Assessment of Acidification Potential of Selected Lower Mainland and Vancouver Island, British Columbia Streams

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ASSESSMENT OF THE ACIDIFICATION POTENTIAL OF SELECTED LOWER MAINLAND AND VANCOUVER ISLAND, BRITISH COLUMBIA STREAMS

by

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Surface water samples from thirty-six streams on the Lower Mainland and Vancouver Island of British Columbia were collected between January 1985 and July 1986 and analyzed for pH, alkalinity, conductivity, colour, sulfate, nitrate, chloride and total and dissolved metals. The minimum alkalinity recorded was 0.2 mg•L^{-1} and the minimum pH recorded was 5.3. Henriksen's acidification index was determined for all streams in the study. The average value of Henriksen's index for Lower Mainland streams was +49 µeq•L^{-1}. The average value calculated for Vancouver Island streams was +28 µeq•L^{-1}. Buffer capacity values calculated on streams ranged from -7.82 µeq•L^{-1}•pH^{-1} to -224 µeq•L^{-1}•pH^{-1}.

The alkalinity and buffer capacity results indicate several coastal streams are sensitive to acidic deposition. Positive Henriksen's acidification index values suggest that acidification is ongoing in some streams.

RÉSUMÉ

On a receuilli des échantillons d'eaux de surface entre janvier 1985 et juillet 1986 dans trente-six cours d'eau situés dans le Lower Mainland et sur l'île Vancouver en Colombie-Britannique et on les a analysés pour déterminer le pH, l'alcalinité, la conductivité, la couleur, les sulfates, les nitrates, les chlorures ainsi que les métaux dissous et totaux. L'alcalinité minimale enregistrée a été de 0,2 mg•L^{-1} et le pH minimum enregistré de 5,3. L'indice d'acidification d'Henriksen a été déterminé pour tous les cours d'eau dans mentionnées dans l'étude. La valeur moyenne de l'indice d'Henriksen pour les cours d'eau du Lower Mainland a été de +49 µeq•L^{-1}. La valeur moyenne calculée pour les cours d'eau de l'île Vancouver s'est établie +28 µeq•L^{-1}. Les valeurs de capacité de tampon des cours d'eau ont varié de -7,82 µeq•L^{-1}•pH^{-1} à -224 µeq•L^{-1}•pH^{-1}.

Les résultats pour l'alcalinité et de la capacité de tampon indiquent que plusieur cours d'eau côtiers sont sensibles aux retombées acides. Les valeurs positives de l'indice d'acidification donnent à penser que certains cours d'eau sont en train de s'acidifier.

INTRODUCTION

Studies investigating the sensitivity of British Columbia salmon streams to acidic precipitation were jointly initiated in 1981 by the Department of Fisheries and Oceans (DFO), Pacific Region and the then International Pacific Salmon Fisheries Commission (IPSFC). The original impetus for these studies was a B.C. Hydro and Power Authority proposal to develop a coal-fired electric generating plant in the Hat Creek valley in south-central B.C. The initial studies (Servizi et al. 1985) were expanded in 1982 to include stream sampling in other areas of the province where bedrock geology and soil type indicated watercourses were likely to be sensitive to acidic depositions (B.C. Ministry of Environment 1978). The results of the expanded survey (Sullivan et al. 1985) indicated low buffering capacity existed in a number of streams in the Pacific Region, particularly in coastal areas.

The present report documents the findings of stream water chemistry sampling conducted from January 1985 to July 1986. The study included monitoring of southern Vancouver Island and Lower Mainland salmon streams in areas of the province where the largest sulfate depositions occur (M. Kotturi, B.C. Ministry of Environment and Parks, pers. comm.). The southwestern corner of B.C. is also an area of the province where transboundary depositions from Washington State are expected to occur (D. Faulkner, Atmospheric Environment Service, Department of Environment, pers. comm.).

METHODS

SAMPLING LOCATIONS AND FREQUENCIES

Twenty-four salmon streams on the B.C. Lower Mainland (Fig. 1) were sampled either weekly or monthly from January 1985 to July 1986. The parameters sampled are listed in Appendix I.

Eleven salmon streams on Vancouver Island (Fig. 2) were sampled monthly or quarterly from October 1985 to February 1986 for the parameters listed in Appendix I.

Daily precipitation volume data from seven weather stations located 1.7 to 10.5 km distant from the Lower Mainland stream sampling sites (Fig. 1) were obtained for the period of sampling from the Atmospheric Environment Service, Climatological Data Service, Pacific Region Office, Vancouver, B.C.

FIELD METHODS

New 1 L polyethylene bottles were used to collect water samples for pH, alkalinity, conductivity, sulfate, nitrate, chloride and colour analyses. Samples were collected at midstream (0.1 to 0.3 m depth) in plastic containers rinsed three times with stream water. Samples were stored on ice in the field. The samples for pH, alkalinity, and conductivity analyses were refrigerated upon receipt at the IPSFC Sweltzer Creek Laboratory (DFO Cultus Lake Salmon Research Laboratory as of January 1986). The samples for sulfate, nitrate, chloride and colour were refrigerated upon receipt at the Department of Environment Environmental Protection Chemistry Laboratory in West Vancouver, B.C. where they were analyzed within 14 days. In a previous study (Servizi *et al*. 1985), no significant pH or alkalinity changes occurred with storage of stream water samples for periods of up to 14 days at 4°C.

Water for the analysis of dissolved metals was collected with a 60 mL disposable plastic syringe and filtered through a 0.45 µm sterile membrane filter into a 100 mL acid-washed polyethylene bottle containing 0.5 mL concentrated nitric acid. The syringe and filtering unit were triple-rinsed with stream water before the sample was collected. Samples for total metals analyses were collected in 100 mL acid-washed polyethylene bottles containing 0.5 mL concentrated nitric acid preservative. Analyses for dissolved and total metals were conducted at the Environmental Protection Laboratory.

ANALYTICAL METHODS

Conductivity was measured using an Industrial Instruments Conductivity Bridge (model R.C.-1) conductivity cell.

Alkalinity and pH were determined using a Radiometer pH meter (model 61) equipped with dual electrodes. Potentiometric titrations were conducted to pH 3.2 using 0.02 N hydrochloric acid and alkalinity was calculated by the "low alkalinity" procedure (APHA 1980).

Metals levels were measured by inductively coupled argon plasma instrumentation. A list of detection limits is included in Appendix II.

True colour was measured using the platinum-cobalt method of visual comparison (Government of Canada 1979) following turbidity removal by centrifugation.

Chloride, sulfate and nitrate were determined colourimetrically. Chloride was determined via thiocyanate liberation. Sulfate determinations were made using the methylthymol blue method. Acid rain quality assurance studies have shown that methylthymol blue analyses are subject to interference by high (>30 relative units) colour. Nitrate was analyzed by diazotization (Government of Canada 1979).

Analysis of variance and the Newman-Keuls Multiple Range Test (Sokal 1969) were performed on the pH, alkalinity, conductivity and precipitation data for the Lower Mainland. (The daily precipitation data were first converted to weekly data by summing the amount of precipitation within each surface water sampling interval.)

Henriksen (1980) developed an index which is used as an approximate indicator of surface water acidification. Henriksen has stated, "Quantitatively, acidification can be operationally defined as the difference between preacidification alkalinity (ie. original alkalinity) and the present day alkalinity." Preacidification alkalinity is derived from measured Ca and Mg in water samples. The index was calculated using chemistry data collected in Lower Mainland and Vancouver Island streams according to the following formula from Welch _et al_. (1986):

$$\text{Alk} = 0.91(\text{Ca}^{*}\,\mu\text{eq}\bullet\text{L}^{-1} + \text{Mg}^{*}\,\mu\text{eq}\bullet\text{L}^{-1}) - \text{alkalinity}\ \mu\text{eq}\bullet\text{L}^{-1})$$

* Indicates Ca and Mg values have been corrected for sea salt influence.
(Alk is the symbol used by Welch _et al_. (1986) for Henriksen's index)
$0.91(\text{Ca}^{*} + \text{Mg}^{*})$ = preacidification alkalinity
alkalinity = current alkalinity
positive Alk = apparent acidification

Ca and Mg sea salt corrections were made according to the method described by Watt _et al_. (1979). Henriksen's index is applicable to both lakes and streams (E.B. Welch, University of Washington, pers. comm.).

The acidification index was initially calculated using data from three sampling occasions. In addition, the acidification index was calculated using minimum alkalinity values for each site in conjunction with average Ca and Mg values for each site. The average Ca and Mg values were used in order to estimate the index for dates when alkalinity was at a minimum, but where Ca and Mg were not recorded.

Buffer capacity is a measure of resistance to pH change (Servizi et al. 1985). The term buffer capacity is to be distinguished from buffering capacity, a commonly used term for alkalinity (ie. a measure of the capacity of water to neutralize a specific quantity of acids). Buffer capacity for Lower Mainland and Vancouver Island streams was calculated according to methods described by Faust and McIntosh (1983) and Faust and Aly (1981).

RESULTS

LOWER MAINLAND

The pH of streams in this study ranged from a minimum of 5.30 (Noons Creek) to a maximum of 7.58 (Mossom Creek, lower site)(Table 1). The minimum and maximum alkalinities of Lower Mainland streams were 0.2 $mg \bullet L^{-1}$ $CaCO_3$ (Whonock Creek), and 25.5 $mg \bullet L^{-1}$ (Mossom Creek, lower), respectively. The conductivity of streams at sites not affected by tide water ranged from a maximum of 118.87 $\mu hmos \bullet cm^{-1}$ (Kanaka Creek) to a minimum of 8.05 $\mu hmos \bullet cm^{-1}$ (McIntyre Creek).

Analysis of variance was performed on pH, alkalinity and conductivity data from the thirteen sites monitored weekly. There are significant differences ($p<0.01$) among some data groups (Fig. 4). There is, however, no significant difference in the amount of rainfall recorded among the seven Atmospheric Environment Service Lower Mainland precipitation monitoring stations.

The Newman-Keuls Multiple Range Test (alpha=0.05) (Sokal 1969) identified seven homogeneous subsets among the pH data, four homogeneous subsets among the alkalinity data and five homogeneous subsets among the conductivity data (Fig. 4). McIntyre, Whonock and Mossom (upper) creeks were always in the same subset (ie. no significant difference existed among pH, alkalinity or conductivity data), as were Lynn and Kanaka creeks. Mossom Creek (lower) was consistently in a separate subset (see Fig. 4). Overlapping subsets were combined into one group (e.g. pH Subsets 3, 4 and 5 became a single subset) in Figures 5, 6 and 7 in order to facilitate comparison of stream chemistry with stream size.

Henriksen's acidification index ranged from -56 $\mu eq \bullet L^{-1}$ to +270 $\mu eq \bullet L^{-1}$ in Lower Mainland streams (Table 7). Both these values occurred in samples taken from Mossom Creek. The variability in the index was not as great at other sites, where most values were between +20 and +50 $\mu eq \bullet L^{-1}$. For Lower Mainland streams, the highest acidification index values were calculated using minimum alkalinity and average Ca and Mg values. True colour values greater than 30 relative units may invalidate Henriksen's index. McIntyre, Noons and Whonock creeks exhibited true colour values greater than 30 relative units at least once during the study period.

Buffer capacity in Lower Mainland streams ranged from -7.82 to -224 $\mu eq \bullet L^{-1} \bullet pH^{-1}$ (Table 1). Twelve of the 24 streams had a buffer capacity between 0 and -50 $\mu eq \bullet L^{-1} \bullet pH^{-1}$.

Sulfate concentrations in the thirteen streams sampled on a weekly basis ranged from non-detectable in the Capilano River to 5 $mg \bullet L^{-1}$ in Noons Creek (Table 3). The highest sulfate levels occurred in the Port Moody creeks (ie. Noons; upper and lower Mossom; Table 3). The maximum nitrate concentration was 0.343 $mg \bullet L^{-1}$ (Mossom Creek, lower), and the minimum was 0.014 $mg \bullet L^{-1}$ (McIntyre Creek). Chloride ranged from non-detectable in several streams to a maximum of 4.5 $mg \bullet L^{-1}$ (Alouette River). True colour ranged from a low of 5 relative units (Alouette River; Inches and Lynn creeks) to a high of 110 in Noons Creek.

Total Al was detected in 84% of the 104 samples collected for metals analyses (detection limit 0.05 $mg \bullet L^{-1}$ for total and dissolved metals; see Appendix II); dissolved Al was detected in 43% of the samples (Table 5). Of the 87 samples with detectable total Al, 24% had concentrations below 0.10 $mg \bullet L^{-1}$, 61% had concentrations between 0.10 and 0.50 $mg \bullet L^{-1}$, 7% had concentrations between 0.50 and 1.00 $mg \bullet L^{-1}$ and 7% had concentrations above 1.00 $mg \bullet L^{-1}$. Of the 43 samples with detectable dissolved Al, 51% had concentrations below 0.10 $mg \bullet L^{-1}$, 47% had concentrations between 0.10 and 0.50 $mg \bullet L^{-1}$, and 2% had concentrations between 0.50 and 1.00 $mg \bullet L^{-1}$.

VANCOUVER ISLAND

The pH values of the nine streams sampled on Vancouver Island at sites not influenced by tide water ranged from 6.18 (Tsitika River) to 7.08 (Tsable River; Table 2). The minimum alkalinity recorded was 2.0 $mg \bullet L^{-1}$ (Tsitika River); the maximum alkalinity was 15.5 mg•L^{-1} (Tsable River). The conductivity of these streams ranged from a minimum of 8.50 µhmos•cm^{-1} (Tsitika River) to a maximum of 140.60 µhmos•cm^{-1} (Tsable River).

Henriksen's acidification index ranged from -81 to + 75.6 µeq•L^{-1} in Vancouver Island streams (Table 7). True colour ranged from 5 to 80 relative units (Table 4). The Keogh, Quatse and Tsitika rivers on Vancouver Island exhibited true colour values greater than 30 relative units at least once during the study period. These colour values may invalidate Henriksen's index.

Buffer capacity values for Vancouver Island watercourses ranged from -48.8 to -95.5 µeq•L^{-1}•pH^{-1} (Table 2). Only one of the 11 streams sampled had a buffer capacity between 0 and -50 µeq•L^{-1}•pH^{-1}.

Sulfate concentrations at sites not affected by tide water ranged from a minimum of 2 mg•L^{-1} to a maximum of 8 mg•L^{-1} (Table 4). Nitrate concentrations ranged from non-detectable to 0.373 mg•L^{-1}. The minimum chloride concentration recorded was 0.9 mg•L^{-1} (Tsitika River); the maximum was 27.3 mg•L^{-1} (Tsable River).

Total Al was detected in 95% of the 20 samples collected for metals analyses, and dissolved Al was detected in 65% of the samples (Table 6). Of the 19 samples with detectable total Al, 21% had levels below 0.10 mg•L^{-1}, 74% were between 0.10 and 0.50 mg•L^{-1} and 5% were above 1.00 mg•L^{-1}. Of the thirteen samples with detectable dissolved Al, 31% had concentrations below 0.10 mg•L^{-1} and 69% were between 0.10 and 0.50 mg•L^{-1}.

DISCUSSION

The water chemistry of streams is influenced by the geologic/edaphic characteristics of watersheds, atmospheric dry depositions and the amount and quality of precipitation. The B.C. Lower Mainland receives annual wet sulfate depositions of up to 20.3 $kg \bullet ha^{-1} \bullet yr^{-1}$ (M. Kotturi, BC Ministry of Environment and Parks, pers. comm.; Feller 1986). Southern Vancouver Island in the immediate vicinity of the city of Victoria, receives annual sulfate depositions of up to 18.7 $kg \bullet ha^{-1} \bullet yr^{-1}$ (M. Kotturi, pers. comm.).

The remainder of the Discussion is primarily concerned with the Lower Mainland because of the larger data record.

Surface water monitoring of selected salmon streams in the Lower Mainland indicated that chemical sensitivity to acidic inputs exists in a number of watercourses. The mean alkalinity of the thirteen stream sites in the weekly sampling program is 3.96 $mg \bullet L^{-1}$.

There was considerable variability in pH, alkalinity and conductivity values between watercourses sampled in this study. These differences did not appear to be related to geographic location. Although the Newman-Keuls Multiple Range Test generated subsets of streams with statistically similar water quality characteristics (Fig. 4), the streams within each subset were not geographically "clumped" (Fig. 5, 6 and 7). Analysis of variance indicated there was no significant difference in the amount of precipitation between the seven rainfall gauging stations within the study area. The differences measured in surface water chemistry were probably related to other characteristics of the watersheds, both geological and anthropogenic. David (1986) reported that differences existed in the water chemistry of two streams entering the same lake in the Adirondack Mountains, N.Y., and related them to differences in watershed characteristics. At Carnation Creek, on Vancouver Island, British Columbia, differences in the water chemistry (eg. nitrate levels) between logged and unlogged areas of the watershed were attributed to logging and slash burning activities (Scrivener 1982). The seasonal fluctuations of ionic concentrations in Carnation Creek tributaries were primarily related to hydrological flux (Scrivener 1982). In the present study, stream size (length and drainage area, Table 9) appeared to be linked to stream water chemistry characteristics (Fig. 5, 6 and 7). The grouping of smaller streams (ie. Noons, McIntyre, Whonock, and upper Mossom creeks) in the same statistical subsets is probably due to the similarities of hydrological processes in small basins. A factor confounding interpretation of the data is the number of watersheds containing impoundments (Capilano, Seymour, Coquitlam, Alouette and Stave).

Precipitation pH on the B.C. Lower Mainland is lowest in Vancouver and the surrounding mountains (Nikleva 1983, 1985). The rainfall pH is higher to the east of Vancouver in the Fraser Valley (Nikleva 1983, 1985). In addition, the sulfate deposition rate generally decreases from the west to east on the Lower Mainland (M. Kotturi, pers. comm.). However, in the present study, there was no corresponding trend in the pH of Lower Mainland watercourses.

The sulfate content of Cascade Mountain lakes in Washington State is partially due to atmospheric deposition from anthropogenic sources (Welch et al. 1986). The concentration of sulfate in Lower Mainland streams is up to 5 times higher than that of the Cascade lakes. This may be an indication that the degree of anthropogenic deposition of sulfate in Lower Mainland watersheds is greater than that of the Cascades. Precipitation sulfate data (Table 8) were collected from deposition monitoring stations on the Lower Mainland near, but not co-located with, surface water monitoring sites. The data indicated that the Lower Mainland may be receiving higher sulfate precipitation concentrations than the Cascade Mountains.

Henriksen's acidification index can be used as an approximate indicator of surface water acidification. Welch et al. (1986) reported values of +9, +119 and +192 $\mu eq \bullet L^{-1}$ for acidified lakes in the Rocky Mountains, the Adirondack Mountains and near Sudbury, Ont., respectively. Positive values indicate apparent acidification. The average value of the index calculated for thirteen Lower Mainland and nine Vancouver Island streams was +49 and +28 $\mu eq \bullet L^{-1}$, respectively. These positive values indicate that southwestern British Columbia streams may be undergoing acidification.

Buffer capacity is an indicator of the sensitivity of a waterbody to acidification. Buffer capacity numerically defines the resistance of a waterbody to pH change (Servizi et al. 1985). A positive buffer capacity indicates a resistance to pH increase; a negative buffer capacity, a resistance to pH decrease. Streams with a buffer capacity between 0 and -50 $\mu eq \bullet L^{-1} \bullet pH^{-1}$ have little capacity to withstand acidification. For example, an acid input of 5 $\mu eq \bullet L^{-1}$ to a waterbody with a buffer capacity of -50 $\mu eq \bullet L^{-1} \bullet pH^{-1}$ would result in a pH reduction of 0.1 unit, according to the following equation (Sullivan et al. 1985):

$$\text{pH reduction} = \frac{5\ \mu eq \bullet L^{-1}}{-50\ \mu eq \bullet L^{-1} \bullet pH^{-1}} = -0.1\ \text{pH unit}$$

The nearer to zero the value for buffer capacity is for a waterbody, the larger would be the pH change for a given acidic input. Most Lower Mainland streams have minimal capacity to withstand acidic inputs because buffer capacities are generally less than -50 $\mu eq \bullet L^{-1} \bullet pH^{-1}$.

Low pH adversely affects Pacific salmon survival (Geen et al. 1985; Rombough 1982; Parker and McKeown 1987; Powell and McKeown 1986a and b). Geen et al. (1985) reported high (ie. 66-100%) chinook (O. tshawytscha) alevin mortality in laboratory bioassays carried out at pH values of 4.5 and 5.0, over a 120-day period. Rombough (1982) conducted 10-day laboratory bioassays on eyed embryos, newly hatched alevins and "buttoned-up" fry of all five species of Pacific salmon (Oncorhynchus spp.). "Buttoned-up" fry generally represented the life stage most sensitive to low pH water (Rombough 1982). Using acidified water in aquaria, the 10-day LC_{10} (ie. the pH at which 10% of the fish died after 10 days) varied from pH 5.01 for coho (O. kisutch) to pH 5.74 for chum salmon (O. keta) (Rombough 1982). Cleavage and newly hatched alevins were the most sensitive development stages of sockeye and kokanee (O. nerka) to acidified (pH 4.1 - 5.7) water (Parker and McKeown 1987).

The mean pH values for thirteen streams sampled weekly in the present study ranged from 5.86 to 6.99, with episodic declines to as low as pH 5.30. Other researchers (Whitfield and Dalley 1987) have electronically measured (ie. using a Hydrolab 8000 system) short term (ie. 11 to 25 hours) pH declines (of greater than 1.0 pH unit) to as low as 4.8 in one Lower Mainland stream (ie. Kanaka Creek) following precipitation events. Sudden pH depression in a stream reportedly can cause acid shock, potentially leading to death of fish at pH levels above those normally lethal (Bubenick 1984). Fish kills attributable to acidification have not been observed in Kanaka Creek, however studies to assess whether lethal or sublethal conditions are occurring have not been carried out.

During smoltification (ie. the process of physiological change preparatory to a salt water existence) and during migration prior to spawning, salmon are reported to be comparatively sensitive to low stream pH (Rosseland 1986; Saunders et al. 1983). Powell and McKeown (1986a and b) have demonstrated that seawater survival of coho salmon (O. kisutch) may be adversely affected by exposure to low pH water. Exposure time, stage of development and size of fish are all factors influencing the effects of acid stress on juvenile coho salmon (Powell and McKeown 1986a and b). Smoltification of Pacific salmon generally occurs during the spring when pH depression can be expected due to snowmelt and heavy rainfall. Research by Parker and McKeown (1987) on kokanee salmon (O. nerka) demonstrated reduced egg and alevin survival, delayed embryo hatching and decreased percent hatch, following exposure of sexually mature kokanee adults to acidified water.

The concentration of heavy metals in the dissolved phase generally increases with the acidification of surface waters (Norton 1982). Aluminum has been identified as a metal most likely to be problematic as fish-supporting waters become acidified (Haines 1981). The toxicity of aluminum is extremely variable, influenced by pH, presence of organic ligands and the chemical species of aluminum present (Baker 1982). These factors are interrelated insofar as pH affects aluminum speciation. Aluminum-fluoride and aluminum-hydrozide complexes, and the free aluminum ion are highly toxic to aquatic life (Baker 1982).

Eleven of the 24 streams monitored on the Lower Mainland periodically exhibited dissolved aluminum concentrations greater than those reported to be acutely toxic to fish (see Table 5) (Baker and Schofield 1982; Cleveland et al. 1986; Siddens et al. 1986). Episodic pH depressions are known to greatly increase aluminum toxicity to fish (Baker and Schofield 1982, Cleveland et al. 1986, Siddens et al. 1986). Toxicity studies using Pacific salmon and acidified water have not been conducted in natural streams where aluminum and other heavy metals would be available for leaching from substrates. The results of laboratory bioassays on salmonids reported by Geen et al. (1985) and Rombough (1982) indicate that fish may not be consistently protected from the effects of reduced pH under conditions prevalent in some Lower Mainland streams. In certain watercourses (eg. Noons and Whonock creeks), humic staining (ie. colour values of up to 110 relative units) may indicate that dissolved organic substances are available to complex metals and potentially reduce toxic effects on fish (Driscoll et al. 1980).

CONCLUSIONS

The low alkalinity and minimal buffer capacity of a number of B.C. coastal streams indicates a sensitivity to acidic deposition. The positive Henriksen's acidification indices suggest ongoing acidification in some of the streams. The relatively high metals concentrations (particularly Al) and low pH levels of some coastal B.C. streams indicate that adverse effects (eg. reduced growth, juvenile mortality) documented elsewhere on salmonid populations, could periodically occur in these watersheds. Further work should be directed at assessing the risk to fish and fish food organisms of episodic pH depressions and associated increases in dissolved metal concentrations in B.C. coastal streams.

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Figure 1 Lower Mainland site locations

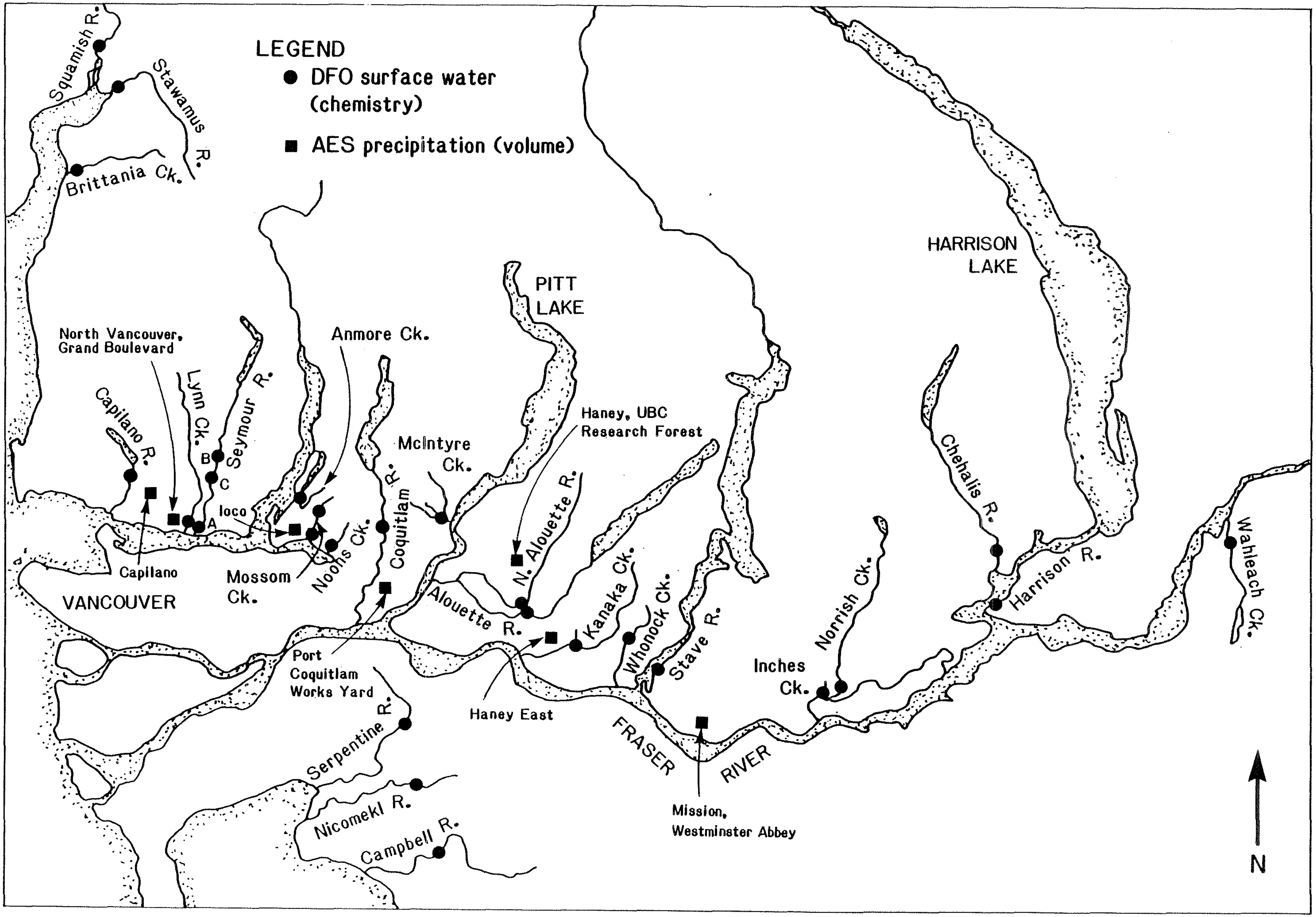


Figure 2 Vancouver Island site locations

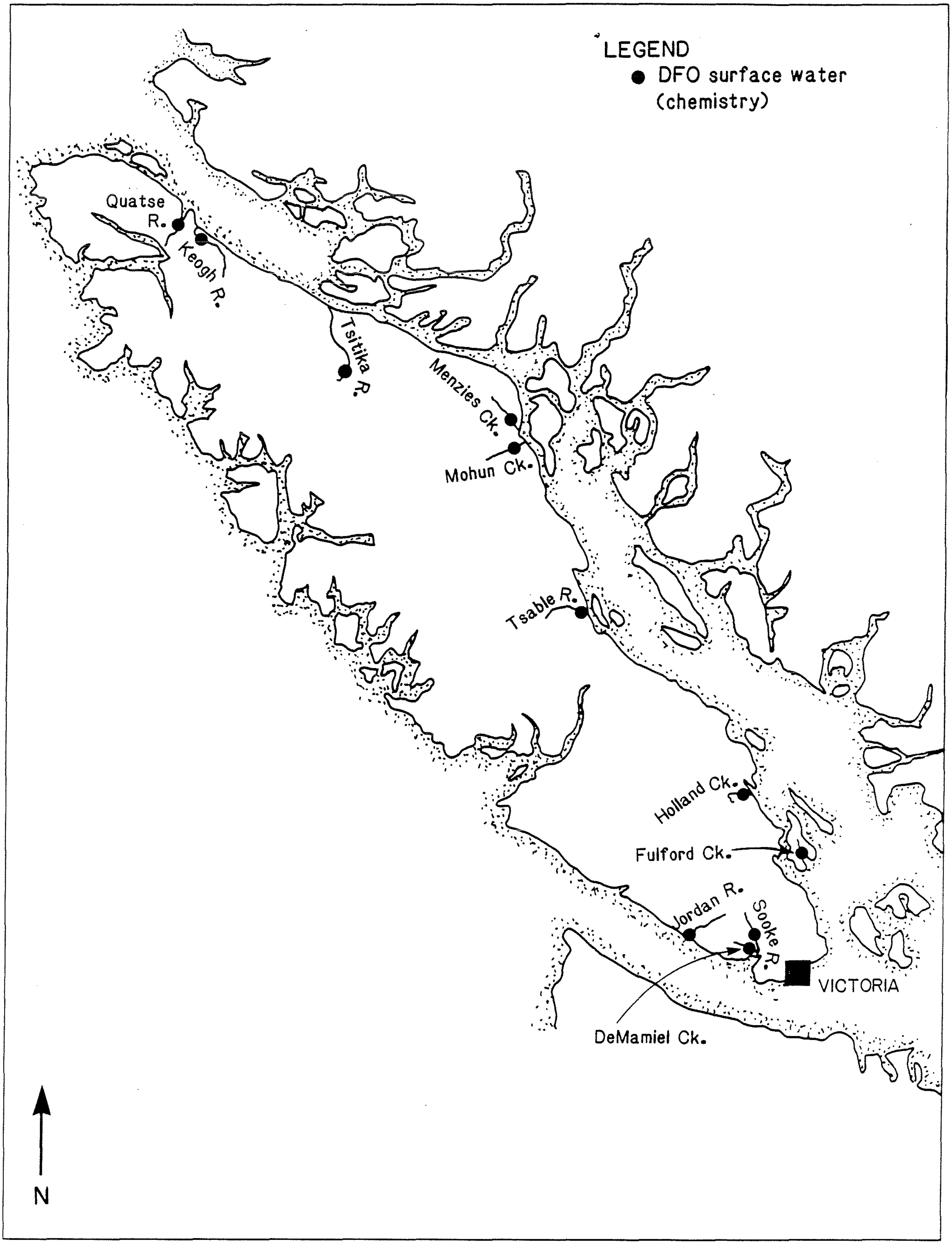
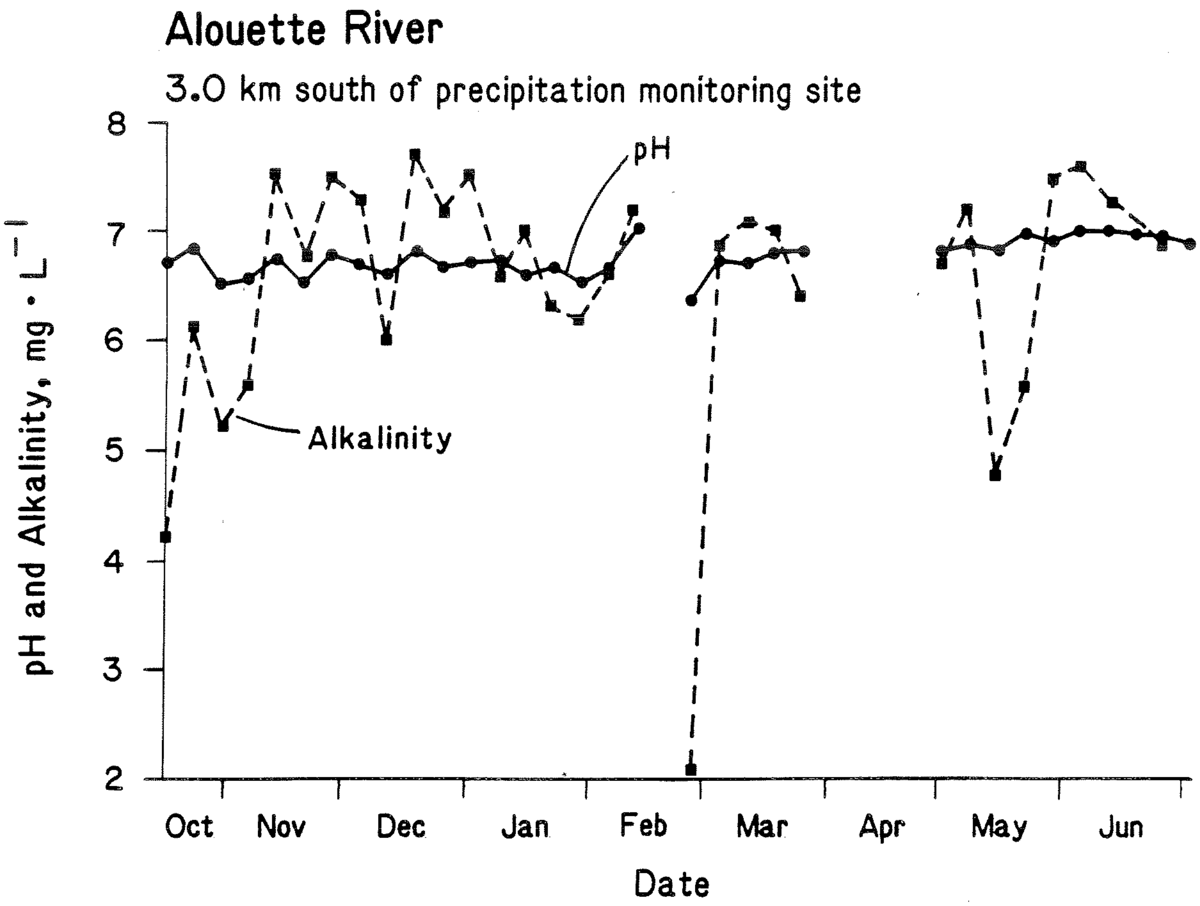


Figure 3a Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986



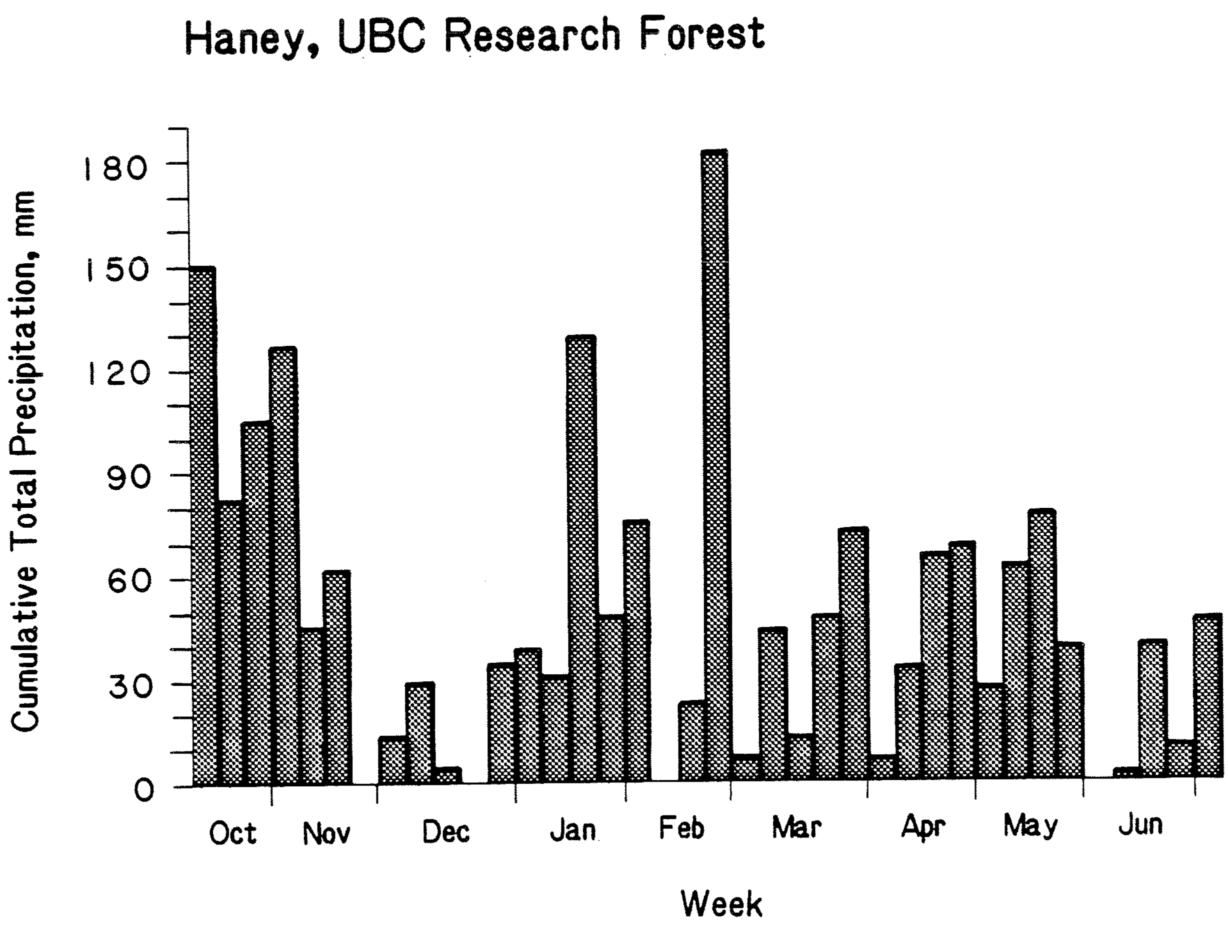
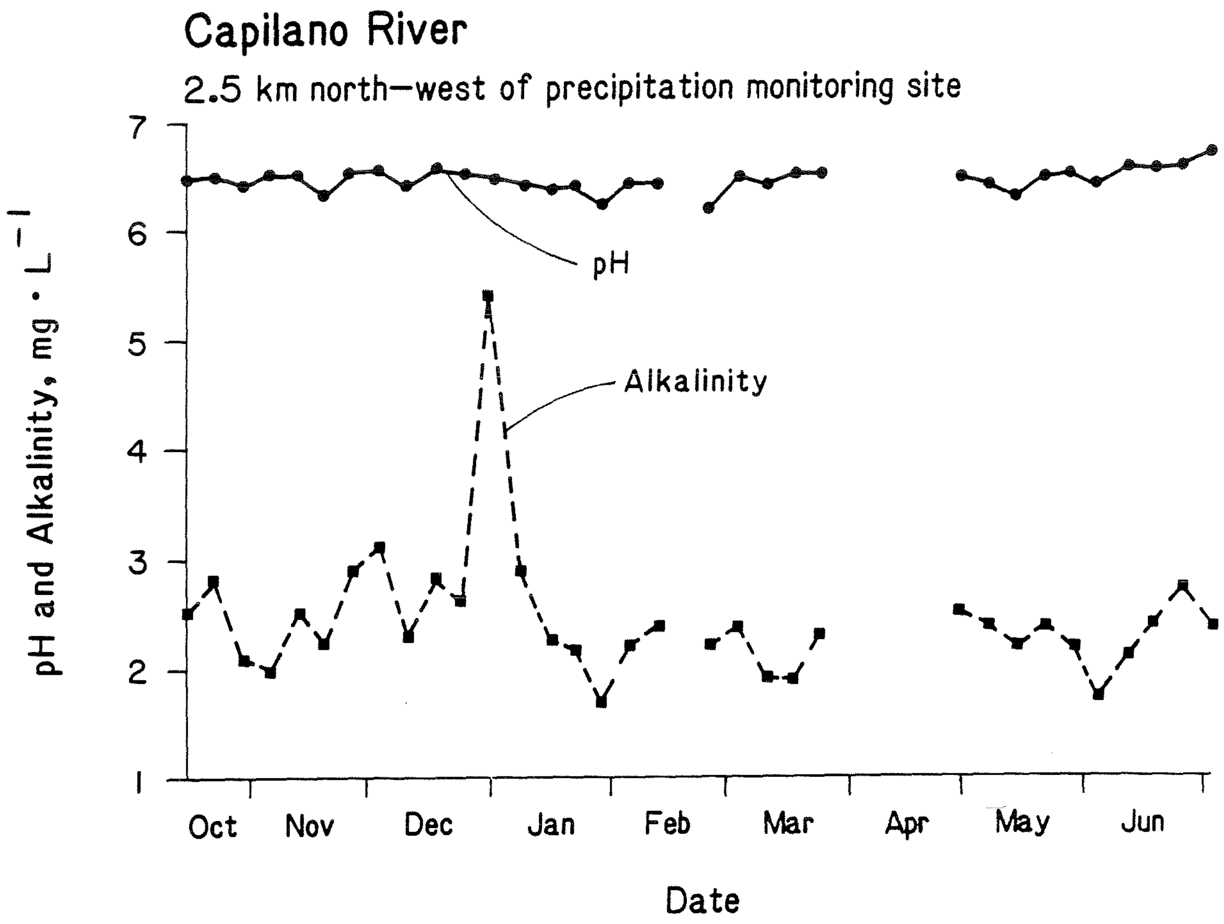


Figure 3b Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986



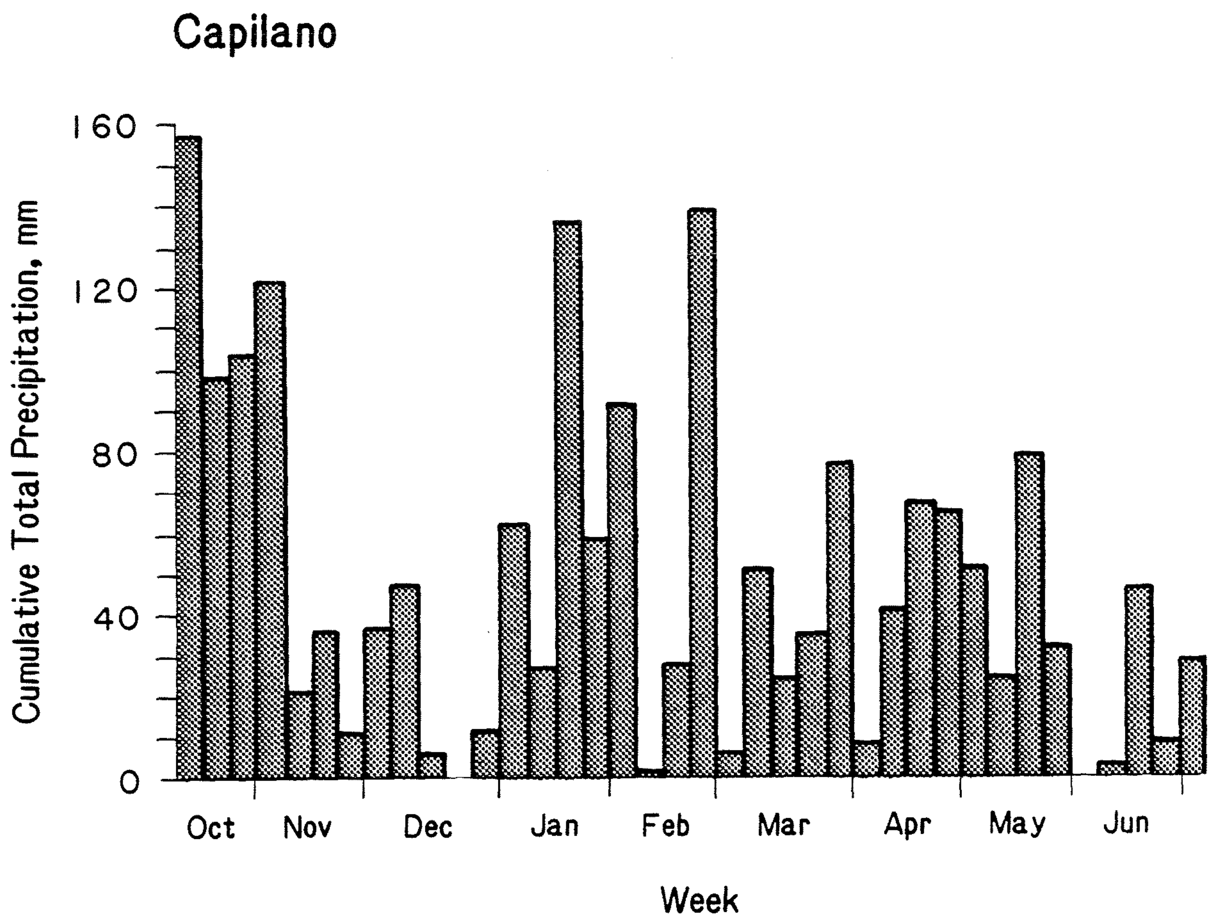
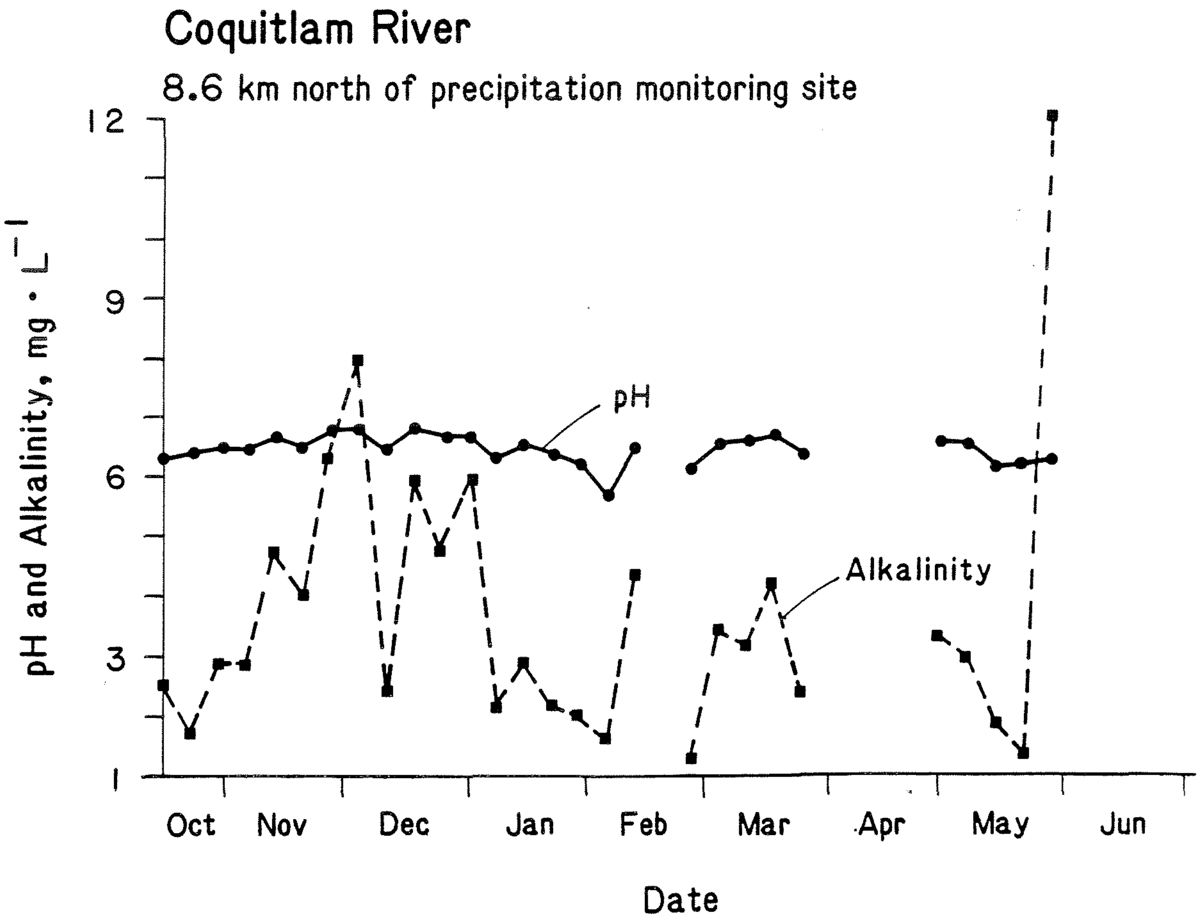


Figure 3c Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986



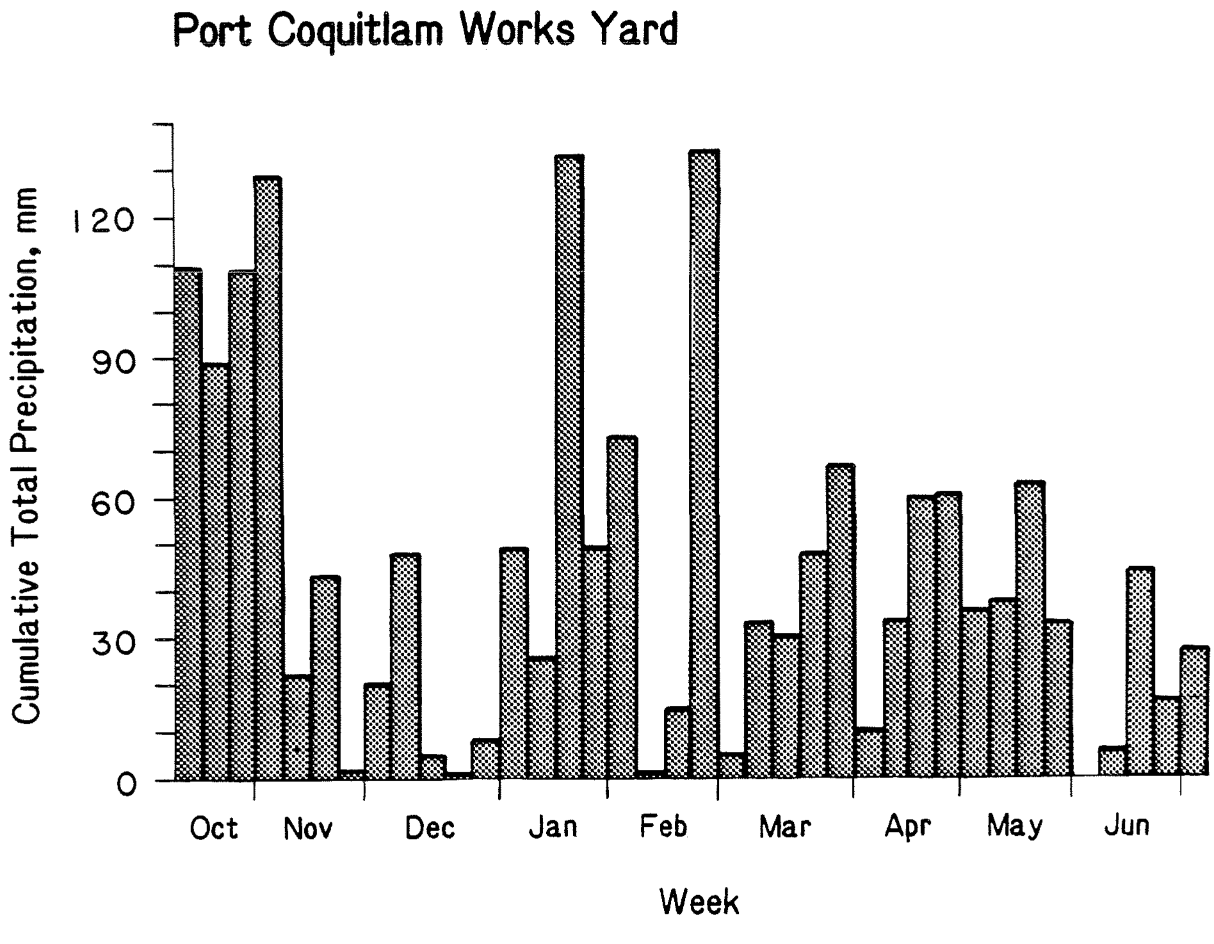
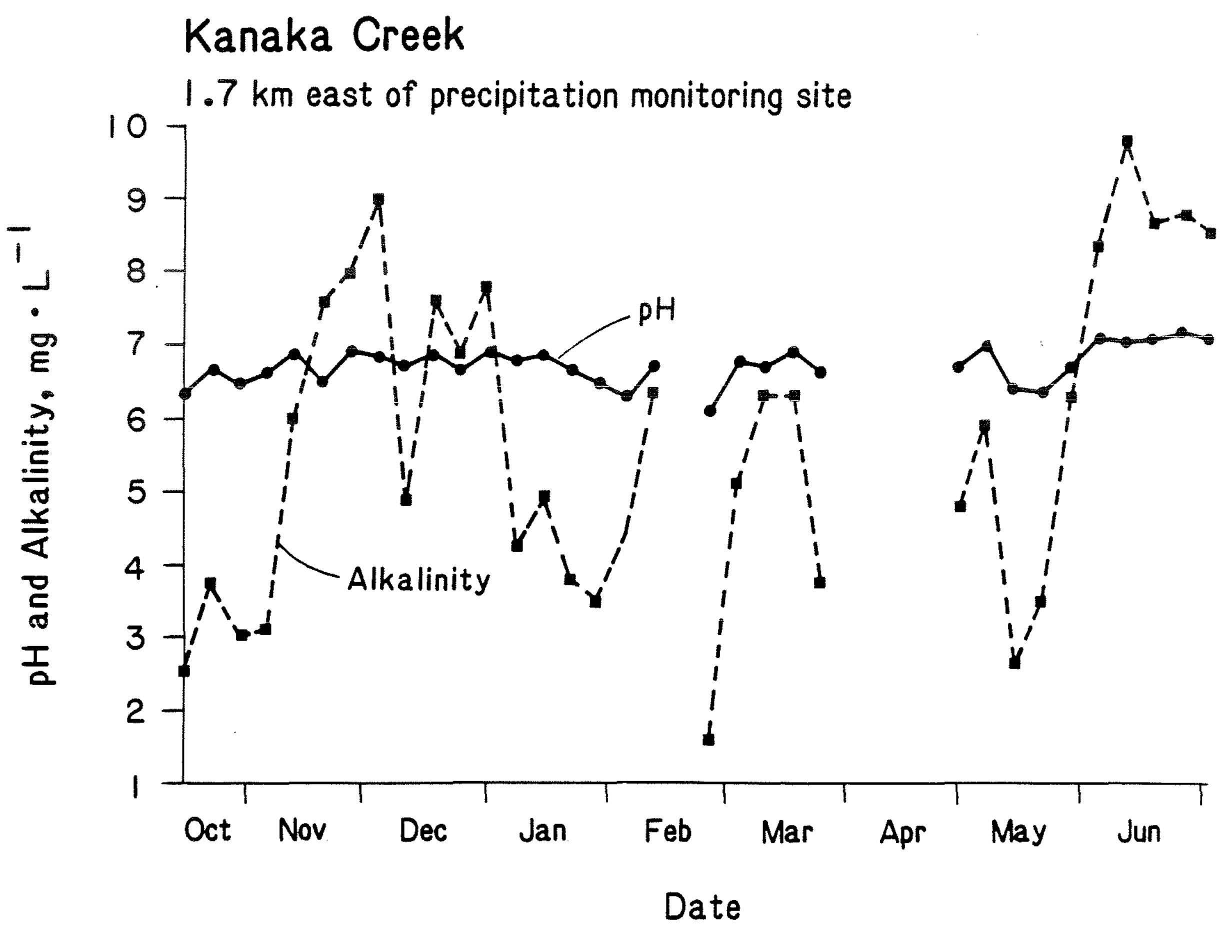


Figure 3d Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986



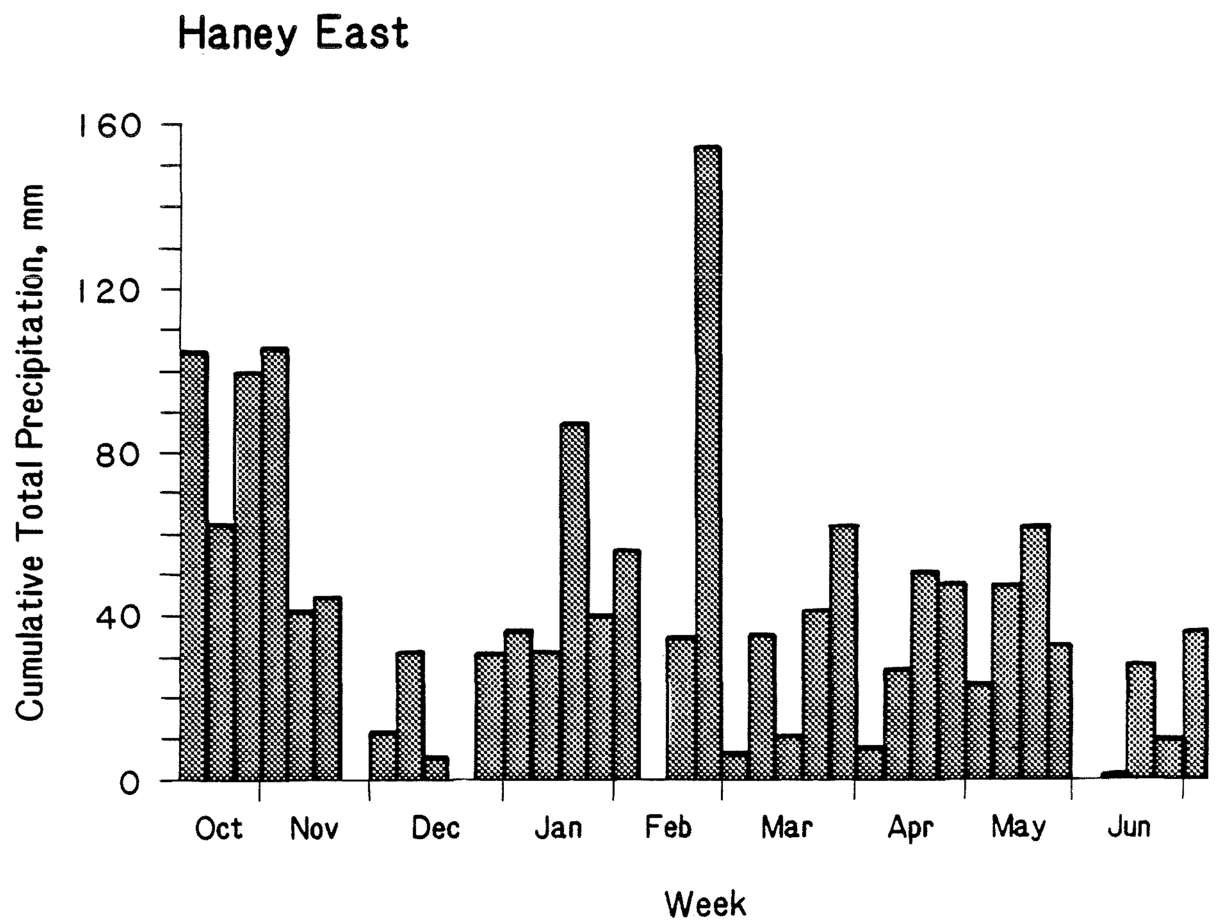
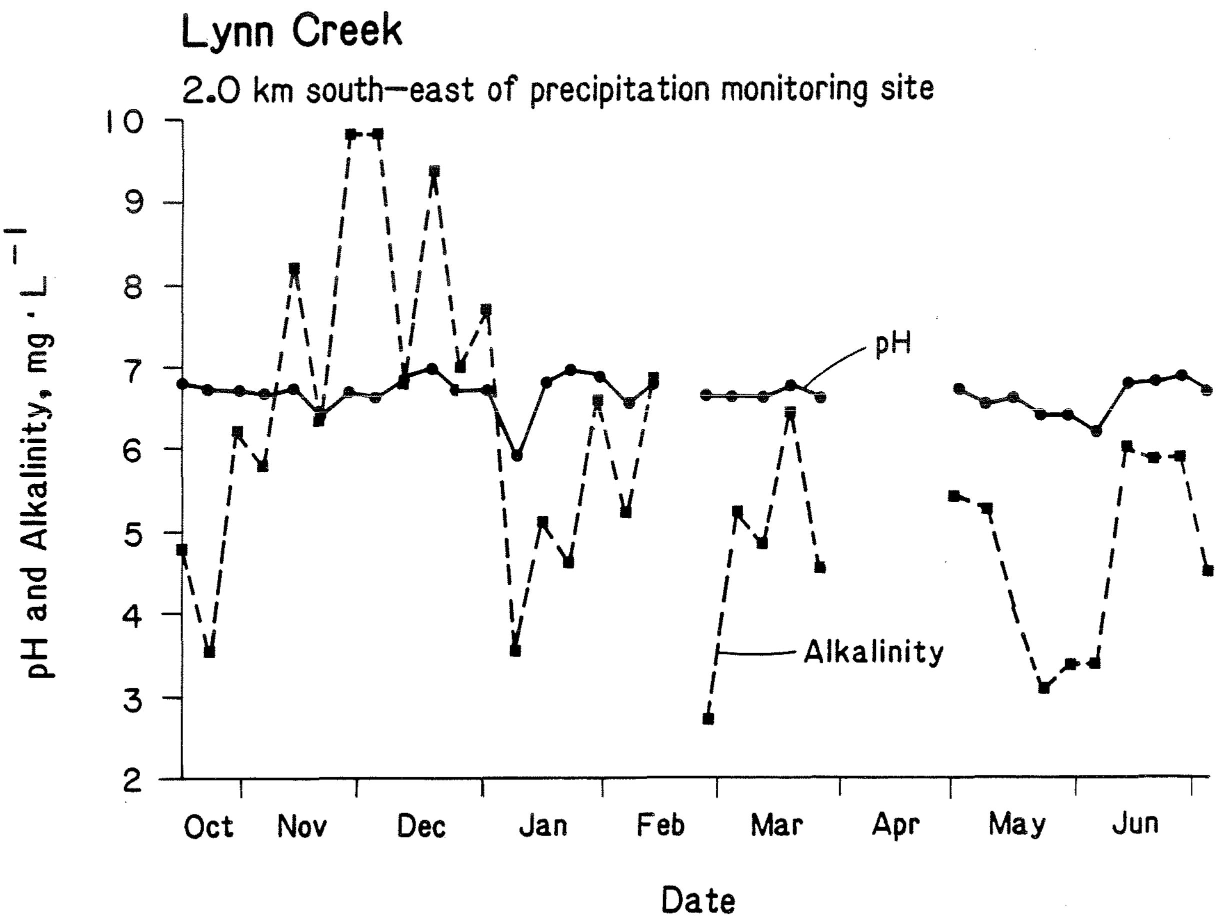


Figure 3e Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986



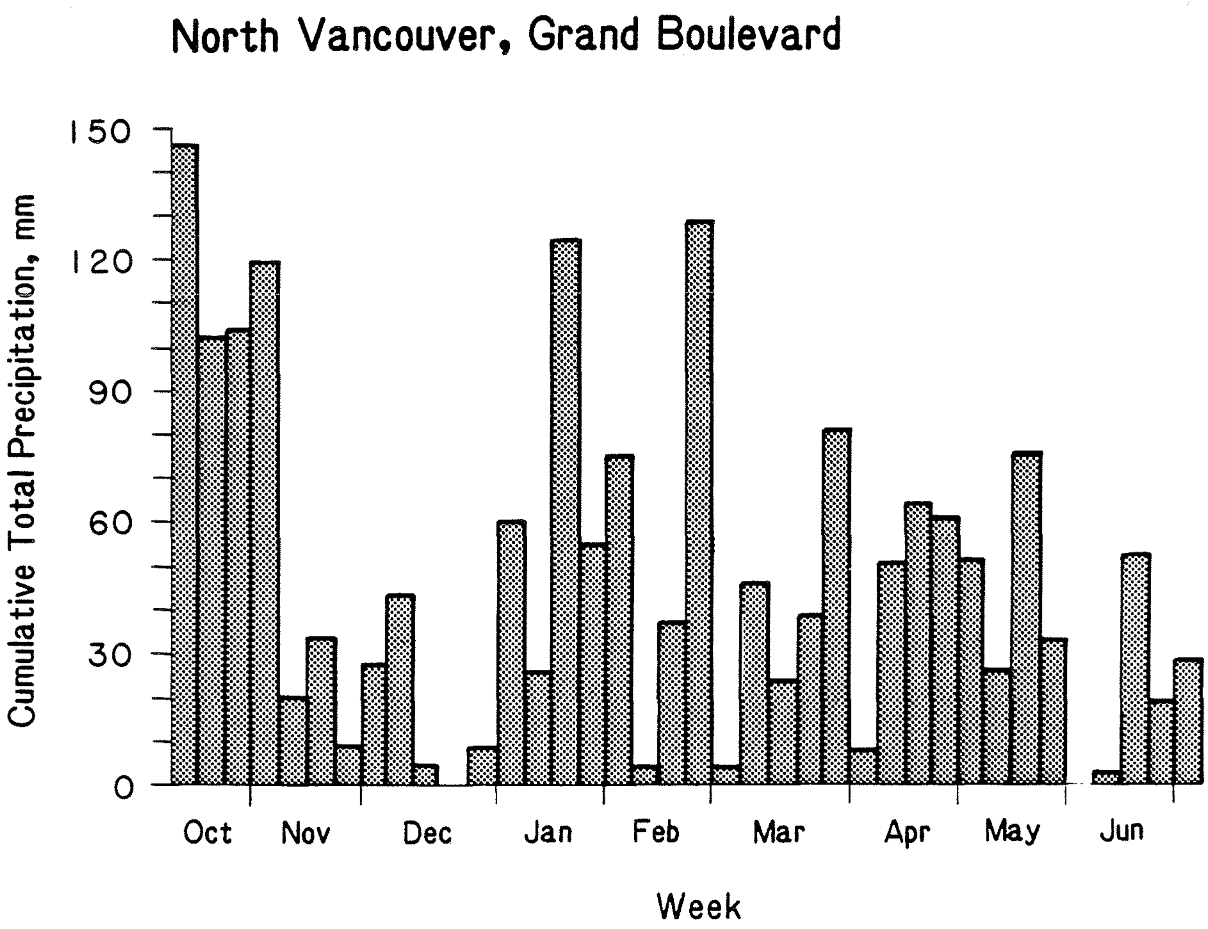
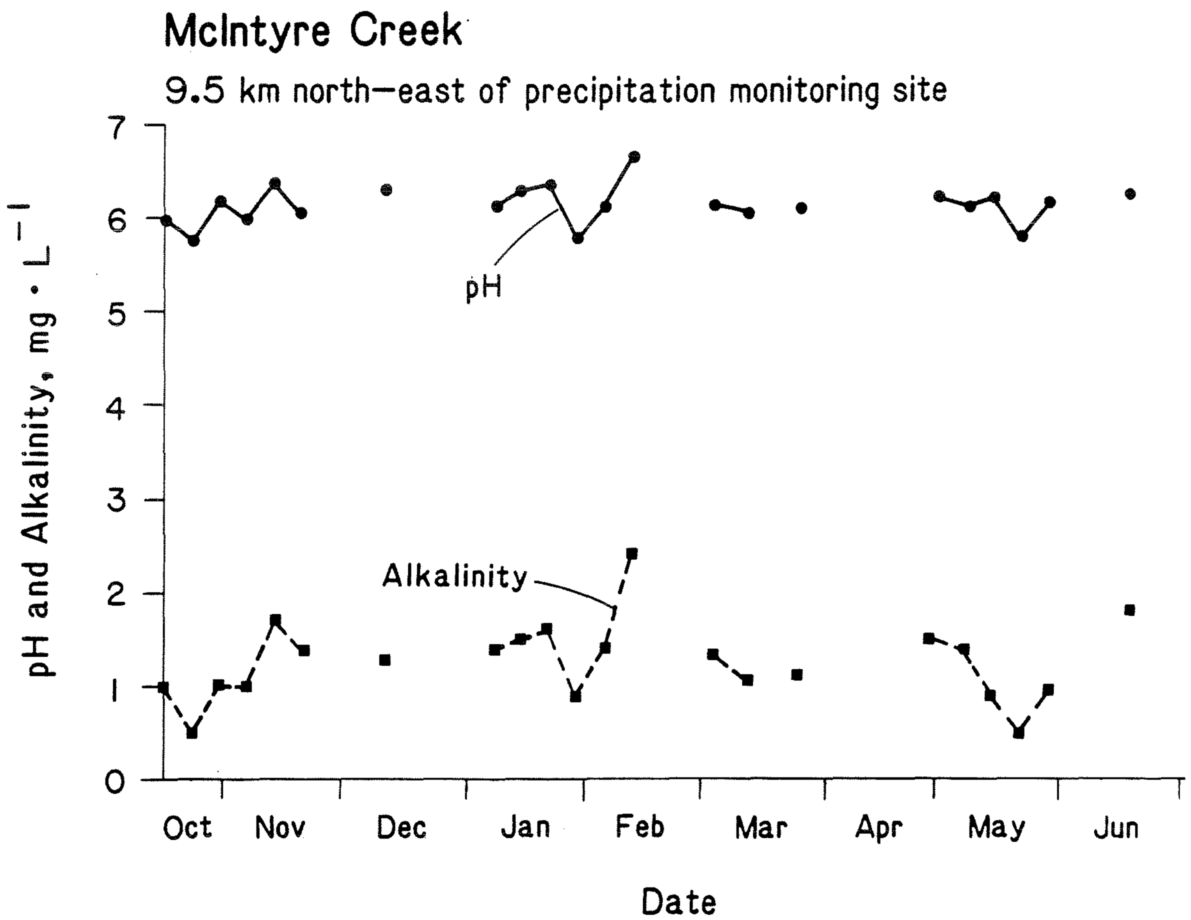


Figure 3f Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986



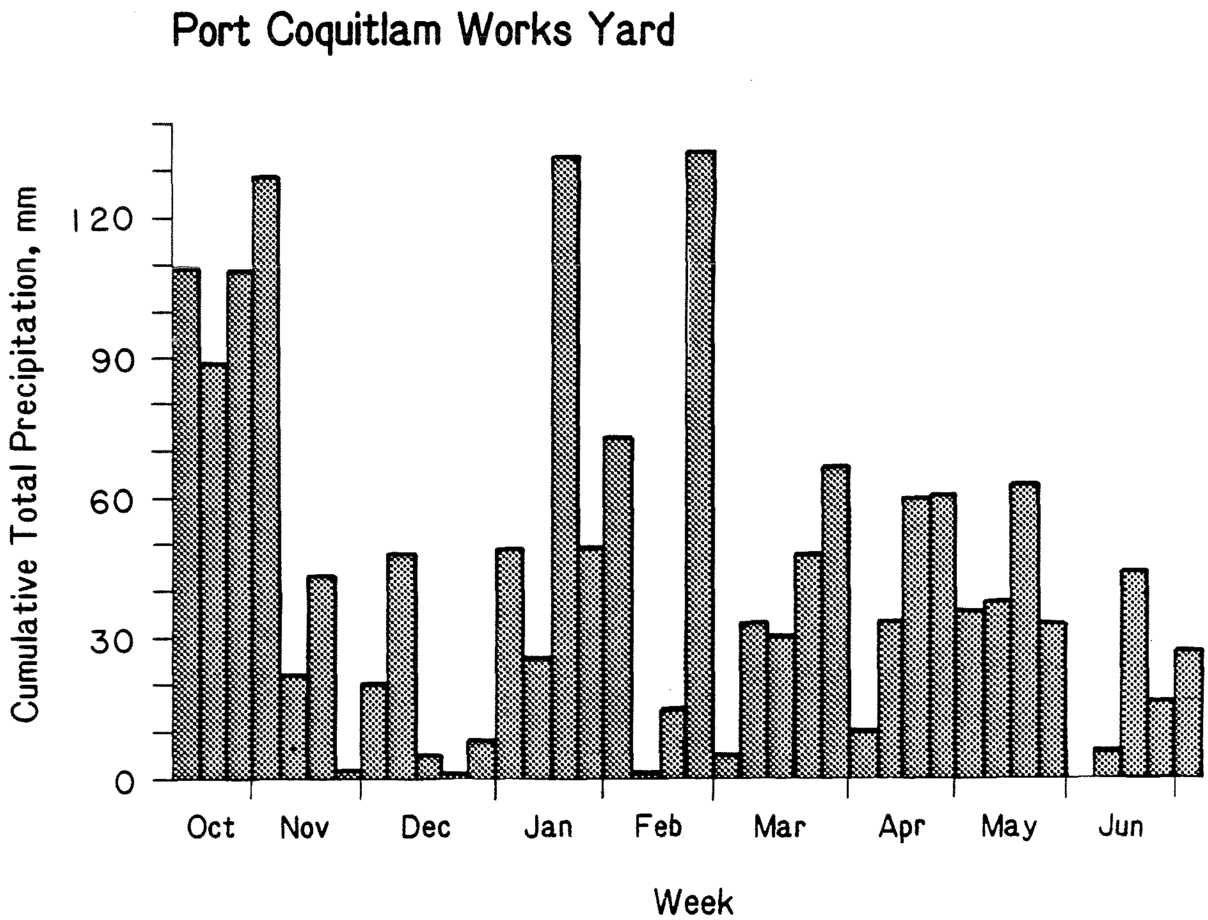
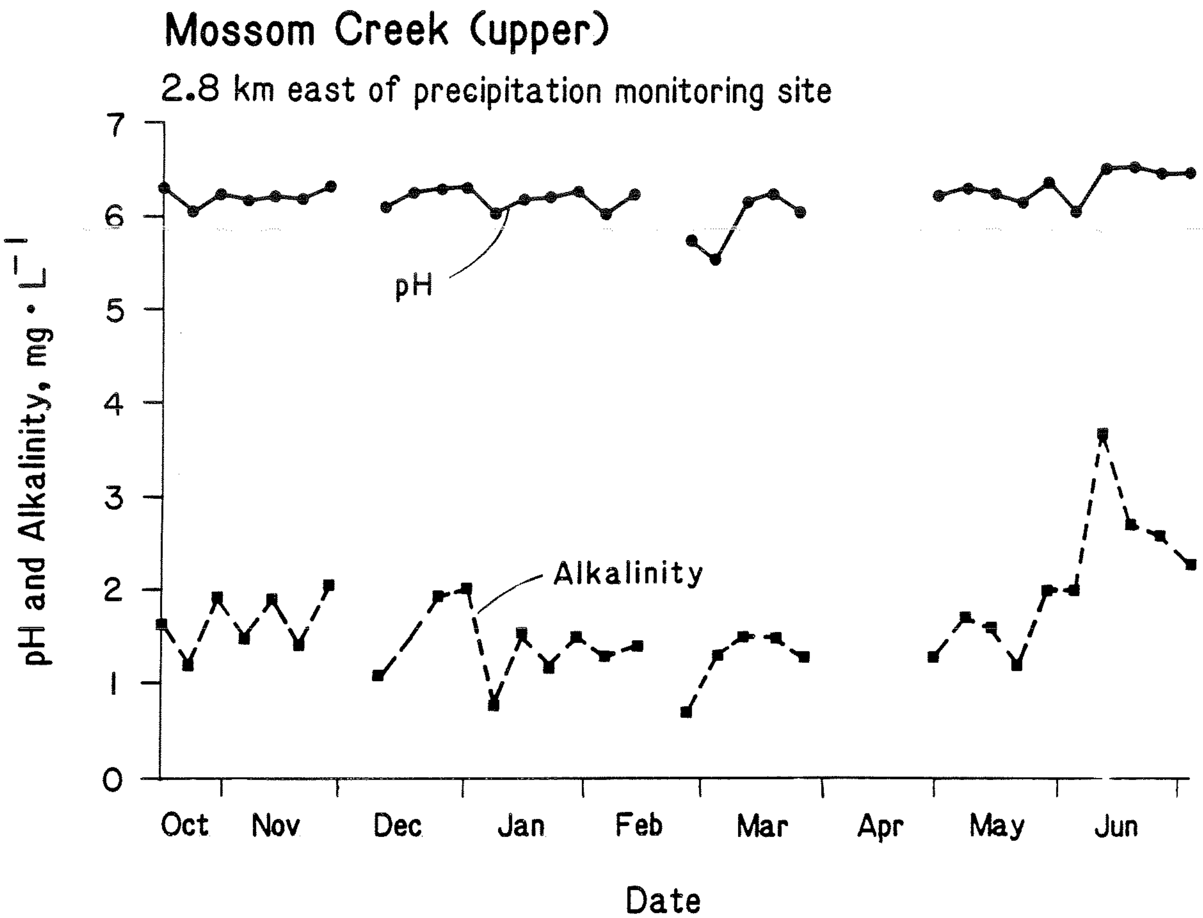


Figure 3g Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986



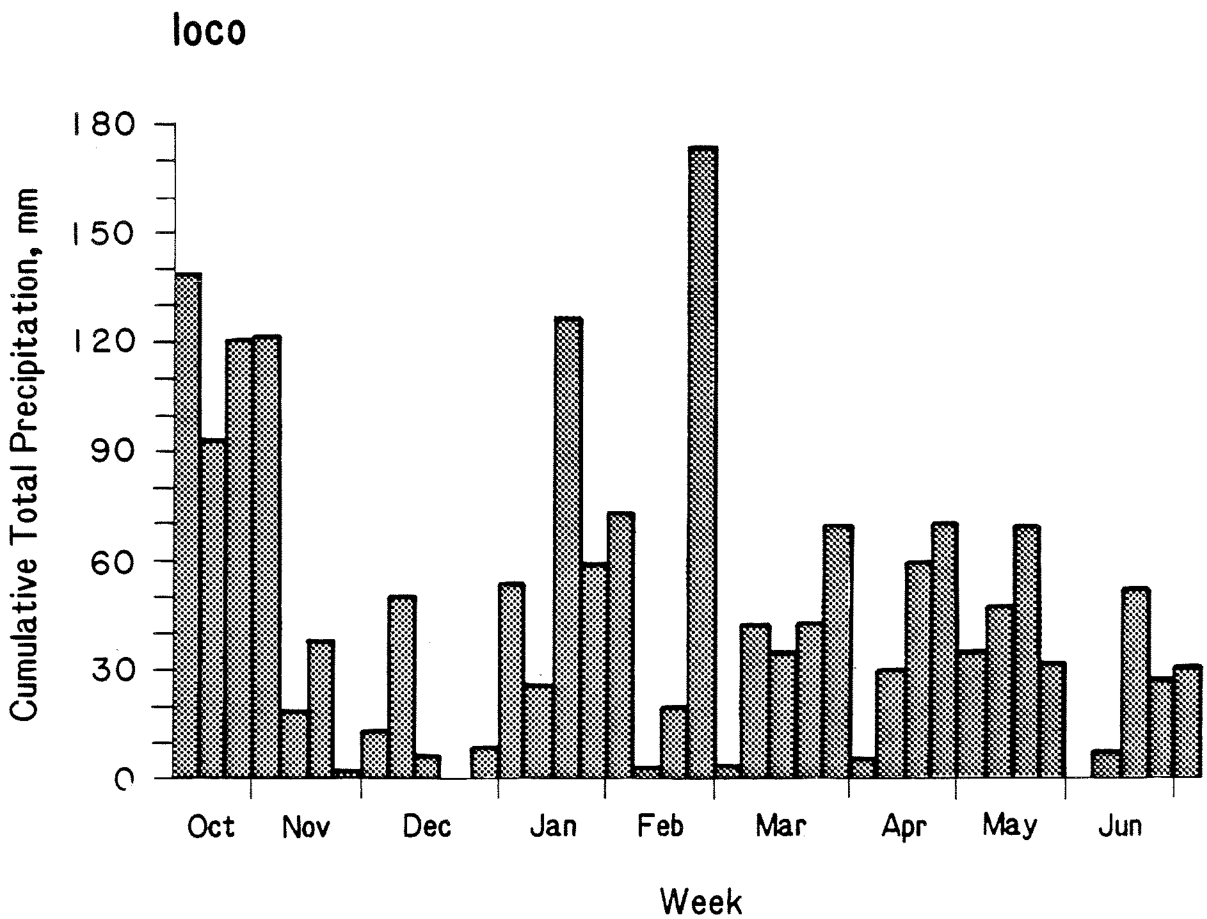
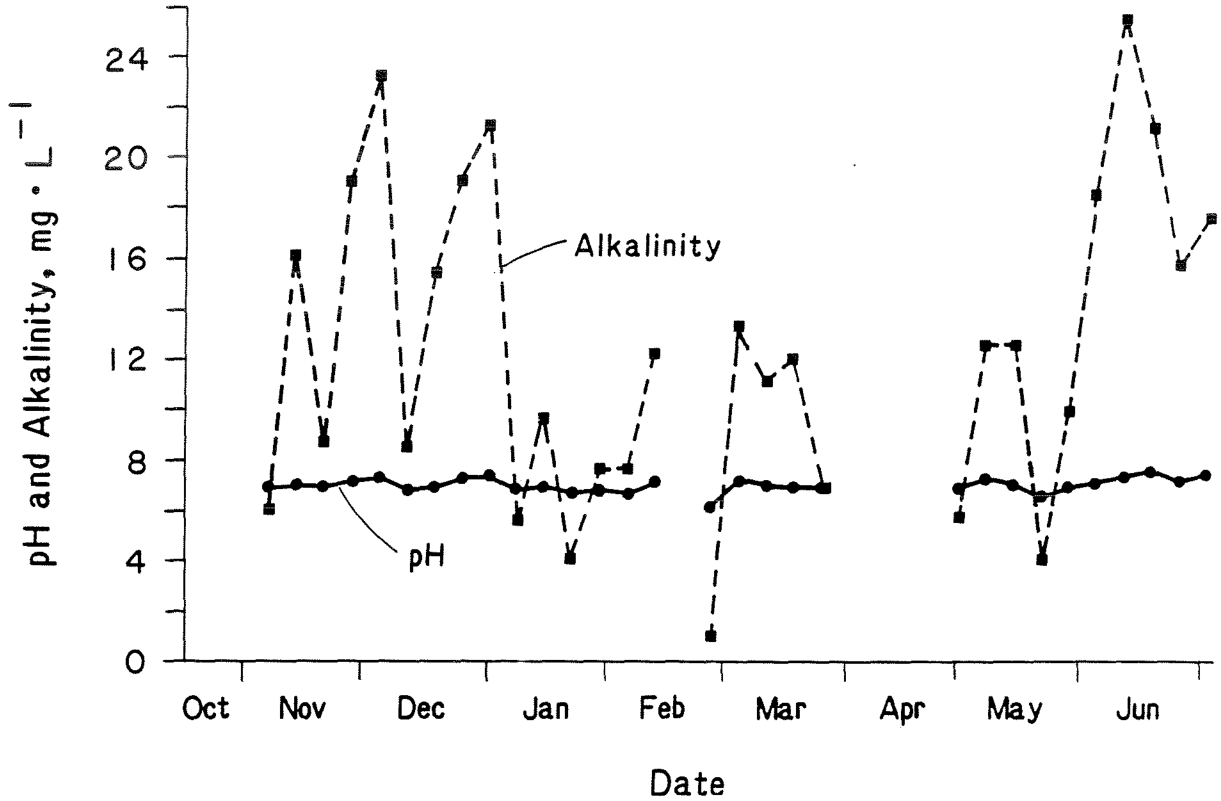


Figure 3h Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986

Mossom Creek (lower)

1.3 km south–east of precipitation monitoring site



Ioco

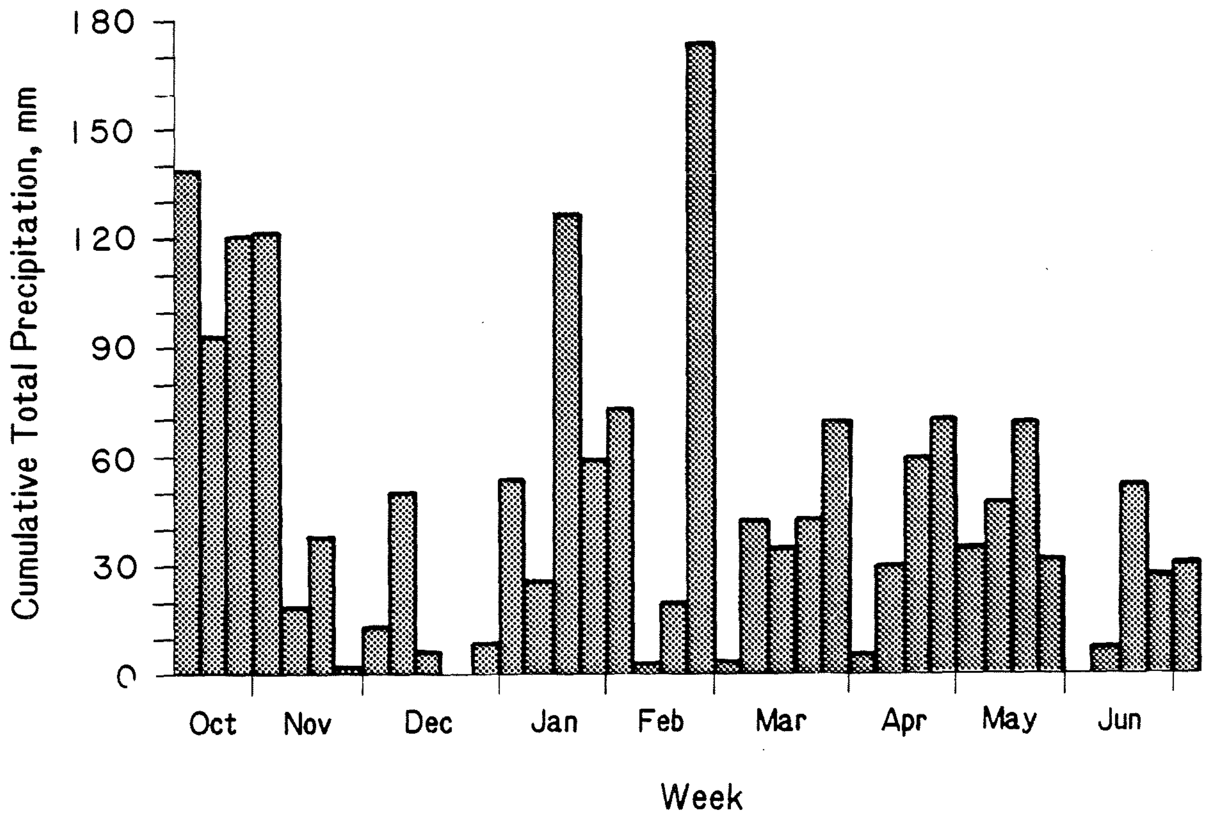


Figure 3i Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986

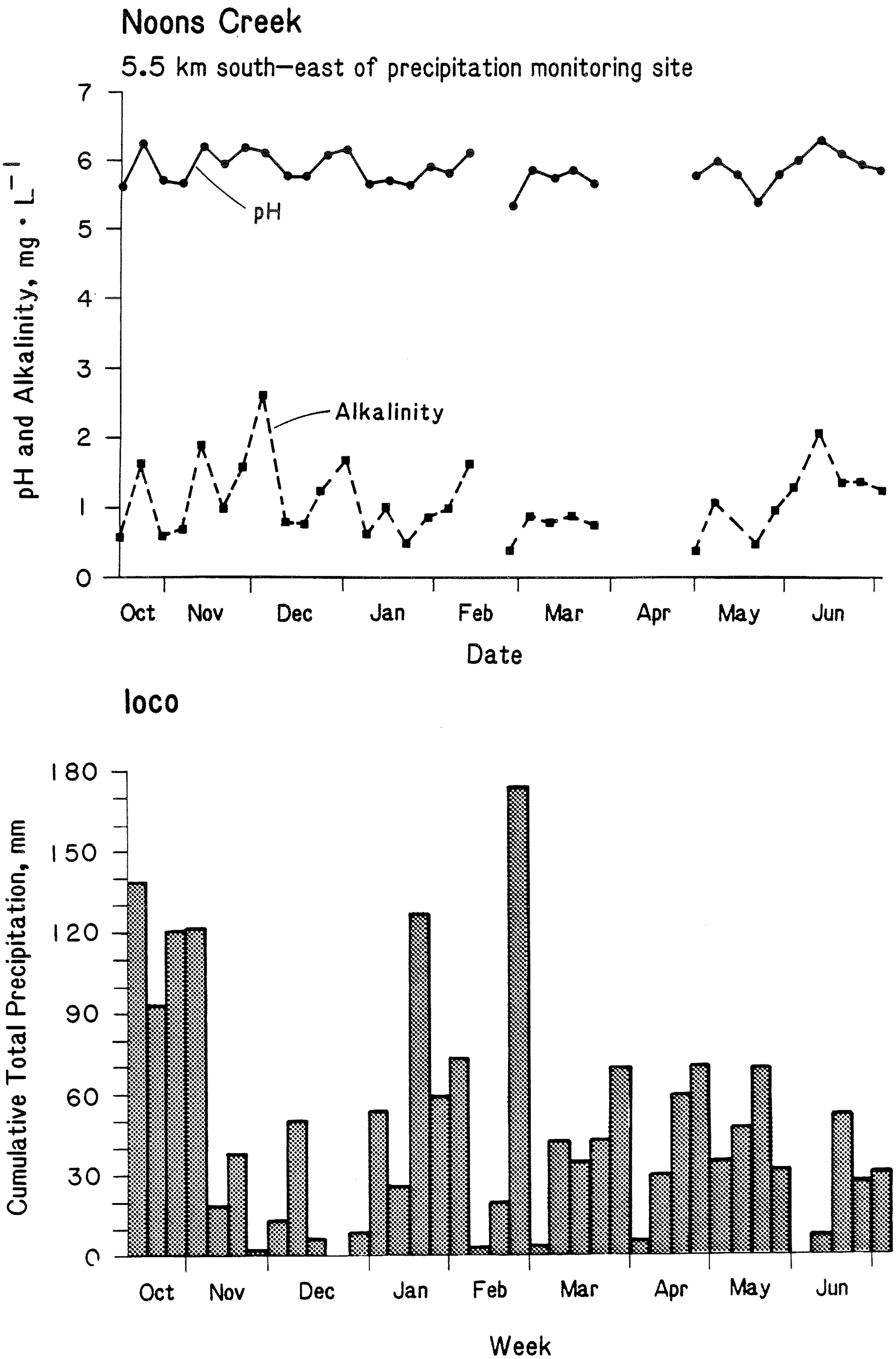
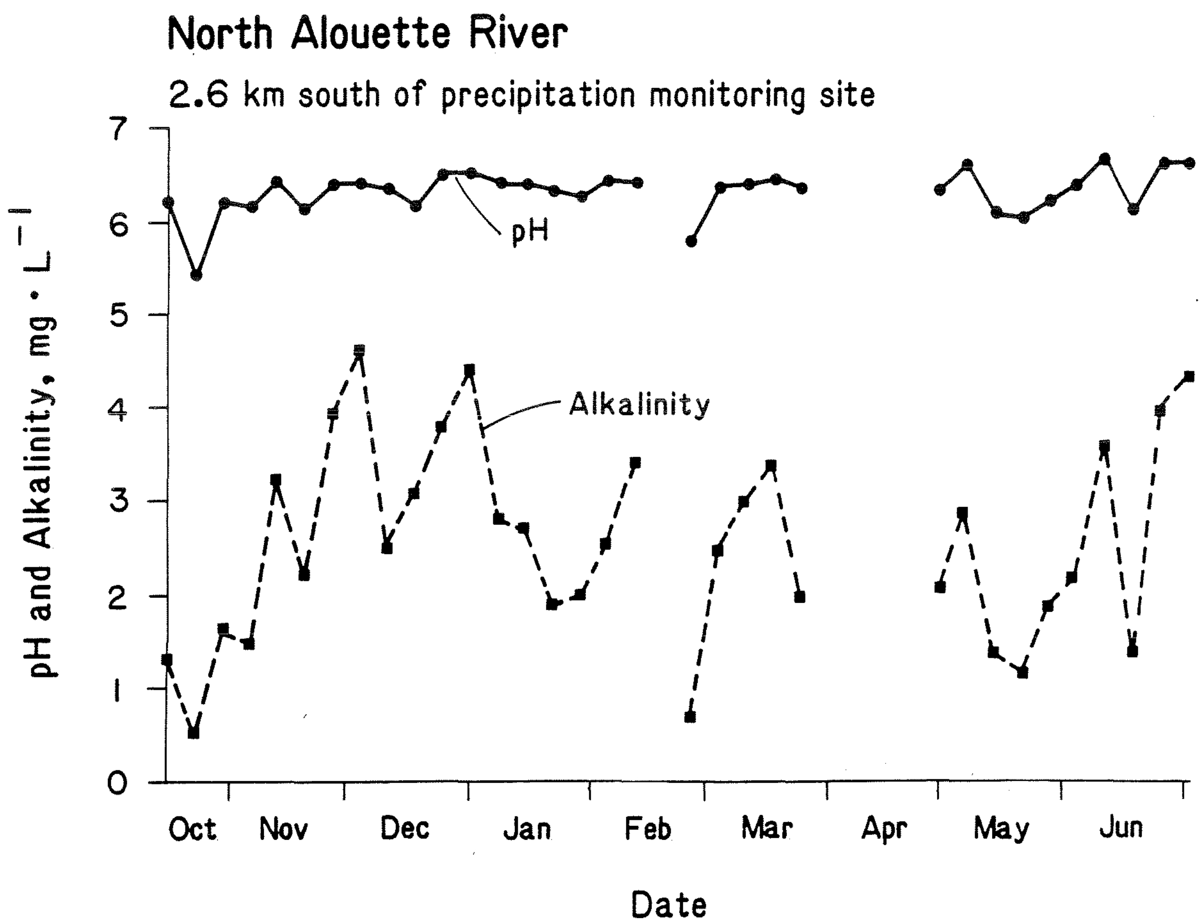


Figure 3 j Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986



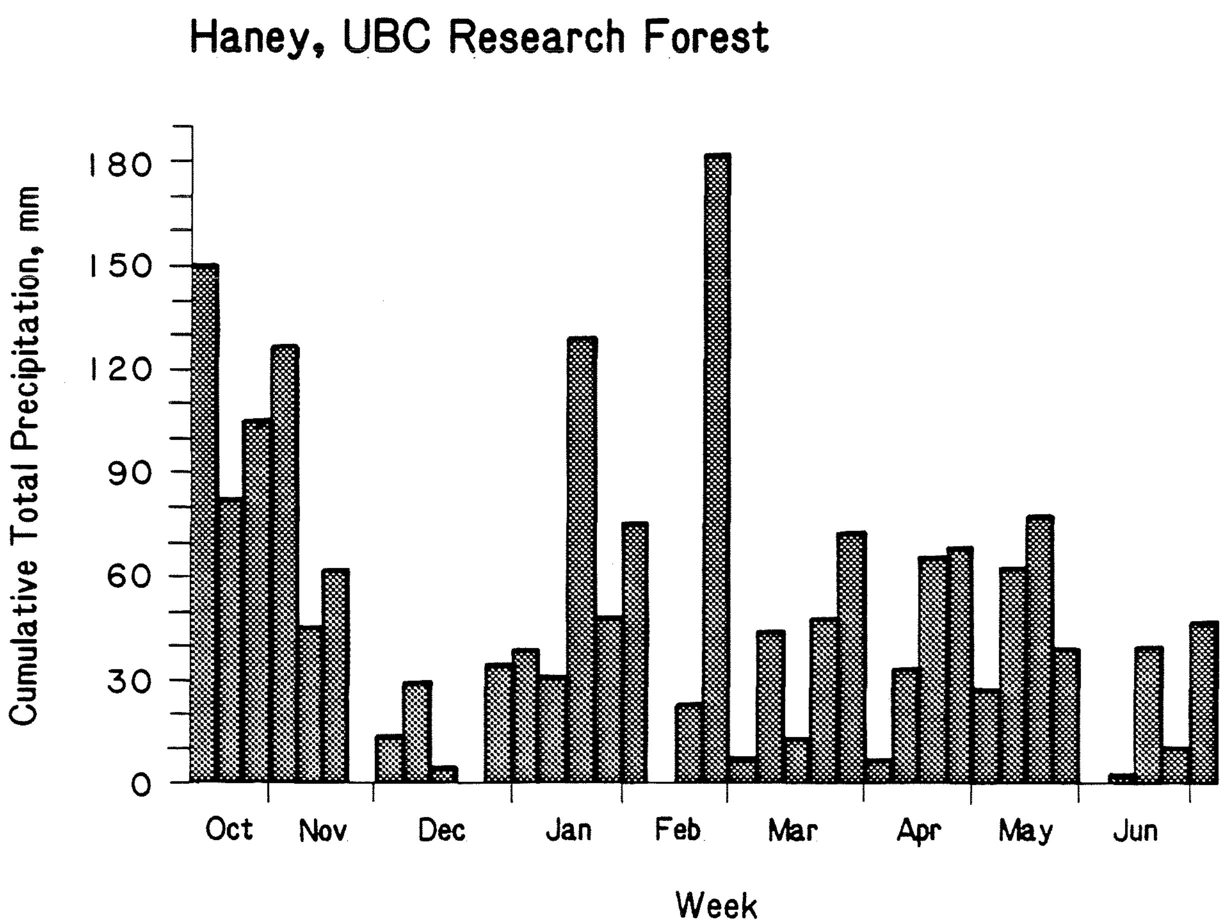


Figure 3k Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986

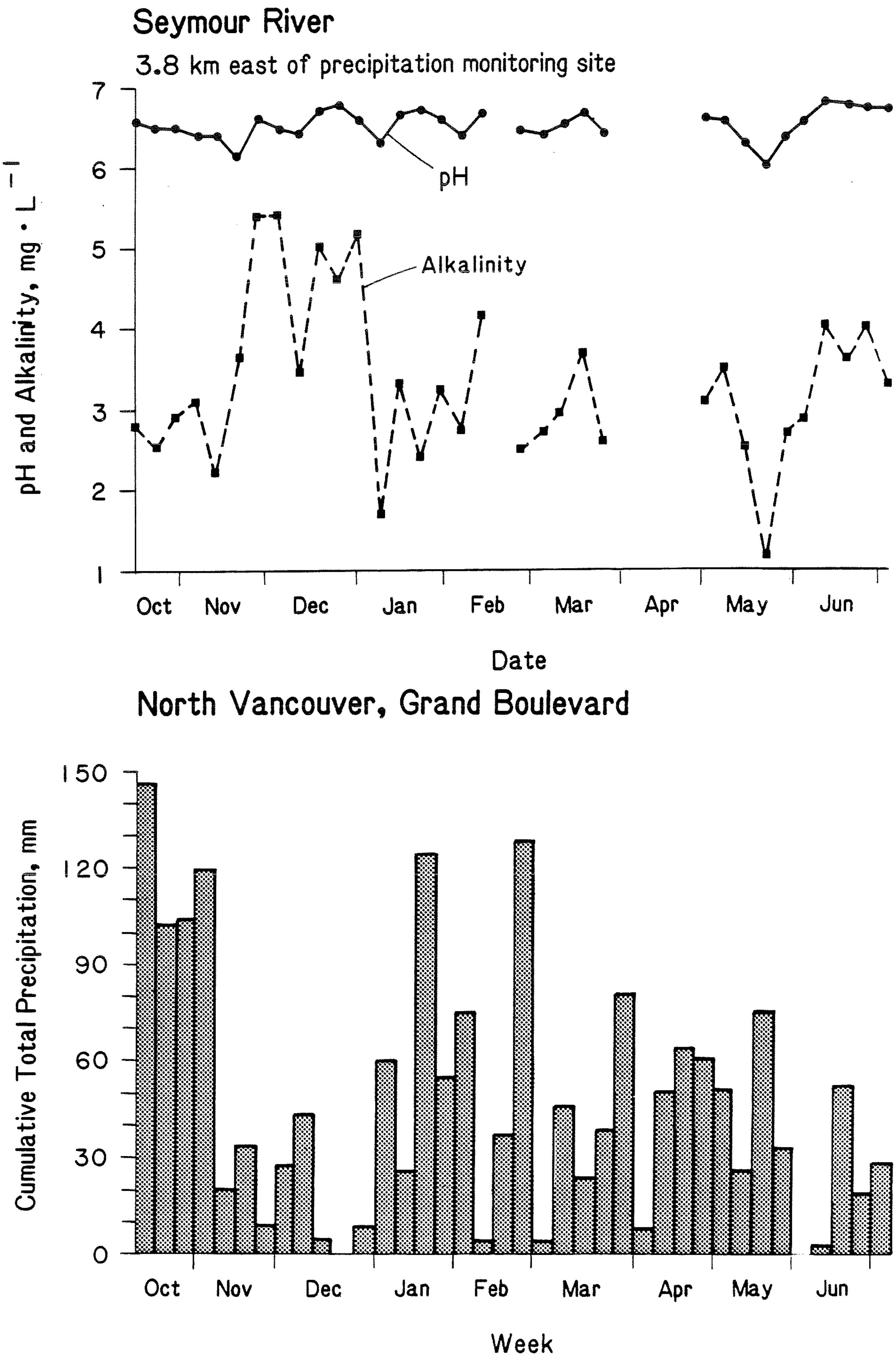
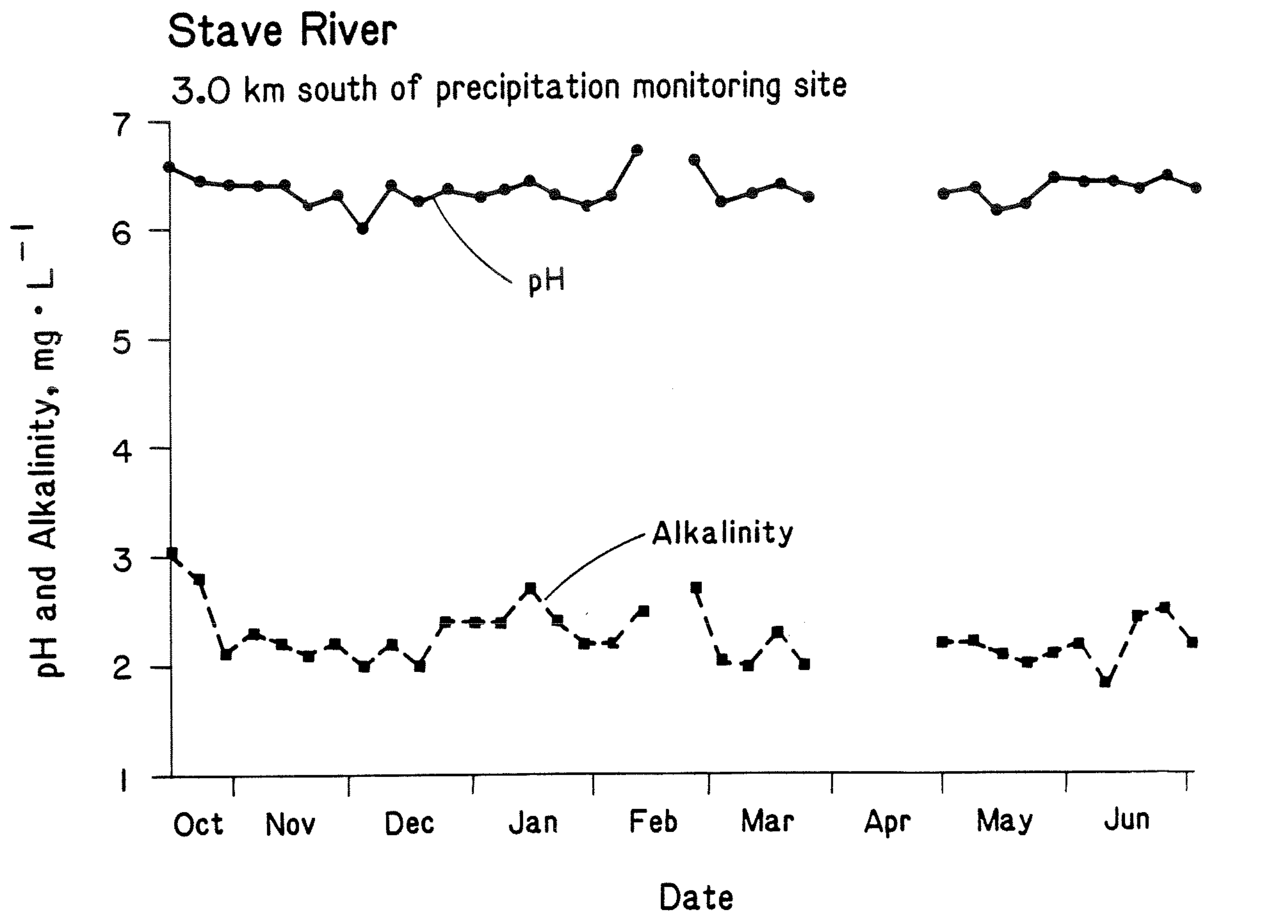


Figure 31 Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986



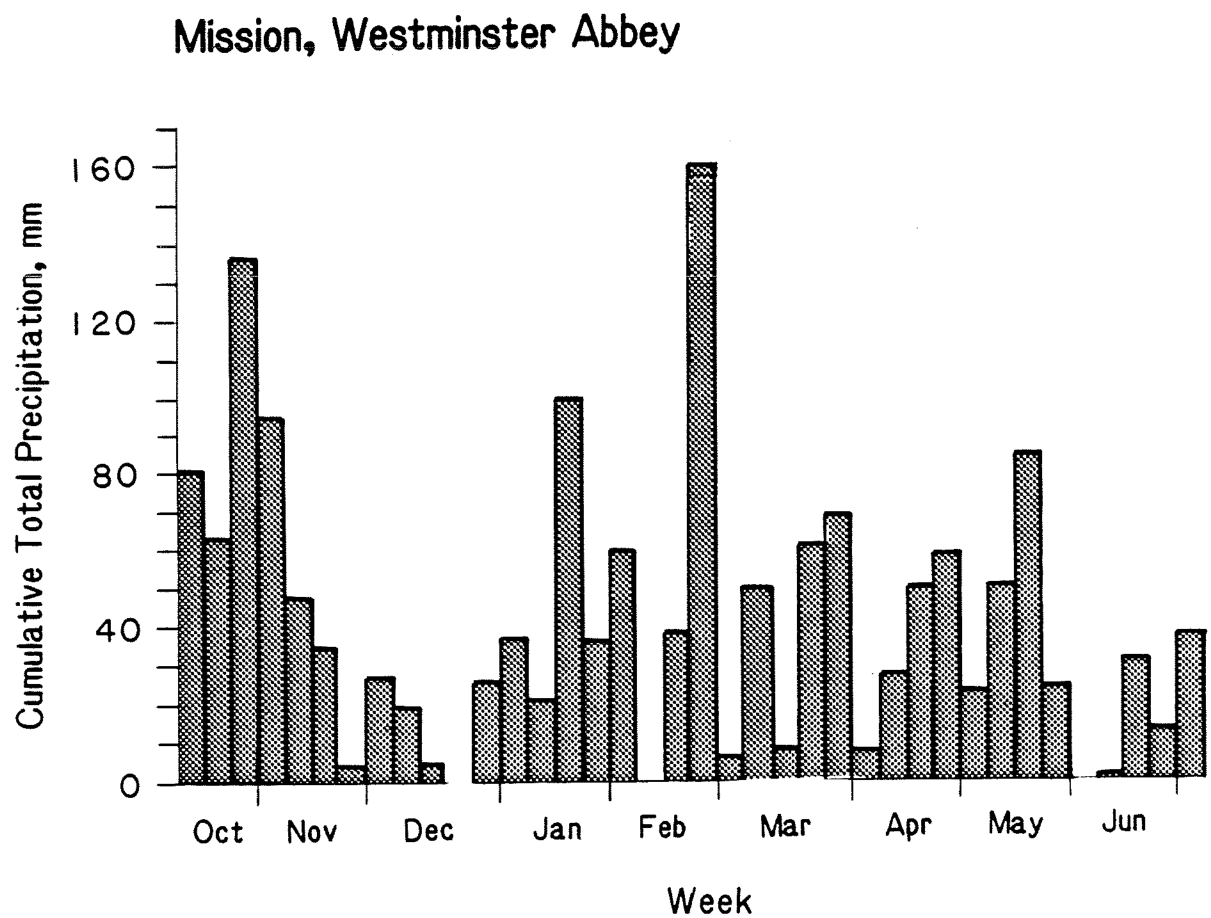
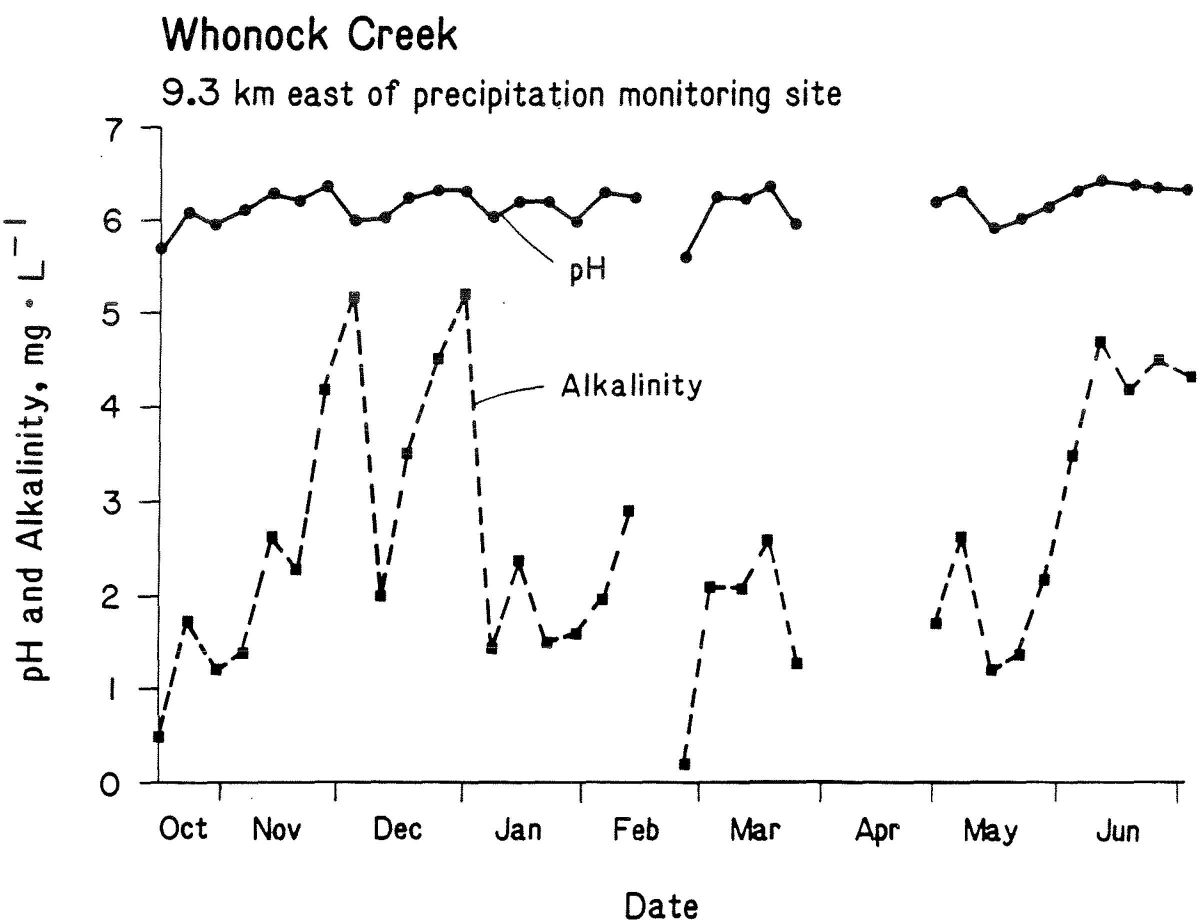


Figure 3 m Weekly pH and alkalinity and cumulative (by week) total precipitation for Oct. 16, 1985 – Jul. 1, 1986



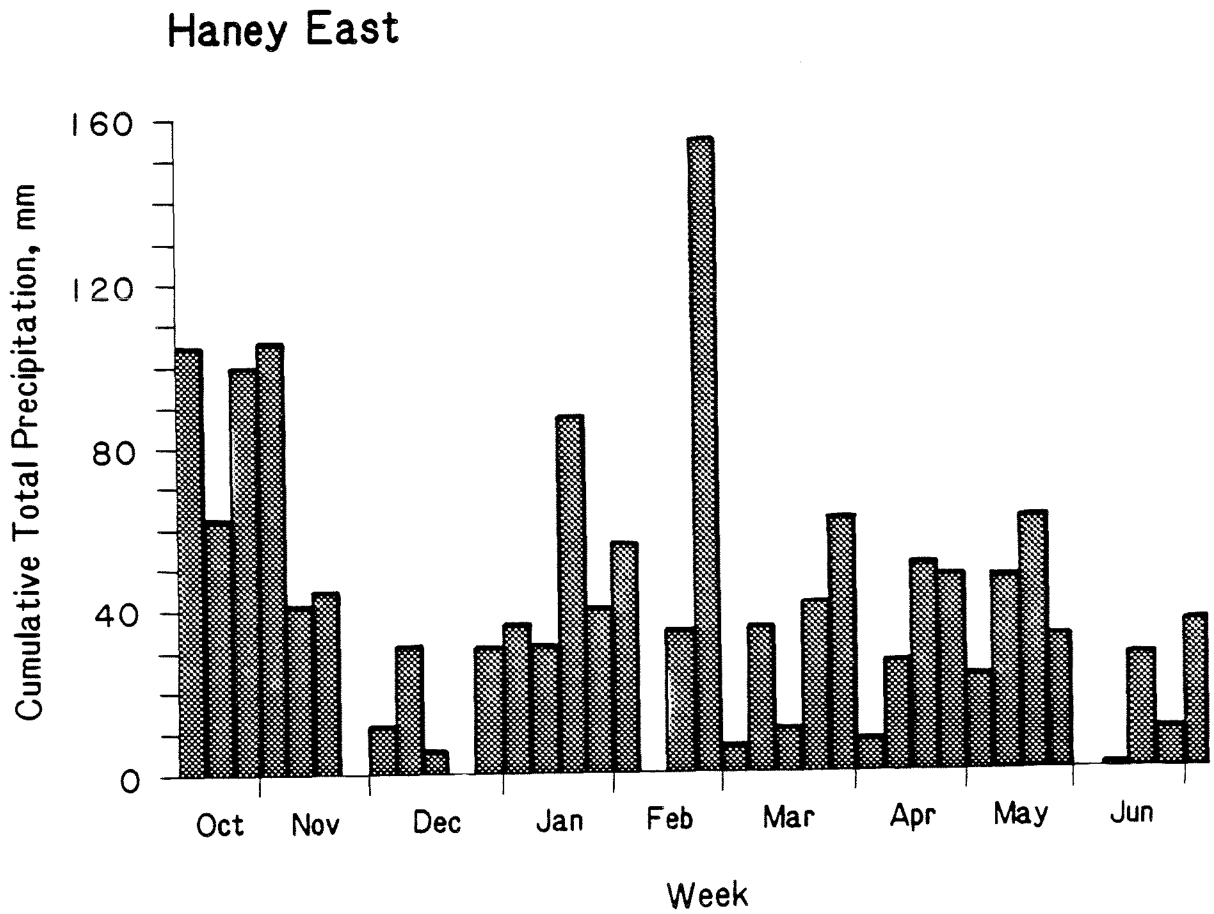


Figure 4 Statistically derived (Newman–Keuls Multiple Range Test) homogeneous subsets of pH, alkalinity and conductivity data for watercourses sampled weekly between Oct. 16, 1985 and Jul. 1, 1986.

pH

Watercourse	$\bar{x}$ ± std. dev.	Subsets
Noons Ck.	5.86 ± 0.24	Subset 1
McIntyre Ck.	6.13 ± 0.21	Subset 2
Whonock Ck.	6.15 ± 0.20	Subset 2
Mossom Ck. (u)	6.18 ± 0.20	Subset 2
N. Alouette R.	6.30 ± 0.25	Subset 3
Stave R.	6.35 ± 0.13	Subset 3, Subset 4
Coquitlam R.	6.45 ± 0.25	Subset 4, Subset 5
Capilano R.	6.45 ± 0.10	Subset 4, Subset 5
Seymour R.	6.53 ± 0.19	Subset 5
Lynn Ck.	6.66 ± 0.22	Subset 6
Kanaka Ck.	6.72 ± 0.26	Subset 6
Alouette R.	6.76 ± 0.17	Subset 6
Mossom Ck. (l)	6.99 ± 0.30	Subset 7

Alkalinity, mg · L^{-1}

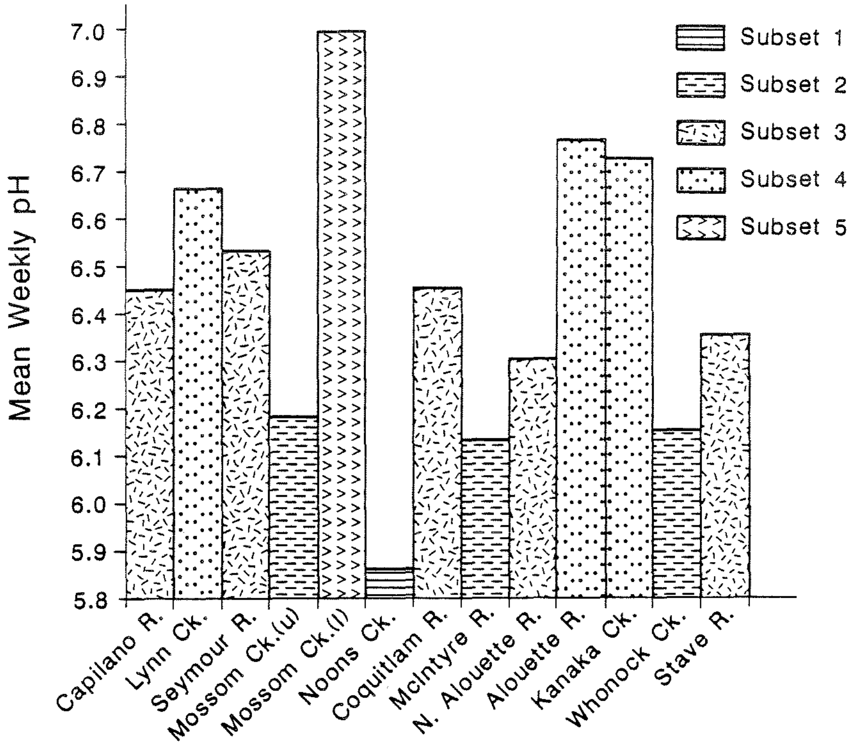
Watercourse	$\bar{x}$ ± std. dev.	Subsets
Noons Ck.	1.09 ± 0.52	Subset 1
McIntyre Ck.	1.26 ± 0.43	Subset 1
Mossom Ck. (u)	1.66 ± 0.58	Subset 1
Stave R.	2.27 ± 0.26	Subset 1, Subset 2
Capilano R.	2.44 ± 0.63	Subset 1, Subset 2
N. Alouette R.	2.56 ± 1.08	Subset 1, Subset 2
Whonock Ck.	2.58 ± 1.38	Subset 1, Subset 2
Seymour R.	3.30 ± 1.00	Subset 2
Coquitlam R.	3.69 ± 2.30	Subset 2
Kanaka Ck.	5.69 ± 2.24	Subset 3
Lynn Ck.	5.70 ± 1.85	Subset 3
Alouette R.	6.53 ± 1.15	Subset 3
Mossom Ck. (l)	12.44 ± 6.33	Subset 4

Conductivity, µhmos · cm^{-1}

Watercourse	$\bar{x}$ ± std. dev.	Subsets
Stave R.	11.16 ± 0.71	Subset 1
McIntyre Ck.	11.36 ± 1.65	Subset 1, Subset 2
Capilano R.	11.58 ± 2.39	Subset 1, Subset 2
N. Alouette R.	13.69 ± 2.82	Subset 1, Subset 2
Seymour R.	14.40 ± 3.01	Subset 1, Subset 2
Whonock Ck.	14.42 ± 2.59	Subset 1, Subset 2
Coquitlam R.	14.42 ± 3.99	Subset 1, Subset 2
Noons Ck.	15.55 ± 2.34	Subset 1, Subset 2
Mossom Ck. (u)	17.30 ± 2.21	Subset 2
Lynn Ck.	26.30 ± 11.03	Subset 3
Kanaka Ck.	27.07 ± 17.50	Subset 3
Alouette R.	31.52 ± 4.48	Subset 4
Mossom Ck. (l)	43.57 ± 13.77	Subset 5

u – upper
l – lower

Figure 5 Mean weekly pH and drainage area of Lower Mainland streams.



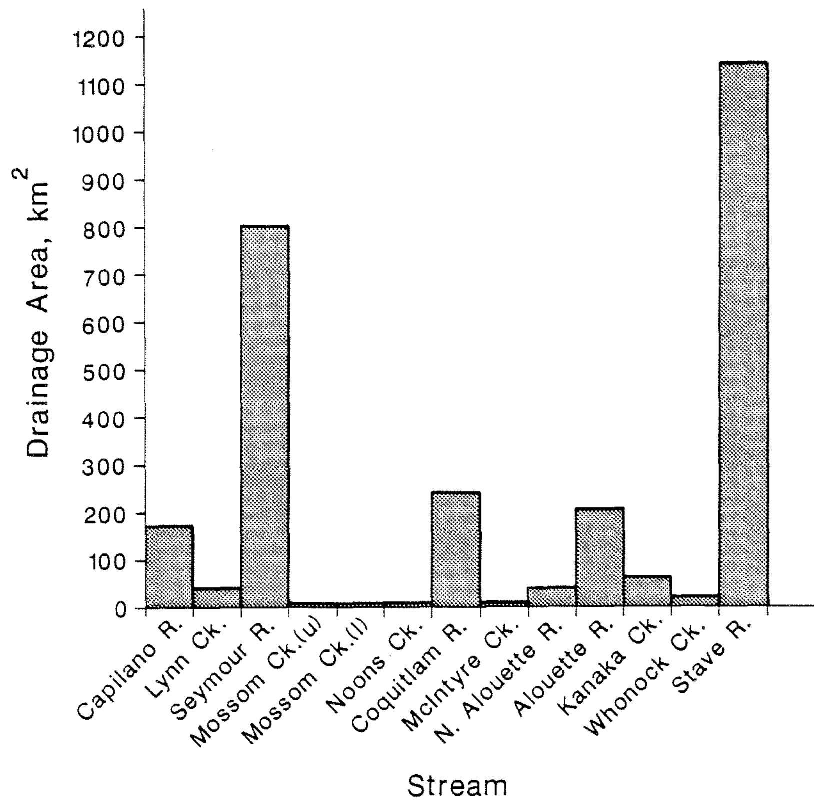


Figure 6 Mean weekly alkalinity and drainage area of Lower Mainland streams.

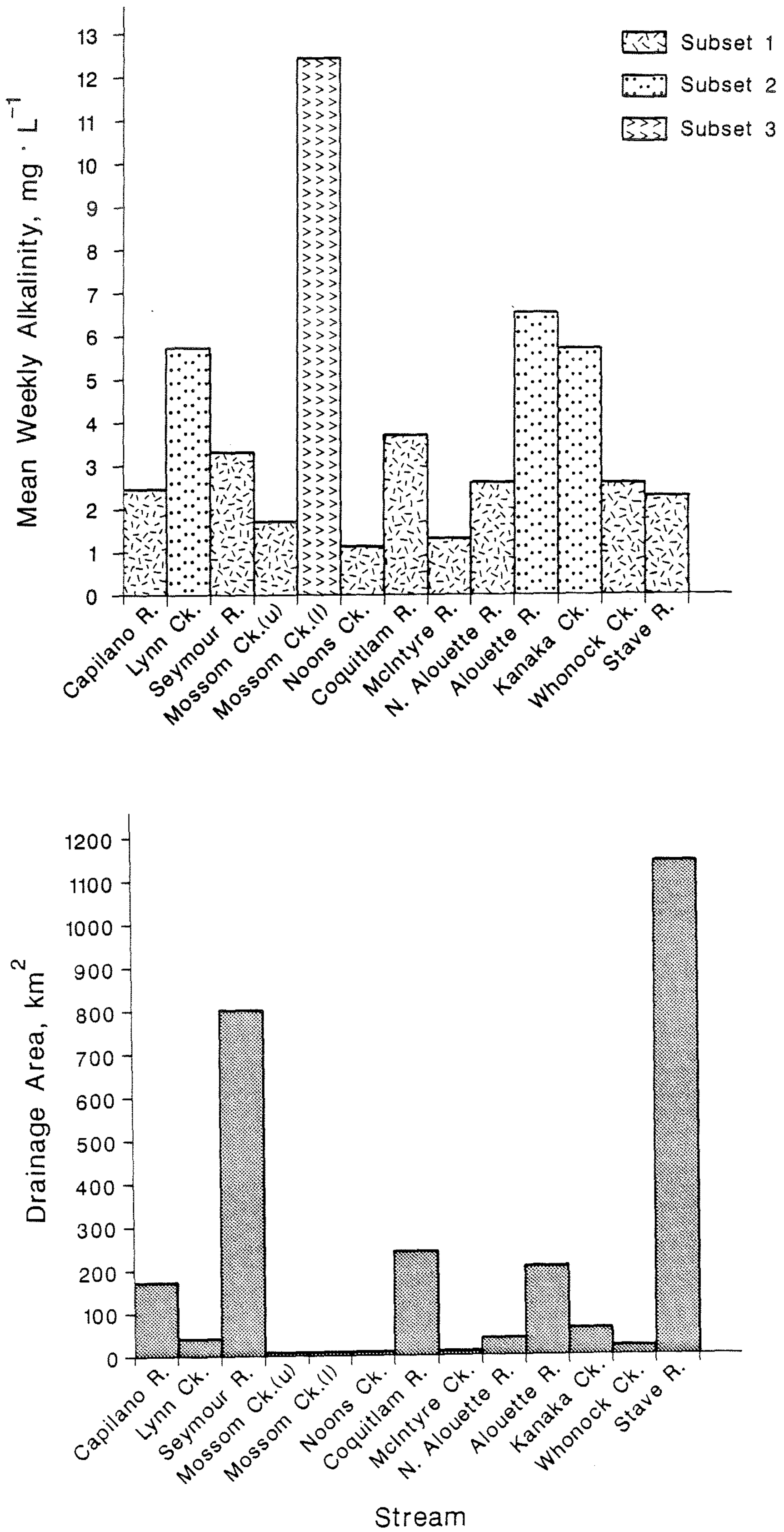


Figure 7 Mean weekly conductivity and drainage area of Lower Mainland streams.

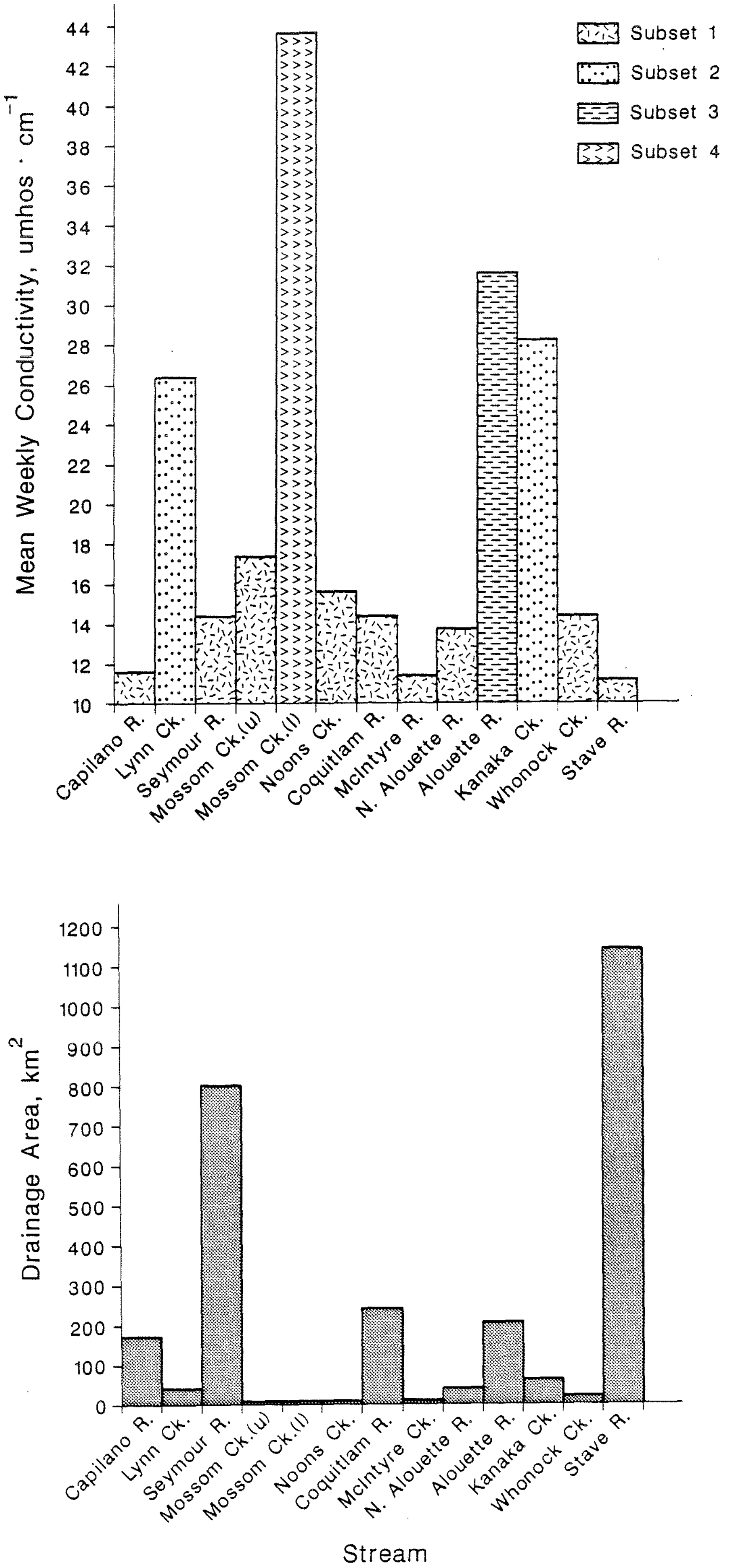


TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \cdot L^{-1}$)	Conductivity ($\mu hmos \cdot cm^{-1}$)	Buffer Capacity ($\mu eq \cdot L^{-1} \cdot pH^{-1}$)
Alouette R.	16 Jan.85	6.60	7.8	37.10	
	23 Feb.85	6.50	5.6	27.31	
	13 Mar.85	6.66	7.4	34.66	
	16 Oct.85	6.68	4.2	30.04	
	21 Oct.85	6.87	6.1	20.02	
	28 Oct.85	6.50	5.2	30.04	-99.4
	4 Nov.85	6.55	5.6	28.34	
	13 Nov.85	6.76	7.5	35.34	
	19 Nov.85	6.51	6.8	33.38	
	25 Nov.85	6.78	7.5	34.26	
	2 Dec.85	6.71	7.3	33.50	
	8 Dec.85	6.59	6.0	36.49	
	17 Dec.85	6.82	7.7	36.05	
	23 Dec.85	6.68	7.2	34.93	
	31 Dec.85	6.71	7.5	37.55	
	7 Jan.86	6.73	6.6	36.78	
	14 Jan.86	6.59	7.0	35.48	
	21 Jan.86	6.68	6.3	34.93	
	28 Jan.86	6.53	6.2	31.51	
	5 Feb.86	6.68	6.6	32.42	
	11 Feb.86	7.02	7.2	33.50	
	24 Feb.86	6.36	2.1	16.39	-47.9
	5 Mar.86	6.73	6.9	30.34	
	11 Mar.86	6.70	7.1	33.62	
	17 Mar.86	6.80	7.0	32.43	
	24 Mar.86	6.82	6.4	29.55	
	29 Apr.86	6.82	6.7	31.07	
	7 May 86	6.89	7.2	33.38	
	13 May 86	6.82	4.8	25.53	
	20 May 86	6.98	5.6	25.97	
	26 May 86	6.90	7.5	31.95	
	3 Jun.86	6.99	7.6	30.45	
	9 Jun.86	7.01	7.3	31.62	
	18 Jun.86	6.98	7.1	31.07	
	23 Jun.86	6.96	6.9	31.08	
	1 Jul.86	6.89	6.9	31.08	
Anmore Ck.	15 Oct.85	6.48	2.5	22.36	
	21 Oct.85	6.41	2.2	17.67	
	29 Oct.85	6.48	2.2	17.67	

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \bullet L^{-1}$)	Conductivity ($\mu hmos \bullet cm^{-1}$)	Buffer Capacity ($\mu eq \bullet L^{-1} \bullet pH^{-1}$)
Brittania Ck	16 Jan.85.	6.60	38.7		
	23 Feb.85	6.50	8.5	324.53	
	13 Mar.85	6.66	25.0	950.00	
Campbell R.	14 Jan.85	6.47	27.5	93.30	
	24 Feb.85	6.89	18.7	76.81	
	12 Mar.85	6.98	25.0	85.71	
Capilano R.	14 Jan.85	5.75	2.5	12.70	-92.1
	22 Feb.85	6.50	3.9	14.77	
	12 Mar.85	6.46	3.4	18.78	
	15 Oct.85	6.48	2.5	22.36	
	21 Oct.85	6.51	2.8	11.55	
	29 Oct.85	6.41	2.1	11.55	
	5 Nov.85	6.51	2.0	10.99	
	12 Nov.85	6.50	2.5	11.86	
	18 Nov.85	6.30	2.2	11.70	
	25 Nov.85	6.52	2.9	13.45	
	3 Dec.85	6.55	3.1	13.45	
	10 Dec.85	6.39	2.3	12.87	
	16 Dec.85	6.56	2.8	13.65	
	23 Dec.85	6.51	2.6	12.43	
	30 Dec.85	6.49	5.4	13.65	
	6 Jan.86	6.42	2.9	12.97	
	13 Jan.86	6.38	2.3	12.09	
	20 Jan.86	6.41	2.2	12.43	
	27 Jan.86	6.21	1.7	10.92	-45.4
	4 Feb.86	6.43	2.2	10.86	
	10 Feb.86	6.41	2.4	11.27	
	25 Feb.86	6.21	2.2	10.86	
	4 Mar.86	6.48	2.4	9.59	
	10 Mar.86	6.40	1.9	10.12	
	17 Mar.86	6.50	1.9	9.59	
	24 Mar.86	6.51	2.3	10.54	
	28 Apr.86	6.48	2.5	11.27	
	8 May 86	6.41	2.4	10.73	
	12 May 86	6.28	2.2	12.43	
	20 May 86	6.45	2.4	10.18	
	26 May 86	6.50	2.2	10.01	
	3 Jun.86	6.39	1.7	8.50	

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \cdot L^{-1}$)	Conductivity ($\mu hmos \cdot cm^{-1}$)	Buffer Capacity ($\mu eq \cdot L^{-1} \cdot pH^{-1}$)
Capilano R.	9 Jun.86	6.56	2.1	9.60	
(cont'd.)	18 Jun.86	6.54	2.4	9.53	
	23 Jun.86	6.58	2.7	9.24	
	2 Jul.86	6.69	2.4	9.74	
Chehalis R.	16 Jan.85	6.80	6.6	27.40	
	23 Feb.85	6.91	6.5	25.03	-64.9
	13 Mar.85	6.69	6.9	30.45	
Coquitlam R.	15 Oct.85	6.31	2.5	14.30	
	21 Oct.85	6.40	1.7	11.86	
	29 Oct.85	6.48	2.9	14.30	
	5 Nov.85	6.45	2.9	12.87	
	12 Nov.85	6.65	4.7	17.50	
	18 Nov.85	6.50	4.0	15.81	
	25 Nov.85	6.75	6.3	21.82	
	2 Dec.85	6.82	7.9	25.31	
	8 Dec.85	6.40	2.4	14.77	
	16 Dec.85	6.80	6.0	20.96	
	23 Dec.85	6.71	4.8	17.33	
	30 Dec.85	6.69	6.0	20.96	
	6 Jan.86	6.34	2.2	13.35	
	13 Jan.86	6.52	2.9	13.45	
	20 Jan.86	6.38	2.2	13.35	
	27 Jan.86	6.18	2.0	10.99	
	4 Feb.86	5.65	1.6	11.86	-61.5
	10 Feb.86	6.48	4.2	16.39	
	24 Feb.86	6.12	1.3	9.80	-37.7
	5 Mar.86	6.55	3.4	13.55	
	10 Mar.86	6.57	3.2	13.16	
	17 Mar.86	6.69	4.2	14.77	
	24 Mar.86	6.42	2.4	11.48	
	28 Apr.86	6.57	3.3	13.76	
	7 May 86	6.53	3.0	11.86	
	12 May 86	6.11	1.9	10.36	
	20 May 86	6.19	1.4	8.97	
	26 May 86	6.29	11.9	8.84	
Harrison R.	16 Jan.85	7.09	15.4	43.30	
	23 Feb.85	6.98	15.5	39.18	
	13 Mar.85	7.29	14.4	41.15	

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \bullet L^{-1}$)	Conductivity ($\mu hmos \bullet cm^{-1}$)	Buffer Capacity ($\mu eq \bullet L^{-1} \bullet pH^{-1}$)
Inches Ck.	16 Jan.85	6.44	8.0	23.80	
	23 Feb.85	6.03	7.2	20.03	
	13 Mar.85	6.30	7.1	22.93	
	16 Oct.85	6.71	7.6	22.53	
	21 Oct.85	6.69	7.7	22.82	
	28 Oct.85	6.42	7.9	23.71	
	4 Nov.85	6.42	8.4	24.69	
	13 Nov.85	6.45	8.1	24.69	
	25 Nov.85	6.57	8.1	24.96	
	2 Dec.85	6.38	7.5	22.93	
Kanaka Ck.	16 Jan.85	6.59	5.4	25.80	
	23 Feb.85	6.14	2.4	19.05	-68.4
	13 Mar.85	6.78	7.5	27.73	
	16 Oct.85	6.31	2.5	14.30	
	21 Oct.85	6.71	3.7	22.30	
	28 Oct.85	6.47	3.0	20.71	
	4 Nov.85	6.58	3.1	18.85	
	13 Nov.85	6.88	6.0	26.27	
	19 Nov.85	6.45	7.6	31.07	
	25 Nov.85	6.90	8.0	30.04	
	2 Dec.85	6.83	9.0	32.77	
	8 Dec.85	6.69	4.9	118.87	
	17 Dec.85	6.86	7.6	31.08	
	23 Dec.85	6.63	6.9	28.33	
	31 Dec.85	6.89	7.8	33.01	
	7 Jan.86	6.77	4.2	24.35	
	14 Jan.86	6.83	4.9	25.03	
	21 Jan.86	6.67	3.8	25.31	
	28 Jan.86	6.49	3.5	19.17	
	5 Feb.86	6.26	4.4	23.59	
	11 Feb.86	6.69	6.3	26.50	
	24 Feb.86	6.08	1.6	36.33	-48.0
	5 Mar.86	6.75	5.1	22.53	
	11 Mar.86	6.68	6.3	27.31	
	17 Mar.86	6.90	6.3	24.36	
	24 Mar.86	6.62	3.8	19.09	
	29 Apr.86	6.70	4.8	21.72	
	7 May 86	6.99	5.9	21.87	
	13 May 86	6.40	2.6	16.24	

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity (mg•L^{-1})	Conductivity (µhmos•cm^{-1})	Buffer Capacity (µeq•L^{-1}•pH^{-1})
Kanaka Ck. (cont'd.)	20 May 86	6.35	3.5	16.24	
	26 May 86	6.70	6.3	18.39	
	2 Jun.86	7.11	8.4	24.69	
	9 Jun.86	7.04	9.8	31.08	
	18 Jun.86	7.08	8.7	28.52	
	23 Jun.86	7.18	8.8	26.82	
	1 Jul.86	7.09	8.6	9.64	
Lynn Ck.	14 Jan.85	6.38	7.6	102.00	
	22 Feb.85	6.68	8.6	53.68	
	12 Mar.85	6.65	10.4	42.31	
	15 Oct.85	6.80	4.8	24.36	
	21 Oct.85	6.73	3.5	18.51	
	29 Oct.85	6.70	6.2	25.74	
	5 Nov.85	6.63	5.8	24.36	
	12 Nov.85	6.75	8.2	23.59	
	18 Nov.85	6.41	6.3	29.26	
	25 Nov.85	6.69	9.8	39.70	
	3 Dec.85	6.61	9.8	69.66	
	10 Dec.85	6.89	6.9	36.78	
	16 Dec.85	6.99	9.4	51.81	
	23 Dec.85	6.71	7.0	28.60	
	30 Dec.85	6.70	7.7	37.87	
	6 Jan.86	5.85	3.6	25.03	-126
	13 Jan.86	6.78	5.1	22.64	
	20 Jan.86	6.95	4.6	25.75	
	27 Jan.86	6.89	6.6	29.16	
	4 Feb.86	6.53	5.2	24.69	
	10 Feb.86	6.77	6.9	30.04	
	25 Feb.86	6.63	2.7	17.67	-42.9
	4 Mar.86	6.63	5.2	24.03	
	10 Mar.86	6.61	4.8	23.11	
	17 Mar.86	6.78	6.5	28.25	
	24 Mar.86	6.61	4.6	19.81	
	28 Apr.86	6.70	5.4	23.59	
	8 May 86	6.53	5.3	21.15	
	12 May 86	6.62	4.1	18.02	
	20 May 86	6.41	3.1	15.54	
	26 May 86	6.40	3.4	14.65	
	2 Jun.86	6.21	3.4	14.08	

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \bullet L^{-1}$)	Conductivity ($\mu hmos \bullet cm^{-1}$)	Buffer Capacity ($\mu eq \bullet L^{-1} \bullet pH^{-1}$)
Lynn Ck.	9 Jun.86	6.80	6.0	21.98	
(cont'd.)	18 Jun.86	6.79	5.9	20.96	
	23 Jun.86	6.89	5.9	21.10	
	2 Jul.86	6.71	4.5	16.39	
McIntyre Ck.	16 Oct.85	6.01	1.0	13.21	
	21 Oct.85	5.73	0.5	11.70	-18.6
	28 Oct.85	6.18	1.0	11.62	
	4 Nov.85	5.98	1.0	10.18	
	12 Nov.85	6.35	1.7	12.91	
	18 Nov.85	6.07	1.4	12.60	
	8 Dec.85	6.31	1.3	14.89	
	6 Jan.86	6.11	1.4	12.87	
	13 Jan.86	6.27	1.5	12.02	
	21 Jan.86	6.35	1.6	13.06	
	27 Jan.86	5.76	0.9	10.47	-32.7
	4 Feb.86	6.11	1.4	11.26	
	11 Feb.86	6.63	2.4	13.25	
	5 Mar.86	6.12	1.3	10.12	
	10 Mar.86	6.08	1.1	9.90	
	24 Mar.86	6.08	1.1	10.48	
	28 Apr.86	6.21	1.5	11.57	
	7 May 86	6.12	1.4	10.01	
	13 May 86	6.19	0.9	9.80	
	20 May 86	5.75	0.5	8.84	
	26 May 86	6.10	0.9	8.05	-26.6
	18 Jun.86	6.25	1.8	11.19	
Mossom Ck.	15 Oct.85	6.29	1.6	22.25	
(upper)	21 Oct.85	6.02	1.2	17.50	
	29 Oct.85	6.22	1.9	19.38	
	5 Nov.85	6.15	1.5	17.00	
	12 Nov.85	6.21	1.9	18.02	
	18 Nov.85	6.18	1.4	17.95	
	25 Nov.85	6.29	2.0	19.09	
	10 Dec.85	6.08	1.1	19.17	
	16 Dec.85	6.25	1.5	19.63	
	23 Dec.85	6.28	1.9	19.17	
	30 Dec.85	6.30	2.0	20.48	
	6 Jan.86	6.01	0.8	17.85	
	13 Jan.86	6.15	1.5	17.67	

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \bullet L^{-1}$)	Conductivity ($\mu hmos \bullet cm^{-1}$)	Buffer Capacity ($\mu eq \bullet L^{-1} \bullet pH^{-1}$)
Mossom Ck. (upper) (cont'd.)	20 Jan.86	6.19	1.2	18.66	
	27 Jan.86	6.25	1.5	18.02	
	4 Feb.86	6.02	1.3	16.69	
	10 Feb.86	6.21	1.4	17.85	
	24 Feb.86	5.72	0.7	13.86	-26.1
	4 Mar.86	5.50	1.3	16.69	-52.7
	10 Mar.86	6.14	1.5	15.81	
	17 Mar.86	6.23	1.5	16.54	
	24 Mar.86	6.03	1.3	14.77	
	28 Apr.86	6.20	1.3	15.27	
	7 May 86	6.28	1.7	16.39	
	12 May 86	6.22	1.6	16.39	
	20 May 86	6.12	1.2	10.01	
	26 May 86	6.33	2.0	15.27	
	2 Jun.86	6.02	2.0	16.09	
	9 Jun.86	6.49	3.7	19.46	
	18 Jun.86	6.52	2.7	17.67	
	23 Jun.86	6.42	2.6	16.38	
	2 Jul.86	6.45	2.3	16.53	
Mossom Ck. (lower)	4 Nov.85	6.91	6.0	28.16	
	12 Nov.85	7.01	16.1	40.96	
	18 Nov.85	6.95	8.8	34.66	
	25 Nov.85	7.10	19.1	51.06	
	2 Dec.85	7.28	23.2	68.86	
	10 Dec.85	6.78	8.7	40.96	
	16 Dec.85	6.89	15.4	57.06	
	23 Dec.85	7.25	19.3	60.52	
	30 Dec.85	7.33	21.4	68.39	
	6 Jan.86	6.81	5.4	34.52	
	13 Jan.86	6.94	9.7	39.88	
	20 Jan.86	6.69	4.1	32.19	
	27 Jan.86	6.80	7.6	37.08	
	4 Feb.86	6.61	7.7	34.66	
	10 Feb.86	7.09	12.3	42.51	
	24 Feb.86	6.08	0.9	19.17	-27.4
	4 Mar.86	7.20	13.1	42.91	
	10 Mar.86	7.02	11.1	39.88	
	17 Mar.86	6.95	12.0	39.18	
	24 Mar.86	6.88	7.3	31.96	
	28 Apr.86	6.85	5.7	31.20	

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \bullet L^{-1}$)	Conductivity ($\mu hmos \bullet cm^{-1}$)	Buffer Capacity ($\mu eq \bullet L^{-1} \bullet pH^{-1}$)
Mossom Ck.	7 May 86	7.24	12.7	43.12	
(lower)	12 May 86	7.08	12.7	40.96	
(Cont'd.)	20 May 86	6.50	4.0	22.70	-76.5
	26 May 86	6.95	9.9	34.26	
	2 Jun.86	7.05	18.7	53.97	
	9 Jun.86	7.35	25.5	74.24	
	18 Jun.86	7.58	21.2	64.42	
	23 Jun.86	7.19	15.8	44.17	
	2 Jul.86	7.42	17.7	53.97	
Nicomekl R.	14 Jan.85	6.70	50.6	387.00	
	24 Feb.85	6.73	31.3	151.29	
	12 Mar.85	7.30	55.4	334.39	
Noons Ck.	15 Oct.85	5.60	0.6	19.30	
	21 Oct.85	6.27	1.6	13.45	
	29 Oct.85	5.70	0.6	16.69	
	5 Nov.85	5.63	0.7	15.15	
	12 Nov.85	6.21	1.9	15.54	
	18 Nov.85	5.92	1.0	15.81	
	25 Nov.85	6.17	1.6	18.58	
	2 Dec.85	6.10	2.6	21.87	
	10 Dec.85	5.75	0.8	16.69	
	16 Dec.85	5.75	0.8	18.58	
	23 Dec.85	6.07	1.3	18.02	
	30 Dec.85	6.15	1.7	19.59	
	6 Jan.86	5.65	0.6	15.27	
	13 Jan.86	5.70	1.0	14.77	
	20 Jan.86	5.61	0.5	15.81	
	27 Jan.86	5.90	0.9	15.54	
	4 Feb.86	5.80	1.0	14.08	
	10 Feb.86	6.10	1.6	15.14	
	24 Feb.86	5.30	0.4	13.06	-16.9
	4 Mar.86	5.86	0.9	13.35	
	10 Mar.86	5.75	0.8	12.69	
	17 Mar.86	5.85	0.9	13.55	
	24 Mar.86	5.68	0.8	12.96	
	28 Apr.86	5.76	0.4	13.97	-14.7
	7 May 86	5.98	1.1	14.89	
	12 May 86	5.81	0.8	14.19	
	20 May 86	5.38	0.5	13.16	

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \bullet L^{-1}$)	Conductivity ($\mu hmos \bullet cm^{-1}$)	Buffer Capacity ($\mu eq \bullet L^{-1} \bullet pH^{-1}$)
Noons Ck. (Cont'd.)	26 May 86	5.79	1.0	12.87	
	2 Jun.86	6.00	1.3	15.14	
	9 Jun.86	6.31	2.1	17.85	
	18 Jun.86	6.10	1.4	14.30	
	23 Jun.86	5.94	1.4	13.55	
	2 Jul.86	5.85	1.3	13.86	
Norrish Ck.	16 Jan.85	6.65	5.4	18.60	
	25 Feb.85	6.60	4.2	17.85	-69.7
	13 Mar.85	6.89	6.4	20.12	
N. Alouette R.	16 Jan.85	6.45	3.3	16.40	
	23 Feb.85	5.96	2.5	15.27	
	13 Mar.85	6.29	4.2	18.51	
	16 Oct.85	6.19	1.3	11.94	
	21 Oct.85	5.40	0.5	11.55	-20.7
	28 Oct.85	6.20	1.6	12.17	
	4 Nov.85	6.12	1.5	11.27	
	13 Nov.85	6.41	3.2	15.27	
	19 Nov.85	6.11	2.2	14.54	
	25 Nov.85	6.40	3.9	18.03	
	2 Dec.85	6.40	4.6	20.86	
	8 Dec.85	6.35	2.5	14.30	
	17 Dec.85	6.12	3.1	18.51	
	23 Dec.85	6.50	3.8	16.84	
	31 Dec.85	6.52	4.4	19.05	
	7 Jan.86	6.40	2.8	15.27	
	14 Jan.86	6.40	2.7	13.97	
	21 Jan.86	6.31	1.9	13.55	
	28 Jan.86	6.25	2.0	12.01	
	5 Feb.86	6.42	2.6	12.97	
	11 Feb.86	6.41	3.4	15.02	
	24 Feb.86	5.78	0.7	8.19	-25.4
	5 Mar.86	6.35	2.5	12.51	
	11 Mar.86	6.38	3.0	13.25	
	17 Mar.86	6.45	3.4	14.19	
	24 Mar.86	6.33	2.0	11.86	
	29 Apr.86	6.31	2.1	14.26	
	7 May 86	6.60	2.9	12.52	
	13 May 86	6.08	1.4	10.18	

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \cdot L^{-1}$)	Conductivity ($\mu hmos \cdot cm^{-1}$)	Buffer Capacity ($\mu eq \cdot L^{-1} \cdot pH^{-1}$)
N. Alouette R. (Cont'd)	20 May 86	6.03	1.2	10.01	
	26 May 86	6.21	1.9	9.39	
	3 Jun.86	6.37	2.2	10.48	
	9 Jun.86	6.66	3.6	14.90	
	18 Jun.86	6.10	1.4	14.30	
	23 Jun.86	6.61	4.0	13.35	
	1 Jul.86	6.61	4.3	15.41	
Serpentine R.	14 Jan.85	6.73	48.0	243.00	
	24 Feb.85	6.51	20.1	119.58	
	12 Mar.85	6.71	43.3	217.06	
Seymour R.					
- Site A	14 Jan.85	6.41	9.6	177.12	
	22 Feb.85	6.40	6.5	199.70	
	12 Mar.85	6.43	9.3	82.28	
- Site B	15 Oct.85	6.58	2.8	15.27	
	21 Oct.85	6.49	2.5	11.86	
	29 Oct.85	6.50	2.9	15.53	
	5 Nov.85	6.40	3.1	13.86	
	12 Nov.85	6.41	2.2	10.86	
	18 Nov.85	6.11	3.6	16.39	
	25 Nov.85	6.62	5.4	19.46	
	3 Dec.85	6.49	5.4	23.40	
	10 Dec.85	6.42	3.4	16.69	
	16 Dec.85	6.71	5.0	19.76	
	23 Dec.85	6.79	4.6	18.02	
	30 Dec.85	6.60	5.2	19.38	
	6 Jan.86	6.31	1.7	13.55	-41.0
	13 Jan.86	6.65	3.3	14.42	
	20 Jan.86	6.72	2.4	13.35	
	27 Jan.86	6.61	3.2	13.65	
	4 Feb.86	6.39	2.8	12.52	
	10 Feb.86	6.70	4.1	16.39	
	25 Feb.86	6.45	2.5	11.70	
	4 Mar.86	6.41	2.7	12.52	
	10 Mar.86	6.52	3.0	12.26	
	17 Mar.86	6.69	3.7	14.30	
	24 Mar.86	6.45	2.6	11.86	
	28 Apr.86	6.60	3.1	14.08	
	8 May 86	6.58	3.5	13.65	

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \bullet L^{-1}$)	Conductivity ($\mu hmos \bullet cm^{-1}$)	Buffer Capacity ($\mu eq \bullet L^{-1} \bullet pH^{-1}$)
Seymour R.					
(Cont'd.)	12 May 86	6.30	2.5	12.97	
- Site C	20 May 86	6.03	1.2	10.01	-37.4
	26 May 86	6.39	2.7	11.06	
	2 Jun.86	6.59	2.9	10.79	
	9 Jun.86	6.80	4.0	15.54	
	18 Jun.86	6.79	3.6	13.55	
	23 Jun.86	6.73	4.0	14.42	
	2 Jul.86	6.72	3.3	12.09	
Stave R.	16 Jan.85	6.20	2.3	11.86	
	23 Feb.85	6.03	2.9	12.52	
	13 Mar.85	6.19	2.9	14.42	
	16 Oct.85	6.58	3.0	10.79	
	21 Oct.85	6.43	2.8	11.55	
	28 Oct.85	6.41	2.1	10.73	
	4 Nov.85	6.40	2.3	10.36	
	13 Nov.85	6.41	2.2	10.86	
	19 Nov.85	6.21	2.1	11.27	
	25 Nov.85	6.30	2.2	11.25	
	2 Dec.85	6.01	2.0	10.92	-63.3
	8 Dec.85	6.39	2.2	10.36	
	17 Dec.85	6.25	2.0	11.94	
	23 Dec.85	6.36	2.4	11.55	
	31 Dec.85	6.29	2.4	12.81	
	7 Jan.86	6.35	2.4	12.02	
	14 Jan.86	6.44	2.7	11.70	
	21 Jan.86	6.31	2.4	13.06	
	28 Jan.86	6.21	2.2	11.41	
	5 Feb.86	6.30	2.2	11.13	
	11 Feb.86	6.72	2.5	11.55	
	24 Feb.86	6.61	2.7	11.55	
	5 Mar.86	6.21	2.0	10.79	
	11 Mar.86	6.31	2.0	10.60	
	17 Mar.86	6.38	2.3	10.92	
	24 Mar.86	6.31	2.0	10.92	
	29 Apr.86	6.31	2.2	12.56	
	7 May 86	6.35	2.2	10.73	
	13 May 86	6.16	2.1	10.73	
	20 May 86	6.21	2.0	10.99	
	26 May 86	6.43	2.1	11.13	
	3 Jun.86	6.41	2.2	10.01	
	9 Jun.86	6.42	1.8	11.26	-38.2

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \bullet L^{-1}$)	Conductivity ($\mu hmos \bullet cm^{-1}$)	Buffer Capacity ($\mu eq \bullet L^{-1} \bullet pH^{-1}$)
Stave R.	18 Jun.86	6.35	2.4	10.99	
(Cont'd.)	23 Jun.86	6.46	2.5	10.13	
	1 Jul.86	6.36	2.2	9.90	
Stawamus R.	14 Jan.85	6.05	7.3	41.50	-224
	22 Feb.85	6.35	7.7	49.93	
	12 Mar.85	6.48	8.8	49.93	
Squamish R.	14 Jan.85	6.37	19.5	73.50	
	22 Feb.85	7.06	18.5	7.12	
	12 Mar.85	6.89	20.7	81.84	
Wahleach Ck.	16 Jan.85	6.98	9.5	27.64	
	13 Mar.85	7.01	11.4	32.19	
Whonock Ck.	16 Jan.85	6.09	2.5	14.08	
	23 Feb.85	5.69	1.1	11.86	-41.6
	13 Mar.85	6.20	2.9	19.17	
	16 Oct.85	5.66	0.5	14.65	
	21 Oct.85	6.09	1.7	15.27	
	28 Oct.85	5.96	1.2	12.51	
	4 Nov.85	6.08	1.4	11.70	
	13 Nov.85	6.27	2.6	14.54	
	19 Nov.85	6.21	2.3	13.25	
	25 Nov.85	6.33	4.2	19.17	
	2 Dec.85	5.99	5.2	20.71	
	8 Dec.85	6.00	2.0	14.54	
	17 Dec.85	6.23	3.6	17.33	
	23 Dec.85	6.31	4.5	18.39	
	31 Dec.85	6.31	5.2	19.81	
	7 Jan.86	6.00	1.5	13.86	
	14 Jan.86	6.19	2.4	14.08	
	21 Jan.86	6.18	1.5	13.65	
	28 Jan.86	5.99	1.6	12.34	
	5 Feb.86	6.28	2.0	12.87	
	11 Feb.86	6.25	2.9	14.30	
	24 Feb.86	5.60	0.2	15.81	-7.82
	5 Mar.86	6.22	2.1	12.43	
	11 Mar.86	6.20	2.1	12.02	
	17 Mar.86	6.33	2.6	13.25	
	24 Mar.86	5.93	1.3	10.99	

TABLE 1
Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \bullet L^{-1}$)	Conductivity ($\mu hmos \bullet cm^{-1}$)	Buffer Capacity ($\mu eq \bullet L^{-1} \bullet pH^{-1}$)
Whonock Ck.					
(Cont'd.)	29 Apr.86	6.20	1.7	11.70	
	7 May 86	6.31	2.6	13.25	
	13 May 86	5.90	1.2	10.79	
	20 May 86	6.00	1.4	11.55	
	26 May 86	6.14	2.2	11.55	
	3 Jun.86	6.31	3.5	14.54	
	9 Jun.86	6.40	4.7	18.97	
	18 Jun.86	6.38	4.2	15.41	
	23 Jun.86	6.33	4.5	15.95	
	1 Jul.86	6.31	4.4	15.54	

TABLE 2

Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \bullet L^{-1}$)	Conductivity ($\mu hmos \bullet cm^{-1}$)	Buffer Capacity ($\mu eq \bullet L^{-1} \bullet pH^{-1}$)
DeMamiel Ck.	25 Oct. 85	6.65	6.2	34.80	-95.5
	15 Nov. 85	6.81	10.9	43.96	
	11 Dec. 85	6.82	8.8	41.15	
	24 Jan. 86	6.65	6.4	32.07	
	21 Feb. 86	6.92	9.8	42.31	
Fulford Ck.	25 Oct. 85	7.33	61.2	190.10	
Holland Ck.	15 Nov. 85	6.68	6.7	30.34	
	11 Dec. 85	6.85	5.6	30.04	
	24 Jan. 86	6.60	4.1	19.59	
	28 Feb. 86	6.60	4.1	18.85	-68.1
Jordan R.	25 Oct. 85	6.33	2.5	43.12	
	15 Nov. 85	6.54	4.1	912.66	
	11 Dec. 85	7.76	72.7	ND	
	24 Jan. 86	6.42	2.3	38.68	-48.8
	21 Feb. 86	6.82	22.5	10.45	
Keogh R.	26 Oct. 85	6.31	4.3	23.10	
	16 Nov. 85	6.80	6.5	24.69	
	12 Dec. 85	6.75	5.6	23.59	
	25 Jan. 86	6.40	4.0	15.95	-86.9
	28 Feb. 86	6.51	4.3	16.54	
Menzies Ck.	26 Oct. 85	6.69	4.7	34.00	
	16 Nov. 85	6.65	4.4	33.38	
	12 Dec. 85	6.65	3.9	34.66	
	25 Jan. 86	6.45	3.7	26.43	
	28 Feb. 86	6.40	3.5	26.04	-76.1
Mohun Ck.	26 Oct. 85	6.70	7.1	41.34	
	16 Nov. 85	6.61	6.3	33.01	
	12 Dec. 85	6.69	6.0	31.07	
	25 Jan. 86	6.50	4.8	17.85	-91.8
	28 Feb. 86	6.50	5.0	25.75	
Quatse R.	26 Oct. 85	6.25	3.3	22.82	
	16 Nov. 85	6.19	3.2	21.72	
	12 Dec. 85	6.45	4.5	25.75	
	25 Jan. 86	6.26	3.1	18.97	-78.8
	28 Feb. 86	6.30	3.4	18.28	

TABLE 2 (Cont'd)

Surface Water Chemistry
pH, Alkalinity, Conductivity

Stream	Date	pH	Alkalinity ($mg \bullet L^{-1}$)	Conductivity ($\mu hmos \bullet cm^{-1}$)	Buffer Capacity ($\mu eq \bullet L^{-1} \bullet pH^{-1}$)
Sooke R.	25 Oct. 85	6.79	5.6	28.16	
	15 Nov. 85	6.72	7.9	31.07	
	11 Dec. 85	6.78	6.4	28.25	
	24 Jan. 86	6.49	4.9	21.20	-95.0
	21 Feb. 86	6.86	8.6	30.04	
Tsable R.	25 Oct. 85	6.98	8.6	24.03	
	15 Nov. 85	7.08	15.5	140.60	
	11 Dec. 85	6.90	10.4	42.91	
	24 Jan. 86	6.80	7.9	23.72	
	28 Feb. 86	6.80	7.2	19.67	-87.1
Tsitika R.	26 Oct. 85	6.20	2.1	10.99	
	16 Nov. 85	6.61	4.2	12.87	
	12 Dec. 85	6.40	4.8	15.14	
	25 Jan. 86	6.38	2.9	10.72	
	28 Feb. 86	6.18	2.0	8.50	-55.0

ND - Not Detected

TABLE 3
Lower Mainland
Sulfate, Nitrate, Chloride, Colour

Stream	Date	Sulfate ($mg \bullet L^{-1}$)	Nitrate ($mg \bullet L^{-1}$)	Chloride ($mg \bullet L^{-1}$)	Colour (Rel.U)
Alouette R.	13 Nov.85	2	0.253	3.7	5
	11 Mar.86	2	0.226	4.5	5
	1 Jul.86	2	0.130	4.4	10
Capilano R.	12 Nov.85	2	0.134	ND	10
	10 Mar.86	2	0.114	0.6	10
	2 Jul.86	ND	0.044	ND	10
Coquitlam R.	12 Nov.85	2	0.189	ND	10
	10 Mar.86	2	0.102	0.7	10
Inches Ck.	13 Nov.85	2	0.272	ND	5
Kanaka Ck.	13 Nov.85	3	0.447	1.1	20
	11 Mar.86	2	0.352	2.4	30
	1 Jul.86	3	0.100	1.8	25
Lynn Ck.	12 Nov.85	3	0.269	2.5	5
	10 Mar.86	3	0.184	2.0	5
	2 Jul.86	2	0.119	ND	10
McIntyre Ck.	13 Nov.85	3	0.102	1.2	10
	10 Mar.86	3	0.014	1.0	40
Mossom Ck. (lower)	12 Nov.85	4	0.343	3.0	10
	10 Mar.86	4	0.260	3.0	10
	2 Jul.86	3	0.166	2.7	20
Mossom Ck. (upper)	12 Nov.85	4	0.253	1.5	10
	10 Mar.86	4	0.117	0.7	10
	2 Jul.86	4	0.063	ND	25
Noons Ck.	12 Nov.85	3	0.127	1.8	30
	10 Mar.86	4	0.063	1.0	70
	2 Jul.86	5	0.041	1.0	110
N. Alouette R.	13 Nov.85	2	0.119	1.2	10
	11 Mar.86	2	0.104	0.7	10
	1 Jul.86	2	0.069	ND	10
Seymour R.	12 Nov.85	2	0.163	1.2	10
	10 Mar.86	3	0.100	0.5	10
	2 Jul.86	2	0.035	ND	10

TABLE 3
Lower Mainland
Sulfate, Nitrate, Chloride, Colour

Stream	Date	Sulfate ($mg \cdot L^{-1}$)	Nitrate ($mg \cdot L^{-1}$)	Chloride ($mg \cdot L^{-1}$)	Colour (Rel.U)
Stave R.	13 Nov.85	2	0.130	1.2	10
	11 Mar.86	2	0.138	0.7	5
	1 Jul.86	1	0.074	ND	10
Whonock Ck.	13 Nov.85	2	0.096	1.0	20
	11 Mar.86	3	0.097	1.0	30
	1 Jul.86	3	0.044	0.8	50

TABLE 4

Surface Water Chemistry
Sulfate, Nitrate, Chloride, Colour
VANCOUVER ISLAND

Stream	Date	Sulfate ($mg \bullet L^{-1}$)	Nitrate ($mg \bullet L^{-1}$)	Chloride ($mg \bullet L^{-1}$)	Colour (Rel.U)
DeMamiel Creek	15 Nov.85	3	0.373	6.3	20
	21 Feb.86	2	0.355	6.0	10
Holland Creek	15 Nov.85	3	0.131	4.7	30
	28 Feb.86	2	0.050	3.7	10
Jordan River	15 Nov.85	30	0.020	268	30
	21 Feb.86	>300	0.190	3,850	20
Keogh River	16 Nov.85	3	0.013	2.9	60
	28 Feb.86	2	0.013	1.8	60
Menzies Creek	16 Nov.85	3	0.134	5.7	10
	28 Feb.86	3	0.069	4.3	5
Mohun Creek	16 Nov.85	4	0.198	4.7	30
	28 Feb.86	3	0.114	3.4	10
Quatse River	16 Nov.85	4	0.007	3.2	70
	28 Feb.86	3	0.007	2.4	80
Sooke River	15 Nov.85	2	0.081	3.9	10
	21 Feb.86	2	0.058	3.4	10
Tsable River	15 Nov.85	8	0.054	27.3	10
	28 Feb.86	2	0.014	1.5	10
Tsitika River	16 Nov.85	3	<0.005	1.4	50
	28 Feb.86	2	ND	0.9	60

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Alouette River

Metal ($mg \bullet L^{-1}$)	16 Jan. 1985 Dissolved	16 Jan. 1985 Total	23 Feb. 1985 Dissolved	23 Feb. 1985 Total	13 Mar. 1985 Dissolved	13 Mar. 1985 Total
Al	ND	ND	ND	0.78	ND	0.08
As	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	0.004	ND	ND
Ba	0.002	0.003	0.002	0.007	0.002	0.003
Be	ND	ND	ND	ND	ND	ND
Ca	3.8	3.8	3.3	3.5	3.7	3.7
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.048	0.080	0.048	0.533	0.040	0.070
Hg						
Mg	0.5	0.5	0.4	0.6	0.4	0.6
Mn	0.005	0.006	0.005	0.015	0.004	0.006
Mo	ND	ND	ND	ND	ND	ND
Na	2.5	2.6	2.2	2.6	2.4	2.6
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	2.2	2.2	2.7	4.1	2.8	2.8
Sn	ND	ND	0.02	0.01	ND	ND
Sr	0.024	0.023	0.021	0.024	0.022	0.023
Ti	0.012	0.007	ND	0.059	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	0.005	ND	ND
Hardness (Ca, Mg)	11.4	11.7	10.0	11.3	11.0	11.5

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Alouette River

Metal ($mg \bullet L^{-1}$)	13 Nov. 1985 Dissolved	Total	11 Mar. 1986 Dissolved	Total	1 Jul. 1986 Dissolved	Total
Al	ND	0.14	ND	0.37	ND	0.08
As	ND	ND	ND	ND	ND	ND
B	0.024	ND	0.020	0.024	0.010	ND
Ba	0.003	0.004	0.002	0.005	0.002	0.003
Be	ND	ND	ND	ND	ND	ND
Ca	3.6	3.6	3.5	3.7	3.4	3.5
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	0.016	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.043	0.380	0.042	0.307	0.063	0.132
Hg						
Mg	0.5	0.5	0.5	0.5	0.4	0.5
Mn	0.007	0.010	0.007	0.011	0.008	0.007
Mo	ND	ND	ND	ND	ND	ND
Na	2.4	2.4	2.3	2.5	2.2	2.3
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	2.3	2.5	2.3	2.7	2.4	2.4
Sn	ND	ND	ND	ND	ND	0.03
Sr	0.024	0.025	0.023	0.024	0.017	0.018
Ti	ND	ND	ND	0.016	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	0.002	ND	ND	ND	0.002
Hardness (Ca, Mg)	11.1	11.2	10.6		10.2	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Brittania Creek

Metal ($mg \bullet L^{-1}$)	14 Jan. 1985 Dissolved	14 Jan. 1985 Total	22 Feb. 1985 Dissolved	22 Feb. 1985 Total	12 Mar. 1985 Dissolved	12 Mar. 1985 Total
Al	0.11	0.17	0.07	0.24	0.10	0.29
As	ND	0.05	ND	ND	ND	ND
B	1.040	1.270	0.209	0.221	0.717	0.776
Ba	0.007	0.006	0.007	0.007	0.006	0.007
Be	ND	ND	ND	ND	ND	ND
Ca	88.3	118.0	24.6	24.8	63.0	67.2
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	0.046	0.048	0.057	0.067	0.038	0.063
Fe	0.049	0.225	0.061	0.098	0.049	0.079
Hg					ND	ND
Mg	306.0	482.0	68.7	64.2	228.0	246.0
Mn	0.010	0.009	0.017	0.017	0.015	0.016
Mo	ND	ND	ND	ND	ND	ND
Na	2320.0	2850.0	533.0	530.0	1450.0	1520.0
Ni	ND	ND	ND	ND	ND	ND
P	0.21	0.22	ND	0.07	0.18	0.21
Pb	ND	0.02	ND	ND	ND	0.03
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.8	7.9	2.9	3.2	3.1	3.1
Sn	ND	ND	ND	ND	ND	ND
Sr	1.610	1.960	0.385	0.373	1.150	1.220
Ti	0.013	ND	ND	0.036	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	0.054	0.063	0.114	0.400	0.098	0.104
Hardness (Ca, Mg)	1480.0	2280.0	344.0	326.0	1100.0	1180.0

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Campbell River

Metal ($mg\bullet L^{-1}$)	14 Jan. 1985 Dissolved	14 Jan. 1985 Total	24 Feb. 1985 Dissolved	24 Feb. 1985 Total	12 Mar. 1985 Dissolved	12 Mar. 1985 Total
Al	ND	0.11	ND	0.22	ND	0.13
As	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	ND	ND	0.001
Ba	0.015	0.016	0.011	0.012	0.011	0.012
Be	ND	ND	ND	ND	ND	ND
Ca	7.5	7.7	5.8	5.9	7.0	7.1
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.202	0.322	0.139	0.252	0.175	0.248
Hg						
Mg	3.1	3.3	2.4	2.4	2.8	3.0
Mn	0.039	0.046	0.009	0.013	0.022	0.026
Mo	ND	ND	ND	ND	ND	ND
Na	5.1	5.3	4.5	5.1	4.6	5.2
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	0.06	ND	ND
Pb	ND	0.03	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	4.5	4.9	2.9	2.9	2.2	2.2
Sn	ND	ND	ND	ND	ND	ND
Sr	0.052	0.050	0.040	0.041	0.047	0.048
Ti	0.014	0.012	ND	0.047	ND	0.002
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	0.002	0.010	ND	ND
Hardness (Ca, Mg)	31.8	32.8	24.5	24.7	29.1	29.9

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Capilano River

Metal $(mg \bullet L^{-1})$	14 Jan. 1985 Dissolved	Total	22 Feb. 1985 Dissolved	Total	12 Mar. 1985 Dissolved	Total
Al	0.07	0.07	ND	0.12	ND	0.13
As	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	ND	ND	0.001
Ba	0.002	0.003	0.003	0.003	0.003	0.003
Be	ND	ND	ND	ND	ND	ND
Ca	1.4	1.4	1.8	1.8	1.7	1.8
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.033	0.045	0.037	0.102	0.051	0.109
Hg						
Mg	0.2	0.2	0.2	0.3	0.2	0.3
Mn	0.008	0.007	0.006	0.007	0.009	0.011
Mo	ND	ND	ND	ND	ND	ND
Na	0.6	0.6	0.7	0.9	0.8	0.8
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	0.02
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.0	1.1	1.9	1.9	2.0	2.0
Sn	ND	ND	ND	ND	ND	ND
Sr	0.007	0.007	0.008	0.009	0.009	0.010
Ti	0.013	0.007	ND	0.042	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	0.005	ND	ND
Hardness (Ca, Mg)	4.32	4.32	5.32	5.65	4.90	5.70

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Capilano River

Metal $(mg{\bullet}L^{-1})$	12 Nov. 1985 Dissolved	12 Nov. 1985 Total	10 Mar. 1986 Dissolved	10 Mar. 1986 Total	2 Jul. 1986 Dissolved	2 Jul. 1986 Total
Al	0.10	0.25	0.09	0.28	ND	0.10
As	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	0.009	ND	ND
Ba	0.003	0.004	0.001	0.003	0.003	0.002
Be	ND	ND	ND	ND	ND	ND
Ca	1.4	1.4	1.1	1.3	1.1	1.2
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.072	0.196	0.035	0.166	0.021	0.065
Hg						
Mg	0.2	0.2	0.1	0.2	0.1	0.1
Mn	0.010	0.011	0.005	0.008	0.005	0.005
Mo	ND	ND	ND	ND	ND	ND
Na	0.5	0.6	0.5	0.5	0.5	0.5
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.4	1.3	0.9	1.1	1.3	1.3
Sn	ND	ND	ND	ND	0.01	0.03
Sr	0.007	0.007	0.006	0.008	0.007	0.006
Ti	ND	ND	ND	0.010	ND	0.008
V	ND	ND	ND	ND	ND	ND
Zn	ND	0.003	ND	ND	ND	0.002
Hardness (Ca, Mg)	4.34	4.39	3.47		3.24	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Chehalis River

Metal ($mg \cdot L^{-1}$)	16 Jan. 1985		23 Feb. 1985		13 Mar. 1985	
	Dissolved	Total	Dissolved	Total	Dissolved	Total
Al	ND	0.14	0.07	0.99	ND	0.08
As	ND	ND	ND	ND	ND	ND
B	ND	ND	0.004	ND	ND	ND
Ba	0.007	0.008	0.006	0.015	0.008	0.008
Be	ND	ND	ND	ND	ND	ND
Ca	3.8	3.9	3.6	3.7	4.2	4.3
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.011	0.050	0.021	0.584	0.008	0.010
Hg						
Mg	0.4	0.5	0.4	0.6	0.4	0.5
Mn	ND	0.002	0.001	0.015	ND	0.001
Mo	ND	ND	ND	ND	ND	ND
Na	0.9	1.0	0.9	1.4	1.0	1.0
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	0.02
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.8	1.9	2.4	4.0	2.7	2.8
Sn	ND	ND	ND	ND	ND	0.02
Sr	0.012	0.012	0.011	0.014	0.014	0.014
Ti	0.010	0.007	ND	0.070	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	0.008	ND	0.005	ND	ND
Hardness (Ca, Mg)	11.1	11.7	10.8	11.7	12.3	12.9

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Coquitlam River

Metal ($mg \bullet L^{-1}$)	12 Nov. 1985 Dissolved	12 Nov. 1985 Total	10 Mar. 1986 Dissolved	10 Mar. 1986 Total
Al	0.07	0.11	0.09	0.41
As	ND	ND	ND	ND
B	0.021	0.020	ND	0.012
Ba	0.003	0.003	0.002	0.003
Be	ND	ND	ND	ND
Ca	2.0	2.0	1.4	1.6
Cd	ND	ND	ND	ND
Co	ND	ND	ND	ND
Cr	ND	ND	ND	ND
Cu	ND	ND	ND	ND
Fe	0.020	0.049	0.021	0.185
Hg				
Mg	0.4	0.4	0.2	0.3
Mn	0.005	0.005	0.005	0.008
Mo	ND	ND	ND	ND
Na	0.9	1.0	0.7	0.9
Ni	ND	ND	ND	ND
P	ND	ND	ND	ND
Pb	ND	ND	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	2.1	2.2	1.4	1.8
Sn	ND	ND	ND	ND
Sr	0.013	0.012	0.009	0.010
Ti	ND	ND	ND	0.011
V	ND	ND	ND	ND
Zn	ND	0.002	ND	ND
Hardness (Ca, Mg)	6.45	6.58	4.57	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Harrison River

Metal ($mg \cdot L^{-1}$)	16 Jan. 1985 Dissolved	16 Jan. 1985 Total	23 Feb. 1985 Dissolved	23 Feb. 1985 Total	13 Mar. 1985 Dissolved	13 Mar. 1985 Total
Al	ND	0.06	ND	0.10	ND	ND
As	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	ND	ND	ND
Ba	0.009	0.010	0.009	0.011	0.010	0.010
Be	ND	ND	ND	ND	ND	ND
Ca	6.3	6.5	6.6	6.6	6.3	6.4
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	0.047	ND	ND
Fe	0.097	0.130	0.105	0.215	0.060	0.080
Hg						
Mg	0.7	0.8	0.8	0.9	0.7	0.7
Mn	0.010	0.011	0.012	0.013	0.005	0.005
Mo	ND	ND	ND	ND	ND	ND
Na	1.2	1.3	1.4	1.6	1.2	1.3
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.8	2.0	2.6	2.7	2.5	2.6
Sn	ND	ND	ND	ND	ND	ND
Sr	0.028	0.028	0.027	0.028	0.028	0.028
Ti	0.012	0.009	ND	0.024	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	0.085	ND	ND
Hardness (Ca, Mg)	18.7	19.5	19.8	20.1	18.7	18.9

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Inches Creek

Metal ($mg \bullet L^{-1}$)	16 Jan. 1985 Dissolved	16 Jan. 1985 Total	23 Feb. 1985 Dissolved	23 Feb. 1985 Total	13 Mar. 1985 Dissolved	13 Mar. 1985 Total
Al	ND	0.11	ND	ND	ND	0.08
As	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	0.004	ND	ND
Ba	0.005	0.006	0.005	0.005	0.005	0.005
Be	ND	ND	ND	ND	ND	ND
Ca	3.0	3.0	2.8	2.9	2.8	2.9
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	ND	0.040	ND	0.081	ND	0.144
Hg						
Mg	0.4	0.4	0.3	0.4	0.3	0.4
Mn	ND	0.001	ND	0.002	ND	ND
Mo	ND	ND	0.005	ND	ND	ND
Na	1.1	1.1	1.0	1.2	1.1	1.1
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	0.07	0.06	0.09
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	2.2	2.1	2.8	2.8	2.7	2.7
Sn	ND	ND	ND	0.01	ND	ND
Sr	0.010	0.008	0.009	0.009	0.009	0.010
Ti	0.011	0.006	ND	0.021	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	0.015	0.002	0.004
Hardness (Ca, Mg)	8.90	9.12	8.41	8.85	8.43	9.01

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Inches Creek

Metal ($mg \bullet L^{-1}$)	13 Nov. 1985 Dissolved	Total
Al	ND	0.07
As	ND	ND
B	0.012	0.004
Ba	0.007	0.008
Be	ND	ND
Ca	3.2	3.3
Cd	ND	ND
Co	ND	ND
Cr	ND	ND
Cu	ND	ND
Fe	ND	0.075
Hg		
Mg	0.4	0.5
Mn	0.001	0.002
Mo	ND	ND
Na	1.2	1.2
Ni	ND	ND
P	ND	ND
Pb	ND	ND
Sb	ND	ND
Se	ND	ND
Si	2.7	2.6
Sn	ND	ND
Sr	0.011	0.011
Ti	ND	ND
V	ND	ND
Zn	ND	0.003
Hardness (Ca, Mg)	9.76	9.99

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Kanaka Creek

Metal ($mg \bullet L^{-1}$)	16 Jan. 1985 Dissolved	16 Jan. 1985 Total	23 Feb. 1985 Dissolved	23 Feb. 1985 Total	13 Mar. 1985 Dissolved	13 Mar. 1985 Total
Al	0.08	0.13	0.11	0.52	ND	0.13
As	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	0.004	ND	ND
Ba	0.003	0.004	0.003	0.006	0.003	0.004
Be	ND	ND	ND	ND	ND	ND
Ca	2.4	2.5	1.9	2.0	2.8	2.8
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.069	0.080	0.027	0.340	0.049	0.079
Hg						
Mg	0.4	0.5	0.2	0.5	0.5	0.6
Mn	0.003	0.004	0.005	0.011	0.002	0.003
Mo	ND	ND	ND	ND	ND	ND
Na	1.9	2.0	1.3	1.5	2.1	2.4
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	2.4	2.5	2.3	2.9	3.6	3.6
Sn	ND	ND	ND	ND	ND	ND
Sr	0.017	0.017	0.014	0.016	0.020	0.021
Ti	0.013	0.007	ND	0.042	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	0.005	ND	ND
Hardness (Ca, Mg)	7.85	8.24	6.32	6.99	9.28	9.65

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Kanaka Creek

Metal $(mg \cdot L^{-1})$	13 Nov. 1985 Dissolved	13 Nov. 1985 Total	11 Mar. 1986 Dissolved	11 Mar. 1986 Total	1 Jul. 1986 Dissolved	1 Jul. 1986 Total
Al	0.07	0.11	0.13	1.36	0.07	0.21
As	ND	ND	ND	ND	ND	ND
B	0.031	ND	0.006	ND	0.042	ND
Ba	0.004	0.004	0.003	0.012	0.003	0.005
Be	ND	ND	ND	ND	ND	ND
Ca	2.6	2.6	2.6	2.8	2.8	3.0
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	0.008	0.007	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.062	0.139	0.087	0.964	0.096	0.204
Hg						
Mg	0.6	0.6	0.6	0.8	0.5	0.6
Mn	0.004	0.005	0.005	0.019	0.002	0.005
Mo	ND	ND	ND	ND	ND	ND
Na	1.7	1.8	2.0	2.2	2.1	2.2
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	2.9	2.9	2.4	4.3	3.6	3.7
Sn	ND	ND	ND	ND	ND	0.02
Sr	0.020	0.020	0.019	0.021	0.020	0.018
Ti	ND	ND	0.004	0.063	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	0.002	ND	0.005	ND	ND
Hardness (Ca, Mg)	8.87	8.98	8.87		9.06	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Lynn Creek

Metal ($mg \bullet L^{-1}$)	14 Jan. 1985		22 Feb. 1985		12 Mar. 1985	
	Dissolved	Total	Dissolved	Total	Dissolved	Total
Al	ND	0.62	ND	0.11	ND	ND
As	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	ND	ND	0.001
Ba	0.005	0.010	0.007	0.008	0.006	0.007
Be	ND	ND	ND	ND	ND	ND
Ca	3.7	3.9	4.4	4.6	4.4	4.4
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	0.006	ND	ND	ND	ND
Fe	0.074	0.860	0.094	0.151	0.165	0.183
Hg						
Mg	0.6	0.7	0.6	0.7	0.7	0.8
Mn	0.013	0.026	0.015	0.016	0.021	0.021
Mo	ND	ND	ND	ND	ND	ND
Na	8.8	9.1	4.1	5.2	3.0	3.2
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	0.05	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.6	2.4	2.7	2.8	2.9	2.9
Sn	ND	ND	ND	0.30	ND	ND
Sr	0.017	0.020	0.023	0.240	0.022	0.023
Ti	0.012	0.031	ND	0.420	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	0.003	0.100	ND	ND
Hardness (Ca, Mg)	11.5	12.7	13.5	14.1	13.9	14.2

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Lynn Creek

Metal ($mg \bullet L^{-1}$)	12 Nov. 1985 Dissolved	12 Nov. 1985 Total	10 Mar. 1986 Dissolved	10 Mar. 1986 Total	2 Jul. 1986 Dissolved	2 Jul. 1986 Total
Al	ND	ND	ND	0.07	ND	0.13
As	ND	ND	ND	ND	ND	ND
B	0.021	0.020	0.010	ND	ND	ND
Ba	0.005	0.005	0.003	0.003	0.004	0.003
Be	ND	ND	ND	ND	ND	ND
Ca	3.7	3.8	2.5	2.7	1.9	2.0
Cd	ND	ND	ND	ND	0.005	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.031	0.041	0.013	0.046	0.014	0.062
Hg						
Mg	0.6	0.6	0.4	0.4	0.3	0.3
Mn	0.004	0.003	0.002	0.002	0.002	0.002
Mo	ND	ND	ND	0.005	ND	ND
Na	1.6	1.7	1.4	1.5	0.8	0.8
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	2.0	2.2	1.4	1.1	1.7	1.7
Sn	ND	ND	0.01	ND	0.04	0.03
Sr	0.018	0.020	0.012	0.014	0.016	0.013
Ti	ND	ND	ND	0.003	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	ND	0.003	ND
Hardness (Ca, Mg)	11.6	12.0	7.79		5.89	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

McIntyre Creek

Metal $(mg \bullet L^{-1})$	13 Nov. 1985 Dissolved	13 Nov. 1985 Total	10 Mar. 1986 Dissolved	10 Mar. 1986 Total
Al	0.07	0.11	0.18	0.20
As	ND	ND	ND	ND
B	0.011	0.012	ND	ND
Ba	0.003	0.003	0.002	0.002
Be	ND	ND	ND	ND
Ca	1.1	1.4	1.0	1.1
Cd	ND	ND	ND	ND
Co	ND	ND	ND	ND
Cr	ND	ND	ND	ND
Cu	ND	ND	ND	ND
Fe	0.007	0.018	0.024	0.031
Hg				
Mg	0.2	0.2	0.2	0.2
Mn	ND	ND	ND	ND
Mo	ND	ND	ND	ND
Na	1.0	1.4	0.7	0.8
Ni	ND	ND	ND	ND
P	ND	ND	ND	ND
Pb	ND	0.02	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	2.8	2.8	1.4	1.1
Sn	ND	ND	ND	ND
Sr	0.010	0.012	0.008	0.009
Ti	ND	ND	ND	0.003
V	ND	ND	ND	ND
Zn	ND	ND	0.002	ND
Hardness (Ca, Mg)	3.68	4.51	3.22	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Mossom Creek (Lower)

Metal ($mg{\bullet}L^{-1}$)	12 Nov. 1985 Dissolved	12 Nov. 1985 Total	10 Mar. 1986 Dissolved	10 Mar. 1986 Total	2 Jul. 1986 Dissolved	2 Jul. 1986 Total
Al	ND	0.09	0.06	0.13	0.06	0.10
As	ND	ND	ND	ND	ND	ND
B	0.031	ND	0.020	0.018	ND	ND
Ba	0.007	0.008	0.005	0.006	0.004	0.004
Be	ND	ND	ND	ND	ND	ND
Ca	4.0	4.1	3.5	4.0	5.0	5.2
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.024	0.031	0.018	0.035	0.037	0.048
Hg						
Mg	1.2	1.3	1.0	1.2	1.6	1.7
Mn	0.001	0.002	ND	0.002	0.001	0.002
Mo	ND	ND	ND	ND	ND	ND
Na	2.3	2.4	2.6	2.8	3.0	2.8
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	4.3	4.7	3.6	3.6	6.5	6.3
Sn	ND	ND	ND	ND	0.02	ND
Sr	0.027	0.027	0.023	0.025	0.038	0.036
Ti	ND	ND	ND	0.003	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	ND	0.002	ND
Hardness (Ca, Mg)	14.9	15.5	13.0		19.3	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Mossom Creek (Upper)

Metal ($mg \bullet L^{-1}$)	12 Nov. 1985 Dissolved	12 Nov. 1985 Total	10 Mar. 1986 Dissolved	10 Mar. 1986 Total	1 Jul. 1986 Dissolved	1 Jul. 1986 Total
Al	0.12	0.14	0.12	0.19	0.17	0.23
As	ND	ND	ND	ND	ND	0.05
B	0.008	0.004	0.010	ND	ND	ND
Ba	0.005	0.006	0.003	0.004	0.005	0.005
Be	ND	ND	ND	ND	ND	ND
Ca	1.9	2.1	1.6	1.8	1.9	2.0
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	0.013	ND	ND	ND	ND
Cu	ND	0.052	ND	ND	0.005	ND
Fe	0.012	0.096	0.011	0.023	0.028	0.077
Hg						
Mg	0.3	0.3	0.2	0.3	0.3	0.3
Mn	0.001	0.003	ND	ND	0.001	0.002
Mo	ND	ND	ND	ND	ND	ND
Na	0.9	1.1	0.9	1.0	1.1	1.1
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	2.0	2.3	1.9	1.8	2.9	2.9
Sn	ND	ND	ND	ND	ND	0.02
Sr	0.015	0.015	0.012	0.013	0.021	0.024
Ti	ND	ND	ND	ND	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	0.006	ND	ND	ND	ND
Hardness (Ca, Mg)	6.15	6.69	4.79		5.82	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Nicomekl River

Metal ($mg \bullet L^{-1}$)	14 Jan. 1985		24 Feb. 1985		13 Mar. 1985	
	Dissolved	Total	Dissolved	Total	Dissolved	Total
Al	ND	2.02	0.17	3.33	0.13	0.31
As	ND	ND	ND	ND	ND	ND
B	0.034	0.016	0.026	0.022	0.037	0.033
Ba	0.015	0.032	0.013	0.035	0.013	0.016
Be	ND	ND	ND	ND	ND	ND
Ca	13.9	15.0	8.4	9.2	15.0	14.9
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	0.007	ND	0.007	ND	ND
Cu	ND	0.008	ND	ND	ND	ND
Fe	0.144	2.590	0.283	2.530	0.425	0.681
Hg						
Mg	5.2	6.2	3.6	4.3	5.9	6.4
Mn	0.111	0.190	0.030	0.073	0.095	0.098
Mo	ND	ND	ND	ND	ND	ND
Na	53.9	55.5	14.4	16.0	20.9	25.1
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	0.080	0.210	0.090	0.080
Pb	ND	0.16	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	5.1	7.6	3.9	10.0	6.4	6.7
Sn	ND	ND	ND	ND	0.01	0.01
Sr	0.079	0.086	0.056	0.064	0.083	0.090
Ti	0.017	0.092	0.009	0.223	ND	0.012
V	ND	0.008	ND	0.009	ND	ND
Zn	0.013	0.054	0.008	0.060	0.004	0.005
Hardness (Ca, Mg)	56.1	63.0	35.7	40.5	61.8	63.3

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Noons Creek

Metal ($mg•L^{-1}$)	12 Nov. 1985 Dissolved	12 Nov. 1985 Total	10 Mar. 1986 Dissolved	10 Mar. 1986 Total	2 Jul. 1986 Dissolved	2 Jul. 1986 Total
Al	0.16	0.25	0.32	0.38	0.52	0.55
As	ND	ND	ND	ND	ND	ND
B	ND	ND	0.010	0.006	ND	ND
Ba	0.005	0.005	0.004	0.004	0.004	0.005
Be	ND	ND	ND	ND	ND	ND
Ca	1.6	1.7	1.3	1.4	1.6	1.7
Cd	ND	ND	ND	ND	0.004	ND
Co	ND	ND	ND	ND	0.011	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	0.007	ND
Fe	0.063	0.140	0.097	0.116	0.175	0.212
Hg						
Mg	0.3	0.3	0.2	0.3	0.3	0.3
Mn	0.004	0.006	0.004	0.005	0.006	0.006
Mo	ND	0.005	ND	ND	ND	ND
Na	0.9	1.0	0.7	0.8	1.0	0.9
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	0.03	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.8	1.8	1.4	1.1	2.1	2.2
Sn	ND	ND	ND	ND	ND	ND
Sr	0.014	0.013	0.009	0.010	0.014	0.020
Ti	ND	ND	0.003	0.003	0.003	0.016
V	ND	ND	ND	ND	0.009	ND
Zn	0.002	0.004	0.003	0.003	0.005	ND
Hardness (Ca, Mg)	5.22	5.69	3.96		5.1	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Norrish Creek

Metal ($mg \bullet L^{-1}$)	16 Jan. 1985 Dissolved	16 Jan. 1985 Total	23 Feb. 1985 Dissolved	23 Feb. 1985 Total	13 Mar. 1985 Dissolved	13 Mar. 1985 Total
Al	ND	0.13	0.10	4.83	ND	0.08
As	ND	ND	ND	ND	ND	ND
B	ND	ND	0.007	ND	0.005	ND
Ba	0.002	0.004	0.001	0.032	0.003	0.003
Be	ND	ND	ND	ND	ND	ND
Ca	2.3	2.3	2.2	3.7	2.6	2.7
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.022	0.050	0.026	2.860	0.009	0.007
Hg						
Mg	0.3	0.3	0.3	1.0	0.3	0.4
Mn	0.001	0.002	0.001	0.056	ND	ND
Mo	ND	ND	ND	ND	ND	ND
Na	0.9	1.0	0.9	2.0	1.1	1.1
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	0.11	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.8	1.9	2.2	10.0	2.9	2.8
Sn	ND	ND	ND	ND	ND	ND
Sr	0.007	0.007	0.006	0.019	0.008	0.008
Ti	0.012	0.008	ND	0.238	ND	ND
V	ND	ND	ND	0.008	ND	ND
Zn	ND	ND	ND	0.015	ND	ND
Hardness (Ca, Mg)	6.80	7.03	6.81	13.3	7.71	8.45

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

North Alouette River

Metal ($mg \bullet L^{-1}$)	16 Jan. 1985 Dissolved	16 Jan. 1985 Total	23 Feb. 1985 Dissolved	23 Feb. 1985 Total	13 Mar. 1985 Dissolved	13 Mar. 1985 Total
Al	0.08	0.12	0.06	0.09	ND	0.06
As	ND	ND	ND	ND	ND	ND
B	ND	ND	0.007	0.004	ND	ND
Ba	0.003	0.003	0.003	0.003	0.003	0.003
Be	ND	ND	ND	ND	ND	ND
Ca	1.8	1.9	1.8	1.9	2.1	2.1
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.032	0.040	0.027	0.045	0.017	0.056
Hg						
Mg	0.2	0.3	0.2	0.2	0.3	0.3
Mn	ND	0.002	0.002	0.003	ND	ND
Mo	ND	0.007	ND	ND	ND	ND
Na	0.9	0.9	0.8	1.1	1.0	1.1
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.3	1.3	1.8	1.8	2.5	2.5
Sn	ND	ND	ND	ND	ND	ND
Sr	0.007	0.008	0.008	0.008	0.010	0.010
Ti	0.011	0.005	ND	0.024	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	0.005	ND	ND
Hardness (Ca, Mg)	5.48	5.94	5.37	5.74	6.46	6.65

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

North Alouette River

Metal ($mg \bullet L^{-1}$)	13 Nov. 1985 Dissolved	13 Nov. 1985 Total	11 Mar. 1986 Dissolved	11 Mar. 1986 Total	1 Jul. 1986 Dissolved	1 Jul. 1986 Total
Al	0.07	0.12	0.08	0.08	ND	0.07
As	ND	ND	ND	ND	ND	0.05
B	0.009	ND	0.010	ND	0.014	0.12
Ba	0.004	0.004	0.003	0.003	0.005	0.004
Be	ND	ND	ND	ND	ND	ND
Ca	1.8	1.9	1.5	1.5	1.8	1.9
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	0.008	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.024	0.027	0.019	0.032	0.018	0.037
Hg						
Mg	0.3	0.3	0.2	0.2	0.2	0.3
Mn	0.002	0.002	ND	ND	0.002	0.005
Mo	ND	ND	ND	ND	ND	ND
Na	0.9	0.9	0.8	0.9	0.9	1.0
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.5	2.0	1.5	1.1	2.0	2.0
Sn	ND	ND	ND	ND	0.02	0.03
Sr	0.011	0.011	0.008	0.008	0.015	0.020
Ti	ND	ND	ND	0.003	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	0.002	ND	ND	ND
Hardness (Ca, Mg)	5.51	6.00	4.75		5.41	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Serpentine River

Metal ($mg•L^{-1}$)	14 Jan. 1985 Dissolved	14 Jan. 1985 Total	24 Feb. 1985 Dissolved	24 Feb. 1985 Total	12 Mar. 1985 Dissolved	12 Mar. 1985 Total
Al	0.08	0.65	0.15	1.78	0.12	1.07
As	ND	ND	ND	ND	ND	ND
B	ND	0.016	0.026	0.002	0.025	0.025
Ba	0.012	0.016	0.013	0.024	0.013	0.020
Be	ND	ND	ND	ND	ND	ND
Ca	13.0	13.4	8.0	8.2	13.0	12.9
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.298	0.879	0.209	1.250	0.350	1.100
Hg						
Mg	5.5	6.0	2.5	2.8	5.3	5.7
Mn	0.074	0.093	0.034	0.050	0.082	0.104
Mo	ND	ND	ND	ND	ND	ND
Na	25.9	26.4	10.7	11.8	21.7	24.7
Ni	ND	ND	ND	ND	ND	ND
P	0.19	ND	0.05	0.15	0.20	0.21
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	7.1	8.4	3.7	6.5	6.9	8.4
Sn	ND	ND	ND	ND	ND	ND
Sr	0.086	0.084	0.056	0.060	0.088	0.093
Ti	0.016	0.025	0.005	0.120	ND	0.045
V	ND	ND	ND	0.006	ND	ND
Zn	ND	0.009	0.010	0.050	0.007	0.010
Hardness (Ca, Mg)	55.0	58.1	30.0	31.9	54.2	55.6

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Seymour River

Metal ($mg \bullet L^{-1}$)	14 Jan. 1985 Dissolved	14 Jan. 1985 Total	22 Feb. 1985 Dissolved	22 Feb. 1985 Total	13 Mar. 1985 Dissolved	13 Mar. 1985 Total
Al	ND	0.07	ND	0.17	ND	ND
As	ND	ND	ND	ND	ND	ND
B	0.068	0.108	0.026	0.022	0.046	0.057
Ba	0.013	0.013	0.004	0.005	0.006	0.006
Be	ND	ND	ND	ND	ND	ND
Ca	15.8	15.7	4.3	4.2	9.0	9.0
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.055	0.115	0.070	0.184	0.076	0.144
Hg						
Mg	40.1	40.8	3.9	4.0	14.9	15.3
Mn	0.019	0.020	0.020	0.022	0.026	0.026
Mo	ND	ND	ND	ND	ND	ND
Na	334.0	334.0	31.6	36.7	116.0	127.0
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.7	2.1	2.8	2.8	2.9	2.8
Sn	ND	ND	ND	ND	ND	ND
Sr	0.251	0.257	0.042	0.043	0.119	0.118
Ti	0.013	0.010	ND	0.042	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	0.010	ND	ND
Hardness (Ca, Mg)	205.0	207.0	26.9	26.9	83.9	85.5

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Seymour River

Metal ($mg \bullet L^{-1}$)	12 Nov. 1985 Dissolved	12 Nov. 1985 Total	10 Mar. 1986 Dissolved	10 Mar. 1986 Total	2 Jul. 1986 Dissolved	2 Jul. 1986 Total
Al	0.05	0.09	0.08	0.15	ND	0.10
As	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	0.006	ND	ND
Ba	0.005	0.005	0.003	0.003	0.004	0.003
Be	ND	ND	ND	ND	ND	ND
Ca	2.0	2.2	1.4	1.6	1.5	1.5
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	0.005	ND
Fe	0.055	0.800	0.033	0.086	0.042	0.094
Hg						
Mg	0.4	0.4	0.2	0.2	0.2	0.2
Mn	0.010	0.011	0.004	0.005	0.004	0.004
Mo	ND	ND	ND	ND	ND	ND
Na	0.9	0.9	0.6	0.6	0.6	0.6
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.8	2.1	0.9	1.1	1.4	1.4
Sn	ND	ND	ND	ND	0.01	ND
Sr	0.012	0.011	0.007	0.009	0.010	0.011
Ti	ND	ND	ND	0.003	ND	ND
V	ND	ND	ND	ND	0.007	ND
Zn	ND	0.006	ND	ND	ND	ND
Hardness (Ca, Mg)	6.50	6.92	4.27		4.28	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Squamish River

Metal ($mg \bullet L^{-1}$)	14 Jan. 1985 Dissolved	14 Jan. 1985 Total	22 Feb. 1985 Dissolved	22 Feb. 1985 Total	12 Mar. 1985 Dissolved	12 Mar. 1985 Total
Al	ND	0.09	ND	0.09	ND	0.13
As	ND	ND	ND	ND	ND	ND
B	ND	0.026	0.026	0.022	0.021	0.001
Ba	0.011	0.012	0.011	0.011	0.011	0.012
Be	ND	ND	ND	ND	ND	ND
Ca	7.9	7.9	7.4	7.7	9.0	9.1
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.133	0.357	0.184	2.640	0.164	0.302
Hg						
Mg	1.4	1.2	1.0	1.1	1.1	1.2
Mn	0.031	0.034	0.025	0.025	0.020	0.022
Mo	ND	ND	ND	ND	ND	ND
Na	6.8	4.1	4.3	4.9	4.5	4.7
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	5.8	5.8	6.3	6.6	6.3	6.2
Sn	ND	ND	ND	ND	ND	ND
Sr	0.059	0.055	0.053	0.055	0.068	0.068
Ti	0.014	0.011	ND	0.041	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	0.01	ND	ND
Hardness (Ca, Mg)	25.6	24.5	22.7	23.6	27.1	27.6

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Stave River

Metal ($mg \bullet L^{-1}$)	16 Jan. 1985 Dissolved	16 Jan. 1985 Total	23 Feb. 1985 Dissolved	23 Feb. 1985 Total	13 Mar. 1985 Dissolved	13 Mar. 1985 Total
Al	ND	0.16	ND	0.19	ND	0.17
As	ND	ND	ND	ND	ND	ND
B	ND	ND	0.007	0.004	ND	ND
Ba	0.003	0.003	0.003	0.004	0.003	0.004
Be	ND	ND	ND	ND	ND	ND
Ca	1.2	1.3	1.4	1.4	1.5	1.6
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.037	0.110	0.090	0.735	0.117	0.304
Hg						
Mg	ND	0.1	0.2	0.2	0.2	0.3
Mn	0.008	0.010	0.013	0.014	0.017	0.019
Mo	ND	0.006	ND	ND	ND	ND
Na	0.5	0.6	0.7	0.8	0.8	0.9
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	0.7	0.7	1.5	1.6	1.6	1.7
Sn	ND	ND	ND	ND	ND	ND
Sr	0.004	0.005	0.006	0.006	0.006	0.007
Ti	0.012	0.010	ND	0.024	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	0.005	ND	ND
Hardness (Ca, Mg)	3.33	3.62	4.25	4.48	4.60	4.95

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Stave River

Metal ($mg \bullet L^{-1}$)	13 Nov. 1985 Dissolved	Total	11 Mar. 1986 Dissolved	Total	1 Jul. 1986 Dissolved	Total
Al	0.05	0.30	ND	0.39	ND	0.14
As	ND	ND	ND	ND	ND	ND
B	0.014	ND	ND	ND	ND	ND
Ba	0.003	0.004	0.002	0.005	0.002	0.003
Be	ND	ND	ND	ND	ND	ND
Ca	1.3	1.3	1.2	1.3	1.1	1.1
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.028	0.212	0.027	0.216	0.018	0.126
Hg						
Mg	0.2	0.2	0.1	0.2	0.1	0.2
Mn	0.004	0.009	0.004	0.008	0.003	0.008
Mo	ND	ND	ND	ND	ND	ND
Na	0.6	0.6	0.6	0.7	0.5	0.5
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.0	1.3	0.9	1.1	1.0	1.2
Sn	ND	ND	ND	ND	ND	0.02
Sr	0.006	0.007	0.006	0.006	0.004	0.005
Ti	ND	0.007	ND	0.012	ND	0.010
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	0.003	ND	ND
Hardness (Ca, Mg)	3.81	4.13	3.57		3.11	

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Stawamus River

Metal	14 Jan. 1985		22 Feb. 1985		12 Mar. 1985	
($mg \bullet L^{-1}$)	Dissolved	Total	Dissolved	Total	Dissolved	Total
Al	ND	0.05	ND	0.07	ND	ND
As	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	ND	ND	0.001
Ba	0.008	0.008	0.010	0.010	0.009	0.010
Be	ND	ND	ND	ND	ND	ND
Ca	5.0	5.0	4.9	5.4	5.1	5.2
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.030	0.074	0.036	0.061	0.033	0.038
Hg						
Mg	0.7	0.6	0.6	0.6	0.7	0.8
Mn	0.008	0.008	0.010	0.010	0.008	0.008
Mo	ND	0.005	ND	ND	ND	ND
Na	2.4	2.1	2.8	3.2	3.3	3.8
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	4.7	4.7	5.2	4.9	5.7	5.5
Sn	ND	ND	0.01	ND	ND	ND
Sr	0.029	0.028	0.029	0.030	0.033	0.033
Ti	0.110	0.007	ND	0.040	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	0.003	0.010	0.002	ND
Hardness (Ca, Mg)	15.2	15.2	14.6	16.1	15.7	16.3

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Wahleach Creek

Metal ($mg•L^{-1}$)	16 Jan. 1985 Dissolved	16 Jan. 1985 Total	23 Feb. 1985 Dissolved	23 Feb. 1985 Total	13 Mar. 1985 Dissolved	13 Mar. 1985 Total
Al	ND	0.38	Not Sampled		0.05	0.19
As	ND	ND			ND	ND
B	ND	ND			ND	ND
Ba	0.007	0.010			0.008	0.010
Be	ND	ND			ND	ND
Ca	3.4	3.5			4.1	4.1
Cd	ND	ND			ND	ND
Co	ND	ND			ND	ND
Cr	ND	ND			ND	ND
Cu	ND	ND			ND	ND
Fe	0.031	0.250			0.032	0.157
Hg						
Mg	0.7	0.9			0.8	0.9
Mn	0.002	0.006			0.001	0.004
Mo	ND	ND			ND	ND
Na	1.1	1.3			1.3	1.5
Ni	ND	ND			ND	ND
P	ND	ND			ND	ND
Pb	ND	ND			ND	ND
Sb	ND	ND			ND	ND
Se	ND	ND			ND	ND
Si	2.5	3.5			3.7	3.7
Sn	ND	0.01			ND	ND
Sr	0.014	0.016			0.017	0.018
Ti	0.012	0.025			ND	0.006
V	ND	ND			ND	ND
Zn	ND	ND			ND	ND
Hardness (Ca, Mg)	11.3	12.4			13.7	14.0

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Whonock Creek

Metal ($mg \bullet L^{-1}$)	16 Jan. 1985 Dissolved	16 Jan. 1985 Total	23 Feb. 1985 Dissolved	23 Feb. 1985 Total	13 Mar. 1985 Dissolved	13 Mar. 1985 Total
Al	0.11	0.12	0.11	0.28	0.07	0.73
As	ND	ND	ND	ND	ND	ND
B	ND	ND	0.007	ND	ND	ND
Ba	0.003	0.003	0.003	0.004	0.003	0.006
Be	ND	ND	ND	ND	ND	ND
Ca	1.4	1.4	1.3	1.3	1.7	1.9
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	ND	ND
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.124	0.120	0.098	0.188	0.129	0.797
Hg						
Mg	0.2	0.3	0.2	0.2	0.2	0.3
Mn	0.007	0.008	0.008	0.010	0.009	0.022
Mo	ND	0.005	ND	ND	ND	ND
Na	0.9	1.0	0.7	0.9	0.9	1.1
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	0.02
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	1.6	1.7	1.6	1.8	2.5	3.1
Sn	ND	ND	0.01	ND	ND	0.02
Sr	0.008	0.009	0.008	0.008	0.010	0.012
Ti	0.012	0.004	ND	0.025	ND	0.020
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	0.005	ND	ND
Hardness (Ca, Mg)	4.27	4.74	3.93	4.19	5.03	6.08

ND = Not Detected

TABLE 5

Surface Water Chemistry
Metals
LOWER MAINLAND

Whonock Creek

Metal $(mg \bullet L^{-1})$	13 Nov. 1985 Dissolved	Total	11 Mar. 1986 Dissolved	Total	1 Jul. 1986 Dissolved	Total
Al	0.09	0.09	0.12	0.37	0.14	0.19
As	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	ND	ND	ND
Ba	0.004	0.004	0.003	0.004	0.004	0.004
Be	ND	ND	ND	ND	ND	ND
Ca	1.5	1.5	1.2	1.3	1.7	1.8
Cd	ND	ND	ND	ND	ND	ND
Co	ND	ND	ND	ND	0.017	0.015
Cr	ND	ND	ND	ND	ND	ND
Cu	ND	ND	ND	ND	ND	ND
Fe	0.156	0.193	0.139	0.395	0.402	0.584
Hg						
Mg	0.2	0.2	0.2	0.2	0.2	0.3
Mn	0.018	0.018	0.010	0.017	0.027	0.027
Mo	ND	ND	ND	ND	ND	ND
Na	0.9	0.9	0.8	0.9	1.1	1.1
Ni	ND	ND	ND	ND	ND	ND
P	ND	ND	ND	ND	ND	ND
Pb	ND	ND	ND	ND	ND	ND
Sb	ND	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND	ND
Si	2.0	2.0	1.4	1.8	2.6	2.5
Sn	ND	ND	0.01	ND	ND	ND
Sr	0.011	0.011	0.007	0.009	0.18	0.017
Ti	ND	ND	ND	0.009	ND	ND
V	ND	ND	ND	ND	ND	ND
Zn	ND	ND	ND	ND	0.004	ND
Hardness (Ca, Mg)	4.80	4.76	3.89		5.12	

ND = Not Detected

TABLE 6
Surface Water Chemistry
Metals
VANCOUVER ISLAND

DeMamiel Creek

Metal ($mg \bullet L^{-1}$)	15 Nov. 1985 Dissolved	15 Nov. 1985 Total	21 Feb. 1986 Dissolved	21 Feb. 1986 Total
Al	ND	0.10	ND	0.09
As	ND	ND	ND	ND
B	0.011	ND	0.026	0.042
Ba	0.001	0.001	ND	ND
Be	ND	ND	ND	ND
Ca	3.4	3.4	3.0	3.1
Cd	ND	ND	ND	ND
Co	ND	ND	ND	ND
Cr	ND	ND	ND	ND
Cu	ND	ND	ND	ND
Fe	0.078	0.139	0.054	0.108
Hg				
Mg	1.9	1.9	1.4	1.5
Mn	0.005	0.006	0.005	0.006
Mo	ND	ND	ND	ND
Na	6.4	6.6	3.3	3.4
Ni	ND	ND	ND	ND
P	ND	0.05	ND	ND
Pb	ND	ND	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	2.9	3.0	2.7	2.9
Sn	ND	ND	ND	ND
Sr	0.011	0.011	0.008	0.008
Ti	ND	ND	ND	0.003
V	ND	ND	ND	ND
Zn	ND	ND	ND	ND
Hardness (Ca, Mg)	16.2	16.1	13.6	

ND = Not Detected

wq18Metals

TABLE 6
Surface Water Chemistry
Metals
VANCOUVER ISLAND

Holland Creek

Metal (mg•L^{-1})	15 Nov. 1985 Dissolved	15 Nov. 1985 Total	28 Feb. 1986 Dissolved	28 Feb. 1986 Total
Al	0.06	0.20	0.10	0.22
As	ND	ND	ND	ND
B	0.043	0.018	0.021	0.021
Ba	0.004	0.006	0.002	0.003
Be	ND	ND	ND	ND
Ca	3.4	3.7	2.0	2.1
Cd	ND	ND	ND	ND
Co	ND	ND	ND	ND
Cr	ND	ND	ND	ND
Cu	ND	ND	ND	ND
Fe	0.061	0.292	0.043	0.123
Hg				
Mg	0.7	0.7	0.5	0.6
Mn	0.002	0.012	0.002	0.003
Mo	ND	ND	ND	ND
Na	2.1	2.1	2.8	3.1
Ni	ND	ND	ND	ND
P	ND	ND	ND	ND
Pb	ND	ND	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	2.0	2.2	1.4	1.5
Sn	ND	ND	ND	ND
Sr	0.023	0.024	0.012	0.014
Ti	ND	ND	ND	0.006
V	ND	ND	ND	ND
Zn	ND	ND	ND	ND
Hardness (Ca, Mg)	11.3	12.1	7.28	

ND = Not Detected

wq18Metals

TABLE 6
Surface Water Chemistry
Metals
VANCOUVER ISLAND

Jordan River

Metal ($mg \bullet L^{-1}$)	15 Nov. 1985 Dissolved	15 Nov. 1985 Total	21 Feb. 1986 Dissolved	21 Feb. 1986 Total
Al	0.11	0.20	0.16	0.42
As	ND	ND	ND	ND
B	0.059	0.057	0.701	0.737
Ba	0.004	0.005	0.005	0.006
Be	ND	ND	ND	ND
Ca	6.2	6.5	65.9	68.1
Cd	ND	ND	ND	ND
Co	ND	ND	ND	ND
Cr	ND	ND	ND	ND
Cu	ND	ND	0.007	0.006
Fe	0.080	0.164	0.089	0.366
Hg				
Mg	16.5	17.9	228.0	234.0
Mn	0.007	0.009	0.009	0.014
Mo	ND	ND	ND	0.007
Na	132.0	137.0	1500.0	1750.0
Ni	ND	ND	ND	ND
P	ND	ND	0.23	0.28
Pb	ND	0.04	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	1.5	1.5	2.1	2.6
Sn	ND	ND	ND	ND
Sr	0.109	0.110	1.170	1.210
Ti	ND	ND	ND	0.016
V	ND	ND	ND	ND
Zn	ND	0.002	0.002	0.003
Hardness (Ca, Mg)	83.2	89.8	1100.0	ND

ND = Not Detected

wq18Metals

TABLE 6
Surface Water Chemistry
Metals
VANCOUVER ISLAND

Keogh River

Metal ($mg\bullet L^{-1}$)	16 Nov. 1985 Dissolved	16 Nov. 1985 Total	28 Feb. 1986 Dissolved	28 Feb. 1986 Total
Al	0.16	0.18	0.17	0.23
As	ND	ND	ND	ND
B	ND	0.002	0.007	0.039
Ba	ND	0.001	ND	ND
Be	ND	ND	ND	ND
Ca	2.6	2.7	1.9	1.9
Cd	ND	ND	ND	ND
Co	ND	ND	ND	ND
Cr	ND	ND	ND	ND
Cu	ND	ND	ND	0.005
Fe	0.210	0.243	0.156	0.254
Hg				
Mg	0.9	1.0	0.6	0.6
Mn	0.005	0.006	0.004	0.007
Mo	ND	ND	ND	ND
Na	1.4	1.4	1.2	1.2
Ni	ND	ND	ND	ND
P	ND	ND	ND	ND
Pb	ND	ND	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	2.6	2.6	2.0	2.0
Sn	ND	ND	ND	ND
Sr	0.008	0.008	0.006	0.005
Ti	ND	ND	0.003	0.011
V	ND	ND	ND	ND
Zn	ND	0.002	ND	ND
Hardness (Ca, Mg)	10.4	10.6	7.18	

ND = Not Detected

wq18Metals

TABLE 6
Surface Water Chemistry
Metals
VANCOUVER ISLAND

Menzies Creek

Metal ($mg \bullet L^{-1}$)	16 Nov. 1985 Dissolved	16 Nov. 1985 Total	28 Feb. 1986 Dissolved	28 Feb. 1986 Total
Al	ND	0.07	ND	0.08
As	ND	ND	ND	ND
B	ND	0.012	0.006	0.048
Ba	ND	ND	ND	ND
Be	ND	ND	ND	ND
Ca	2.2	2.3	1.8	1.9
Cd	ND	ND	ND	ND
Co	ND	ND	ND	ND
Cr	ND	ND	ND	ND
Cu	ND	ND	ND	ND
Fe	0.018	0.018	0.006	0.026
Hg				
Mg	1.0	1.0	0.7	0.8
Mn	ND	0.001	ND	0.001
Mo	ND	ND	ND	ND
Na	2.9	3.0	2.5	2.6
Ni	ND	ND	ND	ND
P	ND	ND	ND	ND
Pb	ND	ND	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	1.6	1.6	0.9	1.1
Sn	ND	ND	ND	ND
Sr	0.006	0.007	0.006	0.005
Ti	ND	ND	ND	0.003
V	ND	ND	ND	ND
Zn	ND	ND	ND	ND
Hardness (Ca, Mg)	9.52	10.0	7.31	

ND = Not Detected

wq18Metals

TABLE 6
Surface Water Chemistry
Metals
VANCOUVER ISLAND

Mohun Creek

Metal ($mg \bullet L^{-1}$)	16 Nov. 1985 Dissolved	16 Nov. 1985 Total	28 Feb. 1986 Dissolved	28 Feb. 1986 Total
Al	0.05	0.13	ND	0.12
As	ND	ND	ND	ND
B	0.007	0.024	0.011	0.030
Ba	0.002	0.003	ND	0.001
Be	ND	ND	ND	ND
Ca	2.5	2.6	1.9	2.0
Cd	ND	ND	ND	ND
Co	ND	ND	ND	ND
Cr	ND	ND	ND	ND
Cu	ND	ND	ND	ND
Fe	0.081	0.164	0.026	0.113
Hg				
Mg	1.1	1.2	0.8	0.8
Mn	0.004	0.006	0.002	0.005
Mo	ND	ND	ND	ND
Na	2.8	2.9	2.3	2.4
Ni	ND	ND	ND	ND
P	ND	ND	ND	ND
Pb	ND	ND	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	1.7	2.2	1.6	1.5
Sn	ND	0.20	ND	ND
Sr	0.012	0.012	0.007	0.009
Ti	ND	ND	ND	0.01
V	ND	ND	ND	ND
Zn	ND	ND	ND	ND
Hardness (Ca, Mg)	10.7	11.4	7.79	

ND = Not Detected

wq18Metals

TABLE 6
Surface Water Chemistry
Metals
VANCOUVER ISLAND

Quatse River

Metal ($mg \cdot L^{-1}$)	16 Nov. 1985 Dissolved	16 Nov. 1985 Total	28 Feb. 1986 Dissolved	28 Feb. 1986 Total
Al	0.20	0.24	0.21	0.27
As	ND	ND	ND	ND
B	ND	ND	0.015	0.036
Ba	0.002	0.003	0.002	0.002
Be	ND	ND	ND	ND
Ca	2.5	2.5	2.0	2.0
Cd	ND	ND	ND	ND
Co	ND	ND	ND	ND
Cr	ND	ND	ND	ND
Cu	ND	ND	ND	ND
Fe	0.233	0.279	0.180	0.270
Hg				
Mg	0.6	0.6	0.5	0.5
Mn	0.007	0.008	0.005	0.008
Mo	ND	ND	ND	ND
Na	1.6	1.7	1.5	1.5
Ni	ND	ND	ND	ND
P	ND	ND	ND	ND
Pb	ND	ND	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	1.5	1.5	0.9	1.1
Sn	ND	ND	ND	ND
Sr	0.009	0.009	0.007	0.007
Ti	ND	ND	0.003	0.010
V	ND	ND	ND	ND
Zn	ND	ND	ND	0.002
Hardness (Ca, Mg)	8.8	8.9	6.96	

ND = Not Detected

wq18Metals

TABLE 6
Surface Water Chemistry
Metals
VANCOUVER ISLAND

Sooke River

Metal ($mg \bullet L^{-1}$)	15 Nov. 1985 Dissolved	15 Nov. 1985 Total	21 Feb. 1986 Dissolved	21 Feb. 1986 Total
Al	ND	0.07	ND	ND
As	ND	ND	ND	ND
B	0.007	ND	0.015	0.033
Ba	0.003	0.003	0.003	0.003
Be	ND	ND	ND	ND
Ca	3.3	3.7	3.2	3.2
Cd	ND	ND	ND	ND
Co	ND	ND	ND	ND
Cr	ND	ND	ND	ND
Cu	ND	ND	ND	ND
Fe	0.015	0.015	0.013	0.031
Hg				
Mg	0.8	0.9	0.8	0.8
Mn	0.001	0.001	ND	0.001
Mo	ND	ND	ND	ND
Na	2.2	3.1	2.0	2.0
Ni	ND	ND	ND	ND
P	ND	ND	ND	ND
Pb	ND	0.05	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	2.0	2.2	2.2	1.9
Sn	ND	ND	ND	ND
Sr	0.018	0.019	0.014	0.015
Ti	ND	ND	ND	ND
V	ND	ND	ND	ND
Zn	ND	0.002	ND	ND
Hardness (Ca, Mg)	11.6	12.7	11.3	

ND = Not Detected

wq18Metals

TABLE 6
Surface Water Chemistry
Metals
VANCOUVER ISLAND

Tsable River

Metal (mg•L^{-1})	15 Nov. 1985 Dissolved	15 Nov. 1985 Total	28 Feb. 1986 Dissolved	28 Feb. 1986 Total
Al	0.05	0.11	0.06	0.18
As	ND	ND	ND	ND
B	0.026	0.040	0.027	0.027
Ba	0.004	0.005	0.002	0.002
Be	ND	ND	ND	ND
Ca	6.0	6.2	2.6	2.7
Cd	ND	ND	ND	ND
Co	ND	ND	ND	ND
Cr	ND	ND	ND	ND
Cu	ND	ND	ND	ND
Fe	0.031	0.089	0.020	0.146
Hg				
Mg	2.6	2.8	0.5	0.6
Mn	0.004	0.005	0.002	0.005
Mo	ND	ND	ND	ND
Na	15.0	15.5	0.9	1.0
Ni	ND	ND	ND	ND
P	ND	ND	ND	ND
Pb	ND	ND	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	1.8	2.1	0.9	1.1
Sn	ND	ND	ND	ND
Sr	0.026	0.027	0.007	0.007
Ti	ND	ND	0.002	0.012
V	ND	ND	ND	ND
Zn	ND	0.003	ND	ND
Hardness (Ca, Mg)	25.7	26.9	8.53	

ND = Not Detected

wq18Metals

TABLE 6
Surface Water Chemistry
Metals
VANCOUVER ISLAND

Tsitika River

Metal ($mg \bullet L^{-1}$)	16 Nov. 1985 Dissolved	16 Nov. 1985 Total	28 Feb. 1986 Dissolved	28 Feb. 1986 Total
Al	0.18	0.21	0.26	1.37
As	ND	ND	ND	0.6
B	0.007	0.024	0.016	0.048
Ba	0.003	0.003	0.001	0.009
Be	ND	ND	ND	ND
Ca	1.8	1.9	1.2	1.7
Cd	ND	ND	ND	ND
Co	ND	ND	ND	0.009
Cr	ND	ND	ND	ND
Cu	ND	ND	ND	0.008
Fe	0.119	0.123	0.122	0.851
Hg				
Mg	0.3	0.3	0.2	0.5
Mn	ND	0.001	0.002	0.016
Mo	ND	ND	ND	ND
Na	0.7	0.8	0.4	0.7
Ni	ND	ND	ND	ND
P	ND	ND	ND	0.5
Pb	ND	ND	ND	ND
Sb	ND	ND	ND	ND
Se	ND	ND	ND	ND
Si	1.8	2.1	0.9	2.8
Sn	0.01	0.01	ND	ND
Sr	0.006	0.007	0.003	0.008
Ti	ND	ND	0.003	0.069
V	ND	ND	ND	0.006
Zn	ND	ND	ND	ND
Hardness (Ca, Mg)	5.76	6.06	3.66	

ND = Not Detected

wq18Metals

TABLE 7
Henriksen's Acidification Index

Stream	Ca* μeq•L^{-1}	Mg* μeq•L^{-1}	alkalinity μeg•L^{-1}	Acidification Index
<u>Lower Mainland</u>				
Alouette R.				
13 Nov. 85	176	20.8	150	29.1
11 Mar. 86	180	16.5	150	28.8
01 Jul. 86	170	17.1	138	49.1
	$\bar{x}$ = 176	$\bar{x}$ = 18.1	min = 42	152.1
Capilano R.				
12 Nov. 85	69.4	13.7	50	25.6
10 Mar. 86	64.4	13.1	38	32.5
02 Jul. 86	59.5	5.5	48	11.2
	$\bar{x}$ = 64.4	$\bar{x}$ = 11.0	min = 34	34.6
Coquitlam R.				
12 Nov. 85	99.5	30.1	94	23.9
10 Mar. 86	79.3	20.8	64	27.1
	$\bar{x}$ = 89.4	$\bar{x}$ = 25.4	min = 26	78.5
Kanaka Ck.				
13 Nov. 85	128.8	43.2	120	36.5
11 Mar. 86	137.5	52.5	126	46.9
01 Jul. 86	148.6	42.2	172	1.6
	$\bar{x}$ = 138.6	$\bar{x}$ = 50.4	min = 32	140.0
Lynn Ck.				
13 Nov. 85	187.4	35.6	164	38.9
10 Mar. 86	132.9	21.9	96	44.8
02 Jul. 86	99.5	21.9	90	20.5
	$\bar{x}$ = 138.2	$\bar{x}$ = 23.6	min = 54	93.2
McIntyre Ck.				
13 Nov. 85	68.7	9.9	34	37.5
10 Mar. 86	53.9	11.0	22	37.1
	$\bar{x}$ = 61.3	$\bar{x}$ 10.4	min = 10	55.2

* Corrected for sea salt

TABLE 7, cont'd

Stream	Ca* $\mu eq \cdot L^{-1}$	Mg* $\mu eq \cdot L^{-1}$	alkalinity $\mu eq \cdot L^{-1}$	Acidification Index
Lower Mainland, cont'd				
Mossom Ck. (lower)				
12 Nov. 85	202	90.2	322	-56
10 Mar. 86	197	82.1	222	32
02 Jul. 86	257	125.0	354	-6
	$\bar{x}$ = 217	$\bar{x}$ = 99.0	min = 18	270
Mossom Ck. (upper)				
12 Nov. 85	103.4	16.4	38	71.0
10 Mar. 86	89.3	20.8	30	70.2
02 Jul. 86	99.5	21.9	46	64.2
	$\bar{x}$ = 99.0	$\bar{x}$ = 19.7	min = 14	94.0
Noons Ck.				
12 Nov. 85	83.1	14.8	38	51.1
10 Mar. 86	68.9	19.2	16	64.2
02 Jul. 86	83.9	19.2	26	67.8
	$\bar{x}$ = 78.6	$\bar{x}$ = 17.5	min = 8	79.5
N. Alouette R.				
13 Nov. 85	93.7	18.1	64	37.7
11 Mar. 86	74.2	12.6	60	18.9
01 Jul. 86	94.5	21.9	86	19.9
	$\bar{x}$ = 89.2	$\bar{x}$ = 17.7	min = 10	87.3
Seymour R.				
12 Nov. 85	109.0	26.3	44	79.1
10 Mar. 86	79.5	13.7	60	24.8
02 Jul. 86	74.5	13.7	66	14.3
	$\bar{x}$ = 89.3	$\bar{x}$ = 20.8	min = 24	76.2
Stave R.				
13 Nov. 85	63.7	9.9	44	23.0
11 Mar. 86	64.3	12.6	40	30.0
01 Jul. 86	54.5	13.7	44	18.0
	$\bar{x}$ = 59.2	$\bar{x}$ = 12.0	min = 36	28.8

* Corrected for sea salt

TABLE 7, cont'd

Stream	Ca* $\mu eq \bullet L^{-1}$	Mg* $\mu eq \bullet L^{-1}$	alkalinity $\mu eq \bullet L^{-1}$	Acidification Index
Whonock Ck.				
13 Nov. 85	73.9	11.0	52	25.3
11 Mar. 86	63.9	11.0	42	26.9
01 Jul. 86	89.2	20.2	88	11.6
	$\bar{x}$ = 74.0	$\bar{x}$ = 11.5	min = 4	73.8
<u>Vancouver Island</u>				
DeMamiel Ck.				
15 Nov. 85	167.9	121.5	218	45.4
21 Feb. 86	43.7	82.2	196	-81.0
Holland Ck.				
15 Nov. 85	165.0	31.8	134	45.1
28 Feb. 86	96.1	20.9	82	24.5
Keogh R.				
16 Nov. 85	126.9	58.0	130	38.6
28 Feb. 86	93.1	39.4	86	34.6
Menzies Ck.				
16 Nov. 85	104.0	51.0	88	53.1
28 Feb. 86	85.5	34.0	70	38.7
Mohun Ck.				
16 Nov. 85	120.0	64.6	126	42.0
28 Feb. 86	91.4	47.1	100	26.0
Quatse R.				
16 Nov. 85	121.6	31.8	64	75.6
28 Feb. 86	97.5	27.9	68	46.1
Sooke R.				
15 Nov. 85	160.9	44.4	158	28.8
21 Feb. 86	156.4	47.1	172	13.9
Tsable R.				
15 Nov. 85	271.2	64.7	310	25.9
28 Feb. 86	128.4	32.8	144	2.7
Tsitika R.				
16 Nov. 85	88.5	17.0	84	12.0
28 Feb. 86	59.0	11.5	40	24.2

* Corrected for sea salt

TABLE 8
Precipitation Sulfate
Lower Mainland, B.C. and Cascade Mountains, Wash.

Location	SO_4[a] µeq•L^{-1}	Source
North Bend, Wash.	25.1	Logan et al. 1982
Snoqualmie Summit, Wash.	14.8	Logan et al. 1982
Tolt River, Wash	15.8[b]	Vong et al. 1985
Fraser Valley, B.C.	12	Nikleva 1983[c]
Vancouver City, B.C.	27	Nikleva 1983[c]
Vancouver Mountains, B.C.	10	Nikleva 1983[c]
Squamish, B.C.	51	B.C. MOE 1985
Agassiz, B.C.	39	B.C. MOE 1985

[a] average concentration for time periods of 3-12 months

[b] corrected for sea salt

[c] average of several sites within named areas

TABLE 9
Stream Length and Watershed Drainage Area (where available)

Stream	Length (km)	Drainage Area (km^2)
Lower Mainland		
Alouette R.	23 (dam to mouth)	205
Anmore Ck.	2.7	2
Brittania Ck.	12	28
Campbell R.	25	
Capilano R.	6.4 (dam to mouth)	172
Chehalis R.	16 (lake to mouth)	379
Coquitlam R.	17 (dam to mouth)	237
Harrison R.	17 (lake to mouth)	
Inches Ck.	1	
Kanaka Ck.	19	62
Lynn Ck.	18	36
Nicomekl R.	33	
Norrish Ck.	25	123
McIntyre Ck.	2.7	8
Mossom Ck.	4.7	4
Noons Ck.	7.3	5
N. Alouette R.	15 (downstream to Alouette R. confluence)	37
Serpentine R.	27	38
Seymour R.	19 (lake to mouth)	805
Stave R.	3.2 (Hayward Dam to mouth)	1,140
Stawamus R.	15	
Squamish R.	69	3,650
Wahleach Ck.	10	114
Whonock Ck.	10	19
Vancouver Island		
DeMamiel Ck.	4.5	4
Fulford Ck.	1	
Holland Ck.	7.5 (lake to mouth)	
Jordan R.	6 (dam to mouth)	
Keogh R.	27	
Menzies R.	7.5	
Mohun Cr.	9	
Quatse R.	9 (lake to mouth)	
Sooke R.	16 (lake to mouth)	77
Tsable R.	10	
Tsitika R.	35	

APPENDIX I

List of Parameters for Water Chemistry Analyses

- alkalinity ($mg \bullet L^{-1}$)
- chloride ($mg \bullet L^{-1}$)
- colour (relative units)
- conductivity ($\mu hmos \bullet cm^{-1}$)
- nitrate ($mg \bullet L^{-1}$)
- pH
- sulfate ($mg \bullet L^{-1}$)
- total and dissolved metals ($mg \bullet L^{-1}$)

APPENDIX II

Detection Limits for Total and Dissolved Metals Analyses

Metal	Detection Limit ($mg \bullet L^{-1}$)
Al	0.05
As	0.05
B	0.001
Ba	0.001
Be	0.001
Ca	0.01
Cd	0.002
Co	0.005
Cr	0.005
Cu	0.005
Fe	0.005
Mg	0.05
Mn	0.001
Mo	0.005
Na	0.02
Ni	0.02
P	0.05
Pb	0.02
Sb	0.05
Se	0.01
Si	0.01
Sn	0.01
Sr	0.001
Ti	0.002
V	0.005
Zn	0.002