Nova Scotia Lake Hypolimnion Project

Prepared by

M. Brylinsky
Acadia Centre for Estuarine Research
Acadia University
Wolfville, Nova Scotia
B0P 1X0

For

Nova Scotia Department of Agriculture and Fisheries

January 2002

Publication No. 67 of the Acadia Centre for Estuarine Research

SUMMARY

A major limiting factor for book trout (*Salvelinus fontinalis*) in Nova Scotia is the presence of suitable cold-water habitat during summer. In an attempt to develop a model that could be used to predict the type of lake most likely to contain cold-water fish habitat during summer, 20 lakes distributed over a wide geographic area within Nova Scotia were surveyed during July and August 2001. The lakes were chosen on the basis of data contained in the Province's lake survey database, and included 11 lakes that contained cold-water habitat and 8 lakes in which cold-water habitat was absent during the time of the original survey. Suitable cold-water habitat was defined as water temperature ≤15 °C and dissolved oxygen saturation ≥50 %. The major parameters measured during the 2001 survey were indices of trophic state (total phosphorus concentration, chlorophyll *a* concentration and Secchi Disk depth), and water temperature and dissolved oxygen depth profiles.

The results indicate that there was relatively little difference between the July and August surveys in determining the status of a lake with respect to the presence of cold-water habitat. There was, however, considerable difference between the status of the lakes based on the original survey data, some of which was collected more than 25 years ago, and the data obtained during the 2001 surveys. Only two of the lakes surveyed during 2001 contained suitable cold-water habitat. It was not possible to determine conclusively, based on the data available, if these changes are a result of changes in trophic state or other factors.

The two lakes that contained suitable cold-water habitat during 2001 were the deepest lakes surveyed. This suggests that an important factor in determining the presence of cold-water habitat is the relative proportions of the epilimnetic and hypolimnetic volumes, a factor that was not fully appreciated when this study was initiated.

Nova Scotia Lake Hypolimnion Project

1. Background

The Nova Scotia sport fishery is estimated to be worth approximately $57 million per year in direct and indirect expenditures (2000 Sport Fishery Summary, Inland Fisheries Division, Nova Scotia Department of Agriculture and Fisheries, unpublished data). The brook trout (*Salvelinus fontinalis*) is one of the most important freshwater sport fish in Nova Scotia, and considerable effort is expended by various agencies to maintain and enhance this species. Particularly important in this respect is the stocking of hatchery reared brook trout by the Nova Scotia Department of Agriculture and Fisheries. In 2000, more than 300,000 fingerling and 195,000 yearling brook trout were stocked into about 400 freshwater systems (Inland Fisheries Division 2000).

Brook trout require cool, well-oxygenated water to survive (Scott and Scott 1988). Although they can withstand water temperatures as high as 24-27 ^{o}C for short periods, the ideal temperature range is 12-14 ^{o}C and they tend to avoid waters warmer than 20 ^{o}C. Dissolved oxygen levels must also be high and brook trout are seldom found in waters having dissolved oxygen levels less than 5.0 mg/l (Lagler 1956; Bennett 1970), which at 20 ^{o}C is equal to about 50% dissolved oxygen saturation. Existing data on water temperatures (Inland Fisheries Division, Nova Scotia Department of Agriculture and Fisheries, unpublished data) suggests that the waters of many lakes, as well as many of the Province's rivers, warm to levels unsuitable for brook trout during the late summer months. In these instances, in order to survive, brook trout must migrate to areas of cooler water, typically located in small shaded tributaries or in the deep water (hypolimnion) of stratified lakes. Identification of these cold-water habitats, as well as their status in terms of temporal change, is important for both the maintenance and enhancement of brook trout within the Province. This is especially true with respect to the lakes chosen for stocking of fingerlings, since it is necessary that cold-water refugia be available if these are to survive to the adult stage.

The extent of well-oxygenated, cold-water refugia present in the deeper, stratified lakes of the province is not well known. Although considerable data has been collected over the last several decades as part of the Province's lake survey program, it has never been adequately analyzed to determine which lakes contain cold-water habitat, or if it possible to predict, based on the existing data, the type of lake most likely to contain cold-water refugia suitable for brook trout. The main objective of this study was to carry out a preliminary study to determine the potential for development of a predictive model that could be used to select lakes having suitable cold-water habitat for brook trout during the summer months. This would allow a greater probability for success of enhancement activities, particularly the stocking of hatchery fish.

In order to do this, a number of issues had to be addressed with respect to the adequacy and validity of the current database. Most importantly, it is necessary to know (1) if data obtained during the earlier survey years, often more than 25 years ago, still accurately describes the status of a lake with respect to water temperatures and dissolved oxygen levels, and (2) the amount of difference, if any, between bottom water temperatures and dissolved oxygen levels for surveys carried out during different months of the summer, particularly July and August.

2. Approach

There are about 6,700 lakes in Nova Scotia having a surface area larger than one hectare. Many of these lakes are deep enough to stratify (generally >3 m for brown-water lakes and >6 m for clear-water lakes) and potentially contain cold water within and below the thermocline that could serve as refugia for brook trout during summer. The Inland Fisheries Division of the Nova Scotia Department of Agriculture and Fisheries has conducted surveys on about 15% of the lakes in the Province. The surveys are typically conducted during a one or two-day period, in most cases during the summer months. The information collected includes, among other parameters, lake bathymetry, surface and bottom water temperatures and dissolved oxygen concentrations, and fish species present. Although the surveys provide a good assessment of the habitat conditions for brook trout at one point in time during the summer, changes in habitat conditions over the summer period are not assessed, and there is no indication of the degree of increase in temperature, or decline in dissolved oxygen level, within the hypolimnion once water column stratification is established.

In order to determine the degree of change that may be occurring in the thermal and dissolved oxygen characteristics during late summer, 20 lakes, widely distributed over four geographic areas within the Province, were selected from a database containing 1080 lakes. The initial selection criteria were: (1) the survey had to be carried out during either July or August (this is the time at which water column stratification is strongest and hypolimnion dissolved oxygen concentrations are the lowest); (2) the maximum depth of the lake had to be μ 6 m (to ensure sufficient hypolimnetic volume to serve as cold-water refugia); and (3) the bottom water temperature had to be [15 °C. A total of 300 (16.7%) of the 1080 lakes surveyed met these criteria. These lakes were then divided into 93 ‘good’ and 207 ‘poor’ lakes based on the level of dissolved oxygen saturation in the bottom waters, ‘good’ lakes being those having values μ 50 % and ‘poor’ lakes having values < 50 %. These lakes are listed in Appendix 1.

Of the 300 lakes, 20 were selected to be re-surveyed, five from each of the following areas: Southern Cape Breton, Eastern Shore, Central Nova Scotia and Southwestern Nova Scotia (Figure 1). Eight of the lakes were classified as ‘poor’ and eleven were classified as ‘good’ with respect to the presence of cold-water habitat. Table 1 summarizes the morphological characteristics of the lakes chosen for the survey.

Each lake was surveyed two times, once during July and once during August. The following parameters were measured during each survey: Secchi Disk depth, temperature and dissolved oxygen at one meter depth intervals, pH, conductivity, chlorophyll *a* concentration, surface and bottom water total phosphorus concentration, and true color.

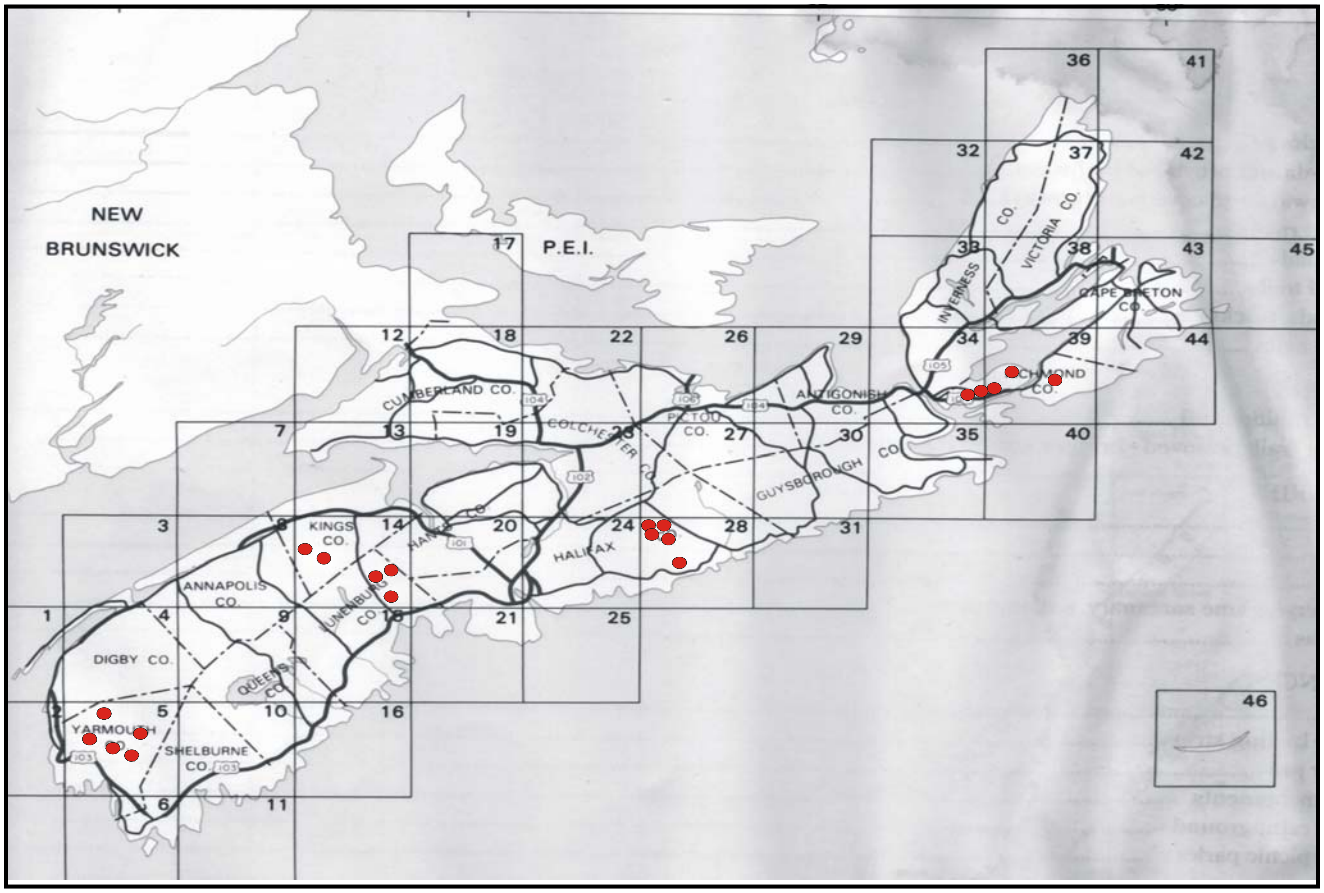

Figure.1 Location of lakes surveyed during July and August 2001.

Table 1. Morphological and other characteristics of the lakes chosen to be re-surveyed in 2001.

Lake	Geographic Area*	Habitat Status	N.S. Mapbook Code	Drainage Basin Area (ha)	Volume (m^3)	Flushing Rate (times/yr)	Maximum Depth (m)	Mean Depth (m)	Surface Area (ha)	Shoreline Length (m)	Shoreline Development	Headwater Lake
Condon	CB	Good	39C4	93	1305679	0.6	15	4.2	31	4277	2.2	Y
Cook	CB	Poor	39B3	271	2270800	0.8	12	2.8	79.7	5148	1.6	Y
Cranberry	CB	Good	39B3	425	340400	8.7	6	2.6	13.2	2010	1.6	N
Long	CB	Good	39B3	348	4700600	0.5	16	6.6	71.1	5628	1.9	Y
MacKay	CB	Poor	39B3	207	2241300	0.6	18	6.1	36.9	2814	1.3	Y
Birch	CNS	Good	14A2	223	962000	1.6	12	3.5	27.5	3310	1.8	Y
Harris	CNS	Poor	14D4	8379	3225600	18.2	11	4.5	71.1	5436	1.8	N
Lewis	CNS	Poor	14D3	708	2822100	1.8	12	3.7	75.3	8300	2.7	Y
Millet	CNS	Poor	14E5	1281	6620677	1.6	23	9.6	68.7	4900	1.7	N
South Twin	CNS	Good	14B3	597	542186	7.9	10	2.9	18.6	4100	2.7	Y
Southwest	ES	Good	28C2	763	11504500	0.6	16	5.7	203.1	5835	1.2	N
Philip	ES	Good	28B2	76	578200	1.2	11	2.9	19.8	2213	1.4	N
Scraggy	ES	Poor	28A2	4237	-	1.8	13	-	644.5	52558	5.8	N
Horseshoe	ES	Good	28A2	152	352500	3.9	8	1.4	25.9	2616	1.5	N
Bare Rock	ES	Good	28B2	90	1011700	0.8	11	3.7	27.4	2817	1.5	Y
Ogden	SWNS	Good	05B1	25034	11674510	17.2	18	4.4	263.8	17424	3	N
Moses	SWNS	Poor	05C3	1429	3801186	3	13	4.8	78.9	4546	1.4	N
Fr. Clearwater	SWNS	Poor	05B3	-	-	-	24	-	118.8	6030	1.6	Y
Biggars	SWNS	Poor	05C3	-	2787057	-	10	1.9	149.9	8100	1.9	N
Agard	SWNS	Good	05A3	11908	1376121	64.9	8	3	45.8	4039	1.7	N

CB – Southern Cape Breton; CNS – Central Nova Scotia; ES – Eastern Shore; SWNS – Southwest Nova Scotia.

3. Field and Laboratory Methods

One sampling station was established over the deepest part of the lake. Water temperature, conductivity, dissolved oxygen and pH vertical profiles were measured at 1 m depth intervals with a Horiba U-10 Water Quality meter. Water samples for dissolved oxygen measurements were also collected from the middle of the epi-, meta- and hypolimnion with a Van-Dorn water sampler, and transferred into 300 ml BOD bottles and fixed in the field. Analysis of dissolved oxygen was carried out using the Winkler procedure (American Public Health Association 1989). These measurements were used to calibrate the Horiba U-10 Water Quality dissolved oxygen sensor.

Water transparency was measured using a 20 cm diameter Secchi Disk. True color was measured using the platinum-cobalt standard procedure as described in the Environment Canada Analytical Methods Manual (1979) using lake water filtered through Watman GF/C filters.

Water samples for total phosphorous analyses were collected from the middle of the epilimnion and from 1 m above the bottom in 500 ml acid washed polyethylene bottles and stored refrigerated until analysis. Samples were analyzed, generally within 24 hr of sample collection, using the molybdate-blue method as described in Wetzel and Likens (1990).

Samples for phytoplankton chlorophyll *a* measurements were collected from the epilimnion in 1-liter polyethylene containers and stored refrigerated until analysis (usually within 24 hr of collection). The samples were filtered through Watman GF/C filters under gentle vacuum (<20 mm Hg). Chlorophyll was extracted from the filters by adding 15 ml of 90 percent acetone and storing the sample refrigerated in the dark for 24 hr. After extraction the samples were centrifuged at 2500 rpm for 5 min, decanted into a 5 cm pathlength cuvette and absorption measured spectrophotometrically at 665 and 750 nanometers before and after acidification with 0.1 ml of 10 percent HCl. Chlorophyll *a* concentration was calculated according to the equations presented in Likens and Wetzel (1990).

4. Results

Appendix II contains a listing of all the data collected during the July and August surveys. Appendix III contains depth profiles of water temperature, dissolved oxygen concentration and percent dissolved oxygen saturation for the July and August 2001 surveys. Table 2 provides a comparison of the values of a number of selected parameters obtained during the original survey and the July and August 2001 surveys.

Comparison of the data collected during the July and August 2001 surveys shows there was relatively little change in hypolimnion temperature and dissolved oxygen values between these two periods. Although all of the lakes had higher water temperatures and lower dissolved oxygen values within the hypolimnion during August compared to July, the difference in all cases was relatively small. This indicates that surveys conducted during July will generally yield the same results as those conducted in August in terms of determining the presence of cold-water habitat. Apparently, once water column stratification is established, which generally occurs during late spring in Nova Scotia lakes, little heat is transferred to water located below the thermocline. In addition, the subsequent decrease in hypolimnion dissolved oxygen levels typical of stratified lakes probably occurs largely during the early summer months, with relatively little further decrease as summer progresses.

There is, however, considerable difference between the data obtained during the original lake surveys and that of the 2001 surveys. Based on the original survey data, of the 20 lakes selected for re-survey, 11 were classified as ‘good’ and 9 as ‘poor’ with respect to the availability of cold-

Table 2. Comparison of values of selected parameters for each survey.

Lake	Survey Date	Water Temp. (°C)		Dissolved O_2 (mg/l)		% DO Saturation		pH	Color (NTUs)	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)		Secchi Depth (m)	Habitat Status
		Surface	Bottom	Surface	Bottom	Surface	Bottom				Surface	Bottom		
Condon	05-08-77	20.0	10.0	10.0	6.0	109.1	52.7	6.9	-	-	-	-	-	Good
"	11-07-01	20.3	9.0	7.7	3.8	85.3	33.4	-	10	2.1	10.0	15.9	4.1	Poor
"	07-08-01	23.1	10.4	8.4	1.9	97.3	16.6	6.5	10	2.3	12.4	19.4	4.7	Poor
Cook	30-07-74	18.5	8.0	-	3.0	-	25.1	-	-	-	-	-	-	Poor
"	11-07-01	20.7	8.9	7.8	0.8	86.0	6.6	5.9	10	2.1	15.9	30.0	2.8	Poor
"	07-08-01	23.4	9.0	8.0	0	92.9	0	7.0	10	5.2	12.4	41.8	2.8	Poor
Cranberry	31-07-74	19.0	11.0	9.0	6.0	96.2	53.9	6.4	-	-	-	-	-	Good
"	11-07-01	21.4	15.0	7.4	0.2	82.8	2.1	6.5	20	11.9	24.1	35.9	2.2	Poor
"	07-08-01	23.8	15.8	7.8	0.2	91.8	2.3	6.3	30	1.1	43.5	29.4	2.7	Poor
Long	05-08-74	20.5	8.0	9.0	10.0	99.2	83.7	6.5	-	-	-	-	-	Good
"	11-07-01	20.2	10.9	7.6	5.4	83.7	48.2	5.1	10	0.0	15.9	8.2	2.4	Poor
"	07-08-01	23.2	11.6	8.1	3.3	93.8	30.4	6.2	10	3.0	14.7	43.5	3.4	Poor
MacKay	27-07-74	20.5	9.5	8.0	5.0	88.1	43.4	6.6	-	-	-	-	1.1	Poor
"	11-07-01	21.7	9.1	8.1	6.3	91.7	54.2	5.7	20	2.3	7.1	8.8	2.5	Good
"	07-08-01	23.7	9.5	8.2	4.4	95.9	38.0	6.4	20	5.0	13.5	34.7	4.0	Poor
Birch	26-07-76	20.5	6.0	8.0	7.0	88.1	55.7	6.5	-	-	-	-	1.9	Good
"	18-07-01	20.7	5.9	7.5	1.4	82.5	11.5	5.5	70	0.0	26.5	11.8	2.1	Poor
"	15-08-01	23.4	6.3	7.4	0.0	86.0	0.0	6.0	60	3.3	17.6	36.5	1.7	Poor
Harris	15-07-80	18.0	13.0	7.0	2.0	73.3	18.8	5.8	-	-	-	-	2.0	Poor
"	18-07-01	21.3	10.9	7.8	0.9	86.9	8.4	5.3	70	4.0	18.2	113.5	1.8	Poor
"	15-08-01	23.0	11.2	6.8	0.0	78.8	0.0	5.2	60	4.0	20.0	55.9	2.2	Poor
Lewis	09-0780	19.0	10.5	8.4	5.0	89.8	44.4	6.3	-	-	-	-	1.7	Poor
"	18-07-01	22.5	11.5	7.6	2.7	87.0	24.3	5.4	8.0	3.5	22.4	41.8	1.3	Poor
"	15-08-01	22.6	10.7	6.7	0.0	77.2	0.0	5.0	60	2.0	20.6	101.8	1.4	Poor
Millet	29-08-00	23.0	8.0	7.2	0.4	83.3	3.3	6.1	-	-	-	-	2.3	Poor
"	18-07-01	21.2	8.1	7.9	7.6	88.1	63.5	5.3	60	4.8	18.2	17.6	1.9	Good
"	15-08-01	23.3	8.5	7.7	6.1	89.1	51.9	6.2	20	3.6	18.8	46.5	2.2	Good
South Twin	21-07-81	23.5	8.8	8.0	7.4	93.4	63.1	6.2	-	-	-	-	2.3	Good
"	18-07-01	22.0	7.3	8.4	0.3	95.8	2.2	5.5	30	2.9	14.1	11.8	3.1	Poor
"	15-08-01	25.0	7.0	7.2	0.0	86.8	0.0	6.2	10	2.0	18.2	25.3	2.7	Poor
Southwest	07-08-75	23.0	8.0	10.0	6.0	115.7	50.2	6.7	-	-	-	-	-	Good
"	25-07-01	22.5	9.4	7.8	6.1	89.5	52.5	5.6	10	1.1	7.1	10.0	4.0	Good

Lake	Survey Date	Water Temp. (°C)		Dissolved O_2 (mg/l)		% DO Saturation		pH	Color (NTUs)	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)		Secchi Depth (m)	Habitat Status
		Surface	Bottom	Surface	Bottom	Surface	Bottom				Surface	Bottom		
"	22-08-01	22.7	9.3	7.5	4.3	86.3	37.1	6.1	10	-	7.6	22.9	3.7	Poor
Philip	30-06-75	22.5	9.0	11.0	7.0	126.0	60.0	6.6	-	-	-	-	-	Good
"	25-07-01	23.1	8.9	8.0	3.2	92.6	27.4	5.5	10	0.9	5.9	18.2	4.5	Poor
"	22-08-01	22.6	9.3	7.9	1.4	90.6	12.0	5.5	10	-	5.3	20.0	4.8	Poor
Scraggy	05-10-00	27.0	10.0	9.0	5.0	112.1	43.9	6.6	-	-	-	-	-	Poor
"	25-07-01	22.5	10.2	8.1	4.1	93.3	36.6	5.1	10	0.1	10.0	33.5	2.3	Poor
"	22-08-01	22.5	10.0	8.0	2.1	91.4	18.3	5.0	20	-	18.8	22.9	3.2	Poor
Horseshoe	18-07-75	27.0	9.0	8.0	9.0	99.6	77.2	6.6	-	-	-	-	3.0	Good
"	25-07-01	23.0	9.6	7.9	0.5	90.9	4.3	5.6	10	1.7	14.7	31.2	3.0	Poor
"	22-08-01	23.5	9.7	7.7	0.0	89.6	0.0	5.6	10	-	21.2	34.7	2.9	Poor
Bare Rock	31-07-75	22.0	9.0	10.0	7.0	113.5	60.0	6.0	-	-	-	-	4.2	Good
"	25-07-01	22.8	9.2	8.3	4.7	95.1	40.6	4.9	40	2.0	10.0	24.1	2.3	Poor
"	22-08-01	23.4	9.3	8.1	3.1	94.8	26.5	5.1	30	-	15.9	19.4	2.4	Poor
Ogden	09-07-86	20.4	10.8	8.0	6.0	87.8	53.7	6.0	-	-	-	-	1.3	Good
"	01-08-01	23.6	13.1	8.1	3.2	95.1	29.9	6.6	50	7.9	29.4	85.9	2.2	Poor
"	27-08-01	21.9	12.8	6.8	1.3	77.3	12.3	5.9	30	1.4	31.8	97.6	1.8	Poor
Moses	17-07-79	23.0	11.0	7.0	3.0	81.0	27.0	6.4	-	-	-	-	2.0	Poor
"	01-08-01	22.5	11.0	8.0	3.1	91.3	27.7	6.0	40	3.3	22.4	11.8	2.2	Poor
"	27-08-01	21.6	11.4	7.2	1.5	80.6	13.8	5.3	40	4.7	7.6	11.2	2.0	Poor
Fr. Clearwater	21-08-89	19.5	7.0	9.0	5.0	97.2	40.8	-	-	-	-	-	-	Poor
"	01-08-01	23.0	11.2	8.3	5.9	95.6	53.0	6.4	5	-	14.7	18.8	6.1	Good
"	27-08-01	22.0	12.3	7.5	5.2	85.7	48.6	5.6	10	2.3	10.0	10.0	4.5	Poor
Biggars	07-08-89	20.0	15.0	4.6	3.2	50.2	31.5	6.1	-	-	-	-	-	Poor
"	01-08-01	22.2	11.5	7.8	0.4	88.5	4.1	5.8	50	2.1	22.4	28.8	2.0	Poor
"	27-08-01	21.8	11.6	7.7	0.0	87.5	0.0	6.0	20	2.4	17.1	18.2	2.0	Poor
Agard	17-07-81	18.2	12.1	9.0	6.0	94.7	55.3	5.8	-	-	-	-	1.7	Good
"	01-08-01	22.5	12.5	7.6	0.1	86.8	0.5	6.6	80	4.1	34.1	47.1	1.5	Poor
"	27-08-01	21.7	13.0	6.9	0.0	77.3	0.0	5.8	50	2.1	22.4	28.8	1.6	Poor

water habitat. Based on the data collected during the 2001 surveys, all of the ‘good’ lakes would now be classified as 'poor', i.e., none of the lakes re-surveyed contain suitable cold-water habitat. This is a surprising, and somewhat worrisome, result. In addition, two lakes, Millet and French Clearwater, classified as 'poor' lakes based on the original survey data, appear to be 'good' lakes based on the 2001 survey data. In the case of French Clearwater Lake, its originally 'poor' classification was somewhat borderline, due to a marginally low dissolved oxygen level, and in 2001 it was slightly higher which resulted in its classification as 'good'. In the case of Millet Lake, its original classification as a 'poor' lake was the result of a very low dissolved oxygen level reported for the bottom waters, which may be the result of an error in measurement during the original survey.

The only two lakes that have marginally good habitat, based on the 2001 survey data, are Millet and French Clearwater. The main characteristic that separates these two lakes from the others is their depth (Table 1).

Even if the criterion for a 'good' lake is expanded to include cold, oxygenated water within the thermocline, no additional lakes contain suitable cold-water habitat in August (Table 3).

Table 3. Water column depths having temperatures ≤15 °C and dissolved oxygen saturation ≥50 %

Lake	Maximum Depth (m)	Water Column Depths	
		July	August
Condon	15	7 m	
Long	16	6-6.5 m	
MacKay	18	7-10 m	
Millet	23	5-14 m	7-15 m
Phillip	11	5-6 m	
Bare Rock	11	6-7 m	
Scraggy	13	7-8 m	
Southwest	16	6-15 m	
French Clearwater	24	8-15 m	9 m

The differences observed between classification of the lakes based on the original survey and that of the 2001 surveys are largely a result of changes in the levels of dissolved oxygen as opposed to water temperature. With few exceptions bottom water temperatures were very similar during the original and 2001 surveys (Table 2 and Figure 2) indicating that little difference existed in the

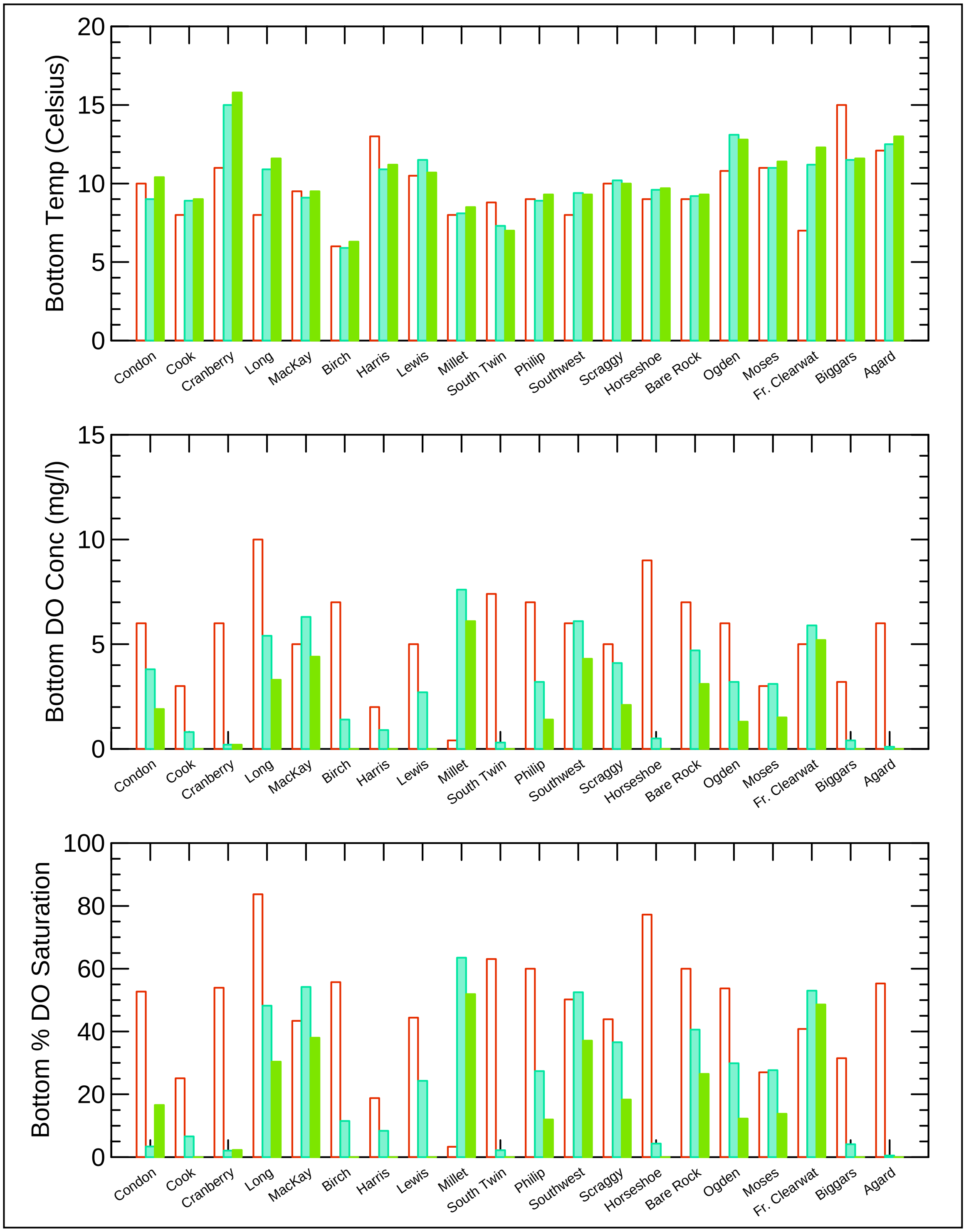

Figure 2. Comparison of bottom water temperature, dissolved oxygen concentration and percent dissolved oxygen saturation measured on each survey date (order of bars from left to right is: original survey; July 2001 survey; August 2001 survey).

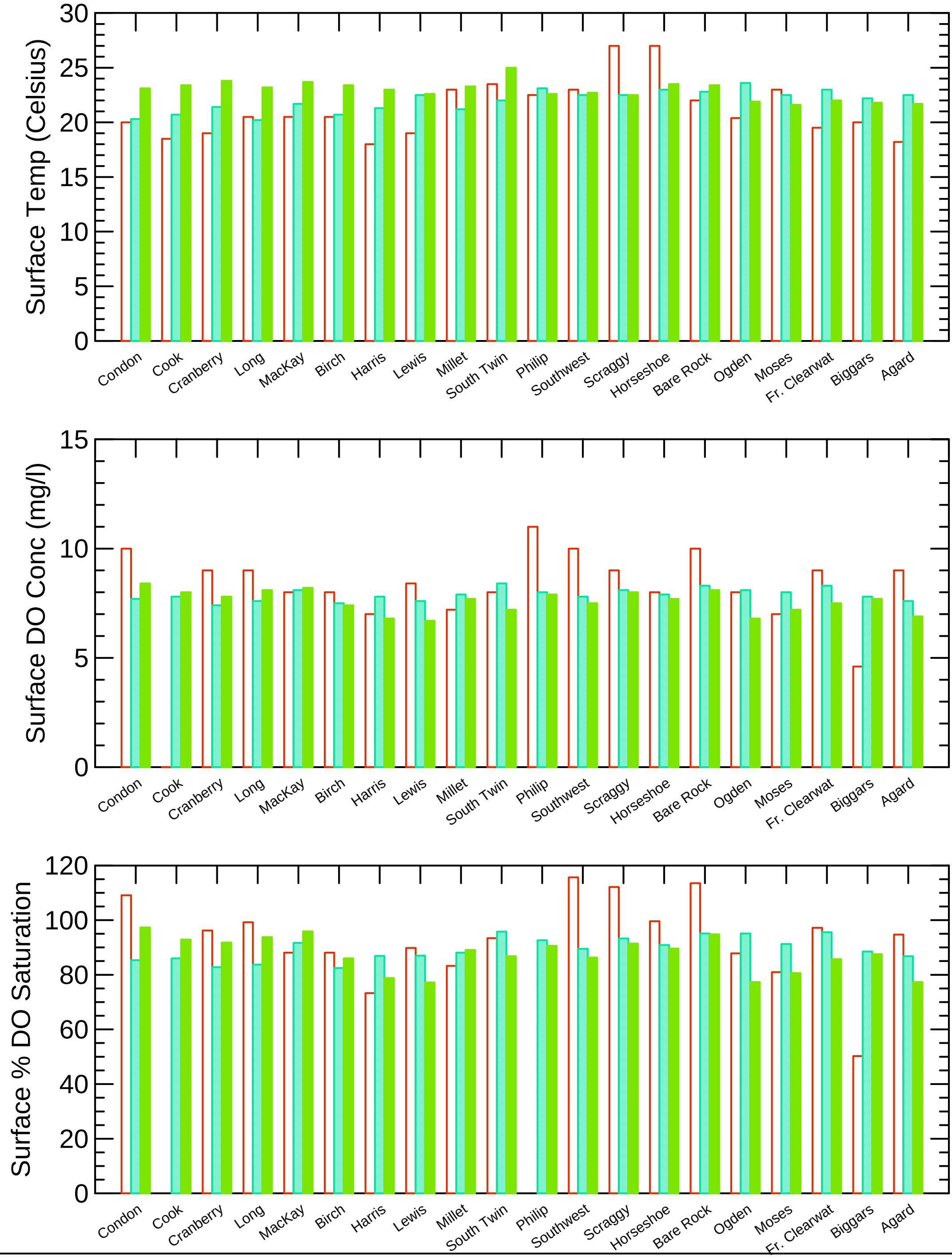
Surface Temp (Celsius)
0
5
10
15
20
25
30
Condon
Cook
Cranberry
Long
MacKay
Birch
Harris
Lewis
Millet
South Twin
Philip
Southwest
Scraggy
Horseshoe
Bare Rock
Ogden
Moses
Fr. Clearwat
Biggars
Agard
Surface DO Conc (mg/l)
0
5
10
15
Surface % DO Saturation
0
20
40
60
80
100
120

Figure 3. Comparison of surface water temperature, dissolved oxygen concentration and percent dissolved oxygen stratification measured on each survey date (order of bars from left to right is: original survey; July 2001 survey; August 2001 survey).

stratification characteristics of the lakes. There was also, in most cases, little difference in surface water temperatures measured during the original and 2001 surveys (Figure 3).

It was not possible, based on the available data, to draw any conclusions with respect to changes in the trophic status of the lakes. Trophic status is typically determined on the basis of mean annual ice-free season values of Secchi Disk depth, chlorophyll *a* level and total phosphorus concentration. Table 4 presents one of the most commonly used classification systems based on these parameters. Unfortunately, of these variables, the only one for which data is available for the original surveys is Secchi Disk depth, and this is only available for 8 of the 20 lakes studied. In addition, it is only available for July or August, a time when Secchi Disk depth tends to be more indicative of water color than algal concentration. As a result, it is not possible to determine to what extent, if any, the trophic status of the lakes has changed.

Table 4. OECD (1982) boundary values for classification of lake trophic status.

Parameter	Oligotrophic	Mesotrophic	Eutrophic
Total Phosphorus (µg/l)	< 10	10 – 35	> 35
Chlorophyll *a* (µg/l)	< 2.5	2.5 - 8.0	> 8.0
Secchi Depth (meters)	> 6	6 – 3	< 3

Based on surface water total phosphorous concentrations measured during July and August 2001, most of the lakes, including French Clearwater and Millet, fall within the mesotrophic range. Although there is a statistically significant ($p < 0.05$) negative relationship between hypolimnion dissolved oxygen concentrations and surface water total phosphorous concentration (Figure 4), it is weak ($r^2 = 0.20$) and used alone would not be an adequate predictor of the presence of cold-water habitat.

One other change noted in comparing surveys was that most of the lakes, other than those located in the Yarmouth area, have experienced a decrease in pH (Figure 5). This may also have indirectly contributed to a loss of cold-water habitat as high levels of acidity can lead to increased water transparency that may increase the depth of the thermocline and, subsequently, result in a reduced hypolimnetic volume (Schofield et al. 1993). Attempts to determine if thermocline depths were significantly different between the original and 2001 surveys, however, failed to find any consistent differences.

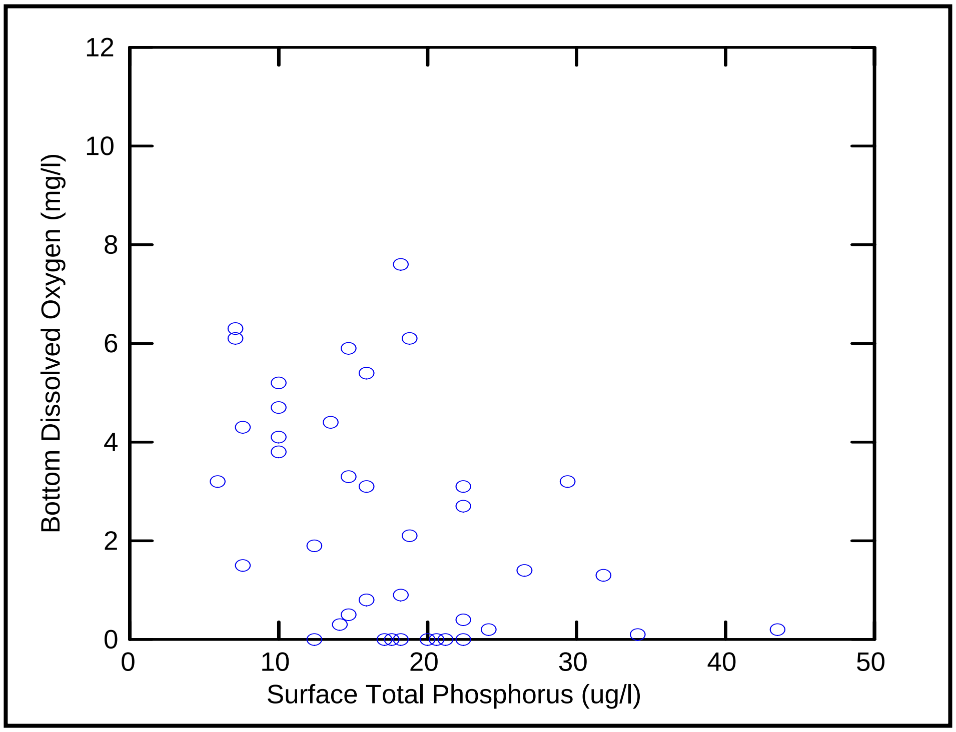

Figure 4. Relationship between hypolimnion dissolved oxygen concentration and surface water total phosphorus concentration.

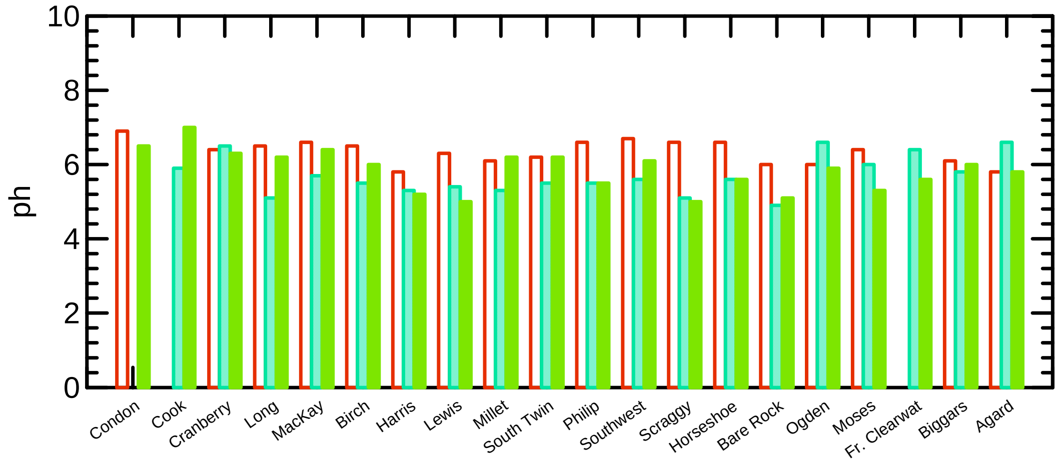

Figure 5. Comparison of surface water pH values measured on each survey date (order of bars from left to right is: original survey; July 2001 survey; August 2001 survey).

4. Discussion

A major objective of this study was to determine if surveys carried out in different months of late summer, particularly July and August, would yield the same results with respect to evaluating a lakes potential to contain cold-water fish habitat, defined as hypolimnetic waters having temperatures ≤15 ºC and dissolved oxygen saturation levels ≥ 50 %. The results of surveys carried out on 20 lakes in 2001 indicated that, for any individual lake, there was little difference in these two variables during July and August. This indicates that survey data collected during either July or August can be used to evaluate lakes for the presence of cold-water habitat. However, if the classification of lakes is extended to include the presence of cold-water habitat anywhere in the lake, such as within the thermocline, results of surveys carried out in July are not as useful as those carried out in August.

Another major objective of this study was to determine if data obtained during the earlier survey years, often as much as 25 years ago, still accurately describes the status of a lake with respect to water temperatures and dissolved oxygen levels. The results indicate that, in most instances, they do not. Although there was little difference in hypolimnetic water temperatures, differences in hypolimnetic dissolved oxygen levels were significant. Most of the lakes classified as ‘good’ on the basis of the original survey data were found to be ‘poor’ based on the 2001 surveys. In one instance, a lake originally classified as ‘poor’ was found to be ‘good’.

It is difficult to explain, based on the data available, why the majority of lakes that originally appeared to be ‘good’, were found to be ‘poor’. Possible explanations include, establishment of stratification late in the spring leading to high temperatures and low dissolved oxygen levels in the hypolimnion, and/or a change in the trophic status of the lakes. Comparisons of hypolimnion water temperatures suggest the former not to be the case. In most instances there was little difference in hypolimnetic water temperatures measured during the original and 2001 surveys. It is possible that the trophic status of the lakes has changed but as previously discussed, the current database is insufficient to draw any conclusions with respect to the changes in the trophic status of the lakes.

It should be noted that, during July, some of the lakes surveyed contained temperatures <20 ºC and dissolved oxygen saturation levels >50 % within the thermocline. Lakes having these characteristics could provide limited refuge for brook trout, but these are also conditions that are very sensitive to change. Because of their intermediate position, they could be considered to fall between 'poor' and 'good', but it is probably safer to consider them as having some suitable cold water during summer, rather than as having suitable hypolimnetic habitat for cold-water species.

These results are surprising in terms of how few of the lakes selected for study actually have suitable cold-water habitat. This brings two important questions to mind. Firstly, if the measured changes are real, and there is little reason to believe they are not, what has caused the lakes to have undergone a loss of cold-water habitat and, secondly, is this typical of all Nova Scotia Lakes, or is it perhaps a result of the selection process used to determine which lakes to include in the survey? With respect to both questions, one of the selection criteria used to determine which lakes to survey was accessibility by road (this is a criterion for stocking). This resulted in choosing lakes that were easily accessible and, consequently, lakes that are most susceptible to development and the kinds of activities that often lead to lake eutrophication, a process that is characterized by low dissolved oxygen levels in the hypolimnion. Indeed, many of the lakes surveyed contained summer cottages or permanent residences along their shoreline. If development activities within the lakes' drainage basin are responsible for the observed changes, it indicates the importance of identifying lakes that currently do contain summertime cold-water habitat so that action can be taken to ensure it is not lost as a result of human activity. It also indicates the importance of identifying and protecting cold-water streams habitats that are associated with lakes.

The rate at which dissolved oxygen is depleted from the hypolimnion of a stratified lake depends on a number of complex factors of which trophic state, climatic conditions during the onset of stratification and lake morphology are the most important. The trophic state of the lake is the most important factor. Deep oligotrophic lakes simply do not produce enough organic matter during the period of stratification to deplete the oxygen contained in the bottom waters. However, climatic conditions at the onset of stratification, and the morphology of the lake, especially the relative volumes of epilimnion and hypolimnion, also have a large influence on hypolimnetic dissolved oxygen levels. Climatic conditions during early spring determine the temperature and dissolved oxygen content of the hypolimnion when it is first established. A period of warm, calm weather during early spring leads to rapid thermocline development resulting in a hypolimnion containing cold, highly oxygenated water. In contrast, periods of warm, stormy weather prevent early development of a thermocline and results in warmer, less highly oxygenated water within the hypolimnion once stratification is established, a condition that leads to higher metabolic rates, less dissolved oxygen available for decomposition and more rapid oxygen depletion. As a result, lakes can in some years contain suitable cold-water fish habitat in the hypolimnion, but in other years may be unsuitable for cold-water species.

The relative volumes of the epilimnion and hypolimnion are important because the former determines the proportion of water column available for production (algae are confined to this layer) and the latter determines the amount of oxygen available to decompose the organic matter produced in the epilimnion. Lakes with a small epilimnetic volume and large hypolimnetic volume are most likely to have suitable cold-water fish habitat. This is probably the case for Millet Lake and French Clearwater Lake, which were the only two lakes surveyed in 2001 that contained at least some cold-water habitat during August. These two lakes were also the deepest and probably have a low eplimnion/hypolmnion volume ratio.

It would be premature, based on the results of this study, to conclude that few lakes in Nova Scotia contain habitat suitable for cold-water species. The criteria used to select lakes for this study should be reviewed, especially with respect to lake morphology and the relative proportions of epilimnion and hypolimnion volume. This would require considerable effort since the current Nova Scotia lakes database does not include this information, although the information required to determine this is contained within the bathymetric data. It is likely a key parameter, and one not fully appreciated when the selection criteria for the lakes to include in this study was established.

Alternatively, it may be possible to use a surrogate variable to determine the relative proportions of the epilimnion and thermocline. Two parameters often employed to characterize the morphology of a lake are ‘development of volume’ and ‘relative depth’ (Wetzel 1983). The former is calculated as the ratio of mean depth and maximum depth, and the latter as the ratio of the maximum depth and the mean diameter of the surface of the lake. Both of these parameters are used to determine if the lake is either cone shaped or saucer shaped. Provided they are deep enough to stratify, saucer shaped lakes will have a higher epilimnion:hypolimnion ratio than a cone shaped lake of equal depth. Another approach would be to compare the surface area of the lake to that of the area at the depth of the thermocline.

A potentially useful approach to identifying factors important in determining whether or not a lake contains summertime cold-water habitat would be to carry out a detailed multivariate analysis on the lake survey database. Various classification and ordination procedures, such as cluster, hierarchal and correspondence analysis have proved useful in numerous studies dealing with limnological data (e.g., Matthews 1991). The current database is quite extensive and potentially contains a great deal of information that, if thoroughly analyzed, should provide more insight toward a better understanding of the characteristics that determine which lakes have summertime cold-water habitat.

5. Acknowledgements

This study was funded by the Nova Scotia Department of Agriculture and Fisheries and the Nova Scotia Power Corporation (through the Nova Scotia Federation of Anglers and Hunters). John

MacMillan of the Nova Scotia Department of Agriculture and Fisheries provided equipment and logistic support for the field work, and Jason LeBlanc and Ralph Heighton, also of the Nova Scotia Department of Agriculture and Fisheries, assisted in the field surveys. Jonathan Lowe of the Acadia Centre for Estuarine Research also assisted in the field and carried out the laboratory analyses.

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APPENDIX I

Lakes selected for possible inclusion in the survey

APPENDIX I

Site Code	Lake Name	Topographic Map Code	N.S. Mapbook Code	Habitat Classification	Survey Date	Lake Volume (m^3)	Maximum Depth (m)	Surface Area (ha)	Bottom Temperature (ºC)	Bottom Dissolved Oxygen (mg/l)	% Dissolved Oxygen Saturation
06968	OAKLEAF	21B01	04A4	Poor	7/12/82	2052013	9.0	94.8	11.5	1.0	9.1
06042	SALMON RIVER	21B01	04A5	Poor	7/19/82	5271336	14.0	179.6	14.0	4.0	38.4
06984	BILL	21A05	04B3	Poor	7/11/85	351003	6.0	16.2	10.5	5.0	44.5
06074	BOARBACK	21A04	04B5	Poor	8/2/77	646000	9.0	23.3	12.4	0.2	1.9
06970	NAPIER	21A04	04D5	Poor	7/26/74	942800	8.0	48.7	10.0	4.0	35.2
06006	LE MERCHANT	21A05	04E1	Poor	8/13/75	3286000	9.0	120.3	11.7	2.0	18.2
18027	BRAZIL	21B01	05A2	Poor	7/8/81	3360700	11.0	99.7	12.2	3.0	27.7
18021	WELLINGTON (SUNDAY)	20O16	05A2	Poor	8/17/81	5290900	12.0	132.3	13.3	3.0	28.3
18080	AGARD	20O16	05A3	Good	7/17/81	1376121	8.0	45.8	12.1	6.0	55.2
18040	OGDEN	21A04	05B1	Good	7/9/86	11674510	18.0	263.8	10.8	6.0	53.7
18977	HAMILTON POND	21A04	05B1	Poor	7/31/85	220210	8.0	6.1	9.8	1.0	8.8
18969	RAYNARDS	20P13	05B2	Poor	7/16/86	25047150	14.0	598.0	14.3	4.0	38.6
18049	BENNETTS	20P13	05B3	Poor	8/15/85	7865487	16.0	151.0	12.1	2.0	18.4
18053	FRENCH CLEARWATER	20P13	05B3	Poor	8/21/68	-	24.0	118.8	7.0	5.0	41.4
18975	MARCEL	20P13	05B3	Poor	7/6/79	854051	14.0	31.5	10.1	1.0	8.8
18980	EEL	20P13	05B4	Poor	7/23/79	7645718	6.0	334.0	7.5	1.0	8.4
18005	RANDAL	20P13	05B4	Poor	8/1/86	4518001	8.0	129.0	18.0	7.0	73.8
18987	BEAVERHOUSE	21A04	05C1	Poor	7/30/85	1581844	6.0	71.6	15.0	3.0	29.4
18978	GILLFILLAN	20P13	05C2	Poor	8/21/85	4022062	12.0	175.8	11.5	2.0	18.2
18059	KEGESHOOK	20P13	05C2	Poor	8/23/85	5546642	8.0	160.6	14.5	2.0	19.4
18116	BIGGARS	20P13	05C3	Poor	8/7/89	2787057	10.0	149.9	15.0	3.2	31.4
18058	JAMES	20P13	05C3	Poor	7/4/79	324270	9.0	8.5	10.5	5.0	44.5
18004	MOSES	20P13	05C3	Poor	7/17/79	3801186	13.0	78.9	11.0	3.0	27.0
18979	FIRST BEAR	21A04	05D1	Good	7/23/74	555200	8.0	23.3	10.0	8.0	70.4
01011	GRAND	21A11	08A4	Good	8/25/75	1007000	15.0	263.8	11.0	8.0	71.9
01012	BAILLE	21A11	08A5	Poor	7/26/75	385700	6.0	19.3	9.8	2.0	17.5
01014	PITTS	21A11	08A5	Poor	8/15/75	325500	6.0	15.4	9.6	2.0	17.5
01013	SANDY BOTTOM	21A11	08A5	Poor	7/21/75	3204000	12.0	104.8	8.0	3.0	25.4
01085	CROSKILL	21A14	08B2	Poor	7/16/75	209800	8.0	9.2	12.6	1.0	9.3
01010	GIBSONS	21A11	08B4	Good	8/18/75	472300	6.0	21.1	10.1	8.0	70.6
01988	BIG MOLLY UPSIM	21A11	08D5	Poor	7/7/75	13183000	11.0	507.3	7.8	5.0	42.1
01982	MCGILL	21A11	08E4	Good	7/4/75	10337300	16.0	221.5	9.2	6.0	52.0
01983	LIVERPOOL HEAD	21A11	09A1	Poor	8/6/75	322800	7.0	12.6	9.0	2.0	17.2
01979	MULGRAVE	21A11	09A1	Poor	8/12/75	11138000	12.0	262.5	12.6	3.0	27.9

Site Code	Lake Name	Topographic Map Code	N.S. Mapbook Code	Habitat Classification	Survey Date	Lake Volume (m^3)	Maximum Depth (m)	Surface Area (ha)	Bottom Temperature (ºC)	Bottom Dissolved Oxygen (mg/l)	% Dissolved Oxygen Saturation
01973	UPPER MINK	21A11	09A1	Poor	8/8/75	469000	7.0	20.7	10.0	2.0	17.6
16981	JUNCTION	21A03	09A5	Good	7/11/74	2226000	10.0	95.0	8.5	6.0	51.2
16061	LONG	21A03	09A5	Poor	7/10/74	195900	6.0	10.2	8.7	5.0	42.9
01015	BOOT	21A11	09B1	Poor	7/27/75	2097800	6.0	119.8	12.1	2.0	18.4
16980	LITTLE TOBEATIC	21A03	09B5	Good	7/3/74	3747700	10.0	119.9	9.5	6.0	52.3
14008	MINARD	21A06	09C2	Poor	8/22/74	2704100	6.0	111.9	14.5	5.0	48.5
01980	MUDFLAT	21A06	09C2	Poor	8/1/82	564985	7.0	27.1	12.0	2.6	23.9
01051	PERCH	21A06	09C2	Poor	8/9/82	658948	6.0	34.8	12.5	4.0	37.1
01087	TWIN	21A06	09C2	Poor	7/6/89	257043	6.0	18.2	7.0	3.6	29.8
14074	HUNT	21A06	09C3	Good	8/30/72	-	7.0	3.3	13.9	10.0	95.7
14003	MCGOWAN	21A06	09D2	Poor	7/15/82	12014200	13.0	430.4	12.0	4.0	36.7
01088	MILL	21A06	09D2	Poor	8/6/90	1260000	6.0	77.7	13.5	1.4	13.3
14004	HARMONY	21A06	09D3	Good	8/21/72	-	11.0	354.1	12.8	8.0	74.7
14011	CHARLOTTE	21A06	09D3	Poor	7/15/82	819567	7.0	40.3	11.0	3.0	27.0
14969	MEAGHER	21A06	09D3	Poor	7/27/82	166679	7.0	7.6	8.0	1.8	15.2
14073	SPECTACLE	21A06	09D3	Poor	8/17/90	302850	6.0	16.6	11.0	1.2	10.8
14957	THIRD CHRISTOPHER	21A06	09D4	Poor	7/30/82	1294855	6.0	67.7	14.0	1.0	9.6
14020	LITTLE TUPPER	21A07	09E2	Good	7/14/82	2622251	9.0	113.3	14.0	9.0	86.3
14018	TUPPER	21A06	09E2	Poor	7/15/82	12548500	14.0	439.9	9.5	5.0	43.6
14977	HOG	21A07	09E3	Poor	8/15/82	-	7.0	98.3	14.0	1.2	11.5
16976	MCKAY (EAST)	20P14	10A3	Poor	8/5/80	608950	9.0	28.0	11.8	0.8	7.3
14987	BIG ROBERTSON	20P15	10E3	Poor	7/10/72	-	15.0	66.3	8.3	2.0	17.0
14069	PATH	20P15	10E4	Poor	7/10/72	-	12.0	21.9	12.2	4.0	36.9
05987	NEWVILLE	21H09	12E5	Poor	8/23/73	-	8.0	78.5	15.0	1.2	11.8
05019	GILBERT	21H08	13E1	Good	7/15/73	-	9.0	22.6	10.6	8.0	71.3
11030	BIRCH	21A15	14A2	Good	7/26/76	962000	12.0	27.5	6.0	7.0	56.9
12957	SEVEN MILE	21A07	14A2	Poor	7/20/84	16811100	18.0	291.0	11.9	1.0	9.2
11982	FOX	21A15	14A3	Poor	8/1/78	390909	11.0	20.0	9.0	4.0	34.5
11984	EAST TWIN	21A15	14A4	Poor	8/23/76	555000	12.0	12.1	5.0	3.0	23.9
11026	SOUTH TWIN	21A15	14B3	Good	7/21/81	542186	10.0	18.6	8.8	7.4	63.6
09984	NS SAND AND GRAVEL PIT	11E04	14D1	Poor	8/5/82	54374	8.0	2.7	14.5	4.0	38.8
12009	LEWIS	21A16	14D3	Poor	7/9/80	2822100	12.0	75.3	10.5	5.0	44.5
12012	HARRIS	21A16	14D4	Poor	7/15/80	3225600	11.0	71.1	13.0	2.0	18.8
12010	INDIAN	21A16	14D4	Poor	7/8/80	1626580	12.0	31.9	9.0	5.0	43.1
09037	NORTH CANOE	21A16	14E3	Poor	7/11/89	2216869	8.0	93.7	10.0	2.3	20.2
09986	LITTLE ISLAND	21A16	14E3	Poor	8/23/77	467470	7.0	19.0	12.2	2.0	18.4

Site Code	Lake Name	Topographic Map Code	N.S. Mapbook Code	Habitat Classification	Survey Date	Lake Volume (m^3)	Maximum Depth (m)	Surface Area (ha)	Bottom Temperature (ºC)	Bottom Dissolved Oxygen (mg/l)	% Dissolved Oxygen Saturation
12024	CARD	21A09	14E4	Good	8/3/90	770000	17.0	270.0	8.0	7.7	65.1
12027	MILLET	21A09	14E5	Poor	8/30/83	6620677	23.0	68.7	6.5	4.4	36.1
12002	HIRTLE	21A07	15A2	Poor	8/8/83	15246283	14.0	330.0	13.0	3.0	28.1
14105	BLACK RATTLE	21A07	15A3	Good	8/26/82	5366793	23.0	83.0	6.5	6.6	54.2
14029	ANNIS	21A07	15A3	Poor	8/26/82	6052150	18.0	75.0	10.0	3.8	33.4
14988	BEAVERTAIL BASIN	21A07	15A3	Poor	8/18/82	11144941	13.0	215.3	11.0	2.8	25.2
14117	HIDDEN HILLS	21A07	15A3	Poor	8/1/90	177000	7.0	5.4	8.0	0.6	5.1
14030	MOLEGA	21A07	15A3	Poor	8/13/82	100477618	26.0	1995.9	9.0	2.8	24.1
12037	WILLIAM	21A10	15B1	Poor	7/21/80	3367800	12.0	87.2	14.5	1.4	13.6
12068	NEW CANADA (HEN)	21A07	15B2	Poor	7/12/83	1761205	12.0	38.0	8.6	2.2	18.8
12059	LONG	21A07	15B4	Poor	8/22/83	3841802	10.0	197.0	12.0	5.0	45.9
12965	MATTHEW	21A07	15B4	Poor	8/3/83	520600	7.0	23.6	12.0	1.4	12.9
12985	CANORAN	21A10	15C1	Poor	8/16/80	538100	10.0	16.7	9.5	1.2	10.5
12039	LITTLE MUSHAMUSH	21A10	15C1	Poor	6/30/89	17673613	13.0	451.2	12.0	3.6	33.0
12951	WENTZELL	21A07	15C2	Good	8/7/83	5316103	12.0	131.7	12.5	7.0	65.0
12955	SUCKER	21A07	15C2	Poor	8/11/83	1019000	8.0	22.7	15.0	4.0	39.3
12976	GARBER	21A07	15C3	Poor	7/3/83	326886	6.0	17.4	11.0	4.0	35.9
12949	WILES (OAKHILL)	21A07	15C3	Poor	7/11/83	2646742	9.0	91.0	12.2	1.0	9.2
12174	ISLAND	21A07	15C4	Good	7/21/88	2354000	10.0	104.3	12.0	5.8	53.2
12053	CROOKED	21A07	15C4	Poor	8/26/83	7581968	17.0	232.0	9.0	3.0	25.9
12008	MILIPSIGATE	21A07	15C4	Poor	8/13/98	15117903	16.0	335.8	12.0	0.2	1.8
12083	CLEARLAND	21A08	15D2	Poor	7/13/83	347711	8.0	16.0	12.8	1.0	9.3
12108	CROUSE	21A08	15D3	Poor	8/23/84	159319	13.0	4.4	6.8	1.0	8.3
12961	RHODES	21A08	15D3	Poor	8/15/84	593791	16.0	12.1	7.5	4.0	33.5
14040	NICKERSON'S POND	21A02	16B1	Poor	7/12/72	-	6.0	33.6	12.8	2.0	18.7
05046	BLACK	11E12	18C3	Poor	8/19/98	5887937	70.0	47.2	4.0	6.2	48.6
05030	VICKERY	11E12	18C3	Poor	8/4/73	66057	34.0	8.5	5.6	6.0	48.4
04009	SIMPSON	11E12	18C5	Poor	7/14/73	2128580	12.0	47.8	12.2	1.0	9.2
05986	PARK (SALT)	11E12	18D3	Poor	8/1/73	-	9.0	4.9	7.8	1.0	8.4
05013	ISSAC	11E12	18E5	Poor	8/3/73	-	8.0	16.2	14.4	3.0	29.0
04008	NEWTON	11E05	19C1	Good	7/20/90	9548000	12.0	35.0	8.5	6.2	52.9
09981	SHEY	21H01	20A1	Poor	7/6/83	205320	18.0	6.6	6.1	4.0	32.6
09016	FALLS	21A16	20A3	Poor	8/15/77	3380000	12.0	98.0	11.5	1.0	9.1
09017	MOCKINGIGH	21A16	20A3	Poor	8/10/77	6182400	10.0	109.3	10.0	1.0	8.8
12100	DAUPHINEES MILL	21A09	20B5	Good	7/17/86	15263280	25.0	287.0	7.6	9.0	75.5
12958	SAWLER	21A09	20B5	Poor	8/26/85	2539627	27.0	53.0	6.8	6.0	49.5

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08037	EGG	11D15	20C2	Good	7/21/75	1269800	12.0	36.6	9.5	10.0	87.1
09987	LILY	11D13	20C2	Poor	7/24/86	1085868	10.0	37.4	10.0	3.0	26.4
09988	FIVE MILE	11D13	20C3	Good	7/21/86	22999720	26.0	505.3	9.0	7.0	60.4
08981	BIG CONNOR	11D12	20C4	Good	7/24/57	551247	12.0	10.3	6.3	8.9	72.8
08148	MILL	11D12	20C4	Poor	7/22/85	551258	8.0	27.3	14.0	4.0	38.4
08880	SANDY (RAFTER)	11D12	20C4	Poor	8/7/85	11106010	24.0	175.3	9.2	4.0	34.6
08974	BRINE	11D12	20C5	Poor	7/17/79	769904	10.0	30.0	8.0	1.0	8.5
08889	PUDDLE	11D12	20C5	Poor	7/10/85	420257	11.0	18.5	8.1	5.0	42.4
09007	COCKSCOMB	11D13	20D2	Good	7/5/78	17000000	33.0	145.5	8.0	9.0	76.1
09043	PIGOTT	11D13	20D2	Poor	7/24/80	5120080	17.0	90.5	9.9	2.0	17.6
08863	TOMAHAWK	11D13	20D3	Good	7/19/78	4700000	9.0	124.5	15.0	6.4	62.8
08936	HALFWAY	11D12	20D4	Good	7/21/78	1000000	16.0	14.0	4.5	7.2	56.9
08850	WRIGHT(S) (MARR)	11D12	20D4	Good	7/13/84	12662071	18.0	268.1	9.7	6.0	52.5
08968	COX	11D12	20D4	Poor	7/8/74	5480000	14.0	100.7	8.0	5.8	49.0
08902	MCCABE	11D13	20D4	Poor	7/30/84	7797970	15.0	163.4	11.1	1.0	9.0
08081	STILLWATER	11D12	20D4	Poor	8/27/79	2266965	17.0	50.6	7.0	3.0	24.9
08868	TAYLOR	11D12	20D4	Poor	8/15/85	2019941	19.0	46.3	8.0	5.0	42.3
08966	CRANBERRY	11D12	20D5	Poor	7/18/79	378403	8.0	29.1	9.0	1.0	8.6
08079	FIVE ISLAND	11D12	20D5	Poor	7/11/79	4556352	11.0	133.5	12.0	3.0	27.5
08947	FRASER'S	11D12	20D5	Poor	8/9/83	5550000	20.0	70.7	7.1	6.0	49.8
08932	HUBLEY BIG	11D12	20D5	Poor	8/29/79	7730469	14.0	255.3	11.0	5.0	44.9
08931	HUBLEY MILL	11D12	20D5	Poor	7/9/79	587587	8.0	20.2	11.5	2.0	18.2
08924	LEWIS	11D12	20D5	Poor	7/4/79	1303670	13.0	24.6	10.0	4.0	35.2
08080	SHELDRAKE	11D12	20D5	Poor	7/5/79	356544	7.0	12.9	10.0	1.0	8.8
08953	FENERTY	11D13	20E3	Poor	7/26/84	1847112	8.0	63.0	12.8	1.5	14.0
08168	SECOND (KEOUGH)	11D13	20E3	Poor	7/27/83	3359160	12.0	90.3	9.0	5.0	43.1
08017	KEARNEY	11D12	20E5	Good	8/11/83	5658920	26.0	61.5	6.5	7.0	57.5
08851	WITHEROD	11D12	20E5	Good	8/26/83	261624	13.0	9.9	9.8	9.0	78.9
08970	CHOCOLATE	11D12	20E5	Poor	8/5/71	273075	13.0	7.1	11.3	1.4	12.7
08943	GOVERNOR	11D12	20E5	Poor	8/10/83	1889888	14.0	40.0	8.8	1.8	15.5
08898	OTTER	11D12	20E5	Poor	8/10/83	3670876	12.0	87.8	12.4	0.2	1.9
12017	SPECTACLE	21A09	21A1	Poor	8/8/83	2209284	17.0	28.4	5.8	5.6	45.4
12176	HOLLAHAN	21A09	21B1	Good	7/5/89	1643788	7.0	99.7	13.0	6.4	60.0
12966	MAPLE	21A09	21B1	Poor	7/25/85	50751	8.0	3.3	8.5	1.6	13.7
12109	LILY POND	21A08	21B2	Poor	7/31/91	142323	12.0	2.2	4.0	0.1	0.8
08087	FRASER	11D12	21C1	Poor	7/16/79	741924	14.0	12.5	6.0	5.0	40.7

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08921	LITTLE	11D12	21C1	Poor	7/30/79	175168	8.0	4.8	11.5	3.0	27.2
08916	LONG CANAL	11D05	21C2	Poor	8/20/79	94375	7.0	3.6	11.5	5.0	45.4
08982	BIG	11D12	21D1	Poor	8/1/79	746903	10.0	27.1	9.0	3.0	25.9
08956	EASTERN	11D12	21D1	Poor	8/1/79	140365	8.0	6.4	9.0	2.0	17.2
08088	SCOTT (MURPHY)	11D12	21D1	Poor	8/8/83	261872	7.0	12.9	13.0	1.0	9.4
08112	WHITES	11D12	21D1	Poor	7/30/79	1610450	11.0	43.7	10.0	2.0	17.6
08976	BLUFF	11D12	21E1	Good	7/15/71	82000	6.0	4.3	12.0	8.8	80.8
08177	HATCHET	11D12	21E1	Poor	7/26/79	5047493	22.0	68.3	8.0	5.0	42.3
08082	MOODY	11D12	21E1	Poor	8/8/79	1531687	11.0	57.8	11.0	2.0	18.0
08937	GREY (GRAY)	11D05	21E2	Poor	8/19/79	236107	9.0	7.2	12.0	3.0	27.5
08208	LITTLE	11D05	21E2	Poor	7/31/79	175168	8.0	4.8	11.5	3.0	27.2
05055	DEWAR (ANGEVINE)	11E12	22A3	Good	7/4/73	-	12.0	124.2	13.3	7.0	66.1
05047	MATTATAL	11E11	22B3	Good	7/24/73	-	11.0	106.8	12.8	7.0	65.4
04014	BYER'S	11E11	22B5	Good	7/18/73	-	6.0	5.6	10.6	10.0	89.1
04033	FROG	11E11	22B5	Poor	7/19/73	-	9.0	9.3	10.0	3.0	26.4
08036	OTTER	11D15	24A1	Poor	7/2/75	1060400	12.0	27.7	7.5	8.0	67.0
08983	BENNERY	11D13	24A2	Poor	7/11/84	1691373	15.0	43.5	9.5	5.0	43.6
08865	THOMAS	11D13	24A3	Poor	7/3/84	3766163	15.0	113.3	1.3	4.0	29.9
08864	THREE MILE	11D13	24A3	Poor	7/9/84	588694	11.0	16.4	8.0	0.4	3.4
08019	ANDERSON	11D12	24A4	Good	8/21/71	-	26.0	61.7	8.0	8.0	67.6
08885	ROCKY	11D12	24A4	Poor	7/23/84	3214975	11.0	141.6	10.2	1.0	8.8
08193	SPIDER	11D12	24A4	Poor	8/22/89	1443615	10.0	64.7	2.0	3.2	24.2
08024	MAYNARD	11D12	24A5	Good	7/16/71	351025	7.0	7.4	8.5	7.0	59.8
08022	PENHORN	11D12	24A5	Good	8/4/71	124525	9.0	4.3	14.5	6.0	58.2
08023	OATHILL	11D12	24A5	Poor	8/19/71	185953	9.0	4.9	12.0	4.0	36.7
08959	EAST	11D14	24B4	Good	8/8/84	9253418	44.0	74.1	6.4	10.0	81.9
08182	OTTER	11D14	24B4	Good	7/18/78	128134	12.0	5.0	15.0	5.0	49.1
08129	EAGLE	11D11	24B4	Poor	8/12/74	4382200	12.0	88.6	9.0	4.0	34.5
08029	LAKE ECHO	11D11	24B4	Poor	7/27/83	4642621	10.0	163.8	7.1	2.0	16.6
08127	MARTIN	11D11	24B4	Poor	8/15/74	553500	9.0	19.1	5.0	2.0	16.0
08878	SETTLE	11D12	24B5	Poor	7/12/90	125718	7.0	6.6	8.0	0.2	1.7
08065	COOKS	11E03	24C1	Good	7/18/84	865076	8.0	44.0	13.5	7.0	66.4
08965	DOLLAR	11D14	24C2	Good	7/3/83	24923200	34.0	215.1	9.5	7.4	64.5
08055	CONROD	11D14	24C4	Good	7/8/74	7330400	27.0	119.5	10.5	8.0	71.1
08155	PORTERS	11D14	24C4	Poor	7/15/67	-	23.0	1651.1	6.7	1.0	8.2
08052	GRAND	11D14	24D2	Poor	7/24/78	9287749	30.0	99.5	7.5	5.0	41.9

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08185	LAY	11D14	24D2	Poor	8/5/88	1109000	11.0	34.0	8.0	4.5	38.0
08062	BAYER	11D14	24D3	Poor	8/22/74	1104200	8.0	36.0	9.0	5.0	43.1
08058	LONG BRIDGE (BRIDGEND)	11D14	24D4	Good	8/29/74	3830600	12.0	69.6	12.5	7.0	65.0
08027	PETPESWICK	11D14	24D4	Good	8/24/74	12506600	20.0	256.8	10.5	9.0	80.0
08186	SHAW BIG	11D14	24E2	Poor	8/9/88	2810000	11.0	78.7	13.0	1.8	16.9
08206	SHAW LITTLE	11D14	24E2	Poor	8/6/91	440629	7.0	20.8	15.0	0.9	8.8
08957	EAST PINE ISLAND POND	11D12	25A1	Poor	8/16/79	173183	9.0	6.8	10.5	2.0	17.8
08890	POWER POND	11D12	25A1	Poor	8/4/81	319206	9.0	9.7	12.0	2.0	18.4
13012	GRANT	11E07	27C1	Poor	7/24/75	697100	9.0	22.7	10.0	1.0	8.8
08867	TAYLOR BAY GRAND	11D15	27C2	Good	8/6/75	4573600	13.0	136.8	8.0	6.0	50.7
07198	PORCUPINE	11E07	27C3	Poor	8/14/91	485946	12.0	16.3	11.0	0.1	0.9
08942	GOVERNOR	11E02	27C4	Poor	8/20/73	-	13.0	651.5	12.2	2.0	18.4
08204	TEN MILE	11E02	27C5	Poor	7/4/91	6682805	14.0	202.6	14.0	2.0	19.2
07984	BOTTLE BROOK	11E07	27D3	Good	7/31/73	-	9.0	37.6	12.2	6.0	55.3
07982	CARIBOU	11E07	27D3	Good	8/1/73	-	4.0	11.3	17.7	8.0	83.7
07968	LONG JOHN	11E07	27D3	Poor	7/19/78	602738	12.0	17.8	6.0	6.0	48.8
07976	FIRST ROCKY	11E02	27D4	Good	7/29/73	-	8.0	51.0	12.2	7.0	64.5
07966	LOWER ROCKY	11E02	27D4	Good	7/25/73	5051261	7.0	128.0	12.2	6.0	55.3
07146	ROUND	11E02	27D4	Good	7/9/73	-	9.0	31.9	13.3	7.0	66.1
08877	SEVENTEEN MILE	11E02	27D4	Good	7/6/73	-	7.0	16.2	12.2	6.0	55.3
08013	SELOAM	11E02	27D4	Poor	8/14/73	-	12.0	291.4	13.2	3.7	34.9
13044	SUTHERLANDS (SMITHS)	11E08	27E1	Good	7/23/75	2108800	9.0	50.0	12.0	6.0	55.1
13001	CAMPBELL	11E08	27E1	Poor	7/2/75	57900	8.0	2.8	10.0	2.0	17.6
13058	NORMAN'S	11E08	27E1	Poor	7/8/75	550100	8.0	16.8	12.5	5.0	46.4
07961	RUSH	11E01	27E4	Good	7/3/73	-	8.0	88.6	14.4	9.0	87.1
08933	HORSESHOE	11D15	28A2	Good	7/18/75	352500	8.0	25.9	9.0	8.0	69.0
08912	LOON POND	11D15	28A2	Good	7/30/80	2038100	20.0	28.4	10.0	6.0	52.8
08929	JONES	11D15	28A2	Poor	7/23/75	429300	8.0	18.8	8.0	4.0	33.8
08034	SCRAGGY	11D15	28A2	Poor	7/15/75	-	13.0	644.5	10.0	5.0	44.0
08893	PEARL	11D15	28A3	Poor	7/29/80	280460	7.0	11.1	10.1	2.0	17.6
08887	PUG HOLE	11D15	28A3	Poor	7/28/80	348590	8.0	10.0	9.3	1.2	10.4
08010	LOWER BEAVER	11E02	28B1	Good	7/9/73	-	8.0	29.1	11.1	7.0	63.0
08134	BARE ROCK	11D15	28B2	Good	7/31/75	1011700	11.0	27.4	9.0	7.0	60.4
08133	PHILIP	11D15	28B2	Good	6/30/75	578200	11.0	19.8	9.0	7.0	60.4
08040	NEWCOMBS	11D15	28B3	Poor	8/11/75	1760400	8.0	70.3	12.0	2.0	18.4
08195	ALMA	11D15	28C1	Good	7/6/90	5400000	20.0	440.0	9.0	9.2	79.3

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08872	SOUTHWEST	11D15	28C2	Good	8/7/75	11504500	16.0	203.1	8.0	6.0	50.7
08870	TANGIER	11D15	28C3	Poor	7/29/75	4253600	11.0	164.5	13.0	3.0	28.1
08138	COON	11D15	28D2	Good	7/7/73	-	22.0	19.0	10.0	6.0	52.8
08899	NOWLIN	11D16	28E1	Good	7/13/81	3599569	16.0	58.1	11.8	7.0	64.0
02034	CAMERON	11F12	29C5	Poor	8/22/75	1420000	9.0	29.6	10.0	1.6	14.1
02004	GILLIS	11F12	29D5	Poor	8/21/75	1080000	11.0	28.0	11.0	2.0	18.0
13032	MILLDAM	11E08	30A2	Good	7/9/75	497000	11.0	10.2	6.0	8.0	65.1
08147	ROUND	11E01	30A5	Good	7/29/81	1798094	8.0	49.8	13.1	8.0	75.2
13057	LONG	11E08	30B2	Poor	7/14/75	470000	6.0	25.9	12.5	5.0	46.4
07988	ASH	11E01	30B5	Poor	7/22/81	399840	7.0	21.8	12.5	1.6	14.8
02028	STEWART (MACMILLAN)	11E08	30C1	Poor	8/19/85	836993	14.0	15.9	6.0	6.0	48.8
07974	GOSHEN	11E05	30C2	Good	7/19/85	365459	8.0	12.1	12.0	6.0	55.1
02086	POLSON (COPPER)	11F05	30C2	Good	7/18/76	1149000	15.0	19.5	8.0	8.0	67.6
07065	EIGHT ISLAND	11F05	30C2	Poor	8/1/73	3260000	10.0	91.3	12.1	2.7	24.8
07109	GLENELG	11E08	30C3	Poor	8/26/78	4273218	16.0	204.1	8.0	1.0	8.5
07952	WALLACE	11E08	30C3	Poor	8/28/85	399122	8.0	11.9	11.0	4.0	35.9
07986	BIG GASPEREAUX	11E01	30C5	Poor	8/7/78	10578903	9.0	325.5	15.0	5.0	49.1
07967	LOWER GASPEREAUX	11E01	30C5	Poor	8/25/81	2432852	10.0	91.8	14.1	1.4	13.5
07100	MITCHELL	11E01	30C5	Poor	8/1/78	6642632	16.0	133.6	8.0	5.0	42.3
07036	G	11F05	30D2	Good	8/6/85	409909	10.0	18.2	7.5	8.0	67.0
07061	PRINGLE	11F05	30D2	Good	7/16/73	6120000	26.0	62.7	9.0	6.1	52.6
07077	CHARLIE	11F05	30D2	Poor	8/13/73	740000	11.0	17.4	11.4	0.9	8.2
07074	CROSS	11F05	30D2	Poor	8/21/73	4000000	7.0	72.7	13.0	0.4	3.8
07076	GIANT	11F05	30D2	Poor	8/7/73	2100000	12.0	57.0	11.8	0.8	7.3
07075	NARROW	11F05	30D2	Poor	8/13/73	1370000	11.0	27.0	10.0	3.9	34.3
07052	PORCUPINE	11F05	30D2	Poor	7/25/77	138000	6.0	4.9	13.2	0.4	3.8
07062	STEWART	11F05	30D2	Poor	8/13/85	308707	7.0	10.6	11.5	2.0	18.2
07069	COUNTRY HARBOUR	11F05	30D3	Poor	7/23/85	697789	8.0	23.6	11.8	3.0	27.4
07989	ARCHIBALD	11F04	30D4	Good	8/6/76	2678000	11.0	128.0	10.0	7.0	61.6
07956	UP.IND.HBR. 6TH	11F04	30D4	Good	7/7/76	521000	13.0	11.3	7.0	7.0	58.0
07084	SHERBROOKE	11F04	30D5	Poor	8/24/77	6360000	17.0	132.3	5.0	3.0	23.9
07943	UP.IND.HBR. 3rd	11F04	30D5	Poor	8/10/77	384163	11.0	11.4	8.3	5.0	42.5
07954	UP.IND.HBR. 4TH	11F04	30D5	Poor	8/11/77	67370	10.0	3.0	8.7	3.0	25.7
07039	CUDDIHY	11F05	30E1	Poor	7/18/85	759257	11.0	18.2	6.5	6.0	49.3
07960	SALMON RIVER	11F05	30E2	Good	7/10/85	1338763	11.0	42.5	12.0	6.0	55.1
07078	BEAVER DAM #2	11F05	30E2	Poor	7/11/78	200000	6.0	8.5	9.5	2.4	20.9

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07042	ROUND (MacDONALD)	11F05	30E2	Poor	8/11/76	197000	7.0	9.4	13.1	0.2	1.9
07983	BULL MOOSE	11E01	31A1	Poor	7/15/81	173498	6.0	10.9	12.3	0.8	7.4
08091	KELLY	11E01	31A1	Poor	8/29/81	1700508	9.8	49.0	12.8	3.0	28.0
08143	GOOSE POND	11D16	31A2	Good	7/12/72	246505	6.0	8.3	8.3	6.0	51.0
08144	GAMMONS POND	11D16	31A2	Poor	7/20/81	212285	10.0	7.5	9.8	3.0	26.3
08149	CHURCH	11D16	31B1	Poor	6/30/81	421551	11.0	13.4	9.9	5.0	43.9
07972	HOOPER	11E01	31C1	Poor	7/21/81	378042	6.0	15.2	11.6	4.0	36.4
07969	KIRBY	11E01	31C1	Poor	7/21/81	447467	8.0	15.9	11.1	3.0	27.0
02021	TRACADIE (JACKSONS)	11F12	34A4	Good	7/13/74	363400	11.0	25.0	10.0	10.0	88.0
10168	MACINTYRE	11F11	34D4	Poor	8/7/74	1605100	9.1	46.0	8.0	3.0	25.4
15044	MCINTYRE	11F11	34D4	Poor	8/7/74	1605100	9.0	46.0	8.0	3.0	25.4
15003	BUCHANAN	11F11	34E4	Poor	7/23/84	249380	6.0	14.4	13.0	2.4	22.5
07020	LONG(S) (ROGER)	11F05	35A2	Good	7/8/85	210291	6.0	9.6	12.0	6.0	55.1
07124	SUSIE	11F05	35A2	Poor	7/27/76	198200	6.0	11.9	14.0	0.2	1.9
07185	OCEAN	14FO4	35A3	Good	7/20/89	28384418	20.0	425.1	11.0	8.2	73.7
07971	IRVING PROV. PARK POND	11F05	35B1	Good	7/16/74	113900	11.0	4.4	10.5	12.0	106.7
07048	MEAGHERS	11F05	35B1	Good	7/14/74	1241500	16.8	21.2	5.4	7.0	56.3
07057	HORSESHOE	11F05	35B3	Poor	7/2/85	706426	9.5	31.1	13.0	3.0	28.1
10068	PEMBROOKE	11K07	37A4	Good	8/8/78	1008345	10.0	42.5	11.4	6.0	54.4
10158	PETIT LAC	11D11	37A4	Poor	8/19/75	451400	16.0	9.1	10.5	1.0	8.9
17014	FRENCH RIVER	11K10	37D4	Poor	8/22/96	1106234	10.0	28.0	14.0	0.1	1.0
17020	BIG	11K07	37D5	Poor	8/20/96	1399393	10.0	35.4	11.5	1.0	9.1
17065	OXFORD LAKES	11K07	38C1	Good	8/15/78	599825	20.0	7.7	8.6	7.0	59.9
17007	TIMBER	11K07	38C1	Good	6/30/76	1630000	12.0	34.0	9.0	9.0	77.6
03056	MCADAMS	11K01	38E4	Poor	8/17/76	1083400	10.0	31.3	10.0	3.0	26.4
15004	GRAND	11F11	39A5	Poor	8/13/84	14498502	19.0	258.2	11.2	4.0	36.1
15006	POTTIE	11F11	39A5	Poor	7/25/84	480980	12.0	21.3	10.2	1.6	14.1
15988	CRANBERRY	11F10	39B3	Good	7/31/74	340400	6.0	13.2	11.0	6.0	53.9
15010	LONG	11F10	39B3	Good	8/5/74	4700600	16.0	71.1	8.0	10.0	84.5
15009	COOK	11F10	39B3	Poor	7/30/74	2270800	12.0	79.7	8.0	3.0	25.4
15008	MACKAY (MACKENZIES)	11F10	39B3	Poor	7/27/74	2241300	18.0	36.9	9.5	5.0	43.6
15013	L'ARDOISE LONG	11F10	39C3	Poor	8/8/84	702191	9.0	31.4	10.1	1.0	8.8
15052	MACLEODS	11F10	39C3	Poor	7/16/84	229967	7.0	13.2	14.7	4.0	39.0
15007	CONDON	11F10	39C4	Good	8/5/77	1305679	15.0	31.0	10.0	6.0	52.8
15019	LONG (LEWIS COVE RD.)	11F10	39C4	Good	7/18/84	562081	7.0	25.2	10.1	8.0	70.6
15045	LOCH CAILEAN	11F10	39C4	Poor	8/1/84	2394520	11.0	92.3	12.0	4.0	36.7

Site Code	Lake Name	Topographic Map Code	N.S. Mapbook Code	Habitat Classification	Survey Date	Lake Volume (m^3)	Maximum Depth (m)	Surface Area (ha)	Bottom Temperature (ºC)	Bottom Dissolved Oxygen (mg/l)	% Dissolved Oxygen Saturation
15049	SCHOOL	11F10	39C4	Poor	8/21/90	253000	8.0	16.0	10.0	0.8	7.0
15017	LOCH LOMOND (NORTH)	11F15	39D2	Good	7/12/84	6818653	19.0	210.4	9.0	8.0	69.0
15002	LOCH LOMOND	11F10	39D3	Good	8/27/74	46048000	18.0	671.3	10.0	6.0	52.8
15989	BENJAMIN POND	11F10	39D3	Poor	7/10/84	85687	7.0	4.6	13.0	4.0	37.5
15984	NARROW	11F10	39D3	Poor	7/17/84	183961	8.0	9.4	11.3	0.4	3.6
15015	FERGUSON	11F10	39D4	Poor	7/25/74	2187500	11.0	51.1	11.0	4.0	35.9
07015	THREE MILE	11F06	40A2	Good	7/5/74	1833400	14.0	55.1	11.0	8.0	71.9
07949	WILKENS (SOUTHWEST)	11F06	40A2	Good	7/2/74	1309000	14.0	29.5	11.5	10.0	90.8
03001	JOHNSON	11K01	43A3	Good	7/4/77	1396500	10.0	32.0	12.0	7.0	64.3
03002	BLACKETTS	11K01	43A4	Good	7/15/75	16400000	30.0	171.0	10.2	9.6	84.8
03025	HARDY	11F16	44B1	Good	7/2/56	3830766	18.3	43.7	7.0	8.5	70.5
03021	GABARUS	11F16	44B2	Good	7/15/77	18586060	16.0	440.0	12.0	11.0	100
03022	LONG	11F16	44B2	Good	8/15/75	2035900	27.0	27.4	13.8	9.2	87.9
18121	FREEMANS	20P13	5C3	Poor	7/17/91	905341	14.0	24.9	9.0	3.7	31.9

APPENDIX II

Survey Data

Appendix II

Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Cape Breton	Condon	11-Jul-01	0.0	21.3	44	7.7	86.3	4.1				
Cape Breton	Condon	11-Jul-01	1.0	20.6	43	7.7	85.3					
Cape Breton	Condon	11-Jul-01	2.0	20.3	42	7.9	86.5					
Cape Breton	Condon	11-Jul-01	3.0	20.1	43	8.2	89.5			2.1	184.1	
Cape Breton	Condon	11-Jul-01	4.0	20.1	43	8.0	87.5					
Cape Breton	Condon	11-Jul-01	5.0	19.7	43	8.1	88.0					
Cape Breton	Condon	11-Jul-01	6.0	18.2	43	7.6	79.7					
Cape Breton	Condon	11-Jul-01	7.0	14.5	42	6.6	63.8			1.7	10.0	10
Cape Breton	Condon	11-Jul-01	8.0	11.5	43	4.9	44.7					
Cape Breton	Condon	11-Jul-01	9.0	10.6	43	4.0	35.5					
Cape Breton	Condon	11-Jul-01	10.0	10.1	44	3.8	33.4					
Cape Breton	Condon	11-Jul-01	11.0	10.0	39					0.6	15.9	10
Cape Breton	Condon	11-Jul-01	12.0	9.0	39							
Cape Breton	Condon	11-Jul-01	13.0	9.0	40							
Cape Breton	Condon	11-Jul-01	14.0	8.9	42							
Cape Breton	Condon	7-Aug-01	0.0	23.2	45	8.3	95.9	4.7				
Cape Breton	Condon	7-Aug-01	1.0	23.1	44	8.2	95.4		6.5	2.3	12.4	10
Cape Breton	Condon	7-Aug-01	2.0	23.1	44	8.4	97.3					
Cape Breton	Condon	7-Aug-01	3.0	23.0	44	8.3	96.2					
Cape Breton	Condon	7-Aug-01	4.0	23.0	44	8.4	97.2					
Cape Breton	Condon	7-Aug-01	5.0	23.0	44	8.5	98.5					
Cape Breton	Condon	7-Aug-01	6.0	20.2	44	7.2	78.6					
Cape Breton	Condon	7-Aug-01	7.0	16.4	43	5.6	57.2		6.2		19.4	
Cape Breton	Condon	7-Aug-01	8.0	13.3	45	3.8	35.8					
Cape Breton	Condon	7-Aug-01	9.0	11.0	45	2.3	20.2					
Cape Breton	Condon	7-Aug-01	10.0	10.4	45	1.9	16.6					
Cape Breton	Condon	7-Aug-01	11.0	10.0	40							
Cape Breton	Condon	7-Aug-01	12.0	9.5	45				6.5		19.4	
Cape Breton	Condon	7-Aug-01	13.0	9.2	45							
Cape Breton	Cook	11-Jul-01	0.0	20.9	33	7.9	88.1	2.8				
Cape Breton	Cook	11-Jul-01	1.0	20.9	32	7.7	85.1					10
Cape Breton	Cook	11-Jul-01	2.0	20.7	32	7.8	86.0		6.0	2.1	15.9	
Cape Breton	Cook	11-Jul-01	3.0	20.4	33	7.1	78.2					
Cape Breton	Cook	11-Jul-01	4.0	19.9	33	7.1	77.1					
Cape Breton	Cook	11-Jul-01	5.0	17.5	32	6.0	61.7		5.9			
Cape Breton	Cook	11-Jul-01	6.0	12.9	30	3.9	36.6					
Cape Breton	Cook	11-Jul-01	7.0	10.7	31	2.7	23.8					
Cape Breton	Cook	11-Jul-01	8.0	9.5	32	1.4	12.3					
Cape Breton	Cook	11-Jul-01	9.0	8.9	33	0.8	6.6		5.9	1.0	30.0	60
Cape Breton	Cook	11-Jul-01	10.0	8.7	34	0.4	3.0					

Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Cape Breton	Cook	7-Aug-01	0.0	23.4	35	7.9	91.9	2.8				
Cape Breton	Cook	7-Aug-01	1.0	23.4	35	7.6	88.7		7.0		12.4	
Cape Breton	Cook	7-Aug-01	2.0	23.4	35	8.0	92.9			5.2		10
Cape Breton	Cook	7-Aug-01	3.0	23.3	35	7.6	88.0					
Cape Breton	Cook	7-Aug-01	4.0	21.7	35	7.2	81.0					
Cape Breton	Cook	7-Aug-01	5.0	17.8	33	2.4	25.5					
Cape Breton	Cook	7-Aug-01	6.0	13.6	33	1.2	11.1					
Cape Breton	Cook	7-Aug-01	7.0	11.6	33	0.3	3.0					
Cape Breton	Cook	7-Aug-01	8.0	9.7	37	-0.1	0.0					
Cape Breton	Cook	7-Aug-01	9.0	9.4	39	-0.1	0.0					
Cape Breton	Cook	7-Aug-01	10.0	9.1	41	-0.1	0.0					
Cape Breton	Cook	7-Aug-01	11.0	9.0	40	-0.1	0.0		6.3		41.8	
Cape Breton	Cook	7-Aug-01	12.0	9.0	50							
Cape Breton	Cranberry	11-Jul-01	0.0	22.1	33	7.7	87.5	2.2				
Cape Breton	Cranberry	11-Jul-01	1.0	21.9	33	7.7	86.8		6.5	11.9	24.1	20
Cape Breton	Cranberry	11-Jul-01	2.0	21.4	33	7.4	82.8					
Cape Breton	Cranberry	11-Jul-01	3.0	19.8	34	7.0	75.7					
Cape Breton	Cranberry	11-Jul-01	4.0	17.1	35	2.8	28.7					
Cape Breton	Cranberry	11-Jul-01	5.0	15.0	42	0.2	2.1			0.0	35.9	50
Cape Breton	Cranberry	11-Jul-01	6.0	13.1	49	0.2	1.9					
Cape Breton	Cranberry	7-Aug-01	0.0	23.8	38	7.7	90.6	2.7				
Cape Breton	Cranberry	7-Aug-01	1.0	23.8	38	7.6	89.7		6.3	1.1	43.5	30
Cape Breton	Cranberry	7-Aug-01	2.0	23.8	37	7.8	91.8					
Cape Breton	Cranberry	7-Aug-01	3.0	21.1	37	5.2	58.5					
Cape Breton	Cranberry	7-Aug-01	4.0	17.6	40	0.3	3.5					
Cape Breton	Cranberry	7-Aug-01	5.0	15.8	52	0.2	2.3		6.3		29.4	
Cape Breton	Cranberry	7-Aug-01	6.0	13.9								
Cape Breton	Long	11-Jul-01	0.0	20.2	38	7.3	80.1	2.4				
Cape Breton	Long	11-Jul-01	1.0	20.2	37	7.7	84.5					
Cape Breton	Long	11-Jul-01	2.0	20.2	37	7.6	83.7					
Cape Breton	Long	11-Jul-01	3.0	20.1	37	7.7	84.4			0.0	15.9	10
Cape Breton	Long	11-Jul-01	4.0	19.5	38	7.5	80.7					
Cape Breton	Long	11-Jul-01	5.0	18.3	38	7.2	76.2					
Cape Breton	Long	11-Jul-01	5.5	16.2	38	6.2	62.9					10
Cape Breton	Long	11-Jul-01	6.0	14.1	38	5.2	50.5					
Cape Breton	Long	11-Jul-01	6.5	13.0	38	5.3	49.4		5.1	0.0	8.2	10
Cape Breton	Long	11-Jul-01	7.0	11.9	38	5.3	48.3					
Cape Breton	Long	11-Jul-01	8.0	11.2	38	5.3	47.5					
Cape Breton	Long	11-Jul-01	9.0	10.9	38	5.4	48.2					
Cape Breton	Long	11-Jul-01	10.0	10.7	38	5.3	47.5					
Cape Breton	Long	11-Jul-01	13.0							2.5	22.9	10
Cape Breton	Long	7-Aug-01	0.0	23.2	40	8.1	94.1	3.4				

Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Cape Breton	Long	7-Aug-01	1.0	23.2	40	8.1	93.8		6.2	3.0	14.7	10
Cape Breton	Long	7-Aug-01	2.0	23.2	40	8.1	93.8					
Cape Breton	Long	7-Aug-01	3.0	23.2	40	8.3	95.9					
Cape Breton	Long	7-Aug-01	4.0	23.2	40	8.3	95.9					
Cape Breton	Long	7-Aug-01	5.0	22.2	40	8.0	90.6					
Cape Breton	Long	7-Aug-01	6.0	15.8	41	4.4	43.7					
Cape Breton	Long	7-Aug-01	7.0	13.4	40	3.4	32.4					
Cape Breton	Long	7-Aug-01	8.0	12.4	40	3.3	30.3					
Cape Breton	Long	7-Aug-01	9.0	12.0	40	3.4	31.5					
Cape Breton	Long	7-Aug-01	10.0	11.6	40	3.3	30.4					
Cape Breton	Long	7-Aug-01	11.0	10.9	39							
Cape Breton	Long	7-Aug-01	12.0	10.9	39							
Cape Breton	Long	7-Aug-01	13.0	10.9	39							
Cape Breton	Long	7-Aug-01	14.0	10.5	39				6.0		443.5	
Cape Breton	Long	7-Aug-01	15.0	10.1	39							
Cape Breton	MacKay	11-Jul-01	0.0	21.9	107	8.0	90.8	2.5				
Cape Breton	MacKay	11-Jul-01	1.0	21.8	107	8.2	92.8					
Cape Breton	MacKay	11-Jul-01	2.0	21.7	107	8.1	91.7					
Cape Breton	MacKay	11-Jul-01	3.0	20.9	107	8.0	89.4			2.3	7.1	20
Cape Breton	MacKay	11-Jul-01	4.0	19.8	105	8.1	87.6					
Cape Breton	MacKay	11-Jul-01	5.0	19.0	105	8.1	86.6					
Cape Breton	MacKay	11-Jul-01	6.0	16.7	105	6.8	69.4					
Cape Breton	MacKay	11-Jul-01	7.0	11.2	106	6.8	61.1			0.6	11.8	20
Cape Breton	MacKay	11-Jul-01	8.0	9.8	106	6.3	55.0					
Cape Breton	MacKay	11-Jul-01	9.0	9.5	107	6.4	55.2					
Cape Breton	MacKay	11-Jul-01	10.0	9.1	107	6.3	54.2		5.7	0.6	8.8	20
Cape Breton	MacKay	11-Jul-01	11.0	9.0	81							
Cape Breton	MacKay	11-Jul-01	12.0	8.5	81							
Cape Breton	MacKay	11-Jul-01	13.0	8.1	81							
Cape Breton	MacKay	11-Jul-01	14.0	8.1	81							
Cape Breton	MacKay	11-Jul-01	15.0	8.1	81							
Cape Breton	MacKay	7-Aug-01	0.0	23.8	110	8.1	94.7	4.0				
Cape Breton	MacKay	7-Aug-01	1.0	23.7	109	8.1	94.4		13.0	5.0	13.5	20
Cape Breton	MacKay	7-Aug-01	2.0	23.7	109	8.2	95.9					
Cape Breton	MacKay	7-Aug-01	3.0	23.6	109	8.3	96.7					
Cape Breton	MacKay	7-Aug-01	4.0	23.6	109	8.3	96.9					
Cape Breton	MacKay	7-Aug-01	5.0	20.1	107	6.7	73.7					
Cape Breton	MacKay	7-Aug-01	6.0	16.7	108	5.8	58.8		6.4		22.9	
Cape Breton	MacKay	7-Aug-01	7.0	12.1	108	5.1	47.2					
Cape Breton	MacKay	7-Aug-01	8.0	10.8	108	4.7	42.1					
Cape Breton	MacKay	7-Aug-01	9.0	10.0	108	4.6	40.1					
Cape Breton	MacKay	7-Aug-01	10.0	9.5	108	4.4	38.0					

Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Cape Breton	MacKay	7-Aug-01	11.0	10.0	85							
Cape Breton	MacKay	7-Aug-01	12.0	9.0	85				6.4		34.7	
Cape Breton	MacKay	7-Aug-01	13.0	9.0	85							
Cape Breton	MacKay	7-Aug-01	14.0	9.0	85							
Cape Breton	MacKay	7-Aug-01	15.0	9.0	85							
Central	Birch	18-Jul-01	0.0	23.8	26	8.2	96.2	2.1				
Central	Birch	18-Jul-01	1.0	21.7	26	8.2	92.0		5.5	-0.6	26.5	70
Central	Birch	18-Jul-01	2.0	20.7	26	7.5	82.5					
Central	Birch	18-Jul-01	3.0	17.2	26	5.3	55.1					
Central	Birch	18-Jul-01	4.0	10.9	26	3.9	35.2		5.3	0.6	36.5	70
Central	Birch	18-Jul-01	5.0	8.5	25	4.5	38.1					
Central	Birch	18-Jul-01	6.0	7.2	26	4.3	35.2					
Central	Birch	18-Jul-01	7.0	6.5	26	3.8	30.8					
Central	Birch	18-Jul-01	8.0	6.2	26	3.4	26.9					
Central	Birch	18-Jul-01	9.0	6.1	26	2.6	20.7		5.1	0.9	11.8	70
Central	Birch	18-Jul-01	10.0	5.9	27	1.4	11.5					
Central	Birch	15-Aug-01	0.0	25.4	25	7.8	94.8	1.7				
Central	Birch	15-Aug-01	1.0	24.5	25	7.7	91.9		6.0	3.3	17.6	60
Central	Birch	15-Aug-01	2.0	23.4	26	7.4	86.0					
Central	Birch	15-Aug-01	3.0	20.1	26	4.2	46.3					
Central	Birch	15-Aug-01	4.0	11.8	26	2.8	25.7					
Central	Birch	15-Aug-01	5.0	9.1	25	3.9	33.6					
Central	Birch	15-Aug-01	6.0	7.9	25	2.6	21.8					
Central	Birch	15-Aug-01	7.0	7.3	26	2.1	17.1					
Central	Birch	15-Aug-01	8.0	6.8	26	2.1	16.9					
Central	Birch	15-Aug-01	9.0	6.5	26	1.3	10.3		5.5		36.5	
Central	Birch	15-Aug-01	10.0	6.3	27	-0.4	0.0					
Central	Birch	15-Aug-01	11.0	7.0	35							
Central	Harris	18-Jul-01	0.0	21.9	22	7.8	88.6	1.8				
Central	Harris	18-Jul-01	1.0	21.3	22	7.8	86.9		5.3	4.0	18.2	70
Central	Harris	18-Jul-01	2.0	21.1	22	7.7	85.8					
Central	Harris	18-Jul-01	3.0	21.1	22	7.9	87.7					
Central	Harris	18-Jul-01	4.0	18.7	23	5.7	60.5					
Central	Harris	18-Jul-01	5.0	14.2	23	3.1	30.2					
Central	Harris	18-Jul-01	6.0	11.9	23	2.3	21.3					
Central	Harris	18-Jul-01	7.0	11.2	23	1.3	11.7					
Central	Harris	18-Jul-01	8.0	10.9	23	0.9	8.4		5.1	4.7	113.5	100
Central	Harris	18-Jul-01	9.0	10.7	23	0.6	4.9					
Central	Harris	15-Aug-01	0.0	24.1	23	7.5	88.5	2.2				
Central	Harris	15-Aug-01	1.0	23.2	23	7.3	85.1		5.5	4.0	20.0	60
Central	Harris	15-Aug-01	2.0	23.0	23	6.8	78.8					
Central	Harris	15-Aug-01	3.0	22.9	23	7.4	84.9					

Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Central	Harris	15-Aug-01	4.0	22.8	23	6.9	79.3					
Central	Harris	15-Aug-01	5.0	16.1	24	0.5	5.0					
Central	Harris	15-Aug-01	6.0	12.8	25	0.0	0.0					
Central	Harris	15-Aug-01	7.0	11.7	28	-0.1	0.0					
Central	Harris	15-Aug-01	8.0	11.4	28	-0.2	0.0					
Central	Harris	15-Aug-01	9.0	11.2	29	-0.2	0.0		5.4		55.9	
Central	Harris	15-Aug-01	10.0	11.1	29	-0.2	0.0					
Central	Lewis (East)	18-Jul-01	0.0	23.1	26	7.6	88.4	1.3				
Central	Lewis (East)	18-Jul-01	1.0	22.5	26	7.6	87.0		4.9	3.5	22.4	80
Central	Lewis (East)	18-Jul-01	2.0	20.9	26	7.4	81.7					
Central	Lewis (East)	18-Jul-01	3.0	20.7	26	7.1	78.0					
Central	Lewis (East)	18-Jul-01	4.0	20.0	28	6.3	69.2					
Central	Lewis (East)	18-Jul-01	5.0	14.8	28	3.4	33.6					
Central	Lewis (East)	18-Jul-01	6.0	12.3	29	3.1	28.3					
Central	Lewis (East)	18-Jul-01	7.0	11.5	29	2.7	24.3		4.6	1.2	41.8	100
Central	Lewis (East)	18-Jul-01	8.0	10.7	30	2.3	20.9					
Central	Lewis (East)	15-Aug-01	0.0	22.5	28	6.6	76.0	1.4				
Central	Lewis (East)	15-Aug-01	1.0	22.6	28	6.8	77.5		5.0	2.0	20.6	
Central	Lewis (East)	15-Aug-01	2.0	22.6	28	6.7	77.2					
Central	Lewis (East)	15-Aug-01	3.0	22.6	28	6.5	74.6					
Central	Lewis (East)	15-Aug-01	4.0	21.0	29	4.4	49.2					
Central	Lewis (East)	15-Aug-01	5.0	16.0	30	1.4	14.0					
Central	Lewis (East)	15-Aug-01	6.0	13.8	30	0.7	6.3					
Central	Lewis (East)	15-Aug-01	7.0	12.3	31	0.5	4.2					
Central	Lewis (East)	15-Aug-01	8.0	11.2	31	0.2	2.3					
Central	Lewis (East)	15-Aug-01	9.0	10.7	31	0.0	0.0		4.7		101.8	
Central	Lewis (East)	15-Aug-01	10.0	10.5	31	-0.2	0.0					
Central	Lewis (West)	18-Jul-01	0.0	21.1	26	7.8	86.7					
Central	Lewis (West)	18-Jul-01	1.0	21.1	26	7.8	86.7					
Central	Lewis (West)	18-Jul-01	2.0	22.8	26	7.9	91.0					
Central	Lewis (West)	18-Jul-01	3.0	20.7	27	7.3	80.8					
Central	Lewis (West)	18-Jul-01	4.0	18.2	27	6.3	65.9					
Central	Lewis (West)	18-Jul-01	5.0	16.0	28	4.1	40.9					
Central	Lewis (West)	18-Jul-01	6.0	12.5	29	3.1	28.8					
Central	Lewis (West)	18-Jul-01	7.0	11.5	28	2.8	25.3					
Central	Lewis (West)	18-Jul-01	8.0	11.0	28	2.3	20.8					
Central	Lewis (West)	18-Jul-01	9.0	10.3	42	0.8	7.2					
Central	Lewis (West)	15-Aug-01	0.0	22.6	28	7.3	83.9					
Central	Lewis (West)	15-Aug-01	1.0	22.7	28	7.3	84.1					
Central	Lewis (West)	15-Aug-01	2.0	22.7	28	7.3	84.5					
Central	Lewis (West)	15-Aug-01	3.0	22.7	28	7.3	84.2					
Central	Lewis (West)	15-Aug-01	4.0	21.6	29	4.9	55.6					

Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Central	Lewis (West)	15-Aug-01	5.0	16.2	30	1.6	16.4					
Central	Lewis (West)	15-Aug-01	6.0	13.8	30	0.8	7.9					
Central	Lewis (West)	15-Aug-01	7.0	11.7	29	0.4	4.1					
Central	Lewis (West)	15-Aug-01	8.0	11.0	29	0.0	0.0					
Central	Lewis (West)	15-Aug-01	9.0	10.6	29	-0.2	0.0					
Central	Millet	18-Jul-01	0.0	21.2	35	7.9	87.9	1.9				
Central	Millet	18-Jul-01	1.0	21.2	35	7.9	88.1		5.3	4.8	18.2	60
Central	Millet	18-Jul-01	2.0	21.2	35	8.0	89.0					
Central	Millet	18-Jul-01	3.0	21.1	35	8.0	89.5					
Central	Millet	18-Jul-01	4.0	18.5	36	6.2	65.4					
Central	Millet	18-Jul-01	5.0	14.7	38	5.7	55.8					
Central	Millet	18-Jul-01	6.0	12.0	38	6.4	59.2		5.3	1.3	7.6	80
Central	Millet	18-Jul-01	7.0	10.5	39	7.1	63.1					
Central	Millet	18-Jul-01	8.0	9.5	41	7.6	66.3					
Central	Millet	18-Jul-01	9.0	8.6	41	7.5	63.8					
Central	Millet	18-Jul-01	10.0	8.1	41	7.6	63.5		4.7	1.5	17.6	70
Central	Millet	18-Jul-01	14.0						4.7	0.6	18.8	60
Central	Millet	15-Aug-01	0.0	23.1	36	7.6	88.4	2.2				
Central	Millet	15-Aug-01	1.0	23.3	37	7.7	89.1		6.2	3.6	18.8	20
Central	Millet	15-Aug-01	2.0	23.3	37	7.7	89.1					
Central	Millet	15-Aug-01	3.0	19.7	37	7.5	81.1					
Central	Millet	15-Aug-01	4.0	15.5	38	4.3	42.4					
Central	Millet	15-Aug-01	5.0	12.3	39	3.5	32.1					
Central	Millet	15-Aug-01	6.0	10.5	40	4.8	42.8					
Central	Millet	15-Aug-01	7.0	9.5	41	5.8	50.2					
Central	Millet	15-Aug-01	8.0	8.8	42	6.1	52.0					
Central	Millet	15-Aug-01	9.0	8.3	42	6.4	53.6					
Central	Millet	15-Aug-01	10.0	8.5	43	6.1	51.9		5.0		46.5	
Central	Philip	25-Jul-01	0.0	23.0	20	8.0	92.3	4.5				171
Central	Philip	25-Jul-01	1.0	23.1	20	7.6	88.4					
Central	Philip	25-Jul-01	2.0	23.1	20	8.0	92.6		5.5		5.9	10
Central	Philip	25-Jul-01	3.0	23.0	19	8.0	92.4					
Central	Philip	25-Jul-01	4.0	20.0	19	7.8	85.6					
Central	Philip	25-Jul-01	5.0	14.4	20	6.3	61.4					
Central	Philip	25-Jul-01	6.0	11.4	21	4.7	42.2					
Central	Philip	25-Jul-01	7.0	10.1	21	3.6	31.3					
Central	Philip	25-Jul-01	8.0	8.9	21	3.2	27.4		5.2		18.2	
Central	South Twin	18-Jul-01	0.0	23.6	26	8.2	96.0	3.1				
Central	South Twin	18-Jul-01	1.0	23.8	26	8.3	97.6		5.5	2.9	14.1	30
Central	South Twin	18-Jul-01	2.0	22.0	25	8.4	95.8					
Central	South Twin	18-Jul-01	3.0	20.1	25	6.6	71.9					
Central	South Twin	18-Jul-01	4.0	13.5	26	3.8	36.1					

Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Central	South Twin	18-Jul-01	5.0	9.8	27	2.0	17.5					
Central	South Twin	18-Jul-01	6.0	7.9	29	0.7	5.6		5.2	1.7	11.8	40
Central	South Twin	18-Jul-01	7.0	7.3	30	0.3	2.2					
Central	South Twin	18-Jul-01	8.0	6.8	31	-0.3	0.0					
Central	South Twin	15-Aug-01	0.0	25.0	25	7.3	87.3	2.7				
Central	South Twin	15-Aug-01	1.0	25.0	25	7.2	86.8		6.2	2.0	18.2	10
Central	South Twin	15-Aug-01	2.0	24.1	25	7.2	84.8					
Central	South Twin	15-Aug-01	3.0	23.4	26	7.1	83.2					
Central	South Twin	15-Aug-01	4.0	16.2	27	2.5	24.8					
Central	South Twin	15-Aug-01	5.0	11.3	29	0.6	5.3					
Central	South Twin	15-Aug-01	6.0	9.0	30	-0.2	0.0					
Central	South Twin	15-Aug-01	7.0	8.1	35	-0.4	0.0					
Central	South Twin	15-Aug-01	8.0	7.4	38	-0.4	0.0		5.9		25.3	
Central	South Twin	15-Aug-01	9.0	7.0	78	-0.5	0.0					
Central	South Twin	15-Aug-01	10.0	7.0	80	-0.5	0.0					
Eastern Shore	Bare Rock	25-Jul-01	0.0	22.5	32	8.2	94.0	2.3				
Eastern Shore	Bare Rock	25-Jul-01	1.0	22.8	32	8.2	94.1					
Eastern Shore	Bare Rock	25-Jul-01	2.0	22.8	32	8.3	95.1		4.9	2.0	10.0	40
Eastern Shore	Bare Rock	25-Jul-01	3.0	20.8	33	7.8	86.4					
Eastern Shore	Bare Rock	25-Jul-01	4.0	16.0	34	5.3	53.1					
Eastern Shore	Bare Rock	25-Jul-01	5.0	12.8	35	5.3	49.9					
Eastern Shore	Bare Rock	25-Jul-01	6.0	11.4	35	5.8	52.3					
Eastern Shore	Bare Rock	25-Jul-01	7.0	10.5	35	5.9	52.3					
Eastern Shore	Bare Rock	25-Jul-01	8.0	9.8	35	5.6	48.8					
Eastern Shore	Bare Rock	25-Jul-01	9.0	9.2	36	4.7	40.6		4.8		24.1	
Eastern Shore	Bare Rock	25-Jul-01	10.0	8.9	36	4.3	36.7					
Eastern Shore	Bare Rock	22-Aug-01	0.0	23.5	33	8.2	95.3	2.4				
Eastern Shore	Bare Rock	22-Aug-01	1.0	23.4	33	8.1	94.8		5.1		15.9	30
Eastern Shore	Bare Rock	22-Aug-01	2.0	23.1	32	8.1	94.2					
Eastern Shore	Bare Rock	22-Aug-01	3.0	22.7	32	8.1	92.9					
Eastern Shore	Bare Rock	22-Aug-01	4.0	19.1	34	4.7	50.3					
Eastern Shore	Bare Rock	22-Aug-01	5.0	15.0	34	2.9	28.6					
Eastern Shore	Bare Rock	22-Aug-01	6.0	12.4	35	3.4	31.7					
Eastern Shore	Bare Rock	22-Aug-01	7.0	10.8	35	4.1	36.8					
Eastern Shore	Bare Rock	22-Aug-01	8.0	9.8	35	3.8	33.3					
Eastern Shore	Bare Rock	22-Aug-01	9.0	9.3	34	3.1	26.5		5.0		19.4	
Eastern Shore	Bare Rock	22-Aug-01	10.0	9.1	34	2.7	23.2					
Eastern Shore	Horseshoe	25-Jul-01	0.0	22.8	19	7.9	90.5	3.0				
Eastern Shore	Horseshoe	25-Jul-01	1.0	23.0	19	7.9	90.9		5.9	1.7	14.7	10
Eastern Shore	Horseshoe	25-Jul-01	2.0	23.0	19	7.5	87.0					
Eastern Shore	Horseshoe	25-Jul-01	3.0	17.9	22	5.1	53.2					
Eastern Shore	Horseshoe	25-Jul-01	4.0	13.4	21	1.8	17.5					

Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Eastern Shore	Horseshoe	25-Jul-01	5.0	11.1	20	1.6	14.4					
Eastern Shore	Horseshoe	25-Jul-01	6.0	10.4	21	1.0	8.5					
Eastern Shore	Horseshoe	25-Jul-01	7.0	9.6	21	0.5	4.3		5.9		31.2	
Eastern Shore	Horseshoe	22-Aug-01	0.0	23.8	21	8.1	94.7	2.9				
Eastern Shore	Horseshoe	22-Aug-01	1.0	23.5	20	7.7	89.6		5.6		21.2	10
Eastern Shore	Horseshoe	22-Aug-01	2.0	22.5	20	7.9	90.9					
Eastern Shore	Horseshoe	22-Aug-01	3.0	20.8	22	4.1	45.0					
Eastern Shore	Horseshoe	22-Aug-01	4.0	15.5	22	0.2	2.2					
Eastern Shore	Horseshoe	22-Aug-01	5.0	11.9	21	0.0	0.2					
Eastern Shore	Horseshoe	22-Aug-01	6.0	10.3	24	-0.1	0.0					
Eastern Shore	Horseshoe	22-Aug-01	7.0	9.7	26	-0.1	0.0		5.6		34.7	
Eastern Shore	Horseshoe	22-Aug-01	8.0	9.4	30	-0.3	0.0					
Eastern Shore	Philip	22-Aug-01	0.0	22.6	21	7.9	90.6	4.8				
Eastern Shore	Philip	22-Aug-01	1.0	22.6	21	7.8	89.5		5.5		5.3	10
Eastern Shore	Philip	22-Aug-01	2.0	22.6	21	7.8	89.4					
Eastern Shore	Philip	22-Aug-01	3.0	22.5	21	7.4	84.7					
Eastern Shore	Philip	22-Aug-01	4.0	22.4	21	7.7	88.5					
Eastern Shore	Philip	22-Aug-01	5.0	18.4	23	5.1	54.0					
Eastern Shore	Philip	22-Aug-01	6.0	13.6	22	3.7	35.3					
Eastern Shore	Philip	22-Aug-01	7.0	10.5	22	2.3	20.2					
Eastern Shore	Philip	22-Aug-01	8.0	9.6	22	1.9	16.7					
Eastern Shore	Philip	22-Aug-01	9.0	9.3	22	1.4	12.0		5.2		20.0	
Eastern Shore	Philip	22-Aug-01	10.0	9.0	22	1.1	9.3					
Eastern Shore	Scraggy	25-Jul-01	0.0	22.5	20	8.2	94.2					
Eastern Shore	Scraggy	25-Jul-01	1.0	22.5	20	8.1	93.3					
Eastern Shore	Scraggy	25-Jul-01	2.0	22.5	20	8.4	96.2	2.3	5.1	0.1	10.0	20
Eastern Shore	Scraggy	25-Jul-01	3.0	22.2	20	8.4	95.7					
Eastern Shore	Scraggy	25-Jul-01	4.0	20.7	21	7.7	84.7					
Eastern Shore	Scraggy	25-Jul-01	5.0	18.5	21	6.8	72.1					
Eastern Shore	Scraggy	25-Jul-01	6.0	16.4	21	5.8	58.5					
Eastern Shore	Scraggy	25-Jul-01	7.0	12.6	22	5.8	54.0					
Eastern Shore	Scraggy	25-Jul-01	8.0	11.5	22	5.3	48.6					
Eastern Shore	Scraggy	25-Jul-01	9.0	10.6	23	4.5	40.1					
Eastern Shore	Scraggy	25-Jul-01	10.0	10.2	22	4.1	36.6					
Eastern Shore	Scraggy	25-Jul-01	11.0	10.2	24							
Eastern Shore	Scraggy	25-Jul-01	12.0	9.8	23							
Eastern Shore	Scraggy	25-Jul-01	13.0	9.4	24				5.0		33.5	
Eastern Shore	Scraggy	25-Jul-01	14.0	9.3	25							
Eastern Shore	Scraggy	25-Jul-01	15.0	9.6	26							
Eastern Shore	Scraggy	22-Aug-01	0.0	23.1	21	8.0	93.0	3.2				
Eastern Shore	Scraggy	22-Aug-01	1.0	22.5	20	8.0	91.4		5.3		18.8	20
Eastern Shore	Scraggy	22-Aug-01	2.0	22.4	21	7.9	90.1					

Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Eastern Shore	Scraggy	22-Aug-01	3.0	22.2	19	8.0	90.7					
Eastern Shore	Scraggy	22-Aug-01	4.0	21.9	20	7.5	84.8					
Eastern Shore	Scraggy	22-Aug-01	5.0	20.5	21	5.7	62.4					
Eastern Shore	Scraggy	22-Aug-01	6.0	16.5	21	3.2	32.3					
Eastern Shore	Scraggy	22-Aug-01	7.0	12.9	21	2.9	27.2					
Eastern Shore	Scraggy	22-Aug-01	8.0	11.4	21	2.7	24.5					
Eastern Shore	Scraggy	22-Aug-01	9.0	10.5	21	2.3	20.2					
Eastern Shore	Scraggy	22-Aug-01	10.0	10.0	21	2.1	18.3					
Eastern Shore	Scraggy	22-Aug-01	11.0	10.0	25							
Eastern Shore	Scraggy	22-Aug-01	12.0	9.5	25							
Eastern Shore	Scraggy	22-Aug-01	13.0	9.5	25				5.0		22.9	
Eastern Shore	Scraggy	22-Aug-01	14.0	9.5	25							
Eastern Shore	Scraggy	22-Aug-01	15.0	9.5	25							
Eastern Shore	Southwest	25-Jul-01	0.0	22.3	21	7.8	88.6	4.0				
Eastern Shore	Southwest	25-Jul-01	1.0	22.5	21	7.8	89.5					
Eastern Shore	Southwest	25-Jul-01	2.0	22.5	21	8.0	91.2		5.6	1.1	7.1	10
Eastern Shore	Southwest	25-Jul-01	3.0	22.4	21	8.1	92.6					
Eastern Shore	Southwest	25-Jul-01	4.0	22.3	21	8.2	93.6					
Eastern Shore	Southwest	25-Jul-01	5.0	19.8	21	7.8	85.2					
Eastern Shore	Southwest	25-Jul-01	6.0	14.7	21	6.3	61.7		5.3	1.3		10
Eastern Shore	Southwest	25-Jul-01	7.0	11.9	21	6.0	55.3					
Eastern Shore	Southwest	25-Jul-01	8.0	10.4	21	6.1	54.3					
Eastern Shore	Southwest	25-Jul-01	9.0	9.7	21	6.1	53.2					
Eastern Shore	Southwest	25-Jul-01	10.0	9.4	21	6.1	52.5				7.1	
Eastern Shore	Southwest	25-Jul-01	11.0	9.0	23							
Eastern Shore	Southwest	25-Jul-01	12.0	8.7	23							
Eastern Shore	Southwest	25-Jul-01	13.0	8.0	24				5.3		10.0	
Eastern Shore	Southwest	25-Jul-01	14.0	7.8	26							
Eastern Shore	Southwest	25-Jul-01	15.0	7.5	27							
Eastern Shore	Southwest	22-Aug-01	0.0	22.7	23	7.7	88.3	3.7				
Eastern Shore	Southwest	22-Aug-01	1.0	22.7	22	7.5	86.3		6.1		7.6	10
Eastern Shore	Southwest	22-Aug-01	2.0	22.7	22	7.3	84.5					
Eastern Shore	Southwest	22-Aug-01	3.0	22.6	22	7.1	81.3					
Eastern Shore	Southwest	22-Aug-01	4.0	22.4	21	7.4	84.5					
Eastern Shore	Southwest	22-Aug-01	5.0	22.0	22	7.0	79.9					
Eastern Shore	Southwest	22-Aug-01	6.0	16.6	23	4.5	46.1					
Eastern Shore	Southwest	22-Aug-01	7.0	12.6	23	4.3	40.1					
Eastern Shore	Southwest	22-Aug-01	8.0	10.8	23	4.4	39.7					
Eastern Shore	Southwest	22-Aug-01	9.0	9.9	23	4.4	38.2					
Eastern Shore	Southwest	22-Aug-01	10.0	9.3	23	4.3	37.1					
Eastern Shore	Southwest	22-Aug-01	11.0	8.5	22							
Eastern Shore	Southwest	22-Aug-01	12.0	8.0	22							

Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Eastern Shore	Southwest	22-Aug-01	13.0	7.8	22							
Eastern Shore	Southwest	22-Aug-01	14.0	7.8	22				5.1		22.9	
Eastern Shore	Southwest	22-Aug-01	15.0	7.8	25							
Southwest	Agard	1-Aug-01	0.0	22.4	54	7.8	89.3	1.5				
Southwest	Agard	1-Aug-01	1.0	22.7	54	7.8	90.1					
Southwest	Agard	1-Aug-01	2.0	22.5	54	7.6	86.8		6.6	4.1	34.1	80
Southwest	Agard	1-Aug-01	3.0	22.2	54	7.8	89.3					
Southwest	Agard	1-Aug-01	4.0	19.0	56	2.2	23.3					
Southwest	Agard	1-Aug-01	5.0	15.6	58	1.3	13.4					
Southwest	Agard	1-Aug-01	6.0	13.3	59	0.1	0.9					
Southwest	Agard	1-Aug-01	7.0	12.5	66	0.1	0.5		6.2		47.1	
Southwest	Agard	1-Aug-01	8.0	12.2	73	0.0	0.3					
Southwest	Agard	27-Aug-01	0.0	21.8	54	7.3	82.8	1.6				
Southwest	Agard	27-Aug-01	1.0	21.7	54	6.9	77.3		5.8	5.5		10
Southwest	Agard	27-Aug-01	2.0	21.6	54	7.0	78.7					
Southwest	Agard	27-Aug-01	3.0	21.6	54	6.8	76.6					
Southwest	Agard	27-Aug-01	4.0	20.2	56	2.5	27.2					
Southwest	Agard	27-Aug-01	5.0	16.0	62	0.2	2.5					
Southwest	Agard	27-Aug-01	6.0	14.1	67	0.1	0.6		5.8			
Southwest	Agard	27-Aug-01	7.0	13.0	74	0.0	0.0					
Southwest	Agard	27-Aug-01	8.0	12.6	77	-0.1	0.0					
Southwest	Biggars	1-Aug-01	0.0	22.0	34	7.6	86.4	2.0				
Southwest	Biggars	1-Aug-01	1.0	22.2	34	7.8	88.5					
Southwest	Biggars	1-Aug-01	2.0	22.2	34	7.9	89.5		5.8	2.1	22.4	50
Southwest	Biggars	1-Aug-01	3.0	22.2	34	7.8	88.5					
Southwest	Biggars	1-Aug-01	4.0	21.0	34	6.8	75.9					
Southwest	Biggars	1-Aug-01	5.0	18.8	35	4.1	43.3					
Southwest	Biggars	1-Aug-01	6.0	15.4	35	2.7	27.0					
Southwest	Biggars	1-Aug-01	7.0	13.5	35	1.3	12.5					
Southwest	Biggars	1-Aug-01	8.0	12.9	36	1.3	12.1					
Southwest	Biggars	1-Aug-01	9.0	11.5	36	0.4	4.1		5.7		28.8	
Southwest	Biggars	1-Aug-01	10.0	11.1	36	0.0	0.0					
Southwest	Biggars	27-Aug-01	0.0	21.8	34	7.7	86.6	2.0				
Southwest	Biggars	27-Aug-01	1.0	21.8	34	7.7	87.5			2.4		20
Southwest	Biggars	27-Aug-01	2.0	21.9	34	7.2	81.9		6.0			
Southwest	Biggars	27-Aug-01	3.0	21.9	34	7.0	79.4					
Southwest	Biggars	27-Aug-01	4.0	21.7	34	7.0	78.5					
Southwest	Biggars	27-Aug-01	5.0	20.9	34	5.6	62.0					
Southwest	Biggars	27-Aug-01	6.0	16.2	36	0.8	7.9					
Southwest	Biggars	27-Aug-01	7.0	14.2	36	0.1	0.6					
Southwest	Biggars	27-Aug-01	8.0	12.6	36	0.0	0.0					
Southwest	Biggars	27-Aug-01	9.0	11.6	40	-0.1	0.0					

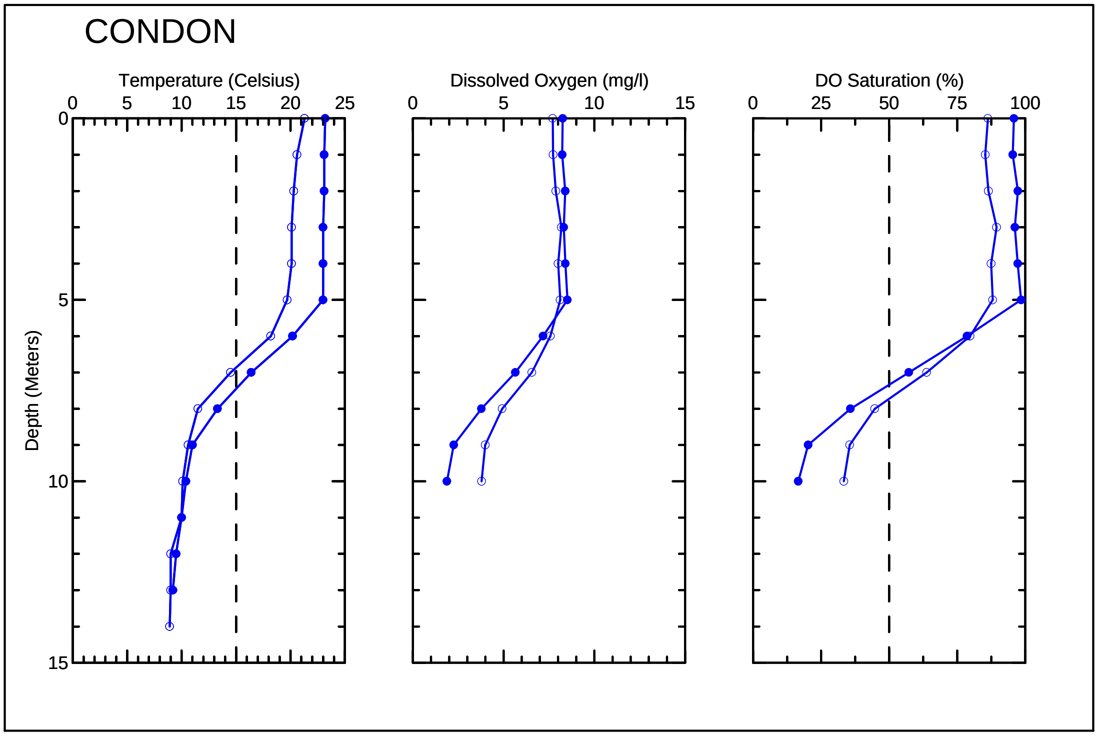
Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Southwest	Biggars	27-Aug-01	10.0	11.2	44	-0.2	0.0		5.1			
Southwest	French	1-Aug-01	0.0	23.4	45	8.2	95.5	6.1				
Southwest	French	1-Aug-01	1.0	23.1	45	8.1	93.5					
Southwest	French	1-Aug-01	2.0	23.0	45	8.3	95.6		6.4		14.7	5
Southwest	French	1-Aug-01	3.0	23.0	45	8.4	96.6					
Southwest	French	1-Aug-01	4.0	22.9	45	8.2	95.1					
Southwest	French	1-Aug-01	5.0	22.9	45	8.5	98.2					
Southwest	French	1-Aug-01	6.0	21.5	45	8.0	89.5					
Southwest	French	1-Aug-01	7.0	18.9	45	7.4	79.3					
Southwest	French	1-Aug-01	8.0	14.9	45	6.9	67.4					
Southwest	French	1-Aug-01	9.0	12.6	45	6.6	61.2					
Southwest	French	1-Aug-01	10.0	11.2	45	5.9	53.0					
Southwest	French	1-Aug-01	11.0	9.6	40							
Southwest	French	1-Aug-01	12.0	9.2	40							
Southwest	French	1-Aug-01	13.0	8.9	40							
Southwest	French	1-Aug-01	14.0	8.2	40							
Southwest	French	1-Aug-01	15.0	8.1	40				6.2		18.8	
Southwest	French	27-Aug-01	0.0	21.9	45	7.7	86.8	4.5				
Southwest	French	27-Aug-01	1.0	21.9	45	7.6	85.7		5.6	2.3		10
Southwest	French	27-Aug-01	2.0	22.0	45	7.5	85.7					
Southwest	French	27-Aug-01	3.0	22.0	45	7.5	84.7					
Southwest	French	27-Aug-01	4.0	22.0	45	7.8	88.3					
Southwest	French	27-Aug-01	5.0	22.0	45	7.6	86.2					
Southwest	French	27-Aug-01	6.0	21.4	45	7.8	88.0					
Southwest	French	27-Aug-01	7.0	21.3	45	7.1	79.9					
Southwest	French	27-Aug-01	8.0	16.8	45	5.6	57.0					
Southwest	French	27-Aug-01	9.0	14.0	44	5.5	53.1					
Southwest	French	27-Aug-01	10.0	12.3	44	5.2	48.6					
Southwest	French	27-Aug-01	11.0	10.7	40							
Southwest	French	27-Aug-01	12.0	9.9	40							
Southwest	French	27-Aug-01	13.0	9.2	40							
Southwest	French	27-Aug-01	14.0	8.9	41							
Southwest	French	27-Aug-01	15.0	8.7	41				5.9			
Southwest	Moses	1-Aug-01	0.0	22.6	42	7.8	89.5	2.2				
Southwest	Moses	1-Aug-01	1.0	22.6	42	7.9	90.9					
Southwest	Moses	1-Aug-01	2.0	22.5	42	8.0	91.3		6.0	3.3	22.4	40
Southwest	Moses	1-Aug-01	3.0	22.4	42	7.9	90.5					
Southwest	Moses	1-Aug-01	4.0	21.7	42	6.6	74.9					
Southwest	Moses	1-Aug-01	5.0	18.0	42	2.4	24.9			0.9		
Southwest	Moses	1-Aug-01	6.0	15.1	42	2.0	19.7					
Southwest	Moses	1-Aug-01	7.0	12.9	42	2.8	26.6					
Southwest	Moses	1-Aug-01	8.0	12.0	42	3.3	30.5					

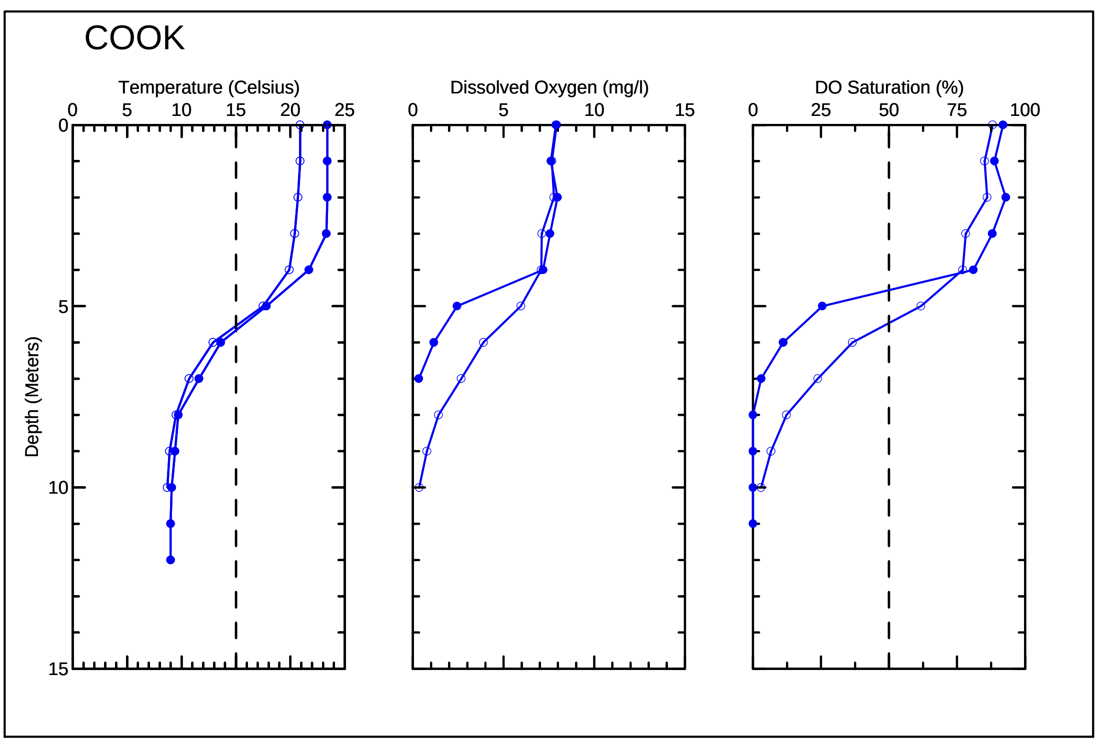
Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Southwest	Moses	1-Aug-01	9.0	11.4	42	3.1	28.4					
Southwest	Moses	1-Aug-01	10.0	11.0	43	3.1	27.7		5.8		11.8	
Southwest	Moses	1-Aug-01	11.0	11.0	40							
Southwest	Moses	1-Aug-01	12.0	10.7	40							
Southwest	Moses	1-Aug-01	13.0	10.6	44							
Southwest	Moses	1-Aug-01	14.0	10.8	48							
Southwest	Moses	27-Aug-01	0.0	21.5	41	7.4	83.7	2.0				
Southwest	Moses	27-Aug-01	1.0	21.6	41	7.2	81.1		5.3	4.7		40
Southwest	Moses	27-Aug-01	2.0	21.6	41	7.2	80.6					
Southwest	Moses	27-Aug-01	3.0	21.6	41	6.9	77.5					
Southwest	Moses	27-Aug-01	4.0	21.6	41	6.6	74.3					
Southwest	Moses	27-Aug-01	5.0	20.7	43	4.9	54.2					
Southwest	Moses	27-Aug-01	6.0	14.8	43	0.3	3.1					
Southwest	Moses	27-Aug-01	7.0	14.3	42	0.8	7.9					
Southwest	Moses	27-Aug-01	8.0	12.4	43	1.7	15.4					
Southwest	Moses	27-Aug-01	9.0	11.6	43	1.6	14.4					
Southwest	Moses	27-Aug-01	10.0	11.4	43	1.5	13.8					
Southwest	Moses	27-Aug-01	11.0	11.2	40				4.9			
Southwest	Moses	27-Aug-01	12.0	10.9	40							
Southwest	Moses	27-Aug-01	13.0	10.9	40							
Southwest	Ogden	1-Aug-01	0.0	23.8	49	8.1	95.0	2.2				
Southwest	Ogden	1-Aug-01	1.0	23.7	48	8.1	94.5					
Southwest	Ogden	1-Aug-01	2.0	23.6	48	8.1	95.1		6.6	7.9	29.4	50
Southwest	Ogden	1-Aug-01	3.0	23.4	48	7.9	91.6					
Southwest	Ogden	1-Aug-01	4.0	23.2	49	7.6	88.5					
Southwest	Ogden	1-Aug-01	5.0	22.4	49	6.6	75.4					
Southwest	Ogden	1-Aug-01	6.0	21.0	50	4.9	54.1					
Southwest	Ogden	1-Aug-01	7.0	18.6	52	2.1	22.2					
Southwest	Ogden	1-Aug-01	8.0	16.5	52	1.8	18.2					
Southwest	Ogden	1-Aug-01	9.0	14.4	52	3.2	31.1					
Southwest	Ogden	1-Aug-01	10.0	13.1	52	3.2	29.9					
Southwest	Ogden	1-Aug-01	11.0	12.0	50							
Southwest	Ogden	1-Aug-01	12.0	11.8	50							
Southwest	Ogden	1-Aug-01	13.0	11.5	50						85.9	
Southwest	Ogden	1-Aug-01	14.0	11.1	50							
Southwest	Ogden	1-Aug-01	15.0	11.0	50				6.8			
Southwest	Ogden	27-Aug-01	0.0	22.1	49	7.0	79.4	1.8				
Southwest	Ogden	27-Aug-01	1.0	22.0	49	6.9	78.2		5.9	1.4		30
Southwest	Ogden	27-Aug-01	2.0	21.9	49	6.8	77.3					
Southwest	Ogden	27-Aug-01	3.0	21.8	49	6.3	71.5					
Southwest	Ogden	27-Aug-01	4.0	21.8	49	6.7	76.2					
Southwest	Ogden	27-Aug-01	5.0	21.8	49	5.9	67.1					

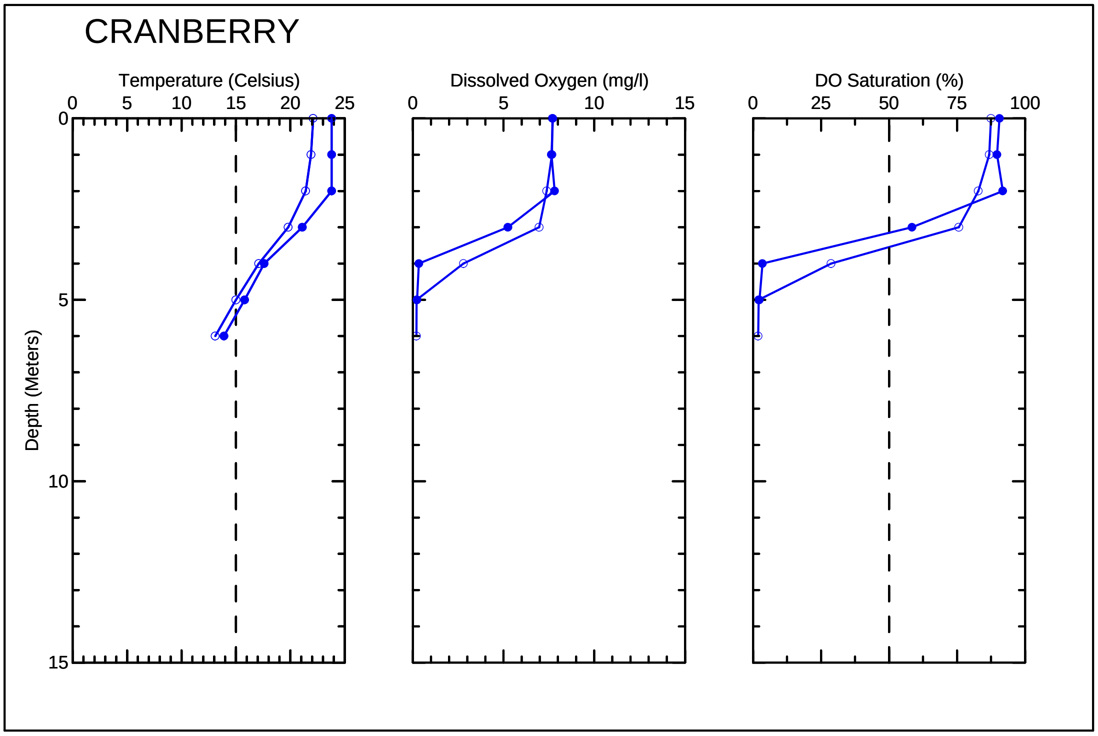
Survey Area	Lake	Survey Date	Depth (m)	Temperature (Celsius)	Conductivity (uS/cm)	Dissolved Oxygen (mg/l)	Percent Oxygen Saturation	Secchi Depth (m)	pH	Chlorophyll *a* (ug/l)	Total Phosphorus (ug/l)	True Colour (TCUs)
Southwest	Ogden	27-Aug-01	6.0	21.5	49	5.2	58.7					
Southwest	Ogden	27-Aug-01	7.0	21.2	49	2.9	32.7					
Southwest	Ogden	27-Aug-01	8.0	15.8	53	0.5	5.4					
Southwest	Ogden	27-Aug-01	9.0	13.9	53	1.3	12.9					
Southwest	Ogden	27-Aug-01	10.0	12.8	53	1.3	12.3					
Southwest	Ogden	27-Aug-01	11.0	11.5	51							
Southwest	Ogden	27-Aug-01	12.0	11.2	51							
Southwest	Ogden	27-Aug-01	13.0	11.1	51							
Southwest	Ogden	27-Aug-01	14.0	11.0	52							
Southwest	Ogden	27-Aug-01	15.0	10.1	52				6.0			

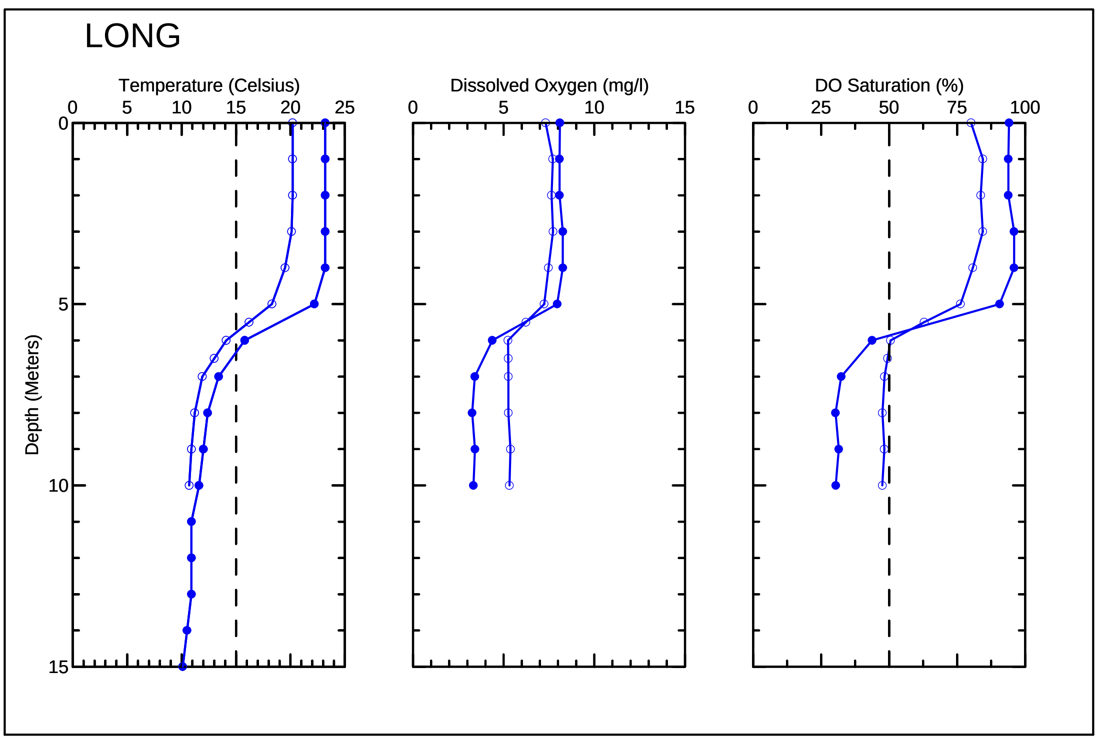
APPENDIX III

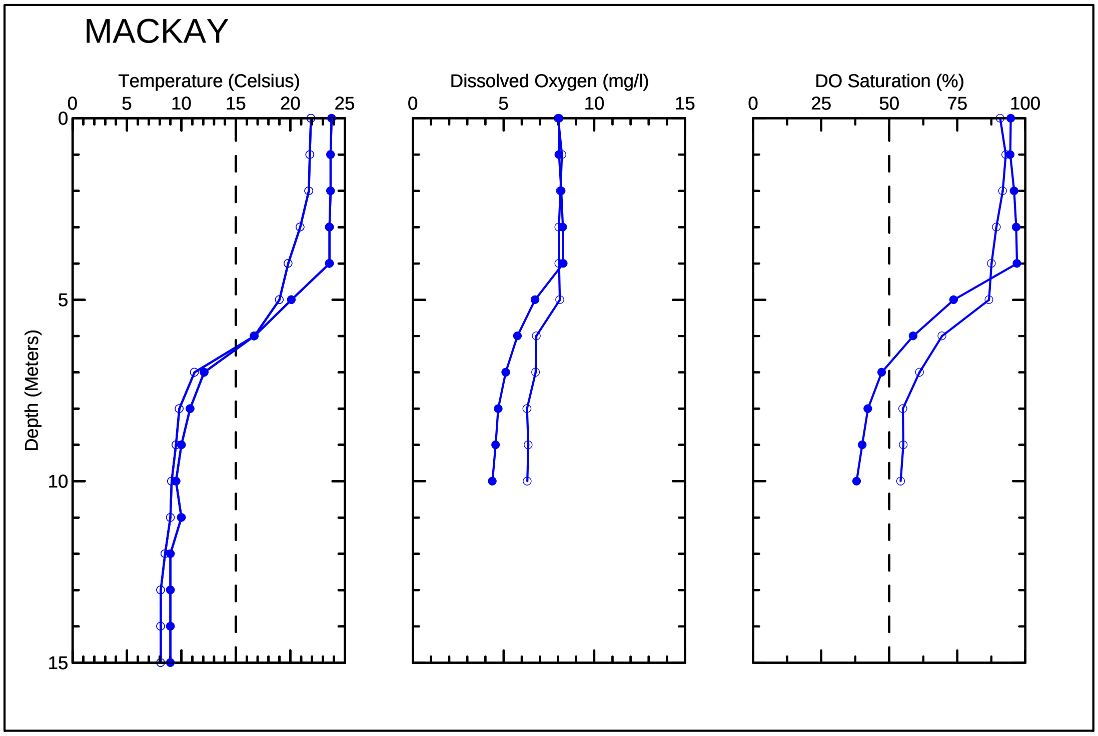
Depth Profiles of Water Temperature, Dissolved Oxygen and Percent Dissolved Oxygen Saturation for the 2001 survey (# - July; ! - August)

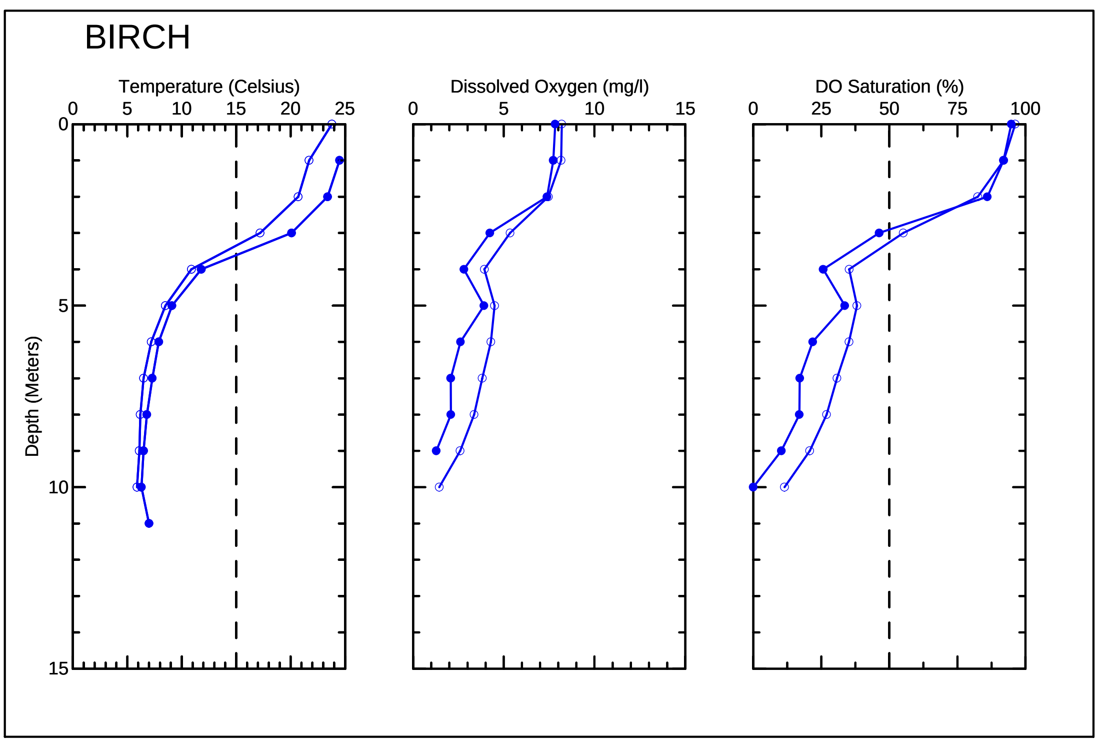

CONDON
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15

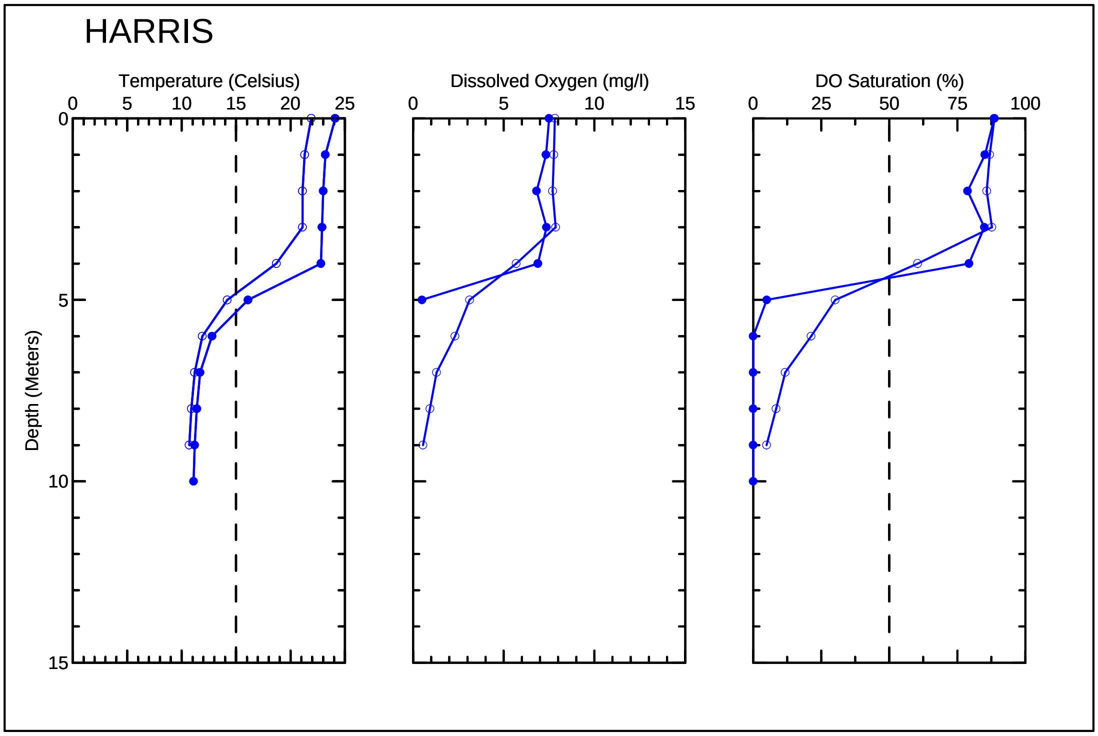

COOK
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15

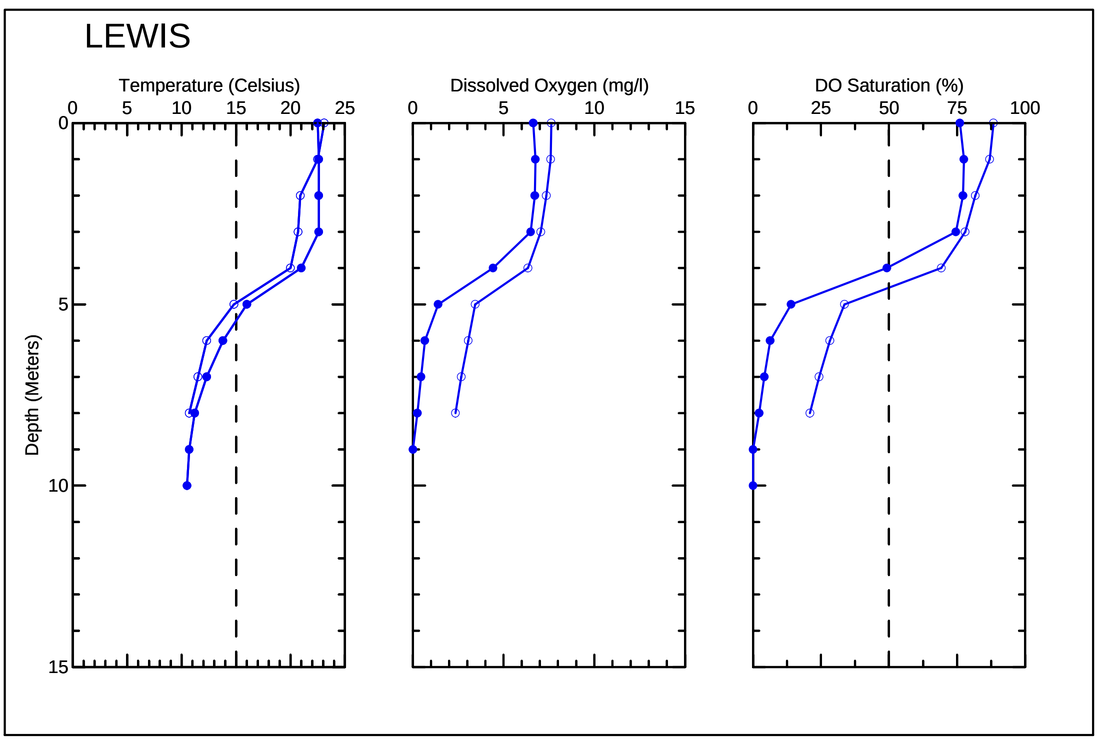

CRANBERRY
Temperature (Celsius)
Dissolved Oxygen (mg/l)
DO Saturation (%)
Depth (Meters)

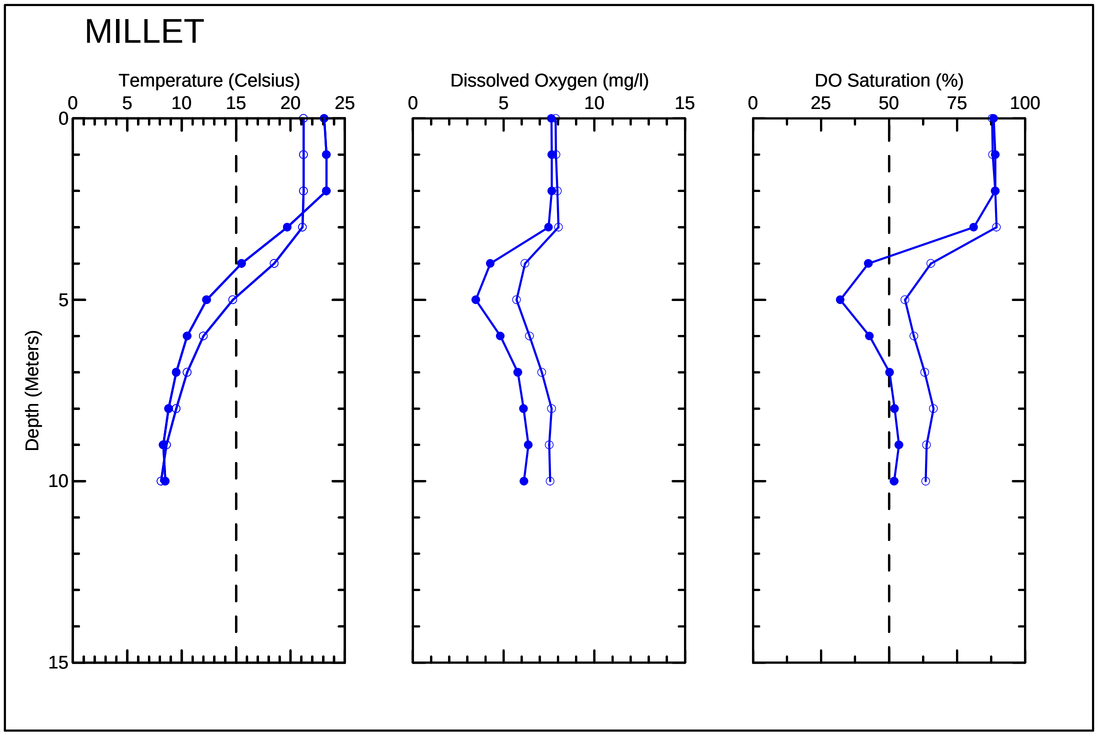

LONG
Temperature (Celsius)
Dissolved Oxygen (mg/l)
DO Saturation (%)
Depth (Meters)

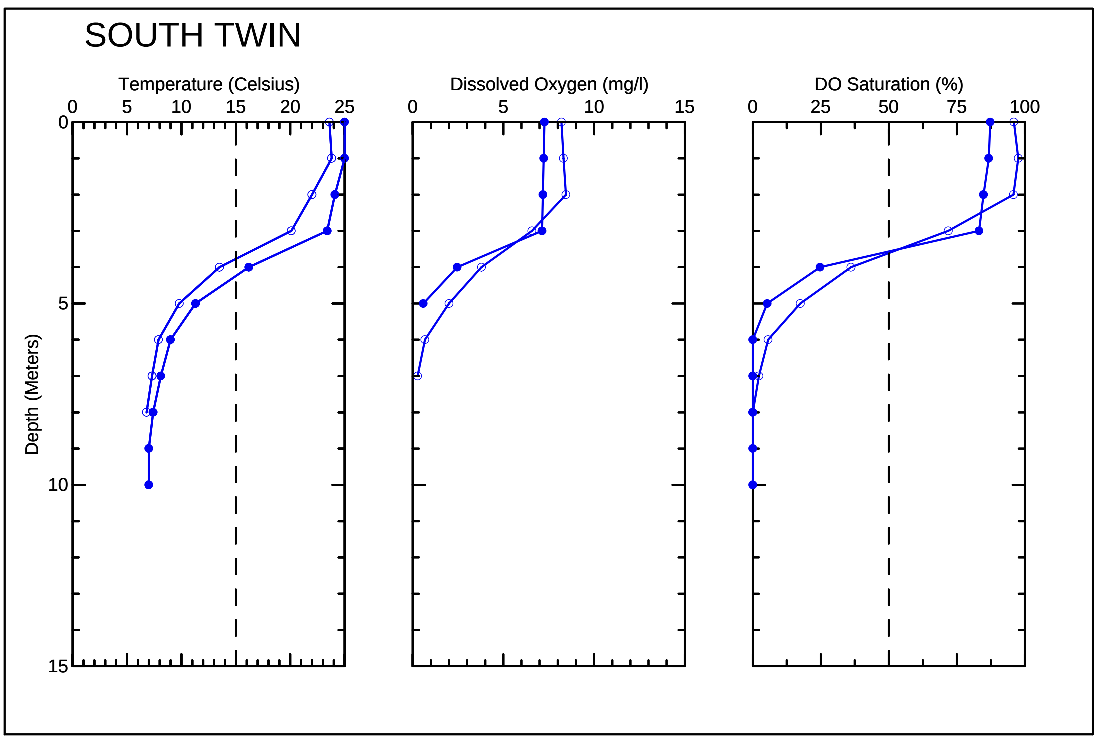

MACKAY
Temperature (Celsius)
Dissolved Oxygen (mg/l)
DO Saturation (%)
Depth (Meters)

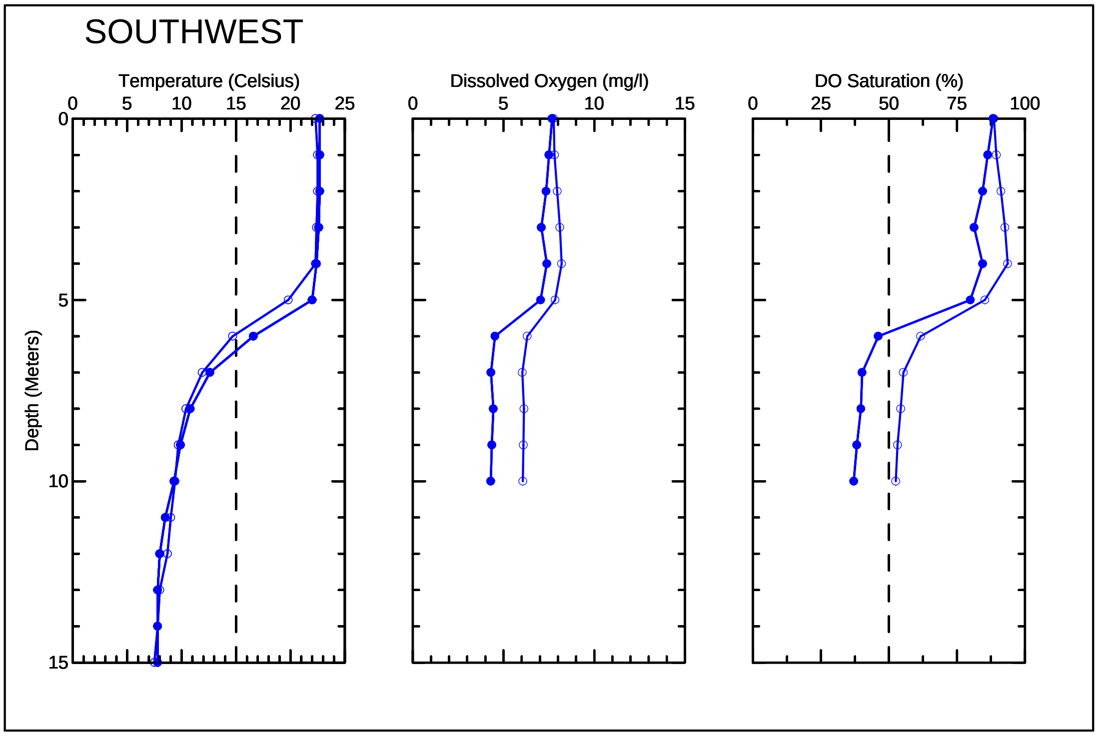

BIRCH
Temperature (Celsius)
Dissolved Oxygen (mg/l)
DO Saturation (%)
Depth (Meters)

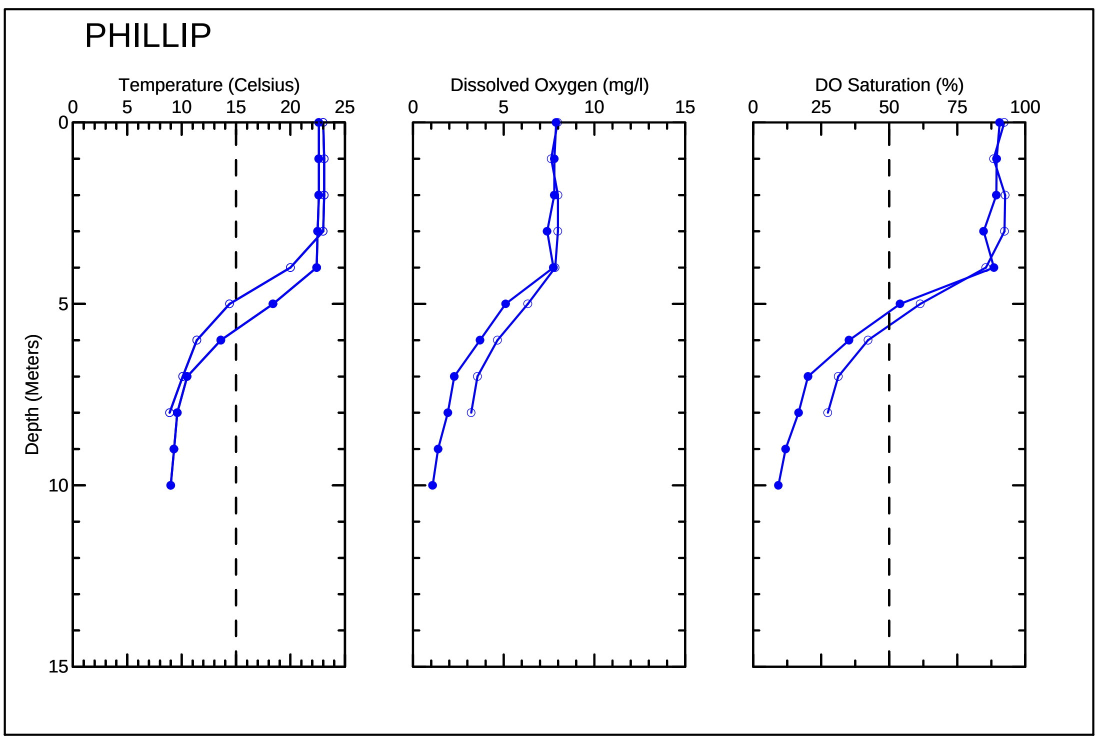

HARRIS
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15

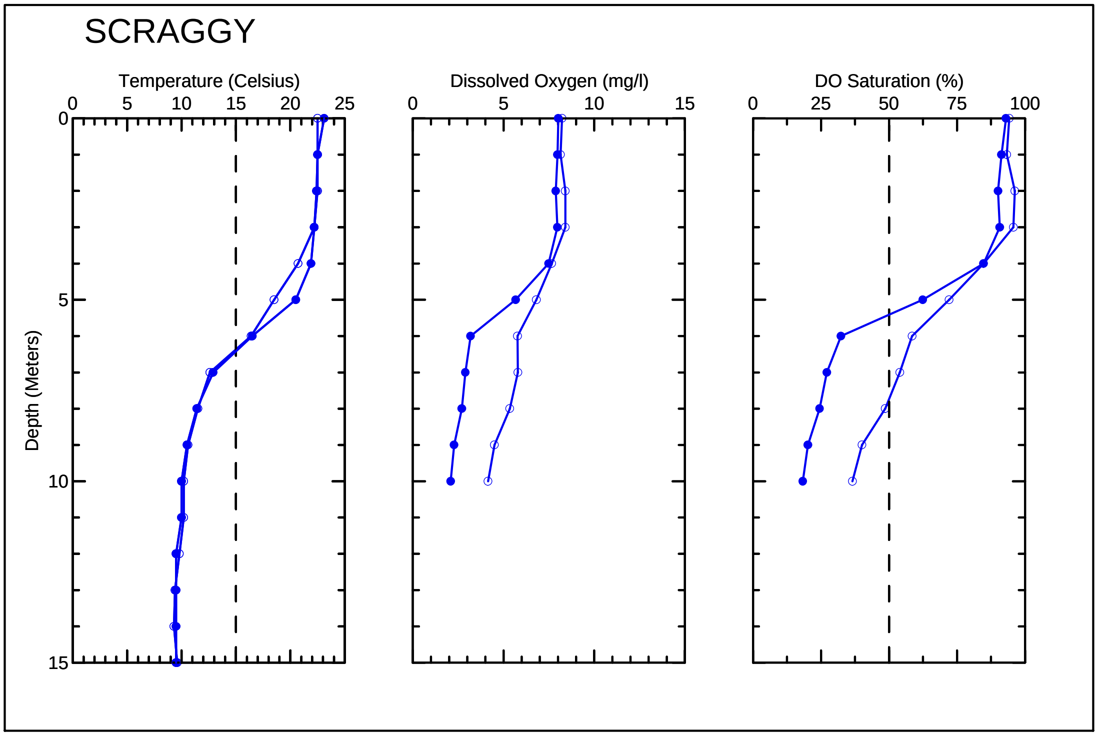

LEWIS
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15

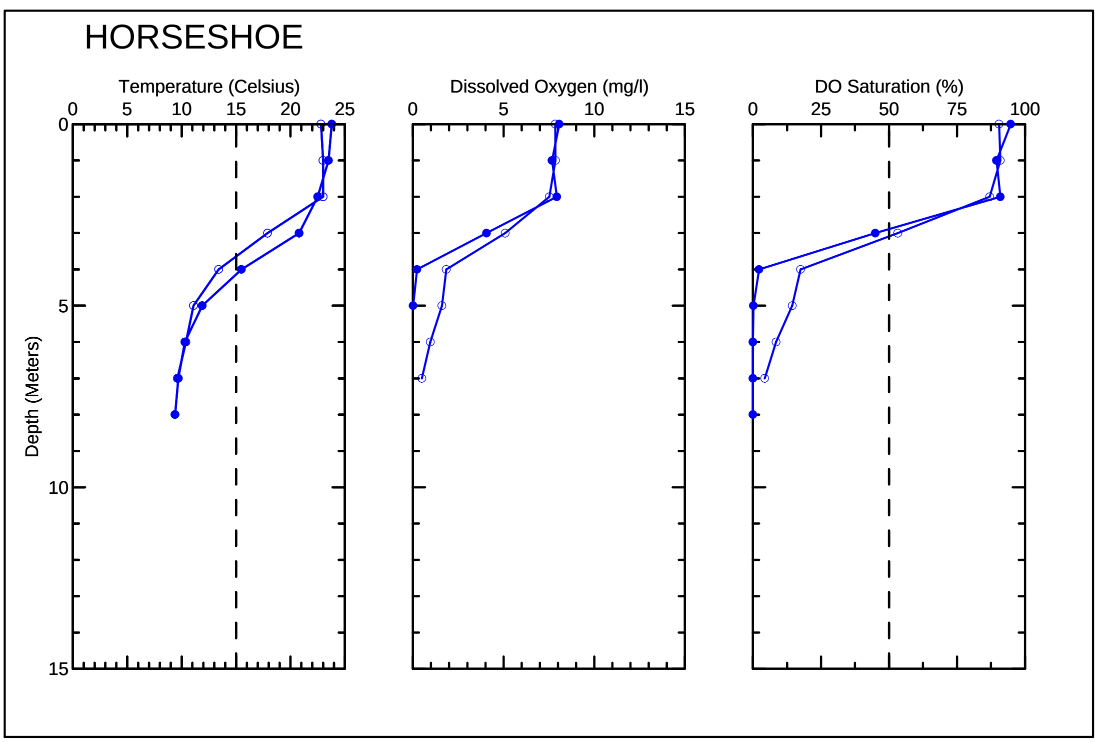

MILLET
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15

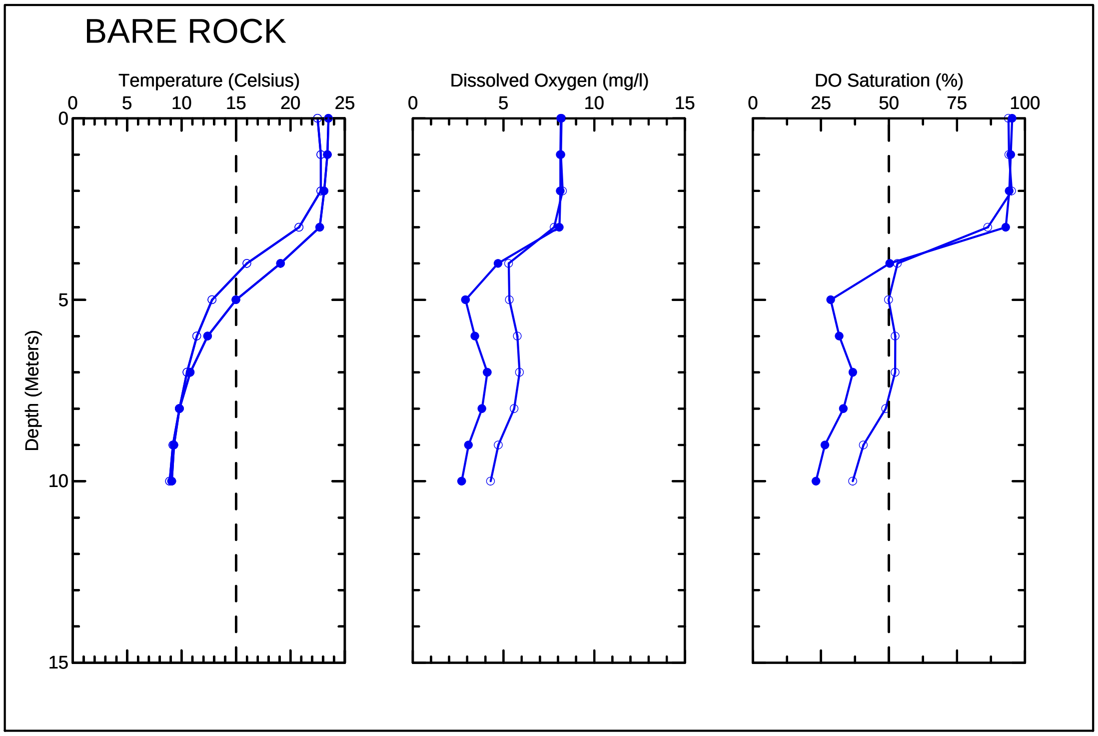

SOUTH TWIN
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15

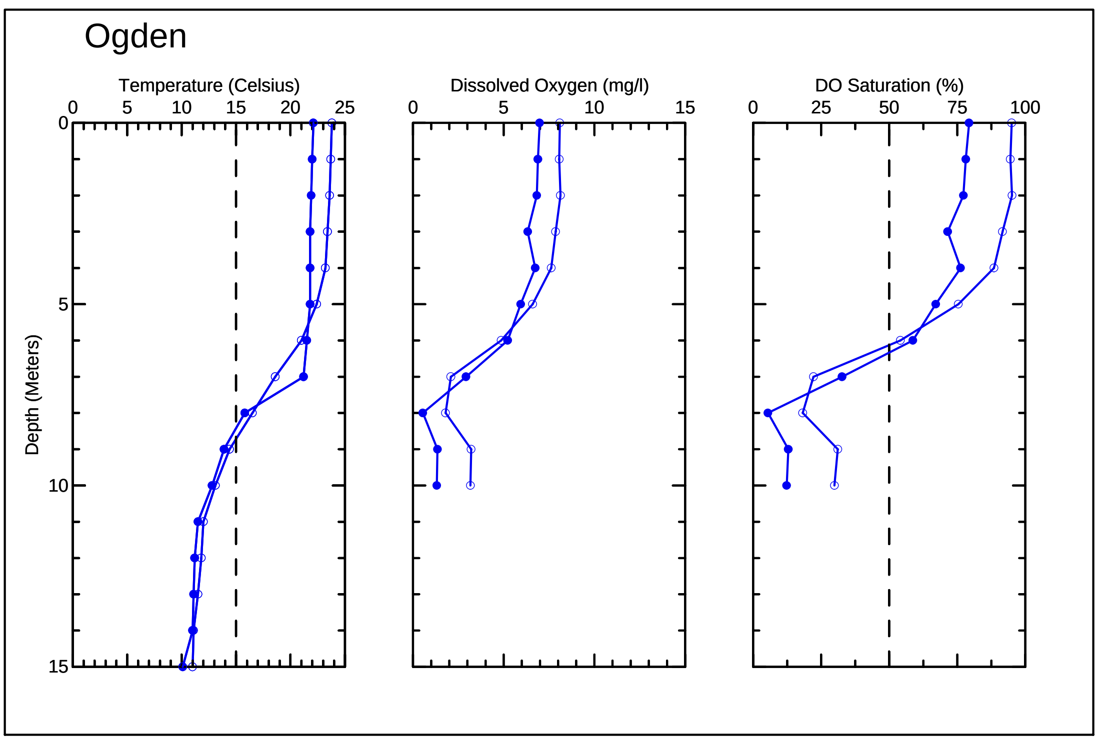

SOUTHWEST
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15

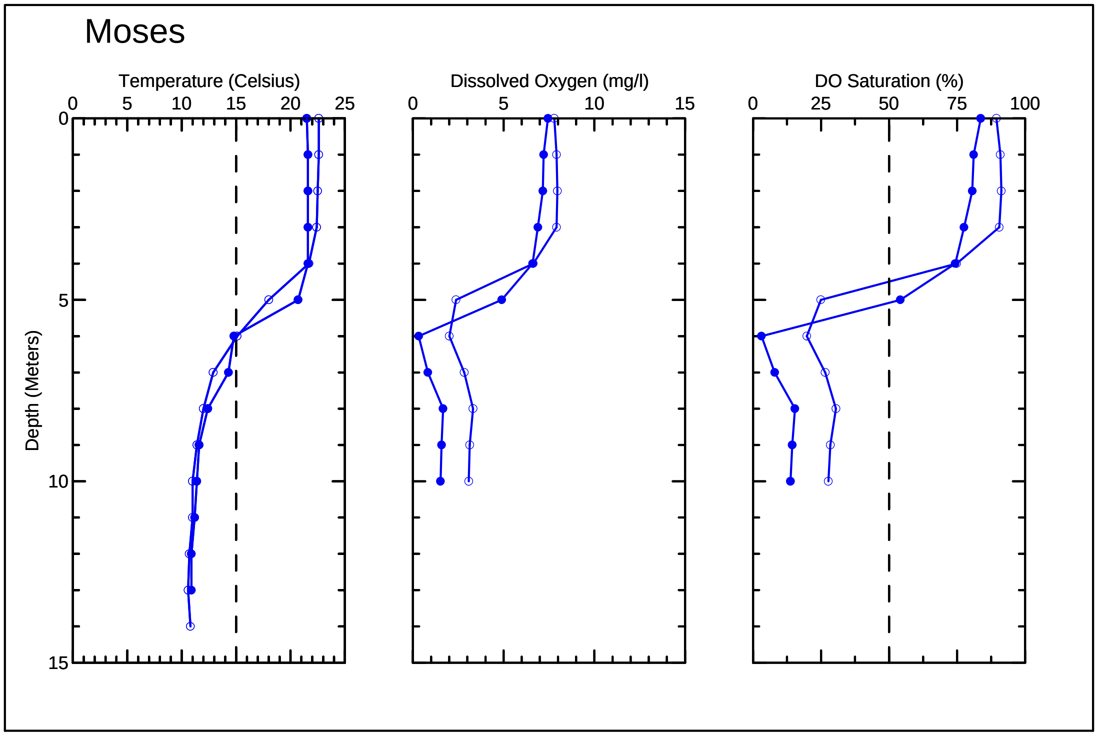

PHILLIP
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15

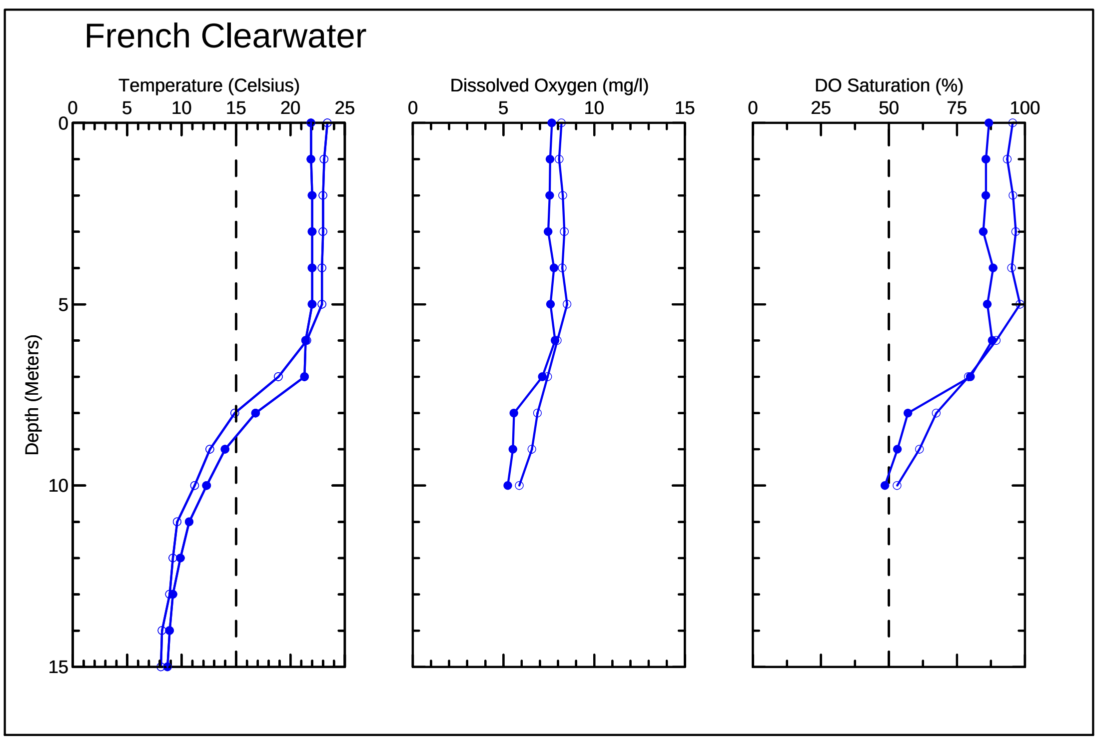

SCRAGGY
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15

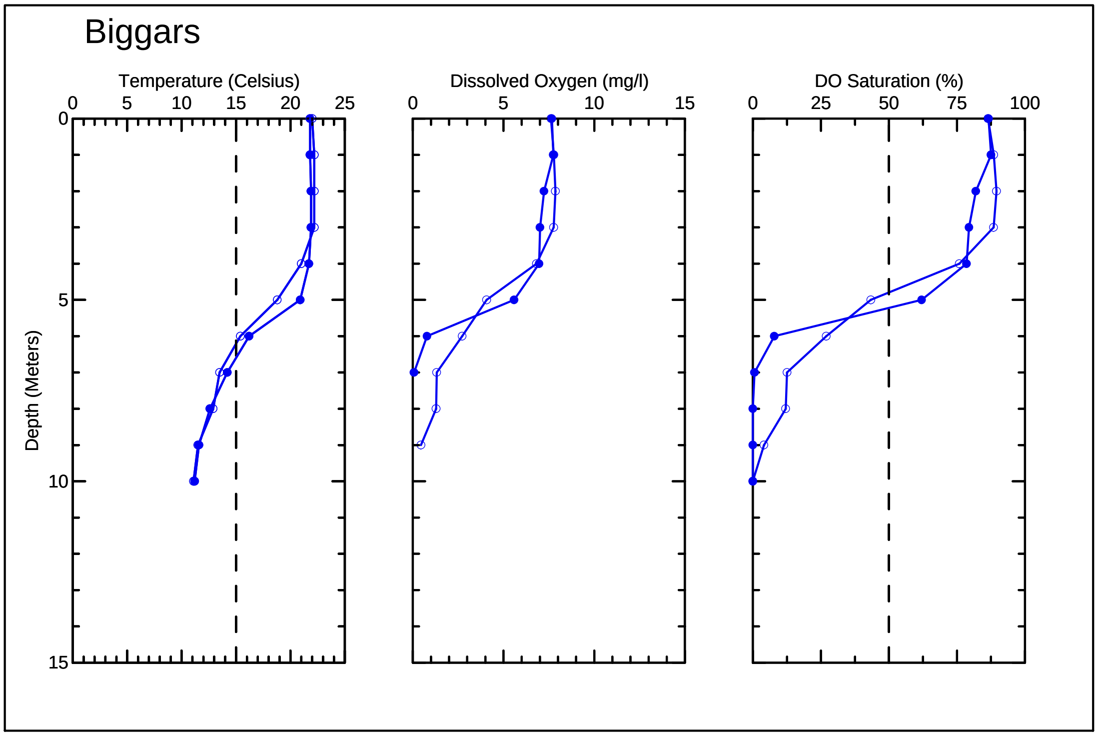

HORSESHOE
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15

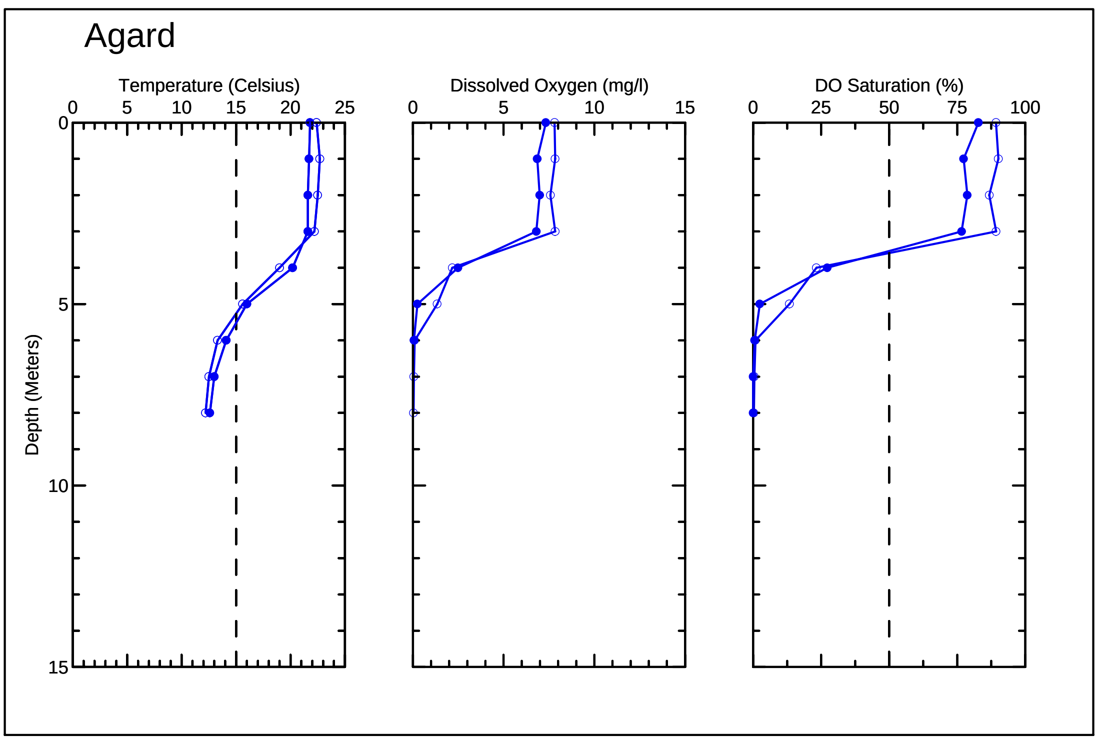

BARE ROCK
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15


Ogden
Temperature (Celsius)
0 5 10 15 20 25
Dissolved Oxygen (mg/l)
0 5 10 15
DO Saturation (%)
0 25 50 75 100
Depth (Meters)
0 5 10 15


Moses
Temperature (Celsius)
Dissolved Oxygen (mg/l)
DO Saturation (%)
Depth (Meters)
0 5 10 15 20 25
0 5 10 15
0 25 50 75 100


French Clearwater
Temperature (Celsius)
Dissolved Oxygen (mg/l)
DO Saturation (%)
Depth (Meters)
0 5 10 15 20 25
0 5 10 15
0 25 50 75 100


Biggars
Temperature (Celsius)
Dissolved Oxygen (mg/l)
DO Saturation (%)
Depth (Meters)
0 5 10 15 20 25
0 5 10 15
0 25 50 75 100
0 5 10 15


Agard
Temperature (Celsius)
Dissolved Oxygen (mg/l)
DO Saturation (%)
Depth (Meters)
0 5 10 15 20 25
0 5 10 15
0 25 50 75 100
0 5 10 15