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LITERATURE SURVEY ON SELECTED TOPICS

KAMLOOPS LAKE

SEPTEMBER 1974

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CANADA CENTRE FOR INLAND WATERS

INLAND WATERS DIRECTORATE-PACIFIC REGION

ENVIRONMENT CANADA

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DEPARTMENT OF  
THE ENVIRONMENT

NOV 18 1974

WATER PLANNING &  
MANAGEMENT BRANCH  
PACIFIC REGION

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## INTRODUCTION

This report, prepared for the Canada Centre for Inland Waters, Inland Waters Directorate - Pacific Region, presents a listing of both published and unpublished material relating to Kamloops Lake. It attempts to be comprehensive, although relatively little in the nature of scientific studies has been done on the lake.

Provincial and federal government departments have been consulted for information and publications. Libraries were the major source of material- the University of British Columbia Library, Vancouver Public Library, British Columbia Provincial Archives and various governmental libraries and collections. In addition, the Water Resources Data Centre (WATDOC), Ottawa, assisted in the search by providing a listing of relevant material contained in its Pollution, Environment and News data bases. Newspapers of interest (e.g. Kamloops, Vancouver) are held on microfilm at the U.B.C. Library, but a search for articles dealing with Kamloops Lake was felt to be beyond the scope of this compilation.

This report is divided into seventeen sections, each one a bibliography presented alphabetically by author. Where no written report was found, a description of available data is included. When one item is concerned with more than one of the section topics, it has been repeated in as many sections as seemed suitable.

In addition to author, title and bibliographic data, each entry also includes an indication of its location-where a copy may be examined or obtained. An asterisk preceding the author shows that a copy is held at

C.C.I.W., West Vancouver. Other locations are given in brackets and most are the U.B.C. Library; a call number and library branch or division are specified.

With many of the articles or books, a brief annotation is presented, indicating relevant information contained therein. Where a copy was already held at C.C.I.W., or when the title gave a clear indication of content, no note was made. Only books, articles and reports that were available for examination are included in the listing, but the compiler believes that the most relevant material has been located and reported.

The report has one appendix containing newspaper clippings dealing with pollution of Kamloops Lake. These were obtained through the courtesy of WATDOC.

As mentioned above, no extensive studies have been done on Kamloops Lake and the surrounding area. There are no Canada Land Inventory maps or reports because this agency has not done any work at all in the Kamloops region. Other sections of this report contain very few items since little work has been done in this region.

The preparation of this bibliography would not have been possible without the help of a great many people. Thanks are extended to Dr. B.E.St.John and Dr. C.H.Pharo of the Canada Centre for Inland Waters for valuable discussions and guidance. Everyone consulted was most cooperative in providing material and the author appreciates their assistance - Mr. S.R. Killick, International Pacific Salmon Fisheries Commission; Dr. W. Erhlebach,

Water Quality Branch; Mr. G. Schafer, Atmospheric Environment Service; Miss M. Akhurst, Geological Survey of Canada; Mrs. M. MacGregor Greer, Pacific Forest Research Centre; as well as staff of the University of British Columbia Libraries, British Columbia Provincial Archives, WATDOC, Water Survey of Canada, British Columbia Forest Service, British Columbia Dept. of Mines, British Columbia Dept. of Agriculture and the Pollution Control Branch, Victoria. The author also thanks Mrs. Joan Heaslip for typing of the final report.

## ANTHROPOLOGY

The Indians are mentioned in historical accounts of the Kamloops area (see History section of this report). The following contain descriptive material about the Shuswap Indians of the Kamloops area.

British Columbia. Dept. of Education. Division of Curriculum. Our Native People. British Columbia Heritage Series. Vol. 3 - Interior Salish.  
(U.B.C. - Sedgewick Library: E78 B9 B8)

Jenness, Diamond (1967). The Indians of Canada. National Museum of Canada. Bulletin No. 65. Anthropological Series No. 15.  
(U.B.C. - Main Library: E92 J3)

pp. 351-358 - Interior Salish (Shuswap); winter home - a subterranean house, summer home - lodge covered with rush mats; food - mainly salmon with deer, elk, bear, beaver

Sanger, David (1970). "The Archaeology of the Lochnore-Nesikep Locality, British Columbia." Syesis 3(Suppl. No.1): 1-129.  
(U.B.C. - Woodward Library: QH1 S94 B75)

- site north of Lytton, not Kamloops, but article includes general summary of Indian life (pp. 9-12)

Swanton, J.R. (1952). The Indian Tribes of North America. Smithsonian Institution, Bureau of American Ethnology. Bulletin No. 145.  
(U.B.C. - Main Library: E51 U6 No. 145)

p. 595 - Shuswap; principal villages at Savona or Deadman's Creek and Kamloops

## BIOLOGY

Very little material dealing with biological studies of Kamloops Lake and the Thompson River. A letter of enquiry addressed to Mr. John Cartwright of the Fish and Wildlife Branch, Kamloops, was not answered.

\*International Pacific Salmon Fisheries Commission (1973). Annual Report.

p. 34 - Commission carries out analysis of plankton samples taken by Weyerhaeuser Canada; mention of algal growths in Thompson River.

\*Kelso, B.W. (1973). A Biological Assessment of the Thompson River System During the Low Flow Period of April, 1973. Pollution Abatement Branch, Environmental Protection Service. Report No. EPS 5-PR-73-9 21 p.  
- three sites on Kamloops Lake

\*Servizi, J.A. and R.A. Burkhalter (1970). Selected Measurements of Water Quality and Bottom-Dwelling Organisms of the Fraser River System, 1963-1968. International Pacific Salmon Fisheries Commission 70 p.  
p. 27 - sampling of bottom organisms  
pp. 50-56 - Thompson bottom organisms results

\*Ward, F.J. (1964). Limnology of Kamloops Lake. International Pacific Salmon Fisheries Commission, Bulletin No. 16.

### CHEMISTRY

Chemical measurements of the lake are included in material contained in the Water Quality section of this report. In addition, chemical studies are included in the following:

\*Ward, F.J. (1964). Limnology of Kamloops Lake. International Pacific Salmon Fisheries Commission. Bulletin No. XVI.

## ECONOMICS OF THE REGION

The City of Kamloops is the major settlement in the Kamloops Lake area. Development of Kamloops and the area around the lake may be traced through references found in the History and Mining sections of this report. The sources listed below provide general surveys of conditions in the region.

British Columbia. Dept. of Industrial Development, Trade and Commerce. Bureau of Economics and Statistics (1961). The Kamloops Region - An Economic Survey.

(U.B.C. Library - Government Publications)

- gives economic history, transportation, retail and wholesale trade, electric power, recreation, agriculture, oil and natural gas, mining and forestry, manufacturing

British Columbia. Dept. of Lands (1919). Kamloops Land Recording Division.

(U.B.C. Library - Main: HD319 B85 K3 1919; Government Publications)

- for area in railway belt along Thompson River
- description of land forms, settlement, agriculture

British Columbia. Dept. of Lands, Forests and Water Resources. Lands Services (1970). The Kamloops Bulletin Area. Bulletin Area No. 6, 62 p.

(U.B.C. Library - Government Publications)

- Kamloops area: historical background, physical description, climate, soils, vegetation, economy, transportation, recreation and wildlife, settlement

- Kamloops Lake in Ashcroft-Nicolo-sub area, pp. 40-47

Oberlander, H. Peter and R.J.Cave (1968). Future Commercial Development in Kamloops, B.C. - A Report on the Planned Development of the Commercial Core of the City 67p.

(U.B.C. Library - Fine Arts Div.: NA9130 K6 03)

- introduction provides history, economic outline

## FISHERIES

Kamloops Lake, as part of the Thompson River System, is important to the Pacific salmon which migrate through its waters. The Adams River sockeye run, the largest run on the Fraser system, passes through the lake. The International Pacific Salmon Fisheries Commission counts spawning salmon and from their data, an estimate of salmon numbers in Kamloops Lake could be obtained. Pink Salmon spawn on the Thompson River below Savona and their spawning grounds are directly influenced by conditions upstream. No other material, other than that dealing with salmon, was found. A letter sent to the Fish and Wildlife Branch, Kamloops, was not answered.

Gilhausen, Philip (1960). Migratory Behavior of Adult Fraser River Sockeye. International Pacific Salmon Fisheries Commission, Progress Report No.7. (U.B.C. - Woodward Library: SH167 S17 I5)  
pp. 6-8 - Adams run; noted by Hudson's Bay personnel as early as 1861

International Pacific Salmon Fisheries Commission (1965). An Examination of the Factors Affecting the Migration of Sockeye and Pink Salmon in the Fraser and Thompson Rivers at Low River Levels.

(International Pacific Salmon Fisheries Commission, New Westminster)

p. 37 - 1954 Adams migration with numbers of salmon vs. date, showing distance travelled; can interpolate dates of passage through Kamloops Lake

\*International Pacific Salmon Fisheries Commission (1973). Annual Report. pp. 44,47 - estimated number of salmon spawning in the Thompson.

Killick, S.R. (1955). The Chronological Order of Fraser River Sockeye Salmon During Migration, Spawning and Death. International Pacific Salmon Fisheries Commission, Bulletin VII.

(U.B.C. - Woodward Library: SH349 I5 B9)

pp. 57-59 - Adams run

Killick, S.R. and W.A. Clemens (1963). The Age, Sex Ratio and Size of Fraser River Sockeye Salmon, 1915-1960. International Pacific Salmon Fisheries Commission, Bulletin XIV.

(U.B.C. - Woodward Library: SH349 I5 B9)

- includes data on Adams River run

Sylvester, Robert O., Dale A. Carlson, Russell F. Christman, Max Katz, and Ray T. Oglesby (1965). An Evaluation of the Thompson River and Kamloops Lake as Receiving Waters for a Kraft Pulp Mill Effluent. Report prepared for B.C. Pollution Control Board.

(U.B.C. - Main Library: TD227 B7 S94 1965)

\*Ward, F.J. (1959). Character of the Migration of Pink Salmon to Fraser River Spawning Grounds in 1957. International Pacific Salmon Fisheries Commission, Bulletin X.

(U.B.C. - Woodward Library: SH349 I5 B9)

- pink salmon spawn on Thompson River up to Savona; peak approximately Oct. 1st.

Ward, F.J. and P.A. Larkin (1964). Cyclic Dominance in Adams River Sockeye Salmon. International Pacific Salmon Fisheries Commission, Progress Re-

port No. 11.

(U.B.C. - Woodward Library: SH167 S17 I5)

## FORESTRY

Kamloops Lake is situated in grassland rather than in forested area.

The British Columbia Forest Service manages the area of the lake and its drainage basin. They should be contacted for information on logging operations and forest fires.

The Forest Service maintains a management atlas - maps showing past and present operations. This may be examined at the Kamloops office. Early records are on microfilm in Victoria. There is also a Fire Atlas, available in both Victoria and Kamloops. This atlas consists of maps of the area with transparent overlays marked to indicate date, location and size of each fire. Records in this form go back to 1950, with earlier fires recorded on charts held in Victoria.

Publications dealing with forests in the Kamloops area are listed below.

Brayshaw, T.C. (1954). Classification of Ponderosa Pine Stands in the Southwestern Interior of British Columbia. 10p.

(U.B.C. - Forestry/Agriculture Library: SD397 P75 B8 1954)

- includes Thompson Valley

Brayshaw, T.C. (1955). An Ecological Classification of the Ponderosa Pine Stands in the Southwestern Interior of British Columbia. Ph.D. thesis, U.B.C.

(U.B.C. Library - Special Collections: LE3 B7 1955 A1 B7 E3)

Brayshaw, T.C. (1965). "The Dry Forest of Southern British Columbia."

In: Krajina, V.J. (ed.) Ecology of Western North America, Vol. 1, U.B.C.  
(U.B.C. - Forestry/Agriculture Library: QK901 E3 V.1)

Brayshaw, T.C. (1970). "The dry forests of southern British Columbia."  
Syesis 3: 17-43.

(U.B.C. - Woodward Library: QH1 S94 B75)

- classification of forest zones with respect to soil and climate

Tisdale, E.W. (1947). "The grasslands of the southern interior of British Columbia." Ecology 28: 346-382.

(U.B.C. - Woodward Library: QH540 E3)

Tisdale, E.W. (1950). "Grazing of Forest Lands in Interior British Columbia."  
J. Forestry 48: 856-860.

(U.B.C. - Forestry/Agriculture Library: SD1 S63)

## GEOLOGY

Geological work in the Kamloops area has been quite extensive. The Geological Survey of Canada has been responsible for many maps and reports. These and publications by other authors are listed below.

Geological Survey (Annual Reports, Summary Reports, Bulletins, Memoirs, Papers):

Report of Progress for 1877-78

pp. 81-173. Preliminary Report on the physical and geological features of the southern portion of the interior of B.C. by G.M. Dawson  
- Kamloops Lake, pp. 17-18B.

Annual Report, Vol. VII, 1894, Part B, pp. 3-427

Report on the area of the Kamloops Map Sheet, B.C. by G.M. Dawson.  
pp. 156-175. Kamloops Lake and vicinity  
(U.B.C. - Main Library: QE185 A13)

Summary Report, 1905

p. 137-138. Note on the Age of the Horsefly, Similkameen and Tranquille Tertiary Beds of the Southern Interior of B.C.

Summary Report, 1912

pp. 115-150. Geology of the Thompson River Valley below Kamloops Lake, B.C. by Chas. W. Drysdale.  
pp. 151-155. Savona Map Area, B.C. by Bruce Rose

Summary Report, 1915

pp. 91-92. Human Skelton in Silt Near Savona

Summary Report, 1918, Part B

pp. 17-22. Mercury Deposits of Kamloops Lake by Charles Camsell

(U.B.C. - Main Library: QE185 S7)

\*Bulletin No. 154. Deglaciation Studies in Kamloops Region, an area of moderate relief, by R.J. Fulton (1967) 36 p.

\*Bulletin No. 196. Glacial Geomorphology and Pleistocene History of Central B.C. by H.W. Tipper (1971).

(U.B.C. - Main Library: QE185 G3; Geology Library)

Memoir No. 69. Coal Fields of British Columbia by D.B. Dowling (1915).

pp. 285-289 - Kamloops Lake Coal areas

\*Memoir No. 249. Geology and Mineral Deposits of Nicola Map Area, B.C. by W.E. Cockfield (1948) 164 p.

(U.B.C. - Main Library: QE185 M7)

Paper 66-1, Sect. 38, p. 61 - An Experimental Seismic Survey, Arrow, Shuswap and Kamloops Lakes by G.D. Hobson.

\*Paper 69-37 - Glacial Lake History, Southern Interior Plateau, B.C. by Robert J. Fulton (1969) 14 p.

(U.B.C. - Main Library: QE185 A11; Geology Library)

Economic Geology Series No. 3; The Iron Ores of Canada, Vol. I -  
British Columbia and Yukon by G.A.Young and W.L. Uglow (1926)

(U.B.C. - Main Library: QE185 E2)

pp. 109-115 - Glen Iron Mine, Kamloops Mining Division

Geological Survey maps (most held at U.B.C. Map Division or Geology  
 Library):

104A Thompson River below Kamloops Lake by C.W.Drysdale (1913)

1432 Kamloops Lake Coal Areas by D.B.Dowling (1915)

\*9-1963 Kamloops Lake by R.J.Fulton (1963)

Geomagnetic maps:

\*5216G Kamloops

\*5217G Cherry Creek

\*5220G Tranquille River

\*7217G Ashcroft

Publications other than those of the Geological Survey:

\*Campbell, R.B. (1966). Tectonics of the South Central Cordillera of  
 British Columbia. CIMM Spec. Vol. 8, pp. 61-71.

(U.B.C. - Main Library: QE376 S94)

Daly, Reginald A. (1913). "Annotated Guide (Golden to Savona)." In:  
 Transcontinental Excursion C1, Guide Book No. 8.

(U.B.C. - Main Library: QE185 A2 No.8 Part II)

pp. 232-234 Kamloops

Fulton, Robert John (1963). Deglaciation of the Kamloops Area, British Columbia. Ph.D., Northwestern University.

(U.B.C. Library - Microfilm: AW1 R2478)

Fulton, R.J. (1965). "Silt Deposition in Late Glacial Lakes of Southern British Columbia." Am. J. Science 263: 553-570.

(U.B.C. - Main Library: Q1 A5)

- discusses area in South Thompson Valley between Kamloops and Little Shuswap Lake

\*Fulton, R.J. and E.C. Halstead (1972). "Interior System." In: Quaternary Geology of the Southern Canadian Cordillera. International Geological Congress-24th Session. Field Excursion A02. pp. 19-40.

\*Mathews, W.H. (1944). "Glacial Lakes and Ice Retreat in South Central British Columbia." Trans. Royal Society of Canada, Sect. IV, 1944, pp. 39-57.

(U.B.C. - Main Library: AS42 C182)

p. 45 - evidence of lakes and ice retreat in the Thompson basin

Rosseau, Gordon R. (1964). The Mineralogy and Paragenesis of Copper Creek Cinnabar Deposits. B.A.Sc. thesis, U.B.C.

(U.B.C. - Geology Library)

Ryder, June Margaret (1969). Alluvial Fans of Post-Glacial Environments within British Columbia. Ph.D. thesis, U.B.C. 435 p.

(U.B.C. Library - Special Collections: LE3 B7 1970 A1 R83)

study area no. 4 - just upstream of Kamloops Lake

\*Ryder, J.M. (1971). "The Stratigraphy and Morphology of Para-glacial Alluvial Fans in South Central B.C." Can. J. Earth Sci. 8: 279-298.  
(U.B.C. - Main Library: QE1 C25)

Staples, Lloyd W. (1955). "X-ray Investigation of Ferrierite, A Zeolite." Amer. Mineralogist 40: 1095-1099.  
(U.B.C. - Main Library: QE351 A7)

- only occurrence of ferrierite in Canada at Kamloops Lake

\*Tipper, Howard W. (1971). "Multiple Glaciation in Central British Columbia." Can. J. Earth Sci. 8: 743-753.  
(U.B.C. - Main Library: QE1 C25)

One additional source was the Canadian Index to Geoscience Data (Sept. 1971) where the following references to the Mineral Occurrence Index were found. The documents themselves are held by: Mineral Resources Branch, #8 Temporary Building, Ottawa, K1A 0E4.

010778	Copper, by Kennco Explorations (1952) 92I/10
012255	Iron (1949) 92I/9
013809	Mercury (1949) 92I/15
015293	Sodium Carbonate (1949) 92I/10
1015301	Sodium Sulphate (1952) 92I/10

GROUNDWATER

The Geological Survey of Canada does not conduct groundwater investigations in the Kamloops area. The British Columbia provincial Dept. of Lands, Forests and Water Resources is responsible for well records and these could be examined by contacting:

Dr. John Foweraker,  
Chief Engineer, Groundwater Div.,  
Water Investigations Branch,  
Dept. Lands, Forests and Water Resources,  
Victoria, B.C.

Only one reference to groundwater was found:

Cockfield, W.E. and A.F. Buckham (1946). "Sink Hole Erosion in the White Silts at Kamloops." Trans. Roy. Soc. Can. 40, Sect.3: 1-10.

(U.B.C. - Main Library: AS42 C182)

- sinkholes formed by drainage of subsurface water

## HISTORY

The City of Kamloops began as a fur trading post. Kamloops Lake received relatively little settlement, Savona being a terminus for a road from Cache Creek area and the start of a steamer service on the lake. Mining activity on the lake is referred to in the Mining section of this report as well as in the references listed below.

Balf, Mary (1969). Kamloops - A History of the District up to 1914.  
Kamloops Museum.

(U.B.C. Library - Special Collections: HR F5848 K3 B34 1969)

1858 - Tranquille River - gold

1861 - bateau for freighting from Kamloops Lake to Shuswap area

1865 - steamer from Savona's Ferry to Seymour (pp. 21-23 description of  
steamers)

- Tranquille Creek - flour mill powered by water wheel, sawmill added 1877;  
steamer deliveries

- iron discovered near mouth of Cherry Creek - Glen Iron Mine (1890)

- cinnabar mines at Copper Creek, northeast of Savona

pp. 114-115: Tranquille settlement

pp. 141-146: Savona district

p. 146 : irrigation at Bates' Flats, water from Snohoosh Lake Re-  
servoir on Deadman's Creek

Black, John A. (1965). Kamloops, A City in the Southern Intermountain  
Region of British Columbia. M.A. thesis, Kent State University.

(U.B.C. Library - Special Collections: HR F5849 K2 B593

- covers Kamloops City with general description of the region

Cottingham, Mollie E. (1947). A History of the West Kootenay District in British Columbia. M.A. thesis, U.B.C.

(U.B.C. - Main Library: LE3 B7 1947 A8 C7 H5)

pp. 105-6 - road from Cache Creek to Savona's Ferry (1865)

- steamer "Marten" ran regularly on lake (1866)

Howay, F.W. and E.O.S. Scholefield (1914). British Columbia from the Earliest Times to the Present. S.J. Clarke Publishing Co., Vol. II.

(U.B.C. - Main Library: F5810.1 S36 V.2)

p. 597 - Vernon began mining on Cherry Creek in 1864

p. 238 - road from Cache Creek to Savona's Ferry

Johnson, F. Henry (1937). "Fur Trading Days at Kamloops". Reprinted from B.C. Historical Quarterly 1(3), July 1937.

(U.B.C. - Main Library: F5849 K2 J8)

This article covers period 1811-1860's - mostly concerned with fur trade and statistics.

p. 177 - 1828, Governor Simpson, "many of the lakes being impregnated with salt and sulphur, and the streams being frequently dried up in the summer"

1858 - gold at Tranquille Creek; gold gone by 1862

Kamloops, B.C. High School. Junior Historical Club (1937). Kamloops, 1812-1937.

(U.B.C. Library - Special Collections: HR F5849 K2 K6)

- quite detailed, but little description of area on lake

Larson, Joan I. (1962). From Cum Cloops 1812 to Kamloops 1962.

(U.B.C. - Main Library: F5849 K2 L3)

- Kamloops Indian Band (Shuswap tribe) - wandered in summer, lodges in winter
- 1812, first trading post at Kamloops
- 1842, decline of trading, fort moved to N. Kamloops
- 1863, gold rush - some gold out of Nicomen and Tranquille Creeks
- 1864, ranching and farming in Thompson Valley; wheat ground at flour mill near Tranquille

Morse, J.J. (1957). Kamloops - The Inland Capital. Kamloops Museum Association. Kamloops.

(U.B.C. Library - Special Collections: HR F5849 K2 M6)

1812 - trading post at Kamloops; horses raised for fur brigades

1852 - gold on Tranquille Creek

- Kamloops - supply centre on route to Cariboo
- C.P.R. divisional point
- steamers built at Kamloops or on Kamloops Lake, 1860's
- 1860 - cattle, hay, grain, vegetables and fruit

Wade, M.S. (1913). "The History of Kamloops." In: Scholefield, E.O.S. A History of British Columbia, Part II, pp. 199-210.

(U.B.C. - Main Library: F5810.1 S38)

p. 199-200: Indian tribes, areas and life style

p. 200-201: forts established - Pacific Fur Co., North West Co.

p.202 : gold on Tranquille Creek; in 1860 200 Chinese working at mouth of creek

p. 206 : steamer "Martin" (1866) trips from Savona to Kamloops  
and Seymour (head of Shuswap Lake)  
1878 - other steamers, "Lady Dufferin", "Spallumcheen"  
1885 - steamer, "Kamloops"

p. 208 : three steamers destroyed by fire  
- after railway, towns: Lytton, Spence's Bridge, Ashcroft, Savona, Eagle  
Pass Landing

Wade, Mark S. (1907). The Thompson Country. Kamloops. Inland Sentinel  
Press.

(U.B.C. Library - Special Collections: HR F5849 K2 W16)

- history of area, Indians, etc., but not much about lake, only mention  
of steamboats

- gold at Tranquille Creek and in bars of North Thompson

## HYDROLOGY AND HYDROMETRY

Hydrometric records have been maintained by the Water Survey of Canada for many years. There are a great many stations in the Kamloops-Thompson River region and Water Survey publications provide both locations and data. These items and others providing both data and discussion are listed below.

British Columbia. Dept. of Lands, Forests and Water Resources. Water Resources Service. Water Investigations Branch. Snow Survey Bulletin.

(U.B.C. Library - Government Publications)

- six issues published each year: Feb. 1st, Mar. 1st, Apr. 1st, May 1st, May 15th, June 1st
- gives station name, elevation, snow depth, water equivalent, previous maximum and minimum depths, years of record, charts, maps

British Columbia. Dept. of Lands, Forests and Water Resources. Water Resources Service. Water Investigations Branch (1971). A Summary of Snow Survey Measurements, 1935-1970.

(U.B.C. - Forestry/Agriculture Library: GB2430 B7 A5 1971)

- 8 stations in North Thompson area
- 5 stations in South Thompson area

\*Canada. Dept. of the Environment. Inland Waters Directorate. Water Survey of Canada. Surface Water Data - British Columbia.

- issued yearly; 1972 is latest edition at Water Survey
- provides daily discharge data for each station

\*Canada. Dept. of the Environment. Inland Waters Directorate. Water

Survey of Canada. Surface Water Data, Reference Index - Canada.

- issued yearly; 1972 is latest edition at Water Survey
- identifies stations in Kamloops/Thompson drainage (8LB, 8LD, 8LE, 8LF), giving location, type of guage and years of record.

Canada. Dept. of the Environment. Inland Waters Directorate. Water Survey of Canada. Historical Streamflow Summary to 1970 - British Columbia. (available at Water Survey office)

- for each station: monthly and annual mean discharges for period of record

Two maps aid in the location of hydrometric stations:

\*Canada. Dept. of the Environment. Water Resources Branch. British Columbia - Active Hydrometric Stations (Dec. 1972).

\*Canada. Dept. of the Environment. Water Resources Branch. British Columbia - Discontinued Hydrometric Stations (Dec. 1972).

Leith, R.M. (1973). Streamflow Regionalization in B.C., Vol. 1: Regression of mean annual floods on physiographic parameters in south-central B.C.

Water Survey of Canada.

(Preliminary draft - final report will be available late in 1974; the author is located at the Water Survey office in Vancouver.)

Sylvester, R.O., Dale A. Carlson, Russell F. Christman, Max Katx and

Ray T. Oglesby (1965). An Evaluation of the Thompson River and Kamloops

Lake as Receiving Waters for Kraft Pulp Mill Effluent. Report prepared for the B.C. Pollution Control Branch. Seattle.

(U.B.C. - Main Library: TD227 B7 S94 1965)

pp. 15-16 - typical monthly flows and theoretical minimum flow-through times in Kamloops Lake

Webb, C.E. (1949). Flood of 1948 in British Columbia. Dominion Water and Power Bureau. Mines, Forests and Scientific Services Branch. Dept. of Mines and Resources. Vancouver.

(U.B.C. - Main Library: TC427 B7 C2)

p. 9 - table of maximum water level at Savona

p.24 - tables of daily water level at Kamloops and Savona

## METEOROLOGY AND CLIMATE

The Atmospheric Environment Service is the primary source for meteorological data. Records for the Kamloops and Thompson drainage areas have been kept for many years. Mr. G. Schafer of the Pacific Regional Office has supplied information for this report. The records of station operation (Table I) in the Kamloops region are taken from the computer-produced Climatological Station Data Catalogue. Daily temperature, precipitation and other parameters are available for each station; all data are stored by computer in Toronto. The stations may be located on a map provided by AES.

The Atmospheric Environment Service also produces the following:

\*Canada. Dept. of the Environment. Atmospheric Environment Service.  
Temperature and Precipitation, 1941-1970, British Columbia.

There are also summaries for other parameters; each lists monthly averages for each station.

The B.C. Dept. of Agriculture publishes climatological summaries, with data provided by the Atmospheric Environment Service.

B.C. Dept. of Agriculture. Climate of B.C. - Tables of Temperature and Precipitation, Climatic Normals, 1941-1970, Extremes of Record.

B.C. Dept. of Agriculture. Climate of B.C. - Tables of Temperature, Precipitation and Sunshine, Report for 1972.

This second booklet is one of a series of annual publications of B.C. data.

TABLE I

<u>Station</u>	<u>Location</u>	<u>Operation</u>	Syn. Rept.	Hrly. Weather	Temp.	Precip.	Rt. Rainfall	Wind Mileage	Soil Temp.	Evaporation	Sunshine	Snow Survey
Blue River	52°07', 119°18'	Dec. 1969-Nov. 1970	x	x	x	x	x	x	x		x	
"	"	Nov. 1970+	x	x	x	x	x	x				x
Blue River	52°09', 119°17'	Jan. 1929-June 1939				x						
"	"	Nov. 1939-Feb. 1941				x						
"	"	Jul. 1941-May 1942				x						
"	"	Dec. 1942-Jul. 1945				x						
"	"	Sept. 1946-Sept. 1969			x	x						
Blue River North	"	Sept. 1969+			x	x						
Barriere	50°10', 120°08'	Nov. 1955-Sept. 1958			x	x						
"	"	Jul. 1961-Jan. 1962				x						
"	51°11', 120°07'	Feb. 1962+			x	x						
Barriere North	51°14', 120°09'	Aug. 1970+				x						
Chase	50°49', 119°41'	Apr. 1952-May 1954			x	x						
"	50°48', 119°42'	Oct. 1957+			x	x						
Chinook Cove	51°15', 120°11'	Dec. 1913-Oct. 1955			x	x						

<u>Station</u>	<u>Location</u>	<u>Operation</u>	Syn. Rept.	Hrly. Weather	Temp.	Precip.	Rt. Rainfall	Wind Mileage	Soil Temp.	Evaporation	Sunshine	Snow Survey
Darfield EPF	51°18', 120°11'	Apr. 1956-Nov. 1958			x							
Darfield	"	Nov. 1958-Nov. 1962			x							
"	"	Nov. 1962+			x							
Eagle Bay	50°56', 119°13'	Jan. 1924-Oct. 1937			x							
"	50°56', 119°11'	Nov. 1937-Oct. 1942			x							
"	50°56', 119°15'	Nov. 1942-May 1943			x							
"	50°56', 119°14'	Apr. 1943-Apr. 1948			x							
"	50°56', 119°18'	May 1948-Sept. 1961			x							
"	50°56', 119°13'	Oct. 1961-May 1965			x							
"	"	June 1965+			x							
Heffley Creek	50°56', 120°11'	Feb. 1953+			x							
Kamloops		Jan. 1878-Nov. 1879										
"	50°14', 120°28'	Jan. 1890-Jan. 1890			x							
"	"	Sep. 1890-June 1893			x							
"	"	Jan. 1895-Ju1. 1896			x							

<u>Station</u>	<u>Location</u>	<u>Operation</u>	Syn. Rept.	Hrly. Weather	Temp.	Precip.	Rt. Rainfall	Wind Mileage	Soil Temp.	Evaporation	Sunshine	Snow Survey
Kamloops	50°14', 120°28'	Aug. 1896-Jun. 1906	x	x	x	x						
"	"	Jul. 1906-Dec. 1950	x	x	x	x					x	
"	50°14', 120°20'	June 1962+			x	x						
Kamloops A	50°42', 120°25'	Jan. 1951-Jul. 1964	x	x	x	x	x	x			x	
"	"	Aug. 1964-Sept. 1966	x	x	x	x	x	x			x	
"	"	Oct. 1966+	x	x	x	x	x				x	
Kamloops Exp. Sta.	50°43', 120°26'	Aug. 1949-Dec. 1961			x	x						
Kamloops CDA	"	Jan. 1962+			x	x						
Kamloops Cherry Creek	50°41', 120°35'	Oct. 1970+				x						
Kamloops Mission Flats	50°41', 120°21'	May 1939-Feb. 1957			x	x						
Kamloops Pass Lake	50°50', 120°30'	Aug. 1949-Nov. 1950			x	x						
"	"	Jun. 1951-Oct. 1951			x	x						
Kamloops Tunstall Cres.	50°04', 120°19'	Jan. 1970-Jan. 1970				x						
"	"	Feb. 1970			x	x						
Kamloops Valleyview	50°41', 120°15'	May 1962-Dec. 1969				x						

<u>Station</u>	<u>Location</u>	<u>Operation</u>	Syn. Rept.	Hrly. Weather	Temp.	Precip.	Rt. Rainfall	Wind Mileage	Soil Temp.	Evaporation	Sunshine	Snow Survey
Kamloops Valleyview	59°41', 120°16'	Sept. 1970→			x							
McClure	51°02', 120°13'	Apr. 1967→			x							
Salmon Arm	50°42', 119°15'	Jul. 1911-Jul. 1936			x	x					x	
"	"	Aug. 1936-Mar. 1938			x	x						
"	"	Apr. 1938-May 1964			x	x					x	
"	"	June 1964→			x	x	x				x	
Salmon Arm 2	50°41', 119°17'	Apr. 1950-Jul. 1962			x	x						
"	50°42', 119°17'	Aug. 1962→			x	x						
Salmon Arm 3	50°42', 119°18'	Apr. 1893-Apr. 1897			x	x						
"	"	May 1906-Jun. 1915			x	x						
Sicamous	50°48', 119°00'	Aug. 1954→			x	x						
Sorrento	50°53', 119°29'	Jan. 1924→				x						
Sorrento East	50°53', 119°24'	Apr. 1969-Aug. 1970			x							
"	"	Sept. 1970→			x	x						
Tappen	50°45', 119°20'	Jan. 1913-Dec. 1947			x	x						

<u>Station</u>	<u>Location</u>	<u>Operation</u>	Syn. Rept.	Hrly. Weather	Temp.	Precip.	Rt. Rainfall	Wind Mileage	Soil Temp.	Evaporation	Sunshine	Snow Survey
Tappen	50°45', 119°20'	May 1950-Dec. 1961		x	x							
Tappen Ford Road	50°48', 119°18'	Jul. 1962-Oct. 1966		x	x							
Tappen North	50°48', 119°18'	Oct. 1970-Oct. 1970			x							
Tappen Tulari Farm	50°40', 119°18'	Nov. 1966-Feb. 1967		x	x							
Tranquille	50°41', 120°29'	Aug. 1908-Mar. 1919		x	x							
"	"	Apr. 1919-May 1920		x	x							
"	"	June 1920-Jul. 1936		x	x						x	
"	"	Aug. 1936-Mar. 1938		x	x							
"	"	Apr. 1938-Jan. 1942		x	x						x	
"	"	Sept. 1942-Oct. 1945		x	x						x	
"	"	Nov. 1945-Feb. 1946		x	x							
"	"	Mar. 1946-Jul. 1946		x	x						x	
"	"	Sept. 1947-Jul. 1953		x	x						x	
Vavenby	51°35', 119°47'	Apr. 1913+		x	x							

Other publications dealing with climate of the Kamloops region:

Jones, Owen D. (1953). Temperature and Precipitation Trends and Variations of the Fraser River Basin, B.C. B.A. thesis, U.B.C.

(U.B.C. - Special Collections: LE3 B7 1953 A9 J6 T4)

Data has been compiled for twelve stations, including Kamloops (1895-1950) and Tranquille (1913-1950). Contains graphs showing trends in temperature and rainfall

Kamloops. Citizens Committee (1895). General Statistics and Other Information Regarding the Suitability of Kamloops as a Health Resort; Kamloops Inland Sentinel Press.

(B.C. Archives, Victoria: NWp 971.1Ka K15g)

This report provides meteorological reports for 1891-94, yearly rainfall, mean temperature and weekly maximum and minimum temperatures for the period Apr. 1893-Mar. 1894.

O'Riordan, Jonathan (1966). The Use of Climatic Data to Estimate Irrigation Water Requirements in the South Central Interior of British Columbia.

M.A. thesis, U.B.C.

(U.B.C. - Main Library: LE3 B7 1966 A8 07)

Wallis, John Hubert (1963). Precipitation of the Fraser River Basin: A Descriptive Study. M.Sc. thesis, U.B.C.

(U.B.C. - Main Library: LE3 B7 1963 A8 W2 P7)

This thesis considers trends over the whole Fraser region. The Thompson basin is presented on pages 89-93. Data appears in the Appendices.

## MINING

Although the area immediately adjacent to Kamloops Lake is not noted as a mining area, it has been the site of several operations. Mention of early mining activity may also be found in the History section of this report. The B.C. Dept. of Mines annual reports contain descriptions of mining properties, location and activity, useful if following the history of a particular mine.

British Columbia. Dept. of Mines. Annual Reports of the Minister of Mines.

(U.B.C. - Main Library: TN27 B7)

1876 - p. 422: Tranquille River, 10 or 12 Chinese working; 1861-62

1891-p. 574: Glen Iron Mine, Cherry Creek Bluff - magnetite ore

1893-p.1068: Thompson R. Hydraulic Mining Co. to rework Tranquille R.;

ditch under construction

cinnabar mines at Savona

Glen Iron mine operating

1895-pp.696-7: mines on Kamloops Lake at Cherry Creek and Copper Creek

1897-p. 614: Glen Iron mine operating

Copper Creek - no development

Cinnabar Mining - furnace operation for short period

1898-p.1104-5: Kamloops Lake

1901-p.1079-80: Cherry Creek - Copper King and Glen Iron

1902-p.191-2: Cherry Creek

dredging on Tranquille

1910-p.127-9: copper on north shore of lake

- 1913-p.184 : Copper King, 2 miles from lake on Cherry Creek, idle  
past 6-7 years; Glen Iron, on bluff near Cherry Creek,  
idle
- p.192-6 : Tranquille Creek; Copper Creek - cinnabar
- 1914-p.361 : "a number of men are prospecting in the Tranquille for  
gold"
- 1926-p.185 : Copper Creek Cinnabar
- 1933-p.193-5 : Tranquille; Cherry Creek - sodium carbonate
- 1956-p.47-54 : Deposits associated with the eastern part of the Iron  
Mask Batholith near Kamloops

Colquhoun, C.J. (1899). "Notes on the Occurrence of Quicksilver in Canada."  
Can. Min. Inst. Jour. 2: 13-16.

(U.B.C. - Main Library: TN1 C2 1899)

\*Cummings, J.M. (1940). Saline and Hydromagnesite Deposits of British  
Columbia. B.C. Dept. of Mines, Bulletin No.4 160p.

(U.B.C. - Main Library: TN27 B7 B61)

p. 26-29 - saline deposits near Kamloops (map); Lake No.1, along Kamloops  
Lake, containing  $\text{Na}_2\text{CO}_3$  and  $\text{Na}_2\text{SO}_4$ ; deposit was mined 1931-  
1935

p. 34 - Lake No.2, one mile southeast of Lake No.1,  $\text{Na}_2\text{SO}_4$  and Mgo

Kamloops and District Mining Gazette. Kamloops. W.W.Clarke and F.E.  
Young. 1899-1900.

(B.C.Provincial Archives, Victoria: NW905 K15)

July 1899 - Coal Hill

\*Sept. 1899 - Kamloops Lake

\*Nov. 1899 - Kamloops Lake

Dec. 1899 - Coal Hill mines

Feb. 1900 - Copper Creek mines - 200-800 ft. above the lake; copper and gold; a number of prospect holes and a tunnel 53 ft. long

Kamloops Mining Camp. Kamloops. Baillie and Bennet Pub. (1897)

(B.C. Provincial Archives: NW971.1 Ka K16)

p. 25 - Glen Iron Mine on south shore of lake, 17 miles west of Kamloops on C.P.R. line; magnetic ore - 70% pure metal; 20,000 tons mined and shipped to Tacoma smelter; aerial tramway - ore loaded on cars from mouth of mine

p. 25-6 - Tranquille Hydraulic Mines - hydraulic plant built but not sufficient head of water; 1895-dam several miles from mouth of stream; tunnel through gravel and washing for gold

p. 9 - cinnabar mines - Savona (Copper Creek)

PHYSICS

Only one source contained information on the physics of the lake:

\*Ward, F.J. (1964). Limnology of Kamloops Lake. International Pacific Salmon Fisheries Commission. Bulletin No. XVI.

## POLLUTION

Concern has been raised about algal growth and foam in the Thompson River and Kamloops Lake. In addition to the references below, newspaper clippings dealing with pollution may be found in the Appendix. Material related to pollution monitoring is presented in the Water Quality section of this report.

\*British Columbia. Dept. of Lands, Forests and Water Resources. Pollution Control Branch and Environment Canada. Environmental Protection Service (1973). A Preliminary Report on Sources and Effects of Colour, Foam and Algal Growth in the Thompson River System.

\*International Pacific Salmon Fisheries Commission (1973). Annual Report. p. 34 - Weyerhaeuser pulp mill monitoring program;"colour, foaming and algal growths" in Thompson River

## SOILS

In addition to the material listed below, items in the Forestry section may also relate to the soils of the Kamloops region.

Cornwall, C.F. and E.M.Soda (1966). Second Approximation Report - Potential Agricultural Development in the Kamloops - Cariboo Area, 1965-1985. B.C. Dept. Agriculture.

(British Columbia Dept. of Agriculture, Victoria)

- general description of area, including soils

Krajina, V.J. (1965) "Biogeoclimatic Zones and Biogeocoenoses of British Columbia." In: Ecology of Western North America, Vol. 1, University of British Columbia.

(U.B.C. - Forestry/Agriculture Library: QK901 E3 V.1)

pp. 1-17 - classification of soil and forest zones

Rowles, C.A. (1949). Soils of British Columbia. British Columbia Natural Resources Conference, 2nd, Transactions, pp. 4-28.

(U.B.C. - Main and Sedgewick Libraries: HC117 B8 B75)

- general survey of soils of the province, with map

\*Sprout, P.N. and C.C.Kelly (1963). Soil Survey of the Ashcroft-Savona Area, Thompson River Valley. B.C. Dept. of Agriculture. Interim Report, plus map.

- west end of Kamloops Lake

## WATER QUALITY

The Water Quality Branch, Inland Waters Directorate, Vancouver, has a file on data obtained from individual water samples taken at points in the Thompson River system, although none are from Kamloops Lake. These are on a computerized data file, NAQUADAT (National Water Quality Data Bank), where access is by area notation for each drainage basin.

The following parameters are measured, although not all for each sample: discharge, temperature, pH, colour, turbidity, specific conductivity, dissolved solids, hardness, calcium, magnesium, potassium, sodium, alkalinity, bicarbonate, carbonate, chloride, fluoride, silica, sulphate, organic carbon, nitrogen, phosphorus, oxygen, iron, lead, manganese, mercury, copper, zinc, carbon dioxide, saturation index, stability index, sodium absorption, residue.

Following are the stations with the years in which samples have been taken. Only a few samples were taken each year.

- 8LF Thompson River at Highway No.1 Bridge, Savona, 1966
- 8LE Salmon River at Highway No.97 Bridge near Falkland, 1966
- South Thompson River at Pritchard, 1966
- 8LB North Thompson River at McLure, 1960-73

### B.C. Pollution Control Branch

The regional office is at 1050 W. Columbia, Kamloops, (H.H.Henderson, Regional Manager). No attempt was made to contact this office as research for the Kootenay area has revealed that all PCB data is obtainable in Victoria where it is stored by computer file.

Other water quality publications:

British Columbia. Dept. of Health and Welfare. Bureau of Local Health Services. South Central Health Unit. Annual Reports.

(U.B.C. - Woodward Library: W2 DC2.1 B7 Z8)

Water quality studies are reported in several years' reports (1964-65,66, 67,68,71) but the Health Unit itself does only fluoride and coliform measurements on public and private water supplies while the Pollution Control Branch carries out sampling on rivers and streams. PCB makes its data available to the health authorities. No actual data is included in the Annual Reports.

British Columbia Research Council (1952). Fraser River Water Quality Survey - Fraser-Thompson River System.

(U.B.C. - Main Library: GB1230 F7 B75 1952)

- sampling sites of interest: Savona, Kamloops and North Kamloops
- parameters: dissolved oxygen, temperature, pH, turbidity, conductivity, alkalinity,  $\text{CO}_2$ , Na, K, Ca, Mg, Fe, Cl,  $\text{SO}_4$ , dissolved solids, BOD,  $\text{PO}_4$ ,  $\text{SiO}_2$ ,  $\text{NO}_3$ ,  $\text{NO}_2$ , hardness

\*Servizi, J.A. and R.A.Burkhalter (1970). Selected Measurements of Water Quality and Bottom-Dwelling Organisms of the Fraser River System, 1963-1968. International Pacific Salmon Fisheries Commission 70p.

- 2 sampling stations in Kamloops Lake
- parameters: temperature, dissolved oxygen, pH, alkalinity, BOD, chemical oxygen demand, chloride, copper, conductivity, tannin and lignin, Pearl-Benson index, turbidity, hardness, residue, suspended solids, metals, surfactants, pesticides, herbicides

- pp. 48-50: water quality results

Sylvester, Robert O., Dale A. Carlson, Russell F. Christman, Max Katz, and Ray T. Oglesby (1965). An Evaluation of the Thompson River and Kamloops Lake as Receiving Waters for a Kraft Pulp Mill Effluent. Report prepared for B.C. Pollution Control Board.

(U.B.C. - Main Library: TD227 B7 S94 1965)

- considers water quality of the river and lake; recommends monitoring programs to check quality during operation of the pulp mill
- pp. 16-17 Kamloops Lake

Sylvester, Robert O. (1965). A Review of the Fraser River Basin with respect to Water Quality. Report prepared for B.C. Pollution Control Board.

(U.B.C. - Main Library: TD365 S94 1965)

- considers whole Fraser system
- for Kamloops area, refers back to earlier Thompson River study

Thomas, J.F.J. (1954). Fraser River Drainage Basin, 1950-51. Industrial Water Resources of Canada. Water Survey Report No.6. Dept. of Mines and Technical Surveys. Mines Branch Report No. 842.

(U.B.C. - Main Library: TD226 A1 C25)

- Thompson River, 9 sampling sites, including Savona, Deadman River and Thompson River below Kamloops
- parameters: dissolved oxygen,  $\text{CO}_2$ , pH, colour, turbidity, suspended matter, specific conductance, residue, Ca, Mg, Na, K, Fe,  $\text{SO}_4$ , Cl,  $\text{NO}_3$ , F, B,  $\text{HCO}_3$ ,  $\text{CO}_3$ , silica and hardness
- analysis of Kamloops water supply

WILDLIFE

Nothing was found dealing specifically with wildlife of the Kamloops area. No B.C. Fish and Wildlife Branch publications have appeared. The books listed below will provide a listing of birds and animals resident in the area, but they must be consulted by individual species.

British Columbia. Provincial Museum. Handbooks.

- No. 2      The Amphibians of British Columbia by G.Clifford Carl
- No. 3      The Reptiles of British Columbia by G. Clifford Carl
- No. 6      The Birds of British Columbia - The Woodpeckers, Crows and  
             their Allies by C.J. Guiguet
- No. 8      The Birds of British Columbia - The Shorebirds by C.J.Guiguet
- No. 10     The Birds of British Columbia - The Upland Game Birds by C.J.  
             Guiguet
- No. 11     The Mammals of British Columbia by I. McTaggart Cowan and C.J.  
             Guiguet
- No. 13     The Birds of British Columbia - The Gulls by C.J.Guiguet
- No. 15     The Birds of British Columbia - The Waterfowl by C.J.Guiguet
- No. 18     The Birds of British Columbia - The Owls by C.J.Guiguet
- No. 22     The Birds of British Columbia - The Chickadees, Thrushes, etc.  
             by C.J.Guiguet
- No. 29     The birds of British Columbia - The Diving Birds by C.J.Guiguet  
(U.B.C. - Forestry/Agriculture Library: Q111 B72)

Brooks, A. and H.S. Swarth (1925). A Distributional List of the Birds of British Columbia. Pacific Coast Avifauna, No. 17 158p.

(U.B.C. - Woodward Library: QL685 B7)