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Abstract:
An empirical model for lake acidification developed in Norway also satisfactorily accounts for observed water chemistry in oligotrophic clearwater, softwater lakes elsewhere in Europe and in North America. This model can be used for prediction of lake acidity in response to future changes in loadings of strong acids. The model takes into account both changes in base cation concentrations and changes in alkalinity due to acid inputs.

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PREDICTING ACIDIFICATION OF NORTH AMERICAN LAKES

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CONTENTS

ABSTRACT

The empirical model for lake acidification (Henriksen 1980) provides the basis for predicting the chemical composition of lakes resulting from a change in loading of strong acids from the atmosphere. A total of 15 sets of lake data from North America and 12 sets from Europe are used to test the general validity of the empirical model. These lakes are oligotrophic, softwater, clearwater lakes not subject to pollutant inputs other than via the atmosphere.

The empirical model derives from the ionic balance. Concentrations of airborne seasalts are subtracted. Minor ions (NH_4, NO_3 and organic anions) are neglected. Concentrations of non-marine Na, non-marine K and an area-specific background SO_4 are subtracted. The result is an acidification equation

$$H^+ + Al - HCO_3 + 0.91\ (Ca^* + Mg^*) = \text{net}\ SO_4^*$$

where asterisks denote non-marine fractions, the factor 0.91 is from the empirical relationship between Ca* + Mg* and HCO_3 in reference areas, Al refers ionic Al only, net SO_4^* is level above background and units are µeq/l. This equation equates 2 measures of acidification and over 90 percent of the lakes in these 27 data sets have a chemical composition close to that given by the acidification equation.

Of these components ionic Al is a function of H^+. H^+ and HCO_3 are related by the carbonic acid equilibria and if expressed in µeq/l are mutually exclusive.

Comparison of precipitation chemistry and lake chemistry shows that on the average lakewater contains about 1.8 times higher concentrations of SO_4 than does wet precipitation. Lake acidification can be estimated from precipitation SO_4 using the acidification equation.

The acidification equation can be used for prediction.

$$\Delta(H^+ + Al - HCO_3) + \Delta 0.91(Ca^* + Mg^*) = \Delta\ \text{net}\ SO_4^*$$

An increase in SO_4* can cause either an increase in (H^+ + Al - HCO_3) (equivalent to a decrease in alkalinity) or an increase in (Ca* + Mg*) or both. Estimated values for the increase factor (F), Δ(Ca* + Mg*)/ΔSO_4, are 0-0.4.

Predicted pH levels for lakes in the Adirondack Mountains, NY, under 50 percent of present-day loading and F = 0.2 are similar to those measured in the 1930s. The model predicts that 12 of 29 lakes sampled in the Rocky Mountain National Park, Colorado, will be acidified to pH below 5.5 if mean pH precipitation falls below about 4.55 and F = 0.2. Such predictions can be made for any group of lakes given present-day chemical composition, future loading of strong acids, and the base cation increase factor (F).

A small number of lakes apparently do not fit this empirical model for acidification. These outliers may be due to analytical errors. The model does not apply to lakes that have a primary source or sink of sulfur (example - the Florida lakes as a group). Other outliers can often be ascribed to local pollution sources such as road salts and agricultural activities. The empirical model appears to hold for more than 90 percent of the oligotrophic, softwater, clearwater lakes examined here.

PREFACE

This report would not have been possible without help of the following individuals who generously provided unpublished data: G. Andersson (Sweden), D.F. Brakke (Quebec), P.L. Brezonik (Florida), T.A. Clair and D.R. Engstrom (Newfoundland and Labrador), P.J. Dillon (Ontario), J.N. Galloway (Colorado), T.A. Haines (New England) and C.L. Schofield (New York). I have profited from discussions with T.A. Haines, A. Henriksen, M. Johannessen, and S.A. Norton. J.N. Galloway assisted with the North American precipitation data.

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1. INTRODUCTION

Deposition of strong acids from the atmosphere (acid precipitation) has resulted in the acidification and loss of fish populations in soft water lakes and streams in both eastern North America and Europe. Research during the past 15 years has provided descriptions of the ecological effects, the geographic distribution and historical development of acidification (Drabløs and Tollan 1980, Overrein et al. 1980).

The focus is now on the future - what will be the effect of the future changes in loading of strong acids. This report attempts to predict the chemical composition and acidification of lakes. Water chemistry and precipitation chemistry data from 15 areas in North America and 12 areas in Europe are used.

2. DESCRIPTION OF THE DATA

A total of 15 sets of water chemistry data from North American lakes are used here. These data include lakes receiving very low (background) loadings of acid and lakes receiving high loadings (10-20 x background). These data by no means exhaust the available water chemistry data from North America; the wide geographic spectrum included makes it unlikely that the results and conclusions on a regional scale would be different were additional data included. A total of 1343 lakes from North America are included here (Figure 1) (Table 1). From Europe a total of 12 data sets encompassing 1337 lakes were used (Figure 2) (Table 2). These include 6 sets from Norway, 3 of which cover large areas of the country and 3 from relatively small areas. A description of each data set and a summary of water chemistry are given in Appendices 2 and 3.

These data were checked for internal analytical consistency by calculating ionic balance and theoretical conductivity. Lakes for which one or more critical chemical parameter was not measured were excluded. Any large group of soft water lakes will include a few "outliers", lakes with clearly unusual chemistry. "Outliers" may be caused by forms of pollution other than acid deposition, for example, road salts. Other "outliers" may reflect natural but highly atypical circumstances, for example, the presence of sulfur-bearing minerals such as gypsum in the catchment. A small number of such "outliers" was excluded from further treatment. Details are given for each data set in Appendix 3.

Table 1. Summary of North American data sets. All sets included the major chemical parameters pH, conductivity, Na, K, Ca, Mg, SO_4 and Cl.

Area	Code	Survey year	Number of lakes	Additional data				Reference
				Al	NO_3	HCO_3	organic matter	
USA								
Adirondack Mountains, New York	ADIRON	1975	212	x	x	S.ACID	No	Schofield (1977)
Florida, north and south	FLORID 1 FLORID 2	1978-79	13 7	No	No	ALK 4.5	TOC	P.L. Brezonik (unpublished)
Rocky Mountain Park, Colorado	ROCKY	1981	30	No	x	ALKTIP	No	J.N. Galloway (unpublished)
New England States	USFWS	1980	201	x	No	ALK 4.5	FARG	T.A. Haines (unpublished)
Canada								
Experimental Lakes Area, northwestern Ontario	ELA	1970	101	No	x	ALK 4.5	TOC	Beamish et al. (1976)
Kejimkujik National Park, Nova Scotia	KEREKE	1978-79	3	No	x	N.A.	FARG	Kerekes (1980)
Churchill Falls, Labrador	LABRAD	1970	13	No	x	ALK 4.5	FARG	Duthie and Ostrofsky (1974)
Labrador	LAB-1	1979	98	x	x	ALKTIP	FARG	Clair et al. (1982)
Newfoundland	NEWF	1980	81	x	x	ALKTIP	FARG	Clair et al. (1982)
Le Parc des Laurentides, southern Quebec	LAUREN	1979	30	No	No	No	FARG	D.F. Brakke (unpublished)
Helifax region, Nova Scotia	NOVASC	1956	16	No	No	S.ACID	TOC	Gorham (1957)
		1977	16	No	No	S.ACID	TOC	Watt et al. (1979)
James Bay, northern Quebec	QUEBEC	1975	24	No	No	ALK 4.5	TOC	Magnin (1977)
Haliburton-Muskaka, southern Ontario	OME	1980	90	No	No	ALKTIP	No	P.J. Dillon (unpublished)
Sudbury region, southern Ontario	SUD	1976	209	No	x	ALK 4.5	No	Conroy et al. (1978)
Whitefish Indian Reservation, southern Ontario	WTFISH	1973	35	No	x	ALK 4.5	No	Beamish et al. (1975)

Codes: S.ACID = strong acid by Gran titration, ALK 4.5 = fixed pH 4.5 end point alkalinity, ALKTIP = total inflection point alkalinity, TOC = total organic carbon, FARG = color

Table 2. Summary of European data sets. All data included the major chemical parameters pH, conductivity, Na, K, Ca, Mg, SO_4 and Cl

Area	Code	Survey year	Number of lakes	Al	NO_3	HCO_3	Organic matter	Reference
Norway								
Southernmost Norway	SNEK-1	1974-75	719	x	x	No	No	Wright and Snekvik (1978)
Southern Norway	REGION	1981	48	x	x	ALK 4.5	PERM	Gjessing and Rogne (1982)
small lakes								
large lakes	BIGSJØ	1981	42	x	x	ALK 4.5	PERM	Gjessing and Rogne (1982)
Northwestern Norway	NVEST	1977	47	x	x	ALK 4.5	FARG, TOC	A. Henriksen (unpublished)
Oslo region	OSLOMA	1980	151	x	x	ALK 4.5	PERM	Henriksen (1982d)
Femund, central Norway	FEMUND	1978	33	x	x	S.ACID	FARG	Drabløs and Sevaldrud (1980)
Northern Norway	NNORGE	1975	29	x	x	ALK 4.5	No	Wright et al. (1977)
Sweden								
Southern Sweden	REGSVE	1981	89	x	x	ALKTIP	PERM	T. Ahl (unpublished)
Central and north Sweden	SVER-A	1930s	89	x	No	ALKTIP	FARG	Lohammar (1938)
		1974	101	x	No	ALKTIP	No	G. Andersson (unpublished)
Other countries								
Jutland, Denmark	DANSK	1978	14	No	x	S.ACID	FARG	A. Rebsdorf (1981)
Galloway, Scotland	SCOTCH	1979	77	x	x	S.ACID	TOC	Wright and Henriksen (1980)
Vosges Mountains, France	VOSGES	1981	9	x	x	ALK 4.5	No	R. Wright (unpublished)

Codes: S. ACID = strong acid by Gran titration. Alk 4.5 = fixed pH 4.5 end point alkalinity, ALKTIP = toal inflection point alkalinity, TOC = total organic carbon, FARG = color, PERM = oxygen demand by permanganate consumption.

North American lake sets

Figure 1. Map of North America showing locations of lake sets examined. See Table 1 for description of codes.

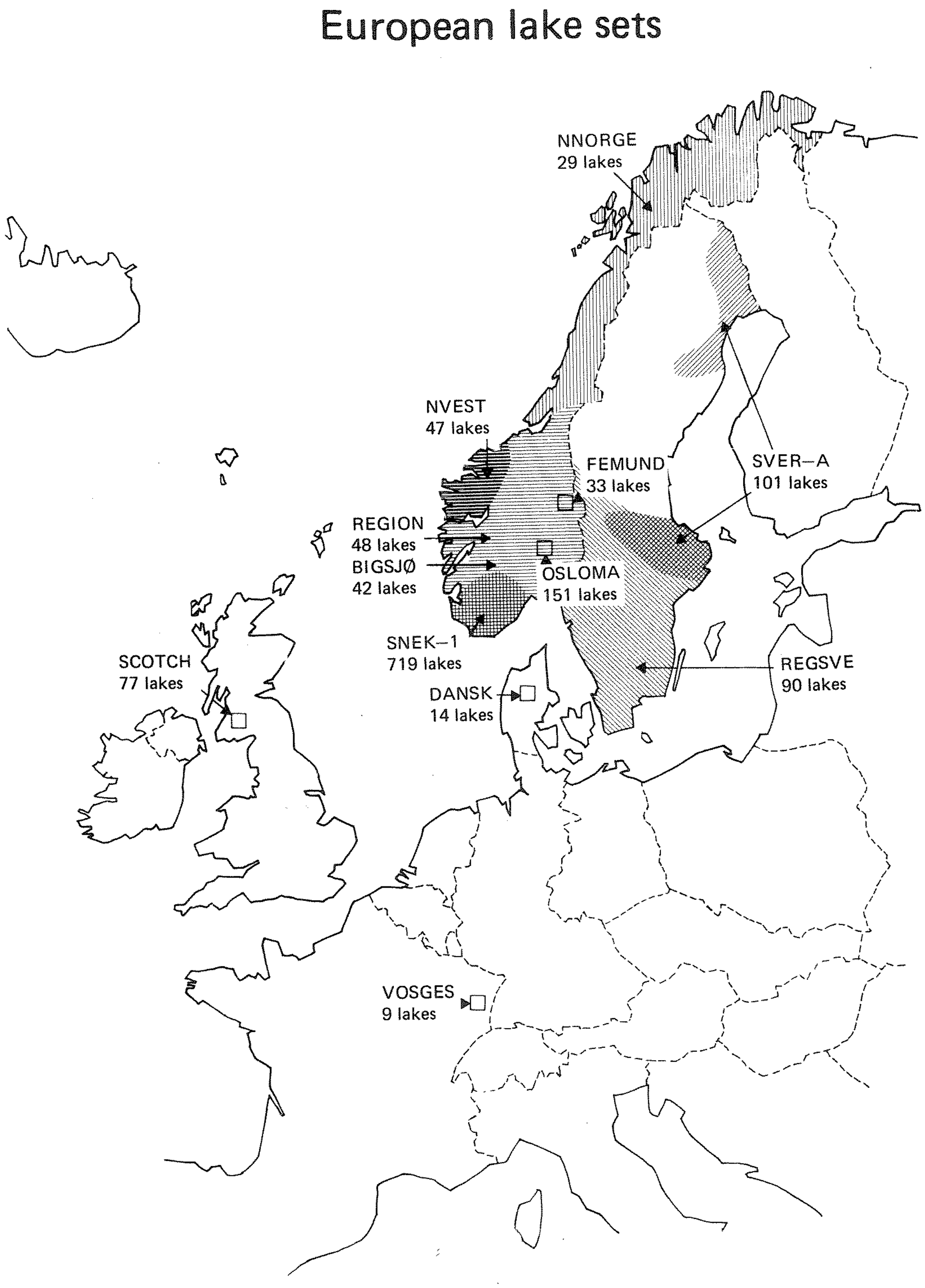

European lake sets

Figure 2. Map of Europe showing locations of lake sets examined. See Table 2 for description of codes.

3. EMPIRICAL MODEL OF LAKE ACIDIFICATION

Henriksen's (1980) empirical model for lake acidification springs from the observation that acidification is analogous to a large-scale titration in which a bicarbonate solution is titrated with a strong acid. Biological activity and chemical weathering provide the bicarbonate and acid precipitation provides the strong acid. Lake water is the net product of the titration.

This empirical approach is in many respects similar to that of Dickson (1980), Dillon et al. (1980) and Thompson (1982).

This model derives from empirical data for the composition of freshwaters and precipitation in areas relatively little subjected to acid precipitation (reference areas) and areas receiving highly acidic precipitation (acidified areas). These data are from oligotrophic freshwaters to which deposition from the atmosphere is the only important source of pollutants. Most of these freshwaters are softwater with low concentrations of dissolved ions. Such waters are characteristic of geologic terrain in which bedrock and overburden are highly siliceous (granite, gneiss, quartzite,) and soils are podzolic. Also typical for such geologic terrain is the absence of terrestrial sources of primary sulfur (i.e. no sulfide or sulfate minerals). Finally the model is based primarily on clearwater lakes and streams. .

The empirical model is simply a consequence of the ionic balance in which many of the ions either cancel each other or can be neglected. Here except for H^+ the valances of the ions will be omitted. Al is taken to be the sum of all positively-charged Al species. Units are µeq/l. The assumptions are as follows:

1. The ionic balance is given by:

   $H^+ + Al + Ca + Mg + Na + K + NH_4 = Cl + NO_3 + SO_4 + HCO_3 +$ organic anions (1)

2. A fraction of these dissolved constituents is marine seaspray. The ionic ratio of bicarbonate plus carbonate to chloride in seawater is about 0.004 and thus the acid-base influence of the marine fraction in lakewater is negligible. The seasalt fraction is subtracted under the assumptions that all Cl is of seawater origin and other ions are proportional to the ionic composition of seawater. Asterisk denote the non-marine fraction.

   $H^+ + Al + Ca^* + Mg^* + Na^* + K^* + NH_4 = NO_3 + SO_4{}^* + HCO_3$ + organic anions (2)

3. Minor ions are negligible or present in equivalent concentrations (NH_4, NO_3 and organic anions).

   $H^+ + Al + Ca^* + Mg^* + Na^* + K^* = SO_4{}^* + HCO_3$ (3)

4. The ions Na* and K* are subtracted as is a "background" of $SO_4{}^*$. In reference areas the sum of Na* + K* comprise a minor portion of the sum of cations. The mean values for 13 sets of data from reference areas listed by Henriksen (1980) show 12 percent Na* + K* and 88 percent Ca* + Mg*. Mean values for the lake sets used here also show a minor fraction of Na* + K* relative to Ca* + Mg* (Figures 3 and 4). The data from 95 lakes in Labrador (data set LAB-1) are typical for reference areas and reveal no significant relationship between Na* + K* and alkalinity (Figure 5). Na* + K* levels are low at all alkalinities. Lakes in reference areas (background) also exhibit a low level of non-marine sulfate, and again this level appears unrelated to ionic strength (Figure 6). The Labrador lakes are typical of this as well (Figure 7).

"Background" sulfate levels as well as Na* + K* may be related to a regional atmospheric deposition of natural and anthropogenic sulfur and terrestrial dusts.

Subtraction of Na* + K* and "background" SO_4 levels gives

$$H^+ + Al + f\ (Ca^* + Mg^*) = \text{net } SO_4{}^* + HCO_3 \qquad (4)$$

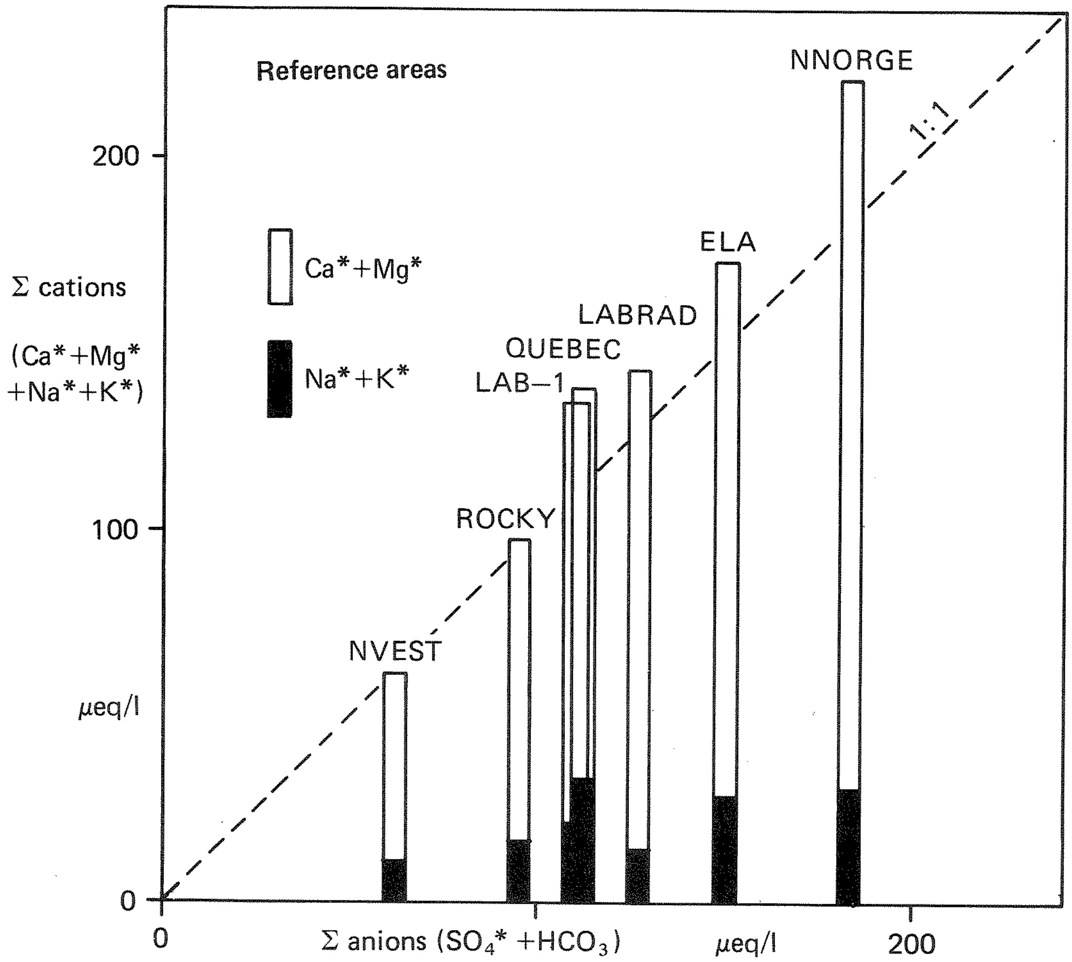


Figure 3. Sum of cations (Ca* + Mg*) and (Na* + K*) vs. sum of anions SO_4* + HCO_3 for lakes in reference areas. Means for lake groups are plotted.

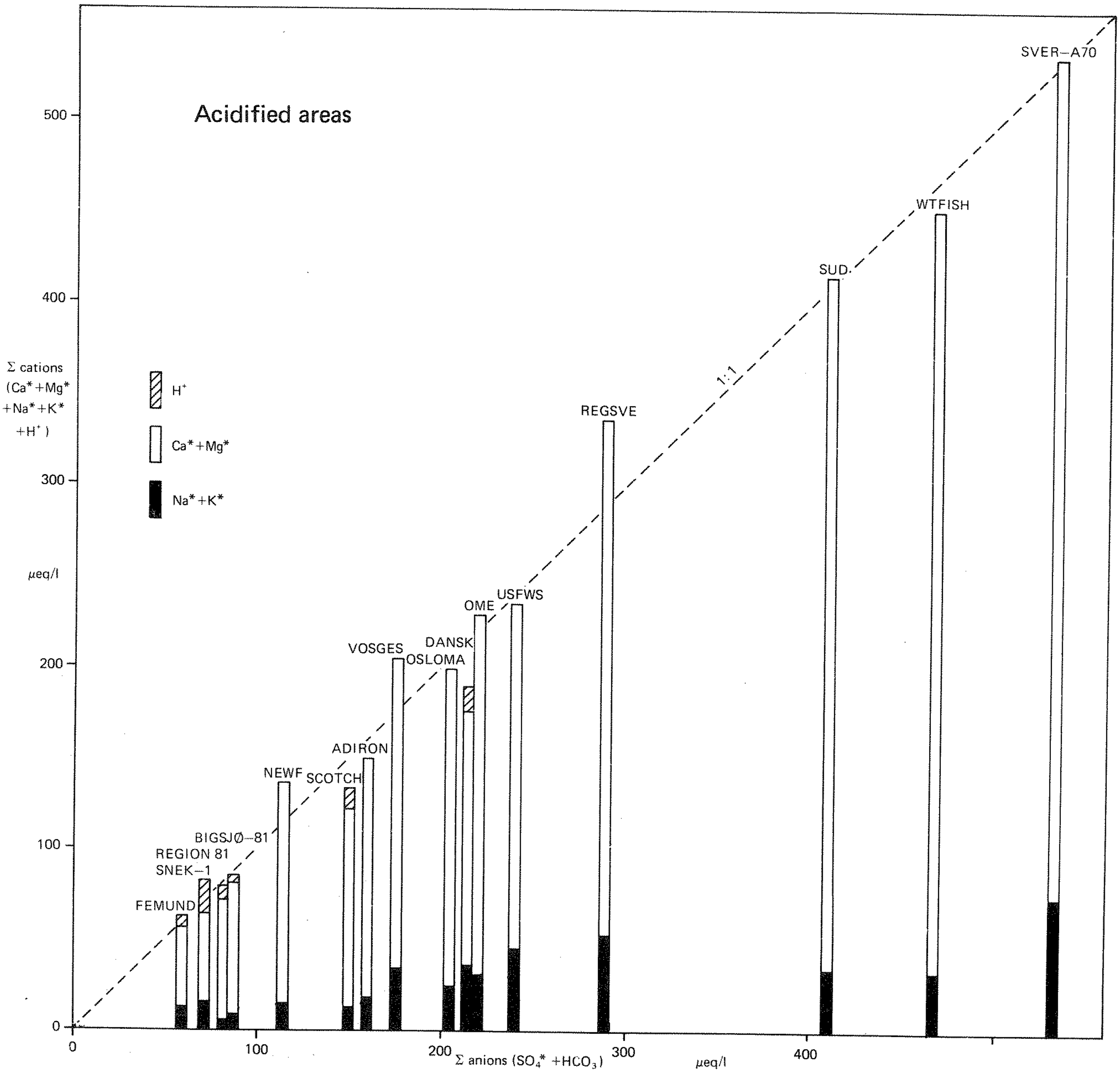


Figure 4. Sum of cations (Ca* + Mg*) and (Na* + K*) vs. sum of anions SO_4* + HCO_3 for lakes in acidified areas. Means for lake groups are plotted.

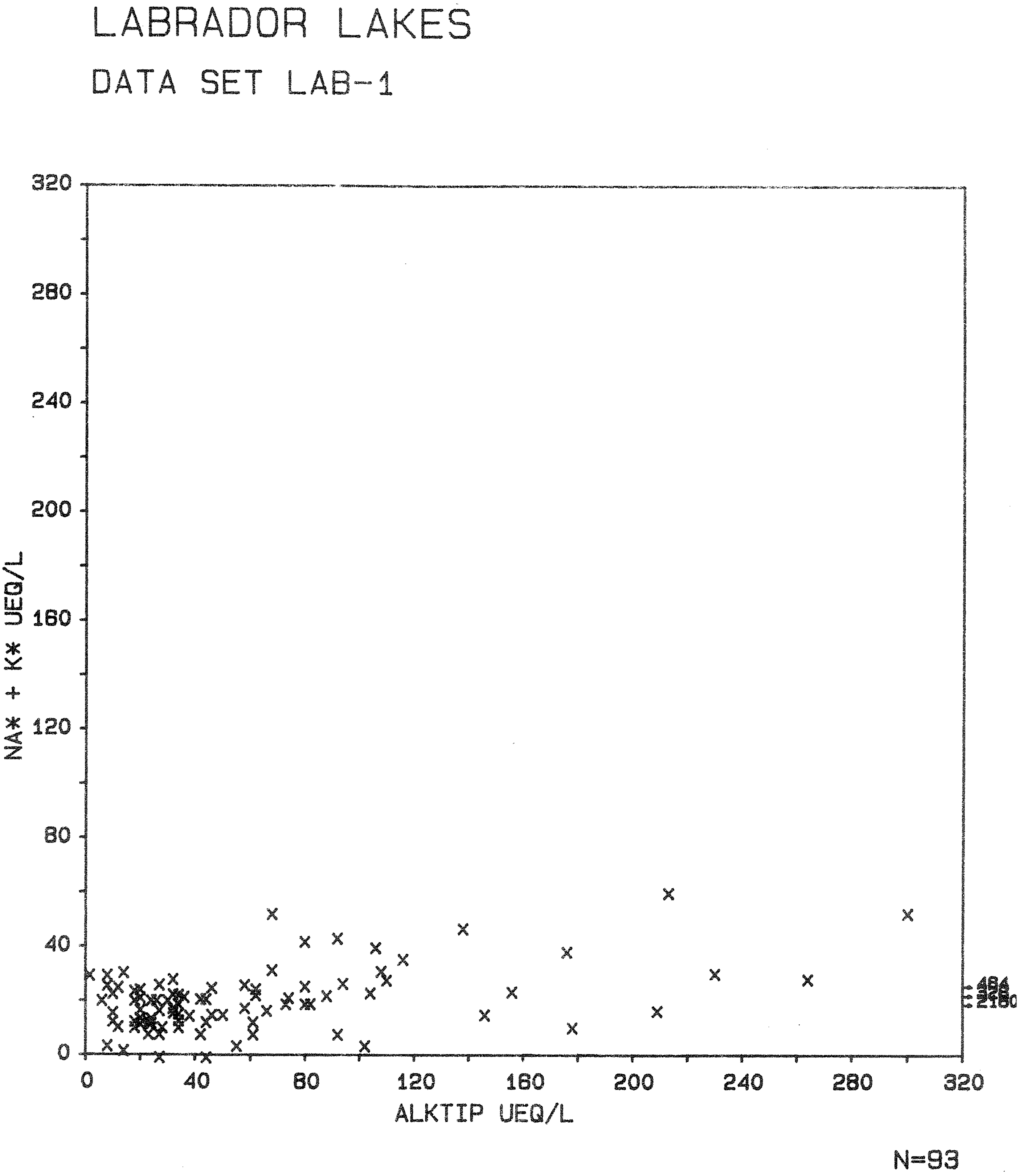


Figure 5. Sum of Na* + K* vs. alkalinity for 95 lakes in Labrador (data set LAB-1). Two lakes with high alkalinity plot off scale. These 2 parameters are not significantly correlated.

where f denotes an empirical function of Ca* + Mg* and net SO_4 is defined as SO_4* above background.

$$\text{net } SO_4^* = SO_4^* - \text{background } SO_4^* \qquad (5)$$

The empirical model of acidification is based on the 6 components in equation 4. The model thus relies on the simplifying assumption that none of the other ions plays a significant role in the acidification of freshwaters.

In reference areas net SO_4* is zero. H^+ and Al are also negligible; no clearwater, oligotrophic low pH lakes are found in such regions. For reference areas equation 4 simplifies

$$f(Ca^* + Mg^*) = HCO_3 \qquad (6)$$

The function f is obtained from the empirical relationship between Ca* + Mg* and HCO_3 in lakes in reference areas (Table 3) Figure 8). These regressions yield slopes of 0.8-1.1 and intercepts ranging from -75 (ELA) to 24 (SVERA-30). The large negative intercept for the ELA data is due to the unusually high level of excess-SO_4 "background" SO_4 in these lakes. The positive intercept obtained from the 1930 Swedish data must be interpreted with caution because of the uncertainities in the accuracy of these historical data. The intercept of these regressions is to a large extent determined by the relative concentrations of Na* + K* and SO_4*. A negative intercept results from SO_4* > Na* + K*. The intercept is apparently area-specific and is dependent on regional variations in background SO_4 levels and Na* + K* levels. For the purpose here of obtaining a general model applicable to softwater lake regions the relationship

$$\text{alk} = 0.91\ (Ca^* + Mg^*) \qquad (7)$$

is chosen. The slope derives from the regression through the origin of alk on Ca* + Mg* for the 13 data sets given by Henriksen (1980).

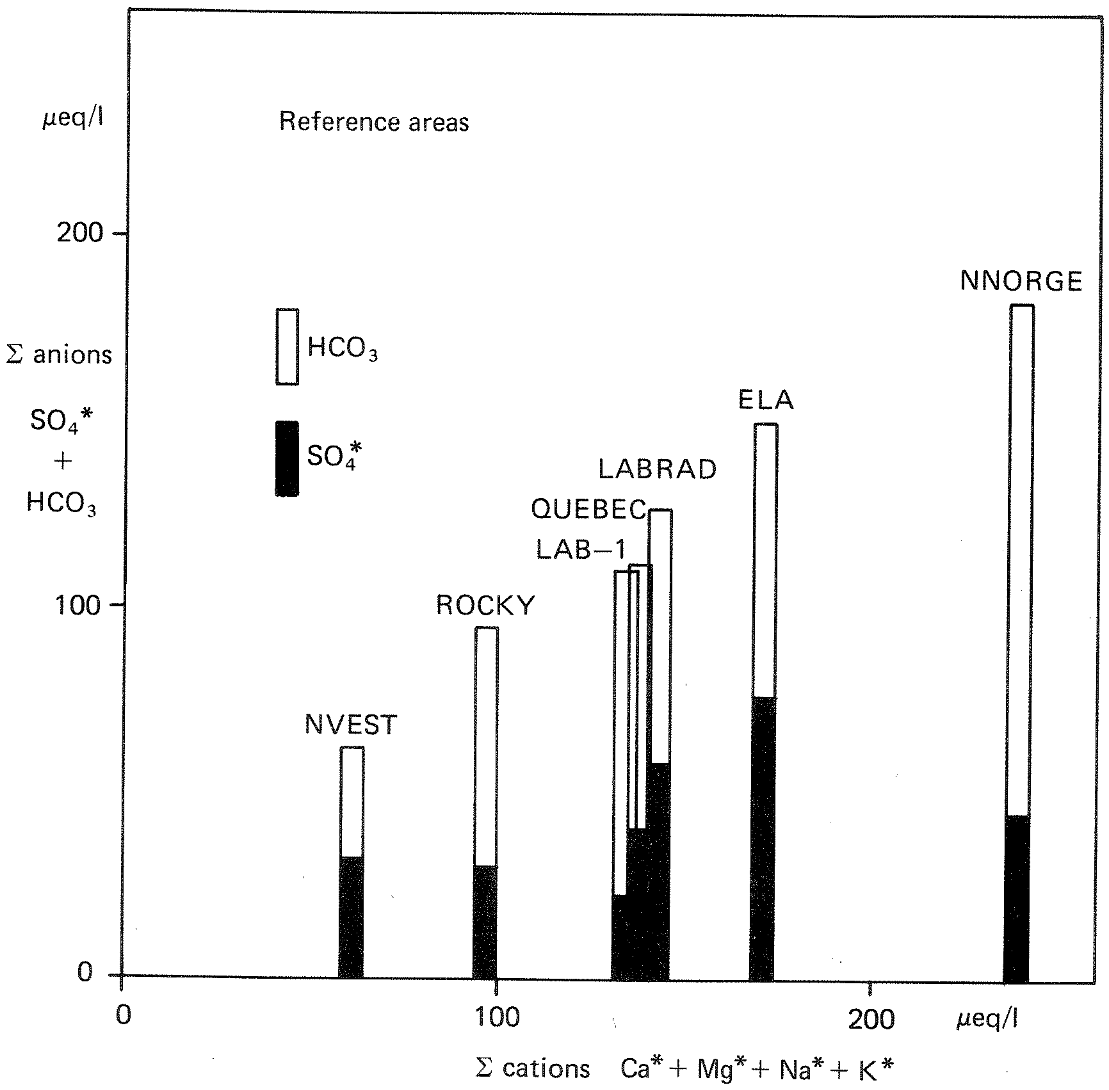


Figure 6. Sum of anions HCO_3 and SO_4* vs. sum of cations for lakes in reference areas. Means for lake groups are plotted.

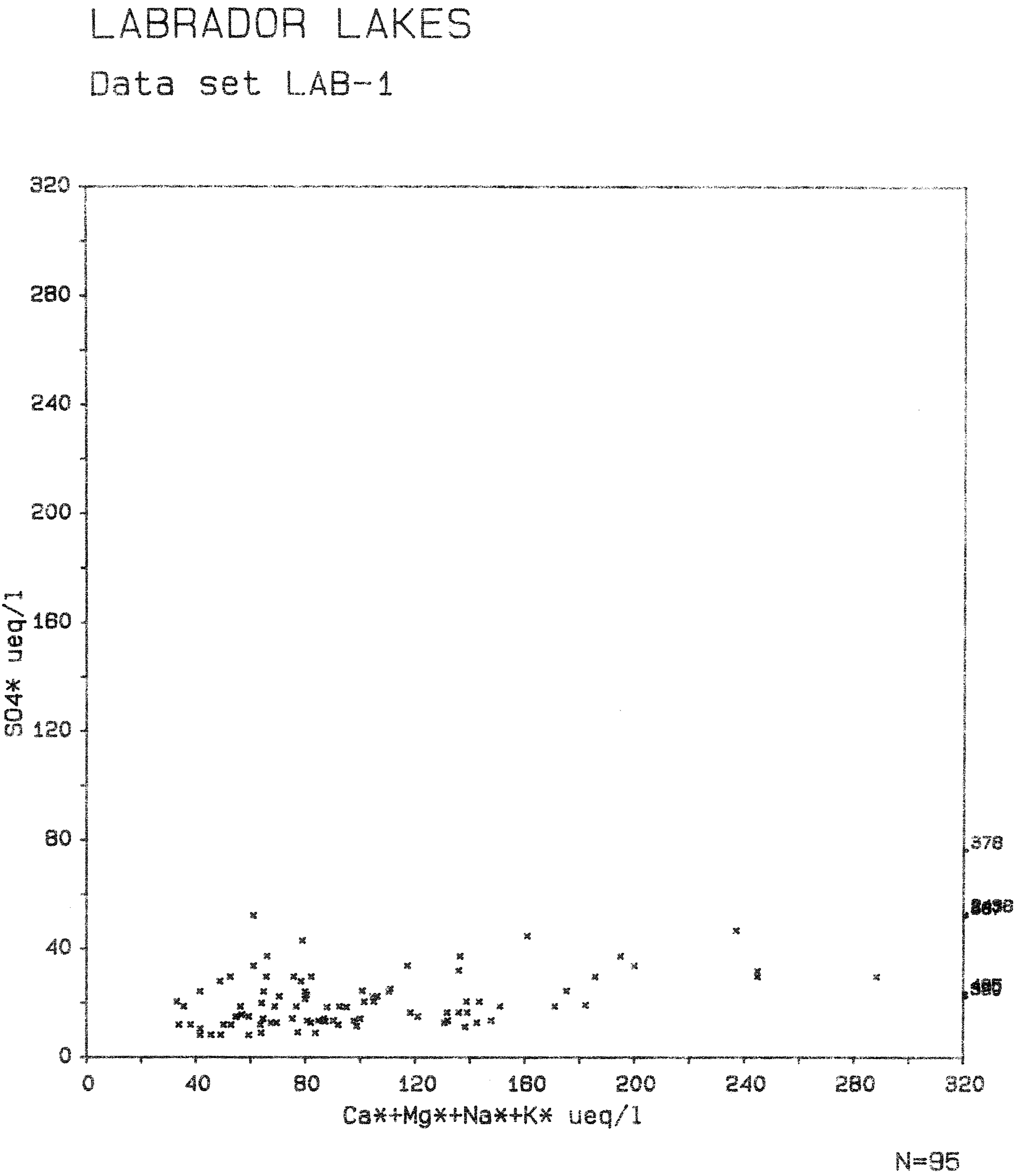


Figure 7. SO_4* vs. sum of cations for 95 lakes in Labrador (data set LAB-1). These 2 parameters are not significantly correlated.

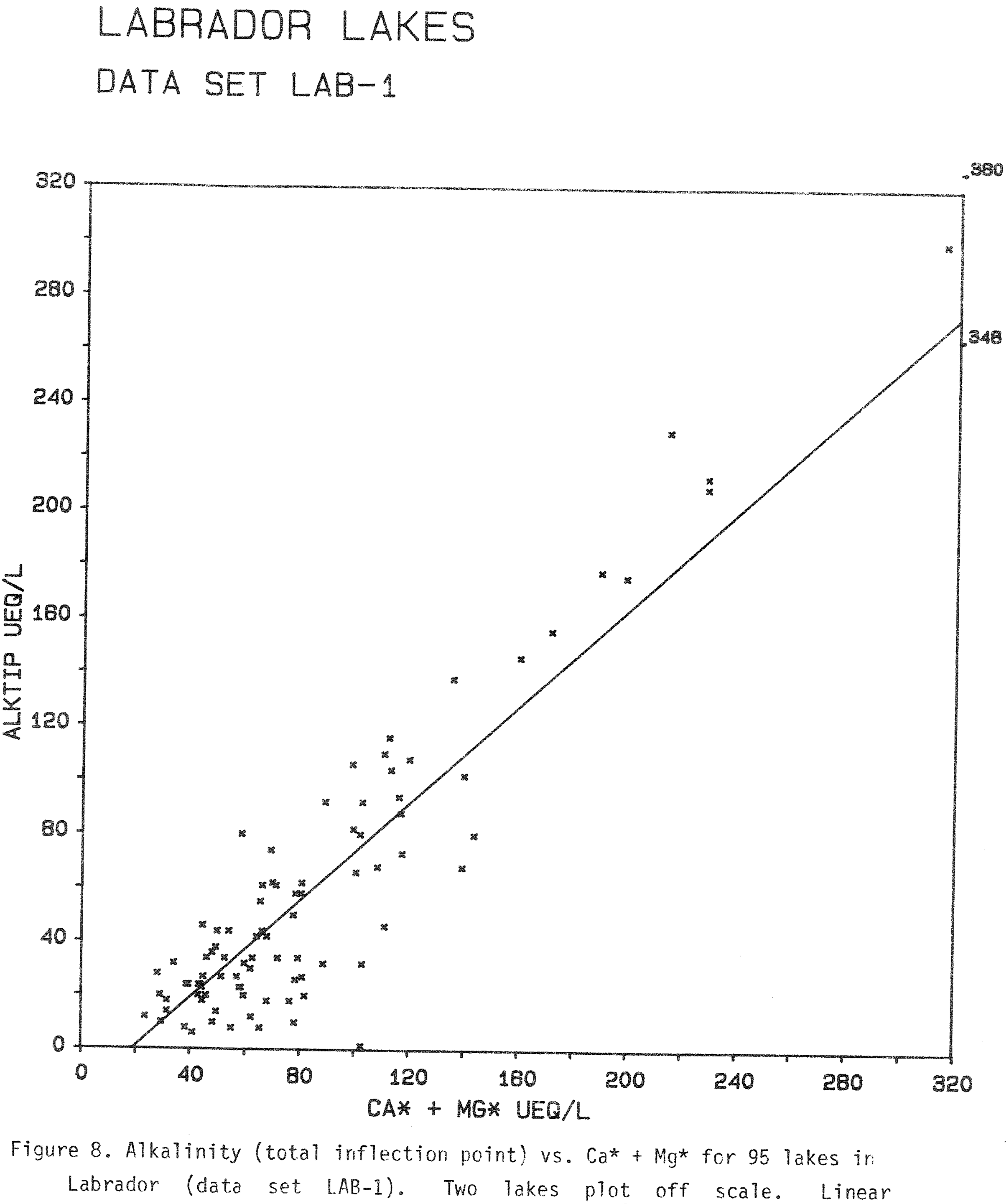


Figure 8. Alkalinity (total inflection point) vs. Ca* + Mg* for 95 lakes in Labrador (data set LAB-1). Two lakes plot off scale. Linear regression gives alk = -26 + 0.99 (Ca* + Mg*), r^2 = 0.92.

Table 3. Least-squares of alkalinity on Ca* + Mg* for groups of lakes in reference areas. Units: µeq/l.

Data set	n	Regression	r^2
Means of 13 lake sets (Henriksen 1980)	13	alk = -14 + 0.93 (Ca* + Mg*)	0.98
ROCKY	30	alk = -26 + 1.12 (Ca* + Mg*)	0.94
LAB-1 all lakes	95	alk = -26 + 0.99 (Ca* + Mg*)	0.92
LAB-1 color $\leq$ 50	77	alk = -20 + 0.99 (Ca* + Mg*)	0.94
ELA	102	alk = -75 + 1.03 (Ca* + Mg*)	0.58
QUEBEC	23	alk = -11 + 0.79 (Ca* + Mg*)	0.90
NNORGE	26	alk = -27 + 1.00 (Ca* + Mg*)	0.94
NVEST SO_4 < 35	24	alk = -7 + 1.08 (Ca* + Mg*)	0.46
SVERA-30	89	alk = 24 + 0.91 (Ca* + Mg*)	0.96

The choice of slope and intercept has relatively minor influence on predicted chemical composition. The choice of intercept will be increasingly important at very low ionic strength, such as a few extreme cases found in Norway (Henriksen, pers. comm.).

The specification of function f in equation 4 completes the required assumptions and empirical relationships necessary.

$$H^+ + Al + 0.91\ (Ca^* + Mg^*) = \text{net}\ SO_4^* + HCO_3 \qquad (8)$$

The concentrations of several ions in equation 8, however, are not independent of one another. Bicarbonate and hydrogen ion are for practical purposes mutually exclusive. When bicarbonate is present in significant amounts, the H^+ concentration is negligible, and visa versa. At the equivalence point pH 5.6 the concentrations of both are very low, about 2.5 µeq/l. In practice this means that either H^+ or HCO_3 can be neglected depending on pH (Figure 9).

Secondly, ionic aluminum is related to H^+ concentration and becomes important at pH levels below about 5. Ionic aluminum was not measured in any of the lake surveys dealt with here. Total dissolved aluminum was included in several data sets, but this comprises inorganic and organic aluminum complexes as well as colloidal and polymeric aluminum (Driscoll, 1980). The theoretical, equilibrium concentration of ionic aluminum can be calculated from solubility and equilibrium constants and measurements or estimates of pH and concentrations of the major complexing ligands sulfate and fluoride (Driscoll, 1980). Ionic aluminum can also be obtained from measurement of the monomeric, labile aluminum fraction again with experimental values for equilibrium constants of various inorganic species (Driscoll, 1980).

Driscoll's data from lakes and streams in the Adirondacks yield log Al (µeq/l) = 11.6 - 2.21 pH. A study of Al-speciation in an acid lake in southernmost Norway yields the relationship log Al (µeq/l) = 12.7 - 2.56 pH (Wright and Skogheim, in prep.). These data show that for the purposes of the acidification model ionic Al is negligible above pH 5 (Figure 10).

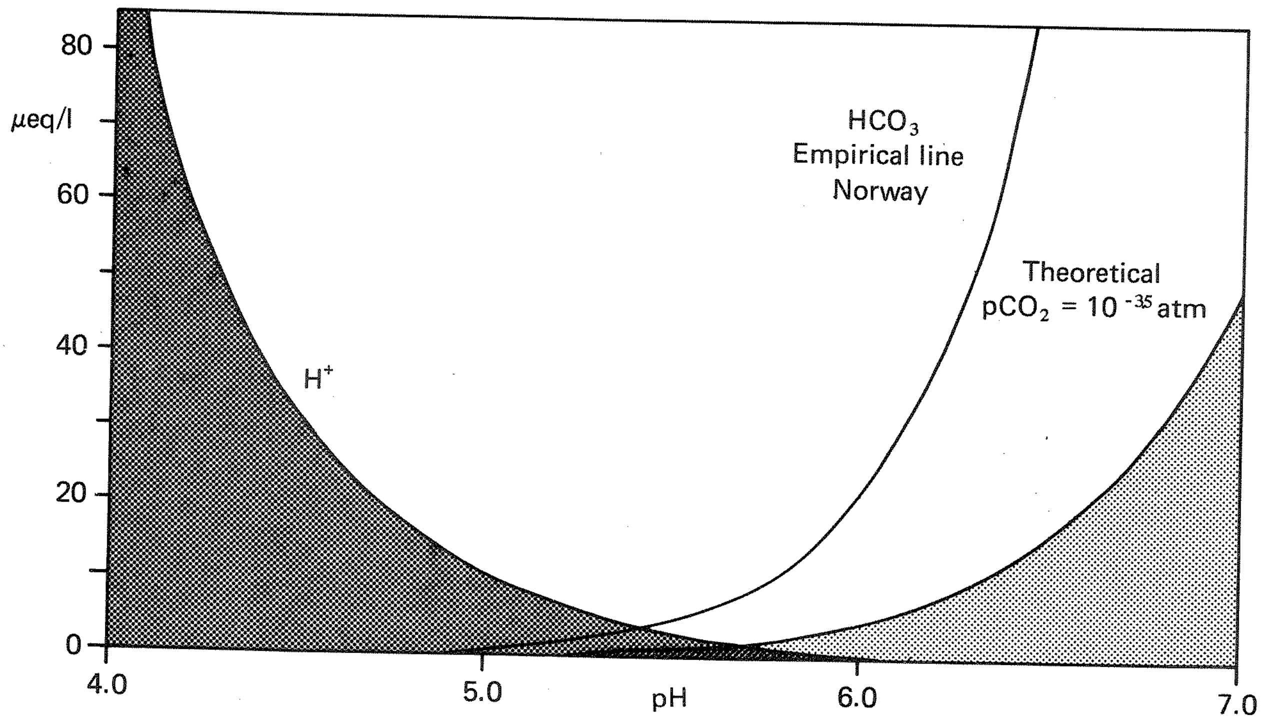


Figure 9. HCO_3 and H^+ concentrations vs. pH for distilled water in equilibrium with atmospheric CO_2 (theoretical line) and the empirical relationship for over 1000 water samples from Norway (Henriksen 1982c).

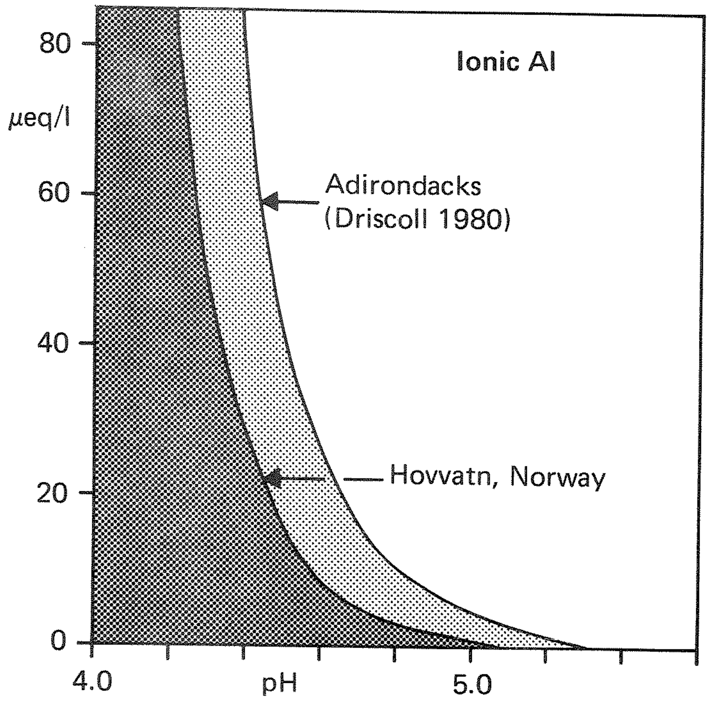


Figure 10. Empirical relationships between ionic aluminum (sum of all positively-charged species) and pH measured in Adirondack, NY, waters (Driscoll 1980) and lake Hovvatn, Norway (Wright and Skogheim, in prep.)

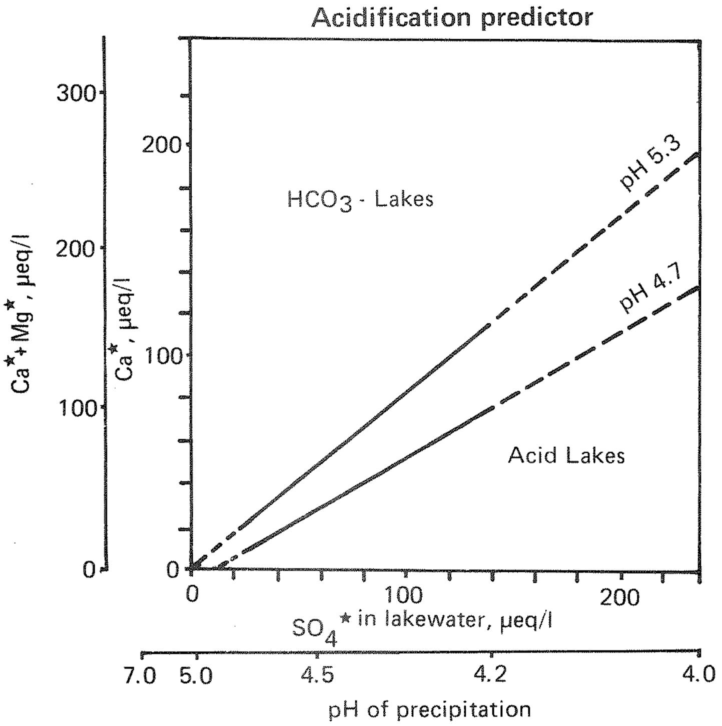


Figure 11. Henriksen's (1980) predictor nomograph to specify the pH of lakes given Ca* + Mg* or Ca* only and SO_4* in lakewater or weighted-average pH of precipitation.

The relationships between pH, HCO_3 and Al mean that lakes in acidified areas can be separated into 3 classes depending upon pH. At $pH > 5.5$ bicarbonate is present in significant concentrations, and H^+ and Al can be neglected (equation 9). At pH about 5.0-5.5 H^+, Al and HCO_3 can be neglected (equation 10). And at pH below 5.0 HCO_3 can be neglected (equation 11).

$$pH > 5.5: 0.91 (Ca^* + Mg^*) = \text{net } SO_4^* + HCO_3 \qquad (9)$$

$$pH\ 5.0\text{-}5.5: 0.91 (Ca^* + Mg^*) = \text{net } SO_4^* \qquad (10)$$

$$pH < 5.0: H^+ + Al + 0.91 (Ca^* + Mg^*) = \text{net } SO_4^* \quad (11)$$

Henriksen's (1980) empirical acidification diagram separates lakes into these three classes (Figure 11).

The empirical model for lake acidification links these 3 cases and the reference area case. Beginning with lakes in reference areas - Ca* + Mg* bicarbonate lakes - an increase in acid deposition leads to an increase in SO_4^* concentrations in lake water which is compensated by either a corresponding decrease in another anion (bicarbonate) or a corresponding increase in cations (Ca* + Mg*) or a fraction of both. Decrease in bicarbonate is analogous to a titration (hence, the original name "titration model") whereas an increase in Ca* + Mg* is analogous to ion-exchange of incoming H^+ with these base cations. The decrease in bicarbonate can occur until bicarbonate is exhausted at which point H^+ concentrations and ionic Al become important. Low pH lakes today thus most likely began as Ca* + Mg*-bicarbonate lakes (equation 7) and then as acid deposition increased passed through stages described by equations 9, 10 and 11.

The empirical model provides 2 quantitative measures of acidification (Henriksen 1979, 1980). Loss of alkalinity (either real or apparent) is defined as original alkalinity minus present-day alkalinity and using equation (7) can be set equal to

$$\Delta alk = 0.91 (Ca^* + Mg^*) - HCO_3 + H^+ + Al \qquad (12)$$

where all components on the right-hand side are measured concentrations in lakewater today.

The second measure is simply the amount of non-marine sulfate above background, net SO_4^* (equation 5). If the assumptions behind the empirical model are correct, then these two measures of acidification should be equal

$$0.91\ (Ca^* + Mg^*) - HCO_3 + H^+ + Al = \text{net } SO_4^* \qquad (13)$$

This is the acidification equation.

4. THE EMPIRICAL MODEL WITH NORTH AMERICAN AND EUROPEAN LAKES

The acidification equation (equation 13) should describe present-day lake water chemistry in oligotrophic, softwater, clearwater lakes in both North America and Europe, if the assumptions behind the empirical model are of general validity. The present-day chemical composition of lakes in each of the 15 sets of data from North America and 12 sets from Europe can be used to test the general applicability of the acidification equation.

4.1 Background SO_4* levels

The first step is to determine the level of background SO_4* for each area. For reference areas background SO_4* can be measured directly. For these data sets background SO_4* is set as the mean of measured SO_4* concentrations (Table 4). For acidified areas background SO_4* must be estimated independently.

In developing the acidification equation Na* + K* and background SO_4* were removed from the ionic balance in going from equation 3 to equation 4 and equation 8. The difference between equations 3 and 8 is arithmetically equal to background SO_4*

$$\text{background } SO_4^* = 0.09\,(Ca^* + Mg^*) + Na^* + K^* \qquad (14)$$

This equation can be used to obtain an estimate of background SO_4^* for acidified areas. To a certain extent area-specific variations in the function f relating HCO_3 and Ca* + Mg* (equation 6), area-specific variations in Na* + K* and area-specific variations in background SO_4* all influence the level of background SO_4* estimated by this equation. Equation 14 suggests that background SO_4* is a function of Ca* + Mg* whereas for lakes within a given area such as Labrador background SO_4* levels are in fact not significantly related to Ca* + Mg* concentrations (Figure 7). Equation 14 thus provides an estimate of background SO_4* for an area as a whole but does not imply a causual relationhip between ionic strength and background SO_4*. Equation 14 is merely a consequence of ionic balance and of the assumptions and empirical relationships used to obtain the acidification equation (equation 13).

Table 4. Estimated levels of background excess-SO_4 (bSO_4*) in reference areas and acidified areas. Estimated levels are obtained from equation (14) $bSO_4^* = 0.09\ (Ca^* + Mg^*) + Na^* + K^*$. Units: µeq/l.

Reference areas				Acidified areas			
Data set	n	measured bSO_4^*	estimated bSO_4^*	Data set	n	measured total SO_4^*	estimated bSO_4^*
ROCKY	29	30 ± 12	24	ADIRON	206	134	31
ELA	102	76 ± 16	41	FLORID 1	13	111	12
LABRAD	13	58 ± 5	26	2	7	283	78
LAB-1	98	23 ± 12	31	USFWS all	168	117	62
NEWF	81	44 ± 14	26	CT	22	160	67
QUEBEC	23	40 ± 12	41	MA	30	116	82
NNORGE	26	45 ± 20	38	ME	31	117	44
NVEST	49	32 ± 20	16	NH	42	105	66
				RI	8	110	26
				VT	34	109	62
				KEREKE	3	63	27
				LAUREN	4	129	24
				NOVASC 1956	16	104	47
				1977	16	118	26
				OME	70	167	49
				SUD	208	250	68
				WTFISH	33	368	70
				SNEK-1	616	71	20
				REGION 81	47	59	11
				BIGSJØ 81	44	51	15
				OSLOMA	151	120	40
				FEMUND	33	41	17
				REGSVE	90	176	79
				DANSK	14	196	49
				SCOTCH	55	111	23
				VOSGES	9	95	49

Of the North American and European data sets used here 8 are from relatively unaffected (reference) areas. For these the measured excess-SO_4 levels are approximately equal to the estimated background levels obtained from equation (14) (Table 4). Estimated background levels of excess-SO_4 for acidified areas are thus assumed to be given by equation (14). Background SO_4* levels are 26-41 µeq/l in both reference areas and acidified areas in northeastern North America and somewhat higher in the Great Lakes region (Table 4, Figure 12). The


Background SO_4
μeq/l

Figure 12. Levels of background excess-sulfate (μeq/l) for groups of lakes in North America. $bSO_4{}^* = 0.09\ (Ca^* + Mg^*) + Na^* + K^*$.

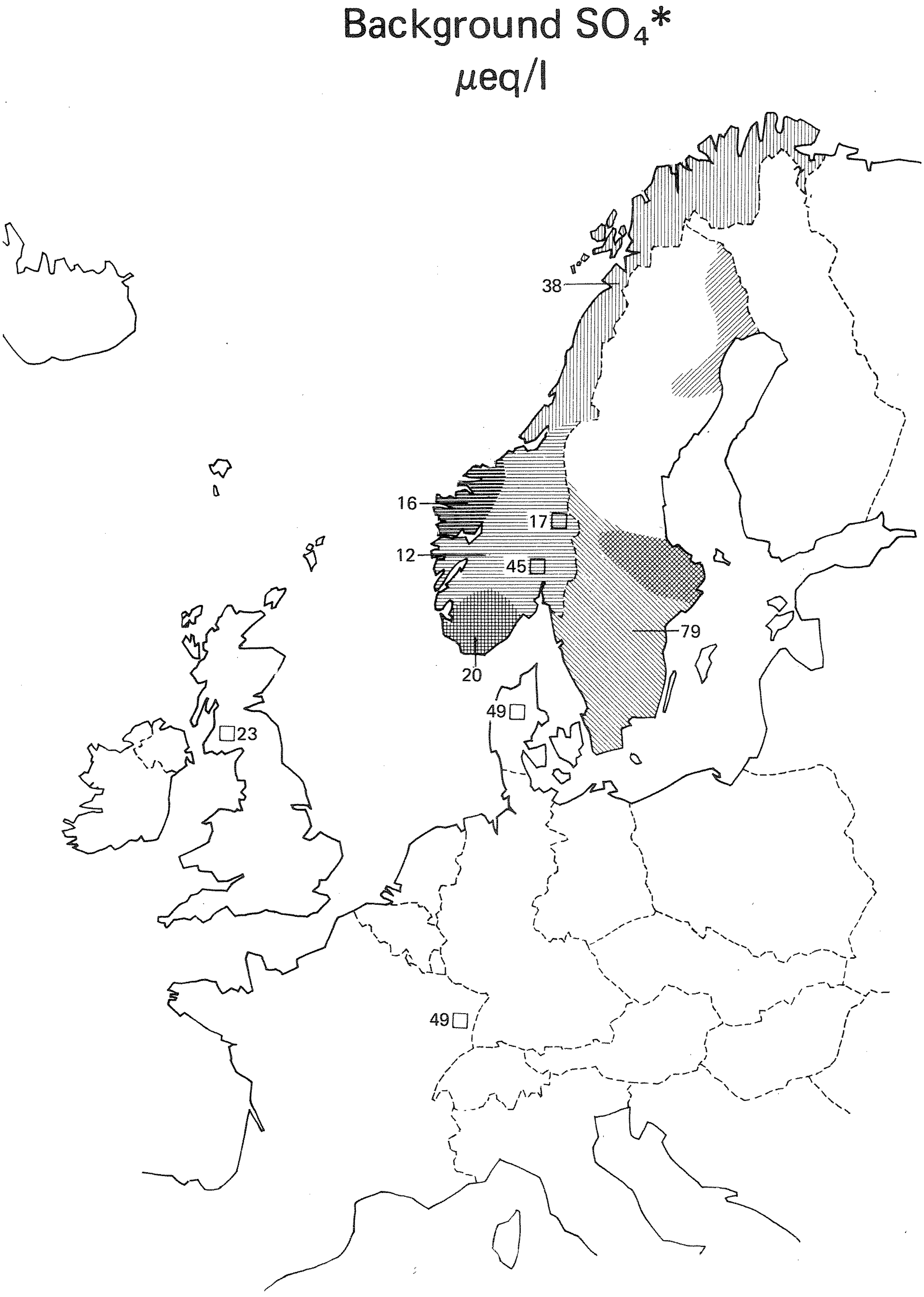


Figure 13. Levels of background excess-sulfate (μeq/l) for groups of lakes in Europe. $bSO_4^* = 0.09\ (Ca^* + Mg^*) + Na^* + K^*$.

estimate for Lake Superior, 67 µeq/l, is taken from Harvey et al. (1981).

For Europe background levels are 12-39 µeq/l in Norway and higher elsewhere (Table 4, Figure 13).

These estimated background SO_4^* levels suggest a possible relationship between evapotranspiration and bSO_4^*. In areas such as the Great Lakes region, southern Sweden and Denmark, a larger fraction of increasing precipitation is lost via evapotranspiration. This will tend to increase the concentrations of dissolved components including SO_4 in runoff and lake water.

There are also indications that background sulfate is of regional character. The data from ROCKY, LAB-1, and ELA show no significant relationship between Ca* + Mg* and SO_4^*. Levels of SO_4^* are relatively uniform from lake-to-lake within each data set. This in turn suggests that for most oligotrophic, softwater lakes background SO_4^* is largely of atmospheric origin.

4.2 Present-day acidification

The acidification equation equates 2 measures of acidification - loss of alkalinity and increase in non-marine sulfate. This equation can now be used with the data sets at hand.

The relationship is tested by linear regression of loss of alkalinity on net excess sulfate and by simple scatter plots of these two parameters. Linear regression analyses within individual data sets are meaningful only for data sets that cover a gradient of acidification; lakes in relatively small areas receiving the same loadings of strong acid theoretically should reveal identical acidification by both measures. In fact data from such lake groups show scatter related probably to variations in hydrology and uncertainities in the chemical analyses. Three of the North American data sets and 5 of the European sets span a 2-fold or greater range in acidification. Regressions of acidification (loss of alkalinity) on excess-SO_4 give highly-significant relationships with slopes ranging from 0.6-0.9 and intercepts at 0 - 100 µeq/l (Table 5). The regression lines through the origin have slopes of about 1.0, the value predicted by the acidification equation.

Plots of Δalk vs. net SO_4* for individual lakes within each of the data sets show that most of lakes cluster along the 1:1 line. The envelopes enclosing 90 percent or more of the lakes in each data set lie along this theoretical line (Figures 14-17). Reference lakes are found in relatively small envelopes near the origin, whereas acidified lakes exhibit acidificaton up to 500 µeq/l.

The relationship between acidification and excess-sulfate can also be evaluated using the group mean for each data set (Table 6). For North America a total of 13 lake group means yield: Δalk = 17 + 0.87 net SO_4*.

USFWS was taken as one group. These data span a 30-fold range in acidification from a mean of 9 µeq/l for ROCKY (28 lakes) to a mean of 280 µeq/l for WTFISH (33 lakes). Excess-sulfate ranges from -8 to 298 µeq/l. European lakes yield a similar relation: Δalk = 20 + 0.74 net SO_4*.

The Florida groups were excluded; these are clearly "outliers", indicating special chemical composition. The lakes in southern Florida appear to have anomalous excess-sulfate levels. Lake-to-lake variations are also high. The Florida lakes are the only North American lakes included that are not in glaciated terrain. The chemistry of the Florida lakes appears to differ substantially from lakes in glaciated regions, and the interpretation of these differences requires a separate study.

That all these diverse sets of lake chemistry data yield approximately similar relationships between acidification (loss of alkalinity) and increase in excess-sulfate concentrations in lakewater strongly suggests that the empirical model of lake acidification adequately describes present-day chemical composition of oligotrophic, softwater, clearwater lakes. Furthermore inasmuch as the model basically relies on ionic

Table 5. Linear regression analyses of loss of alkalinity (Δalk) on increase in excess sulfate (net SO_4^*) for sets of lakes in North America and Europe. Only data sets that span a gradient in acidification are listed. Δalk = 0.91 (Ca* + Mg*) - HCO_3 + H^+ + Al; net SO_4^* = SO_4^* - bSO_4^*. Units: μeq/l.

Data set	n	Regression Δalk = a + b.net SO_4^*		r^2	Through origin Δalk = b.net SO_4^*	Mean ± S.D.		Al function used
		a	b		b	Δalk	net SO_4^*	
USFWS	168	16	0.65	0.27	1.00	52 ± 38	56 ± 38	log Al = 11.6 - 2.21 pH
SUD	208	45	0.81	0.78	1.00	192 ± 91	182 ± 98	log Al = 11.6 - 2.21 pH
WTFISH	33	114	0.62	0.70	0.95	296 ± 85	298 ± 116	log Al = 11.6 - 2.21 pH
SNEK-1	616	11	0.78	0.87	0.83	51 ± 31	51 ± 34	log Al = 12.7 - 2.56 pH
REGION 1981	49	3	0.92	0.93	0.96	51 ± 43	51 ± 45	log Al = 12.7 - 2.56 pH
BIGSJØ 1981	43	7	0.79	0.70	0.92	35 ± 24	36 ± 25	log Al = 12.7 - 2.56 pH
REGSVE	90	83	0.61	0.65	1.02	148 ± 76	108 ± 101	log Al = 12.7 - 2.56 pH
SVER-A 1970	101	35	0.65	0.71	0.81	97 ± 80	95 ± 105	log Al = 12.7 - 2.56 pH

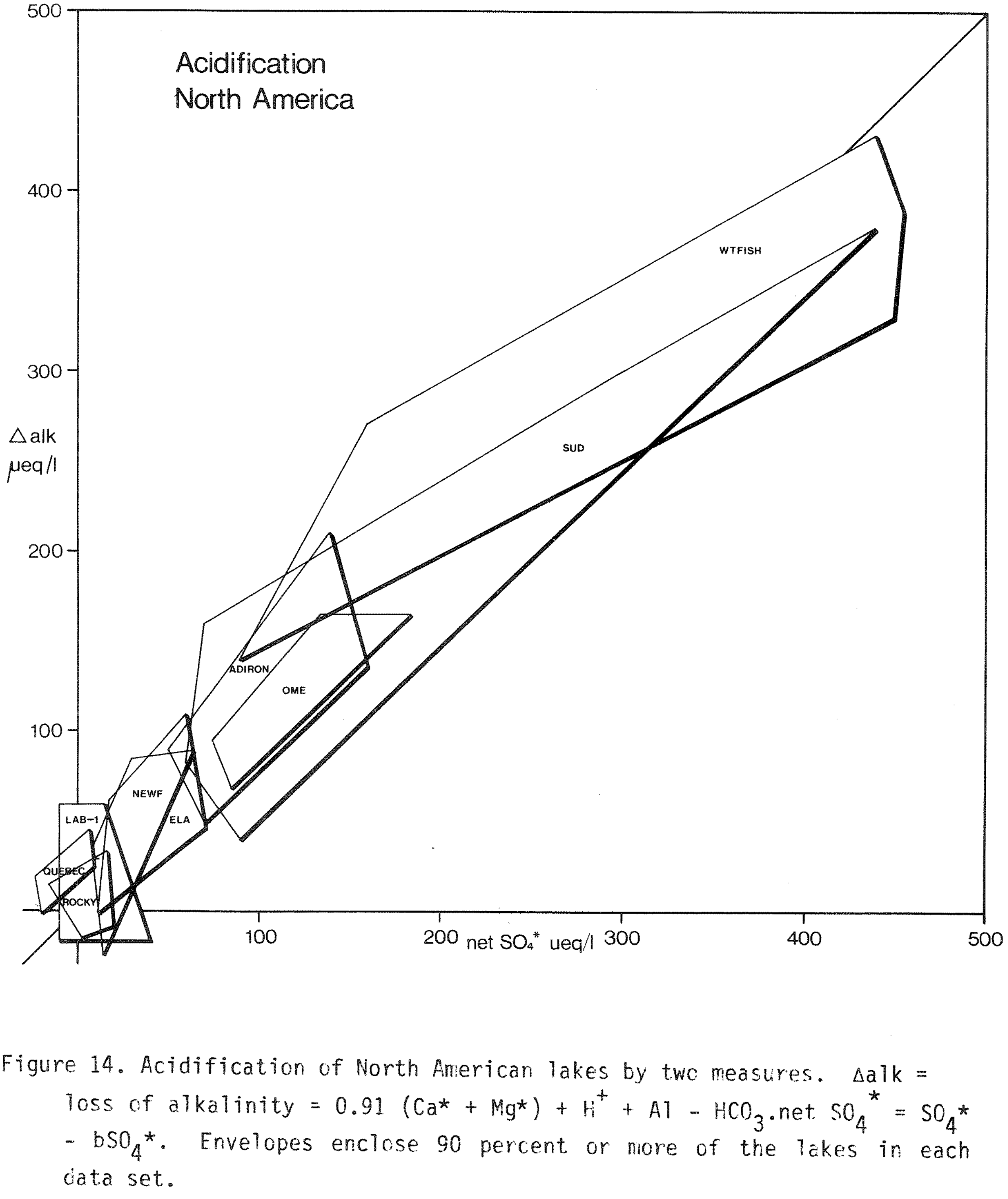


Figure 14. Acidification of North American lakes by two measures. Δalk = loss of alkalinity = 0.91 (Ca* + Mg*) + H^+ + Al - HCO_3.net SO_4^* = SO_4^* - bSO_4^*. Envelopes enclose 90 percent or more of the lakes in each data set.

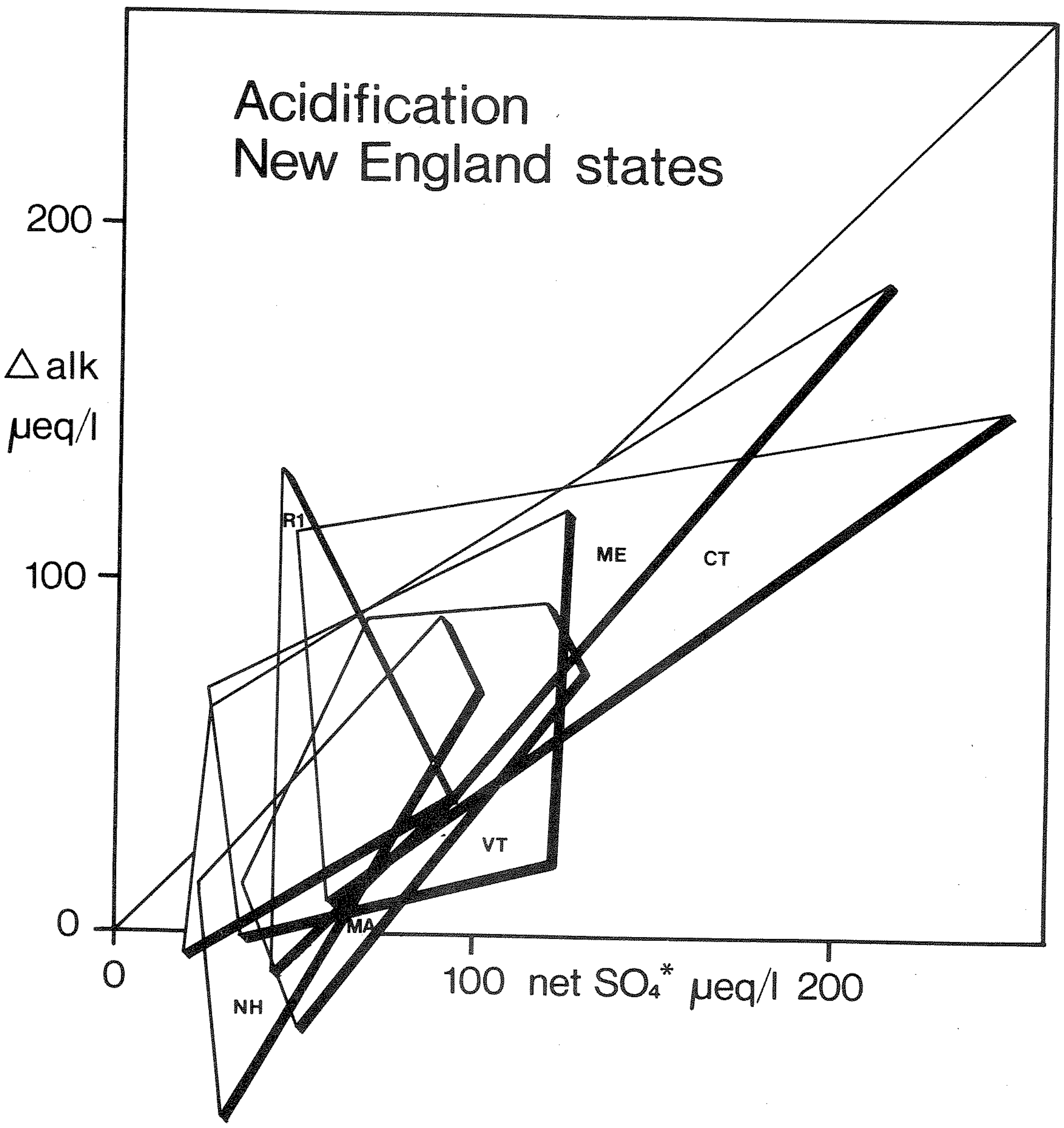


Figure 15. Acidification of lakes in the New England states (data set USFWS). See also Figure 14.

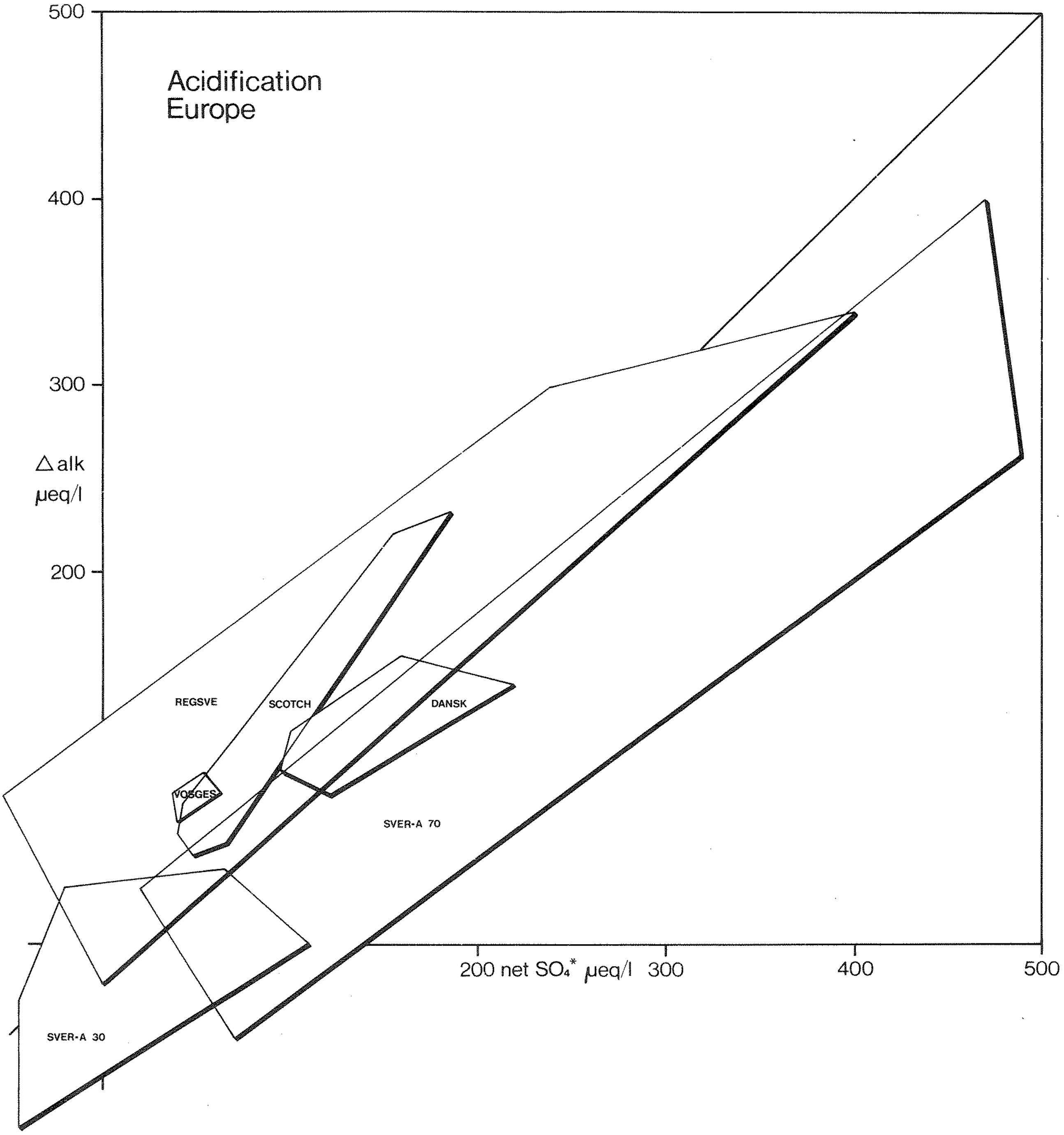


Figure 16. Acidification of lakes in Europe. See also Figure 14.

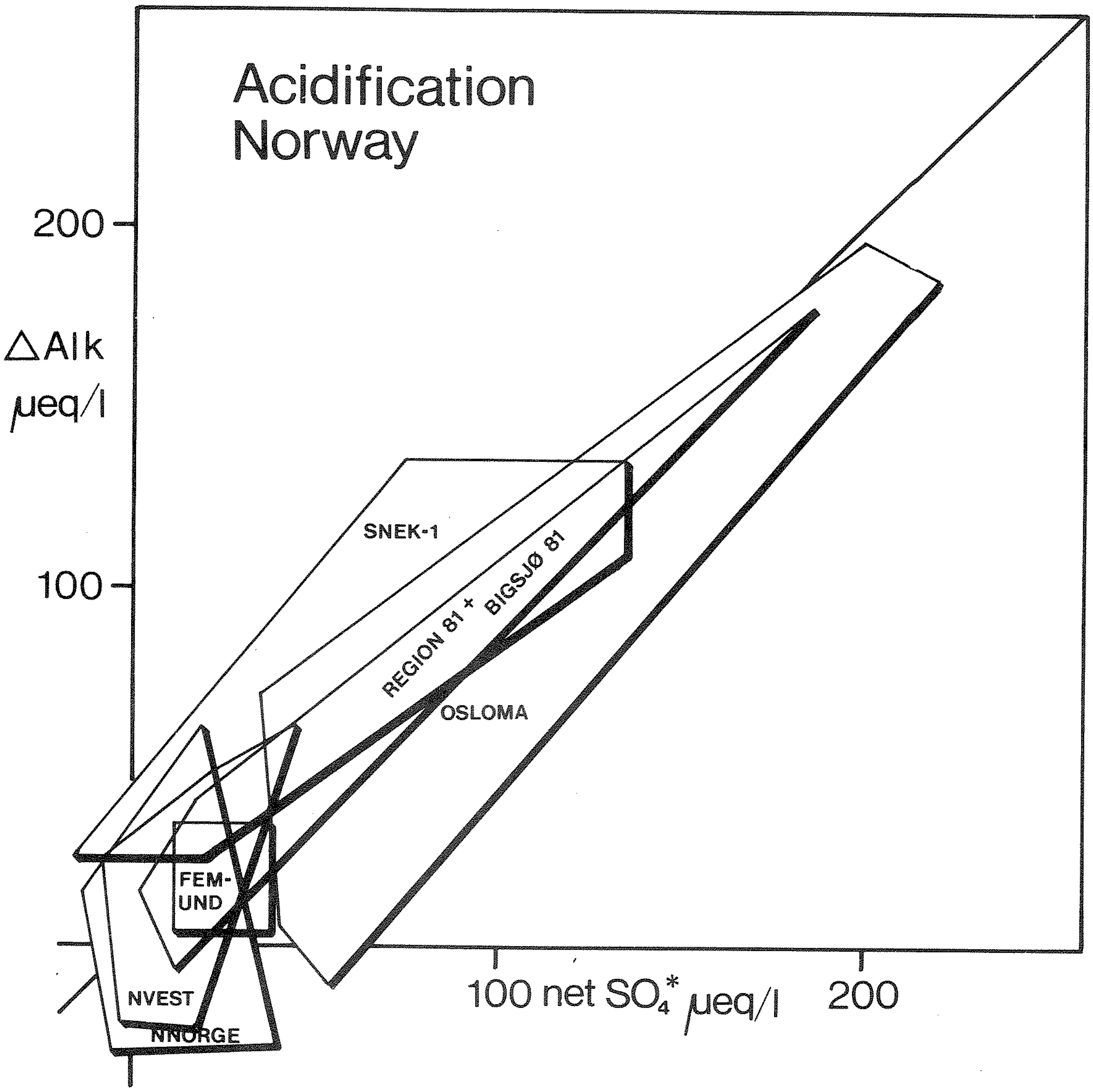


Figure 17. Acidification of lakes in Norway. See also Figure 14.

balance, the results also indicate that for those data sets that follow the consistent pattern, the original analytical measurements are sufficiently accurate at least with respect to the parameters entering into the model (Cl to deduct seawater salts, sulfate, calcium and magnesium, alkalinity and pH); the predictive capabilities of the model can now be explored.

Table 6. Mean loss of alkalinity (Δalk) and mean increase in excess-sulfate (net SO_4*) for data sets from North America and Europe. Units μeq/l.

Least squares regressions

		n	r
North American groups (less FLORID and NOVASC)	Δalk = 17 + 0.87 net SO_4*	13	0.99
European lakes	Δalk = 20 + 0.74 net SO_4*	13	0.90
All lake groups (less FLORID and NOVASC)	Δalk = 16 + 0.85 net SO_4*	26	0.97

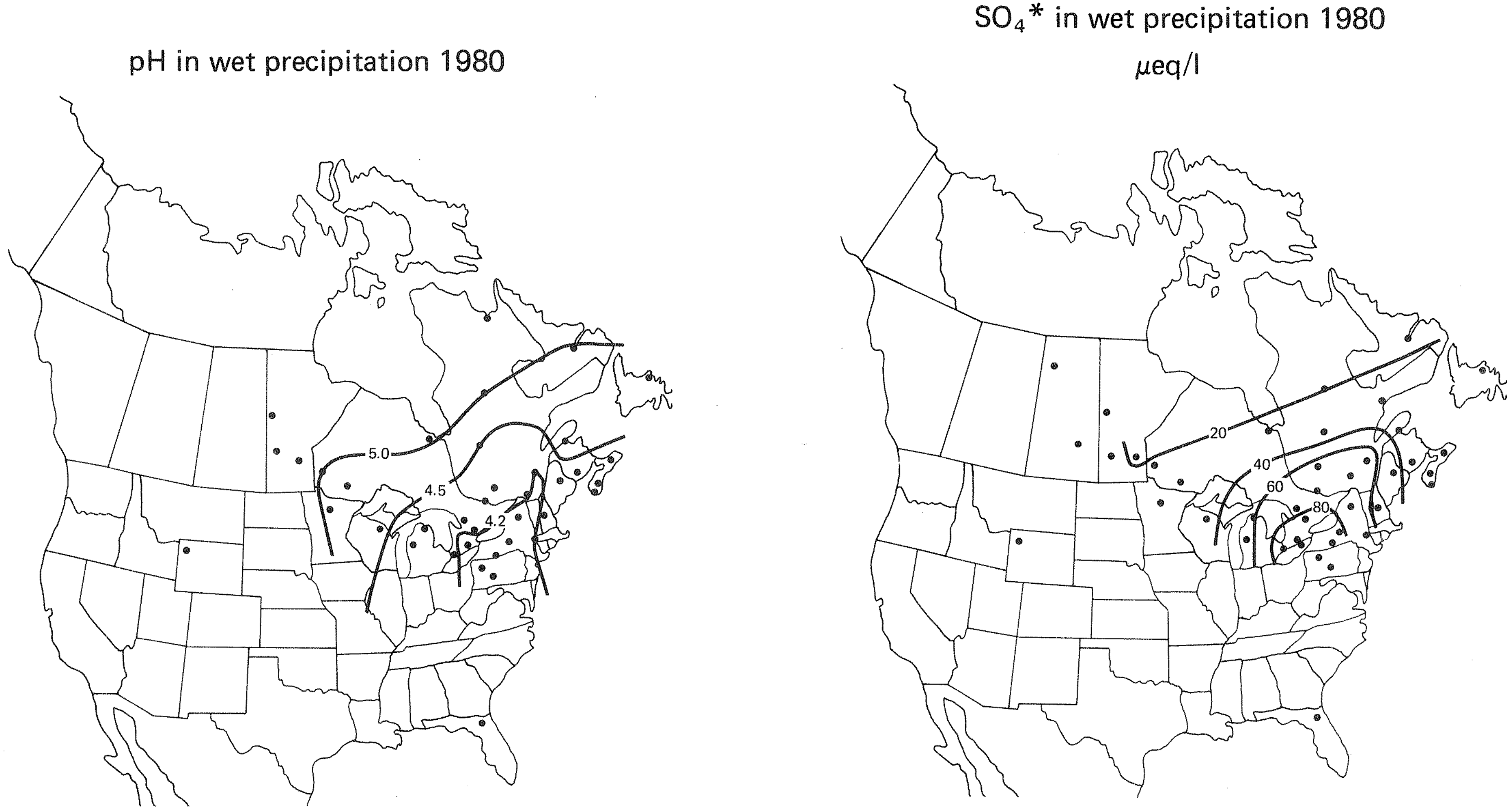
North America Data set	n	Δalk	netSO_4*	Europe Data set	n	Δalk	net SO_4^*
ADIRON	206	119	103	SNEK-1	616	51	45
FLORID 1	13	52	99	REGION 81	47	38	48
2	7	188	205	BIGSJØ 81	44	30	36
ROCKY	30	9	6	NVEST	49	16	16
USFSW All	168	52	56	OSLOMA	151	74	80
CT	22	83	93	FEMUND	33	20	24
MA	30	57	34	NNORGE	26	33	7
ME	31	32	73	REGSVE	90	148	108
NH	42	31	40	SVER-A 1930	101	13	-33
RI	8	69	84	1970	101	97	95
VT	34	50	47	DANSK	14	108	147
ELA	102	57	35	SCOTCH	57	98	88
KEREKE	3	38	36	VOSGES	9	74	46
LABRAD	13	48	32				
LAB-1	98	16	-8				
LAUREN	4	104	105				
NEWF	81	40	18				
NOVASC 1977	16	94	92				
QUEBEC	23	24	-2				
OME	70	126	118				
SUD	208	192	182				
WTFISH	33	296	298				

5. PRECIPITATION CHEMISTRY VS.LAKE CHEMISTRY

Acidification of lakes as measured by loss of alkalinity or as excess-sulfate is related to the chemistry of precipitation. Henriksen (1980) used empirical data from Norway to relate excess-sulfate concentrations in lakes to excess-sulfate and hydrogen-ion concentrations in precipitation. Thus for the Norwegian lakes it appeared possible to specify loss of alkalinity from pH of precipitation.

The lake data from North America and Europe provide a basis for determining the general relationship between lakewater chemistry and precipitation chemistry. Precipitation chemistry data for North America are available from the National Atmospheric Deposition Program (NADP) and Canadian Network for Sampling Precipitation (CANSAP). Data used here are volume-weighted annual means for 1980 and were obtained from J. Gibson (pers. comm NADP) of Barrie and Sirois (1982) (CANSAP) (Figure 18). For each set of lakes one or more nearby precipitation stations were chosen and assumed representative for precipitation chemistry for the entire lake set (Table 7). Two lake sets (SUD, WTFISH) are not included in Table 7, because these lakes are in proximity to the large point source of SO_2 at the smelting complex at Sudbury, Ontario. These data exhibit large gradients in SO_4* and acidification, no single precipitation station is representative, and dry-deposition is probably an unusually important source of strong acids to these lakes.

Precipitation data for Europe are less complete and more heterogenous (Table 8). For Norway 1980 data from 7 stations operated by NILU (Norwegian Institute for Air Research) are used. For Scotland 1978 data from 2 stations reported by Wright et al. (1980) are used. For Denmark 1977-79 data from 3 stations reported by Rebsdorf (1981) are used. And for the Vosges mountains, the 1974 data from the nearest OECD station (Organisation for Economic Cooperation and Development, 1979) are used. The European precipitation data must be used with caution because the data cover several types of collection and analysis procedures as well as several different years. The OECD data and NILU data are daily wet precipitation samples. The Scotland data are weekly



pH in wet precipitation 1980

SO$_4$* in wet precipitation 1980

μeq/l

Figure 18. Weighted-mean pH and SO$_4$* concentrations in wet precipitation in 1980 measured at NADP (National Atmospheric Deposition Program, US) and CANSAP (Canadian Network for Sampling Precipitation, Canada) stations. Data from J. Gibson (pers. comm.) and Barrie and Sirois (1982).

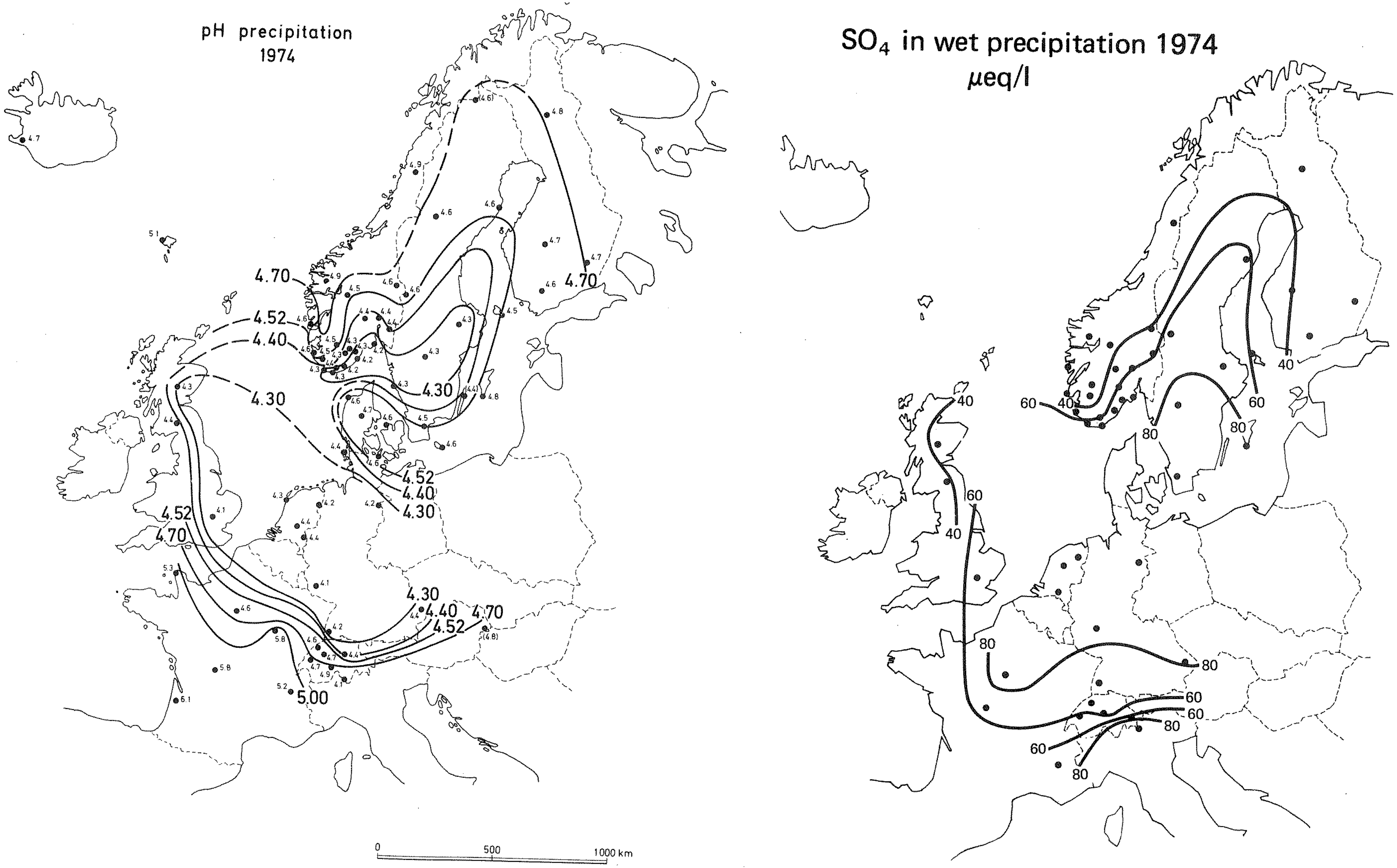


Figure 19. Weighted-mean pH and SO$_4^*$ concentrations in precipitation in 1974 at OECD stations in Europe. Data from OECD (1979).

bulk precipitation. The Denmark data are bulk samples of unspecified duration.

Table 7. Precipitation chemistry (weighted-average for 1980) and lake chemistry at 13 lake regions in North America. Loss of alkalinity is defined as 0.91 (Ca* + Mg*) - HCO_3 + H^+ + Al.

	Precipitation		µeq/l						Deposition	Lakes	µeq/l		
Station	Network	pH	H^+	NH_4	NO_3	SO_4*	H^+ + NH_4	NO_3 + SO_4^*	meq SO_4^*/m^2	CODE	n	SO_4*	Δalk
Sand Spring, CO	NADP	4.9	13	8	14	21	21	35	6	ROCKY	29	30	9
ELA, Ont.	CANSAP	5.0	10	13	15	24	23	39	12	ELA	102	76	57
Huntington, NY	NADP	4.2	58	15	32	54	73	86	46	ADIRON	206	134	119
Nitchequon, Que.	CANSAP	5.0	11	2	2	20	13	22	16	QUEBEC	23	40	24
Goose, Lab.	CANSAP	4.9	12	2	3	18	14	21	20	LABRAD	13	58	48
Quebec, Que.	CANSAP	4.2	58	35	31	82	93	113	92	LAUREN	4	129	104
Dorset, Ont.	CANSAP	4.2	64	23	32	62	87	94	72	OME	70	167	126
Gander, Newf.	CANSAP	4.8	15	14	4	30	29	34	42	NEWF	81	144	40
Goose, Lab.	CANSAP	4.9	12	2	3	18	14	21	20	LAB-1	98	23	16
Bradford, FL.	NADP	4.7	20	7	12	28	27	40	30	FLORID 1	13	111	52
Truro, N.S.	CANSAP	4.3	45	16	18	52	61	70	54	NOVASC-77	16	119	94
Kejimukjik, N.S.	CANSAP	4.5	30	3	11	30	33	41	34	KEREKE	3	63	39
Knabit, NY	NADP	4.2	62	26	37	74	88	111	48	USFWS-CT	22	160	83
Greenville, ME	NADP	4.4	41	10	20	42	51	62	34	USFWS-ME	31	117	32
Hubbard, NH	NADP	4.3	55	9	30	50	64	80	44	USFWS-NH	42	105	31

Table 8. Precipitation chemistry and lake chemistry in 18 areas in Europe. For Norwegian sites only lakes within 20-30 km of the precipitation station are used. Loss of alkalinity is defined as 0.91 (Ca* + Mg*) - HCO_3 + H^+ + Al.

		Precipitation		μeq/l		Deposition	Lakes	μeq/l		
Station	Period	Network	pH	H^+	SO_4*	meq $SO_4{}^*/m^2$	CODE	n	SO_4*	Δalk
Birkenes, N.	1980	NILU	4.2	69	74	86	REGION-81	4	115	72
Lista, N.	1980		4.2	60	63	60	+	2	78	48
Skreådalen, N.	1980		4.5	28	29	56	BIGSJØ-81	3	48	25
Treungen	1980		4.2	59	53	40	"	4	75	53
Vatnedalen	1980		4.6	28	27	22	"	6	63	36
Narbuvoll	1980		4.8	16	24	14	"	1	49	15
Kårvatn	1980		4.9	13	12	15	NVEST	49	32	16
Galloway, UK	1978	ave.2	4.5	30	75	75	SCOTCH	57	111	98
Jutland, DK	1977-79	ave.3	4.3	48	104	98	DANSK	14	196	108
CH3 Delemont	1974	OECD	4.5	37	80	80	VOSGES	95	95	74

The precipitation data from North America show that concentrations of H^+, NH_4, NO_3 and SO_4*, the 4 major ions comprising acid precipitation, exhibit clear covariation. The pairs H^+ and SO_4*, NH_4 and NO_3, and the sums H^+ + NH_4 and NO_3 + SO_4* are present in approximately equivalent concentrations (Figures 20-22). In general North American precipitation appears to contain somewhat more NO_3 than NH_4.

For Europe the relationship between these major acidic components in precipitation are less clear. The Norwegian data show clear equivalent proportions of the ion pairs H^+ and SO_4*, NH_4 and NO_3 and the sum of H^+ + NH_4 and NO_3 + SO_4*. Elsewhere in Europe precipitation appears to contain relatively more SO_4* than H^+ (Figure 23). Data for NH_4 and NO_3 for most of these stations are lacking; the Danish data indicate that $NH_4 > NO_3$.

The North American data listed in Table 7 indicate a close relationship between concentrations acid components in precipitation on the one hand

and acidification and increase in excess-sulfate concentrations in lakes on the other (Table 9, Figures 24 and 25).

Table 9. Summary of linear regressions of lake chemistry on precipitation chemistry for Norwegian lakes used by Henriksen (1980) and groups of lakes in North America and Europe. Units: µeq/l.

	Regression	n	r^2
Norway	$SO_4{*}l = -19 + 1.86\ SO_4{*}p$	59	0.84
North America	$SO_4{*}l = 14 + 1.92\ SO_4{*}p$	15	0.74
Europe	$SO_4{*}l = -8 + 1.44\ SO_4{*}p$	10	0.85
Norway	$SO_4{*}l = -24 + 2.55\ H^+p$	33	-
North America	$SO_4{*}l = 26 + 1.94\ H^+p$	15	0.79
Europe	not significant	10	
Norway	$SO_4{*}p = -3 + 1.37\ H^+p$	33	0.89
North America	$SO_4{*}p = 10 + 0.91\ H^+p$	15	0.87
Europe	$SO_4{*}p = 16 + 0.99\ H^+p$	10	0.41
North America	$\Delta alk = 3 + 1.37\ SO_4{*}p$	15	0.58
Europe	$\Delta alk = -2 + 1.04\ SO_4{*}p$	10	0.90
North America	$\Delta alk = 15 + 1.29\ H^+p$	15	0.55
Europe	not significant	10	

Because of the close correspondence between acidification (loss of alkalinity) and increase in excess-sulfate concentrations in the lake groups, the relationship between acidification in lakes and excess-sulfate levels in precipitation is also highly significant (Table 9). Further because for the North American precipitation data used here the relationship between H^+ and $SO_4{*}$ in precipitation is highly significant, there emerges a significant relation between acidification in lakes and H^+ concentration in precipitation (Table 9, Figure 26). For the European groups the relationship between acidification in lakes and excess-

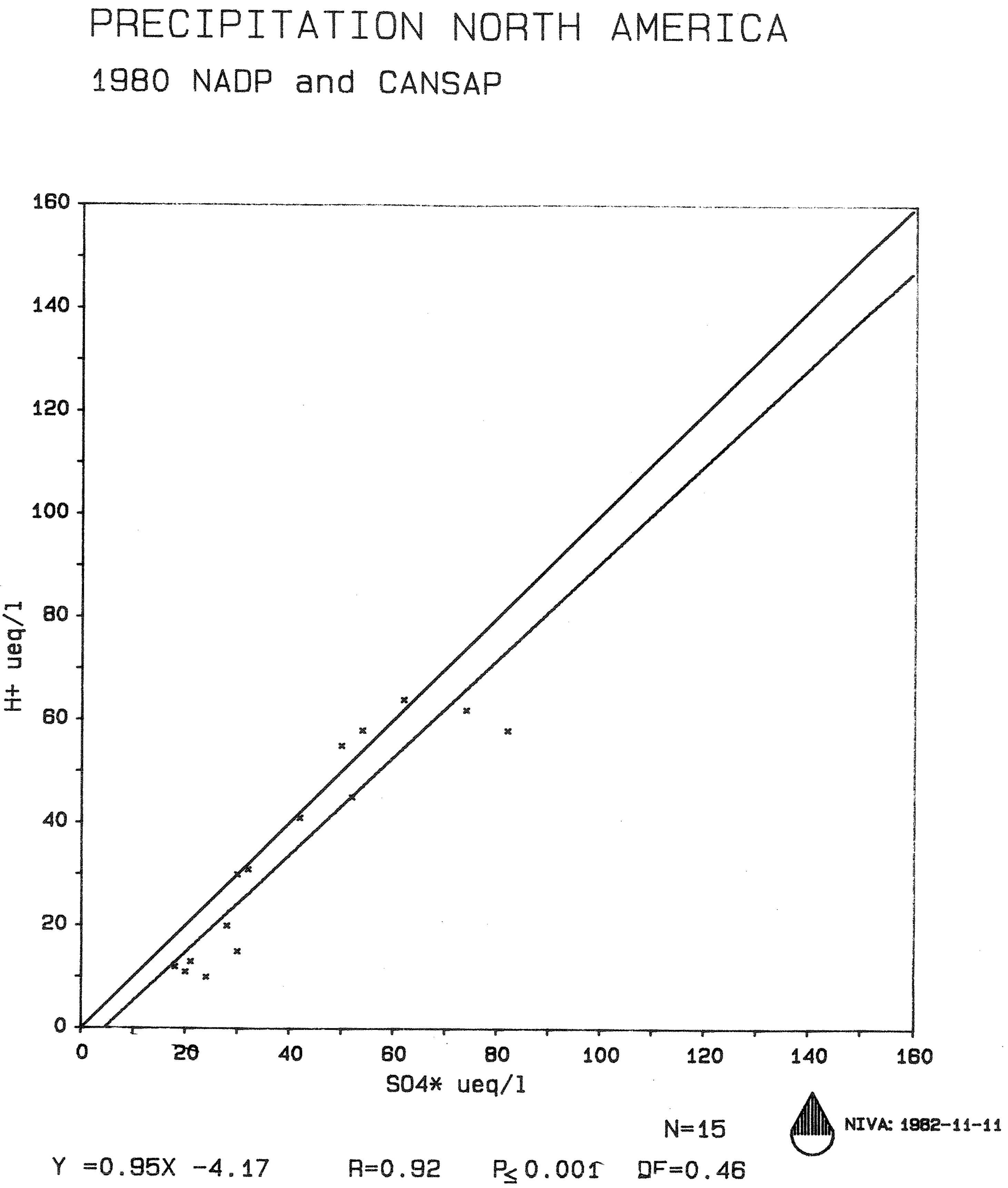


Figure 20. Weighted-mean concentrations of H^+ vs. SO_4* for 1980 in wet precipitation in North America.

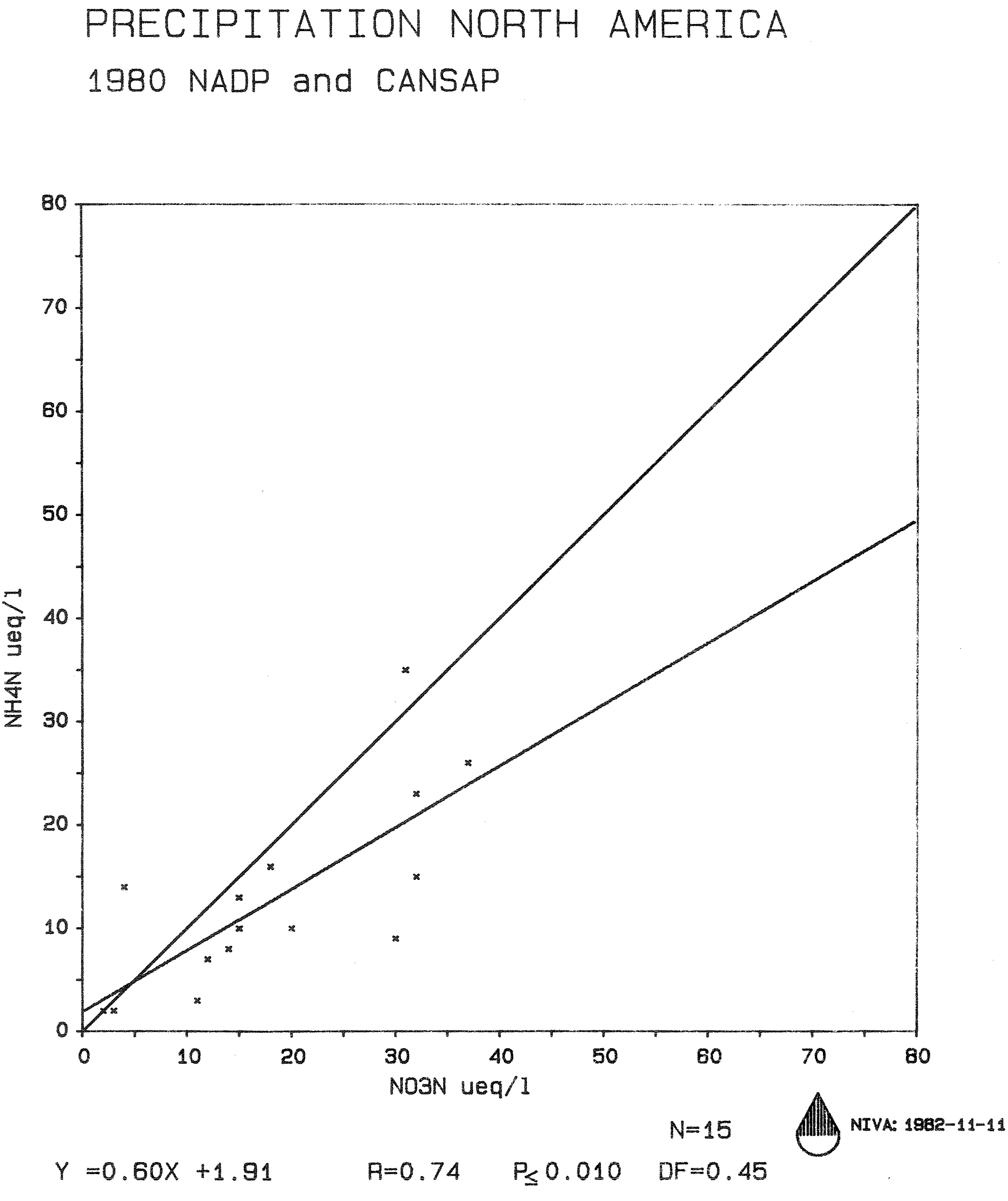


Figure 21. Weighted-mean concentrations of NH_4 vs. NO_3 for 1980 in wet precipitation in North America.

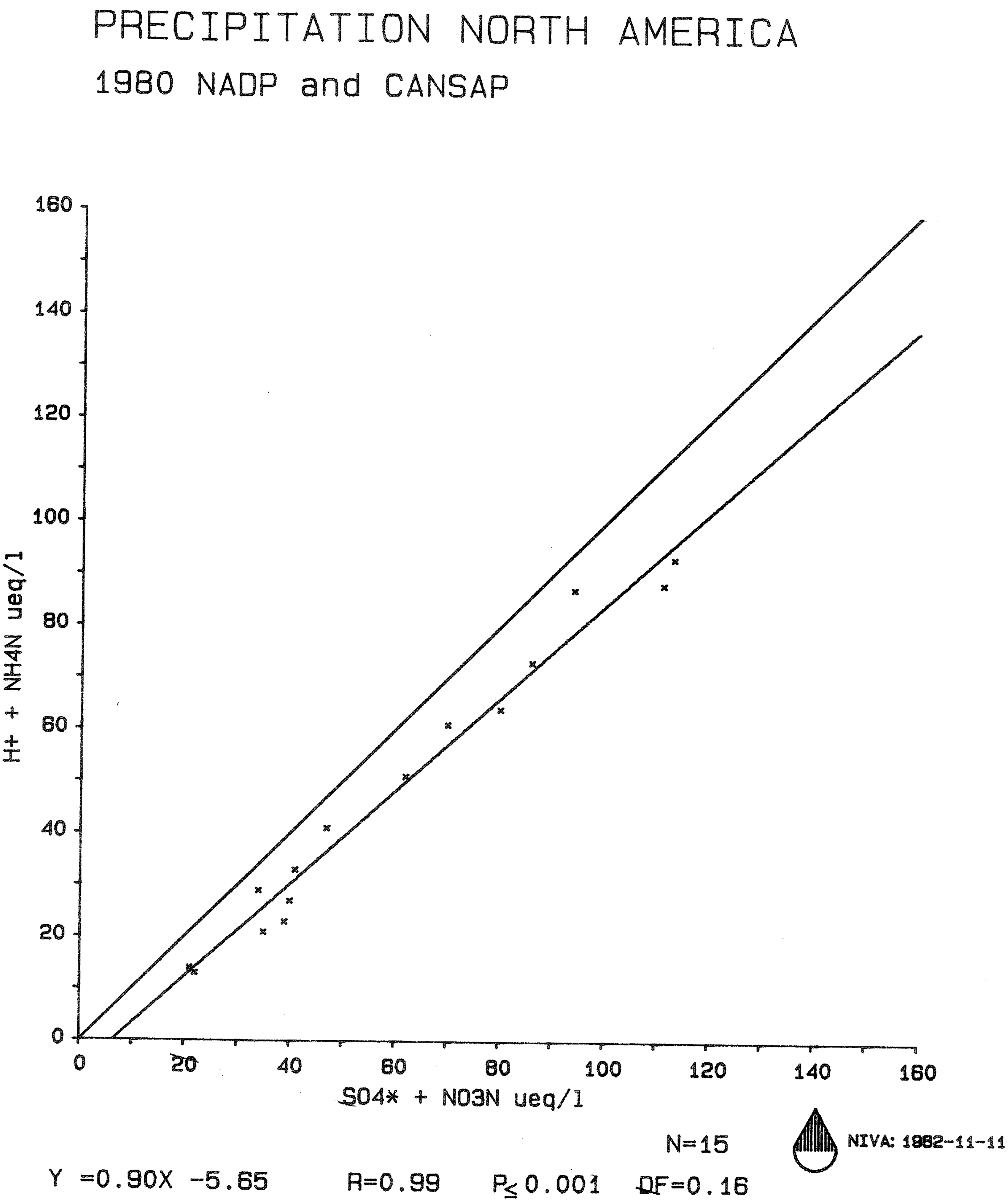


Figure 22. Weighted-mean concentrations of H^+ + NH_4 vs. SO_4* + NO_3 for 1980 in wet precipitation in North America.

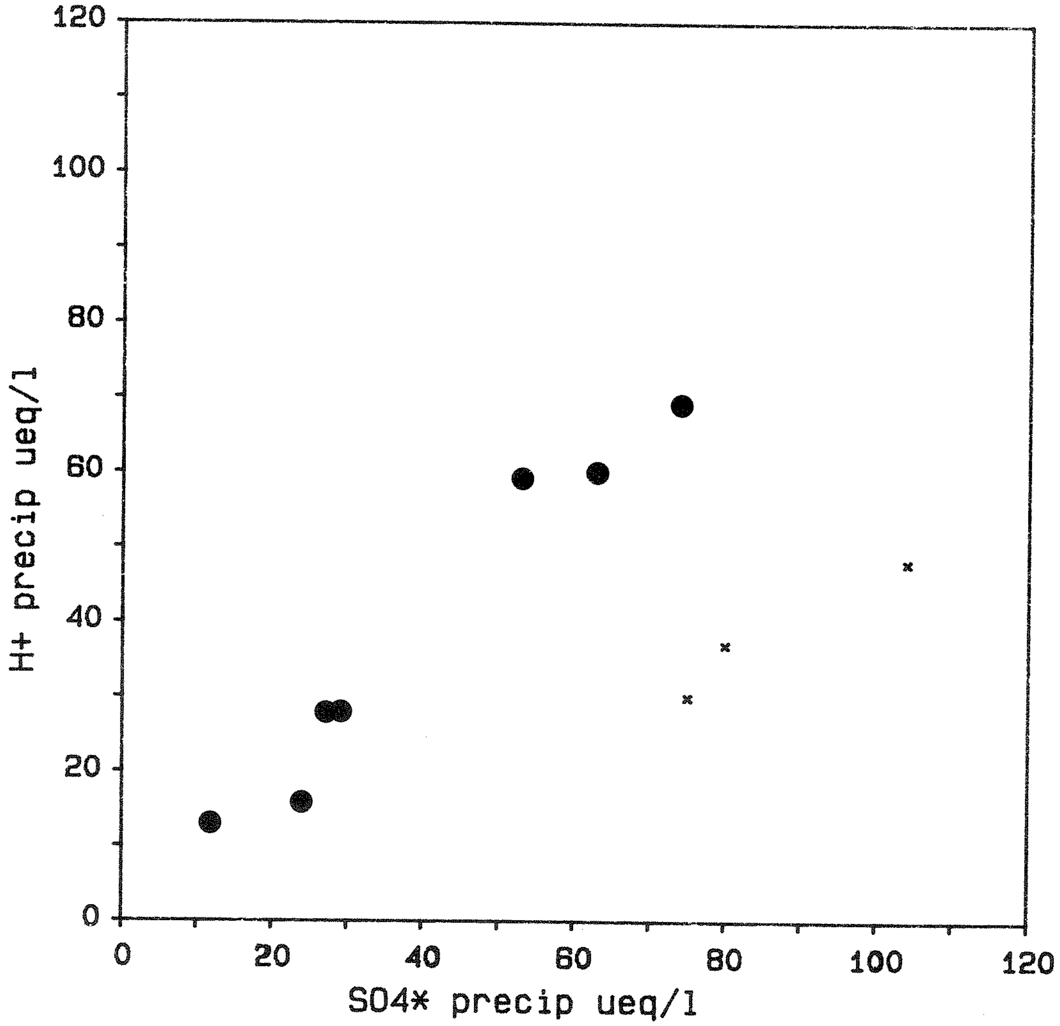


Figure 23. Weighted-mean concentrations of H^+ and excess-SO_4 in precipitation in Europe (Circles: Norway). See Table 8 for details.

Fig 24

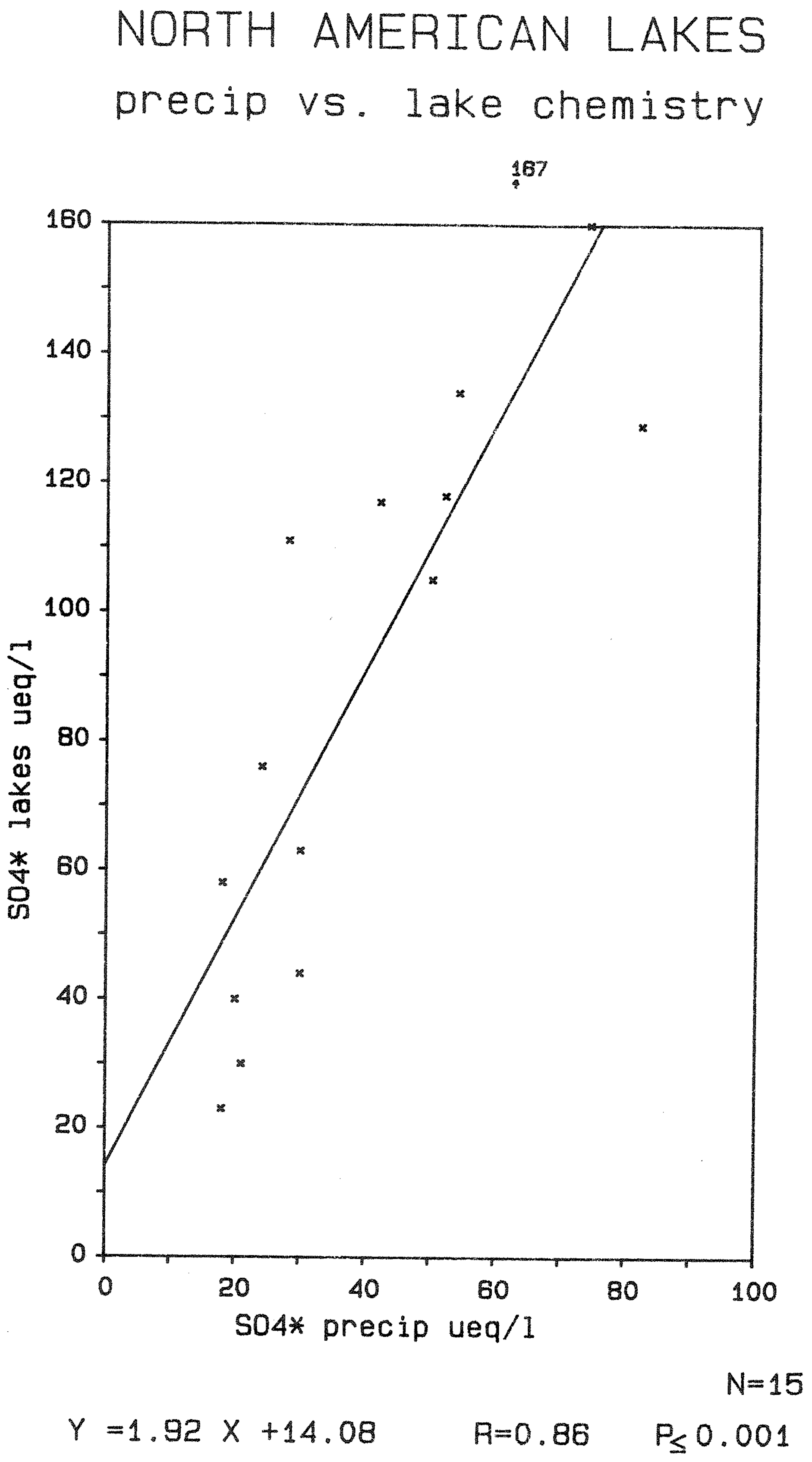


Figure 24. Mean concentrations of SO_4* for 15 lake groups in North America and mean SO_4* in wet precipitation at nearby stations.

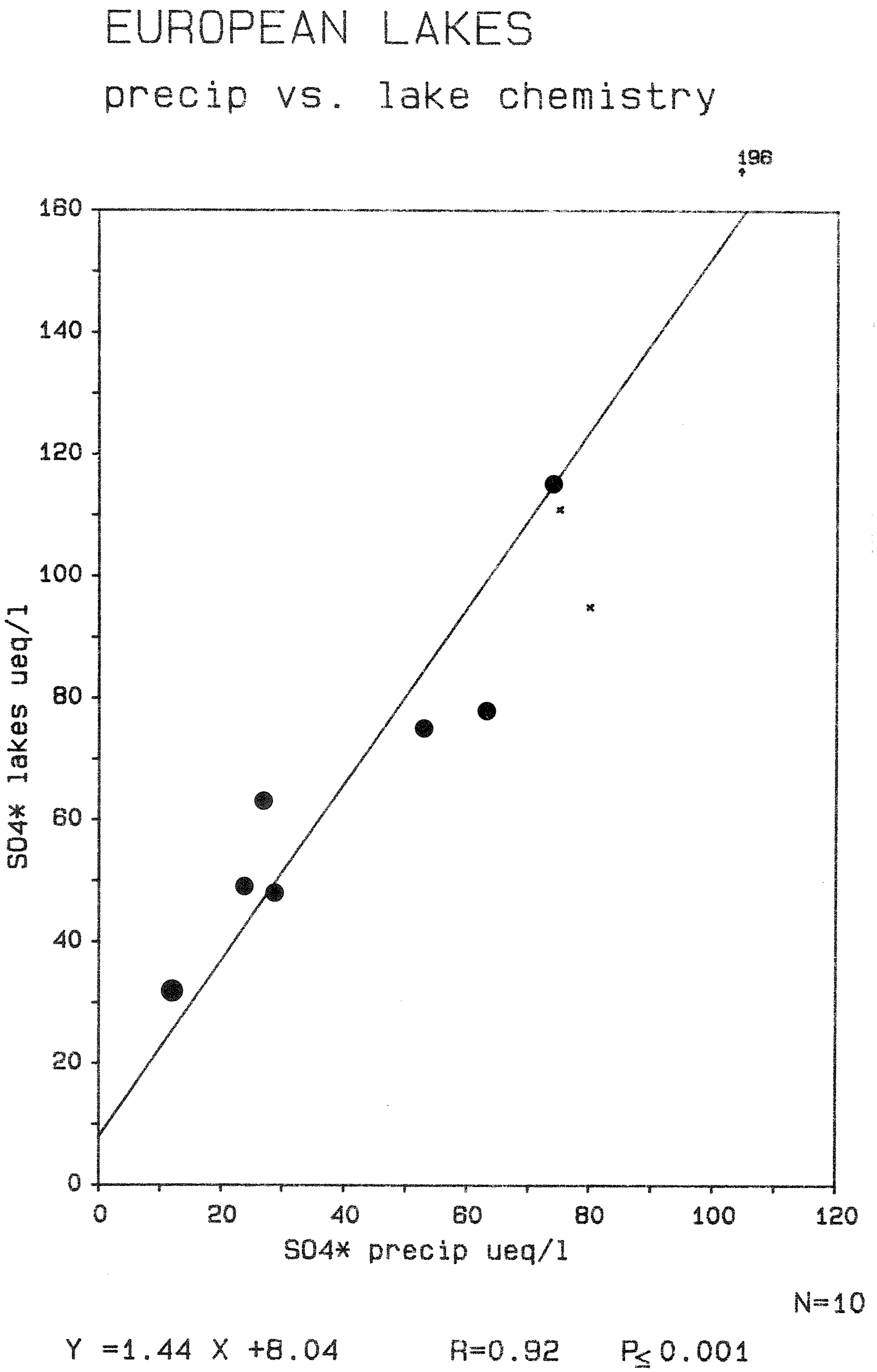


Figure 25. Mean concentrations of SO_4* for 10 lake groups in Europe and mean SO_4* in precipitation at nearby stations (circles: Norway). See Table 8 for details.

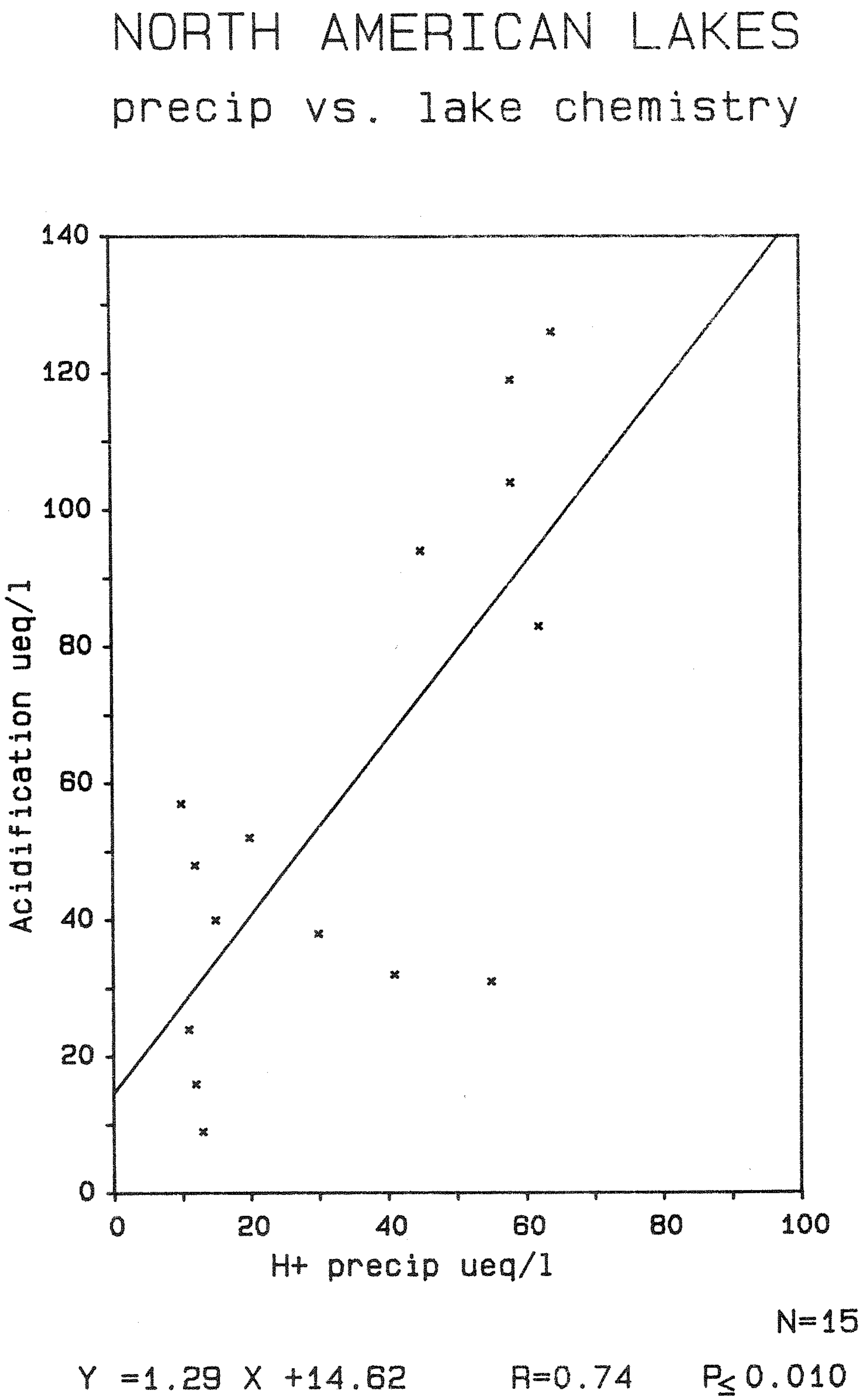


Figure 26. Acidification in lakes as estimated by loss of alkalinity and H^+ concentrations in precipitation at nearby stations for 15 lake groups in North America.

sulfate in precipitation is significant, but because the relationship between H^+ and SO_4* in precipitation is 1-to-1 for Norway but not so for the other stations, the relation between acidification or excess-sulfate in lakes and H^+ in precipitation for the European lake groups taken together are not significant (Figure 27). Here the bulk precipitation data from Sweden and Denmark show much higher excess-sulfate levels than H^+ levels.

In conclusion it appears that excess-sulfate levels and acidification (loss of alkalinity) in lakes today can be specified given precipitation excess-sulfate levels or precipitation pH (for the North American and Norwegian lakes).

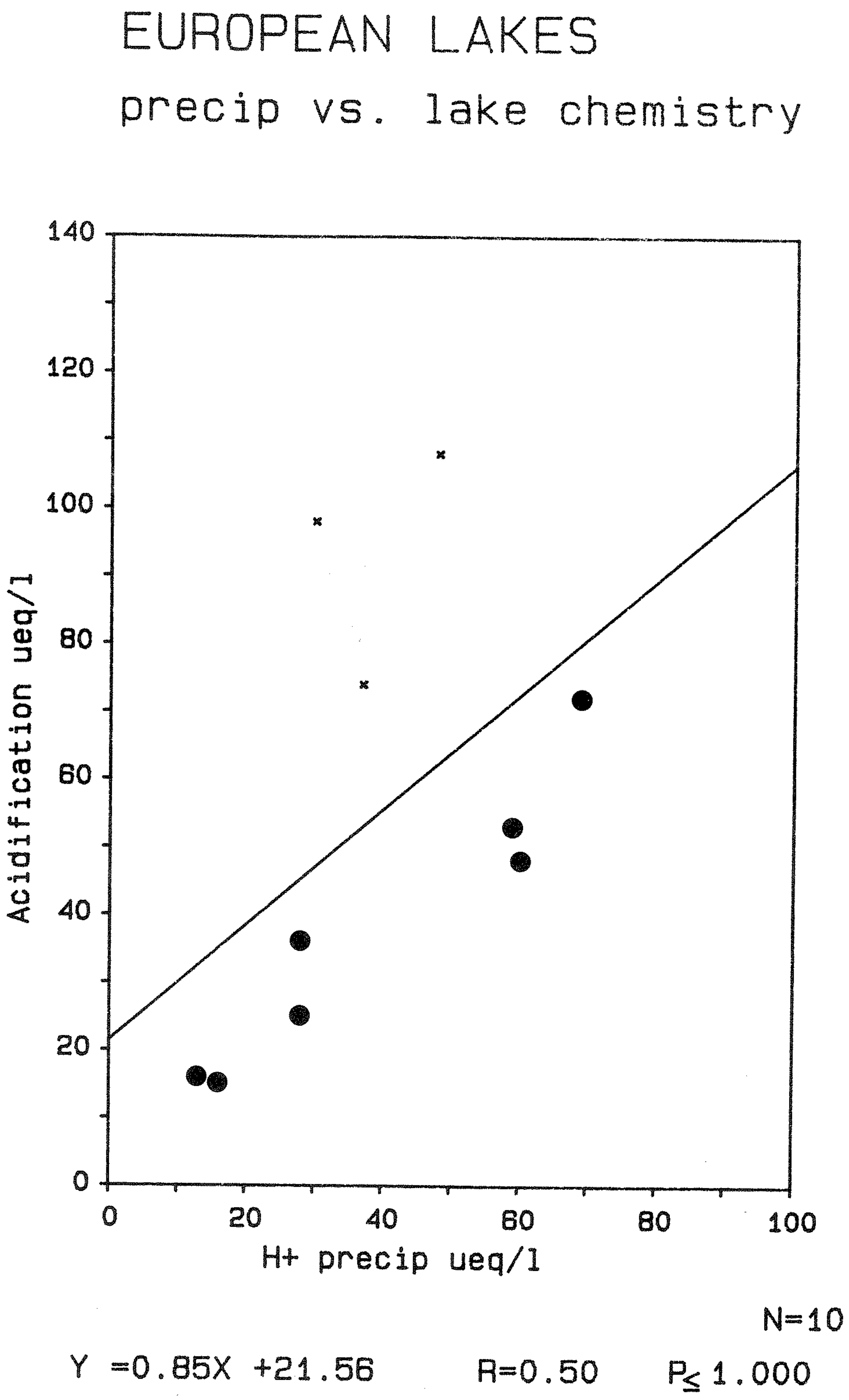


Figure 27. Linear regressions of SO_4* in precipitation and net SO_4* in lakes and on H^+ in precipitation for groups of lakes in North America and Europe. See Table 9 for details. Units: μeq/l.

6. DEVELOPMENT OF A PREDICTIVE MODEL

6.1 Does acidification entail changes in concentrations of base cations?

Henriksen's (1980) original empirical model for lake acidification is a static model. It merely uses empirical relationships between various chemical components in lakewater and precipitation to describe observed regional patterns in lake acidification. Henriksen (1980) suggests that these empirical relationships may provide the basis for predicting future trends in lake acidification given changes in precipitation chemistry. He points out that a major question is whether acidification of lakes entails a change in base cation concentrations in addition to a loss of alkalinity. The ratio of change in Ca* + Mg* to change in SO_4* is defined as

$$F = \Delta(Ca^* + Mg^*)/\Delta SO_4^* \qquad (15)$$

To assess changes in base cation concentrations in response to increases in SO_4* Henriksen (1982 a) uses 3 independent methods. The first approach compares historical "pre-acidification" data with present-day "acidification" data. A total of 15 groups of lake and river data are examined. Henriksen (1982 a) concludes that for lakes still containing bicarbonate, with few exceptions the increase in SO_4* has been mainly compensated by a decrease in alkalinity.

The other two methods are based on present-day data. First, lakes over a gradient in acid loading are compared under the assumption that they are otherwise similar. For lakes in southernmost Norway (data set SNEK-1), Henriksen grouped the lakes into elevation classes and then calculated the linear regression of Ca* + Mg* on SO_4*. The average increase is 0.4 μeq (Ca* + Mg*)/μeq SO_4*, under the conditions of linearity, background SO_4* levels of 20 μeq/l and minimum (Ca* + Mg*) concentrations of 8 μeq/l. The same method applied to the Sudbury, Ontario, data (data set SUD) also yields an average increase of 0.4, again under the assumptions of linearity, background SO_4 levels of 50 µeq/l, and minimum (Ca* + Mg*) concentrations of 75 µeq/l.

The third method is based on lakes with pH < 5.0. Here the reasoning is that the increase in excess-sulfate in the lakes is compensated entirely by increases in (Ca* + Mg*), H^+, and Al (Henriksen, 1982 a). In other words it is assumed that the original alkalinity was zero. This produces an overestimate of base cation increase in that original alkalinity in most cases was positive.

$$\Delta SO_4^* = \Delta(Ca^* + Mg^*) + \Delta H^+ + \Delta Al \qquad (16)$$

Neither H^+ nor ionic Al are present in significant concentrations in non-acidified lakes; thus $\Delta H^+ = H^+$ and $\Delta Al = Al$. For the lakes in southernmost Norway (data set SNEK-1) the average factor F is 0.44 (n = 356 acid lakes). Again background SO_4^* levels are assumed to be 20 µeq/l. This method clearly overestimates the increase in Ca* + Mg* because original alkalinity is assumed to be zero.

This third approach can be made more realistic by including an estimate of original alkalinity. Again only low pH lakes are taken (pH < 5.0), background sulfate levels are set at 20 µeq/l, and minimum original Ca* + Mg* level is 8 µeq/l. First the "pre-acidification" Ca* + Mg* levels are calculated as before from equation (16). Pre-acidification alkalinity is then set at 0.91 ($Ca_o^* + Mg_o^*$). Finally the values for Δ(Ca* + Mg*) are recalculated but this time taking into account the estimated minimum original alkalinity:

$$\Delta(Ca^* \mp Mg^*) = \Delta SO_4^* - H^+ - Al - alk_o \qquad (17)$$

This method is illustrated with data from Woods Lake, Adirondack Mountains, N.Y. (Figure 28) (data from Galloway et al. 1980). For 230 lakes from southernmost Norway with ΔSO_4^* greater than 50 µeq/l, the mean F is 0.44 ± 0.20. For 138 of these lakes with pH <4.7 F is 0.37 ± 0.18. Similarly for 23 lakes in the Adirondacks (data set ADIRON) with pH <4.7 this method yields of 0.23 ± 0.21 under the assumptions of background SO_4^* of 31 µeq/l and minimum (Ca* + Mg*) of 25 µeq/l (Table 10).

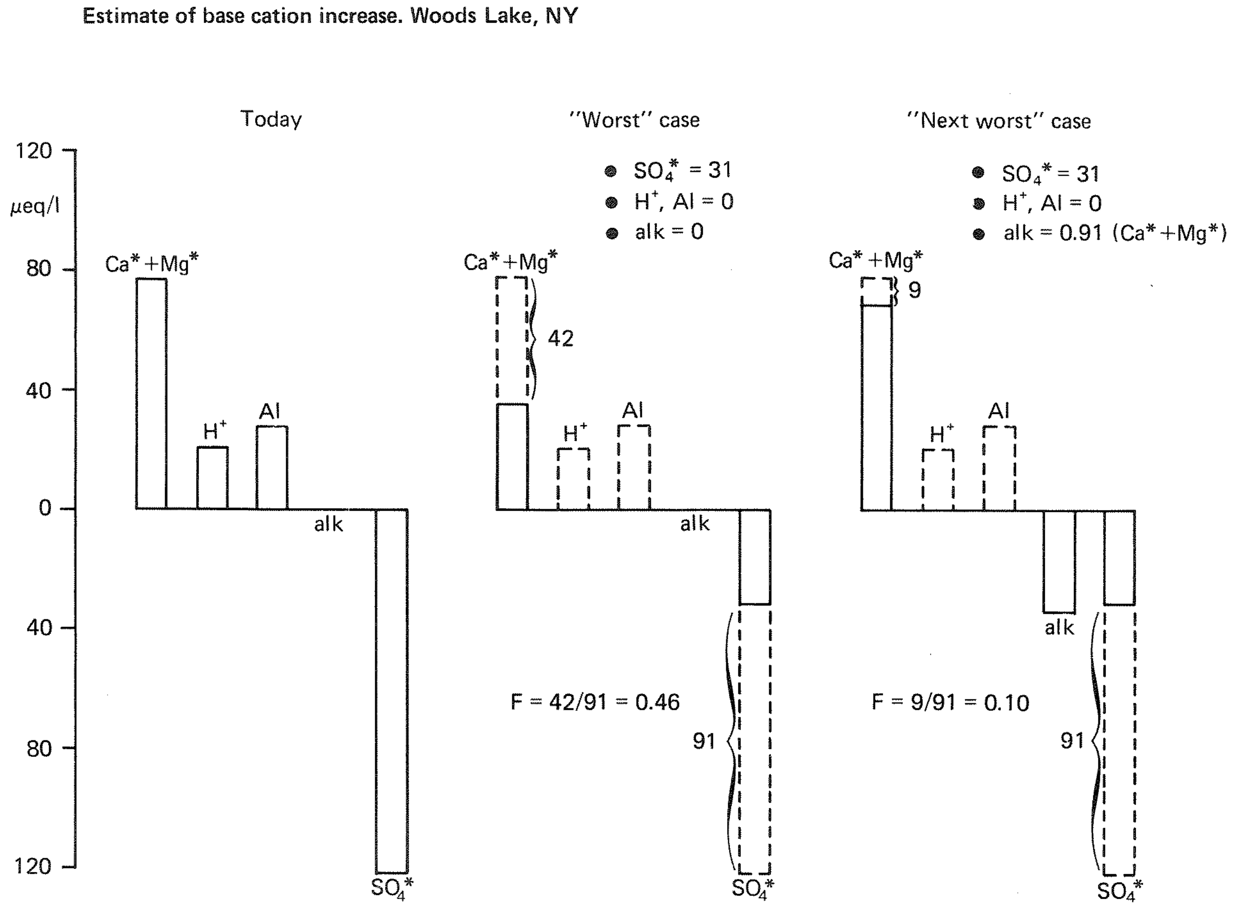


Figure 28. Illustration of calculation of base cation increase factor, F, for an acid lake. In the "worst" case original HCO_3 concentrations are set at zero, an unrealistically low value. In the "next worse" case original HCO_3 is estimated from worst case Ca* + Mg* level. F values obtained are 0.48 and 0.10, respectively. Data are from Woods Lake, Adirondack Mountains, NY (Galloway et al. 1980).

Table 10. Increase factors, F = $\Delta(Ca^* + Mg^*)/\Delta SO_4^*$ for various groups of lakes using 2 methods.

I. Minimum Ca* + Mg* method

Data set		F	Reference
SNEK-1	0-50 m	0.44	Henriksen 1982 a
	50-100	0.44	"
	100-200	0.30	"
	200-400	0.37	"
	400-600	0.34	"
	600-800	0.38	"
	800-1000	0.20	"
	>1000	0.44	"
	range	0.20-0.44	

Data set	SO_4* group µeq/l	F†	Reference
SUD	360	0.40	Henriksen 1982 a
	280	0.41	"
	220	0.44	"
	190	0.25	"
	115	0.31	"
	range	0.31-0.44	

† recalculated from Table 12 in Henriksen (1982 a) assuming bSO_4^* 50 µeq/l and minimum (Ca* + Mg*) of 75 µeq/l.

II Maximum (Ca* + Mg*) increase in acid lakes

	Conditions						
Data set	n	pH	ΔSO_4^* µeq/l	alk_0 µeq/l	Al-function µeq/l	F	Reference
SNEK-1	356	<5.0	>50	0	$Al^{+3} = 0.4\ Al_t$	0.44 ± 0.21	Henriksen, 1982 a
REGION	130	<5.0	>50	0	$Al^{+3} = 0.4\ Al_t$	0.48 ± 0.24	"
SNEK-1	138	<4.7	>50	$0.91\ (Ca^* + Mg^*)_0$	log Al = 12.7-2.56 pH	0.23 ± 0.18	This study
ADIRON	23	<4.7	>0	$0.91\ (Ca^* + Mg^*)_0$	log Al = 11.6-2.21 pH	0.23 ± 0.21	"

These latter 2 methods arrive at increase factors that are means for groups of lakes and are clearly overestimates. For a future increase in acid deposition they will thus give a conservative estimate of the number of lakes that will be acidified to below a specific pH given a set future loading. Conversely for future decreases in acid loading use of these factors will give a conservative estimate of the number of lakes that will be "restored" to above a given pH. To obtain these estimated increase factors it was necessary to use groups of lakes and calculate averages. The increase factors for individual lakes may deviate widely from these average values. It is especially difficult to assess lakes with relatively high levels of Ca* + Mg*.

Base cation increase due to acidification can thus be estimated to be maximum of about 0.4 μeq (Ca* + Mg*)/μeq SO_4* as an average for groups of lakes. The actual increase factor is probably lower. A value of 0.2 appears appropriate for Norway (Henriksen 1982 c). With the data presently available it appears difficult to arrive at more precise estimates. For prediction purposes increase factors in the range 0-0.4 probably give reasonable estimates.

6.2 Specification of pH using alkalinity

The acidification equation (13) specifies HCO_3, H^+ and ionic Al for a given level of Ca* + Mg* and a given level of net SO_4*. Bicarbonate concentrations are usually measured as alkalinity by acid titration to fixed-endpoint pH or to the inflection point. Inflection point alkalinity can be calculated from fixed-endpoint data as outlined by Henriksen (1982 b). For pH levels below 7.5 bicarbonate alkalinity is given by

$$\text{alkalinity} = HCO_3 - H^+ \qquad (18)$$

At pH levels below inflection point ($HCO_3 = H^+$) alkalinity becomes negative. Here ionic aluminum can be added to strong acid in that negative alkalinity can be considered to consist of strong acid and ionic Al. pH is thus a dependent variable. pH can be specified from alkalinity using the theoretical equilibrium constants for carbonic acid or empirical relationships between measured pH and measured alkalinity in lake data at hand (Henriksen 1982 b).

The theoretical relationship is

$$CO_2 + H_2O = H^+ + HCO_3^- \qquad (19)$$

where CO_2 is the partial pressure of CO_2 and H^+ and HCO_3^- are concentrations in solution. The equilibrium constant for this reaction is $10^{-7.82}$ at 25 °C (Garrels and Christ 1965). For atmospheric CO_2 (partial pressure $10^{-3.5}$ atm.) and at 25 °C equation 19 reduces to

$$pH = 11.3 + \log(HCO_3^-) \qquad (20)$$

This theoretical relationship can be compared to empirical measurements of pH and HCO_3. Here all HCO_3 concentrations are measured as total inflection point alkalinity (ALKTIP) (Dillon et al., 1978) or fixed-end point alkalinity and then corrected to ALKTIP as suggested by Henriksen (1982 b). Linear regressions of pH on log HCO_3 for several sets of data from North America and Europe give statistically significant regression lines with intercepts of 8.8-10.9 (theoretical 11.3) and slopes of 0.66-1.04 (theoretical 1.00) (Table 11, Figure 29). One data set, SVER-A 1930s, yields a slope of 1.31; this set represents measurements made in the 1930s with colorimetric methods for both pH and alkalinity.

These regression lines lie for the most part between the theoretical bicarbonate lines at $pCO_2 = 10^{-3.5}$ and $10^{-2.5}$ atmospheres. This suggests that the bicarbonate concentrations in these lake samples are in equilibrium with CO_2 pressures higher than ambient air. That the slopes of the lines are generally less than the 1.0 theoretical slope may reflect the contribution to other components to alkalinity. Humic substances may be one such component.

The empirical relationship between pH and HCO_3 can be used to specify pH levels given predicted HCO_3 levels from the titration model. This relationship holds for positive alkalinity. When alkalinity is negative, pH is simply the negative log of (-1 x alkalinity) (i.e. strong

Table 11. Empirical relationships between pH and log HCO_3 for lakes in North America and Europe. All values are measured as either total inflection point alkalinity or converted from fixed-end point alkalinity as suggested by Henriksen (1982 b). HCO_3 units eq/l.

North America Data set	Regression	n	r	Europe Data set	Regression	n	r
ADIRON	pH = 10.82 + 0.86 log HCO_3	94	0.87	Norway			
FLORID	PH = 9.61 + 0.79 log HCO_3	9	0.86	REGION, BIGSJØ			
ROCKY	pH = 11.25 + 0.86 log HCO_3	29	0.83	DIVER (NVEST)	pH = 9.34 + 0.74 log HCO_3	406	0.79
USFWS	pH = 10.71 + 0.92 log HCO_3	145	0.87	OSLOMA, FEMUND			
ELA	pH = 10.10 + 0.86 log HCO_3	97	0.70	SCOTCH	pH = 8.84 + 0.66 log HCO_3	44	0.88
LABRAD				SVER-A 1930's	pH = 9.89 + 1.31 log HCO_3	89	0.75
LAB-1	pH = 9.75 + 0.79 log HCO_3	167	0.73	1970's	pH = 10.86 + 1.04 log HCO_3	101	0.69
NEWF				Norway			
NOVASC				Lakes + rivers	pH = 9.57 + 0.77 log HCO_3	834	0.86
QUEBEC	pH = 9.08 + 0.78 log HCO_3	23	0.84	(Henriksen, 1982 c)			
OME	pH = 10.14 + 0.93 log HCO_3	70	0.68				
SUD	pH = 10.92 + 1.04 log HCO_3	172	0.94				
WTFISH							
Ontario							
ELA, OME, SUD, WTFISH	pH = 10.83 + 1.04 log HCO_3	378	0.85				

acid). At low pH levels some of the strong acid will be compensated by ionic Al, whose contribution in turn can be estimated from either theoretical or empirical relationships between ionic Al and pH.

6.3 Prediction of water chemistry by means of the titration model

The stage is now set for prediction of the chemical composition of lakes in response to a change in deposition of strong acids from the atmosphere. The starting point is the titration model and acidification equation.

$$\Delta(H^+ + Al - HCO_3) + \Delta 0.91\ (Ca^* + Mg^*) = \Delta SO_4^* \qquad (21)$$

where Δ represents change in concentration.

The fraction of the change in SO_4^* compensated by change in $Ca^* + Mg^*$ is given by the factor F. Thus

$$(1-F).\Delta(H^+ + Al - HCO_3) + F.\Delta\ 0.91\ (Ca^* + Mg^*) = \Delta SO_4^* \qquad (22)$$

Predicted levels of $Ca^* + Mg^*$ are given by

$$(Ca^* + Mg^*)_p = (Ca^* + Mg^*)_t + F.\Delta SO_4^* \qquad (23)$$

where the subscripts p and t denote "predicted" and "today", respectively. Similarly the predicted total of $H^+ + Al - HCO_3$ is given by

$$(H^+ + Al - HCO_3)_p = (H^+ + Al - HCO_3)_t + (I-F).\Delta SO_4^* \qquad (24)$$

If the sum of $(H^+ + Al - HCO_3)$ is positive, HCO_3 can be neglected and H^+ and Al can be calculated from empirical relationships between ionic Al and H^+. If the sum of $(H^+ + Al - HCO_3)$ is negative, $H^+ + Al$ can be neglected and predicted pH calculated from the empirical relationship between pH and log HCO_3. As an example of this method of predicting lake chemistry the 4 data sets from Ontario are used (ELA, OME, SUD, WTFISH). These data span an 8-fold range of present-day loadings;

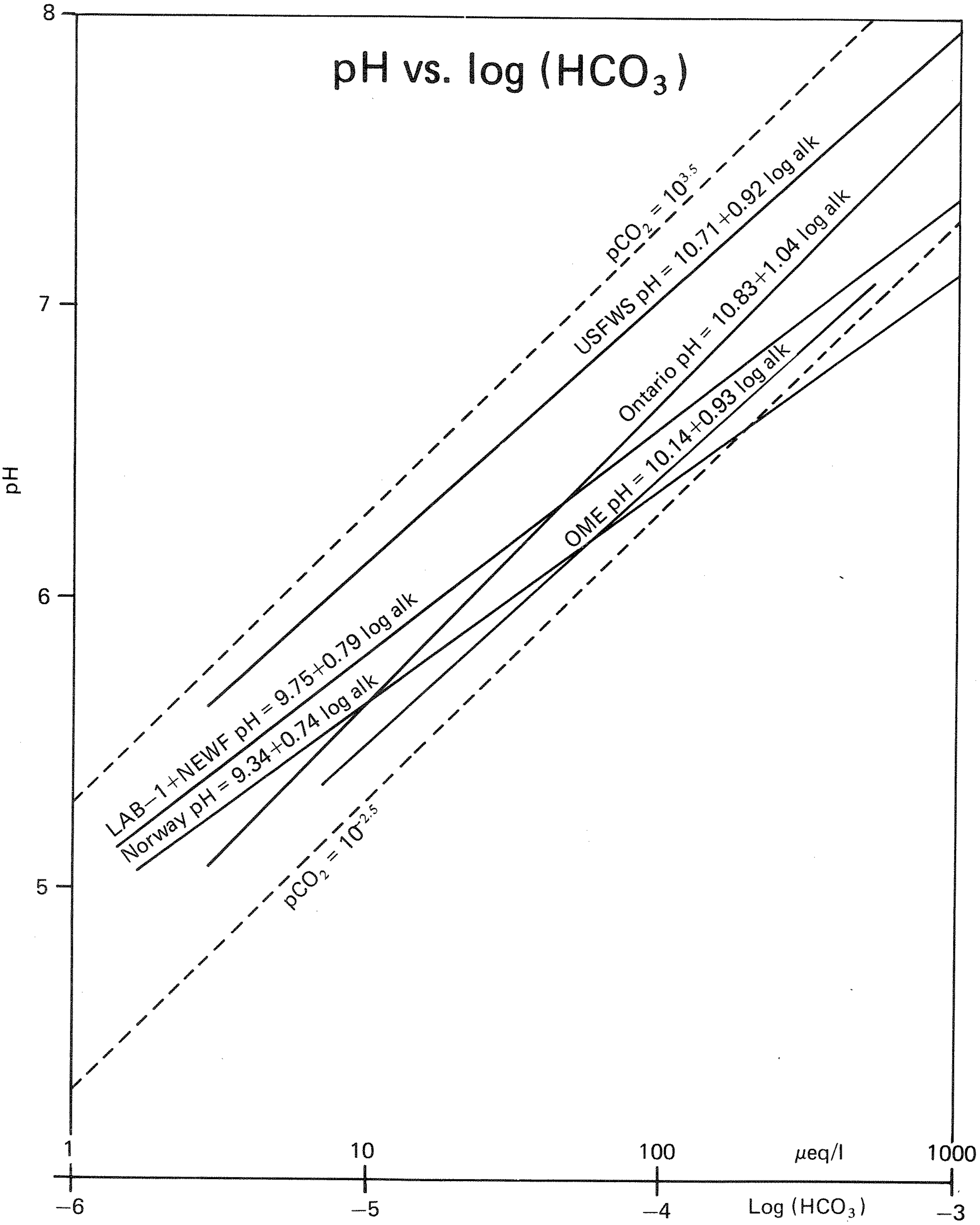


Figure 29. Linear regressions of pH on log HCO_3 for data from groups of lakes in North America and Europe (see Table 11 for details). Also shown are the theoretical lines for 25 ^{0}C and $_{p}CO_2$ of $10^{-3.5}$ (atmospheric partial pressure) and $10^{-2.5}$ (10 times atmospheric partial pressure).

group mean net SO_4^* levels (background subtracted) are 35 μeq/l at ELA, 118 μeq/l at OME, 180 μeq/l at SUD and 298 μeq/l at WTFISH.

Using the procedure outlined above pH levels and Ca* + Mg* concentrations are predicted for each of these 4 data sets for each of these loadings and F of 0 and 0.4. The results indicate that if loading at the WTFISH lakes is reduced such that net SO_4^* levels in the lakes average 180 μeq/l (the present-day mean for the SUD lakes), none of the lakes will have pH below 5.0 (Figures 30 and 31).

Similarly if the loading at the ELA lakes is increased from today's mean 35 μeq/l net SO_4^* in the lakes to the levels observed today in the Haliburton-Muskoka region (data set OME, SO_4^* 118 μeq/l), then at F of 0 about 50 percent of the lakes will become acidic (pH < 5.0) whereas at F of 0.4 about 25 percent will become acidic (Figures 30 and 31).

Because of the Ca* + Mg* concentrations provide a measure of lake sensitivity, the frequency diagrams for Ca* + Mg* reveal the relative similarity of these lake groups in terms of sensitivity. For a given data set the fraction of lakes acidified to pH below 5.0 will be dependent on the selecton of lakes comprising the original data set. If a large number of less-sensitive high Ca* + Mg* lakes are included, predicted changes in lake pH will be minor. The Ca* + Mg* frequency diagrams for the data sets ELA and OME indicate that these 2 sets represent lake samples of comparable sensitivity (Figure 32). Using F of 0.4 the frequency distribution of the OME lakes at net SO_4^* level of 35 μeq/l (ELA average) is very similar to the Ca* + Mg* frequency measured in the ELA lakes (Figure 32).

At a given level of net SO_4^*, lakes below a threshold level of (Ca* + Mg*) will be acidic (alkalinity < 0) whereas lakes with (Ca* + Mg*) levels above this threshold will still have bicarbonate. The threshold depends on net SO_4^* in the lakes, and can also be derived from the acidification equation. From equation 13 at $(H^+ + Al - HCO_3) = 0$

$$\text{threshold } (Ca^* + Mg^*) = 1.10 \text{ (net } SO_4^*) \qquad (25)$$

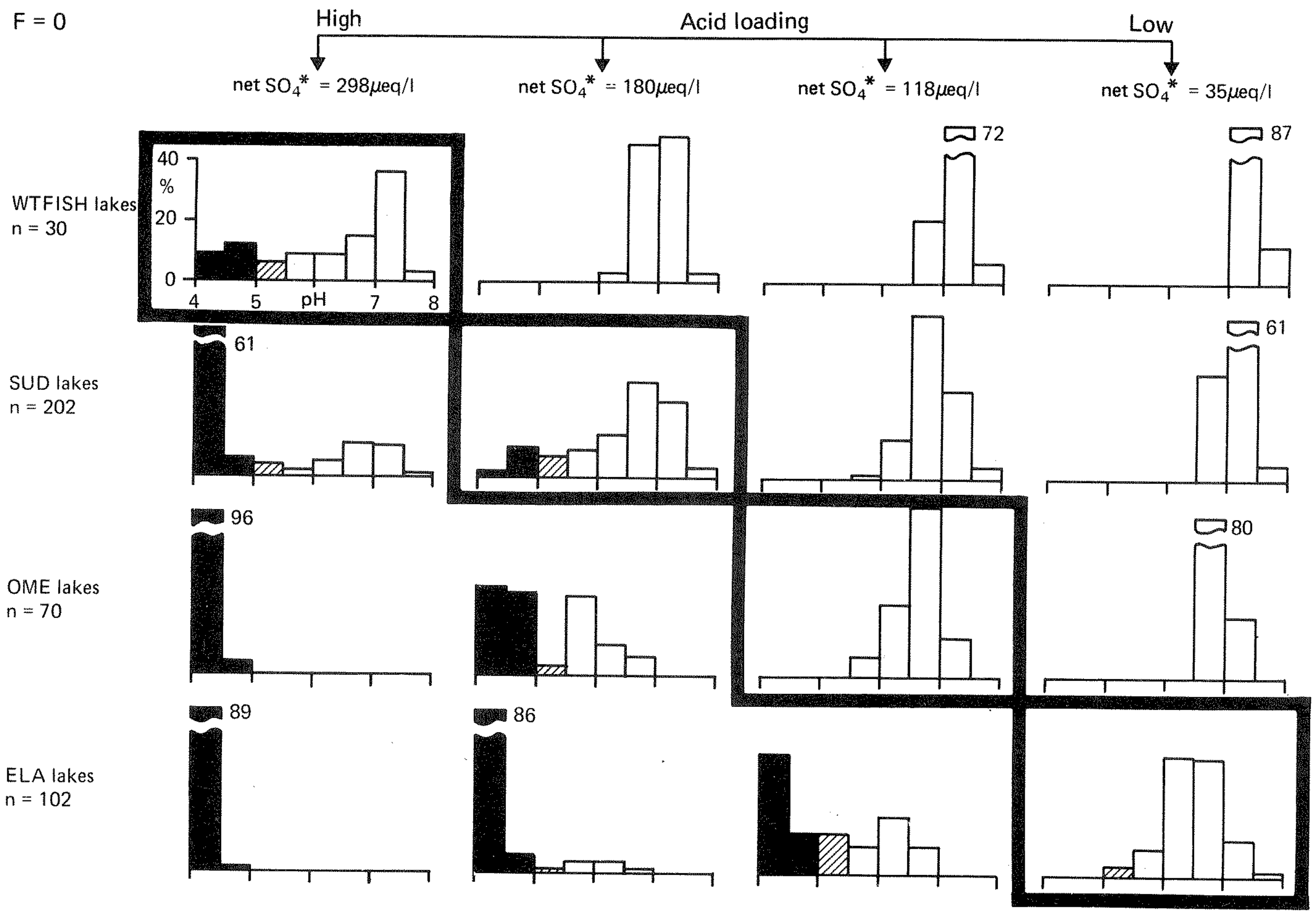


Figure 30. Frequency distributions of pH in 4 sets of lakes (WTFISH, SUD, OME, ELA) as measured and predicted under 4 different loadings (corresponding to mean levels of net SO_4* of 298 µeq/l = WTFISH today; 180 µeq/l = SUD today, 118 µeq/l = OME today, and 35 µeq/l = ELA today). Cation factor F = 0. F is defined as Δ(Ca* + Mg*)/net SO_4*. The heavy lines denote the present-day situation.

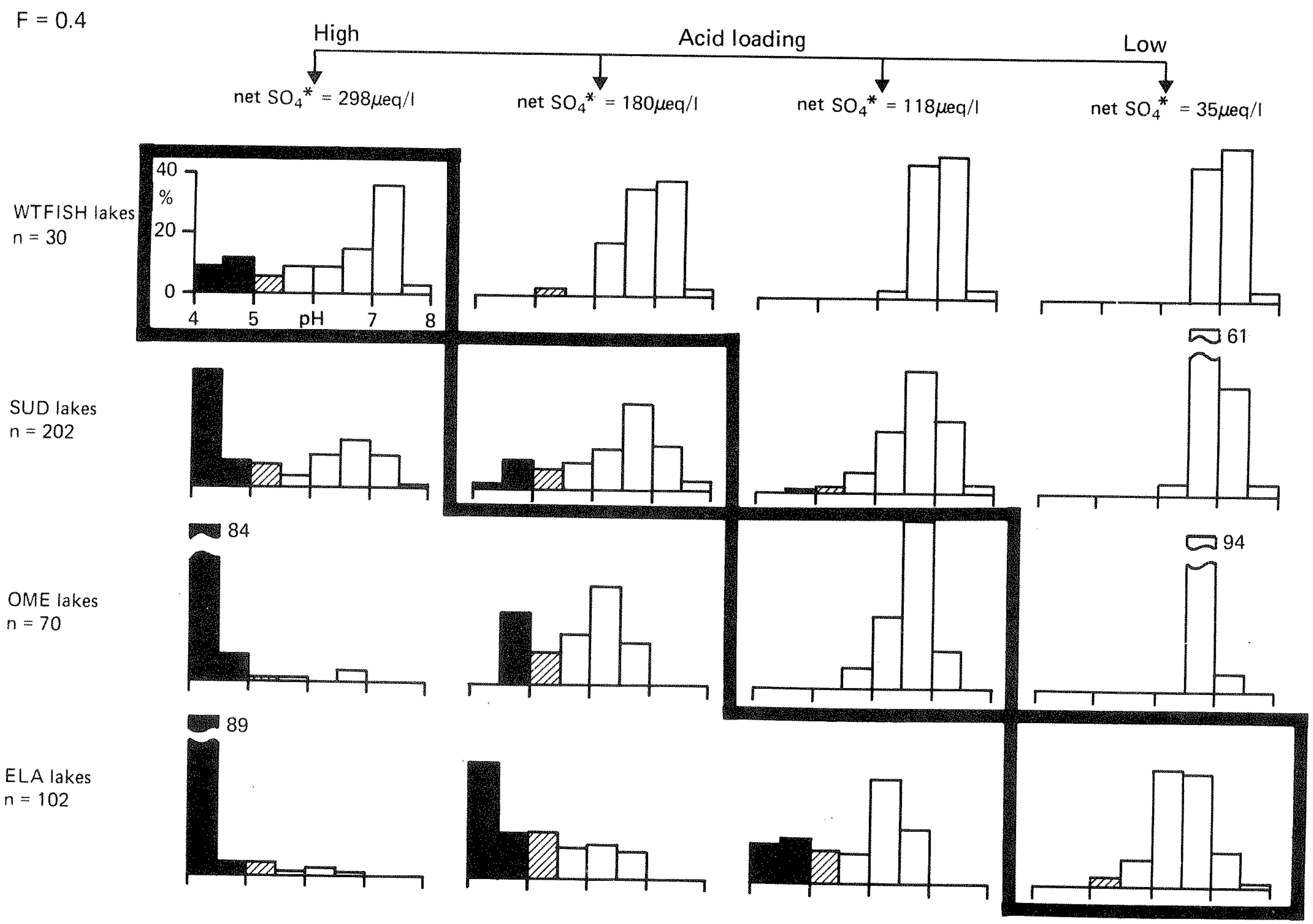


Figure 31. Frequency distributions of pH in 4 sets of lakes (WTFISH, SUD, OME, ELA) as measured and predicted under 4 different loadings (corresponding to mean levels of net SO_4* of 298 µeq/l = WTFISH today; 180 µeq/l = SUD today, 118 µeq/l = OME today, and 35 µeq/l = ELA today). Cation factor F = 0.4. F is defined as Δ(Ca* + Mg*)/net SO_4*. The heavy lines denote the present-day situation.

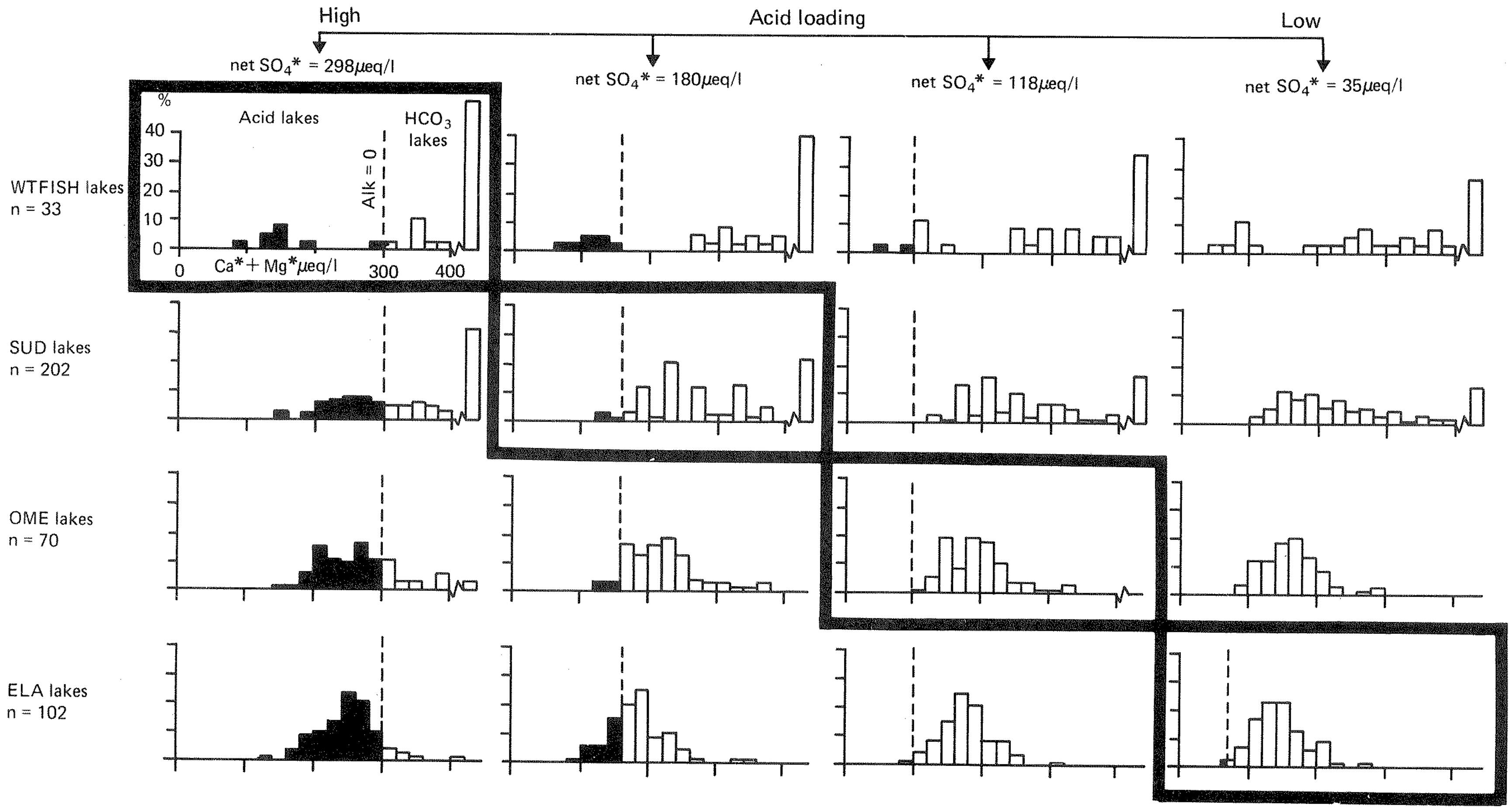


Figure 32. Frequency distributions of (Ca* + Mg*) in 4 sets of lakes under 4 loadings. Cation factor F = 0.4. See also Figure 30.

The factor 1.10 is 1/0.91. The threshold levels can also be obtained empirically from the regression of Ca* + Mg* on (H^+ + Al - HCO_3) for sets of lakes subjected to the same loading of SO_4^*. A change in loading will change the threshold Ca* + Mg* level; if the base cation factor F is greater than 0, then the Ca* + Mg* levels in the lakes themselves will also change. These changes are illustrated by frequency distributions for (Ca* + Mg*) for the 4 data sets ELA, OME, SUD and WTFISH assuming F = 0.4 and under 4 different net SO_4* levels (35, 118, 180 and 298 μeq/l) (Figure 32). The thresholds shown are derived from the empirical relationships and are close to those obtained from equation 25.

As a second example of use of the predictive model the high-elevation lakes in the Adirondacks Mountains (data set ADIRON) are used. In this case the pH frequency distribution following a 50 percent increase in net SO_4* in the lakes, a 50 percent decrease and the "preacidification" pH are calculated (Figure 33). The results are shown for 3 values of F. (0, 0.2 and 0.4). The "preacidification" pH levels can be compared with pH levels in 40 high-elevation lakes measured in the 1930's (Schofield 1976) (Figure 33).

Finally, as a third example of the predictive model the relatively unaffected lakes of the Rocky Mountains (data set ROCKY) are used. Here an increase of 50 μeq/l SO_4* in the lakes causes 50 percent to become acidic (pH < 5) at F = 0, and 10 percent if F = 0.4. A relatively large number of these lakes have very low (Ca* + Mg*) concentrations, and thus the rather modest increase in SO_4* of 50 μeq/l will affect a large proportion of the lakes (Figure 34).

The 50 μeq/l increase in SO_4^* corresponds to precipitation pH 4,55. This is about the level measured at, for example, northern Wisconsin and inland areas of southern Norway today. In both these regions acidification of extremely sensitive freshwaters has been reported.

The 100 μeq/l increase corresponds to precipitation pH 4.2, about the level today in the Adirondack mountains. At this level with F = 0.2 -

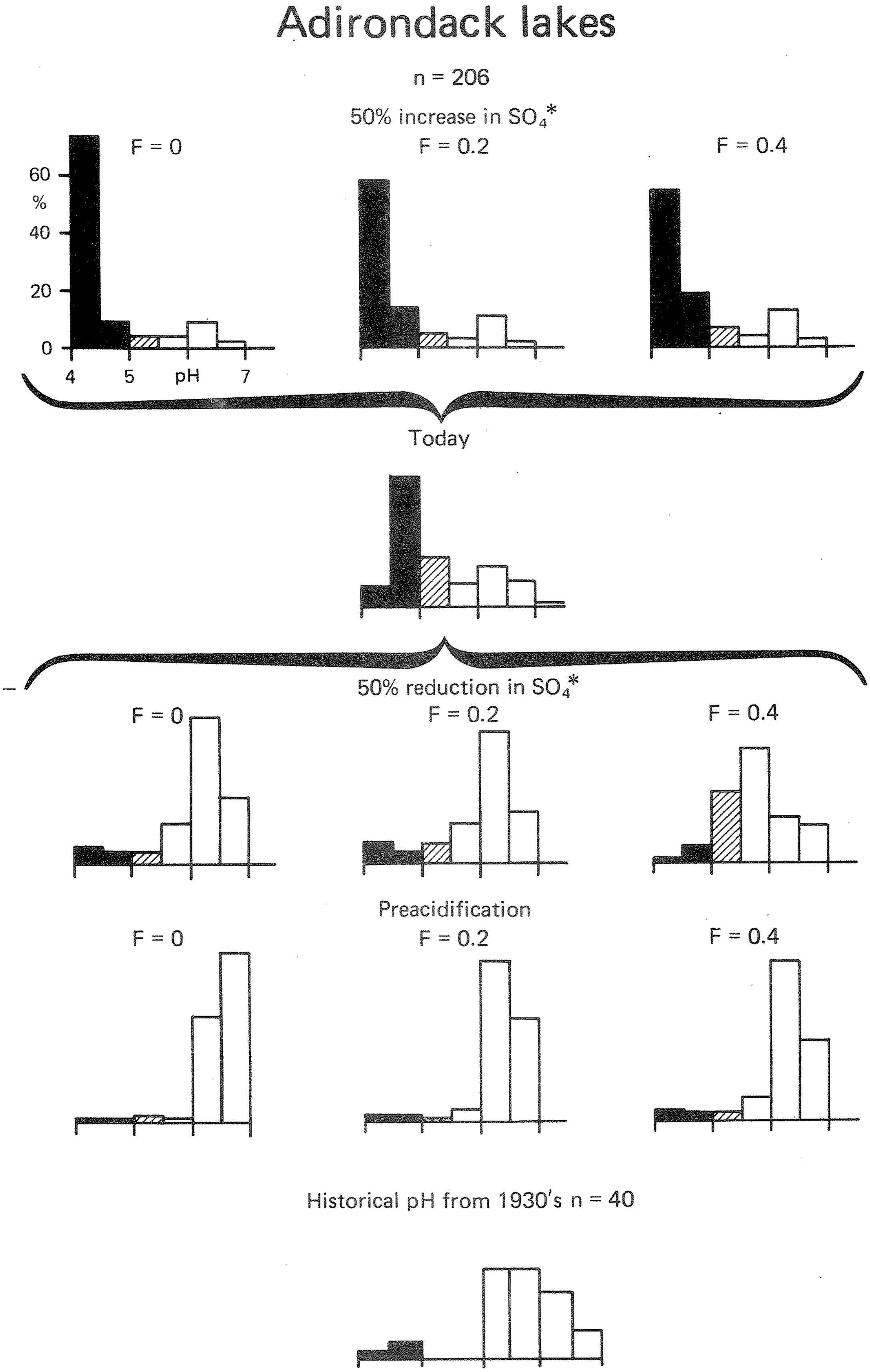


Figure 33. Measured and predicted pH frequency distributions for 206 high-elevation lakes in the Adirondacks (data set ADIRON) under 4 loadings (present-day, 50 percent increase, 50 percent decrease and "preacidification") at 3 F-factors, 0,0.2, and 0.4. Also shown as pH frequency distribution for 40 high-elevation lakes sampled in the 1930s (from Schofield 1976).

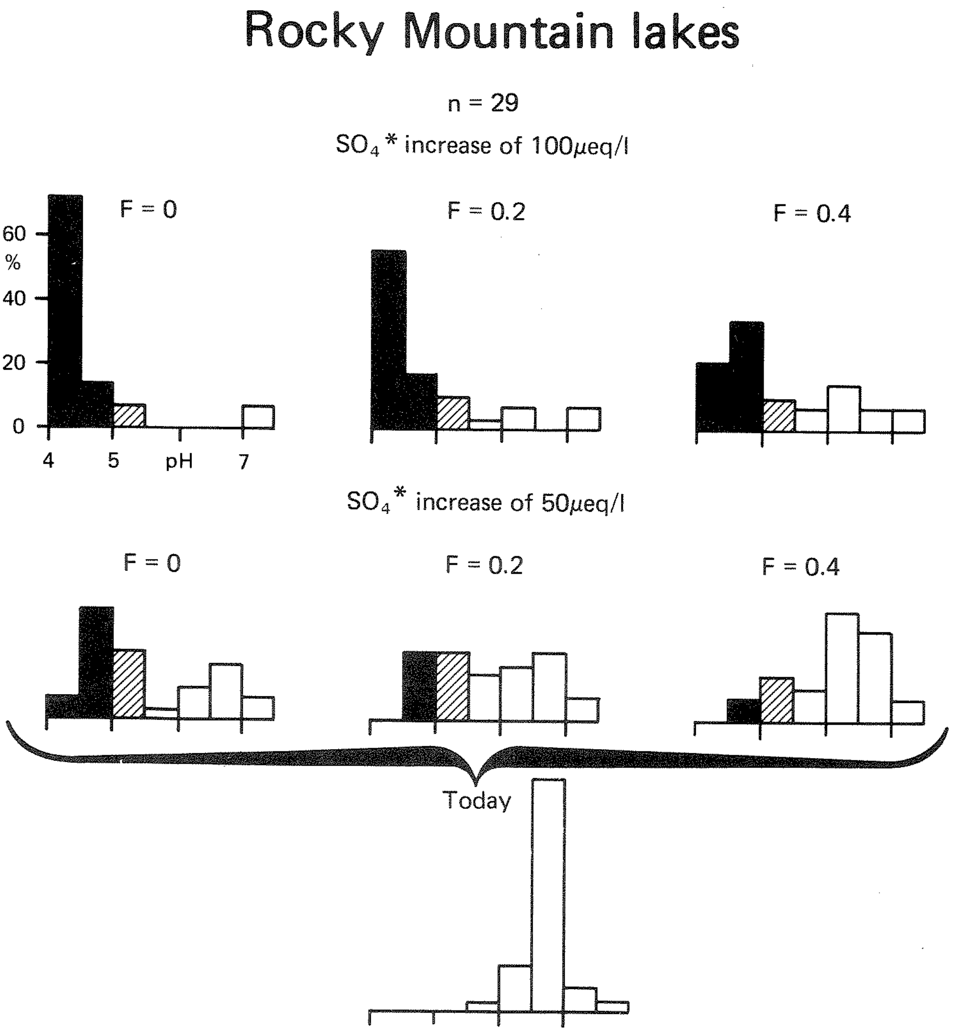


Figure 34. Measured and predicted pH frequency distributions for 29 lakes in the Rocky Mountain National Park (data set ROCKY) under 3 loadings (present-day, increase in net SO_4* in lakes by 50 µeq/l, and increase in net SO_4* by 100 µeq/l) at 3 F-factors, 0.02 and 0.4. Increase in net SO_4* lakes by 50 µeq/l corresponds to future pH of precipitation of about 4.55.

0.4 the pH frequency distribution of the Rocky mountain lakes would be similar to that observed today in the high-elevation Adirondack lakes.

The predictive model has also been applied to Norwegian data. Henriksen (1982 c) showed that "preacidification" pH levels derived from the model using F = 0.2 agree well with historical pH measurements for several rivers in southernmost Norway. As an example of the effects of increased loading Henriksen (1982 d) calculated future pH levels in Oslo region lakes using F = 0.2 and 50 percent increase in SO_4*.

7. DISCUSSION

7.1 Rate of response

Prediction of lakewater chemistry by means of the large-scale titration model allows estimation of future steady-state chemical composition of lakes in response to changes in loading of strong acids. The method does not address the time required to attain the new steady-state. A lag between the onset of an increase in loading, for example, and the achievement of the predicted response in lake chemistry could be caused by among other things (1) net retention of sulfur in the lake catchment and (2) net depletion of the pool of base cations in the catchment.

Sulfate adsorption in soils appears to be a key factor determining the degree of acidification of surface waters due to deposition of strong acids from the atmosphere. In non-glaciated areas with thick deeply-weathered soils a significant fraction of the increasing sulfate is adsorbed in the soils and thus is less available. Examples include sites at Oak Ridge, Tennessee (Johnson et al. 1981) and Shenandoah National Park, Virginia (J. Galloway, pers. comm.). In glaciated areas with thin, young soils the net retention of sulfate in terrestrial catchments is apparently minor. This is supported by the systematic relationship between sulfate concentrations in precipitation and lakes for the data sets considered here as well as by intensive studies of sulfur mass balances at gauged catchments in many of these same areas (for example, Norway, Wright and Johannessen 1980, Christophersen and Wright 1981).

This does not mean, however, that there is no lag time in such glaciated areas. Whereas at Oak Ridge steady-state for sulfur has not been achieved after at least 30 years of anthropogenic sulfur inputs, at Birkenes, southernmost Norway, the catchment is at steady-state today about 15-20 years after the last significant increase in sulfur loading (Christophersen and Wright 1981). Thus lag-time at Birkenes appears thus to be less than ca. 15 years.

With respect to base cations, however, even in glaciated areas steady-state may not yet have been attained at present. By considering together present-day precipitation and streamwater chemistry, history of sulfur emissions and probable deposition, history of fish spawning, Christophersen (1982) arrives at the conclusion that at the Birkenes catchment the base status of the soil may have declined by 50 percent over the past 25 years. pH and base cation concentrations in surface waters can change despite a constant sulfate loading and constant sulfate concentration in lake or streamwater. If the base saturation of the catchment soil changes then presumably the (Ca* + Mg*) concentration in runoff changes, and thus HCO_3 and pH must change in order to maintain ionic balance.

The soil pool of base cations is replenished by chemical weathering of soils and parent material. An increase in acid deposition may increase chemical weathering. The (Ca* + Mg*) increase factor (F) may mainly reflect changes in chemical weathering in addition to a net depletion of base cations in the soil itself. Several laboratory studies of weathering of primary minerals suggest that weathering rate is a function of H^+ concentration.

Conceivably, then, during the attainment of a new steady-state, the change in concentrations of (Ca* + Mg*) in surface waters in response to a change in loading may not be linear and indeed may not be unidirectional. An increase in loading could result in increased (Ca* + Mg*) concentrations due to ion-exchange in the soil, but then a net depletion of base cations in the soil could cause a decrease in (Ca* + Mg*) concentrations in surface waters. Perhaps this explains why F-factors obtained by Henriksen (1982 a) appear to be somewhat larger for the Sudbury, Ontario, lakes where most of the increase in sulfate loading apparently has occurred during the past 20-30 years, as compared with the Adirondack Mountain lakes and lakes in Norway where acidification probably occurred earlier and over a longer period of time.

The entire question of time lag and rate of change deserves separate study and the full answer may require long-term large-scale experiments.

7.2 Ca, SO_4 and Cl as key parameters

Prediction of lake water chemistry using the titration model basically requires specification of only 3 chemical parameters - Ca, SO_4 and Cl. The other ions contributing to the ionic balance can be estimated from these. The seawater component is obtained from the Cl concentrations. The concentrations of the cations Mg*, Na*, and K* can be obtained from the calcium concentration under the assumption that the ionic cations are the same as in "standard composition". The difference between the sum of these cations and SO_4* gives the alkalinity, and the pH can be estimated from the alkalinity.

Both alkalinity and pH are "dependent" variables. At a given concentration of excess-sulfate, the Ca* (or Ca* + Mg*) level will be decisive for lakewater alkalinity and pH. Low pH lakes (<5) will be those in which SO_4* concentrations are greater than Ca* + Mg* concentrations. Because the level of Ca* + Mg*, however, may also change as a result of changes in acid loading, SO_4* is really the only independent variable.

Present-day alkalinity gives rather little information as to degree of acidification or even as to lake sensitivity. Present-day alkalinity may be low because the lake is of naturally low ionic strength and thus has low Ca concentration or because much of the original alkalinity has been lost due to acidification or some combination of the two.

Present-day alkalinity is a measure of how much acidification a lake can tolerate before pH falls below a critical level (e.g. pH 5.3). But because the base cation factor (F) may be greater than zero, alkalinity will give an underestimate of lake tolerance to a future increase in loading; a fraction (F) will go to increase (Ca* + Mg*) rather than to deplete alkalinity.

7.3 pH 4.7 in precipitation as threshold for adverse effects in lakes

Several previous treatments of water chemistry data have yielded the result that the threshold for adverse effects (primarily sport fisheries) in the most sensitive waters is reached when average annual pH of precipitation is about pH 4.7 (Wright and Henriksen 1979, Henriksen 1980, Wright and Johannessen 1980). The titration model can also be applied here. Equation (25) gives the relationship between the threshold (Ca* + Mg*) and net SO_4*. At levels of (Ca* + Mg*)below this threshold the model predicts that alkalinity will be less than zero, i.e. acidic lakes (pH < 5.3). The level of net SO_4* is in turn related to SO_4* concentration in precipitation. The least-squares regressions for the North America data sets and Norwegian data sets (Table 9) yield slopes of about 1.9; SO_4* lakes = 1.9 SO_4* precipitation. Furthermore the relationship between SO_4* and H^+ concentrations in precipitation for these data is about 1:1. Thus the threshold (Ca* + Mg*) can be specified for any given mean pH of precipitation (Table 12). This relationship shows that at precipitation pH of 4.7 and SO_4* lakes/ SO_4* precipitation of 1.9, the threshold Ca* + Mg* is 40 μeq/l.

At precipitation pH of 4.7 only lakes with (Ca* + Mg*) less than about 40 μeq/l will have alkalinity <0. This corresponds to Ca concentrations of about 20-30 μeq/l or 0.4-0.6 mg/l. In the data sets from North America and Europe used here only few of the lakes had Ca levels below this threshold. Thus it appears that precipitation pH 4.7 is a useful critical limit below which adverse effects in lakes can be expected.

Table 12. Relationship between mean annual pH of precipitation and threshold levels of (Ca* + Mg*) in lakes. At (Ca* + Mg*) concentrations below threshold the acidification equation predicts alkalinity <0 and pH <5.3. These thresholds are derived from the empirical relationships: H^+ precipitation = SO_4* precipitation, threshold (Ca* + Mg*) = 1.10 SO_4* and SO_4* lakes = 1.9 SO_4* precipitation. Loading is calculated assuming 1000 mm precipitation + 30 percent dry deposition. Units: µeq/l.

Precipitation pH	Precipitation H^+	Precipitation SO_4*	SO_4* Loading kg/ha/yr	lakes SO_4*	lakes Ca* + Mg* threshold
5.0	10	10	13	19	21
4.9	13	13	17	25	27
4.7	20	20	26	38	42
4.6	25	25	32	48	52
4.3	50	50	65	95	105
4.0	100	100	130	190	210

7.4 The role of nitrate as a strong acid anion

Nitrate is a major anion (> 10 percent of sum of non-marine anions) only in 2 of 11 European and 6 North American data sets (nitrate was not measured in 1 of the European and 9 of the North American lake sets). The 77 lakes in southwestern Scotland (SCOTCH) had an average of 46 µeq/l NO_3-N (22 percent of the sum of non-marine anions) and the 9 lakes in the Vosges Mountains, southeastern France (VOSGES) had an average of 39 µeq/l NO_3-N (again 22 percent). By comparison the next largest average nitrate concentration was measured in the 206 Adirondack lakes (16 µeq/l NO_3-N).

There is no ready explanation for the high nitrate levels in the Scottish and French lakes. They cannot be attributed to faulty analytical methods. The samples were analyzed at the Norwegian Institute for Water

Research and a subset of the Scottish samples were also analyzed at the Freshwater Fisheries Laboratory, Pitlochry, UK. Vegetation type is apparently not a factor. The Scottish lakes lie in a variety of vegetation areas, from heath and brakken-covered blanket peat to coniferous forests to agricultural pastureland. The Vosges lakes lie in coniferous forests. Both areas are in granitic bedrock. Nitrate levels in precipitation are not unusually high compared to other regions receiving pH 4.3 precipitation.

For these 2 regions the titration model, which focuses on sulfate as the acid anion, underestimates loss of alkalinity in the lakes. As a consequence, prediction of future water chemistry in these and other such areas should also take into account nitrate.

7.5 Exceptions: Lakes that do not fit this empirical model

The chemical composition of a fraction of the lakes does not fit this empirical model for lake acidification. Such deviation may be artificial due to analytical error. Deviation may be real and natural due to (1) a source or sink of sulfate in the catchment, (2) an unusually high level of Na* relative to Ca* or (3) the presence of high concentrations of dissolved organic matter. Finally, deviation may be real but man-made due to pollution other than acid precipitation (Table 13).

Significant analytical error can usually be identified from the ionic balance or other clear internal inconsistency in the data (for example, reported alkalinity > 0 at pH < 5).

The presence of significant net sources or sinks of SO_4 in the lake or catchment is usually apparent upon comparison with SO_4 levels in adjacent lakes and SO_4 levels in precipitation. For a group of lakes within an area receiving similar SO_4 loadings, such deviates are readily apparent from a frequency histogram of SO_4*. For the 95 lakes sampled in Labrador (LAB-1) for example, 1 lake had SO_4* level above 80 µeq/l wheras the mean SO_4* for the group was only 23 µeq/l. Often such high SO_4 lakes have also high Ca levels indicating the presence of a Ca-SO_4 mineral such as gypsum in the catchment, or the presence of marine deposits.

Kramer and Tessier (1982) claim that in many lakes the concentrations of Na* + K* are not negligible and that they can vary greatly between lakes within a restricted region. Except for lakes polluted by road salts this is not borne out by the lake data used here. The Labrador lakes are typical (Figure 5). Lakes receiving runoff containing road salts clearly can exhibit unusually high Na and Cl concentrations but such lakes are not pristine and should be excluded. Lakes with unusually high Na* levels appear as outliers in frequency histograms of Na*. Such cases may indicate analytical error for Cl (or Na). Alternatively such lakes may lie in catchments with geology such that Na* is released by weathering at an unusually high rate. Prior to acidification such lakes were Na-HCO_3 lakes. In the titration model such Na-lakes will exhibit values for calculated acidification (loss of alkalinity) much lower than levels of net SO_4*. Indeed acidification can even be negative in such cases. In the data sets used here such Na-lakes are rare. For example, of the 167 lakes in the Oslo, Norway area (OSLOMA) only 1 clearly deviates due to excessive Na*.

Colored-water lakes differ chemically from clearwater lakes in several important respects. Total dissolved aluminum levels are commonly higher and pH is lower for a given alkalinity. With respect to the titration model such lakes may deviate for 2 reasons. Measured (Ca* + Mg*) levels may be higher than actual concentrations of ionic (Ca* + Mg*) due to complexing of these elements by the organic matter. Acidification (loss of alkalinity) as estimated by equation (12) will thus be overestimated. Also the concentration of organic anions may be significant. Acidification of colored waters requires a separate study.

Pollution other than acid precipitation affects the chemical composition of lakes. Disturbance in the lake catchment can alter the chemical composition of lakewater. In most cases lakes affected by pollution from within the catchment can be eliminated readily at the time of sampling from maps or other such information. In some cases the chemical composition of such lakes is sufficient evidence. Lakes receiving inputs of road salts, for example, exhibit high concentrations of Na and Cl relative to adjacent lakes. Lakes receiving runoff from agricultural lands often have unusually high levels of nitrate. Such lakes can often be identified from frequency histograms of Na, Cl and NO_3.

Table 13. Causes and symptoms for lakes deviating from the titration model.

Cause	Symptom - water chemistry
Artificial misfit	
1) analytical error	poor ionic balance
Real misfit - natural causes	
1) geologic source of SO_4 in catchment	SO_4* in lake >> SO_4* in adjacent lakes
2) net sink of SO_4 in catchment	SO_4* in lake << SO_4* in adjacent lakes and precipitation
3) large geologic source of Na* in catchment	ratio (Na*/Ca* + Mg*) >> 0,2
4) release of humic acids from catchment	highly colored waters, Σ cations > Σ anions by 20% or more
Real misfit-pollution	
1) road salts	Cl and Na >> Cl and Na in adjacent lakes
2) agriculture	high NO_3-N concentrations

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APPENDIX 1. List of equations. Asterisk denotes non-marine fraction. Units: µeq/l.

(1) $H^+ + Al + Ca + Mg + Na + K + NH_4 = Cl + NO_3 + SO_4 + HCO_3 +$ organic anions

(2) $H^+ + Al + Ca^* + Mg^* + Na^* + K^* + NH_4 = NO_3 + SO_4^* + HCO_3 +$ organic anions

(3) $H^+ + Al + Ca^* + Mg^* + Na^* + K^* = SO_4^* + HCO_3$

(4) $H^+ + Al + f(Ca^* + Mg^*) = \text{net } SO_4^* + HCO_3$

(5) $\text{net } SO_4^* = SO_4^* - \text{background } SO_4^*$

(6) $f(Ca^* + Mg^*) = HCO_3$

(7) $\text{alk} = 0.91(Ca^* + Mg^*)$

(8) $H^+ + al + 0.91(Ca^* + Mg^*) = \text{net } SO_4^* + HCO_3$

(9) $0.91(Ca^* + Mg^*) = \text{net } SO_4^* + HCO_3$

(10) $0.91(Ca^* + Mg^*) = \text{net } SO_4^*$

(11) $H^+ + Al + 0.91(Ca^* + Mg^*) = \text{net } SO_4^*$

(12) $\Delta\text{alk} = 0.91(Ca^* + Mg^*) - (HCO_3 - H^+ - Al)$

(13) $0.91(Ca^* + Mg^*) - HCO_3 + H^+ + Al = \text{net } SO_4^*$

(14) $\text{background } SO_4^* = 0.09(Ca^* + Mg^*) + Na^* + K^*$

(15) $F = \Delta(Ca^* + Mg^*)/\Delta SO_4^*$

(16) $\Delta SO_4^* = \Delta(Ca^* + Mg^*) + \Delta H^+ + \Delta Al$

(17) $\Delta(Ca^* + Mg^*) = \Delta SO_4^* - H^+ - Al - alk.$

(18) $alk = HCO_3 - H^+$

(19) $CO_2 + H_2O = H^+ + HCO_3$

(20) $pH = 11.3 + \log(HCO_3^-)$

(21) $\Delta(H^+ + Al - HCO_3) + \Delta\ 0.91(Ca^* + Mg^*) = \Delta SO_4^*$

(22) $(1-F).\Delta(H^+ + Al - HCO_3) + (F)\Delta\ 0.91(Ca^* + Mg^*) = \Delta SO_4^*$

(23) $(Ca^* + Mg^*)_p = (Ca^* + Mg^*)_t - (F.\Delta SO_4^*)$

(24) $(H^+ + Al - HCO_3)_p = (H^+ + Al - HCO_3)_t + (1-F)(\Delta SO_4^*)$

(25) Threshold $(Ca^* + Mg^*) = 1.10\ \Delta SO_4^*$

APPENDIX 2. Group mean concentrations of major ions as measured, with marine fraction subtracted, calculated background excess-sulfate, and acidification estimated by excess-sulfate above background and loss of alkalinity. $bSO_4* = 0.09(Ca* + Mg*) + Na* + K*$. net $SO_4* - bSO_4*$. $\Delta alk = 0.91(Ca* + Mg*) + H^+ + Al - HCO_3$. Units: µeq/l.

North America

Data set	n	Measured									Excess								Ca* + Mg*	Na* + K*	bSO$_4$*	net SO$_4$*	Δalk
		H$^+$	Ca	Mg	Na	K	Cl	HCO$_3$	SO$_4$	NO$_3$	H$^+$	Ca*	Mg*	Na*	K*	Cl	HCO$_3$	SO$_4$*					
ADIRON	206	12	108	32	24	6	14	25	135	16	12	102	30	12	6	0	26	134	131	18	31	103	119
FLORID 1	13	7	74	52	144	15	176	25	111	1	7	67	18	-7	12	0	25	111	85	5	(12)	(99)	(52)
2	7	1	194	220	280	67	343	125	318	1	1	191	153	-14	61	0	125	283	344	47	(78)	(205)	(188)
ROCKY	30	0	66	16	17	3	5	65	31	9	0	66	15	13	3	0	65	30	81	16	24	6	9
USFWS All	168	4	148	67	116	18	102	122	128	-	4	144	47	29	16	0	122	117	191	45	62	55	52
CT	22	2	178	99	182	31	192	130	180	-	2	171	61	18	28	0	130	160	232	46	67	93	83
MA	30	3	160	78	211	21	192	122	136	-	3	153	40	47	18	0	122	116	193	65	82	34	57
ME	31	2	177	57	47	8	36	138	121	-	2	176	50	17	7	0	138	117	226	24	44	73	32
NH	42	1	112	48	205	17	79	99	113	-	1	109	33	37	16	0	99	105	142	53	66	40	31
RI	8	32	71	46	165	16	182	30	129	-	32	65	10	6	13	0	30	110	74	19	26	84	69
VT	34	5	155	74	56	17	35	156	113	-	5	154	67	26	16	0	156	109	221	42	62	47	50
ELA	102	1	96	54	39	9	23	74	78	1	1	95	49	19	9	0	74	76	144	28	41	35	57
KEREKE	3	18	22	30	128	6	125	0	76	3	18	17	6	21	4	0	0	63	23	25	27	36	38
LABRAD	13	1	80	54	21	11	20	69	60	2	1	79	50	3	11	0	69	58	129	14	26	32	48
LAB-1	98	1	90	30	30	7	18	87	26	-	1	87	26	14	7	0	87	23	113	21	31	(-8)	16
LAUREN	4	14	77	25	15	11	13	0	129	-	14	77	22	4	11	0	0	129	99	15	24	105	104
NEWF	81	2	91	48	76	5	76	70	52	-	2	88	33	11	4	0	70	44	121	15	26	18	40
NOVASC 1956	16	16	94	49	182	13	180	-	123	-	16	87	14	28	10	0	-	104	101	38	47	61	-
1977	16	29	123	75	289	16	331	45	152	-	29	111	10	5	10	0	45	118	121	15	26	92	94
QUEBEC	23	1	85	26	47	9	26	72	42	-	1	84	21	25	8	0	72	40	105	33	42	-2	24
OME	70	1	147	56	43	12	26	53	170	-	1	146	51	20	11	0	53	167	197	31	49	118	126
SUD	208	4	273	114	44	13	28	160	252	-	4	272	108	21	13	0	160	250	380	34	68	182	192
WTFISH	33	1	284	145	60	17	51	99	373	-	1	282	135	17	16	0	99	368	417	33	70	298	296

Europe

Data set	n	Measured									Excess										bSO$_4$	net SO$_4$*	Δalk
		H$^+$	Ca	Mg	Na	K	Cl	HCO$_3$	SO$_4$	NO$_3$	H$^+$	Ca*	Mg*	Na*	K*	Cl	HCO$_3$	SO$_4$*	Ca* + Mg*	Na* + K*			
SNEK-1	616	18	41	37	117	7	123	-	84	7	18	36	13	11	5	0	0	71	49	16	20	51	45
REGION 81	47	8	55	31	75	5	86	22	68	7	8	52	14	1	4	0	22	59	66	5	11	48	38
BIGSJO 81	44	4	64	20	43	5	46	36	56	9	4	62	11	4	4	0	36	51	73	8	15	36	30
NVEST	49	1	47	24	77	8	85	30	41	2	1	44	7	4	7	0	30	32	50	11	16	16	16
OSLOMA	151	2	146	39	51	9	41	85	124	7	2	144	31	16	8	0	85	120	175	24	40	80	74
FEMUND	33	6	32	14	20	5	14	19	43	2	6	31	11	8	5	0	19	41	43	13	17	24	20
NNORGE	26	1	131	78	87	8	85	138	54	2	1	128	60	15	6	0	138	45	188	31	38	7	33
REGSVE	90	4	228	81	139	19	118	113	198	9	4	135	58	38	16	0	113	187	283	54	79	108	148
SVER-A 1930	101	0	255	107	78	20	52	305	56	-	0	253	96	34	19	0	305	51	349	53	84	-33	13
1970	101	0	357	120	107	30	75	322	213	-	0	355	105	43	31	0	322	210	460	74	115	95	97
DANSK	14	14	137	145	588	31	657	18	264	4	14	123	16	16	20	0	18	196	139	36	49	147	108
SCOTCH	57	12	83	74	166	11	200	17	132	18	12	74	34	6	8	0	17	111	108	13	23	88	98
VOSGES	9	2	132	58	102	9	89	81	104	39	2	129	41	26	8	0	81	95	170	34	49	46	74

APPENDIX 3. Description of lake data from North America and Europe. VANN = lake number. Units: µeq/l. PERM = mg O/l. FARG = color PT-units. TOC = mg C/l.

CODE: ADIRON

DESCRIPTION: Survey of 217 lakes above 610 m elevation in the Adirondack Mountains, New York, conducted in June 1975 by C.L. Schofield, Cornell University.

PARAMETERS USED: pH, cond, Na, K, Ca, Mg, Al, SO_4, Cl, NO_3, alkalinity (S.Acid)

REFERENCE: Schofield, C.L., 1976. Ambio 5:228. Schofield, C.L. 1977. Acidification of Adirondack lakes by acid precipitation: extent and magnitude of the problem. USFWS Fed. Aid Fish Restoration Project F-28-R, Final Report, 36 pp. (mimeo).

OUTLIERS: 5 lakes with unusually high sulfate levels (primary sulfur sources in soils or bedrock or analytical error) are excluded from further treatment (SO_4 > 250 µeq/l)

DATA SOURCE: Schofield (1977).

COMMENTS: SO_4 determined by difference in the ionic balance.

FILKODE: ADIRON NAVN: REGIONAL-UNDERSØKELSE I ADIRONDACK, NEW YORK. SCHOFIELD DATANORD-AMERIKA DATO: 830325 1

VANN	Å M D R N G	DYP	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	S.ACID	ES04	EN03
10	67500	1	4.71	19.5	81.8	24.7	19.1	3.6	21.1	9.3	15.0	149.9	1.8
97	67500	1	5.41	3.9	64.9	23.0	7.8	12.8	14.5	7.9	-7.0	95.8	.3
166	67500	1	5.53	3.0	96.8	21.4	21.8	7.4	10.0	9.3	-8.0	131.8	.3
167	67500	1	5.12	7.6	109.8	21.4	19.1	5.1	8.9	8.7	5.0	139.9	14.4
186	67500	1	4.52	30.2	57.9	18.1	15.7	8.2	44.5	7.1	27.0	99.9	22.3
192	67500	1	5.19	6.5	94.8	28.0	24.4	2.0	109.0	10.7	4.0	144.3	.3
196	67500	1	4.47	33.9	54.9	16.5	13.0	8.7	58.9	9.0	27.0	141.6	20.8
197	67500	1	4.60	25.1	57.9	41.1	14.8	6.9	36.7	6.2	17.0	141.6	19.8
201	67500	1	4.64	22.9	74.8	18.1	23.5	5.6	29.1	11.0	13.0	137.4	10.1
208	67500	1	6.28	.5	139.7	47.7	30.5	6.6	13.3	16.1	-50.0	150.5	7.9
210	67500	1	4.60	25.1	51.9	24.7	18.3	8.7	36.7	8.7	16.0	127.0	40.5
214	67500	1	4.68	20.9	89.8	21.4	14.8	8.2	36.0	11.0	12.0	137.4	28.6
230	67500	1	6.32	.4	138.7	36.2	33.1	3.6	6.7	13.0	-79.0	109.9	8.7
233	67500	1	6.05	.8	137.7	47.7	20.9	3.6	6.7	7.9	-23.0	162.8	16.5
235	67500	1	5.14	7.2	121.8	32.9	21.8	4.3	10.0	7.1	-1.0	149.9	23.6
238	67500	1	5.10	7.9	121.8	32.9	20.9	4.3	14.5	8.7	1.0	143.7	34.7
239	67500	1	5.17	6.8	121.8	36.2	21.8	4.3	15.6	8.7	3.0	145.1	34.2
241	67500	1	5.30	5.0	89.8	32.9	20.0	5.6	14.5	11.8	-1.0	129.5	6.3
247	67500	1	5.17	6.8	109.8	36.2	24.4	7.4	24.5	8.7	1.0	145.7	27.1
255	67500	1	4.72	19.1	74.8	23.0	19.6	6.1	24.5	11.8	1.0	118.7	23.4
256	67500	1	4.60	25.1	79.8	29.6	19.1	6.1	42.3	10.7	18.0	156.1	20.1
257	67500	1	4.64	22.9	74.8	29.6	19.1	6.1	41.1	14.4	15.0	149.9	13.7
258	67500	1	6.61	.2	174.6	57.6	23.5	6.6	8.9	14.4	-51.0	184.3	12.9
261	67500	1	4.75	17.8	96.8	21.4	20.9	3.6	21.1	5.1	6.0	152.2	7.4
267	67500	1	5.04	9.1	68.9	36.2	18.3	7.4	11.1	11.8	3.0	110.1	13.9
268	67500	1	6.39	.4	119.8	26.3	21.8	3.1	41.1	9.0	-34.0	121.0	7.1
270	67500	1	7.06	.0	281.4	87.2	200.1	4.3	4.4	196.1	-158.0	209.4	9.5
271	67500	1	7.15	.0	259.5	93.8	178.4	5.1	11.1	170.7	-169.0	185.5	11.6
273	67500	1	4.57	26.9	54.9	19.7	31.3	5.6	34.5	35.8	21.0	118.7	7.1
274	67500	1	4.57	26.9	54.9	16.5	14.8	3.6	53.4	16.1	18.0	124.9	10.6
276	67500	1	4.70	20.0	74.8	26.3	104.4	13.8	30.0	104.9	12.0	143.7	5.6
278	67500	1	4.74	18.2	109.8	32.9	20.0	7.4	35.6	8.7	3.0	149.9	43.9
285	67500	1	5.58	2.6	113.8	16.5	20.9	2.6	15.6	11.3	-4.0	134.9	3.7
289	67500	1	5.92	1.2	139.7	44.4	26.1	2.6	20.0	14.4	-49.0	149.3	.3
291	67500	1	6.48	.3	154.7	42.8	34.8	6.6	13.3	15.2	-38.0	151.6	34.2
292	67500	1	6.51	.3	139.7	41.1	30.5	5.6	15.6	12.4	-60.0	114.9	31.3
293	67500	1	6.59	.2	146.7	47.7	37.4	6.6	58.9	16.6	-124.0	62.9	35.2
295	67500	1	6.40	.4	129.7	57.6	40.9	8.7	12.2	20.9	-101.0	115.3	.3
299	67500	1	6.10	.7	121.8	49.4	34.8	8.2	8.9	11.3	-28.0	175.1	0.0
300	67500	1	6.67	.2	469.1	246.8	313.2	40.9	15.6	88.6	-190.0	791.2	.3
302	67500	1	6.07	.8	109.8	36.2	23.5	7.4	5.6	9.3	-31.0	137.4	0.0
303	675000	1	6.15	.7	137.7	47.7	31.3	7.4	3.3	12.1	-45.0	142.2	25.0
306	67500	1	6.33	.4	182.6	65.8	24.4	8.2	15.6	28.2	-120.0	132.4	.5
311	67500	1	6.51	.3	161.7	49.4	143.5	10.7	2.2	117.9	-78.0	169.3	.3
312	67500	1	5.68	2.1	139.7	41.1	27.0	4.1	14.5	14.4	-30.0	142.0	25.8
315	67500	1	4.59	25.7	96.8	41.1	32.2	8.2	48.9	14.1	10.0	222.8	0.0
320	67500	1	5.42	3.8	94.8	34.5	23.5	7.7	18.9	17.5	-4.0	126.0	13.7
323	67500	1	5.42	3.8	109.8	37.8	28.7	10.0	12.2	15.0	-12.0	159.9	1.8
328	67500	1	4.54	28.8	57.9	-24.7	14.8	9.5	33.4	9.3	29.0	156.1	0.0
365	67500	1	4.59	25.7	103.8	21.4	16.5	7.4	36.0	14.1	13.0	152.0	27.1
366	67500	1	4.64	22.9	103.8	24.7	31.3	6.1	33.4	9.0	15.0	181.1	18.4
368	67500	1	4.71	19.5	89.8	21.4	20.9	5.1	33.4	11.8	2.0	152.0	3.7
372	67500	1	4.57	26.9	81.8	24.7	15.7	11.3	41.1	6.2	22.0	164.5	19.3
373	67500	1	4.64	22.9	81.8	24.7	17.4	10.7	25.6	7.9	11.0	127.0	33.6
377	67500	1	5.37	4.3	179.6	32.9	17.4	6.9	11.3	10.4	-11.0	178.6	40.0

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FILKODE: ADIRON    NAVN: REGIONAL-UNDERSØKELSE I ADIRONDACK, NEW YORK. SCHOFIELD DATANORD-AMERIKA        DATO: 830325        2
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VANN  Å M D   DYP        PH     EH+     ECA     EMG     ENA      EK     EAL     ECL  S.ACID  ES04    EN03
      R N G
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379   67500            4.91    12.3    99.8    62.5    21.8     3.1    24.5    12.1     1.0  183.2     9.4
398   67500     1      5.44     3.6    94.8    24.7    17.4     3.1     8.0    11.8    -3.0  112.0    16.5
461   67500     1      6.45      .3   190.6    37.8    35.7     4.3     7.1     9.9  -110.0  119.5    34.2
498   67500     1      4.48    33.1    68.9    21.4    13.9     8.2    41.1     7.9    28.0  133.2    36.3
499   67500     1      5.58     2.6    96.8    32.9    22.6     8.7    13.3     9.9   -14.0  123.7    14.9
504   67500     1      4.66    21.9    81.8    24.7    14.8     7.4    33.4     9.3    16.0  127.0    34.7
511   67500     1      4.68    20.9    54.9    16.5    13.0     8.2   122.3     9.0    22.0  177.0    20.8
515   67500     1      4.48    33.1    46.9    19.7    13.9     8.7    41.1     7.1    31.0  143.7     4.4
519   67500     1      6.49      .3   179.6    32.9    16.5     4.3     3.6    16.1   -36.0  181.8      .1
525   67500     1      5.10     7.9   121.8    49.4    21.8    10.0    12.2    10.7    -1.0  138.2    55.0
527   67500     1      4.78    16.6    99.8    21.4    17.4     8.7    46.7    10.4    15.0  154.1    34.2
529   67500     1      6.63      .2   149.7    49.4    30.5     5.1     2.7     8.2   -97.0  128.5     1.3
538   67500     1      6.04      .9   103.8    36.2    18.3     5.1     1.1     6.5   -33.0  124.3     0.0
541   67500     1      6.96      .1   234.5    77.3    96.6     4.3     3.6    27.6  -122.0  260.0     3.4
542   67500     1      6.48      .3   149.7    52.6    20.9     3.6     1.1    11.8   -66.0  141.8     7.4
551   67500     1      6.00     1.0   121.8    49.4    28.7     8.2    11.3     2.0   -57.0  140.1     9.4
552   67500     1      6.76      .1   135.7    52.6    35.7     9.5     4.0     1.4   -95.0  113.9    23.6
556   67500     1      5.40     4.0   121.8    36.2    25.2    11.3    15.6    10.4    -8.0  150.5    26.8
557   67500     1      5.44     3.6   135.7    41.1    24.4     7.4    12.5    16.1   -11.0  162.6    20.5
566   67500     1      6.70      .2   190.6    41.1    35.7     2.6     6.0    19.2  -117.0  124.7     9.4
570   67500     1      4.70    20.0    93.8    21.4    15.7    11.3    24.5    10.4     0.0  144.3     7.6
571   67500     1      4.56    27.5    68.9    21.4    17.4     8.2    24.5     7.9    17.0  135.3    11.4
573   67500     1      5.49     3.2    96.8    32.9    29.6     8.2     6.7     9.3   -50.0   79.1    31.1
577   67500     1      6.51      .3   149.7    52.6    27.8     7.4     6.0    64.3   -75.0   72.0    26.5
578   67500     1      5.27     5.4   121.8    29.6    20.9     6.9    10.0    17.8     5.0  139.9    29.3
580   67500     1      4.97    10.7    81.8    21.4    15.7     8.2    26.7     8.7    13.0  108.3    43.6
581   67500     1      4.30    50.1    57.9    16.5    12.2     5.1    58.9     9.9    45.0  172.8     9.2
582   67500     1      4.72    19.1    57.9    21.4    15.7     6.9    31.1     9.3    13.0  108.3    21.1
583   67500     1      4.58    26.3    58.9    21.4    16.5     8.2    51.2     8.7    23.0  152.0     8.4
584   67500     1      4.86    13.8   109.8    29.6    21.8     8.2    30.0     9.3    11.0  162.4    33.6
585   67500     1      4.93    11.7    74.8    18.1    29.6     5.1    26.7    16.9    -5.0  123.0      .6
588   67500     1      4.54    28.8    68.9    21.4    15.7     8.2    34.5     9.3    19.0  141.6    12.9
589   67500            6.36      .4   135.7    49.4    30.5     6.1     6.4    14.1   -34.0  157.6    16.3
607   67500     1      5.48     3.3   103.8    36.2    23.5     5.1    12.5    11.0    -5.0  136.2    19.1
608   67500     1      6.43      .3   118.8    49.4    28.7     4.3     6.0    10.4   -54.0  125.5    11.8
640   67500     1      6.05      .8   121.8    37.8    23.5     8.2     4.0    11.8   -14.0  129.7    36.5
651   67500     1      4.74    18.2    68.9    29.6    20.0     7.4    26.7     9.9    11.0  147.8     0.0
653   67500     1      6.33      .4   121.8    49.4    33.1     4.9     3.6    11.8   -58.0  138.0     1.3
664   67500     1      6.11      .7   137.7    47.7    21.8     5.6     4.4    12.1   -40.0  160.9      .1
665   67500     1      4.68    20.9   118.8    37.8    29.6     3.6    50.0    17.5     7.0  218.6      .7
666   67500     1      6.55      .2   149.7    70.7    22.6     6.9     1.1    66.0   -81.0  103.3     0.0
668   67500     1      6.14      .7   121.8    47.7    22.6     6.9     1.1    30.7   -34.0  135.1      .1
669   67500     1      4.92    12.0    49.9    21.4    10.4    10.7     8.9     5.9     7.0  101.4     0.0
670   67500     1      6.20      .6   121.8    37.8    15.7     5.1     1.1     6.2   -22.0  134.3    18.7
671   67500     1      5.24     5.8    81.8    32.9    17.4     5.6     6.7     8.5    -4.0  126.8     0.0
678   67500     1      6.87      .1   121.8    52.6    28.7     7.7     0.0     1.4  -109.0  100.6     0.0
698   67500     1      6.02      .9   177.6    32.9    27.0     3.1     3.3    13.3   -20.0  164.1    43.6
704   67500     1      4.84    14.5    96.8    21.4    17.4     3.1    24.5     7.1     9.0  127.0    31.5
706   67500     1      4.77    17.0    96.8    21.4    17.4     3.1    36.7    11.0     9.0  135.3    28.1
707   67500     1      4.74    18.2   103.8    24.7    16.5     4.3    76.1    15.0    -3.0  149.9    37.9
711   67500     1      6.57      .2   149.7    49.4    25.2     3.1     7.8    12.1   -99.0  109.9     6.4
717   67500     1      4.75    17.8   109.8    21.4    15.7     4.3    55.6    11.0     8.0  154.1    34.2
718   67500     1      4.95    11.2   109.8    24.7    20.0     3.1    24.5     9.3     3.0  135.3    31.9
719   67500     1      4.87    13.5    81.8    21.4    14.8     2.6    43.4     7.1     1.0  137.4     6.6
720   67500     1      4.86    13.8    79.8    21.4    15.7     2.8   133.4     5.9     9.0  210.3     1.8
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FILKODE: ADIRON   NAVN: REGIONAL-UNDERSØKELSE I ADIRONDACK, NEW YORK. SCHOFIELD DATANORD-AMERIKA   DATO: 830325   3

VANN	Å M D R N G	DYP	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	S.ACID	ES04	EN03
725	67500	1	4.72	19.1	64.9	23.0	19.6	4.3	20.0	11.8	14.0	129.1	0.0
733	67500	1	4.85	14.1	68.9	21.4	15.7	5.6	13.3	7.9	9.0	122.8	0.0
738	67500	1	5.18	6.6	96.8	29.6	24.4	8.2	12.2	14.1	2.0	128.5	19.8
741	67500	1	6.46	.3	121.8	49.4	84.4	8.2	4.4	22.0	-52.0	178.4	11.6
752	67500		4.58	26.3	74.8	24.7	17.0	5.6	36.7	11.3	22.0	118.7	18.1
755	67500		6.47	.3	109.8	49.4	27.0	5.1	0.0	8.5	-56.0	101.8	25.5
756	67500	1	4.58	26.3	57.9	18.1	15.7	4.3	36.7	7.1	23.0	137.4	6.0
760	67500	1	5.02	9.5	121.8	36.2	23.5	8.7	16.7	11.0	3.0	168.6	19.8
768	67500		4.71	19.5	74.8	23.0	15.7	6.6	20.0	10.4	12.0	110.3	28.6
772	67500	1	4.93	11.7	96.8	29.6	19.1	8.7	18.9	11.3	7.0	145.7	18.7
775	67500		4.60	25.1	74.8	29.6	17.4	16.9	24.9	19.2	18.0	256.1	22.3
776	67500	1	4.37	42.7	54.9	16.5	43.5	25.6	30.0	34.7	37.0	312.3	1.9
779	67500	1	4.66	21.9	81.8	29.6	20.0	12.0	25.6	10.4	22.0	158.2	17.4
787	67500	1	4.73	18.6	59.9	21.4	13.9	5.1	44.0	29.1	7.0	79.1	32.6
821	67500	1	4.78	16.6	64.9	21.4	17.4	8.2	27.8	14.1	13.0	310.2	15.1
822	67500		4.76	17.4	74.8	23.0	17.0	5.6	21.1	7.9	11.0	108.3	32.1
823	67500		4.75	17.8	64.9	21.4	27.8	5.1	23.4	15.8	15.0	108.3	28.6
828	67500	1	6.68	.2	171.7	31.3	13.9	5.1	15.6	3.4	-77.0	135.3	6.4
831	67500	1	4.60	25.1	49.9	14.8	12.2	6.1	6.7	18.6	20.0	87.9	3.4
832	67500	1	4.38	41.7	49.9	18.1	13.9	6.6	33.4	11.6	38.0	145.7	.6
838	67500	1	5.40	4.0	81.8	32.9	20.0	8.2	7.8	6.2	-2.0	112.6	23.8
844	67500	1	4.38	41.7	49.9	18.1	13.9	1.5	41.1	8.2	37.0	149.9	0.0
846	67500		5.24	5.8	74.8	23.0	20.0	6.1	17.8	9.0	-6.0	103.7	6.9
850	67500		6.75	.1	191.6	36.2	18.3	5.1	12.5	9.3	-72.0	132.2	37.9
852	67500	1	5.03	9.3	1.0	32.9	16.5	7.4	17.8	8.7	-6.0	129.3	24.8
853	67500	1	5.76	1.7	99.8	23.0	17.4	5.1	2.2	9.0	-22.0	113.3	1.8
854	67500	1	4.94	11.5	81.8	24.7	17.4	6.9	11.1	8.7	6.0	114.5	24.8
855	67500	1	4.36	43.7	61.9	18.1	10.4	6.1	26.7	13.3	38.0	137.4	8.7
857	67500		4.93	11.7	64.9	23.0	18.3	6.1	24.5	7.9	6.0	91.6	36.5
859	67500	1	5.84	1.4	127.7	26.3	16.5	9.2	3.3	12.1	-12.0	126.6	30.3
860	67500		4.70	20.0	74.8	28.0	17.4	1.5	34.5	15.2	11.0	145.7	0.0
861	67500		6.73	.1	159.7	41.1	22.2	4.3	5.6	8.5	-85.0	154.1	.3
862	67500		4.82	15.1	74.8	24.7	15.7	6.1	44.5	9.0	6.0	122.8	28.3
865	67500		4.92	12.0	44.9	16.5	0.0	26.6	21.1	0.0	8.0	139.5	.6
866	67500	1	4.89	12.9	44.9	16.5	13.5	8.2	21.1	11.3	5.0	91.6	.6
869	67500	1	4.64	22.9	81.8	29.6	15.7	7.4	33.4	7.9	23.0	147.8	28.7
870	67500	1	4.58	26.3	49.9	16.5	10.4	3.1	37.8	6.2	23.0	127.0	1.4
873	67500	1	4.39	40.7	61.9	21.4	13.9	2.6	48.9	8.5	16.0	147.8	2.7
874	67500	1	4.99	10.2	93.8	23.0	16.5	6.1	33.4	9.0	4.0	137.4	21.6
875	67500	1	5.29	5.1	74.8	32.9	21.3	7.7	11.1	8.5	1.0	102.4	29.2
876	67500	1	4.89	12.9	181.6	26.3	16.5	5.1	15.6	7.1	12.0	210.3	38.6
877	67500	1	4.91	12.3	79.8	26.3	18.3	6.6	41.1	7.9	10.0	118.7	43.6
879	67500	1	4.69	20.4	44.9	21.4	17.0	5.1	21.1	8.5	15.0	108.3	4.4
880	67500		4.89	12.9	149.7	49.4	25.2	10.7	20.2	8.5	4.0	226.9	19.2
881	67500	1	4.97	10.7	93.8	31.3	15.7	6.1	15.6	8.5	1.0	131.2	21.1
882	67500		4.88	13.2	64.9	21.4	17.4	5.1	23.4	8.5	6.0	120.8	27.4
883	67500	1	4.98	10.5	84.8	31.3	17.4	6.6	14.5	11.8	4.0	104.1	39.2
884	67500	1	5.74	1.8	127.7	46.1	36.5	6.1	15.6	18.6	-54.0	144.5	0.0
885	67500		4.65	22.4	89.8	31.3	13.0	5.1	35.8	6.5	15.0	141.6	14.4
888	67500	1	4.47	33.9	57.9	24.7	13.9	10.0	33.4	9.3	30.0	154.1	3.2
889	67500	1	4.30	50.1	54.9	24.7	15.7	2.0	155.7	8.5	51.0	279.0	.3
890	67500	1	6.78	.1	121.8	62.5	28.7	8.2	7.8	25.1	-126.0	70.4	0.0
891	67500		4.55	28.2	88.8	21.4	12.2	4.1	30.0	8.2	19.0	158.2	5.8
895	67500		4.85	14.1	84.8	29.6	16.1	5.6	20.0	7.6	9.0	149.9	1.9
897	67500		4.92	12.0	84.8	29.6	15.7	7.2	22.2	7.9	3.0	110.3	37.8

FILKODE: ADIRON   NAVN: REGIONAL-UNDERSØKELSE I ADIRONDACK, NEW YORK. SCHOFIELD DATANORD-AMERIKA   DATO: 830325   4

VANN	Å M D R N G	DYP	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	S.ACID	ES04	EN03
900	67500		4.98	10.5	99.8	29.6	15.7	7.2	15.6	7.9	5.0	122.8	39.2
905	67500		4.34	45.7	61.9	18.1	11.3	5.1	53.4	10.4	44.0	174.9	3.4
907	67500		5.88	1.3	119.8	47.7	17.4	6.4	6.7	7.9	-11.0	128.3	45.7
908	67500	1	5.02	9.5	84.8	29.6	12.6	7.7	15.6	8.5	3.0	85.4	47.1
909	67500		4.86	13.8	74.8	23.0	17.0	7.4	30.0	7.9	9.0	95.8	50.7
911	67500	1	5.21	6.2	74.8	29.6	18.7	6.6	15.6	8.5	-1.0	109.9	12.1
912	67500	1	4.97	10.7	74.8	23.0	18.3	5.6	17.8	8.5	4.0	106.2	23.4
913	67500		5.05	8.9	93.8	28.0	21.8	4.1	17.8	10.4	3.0	137.8	3.6
915	67500		6.13	.7	119.8	41.1	25.2	2.6	22.2	15.2	-55.0	118.7	.7
919	67500	1	4.77	17.0	74.8	24.7	18.7	4.1	22.2	11.3	6.0	134.3	0.0
922	67500		4.86	13.8	64.9	29.6	15.7	4.9	16.7	8.5	7.0	98.7	26.6
926	67500	1	7.31	.0	294.4	54.3	14.4	5.6	4.4	9.0	-224.0	118.5	17.3
927	67500		5.12	7.6	74.8	28.0	17.4	6.1	5.6	8.2	-2.0	117.4	1.0
929	67500		5.89	1.3	127.7	44.4	22.6	2.6	4.4	8.2	-43.0	146.6	0.0
930	67500	1	4.98	10.5	99.8	31.3	17.4	5.1	15.6	8.5	-2.0	140.1	15.0
931	67500	1	5.53	3.0	84.8	32.9	19.6	6.1	4.4	7.9	-2.0	100.8	34.3
932	67500		5.86	1.4	204.6	41.1	24.4	6.1	6.7	11.8	-114.0	150.5	0.0
936	67500	1	5.71	1.9	99.8	29.6	16.1	6.6	5.6	7.9	-4.0	115.8	25.8
937	67500	1	6.39	.4	109.8	42.8	20.9	5.1	20.0	7.1	-60.0	109.1	2.7
938	67500	1	5.43	3.7	109.8	31.3	19.6	4.6	15.6	7.6	-6.0	154.1	0.0
975	67500	1	6.00	1.0	119.8	37.8	24.4	5.1	2.2	5.6	-23.0	136.4	23.4
976	67500	1	5.98	1.0	109.8	37.8	25.2	8.7	3.3	8.5	-16.0	131.0	24.1
977	67500	1	6.58	.2	137.7	41.1	29.6	9.5	4.4	12.4	-46.0	132.0	28.6
978	67500	1	6.59	.2	109.8	28.0	19.1	4.1	6.7	11.0	-69.0	57.3	24.2
979	67500	1	6.61	.2	143.7	51.0	38.3	9.2	6.7	11.0	-50.0	135.3	46.5
980	67500	1	5.46	3.5	81.8	36.2	27.0	8.2	11.1	14.1	-17.0	109.3	14.9
1003	67500	1	4.99	10.2	68.9	32.9	27.8	8.2	17.8	7.1	2.0	110.6	34.6
1004	67500	1	4.98	10.5	96.8	32.9	21.8	6.9	14.5	8.7	6.0	116.8	50.1
1008	67500	1	5.12	7.6	68.9	36.2	28.7	6.9	11.1	17.2	-3.0	117.2	4.4
1010	67500	1	4.33	46.8	57.9	24.7	15.7	3.6	25.6	10.4	41.0	156.1	0.0
1011	67500	1	4.38	41.7	57.9	21.4	15.7	4.3	21.1	9.9	35.0	143.7	0.0
1012	67500	1	4.37	42.7	49.9	18.1	13.9	5.1	41.1	1.7	37.0	158.2	0.0
1015	67500	1	5.33	4.7	81.8	31.3	20.0	8.2	10.0	7.9	-8.0	114.7	13.4
2561	67500	1	6.52	.3	149.7	41.1	27.0	6.9	6.7	12.1	-88.0	124.9	0.0
2701	67500	1	4.92	12.0	94.8	34.5	25.2	6.6	57.8	11.8	6.0	152.0	42.9
2711	67500	1	5.08	8.3	89.8	34.5	39.1	8.7	41.1	43.7	-17.0	108.5	3.9
3121	67500	1	5.98	1.0	137.7	49.4	33.1	9.5	8.9	16.9	-37.0	161.8	14.1
5931	67500	1	4.96	11.0	132.7	36.2	24.4	7.4	24.9	9.3	-18.0	184.7	6.1
5932	67500	1	5.78	1.7	161.7	41.1	23.5	6.9	6.0	5.9	-11.0	187.4	30.8
8211	67500	1	4.78	16.6	74.8	23.0	15.7	9.2	15.6	11.6	5.0	128.5	.1
8321	67500	1	4.82	15.1	74.8	31.3	15.7	7.4	29.1	19.2	3.0	112.8	21.5
8532	67500		4.72	19.1	64.9	16.5	28.3	4.6	32.2	17.2	16.0	99.9	39.2
8601	67500	1	4.33	46.8	54.9	18.1	13.0	3.1	34.5	16.6	45.0	116.6	2.4
8631	67500		4.85	14.1	79.8	16.5	17.0	5.6	15.6	10.4	13.0	99.9	29.2
8801	67500	1	4.77	17.0	99.8	32.9	20.9	6.1	24.5	13.3	8.0	172.8	.5
8831	67500	1	6.46	.3	127.7	26.3	37.4	6.6	3.3	16.9	-61.0	112.2	0.0
8851	67500	1	4.67	21.4	81.8	36.2	17.4	8.2	27.8	9.3	15.0	145.7	27.9

CODE: FLORID

DESCRIPTION: Survey of 20 lakes in Florida, 13 in northern Florida (group 1) Trail Ridge and 7 in southern Florida (group 2, Highlands Ridge). Mean of 4 samples collected during 1978-79.

PARAMETERS USED: pH, cond. Na, K, Ca, Mg, NH_4N, Al, SO_4, Cl, NO_3N, alkalinity (ALK 4.5), color, TOC.

REFERENCE: Crisman, T.L:, R.L. Schulze, P.L. Brezonik, and S.A. Bloom, 1980). P. 296. In Drabløs and Tollan (eds.) Proc. Int. Conf. Ecol. Impact Acid Precipitation, Norway, SNSF-project, 1432 Aas-NLH. Original data unpublished.

OUTLIERS: Sulfate levels vary greatly between lakes indicating primary sources or sinks for sulfur. These lakes require special study.

DATA SOURCE: P.L. Brezonik, personal communication.

CODE: ROCKY

DESCRIPTION: Survey of 30 high elevation lakes in the Rocky Mountain National Park, Colorado conducted summer 1981.

PARAMETERS USED: pH, cond, Na, K, Ca, Mg, SO_4, Cl, NO_3N, alkalinity (ALKTIP).

REFERENCE: Unpublished

OUTLIERS: None

DATA SOURCE: J.N. Galloway, personal communication

CODE: USFWS

DESCRIPTION: Survey of 201 headwater lakes in New England conducted in 1979-80 by the U.S. Fish and Wildlife Service.

PARAMETERS USED: pH, cond, Na, K, Ca, Mg, Al, SO_4, Cl, alkalinity (ALK 4.5), color.

REFERENCE: Haines, T.A., and J.J. Akiehaszek. 1983. A regional survey of the chemistry of headwater lakes and streams in New England, vulernability to acidification. U.S. Fish. Wildlife Service, Orono, ME.

OUTLIERS: 39 lakes with high base cation concentrations ($Ca > 400$ μeq/l) or with high sulfate concentrations ($SO_4 > 400$ μeq/l) excluded.

DATA SOURCE: T.A. Haines, personal communication.

COMMENTS: Total inflection point alkalinity (ALKTIP) also measured but not used here.

FILKODE: USFWS NAVN: USWFS LAEK SURVEY, DATA FROM T. HAINES NORD-AMERIKA DATO: 830321 1

STNUM	LOK	Å M D R N G	NAVN	PH	EH+	FCA	FMG	FNA	FK	EAL	ECL	ALK-X	ES04	FARG
CT	1039	801008	CLUBHO	6.43	.3	299.0	102.0	162.7	40.0	1.8	119.9	259.2	212.4	20.0
CT	1096	801008	BLACKL	6.80	.1	157.5	161.1	197.6	34.4	3.9	222.9	216.3	152.0	10.0
CT	1098	801008	DICKIN	6.80	.1	128.4	75.4	131.0	38.6	7.5	70.5	185.6	130.1	10.0
CT	1099	801008	SALMON	6.78	.1	336.9	157.7	374.4	66.6	2.1	417.5	258.2	276.9	10.0
CT	1100	801008	SOESTR	6.85	.1	195.0	102.0	195.4	41.8	1.6	253.9	204.0	128.0	10.0
CT	1101	801009	MOHAWK	6.50	.3	126.3	72.0	53.0	18.4	1.1	29.6	96.1	152.0	20.0
CT	1102	801009	STRAIT	6.58	.2	109.2	78.9	85.7	26.6	16.2	100.1	94.1	134.3	95.0
CT	1147	801211	BIGELO	6.24	.5	91.5	103.7	144.6	16.0	6.6	200.3	57.7	99.9	45.0
CT	1148	801209	BLUE P	6.64	.2	217.3	90.9	197.2	14.9	7.8	208.8	127.1	175.9	25.0
CT	1149	801201	BURR P	6.51	.3	241.3	111.4	412.5	33.3	5.2	530.3	100.3	139.5	25.0
CT	1150	801211	DARLIN	6.03	.9	120.1	70.3	110.1	26.4	8.8	103.0	68.1	142.6	40.0
CT	1151	801210	EMMONS	4.60	25.1	100.4	67.7	209.9	7.5	37.1	235.6	.0	147.8	10.0
CT	1152	801211	GRIGGS	6.37	.4	145.6	88.3	101.1	18.4	8.2	104.4	102.3	122.8	65.0
CT	1153	801210	HOWELL	5.49	3.2	120.1	59.1	59.8	14.7	12.1	36.7	13.1	239.4	30.0
CT	1154	801211	HOLBRO	6.78	.1	302.6	172.3	180.9	53.8	2.3	214.4	241.8	318.5	35.0
CT	1155	801210	MILLER	5.57	2.7	56.2	57.4	93.4	23.7	6.2	71.9	.0	173.8	15.0
CT	1156	801209	NORWIC	6.76	.1	205.4	135.4	124.6	20.2	6.9	119.9	221.4	179.1	30.0
CT	1157	801211	POTTER	6.14	.7	147.1	78.0	100.2	26.9	6.1	86.0	62.9	216.5	40.0
CT	1158	801210	SPRING	7.10	.0	471.1	114.9	161.4	16.8	1.3	221.4	388.5	228.0	10.0
CT	1159	801209	UNCAS	6.82	.1	146.6	90.9	129.6	21.8		101.6	129.1	180.1	10.0
CT	1160	801212	WHITMA	5.02	9.5	84.8	40.3	167.3	10.9	40.8	163.6	.0	167.6	40.0
CT	1189	801008	BLACKL	6.80	.1	317.7	142.3	363.5	59.7	4.2	409.0	250.0	245.7	10.0
CT	1190	801008	DICKIN	6.85	.1	241.8	26.6	385.7	49.0	3.7	428.8	178.4	223.8	10.0
MA	1050	800911	ADAMS	5.75	1.8	83.2	41.1	96.5	15.7	14.7	57.8	18.6	131.2	65.0
MA	1051	800909	BOG PD	5.85	1.4	91.0	28.3	22.2	5.9	6.7	0.0	30.4	116.6	30.0
MA	1052	800911	CHARNO	6.91	.1	244.9	72.0	102.4	28.5	8.2	42.3	214.2	173.8	20.0
MA	1053	800911	CROW H	6.79	.1	55.1	23.1	195.4	17.6	5.6	142.5	33.5	90.6	15.0
MA	1054	800911	FOLEY	6.30	.5	52.5	36.9	122.4	24.2	6.1	131.2	50.4	128.0	25.0
MA	1055	800909	GOODNC	7.50	.0	406.6	60.0	115.6	23.4	10.7	55.0	402.8	131.2	40.0
MA	1056	800910	HALLS	6.47	.3	211.1	62.6	50.3	28.8	30.1	9.9	78.5	113.5	40.0
MA	1057	800911	HOWE P	6.55	.2	153.4	77.1	166.8	30.6	10.0	128.4	157.9	143.7	40.0
MA	1058	800909	N POND	6.61	.2	128.9	44.6	25.4	19.5	5.6	0.0	75.4	122.8	10.0
MA	1059	800909	SHEOME	6.76	.1	127.4	63.4	88.4	26.6	3.4	40.9	131.2	112.4	25.0
MA	1060	800909	SOUTH	5.14	7.2	65.0	22.3	20.9	12.0	6.9	0.0	.0	135.3	
MA	1061	800911	STREET	6.52	.3	124.8	49.7	220.3	24.2	4.2	228.5	79.6	144.7	20.0
MA	1062	800910	UP SPE	6.69	.2	198.1	110.6	140.5	24.8	3.4	135.4	166.1	177.0	50.0
MA	1063	800909	WICKET	4.75	17.8	49.9	18.9	60.3	2.4	16.8	0.0	.0	149.9	10.0
MA	1064	800912	WOLF B	7.01	.0	164.3	62.6	549.8	32.2	9.0	545.9	108.5	137.4	80.0
MA	1065	800912	LOWER	5.43	3.7	51.5	25.7	156.8	13.6	4.4	105.8	7.6	126.0	20.0
MA	1066	800910	YORK P	7.66	.0	277.7	152.6	50.8	5.1	2.9	31.0	332.6	149.9	20.0
MA	1127	801111	BADDAC	7.01	.0	418.0	86.6	251.6	46.6	1.8	318.8	335.6	149.9	50.0
MA	1128	801110	BALDPA	7.11	.0	461.7	192.9	809.1	39.2		0.0	390.6	134.3	20.0
MA	1129	801112	BIG BE	7.28	.0	372.8	148.3	406.1	26.1		252.5	273.5	135.3	25.0
MA	1130	801112	ECHO L	6.50	.3	89.4	67.7	119.7	10.4	3.2	145.3	74.4	121.8	40.0
MA	1131	801112	HOLTS	5.32	4.8	831.9	258.9	173.1	15.7	18.3	83.2	9.8	929.6	40.0
MA	1132	801113	JOHN S	5.05	8.9	46.8	57.4	161.8	29.3	5.6	197.5	.0	131.2	0.0
MA	1133	801112	LEACH	6.09	.8	103.0	62.6	182.2	11.7	7.7	191.8	25.0	144.7	15.0
MA	1134	801113	L CLIF	6.91	.1	164.3	115.7	414.3	17.3	4.1	433.0	105.4	137.4	
MA	1135	801113	L COLL	4.38	41.7	30.2	73.7	209.0	19.2	5.8	245.4	0.0	135.3	20.0
MA	1136	801111	L FARM	7.31	.0	410.8	160.3	315.5	28.2	.4	356.9	479.9	150.9	20.0
MA	1137	801111	MILLHA	7.06	.0	302.1	111.4	606.0	50.6	3.2	485.2	294.9	144.7	40.0
MA	1138	801113	NEW LO	5.44	3.6	34.3	79.7	199.9	14.4	1.3	201.7	.0	129.1	10.0
MA	1139	801114	ROUND	7.24	.0	314.6	172.3	572.9	34.6		579.7	285.7	149.9	50.0
MA	1140	801113	RUTH P	4.92	12.0	51.5	125.1	418.4	15.7	4.4	457.0	.0	149.9	10.0
MA	1141	801110	STREAR	6.52	.3	176.8	64.3	162.3	13.1	6.2	191.8	74.4	136.4	30.0

FILKODE: USFWS NAVN: USWFS LAEK SURVEY, DATA FROM T. HAINES NORD-AMERIKA DATO: 830321 2

STNUM	LOK	Å M D R N G	NAVN	PH	EH+	FCA	FMG	FNA	FK	EAL	ECL	ALK-X	ES04	FARG
MA	1142	801111	WALDEN	6.89	.1	202.3	77.1	320.5	32.2		372.4	144.6	127.0	10.0
MA	1143	801111	WHEELE	7.10	.0	621.9	195.4	569.8	73.3	1.3	576.9	332.6	329.0	20.0
ME	1012	800730	L SWIF	5.55	2.8	69.7	23.1	32.2	9.1	13.0	31.0	7.6	105.1	20.0
ME	1013	800731	SOUTH	5.60	2.5	59.8	21.4	24.0	3.7	1.3	2.8	5.3	84.3	10.0
ME	1025	800812	L LONG	6.00	1.0	40.6	27.4	94.3	9.6	7.3	77.6	15.3	64.5	
ME	1026	800812	TILDEN	6.58	.2	51.5	28.3	94.3	8.5		60.7	51.4	55.2	10.0
ME	1027	800814	MUD PD	4.68	20.9	37.4	27.4	103.3	8.8	26.7	105.8	.0	77.0	
ME	1028	800814	SALMON	6.75	.1	61.4	30.9	97.0	15.7	.2	86.0	64.0	44.8	20.0
ME	1029	800819	DAY MO	7.20	.0	336.4	37.7	46.7	11.2	4.8	35.3	355.0	61.4	40.0
ME	1030	800818	SPENCE	6.05	.8	57.2	34.3	29.0	11.7	6.0	19.7	22.9	73.9	
ME	1067	800917	ANDERS	6.14	.7	34.8	24.9	79.8	9.3		56.4	20.7	89.5	10.0
ME	1068	800917	UNNAME	5.85	1.4	43.7	33.4	96.5	6.7	9.9	86.0	16.4	82.2	120.0
ME	1108	801021	PEEP P	5.74	1.8	25.0	16.3	63.9	9.9	2.6	53.6	7.6	71.8	10.0
ME	1109	801021	PRETTY	4.86	13.8	16.6	14.6	47.1	5.1	12.0	32.4	.0	75.0	5.0
ME	1110	801021	SALMON	4.74	18.2	18.2	12.9	44.4	3.7	4.4	103.0	.0	73.9	20.0
ME	1162	810304	IRONBO	6.64	.2	410.8	85.7	45.3	8.0	3.1	16.9	455.6	164.5	10.0
ME	1163	810304	FOLEY	6.53	.3	228.8	94.3	27.2	5.3	7.9	4.2	169.2	139.5	25.0
ME	1164	810304	CRANBE	6.64	.2	327.6	85.7	27.2	13.3	13.6	32.4	339.7	132.2	35.0
ME	1165	810304	UP.FIR	6.19	.6	176.8	85.7	27.2	8.0	7.2	36.7	94.1	164.5	25.0
ME	1166	810304	ALLAGA	5.72	1.9	104.0	51.4	27.2	10.7	19.6	15.5	80.6	139.5	40.0
ME	1167	810304	MOUNTA	6.28	.5	223.6	68.6	31.7	5.3	19.3	0.0	185.6	155.1	11.0
ME	1168	810304	JONES	6.49	.3	228.8	77.1	31.7	8.0	2.8	2.8	203.0	133.2	20.0
ME	1169	810304	CORNER	6.44	.3	280.8	85.7	31.7	8.0	4.8	31.0	248.0	152.0	35.0
ME	1170	810304	TURNER	6.26	.5	182.0	85.7	36.3	8.0	12.2	7.1	105.4	175.9	50.0
ME	1171	810304	FERGUS	7.18	.0	1071.1	102.9	54.4	5.3	2.7	21.2	980.0	233.2	25.0
ME	1172	810304	AUSTIN	6.43	.3	265.2	128.6	31.7	8.0	9.7	26.8	271.4	134.3	25.0
ME	1173	810304	UGH PD	6.34	.4	348.4	51.4	31.7	10.7	.5	25.4	238.8	127.0	35.0
ME	1174	810304	4TH PE	6.91	.1	759.1	102.9	36.3	5.3	2.2	29.6	757.6	124.9	20.0
ME	1175	810304	B LAKE	6.45	.3	171.6	85.7	40.8	10.7	5.9	36.7	184.6	114.5	20.0
ME	1176	810304	MCPHER	6.41	.3	234.0	60.0	40.8	8.0	6.7	29.6	141.5	189.5	20.0
ME	1177	810304	BLUFFE	6.64	.2	353.6	68.6	36.3	5.3	9.5	19.7	179.4	240.5	25.0
ME	1178	810304	2NDCUR	6.30	.5	244.4	68.6	27.2	8.0	8.5	21.2	179.4	166.6	35.0
ME	1179	810304	UP.HUD	6.69	.2	265.2	60.0	31.7	8.0		16.9	203.0	149.9	15.0
ME	1180	810304	CUNLIF	6.73	.1	312.0	77.1	40.8	10.7	6.4	25.4	244.9	162.4	40.0
ME	1181	810304	W LAKE	6.33	.4	234.0	34.3	31.7	5.3	4.2	15.5	173.3	149.9	40.0
NH	1020	800807	COLDRI	6.85	.1	185.1	68.6	285.6	30.1	13.0	301.8	155.9	127.0	60.0
NH	1021	800808	CRESCE	6.55	.2	111.8	48.0	104.3	20.8	1.7	94.5	69.2	114.5	10.0
NH	1022	800807	GREATB	6.53	.3	206.9	68.6	118.3	25.0	2.3	66.3	172.3	150.9	10.0
NH	1023	800807	NEWELL	6.55	.2	148.7	76.3	92.0	37.3	6.7	18.3	173.3	124.9	30.0
NH	1031	800829	BEAVER	7.13	.0	184.6	53.1	61.6	16.0	7.8	29.6	197.9	105.1	60.0
NH	1032	800829	CHAPIN	6.33	.4	93.6	45.4	43.5	7.5	12.8	14.1	111.6	70.8	50.0
NH	1033	800829	DODGEB	6.85	.1	248.0	105.4	93.4	21.6	2.1	15.5	329.5	157.2	10.0
NH	1034	800829	GOVERN	6.13	.7	61.4	36.0	39.4	8.5	2.4	16.9	17.5	128.0	10.0
NH	1035	800825	W A MMO	6.65	.2	119.1	31.7	63.5	18.4	7.0	69.1	114.7	93.7	10.0
NH	1036	800827	ATWOOD	6.55	.2	98.8	31.7	58.9	10.7	10.3	22.6	79.6	114.5	50.0
NH	1037	800828	BACON	5.85	1.4	61.9	37.7	37.6	14.4	4.4	19.7	17.5	127.0	20.0
NH	1038	800826	DURGIN	6.58	.2	104.0	30.0	77.1	5.9	4.1	36.7	112.7	69.7	30.0
NH	1040	800828	FLETCH	5.70	2.0	59.3	26.6	47.6	16.5	6.7	25.4	15.3	124.9	10.0
NH	1041	800828	FROG P	5.53	3.0	78.5	27.4	46.2	13.9	7.5	25.4	8.7	132.2	10.0
NH	1042	800827	UPPERH	5.98	1.0	78.0	29.1	40.8	15.2	5.7	40.9	21.8	118.7	10.0
NH	1043	800827	M HALL	6.45	.3	87.4	32.6	43.5	13.6	8.0	24.0	42.0	116.6	0.0
NH	1044	800829	L HALL	6.73	.1	81.6	24.9	49.0	18.9	5.6	2.8	37.8	114.5	0.0
NH	1045	800828	HEDGEH	5.23	5.9	66.6	27.4	476.4	6.1	10.7	486.6	.0	118.7	20.0
NH	1046	800827	KIAH P	6.38	.4	98.8	26.6	51.2	11.7	10.1	32.4	53.5	124.9	40.0
NH	1047	800826	MOUNTA	6.33	.4	44.2	15.4	43.1	12.3	2.8	8.5	21.8	83.3	10.0

FILKODE: USFWS NAVN: USWFS LAEK SURVEY, DATA FROM T. HAINES NORD-AMERIKA DATO: 830321 3

STNUM	LOK	Å M D R N G	NAVN	PH	EH+	FCA	FMG	FNA	FK	EAL	ECL	ALK-X	ES04	FARG
NH	1048	800828	NOR PD	5.63	2.3	67.6	30.0	51.7	10.9	7.5	5.6	19.7	132.2	30.0
NH	1069	800925	ADAMS	6.64	.2	68.6	40.3	82.9	13.9		46.5	81.6	110.3	10.0
NH	1070	800922	BEAR P	6.69	.2	81.6	17.1	76.1	10.4	1.3	24.0	69.2	92.6	10.0
NH	1071	800923	CLOUGH	6.85	.1	87.4	66.9	48.0	9.6		11.3	105.4	110.3	5.0
NH	1073	800924	CRANEY	6.07	.8	62.9	31.7	73.0	6.9	2.8	25.4	34.6	112.4	30.0
NH	1074	800925	CROOKE	6.29	.5	59.3	46.3	84.8	11.5	1.8	18.3	76.4	106.2	15.0
NH	1075	800924	DUDLEY	6.69	.2	110.2	42.0	86.1	22.1	4.0	31.0	94.1	117.6	10.0
NH	1076	800925	EATON	6.69	.2	110.2	42.0	86.1	22.1	4.0	31.0	94.1	117.6	10.0
NH	1077	800924	FERRIN	6.17	.6	61.4	32.6	62.6	12.0	1.1	66.3	26.1	118.7	10.0
NH	1078	800922	GILMAN	6.69	.2	95.2	26.6	83.4	11.2	3.7	38.1	100.3	72.9	40.0
NH	1079	800923	HUNKIN	7.40	.0	287.0	130.3	345.8	127.6	1.7	418.9	371.2	127.0	10.0
NH	1080	800925	KENISO	6.00	1.0	69.7	45.4	136.4	13.3	4.6	162.2	49.3	92.6	60.0
NH	1081	800923	KNIGHT	7.08	.0	159.6	29.1	90.7	12.5	1.2	40.9	215.3	76.0	10.0
NH	1082	800923	KNOWLE	6.37	.4	57.7	45.4	76.6	10.1	.2	56.4	35.7	127.0	
NH	1083	800925	L LONG	5.96	1.1	99.8	36.9	276.9	12.0	2.0	323.0	56.7	85.4	65.0
NH	1084	800924	LONG P	5.41	3.9	52.5	29.1	61.6	4.3	5.0	31.0	6.4	117.6	25.0
NH	1085	800924	MIDDLE	6.76	.1	122.2	40.3	73.9	11.7	2.6	43.7	128.1	81.2	35.0
NH	1086	800923	POVERT	5.59	2.6	80.1	27.4	32.2	5.9	2.1	16.9	14.2	128.0	10.0
NH	1087	800925	STONEH	5.71	1.9	41.6	32.6	74.3	8.3	5.2	53.6	15.3	102.0	20.0
NH	1088	800924	UPPER	6.50	.3	123.2	39.4	70.3	10.4	.4	9.9	137.4	91.6	40.0
NH	1191	800807	GREAT	7.25	.0	333.3	154.3	166.8	30.9	10.9	198.9	444.4	175.9	
NH	1192	800807	WARREN	7.10	.0	191.9	114.0	348.6	36.8	7.0	301.8	243.9	120.8	20.0
NH	1072	800922	COLDRA	5.72	1.9	54.6	20.6	75.7	12.3	17.8	86.0	25.0	105.1	100.0
RI	1103	801007	CARBUN	6.25	.5	100.4	52.3	193.5	21.3	2.1	204.5	55.6	155.1	20.0
RI	1104	801007	DEEP P	5.83	1.5	67.6	50.6	183.1	13.6	3.7	198.9	16.4	136.4	10.0
RI	1105	801007	ELL PO	4.30	50.1	33.3	27.4	115.6	12.0	18.1	153.7	0.0	102.0	100.0
RI	1106	801007	LONG P	4.38	41.7	33.8	24.9	94.3	11.2	18.9	111.4	0.0	119.7	55.0
RI	1107	801006	SUCKER	6.80	.1	160.7	87.4	319.1	32.8	5.6	371.0	170.2	122.8	20.0
RI	1144	801208	CARR P	4.74	18.2	52.0	28.3	112.4	10.9	42.4	112.8	.0	136.4	
RI	1145	801209	WHITE	4.40	39.8	45.2	50.6	171.3	15.2	64.4	211.6	0.0	122.8	
RI	1146	801212	WILBUR	3.98	104.7	65.0	30.0	100.2	11.7	39.7	95.9	0.0	138.5	150.0
VT	1001	800724	LYE BR	4.15	70.8	149.7	18.9	36.3	7.7	42.8	71.9	0.0	50.0	260.0
VT	1002	800724	BRANCH	4.65	22.4	46.3	17.1	30.4	13.9	20.2	29.6	.0	106.2	20.0
VT	1003	800722	NOYES	7.70	.0	336.4	64.3	62.1	16.5	18.1	15.5	416.0	109.3	30.0
VT	1004	800724	BEEBE	5.05	8.9	46.8	29.1	38.5	13.6	30.1	28.2	7.6	105.1	40.0
VT	1005	800723	BOURN	5.00	10.0	45.2	30.0	39.0	13.3	18.1	7.1	.0	103.1	30.0
VT	1006	800724	S FORK	5.50	3.2	52.0	24.0	47.1	12.0	20.9	22.6	5.3	98.9	
VT	1007	800725	STERLI	6.45	.3	82.7	72.0	19.9	8.0	16.0	7.1	53.5	99.9	50.0
VT	1008	800723	STRATT	6.05	.8	56.7	30.0	27.2	17.1	7.1	22.6	13.1	93.7	20.0
VT	1009	800721	WHEELE	7.45	.0	262.1	63.4	50.8	12.3	12.0	12.7	279.6	116.6	10.0
VT	1010	800722	KETTLE	7.05	.0	156.5	38.6	49.0	12.8	6.7	22.6	110.6	126.0	20.0
VT	1011	800722	OSMORE	7.25	.0	178.9	41.1	68.9	14.1	7.5	15.5	184.6	101.0	
VT	1014	800806	BALL M	5.20	6.3	78.5	31.7	46.2	11.2	38.1	7.1	2.9	124.9	20.0
VT	1015	800807	GREEND	6.58	.2	223.1	107.1	54.4	25.0	10.1	16.9	292.8	96.8	30.0
VT	1016	800807	ROCK R	7.13	.0	276.6	121.7	63.0	27.4	2.3	15.5	304.1	162.4	
VT	1017	800806	WARDSB	6.53	.3	151.3	64.3	49.4	16.3	8.2	15.5	141.5	108.3	20.0
VT	1018	800807	W RIVE	7.18	.0	524.6	192.9	338.1	38.9	3.7	386.5	468.8	147.8	
VT	1019	800805	WINHAL	4.90	12.6	46.3	28.3	36.3	9.1	36.4	25.4	.0	68.7	120.0
VT	1024	800806	FORRES	5.08	8.3	55.6	14.6	34.0	14.4	15.0	24.0	7.6	92.6	20.0
VT	1089	801009	BAKER	7.44	.0	1231.8	237.4	67.5	41.6	21.2	60.7	1316.2	177.0	20.0
VT	1090	801009	BALD H	7.47	.0	623.9	48.0	20.9	8.0	.1	0.0	839.5	136.4	10.0
VT	1091	801010	COW MO	6.54	.2	134.7	66.9	37.2	13.3	9.5	0.0	130.2	120.8	40.0
VT	1092	801008	GUT PD	6.67	.2	94.1	103.7	15.0	7.2	.5	0.0	124.0	73.9	10.0
VT	1093	801009	HARDWO	5.75	1.8	85.8	42.0	22.2	6.7	.2	4.2	12.0	165.5	30.0
VT	1094	801007	ROODS	8.10	.0	1536.0	1352.6	218.0	34.1	0.0	241.2	2789.9	195.7	10.0

FILKODE: USFWS   NAVN: USWFS LAEK SURVEY, DATA FROM T. HAINES   NORD-AMERIKA   DATO: 830321   4

STNUM	LOK	A M D R N G	NAVN	PH	EH+	FCA	FMG	FNA	FK	EAL	ECL	ALK-X	ES04	FARG
VT	1095	801008	RICHMO	6.64	.2	230.3	66.9	28.6	11.5	35.5	0.0	242.9	133.2	50.0
VT	1111	801028	BEAVER	5.40	4.0	77.5	26.6	19.9	4.0	6.1	15.5	8.7	130.1	20.0
VT	1112	801028	CHOATE	7.64	.0	860.5	270.0	47.1	13.9	2.0	0.0	788.9	286.3	15.0
VT	1113	801028	COITS	7.75	.0	1168.3	110.6	32.6	22.1		7.1	1130.5	193.6	10.0
VT	1114	801028	CRANBE	7.30	.0	932.3	178.3	32.6	8.8		15.5	980.0	145.7	20.0
VT	1115	801029	HALFMO	7.70	.0	877.2	192.9	55.3	14.4	3.8	52.2	1229.4	158.2	10.0
VT	1116	801028	HORN O	7.98	.0	1942.6	353.1	63.5	17.6		76.2	2308.8	162.4	20.0
VT	1117	801029	HOUGH	7.67	.0	1955.6	417.4	76.1	12.3	.7	49.4	2020.8	351.9	20.0
VT	1118	801029	JOHNSO	6.99	.1	227.2	102.0	58.5	21.0	.7	46.5	285.7	90.6	40.0
VT	1119	801031	L MITC	7.90	.0	1785.0	178.3	132.8	47.2	1.1	172.1	1811.3	174.9	10.0
VT	1120	801030	LAKOTA	7.12	.0	197.6	72.0	29.9	9.9	4.2	0.0	220.4	116.6	25.0
VT	1121	801031	MUDDY	7.45	.0	712.3	112.3	54.8	15.2	1.8	9.9	607.7	243.6	15.0
VT	1122	801030	NORTH	7.93	.0	1519.8	168.0	34.4	4.8	.8	50.8	1640.0	105.1	20.0
VT	1123	801029	SUGAR	7.68	.0	709.2	534.0	46.2	20.5	3.2	32.4	972.9	245.7	20.0
VT	1124	801030	TINY P	7.25	.0	188.7	87.4	31.3	23.2	6.9	19.7	244.9	97.9	40.0
VT	1125	801030	TWIN P	8.08	.0	2389.7	596.6	53.5	17.6		22.6	2837.2	153.0	20.0
VT	1126	801029	WALLIN	6.59	.2	122.7	58.3	29.9	17.6	5.2	8.5	93.0	166.6	20.0
VT	1161	801008	WESTFO	7.32	.0	383.2	198.0	34.9	11.7	32.2	18.3	508.4	166.6	10.0
VT	1182	801008	KINGS	5.18	6.6	90.5	34.3	20.4	6.1	55.8	0.0	.0	132.2	40.0
VT	1183	800806	BALL M	6.80	.1	111.8	47.1	97.9	31.4	18.1	62.1	72.3	115.6	20.0
VT	1184	800807	GREEND	7.45	.0	169.5	193.7	71.6	32.2	1.6	15.5	422.1	94.7	10.0
VT	1185	800807	ROCK R	7.60	.0	223.6	221.1	141.9	44.5	6.7	132.6	437.3	134.3	10.0
VT	1186	800806	WARDSB	7.20	.0	187.2	85.7	154.1	34.6	28.7	155.2	208.1	116.6	20.0
VT	1187	800807	W RIVE	7.15	.0	334.3	146.6	247.0	40.0	2.1	277.9	358.0	117.6	10.0
VT	1188	800806	WINHAL	6.85	.1	132.1	65.1	89.7	25.3	17.3	84.6	103.4	107.2	60.0

CODE: ELA

DESCRIPTION: Survey of 109 lakes (102 with chemistry) in the Experimental Lakes Area, northwestern Ontario conducted 23-25 September 1973.

PARAMETERS USED: pH, cond, Na, K, Ca, Mg, SO_4, Cl, alkalinity (ALK 4.5), TOC.

REFERENCE: Beamish, R.J., L.M. Blouw, and G.A. McFarlane. 1976. A fish and chemical study of 109 lakes in the Experimental Lakes Area (ELA), northwestern Ontario, with appended reports on lake whitefish ageing errors and the northwestern Ontario baitfish industry. Tech. Rept. 607, Fisheries and Marine Service, Environment Canada, 116 pp.

OUTLIERS: None

DATA SOURCE: Beamish et al., 1976.

FILKODE: ELA CANADA NORD-AMERIKA DATO: 830121

VANN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ESO4	ENO3	TOC
99	6.60	.2	94.8	49.4	34.8	10.2		16.9	101.4	45.8	.6	9.3
100	7.00	.1	129.7	57.6	39.1	12.8		22.6	139.1	62.5	1.5	7.8
101	6.90	.1	89.8	49.4	30.5	7.7		22.6	109.8	62.5	.5	6.0
102	6.60	.2	94.8	49.4	34.8	5.1		22.6	57.1	83.3	.5	7.1
103	6.30	.5	84.8	49.4	30.5	2.6		22.6	30.3	99.9	.6	10.8
104	6.60	.2	104.8	49.4	39.1	15.3		33.9	84.6	75.0	.3	9.4
105	6.20	.6	79.8	49.4	34.8	5.1		11.3	33.6	79.1	.5	10.3
112	5.90	1.3	54.9	49.4	26.1	7.7		16.9	15.0	50.0	.5	7.9
113	6.40	.4	74.8	57.6	34.8	7.7		22.6	46.4	87.4	.2	6.6
114	6.00	1.0	49.9	41.1	21.8	10.2		22.6	40.0	70.8	.2	8.8
115	5.90	1.3	84.8	49.4	47.8	20.5		33.9	30.3	99.9	2.7	12.5
117	5.90	1.3	84.8	57.6	43.5	35.8		45.1	44.3	91.6	.8	18.4
118	5.90	1.3	54.9	41.1	34.8	17.9		33.9	4.8	70.8	.9	14.5
122	6.20	.6	69.9	41.1	30.5	7.7		16.9	32.5	75.0	.5	7.6
123	6.30	.5	74.8	41.1	30.5	5.1		11.3	49.6	70.8	.7	6.3
124	7.90	.0	124.8	49.4	34.8	7.7		16.9	89.8	70.8	.9	6.4
127	6.40	.4	59.9	41.1	26.1	5.1		16.9	37.9	62.5	.6	6.5
128	6.80	.1	124.8	49.4	34.8	5.1		16.9	101.4	54.1	.7	8.7
129	6.40	.4	99.8	57.6	39.1	5.1		16.9	.0	87.4	.7	11.6
130	6.60	.2	89.8	41.1	30.5	5.1		16.9	82.4	54.1	.4	5.1
131	6.10	.7	59.9	32.9	21.8	2.6		16.9	13.9	62.5	.7	6.1
132	6.20	.6	64.9	41.1	26.1	7.7		16.9	37.9	54.1	1.1	6.0
133	6.40	.4	74.8	41.1	26.1	2.6		16.9	57.1	58.3	.7	9.6
161	7.00	.1	149.7	57.6	39.1	10.2		16.9	174.6	58.3	.3	2.8
163	6.90	.1	144.7	65.8	43.5	10.2		16.9	174.6	50.0	.6	5.6
168	6.40	.4	99.8	57.6	34.8	15.3		22.6	99.3	54.1	.7	10.0
171	6.40	.4	89.8	57.6	39.1	7.7		16.9	56.0	91.6	.6	13.8
188	6.70	.2	89.8	49.4	34.8	7.7		5.6	83.5	75.0	1.2	5.5
189	6.70	.2	114.8	49.4	39.1	10.2		11.3	131.8	58.3	.3	6.1
190	6.60	.2	134.7	74.0	47.8	12.8		16.9	163.1	66.6	.8	8.3
219	6.30	.5	74.8	41.1	39.1	5.1		16.9	38.9	91.6	.3	7.6
220	6.30	.5	74.8	49.4	34.8	5.1		22.6	41.1	79.1	.2	6.6
221	6.50	.3	99.8	57.6	39.1	7.7		22.6	68.7	87.4	.7	10.0
222	7.00	.1	159.7	65.8	43.5	7.7		22.6	151.6	79.1	.7	9.6
223	7.00	.1	114.8	49.4	39.1	7.7		16.9	102.4	66.6	.7	5.0
224	6.80	.1	84.8	32.9	30.5	7.7		28.2	86.7	58.3	.2	3.7
225	5.40	4.0	39.9	41.1	26.1	5.1		22.6	.0	79.1	.2	9.8
226	6.90	.1	79.8	41.1	52.2	5.1		28.2	86.7	70.8	.3	6.3
227	7.30	.0	104.8	49.4	234.9	2.6		16.9	271.2	91.6	7.1	9.7
228	6.90	.1	109.8	49.4	39.1	10.2		16.9	133.9	45.8	7.3	3.6
230	6.20	.6	74.8	49.4	30.5	10.2		16.9	42.1	75.0	.5	9.4
232	6.10	.7	74.8	65.8	43.5	17.9		16.9	47.5	99.9	1.2	13.7
236	6.10	.7	69.9	49.4	34.8	10.2		28.2	34.6	87.4	.3	12.5
237	5.80	1.6	54.9	57.6	30.5	7.7		16.9	9.4	91.6	.6	15.1
238	6.30	.5	39.9	41.1	26.1	10.2		22.6	9.4	66.6	.4	7.8
239	6.70	.2	144.7	65.8	47.8	10.2		16.9	110.8	99.9	.8	8.4
240	6.60	.2	109.8	65.8	39.1	7.7		22.6	89.8	87.4	1.6	7.3
256	7.00	.1	129.7	57.6	39.1	10.2		16.9	133.9	62.5	.4	3.4
259	6.60	.2	84.8	49.4	34.8	10.2		28.2	57.1	79.1	.2	6.4
260	6.90	.1	104.8	49.4	39.1	10.2		22.6	121.3	54.1	.1	3.4
261	5.80	1.6	54.9	49.4	34.8	5.1		16.9	16.1	83.3	.2	10.1
262	6.90	.1	114.8	49.4	39.1	7.7		28.2	111.9	75.0	.2	6.1
263	6.80	.1	114.8	49.4	39.1	7.7		16.9	42.1	66.6	.7	5.2
264	5.80	1.6	59.9	41.1	30.5	2.6		16.9	4.8	79.1	.4	11.3
265	7.00	.1	114.8	65.8	47.8	10.2		22.6	98.2	104.1	.5	8.0

FILKODE: ELA CANADA NORD-AMERIKA DATO: 830121

VANN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	EN03	TOC
269	6.70	.2	114.8	74.0	52.2	10.2		11.3	124.5	79.1	1.1	13.6
302	6.70	.2	79.8	49.4	30.5	7.7		33.9	61.3	129.1	.2	5.5
303	6.50	.3	69.9	41.1	26.1	5.1		22.6	45.3	62.5	.3	6.6
304	6.10	.7	84.8	49.4	30.5	5.1		220.0	16.1	50.0	2.7	5.8
305	7.10	.0	114.8	57.6	47.8	10.2		22.6	120.3	75.0	.2	4.3
309	6.60	.2	114.8	90.5	39.1	10.2		16.9	82.4	87.4	.9	10.4
310	6.60	.2	114.8	57.6	39.1	10.2		16.9	84.6	87.4	.8	10.2
311	6.50	.3	74.8	57.6	30.5	10.2		16.9	46.4	79.1	.5	9.1
312	6.30	.5	124.8	65.8	47.8	10.2		11.3	90.9	108.3	1.2	17.8
313	6.80	.1	89.8	57.6	43.5	10.2		22.6	61.3	91.6	.4	10.8
314	6.10	.7	79.8	49.4	30.5	10.2		11.3	29.2	87.4	.7	12.3
315	7.10	.0	109.8	57.6	43.5	12.8		22.6	97.2	83.3	.4	9.2
316	6.00	1.0	94.8	57.6	34.8	12.8		16.9	61.3	87.4	.8	13.4
317	7.20	.0	109.8	57.6	43.5	12.8		33.9	96.1	79.1	.1	7.8
318	6.30	.5	69.9	49.4	30.5	10.2		16.9	56.0	66.6	.2	8.9
319	6.30	.5	74.8	57.6	34.8	10.2		28.2	35.7	91.6	.5	11.0
320	6.00	1.0	64.9	57.6	34.8	10.2		22.6	18.3	104.1	.5	11.2
321	6.10	.7	74.8	49.4	34.8	10.2		16.9	27.1	95.8	1.2	1.1
322	6.80	.1	104.8	57.6	43.5	10.2		28.2	103.5	79.1	.7	7.7
378	5.50	3.2	104.8	49.4	39.1	7.7		22.6	84.6	79.1	.5	6.6
381	6.40	.4	79.8	41.1	30.5	5.1		16.9	57.1	58.3	.3	9.0
382	6.90	.1	99.8	49.4	34.8	7.7		22.6	76.1	79.1	.5	7.1
383	6.30	.5	114.8	65.8	34.8	7.7		16.9	95.1	95.8	.8	12.1
384	6.40	.4	99.8	49.4	34.8	5.1		16.9	71.9	79.1	.7	9.7
385	6.50	.3	164.7	49.4	26.1	5.1		16.9	66.6	66.6	.4	4.8
465	7.00	.1	134.7	65.8	47.8	12.8		16.9	157.9	75.0	.5	6.2
467	6.50	.3	89.8	49.4	34.8	12.8		16.9	63.4	83.3	.7	8.8
468	6.70	.2	109.8	49.4	39.1	10.2		16.9	99.3	75.0	.8	5.0
470	6.30	.5	79.8	49.4	30.5	2.6		45.1	29.2	75.0	.2	9.9
631	6.90	.1	149.7	57.6	39.1	10.2		22.6	155.9	58.3	.5	6.8
635	6.50	.3	99.8	49.4	30.5	7.7		16.9	77.2	70.8	.5	5.5
661	6.00	1.0	79.8	57.6	30.5	2.6		50.8	.0	75.0	.2	8.8
662	6.10	.7	99.8	57.6	43.5	15.3		16.9	72.9	87.4	1.2	17.2
663	6.30	.5	104.8	57.6	43.5	10.2		16.9	77.2	87.4	1.1	11.8
664	5.60	2.5	109.8	57.6	43.5	12.8		22.6	85.6	95.8	.5	9.3
679	6.60	.2	134.7	74.0	52.2	7.7		22.6	112.9	95.8	.7	14.8
681	6.60	.2	99.8	57.6	39.1	10.2		45.1	78.2	87.4	.2	12.5
695	6.90	.1	189.6	90.5	56.5	12.8		22.6	199.6	104.1	.3	10.8
701	6.10	.7	79.8	49.4	26.1	5.1		16.9	46.4	79.1	1.4	8.1
705	6.30	.5	154.7	65.8	39.1	10.2		16.9	83.5	66.6	.4	12.4
706	6.40	.4	109.8	57.6	34.8	7.7		22.6	95.1	70.8	.5	9.9
707	5.20	6.3	69.9	57.6	34.8	5.1		16.9	.0	99.9	.8	20.5
711	6.60	.2	99.8	57.6	43.5	12.8		33.9	100.3	87.4	.6	10.8
712	6.30	.5	74.8	49.4	34.8	10.2		16.9	38.9	87.4	.5	12.6
716	5.00	10.0	54.9	49.4	30.5	10.2		22.6	.0	104.1	1.4	21.2
717	6.10	.7	79.8	49.4	39.1	7.7		33.9	31.4	99.9	.9	13.7
980	7.00	.1	124.8	65.8	47.8	12.8		16.9	153.7	75.0	.4	6.4

CODE: KEREKE

DESCRIPTION: Study of 3 lakes in the Kejimkujik National Park Nova Scotia. Data used are volume-weighted means for 1978-79.

PARAMETERS USED: pH, cond, Na, K, Ca, Mg, SO_4, Cl, NO_3N, color.

REFERENCE: Kerekes, J.J., 1980. pp. 232-233. *In* Drabløs and Tollan (eds.)

OUTLIERS: None

DATA SOURCE: Kerekes, 1980

COMMENTS: No alkalinity because pH < 5.4.

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FILKODE: KERIKE      NAVN: KEREKE'S DATA FRA ATLANTIC PROVINCES                                  NORD-AMERIKA    DATO: 830121
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STNUM  VANN  Å M D   DYP          NAVN    PH      EH+      ECA      EMG      ENA      EK       ECL      ALK-X    ESO4   ENO3     FARG
             R N G
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 4        1  790101   50          BEAVER  5.38     4.2     16.0     28.0    124.0      6.1    124.4      0.0    57.0    2.1      1.3
 4        2  790101   50          PEBBLE  4.49    32.4     16.5     23.9    124.4      7.2    123.0      0.0    88.3    2.9     80.0
 4        3  790101   50          KEJIMK  4.80    15.8     33.9     38.7    135.7      6.1    127.8      0.0    81.2    2.9     55.0
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CODE: LABRAD

DESCRIPTION: 13 lake sites in the Churchill Falls region, Labrador, studied 1970-71. Data are means of summer 1970.

PARAMETERS USED: pH, cond, Na, K, Ca, Mg, SO_4, Cl, NO_3N, alkalinity (ALK 4.5), color

REFERENCE: Duthie, H.C., and M.L. Ostrofsky. 1974. J. Fish Res. Bd. Canada 31: 1105.

OUTLIERS: None

DATA SOURCE: Duthie and Ostrofsky, 1974

CODE: LAB-1

DESCRIPTION: Data from 98 lakes in Labrador surveyed in 1978-79 by Environment Canada (T.A. Clair), the University of Minnesota (D.R. Engstrom), and Canadian Wildlife Service (W. Whitman).

PARAMETERS USED: pH, cond, Na, K, Ca, Mg, Al, SO_4, Cl, alkalinity (ALKTIP), color.

REFERENCE: Clair, T.A., D.R. Engstrom and W. Whitman. 1982. Data report. Sensitivity of surface waters in Newfoundland and Labrador precipitation. Inland Waters Directorate, Environment Canada, IWD-AR-WQB-82-32.

OUTLIERS: None

DATA SOURCE: Clair and Engstrom, personal communication.

FILKODE: LAB-1 NAVN: INNSJØER I LABRADOR, CANADA. DATA FRA CLAIR + ENGSTRØM NORD-AMERIKA DATO: 830121

VANN	Å M D R N G	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALKTIP	ES04	FARG
1	790800	KANARI	7.00	.1	149.7	52.6	47.8	2.6		14.1	176.00	52.0	10.0
2	790800		7.00	.1	129.7	63.3	17.4	5.1	4.4	14.1	178.00	37.5	30.0
3	790800		6.10	.7	34.9	25.5	17.4	2.6		14.1	27.00	27.1	30.0
4	790800		6.00	1.0	34.9	0.0	8.7	5.1		14.1	14.00	22.9	20.0
5	790800		7.10	.0	139.7	78.1	34.8	7.7		14.1	230.00	35.4	10.0
6	790800		6.60	.2	79.8	41.1	26.1	5.1	3.3	14.1	73.00	41.6	20.0
7	790800		6.30	.5	44.9	24.7	21.8	2.6		14.1	61.00	31.2	30.0
8	790800		5.90	1.3	25.0	16.5	13.0	2.6		14.1	8.00	27.1	25.0
9	790800		6.30	.5	34.9	18.1	8.7	2.6	8.9	14.1	44.00	31.2	20.0
10	790800		6.10	.7	34.9	13.2	17.4	2.6	8.9	14.1	0.00	33.3	35.0
11	790800		6.00	1.0	25.0	14.8	8.7	2.6		14.1	0.00	20.8	10.0
12	790800		6.10	.7	44.9	23.9	13.0	2.6		14.1	55.00	20.8	20.0
13	790800		6.60	.2	49.9	34.5	8.7	2.6		14.1	27.00	27.1	25.0
14	790800	NASKAU	7.10	.0	144.7	30.4	30.5	5.1	55.6	14.1	156.00	41.6	20.0
15	790800		5.30	5.0	29.9	15.6	34.8	2.6		19.7	6.00	58.3	70.0
16	790800		6.50	.3	49.9	21.4	17.4	2.6	4.4	14.1	42.00	33.3	25.0
17	790800		6.60	.2	44.9	16.5	17.4	2.6	2.2	14.1	23.00	33.3	5.0
18	790800		6.50	.3	44.9	30.4	17.4	5.1	6.7	14.1	34.00	33.3	25.0
19	790800		5.90	1.3	39.9	17.3	21.8	2.6	11.1	14.1	44.00	41.6	50.0
20	790800		6.40	.4	61.9	23.0	34.8	5.1		17.8	62.00	22.9	7.0
21	790800		6.20	.6	60.9	21.4	34.8	5.1		16.1	58.00	25.0	15.0
22	790800		6.20	.6	106.8	37.0	40.0	7.7		18.6	68.00	20.8	G 100.0
23	790800		6.10	.7	61.4	21.4	30.9	3.8		14.4	34.00	22.9	G 100.0
24	790800		6.70	.2	71.4	32.9	41.3	17.9		22.3	106.00	22.9	8.0
25	790800		7.90	.0	1831.3	610.4	87.0	14.6		96.8	2160.00	58.3	8.0
26	790800		6.90	.1	45.9	17.3	25.2	5.1		15.2	32.00	20.8	M 5.0
27	790800		6.90	.1	29.4	12.3	20.0	2.8		13.0	24.00	13.3	M 5.0
28	790800		6.60	.2	29.9	12.3	20.9	2.8		11.8	24.00	13.3	M 5.0
29	790800		6.50	.3	123.8	42.8	29.1	9.2		26.8	146.00	27.3	15.0
30	790800		6.70	.2	39.4	7.4	17.4	3.6		9.9	18.00	17.5	M 5.0
31	790800		5.60	2.5	24.5	9.9	18.3	2.3		12.1	18.00	11.7	8.0
32	790800		6.20	.6	35.9	10.7	19.6	4.9		15.0	20.00	16.7	M 5.0
33	790800		6.60	.2	40.9	14.0	20.9	3.6		10.7	34.00	14.2	M 5.0
34	790800		6.20	.6	36.9	13.2	13.9	3.6		3.7	38.00	13.3	8.0
35	790800		6.30	.5	24.0	5.8	10.4	3.3		1.7	10.00	9.2	5.0
36	790800		6.40	.4	38.9	6.6	18.3	.5		4.5	46.00	9.2	M 5.0
37	790800		6.00	1.0	61.4	9.9	25.2	1.8		5.6	62.00	13.3	M 5.0
38	790800		6.60	.2	62.4	14.8	25.2	1.0		3.1	18.00	15.8	M 5.0
39	790800		6.50	.3	49.9	9.0	26.1	.7		1.7	80.00	10.0	M 5.0
40	790800		6.40	.4	84.3	36.2	30.0	2.6		2.0	108.00	20.8	15.0
41	790800		6.90	.1	71.9	28.8	18.3	4.9		5.1	82.00	18.3	M 5.0
42	790800		6.80	.1	92.3	19.7	30.0	2.0		5.1	110.00	12.5	8.0
43	790800		5.90	1.3	61.9	18.1	20.9	2.6		9.9	50.00	20.8	15.0
44	790800	POCKET	7.20	.0	199.6	32.1	69.6	2.6	2.2	14.1	213.00	33.3	M 5.0
45	790800		7.10	.0	311.9	39.5	32.2	8.2		14.1	264.00	84.3	M 5.0
46	790800		7.60	.0	399.2	65.0	30.0	4.1		12.4	464.00	25.6	M 5.0
47	790800		7.30	.0	301.4	61.7	27.4	2.6		11.8	326.00	23.9	8.0
48	790800		6.20	.6	63.4	26.3	40.0	5.9		3.4	92.00	18.3	15.0
49	790800		6.20	.6	30.9	15.6	18.3	2.0		2.0	34.00	15.8	8.0
50	790800		6.50	.3	46.9	23.0	20.9	2.3		2.5	74.00	15.0	8.0
51	790800		7.30	.0	254.5	63.3	56.5	6.4		12.1	300.00	57.0	M 5.0
52	790800		6.80	.1	104.3	32.9	47.8	4.1		6.2	138.00	21.4	15.0
53	790800		6.30	.5	86.8	26.3	36.5	1.3		2.8	116.00	15.0	15.0
54	790800		7.00	.1	77.8	25.5	30.0	1.3		2.3	1.40	15.0	8.0
55	790800		6.30	.5	98.8	18.1	27.4	1.0		2.5	94.00	14.2	8.0

FILKODE: LAB-1 NAVN: INNSJØER I LABRADOR, CANADA. DATA FRA CLAIR + ENGSTRØM NORD-AMERIKA DATO: 830121

VANN	A M D R N G	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALKTIP	ES04	FARG
56	790800		6.40	.4	82.8	34.5	21.8	1.0		1.1	88.00	18.3	15.0
57	790800		6.10	.7	83.3	30.4	23.9	.7		2.0	104.00	18.3	8.0
58	790800		6.20	.6	51.4	12.3	13.9	1.8	2.2	3.7	34.00	15.8	M 5.0
59	790800	LAKE M	7.10	.0	199.6	32.1	26.1	2.6	2.2	14.1	209.00	33.3	5.0
60	790800	STONEY	6.60	.2	99.8	43.6	13.0	2.6		14.1	102.00	22.9	20.0
61	790800	GABBRO	6.20	.6	29.4	18.1	21.8	2.6	2.2	14.1	23.00	20.8	20.0
62	790800		6.50	.3	35.4	26.3	21.8	2.6	3.3	14.1	23.00	25.0	10.0
63	790800		6.30	.5	34.9	19.7	30.5	7.7		14.1	27.00	10.4	20.0
64	790800		6.10	.7	32.4	15.6	26.1	2.6		14.1	27.00	37.5	20.0
65	790800		5.40	4.0	65.4	18.9	28.7	3.8		9.6	20.00	25.0	55.0
66	790800		5.30	5.0	43.4	21.4	30.9	3.3		10.7	12.00	14.8	65.0
67	790800		5.60	2.5	67.9	23.0	25.2	4.6		8.7	32.00	28.1	45.0
68	790800		5.90	1.3	87.3	26.3	28.7	4.9		10.2	46.00	35.6	55.0
69	790800		5.80	1.6	110.3	36.2	43.5	8.7		11.8	80.00	33.1	63.0
70	790800		5.60	2.5	52.4	17.3	23.9	2.6		7.3	18.00	20.6	55.0
71	790800		5.20	6.3	57.9	23.0	30.0	2.8		11.6	10.00	27.3	65.0
72	790800		6.70	.2	72.9	9.9	23.1	2.8		9.9	58.00	15.0	8.0
73	790800		6.40	.4	90.8	14.0	25.2	3.8		11.6	80.00	16.7	6.0
74	790800		6.50	.3	16.0	14.0	13.9	3.8		8.7	28.00	13.3	M 5.0
75	790800		6.80	.1	64.9	41.1	17.4	2.6	2.2	14.1	92.00	27.1	10.0
76	790800		6.00	1.0	49.9	24.7	17.4	2.6	13.3	14.1	61.00	47.9	50.0
77	790800		6.20	.6	71.4	35.4	35.7	6.1		16.1	32.00	14.2	90.0
78	790800		5.90	1.3	60.4	22.2	27.4	7.7		17.2	26.00	12.9	S 100.0
79	790800		6.10	.7	44.4	19.7	33.5	4.9		19.7	20.00	15.0	55.0
80	790800		5.00	10.0	52.9	22.2	52.2	13.6		41.5	8.00	20.6	S 100.0
81	790800		5.90	1.3	37.4	19.7	43.5	4.9		37.5	10.00	22.3	35.0
82	790800		5.30	5.0	61.4	33.7	64.4	124.8		156.8	12.00	47.3	65.0
83	790800		5.70	2.0	35.4	26.3	69.6	6.1		51.9	14.00	23.9	45.0
84	790800		5.20	6.3	41.4	28.8	73.9	9.2		65.7	8.00	25.6	65.0
85	790800		6.20	.6	44.4	20.6	27.4	4.1		13.0	30.00	14.2	45.0
86	790800		5.70	2.0	60.4	30.4	56.5				26.00	116.0	55.0
87	790800		5.80	1.6	59.9	24.7	51.8	116.1		128.1	3.00	35.6	65.0
88	790800		6.40	.4	49.9	18.1	27.4	7.2		16.1	42.00	15.0	65.0
89	790800	LAKE C	6.60	.2	83.8	56.8	160.9	12.5		138.2	68.00	50.0	35.0
90	790800		5.90	1.3	72.9	49.4	91.3	6.6		93.1	66.00	37.5	M 5.0
91	790800		6.20	.6	19.0	4.9	8.7	3.3		2.0	12.00	13.3	M 5.0
92	790800		6.50	.3	26.9	7.4	12.6	4.1		1.7	32.00	9.2	M 5.0
93	790800		7.10	.0	36.9	7.4	17.4	4.9		2.5	24.00	10.0	M 5.0
94	790800		6.50	.3	38.4	5.8	11.3	3.6		3.9	24.00	16.7	M 5.0
95	790800		6.80	.1	33.9	14.8	17.4	6.4		2.8	36.00	14.2	M 5.0
96	790800		6.30	.5	20.5	9.0	12.6	5.6		2.0	20.00	9.2	M 5.0
97	790800		6.30	.5	54.9	12.3	18.3	5.4		3.7	44.00	15.8	8.0
98	790800		6.10	.7	36.9	9.9	12.6	4.6		4.2	20.00	16.7	M 5.0

CODE: NEWF

DESCRIPTION: Survey of 81 lakes in Newfoundland conducted by Environment Canada in 1979-80.

PARAMETERS USED: pH, cond, Na, K, Ca, Mg, Al, SO_4, Cl, alkalinity (ALKTIP), color.

REFERENCE: Clair, T.A., D.R. Engstrom and W. Whitman, 1982. Data report. Water quality of surface waters of Newfoundland and Labrador. Inland Waters Directorate, Environment Canada, IWD-AR-WQB-82-32.

OUTLIERS: None

DATA SOURCE: Clair and Engstrom, personal communication

FILKODE: NEWF NAVN: INNSJØER I NEWFOUNDLAND, CANADA. DATA FRA CLAIR + ENGSTRØM NORD-AMERIKA DATO: 830121

VANN	A M D R N G	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALKTIP	ES04	FARG
1	801100	GRANDY	5.10	7.9	28.4	16.5	52.2	2.6	17.8	53.6	0.00	41.6	35.0
2	801100	GREY R	5.30	5.0	36.4	18.9	56.5	2.6	23.4	59.2	3.00	47.9	50.0
3	801100		5.50	3.2	54.9	61.7	69.6	5.1	43.4	64.9	14.00	81.2	S 100.0
4	801100	WIGWAM	7.60	.0	998.0	649.9	117.4	5.1	11.1	143.9	1505.00	60.4	M 5.0
5	801100		4.90	12.6	89.8	72.4	65.2	7.7	34.5	76.2	0.00	114.5	S 100.0
6	801100	GLIDE	6.70	.2	299.4	82.3	117.4	2.6	10.0	146.7	240.00	58.3	55.0
7	801100		6.70	.2	79.8	33.7	73.9	5.1	21.1	73.3	0.00	41.6	50.0
8	801100		6.80	.1	54.9	29.6	60.9	2.6	10.0	45.1	42.00	31.2	25.0
9	801100	LITTLE	6.60	.2	119.8	42.0	82.6	5.1	16.7	95.9	0.00	68.7	30.0
10	801100		6.50	.3	144.7	44.4	82.6	5.1	16.7	90.3	135.00	58.3	60.0
11	801100	ISLAND	6.90	.1	399.2	100.9	117.4	5.1	22.2	163.6	399.00	58.3	35.0
12	801100		6.30	.5	79.8	30.4	52.2	5.1	16.7	53.6	0.00	47.9	70.0
13	801100		6.80	.1	134.7	41.1	95.7	5.1	6.7	64.9	162.00	47.9	70.0
14	801100	BIRCHY	5.90	1.3	69.9	45.2	87.0	7.7	15.6	101.6	30.00	52.0	50.0
15	801100	CORNER	6.70	.2	144.7	43.6	91.3	7.7	11.1	126.9	98.00	52.0	20.0
16	801100	NOBLE	6.40	.4	35.9	37.8	87.0	5.1	14.5	101.6	67.00	41.6	10.0
17	801100		6.00	1.0	25.0	28.0	95.7	5.1	16.7	121.3	8.00	41.6	15.0
18	801100		6.60	.2	45.9	57.6	52.2	2.6	26.7	45.1	63.00	47.9	50.0
19	801100		7.10	.0	204.6	49.4	82.6	5.1	8.9	84.6	156.00	52.0	40.0
20	801100		5.10	7.9	54.9	35.4	60.9	2.6	11.1	50.8	0.00	52.0	15.0
21	801100		6.00	1.0	89.8	35.4	65.2	7.7	35.6	64.9	43.00	58.3	100.0
22	801100		6.10	.7	34.9	37.8	87.0	5.1	14.5	101.6	67.00	41.6	10.0
23	801100	KING G	6.60	.2	124.8	44.4	82.6	2.6	11.1	79.0	94.00	52.0	30.0
24	801100	LLOYDS	6.60	.2	104.8	44.4	91.3	2.6	13.3	101.6	40.00	52.0	45.0
25	801100		6.40	.4	54.9	35.4	52.2	2.6	13.3	53.6	88.00	41.6	30.0
26	801100	COSTIG	6.70	.2	139.7	35.4	56.5	2.6	5.6	64.9	119.00	43.7	10.0
27	801100	SANDY	6.10	.7	89.8	28.0	47.8	5.1	5.6	56.4	76.00	47.9	70.0
28	801100	MARKS	6.00	1.0	134.7	57.6	95.7	12.8	50.0	70.5	56.00	110.3	S 100.0
29	801100	MONICA	6.20	.6	74.8	31.3	65.2	5.1	16.7	53.6	109.00	41.6	30.0
30	801100	TEMPLE	6.70	.2	79.8	39.5	87.0	12.8	20.0	81.8	59.00	47.9	70.0
31	801100		6.30	.5	79.8	39.5	56.5	2.6	18.9	48.0	29.00	56.2	100.0
32	801100		4.90	12.6	59.9	45.2	60.9	5.1	38.9	56.4	0.00	89.5	S 100.0
33	801100	GULL L	6.40	.4	79.8	35.4	69.6	5.1	23.4	67.7	38.00	47.9	50.0
34	801100	WILDIN	6.00	1.0	74.8	32.9	56.5	2.6	17.8	56.4	34.00	52.0	55.0
35	801100	TALLY	6.50	.3	79.8	28.8	47.8	2.6	6.7	48.0	100.00	37.5	5.0
36	801100	GLIDES	6.60	.2	109.8	31.3	52.2	2.6	8.9	48.0	123.00	37.5	20.0
37	801100	LEWIS	6.50	.3	94.8	42.0	73.9	7.7	16.7	73.3	59.00	47.9	70.0
38	801100		6.70	.2	134.7	60.0	95.7	10.2	15.6	95.9	125.00	47.9	60.0
39	801100	ROCKY	6.50	.3	114.8	41.1	91.3	7.7	21.1	87.5	94.00	58.3	100.0
40	801100	WEST P	7.00	.1	139.7	46.1	82.6	7.7	10.0	62.1	174.00	37.5	30.0
41	801100	BELLMA	6.80	.1	84.8	59.2	113.1	5.1	5.6	104.4	100.00	41.6	30.0
42	801100	GANDER	6.00	1.0	89.8	44.4	60.9	7.7	21.1	67.7	54.00	54.1	70.0
43	801100	CARIBO	6.00	1.0	59.9	39.5	65.2	7.7	22.2	67.7	38.00	43.7	40.0
44	801100	LOWER	5.70	2.0	54.9	34.5	73.9	7.7	32.2	62.1	20.00	52.0	100.0
45	801100	DEAD W	5.20	6.3	54.9	42.0	69.6	10.2	46.7	62.1	2.00	68.7	S 100.0
46	801100	LITTLE	5.10	7.9	54.9	57.6	52.2	2.6	21.1	53.6	7.00	72.9	S 100.0
47	801100	COY PO	5.70	2.0	69.9	48.5	60.9	5.1	11.1	64.9	30.00	58.3	100.0
48	801100	GREAT	5.60	2.5	49.9	36.2	52.2	2.6	10.0	50.8	22.00	52.0	60.0
49	801100	WEIRS	6.60	.2	59.9	98.7	113.1	7.7	15.6	124.1	82.00	54.1	80.0
50	801100	INDIAN	5.90	1.3	49.9	57.6	91.3	5.1	26.7	87.5	32.00	47.9	70.0
51	801100		5.40	4.0	30.9	48.5	104.4	5.1	35.6	101.6	6.00	62.5	S 100.0
52	801100	NORTH	6.00	1.0	59.9	40.3	69.6	7.7	21.1	64.9	40.00	43.7	50.0
53	801100	MOLLYG	6.60	.2	74.8	27.1	65.2	2.6	10.0	62.1	14.00	43.7	40.0
54	801100	DEER P	6.40	.4	54.9	37.0	65.2	2.6	10.0	62.1	21.00	43.7	30.0
55	801100		5.20	6.3	54.9	26.3	65.2	2.6	25.6	59.2	6.00	68.7	S 100.0

FILKODE: NEWF NAVN: INNSJØER I NEWFOUNDLAND, CANADA. DATA FRA CLAIR + ENGSTRØM NORD-AMERIKA DATO: 830121

VANN	A M D R N G	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALKTIP	ES04	FARG
56	801100		5.60	2.5	49.9	20.6	52.2	2.6	16.7	45.1	14.00	43.7	55.0
57	801100		5.80	1.6	74.8	51.0	147.9	10.2	15.6	138.2	40.00	62.5	40.0
58	801100	PORTAG	6.00	1.0	54.9	36.2	104.4	2.6	7.8	101.6	29.00	47.9	20.0
59	801100		6.70	.2	149.7	64.2	178.4	7.7	12.2	197.5	141.00	68.7	35.0
60	801100	DASHWO	5.80	1.6	37.4	28.0	73.9	2.6	13.3	79.0	11.00	41.6	25.0
61	801100	SILVER	6.40	.4	109.8	54.3	100.1	5.1	15.6	141.0	65.00	62.5	50.0
62	801100	BIG PO	5.50	3.2	37.4	19.7	65.2	2.6	7.8	64.9	6.00	39.6	10.0
63	801100		5.20	6.3	26.4	22.2	73.9	2.6	22.2	67.7	0.00	52.0	40.0
64	801100		5.40	4.0	22.5	19.7	69.6	2.6	15.6	81.8	0.00	39.6	20.0
65	801100	STEPHE	5.90	1.3	34.9	19.7	69.6	2.6	10.0	56.4	22.00	41.6	20.0
66	801100		5.80	1.6	29.9	17.3	56.5	2.6	7.8	64.9	7.00	33.3	10.0
67	801100	SPRUCE	5.70	2.0	39.9	25.5	73.9	2.6	17.8	67.7	8.00	52.0	50.0
68	801100	WHITE	5.60	2.5	64.9	30.4	78.3	2.6	28.9	64.9	24.00	62.5	100.0
69	801100		5.60	2.5	40.9	15.6	60.9	2.6	21.1	50.8	8.00	43.7	40.0
70	801100		5.70	2.0	40.9	23.0	65.2	5.1	10.0	59.2	16.00	41.6	35.0
71	801100		5.30	5.0	54.9	23.9	69.6	2.6	22.2	64.9	2.00	54.1	80.0
72	801100	MATTHE	6.70	.2	79.8	33.7	60.9	2.6	4.4	64.9	61.00	41.6	10.0
73	801100	COLD S	5.90	1.3	54.9	30.4	69.6	2.6	10.0	59.2	30.00	41.6	30.0
74	801100		5.80	1.6	49.9	26.3	60.9	2.6	31.1	48.0	16.00	62.5	100.0
75	801100	SITDOW	6.10	.7	38.9	82.3	52.2	2.6	10.0	53.6	77.00	47.9	50.0
76	801100	GODSLE	6.50	.3	69.9	36.2	65.2	2.6	15.6	76.2	25.00	43.7	45.0
77	801100	RIVER	6.20	.6	89.8	38.7	78.3	2.6	10.0	70.5	44.00	52.0	35.0
78	801100	META P	6.20	.6	54.9	22.2	65.2	2.6	6.7	48.0	44.00	39.6	25.0
79	801100		5.60	2.5	54.9	42.0	56.5	2.6	8.9	45.1	28.00	52.0	90.0
80	801100		6.30	.5	34.9	18.1	73.9	2.6	6.7	56.4	0.00	31.2	5.0
81	801100	HUNGRY	5.70	2.0	54.9	30.4	78.3	2.6	12.2	67.7	39.00	39.6	35.0

CODE: LAUREN

DESCRIPTION: Survey of 30 lakes in Le Parc des Laurentides, Quebec, conducted in 1979 by IRNS-Eau, Quebec.

PARAMETERS USED: pH, cond, Na, K, Ca, Mg, SO_4, Cl, color. Alkalinity not reported.

REFERENCE: Unpublished.

OUTLIERS: Only lakes with pH < 5.4 (4 lakes only) were used due to lack of alkalinity data.

DATA SOURCE: D.F. Brakke, personal communication.

FILKODE: LAUREN NAVN: LAURENTIDES PARC, QUEBEC. DATA FRA IRNS-EAU. NORD-AMERIKA DATO: 830318

VANN	A M D R N G	DYP	PH	EH+	ECA	EMG	ENA	EK	ECL	ALKTIP	ES04	FARG
1	790101	50	6.06	.8	159.7	74.0	156.6	20.5	214.4		95.8	45.0
2	790101	50	5.78	1.7	119.8	41.1	65.2	17.9	39.5		122.8	45.0
3	790101	50	6.06	.8	139.7	49.4	113.1	7.7	104.4		112.4	30.0
4	790101	50	6.14	.7	174.6	57.6	352.3	7.7	468.3		104.1	25.0
8	790101	50	6.10	.7	159.7	49.4	478.5	15.3	552.9		112.4	20.0
9	790101	50	6.20	.6	234.5	90.5	2218.5	15.3	2341.4		143.7	10.0
12	790101	50	6.38	.4	169.7	98.7	243.6	12.8	284.9		112.4	30.0
13	790101	50	6.02	.9	99.8	41.1	134.8	10.2	118.5		102.0	25.0
14	790101	50	6.21	.6	99.8	49.4	60.9	10.2	19.7		102.0	25.0
15	790101	50	6.12	.7	114.8	49.4	156.6	12.8	121.3		106.2	35.0
16	790101	50	6.21	.6	104.8	49.4	217.5	12.8	197.5		93.7	40.0
17	790101	50	6.07	.8	99.8	49.4	95.7	10.2	56.4		97.9	25.0
18	790101	50	5.83	1.5	89.8	24.7	208.8	10.2	200.3		114.5	25.0
28	790101	50	5.47	3.4	169.7	24.7	30.5	7.7	25.4		108.3	60.0
30	790101	50	6.50	.3	349.3	74.0	1218.0	17.9	1297.7		116.6	35.0
32	790101	50	7.20	.0	69.9	82.3	3219.0	498.6	3639.1		195.7	45.0
33	790101	50	7.04	.0	648.7	65.8	2436.0	20.5	2933.8		149.9	7.0
36	790101	50	6.95	.1	294.4	41.1	95.7	10.2	98.7		106.2	55.0
40	790101	50	5.72	1.9	94.8	32.9	39.1	17.9	31.0		114.5	75.0
41	790101	50	6.16	.6	64.9	32.9	34.8	5.1	11.3		70.8	7.0
42	790101	50	6.23	.5	54.9	24.7	34.8	7.7	8.5		58.3	4.0
43	790101	50	5.93	1.2	84.8	41.1	47.8	28.1	25.4		99.9	70.0
44	790101	50	5.92	1.2	49.9	24.7	30.5	10.2	11.3		58.3	5.0
45	790101	50	6.61	.2	154.7	65.8	100.1	15.3	67.7		85.4	20.0
46	790101	50	6.60	.2	89.8	41.1	65.2	10.2	28.2		68.7	4.0
47	790101	50	6.54	.2	74.8	32.9	39.1	5.1	16.9		54.1	7.0
90	790101	50	5.08	8.3	69.9	24.7	17.4	7.7	8.5		129.1	3.0
91	790101	50	4.92	12.0	104.8	24.7	17.4	12.8	14.1		145.7	5.0
92	790101	50	4.66	21.9	69.9	24.7	17.4	12.8	16.9		129.1	7.0
93	790101	50	4.90	12.6	64.9	24.7	8.7	10.2	11.3		118.7	25.0

CODE: NOVASC

DESCRIPTION: Survey of 23 lakes in the Halifax, Nova Scotia area conducted in December 1956 (E. Gorham) and resurveyed in January 1977 (Watt et al.).

PARAMETERS USED: pH, cond, Na, K, Ca, Mg, SO_4, alkalinity (S.Acid, ALK 4.5), TOC.

REFERENCE: Gorham, E. 1957. Limnol. Oceanog. 2:12. Watt, W.D., D. Scott and S. Ray. 1979. Limnol. Oceanog. 24:1154.

OUTLIERS: In the resurvey 16 of the lakes showed no sign of alteration in drainage basins. The other 7 were excluded.

DATA SOURCE: Gorham, 1957. Watt et al:, 1979.

FILKODE: NOVASC   NAVN: INNSJØER I NOVA SCOTIA, CANADA.   NORD-AMERIKA   DATO: 830121

VANN	A M D R N G	DYP	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	TOC
1	551201	50	HUBLEY	4.84	14.5	49.9	16.5	147.9	10.2		138.2	.0	87.4	7.2
1	770101	50		4.56	27.5	66.4	51.0	352.3	15.3		400.6	.0	149.9	10.0
2	551201	50	RAILWA	5.36	4.4	54.9	32.9	147.9	10.2		135.4	.0	95.8	5.2
2	770101	50		4.68	20.9	83.3	55.9	461.1	17.9		538.8	.0	120.8	8.0
4	551201	50	LONG	4.84	14.5	54.9	49.4	174.0	12.8		169.3	.0	112.4	4.2
4	770101	50		4.38	41.7	83.3	68.3	321.9	15.3		392.1	.0	160.3	9.5
7	551201	50	SILVER	4.47	33.9	54.9	49.4	247.9	10.2		222.9	.0	156.1	11.6
7	770101	50		4.22	60.3	77.8	71.6	321.9	15.3		423.1	.0	149.9	9.0
8	551201	50	PURCEL	3.95	112.2	39.9	32.9	217.5	7.7		203.1	.0	197.8	11.1
8	770101	50		3.89	128.8	41.4	80.6	252.3	7.7		341.3	.0	179.1	9.5
9	551201	50	BLACK	4.55	28.2	49.9	49.4	278.4	10.2		279.3	.0	116.6	7.9
9	770101	50		4.28	52.5	51.4	74.9	282.8	17.9		361.1	.0	156.1	16.5
10	551201	50	DUNCAN	4.63	23.4	39.9	82.3	413.3	15.3		428.8	.0	133.2	7.5
10	770101	50		4.25	56.2	48.9	79.0	556.8	20.5		392.1	.0	179.1	15.5
11	551201	50	MT.UNI	6.66	.2	104.8	24.7	104.4	15.3		107.2	22.9	85.4	6.7
11	770101	50		5.58	2.6	106.8	41.1	113.1	10.2		132.6	.0	127.0	8.5
12	551201	50	WEBBER	5.50	3.2	89.8	32.9	130.5	12.8		126.9	.0	108.3	9.5
12	770101	50		4.68	20.9	103.8	60.0	226.2	12.8		273.6	.0	166.6	9.0
13	551201	50	LEWIS	5.00	10.0	94.8	32.9	126.1	10.2		135.4	.0	116.6	10.3
13	770101	50		4.68	20.9	114.8	59.2	234.9	10.2		318.8	.0	143.7	9.5
15	551201	50	BAPTIZ	6.04	.9	84.8	41.1	147.9	17.9		158.0	.0	108.3	5.3
15	770101	50		5.12	7.6	133.2	81.4	469.8	20.5		473.9	.0	166.6	9.3
18	551201	50	P.SLAT	4.92	12.0	69.9	90.5	200.1	17.9		205.9	.0	164.5	M .5
18	770101	50		4.80	15.8	159.7	128.3	443.7	35.8		513.4	.0	216.5	4.0
20	551201	50	FRASER	6.90	.1	129.7	41.1	121.8	7.7		115.7	47.2	99.9	9.3
20	770101	50		6.00	1.0	100.8	50.2	117.4	10.2		129.8	.0	89.5	7.0
21	551201	50	CROSSG	7.10	.0	159.7	57.6	121.8	15.3		121.3	99.2	114.5	8.7
21	770101	50		6.02	.9	177.6	74.0	117.4	12.8		152.3	9.8	116.6	11.0
22	551201	50	BRINE	7.09	.0	154.7	57.6	230.5	15.3		220.0	73.3	116.6	4.7
22	770101	50		6.32	.4	171.7	80.6	239.2	12.8		299.0	.0	149.9	10.0
23	551201	50	NELSON	7.50	.0	279.4	98.7	108.8	15.3		107.2	244.9	154.1	4.8
23	770101	50		6.41	.3	451.6	146.4	113.1	15.3		155.2	52.5	156.1	10.0

CODE: QUEBEC

DESCRIPTION: Study of surface waters in the James Bay region, northern Quebec. Total of 24 lakes and streams sampled in 1975. Mean of 2-23 samples.

PARAMETERS USED: pH, cond, Na, K, Ca, Mg, SO_4, alkalinity (ALK 4.5), TOC.

REFERENCE: Magnin, E. 1977. Ecologie des eaux douces du territoire de la Baie James. Soc. Energie Baie James, Montreal, Quebec.

OUTLIERS: One highly-colored water was excluded (TOC < 25 mg C/l).

DATA SOURCE: Magnin, 1977. Table 1.4.

FILKODE: QUEBEC NAVN: VANN OG ELVER I JAMES BAY, NORD QUEBEC. NORD-AMERIKA DATO: 830121

VANN	A M D R N G	DYP	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	TOC
1	750101	50	CA153	6.30	.5	44.9	24.7	23.9	7.7		17.5	43.0	33.3	4.1
2	750101	50	CA152	5.90	1.3	44.9	24.7	25.2	7.2		16.4	32.5	39.6	3.6
3	750101	50	CA151	6.10	.7	49.9	23.0	22.6	6.1		18.1	51.4	31.2	3.5
4	750101	50	LA028	6.20	.6	64.9	20.6	30.5	7.2		19.2	54.6	29.1	4.2
5	750101	50	N1001	6.10	.7	54.9	16.5	25.2	10.2		17.8	46.2	35.4	3.9
6	750101	50	G4001	6.30	.5	74.8	18.1	29.6	8.7		24.8	78.5	33.3	3.9
7	750101	50	P0001	6.00	1.0	59.9	14.8	28.7	8.2		9.0	33.5	37.5	5.5
8	750101	50	G3430	6.20	.6	64.9	18.9	30.5	8.4		14.1	54.6	37.5	3.8
9	750101	50	G3410	6.20	.6	64.9	16.5	27.4	8.4		12.1	46.2	41.6	5.0
10	750101	50	G3409	6.20	.6	59.9	19.7	32.2	8.2		18.6	52.5	35.4	5.1
11	750101	50	KA007	6.40	.4	84.8	16.5	36.1	10.7		12.4	102.3	37.5	3.8
12	750101	50	G2102	6.40	.4	84.8	24.7	49.6	9.7		21.4	86.8	35.4	4.4
13	750101	50	G2104	6.30	.5	84.8	32.9	57.9	11.0		26.2	85.8	45.8	4.5
14	750101	50	G2105	6.50	.3	79.8	32.9	60.9	12.0		37.5	59.8	43.7	6.8
15	750101	50	G2103	6.30	.5	64.9	24.7	43.5	10.0		22.9	54.6	37.5	5.2
16	750101	50	G1201	6.40	.4	69.9	26.3	47.8	10.2		24.3	62.9	43.7	5.6
17	750101	50	SK002	6.20	.6	64.9	38.7	62.2	12.8		38.6	54.6	47.9	7.1
18	750101	50	EM087	5.70	2.0	59.9	24.7	32.6	5.1		18.3	37.8	43.7	5.7
19	750101	50	EA017	6.20	.6	69.9	19.7	36.5	9.5		22.0	40.9	45.8	6.2
20	750101	50	EA018	6.10	.7	74.8	28.0	53.1	10.2		22.6	46.2	50.0	5.9
21	750101	50	NATHAL	6.80	.1	204.6	43.6	117.0	9.5		64.0	189.7	58.3	7.5
22	750101	50	HELENE	6.70	.2	214.6	46.9	117.0	8.2		70.8	194.8	60.4	8.1
23	750101	50	JULIE	6.40	.4	209.6	52.6	94.0	7.2		56.7	155.9	70.8	14.1
24	750101	50	TOURBI	4.20	63.1	99.8	30.4	38.3	6.6		66.9	.0	93.7	26.8

CODE: OME

DESCRIPTION: Survey of 90 lakes in the Haliburton - Muskoka region, southeastern Ontario, sampled in 1980.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, SO_4, Cl, alkalinity (ALKTIP)

REFERENCE: Unpublished data. See Dillon, P.J. Jeffries, W.A. Scheider, and N.D. Yan. 1980. p 212-213. In Drabløs and Tollan (eds.). Dillon, P.J., D.S. Jeffries and W.A. Scheider. 1982. Water Air Soil Pollut. (in press).

OUTLIERS: 20 lakes with high Cl concentrations excluded ($Cl < 100$ μeq/l) (road salts?).

DATA SOURCE: P.J. Dillon, personal communication.

CODE: SUD

DESCRIPTION: Survey of 209 lakes in the Sudbury, Ontario region conducted over the period 1974-78.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, SO_4, Cl, NO_3N, alkalinity (ALK 4.5), TOC

REFERENCE: Conroy, N., K. Hawley, and W. Keller. 1978. Extensive monitoring of lakes in the greater Sudbury area 1974-1976. Ontario Ministry of the Environment.

OUTLIERS: One lake with high Cl excluded (Cl < 500 µeq/l) (road salts?).

DATA SOURCE: Conroy et al., 1978.

FILKODE: SUD　　NAVN: SUDBURY, ONTARIO　　NORD-AMERIKA　　DATO: 830121

VANN	Å M D R N G	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	EN03
1	760602		6.50	.3	249.5	82.3	30.5	10.2		11.3	52.5	301.9	2.0
2	760518		6.40	.4	199.6	82.3	91.3	10.2		90.3	52.5	249.8	6.4
3	760602		7.80	.0	748.5	411.3	213.1	35.8		231.3	482.0	707.9	.3
4	760527		7.30	.0	399.2	82.3	34.8	10.2		19.7	217.3	291.5	2.1
5	760526		5.40	4.0	249.5	82.3	30.5	10.2		14.1	20.7	343.5	.3
6	760525		6.90	.1	249.5	82.3	34.8	23.0		28.2	83.7	239.4	.3
7	760601		7.70	.0	598.8	164.5	47.8	17.9		50.8	502.3	281.1	.3
8	760601		4.80	15.8	249.5	82.3	34.8	15.3		14.1	.0	395.6	2.1
9	760601		4.70	20.0	199.6	82.3	39.1	15.3		14.1	.0	353.9	3.5
10	760602		5.00	10.0	249.5	82.3	26.1	12.8		11.3	9.8	353.9	7.9
11	760602		7.20	.0	399.2	246.8	226.2	28.1		259.5	176.4	478.9	3.1
12	760602		6.80	.1	349.3	164.5	52.2	20.5		19.7	106.5	478.9	.2
13	760601		4.60	25.1	299.4	164.5	56.5	15.3		50.8	.0	530.9	4.6
14	760602		6.50	.3	299.4	164.5	43.5	17.9		14.1	94.1	416.4	.9
15	760605		6.90	.1	249.5	164.5	43.5	17.9		22.6	135.3	343.5	.3
16	760526		6.00	1.0	299.4	164.5	56.5	15.3		14.1	20.7	520.5	.3
17	760526		7.50	.0	748.5	411.3	591.6	35.8		747.6	441.4	624.6	.3
18	760602		5.00	10.0	449.1	246.8	239.2	30.7		245.4	9.8	718.3	.3
19	760602		6.50	.3	299.4	82.3	39.1	10.2		22.6	44.1	353.9	.3
20	760609		6.50	.3	199.6	82.3	43.5	10.2		39.5	77.5	229.0	1.7
21	760609		6.60	.2	199.6	82.3	26.1	10.2		11.3	56.7	239.4	.3
22	760609		7.70	.0	499.0	82.3	17.4	17.9		14.1	360.1	270.7	.3
23	760518		6.60	.2	199.6	82.3	43.5	10.2		11.3	83.7	229.0	3.4
24	760518		6.30	.5	149.7	82.3	34.8	10.2		11.3	52.5	197.8	3.4
25	760609		6.80	.1	199.6	82.3	30.5	7.7		8.5	94.1	229.0	.3
26	760609		6.50	.3	149.7	82.3	26.1	7.7		8.5	48.3	197.8	.3
27	760609		6.50	.3	149.7	82.3	26.1	15.3		11.3	18.6	249.8	.3
28	760609		7.20	.0	399.2	82.3	30.5	7.7		14.1	339.7	187.4	.3
29	760609		7.00	.1	249.5	82.3	30.5	15.3		16.9	196.9	145.7	.3
30	760518		6.40	.4	149.7	82.3	34.8	10.2		8.5	62.9	177.0	5.2
31	760518		6.90	.1	199.6	82.3	39.1	10.2		11.3	166.1	156.1	5.1
32	760611		6.20	.6	199.6	82.3	73.9	12.8		81.8	52.5	218.6	.3
33	760610		7.20	.0	299.4	164.5	147.9	20.5		90.3	278.6	218.6	.3
34	760605		6.80	.1	199.6	164.5	43.5	15.3		19.7	94.1	312.3	2.0
35	760603		6.90	.1	149.7	164.5	43.5	15.3		16.9	110.6	260.2	2.0
36	760605		7.00	.1	299.4	82.3	65.2	20.5		56.4	196.9	218.6	.3
37	760617		7.20	.0	249.5	246.8	156.6	15.3		160.8	196.9	312.3	.3
38	760512		6.40	.4	149.7	82.3	47.8	12.8		45.1	52.5	187.4	16.2
39	760512		5.60	2.5	99.8	82.3	21.8	7.7		16.9	20.7	145.7	9.5
40	760512		4.80	15.8	99.8	41.1	17.4	7.7		14.1	.0	135.3	10.4
42	760512		6.00	1.0	149.7	41.1	21.8	10.2		16.9	20.7	156.1	4.2
43	760610		5.70	2.0	99.8	41.1	17.4	7.7		11.3	14.2	124.9	2.1
44	760512		6.50	.3	149.7	82.3	43.5	15.3		48.0	94.1	156.1	4.9
45	760513		6.60	.2	149.7	82.3	60.9	15.3		56.4	52.5	177.0	.7
46	760610		6.70	.2	199.6	82.3	47.8	15.3		39.5	73.3	197.8	4.6
47	760512		6.00	1.0	149.7	41.1	39.1	7.7		39.5	20.7	145.7	9.9
48	760605		6.90	.1	299.4	164.5	56.5	20.5		19.7	147.6	364.3	.3
49	760614		5.60	2.5	299.4	82.3	30.5	10.2		11.3	20.7	374.8	.3
50	760719		4.30	50.1	199.6	82.3	30.5	10.2		11.3	.0	343.5	3.2
51	760614		4.60	25.1	149.7	164.5	30.5	12.8		8.5	.0	364.3	1.7
52	760614		7.20	.0	399.2	164.5	39.1	10.2		14.1	299.0	322.7	5.6
53	760614		6.40	.4	249.5	82.3	34.8	10.2		11.3	31.4	364.3	.3
54	760615		5.80	1.6	249.5	82.3	26.1	12.8		8.5	.0	353.9	.3
55	760719		7.00	.1	349.3	164.5	34.8	10.2		11.3	129.1	406.0	.3
56	760614		7.30	.0	499.0	246.8	95.7	17.9		81.8	299.0	458.0	2.8

FILKODE: SUD　　NAVN: SUDBURY, ONTARIO　　NORD-AMERIKA　　DATO: 830121

VANN	A M D R N G	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ESO4	ENO3
57	760618		6.50	.3	249.5	82.3	34.8	15.3		11.3	73.3	249.8	.3
58	760621		7.00	.1	349.3	164.5	47.8	15.3		45.1	258.2	260.2	.3
59	760621		7.20	.0	299.4	164.5	39.1	10.2		36.7	176.4	281.1	.3
60	760618		6.20	.6	149.7	82.3	30.5	12.8		11.3	35.7	197.8	.3
61	760618		6.10	.7	149.7	82.3	30.5	12.8		8.5	22.9	229.0	.3
62	760610		7.30	.0	449.1	164.5	73.9	10.2		70.5	339.7	291.5	1.3
63	760723		7.20	.0	399.2	164.5	26.1	7.7		11.3	339.7	249.8	.3
64	760621		6.30	.5	99.8	82.3	21.8	10.2		11.3	31.4	187.4	.3
65	760706		7.40	.0	499.0	246.8	60.9	7.7		25.4	563.1	208.2	.3
66	760723		7.20	.0	349.3	164.5	130.5	7.7		132.6	278.6	249.8	.3
67	760723		6.00	1.0	249.5	82.3	26.1	10.2		8.5	9.8	343.5	.3
68	760722		7.40	.0	648.7	164.5	34.8	23.0		16.9	461.7	364.3	.3
69	760722		7.00	.1	299.4	164.5	47.8	17.9		25.4	139.4	374.8	.3
70	760604		5.50	3.2	149.7	82.3	34.8	12.8		19.7	5.3	260.2	4.9
71	760605		4.40	39.8	99.8	82.3	21.8	7.7		14.1	.0	291.5	10.6
72	760611		7.40	.0	399.2	164.5	47.8	15.3		19.7	339.7	260.2	3.9
73	760611		7.10	.0	299.4	164.5	56.5	17.9		39.5	217.3	260.2	1.6
74	760611		7.00	.1	199.6	164.5	60.9	15.3		45.1	145.6	239.4	.3
75	760611		6.70	.2	199.6	82.3	30.5	10.2		14.1	67.1	239.4	.3
76	760601		7.10	.0	299.4	82.3	52.2	17.9		31.0	85.8	364.3	.6
77	760604		5.10	7.9	199.6	82.3	34.8	15.3		16.9	.0	322.7	.3
78	760611		8.30	.0	2295.4	658.1	117.4	20.5		126.9	2238.4	395.6	.3
79	760604		4.60	25.1	149.7	82.3	26.1	10.2		16.9	.0	281.1	15.6
80	760605		5.00	10.0	149.7	82.3	34.8	10.2		16.9	.0	260.2	4.9
81	760611		8.50	.0	1996.0	740.3	56.5	20.5		104.4	2459.8	541.3	.3
82	760611		8.30	.0	1696.6	1233.9	30.5	17.9		95.9	2298.8	468.4	.3
83	760601		7.00	.1	249.5	82.3	34.8	10.2		14.1	114.7	229.0	.3
84	760630		6.60	.2	199.6	82.3	30.5	15.3		14.1	48.3	249.8	.3
85	760623		7.70	.0	548.9	164.5	43.5	12.8		14.1	603.7	166.6	1.1
86	760528		8.00	.0	1646.7	329.0	43.5	17.9		8.5	1775.0	187.4	.3
87	760525		6.60	.2	249.5	82.3	30.5	10.2		14.1	104.4	229.0	.6
88	760525		6.60	.2	249.5	82.3	30.5	10.2		14.1	104.4	260.2	3.9
89	760623		8.10	.0	948.1	329.0	34.8	10.2		8.5	1190.1	104.1	.3
90	760623		7.00	.1	299.4	82.3	30.5	7.7		11.3	237.8	166.6	.3
91	760618		6.10	.7	199.6	41.1	30.5	12.8		11.3	27.2	260.2	.3
92	760728		4.60	25.1	99.8	82.3	17.4	10.2		5.6	.0	218.6	5.7
93	760618		4.90	12.6	149.7	82.3	26.1	10.2		11.3	.0	260.2	.3
94	760618		4.50	31.6	149.7	82.3	26.1	10.2		8.5	.0	260.2	3.6
95	770705		7.30	.0	449.1	164.5	47.8	10.2		22.6	441.4	208.2	.3
96	760623		7.30	.0	349.3	123.4	30.5	5.1		8.5	319.3	187.4	.3
97	760618		4.60	25.1	99.8	41.1	26.1	15.3		8.5	.0	197.8	.3
98	760728		6.60	.2	99.8	82.3	21.8	7.7		8.5	65.0	156.1	.3
99	760728		6.70	.2	199.6	41.1	34.8	10.2		16.9	94.1	166.6	2.1
100	760728		6.60	.2	99.8	82.3	39.1	7.7		31.0	73.3	124.9	.3
101	760527		6.60	.2	199.6	41.1	30.5	12.8		31.0	31.4	208.2	1.0
102	760527		6.60	.2	199.6	82.3	30.5	12.8		19.7	73.3	218.6	.3
103	760610		7.30	.0	249.5	164.5	56.5	23.0		36.7	258.2	187.4	.3
104	760610		7.00	.1	249.5	82.3	82.6	25.6		76.2	176.4	218.6	4.6
105	760610		7.20	.0	249.5	164.5	191.4	28.1		220.0	176.4	229.0	8.8
106	760621		6.50	.3	149.7	82.3	56.5	20.5		56.4	44.1	208.2	.3
107	760617		7.00	.1	349.3	164.5	34.8	15.3		31.0	299.0	260.2	.3
108	760617		6.90	.1	299.4	164.5	82.6	12.8		110.0	143.5	322.7	.3
109	760617		6.50	.3	199.6	82.3	56.5	15.3		53.6	69.2	208.2	.5
110	760621		7.30	.0	249.5	82.3	30.5	15.3		8.5	237.8	135.3	.3
111	760617		6.30	.5	149.7	41.1	21.8	15.3		8.5	44.1	166.6	.3

FILKODE: SUD NAVN: SUDBURY, ONTARIO NORD-AMERIKA DATO: 830121

VANN	A M D R N G	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	EN03
112	760621		6.80	.1	199.6	164.5	26.1	12.8		14.1	114.7	239.4	1.4
113	760604		5.00	10.0	149.7	82.3	43.5	15.3		19.7	.0	322.7	2.1
114	760604		5.20	6.3	149.7	82.3	39.1	12.8		16.9	.0	301.9	3.5
115	760604		5.90	1.3	149.7	82.3	52.2	15.3		11.3	9.8	291.5	.3
117	760719		5.80	1.6	199.6	82.3	39.1	15.3		11.3	5.3	291.5	.3
118	760615		4.70	20.0	149.7	82.3	26.1	10.2		8.5	.0	322.7	3.1
119	760706		6.00	1.0	249.5	82.3	47.8	10.2		11.3	12.0	343.5	2.4
120	760706		6.20	.6	249.5	82.3	47.8	10.2		8.5	16.4	343.5	.3
121	760706		4.40	39.8	249.5	41.1	47.8	5.1		8.5	.0	364.3	6.0
122	760706		7.40	.0	349.3	164.5	43.5	7.7		8.5	299.0	260.2	.3
123	760615		4.50	31.6	149.7	82.3	34.8	10.2		8.5	.0	333.1	2.8
124	760607		6.40	.4	199.6	82.3	30.5	15.3		16.9	73.3	239.4	.5
125	760705		6.90	.1	249.5	164.5	43.5	10.2		16.9	168.2	229.0	.3
126	760605		6.90	.1	249.5	82.3	34.8	12.8		11.3	143.5	208.2	1.4
127	760729		5.10	7.9	149.7	41.1	30.5	12.8		11.3	.0	229.0	.3
128	760729		7.50	.0	499.0	246.8	43.5	7.7		11.3	563.1	197.8	.3
129	760729		5.30	5.0	149.7	82.3	30.5	12.8		8.5	.0	260.2	.3
130	760729		5.40	4.0	249.5	41.1	30.5	10.2		11.3	.0	333.1	.3
131	760729		5.80	1.6	299.4	41.1	30.5	10.2		11.3	2.9	353.9	.5
132	760729		6.70	.2	249.5	82.3	34.8	15.3		11.3	123.0	218.6	.3
133	760721		6.60	.2	149.7	41.1	47.8	12.8		48.0	69.2	124.9	.3
134	760721		6.70	.2	149.7	41.1	30.5	10.2		14.1	56.7	156.1	.3
135	760721		5.90	1.3	149.7	41.1	56.5	10.2		62.1	5.3	166.6	.3
136	760721		6.60	.2	99.8	41.1	21.8	10.2		22.6	58.7	114.5	.3
137	760721		6.80	.1	199.6	41.1	34.8	12.8		28.2	60.8	166.6	19.1
138	760721		6.00	1.0	149.7	41.1	60.9	10.2		70.5	44.1	145.7	.3
139	760709		6.80	.1	249.5	41.1	34.8	10.2		16.9	139.4	135.3	.3
140	760709		4.80	15.8	99.8	41.1	21.8	12.8		16.9	.0	135.3	.3
141	760730		5.20	6.3	249.5	41.1	30.5	12.8		11.3	.0	322.7	.3
142	760730		4.30	50.1	199.6	41.1	26.1	15.3		11.3	.0	333.1	2.9
143	760823		4.70	20.0	149.7	41.1	26.1	10.2		8.5	.0	229.0	.3
145	760723		6.00	1.0	149.7	82.3	34.8	10.2		5.6	14.2	270.7	.3
147	760714		6.70	.2	149.7	82.3	39.1	17.9		11.3	94.1	166.6	1.0
148	760714		6.70	.2	149.7	82.3	43.5	15.3		11.3	106.5	166.6	1.3
149	760714		7.00	.1	149.7	82.3	39.1	17.9		11.3	125.0	177.0	.3
150	760714		6.70	.2	74.8	164.5	56.5	17.9		11.3	114.7	208.2	.3
151	760714		6.10	.7	149.7	41.1	26.1	12.8		11.3	25.0	177.0	6.7
152	760714		7.30	.0	249.5	123.4	47.8	15.3		11.3	217.3	187.4	.3
153	760714		6.90	.1	149.7	164.5	43.5	15.3		11.3	196.9	156.1	.3
154	760714		6.90	.1	149.7	41.1	30.5	7.7		11.3	50.4	156.1	.3
155	760809		5.80	1.6	149.7	41.1	39.1	12.8		16.9	14.2	166.6	4.9
156	760714		5.90	1.3	99.8	41.1	21.8	12.8		11.3	18.6	145.7	2.1
157	760809		6.90	.1	199.6	41.1	121.8	23.0		115.7	110.6	166.6	1.4
158	760809		6.70	.2	199.6	82.3	73.9	28.1		42.3	155.9	197.8	.6
159	760809		5.70	2.0	149.7	41.1	26.1	15.3		14.1	5.3	166.6	9.2
160	760714		6.60	.2	149.7	82.3	43.5	12.8		28.2	54.6	166.6	2.7
161	760714		6.40	.4	149.7	41.1	26.1	12.8		8.5	33.5	166.6	2.8
162	760708		5.40	4.0	149.7	41.1	34.8	7.7		11.3	.0	197.8	.3
164	760708		6.80	.1	199.6	41.1	52.2	10.2		16.9	77.5	156.1	2.1
165	760728		6.70	.2	99.8	41.1	47.8	10.2		8.5	62.9	135.3	.3
166	760728		7.10	.0	249.5	82.3	34.8	10.2		11.3	217.3	135.3	.3
167	760803		6.90	.1	249.5	82.3	39.1	12.8		11.3	217.3	145.7	.3
168	760714		6.70	.2	149.7	41.1	30.5	10.2		8.5	77.5	135.3	.3
169	760803		6.80	.1	249.5	82.3	30.5	12.8		8.5	196.9	135.3	.3
170	760714		6.80	.1	199.6	41.1	30.5	10.2		11.3	118.8	145.7	.3

FILKODE: SUD NAVN: SUDBURY, ONTARIO NORD-AMERIKA DATO: 830121

VANN	ÅR MND DG	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	EN03
171	760714		5.90	1.3	149.7	41.1	26.1	20.5		16.9	33.5	197.8	.3
172	760803		7.70	.0	748.5	246.8	52.2	12.8		11.3	806.1	208.2	.3
173	760803		7.40	.0	648.7	246.8	34.8	12.8		11.3	644.2	187.4	.3
174	760806		5.20	6.3	149.7	41.1	30.5	12.8		8.5	.0	260.2	.3
175	760806		6.60	.2	249.5	82.3	30.5	10.2		11.3	85.8	260.2	.3
176	760803		7.60	.0	998.0	411.3	30.5	10.2		5.6	1371.7	83.3	.6
177	760709		6.60	.2	199.6	41.1	78.3	17.9		62.1	71.2	177.0	17.7
178	760806		5.90	1.3	149.7	41.1	30.5	10.2		5.6	14.2	229.0	.3
179	760601		4.50	31.6	99.8	82.3	30.5	12.8		8.5	.0	260.2	1.4
180	760909		4.70	20.0	299.4	82.3	26.1	10.2		8.5	.0	458.0	15.7
181	760909		5.10	7.9	149.7	41.1	21.8	12.8		8.5	5.3	229.0	.7
182	760728		4.70	20.0	149.7	41.1	26.1	12.8		5.6	.0	270.7	1.1
183	760913		4.70	20.0	149.7	41.1	30.5	12.8		8.5	.0	249.8	.3
184	760909		6.10	.7	149.7	82.3	30.5	10.2		8.5	31.4	239.4	4.9
185	760728		5.30	5.0	149.7	82.3	34.8	12.8		8.5	.0	260.2	.3
186	760909		5.90	1.3	149.7	82.3	30.5	12.8		8.5	14.2	239.4	.3
187	760909		5.90	1.3	149.7	82.3	26.1	10.2		8.5	18.6	208.2	.3
188	760909		5.90	1.3	199.6	82.3	30.5	10.2		11.3	65.0	229.0	6.0
189	760909		7.00	.1	249.5	164.5	34.8	10.2		11.3	147.6	239.4	.3
190	760909		6.00	1.0	149.7	41.1	26.1	10.2		8.5	18.6	208.2	.3
191	760909		6.80	.1	249.5	164.5	26.1	10.2		11.3	94.1	270.7	.3
192	760909		7.20	.0	449.1	164.5	34.8	7.7		14.1	319.3	270.7	.3
193	760909		6.50	.3	149.7	82.3	30.5	10.2		8.5	35.7	229.0	.3
194	760909		5.50	3.2	149.7	82.3	26.1	10.2		8.5	18.6	218.6	2.1
195	760909		6.40	.4	149.7	82.3	34.8	12.8		8.5	39.9	229.0	.3
196	760909		6.70	.2	199.6	82.3	30.5	12.8		8.5	69.2	229.0	1.7
197	760726		4.60	25.1	99.8	82.3	26.1	10.2		5.6	.0	249.8	.3
198	760909		6.90	.1	249.5	82.3	30.5	7.7		8.5	89.9	270.7	.3
199	760913		6.40	.4	249.5	82.3	21.8	10.2		5.6	22.9	291.5	.3
200	760825		6.90	.1	199.6	164.5	52.2	17.9		14.1	139.4	229.0	.3
201	760825		6.10	.7	199.6	82.3	43.5	20.5		8.5	31.4	312.3	.3
202	760825		6.70	.2	199.6	82.3	39.1	17.9		11.3	77.5	249.8	.3
203	760730		6.50	.3	249.5	82.3	39.1	15.3		11.3	89.9	270.7	.3
204	760825		7.80	.0	499.0	164.5	39.1	10.2		8.5	542.8	145.7	.3
205	760809		7.00	.1	449.1	246.8	139.2	25.6		126.9	176.4	510.1	.5
206	760722		7.10	.0	349.3	164.5	69.6	20.5		45.1	135.3	426.8	.3
207	760723		5.70	2.0	249.5	123.4	26.1	10.2		11.3	5.3	364.3	.6
208	760722		4.50	31.6	199.6	82.3	43.5	17.9		16.9	.0	395.6	4.3
209	760825		6.80	.1	199.6	82.3	34.8	10.2		33.9	73.3	229.0	.3
210	760728		6.80	.1	149.7	82.3	30.5	7.7		8.5	114.7	166.6	.3
211	760709		6.10	.7	199.6	82.3	43.5	12.8		33.9	127.1	145.7	19.2
212	760708		6.80	.1	199.6	41.1	52.2	7.7		22.6	73.3	135.3	18.8
213	760607		7.20	.0	249.5	82.3	30.5	7.7		14.1	217.3	135.3	.3
214	760722		4.60	25.1	149.7	41.1	21.8	7.7		11.3	.0	249.8	.5

CODE: WTFISH

DESCRIPTION: Survey of 35 lakes on the Whitefish Lake Indian Reserve, near Sudbury, Ontario, conducted on 23 August 1973.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, SO_4, Cl, alkalinity (ALK 4.5)

REFERENCE: Beamish, R.J., G.A. McFarlane, J.C. VanLoon and J. Lichwa. 1975. An examination of the possible effects of Sudbury nickel mining and smelting operations on fishes and the water chemistry of lakes within the Whitefish Lake Indian Reserve. Tech. Rept. 579, Fisheries and Marine Service, Envionment Canada.

OUTLIERS: None

DATA SOURCE: Beamish et al., 1975

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FILKODE: WTFISH     NAVN: WHITEFISH INDIAN RESERVE, ONTARIO.                              NORD-AMERIKA          DATO: 830121
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VANN  A M D   DYP           NAVN     PH      EH+     ECA     EMG     ENA     EK     EAL     ECL    ALK-X    ES04
      R N G
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  1  730823   50                     7.30     .0    430.6   214.7    67.0    4.6             39.5   327.5   370.6
  2  730823   50                     7.00     .1    296.9   223.7    61.8   16.1             39.5   129.1   353.9
  3  730823   50                     7.00     .1    281.9   184.3    62.6   23.5             28.2   115.7   424.7
  4  730823   50                     7.10     .0    209.6   139.0    52.2   22.8             33.9   129.1   245.7
  5  730823   50                     7.10     .0    519.0   292.8   113.1   17.1             62.1   470.8   387.3
  6  730823   50                     7.30     .0    466.1   226.2    70.5   22.5             56.4   288.8   530.9
  7  730823   50                     6.70     .2    390.7   191.7   140.1   23.3            152.3    74.4   508.0
  8  730823   50                     5.50    3.2    211.6    92.1    43.1   13.3             33.9      .0   254.0
  9  730823   50                     6.70     .2    249.0   127.5    50.5   18.4             33.9    29.3   374.8
 10  730823   50                     4.50   31.6    138.2    56.8    26.1   13.6             33.9      .0   266.5
 11  730823   50                     7.10     .0    339.3    97.9    33.5   19.2             33.9   203.0   258.2
 12  730823   50                     7.00     .1    297.9   208.1    53.9   15.1             33.9   152.8   458.0
 13  730823   50                     6.70     .2    287.9   102.8    39.1   15.3             33.9   148.7   274.8
 15  730823   50                     5.20    6.3    245.5   113.5    43.1   16.6             28.2      .0   370.6
 16  730823   50                     5.30    5.0    211.1   106.9    43.1   12.5             28.2      .0   345.6
 17  730823   50                     5.50    3.2    226.5   126.7    45.2   17.9             28.2      .0   358.1
 18  730823   50                     5.90    1.3    282.9   111.1    40.0   13.8            180.5      .0   530.9
 19  730823   50                     6.00    1.0    299.9   143.1    84.4   16.6             28.2      .0   349.8
 21  730823   50            FLY      7.00     .1    363.8   190.8    61.8   21.2             28.2   179.4   437.2
 22  730823   50            WHITEF   7.00     .1    325.3   180.1    62.2   21.5             28.2    87.8   487.2
 23  730823   50            MAKADA   7.20     .0    379.7   218.0    70.0   24.5             56.4   139.4   530.9
 24  730823   50            WAKEMI   6.30     .5    286.9   157.1    57.9   20.5             22.6      .0   491.4
 25  730823   50            NEMAG    6.00    1.0    277.4   157.1    57.4   21.7             28.2     6.4   516.3
 26  730823   50            BLACKW   7.50     .0    558.9   272.3   114.8   27.1             67.7   363.1   433.1
 27  730823   50            ROUND    6.90     .1    413.7   213.9   115.7   24.5            107.2   174.3   516.3
 28  730823   50            LONG     6.90     .1    373.8   186.7   140.5   23.8            152.3    79.6   516.3
 29  730823   50            LA VAS   7.10     .0    415.7   212.2   110.9   21.7            107.2   176.4   466.4
 30  730823   50            CLO 1A   4.40   39.8    109.3    42.0    23.1    8.4             28.2      .0   233.2
 31  730823   50            CLO 2A   4.80   15.8    107.3    39.5    24.4    6.6             28.2      .0   187.4
 32  730823   50            CLO 3A   4.10   79.4    101.3    29.6    15.2    7.7             28.2      .0   245.7
 33  730823   50            CLO 4A   4.40   39.8    102.3    35.4    23.9    8.2             22.6      .0   195.7
 34  730823   50            CLO 5A   4.50   31.6     53.9    34.5    23.1    5.1             33.9      .0   162.4
 35  730823   50            CLO 6A   4.50   31.6    112.3    41.1    21.3    7.9             33.9      .0   220.7
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CODE: SNEK-1

DESCRIPTION: Survey of 719 lakes in southernmost Norway conducted in 1974-75.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, Al, SO_4, Cl, NO_3

REFERENCE: Wright, R.F., and E. Snekvik. 1977. Chemistry and fish populations in 700 lakes in southernmost Norway. Tech. Note 37/77, SNSF-project, 1432 Ås, Norway.

OUTLIERS: 5 lakes with excess-sulfate levels above 200 were excluded (below marine limit or have sources within catchment). For some data treatment also 99 lakes with pH above 5.4 were excluded (alkalinity not measured).

DATA SOURCE: Wright and Snekvik, 1977.

COMMENTS: Alkalinity not measured.

FILKODE: SNEK-1   NAVN: INNSJØER - SØRLANDET   SNEKVIKS SJØER   DATO: 830314   1

KOMM	VANN	A M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ESO4	ENO3
830	2	751018	4.47	33.9	24.5	16.5	33.1	3.1	21.1	31.0	64.5	5.0
830	3	751018	4.63	23.4	31.4	24.7	37.4	6.1	23.4	36.7	70.8	5.0
830	4	751030	4.58	26.3	29.4	22.2	34.8	4.1	23.4	33.9	68.7	2.1
830	7	751030	5.12	7.6	33.9	14.8	30.5	3.6	20.0	25.4	52.0	5.7
830	8	751020	5.17	6.8	33.9	14.8	29.6	3.6	17.8	25.4	58.3	6.4
830	10	751030	4.86	13.8	31.4	13.2	28.7	3.1	23.4	25.4	60.4	5.0
830	11	751030	4.78	16.6	31.4	12.3	24.4	3.1	21.1	22.6	60.4	10.0
830	12	751105	5.47	3.4	58.4	19.7	30.5	5.6	10.0	28.2	62.5	10.7
830	13	751105	5.38	4.2	54.9	18.9	33.1	6.1	11.1	28.2	64.5	10.0
830	14	751105	5.23	5.9	65.9	26.3	68.7	8.9	15.6	62.1	97.9	10.7
830	16	751104	4.71	19.5	35.4	16.5	36.5	4.1	15.6	39.5	79.1	13.6
830	17	751021	4.89	12.9	42.4	18.1	37.4	5.1	13.3	36.7	75.0	10.7
830	18	751031	4.63	23.4	35.4	15.6	35.2	4.1	16.7	36.7	77.0	10.0
830	19	751104	4.74	18.2	26.9	14.8	29.6	3.1	18.9	28.2	64.5	8.6
830	20	751104	4.77	17.0	29.4	14.8	29.6	2.6	17.8	28.2	62.5	7.9
830	21	751104	4.70	20.0	26.9	13.2	25.2	2.6	18.9	25.4	60.4	11.4
830	22	751104	4.51	30.9	18.5	12.3	27.8	3.1	21.1	28.2	66.6	10.0
830	23	751104	4.61	24.5	22.0	14.8	25.7	4.1	11.1	25.4	62.5	7.1
830	24	751104	4.67	21.4	26.9	15.6	27.0	4.1	11.1	28.2	60.4	2.9
830	25	751104	4.67	21.4	27.9	17.3	25.7	4.1	12.2	28.2	66.6	2.9
830	26	751104	5.01	9.8	44.9	27.1	27.8	3.6	7.8	28.2	72.9	4.3
831	1	750929	4.73	18.6	15.0	9.0	29.6	4.1	24.5	19.7	50.0	3.6
831	2	750929	4.82	15.1	17.5	11.5	37.4	2.3	23.4	16.9	41.6	1.4
831	3	750928	5.42	3.8	42.4	17.3	37.0	4.1	15.6	19.7	43.7	1.4
831	13	750929	5.53	3.0	82.3	25.5	42.2	3.8	16.7	33.9	50.0	2.1
831	14	750929	5.52	3.0	54.9	16.5	37.0	4.1	11.1	22.6	35.4	5.7
831	15	750928	5.89	1.3	67.4	18.9	28.7	4.1	6.7	19.7	37.5	3.6
831	16	750928	5.53	3.0	99.8	24.7	37.4	2.6	20.0	36.7	47.9	.7
831	19	750929	5.65	2.2	54.9	16.5	34.8	3.6	8.9	22.6	35.4	2.1
831	20	741010	5.24	5.8	37.4	12.3	25.2	2.8	6.7	22.6	58.3	2.1
831	21	750929	4.96	11.0	42.4	19.7	36.1	3.3	12.2	25.4	41.6	1.4
831	23	750929	5.46	3.5	57.4	21.4	39.6	4.6	11.1	31.0	50.0	1.4
831	28	750929	5.53	3.0	52.4	18.9	37.4	5.1	10.0	22.6	50.0	3.6
831	43	750928	5.17	6.8	42.4	19.7	36.1	3.6	13.3	22.6	47.9	4.3
831	52	750820	4.99	10.2	27.4	17.3	27.4	3.6	8.9	19.7	45.8	0.0
831	53	750820	5.05	8.9	27.4	14.0	26.5	3.1	16.7	16.9	45.8	2.9
831	56	750929	5.32	4.8	64.9	23.9	45.2	3.8	17.8	33.9	50.0	2.1
831	58	750925	4.76	17.4	20.0	10.7	28.7	3.1	32.2	19.7	43.7	3.6
831	60	750929	4.74	18.2	32.4	19.7	29.1	2.6	24.5	22.6	54.1	.7
831	61	750929	5.16	6.9	25.0	17.3	28.7	3.8	7.8	22.6	45.8	.7
904	1	750927	6.52	.3	232.0	152.2	348.0	35.0	3.3	332.9	208.2	18.6
904	2	750926	4.71	19.5	77.3	51.8	130.1	13.0	35.6	126.9	133.2	18.6
904	4	750926	4.66	21.9	69.9	47.7	133.1	8.9	46.7	155.2	122.8	15.7
904	5	750927	4.85	14.1	74.8	57.6	119.2	10.0	25.6	124.1	127.0	10.7
904	6	750927	4.46	34.7	59.9	56.8	127.0	7.9	43.4	126.9	143.7	6.4
904	7	750926	4.59	25.7	59.9	49.4	134.8	9.2	45.6	129.8	133.2	15.0
904	8	750927	4.74	18.2	64.9	47.7	124.4	10.2	35.6	118.5	129.1	10.0
904	9	750927	4.86	13.8	77.3	56.8	112.7	10.2	24.5	101.6	131.2	8.6
904	10	750927	4.99	10.2	74.8	55.9	104.4	9.7	18.9	95.9	118.7	7.1
904	11	750927	5.03	9.3	82.3	51.8	105.7	9.5	26.7	98.7	124.9	10.7
904	12	750927	5.15	7.1	97.3	60.9	102.2	12.0	12.2	101.6	122.8	9.3
904	13	751005	4.62	24.0	57.9	42.8	115.3	6.4	50.0	115.7	135.3	7.1
904	14	751004	4.43	37.2	44.9	39.5	110.9	5.4	51.2	115.7	118.7	8.6
904	15	751004	4.44	36.3	39.4	36.2	116.6	6.1	47.8	118.5	116.6	5.0
904	16	750926	4.68	20.9	59.9	37.0	101.8	8.4	40.0	98.7	108.3	10.0

FILKODE: SNEK-1 NAVN: INNSJØER - SØRLANDET SNEKVIKS SJØER DATO: 830314 2

KOMM	VANN	Å M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
904	17	750926	4.90	12.6	84.8	37.0	104.0	9.2	26.7	95.9	122.8	5.7
904	18	750928	4.68	20.9	49.9	37.0	118.3	8.2	37.8	98.7	110.3	9.3
904	19	750926	4.65	22.4	77.3	45.2	131.8	14.3	31.1	132.6	129.1	8.6
904	20	750926	4.68	20.9	59.9	42.0	122.7	9.7	37.8	112.8	122.8	6.4
904	21	750926	5.09	8.1	97.3	52.6	148.3	13.6	24.5	141.0	137.4	2.1
904	23	750927	5.22	6.0	77.3	55.9	103.5	10.5	15.6	98.7	118.7	7.1
914	1	751111	5.68	2.1	141.2	102.8	278.4	11.3	12.2	299.0	168.6	5.0
914	2	751111	5.89	1.3	167.2	98.7	243.6	24.5	18.9	304.7	166.6	8.6
914	3	751111	5.01	9.8	77.8	78.1	208.8	8.2	20.0	222.9	145.7	5.7
914	4	751111	5.53	3.0	111.8	90.5	226.2	12.3	7.8	239.8	156.1	6.4
914	5	751112	6.14	.7	155.7	106.9	274.0	11.3	10.0	259.5	191.5	5.7
914	6	751111	5.36	4.4	114.3	94.6	221.9	15.3	16.7	239.8	162.4	7.9
914	7	751111	5.44	3.6	163.2	113.5	304.5	15.3	18.9	344.2	191.5	7.1
914	8	751111	5.00	10.0	104.8	94.6	217.5	19.4	28.9	222.9	177.0	7.9
914	9	751111	4.66	21.9	65.9	79.0	234.9	9.2	25.6	225.7	152.0	7.9
914	10	751111	5.81	1.5	89.8	90.5	208.8	14.3	33.4	203.1	179.1	8.6
914	11	751111	5.91	1.2	94.8	98.7	139.2	13.3	36.7	225.7	181.1	5.7
914	12	751111	5.03	9.3	96.8	90.5	182.7	12.3	25.6	183.4	170.7	7.9
914	13	751111	5.06	8.7	84.8	93.0	213.1	12.8	18.9	197.5	166.6	8.6
914	14	751111	5.09	8.1	58.4	80.6	191.4	11.3	11.1	174.9	139.5	17.1
914	15	751111	5.73	1.9	117.3	111.1	234.9	12.3	11.1	248.2	160.3	3.6
914	16	751111	6.51	.3	177.1	123.4	278.4	20.5	4.4	293.4	156.1	1.4
914	17	751112	6.54	.2	227.0	148.1	391.5	24.5	4.4	428.8	195.7	7.1
914	18	751112	6.59	.2	279.4	139.8	234.9	26.6	4.4	434.4	210.3	6.4
914	19	751112	4.75	17.8	67.9	54.3	114.4	9.2	26.7	129.8	127.0	4.3
914	20	751112	5.44	3.6	118.8	64.2	89.6	11.3	15.6	104.4	135.3	7.9
914	21	751112	5.53	3.0	114.8	61.7	92.7	11.3	15.6	107.2	124.9	7.9
914	22	751112	5.67	2.1	114.8	60.9	97.4	11.8	15.6	110.0	124.9	8.6
914	23	751112	6.13	.7	138.2	139.8	182.7	13.8	5.6	177.7	156.1	19.3
914	24	751112	5.09	8.1	80.3	60.0	111.4	10.7	24.5	124.1	120.8	7.9
914	25	751112	5.34	4.6	99.8	69.1	107.0	12.3	21.1	121.3	129.1	5.7
914	26	751112	5.35	4.5	107.3	69.9	109.6	12.3	22.2	126.9	135.3	7.1
914	27	751112	6.00	1.0	118.8	81.4	160.9	14.8	6.7	158.0	152.0	9.3
914	28	751112	5.40	4.0	84.8	46.9	73.1	10.2	6.7	93.1	106.2	14.3
914	29	751112	5.29	5.1	99.8	51.8	93.1	13.3	13.3	110.0	116.6	9.3
914	30	751112	5.60	2.5	114.8	63.3	111.4	11.3	7.8	135.4	129.1	10.7
914	31	751112	5.77	1.7	115.8	62.5	111.4	11.3	8.9	132.6	124.9	9.3
926	1	751102	5.20	6.3	109.8	88.8	269.7	17.4	20.0	279.3	181.1	9.3
926	2	751102	5.03	9.3	182.1	100.4	269.7	36.8	23.4	304.7	208.2	11.4
926	3	751102	4.89	12.9	92.8	81.4	247.9	15.3	30.0	265.2	179.1	7.9
926	4	751102	4.85	14.1	92.8	70.7	200.1	14.8	30.0	217.2	162.4	8.6
926	5	751102	4.75	17.8	67.9	69.9	217.5	13.3	32.2	211.6	154.1	8.6
926	6	751102	5.00	10.0	227.0	156.3	274.0	36.8	33.4	355.4	229.0	25.7
926	7	751103	5.56	2.8	194.6	62.5	174.0	17.4	17.8	183.4	131.2	5.0
926	8	751103	5.23	5.9	97.8	63.3	182.7	15.3	22.2	183.4	143.7	14.3
926	9	751103	4.77	17.0	75.3	57.6	182.7	13.8	33.4	183.4	143.7	17.8
926	10	751102	4.64	22.9	67.9	43.6	130.5	10.2	41.1	155.2	133.2	10.7
926	11	751102	4.66	21.9	72.9	47.7	147.9	10.7	40.0	158.0	139.5	9.3
935	1	750914	4.73	18.6	49.9	39.5	100.1	8.9	23.4	93.1	81.2	7.1
935	2	750914	4.78	16.6	49.9	37.8	93.1	7.4	18.9	84.6	79.1	1.4
935	3	750914	4.70	20.0	49.9	37.0	94.8	6.6	20.0	84.6	87.4	5.0
935	4	750914	4.45	35.5	27.4	28.8	87.4	1.3	18.9	70.5	95.8	0.0
935	5	750914	4.94	11.5	52.4	40.3	104.8	6.6	17.8	90.3	85.4	2.9
935	6	750914	4.76	17.4	52.4	41.1	100.9	5.6	17.8	90.3	93.7	3.6
935	7	750915	4.86	13.8	44.9	41.1	104.4	8.9	22.2	93.1	91.6	2.9

FILKODE: SNEK-1   NAVN: INNSJØER - SØRLANDET   SNEKVIKS SJØER   DATO: 830314   3

KOMM	VANN	A M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
935	8	750914	4.85	14.1	47.4	38.7	100.9	6.9	22.2	87.5	89.5	.7
935	9	750915	5.04	9.1	94.8	53.5	102.7	11.5	11.1	98.7	116.6	3.6
935	10	750914	5.45	3.5	74.8	49.4	104.4	9.7	11.1	84.6	104.1	1.4
935	11	750915	5.24	5.8	77.3	45.2	102.2	9.7	15.6	90.3	99.9	2.9
935	12	750916	4.95	11.2	67.4	49.4	122.7	9.5	24.5	101.6	112.4	2.9
935	13	750916	5.02	9.5	52.4	41.1	110.1	7.7	18.9	87.5	97.9	1.4
935	14	750914	4.54	28.8	34.9	34.5	87.0	2.8	24.5	73.3	93.7	2.9
935	15	750915	4.92	12.0	52.4	37.0	80.0	6.6	14.5	67.7	85.4	1.4
935	16	750915	4.89	12.9	64.9	41.1	92.2	24.8	15.6	79.0	106.2	5.7
935	35	750914	5.61	2.5	42.4	19.7	74.4	5.1	7.8	33.9	37.5	5.7
935	36	750914	5.71	1.9	34.9	18.1	47.0	4.3	6.7	33.9	35.4	5.7
935	37	750914	5.67	2.1	42.4	19.7	49.2	4.6	6.7	36.7	37.5	5.0
935	38	750914	5.60	2.5	37.4	18.9	47.8	4.6	6.7	36.7	37.5	5.7
935	39	750914	5.70	2.0	39.9	20.6	52.2	4.9	7.8	39.5	39.6	5.7
935	40	750914	5.78	1.7	37.4	18.9	46.5	4.1	5.6	36.7	35.4	5.0
935	41	750916	5.74	1.8	94.8	49.4	122.2	12.5	18.9	98.7	110.3	6.4
935	42	750914	4.83	14.8	37.4	32.1	93.5	6.9	16.7	79.0	70.8	1.4
935	43	750914	4.96	11.0	67.4	46.9	107.0	7.4	20.0	93.1	102.0	12.1
935	44	750914	4.77	17.0	57.4	46.1	100.5	5.9	22.2	87.5	97.9	3.6
935	45	750914	4.71	19.5	54.9	38.7	87.4	4.3	17.8	64.9	95.8	1.4
937	1	750427	4.51	30.9	25.4	20.6	57.0	4.3	24.5	62.1	77.0	12.1
937	2	750427	4.53	29.5	25.4	20.6	60.9	6.4	25.6	62.1	77.0	7.9
937	3	750427	4.37	42.7	21.5	22.2	71.3	6.6	22.2	70.5	87.4	14.3
937	4	750427	4.56	27.5	17.0	14.0	46.5	5.4	13.3	50.8	60.4	2.9
937	6	750427	4.97	10.7	42.9	37.0	130.5	6.1	15.6	126.9	75.0	5.0
937	8	750427	4.72	19.1	25.9	15.6	50.0	10.2	17.8	56.4	64.5	2.9
937	9	750501	4.65	22.4	23.0	21.4	64.8	5.9	21.1	62.1	62.5	12.1
937	10	750501	4.64	22.9	26.4	25.5	66.6	7.7	24.5	59.2	72.9	10.7
937	11	750501	4.74	18.2	30.9	23.0	67.0	7.2	21.1	64.9	70.8	9.3
937	13	750501	4.67	21.4	27.9	23.9	71.3	5.4	22.2	76.2	66.6	7.9
937	14	750501	4.64	22.9	23.5	21.4	69.2	5.4	22.2	67.7	68.7	7.1
937	15	750501	4.53	29.5	19.5	15.6	61.8	5.4	15.6	56.4	72.9	8.6
937	18	750502	4.64	22.9	32.4	29.6	68.3	8.2	18.9	67.7	83.3	5.0
937	19	750501	5.13	7.4	78.8	26.3	61.3	10.7	26.7	62.1	104.1	2.9
937	20	750502	4.63	23.4	16.5	9.0	24.4	2.3	6.7	31.0	41.6	20.7
937	22	750502	4.71	19.5	46.9	33.7	56.1	13.6	27.8	64.9	81.2	7.1
937	23	750508	4.75	17.8	19.5	18.9	41.3	6.4	15.6	39.5	56.2	.7
937	25	750502	4.94	11.5	30.4	20.6	36.5	11.8	11.1	45.1	37.5	0.0
937	28	750508	4.78	16.6	16.5	12.3	36.1	5.1	7.8	28.2	37.5	0.0
937	29	750508	4.65	22.4	16.0	12.3	35.2	4.9	8.9	36.7	41.6	1.4
937	30	750502	4.68	20.9	37.9	27.1	53.9	10.7	22.2	59.2	81.2	4.3
937	33	750505	4.51	30.9	14.5	16.5	53.9	3.6	16.7	53.6	56.2	12.9
937	37	750505	4.76	17.4	42.9	23.9	55.7	8.9	17.8	56.4	77.0	8.6
937	38	750505	4.57	26.9	26.4	22.2	53.9	6.9	18.9	53.6	75.0	9.3
938	35	751015	4.65	22.4	32.4	23.0	43.1	3.6	21.1	33.9	66.6	2.1
938	49	751015	4.52	30.2	36.9	25.5	47.8	4.9	34.5	36.7	79.1	.7
938	58	751015	4.70	20.0	27.4	19.7	40.0	6.9	17.8	36.7	66.6	1.4
938	66	750912	5.00	10.0	22.5	18.9	54.8	6.4	13.3	39.5	60.4	.7
938	67	750912	4.86	13.8	25.0	23.9	61.8	7.4	15.6	45.1	70.8	5.7
938	74	750912	4.98	10.5	29.9	16.5	45.7	4.1	10.0	28.2	60.4	.7
938	75	750912	4.83	14.8	22.5	17.3	57.0	4.9	14.5	36.7	64.5	2.9
938	76	750907	4.15	70.8	49.9	36.2	52.2	2.3	31.1	36.7	124.9	0.0
938	77	750907	5.00	10.0	49.9	26.3	63.5	6.1	17.8	45.1	85.4	2.1
938	78	750907	4.78	16.6	37.4	25.5	62.2	7.2	15.6	50.8	83.3	2.1
938	79	751015	4.63	23.4	25.9	20.6	35.2	3.8	18.9	31.0	64.5	3.6

FILKODE: SNEK-1 NAVN: INNSJØER - SØRLANDET SNEKVIKS SJØER DATO: 830314 4

KOMM	VANN	Å M D R N G	KOM	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
938	80	751015		4.65	22.4	24.5	19.7	33.5	3.1	18.9	31.0	62.5	2.1
938	105	750630		4.80	15.8	10.0	11.5	43.5	3.1	20.0	36.7	41.6	7.9
938	106	750630		4.85	14.1	12.5	12.3	43.5	2.6	20.0	33.9	43.7	1.4
938	107	750630		4.96	11.0	15.0	12.3	50.0	3.6	16.7	39.5	41.6	.7
938	108	750630		5.00	10.0	15.0	11.5	56.5	25.1	16.7	33.9	39.6	.7
938	109	750630		4.90	12.6	10.0	9.0	37.0	2.0	16.7	28.2	31.2	0.0
938	110	750630		4.82	15.1	10.0	10.7	37.0	2.8	18.9	31.0	39.6	0.0
938	116	750630		5.00	10.0	15.0	11.5	39.1	2.8	17.8	31.0	31.2	4.3
938	117	750701		5.30	5.0	22.5	11.5	34.8	2.0	15.6	28.2	37.5	5.0
938	118	750701		5.08	8.3	15.0	9.9	34.8	2.8	15.6	28.2	29.1	5.0
938	119	750701		5.22	6.0	25.0	11.5	34.8	2.8	15.6	25.4	43.7	0.0
938	120	750630		5.08	8.3	15.0	11.5	39.1	3.1	16.7	31.0	41.6	2.1
938	125	750630		4.88	13.2	15.0	10.7	34.8	2.8	17.8	31.0	47.9	2.9
938	126	750630		4.90	12.6	15.0	10.7	37.0	2.0	20.0	31.0	50.0	5.7
938	127	750630		4.92	12.0	15.0	10.7	34.8	3.1	20.0	28.2	47.9	6.4
938	128	750630		4.90	12.6	10.0	11.5	37.0	2.6	17.8	31.0	37.5	3.6
938	129	750630		4.83	14.8	15.0	10.7	37.0	2.8	18.9	31.0	50.0	1.4
938	130	750630		4.78	16.6	15.0	10.7	34.8	2.6	18.9	31.0	52.0	0.0
938	131	750801		5.21	6.2	17.5	9.9	28.3	2.8	7.8	31.0	31.2	.7
938	201	750516		4.71	19.5	15.5	19.7	59.6	4.3	23.4	62.1	54.1	14.3
938	202	750516		4.60	25.1	16.5	20.6	53.9	4.6	23.4	62.1	54.1	15.0
938	203	750516		4.58	26.3	15.0	19.7	54.8	2.0	22.2	59.2	54.1	15.7
938	204	750516		4.58	26.3	17.0	18.9	53.9	3.3	21.1	62.1	58.3	16.4
938	211	750516		4.69	20.4	17.5	20.6	59.6	4.6	20.0	67.7	54.1	12.9
938	212	750516		4.70	20.0	19.0	21.4	60.5	5.4	16.7	64.9	52.0	10.7
938	213	750516		4.73	18.6	21.5	21.4	57.9	6.4	16.7	64.9	52.0	10.7
938	214	750516		4.74	18.2	16.5	23.0	66.6	4.6	17.8	76.2	56.2	12.1
938	215	750516		4.72	19.1	18.5	22.2	57.4	5.6	12.2	64.9	54.1	9.3
940	30	740911		4.94	11.5	13.5	9.0	23.1	2.0	13.3	19.7	35.4	7.1
940	31	740911		5.00	10.0	19.5	9.9	26.5	2.3	8.9	25.4	35.4	3.6
940	32	740912		5.14	7.2	25.0	13.2	28.3	3.1	13.3	22.6	45.8	8.6
940	33	740911		5.13	7.4	27.4	11.5	27.4	3.1	3.3	19.7	39.6	3.6
940	34	740912		4.98	10.5	16.0	9.0	24.8	1.5	17.2	25.4	45.8	4.3
940	35	740912		4.98	10.5	20.5	10.7	29.1	2.8	7.8	25.4	43.7	2.9
940	36	740912		4.96	11.0	23.0	12.3	30.9	2.8	6.7	31.0	41.6	7.1
940	37	740912		4.97	10.7	24.5	10.7	27.0	2.3	5.6	25.4	43.7	2.9
940	38	740912		4.99	10.2	18.5	9.0	23.1	2.3	13.3	19.7	45.8	5.7
940	39	740912		5.00	10.0	20.0	9.9	24.4	2.0	14.5	28.2	43.7	3.6
940	42	740915		4.96	11.0	27.9	13.2	29.6	2.0	7.8	31.0	41.6	2.1
940	43	740915		5.07	8.5	37.9	16.5	39.1	6.4	0.0	39.5	50.0	2.1
940	47	740912		4.95	11.2	26.9	13.2	29.6	2.8	3.3	31.0	37.5	2.1
940	54	740915		4.98	10.5	24.0	13.2	32.6	2.3	7.8	33.9	39.6	3.6
940	520	751016		5.26	5.5	22.5	10.7	35.7	2.0	7.8	28.2	33.3	3.6
940	522	750710		5.63	2.3	17.5	8.2	26.1	2.0	6.7	22.6	31.2	3.6
940	523	751029		5.31	4.9	24.5	8.2	35.7	2.0	8.9	31.0	35.4	5.0
940	524	751029		5.50	3.2	48.9	14.8	40.0	3.1	10.0	36.7	47.9	6.4
940	525	751029		5.37	4.3	37.9	11.5	33.1	1.5	11.1	28.2	41.6	6.4
940	526	750915		4.92	12.0	13.0	14.0	28.3	1.5	11.1	25.4	22.9	10.0
940	527	751030		5.20	6.3	21.0	9.9	35.7	2.6	8.9	36.7	27.1	7.9
940	528	751030		5.19	6.5	42.9	13.2	35.7	2.6	8.9	36.7	47.9	4.3
940	529	751030		5.17	6.8	17.0	9.0	34.8	2.6	11.1	36.7	31.2	8.6
940	530	751030		5.18	6.6	17.0	10.7	34.8	2.0	7.8	33.9	22.9	7.9
940	531	750915		5.13	7.4	23.0	14.8	33.5	1.5	10.0	31.0	35.4	7.9
940	532	750916		5.21	6.2	34.9	14.8	38.3	2.6	8.9	31.0	25.0	5.7
940	533	750916		5.28	5.2	21.0	11.5	25.7	1.3	5.6	19.7	18.7	0.0

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KOMM	VANN	A M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
940	534	750916	5.04	9.1	23.0	11.5	26.1	1.3	8.9	19.7	22.9	0.0
940	535	750916	5.17	6.8	21.0	13.2	27.8	4.1	7.8	22.6	27.1	2.9
940	536	750916	5.00	10.0	20.0	12.3	28.7	1.5	11.1	25.4	27.1	6.4
940	539	750916	5.44	3.6	30.4	18.1	28.7	2.0	6.7	19.7	27.1	0.0
940	540	750917	5.09	8.1	25.0	21.4	42.6	2.8	5.6	39.5	25.0	2.9
941	24	740812	5.31	4.9	12.5	9.9	34.8	3.8	6.7	22.6	27.1	5.0
941	26	740813	5.78	1.7	27.4	15.6	60.5	3.6	4.4	31.0	31.2	6.4
941	27	740812	6.21	.6	52.4	23.9	53.9	9.5	5.6	36.7	43.7	0.0
941	29	740812	5.49	3.2	15.0	12.3	29.6	3.8	21.1	16.9	20.8	2.9
941	30	740812	5.20	6.3	15.0	14.0	42.2	3.8	8.9	33.9	33.3	8.6
941	31	740812	5.38	4.2	15.0	10.7	37.0	3.8	10.0	25.4	29.1	7.1
941	501	750917	5.21	6.2	12.5	11.5	21.8	1.5	6.7	16.9	10.4	2.1
941	502	750917	5.12	7.6	12.0	11.5	24.4	1.8	2.2	22.6	14.6	2.1
941	503	750918	4.97	10.7	13.5	14.0	23.1	2.6	8.9	14.1	27.1	3.6
941	504	750819	5.05	8.9	13.0	14.8	29.6	2.0	5.6	28.2	18.7	2.9
941	505	750921	5.16	6.9	12.5	8.2	25.7	1.5	6.7	16.9	18.7	5.0
941	506	750921	5.16	6.9	12.5	7.4	26.5	1.8	5.6	14.1	16.7	3.6
941	507	751013	4.95	11.2	10.0	9.0	35.7	2.8	5.6	25.4	25.0	3.6
941	508	751013	5.04	9.1	10.0	9.0	33.9	3.8	4.4	28.2	29.1	2.1
941	509	750921	5.09	8.1	17.5	10.7	34.4	3.1	6.7	25.4	18.7	4.3
941	510	750918	5.10	7.9	12.0	13.2	28.3	2.0	8.9	28.2	16.7	2.9
941	511	750921	5.07	8.5	15.0	12.3	40.9	2.6	7.8	33.9	27.1	6.4
941	512	751014	5.05	8.9	11.0	9.9	49.6	2.3	6.7	31.0	25.0	2.1
941	513	751014	4.93	11.7	10.0	10.7	34.8	2.3	4.4	33.9	31.2	3.6
941	514	751015	5.33	4.7	16.0	11.5	47.8	5.9	5.6	42.3	29.1	4.3
941	516	751015	5.22	6.0	17.5	9.9	30.0	4.9	6.7	48.0	31.2	4.3
941	517	751016	5.16	6.9	15.0	9.0	30.5	3.6	3.3	28.2	27.1	3.6
941	518	751015	5.19	6.5	15.0	9.9	37.4	2.6	6.7	28.2	27.1	3.6
941	519	751016	5.26	5.5	19.0	9.9	30.5	2.3	7.8	28.2	31.2	2.9
941	521	751015	5.03	9.3	15.0	9.9	28.7	2.0	8.9	28.2	29.1	3.6
941	548	750921	5.37	4.3	17.5	10.7	30.5	4.3	2.2	19.7	22.9	4.3
941	549	750917	5.24	5.8	16.0	12.3	25.7	2.8	7.8	16.9	20.8	1.4
941	551	750819	5.36	4.4	31.9	15.6	28.3	2.0	11.1	19.7	35.4	2.1
941	552	751016	5.32	4.8	22.5	11.5	30.5	2.0	7.8	25.4	33.3	2.9
1002	1	750507	5.85	1.4	196.6	139.8	439.3	29.1	15.6	507.8	249.8	12.9
1002	2	750507	4.80	15.8	92.3	72.4	256.6	15.3	35.6	287.7	152.0	17.8
1002	3	750507	4.87	13.5	107.3	79.8	265.3	14.1	31.1	299.0	172.8	20.0
1002	4	750507	4.75	17.8	75.8	64.2	230.5	13.3	65.6	265.2	141.6	17.1
1002	5	750507	4.59	25.7	60.9	60.9	221.9	10.0	35.6	248.2	129.1	18.6
1002	6	750507	4.63	23.4	59.9	69.9	261.0	9.2	40.0	287.7	141.6	14.3
1002	7	750507	4.56	27.5	44.9	57.6	217.5	7.9	37.8	237.0	127.0	14.3
1002	8	750507	4.77	17.0	61.4	55.9	204.4	8.4	31.1	220.0	129.1	10.0
1002	10	750507	5.64	2.3	294.4	139.8	426.3	34.5	32.2	536.0	270.7	37.8
1002	11	750507	5.77	1.7	314.4	123.4	387.1	19.9	25.6	564.2	208.2	22.1
1002	12	750507	5.35	4.5	110.3	80.6	230.5	12.8	25.6	262.4	145.7	15.7
1002	13	750507	5.80	1.6	169.2	106.9	282.8	21.5	16.7	332.9	172.8	23.6
1002	14	750507	5.77	1.7	178.1	123.4	356.7	21.2	14.5	423.1	195.7	20.7
1003	1	741019	5.76	1.7	143.7	123.4	365.4	15.6	6.7	437.3	197.8	20.0
1003	2	741019	5.74	1.8	132.2	115.2	361.0	13.6	8.1	423.1	189.5	15.0
1003	3	741019	4.94	11.5	106.8	123.4	382.8	25.3	24.5	437.3	202.0	14.3
1003	4	741019	4.56	27.5	62.9	115.2	387.1	10.2	31.1	479.6	199.9	12.1
1003	5	741019	5.28	5.2	125.7	131.6	452.4	13.0	12.8	536.0	187.4	6.4
1003	6	741019	6.85	.1	329.3	222.1	595.9	33.2	0.0	705.3	208.2	5.7
1003	7	741019	6.97	.1	248.5	230.3	582.9	33.5	0.0	705.3	195.7	7.1
1003	8	741019	4.46	34.7	519.0	353.7	639.4	45.5	127.9	677.0	895.3	47.1

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KOMM	VANN	A M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
1003	9	741019	4.51	30.9	653.7	444.2	669.9	52.2	51.7	705.3	1041.0	49.3
1003	10	741019	6.21	.6	185.1	189.2	491.5	17.1	4.4	564.2	229.0	11.4
1003	11	741019	4.65	22.4	67.4	106.9	387.1	8.7	18.9	423.1	208.2	7.1
1003	12	741019	5.18	6.6	95.8	131.6	417.6	11.0	10.0	493.7	179.1	14.3
1003	13	741019	4.43	37.2	50.4	75.7	291.4	16.1	21.1	338.5	141.6	10.7
1003	14	741019	5.38	4.2	159.7	164.5	448.0	18.2	34.5	507.8	208.2	25.7
1003	15	741019	6.45	.3	228.5	164.5	461.1	16.4	2.2	536.0	181.1	7.1
1003	16	741019	4.80	15.8	61.4	82.3	321.9	12.0	30.0	338.5	156.1	5.7
1003	17	741019	5.55	2.8	129.2	115.2	387.1	15.1	15.6	423.1	199.9	12.9
1003	18	741019	5.55	2.8	101.8	88.8	352.3	17.6	18.3	352.6	185.3	17.1
1003	19	741019	4.65	22.4	56.9	77.3	321.9	9.7	32.8	380.8	154.1	9.3
1003	20	741020	4.48	33.1	46.4	72.4	308.8	7.4	18.3	366.7	141.6	7.9
1003	21	741020	4.45	35.5	43.4	68.3	308.8	7.7	18.9	352.6	141.6	7.1
1003	22	741020	4.45	35.5	45.9	70.7	304.5	7.9	18.9	338.5	141.6	7.1
1003	23	741020	4.42	38.0	45.9	72.4	321.9	8.2	23.4	352.6	156.1	4.3
1003	24	741020	5.13	7.4	86.8	83.1	326.2	12.8	13.3	394.9	208.2	9.3
1003	25	741020	4.66	21.9	42.9	68.3	265.3	6.6	17.8	259.5	114.5	12.1
1003	26	741020	5.04	9.1	62.9	69.9	261.0	7.7	12.2	248.2	139.5	5.7
1003	27	741020	5.01	9.8	64.4	72.4	269.7	7.4	11.1	259.5	129.1	5.0
1003	28	741020	4.73	18.6	46.9	53.5	217.5	7.2	20.0	200.3	122.8	8.6
1003	29	741020	4.98	10.5	66.9	68.3	252.3	11.5	19.5	245.4	139.5	7.1
1003	30	741020	4.98	10.5	49.4	60.9	234.9	5.4	16.1	203.1	127.0	6.4
1004	2	741111	4.58	26.3	16.0	26.3	96.6	2.8	16.7	104.4	75.0	6.4
1004	3	741111	4.59	25.7	16.5	28.0	102.7	4.1	15.6	115.7	64.5	6.4
1004	4	741111	4.59	25.7	16.5	28.0	100.9	3.8	15.6	112.8	64.5	6.4
1004	6	741118	4.72	19.1	24.5	32.1	125.3	4.6	13.3	135.4	72.9	1.4
1004	7	741103	4.57	26.9	26.4	48.5	174.0	7.2	21.1	180.5	89.5	10.0
1004	8	741116	4.54	28.8	18.5	32.9	114.8	3.1	12.8	135.4	70.8	7.1
1004	9	741116	4.59	25.7	20.5	32.9	117.0	3.6	12.2	135.4	68.7	5.7
1004	10	741017	4.56	27.5	27.4	28.8	88.3	5.4	11.7	95.9	72.9	6.4
1004	11	741017	4.54	28.8	27.4	29.6	90.0	4.3	12.2	95.9	72.9	5.7
1004	12	741017	4.62	24.0	27.4	31.3	93.1	5.1	11.1	101.6	70.8	5.0
1004	13	741017	4.70	20.0	29.4	33.7	111.8	4.3	12.2	126.9	77.0	10.7
1004	14	741017	4.66	21.9	29.9	37.8	124.0	4.1	16.7	135.4	85.4	5.0
1004	15	741118	4.71	19.5	50.4	63.3	252.3	11.0	30.6	338.5	112.4	10.0
1004	16	741118	5.03	9.3	63.9	64.2	230.5	11.8	14.5	282.1	106.2	15.7
1004	25	741118	4.51	30.9	26.4	39.5	152.3	5.1	17.8	160.8	83.3	15.0
1014	1	741017	4.53	29.5	77.8	53.5	191.4	8.9	37.8	208.8	156.1	2.9
1014	8	741017	4.38	41.7	49.9	37.0	101.4	6.4	25.6	112.8	108.3	3.6
1014	9	741017	4.92	12.0	72.9	44.4	111.4	13.8	14.5	135.4	110.3	4.3
1014	11	741017	4.63	23.4	95.8	50.2	127.0	16.6	25.6	189.0	110.3	6.4
1014	12	741017	4.70	20.0	64.4	45.2	130.9	11.3	25.6	146.7	110.3	1.4
1014	14	741017	4.62	24.0	64.4	41.1	104.0	11.0	20.0	124.1	104.1	6.4
1014	15	741017	4.52	30.2	47.4	37.0	110.1	6.9	20.6	126.9	108.3	7.9
1014	16	741017	4.48	33.1	56.4	39.5	107.4	8.7	20.0	126.9	104.1	7.9
1014	17	741017	4.77	17.0	62.9	43.6	117.4	14.3	20.0	143.9	104.1	4.3
1014	18	741017	5.43	3.7	164.2	60.0	156.6	32.5	22.8	177.7	135.3	17.8
1014	20	741017	4.86	13.8	63.4	50.2	156.6	10.0	22.2	163.6	127.0	4.3
1014	21	741017	5.01	9.8	84.3	49.4	152.3	11.0	12.8	160.8	124.9	7.1
1014	22	741017	5.51	3.1	57.9	43.6	156.6	10.0	32.2	160.8	114.5	2.1
1014	23	741017	4.63	23.4	66.9	49.4	122.2	10.7	22.2	155.2	114.5	3.6
1014	24	741017	4.90	12.6	78.3	51.8	128.8	12.8	21.1	155.2	114.5	5.0
1014	25	741017	4.61	24.5	65.9	47.7	124.4	11.0	27.8	155.2	116.6	5.0
1014	26	741017	5.05	8.9	137.7	54.3	156.6	25.8	25.6	197.5	135.3	13.6
1014	29	741017	4.53	29.5	45.9	38.7	105.3	7.7	30.0	124.1	104.1	7.1

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KOMM	VANN	Å M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
1014	30	741017	4.64	22.9	51.9	39.5	107.0	7.9	28.9	126.9	104.1	7.9
1014	32	741017	4.84	14.5	113.8	60.0	174.0	12.8	23.4	194.6	145.7	7.1
1014	33	741017	5.21	6.2	105.8	65.0	169.6	21.5	18.9	189.0	152.0	12.1
1014	35	741017	4.55	28.2	71.4	51.0	147.9	9.5	33.4	174.9	120.8	2.9
1014	36	741017	4.66	21.9	89.8	48.5	125.3	9.5	22.2	160.8	116.6	1.4
1014	37	741017	4.65	22.4	72.9	54.3	152.3	8.7	26.7	160.8	120.8	10.7
1014	38	741017	5.30	5.0	151.2	60.0	156.6	31.7	31.1	177.7	149.9	17.8
1014	41	741017	4.61	24.5	52.4	37.8	109.6	8.4	31.1	124.1	108.3	5.7
1017	3	741117	4.94	11.5	70.4	52.6	147.9	10.5	17.8	163.6	106.2	4.3
1017	12	741117	5.00	10.0	89.8	52.6	165.3	11.3	23.9	189.0	124.9	1.4
1017	13	741117	4.83	14.8	80.3	54.3	165.3	10.5	26.1	191.8	124.9	9.3
1017	17	741117	5.54	2.9	143.7	67.5	213.1	15.6	20.6	256.7	162.4	12.1
1018	1	741019	5.24	5.8	177.6	123.4	334.9	21.0	20.0	423.1	187.4	11.4
1018	2	741019	5.56	2.8	129.7	98.7	291.4	16.4	12.8	338.5	187.4	6.4
1018	3	741019	4.91	12.3	66.4	60.9	204.4	11.3	18.9	239.8	129.1	10.0
1018	4	741019	4.84	14.5	79.3	60.9	208.8	11.5	30.0	251.1	133.2	9.3
1018	5	741020	4.56	27.5	62.9	57.6	208.8	11.0	31.7	225.7	135.3	15.7
1018	6	741020	4.49	32.4	49.4	47.7	182.7	9.2	35.0	183.4	133.2	24.3
1018	7	741020	4.53	29.5	53.9	51.0	191.4	10.5	36.1	197.5	124.9	17.1
1018	8	741020	4.96	11.0	137.7	57.6	208.8	11.8	23.4	268.0	135.3	15.0
1018	9	741020	4.94	11.5	137.7	58.4	213.1	12.3	23.4	273.6	135.3	14.3
1018	10	741019	5.60	2.5	218.6	131.6	413.3	20.2	11.1	536.0	166.6	8.6
1018	11	741019	5.53	3.0	186.6	353.7	1439.8	47.0	27.8	1692.6	270.7	19.3
1018	12	741019	5.66	2.2	221.1	156.3	513.3	30.4	12.2	592.4	229.0	4.3
1018	13	741019	4.63	23.4	94.3	131.6	465.5	17.6	31.1	564.2	187.4	15.7
1018	14	741019	4.74	18.2	110.3	89.7	326.2	13.0	40.0	394.9	187.4	11.4
1021	1	741010	4.76	17.4	43.4	37.8	105.7	6.9	16.7	110.0	104.1	2.9
1021	2	741008	4.45	35.5	37.4	28.8	67.0	5.6	26.7	76.2	127.0	3.6
1021	3	741008	4.40	39.8	35.4	30.4	80.9	3.6	18.9	95.9	89.5	4.3
1021	4	741010	4.33	46.8	44.4	37.0	111.4	6.6	36.7	124.1	147.8	1.4
1021	5	741010	4.52	30.2	71.9	42.0	120.5	9.5	30.0	138.2	127.0	4.3
1021	6	741006	4.39	40.7	40.9	35.4	110.5	5.4	17.8	135.4	122.8	5.7
1021	7	741006	4.40	39.8	34.4	37.0	137.9	5.4	23.4	152.3	104.1	.7
1021	8	741006	4.71	19.5	69.4	43.6	142.2	9.2	25.0	155.2	102.0	1.4
1021	9	741006	4.47	33.9	43.4	42.8	122.7	5.1	25.6	146.7	116.6	2.1
1021	10	741006	4.79	16.2	48.4	44.4	152.7	25.3	30.0	172.1	141.6	2.9
1021	11	741005	4.52	30.2	44.9	42.8	143.5	6.1	23.9	160.8	143.7	2.1
1021	12	741005	4.52	30.2	48.9	42.8	140.5	6.1	23.4	160.8	114.5	2.1
1021	13	741005	4.54	28.8	64.9	28.0	127.0	2.3	25.6	160.8	106.2	0.0
1021	14	741005	4.60	25.1	48.4	46.9	148.8	7.4	18.9	172.1	124.9	7.1
1021	15	741005	4.48	33.1	44.4	43.6	159.6	5.6	26.7	177.7	124.9	5.7
1021	16	741010	4.41	38.9	44.4	42.8	110.9	8.4	34.5	135.4	124.9	2.9
1021	17	741006	4.70	20.0	60.4	24.7	65.2	8.4	20.0	93.1	75.0	5.7
1021	18	741006	4.62	24.0	57.4	23.9	59.6	5.6	20.0	93.1	93.7	5.7
1021	19	741008	4.62	24.0	94.3	61.7	215.3	10.2	27.8	228.5	143.7	6.4
1021	20	741008	4.71	19.5	93.8	60.0	213.1	10.7	27.8	225.7	143.7	7.1
1021	21	741008	5.04	9.1	81.3	53.5	143.1	9.5	14.5	166.4	112.4	2.9
1021	22	741008	4.85	14.1	81.3	77.3	213.1	9.2	24.5	228.5	156.1	5.0
1021	23	741008	4.92	12.0	76.8	68.3	205.3	12.0	20.0	211.6	139.5	10.7
1021	24	741006	5.02	9.5	99.8	61.7	177.5	14.1	20.0	203.1	139.5	10.0
1021	25	741006	5.28	5.2	108.3	64.2	197.5	13.8	16.7	211.6	156.1	6.4
1021	26	741006	4.58	26.3	50.4	47.7	146.2	10.7	21.1	174.9	108.3	7.1
1021	27	741005	4.45	35.5	55.9	49.4	153.6	9.7	30.0	183.4	116.6	4.3
1021	28	741006	4.54	28.8	54.9	50.2	156.2	9.2	26.7	180.5	114.5	4.3
1021	29	741006	4.43	37.2	47.9	47.7	138.3	11.3	27.8	169.3	170.7	5.7

FILKODE: SNEK-1   NAVN: INNSJØER - SØRLANDET   SNEKVIKS SJØER   DATO: 830314   8

KOMM	VANN	Å M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
1021	30	741006	4.83	14.8	79.8	56.8	153.6	14.3	20.0	174.9	127.0	7.9
1026	37	750622	4.70	20.0	20.0	15.6	45.2	3.1	21.1	33.9	50.0	5.7
1026	42	750624	4.71	19.5	27.4	16.5	50.5	3.6	18.9	36.7	43.7	4.3
1026	43	750624	4.70	20.0	20.0	18.9	58.7	3.3	28.9	48.0	54.1	5.0
1026	44	750624	4.82	15.1	27.4	21.4	64.4	5.1	21.1	50.8	58.3	4.3
1026	45	750624	5.17	6.8	42.4	24.7	68.7	6.4	23.4	56.4	66.6	0.0
1026	46	750624	5.09	8.1	37.4	24.7	72.2	5.6	21.1	62.1	64.5	0.0
1026	205	750627	4.71	19.5	6.0	9.9	33.9	2.6	18.9	36.7	37.5	10.7
1026	206	750626	5.06	8.7	12.5	10.7	29.1	1.5	8.9	19.7	20.8	5.7
1026	209	750626	5.09	8.1	12.5	11.5	30.9	1.8	7.8	19.7	22.9	4.3
1026	210	750625	4.85	14.1	15.0	14.0	40.0	2.3	11.1	31.0	35.4	5.7
1026	211	750625	4.83	14.8	12.5	10.7	41.3	2.6	17.8	31.0	45.8	5.0
1026	212	750625	4.89	12.9	10.0	10.7	33.9	1.5	20.0	33.9	37.5	5.7
1026	213	750627	4.68	20.9	6.0	10.7	35.7	3.3	16.7	36.7	47.9	13.6
1026	214	750627	4.85	14.1	14.0	14.0	36.5	3.3	15.6	36.7	47.9	8.6
1026	215	750627	4.80	15.8	12.0	14.8	43.5	3.3	20.0	45.1	47.9	11.4
1026	216	750626	4.89	12.9	12.5	15.6	40.0	2.3	16.7	31.0	37.5	8.6
1026	217	750625	4.70	20.0	15.0	17.3	51.8	4.1	14.5	48.0	45.8	12.9
1026	218	750620	4.73	18.6	15.0	14.0	43.5	2.6	11.1	36.7	29.1	8.6
1026	219	750620	4.62	24.0	20.0	19.7	56.1	3.1	12.2	50.8	47.9	11.4
1026	220	750620	4.70	20.0	12.5	14.0	41.8	2.3	11.1	33.9	60.4	5.7
1026	221	750620	4.64	22.9	12.5	14.0	41.8	2.3	7.8	33.9	33.3	7.1
1026	222	750620	4.84	14.5	22.5	12.3	46.5	4.6	7.8	36.7	27.1	3.6
1026	223	750620	4.70	20.0	12.5	14.8	43.9	2.8	10.0	36.7	33.3	5.7
1026	224	750620	4.62	24.0	15.0	15.6	49.2	3.3	10.0	42.3	41.6	8.6
1026	225	750620	4.53	29.5	15.0	18.9	54.8	3.1	13.3	48.0	47.9	15.0
1026	226	750620	4.67	21.4	12.5	15.6	51.3	2.8	13.3	42.3	41.6	9.3
1026	227	750619	4.56	27.5	17.5	18.1	57.4	2.6	14.5	50.8	50.0	14.3
1026	228	750619	4.61	24.5	22.5	18.9	57.0	2.0	16.7	50.8	64.5	10.0
1026	229	750619	4.68	20.9	20.0	18.1	57.0	3.1	12.2	50.8	52.0	3.6
1026	230	750619	4.62	24.0	20.0	19.7	60.0	3.1	13.3	56.4	45.8	5.7
1026	231	750619	4.65	22.4	20.0	18.9	55.2	3.3	15.6	48.0	41.6	11.4
1026	232	750619	4.62	24.0	25.0	23.0	70.0	2.8	15.6	64.9	58.3	6.4
1026	233	750619	4.63	23.4	20.0	25.5	60.5	2.6	11.1	50.8	47.9	7.1
1026	234	750801	4.98	10.5	20.0	12.3	37.0	3.1	14.5	39.5	37.5	0.0
1026	235	750801	5.15	7.1	20.0	9.9	28.3	2.8	7.8	31.0	33.3	0.0
1026	236	750801	5.28	5.2	29.9	12.3	41.3	6.4	13.3	39.5	47.9	1.4
1026	238	750625	4.71	19.5	20.0	17.3	45.7	3.6	21.1	36.7	43.7	10.0
1026	240	750625	4.94	11.5	27.4	17.3	50.5	4.6	14.5	42.3	39.6	8.6
1026	241	750703	4.90	12.6	10.0	7.4	30.5	2.8	16.7	22.6	43.7	0.0
1026	301	751106	4.73	18.6	14.5	13.2	40.0	3.1	17.8	42.3	35.4	10.7
1026	302	751106	4.73	18.6	12.0	12.3	46.1	6.1	23.4	42.3	37.5	10.0
1026	303	751106	4.72	19.1	17.0	14.8	42.6	2.0	20.0	45.1	41.6	7.9
1026	304	751106	4.78	16.6	19.5	13.2	39.1	2.0	17.8	42.3	37.5	9.3
1026	306	750626	4.82	15.1	10.0	14.0	49.2	3.1	20.0	39.5	35.4	12.1
1026	307	750626	4.82	15.1	7.5	10.7	45.2	3.1	14.5	33.9	27.1	10.7
1027	1	751024	5.47	3.4	89.8	46.9	114.4	15.9	17.8	118.5	97.9	4.3
1027	2	751014	5.61	2.5	104.8	46.9	150.1	7.2	27.8	121.3	116.6	0.0
1027	4	751024	5.16	6.9	109.8	50.2	113.1	16.9	35.6	115.7	124.9	6.4
1027	7	751024	4.66	21.9	62.4	39.5	124.0	7.2	26.7	129.8	116.6	.7
1027	8	751004	4.48	33.1	43.4	36.2	127.0	5.9	33.4	132.6	99.9	.7
1027	9	751004	4.33	46.8	29.9	32.1	119.2	5.6	27.8	126.9	91.6	2.9
1027	11	751014	4.43	37.2	35.9	31.3	117.4	8.4	26.7	129.8	89.5	4.3
1027	12	751014	4.66	21.9	5.5	41.1	156.6	6.6	26.7	155.2	99.9	0.0
1027	13	751004	4.79	16.2	82.3	42.0	174.0	16.9	22.2	183.4	106.2	11.4

FILKODE: SNEK-1   NAVN: INNSJØER - SØRLANDET   SNEKVIKS SJØER   DATO: 830314   9

KOMM	VANN	Å M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
1027	14	751024	4.92	12.0	60.9	35.4	114.4	9.2	22.2	118.5	93.7	5.7
1029	13	741012	4.56	27.5	56.4	49.4	187.5	8.9	22.2	220.0	108.3	8.6
1029	14	741012	4.42	38.0	38.9	47.7	167.9	7.4	16.7	208.8	99.9	5.0
1029	15	741013	4.50	31.6	45.9	50.2	188.8	9.7	28.9	220.0	154.1	13.6
1029	20	741013	4.42	38.0	44.4	46.1	174.4	6.1	26.1	214.4	104.1	3.6
1029	22	741013	4.53	29.5	47.4	44.4	164.0	8.9	21.1	197.5	104.1	5.7
1029	24	741013	4.49	32.4	44.9	44.4	159.2	8.4	23.4	189.0	124.9	5.0
1029	25	741013	4.39	40.7	29.9	39.5	149.6	5.4	22.8	180.5	99.9	6.4
1029	26	741013	4.56	27.5	51.9	43.6	143.1	7.4	22.2	174.9	102.0	7.9
1029	27	741013	4.55	28.2	59.9	45.2	138.8	9.2	15.6	163.6	97.9	9.3
1029	29	741013	4.60	25.1	93.3	50.2	152.7	14.8	9.5	183.4	108.3	1.4
1029	30	741013	4.75	17.8	68.9	47.7	153.6	7.4	19.5	183.4	122.8	2.9
1029	32	741013	4.59	25.7	46.9	45.2	150.5	6.1	20.6	180.5	127.0	6.4
1029	33	741013	4.56	27.5	56.9	44.4	160.5	7.2	26.7	191.8	133.2	5.0
1029	34	741013	4.59	25.7	47.9	49.4	173.1	7.2	22.2	200.3	124.9	7.1
1029	35	741013	4.50	31.6	44.9	49.4	193.6	8.2	21.1	220.0	131.2	4.3
1029	36	741013	4.50	31.6	46.4	46.9	173.6	6.4	23.4	203.1	129.1	7.9
1029	39	741013	4.58	26.3	70.4	51.8	186.2	10.2	21.1	211.6	129.1	1.4
1029	40	741013	4.74	18.2	70.4	51.8	181.4	13.6	22.2	211.6	133.2	5.7
1029	41	741013	4.51	30.9	58.9	49.4	197.1	6.4	27.8	225.7	143.7	2.1
1032	1	741026	4.40	39.8	35.9	52.6	213.1	6.4	25.6	228.5	120.8	15.7
1032	2	741026	4.35	44.7	32.9	51.0	204.4	8.2	23.4	220.0	114.5	12.9
1032	3	741026	4.51	30.9	44.9	47.7	191.4	6.9	22.2	194.6	114.5	4.3
1032	4	741026	4.58	26.3	45.9	60.0	247.9	7.4	38.4	270.8	135.3	5.0
1032	5	741026	4.37	42.7	41.4	56.8	213.1	10.2	23.4	231.3	118.7	7.9
1032	6	741027	4.52	30.2	41.4	45.2	182.7	6.6	24.5	197.5	110.3	5.0
1032	10	741027	4.64	22.9	36.4	44.4	169.6	6.1	19.5	177.7	104.1	9.3
1032	11	741027	5.58	2.6	71.4	55.1	182.7	23.0	13.9	183.4	99.9	6.4
1032	12	741020	4.76	17.4	44.4	47.7	169.6	7.4	13.3	172.1	97.9	2.9
1032	13	741020	4.81	15.5	38.4	47.7	169.6	6.1	15.6	180.5	93.7	5.0
1032	14	741020	4.38	41.7	21.5	36.2	139.2	5.1	21.1	160.8	93.7	10.7
1032	15	741020	4.45	35.5	25.9	37.0	156.6	5.1	22.2	163.6	91.6	15.7
1032	16	741020	4.71	19.5	37.4	46.9	156.6	6.9	18.9	174.9	93.7	6.4
1032	18	741020	4.48	33.1	26.4	43.6	152.3	6.1	19.5	172.1	99.9	12.9
1032	19	741027	4.68	20.9	41.4	46.1	174.0	7.7	17.8	177.7	93.7	6.4
1032	20	741027	4.81	15.5	52.9	48.5	174.0	7.7	20.0	180.5	97.9	4.3
1032	21	741027	4.89	12.9	55.9	46.9	182.7	5.9	18.9	174.9	97.9	1.4
1032	22	741028	4.61	24.5	44.4	42.0	147.9	8.4	18.9	149.5	97.9	4.3
1032	23	741028	4.72	19.1	45.9	42.0	152.3	8.2	19.5	152.3	95.8	5.0
1032	24	741020	5.60	2.5	73.9	58.4	191.4	27.1	15.6	200.3	102.0	5.7
1032	25	741020	4.73	18.6	39.9	46.9	165.3	10.0	20.6	189.0	104.1	5.0
1032	26	741020	4.72	19.1	38.9	41.1	156.6	8.2	21.1	155.2	99.9	6.4
1032	27	741020	4.77	17.0	43.4	43.6	160.9	11.0	24.5	163.6	104.1	7.1
1032	28	741020	4.80	15.8	43.4	43.6	174.0	7.2	18.9	166.4	104.1	7.1
1032	29	741020	5.55	2.8	101.3	82.3	313.2	12.3	5.6	338.5	158.2	.7
1032	30	741020	4.99	10.2	93.3	80.6	300.1	18.9	17.2	352.6	172.8	7.9
1032	31	741020	5.08	8.3	119.8	98.7	321.9	7.9	25.6	310.3	202.0	7.1
1032	32	741020	4.93	11.7	86.8	88.0	352.3	9.5	24.5	380.8	170.7	10.7
1032	33	741027	4.78	16.6	80.3	60.0	226.2	8.9	15.6	239.8	129.1	7.9
1032	34	741027	4.73	18.6	69.4	65.8	234.9	9.2	21.1	256.7	127.0	5.0
1032	35	741020	4.87	13.5	87.3	72.4	269.7	10.5	21.7	296.2	154.1	12.9
1032	36	741020	4.93	11.7	72.9	67.5	256.6	10.2	18.9	293.4	137.4	11.4
1032	37	741019	4.92	12.0	63.9	66.6	243.6	12.5	26.1	270.8	135.3	12.9
1032	38	741019	5.05	8.9	84.8	71.6	256.6	12.0	18.3	296.2	147.8	11.4
1032	39	741019	4.72	19.1	61.4	60.9	243.6	8.7	21.7	265.2	137.4	7.1

FILKODE: SNEK-1 NAVN: INNSJØER - SØRLANDET SNEKVIKS SJØER DATO: 830314 10

KOMM	VANN	Å M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
1032	40	741019	5.12	7.6	71.4	65.8	256.6	14.6	15.6	279.3	139.5	7.1
1032	41	741019	5.50	3.2	82.3	65.8	243.6	15.3	22.2	259.5	137.4	7.9
1032	42	741019	4.80	15.8	44.4	58.4	230.5	8.2	23.4	248.2	118.7	10.0
1032	43	741103	4.38	41.7	42.9	51.0	187.0	7.7	32.2	191.8	112.4	31.4
1032	44	741103	4.51	30.9	42.4	51.0	187.0	8.4	24.5	194.6	106.2	10.7
1032	47	741103	4.43	37.2	40.4	48.5	182.7	8.7	27.8	189.0	106.2	20.0
1032	48	741027	4.59	25.7	44.9	48.5	182.7	7.9	23.9	186.2	106.2	8.6
1032	49	741027	4.60	25.1	52.4	49.4	178.4	7.7	25.6	189.0	108.3	6.4
1032	50	741027	4.68	20.9	60.9	51.8	182.7	8.9	28.4	189.0	106.2	5.0
1032	51	741027	4.49	32.4	37.9	40.3	156.6	6.4	26.7	160.8	104.1	3.6
1032	52	741027	4.51	30.9	30.9	40.3	156.6	6.9	24.5	163.6	95.8	7.1
1032	53	741027	4.57	26.9	50.9	46.9	165.3	7.7	26.1	166.4	97.9	5.0
1032	54	741103	4.57	26.9	32.9	39.5	147.9	5.6	23.4	146.7	93.7	4.3
1032	56	741103	4.47	33.9	42.9	42.8	156.6	6.4	25.0	155.2	102.0	5.0
1032	57	741103	4.43	37.2	24.5	36.2	128.3	5.4	18.9	141.0	89.5	3.6
1032	58	741103	4.40	39.8	25.4	35.4	127.0	5.6	26.7	141.0	93.7	7.1
1032	59	741028	4.52	30.2	40.4	37.0	130.9	9.5	15.6	143.9	93.7	6.4
1032	60	741028	4.40	39.8	34.9	36.2	124.8	7.2	16.7	138.2	93.7	5.0
1032	61	741028	4.54	28.8	39.9	39.5	143.5	7.9	18.9	141.0	91.6	3.6
1032	62	741020	5.83	1.5	126.2	172.7	465.5	16.1	2.2	536.0	197.8	17.8
1032	63	741020	5.88	1.3	147.2	181.0	578.5	20.2	8.3	648.8	187.4	7.1
1032	64	741026	4.41	38.9	39.4	53.5	234.9	6.1	33.4	242.6	127.0	6.4
1032	65	741020	4.84	14.5	84.3	78.1	287.1	7.9	21.1	310.3	141.6	2.9
1032	66	741103	4.40	39.8	40.9	49.4	182.7	8.4	28.4	194.6	114.5	26.4
1034	1	751103	4.49	32.4	17.0	16.5	52.2	2.6	14.5	59.2	60.4	7.9
1034	2	751103	4.46	34.7	17.0	15.6	51.3	2.6	13.3	56.4	62.5	8.6
1034	3	751103	4.67	21.4	16.0	16.5	42.6	2.6	16.7	56.4	47.9	5.7
1034	4	751103	4.56	27.5	62.9	37.8	94.0	18.4	27.8	110.0	99.9	25.7
1034	5	751103	4.50	31.6	26.9	21.4	60.9	2.6	16.7	70.5	56.2	2.9
1034	6	751103	4.63	23.4	26.9	18.1	54.8	20.5	14.5	62.1	47.9	3.6
1034	7	751103	4.80	15.8	32.4	21.4	85.7	5.1	12.2	64.9	60.4	7.1
1034	8	751103	4.38	41.7	22.5	23.0	64.4	3.6	15.6	59.2	66.6	2.1
1034	9	751103	4.46	34.7	25.0	22.2	61.8	2.0	14.5	59.2	66.6	4.3
1034	10	751103	4.45	35.5	27.4	23.9	67.0	2.8	17.8	62.1	77.0	2.9
1034	11	741020	4.38	41.7	33.4	20.6	94.4	24.8	11.1	107.2	70.8	3.6
1034	12	741006	4.55	28.2	21.5	21.4	62.2	3.6	11.7	64.9	60.4	4.3
1034	13	741026	4.53	29.5	25.4	18.1	60.9	2.6	13.9	64.9	66.6	3.6
1034	14	740928	4.83	14.8	39.9	32.1	101.8	4.6	14.5	107.2	79.1	9.3
1034	15	740928	4.43	37.2	36.4	33.7	108.8	5.1	22.2	126.9	89.5	1.4
1034	16	740928	4.48	33.1	42.9	36.2	114.8	6.6	21.1	132.6	91.6	0.0
1034	17	740928	5.26	5.5	92.3	42.0	136.2	10.9	10.0	160.8	104.1	4.3
1034	18	740928	4.62	24.0	38.9	35.4	124.4	8.9	20.0	135.4	93.7	10.0
1034	19	741021	4.68	20.9	38.9	29.6	115.7	12.0	17.8	121.3	81.2	3.6
1034	20	741012	4.64	22.9	26.4	31.3	102.2	2.6	13.3	107.2	77.0	5.7
1034	21	741005	4.76	17.4	40.4	29.6	94.4	4.1	13.9	98.7	77.0	5.7
1034	22	741005	4.76	17.4	36.9	28.8	97.4	3.3	13.3	98.7	72.9	4.3
1034	23	741006	4.72	19.1	27.4	29.6	106.1	5.1	12.2	112.8	72.9	7.9
1034	24	741005	4.60	25.1	22.5	25.5	84.8	3.1	15.6	87.5	72.9	5.0
1034	25	741010	4.53	29.5	17.5	23.0	78.3	5.1	11.1	81.8	62.5	5.7
1037	5	750516	4.58	26.3	14.0	20.6	60.0	4.1	10.0	67.7	45.8	7.9
1037	6	750516	4.55	28.2	15.0	20.6	60.5	3.8	10.0	70.5	43.7	7.9
1037	7	750516	4.51	30.9	16.0	23.9	70.5	5.1	12.2	81.8	47.9	7.9
1037	8	750516	4.78	16.6	13.5	20.6	65.7	6.4	8.9	73.3	43.7	5.7
1037	9	750514	4.59	25.7	26.4	32.1	94.8	4.9	17.8	107.2	64.5	5.7
1037	10	750515	4.59	25.7	15.0	19.7	63.5	3.3	12.2	79.0	43.7	7.1

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KOMM	VANN	ÅR MND DAG	KOM	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
1037	12	750519		4.77	17.0	25.4	34.5	152.7	20.2	25.6	143.9	77.0	12.1
1037	13	750519		4.62	24.0	32.9	44.4	146.2	6.1	16.7	141.0	83.3	10.7
1037	14	750519		4.68	20.9	30.9	46.9	154.9	7.2	11.1	149.5	81.2	6.4
1037	15	750519		4.82	15.1	31.4	33.7	97.0	7.2	20.0	104.4	70.8	.7
1037	16	750519		4.76	17.4	32.9	36.2	102.2	7.2	22.2	107.2	75.0	3.6
1037	17	750519		4.68	20.9	18.5	19.7	59.6	6.1	13.3	59.2	47.9	6.4
1037	18	750519		4.64	22.9	22.5	28.0	77.9	4.6	17.8	81.8	58.3	5.0
1037	19	750519		5.07	8.5	46.4	37.8	103.1	11.0	20.0	118.5	75.0	2.9
1037	20	750519		4.79	16.2	33.9	36.2	104.8	8.2	21.1	104.4	72.9	2.9
1037	21	750514		4.69	20.4	30.9	36.2	115.7	7.4	13.3	115.7	72.9	4.3
1037	22	750514		5.19	6.5	56.4	42.8	138.3	7.7	13.3	132.6	87.4	6.4
1037	23	750518		4.76	17.4	27.9	29.6	88.7	5.1	11.1	90.3	58.3	5.7
1037	24	750518		4.71	19.5	28.9	30.4	90.9	4.3	11.1	98.7	58.3	7.1
1037	25	750518		4.74	18.2	28.9	30.4	91.3	5.1	11.1	95.9	58.3	6.4
1037	26	750518		4.62	24.0	24.5	28.8	90.9	4.9	11.1	90.3	58.3	5.7
1037	27	750515		4.72	19.1	29.9	27.1	87.4	5.4	11.1	87.5	60.4	5.0
1037	28	750521		4.66	21.9	26.9	28.8	120.9	6.1	12.2	104.4	62.5	2.9
1037	29	750516		4.63	23.4	28.9	35.4	120.1	6.4	17.8	124.1	70.8	7.1
1037	30	750516		4.72	19.1	37.9	38.7	124.0	6.1	18.9	126.9	77.0	6.4
1037	31	750516		4.68	20.9	33.9	37.8	127.0	6.4	16.7	132.6	79.1	7.9
1037	32	750514		4.74	18.2	29.4	28.8	90.9	7.2	17.8	93.1	62.5	8.6
1037	33	750519		4.54	28.8	38.4	60.0	228.4	6.1	20.0	225.7	104.1	16.4
1037	34	750518		4.94	11.5	62.4	62.5	221.9	8.2	14.5	211.6	110.3	10.0
1037	35	750518		5.10	7.9	67.9	61.7	221.9	8.9	13.3	211.6	108.3	8.6
1037	36	750518		4.69	20.4	34.9	44.4	165.3	6.1	17.8	158.0	85.4	8.6
1037	402	750626		4.72	19.1	12.5	14.0	52.6	2.8	17.8	42.3	35.4	18.6
1037	403	750626		4.77	17.0	10.0	14.0	49.6	2.3	20.0	42.3	25.0	10.7
1037	404	750626		4.85	14.1	5.0	10.7	40.5	1.8	16.7	31.0	20.8	7.1
1046	101	750610		4.69	20.4	7.5	22.2	76.1	3.8	12.2	76.2	41.6	14.3
1046	102	750610		4.87	13.5	10.0	18.1	57.0	3.1	10.0	50.8	31.2	7.9
1046	103	750610		4.80	15.8	12.5	20.6	67.4	2.8	13.3	62.1	35.4	7.9
1046	104	750610		4.77	17.0	15.0	21.4	70.0	3.1	14.5	67.7	39.6	11.4
1046	105	750610		4.75	17.8	7.5	20.5	67.4	2.8	13.3	64.9	41.6	10.0
1046	106	750623		4.86	13.8	12.5	17.3	59.2	3.1	16.7	50.8	27.1	6.4
1046	107	750616		4.80	15.8	12.5	17.3	64.4	3.1	20.0	53.6	35.4	7.9
1046	108	750609		4.72	19.1	17.5	23.0	72.6	3.8	15.6	70.5	45.8	11.4
1046	109	750609		4.69	20.4	12.5	19.7	66.6	3.8	13.3	62.1	39.6	7.9
1046	110	750609		4.62	24.0	12.5	19.7	67.0	4.6	12.2	62.1	41.6	11.4
1046	111	750616		4.86	13.8	12.5	14.0	52.2	2.6	16.7	42.3	29.1	7.9
1046	112	750616		4.95	11.2	12.5	14.0	50.9	2.3	14.5	39.5	29.1	7.9
1046	541	750920		4.82	15.1	17.5	12.3	37.0	2.3	4.4	28.2	25.0	7.9
1046	542	750920		4.88	13.2	15.0	10.7	35.7	1.8	8.9	22.6	27.1	5.0
1046	543	750914		4.79	16.2	16.5	17.3	30.9	2.8	8.9	28.2	27.1	4.3
1046	544	750914		4.95	11.2	15.0	14.0	28.3	1.5	7.8	25.4	27.1	3.6
1046	545	750914		5.20	6.3	15.0	19.7	39.1	2.6	8.9	36.7	25.0	4.3
1046	546	750914		4.98	10.5	13.0	15.6	36.5	1.5	7.8	25.4	25.0	2.9
1046	547	750914		5.14	7.2	12.5	14.0	34.4	1.5	6.7	25.4	14.6	.7
1101	14	750504		5.27	5.4	80.3	69.1	252.3	18.9	8.9	293.4	95.8	21.4
1101	18	750422		4.95	11.2	55.4	62.5	256.6	12.3	18.9	245.4	106.2	20.0
1101	22	750504		4.81	15.5	53.4	63.3	226.2	10.7	23.4	256.7	106.2	22.8
1101	23	750504		5.13	7.4	69.9	66.6	217.5	14.3	14.5	259.5	93.7	20.0
1101	26	750524		5.78	1.7	37.4	31.3	111.4	5.1	7.8	112.8	62.5	4.3
1101	27	750529		4.82	15.1	37.4	31.3	111.4	5.1	17.8	95.9	47.9	15.0
1101	28	750529		4.61	24.5	12.0	23.0	81.3	2.6	15.6	112.8	47.9	15.7
1101	29	750529		4.75	17.8	20.5	33.7	124.8	5.1	16.7	112.8	54.1	16.4

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KOMM	VANN	ÅR MN DG	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
1101	30	750519	4.78	16.6	25.0	35.4	115.3	4.9	22.2	132.6	62.5	11.4
1101	31	750519	4.83	14.8	26.4	34.5	124.8	9.5	24.5	141.0	66.6	10.7
1101	32	750519	5.01	9.8	34.9	38.7	124.0	5.4	16.7	138.2	70.8	10.7
1101	33	750519	5.34	4.6	33.9	45.2	150.1	6.4	8.9	149.5	89.5	.7
1101	34	750519	6.54	.2	92.8	75.7	153.6	19.7	4.4	183.4	108.3	8.6
1101	35	750526	4.95	11.2	37.4	58.4	185.7	6.4	11.1	197.5	81.2	10.0
1101	36	750423	4.97	10.7	41.4	48.5	208.8	8.9	8.9	186.2	93.7	7.9
1101	37	750423	5.02	9.5	46.4	50.2	200.1	10.2	10.0	189.0	93.7	10.7
1101	38	750423	5.22	6.0	49.9	51.0	200.1	10.5	7.8	189.0	95.8	6.4
1101	40	750504	4.78	16.6	34.4	52.6	195.8	5.9	25.6	217.2	83.3	17.1
1101	41	750504	4.75	17.8	33.4	50.2	195.8	6.9	30.0	222.9	85.4	20.7
1101	42	750504	4.81	15.5	28.4	48.5	200.1	6.9	37.8	222.9	85.4	16.4
1101	43	750501	5.00	10.0	30.9	55.1	178.4	6.4	23.4	172.1	104.1	5.0
1101	44	750501	5.26	5.5	64.9	62.5	200.1	10.7	16.7	242.6	87.4	7.9
1101	45	750501	5.43	3.7	87.3	69.9	221.9	19.2	7.8	259.5	102.0	27.8
1101	46	750427	4.96	11.0	45.4	60.0	217.5	6.4	18.9	242.6	91.6	15.7
1101	47	750422	4.67	21.4	31.9	60.9	282.8	6.1	38.9	287.7	104.1	18.6
1101	48	750422	6.59	.2	169.7	98.7	408.9	20.5	6.7	389.3	135.3	30.0
1101	49	750422	6.81	.1	159.7	123.4	548.1	36.1	5.6	564.2	162.4	9.3
1101	50	750422	6.33	.4	139.7	106.9	469.8	15.1	4.4	468.3	139.5	22.1
1101	51	750422										
1101	51	750501	5.12	7.6	46.4	74.0	313.2	7.4	13.3	327.2	106.2	6.4
1101	52	750426	5.25	5.6	43.9	48.5	174.0	7.7	31.1	186.2	79.1	9.3
1101	53	750423	5.50	3.2	57.4	52.6	200.1	7.7	3.3	166.4	106.2	0.0
1111	1	751007	4.64	22.9	34.4	60.0	224.0	7.4	35.6	248.2	93.7	19.3
1111	2	751007	4.65	22.4	26.4	51.0	194.9	6.4	37.8	217.2	81.2	14.3
1111	3	751007	4.63	23.4	28.4	51.8	203.6	6.6	36.7	222.9	85.4	15.7
1111	4	751012	4.99	10.2	42.4	55.9	182.7	7.9	14.5	200.3	87.4	11.4
1111	5	751012	4.80	15.8	37.4	55.9	202.3	5.9	21.1	214.4	89.5	7.9
1111	6	751012	4.81	15.5	40.9	60.9	219.2	5.9	17.8	225.7	93.7	7.1
1111	7	751012	4.69	20.4	28.4	53.5	189.7	6.1	31.1	203.1	95.8	6.4
1111	8	751012	5.00	10.0	67.4	66.6	193.1	18.9	10.0	217.2	104.1	15.7
1111	9	751012	5.00	10.0	46.4	56.8	181.8	10.2	14.5	203.1	87.4	12.1
1111	10	751011	4.93	11.7	42.9	53.5	158.3	8.9	13.3	169.3	87.4	12.1
1111	11	751006	4.57	26.9	19.0	39.5	139.2	4.6	26.7	146.7	70.8	13.6
1111	12	751006	4.53	29.5	22.0	47.7	140.1	5.4	22.2	149.5	70.8	10.0
1111	13	751006	4.57	26.9	23.0	39.5	130.5	5.9	17.8	141.0	70.8	7.1
1111	14	751006	4.67	21.4	36.9	46.1	152.3	6.6	21.1	172.1	75.0	8.6
1111	15	751006	4.81	15.5	30.9	49.4	159.2	4.3	14.5	169.3	72.9	7.1
1111	16	751006	4.50	31.6	20.5	43.6	154.9	5.4	21.1	169.3	72.9	17.1
1111	17	751006	4.68	20.9	29.4	44.4	158.8	6.9	21.1	152.3	79.1	10.0
1111	18	751006	4.78	16.6	34.4	47.7	152.3	7.7	18.9	160.8	81.2	11.4
1111	19	751011	4.70	20.0	28.4	48.5	167.9	4.6	28.9	177.7	85.4	13.6
1111	20	751011	4.65	22.4	24.5	43.6	150.1	5.4	30.7	143.9	87.4	9.3
1111	21	751011	4.70	20.0	22.0	44.4	150.1	4.6	43.4	160.8	85.4	7.9
1111	22	751008	4.80	15.8	43.9	54.3	171.8	6.1	35.6	183.4	93.7	19.3
1111	23	751008	4.60	25.1	28.4	55.9	198.4	5.4	53.4	217.2	108.3	17.8
1111	24	751008	4.70	20.0	31.4	54.3	200.1	5.4	46.7	211.6	104.1	12.1
1111	25	751011	4.79	16.2	36.4	51.0	162.7	7.7	24.7	169.3	91.6	8.6
1112	1	751002	4.58	26.3	20.0	28.8	95.7	3.6	20.0	98.7	58.3	6.4
1112	2	751002	4.50	31.6	17.0	24.7	80.5	3.1	17.8	79.0	56.2	10.7
1112	5	751002	4.74	18.2	28.4	35.4	108.8	5.1	18.9	110.0	62.5	9.3
1112	10	751011	5.59	2.6	60.9	54.3	137.0	16.9	11.1	141.0	93.7	17.1
1112	11	751003	4.97	10.7	30.9	42.0	133.1	4.6	21.1	138.2	64.5	9.3
1112	12	751003	4.87	13.5	26.4	40.3	132.2	4.3	18.9	135.4	68.7	8.6

KOMM	VANN	Å M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ES04	EN03
1112	13	751003	4.80	15.8	23.0	36.2	121.8	3.8	21.1	112.8	72.9	8.6
1112	14	751009	4.75	17.8	24.5	38.7	121.8	4.1	15.6	124.1	68.7	9.3
1112	15	751009	4.70	20.0	21.0	37.8	124.4	4.9	23.4	129.8	68.7	11.4
1112	16	751009	4.80	15.8	20.0	35.4	112.2	4.6	18.9	112.8	66.6	7.1
1112	17	751002	4.83	14.8	29.4	45.2	152.3	5.6	14.5	155.2	79.1	10.0
1112	18	751002	4.87	13.5	33.9	38.7	119.6	7.4	18.9	121.3	70.8	12.9
1112	20	751009	5.28	5.2	61.9	58.4	140.1	12.5	13.3	138.2	104.1	7.9
1112	21	751007	4.60	25.1	22.0	42.8	148.8	5.1	14.5	143.9	79.1	3.6
1112	22	751009	5.05	8.9	53.9	55.1	147.0	13.8	14.5	146.7	102.0	12.9
1112	23	751007	4.90	12.6	36.9	51.0	169.6	8.4	12.2	172.1	89.5	5.7
1112	24	751007	5.08	8.3	50.4	55.9	152.3	12.0	10.0	166.4	95.8	14.3
1112	25	751002	4.79	16.2	27.4	42.8	147.0	5.4	21.1	152.3	77.0	7.9
1112	26	751009	4.59	25.7	19.0	34.5	103.1	3.3	20.0	101.6	70.8	7.9
1112	27	751010	4.42	38.0	14.5	36.2	119.6	4.3	17.8	132.6	72.9	13.6
1112	28	751010	4.50	31.6	14.5	37.0	120.9	3.6	18.9	132.6	72.9	13.6
1112	29	751008	4.50	31.6	18.0	39.5	128.8	4.1	23.4	143.9	79.1	12.9
1112	30	751008	4.50	31.6	17.5	38.7	130.5	4.1	18.9	143.9	75.0	14.3
1112	31	751008	4.61	24.5	22.0	41.1	139.2	3.8	21.1	152.3	81.2	8.6
1112	32	751008	4.70	20.0	28.4	46.9	152.3	4.6	20.0	172.1	83.3	5.0
1112	33	751013	4.61	24.5	25.9	41.1	133.1	5.6	17.8	146.7	79.1	5.0
1112	34	751013	4.60	25.1	25.9	40.3	139.2	4.9	18.9	149.5	81.2	4.3
1112	35	751013	4.65	22.4	26.9	43.6	143.5	4.6	20.0	149.5	87.4	4.3
1112	36	751013	4.65	22.4	27.4	44.4	147.0	5.9	21.1	152.3	87.4	4.3
1112	37	751008	4.65	22.4	28.4	45.2	150.1	5.4	21.1	155.2	87.4	5.0
1112	38	751013	4.62	24.0	23.0	37.8	119.6	6.1	17.8	121.3	77.0	6.4
1112	39	751013	4.60	25.1	22.0	36.2	112.2	3.6	14.5	112.8	75.0	5.0
1133	2	751009	5.23	5.9	17.0	14.0	33.9	2.3	5.6	33.9	25.0	5.7
1133	3	751009	5.21	6.2	16.5	13.2	33.9	1.5	5.6	33.9	25.0	5.7
1133	5	750827	5.19	6.5	25.0	10.7	44.4	3.1	16.7	28.2	20.8	5.7
1133	6	751009	5.23	5.9	16.5	14.0	33.1	1.5	5.6	33.9	22.9	5.7
1133	7	751009	5.20	6.3	16.5	14.0	32.2	1.3	5.6	33.9	22.9	5.7
1133	8	751009	5.20	6.3	16.5	13.2	32.6	1.3	5.6	33.9	25.0	5.7
1133	9	751009	5.20	6.3	17.5	13.2	33.1	1.0	5.6	31.0	22.9	5.7
1133	10	750714	5.60	2.5	20.0	15.6	54.4	10.0	8.9	48.0	33.3	6.4
1133	11	751009	5.80	1.6	20.5	13.2	47.0	5.6	2.2	45.1	20.8	5.0
1133	12	751009	5.77	1.7	21.0	14.0	55.2	6.1	2.2	42.3	20.8	5.0
1133	13	751009	5.22	6.0	17.0	12.3	33.1	2.3	5.6	31.0	22.9	5.7
1133	14	750825	5.29	5.1	17.5	12.3	47.4	2.0	16.7	39.5	37.5	6.4
1133	15	750825	5.16	6.9	12.5	9.9	42.2	2.0	16.7	33.9	18.7	6.4
1133	16	750825	5.83	1.5	12.5	11.5	54.4	7.4	15.6	42.3	20.8	7.1
1133	17	750725	5.99	1.0	25.0	12.3	37.0	1.5	5.6	42.3	25.0	5.7
1133	18	750725	5.52	3.0	15.0	13.2	47.8	1.8	6.7	48.0	25.0	5.7
1133	20	750714	5.35	4.5	15.0	14.0	52.2	2.8	10.0	45.1	33.3	7.1
1133	515	750918	4.92	12.0	17.5	10.7	37.4	4.9	3.3	19.7	20.8	1.4
1134	3	751002	5.94	1.1	21.0	18.1	27.4	2.8	0.0	25.4	20.8	5.7
1134	6	751012	6.05	.8	38.4	26.3	57.0	3.6	3.3	56.4	39.6	6.4
1134	7	751008	6.30	.5	45.4	25.5	47.4	3.6	3.3	48.0	41.6	5.7
1134	14	751109	5.67	2.1	25.4	17.3	41.8	3.6	6.7	45.1	27.1	5.7
1134	15	751116	5.47	3.4	27.4	16.5	90.5	7.7	3.3	45.1	41.6	4.3
1134	16	751003	5.76	1.7	31.4	12.3	27.4	6.4	4.4	19.7	29.1	5.0
1134	17	751001	6.27	.5	41.9	18.9	36.5	3.1	2.2	28.2	27.1	7.9
1134	18	751009	5.89	1.3	24.5	18.1	21.8	1.8	0.0	19.7	25.0	5.0
1134	19	751001	6.29	.5	53.9	19.7	37.0	2.6	0.0	28.2	31.2	6.4
1134	20	751009	7.30	.0	484.0	34.5	41.3	18.7	3.3	22.6	179.1	5.0
1134	21	751003	5.43	3.7	21.0	11.5	24.4	4.3	3.3	22.6	27.1	5.0
1134	22	751125	6.22	.6	69.9	21.4	73.1	5.4	3.3	81.8	45.8	10.0
1134	23	751125	6.03	.9	74.8	22.2	74.8	7.9	4.4	84.6	50.0	7.1
1134	28	751012	5.25	5.6	15.5	19.7	50.9	3.1	7.8	79.0	35.4	1.4

CODE: REGION

DESCRIPTION: Survey of 48 small lakes in southern Norway sampled in March 1981. Similar surveys were conducted previously in 1974, 1975, 1976, 1977 and 1978.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, Al, SO_4, Cl, NO_3N, alkalinity (ALK 4.5), organic matter (permanganate consumption).

REFERENCE: Gjessing, E., and A.K.Gudmundson Rogne. 1982. Regional survey of lakes and snow. Large and small lakes in southern Norway. Rept. 27/82. National Envionmental Monitoring Program, Norwegian Institute for Water Research, Oslo (in Norwegian).

OUTLIERS: None

DATA SOURCE: Gjessing and Gudmundson Rogne, 1982.

FILKODE: REGION NAVN: REGIONALE UNDERSØKELSER - VANN REGIONALE DATA DATO: 830121

BLK	LOK	Å M D R N G	DYP	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	EN03	PERM
1	2	810427	100	4.63	23.4	53.9	50.2	170.5	9.7	38.9	203.1	.0	124.9	24.3	1.5
2	1	810427	100	4.96	11.0	51.9	55.9	174.9	6.6	16.7	208.8	.0	99.9	13.2	1.1
4	1	810318	100	4.49	32.4	23.5	17.3	44.4	3.8	30.0	56.4	0.0	75.0	15.7	
5	2	810303	100	5.21	6.2	81.8	59.2	77.4	6.9	25.6	101.6	14.2	116.6	8.6	6.8
6	2	810303	100	4.69	20.4	25.4	13.2	37.8	1.5	24.5	48.0	.0	60.4	7.9	3.6
7	1	810218	100	4.94	11.5	11.5	14.8	60.0	2.3	6.7	76.2	.0	37.5	10.0	M .5
8	1	810303	100	4.90	12.6	19.5	10.7	30.0	1.0	15.6	36.7	.0	43.7	5.0	3.2
9	1	810217	100	4.54	28.8	22.5	14.8	25.2	4.3	14.5	28.2	.0	79.1	14.3	1.5
10	2	810303	100	5.75	1.8	125.7	95.4	109.2	16.9	8.9	118.5	42.0	181.1	26.4	3.1
11	1	810218	100	5.43	3.7	28.4	14.8	55.2	2.3	5.6	73.3	7.6	31.2	3.6	1.4
12	1	810217	100	5.19	6.5	32.9	12.3	28.7	2.6	11.1	28.2	.0	60.4	11.4	1.3
13	1	810218	100	5.70	2.0	60.4	22.2	30.9	2.0	22.2	31.0	25.0	60.4	2.9	4.7
15	1	810217	100	5.38	4.2	69.4	24.7	39.1	7.4	18.9	36.7	8.7	102.0	11.4	4.2
17	2	810324	100	4.90	12.6	93.3	62.5	124.4	10.2	17.8	135.4	8.7	158.2	8.6	3.7
18	1	810218	100	6.02	.9	38.9	9.9	30.0	4.3	2.2	36.7	19.7	41.6	4.3	1.0
19	2	810218	100	6.25	.5	51.9	8.2	21.3	3.3	2.2	16.9	36.7	35.4	.7	1.1
20	1	810218	100	6.67	.2	116.8	10.7	21.8	5.1	1.1	14.1	117.8	37.5	.7	1.8
21	1	810218	100	6.09	.8	99.3	32.9	33.9	5.4	11.1	28.2	49.3	87.4	3.6	5.1
24	1	810320	100	5.21	6.2	89.3	48.5	53.9	8.9	20.0	53.6	13.1	112.4	3.6	10.1
30	3	810320	100	5.98	1.0	108.8	31.3	35.7	7.9	7.8	25.4	57.7	89.5	4.3	4.4
32	3	810320	100	4.93	11.7	62.9	38.7	40.9	5.9	54.5	36.7	.0	89.5	5.0	10.6
34	1	810317	100	4.87	13.5	9.5	17.3	72.6	2.6	8.9	101.6	.0	27.1	6.4	M .5
36	1	810225	100	5.66	2.2	18.5	4.1	13.9	2.0	1.1	11.3	10.9	25.0	5.0	.7
40	1	810320	100	5.67	2.1	92.3	57.6	46.1	6.9	6.7	39.5	49.3	87.4	3.6	7.4
42	1	810224	100	5.18	6.6	18.5	27.1	112.7	3.1	6.7	138.2	1.6	33.3	2.1	2.5
43	1	810224	100	6.29	.5	76.8	13.2	25.7	5.4	2.2	33.9	60.8	33.3	2.9	3.4
46	2	810320	100	6.37	.4	103.3	32.9	22.6	4.1	1.1	14.1	86.8	47.9	3.6	3.4
47	1	810320	100	5.68	2.1	61.9	18.9	30.0	5.6	1.1	11.3	65.0	37.5	14.3	2.0
49	1	810224	100	5.45	3.5	16.0	26.3	124.8	2.6	15.6	143.9	8.7	35.4	7.1	.8
50	1	810224	100	5.54	2.9	24.0	21.4	78.3	3.6	5.6	101.6	13.1	33.3	3.6	.7
57	1	810223	100	5.25	5.6	26.4	49.4	205.8	4.3	4.4	242.6	5.3	45.8	.7	2.5
58	1	810223	100	5.55	2.8	31.9	42.0	153.1	4.1	5.6	197.5	10.9	33.3	.7	1.3
65	2	810223	100	6.13	.7	32.9	28.8	114.8	5.4	2.2	129.8	33.5	35.4	.7	2.0
80	1	810427	100	4.92	12.0	38.4	41.1	135.3	6.4	23.4	163.6	.0	81.2	6.1	1.6
81	2	810303	100	4.50	31.6	27.4	27.1	72.6	2.8	25.6	90.3	0.0	87.4	7.1	5.7
82	1	810303	100	4.66	21.9	24.0	13.2	40.9	1.8	17.8	59.2	.0	45.8	4.3	5.0
83	1	810216	100	4.92	12.0	12.5	22.2	88.7	2.6	10.0	115.7	.0	39.6	9.3	M .5
85	2	810324	100	4.84	14.5	130.2	104.5	194.0	26.6	60.0	214.4	24.0	208.2	20.0	12.3
86	1	810217	100	4.84	14.5	64.9	23.9	29.6	6.4	20.0	39.5	.0	99.9	11.4	6.1
87	2	810217	100	5.11	7.8	36.4	11.5	24.4	2.3	11.1	25.4	.0	62.5	8.6	1.7
88	1	810218	100	6.17	.6	44.4	9.9	21.8	1.8	1.1	16.9	33.5	37.5	2.9	.8
89	1	810218	100	5.82	1.5	37.9	21.4	63.9	2.8	2.2	87.5	17.5	41.6	.7	.5
94	1	810320	100	5.75	1.8	128.7	41.1	42.6	11.0	13.3	28.2	48.3	120.8	3.6	7.2
95	1	810224	100	5.50	3.2	29.4	34.5	129.2	4.3	4.4	152.3	16.4	33.3	5.0	1.2
111	1	810223	100	5.98	1.0	57.9	34.5	118.8	5.6	5.6	158.0	34.6	41.6	.7	2.7
113	2	810223	100	6.72	.1	133.2	39.5	132.2	4.1	4.4	166.4	120.9	41.6	2.1	2.2
115	1	810223	100	5.29	5.1	39.4	46.1	166.6	1.8	6.7	186.2	5.3	43.7	.7	5.3

CODE: BIGSJ0

DESCRIPTION: Survey of 42 large lakes in southern Noway sampled in March 1981. Similar survey was conducted in March 1979.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, Al, SO_4, Cl, NO_3N, alkalinity (ALK 4.5), organic matter (permanganate consumption).

REFERENCE: Gjessing, E., and A.K. Gudmundson Rogne, 1982.

OUTLIERS: None

DATA SOURCE: Gjessing and Gudmundson Rogne, 1982

FILKODE: BIGSJØ NAVN: REGIONAL-UNDERSØKELSER AV STORE NORSKE INNSJØER REGIONALE DATA DATO: 830121

VANN	Å M D R N G	DYP	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	EN03	PERM
501	810303	200	5.56	2.8	95.3	33.7	48.7	9.2	14.5	53.6	21.8	106.2	21.4	3.0
502	810303	200	4.94	11.5	63.4	36.2	60.5	8.7	17.8	70.5	.0	112.4	17.8	1.3
503	810427	200	6.41	.3	85.8	16.5	25.7	4.6	1.1	25.4	47.2	52.0	9.6	.8
504	810317	200	5.27	5.4	48.9	16.5	32.6	5.6	10.0	28.2	2.9	62.5	14.3	1.2
505	810427	200	5.75	1.8	55.4	14.8	25.7	4.9	10.0	28.2	10.9	58.3	9.3	2.5
506	810331	200	6.19	.6	74.8	14.0	27.4	4.3	1.1	22.6	44.1	45.8	7.1	.8
507	810427	200	5.43	3.7	45.4	15.6	28.7	4.3	8.9	31.0	4.1	54.1	9.6	1.5
508	810217	200	5.05	8.9	38.4	13.2	28.7	3.8	16.7	28.2	.0	68.7	10.0	1.6
509	810427	200	5.74	1.8	43.9	14.8	33.5	3.8	7.8	39.5	12.0	43.7	9.3	1.1
510	810427	200	4.69	20.4	25.9	21.4	72.6	4.6	17.8	95.9	.0	58.3	8.9	2.9
511	810331	200	4.94	11.5	23.5	20.6	68.7	3.8	12.2	79.0	.0	43.7	9.6	1.0
512	810331	200	4.95	11.2	21.0	15.6	55.2	3.1	12.2	67.7	.0	41.6	8.9	1.1
513	810331	200	4.90	12.6	28.4	32.9	124.0	4.3	14.5	124.1	.0	62.5	15.0	.6
514	810218	200	5.13	7.4	22.0	9.9	35.2	2.8	10.0	45.1	.0	37.5	9.3	1.0
515	810331	200	5.73	1.9	37.9	23.9	91.3	3.3	2.2	101.6	9.8	39.6	7.1	.7
516	810304	200	5.05	8.9	16.5	8.2	29.6	1.8	8.9	36.7	.0	31.2	9.3	M .5
517	810331	200	6.10	.7	56.4	16.5	39.6	4.6	1.1	45.1	29.3	37.5	9.6	.5
518	810218	200	6.43	.3	84.3	14.0	28.3	4.3	1.1	28.2	51.4	52.0	8.6	1.7
519	810218	200	6.51	.3	100.8	12.3	24.8	3.8	1.1	19.7	62.9	66.6	5.0	1.0
520	810218	200	6.21	.6	57.4	8.2	19.1	2.6	1.1	16.9	28.2	45.8	6.4	.6
521	800218	200	6.36	.4	52.4	11.5	24.4	4.9	1.1	14.1	39.9	37.5	5.7	.9
521	810218	200	6.36	.4	52.4	11.5	24.4	4.9	1.1	14.1	39.9	37.5	5.7	.9
522	810218	200	6.62	.2	150.7	7.4	21.8	3.1	1.1	16.9	106.5	75.0	1.4	.5
523	810218	200	6.56	.2	127.2	9.0	23.1	4.1	1.1	16.9	96.1	50.0	2.1	1.2
524	810317	200	5.54	2.9	33.9	31.3	111.4	5.4	3.3	158.0	8.7	37.5	4.3	.9
525	810225	200	6.71	.1	132.7	14.0	28.7	5.4	1.1	22.6	105.4	62.5	1.4	1.4
526	810225	200	6.26	.5	41.9	12.3	14.4	5.1	1.1	11.3	33.5	39.6	5.0	M .5
527	810224	200	6.12	.7	31.9	10.7	15.7	3.8	1.1	14.1	25.0	33.3	5.0	.5
527	810317	200	5.92	1.2	37.9	10.7	14.4	2.3	1.1	8.5	20.7	37.5	5.7	.6
528	810225	200	6.34	.4	53.9	18.1	20.0	6.9	3.3	14.1	43.0	47.9	7.1	M .5
529	810225	200	6.63	.2	63.9	25.5	15.7	4.6	3.3	8.5	73.3	39.6	6.4	M .5
530	810401	200	6.10	.7	51.4	18.1	53.5	7.4	1.1	62.1	14.2	37.5	7.9	.7
531	810401	200	6.31	.4	68.4	19.7	49.2	11.0	1.1	56.4	35.7	47.9	15.7	1.2
532	810402	200	6.39	.4	78.8	14.0	32.6	9.2	1.1	33.9	44.1	50.0	2.1	.5
533	810402	200	6.36	.4	96.3	14.0	37.0	8.7	1.1	33.9	45.1	70.8	10.7	.5
534	810402	200	6.36	.4	112.3	13.2	35.2	8.4	1.1	33.9	40.9	87.4	10.0	.6
535	810402	200	6.15	.7	38.4	23.9	75.3	7.2	1.1	84.6	26.1	33.3	.7	1.0
.536	810402	200	6.44	.3	81.8	19.7	61.8	8.4	1.1	56.4	49.3	62.5	5.7	.5
537	810223	200	7.14	.0	243.5	57.6	33.5	12.3	1.1	31.0	289.8	45.8	3.6	1.6
538	810223	200	6.52	.3	55.9	39.5	27.0	8.7	3.3	14.1	73.3	37.5	2.9	3.9
539	810329	200	5.29	5.1	18.5	3.3	7.0	6.9	4.4	5.6	.0	25.0	10.0	M .5
541	810303	200	4.74	18.2	63.4	46.1	107.9	10.7	37.8	132.6	.0	139.5	26.4	2.0
542	810303	200	4.70	20.0	63.9	41.1	104.0	8.9	50.0	132.6	.0	139.5	24.3	2.7
543	810317	200	6.30	.5	54.4	25.5	50.0	7.2	1.1	62.1	45.1	45.8	5.0	.5

CODE: DIVER (NVEST)

DESCRIPTION: Survey of 47 small lakes in northwestern Norway conducted in autumn 1977.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, Al, SO_4, Cl, NO_3N, alkalinity (ALK 4.5), color, TOC

REFERENCE: Unpublished data. NIVA

OUTLIERS: None

DATA SOURCE: A. Henriksen, personal comminication.

FILKODE: DIVER NAVN: DIVERSE PRØVER DIVERSE PRØVER DATO: 830121

STNUM	LOK	A M D R N G	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	EN03	FARG	TOC
NVEST	1	770921		6.44	.3	86.8	20.6	62.6	15.3	2.2	56.4	60.8	58.3	9.3	2.5	1.1
NVEST	2	770921		5.12	7.6	26.9	24.7	45.7	8.7	6.7	84.6	21.8	10.4	.7	40.5	3.9
NVEST	3	770921		6.17	.6	56.9	17.3	56.1	7.7	3.3	56.4	29.3	47.9	2.9	5.0	1.3
NVEST	4	770921		6.12	.7	51.9	16.5	54.4	8.4	6.7	62.1	0.0	47.9	2.9	8.0	
NVEST	5	770921		6.14	.7	58.9	15.6	50.9	8.2	3.3	50.8	29.3	45.8	5.0	2.5	.9
NVEST	6	770921		6.27	.5	69.9	16.5	53.9	10.0	3.3	45.1	0.0	62.5	5.7	5.0	
NVEST	7	770921		6.42	.3	86.8	17.3	54.4	9.5	4.4	50.8	38.8	87.4	6.4	2.5	1.1
NVEST	8	770920		6.28	.5	54.9	32.9	137.5	8.4	7.8	152.3	31.4	75.0	.7	16.0	2.2
NVEST	9	770920		6.68	.2	146.7	89.7	180.5	11.5	5.6	186.2	155.9	56.2	.7	21.5	2.5
NVEST	10	770920		6.25	.5	40.9	42.8	145.3	6.6	7.8	169.3	27.2	33.3	.7	21.5	3.3
NVEST	11	770920		6.03	.9	30.9	41.1	137.5	6.9	6.7	163.6	19.7	41.6	.7	35.0	3.6
NVEST	12	770920		5.52	3.0	30.9	50.2	161.8	7.7	10.0	220.0	18.6	35.4	.7	35.0	3.5
NVEST	13	770920		5.81	1.5	54.9	37.8	142.7	7.4	10.0	174.9	18.6	31.2	.7	21.5	2.8
NVEST	14	770920		6.10	.7	32.4	33.7	125.3	6.4	7.8	146.7	22.9	39.6	.7	10.5	1.9
NVEST	15	770920		6.22	.6	61.9	52.6	172.3	8.4	8.9	197.5	0.0	39.6	.7	32.5	
NVEST	16	770920		6.33	.4	51.9	34.5	130.5	6.4	7.8	158.0	0.0	27.1	.7	16.0	2.3
NVEST	17	770920		6.32	.4	56.9	39.5	146.2	6.9	4.4	180.5	0.0	31.2	.7	10.5	
NVEST	18	770920		5.94	1.1	49.9	34.5	139.2	5.4	8.9	169.3	0.0	43.7	.7	26.5	
NVEST	19	770920		6.14	.7	40.9	32.1	129.2	6.1	4.4	158.0	0.0	45.8	.7	10.5	1.8
NVEST	20	770922		6.36	.4	82.8	39.5	144.4	3.3	7.8	169.3	50.4	72.9	.7	21.5	2.8
NVEST	21	770922		6.47	.3	82.8	41.1	150.1	3.8	5.6	186.2	48.3	79.1	2.1	13.0	2.6
NVEST	21	771125	GRØNDA	6.04	.9	47.9	9.0	24.4	3.1	4.4	19.7	19.7	50.0	2.9		
NVEST	22	770922		5.93	1.2	32.4	28.0	97.4	11.3	10.0	129.8	16.4	54.1	.7	35.0	2.9
NVEST	22	771125	KRYNKE	6.09	.8	70.4	9.0	24.8	2.8	1.1	19.7	32.5	77.0	.7	5.0	.4
NVEST	23	770922		6.42	.3	40.9	28.8	108.8	17.4	3.3	129.8	39.9	56.2	.7	8.0	1.5
NVEST	23	771125	TJØRPA	5.93	1.2	41.4	8.2	21.3	2.3	4.4	19.7	27.2	41.6	1.4		
NVEST	31	771125	1013	5.98	1.0	45.9	8.2	22.6	3.1	4.4	16.9	50.4	52.0	1.4		
NVEST	32	771125	HEIMST	5.89	1.3	43.4	9.0	24.8	4.1	1.7	16.9	21.8	54.1	1.4		
NVEST	33	771125	BJØRNE	5.89	1.3	48.4	9.0	23.5	4.9	2.2	19.7	20.7	50.0	1.4	2.5	.6
NVEST	41	771125	GRYTVA	6.10	.7	28.9	18.9	63.9	2.8	8.3	73.3	33.5	27.1	2.1		
NVEST	42	771125	LITLEB	6.21	.6	39.9	20.6	63.1	4.9	1.1	67.7	43.0	37.5	2.9	5.0	.5
NVEST	51	771125	STAVVA	6.37	.4	56.4	24.7	80.9	6.6	7.8	81.8	79.6	41.6	.7		
NVEST	52	771125	OSPEVA	6.26	.5	23.0	16.5	62.6	4.3	2.2	59.2	35.7	18.7	.7		
NVEST	53	771125	KVASST	6.09	.8	21.5	16.5	55.7	3.3	2.2	59.2	18.6	18.7	2.1		
NVEST	54	771125	MÅNVAT	6.36	.4	44.4	22.2	63.1	5.1	3.3	62.1	68.1	22.9	.7	8.0	.5
NVEST	55	771125	GEITMJ	6.01	.9	19.5	14.8	53.9	2.8	2.2	62.1	13.1	20.8	2.1		
NVEST	71	771125	GLUTER	6.03	.9	45.4	10.7	35.2	2.8	3.9	36.7	18.6	43.7	2.1	5.0	.4
NVEST	81	771125	ØVRE B	6.05	.8	28.9	9.0	29.1	2.3	1.7	28.2	18.6	22.9	3.6		
NVEST	82	771125	NEDRE	6.01	.9	32.9	9.9	34.4	2.6	2.8	28.2	19.7	25.0	3.6		
NVEST	110	771125	DJUPDA	6.26	.5	87.3	14.8	36.5	6.4	1.7	25.4	40.9	93.7	1.4		.6
NVEST	111	771125	MEISAL	6.23	.5	32.9	25.5	86.6	4.1	3.3	90.3	35.7	31.2	2.9		
NVEST	112	771125	ØVRE V	6.14	.7	42.4	18.1	65.2	4.6	2.8	67.7	45.1	29.1	5.7		
NVEST	121	771125	ØV. NE	6.19	.6	26.4	14.0	36.1	3.6	3.3	33.9	30.4	20.8	.7		
NVEST	122	771125	NEDRE	6.24	.5	30.9	15.6	39.6	3.3	3.9	36.7	30.4	22.9	1.4	5.0	.9
NVEST	123	771125	TVERRÅ	5.94	1.1	14.5	10.7	42.2	2.8	2.2	33.9	4.1	16.7	7.9		
NVEST	124	771125	TVERRA	6.06	.8	20.0	14.0	43.1	2.6	2.2	39.5	21.8	16.7	2.9		
NVEST	125	771125	NEÅA	6.16	.6	27.9	14.8	39.1	1.5	3.3	33.9	36.7	20.8	1.4		
NVEST	126	771125	FALLBA	6.06	.8	19.0	9.9	30.0	4.1	2.2	22.6	54.6	16.7	1.4	5.0	.6
NVEST	127	771125	1078	5.85	1.4	14.0	9.9	32.6	3.6	2.2	33.9	5.3	12.5	1.4		

CODE: OSLOMA

DESCRIPTION: Survey of 167 lakes north of Oslo conducted in 1980.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, Al, SO_4, Cl, NO_3, alkalinity (ALK 4.5), organic matter (permanganate consumption).

REFERENCE: Henriksen, A. 1982d. Acidification situation in lakes in the Oslo forest. Acid Rain Res. Rept. 2/82, NIVA, Oslo Norway. 44 pp. (in Norwegian).

OUTLIERS: 16 lakes with Ca > 400 µeq/l were excluded.

DATA SOURCE: A. Henriksen 1982d.

FILKODE: OSLOMA NAVN: OSLO-MARKA DATO: 830121

VASSNR	LOK	A M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	EN03	FARG	TOC	PERM
01	1	800301	6.05	.8	159.7	56.8	70.9	8.9	16.7	56.4	47.2	185.3	11.1		4.4	3.7
01	2	800301	5.95	1.1	136.2	59.2	70.5	9.2	16.7	64.9	59.8	162.4	7.1		3.8	3.8
02	1	800301	6.75	.1	263.0	84.7	86.6	10.5	5.6	70.5	166.1	229.0	12.1		2.7	1.9
02	2	800301	6.33	.4	181.1	79.8	83.5	10.0	7.8	67.7	73.3	208.2	15.0		2.3	1.7
02	3	800301	5.98	1.0	121.8	65.0	72.2	7.7	8.9	59.2	29.3	179.1	6.8		2.4	1.7
02	4	800301	5.96	1.1	113.3	65.0	75.3	7.7	11.1	67.7	65.0	154.1	2.1		4.1	3.7
02	5	800301	6.55	.2	151.7	87.2	80.9	8.2	1.1	64.9	124.0	154.1	2.5		3.0	2.2
02	6	800301	5.14	7.2	105.3	51.0	59.2	5.6	55.6	64.9	15.3	164.5	6.4		9.4	11.5
02	7	800301	4.96	11.0	122.3	47.7	65.2	6.1	36.7	76.2	8.7	158.2	4.6		9.9	13.0
02	8	800301	5.82	1.5	163.7	51.8	76.6	14.3	16.7	79.0	31.4	187.4	8.6		4.8	4.0
02	9	800301	6.11	.7	191.1	60.9	69.2	8.9	31.1	70.5	73.3	187.4	5.7		6.2	7.2
02	10	800301	6.06	.8	150.7	49.4	63.1	8.7	15.6	62.1	45.1	164.5	8.6		3.8	3.2
02	11	800301	5.16	6.9	125.2	45.2	60.5	6.4	36.7	64.9	13.1	174.9	9.3		7.8	7.3
03	3	800229	7.13	.0	913.2	70.7	65.2	9.7	3.3	53.6	848.6	154.1	13.9		3.0	2.4
03	4	800229	7.14	.0	1167.7	79.8	65.2	12.0	3.3	50.8	1187.0	145.7	8.6		2.8	2.0
03	5	800229	7.55	.0	1596.8	74.9	54.4	15.3	1.1	50.8	1495.8	164.5	8.6		2.5	1.3
03	6	800225	6.51	.3	133.7	37.8	47.4	8.7	5.6	31.0	62.9	120.8	10.0		3.6	2.9
03	7	800327	4.87	13.5	72.4	20.6	41.8	4.1	52.3	48.0	.0	110.3	3.6		12.5	12.7
03	8	800225	5.66	2.2	133.2	37.8	59.6	8.7	17.8	42.3	26.1	177.0	9.3		4.5	4.1
03	9	800226	5.20	6.3	106.8	30.4	54.8	8.2	38.9	56.4	16.4	137.4	4.3		10.7	9.9
03	10	800226	5.27	5.4	127.7	37.0	47.0	7.2	26.7	59.2	22.9	141.6	4.3		11.7	9.7
03	11	800226	5.32	4.8	121.8	35.4	46.1	10.0	24.5	50.8	16.4	145.7	5.7		5.9	7.6
03	12	800225	6.01	.9	147.2	37.8	54.8	7.9	16.7	42.3	45.1	154.1	8.6		5.0	4.8
03	13	800225	5.54	2.9	140.2	40.3	53.1	3.1	18.9	45.1	58.7	135.3	2.1		7.3	6.8
03	14	800226	5.16	6.9	65.9	25.5	45.2	12.0	27.8	39.5	5.3	122.8	6.4		6.6	6.3
03	15	800226	5.45	3.5	106.3	23.0	41.8	8.9	41.1	42.3	30.4	110.3	5.7		11.5	10.3
03	16	800225	6.51	.3	204.6	42.8	56.5	9.5	5.6	42.3	133.3	131.2	8.6		3.6	2.9
03	17	800226	6.42	.3	131.7	37.8	41.3	9.2	4.4	33.9	61.9	120.8	10.0		3.7	3.5
03	18	800227	6.21	.6	145.2	33.7	50.5	5.1	8.9	36.7	91.0	129.1	3.6		2.6	5.3
03	19	800226	6.40	.4	125.2	37.0	48.3	12.3	5.6	50.8	60.8	116.6	10.0		4.7	3.8
03	20	800327	6.25	.5	105.3	29.6	43.9	7.2	6.7	33.9	42.0	118.7	11.4		2.7	2.9
03	21	800325	5.62	2.4	86.8	30.4	34.4	5.9	21.1	28.2	38.8	97.9	3.2		5.6	7.4
03	22	800323	6.43	.3	106.8	37.8	47.0	9.7	20.0	28.2	73.3	112.4	6.8		3.8	3.8
03	24	800322	6.40	.4	108.8	37.0	44.4	9.2	8.9	22.6	77.5	95.8	5.7		3.4	3.8
03	25	800321	5.51	3.1	124.8	41.1	44.8	5.9	35.6	45.1	48.3	112.4	2.1		12.2	12.6
03	26	800321	5.93	1.2	104.8	30.4	38.7	3.8	21.1	28.2	51.4	93.7	3.2		4.6	6.9
03	27	800321	6.37	.4	118.3	39.5	46.1	8.2	11.1	28.2	83.7	102.0	3.6		4.1	4.9
03	28	800322	6.62	.2	134.2	38.7	49.6	9.2	10.0	25.4	127.1	95.8	6.4		4.0	3.7
03	29	800322	6.21	.6	94.3	38.7	41.3	5.4	13.3	25.4	52.5	99.9	4.3		3.2	4.3
03	30	800322	5.58	2.6	57.9	32.1	37.8	5.6	17.8	25.4	16.4	99.9	3.6		3.8	3.8
03	31	800323	6.25	.5	100.3	37.8	43.5	9.7	11.1	33.9	55.6	106.2	6.1		5.1	4.9
03	32	800327	4.66	21.9	27.9	24.7	39.6	8.7	32.2	36.7	.0	108.3	1.4		4.7	6.5
03	33	800327	5.71	1.9	70.4	32.1	36.1	4.9	16.7	28.2	38.8	87.4	3.9		6.8	7.8
03	34	800321	6.20	.6	84.3	34.5	38.7	10.0	15.6	22.6	46.2	102.0	5.4		3.5	3.6
03	35	800321	5.00	10.0	51.4	24.7	31.8	8.4	27.8	25.4	.0	79.1	4.6		6.2	7.9
03	36	800321	6.13	.7	82.3	31.3	37.0	9.5	7.8	28.2	39.9	99.9	3.9		3.7	3.6
03	37	800325	5.71	1.9	80.3	28.8	33.9	6.9	11.1	28.2	21.8	102.0	5.0		3.7	4.9
03	38	800227	6.55	.2	260.0	63.3	47.4	14.3	4.4	36.7	241.8	110.3	12.9		6.5	7.0
03	39	800227	6.16	.6	109.8	39.5	87.4	18.2	15.6	59.2	76.4	120.8	4.3		7.2	5.6
03	40	800331	5.49	3.2	100.8	43.6	57.9	7.7	15.6	48.0	14.2	166.6	5.4		3.6	2.2
03	41	800227	6.33	.4	157.7	35.4	50.5	7.4	5.6	36.7	68.1	139.5	10.7		2.0	2.4
03	42	800324	5.51	3.1	81.3	31.3	47.8	5.1	17.8	39.5	20.7	97.9	3.6		5.2	8.0
03	43	800324	6.15	.7	191.6	45.2	54.8	10.5	21.1	53.6	166.1	89.5	.7		5.1	8.5
03	44	800324	5.07	8.5	62.4	27.1	41.8	6.4	43.4	42.3	6.4	102.0	2.1		8.7	11.4
03	45	800324	6.35	.4	173.2	43.6	61.3	6.4	20.0	45.1	121.9	120.8	3.9		6.9	7.4

FILKODE: OSLOMA NAVN: OSLO-MARKA DATO: 830121

VASSNR	LOK	A M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ESO4	ENO3	FARG	TOC	PERM
03	46	800226	5.77	1.7	106.8	32.9	71.8	17.6	20.0	59.2	29.3	127.0	5.0		6.1	5.0
03	47	800226	6.35	.4	152.7	35.4	49.2	8.4	6.7	39.5	68.1	133.2	12.1		3.5	2.5
03	48	800225	6.47	.3	152.7	36.2	56.5	7.2	11.1	42.3	68.1	135.3	10.7		3.1	2.3
03	49	800225	6.41	.3	148.7	34.5	53.9	7.2	11.1	39.5	67.1	135.3	10.0		4.0	2.5
03	50	800225	7.01	.0	347.3	50.2	57.0	7.9	7.8	42.3	259.2	156.1	8.6		3.5	2.9
03	51	800225	7.02	.0	369.8	50.2	53.1	7.7	4.4	39.5	284.7	156.1	8.6		3.7	2.6
03	52	800324	5.00	10.0	46.9	28.0	52.6	4.1	62.3	45.1	.0	158.2	2.5		1.6	.9
03	53	800226	7.14	.0	518.5	57.6	48.3	9.7	2.2	42.3	394.6	162.4	12.1		3.6	3.5
03	54	800226	6.83	.1	475.0	52.6	55.2	8.9	2.2	45.1	345.8	177.0	10.0		4.7	4.2
03	55	800226	5.82	1.5	58.4	28.0	49.6	8.9	11.1	33.9	27.2	106.2	2.9		2.9	2.2
03	56	800226	6.97	.1	596.3	60.0	48.3	8.7	5.6	50.8	517.5	143.7	8.6		7.7	4.6
03	57	800226	6.81	.1	346.3	44.4	53.5	8.9	2.2	45.1	243.9	162.4	8.6		3.7	3.1
04	2	800319	6.28	.5	152.7	42.8	69.6	10.0	7.8	48.0	68.1	170.7	12.1		2.0	1.5
04	3	800319	6.17	.6	141.7	40.3	70.9	10.0	7.8	50.8	64.0	164.5	7.9		2.2	1.6
05	1	800304	6.26	.5	360.3	65.0	94.8	17.9	10.0	132.6	220.4	208.2	13.2		4.6	4.1
05	2	800304	6.50	.3	323.9	80.6	95.7	16.9	12.2	79.0	351.9	133.2	.7		6.2	4.3
05	3	800304	5.87	1.3	163.7	53.5	74.4	7.7	14.5	62.1	57.7	187.4	6.1		4.1	3.9
05	4	800304	6.19	.6	193.1	55.9	75.7	8.2	16.7	64.9	70.2	208.2	10.7		2.5	2.0
06	1	800304	6.77	.1	613.8	134.9	138.3	22.5	5.6	138.2	454.6	249.8	73.5		2.8	1.8
06	2	800304	6.78	.1	663.7	136.6	141.8	22.0	4.4	112.8	521.5	270.7	65.0		2.5	2.0
06	3	800311	6.37	.4	219.6	35.4	52.2	8.4	12.2	42.3	124.0	120.8	16.1		6.4	7.7
06	4	800303	6.25	.5	244.0	37.8	51.8	7.7	14.5	45.1	170.2	114.5	7.1		7.6	10.0
06	5	800311	6.99	.1	1237.5	186.7	321.0	10.5	26.7	59.2	1613.7	116.6	.7		6.8	7.1
06	7	800311	6.52	.3	374.2	60.0	52.6	5.9	15.6	48.0	273.5	137.4	12.9		8.9	10.8
06	8	800317	6.23	.5	151.2	37.8	54.8	9.7	11.1	33.9	77.5	149.9	7.5		3.6	3.5
06	9	800311	6.35	.4	136.2	27.1	39.1	6.6	11.1	31.0	50.4	110.3	7.9		4.8	5.0
06	10	800310	6.53	.3	164.2	29.6	40.9	6.6	12.2	28.2	88.9	106.2	8.2		4.9	6.0
06	11	800310	6.83	.1	250.0	38.7	48.7	7.7	5.6	33.9	193.8	104.1	5.7		3.2	4.4
06	12	800327	6.88	.1	563.9	54.3	64.4	9.7	10.0	42.3	518.5	122.8	13.2		5.9	8.1
06	13	800321	6.45	.3	166.2	34.5	47.8	5.6	26.7	36.7	112.7	120.8	5.0		5.3	6.1
06	14	800321	6.00	1.0	115.8	29.6	43.9	5.9	25.6	31.0	46.2	120.8	5.7		3.7	5.0
06	15	800327	4.97	10.7	46.9	16.5	36.5	9.2	38.9	39.5	.0	102.0	5.0		4.7	5.3
06	16	800317	4.81	15.5	51.9	18.9	36.1	7.4	41.1	36.7	.0	102.0	5.0		7.8	9.0
06	17	800321	4.71	19.5	46.9	19.7	30.5	4.9	46.7	28.2	.0	91.6	4.3		6.9	10.5
06	18	800229	6.02	.9	155.2	39.5	56.5	6.6	21.1	56.4	59.8	133.2	14.3		4.5	5.0
06	19	800229	5.80	1.6	151.2	40.3	59.2	7.7	26.7	59.2	59.8	137.4	8.2		6.2	6.1
06	20	800229	5.76	1.7	140.2	37.0	50.5	6.1	3.3	53.6	66.0	131.2	4.3		6.0	6.6
06	21	800229	6.10	.7	167.7	30.4	46.1	4.6	27.8	42.3	74.4	127.0	3.6		5.7	6.8
06	22	800321	5.18	6.6	101.3	22.2	43.5	5.6	61.2	59.2	49.3	81.2	.7		20.0	22.8
06	23	800229	5.70	2.0	120.8	31.3	47.4	10.2	27.8	50.8	37.8	112.4	8.2		8.8	9.5
06	24	800229	7.16	.0	1512.0	84.7	58.3	10.0	1.1	53.6	1499.8	166.6	8.6		2.5	2.4
06	25	800229	5.19	6.5	98.3	28.0	51.3	9.5	21.1	42.3	9.8	145.7	7.1			2.8
06	26	800229	7.42	.0	1487.0	85.6	69.6	15.6	2.2	53.6	1404.0	187.4	27.8		4.1	3.4
06	27	800228	6.27	.5	158.7	32.1	43.1	8.9	8.9	31.0	94.1	112.4	13.2		3.3	2.8
06	28	800228	6.41	.3	149.2	32.1	42.2	7.7	8.9	28.2	84.7	106.2	9.3		4.2	4.4
06	29	800228	6.43	.3	170.2	36.2	46.1	9.2	8.9	31.0	117.8	106.2	8.6		4.6	3.8
06	30	800228	6.32	.4	165.7	36.2	44.4	10.7	5.6	31.0	106.5	110.3	9.6		5.9	6.1
06	31	800228	6.24	.5	235.5	37.8	53.5	8.9	8.9	36.7	232.6	89.5	3.6		4.0	3.2
06	32	800228	6.33	.4	160.2	28.0	42.2	7.9	6.7	22.6	124.0	93.7	5.4		4.1	3.9
06	33	800310	7.04	.0	548.9	97.1	70.0	5.9	7.8	36.7	574.3	83.3	7.1		6.1	7.7
06	34	800228	6.26	.5	179.1	34.5	40.5	3.6	15.6	33.9	112.7	91.6	2.9		10.2	11.0
06	35	800327	6.66	.2	167.2	39.5	62.2	19.7	12.2	48.0	134.3	116.6	7.5		4.8	5.3
06	36	800327	6.77	.1	196.6	46.1	53.5	9.2	5.6	33.9	195.8	104.1	3.2		3.7	4.6
06	37	800322	6.16	.6	100.8	30.4	44.8	4.9	20.0	28.2	57.7	91.6	5.7		4.4	6.6
06	38	800321	5.96	1.1	117.3	32.9	40.0	5.9	30.0	36.7	60.8	91.6	2.9		11.0	11.0

FILKODE: OSLOMA NAVN: OSLO-MARKA DATO: 830121

VASSNR	LOK	A M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	EN03	FARG	TOC	PERM
06	39	800322	6.27	.5	136.7	41.1	47.0	8.4	22.2	33.9	73.3	118.7	10.0		5.5	5.6
06	40	800322	6.84	.1	338.8	87.2	60.5	9.7	8.9	33.9	327.5	139.5	8.6		3.7	3.8
06	41	800321	4.62	24.0	58.4	28.0	40.9	8.2	51.2	39.5	.0	118.7	1.8		11.9	12.6
06	42	800327	6.86	.1	389.2	41.1	59.2	6.6	1.1	39.5	337.7	137.4	11.1		2.9	2.8
06	43	800327	6.77	.1	407.7	56.8	97.9	14.6	1.1	48.0	379.4	158.2	23.6		2.5	2.5
06	44	800327	6.20	.6	115.3	29.6	44.4	5.6	12.2	33.9	60.8	114.5	4.3		3.9	4.3
06	45	800310	6.78	.1	243.0	47.7	52.6	7.7	5.6	39.5	154.8	143.7	18.6		3.6	4.2
07	1	800304	6.18	.6	209.6	43.6	70.5	7.4	16.7	64.9	89.9	185.3	9.6		5.7	6.4
08	1	800313	6.78	.1	446.1	67.5	79.6	8.4	2.2	53.6	369.2	164.5	15.0		4.3	4.2
08	3	800314	6.59	.2	169.2	37.0	50.9	8.4	11.1	33.9	104.4	118.7	10.0		4.3	4.9
08	4	800314	6.57	.2	156.7	33.7	47.8	7.4	11.1	31.0	96.1	114.5	9.3		5.3	5.2
08	5	800317	6.04	.9	170.2	33.7	46.1	5.1	27.8	33.9	147.6	116.6	.7		5.9	7.0
08	6	800317	4.68	20.9	35.9	18.1	34.8	5.4	14.5	28.2	.0	99.9	3.9		5.1	6.0
08	7	800314	6.55	.2	147.2	32.1	47.4	7.4	12.2	33.9	86.8	106.2	8.9		3.7	5.0
08	8	800317	5.92	1.2	147.7	42.8	51.3	4.1	26.7	39.5	84.7	116.6	2.9		9.0	10.3
08	9	800312	7.08	.0	688.6	102.8	83.1	7.2	5.6	45.1	665.5	156.1	15.7		3.8	3.8
08	10	800317	5.81	1.5	132.7	34.5	45.7	3.6	30.0	33.9	54.6	116.6	3.6		8.8	9.8
08	11	800229	6.07	.8	134.7	29.6	38.3	4.6	20.0	31.0	66.0	104.1	3.6		7.1	7.7
08	12	800229	4.62	24.0	21.5	16.5	30.9	4.9	12.2	28.2	.0	83.3	2.9		4.7	6.4
08	13	800229	6.59	.2	303.4	52.6	47.4	4.9	16.7	36.7	275.5	97.9	2.5		9.3	9.8
10	2	800301	6.29	.5	206.6	39.5	39.6	4.6	16.7	36.7	118.8	122.8	6.4		8.5	10.5
11	1	800322	6.35	.4	91.8	29.6	36.5	7.2	5.6	25.4	44.1	95.8	5.7		3.3	3.0
11	2	800322	6.10	.7	86.3	27.1	36.1	7.4	4.4	25.4	38.8	99.9	4.6		2.8	2.3
13	1	800228	6.54	.2	170.2	48.5	52.6	9.5	6.7	42.3	138.4	106.2	8.9		4.1	4.1
13	2	800228	6.44	.3	174.6	55.1	62.6	9.7	4.4	36.7	167.1	106.2	3.9		2.6	2.8
13	3	800228	6.11	.7	165.2	46.9	53.9	9.5	13.3	36.7	189.7	97.9	4.3		4.6	5.4
13	4	800228	6.44	.3	171.2	50.2	48.3	12.3	6.7	31.0	132.2	114.5	8.6		4.2	4.0
13	5	800228	6.69	.2	328.3	66.6	47.4	12.5	2.2	33.9	328.5	112.4	2.9		4.6	4.4
13	6	800228	6.45	.3	279.4	61.7	54.4	13.0	5.6	39.5	261.2	118.7	5.7		4.7	5.2
13	7	800325	6.43	.3	122.8	38.7	40.9	8.9	4.4	25.4	78.5	108.3	8.6		2.2	2.8
13	8	800228	6.22	.6	129.7	41.1	46.5	18.9	4.4	33.9	79.6	118.7	12.9		3.3	2.3
13	9	800228	5.84	1.4	136.7	46.9	55.7	14.1	20.0	33.9	96.1	118.7	11.4		6.5	6.8
13	10	800228	5.86	1.4	111.8	34.5	40.9	14.6	15.6	33.9	57.7	114.5	9.6		4.3	3.4
13	11	800325	6.55	.2	186.6	42.8	47.8	15.3	7.8	31.0	147.6	112.4	6.8		3.7	4.7
13	12	800325	6.12	.7	142.2	39.5	35.2	8.7	14.5	31.0	106.5	85.4	9.3		4.8	7.0
13	13	800325	5.86	1.4	113.8	39.5	40.5	8.9	15.6	31.0	58.7	112.4	10.0		4.3	5.6
13	14	800325	6.35	.4	156.7	36.2	43.1	8.7	10.0	28.2	113.7	106.2	3.2		4.0	5.4
13	15	800325	6.12	.7	142.2	36.2	46.5	7.4	15.6	33.9	126.0	104.1	2.9		3.9	6.5
13	16	800323	6.46	.3	117.3	35.4	45.2	9.5	5.6	31.0	71.2	124.9	7.9		2.9	2.5
14	1	800228	6.05	.8	123.3	37.8	47.8	7.9	17.8	33.9	77.5	106.2	2.9		6.4	6.5
15	1	800227	5.96	1.1	133.7	35.4	46.1	5.1	22.2	39.5	119.9	95.8	1.4		5.6	7.9
16	1	800227	5.42	3.8	54.9	24.7	51.3	11.5	15.6	42.3	13.1	116.6	5.7		3.1	3.2
16	2	800227	5.46	3.5	57.9	25.5	48.3	9.5	13.3	33.9	8.7	116.6	5.0		2.4	2.7
16	3	800227	5.91	1.2	108.8	34.5	57.0	13.3	11.1	50.8	55.6	116.6	7.1		4.0	4.6
16	4	800227	5.88	1.3	85.8	28.8	46.5	7.2	8.9	33.9	31.4	114.5	6.4		3.0	3.8
16	5	800227	5.10	7.9	48.4	21.4	38.3	4.9	13.3	33.9	.0	102.0	3.6		2.9	4.4
16	6	800227	5.30	5.0	51.9	20.6	38.7	5.6	7.8	31.0	4.1	106.2	4.3		2.6	2.6
16	7	800227	5.96	1.1	102.3	32.9	48.3	6.9	5.6	33.9	31.4	129.1	5.7		2.8	3.3
16	8	800226	5.93	1.2	98.3	32.1	44.8	7.4	7.8	33.9	29.3	114.5	4.3		4.5	3.7
16	9	800226	6.17	.6	126.2	42.8	51.8	6.9	6.7	39.5	69.2	124.9	5.0		3.4	2.8
16	10	800227	6.14	.7	141.2	37.0	57.9	7.2	6.7	39.5	101.3	114.5	4.3		4.1	4.9
16	11	800227	6.06	.8	136.7	38.7	60.5	6.6	8.9	39.5	108.5	110.3	3.6		3.7	4.9
16	12	800227	6.08	.8	107.3	28.8	44.4	7.2	6.7	31.0	36.7	114.5	5.0		3.0	3.2
17	1	800227	6.27	.5	156.2	35.4	57.9	9.7	20.0	50.8	65.0	154.1	10.0		3.4	3.9
17	2	800227	6.57	.2	215.1	40.3	61.8	8.4	13.3	45.1	128.1	152.0	7.1		3.3	4.0
17	3	800324	5.48	3.3	58.4	29.6	49.6	8.2	31.1	42.3	16.4	112.4	4.6		2.0	3.8
17	4	800324	5.15	7.1	47.9	23.0	50.9	9.7	33.4	39.5	.0	114.5	6.8		1.8	1.6

CODE: FEMUND

DESCRIPTION: Study of 33 lakes in the Femund area, east-central Norway carried out in 1978. Samples collected 15 October - 5 November 1978 were used.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, Al, SO_4, Cl, NO_3N, alkalinity (S. Acid), color.

REFERENCE: Drabløs, D., and I. Sevaldrud. 1980. Acidification trends, changes in use of outfields and acid precipitation in selected areas in northern Hedmark (southeastern Norway). IR 59/80, SNSF-project, 1432 Ås, Norway. (in Norwegian).

OUTLIERS: None

DATA SOURCE: Drabløs and Sevaldrud, 1980.

FILKODE: FEMUND NAVN: DATA FRA NORD-HEDEMARK (REF: DRABLØS). ØSTLANDET DATO: 830124 1

STNUM	LOK	A M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	S.ACID	ES04	EN03	FARG
1	1	781024	5.41	3.9	23.5	13.2	19.6	6.1	6.1	14.1	4.0	39.6	1.8	21.0
1	2	781024	5.00	10.0	20.0	9.0	21.8	3.6	15.6	14.1	2.1	50.0	.7	67.0
1	3	781024	4.89	12.9	8.0	9.0	16.1	5.1	17.8	11.3	1.5	47.9	1.1	6.0
1	4	781029	4.93	11.7	8.0	8.2	15.2	5.1	15.6	11.3	1.5	45.8	2.9	6.0
1	5	781029	4.96	11.0	8.0	9.0	17.4	5.6	16.1	11.3	3.2	45.8	3.2	3.0
1	6	781029	4.73	18.6	14.5	12.3	13.0	2.6	16.7	11.3	7.4	41.6	.7	47.0
2	1	781103	5.23	5.9	16.5	10.7	18.3	7.7	5.0	14.1	-10.0	45.8	5.0	24.0
2	2	781103	5.67	2.1	17.5	9.9	19.6	6.6	3.9	14.1	-18.0	47.9	6.4	18.0
2	3	781103	4.74	18.2	14.5	9.9	17.4	6.6	18.9	22.6	-8.0	62.5	11.4	24.0
2	4	781103	5.32	4.8	14.5	9.9	23.9	9.5	10.0	16.9	-10.0	41.6	1.4	21.0
2	5	781029	5.65	2.2	15.0	12.3	23.1	8.2	3.9	11.3	-12.0	37.5	.7	34.0
2	6	781028	5.55	2.8	15.0	10.7	23.9	7.9	5.6	11.3	-12.0	39.6	1.1	40.0
2	7	781028	5.82	1.5	22.0	14.0	20.9	6.4	4.4	8.5	-21.0	41.6	.7	15.0
2	8	781029	5.64	2.3	30.9	18.1	39.1	16.6	3.3	39.5	-53.0	50.0	.7	57.0
2	9	781028	5.63	2.3	27.9	15.6	28.3	7.9	2.8	19.7	-30.0	45.8	.7	18.0
2	10	781028	5.86	1.4	24.0	14.8	21.8	5.9	2.8	11.3	-25.0	41.6	.7	12.0
3	1	781028	4.83	14.8	12.0	7.4	8.7	8.7	18.9	8.5	8.3	56.2	1.4	12.0
3	3	781021	5.21	6.2	15.5	8.2	9.6	5.6	13.3	5.6	4.9	35.4	1.1	60.0
3	4	781021	5.16	6.9	33.4	14.0	17.4	7.7	16.7	11.3	-7.0	43.7	.7	135.0
4	1	781026	5.17	6.8	16.5	11.5	17.4	13.6	18.3	14.1	-1.6	47.9	.7	71.0
4	3	781026	5.13	7.4	24.5	13.2	13.9	5.1	17.2	8.5	-5.5	47.9	3.6	85.0
4	4	781020	5.05	8.9	13.5	9.0	18.3	5.6	14.5	8.5	-2.2	45.8	.7	44.0
4	5	781020	5.08	8.3	12.5	8.2	11.7	5.1	15.0	5.6	-2.7	39.6	.7	12.0
4	6	781020	5.31	4.9	14.5	9.0	15.2	5.6	11.7	5.6	-12.0	33.3	.7	54.0
4	7	781020	6.28	.5	20.5	7.4	27.0	7.9	7.8	5.6	-68.0	18.7	.7	9.0
4	9	781018	6.18	.6	29.9	7.4	4.3	1.3	14.5	2.8	-49.0	14.6	.7	50.0
4	10	781018	6.35	.4	59.9	21.4	21.8	5.4	7.2	14.1	-58.0	37.5	.7	18.0
4	11	781018	5.22	6.0	21.0	11.5	11.7	7.2	16.7	11.3	-4.7	29.1	.7	37.0
4	12	781018	6.85	.1	157.7	33.7	23.9	10.2	12.2	16.9	-148.0	58.3	.7	34.0
5	1	781027	5.17	6.8	31.9	14.8	26.1	5.6	19.5	14.1	-6.0	56.2	.7	67.0
5	2	781027	6.21	.6	78.3	35.4	32.6	8.4	10.0	14.1	-70.0	47.9	.7	88.0
5	4	781027	6.35	.4	120.8	32.9	34.8	7.7	7.8	28.2	-116.0	39.6	.7	100.0
5	5	781027	6.45	.3	121.8	30.4	34.8	7.7	6.1	28.2	-121.0	34.4	.7	113.0

CODE: NNORGE

DESCRIPTION: Survey of lakes in northern Norway in March 1975, 26 with alkalinity measurements.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, Al, SO_4, Cl, NO3N, alkalinity (ALK 4.5).

REFERENCE: Wright et al. 1977.

FILKODE: REGION NAVN: REGIONALE UNDERSØKELSER - VANN REGIONALE DATA DATO: 830425

BLK	LOK	Å M D R N G	DYP	PH	K20	ENA	EK	ECA	EMG	EAL	ES04	ECL	ENO3	ALK-X
138	1	750328	50	6.61	14.8	44.4	12.3	60.4	54.3	4.4	29.1	16.9	0.0	100.3
138	2	750328	50	7.15	32.0	44.4	15.3	250.0	56.8	1.1	47.9	14.1	0.0	295.9
139	1	750328	50	6.17	31.3	91.8	23.0	160.7	32.3	12.2	62.5	36.7	37.3	150.7
139	2	750328	50	6.21	40.2	99.6	29.9	284.4	115.2	5.6	25.0	19.7	0.0	419.0
143	1	750328	50	6.54	17.1	63.1	4.6	73.4	23.9	2.2	68.7	50.8	1.4	35.7
145	1	750328	50	6.66	29.3	95.7	18.4	162.2	82.3	5.6	35.4	31.0	3.6	240.6
145	2	750321	50	6.43	21.3	74.8	15.3	90.8	65.0	3.3	37.5	31.0	1.4	133.3
145	3	750328	50	6.31	40.7	98.3	22.8	164.2	139.8	18.9	37.5	42.5	1.4	335.7
146	1	750328	50	6.30	15.7	61.3	11.3	66.4	41.1	4.4	31.2	22.6	.7	59.9
146	2	750328	50	6.58	25.5	88.3	15.9	135.2	72.4	4.4	166.6	31.0	2.9	192.8
147	1	750327	50	6.33	29.3	169.6	9.5	53.4	45.2	3.3	58.3	174.9	.7	227.5
149	1	750321	50	6.54	22.3	112.2	5.9	73.9	35.4	1.1	33.3	104.4	0.0	57.7
150	1	750321	50	7.07	42.5	79.2	22.8	304.4	115.2	2.2	75.0	33.9	3.6	379.4
150	2	750321	50	7.13	32.2	67.4	17.6	212.1	81.4	1.1	52.0	36.7	.7	267.4
151	2	750321	50	6.33	22.8	107.4	11.5	41.4	77.3	3.3	52.0	84.6	2.1	74.4
152	1	750321	50	6.78	34.4	106.6	13.8	134.7	90.5	2.2	122.8	132.6	1.4	147.6
155	1	750328	50	6.97	35.8	187.0	19.2	142.7	49.4	6.7	43.7	158.0	.7	163.0
155	2	750328	50	6.92	41.6	217.5	19.4	171.2	62.5	3.3	45.8	180.5	.7	201.0
156	1	750328	50	6.61	42.7	182.7	27.6	91.3	148.1	2.2	158.2	169.3	.7	97.2
156	2	750328	50	7.60	85.2	230.5	10.7	399.2	378.4	2.2	79.1	222.9	.7	651.3
157	1	750321	50	6.43	24.5	109.6	16.1	77.8	59.2	2.2	72.9	73.3	0.0	127.1
158	1	750328	50	7.02	36.1	169.6	8.9	81.3	148.1	3.3	72.9	155.2	0.0	140.6
162	1	750328	50	6.89	56.6	343.6	17.4	126.2	90.5	1.1	79.1	355.4	.7	20.7
164	1	750328	50	6.37	22.9	108.8	6.4	64.4	43.6	2.2	56.2	90.3	.7	46.2
164	2	750328	50	6.53	21.5	99.6	6.6	66.9	39.5	3.3	64.5	81.8	.7	43.0
165	1	750328	50	6.12	20.9	113.1	5.9	38.9	36.2	2.2	52.0	107.2	.7	17.5
165	2	750328	50	6.09	18.3	104.4	4.9	34.4	32.9	6.7	43.7	95.9	2.1	12.0

CODE: REGSVE

DESCRIPTION: Survey of 89 small lakes in southern Sweden conducted in March 1981.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, Al, SO_4, Cl, NO_3N, alkalinity (ALKTIP), organic matter (permanganate consumption).

REFERENCE: Unpublished.

OUTLIERS: None

DATA SOURCE: T. Ahl, personal communication.

COMMENTS: Analytical method overestimates sulfate in highly colored waters. Intercalibration (NIVA-NLU) gives correction values SO_4^* corr. = SO_4^* meas. - (10.7 + 5.6 PERM). Corrected SO_4 values used in all data treatment.

CODE: SVER-A

DESCRIPTION: Survey of 104 lakes in central and northern Sweden sampled in the 1930's and resampled in 1974.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, Al, SO_4, Cl, alkalinity (ALKTIP), color.

REFERENCE: Lohammar, G. 1938. Wasserchemie und höhere Vegetation schwedischer Seen. Symb. bot. Ups. 3.1 Uppsala. Andersson, G. 1977. Chemical changes in lakes in Norrbotten and southwest Dalarna. Limnol. Inst. Univ. Lund (in Swedish).

OUTLIERS: In the resurvey 3 lakes discarded due to disturbance in the catchment.

DATA SOURCE: G. Andersson, personal communication.

FILKODE: SVER-A NAVN: G. ANDERSSONS DATA - DALARNE OG NORRLAND SVERIGE DATO: 830318 1

STNUM	LOK	A M D R N G	PH	EH+	ECA	EMG	ENA	EK	ECL	ALKTIP	ES04	FARG
AO	26	340722	6.80	.1	59.9	29.1	17.0	18.0	44.9	44.00	35.0	
AO	26	740714	7.20	.0	123.8	36.1	37.0	46.0	39.0	122.00	78.0	5.0
AO	27	340722	6.40	.4	34.9	25.1	13.0	31.0	47.9	16.00	40.0	
AO	27	740717	7.60	.0	173.7	41.1	45.0	85.0	41.9	191.00	109.9	17.0
AO	29	340718	7.10	.0	79.8	74.3	65.0	51.0	75.9	161.00	33.0	
AO	29	740712	6.90	.1	96.8	67.2	105.1	101.0	106.9	94.00	160.9	35.0
AP	31	340722	7.00	.1	149.7	62.2	74.0	54.0	109.8	211.00	19.0	
AP	31	740714	7.80	.0	410.2	118.5	202.1	155.0	213.7	527.00	132.9	30.0
AP	46	340715	7.80	.0	199.6	140.5	109.1	59.0	112.8	381.00	14.0	
AP	46	740713	8.30	.0	477.0	193.7	252.1	156.0	278.6	649.00	134.9	15.0
AP	51	340715	6.80	.1	203.6	132.4	117.1	59.0	123.8	326.00	62.0	
AP	51	740713	7.80	.0	489.0	226.8	155.1	166.0	192.7	490.00	331.8	70.0
AP	53	340918	7.00	.1	518.0	206.7	152.1	28.0	75.9			
AP	53	740713	8.40	.0	811.4	293.0	167.1	61.0	244.7	599.00	487.7	45.0
AP	55	340715	7.40	.0	343.3	247.8	135.1	38.0	98.9	534.00	130.9	
AP	55	740713	8.00	.0	873.3	349.3	196.1	66.0	270.6	650.00	544.7	55.0
AP	56	340718	7.90	.0	308.4	206.7	130.1	46.0	134.8	429.00	126.9	
AP	56	740712	7.20	.0	439.1	196.7	376.2	126.0	466.4	364.00	286.8	35.0
AP	59	340718	7.80	.0	243.5	123.5	218.1	138.0	205.7	473.00	44.0	
AP	59	740712	7.80	.0	409.2	189.7	170.1	132.0	198.7	475.00	214.9	25.0
AP	67	340722	7.50	.0	343.3	140.5	235.1	148.0	163.8	689.00	14.0	
AP	67	740714	8.20	.0	783.4	156.5	175.1	126.0	116.8	971.00	159.9	25.0
B	47	340821	7.00	.1	288.4	173.7	117.1	19.0	72.9			
B	47	740715	7.80	.0	434.1	171.6	152.1	46.0	114.8	333.00	332.8	70.0
B	48	340715	7.40	.0	288.4	206.7	135.1	23.0	84.9	456.00	111.9	
B	48	740715	7.30	.0	389.2	186.6	138.1	46.0	118.8	311.00	343.8	50.0
B	49	340715	6.90	.1	298.4	140.5	100.1	21.0	78.9	373.00	107.9	
B	49	740715	6.80	.1	444.1	178.7	149.1	47.0	103.9	328.00	362.8	100.0
B	50	340903	7.00	.1	318.4	206.7	109.1	23.0	53.9			
B	50	740715	7.30	.0	404.2	179.7	164.1	34.0	149.8	303.00	342.8	25.0
B	52	340722	7.60	.0	338.3	173.7	100.1	26.0	84.9	447.00	105.9	
B	52	740713	7.60	.0	481.0	175.6	131.1	40.0	122.8	399.00	313.8	15.0
B	58	340821	7.30	.0	801.4	189.7	91.0	26.0	62.1			
B	58	740715	7.50	.0	597.8	150.5	80.0	17.0	34.0	607.00	200.9	45.0
D	57	340718	7.80	.0	503.0	181.6	87.0	20.0	75.9	498.00	217.9	
D	57	740712	7.80	.0	643.7	181.6	129.1	37.0	94.9	527.00	378.8	20.0
D	60	340718	7.60	.0	478.0	189.7	117.1	22.0	84.9	599.00	122.9	
D	60	740712	7.50	.0	618.8	187.6	145.1	49.0	116.8	578.00	304.8	20.0
D	62	340718	7.90	.0	557.9	181.6	126.1	31.0	89.9	697.00	109.9	
D	62	740712	7.80	.0	673.6	191.7	145.1	58.0	125.8	626.00	317.8	15.0
D	65	340718	8.30	.0	443.1	272.0	148.1	20.0	84.9	625.00	172.9	
D	65	740712	7.20	.0	698.6	266.9	158.1	51.0	197.7	694.00	275.8	25.0
D	68	340908	7.30	.0	716.6	214.8	135.1	22.0	72.9			
D	68	740714	7.70	.0	848.3	222.8	149.1	52.0	139.8	729.00	409.7	10.0
D	71	340717	7.90	.0	602.8	297.0	170.1	36.0	117.8	838.00	149.9	
D	71	740712	7.30	.0	821.4	320.2	224.1	72.0	261.6	852.00	303.8	30.0
D	73	340908	7.10	.0	996.0	230.8	161.1	5.0	98.9			
D	73	740714	7.80	.0	766.5	187.6	409.2	72.0	445.4	694.00	290.8	40.0
D	75	340908	7.30	.0	956.1	264.0	178.1	31.0	103.9			
D	75	740714	8.70	.0	1190.6	293.0	213.1	91.0	260.6	1116.00	401.7	25.0
E	101	350814	6.70	.2	84.8	49.2	26.0	4.0	11.0	149.00	4.0	
E	101	740727	6.50	.3	76.8	41.1	24.0	6.0	22.0	57.00	62.0	40.0
E	103	350811	6.60	.2	69.9	30.1	30.0	5.0	17.0	95.00	23.0	
E	103	740725	6.90	.1	113.8	66.2	57.0	10.0	28.0	123.00	96.9	50.0
E	112	350805	6.80	.1	89.8	49.2	26.0	8.0	22.0	141.00	10.0	

FILKODE: SVER-A NAVN: G. ANDERSSONS DATA - DALARNE OG NORRLAND SVERIGE DATO: 830318 2

STNUM	LOK	Å M D R N G	PH	EH+	ECA	EMG	ENA	EK	ECL	ALKTIP	ES04	FARG
E	112	740728	6.80	.1	100.8	49.2	41.0	9.0	32.0	96.00	69.0	40.0
K	128	350805	6.80	.1	124.8	90.3	48.0	7.0	22.0	234.00	14.0	
K	128	740728	6.80	.1	173.7	87.3	60.0	8.0	32.0	128.00	163.9	135.0
K	129	350810	7.50	.0	124.8	74.3	48.0	12.0	30.9	209.00	19.0	
K	129	740728	9.20	.0	123.8	80.3	59.0	16.0	30.9	156.00	92.9	50.0
K	132	350808	7.00	.1	114.8	99.4	39.0	16.0	25.0	236.00	8.0	
K	132	740727	7.00	.1	165.7	109.4	66.0	20.5	34.0	188.00	135.9	70.0
K	135	350805	6.80	.1	89.8	82.3	44.0	12.0	28.0	179.00	21.0	
K	135	740728	7.30	.0	206.6	121.4	90.0	37.0	37.9	234.00	189.9	60.0
K	153	350808	6.90	.1	213.6	164.6	61.0	5.0	20.0	308.00	44.0	
K	153	740728	6.60	.2	291.4	148.6	68.0	9.0	28.0	275.00	215.9	240.0
K	160	350808	7.00	.1	179.6	90.3	65.0	5.0	22.0	291.00	27.0	
K	160	740728	6.30	.5	250.5	113.4	62.0	10.0	29.0	191.00	204.9	275.0
KU	149	350820	6.60	.2	99.8	49.2	135.1	23.0	50.9	181.00	75.0	
KU	149	740720	7.30	.0	223.6	109.4	148.1	37.0	35.0	236.00	244.8	35.0
KU	156	350726	7.00	.1	119.8	90.3	135.1	21.0	67.9	221.00	77.0	
KU	156	740720	7.20	.0	311.4	158.6	200.1	35.0	33.9	239.00	416.4	55.0
KU	157	350728	6.70	.2	124.8	82.3	178.1	28.0	92.9	224.00	95.9	
KU	157	740721	7.30	.0	225.5	123.5	225.3	16.0	35.9	203.00	353.9	80.0
KU	163	350727	7.00	.1	233.5	148.6	109.1	25.0	58.9	363.00	93.9	
KU	163	740721	7.50	.0	491.0	154.6	140.1	33.0	34.0	381.00	418.7	18.0
L	102	350803	6.20	.6	54.9	58.2	48.0	12.0	34.0	118.00	21.0	
L	102	740722	6.30	.5	73.9	62.2	77.0	16.0	30.9	32.00	160.9	90.0
L	104	350803	6.40	.4	79.8	49.2	48.0	8.0	20.0	142.00	23.0	
L	104	740722	6.80	.1	121.8	75.3	75.0	13.0	30.0	78.00	173.9	70.0
L	105	350802	6.80	.1	74.8	66.2	44.0	13.0	30.9	119.00	48.0	
L	105	740722	6.80	.1	105.8	63.3	58.0	19.0	30.9	69.00	144.9	40.0
L	106	350802	7.10	.0	69.9	49.2	44.0	12.0	30.9	100.00	44.0	
L	106	740723	6.90	.1	99.8	61.2	60.0	20.0	33.9	70.00	133.2	20.0
L	107	350803	6.60	.2	79.8	49.2	44.0	12.0	30.9	110.00	44.0	
L	107	740722	6.70	.2	96.8	62.2	64.0	18.0	32.0	61.00	144.9	35.0
L	108	350729	6.60	.2	89.8	49.2	83.0	21.0	58.9	153.00	31.0	
L	108	740721	7.30	.0	114.8	83.3	112.1	31.0	35.9	194.00	122.9	40.0
L	109	350801	6.50	.3	79.8	58.2	52.0	10.0	25.0	146.00	29.0	
L	109	740722	6.60	.2	126.7	90.3	72.0	15.0	32.0	68.00	198.9	70.0
L	111	350731	6.60	.2	69.9	58.2	56.0	12.0	28.0	131.00	37.0	
L	111	740721	6.80	.1	110.8	69.3	80.0	21.0	32.9	85.00	166.9	80.0
L	122	350731	6.80	.1	104.8	90.3	56.0	18.0	30.9	192.00	46.0	
L	122	740722	6.90	.1	191.6	82.3	73.0	19.0	32.0	172.00	161.9	75.0
L	125	350731	6.60	.2	84.8	66.2	78.0	16.0	37.0	177.00	31.0	
L	125	740722	6.90	.1	102.8	75.3	113.1	22.0	34.0	110.00	162.9	65.0
LS	37	340717	7.40	.0	223.6	74.3	78.0	12.0	61.9	243.00	82.9	
LS	37	740716	7.40	.0	278.4	109.4	104.1	17.0	40.9	212.00	255.8	15.0
LS	38	340917	6.80	.1	233.5	99.4	78.0	9.0	44.9			
LS	38	740716	7.30	.0	282.4	111.4	103.1	18.0	42.9	226.00	257.8	15.0
LS	39	340917	6.80	.1	249.5	107.3	83.0	17.0	55.9			
LS	39	740716	7.30	.0	318.4	112.4	106.1	19.0	40.9	233.00	276.8	10.0
LS	41	340910	7.00	.1	194.6	181.6	100.1	12.0	39.0			
LS	41	740713	7.40	.0	342.3	156.5	122.1	26.0	46.9	323.00	268.8	25.0
LS	42	340910	7.10	.0	263.5	173.7	122.1	16.0	61.9			
LS	42	740713	7.50	.0	342.3	159.6	123.1	32.0	65.9	290.00	296.8	25.0
LS	43	340717	7.60	.0	263.5	123.5	117.1	20.0	69.9	360.00	93.9	
LS	43	740713	7.60	.0	332.3	150.5	124.1	33.0	55.9	293.00	275.8	15.0
LS	44	340917	6.90	.1	333.3	107.3	109.1	12.0	55.9			
LS	44	740716	7.30	.0	344.3	113.4	113.1	17.0	45.9	244.00	299.8	40.0

FILKODE: SVER-A NAVN: G. ANDERSSONS DATA - DALARNE OG NORRLAND SVERIGE DATO: 830318 3

STNUM	LOK	A M D R N G	PH	EH+	ECA	EMG	ENA	EK	ECL	ALKTIP	ES04	FARG
N	119	350816	6.90	.1	149.7	82.3	39.0	9.0	22.0	227.00	31.0	
N	119	740727	7.20	.0	185.6	80.3	50.0	15.0	30.9	219.00	82.9	35.0
N	120	350814	6.80	.1	134.7	49.2	26.0	6.0	17.0	180.00	19.0	
N	120	740727	6.80	.1	166.7	79.3	44.0	13.0	32.0	198.00	69.0	60.0
N	131	350811	6.80	.1	94.8	74.3	39.0	10.0	17.0	178.00	23.0	
N	131	740725	7.20	.0	142.7	84.3	61.0	19.0	30.0	194.00	80.9	30.0
N	133	350816	6.90	.1	119.8	74.3	26.0	5.0	17.0	185.00	23.0	
N	133	740727	6.80	.1	182.6	84.3	43.0	6.0	28.0	188.00	103.9	90.0
N	146	350812	7.10	.0	84.8	74.3	56.0	5.0	14.0	160.00	46.0	
N	146	740725	7.20	.0	137.7	72.2	62.0	8.0	32.9	144.00	99.9	55.0
N	147	350812	6.90	.1	164.7	90.3	35.0	6.0	14.0	247.00	35.0	
N	147	740725	6.90	.1	183.6	82.3	54.0	8.0	27.0	178.00	117.9	90.0
N	148	350815	7.00	.1	179.6	99.4	48.0	8.0	22.0	265.00	48.0	
N	148	740726	7.00	.1	203.6	88.3	55.0	7.0	32.0	228.00	96.9	50.0
N	151	350812	6.80	.1	144.7	74.3	70.0	14.0	28.0	150.00	124.9	
N	151	740726	7.00	.1	185.6	69.3	77.0	10.0	32.9	163.00	140.9	15.0
N	158	350815	7.10	.0	253.5	99.4	56.0	14.0	16.0	343.00	64.0	
N	158	740726	6.80	.1	214.6	96.3	56.0	7.0	30.0	230.00	112.9	70.0
N	159	350816	8.30	.0	233.5	123.5	48.0	14.0	14.0	400.00	5.0	
N	159	740727	7.20	.0	234.5	118.5	61.0	23.0	30.9	294.00	105.9	65.0
OE	110	350801	6.70	.2	94.8	41.1	48.0	12.0	25.0	148.00	23.0	
OE	110	740722	7.20	.0	145.7	73.3	64.0	19.0	30.9	136.00	132.9	70.0
OE	116	350819	6.70	.2	104.8	33.2	56.0	12.0	25.0	160.00	21.0	
OE	116	740724	7.40	.0	146.7	70.3	79.0	20.0	32.9	167.00	122.9	55.0
OE	117	350809	6.60	.2	59.9	58.2	65.0	14.0	28.0	150.00	19.0	
OE	117	740728	9.20	.0	119.8	66.2	60.0	17.0	34.0	100.00	129.9	65.0
OE	121	350804	6.60	.2	109.8	82.3	56.0	18.0	28.0	215.00	23.0	
OE	121	740724	7.00	.1	107.8	83.3	63.0	20.0	32.0	108.00	133.9	40.0
OE	127	350818	6.70	.2	104.8	74.3	74.0	16.0	24.0	222.00	23.0	
OE	127	740724	7.10	.0	159.7	83.3	80.0	24.0	30.0	154.00	158.9	100.0
OE	134	350818	6.80	.1	99.8	90.3	48.0	16.9	25.0	199.00	31.0	
OE	134	740724	7.30	.0	150.7	85.3	68.0	21.0	29.0	140.00	151.9	60.0
OE	137	350804	6.70	.2	114.8	74.3	52.0	13.0	22.0	211.00	21.0	
OE	137	740724	7.00	.1	133.7	86.3	70.0	18.0	30.9	125.00	145.9	120.0
OE	138	350806	6.80	.1	94.8	82.3	52.0	9.0	25.0	188.00	25.0	
OE	138	740723	7.20	.0	180.6	90.3	70.0	10.0	30.9	162.00	146.9	80.0
OE	142	350806	7.00	.1	199.6	82.3	48.0	17.0	28.0	286.00	33.0	
OE	142	740725	7.90	.0	176.6	89.3	67.0	24.0	32.0	195.00	131.9	35.0
R	64	340720	7.70	.0	841.3	58.2	56.0	12.0	41.9	871.00	56.0	
R	64	740717	7.90	.0	1082.8	73.3	128.1	17.0	80.9	976.00	255.8	45.0
R	69	340721	7.80	.0	931.1	49.2	61.0	8.0	64.9	917.00	69.0	
R	69	740717	8.10	.0	1225.5	72.2	83.0	25.0	34.0	1080.00	293.8	10.0
R	70	340721	7.70	.0	916.2	66.2	74.0	10.0	61.9	927.00	78.9	
R	70	740717	7.70	.0	1177.6	82.3	122.1	29.0	53.9	1050.00	314.8	35.0
R	72	340721	8.20	.0	1006.0	74.3	70.0		53.9	1038.00	60.0	
R	72	740717	8.10	.0	1354.3	71.2	109.1	13.0	39.9	1251.00	249.8	15.0
R	74	340721	8.10	.0	931.1	82.3	104.1	14.0	109.8	911.00	111.9	
R	74	740717	8.20	.0	1494.0	89.3	134.1	29.0	115.8	1233.00	409.7	25.0
S	113	350809	6.80	.1	84.8	74.3	39.0	15.0	24.0	170.00	19.0	
S	113	740723	7.10	.0	112.8	76.3	56.0	15.0	30.9	129.00	102.9	15.0
S	123	350807	6.50	.3	94.8	82.3	44.0	5.0	22.0	183.00	21.0	
S	123	740723	6.50	.3	145.7	109.4	82.0	10.0	32.9	100.00	205.9	120.0
S	126	350806	6.90	.1	94.8	66.2	48.0	9.0	22.0	175.00	21.0	
S	126	740723	7.00	.1	141.7	86.3	69.0	12.0	30.9	122.00	146.9	90.0
S	130	350809	6.60	.2	114.8	74.3	48.0	7.0	22.0	199.00	23.0	

FILKODE: SVER-A NAVN: G. ANDERSSONS DATA - DALARNE OG NORRLAND SVERIGE DATO: 830318 4

STNUM	LOK	A M D R N G	PH	EH+	ECA	EMG	ENA	EK	ECL	ALKTIP	ES04	FARG
S	130	740723	6.80	.1	141.7	86.3	64.0	8.0	30.9	106.00	156.9	120.0
S	136	350807	6.80	.1	109.8	82.3	52.0	14.0	27.0	206.00	25.0	
S	136	740723	7.60	.0	179.6	105.4	60.0	16.0	32.9	212.00	116.9	20.0
S	150	350817	7.40	.0	139.7	173.7	56.0	18.0	30.9	337.00	19.0	
S	150	740725	7.20	.0	196.6	146.5	77.0	37.0	32.9	254.00	156.9	55.0
S	152	350807	6.80	.1	129.7	99.4	61.0	7.0	20.0	260.00	17.0	
S	152	740723	6.60	.2	153.7	92.3	64.0	3.0	29.0	120.00	144.9	135.0
SK	30	340715	6.90	.1	134.7	82.3	56.0	9.0	47.9	149.00	84.9	
SK	30	740715	6.80	.1	174.6	81.3	73.0	10.0	37.0	71.00	231.9	80.0
SK	33	340717	7.40	.0	229.5	82.3	70.0	10.0	50.9	272.00	69.0	
SK	33	740715	7.10	.0	286.4	107.3	84.0	17.0	39.0	204.00	253.8	55.0
SK	34	340715	6.50	.3	194.6	90.3	78.0	5.1	72.9	189.00	105.9	
SK	34	740713	6.90	.1	283.4	104.4	93.0	0.0	41.9	106.00	324.8	105.0
SK	35	340715	7.00	.1	179.6	115.4	83.0	12.0	64.9	231.00	93.9	
SK	35	740713	7.70	.0	316.4	157.5	110.1	19.0	41.9	275.00	272.8	60.0
SK	36	340717	7.50	.0	233.5	90.3	74.0	15.0	53.9	276.00	82.9	
SK	36	740712	7.10	.0	312.4	107.3	97.0	19.0	35.9	230.00	265.8	35.0
U	1	340713	5.50	3.2	94.8	49.2	39.0	9.0	47.9	92.00	52.0	
U	1	740718	5.90	1.3	128.7	63.3	67.0	3.0	44.0	5.00	211.9	45.0
U	2	340713	6.70	.2	229.5	90.3	70.0	12.0	61.9	271.00	69.0	
U	2	740718	7.30	.0	369.3	109.4	114.1	14.0	75.9	207.00	326.8	20.0
U	4	340713	7.10	.0	498.0	214.8	104.1	31.0	75.9	618.00	153.9	
U	4	740718	8.30	.0	768.5	192.7	152.1	28.0	94.9	692.00	362.8	30.0
U	6	340713	7.10	.0	806.4	321.1	178.1	41.0	115.8	957.00	273.8	
U	6	740718	8.30	.0	1257.5	345.2	304.2	41.0	252.6	1154.00	559.6	35.0
V	114	350723	6.00	1.0	99.8	49.2	39.0	17.0	30.9	147.00	27.0	
V	114	740730	6.60	.2	140.7	55.2	60.0	26.0	32.9	78.00	162.9	140.0
V	118	350723	6.20	.6	104.8	41.1	39.0	12.0	25.0	147.00	25.0	
V	118	740730	6.60	.2	153.7	54.2	66.0	10.0	30.9	102.00	147.9	130.0
V	139	350724	6.80	.1	134.7	58.2	48.0	17.0	44.9	190.00	23.0	
V	139	740730	7.30	.0	249.5	63.3	68.0	24.0	35.0	205.00	165.9	45.0
V	144	350721	6.90	.1	139.7	74.3	44.0	12.0	34.0	194.00	42.0	
V	144	740730	7.20	.0	204.6	87.3	79.0	28.0	35.0	182.00	179.9	25.0
V	154	350722	7.40	.0	213.6	41.1	26.0	7.0	25.0	236.00	27.0	
V	154	740730	7.40	.0	312.4	55.2	53.0	15.0	32.9	299.00	114.9	25.0
V	155	350724	6.90	.1	233.5	49.2	49.0	12.0	39.0	253.00	52.0	
V	155	740730	7.20	.0	334.3	56.2	67.0	16.0	35.0	234.00	208.9	50.0

CODE: DANSK

DESCRIPTION: Study of 14 lakes in 2 areas of Jutland, Denmark conducted in 1977-79. Data used are means of 24 samples.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, SO_4, NO_3N, alkalinity (S.Acid), color.

REFERENCE: Rebsdorf, A. 1981. Danish lakes threatened by acidification. Rept. 38. Ministry Environ. Copenhagen.

OUTLIERS: None

DATA SOURCE: Rebsdorf, 1981

FILKODE: DANSK NAVN: INNSJØER I DANMARK DANMARK DATO: 830121

STNUM	LOK	Å M D R N G	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	S.ACID	ES04	EN03	FARG
1	1	780101	6.69	.2	214.6	90.5	291.4	20.5		338.5	-65.0	216.5	3.1	13.0
1	2	780101	6.70	.2	234.5	115.2	465.5	30.7		493.7	-56.0	268.6	5.1	11.0
1	3	780101	5.89	1.3	139.7	65.8	234.9	20.5		293.4	-11.0	177.0	4.7	13.0
1	4	780101	5.82	1.5	129.7	98.7	282.8	38.4		361.1	-7.0	245.7	3.6	9.0
1	5	780101	5.19	6.5	109.8	65.8	247.9	23.0		310.3	3.0	177.0	2.9	6.0
1	6	780101	5.09	8.1	134.7	98.7	334.9	20.5		403.4	9.0	206.1	3.4	17.0
1	7	780101	4.99	10.2	139.7	90.5	291.4	20.5		330.1	13.0	235.3	3.7	14.0
1	8	780101	4.46	34.7	64.9	74.0	234.9	28.1		290.6	41.0	195.7	3.4	27.0
1	9	780101	4.17	67.6	69.9	98.7	404.5	25.6		423.1	75.0	249.8	2.0	15.0
2	1	780101	5.59	2.6	179.6	304.4	1235.4	40.9		1387.9	-5.0	412.2	1.1	38.0
2	2	780101	5.43	3.7	149.7	230.3	1065.7	40.9		1173.5	-5.0	343.5	7.2	155.0
2	3	780101	5.02	9.5	109.8	222.1	1022.2	35.8		1117.1	12.0	283.2	3.9	62.0
2	4	780101	4.76	17.4	124.8	263.2	1204.9	38.4		1275.1	24.0	349.8	4.9	38.0
2	5	780101	4.58	26.3	114.8	205.6	917.8	43.5		1001.5	33.0	333.1	5.6	76.0

CODE: SCOTCH

DESCRIPTION: Survey of 77 lakes in the Galloway area, southwestern Scotland conducted in April 1979.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, Al, SO_4, Cl, NO_3N, alkalinity (S. Acid), TOC:

REFERENCE: Wright, R.F., and A. Henriksen 1980. Regional survey of lakes and streams in southwestern Scotland, April 1979. IR 72/80, SNSF-project, 1432 Ås, Norway.

OUTLIERS: None

DATA SOURCE: Wright and Henriksen, 1980.

FILKODE: SCOTCH NAVN: SNSF - SKOTTLAND. EGNE DATA. SKOTTLAND DATO: 830218 1

VANN	A M D R N G	DYP	KOM	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	S.ACID	ES04	EN03	TOC
1	790421	1		4.56	27.5	32.4	46.9	130.9	9.7	17.2	132.6	28.0	118.7	14.3	4.0
2	790421	50		4.54	28.8	22.0	37.0	126.6	6.6	16.7	146.7	25.0	89.5	11.8	1.1
2	790421	1000		4.55	28.2	22.0	37.0	127.5	6.6	16.1	149.5	27.0	89.5	11.8	1.6
3	790421	50		4.60	25.1	33.9	45.2	133.5	8.7	21.7	149.5	23.0	104.1	16.1	3.3
3	790421	300		4.71	19.5	31.9	44.4	136.6	12.5	21.7	149.5	15.0	104.1	17.1	2.9
4	790421	0		4.64	22.9	33.9	45.2	134.8	9.2	22.2	146.7	24.0	112.4	13.9	2.6
5	790421	1		4.72	19.1	38.4	45.2	134.4	6.6	12.2	143.9	18.0	112.4	6.1	3.4
6	790421	1		4.67	21.4	34.9	45.2	138.3	8.7	18.3	149.5	22.0	112.4	10.0	2.5
7	790421	0		5.18	6.6	60.9	66.6	145.3	12.0	10.6	158.0	-1.4	116.6	32.1	2.5
8	790422	0		5.60	2.5	56.9	61.7	147.0	10.0	6.1	163.6	-14.0	106.2	1.1	5.1
9	790422	0		5.10	7.9	37.4	50.2	130.5	9.7	7.8	143.9	3.1	102.0	1.1	3.7
10	790422	1		5.38	4.2	72.4	71.6	150.9	11.3	13.9	169.3	-8.3	112.4	23.2	5.7
11	790420	50		4.53	29.5	56.9	54.3	166.2	11.5	34.5	186.2	34.0	139.5	23.2	5.5
11	790420	400		4.55	28.2	56.4	54.3	164.9	11.8	36.7	186.2	32.0	135.3	23.6	5.7
12	790420	0		4.42	38.0	52.4	54.3	157.0	7.9	28.4	177.7	41.0	135.3	26.8	4.0
13	790420	50		5.25	5.6	100.3	74.9	157.5	11.0	24.5	231.3	-6.0	152.0	10.0	6.5
13	790420	300		5.24	5.8	99.3	75.7	201.0	11.0	23.9	231.3	-4.3	152.0	10.4	6.9
14	790423	1		5.98	1.0	159.7	143.1	289.3	21.7	9.5	344.2	-54.0	177.0	29.3	10.8
15	790423	1		5.48	3.3	108.3	120.9	261.9	12.0	25.0	310.3	-15.0	172.8	16.4	10.5
16	790423	1		5.83	1.5	129.2	124.2	250.6	17.9	5.6	304.7	-30.0	156.1	30.7	9.9
17	790423	1		5.08	8.3	91.3	83.9	225.8	11.5	17.8	259.5	3.8	156.1	.7	5.7
18	790423	0		4.93	11.7	57.9	60.0	157.9	10.7	21.7	177.7	7.0	120.8	22.8	2.7
19	790423	1	B	4.78	16.6	71.4	63.3	184.4	8.9	26.1	197.5	15.0	133.2	26.1	4.0
20	790423	0		4.95	11.2	53.4	51.8	131.4	9.2	31.1	138.2	8.5	93.7	43.6	1.7
21	790423	50		4.96	11.0	38.4	53.5	129.6	11.8	32.8	138.2	7.4	91.6	46.4	.9
21	790423	2000		4.99	10.2	39.4	54.3	125.7	11.8	34.5	138.2	9.1	93.7	46.8	1.3
22	790423	0		4.86	13.8	45.9	52.6	130.5	8.7	32.8	143.9	12.0	102.0	38.6	2.5
23	790422	1		5.76	1.7	99.8	98.7	261.4	16.9	20.6	327.2	-34.0	112.4	.7	9.7
24	790422	1		5.91	1.2	81.8	63.3	155.7	7.9	43.9	174.9	-29.0	116.6	7.9	3.6
26	790422	0		5.25	5.6	66.4	68.3	174.4	8.7	10.6	191.8	-3.5	139.5	.7	4.6
27	790422	0		5.97	1.1	79.3	72.4	161.8	9.2	5.0	172.1	-33.0	127.0	1.1	3.8
29	790422	1		4.85	14.1	47.9	50.2	146.6	5.4	11.1	174.9	13.0	99.9	.7	4.8
30	790422	0		5.77	1.7	49.9	63.3	143.5	11.3	7.2	149.5	-22.0	97.9	2.9	3.8
31	790422	1		5.83	1.5	53.4	65.0	147.5	11.0	5.0	152.3	-20.0	110.3	.7	3.9
32	790422	1		5.99	1.0	66.4	67.5	154.0	9.7	6.1	163.6	-32.0	116.6	1.1	5.0
33	790422	1		5.85	1.4	58.9	65.0	145.7	9.5	5.6	160.8	-19.0	108.3	6.1	2.6
34	790422	1		5.86	1.4	93.3	66.6	153.1	9.2	10.6	186.2	-28.0	120.8	9.3	5.8
39	790421	0		4.42	38.0	32.9	51.8	148.3	10.7	41.1	158.0	39.0	127.0	35.0	2.8
40	790423	1		5.03	9.3	48.4	61.7	164.0	11.3	10.6	208.8	-.2	97.9	.7	3.9
42	790421	1		4.76	17.4	43.9	57.6	144.0	7.9	14.5	158.0	14.0	122.8	11.4	1.9
43	790421	0		4.80	15.8	40.4	52.6	134.8	6.9	22.2	155.2	12.0	104.1	20.3	2.3
44	790421	0		4.76	17.4	39.4	52.6	141.8	10.0	29.5	155.2	13.0	116.6	27.1	2.4
45	790421	0		4.47	33.9	25.0	46.1	139.6	8.4	29.5	143.9	34.0	112.4	18.6	2.8
46	790421	1		4.44	36.3	14.0	37.0	111.4	6.1	5.6	135.4	34.0	75.0	1.1	6.3
48	790423	1		6.55	.2	192.1	141.5	167.5	13.8	14.5	183.4	-160.0	127.0	30.7	11.1
49	790423	1		6.59	.2	178.6	127.5	163.6	13.3	7.2	189.0	-132.0	129.1	30.7	7.6
50	790423	1		5.73	1.9	163.2	94.6	193.1	10.7	16.7	211.6	-10.0	191.5	65.7	3.4
52	790423	1		5.77	1.7	210.6	116.0	234.9	7.7	32.2	231.3	-21.0	249.8	44.3	4.1
53	790423	1		6.50	.3	217.6	133.3	261.9	25.3	5.6	251.1	-40.0	208.2	37.1	5.1
56	790420	1		6.50	.3	282.4	146.4	304.1	15.3	15.0	349.8	-95.0	229.0	60.7	6.7
57	790420	1		5.02	9.5	97.3	72.4	211.8	5.9	37.8	222.9	5.1	177.0	4.3	5.8
58	790423	1		6.35	.4	176.1	88.0	192.3	13.3	2.8	256.7	-84.0	145.7	3.9	2.7
59	790423	1		6.08	.8	176.1	129.1	241.0	18.4	10.0	282.1	-53.0	208.2	11.1	4.8
74	790423	0.		6.23	.5	166.2	153.0	294.5	32.2	7.8	332.9	-59.0	174.9	36.4	10.2
76	790423	1		5.69	2.0	185.1	143.1	274.0	16.9	17.8	316.0	-55.0	166.6	50.0	16.7
78	790423	1		6.11	.7	152.2	146.4	348.9	16.1	6.7	392.1	-68.0	156.1	1.4	11.9
79	790423	1		4.39	40.7	76.8	65.8	193.6	14.6	26.7	214.4	50.0	154.1	.7	10.0

CODE: VOSGES

DESCRIPTION: Sampling of 9 high-elevation lakes in the Vosges Mountains, eastern France, December 1981.

PARAMETERS USED: pH, cond., Na, K, Ca, Mg, Al, SO_4, Cl, NO_3N, alkalinity (ALK 4.5).

REFERENCE: Unpublished

OUTLIERS: None

DATA SOURCE: R.F. Wright

FILKODE: VOSGES NAVN: INNSJØER I VOSGES FJELLENE, ALSACE FRANKRIKE DATO: 830121

VANN	A M D R N G	NAVN	PH	EH+	ECA	EMG	ENA	EK	EAL	ECL	ALK-X	ES04	EN03
1	811222	CORBEA	4.91	12.3	60.4	24.7	52.6	9.5	51.2	39.5	.0	102.0	52.1
2	811222	BLANC	6.76	.1	162.7	51.8	80.9	12.0	1.1	64.9	106.5	108.3	28.6
3	811222	LUPE	6.57	.2	121.3	60.9	66.6	11.0	3.9	59.2	74.4	91.6	37.1
4	811222	BLANCH	5.86	1.4	85.3	47.7	47.8	6.4	7.2	36.7	10.9	93.7	46.4
5	811222	LONGEM	6.65	.2	173.2	86.4	211.8	13.3	2.2	208.8	107.5	122.8	45.7
6	811222	LISPAC	5.40	4.0	81.8	43.6	97.0	10.2	22.2	93.1	6.4	112.4	37.1
7	811222	RETOUR	6.57	.2	180.6	94.6	182.7	8.4	2.2	183.4	143.5	108.3	45.0
8	811222	NOIR	6.76	.1	159.2	50.2	78.7	11.0	1.1	62.1	96.1	118.7	29.3
9	811222	LAUCH	6.76	.1	162.2	65.8	98.7	9.5	1.1	50.8	186.6	75.0	32.1