

Resource Issues:

Water

2-26-92

WALTER J. HICKEL, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER

400 WILLOUGHBY AVENUE
SUITE 400
JUNEAU, ALASKA 99801
PHONE: (907) 465-3400

February 25, 1992

Dear Legislature:

Attached you will find copies of materials pertaining to the Division of Water (DOW). Included is information concerning the organization of DOW, a description of the division's mission and major program functions that DOW is involved in, a synopsis of Alaska's water resources, and information on how and why DOW was created.

I have also included information on appropriations of water in the state to date which exceed 50 acre feet per year, some commonly asked questions with DOW's answers concerning water management fees, and copies of HB 550 and SB 442 which would establish the state's ability to assess water management fees or provide for the sale of water.

I would be very happy to discuss any of the above enclosed materials and answer any questions you might have. Please do not hesitate to call on me if I can be of assistance. In closing, I am also including a graph of predicted state oil production through the year 2015. I believe you will agree that we have about eight years remaining to change Alaska's dependance on oil revenues as the primary means for financing governmental functions of the state.

Sincerely,



Ric Davidge
Director

Enclosures



THE DIVISION OF WATER

The Alaska Division of Water manages an estimated 40% of our Nation's water resources including over 3 million lakes and an estimated 20,000 streams. These responsibilities include the State Water Policy and 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 five sections; Hydrologic Survey which includes the State Water Lab, Water Management, Policy and Special Projects, Navigability, and Dam Safety and Construction. The Division has offices in Anchorage, Fairbanks, Juneau and Wasilla.

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER

DIRECTOR'S OFFICE

Davidge, R.
Director
EBA 0004 25

ADMINISTRATION

Avery, S.
Admin. Asst. II
EBA 8243 14

SECRETARIAL SUPPORT

Vacant
Secretary I
EBA 8201 10

DAM SAFETY

Cherry, K.
Technical Engr II
EBK 1679 22

HYDROLOGIC SURVEY

Long, W.
Hydrologist V
EBK 2051 22

ADMINISTRATION

Weir, J.
Field Office Asst
EBK 2108 10

SURFACE WATER

Inghram, M.
Hydrologist IV
EBK 2078 20

Carrick, S.
Hydro II
EBK 2145 18

GROUND WATER

Munter, J.
Hydrologist IV
EBK 2144 20

Allely, R.
Hydro II
EBK 2097 16

Patrik, B.
Hydro II
EBK 2095 16

Vacant
Hydro II
EBK 2141 16

COMPUTER SUPPORT

Ireland, R.
Hydrologist III
EBK 2143 18

NORTHERN REGION

Ray, S.
Hydrologist III
JBC 2174 18

Water Lab

Vanden, J.
Chemist II
JBC 2037 16

Vacant
Hydro III
JBC 2056 18

WATER QUALITY

Haurer, M.
Hydrologist III
EBK 2142 18

SOUTHEAST REGION

Holl, R.
Hydrologist I
AMA 2052 14

WATER MANAGEMENT

Prokeach, G.
NRM I
EDA 1315 18

NORTHERN REGION

Kerin, J.
NRM II
JBC 1594 16

SOUTHCENTRAL REGION

Litten, K.
NRM II
EDA 1274 16

Hansen, A.
NRM I
EBA 1377 14

Heems, S.
NRM I
EBA 1633 14

Hot-Su Area
Compton, C.
NRM II
ECP 1272 12

SOUTHEAST REGION

Rader, T.
NRM II
AMA 1809 16

Dunker, J.
NRM I
AMA 1263 14

POLICY & SPECIAL PROJECTS

Orr, D.
NRM I
EDA 1724 18

Long, Simone
CI III
EDA 1718 8

Navigability

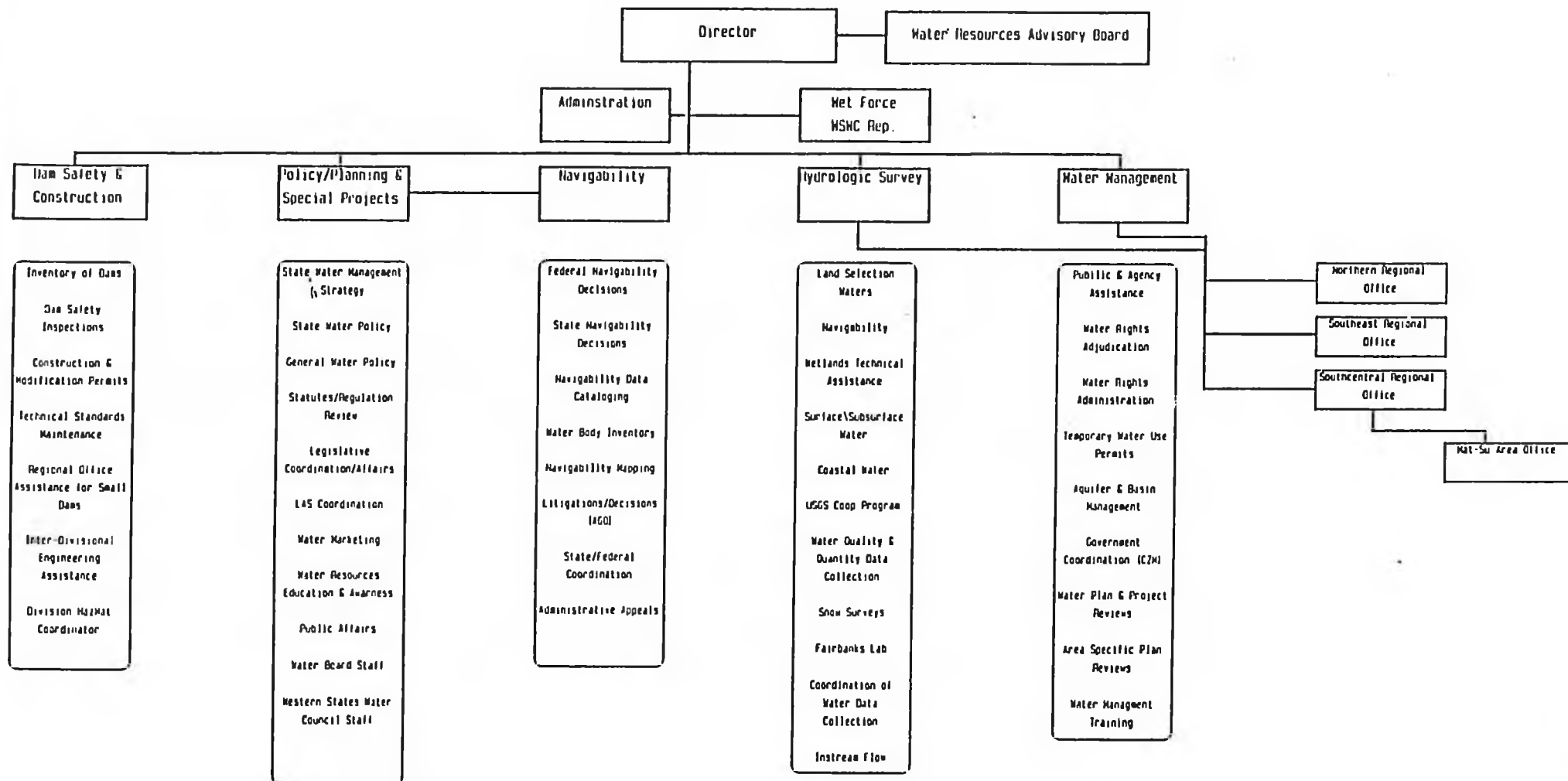
Allison, D.
NRM I
EBA 3063 18

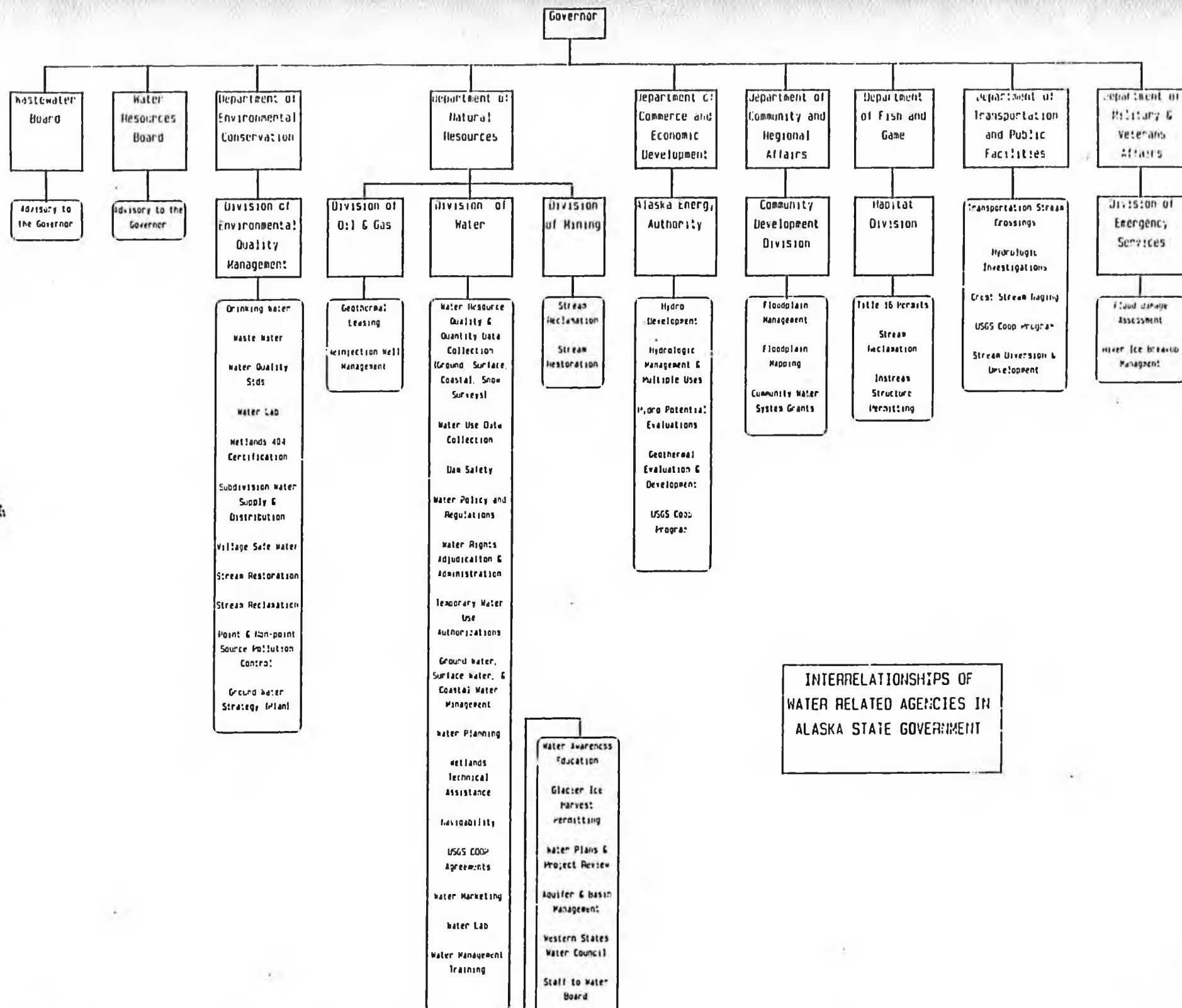
Watts, R.
NRM II
EBA 1692 16

Department of Natural Resources

Division of Water

Program Functions





MEMORANDUM

DEPARTMENT OF NATURAL RESOURCES

STATE OF ALASKA

DIVISION OF MANAGEMENT

TO: Max Hodel
Chief of Staff
Office of the Governor

DATE: June 25, 1991

FILE NO.: Diwater

PHONE NO.: 465-2409

THRU: Shelby Starnby
Director
Office of Management and
Budget

SUBJECT: Establishment of Division
of Water Resources

FROM: Harold C. Heinze
Commissioner

One of the first organizational suggestions I received as Commissioner was to establish a separate Division of Water Resources. Now that I have had time to study this suggestion and consult with affected interests (i.e., Water Resources Board, House Resources Committee, etc.). I am convinced that creation of this division would be in the best interest of the State.

In recent years, water management has become increasingly important to Alaskans. Water availability is critical to our cities and villages, our fisheries, oil and gas production, seafood processing, hydroelectric development, mining, recreation, navigation and a host of other purposes. Maintenance of our water resources and water allocation decisions among user groups is expected to become even more important in the 1990's. A Division of Water will provide the necessary focus and demonstrate our recognition of the importance of this resource and our commitment to responsible management.

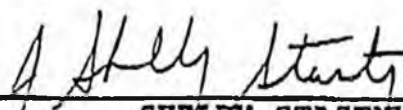
Water resources programs within the Department of Natural Resources currently reside in two divisions -- the Division of Land and Water (DLW) and the Division of Geological and Geophysical Surveys (DGGS). The DLW water programs include the water rights and dam safety projects. Other DLW water responsibilities include serving as staff to the Water Resources Board, representing the State on the Western States Water Council, and water resources planning. The DGGS is responsible for water resources data collection, storage, analysis, and dissemination, and for providing hydrologic assistance to DLW and other government agencies.

The Division of Water Resources would initially consist of 20-25 permanent positions. A new Director position at the Range 26 level will be established. The proposed organizational chart is attached for your approval.

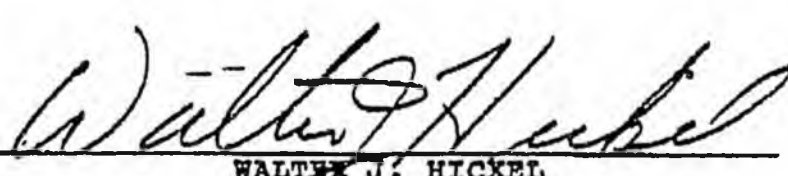
AS 46.15.020(3) specifically authorizes the Commissioner to establish a Division of Water and no new statutes or changes to existing law will be necessary.

Max Hodel
Page 2
June 25, 1991

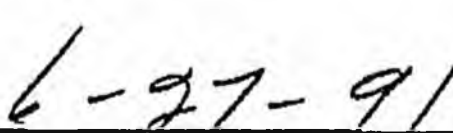
IN ACCORDANCE WITH AB 46.15.020(3), A DIVISION OF WATER IS
ESTABLISHED IN THE DEPARTMENT OF NATURAL RESOURCES AS DESCRIBED
ABOVE, EFFECTIVE ON THE DATE APPROVED.



SHELBY STASTNY
DIRECTOR
OFFICE OF MANAGEMENT AND BUDGET



WALTER J. HICKEL
GOVERNOR

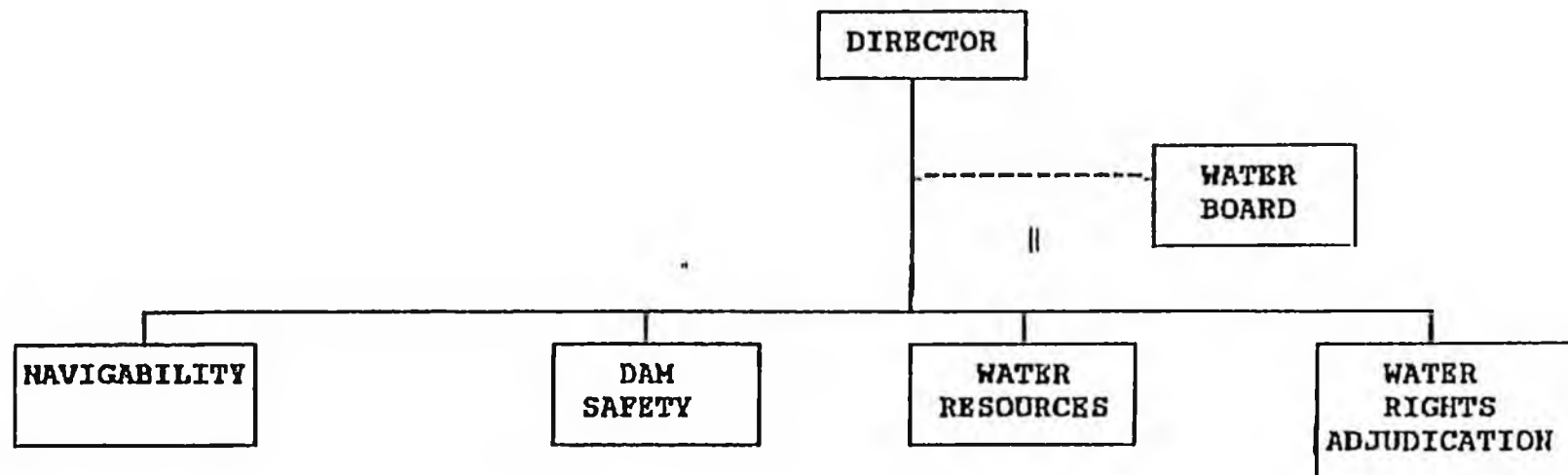


DATE

Attachment

cc: Gary Gustafson, Director, DLW
Tom Smith, Acting Director, DGGS
Sharon Barton, Director, Management

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER



Harold C. Fleming

COMMISSIONER, DEPARTMENT OF NATURAL RESOURCES

Ally Steady

DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

Walter J. Kiebel

GOVERNOR, STATE OF ALASKA

6-27-91

EFFECTIVE DATE

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER
PCN LIST

Division of Geological & Geophysical Surveys

<u>PCN</u>	<u>Title</u>	<u>Name</u>	<u>Location</u>
10-2051	Hydrologist V	Long	Eagle River
10-2144	"	IV Muntar	" "
10-2097	"	II Allely	" "
10-2141	"	II LaSage	" "
10-2095	"	II Petrik	" "
10-2078	"	IV Inghram	" "
10-2145	"	III Carrick	" "
10-2142	"	III Maurer	" "
10-2143	"	III Ireland	" "
10-2174	"	II Ray	Fairbanks
10-2037	Chemist II	Vohden	" "
10-2056	Hydrologist III	Moorman	" "
10-2055	Geologist IV	Motyka	Juneau
10-2052	Hydrologist I	Noll	" "
10-2108	Field Office Assistant	Weir	Eagle River

Division of Land & Water

10-1679	Tech Engineer	K. Cherry	Anchorage
10-1724	Nat Res Mgr I	M. Harle	" "
10-1692	Nat Res Off II	R. Watts	" "
10-1718	Clerk Typ III	P. Reamer	" "

Water Rights Adjudicators

10-1263	Nat Res Off I	Dunkar	Juneau
10-1609	Nat Res Off II	Rader	" "
10-1274	Nat Res Tech	Litzen	Anchorage
10-1377	Nat Res Off I	Monson	" "
10-1272	Nat Res Tech	Compton	Wasilla (1/2 time)
10-1315	Nat Res Mgr I	Prokosch	Anchorage
10-1633	Nat Res Off I	Weeks	" "
10-1524	Nat Res Off II	Karin	Fairbanks

ALASKA

Water Supply and Use

Alaska's water supplies might appear to be unlimited because of the large quantities of precipitation received in the State (fig. 1A). Statewide average annual precipitation is about 1,050,000 Mgal/d (million gallons per day), and average annual runoff is about 989,000 Mgal/d. Alaska contains more than 40 percent of the Nation's surface-water resources. Three rivers (the Yukon, the Kuskokwim, and the Copper) are among the 10 largest in the United States. More than 3 million lakes range in area from pond size to about 1,000 mi² (square miles). Also, large amounts of water are stored within two principal aquifers. Environmental conditions, legal restrictions, and technological problems, however, limit the usability of these abundant supplies.

Alaska encompasses a land area of about 586,000 mi², or about one-fifth of the area of the conterminous United States. Climates range from frozen desert in the Arctic Slope basin to maritime rain forest in the Southeast Alaska basin. Average annual precipitation and temperatures range from about 5 inches and 10° F (degrees Fahrenheit) in the Arctic Slope basin to about 300 inches and 45° F in the Southeast Alaska basin. Much precipitation occurs as snow. Glaciers and icefields cover 28,500 mi², or nearly 5 percent of the land (Post and Mayo, 1971) and affect the timing and the quantity of runoff. Many of the rivers are silt laden, are affected by mid-winter overflow icing or ice-jam flooding at spring breakup, or are ice covered much of the year. The occurrence and the availability of ground water are limited by permafrost. The extent and thickness of the permafrost decrease southward from a continuous layer as much as several hundred feet thick in the Arctic Slope basin to areas

that are generally free of permafrost in the South Central Alaska and the Southeast Alaska basins. Because of these conditions, there is no certainty that either surface or ground water will be available at a given time and location.

Several water issues in Alaska result from this variability in the availability and occurrence of the water resource. Additionally, the legal precedents for obtaining water rights cause conflicts. Com-

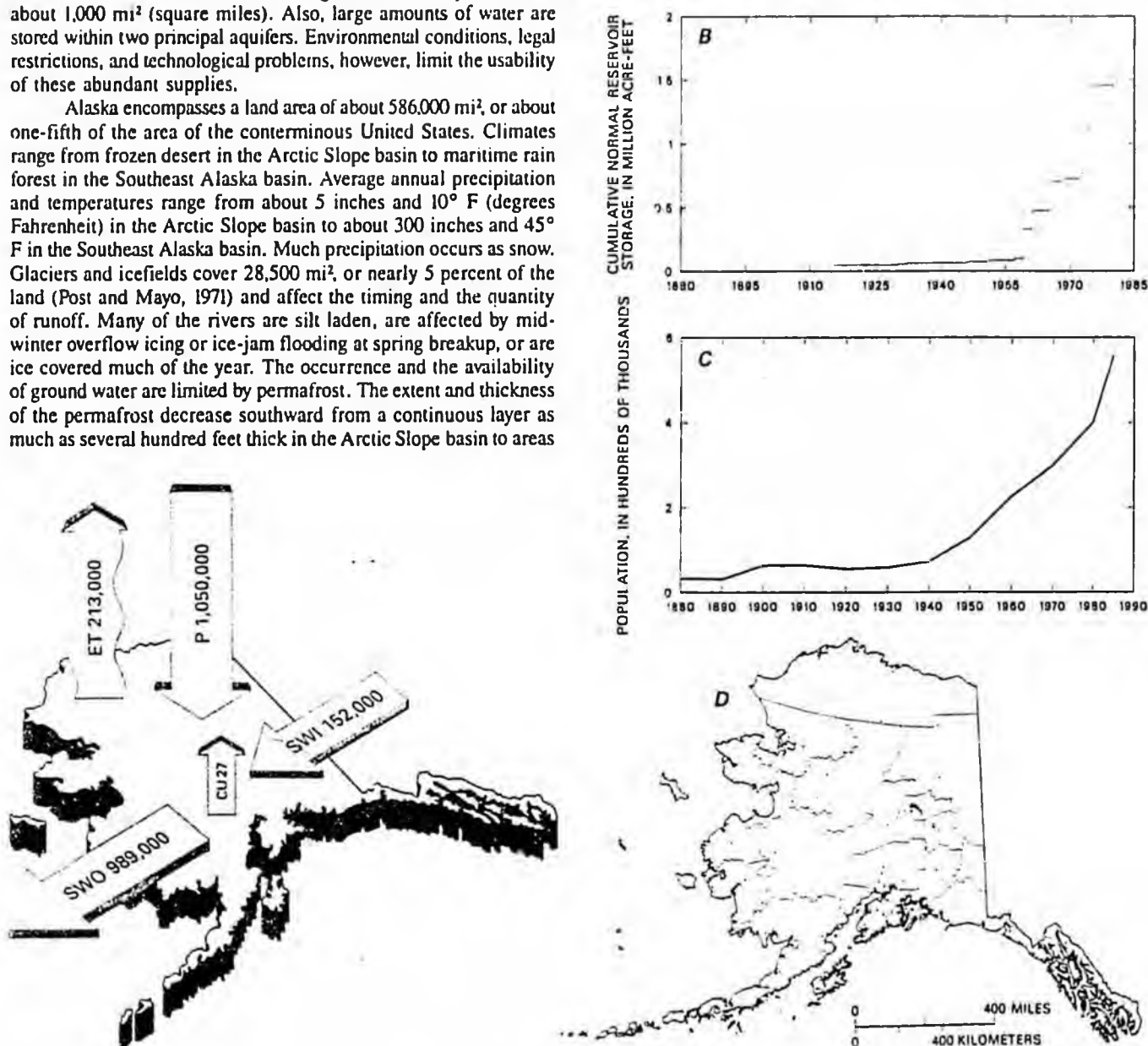


Figure 1. Water supply and population in Alaska. A, Water budget, in million gallons per day. B, Cumulative normal storage of reservoirs with at least 5,000 acre-feet capacity, 1880 to 1985. C, Population trend, 1880 to 1985. D, Population distribution, 1985; each dot on the map represents 1,000 people within a census tract. Abbreviations: CU, consumptive use; ET, evapotranspiration; P, precipitation; SWI, surface-water inflow; SWO, surface-water outflow (Sources: A, R.D. Lamke (U.S. Geological Survey, written commun., 1995). B, U.S. Army Corps of Engineers, 1981. C, D, Compiled by U.S. Geological Survey from U.S. Bureau of the Census data.)

petition for limited surface-water resources exists among industry, fish hatcheries, recreation, and fish and wildlife habitat demands. Ground-water-rights issues primarily involve public supply in basins where surface water is scarce. Currently (1987), the Arctic Slope, the South Central Alaska, and the Southeast Alaska basins are the focus of these issues.

HISTORY OF WATER DEVELOPMENT

In 1914, the first large reservoir was constructed to provide power for the mining and the timber industries in the Southeast Alaska basin. Since then, 19 additional reservoirs that have storage capacities greater than 5,000 acre-ft (acre-feet) have been built for electric power generation and public supplies. Of these 20 reservoirs, 13 are in the Southeast Alaska basin, 6 are in the South Central Alaska basin, and 1 is in the Yukon basin. These reservoirs contain a cumulative capacity of about 1.78 million acre-ft (fig. 1B).

The first significant increase of Alaska's population occurred during the gold rushes of the late 1800's (fig. 1C). Postwar migration and homesteading increased the population during the late 1940's and 1950's. Population growth during the 1960's and 1970's can be attributed to the development of oil fields in Cook Inlet and at Prudhoe Bay and the related pipeline-construction activities. The continued rapid population growth of the early 1980's can be attributed to the general economic well-being that oil production brought to the State. The population reached 558,000 in 1985; 77 percent of the inhabitants live within 5 of the 28 census districts, or county equivalents (fig. 1D). Anchorage contained 44 percent of the State's population; the next largest concentrations of population were in Fairbanks (13 percent), Kenai (8 percent), Matanuska-Susitna (7 percent), and Juneau (5 percent).

Interest in Alaska's water supplies began during the gold rushes of the late 1800's; miners washed the placer deposits to extract the gold. The population growth and the corresponding urban development, especially after 1940, placed increasing emphasis on water supply. Increasing needs for water supplies for power in the Southeast Alaska and the South Central Alaska basins, for the pulp and paper industry in the Southeast Alaska basin, and for the canneries in the Southeast Alaska and Southwest Alaska basins created demands for water-resource information. Intensive development of other natural resources began during the 1960's and continued through the 1970's. Water was critical to support the oil fields in the Arctic Slope basin and the petrochemical, the seafood, and the timber production industries in the South Central Alaska and the Southeast Alaska basins. Continued population growth, especially in the South Central Alaska basin, increased the demand for public supplies; ground water became a major source of supply. Maintaining instream flows became an issue during the late 1970's, and that concern has increased during the 1980's. Instream flow for hydroelectric power generation and fish hatcheries is an additional water issue today.

WATER USE

The State's water budget is shown diagrammatically in figure 1A. Several natural conditions limit the quantity of freshwater that can be recovered efficiently from Alaska's hydrologic environment; for example, the availability of surface water may be affected by the timing of winter freezeup and spring breakup and by the quantity and the timing of runoff derived from melting snow and glacier ice. The availability of ground water is limited by thick lenses and layers of relatively impermeable sediments and by the limited extent of coarse-grained permeable sediments. In permafrost zones, even coarse-grained sediments may be frozen. Thus, although a substantial quantity of water may be present within the State, the water may not be available when and where it is needed.

Hydroelectric powerplants used 1,480 Mgal/d to generate 18 percent, or 746 GWh (gigawatt-hours), of the electricity used statewide. About 90 percent of this power was generated in the Southeast Alaska basin. The water was used instream, and no water was considered for consumptive use.

Surface-water withdrawals supplied 82.2 percent of the water needed for offstream uses; ground water provided the remaining 17.8 percent. These values were determined by using the results of a cooperative survey conducted by the Alaska Department of Natural Resources and the U.S. Geological Survey in 1985, in which communities and industries estimated their water use. Where quantities of water use were not available, such data were estimated on the basis of similarities between communities and uses. The statewide distribution of total, surface-water and ground-water withdrawals is aggregated by county in figures 2A, 2B, and 2C, respectively. Surface-water withdrawals by principal drainage basin and ground-water withdrawals by principal aquifer are shown in figures 3A and 3B, respectively. Aquifers have been grouped informally into unconsolidated alluvium and glacial outwash aquifers and bedrock aquifers (U.S. Geological Survey, 1985, p. 129-131). Major ground-water withdrawals were from the unconsolidated aquifers.

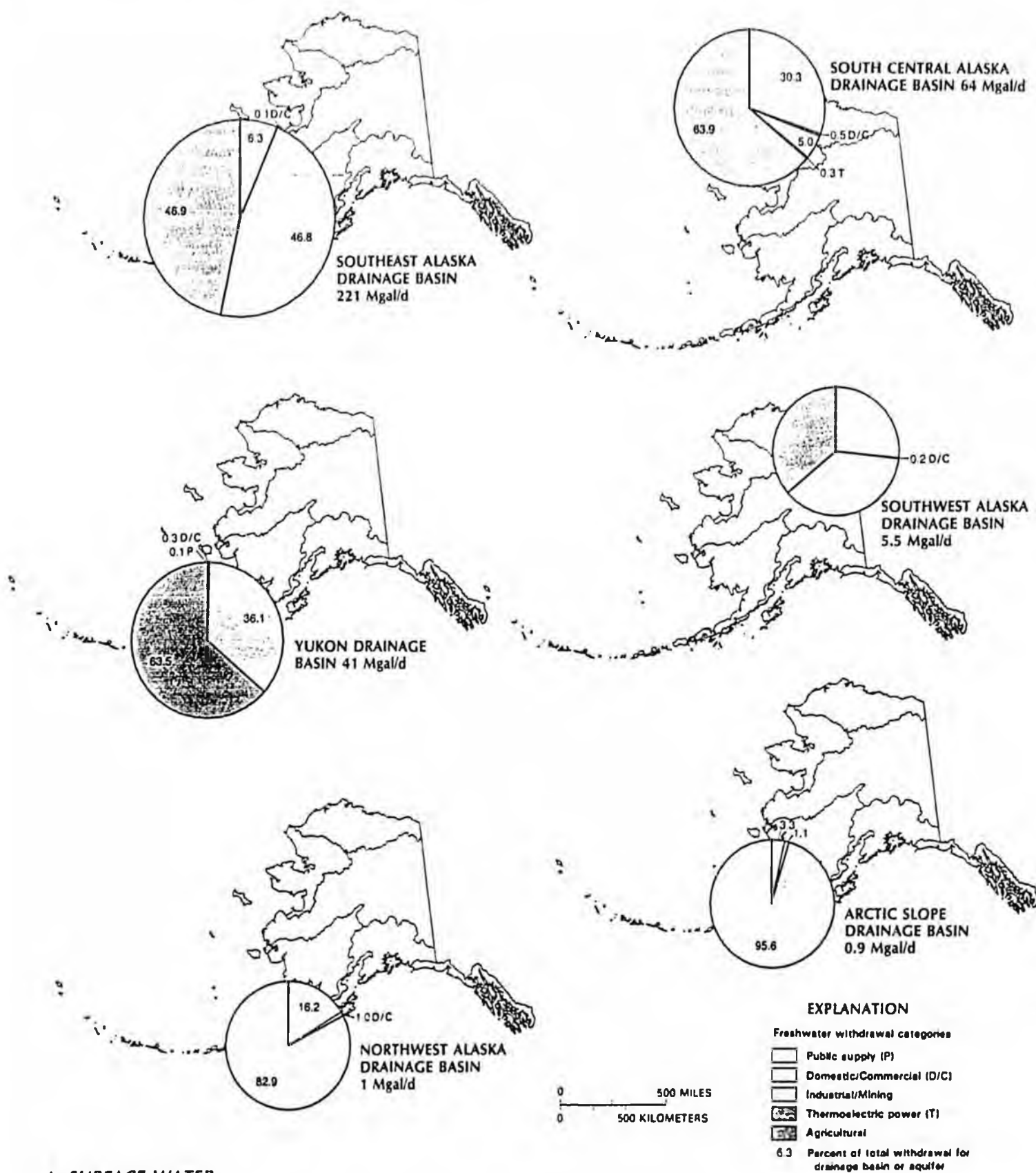
Most withdrawals occur in three of the principal river basins—Southeast Alaska, South Central Alaska, and Yukon (fig. 3A). Withdrawals in the Southeast Alaska basin were 55 percent (221 Mgal/d) of total water use in Alaska. About 99 percent of these withdrawals was surface water. Industry and fish hatcheries were the primary users of this water. In contrast, the South Central Alaska basin accounted for about 27 percent (110 Mgal/d) of the total withdrawals during 1985. This basin withdrew about 64 percent (64 Mgal/d) of the total ground water during 1985. The large withdrawals for public supply and self-supplied domestic uses provide water to the comparatively large population of the area. Public supply, self-supplied domestic, and industry were the major water users. The Yukon basin accounted for 15 percent (41 Mgal/d) of the total withdrawals. Water used for mining and fossil-fueled powerplants was 74 percent of the 61 Mgal/d withdrawn in the Yukon basin. Surface water was used for nearly two-thirds of this quantity.

The remaining basins, the Arctic Slope, the Southwest Alaska, and the Northwest Alaska, included 8 percent of the population and used 3 percent of the total water. Public supply and self-supplied domestic and commercial uses accounted for 61.9 percent of the ground-water withdrawals within the Yukon basin.

The source, use, and disposition of Alaska's water resources are shown diagrammatically in figure 4. The quantities of water given in this figure and elsewhere in this report may not add to the totals indicated because of independent rounding. The source data indicate that total freshwater withdrawals were 406 Mgal/d, of which 334 Mgal/d was surface water and 72 Mgal/d was ground water. The use data indicate that, of total freshwater use, industry and mining accounted for 34.7 percent and agriculture accounted for 38.6 percent. The disposition data indicate that most water (93.3 percent) was returned to natural sources and was available for reuse. Estimated consumptive use was 6.7 percent (27 Mgal/d).

Alaska's water is generally of sufficient quantity and acceptable quality for most uses. However, population increases during the last decade, especially in urban areas, have strained water-distribution systems and generated concern about water availability. In Anchorage, a measurable decline in ground-water levels has been attributed to increased withdrawals. Saltwater intrusion has halted further ground-water development in Auke Bay, near Juneau. In Kenai and in the Arctic Slope basin, water supply is a concern to communities near petrochemical industry activities.

Surface- and ground-water quality problems have been caused either by natural processes or by human activities. Natural processes include suspended sediment caused by glaciers, salinity, and undesirable concentrations of iron or arsenic produced by geo-



A. SURFACE WATER

Figure 3. Freshwater withdrawals by category of use and hydrologic unit in Alaska, 1985. *A.* Surface-water withdrawals by principal drainage basin. *B.* Ground-water withdrawals by principal aquifer. Abbreviation: Mgal/d is million gallons per day. (Sources: *A.* Drainage basins from Seaber and others, 1987; data from U.S. Geological Survey National Water Data Storage and Retrieval System. *B.* Data from U.S. Geological Survey files.)

chemical processes. Human activities include petrochemical contamination, the addition of nitrates through septic-tank systems, and the encroachment of saltwater in response to intensive ground-water withdrawal. Nevertheless, even in areas of water-supply difficulties, Alaska's water is generally satisfactory for most uses, although locally it may not be readily obtainable from the nearest or most economical source.

PUBLIC SUPPLY

Public-supply systems withdraw, treat, and distribute water to users. The total withdrawals for public-supply in Alaska were an estimated 76 Mgal/d (fig. 4), which was 18.7 percent of total withdrawals in 1985. Surface water provided 46.2 percent (35

Mgal/d) of public-supply withdrawals, and ground water provided 53.8 percent (41 Mgal/d). Of total withdrawals for public supply, 40.3 percent was delivered for commercial use, and 39.0 percent was delivered for domestic use. About 60 percent (45 Mgal/d) of public-supplied water was delivered in the South Central Alaska basin.

About 62 percent of Alaska's population was served by public water suppliers in 1985. The Municipality of Anchorage supplied water to one-half of the population served by public-supply systems. The per capita use by all public-supply customers ranged from 10 to 380 gal/d (gallons per day) in 1985. Public-supplied domestic use ranged from 6 to 170 gal/d per capita. These values reflect the different types of water-distribution systems; for example, a public-supply system in the Arctic Slope basin may consist of a water-

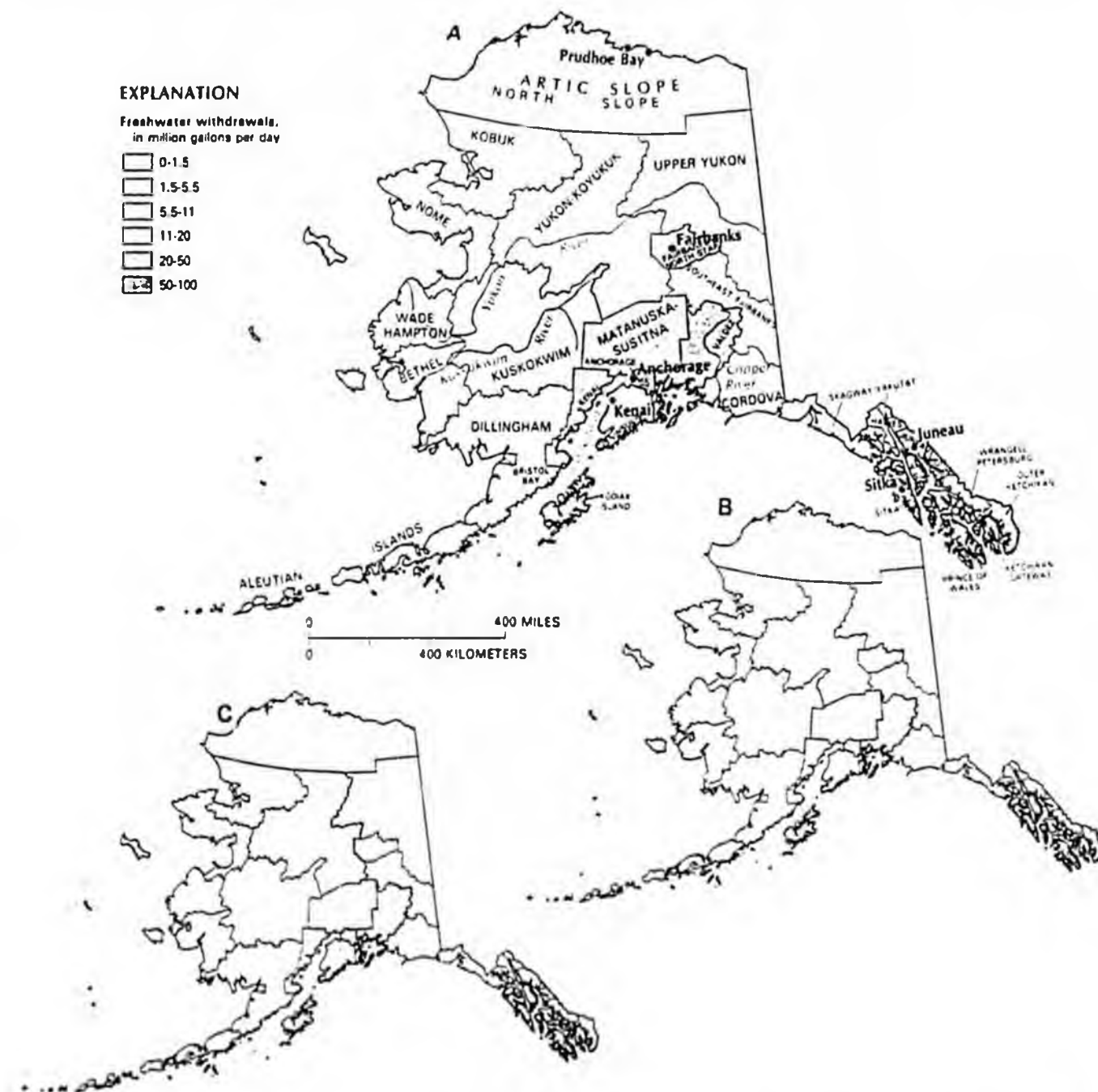


Figure 2. Freshwater withdrawals by county in Alaska, 1985. A. Total withdrawals B. Surface-water withdrawals C. Ground-water withdrawals. (Source: Data from U.S. Geological Survey National Water Data Storage and Retrieval System)

delivery truck or a common well, and the primary use is domestic. In contrast, water in the Southeast Alaska basin is abundant, and distribution systems commonly are leaky; residents commonly leave their faucets running to prevent the pipes from freezing. In addition, water-intensive industries in the Southeast Alaska basin are served by public supply.

DOMESTIC AND COMMERCIAL

Total domestic and commercial water use, including conveyance losses and consumptive use, from public-supplied and self-supplied sources was 78 Mgal/d (fig. 4). Domestic use was about 39 Mgal/d, of which 29 Mgal/d was delivered by public-supply systems and 10 Mgal/d was self-supplied. Commercial withdrawals were about 31 Mgal/d, virtually all from public-supply sources. Conveyance losses were 7.6 Mgal/d.

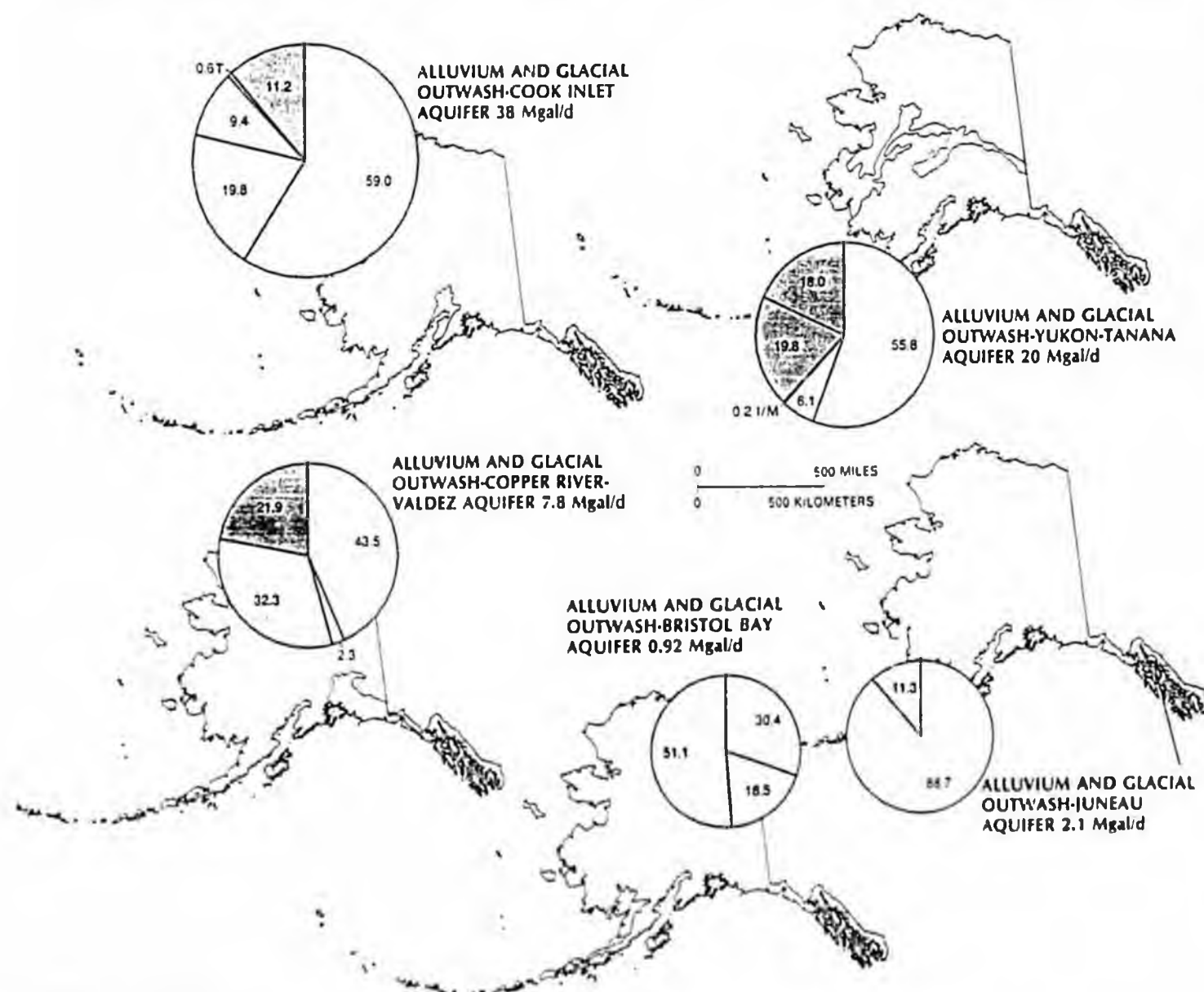
The average per capita domestic use for the population served by public supply was about twice that for the population that was self-supplied. This difference can be explained, in part, by conditions under which water is delivered to homes that use these two

types of supply. Public-supply systems typically serve a household that has standard plumbing. In contrast, many self-supplied households haul water from a lake, spring, river, or well and may have no plumbing.

INDUSTRIAL AND MINING

The estimated industrial and mining use was 141 Mgal/d in 1985. This represents 34.7 percent of total offshore water use (fig. 4). Industry used about 122 Mgal/d, of which 87 percent was self-supplied from surface-water sources. About 89 percent of the industrial water use was in the Southeast Alaska basin. Wood-pulp mills and seafood-processing industries in this basin used more than 100 Mgal/d in 1985. The petroleum industry was a major water user in the South Central basin.

Mining accounted for about 19 Mgal/d of water use. The Yukon basin had the largest area of mining activity and accounted for 76 percent of this water use. Adequate water supplies to support the exploration, development, and production in the Arctic Slope



B. GROUND WATER

Figure 3. Freshwater withdrawals by category of use and hydrologic unit in Alaska, 1985—Continued.

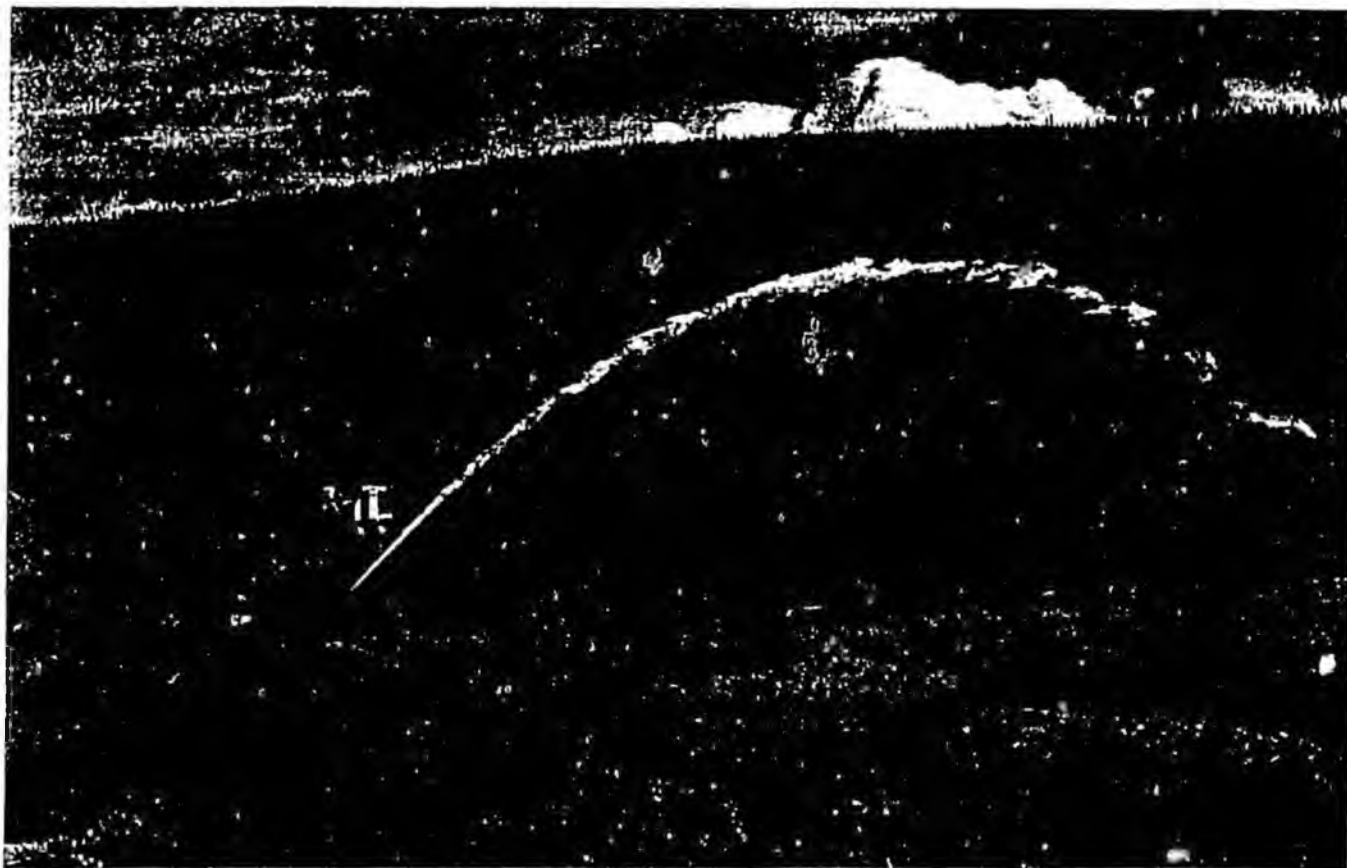
Figure 4. Source, use, and disposition of an estimated 406 Mgal/d (million gallons per day) of freshwater in Alaska, 1985. Conveyance losses in public-supply distribution systems and some public water uses, such as fire fighting, are included in the total shown for domestic and commercial use; losses in irrigation distribution systems are included in the total shown for agricultural return flow. All numbers have been rounded and values may not add to totals. Percentages are rounded to the nearest one-tenth of 1 percent (0.1%) between 0.1 and 99.9 percent. (Source: Data from U.S. Geological Survey National Water Data Storage and Retrieval System.)

Although few streams in Alaska are overappropriated, potential water-use problems exist. In the event of water shortages or drought, Ship Creek at Anchorage and Indian River at Sitka could possibly be examples in which the amount of legally obtainable water may exceed the water available for use. Water issues in Alaska also include hydroelectric projects, placer mining, oil development, salmon aquaculture, and proposed mining developments in the Southeast Alaska basin.

Most ground-water shortages in Alaska currently involve water for public supply and domestic use. Some areas within the Municipality of Anchorage are experiencing great ground-water demand for public and single-family domestic water supplies. As water levels declined, domestic wells become dry. The ADNR and Municipality of Anchorage are working cooperatively to solve several water-supply and distribution problems. Another area experiencing declining ground-water levels and saltwater intrusion is the Auke Bay area near Juneau (Dearborn, 1985), where the ADNR established Alaska's first "Critical Groundwater Management Area" to restrict further water-well drilling and development of ground water.

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Hydraulic "giant" used to remove overburden and expose gold-bearing gravel north of Fairbanks, Alaska. (Photograph by Gary Prokosch, Alaska Department of Natural Resources.)

Prepared by Leslie D. Patrick and Elisabeth F. Snyder, U.S. Geological Survey, and Mary Lu Harle, Alaska Department of Natural Resources

FOR ADDITIONAL INFORMATION: District Chief, U.S. Geological Survey, 4230 University Drive, Anchorage, AK 99508-4664

WATER APPROPRIATIONS 50 ACRE-FT. PER YEAR OR GREATER			
Type of Use	No. of Large Users	Ave. Acre-Ft Per User	Total Acre-Ft per Year
Cash Grains	2	405	810
Potatoes	1	100	100
Field Crops	12	145	1744
Farms-general	31	1584	49099
Animals-noncommercial	1	123	123
Lawn and Garden	5	266	1331
FinFish Fishing	1	5000	5000
Fish Hatcheries	79	4478	353736
Lode Gold	11	861	9472
Placer Gold	896	2130	1908270
Molybdenum Mining	1	1447	1447
Metal Mining	5	678	3389
Coal Mining	1	281	281
Crude Petroleum	2	1253	2505
Sand and Gravel	1	539	539
Aggregate Wash	2	328	657
Highway Construction	2	1202	2403
Frt. Trucking Terminal	1	484	484
Meat Packing	2	1086	2171
Seafood Canned	8	2874	22993
Seafood Fresh	1	81	81
Pulp Mills	1	5415	5415
Urea and Fertilizer	4	1149	4597
Petroleum Refining	1	855	855
Electric Power Generation	21	81983	1721650
Hydro Power Generation	72	35577	2561528
Public Supply	42	6531	274303
Sanitary and Waste	1	1954	1954
Steam Supply	3	67	202
Construction Material Whsl.	1	4000	4000
Office Building	1	61	61
Golf Course	2	60	120
Rec. Services	6	519	3115
Colleges	2	175	351
Wildlife Conservation	43	227537	9784083
Total	1265		16728869

* Does not include applications accepted, and pending.

WATER MANAGEMENT FEES

WHY A WATER MANAGEMENT FEE ?

The State of Alaska is considering a water management fee for a number of reasons, not the least being a method for the state to recover the cost of managing Alaska's water resources from the users of that resource. A water management fee has a few other benefits that the Department feels make the overall management fee proposal a complete management package. The management fee concept in addition to management cost recovery, promotes the idea that water is a valuable natural resource that is required by all Alaskans to fulfill their basic needs, such as for drinking and bathing, but is also used for the generation of power (hydroelectric, natural gas and oil), food (agriculture, seafood and other processing), timber, other petroleum products, mining, and many other products and services used on a day-to-day basis. These same water resources are used in their natural state to protect fish and wildlife and their habitat, recreation, transportation and water quality. The management fee concept may also promote water conservation. There are a number of studies that show, as the cost of water increases, the use of water decreases. The management of Alaska's water resource will also benefit the state's water rights program by providing the opportunity to update many of its water right files by eliminating those water rights no longer in use or by decreasing those water rights where the total quantity of water is no longer being used. The holders of these water rights will let the Department of Natural Resources know when they stopped using water or are using less water than what was originally granted to them when they receive their management fee notice each year. The updating of the water rights system will help the water manager better understand the water use requirements for specific commercial and industrial water users, sources of water in specific areas, where water is used and what it's used for.

WHO PAYS ?

Individuals and commercial and/or industrial businesses who use Alaska's water resources. In reality, it's not cost effective or feasible to charge all water users a fee. It has been estimated to cost the state \$50.00 to send and receipt a bill, so the lower limit of a management fee would have to be \$50.00. If the management fee is set at \$1.00 per acre foot of water used, no water user using less than 50 acre feet per year would be charged. 50 acre feet of water is equal to about 44,600 gallons of water per day. The homeowner using an individual water system (well, stream, or lake), most small businesses, community water systems (serving less than 90 homes), and placer miners using a suction dredge smaller than 6 inches would not be subject to a management fee. The larger water users (50 acre feet per year or more) would be subject to the management fee. These could include commercial and industrial businesses, seafood processors, public water supply, agriculture, mining, pulp mills, oil and gas development, oil and gas processing and other large water users.

WOULD THE AVERAGE HOMEOWNER BE AFFECTED BY THE MANAGEMENT FEE

No, a homeowner using a well, spring, stream or lake for his water supply would not be affected by the management fee. The management fee would only apply to those water users using a quantity of water equal to or greater than 50 acre feet of water per year. A typical single family home uses about 500 gallons of water per day or 0.6 acre feet per year.

WHAT WILL THE FEES BE USED FOR ?

Our State Constitution does not allow the revenue generated from the management fee to be dedicated for a specific purpose. The Department of Natural Resources would account for these revenues under a separate accounting system and would request the legislature to appropriate these revenues each year to the Department for the purpose of managing the state's water resources. The yearly revenues would be used to collect, analyze and distribute water resource data, administer the water rights program, water resource planning, enforcement and compliance, and public education. Any revenues generated in excess of those necessary for management purposes can be used to strengthen the state's stream gaging network, establishment of instream flow reservations, and to provide funds to improve or construct remote water systems for towns and villages.

HOW MUCH REVENUE CAN BE GENERATED ?

Currently there are about 12,000 active water right files in the state. Those water users with a Permit to Appropriate Water or a Certificate of Appropriation would be subject to management fees if their use of water is 50 acre feet per year or more. Of the 12,000 active files less than 1265 use a quantity of water equal to or greater than 50 acre feet per year. The quantity of water associated with these 1400 water right files is about 16,720,000 acre feet per year. The largest single category of water user, if you include pending water right applications, is for fish and wildlife conservation. There are 43 files in this category with a total quantity of 9,780,000 acre feet or 58% of the total quantity associated with the 1265 water right files. The water in this category is proposed for use, or is used, for instream flow reservations, fish ladders, and habitat enhancement projects. Of the 43 water rights in this category, 42 belong to the Alaska Department of Fish and Game. It is the intent of the department to exempt state agencies and non-profit organizations from the management fee. If the water used by these exempted agencies and organizations are subtracted from the total quantity of water (16,720,000 acre feet), the quantity subject to management fees would total 3,400,000 acre feet. Assuming the management fee was set at \$1.00 per acre foot per year, the revenues generated could total as much as 3.4 million dollars a year. As the state grows and water appropriations increase accordingly, the revenues would also increase.

NOTE: These revenue figures are subject to the review and updating of the estimated 1265 water right files in which water use of 50 acre feet a year or more is on record.

WATER APPROPRIATIONS 50 ACRE-FT. PER YEAR OR GREATER			
Type of Use	No. of Large Users	Ave. Acre-Ft Per User	Total Acre-Ft per Year
Cash Grains	2	405	810
Potatoes	1	100	100
Field Crops	12	145	1744
Farms-general	31	1584	49099
Animals-noncommercial	1	123	123
Lawn and Garden	5	266	1331
FinFish Fishing	1	5000	5000
Fish Hatcheries	79	4478	353736
Lode Gold	11	861	9472
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Rec. Services	6	519	3115
Colleges	2	175	351
Wildlife Conservation	43	227537	9784083
Total	1265		16728869

* Does not include applications accepted, and pending.

HOUSE BILL NO. 550

IN THE LEGISLATURE OF THE STATE OF ALASKA

SEVENTEENTH LEGISLATURE - SECOND SESSION

BY THE HOUSE RULES COMMITTEE BY REQUEST OF THE GOVERNOR

Introduced: 2/19/92

Referred: Labor & Commerce, Resources, Finance

A BILL

FOR AN ACT ENTITLED

1 "An Act relating to the authority of the commissioner of the Department of Natural
2 Resources to establish water use fees or provide for the sale of water resources; and
3 providing for an effective date."

4 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

5 * Section 1. AS 46.15.020(a) is amended to read:

6 (a) The commissioner shall exercise all those powers and do all those acts necessary to
7 carry out the provisions and objectives of this chapter. The commissioner may

8 (1) subject to AS 36.30 (State Procurement Code), enter into contractual
9 agreements necessary to carry out the provisions of this chapter including agreements with
10 federal, state, and local agencies;

11 (2) apply for, accept, administer, and expend grants, gifts, and loans from the
12 federal government and any other public or private sources for the purposes of this chapter, and
13 adopt procedures and do acts not otherwise restricted by law which are necessary to qualify the
14 state to receive grants, gifts, and loans;

1 (3) establish a division of water in the Department of Natural Resources and
2 assign to that division the responsibility for carrying out the provisions of this chapter;

3 (4) notwithstanding any other provision of law, establish, by regulation, in
4 appropriate circumstances, a water use fee or provide for the sale of water resources.

5 * Sec. 2. This Act takes effect immediately under AS 01.10.070(c).

SENATE BILL NO. 442

IN THE LEGISLATURE OF THE STATE OF ALASKA

SEVENTEENTH LEGISLATURE - SECOND SESSION

BY THE SENATE RULES COMMITTEE BY REQUEST OF THE GOVERNOR

Introduced: 2/19/92
Referred: Resources, FSH, Finance

A BILL

FOR AN ACT ENTITLED

1 "An Act relating to the authority of the commissioner of the Department of Natural
2 Resources to establish water use fees or provide for the sale of water resources; and
3 providing for an effective date."

4 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

5 * Section 1. AS 46.15.020(a) is amended to read:

6 (a) The commissioner shall exercise all those powers and do all those acts necessary to
7 carry out the provisions and objectives of this chapter. The commissioner may

8 (1) subject to AS 36.30 (State Procurement Code), enter into contractual
9 agreements necessary to carry out the provisions of this chapter including agreements with
10 federal, state, and local agencies;

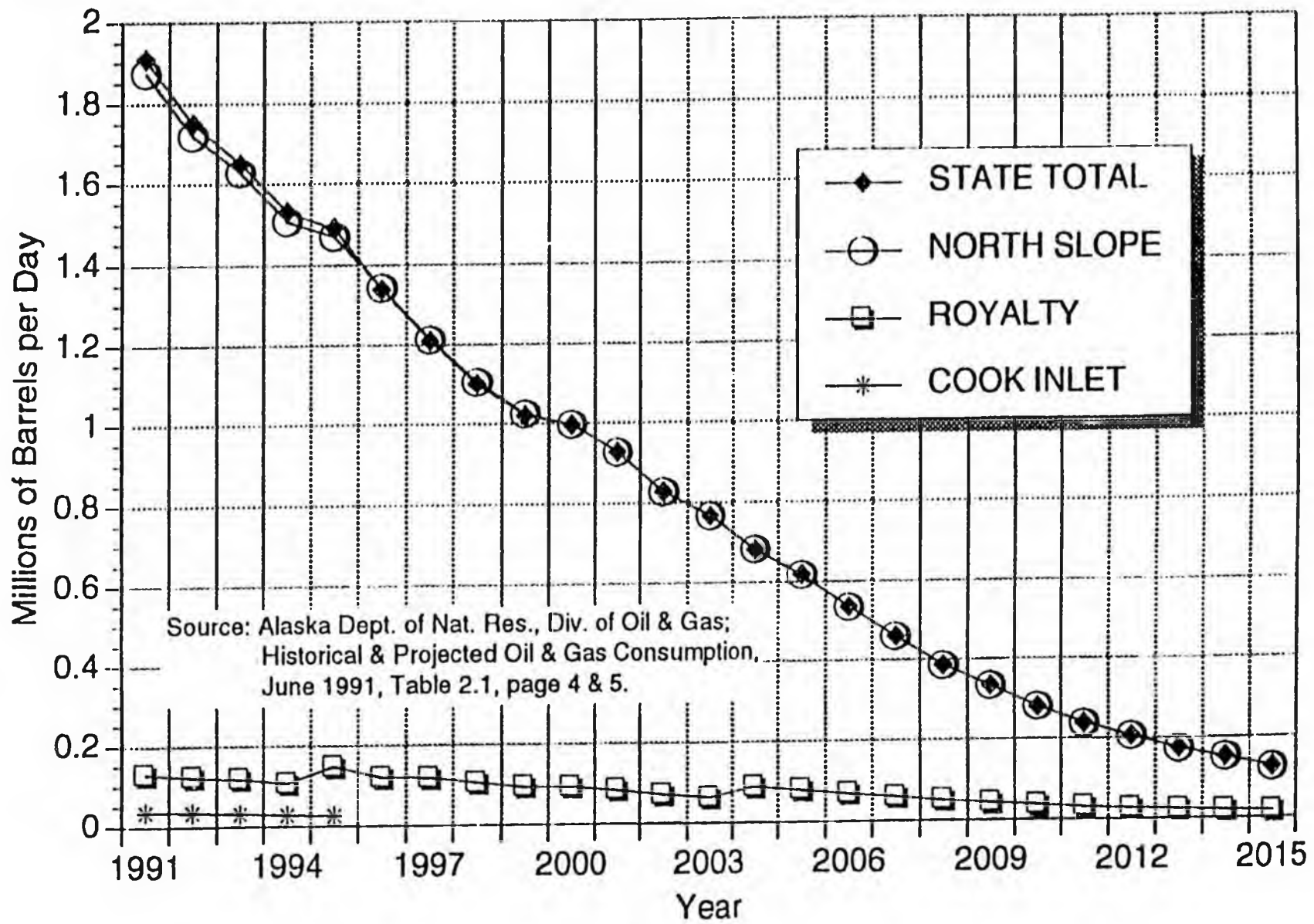
11 (2) apply for, accept, administer, and expend grants, gifts, and loans from the
12 federal government and any other public or private sources for the purposes of this chapter, and
13 adopt procedures and do acts not otherwise restricted by law which are necessary to qualify the
14 state to receive grants, gifts, and loans;

1 (3) establish a division of water in the Department of Natural Resources and
2 assign to that division the responsibility for carrying out the provisions of this chapter;

3 (4) notwithstanding any other provision of law, establish, by regulation, in
4 appropriate circumstances, a water use fee or provide for the sale of water resources.

5 * Sec. 2. This Act takes effect immediately under AS 01.10.070(c).

Figure 4. Predicted State Oil Production



Alaska Water Resources Board

Established pursuant to AS 46.15.190-240

February 1992

Stosh Anderson
Acting Chairman
P.O. Box 310
Kodiak, AK 99615
Home: 486-3673
Term ends: 2/21/93
Occupation: Commercial
Fisherman

Alan "Mike" Neimeyer
601 West Fifth Avenue, Suite 200
Anchorage, AK 99501
Work: 279-5516
Home: 272-3948
Term ends: 2/21/93
Occupation: Land Analyst-
Calista

Wayne Westberg
P.O. Box 110378
Anchorage, AK 99511
Office: 345-4000
Term ends: 2/21/93
Occupation: Well driller

Anthony F. Williams
9029 Rosedale Street
Juneau, AK 99801
Work: 463-5756
Home: 789-2301
Term ends: 2/21/93
Occupation: Miner

John A. Sander
Commissioner
Department of Environmental
Conservation
Box O
Juneau, AK 99811-1800
Office: 465-2600
(ex-officio member)

J. David Norton
Alyeska Pipeline Serv. Co.
1835 S. Bragaw, Mail Stop 530
Anchorage, AK 99512
Work: 265-8179
Home: 276-2530
Term ends: 2/21/95
Occupation: Project Manager
Design & Construction

Jenifer McBeath
1777 Redfox Drive
Fairbanks AK 99709
Work: 474-7431
Home: 479-2870
Term Ends: 2/21/94
Occupation: Researcher &
Univ. Prof.

Keith E. Tryck
P.O. Box 310
Girdwood, AK 99587
Work: 277-2204
Home: 783-2666
Term ends: 2/21/95
Occupation: Miner

Harold C. Heinze
Commissioner
Department of Natural Resources
400 Willoughby Avenue
Juneau, AK 99801
Office: 465-2400
(executive secretary)

ALASKA WATER RESOURCES BOARD

Resolution 92-1

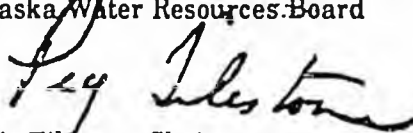
Arctic National Wildlife Refuge Task Force

- WHEREAS:** In Resolution 91-5 the Alaska Water Resources Board recommended that the State fund water data collection program for ANWR; and
- WHEREAS:** The State has a request for funding of this program from the Division of Water, Alaska Department of Natural Resources; and
- WHEREAS:** The Kenai Groundwater Task Force has been very successful in establishing the cooperative efforts of state agencies, federal agencies and private industry in pursuing a similar project; and
- WHEREAS:** The ANWR Water Data Collection effort would lend itself very well to the same type of joint effort; and
- WHEREAS:** It would be beneficial and important for industry to participate as an indication of its commitment to environmentally sound and orderly development of ANWR.

NOW THEREFORE BE IT RESOLVED:

The Alaska Water Resources Board recommends that the administration invite industry to participate in a cooperative effort on ANWR ground water data collection.

Adopted this 7th day of November, 1991
Alaska Water Resources Board


Peg Tileston, Chairwoman
Alaska Water Resources Board

ALASKA WATER RESOURCES BOARD

Resolution 92-2

Division of Water Funding

- WHEREAS: The Alaska Water Resources Board congratulated Governor Hickel and Commissioner Heinze for their decision to finally establish a Division of Water; and
- WHEREAS: The creation of the Division of Water culminates years of effort by this Board and many others; and
- WHEREAS: The creation of the Division of Water did transfer funds existing appropriations to properly fund the new division; and
- WHEREAS: The Division of Water, although in its infancy, has already identified a significant new revenue source to the state through a water use fee; and
- WHEREAS: Sufficient funds for Fiscal Year 92 are necessary to provide the Fiscal Year 92 base for the Division of Water.

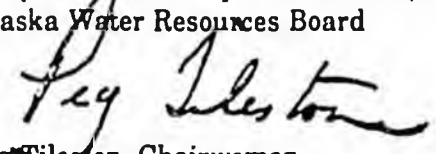
THEREFORE BE IT RESOLVED:

That the Alaska Water Resources Board urges the Commissioner to allocate funds to the Division of Water which represent Fiscal Year 92 appropriations intended for water programs; and

FURTHER BE IT RESOLVED:

That the Alaska Water Resources Board calls upon the Governor and the Commissioner to modify the Fiscal Year budget to reflect the above mentioned changes.

Adopted this 7th day of November, 1991
Alaska Water Resources Board


Peg Tilton, Chairwoman
Alaska Water Resources Board

ALASKA WATER RESOURCES BOARD

Resolution 92-3

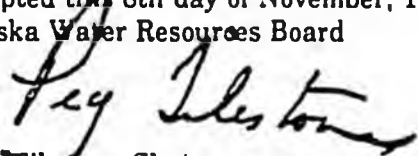
Ballast Treatment for Water Transport Tankers

- WHEREAS:** The export of water by marine tanker has been authorized by ADNR and there are pending applications of further permits; and
- WHEREAS:** The use of large marine tankers used for water transportation is a developing industry and the associated terminal facilities have not been constructed;
- WHEREAS:** The public process for ballast water discharge of water tankers has not been established.

NOW THEREFORE BE IT RESOLVED:

The Alaska Water Resources Board request that a public review process be established and implemented before ballast water discharge permits are issued for any marine tankers in the water transport trade.

Adopted this 8th day of November, 1991
Alaska Water Resources Board


Peg Fieston, Chairwoman
Alaska Water Resources Board

ALASKA WATER RESOURCES BOARD

Resolution 92-4

Funding for Water Resources Data Collection

WHEREAS: The water resources of Alaska have not been adequately quantified; and

WHEREAS: A complete data storage and retrieval system has not been implemented for surface and ground water; and

WHEREAS: The newly created Division of Water has proposed a potential revenue source for the State of Alaska by establishing a user fee for users exceeding 50 acre feet/year.

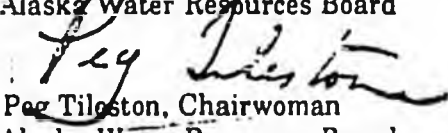
NOW THEREFORE BE IT RESOLVED:

The Alaska Water Resources Board request that funds be identified in Alaska Department of Natural Resources budget request for a comprehensive data collection and retrieval system for Alaskas' water resource; and

BE IT FURTHER RESOLVED:

The ADNR pursue user fees to be paid by consumptive users of water to offset the general fund expenditure to quantifying for Alaska water resources.

Adopted this 8th day of November, 1991
Alaska Water Resources Board


Peg Tilston, Chairwoman
Alaska Water Resources Board

ALASKA WATER RESOURCES BOARD

Resolution 92-5

Continual Participation in Wetlands Policy Development

- WHEREAS: The National Wetlands Policy is in its final staged of development; and
- WHEREAS: This policy will have a major impact on Alaska; and
- WHEREAS: The Alaska Water Resources Board has previously expressed its concern over this issue in Resolution 91-6, March 20, 1991; and
- WHEREAS: The Alaska Water Resources Board continues to be concerned about the impact of the National Wetlands Policy concerning Alaska.

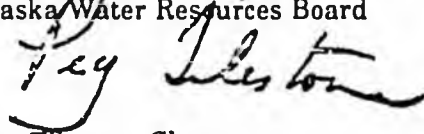
NOW THEREFORE BE IT RESOLVED:

That the state investigate the possibility of state assumption of the Army Corps of Engineers responsibility in Alaska; and

BE IT FURTHER RESOLVED:

That the investigation clearly review the benefits and problems associated with continued Corps of Engineers administration versus on state administration.

Adopted this 8th day of November, 1991
Alaska Water Resources Board

A handwritten signature in dark ink, appearing to read "Peg Tileston", is written over the printed name.

Peg Tileston, Chairwoman
Alaska Water Resources Board

ALASKA WATER RESOURCES BOARD

Resolution 92-6

AWRB

Snowfall Data Collection

- WHEREAS: Accurate data on snowfall is essential to any planning concerning the uses of Alaska's Water Resources, including those in Arctic National Wildlife Refuge; and
- WHEREAS: U.S. Weather Services methods of measuring snowfall have been found to be highly inaccurate in areas prone to high wind conditions; and
- WHEREAS: The Soil Conservation Service has undertaken to improve the accuracy of snowfall collection data through the use of shielded facilities; and
- WHEREAS: The S.C.S. service has made use of local schools to aid in gathering of accurate snowfall data.

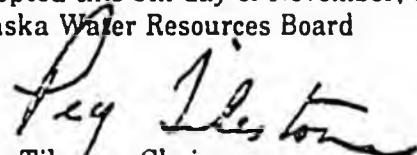
NOW THEREFORE BE IT RESOLVED:

That the Alaska Water Resources Board request the Governor notify state and federal agencies to establish accurate snowfall data collection and recording facilities throughout Alaska; and

BE IT FURTHER RESOLVED:

That the Water Board directs the Commissioner of Natural Resources to work with the Soil Conservation Service to establish accurate snowfall collection and recording facilities throughout Alaska.

Adopted this 8th day of November, 1991
Alaska Water Resources Board


Peg Tileston, Chairwoman
Alaska Water Resources Board

ALASKA WATER RESOURCES BOARD

Resolution 92-7

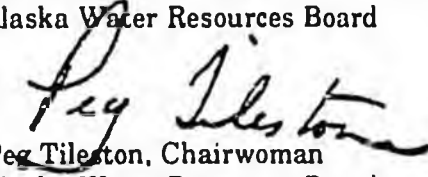
Adequate Funding for the Alaska Water Resources Board

- WHEREAS: The Alaska Water Resources Board funding is provided through the budget of the Department of Natural Resources; and
- WHEREAS: The level of funding to provide for the twice yearly meetings and staff support is approximately \$10,000; and
- WHEREAS: The Alaska Water Resources Board has been and continues to be an effective citizen's entity which focuses on and brings together a broad spectrum of water quality and quantity issues and recommends action to appropriate governmental bodies; and
- WHEREAS: The Alaska Water Resources Board is respected by citizens, industry, legislators and agency personnel as a deliberative and balanced forum before which to present concerns and suggestions on water matters; and
- WHEREAS: Resolutions from the Alaska Water Resources Board have resulted in the establishment of the such programs; as the remote maintenance worker, the Kenai Ground Water Task Force; in-stream flow, dam safety and basin-wide adjudication.

NOW THEREFORE BE IT RESOLVED:

The Alaska Water Resources Board requests support from the Department of Natural Resources and the legislature for adequate funding in the 1993 budget for continued effective functioning; including two meetings and staff support.

Adopted this 7th day of November, 1991
Alaska Water Resources Board


Peg Tileston, Chairwoman
Alaska Water Resources Board

ALASKA WATER RESOURCES BOARD

Resolution 92-8

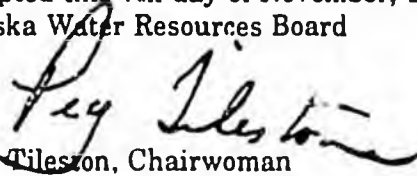
Support for Continued Participation in Western States Water Council

- WHEREAS: The Western States Water Council studies, recommends actions and lobbies on all water related issues affecting Western States, including Alaska; and
- WHEREAS: The Alaska Water Resources Board has long advocated Alaska's membership an active participation in the Council because the information network and resource assistance provided by that organization is very beneficial; and
- WHEREAS: The Western States Water Council is an effective and well respected voice on all water matters in Washington, DC and the state capitals of participating members; and
- WHEREAS: Participation in Council meetings by staff from Alaska Departments of Natural Resources and Environmental Conservation have shared Alaska's experiences and concerns with other western states and have learned from the many presentation and policy papers provided by the Council.

NOW THEREFORE BE IT RESOLVED:

The Alaska Water Resources Board strongly urges continued membership and active participation in the Western States Water Council by the State of Alaska.

Adopted this 7th day of November, 1991
Alaska Water Resources Board


Peg Tieson, Chairwoman
Alaska Water Resources Board

Fact Sheet:



Alaska Department of
**NATURAL
RESOURCES**

Alaska Water Resources Board

Division of Land & Water Management • October, 1990

The seven-member Water Resources Board advises the Governor on all matters relating to the use and appropriation of water. This includes reviewing bills, statutes and regulations that govern water rights, multi-purpose uses of water, prevention of pollution, protection of fish and game, water resources studies and plans, water resources development, dams, impoundments, and reservoirs. The Alaska Water Resources Board was established by Article 3 of Alaska Statute 46.15, the Water Use Act, which was enacted in 1966.

Membership

The Board is composed of seven citizens appointed by the Governor and confirmed by the Legislature, who have knowledge about the use, conservation and protection of water in Alaska. Board members serve four-year terms of office and represent a geographic diversity and variety of occupations and professions associated with water resources. The Director of Boards and Commissions in the Governor's Office will provide application information to anyone interested in serving on the Board.

In addition to the seven citizen members, the Commissioner of Environmental Conservation is an ex-officio member, and the Commissioner of Natural Resources is the executive secretary and provides staff to the Board.

Board Meetings

The Board is required by AS 46.15.220 to hold at least two meetings a year, with one of the meetings held in Juneau. The Board holds the Juneau meeting each spring when it reviews pending water resources legislation and meets with legislative committees and the Governor. The Board also holds a fall meeting in another part of the state to discuss regional water issues and to allow residents an opportunity to voice their water resources concerns to the Board. Meetings generally last two to three days. On occasion, the Board holds interim meetings which may be by teleconference.

The Board covers a wide range of topics at its meetings. In general, a presentation on a topic is given by an agency, industry, interest group representative or member of the public, followed by a discussion of the topic by the Board. At the conclusion of meetings the Board adopts resolutions recommending a course of action to the Governor. The Board may also send a resolution or letter to a state agency, the legislature, or the Congressional delegation, or informally discuss problems with agency representatives.

Public Participation

All Board meetings are open to the public and the public is invited to attend. An evening is set aside for a public comment session specifically to allow members of the public, industry, interest groups or agencies to discuss water resources matters of concern with the Board.

More Information

For further information about the Water Resources Board, its meetings or current members, contact:

Department of Natural Resources
Division of Land and Water Management
Water Resources Board Coordinator
P.O. Box 107005
Anchorage, Alaska 99501-7005
(907) 762-2263

Office of the Governor
Director of Boards and Commissions
P.O. Box A
Juneau, Alaska 99811-0101
(907) 465-3500

ALASKA WATER RESOURCES BOARD

February 1992

BIANNUAL REPORT TO THE BOARD

by Ric Davidge, Director of Water
State of Alaska

Much has happened since my last report to you. I do want to again encourage each of you to take the time and visit with us between Board meetings. I hope the materials that we have sent you over these months have helped you keep in touch. As you know Dan Allison has been assigned by Dave Orr to assist in staffing the Board. We would like you to communicate directly with him if you have any travel or per diem questions. Dan would also like any feed back on the monthly mailings, the agenda or the packet provided you.

The Water Summit

We have had the first meeting of the senior managers for state and federal agencies involved in water resource management in Alaska. Nearly every agency was represented. Termed the "Water Summit", this gathering, the first of its kind since Statehood, sat down and reviewed who was doing what and how we can do it better together. Commissioners Heinze (DNR), Sandor (DEC), and Rosier (F&G) lead the meeting.

One of the conclusions of the Summit was the creation of a Water Management Council. This water management coordinating body, originally suggested by Frank Trelease in 1976 although in a different form, will consist of the senior program managers at the Director's level of all state and federal agencies dealing with water issues. Mike Menge, Director of Environmental Quality, ADEC; Frank Rue, Director of Habitat, ADF&G; and myself will formalize the Council for approval by the Cabinet. We hope to have this completed by the first of March this year.

The Council will meet no less than quarterly to review water program coordination issues and resolve any conflicts. Activity specific cooperative agreements will be developed and institutionalized to ensure decisions are carried forward over time. Broader programmatic agreements will also be developed to ensure that key activities are coordinated. For example: The Division of Water has discovered that public water systems have been permitted and are in operation without any authorization to use the water. Already this problem has been identified by the Council and internal procedural changes are being implemented to ensure this does not happen.

One of the most important results of the Summit is the identification and development of specific work groups. One of the key groups is in water data collection, storage, management, reporting/publishing and quality control. A host of other work groups have been identified and I hope to be able to report to you at the Board meeting just what they are, who has been assigned to them, what their task is, and what due dates have been set for completion.

The recommendations of the State Water Resources Board are an important source of direction to the emerging Water Management Council. You might say that we now have a vehicle to ensure that your recommendations are directly addressed in the cooperative nature that many require. It is our intention to advise the Water Board of all meetings of the Council so that you may attend.

National Water Law Conference

I have just returned from attending my first Water Law Conference and am pleased to report that I was able to convince the Attorney General's office to assign an Assistant AG to water. Rob Nauheim, Asst AG in the Civil Litigation Division in Anchorage has been assigned to work on water issues and was able to travel with me to the Water Law Conference.

Alaska continues to be on the cutting edge of many water management issues. It is generally agreed that our "public interest doctrine" in the "Alaska Water Act" is one of the best, most specific and forward thinking. It also clearly places authority and responsibility on the Commissioner of Natural Resources as he considers water management decisions. Alaska's "In Stream Flow" statute is also considered one of the best in the nation and is being used as the basis for such statutes in other states.

Our proposed water user fee and water sales legislation and the approach we are taking with this bill is considered novel and very progressive by many states that are also wrestling with the question of financing water resource management in the face of fewer general fund dollars. I expect we will see some national interest in how this all works out.

One of the best things that comes out of these multi-state meetings is the development of a network with top officials across the nation on water issues. Both Rob and I connected with many scholars and litigators who are on the front line of water policy.

New Application Regulations

Faced with the need to increase program receipts as a revenue base for water management funding, and with some technical and policy problems in the existing water management regulations, we have spent a great deal of time making the

necessary corrections. The proposed regulations to implement these changes have now been published for public comment including providing for public hearings in three major cities.

We did not just raise fees. In fact we propose to lower the fee for single family domestic applications because, it is my opinion, and one I believe you share, that the public interest is served with a low fee that encourages applications, not required by law, from single family domestic water users. But it is the well log data we receive from this source of applications that provides the widest sampling of ground water resources in developing areas for the least cost.

In addition to the application fee adjustments in the proposed regulations, we have included the State Water Management Policy for public comment. This has been previously presented to you and all state agencies for review and comment. Dave Orr and I have reviewed all comments received and modified the policy to reflect what we believe to be the interest of most. I want to encourage you to review this articulation of state water management policy and participate in the public commenting process.

Exports

I continue to make an effort to market the water resources of Alaska. In this endeavor I am more and more aware of the need for water resource data and information management. As I discuss potential sources for water exports I find that ADF&G often has data on the source as a potential location for hatcheries or for other purposes. This has brought the FRED Division and DOW Hydrology closer together in a very constructive way. I also find that there are a number of large water sources in SE that have already had some impact by man in the form of dams or pipelines many of which are no longer in operation. Rick Noll our new Hydrologist III in Juneau continues to do an outstanding job in coordinating with federal and state agencies on potential water export sources.

I have spoken before the Metro Water District of Southern California (165 managers), the Association of California Water Agencies biannual meeting (over 500 managers) and with a number of smaller groups. My presentation includes over 80 slides and about a 30 minute talk. This has been well received and many follow up calls are initiated.

Sun Belt Water of California continues to be the only applicant for water exports to date. We have two applications and anticipate many more. I continue to be impressed with the sensitivity that Sun Belt shows to Alaska environmental and political concerns. I recently met with the CEO and senior managers of Montgomery Engineering in Pasadena, following the Water Law Conference. Montgomery is working with Sun Belt on the tanker concept.

David Kennedy, the Director of Water for California, and I have established a very positive and professional relationship. He is highly regarded in the western states and continues to be a valuable resource.

I have started to collect materials on water markets in California and other states. John Fraser, Ex Dir, Assoc. of Calif Water Agencies has been a great help. If you are interested in any of this material let me know.

Western States Water Council

July 1993 Meeting of WSWC will be in Anchorage

The Executive Committee of the Council has agreed to have its July 1993 meeting in Anchorage, Alaska. This will be the third time the Council has met in Alaska but the first time in Anchorage. I am working with the Alaska Visitors Association and local hotels etc. to ensure that this visit is very successful. Given the level of interest in Alaska at the Council I expect a full meeting with even some hangers on. The participation of the Board at this Council meeting would be most helpful to the Council and the Board. I will keep you advised of our scheduling progress.

Reauthorization of the Clean Water Act

For the last two meetings of the WSWC we have spent a great deal of time on Senate Bill 1181. We have forwarded to each of you the last rendition of the bill from the majority staff of the Senate Environment and Public Works Committee. Mike Menge, who has now joined me on the Council representing the Commissioner of ADEC, has taken the lead on this very complicated and expanding issue. The State of Alaska has prepared and submitted some preliminary comments on the bill which have been sent to you. We are continuing to review the legislation and assist Mike in his efforts. On February 7, Mike attended a meeting in Washington, D.C. with representatives of all states, EPA and Congressional staff. Mike will give you a report during the Board meeting on the status of this important legislative activity.

FERC Issues

At my request the Alaska Energy Authority has assigned Brent Petrie to the Council to work with me on FERC issues. I have enclosed in your packet a copy of his report from the last meeting.

National Water Policy Act

There appears to be little activity on this effort in Congress and I do not expect any significant activity until after the November election. The concerns of states and tribes have been heard in the Congress and we expect the legislation to recognize the

critical role western states play in water policy. We will continue to keep you advised as this issue develops.

Wetlands

During the last meeting of the WSWC, the Deputy Administrator for EPA and the Assistant Secretary of the Army discussed the comments they have received on the wetlands delineation manual. We were encouraged to hear that most states commented that regional criteria should be developed recognizing the different hydrological, vegetation and soils characteristics of wetlands. They also recognized that "values" can be quite different based on regional ecologies.

I also had the opportunity to talk with Assistant Administrator of EPA, LaJuana Wilcher at the Water Law Conference. She advised that there is broad recognition of the differences in Alaska wetlands and that the State has impacted far less than 1 percent of its wetlands. LaJuana has just completed a tour of Alaska with Senator Murkowski and participated in a number of hearings on national wetland policy.

WET FORCE has met twice since the last board meeting and is monitoring developments. Our focus is to identify specific wetland delineation criteria unique to Alaska and to provide the technical, scientific support needed by the Commissioner and DEC on wetland issues. We have also reviewed an ecological mapping program of the State that was done some years ago and is now underway with USGS and EPA.

State Water Management Organizations

The staff of the WSWC have been very helpful in assisting me solicit and collect copies of state laws and regulations as well as organizational materials from the western states on how they have organized their water resource management. You should know that a number of states, Oregon being the most aggressive, are proposing many water organizational changes. There seems to be an effort to merge water quality and quantity together as managers discover the interrelationships of these two aspects of water management and the efficiencies that can be realized. We have collected the material we have to date in binders that you are certainly welcome to review. We will continue to collect this material for reference purposes.

Our efforts have, however, triggered a general awareness that the WSWC needs current organizational information on each member state and the Council staff are now attempting to institutionalize the collection and review of such material each year or as changes are made.

State Fee Programs

Similar to our efforts to collect organizational information from other states, we have also collected material on water fees. This material is in a binder in the main office and available to you. This review did discover a law in Utah that charges a special fee for removal of groundwater from a drainage. This idea is now being reviewed by myself, staff and the AG's office as a possible mechanism to establish a special fee for the removal of water from a hydrological unit. This may be one of the means we use in our regulations, provided the water fees legislation is passed, to assess a separate fee for water transfers out of a hydrological unit.

The State of Oregon appears to be leading other states and moving quickly towards an aggressive fees program, according to the pages we received from a DRAFT report prepared for the Governor of Oregon. It is also important to note that Oregon recently won an important court decision that federal agencies must pay a state for the adjudication of a reserved federal water right. This recognizes that the water belongs to the people of that state, or to the state itself, depending on the particular state constitution, and that the state is the proper entity to adjudicate water rights on all lands within that state.

We will continue to solicit and collect information on other State fee programs. We have recently been informed that the State of Kentucky has had a water user fee program in existence for over 15 years.

Legislation

As you all know by now the administration has agreed to support two bills introduced by Rep. Cliff Davidson. HB354 that will direct and provide funding for a cooperative effort by USGS and the State to evaluate our water data collection network, and HB353 that will direct and provide funds for the completion of the STORET or similar information system are now formally supported by the State. We have not agreed to support HB355 which would make amendments to the instream flow statute because we believe that the public interest doctrine embodied in the Water Act and language in the Instream flow law are more than sufficient to ensure that fish and wildlife concerns are addressed.

One of the problems we have identified in HB355 is the reference to a general reservation of "wildlife habitat". To date I have not been able to find a model or water appropriation tool that would allow adjudicators to "reserve" water specific to wildlife needs. The quantification of a "wildlife habitat" reservation presents enough scientific problems that I suggested to Rep. Davidson he drop the reference. We do continue to work with Rep. Davidson and his staff as well as ADF&G to identify any specific concerns that can not be addressed in existing law or process.

I am concerned that we have a growing number of instream flow reservation applications pending that we do not have the fiscal or manpower resources to adjudicate. I have raised this issue directly to ADF&G and in the Water Summit. I have also suggested that funds now consumed by ADF&G from the Dingell-Johnson fund be reapportioned to allow the funding of one adjudicator in the Division of Water for instream applications. These funds are basically used for water bodies that are used for sport fishing, however almost all streams that are of concern to ADF&G would be those that are used or potentially could be used for sport fishing. Rather than use the Dingell-Johnson funds to just make applications we should use some for adjudications too. I will continue to work with ADF&G and the US FWS in an effort to resolve this.

Budget

Although there was significant discussion at the last Board meeting about the budget of the Division of Water, with the assistance of DNR's Division of Management and my Section Chiefs, it looks as if we can get through this fiscal year without too much concern. I do receive monthly reports on expenditures and the fiscal office in Juneau is watching this closely for me.

We have included a copy of the FY93 DNR Budget overview for your review and discussion at the meeting. We certainly look forward to your assistance as we move our budget through the various legislative committees. If you have specific questions regarding any budget concerns please call me directly.

Title Navigability

I have made some organizational changes in this area allowing more people to work on this priority. In addition to Russ Watts, Dan Allison and Dave Orr have been assigned aspects of title navigability. We have presented the Bureau of Land Management our first drainage wide navigability determination and are awaiting their review and comments. These are due to me by February 15th so I should have an updated report for you at the meeting. We have included a status report on our review of water bodies in federal units in your packet.

The development of our data base on waterbodies continues. We are currently awaiting the acquisition and receipt of some additional computer hardware and software that will significantly expand our capabilities. If the STORET legislation is approved and the funds are made available, the integration of our data base and STORET should also provide use with graphic capabilities on waterbodies.

Consistent with my decision that when we are surveying title navigability, we review entire stream basins or watersheds rather than segments of streams, staff is now reviewing the Kantishna watershed. Kantishna was identified as a high priority due

to mining claim and National Park Service conflicts.

State Water Management Strategy

We have called in some national (with offices in Alaska) water consulting firms and discussed with them our ideas on the development of a State Water Management Strategy. I have also met with one firm while in California which has expressed an interest in our effort. What we asked of each was their ideas on approach and what we could expect to get for the proposed \$150,000 originally requested. We have received comments from three of the firms and are awaiting comments from the California firm. Each of the firms understands that their participation in this informal consultation does in no way give them any advantage when and if a formal request for proposal is issued. Once we have received all the comments and suggestions requested we will make them available to you.

Increase Water Rights Compliance

As we discussed in the last board meeting, I have identified a priority of alerting Alaskans that they need to protect their water rights by securing permits and certificates. We did send two adjudicators out to the Palmer and Wasilla area for two days and asked them to contact commercial enterprises that we thought should, but did not have, water rights. Although the return has not been what I would have hoped, we did make a number of important discoveries about ADEC permitted public water systems that did not have water rights. We are in the process of correcting this coordination problem.

With the publication of proposed adjustments in water application fees, we expect a surge of water rights applications. We are also still looking at the Water Management Strategy project as an important vehicle to alert people to protect their water rights.

To date it is my conclusion that our most cost effective approach is in program coordination. The institutionalization of the Water Management Council is key to identifying compliance problems. We will continue community notification efforts such as we have begun with the financial institutions in the Anchorage area and with municipalities.

Hydrological Survey

In addition to the update you have in your packet from Bill Long, I want to raise a couple of issues. When I arrived it was brought to my attention that conflict had developed between USGS and the State Hydro Survey. Bill Long, Section Chief for our Hydro Survey and Phil Carpenter, State Director for USGS and I have spent a few hours reviewing and exploring this challenge. I am pleased to report to you that

we now have resolved the concerns and have begun 1992 with a very close and constructive working relationship which was culminated in a new Coop-Agreement.

This effort was then extended to the US Soil Conservation Service and we should soon have a cooperative agreement between the Division and US SCS as well as USGS that will set a standard for interagency cooperation. To me this was a significant accomplishment and one that is greatly due to the mature and professional efforts of Bill Long and Phil Carpenter.

The Interagency Hydrologic Committee has also recognized that the relationship between the state and USGS as well as all other water management related agencies has greatly improved. Again the institutionalization of the Water Management Council is essential if we are to continue to move forward in agency cooperation.

We have also included for your attention a Cost Recovery Agreement which we have negotiated with USGS. Jim Munter is the key staff person on this agreement.

Dam Safety

The Lake of the Hills Dam in Anchorage has not been in compliance with respect to their emergency notification and action plan for some time. Due to the continuing efforts of Kyle Cherry and the AG's office we have served notification of penalties etc. to the homeowners association which has now resulted in a serious effort to come into compliance. Kyle continues to work with the Municipality of Anchorage and the homeowners association to bring this high risk dam into compliance.

We are working closely with the Homer community to assist in their efforts to correct problems with their drinking water dam. These problems appear to be from the construction of the core of the dam. We should know by this summer what needs to be done to correct the problems.

One of the things I discovered over the past months is that emergency preparedness exercises have not considered dam failures in the past. As a result we have requested that during the next natural disaster exercise some specific dams fail and that the exercise evaluate the effectiveness of our efforts to deal with such events. We hope to have our first experience this spring. I'm sure you will all find this of interest at our next meeting.

Time Management Program

As we discussed in the first meeting I required all employees of the DOW to fill out time/project management forms. My purpose in doing this was two fold. One it would allow me weekly to know and understand what we are all doing and second

it would give me some idea of the amount of time and money we spent doing it. We have reviewed the data collected over the last half the 1991 and evaluated the program. I have decided that I will now rely on each of my Section Chiefs to keep track of time and costs and that they will be responsive to management questions as they arise.

I have instituted a monthly report requirement for all section chiefs and field offices. You have the first such reports included in your packet. Dan Allison will now send each member of the Board a copy of all monthly reports after they are received and reviewed by me. This should assist you in keeping up to date on what we are doing.

Review of all PDQ's

With the creation and organization of the Division of Water it is necessary that we review and revise all Position Description Questionnaires (PDQ). This is the document that describes what each position is responsible for and what management's expectations are. We are well on our way to finalizing these documents. If you are interested in a particular position description please contact me directly.

SIXTH ANNUAL
WESTERN STATES WATER COUNCIL
WATER MANAGEMENT SYMPOSIUM PROCEEDINGS

STATE WATER PLANS

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Western States Water Council

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WATER RESOURCES PLANNING IN ALASKA

Mary Lu Harle*

ABSTRACT: The State of Alaska does not have a state water plan nor a comprehensive list of water resources planning-related activities. In the absence of either of these, this paper describes the organization of water resources planning and management by the state resource agencies, and presents a brief outline of what might be included in a state water plan. The primary focus of the paper is to describe major planning-related efforts that are being conducted by the state resource agencies.

INTRODUCTION

Water resources planning in the State of Alaska is neither comprehensive nor well coordinated. While there are many types of water resources planning that have been completed or are underway, the state does not have a comprehensive state water plan.

In many respects, Alaska does not share common characteristics with other western states that have lead to state water plans. Water resources in Alaska are generally abundant, though not evenly distributed seasonally or geographically. The state contains more than 40 percent of the Nation's surface water resources, but some streams freeze completely or have periods of low flow during the winter and early spring. Conversely, ice-jam floods are common on some rivers during spring snowmelt and summer floods have caused extensive damage on other streams. Average runoff for the state is about 25 inches, but varies from as much as 300 inches in Southeastern Alaska to only 4 inches in some Arctic coastal areas.¹

The state has a population of less than one-half million people, mostly concentrated in a few urban areas. Many cities, towns, and villages provide public water supply, but there are no local water districts in the state. In fact, some parts of the state have no local government.

Water resources data including surface and groundwater supply, precipitation, and water quality is limited. During water year 1988, the U.S. Geological Survey collected water discharge data at 85 gaging stations, 66 crest-stage partial recording stations, 13 lakes, water quality data at 24 gaging stations, and water levels for 26 observation wells statewide.²

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To date, there are few instances of over-appropriation. Major water uses include public water supplies, fish processing, forest products, mining, and oil and gas exploration and development. Agricultural water use is very small. Hydroelectric power generation, fish hatcheries and placer mining are important non-consumptive uses of water. Instream water use for fish habitat maintenance, recreation, and navigation and transportation are important water uses in the state.

Finally, few major federal water projects have been constructed for water use in the state. There are no Bureau of Reclamation projects, very few Corps of Engineers projects, and only two federal hydroelectric projects.

Since Alaska does not have a state water plan, this paper outlines what might be included in a state water plan for Alaska, and describes some parts of a plan that already exist.

WATER RESOURCES ADMINISTRATION

The majority of water resources administration and planning conducted by the state is done by the Departments of Natural Resources (DNR) and Environmental Conservation (DEC). Within DNR, water resources responsibilities are housed in two divisions. The Division of Land and Water Management is responsible for managing and adjudicating water rights, including surface and groundwater for diversionary and instream uses (AS 46.15); administering the state's dam safety program (AS 46.17); preparing land use plans, including water resources, for state lands (AS 38.04.065); and determining navigability for state title for submerged lands (AS 38.05.127). The Division of Geological and Geophysical Surveys (DGGS) is responsible for collecting, analyzing, and distributing data for surface and groundwater and water quality (AS 41.08.017 and .020). The Division manages the state's well log and water use programs and is beginning a statewide water quality data base.

The Department of Environmental Conservation is responsible for protecting water quality in the state (AS 46.03 - AS 46.09). Water pollution control responsibilities cover point and nonpoint pollution sources including maintaining regulations for water quality standards, reviewing wastewater system and subdivision plans, certifying residential septic systems, permitting wastewater disposal from municipalities and industrial facilities, evaluating the effects of nonpoint sources on water quality, protecting public drinking water, providing water and sewage disposal facilities in second class cities in the state, regulating oil pollution control, managing the underground storage tank program, regulating solid waste and hazardous wastes, managing the Superfund program, regulating pesticide use, and coordinating with other agencies in coastal zone management.

In addition to these two agencies, a number of other state

agencies have water resources management and planning responsibilities. The Department of Fish and Game (DFG) is responsible for protecting fish habitat (AS 16.05). The Department of Community and Regional Affairs administers floodplain management for insurance purposes. (AS 44.47). The Alaska Energy Authority in the Department of Commerce and Economic Development is responsible for hydroelectric power development (AS 44.83). Finally, the Division of Emergency Services in the Department of Military and Veterans Affairs is responsible for coordinating protection of life and property during emergencies such as river flooding or dam failures (AS 26.23.040). Figure 1 shows a generalized state agency organization chart emphasizing these water resources agencies.

A STATE WATER PLAN FOR ALASKA

A state water plan for Alaska would likely be a dynamic process that evolves over time, rather than a single document. However, there is value in having a document that summarizes the elements of the plan and how they are developed. Such a plan might have the following contents.

- Goals and objectives

- Policy statements

- Resource inventories

- Specific resource elements

 - Water supply

 - Water use, water rights, and water demand

 - Water quality

 - Conservation

 - Public trust uses, including instream flow

 - Water resources protection, including critical water management areas, riparian, and wetlands protection

 - Fisheries

 - Hydroelectric power development

- Future directions and recommended action

WATER RESOURCES PLANNING IN ALASKA

While Alaska does not have a comprehensive state water plan,

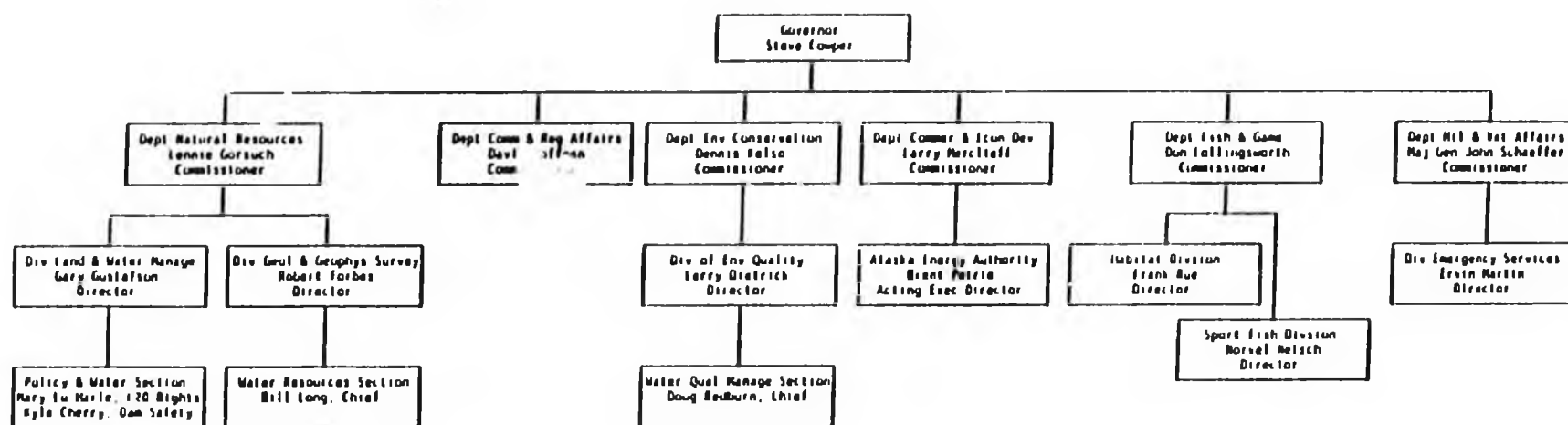


Figure 1

there is some water planning-related activity that is being done.

State Policies

As in other states, Alaska has much of its water resources policy set out in the state constitution, statutes and regulations. In addition there are other policy documents such as interagency cooperative agreements and policy directives, such as the water management policy for state lands on the North Slope. Other policy statements are found in Attorney General's Opinions, state agency department orders and operating procedures, and administrative and executive orders issued by the Governor.

Land Use Planning

There are two major land planning efforts that are authorized by state law. While both of these are land use plans, they also include water resources planning to varying degrees. The Department of Natural Resources develops land use plans for state lands and coastal management districts develop coastal management planning documents.

State Land Use Plans

Approximately 28.5 percent of the land in Alaska is in state ownership. The Department of Natural Resources is responsible for land use planning on state lands under the authority of AS 30.04.065 and 11 AAC 55.010-280. There are three main types of planning efforts for state lands; area plans, management plans, and recreational river plans. All of these efforts include some water resources planning, however the emphasis varies depending on the geographic area and the nature of land and water use issues within each planning area. Water resources issues that are commonly addressed include compiling information on existing water rights; identifying streams and lakes that need instream flow protection for fish and wildlife and recreation; riparian and wetlands protection; navigability determinations; water quality issues; and floodplain management for state lands scheduled for sale. Little water resources inventory or assessment is done with regard to water supply or water use. More recent plans include a water resources element, or chapter, in the plan.

The planning process for all three types of state plans includes three public meetings to receive public input into the plan. Some plans also have advisory boards composed of user group representatives, government officials, and private citizens. All of the plans have interagency planning teams. The state land planning process includes the following eight steps.

1. Public meetings are held to learn of local problems, interests, and concerns about state lands and water.

2. Information about natural resources (oil and gas, minerals, fish, water, forests, soils), existing land uses and ownership, and economic and social characteristics is gathered, mapped and analyzed.
3. Different land and water use options are developed using public comments, resource information, and state policy.
4. Public meetings are held to review plan alternatives.
5. Public comments are reviewed, conflicts are resolved, a preferred alternative is selected, and a draft plan is written.
6. Public hearings are held on the draft plan.
7. Changes to the draft plan are made based on public comments. Final plan recommendations are developed.
8. The Commissioner of the Department of Natural Resources adopts the final plan. The plan then guides the state's land and water management decisions.

Area plans are developed for large regional areas of state land. Management plans are written for smaller areas such as the Hatcher Pass recreational area and the Matanuska Valley Moose Range, both located north of Anchorage. Figure 2 shows the status of area planning for the following state lands.

The Bristol Bay Plan was adopted in 1984 and covers 13 million acres of state-owned and state-selected land.

The Copper River Basin Plan was adopted in 1986 and covers 3.3 million acres of state-owned and state-selected land.

The Haines/Skagway Plan was adopted in 1979 and covers 400,000 acres of state-owned and state-selected land. It was superseded by the Alaska Chilkat Bald Eagle Preserve Management Plan in 1985 and the Haines State Forest Management Plan in 1986.

The Kuskokwim Basin Plan was adopted in 1988 and covers 16 million acres of state-owned and state-selected land.

The Northwest Area Plan was adopted in 1989 and covers 10 million acres of state-owned and state-selected land in the Bering Straits region, the Northwest Arctic Borough, and the far western segment of the North Slope Borough.

The Prince of Wales Island Plan was developed in two parts and adopted in 1985 and 1988. This plan is for 30,000 acres of state-owned and state-selected uplands and about one million acres of adjacent tidelands and submerged lands. The plan

Alaska Department of Natural Resources

AREA PLANS



AREA PLANNING STATUS

- ☐ Completed area plans
- ☒ Area plans in progress
- ☐ Not scheduled for area plans at this time

addresses such issues as land offerings, log transfer and storage facilities, floating camps, floathomes, sea-farming, and state selections from the Tongass National Forest.

The Prince William Sound Plan was adopted in 1988 and covers 850,000 acres of state-owned and state-selected uplands and most of the tidelands and submerged lands in Prince William Sound.

The Susitna Area Plan was adopted in 1985 and covers 9.5 million acres of state-owned and state-selected land.

The Tanana Basin Plan was adopted in 1985 and covers 12.5 million acres.

The Kenai Area Plan is underway and will cover state land within the Kenai Peninsula Borough with the exception of lands that have been legislatively designated for refuges, critical habitat, and other special use areas. The plan will be complete in 1991.

The Central Southeast Plan will cover the area from the Cleveland Peninsula north to Frederick Sound. It will include the Stikine River and there will be a shorelands river management component. The plan will be complete in 1991.

In 1988, the Alaska Legislature passed the Recreation Rivers Act, AS 41.23.400-510. This act establishes six recreation rivers in Southcentral Alaska, including the Little Susitna River, Deshka River, Talkeetna River, Lake Creek, Talachulitna River, and Alexander Creek. The rivers are to be managed to maintain and enhance land and water in the river corridors for recreation; manage, protect, and maintain fish and wildlife on a sustained yield basis; continue recreation and economic uses; multiple use management of upland activities to mitigate potential adverse effects on water quality and stream flow; and provide access for recreation uses. The Department of Natural Resources is responsible for developing a plan and managing the river corridors. A planning team composed of state, federal, and local government representatives has been formed. In addition, an advisory board of 13 user group representatives has been established. The plan will be complete in December, 1990, and will address the following issues:

- * How to manage recreation activities and facilities, such as campsites, restrooms, garbage, boating, and trail use.
- * What measures are needed to protect fish and wildlife habitat.
- * What measures are needed to protect water quality and ensure adequate stream flow in the rivers to protect the purposes of the Recreation Rivers Act.

- * How to manage transportation facilities and resources.
- * Where commercial facilities, such as lodges and campgrounds, will be allowed.
- * Guidelines for resource use, such as timber harvest for personal use and small material sales, and if new mining claims will be permitted on uplands.
- * Document illegal activities such as trespass cabins and long term camps and develop management options to resolve unauthorized uses of state land.

The Recreation Rivers Act mandated that instream flows be reserved to protect the purposes of the recreation rivers. Unfortunately no funds were appropriated to do this work. Three of the rivers have stream gage data, and a cooperative effort among state and federal agencies is underway on a limited basis to establish stream gages on the ungaged rivers and to collect miscellaneous discharge and water quality data to quantify instream flows for these rivers.

Coastal Management Planning

Coastal management planning is a result of both the Federal Coastal Zone Management Act of 1972, and the Alaska Coastal Management Act of 1977. The Alaska Coastal Management Act establishes a process to resolve controversies over how to use or not use the land and waters of Alaska's coast through development and use of district coastal management plans. The Act also established a 16 member Coastal Policy Council composed of state and local elected officials. The Council developed standards and guidelines for district coastal management programs which have been adopted as regulations, 6 AAC 85.010-110. The statutes and regulations of the Department of Environmental Conservation relating to air, land, and water quality are also incorporated into the coastal management program.

Each district program must address ten program elements: (1) needs, objectives, and goals, (2) organization, (3) boundaries, (4) resource inventory, (5) resource analysis, (6) subject uses, (7) proper and improper uses, (8) policies, (9) implementation, and (10) public participation. Water dependent and related uses and activities which must be covered by the plan include coastal development, geophysical hazard areas, recreation, energy facilities, transportation and utilities, fish and seafood processing, timber harvesting processing, mining and mineral processing, and subsistence.³ Twenty five coastal management districts have plans in effect and seven more are being developed

Water Resources Inventories

There are a number of programs that inventory, store, and report data on water supply and use, dams, water quality and fisheries habitat. These data are frequently used by planners, resource managers, industry, and the public. Listed below are some of the major inventories that the state resource agencies maintain or participate with federal agencies in maintaining.

Alaska Water Resources Evaluation Five-Year Plan

The DNR Division of Geological and Geophysical Surveys (DGGS), in cooperation with the U.S. Geological Survey (USGS) and the U.S. Army Corps of Engineers has developed a report of statewide water resources data collection and hydrologic studies called the Alaska Water Resources Evaluation, or AWARE Plan. The document is a summary of current and proposed (through 1994) plans for basic hydrologic data collection in Alaska by these and other state, federal, and local agencies. The plan's goal is to provide water resources information to government agencies, industry and the public to promote the use and management of the state's water resources. The plan is organized by regions of the state and describes data collection programs for surface water, groundwater, and water quality. It describes programs of the USGS, Water Resources Division; the National Weather Service; the U.S. Army Corps of Engineers; the U.S. Department of Agriculture, Agricultural Stabilization and Conservation Service; the National Park Service; and the U.S. Fish and Wildlife Service. State programs described include the Department of Natural Resources Division of Geological and Geophysical Surveys and Division of Land and Water Management; the Department of Community and Regional Affairs; the Department of Fish and Game; the Department of Environmental Conservation; and the Division of Governmental Coordination in the Governor's Office. Water resources programs undertaken by the Matanuska-Susitna Borough are also included.⁴

Water Well Logs

The DNR Division of Geological and Geophysical Surveys has developed and maintains a computerized water well log inventory called WELTS, or Well Log Tracking System. Approximately 16,000 well records are contained in WELTS which are commonly received from well drilling contractors and through the state's water rights program. The inventory is used by DGGS hydrologists in hydrogeological investigations, by planners, by DNR water rights adjudicators, and by homeowners and realtors. The system is cross indexed to water rights case file numbers and to USGS locational numbers. The well log information is also transferred to the USGS Ground-Water Site Inventory database.⁵

Water Use Data

DNR's Division of Geological and Geophysical Surveys also operates the Alaska Water Use Data System, or AWUDS. Water use data are collected primarily from the Division of Land and Water Management water rights program, which requires water meter records from all permitted water uses greater than 30,000 gallons of water per day. The 1988 water use summary will include approximately 225 water use points. The emphasis of the program has been on collecting public water supply water use data. This was expanded in 1988 to include water use by hydroelectric power generation sites and state fish hatcheries. Plans for 1989 include collecting water use data from the Kenai-Nikiski area and possibly from North Slope industrial water users.⁶

Groundwater Quality Data

The Division of Geological and Geophysical Surveys in DNR has prepared a report recommending a plan to collect and store groundwater quality data in Alaska. There is presently no coordinated system for storing this information. Groundwater quality data are collected for various regulatory programs within the Department of Environmental Conservation and during investigations by the USGS and military installations in the state. With the exception of the USGS, the majority of these data are not stored or generally available for systematic retrieval. The report concludes that the National Water Information System maintained by the USGS is the recommended data management system to manage groundwater data in Alaska. The DGGs in cooperation with the USGS is beginning a large scale pilot project to test the system.⁷

Water Rights - Land Administration System

The Department of Natural Resources has developed a data base to store and track land and water case file information. The system is called the Land Administration System (LAS). Within this system is the water subsystem which is devoted to storing water rights information, locating prior appropriators to give public notice during adjudications, and printing various letters and documents, such as notices, permits, and certificates of appropriation. The system stores all information contained in the application, including customer name, identification number, and address; location including latitude and longitude and the legal description of points of diversion and use; type of use which is identified by a standard industrial code (SIC) number; source of water; and quantity of water. Because the system was designed to primarily store and retrieve data, there is limited capability to manipulate data. The system is one of the most comprehensive in the state and contains approximately 21,240 water rights case files.

Dam Safety Inventory

The Alaska Dam Inventory is also maintained as part of the water subsystem in LAS. It contains information on approximately 200 dams in the Corps of Engineers inventory format. At the present time all known dams in the state are included in the inventory, even those not jurisdictional under AS 46.17, the Alaska Dam Safety Act. When the upcoming federally required inventory is done, only jurisdictional dams will be entered on the inventory. A separate inventory is planned to be maintained for non-jurisdictional dams for use with the water rights program under AS 46.15.⁸

Federal Reserved Water Rights Inventory

In 1985, the Department of Natural Resources established the Federal Reserved Water Rights Work Group to coordinate federal and state activities dealing with federal reserved water rights. The group was composed of representatives of the state resource agencies and federal land management agencies. One of the goals of the group was to identify lands that the federal government might claim federal reserved water rights for, and to describe the location, legal history, primary purposes and pertinent authorities establishing the federal land withdrawals. This information was submitted to DNR by the National Park Service for approximately 51 million acres, the U.S. Forest Service for approximately 23 million acres and the U.S. Fish and Wildlife Service for approximately 76 million acres and provides a great deal of information about federal reserved water rights in Alaska. DNR had plans to establish this information on a data base, but budget reductions to this program have limited further work on the project.

Public Water Supply Inventory

The Department of Environmental Conservation maintains a data base of approximately 2500 public water supply systems in the state. The data are submitted by public water suppliers when systems are tested and by laboratories. Data include owner information, source of water, kind of treatment, and testing results. Reports are generated on a quarterly basis and submitted the U.S. Environmental Protection Agency. The system has been in operation about five years, and is currently being updated.⁹

Anadromous Fish Catalog

The Department of Fish and Game (DFG) developed and maintains the "Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fish", which is composed of an atlas and catalog listing documented streams, rivers, and lakes that are used by anadromous fish. The Atlas presents maps showing the location of the anadromous fish waters, the fish species using these waters,

and the life history of the fish species using the waters. Waterways containing anadromous fish are protected by DFG under AS 19.05.870. A fish habitat permit is required from DFG for activities which affect these waterways. Additions to the catalog can be made by DFG personnel, private individuals, or other agencies and changes are made using regulation adoption procedures. The document is divided into six volumes corresponding to the state's six fish and game resources management regions.¹⁰

Alaska Habitat Management Guides

The Department of Fish and Game also maintains the "Alaska Habitat Management Guides". The guides present the best available information on selected fish and wildlife species, describing their life functions and habitat requirements; mapping and discussing their geographic distribution; mapping and discussing the human uses made of the water; and estimating their value to residents of the state. The guides include information about mammals, birds, and fish.¹¹

Instream Flow Reservation Schedule

The State of Alaska has statutory authority to reserve instream flows under the AS 46.15.145. The Department of Natural Resources adjudicates and grants instream reservations. State, federal, and local agencies and private persons and organizations can apply for reservations for fish and wildlife, recreation and park purposes, navigation and transportation purposes, and water quality purposes. In fiscal year 1987, the Department of Fish and Game formally established an instream flow program with the goal of protecting the habitat of sport fish species by reserving instream flows. The program is funded primarily by the Wallop-Breaux federal legislation and is therefore limited to protecting instream flows for sport fish species. Under this program, the DFG quantifies instream flow needs and files applications to reserve water with the Department of Natural Resources. Thus far, DFG has submitted 18 applications, of which six have been granted. The DFG prioritizes and schedules streams needing instream flow reservations after coordinating with the various DFG divisions and the Department of Natural Resources water rights and state land planning programs.¹²

Hydrologic Data Collection

The U.S. Geological Survey in coordination with the state Division of Geological and Geophysical Survey, the National Weather Service, and the Soil Conservation Service are the primary agencies that collect baseline hydrologic data in Alaska. Included are surface water stream gage stations, groundwater stations to collect long term water level records, water quality stations, sediment stations, flood frequency determinations, precipitation gages, and

snow surveys. All of these agencies report and disseminate data for use by planners, managers, industry, and the public.

Water Quality Planning

The Alaska Department of Environmental Conservation, Division of Environmental Quality, undertakes a number of water quality planning efforts. Listed below are two of the most recent water quality planning programs.

Groundwater Quality Protection Strategy

Alaskans depend heavily on groundwater for public water supplies, industrial uses, and to supply baseflow in streams. Recent cases of groundwater contamination in Alaska have prompted an increased concern for groundwater quality protection. The Groundwater Quality Protection Strategy was developed to describe the nature and location of groundwater resources and to describe potential contamination sources and how they are regulated in Alaska. The strategy defines problems, identifies existing programs, and makes recommendations for improving protection of Alaska's groundwater resources. The Strategy discusses 23 separate topics and identifies 74 recommendations to improve groundwater protection. Many of the recommendations can be accomplished by existing regulatory programs with no additional funding. However, some of the recommendations require new regulations and new sources of funding. The recommendations are presented in six groups, including education, data collection and management, planning, control of contamination sources, response and enforcement, and action plan and funding. The draft strategy is complete, and the final document is expected to be published this year.¹³

Nonpoint Source Pollution Control Assessment

The Department of Environmental Conservation is also preparing a nonpoint source pollution control assessment that is required by section 319 of the Clean Water Act. The goals of the assessment are to identify waterbodies which are impaired or threatened by nonpoint source pollution and the pollution sources affecting each waterbody, and to prepare narrative descriptions of the categories of nonpoint source pollution and their impacts on water quality. Nonpoint source categories that are planned to be included in the assessment include timber harvest and related activities, placer mining, oil and gas development, agriculture, urban development, rural sanitation and waste disposal, on-site sewage disposal, fuel and chemical storage and handling, and harbor and boating wastes. The assessment is presently being prepared and will be completed this year. It will be followed by a Nonpoint Source Pollution Control Strategy which will describe programs and activities necessary to control categories of nonpoint source pollution and to reduce nonpoint source pollution in certain

individual waterbodies. 14

CONCLUSION

This paper has presented some of the major water resources planning-related efforts and inventories that are in progress or planned for the near future by the state resource agencies. It is by no means a comprehensive description of planning-related programs in Alaska. A comprehensive list or description of planning-related programs undertaken by the state does not exist. It is hoped that this paper might serve as a starting point for developing a comprehensive list of state water resources planning efforts, which could be used to develop a state water plan for Alaska. A state water plan would benefit the state in collecting baseline hydrologic data, allocating and managing water use, protecting water quality, and protecting life and property resulting from dam failures, flooding, and related catastrophic events.

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ALASKA

Water Supply and Use

Alaska's water supplies might appear to be unlimited because of the large quantities of precipitation received in the State (fig. 1A). Statewide average annual precipitation is about 1,050,000 Mgal/d (million gallons per day), and average annual runoff is about 989,000 Mgal/d. Alaska contains more than 40 percent of the Nation's surface-water resources. Three rivers (the Yukon, the Kuskokwim, and the Copper) are among the 10 largest in the United States. More than 3 million lakes range in area from pond size to about 1,000 mi² (square miles). Also, large amounts of water are stored within two principal aquifers. Environmental conditions, legal restrictions, and technological problems, however, limit the usability of these abundant supplies.

Alaska encompasses a land area of about 586,000 mi², or about one-fifth of the area of the conterminous United States. Climates range from frozen desert in the Arctic Slope basin to maritime rain forest in the Southeast Alaska basin. Average annual precipitation and temperatures range from about 5 inches and 10° F (degrees Fahrenheit) in the Arctic Slope basin to about 300 inches and 45° F in the Southeast Alaska basin. Much precipitation occurs as snow. Glaciers and icefields cover 28,500 mi², or nearly 5 percent of the land (Post and Mayo, 1971) and affect the timing and the quantity of runoff. Many of the rivers are silt laden, are affected by mid-winter overflow icing or ice-jam flooding at spring breakup, or are ice covered much of the year. The occurrence and the availability of ground water are limited by permafrost. The extent and thickness of the permafrost decrease southward from a continuous layer as much as several hundred feet thick in the Arctic Slope basin to areas

that are generally free of permafrost in the South Central Alaska and the Southeast Alaska basins. Because of these conditions, there is no certainty that either surface or ground water will be available at a given time and location.

Several water issues in Alaska result from this variability in the availability and occurrence of the water resource. Additionally, the legal precedents for obtaining water rights cause conflicts. Com-

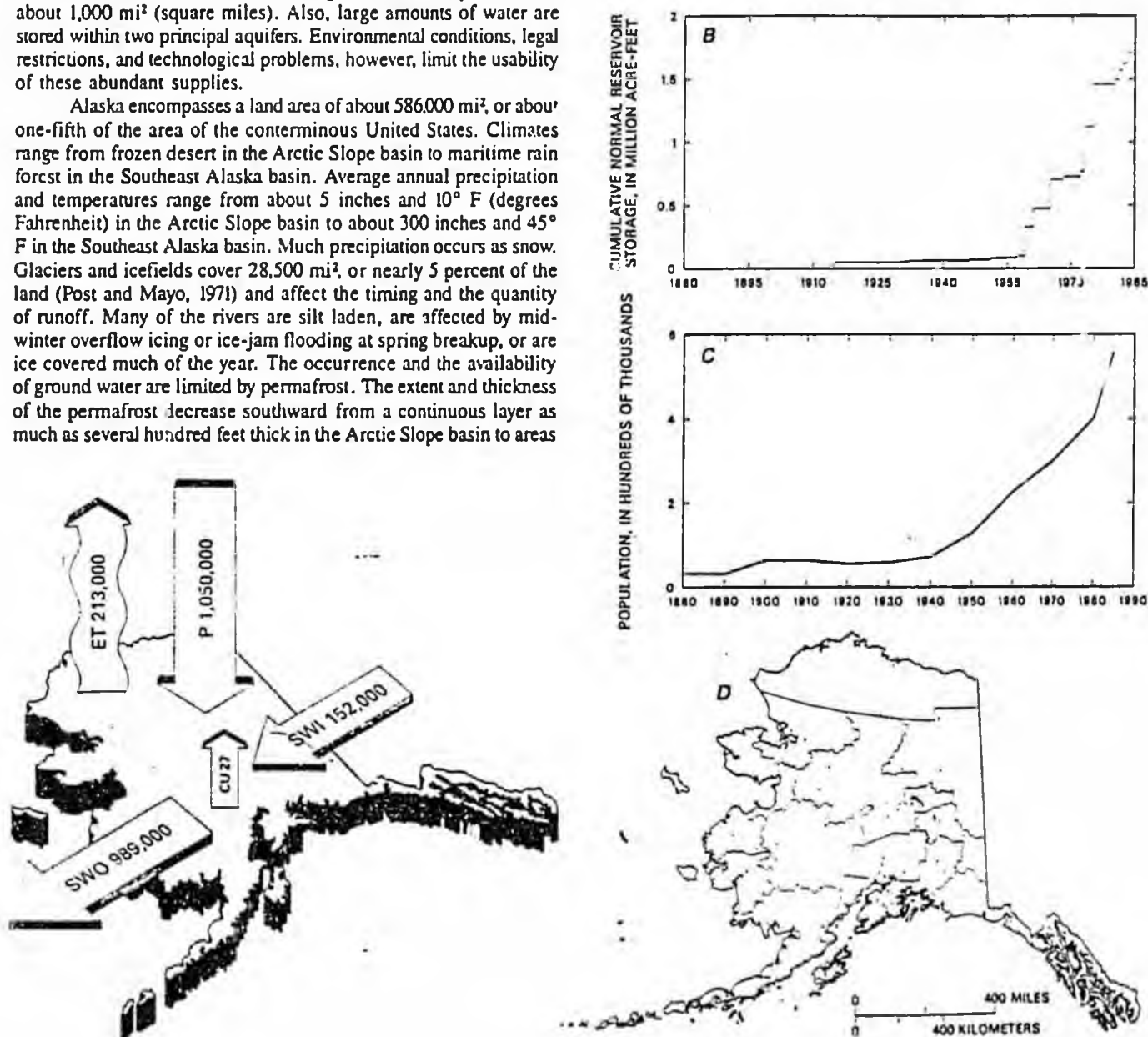


Figure 1. Water supply and population in Alaska. A. Water budget, in million gallons per day. B. Cumulative normal storage of reservoirs with at least 5,000 acre-feet capacity, 1880 to 1985. C. Population trend, 1880 to 1985. D. Population distribution, 1985; each dot on the map represents 1,000 people within a census tract. Abbreviations: CU, consumptive use; ET, evapotranspiration; P, precipitation; SWI, surface-water inflow; SWO, surface-water outflow. Sources: A, R. D. Lamke (U.S. Geological Survey, written commun., 1985). B, U.S. Army Corps of Engineers, 1981. C, D, Compiled by U.S. Geological Survey from U.S. Bureau of the Census data.

petition for limited surface-water resources exists among industry, fish hatcheries, recreation, and fish and wildlife habitat demands. Ground-water-rights issues primarily involve public supply in basins where surface water is scarce. Currently (1987), the Arctic Slope, the South Central Alaska, and the Southeast Alaska basins are the focus of these issues.

HISTORY OF WATER DEVELOPMENT

In 1914, the first large reservoir was constructed to provide power for the mining and the timber industries in the Southeast Alaska basin. Since then, 19 additional reservoirs that have storage capacities greater than 5,000 acre-ft (acre-feet) have been built for electric power generation and public supplies. Of these 20 reservoirs, 13 are in the Southeast Alaska basin, 6 are in the South Central Alaska basin, and 1 is in the Yukon basin. These reservoirs contain a cumulative capacity of about 1.78 million acre-ft (fig. 1B).

The first significant increase of Alaska's population occurred during the gold rushes of the late 1800's (fig. 1C). Postwar migration and homesteading increased the population during the late 1940's and 1950's. Population growth during the 1960's and 1970's can be attributed to the development of oil fields in Cook Inlet and at Prudhoe Bay and the related pipeline-construction activities. The continued rapid population growth of the early 1980's can be attributed to the general economic well-being that oil production brought to the State. The population reached 558,000 in 1985; 77 percent of the inhabitants live within 5 of the 28 census districts, or county equivalents (fig. 1D). Anchorage contained 44 percent of the State's population; the next largest concentrations of population were in Fairbanks (13 percent), Kenai (8 percent), Matanuska-Susitna (7 percent), and Juneau (5 percent).

Interest in Alaska's water supplies began during the gold rushes of the late 1800's; miners washed the placer deposits to extract the gold. The population growth and the corresponding urban development, especially after 1940, placed increasing emphasis on water supply. Increasing needs for water supplies for power in the Southeast Alaska and the South Central Alaska basins, for the pulp and paper industry in the Southeast Alaska basin, and for the canneries in the Southeast Alaska and Southwest Alaska basins created demands for water-resource information. Intensive development of other natural resources began during the 1960's and continued through the 1970's. Water was critical to support the oil fields in the Arctic Slope basin and the petrochemical, the seafood, and the timber production industries in the South Central Alaska and the Southeast Alaska basins. Continued population growth, especially in the South Central Alaska basin, increased the demand for public supplies; ground water became a major source of supply. Maintaining instream flows became an issue during the late 1970's, and that concern has increased during the 1980's. Instream flow for hydroelectric power generation and fish hatcheries is an additional water issue today.

WATER USE

The State's water budget is shown diagrammatically in figure 1A. Several natural conditions limit the quantity of freshwater that can be recovered efficiently from Alaska's hydrologic environment; for example, the availability of surface water may be affected by the timing of winter freezeup and spring breakup and by the quantity and the timing of runoff derived from melting snow and glacier ice. The availability of ground water is limited by thick lenses and layers of relatively impermeable alluvium and by the limited extent of coarse-grained permeable sediments. In permafrost zones, even coarse-grained sediments may be frozen. Thus, although a substantial quantity of water may be present within the State, the water may not be available when and where it is needed.

Hydroelectric powerplants used 1,480 Mgal/d to generate 18 percent, or 746 GWh (gigawatthours), of the electricity used statewide. About 90 percent of this power was generated in the Southeast Alaska basin. The water was used instream, and no water was considered for consumptive use.

Surface-water withdrawals supplied 82.2 percent of the water needed for offstream uses; ground water provided the remaining 17.8 percent. These values were determined by using the results of a cooperative survey conducted by the Alaska Department of Natural Resources and the U.S. Geological Survey in 1985, in which communities and industries estimated their water use. Where quantities of water use were not available, such data were estimated on the basis of similarities between communities and uses. The statewide distribution of total, surface-water and ground-water withdrawals is aggregated by county in figures 2A, 2B, and 2C, respectively. Surface-water withdrawals by principal drainage basin and ground-water withdrawals by principal aquifer are shown in figures 3A and 3B, respectively. Aquifers have been grouped informally into unconsolidated alluvium and glacial outwash aquifers and bedrock aquifers (U.S. Geological Survey, 1985, p. 129-131). Major ground-water withdrawals were from the unconsolidated aquifers.

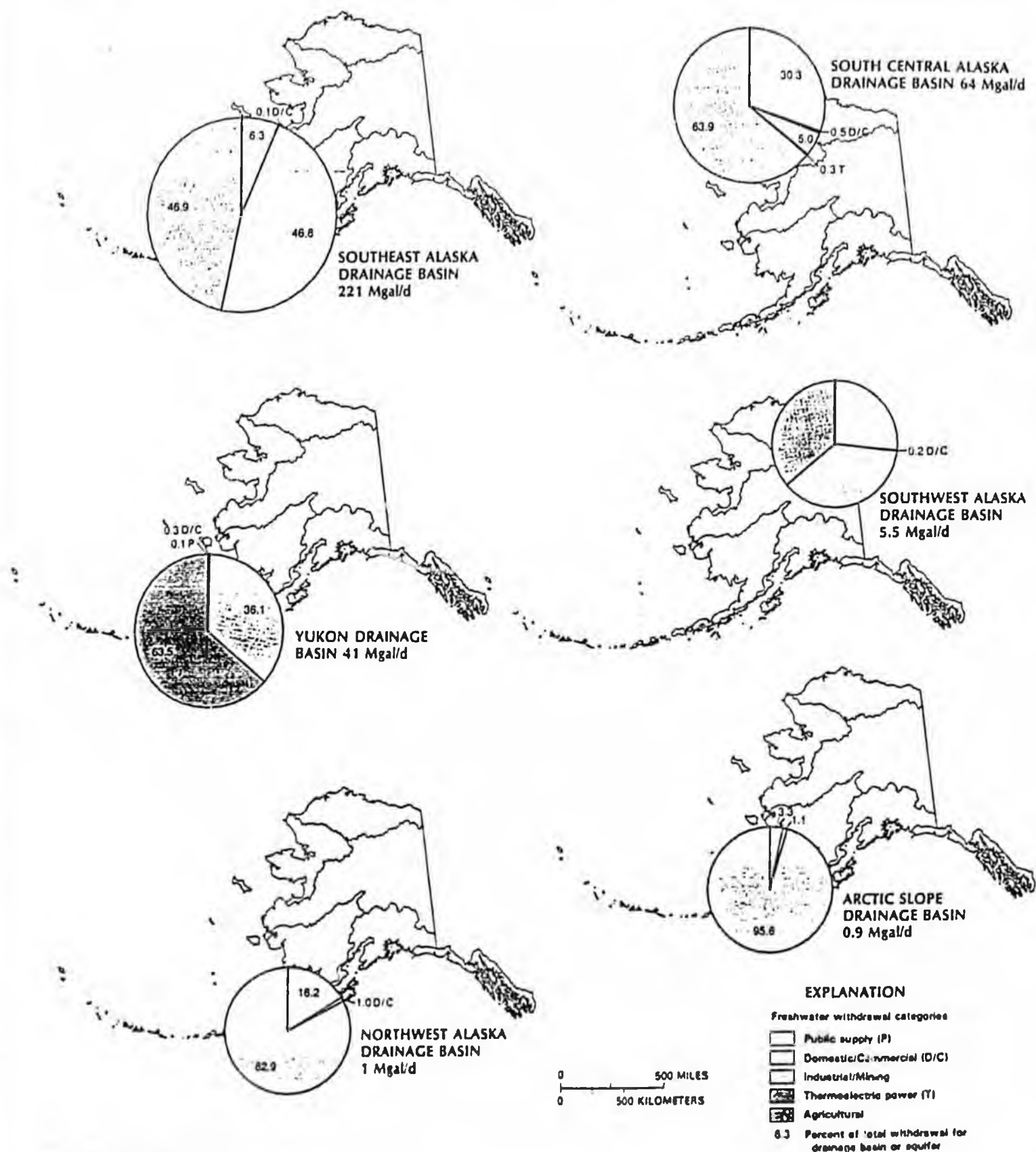
Most withdrawals occur in three of the principal river basins—Southeast Alaska, South Central Alaska, and Yukon (fig. 3A). Withdrawals in the Southeast Alaska basin were 55 percent (221 Mgal/d) of total water use in Alaska. About 99 percent of these withdrawals was surface water. Industry and fish hatcheries were the primary users of this water. In contrast, the South Central Alaska basin accounted for about 27 percent (110 Mgal/d) of the total withdrawals during 1985. This basin withdrew about 64 percent (64 Mgal/d) of the total ground water during 1985. The large withdrawals for public supply and self-supplied domestic uses provide water to the comparatively large population of the area. Public supply, self-supplied domestic, and industry were the major water users. The Yukon basin accounted for 15 percent (41 Mgal/d) of the total withdrawals. Water used for mining and fossil-fueled powerplants was 74 percent of the 61 Mgal/d withdrawn in the Yukon basin. Surface water was used for nearly two-thirds of this quantity.

The remaining basins, the Arctic Slope, the Southwest Alaska, and the Northwest Alaska, included 8 percent of the population and used 3 percent of the total water. Public supply and self-supplied domestic and commercial uses accounted for 61.9 percent of the ground-water withdrawals within the Yukon basin.

The source, use, and disposition of Alaska's water resources are shown diagrammatically in figure 4. The quantities of water given in this figure and elsewhere in this report may not add to the totals indicated because of independent rounding. The source data indicate that total freshwater withdrawals were 406 Mgal/d, of which 334 Mgal/d was surface water and 72 Mgal/d was ground water. The use data indicate that, of total freshwater use, industry and mining accounted for 34.7 percent and agriculture accounted for 38.6 percent. The disposition data indicate that most water (93.3 percent) was returned to natural sources and was available for reuse. Estimated consumptive use was 6.7 percent (27 Mgal/d).

Alaska's water is generally of sufficient quantity and acceptable quality for most uses. However, population increases during the last decade, especially in urban areas, have strained water-distribution systems and generated concern about water availability. In Anchorage, a measurable decline in ground-water levels has been attributed to increased withdrawals. Saltwater intrusion has halted further ground-water development in Auke Bay, near Juneau. In Kenai and in the Arctic Slope basin, water supply is a concern to communities near petrochemical industry activities.

Surface- and ground-water quality problems have been caused either by natural processes or by human activities. Natural processes include suspended sediment caused by glaciers, salinity, and undesirable concentrations of iron or arsenic produced by geo-



A. SURFACE WATER

Figure 3. Freshwater withdrawals by category of use and hydrologic unit in Alaska, 1985. A, Surface-water withdrawals by principal drainage basin. B, Ground-water withdrawals by principal aquifer. Abbreviation: Mgal/d is million gallons per day. (Sources: A, Drainage basins from Seaber and others, 1987; data from U.S. Geological Survey National Water Data Storage and Retrieval System. B, Data from U.S. Geological Survey files.)

chemical processes. Human activities include petrochemical contamination, the addition of nitrates through septic-tank systems, and the encroachment of saltwater in response to intensive ground-water withdrawal. Nevertheless, even in areas of water-supply difficulties, Alaska's water is generally satisfactory for most uses, although locally it may not be readily obtainable from the nearest or most economical source.

PUBLIC SUPPLY

Public-supply systems withdraw, treat, and distribute water to users. The total withdrawals for public-supply in Alaska were an estimated 76 Mgal/d (fig. 4), which was 18.7 percent of total withdrawals in 1985. Surface water provided 46.2 percent (35

Mgal/d) of public-supply withdrawals, and ground water provided 53.8 percent (41 Mgal/d). Of total withdrawals for public supply, 40.3 percent was delivered for commercial use, and 39.0 percent was delivered for domestic use. About 60 percent (45 Mgal/d) of public-supplied water was delivered in the South Central Alaska basin.

About 62 percent of Alaska's population was served by public water suppliers in 1985. The Municipality of Anchorage supplied water to one-half of the population served by public-supply systems. The per capita use by all public-supply customers ranged from 10 to 380 gal/d (gallons per day) in 1985. Public-supplied domestic use ranged from 6 to 170 gal/d per capita. These values reflect the different types of water-distribution systems; for example, a public-supply system in the Arctic Slope basin may consist of a water-

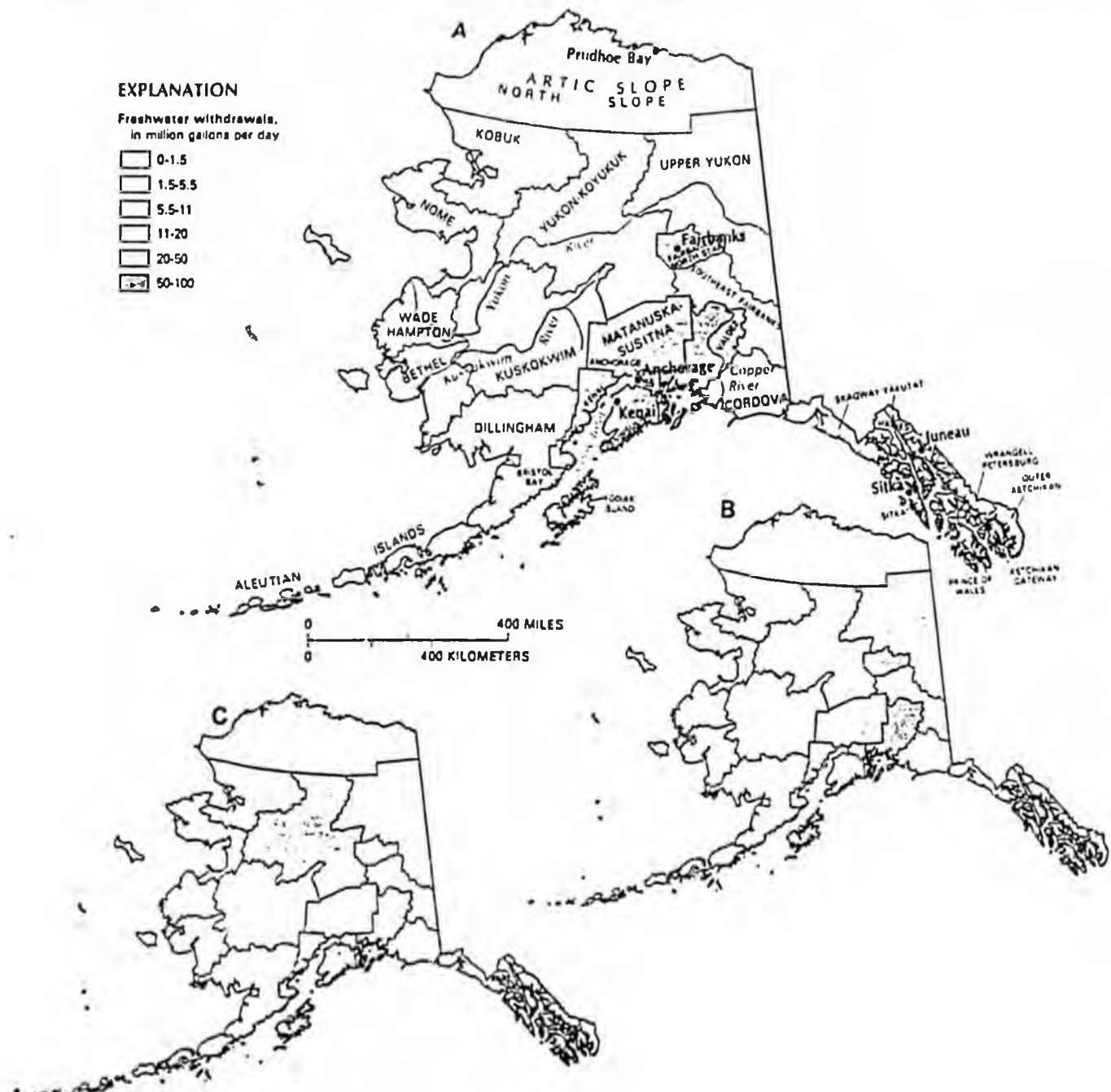


Figure 2. Freshwater withdrawals by county in Alaska, 1985. A, Total withdrawals. B, Surface-water withdrawals. C, Ground-water withdrawals. (Source: Data from U.S. Geological Survey National Water Data Storage and Retrieval System.)

delivery truck or a common well, and the primary use is domestic. In contrast, water in the Southeast Alaska basin is abundant, and distribution systems commonly are leaky; residents, commonly leave their faucets running to prevent the pipes from freezing. In addition, water-intensive industries in the Southeast Alaska basin are served by public supply.

DOMESTIC AND COMMERCIAL

Total domestic and commercial water use, including conveyance losses and consumptive use, from public-supplied and self-supplied sources was 78 Mgal/d (fig. 4). Domestic use was about 39 Mgal/d, of which 29 Mgal/d was delivered by public-supply systems and 10 Mgal/d was self-supplied. Commercial withdrawals were about 31 Mgal/d, virtually all from public-supply sources. Conveyance losses were 7.6 Mgal/d.

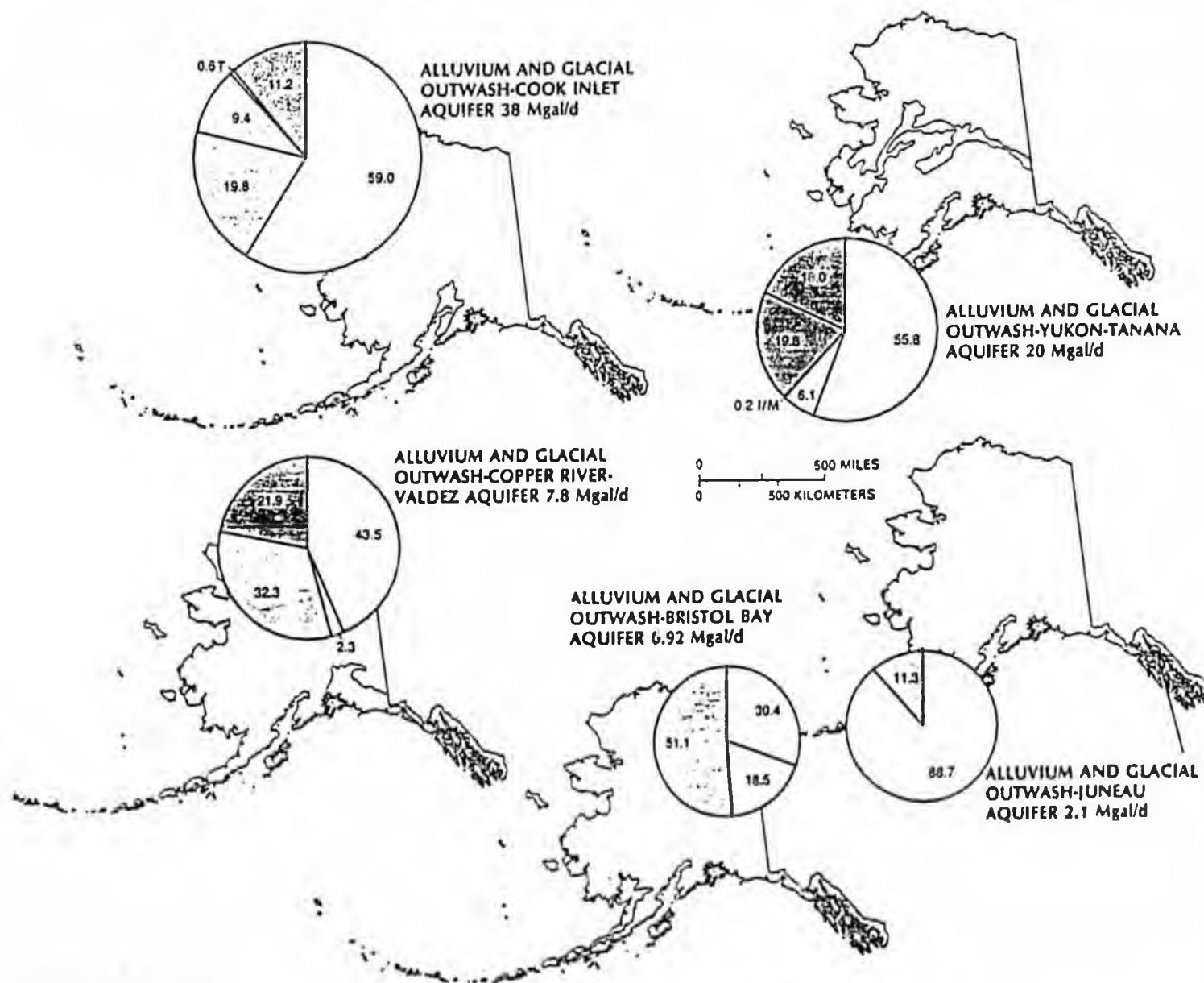
The average per capita domestic use for the population served by public supply was about twice that for the population that was self-supplied. This difference can be explained, in part, by conditions under which water is delivered to homes that use these two

types of supply. Public-supply systems typically serve a household that has standard plumbing. In contrast, many self-supplied households haul water from a lake, spring, river, or well and may have no plumbing.

INDUSTRIAL AND MINING

The estimated industrial and mining use was 141 Mgal/d in 1985. This represents 34.7 percent of total offstream water use (fig. 4). Industry used about 122 Mgal/d, of which 87 percent was self-supplied from surface-water sources. About 89 percent of the industrial water use was in the Southeast Alaska basin. Wood-pulp mills and seafood-processing industries in this basin used more than 100 Mgal/d in 1985. The petroleum industry was a major water user in the South Central basin.

Mining accounted for about 19 Mgal/d of water use. The Yukon basin had the largest area of mining activity and accounted for 76 percent of this water use. Adequate water supplies to support the exploration, development, and production in the Arctic Slope



B. GROUND WATER

Figure 3. Freshwater withdrawals by category of use and hydrologic unit in Alaska, 1985—Continued.

basin are commonly difficult to locate. Surface water is used primarily by placer-mining operations for washing sediments.

THERMOELECTRIC POWER

The fossil-fueled powerplants included in the survey used an estimated 31 Mgal/d (fig. 4) to produce 3,430 GWh of electricity during 1985. About 97 percent of the water was used by two plants in the Yukon basin, whereas 80 percent of the power produced by fossil fuel was produced by six plants in the South Central Alaska basin. These differences reflect the availability of water, the age of the powerplants, and perhaps different reporting methods. The water was used mainly for cooling purposes, and most was returned to surface-water sources.

AGRICULTURAL

Agricultural use during 1985 was an estimated 157 Mgal/d (fig. 4). Fish hatcheries dominated this category by using about 156 Mgal/d, of which 66 percent was used in the Southeast Alaska basin. Although the hatcheries in the Southeast Alaska basin exclusively use surface water, facilities elsewhere use ground water, which has a more consistent temperature and quality.

Agricultural water use for purposes other than fish hatcheries or irrigation totaled 0.21 Mgal/d, 48 percent of which was on Kodiak Island. Only 0.03 Mgal/d was used for irrigation; all of the reported irrigated farm acreage is in the Matanuska Valley, which is 40 miles north of Anchorage.

WATER MANAGEMENT

The Alaska Water Use Act (AS 46.15.010-270), which was enacted in 1966, established procedures to appropriate State water.

The Act defines the doctrine of prior appropriation ("first in time, first in right") authorized by the State Constitution and delegates administration of the Act to the Alaska Department of Natural Resources (ADNR). The Act established procedures for maintaining existing water rights and for obtaining new water rights to all surface and ground water in Alaska. Water appropriations are limited to the specific use for which an individual applies. Additionally, the ADNR issues permits authorizing development and beneficial use of water. Issuance of a certificate of appropriation by the ADNR to the applicant is the final step in the water-rights process.

The original regulations implementing the Water Use Act were amended extensively on December 29, 1979, and incorporated as 11 AAC 93, Water Management. Recent amendments to the Water Use Act relate to geothermal development, reservation of water for instream uses, and administrative and judicial basinwide water-rights adjudication.

To manage the State's water resources effectively, the ADNR's Division of Land and Water Management (DLWM) requires technical descriptions and analyses and interpretations of various hydrologic conditions. The Department's Division of Geological and Geophysical Surveys (DGGs), Water Resources Section, provides the necessary data, analyses, and interpretations. Many long-term data are collected and interpreted by the U.S. Geological Survey, in cooperation with other Federal, State, and municipal agencies. Water managers of the DLWM use this information for water appropriation and water management decisions. Additionally, the DGGs, in cooperation with the U.S. Geological Survey and other State and Federal agencies, has developed and implemented the Alaska Water Resources Evaluation Plan to coordinate water-data collection and water-resource investigations in the State (Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys, and U.S. Geological Survey, 1985).

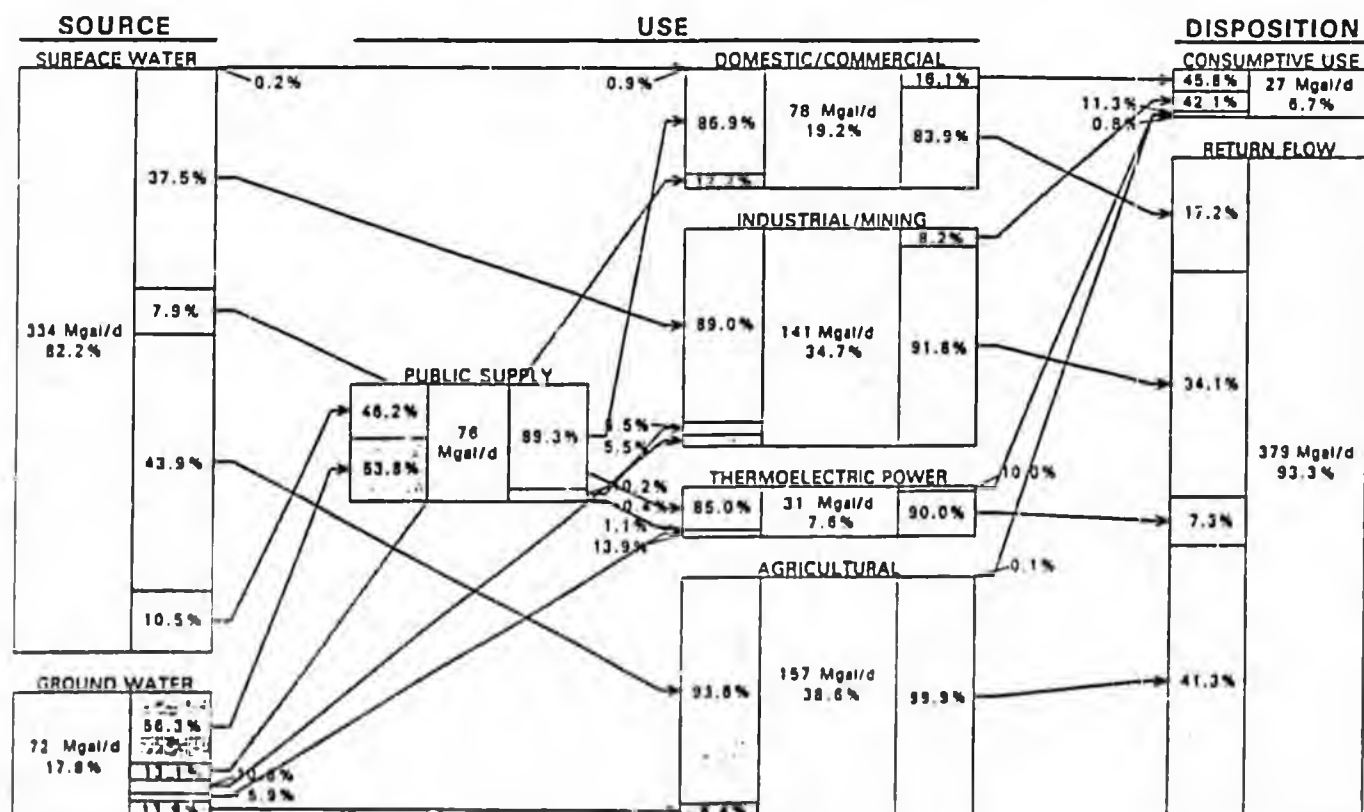


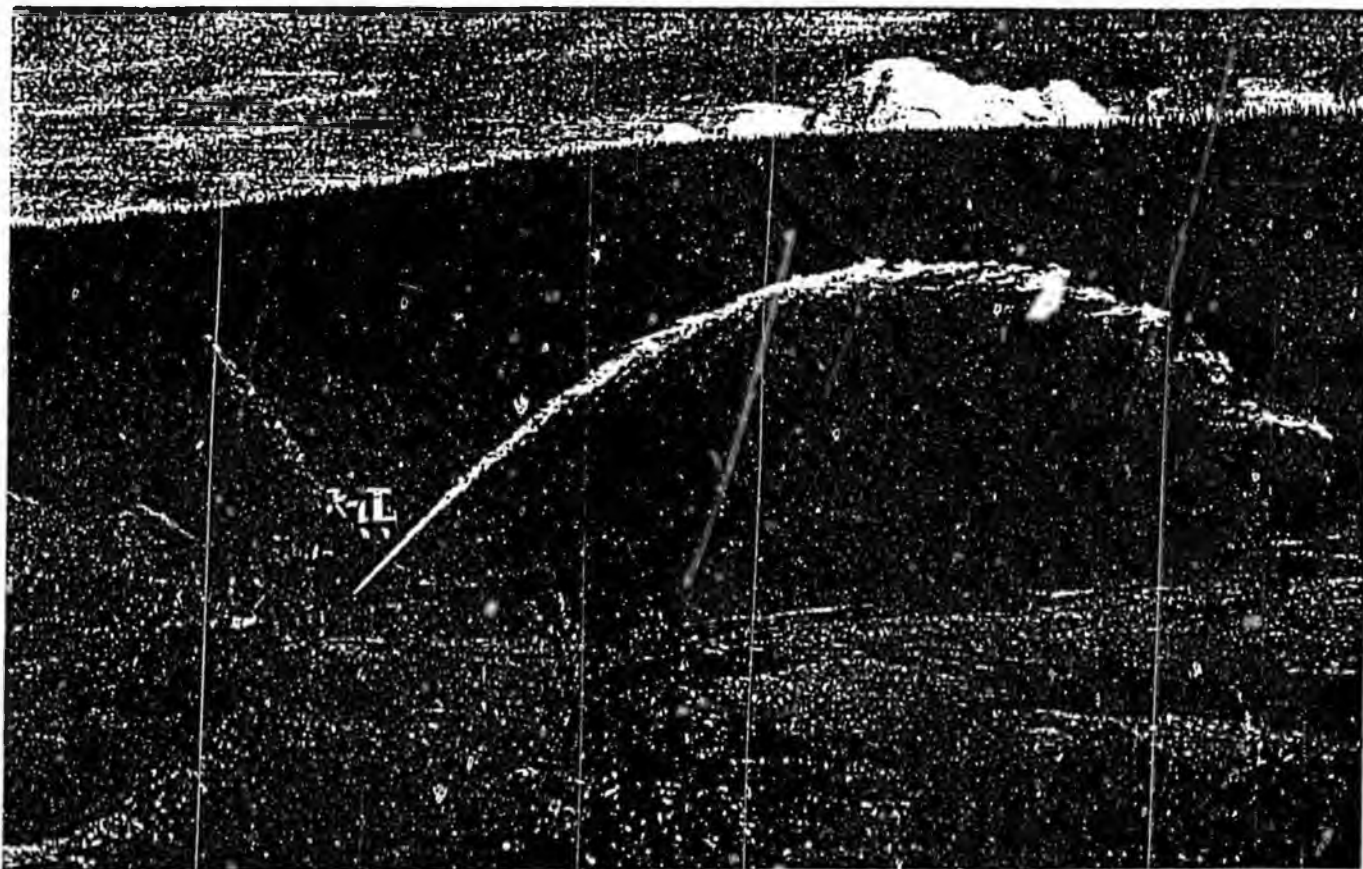
Figure 4. Source, use, and disposition of an estimated 406 Mgal/d (million gallons per day) of freshwater in Alaska, 1985. Conveyance losses in public-supply distribution systems and some public water uses, such as fire fighting, are included in the total shown for domestic and commercial use; losses in irrigation distribution systems are included in the total shown for agricultural return flow. All numbers have been rounded and values may not add to totals. Percentages are rounded to the nearest one-tenth of 1 percent (0.1%) between 0.1 and 99.9 percent. (Source: Data from U.S. Geological Survey National Water Data Storage and Retrieval System.)

Although few streams in Alaska are overappropriated, potential water-use problems exist. In the event of water shortages or drought, Ship Creek at Anchorage and Indian River at Sitka could possibly be examples in which the amount of legally obtainable water may exceed the water available for use. Water issues in Alaska also include hydroelectric projects, placer mining, oil development, salmon aquaculture, and proposed mining developments in the Southeast Alaska basin.

Most ground-water shortages in Alaska currently involve water for public supply and domestic use. Some areas within the Municipality of Anchorage are experiencing great ground-water demand for public and single-family domestic water supplies. As water levels declined, domestic wells become dry. The ADNRR and Municipality of Anchorage are working cooperatively to solve several water-supply and distribution problems. Another area experiencing declining ground-water levels and saltwater intrusion is the Auke Bay area near Juneau (Dearborn, 1985), where the ADNRR established Alaska's first "Critical Groundwater Management Area" to restrict further water-well drilling and development of ground water.

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Hydraulic "giant" used to remove overburden and expose gold-bearing gravel north of Fairbanks, Alaska. (Photograph by Gary Prokosch, Alaska Department of Natural Resources.)

Prepared by Leslie D. Patrick and Elisabeth F. Snyder, U.S. Geological Survey, and Mary Lu Harle, Alaska Department of Natural Resources

FOR ADDITIONAL INFORMATION: District Chief, U.S. Geological Survey, 4230 University Drive, Anchorage, AK 99508-4664

In 1946, the Alaska District of the USGS was established and the stream-gaging program was initiated with 16 stations. By 1961, 68 gaging stations were operating. The graph below shows the status of the network since 1946. The greatest number of stream-gaging stations was 131 in 1970.

During 1990, water-discharge data were collected at 85 gaging stations and water-quality data at 24 of these. Data were also collected at 66 crest-stage partial-record stations and at 22 lakes. The map below shows the locations of these stations.

Although surface-water records have been compiled in Alaska since the early years of the century, the State is so large that data are sparse for many areas. Northern and western areas of the State, in particular, have few stream gages. More streamflow data are needed in response to the increasing water-resources development within the State.

DATA COMPILATION AND REPORTS

How can I acquire streamflow data?

The U.S. Geological Survey publishes the surface-water records obtained at gaging stations. From 1957 to 1971, water resources data for Alaska were published annually by the Survey in Water-Supply Papers. In 1972, a series of Water-Data Reports was started, which merged all water resources data. The most recent of these are referenced below:

U.S. Geological Survey, 1976-91, Water resources data for Alaska, water years 1975-90: U.S. Geological Survey Water Data Reports AK-75-1 to AK-90-1 (published annually).

The following report lists all sites in Alaska that had surface-water records up to 1988:

Stall, P.J., and Cosby, J.M., 1989, Alaska index: Streamflow, lake levels, and water-quality records to September 30, 1988: U.S. Geological Survey Open-File Report 89-269, 189 p.

The following reports may also be of interest:

Feulner, A.J., and Reed, K.M., 1977, Bibliography of reports by members of the U.S. Geological Survey on the water resources of Alaska, 1870 through 1976: U.S. Geological Survey Open-File Report 77-687, 112 p.

Lamke, R.D., 1984, Cost-effectiveness of the stream-gaging program in Alaska: U.S. Geological Survey Water-Resources Investigations Report 84-4096, 100 p.

Parks, Bruce, and Madison, R.J., 1985, Estimation of selected flow and water-quality characteristics of Alaskan streams: U.S. Geological Survey Water-Resources Investigations Report 84-4247, 64 p.

Snyder, E.F., 1990, Activities of the Alaska District, Water Resources Division, U.S. Geological Survey, 1990: U.S. Geological Survey Open-File Report 90-157, 21 p.

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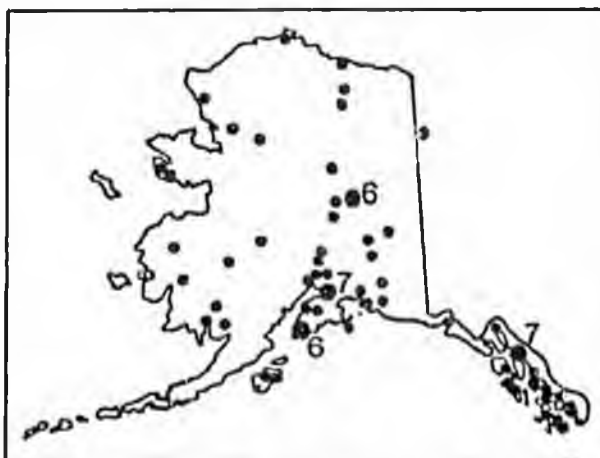
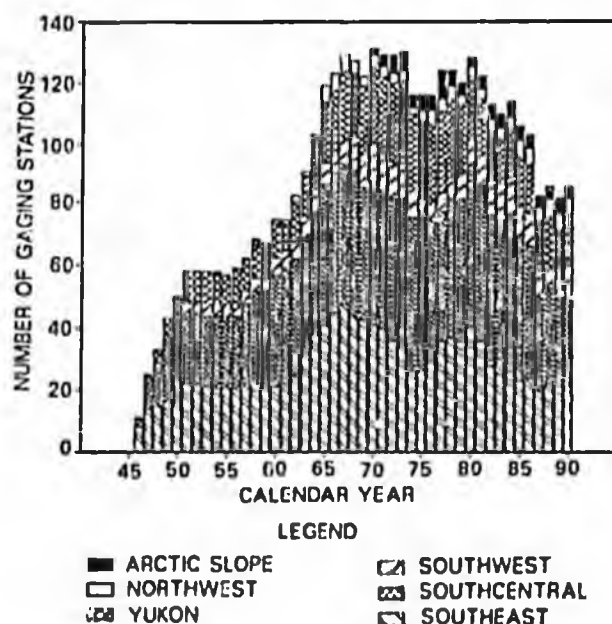
In addition to the reports, most of the surface-water data are available through computerized data-retrieval programs. For information contact:

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by Elisabeth F. Snyder

February 1992

HISTORY OF STREAM GAGING BY AREAS IN ALASKA



Locations of stream-gaging stations in 1990

THE U.S. GEOLOGICAL SURVEY STREAM-GAGING PROGRAM IN ALASKA

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey (USGS) is the principal Federal agency that collects water data in the United States. These data are collected in cooperation with State and local governments and other Federal agencies. Water in rivers and lakes is called "surface water." One method of collecting data from surface water is the establishment of a stream-gaging program.

What is a stream-gaging program? It is a network of stream-gaging stations on rivers and lakes that provides data on surface-water resources. These data help planners make decisions on the use and management of these resources.

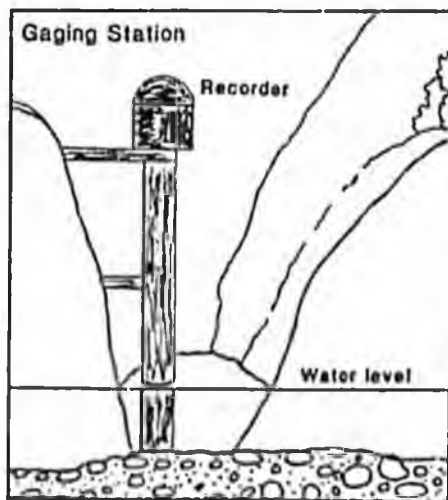
What is a stream-gaging station? It is a particular site on a stream or lake where systematic observations of hydrologic data are collected (see sketch below). The most commonly collected data, called "stages," are measured by recording gage heights (1) manually by an observer, (2) with mechanical instruments on special purpose paper, or (3) with electronic methods into a computer file. A continuous record of discharge at a station can be computed using recorded gage-height and 6 to 12 discharge measurements made at the station each year. The commonly reported data are discharges at a site for each day of the year.

What are surface-water records? Surface-water records consist of data on stage and discharge. Data are also collected at "partial-record stations," such as the network of "crest-stage gages" where only the peak discharge for the year is determined. Water-quality data are collected at many stream-gaging stations.

Stage (gage height) is the height of a water surface above an established datum plane. Stream-gaging stations provide a continuous record of stage.

Discharge is the volume of water that passes a given point at a given time.

Water-quality data report the following types of water characteristics: physical (such as water temperature), biological (such as fecal coliform bacteria), and chemical (such as dissolved iron).



USES OF DATA COLLECTED

What are the data collected at gaging stations used for?

Regional Hydrology: Discharge data at a station whose streamflow characteristics have not been altered by man can be used to develop relationships for a region. The relationship, which is based on streamflow characteristics (stage, discharge) and basin characteristics (geographic traits, climatic data), can estimate streamflow characteristics at ungaged sites on streams within the same region.

Hydrologic Systems: Data can be used to define current hydrologic conditions and to document changes in these conditions. For example, as an urban area becomes increasingly developed, stations can yield data that show changing streamflow characteristics.

Planning and Design: Data from these stations are used to plan and design a specific project, such as a dam or bridge.

Project Operation: Data are used to assist water managers in making operational decisions, such as reservoir releases at hydroelectric power plants and reservoir storage and release at flood-control projects.

Hydrologic Forecasts: Data provide information to various government agencies for flood forecasts.

Water-Quality Monitoring: Continued monitoring of streams can detect physical, chemical, and biological changes in water quality. Some gaging stations in Alaska are part of a nationwide network designed to assess the water-quality of major streams.

Research: Some gaging stations are operated for a particular research water-investigations study, such as those operated for the studying the effects of the Redoubt Volcano eruptions.

Other: Some stations are operated to collect data for legal obligations or for the adjudication of water rights.

THE STREAM-GAGING PROGRAM IN ALASKA

The USGS began its streamflow data collection in the summer of 1906 near Nome, in connection with gold placer mining. During the next few years, data collection expanded on the Seward Peninsula and into the Yukon and Tanana River basins. In 1913, emphasis shifted to reconnaissance of water-power sites in the lower Copper River basin and Prince William Sound area, and eventually in southeast Alaska. Although the USGS discontinued data collection in 1921, private companies and other Federal agencies continued to collect some data in southeast Alaska until 1946.

ALASKA

Floods and Droughts

Moisture-laden storms that move northeasterward from the Pacific Ocean are the source of most of Alaska's precipitation (fig. 1) and subsequent streamflow. In the coastal area adjacent to the Gulf of Alaska and the Pacific Ocean, most of the annual precipitation is received from September through February, and October is the wettest month. Farther north toward the interior of Alaska, most of the precipitation occurs earlier, from June through November, and August is the wettest month. Seasonal distribution and type of precipitation (rain or snow) are affected by mountain ranges and fluctuations in air temperature. A prolonged cold, dry arctic airmass during the winter decreases annual precipitation in Alaska's interior. Annual precipitation increases tenfold from north to south.

Floods in coastal areas, which are affected by maritime conditions, generally result from late summer and fall rainstorms. The documented floods have been of local extent since the U.S. Geological Survey began widespread collection of streamflow data in the late 1940's and early 1950's. Adjacent to and somewhat inland from the coastal areas, rainfall combined with snowmelt causes local floods in the fall and winter. In the rest of the State, areawide floods have resulted from either snowmelt (and local rains) in late spring or from widespread summer rains. On large rivers, increased runoff during spring snowmelt breaks the winter ice cover, which can cause localized ice-jam floods. The severity of these floods depends on antecedent conditions of ice thickness, snowpack, air temperature, and quantity of water and ice released when ice jams upstream break free. Large and sometimes damaging floods also

occur on some streams because of a rapid release of water stored beneath glaciers or in glacier-dammed lakes. Storm waves or surges have flooded coastal towns, such as Nome and Barrow. Other coastal towns have been inundated by tsunamis, which are waves generated by earthquakes. Tsunamis during and after the Great Alaska Earthquake of March 27, 1964, in the Gulf of Alaska caused more loss of life and probably more total damage than all other floods within the State since 1950.

Alaska has had no statewide droughts; however, five prolonged regional droughts are identified in this report. The most severe drought was from the mid-1970's to 1980 in the Chena and Salcha River basins near Fairbanks. Regional droughts are little noticed because only a small percentage of Alaska's surface-water resources is used.

Flood- and drought-management programs are limited in extent because of Alaska's abundant water resources and small population. However, flood warnings are issued for inhabited areas, and flood-prone areas in most communities have been identified.

GENERAL CLIMATOLOGY

Most storms that affect Alaska throughout the year originate over the North Pacific Ocean and the southern fringes of the Bering Sea (Seikregg, 1974, p. 10-11). Seasonal fluctuations in the loca-

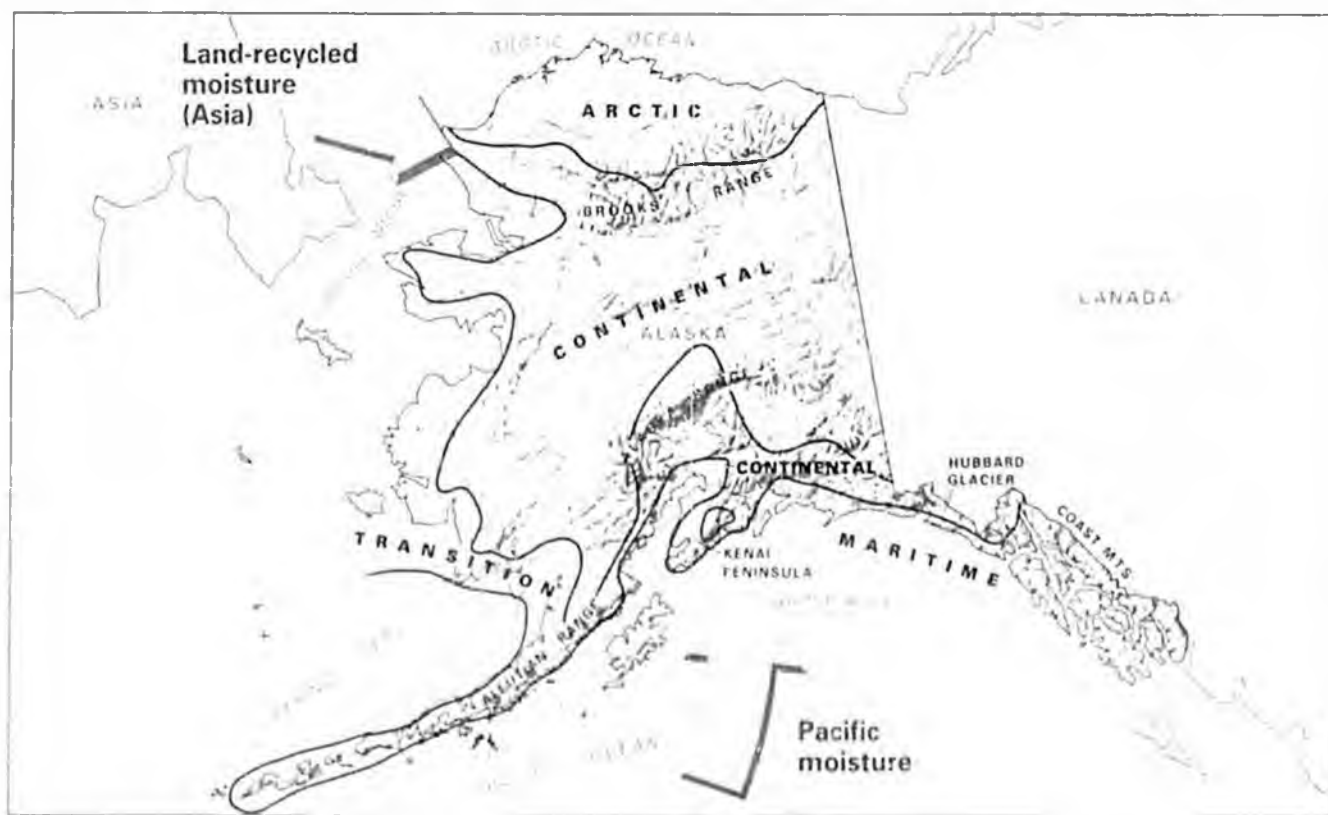


Figure 1. Principal sources and patterns of delivery of moisture into Alaska. Size of arrows implies relative contribution of moisture from source shown. (From U.S. Geological Survey, 1974, and modified from U.S. Geological Survey, 1974, and modified from U.S. Geological Survey, 1974.)

tion and direction of the predominant paths of these storms partly control geographic distribution of seasonal and annual precipitation. During most of the year, major storms move northeastward toward the Gulf of Alaska and southeastern Alaska (fig. 1). During August, major storms also commonly move northward over the Bering Sea and the Bering Strait. As a result, storms penetrate Alaska's interior more frequently in the summer (mainly in August) than in the winter. A mass of cold air develops and increases in size over the interior as the seasons change; by October, the storm tracks have shifted and are located around the northwestern, northern, and southern edges of the State. These storm tracks are at the boundary of the cold and warmer airmasses; the southern storm tracks are predominant.

In addition to the oceans, Asia is a summertime moisture source for northern Alaska. Moisture that evaporated from lakes and local and upwind land surfaces combines with moisture from either the Arctic Ocean or the Bering Strait. This moisture source is also important to interior Alaska during the summer.

The differences in annual temperatures from north to south also affect the distribution of precipitation. During winter, the cold, dry air mass persists over interior and northern Alaska; most of the Bering Sea and the entire Arctic Ocean are frozen. The potential for winter precipitation is greater in the southern parts of the State because the Pacific Ocean is much warmer, is never ice covered, and thus serves as a source of abundant moisture.

Alaska has been divided into four climatic zones (fig. 1) because of its diverse climatic conditions (Selkregg, 1974, p. 9). The climatic differences result from the great size of Alaska, the topography (mainly, its major mountain ranges), and the mechanisms by

which temperature and precipitation are affected by the oceans on three sides. The climatic zones have the following characteristics. The Maritime Zone has small temperature variations, large annual precipitation, cool summers, and warm winters that have short periods of below-freezing temperature. The Transition Zone has greater diurnal and seasonal temperature variations and less precipitation than the Maritime Zone. The Continental Zone has large diurnal and annual temperature ranges and a small quantity of annual precipitation. The Arctic Zone has less temperature variation, less precipitation (especially near the Arctic Ocean), and lower mean annual temperature than the Continental Zone. Precipitation is greatest during August in the Arctic and Continental Zones and during October in the Maritime Zone (U.S. Geological Survey, 1986, p. 138). The seasonal precipitation pattern is not well defined for the Transition Zone.

The distribution of precipitation in Alaska is affected by several mountain ranges. From south to north, the principal mountain ranges are an arc of coastal mountains, an extensive second arc of higher mountains that includes the Coast Mountains (in southeastern Alaska), the Alaska and Aleutian Ranges, and still farther north, the Brooks Range (fig. 1). Moisture-laden airmasses rise and cool as they approach these ranges, which causes moisture to condense and precipitation to increase with altitude. The mountains in southeastern Alaska are barriers to the movement of precipitation. In the rest of the State, however, storm tracks tend to move parallel to major mountain ranges, and the effect of these ranges on precipitation varies. Several smaller mountain ranges affect local climate.



Figure 2. Selected geographic features, Alaska.

Average annual precipitation ranges from about 320 inches in parts of southeastern Alaska to less than 5 inches near the Arctic Ocean. Mean annual precipitation for the State is about 40 inches, but ranges from about 150 inches throughout southeastern Alaska to an average of about 15 inches north of the Brooks Range. Average annual temperature decreases from -45 to 10 °F (degrees Fahrenheit) from south to north. Temperature affects quantities and timing of runoff. For example, precipitation at temperatures below 32 °F generally falls as snow and becomes part of a snowpack; runoff may occur later in the year as the snow melts or some of the snow may be retained in glacier storage. As another example, local floods result from convective storms in the middle and eastern Yukon River basin where diurnal temperature variations are large during the summer. Although annual maximum peak discharges in the Maritime Zone occur mostly from August through October, temperatures commonly are mild enough for rainstorms and the resulting floods from November through January (Lamke, 1979, p. 8). In the rest of Alaska, most of the annual peak discharges occur between May and October.

The factors that produce flooding generally can be identified either during or after the flood. Causes of droughts are less obvious. Some reasons for droughts might be that storms normally causing precipitation are less severe or less frequent, or that the normal position of a major storm track has shifted for a prolonged time. This shift can be the result of changes in the surface temperatures of the oceans over which the storms originate or of global changes in air temperature.

MAJOR FLOODS AND DROUGHTS

Floods affect people directly, particularly if they inundate populated areas, are widespread, and cause loss of life and property. Droughts and their effects are not readily identifiable in Alaska, mainly because only a small part of the State's vast surface-water supply is used (U.S. Geological Survey, 1990a). The major floods and droughts discussed herein are those that were areally extensive and had significant recurrence intervals—greater than 25 years for floods and greater than 10 years for droughts. These major events, plus those of a more local nature, are listed chronologically in table 1; rivers and cities are shown in figure 2. Evaluation of floods and droughts, as determined from long-term streamflow records, is limited to a period starting about 1948. Long-term records of streamflow are sparse or nonexistent in much of Alaska, so that an analysis of floods and droughts is not possible for some areas. Six active, long-term gaging stations that monitor flows generally unaffected by human activity were selected to represent hydrologic conditions. Floods and droughts for these six sites are depicted in figures 3 and 4, respectively. Streamflow data are collected, stored, and reported by water year (a water year is the 12-month period from October 1 through September 30 and is identified by the calendar year in which it ends).

FLOODS

Little is known of the history of flooding in Alaska before the establishment of a network of gaging stations in the late 1940's and early 1950's. The few identified historical floods range in time from postulated late Pleistocene catastrophic floods in the upper Porcupine and Yukon Rivers that resulted from sudden draining of glacial lakes in Yukon Territory, Canada (Thorson and Dixon, 1983), to large releases of water from glacier-dammed lakes on the Alsek and Takli Rivers during the last 1 or 2 centuries (Post and Mayo, 1971). In this century, the flood history of the Chena River at Fairbanks began with a major flood in 1905. Fairbanks is one of the few large Alaskan cities located on a major river.

Floods are not always the result of extreme river discharges caused by precipitation or snowmelt. Storm-generated waves or surges can inundate coastal towns; such waves caused \$3 million in damage at Barrow in October 1963 (Wise and others, 1981, p. 1). In November 1974, Nome was inundated by storm waves, and water was as deep as 10 feet in places; damage was estimated at \$12 million (Wise and others, 1981, p. 1). Another type of flood, although rare, is the giant waves that have occurred in Lituya Bay, notably those of July 9, 1958. The maximum wave runup of 1,720 feet resulted from a massive rockslide caused by an earthquake (Miller, 1960, p. 79). Coastal communities along the Gulf of Alaska were affected by tsunamis after the Great Alaska Earthquake of March 27, 1964. These waves reached heights as great as 170 feet above tide level immediately after the earthquake, and a rhythmic series of seismic sea waves as high as 35 feet above tide level began about 20 minutes after the earthquake. Local waves were larger in Prince William Sound between Valdez and Seward, but at Kodiak and in the Cordova area, which are farther from the epicenter, seismic sea waves caused most of the damage (Plafker and others, 1969). Most deaths resulting from the earthquake (115 in Alaska and 15 in Oregon and California) were attributable to tsunamis, which also caused a large proportion of the property damage (National Academy of Sciences, 1968, p. X-XI).

Flooding on some Alaskan streams is caused by the release of water from glacier-dammed lakes (Post and Mayo, 1971); such outbursts may be sudden and unexpected. Ice jams also have caused local floods along major rivers. The maximum recorded flood stages at sites 2-5 (fig. 3) were the result of ice jams. A flood on January 18, 1969, on the Kenai River at Soldotna (fig. 3, site 2) was caused by an outburst from Skilak Glacier at the head of Skilak Lake and by subsequent ice jams downstream from the lake on the lower Kenai River. Maximum stage due to ice jamming is compared below with the stage of maximum discharge at sites 2-5.

Site (fig. 3)	Maximum stage from ice jams		Stage during the maximum discharge	
	Stage (feet)	Date	Stage (feet)	Date
2	22.62	Jan. 18, 1969	13.45	Sept. 9, 1977
3	24.48	May 10, 1954	16.58	June 7, 1964
4	26.36	May 16, 1968	25.74	June 5, 1964
5	35.94	May 1962	33.85	June 12, 1964

Because of its great size and the many different causes of flooding, Alaska does not have statewide floods. Southeastern Alaska has not experienced areawide floods, even though precipitation quantities are large and storms are frequent. Information on major flooding at communities in ungaged areas has been compiled by the U.S. Army Corps of Engineers (1987). The areal extent and severity of major floods in the rest of the State are shown in figure 3. The magnitude of annual peak discharges and discharges with 10- and 100-year recurrence intervals at the six gaging stations also are shown.

Since 1949, the State has had four major floods. The floods were major in areal extent (fig. 3) and in damage.

The flood of June and July 1964 resulted from record-breaking peak discharges on several streams in interior Alaska. The floods were caused by rapid snowmelt from large snowpacks and, in some places, rain on water-saturated snow. Flooding was sporadic but occurred mainly in sparsely populated areas of the middle Susitna, upper Yukon (in Alaska), Kuskokwim, and Koyukuk River basins. In many small streams, peak discharges were minor; in others, if the conditions of snow cover and rainfall were right, peak discharges were the largest of record. The dates of the peak discharges ranged from early June to early July, depending on the air temperature, the aspect and altitude of the contributing basins, and the dates of substantial rainfall. These floods caused relatively little damage, but a

few highways and small communities along the larger rivers were affected.

The flood of August 12-18, 1967, was caused by a series of widespread general rains beginning August 8 in the middle and lower Tanana River basin near Fairbanks. Locally, storm rainfall totaled 10 inches, which is nearly the average annual precipitation for the

area. Floods of the Salcha River near Salchaket (fig. 3, site 6) and the Chena River at Fairbanks were extremely large. The maximum discharge of the Chena River at Fairbanks was almost twice that of a flood peak that has a 100-year recurrence interval. About 95 percent of Fairbanks was under water (Childers and others, 1972, p. A28). Nenana, which is downstream from Fairbanks on the Tanana River,

Areal Extent of Floods

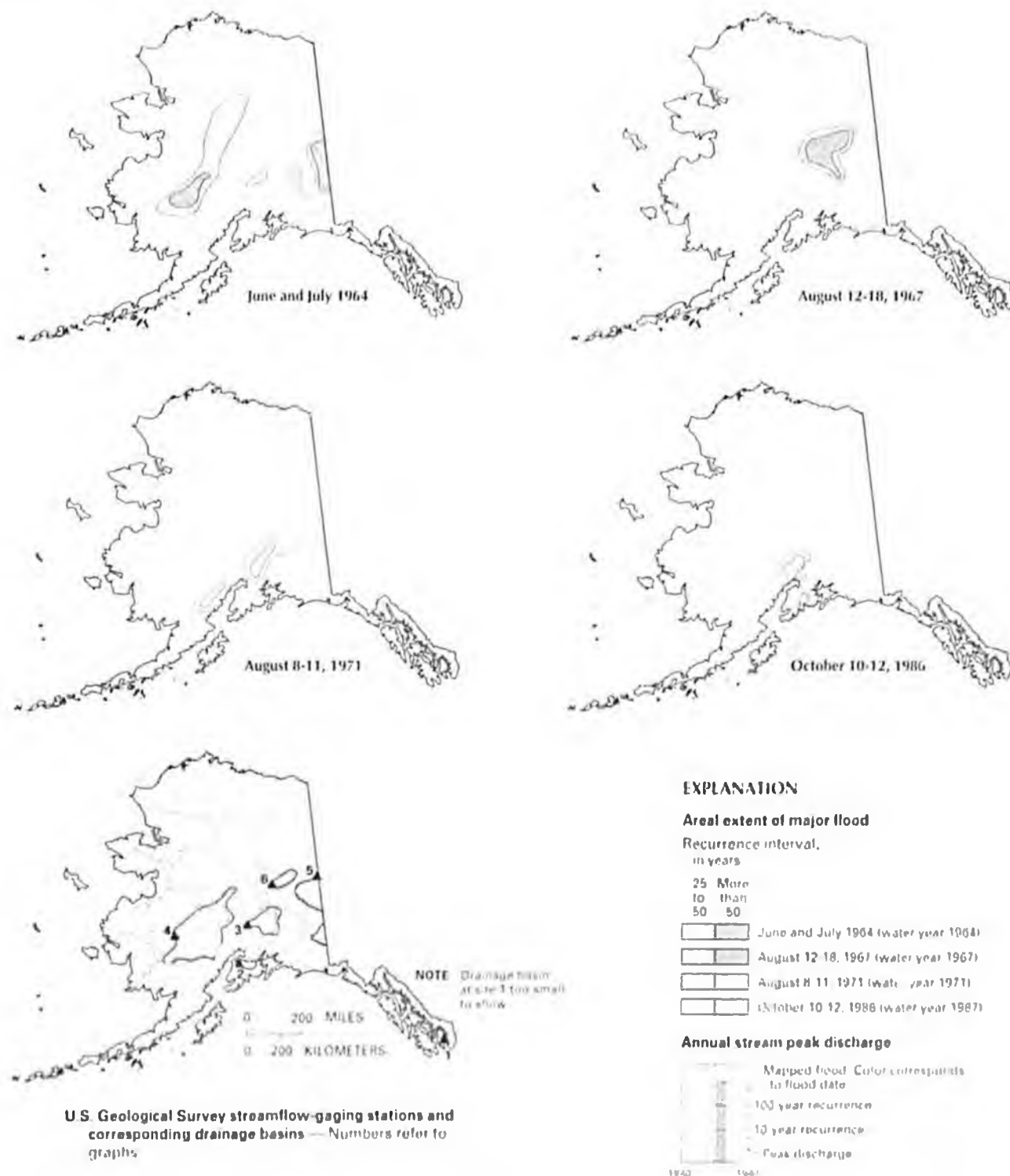


Figure 3. Areal extent of major floods with a recurrence interval of 25 years or more in Alaska, and annual peak discharge for selected sites, water years 1916-88. (Source: Data from U.S. Geological Survey, 1988.)



Ice-jam formation in Meade River at Atkasuk south of Barrow, Alaska. View downstream of newly formed ice jam on June 7, 1978, which increased the stage and caused local overbank flow. (Photograph by Charles E. Sloan, U.S. Geological Survey.)

Peak Discharge

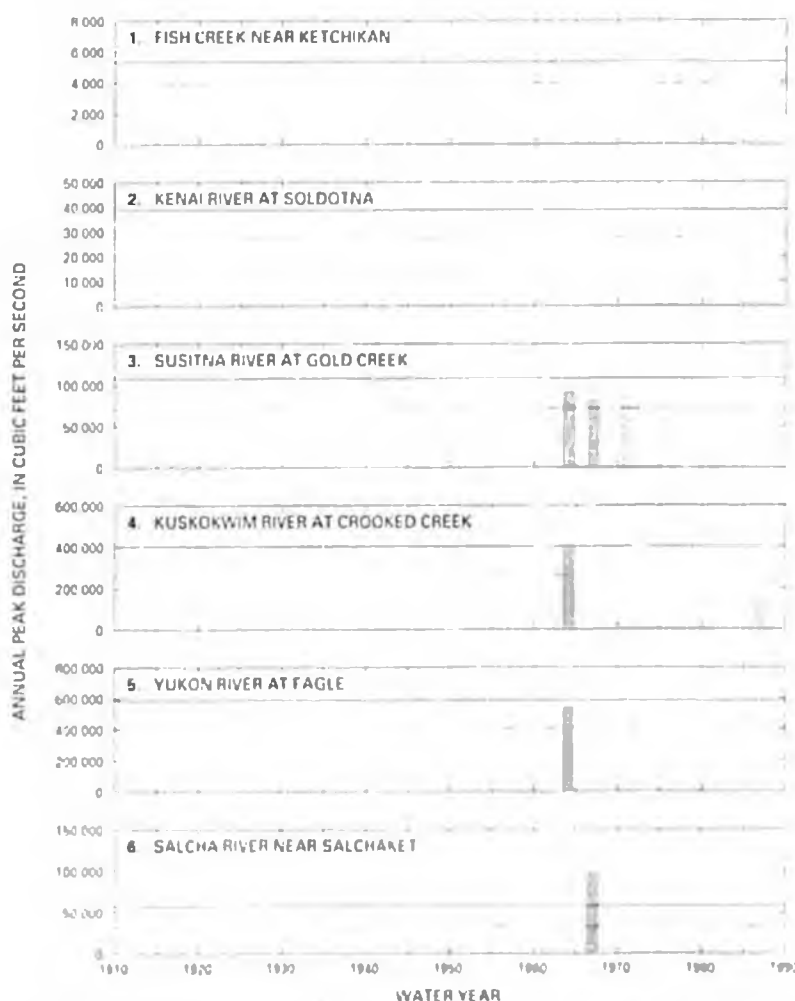


Figure 3. Areal extent of major floods with a recurrence interval of 25 years or more in Alaska, and annual peak discharge for selected sites, water years 1916-88—Continued

also was inundated. These floods caused 6 deaths, damage of about \$85 million, and the evacuation of 12,900 people (Childers and others, 1972, p. A1). These losses are much larger than the combined total loss during the other three major floods described here.

The flood of August 8-11, 1971, inundated areas northeast and west of Anchorage; the upper and middle Susitna River basin (fig. 3, site 3) and part of the Matanuska River basin were the most affected. Precipitation ranging from 3 to 9 inches was recorded during August 5-11 (Lamke, 1972, p. 12-15). July flooding in some streams in the area and in other nearby rivers created antecedent conditions that were a factor in the August flood. Total damage was about \$10 million, mostly to highways east of Palmer.

The flood of October 10-12, 1986 (water year 1987), affected south-central Alaska, generally south of the 1971 flood area. During October 9-11, almost 18 inches of rainfall was recorded at Seward on the Kenai Peninsula, and 8 or more inches fell farther north in the Susitna River basin near Talkeetna. These two storms were caused by different meteorological conditions. The rainstorm near Seward resulted from a stationary storm front, whereas that near Talkeetna resulted from a plume of relatively warm, moist air moving northward from Seward that met a cold front moving southeastward from Barrow (Lamke and Bigelow, 1988, p. 3-7). Most affected by these floods were the Seward area, the lower Susitna River valley, and a few small streams to the west along Cook Inlet. Peak discharges of several streams were greater than those having a 100-year recurrence interval. Kuskokwim River at Crooked Creek (site 4) was the only gaging station of the six in figure 3 at which the peak discharge was the maximum for the water year. Flood damage from inundation in the Seward area was increased by dammed streams resulting from landslides, as well as by eroding and migrating channels (Jones and Zenone, 1988). Flood damage was estimated to have been \$20 million (Lamke and Bigelow, 1988, p. 1).

Areal Extent of Droughts



Figure 4. Areal extent of major droughts with a recurrence interval of 10 years or more in Alaska, and annual departure from average stream discharge for selected sites, water years 1916-88.



U.S. Geological Survey streamflow-gaging stations and corresponding drainage basins—Numbers refer to graphs

Annual Departure

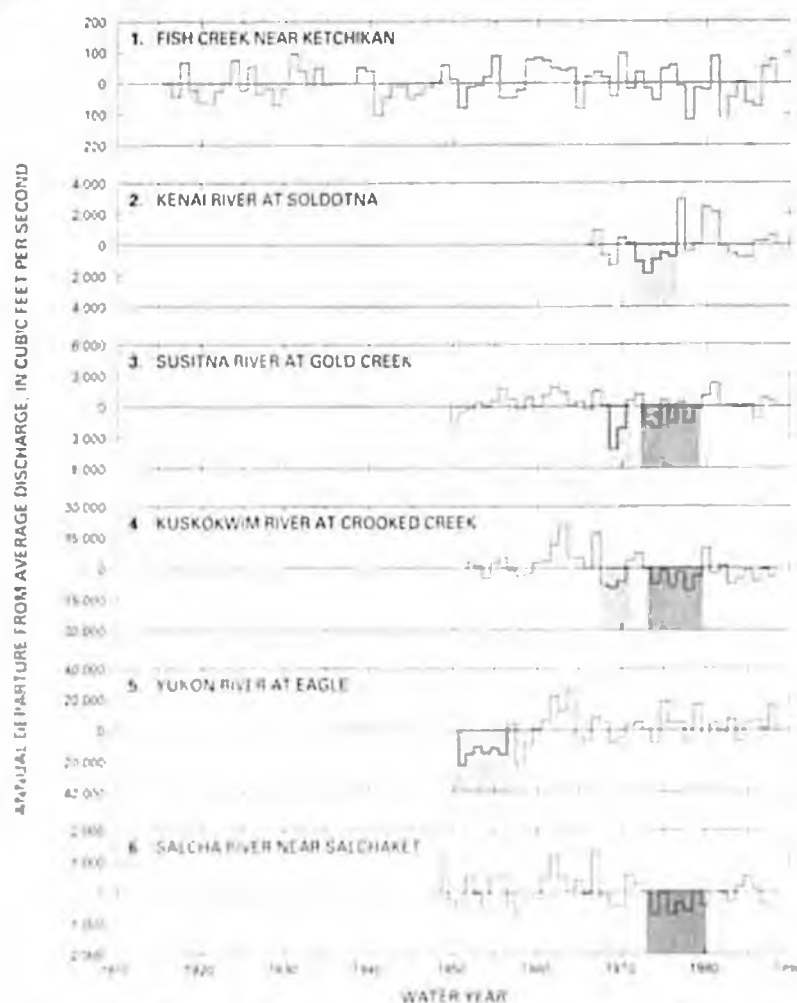


Figure 4. Areal extent of major droughts with a recurrence interval of 10 years or more in Alaska, and annual departure from average stream discharge for selected sites, water years 1916-88—Continued.

Intensive floods of local extent have occurred at other times and places in Alaska (table 1), but they generally caused minimal damage in unpopulated and undeveloped areas. For example, the discharge of many small streams in Anchorage was a record maximum on June 21, 1949, when most of the area was undeveloped. Floods on two small streams in urban areas of Anchorage resulted in record-breaking peak discharges on Aug. 25-29, 1989 (U.S. Geological Survey, 1990b, p. 6-9). Nearby areas were less severely affected; damage was estimated at about \$10 million, mostly from inundation of residences.

Two other recent floods of local extent are noteworthy (table 1). In 1986, Hubbard Glacier advanced and dammed Russell Fiord, thereby creating Russell Lake. The ice dam failed on October 8, 1986, and released an estimated 1.3 cubic miles of water from the lake; the peak discharge was estimated to be about 4,100,000 cubic feet per second (Mayo, 1988, p. 42, 46). A flood near Black Rapids on July 14, 1987 (U.S. Geological Survey, 1988, p. 9), is an example of local flooding caused by convective rainstorms in the Yukon River basin.

DROUGHTS

To identify droughts in Alaska, monthly streamflow data were analyzed for 50 gaging stations that have 20 or more years of daily discharge record and for 26 other gaging stations that have shorter records. For each station, annual departures of actual monthly flows from average monthly flow for the period of record were determined. For the purposes of this report, drought periods were defined by a concurrent, extended negative trend in the annual departures for several streams in an area. Five major droughts in Alaska can be distinguished. A sixth drought of lesser intensity and areal extent also was evident in parts of southeastern Alaska. For this last drought, data for water years 1981-88 were used to determine whether conditions that caused severe deficit flows in Pacific Northwest streams in the 1980's extended into Alaska. Even though Fish Creek near Ketchikan (fig. 4, site 1) experienced a drought from May 1981 to October 1986 that was the second most severe in 70 years of discharge record, flow deficits at other nearby long-term stations were not as large. Flows in these streams returned to normal within water year 1987.

Flow in most Alaska streams outside the Maritime Climatic Zone is small during winter. However, severe droughts that last as long as a year can happen when flows far less than average persist throughout the normally high-flow period of summer and into winter. Such a drought occurred in 1969 in the Copper River basin and in the rest of south-central Alaska outside the Maritime Climatic Zone. Flow records indicate another severe short-term drought in the low-altitude mainland and island streams around Ketchikan during the latter part of water year 1965 and the early part of water year 1966.

The assignment of a time period for an areawide drought is somewhat subjective. For example, the drought of 1950-57 might be considered to extend into water year 1960 on the Yukon River at

Eagle (fig. 4, site 5). However, at two nearby gaging stations in the upper Tanana River basin, the drought was ended by greater than normal snowmelt runoff after April 1957. For this report, a drought was considered to end just before a year of generally normal and greater than normal flows (indicated by zero or positive trends in

annual departures) or just preceding periods of noticeable high flow. If the cumulative deficit for a given drought is divided by the long-term average annual discharge, then an index to the severity of the drought can be calculated in terms of months of long-term average flow equivalent to the deficit. The five principal droughts in Alaska

Table 1. Chronology of major and other memorable floods and droughts in Alaska, 1949-89

Recurrence interval: The average interval of time within which a flow will be greater than a particular value for floods, or less than a particular value for droughts. Symbol: >, greater than. Sources: Recurrence intervals calculated from U.S. Geological Survey data; other information from U.S. Geological Survey, State and local reports, and newspapers.

Flood or drought	Date	Area affected (fig. 2)	Recurrence interval (years)	Remarks
Flood	June 21, 1949	Anchorage area	10 to >100	Largest known peak discharge in some small streams in Anchorage.
Drought	1950-52	Southeastern Alaska (mainland southeast of Juneau and islands near Ketchikan)	10 to >35	Deficit flows from Dec. 1949 to May 1952 in small streams. Less severe near Ketchikan.
Drought	1950-57	Upper Yukon River (in Alaska) and upper Tanana River basins.	10 to >30	Deficit flows on Yukon River from June 1950 to July 1960. Deficit flow ended May 1957 in upper Tanana River basin.
Flood	Aug. 12-13, 1961	Juneau area	10 to >100	High water in Juneau and mainland streams as much as 40 miles southeast.
Flood	Oct. 2-15, 1961	Ketchikan area	10 to >100	High water in island streams and mainland streams near Ketchikan.
Flood	June 1962	Yukon River and south-central Alaska (upper Susitna River basin).	10 to 75	Snowmelt and breakup peaks on Yukon River main stem and scattered streams in the Alaska Range.
Flood	Mar. 27, 1964	Gulf of Alaska coastal area	Unknown	Tsunami. Local and seismic sea waves from Great Alaska Earthquake extensively damaged coastal communities; lives lost, 115.
Flood	June-July 1964	South-central Alaska (middle Susitna River), southwestern Alaska (Kuskokwim River), and Yukon River in Alaska (upper Yukon and Koyukuk River basins).	10 to near 100	Snowmelt and rain on snow caused scattered flooding of villages along major rivers and some damage to highways.
Drought	Spring 1965-spring 1966	Southeastern Alaska (southern mainland and islands)	Unknown	Short, extreme low-flow period of about 1 year in many streams.
Flood	Aug. 12-18, 1967	Yukon River in Alaska (middle and lower Tanana River basin, particularly the Chena and Saicha River basins).	10 to >100	Result of widespread rainstorms. Fairbanks and Nenana almost inundated. Most damaging since records began. Lives lost, 6; damage, \$85 million.
Drought	1968-71	South-central (Copper, Matanuska, and Susitna River basins, Anchorage area), southwestern Alaska (Kuskokwim River), and Yukon River in Alaska (middle Yukon, Tanana, Nenana, and Koyukuk River basins).	10 to >35	Severe streamflow deficits on southern side of Alaska Range; less severe in other areas. Drought began in Aug. 1968 and ended in July and Aug. 1971.
Flood	Aug. 8-11, 1971	South-central (lower Matanuska and upper and middle Susitna River basins, Palmer area) and southwestern Alaska (Kvichak River basin).	10 to >100	Mostly result of widespread rainstorms; antecedent rain and high water were also significant. Damage, \$10 million.
Drought	1972-76	South-central and southwestern Alaska (southern one-half of these regions, excluding lower Kenai and Alaska Peninsulas).	10 to >35	Deficit flows from Cordova to the Kenai River, and Anchorage areas, less severe on Kodiak Island and Bristol Bay drainages. Started in fall 1971 and ended in fall 1976.
Drought	1973-80	South-central (middle Susitna River), southwestern Alaska (upper Kuskokwim River), and Yukon River in Alaska (lower Tanana, central Yukon, and Koyukuk River basins).	10 to >30	Streamflow deficiencies most severe on northwestern side of Alaska Range and in Saicha-Chena River basins. Began in spring 1973 and generally ended in fall 1980.
Flood	Nov. 11-13, 1974	Nome area	Est. 30	Storm surge. Storm waves as much as 10 feet in depth flooded parts of Nome. Damage, \$12 million.
Drought	1981-86	Southeastern Alaska (islands near Ketchikan and on mainland north to Juneau)	10 to >30	Deficient runoff in some island streams near Ketchikan. Lesser deficits elsewhere. Extended from May 1981 to Oct. 1986.
Flood	Oct. 8, 1986	Russell Ford Lake	Unknown	Breakout of lake formed when advancing Hubbard Glacier dammed a fiord.
Flood	Oct. 10-12, 1986	South-central Alaska (Seward area, lower Susitna River basin, and streams west of Susitna River mouth).	10 to >100	More than 15 inches of rain near Seward and 8 inches near Talkeetna. Damage, \$20 million, mostly to roads and the railroad.
Flood	July 14, 1987	Black Rapids area in Tanana River basin	Unknown	Local, caused by a convective rainstorm. Damage, \$1 million, mostly to highway and exposed Trans-Alaska pipeline.
Flood	Aug. 25-29, 1989	Anchorage area	25 to >100	Local floods on two urban streams in Anchorage and, to a lesser extent, on other streams in Anchorage area. Damage, \$10 million, mostly from inundation of residences.

are described in chronological order. The extent of these droughts and the annual departures from the long-term mean flow are shown in figure 4.

The drought of 1950-52 began with deficit flows in south-eastern Alaska in December 1949 or January 1950 in most mainland streams from Juneau southward past Wrangell and in most island streams near Ketchikan. The drought ended in either April or May 1952. The annual departures for Fish Creek near Ketchikan (fig. 4, site 1) show that this drought is the sixth most severe in nearly 70 years of record; thus, the recurrence interval is slightly greater than 10 years. However, the recurrence interval of the drought, as reflected in streamflow records at most mainland gaging stations, is 30-35 years. Where the drought was most severe, the cumulative deficit at the end of the period was equivalent to 5-6 months of average flow.

The drought of 1950-57 affected the upper Yukon River basin (in Alaska), which includes the upper Tanana River basin. The drought was less severe farther west along the Alaska Range. On the main stem of the Yukon River, deficit flows began in June 1950 at Dawson City in Yukon Territory, Canada, upstream from the Alaska border. The cumulative deficit in the almost 7 years of drought was equivalent to about 1 year of average flow.

The drought of 1968-71 resulted from severe deficits in streamflow in south-central Alaska outside the Maritime Climatic Zone; the 3-year drought includes a more severe short-term drought in 1969. Deficits were less extreme in adjacent areas, notably the Anchorage area, the Kuskokwim River basin, and in streams that drain northward from the Alaska Range to the Tanana River. Deficits also were less extreme in the central Yukon River main stem and Koyukuk River basin. Effects of the drought were marginal in the Skagway area in southeastern Alaska and in low-altitude streams on the Kenai Peninsula. The drought ended with high flows that began in June and July 1971 and the floods of August 8-11, 1971 (see fig. 3, site 3). Cumulative deficits in the most severely affected areas were equivalent to about 10 months of average streamflow.

The drought of 1972-76 resulted from severe flow deficits in south-central Alaska streams in the high-altitude areas of the Kenai Peninsula, in the Anchorage vicinity, and in coastal areas from Cordova to Seward. Drought conditions had begun to develop in water year 1968 in these areas but were interrupted by the floods of October 1969 (fig. 3, site 2; U.S. Geological Survey, 1975). The drought was less severe on Kodiak Island and in the Bristol Bay drainages of southwestern Alaska. Deficits in cumulative departures in the most affected streams were equal to about 1 year of normal flow.

In terms of total flow deficit and length, the regional drought of 1973-80 was the most severe everywhere in Alaska since streamflow recordkeeping began. In the most severely affected drainage basins, those of the Salcha River (fig. 4, site 6) and the adjacent Chena River, the cumulative deficits at the end of the drought period were equivalent to 2-2.5 times the normal annual flow. The ending date of this drought differed among stations. The period of less than average flows ended in fall 1980 on the Salcha River and in December 1978 on the Tanana River at Nenana, but persisted until September 1983 on the Chena River at Fairbanks. Severe deficits extended westward to the Kuskokwim River basin (fig. 4, site 4); deficits were less severe in adjacent areas that extended northward into the main stem of the Yukon River and the Koyukuk River basin and southward to parts of the Susitna River basin.

Deficit streamflow in Alaska primarily affects anadromous fish, which may not have sufficient streamflow to migrate upstream to spawn, or affects the eggs after spawning, which may not survive if they are exposed by decreasing stream levels. Long periods of deficit rainfall commonly lead to declines in ground-water levels, which, in turn, decrease base flows of streams, decrease available supply from small yield wells, and lower water levels in recreational lakes. A decrease in soil moisture can create poor growing conditions for plants and an increased potential for tundra fires.

WATER MANAGEMENT

Because of the relative abundance of water for the small population and large size of Alaska, intensive water management of most of the State's streams is not needed. However, some aspects of water management are necessary. These areas of responsibility include flood plain management, flood warning systems, and water-use management during droughts.

Flood Plain Management. Management of flood plains at the State level is the responsibility of the Alaska Department of Community and Regional Affairs. The principal Federal responsibility lies with the Federal Emergency Management Agency, which coordinates the National Flood Insurance Program and studies of flood prone areas. Locally, communities may or may not have been granted flood plain management control, which depends on their classification by the State (for example, city, borough, or unincorporated area). Incorporated cities and boroughs are permitted by State statutes to have flood-control responsibility, but many have not assumed it. Most of the larger Alaska communities are included in the National Flood Insurance Program. All three governmental levels—local, State, and Federal—have some management responsibility for development on flood plains or coastal areas and encroachment on wetlands.

The only large-scale, flood-control project in Alaska is the Moose Creek Reservoir on the Chena River near Fairbanks, which is operated by the U.S. Army Corps of Engineers. Floodwaters are stored temporarily in the reservoir, and during extreme floods can be diverted from the Chena River into the Tanana River. The flood-control project also incorporates levees built along the Tanana River on the southern side of Fairbanks. In other areas of the State, dikes, levees, and drainage ditches have been built to control more localized floods.

Flood-Warning Systems.—The National Weather Service maintains a River Forecast Center in Anchorage that is responsible for issuing flood warnings for inhabited areas of the State. One of their principal flood-prediction tools is river-stage information from about 60 sites; about one-third of these sites are active U.S. Geological Survey gaging stations, and another one-third are at discontinued Geological Survey gaging stations. The River Forecast Center also monitors spring ice breakups on the major rivers (principally the Kuskokwim and Yukon) that are particularly subject to ice-jam flooding. The Alaska Division of Emergency Services also has flood-warning responsibilities and arranges for evacuation of threatened communities. The U.S. Department of Commerce's Alaska Tsunami Warning Center in Palmer issues warnings for potential tsunamis following earthquakes.

Water-Use Management During Droughts.—No explicit provision exists at any governmental level for management of droughts in Alaska. However, the Alaska Department of Natural Resources, which administers water rights, has some implied authority in the allocation of water in streams during low-flow periods. The Alaska Water Use Act (Alaska Statutes 46.15.010, 270) provides for instream water rights, but the administrative process necessary to reserve instream water rights has been completed for only a few streams. The water rights of the larger hydroelectric projects usually contain provisions for minimum flows if the stream downstream from the project contains fish.

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ALASKA

Surface-Water Resources

Alaska contains more than 40 percent of the Nation's surface-water resources, but most of the rivers and lakes are undeveloped and unaffected by humans. However, water is not always available where and when it is needed. For example, the most readily available and economical local water sources will be insufficient to meet projected demands at Anchorage and Juneau. Surface-water sources are not always dependable during the winter; some streams freeze completely or have periods of very low flows or no flow. Conversely, too much water occasionally is a problem. Ice-jam floods are common on many rivers during periods of snowmelt, and summer floods have caused extensive damage on other streams.

Generally, surface water is of suitable quality for most uses; but, in some areas, local degradation occurs from human activities or from natural causes. Suspended sediment in glacier-fed rivers makes the water unsuitable for most uses without some treatment. Alaska's principal surface-water issues are to maintain its good water quality, to minimize adverse effects on water resources when development occurs, and to improve conditions adversely affected by development.

Surface water supplies 32 percent of the State's population and 78 percent of the total water withdrawn for offstream use. Only 18 percent of this use is for public supply; the remainder is for fish processing, pulp mills, mining, and other industrial uses. In 1980, water used instream for hydropower generation was 3.5 times more than that used offstream. Surface-water withdrawals in Alaska in 1980 for various purposes and related statistics are given in table 1.

GENERAL SETTING

Wahrhaftig (1965) defined four major physiographic divisions—Pacific Mountain System, Intermontane Plateaus, Rocky Mountain System, and Arctic Coastal Plain (fig. 1). The Pacific Mountain System contains the Coast Mountains, Alaska Range, Aleutian Range, Aleutian Islands, and a parallel southern arc of lower elevation mountains in the islands of southeastern Alaska and along the Gulf of Alaska. The Intermontane Plateaus, which consist of dissected uplands, broad alluvial valleys, and lowland basins, lie between the Alaska Range and the Brooks Range of the Rocky Mountain System.

Alaska has four climatic zones (Hartman and Johnson, 1978, p. 59-61)—Maritime, Transition, Continental, and Arctic (fig. 1). The State's high mountain ranges, extensive ocean bounds, and vast size—one-sixth of the total area of the United States—are the principal causes of the great differences in climatic conditions and in the diverse patterns and amounts of runoff throughout the State. From the southern part of the Maritime Zone to the northern part of the Arctic Zone, average annual precipitation and temperature range from 320 to 5 inches and from 45 to 10 °F (degrees Fahrenheit), respectively. In the Maritime Zone, two-thirds of the annual precipitation occurs from September through March; October usually is the wettest month (fig. 1, bar graph for Annette). The driest period is from mid-May through July. In the Continental and Arctic Climatic Zones, about two-thirds of the precipitation falls from June through November and the driest months are March through May (fig. 1, bar graphs for Talkeetna and Barrow). In the Transition Zone, seasonal precipitation patterns are not sharply defined, fluctuate from year to year, and may resemble those of either the Maritime or Continental Zones. In low-elevation areas of the Maritime Zone, snow falls but usually melts fairly rapidly.

Table 1. Surface-water facts for Alaska

[Data may not add to totals because of independent rounding. Mgal/d = million gallons per day, gal/d = gallons per day, < = less than. Source: Sulley, Chase and Mann, 1983]

POPULATION SERVED BY SURFACE WATER, 1980	
Number (thousands)	127
Percentage of total population	32
From public water-supply systems	
Number (thousands)	113
Percentage of total population	28
From rural self-supplied systems	
Number (thousands)	14
Percentage of total population	4
OFFSTREAM USE, 1980	
FRESHWATER WITHDRAWALS	
Surface water and ground water, total (Mgal/d)	220
Surface water only (Mgal/d)	170
Percentage of total	77
Percentage of total excluding withdrawals for thermoelectric power	78
Category of use	
Public supply withdrawals	
Surface water (Mgal/d)	30
Percentage of total surface water	18
Percentage of total public supply	57
Per capita (gal/d)	265
Rural-supply withdrawals	
Domestic	
Surface water (Mgal/d)	0.1
Percentage of total surface water	< 1
Percentage of total rural domestic	1
Per capita (gal/d)	10
Livestock	
Surface water (Mgal/d)	0.1
Percentage of total surface water	< 1
Percentage of total livestock	50
Industrial self-supplied withdrawals	
Surface water (Mgal/d)	140
Percentage of total surface water	82
Percentage of total industrial self-supplied:	
including withdrawals for thermoelectric power	31
excluding withdrawals for thermoelectric power	95
Irrigation withdrawals	
Surface water (Mgal/d)	0
Percentage of total surface water	0
Percentage of total irrigation	100
INSTREAM USE, 1980	
Hydroelectric power (Mgal/d)	770

Along the Arctic coast, snow generally falls from mid-September to mid-June but may occur in July and August. At higher elevations, snow falls throughout the year. Glaciers cover 5 percent of the State and are present mainly in the Coast Mountains, the Alaska Range, and the mountains bordering the Gulf of Alaska.

Average annual runoff for the State is about 25 inches, but the amount varies significantly depending on location (fig. 1). In southeastern Alaska, average runoff is about 150 inches, but locally it may be as much as 300 inches (not shown on map). At the other extreme, runoff averages about 8 inches north of the Brooks Range, but the average is only 4 inches in some Arctic coastal areas. No consistent statewide, long-term trend in streamflow is evident in the bar graphs of average annual discharges in figure 2.

Seasonal variations in streamflow result from precipitation and temperature fluctuations; ranges in basin elevation; and the effects of natural storage and release from the snowpack, glaciers, and lakes. Most streamflow patterns in the Maritime Climatic Zone are similar to those for Fish Creek (fig. 1); peak-flow periods occur

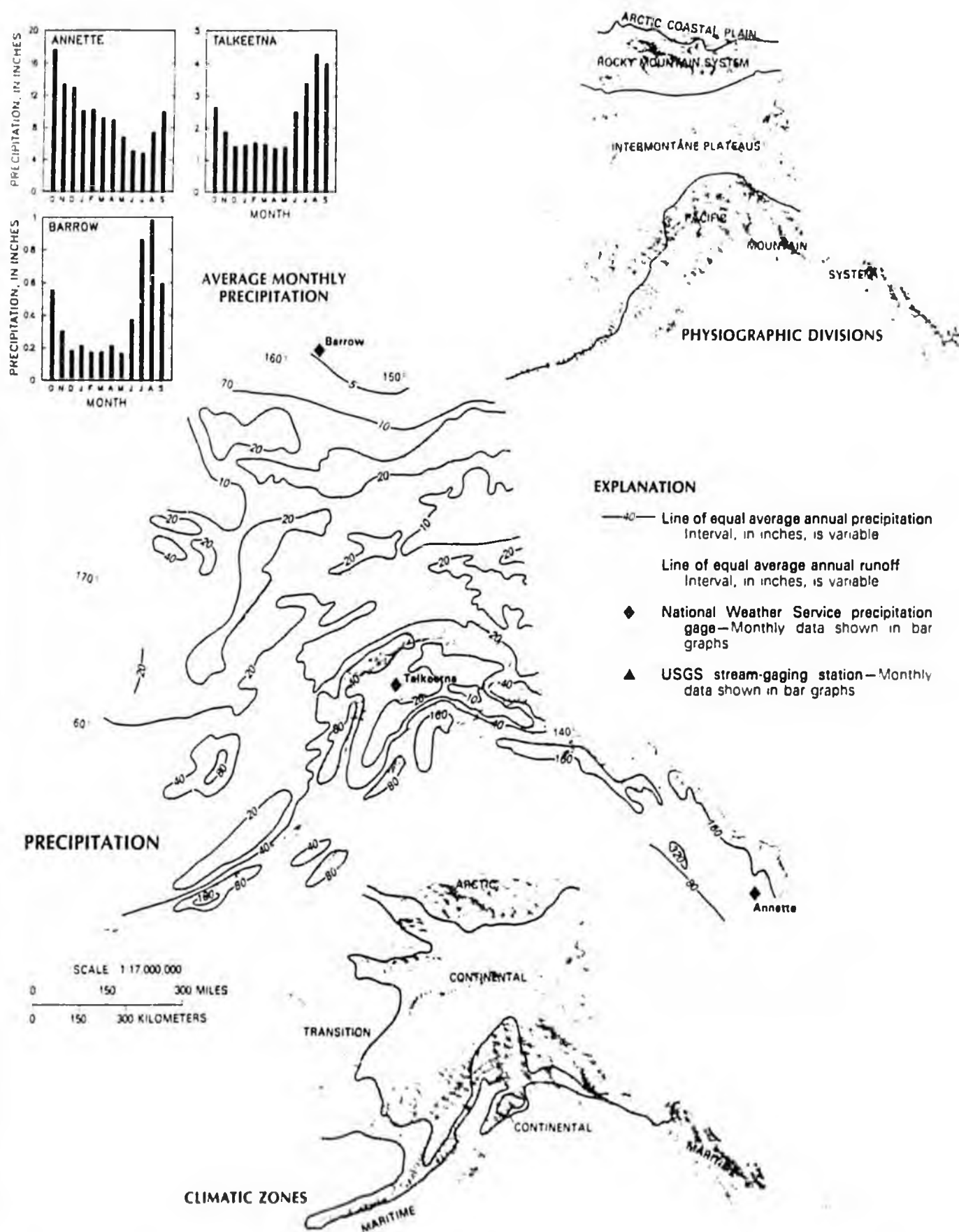


Figure 1. Average annual precipitation and runoff in Alaska and average monthly data for selected sites, 1951-80.

Sources: Precipitation—annual data modified from National Weather Service, 1972; monthly data from National Oceanic and Atmospheric Administration files. Runoff—annual data from Gebert, Graczyk, and Krug, 1985. Discharge—monthly and relative-discharge data, and discharge data at mouth of principal rivers, from U.S. Geological Survey files. Physiographic diagram from Harrison, 1969; divisions from Wahrhaftig, 1965. Climatic zones from Hartman and Johnson, 1978.

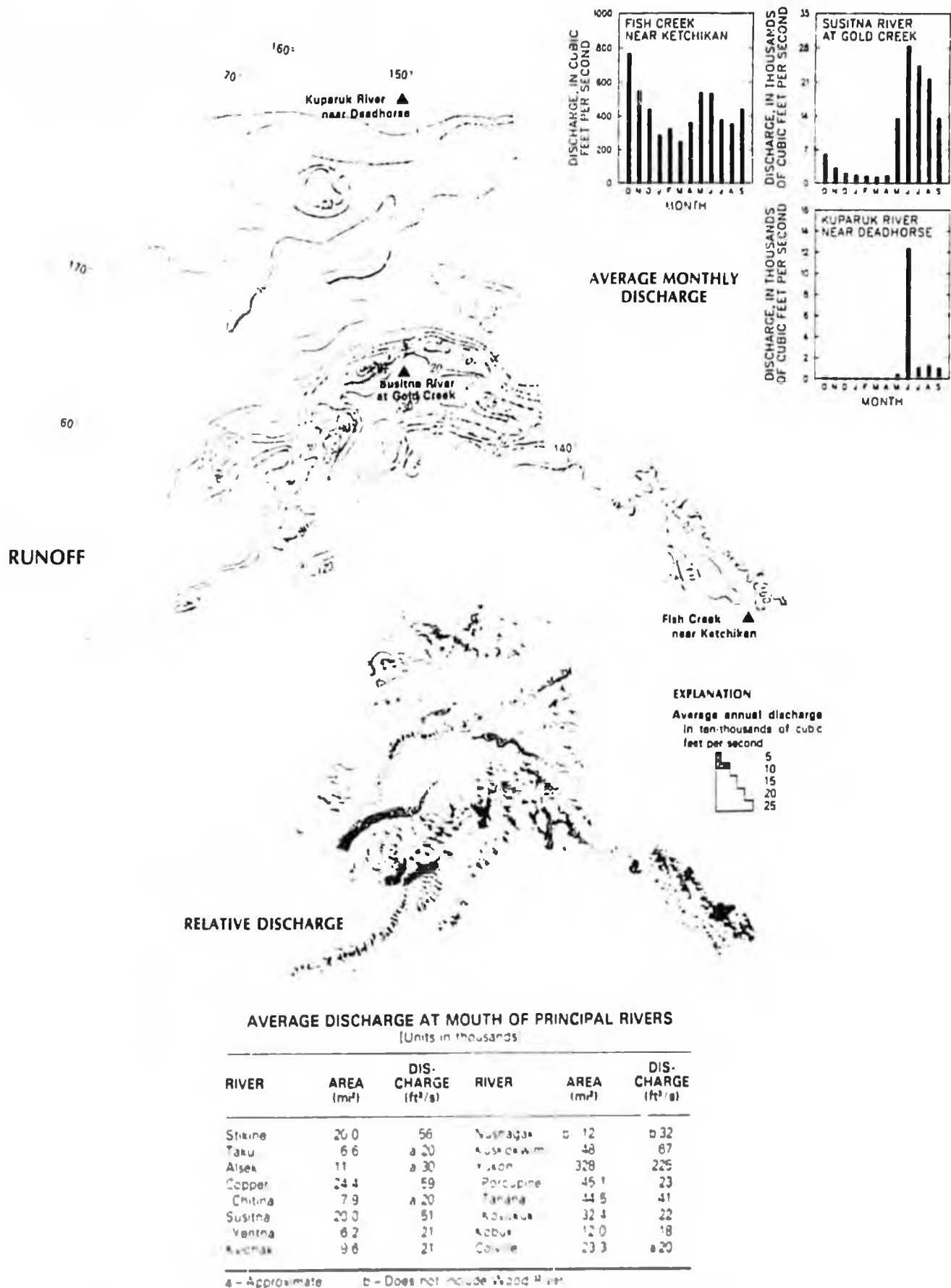


Figure 1. Average annual precipitation and runoff in Alaska and average monthly data for selected sites, 1951-80—Continued.

Sources: Precipitation—annual data modified from National Weather Service, 1972; monthly data from National Oceanic and Atmospheric Administration files. Runoff—annual data from Gebert, Graczyk, and Krug, 1965. Discharge—monthly and relative discharge data and discharge data at mouth of principal rivers from U.S. Geological Survey files. Physiographic diagram from Harrison, 1969; divisions from Washington, 1965. Climatic zones from Hartman and Johnson, 1973.

in the fall and spring due to rainfall and snowmelt, respectively. However, the seasonal flow distribution in some southeastern-mainland streams, whose basins contain glaciers in their higher elevations, are similar to those for other high-elevation mountain streams throughout the State.

The seasonal flow pattern of the Susitna River (fig. 1) is characteristic of most large major rivers and of streams in the State's interior, but the temporal distribution in flow varies with basin elevation, latitude, and relative amounts of natural storage in lakes and glaciers. Discharge increases when snowmelt at lower elevations begins in late May or June, and it peaks in the following month; flow is sustained through the summer by rain, snowmelt at higher elevations, and runoff from glaciers. Most low-elevation basins have two high-flow periods—during the spring snowmelt period and a late-summer rainy period. The Kuparuk River (fig. 1) is characteristic of streams on the Arctic Coastal Plain that have short, intense, snowmelt-runoff periods but little response to summer rains.

According to Iseri and Langbein (1974), 16 rivers in Alaska qualify as "large" rivers because average annual discharge exceeds 17,000 ft³/s (cubic feet per second) or 11,000 Mgal/d (million gallons per day). Estimated average discharges at the mouth of the 16 rivers are shown in figure 1.

Lakes cover about 1 percent of Alaska. Ninety-five lakes have a surface area larger than 10 mi² (square miles), eight are larger than 100 mi², and one (Iliamna Lake) has an area of 1,000 mi² (Bue, 1963). The State has an estimated 3 million lakes larger than "pond-size," mainly in lowland areas of the Yukon-Kuskokwim Delta, Yukon Flats, and Arctic Coastal Plain. Twenty-two reservoirs (fig. 2) have usable storage capacities of more than 5,000 acre-ft (acre-feet) or 1,600 Mgal (million gallons).

PRINCIPAL RIVER BASINS

The Alaska Water-Resources Region, which coincides with the State of Alaska, contains six subregions (fig. 2). The tabulation below (modified from Balding, 1976) summarizes runoff originating in each subregion. If part of the drainage area is in Canada, the drainage size and inflows to Alaska are given in parentheses.

(mi² = square miles; ft³/s = cubic feet per second)

Subregion	Drainage area (thousand mi ²)	Runoff (thousand ft ³ /s)	Subregion	Drainage area (thousand mi ²)	Runoff (thousand ft ³ /s)
Southeast	45 (35)	500 (120)	Yukon	210 (130)	154 (78)
South-Central	80 (1)	207 (5)	Northwest	67	78
Southwest	108	224	Arctic	81	44

The location of the subregions, and long-term variations in streamflow at representative streamflow-gaging stations, are shown in figure 2. Streamflow characteristics and other pertinent information are given in table 2. The Hydrologic Unit Map for Alaska is being revised. Table 2 and figure 2 use provisional information from the proposed map. A few subregion boundaries and names were changed from the previous map.

ALASKA REGION

Southeast Alaska Subregion

The Southeast Alaska Subregion encompasses the mountainous, glaciated southeastern panhandle of Alaska and includes hundreds of islands, which comprise 37 percent of the subregion's area. Most drainage basins in the subregion are smaller than 200 mi²; however, basins with headwaters in Canada are larger. Runoff from the subregion (including inflow from Canada) is almost as much as that of the Mississippi River.

Twelve hydroelectric reservoirs (mountain lakes that have been dammed at their outlets) have a total usable storage capacity of 624,000 acre-ft or 203,400 Mgal. Blue Lake (150,000 acre-ft or 48,900 Mgal) and Long Lake (140,000 acre-ft or 45,600 Mgal) have the largest usable storage capacities. The Snettisham Project (Long Lake) has 70,000 kW (kilowatts) of power generation capacity; the capacity of each of the other powerplants is less than 25,000 kW. The largest natural lake is Bering Lake (surface area about 17 mi²) near Cordova. Offstream users are pulp mills at Ketchikan and Sitka, seafood processors, and public water-supply systems. The development of small, local streams to meet growing demands in outlying areas is being considered at Juneau.

South-Central Alaska Subregion

The South-Central Alaska Subregion lies between the crest of the Alaska and the Aleutian Ranges and the Gulf of Alaska and includes Kodiak Island (Alaska's largest island at 3,670 mi²) and several smaller islands. The principal river basins—the Copper and the Susitna—comprise 56 percent of the subregion. Tustumena Lake (117 mi²) is the largest lake, and 15 other lakes are 10 mi² or larger in area.

Four hydroelectric reservoirs have a total usable storage capacity of 380,500 acre-ft or 124,000 Mgal. Eklutna Lake, with 163,300 acre-ft or 53,220 Mgal of usable capacity, is the largest and supplies the Eklutna project (30,000 kW).

Offstream uses are for public water supply and industrial use, primarily seafood processing. The Municipality of Anchorage, home to half of Alaska's population, has begun construction of a pipeline to Eklutna Lake to augment the water supply in developed areas. Water from the glacier-fed lake will have to be treated to remove suspended sediment; also, an alternate means of power generation will be provided to compensate for power lost in the Eklutna project. The municipality recently has embarked on a program to reduce pollution of urban streams.

Southwest Alaska Subregion

The Southwest Alaska Subregion includes basins that drain to the southwest into Kuskokwim and Bristol Bays, the Aleutian Islands (6,820 mi²), and many other islands. The principal river basins—the Kuskokwim, the Nushagak, and the Kvichak—comprise 64 percent of the subregion. Iliamna, Becharof, Naknek, Clark, and Dall Lakes have surface areas of 1,000, 458, 242, 110, and 100 mi², respectively; 50 more lakes are 10 mi² or larger. The interconnected stream and lake systems draining to Bristol Bay constitute the most productive area for salmon in Alaska. Floods, particularly those caused by recurrent ice jams, occur along the

Kuskokwim River and other large streams. Relatively small amounts of water are withdrawn for domestic supply, mining, and fish processing.

Yukon Subregion

The Yukon Subregion is virtually equivalent to the Yukon River basin, which extends across interior Alaska between the Alaska and the Brooks Ranges. Outflow at the mouth of the Yukon River is about 225,000 ft³/s or 145,000 Mgal/d; inflow from Canada (table 2, site 10) is about 83,000 ft³/s or 53,600 Mgal/d. Major tributaries are the Tanana, the Porcupine, and the Koyukuk Rivers. According to Bue (1963), the largest lakes in the subregion are Kgun Lake (31 mi²) and Tetlin Lake (27 mi²). Eight other lakes in the Yukon Delta and another farther upstream are 10 mi² or larger. Floods on the Yukon River and its major tributaries are caused by ice jams in May or early June and by rainstorms later in the year. The maximum recorded discharge (1,030,000 ft³/s or 666,000 Mgal/d) on the Yukon River was at Kaltag (drainage area, 296,000 mi²) on June 22, 1964. Extreme floods in the Tanana River basin occur in July or August from a combination of runoff caused by melting of snow and glacier ice at high elevations and areawide rainstorms. The State's most damaging flood occurred August 15, 1967, on the Chena River, when about 95 percent of Fairbanks was inundated. Floodwaters of the Chena River are temporarily stored (since 1981) in Moose Creek Reservoir, which has a capacity of 160,000 acre-ft or 52,000 Mgal, and may be diverted to the Tanana River when reservoir capacity is exceeded. Principal water uses are for cooling fossil-fuel powerplants, placer mining, and public water-supply systems. The principal surface-water issue in the subregion concerns placer mining and its effects on water quality; particularly, how to efficiently control the amount of sediment downstream from the mining area.

Northwest Alaska Subregion

The Northwest Alaska Subregion consists of the drainage basins of rivers that flow westward into Kotzebue and Norton Sounds. The principal rivers are the Kobuk and the Noatak; their basins comprise 36 percent of the subregion. Although their drainage areas are similar, flow in the Noatak is only about three-fourths that of the Kobuk River. Selawik Lake—a tidal, saline lake (400-mi²)—is the largest in the subregion. The largest freshwater lakes are Imuruk Lake (26 mi²) and Walker Lake (14 mi²) (fig. 2). Surface water is used mainly for rural domestic purposes and for a few public water-supply systems.

Arctic Subregion

The streams in the Arctic Subregion flow northward from the Brooks Range into the Arctic Ocean. The Colville River—the subregion's largest—flows eastward for 200 miles before turning north; its basin comprises 29 percent of the subregion. Teshekpuk Lake has a surface area of 315 mi²; two other lakes are larger than 10 mi². Because of the underlying permafrost, more than half of the flat, western parts of the coastal plain are covered by shallow lakes. Water is used mainly for domestic purposes and for petroleum

development and production. The rivers, except for a few that are fed by springs, have no-flow periods during the winter. The larger deep lakes are a more dependable water-supply source. If water is withdrawn during the winter from shallow lakes or from rivers, the "overwintering" habitat of fish can be impaired or destroyed.

SURFACE-WATER MANAGEMENT

The "Alaska Water Use Act" (Alaska Statutes 46.15.010-270, enacted in 1966 and amended in 1980) defines the doctrine of prior appropriation authorized by the State Constitution, and it delegates administration of the act to the Alaska Department of Natural Resources (ADNR). The act states "Wherever occurring in a natural state, the waters are reserved to the people for common use and are subject to appropriation and beneficial use and to reservation of instream flows and levels of water, . . ." (Alaska Department of Natural Resources, 1985, p. 39). The regulations provide for certifying water rights for users prior to 1966 and for obtaining rights to appropriate surface and subsurface waters thereafter. ("Appropriate" means to divert, impound, or withdraw water or to reserve water for instream uses, including fisheries, navigation, recreation, and water-quality purposes (Alaska Department of Natural Resources, 1985, p. 48).) Dam safety is also covered in the act.

The Alaska Department of Environmental Conservation enforces Alaska's Water Quality Standards established in Title 18, Chapter 70 of Alaska Administrative Code. The standards identify limits to allowable pollution (Alaska Department of Environmental Conservation, 1979). The Alaska Department of Fish and Game, Alaska Statutes 16.05.840 and 16.05.870, has permit jurisdiction over activities that could affect fish (Alaska Department of Fish and Game, 1984).

Alaska has 25 rivers in the National Wild and Scenic Rivers System; 12 other rivers are being studied for possible inclusion. The designated rivers are administered by the following U.S. Department of the Interior agencies: National Park Service, Fish and Wildlife Service, and Bureau of Land Management. These agencies and the other Federal land-management agencies in Alaska—the Forest Service (Department of Agriculture) and the Department of Defense—also have water-related responsibilities. The U.S. Army Corps of Engineers, U.S. Coast Guard, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and U.S. Environmental Protection Agency have review and permitting responsibilities for specific activities on navigable rivers, wetlands, anadromous fish streams, and other water bodies.

The Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys (DGGs), is the designated State agency responsible for water-data collection. Most long-term surface-water data are collected and interpreted by the U.S. Geological Survey in cooperation with other Federal, State, and municipal agencies. Short-term, special-purpose data are collected by the U.S. Geological Survey, DGGs, and other agencies. The DGGs, in cooperation with the U.S. Geological Survey and other State and Federal agencies, has developed and implemented an Alaskan Water Resources Evaluation (AWARE) Plan to coordinate water-data collection and water-resource studies in the State (U.S. Geological Survey and Alaska Department of Natural Resources, 1985).

Table 2. Selected streamflow characteristics of principal river basins in Alaska

(Gaging station: Period of analysis is for the water years used to compute average discharge and may differ from that used to compute other streamflow characteristics. Streamflow characteristics: The 7 day, 10 year low flow is a discharge statistic; the lowest mean discharge during 7 consecutive days of a year will be equal to or less than this value, on the average, once every 10 years. The average discharge is the arithmetic average of annual average discharges during the period of analysis. The 100 year flood is that flow that has a 1-percent chance of being equaled or exceeded in a given year. Abbreviations: Do = ditto, mi² = square miles, ft³/s = cubic feet per second. Sources: Reports of the U.S. Geological Survey.)

Site no. (see fig. 2)	Gaging station			Streamflow characteristics				Remarks
	Name and USGS no.	Drainage area (mi ²)	Period of analysis	7 day, 10 year low flow (ft ³ /s)	Average discharge (ft ³ /s)	100 year flood (ft ³ /s)	Degree of regulation	
ALASKA REGION								
SOUTHEAST ALASKA SUBREGION								
1.	Stikine River near Wrangell (15024800)	19,920	1976-83	14,500	56,674	299,600	Moderate	Flow crosses international boundary. Major tributary is regulated.
2.	Fish Creek near Ketchikan (15072000)	32.1	1915-36 1938-83	31	421	5,420	None	Longest record in Alaska. Representative island stream.
SOUTH-CENTRAL ALASKA SUBREGION								
3.	Copper River near Chitna (15212000)	20,600	1955-83	3,040	37,870	321,000	None	Large stream draining part of Alaska Range.
4.	Sustina River at Gold Creek (15292000)	6,160	1949-83	723	9,724	115,000	do	Drainage basin in Alaska Range. Proposed hydropower development. Long-term record.
5.	Sustina River at Sustina Station (15294350)	19,400	1974-83	15,000	49,940	230,000	do	Large stream draining part of Alaska Range.
SOUTHWEST ALASKA SUBREGION								
6.	Kvichak River at Igroog (15300500)	6,500	1967-83	7,380	18,060	65,500	None	Ikamna Lake and other smaller lakes total 1,100 mi ² .
7.	Nuyakuk River near Dillingham (15302000)	1,490	1953-83	1,100	6,156	36,200	do	Representative long-term record.
8.	Nushagak River at Ekwick (15302500)	9,850	1977-83	16,000	23,840	189,200	do	Large stream. Headwaters of main tributary drain Aleutian Range.
9.	Kuskokwim River at Crooked Creek (15304000)	31,100	1951-83	7,650	41,220	445,000	do	Large stream draining part of Alaska Range.
YUKON SUBREGION								
10.	Yukon River at Eagle (15356000)	113,500	1911-13, 1950-83	10,500	82,660	605,000	Negligible	Flow crosses international boundary.
11.	Porcupine River near Fort Yukon (15389000)	29,500	1964-79	16	14,230	476,000	None	Headwaters in Canada.
12.	Chena River at Fairbanks (15514000)	1,980	1948-83	150	1,384	138,800	Moderate	Some flood control by Moose Creek Dam since 1981.
13.	Tanana River at Nenana (15515500)	25,600	1962-83	4,740	23,550	153,000	Negligible	Large river draining part of Alaska Range.
14.	Koyukuk River at Hughes (15564900)	18,700	1960-82	267	14,540	332,000	None	Large river draining part of Brooks Range.
15.	Yukon River at Pilot Station (15565447)	321,000	1975-83	137,000	218,600	1751,000	Negligible	Gaged at head of distributary delta. Largest river in Alaska.
NORTHWEST ALASKA SUBREGION								
16.	Kobuk River near Kiana (15744500)	9,520	1976-83	1,300	15,270	152,000	None	Large river.
ARCTIC SUBREGION								
17.	Kuparuk River near Deadhorse (15896000)	3,130	1971-83	No flow	1,367	218,000	do	Longest record in subregion. Representative stream.

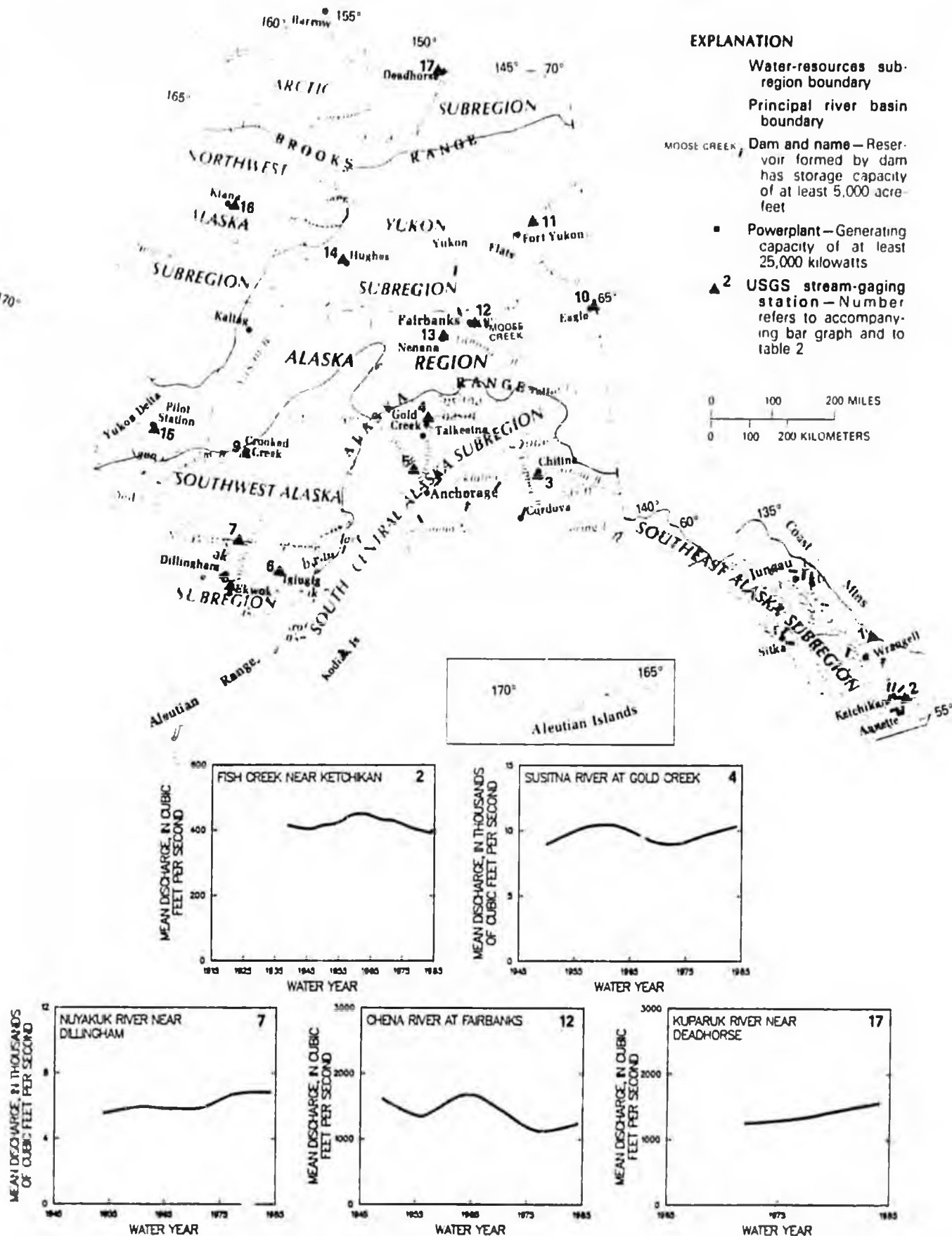
¹Less than 10 years of record. Minimum discharge and maximum instantaneous discharge for period of record are shown.

²Record interrupted.

³Adjusted for no flow periods.

⁴Adjusted for high outlier in period of record. Did not use 1981 data because it was regulated.

⁵Adjusted for high outlier in period of record.



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FOR ADDITIONAL INFORMATION

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Prepared by R. D. Lamke

Excerpt from USGS
Water Resources Cooperative
Program Briefing Document
Feb. 22, 1991

U.S. GEOLOGICAL SURVEY - ALASKA

Perspective

The U.S. Geological Survey (USGS) is a natural resources assessment Bureau of the Department of the Interior and is the Nation's largest earth-science resource agency. It is a non-regulatory, non management agency whose mission is:

"to provide hydrologic, geologic, and topographic information that contributes to the wise management of the Nation's natural resources and that promotes the safety and well-being of the public".

The USGS was created in 1879, and water-resources investigations have been a part of it's program since inception. The general objective of the Water Resources Division, USGS, is to provide the hydrologic information and understanding needed for optimum utilization and management of the Nation's water resources. This is accomplished through data collection, interpretive appraisals, basic and applied research in hydraulics and hydrology, and providing scientific and technical assistance to other agencies.

The Water Resources Division of the USGS accomplishes these missions through cooperatively funded programs (50-50) with State and local agencies, full funding by other Federal Agencies, and some direct appropriations. Our goal at the District (state) level is to maintain communication and cooperation with the principal state water agencies so that the state is properly represented in the national context. The desired result is a broad, progressive, and flexible cooperative water-resources program in Alaska that meets both state and national needs.

The Water Resources Division program in Alaska consists of hydrologic monitoring activities and in-depth scientific investigations of hydrology.

Hydrologic Monitoring for Alaska

Collection of stream flow data by the Geological Survey in the Territory of Alaska began during the summer of 1906 in connection with placer mining for gold near Nome on the Seward Peninsula. Data collection expanded in 1907 on the Seward Peninsula and into the Yukon and Tanana River basins. In 1913, efforts shifted to a general reconnaissance of the water-power potential of many sites in the lower Copper River basin and in southeast Alaska. In 1921, data collection in Alaska by the U.S. Geological Survey halted but was restarted in 1946. By 1950, there were 47 active stream-gaging stations operated by the U.S. Geological Survey. A bar graph showing a history of the number of continuous-recording stream gages operated in Alaska since 1946 is attached.

Streamflow data have been collected continuously by the U.S. Geological Survey at about 230 sites for 5 or more years and about 160 sites for 10 or more years. Most of those records have been collected in Southeast Alaska, developed areas of South Central Alaska, and within the Tanana River basin. In the "lower 48" the density of stream-gaging stations is about 1 gage per 400 square miles. By comparison, Alaska contains more than 40 percent of the nation's surface-water resources, however the density of stream-gaging stations is only about 1 gage per 6,000 square miles.

* — The maximum number of stream-gaging stations operated during one water year was 130 stations in 1972. During the 1989 water year, we collected data from 85 stream-gaging stations, which is about 35 percent fewer stations. One of the principal reasons for this reduction in stream-gaging activity, especially during the 1980's has been the reduction of cooperative funding from State, local and other agencies who experienced budget cuts in their programs. (See attached figure and table showing funding sources for the current stream gaging program).

Data for about 2,560 surface-water sites, including data for 96 Canadian stations, are stored in the USGS National Water Information System (NWIS) data base for Alaska. Among these surface-water sites are about 1,880 streams, 630 lakes, 33 meteorological sites and 11 estuaries.

Information for about 17,000 ground-water sites is stored in the data base. The aerial distribution of the data is about 6,400 sites in the Municipality of Anchorage, 2,610 sites in the Kenai Peninsula Borough and 1,630 sites in the Fairbanks North Star Borough. The remaining sites are in towns, villages and remote areas scattered across the State. Some of the earliest ground-water data were collected in 1903 from wells near Cordova. The deepest well in Alaska contained in our data base was drilled by SOCAL in 1962 to a depth of 16,428 feet in the Beluga gas field, on the west side of Cook Inlet. Logs of most wells drilled in Alaska, however, have not been entered into the data base.

In our water-quality data base, we have water-quality information at about 4,130 sites in Alaska. Surface-water sites comprise about 1,550 of these sites and ground-water about 2,100 of these sites. The majority of the remaining sites are lakes and estuaries.

Hydrologic Investigations for Alaska

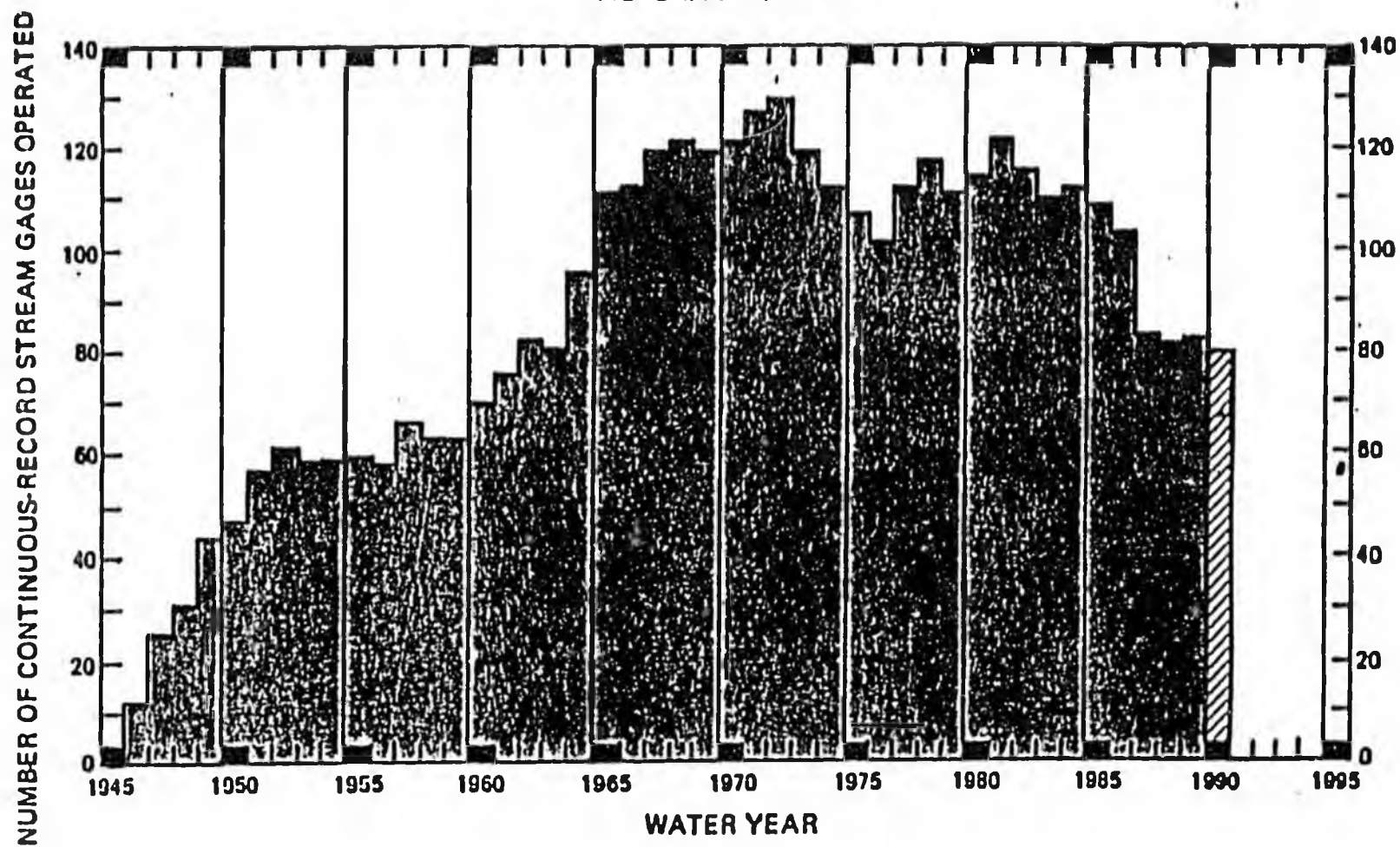
The Geological Survey conducted the first water-resources assessments in Alaska shortly after the gold miners arrived near the turn of the century. Prior to Alaska Statehood, these studies were federally funded and were conducted in response to Federal information needs. By the 1960's, however, the Geological Survey's "Cooperative Program", in which State or local government agencies paid half of the costs, became a principal component of the water-resources studies in the State. Initially, the State lacked revenues to support a significant long-term program and much of the Survey's efforts were in cooperation with the Boroughs, notably the Greater Anchorage Area Borough. Almost from the beginning of the Cooperative Program, however, a study with the Alaska Department of Transportation has maintained a network of gages on small streams. It is this network that provides the flood data required to evaluate flood risks and calibrate equations for estimating regional flood hazards.

When State revenues increased dramatically following completion of the Alyeska Pipeline, the Alaska Division of Geological and Geophysical Surveys (DGGS) assumed responsibility for investigations previously conducted by other State agencies and became a major cooperator of the Geological Survey. the USGS and DGGS formalized this large program of hydrologic studies during the early 1980's as the AWaRE Program (an acronym for Alaska Water Resources Evaluation). The AWaRE Program has been the only long-range planning document for hydrologic studies in Alaska. Unfortunately, its utility has been severely limited by lack of funding to implement long-term plans. Most hydrologic studies in Alaska are therefore in response to short-term information needs.

The Geological Survey, in cooperation with many Federal, State, and local agencies, has published more than 200 reports on the hydrology of Alaska and maintains the largest data base of water-resources information in the State. Much of that data base would not exist without the support of State and local agencies. In particular, the long-term support of DGGS is largely responsible for the quality of Alaska's ground water data base, which is among the best in the Nation.

Although there are now many agencies and firms conducting hydrologic studies in Alaska, the background information cited in virtually every water-resources report in the State includes the pioneering work by the U.S. Geological Survey. In addition, the Geological Survey is the only agency that maintains a long-term commitment to maintenance of a water-resources data base that is accessible to all users.

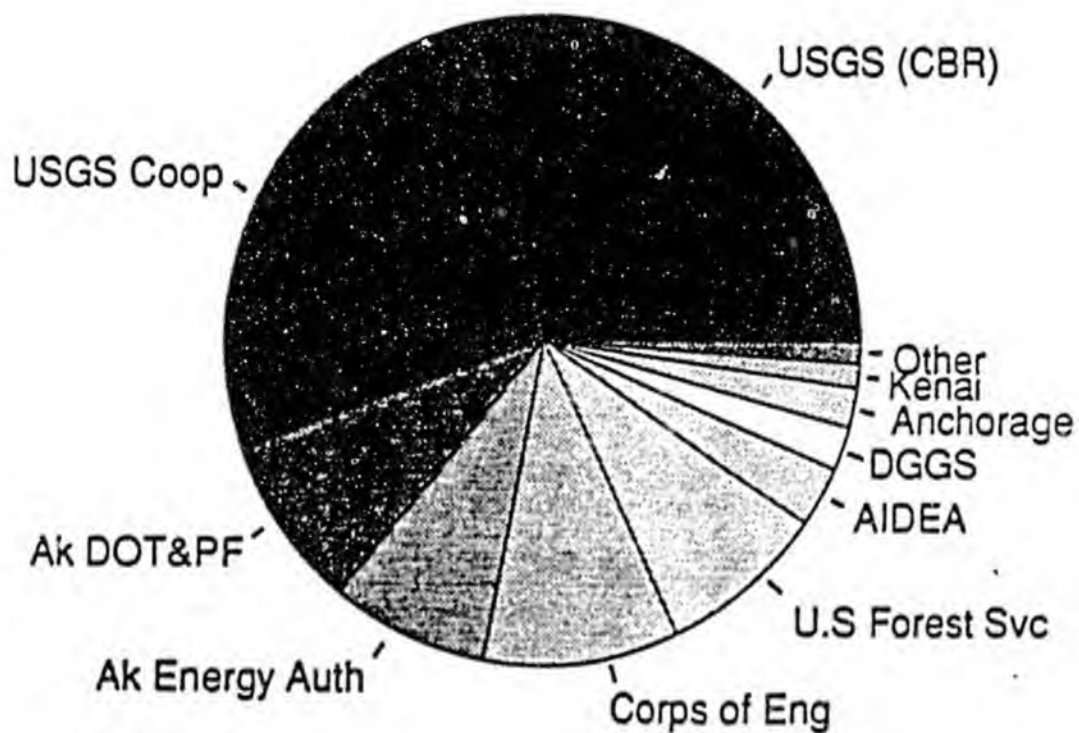
U.S. GEOLOGICAL SURVEY
ALASKA DISTRICT



U.S. GEOLOGICAL SURVEY

Stream gaging program

\$ 2,187,800



**FY90 or Projected FY91 Program Costs
Surface Water Stream Gaging Sites**

<u>Cooperator</u>	<u>No. of Gaging Stations</u>	<u>CGS</u>	<u>Funding</u>			<u>Total</u>
			<u>Coop</u>	<u>USGS</u>	<u>OFA</u>	
CAR (1)	28	--	--	\$657,500	--	\$657,500
DOT	--	70	\$200,000	\$200,000	--	\$400,000
AEA (1)(2)	9	--	\$183,000	\$ 91,980	--	\$274,980
Corps	15	6	--	\$ 61,000	\$171,000	\$232,000
Forest Service (1)	12	--	--	--	\$194,700	\$194,700
DGGS	7	--	\$ 48,700	\$ 48,700	--	\$ 97,400
AIDEA (1)(2)	2	--	\$ 69,300	\$ 20,800		\$ 90,100
Anchorage (1)	6	--	\$ 45,000	\$ 45,000	--	\$ 90,000
Kenai	3	2	\$ 27,800	\$ 27,800	--	\$ 55,600
Other	2	--	\$ 25,100	\$ 25,100	--	\$ 50,200
Juneau (1)	2	--	\$ 18,700	\$ 18,700	--	\$ 37,400
Sitka	1	--	\$ 4,000	\$ 4,000	--	\$ 8,000
	81					
	Subtotals		\$621,600	\$1,200,580	\$ 365,700	
					TOTAL	\$2,187,880

(1) Includes water-quality work

(2) Includes construction costs

Stream Gaging for Alaska

Advantages of the U.S. Geological Survey Program

- o The U.S. Geological Survey (USGS) has developed, published and uses standard methods for collection, analysis and dissemination of data and information. These standards have been accepted and recognized by the National and International hydrologic communities and ensure the compatibility of widely used analytical techniques.
- o The USGS has developed and used a nationwide quality control and quality assurance program to quantify the accuracy of data collected, stored, and published.
- o The USGS, a non-regulatory and non-management agency, has a strong reputation for the collection of unbiased data. This data has historically stood up in court after close technical scrutiny.
- o Data collected by the USGS in Alaska are published for use by all parties including other Federal agencies, State agencies, local Boroughs, cities, private Alaskan business, and the general public.
- o Data collected by the USGS are stored in a local and a national computer data base. These data bases allow easy access to all current and historic USGS data.
- o The data base allows timely retrieval of data. Existing software allows for efficient tabling, graphics, data reduction and statistical evaluation of Alaskan data.
- o No other comprehensive data base exists in Alaska that allows easy access by not only all Alaskans but all interested parties nation-wide. The USGS data are also available commercially on CD-ROM (laser disks) for ease of use in desk-top applications.
- o The USGS data base will be maintained indefinitely.
- o The USGS cooperative program provides up to 50% of the costs in joint water-resource programs with State and local government agencies in Alaska.
- o The USGS has a local staff of trained hydrologists and hydrologic technicians familiar with all aspects of hydrology in Alaska.
- o The USGS has local field offices in Anchorage, Juneau and Fairbanks. Locating field offices in three different areas of the state allows our staff to be aware of local hydrology and associated local problems and needs.
- o The USGS has a nationally recognized training program that insures our personnel use the best techniques available to collect water-resource data. This training program is available to cooperators.
- o The USGS has the necessary equipment to collect all types of water-resource data.

- o The USGS has an ongoing program of research and development of new methods and new instrumentation in the field of hydrology.
- o The USGS in Alaska has access to a highly skilled research staff and leading experts in the field of hydrology nationwide capable of addressing the most difficult hydrologic problems. This pool of expertise is unparalleled worldwide.
- o The USGS actively seeks out local governmental agencies to share resources and knowledge and cooperate with on water-resource data collection and water-resource studies.
- o The USGS collects data from all areas of Alaska.
- o The USGS works jointly with Canada to share data and information concerning water-resources common to both countries.
- o The USGS works cooperatively with local universities to provide expertise when needed and learn from new ideas generated by the universities.
- o The USGS hires local university students in our "Student Coop Program" to help train future Alaskan scientists and inject new ideas in our day-to-day programs.
- o The USGS hires local high school students to aid career development and job skills.
- o The USGS collects data in the most cost effective manner consistent with the quality assurance guidelines.
- o USGS programs and presence in Alaska feed monies directly into the Alaskan business community.
- o USGS data are often the first stepping stone in detailed studies of hydrology.

- A review of the State institutional and administrative plans to address priority State water-resources issues.
- A review of the technical, financial, and logistical capabilities of the USGS to enter into cooperative programs with the State and/or local agencies in order to assist them in their water-resources regulatory and management efforts. This would include a review of USGS goals and objectives for water-resources investigations in the State, of USGS technical qualifications, personnel, and of anticipated timely response.
- A discussion of problems or barriers to future cooperative program development.
- A discussion of multi-agency funded cooperative programs; for example one quarter funding by a local agency, one quarter by the State, and one half by the USGS.
- A discussion on how to maximize the use of technical personnel, data bases and software, and physical facilities of both agencies in support of the cooperative program.

Products of the meeting should include:

- A prioritized listing of short- and long-term cooperative program objectives.
- A joint statement by both agencies describing their intentions relative to the extent and program content of the cooperative program, both for the upcoming fiscal year and beyond.
- A joint statement by both agencies describing their intent and giving direction to maximize the use of personnel, software, and facilities of each agency in support of the cooperative program.

Development of projects within the cooperative program should be the responsibility of the State program managers, operation managers, and the USGS Assistant Chiefs. They should meet periodically to discuss mutual water resources concerns, to develop cooperative project proposals, and to implement the general directive of their respective supervisors and higher headquarters. Project chiefs and other technical personnel of both agencies should be encouraged to meet periodically to exchange water resources information and data, and to propose new projects in support of the objectives of the cooperative program.

APPENDIX

Observations on Streamflow Information for Alaska

Water resources planners, managers, and regulators rely on several types of water data all of which has associated errors (or accuracy). The most basis data is stream stage and discharge; a higher level of information would be that taken from a regression analysis.

- Discharge Measurements. A discharge measurement consists of a water surface elevation and a flow measurement at a single point on a stream and at a single time. The accuracy of the water surface elevation depends on the stability of the sensor and the ability of the hydrographer to read. The USGS anchors the sensor such that it is stable at all stages and pipes the water to a stilling well for ease of reading. If a stilling well is not used the stage is transmitted to a recorder in a shelter on the bank. The accuracy of a discharge measurement depends on the equipment and procedures used by the hydrographer; we use equipment and methods prescribed by the Bureau of Standards. Discharge measurements made by the USGS are accurate to the 95% level unless otherwise noted. One cannot compute stream flow statistics at a site from a discharge measurements(s) alone; such statistics may be computed from correlations with sites having continuous record with the error of estimate dependent on the correlation coefficient.
- Continuous record of discharge. A continuous record of discharge at a point on a stream is developed from a rating of discharge measurements plotted against the water surface elevation at the time of the measurement. Daily discharges are computed from a continuous record of stage and the rating adjusted for shifts in the channel conditions. Accuracy of the computed daily discharges depends on the accuracy and number of discharge measurements, the field observation of channel conditions by the hydrographer, and the ability and experience of the person performing the analysis. The USGS makes 6-8 measurements per year (including ice periods) and all data analyses are performed or checked by senior engineers. An accuracy statement is estimated for each record (such as 95% accurate 95% of the time) and all daily discharges are entered and stored in a National Data Base. Streamflow statistics can be computed from a continuous record of discharge with the accuracy increasing with the number of years of record. For instance the mean annual discharge at a gaging station in Alaska can be computed from 10 years of record with an error of estimate of 20%; 10 years or more of record are required for computation of other statistics with larger errors of estimate - figure 1. (Note this is site data only.) Figures 2 and 3 show the year to year variability at two Alaska gaging stations and the error possible using 5 years of data.
- Discharge information from correlation techniques. As noted above discharge measurements made at a site can be correlated with concurrent daily discharges at a continuous gaging station. The accuracy of the correlation depends on the number of observations and the similarity of basin, climatic, and channel parameters, as well as, the accuracy of the discharge measurements and computed daily discharges. Correlations on the same stream often work well, whereas, correlations between streams do not. If the correlation coefficient is .8 or greater it is possible to estimate streamflow statistics from the relationship. In Alaska, such correlations should be limited to within at least 6 similar physiographic provinces. (Note this is site data only)

- Discharge information from multiple regression techniques. Records of continuous discharge at several or many gaging stations can be combined using multiple regression techniques. Streamflow statistics at continuous gaging stations are regressed against basin, climatic, and channel parameters. An error of estimate is computed by comparing the station data to that obtained from the regression; the station error is included. In, Alaska, the error associated with computation of the mean annual discharge in 6 physiographic provinces ranges from 20 to 35%; the error for other statistics is greater, with those for flood and low flows being much greater. The value of this technique is that discharge information for any point on any stream can be estimated. This technique can be misused, however, when it is extended to areas or drainage area sizes outside of those used in the investigation.

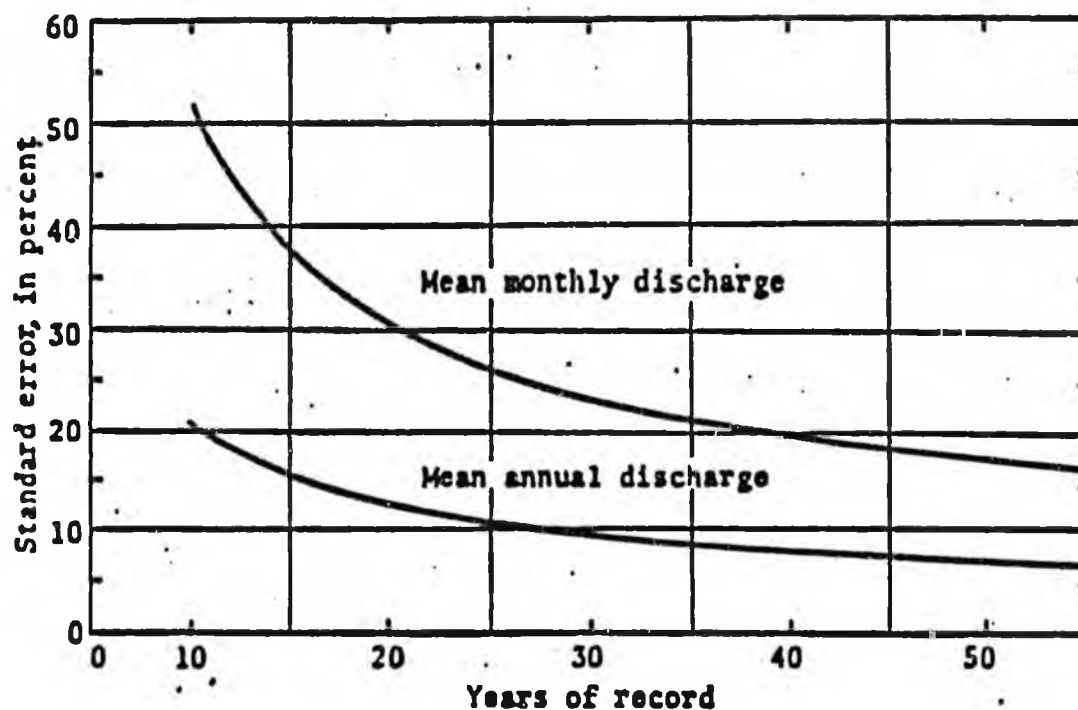
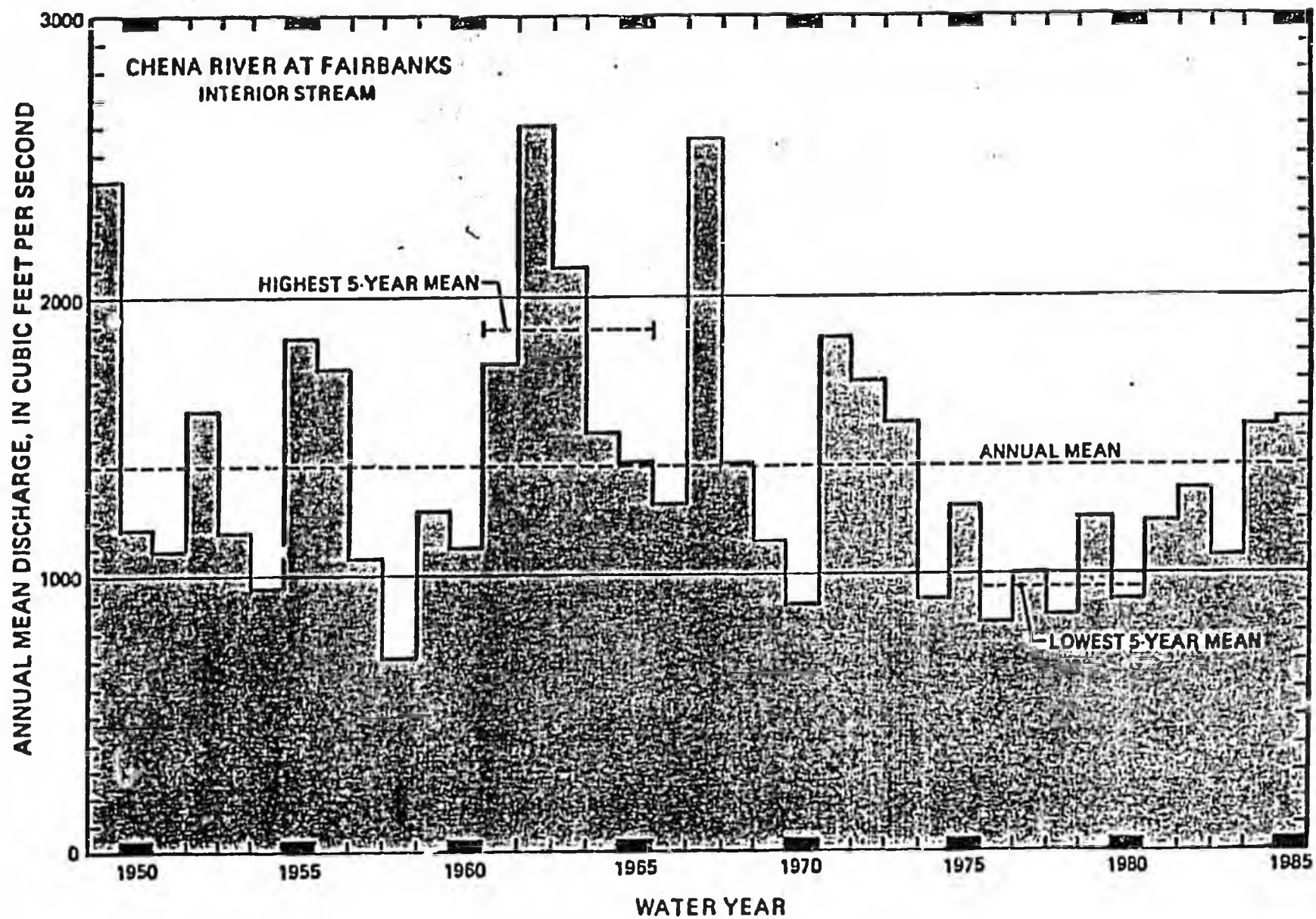
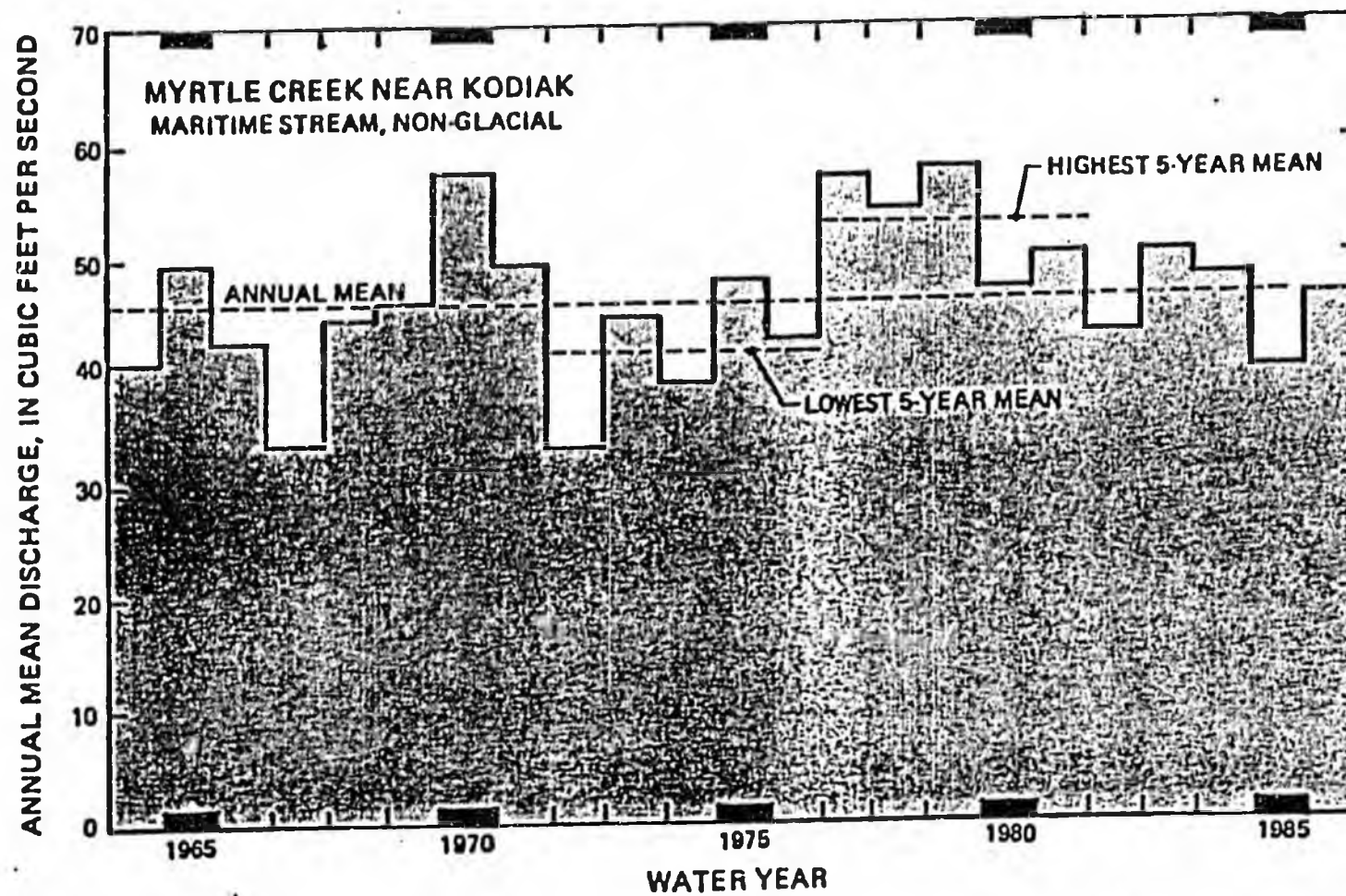


Figure 1.--Curve showing relation of standard error to length of record.

SE Ak (Maritime)





Suggested USGS-State of Alaska Cooperative Program Process

The Alaska District, USGS, desires to coordinate its activities with a State agency principally responsible for identifying the States water resources priorities. We look to that agency for guidance in program development and coordination of studies with other State and local agencies. Additionally, that agency could provide a stable funding base to the cooperative program in Alaska. From the State's perspective, a strong cooperative program insures that study results will be used by all management and regulatory agencies. Acceptance of our cooperative program at the Survey's Regional and National headquarters level depends on the State's success in this area.

Following are some of the advantages of the cooperative program to the State of Alaska as viewed by the Geological Survey;

- Water resources investigations are conducted by an unbiased agency which has no management or regulatory function. The results of these investigations can be used by the State with confidence that they will stand up to close technical scrutiny by all users and the Courts without the apparent conflict of interest suggested if the State were to do the same investigations.
- The cost of water resources investigations for the State can be shared equally by the Geological Survey. This enables the State to obtain the benefits of a large staff without incurring a comparable large cost.
- The water resources investigations will be conducted by the Geological Survey with minimum personnel commitments by the State. This will free the State for technical and administrative oversight of the investigations and for other Agency work.
- State personnel have the opportunity to work first hand with Geological Survey in project proposal formulation and conduct.
- State personnel are offered the opportunity for technical training at the Survey's training center in Denver, at its Regional office in Menlo Park, California, and in the District offices in Anchorage. Several have participated in this training.

We believe that for the cooperative program to meet its objectives in the State of Alaska, strong leadership by the State and USGS is required. General program direction should be provided at least yearly through a formal meeting between the Commissioner, Department of Natural Resources and/or State Geologist (or equivalent) and the District Chief, USGS. The meeting should be focused on general program direction, not specific projects. Topics to be covered would include:

- A discussion of the short- and long-term water-resources issues of the State as viewed by both agencies.
- A review of the National priority programs of the USGS to determine their short-term relevance to the State water-resources issues and to provide the the USGS with information for the setting of long-term future programs.

- o The USGS has an ongoing program of research and development of new methods and new instrumentation in the field of hydrology.
- o The USGS in Alaska has access to a highly skilled research staff and leading experts in the field of hydrology nationwide capable of addressing the most difficult hydrologic problems. This pool of expertise is unparalleled worldwide.
- o The USGS actively seeks out local governmental agencies to share resources and knowledge and cooperate with on water-resource data collection and water-resource studies.
- o The USGS collects data from all areas of Alaska.
- o The USGS works jointly with Canada to share data and information concerning water-resources common to both countries.
- o The USGS works cooperatively with local universities to provide expertise when needed and learn from new ideas generated by the universities.
- o The USGS hires local university students in our "Student Coop Program" to help train future Alaskan scientists and inject new ideas in our day-to-day programs.
- o The USGS hires local high school students to aid career development and job skills.
- o The USGS collects data in the most cost effective manner consistent with the quality assurance guidelines.
- o USGS programs and presence in Alaska feed monies directly into the Alaskan business community.
- o USGS data are often the first stepping stone in detailed studies of hydrology.

A Citizen's Guide

GORDON S. HARRISON

Agreed upon by the delegates in Constitutional Convention assembled at the University of Alaska, this fifth day of February, in the year of our Lord one thousand nine hundred and fifty six, and of the Independence of the United States the one hundred and eighth.

[illegible]

Abstract

SECTION 3. Each student who wishes to vote upon any proposition shall be given a ballot by the clerk on paper which shall be separate from the ballot on which candidates in the primary election are listed. Each of the propositions offered by the student government Committee shall be set forth separately for vote on the same ballot form. The said propositions shall be as follows:

"That the Committee be the form of student government and agreed upon by the student Government Council be in effect."

b6 ()
b7 ()

SECTION 2 The Committee for the State of Nevada agreed upon by the delegates to the Nevada Constitutional Convention on February 5, 1959, shall be submitted to the voters of Nevada for ratification or rejection at the next general election to be held on April 20, 1959. The statute shall be amended according to existing laws regarding public officers and the public employees.

Article VIII **AK Water Use Act +**
Section 12 **AK Constitution**
Water Rights

Section 13. Water Rights

All surface and subsurface waters reserved to the people for common use, except mineral and medicinal waters, are subject to appropriation. Priority of appropriation shall give prior right. Except for public water supply, an appropriation of water shall be limited to stated purposes and subject to preferences among beneficial uses, concurrent or otherwise, as prescribed by law, and to the general reservation of fish and wildlife.

This section continues the traditional right to use water on a "first-come-first-served" basis. This method differs from an early method of acquiring water rights used historically on the East Coast. Known as the "riparian method," it allocated water rights to owners of the stream bank. In Alaska and the other western states, however, water rights were traditionally acquired by actual use of the water. Under this constitutional provision, which is further developed in state statute and regulation, a prior user of water has preference to it, but his rights may be withdrawn or limited as necessary to protect public interests.

Section 14. Access to Navigable Waters

Free access to the navigable or public waters of the State, as defined by the legislature, shall not be denied any citizen of the United States or resident of the State, except that the legislature may by general law regulate and limit such access for other beneficial uses or public purposes.

Citizens have the right to use publicly owned lakes and streams. The state may not deny this use except by a general law that protects a public interest. For example, the state may keep people away from a lake that supplies drinking water to a town, or build a dam on a river, but it may not prevent the public from fishing in a public lake because it wants to protect the interest of nearby private fishing lodges. Disposals of state owned land along navigable waters must reserve a public access easement.

Section 15. No Exclusive Right of Fishery

No exclusive right or special privilege of fishery shall be created or authorized in the natural waters of the State. This section does not restrict the power of the State to limit entry into any fishery for purposes of resource conservation, to prevent economic distress among fishermen and those dependent upon them for a livelihood and to promote the efficient development of aquaculture in the State.

The second sentence of this section was added in 1972 by amendment. In the mid 1960s, Alaska's major salmon fisheries were in bad shape: too few fish, too many fishermen, and low prices.

\$2.00

Alaska Statutes

Title 46. Water, Air, Energy, and Environmental Conservation.

Chapter 15. Water Use Act.

Article

- 1 Administration (§§ 46.15.010 - 46.15.020)
- 2 Appropriation and Use of Water (§§ 46.15.030 - 46.15.105)
- 3 Water Resources Board (§§ 46.15.190 - 46.15.240)
- 4 General Provisions (§§ 46.15.250 - 46.15.270)

Article 1. Administration.

Section

- 101 Determination of water rights
- 20 Authority and duties of the commissioner

Sec. 46.15.010. Determination of water rights. The Department of Natural Resources shall determine and adjudicate rights in the waters of the state, and in its appropriation and distribution. (§ 1 ch 50 SLA 1966)

Sec. 46.15.020. Authority and duties of the commissioner. (a) The commissioner shall exercise all those powers and do all those acts necessary to carry out the provisions and objectives of this chapter. The commissioner may

(1) enter into contractual agreements necessary to carry out the provisions of this chapter including agreements with federal, state and local agencies;

(2) apply for, accept, administer and expand grants, gifts, and loans from the federal government and any other public or private sources for the purpose of this chapter, and adopt procedures and do acts not otherwise restricted by law which are necessary to qualify the state to receive grants, gifts and loans;

(3) establish a division of water in the Department of Natural Resources and assign to that division the responsibility for carrying out the provisions of this chapter.

(b) The Commissioner shall

(1) adopt procedural and substantive regulations to carry out the provisions of this chapter, taking into consideration the responsibilities of the Department of Environmental Conservation under AS 46.03 and the Department of Fish and Game under AS 16;

(2) Keep a public record of all applications for permits and certificates and other documents filed in his office, and shall record all permits and certificates and amendments and orders affecting them and shall index them in accordance with the source of the water and the name of the applicant or appropriator.

(3) cooperate with, assist, advise and coordinate plans with the federal, state and local agencies in matters relating to the appropriation, use, conservation, quality, disposal or control of waters and activities related thereto;

(4) prescribe fees or service charges for any public service rendered. (§ 1 ch 50 SLA 1966, am § 6 ch 104 SLA 1971, am § 50 ch 71 SLA 1972)

Legislative committee report. For report on ch. 71, SLA 1972 (H. 550, 380 and 11), see 1972 House Journal, p. 898.

Article 2. Appropriation and Use of Water.

Section

- 30 Waters reserved to the people
- 30 Right to appropriate
- 50 Priority
- 60 Existing rights
- 65 Determination of existing rights
- 70 [Renumbered]
- 80 Criteria for issuance of permit
- 90 Preference in granting permits

- 100 Terms of permit
- 110 Time for construction and completion
- 120 Certificates

Section

- 130 Priority
- 133 Notices, objections
- 135 [Renumbered]
- 140 Abandonment, forfeiture, and reversion of appropriations
- 145 Reservation of water
- 147 Termination of permits
- 150 Preferred use
- 160 Transfer and change of appropriations
- 170 Effect of recording
- 180 Crimes
- 185 Appeals

Sec. 46.15.030. Waters reserved to the people. Wherever occurring in a natural state, the waters are reserved to the people for common use and are subject to appropriation and beneficial use and to reservation of in-stream flows and levels of water, as provided in this chapter. (§ 1 ch 50 SLA 1966; am § 4 ch 84 SLA 1980)

Effect of amendment. — The 1980 amendment, effective June 19, 1980, inserted "and to reservation of in-stream flows and levels of water" near the end of the section.

Pursuant to the Alaska Statehood Act, the Submerged Lands Act of 1953 applies to Alaska. Alaska Pub. Easement Defense Fund v. Andrus, 435 F. Supp. 664 (D. Alas. 1977).

Ownership and control of land under navigable waters. — The court takes judicial notice of the fact that Alaska lies westward of the 98th meridian. Thus, under federal law ownership and control of the land under navigable waters is confirmed in the state. Alaska Pub. Easement Defense Fund v. Andrus, 435 F. Supp. 664 (D. Alas. 1977).

Ownership of ground and surface waters is to be determined according to state law. Under the Alaska Constitution and state law, the right to use such waterways is placed in the people of the state. Alaska Pub. Easement Defense Fund v. Andrus, 435 F. Supp. 664 (D. Alas. 1977).

Purpose of easement along courses of major waterways is to provide a place for docks, campsites and such facilities to service those who are properly using the public waters. This purpose is apparently accommodated by the reservation of site easements under the order of the Secretary of the Interior. Alaska Pub. Easement Defense Fund v. Andrus, 435 F. Supp. 664 (D. Alas. 1977).

Sec. 46.15.040 Right to appropriate. (a) A right to appropriate water can be acquired only as provided in this chapter. No right to the use of water either appropriated or unappropriated shall be acquired by adverse use or possession.

(b) A right to appropriate water shall be obtained by first making application to the commissioner for a permit to appropriate. The commissioner shall by regulation prescribe the form and contents of the application and the procedure for filing the application. If a permit is granted and the means of appropriation is constructed a certificate of appropriation may be obtained.

(c) All applications to the commissioner for a permit to appropriate water, filed subsequent to July 1, 1966, shall be considered as having been simultaneously filed with the Department of Fish and Game under AS 16 and the Department of Environmental Conservation under AS 46.03. (§ 1 ch 50 SLA 1966; am § 6 ch 104 SLA 1971; am § 51 ch 71 SLA 1972)

Legislative committee report. — For report on ch 71, SLA 1972 (HLC SSB 383 am 11), see 1972 House Journal, p. 898.

Sec. 46.15.050. Priority. Priority of appropriation gives prior right. Priority of appropriation does not include the right to prevent changes in the condition of water occurrence, such as the increase or decrease of stream flow, or the lowering of a water table, artesian pressure, or water level, by later appropriators, if the prior appropriator can reasonably acquire his water under the changed conditions. (§ 1 ch 50 SLA 1966)

Sec. 46.15.060. Existing rights. A water right acquired by law before July 1, 1966 or a beneficial use of water on July 1, 1966, or made within five years before July 1, 1966, or made in conjunction with works under construction on July 1, 1966, under a lawful common law or customary appropriation or use, is a lawful appropriation under this chapter. The appropriation is subject to applicable provisions of this chapter and rules and regulations adopted under this chapter. (§ 1 ch 50 SLA 1966)

Sec. 46.15.065. Determination of existing rights. (a) A claimant of an existing right under AS 46.15.060 shall file a declaration of appropriation with the commissioner as set out in this section. The declaration shall be considered correct until a certificate of appropriation is issued or denied. Priority of such right dates from the day work was begun on the appropriation if due diligence was used in completing the work; otherwise, from the day water was applied for the beneficial use.

(b) The commissioner shall, as soon as practicable, determine the rights of persons owning existing appropriations. To accomplish this, the commissioner shall

(1) by order set a definite period for filing a declaration of appropriation within a specified area or from a specified source;

(2) publish notice of the order once a week for three weeks before the beginning of the period in a newspaper of general circulation in the affected area;

(3) give notice of the order by certified mail to any appropriator within the specified area or from the specified source who has requested mailed notice or of whom the commissioner can readily obtain knowledge including each owner of a recorded mining claim.

(c) The commissioner shall make such investigations as he considers necessary of rights asserted by declarations filed under this section and shall determine each existing appropriation and mail a summary of such determination to each person who has filed a declaration with respect to the specified area or source. Any person adversely affected by a determination may file with the commissioner a request for a hearing within 20 days of the date the notice is mailed. If a hearing is requested the commissioner shall send a notice of the time and place of the hearing to each person who has filed a declaration.

(d) If a hearing is not requested with respect to a determination, or if, after the hearing, the commissioner finds the determination to have been correctly made, he shall immediately issue a certificate of appropriation. If the commissioner finds the determination to be incorrect, he shall correct it and either issue a certificate of appropriation or refuse the certificate according to his findings.

(e) A person aggrieved by the action of the commissioner may appeal to the superior court within 30 days of the date on which that action is final. (§ 1 ch 50 SLA 1966)

Revised's note. — This section formerly appeared as AS 46.15.135. It was renumbered by the revision of statutes for more logical arrangement.

Sec. 46.15.070. Notices; objections [Renumbered].

Revised's note. — This section formerly appeared as AS 46.15.131. It was renumbered by the revision of statutes for more logical arrangement.

Sec. 46.15.080. Criteria for issuance of permit. (a) The commissioner shall issue a permit if he finds that

- (1) rights of a prior appropriator will not be unduly affected;
- (2) the proposed means of diversion or construction are adequate;
- (3) the proposed use of water is beneficial, and
- (4) the proposed appropriation is in the public interest.

(b) In determining the public interest, the commissioner shall consider

(1) the benefit to the applicant resulting from the proposed appropriation;

- (2) the effect of the economic activity resulting from the proposed appropriation;
- (3) the effect on fish and game resources and on public recreational opportunities;
- (4) the effect on public health;
- (5) the effect of loss of alternate uses of water that might be made within a reasonable time if not precluded or hindered by the proposed appropriation;
- (6) harm to other persons resulting from the proposed appropriation;
- (7) the intent and ability of the applicant to complete the appropriation; and
- (8) the effect upon access to navigable or public waters. (§ 1 ch 50 SLA 1966)

Sec. 46.15.090. Preference in granting permits. When there are competing applications for water from the same source, and the source is insufficient to supply all applicants, the commissioner shall give preference first to public water supply and then to the use which alone or in combination with other foreseeable uses will constitute the most beneficial use. (§ 1 ch 50 SLA 1966)

Sec. 46.15.100. Terms of permit. The commissioner may issue a permit for less than the amount of water requested, but in no case may he issue a permit for more water than can be beneficially used for the purposes stated in the application. He may require modification of plans and specifications for the appropriation. He may issue a permit subject to terms, conditions, restrictions, and limitations he considers necessary to protect the rights of others, and the public interest. However, the permit shall be subject to termination only as provided in this chapter. (§ 1 ch 50 SLA 1966)

Sec. 46.15.110. Time for construction and completion. A permit may place a time limit for beginning construction and perfecting appropriation. Reasonable extensions of time shall be permitted for good cause shown. (§ 1 ch 50 SLA 1966)

Sec. 46.15.120. Certificates. Upon completion of construction of the works and commencement of use of water, the permit holder shall notify the commissioner that he has perfected his appropriation. If the commissioner determines that the appropriation has been perfected in substantial accordance with the permit, he shall issue the permit holder a certificate of appropriation. The certificate shall set out any condition which the commissioner may prescribe by regulation, including conditions that are necessary to protect the prior rights of other persons and the public interest. (§ 1 ch 50 SLA 1966; am § 9 ch 175 SLA 1980)

Sec. 46.15.130. Priority. (a) Priority of appropriation made under this chapter dates from the filing of an application with the commissioner.

(b) Priority of appropriation perfected before July 1, 1966, shall be determined as provided in § 135 of this chapter. (§ 1 ch 50 SLA 1966)

Sec. 46.15.133. Notices; objections. (a) Upon receipt of an application, the commissioner shall prepare a notice containing the location and extent of the proposed appropriation, the name and address of the applicant and other information he considers pertinent. The notice shall state that within 15 days of publication or service of notice, persons may file with the director written objections, stating the name and address of the objector, and any facts tending to show that rights of the objector or the public interest would be adversely affected by the proposed appropriation.

(b) The commissioner shall publish the notice at the applicant's expense in one issue of a newspaper of general distribution in the area of the state in which the water is to be appropriated. The commissioner shall also have notice served personally or by certified mail upon an appropriator of water or applicant for or holder of a permit who, according to the records of the division of lands, may be affected by the proposed appropriation and may serve notice upon any governmental agency, political subdivision or person, notice shall also be served upon the Department of Fish and Game and the Department of Environmental Conservation.

(c) Within 15 days of publication or service of notice, an interested person may file an objection. The commissioner may hold hearings upon giving due notice and shall grant, deny, or condition the application in whole or in part within 30 days of receipt of the last objection or, if the commissioner elects to hold hearings, within 180 days of receipt of the last objection. Notice of the order or decision shall be served personally or mailed to any person who has filed an objection.

(d) If no objection is filed, the commissioner may proceed to make his determination upon the application.

(e) A person aggrieved by the action of the commissioner or by the failure of the commissioner to grant, deny, or condition an application in accordance with (c) of this section may appeal to the superior court.

(f) The commissioner may, by regulation, designate types of appropriations which are exempt from this section and provide simplified procedures for ruling on the applications. (§ 1 ch 50 SLA 1966; am § 6 ch 104 SLA 1971; am § 52 ch 71 SLA 1972; am §§ 5, 6 ch 84 SLA 1980)

Revisor's note. — This section formerly appeared as AS 46.15.070. It was renumbered by the revisor of statutes for more logical arrangement.

Effect of amendment. — The 1980 amendment, effective June 19, 1980, substituted "if the commissioner elects to hold hearings,

within 180 days of receipt of the last objection" "at the conclusion of the hearing" at the end of the second sentence of subsection (c), and inserted "or by the failure of the commissioner to grant, deny, or condition an application in accordance with (c) of this section" near the middle of subsection (c).

Sec. 46.15.135. Determination of existing rights [Renumbered].

Revisor's note. — This section now appears as AS 46.15.065. It was renumbered by the revisor of statutes for more logical arrangement.

Sec. 46.15.140. Abandonment, forfeiture, and reversion of appropriations. (a) The commissioner may declare an appropriation to be wholly or partially abandoned and revoke the certificate of appropriation if an appropriator, with intention to abandon, does not make beneficial use of all or a part of his appropriated water. An appropriation so forfeited and abandoned reverts to the state and the water becomes unappropriated water.

(b) The commissioner may declare an appropriation to be wholly or partially forfeited and shall revoke the certificate of appropriation if an appropriator voluntarily fails or neglects, without sufficient cause, to make use of all or a part of his appropriated water for a period of five successive years. (§ 1 ch 50 SLA 1966)

Sec. 46.15.145. Reservation of water. (a) The state, an agency or a political subdivision of the state, an agency of the United States or a person may apply to the commissioner to reserve sufficient water to maintain a specified instream flow or level of water at a specified point on a stream or body of water, or in a specified part of a stream, throughout a year or for specified times, for

(1) protection of fish and wildlife habitat, migration, and propagation;

(2) recreation and park purposes;

(3) navigation and transportation purposes; and

(4) sanitary and water quality purposes.

(b) Upon receiving an application for a reservation under this section, the commissioner shall proceed in accordance with AS 46.15.070.

(c) The commissioner shall issue a certificate reserving the water applied for under this section if he finds that

(1) the rights of prior appropriators will not be affected by the reservation;

(2) the applicant has demonstrated that a need exists for the reservation;

(3) there is unappropriated water in the stream or body of water sufficient for the reservation; and

(4) the proposed reservation is in the public interest.

(d) After the issuance of a certificate reserving water, the water specified in the certificate shall be withdrawn from appropriation and the commissioner shall reject an application for a permit to appropriate the reserved water.

(e) A reservation under this section does not affect rights in existence on the date the certificate reserving water is issued.

(f) At least once each 10 years the commissioner shall review each reservation under this section to determine whether the purpose described in (a) of this section for which the certificate reserving water was issued and the findings described in (c) of this section still apply to the reservation. If the commissioner determines that the purpose or part or all of the findings no longer apply to the reservation, he may revoke or modify the certificate reserving the water in accordance with AS 46.15.140(b). (§ 7 ch 84 SLA 1980)

Effective date. — Section 12, ch. 84, SLA 1980, makes this section effective June 19, 1980, in accordance with AS 01.10.070(c).

Editor's note. — As to declaration of legislative policy, see § 1, ch. 175, SLA 1980, in Temporary and Special Acts and Resolves.

Sec. 46.15.147. Termination of permits. (a) If the commissioner has reason to believe that a person who holds an appropriation permit under this chapter is wilfully violating or has wilfully violated a term, condition, restriction or limitation of his permit, he may commence proceedings to terminate the appropriation permit under the Administrative Procedure Act (AS 44.62.330 — 44.62.630).

(b) When an appropriation permit is terminated under this section, the appropriation of water made by the permit reverts to the state and becomes unappropriated water. (§ 8 ch 175 SLA 1980)

Editor's note. — As originally enacted, this section was designated AS 46.15.145. However, since a section with that designation had already been enacted by SLA 1980, ch. 84, this section was redesignated AS 46.15.147.

Sec. 46.15.150. Preferred use. (a) An applicant who asserts and proves a preferred use shall be granted a permit and shall be granted preference over other appropriators. A preferred use of water is for a public water supply.

(b) To be entitled to a preference an applicant must show that his use will be prevented or substantially interfered with by a prior appropriation; the use is a preferred use; the applicant agrees to compensate a permit or certificate holder for the prior appropriation for any damages sustained by the preferred use; and other information which the commissioner requires by regulation. (§ 1 ch 50 SLA 1966)

Sec. 46.15.160. Transfer and change of appropriations. (a) The right to use water under an appropriation or permit shall be appurtenant to the land or place where it has been or is to be beneficially used, provided, that water supplied by one person to another person's property shall not be appurtenant to the property unless the parties so intend. An appurtenant water right shall pass with a conveyance of the land, or transfer, or by operation of law unless specifically exempted from the conveyance.

(b) With the permission of the commissioner, all or any part of an appropriation may be severed from the land to which it is appurtenant, may be sold, leased or transferred for other purposes or to other lands and be made appurtenant to other lands. A permit or certificate or a deed, lease, contract, assignment of permit or other instrument transferring an appropriation must be filed for record in the office of the commissioner and a certified copy of the instrument must be recorded in the recorder's office of the recording district in which the appropriation is located. (§ 1 ch 50 SLA 1966)

Sec. 46.15.170. Effect of recording. (a) A deed, lease, contract, assignment of permit or other instrument transferring an appropriation is void as against a subsequent innocent purchaser who in good faith paid a valuable consideration for the appropriation or any portion of it and whose instrument is first filed and recorded under § 160(b) of this chapter.

(b) A deed, lease, contract, assignment of permit or other instrument transferring an appropriation which is recorded under § 160(b) of this chapter is constructive notice of its contents to subsequent purchasers of the appropriation or any portion of it. An unrecorded instrument is valid between the parties to it and as against one who has actual notice of it. (§ 1 ch 50 SLA 1966)

Sec. 46.15.180. Crimes. A person who constructs works for an appropriation, or diverts, impounds, withdraws or uses a significant amount of water from any source without a permit or certificate of appropriation; or a person who violates an order of the commissioner to cease and desist from preventing any water from moving to a person having a prior right to use the same; or who disobeys an order of the commissioner requiring him to take steps to cause the water to so move; or who fails or refuses to install meters, gauges or other measuring devices or control works; or who violates an order establishing corrective control works; or who violates an order establishing corrective controls for an area or for a source of water, or who knowingly makes a false or misleading statement in a declaration of existing rights, is guilty of a misdemeanor. Crimes under this section are in addition to any other crimes provided by law. (§ 1 ch 50 SLA 1966)

Quoted in *C. & A. Contractors, Inc. v. Alaska Greenhouses, Inc.*, Sup. Ct. (Op. No. 98) (file No. 1761), 517 P.2d 1379 (1974)

Sec. 46.15.185. Appeals. Appeals to the superior court under this chapter are subject to the provisions of the Administrative Procedure Act, AS 44.62.560 — 44.62.570. (§ 1 ch 50 SLA 1966)

Article 3. Water Resources Board.

Section
190 The Water Resources Board
200 Term of office
210 Duties of the board

Section
220 Board meetings
230 Public meetings
240 Compensation of board members

Sec. 46.15.190. The Water Resources Board. There is created the Water Resources Board composed of seven members having a general knowledge of the use and requirements for use of the waters of the state and the conservation and protection thereof, and the commissioner of environmental conservation or his designee shall serve as an additional, ex officio member serving without a vote. The commissioner of natural resources shall act as the executive secretary of the board, and shall provide clerical staff for the board. Members of the board are appointed by the governor, subject to confirmation by a majority of the members of the legislature in joint session. (§ 1 ch 50 SLA 1966; am § 1 ch 58 SLA 1972)

Sec. 46.15.200. Term of office. The term of office for members of the board is four years. The first members appointed serve as follows: two members serve for one year, three for two years and two for three years. If a vacancy occurs, the governor shall fill it by appointment for the unexpired term. The appointment shall be submitted to the legislature for confirmation at the next regular or special session. (§ 1 ch 50 SLA 1966)

Sec. 46.15.210. Duties of the board. The board shall inform and advise the governor on all matters relating to the use and appropriation of water in the state, including, but not limited to: the effect and adequacy of all state laws and regulations governing the establishment of water rights, the multi-purpose uses of water, the prevention of pollution and the protection of fish and game, studies of the state's water supplies and plans for future requirements, development of water resources, participation of local governmental units in the management of water resources, lands which are or may be needed for dams, reservoirs, flood dams, flood ways, canals or ditches for the impoundment, storage, flow and control of waters. (§ 1 ch 50 SLA 1966)

Sec. 46.15.220. Board meetings. The board shall hold one regular meeting annually at the state capital and one or more additional meetings at the time and place in the state the board selects for the transaction of business. (§ 1 ch 50 SLA 1966)

Sec. 46.15.230. Public meetings. The board may hold and conduct public meetings at any time or any place in the state in order to obtain public opinion on a water use problem or proposal and it may, by majority vote of all members, formally or informally delivered, authorize one or more of its members to hold and conduct a public meeting (§ 1 ch 50 SLA 1966)

Sec. 46.15.240. Compensation of board members. Each member of the board is entitled to travel expenses and per diem as authorized for rate boards by AS 39.20.180 while traveling to or from, or in attendance at, regular or special meetings or conferences authorized by the board (§ 1 ch 50 SLA 1966)

Article 4. General Provisions.

action
50 Enforcement authority
60 Definitions
70 Short title

Sec. 46.15.250. Enforcement authority. The following persons are peace officers of the state and they shall enforce this chapter:

- (1) a state employee authorized by the commissioner;
- (2) a police officer of the state. (§ 1 ch 50 SLA 1966)

Sec. 46.15.260 Definitions. In this chapter, unless the context otherwise requires,

(1) "appropriate" means to divert, impound, or withdraw a quantity of water from a source of water, for a beneficial use or reserve water in accordance with AS 46.15.145;

(2) "appropriation" means the diversion, impounding or withdrawal of a quantity of water from a source of water for a beneficial use or the reservation of water in accordance with AS 46.15.145;

(3) "beneficial use" means a use of water for the benefit of the appropriator, other persons or the public, that is reasonable and consistent with the public interest, including, but not limited to, domestic, agricultural, irrigation, industrial, manufacturing, fish and shellfish processing, navigation and transportation, mining, power, public, sanitary, fish and wildlife, recreational uses, and maintenance of water quality;

(4) "source of water" means a substantial quantity of water capable of being put to beneficial use;

(5) "water" means all water of the state, surface and subsurface, occurring in a natural state, except mineral and medicinal water;

(6) "commissioner" means the commissioner of the Department of Natural Resources;

(7) "director" means the director of the Division of Lands, Department of Natural Resources,

(8) "person" includes an individual, partnership, association, public or private corporation, state agency, political subdivision of the state, and the United States. (§ 1 ch 50 SLA 1966)

(9) "mineral and medicinal water" means

(A) water of a hot spring or spring with curative properties which has been reserved by the federal government under Public Land Order No. 399; and

(B) geothermal fluid, as the term is defined in AS 41.06.060. (am §58 — 10 ch 84 SLA 1980; am §§ 10, 11 ch 175 SLA 1980)

Effect of amendment. The first 1980 amendment, effective June 19, 1980, added "or to reserve water in accordance with AS 46.15.145" at the end of paragraph (1); added "or the reservation of water in accordance with AS 46.15.145" at the end of paragraph (2); inserted "fish and shellfish processing, navigation and transportation" near the middle of paragraph (1); and added "and maintenance of water quality" at the end of paragraph (3).

The second 1980 amendment substituted "subsurface" for "subsurface" near the middle of paragraph (3), and added paragraph (9).

As the rest of the section was not affected by the amendment, it is not set out.

Editor's note. As to declaration of legislative policy, see § 1 ch 175, SLA 1980, in Temporary and Special Acts and Resolves.

Sec. 46.15.270. Short title. This chapter may be cited as the Alaska Water Use Act. (§ 1 ch 50 SLA 1966)

State: Charge for use of water

By DIRK MILLER

THE JUNEAU EMPIRE

The Hickel administration wants to put a price on the water that flows through Alaska's streams, rivers, lakes, hot springs and underground aquifers, and start charging users for a resource that until now has been as free as rain.

The proposal could translate into nominal charges for homeowners, bigger fees for larger users such as hydroelectric plants, seafood processors and possibly some miners, and an export fee on those who want to sell the state's precipitation to dry states like California.

Authorizing the state to begin charging water fees is one of the administration's legislative priorities this session, state officials say. Currently, Alaska law does not allow the state to charge fees for its water.

The idea of water fees for large consumers came from Gov. Walter J. Hickel's new division of water at the Department of Natural Resources. Even before that, Hickel has boosted the idea of a 2,000-mile pipeline to pump millions of gallons of fresh water from Southeast Alaska to arid California.

"Bringing up the idea of a pipeline to California opened up the concept of exporting water," said Keith Tryck, a member of the state's Water Resources Board in Anchorage. "When you remove that water from Alaska and somebody uses it, whether shipping it out in 12-ounce cans or bottles like Perrier, somebody should pay for it."

Ric Davidge, director of the state's water division, said when he started looking into water exports - even glacier ice - he discovered the state was not making money on the deals.

Under current law, the state charges at most a \$200 filing fee for people or firms seeking water appropriations - simply the right to take a certain volume from a water supply.

And firms have been lining up for the chance to export Alaska's water to the Lower 48.

"Should we give them a water right and basically give it away?" Davidge said. "Unless we have statutory authority, the state cannot realize any benefit from that water."

Please turn to Water, Page 12

California firm to use water tankers

By DIRK MILLER

THE JUNEAU EMPIRE

A Santa Barbara, Calif., company has downsized Gov. Walter J. Hickel's idea of a water pipeline to thirsty California, instead proposing to ship tankers of fresh water from Southeast to water districts in the Golden State.

Sun Belt Water Inc. has applied for rights for as much as 200,000 acre feet of water a year from Orchard Lake near Ketchikan and as much as 150,000 acre feet a year from the Snettisham River, south of Juneau.

An acre foot is the amount of water it takes to cover an acre, one foot deep, or 325,851 gallons of water.

Company officials said today they plan to file for water rights at approximately 10 more sites in Southeast.

"You have so many streams and lakes available, it's our current feeling we will never be in a position of being in conflict with other activities of the state," said Jack Lindsey, Sun Belt's chief executive officer.

"Alaska is the most fabulous water resource story in the world," he said. "And as people begin to understand the magnitude of what the state is trying to harness, it's our feeling that you will see this, not as a renewable resource, but as a continuous resource."

Hickel has been pushing for a 2,000-mile pipeline from Southeast Alaska to California to ship fresh water to the dry state. The Hickel administration also plans on filing legislation that would allow the state to levy fees on in-state water.

Please turn to Tanker, Page 12

Water...

Continued from Page 1

Davidge said the proposed legislation - which has not yet been submitted to lawmakers - would give the state the authority to levy fees. Regulations to enforce the law would determine if some users, such as non-profit organizations, would be exempted.

Non-consumptive uses, depending on what they are, would be exempted, he said. That would be any user that returns the water back to its system essentially unchanged, such as those who use water to cool buildings.

Davidge said the money would be used to fund the state's water division and water programs statewide.

Officials have been talking about charging users \$1 per acre foot for larger users.

An acre foot is equivalent to the amount of water that would cover one acre to a depth of one foot, or 325,851 gallons.

The funds could be used for village safe-water projects for example, Davidge said. The idea is to have the water resource and its use pay for itself.

Though no one is shipping tankers full of Alaska water to California just yet, the state already has issued 26 permits for harvesting glacier ice, which is sold both in- and out-of state as glacial water, he said.

Some bottlers already are selling Alaska water, and the state last year granted the first large-scale permit for water exports to a Wrangell hatchery, which is looking to make

money off excess water from its Etolin island site.

Bruce Geraghty, one of Hickel's legislative lobbyists, said the water-fee idea is in accord with the governor's owner-state philosophy, in which the state's resources are owned by all Alaskans and managed for their mutual benefit. Instead of giving away water, the state could make money, he said.

The prospect of water fees means many municipal water systems might be charged a user fee for the water they sell to their residents, Davidge said. But those types of domestic uses likely would not be charged as much as a private company making a profit from the sale of water.

The municipality of Anchorage uses more than 26,350 acre feet a year, he said, but every household would probably pay less than a dollar a year for that.

Robert LeVar, water treatment superintendent for Anchorage, said the fees might run the municipality about \$25,000 to \$30,000 a year, and cost each homeowner a couple of cents a month.

In Juneau, the city's water system uses about 4,600 acre feet a year. Using LeVar's figures, the could cost Juneau about \$5,200 a year, or less than 50 cents a year per household.

"I'm surprised. This is the first that I've heard about it," said Jim Beeson, Juneau's water utility superintendent. "I would imagine if the state charges us, we would pass that on to the consumer."

The idea has conditional support from some environmental organizations.

"Our initial thought is it makes sense to levy some charge on this natural resource, just as we do any other natural resource," said Cliff Eames of the Alaska Center for the Environment in Anchorage.

"I think it's a good idea to charge for a resource you're going to sell," said Cliff Davidson, D-Kodiak and House Resource Committee chairman. But he cautioned that the state needs more information on water resources and the effect of large-scale water sales on fish, wildlife and people before it begins to sell its supply.

"We do not know enough about our water resources to set a price on that and try to sell off a lot of water," Davidson said. "Until we have in place the policy to get that information, we have the cart before the horse."

"We don't want the people in Alaska to take a second seat behind a tanker of water going to California," he said.

Steve Borell, executive director of the Alaska Miners Association, said his group has not been approached by the administration. Mining operations, in general, use a lot of water in processing ore.

"We are very concerned to see exactly what the governor's proposing," Borell said.

The association is a booster of Hickel, but Borell said the water fees might not be something that miners support, especially if the fees are excessive.

Davidge said miners might not be affected.

"Most miners, particularly placer miners, they recycle their water," Davidge said.

Tanker...

Continued from Page 1
users and exporters

Ric Davidge, director of Hickel's new water division in the Department of Natural Resources, said he has met with Sun Belt and other companies and California municipalities to discuss water-export projects.

Davidge said Sun Belt's applications would be analyzed by the division for its effect on fish and wildlife resources, water sources and other users. "We cannot appropriate water if it would take water away that had a previous appropriation," he said.

The business could start carrying water to California by the end of the year, he said.

Davidge and Lindsey said Southeast Alaska's great draw was its closeness to California and its abundance of water.

Lindsey would not disclose the other Southeast locations the company is considering, though Sun Belt recently withdrew an application for water rights from the Maksoutof River on Baranof Island.

"They did withdraw one appli-

cation because it was in a federal wilderness area," Davidge said. "We requested they withdraw that and they did."

Lindsey said the company has no contracts as yet to deliver water to California water districts, though it has financial backing from the Bank of America in San Francisco, he said.

Well, maybe support but no money yet. "What we've done is we have given him a strong expression of interest in providing project financing to a project," said Lester Stephens, vice president of the bank. "We have not committed any equity money to the company, nor have we committed to any specific financing yet."

Stephens said the bank would have to be satisfied that the company could deliver water before it would sign any financing arrangements.

Shipping water is an expensive proposition. The company does not own any tankers and would have to buy or lease them, Lindsey said. The plan is to fill tankers offshore, using pipelines to deep-water moorage facilities. Pipelines, he said, could cost about \$1

million a mile.

Environmental organizations say the idea of shipping Alaska's fresh water south must be carefully reviewed.

"If they're going to deplete water to go sell down south, there may be existing uses that will be affected," said Buck Lindekugel of the Southeast Alaska Conservation Council in Juneau. Fish and wildlife resources must be protected, he said.

Cliff Eames of the Alaska Center for the Environment in Anchorage, said the idea of exporting water south may open up a deeper philosophical question than strictly environmental concerns.

Throughout the world, we need to start assessing whether we are exceeding carrying capacity of some portions of the world," he said. California's water scarcity is in part due to a tremendous population growth and a lengthy drought.

Eames and Lindsey said some of the sites the company is considering might require a federal environmental impact study because of their location in the Tongass National Forest.

Water director has past ties to Calif. firm

By DIRK MILLER

THE JUNEAU EMPIRE

A state official overseeing Alaska's largest water-rights case has past ties to the California company that wants billions of gallons of water from Southeast.

Ric Davidge, director of the state's new water division, is a former employee of Environmental Services Ltd., the Alaska representative for Sun Belt Water Inc. Sun Belt is a Santa Barbara, Calif., company that wants to ship water in tankers from lakes and rivers near Ketchikan and Juneau to thirsty California cities. The water division is handling Sun

Belt's water rights application.

State ethics law prohibits a former public employee from working on any matter for two years in which the former employee had participated while in public service. But there is nothing barring the state from hiring people from a private firm to work on related matters in public service, said Tina Kobayashi, an assistant attorney general, if the employee has no financial interest in his former firm.

"That's the sort of the key, whether it's going to benefit him personally," she said today.

Davidge said Thursday that Envi-

ronmental Services had not started working on Sun Belt's water application until after he left the firm to work for the Hickel administration. He gets no retirement or pension benefits from the firm and has no financial link whatsoever, he said. Environmental Services president Jim Kross did not return a phone call this morning.

Davidge, 45, said he has delegated the authority to decide whether Sun Belt should be given the water rights to Gary Prokosch, a water resources officer in Anchorage.

"That's one of the reasons why Gary is delegated to make decisions

on water appropriations," Davidge said. "If there's a statutory problem here, Gary and I talked it through and felt comfortable with fact that he signs the appropriation."

Davidge said he told his boss, Natural Resources Commissioner Harold Heinze, of his former involvement on Thursday.

Heinze said today Davidge had done the right thing by telling him and the division's staff of prior employment with the consultant.

"It is not an extraordinary issue in my mind," Heinze said.

"The fact that you know somebody or have worked with somebody

is not a disqualification," he said. "More importantly, he does not have a financial interest in it."

Water rights, or appropriations, are simply the right to a certain amount of water from a certain source. The state issues water rights after investigating applications from interested parties. In most cases, parties are given a temporary permit for the water and once their facilities are in place, a permanent appropriation can be granted after the state considers the application.

Gov. Walter J. Hickel's administration is planning to push law-

makers to approve legislation that would allow the state to levy fees on water exported and used in the state.

Prokosch said he is supervised by Davidge.

"If things go wrong on my end and someone doesn't like what I've done, it's going to be elevated," Prokosch said.

If a party wants to appeal Prokosch's decision, Davidge said, the director normally would handle the appeal. But, Davidge said, he plans to send any appeals of Sun Belt's cases on to Heinze.

"The only time I would be involved is if it's appealed," Davidge said. "I would suggest it go directly to the commissioner."

Davidge, though, is still working with Sun Belt on its application for water rights, and he said he has met several times with the company.

Davidge is the former planning, permitting and government affairs director for Environmental Services, an Anchorage consulting firm. He

joined the firm during the Exxon Valdez oil spill in 1989 and worked there until being hired by the Hickel administration last year.

Sun Belt is seeking rights to up to 200,000 acre feet of water a year from Orchard Lake near Ketchikan and 150,000 acre feet of water from Snettisham River near Juneau. An acre foot is the amount of water it would take to cover an acre to a depth of a foot. That amount is 325,851 gallons.

Prokosch said the Sun Belt proposal is so large that the eventual decision might end up in Heinze's lap, anyway.

Sun Belt plans to ship the water to California for sale to water districts, said Jack Lindsey, the company's chief executive officer. Sun Belt is also considering filing for water rights on up to 10 other sites in Southeast, he said.

Lindsey said Environmental Services is the company's Alaska representative.

"They are sort of the voice for

Sun Belt in Alaska," Davidge said. "They interact with the adjudication staff."

"It's one of those things, if you're employed in Alaska, you eventually end up running into a conflict with one of your employers."

It is not the first apparent conflict of interest that has arisen in the Hickel administration. Hickel fired former Revenue Commissioner Lee Fisher last year over allegations that he had mishandled a contract with his old accounting firm, Coopers & Lybrand. State lawyers are also investigating a contract issued by the Alaska Energy Authority to an Alaska contractor with past ties to the agency's executive director, Charlie Bussell.

Hickel himself was alleged by a state Personnel Board report to have violated conflict-of-interest rules in promoting a gas pipeline project in which he held stock. To resolve the problem, Hickel donated the stock in Yukon Pacific to a charitable foundation he set up bearing his name.

Hickel wants to dip into water profits

The Associated Press

JUNEAU — Alaska's endless supply of fresh water may not be free for long. Gov. Wally Hickel plans to introduce legislation soon to charge water user and export fees.

The legislation may mean nominal charges for homeowners and higher fees for large users such as hydroelectric plants, seafood processors and possible mines. An export fee also may be

charged on water sales outside the state.

Hickel has proposed building a 2,000-mile freshwater pipeline to California. When he resurrected the idea last year, it raised some interest in Southern California but was quickly dismissed because of the pipeline's huge cost.

The idea got administration officials thinking of other ways to make money

from Alaska's many streams, rivers, lakes, hot springs and underground aquifers.

"Bringing up the idea of a pipeline to California opened up the concept of exporting water," said Keith Tryck, a member of the state Water Resources Board in Anchorage.

"When you remove that water from Alaska and somebody uses it, whether shipping it out in 12-ounce cans or bottles like Perrier, somebody should pay for it," he said.

Hickel's new Water Division at the Department of Natural Resources proposed charging water fees to large users after discovering that the state didn't make any money on water or glacier-ice exports.

Authorizing the state to begin charging water fees is one of the administration's legislative priorities this session, said Ric Davidge, director of the Water Division.

"Should we basically give it away? Unless we have statutory authority, the state cannot realize any benefit from that water."

The proposed legislation likely will be introduced in the coming week, Hickel spokesman John Manly said Friday. It would fund the Water Division and water programs statewide.

Officials have talked about charging users \$1 an

acre-foot, or 325,851 gallons, for larger users.

Non-profit groups and users that return water to its system essentially unchanged, such as those who use water to cool buildings, may be exempted from the proposed fees, Davidge said.

The state has issued 26 permits for harvesting glacial ice, which is sold as glacial water in Alaska and out of state, he said.

Some bottlers already sell Alaska water, and the state last year granted the first large-scale permit for water exports to a Wrangell hatchery, which wants to profit off of excess water from its Etolin Island site.

Under the proposal, water fees may be charged to many municipal water systems for the water they sell to residential customers, Davidge said. But domestic users likely would not be charged as much as a private company that profits from water sales.

Robert LeVar, water treatment superintendent for Anchorage, said the fees may cost the city about \$25,000 to \$30,000 a year, and cost each homeowner a couple of cents a month.

Cliff Davidson, D-Kodiak and chairman of the House Resource Committee, called

the fees a good idea for groups that profit from selling Alaska water. But he said the state needs more information on the effect of large-scale water sales on fish, wildlife and people.

"We do not know enough about our water resources to set a price on that and try to sell off a lot of water," Davidson said. "We don't want the people in Alaska to take a second seat behind a tanker of water going to California."

Steve Borell, executive director of the Alaska Miners Association, said miners, who generally use a lot of water, are concerned the fees may be excessive.

"I guess it's one thing to be able to charge for blocks of ice that leave the state," he said. "It's a political decision, whether or not you charge tourists for the air they breathe. That's the next step."

But Davidge said most miners, especially placer miners, recycle their water, and would not be charged.

Water rights attract Outside firm

The Associated Press

JUNEAU — A Southern California company has applied to ship billions of gallons of fresh water from southeast Alaska to help quench the Golden State's thirst.

Sun Belt Water Inc. of Santa Barbara, Calif., has applied to the state for rights to as much as 65 billion gallons of water a year from Orchard Lake near Ketchikan, and as much as 48 billion gallons annually from the Snettisham River, south of Juneau.

By comparison, Anchorage residents use about 8.5 billion gallons a year.

Sun Belt officials said this week they plan to file for water rights at about 10 other southeast Alaska sites not yet disclosed.

Jack Lindsey, Sun Belt's chief executive officer, said people will realize that Alaska water is not a renewable resource, but a continuous one.

"Alaska is the most fabulous water-resource story in the world," he said. "You have so many streams and lakes available. It's our current feeling we will never be in a position of being in conflict with other activities of the state."

Ric Davidge, director of Gov. Wally Hickel's new Water Division in the Department of Natural Resources, said he has met with Sun Belt and other companies

and California cities to discuss water-export projects.

Sun Belt's applications will be analyzed by the division for potential effects on fish and wildlife, water sources and other users. Davidge said.

If the applications are approved, the company may be able to ship water to California by the end of the year, he said.

Sun Belt recently withdrew an application for water rights from the Maksoutof River on Baranof Island because it was in a federal wilderness area, Davidge said. The state asked the company to withdraw the application.

The company has no contracts to deliver water to California water districts.

Bank of America in San Francisco has expressed interest in providing financing

for the project but has not committed any money to Sun Belt, said Lester Stephens, a bank vice president.

Sun Belt must convince the bank it can deliver water before it would sign any financing arrangements, Lester said.

The company does not own any tankers and would have to buy or lease them, Lindsey said. The plan is to fill tankers offshore, using pipelines to deep-water moorage facilities. Pipelines, he said, could cost about \$1 million a mile.

Environmental groups say the idea of shipping Alaska's fresh water south must be carefully reviewed.

"If they're going to deplete water to go sell down south, there may be existing uses that will be affected," said Buck Lindekugel of the Southeast Alaska Conservation Council in Juneau.

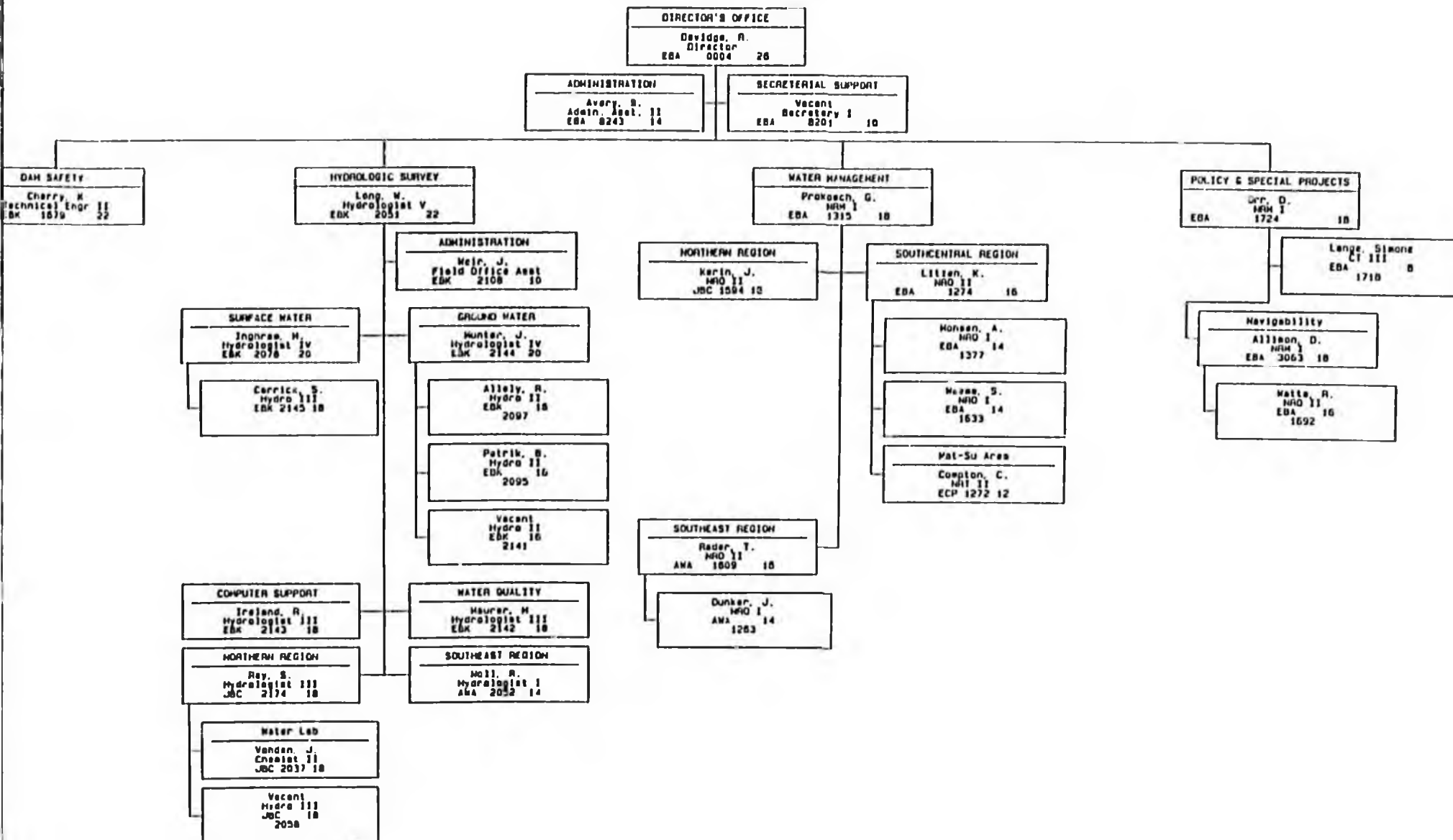


THE DIVISION OF WATER

The Alaska Division of Water manages an estimated 40% of our Nation's water resources including over 3 million lakes and an estimated 20,000 streams. These responsibilities include the State Water Policy and 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 five sections; Hydrologic Survey which includes the State Water Lab, Water Management, Policy and Special Projects, Navigability, and Dam Safety and Construction. The Division has offices in Anchorage, Fairbanks, Juneau and Wasilla.

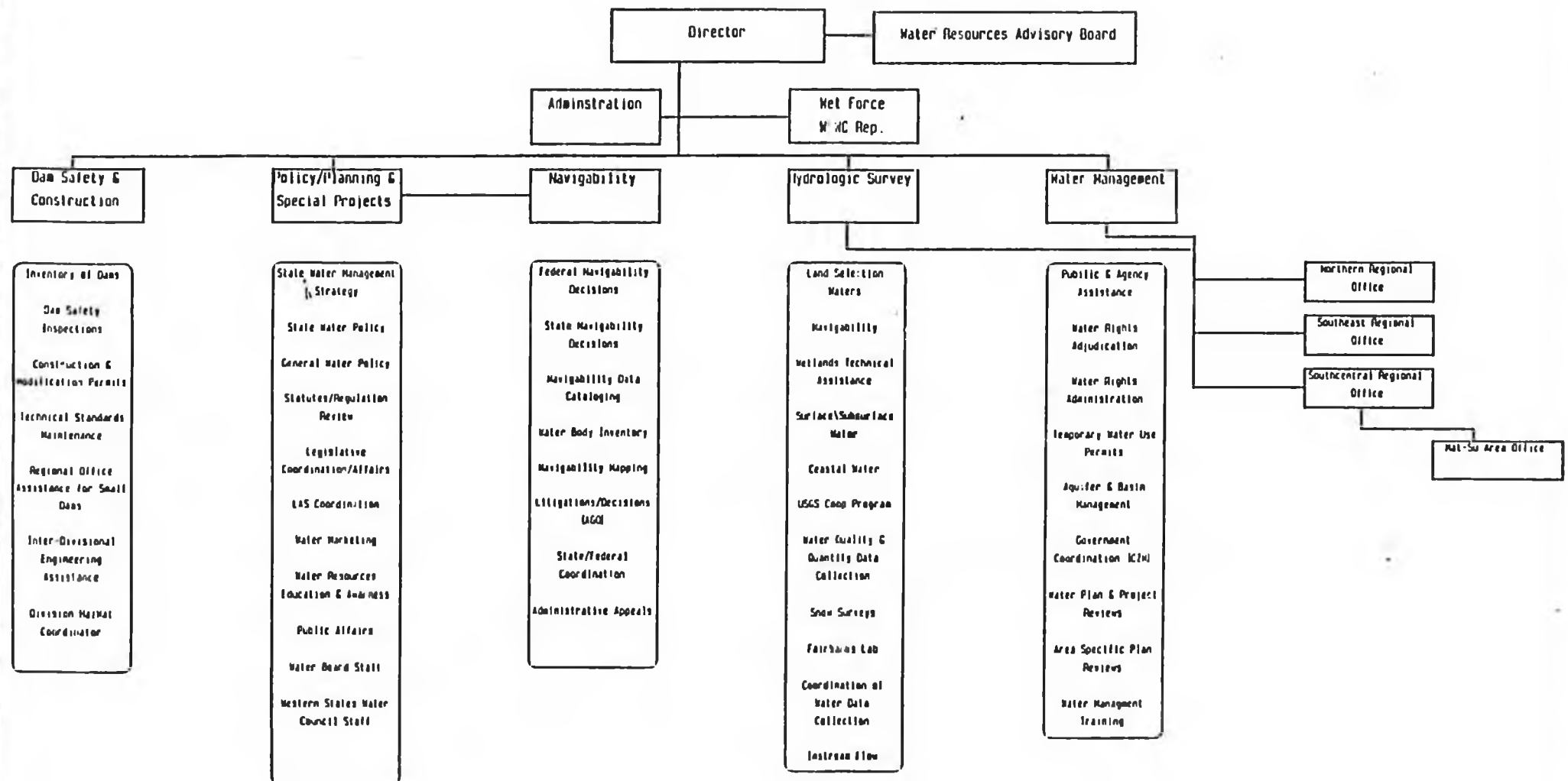
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER

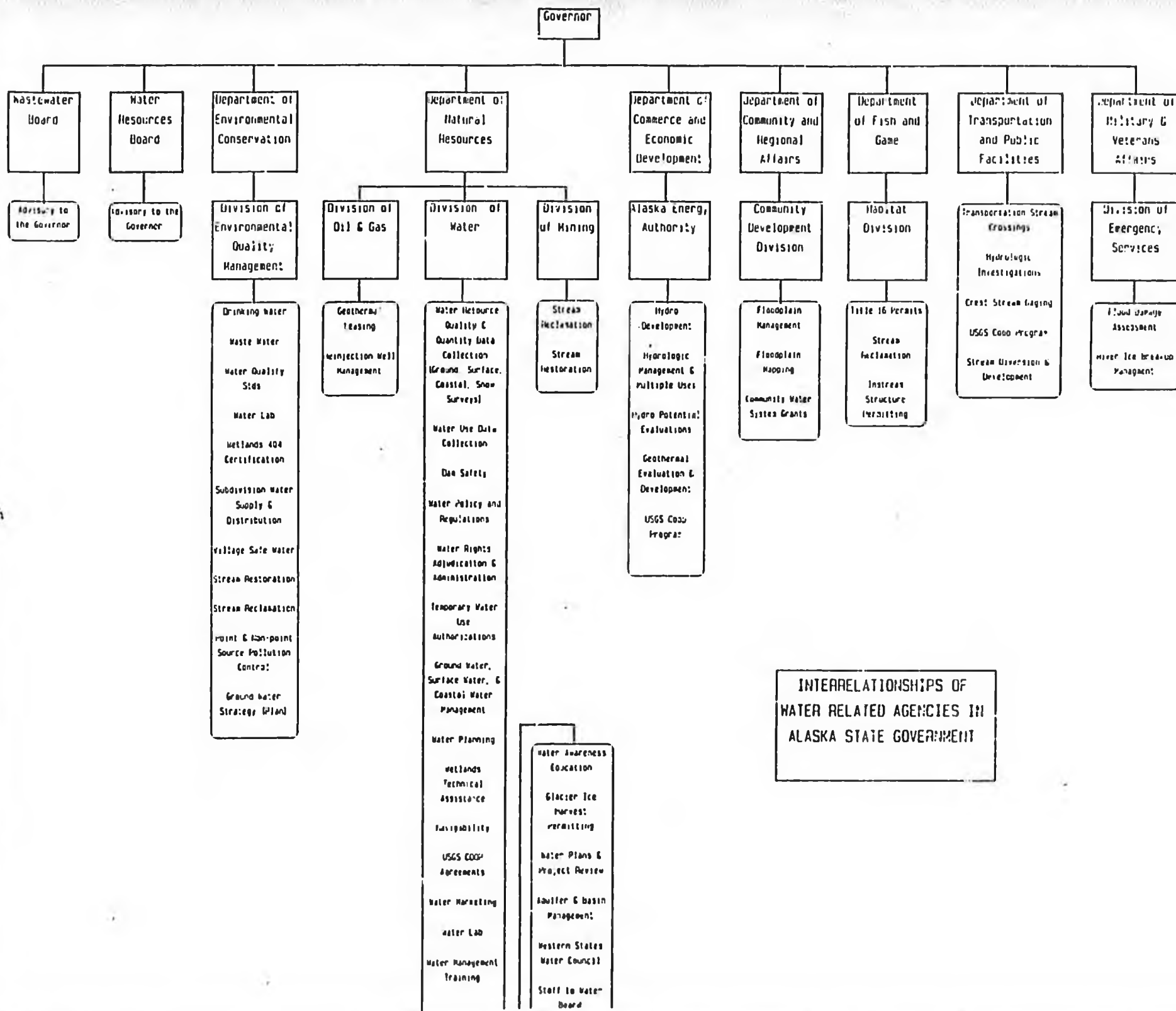


Department of Natural Resources

Division of Water

Program Functions





MEMORANDUM
DEPARTMENT OF NATURAL RESOURCES

STATE OF ALASKA
DIVISION OF MANAGEMENT

TO: Max Hodel
Chief of Staff
Office of the Governor

DATE: June 25, 1991

PHONE NO.: 465-2409

THRU: Shelby Starny
Director
Office of Management and
Budget

SUBJECT: Establishment of Division
of Water Resources

FROM: Harold C. Heinze
Commissioner

* { One of the first organizational suggestions I received as Commissioner was to establish a separate Division of Water Resources. Now that I have had time to study this suggestion and consult with affected interests (i.e., Water Resources Board, House Resources Committee, etc.). I am convinced that creation of this division would be in the best interest of the State.

In recent years, water management has become increasingly important to Alaskans. Water availability is critical to our cities and villages, our fisheries, oil and gas production, seafood processing, hydroelectric development, mining, recreation, navigation and a host of other purposes. Maintenance of our water resources and water allocation decisions among user groups is expected to become even more important in the 1990's. A Division of Water will provide the necessary focus and demonstrate our recognition of the importance of this resource and our commitment to responsible management.

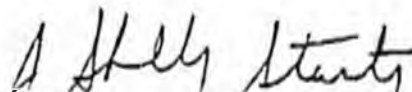
Water resources programs within the Department of Natural Resources currently reside in two divisions -- the Division of Land and Water (DLW) and the Division of Geological and Geophysical Surveys (DGGS). The DLW water programs include the water rights and dam safety projects. Other DLW water responsibilities include serving as staff to the Water Resources Board, representing the State on the Western States Water Council, and water resources planning. The DGGS is responsible for water resources data collection, storage, analysis, and dissemination, and for providing hydrologic assistance to DLW and other government agencies.

The Division of Water Resources would initially consist of 20-25 permanent positions. A new Director position at the Range 26 level will be established. The proposed organizational chart is attached for your approval.

AS 46.15.020(3) specifically authorizes the Commissioner to establish a Division of Water and no new statutes or changes to existing law will be necessary.

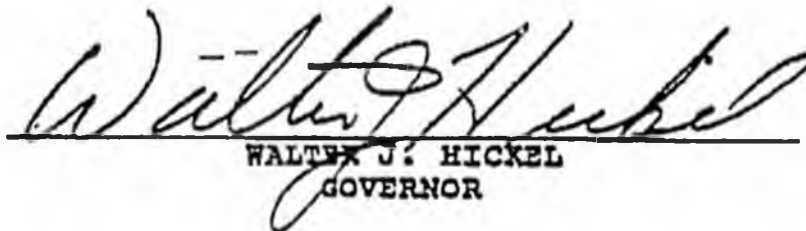
Max Hodel
Page 2
June 25, 1991

IN ACCORDANCE WITH AS 46.15.020(3), A DIVISION OF WATER IS ESTABLISHED IN THE DEPARTMENT OF NATURAL RESOURCES AS DESCRIBED ABOVE, EFFECTIVE ON THE DATE APPROVED.

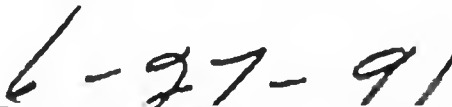


SHELBY STASTNY
DIRECTOR

OFFICE OF MANAGEMENT AND BUDGET



WALTER J. HICKEL
GOVERNOR

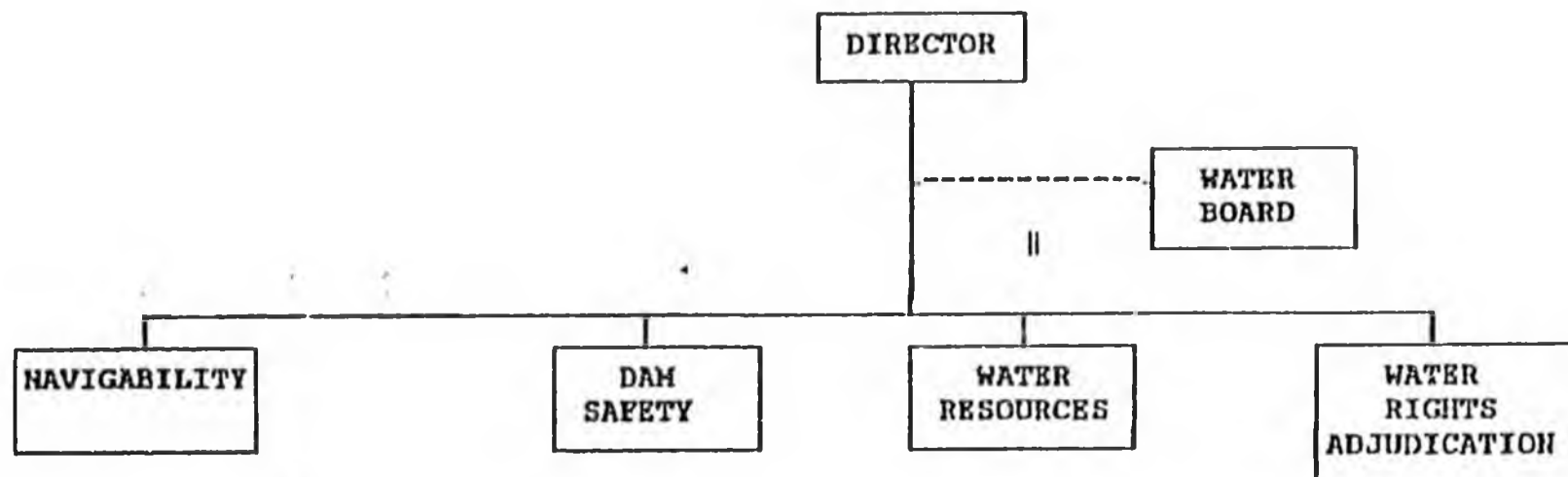


DATE

Attachment

cc: Gary Gustafson, Director, DLW
Tom Smith, Acting Director, DGGS
Sharon Barton, Director, Management

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER



Harold C. Henne

COMMISSIONER, DEPARTMENT OF NATURAL RESOURCES

William H. Steady

DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

Walter J. Krueger

GOVERNOR, STATE OF ALASKA

6-27-91

EFFECTIVE DATE

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER
PCN LIST

Division of Geological & Geophysical Surveys

<u>PCN</u>	<u>Title</u>	<u>Name</u>	<u>Location</u>
10-2051	Hydrologist V	Long	Eagle River
10-2144	"	IV Muntar	" "
10-2097	"	II Allely	" "
10-2141	"	II LaSage	" "
10-2095	"	II Petrik	" "
10-2078	"	IV Inghram	" "
10-2145	"	III Carrick	" "
10-2142	"	III Maurer	" "
10-2143	"	III Ireland	" "
10-2174	"	II Ray	Fairbanks
10-2037	Chemist II	Vohden	" "
10-2056	Hydrologist III	Moorman	" "
10-2055	Geologist IV	Motyka	Juneau
10-2052	Hydrologist I	Noll	" "
10-2108	Field Office Assistant	Weir	Eagle River

Division of Land & Water

10-1679	Tech Engineer	K. Cherry	Anchorage
10-1724	Nat Res Mgr I	M. Harle	" "
10-1692	Nat Res Off II	R. Watts	" "
10-1718	Clerk Typ III	P. Reamer	" "

Water Rights Adjudicators

10-1263	Nat Res Off I	Dunker	Juneau
10-1609	Nat Res Off II	Rader	" "
10-1274	Nat Res Tech	Litzen	Anchorage
10-1377	Nat Res Off I	Monson	" "
10-1272	Nat Res Tech	Compton	Wasilla (1/2 time)
10-1315	Nat Res Mgr I	Prokosch	Anchorage
10-1633	Nat Res Off I	Weeks	" "
10-1504	Nat Res Off II	Karin	Fairbanks

Division of Water

Director: Ric Davidge (762-2575)



3.76% of DNR budget

Mission

The Division of Water was created in 1991 to manage, plan, promote and authorize the responsible use and economic potential of Alaska's water resources; to resolve state title to the submerged lands under all navigable water bodies; to collect and provide information needed on the quantity and quality of Alaska's vast surface, ground and coastal waters; to protect lives and property at risk by dams; and to educate Alaskans about the responsible use of their water resources.

	General Fund	Other Funds	FTE
FY92 Authorized	0	0	0
FY93 Governor's Budget	2,115.9	540.9	28

NOTE: A full explanation of the transfers required to fund and staff the new Division of Water can be found in Appendix D.

Governor's Approved Increments

Funding Request

Water Management

337.0 (GF/PR)

Increasing program receipts encourages cost effectiveness and establishes a dollar relationship to services provided. These funds, generated through water rights applications fees, temporary water use fees, dam safety application fees and the USGS-Hydro Survey Co-op cost recovery program, are essential to the continued operation of the Division of Water at the current level. Failure to authorize this increase in program receipts will require personnel layoffs in water rights adjudication and hydrologic surveys. Backlogs in permit applications would likely increase and site inspection of high hazard dams will be limited.

FY93 Project Descriptions

<u>Project</u>	<u>Benefit</u>	<u>Funding</u>
Director's Office Provides overall management and administrative support.	Focuses division objectives and methods of obtaining them.	154.6 (GF)

<u>Project</u>	<u>Benefit</u>	<u>Funding</u>
Dam Safety Reviews and inspects dams and responds to emergencies in the event of a disaster. Construction of new dams will begin in FY93.	Protects lives and property from possible dam failures.	235.6 56.4 (GF) 64.2 (GF/PR) 115.0 (Fed)
Hydrologic Survey Collects and disseminates information on Alaska's surface and ground waters. Hundreds of streams and millions of lakes have yet to be added to data base. Includes a cooperative program with US Soil Conservation Service to improve snow fall data in arctic regions.	Provides information vital to public health and economic development. The arctic snow survey may revolutionize human understanding of arctic environments thus allowing more oil and gas exploration and development.	1,536.8 558.4 (GF) 602.5 (GF/PR) 196.8 (Fed) 179.1 (I-A)
Water Rights Adjudicates water rights applications associated with the use of water for domestic, commercial and industrial needs. Enforces compliance on water users in Alaska now taking large quantities of water without authorization. Participates in land and water resource plans.	Authorizes the use of water while protecting the public interest. Provides increased revenues and increased collection of water data related to site-specific hydrology and the availability, use and distribution of water.	547.2 452.9 (GF) 44.3 (GF/PR) 50.0 (Fed)
Water Management Policies and Procedures Develops and promulgates Alaska's first comprehensive water management policy. Develops, publishes and holds public hearings on Alaska's first statewide water management strategy organized by hydrological unit.	Gives guidance to and provides context for water management decisions. An organized strategy allows public input into water management decisions.	89.1 (GF)
Title Navigability Establishes and protects the state's title to submerged lands and access to millions of acres of uplands. The emphasis is to identify and claim title to all remaining, but currently unclaimed, navigable water bodies before the state land selection process is concluded.	Increases the total upland acres the state can select. It also protects access for recreation and commerce.	93.5 (GF)

NOTICE OF PROPOSED CHANGE IN THE REGULATIONS OF THE DEPARTMENT OF NATURAL RESOURCES

Notice is given that the Department of Natural Resources, under the authority of AS 46.15.20, proposes to adopt, amend or repeal regulations in Title 11 and Title 93 of the Alaska Administrative Code, dealing with filing fees, state water policy, and water rights to interpret and implement AS 46.15, as follows:

Amendments are proposed for 11 AAC 05.010 (a) to add or charge application fees for water use, permit extensions, temporary water use, and glacier ice. An amendment is proposed to adopt a new article and section in Chapter 93, Article 1., section 10., State Water Policy. An amendment is proposed for 11 ACC 93.970 to define when a water use would "unduly affect" an existing water right. State water law protects existing water rights against such impacts by later applicants. 11 AAC 93.970 is also being amended to clarify the definition of a "significant amount of water." An amendment to correct an error is proposed for 11 ACC 93.210. It will allow temporary water use permits to be issued for uses that are "significant" (defined by quantity) but short term (not more than five years). If a use is not "significant," no permit is necessary. In addition this section is being amended to allow for an extension of a temporary water use permit for an additional five years. 11 AAC 93 is also being amended to include a section outlining the state water policy.

Notice is also given that any person interested may present oral or written comments relevant to the proposed action at hearings to be held in Anchorage, Fairbanks and Juneau. The Juneau hearing will be held in the Southeast Regional Office's conference room A, on the Fourth Floor, 400 Willoughby Avenue on February 28, 1992. The Fairbanks hearing will be held at the Northern Regional Office, 3700 Airport Way, in the main conference room, on March 4, 1992. The Anchorage hearing will be held at the Frontier Building, 3601 C. Street, room 336 on March 3, 1992. Each hearing will be held from 11 a.m. to 2 p.m. and might be extended to accommodate those present before 2 p.m. who did not have the opportunity to testify earlier. In addition, written comments may be sent to Director, Ric Davidge, Division of Water, Department of Natural Resources, P.O. Box 107005, Anchorage, Alaska 99510-7005, to be received no later than March 20, 1992.

This action is not expected to require an increased appropriation.

Copies of the proposed regulations may be obtained upon written request to the Division of Water at the above address or in person from the division's Northern Regional Office (3700 Airport Way, Fairbanks), Southeast Regional Office (400 Willoughby Avenue, Fourth Floor, Juneau) or the Southcentral Regional Office (3601 C Street, Room 822, Anchorage).

After the end of the comment period, the Department of Natural Resources will either adopt these or other proposals dealing with the same subject, without further notice, or decide to take no action on them.

TITLE 11. NATURAL RESOURCES

Part 1. Office of the Commissioner (11 AAC 03--11 AAC 06)

PART 1. OFFICE OF THE COMMISSIONER.

Chapter

05. Fees for Department Services (11 AAC 05.010--11 AAC 05.900)

CHAPTER 05. FEES FOR DEPARTMENT SERVICES.

Section

010. Fees

11 AAC 05.010(a)(8)(A) and (a)(8)(C)--(D) are amended and are adopted, to read:

11 AAC 05.010. FEES. (a) Non-refundable fees to apply for authorizations, and fees to obtain publications or services from the department, are as follows:

(8) water management

(A) water rights application,

(i) \$50 for proposed use of 5,000 gallons a day or less;

(ii) \$100 for proposed use of more than 5,000 gallons a day, but less than 30,000 gallons a day; [OR]

(iii) \$200 for proposed use of 30,000 gallons a day or more, but less than 100,000 gallons a day;

(iv) \$300 for proposed use of 100,000 gallons a days or more, but less than 500,000 gallons a day;

(v) \$500 for proposed use of 500,000 gallons a day or more, but less than 1 million gallons per day;

(vi) \$1000 for proposed use of 1 million gallons of water per day or more;

(vii) \$1500 for proposed use of 1 million gallons of water per day or more, where the water will be used outside of the hydrologic unit from which it was removed. A hydrologic unit is based on the USGS Hydrologic Unit Map of Alaska-1974.

(viii) \$20 for proposed use of 1000 gallons per day or less for single family domestic water use;

(ix) \$500 for proposed use of any quantity of glacier ice;

(B) application for reservation of water, \$500;

(C) extension of permit to appropriate water, \$50 for 5,000 gallons a day or less, or \$100 for more than 5,000 gallons a day, but less than 30,000 gallons per day, \$200 for 30,000 gallons per day or more;

(D) application for a temporary water use permit and the extension of a temporary water use permit, the same fee as for a water rights application and permit extension apply;

[(I) \$50 FOR PROPOSED USE OF 5,000 GALLONS A DAY OR LESS;]

[(II) \$100 FOR PROPOSED USE OF MORE THAN 5,000 GALLONS A DAY BUT LESS THAN 30,000 GALLONS A DAY; OR]

[(III) \$200 FOR PROPOSED USE OF 30,000 GALLONS A DAY OR MORE;]

Authority:

AS 46.15.020

AS 44.37.025

CHAPTER 93. WATER MANAGEMENT.

Article

1. State Water Policy (11 AAC 93.010.)
2. Appropriation of Water (11 AAC 93.040--11 AAC 93.174)
-
4. Temporary Water Use (11 AAC 93.210--11 AAC 93.220)
-
8. General Provisions (11 AAC 93.910--11 AAC 93.970)

ARTICLE 1. STATE WATER POLICY

Section

10. STATE WATER POLICY

11 AAC 93.15.010 is adopted to read:

11 AAC 93.010. State Water Policy. It is the policy of the State of Alaska to efficiently manage and conserve its water resources for the maximum use and benefit of its citizens, consistent with the public's interest. In so doing, the state's goal is to maximize public benefits by improving the quality of life of its residents; conserving the natural environment; facilitating and encouraging economic development; and protecting life and property. To further this policy, the following principles will guide the management of Alaska's water resources:

(1) The state is the conservator of the public's water resources;

(2) The state will permit the broadest possible access to and common use of state waters, consistent with the public's best interests, except that the legislature may by general law regulate and limit such access for other beneficial uses or public purposes (Constitution of Alaska, Article VIII, Sections 3 and 14);

(3) Whenever occurring in a natural state the state shall reserve all surface and ground water resources to the people for common use. Such use and priority for use is subject to prior appropriation rights; except for public water supply, an appropriation of water shall be limited to stated purposes and subject to preferences among beneficial uses, concurrent or otherwise, as prescribed by law; and subject to the general reservation of fish and wildlife (Constitution of Alaska, Article VIII, Sections 3 and 13) and (AS 46.15.030);

(4) No person shall be involuntarily divested of his right to the use of waters, or improvements affecting that use, except for a superior beneficial use or public purpose and then only with just compensation and by operation of law (Constitution of Alaska, Article VIII, Section 16);

(5) The state shall manage its water resources to ensure that adequate supplies of water are available for public water supplies; the protection of fish and wildlife habitat, migration, and propagation; recreation and park purposes; navigation and transportation purposes; and sanitary and water quality purposes, if found to be in the public interest (AS 46.15.080(b));

(6) State water quality standards shall be judiciously and uniformly enforced among all users;

(7) The state shall maintain, or improved to minimum water quality standards the quality of its water resources when feasible and prudent, so that current and future generations will have access to good quality water with which to meet their basic needs;

(8) Water resources planning is integral to wise water management. The state shall conduct the necessary water resources planning to ensure wise use and management of its waters. The state shall also solicit public participation in the planning and management of its water resources;

(9) The state will encourage water conservation and public education in its management of water resources;

(10) The state shall provide for the regulation, supervision, and periodic inspection of privately owned and state-owned dams, reservoirs, and appurtenant works in order to ensure that the design, construction, and removal of dams and reservoirs is consistent with the protection of life and property (AS 46.17.010);

(11) The state shall work cooperatively with the public and other state, local, and federal agencies to administer water rights, to conduct navigability determinations, to collect water resources data, to assure water quality standards are upheld, and to provide scientific and technical assistance as requested;

(12) The state shall systematically collect, record, store, evaluate, and distribute water resources data to determine the quality, quantity, location, and use of the state's water resources. Such activities are in the public's interest and are necessary for the orderly domestic and industrial development of the state (AS 41.08.017); and

(13) State agencies shall ensure that regulatory processes involving the state's water resources are efficient and that, to the extent feasible, regulatory or jurisdictional duplication among state agencies is avoided or eliminated wherever found. (Eff. / /92, Register ;)

Authority: AS 46.15.020.

ARTICLE 2. APPROPRIATION OF WATER

Section

100. Exemption to Notice.

11 AAC 93.100., is amended to read:

11 AAC 93.100. Exemption to Notice. An application to appropriate 5,000 gallons of water per day (gpd) or less is exempt from the notice provisions of 11 AAC 93.080 and AS 46.15.133, except that the Department of Fish and Game will be notified of an application for a water right for a quantity of water of more than 1000 gpd from an anadromous fish stream listed in the Alaska Department of Fish and Game Catalog of Water Important for Spawning, Rearing, or Migration of Anadromous Fishes or a stream identified as supporting fish in the ADF&G Habitat Regional Guides. However, in an area where the total amount of water available appears to the department to be limited with respect to the number of potential users of the same source, or upon the request of another state or federal agency or a municipality as defined by AS 29, or to protect the public interest, the commissioner will, in his or her discretion, require public notice as provided by 11 AAC 93.080. (Eff.12/29/79, Register 72; am 11/7/90, Register 116; am / /92, Register)

Authority: AS 46.15.020
AS 46.15.133

ARTICLE 4. TEMPORARY WATER USE.

Section

210. Temporary water use

11 AAC 93.210 (a) is amended, and a new 11 AAC 93.210(c) is adopted to read:

11 AAC 93.210. TEMPORARY WATER USE. (a) Simplified procedures to authorize the temporary use of water, as provided in 11 AAC 93.220, will be followed if the amount of water is [NOT] a significant amount as defined by 11 AAC 93.970(14), the use continues for less than five consecutive years, and the water applied for is not otherwise appropriated.

(c) Upon the commissioner's receipt of a written request from the permittee, a temporary water use permit will, in the commissioner's discretion, be extended for a period of time not to exceed five years. The request for a temporary water use permit extension must be accompanied by the fee prescribed by 11 AAC 05.010. (Eff. 2/8/67, Register 23; am 12/29/79, Register 72; am 11/7/90, Register 116; am / /92, Register)

Authority: AS 46.15.020
AS 46.15.040
AS 46.15.133

ARTICLE 8. GENERAL PROVISIONS.

Section

970. Definitions

11 AAC 93.970(14) is amended, and a new paragraph (38) is added to read:

11 AAC 93.970. DEFINITIONS. Unless the context indicates otherwise, in this chapter

(14) "significant amount of water" means any use of more than 5000 gallons of water in a single day from a single source, or the regular daily or recurring [SEASONAL] use of more than 500 gallons of water per day, for more than 10 days [OR MORE] per calendar year from a single source, or the nonconsumptive use of more than 30,000 gallons of water per day (0.05 cfs) from a single source, [OR ANY USE OF WATER FROM A SOURCE OR SOURCES LISTED IN THE ALASKA DEPARTMENT OF FISH AND GAME " CATALOG OF WATERS IMPORTANT FOR THE SPAWNING, REARING OR MIGRATION OF ANADROMOUS FISHES,"] or any water that might adversely affect the water rights of other appropriators or the public interest;

(38) "unduly affect" means that a prior appropriator loses the ability to reasonably acquire an adequate quantity of water to fulfill the purposes of the appropriation from the water source from which the water right is permitted or certificated, except that a prior appropriator has not been unduly affected if water can reasonably be obtained by installing more efficient diversion works for the withdrawal of water or by performing effective routine repair and maintenance of diversion works or water well equipment in order to allow for the full development of the water resource. (Eff. 2/8/67, Register 23; am 12/29/79, Register 72; am 9/11/83, Register 87; am 11/7/90, Register 116; am / /92, Register)

Authority: AS 46.15.020
AS 46.15.040
AS 46.15.050
AS 46.15.080
AS 46.15.133
AS 46.15.145

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER

WALTER J. HICKEL, GOVERNOR

3601 C. Street
 P.O. Box 107005
 Anchorage, Alaska 99510-7005
 Phone: (907) 762-2575

February 21, 1992

Representative Cliff Davidson
 Alaska State Legislature
 P.O. Box V (MS 3100)
 Juneau, Alaska 99811

Post-it brand fax transmittal memo 7875 *olpages*	
To: Heather Henderson	From: Ric Davidson
Co. Cliff Davidson	Co. DNR/DOA
Dept. H.K. Legislature	Phone # 762-2224
Fax # 465-3464	Fax # 4

Dear Representative Davidson:

Attached is a table that addresses the questions posed in your January 24, 1992 letter regarding water right applications received and adjudicated from January 1, 1987 thru January 31, 1992.

This table addresses questions number 2a, 2c and 4. The table does not address the number of temporary water use permits (TWP) received or issued during this 5 year period because we do not tract this type of water use through the LAS system. We only have the records on the issuance of TWPs dating back to July 1, 1988. Since that time we have issued 245 TWPs. The majority of these permits were issued for construction projects such as road, highway, and airports, or for glacier ice harvesting and oil and gas development. Most of the applications were for surface water in excess of 30,000 gallons per day.

1. Please define divert, impound and withdraw and differentiate between these uses of water. the Water Use Act (AS 46.15) allows the right to divert, impound or withdraw the surface and subsurface waters of the state.

Divert: to turn, modify, or change the direction of the natural flow of water. A diversion is usually accomplished by using a ditch, berm, culvert or pipe.

Impound: to gather and/or enclose water. An impoundment is usually accomplished through the use of a dam, berm or reservolrs.

Withdraw: to take or remove water from its natural source or from an impoundment. Water withdrawn from a source is usually accomplished through the use of a pump and/or gravity.

Note: The out-of-stream appropriations are associated with one or more of these definitions. Water reserved under an Instream flow reservations is not diverted, impounded, or withdrawn from its source and is considered a beneficial use in Alaska.

2.a) How many applications to appropriate water has the Department received over the five years from January 1987 to January 1992 ? Please list by calendar year.

The Department has received 1119 water rights applications over the past five years. We did not request from the department programmers the total number of applications received by calendar year because of the additional programming time. This information is being gathered and should be available by noon on Tuesday, February 25th.

2.b) Of these applications how many were to divert, impound, or withdraw water ? How many were for instream and out-of-stream applications ? How many were for surface or subsurface?

Of the 1119 applications received all of them involved the diversion or withdrawal of water except for the 38 applications for a reservation of water (instream flow). We are not sure of the total number that had an impoundment associated with the withdrawal or diversion of water, this information is not tracked in LAS.

2.c) What is the status of these applications ?

The attached table shows the status of the 1119 applications filed during this five year period. To summarize; 253 are still in the application stage, 391 have been issued permits, 360 have been issued certificates and 115 have been closed.

3. How does your division consider non-consumptive use of water ? Do these uses of water fit into the above statistics ? If not, please explain.

11 AAC 93.970. Definitions (33) "non-consumptive water use" means the instream use of water, or the diversion of water where the quantity of water diverted is not diminished except by evaporation or transpiration and the water is returned to its original source at the original point of diversion immediately after its use;

A water right application for a non-consumptive use (such as small suction dredge) is adjudicated under the same authority and in the same manner as an application for a consumptive use. So the answer is yes, they fit into the statistics as discussed above, but we do not keep track of consumptive and non-consumptive water uses in different categories.

4. Of the applications to appropriate water the Department has received over the past five years, please breakdown how many were for:

500 gallons per day (gpd) or less

1,000 gpd or less

5,000 gpd or less

10,000 gpd or less

30,000 gpd or less

40,000 gpd or less

greater than 100,000 gpd or less

Please give these figures in acre feet , GPD, cubic feet per second. Please also provide a conversion chart.

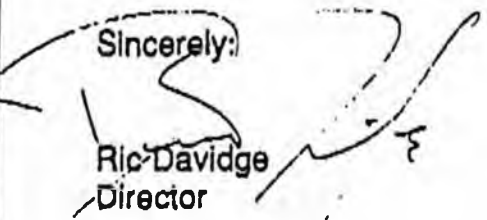
The answer to this question is provided in the attached table. In summary: 500 gpd or less, 445 applications were received; 500 gpd thru 1000 gpd, 121 applications were received; 1000 gpd thru 5000 gpd, 96 applications were received; 5000 gpd thru 10,000 gpd, 41 applications were received; 10,000 gpd thru 30,000 gpd, 63 applications were received; 30,000 gpd thru 40,000 gpd, 8 applications were received; 40,000 gpd thru 100,000 gpd, 44 applications were received; over 100,000 gpd, 301 applications were received. Attached for your information is a conversion table.

5. How do you treat a diversion of water that is not put to a beneficial use ?

On April 4, 1977, Thomas Meacham, AGO, Anchorage address this issue in a memorandum to the Department of Fish and Game, copy attached, the memorandum stated, If there is not a beneficial use of water associated with the diversion, withdrawal or impoundment of water DNR does not have the authority under the Water Use Act to issue a permit. It was not until June 17, 1980 that the Department stopped accepting and adjudicating applications to alter a waterbody. A copy of Director's Policy File 80-50 is attached for your information. .

If we can be of further assistance please call.

Sincerely:


Ric Davidge
Director

cc: Harold Heinze, Commissioner
Gary Prokosch, DOW
Carol Wilson, commissioner's Office

5 YEAR REPORT

FEB 21 '92 02:02PM ST-AK DNR MINING 907 563 1853

Status of Applications Receiceved from January 1987 thru January 1992.											
Gallons per Day	Application Pending		Permit Issued		Certificate Issued		Closed		Source Totals		Total Files
	Sur	Sub	Sur	Sub	Sur	Sub	Sur	Sub	Sur	Sub	
500 or Less	31	58	42	18	36	235	16	9	125	320	445
500 thru 1,000	4	23	9	12	9	49	9	6	31	90	121
1,000 thru 5,000	14	20	25	18	0	10	8	1	47	49	96
5,000 thru 10,000	12	6	11	4	1	2	3	2	27	14	41
10,000 thru 30,000	9	9	11	18	4	1	6	5	30	33	63
30,000 thru 40,000	0	1	2	3	0	0	1	1	3	5	8
40,000 thru 100,000	9	3	22	7	0	0	3	0	34	10	44
Over 100,000	43	11	178	11	13	0	36	9	270	31	301
Total	122	131	300	91	63	297	82	33	567	552	1119

Notes

*Does not include Temporary Water Permits

*Only includes applications with a priority date 01-01-1987 or later.

*When multiple quantities due to seasonal variation occurs w/in a file, the greatest gpd value was selected.

*When multiple uses occur within a file, quantities were added together for a single gpd value.

WATER CONVERSION FACTORS

1 Acre-foot per day (AF/d) = 325,851 gallons
= 226 gpm
= 0.505 cfs
= 1,358.8 tons
50 AF/y (365 days/year) = 44,640 gpd

1 Gallon per minute (gpm) = 1440 gpd
= .0044 AF/d
= .0022 cfs
= 1.6 AF/y
= 0.72 tons

1 Cubic-Foot per second (cfs) = 646,358 gpd
= 449 gpm
= 1.98 AF/d
= 722.7 AF/y
= 2695.3 tons

1 million gallons per day = 694 gpm
= 1.55 cfs
= 3.07 AF/d
= 1,120 AF/y
= 4,170 tons

AF/d = Acre feet per day

AF/y = Acre feet per year

gpm = Gallons per minute

gpd = Gallons per day

cfs = Cubic foot per second

tons = 2000 pounds (1 gallon weights 8.34 pounds)

STATE
of ALASKA*MEMORANDUM*

P.5/916 V

1976

TO: [Bruce Barrett
Habitat Section
Alaska Department of Fish & Game
333 Raspberry Road
Anchorage, Alaska

DATE: April 4, 1976
HABITAT
REGIONAL OFFICE

TELEPHONE NO:

FROM: Thomas E. Meacham
AGO - Anchorage

SUBJECT: Scope of Permit Authority
for Alteration of Stream
Banks or Diversion of
Water Flow.

I have been informally requested several times, by different individuals, to examine the statutory basis, if any, in Title 46 under which the State Division of Lands may require application for a permit, with payment of appropriate fees, to authorize the diversion of natural water flows, or the alteration of stream banks or stream location, where no appropriation of the water itself takes place or is intended to take place. Up to the present time the Division of Lands has apparently been requiring applications for such permits under the premise that the alteration of stream banks or the diversion of water flow constituted an "appropriation" of water under AS 46.15.260 (1) and (3).

In the Alaska Water Use Act, an appropriation is defined in AS 46.15.260 as follows:

- (1) "appropriate" means to divert, impound, or withdraw a quantity of water from a source of water for a beneficial use;...

In the same statute, the word "appropriation" is defined as follows:

- (2) "appropriation" means the diversion, impounding or withdrawal of the quantity of water from a source of water for a beneficial use;...

The phrase "beneficial use" is defined as follows:

- (3) "beneficial use" means a use of water for the benefit of the appropriator, other persons or the public, that is reasonable and consistent with the public interest, including, but not limited to, domestic, agricultural, irrigation, industrial, manufacturing, mining, power, public, sanitary, fish and wildlife, and recreational use;...

It may be seen from the context of the definitions that the diversion, impoundment, or withdrawal of water becomes an "appropriation" when it is applied to "beneficial use". The mere act of diverting, impounding, or withdrawing water, or the alteration of stream banks to do so, cannot constitute an appropriation unless that water is applied to a beneficial use. If

Bruce Barrett

-2-

April 4, 1977

permits for, the alteration of stream banks or diversion of water not constituting an appropriation. In view of the State's vital interest in protecting natural streams and stream flows, such control would seem to be imperative. However, it is my view that it cannot be directly accomplished at the present time by requiring applications for permits under the appropriation provisions of the existing Alaska Water Use Act, AS 46.15.

cc: Dean Nation
Water Resources Section
Alaska Division of Lands
McKay Building, 323 E. 4th Ave.
Anchorage, Alaska 99501

TEH:nb

Druce Barrett

-2-

April 4, 1977

it is merely returned unaltered, in quantity or quality, to the natural stream from which it was taken, no appropriation has occurred. Of course, if the quantity returned is less than that diverted, the missing water may have been applied to a beneficial use. Likewise, if the quality of the water is altered (by pollutants, turbidity, etc.) then a beneficial use may still not exist, but other statutory authority regarding water quality would seem to be adequate to meet this situation.

The context of the Water Use Act compels an interpretation that, to be perfected, an appropriation must consist of both a diversion, etc., and a beneficial use. AS 46.15.010 permits the Department of Natural Resources to adjudicate water rights "...in the waters of the State, and in its [sic] appropriation and distribution." AS 46.15.030 states that,

"...wherever occurring in a natural state, the waters are reserved to the people for common use and are subject to appropriation and beneficial use as provided in this chapter."
[Emphasis supplied]

Given this background, and the specific legal significance of the definitions of "appropriate" and "appropriation", it is important to note that AS 46.15.120, which is the penalty provision of the Alaska Water Use Act, makes criminal the acts of, "...a person who constructs works for an appropriation, or diverts, impounds, withdraws or uses a significant amount of water from any source without a permit or certificate of appropriation;..." This criminal penalty, by its terms, applies to unpermitted appropriations, i.e. the diversion, etc. of water for a beneficial use. Since such a person could not obtain a permit or certificate of appropriation if he "...diverts, impounds or withdraws..." water without putting it to a beneficial use, such an action, with no intention or possibility of perfecting an appropriation, can not be criminal under the statutes. An elementary maxim of law is that criminal or penal statutes are to be interpreted strictly, and any doubt in the construction or application of a criminal provision is to be resolved in favor of the individual, and against the State. State vs. Marathon Oil Co., 523 P.2d 293 (Alaska 1974); Stock vs. State, 526 P.2d 3 (Alaska 1974); Marks vs. City of Anchorage, 500 P.2d 644 (Alaska 1972).

It is the responsibility of the Legislature to accurately define crimes and criminal conduct, and under this guideline, if the alteration of a stream bed or diversion of water from a natural watercourse does not amount to an appropriation, it follows that no permit to do such an act can be required under existing law, and no crime for failure to obtain such a permit has been created. The draft bill which Professor Frank Trelease has circulated would seem to fill this void, and would give the State the opportunity to review, and to issue

Director's Policy File

2

June 17, 1980

adjudicated as a land use permit. All other pending waterbody alterations will be closed. Issued waterbody alteration permits will be closed when practicable based on project completion, project abandonment, or lack of information from the permittee on the status of the project.

MEMORANDUM

State of Alaska

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FOREST, LAND AND WATER MANAGEMENT

TO: DIRECTOR'S POLICY FILE
80-50

DATE: June 17, 1980

FILE NO: 1130, X-File 3200

TELEPHONE NO: 279-5577

FROM: THEODORE G. SMITH *TS*
Director

SUBJECT: Waterbody Alterations

Situation: There is currently within the division confusion regarding waterbody alteration application submittal, pending applications and issued permits. Is the division accepting waterbody alteration applications? What is the status of adjudicating pending waterbody alteration applications and issued permits?

Policy: It is the policy of the Division of Forest, Land and Water Management that the division will cease accepting waterbody alteration applications. This policy is based on the decision that the Water Use Act, AS 46.15, does not contain language of such specificity to allow the department to issue waterbody alteration permits where there is no beneficial use of water. All existing waterbody alteration application forms shall be destroyed. After this date applicants for waterbody alterations that include a beneficial use of water pursuant to AS 46.15.080 and AS 46.15.260(3) shall be instructed to file an application for water rights. If a dam is to be constructed or modified that is 10 feet or more in height or stores 50 acre-feet or more of water, the applicant shall be instructed to file an application to construct or modify a dam. If the waterbody alteration is on state land, whether associated with a beneficial use of water or not, the applicant will be requested to submit an application for a land use permit pursuant to AS 38.05.330. Applicants for activities involving waterbody alterations will be informed that they may also require permits from ADF&G, the Corps of Engineers and if the activity is in a borough, from the borough. If the waterbody alteration is not subject to a water rights permit but interferes with the water right of another person, a Commissioner's Order pursuant to 11AAC 93.290 may be issued to protect the rights of prior appropriators.

Additionally, it is the policy of the Division of Forest, Land and Water Management that pending waterbody alteration applications shall be processed as soon as practicable. Pending waterbody alteration applications associated with a beneficial use of water shall be adjudicated as a water rights application. The date of filing shall constitute the priority date for water rights purposes. Pending waterbody alterations not associated with a beneficial use of water but that take place on state land will be



Alaska State Legislature

HOUSE RESOURCES COMMITTEE

P.O. Box V
State Capitol
Juneau, Alaska 99811
(907) 465-3715

January 24, 1991

Mr. Ric Davidge, Director
Division of Water
Department of Natural Resources
P.O. Box 107005
Anchorage, Alaska 99510-7005

Dear Mr. Davidge:

In preparation for the Division of Water briefing before the House Resources Committee on Tuesday, January 28, I would appreciate the following information in writing by Monday, January 27.

1. Please define "divert," "impound," and "withdraw" and differentiate between these uses of water. Alaska's Water Use Act (AS 46.15) allows the right to divert, impound or withdraw the surface or subsurface waters of the state.

2.a) How many applications to appropriate water has the Department received over the last year, including January 1992?

b) Of these applications, how many were to divert, impound, or withdraw water? How many were for instream and out-of-stream applications? How many were for surface or subsurface water?

c) What is the status of these applications?

How many are still in the adjudication process and at what stage?

How many have been granted certificates of appropriation?

How many have been granted permits?

How many have been denied?

How many of these are for a temporary and standard water use permit?

3. How does your division consider non-consumptive uses of water? Do these uses of water fit into the above statistics? If not, please explain.

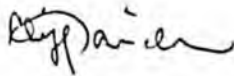
Page 2

I have also enclosed five additional questions. Please provide this information by Thursday, February 6. I would appreciate your contacting my office if you need additional time to fulfill this request.

Thank you for your assistance in this matter. I look forward to working with you throughout the session to improve the policy and management of this important public resource.

Thank you for contacting my staff on water issues this interim. Please contact my office if you have any questions or wish clarification on any of these requests. With best regards,

Cordially,

A handwritten signature in cursive script, appearing to read "Cliff Davidson".

Representative Cliff Davidson

Enclosure

cc: Commissioner Harold Heinze

1. Please define "divert", "impound," and "withdraw" and differentiate between these uses of water. Alaska's Water Use Act (AS 46.15) allows the right to divert, impound or withdraw the surface or subsurface waters of the state.

2.a) How many applications to appropriate water has the Department received over the five years from January 1987 to January 1992? Please list by calendar year.

b) Of these applications, how many were to divert, impound, or withdraw water? How many were for instream and out-of-stream applications? How many were for surface or subsurface water?

c) What is the status of these applications?

How many are still in the adjudication process and at what stage?

How many have been granted certificates of appropriation?

How many have been granted permits?

How many have been denied?

How many of these are for a temporary and standard water use permit?

3. How does your division consider non-consumptive uses of water? Do these uses of water fit into the above statistics? If not, please explain.

4. Of the applications to appropriate water the Department has received over the past five years, please breakdown how many were for:

- 500 gallons per day or less
- 1,000 gallons per day or less
- 5,000 gallons per day or less
- 10,000 gallons per day or less
- 30,000 gallons per day or less
- 40,000 to 100,000 gallons per day or less
- greater than 100,000 gallons per day or less

Please give these figures in acre per foot, gallons per day, and cubic feet per second. Please also provide a conversion chart.

5. How do you treat a diversion of water that is not put to a beneficial use?

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER

WALTER J. HICKEL, GOVERNOR

3601 C. Street
P.O. Box 107005
Anchorage, Alaska 99510-7005
Phone: (907) 762-2575

January 27, 1992

Representative Cliff Davidson
Alaska State Legislature
P.O. Box V (MS 3100)
Juneau, Alaska 99811

Dear Representative Davidson:

The following are the answers to the questions posed in your January 24, 1992 memo regarding water right applications received and adjudicated during 1991. The answers are addressed in the order they appear in your memo.

Divert: to turn, modify, or change the direction of the natural flow of water. A diversion is usually accomplished by using a ditch, berm, culvert or pipe.

Impound: to gather and/or enclose water. An impoundment is usually accomplished through the use of a dam, berm or reservoirs.

Withdraw: to take or remove water from its natural source or from an impoundment. Water withdrawn from a source is usually accomplished through the use of a pump and/or gravity.

Note: The out-of-stream appropriations are associated with one or more of these definitions. Water reserved under an Instream flow reservations are not diverted, impounded, or withdrawn from its source and is considered a beneficial use in Alaska.

2a. Total number of applications received since 1/1/91: 217

2b. divert, impound or withdraw: 209

instream flow reservations: 8

subsurface: 100

surface: 117

2c. still in adjudication process: 148

granted certificates: 3

issued permits: 59

denied: 7

temporary water use permits : 61

non-temporary: 156

The Division of Water, Water Management Section adjudicated 627 water files during 1991. These included water rights applications, permit extensions, certificate and permit amendments and temporary water use permits.

3. 11 AAC 93.970. Definitions (33) "non-consumptive water use" means the instream use of water, or the diversion of water where the quantity of water diverted is not diminished except by evaporation or transpiration and the water is returned to its original source at the original point of diversion immediately after its use;

A water right application for a non-consumptive use (such as placer mining) is adjudicated under the same authority and in the same manner as an application for a consumptive use.

The questions you posed regarding applications and adjudication of water rights over the past 5 years will be sent as soon as the information can be generated from our computer system. We anticipate that the programming will take a week and the first draft of information should be available to us within 10 days. We will pass the information on to you as soon as we are sure it is correct.

If we can be of further assistance please call.

Sincerely:



Ric Davidge
Director

cc: Harold Heinze, Commissioner
Gary Prokosch, DOW



Alaska State Legislature

HOUSE RESOURCES COMMITTEE

P.O. Box V
State Capitol
Juneau, Alaska 99811
(907) 465-3715

February 20, 1992

Ric Davidge, Director
Division of Water
Dept. of Natural Resources
P.O. Box 107005
Anchorage, Alaska 99510-7005

Dear Mr. Davidge:

Thank you for your response to my January 24 request for information on water rights applications the Department has received from January 1991 to January 1992. Please clarify the following questions regarding your response dated January 27.

First, in your response to 2a, does the figure 217 include applications through January 1992? Also, in your response to 2b. am I to assume the 8 instream flow applications are a subset of the 117 surface water applications? Also, in your response to 2b. how many of the 209 applications to divert, impound and withdraw water were to divert water? How many were to impound water? How many were to withdraw water?

Second, please clarify how your answer to 2c relates to the numbers in 2a and 2b.

Third, in your response to the definition of non-consumptive, would you have any objection to putting this definition in statute and why? And, if so, why? Please explain.

Fourth, I also note there are three other categories I did not consider: permit extensions and certificate and permit amendments. Please include these in the category breakdown for calendar years 1987 through 1992.

Fifth, I would still appreciate how many of the above applications specified in question #2 are for non-consumptive uses of water.

Page 2

Sixth, please clarify how many out of stream permits and certificates have been issued as far back is reasonably possible to ascertain. Based on previous correspondence from the Department, this number is 4,496. (1,607 out-of-stream permits issued and 2,889 out-of-stream certificates issued). However, based on recent conversations with your staff and in presentations, I have heard you state there are over 12,000 active water rights files in the state. Please clarify this discrepancy and define "active water rights" files. I would appreciate this clarification as soon as possible.

And, finally, I am requesting a breakdown of the number of out of stream permits and certificates issued as far back as is possible to ascertain. Please provide this per calendar year and by month and in the same format as requested in the January 24 letter. Please indicate how many water rights were grandfathered under the 1966 Water Use Act. Again, I would also appreciate this information as soon as possible.

Thank you for your attention to this matter. I appreciate your providing this data without which we can not make informed policy decisions regarding this important public resource.

With best regards,

Cordially,

Cliff Davidson

Representative Cliff Davidson
Chairman, House Resources Committee

cc: Commissioner Harold Heinze
Department of Natural Resources

STATE OF ALASKA

WALTER J. HICKEL, GOVERNOR

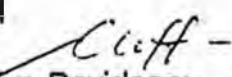
DEPT. OF ENVIRONMENTAL CONSERVATION

OFFICE OF THE COMMISSIONER
410 WILLOUGHBY AVENUE, SUITE 105
JUNEAU, AK 99801-1795

Phone: (907) 465-5000
Fax: (907) 465-5070

January 29, 1992

The Honorable Cliff Davidson, Chairman
House Resources Committee
Alaska House of Representatives
P.O. Box V
Juneau, AK 99811


Dear Representative Davidson:

Thank you for your letter of January 22 requesting additional information on the Water Summit scheduled for January 30. I look forward to your involvement at the meeting.

The purpose of the Water Summit is to improve coordination and sharing of expertise between State agencies. This should eliminate some existing confusion on agency roles in managing water resources. The enclosed Administrative Order No. 120 defines the relative responsibilities of the Departments of Natural Resources (DNR) and Environmental Conservation with respect to carrying out the Alaska Groundwater Protection Strategy. It could well serve as a model for clarifying other water-related programs where the management lines may not be clearly delineated, such as has been outlined in DNR's response to you.

I believe the multitude of water-related programs throughout State government could be better coordinated to solve the State's water use and quality problems. Uncoordinated water monitoring programs, confusion over which agency is the lead on a particular issue, and a failure to develop a reliable and accessible interagency water database are examples of issues that sometimes constrain our ability to effectively solve problems.

Some information that you requested is not available and will logically be work products generated by the participants after the Water Summit meeting. For example, a listing of various agency programs that need better coordination and efficiency will be developed after each agency gives an overview of their current water related programs and opportunities for coordination are discussed. Similarly, identification of both particularly well-run programs and any existing problems is expected to be a product of the meeting. Concerning a list of participants, the memorandum announcing the Water Summit was mailed to the commissioners of the Departments of Fish and Game, Commerce and Economic Development, Community and Regional Affairs, Transportation and Public Facilities, to the Division of Governmental

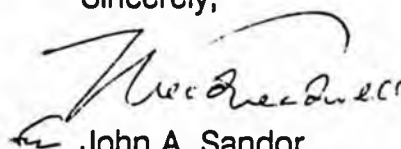
January 29, 1992

Coordination, and to the Department of Military and Veterans Affairs with the understanding that they would decide which staff should attend from their respective agencies. The meeting is open to the public.

In addition to the above-referenced Administrative Order, I have also enclosed copies of what correspondence we have in our files on the Water Summit.

Thank you for your inquiry. I look forward to a productive meeting on January 30.

Sincerely,



John A. Sandor
Commissioner

DR/JA/JS/bkt (EQ-Commis\Davidson.ltr)

Enclosures

cc/enc: House Resources Committee
The Honorable Kay Brown, House of Representatives
The Honorable Mark Boyer, House of Representatives
The Honorable Jim Duncan, Alaska State Senate
Harold C. Heinze, Commissioner
Department of Natural Resources
Janice Adair, Special Assistant
Commissioner's Office/ADEC

STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

ADMINISTRATIVE ORDER NO. 120

Under the authority of Article III, Sections 1, 16 and 24, of the Alaska Constitution, AS 41.08.017(a), AS 44.17.060 and AS 44.19.145(c), I hereby (1) describe the need for all Alaskans to protect the state's groundwater resource consistent with the "Alaska Groundwater Quality Protection Strategy" and (2) assign the responsibilities for implementing that strategy to the Department of Environmental Conservation (DEC) and the Department of Natural Resources (DNR) in investigating, managing and protecting this resource.

Section 1. Findings. Groundwater is an important resource that is vulnerable to contamination. Alaska must implement, with a prevention-oriented approach, improvements in existing government industry, and public efforts to protect this valuable resource. DEC, in cooperation with the public, industry, local governments, and state and federal agencies, developed the "Alaska Groundwater Quality Protection Strategy" to guide improvements in managing and protecting our groundwater. The Strategy is based on the following facts:

- (a) protection of groundwater is essential for the health, welfare, and economic prosperity of all Alaskans;
- (b) groundwater is used by many Alaskans for their source of drinking water;
- (c) groundwater is widely used for industrial water supply and fish processing;
- (d) groundwater provides water to streams, lakes, marshes, and intertidal areas important for sustaining fish and wildlife;
- (e) prevention of groundwater pollution is more economical and easier than detection and cleanup;
- (f) Alaskans are finding more and more of their groundwater resource polluted, and

(g) all Alaskans share a responsibility for protection of our groundwater resource.

Section 2. Responsibilities. DEC and DNR are the primary state agencies responsible for the identification, management and protection of Alaska's groundwater resource. DEC's responsibilities are:

- (a) to prevent and abate pollution of the state's groundwater resource;
- (b) to systematically identify, investigate, and quantify potential sources of soil and groundwater pollution;
- (c) to oversee the investigation and cleanup of sites with soil or groundwater pollution;
- (d) to coordinate management of data related to regulatory responsibilities for protection of public health and the environment; and
- (e) to work with local governments, state and federal agencies, and the public to improve groundwater protection activities.

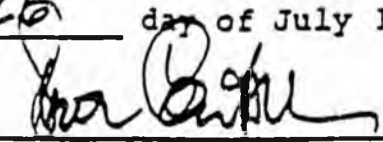
DNR's responsibilities are:

- (a) to collect, record, evaluate, and distribute data on the quantity, quality, location, and use of groundwater;
- (b) to periodically publish data related to the quantity or quality of groundwater of the state;
- (c) to systematically identify, investigate, and quantify the quantity and quality of the state's groundwater resource;
- (d) to coordinate management of data related to geologic and hydrologic characteristics of aquifers;
- (e) to work with local governments to improve the knowledge and understanding of the groundwater resource in their area;
- (f) to adjudicate and grant water rights for the use of groundwater; and
- (g) to establish policy related to groundwater use and management.

Section 3. Interagency Cooperation. DEC and DNR, where there is a joint concern, shall initiate cooperative efforts or studies to provide information for aquifer protection, planning and management. DNR shall collect and be the lead agency in investigating aquifer and groundwater characteristics and in managing the use of groundwater. DEC shall be the lead agency in investigating actual or potential sources of groundwater contamination. Both agencies shall coordinate with other state and federal agencies, local governments, industry, and the public to enhance protection and management of Alaska's groundwater resource.

This order takes effect immediately.

Dated at Juneau, Alaska, this 20 day of July 1990.



Steve Cowper
Governor

WALTER J. HICKEL, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER

400 WILLOUGHBY AVENUE
SUITE 400
JUNEAU, ALASKA 99801
PHONE: (907) 465-3400

January 27, 1992

Representative Cliff Davidson
Chairman
House Resources Committee

RECEIVED

JAN 28 1992

A.D.E.C.
COMMISSIONER'S OFFICE

Dear Mr. Chairman:

In response to your letter which we received January 23, 1992, containing questions regarding the Water Summit Meeting scheduled for January 30, 1992, we have prepared the following responses:

1. The purpose of the summit is to begin an open and constructive dialog on water resource management by bringing together the many State agencies that have various levels of water management responsibilities and reviewing just what each is doing. Additionally we are attempting to move forward with efforts in water program coordination to ensure that we are not duplicating the expenditure of public funds in various water management activities. The intentions of this meeting are to eventually formalize this discussion on water program coordination, including Federal agencies, to ensure the highest quality of service at the most responsible cost. We have suggested, for example, the creation of a Water Management Council made up of the various program managers. As indicated to your staff previously, this recommendation is in response to concerns raised by the State Water Management Board and the late Frank Trelease who wrote the State Water Act and subsequently reviewed its implementation.
2. The use of terms such as "state water programs" and "water policies" are used in a very broad and general sense. We have enclosed a DRAFT illustration of the many water program activities within state government that will give you some sense of the scope of these concepts.
3. One of the purposes of this joint meeting is to explore the problems that each of the agencies has identified. Some examples are as follows:

One of the fundamental responsibilities of the Division of Water is the collection, storage, management, presentation and distribution of water data. This includes both surface and ground water as well as coastal waters. Most of the groundwater data collected, which is essential to our developing a clearer understanding of state groundwater resources, comes from water well logs provided by water well drilling companies. State law, for some years, has required all water well drillers to provide a copy of their water well log to the state. However, there is

no enforcement provision in the law and many of the companies drilling water wells do not comply. This is further complicated by the fact that Alaska does not require a specific license to drill a water well. Consequently, the option to revoke a license due to a failure to comply with this statutory requirement is not available. Additionally, ADEC collects well log data for all public and subdivision water supplies as they review and approve permits for the systems necessary to deliver this water. Except for the Kenai Peninsula, these well log data are filed manually by ADEC, and they are not in a form that can be easily transferred to the DOW for entry into the state water resource data base. We believe that with a little coordination and possible statutory clarifications, the amount of well log data now available to the state can dramatically be increased and made much more useful. Please understand that in all areas of the state this information provides critical data essential to the understanding of current and future groundwater problems. This is also the most cost effective mechanism to collect such data.

Another concern is that ADEC permits public drinking water systems without DOW ever receiving a permit application for that water. We have found in test surveys in the Mat-Su area, for example, that a number of persons who thought they had a "water permit" only had a DEC permit for the "system" but no permit for the "water". This is not only confusing to the citizens of Alaska but also a violation of state statute. Thus, we believe that this meeting will help begin a level of coordination between ADEC and DOW to ensure that public drinking water system permits are not issued by DEC until the water is legally available.

DEC certifies EPA NPDES permits without checking with DOW to see if the water user (seafood processor, miner or others) has received a permit for the use of the water.

In the Village Safe Water program, DEC gives grants for the construction of water and waste water systems yet there are many DEC funded systems in the state that do not have a state permitted water right as required by law.

The ADF&G (Title 16) permits have authorized structures in a stream such as dams, water intakes, or discharge pipes without the applicant having rights to the water. Again this is a function of program coordination and regulatory consistency.

DCRA also awards water and waste water grants, however the DOW is never notified of such grants or applications. The result is state funds being expended when it is possible that sufficient water appropriations are not available. Program coordination not only increases compliance of statutes, but also cuts down on red tape and the public perception that one hand of government is unaware of what the other is doing.

Consistent with law, any action by a state agency that could result in an appropriation of water should trigger notification of DOW, and no permit for a water related structure or activity that would result in an appropriation should be issued without the water permit having been approved.

Additional coordination is necessary between Dam Safety and Construction and the state and local emergency services program. In the event of a dam failure or potential dam failure, notification and evacuation will be carried out under the direction of either the local or state emergency services agency. In order to provide adequate protection to lives and property, additional coordination with these agencies is essential. In order to illustrate this problem we have requested that during the next state/federal joint earthquake or natural disaster exercise that a number of dams fail.

There are a large number of smaller dams that are not regulated by the Dam Safety and Construction Section of DOW. This is because they are not jurisdictional under AS 46.17. These dams need to be inspected to ensure proper operation and maintenance to protect the capital investment in the dams if for no other reason. If the dams were to fail, it is likely the owners would seek state funding for replacement of the structures. This would involve voluntary cooperation between the dam owners, municipalities, DOW and state agencies.

To get "hands on" training, the State Dam Safety Engineer needs further coordination with the Alaska Energy Authority and the Federal Energy Regulatory Commission. Larger dams in the state are generally operated by AEA and regulated by FERC and therefore are exempt from regulation by DNR. Allowing DNR personnel to be involved in the inspection of these dams would provide valuable, cost effective training for the State Dam Safety Engineer.

One of the sections in DOW is Hydrological Survey. We have discovered, after calls from other agencies advising that they have hydrologists and wanted to know what to do with them, that there are at least three other agencies with hydrologists on staff. Hydrology is a scientific discipline and one that requires constant and continuing education/training. It also requires that a certain "critical mass" of hydrologists, with different academic credentials and theoretical perspectives, be of enough number and in an environment that allows them to interact on consultations and project reviews to ensure that the different scientific perspectives are considered. We have thus suggested that all hydrologists in the employ of the state be located in the Hydrological Survey Section and that if an agency requires the services of a hydrologist that they contract with the private sector or with DOW for those services.

ADF&G, DOT/PF and AEA, for example, collect water resource data through private contracts and by internal staff. At present there is no program or mechanism for data coordination that ensures this water resource data is transferred to the DOW and assimilated with the State Water Resource Data Base. Recent discussions with the US Geological Survey and the US Soil Conservation Service indicate that with

a coordinated state agency water data collection, storage, and management program in cooperation with these federal agencies, we could significantly increase available water data as well as dramatically reduce redundancies in gathering, storage and use.

At a recent meeting of the Interagency Hydrology Committee (IHC), it recognized the inadequate water data base for Alaska as well as the lack of an overall and coordinated state and federal plan for data collection, storage and distribution. The IHC is now proposing that USGS (for federal agencies) and DOW (for state agencies) respectively coordinate all water data collection projects within Alaska.

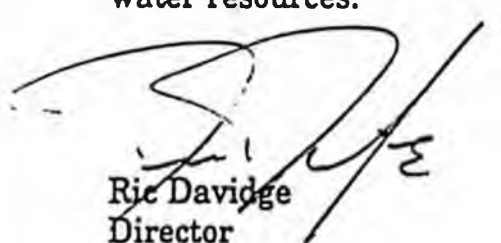
There are many other examples in water conservation, water education, instream flow coordination and prioritization with ADF&G, coordination of field activities, title navigability reviews, and so forth.

4. We have attached the proposed Water Management Policy/Regulations now under final review in the Attorney General's office. We have also attached the Administrative Order referenced.

5. ADEC has prepared the invitation list with the consultation of DNR. The DNR and DOW will have the following in attendance:

Commissioner Harold Heinze
Director Ric Davidge
Water Management Section Chief Gary Prokosch
Water Policy and Special Projects Section Chief David Orr
Hydrological Survey Section Chief Dr. Bill Long

We are pleased to hear of your interest in participating in our efforts to identify areas which could be improved for the responsible management of state water resources.



Ric Davidge
Director

CC: Heinze
Sandor

MEMORANDUM

STATE OF ALASKA

Department of Environmental Conservation

TO: Harold Heinze, Commissioner
Department of Natural Resources

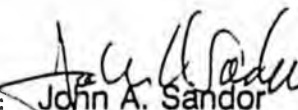
DATE: December 27, 1991

FILE NO:

THRU:

TELEPHONE NO: 465-5050, Fax 465-5070

FROM:


John A. Sandor
Commissioner

SUBJECT: Consolidation of Water Boards

I have received the proposal to merge the Water and Wastewater Works Advisory Board and the Water Resources Board. While I believe this suggestion has merit, I think it should be discussed in the context of overall water management. If the Boards are combined, I would like to see more specific duties described in the charter.

You will recall my November 18 memorandum to you (copy attached). I recommended that our departments and other interested parties meet to discuss state water policies. We are in the process of scheduling this meeting for sometime in January as people's schedules permit. Let's discuss this issue along with the proposed agenda for this meeting.

I look forward to some significant activities in improving Alaska's water protection and management programs.

JA/JAS/vr (CO-comm\davidge.brd)

Attachment: November 18 memorandum to Harold Heinze

cc w/attachment: Mead Treadwell, Deputy Commissioner, DEC
Janice Adair, Special Assistant/CO, DEC
Ric Davidge, Director, Division of Water/DNR
Deena Henkins, Water Wastewater Treatment/EQ, DEC

STATE OF ALASKA

WALTER J. HICKEL, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

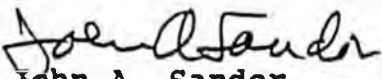
OFFICE OF THE COMMISSIONER
P.O. BOX 0, JUNEAU, ALASKA 99811-1800

Fax: (907) 465-2617
Phone: (907) 465-2600

November 18, 1991

MEMORANDUM

TO: Harold C. Heinze
Commissioner
Department of Natural Resources

FROM: 
John A. Sandor
Commissioner

SUBJECT: Alaska's Water Policies, Regulations and Management

The Department of Environmental Conservation (DEC) staff has reviewed the September 27, 1991 Draft of the State of Alaska Water Policy and had no suggestions for modification of these statements.

I believe the policy statement is excellent, but would like to suggest that the existing processes by which the Federal government, State agencies and local communities regulate and manage the water resources of Alaska should be carefully reviewed and redefined. It is my observation that Federal, State and local government policies, objectives and practices are not effectively integrated (or coordinated); and are sometimes in conflict. These deficiencies are a barrier to the achievement of our water management and related objectives.

As you know, the DEC is engaged in many activities related to water resource protection. We are developing new regulations as mandated by the Safe Drinking Water Act and we are working with the urban and rural communities of the state in the development of public water/waste water systems. I believe our existing water quality regulations and their application to the waters of our State should be revised.

I would like to suggest that our Departments, with participation by ADF&G, EPA, local governments and professional water/waste-water organizations explore the opportunities for reforming and improving the way in which we regulate and manage our water resources. I am convinced that substantial improvements can be made in the organization and administration of these activities.

I believe it would be worthwhile for key members of our staffs to meet with us within the next several weeks to lay out an action plan that will achieve these objectives.

MEMORANDUM
DEPARTMENT OF NATURAL RESOURCES

STATE OF ALASKA
DIVISION

TO: John Sandor, Commissioner
Dept. of Environmental Conservation

DATE: December 2,

THRU: Harold Heinze, Commissioner
Dept. of Natural Resources

FILE NO:

TELEPHONE NO.: 762-2572

FROM: Ric Davidge
Director

SUBJECT: Consolidation of Water Boards

RECEIVED
DEC 05 1991

ADEC
COMMISSIONER'S OFFICE

Attached are fact sheets concerning the Water and Wastewater Works Advisory Board and the Water Resources Board. Although the two boards may have significantly different stated missions, I believe they have similar functional missions and interests and should therefore be combined.

By combining the two boards into one, the goal of statewide water management would be enhanced. In addition, the state could save money, eliminate duplication of effort, conserve personnel costs related to staff support of the boards, and still have a board reflective of the interests of DNR and DEC...perhaps even more so.

Recommendations:

1. Combine the Water and Wastewater Works Advisory Board and the Water Resources Board into a new Water Resources Management Board. Savings in administrative costs would be significant.

2. The new board would consist of six members plus a chairperson. Savings of eight people and associated per diem costs, and a reduction in state employee, postage, and supplies support costs.

3. DNR supports the Water Resources Board on approximately \$10,000 annually. I do not know how much your department spends on the Water and Wastewater Works Advisory Board. Perhaps our two departments could jointly spend approximately \$15,000 so that the new board is more effective than the combined efforts of the two existing boards.

A. Increase length of meetings from two to three days.

B. Additional funding will allow the board to meet in communities around the state other than just Anchorage or Juneau which has been the norm for the Water Resources Board. In the past, per diem and travel costs have prevented that board from meeting in communities which are more expensive to travel to or stay in.

4. A revision to Article 3 of AS 46.15, the Water Use Act, which established the Alaska Water Resources Board, may have to be accomplished, and we can do the same if there is a similar technicality concerning the Water and Wastewater Works Advisory Board. We will check with the AG's office before proceeding beyond your concurrence.

If you concur with these recommendations, I will proceed with advising Don Tanner, Director, Boards and Commissions.

CONCUR:

Harold C. Heinze
Commissioner

Date

John A. Sandor
Commissioner

Date

BOARD: WATER AND WASTEWATER WORKS ADVISORY BOARD

BOARD NUMBER: 105

TITLE: Water and Wastewater Works Advisory Board

DEPT: Department of Environmental Conservation

AUTHORITY: AS 46.30.020

STATUS: ACTIVE

REQUIREMENTS:

PROHIBITIONS:

TERM: 5 years

DESCRIPTION: 8 members appointed by Governor; serve at the pleasure of Governor, plus the Commissioner of the Dept. of Environmental Conservation.

SPECIAL FACTS:

FUNCTION: Advises and assists departmental preparation of certification exam; develops regulations governing water and wastewater operator certification; system classification; also serves as a semi-final authority in settling disputes between operators and the department.

COMPENSATION: Standard travel/per diem.

MEETINGS: 1-2 times per year; 4-5 days maximum.

*FOR FURTHER INFORMATION CONTACT: Certification and Training Engineer, Division of Facilities Construction and Operation, Dept. of Environmental Conservation, Box O, Juneau, AK 99811
PHONE: 465-2673

MEMORANDUM

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RESOURCES

ENCLOSURE 2
2.4.5
OFFICE OF
MANAGEMENT & SUPPORT
State of Alaska

SEP 5 1991

TO: Harold Heinze
Commissioner

DATE: August GOVERNMENTAL
COORDINATION

FILE NO:

TELEPHONE NO.: 762-2145

FROM: Ric Davidge
Director

SUBJECT: Consolidation of
Water Related
Programs

As we have discussed the consolidation of water related programs into the new Division of Water would realize significant government wide cost savings, increase program efficiencies, provide one stop shopping for water related permitting and activities, allow better public understanding of State water management and generally be consistent with what other states have done or would like to do.

Upon my arrival I reviewed a number of studies and discussion papers on the way the State of Alaska should organize and manage water related activities. The consistent theme of these reviews, some of which go back 12 years, is that by consolidating water programs the coordination necessary in government to meet the expectations of service and cost efficiency can be better realized by water program consolidation.

At present six State departments have water responsibilities. These include DNR which is mainly focused on water policy, quantity management, water appropriations, water resource research necessary to support ownership and allocations (Fed, State and private), dam and diversion safety and State ownership of submerged lands.

The other water programs located in DEC, ADF&G, CRA, DOT/FF, CED and the Alaska Energy Authority include:

- Erosion Control
- Flooding
- Transportation System Crossings (roads/rail)
- Stream Restoration
- Stream Reclamation
- Subdivision Review
- Hydrologic Management & Multiple Uses
- Village Safe Water
- Title 16 Permitting
- Wetlands
- Water Labs (now two - one in Juneau and one in Fbks)
- Waste Water
- Drinking Water

The old political argument that you need checks and balances in government is not consistent with the original intent of checks and balances which was between the Exec, Judicial and Leg branches not within the Exec branch. Now, someone involved in a water related program spends a great deal of time and money working with

three or four different agencies in order to accomplish a single project. This inefficiency also cost the State of Alaska a great deal of time and money.

The other old political argument that DNR as the "development" agency can not properly manage "regulatory" programs because of some philosophical incompatibility. This is uninformed. The legal standards of performance required of programs now in DEC, for example, do not change if the program is managed by DNR. Compliance requirements are not "relaxed" based on where the program is located, they are driven by law.

One of the things I have heard since arriving is that many involved in regulating the use of resources do not have a good understanding of what that resource is or how it is used. By consolidating water related programs under one Division, the collegial integration that occurs allows for very effective cross training that will lead to increasing the effectiveness of field efforts while decreasing manpower and other cost requirements.

As a three year goal I would like to secure your support and that of OMS and the Governor to complete a government wide consolidation of water programs. This effort will start with a preliminary study of dollars and personnel savings that can be realized with such a consolidation. My target for implementation would begin in the later part of FY93 and completed by FY94. The models used will be based on existing and proposed water organizations in other States. The Western States Water Council has offered to be of assistance already at no cost.

I recognize that this effort has some political problems, but put in the context of better government and lower cost - and given the concerns of many water user constituencies in the face of budget reductions I believe it can sell and be implemented.

I have inclosed a copy of a proposed program organization with program areas outlined under the various sections. Please review this concept as you consider your decision.

MEMORANDUM

State of Alaska

DEPARTMENT OF FISH AND GAME

TO: Harold Heinze
Commissioner
Department of Natural
Resources

DATE: November 15, 1991

FILE NO.:

TELEPHONE NO.: 465-4100

SUBJECT: State Water Policy

FROM: Carl L. Rosier
Commissioner
Department of Fish and Game

As requested in your enclosed October 24 memorandum, we have reviewed your September 27 proposal for a state water policy.

I assume from your reference to a state water policy, your partial reference to statutory authorities of agencies other than DNR, and the enclosed August memorandum by your director of Water Resources, that your intent is indeed for the draft document to reflect the policies of all state agencies with water related authorities. In accordance with past practices, it is essential that a state policy be finalized with the concurrence of all appropriate departments..

Before getting into specific details of your September 27 proposal, it is important that the Resource Cabinet and the governor come to terms with the implicit assumption in your proposed draft that all water related statutory authorities and responsibilities of other agencies be shifted to DNR. I do not concur that all water conservation authority be vested in the Division of Water within DNR.

ADF&G is fully supportive of developing a state of Alaska water policy that incorporates water related authorities and responsibilities across department lines. My Department is also committed to providing a streamlined regulatory process consistent with our statutory responsibilities and authorities.

The degree and extent to which the management of renewable and nonrenewable natural resources features in the affairs of Alaska is unparalleled in any other state in this country, and it is for good reason that those organizing state government following statehood chose to establish separate Departments of Fish and Game, Natural Resources, and Environmental Conservation. Contrary to the Division of Water Resources suggestion, it is the checks and balances between these departments that help to ensure that natural resource management decisions are made in the overall best interest of Alaskans. Those who advocate combining the basic statutory responsibilities of the three resource agencies under one department in the name of increased government efficiency invite a public perception that, first, there is significant duplication of effort between the departments and, second, that an effort is being made to manipulate the interdisciplinary process

by which agency decisions are derived. The reality is that, overall, resource agency authorities complement rather than duplicate one another.

I am prepared to discuss this important subject with you and other cabinet members. The following are (1) more specific comments regarding your September 27 proposal, and (2) a revision of your proposed policy which reflects our comments.

Preamble. For the policy to be statewide in scope, the preamble needs to reflect the statutory authorities and responsibilities of ADF&G and DEC that relate to water quality or aquatic habitat protection.

Item 2. Article VIII, Section 14 of the Alaska Constitution provides for the "free access to the navigable or public waters of the state . . . except that the legislature may by general law regulate and limit such access for other beneficial uses or public purposes." This constitutional language should be cited and reflected in the policy.

Item 6. The term, "judiciously," should be dropped because it implies that the state needs a policy to make an informed decision on whether to enforce water quality standards. Inasmuch as DEC is responsible by statute for implementing the state's water quality standards, that department's statutory authority for doing so needs to be cited. There are ample discretionary authorities available to DEC.

Item 7. The policy should be to meet minimum water quality standards and to strive for the highest attainable water quality rather than simply "good" water quality. Again, it is DEC which has the statutory responsibility to enforce water quality standards, and the insertion of "when feasible and prudent" into your proposed policy is inconsistent with DEC statutes.

Item 8. AS 38.04.065 requires DNR to "provide for meaningful participation in the planning process by affected local governments, state and federal agencies, adjacent landowners, and the general public." To say that the state shall "encourage" public participation does not adequately reflect this.

Item 11. The language, "to assure water quality standards are upheld," should be deleted. DNR does not have the statutory authority to accomplish this. Rather, the legislature, under AS 46.03.020, has charged DEC with the authority to ensure that state water quality standards are upheld.

Item 13. This item should be changed to read, "State agencies shall ensure that regulatory processes involving the state's water resources are efficient and that, to the extent feasible, regulatory or jurisdictional duplication among state agencies is avoided." This rewording removes the presumption that inefficiency and duplication exist and simply indicates agency responsibility to see that it does not.

In reality, there are a number of procedural mechanisms in place that are intended to ensure efficiency and to avoid duplication of effort, and these should be capitalized upon. One example is the tri-agency project review process for placer mining projects. That policy provides for one-stop permit application for miners as well as coordinated field assistance and enforcement actions by the three resource agencies. Another example consists of the regulatory procedures governing the multiagency reviews of projects within the coastal zone. The point is that we should continue to implement those process which are working well, fine-tune those in need of adjustment, and fix any that it can be demonstrated are inadequate.

In the area of water management per se, the basic statutory division of labor between the resource agencies is clear. DNR regulates water appropriations which include diversions; DEC regulates wastewater discharges; and ADF&G regulates uses in anadromous and resident streams, applies to DNR for instream flow reservations, and applies to DNR for water appropriations for activities or facilities such as fish hatcheries.

An area of state water management that we believe is in need of streamlining is DNR's water appropriation adjudication process. Many applicants wait years to obtain a decision on their water rights and there continues to be a backlog of appropriation applications.

In closing, a meaningful state policy needs to reflect the statutory water management responsibilities of other state agencies as well as DNR. As indicated above, we are prepared to continue working with you and other appropriate agencies toward this end.

Enclosures

cc: The Cabinet
Paul Rusanowski, Director, DGC

Water Policy
Draft Sept. 27, 1991
Page 3 of 3

13[*] State agencies shall ensure that regulatory processes involving the state's water resources are efficient and that, to the extent feasible, regulatory or jurisdictional duplication among state agencies is avoided. [REGULATORY PROCESSES CONCERNING THE STATE'S WATER RESOURCES SHALL BE STREAMLINED. TO THE EXTENT FEASIBLE AND PRUDENT, REGULATORY OR JURISDICTIONAL DUPLICATION AMONG STATE AGENCIES SHALL BE IDENTIFIED AND ELIMINATED.]

Supersedes drafts dated 9/19/91 and 9/24/91. All previous versions of the proposed water policy should be discarded.

NOVEMBER 12, 1991 ADF&G MARKUP
OF

STATE OF ALASKA WATER POLICY

DRAFT September 27, 1991

Supersedes drafts dated 9/19/91 and 9/24/91. All previous versions of the proposed water policy should be discarded.

It is the policy of the State of Alaska, [THROUGH ITS DIVISION OF WATER,] to efficiently manage and conserve its water resources for the maximum use and benefit of its citizens, consistency with the public's interest. In so doing, the state's goal is to maximize public benefits by improving the quality of life of its residents; conserving the natural environment; stimulating and encouraging economic development; and protecting life and property. To further this policy, the following principles will guide the management of Alaska's water resources..

- 1[*] The state is the conservator of the public's water resources.
- 2[*] Permit the broadest possible access to common use of state waters, consistent with the public's best interests (Constitution of Alaska, Article VIII, Section 3), and provide "free access to the navigable or public waters of the state . . . except that the legislature may, by general law regulate and limit such access for other beneficial uses or public purposes." (Constitution of Alaska, Article VIII, Section 4).
- 3[*] Whenever occurring in a natural state, all surface and ground water resources are reserved to the people for common use. Such use and priority for use is subject to prior appropriation rights; except for public water supply, an appropriation of water shall be limited to stated purposes and subject to preferences among beneficial uses, concurrent or otherwise, as prescribed by law; and subject to the general reservation of fish and wildlife (Constitution of Alaska, Article VIII, Sections 3 and 13) and (AS 46.15.030).
- 4[*] No person shall be involuntarily divested of his right to the use of waters, or improvements affecting that use, except for a superior beneficial use of public purpose and then only with just compensation and by operation of law (Constitution of Alaska, Article VIII, Section 16).
- 5[*] Water resources shall be managed to ensure that adequate supplies of water are reserved for public water supplies; the protection of fish and wildlife habitat, migration, and propagation; recreation and park purposes; navigation and transportation purposes; and sanitary and water quality purposes (AS 46.15.080 (b)).

- 6[*] State water quality standards shall be [JUDICIOUSLY] and uniformly enforced among all users (cite applicable DEC statutes).
- 7[*] [THE EXISTING QUALITY OF] W[ater] resources will be managed to meet [MAINTAINED, OR IMPROVED TO] minimum water quality standards and to strive for the highest attainable water quality [WHEN FEASIBLE AND PRUDENT,] so that current and future generations of Alaskans will have access to good quality water with which to meet their basic needs.
- 8[*] Water resources planning is integral to wise water management. The state shall ensure [ENCOURAGE] public participation in the planning and management of its water resources.
- 9[*] The state will encourage water conservation and public education in its management of water resources.
- 10[*] The Department of Natural Resources [DIVISION OF WATER] shall provide for the regulation, supervision, and periodic inspection of privately owned and state-owned dams, reservoirs, and appurtenant works in order to ensure that the design, construction, and removal of dams and reservoirs is consistent with the protection of life and property (AS 46.17.010).
- 11[*] The Department of Natural Resources [DIVISION OF WATER] shall work cooperatively with the public and other state, local, and federal agencies to administer water rights, to conduct navigability determinations, and to collect water resources data (cite applicable DNR statutes). The Department of Environmental Conservation shall ensure that [TO ASSURE] water quality standards are met [UPHELD] (cite applicable DEC statutes). The Department of Fish and Game shall ensure that fish and wildlife and aquatic habitats are protected (AS 16.05.840 and AS 16.05.870). All three agencies shall provide scientific and technical assistance as requested.
- 12[*] The Department of Natural Resources [DIVISION OF WATER] shall systematically collect, record, store, evaluate, and distribute water resources data to determine the quantity, [QUALITY,] location, and use of the state's water resources. Such activities are in the public interest and are necessary for the orderly domestic and industrial development of the state (AS 41.08.017). The Department of Environmental Conservation shall monitor the quality of the state's resources (cite applicable DEC statutes).

OCT 31 1991 ADF2G HABITAT DIVISION

ENCLOSURE 2

P. 4/6

MEMORANDUMDEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RESOURCESOFFICE OF
State of Alaska
MANAGEMENT SUPPORT

SEP 5 1991

TO: Harold Heinze
CommissionerDATE: August 1991
GOVERNMENTAL
COORDINATION

FILE NO:

RECEIVED TELEPHONE NO. 1 763-2145

FROM: Ric Davidge
Director

DEC 04 1991

A.D.E.C.
COMMISSIONER'S OFFICESUBJECT: Consolidation of
Water Related
Programs

As we have discussed the consolidation of water related programs into the new Division of Water would realize significant government wide cost savings, increase program efficiencies, provide one stop shopping for water related permitting and activities, allow better public understanding of state water management and generally be consistent with what other states have done or would like to do.

Upon my arrival I reviewed a number of studies and discussion papers on the way the State of Alaska should organize and manage water related activities. The consistent theme of these reviews, some of which go back 12 years, is that by consolidating water programs the coordination necessary in government to meet the expectations of service and cost efficiency can be better realized by water program consolidation.

At present six State departments have water responsibilities. These include DNR which is mainly focused on water policy, quantity management, water appropriations, water resource research necessary to support ownership and allocations (Fed, State and private), dam and diversion safety and State ownership of submerged lands.

The other water programs located in DEC, ADF&G, CMA, DOT/PP, CDP and the Alaska Energy Authority include:

- Erosion Control
- Flooding
- Transportation System Crossings (roads/rail)
- Stream Restoration
- Stream Reclamation
- Subdivision Review
- Hydrologic Management & Multiple Uses
- Village Safe Water
- Title 16 Permitting
- Wetlands
- Water Lake (now two - one in Tuxau and one in Fbks)
- Waste Water
- Drinking Water

The old political argument that you need checks and balances in government is not consistent with the original intent of checks and balances - the Exec. Judicial and Leg branches not

OCT 31 '91 11:37:41 PDF&G/HABITAT DIVISION

P.5/6

three or four different agencies in order to accomplish a single project. This inefficiency also cost the State of Alaska a great deal of time and money.

The other old political argument that DNR as the "development" agency can not properly manage "regulatory" programs because of some philosophical incompatibility. This is uninformed. The legal standards of performance required of programs now in DEC, for example, do not change if the program is managed by DNR. Compliance requirements are not "relaxed" based on where the program is located, they are driven by law.

One of the things I have heard since arriving is that many involved in regulating the use of resources do not have a good understanding of what that resource is or how it is used. By consolidating water related programs under one Division, the collegial integration that occurs allows for very effective cross training that will lead to increasing the effectiveness of field efforts while decreasing manpower and other cost requirements.

As a three year goal I would like to secure your support and that of CMG and the Governor to complete a government wide consolidation of water programs. This effort will start with a preliminary study of dollars and personnel savings that can be realized with such a consolidation. My target for implementation would begin in the later part of FY93 and completed by FY94. The models used will be based on existing and proposed water organizations in other states. The Western States Water Council has offered to be of assistance already at no cost.

I recognize that this effort has some political problems, but put in the context of better government and lower cost - and given the concerns of many water user constituencies in the face of budget reductions I believe it can sell and be implemented.

I have inclosed a copy of a proposed program organization with program areas outlined under the various sections. Please review this concept as you consider your decision.

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of pages 1

To	Don Kachurn	From	Murphy
Co.	FYE	Co.	
Dept.			

L, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

OFFICE OF THE COMMISSIONER

P.O. BOX 0, JUNEAU, ALASKA 99811-1800

Fax: (907) 465-2617

Phone: (907) 465-2600

November 18, 1991

MEMORANDUM

TO: Harold C. Heinze
Commissioner
Department of Natural Resources

FROM: *John A. Sandor*
John A. Sandor
Commissioner

SUBJECT: Alaska's Water Policies, Regulations and Management

The Department of Environmental Conservation (DEC) staff has reviewed the September 27, 1991 Draft of the State of Alaska Water Policy and had no suggestions for modification of these statements.

I believe the policy statement is excellent, but would like to suggest that the existing processes by which the Federal government, State agencies and local communities regulate and manage the water resources of Alaska should be carefully reviewed and redefined. It is my observation that Federal, State and local government policies, objectives and practices are not effectively integrated (or coordinated); and are sometimes in conflict. These deficiencies are a barrier to the achievement of our water management and related objectives.

As you know, the DEC is engaged in many activities related to water resource protection. We are developing new regulations as mandated by the Safe Drinking Water Act and we are working with the urban and rural communities of the state in the development of public water/waste water systems. I believe our existing water quality regulations and their application to the waters of our State should be revised.

I would like to suggest that our Departments, with participation by ADF&G, EPA, local governments and professional water/waste-water organizations explore the opportunities for reforming and improving the way in which we regulate and manage our water resources. I am convinced that substantial improvements can be made in the organization and administration of these activities.

I believe it would be worthwhile for key members of our staffs to meet with us within the next several weeks to lay out an action plan that will achieve these objectives.

Redburn

MEMORANDUM **STATE OF ALASKA**
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Office of the Commissioner

TO: Harold Heinze
Commissioner
Department of Natural Resources

DATE: November 26, 1991

FILE #:

THRU:

PHONE #: 465-2600

John A. Sandor
FROM: John A. Sandor
Commissioner

SUBJECT: Additional Comments on
Proposed Alaska Water
Policy

My November 18 memorandum to you inadvertently omitted staff comments on the Department of Natural Resources proposed Alaska Water Policy. Please include these with my earlier comments as part of the department's formal response to the proposed policy. Thank you.

DR/mf

RECEIVED
NOV 27 1991

DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

stuff **DRAFT**

MEMORANDUM STATE OF ALASKA

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
OFFICE OF THE COMMISSIONER

TO: Harold C. Heinze
Commissioner
Department of Natural Resources

DATE: November 22, 1991

FILE NO.:

FROM: John A. Sandor
Commissioner
Department of Environmental Conservation

PHONE NO.: 465-2600

SUBJECT: Draft State Water Use Policy

The Department of Environmental Conservation submits the attached comments on the Department of Natural Resource's draft State Water Policy. I commend the Department for its efforts to clarify water use policy within its jurisdiction. This is an important step. However, I believe the policy needs to clearly acknowledge the separate authorities and responsibilities of the Departments of Natural Resources and Environmental Conservation. Our proposed revisions suggest language to achieve this.

We have proposed retitling the policy as "State of Alaska Water Use and Management Policy" to reflect that the policy implements only the authorities of the Department of Natural Resources. We have added language to reflect DEC's authorities and responsibilities for protection of water quality, and have suggested minor editing. We also recommend that the Governor's Administrative Order No. 120 be used as a model to clarify the respective responsibilities. This order defines the separate authorities and responsibilities of DNR and DEC in implementation of the Alaska Groundwater Quality Protection Strategy.

Mike Menge, Director of the Division of Environmental Quality, will be meeting soon with members of the Division of Water to discuss the draft State Water Policy. After that meeting, we will be prepared to discuss the proposed policy at a Cabinet-level meeting.

Thank you.

CC: Mead Treadwell
Mike Menge

Attachment

stuff
DRAFT
CARD # _____ BY _____

STATE OF ALASKA

WATER USE AND MANAGEMENT POLICY

DEC Comments, 11-15-91

It is the policy of the State of Alaska, through the Department of Natural Resources, Division of Water, to efficiently manage and conserve ~~protect~~, its ~~the state's~~ water resources for the maximum use and benefit of its citizens, consistent with the public interest. In so doing, the state's goal is to maximize public benefits by improving the quality of life of its residents; conserving the natural environment; ~~maintaining and improving the quality of its waters~~; stimulating and encouraging economic development; and protecting life and property.

~~It is acknowledged that the Department of Environmental Conservation has separate authorities and responsibilities not covered under this policy. Specifically, the Department of Environmental Conservation, Division of Environmental Quality, is responsible for preventing and abating pollution of the state's waters and for maintaining and enforcing the Alaska Water Quality Standard.~~

~~The Department of Natural Resources, Division of Water, is responsible for managing use of the state's surface and groundwater resources.~~ To further this policy, the following principles will guide the management of ~~Division of Water in managing~~ Alaska's water resources.

- The state is ~~the conservator~~ both the manager and ~~protector~~ of the public's water resources.
- ~~The state will promote~~ Permit the broadest possible access to and common use of state waters, consistent with the public's best interests (Constitution of Alaska, Article VIII, Section 3).
- Whenever occurring in a natural state, all surface and ground water resources are reserved to the people for common use. Such use and priority for use is ~~are~~ subject to prior appropriation rights; except for public water supply, an appropriation of water shall be limited to stated purposes and subject to preferences among beneficial uses, concurrent or otherwise, as prescribed by law; and subject to the general reservation of water ~~for~~ fish and wildlife (Constitution of Alaska, Article VIII, Sections 3 and 13; and AS 46.15.030).
- No person shall be involuntarily divested of his ~~or her~~ right to the use of waters, or improvements affecting that such use, except for a superior beneficial use or public purpose and then only with just compensation and by operation of law (Constitution of Alaska, Article VIII, Section 16).
- Water resources shall be managed to ensure that adequate supplies of water are reserved for public water supplies; the protection of fish and wildlife habitat, migration, and propagation; recreation and park purposes; navigation and transportation purposes; and sanitary and water quality purposes (AS 46.15.080(b)).

- State water quality standards shall be judiciously and uniformly enforced among all users.
- The existing quality of water resources will be maintained, or improved to meet minimum water quality standards when feasible and prudent; ~~The Department of Natural Resources shall manage the state's land and water resources to maintain and attain the Alaska Water Quality Standards~~ so that current and future generations of Alaskans will have access to good quality water with which to meet their basic needs.
- Water resources planning is integral to wise water management. ~~The state shall conduct the necessary water resources planning to ensure wise use and management of its waters~~ The state shall encourage public participation in the planning and management of its water resources.
- The state will encourage water conservation and public education in its management of water resources.
- The Division of Water shall provide for the regulation, supervision, and periodic inspection of privately owned and state-owned dams, reservoirs, and appurtenant works in order to ensure that the design, construction, and removal of dams and reservoirs is consistent with the protection of life and property (AS 46.17.010).
- The Division of Water shall work cooperatively with the public and other state, local, and federal agencies to administer water rights, to conduct navigability determinations, to collect water resources data, to assure water quality standards are upheld, and to provide scientific and technical assistance as requested.
- The Division of Water shall systematically collect, record, store, evaluate, and distribute water resources data to determine the quantity, quality, location, and use of the state's water resources. ~~Such activities are in the public interest and are necessary for the orderly domestic and industrial development of the state (AS 41.08.017).~~ Such activities are in the public interest and are necessary for the orderly domestic and industrial development of the state (AS 41.08.017).
- Regulatory processes concerning ~~water~~ the state's water resources shall be streamlined. To the extent feasible and prudent, regulatory or jurisdictional duplication among state agencies shall be identified and eliminated.
- ~~The Department of Natural Resources shall manage the state's land and water resources to maintain and attain the Alaska Water Quality Standards~~

MEMORANDUM

State of Alaska

DEPARTMENT OF FISH AND GAME

TO: Harold Heinze
Commissioner
Department of Natural
Resources

DATE: November 15, 1991

FILE NO.:

TELEPHONE NO.: 465-4100

SUBJECT: State Water Policy

FROM: Carl L. Rosier
Commissioner
Department of Fish and Game

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Harold Heinze

- 2 -

November 15, 1991

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Harold Heinze

- 3 -

November 15, 1991

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Enclosures

cc: The Cabinet
Paul Rusanowski, Director, DGC

NOVEMBER 12, 1991 ADF&G MARKUP
OF

STATE OF ALASKA WATER POLICY

DRAFT September 27, 1991

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Water Policy
Draft Sept. 27, 1991
Page 2 of 3

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- 9[*] The state will encourage water conservation and public education in its management of water resources.
- 10[*] The Department of Natural Resources [DIVISION OF WATER] shall provide for the regulation, supervision, and periodic inspection of privately owned and state-owned dams, reservoirs, and appurtenant works in order to ensure that the design, construction, and removal of dams and reservoirs is consistent with the protection of life and property (AS 46.17.010).
- 11[*] The Department of Natural Resources [DIVISION OF WATER] shall work cooperatively with the public and other state, local, and federal agencies to administer water rights, to conduct navigability determinations, and to collect water resources data (cite applicable DNR statutes). The Department of Environmental Conservation shall ensure that [TO ASSURE] water quality standards are ~~not~~ [UPHELD] (cite applicable DEC statutes). The Department of Fish and Game shall ensure that fish and wildlife and aquatic habitats are protected (AS 16.05.840 and AS 16.05.870). All three agencies shall provide scientific and technical assistance as requested.
- 12[*] The Department of Natural Resources [DIVISION OF WATER] shall systematically collect, record, store, evaluate, and distribute water resources data to determine the quantity, [QUALITY,] location, and use of the state's water resources. Such activities are in the public interest and are necessary for the orderly domestic and industrial development of the state (AS 41.08.017). The Department of Environmental Conservation shall monitor the quality of the state's resources (cite applicable DEC statutes).

Water Policy
Draft Sept. 27, 1991
Page 3 of 3

11[*] State agencies shall ensure that regulatory processes involving the state's water resources are efficient and that, to the extent feasible, regulatory or jurisdictional duplication among state agencies is avoided. [REGULATORY PROCESSES CONCERNING THE STATE'S WATER RESOURCES SHALL BE STREAMLINED. TO THE EXTENT FEASIBLE AND PRUDENT, REGULATORY OR JURISDICTIONAL DUPLICATION AMONG STATE AGENCIES SHALL BE IDENTIFIED AND ELIMINATED.]

Supersedes drafts dated 9/19/91 and 9/24/91. All previous versions of the proposed water policy should be discarded.

MEMORANDUM

DEPARTMENT OF NATURAL RESOURCES

TO: The Cabinet and Director, DGC

State of Alaska

DATE: October 11, 1991

FILE NO:

TELEPHONE NO: 465-2400

FROM: Harold C. Heinze
Commissioner

SUBJECT: Draft Water Policy
Review

Attached is a draft of the state's water policy dated September 24, 1991. Please take the time to give this proposed policy your careful review and consideration. I would appreciate your written comments concerning this proposed water policy by Nov 15, 1991. If your department does not have any comments, please so indicate.

Written comments may be sent to me directly, or to the Division of Water.

10/23/91
RECEIVED
OCT 23 1991
COMMISSIONER

comments
→ to the water
division to Water
meetings next week
Thank you.

RECEIVED
OCT 30 1991
Department of
Environmental Conservation

STATE OF ALASKA WATER POLICY

DRAFT September 27, 1991

Supersedes drafts dated 9/19/91 and 9/24/91. All previous versions of this proposed water policy should be discarded.

It is the policy of the State of Alaska, through its Division of Water, to efficiently manage and conserve its water resources for the maximum use and benefit of its citizens, consistent with the public's interest. In so doing, the state's goal is to maximize public benefits by improving the quality of life of its residents; conserving the natural environment; stimulating and encouraging economic development; and protecting life and property. To further this policy, the following principles will guide the management of Alaska's water resources.

- * The state is the conservator of the public's water resources.
- * Permit the broadest possible access to and common use of state waters, consistent with the public's best interests (Constitution of Alaska, Article VIII, Section 3).
- * Whenever occurring in a natural state, all surface and ground water resources are reserved to the people for common use. Such use and priority for use is subject to prior appropriation rights; except for public water supply, an appropriation of water shall be limited to stated purposes and subject to preferences among beneficial uses, concurrent or otherwise, as prescribed by law; and subject to the general reservation of fish and wildlife (Constitution of Alaska, Article VIII, Sections 3 and 13) and (AS 46.15.030).
- * No person shall be involuntarily divested of his right to the use of waters, or improvements affecting that use, except for a superior beneficial use or public purpose and then only with just compensation and by operation of law (Constitution of Alaska, Article VIII, Section 16).
- * Water resources shall be managed to ensure that adequate supplies of water are reserved for public water supplies; the protection of fish and wildlife habitat, migration, and propagation; recreation and park purposes; navigation and transportation purposes; and sanitary and water quality purposes [AS 46.15.080(b)].
- * State water quality standards shall be judiciously and uniformly enforced among all users.
- * The existing quality of water resources will be maintained, or improved to minimum water quality standards when feasible and prudent, so that current and future generations of Alaskans will have access to good quality water with which to meet their basic needs.
- * Water resources planning is integral to wise water management. The state shall encourage public participation in the planning and management of its water resources.
- * The state will encourage water conservation and public education in its management of water resources.
- * The Division of Water shall provide for the regulation, supervision, and periodic inspection of privately owned and state-owned dams, reservoirs, and appurtenant works in order to ensure that the design, construction, and removal of dams and reservoirs is consistent with the protection of life and property (AS 46.17.010).

- The Division of Water shall work cooperatively with the public and other state, local, and federal agencies to administer water rights, to conduct navigability determinations, to collect water resources data, to assure water quality standards are upheld, and to provide scientific and technical assistance as requested.
- The Division of Water shall systematically collect, record, store, evaluate, and distribute water resources data to determine the quantity, quality, location, and use of the state's water resources. Such activities are in the public interest and are necessary for the orderly domestic and industrial development of the state (AS 41.08.017).
- Regulatory processes concerning the state's water resources shall be streamlined. To the extent feasible and prudent, regulatory or jurisdictional duplication among state agencies shall be identified and eliminated.

Supersedes drafts dated 9/19/91 and 9/24/91. All previous versions of this proposed water policy should be discarded.

OCT 31 1991 ADFG HABITAT DIVISION

ENCLOSURE 2

P. 4/6

MEMORANDUMDEPARTMENT OF NATURAL RESOURCES
~~NATURAL WATER RESOURCES~~OFFICE OF
State of Alaska

SEP 5 1991

TO: Harold Hainze
CommissionerDATE: August GOVERNMENTAL
COORDINATION

FILE NO:

TELEPHONE NO.: 762-2149

FROM: Ric Davidge
DirectorSUBJECT: Consolidation of
Water Related
Programs

As we have discussed the consolidation of water related programs into the new Division of Water would realize significant government wide cost savings, increase program efficiencies, provide one stop shopping for water related permitting and activities, allow better public understanding of state water management and generally be consistent with what other states have done or would like to do.

Upon my arrival I reviewed a number of studies and discussion papers on the way the state of Alaska should organize and manage water related activities. The consistent theme of these reviews, some of which go back 12 years, is that by consolidating water programs the coordination necessary in government to meet the expectations of service and cost efficiency can be better realized by water program consolidation.

At present six state departments have water responsibilities. These include DNR which is mainly focused on water policy, quantity management, water appropriations, water resource research necessary to support ownership and allocations (Fed, state and private), dam and diversion safety and state ownership of submerged lands.

The other water programs located in DEC, ADFG, CRA, DOT/PT, CIO and the Alaska Energy Authority include:

- Erosion Control
- Flooding
- Transportation System Crossings (roads/rail)
- Stream Restoration
- Stream Reclamation
- Subdivision Review
- Hydrologic Management & Multiple Uses
- Village Safe Water
- Title 16 Permitting
- Wetlands
- Water Labs (now two - one in Fairbanks and one in Paks)
- Waste Water
- Drinking Water

The old political argument that you need checks and balances in government is not consistent with the original intent of checks and balances in the Exec. Judicial and Leg branches not

OCT 31 '93 11:37:41 WDF&G/HABITAT DIVISION

P.5/6

three or four different agencies in order to accomplish a single project. This inefficiency also cost the State of Alaska a great deal of time and money.

The other old political argument that ONR as the "development" agency can not properly manage "regulatory" programs because of some philosophical incompatibility. This is uninformed. The legal standards of performance required of programs now in DEC, for example, do not change if the program is managed by ONR. Compliance requirements are not "relaxed" based on where the program is located, they are driven by law.

One of the things I have heard since arriving is that many involved in regulating the use of resources do not have a good understanding of what that resource is or how it is used. By consolidating water related programs under one Division, the collegial integration that occurs allows for very effective cross training that will lead to increasing the effectiveness of field efforts while decreasing manpower and other cost requirements.

|| [As a three year goal I would like to secure your support and that of CMS and the Governor to complete a government wide consolidation of water programs. This effort will start with a preliminary study of dollars and personnel savings that can be realized with such a consolidation. My target for implementation would begin in the later part of FY93 and completed by FY94. The models used will be based on existing and proposed water organizations in other states. The Western States Water Council has offered to be of assistance already at no cost.

I recognize that this effort has some political problems, but put in the context of better government and lower cost - and given the concerns of many water user constituencies in the face of budget reductions I believe it can sell and be implemented.

I have inclosed a copy of a proposed program organization with program areas outlined under the various sections. Please review this concept as you consider your decision.

- of 5

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of pages > 1

To: <i>Dorey Keshorn</i>	From: <i>Mertha</i>
Co. <i>F4I</i>	Co. <i>[redacted]</i>
Dept. <i>[redacted]</i>	

L. GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

OFFICE OF THE COMMISSIONER
P.O. BOX 0, JUNEAU, ALASKA 99811-1800

Fax: (907) 465-2617
Phone: (907) 465-2600

November 18, 1991

MEMORANDUM

TO: Harold C. Heinze
Commissioner
Department of Natural Resources

John A. Sandor
FROM: John A. Sandor
Commissioner

SUBJECT: Alaska's Water Policies, Regulations and Management

The Department of Environmental Conservation (DEC) staff has reviewed the September 27, 1991 Draft of the State of Alaska Water Policy and had no suggestions for modification of these statements.

I believe the policy statement is excellent, but would like to suggest that the existing processes by which the Federal government, State agencies and local communities regulate and manage the water resources of Alaska should be carefully reviewed and redefined. It is my observation that Federal, State and local government policies, objectives and practices are not effectively integrated (or coordinated); and are sometimes in conflict. These deficiencies are a barrier to the achievement of our water management and related objectives.

As you know, the DEC is engaged in many activities related to water resource protection. We are developing new regulations as mandated by the Safe Drinking Water Act and we are working with the urban and rural communities of the state in the development of public water/waste water systems. I believe our existing water quality regulations and their application to the waters of our State should be revised.

I would like to suggest that our Departments, with participation by ADF&G, EPA, local governments and professional water/waste-water organizations explore the opportunities for reforming and improving the way in which we regulate and manage our water resources. I am convinced that substantial improvements can be made in the organization and administration of these activities.

I believe it would be worthwhile for key members of our staffs to meet with us within the next several weeks to lay out an action plan that will achieve these objectives.

Redburn

MEMORANDUM **STATE OF ALASKA**
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Office of the Commissioner

TO: Harold Heinze
Commissioner
Department of Natural Resources

DATE: November 26, 1991

FILE #:

THRU:

PHONE #: 465-2600

Handwritten: Fair
FROM: John A. Sandor
Commissioner

SUBJECT: Additional Comments on
Proposed Alaska Water
Policy

My November 18 memorandum to you inadvertently omitted staff comments on the Department of Natural Resources proposed Alaska Water Policy. Please include these with my earlier comments as part of the department's formal response to the proposed policy. Thank you.

DR/mf

[RECEIVED]
NOV 27 1991

DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

STATE OF ALASKA

WATER USE AND MANAGEMENT POLICY

DEC Comments, 11-15-91

It is the policy of the State of Alaska, through the Department of Natural Resources, Division of Water, to efficiently manage and conserve protect, its the state's water resources for the maximum use and benefit of its citizens, consistent with the public interest. In so doing, the state's goal is to maximize public benefits by improving the quality of life of its residents; conserving the natural environment; maintaining and improving the quality of its waters; stimulating and encouraging economic development; and protecting life and property.

~~It is acknowledged that the Department of Environmental Conservation has separate authorities and responsibilities not covered under this policy. Specifically, the Department of Environmental Conservation, Division of Environmental Quality, is responsible for preventing and abating pollution of the state's waters and for maintaining and enforcing the Alaska Water Quality Standards.~~

~~The Department of Natural Resources, Division of Water, is responsible for managing use of the state's surface and groundwater resources.~~ To further this policy, the following principles will guide the management of Division of Water in managing Alaska's water resources.

- The state is the conservator both the manager and protector of the public's water resources.
- ~~The state will promote~~ Permit the broadest possible access to and common use of state waters, consistent with the public's best interests (Constitution of Alaska, Article VIII, Section 3).
- Whenever occurring in a natural state, all surface and ground water resources are reserved to the people for common use. Such use and priority for use is are subject to prior appropriation rights; except for public water supply, an appropriation of water shall be limited to stated purposes and subject to preferences among beneficial uses, concurrent or otherwise, as prescribed by law; and subject to the general reservation of water for fish and wildlife (Constitution of Alaska, Article VIII, Sections 3 and 13; and AS 46.15.030).
- No person shall be involuntarily divested of his ~~other~~ right to the use of waters, or improvements affecting that such use, except for a superior beneficial use or public purpose and then only with just compensation and by operation of law (Constitution of Alaska, Article VIII, Section 16).
- Water resources shall be managed to ensure that adequate supplies of water are reserved for public water supplies; the protection of fish and wildlife habitat, migration, and propagation; recreation and park purposes; navigation and transportation purposes; and sanitary and water quality purposes (AS 46.15.080(b)).

- ~~State water quality standards shall be judiciously and uniformly enforced among all users.~~
- ~~The existing quality of water resources will be maintained, or improved to meet minimum water quality standards when feasible and prudent. The Department of Natural Resources shall manage the state's land and water resources to maintain and attain the Alaska Water Quality Standards so that current and future generations of Alaskans will have access to good quality water with which to meet their basic needs.~~
- ~~Water resources planning is integral to wise water management. The state shall conduct the necessary water resources planning to ensure wise use and management of its waters. The state shall encourage public participation in the planning and management of its water resources.~~
- ~~The state will encourage water conservation and public education in its management of water resources.~~
- ~~The Division of Water shall provide for the regulation, supervision, and periodic inspection of privately owned and state-owned dams, reservoirs, and appurtenant works in order to ensure that the design, construction, and removal of dams and reservoirs is consistent with the protection of life and property (AS 46.17.010).~~
- ~~The Division of Water shall work cooperatively with the public and other state, local, and federal agencies to administer water rights, to conduct navigability determinations, to collect water resources data, to assure water quality standards are upheld, and to provide scientific and technical assistance as requested.~~
- ~~The Division of Water shall systematically collect, record, store, evaluate, and distribute water resources data to determine the quantity, quality, location, and use of the state's water resources, and shall work cooperatively with the public and other state, local, and federal agencies in these activities. Such activities are in the public interest and are necessary for the orderly domestic and industrial development of the state (AS 41.08.017).~~
- ~~Regulatory processes concerning use of the state's water resources shall be streamlined. To the extent feasible and prudent, regulatory or jurisdictional duplication among state agencies shall be identified and eliminated.~~
- ~~The Department of Natural Resources shall undertake a cooperative effort to implement the Alaska Groundwater Protection Strategy as directed by the Governor's Administrative Order No. 120. Agency responsibilities for the protection of groundwater resources are itemized in the order. In general, the Department of Natural Resources shall be the lead agency in collecting groundwater data, investigating aquifer and groundwater characteristics, and managing the use of groundwater. The Department of Environmental Conservation shall be the lead agency in investigating actual or potential sources of groundwater contamination.~~

MEMORANDUM

State of Alaska

DEPARTMENT OF FISH AND GAME

TO: Harold Heinze
Commissioner
Department of Natural
Resources

DATE: November 15, 1991

FILE NO.:

TELEPHONE NO.: 465-4100

SUBJECT: State Water Policy

FROM: Carl L. Rosier
Commissioner
Department of Fish and Game

As requested in your enclosed October 24 memorandum, we have reviewed your September 27 proposal for a state water policy.

I assume from your reference to a state water policy, your partial reference to statutory authorities of agencies other than DNR, and the enclosed August memorandum by your director of Water Resources, that your intent is indeed for the draft document to reflect the policies of all state agencies with water related authorities. In accordance with past practices, it is essential that a state policy be finalized with the concurrence of all appropriate departments..

Before getting into specific details of your September 27 proposal, it is important that the Resource Cabinet and the governor come to terms with the implicit assumption in your proposed draft that all water related statutory authorities and responsibilities of other agencies be shifted to DNR. I do not concur that all water conservation authority be vested in the Division of Water within DNR.

ADF&G is fully supportive of developing a state of Alaska water policy that incorporates water related authorities and responsibilities across department lines. My Department is also committed to providing a streamlined regulatory process consistent with our statutory responsibilities and authorities.

The degree and extent to which the management of renewable and nonrenewable natural resources features in the affairs of Alaska is unparalleled in any other state in this country, and it is for good reason that those organizing state government following statehood chose to establish separate Departments of Fish and Game, Natural Resources, and Environmental Conservation. Contrary to the Division of Water Resources suggestion, it is the checks and balances between these departments that help to ensure that natural resource management decisions are made in the overall best interest of Alaskans. Those who advocate combining the basic statutory responsibilities of the three resource agencies under one department in the name of increased government efficiency invite a public perception that, first, there is significant duplication of effort between the departments and, second, that an effort is being made to manipulate the interdisciplinary process

Harold Heinze

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November 15, 1991

by which agency decisions are derived. The reality is that, overall, resource agency authorities complement rather than duplicate one another.

I am prepared to discuss this important subject with you and other cabinet members. The following are (1) more specific comments regarding your September 27 proposal, and (2) a revision of your proposed policy which reflects our comments.

Preamble. For the policy to be statewide in scope, the preamble needs to reflect the statutory authorities and responsibilities of ADF&G and DEC that relate to water quality or aquatic habitat protection.

Item 2. Article VIII, Section 14 of the Alaska Constitution provides for the "free access to the navigable or public waters of the state . . . except that the legislature may by general law regulate and limit such access for other beneficial uses or public purposes." This constitutional language should be cited and reflected in the policy.

Item 6. The term, "judiciously," should be dropped because it implies that the state needs a policy to make an informed decision on whether to enforce water quality standards. Inasmuch as DEC is responsible by statute for implementing the state's water quality standards, that department's statutory authority for doing so needs to be cited. There are ample discretionary authorities available to DEC.

Item 7. The policy should be to meet minimum water quality standards and to strive for the highest attainable water quality rather than simply "good" water quality. Again, it is DEC which has the statutory responsibility to enforce water quality standards, and the insertion of "when feasible and prudent" into your proposed policy is inconsistent with DEC statutes.

Item 8. AS 38.04.065 requires DNR to "provide for meaningful participation in the planning process by affected local governments, state and federal agencies, adjacent landowners, and the general public." To say that the state shall "encourage" public participation does not adequately reflect this.

Item 11. The language, "to assure water quality standards are upheld," should be deleted. DNR does not have the statutory authority to accomplish this. Rather, the legislature, under AS 46.03.020, has charged DEC with the authority to ensure that state water quality standards are upheld.

Harold Heinze

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November 15, 1991

Item 13. This item should be changed to read, "State agencies shall ensure that regulatory processes involving the state's water resources are efficient and that, to the extent feasible, regulatory or jurisdictional duplication among state agencies is avoided." This rewording removes the presumption that inefficiency and duplication exist and simply indicates agency responsibility to see that it does not.

In reality, there are a number of procedural mechanisms in place that are intended to ensure efficiency and to avoid duplication of effort, and these should be capitalized upon. One example is the tri-agency project review process for placer mining projects. That policy provides for one-stop permit application for miners as well as coordinated field assistance and enforcement actions by the three resource agencies. Another example consists of the regulatory procedures governing the multiagency reviews of projects within the coastal zone. The point is that we should continue to implement those process which are working well, fine-tune those in need of adjustment, and fix any that it can be demonstrated are inadequate.

In the area of water management per se, the basic statutory division of labor between the resource agencies is clear. DNR regulates water appropriations which include diversions; DEC regulates wastewater discharges; and ADF&G regulates uses in anadromous and resident streams, applies to DNR for instream flow reservations, and applies to DNR for water appropriations for activities or facilities such as fish hatcheries.

An area of state water management that we believe is in need of streamlining is DNR's water appropriation adjudication process. Many applicants wait years to obtain a decision on their water rights and there continues to be a backlog of appropriation applications.

In closing, a meaningful state policy needs to reflect the statutory water management responsibilities of other state agencies as well as DNR. As indicated above, we are prepared to continue working with you and other appropriate agencies toward this end.

Enclosures

cc: The Cabinet
Paul Rusanowski, Director, DGC

NOVEMBER 12, 1991 ADF&G MARKUP
OF

STATE OF ALASKA WATER POLICY

DRAFT September 27, 1991

Supersedes drafts dated 9/19/91 and 9/24/91. All previous versions of the proposed water policy should be discarded.

It is the policy of the State of Alaska, [THROUGH ITS DIVISION OF WATER,] to efficiently manage and conserve its water resources for the maximum use and benefit of its citizens, consistency with the public's interest. In so doing, the state's goal is to maximize public benefits by improving the quality of life of its residents; conserving the natural environment; stimulating and encouraging economic development; and protecting life and property. To further this policy, the following principles will guide the management of Alaska's water resources..

- 1[*] The state is the conservator of the public's water resources.
- 2[*] Permit the broadest possible access to common use of state waters, consistent with the public's best interests (Constitution of Alaska, Article VIII, Section 3), and provide "free access to the navigable or public waters of the state . . . except that the legislature may, by general law regulate and limit such access for other beneficial uses or public purposes." (Constitution of Alaska, Article VIII, Section 4).
- 3[*] Whenever occurring in a natural state, all surface and ground water resources are reserved to the people for common use. Such use and priority for use is subject to prior appropriation rights; except for public water supply, an appropriation of water shall be limited to stated purposes and subject to preferences among beneficial uses, concurrent or otherwise, as prescribed by law; and subject to the general reservation of fish and wildlife (Constitution of Alaska, Article VIII, Sections 3 and 13) and (AS 46.15.030).
- 4[*] No person shall be involuntarily divested of his right to the use of waters, or improvements affecting that use, except for a superior beneficial use of public purpose and then only with just compensation and by operation of law (Constitution of Alaska, Article VIII, Section 16).
- 5[*] Water resources shall be managed to ensure that adequate supplies of water are reserved for public water supplies; the protection of fish and wildlife habitat, migration, and propagation; recreation and park purposes; navigation and transportation purposes; and sanitary and water quality purposes (AS 46.15.080 (b)).

Water Policy
Draft Sept. 27, 1991
Page 2 of 3

- 6[*] State water quality standards shall be [JUDICIOUSLY] and uniformly enforced among all users (cite applicable DEC statutes).
- 7[*] [THE EXISTING QUALITY OF] W[w]ater resources will be managed to meet [MAINTAINED, OR IMPROVED TO] minimum water quality standards and to strive for the highest attainable water quality [WHEN FEASIBLE AND PRUDENT,] so that current and future generations of Alaskans will have access to good quality water with which to meet their basic needs.
- 8[*] Water resources planning is integral to wise water management. The state shall ensure [ENCOURAGE] public participation in the planning and management of its water resources.
- 9[*] The state will encourage water conservation and public education in its management of water resources.
- 10[*] The Department of Natural Resources [DIVISION OF WATER] shall provide for the regulation, supervision, and periodic inspection of privately owned and state-owned dams, reservoirs, and appurtenant works in order to ensure that the design, construction, and removal of dams and reservoirs is consistent with the protection of life and property (AS 46.17.010).
- 11[*] The Department of Natural Resources [DIVISION OF WATER] shall work cooperatively with the public and other state, local, and federal agencies to administer water rights, to conduct navigability determinations, and to collect water resources data (cite applicable DNR statutes). The Department of Environmental Conservation shall ensure that [TO ASSURE] water quality standards are met [UPHELD] (cite applicable DEC statutes). The Department of Fish and Game shall ensure that fish and wildlife and aquatic habitats are protected (AS 16.05.840 and AS 16.05.870). All three agencies shall provide scientific and technical assistance as requested.
- 12[*] The Department of Natural Resources [DIVISION OF WATER] shall systematically collect, record, store, evaluate, and distribute water resources data to determine the quantity, [QUALITY,] location, and use of the state's water resources. Such activities are in the public interest and are necessary for the orderly domestic and industrial development of the state (AS 41.08.017). The Department of Environmental Conservation shall monitor the quality of the state's resources (cite applicable DEC statutes).

Water Policy
Draft Sept. 27, 1991
Page 3 of 3

11[*] State agencies shall ensure that regulatory processes involving the state's water resources are efficient and that, to the extent feasible, regulatory or jurisdictional duplication among state agencies is avoided. [REGULATORY PROCESSES CONCERNING THE STATE'S WATER RESOURCES SHALL BE STREAMLINED. TO THE EXTENT FEASIBLE AND PRUDENT, REGULATORY OR JURISDICTIONAL DUPLICATION AMONG STATE AGENCIES SHALL BE IDENTIFIED AND ELIMINATED.]

Supersedes drafts dated 9/19/91 and 9/24/91. All previous versions of the proposed water policy should be discarded.

MEMORANDUM

State of Alaska
Department of Natural Resources - Division of Land and Water
Management

TO: Gary Gustafson
Director

DATE: March 7, 1991

TELEPHONE NO: 762-2680

SUBJECT: Selling Alaskan Water

FROM: Mary Lu Harle *MLH*
Water Resources Manager

You asked me to contact the Attorney General's Office concerning whether there are any constitutional problems with selling and exporting Alaska's water to other states. I contacted Mike Frank and we discussed the issue. He concluded, as I had, that a state would have to apply for and receive an appropriation to divert, use, and export water from Alaska in compliance with the Alaska Constitution, Article VIII, Section 13, and AS 46.15. This would be similar to the collection and exportation of glacial ice. The provisions of Sporhase v. Nebraska would apply. A short discussion of this case and its implications is attached, excerpted from the draft report on interregional water transfers being written by the Western States Water Council.

Mike and I also discussed collecting revenue from the sale of water. He concluded that a new statute rather than simply a new regulation would be needed to allow Alaska to charge for the use of water or to sell water as a resource commodity. Presently, AS 46.15.020(b)(4) allows DNR to prescribe fees or service charges for any public service rendered. Selling water as a commodity would go beyond this statute however thus a new statute addressing a user or sale charge would be needed.

cc: Mike Frank
Ron Swanson
Regional Water Officers

complex under current state water laws. Three areas of major importance in this regard are export statutes, public interest protection, and area-of-origin protection.

1. Export Statutes

Traditionally, western states were flexible relative to conveyance of water from its natural location to any other place of beneficial use, providing, however, the conveyance did not cross state lines. Out-of-state conveyance was often allowed, but carefully restricted. The restrictions varied from state to state. In some instances states enacted embargo statutes that strictly prohibited water export. The states assumed the power to require such restrictions on the theory that the waters of the state were owned by the state, or owned by the "public" and held by the state.

This assumption was challenged in a case involving a Nebraska statute that restricted out-of-state export of water to other states that reciprocally allowed import of water into Nebraska. In 1982, in Sporhase v. Nebraska ex rel. Douglas,¹⁰ the Supreme Court held that state water "ownership" as articulated under Nebraska law was a legal fiction, and that water is a commodity in

¹⁰ 458 U.S. 941 (1982).

interstate commerce.¹¹ Therefore, the Court analyzed the Nebraska statute¹² as one which discriminated against interstate commerce. The Court has required a statute regulating the interstate movement of an article in commerce to regulate evenhandedly and to be narrowly drawn to promote only permissible local interests.¹³ The Nebraska reciprocity statute failed the test and was struck down by the Supreme Court.¹³

Relying on Sporhase, a federal district court in New Mexico, struck down a New Mexico statute that placed an absolute embargo on out-of-state transfers of ground water.¹⁴ The court pointed out that ground water in New Mexico had been treated as a commodity for purposes of intrastate transfer and that New Mexico could not deny that status simply because a particular transfer was to an out-of-state municipality.

These important rulings changed the way interstate transfer of water was viewed in the West, but they did not portend the unfettered purchase and sale of water West-wide. Some restrictions are allowed. Also, the Supreme Court acknowledged in Sporhase that the nature of water resources required a somewhat different and

¹¹ Id. at 958.

¹² Pike v. Bruce Church, Inc., 397 U.S. 137 (1970).

¹³ Sporhase, 458 U.S. 941.

¹⁴ City of El Paso v. Reynolds, 563 F. Supp. 279 (D.N.M. 1983), later proceeding, 597 F. Supp. (D.N.M. 1984).

more careful commerce clause review than the traditional analysis.¹⁵ The Court said that protection of the public welfare and the conservation of water were legitimate bases for regulating the transfer of water rights. It also said that a demonstrably arid state should be able to assert a preference for its citizens in times of water shortage. Further, the Court suggested that if the state had a real plan for using its water resources, rather than simply a theoretical, anticipated future need, the state could exercise a limited preference for in-state use.

The states have responded in different ways to Sporhase. Some states did not amend their export statutes after Sporhase was handed down. In several instances, however, states changed their statutes to comply with the Sporhase decision. Nine states, Arizona, Arkansas, Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, and Wyoming, specifically allow out-of-state transfer of water under certain conditions. All have public welfare and conservation of water, among other things, as criteria that must be considered when out-of-state transfers are proposed. Five states have set up complicated administrative processes by which out-of-state transfers must be judged, or have required legislative approval of such transfers.

¹⁵ Sporhase, 458 U.S. at 956.

Kansas has enacted an unusual, but evenhanded, twist on the appropriation doctrine. Its statute says that if water is to be diverted and conveyed more than a certain distance from the point of diversion, regardless of whether the point of use is in or out of state, a complex administrative process must be followed.

There are still some states that prohibit the export of water or whose statutes contain a reciprocity provision similar to that in the statute found unconstitutional in Sporhase. Regardless of what a statute might currently say, the Sporhase standard is the standard by which statutes pertaining to interstate water transfers will be judged if legally challenged.

The recognition of water as an article of interstate commerce seems to provide a solid foundation for interregional water transfers. However, as previously noted, states can legitimately impose some instructions tied to conservation of water and protection of public welfare interests. The conservation requirements must be based upon a practical evaluation of the need by the state for the water. Although public welfare interests were not defined by the Supreme Court in Sporhase, they would presumably include at a minimum health and welfare interests and state concern for environmental quality.

Also, the Sporhase analysis does not apply to water diverted pursuant to a congressionally approved compact between two or more

he.

states. For example, under the Yellowstone River Compact unanimity of three signatory states is required before any out-of-basin transfer may be made. Without the benefit of a congressionally approved compact, application of this provision would likely violate commerce clause principles. However, in Intake Water Co. v. Yellowstone River Compact Comm'n,¹⁶ the Ninth Circuit Court of Appeals held that congressional approval of the compact immunized its provisions from constitutional challenge under the commerce clause. Similarly, Sporhase does not apply where there has been an equitable apportionment of a watercourse by the Supreme Court pursuant to its original jurisdiction.

In the future, states may choose to turn more to congressionally approved compacts with other states and equitable apportionments as means to avoid the impacts of the Sporhase decision. Alternately, states may rely on conservation and public welfare protection interests to seek greater control of their water resources.

Further, some observers believe, that in an appropriate factual setting, the Supreme Court might be convinced that the initial granting of an appropriative water right for use out-of-state is something different than the sale of a vested water right for use out-of-state. This is because the initial appropriation

¹⁶ 769 F.2d 568 (9th Cir. 1985), cert. denied, ___ U.S. ___ (1986).

of water is made under a permit issued by a state subject to whatever criteria that state imposes. It is not a market transaction like the sale of a vested water right, and the Sporhase analysis may not apply.

The Supreme Court in Sporhase hinted at another option whereby states can legitimately take greater control of their water resources by citing Reese v. State.¹⁷ This case involved the state acting as a market participant. The Supreme Court has carved out an exception to traditional commerce clause principles where states act as market participants, acquiring assets through the use of taxpayers money and distributing the wealth derived from ownership of those assets to state citizens. Although no cases have developed this doctrine with respect to water, important cases have been decided involving solid waste disposal.¹⁸ In all of those, the circuit courts of appeals have held that where a state has spent taxpayers money and developed infrastructure for a garbage dump, it has the right to refuse access to that dump to those hauling interstate garbage. Relying on the reasoning of those cases, New Mexico, with 100% state financing, built a reservoir and stores water in the reservoir that is appropriated in the name of the state. State officials opine that, regardless of Sporhase, such water is unavailable for out-of-state use unless New Mexico, in its

¹⁷ Sporhase, 458 U.S. at ____.

¹⁸ [DuMars article to be published]

unfettered discretion, chooses to allow the water to be used out-of-state.¹⁹

In summary, the principles upon which the appropriation doctrine is based imposes no special barriers to the interregional transfer of water. Traditionally, however, states acted to restrict the diversion of water for uses outside their borders. In 1982 the Supreme Court held in Sporhase that water is an article in interstate commerce and that commerce clause principles that protect the free flow of trade between states apply to statutes governing interstate water use. The Court, however, recognized some exceptions to the commerce clause analysis, and there are other limited circumstances under which a state may act to protect its interest in use of water within the state, as opposed to out-of-state use. In any event, proponents of interregional transfer projects must follow state law governing interstate water transfers, provided that such law is consistent with Sporhase and related cases.

2. Public Interest Criteria

In addition to amending export statutes, some states have recently acted to further public interest protection under state water law. Increasingly, state water laws regulating transfers

¹⁹ [DuMars speech at Symposium]

DEPARTMENT OF FISH AND GAME

July 21, 1987

333 RASPBERRY ROAD
ANCHORAGE, ALASKA 99516-1699
PHONE: (907) 254-0541

1.700.400.500 250

Ms. Mary Lu Harle
Alaska Department of Natural Resources
Water Management
Pouch 7-005
Anchorage, AK 99510

Dear Ms. Harle: *Mary Lu*

Re: Interstate Water Transfer

Per the attached article from "U.S. Water News," I am curious whether your agency has been in contact with the Alaska Congressional delegation and/or the Western States Water Council regarding interstate water transfers.

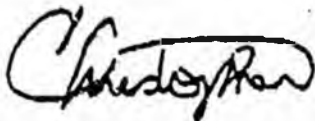
I do not know whether or how "demonstrated instate need" was defined by the U.S. Supreme Court decision in *Sporhase v. Nebraska*. However, I would suggest that it would be in the interest of the state of Alaska to determine whether federal legislation is required to insure that the definition of "a demonstrated instate need" (for water) encompasses instream flow reservations in addition to out of stream flow appropriations.

Because Alaska contains one third of the nation's freshwater, it is likely that any legislation that passes on this topic will affect us.

Also, please send me a copy of the *Sporhase* case if you have one.

Thanks.

Sincerely,



Christopher Estes
Statewide Instream Flow Coordinator,
Research and Technical Services
Division of Sport Fish
(907) 267-2142

Attachment

Water transfers are inevitable

By Loran Schmit

Nebraska State Senator

Commercial marketing of water represents one of the most emotionally charged resource management issues ever to face the citizens and elected officials of Nebraska. Many are concerned about possible damage to the environment; others fear that farmers and ranchers will be left literally high and dry; others simply claim such transfers are not economically or physically feasible.

While these concerns are legitimate, they should not combine to intimidate those of us in positions of responsibility from studying the issue in-depth, reviewing our options, and producing a medium- to long-range plan for the management of one of our most valued resources.

LB 146, which I introduced, was passed this year by the Nebraska Legislature to assess the current legal, environmental, and economic framework for water marketing, and

already be in surplus and, therefore, contribute even further to the depressed economy.

The LB 146 process will hopefully provide a sound decision-making framework from which sound policy can emanate. And if interstate transfers of water are inevitable, as I feel they are, every effort should be made to ensure such transfers are carried out in a manner that is environmentally sound, economically feasible, and equitable to all parties affected.

Senator Schmit, a Nebraska legislator for 14 years, is chairman of the Legislature's Committee on Natural Resources.



Agricultural water: Saleable commodity, valued future resource — or both?

Water is too valuable for the future to sell today

By Bryce Noldig
President

Nebraska Farm Bureau Federation

In 1949, my family took an extended vacation throughout the western United States. As we prepared to drive across the Mojave Desert, we stopped at a filling station to fill our water bag. We had to pay for that water. As a teenage Nebraska farm boy, I could hardly comprehend why anyone would either charge for or pay for water.

Now in 1987, we in Nebraska have seen legislation introduced to enable us as a state and as individuals to sell our water. Those who advocate this approach have argued this would be one way in which to improve the financial condition of some farmers. But should we be willing to sell our souls for 30 pieces of silver?

Nebraska Farm Bureau Federation has a long-standing policy to develop Nebraska's water resources to the greatest benefit for the citizens of the state. We have great reservations, however, about the concept of selling water, particularly to out-of-state purchasers, because of the possible long-term consequences this

concept presents not just to agriculture, but to all Nebraskans.

The idea of selling water has brought to the forefront a number of legal and social questions which need further research and documen-

Both surface water and groundwater are more valuable to us in the future than any price we could currently receive.

tation. Numerous factual and mythical perceptions of our water resources need to be resolved before Nebraska considers selling its water.

Looming over this entire debate is the traditional perception that there is an excess of water and that, if citizens don't use it, they'll lose it. The concern of our members however, is that, once we lose it or sell it, can we ever get it back if we need it? In other words, what may be considered as "excess" or "surplus" water today may be vital for agriculture and

economic development tomorrow. Reaction to the immediate is not always in our long-term best interest.

With the largest portion of the world-famous Ogallala Aquifer underlying the state of Nebraska, perhaps we should recognize that we really do hold this great natural resource in trust, not only for Nebraskans, but for all people.

We are firmly convinced that both surface water and groundwater are more valuable to use in the future than any price we could currently receive, especially for a state such as Nebraska, which needs to diversify its economy. If, as the proponents of the sale of water argue, Nebraska's water is needed elsewhere for industry, we invite industry to come to our state, establish their business here, and share in the growth.

Alfred, if you just make good sense to keep and use wisely one of life's most precious resources, rather than to simply turn it into nothing more than a commodity to be bought and sold. To do otherwise is shortsighted, if not downright irresponsible.

Bryce Noldig has been president of Nebraska Farm Bureau Federation for nearly 20 years.

Individual states are no longer free to prohibit the interstate transfer of water, absent a demonstrated in-state need.

to identify the various positions and roles the state of Nebraska could take to this area.

LB 146 faces much opposition, even though it does nothing more than provide for a study of the water marketing issue. Many people in Nebraska simply feel that it is our water, that we can do — or not do — with it as we see fit, and that therefore we should not even discuss the possibility of transferring water to other states. In my opinion, this is a very dangerous position to take, particularly in view of the 1982 United States Supreme Court decision in *Sporhase v. Nebraska*.

While many facets of the *Sporhase* decision remain unclear and will have to wait for further judicial elaboration, one message comes across distinctly: Individual states are no longer free to prohibit the interstate transfer of water, absent a demonstrated in-state need. Furthermore, if such a transfer were to take place, there is no provision currently in the law that would require the payment of compensation.

Viewed in this light, the LB 146 process may provide some protection from out-of-state transfers of water, particularly uncompensated transfers if Nebraska diligently assesses and documents its current and anticipated water needs.

Nebraska is fortunate in that it enjoys abundant supplies of high quality groundwater. The lion's share of this water is located in the Sandhills region of the state, which provides rapid recharge of the underlying aquifer but is only marginally suitable for crop production. If surplus water can be transferred to an area of shortage, then I am confident the courts, if not our own sense of equity, will not permit us to do otherwise.

The matter of compensation is secondary but significant. Nebraska farmers and ranchers, many of whom are suffering from severe financial hardships, should at least have the choice of following the diversion of a portion of the water located on their land in exchange for monetary compensation — or they can continue to use it to grow crops that may

Freshwater Perspective

Water plans can allow for present and future needs

The agricultural economics of the nation are shifting dramatically and, as the economic base of any industry shifts, so does its political clout. Nebraska has been grappling with this issue ever since realizing that its water supplies were more valuable than \$1.30-per-bushel corn and \$2-per-bushel wheat. As Nebraska Senator Loran Schmit has said, "... If the water we pour on crops is more valuable than the crop itself, then I believe the time has come to consider the possibility of making some money selling water."

Senator Schmit brings up a significant and sensitive point: How can states benefit from the changing economics of the West? The increasing need for water supplies by Western cities, along with their ability to pay top dollar for those supplies, is fostering the reallocation of water from agriculture to municipalities. Expanding urban areas may become the new bumper crop of the West.

There are, however, many people, particularly those in the agricultural community, who decry "selling Nebraska's future." Concern focuses on ramifications such as groundwater depletion, declining real estate values, reduced property tax income and the decline of many rural communities that could occur if farmers begin to sell their water rights.

These are important concerns that must be examined.

Yet Western water law, like Western economics, is changing. The Supreme Court case of *Sporhase v. Nebraska* states that water is an article of commerce and, as such, cannot be prohibited from being sent across state lines. The *El Paso v. Reynolds* case pending in district court could further encourage the in-

A thoughtful plan can accommodate both the present and the future, avoiding the need to make rigid 'either-or' decisions.

terstate transfer of water. This case, which involves the right of Texas to drill 326 wells just across the border in New Mexico to provide water for the people of El Paso, states that the need of El Paso's citizens for water takes precedence over New Mexico's ownership — a rather significant statement.

The caveat in the *El Paso* ruling is that El Paso's use of New Mexico water cannot threaten the health and welfare of New Mexico's citizens. New Mexico, therefore, is carefully

assessing and quantifying its future water requirements in order to protect those resources truly needed by the state.

One of the important byproducts of these court cases has been the development of long-range state water plans, which in the end may provide the only real means of protecting local water resources.

As states begin to assess and quantify their future water needs, they can build into these plans the flexibility needed to respond to current economic realities as well as future contingencies. A thoughtful plan can accommodate both the present and the future, avoiding the need to make rigid "either-or" decisions.

The true potential effect of water marketing on agriculture needs to be kept in perspective. Agriculture holds the rights to 85 percent of the water in the West, and a yield of only about 10 percent of that water would provide sufficient additional supplies into the 21st century.

The real question is not whether agriculture will survive water marketing — it will. Percentage-wise, urban needs are not large enough to threaten the agricultural economy as a whole. The critical question for the future of agriculture is how effectively and efficiently it uses the remaining 75 percent.

**WESTERN STATES WATER COUNCIL**

Creekview Plaza, Suite A-201/942 East 7145 South/Midvale, Utah 84047/(801) 561-5300 / FAX (801) 255-9642

February 21, 1992

Ms. Heather Bradner
Legislative Staff
Representative Cliff Davidson
State Capitol
Juneau, AK 99801

Dear Heather:

Tony Willardson of our staff has advised me of your request to join by conference call the joint meeting of the House Resources Committee and the Water Board. He has also indicated the areas that you would like to discuss with us, including our views with regard to proposed legislation regarding water use fees on water exports and establishing instream flows. While we are flattered by the request, the nature of our organization is such that we will not be able to offer an opinion regarding the merits of such proposed legislation. I, therefore, do not believe that we would be able to participate constructively in the discussion. However, I do want to enclose some information that in my opinion may be helpful to the meeting participants in comparing and evaluating these proposals.

Let me first explain the nature of our organization. The Western States Water Council was formed by the Western Governors' Conference in 1965. Our members are appointed by the governors and serve at the pleasure of the governors. As they are directly accountable to governors, we likewise are directly accountable to them. In your case, Rio Davidge is the lead representative from Alaska. The governor has also appointed Mike Menge, Director of the Division of Environmental Quality, as a Council member. A member of the Board has also been serving, although that spot is temporarily vacant.

A primary purpose of the Council is to provide a forum for the exchange of views and perspectives among the member states and to provide information regarding federal and state developments in order to assist member states in evaluating impacts of federal laws and programs and the effectiveness of state laws and policies. We also provide a collective voice for western states regarding matters pertaining to national policy. For example, we have been heavily involved with Alaska and other western state representatives in discussions regarding the reauthorization and amendment of the Clean Water Act and national wetlands policy. When there is a consensus among our member states, we believe we can provide an effective forum for expressing that consensus to Congress and the Administration.

However, while expressing positions with regard to proposed federal laws and policies, we have not attempted to render judgment with regard to proposed state laws and policies. Rather, we have provided a forum for exchange of information and have generated reports and studies that deal with issues of common concern to our member states. They are then in a position to better evaluate the merits of their own laws and policies and proposed changes and additions to those laws and policies.

Ms. Bradner
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For example, at Mr. Davidge's request, we helped facilitate the gathering of information regarding water use fees imposed by our member states, as well as how our various member states are organized to address water resource management. Mr. Davidge has copies of all the information that was gathered as a result of this effort, and I am sure he would be most pleased to share them with you. He also has a copy of a report prepared in the Oregon Governor's Office which attempts to summarize the use of water fees in the West.

With respect to the associated question of the imposition of water use fees on water exported out of the state, in light of the Supreme Court's decision in Sporhase, this was also a matter of considerable discussion within the Council. One of the work products that resulted is a law review article prepared by Norm Johnson, our Legal Counsel, and Charles DuMars, Professor of Law at the University of New Mexico and also a Council member. I am enclosing a copy of that portion of the article which discusses the Sporhase decision and how states have responded to that decision.

We have also spent considerable time examining instream flow protection in the West. We previously sent you a copy of the proceedings of a symposium which the Council sponsored on the subject.

In summary, we found that a considerable range exists within our member states regarding the extent and methods by which they protect instream flow values. For example, New Mexico contains no express provisions for instream flow protection, but instead relies on interstate compacts, international treaties, federal court decrees, and existing water rights, as well as geography and public land ownership patterns, to provide protection for instream values.

California recognizes the use of water for recreation and preservation and enhancement of fish and wildlife resources as a beneficial use of water. However, diversion or impoundment of water must be made to establish an appropriative right. So the state may grant a right to impound water for use downstream from the impoundment to enhance fish and wildlife habitat. Such a right may be issued to a public or private entity.

A state agency in Oregon and other states may protect instream flows under state public interest statutes by imposing terms and conditions to be included in appropriative rights to maintain bypass flows.

In Montana, a public entity may acquire a water reservation to secure the equivalent of a right for an instream flow. The law provides that reservations for the maintenance of minimum flow, level, or quality of water may make up to a maximum of 50% of the average annual flow of gauged streams. Laws in California, Oregon, and Washington also provide for reservation of water by a state agency, pursuant to a similar process.

Wyoming considers instream flow and storage of water for release to maintain instream flow to be beneficial uses under certain conditions, and has established a procedure for appropriating water for such uses. Utah has enacted a similar statute. It allows for acquisition of established water rights by the state to "provide water for instream flows in natural channels necessary for the preservation or propagation of fish within a designated section of a natural stream channel."

In Washington, the legislature declared that the policy of the state was "that a flow of water sufficient to support game, fish, and foodfish populations be maintained at all times in the streams of

Ms. Bradner
February 21, 1992
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the state." The statute allows the Department of Ecology director to refuse to issue permits where instream flow needs would be harmed. Often, rather than deny permits, the Department issues them with conditions protecting instream flows. The Department of Ecology, on its own, or when requested by the Department of Fisheries, may establish minimum streamflows and lake levels to protect fish and wildlife resources.

Since my letter of January 29th, I have had a chance to review Alaska law in this area. Our information indicates that Alaska law allows for the reservation of water for the following instream uses: (1) protection of fish and wildlife habitat, migration and propagation; (2) recreation and park purposes; (3) navigation and transportation purposes; and (4) sanitary and water quality purposes. The statute authorizes local, state, and federal agencies, as well as private individuals, to apply for reservations for instream uses.

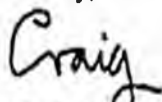
The process to secure such a reservation includes the following steps: the filing of an application, public notice, evaluation of the effects of the proposed reservation on prior appropriators, and the public interest, determination of the need for the reservation and whether unappropriated water is available for it, issuance of a certificate of reservation, and mandatory ten-year review of reservation certificates. To assist applicants in applying for water for instream use, the state has published a booklet that describes the instream flow reservation program and contains detailed instructions on how to apply for a reservation. Further, Alaska may reject applications to appropriate water if it determines that there would be an unacceptable effect on fish and game resources and on public recreational opportunities.

Based on this assessment, and looking at our other member states, I would conclude that your state has gone far in providing legal mechanisms and opportunities for protecting instream flows. However, I have no information with regard to what extent these authorities have been used to protect instream flows. Furthermore, I am not saying that further authority may not be necessary or desirable. In my view, that must be a judgment made by the state based on its own values and interests. I believe Alaska's political process is also the best means for determining whether and by what means it should levy a fee for water use.

I hope the above information may provide a useful comparison with regard to other states. In order to provide you more detailed information regarding instream flows in the western states, I am also including a portion of an article which we prepared which was published in "Environmental Law," published by the Northwestern School of Law of Lewis and Clark College. Also, you may wish to contact Larry Morand, of the National Council of State Legislatures in Denver. Larry has written a good deal on water policy issues and may well be able to provide you with further information. His telephone number is (303) 623-7800.

Again, we hope this information may be of assistance to you as you meet with the Board.

Sincerely,



D. Craig Bell
Executive Director

cc: Rio Davidge

law, including public interest criteria.

Arizona statutes require the Department of Water Resources Director to consider the potential effect on the public interest and welfare when considering applications to use surface water. The Director must reject such applications where a proposed use is contrary to public values.²⁹ The Arizona State Land Department (the predecessor to the Arizona Department of Water Resources which reviewed water appropriation applications) used public interest criteria to deny an application which, if granted, would have resulted in the loss of 1.7% of the total recharge of one of Arizona's ground water basins.³⁰

The State Land Department determined that it would not have been in the public interest to place additional strain on a source of ground water supply experiencing substantial overdraft.³¹ The Arizona Court of Appeals upheld the denial of the application. It emphasized that, in a water short area, even a small reduction in recharge might cause substantial injury to the public welfare, particularly if followed by additional reductions.³²

2. Instream Flow Laws

Public interest protection in western water resource management is also enhanced by establishing and maintaining instream flows. The traditional law of prior appropriation favored off-stream uses. However, instream flows were indirectly protected. Longtime New Mexico State Engineer, Steve Reynolds, observed:

The streamflow required at various points in the State is governed by interstate compacts, international treaties, federal court decrees, water rights conferred by the state . . . and legislation authorizing federal water development projects. In many situations, an incidental effect of these institutional constraints is an instream flow having important value in terms of recreation, fish and wildlife habitat, and aesthetics. Furthermore, in many areas of the state the geography and public land ownership patterns adequately protect instream values. Mountain streams generally do not provide favorable sites for conservation, storage, and beneficial use of

29. ARIZ. REV. STAT. ANN. § 45-153(A) (1987).

30. Arizona Game & Fish Dep't v. Arizona State Land Dep't, 24 Ariz. App. 29, 535 P.2d 621 (1975), *reh'g denied* (1979).

31. *Id.* at 30, 535 P.2d at 622.

32. *Id.* at 31, 535 P.2d at 623.

water.³³

Reynolds' comments describe the incidental "base-line" of instream flow protection under the appropriation doctrine. His comments also apply to states other than New Mexico. In addition, the western states have established instream flows to enhance preservation of public values in water resource management. Instream flow establishment provides water for fish wildlife, recreation uses, and aesthetics. In every western state legal mechanisms are now in place to provide some protection for instream flows.

Instream values are protected in California where public interest statutes form a legal basis to protect "use of water for recreation and preservation and enhancement of fish and wildlife resources [as] a beneficial use of water."³⁴ However, a diversion or impoundment of water must be made to establish an appropriate right to effect protection of instream values. For example, the state might grant a right to impound water for use downstream to enhance fish and wildlife habitat. Such a right could be issued to a public or a private entity.³⁵ A state agency may also protect instream flows in California, Oregon, and other states, under state public interest statutes that allow terms and conditions to be included in appropriative rights to maintain bypass flows.³⁶

These provisions affect water appropriation for instream use in various ways. First, the state agency may disallow new appropriations where wildlife or aesthetic values would be harmed. Second, the state agency may allow new appropriation only where a by-pass flow can be assured. Further, the state agency may disallow a transfer proposal if it is detrimental to the public interest. A state agency or, in some instances, a private party protesting the transfer may assert the proposed transfer's detrimental effect on the public interest.

33. Memorandum by Steve Reynolds at 4, Re: House Bill 228 (Feb. 7, 1977) (State Engineer Files, Santa Fe, New Mexico) quoted in *INSTREAM FLOW PROTECTION IN THE WEST* 334 (L. MacDonnell, T. Rice & S. Skupe, ed. 1989).

34. CAL. WATER CODE § 1243 (West 1971 & 1990 Supp.).

35. California also recognizes limited riparian rights, which may be similar to appropriative rights for instream flows in some instances. See *In re Matter of Hallett Creek Stream Sys.*, 44 Cal. 3d 449, 749 P.2d 324, 243 Cal. Rptr. 887 (1987) *cert. denied* 109 S.Ct. 71 (1988).

36. CAL. WATER CODE § 1243.5; OR. REV. STAT. § 537.170 (5)(a) (1989). See *supra* text accompanying notes 11-32.

In Montana, a public entity may acquire a water reservation to secure the equivalent of a right for instream flow. The law provides that reservations for the "maintenance of minimum flow, level, or quality of water [may be made up] to a maximum of 50% of the average annual flow of . . . gauged streams."³⁷ Laws in California,³⁸ Oregon,³⁹ and Washington⁴⁰ also provide for water reservation by a state agency, or a similar process.

Wyoming considers instream flow and water storage for later release to maintain instream flow to be beneficial uses under certain conditions, and established a procedure for appropriating water for such uses.⁴¹ The Game and Fish Commission identifies stream segments and flow rates that should be appropriated and reports them to the Water Development Commission which then files an application to appropriate natural flow after analyzing whether natural flow is available, whether storage is required, or whether a combination of both must be used. The appropriative right's priority date is the Water Development Commission's application date. Water commissioners regulate the water course to provide water for the instream use on the basis of its priority.⁴²

Utah enacted a similar statute.⁴³ The state may acquire established water rights to provide "water for instream flows in natural channels necessary for the preservation or propagation of fish

37. MONT. CODE ANN. § 85-2-316 (1989).

38. See Lilly, *Protecting Stream Flows in California*, 8 *Ecology L.Q.* 697 (1979). The use of the term "reserve" in this context refers to the state setting aside, or "reserving" from appropriation, sufficient water to assure maintenance of instream flows and should not be confused with federal "reserved water rights" recognized under the "reserved rights" doctrine. See *infra* notes 233-54 and accompanying text (§ III(C)(6)) (1989).

39. OR. REV. STAT. § 536.410 allows the Water Resources Commission to withdraw waters from further appropriation while the order of withdrawal is in effect. This is somewhat different from the reservation concept in Montana, which involves reservation of a quantity of water with a priority date. Any Oregon state agency may request a reservation of unappropriated water for future economic development under OR. REV. STAT. §§ 537.356, .358. As to instream flow protection, Oregon has a minimum stream flow program authorized by OR. REV. STAT. § 536.325. As a practical matter, the minimum streamflow program has been largely supplanted by the Water Resources Commission's instream water rights program.

40. WASH. REV. CODE ANN. § 90.22.010 (1982 & Supp. 1990).

41. See WYO. STAT. §§ 41-3-1001 to -1014 (Supp. 1990).

42. *Id.*

within a designated section of a natural stream channel."⁴⁴ In Colorado, the Water Conservation Board may appropriate "such waters of natural streams and lakes as the Board determines may be required for minimum stream flows or for natural surface water levels or volumes for natural lakes to preserve the natural environment to a reasonable degree."⁴⁵

Idaho law provides two methods to protect instream flows for public use. First, applications to appropriate water for out-of-stream purposes must be evaluated against broad "local public interest"⁴⁶ criteria, which include a determination of minimum streamflow to be retained in the natural channel. Second, a minimum instream flow may be assured by establishing a recorded right for the flow. The Idaho Water Resources Board, an eight member citizen policy commission, is authorized under state law to apply for and hold such rights.⁴⁷ The Idaho Supreme Court affirmed the validity of instream flow rights. The court recognized some instream public uses as beneficial uses under state law.⁴⁸

Oregon protects instream flows in a variety of ways. One is legislative⁴⁹ or administrative⁵⁰ withdrawal of streams from further appropriation. In 1983, Oregon also administratively established minimum streamflows to support aquatic life and minimize pollution.⁵¹ In 1987, the Oregon legislature explicitly authorized instream water rights, largely superseding the state's minimum streamflow program.⁵² The Oregon Departments of Fish and Wildlife, Environmental Quality, and Parks and Recreation may apply for instream water rights for public use.⁵³ Public uses include "(a) recreation; (b) conservation, maintenance and enhancement of aquatic and fish life, wildlife, fish and wildlife habitat and any other ecological values; (c) pollution abatement; or (d

44. *Id.*

45. COLO. REV. STAT. § 37-92-102(3) (Cum. Supp. 1987).

46. IDAHO CODE § 42-203A(5) (1990).

47. *Id.* § 42-1503.

48. *State Dep't of Parks v. Idaho Dep't of Water Admin.*, 96 Idaho 440, 444 P.2d 974, 978-79 (1974).

49. OR. REV. STAT. §§ 538.010-.300 (1989).

50. *Id.* § 536.410.

51. Act of Aug. 8, 1983, ch. 796, § 2, 1983 Or. Laws 1634 (codified as amended at OR. REV. STAT. §§ 536.235, .325).

52. Act of July 18, 1987, ch. 859, § 2, 1987 Or. Laws 1757 (codified at OR. REV. STAT. §§ 537.332-.360).

navigation."⁵⁴ The Water Resources Commission holds instream water rights in trust for the people of the state.⁵⁵ The Commission converted most of the earlier established minimum streamflows to instream rights.⁵⁶

In 1949, the Washington legislature declared "that a flow of water sufficient to support game, fish and foodfish populations be maintained at all times in the streams of [the] State."⁵⁷ The Director of the Department of Ecology may refuse to issue permits where instream flow needs would be harmed.⁵⁸ Rather than denying permits, the Department often issues them with conditions protecting instream flows. Also, Washington law provides a more formal process to protect instream flows. The Department of Ecology, on its own or when requested by the Department of Fisheries or the Game Commission, may establish minimum streamflows and lake levels to protect fish and wildlife resources, recreation, or aesthetic values.⁵⁹

Further, Washington's Water Resources Act of 1971 provides that "[p]erennial rivers and streams of the state shall be retained with base flows necessary to provide for preservation of wildlife, fish, scenic, aesthetic and other environmental values, and navigational values."⁶⁰ Between 1975 and 1985 the Department secured instream flows for a substantial area of the state under the administrative process established pursuant to the 1971 Act.⁶¹

In Alaska, the Water Use Act allows for the reservation of water for the following instream uses: "(1) protection of fish and wildlife habitat, migration, and propagation; (2) recreation and park purposes; (3) navigation and transportation purposes; and (4) sanitary and water quality purposes."⁶² The statute authorizes local, state, and federal agencies, and private individuals to apply for reservations for instream uses. To aid private entities, the

54. *Id.* § 537.332(4).

55. *Id.* § 537.341.

56. *Id.* § 537.346.

57. Fisheries Code, ch. 112, § 46, 1949 Wash. Laws 272 (codified at WASH. REV. CODE ANN. § 75.20.050 (1962 & Supp. 1990)).

58. *Id.*

59. *Id.* § 90.22.

60. *Id.* § 90.54.020(3)(a).

61. WASH. ADMIN. CODE § 173-500 (1989) (Water Resources Management Program established pursuant to the Water Resources Act of 1971).

state published a booklet describing the instream flow reservation program, including instructions on how to apply for a reservation.⁶³

There are a few states where instream flow appropriations or their equivalent are not recognized by statute. Nevertheless, state administrators may provide protection pursuant to public interest provisions.⁶⁴ For example, in Arizona and Nevada, state officials have interpreted their laws requiring a diversion to establish a water right to allow for *in situ* (instream) water use. The Arizona Court of Appeals held that state statutes authorize *in situ* appropriations for recreation and wildlife purposes.⁶⁵ The Arizona Department of Water Resources issued three permits to appropriate water for instream use: two permits to the Nature Conservancy in April 1983, and one permit to the federal Bureau of Land Management in March 1989.⁶⁶

In Nevada, the State Supreme Court upheld the State Engineer's issuance of appropriative water rights to two federal agencies for recreation, fishery, and stock and wildlife watering purposes, including instream rights.⁶⁷ The court said: "[A]pplications by United States agencies to appropriate water for applications to beneficial uses pursuant to their land management functions must be treated on an equal basis with applications by private landowners."⁶⁸ Thus, instream rights were provided for use on federal lands under state regulatory authority, not federal proprietary claims. These rights will enjoy the protection of state law and will be integrated into the regimen of rights administered by the State Engineer.

3. Water Transfers

Transfers may also promote the public interest by allowing

63. ALASKA DEP'T OF NATURAL RESOURCES, STATE OF ALASKA INSTREAM FLOW HANDBOOK - A GUIDE TO RESERVING WATER FOR INSTREAM USE (1985).

64. See generally Grant, *supra* note 11.

65. McClellan v. Jantzen, 26 Ariz. App. 223, 225, 547 P.2d 494, 496 (1976).

66. Letter from Kathleen Ferris, Director, Arizona Dep't of Water Resources to Norman K. Johnson (June 20, 1986) (copy on file at the Western States Water Council office); telephone conversation between Laurence Linzer, Arizona Dep't of Water Resources, and Norman K. Johnson (Dec. 19, 1989).

67. Nevada v. Morros, 766 P.2d 263 (Nev. 1988).

68. *Id.* at 263.

established uses to change with evolving values and needs. The ability to make such transfers was recognized early in the development of the prior appropriation doctrine.⁷³ As used here, "transfer" refers to the conveyance of a water right from one user to another involving a change in the location or type of use.

The interrelated nature of appropriative water rights requires state agencies to play an active role in the water right transfer process. Generally, before a transfer may proceed, a "change" or "transfer" application must be filed with and approved by a state administrative body or a state water court. This gives third parties the opportunity to protest the transfer if they believe it may harm their rights. Usually a state agency or court must also determine whether the transfer will be in the public interest.⁷⁴

A transfer application is either approved or disapproved after a time period for objections by third parties and a state agency's consideration of the transfer implications. Historic consumptive use is generally the quantity of water that may be transferred. The state agency's decision is usually subject to judicial review. Complex transfers, with the potential to affect a number of vested rights, can be costly and time consuming, while simple transfers are routine in many states.⁷⁵ Most states recognize instream flows as a beneficial use to which water may be transferred. However, in some states only state entities are authorized to obtain transfer approval of a diversionary water right to an instream right.⁷⁶

According to a 1986 survey by the Western States Water Council, the annual number of transfers varies significantly from state to state. Water rights are rarely transferred in Alaska, Nebraska, and North and South Dakota, while water rights are transferred frequently in other states. Colorado, Idaho, Nevada, New Mexico, Utah, Washington, and Wyoming reported that fifty or more transfers occur annually. Colorado, Nevada, and Utah re-

73. See *McDonald v. Bear River & Auburn Water & Mineral Co.*, 13 Cal. 220, 232-33 (1859); *Thayer v. California Dev. Co.*, 164 Cal. 117, 128 P. 21 (1912).

74. A matrix summarizing state-by-state water right transfer information is included in *WESTERN GOVERNORS' ASS'N WATER EFFICIENCY WORKING GROUP, WATER EFFICIENCY: OPPORTUNITIES FOR ACTION, REPORT TO THE WESTERN GOVERNORS' ASS'N*, at 136 (1987).

75. *Id.*

ported that more than 300 transfers occur each year.⁷⁷

Recently, some states have simplified the marketing of water rights. In 1979, Idaho formalized some types of water transfer activities by creating a water bank for marketing purposes.⁷⁸ The bank "provide[s] a source of adequate water supplies to benefit new and supplemental water uses, and provide[s] a source of funding for improving water user facilities and efficiencies."⁷⁹ The Idaho Water Resource Board operates the bank on a statewide basis and appoints committees in local drainage areas. Farmers "deposit" water held under private rights or by allocations in federal reservoirs into either the state or the local water bank, where it may be leased by other water users.

The California legislature adopted a policy to encourage transfers. It directs the Department of Water Resources, the State Water Resource Control Board, and other appropriate state agencies "to encourage voluntary transfers of water and water rights, including, but not limited to, providing technical assistance to persons to identify and implement water conservation measures which will make additional water available for transfer."⁸⁰ The legislature also requested the Department of Water Resources to establish a program to facilitate the voluntary exchange of water rights and to report legal and procedural change that could be made to facilitate water marketing. Further, the Department must prepare and update a "water transfer guide" and create and maintain a periodically updated list of entities seeking to enter water transfer, lease, or exchange agreements.⁸¹

4. Other Developments

The western states have acted to protect public interest values in various other ways.⁸² For example, Colorado expanded the

73. *Id.* See also L. McDONNELL, *THE WATER TRANSFER PROCESS AS A MANAGEMENT OPTION FOR MEETING CHANGING DEMANDS* (Report prepared for the U.S. Geological Survey, 1990).

74. See IDAHO CODE § 42-1761 (1990).

75. *Id.*

76. CAL. WATER CODE § 109(b) (West 1971).

77. *Id.* §§ 470-483 (West 1989).

78. Although this Article focuses on state water quantity laws, western states have also become increasingly active in water quality protection. Many surface

state role in the administration of appropriative water rights, with an increased recognition of the State Engineer's discretion to make rules governing water use. Instead of being guided by the priority of application alone, the Engineer can formulate rules to optimize water use.⁷⁹ The courts have expanded this principle, indicating that "maximum utilization" does not require a "single-minded endeavor to squeeze every drop of water" from a water source, but to make "optimum use" of the resource.⁸⁰

Also, the State Engineer more strictly enforces the due dili-

Act (CWA), 33 U.S.C. §§ 1251-1377 (1968), which allows states to attain primacy for carrying out the most important federal water pollution control programs. *Id.* § 1342. The CWA recognizes "the primary responsibilities and rights of States" to mitigate and control water pollution. *Id.* § 1251(b).

In addition to state and federal efforts to mitigate surface water pollution under federal law, every state has acted to protect ground water quality. See WESTERN STATES WATER COUNCIL, WESTERN STATE GROUND WATER MANAGEMENT (1986). The states continue to enhance their legal protection of ground water quality. The U.S. Environmental Protection Agency reported in 1988 that 37 states enacted ground water legislation during the period 1985-1987, with 27 states enacting underground storage tank programs and 25 enacting legislation to protect ground water from contamination by agricultural chemicals. Twelve states enacted comprehensive statewide ground water protection strategies. See U.S. ENVIRONMENTAL PROTECTION AGENCY, SURVEY OF STATE GROUND WATER QUALITY PROTECTION LEGISLATION ENACTED 1985-1987, at vii-xi (1989).

States have also expanded upon federal legal protection for surface water. Many states establish standards more stringent than national standards to protect public drinking water supplies, for purposes of secondary wastewater treatment, and with respect to baseline water quality. States have also acted independently of federal law to control water pollution by establishing (1) underground storage tank programs (see, e.g., ARIZ. REV. STAT. ANN. §§ 49-1081 to -1814 (1988 & Supp. 1989); MONT. CODE ANN. §§ 75-10-483 to -451 (1989); and S.D. COMPIL. LAWS ANN. § 34A-2-98 to -99 (1987)); (2) chemigation controls (see, e.g., CAL. FOOD & AGRIC. CODE § 13145 (West 1988); COLO. REV. STAT. § 35-11-106 (Supp. 1988); N.D. CONST. CODE § 4-35.1-03 (1987)); (3) pesticide controls (see, e.g., ARIZ. REV. STAT. ANN. §§ 49-301 to -309 (1988); and CAL. FOOD & AGRIC. CODE §§ 13141 - 13152 (West 1986)); and (4) critical ground water management areas (see, e.g., COLO. REV. STAT. § 37-90-106 (1973 & Supp. 1989); IOWA CODE § 42-233 (1990); OR. REV. STAT. § 537.730 (1989)), among other water quality programs. States have also created state superfunds and programs to control hazardous waste and toxic substances. See Begley, Hager, Wright, Springen, Hutchison, de la Pena & Murr, *E pluribus pluries: Without Leadership from Washington, the States Set the Environmental Agenda for the Nation*, *Newweek*, Nov. 13, 1989, at 70.

79. See *Felthauer v. People*, 167 Colo. 320, 338, 447 P.2d 986, 994 (1968); *Colorado Springs v. Bender*, 148 Colo. 458, 464, 360 P.2d 552, 556 (1961).

80. *Alamosa-La Jara Water Users Protection Ass'n v. Gould*, 674 P.2d 914, 935 (Colo. 1983).

gence requirements relating to the acquisition of conditional water rights. In the past, conditional rights, those established by declaring an intent to divert water without making a diversion, have sometimes been maintained for many years with only minimal physical effort or investment. Colorado courts have imposed stricter requirements.⁸¹ Thus, the water courts are scrutinizing such rights to insure that there is a genuine intent to appropriate, not merely speculate.⁸² Further, Colorado law⁸³ now requires proof that a project will be completed with diligence before a decree for a conditional right can be issued.⁸⁴ Imposing stricter requirements on conditional rights makes more water available for current demands to meet present economic uses.

In 1987, Oregon enacted a law to provide for the sale or lease of "conserved water."⁸⁵ The law defines "conserved water" as "that amount . . . previously unavailable to subsequent appropriators, that results from conservation measures."⁸⁶ "Conservation" is defined as "the reduction of the amount of water [previously] consumed or irretrievably lost . . . achieved either by improving the technology or method for diverting, transporting, applying or recovering the water or by implementing other improved conservation measures."⁸⁷ Any water right holder may apply to the Water Resources Commission for approval to implement conservation measures.

In evaluating the applications, the Water Resources Commis-

81. *Colorado River Water Conservation Dist. v. City & County of Denver*, 640 P.2d 1139 (Colo. 1982).

82. See, e.g., *Colorado River Water Conservation Dist. v. Vidler Tunnel Water Co.*, 197 Colo. 413, 417, 584 P.2d 566, 568 (1979).

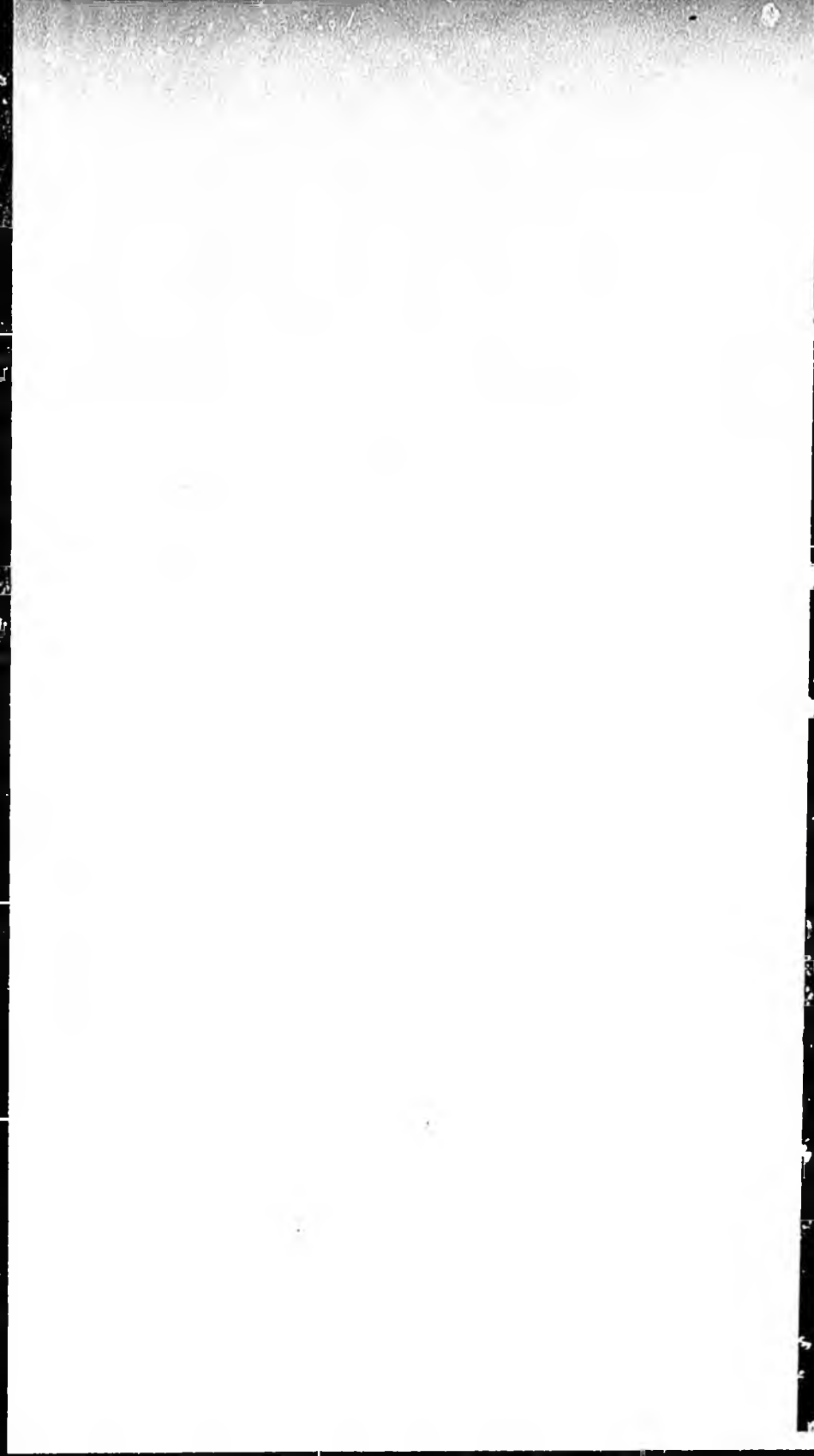
83. COLO. REV. STAT. § 37-92-305(c)(b) (Cum. Supp. 1987).

84. See *Southeastern Colorado Water Conservancy Dist. v. City of Florence*, 688 P.2d 715, 718 (Colo. 1984); see also *Talco Ltd. v. Danielson*, 769 P.2d 468 (Colo. 1989).

85. OR. REV. STAT. §§ 537.455-500 (1989).

86. *Id.* § 537.456(2).

87. *Id.* § 537.455(1). The Washington legislature enacted a somewhat similar program which allows the state Department of Ecology to assist the water right holders in the Yakima River Basin in the financing of water conservation projects. See WASH. REV. CODE ANN. §§ 90.38.005-.302 (1962 & Supp. 1990). The conserved water then becomes a "trust water right" which is conveyed to the Department of Ecology to increase the state's overall ability to manage water in the Yakima Basin. *Id.* § 90.38.030. The statute may be expanded in the next legislative session to cover the entire state.



sion must consider whether the project would be feasible, whether the public interest would be served, if any injury would accrue to other vested water rights, and if the project adequately mitigates effects on other water users. The Commission allocates a percentage of the water proposed to be conserved to the applicant (usually seventy-five percent), and a percentage (presumed to be twenty-five percent unless reasons dictate a lesser or greater percentage) to the state.⁸⁸

After the applicant successfully carries out the conservation project, the Commission determines the amount of conserved water and issues a new water right certificate to the conserving party for that party's percentage of the water.⁸⁹ The certificate contains a priority to the conserved water "one minute after the priority of the water right held by the person implementing the conservation measure."⁹⁰ This law encourages water conservation and protects the public interest by allowing a water user not only to benefit from his conservation measures, but at the same time, to increase water available for other public uses. Any person or agency allocated conserved water may reserve the water instream for future out-of-stream use or otherwise use or dispose of conserved water.⁹¹

5. Public Trust Doctrine

Public interest values in western water resource management are also protected by the public trust doctrine. This doctrine is based on ancient common-law principles forcefully articulated in the United States Supreme Court's 1892 decision in *Illinois Central Railroad v. Illinois*.⁹² In *Illinois Central*, the Illinois legisla-

88. *Id.* § 537.470.

89. *Id.* § 537.475.

90. *Id.* § 537.485.

91. *Id.* § 537.490. Oregon is also formulating a policy to expand the state's longstanding prohibition of waste in water use to require water users to employ best practicable technology to assure maximum efficiency. Public hearings on the subject are currently being held. The hearings have been well-attended and interest in the subject has been high. See remarks by William Young, Director, Oregon Water Resources Dep't, Meeting of the Western States Water Council (July 13, 1990) (included as part of the minutes on file at the Western States Water Council Office). Washington State is considering similar actions. See *id.* remarks by Ken Slattery, Washington Dep't of Ecology.

92. 146 U.S. 387 (1892).

California recently enacted a law requiring the State Department of Water Resources (DWR) to establish a program to facilitate the voluntary exchange of water rights and to report to the legislature legal and procedural changes which could be made to facilitate water marketing. Also, DWR must prepare a "water transfer guide" and create and maintain a periodically updated list of entities seeking to enter into water transfers, leases, or exchanges.¹²⁵

In 1986 Idaho enacted legislative changes to streamline water marketing activities.¹²⁶ Minor modifications were made to various statutes to simplify the transfer process and to ensure that those who need to acquire water do so through appropriate state procedures. Other states are considering legislative changes which would facilitate transfer activity.

INTERSTATE SALE AND LEASE OF WATER

Intrastate water transfers have occurred under the appropriation doctrine almost since its inception. Statutes and administrative regulations governing transfers have evolved in each state and are still gradually changing. Legal and administrative procedures related to intrastate transfers also evolved through time. Recent developments, however, have required significant changes in some state laws.

Justice Marshall, in *Wilson v. Blackbird Creek Marsh Co.*,¹²⁷ suggested the states have plenary power to regulate water resources within state boundaries. Justice Holmes, in *Hudson Water Co. v. McCarter*,¹²⁸ was even more emphatic in holding that a state plainly had the right to control the water resources exclusively within its boundaries. Both of these cases, however, occurred in the East where the riparian doctrine applied and water was part of the land it abutted.

A western state's right to control water supplies is based on two doctrines. The first was enunciated in the Desert Lands Act of 1877¹²⁹ which made it clear that the state had the right to control waters on the federal public domain. The second was the doctrine of equitable apportionment, which provides that when two states share the surface flows of a stream the states have the power to compact for the use of that water.¹³⁰ If they fail to do so, the Supreme Court gives each state a portion of the stream for its exclusive use.¹³¹ Finally, based on these concepts, numerous west-

ern state constitutions provide that the waters of the state belong to the people of the state or the state itself.¹³²

While all of these theoretical public ownership of water pronouncements were taking place, the western water law of prior appropriation was maturing in a somewhat different direction. Since the turn of the century, the courts of the western states have been concluding that a water right is a property right that can be freely sold and transferred like any other commodity.¹³³ Many commentators and water administrators argued persuasively that if water rights were allowed to be traded in the marketplace as any ordinary commodity, then water rights would pass to the highest and best use.¹³⁴ Thus, there was a great disparity between the language of many state constitutions which declared water to be a public good subject to planning and control by the state, and the actual practice of treating water as a commodity.

This disparity was revealed poignantly in *Sporhase v. Nebraska ex rel. Douglas*,¹³⁵ in which the United States Supreme Court was asked to decide whether a Nebraska statute was unconstitutional because it prohibited the export of water to a state which would not reciprocate by allowing water to be imported into Nebraska. While, as the late Frank Trelease stated, the case should not have been used to make precedent because it involved "but a cupful of water," the Supreme Court took this opportunity to clarify its view of the nature of water under western prior appropriation law.¹³⁶

The Supreme Court held that state ownership of water as articulated by Nebraska was a fiction and that the western water resource is a commodity in commerce.¹³⁷ Therefore, the *Pike v. Bruce Church, Inc.*¹³⁸ analysis of statutes discriminating against interstate commerce must be applied. Under this test a statute regulating a resource in interstate commerce must regulate evenhandedly to promote a legitimate local interest and must be narrowly drawn to achieve that purpose. The Nebraska statute failed that test.

The Court did, however, acknowledge that the nature of water resources required a somewhat different and more careful review than the *Pike* analysis.¹³⁹ The Court pointed out that protection of the public welfare and the conservation of water were legitimate bases for regulating the transfer of water rights, and that a demonstrably arid state should certainly

125. *Id.*, §§470-483 (West 1989).

126. Ch. 313, 1986 Idaho Sess. Laws, 763.

127. 27 U.S. (2 Pet.) 245 (1829).

128. 209 U.S. 349 (1908).

129. 43 U.S.C. §§321-339 (1983); See discussion in *California-Oregon Power Co. v. Beaver Portland Cement Co.*, 295 U.S. 142 (1935).

130. See, e.g., *Upper Colorado River Basin Compact*, ch. 48, 63 Stat. 31 (1949).

131. See e.g., *Kansas v. Colorado*, 206 U.S. 46 (1907).

132. See e.g., N.D. CONST. art. XI, §3.

133. See *infra* p. 38 and accompanying notes.

134. *Id.*

135. 458 U.S. 941 (1982).

136. Conversation of Charles F. DuMars with Frank Trelease (June 1983).

137. *Sporhase*, 458 U.S. at 958.

138. 397 U.S. 137 (1970).

139. *Sporhase*, 458 U.S. at 956.

be able to assert a limited preference for its citizens in times of shortage.¹⁴⁰ It also suggested that, if a state had a real plan for using its water resources rather than simply a theoretical anticipated future need, the state could exercise such a limited preference.¹⁴¹

Relying on *Sporhase v. Nebraska ex rel. Douglas*, a federal district court in New Mexico in *City of El Paso v. Reynolds* [El Paso II]¹⁴² struck down a New Mexico statute which placed an absolute embargo on out-of-state transfers of groundwater. The court pointed out that groundwater in New Mexico had been treated as a commodity for purposes of intrastate transfers and that New Mexico could not deny that status simply because this particular transfer was to an out-of-state municipality.¹⁴³

States have responded variously to this decision. No one can ever really know the motivations of a state legislature. Nevertheless, in at least some instances the *Sporhase* decision has undoubtedly had the effect of encouraging water planning legislation of the kind discussed below. Other statutes discussed below may antedate *Sporhase*; however, they address similar concerns with respect to out-of-state water use.

Certainly no state is anxious to allow its water resources to be taken without some control over the ultimate use of the water from a conservation standpoint. It is also likely that a state may seek to acquire some value for the resource as it leaves the state. These goals seem to have motivated legislation in various western states.

In Colorado, for example, a statute provides in part that "[a]ny diversion of water from this state which is not in compliance with this section shall not be recognized as a beneficial use."¹⁴⁴ This section provides for complicated determinations by the state of the impact on surface water compacts and the public welfare when water is transported out of state. It further provides a charge of fifty dollars per acre-foot to be assessed and collected on out-of-state transfers. The Colorado Attorney General has opined, however, that the fee is probably unconstitutional.¹⁴⁵

South Dakota requires that applications for appropriation of water "in excess of one thousand acre feet annually" be approved by the legislature.¹⁴⁶ The South Dakota statute provides for extensive water planning to achieve a myriad of purposes within the concept of "public welfare." These range from economic welfare and prosperity to water quality to joint projects with Indian tribes.¹⁴⁷

140. *Id.* at 956-57.

141. *Id.*

142. 563 F. Supp. 379 (D.N.M. 1983), later proceeding, 597 F. Supp. 694 (D.N.M. 1984).

143. 563 F. Supp. at 391.

144. COLO. REV. STAT. § 37-81-101 (Cum. Supp. 1987).

145. Ag. alpha No. NR WE AGAON (Sept. 10, 1985).

146. S.D. CODIFIED LAWS ANN. § 46-5-20.1 (1983).

147. S.D. CODIFIED LAWS ANN. § 46A-2-2 (1983).

Idaho also has stated that "[a]ll ground waters in this state are declared to be the property of the state"¹⁴⁸ and has placed a limit on the amount of water that can be taken out of a groundwater basin. It further requires legislative approval of any application exceeding that amount.¹⁴⁹

California has a history, dating back to 1927, of reserving some quantity of water for the state. The state through its agencies can file applications to appropriate water "required in the development and completion . . . of a general or coordinated plan looking toward the development, utilization, or conservation of the water resources of the state."¹⁵⁰ State appropriations are exempt from diligence requirements and remain dormant (reserved) until development occurs. The California Department of Water Resources, as operator of the State Water Project, controls allocation of a significant proportion of state-appropriated water. The California Water Resources Control Board is an independent quasi-judicial body whose regulatory authority includes jurisdiction over the State Water Project and all other appropriators. Board members are appointed by the Governor and must be confirmed by the State Senate. Although most of these appropriations are held for specific governmental purposes, some are held by the state because the state funded the projects that made the waters available for use. If the water is owned by the state, it is available to the interstate market, but like any other seller, a state can be flexible about when and how much it wants to sell.

Montana's laws¹⁵¹ tightly centralize state control over water resources. The Department of Natural Resources has full control over all waters in the state not under the exclusive control of the federal government or vested in private ownership. Since there is a great deal of unappropriated water in Montana, this statute has a significant effect. The Department has a duty to appropriate and conserve water for "the use of the people."¹⁵² Its authority extends to "rights to the natural flows of the waters of [the] state which it may acquire by condemnation, purchase, exchange, appropriation or agreement."¹⁵³ Its decisions are subject to approval by the Board of Natural Resources and Conservation.

Montana laws allow the state to appropriate only amounts greater than 4,000 acre-feet per year and 5.5 cubic feet per second for any consumptive use.¹⁵⁴ The state appropriates such quantities in its own name and then leases them to users under the State Water Leasing Program.¹⁵⁵ The state

148. MONT. CONN. § 42-106 (Supp. 1988).

149. *Id.*

150. CAL. WATER CODE §§ 10500-10507 (West 1971).

151. MONT. CONN. ANN. § 85-2-101 (1988).

152. *Id.*

153. *Id.*

154. *Id.* § 85-2-301(2)(a)(ii).

155. *Id.* § 85-2-141(1).

may acquire water rights for its leasing program through agreement with, or purchase from, other water right owners, as well as by appropriation.¹⁵⁶ Water from the state leasing program must be obtained from specified sources,¹⁵⁷ and no more than 50,000 acre-feet may be leased by any entity.¹⁵⁸ Lease terms may be longer than 50 years but may be extended for additional terms.¹⁵⁹ Water may be leased for any beneficial use. Special provisions relating to the evaluation of the impact on Montana apply to appropriations for large quantities if the water is to be transferred for use out of state.¹⁶⁰

In Texas, provisions for appropriation by the state have appeared in a number of fairly recent legislative initiatives.¹⁶¹ In 1985, the Texas Department of Water Resources was abolished and its authority and duties were divided between the Texas Water Development Board and the Texas Water Commission. The Texas Water Development Board is an advisory body whose members are appointed by the Governor. The board administers financial assistance to political subdivisions for water development projects. Recent legislation allows the board to sell public water acquired by the state.¹⁶²

The board administers the state's storage acquisition fund. The board may use the fund for design, acquisition, lease, construction, reconstruction, development, or enlargement, in whole or part of any existing or proposed water storage project.

The board may also "sell any unappropriated public waters of the state and other water acquired by the state that is stored by or for it."¹⁶³ The board, however, may not compete with any political subdivision in the sale of water if the competition jeopardizes the ability of the political subdivision to meet obligations incurred to finance its own water supply projects. Political subdivisions also have a preferential, but not an exclusive, right to purchase, acquire, or lease facilities and water from facilities. Finally, the statute provides that "[t]he board and the commission shall coordinate their efforts to meet these objectives and to assure that the public water, which is held in trust for the use and benefit of the public, will be conserved, developed, and utilized in the greatest practicable measure for the public welfare."¹⁶⁴

Wyoming has a water development program administered by the same

commission that formulates water resource plans. Under that program, the Commission must provide: "procedures and policies for the planning, selection, financing, construction, acquisition and operation of projects and facilities for the conservation, storage, distribution and use of water necessary in the public interest to develop and preserve Wyoming's water and related resources."¹⁶⁵ The program is intended to "encourage development of water facilities for irrigation, for reduction of flood damage, for abatement of pollution, for preservation and development of fish and wildlife resources and for protection and improvement of public lands."¹⁶⁶ The water development program is also intended to make state waters available for all beneficial uses, including protecting the "health, safety and general welfare of the people of the state of Wyoming."¹⁶⁷

On the basis of the state water plan or as directed by the legislature, the Commission identifies and selects potential projects for inclusion in the water development program. The selection process includes several steps. Each step terminates with recommendations to the legislature as to whether a project should be studied further or discarded. The first stage requires that "reconnaissance studies"¹⁶⁸ be made. The second stage requires "feasibility studies."¹⁶⁹ The studies address economic feasibility, whether a project is socially desirable, and if so, what obstacles might be faced if it is attempted. The third stage requires development plans,¹⁷⁰ which include an analysis of economic feasibility along with other factors. If a project is found to be in the public interest and private enterprise does not want to build or operate the project, construction and operating plans proceed as authorized and approved by the legislature under the direction and control of the Construction Division of the Commission. In addition to new projects, the program provides for rehabilitation of existing water projects.

In Wyoming, the Administrator of the Water Development Commission, at the direction of the governor, files applications in the name of the state for permits to appropriate water, to construct dams and other works. He is also directed to take steps necessary to acquire, maintain, or preserve the priority of any right essential to any project which is or may become a project of the state water development program.¹⁷¹

In February of 1983, the New Mexico legislature passed a water ex-

156. *Id.* § 85-2-141(2).

157. *Id.* § 85-2-141(3).

158. *Id.* § 85-2-141(4).

159. *Id.* § 85-2-141(5).

160. *Id.* § 85-2-402(5)(b)(i).

161. See, e.g., TEX. WATER CODE ANN. § 15.323(a) (Vernon 1988).

162. *Id.*

163. *Id.* § 15.324(a).

164. *Id.* § 15.326.

165. WYO. STAT. § 41-2-112(a) (Supp. 1988).

166. *Id.*

167. *Id.*

168. Reconnaissance studies involve preliminary assessment of the various factors that are relevant in seeking to develop a project including need, environmental impact and legal impediments.

169. Feasibility studies involve more detailed analyses often associated problems and reflect the responses of public comment, test drilling and needed legislation.

170. Both plans and the economic analysis are required.

171. WYO. STAT. § 41-2-116 (Supp. 1988).

portation statute replacing the one struck down in *El Paso I*. That statute legitimizes the interstate transportation and use of New Mexico's public waters. This statute reads as follows:

The state of New Mexico has long recognized the importance of the conservation of its public waters and the necessity to maintain adequate water supplies for the state's water requirements. The state of New Mexico also recognizes that under appropriate conditions the out-of-state transportation and use of its public waters is not in conflict with the public welfare of its citizens or the conservation of its waters.¹⁷²

The exportation statute struck down in *El Paso I* explicitly banned the out-of-state transport and use of New Mexico groundwater. In contrast, the new statute provides that "under appropriate conditions" the interstate transportation and use of New Mexico's public waters may not be in conflict with the public welfare of the state's citizens or the conservation of the state's waters.¹⁷³ The new statute is not limited to groundwater but also encompasses surface waters.

The statute requires that the person or entity who wants to export water outside New Mexico shall apply for a permit from the state engineer. In addition to requiring the State Engineer to publish notice of the permit application, the statute stipulates that the state engineer, before granting the permit, must find that the proposed export is neither contrary to water conservation policies within the state nor otherwise detrimental to the public welfare of New Mexico's citizens. In making his decisions the state engineer must consider, among others, the following factors:

- (1) the supply of water available to New Mexico;
- (2) water demands of New Mexico;
- (3) whether there are water shortages within New Mexico;
- (4) whether the water that is the subject of the application could feasibly be transported to alleviate water shortages in New Mexico;
- (5) the supply and sources of water available to the applicant in the state where the applicant intends to use the water; and
- (6) the demands placed on the applicant's supply in the state where the applicant intends to use the water.¹⁷⁴

The statute further provides that by filing an application to export New Mexico water, the applicant shall abide by the New Mexico laws governing the appropriation and use of the water. The state engineer is empowered to condition the permit to guarantee that the water, once out

of state, will be used in accordance with the rules and regulations imposed upon in-state users.

In response to the *El Paso* court's observation that New Mexico law placed no conservation restrictions on in-state groundwater permit applicants, the New Mexico legislature amended its in-state groundwater withdrawal criteria. Before the *El Paso* decision, the in-state groundwater application statute required the state engineer to issue a withdrawal permit if it found that unappropriated groundwater was available and that the withdrawal would not impair existing water rights. As discussed above, following the *El Paso* ruling, in-state applicants must meet two additional criteria: the appropriation must not be (1) contrary to water conservation within New Mexico or (2) detrimental to the public welfare of the state's citizens.¹⁷⁵ The new statute was upheld in *El Paso II*,¹⁷⁶ in which the federal district court found the statute to be evenhanded and nondiscriminatory on its face. In addition to the statutory amendments, after three and one-half years of study, the New Mexico legislature in 1987 authorized the Interstate Streams Commission to fund regional water planning in New Mexico. The goal was to allow the various regions of the state to plan for the future use of water supplies for time horizons up to forty years.¹⁷⁷

Thus, the range of reaction in the prior appropriation states to the potential for interstate transfers of water has been varied. Some states have attempted to capture economic value as water is transferred out of the state by assessing export fees or by establishing a lease system. Others have attempted to control the activity through legislative approval of transfers. Still others have adopted broad, evenhanded criteria related to the conservation of water and the public welfare similar to that referred to as "legitimate" in *Sporhase*. Others have attempted to promote bona fide water planning with respect to unappropriated water to ensure that their state has sufficient water supplies in the future. The constitutionality of each of these provisions will undoubtedly depend on the factual contexts in which they are challenged and the evolution of Supreme Court case law.

OTHER INNOVATIONS IN WESTERN WATER LAW

Arizona's response to problems associated with the groundwater overdraft signals significant development in western water law. The allocation and use of groundwater is now governed by Arizona's Ground Water Code, which was adopted in 1980 and has been amended as nec-

172. N.M. STAT. ANN. §72-12B-1, -2 (1988).

173. *Id.* §72-12B-1(B).

174. *Id.* §72-12B-1(B)(C).

175. *Id.* §72-12-3E.

176. 597 F. Supp. 693 (D.N.M. 1984) (1985 Repl.).

177. Act of Apr. 8, 1987, ch. 182, 1987 N.M. Laws 1039.



WESTERN STATES WATER COUNCIL

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February 24, 1992

Ms. Heather Bradner
Legislative Staff
Rep. Cliff Davidson
State Capitol
Juneau, AK 99801

Dear Heather:

Enclosed please find ten copies of our most recently published Annual Report (1990). The 1991 report has not yet been published. I am also enclosing a recent membership list, which includes several changes from that published in the Annual Report.

As I indicated in my letter to you of February 21, a primary purpose of the Council is to provide a forum for the exchange of views and perspectives among the member states and to provide information regarding federal and state developments in order to assist member states in evaluating impacts of federal laws and programs and the effectiveness of state laws and policies. With regard to state laws, we believe our member states are then in a better position to evaluate the merits of their own laws and policies and any proposed changes and additions to those laws and policies.

In that spirit, we would be glad to be available for your meeting this Wednesday for questions pertaining to the history of water law in the western states, as you have requested. Norm Johnson, our Legal Counsel, and I will plan to call the number you gave us at five minutes before 3:00 p.m. your time.

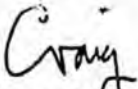
With regard to the second part of Rep. Davidson's request, we will plan to provide you with our reaction to House bills 353, 354, and 355. As indicated, we will not attempt to render judgement on the merits of these bills, but rather provide some reflections with regard to these bills in light of other western state laws and programs in general. With regard to H.R. 355, most of the information we could provide in this regard was included in the letter or in the enclosed materials. However, if you have any questions regarding these materials, we would be happy to answer them. We will attempt to provide you similar reactions with regard to House bills 353 and 354.

For purposes of this coming Wednesday's discussion, we will plan to be especially prepared to answer questions with regard to the meaning of the Sporhase decision, and how various states have

Ms. Bradner
February 24, 1992
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responded to that decision. Some information in this regard was enclosed with the February 21st letter. I have also enclosed with this mailing copies of our most recent issue of "Water Intelligence Monthly." I am also enclosing a portion of an article which Mr. Johnson of our staff and Professor DuMars prepared regarding water right transfers in the West. It includes some prices for water transfers in various of our western states. You will see a broad range of prices. Please feel free to use any of the materials we have provided to you in the package for the legislators and members of the Board. I look forward to talking with you again on Wednesday afternoon.

Sincerely,



D. Craig Bell
Executive Director

Enclosures

P.S. I will probably defer to our Legal Counsel for most questions pertaining to water law. I would be happy to answer any questions about the organization itself and its purposes and functions.

WATER INTELLIGENCE MONTHLY

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TRANSACTIONS

CA: Santa Barbara Sells 4,319 af/yr of Desalted Water Under 5-Year Agreements

<i>Acquirers:</i>	<i>a) Goleta Water District and b) Montecito Water District</i>
<i>Supplier:</i>	<i>City of Santa Barbara</i>
<i>Water:</i>	<i>a) up to 3,069 af/yr and b) up to 1,250 af/yr from Santa Barbara's desalination plant</i>
<i>Purpose:</i>	<i>Municipal Use</i>
<i>Terms:</i>	<i>Both at \$1,935/af, escalated, with standby fees</i>
<i>Status:</i>	<i>Complete</i>

The City of Santa Barbara has entered into five-year agreements with the Goleta Water District and the Montecito Water District for the delivery of water from the city's desalination plant. Goleta may purchase up to 3,069 af/yr, and Montecito may purchase up to 1,250 af/yr. The districts will use the purchased water to replace water supplies lost because of the current drought.

The water will be delivered from the city's temporary emergency desalination plant currently under construction. The plant, with an initial capacity of 5,000 af/yr, is expected to begin operations in February 1992. Because the city is expected to request only 3,181 af/yr, Goleta and Montecito will begin taking deliveries at that time. An additional capacity of 2,500 af/yr will be completed in the spring, so that sufficient water will be available to meet the city's demand of 3,181 af/yr and the maximum deliveries the districts may request under the five-year agreements.

The financial terms of the city-district agreements incorporate the financial terms of the city's agreement with *Ionics, Inc.* for the construction and operation of the desalination plant. The districts must pay \$1,916/af for delivered water, the sum of a capital facilities component and a water delivery component (each component originally accounts for about half of the total). The capital facilities component amortizes, over a five-year period, the total capital cost of the plant at a 10 percent annual interest rate. The capital facilities component will be adjusted annually to reflect changes in Ionic's local property tax payments. The water delivery component will be escalated at the beginning of each contract year by 75 percent of the percentage increase in the consumer price index for urban consumers residing in the Los Angeles-Anaheim-Riverside area.

The districts are not obligated to take all water available under the agreements. During the first three years, the districts may elect to pay a "short-term standby fee" on the water not taken, designed to cover all fixed and variable portions of the costs of capital facilities, operations, maintenance and decommissioning costs associated with the plant when on short-term standby status. The fee consists of the capital facilities component (see above) and a "short-term standby component". Under the city-district agreements, the short-term standby fee is \$1,213/af for the first year of the agreement. The short-term standby fee component will be escalated at the beginning of each contract year at 100 percent of the percentage increase in the consumer price index used to escalate the water delivery fee. Following the third year of the contract, the districts may elect to pay a "long-term standby fee" on the water not taken. This fee consists of the capital facilities component (see above) and a "long-term standby component," which is escalated at the beginning of each contract year by the percentage increase in the same consumer price index.

The five-year, city-district agreements include an option to extend the agreements another five years. While the financial terms of renewal are not specified, it is expected

that contract prices may be below those in the initial agreement because the capital costs of the desalination plant will be paid. Under the city's agreement with Ionics, the city has the option to extend the term of the 5-year agreement. Last June, voters in Santa Barbara approved, by a 5-1 margin, an advisory measure that the city should develop a permanent desalination facility (WIM 7-8/91).

CA: Yuba County Water Agency Sells 157,200 af to DWR

<i>Acquirer:</i>	<i>Department of Water Resources</i>
<i>Supplier:</i>	<i>Yuba County Water Agency</i>
<i>Water:</i>	<i>Total of 157,200 af of Yuba River water stored in New Bullards Bar Reservoir</i>
<i>Purpose:</i>	<i>a) 30,000 af held in storage for next year; b) 99,200 af for State Water Bank; c) 28,000 af for California Department of Fish and Game</i>
<i>Terms:</i>	<i>a) and b) \$125/af; c) \$50/af</i>
<i>Status:</i>	<i>a) and b) complete; c) awaiting Governor's signature of AB 12</i>

The Yuba County Water Agency has sold a total of 157,200 af of water stored in its New Bullards Bar Reservoir to the Department of Water Resources (DWR). Under the agreement, Yuba County agrees to transfer to DWR a total of 129,200 af--99,200 af will be released in 1991 for the State Water Bank and 30,000 af will be banked by the agency in its reservoir on behalf of DWR for release during 1992. The agency further agrees to transfer an additional 28,000 af to the State Water Bank who, in turn, will make the water available to the Department of Fish and Game, provided Fish and Game concurs that Yuba County may apply shortages of up to 28,000 af for instream flow releases in 1992 in accordance with the shortage provisions of a 1965 Agreement on stream flow releases between Yuba County and the Department of Fish and Game.

DWR will pay Yuba County \$125/af of water transferred to the State Water Bank or stored on behalf of DWR. It will pay \$50/af for water transferred to the Department for use by Fish and Game. The completion of the financial arrangements for the acquisition for Fish and Game is pending the Governor's signature of AB 12, which would appropriate \$16.3 million for Fish and Game's efforts "to minimize the effects of the drought on fish and wildlife." Of that amount, \$7.9 million can be used for support costs for "opportunity purchases of water for rare, threatened, or endangered species and anadromous fish," \$3.0 million for support costs and \$1.0 million for capital outlays to develop and fund alternative water supplies, "including surface, groundwater, and reclaimed water entitlements, by grant, contract, transfer, or other appropriate methods of transactions."

CO: 235 CBT Units Change Hands

<i>Acquirer:</i>	<i>Ft Collins-Loveland Water District</i>
<i>Suppliers:</i>	<i>Farmers</i>
<i>Water:</i>	<i>135 CBT units</i>
<i>Purpose:</i>	<i>Municipal use</i>
<i>Terms:</i>	<i>\$1,500/unit</i>
<i>Status:</i>	<i>Complete</i>

Ft Collins-Loveland Water District has acquired 135 CBT units at \$1,500/unit from two farmers to meet future demands. Until it needs the water, the district will lease back the water for \$15/unit to the farmer who sold 130 units. The city is financing its purchases from a tap fee of \$1,700.

Acquirer: Northern Colorado Water Association
Supplier: Farmer
Water: 100 CBT units
Purpose: Long term municipal use
Terms: not available
Status: Complete

The Northern Colorado Water Association has acquired 100 CBT units from a farmer for an undisclosed price through Harrison Resource Corporation. The water will be used to meet future municipal demands.

KS: Wichita Buys 1142 af of Groundwater Rights Options

Acquirer: City of Wichita
Supplier: Farmer
Water: Options for 7 certified groundwater rights yielding 1142 af/year. 642 af from the Little Arkansas River; 500 af from the Equus Beds Aquifer
Purpose: Future municipal supply
Terms: \$400/af
Status: Complete

The City of Wichita has purchased 7 certified groundwater rights to the Equus Beds Aquifer yielding 1142 af/year under its standing offer price of \$400/af (described in WIM, 11/90). Three other suppliers who were negotiating with the city failed to reach agreement. The city will not begin using the water until 2002 and the farmer will use the water at no cost until that date.

The option is purchased for 5% of the \$400/af upon signing the agreement. The initial term is for one year but may be extended by the city for up to ten years by paying the owner annual progress payments equal to one-half of the option price (\$10/af) for the second and third year and one-quarter of the option price (\$5/af) annually from the fourth to the ninth years. Wichita can exercise its right to purchase by paying the seller the difference between the full price of \$400/af and the sum of the option and progress payments to date.

Wichita will pump the water through its existing wells. The quantity of water available for a change to municipal use has been determined by state agencies. There will be a 10% conveyance lost when the water is actually delivered to Wichita.

NV: 874 af of Rights Dedicated to Reno/Sparks & Washoe Co

Acquirers: *Cities of Reno (467 af) and Sparks (338 af) and Washoe Co (69 af)*
Suppliers: *Developers*
Water: *Water rights purchased from Sierra Pacific Resources and groundwater rights appurtenant to land owned by developers or purchased from other sources*
Purpose: *Municipal*
Terms: *Dedication in exchange for service*
Status: *Complete*

In 78 separate transactions, developers have dedicated rights to 874 af of water to the cities of Reno and Sparks and Washoe County in exchange for water service. Sierra Pacific Resources water rights were purchased at the standard price of \$2,600/af. The remaining rights were appurtenant to the developed land or were already owned by the developers.

TX: Bexar MWD Buys 'Excess' Irrigation Water from Lakes

Acquirer: *Bexar Metropolitan Water District*
Supplier: *Bexar-Medina-Atascosa Counties Water Control and Improvement District No.1*
Water: *Up to 26,000 af/year surface water from Medina, Diversion and Chicon Lakes for 20 years*
Purpose: *Municipal use*
Terms: *\$56/af for first two years plus pro-rated share of watermaster's fees. Seller has right to adjust price after two years*
Status: *Subject to approval of Texas Water Commission*

Bexar Metropolitan Water District (MWD) has purchased for 20 years 'excess' irrigation water owned by the Bexar-Medina-Atascosa Counties Water Control and Improvement District No.1 for \$56/af plus its pro-rated share of the watermaster's fees. Bexar-Medina owns rights to 66,000 af/year of surface water from Medina, Diversion, and Chicon Lakes. Its average annual use over the past 50 years has been only 40,000 af/year.

The excess water is defined as water remaining from Bexar-Medina's 66,000 af/year rights that is 1) not already adjudicated to Bexar-Medina's landowners (they have approximately 2 af per acre of land), and water needed to meet Springhill Water Management District's request for 5,000 af/year. The level of 'excess' water is determined 'in good faith' each month by the seller. The buyer must pay for the full amount declared surplus whether or not it is actually taken. If the MWD sells any of the water at a price above what it is paying Bexar-Medina, the purchase price will be adjusted upward by 50% of the price difference. After two years, the contract price can be adjusted reflecting any increases in the seller's costs.

The MWD serves a population of about 100,000 people utilizing about 15,000 af/year--mostly groundwater from the Edwards Aquifer. Because the Aquifer is seriously overdrawn, the District has been seeking alternative supplies. It will have to construct a conveyance system to take delivery of the water.

TX: Union Water Supply Co Leases up to 250 af of Rio Grande Surface Water

Acquirer:	Up to 250 af Rio Grande surface water	
Supplier:	Municipal use	
Water:	\$3,750 or \$15/af	District
Purpose:	Up to 250 af Rio Grande surface water	
Terms:	Municipal use	
Status:	\$3,750 or \$15/af	
	Complete	

Union Water Supply Corporation has purchased up to 250 af of Rio Grande surface water for one year for \$15/af from Brownsville Irrigation and Drainage District. The water the District is selling was conserved when the District replaced canals with underground pipes. The water will be diverted from the Rio Grande into elevated supply tanks, and from these to the towns of Garciasville, La Porta, La Casita, and Santa Cruz, served by Union Water. Union Water will pay the full \$3,750 whether or not it takes delivery of the full 250 af.

FEDERAL ACTIONS

Senate Hearings on Western Water Policy Review Act

On September 19, the Water and Power Subcommittee of the Senate Energy and Natural Resources Committee held hearings on the *Western Water Policy Review Act of 1991* (S. 1228). Introduced on June 6 by Senator Hatfield (R-OR), the bill would direct the Secretary of Interior "to undertake a comprehensive review of Federal activities in the nineteen Western States which directly or indirectly affect the allocation and use of water resources, whether surface or subsurface." Within five years of enactment of the act, the Secretary must submit findings and recommendations to the President, the President of the Senate, and the Speaker of the House. In conducting the review, the Interior Secretary is directed to consult with the "Western Water River Commission," which would include fourteen members (the ranking majority and minority members of the Senate Committees on Energy and Natural Resources and Appropriations and the House Committees on Appropriations and Interior and Insular Affairs, and six persons appointed by the President).

The Commission shall: 1) review present and anticipated national water problems affecting the nineteen western states (reclamation states plus Alaska and Hawaii), and identify alternative ways to meet requirements—including efficient use of existing supplies and innovations to encourage the highest economic use of water; 2) examine current federal programs and recommend whether they should be continued, reorganized, or consolidated; 3) review the need for additional storage; 4) review the effectiveness of institutional arrangements, including interstate water compacts, federal-state regional corporations, municipal and irrigation districts, and the authorities of BuRec under reclamation law; 5) review legal regimes governing the development and use of water, the respective role of both the Federal government and the states, and various doctrines of federal reserved water rights (including Indian water rights and the public trust doctrine); 6) review the activities, authorities, and responsibilities of the various federal agencies with direct water management responsibilities, including the Federal Energy Regulatory Commission.

The bill would authorize appropriations up to \$18 million. Governors of each State may designate a representative to work closely with the Commission and its staff. The

Commission, at its discretion, may also invite "appropriate public or private interest groups" to work closely with the Commission and its staff.

Testimony at the hearing evidenced a consensus that the scope of the policy review should be national. Some witnesses urged that the membership on the Commission should be expanded to include states and Indian tribes. Within the next three weeks, the bill is expected to be marked-up in the Energy and Natural Resources Committee to make the bill national in focus. The main outstanding issues are the length of the study and the budget.

STATE POLICY ACTIONS

CA: Legislature Passes Bill That Creates Markets for Desalted Water

On the eve of adjournment, the Legislature passed the *Desalination for Assured Water Policy Act* (AB 2111), a bill sponsored by Assemblyman Polanco (D-55) to 1) facilitate public-private partnerships to develop desalination facilities; 2) provide opportunities for scientific advances in desalination technology; and 3) establish a marketing and distribution system for desalted water. Under the bill, local water agencies are required to purchase desalted water from owners or operators of "qualifying facilities" at the "actual cost" of obtaining new, additional supplies of water from other sources. Purchases mandated by the act would be conducted under a three-step procedure.

First, owners or operators of a desalination facility may request a local water agency to determine the "actual cost" of providing new, additional supplies of water. The bill defines actual cost to include:

- 1) the costs which the agency would otherwise incur in developing new supplies of comparable quality and quantities to those offered by the desalination facility;
- 2) the full incremental cost to the local agency of procuring or developing new water supplies which would be delivered as reliably as the water from the desalination facility.

The owners or operators of the desalination facility must pay a fee to the local agency at the time they submit their request. The fee shall be sufficient for the agency to calculate the "actual cost."

After the calculation of actual cost, the owners or operators may request that the local agency designate the facility as a "qualifying water facility". A "qualifying facility" is a desalination facility which is owned or operated by a private or not-for-profit entity, reduces the concentration of dissolved solids and mineral compounds in surface, underground, or seawater (making the water suitable for normal uses of the agency's customers), and has a desalination capacity of at least 400,000 gallons per day.

Following both the designation as a qualified facility and construction of the desalination facility, the owners or operators may request the local agency to issue an order which includes the following requirements:

- 1) the physical connection of the facility to the local agency's treatment and transmission facilities;
- 2) the purchase by the local agency of water desalted and supplied by the qualifying facility;
- 3) necessary action to make effective the above physical connections (e.g. connections ineffective due to inadequate size, poor maintenance, physical or mechanical unreliability);
- 4) the sale of water, or the exchange of water with another local agency as may be necessary to connect the desalination facility to the agency's treatment and transmission facilities.

The agency shall issue the order if deliveries from the desalination facility:

- 1) will improve or equal the quality and reliability of water for the agency's customers;
- 2) will reduce the likelihood that any local agency, which has imposed mandatory rationing for more than 90 days during the previous ten years, will experience future shortages;
- 3) will not result in uncompensated financial losses for the local agency;
- 4) will not impair the local agency's ability to deliver potable water to its customers;
- 5) will not exceed the amount of water purchased by the agency's customers;
- 6) will not cause the agency to discontinue, in whole or in part, an existing supply source which provides water at a cost lower than the price paid for desalted water.

No agency may be required to purchase water if, as a result of the purchase, desalinated water would contribute more than 8 percent of the amount of water which the agency delivered to its customers during the previous year. Prior to issuing the order, the local agency shall provide opportunities for public comment. The term of the order shall be 10 years for facilities capable of supplying up to 20 million gallons per day (gpd), and 20 years for facilities with capacities above 20 million gpd.

Any order will be terminated if a qualifying facility is not capable of providing desalted water to the agency within the following periods: two years for facilities with capacity below 10 million gpd; four years for facilities with capacities between 10 million gpd and 20 million gpd; and six years for facilities with capacities above 20 million gpd.

Governor Wilson has until October 14 to sign or veto the bill, which was strenuously opposed by the Metropolitan Water District.

NV: Status Conference Held on Las Vegas's Application

On September 17, the State Engineer held a status meeting with interested parties to review the progress of preparations for the September 1992 public hearing on the application by the Las Vegas Valley Water District (LVVWD) to appropriate ground and surface waters in Clark, Lincoln, White Pine, and Nye Counties. LVVWD, the counties, and the State Engineer agreed to participate in defining the scope of study for an analysis of the district's project. (After an August interim ruling--described below--LVVWD agreed to work with federal agencies on a computer model that would estimate the hydrologic impact of the planned appropriations.) The State Engineer also gave the counties 60 days to decide how they wish to proceed with the 25 applications (totalling 53,500 af/year) that LVVWD had conveyed, without compensation, to them last April. The State Engineer also declined a request by Nye County that LVVWD be ordered to do an environmental impact statement--LVVWD has agreed to retain the environmental consultant for the project. Finally, LVVWD offered to establish a Regional Conservancy Board which would include the rural counties.

The status meeting was held less than a month after an Interim Ruling issued by the State Engineer on August 26. The State Engineer ordered LVVWD to supply rural counties with "all relevant information which will be the basis for the applicant's evidence and testimony." He also granted, in part, a motion filed by the United States on January 28, 1991, requesting a 18 month delay in the hearings so that studies may be conducted to determine the overall impact of the project. He set a September 1992 date for evidentiary hearings, "giving the United States 18 months to conduct the studies and 60 days for the applicant to avail itself of the results."

Finally, the State Engineer's interim ruling rejected a challenge by LVVWD to the standing of many protestants to its applications. The district argued that protestants have no standing unless they hold an existing water right in the proposed source of supply which has been fully appropriated, or one of the applicant's applications would conflict with their existing rights, or they have the legal capacity to sue to vindicate the public interest. The State Engineer concluded that Nevada law allows "virtually any existing water right holder, member of the public, or governmental entity who has timely protested an application to be heard on its concerns."

LVVWD plans to acquire rights to 250,000 af/year (185,000 af/year of ground water and 65,000 af/year of surface water from the Virgin River) to satisfy projected population growth to the year 2050. LVVWD estimates the project will cost \$1.9 billion over 30 years. Under Nevada law, the State Engineer evaluates an application to appropriate unappropriated ground water on 1) whether the water may be pumped and still maintain safe yield in the basin, 2) whether increased pumping will harm existing users, and 3) whether increased pumping will be detrimental to the public interest.

Another status conference will be held in February 1992. The public hearing process will proceed in three steps: the September 1992 hearing will address the entire project, a separate hearing will then be held on the Virgin River applications, followed by hearings in rural counties. For more background, see WIM (4/91, 4/90).

WATER QUALITY & THE ENVIRONMENT

CO: State Engineer Proposes Rules to Implement Senate Bill 181

In October, the Office of the State Engineer (SEO) will hold hearings on Proposed Rules and Regulations for the Implementation of Senate Bill 181. Passed in 1989, the bill requires SEO to implement water quality standards and classifications promulgated by the Water Quality Control Commission in those instances where SEO has water quality authority. Under Colorado law, the Commission adopts standards and classifications for ground and surface water (it classifies water according to beneficial uses--public water supply, agricultural, industrial--then sets standards for concentrations of various organic, inorganic, and bacteriological parameters suitable for classified uses). SEO is responsible for implementing standards for discharges other than point source discharges into surface water, regulates the drilling and construction of wells to assure that ground water is not contaminated, and has jurisdiction over substitute supply plans, augmentation plans, and exchanges.

The Proposed Rules and Regulations address three major areas: discharges to ground water, nondecreed exchanges and substitute supply plans, and decreed exchanges and augmentation plans. According to Rule 3.6, "nothing in these rules shall be construed, enforced, or applied so as to cause or result in material injury to water rights."

Discharges to Ground Water (Rule 5): The SEO relies on the promulgation of the Board of Examiners of Water Well Construction and Pump Installation Contractors Rules and Regulations to ensure that well permitting and licensing (a) does not result in a discharge to state water, and (b) contaminate or pollute aquifers. For other activities which may result in discharges to ground water, "the point of compliance shall be located at the boundary of the area of the spreading basin or the area physically disturbed by the construction of the pit or excavation."

Nondecreed Exchanges and Substitute Supply Plans (Rule 6): Water offered under nondecreed exchanges and substitute supply plans shall be of a quality to meet the requirements of use to which the senior appropriation has normally been put. Analysis and

evaluation by the SEO may consider, among other factors, any appropriate water quality standards and/or classifications established by the Water Quality Control Commission for the use which is appropriate for the senior appropriator. Evaluation of water quality data of the substitute supply will be at or near the point where replacement water enters the waterway or aquifer.

Decreed Exchanges and Augmentation Plans (Rule 7): The SEO may oppose applications to a water court for augmentation plans, including exchanges, in which any substituted water may not meet the water requirements of the senior appropriator. Analysis and evaluation by the SEO may consider the same factors of nondecreed exchanges and substitute supply plans--e.g. appropriate water quality standards and/or classifications established by the Water Quality Control Commission. Similarly, evaluation of water quality data of the substitute supply will be at or near the point where replacement water enters the waterway or aquifer.

Under Rule 8, the SEO may grant, upon written request, variances to the rules. The applicant must show that the requested variance will comply with the intent of the rules to protect the public health, safety, health and environment, and prevent the waste or contamination of surface water and ground water, without material injury to water rights.

ID: State Ground Water Quality Plan Nears Completion

In mid-October, the Ground Water Council will undertake final revisions of the *Idaho Ground Water Quality Plan*, which is designed to protect and maintain the quality of Idaho's ground water. Required by the Ground Water Protection Act of 1989, the goals of the plan include:

- 1) maintain the existing high quality of the state's ground water to satisfy existing and future beneficial uses;
- 2) restore the quality of contaminated ground water where feasible and appropriate;
- 3) prevent contamination of ground water from point and nonpoint sources of contamination to the maximum extent possible;
- 4) provide direction for appropriate clean up of contaminated ground water;
- 5) investigate ground water quality;
- 6) develop ground water monitoring programs;
- 7) prevent ground water contamination from agricultural activities.

The Plan has three sections -- general ground water, monitoring, and agricultural chemicals.

The general ground water section includes:

- a) *contamination prevention program*: developing Best Management Practices for major land uses improving existing prevention programs, and developing a well-head protection program;
- b) *remediation program*: determining when to clean up, how, and to what level, and who is responsible (specific regulations will be developed by Division of Environmental Quality);
- c) *aquifer categorization for protection*: specifying three levels of protection according to present water quality, the aquifer's vulnerability to contamination, and existing and future beneficial uses

The prevention program is an important part of the Plan because it entails lower financial and social costs than the clean up of contaminated ground water.

The monitoring section provides for the development of programs to assess current state ground water quality and localized problem areas. The Department of Water Re-

sources is currently developing a statewide monitoring network. The Plan would require the Division of Environmental Quality to monitor known areas of contamination to determine both the source of contamination problems and the best solutions.

Under the guidance of the Idaho Department of Agriculture, the agricultural chemicals section focuses on the prevention of agricultural activities that reduce ground water quality. The Plan relies on the use Best Management Practices for agricultural activities, including field use of pesticides and fertilizers, agricultural waste disposal, and irrigation water management.

Public comments on the plan were received during meetings held in July and August. The Council will respond to the comments and make final revisions to the Plan in two sets of meetings scheduled to be held on October 17-18 and November 13-14. The governor-appointed Council includes 22-members representing industry, the general public, environmental groups, and local governments.

The final Plan will be submitted to the Legislature for ratification when it reconvenes in January. Legislative action will include legislation for ratification, providing local authorities with any new powers necessary to implement the Plan, and funding for overall implementation as well as specific programs undertaken by the Division of Environmental Quality, the Department of Water Resources, and the Department of Agriculture.

BRIEFLY NOTED

Federal

The U.S. Fish and Wildlife Service has listed the Delta Smelt as "threatened" under the Endangered Species Act. Fish and Wildlife Service biologists had recommended that the fish be listed as "endangered." * * * The Senate Energy and Natural Resources Committee has passed by an unanimous vote the *Reclamation States Relief Act of 1991* (H.R. 355). For background on H.R. 355, see WIM 4/91. * * * The same committee has yet to act on The *Omnibus Reclamation Bill* (H.R. 429), passed by the House on June 20. * * * In testimony before the House Interior Subcommittee, the Director of the Bureau of Land Management (Cy Jamison) urged Congress to pass H.R. 3066, the *California Public Lands Wilderness Act*. The bill calls for wilderness preservation of 2.3 million acres of BLM lands, and the placement under management of another 4.8 million acres.

Around the States

Arizona: The Salt River Project has announced an improvement program for the Roosevelt Dam which will provide for more water storage and improved spillway and diversion facilities for dam safety. Once construction is completed in 1995, water conservation capacity will be increased to 1.6 million af from the current 1.3 million af capacity, and an additional 1.8 million af of storage will be available for flood control. During construction, water normally stored in Roosevelt Lake above the 75-percent capacity limit will be released into the Salt River, which will translate into a loss of 340,000 af of water storage capacity.

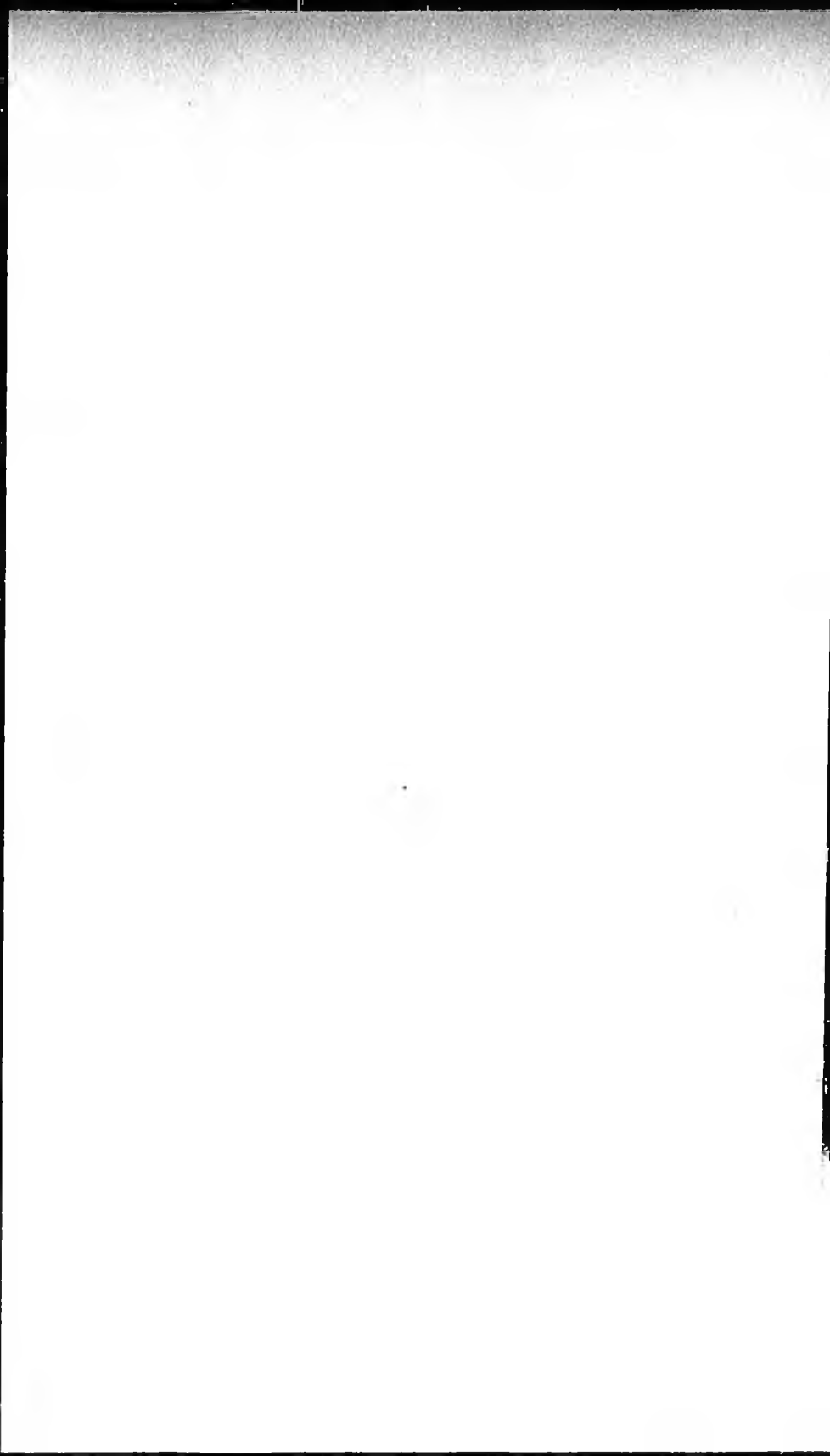
California: The State Water Project ended the 1990-91 water year with 2.4 million af in storage, almost 0.6 million af above the amount in storage at the end of the 1989-90 water year. * * * At a three-day retreat, the Board of the Metropolitan Water District endorsed, in concept, increased reliance on voluntary water transfers to meet water demands in its service area, increased sensitivity to environmental concerns, and substantial increases in water rates and taxes to replace financial reserves depleted by the drought and

to finance the district's \$8 billion capital plan. Resolutions incorporating major shifts in MWD policy are expected to be passed in future months. * * * The Board of Directors of the Marin Municipal Water District have placed an \$80 million bond measure on the November 1991 ballot to approve funding of a plan to import up to an additional 10,000 af of water annually from the Russian River.

Kansas: Kansas State University has begun a study of the economic impact of water table stabilization on Northwest Kansas. The study is part of the assessment of policy options for the Northwest Kansas Groundwater Management District.

Oregon: The Water Resources Commission has approved the McKay and Umatilla River Water Management Plan.

Pacific Northwest: The Northwest Power Planning Council is reviewing some 125 proposals submitted by state and federal fish and wildlife agencies, Indian tribes, utilities, and citizens to aid the recovery of depleted salmon stocks. Among them include a proposal for experimental drawdown of reservoirs behind hydro-dams on the lower Snake River in 1992 to improve the survival of young salmon and steelhead migrating to the Pacific Ocean.



for the use and benefit of the public"¹¹⁰ and provides for state ownership of reservoirs in situations necessary to achieve optimum reservoir development.¹¹¹ This provision, in addition to the state's police powers, the wide variety of purposes recognized as beneficial uses under state water law, and the protection of instream uses, fish and wildlife habitat, and bays and estuaries, suggests to some state officials that the public trust doctrine may have a life of its own related to water resource allocation outside the Texas Water Code and Constitution.

As further attempts are made to employ the public trust doctrine to satisfy competing demands for water resources, the interpretation and implementation of the doctrine will undoubtedly be modified in different ways from state to state. One important issue which is not yet resolved is the question of compensation for appropriative rights which are modified or taken. A minority view may be that such rights are inherently subject to modification. The majority view, indeed what some would call the settled law in the West, is that because vested water rights are constitutionally protected property interests they are not subject to modification unless expressly conditioned. Yet the application of the public trust doctrine in its purest form to rescind or modify a vested water right would be a noncompensable taking, akin to a "taking" under the navigation servitude. The theory is that no compensable taking occurs because the holder of the right could never have possessed a property interest contrary to the public trust. Many observers find this objectionable. Even some proponents of applying the public trust doctrine to modify or, as necessary, rescind vested water rights see the result as equitable only if those who lose such rights, or a portion of them, receive payment for them. Others may question the need for application of the public trust doctrine outside a system of water allocation which they believe presently protects trust uses.

WATER RIGHT TRANSFERS

The "reallocation" of appropriated water by transfer of water rights is another method of promoting public interest values as well as meeting new water demands. The use of this method varies from state to state in the West. A transfer refers to the conveyance of a water right from one water user to another or to a change in the location or type of use by the holder of an appropriative water right. The transferability of appropriative water rights promotes the public interest by allowing established uses to change in accordance with changing needs and values. This characteristic

110. TEX. CONST. art III, § 49d (Supp. 1989).

111. *Id.*

of appropriative water rights was recognized early in the development of appropriative water law.¹¹² As the appropriation doctrine has developed, some states have acted to facilitate the transfer process through legal and administrative means.

In 1859, the California Supreme Court recognized the right to use water under the appropriation doctrine as "substantive and valuable property."¹¹³ That court also said:

Under the law of this state as established at the beginning, the water-right which a person gains by diversion from a stream for a beneficial use is a private right, a right subject to ownership and disposition by him, as in the case of other private property. All the decisions recognize it as such.¹¹⁴

An important treatise on western water law simply concludes, "the basic right of ownership and divestiture of ownership [of appropriative water rights] was so well established in the early development of the appropriation doctrine in the West, and so consistently confirmed, as to be axiomatic."¹¹⁵

Before an appropriative water right may be transferred, certain criteria must be met. First, the right must be vested, that is, all requirements entitling the applicant to the use of the water must be fulfilled. Second, the parties must intend that the transfer take place. Third, the transfer must not detrimentally affect other water users. This requirement stems from the interrelated nature of the rights to use water on any water course. Fourth, a "change application," or its equivalent, must be filed with and approved by a state administrative body or a water court. This gives the administrative agency or court the opportunity to notify other parties which may be affected by the transfer and to rule on whether the transfer should be approved. Affected parties may protest the transfer if they believe it will harm their rights. After a time period for objections, the transfer is either approved by the state agency or court, or further hearings or proceedings are held. Complex transfers, with the potential to adversely affect many vested rights, can be costly and time consuming. More routine transfers are part of "business as usual" in many states.¹¹⁶

112. See *Thayer v. California Dev. Co.*, 164 Cal. 117, 128 Pac. 21 (1912).

113. *McDonald v. Bear River & Auburn Water & Mineral Co.*, 13 Cal. 220, 232 (1859).

114. *Thayer v. California Dev. Co.*, *supra* note 112, at 164 Cal. 125.

115. I. W. HUTCHINS, *supra* note 3, at 468.

116. See K. HICKINSON & J. BARNETT, *WATER RIGHTS AND THEIR TRANSFER IN THE WESTERN UNITED STATES—A REPORT TO THE CONSERVATION FOUNDATION* (1984). This report indicates that in 1982 (the final year for which information is included) more than 100 transfer applications were filed in California, Colorado, Idaho, Kansas, Montana, Nevada, Oregon, and Utah. *Id.* at 8.

In 1986, the Western States Water Council surveyed its members requesting information on water right transfer activity.¹¹⁷ While the specific state laws relating to transfer vary, the following generalizations can be made. In virtually every western state, appropriative water rights may be severed from the land to which they are appurtenant and transferred. Changes in point of diversion, place, or nature of use, or other changes with the potential to affect the rights of other users, require state agency or court approval. A simple change in ownership of a water right usually requires no such approval. The time required to approve a transfer ranges from 30 days to more than one year, with an average of 60 to 90 days. Most states charge fees to process transfer applications. They range from \$10 to \$150, with an average fee of about \$50. In a few states the fee depends on the volume of the transferred right. In all states the cost associated with contested transfers can be significant. In all states, injury to other vested water rights must be considered in determining whether to approve a transfer application. In most of the states "public interest" factors (variously defined) must also be considered. Most states allow temporary transfer, or water leasing. Usually historic consumptive use determines the quantity of water which may be transferred. Most states allow out-of-state transfers, and most recognize instream flows as a beneficial use to which water may be transferred.

Prices paid for an acre-foot or other measured unit of a transferred or conveyed water right vary drastically depending on the location of the water, supply and demand in the area, the use to which the water will be put, the priority date of the right, and other factors. Reported prices in the council's survey range from a low of \$30 per acre-foot for a sale which occurred in Utah to a high of \$12,500 per acre-foot for a sale in New Mexico. The most drastic range in a state was \$300 to \$10,000 per acre-foot which was reported by Nevada.

The annual number of transfers also varies greatly from state to state. In North Dakota new appropriations are apparently available to meet all water needs. While state law provides for the transfer of appropriative water rights, very few occur. Alaska, Nebraska, and South Dakota also reported a paucity of transfers and no sales or purchases of water rights. At the other extreme, water rights are bought and sold frequently in other states. Colorado, Idaho, Nevada, New Mexico, Utah, Washington, and Wyoming reported that 50 or more transfers occur annually. Colorado, Nevada, and Utah reported that more than 300 transfers occur each year.

The monthly periodical *Water Market Update*, which began publication

117. A matrix summarizing the results of this survey was published as an appendix to *WATER EFFICIENCY TASK FORCE, REPORT TO THE WESTERN GOVERNOR'S ASS'N, WESTERN WATER: TUNING THE SYSTEM* (B. Driver ed. 1986).

in January 1987, reports on business activities and transactions in the water markets of the western states. A sampling of the news reported in the January 1989 issue, reviewing information for 1988, gives an idea of trends in water marketing in the West. For example, while the drought in many western states contributed to marketing pressures, prices for water rights generally remained steady through the year. Interest in western water rights by institutional investors increased sharply. Environmental activists, state departments of game and fish, sportsmen's clubs, and others who desired to protect instream habitat, used water markets and water transfers together with other strategies to meet their goals. Controversy surrounding the protection of rural communities from indiscriminate water transfer activity and the ability of Indian tribes to market their water rights off-reservation continued.¹¹⁸

Prices paid per acre-foot of permanent water right ranged from a low of \$15 per acre-foot for certain sales in Idaho, to more than \$4,000 per acre-foot in the Denver, Colorado area. In the Reno, Nevada area a number of senior rights on formerly irrigated land that has been urbanized were sold for \$2,000 per acre-foot. Along the Colorado Front Range many Colorado-Big Thompson project water rights were marketed within the district at prices ranging from \$1,000 to \$3,000. Water immediately south of the district sold for three to four times that amount. Irrigation rights transferred to municipal and domestic use along the lower Rio Grande in southern Texas brought prices between \$400 and \$600. Marketing of groundwater rights in the Tucson and Phoenix, Arizona, area continued to be active, with prices ranging from \$700 to \$1,000 per acre-foot. Albuquerque, New Mexico maintained its program of purchasing water rights for future growth needs. The average price paid by the city was \$1,000 per acre-foot of water.¹¹⁹

These brief examples, culled from many listed in the *Water Market Update*, are not necessarily representative of market conditions in any state or area. They are included to illustrate the activity in various western water markets. Indeed, publication of this monthly periodical indicates strong interest in such activity. Two other periodicals have performed functions similar to those of the *Water Market Update*. *Water Strategist*¹²⁰ focuses on water marketing, finance, legislation, and litigation in the West. *Water Exchange Information Service*¹²¹ provides detailed information on water rights for sale in Colorado.

Measures have been taken in some states to facilitate the marketing of water rights. In Idaho, for example, farmers began in the 1930s to "de-

118. 3 WATER MARKET UPDATE, Jan. 1989, at 1.

119. *Id.* at 2-4.

120. See WATER STRATEGIST, Apr. 1987.

121. See WATER EXCHANGE INFORMATION SERVICE, Apr. 1987.

posit" water allocated to them in federal reservoirs in the Upper Snake River to be "withdrawn" by other farmers. These "deposits" and "withdrawals" were made on a yearly basis using lease agreements. Because questions arose about the continued beneficial use of water deposited every year, in 1979 the Idaho Legislature formalized the activity by creating a "waterbank" for marketing purposes.¹²² The bank is operated by the Idaho Water Resources Board, which can appoint local committees to oversee the rental of stored water. The bank was created to:

Provide a source of adequate water supplies to benefit new and supplemental water uses, and provide a source of funding for improving water user facilities and efficiencies.¹²³

The principal recent use of the bank has been by the local committee in the Upper Snake River Basin where farmers with entitlements to Bureau of Reclamation water have made "deposits" and the Idaho Power Company has made "withdrawals" and used water to produce electricity. Both parties benefit since the farmers are paid for water they do not need, and the Power Company obtains water to increase its production of electricity, saving its rate payers money. A water banking program also functions in Kern County, California.

In Colorado, where water is marketed statewide, a particularly active market exists in the Northern Colorado Water Conservancy District where water rights from the Colorado-Big Thompson Project are actively bought and sold. Market transactions have been simplified by assignment of individual water shares to members of the district. A periodic auction of such shares further facilitates their purchase. A number of real estate professionals in the district specialize in water right transactions. Active trading of water rights also occurs within mutual irrigation districts in Utah and other western states.

The California Water Code has clear statements of policy and procedure encouraging water right transfers. A portion of the Code reads:

It is hereby declared to be the established policy of this State to facilitate the voluntary transfer of water and water rights where consistent with the public welfare of the place of export and the place of import. The Legislature hereby directs the Department of Water Resources, the State Water Resources Control Board, and all other appropriate state agencies to encourage voluntary transfers of water and water rights, including, but not limited to, providing technical assistance to persons to identify and implement water conservation measures which will make additional water available for transfer.¹²⁴

122. See IDAHO CODE § 42-1761 (Supp. 1988).

123. *Id.*

124. CAL. WATER CODE § 109 (West 1971).

California recently enacted a law requiring the State Department of Water Resources (DWR) to establish a program to facilitate the voluntary exchange of water rights and to report to the legislature legal and procedural changes which could be made to facilitate water marketing. Also, DWR must prepare a "water transfer guide" and create and maintain a periodically updated list of entities seeking to enter into water transfers, leases, or exchanges.¹²⁵

In 1986 Idaho enacted legislative changes to streamline water marketing activities.¹²⁶ Minor modifications were made to various statutes to simplify the transfer process and to ensure that those who need to acquire water do so through appropriate state procedures. Other states are considering legislative changes which would facilitate transfer activity.

INTERSTATE SALE AND LEASE OF WATER

Intrastate water transfers have occurred under the appropriation doctrine almost since its inception. Statutes and administrative regulations governing transfers have evolved in each state and are still gradually changing. Legal and administrative procedures related to intrastate transfers also evolved through time. Recent developments, however, have required significant changes in some state laws.

Justice Marshall, in *Wilson v. Blackbird Creek Marsh Co.*,¹²⁷ suggested the states have plenary power to regulate water resources within state boundaries. Justice Holmes, in *Hudson Water Co. v. McCarter*,¹²⁸ was even more emphatic in holding that a state plainly had the right to control the water resources exclusively within its boundaries. Both of these cases, however, occurred in the East where the riparian doctrine applied and water was part of the land it abutted.

A western state's right to control water supplies is based on two doctrines. The first was enunciated in the Desert Lands Act of 1877¹²⁹ which made it clear that the state had the right to control waters on the federal public domain. The second was the doctrine of equitable apportionment, which provides that when two states share the surface flows of a stream the states have the power to compact for the use of that water.¹³⁰ If they fail to do so, the Supreme Court gives each state a portion of the stream for its exclusive use.¹³¹ Finally, based on these concepts, numerous west-

125. *Id.*, §§ 470-483 (West 1989).

126. Ch. 313, 1986 Idaho Sess. Laws, 763.

127. 27 U.S. (2 Pet.) 245 (1829).

128. 209 U.S. 349 (1908).

129. 43 U.S.C. §§ 321-339 (1983); See discussion in *California-Oregon Power Co. v. Beaver Portland Cement Co.*, 295 U.S. 142 (1935).

130. See, e.g., Upper Colorado River Basin Compact, ch. 48, 63 Stat. 31 (1949).

131. See e.g., *Kansas v. Colorado*, 206 U.S. 46 (1907).