

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

ACTIVITIES OF THE ALASKA DISTRICT,  
WATER RESOURCES DIVISION, U.S. GEOLOGICAL SURVEY, 1984  
Compiled by Elisabeth F. Snyder

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U. S. GEOLOGICAL SURVEY

Open-File Report 84-246

Activities conducted in cooperation with:  
Alaska Department of Natural Resources  
    Division of Geological and Geophysical Surveys (DGGS)  
    Division of Land and Water Management (DLWM)  
Alaska Department of Environmental Conservation  
Alaska Department of Fish and Game  
Alaska Department of Transportation and Public Facilities  
Alaska Power Authority  
National Park Service  
U. S. Bureau of Land Management  
U. S. Forest Service  
U. S. Air Force  
U. S. Department of the Army, Corps of Engineers  
Municipality of Anchorage  
Fairbanks North Star Borough  
City and Borough of Juneau  
Kenai Peninsula Borough  
Matanuska-Susitna Borough  
City of Sand Point  
City and Borough of Sitka

Anchorage, Alaska  
1984

UNITED STATES DEPARTMENT OF THE INTERIOR

WILLIAM P. CLARK, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

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For additional information  
write to:

District Chief  
U.S. Geological Survey  
Water Resources Division  
1515 East 13th Avenue  
Anchorage, Alaska 99501

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Compiled by Elisabeth F. Snyder

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INTRODUCTION

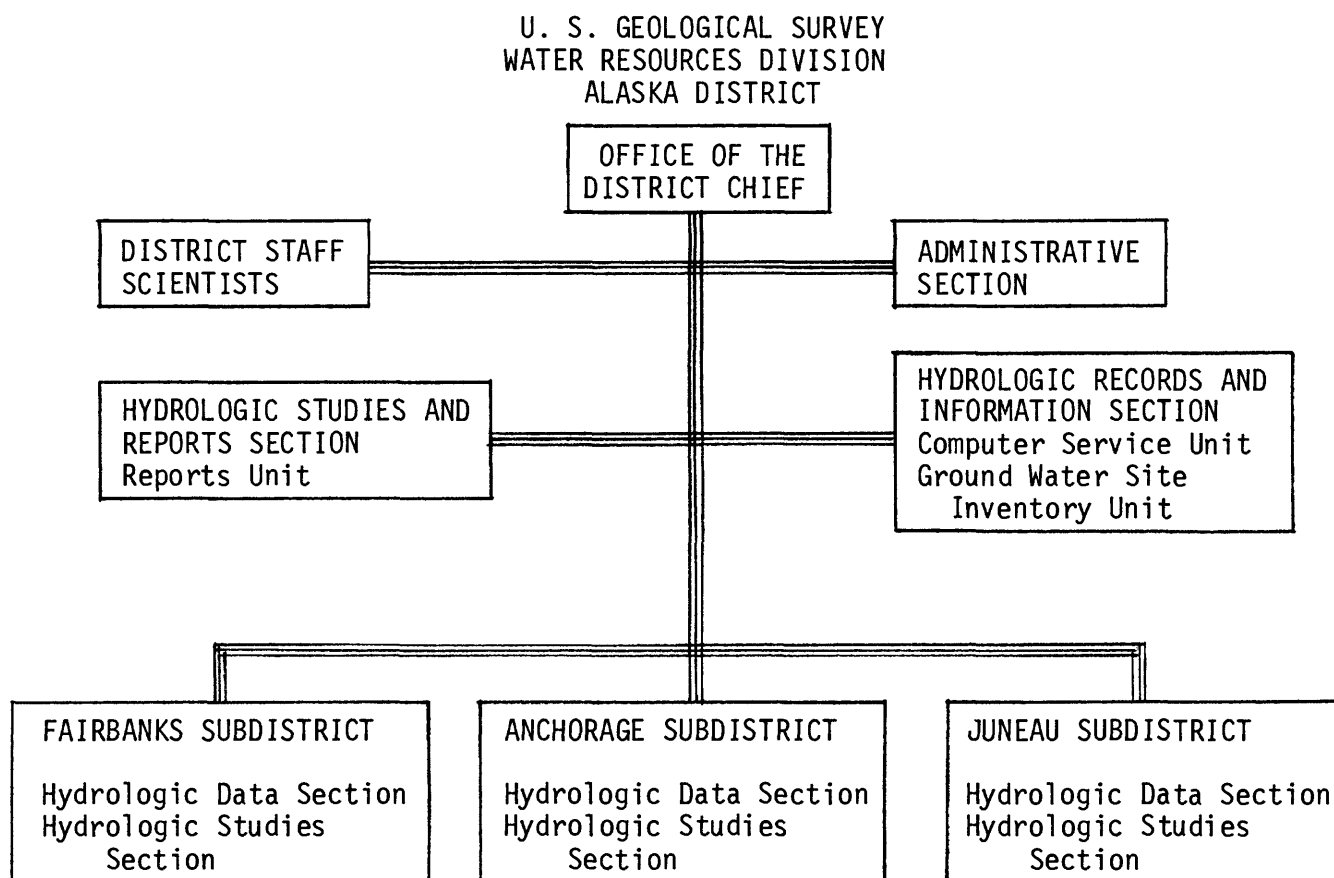
The overall mission of the U. S. Geological Survey's Water Resources Division is to provide the hydrologic information and understanding needed for the best use and management of the Nation's water resources. For more than 85 years, the U. S. Geological Survey has studied the occurrence, quantity, quality, distribution, and movement of the surface and underground water that composes the Nation's water resources. As the principal Federal water-data agency, the Geological Survey collects and disseminates about 70 percent of the water data currently being used by numerous State, local, private, and other Federal agencies to develop and manage our water resources. This nationwide program, which is carried out through the Water Resources Division's 43 District offices and 4 Regional offices, includes the collection, analysis, and dissemination of hydrologic data and water-use information, areal resource appraisals and other interpretive studies, and research projects. Much of this work is a cooperative effort in which planning and financial support are shared by state and local governments and other Federal agencies.

Activities

The Water Resources Division's activities in Alaska are divided into three broad categories. One category is hydrologic data collection to provide information about hydrologic characteristics essential to planning and carrying out hydrologic appraisals and/or hydrologic research. In 1984 this type of work constitutes the major part of the Division's efforts in Alaska. A second category is hydrologic appraisals. This includes: analyses of conditions in hydrologic basins; studies of areas likely to be or being affected by mineral, energy, fisheries, coastal zone, or urban development; studies of water resources in urban areas; and investigations of potential hydrologic hazards. The third category is basic and applied research in hydrologic topics unique to cold climates. Subjects being studied include surface and ground water, water quality, instrumentation, glaciers, snow and ice, ice dynamics, and limnology.

The Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys (ADNR-DGGS) and the U. S. Geological Survey, Water Resources Division (USGS-WRD) have developed a Statewide program for water-data collection and hydrologic studies called AWARE (Alaska Water Resources Evaluation). This program is documented in a "5-Year Plan", updated annually by USGS and DGGS in consultation with Federal, State, and local agencies. The purpose of this plan is to fulfill the data and information needs of all Alaska water users.

## Organization



Inquiries regarding projects described in this report may be directed to the District Office or Subdistrict Office in which the work originated.

District Office	(907)271-4138	District Chief 1515 East 13th Avenue Anchorage, AK 99501
Anchorage Subdistrict Office	(907)271-4153	Subdistrict Chief 1209 Orca Street Anchorage, AK 99501
Fairbanks Subdistrict Office	(907)456-0214	Subdistrict Chief 101 12th Ave., Box 11 Fairbanks, AK 99701
Juneau Subdistrict Office	(907)586-7216	Subdistrict Chief P.O. Box 1508 Juneau, AK 99802

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## SURFACE WATER STATIONS

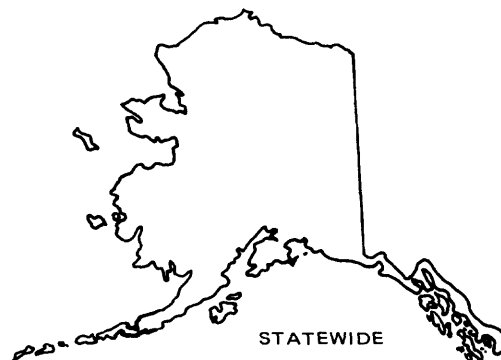
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Period of project:

Continuous since July 1948

Chief:

Robert D. Lamke  
District Office



Funding:

USGS; Alaska Departments of Natural Resources (DGGs), Fish and Game, Environmental Conservation, Transportation and Public Facilities; U.S. Army Corps of Engineers; U.S. Forest Service; Alaska Power Authority; Municipality of Anchorage; City of Sand Point; City and Borough of Sitka; Kenai Peninsula Borough

Purpose:

To provide a surface-water data base through collection, analysis, and publication of records for gaging stations and selected sites along streams and lakes throughout Alaska. The gaging network is operated in cooperation with other Federal, State, and local agencies. The surface-water data base provides information for research purposes of surveillance, planning, design, hazards warning, accounting systems, operation, and management in various water-related fields.

Status:

The ongoing data-collection effort and processing continues. At present, the USGS operates 105 gaging stations and 69 crest-stage gages in Alaska.

Reports:

Data published in U. S. Geological Survey annual report "Water Resources Data for Alaska".

Jones, S. H., 1983, Floods from small drainage basins in Alaska: U. S. Geological Survey Open-File Report 83-258, 60 p.

Lamke, R. D., Cost-effectiveness of stream-gaging program in Alaska: (Water-Resources Investigations Report in preparation).

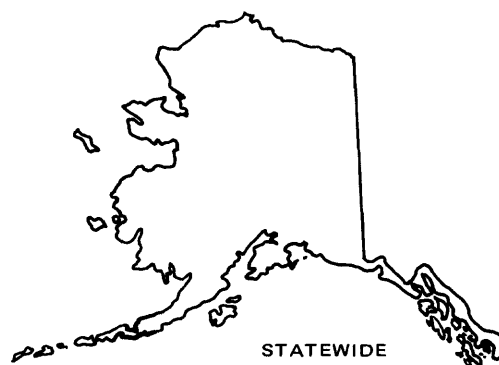
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## GROUND WATER STATIONS

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Period of project:  
Continuous since June 1947

Chief:  
Gordon L. Nelson  
District Office



Funding:  
USGS, Kenai Peninsula Borough, Alaska Dept. of  
Natural Resources (DGGS), Fairbanks North Star  
Borough, Municipality of Anchorage, U.S. Air Force

Purpose:  
Ground water is an important source of water supply for many Alaskan communities. Thus, it is essential to observe the effects on ground-water quantity and quality exerted by such factors as climatic variations and withdrawal patterns. Water-level data are collected to provide a base against which short- and long-term fluctuations can be compared for proper planning and management.

Status:  
Of the 96 wells currently being monitored, 34 are equipped with recorders that continuously record water levels. Water levels in other wells are measured from 2 to 12 times per year.

Reports:  
Data published in U.S. Geological Survey annual report "Water Resources Data for Alaska."

Bailey, B. J., 1983, Hydrologic data stations and lake levels, Kenai-Nikiski area, Alaska, 1983: U. S. Geological Survey Open-File Report 83-938, 1 sheet.

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## QUALITY OF WATER STATIONS

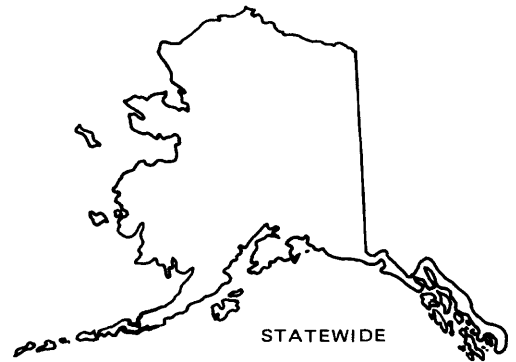
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Period of project:

Continuous since June 1949

Chief:

Robert J. Madison  
District Office



Funding:

USGS and other agencies

Purpose:

To collect, analyze and publish water-quality data for selected sites in Alaska. In addition to serving needs of cooperating agencies, the records contribute to a national water-quality data base requisite to nationwide and regional planning and action programs.

Status:

Operation of 9 NASQAN (National Stream-Quality Accounting Network) stations, 23 temperature stations and 18 water-quality stations. In addition, one hydrologic benchmark station provides data for a basin in which the hydrologic regimen will likely be governed solely by natural conditions.

Reports:

Data published in U. S. Geological Survey annual report "Water Resources Data for Alaska."



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## SEDIMENT STATIONS

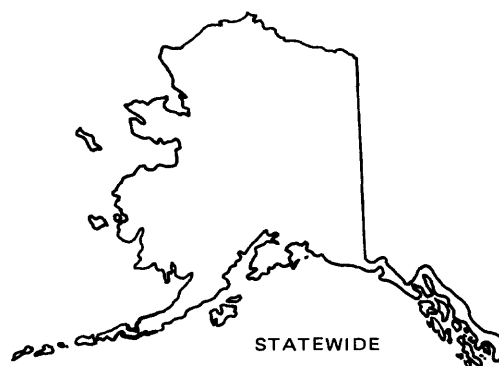
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Period of project:

Continuous since July 1949

Chief:

James M. Knott  
District Office



Funding:

USGS and other agencies

Purpose:

To provide a data base needed to assess sediment transport characteristics of drainage areas required for water resources planning and management.

Status:

Collection of miscellaneous sediment data at 8 NASQAN sites, 1 benchmark station, and at 16 other sites.

Reports:

Data published in U. S. Geological Survey annual report "Water Resources Data for Alaska."

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## ALASKA WATER USE DATA PROGRAM

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Period of project:

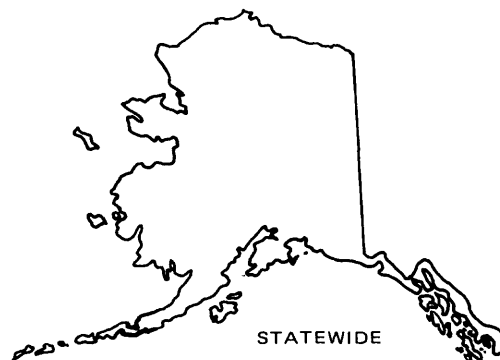
Continuous since April 1978

Chief:

Leslie D. Patrick  
Anchorage Subdistrict Office

Funding:

USGS, Alaska Department of Natural Resources  
(DLWM)



Purpose:

To establish an effective and coordinated program for collecting, storing, accessing, and disseminating water-use data. Information will help resolve critical water problems such as water-quality residuals, environmental impact, energy development, and resources allocation.

Status:

The Land Administration System/Alaska Water-Use Data System (AWUDS) water subsystem moved to production. Water-rights files actively used. Use file, well-log file, and dam-inventory file minimally used. U. S. Corps of Engineers data included in production data base. Screen enhancements progressing. User manual completed. Water-use questionnaires sent to government hatcheries, hydroelectric plants, public water suppliers, and waste-water treatment facilities. USGS Ground Water Site Inventory data transferred to two tapes and readied for transfer to AWUDS. Prepared code for automated transfer of AWUDS data to National Water Use Data System.

Reports:

The following reports were prepared jointly by the Alaska Department of Natural Resources (Division of Land and Water Management) and the U. S. Geological Survey.

Alaska Department of Natural Resources, 1981, Alaska water use data system -- 1981.

\_\_\_\_ 1981, Statistical sampling strategy for agricultural SIC series -- 1981.

\_\_\_\_ 1981, Alaskan livestock water use estimate -- 1980.

\_\_\_\_ 1981, Statement of statistical sampling strategy for seafood processing industry, SIC 2091, 2092.

\_\_\_\_ 1982, Alaskan nonirrigation agricultural services water use estimate (excluding livestock) -- 1980.

\_\_\_\_ 1982, Westinghouse ultrasonic LEFM 801A flowmeter demonstration and instrumentation purchase recommendation.

\_\_\_\_ 1982, Alaskan irrigation water-use estimate -- 1981.

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## GEOHYDROLOGY OF THE ANCHORAGE AREA

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Period of project:

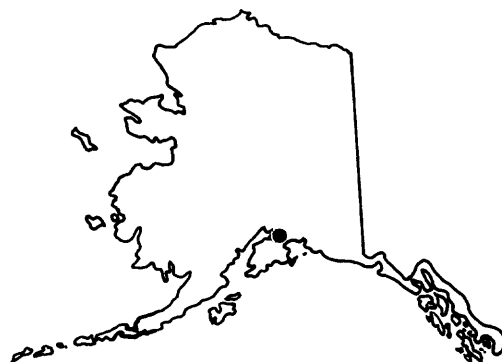
Continuous since July 1966

Chief:

Timothy P. Brabets  
Anchorage Subdistrict Office

Funding:

USGS, Municipality of Anchorage



Purpose:

To determine the quantity and quality of the area's water resources; to address current and anticipated water-related problems.

Status:

Current project activities include: (1) operation of the basic data collection network of 6 streamgages, 50 wells for water-level measurements, and lake level measurements at 8 lakes; (2) studies to determine basic hydrologic factors and conditions for two wetlands in the Anchorage area, commonly known as Klatt Bog and Connors Bog; and (3) development of a three-dimensional ground-water model of the Anchorage Bowl.

Recent reports: (See "Bibliography" for earlier reports)

Brunett, Jilann, and Lee, Michael, 1983, Hydrogeology for land-use planning: The Peters Creek area, Municipality of Anchorage, Alaska: U. S. Geological Survey Water Resources Investigations 82-4120, 6 sheets.

Emanuel, R. P., and Cowing, D. J., 1982, Hydrogeology for land-use planning: The Potter Creek area, Anchorage, Alaska: U. S. Geological Survey Water Resources Investigations Open-File Report 82-86, 4 sheets.

Nelson, Gordon L., 1982, Vertical movement of ground water under the Merrill Field landfill, Anchorage, Alaska: U. S. Geological Survey Open-File Report 82-1016, 24 p.

Planned reports:

Glass, Roy L., Hydrology of Klatt Bog, Anchorage, Alaska (Water Resources Investigations Report in preparation).

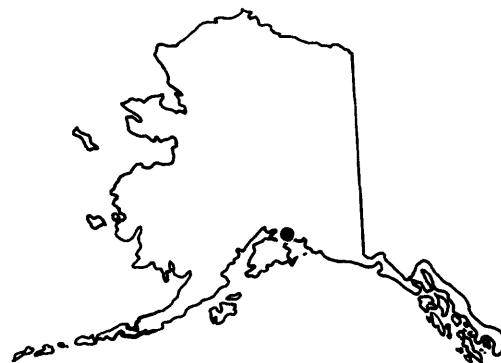
Patrick, Leslie D., Analysis of the unconfined and confined aquifer (ground water) system(s) in the Anchorage area, Alaska (Water Resources Investigations Report).

Glass, Roy L., Hydrology of Connors Bog, Anchorage, Alaska (Water Resources Investigations Report).

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## FREQUENCY OF RECURRENCE OF LAKE GEORGE ON KNIK GLACIER

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Period of project:

November 1978 to September 1984

Chief:

Lawrence R. Mayo  
Fairbanks Subdistrict Office

Funding:

USGS, Alaska Department of Natural Resources  
(DGGS)

Purpose:

To determine the mechanism that causes the formation and discharge of Lake George, and to determine the parameters that can be measured to predict outburst flooding. The "breakout" of glacially-dammed Lake George with resulting flooding of Knik River was an annual event until 1966.

Status:

Geodetic surveys and mass balance measurements have been made at Knik Glacier for the past five summers. Interpretation of those data is now under way, but preliminary analyses indicate the glacier is gradually thickening in its upper snow basins and gradually thinning in its lower reaches. The data also indicate a steady increase in ice velocity at Knik Glacier. This has not, however, resulted in any dramatic changes at the glacier terminus, so that no immediate changes are anticipated in the status of now dormant Lake George.

Reports:

Mayo, L. R., and Trabant, D. C., 1982, Geodetic trisection, altitude, and ice-radar surveying techniques used at Knik Glacier, Alaska, and summary of 1979, 1980, and 1981 data: U. S. Geological Survey Open-File Report 82-685, 26 p.

Trabant, D. C., and Mayo, L. R., 1979, Knik Glacier, Alaska, May 1979 monument and glacier survey: U.S. Geological Survey Open-File Report 80-48, 20 p., 2 plates.

——— Knik Glacier, Alaska: Assessment of history and potential for re-damming Lake George (planned journal article).

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## WATER QUALITY CHARACTERISTICS OF SURFACE-WATER RUNOFF IN CHESTER CREEK, ANCHORAGE

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Period of project:

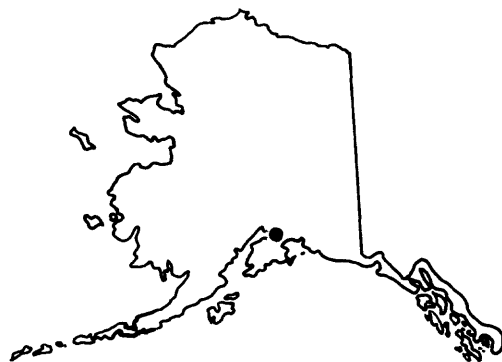
October 1980 to September 1984

Chief:

Timothy P. Brabets  
Anchorage Subdistrict Office

Funding:

USGS, Municipality of Anchorage



Purpose:

To describe the chemical, physical, and biological characteristics of baseflow, snowmelt runoff, and rainfall runoff to Chester Creek from different land uses. To relate water-quality and runoff characteristics to basin and climatic characteristics. To calibrate and verify the USGS DR3M (Distributed Routing Rainfall Runoff Model) and USGS DR3M-QUAL models.

Status:

Data have been collected for 2 years at five sites in the Chester Creek basin: in a natural area in the headwaters of the basin, in a predominantly commercial area, in both a high density and low-density residential area, and at the outflow of the basin near the mouth of Chester Creek. Data analyses indicate distinct changes in both quantity and quality of water from the headwaters of Chester Creek to its mouth. Urbanization has resulted in higher levels of dissolved constituents (especially during snowmelt) and higher values of suspended sediment, lead, and iron. The USGS DR3M model has been successfully calibrated for one site.

Reports:

Brabets, T. P., and Wittenberg, L. A., 1983, Surface-water quality in the Campbell Creek basin, Anchorage, Alaska: U.S. Geological Survey Water Resources Investigations Report 83-4096, 28 p.

Brabets, T. P., Water-quality characteristics of surface-water runoff in Chester Creek, Anchorage, Alaska (Water-Resources Investigations Report in preparation).

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## HYDROLOGIC STUDIES OF THE POINT MACKENZIE- HORSESHOE FLATS AREA

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Period of project:

October 1980 to September 1984

Chief:

Roy L. Glass

Anchorage Subdistrict Office



Funding:

USGS, Matanuska-Susitna Borough

Purpose:

To collect and compile hydrologic information for this area. To evaluate the area's hydrologic boundaries, aquifers, and aquifer materials. To evaluate the quality of ground water and lakes.

Status:

Slower-than-anticipated development, and consequently ground-water exploration, in the study area has prevented full achievement of original objectives. The report cited below presented available hydrologic data for the Point MacKenzie area. To date, only 20 wells have been drilled. USGS will continue to collect information on lithology, water levels, and water quality for each new well drilled. Water-level measurements will continue to be made every 6 to 8 weeks at four wells and intermittently at three others. Water levels in four lakes will be measured twice a year. Data collected during the 1984 water year will be presented in a data report in late 1984.

Report:

Glass, R. L., 1983, Hydrologic data for Point MacKenzie area, southcentral Alaska: U.S. Geological Survey Open-File Report 83-142, 47 p. (updated version, October 1983, 34 p.).

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## SEDIMENT TRANSPORT BELOW DEVILS CANYON DAMSITE ON SUSITNA RIVER

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Period of project:

May 1981 to September 1984

Chief:

James M. Knott  
District Office

Funding:

USGS, Alaska Power Authority



Purpose:

To define total sediment transport by the Susitna River and selected tributaries below Devils Canyon. Specific objectives are to define: (1) suspended-sediment and bedload discharge as a function of water discharge; (2) particle-size distribution of suspended sediment, bedload, and bed material; and (3) channel hydrologic characteristics.

Status:

Data collection began in June 1982. The report cited below indicated that the Chulitna and Talkeetna Rivers, despite a smaller combined drainage area, transported three times as much total sediment as the upper Susitna River. Most of the coarse sediment (gravel) transported by the Chulitna, Talkeetna, and upper Susitna Rivers during 1982, was deposited in the river reach between the upper monitoring sites and the downstream site on the Susitna River at Sunshine. An additional monitoring site was established in 1983 to determine the location of the deposited sediment. Some winter monitoring of bedload discharge was initiated in 1983.

Reports:

Knott, J. M., and Lipscomb, S. W., 1983, Sediment discharge data for the Susitna River basin, Alaska, 1981-82: U.S. Geological Survey Open-File Report 83-870, 45 p.

Knott, J.M., Sediment discharge data for the Susitna River basin, Alaska, 1983 (Open-File Report in preparation).

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EVALUATION OF HYDROLOGIC HAZARDS FROM VOLCANIC ACTIVITY  
AT MT. SPURR

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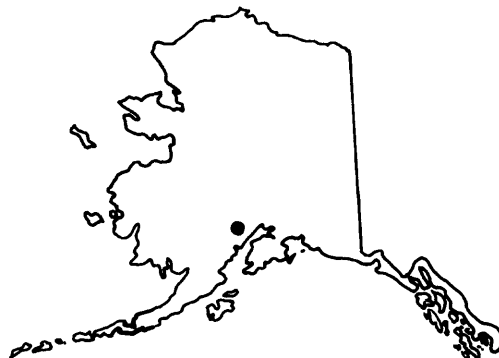
Period of project:

May 1981 to September 1984

Chief:

Richard P. Emanuel

Anchorage Subdistrict Office



Funding:

USGS, Alaska Department of Natural Resources  
(DGGs)

Purpose:

To evaluate the hydrologic hazards and impacts in the area that would be affected by an eruption of Mt. Spurr. To obtain aerial photography of floodways to be used as a base for measuring channel changes caused by future eruptions.

Status:

An inventory of facilities and resources in the vicinity of Mt. Spurr has been completed. Computer simulations of possible eruption-related floods on the Chakachatna River are nearing completion. Report preparation is in progress.

Planned report:

Emanuel, R. P., Hydrologic hazards from volcanic activity, Mt. Spurr, Alaska  
(Water-Supply Paper).



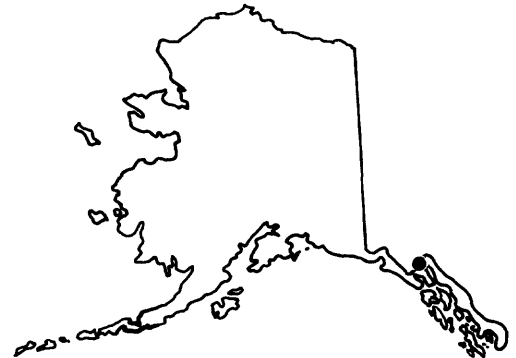
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WATER RESOURCES OF THE CHILKAT RIVER BASIN  
NEAR HAINES

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Period of project:  
May 1981 to June 1984

Chief:  
Edward F. Bugliosi  
Juneau Subdistrict Office



Funding:  
USGS, Alaska Department of Natural Resources  
(DGGs)

Purpose:  
Ground-water discharge into the Chilkat River at the toe of the Tsirku River Fan maintains open leads that support a late fall run of salmon. A large population of bald eagles congregates there to feed on spawning salmon. The objectives of the project were to describe the hydrologic system of the Chilkat River basin, especially conditions near the Tsirku River Fan; to estimate streamflow characteristics; and to determine water-quality conditions at selected locations within the Chilkat basin.

Status:  
All fieldwork has been completed and the report is in review status.

Report in progress:  
Bugliosi, E. F., Hydrologic reconnaissance of the Chilkat River basin, Alaska  
(Water Supply Paper).

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## WATER RESOURCES OF THE NORTH SLOPE

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Period of project:  
October 1981 to September 1984

Chief:  
Charles E. Sloan  
District Office

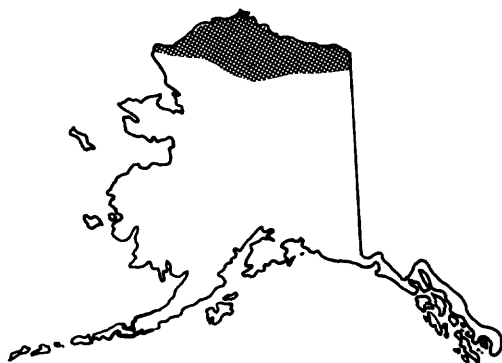
Funding:  
U.S. Bureau of Land Management

Purpose:  
To evaluate and report on potential water-supply sources on the North Slope, to provide information for planning the development of oil and gas resources.

Status:  
Potential water-supply sources include streams, lakes, springs, and snow. Digital processing of Landsat data on lakes has been completed and the computer lake data file has been established. Field inventory of major springs has been completed and snow surveys were made in FY 1982 and 1983. Activity in 1984 will consist of report preparation.

Planned reports:  
Sloan, C. E., Inventory of wells and springs, North Slope, Alaska (Open-File Report).

\_\_\_\_ Water resources of the North Slope, Alaska (Water-Resources Investigations Report).



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## ALASKA OBSERVATION-WELL NETWORK DESIGN

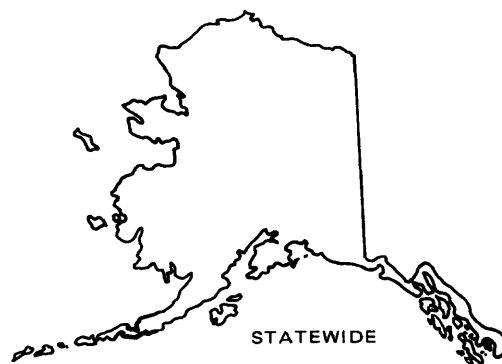
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Period of project:

October 1981 to September 1984

Chief:

Jilann O. Brunett  
District Office



Funding:

USGS, Alaska Department of Natural Resources  
(DGGs)

Purpose:

To design a network of observation wells that would provide water-level information necessary for statewide, regional, or local hydrologic analyses. To evaluate existing ground-water data for adequacy in providing required quantitative information in each proposed network.

Status:

Most of the project activities were terminated because of lack of funds. Publication of two reports is funded for 1984.

Planned reports:

Brunett, J. O., Annual data summary report (Open-File Report).

\_\_\_\_ Observation wells and base flow near Fairbanks, Alaska (Water Resources Investigations Report).

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GROUND-WATER RESOURCES OF THE MENDENHALL VALLEY,  
JUNEAU

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Period of project:

July 1983 to September 1985

Chief:

Edward F. Bugliosi  
Juneau Subdistrict Office



Funding:

USGS, City and Borough of Juneau

Purpose:

To define present and projected water use. To determine if pumping of any new public supply wells will cause salt water (from the coast and a deep aquifer) to intrude the shallow aquifer that provides water to domestic wells.

Status:

Activities to date include: drilling 10 observation wells; installing a continuous recording gage on Montana Creek; collating previous data; compiling a well inventory in Mendenhall Valley; and monitoring water levels in selected wells. Development of a model of the valley ground-water system will begin this year. Model input will be available information on aquifer hydraulic properties, and projected or hypothetical pumping rates in most likely areas of ground-water development.

Planned reports:

Bugliosi, E. F., Water-table map of Mendenhall Valley (Water-Resources Investigations Report).

\_\_\_\_ Ground-water resources of Mendenhall Valley (Water-Resources Investigations Report).

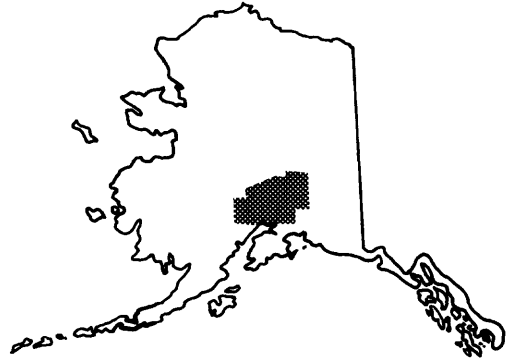
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RELATIONSHIP OF LIMNOLOGICAL VARIABLES  
AND SALMONID PRODUCTION IN NINE LAKES  
OF THE MATANUSKA-SUSITNA BOROUGH

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Period of project:  
October 1982 to September 1984

Chief:  
Paul F. Woods  
Anchorage Subdistrict Office



Funding:  
USGS, Alaska Department of Natural Resources  
(DGGs)

Purpose:  
To develop empirical equations relating salmonid growth to limnological variables in nine small lakes in the Matanuska-Susitna Borough of south-central Alaska.

Status:  
Limnological and fisheries sampling completed in September 1983. Initial analysis of data base indicates that fish growth during summer is only weakly correlated with limnological variables such as concentrations of total phosphorous, total nitrogen, chlorophyll a, and the Morphoedaphic Index (MEI). Reasons for the lack of stronger correlations are presently being researched.

Planned report:  
Woods, P. F., Relation of limnological variables to salmonid production in lakes, southcentral Alaska (journal article).

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## CHANNEL MODIFICATION DOWNSTREAM FROM UNSTABLE PLACER MINING DAMS

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Period of project:

October 1982 to September 1986

Chief:

Gary L. Solin

Anchorage Subdistrict Office

Funding:

USGS, Alaska Department of Natural Resources  
(DGGs), National Park Service

Purpose:

To document the hydraulics of flow, channel-bed composition, and channel morphology downstream from placer-mining areas, where dikes and settling ponds may be breached by floods. To monitor the movement of coarse sediment mobilized during or following dam breaching.

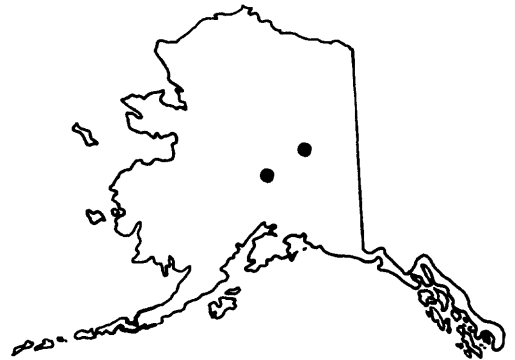
Status:

Monitoring sites were established on three watersheds in central and southcentral Alaska. Bed material and cross-section data were collected in three areas in 1983: Birch Creek near Fairbanks, streams in the Kantishna Hills of Denali National Park and Preserve, and Sixmile Creek near Hope, on the Kenai Peninsula. Only the Birch Creek and Kantishna Hills study areas will be continued in 1984.

Planned reports:

Solin, G. L., Hydraulic and channel characteristics of selected streams in the Kantishna Hills area, Denali National Park and Preserve, Alaska (Open-File Report in preparation).

\_\_\_\_ Summary of hydrologic data at selected placer-mining sites in Alaska (Open-File Report).



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LIMNOLOGICAL STUDY OF BIG LAKE,  
SOUTHCENTRAL ALASKA

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Period of project:

October 1982 to September 1985

Chief:

Paul F. Woods

Anchorage Subdistrict Office

Funding:

USGS, Alaska Department of Natural Resources  
(DGGS)



Purpose:

To investigate the limnological characteristics of Big Lake and to ascertain its present trophic state and susceptibility to cultural eutrophication.

Status:

One year of intensive limnological sampling has been completed. Preliminary analysis of data collected in two main basins of the lake indicates substantial differences in depth of light penetration and chlorophyll a. Nutrient concentrations of phosphorus and nitrogen place Big Lake in the oligotrophic category. Total nitrogen to total phosphorus ratios indicate that algal productivity may be phosphorus-limited in the summer; however, extremely low concentrations of inorganic nitrogen occur during the summer months. The lake is dimictic but circulates incompletely in the spring, thereby failing to replenish dissolved oxygen beneath the epilimnion prior to summer stratification which is quite pronounced. A second year of limnological sampling now under way will involve detailed analysis of primary productivity using the carbon-14 method in an incubator.

Planned reports:

Woods, P. F., Summary of limnological conditions, Big Lake, Alaska (Water Resources Investigations Report).

\_\_\_\_\_ Nutrients and algal production in an Alaskan lake (journal article).

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## HYDROLOGY AND GEOCHEMICAL PROCESSES AT A SUB-ARCTIC LANDFILL, FAIRBANKS

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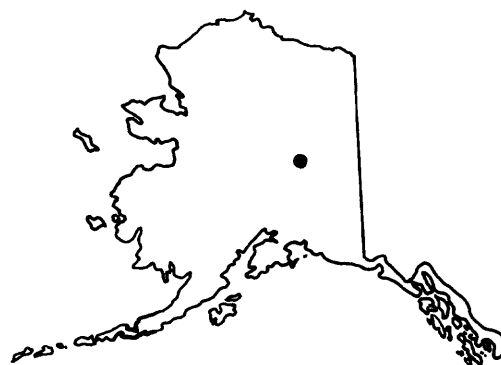
Period of project:

October 1982 to September 1984

Chief:

Bruce Parks

Fairbanks Subdistrict Office



Funding:

USGS, Fairbanks North Star Borough

Purpose:

To compare chemical and physical processes between landfills in temperate and subarctic areas. To determine the extent of any degradation of ground-water quality by leachate from the Fairbanks landfill. To assess the potential for degradation of public and private water supplies in the area.

Status:

Project complete except for reports.

Planned reports:

Flynn, David, Hydrology and geochemical processes in a sub-arctic landfill at Fairbanks, Alaska: Basic data (Open-File Report in preparation).

Downey, J. S., Hydrology and geochemical processes in a sub-arctic landfill at Fairbanks, Alaska (Water-Resources Investigations Report).



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## HYDROLOGY AND WATER QUALITY OF POTTER MARSH, ANCHORAGE

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Period of project:

October 1983 to September 1986

Chief:

Chester Zenone  
District Office



Funding:

USGS, Municipality of Anchorage

Purpose:

To collect basic hydrologic data--inflow, outflow, water quality--at Potter Marsh, a popular wildlife viewing area. To assess the potential hydrologic effects of increasing development in the marsh's watershed.

Status:

Discontinued stream-gaging stations were reactivated and new stream-gaging, water quality, and precipitation stations were established in the Potter Marsh watershed in late 1983 and early 1984. Of particular significance to understanding the hydrologic environment of at least a part of the marsh are the water-quality and current velocity (and direction) data that will be collected at the culverts at the New Seward Highway. Water from Turnagain Arm flows through the culverts back into Potter Marsh during high tides on 3 or 4 days each month.

Planned report:

Brabets, T. P., and Zenone, Chester, Hydrology and water quality of Potter Marsh, Anchorage, Alaska (Water Resources Investigations Report).

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UNSATURATED FLOW NEAR LEACH FIELDS  
IN A SUBARCTIC ENVIRONMENT

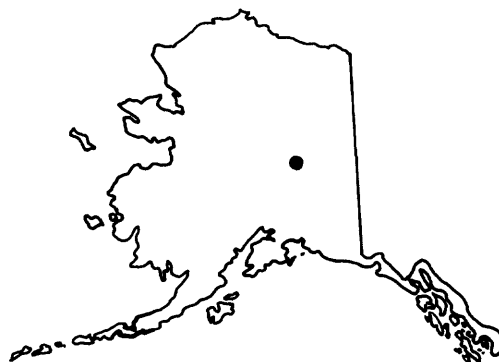
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Period of project:

April 1984 to April 1987

Chief:

Gordon L. Nelson  
District Office



Funding:

USGS, Fairbanks North Star Borough

Purpose:

To determine net water use of Fairbanks households pumping water from wells in an upland area where water levels have been declining continuously. (Net water use is the volume of water pumped minus the amount that percolates to the water table from leach fields.) To define unsaturated flow processes in order to analyze evaporative losses from leach fields.

Status:

New project--began April 1984.

Planned reports:

Nelson, G. L., Net water use by households using wells and septic systems near Fairbanks, Alaska (Professional Paper).

\_\_\_\_ Unsaturated flow from domestic seepage fields in a subarctic environment (journal article).

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## MAGNITUDE AND FREQUENCY OF FLOODS IN ALASKA

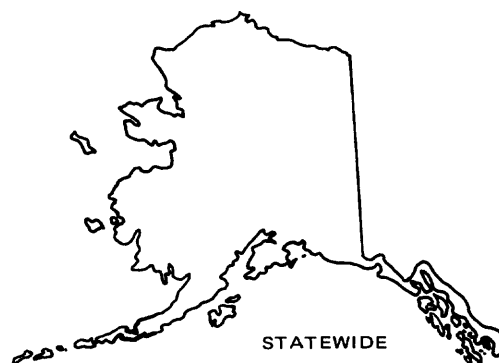
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Period of project:

August 1984 to September 1985

Chief:

Stanley H. Jones  
District Office



Funding:

USGS, Alaska Department of Transportation  
and Public Facilities

Purpose:

To provide information on flood characteristics of streams. This information is critical to the design of drainage and flood protection structures, in order to minimize potential damages and costs resulting from floods.

Status:

New project--begins August 1984.

Planned report:

Jones, S. H., Magnitude and frequency of floods in Alaska (Open-File Report).

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Emmett, W. W., Burrows, R. L., and Parks, Bruce, 1978, Sediment transport in the Tanana River in the vicinity of Fairbanks, Alaska: U. S. Geological Survey Open-File Report 78-290, 28 p.

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