



Water Quality

Second Report On Chemical Sensitivity Of Bc Lakes To Acidic Inputs

Water Management Branch
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ABSTRACT

This second summary document provides information (pH, alkalinity, calcium and sensitivity rating) for about 760 lakes sampled between 1977 and 1986. This represents about 3.5% of the estimated 22,000 lakes in British Columbia. It provides locations where ten lakes with pH less than 6.0 have been found and presents a generalized sensitivity map for the province. A distribution of lakes in the Province by sensitivity indicator is presented which shows that about 20% of the lakes have high sensitivity to acidic inputs.

Information is also provided on calculated relationships between total dissolved solids and several characteristics. Relationships with a high level of confidence exist for calcium, inflection point alkalinity and alkalinity to pH 4.5.

ACKNOWLEDGEMENTS

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Ms. L. Rounds typed several drafts of this report.

To these people goes the credit for any information presented herein. As author, I must take responsibility for any inaccuracies

INTRODUCTION

This second summary document of the chemical sensitivity of lakes in British Columbia provides information on about 760 lakes sampled in the period 1977-1986. This represents about 3.5% of the estimated 22,000 lakes in British Columbia. The distribution of this sampling within British Columbia is shown on Figure 1. The biological sensitivity of lakes is more complex than chemical sensitivity because it is influenced by numerous biological factors not measured during the surveys reported here.

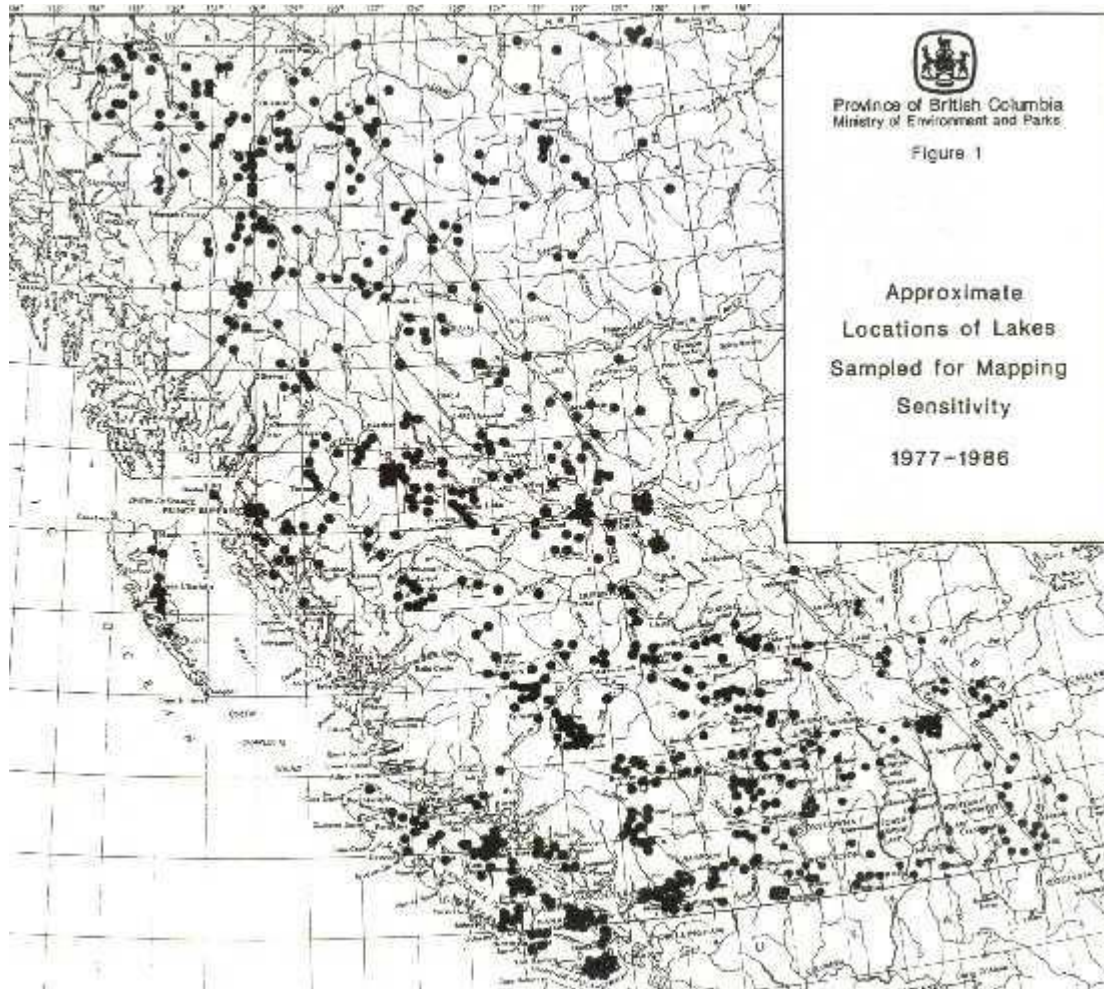
The purpose of this document is to provide information on the status of lakes in British Columbia with respect to acidic inputs. Acidic inputs do not originate necessarily as acid precipitation, but also can originate as acidic waste water effluents discharged from industrial operations.

The information in this document relates solely to lakes and does not reflect river water quality. The reasons for this are:

1. Rivers and streams can reflect recent events such as snowmelt. An accurate representation of the water quality of a river or stream is not possible unless a large number of samples are obtained in one season
2. Lakes provide a zone in a watershed where short-term events such as snowmelt can be averaged out. This reduces the necessity to collect samples as frequently as would be the case for rivers and streams
3. The water quality of rivers and streams can vary along their length more than lakes due to the heterogeneous geological nature of drainage basins

Acidic inputs to a lake can cause the lake to increase in acidity. The acidity of any substance can be measured on the pH scale which has values ranging from 0.0 to 14.0. The scale is divided equally between acidic and basic conditions; values less than pH 7.0 are acidic while those greater than pH 7.0 are basic. Vinegar has a pH of 2.2 while milk of magnesia has a pH of 10.5.

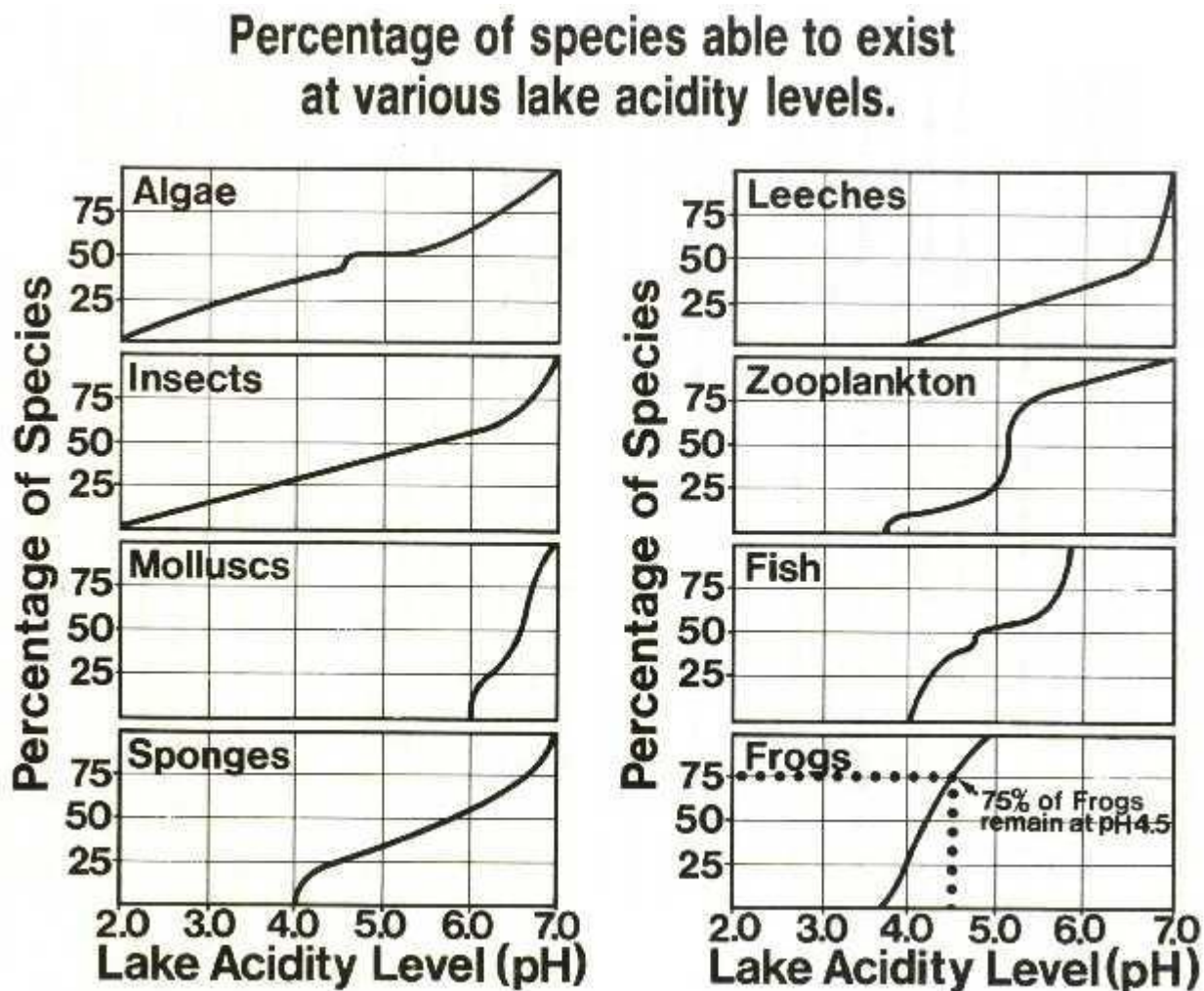
Figure 1. Approximate Locations of Lakes Sampled for Mapping Sensitivity.



DISCUSSION

The acidity of a lake has a direct impact on the numbers and types of aquatic organisms present. This is illustrated in [Figure 2](#), which shows that 100% of fish will be present at pH 6.0 but less than 50% of leeches. All freshwater molluscs will disappear at this same pH.

Figure 2. Percentage of Species Able to Exist at Various Lake Acidity Levels.



In British Columbia, most of the 752 lakes where pH measurements have been made since 1977 have pH values greater than 6.0. Figure 3 represents the percentage of values in each pH range. Only about 1% of the 752 lakes have had pH values less than 6.0 The locations of these lakes is shown in Figure 4. The lakes are distributed throughout British Columbia, from the Queen Charlotte Islands and Prince Rupert area to the Wells Gray Park area (Haggen #1 in Figure 4).

Figure 3. Lake Acidity Levels in British Columbia.

Lake acidity levels in British Columbia (n= 752).

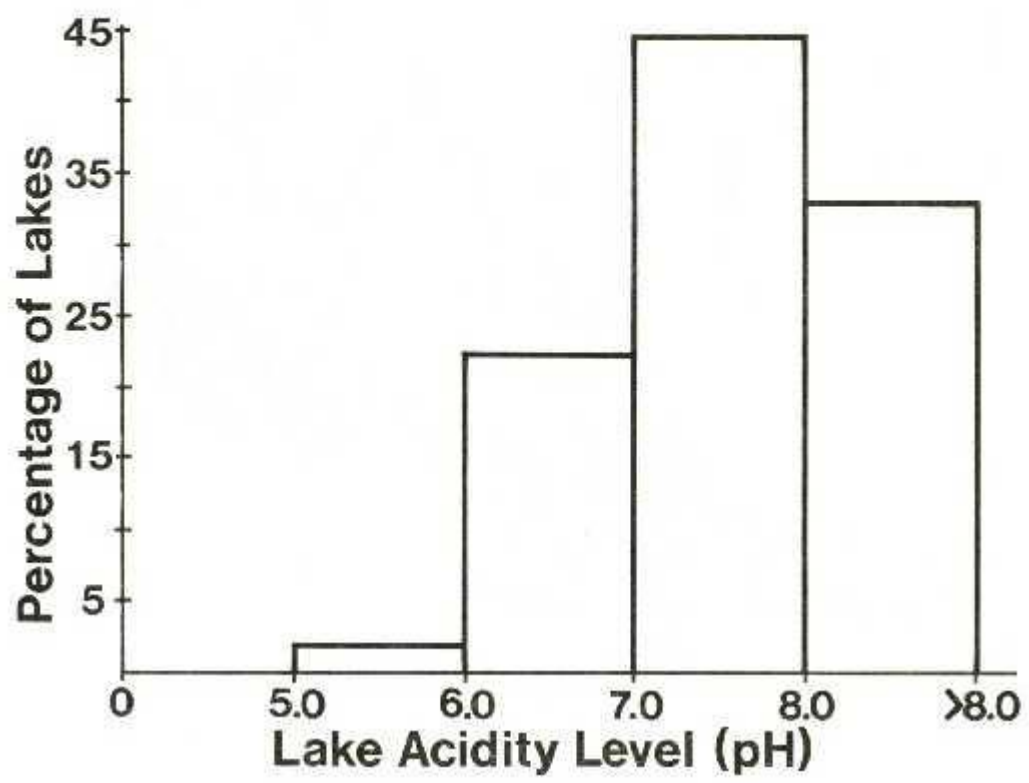


Figure 4. Lakes with pH less than 6.0.

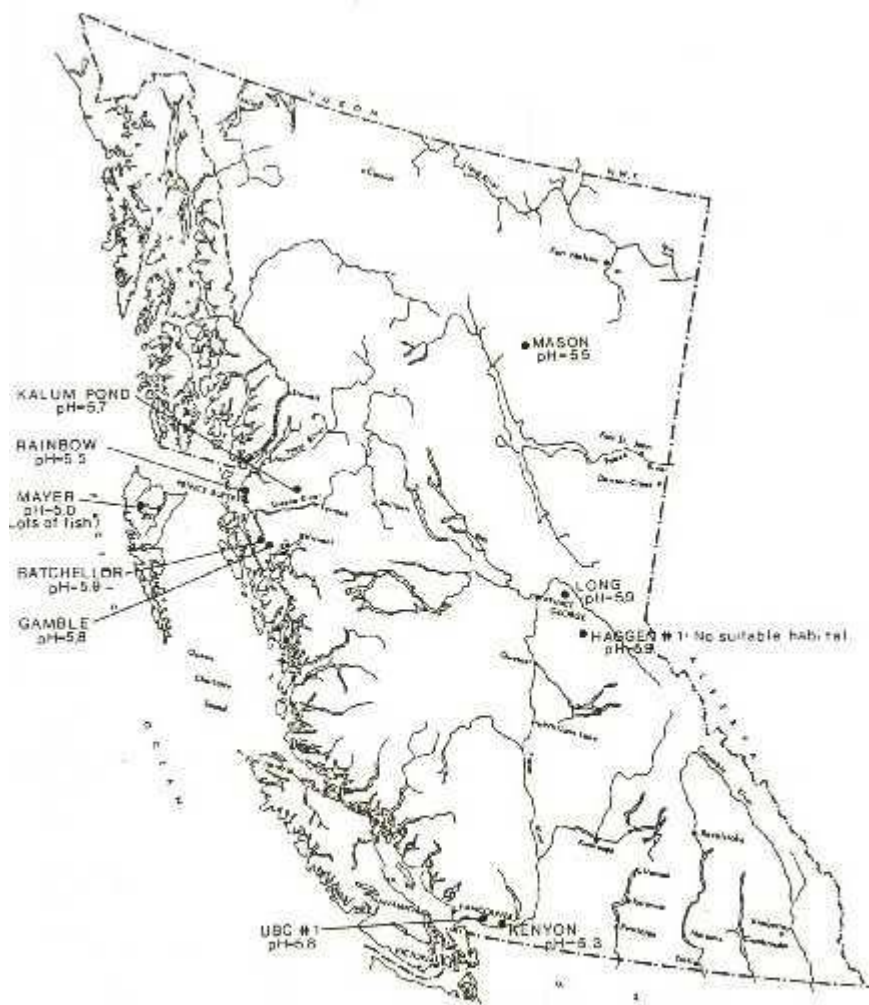


Figure 4 Lakes With pH < 6.0

The biological effect that any acidic input will have on a lake will depend on several factors. These factors include the number and type of aquatic organisms present, the quantity of acid which reaches the lake, the degree of neutralization of the acid which occurs prior to its reaching the lake and the chemical

sensitivity of the lake to pH change. The chemical sensitivity of a lake to acidic inputs relates to the quantity of buffering material present in the lake to neutralize incoming acids. A lake of high chemical sensitivity has little capacity to provide buffering, while one of low sensitivity has sufficient buffering material present to neutralize most acidic inputs. A lake with moderate sensitivity can neutralize all but fairly large acidic inputs.

In British Columbia, lake sensitivity is determined from measurements of the alkalinity and/or calcium present. Measurements of these characteristics were made at the Environmental Laboratory of the Ministry of Environment and Parks in Vancouver. Alkalinity provides the most direct measurement of sensitivity of a lake to acidic inputs, since it measures the carbonate-bicarbonate buffering capacity. These anions generally are in equilibrium with calcium and magnesium cations. In British Columbia, the chemical sensitivity of lakes is determined according to the following criteria for alkalinity and calcium.

| Characteristics (mg/L) | Sensitivity | | |
|---------------------------|--------------|----------|---------|
| | High | Moderate | Low |
| Calcium | less than 4 | 5 to 8 | over 8 |
| Alkalinity | less than 10 | 10 to 20 | over 20 |

These criteria are consistent across Western Canada (Saskatchewan Research Council, 1982).

Using these criteria a lake sensitivity map for British Columbia was prepared using data collected from 1977 to 1983. The preparation of this map initially required that two sensitivity maps based on calcium and alkalinity measurements had to be prepared. The lake sensitivity map was produced by overlaying these calcium and alkalinity maps (Figure 5). The final map depicts the most sensitive rating from either of the initial maps, *i.e.* an area of high sensitivity on either map became an area of high sensitivity on the final map, an area of moderate and low sensitivity on the initial two maps became an area of moderate sensitivity on the final map.



Figure 5. Lake Sensitivity to Acid Rain.



Figure 8. Lake Sensitivity to Acid Rain: Based on Calcium.

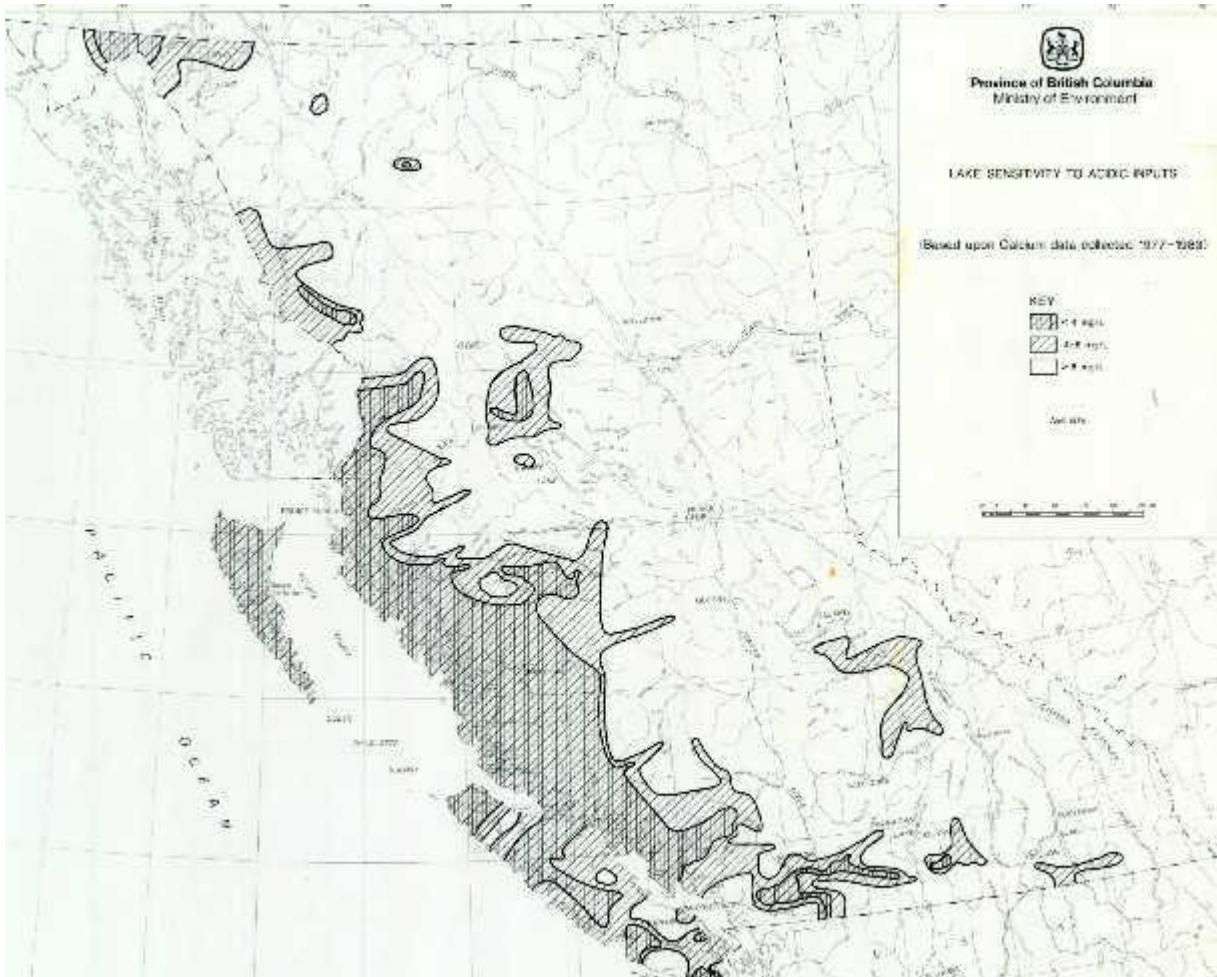


Figure 9. Lake Sensitivity to Acid Rain: Based on Alkalinity.



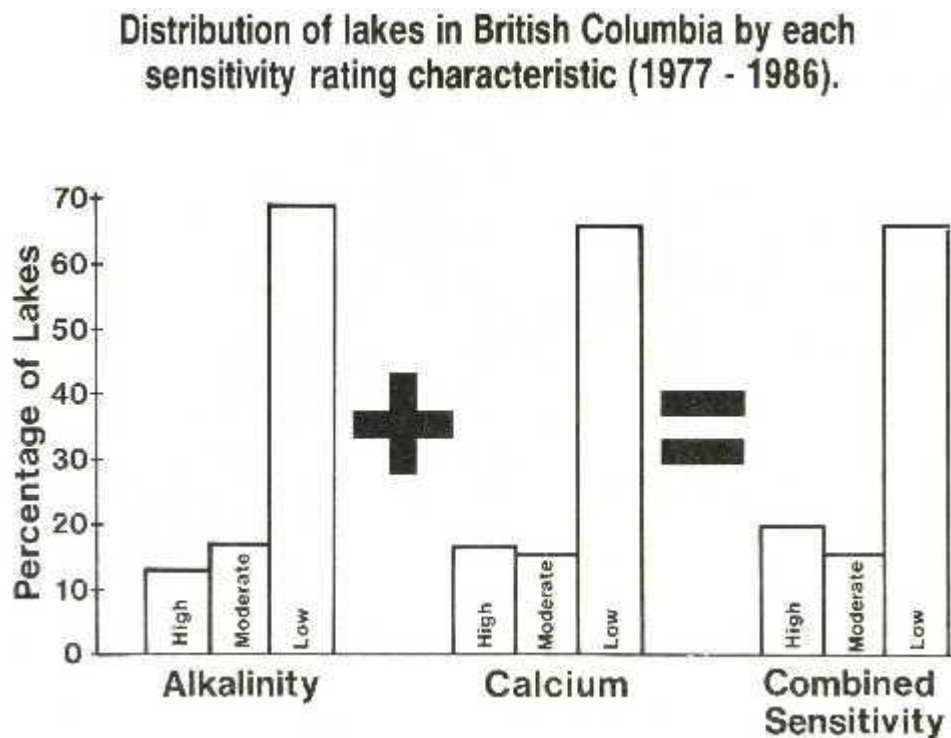
Finally, we took this map, [Figure 5](#) and combined it with a similar map based on the potential of soils and surficial geology to reduce acidity to produce a map of sensitive environments to acidic deposition, [Figure 11](#).

Figure 11. Sensitive Environments to Acidic Deposition.



Figure 6 shows the distribution of lakes according to calcium and alkalinity measurements for the period 1977 to 1986. Approximately 65% of all lakes sampled have low sensitivity, 15% moderate sensitivity and 20% have high sensitivity.

Figure 6. Distribution of Lakes in British Columbia by Each Sensitivity Rating Characteristic (1977-1986).



The lakes classed as having high sensitivity based only on alkalinity can be further subdivided as follows:

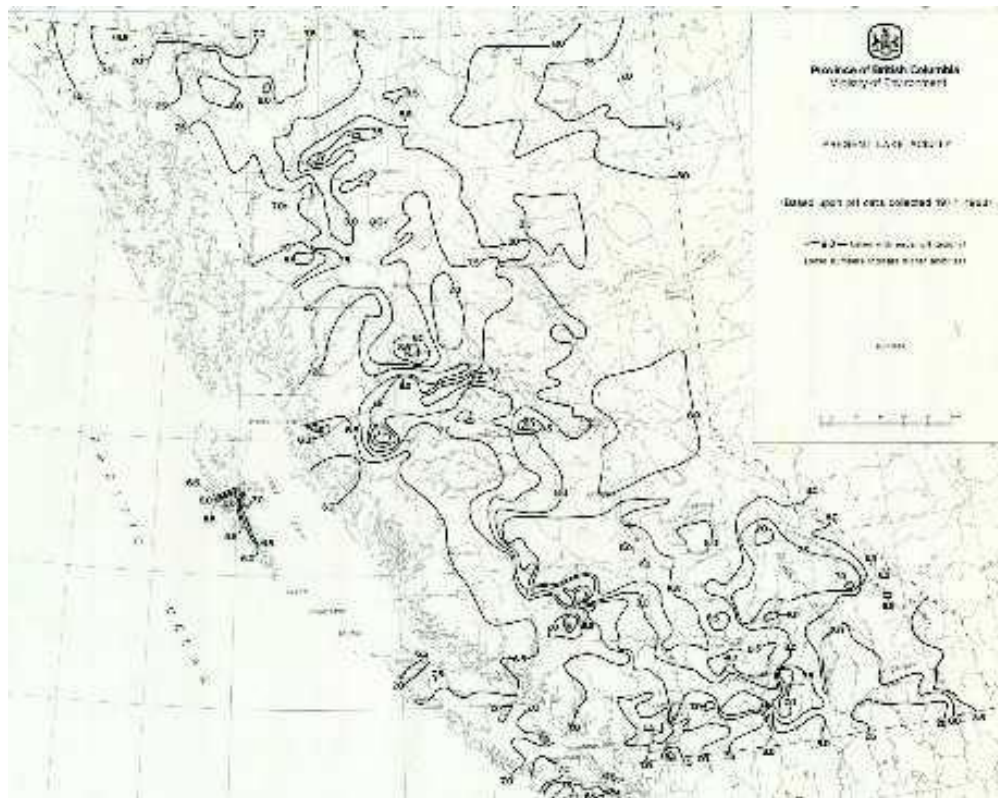
- Those with 0.0 to 2.49 mg/L alkalinity comprise 0.8%
- Those with 2.5 to 4.99 mg/L alkalinity comprise 4.7%
- Those with 5.0 to 7.49 mg/L alkalinity comprise 3.3%
- Those with 7.5 to 9.99 mg/L alkalinity comprise 3.3%

Details related to the pH and sensitivity of each lake sampled in the period 1977 to 1986 are in Tables 1 to 5. Lakes are listed alphabetically and have been grouped according to their location by Ministry of Environment and Parks regions (Figure 7 because of duplication of some lake names within the Province. When calcium and/or alkalinity values are not available for a lake, the sensitivity has been estimated from the lake pH. This estimate has been made according to the region that the lake is located in and by data for other lakes in the same region with similar pH and known calcium and/or alkalinity, Figure 10.

Figure 7. Regional Boundaries of the Ministry of Environment.



Figure 10. Present Lake Acidity: Based on pH.



In some other cases, calcium and alkalinity values (and hence sensitivity) have been estimated using relationships between total dissolved solids and each of calcium and alkalinity. These relationships have a confidence level of between 85 and 90% associated with them, and are based on between 670 and 740 paired measurements in lakes throughout British Columbia. These relationships are indicated in the Tables.

Other relationships which do not have the same confidence level are listed below. These are provided for the benefit of other researchers.

$$\text{Alk}_i = -1.912 + 1.008 \text{Alk}_T$$

where: Alk_i = inflection point alkalinity in mg/L and Alk_T = total alkalinity to pH 4.5 in mg/L
 $n = 698$; $r^2 = 0.9996$

$$\text{Alk}_1 = -12.133 + 0.770 \text{ TDS}$$

where: Alk_1 = inflection point alkalinity in mg/L and TDS = total dissolved solids in mg/L
n = 662; $r^2 = 0.9047$

$$\text{SO}_4 = -0.001 + 0.087 \text{ TDS}$$

where: SO_4 = sulphate in mg/L and TDS = total dissolved solids in mg/L
n = 698; $r^2 = 0.9996$

$$\text{Na} = -0.278 + 0.524 \text{ TDS}$$

where: Na = sodium in mg/L and TDS = total dissolved solids in mg/L
n = 251; $r^2 = 0.6746$

$$\text{K} = -0.586 + 0.021 \text{ TDS}$$

where: K = potassium in mg/L and TDS = total dissolved solids in mg/L
n = 242; $r^2 = 0.6295$

REFERENCES CITED

- Saskatchewan Research Council. 1982. Evaluation of the Status of Surface Water Sensitivity Mapping for Acidic Deposition in Western Canada. Prepared for the Technical Committee, Western Canada Long Range Transport of Atmospheric Pollutants by the Coordinating Committee on Surface Waters. SRC Publication No. C-805-11-E-82. February.
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Table 1. Lake Sensitivity Characteristics: Vancouver Island Region.

| Lake Names | pH | Calcium (mg/L) | Alkalinity (mg/L) | Sensitivity Rating |
|----------------------|-----|----------------|-------------------|--------------------|
| Alice | 7.2 | 8.5 | 24.6 | low |
| Bear Creek Reservoir | 6.8 | 1.7 | 7.1 | high |
| Beaver | 7.1 | 4.8 | 18.8 | moderate |
| Beck | 7.5 | 23.8 | 93.5 | low |
| Benson | 7.5 | 9.6 | 26.7 | low |
| Blackburn | 7.3 | 12.1 | 38.0 | low |
| Blackjack | 7.0 | 5.6 | 21.1 | moderate |
| Blenkinsop | 7.6 | 29.3 | 101.26 | low |
| Blinkhorn | 7.1 | ..... | 23.6 | low |
| Bonanza | 7.1 | 3.3 | 14.7 | high |
| Brannen | 7.3 | 6.0 | 18.6 | moderate |
| Bullocks | 7.3 | 11.9 | 34.8 | low |
| Buttle | 7.3 | 8.9 | 24.6 | low |
| Cameron | 7.6 | 12.2 | 35.8 | low |
| + Camp | 7.1 | 4.7 | 15.3 | moderate |
| Campbell | 7.2 | 7.0 | 20.0 | moderate |
| * Cathers | 7.4 | ..... | ..... | high |
| + Cecil | 6.7 | 20.2 | 83.6 | low |
| * Chewhat | 6.8 | ..... | ..... | high |
| Chehalis | 6.8 | 2.0 | 7.5 | high |
| Comox | 7.4 | 5.2 | 18.6 | moderate |
| Cowichan | 7.2 | 7.2 | 20.1 | moderate |

| | | | | |
|------------------------|------------|-------------|--------------|-----------------|
| Crest | 7.1 | 4.2 | 15.0 | moderate |
| Cusheon | 7.5 | 10.1 | 26.1 | low |
| Daisy Reservoir | 7.3 | 8.3 | 21.5 | low |
| Doobah | 6.7 | 1.65 | 5.3 | high |
| Durrance | 7.9 | 21.4 | 65.1 | low |
| Echo | 8.1 | 42.7 | 100.1 | low |
| Elk | 8.3 | 15.6 | 51.4 | low |
| Elsie | 6.9 | 4.0 | 14.1 | moderate |
| Flume | 7.1 | 6.9 | 23.4 | moderate |
| Ford | 7.6 | 13.1 | 37.7 | low |
| Fork | 6.8 | 4.8 | 14.8 | moderate |
| Fuller | 7.1 | 3.8 | 11.4 | high |
| Fulmore | 6.4 | 1.2 | 4.2 | high |
| + Garrett | 7.2 | 3.7 | 10.6 | high |
| Glen | 7.5 | 13.9 | ..... | low |
| Glinz | 7.2 | 3.4 | 14.0 | high |
| Great Central | 6.9 | 5.1 | 14.7 | moderate |
| Green | 7.1 | 10.6 | 26.8 | low |
| Heal | 7.6 | 18.1 | 48.1 | low |
| Henderson | 6.7 | 3.2 | 8.9 | high |
| Hobiton | 6.7 | 1.9 | 6.6 | high |
| Holyoak | 6.8 | 1.1 | 4.6 | high |
| Horne | 7.3 | 9.8 | 29.7 | low |
| Ida | 7.4 | 6.9 | 20.7 | moderate |
| + Illusion | 7.1 | 5.9 | 20.6 | moderate |

| | | | | |
|---------------------|-----|-------|-------|----------|
| Jarvis | 6.6 | 0.9 | 5.26 | high |
| John Hart Reservoir | 6.8 | 6.4 | 19.2 | moderate |
| Kennedy | 6.8 | 3.6 | 10.8 | high |
| Keta | 6.5 | 1.6 | 5.6 | high |
| Langford | 8.1 | 18.5 | 55.6 | low |
| Lapan | 6.4 | 1.2 | 3.8 | high |
| Larry | 6.2 | 1.0 | 4.1 | high |
| + Lawson | 7.1 | 3.6 | 9.9 | high |
| Lizard | 7.1 | 3.4 | 12.3 | high |
| Long | 7.3 | 9.3 | 25.3 | low |
| Lower Campbell | 6.9 | 6.4 | 17.6 | moderate |
| Lower Drum | 7.3 | 2.9 | 11.1 | high |
| + Lower Stella | 7.3 | 2.7 | 5.3 | high |
| Maggie | 7.4 | 3.3 | 10.0 | high |
| Magic | 7.8 | 13.4 | 55.5 | low |
| Maltby | 6.9 | 10.4 | 24.6 | low |
| Maxwell | 7.6 | 5.2 | 15.9 | moderate |
| * McKay | 6.7 | ..... | ..... | high |
| Mesachie | 7.3 | 4.3 | 16.6 | moderate |
| Myles | 6.5 | 4.0 | 12.0 | moderate |
| Nahmint | 7.1 | 6.7 | 20.6 | moderate |
| Nimpkish | 7.0 | 2.8 | 13.1 | high |
| Nitnat | 7.8 | 141.0 | 56.7 | low |
| + O'Conner | 6.6 | 4.2 | 13.0 | moderate |
| Old Wolf | 6.5 | 1.6 | 7.2 | high |

| | | | | |
|----------------------|-------------|--------------|--------------|-----------------|
| Oliphant | 6.5 | 5.8 | 17.1 | moderate |
| Philips | 6.4 | 0.9 | 4.4 | high |
| Pike | 6.9 | 8.67 | 22.9 | low |
| Poiorier | 6.7 | 3.0 | 12.6 | high |
| Powell | 6.6 | 1.0 | 4.8 | high |
| Prospect | 7.4 | 9.0 | 29.5 | low |
| Quarantine | 6.9 | 4.1 | 10.9 | moderate |
| * Quennell | 8.2 | ..... | ..... | low |
| + Raven | 7.2 | 3.6 | 9.9 | high |
| * Reinhart | 7.4 | ..... | ..... | high |
| * Richard | 6.9 | ..... | ..... | high |
| Roe | 7.6 | 15.6 | 54.5 | low |
| * Round | 6.83 | ..... | ..... | high |
| Shaw | 7.2 | 9.2 | 34.2 | low |
| Shawnigan | 7.4 | 5.4 | 17.2 | moderate |
| Sherwood Pond | 7.9 | 97.9 | 125.0 | low |
| Silburn | 6.2 | 3.6 | 10.7 | high |
| * Snakehead | 7.5 | ..... | ..... | low |
| Songhees | 6.1 | 0.6 | 3.1 | high |
| Spectacle | 7.0 | 4.0 | 13.0 | moderate |
| + Spider | 7.0 | 5.6 | 19.9 | moderate |
| Sproat | 7.1 | 8.6 | 25.2 | low |
| St. Mary | 7.6 | 9.0 | 30.8 | low |
| Stocking | 6.9 | 3.0 | 10.2 | high |
| Stowell | 6.9 | 8.4 | 23.1 | low |

| | | | | |
|----------------|-------|-------|-------|----------|
| Swan | 8.0 | 40.4 | ..... | low |
| Teanook | 7.1 | 9.4 | 24.4 | low |
| Tom Browne | 6.5 | 1.2 | 4.9 | high |
| Tsusiat | 6.4 | 1.3 | 4.4 | high |
| Tugwell | 6.6 | 0.9 | 4.6 | high |
| Upper Campbell | 6.9 | 6.9 | 20.5 | moderate |
| Upper Drum | 7.2 | 3.8 | 14.2 | high |
| Upper Quinsam | 6.8 | 7.1 | 16.2 | moderate |
| Upper Thelwood | 6.8 | 1.0 | 3.9 | high |
| Victoria | 7.0 | 3.2 | 13.23 | high |
| Volcano | ..... | 12.47 | ..... | low |
| Weston | 6.9 | 11.3 | 29.53 | low |
| Westwood | 6.9 | 2.7 | 9.8 | high |
| Woss | 7.0 | 2.2 | 10.93 | high |
| Wrigglesworth | 7.5 | 11.8 | 35.0 | low |
| Young | 7.0 | 2.9 | 15.5 | high |

Notes:

* sensitivity estimated on basis of pH
+ sensitivity estimated on basis of:

$$\text{alkalinity} = -10.086 + 0.768 \text{ TDS} \quad (r^2 = 0.9056)$$

and

$$\text{calcium} = 0.093 \text{ TDS}^{1.12} \quad (r^2 = 0.8341)$$

Table 2. Lake Sensitivity Characteristics: Lower Mainland Region.

| Lake Names | pH | Calcium (mg/L) | Alkalinity (mg/L) | Sensitivity Rating |
|------------------------------|-----|----------------|-------------------|--------------------|
| Acta | 7.4 | 13.0 | 16.6 | moderate |
| Alouette | 6.6 | 1.1 | 3.8 | high |
| Alpha | 7.1 | 6.6 | 17.2 | moderate |
| Alta | 6.9 | 11.8 | 15.0 | moderate |
| Anderson | 7.8 | 15.3 | 50.9 | low |
| Blaney (UBC Research Forest) | 6.7 | 2.0 | 5.2 | high |
| Burnaby | 7.0 | 15.0 | 40.0 | low |
| Carpenter | 7.7 | 9.3 | 33.9 | low |
| Cheakamus | 7.0 | 5.7 | 14.4 | moderate |
| Chilliwack | 6.8 | 3.1 | 7.7 | high |
| Coquihalla Pond | 7.1 | 3.1 | 8.4 | high |
| Coquihalla-1 | 6.8 | 3.7 | 11.5 | high |
| Cultus | 8.0 | 26.8 | 63.0 | low |
| Daisy Reservoir | 7.4 | 4.8 | 13.9 | moderate |
| Davis | 8.2 | 44.5 | 163.0 | low |
| Dodd | 6.7 | 2.2 | 7.6 | high |
| Eunice (UBC Research Forest) | 6.6 | 1.4 | 3.9 | high |
| Fire | 7.5 | 14.9 | 30.3 | low |
| Glacier | 6.8 | 4.2 | 8.4 | high |
| Green | 7.4 | 9.0 | 23.0 | low |
| Green (0300203)g | 7.1 | 18.7 | ..... | low |

| | | | | |
|----------------------------------|-----|-------|-------|-----------|
| Gwendoline (UBC Research Forest) | 6.7 | 1.5 | 4.4 | high |
| Harrison | 7.5 | 5.7 | 16.0 | moderate |
| Haslam | 6.8 | ..... | 7.8 | high |
| Hatzic | 7.4 | 7.1 | 25.3 | moderate |
| * Hayward | 6.8 | ..... | ..... | high |
| Holden | 7.8 | 9.3 | 29.3 | low |
| Horseshoe | 6.8 | 1.7 | 6.9 | high |
| Jacobs (Marion) | 6.6 | 1.7 | 5.6 | high |
| Kenyon | 5.4 | 0.4 | 1.9 | high |
| Kwotlenemo | 8.5 | 26.2 | 130.0 | low |
| Lillooet | 7.3 | 7.7 | 21.9 | moderateh |
| Loisg | 6.7 | 1.89 | 6.4 | high |
| Lookout | 6.9 | 3.7 | 12.3 | high |
| Lost | 7.5 | 9.8 | 23.2 | low |
| Lower Joffre | 6.8 | 4.5 | 12.7 | moderate |
| Marion (Jacobs) | 6.6 | 1.7 | 5.6 | high |
| Mosquito | 6.9 | 11.9 | 25.5 | low |
| Nita | 7.1 | 6.1 | 14.0 | moderate |
| Pitt | 6.9 | 2.2 | 6.4 | high |
| Placid (UBC Research Forest) | 6.6 | 1.8 | 4.6 | high |
| Powell | 6.6 | 1.0 | 4.7 | high |
| Rolley | 6.6 | 1.9 | 5.3 | high |
| Sayers | 6.7 | 1.1 | 3.9 | high |
| Squeah | 7.0 | 3.3 | 11.5 | high |

| | | | | |
|------------------------|-----|------|------|----------|
| Stave | 6.6 | 1.2 | 4.5 | high |
| Sukinaw | 7.4 | 5.2 | 17.6 | moderate |
| Twin (East) | 6.4 | 1.9 | 5.3 | high |
| Twin (West) | 6.2 | 0.9 | 3.8 | high |
| UBC Research Forest #1 | 5.8 | 0.9 | 2.5 | high |
| UBC Research Forest #2 | 6.2 | 1.6 | 4.0 | high |
| UBC Research Forest #3 | 6.1 | 1.2 | 3.3 | high |
| * West Kakawa | 7.8 | 11.4 | 38.7 | low |

Notes:

* sensitivity estimated on basis of pH
+ sensitivity estimated on basis of:

alkalinity = $-10.086 + 0.768 \text{ TDS}$ ($r^2 = 0.9056$)

and

calcium = $0.093 \text{ TDS}^{1.12}$ ($r^2 = 0.8341$)

Table 3. Lake Sensitivity Characteristics: Southern Interior Region.

| Lake Names | pH | Calcium (mg/L) | Alkalinity (mg/L) | Sensitivity Rating |
|------------|-----|----------------|-------------------|--------------------|
| * 130 Mile | 8.5 | ..... | ..... | low |
| Allison | 8.3 | 42.0 | 158.9 | low |

| | | | | |
|------------------|-------|-------|-------|----------|
| Anahim | 9.3 | 6.6 | 56.4 | moderate |
| Barriere (North) | 7.6 | 6.2 | 21.1 | moderate |
| Beaver | 8.7 | 30.3 | 209.7 | low |
| Birkenhead | 6.5 | 4.5 | 38.7 | moderate |
| Blue | 8.2 | 38.9 | 312.5 | low |
| Boar | 8.5 | 32.1 | 31.9 | low |
| Boldue | 7.7 | 26.4 | 78.6 | low |
| * Bose | 7.8 | ..... | ..... | low |
| Boss | 8.3 | 29.7 | 123.0 | low |
| Bowers | 8.6 | 42.2 | 175.0 | low |
| Brenda | 6.8 | 3.0 | 9.6 | high |
| * Burnell | 8.1 | ..... | ..... | low |
| Carpenter | 7.3 | 10.5 | 34.0 | low |
| Chain | ..... | 18.0 | 66.5 | low |
| Chantslar | 8.5 | 25.9 | 132.0 | low |
| Chapperon | 9.3 | 15.4 | 95.8 | low |
| Charlotte | 6.7 | 3.7 | 15.5 | high |
| Chaunigan | 8.4 | 28.8 | 111.9 | low |
| Chilko | 6.7 | 8.4 | 20.5 | low |
| * Chimney | 8.9 | 15.6 | 473.0 | low |
| Choelqoit | 8.7 | 32.3 | 237.3 | low |
| Clearwater | 8.0 | 16.3 | 78.1 | low |
| Coldscaur | 8.2 | 15.9 | 59.6 | low |
| Conkle | 7.2 | 3.7 | 16.9 | high |
| Crooked | 7.3 | 4.5 | 11.7 | moderate |

| | | | | |
|-----------------|-----|-------|-------|----------|
| Crown | 8.3 | 38.9 | 143.0 | low |
| Cup | 7.3 | 6.5 | 14.3 | moderate |
| Dease, Little | 8.3 | 32.9 | 99.1 | low |
| Demers | 8.3 | 57.0 | 150.0 | low |
| Douglas | 8.0 | 14.6 | 63.6 | low |
| Downton | 7.2 | 6.9 | 26.2 | moderate |
| Dragon | 8.3 | 30.5 | 122.0 | low |
| Dunn | 7.6 | 7.4 | 26.7 | moderate |
| Dutch | 8.4 | 21.5 | 96.9 | low |
| Eagle | 8.6 | 27.9 | 184.4 | low |
| * East Hatfield | 8.5 | ..... | ..... | low |
| East King | 7.8 | 24.2 | 78.1 | low |
| Echo | 7.9 | 41.7 | 94.2 | low |
| Elkin | 6.9 | 9.3 | 30.7 | low |
| Ellison | 8.3 | 13.2 | 59.5 | low |
| Evaline | 8.9 | 17.6 | 611.5 | low |
| Felker | 9.0 | 46.0 | 138.0 | low |
| Fifteen Mile | 7.6 | 9.4 | 36.8 | low |
| Finney | 8.3 | 22.6 | 97.7 | low |
| Fishemn | 6.9 | 16.3 | 39.3 | low |
| Fishem (upper) | 7.6 | 21.5 | 68.8 | low |
| Fletcher | 8.6 | 31.5 | 128.9 | low |
| Forest | 8.6 | 28.5 | 496.0 | low |
| Gardom | 7.8 | 50.0 | 140.5 | low |
| Garnet | 8.3 | 55.4 | 189.0 | low |

| | | | | |
|-------------------|-----|-------|-------|----------|
| Glacier | 6.8 | 1.4 | 7.5 | high |
| Gladstone | 7.7 | 49.2 | 278.0 | low |
| Goat | 6.8 | 1.9 | 7.4 | high |
| Green | 8.1 | 36.9 | 135.0 | low |
| Gun | 7.9 | 14.5 | 60.4 | low |
| * Hatfield (East) | 8.5 | ..... | ..... | low |
| Hawkins | 8.2 | 23.9 | 101.0 | low |
| Hendrix | 7.4 | 7.0 | 22.9 | moderate |
| Holstein | 7.9 | 27.7 | 68.9 | low |
| Horn | 8.5 | 41.7 | 125.9 | low |
| * Horse | 8.3 | ..... | ..... | low |
| Hydraulic | 6.4 | 3.8 | 13.7 | high |
| Idleback | 6.7 | 1.7 | 10.0 | high |
| Ivey | 8.0 | 25.1 | 46.1 | low |
| Jacko | 8.2 | 59.3 | 247.0 | low |
| Jewel | 8.4 | 19.9 | 72.2 | low |
| Joan | 7.2 | 4.5 | 13.9 | moderate |
| Kalamalka | 8.4 | 35.0 | 146.0 | low |
| Keefer | 7.7 | 11.2 | 33.7 | low |
| King (East) | 7.8 | 24.2 | 78.1 | low |
| King (West) | 7.9 | 26.5 | 81.0 | low |
| Knox | 9.0 | 19.3 | 392.6 | low |
| Konni | 8.4 | 34.0 | 116.4 | low |
| Kostal | 6.9 | 2.3 | 9.7 | high |
| Lacroix (Round) | 8.5 | 26.0 | 113.0 | low |

| | | | | |
|---------------------|-------|-------|-------|----------|
| Lac La Hache | 8.6 | 25.2 | 128.0 | low |
| Lac La Jeune | 8.4 | 37.3 | 140.5 | low |
| Ladyslipper | 6.7 | 1.3 | 8.0 | high |
| Laird | 8.4 | 53.0 | 166.0 | low |
| Lake of Woods | 6.9 | 1.7 | 8.9 | high |
| Lassie | 7.5 | 12.7 | 23.3 | low |
| Lastman | 8.0 | 66.5 | 80.8 | low |
| Link | ..... | 15.1 | 59.0 | low |
| Little Horsefly | 7.8 | ..... | 56.8 | low |
| Little Shuswap | 7.6 | 13.6 | 376.4 | low |
| Logan | 8.5 | 49.2 | 423.0 | low |
| Long | 8.8 | 19.2 | 241.0 | low |
| Loon | 8.8 | 23.2 | 296.0 | low |
| * Lund | 7.8 | 69.1 | 271.0 | low |
| Mabel | 7.9 | 15.1 | ..... | low |
| MacDonald | 6.8 | 2.0 | 9.5 | high |
| Mamit | 8.5 | 45.0 | ..... | low |
| Mara | 7.9 | 15.6 | ..... | low |
| Martin | 9.0 | 21.3 | 329.0 | low |
| McConnell | 8.1 | 34.1 | 149.0 | low |
| McCulloch Reservoir | 7.0 | 3.5 | 13.1 | high |
| McDougall | 7.0 | 4.6 | 13.7 | moderate |
| McGillivray | 7.0 | 3.1 | 12.6 | high |
| McIntoshl | 8.1 | 17.6 | 85.0 | low |
| McKinley | 7.9 | 14.5 | 44.4 | low |

| | | | | |
|-------------------------------|--------------|--------------|--------------|-----------------|
| McKinley Reservoir | 7.4 | 7.6 | 29.0 | moderate |
| Middle | 7.5 | 20.4 | 50.1 | low |
| Milburn | 7.9 | 23.7 | 91.2 | low |
| Mink | 6.6 | 4.5 | 20.6 | moderate |
| Missezula | ..... | ..... | 151.0 | low |
| Momich | 7.2 | 4.1 | 15.9 | moderate |
| Monashee Pond | 8.2 | 33.5 | 117.0 | low |
| Monte | 8.1 | 18.2 | 110.3 | low |
| Mud | 6.8 | 4.0 | 7.2 | high |
| Murtle | 6.8 | 2.6 | 8.4 | high |
| Nazko | 8.7 | 36.2 | 241.0 | low |
| Ned Roberts | 8.3 | 29.5 | 170.0 | low |
| Nickel Plate | 7.2 | 3.1 | 11.5 | high |
| Nicola | 8.2 | 23.2 | 96.4 | low |
| Nimpo | 8.2 | 13.2 | 97.8 | low |
| Nipet (Twin Lake East) | 8.7 | 27.5 | 226.0 | low |
| Niskonlith | 8.1 | 28.9 | 76.6 | low |
| North Barriere | 7.6 | 6.2 | 21.1 | moderate |
| North Poison | 8.5 | 15.7 | 158.0 | low |
| North Taseko | 6.5 | 7.4 | 15.1 | moderate |
| Okanagan | 8.4 | 33.4 | 123.0 | low |
| One Eye | 6.9 | 14.0 | 38.6 | low |
| Osoyoos | 8.3 | 32.5 | ..... | low |
| Osprey | ..... | 18.0 | 65.0 | low |

| | | | | |
|----------------|-----|-------|-------|----------|
| Otter | 7.6 | 21.9 | 72.3 | low |
| Oyama | 6.9 | 4.3 | 16.6 | moderate |
| Palmer | 8.7 | 24.0 | 151.2 | low |
| Pass | 8.8 | 17.1 | 451.0 | low |
| Paul | 8.3 | 41.5 | 163.4 | low |
| Pavilion | 8.4 | 40.7 | 148.0 | low |
| Peachland | 7.8 | 22.9 | 47.0 | low |
| Pennask | 7.6 | 6.5 | 22.2 | moderate |
| Phinetta | 7.9 | 27.6 | 98.0 | low |
| Pinaus | 8.9 | 15.1 | 73.9 | low |
| Poison (North) | 8.5 | 15.7 | 158.0 | low |
| Poison (South) | 8.4 | 19.0 | 140.0 | low |
| Providence | 7.8 | 61.0 | 108.7 | low |
| Puntchesakut | 7.8 | 11.5 | 57.6 | low |
| Puntzi | 8.8 | 26.7 | 265.0 | low |
| Pyper | 8.6 | 41.2 | 165.0 | low |
| Pyramid | 6.9 | 1.8 | 9.9 | high |
| Quiniscoe | 6.9 | 1.6 | 9.7 | high |
| Ray | 7.0 | 3.8 | 11.1 | high |
| Red | 8.5 | 32.5 | 290.0 | low |
| Redfish | 6.6 | 5.4 | 18.8 | moderate |
| + Ripley | 7.9 | 33.0 | 135.1 | low |
| * Roe | 7.8 | ..... | ..... | low |
| Roserim | 8.0 | ..... | 153.4 | low |
| Sapeye | 8.2 | 28.8 | 86.1 | low |

| | | | | |
|-----------------------|------------|--------------|--------------|-----------------|
| Scout | 6.6 | 0.4 | 6.20 | high |
| Seton | 7.4 | 10.5 | 34.6 | low |
| Shuswap | 7.9 | 13.6 | ..... | low |
| Six Mile | 8.6 | 30.9 | 359.5 | low |
| Sixteen Mile | 7.7 | 8.7 | 32.2 | low |
| Skaha | 8.4 | 30.6 | 107.5 | low |
| Sneezie | 8.2 | 42.5 | 147.0 | low |
| * Soap | 9.1 | ..... | ..... | low |
| South Poison | 8.4 | 19.0 | 140.0 | low |
| South Taseko | 6.5 | 4.4 | 10.6 | moderate |
| Souran | 8.2 | 68.8 | 183.0 | low |
| St. Thomas | 6.4 | 2.6 | 13.5 | high |
| Stum | 8.5 | 24.2 | 161.1 | low |
| Stump | 9.0 | 8.5 | 320.1 | low |
| Sugar | 7.7 | 9.2 | ..... | low |
| Sulphurous | 8.3 | ..... | 147.0 | low |
| Tahla | 8.2 | 39.7 | 153.0 | low |
| Tanilkul | 8.7 | 29.0 | 207.2 | low |
| Taseko (North) | 6.5 | 7.4 | 15.10 | moderate |
| Taseko (South) | 6.5 | 4.4 | 10.6 | moderate |
| Tatla | 8.8 | 19.5 | 294.1 | low |
| Tatlayoko | 6.9 | 18.0 | 36.3 | low |
| Temapho | 8.9 | 31.1 | 296.0 | low |
| Ten Mile | 7.9 | 8.5 | 37.7 | low |
| Three Valley | 7.5 | 8.4 | 22.9 | low |

| | | | | |
|------------------------|-----|-------|-------|----------|
| Tsuniah | 7.5 | 18.0 | 51.71 | low |
| Tum Tum | 7.2 | 4.9 | 11.51 | moderate |
| Tunkwa | 8.8 | 29.3 | 208.5 | low |
| Tuzcha | 7.9 | 23.2 | 68.8 | low |
| Twin Lake East (Nipet) | 8.7 | 27.5 | 226.0 | low |
| Tyughton | 8.4 | 33.9 | 138.8 | low |
| Tyee | 8.4 | 31.4 | 172.0 | low |
| Upper Fishem | 7.6 | 21.5 | 68.8 | low |
| Valerie | 8.4 | 66.0 | 187.0 | low |
| Vedan | 6.7 | 8.0 | 26.9 | moderate |
| Venables | 8.5 | 39.6 | 476.0 | low |
| * Watson | 9.2 | ..... | ..... | low |
| West King | 7.9 | 26.5 | 81.0 | low |
| White | 8.3 | 41.9 | 128.8 | low |
| Wilgress | 8.2 | 55.7 | 134.0 | low |
| Williams | 8.8 | 30.7 | 293.4 | low |
| Wood | 8.5 | 26.0 | 138.0 | low |
| Zero | 7.0 | 6.4 | 20.5 | moderate |

Notes:

* sensitivity estimated on basis of pH
+ sensitivity estimated on basis of:

$$\text{alkalinity} = -10.086 + 0.768 \text{ TDS} \quad (r^2 = 0.9056)$$

and

$$\text{calcium} = 0.093 \text{ TDS}^{1.12} \quad (r^2 = 0.8341)$$

Table 4. Lake Sensitivity Characteristics: Kootenay Region.

| Lake Names | pH | Calcium (mg/L) | Alkalinity (mg/L) | Sensitivity Rating |
|---------------|-----|----------------|-------------------|--------------------|
| 14 Mile | 8.4 | 35.3 | 200.7 | low |
| Aid | 8.1 | 28.5 | 122.0 | low |
| Alces | 8.4 | 44.1 | 127.0 | low |
| Arrow (lower) | 8.0 | 14.8 | 43.1 | low |
| Arrow (upper) | 7.9 | 14.7 | 50.7 | low |
| Baird | 6.8 | 24.5 | 16.6 | moderate |
| * Baynes | 8.1 | ..... | ..... | low |
| Bittern | 8.3 | 51.3 | 239.6 | low |
| Blackwater | 8.2 | 37.8 | 136.0 | low |
| Bridal | 7.2 | 4.6 | 13.6 | moderate |
| + Campbell | 8.5 | 111.3 | 420.0 | low |
| Champion #1 | 7.3 | 34.6 | 81.4 | low |
| Champion #2 | 7.2 | 24.4 | 58.9 | low |
| Champion #3 | 7.1 | 24.1 | 57.9 | low |
| Champion #4 | 7.9 | 13.8 | 41.4 | low |
| Cherry | 7.5 | 22.5 | 76.3 | low |
| Christina | 7.8 | 9.9 | 32.0 | low |
| Columbia | 8.5 | 31.6 | 128.0 | low |
| Comfort | 8.2 | 38.9 | 144.0 | low |

| | | | | |
|----------------------|-----|-------|-------|----------|
| * Edwards | 8.5 | ..... | ..... | low |
| * Elizabeth | 7.7 | ..... | ..... | low |
| Emerald | 8.4 | 29.1 | 103.0 | low |
| * Eohippus | 7.3 | ..... | ..... | moderate |
| Fortress | 7.9 | 21.5 | 67.6 | low |
| Gavia #1 | 8.6 | 35.9 | 274.8 | low |
| Gavia #2 | 8.4 | 33.9 | 251.2 | low |
| Gavia #3 | 8.1 | 43.4 | 318.4 | low |
| * Gog | 8.2 | ..... | ..... | low |
| Grave | 8.0 | ..... | 156.0 | low |
| * Grizzly | 7.6 | ..... | ..... | low |
| Hanson (Wasa) | 8.6 | 29.7 | 207.0 | low |
| Help | 8.1 | 27.1 | 120.0 | low |
| Hobo | 8.2 | 58.5 | 251.2 | low |
| Jim Smith | 8.6 | 44.7 | 212.0 | low |
| Kearns | 7.7 | 47.5 | 95.5 | low |
| Kiakho | 7.6 | 18.2 | 68.5 | low |
| Koocanusa | 8.2 | 31.0 | 95.0 | low |
| Kootenay | 8.1 | ..... | 68.0 | low |
| * Larix | 8.1 | ..... | ..... | low |
| Lassie | 7.2 | 4.8 | ..... | moderate |
| Lower Arrow | 8.0 | 14.8 | 43.1 | low |
| Magog | 7.9 | ..... | 61.3 | low |
| McNaughton-Kinbasket | 7.9 | 19.5 | ..... | low |
| Mica Reservoir | 7.9 | 19.3 | ..... | low |

| | | | | |
|---------------|-----|-------|-------|----------|
| Mineral | 7.9 | 57.1 | 213.9 | low |
| Mitten | 8.4 | 43.4 | 215.6 | low |
| Moyie | 7.4 | 4.2 | 17.5 | moderate |
| Nancy Green | 7.8 | 8.9 | 31.6 | low |
| Ninebay | 8.6 | 29.8 | 290.9 | low |
| Nixon | 8.1 | 30.1 | 128.0 | low |
| North Star | 8.1 | ..... | 227.0 | low |
| O'Hara | 8.0 | 10.3 | 38.3 | low |
| * Og | 7.9 | ..... | ..... | low |
| Premier | 8.6 | 27.7 | 161.0 | low |
| * Rock Isle | 7.5 | ..... | ..... | low |
| Slocan | 7.8 | 12.3 | 36.0 | low |
| St. Mary | 7.3 | 5.7 | 20.7 | moderate |
| Summitt | 8.2 | ..... | 134.0 | low |
| * Sunburst | 7.4 | ..... | ..... | low |
| Suzanne | 8.2 | ..... | 248.0 | low |
| Tie | 8.3 | 44.5 | 240.0 | low |
| Trout | 8.0 | 15.0 | 40.7 | low |
| Upper Arrow | 7.9 | 14.7 | 50.7 | low |
| Wapta | 8.3 | 18.5 | 69.4 | low |
| Wasa (Hanson) | 8.6 | 29.7 | 207.0 | low |
| * Wedgwood | 8.0 | ..... | ..... | low |
| Whiskey | 8.4 | 38.8 | 163.3 | low |
| Whiteswan | 8.4 | 36.2 | 118.0 | low |
| Wilbur | 8.3 | 31.2 | 218.8 | low |

| | | | | |
|------------|-----|------|------|-----|
| Windermere | 8.5 | 23.4 | 95.0 | low |
|------------|-----|------|------|-----|

Notes:

* sensitivity estimated on basis of pH
+ sensitivity estimated on basis of:

alkalinity = -10.086 + 0.768 TDS ($r^2 = 0.9056$)

and

calcium = 0.093 TDS^{1.12} ($r^2 = 0.8341$)

Table 5. Lake Sensitivity Characteristics: Northern Region.

| Lake Names | pH | Calcium (mg/L) | Alkalinity (mg/L) | Sensitivity Rating |
|-------------|-----|----------------|-------------------|--------------------|
| Aconitum | 7.2 | 3.6 | 13.1 | high |
| Acorn | 7.1 | 6.1 | 20.2 | moderate |
| Aeroplane | 8.3 | 44.2 | 231.5 | low |
| Aiken | 7.3 | 8.8 | 22.6 | low |
| Alec Chief | 8.0 | 32.2 | 111.5 | low |
| Alistair | 6.3 | 1.2 | 5.4 | high |
| Andy Bailey | 7.8 | 22.6 | 68.3 | low |
| Atlin | 7.8 | 14.2 | 49.9 | low |
| Augier | 7.1 | 6.3 | 24.9 | moderate |
| Azouzetta | 8.1 | 24.0 | 70.1 | low |
| Babine | 7.4 | 10.8 | 37.5 | low |

| | | | | |
|--------------------------|------------|--------------|--------------|-----------------|
| Barney | 8.5 | 49.5 | 193.0 | low |
| Batchellor | 5.9 | 0.2 | 2.4 | high |
| Beale | 7.4 | ..... | 14.5 | moderate |
| + Bear | 7.1 | 5.8 | 20.6 | moderate |
| Beaver | 8.1 | 35.0 | 139.4 | low |
| * Bednesti | 7.7 | 13.8 | 69.8 | low |
| Bell | 8.0 | 30.9 | 93.8 | low |
| * Berman | 7.9 | ..... | ..... | low |
| Bigelow | 7.1 | 12.1 | 47.2 | low |
| Birches | 8.6 | 33.8 | 265.7 | low |
| Blue (Forcier) | 8.2 | 47.9 | 156.5 | low |
| Bob Quinn | 7.4 | 32.9 | 63.5 | low |
| Bob Quinn, Little | 7.5 | 32.8 | 85.1 | low |
| Bobtail, Little | 8.0 | 15.1 | 89.2 | low |
| Bonney | 6.9 | 3.4 | 11.5 | high |
| Boomerang, North | 8.0 | 39.9 | 132.7 | low |
| Boomerang, South | 6.9 | 10.1 | 34.5 | low |
| Boot | 8.3 | 31.1 | 107.0 | low |
| Border | 6.8 | 8.0 | 31.4 | moderate |
| * Bow | 7.9 | ..... | ..... | low |
| Bowser | 7.7 | 14.9 | 36.8 | low |
| Boya | 8.3 | 49.2 | 156.0 | low |
| Buckinghorse | 7.9 | 13.9 | 42.6 | low |
| Buckley | 8.1 | 11.8 | 82.4 | low |

| | | | | |
|----------------------|--------------|--------------|--------------|-----------------|
| Buckley Point | 6.2 | 0.6 | 3.5 | high |
| Burden | 8.1 | 34.2 | 115.5 | low |
| Burns | 7.5 | 12.0 | 46.6 | low |
| Butte | 7.3 | 4.8 | 24.3 | moderate |
| * Butterfly | 8.3 | ..... | ..... | low |
| * Byers | 8.0 | ..... | ..... | low |
| * Camp | 7.9 | ..... | ..... | low |
| + Camp Island | 7.8 | 22.4 | 92.8 | low |
| Canyon | 7.8 | 14.0 | 43.9 | low |
| * Carina | 7.8 | ..... | ..... | low |
| Carl | 7.7 | 15.7 | 52.2 | low |
| Cartmel | 7.3 | 9.7 | 23.9 | low |
| Chapman | 7.0 | 6.6 | 24.3 | moderate |
| Chara | 7.8 | 30.2 | 112.1 | low |
| Charlie | ..... | 15.6 | ..... | low |
| Chesterfield | 8.4 | 43.0 | 132.5 | low |
| Chief | 8.0 | 9.1 | 37.3 | low |
| Chinaman | 8.1 | 16.0 | 65.0 | low |
| Chismania | 7.9 | 23.5 | 96.3 | low |
| Christina | 7.1 | 4.4 | 17.7 | moderate |
| Chuchi | 7.8 | 10.0 | 34.3 | low |
| Chukachida | 7.5 | 10.6 | 27.8 | low |
| * Circle | 7.5 | ..... | ..... | moderate |
| * Clam | 7.1 | ..... | ..... | high |
| Cold Fish | 7.9 | 17.7 | 43.7 | low |

| | | | | |
|--------------|-----|-------|-------|----------|
| Coles | 7.9 | 27.0 | 54.5 | low |
| Collins | 6.6 | 4.7 | 16.5 | moderate |
| Cow | 7.8 | 21.5 | 67.5 | low |
| Crab | 6.3 | 1.0 | 4.5 | high |
| * Cry | 7.4 | ..... | ..... | low |
| Dahl | 7.8 | 11.4 | 67.7 | low |
| Dall | 7.9 | 12.8 | 41.0 | low |
| Davie | 7.3 | 11.3 | 37.5 | low |
| Davis | 6.7 | 1.1 | 4.1 | high |
| Deadwood | 8.4 | ..... | 182.0 | low |
| Dease | 8.3 | 29.7 | 101.0 | low |
| Deception | 6.9 | 13.5 | 34.9 | low |
| Decker | 7.4 | 11.2 | 42.5 | low |
| * Deep | 6.5 | ..... | ..... | high |
| Denetiah | 8.2 | 29.4 | 84.0 | low |
| Desiree | 7.0 | 33.0 | 64.3 | low |
| Dina | 7.9 | 22.7 | 81.5 | low |
| Dixie | 7.7 | ..... | 35.0 | low |
| * Dominion | 7.2 | ..... | ..... | moderate |
| Dunalter | 6.9 | 8.4 | 29.7 | low |
| Eaglehead | 7.5 | 7.2 | 30.3 | moderate |
| Ealue | 8.5 | 51.0 | 149.0 | low |
| East Klua | 8.3 | 16.7 | 26.8 | low |
| East Niska | 6.7 | 2.6 | 10.7 | high |
| East Tuchodi | 8.1 | 35.7 | 91.8 | low |

| | | | | |
|----------------|-----|-------|-------|----------|
| Ecstall | 6.8 | 3.6 | 8.9 | high |
| + Ed Asp | 7.0 | 4.2 | 13.0 | moderate |
| Ed Bird | 8.2 | 43.4 | ..... | low |
| Eddontenajon | 8.4 | 38.2 | 110.0 | low |
| * Eena | 7.1 | ..... | ..... | moderate |
| Ekwan | 7.9 | 44.2 | 74.9 | low |
| Ella | 7.9 | 16.1 | 43.6 | low |
| Elwin #1 | 7.2 | 11.3 | 52.7 | low |
| Elwin #2 | 7.7 | 9.9 | 52.1 | low |
| Estsine | 8.4 | 34.6 | 86.3 | low |
| Etthithum | 7.4 | 13.1 | 53.8 | low |
| Eutsuk | 6.7 | 3.6 | 14.5 | high |
| Fern | 8.1 | 38.5 | 105.0 | low |
| Firth #1 | 7.4 | 8.8 | 34.5 | low |
| Firth #2 | 8.3 | 34.4 | 123.5 | low |
| Fishing | 8.2 | 66.1 | 194.0 | low |
| Fiussion | 6.7 | 5.5 | 16.4 | moderate |
| Forcier (Blue) | 8.2 | 47.9 | 156.5 | low |
| * Francois | 7.8 | .... | ..... | low |
| Frank Ogilve | 6.5 | 0.7 | 4.6 | high |
| Fraser | 8.2 | 12.2 | 44.9 | low |
| Fred Wright | 6.9 | 3.6 | 12.0 | high |
| Fredrikson | 6.6 | 4.6 | 15.0 | moderate |
| Gamble | 5.8 | 0.2 | 2.45 | high |
| Germansen | 7.6 | 14.4 | 42.8 | low |

| | | | | |
|-------------------|------------|--------------|--------------|-----------------|
| Gladys #1 | 6.6 | ..... | 5.1 | high |
| Gladys #2 | 7.9 | 10.6 | 37.4 | low |
| Goodhope | 8.3 | 51.4 | 147.0 | low |
| Goosly | 7.2 | 11.6 | 30.0 | low |
| Graveyard | 8.5 | 51.1 | 194.0 | low |
| Grizzly | 7.4 | 10.4 | 49.1 | low |
| + Gun | 8.3 | 18.0 | 74.4 | low |
| Haggen #1 | 5.9 | 1.0 | 4.9 | high |
| Haggen #2 | 7.5 | 53.6 | 240.0 | low |
| Haggen #3 | 6.3 | 3.1 | 23.0 | high |
| Haggen #4 | 6.4 | 2.0 | 7.3 | high |
| Haggen #5 | 6.1 | 1.4 | 10.7 | high |
| Halfmoon | 8.1 | 21.6 | 65.4 | low |
| Hall | 7.8 | 11.9 | 45.3 | low |
| Happy | 8.0 | 14.0 | 49.0 | low |
| Hard | 7.0 | 2.8 | 11.2 | high |
| Haworth | 8.3 | 36.7 | 91.9 | low |
| Hayward | 6.2 | 0.4 | 2.7 | high |
| Helen | 7.6 | 25.6 | 69.8 | low |
| Hilltout | 7.3 | 10.3 | 20.7 | low |
| Hluey | 7.0 | ..... | 186.0 | low |
| Hodkin | 6.5 | 3.7 | 11.0 | high |
| Horneline | 8.3 | 53.3 | 173.0 | low |
| Horseranch | 8.3 | 36.9 | 187.0 | low |
| * Hottah | 6.9 | ..... | ..... | moderate |

| | | | | |
|------------------------|-----|-------|-------|----------|
| Indian | 8.2 | 18.4 | 75.3 | low |
| Intada | 7.8 | 13.6 | 45.3 | low |
| Island | 7.3 | 5.8 | 18.9 | moderate |
| Jennings | 7.2 | 3.3 | 15.5 | high |
| Jennings (south basin) | 7.2 | 3.0 | 13.4 | high |
| + Johanson | 7.3 | 10.5 | 42.1 | low |
| Johia | 6.8 | 3.3 | 12.3 | high |
| Johnston | 6.9 | 3.6 | 9.7 | high |
| July | 8.1 | 27.8 | 73.6 | low |
| Kaham | 7.2 | 5.0 | 15.1 | moderate |
| Kakiddi | 7.4 | 24.5 | 71.9 | low |
| Kalum Road Pond #1 | 5.7 | 0.2 | 1.7 | high |
| * Kathie | 7.6 | ..... | ..... | low |
| Kathlyn | 7.1 | 7.0 | 19.9 | moderate |
| Kazchek | 7.8 | 20.8 | 67.0 | low |
| Kedahda | 8.1 | 24.2 | 57.9 | low |
| Kelsall | 6.9 | 3.1 | 11.4 | high |
| Khtada | 6.3 | 1.0 | 4.5 | high |
| Kinaskan | 7.9 | 26.9 | 74.2 | low |
| Kitchener | 7.4 | 9.7 | 29.6 | low |
| Kitsumkalum | 6.8 | 5.2 | 16.1 | moderate |
| Kitwanga | 7.8 | 13.9 | 51.1 | low |
| Klinket | 7.5 | 7.0 | 28.9 | moderate |
| Klinkit | 7.6 | 7.9 | 29.3 | moderate |

| | | | | |
|--------------------------|------------|--------------|--------------|-----------------|
| Klock | 7.8 | 21.7 | 68.7 | low |
| Klowee | 7.7 | 15.2 | 42.1 | low |
| Klua East | 8.3 | 16.7 | 26.8 | low |
| Klua West | 8.0 | 21.8 | 57.0 | low |
| Kluachesi | 8.4 | 49.5 | 165.0 | low |
| Kluachon | 8.3 | 44.4 | 145.0 | low |
| Kluea | 8.1 | 38.9 | 93.3 | low |
| Kotcho | 7.0 | 21.6 | 33.4 | low |
| Kumealon | 6.1 | 0.5 | 2.8 | high |
| Kuthai | 8.2 | 29.0 | 121.0 | low |
| Kwinageese | 6.8 | 4.3 | 13.6 | moderate |
| Kwokville | 7.6 | 20.4 | 27.2 | low |
| Lachmach | 6.0 | 0.7 | 3.1 | high |
| Lady Laurier | 8.5 | 41.4 | 164.0 | low |
| Laidman | 7.5 | 11.4 | 32.2 | low |
| Lakelse | 7.3 | 8.9 | 30.0 | low |
| Lava | 6.9 | 3.5 | 11.4 | high |
| Leverson | 6.1 | 0.7 | 2.7 | high |
| Lindeman | 6.9 | 3.8 | 13.4 | high |
| Little Bob Quinn | 7.5 | 32.8 | 85.1 | low |
| Little Bobtail | 8.0 | 15.1 | 89.2 | low |
| Little Dease | 8.3 | 32.9 | 99.1 | low |
| Little Tatsamenie | 8.0 | 24.3 | 65.3 | low |
| Little Trapper | 7.8 | 19.4 | 46.6 | low |
| * Long | 5.9 | | | high |

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|----------------------|------------|--------------|---------------|-----------------|
| Long Mountain | 8.0 | | 121.5 | low |
| Looncry | 8.2 | 48.5 | 134.0 | low |
| Lower | 6.8 | 2.3 | 5.8 | high |
| * Lyon | 7.7 | | | low |
| Marie | 6.8 | 4.2 | 12.2 | moderate |
| Marion #1 | 6.2 | 0.8. | 3.4 | high |
| Marion #2 | 8.8 | 34.0 | 112.0 | low |
| Mason | 5.5 | 4.2 | 4.7 | high |
| Mathors | 6.2 | 1.4 | 4.7 | high |
| Maxhamish | 8.3 | 39.0 | 83.6 | low |
| Mayer | 5.0 | 1.3 | ..... | high |
| McBride | 6.7 | 5.2 | 19.4 | moderate |
| McDame | 8.2 | 43.1 | 129.0. | low |
| McDowell | 6.8 | 9.6 | 32.6 | low |
| * McLeod | 7.7 | ..... | ..... | low |
| McQuarrie | 7.9 | 13.8 | 42.0 | low |
| Meek | 6.7 | 2.5 | 8.0 | high |
| Mesantan | 7.4 | 9.1 | 22.7. | low |
| Mess | 8.1 | 26.0 | 98.1 | low |
| Meziadin | 7.3 | 12.4 | 31.6 | low |
| Midwinter | 8.0 | 22.4. | 59.5 | low |
| * Milk | 6.3 | | | high |
| Milo | 7.2 | 10.2 | 24.0 | low |
| Moodie #1 | 8.5 | 36.2 | 194.0 | low |
| Moodie #3 | 8.3 | 46.4 | 213.2 | low |

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|-------------------------|------------|--------------|--------------|-----------------|
| Moose #1 | 7.5 | 10.5 | 44.4 | low |
| Moose #2 | 8.1 | 18.0. | 64.9 | low |
| Moose #3 | 8.1 | 22.1 | 81.7 | low |
| Morchuea | 8.2 | 29.9 | 100.7 | low |
| Morice | 6.9 | 6.2 | 17.1 | moderate |
| Mosquito | 7.2 | 5.4 | 16.9 | moderate |
| Mowchilla | 7.6 | 21.5 | 61.2 | low |
| Mowdade | 7.7 | 30.9 | 79.6. | low |
| * Murch | 7.6 | ..... | ..... | low |
| Nadsilnich, West | 8.0 | 11.8 | 50.0 | low |
| Nanika | 6.5 | 4.1 | 11.9 | moderate |
| Nass | 7.8 | 8.0 | 49.4 | low |
| Ndakdolk (Sarah) | 6.4 | 0.8 | 3.6 | high |
| Nellian | 7.2 | 5.3 | 12.0 | moderate |
| Ness | 8.3 | 18.7 | 76.0 | low |
| Netson | 8.1 | 56.9 | 187.0 | low |
| + Nina | 7.8 | 13.6 | 56.0 | low |
| Niska, East | 6.7 | 2.6 | 10.7 | high |
| Niska, West | 6.7 | 2.8 | 13.2 | high |
| Nome | 6.8 | 2.4 | 9.7 | high |
| North Boomerang | 8.0 | 39.9 | 132.7 | low |
| Nukko | 8.0 | 8.9 | 35.9 | low |
| Nulki | 8.1 | 16.6 | 81.0 | low |
| Nuttlude | 7.4 | 19.4 | 60.5 | low |
| * Odell | 6.5 | | | high |

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|---------------|-----|-------|-------|----------|
| Onion | 6.3 | 0.9 | 2.8 | high |
| * Opatcho | 7.9 | | | low |
| Outaanetdey | 7.4 | 12.3 | 22.8 | low |
| Pam | 6.5 | 2.2 | 5.7 | high |
| Parker | 7.6 | 39.4 | 49.0 | low |
| Patry | 7.2 | 9.8 | 18.1 | moderate |
| Paul | 6.9 | 4.5 | 13.4 | moderate |
| Pelly | 8.4 | 41.7 | 125.0 | low |
| Peter (Piper) | 6.8 | 3.9 | 11.1 | high |
| Pinchi | 8.0 | 16.0 | 77.8 | low |
| Pine Tree | 7.1 | 10.8 | 37.5 | low |
| Pinkut | 7.2 | 7.6 | 28.6 | moderate |
| Piper (Peter) | 6.8 | 3.9 | 11.1 | high |
| * Plantation | 6.0 | ..... | ..... | high |
| Pondosy | 6.6 | 5.2 | 15.6 | moderate |
| Poorman | 8.1 | 42.5 | 132.0 | low |
| Prairie | 7.8 | 16.3 | 68.6 | low |
| Prudhomme | 6.4 | 1.5 | 5.0 | high |
| Punchaw | 8.2 | 12.2 | 55.7 | low |
| * Purden | 7.4 | ..... | ..... | low |
| Quality | 8.3 | 36.3 | 146.0 | low |
| Quentin | 8.1 | 35.2 | 84.2 | low |
| * Rainbow #1 | 7.4 | | | moderate |
| Rainbow #2 | 5.5 | 0.4 | 3.0 | high |
| Ridgeway | 8.4 | 41.7 | 141.0 | low |

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|--------------------|-----|-------|-------|----------|
| Richie | 7.7 | 24.8 | 68.9 | low |
| Ross | 7.2 | 12.5 | 37.9 | low |
| Rossa-2 (Six Mile) | 7.9 | 9.7 | 37.2 | low |
| Round (Lacroix) | 8.5 | 26.0 | 113.0 | low |
| Sand | 7.5 | 10.4 | 32.3 | low |
| Sarah (Ndakdolk) | 6.4 | 0.8 | 3.6 | high |
| * Sawmill | 7.5 | ..... | ..... | moderate |
| * Saxton | 7.7 | ..... | ..... | low |
| Scoop | 8.7 | 27.6 | 273.0 | low |
| Seeley | 7.4 | 18.2 | 47.5 | low |
| Seymour | 7.4 | 7.8 | 38.7 | moderate |
| Shawatlan | 7.0 | 3.2 | 9.2 | high |
| Shiela | 6.9 | 5.7 | 15.8 | moderate |
| Six Mile (Rossa-2) | 7.9 | 9.7 | 37.2 | low |
| Skidegate | 7.1 | 4.7 | 15.4 | moderate |
| * Skunk | 7.9 | ..... | ..... | low |
| Sloko | 7.6 | 13.4 | 38.3 | low |
| Snake | 7.6 | 32.7 | 79.4 | low |
| Solitary | 8.5 | 35.4 | 207.2 | low |
| Sorensons Pond | 8.4 | ..... | 174.0 | low |
| South Boomerang | 6.9 | 10.1 | 34.5 | low |
| Spinel | 8.2 | 31.4 | 85.3 | low |
| Stalk | 7.3 | 8.2 | 21.4 | low |
| Stuart | 7.6 | 12.6 | 44.2 | low |

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|--------------------|-----|-------|-------|----------|
| Sucker | 6.8 | 2.2 | 14.0 | high |
| + Sukunka | 7.7 | 23.7 | 98.2 | low |
| Summit | 8.4 | 25.3 | 115.0 | low |
| * Summitt | 7.1 | | | moderate |
| Surel | 6.6 | 4.0 | 13.6 | moderate |
| Surprise #1 | 7.7 | 6.9 | 35.8 | moderate |
| Surprise #2 | 7.8 | 7.3 | 31.7 | moderate |
| Sustut | 7.5 | 12.1 | 32.2 | low |
| Swan #1 | 7.1 | 5.6 | 17.5 | moderate |
| Swan #2 | 8.2 | 23.5 | 98.0 | low |
| Swans | 7.4 | 7.7 | 38.3 | moderate |
| Swift | 7.7 | 9.7 | 35.5 | low |
| Tabor | 8.1 | 20.7 | 70.6 | low |
| Tachick | 8.2 | 20.0 | 99.0 | low |
| Tachilta | 7.9 | 18.1 | 66.4 | low |
| Tahtsa | 6.6 | 6.0 | 20.3 | moderate |
| Takatoot | 7.4 | 12.3 | 39.4 | low |
| Taltapin | 7.4 | 9.2 | 36.6 | low |
| Tatlatui | 7.3 | 13.8 | 22.0 | low |
| Tatogga | 8.1 | 30.9 | 90.5 | low |
| Tatsamenie | 8.0 | 25.6 | 67.8 | low |
| Tatsamenie, Little | 8.0 | 24.3 | 65.3 | low |
| Tchentlo | 7.8 | 10.6 | 39.0 | low |
| Tchesinkut | 7.9 | 17.0 | 63.6 | low |
| Teigen | 6.4 | 4.3 | 10.5 | moderate |

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|-----------------|-----|-------|-------|----------|
| Telsa | 6.6 | 5.0 | 15.5 | moderate |
| Tetachuck | 6.7 | 4.4 | 15.3 | moderate |
| Thinahtea | 7.9 | 36.2 | 87.5 | low |
| Thirty Mile | 8.1 | 18.4 | 86.0 | low |
| Thutade | 7.3 | 8.5 | 20.1 | low |
| * Tobin | 7.1 | ..... | ..... | low |
| Toboggan | 6.3 | 4.3 | 8.2 | high |
| Todagin | 8.0 | 35.6 | 87.0 | low |
| Tom MacKay | 6.4 | 2.8 | 9.4 | high |
| Tomias | 8.0 | 18.4 | 56.7 | low |
| Tootsee | 7.3 | 6.8 | 25.5 | moderate |
| Top | 7.6 | 14.2 | 46.2 | low |
| Trapper, Little | 7.8 | 19.4 | 46.6 | low |
| Trout | 7.7 | 8.1 | 27.6 | low |
| Trygve | 7.6 | 10.6 | 30.8 | low |
| * Tsayta | 7.8 | ..... | ..... | low |
| Tsenaglode | 7.9 | 13.1 | 44.8 | low |
| * Tucha | 7.9 | ..... | ..... | low |
| * Tucho | 6.9 | ..... | ..... | moderate |
| Tuchodi, East | 8.1 | 35.7 | 91.8 | low |
| Tuchodi, West | 7.9 | 40.9 | 82.7 | low |
| Tumeka | 7.9 | 12.7 | 53.0 | low |
| Turnagain | 8.3 | 31.1 | 93.1 | low |
| * Turner | 6.8 | | | high |
| Tutizzi | 7.2 | 6.3 | 18.5 | moderate |

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|-------------------------|-------|-------|-------|----------|
| + Tuya | 7.4 | 7.8 | 29.8 | moderate |
| Twin Island | 8.3 | 62.4 | 240.7 | low |
| Tyhee | 8.2 | 35.1 | 128.1 | low |
| Unnamed #1 (1132407) | 7.0 | 6.9 | 13.1 | moderate |
| Unuk | 6.7 | 8.4 | 16.3 | moderate |
| * Uslika | 6.9 | 3.3 | 8.3 | high |
| Vallee | 7.1 | 20.4 | 61.8 | low |
| Victoria | 8.0 | 18.6 | 84.8 | low |
| Vincentt | 8.3 | 31.2 | 133.0 | low |
| * Vivian | 8.2 | ..... | ..... | low |
| + Wasi | ..... | 10.5 | 42.1 | low |
| * Wedge | 7.1 | ..... | ..... | moderate |
| Weissener | 8.3 | 43.7 | 126.3 | low |
| West Klua | 8.0 | 21.8 | 57.0 | low |
| West Nadsilnich | 8.0 | 11.8 | 50.0 | low |
| West Niska | 6.7 | 2.8 | 13.2 | high |
| West Tuchodi | 7.9 | 40.9 | 82.7 | low |
| Whitefish | 7.6 | 15.0 | 47.1 | low |
| Whitesail | 6.7 | 4.7 | 18.3 | moderate |
| Williamson | ..... | 11.0 | ..... | low |
| Williston Reservoir | 7.8 | 15.3 | 53.0 | low |
| Wokkpash | 8.2 | 19.6 | 68.5 | low |
| Woodcock | 7.5 | 13.6 | 57.9 | low |
| Woodworth | 6.6 | 2.9 | 8.7 | high |

| | | | | |
|-------------------|------------|-------------|-------------|-------------|
| Yakoun | 6.6 | 2.3 | 6.6 | high |
| * Yehiniko | 7.8 | 13.3 | 36.9 | low |

Notes:

*** sensitivity estimated on basis of pH
+ sensitivity estimated on basis of:**

alkalinity = -10.086 + 0.768 TDS ($r^2 = 0.9056$)

and

calcium = 0.093 TDS^{1.12} ($r^2 = 0.8341$)

L. Swain
Water Quality Branch
Environmental Protection Department
Ministry of Environment and Parks
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