Environment Waikato Technical Report 2007/21

Lake Taupo Long-Term Monitoring Programme 2005-2006

www.ew.govt.nz
ISSN: 1172-4005

Prepared by:
M.M. Gibbs (National Institute of Water and Atmospheric Research)

For:
Environment Waikato
PO Box 4010
HAMILTON EAST

March 2007

Document #: 1187169v3

Peer reviewed by:
Bill Vant Date June 2007

Approved for release by:
Dr Vivienne Smith Date June 2007

Lake Taupo Long-Term Monitoring Programme 2005-2006

NIWA Client Report: HAM2007-029
March 2007

NIWA Project: EVW06204

Lake Taupo Long-Term Monitoring Programme 2005-2006

M.M. Gibbs

Prepared for

Environment Waikato

NIWA Client Report: HAM2007-029
March 2007

NIWA Project: EVW06204

National Institute of Water & Atmospheric Research Ltd
Gate 10, Silverdale Road, Hamilton
P O Box 11115, Hamilton, New Zealand
Phone +64-7-856 7026, Fax +64-7-856 0151
www.niwa.co.nz

Contents

Reviewed by: *Approved for release by:*

Robert Spigel

Dr R. Spigel

Dr C. Howard-Williams

Formatting checked

A. Bartley

Executive Summary

With the expectation that the trophic status of Lake Taupo will slowly change to reflect changes in land use within the lake's catchments, a long term programme monitoring the lake's water quality was commissioned by Environment Waikato. This programme commenced in October 1994 and is conducted by NIWA with field assistance from the Department of Internal Affairs, Taupo Harbourmaster's Office.

The monitoring programme was designed to detect change through assessment of the rate of consumption of oxygen from the bottom waters of the lake (volumetric hypolimnetic oxygen depletion – VHOD) as an integration of all biological processes occurring in Lake Taupo. Additional parameters are measured to provide a more comprehensive picture of water quality. Recently it has become apparent that VHOD may be too coarse to determine trophic change in a lake the size and complexity of Lake Taupo. Consequently, more emphasis is now focused on the parameters 'phytoplankton biomass', 'water clarity', and nutrient (particularly nitrate) accumulation in the lake. This report presents the results from the 2005/06 monitoring period at the mid-lake site, Site A. Monitoring of additional sites in the Kuratau Basin (Site B) and the Western Bays (Site C) between January 2002 and December 2004 determined that spatial variability of water quality across Lake Taupo is minimal and that it is valid to use the mid-lake site as representative of the open water quality of the lake.

There is a long-term trend of increasing phytoplankton biomass (chlorophyll *a*) in the upper 10 m of water column over the monitoring period of 0.050 ± 0.030 mg m^{-3} y^{-1} with winter 2006 chlorophyll *a* concentrations being higher than in most previous winter bloom periods. The low maximum chlorophyll *a* in winter/spring 2005 was attributed to the incomplete mixing of the lake in winter 2005 and a retention of about 50% of the accumulated mass of NO_3-N and DRP in the bottom waters that would normally have been mixed up into the surface waters.

Highest biomass occurred in August when the lake had mixed and lowest biomass occurred in early summer when that winter biomass peak had sedimented from the water column. The 2005 winter bloom was dominated by the diatoms *Aulacoseira granulata*, *Asterionella formosa* and *Fragilaria crotonensis* and these species were present throughout most of the year. These 3 algal species also dominated the algal assemblage in the winter 2006 bloom. However, they were replaced in dominance by *Dinobryons* and *Botryococcus braunii* through late spring 2005 and summer 2006 before resuming dominance through late summer and autumn 2006. While blue-green algae (*Anabaena flos-aquae*) were present throughout the lake in spring, these did not exceeded 4th level order of dominance at the mid lake site at any time during the 2005/2006 monitoring period.

Nutrient concentrations (DRP, NH_4-N, and NO_3-N) in the upper water column were comparable with concentrations since 2003, although NO_3-N concentrations were very high during initial winter mixing in 2006. Incomplete mixing in winter 2005 left elevated NO_3-N and DRP concentrations in the bottom

waters (150 m). However, contrary to expectations of subsequent nutrient accumulation adding to these concentrations as the new baseline, the concentrations of both DRP and NO_3-N were lower in autumn 2006 than in previous years and there was a net loss of NO_3-N from the hypolimnion. As a similar drop in nutrient accumulation in the hypolimnion followed incomplete mixing in winter 1998 it is likely that this is an anomaly which occurs in years when winter mixing was incomplete.

The total mass of NO_3-N in the hypolimnion before winter mixing in 2006 was 270 t, which was lower than in previous years. Regression analysis showed that the total mass of NO_3-N in the hypolimnion at this time of year has increased at a statistically significant rate of about 9.5 t y^{-1} ($P < 0.001$, $r^2 = 0.52$, $n = 21$) over the last 30 years.

In past reports, only the total mass of NO_3-N in the hypolimnion has been reported as a "standing stock" before winter mixing. In this report, it is recognised that the standing stock is a function of the mass of NO_3-N in the hypolimnion at the beginning of the stratified period plus the net mass that was released from the sediments and accumulated in the hypolimnion during the stratified period. While the standing stock is the mass present at one time, the mass released from the sediments over the stratified period can be expressed as a rate which may give a more reliable estimate of change. Consequently, in this report the net accumulation rate of NO_3-N in the hypolimnion is also reported. Net values were estimated as the increase that occurred between the spring and autumn samplings in each period of stratification divided by the time in days between these two samplings. Converting all standing stock data to net accumulation rates showed that the net accumulation rate of NO_3-N in the hypolimnion ranged from about 0.5 t d^{-1} in 1975 to 2.5 t d^{-1} in 2002. A regression analysis showed that there has been a weakly significant trend of increase in the net NO_3-N accumulation rate of 0.03 t d^{-1} yr^{-1} ($P = 0.11$, $r^2 = 0.14$, $n = 19$) over the last 30 years. However, these data also showed that, while there was a net NO_3-N accumulation rate of around 2 t d^{-1} in the hypolimnion below 70 m in 2004/2005, there was a net loss of around 0.25 t d^{-1} in the 2005/2006 stratified period. The reason for this loss is not known, but may be associated with the incomplete mixing in winter 2005.

During the 2005/06 monitoring period, summer water clarity was lower than in the previous few summers with Secchi depth values of 16 to 19 m and this level of clarity continued through most of autumn 2006. Water clarity in winter 2005 was higher than previously recorded, remaining above 13 m. This was attributed to incomplete mixing and the concomitant low winter algal biomass.

The 2005/06 net VHOD rate at 9.56 ± 2.24 mg m^{-3} d^{-1} (mean ± 95% confidence limit) was 2 mg m^{-3} d^{-1} lower than the rate for the previous year which was 11.30 ± 1.13 mg m^{-3} d^{-1}. The present VHOD rate is around the level of 9 mg m^{-3} d^{-1} suggested in an earlier report as a possible natural VHOD level for Lake Taupo.

In the 2002 review of the long-term monitoring programme data, 3 trends in the data were identified — increasing phytoplankton biomass in the upper 10 m, increasing NO_3-N mass in the hypolimnion prior to winter mixing, and an increasing range in the variability of water clarity — that were of concern with respect to the water quality of Lake Taupo. These trends are still present in the data. In this report, it has also been shown that the net accumulation rate of NO_3-N in the hypolimnion during the stratified period has increased over the last 30 years, although the trend is not strong.

Glossary

BOD	Biochemical Oxygen Demand: the rate of oxygen consumption associated with biological decomposition and chemical processes and in the water column.
VHOD	Volumetric Hypolimnetic Oxygen Demand: the net rate of oxygen loss associated with biological, chemical and physical processes in the hypolimnion of a lake in the absence of a temperature change
Phytoplankton	Microscopic free-floating aquatic plants (algae)
Cyanobacteria	Blue-green algae. These are potentially toxic. They can adjust their depth in the water column using small gas bladders (gas vacuoles), and some species can use (i.e., fix) atmospheric nitrogen for growth when nutrient nitrogen in the water column is depleted.
Zooplankton	Small to microscopic free-swimming aquatic animals which graze on phytoplankton or smaller zooplankton
Biomass	The living mass of the phytoplankton or zooplankton populations
Thermal stratification	Separation of a water column into two layers by temperature – warmer water on top
Thermocline	The boundary zone or temperature gradient between the two layers in a thermally stratified water column.
Epilimnion	The upper water column in a thermally stratified water column
Hypolimnion	The lower water column in a thermally stratified water column
Metalimnion	The thermocline zone — of variable thickness
Euphotic zone	The upper water column in which there is sufficient light for photosynthesis and hence phytoplankton growth.
Euphotic depth	Lower limit of phytoplankton growth where light levels are 1% of surface irradiance
Nutrients	Essential dissolved inorganic nitrogen and phosphorus compounds which can be used directly by plants for growth
Ammoniacal nitrogen	Sum of ammonium ion (NH_4^+) plus free (unionised) ammonia (NH_3). Some amines (NH_2^-) may be included as interference during analysis. Symbol, NH_4-N.
Nitrate nitrogen	Used in this report as the sum of nitrate (NO_3^-) plus nitrite (NO_2^-). Symbol, NO_3-N.
DIN	Dissolved Inorganic Nitrogen: the sum of NH_4-N + NO_3-N
DON	Dissolved Organic Nitrogen: the soluble nitrogen other than DIN
PN	Particulate Nitrogen: includes phytoplankton and other detritus
TN	Total Nitrogen: Sum of DIN + DON + PN
NO_x	Gaseous oxides of nitrogen, including N_2O, NO, NO_2

1. Introduction

With the expectation that the trophic status of Lake Taupo will slowly change to reflect changes in land use within the lake's catchment, a long term monitoring programme of the lake's water quality was commissioned by Environment Waikato. This programme commenced in October 1994 and is conducted by NIWA with field assistance from the Department of Internal Affairs, Taupo Harbourmaster's Office. The monitoring precision was augmented from February 1999 by the use of a new profiling instrument – a Richard Brancker Research model RBR410 conductivity-temperature-depth (CTD) profiler/logger fitted with a Yellow Springs Instrument (YSI) model 5739 dissolved oxygen (DO) probe. In January 2002, this instrument was upgraded to a Richard Brancker Research model XR420f freshwater profiler/logger with improved sensitivity. The new profiler is fitted with a YSI model 5739 DO probe as well as a Sea Point Chlorophyll Fluorometer to give *in situ* estimates of vertical distribution of algal biomass within the lake water column. This report presents data from the routine mid-lake monitoring station from August 2005 to September 2006.

The 2000 – 2001 annual report (Gibbs et al. 2002) reviewed the monitoring data accumulated since 1994, relating it to the known sensitivity of Lake Taupo to nitrogen (N), and known increased N loading from the catchment. A continuation of that assessment in such detail is not included in this report. Rather, the new data are presented in the context of the long-term data set, and a further review will be provided in a future report.

In the two previous reports, data was included from two additional sites representing those historically measured in the 1974-76 assessment of lake water quality (White et al. 1980) (Fig.1) to evaluate spatial variability of water quality across the lake. Results from these additional sites showed that, in general, there was minimal variation between the sites spatially or with season and that data collected from Site A (mid lake) could be used as being representative of the main body of the lake. This report presents data from Site A only.

The monitoring programme has 3 components: bottom water oxygen depletion, upper water column water quality, and whole water column water quality. Bottom water oxygen depletion is estimated as the volumetric hypolimnetic oxygen depletion (VHOD) rate, which is sensitive to changes in trophic status of lakes that thermally stratify for part of the year (Burns 1995). VHOD was chosen as the parameter most likely to detect a change in the water quality of Lake Taupo. Estimates of VHOD are made from dissolved oxygen and temperature profiles measured at 2-3 week intervals during the stratified period. However, the VHOD rate will only indicate that a change has occurred and will not detect other indicators of changing water quality. For that purpose, the upper water column is sampled for nutrients, chlorophyll *a*, phytoplankton species composition and water clarity at 2-3 weekly intervals, and the whole lake water quality is estimated from full profiles which are made twice during the stratified period. The first profile is in spring, when thermal stratification has become established and is stable. The second is in autumn the following year before thermal stratification begins to break down, and the thermocline deepens.

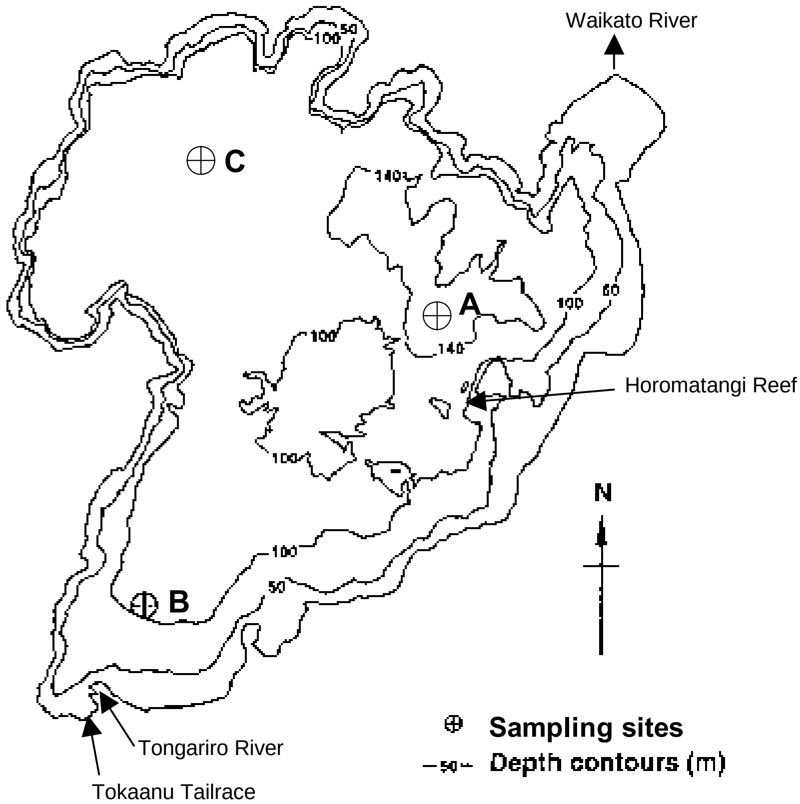

Figure 1: Site map of Lake Taupo showing location of the routine monitoring site at mid-lake (**A**), and the two additional sites at Kuratau Basin (**B**) and the Western Bays (**C**) sampled during the three-year period 2002-04. The generally close agreement between most data from the three sites gives confidence in the past and future use of the Site A data as representing the water quality of the whole lake.

2. Methods

Detailed method descriptions are given in Appendix 1. The parameters measured routinely at 2-3 weekly intervals are:

- depth-related temperature and dissolved oxygen (DO), using the RBR XR420f CTD profiler. Additional parameters of conductivity and chlorophyll fluorescence recorded by the profiler sensors are available at NIWA and will only be reported as appropriate;

- water clarity by Secchi disc depth;

- chlorophyll *a*, nitrate+nitrite N (NO_3-N), ammoniacal-N (NH_4-N), dissolved organic N (DON), particulate N (PN), total nitrogen (TN), dissolved reactive phosphorus (DRP), dissolved organic phosphorus (DOP), particulate phosphorus (PP), total phosphorus (TP), and algal species dominance in integrated-tube water samples from the top 10 m.

Water samples have also been collected at the same time from just above the lake bed (150 m) for analysis of NO_3-N, NH_4-N, and DRP to assess nutrient accumulation in the hypolimnion and to assess the extent of winter mixing.

For whole water column sampling, the parameters measured at 10 m depth intervals from the surface to the bottom of the lake twice a year are:

- conductivity, pH, temperature, DO, chlorophyll *a*, DRP, DOP, PP, TP, NO_3-N, NH_4-N, DON, PN, TN, urea nitrogen (Urea-N), total suspended solids (SS), volatile suspended solids (VSS), particulate carbon (PC), and dissolved organic carbon (DOC).

Additional parameters measured twice yearly, but not as complete profiles were:

- algal species composition and abundance on water samples from 1, 10, 50, 100 and 140 m.

Details of data handling and the treatment of values that are near analytical detection limits are described in Appendix 1.

2.1 Report contents

This report presents the results from the 2005/2006 stratified period plus the winter 2006 mixing, and refers to data in previous annual monitoring reports from 1995 to 2005 (Gibbs 1995, 1997a, 1997b, 1998, 2000a, 2000b, 2002, 2004, 2005, 2006; Gibbs et al. 2002) for inter-annual comparisons, and archived historical data since 1974 held by NIWA. The methods used are as per the 1994/95 report and a copy of these methods is included in Appendix 1. The calculation of the net VHOD rate, as applied to Lake Taupo data, was described in the 1996/97 report and a copy is presented in Appendix 2. Copies of temperature and dissolved oxygen, and nutrient data from the previous eleven years are included in Appendix 3 and 4 respectively. Graphical presentations of historical time-series temperature, dissolved oxygen, and Secchi disc depth data collected since the start of this monitoring programme are updated and presented in figures in the text. Phytoplankton species composition and dominance data for 2005/06 are included in Appendix 5 and discussed in the text. Graphical presentations of all available chlorophyll *a* concentration and Secchi depth water clarity data are presented where appropriate. Historical nitrate and dissolved reactive phosphorus data from spring and autumn full lake profiles are presented in Appendix 6 for reference.

2.2 Statistical evaluation

Simple statistical evaluation of data has been made using Microsoft Excel® and regression results have been reported to ± 95% confidence limits. Statistical significance (P), where used, is qualified with the coefficient of determination (r^2) and the number of data points used (n). For details see Statistical Methods, Appendix 1.

Note that statistical significance is dependent on the number of data points used. Comparisons between trends should only be made where there are similar numbers of data points.

2.3 "TREND" definition

As in previous reports, the word "trend" is used in the context of a change between the start and the end of a time series data set where the use of a linear regression analysis shows a statistically significant difference from the null hypothesis of there being no change. Use of the word "trend" is a statistical one. It does not imply any valid *extrapolation* of the observed change beyond the period of the data set being examined by the linear regression.

3. Results and discussion

3.1 Temperature and dissolved oxygen

Depth profiles of temperature and dissolved oxygen (DO) were measured at the mid lake site, Site A (Fig. 1), at about 2-3 weekly intervals, depending on the weather, throughout the year. These data, plus profiles measured during the full water quality samplings at Site A on 25 October 2005 (spring) and 12 April 2006 (autumn), are presented in Appendix 3. The time-series temperature and DO data from specific depths of 20 m (epilimnion) and 130 m (hypolimnion) collected in the monitoring programme since 1994 are presented in Figure 2.

Temperature and DO data indicate that Lake Taupo was only briefly mixed in winter 2005 with the mixing period being less than 2 weeks in mid August. This allowed the bottom waters to warm again after the rapid cooling in winter 2004 (Fig. 2A). In contrast the lake was well mixed in winter 2006 and bottom temperature fell slightly. Surface water temperatures in December have been colder than normal for that month for the last 3 years although the maximum surface temperatures in the last 2 summers were generally warmer than normal. The short duration mixing in winter 2005 produced only one DO value approaching saturation before bottom water oxygen consumption resumed (Fig. 2B). Notwithstanding this, the lack of low DO values in autumn 2006 suggests the effect of poor mixing in winter 2005 was not accumulative.

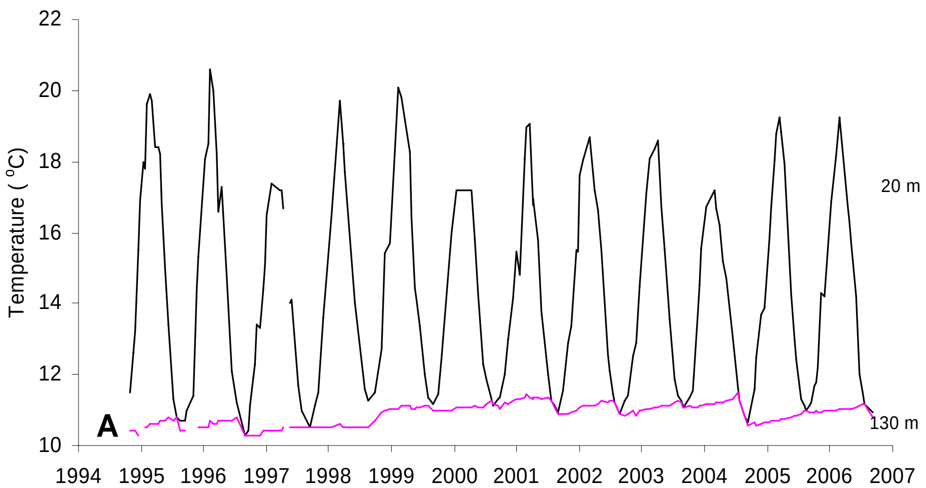

Figure 2A: Time-series temperature from 20 m (black line) and 130 m (pink line) depths. Winter mixing occurred where these two lines meet. The data show the lack of mixing in winter 1998 and only partial mixing in 1999. Mixing was brief in 1997 and 2005.

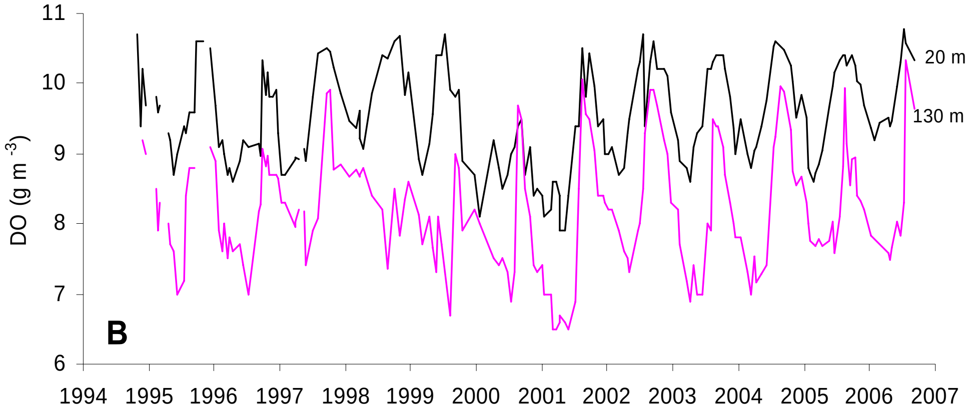

Figure 2B: Time-series dissolved oxygen data from 20 m (black line) and 130 m (pink line) depths. Mixing and complete reoxygenation occurred where the 2 lines in the temperature data (Fig. 2A) meet each winter. This corresponds with the period that the 2 lines on the oxygen data meet. However, where temperature data indicate incomplete mixing and the 2 lines of the oxygen data do not meet, there is incomplete reoxygenation of the hypolimnion. Date ticks are 1 January in each year.

3.2 VHOD rate

The VHOD rate was estimated between August 2005 and March 2006 based on oxygen profile data collected at Site A (Mid Lake). The VHOD rate in 2005/2006 was 9.56 ± 2.24 mg m^{-3} d^{-1} (mean ± 95% confidence limit) (Fig. 3).

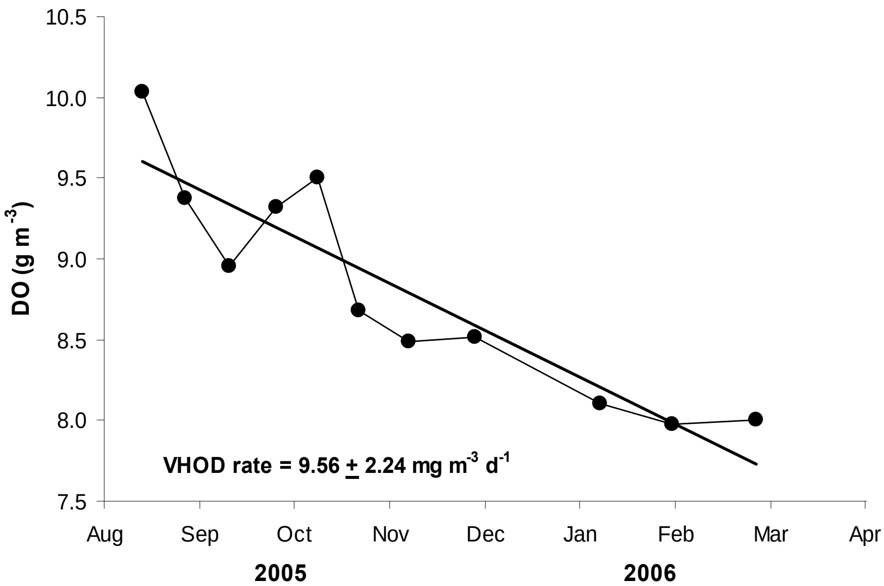

Figure 3: VHOD data and linear regression of 2005/2006. ($P < 0.001$, $r^2 = 0.83$, $n = 11$).

Table 1: Summary of VHOD rates (± 95% confidence limit) and the dominant phytoplankton species during the preceding winter bloom.

Year	VHOD rate	Dominant phytoplankton species	
1994-95	8.93 (2.39)	*Aulacoseira granulata**	Diatom
1995-96	9.07 (2.77)	*A. granulata*	Diatom
1996-97	5.12 (1.37)	*Botryococcus braunii*	Colonial green
1997-98	3.21 (2.03)	*B. braunii*	Colonial green
1998-99	2.64 (1.90)	*B. braunii*	Colonial green
1999-00	5.11 (1.14)	*B. braunii* + *A. granulata* + *Cyclotella stelligera*	C.G. – Diatom mix
2000-01	9.34 (2.9)	*A. granulata*	Diatom
2001-02	9.06 (2.7)	*Asterionella formosa*	Diatom
2002-03	13.76 (2.14)	*A. formosa* + *A. granulata*	Diatom
2003-04	11.50 (2.80)	*A. formosa* + *A. granulata*	Diatom
2004-05	11.30 (1.13)	*Fragilaria crotonensis* + *A. formosa*	Diatom
2005-06	9.56 (2.24)	*A. formosa* + *A. granulata*	Diatom

* Not measured in winter but measured in October 1994.

The 2005/2006 VHOD rate at 9.56 ± 2.24 mg m^{-3} d^{-1} was substantially lower than the value for the previous year, 11.30 ± 1.13 mg m^{-3} d^{-1} (Table 1). The 2005/2006 VHOD rate is close to the level of 9 mg m^{-3} d^{-1} which was suggested as a possible "normal" VHOD value for the lake (Gibbs 2002).

3.3 Secchi depth

The time-series Secchi depth data (Fig. 4) show that the annual cycle of water clarity is low in winter and high in summer and mostly lies within the range of 10 – 20 m and has a mean value of 15.7 m for the period shown. The annual cyclical pattern inversely follows the seasonal pattern of phytoplankton abundance, with low clarity during the winter/spring growth phase and high clarity during summer when the phytoplankton have sedimented out of the water column.

Water clarity has been higher than normal in the last few winters with Secchi depth values of more than 12 m. However, while water clarity in summer 2005/2006 was lower that the previous year, it was clearer than most summers since 1995, and autumn 2006 produced an extended period with unusually high clarity (Figs 4, 5).

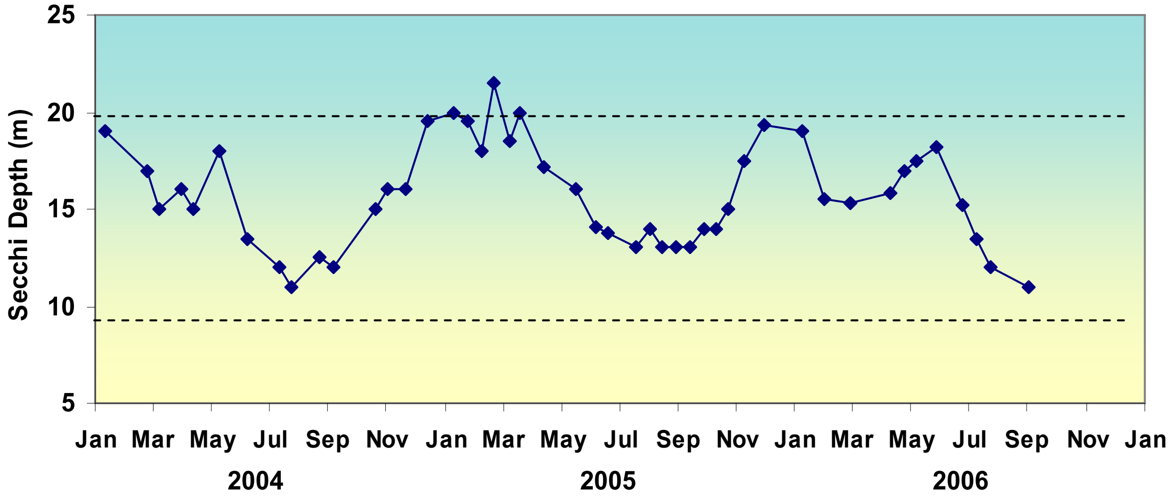

Figure 4: Water clarity as indicated by Secchi disk depth from winter 2004 through winter 2006. Broken lines represent 10 m and 20 m. Date ticks are 1st of each month.

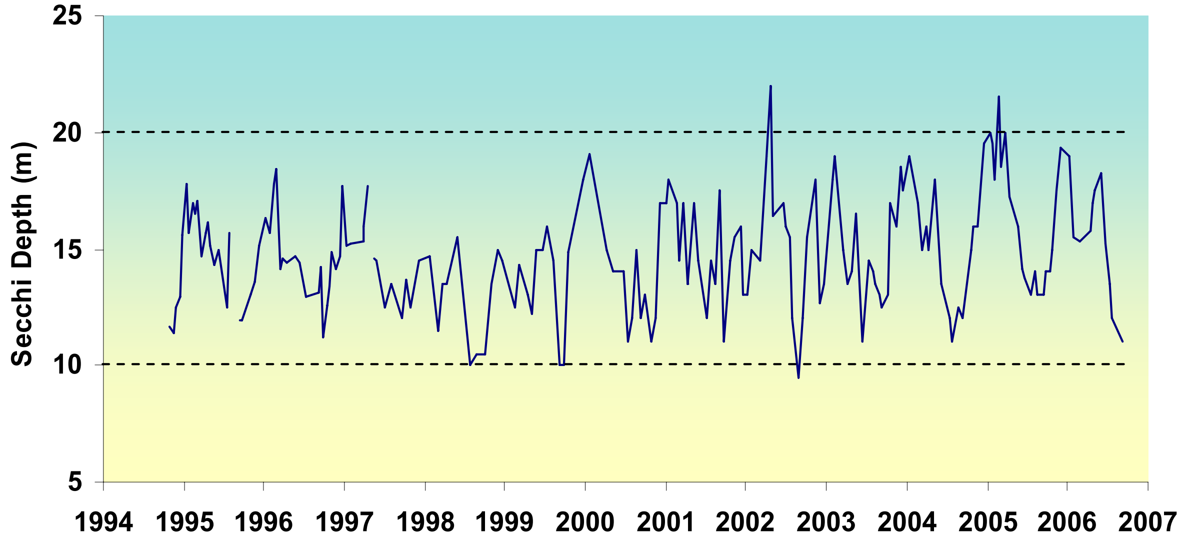

Figure 5: Long-term changes in water clarity as indicated by Secchi depth shows the variability across seasons and years for the present monitoring programme since 1994. The broken lines mark 10 m and 20 m. Date ticks are 1 January in each year.

3.4 Phytoplankton

The long-term trend of increasing chlorophyll *a* concentration in the upper 10 m of the water column at the mid lake site has continued, with higher concentrations in both summer and winter 2006. The overall rate of increase [all data] was 0.053 ± 0.022 mg m^{-3} y^{-1} ($P < 0.0001$, $r^2 = 0.10$, n = 191) (Fig. 6).

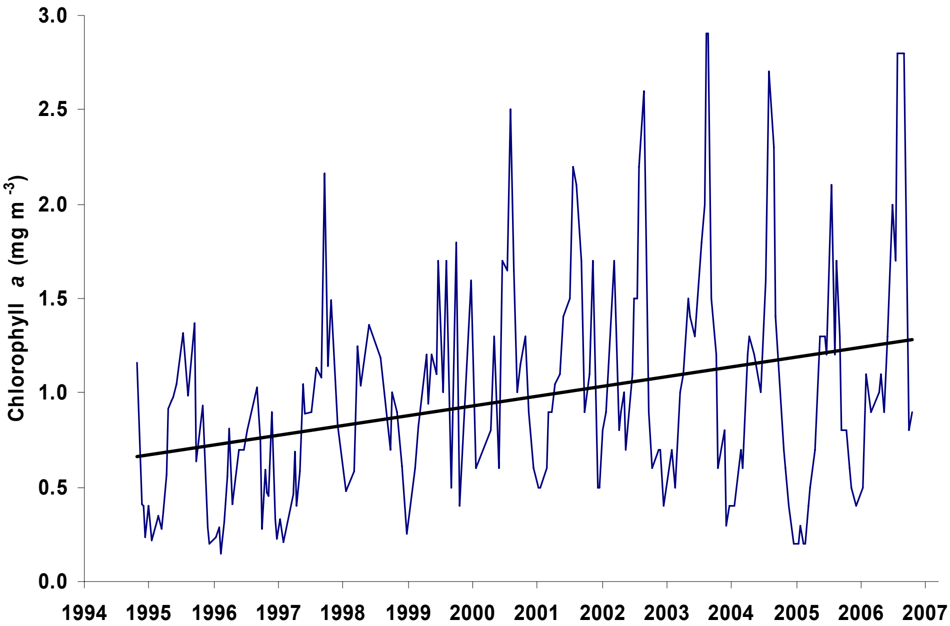

Figure 6: Time-series chlorophyll *a* concentrations in the upper 10 m of Lake Taupo at the mid-lake site, Site A. The solid regression line represents a statistically significant increase in the chlorophyll *a* concentrations of 0.053 ± 0.022 mg m^{-3} y^{-1} ($P < 0.0001$, $r^2 = 0.10$, n = 191). Date ticks are 1 January in each year.

The overall pattern of chlorophyll *a* concentration changes since 1994 is one of maximum concentrations during the winter algal bloom and minimum concentrations in early summer, and there is a statistically significant inverse logarithmic relationship between chlorophyll *a* concentration and Secchi disk depth as discussed in the last report (Gibbs 2006). Consistent with that relationship, the low chlorophyll *a* concentrations in winter and spring 2005 correspond with the exceptionally high water clarity at that time and appear to be the direct result of incomplete mixing in winter 2005. Incomplete mixing resulted in only part of the nutrients accumulating in the hypolimnion being available for phytoplankton growth in the winter-spring bloom and the remainder being carried over to the next stratified period.

Evaluation of the chlorophyll *a* data on a seasonal basis shows that the winter maximum concentrations have increased at 0.14 ± 0.06 mg m^{-3} y^{-1} (r^2 = 0.69, n = 13) since 1994 while the annual mean concentrations have increased at 0.05 ± 0.03 mg m^{-3} y^{-1} (r^2 = 0.53, n = 13) (Fig. 7).

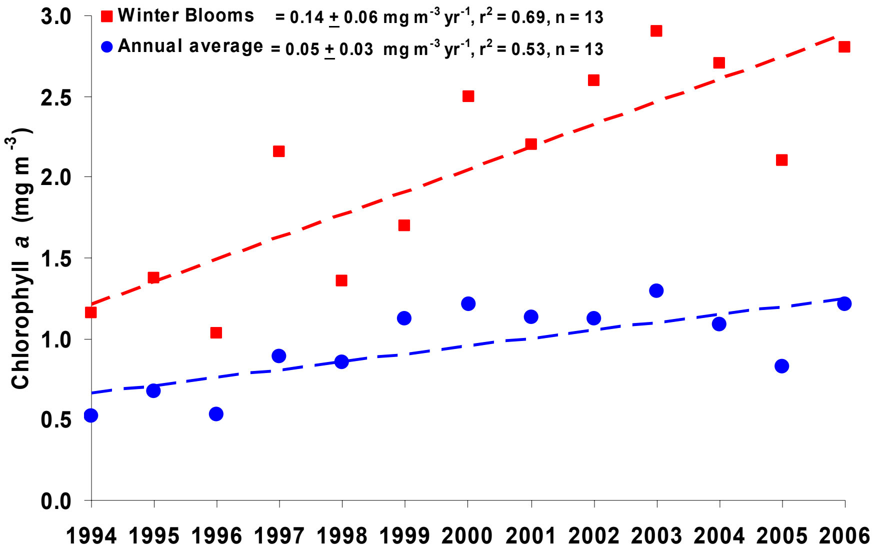

Figure 7: Annual average and winter maximum chlorophyll *a* concentrations from the 10-m tube samples since 1994. Regression lines indicate significant (P<0.005) trends in the data. Regression slopes are as given in the graph. Date ticks are 1 January in each year.

The monitoring programme uses the chlorophyll *a* concentrations as an indicator of algal biomass in the upper 10 m because chlorophyll *a* concentrations can be related to water clarity as indicated by Secchi depth. The use of the profiler fitted with a chlorophyll fluorescence sensor indicates that a large proportion of the algal biomass in Lake Taupo through spring and summer is associated with the thermocline as a deep chlorophyll maxima (DCM) (e.g., 10 January 2006; Fig, 8).

In this example, the chlorophyll *a* concentrations estimated from the fluorescence data in the DCM were about 70% higher than the measured chlorophyll *a* concentrations in the surface waters (red line, Fig. 8) indicating that the algal biomass was substantially higher in the DCM than in the surface waters. The DCM developed at the top of the hypolimnion below the thermocline. At this position in the lake water column, the algae have sufficient light for growth with a euphotic depth of about 60 m[1], and an

[1] The euphotic depth or 1% light level in Lake Taupo is approximately 3 times the Secchi depth (W.F. Vincent, pers. com.;. Fig. 26 in Forsyth & Howard-Williams 1983). On 10 January 2006 the Secchi depth was 19m giving a photic depth of about 60 m.

ample supply of DRP and NO_3-N from deeper in the hypolimnion. The seasonal changes in the dynamics of the DCM and how these affect the accumulation of nutrients in the hypolimnion have not been evaluated.

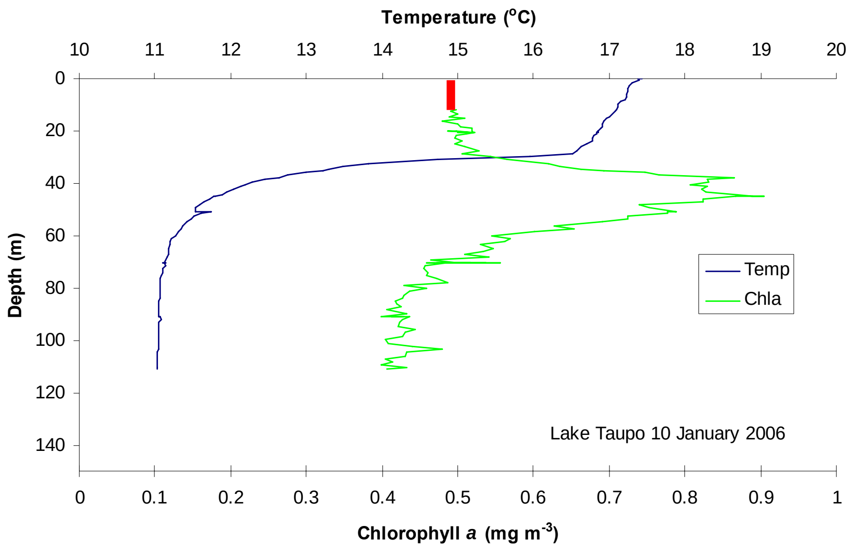

Figure 8: Temperature and chlorophyll *a* concentration profiles from 10 January 2006 showing the position of the deep chlorophyll maxima (DCM) relative to photic depth (estimated at 60 m) and the thermocline (28 – 44 m). Chlorophyll *a* values were converted from fluorescence data. The red bar is the extracted chlorophyll *a* concentration from the 10-m tube on the 10 January 2006 (0.5 mg m^{-3}).

3.5 Species abundance

In the 2005-06 monitoring period, there were 5 major algal species which reached a dominance[2] level of 1 to 3 (1 = dominant, 10 = rare) at Site A. These were *Aulacoseira granulata, Fragilaria crotonensis* and *Asterionella formosa,* which were the dominant species through winter and spring, and co-dominant with *Dinobryon* in early summer and *Botryococcus braunii* through mid to late summer. Cyanophytes were present on most occasions at low levels with *Anabaena* being the most abundant at a dominance value of 4 throughout spring and again in autumn (April 2006).

[2] Algal dominance is estimated from biovolume rather than cell counts.

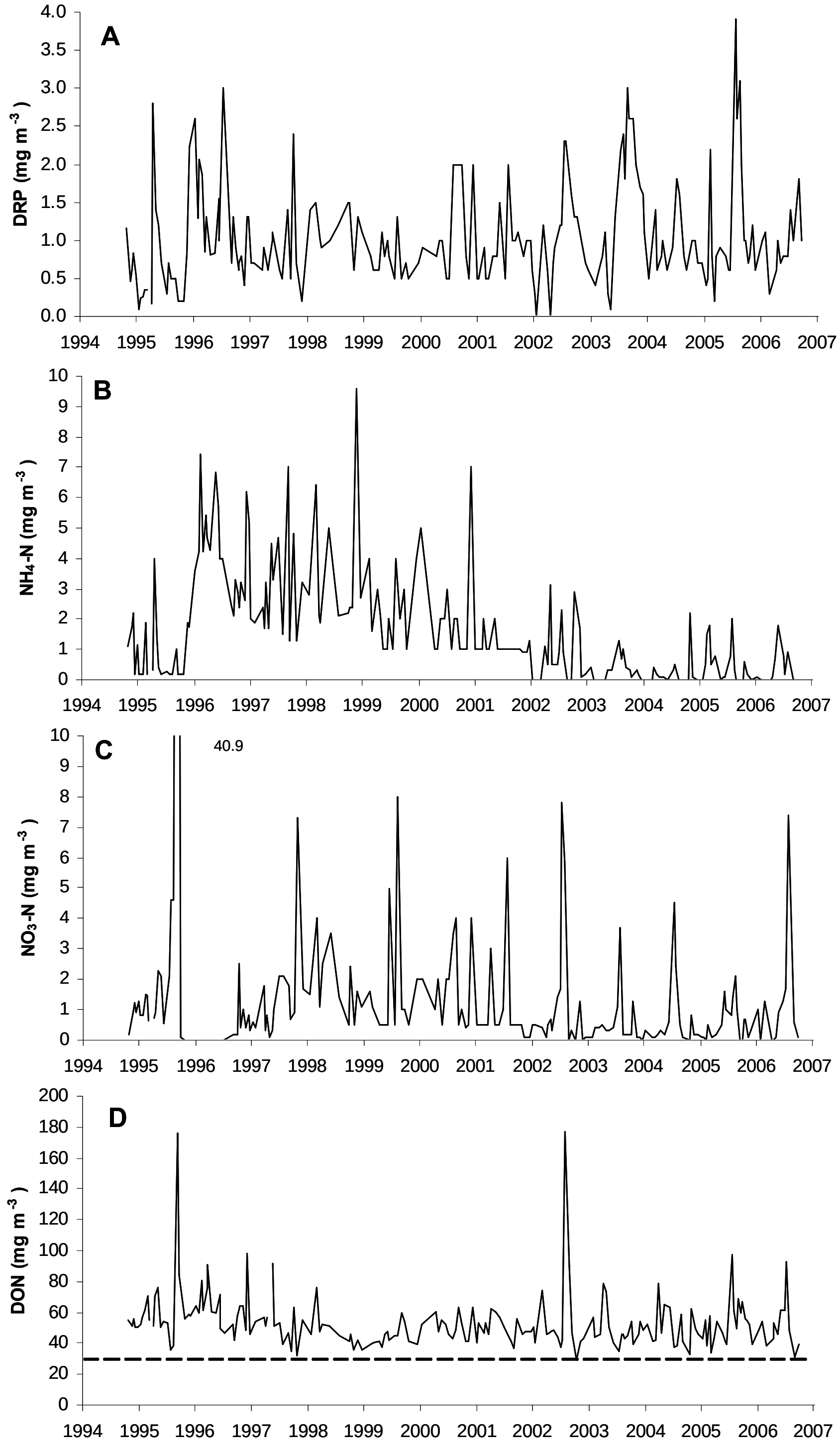

Figure 9: Time series data from the top 10 m of water column in Lake Taupo for (A) dissolved reactive phosphorus (DRP), (B) ammoniacal nitrogen (NH_4-N), (C) nitrate + nitrite nitrogen (NO_3-N), and (D) dissolved organic nitrogen (DON). Broken line indicates the minimum DON concentration, which may be the concentration of refractory organic material in the lake. Date ticks are 1 January in each year.

3.6 Nutrients in the upper waters

Time-series plots of DRP (Fig. 9A), NH_4-N (Fig. 9B), NO_3-N (Fig. 9C) and DON (Fig 9D), showed values within the seasonal range measured over the whole period of the present monitoring programme since 1994. As previously noted (Gibbs 2006), nutrient concentrations changed abruptly at the time of the Mount Ruapehu eruptions in 1995 and slowly returned to pre-eruptions levels by 2003 (Fig. 9). Since 2003, fluctuations in the surface NO_3-N and (Fig. 10) have mostly corresponded with winter mixed periods when nutrient enriched bottom waters (Fig. 11) were dispersed up through the lakes water column.

The low NO_3-N but high DRP concentrations in winter 2005 are consistent with incomplete mixing in that year. Coupled with the lower than expected chlorophyll *a* concentrations (Fig. 6), these data suggest that the phytoplankton ran out of nitrogen for growth leaving the excess DRP. This is in contrast with winter 2006 where high NO_3-N and low DRP concentrations coupled with high chlorophyll *a* concentrations (Fig. 6), suggest that the phytoplankton ran out of DRP for growth.

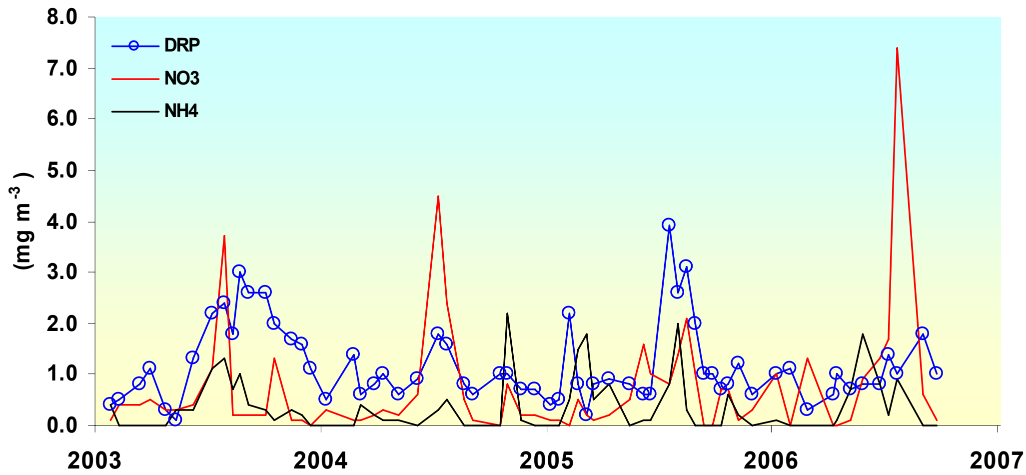

Figure 10: Time series data from the top 10 m of water column in Lake Taupo for dissolved reactive phosphorus (DRP), nitrate + nitrite nitrogen (NO_3-N) and ammoniacal nitrogen (NH_4-N) since January 2003. The low NO_3-N concentrations in winter 2005 are consistent with incomplete mixing in that year. Date ticks are 1 January in each year.

3.7 Nutrient accumulation in the hypolimnion

3.7.1 Total mass accumulated

Dissolved inorganic nutrients in water samples from 150 m demonstrated consistent seasonal patterns which more precisely indicate the time of complete mixing in winter (Fig. 11). Winter mixing was indicated by the sudden drop in DRP and NO_3-N concentrations that usually occurs around the beginning of August. However, the 2005 winter data show that mixing was incomplete and only part of the nutrient accumulation in the hypolimnion was dispersed. These nutrient data are consistent with the temperature data (Fig. 2A) which indicated that mixing was brief and that there was insufficient time for complete mixing.

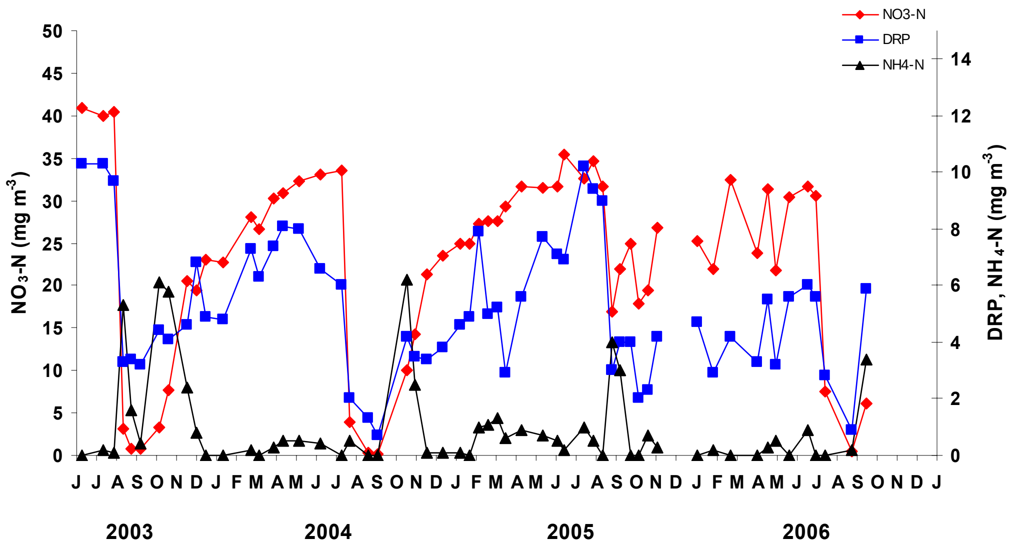

Figure 11: Time series data for DRP, NO_3-N and NH_4-N in the bottom waters of Lake Taupo since winter mixing 2003.

The total mass[3] of NO_3-N in the hypolimnion in autumn each year before winter mixing has ranged from about 120 t (in 1978) to more than 650 t (in 2000) (Fig. 12). While this graph is similar to those in earlier reports, this graph also includes all additional information from historical data sets held by NIWA. A copy of the historical source data used to produce the additional data points from 1988 to 1990 is included in Appendix 6. Including the additional historical data, since 1975 there has been a statistically significant ($P < 0.001$, $r^2 = 0.52$, $n = 21$) long-term trend of increase in the total mass of NO_3-N in the hypolimnion before winter mixing of around 9.5 t y^{-1} (Fig. 12).

[3] In previous reports the total mass of NO_3-N in the hypolimnion each year has been referred to as the "total accumulated mass" of NO_3-N. It is the "standing stock" of NO_3-N at that time.

The inclusion of the additional data points has strengthened the regression but has not substantially altered the slope of the regression line. Note that the historical profile data for 1975 and 1976 do not extend below 110 m. However, based on the average mass of NO_3-N below 110 m in 1978 to 1980, the resulting error is likely to be < 6 t in each year which does not substantially alter the results of the regression analysis. The data points for 1976 and 1987 are not included in the regression analysis because they are for periods which differ from the normal autumn sampling time in March/April each year (i.e., 1976 profile was collected in January 1976 while the 1987 profile was collected in July 1987) and thus these data cannot be compared directly with the rest of the data. The 1976 and 1987 data points are included in Figure 12 as an indication of what the total mass of NO_3-N may have been in those two years.

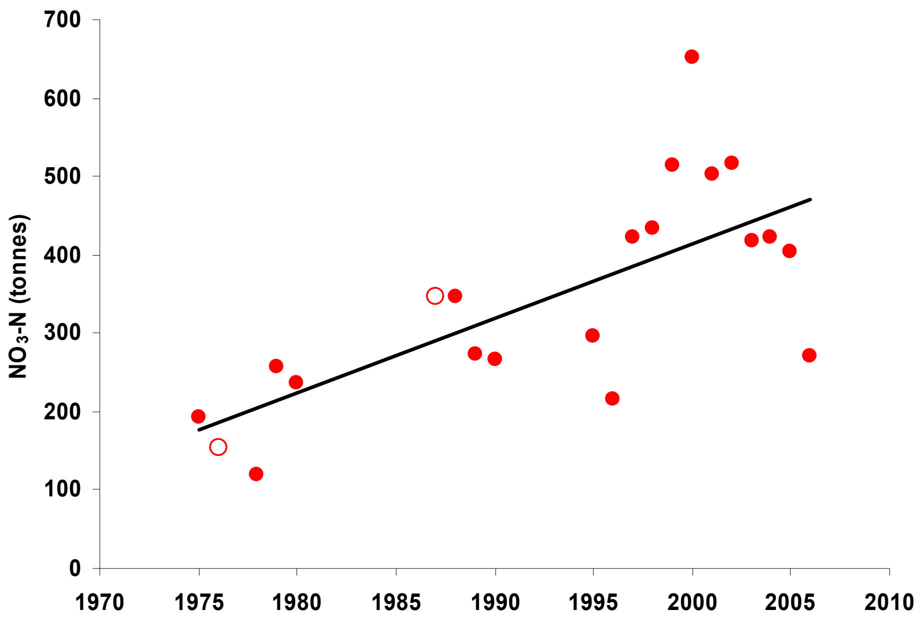

Figure 12: Long-term time series of total mass of NO_3-N in the hypolimnion of Lake Taupo in autumn before winter mixing. The regression line indicates a statistically significant trend of increase in the total mass of 9.4 t y^{-1} ($P < 0.001$, $r^2 = 0.47$, $n = 19$). Open circle data not included in regression (see text). Date ticks are 1 January in each year.

3.7.2 Net mass accumulated

In past reports, only the total mass of NO_3-N in the hypolimnion has been reported, as a "standing stock" before winter mixing. In this report, it is recognised that the standing stock is a function of the mass of NO_3-N in the hypolimnion at the beginning of the stratified period plus the net mass that was released from the sediments and accumulated in the hypolimnion during the stratified period. While the standing stock is the mass present at one time, the mass released from the sediments over the stratified period can be expressed as a rate which may give a more reliable estimate of change. Consequently, in this report the net accumulation rate of NO_3-N in the hypolimnion is also reported.

To facilitate this, the total mass data (Fig. 12) have been transformed into accumulation rate data by subtracting the spring profile data from the autumn profile data and dividing by the number of days between the spring and autumn samplings (Fig. 13).

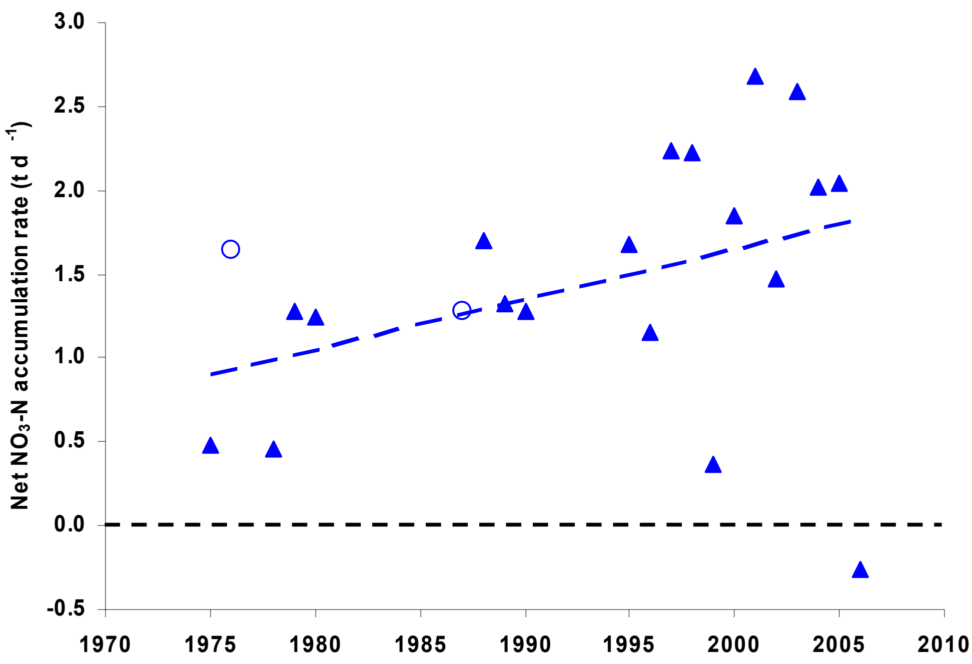

Figure 13: Net NO_3-N accumulation rates (t d^{-1}) in the hypolimnion below 70 m. The regression line shows an increase in the net accumulation rate of 0.03 t d^{-1} yr^{-1} ($P = 0.11$, $r^2 = 0.138$, $n = 19$). Open circle data were not included in the regression analysis (see text). Note that the Y-axis extends to -0.5 t d^{-1} for the 2006 data point. Date ticks are 1 January in each year.

As sediment process rates are generally slow to change, the expectation would be for a reasonably consistent pattern to the net accumulation rates between years allowing any trends to be well defined. A regression through all of these rate data (Fig. 13) shows a weakly significant trend in the data with the net accumulation rate increasing at 0.03 t d^{-1} per year ($P = 0.11$, $r^2 = 0.138$, $n = 19$). The data for 1976 and 1987 were excluded from the regression analysis because they are for different periods than the rest of the data (see above). The data points are included in Figure 13 as an indication of what the net accumulation rates may have been in those two years.

The net accumulation rates of NO_3-N (Fig. 13) show a higher degree of variability between years than would be normally expected, with both the 1999 and 2006 data points falling well below the spread of the rest of the data and the trend line. The negative net accumulation rate in 2006 indicates a substantial loss of NO_3-N from the hypolimnion during the 2005-06 stratified period. Coincidentally, both of these data points are for years following a winter where there was incomplete mixing. This suggests that the low values are anomalies relative to the rest of the data.

3.7.3 Incomplete mixing

Incomplete mixing leaves residual amounts of nutrients from the previous year in the hypolimnion, and the expectation would be that the subsequent accumulation of nutrients in the following stratified period would be added on top of this as the new starting baseline (e.g., NO_3-N Fig.14). The data for the 2005-06 stratified period clearly show that this did not happen, which raises the question "Why?".

The answer at this time is "We don't know".

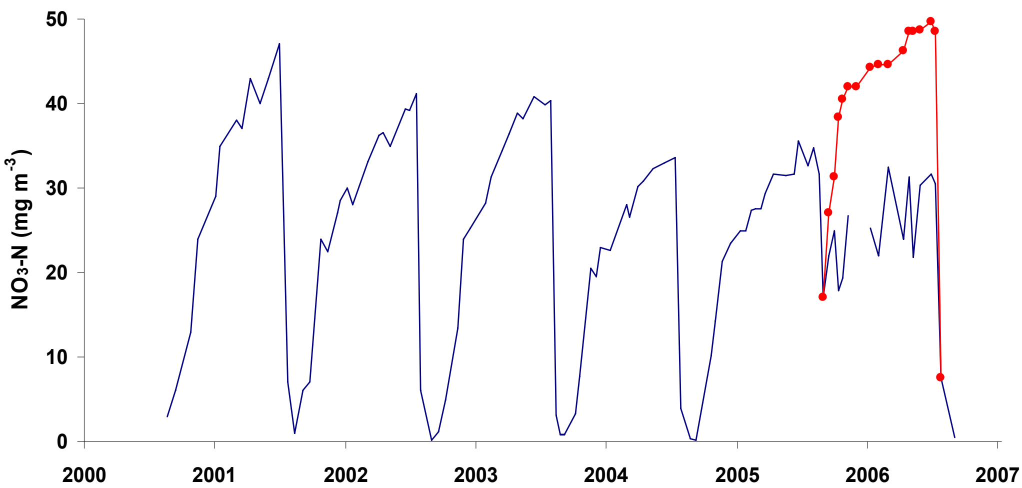

Figure 14: Time-series of bottom water NO_3-N concentrations since winter 2000 (blue line) showing the expectation for additive accumulation of NO_3-N on the new starting baseline following incomplete mixing (red dots and line). The red data are the superposition of the 2004-2005 NO_3-N concentrations on the residual NO_3-N concentrations at the end of winter mixing. Date ticks are 1 January in each year.

Two obvious possibilities are that either 1) the incomplete mixing affects the supply of readily mineralised organic material in the hypolimnion, or 2) the incomplete mixing affects the loss rate of the nutrients from the hypolimnion. Whatever the process is that causes the observed effect, it affects both NO_3-N and DRP (Fig. 11) and thus is most likely a biological process, but not a change that affects sediment microbial denitrification rates as that would affect NO_3-N but not DRP. Further work is required to understand the processes involved.

3.7.4 Total N

Total nitrogen (TN) mass in Lake Taupo was estimated from the spring profile in each year. Regression analysis found that, although there was an average increase of about 10 t y^{-1} over the data record, there was no statistically significant trend in the long-term time-series data for TN (Fig. 15). Although there is obvious interannual variability in the mass of TN in spring, after winter mixing, and there is a net annual external TN load on the lake of around 1200 t, the total mass of TN in Lake Taupo in spring remains at around 3300 t.

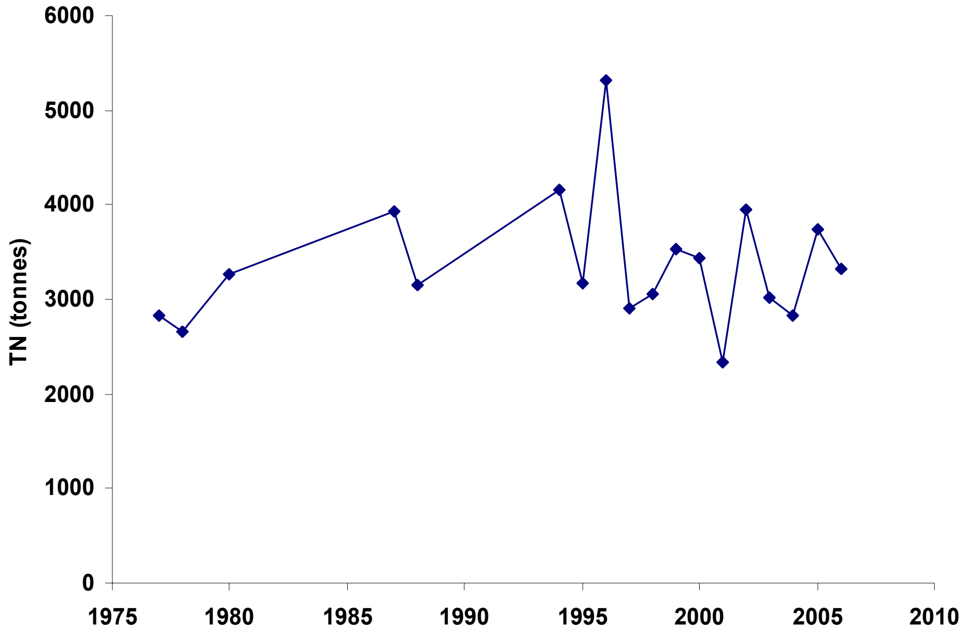

Figure 15: Long-term time series estimates of the mass of total nitrogen (TN) in Lake Taupo in spring after winter mixing. Although there is an average increase of about 10 t y^{-1} over the data record, this apparent trend in the data is not statistically significant. The mean of the mass is around 3370 t. Date ticks are 1 January in each year.

4. Knowledge gaps

The previous report (Gibbs 2006) commented on several knowledge gaps including in-lake processes in Lake Taupo, especially the rate processes at the sediment-water interface. The dramatic changes in the hypolimnetic NO_3-N accumulation data in the 2005/2006 stratified period following incomplete mixing in winter 2005, highlights the need to understand how the in-lake processes work. Two valid but very different scenarios have been suggested to explain the changes in the hypolimnetic NO_3-N accumulation data. Both invoke in-lake processes which are reasonable and thus warrant further investigation.

5. Summary

- The annual mean phytoplankton biomass in Lake Taupo, as indicated by chlorophyll *a* concentration in the upper 10 m of water column, has increased at a rate of 0.05 ± 0.03 mg m^{-3} y^{-1} ($P < 0.01$, $r^2 = 0.53$, n = 13) over the 12 year monitoring period.

- Winter chlorophyll *a* maximum concentrations have increased at 0.14 ± 0.06 mg m^{-3} y^{-1} ($r^2 = 0.69$, n = 13) since 1994 and the peak biomass in winter 2006 was one of the highest on record. The lower than expected peak biomass in winter 2005 was attributable to incomplete mixing in winter 2005.

- There was a substantial deep chlorophyll maxima (DCM) below the thermocline in the lake during spring and summer with an estimated chlorophyll *a* concentration about 70% higher than the chlorophyll *a* concentrations measured in the surface waters.

- Algal species dominance followed a succession from diatoms *Aulacoseira granulata, Fragilaria crotonensis* and *Asterionella formosa,* at dominance levels of 1, 2, and 3 in winter and spring, with *Dinobryon* and *Botryococcus* becoming dominant in summer and autumn. Blue-green algae (*Anabaena flos-aquae*) were present in low numbers and did not exceed a dominance level of 4 throughout the 2005/2006 monitoring period.

- There was a statistically significant trend of increase in the total mass of NO_3-N in the hypolimnion before winter mixing of around 9.4 t yr^{-1} ($P < 0.001$, $r^2 = 0.47$, n = 19).

- The total mass of NO_3-N in the hypolimnion as a standing stock in autumn in 2006, at around 275 t, was substantially less than in the previous year at about 400 t. This was despite incomplete mixing which left about half of the previous years NO_3-N accumulation as the starting mass, and thus the expectation for a higher than normal total mass.

- The net accumulation rate of NO_3-N rate in the hypolimnion below 70 m in the last few years has been in the order of 2 t d^{-1} and regression analysis showed that there has been a weakly significant trend of increase in that rate of 0.03 t d^{-1} yr^{-1} ($P = 0.11$, $r^2 = 0.138$, n = 19) over the last 30 years.

- The net accumulation rate of NO_3-N in the hypolimnion in 1999 and 2006 were much lower than expected and the data indicate that there was a net loss of NO_3-N from the hypolimnion in 2006. The mechanism for the loss appears to be a function of in-lake processes associated with the incomplete mixing of the lake in the previous winter. Consequently, data from years following winters with incomplete mixing may be anomalies.

- The 2005/2006 net VHOD rate for the period from August 2005 to March 2006 was 9.56 ± 2.24 mg m^{-3} d^{-1} (mean ± 95% confidence limit) which was less than the previous year at 11.3 ± 1.1 mg m^{-3} d^{-1}.

- Nutrient concentrations (DRP, NH_4-N, and NO_3-N) in the upper water column were generally comparable with concentrations since 2003 and are similar to historical concentrations before Mount Ruapehu erupted in 1995.

- After rapid cooling to 10.6 ºC in 2004, the bottom water temperatures have risen to above 11 ºC following incomplete mixing in winter 2005.

- Unusually high water clarity in winter 2005 may be attributed to the relatively low winter algal biomass which followed the incomplete mixing of accumulated bottom water nutrients into the surface waters in 2005.

- Water clarity during summer 2006 was generally higher than most previous summers.

In a previous annual report (Gibbs et al. 2002), 3 trends in the data were identified — increasing phytoplankton biomass in the upper 10 m, increasing NO_3-N mass in the lake hypolimnion prior to winter mixing, and an increasing range in the variability of water clarity — that were of concern with respect to the water quality of Lake Taupo. These trends in the data are still present.

In this report, it has also been shown that the net accumulation rate of NO_3-N in the hypolimnion during the stratified period has increased over the last 30 years, although the trend is not strong.

6. Acknowledgments

This report was made possible by the team effort of Les Porter, Brent McIntosh and Jill Cogswell of the Taupo Harbourmaster's Office, and Eddie Bowman (NIWA Rotorua) who have collected the data. Much of the success of this monitoring programme is attributable to the extra effort by Eddie and the team.

Water samples were processed in the NIWA chemistry laboratory and analytical results were provided by Graham Bryers, Denise Rendle, Stu Pickmere and team. Quality control was provided by Mike Crump, Lab Manager.

Phytoplankton dominance and enumeration results were provided by Karl Safi.

7. References

Forsyth, D.J.; Howard-Williams, C. (1983). Lake Taupo: Ecology of a New Zealand Lake. DSIR Information Series No. 158. Wellington.

Gibbs, M.M. (1995). Lake Taupo long term monitoring programme. *NIWA consultancy report to Environment Waikato, report No. EVW60203/1.*

Gibbs, M.M. (1997a). Lake Taupo long term monitoring programme: 1995-1996. *NIWA consultancy report to Environment Waikato, report No. EVW60203/2.*

Gibbs, M.M. (1997b). Lake Taupo long term monitoring programme: 1996-1997. *NIWA consultancy report to Environment Waikato, report No. EVW60203/4*.

Gibbs, M.M. (1998). Lake Taupo long term monitoring programme: 1997-1998. *NIWA consultancy report to Environment Waikato, report No. EVW80203.*

Gibbs, M.M. (2000a). Lake Taupo long term monitoring programme: 1998-1999. *NIWA consultancy report to Environment Waikato, report No. EVW90203*.

Gibbs, M.M. (2000b). Lake Taupo long term monitoring programme: 1999-2000. *NIWA consultancy report to Environment Waikato, report No. EVW01203.*

Gibbs, M.M.; Rutherford, J.C.; Hawes, I. (2002). Lake Taupo long term monitoring programme 2000 – 2001, with a review of accumulated data since 1994. *NIWA consultancy report to Environment Waikato, report No. HAM2002-029, August*.

Gibbs, M.M. (2002). Lake Taupo long term monitoring programme 2001-2002: including two additional sites. *NIWA consultancy report to Environment Waikato, report No.HAM2002-060, December*.

Gibbs, M.M. (2004). Lake Taupo long term monitoring programme 2002-2003: including two additional sites. *NIWA consultancy report to Environment Waikato, report No.HAM2004-001, March*.

Gibbs, M.M. (2005). Lake Taupo long term monitoring programme 2003-2004: including two additional sites. *NIWA consultancy report to Environment Waikato, report No.HAM2005-006, February*.

Gibbs, M.M. (2006). Lake Taupo long term monitoring programme 2004-2005: including two additional sites. *NIWA consultancy report to Environment Waikato, report No.HAM2006-033, May*.

Vincent, W.F. (1983). Plankton production and winter mixing: contrasting effects in two oligotrophic lakes. *Journal of Ecology 71*: 1-20.

8. Appendix 1. Site map, sampling strategy and methods

The following section has been copied from Gibbs 1995, and modified after 1998.

Site Map

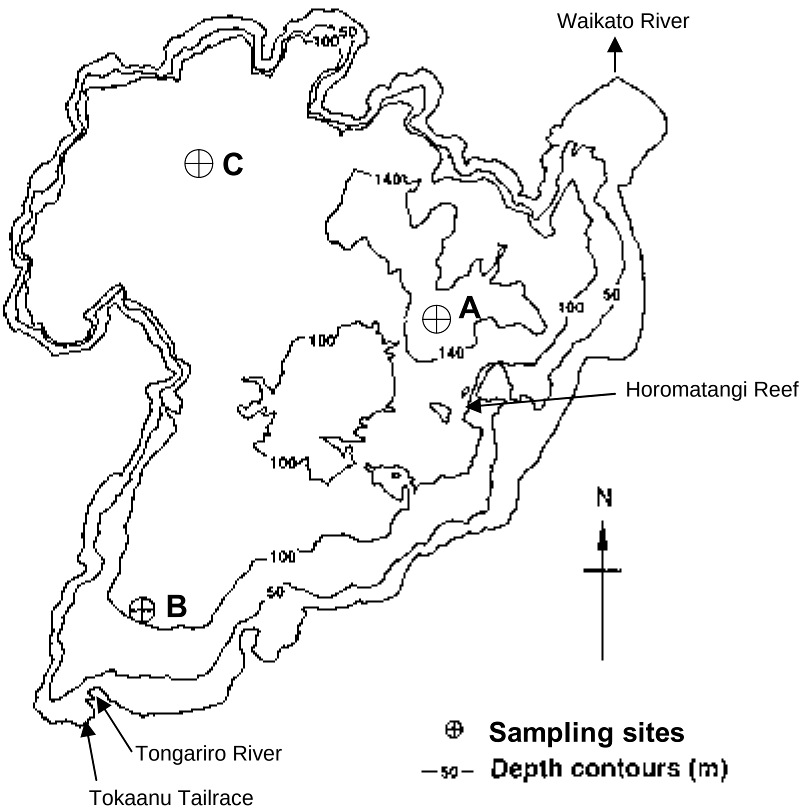

Figure 1: Site map of Lake Taupo showing location of the routine monitoring site at mid-lake (**A**). Two additional sites at Kuratau Basin (**B**) and the Western Bays (**C**) were sampled between January 2002 and December 2004 inclusive. Data from those sites have been retained with the Site A data presented in the appendices.

8.1 Methods

The sampling site was selected in the central basin of Lake Taupo (Site Map) with a water depth of about 160 m. This site is more than 5 km from the nearest land and is exposed to both the north-south and east-west axis of the lake.

To calculate VHOD requires two measurements each year far enough apart in time for a measurable change to occur in the DO concentrations in the hypolimnion of the lake. Details of the procedure and limitations of this measurement are described by Vant (1987). For the monitoring of Lake Taupo, which mixes briefly in winter between July and August, the initial sampling time was selected to be in October, to give sufficient time for thermal stratification to establish a stable hypolimnion. The final sampling time was selected to be in April, before lake cooling causes the downward movement of the thermocline which precedes the winter mixing.

At each of these biannual samplings, a detailed profile of DO and temperature was measured. Prior to 1998, measurements were made at 1 m depth intervals through the full depth of the water column using an *in situ* recording Applied Microsystems STD-12 profiler fitted with a Royce DO sensor, and compared with manual measurements of DO and temperature made at 10 m depth intervals from the surface to the bottom of the lake using a Yellow Springs Instrument (YSI) model 58 dissolved oxygen meter fitted with a stirred Model 5739 probe on a 160 m cable. Subsequent to 1998, a Richard Brancker Research (RBR) model TD410 conductivity-temperature-depth (CTD) profiler fitted with a stirred YSI model 5739 DO sensor was used. In January 2002, the TD410 CTD profiler was upgraded to an RBR model XR420f freshwater CTD profiler fitted with the YSI model 5739 DO sensor and a Seapoint chlorophyll fluorescence probe. The DO sensor was calibrated regularly by NIWA, Rotorua staff and chlorophyll fluorescence was converted to chlorophyll *a* from extracted chlorophyll *a* analyses of water samples collected beside profiler.

The following parameters were also measured as profiles from water samples collected using a van Dorn water sampling bottle starting at 1 m and then at 10 m intervals from 10 m to the bottom of the lake:

DO, chlorophyll *a*, dissolved reactive phosphorus (DRP), dissolved organic phosphorus (DOP), particulate phosphorus (PP), total phosphorus (TP), nitrate + nitrite nitrogen* (NO_3-N), ammoniacal nitrogen (NH_4-N), dissolved organic nitrogen (DON), particulate nitrogen (PN), total nitrogen (TN), urea nitrogen (Urea-N), total suspended solids (SS), volatile suspended solids (VSS), particulate carbon (PC), dissolved organic carbon (DOC), and water colour. (* Little, if any nitrite is ever found in the Lake Taupo water column, hence the use of NO_3-N).

Note: TN and TP values are the summation of all other N and P components, respectively, excluding Urea-N which is part of the DON component.

Additional parameters measured but not as complete profiles were:

Water clarity (by Secchi disc depth) and algal species composition and abundance on water samples from 1, 10, 50, 100, and 140 m.

Determinations on the water samples were made with the standard methods routinely used for freshwater analysis by NIWA.

Data for the long term monitoring programme were scheduled to be collected from the mid-lake sampling station at 2 weekly intervals. The practicality of achieving this target was limited by the weather and in reality data were generally collected at about 2-3 weekly intervals. Parameters measured were:

DO and temperature profiles at 1 m depth intervals to the bottom of the lake by RBR XR420f profiler, water clarity as Secchi disc depth, and a 10 m tube water sample was collected for measurement of chlorophyll *a*, NO_3-N, NH_4-N, TN, DRP, TP, and algal species dominance.

Near-bottom water samples from 150 m were collected using a van Dorn water sampling bottle and analysed for DRP, NO_3-N, and NH_4-N.

8.2 Data handling and less than detection limit values

All data in this report have been processed and manipulated on Excel spreadsheets. Data is rounded using the Excel protocol to an appropriate number of significant numbers based on the need for detailed knowledge tempered with the confidence in the precision and accuracy of the analytical methods used. This treatment may lead to small differences between electronic copies of the data and the values presented in this report.

The difference between the written report and the Excel spreadsheet of essentially the same data is the treatment of the less than detection limit (<DL) results. The data have

in the past been written as <DL or <DL(value). For statistical analysis the excel spreadsheet replaces <DL with 0 or uses the value in brackets in place of 0. Although it is recognised that the former action will be in error, the use of the value in brackets requires some justification.

In discussion with Burns Macaskill, Graham McBride, and Mike Crump from NIWA on this issue, the following conclusions were reached:

- In general the data is reported as a series of results from analytical methods which have known limitations and precision. The raw number is reported where ever possible so that the user can draw their own conclusions about the reliability of the "last significant figure" on any result when performing data manipulations.

- The real problem arises at very low levels and the result obtained is less than the method's prescribed DL The problem is not so much the result obtained but what to do with it which in turn raises the question 'What do we mean by detection limit'?

- In the book "Statistical methods in water resources" Helsel & Hirsch 1992 [Studies in Environmental Science 49, Elsevier], and chapter 13 "Methods for data below the reporting limit" it is pointed out that the 'detection limit' is variously known as the 'reporting limit' or the 'limit of quantitation'. If no other value is available, there are 3 main options: call it zero (which is clearly an under estimate), call it the detection limit (which is clearly an over estimate), or call it half the detection limit (which gives a 50:50 chance of an over or under estimate). The choice then is one of 'which convention do you wish to use'. In the written reports, I have treated the <DL as zero for summation purposes. This is an under estimate which I should have noted on each report page so that anyone using that data is aware of the convention used.

- An alternative approach is to say that, before the sample is analysed, the DL is the ***predicted minimum*** level that will be found using the stipulated method. However, once the sample is analysed the result is what was ***actually measured*** and may be <DL on the day of analysis. As it is an actual analytical result, that value (reported in brackets) should be reported even though it is <DL. This implies that the method DL is in reality a reporting level or level of confidence.

- The "DL" was derived for the Lake Taupo data, on each analytical occasion, from a series of blanks and 1ppb standards run with the samples. The "DL" is set as 3 times the SD of the 1 ppb standard. This is actually a limit of confidence. All samples are run in duplicate and the mean of the two results becomes the concentration reported.

- With the introduction of the Lachet FIA system, the limits of detection have been confidently pushed to the point where replicate results may often be <DL. In these instances, in the written report, the value is reported as <DL(result). In the past I have still used the <DL =0 convention in summation for the TN and TP data. This is obviously wrong and the actual result should be used, as is done in the electronic spreadsheet.

In this report the analytical value 'on-the-day' has been used wherever possible. Data reported as <DL use the <DL = DL/2 convention. Past data have not been corrected or altered to conform to this protocol.

These technical details are incorporated in this annual report so that data users are aware of how the 'DL' or confidence limit was set and how the values <DL are treated when performing data manipulations.

There is still the question of how to deal with numbers where the result has been simply reported as <DL. The use of the DL/2 convention is probably closer to reality than the DL = 0 convention.

Helsel & Hirsch suggest an alternative method for estimating a value in the <DL range. If there is sufficient real data >DL, a probability curve can be derived and extrapolated around the DL to generate the most probable number for the <DL value.

8.3 Statistical methods

Copied from Gibbs (2000b).

In this report we have used linear regressions and associated statistical tests to examine trends. The key result of these procedures is the coefficient of determination (r^2), which measures the amount of variability in the data that is accounted for by the regression. Another is the *P*-value.[4] This can be used as a weight of evidence against the hypothesis that there was in fact no trend. This weight is strong when *P* is small, meaning that a trend at least as large as that measured could have occurred merely by chance—we have only a limited number of data from which to infer the strength of any trend, so our measurements always are uncertain to some degree. So if *P* is low enough (taken as less than 5% in this report, which is the usual practice), it is conventional to say that the measured trend is "statistically significant", and that convention is followed in this report. However, it is important (and often not realised) to note that the *P*-value cannot be used as an *absolute* weight of evidence. This is because it tends to decrease as the number of samples taken in a given period is increased. For example, when we plot monthly Secchi disc depth data from 1994–2001 (Figure 3A, Gibbs 2000b) with these 93 data we obtain a statistically significant result (because $P < 0.05$)—even though the coefficient of determination was only $r^2 = 0.0445$. When we plot the minimum winter clarity over this period we then have only 7 data. In this case (Fig. 3B, Gibbs 2000b) we happen to have the same measured trend slope with a much higher coefficient of determination ($r^2 = 0.464$), yet the result is *not* statistically significant (because $P = 0.09$). This is entirely because of the reduced number of samples in the winter minimum case. What this makes clear is that the *P* value is useful as a *relative* weight of evidence when comparing datasets of the *same size*, but it has no evidential meaning when comparing results from datasets of very different sizes.

[4] It is defined as the probability of obtaining a trend at least as extreme as was obtained if in fact there was no trend at all.

9. Appendix 2. The calculation of net VHOD rates

Copied from Gibbs 1995.

Rationale

In the strictest terms, VHOD can only be calculated for a lake which has thermally stratified and the resultant thermocline provides an effective barrier against re-oxygenation of the hypolimnion. The measure of the barrier efficiency is the rate of heating of the hypolimnion following stratification as heat will be transferred across the thermocline at a similar rate to oxygen.

In Lake Taupo, the thermal inertia of the hypolimnion is so great that heating during the stratified period is typically about 0.2 °C and never more than 0.4 °C over a 200 day period. While this would seem to meet the temperature criterion, in a lake that large, oxygen can be transferred into the hypolimnion by mechanisms other than diffusion.

Wind induced mixing may increase turbulent diffusion across the thermocline as would an internal seiche on the thermocline. Both of these mechanisms would also transfer heat. The penetration of the thermocline by an underflowing density current would entrain oxygenated surface water into the hypolimnion with that flow. As the density current must be colder than the thermocline to plunge through it, there is no heat transferred with this mechanism.

In Lake Taupo the Tongariro River is always colder than the surface water and for at least 9 months of the year it is also colder than the minimum lake water temperature of 10.3 ^{o}C. Thus, during most of the stratified period, the Tongariro River flows directly into the hypolimnion entraining oxygenated surface water with it. The amount of surface water entrained has been estimated to be about 10 times the river discharge. The amount of oxygen transported in this way is likely to be more than 200 tonnes per day (Gibbs 1996).

Clearly this is a substantial oxygen input which invalidates the concept of the thermocline forming an oxygen barrier for purposes of calculating the VHOD. The true VHOD may only be calculated during mid summer when the Tongariro River flows deep into the epilimnion but does not penetrate the thermocline.

The data collected to date indicates that hypolimnetic oxygen depletion occurs throughout the stratified period - with or without the density current re-oxygenation - and hence the value obtained from a VHOD calculation over the whole stratified period is the net VHOD rate taking all the factors affecting the hypolimnion into account.

As the data from 1996/97 shows, the density current also advects dissolved organic nutrients with it. Hence, management strategies which affect the Tongariro River also impact on the lake. Hence it is appropriate to use the net VHOD rate for interannual comparisons rather than the true or gross VHOD rate calculated only through mid summer.

Method of calculation

The following is the method used to calculate the net VHOD rate for Lake Taupo.

Requirements: Microsoft EXCEL spreadsheet or equivalent.

EASY PLOT statistical graphing package or equivalent.

Although the thermocline in Lake Taupo is usually at about 40 m, the isothermal water column lies below 70 m. To accommodate the gradient across the thermocline, the net VHOD rate calculation only uses oxygen data from below 70 m.

To calculate the mean oxygen concentration in the water column below 70 m, the DO concentration at each 10 m depth increment is multiplied by the volume of the 10 m slice it came from. This assumes rapid horizontal mixing and minimal vertical mixing to extrapolate one DO value across the whole lake. Historical data from multiple sites would suggest that this is a reasonable assumption.

The slice volumes (hypsographic volumes) for Lake Taupo have been calculated for 10 m thick layers centred on the 5 m point of each slice i.e., 75, 85, 95, 105 m etc. The DO measurements are made at 10 m intervals i.e., 70, 80, 90, 100, 110 m etc.

The mass of oxygen in each 10 m slice is the average of the DO concentration at the top and bottom of a slice multiplied by the slice volume. i.e., for the 70 - 80 m slice the calculation is:-

$$mass_{70\text{-}80m} = ((DO_{70m} + DO_{80m}) \div 2) \times Volume_{70\text{-}80m}$$

For each profile date:

Compute the mass for each 10 m slice between 70 m and 150 m and sum the results as the total mass of DO in the hypolimnion below 70 m. Sum the slice volumes below 70 m as the total volume of the hypolimnion below 70 m.

The volume weighted mean DO concentration is the total mass value divided by the total volume value.

Use the sequential day number or equivalent to construct a time series of volume weighted mean DO concentrations over the stratified period and use the CURVE FIT regression analysis of EASY PLOT to obtain the $y = ax + b$ straight line fit for these data.

As the DO data are in g m^{-3}, the value of 'a' is in g m^{-3} d^{-1}. Multiply 'a' by 1000 to get the net VHOD rate in mg m^{-3} d^{-1}. The negative sign indicates a loss rate.

The hypsographic volumes and upper surface areas of the 10 m slices through the whole depth of Lake Taupo are listed at the end of this section.

Lake Taupo Hypsographic Data used in the Net VHOD RATE calculation.

Slice depths (m)	Volume of slice (km^3)	Upper surface area of slice (km^2)
0 - 10	5.849359	600
10 - 20	5.599702	570
20 - 30	5.459951	550
30 - 40	5.359888	542
40 - 50	5.288266	530
50 - 60	5.150538	528
60 - 70	4.899510	502
70 - 80	4.619076	478
80 - 90	4.278738	446
90 - 100	3.847292	410
100 - 110	3.006616	360
110 - 120	1.730549	245
120 - 130	0.837468	110
130 - 140	0.394439	60
140 - 150	0.073333	22
150 -	0	0

Statistical evaluation of the VHOD rate

From the 1999-2000 monitoring report (Gibbs 2000b), the VHOD rate is expressed as the calculated net VHOD rate ± the 95% confidence limit. This gives a meaningful estimate of the range within which the VHOD rate lies and is more appropriate than the standard deviation on the data or a standard error estimate on the regression coefficient.

Julian Date or sequential day number for each day of the year excluding leap years. For Leap Years, add 1 to the sequential day number from 1 March to 31 December of that year.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1	1	32	60	91	121	152	182	213	244	274	305	335	1
2	2	33	61	92	122	153	183	214	245	275	306	336	2
3	3	34	62	93	123	154	184	215	246	276	307	337	3
4	4	35	63	94	124	155	185	216	247	277	308	338	4
5	5	36	64	95	125	156	186	217	248	278	309	339	5
6	6	37	65	96	126	157	187	218	249	279	310	340	6
7	7	38	66	97	127	158	188	219	250	280	311	341	7
8	8	39	67	98	128	159	189	220	251	281	312	342	8
9	9	40	68	99	129	160	190	221	252	282	313	343	9
10	10	41	69	100	130	161	191	222	253	283	314	344	10
11	11	42	70	101	131	162	192	223	254	284	315	345	11
12	12	43	71	102	132	163	193	224	255	285	316	346	12
13	13	44	72	103	133	164	194	225	256	286	317	347	13
14	14	45	73	104	134	165	195	226	257	287	318	348	14
15	15	46	74	105	135	166	196	227	258	288	319	349	15
16	16	47	75	106	136	167	197	228	259	289	320	350	16
17	17	48	76	107	137	168	198	229	260	290	321	351	17
18	18	49	77	108	138	169	199	230	261	291	322	352	18
19	19	50	78	109	139	170	200	231	262	292	323	353	19
20	20	51	79	110	140	171	201	232	263	293	324	354	20
21	21	52	80	111	141	172	202	233	264	294	325	355	21
22	22	53	81	112	142	173	203	234	265	295	326	356	22
23	23	54	82	113	143	174	204	235	266	296	327	357	23
24	24	55	83	114	144	175	205	236	267	297	328	358	24
25	25	56	84	115	145	176	206	237	268	298	329	359	25
26	26	57	85	116	146	177	207	238	269	299	330	360	26
27	27	58	86	117	147	178	208	239	270	300	331	361	27
28	28	59	87	118	148	179	209	240	271	301	332	362	28
29	29		88	119	149	180	210	241	272	302	333	363	29
30	30		89	120	150	181	211	242	273	303	334	364	30
31	31		90		151		212	243		304		365	31

10. Appendix 3. Temperature and dissolved Oxygen data

Includes accumulated data since 1994.

* represents data missing or invalid.

For completeness, additional data from the Kuratau Basin (site B) and Western Bays (site C) collected for the period between January 2002 and December 2004 are included as separate sheets following the mid-lake data from site A for those years.

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2005-2006**
Mid-Lake site A for the period starting 17 August 2005

Temperature

Date / Depth (m)	17/08/2005	31/08/2005	14/09/2005	29/09/2005	12/10/2005	25/10/2005	10/11/2005	1/12/2005	10/01/2006	2/02/2006	1/03/2006	12/04/2006	27/04/2006	9/05/2006	30/05/2006	27/06/2006	11/07/2006	25/07/2006	4/09/2006
0	11.17	11.74	12.42	11.91	11.92	13.40	16.10	15.09	17.40	20.20	19.50	16.71	16.31	15.70	14.21	11.94	11.51	11.15	11.10
10	10.98	11.24	11.76	11.68	11.79	12.84	14.59	14.93	17.10	20.11	19.50	16.72	16.29	15.70	14.21	11.99	11.51	11.15	10.93
20	10.97	11.10	11.22	11.67	11.76	12.17	14.27	14.22	16.85	18.15	19.25	16.72	16.29	15.70	14.21	11.99	11.50	11.15	10.93
30	10.97	11.05	11.05	11.66	11.66	11.63	12.36	13.34	14.84	15.46	16.14	16.71	16.29	15.70	14.21	11.99	11.48	11.15	10.89
40	10.97	11.00	11.01	11.60	11.47	11.47	11.66	12.32	12.21	13.40	12.93	16.48	13.96	13.40	14.20	11.99	11.48	11.15	10.87
50	10.97	10.98	10.98	11.18	11.39	11.29	11.27	11.66	11.60	11.75	11.57	12.00	12.20	11.94	14.16	11.99	11.48	11.15	10.83
60	10.97	10.97	10.99	11.02	11.37	11.17	11.15	11.26	11.21	11.35	11.35	11.53	11.56	11.36	11.54	11.39	11.47	11.15	10.82
70	10.96	10.97	10.97	10.97	11.26	11.06	11.04	11.11	11.13	11.19	11.16	11.29	11.30	11.23	11.27	11.21	11.46	11.15	10.82
80	10.97	10.96	10.97	10.97	11.13	10.99	11.00	11.06	11.06	11.11	11.14	11.19	11.19	11.14	11.19	11.16	11.45	11.15	10.82
90	10.96	10.96	10.96	10.96	11.07	10.97	10.98	11.01	11.05	11.06	11.06	11.12	11.12	11.10	11.16	11.15	11.42	11.15	10.81
100	10.96	10.95	10.96	10.95	11.01	10.97	10.97	10.98	11.04	11.04	11.05	11.08	11.08	11.09	11.12	11.14	11.23	11.15	10.81
110	10.96	10.94	10.94	10.94	10.98	10.94	10.95	10.97	11.02	11.02	11.05	11.05	11.07	11.06	11.11	11.14	11.20	11.15	10.81
120	10.96	10.94	10.93	10.93	10.98	10.94	10.94	10.97	11.00	11.02	11.05	11.03	11.06	11.06	11.09	11.13	11.19	11.15	10.80
130	10.96	10.93	10.93	10.92	10.96	10.93	10.93	10.96	10.99	11.00	11.03	11.02	11.05	11.04	11.07	11.13	11.18	11.15	10.79
140	10.95	10.93	10.91	10.91	10.96	10.93	10.94	10.96	10.99	11.00	11.00	11.02	11.04	11.03	11.07	11.12	11.18	11.15	10.76
150	10.93	10.93	10.89	10.91	10.96	10.92	10.96	10.97	10.98	10.99	11.00	11.02	11.04	11.04	11.07	11.10	11.14	11.15	10.75

Dissolved Oxygen (g m^{-3})

Depth (m)	17/08/2005	31/08/2005	14/09/2005	29/09/2005	12/10/2005	25/10/2005	10/11/2005	1/12/2005	10/01/2006	2/02/2006	1/03/2006	12/04/2006	27/04/2006	9/05/2006	30/05/2006	27/06/2006	11/07/2006	25/07/2006	4/09/2006
0	10.52	10.47	10.26	10.35	10.38	10.04	9.95	9.70	9.23	9.00	9.20	9.33	9.39	9.46	9.97	10.29	10.84	10.54	10.52
10	10.55	10.47	10.26	10.47	10.49	9.98	9.99	9.94	9.38	9.39	9.24	9.15	9.96	9.59	10.49	10.27	10.88	10.94	10.47
20	10.41	10.26	10.37	10.39	10.40	10.04	9.88	9.69	9.37	9.20	9.43	9.51	9.39	9.47	9.97	10.30	10.77	10.59	10.33
30	10.39	10.28	10.19	10.39	10.44	9.89	9.74	9.26	8.96	8.94	8.99	9.23	9.31	9.50	10.21	10.22	10.76	10.54	10.23
40	10.31	9.80	9.40	10.32	10.25	9.61	9.48	9.74	8.95	8.69	9.02	8.92	8.82	8.90	9.98	10.22	10.74	10.34	10.13
50	10.29	9.66	9.39	10.20	10.23	9.51	9.36	9.63	8.61	8.59	8.91	8.61	8.70	8.51	10.10	10.16	10.71	10.54	10.00
60	10.17	9.57	9.18	9.83	9.92	9.14	8.65	9.08	8.69	8.22	8.78	8.49	8.31	8.29	9.25	9.64	10.70	10.38	9.91
70	10.13	9.41	9.26	9.63	9.86	9.03	8.83	8.80	8.50	8.20	8.52	8.20	8.51	8.26	8.87	8.85	10.64	10.45	9.82
80	10.06	9.38	9.01	9.46	9.63	8.76	8.50	8.78	8.21	8.04	8.19	7.94	8.17	8.19	8.47	8.42	10.47	10.36	9.88
90	10.05	9.42	9.07	9.38	9.68	8.76	8.59	8.40	8.12	8.07	7.82	7.98	8.10	8.08	8.33	8.15	10.46	10.44	9.78
100	10.04	9.41	8.86	9.20	9.33	8.54	8.35	8.39	7.96	7.88	7.89	8.05	8.12	8.06	8.16	8.05	9.65	10.34	9.82
110	10.04	9.37	8.88	9.12	9.24	8.49	8.41	8.35	7.92	7.94	7.85	7.91	7.84	7.96	8.11	7.96	8.87	10.35	9.73
120	9.96	9.23	8.56	9.03	9.13	8.44	8.22	8.28	7.89	7.62	7.86	7.44	7.57	7.77	8.04	7.89	8.41	10.17	9.79
130	9.93	9.14	8.56	8.96	9.07	8.40	8.27	8.20	7.82	7.78	7.72	7.58	7.49	7.66	8.04	7.84	8.31	10.33	9.65
140	9.32	8.94	8.38	8.79	9.01	8.38	7.92	8.08	7.62	7.36	7.67	7.34	7.32	7.58	7.99	7.82	8.29	10.39	9.61
150	8.63	8.57	8.20	8.56	8.94	8.24	7.86	8.00	7.39	7.28	7.34	7.19	7.15	7.23	7.57	7.61	8.14	10.28	9.65

Secchi depth

	17/08/2005	31/08/2005	14/09/2005	29/09/2005	12/10/2005	25/10/2005	10/11/2005	1/12/2005	10/01/2006	2/02/2006	1/03/2006	12/04/2006	27/04/2006	9/05/2006	30/05/2006	27/06/2006	11/07/2006	25/07/2006	4/09/2006
(m)	13	13	13	14	14	15	17.5	19.3	19	15.5	15.3	15.8	17	17.5	18.2	15.2	13.5	12	11

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2004-2005**
Mid-Lake site A for the period starting 24 August 2004

Temperature

Date / Depth (m)	24/08/2004	7/09/2004	21/10/2004	2/11/2004	22/11/2004	15/12/2004	11/01/2005	25/01/2005	9/02/2005	22/02/2005	10/03/2005	21/03/2005	14/04/2005	18/05/2005	9/06/2005	20/06/2005	20/07/2005	3/08/2005	17/08/2005	31/08/2005	14/09/2005
0	10.92	10.70	11.75	12.94	15.31	14.17	16.97	19.27	20.73	20.05	19.25	19.34	17.92	14.33	12.98	12.67	11.46	11.12	11.17	11.74	12.42
10	10.83	10.66	11.61	12.89	15.15	14.10	16.01	18.05	20.19	19.73	19.24	19.17	17.96	14.31	12.99	12.47	11.31	11.11	10.98	11.24	11.76
20	10.83	10.66	11.60	12.49	13.69	13.89	15.83	16.72	18.05	18.80	19.23	18.81	17.95	14.24	12.98	12.43	11.31	11.10	10.97	11.10	11.22
30	10.83	10.66	11.59	11.65	13.17	13.79	13.37	14.55	14.65	14.02	14.92	14.59	15.13	14.13	12.98	12.42	11.30	11.11	10.97	11.05	11.05
40	10.83	10.66	11.59	11.28	11.61	13.59	12.39	13.12	12.83	12.36	13.06	12.62	12.92	13.88	12.98	12.44	11.30	11.10	10.97	11.00	11.01
50	10.83	10.65	11.58	10.93	11.09	11.35	11.33	11.89	11.75	11.49	11.75	11.64	12.00	11.47	12.97	12.42	11.28	11.11	10.97	10.98	10.98
60	10.83	10.66	11.15	10.75	10.97	11.03	11.04	11.23	11.12	11.00	11.16	11.20	11.33	11.18	12.57	11.54	11.28	11.10	10.97	10.97	10.99
70	10.83	10.66	10.78	10.72	10.77	10.88	10.86	10.98	10.90	10.87	10.92	10.96	10.99	10.97	11.13	11.07	11.26	11.11	10.96	10.97	10.97
80	10.83	10.65	10.74	10.64	10.73	10.80	10.81	10.91	10.83	10.82	10.88	10.94	10.88	10.93	10.98	11.00	11.21	11.10	10.97	10.96	10.97
90	10.82	10.61	10.72	10.62	10.69	10.73	10.75	10.80	10.75	10.80	10.80	10.81	10.82	10.89	10.95	10.93	10.98	11.10	10.96	10.96	10.96
100	10.83	10.58	10.71	10.61	10.68	10.70	10.74	10.81	10.80	10.78	10.80	10.82	10.78	10.90	10.90	10.91	10.94	11.10	10.96	10.95	10.96
110	10.83	10.56	10.67	10.60	10.64	10.67	10.69	10.72	10.73	10.75	10.74	10.76	10.76	10.87	10.89	10.87	10.93	11.08	10.96	10.94	10.94
120	10.83	10.56	10.66	10.58	10.64	10.66	10.68	10.73	10.76	10.76	10.76	10.79	10.76	10.88	10.87	10.86	10.89	10.99	10.96	10.94	10.93
130	10.82	10.55	10.64	10.57	10.61	10.63	10.66	10.69	10.71	10.71	10.72	10.73	10.74	10.81	10.84	10.86	10.88	10.97	10.96	10.93	10.93
140	10.82	10.53	10.61	10.57	10.61	10.61	10.65	10.68	10.74	10.73	10.75	10.77	10.74	10.82	10.80	10.86	10.88	10.93	10.95	10.93	10.91
150	10.79	10.47	10.56	10.58	10.60	10.62	10.67	10.67	10.70	10.70	10.71	10.72	10.72	10.77	10.78	10.85	10.87	10.90	10.93	10.93	10.89

Dissolved Oxygen (g m^{-3})

Depth (m)	24/08/2004	7/09/2004	21/10/2004	2/11/2004	22/11/2004	15/12/2004	11/01/2005	25/01/2005	9/02/2005	22/02/2005	10/03/2005	21/03/2005	14/04/2005	18/05/2005	9/06/2005	20/06/2005	20/07/2005	3/08/2005	17/08/2005	31/08/2005	14/09/2005
0	10.7	10.7	10.4	10.1	9.5	9.9	9.4	8.95	8.64	8.74	8.77	8.89	9.12	9.75	10.12	10.15	10.7	10.7	10.4	10.1	9.5
10	10.5	10.5	10.1	10.2	9.6	9.8	9.5	8.87	8.75	8.78	8.77	8.87	9.01	9.75	10.03	10.12	10.5	10.5	10.1	10.2	9.6
20	10.5	10.5	10.3	10.0	9.5	9.8	9.5	8.79	8.73	8.59	8.72	8.85	9.04	9.66	9.97	10.17	10.5	10.5	10.3	10.0	9.5
30	10.4	10.4	10.1	9.9	9.5	9.7	9.2	8.72	8.68	8.62	8.01	8.34	8.37	9.55	9.97	10.03	10.4	10.4	10.1	9.9	9.5
40	10.4	10.3	10.2	9.9	9.5	9.7	9.2	8.80	8.76	8.68	8.48	8.39	8.66	9.49	9.88	9.99	10.4	10.3	10.2	9.9	9.5
50	10.3	10.3	10.0	9.6	9.4	9.3	9.0	8.54	8.45	8.36	8.16	8.17	8.34	9.01	9.87	9.93	10.3	10.3	10.0	9.6	9.4
60	10.3	10.2	9.9	9.5	9.1	9.4	8.9	8.50	8.41	8.37	8.14	8.22	8.21	8.66	9.69	9.05	10.3	10.2	9.9	9.5	9.1
70	10.2	10.2	9.7	9.3	9.1	9.3	8.8	8.40	8.36	8.32	8.04	8.18	8.21	8.56	8.90	8.72	10.2	10.2	9.7	9.3	9.1
80	10.2	10.1	9.6	9.2	9.0	9.2	8.7	8.29	8.24	8.27	8.04	8.13	8.19	8.22	8.70	8.33	10.2	10.1	9.6	9.2	9.0
90	10.1	10.0	9.4	9.1	8.8	9.1	8.6	8.18	8.12	8.13	8.03	8.11	8.27	8.07	8.39	8.23	10.1	10.0	9.4	9.1	8.8
100	10.1	10.0	9.4	9.0	8.8	9.0	8.5	8.13	7.86	7.93	7.89	7.90	7.99	7.90	8.27	8.06	10.1	10.0	9.4	9.0	8.8
110	9.9	9.9	9.3	9.0	8.8	8.9	8.4	8.07	7.84	7.81	7.82	7.83	7.82	7.75	8.16	7.99	9.9	9.9	9.3	9.0	8.8
120	10.0	9.9	9.3	8.9	8.6	8.8	8.4	8.02	7.78	7.71	7.73	7.81	7.66	7.78	8.08	7.70	10.0	9.9	9.3	8.9	8.6
130	10.0	9.9	9.3	8.7	8.6	8.7	8.3	8.00	7.76	7.71	7.68	7.78	7.69	7.77	8.03	7.57	10.0	9.9	9.3	8.7	8.6
140	9.9	9.9	9.2	8.7	8.4	8.5	8.1	7.83	7.59	7.50	7.36	7.48	7.56	7.69	7.94	7.42	9.9	9.9	9.2	8.7	8.4
150	9.8	9.7	9.0	8.6	8.2	8.3	7.9	7.51	7.54	7.46	7.35	7.43	7.47	7.67	7.75	7.36	9.8	9.7	9.0	8.6	8.2

Secchi depth

	24/08/2004	7/09/2004	21/10/2004	2/11/2004	22/11/2004	15/12/2004	11/01/2005	25/01/2005	9/02/2005	22/02/2005	10/03/2005	21/03/2005	14/04/2005	18/05/2005	9/06/2005	20/06/2005	20/07/2005	3/08/2005	17/08/2005	31/08/2005	14/09/2005
(m)	12.5	12	15	16	16	19.5	20	19.5	18	21.5	18.5	20	17.2	16	14.1	13.8	13	14	13	13	13

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2003-2004**
Mid-Lake site A for the period starting 14 July 2003

Temperature

Date / Depth (m)	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003	7/10/2003	21/10/2003	19/11/2003	4/12/2003	18/12/2003	13/01/2004	26/02/2004	8/03/2004	31/03/2004	14/04/2004	10/05/2004	10/06/2004	13/07/2004	26/07/2004	24/08/2004	7/09/2004
0	11.85	11.38	11.25	11.23	11.13	11.48	13.11	13.96	16.15	17.72	20.29	17.20	17.50	16.49	15.27	14.74	13.04	11.59	11.29	10.92	10.70
10	11.86	11.38	11.24	11.17	11.13	11.39	11.92	13.79	15.11	17.76	19.60	17.19	17.00	16.29	15.24	14.74	13.05	11.64	11.26	10.83	10.66
20	11.86	11.38	11.24	11.12	11.11	11.37	11.53	13.78	14.53	15.57	16.72	17.18	16.70	16.23	15.21	14.74	13.04	11.62	11.25	10.83	10.66
30	11.86	11.38	11.24	11.11	11.06	11.37	11.40	13.70	12.96	13.23	13.87	17.16	16.55	16.19	15.19	14.74	13.05	11.65	11.25	10.83	10.66
40	11.86	11.38	11.24	11.11	11.06	11.32	11.34	12.30	12.26	12.33	12.58	12.90	13.30	16.15	15.13	14.73	13.05	11.62	11.26	10.83	10.66
50	11.86	11.38	11.24	11.11	11.06	11.31	11.23	11.35	11.48	11.84	11.58	11.83	11.60	12.51	12.40	12.56	13.05	11.65	11.26	10.83	10.65
60	11.86	11.38	11.24	11.11	11.06	11.31	11.19	11.28	11.41	11.39	11.33	11.53	11.60	11.59	11.67	11.66	13.05	11.64	11.26	10.83	10.66
70	11.86	11.38	11.24	11.10	11.06	11.31	11.16	11.23	11.26	11.26	11.26	11.35	11.40	11.40	11.48	11.43	12.42	11.65	11.25	10.83	10.66
80	11.35	11.38	11.24	11.00	11.06	11.30	11.15	11.19	11.25	11.22	11.23	11.30	11.35	11.34	11.39	11.38	11.56	11.64	11.25	10.83	10.65
90	11.31	11.38	11.24	11.09	11.06	11.29	11.13	11.16	11.20	11.17	11.22	11.25	11.27	11.30	11.32	11.35	11.51	11.66	11.25	10.82	10.61
100	11.27	11.35	11.24	11.09	11.06	11.25	11.11	11.15	11.18	11.17	11.21	11.23	11.27	11.27	11.30	11.32	11.39	11.65	11.25	10.83	10.58
110	11.24	11.34	11.23	11.09	11.06	11.21	11.10	11.12	11.17	11.15	11.19	11.20	11.24	11.26	11.28	11.30	11.35	11.65	11.26	10.83	10.56
120	11.22	11.32	11.22	11.09	11.06	11.14	11.10	11.11	11.18	11.14	11.18	11.18	11.22	11.24	11.25	11.30	11.34	11.65	11.26	10.83	10.56
130	11.21	11.27	11.22	11.08	11.06	11.11	11.08	11.09	11.14	11.13	11.17	11.18	11.20	11.22	11.23	11.28	11.33	11.49	11.26	10.82	10.55
140	11.21	11.26	11.21	11.08	11.06	11.09	11.08	11.09	11.15	11.13	11.16	11.17	11.20	11.21	11.21	11.27	11.32	11.39	11.26	10.82	10.53
150	11.20	11.22	11.20	11.08	11.07	11.09	11.08	11.09	11.14	11.13	11.16	11.17	11.20	11.21	11.21	11.26	11.31	11.34	11.26	10.79	10.47

Dissolved Oxygen (g m^{-3})

Depth (m)																					
0	10.3	10.6	10.5	10.5	10.5	10.5	10.1	9.9	9.5	9.1	9.2	9.3	9.4	9.2	9.5	9.7	10.2	10.5	10.6	10.7	10.7
10	10.2	10.4	10.5	10.5	10.6	10.5	10.0	9.9	9.5	9.2	9.3	9.4	9.0	9.1	9.2	9.6	9.9	10.5	10.6	10.5	10.5
20	10.2	10.2	10.3	10.4	10.4	10.4	10.2	9.8	9.4	9.0	9.1	9.0	8.8	9.0	9.1	9.4	9.8	10.5	10.6	10.5	10.5
30	10.2	9.9	10.1	10.3	10.1	10.1	10.0	9.5	9.2	9.2	9.1	8.9	8.5	9.0	8.8	9.3	9.5	10.3	10.3	10.4	10.4
40	10.1	9.9	10.0	10.0	9.8	10.0	9.7	9.3	9.0	9.1	8.7	8.4	8.0	8.9	8.8	9.2	9.5	10.1	10.1	10.4	10.3
50	10.0	9.0	9.9	9.9	9.8	9.8	9.4	9.0	8.7	8.8	8.5	8.1	7.9	8.2	8.2	8.6	9.4	9.8	9.9	10.3	10.3
60	9.9	8.8	9.8	9.7	9.6	9.7	9.2	8.9	8.6	8.4	8.2	8.0	7.7	8.0	8.0	8.2	9.4	9.9	9.8	10.3	10.2
70	9.9	8.7	9.8	9.6	9.6	9.6	9.1	8.7	8.5	8.3	8.1	7.9	7.6	8.0	7.8	7.9	9.1	9.6	9.7	10.2	10.2
80	8.7	8.6	9.7	9.5	9.5	9.6	8.9	8.6	8.4	8.1	8.0	7.9	7.5	8.0	7.7	7.9	8.5	9.7	9.6	10.2	10.1
90	8.5	8.5	9.7	9.5	9.5	9.5	8.9	8.6	8.3	8.1	8.0	7.9	7.5	7.9	7.6	7.8	8.0	9.5	9.5	10.1	10.0
100	8.2	8.4	9.6	9.5	9.5	9.4	8.8	8.6	8.2	7.9	7.8	7.8	7.4	7.8	7.5	7.7	7.7	9.5	9.4	10.1	10.0
110	8.2	8.1	9.6	9.4	9.5	9.3	8.8	8.4	8.2	7.9	7.8	7.7	7.3	7.7	7.4	7.6	7.6	9.4	9.4	9.9	9.9
120	8.0	8.0	9.5	9.4	9.5	9.3	8.7	8.4	8.1	7.8	7.7	7.5	7.1	7.6	7.3	7.4	7.5	9.4	9.3	10.0	9.9
130	8.0	7.9	9.5	9.4	9.4	9.1	8.7	8.3	8.0	7.8	7.5	7.3	7.0	7.5	7.2	7.3	7.4	9.1	9.2	10.0	9.9
140	7.8	7.8	9.5	9.3	9.4	9.0	8.5	8.2	7.9	7.5	7.4	7.3	6.9	7.4	7.0	7.3	7.3	8.3	9.2	9.9	9.9
150	7.7	7.6	9.3	9.3	9.4	8.9	8.5	8.0	7.7	7.3	7.2	7.1	6.8	7.1	6.8	7.1	7.3	8.0	9.2	9.8	9.7

Secchi depth

(m)	14.5	14	13.5	13	12.5	13	17	16	18.5	17.5	19	17	15	16	15	18	13.5	12	11	12.5	12

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2003-2004**
Additional site B (Kuratau Basin) for the period starting 14 July 2003

Temperature

Date / Depth (m)	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003	7/10/2003	21/10/2003	19/11/2003	4/12/2003	18/12/2003	13/01/2004	26/02/2004	8/03/2004	31/03/2004	14/04/2004	10/05/2004	10/06/2004	13/07/2004	26/07/2004	24/08/2004	7/09/2004
0	11.82	11.32	11.38	11.36	11.13	11.70	13.31	13.79	15.65	17.08	20.25	16.83	17.63	15.92	15.10	14.72	13.02	11.43	11.26	10.92	10.85
10	11.80	11.29	11.22	11.17	11.11	11.44	12.28	13.49	15.00	16.43	19.73	16.72	16.56	15.90	15.02	14.68	12.95	11.40	11.20	10.77	10.59
20	11.79	11.29	11.22	11.14	11.07	11.40	11.71	13.33	13.81	15.28	16.73	16.58	16.51	15.89	15.00	14.64	12.84	11.41	11.20	10.73	10.58
30	11.79	11.29	11.21	11.13	11.03	11.35	11.46	12.22	12.37	13.38	13.74	16.16	16.40	15.88	14.99	14.47	12.71	11.41	11.20	10.72	10.57
40	11.79	11.29	11.21	11.13	11.02	11.34	11.38	11.67	11.90	12.91	12.48	15.75	15.53	15.53	14.18	14.07	12.67	11.41	11.19	10.72	10.57
50	11.79	11.29	11.21	11.13	11.02	11.33	11.28	11.40	11.57	11.65	11.62	12.97	12.55	12.89	12.48	12.48	12.66	11.41	11.19	10.72	10.56
60	11.78	11.29	11.21	11.13	11.01	11.25	11.23	11.31	11.37	11.33	11.40	11.88	11.64	11.69	11.72	11.78	12.57	11.40	11.19	10.72	10.56
70	11.78	11.29	11.21	11.12	11.01	11.12	11.15	11.24	11.25	11.27	11.28	11.55	11.47	11.49	11.51	11.47	12.51	11.41	11.18	10.72	10.56
80	11.77	11.29	11.16	11.12	11.01	11.06	11.09	11.18	11.21	11.25	11.20	11.38	11.41	11.37	11.43	11.38	12.27	11.37	11.18	10.72	10.51
90	11.35	11.29	11.04	11.11	11.01	11.02	11.08	11.13	11.13	11.19	11.16	11.32	11.35	11.32	11.37	11.31	11.77	11.26	11.17	10.71	10.45
100	11.27	11.29	10.91	11.08	11.01	11.02	11.05	11.10	11.11	11.16	11.14	11.28	11.33	11.26	11.30	11.24	11.65	11.24	11.17	10.66	10.38

Dissolved Oxygen (g m^{-3})

Depth (m)	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003	7/10/2003	21/10/2003	19/11/2003	4/12/2003	18/12/2003	13/01/2004	26/02/2004	8/03/2004	31/03/2004	14/04/2004	10/05/2004	10/06/2004	13/07/2004	26/07/2004	24/08/2004	7/09/2004
0	10.7	10.9	10.8	10.6	10.6	10.4	10.5	10.1	9.8	9.1	9.2	9.3	9.5	8.8	10.5	11.4	12.3	10.6	10.5	10.5	10.8
10	10.5	11.0	10.6	10.6	10.5	10.4	10.4	10.3	9.9	9.3	9.2	9.1	9.0	9.0	9.5	10.2	10.7	10.6	10.5	10.4	10.7
20	10.3	11.3	10.4	10.2	10.2	10.2	10.1	9.9	9.6	9.4	9.2	9.0	8.9	8.9	9.2	9.9	10.1	10.1	10.5	10.5	10.7
30	10.2	11.2	10.1	9.9	10.1	9.9	10.0	9.6	9.3	9.1	9.0	9.0	8.7	8.8	8.9	9.4	9.7	9.8	10.3	10.4	10.6
40	10.1	11.2	9.9	9.8	9.9	9.6	9.7	9.2	8.9	9.1	8.8	8.7	8.2	8.7	8.5	9.1	9.6	9.6	10.0	10.3	10.5
50	10.0	10.9	9.8	9.6	9.8	9.6	9.4	9.0	8.8	8.7	8.5	8.2	7.9	8.2	7.9	8.5	9.3	9.5	9.8	10.2	10.3
60	9.9	10.7	9.7	9.5	9.7	9.4	9.0	8.8	8.6	8.3	8.2	8.1	7.7	8.0	7.6	8.0	9.2	9.3	9.6	10.1	10.3
70	9.9	10.4	9.7	9.5	9.7	9.3	8.9	8.7	8.6	8.3	8.1	7.9	7.6	7.8	7.3	7.7	8.9	9.2	9.6	10.1	10.2
80	9.8	10.3	9.4	9.4	9.6	9.1	8.7	8.6	8.4	7.9	7.8	7.8	7.4	7.6	7.1	7.4	8.7	9.1	9.4	10.0	10.1
90	9.2	10.1	9.2	9.3	9.6	9.0	8.7	8.5	8.3	7.9	7.8	7.7	7.3	7.6	7.0	7.5	8.3	8.7	9.5	9.9	10.1
100	8.3	10.0	9.2	9.3	9.6	8.9	8.6	8.2	7.9	7.9	7.6	7.4	7.3	7.3	6.8	7.0	8.1	8.1	9.4	9.8	10.0

Secchi depth

	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003	7/10/2003	21/10/2003	19/11/2003	4/12/2003	18/12/2003	13/01/2004	26/02/2004	8/03/2004	31/03/2004	14/04/2004	10/05/2004	10/06/2004	13/07/2004	26/07/2004	24/08/2004	7/09/2004
(m)	12	13	13	11.5	11	9.5	15	17	17	15	16	13.5	5	11	14	15.5	12	11	10	10	11

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2003-2004**
Additional site C (Western Bays) for the period starting 14 July 2003

Temperature

Date / Depth (m)	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003	7/10/2003	21/10/2003	19/11/2003	4/12/2003	18/12/2003	13/01/2004	26/02/2004	8/03/2004	31/03/2004	14/04/2004	10/05/2004	10/06/2004	13/07/2004	26/07/2004	24/08/2004	7/09/2004
0	11.86	11.43	11.56	11.31	11.32	11.85	13.29	15.10	15.79	17.00	20.17	16.90	18.43	16.37	15.41	14.98	13.16	11.58	11.51	10.97	11.14
10	11.80	11.36	11.26	11.21	11.13	11.24	11.93	13.84	15.29	16.33	18.89	16.69	17.02	16.35	15.18	14.80	13.08	11.61	11.32	10.94	10.73
20	11.80	11.34	11.25	11.14	11.09	11.17	11.62	13.76	14.31	15.26	17.11	16.34	16.45	16.35	15.15	14.76	13.07	11.61	11.30	10.90	10.71
30	11.80	11.32	11.25	11.14	11.08	11.14	11.52	13.63	12.99	13.46	13.74	14.66	15.33	15.95	15.15	14.75	13.07	11.61	11.31	10.90	10.71
40	11.80	11.31	11.25	11.14	11.08	11.14	11.50	11.91	12.03	12.88	12.25	12.56	13.64	13.21	15.14	14.73	13.07	11.60	11.31	10.89	10.70
50	11.80	11.31	11.25	11.14	11.07	11.13	11.46	11.42	11.43	11.64	11.57	11.63	11.64	11.68	12.68	12.57	12.80	11.61	11.30	10.90	10.70
60	11.80	11.31	11.25	11.14	11.07	11.13	11.38	11.31	11.30	11.31	11.36	11.53	11.48	11.45	11.76	11.73	11.68	11.60	11.30	10.89	10.70
70	11.80	11.31	11.25	11.14	11.07	11.12	11.21	11.27	11.28	11.26	11.28	11.39	11.37	11.34	11.54	11.48	11.44	11.61	11.30	10.89	10.70
80	11.79	11.31	11.25	11.14	11.07	1.10	11.13	11.20	11.25	11.22	11.25	11.31	11.35	11.32	11.37	11.39	11.37	11.58	11.30	10.89	10.70
90	11.60	11.29	11.25	11.14	11.07	11.04	11.07	11.14	11.21	11.19	11.21	11.26	11.33	11.29	11.30	11.32	11.33	11.61	11.30	10.89	10.70
100	11.28	11.27	11.24	11.14	11.07	11.03	11.07	11.11	11.19	11.12	11.19	11.23	11.32	11.25	11.29	11.31	11.32	11.61	11.30	10.89	10.70

Dissolved Oxygen (g m^{-3})

Depth (m)	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003	7/10/2003	21/10/2003	19/11/2003	4/12/2003	18/12/2003	13/01/2004	26/02/2004	8/03/2004	31/03/2004	14/04/2004	10/05/2004	10/06/2004	13/07/2004	26/07/2004	24/08/2004	7/09/2004
0	10.3	10.7	10.3	10.4	10.4	11.4	10.1	9.8	9.5	9.2	9.2	9.3	9.3	9.4	10.4	10.3	10.6	10.6	11.0	10.4	10.7
10	10.3	10.8	10.3	10.3	10.4	11.0	10.1	9.9	9.9	9.1	9.2	9.1	9.0	9.2	9.5	9.8	10.1	10.6	10.5	10.4	10.4
20	10.1	10.3	10.1	10.1	10.2	10.8	9.9	9.9	9.5	9.2	9.1	9.2	9.1	9.0	9.1	9.7	9.9	10.6	10.2	10.3	10.4
30	10.1	10.0	9.9	9.9	10.0	10.1	9.6	9.6	9.3	9.1	8.8	8.6	8.6	8.9	8.9	9.4	9.7	10.3	9.9	10.2	10.4
40	10.0	10.0	9.8	9.7	9.9	9.7	9.4	9.4	9.0	9.1	8.8	8.4	8.4	8.3	8.7	9.2	9.6	9.9	9.8	10.1	10.3
50	9.9	9.9	9.6	9.6	9.7	9.7	9.3	9.2	8.8	8.8	8.5	8.2	8.0	8.0	8.2	8.7	9.3	9.6	9.6	10.1	10.2
60	9.8	9.6	9.6	9.5	9.6	9.5	9.2	9.0	8.5	8.5	8.2	8.0	7.9	8.0	7.8	8.2	8.6	9.5	9.5	10.1	10.2
70	9.8	9.5	9.5	9.4	9.5	9.4	9.1	8.8	8.5	8.3	8.1	7.9	7.8	7.9	7.5	8.0	8.2	9.4	9.5	10.0	10.1
80	9.7	9.5	9.5	9.4	9.5	9.3	8.8	8.8	8.3	8.2	7.9	7.8	7.8	7.8	7.4	7.8	8.0	9.3	9.4	10.0	10.0
90	9.6	9.1	9.4	9.3	9.4	9.2	8.7	8.6	8.4	7.9	7.8	7.8	7.7	7.7	7.3	7.6	7.9	9.2	9.2	9.9	10.0
100	8.8	8.8	9.0	9.3	9.4	9.1	8.7	8.5	8.3	7.9	7.7	7.6	7.7	7.5	7.3	7.5	7.8	9.1	9.3	9.9	10.0

Secchi depth

	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003	7/10/2003	21/10/2003	19/11/2003	4/12/2003	18/12/2003	13/01/2004	26/02/2004	8/03/2004	31/03/2004	14/04/2004	10/05/2004	10/06/2004	13/07/2004	26/07/2004	24/08/2004	7/09/2004
(m)	14	12	14.5	13	12	12.5	12	17.2	17	19	17.5	14	13	12.5	16.5	16	14	12.5	11	10	12

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2002-2003**
Mid-Lake site A for the period starting 1 July 2002

Temperature

Date / Depth (m)	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002	9/10/2002	13/11/2002	28/11/2002	18/12/2002	30/01/2003	13/02/2003	17/03/2003	3/04/2003	28/04/2003	15/05/2003	12/06/2003	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003
0	12.13	11.44	11.20	11.10	11.38	11.60	12.58	14.12	15.00	17.84	19.31	18.55	19.05	16.76	15.67	13.59	11.85	11.38	11.25	11.23	11.13
10	12.12	11.44	11.20	10.90	11.33	11.60	12.55	14.02	14.78	17.59	19.19	18.43	18.70	16.73	15.57	13.56	11.86	11.38	11.24	11.17	11.13
20	12.11	11.44	11.20	10.90	11.28	11.40	12.50	12.91	14.48	17.08	18.10	18.37	18.59	16.73	15.56	13.55	11.86	11.38	11.24	11.12	11.11
30	12.11	11.44	11.20	10.80	11.02	11.30	12.38	12.41	14.26	16.13	15.50	16.77	17.02	16.72	15.57	13.55	11.86	11.38	11.24	11.11	11.06
40	12.11	11.44	11.20	10.90	10.97	11.30	12.16	11.98	12.67	12.69	12.85	13.44	13.31	12.80	15.53	12.22	11.86	11.38	11.24	11.11	11.06
50	12.11	11.44	11.20	10.90	10.96	11.20	12.00	11.54	11.87	12.03	12.14	12.03	12.30	11.96	12.20	11.82	11.86	11.38	11.24	11.11	11.06
60	12.10	11.44	11.20	10.80	10.94	11.20	11.72	11.22	11.64	11.70	11.68	11.60	11.81	11.62	11.61	11.52	11.86	11.38	11.24	11.11	11.06
70	12.10	11.44	11.20	10.80	10.93	11.20	11.51	11.09	11.31	11.41	11.33	11.39	11.52	11.34	11.36	11.38	11.86	11.38	11.24	11.10	11.06
80	11.97	11.44	11.20	10.90	10.92	11.10	11.32	10.98	11.17	11.25	11.25	11.27	11.31	11.27	11.27	11.27	11.35	11.38	11.24	11.00	11.06
90	11.49	11.43	11.20	10.90	10.91	11.10	11.13	10.95	11.06	11.15	11.16	11.16	11.20	11.17	11.22	11.21	11.31	11.38	11.24	11.09	11.06
100	11.39	11.41	11.20	10.90	10.90	11.10	11.05	10.92	11.04	11.11	11.10	11.13	11.18	11.15	11.20	11.20	11.27	11.35	11.24	11.09	11.06
110	11.32	11.37	11.20	10.90	10.89	11.00	11.05	10.90	11.04	11.09	11.08	11.10	11.13	11.13	11.16	11.17	11.24	11.34	11.23	11.09	11.06
120	11.29	11.32	11.20	10.90	10.87	11.00	11.01	10.87	11.00	11.06	11.06	11.09	11.13	11.13	11.15	11.15	11.22	11.32	11.22	11.09	11.06
130	11.25	11.27	11.20	10.90	10.85	10.90	10.99	10.85	10.98	11.04	11.04	11.08	11.09	11.10	11.12	11.12	11.21	11.27	11.22	11.08	11.06
140	11.23	11.26	11.20	10.80	10.83	10.90	10.97	10.83	10.97	11.03	11.03	11.09	11.09	11.09	11.12	11.11	11.21	11.26	11.21	11.08	11.06
150	11.23	11.26	11.20	10.80	10.81	10.90	10.96	10.82	10.97	11.03	11.03	11.07	11.08	11.09	11.11	11.11	11.20	11.22	11.20	11.08	11.07

Dissolved Oxygen (g m^{-3})

Depth (m)	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002	9/10/2002	13/11/2002	28/11/2002	18/12/2002	30/01/2003	13/02/2003	17/03/2003	3/04/2003	28/04/2003	15/05/2003	12/06/2003	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003
0	10.3	10.4	9.7	10.5	10.5	10.3	10.2	9.8	9.6	9.1	8.9	9.0	8.8	9.2	9.5	10.0	10.3	10.6	10.5	10.5	10.5
10	10.3	10.7	9.5	10.4	10.7	10.3	10.2	10.0	9.7	9.1	8.9	8.9	8.8	9.2	9.2	9.7	10.2	10.4	10.5	10.5	10.6
20	10.3	10.7	9.4	10.3	10.6	10.2	10.2	10.1	9.6	9.2	8.9	8.8	8.6	9.1	9.3	9.4	10.2	10.2	10.3	10.4	10.4
30	10.2	10.7	9.4	10.3	10.5	10.2	10.2	10.1	9.6	9.1	8.8	8.5	8.3	8.9	9.2	9.3	10.2	9.9	10.1	10.3	10.1
40	10.2	10.6	9.4	10.2	10.4	10.2	10.1	9.7	9.5	9.2	8.8	8.4	8.0	8.4	9.1	9.0	10.1	9.9	10.0	10.0	9.8
50	10.2	10.6	9.4	10.2	10.3	10.1	10.1	9.7	9.3	9.1	8.6	8.2	7.8	8.2	8.2	8.2	10.0	9.0	9.9	9.9	9.8
60	10.1	10.5	9.4	10.2	10.2	10.1	10.0	9.5	9.1	8.9	8.4	8.0	7.7	8.1	8.1	8.1	9.9	8.8	9.8	9.7	9.6
70	10.1	10.5	9.3	10.1	10.2	10.0	9.9	9.5	8.8	8.8	8.4	7.8	7.6	8.0	8.0	8.0	9.9	8.7	9.8	9.6	9.6
80	10.0	10.3	9.4	10.1	10.2	10.1	9.7	9.4	8.7	8.7	8.3	7.8	7.5	7.9	7.8	7.9	8.7	8.6	9.7	9.5	9.5
90	9.7	10.3	9.4	10.1	10.1	10.1	9.5	9.3	8.7	8.7	8.2	7.8	7.4	7.8	7.5	7.6	8.5	8.5	9.7	9.5	9.5
100	8.6	10.1	9.4	10.1	10.0	9.8	9.4	9.1	8.6	8.6	8.1	7.7	7.3	7.7	7.2	7.5	8.2	8.4	9.6	9.5	9.5
110	8.3	9.8	9.3	9.9	9.9	9.8	9.4	9.1	8.4	8.4	8.0	7.6	7.2	7.6	7.1	7.4	8.2	8.1	9.6	9.4	9.5
120	8.1	8.8	9.3	9.9	9.9	9.8	9.3	9.0	8.3	8.3	7.8	7.4	7.0	7.5	7.1	7.2	8.0	8.0	9.5	9.4	9.5
130	8.0	8.5	9.3	9.9	9.9	9.7	9.2	9.0	8.3	8.2	7.7	7.2	6.9	7.4	7.0	7.0	8.0	7.9	9.5	9.4	9.4
140	7.8	8.1	9.3	9.9	9.9	9.4	9.0	8.8	8.2	8.0	7.4	7.1	6.8	7.2	6.8	6.7	7.8	7.8	9.5	9.3	9.4
150	7.8	8.1	9.3	9.8	9.8	9.4	8.9	8.7	8.1	7.9	7.3	6.9	6.5	6.9	6.7	6.5	7.7	7.6	9.3	9.3	9.4

Secchi depth

(m)	16	15.5	12	9.5	12	15.5	18	12.7	13.5	18	19	15	13.5	14	16.5	11	14.5	14	13.5	13	12.5

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2002-2003**
Additional site B (Kuratau Basin) for the period starting 1 July 2002

Temperature

Date	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002	9/10/2002	13/11/2002	28/11/2002	18/12/2002	30/01/2003	13/02/2003	17/03/2003	3/04/2003	28/04/2003	15/05/2003	12/06/2003	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003
Depth (m)																					
0	12.13	11.48	11.3	11	11.08	11.70	11.98	13.82	15.16	16.76	18.87	18.74	19.09	16.73	15.79	13.24	11.82	11.32	11.38	11.36	11.13
10	12.09	11.49	11.1	10.8	11.05	11.30	11.94	13.67	15.08	16.75	18.46	18.54	18.82	16.66	15.49	13.02	11.8	11.29	11.22	11.17	11.11
20	12.09	11.48	11.1	10.8	11.03	11.20	11.9	12.79	13.86	16.53	17.71	18.45	18.49	16.62	15.47	12.79	11.79	11.29	11.22	11.14	11.07
30	12.09	11.48	11.1	10.8	11.03	11.20	11.8	12.31	13.4	14.33	16.2	14.87	15.32	16.2	15.41	11.83	11.79	11.29	11.21	11.13	11.03
40	12.08	11.48	11.1	10.8	11.02	11.20	11.68	11.75	13.18	12.98	13.89	12.03	13.25	13.46	13.2	11.62	11.79	11.29	11.21	11.13	11.02
50	11.97	11.49	11.1	10.8	10.91	11.20	11.44	11.44	12.91	12.1	12.59	12.06	12	12.28	12.09	11.51	11.79	11.29	11.21	11.13	11.02
60	11.93	11.49	11.1	10.8	10.9	11.10	11.26	11.27	12.27	11.69	11.75	11.58	11.58	11.7	11.71	11.38	11.78	11.29	11.21	11.13	11.01
70	11.87	11.48	11.1	10.8	10.89	11.10	11.11	11.17	11.58	11.37	11.4	11.36	11.35	11.4	11.4	11.29	11.78	11.29	11.21	11.12	11.01
80	11.78	11.48	11.1	10.8	10.89	11.00	11	11.03	11.51	11.23	11.3	11.24	11.25	11.25	11.28	11.27	11.77	11.29	11.16	11.12	11.01
90	11.37	11.46	11.1	10.7	10.87	11.00	10.93	10.96	11.39	11.14	11.17	11.13	11.15	11.18	11.21	11.26	11.35	11.29	11.04	11.11	11.01
100	11.28	11.3	11	10.7	10.85	11.00	10.91	10.92	11.2	11.09	11.12	11.13	11.12	11.12	11.18	11.25	11.27	11.29	10.91	11.08	11.01
110			10.7	10.7		10.90															

Dissolved Oxygen (g m^{-3})

Depth (m)	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002	9/10/2002	13/11/2002	28/11/2002	18/12/2002	30/01/2003	13/02/2003	17/03/2003	3/04/2003	28/04/2003	15/05/2003	12/06/2003	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003
0	10.3	10.4	9.9	10.4	10.4	10.4	10.3	9.9	9.6	9.3	9.4	8.9	8.9	9.7	9.4	10	10.7	10.9	10.8	10.6	10.6
10	10.3	10.8	9.7	10.3	10.5	10.5	10.3	10	9.7	9.3	9.3	8.9	8.8	9.6	9.4	10	10.5	11	10.6	10.6	10.5
20	10.2	10.6	9.6	10.3	10.5	10.3	10.3	9.9	9.5	9.2	9.3	8.8	8.5	9.5	9.3	9.6	10.3	11.3	10.4	10.2	10.2
30	10.2	10.6	9.6	10.2	10.5	10.3	103	9.9	9.6	9.2	9.2	8.2	8.1	9.4	8.8	9.2	10.2	11.2	10.1	9.9	10.1
40	10.1	10.5	9.6	10.2	10.4	10.2	10.2	9.5	9.4	9.1	9	8.2	8	8.8	8.5	8.8	10.1	11.2	9.9	9.8	9.9
50	10.1	10.5	9.6	10.1	10.3	10.1	10.1	9.5	9.4	8.9	8.8	8	7.7	8.3	7.9	8.5	10	10.9	9.8	9.6	9.8
60	9.8	10.4	9.6	10.1	10.2	10.1	9.9	9.4	9.2	8.6	8.6	7.8	7.6	8.3	7.8	8.3	9.9	10.7	9.7	9.5	9.7
70	9.7	10.4	9.5	10	10.1	9.8	9.8	9.4	9	8.4	8.4	7.7	7.4	8.2	7.7	8.2	9.9	10.4	9.7	9.5	9.7
80	9.5	10.3	9.5	10	10.1	9.7	9.7	9	8.6	8.3	8.3	7.3	7.3	8	7.7	8.1	9.8	10.3	9.4	9.4	9.6
90	9.1	10.3	9.5	10	10	9.7	9.5	9	8.6	8.2	8	7.2	7.1	7.7	7.5	7.7	9.2	10.1	9.2	9.3	9.6
100	8.7	9.8	9.6	9.9	9.9	9.7	9.2	9	8.4	7.7	7.6	7	7	7.6	7.1	7.5	8.3	10	9.2	9.3	9.6
110			9.2	9.8		9.4															

Secchi depth

	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002	9/10/2002	13/11/2002	28/11/2002	18/12/2002	30/01/2003	13/02/2003	17/03/2003	3/04/2003	28/04/2003	15/05/2003	12/06/2003	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003
(m)	16	12.5	10.5	8	11	16	14	12.7	14	18	11	14	12.8	13.5	15.5	12	12	13	13	11.5	11

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2002-2003**
Additional site C (Western Bays) for the period starting 1 July 2002

Temperature

Date / Depth (m)	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002	9/10/2002	13/11/2002	28/11/2002	18/12/2002	30/01/2003	13/02/2003	17/03/2003	3/04/2003	28/04/2003	15/05/2003	12/06/2003	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003
0	12.22	11.52	11.6	11.4	11.24	12.10	12.56	13.98	15.12	17.61	19.58	19.04	18.15	17.1	15.8	13.65	11.86	11.43	11.56	11.31	11.32
10	12.15	11.5	11.2	10.9	11.23	11.30	12.5	13.45	14.21	17.49	18.95	18.45	18.58	16.82	15.54	13.62	11.8	11.36	11.26	11.21	11.13
20	12.14	11.49	11.2	10.9	11.16	11.30	12.38	12.63	13.31	17.48	17.41	18.29	18.3	16.77	15.52	13.59	11.8	11.34	11.25	11.14	11.09
30	12.14	11.49	11.2	10.8	11.06	11.20	12.33	12.42	12.73	14.31	14.19	14.81	14.61	16.76	15.51	13.59	11.8	11.32	11.25	11.14	11.08
40	12.13	11.49	11.2	10.8	11.02	11.20	11.75	12.2	11.98	12.36	12.79	12.88	12.73	13.62	13.07	13.59	11.8	11.31	11.25	11.14	11.08
50	12.13	11.49	11.2	10.8	11.02	11.20	11.28	11.98	11.53	12	11.98	11.86	12.1	12.08	12.14	13.54	11.8	11.31	11.25	11.14	11.07
60	11.92	11.49	11.2	10.8	11	11.10	11.12	11.37	11.33	11.61	11.68	11.49	11.71	11.56	11.71	13.28	11.8	11.31	11.25	11.14	11.07
70	11.55	11.49	11.2	10.8	10.99	11.10	11.08	11.21	11.15	11.29	11.3	11.35	11.37	11.35	11.4	11.8	11.8	11.31	11.25	11.14	11.07
80	11.5	11.49	11.2	10.8	10.95	11.10	11.03	11.04	11.12	11.19	11.19	11.25	11.22	11.24	11.27	11.45	11.79	11.31	11.25	11.14	11.07
90	11.47	11.49	11.2	10.8	10.94	11.00	11	10.98	11.1	11.11	11.15	11.2	11.18	11.18	11.22	11.35	11.6	11.29	11.25	11.14	11.07
100	11.45	11.49	11.2	10.8	10.92	11.00	10.97	10.96	11.08	11.08	11.13	11.2	11.15	11.15	11.17	11.23	11.28	11.27	11.24	11.14	11.07

Dissolved Oxygen (g m^{-3})

Depth (m)	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002	9/10/2002	13/11/2002	28/11/2002	18/12/2002	30/01/2003	13/02/2003	17/03/2003	3/04/2003	28/04/2003	15/05/2003	12/06/2003	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003
0	10.4	10.5	9.7	10.3	10.5	10.4	10.2	9.9	9.6	9.1	9.5	9.9	8.9	9.4	9.3	10	10.3	10.7	10.3	10.4	10.4
10	10.4	10.8	9.5	10.2	10.7	10.4	10.3	9.7	9.6	9	9.3	9.7	8.8	9.2	9.1	9.6	10.3	10.8	10.3	10.3	10.4
20	10.4	10.8	9.5	10.2	10.7	10.4	10.3	9.9	9.7	9	9.3	9	8.8	9.2	9	9.3	10.1	10.3	10.1	10.1	10.2
30	10.3	10.7	9.4	10.1	10.6	10.4	10.2	9.9	9.6	8.7	9	8.4	8.3	9	8.8	9.1	10.1	10	9.9	9.9	10
40	10.3	10.5	9.4	10	10.5	10.3	10.1	9.7	9.5	8.7	9	8.4	8.1	8.5	8.3	9.3	10	10	9.8	9.7	9.9
50	10.2	10.5	9.4	10	10.4	10	9.9	9.7	9.2	8.6	8.7	8.1	7.9	8.2	7.8	9.2	9.9	9.9	9.6	9.6	9.7
60	10	10.5	9.4	10	10.4	10	9.7	9.6	9.1	8.5	8.5	8.1	7.9	8.2	7.8	9.9	9.8	9.6	9.6	9.5	9.6
70	9.6	10.5	9.4	9.9	10.3	9.9	9.7	9.5	9	8.4	8.4	7.9	7.8	8	7.7	9.7	9.8	9.5	9.5	9.4	9.5
80	8.8	10.5	9.3	9.9	10.2	9.9	9.5	9	8.8	8.3	8.3	7.6	7.7	8	7.5	9.4	9.7	9.5	9.5	9.4	9.5
90	8.7	10.4	9.3	9.9	10.1	9.8	9.5	9.1	8.7	8.1	8.3	7.5	7.6	7.9	7.3	9.2	9.6	9.1	9.4	9.3	9.4
100	8.6	10.2	9.3	10	10	9.6	9.3	9.1	8.7	8	8.1	7.3	7.4	7.8	7.2	9.1	8.8	8.8	9	9.3	9.4

Secchi depth

	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002	9/10/2002	13/11/2002	28/11/2002	18/12/2002	30/01/2003	13/02/2003	17/03/2003	3/04/2003	28/04/2003	15/05/2003	12/06/2003	14/07/2003	31/07/2003	14/08/2003	26/08/2003	8/09/2003
(m)	14	12.5	12	8	12	19	16	15.5	13.5	18.5	19	15	14.5	14.5	17	11	14	12	14.5	13	12

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2001-2002**

Mid-Lake site A for the period starting 2 July 2001

Temperature

Date / Depth (m)	2/07/01	25/07/01	13/08/01	3/09/01	25/09/01	25/10/01	12/11/01	10/12/01	20/12/01	8/01/02	22/01/02	6/03/02	4/04/02	22/04/02	5/05/02	19/06/02	1/07/02	17/07/02	31/07/02	29/08/02	18/09/02	9/10/02
0	12.11	11.26	11.15	10.96	11.58	12.97	14.23	15.47	17.92	18.37	19.4	18.69	17.45	17.05	15.51	12.57	12.13	11.44	11.2	11.1	11.38	11.60
10	12.04	11.26	11.12	10.98	11.57	12.91	14.16	15.51	16.60	18.07	18.8	18.69	17.38	16.64	15.54	12.57	12.12	11.44	11.2	10.9	11.33	11.60
20	12.00	11.26	11.12	10.95	11.56	12.90	13.37	15.52	15.46	17.62	18.05	18.68	17.18	16.61	15.52	12.57	12.11	11.44	11.2	10.9	11.28	11.40
30	11.99	11.26	11.11	10.94	11.52	12.89	12.85	14.52	13.79	13.5	14.8	15.3	16.83	16.56	15.5	12.56	12.11	11.44	11.2	10.8	11.02	11.30
40	11.98	11.26	11.11	10.94	11.04	12.00	11.87	13.01	12.41	12.43	13.1	12.42	12.9	13.35	15.39	12.56	12.11	11.44	11.2	10.9	10.97	11.30
50	11.98	11.26	11.11	10.94	10.96	11.50	11.57	11.80	11.70	11.61	12.06	11.73	12.09	11.93	11.92	12.56	12.11	11.44	11.2	10.9	10.96	11.20
60	11.95	11.26	11.10	10.94	10.92	11.13	11.24	11.27	11.32	11.38	11.52	11.43	11.51	11.53	11.49	12.53	12.1	11.44	11.2	10.8	10.94	11.20
70	11.76	11.26	11.09	10.94	10.91	11.01	11.13	11.13	11.22	11.24	11.25	11.27	11.3	11.3	11.33	11.98	12.1	11.44	11.2	10.8	10.93	11.20
80	11.51	11.26	11.08	10.92	10.90	10.96	11.03	11.05	11.16	11.16	11.17	11.2	11.24	11.25	11.27	11.35	11.97	11.44	11.2	10.9	10.92	11.10
90	11.45	11.26	11.08	10.91	10.90	10.95	11.01	11.02	11.12	11.13	11.15	11.17	11.19	11.22	11.28	11.27	11.49	11.43	11.2	10.9	10.91	11.10
100	11.41	11.26	11.08	10.91	10.90	10.94	10.99	11.00	11.08	11.12	11.14	11.16	11.17	11.2	11.38	11.25	11.39	11.41	11.2	10.9	10.9	11.10
110	11.39	11.26	11.08	10.91	10.90	10.92	10.97	10.99	11.07	11.1	11.13	11.13	11.14	11.18	11.27	11.24	11.32	11.37	11.2	10.9	10.89	11.00
120	11.36	11.26	11.08	10.91	10.89	10.92	10.95	10.97	11.04	11.1	11.12	11.13	11.14	11.17	11.26	11.21	11.29	11.32	11.2	10.9	10.87	11.00
130	11.35	11.26	11.07	10.90	10.89	10.91	10.94	10.96	11.04	11.09	11.1	11.13	11.13	11.15	11.24	11.2	11.25	11.27	11.2	10.9	10.85	10.90
140	11.34	11.26	11.07	10.90	10.89	10.90	10.94	10.96	11.04	11.08	11.1	11.13	11.13	11.14	11.23	11.19	11.23	11.26	11.2	10.8	10.83	10.90
150	11.33	11.26	11.07	10.90	10.89	10.90	10.94	10.96	11.03	11.08	11.1	11.12	11.13	11.14	11.19	11.9	11.23	11.26	11.2	10.8	10.81	10.90

Dissolved Oxygen (g m^{-3})

Depth (m)	2/07/01	25/07/01	13/08/01	3/09/01	25/09/01	25/10/01	12/11/01	10/12/01	20/12/01	8/01/02	22/01/02	6/03/02	4/04/02	22/04/02	5/05/02	19/06/02	1/07/02	17/07/02	31/07/02	29/08/02	18/09/02	9/10/02
0	9.2	10.2	9.6	10.6	10.4	9.9	9.5	9.4	9.1	9.1	9.0	8.7	8.8	9.4	10.5	10.2	10.3	10.4	9.7	10.5	10.5	10.3
10	9.1	10.5	9.6	10.7	10.4	9.9	9.8	9.5	8.9	9.0	8.9	8.7	8.9	9.3	9.5	10.2	10.3	10.7	9.5	10.4	10.7	10.3
20	9.4	9.4	9.6	10.6	10.4	10.0	9.4	9.5	9.0	9.0	9.1	8.7	8.8	9.3	9.5	10.2	10.3	10.7	9.4	10.3	10.6	10.2
30	9.8	9.2	9.6	10.6	10.4	10.1	9.4	9.1	8.8	9.0	9.1	8.4	8.7	9.2	9.4	10.2	10.2	10.7	9.4	10.3	10.5	10.2
40	9.8	9.1	9.6	10.6	10.0	9.7	8.9	9.1	8.6	8.8	9.0	8.4	8.3	8.7	9.3	10.1	10.2	10.6	9.4	10.2	10.4	10.2
50	9.6	8.9	9.6	10.6	9.9	9.5	9.0	8.7	8.6	8.7	8.7	8.2	8.2	8.3	8.6	10.1	10.2	10.6	9.4	10.2	10.3	10.1
60	9.4	8.9	9.5	10.5	9.8	9.3	8.7	8.6	8.5	8.6	8.6	8.2	8.1	8.1	8.3	10.0	10.1	10.5	9.4	10.2	10.2	10.1
70	9.5	9.0	9.4	10.4	9.7	9.3	8.8	8.7	8.5	8.6	8.5	8.2	8.0	8.0	8.2	9.6	10.1	10.5	9.3	10.1	10.2	10.0
80	7.7	8.9	9.4	10.4	9.7	9.2	8.6	8.4	8.5	8.6	8.4	8.1	7.9	7.9	8.2	8.5	10.0	10.3	9.4	10.1	10.2	10.1
90	7.8	8.9	9.4	10.4	9.6	9.5	8.8	8.5	8.5	8.6	8.2	8.1	7.8	7.8	8.0	8.3	9.7	10.3	9.4	10.1	10.1	10.1
100	7.5	8.6	9.3	10.4	9.6	9.2	8.6	8.4	8.3	8.5	8.1	8.0	7.8	7.8	7.5	8.2	8.6	10.1	9.4	10.1	10.0	9.8
110	7.4	8.7	9.3	10.4	9.6	9.2	8.6	8.4	8.3	8.4	8.1	8.0	7.7	7.7	7.3	8.1	8.3	9.8	9.3	9.9	9.9	9.8
120	6.9	8.5	9.3	10.3	9.5	9.0	8.4	8.4	8.3	8.2	8.1	7.9	7.7	7.6	7.2	8.0	8.1	8.8	9.3	9.9	9.9	9.8
130	6.9	8.5	9.3	10.2	9.5	9.0	8.4	8.4	8.3	8.2	8.2	7.9	7.6	7.5	7.3	7.9	8.0	8.5	9.3	9.9	9.9	9.7
140	6.8	8.3	9.2	10.2	9.5	8.6	8.2	8.2	8.1	8.0	8.1	7.8	7.1	7.8	7.3	7.8	7.8	8.1	9.3	9.9	9.9	9.4
150	6.4	8.2	9.2	10.2	9.3	8.5	8.1	8.1	7.9	7.8	7.9	7.6	7.0	7.2	7.3	7.7	7.8	8.1	9.3	9.8	9.8	9.4

Secchi depth

	2/07/01	25/07/01	13/08/01	3/09/01	25/09/01	25/10/01	12/11/01	10/12/01	20/12/01	8/01/02	22/01/02	6/03/02	4/04/02	22/04/02	5/05/02	19/06/02	1/07/02	17/07/02	31/07/02	29/08/02	18/09/02	9/10/02
(m)	12	14.5	13.5	17.5	11	14.5	15.5	16	13	13	15	14.5	19	22	16.4	17	16	15.5	12	9.5	12	15.5

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2001-2002**
Additional site B (Kuratau Basin) for the period starting 8 January 2002 on

Temperature

Date	8/01/2002	22/01/2002	6/03/2002	4/04/2002	22/04/2002	5/05/2002	19/06/2002	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002
Depth (m)												
0	18.1	18.8	18.64	17.38	16.84	15.12	12.45	12.13	11.48	11.3	11	11.08
10	17.55	18.45	18.58	17.35	16.61	15.14	12.44	12.09	11.49	11.1	10.8	11.05
20	15.72	17.4	18.56	17.1	16.6	15.05	12.44	12.09	11.48	11.1	10.8	11.03
30	13.74	13.9	15.07	16.74	16.4	14.75	12.43	12.09	11.48	11.1	10.8	11.03
40	12.62	12.73	13.08	14.3	13.4	14.4	12.24	12.08	11.48	11.1	10.8	11.02
50	11.92	11.98	11.91	12.77	12.12	14.07	12.11	11.97	11.49	11.1	10.8	10.91
60	11.31	11.41	11.5	12.03	11.53	12.96	11.73	11.93	11.49	11.1	10.8	10.9
70	11.21	11.25	11.24	11.5	11.32	12.2	11.49	11.87	11.48	11.1	10.8	10.89
80	11.15	11.19	11.21	11.29	11.24	11.97	11.38	11.78	11.48	11.1	10.8	10.89
90	11.1	11.13	11.15	11.2	11.18	11.69	11.3	11.37	11.46	11.1	10.7	10.87
100	11.1	11.12	11.12	11.19	11.15	11.39	11.22	11.28	11.3	11	10.7	10.85
110										10.7	10.7	

Dissolved Oxygen (g m^{-3})

Depth (m)	8/01/2002	22/01/2002	6/03/2002	4/04/2002	22/04/2002	5/05/2002	19/06/2002	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002
0	8.7	8.8	9.3	9.3	9.3	10.9	10.4	10.3	10.4	9.9	10.4	10.4
10	8.6	9	9.1	9.2	9.3	9.5	10.3	10.3	10.8	9.7	10.3	10.5
20	8.8	9	9.1	9.2	9.2	9.4	10.2	10.2	10.6	9.6	10.3	10.5
30	8.8	8.9	8.6	9.1	9.2	9.3	10.2	10.2	10.6	9.6	10.2	10.5
40	8.7	8.7	8.7	8.9	8.5	9.1	10.1	10.1	10.5	9.6	10.2	10.4
50	8.7	8.4	8.5	8.6	8.2	9	10	10.1	10.5	9.6	10.1	10.3
60	8.7	8.3	8.4	8.4	8	8.6	9	9.8	10.4	9.6	10.1	10.2
70	8.7	8.3	8.3	8.3	7.9	8.1	8.7	9.7	10.4	9.5	10	10.1
80	8.7	8.2	8.1	8.1	7.8	7.9	8.4	9.5	10.3	9.5	10	10.1
90	8.2	8.1	7.9	7.7	7.7	7.8	8.2	9.1	10.3	9.5	10	10
100	8	7.6	7.5	7.7	7.5	7.7	7.8	8.7	9.8	9.6	9.9	9.9
110	8				6.2					9.2	9.8	

Secchi depth

	8/01/2002	22/01/2002	6/03/2002	4/04/2002	22/04/2002	5/05/2002	19/06/2002	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002
Depth (m)	13.5	12	14.5	19.5	19	13.2	15	16	12.5	10.5	8	11

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2001-2002**
Additional site C (Western Bays) for the period starting 8 January 2002 on

Temperature

Date	8/01/2002	22/01/2002	6/03/2002	4/04/2002	22/04/2002	5/05/2002	19/06/2002	1/07/2002	17/07/2002	31/07/2002	29/08/2002	18/09/2002	9/10/2002
Depth (m)													
0	18.72	18.82	18.68	17.47	16.88	15.6	12.58	12.22	11.52	11.6	11.4	11.24	12.10
10	17.41	18.46	18.47	17.24	11.63	15.64	12.56	12.15	11.5	11.2	10.9	11.23	11.30
20	16.95	18.21	18.32	17.16	16.58	15.64	12.56	12.14	11.49	11.2	10.9	11.16	11.30
30	14	13.77	15.9	17.12	16.5	15.61	12.56	12.14	11.49	11.2	10.8	11.06	11.20
40	13.14	12.01	12.98	13.17	13.02	12.26	12.56	12.13	11.49	11.2	10.8	11.02	11.20
50	11.97	11.5	12.13	12.11	11.87	11.57	12.56	12.13	11.49	11.2	10.8	11.02	11.20
60	11.44	11.26	11.59	11.57	11.47	11.37	11.9	11.92	11.49	11.2	10.8	11	11.10
70	11.26	11.17	11.36	11.38	11.32	11.29	11.36	11.55	11.49	11.2	10.8	10.99	11.10
80	11.18	11.16	11.25	11.32	11.26	11.24	11.28	11.5	11.49	11.2	10.8	10.95	11.10
90	11.15	11.14	11.18	11.21	11.23	11.21	11.23	11.47	11.49	11.2	10.8	10.94	11.00
100	11.12	11.11	11.18	11.19	11.19	11.19	11.22	11.45	11.49	11.2	10.8	10.92	11.00
110	11.11	11.1			11.16	11.15				11.2	10.8		10.90
120										11.2	10.8		10.90

Dissolved Oxygen (g m^{-3})

Depth (m)													
0	8.6	8.9	9.3	9.4	9.3	10.6	10.3	10.4	10.5	9.7	10.3	10.5	10.4
10	8.4	8.9	9	9.1	9.2	9.5	10.2	10.4	10.8	9.5	10.2	10.7	10.4
20	8.9	8.9	9	9.1	9.2	9.5	10.2	10.4	10.8	9.5	10.2	10.7	10.4
30	8.6	8.9	8.8	9.1	9.1	9.4	10.1	10.3	10.7	9.4	10.1	10.6	10.4
40	8.6	8.5	8.6	8.6	8.5	8.9	10.1	10.3	10.5	9.4	10	10.5	10.3
50	8.5	8.2	8.5	8.5	8.1	8.6	10	10.2	10.5	9.4	10	10.4	10
60	8.6	8.1	8.5	8.2	7.9	8.3	9.7	10	10.5	9.4	10	10.4	10
70	8.6	8.1	8.2	8.2	7.8	8.2	9.1	9.6	10.5	9.4	9.9	10.3	9.9
80	8.7	8.1	8.1	8	7.7	8	8.4	8.8	10.5	9.3	9.9	10.2	9.9
90	8.6	8.1	8.1	7.9	7.7	7.9	8	8.7	10.4	9.3	9.9	10.1	9.8
100	8.7	8.1	8.1	7.9	7.6	7.8	7.7	8.6	10.2	9.3	10	10	9.6
110	8.5	7.9			7.6	7.7				9.3	10		9.7
120	8.5	7.7								9.1	9.9		9.6

Secchi depth

Depth (m)	14.5	15.5	16	19	18.5	15.6	16	14	12.5	12	8	12	19

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **2000-2001**
For the period starting 11 July 2000

Temperature																				
Date	**11-7-00**	**04-8-00**	**21-8-00**	**11-9-00**	**28-9-00**	**25-10-00**	**13-11-00**	**06-12-00**	**03-1-01**	**15-1-01**	**20-2-01**	**01-3-01**	**19-3-01**	**09-4-01**	**11-4-01**	**10-5-01**	**29-5-01**	**02-7-01**	**25-7-01**	**13-8-01**
Depth (m)																				
0	11.87	11.32	11.19	11.80	12.47	14.04	13.27	15.73	18.16	18.98	20.47	20.87	19.01	16.99	16.99	15.78	13.62	12.11	11.26	11.15
10	11.87	11.32	11.15	11.46	11.52	13.03	13.09	15.06	17.37	18.51	19.37	20.71	19.05	16.87	16.99	15.78	13.74	12.04	11.26	11.12
20	11.86	11.32	11.14	11.33	11.36	11.99	12.98	14.15	15.46	14.79	18.08	18.98	19.06	16.78	16.97	15.78	13.78	12.00	11.26	11.12
30	11.86	11.33	11.14	11.30	11.33	11.83	12.80	13.31	13.61	13.63	16.06	15.95	16.46	15.82	16.84	15.73	13.79	11.99	11.26	11.11
40	11.86	11.33	11.14	11.27	11.31	11.60	12.36	12.49	12.73	12.81	13.39	13.36	13.05	13.13	13.87	13.19	13.80	11.98	11.26	11.11
50	11.86	11.33	11.14	11.22	11.30	11.49	12.10	12.16	12.21	12.27	12.67	12.58	12.42	12.35	12.68	12.42	13.80	11.98	11.26	11.11
60	11.64	11.33	11.15	11.18	11.27	11.42	11.69	11.78	11.76	11.87	12.01	12.01	11.84	11.81	11.89	11.90	11.92	11.95	11.26	11.10
70	11.42	11.33	11.15	11.15	11.24	11.39	11.41	11.53	11.64	11.67	11.77	11.79	11.67	11.67	11.69	11.69	11.61	11.76	11.26	11.09
80	11.31	11.33	11.15	11.14	11.20	11.38	11.29	11.40	11.47	11.55	11.56	11.63	11.55	11.54	11.54	11.52	11.54	11.51	11.26	11.08
90	11.22	11.33	11.15	11.13	11.17	11.33	11.26	11.36	11.43	11.46	11.50	11.55	11.49	11.46	11.48	11.47	11.46	11.45	11.26	11.08
100	11.21	11.32	11.15	11.13	11.14	11.33	11.21	11.32	11.38	11.39	11.43	11.50	11.43	11.41	11.43	11.42	11.42	11.41	11.26	11.08
110	11.19	11.32	11.15	11.13	11.06	11.29	11.19	11.28	11.36	11.36	11.40	11.46	11.41	11.37	11.39	11.40	11.38	11.39	11.26	11.08
120	11.19	11.31	11.15	11.13	11.04	11.27	11.19	11.27	11.33	11.34	11.39	11.44	11.39	11.33	11.35	11.38	11.35	11.36	11.26	11.08
130	11.18	11.26	11.15	11.12	11.02	11.23	11.17	11.26	11.30	11.32	11.37	11.43	11.37	11.32	11.34	11.36	11.33	11.35	11.26	11.07
140	11.16	11.18	11.14	11.12	11.01	11.18	11.15	11.25	11.30	11.31	11.35	11.40	11.35	11.31	11.32	11.34	11.31	11.34	11.26	11.07
150	11.15	11.18	11.14	11.12	11.01	11.15	11.15	11.25	11.32	11.31	11.33	11.41	11.34	11.31	11.32	11.34	11.31	11.33	11.26	11.07
Dissolved Oxygen (g m^{-3})																				
Depth (m)																				
0	9.0	9.0	9.2	9.3	9.1	8.9	8.2	8.7	8.2	8.0	8.0	8.2	8.4	8.3	8.4	8.2	8.7	9.2	10.2	9.6
10	9.0	9.0	9.4	9.5	8.7	8.8	8.4	8.3	8.3	8.6	8.0	8.5	8.3	8.3	8.2	8.0	8.5	9.1	10.5	9.6
20	9.0	9.1	9.4	9.5	8.7	9.1	8.4	8.5	8.4	8.1	8.2	8.6	8.6	8.4	7.9	7.9	8.4	9.4	9.4	9.6
30	9.0	9.1	9.6	9.5	8.7	8.9	8.4	8.5	8.5	8.2	8.0	8.3	8.0	8.0	8.0	7.8	8.4	9.8	9.2	9.6
40	9.0	9.1	9.6	9.5	9.1	8.7	8.2	8.2	8.4	7.9	8.1	8.1	7.6	7.8	7.6	7.7	8.3	9.8	9.1	9.6
50	9.0	9.1	9.6	9.5	9.1	8.5	8.2	8.2	8.2	8.1	7.9	7.8	7.6	7.5	7.4	7.5	8.3	9.6	8.9	9.6
60	9.0	9.1	9.7	9.5	8.7	8.4	8.0	7.9	8.0	7.5	7.7	7.4	6.8	7.2	7.2	7.5	7.2	9.4	8.9	9.5
70	8.9	9.1	9.7	9.5	8.7	8.3	7.9	7.8	7.9	7.4	7.6	7.2	6.8	7.1	7.4	7.3	7.0	9.5	9.0	9.4
80	7.8	9.0	9.7	9.5	8.7	8.2	7.6	7.6	7.8	7.5	7.4	7.0	6.5	6.9	7.3	7.3	7.0	7.7	8.9	9.4
90	7.4	8.9	9.7	9.5	8.7	8.2	7.6	7.6	7.7	7.5	7.4	6.9	6.5	6.9	7.1	7.1	7.0	7.8	8.9	9.4
100	7.2	8.7	9.7	9.5	8.7	8.0	7.5	7.6	7.6	7.3	7.2	6.8	6.6	6.8	7.0	7.0	6.9	7.5	8.6	9.3
110	7.1	8.3	9.7	9.5	8.7	8.0	7.5	7.5	7.6	7.2	7.1	6.7	6.5	6.8	7.0	7.0	6.7	7.4	8.7	9.3
120	6.9	7.9	9.7	9.5	8.2	8.1	7.4	7.4	7.5	7.1	7.0	6.5	6.5	6.7	6.8	6.9	6.6	6.9	8.5	9.3
130	6.9	7.3	9.7	9.5	8.5	8.1	7.4	7.3	7.4	7.0	7.0	6.5	6.5	6.6	6.7	6.6	6.5	6.9	8.5	9.3
140	6.9	7.1	9.7	9.5	8.6	8.0	7.3	7.2	7.2	6.9	6.8	6.4	6.5	6.4	6.4	6.7	6.3	6.8	8.3	9.2
150	6.8	7.4	9.7	9.3	8.5	7.9	7.3	7.1	7.1	6.6	6.5	6.3	6.4	6.3	6.3	6.6	6.1	6.4	8.2	9.2
Secchi depth																				
Depth (m)																				
	11	12	15	12	13	11	12	17	17	18	17	14.5	17	13.5	13.5	17	14.5	12	14.5	13.5

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **1999-2000**
For the period starting 13 July 1999

Temperature

Date Depth (m)	13-7-99	6-8-99	3-9-99	29-9-99	18-10-99	19-12-99	18-1-00	12-4-00	4-5-00	25-5-00	20-6-00	11-7-00	4-8-00	21-8-00	11-9-00	28-9-00	25-10-00	13-11-00	6-12-00
0	12.0	11.8	11.8	11.5	12.8	16.56	18.63	17.41	15.82	14.22	12.28	11.87	11.32	11.19	11.80	12.47	14.04	13.27	15.73
10	12.0	11.4	11.3	11.5	12.7	16.40	18.35	17.25	15.77	14.28	12.28	11.87	11.32	11.15	11.46	11.52	13.03	13.09	15.06
20	12.0	11.4	11.2	11.5	12.4	15.96	17.22	17.21	15.76	14.31	12.28	11.86	11.32	11.14	11.33	11.36	11.99	12.98	14.15
30	12.0	11.4	11.1	11.4	11.6	15.23	14.94	16.65	15.75	14.28	12.27	11.86	11.33	11.14	11.30	11.33	11.83	12.86	13.31
40	12.0	11.3	11.1	11.2	11.4	12.16	13.29	12.55	13.64	14.22	12.26	11.86	11.33	11.14	11.27	11.31	11.60	12.36	12.49
50	12.0	11.3	11.1	11.1	11.3	11.64	11.91	11.67	12.14	12.53	12.26	11.86	11.33	11.14	11.22	11.30	11.49	12.10	12.16
60	12.0	11.3	11.0	11.1	11.1	11.35	11.45	11.39	11.56	11.56	12.21	11.85	11.33	11.15	11.18	11.27	11.42	11.69	11.78
70	12.0	11.3	11.0	11.0	11.1	11.25	11.31	11.29	11.36	11.34	11.58	11.64	11.33	11.15	11.15	11.24	11.39	11.41	11.53
80	11.4	11.3	11.0	11.0	11.0	11.18	11.21	11.23	11.24	11.23	11.32	11.42	11.33	11.15	11.14	11.20	11.38	11.29	11.40
90	11.3	11.3	11.0	11.0	11.0	11.16	11.17	11.20	11.21	11.20	11.24	11.31	11.33	11.15	11.13	11.17	11.33	11.26	11.36
100	11.2	11.2	11.0	11.0	11.0	11.14	11.14	11.17	11.17	11.15	11.17	11.22	11.32	11.15	11.13	11.14	11.33	11.21	11.32
110	11.2	11.2	11.0	11.0	11.0	11.12	11.12	11.15	11.14	11.12	11.16	11.21	11.32	11.15	11.13	11.06	11.29	11.19	11.28
120	11.2	11.1	11.0	11.0	11.0	11.10	11.09	11.13	11.12	11.10	11.14	11.19	11.31	11.15	11.13	11.04	11.27	11.19	11.27
130	11.1	11.1	11.0	11.0	11.0	11.08	11.08	11.11	11.10	11.09	11.12	11.18	11.26	11.15	11.12	11.02	11.23	11.17	11.26
140	11.1	11.1	11.0	11.0	11.0	11.07	11.07	11.09	11.09	11.09	11.10	11.16	11.18	11.14	11.12	11.01	11.18	11.15	11.25
150	11.1	11.0	11.0	10.9	11.0	11.10	11.06	11.09	11.09	11.07	11.10	11.15	11.18	11.14	11.12	11.01	11.15	11.15	11.25

Dissolved Oxygen (g m^{-3})

Depth (m)	13-7-99	6-8-99	3-9-99	29-9-99	18-10-99	19-12-99	18-1-00	12-4-00	4-5-00	25-5-00	20-6-00	11-7-00	4-8-00	21-8-00	11-9-00	28-9-00	25-10-00	13-11-00	6-12-00
0	10.5	10.1	9.2	9.5	8.9	8.3	7.9	9.2	8.7	8.5	8.1	9.0	9.0	9.2	9.3	9.1	8.9	8.2	8.7
10	10.7	10.2	9.8	9.8	8.9	8.6	7.9	9.2	8.6	8.3	8.3	9.0	9.0	9.4	9.5	8.7	8.8	8.4	8.3
20	10.7	9.9	9.8	9.9	8.9	8.7	8.1	9.2	8.8	8.5	8.7	9.0	9.1	9.4	9.5	8.7	9.1	8.4	8.5
30	10.6	10.0	9.8	9.7	8.9	8.7	8.3	9.0	8.8	8.5	8.6	9.0	9.1	9.6	9.5	8.7	8.9	8.4	8.5
40	10.6	9.7	9.5	9.6	8.8	8.7	8.1	8.3	8.2	8.6	8.6	9.0	9.1	9.6	9.5	9.1	8.7	8.2	8.2
50	10.4	9.9	9.5	9.3	8.6	8.7	8.0	8.0	7.9	8.2	8.6	9.0	9.1	9.6	9.5	9.1	8.5	8.2	8.2
60	10.4	9.8	9.4	9.2	8.6	8.6	8.0	8.0	7.9	7.7	8.7	9.0	9.1	9.7	9.5	8.7	8.4	8.0	7.9
70	10.3	9.7	9.3	9.0	8.6	8.7	8.0	8.0	7.8	7.7	8.4	8.9	9.1	9.7	9.5	8.7	8.3	7.9	7.8
80	10.3	9.0	9.2	9.0	8.5	8.5	7.9	7.9	7.7	7.6	7.6	7.8	9.0	9.7	9.5	8.7	8.2	7.6	7.6
90	8.1	8.6	9.2	9.0	8.6	8.5	7.7	7.9	7.8	7.4	7.4	7.4	8.9	9.7	9.5	8.7	8.2	7.6	7.6
100	7.9	7.3	9.2	8.9	8.6	8.5	8.3	7.7	7.6	7.4	7.3	7.2	8.7	9.7	9.5	8.7	8.0	7.5	7.6
110	7.5	7.1	9.1	8.9	8.6	8.3	8.1	7.7	7.6	7.6	7.4	7.1	8.3	9.7	9.5	8.7	8.0	7.5	7.5
120	7.4	6.8	9.1	8.9	8.3	8.4	8.1	7.7	7.4	7.5	7.3	6.9	7.9	9.7	9.5	8.2	8.1	7.4	7.4
130	7.3	6.7	9.0	8.8	7.9	8.2	8.0	7.5	7.4	7.5	7.3	6.9	7.3	9.7	9.5	8.5	8.1	7.4	7.3
140	7.1	6.7	8.9	8.7	7.5	8.1	8.0	7.5	7.2	7.4	7.2	6.9	7.1	9.7	9.5	8.6	8.0	7.3	7.2
150	6.9	6.4	8.9	8.6	7.5	8.0	7.5	7.2	6.8	7.0	6.9	6.8	7.4	9.7	9.3	8.5	7.9	7.3	7.1

Secchi depth

	13-7-99	6-8-99	3-9-99	29-9-99	18-10-99	19-12-99	18-1-00	12-4-00	4-5-00	25-5-00	20-6-00	11-7-00	4-8-00	21-8-00	11-9-00	28-9-00	25-10-00	13-11-00	6-12-00
Depth (m)	16	14.5	10	10	14.9	18	19.1	15	14	14	14	11	12	15	12	13	11	12	17

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **1998-1999**
For the period starting 28 July 1998

Temperature

Date / Depth (m)	28-7-98	22-8-98	29-9-98	1-11-98	26-11-98	22-12-98	12-2-99	3-3-99	14-4-99	30-4-99	19-5-99	1-6-99	17-6-99	13-7-99	6-8-99	3-9-99	29-9-99	18-10-99
0	11.4	11.5	12.9	13.6	18.4	18.5	20.1	20.9	18.3	16.4	14.4	14.2	13.0	12.0	11.8	11.8	11.5	12.8
10	11.6	11.3	11.9	13.2	15.6	16.7	20.1	19.8	18.3	16.4	14.4	14.1	13.4	12.0	11.4	11.3	11.5	12.7
20	11.6	11.3	11.5	12.7	15.4	15.7	20.1	19.8	18.3	16.4	14.5	14.1	13.4	12.0	11.4	11.2	11.5	12.4
30	11.6	11.3	11.3	12.4	12.7	14.5	14.9	15.1	18.1	16.0	14.5	14.1	13.4	12.0	11.4	11.1	11.4	11.6
40	11.6	11.3	11.2	12.4	12.1	12.7	13.2	13.1	12.9	13.1	14.5	13.9	13.4	12.0	11.3	11.1	11.2	11.4
50	11.6	11.3	11.1	12.2	11.8	11.8	12.1	12.1	11.9	12.2	13.1	13.0	13.4	12.0	11.3	11.1	11.1	11.3
60	11.6	11.3	11.1	11.7	11.5	11.5	11.6	11.8	11.6	12.0	11.8	12.0	12.1	12.0	11.3	11.0	11.1	11.1
70	11.6	11.1	11.0	11.2	11.3	11.3	11.4	11.5	11.4	11.8	11.3	11.4	11.5	12.0	11.3	11.0	11.0	11.1
80	10.6	10.9	11.0	11.1	11.2	11.2	11.2	11.4	11.3	11.2	11.2	11.3	11.3	11.4	11.3	11.0	11.0	11.0
90	10.6	10.9	10.9	11.1	11.1	11.1	11.1	11.3	11.2	11.1	11.1	11.2	11.2	11.3	11.3	11.0	11.0	11.0
100	10.5	10.8	10.9	11.0	11.1	11.1	11.1	11.3	11.2	11.1	11.1	11.1	11.2	11.2	11.2	11.0	11.0	11.0
110	10.5	10.5	10.9	11.0	11.0	11.1	11.1	11.2	11.2	11.1	11.1	11.1	11.1	11.2	11.2	11.0	11.0	11.0
120	10.5	10.5	10.9	11.0	11.0	11.0	11.0	11.2	11.2	11.1	11.1	11.1	11.1	11.2	11.1	11.0	11.0	11.0
130	10.5	10.5	10.7	11.0	11.0	11.1	11.1	11.1	11.1	11.1	11.0	11.1	11.1	11.1	11.1	11.0	11.0	11.0
140	10.5	10.5	10.7	10.9	11.0	11.1	11.1	11.1	11.1	11.1	11.0	11.1	11.0	11.1	11.1	11.0	11.0	11.0
150	10.5	10.5	10.7	10.9	11.0	11.1	11.1	11.1	11.1	11.1	11.0	11.1	11.0	11.1	11.0	11.0	10.9	11.0

Dissolved Oxygen (g m^{-3})

Depth (m)	28-7-98	22-8-98	29-9-98	1-11-98	26-11-98	22-12-98	12-2-99	3-3-99	14-4-99	30-4-99	19-5-99	1-6-99	17-6-99	13-7-99	6-8-99	3-9-99	29-9-99	18-10-99
0	10.6	10.6	10.6	10.4	9.6	9.7	9.0	8.6	9.1	9.5	9.9	10.0	10.4	10.5	10.1	9.2	9.5	8.9
10	10.5	10.5	10.7	10.7	9.9	10.1	9.0	8.7	9.2	9.5	10.5	10.4	10.3	10.7	10.2	9.8	9.8	8.9
20	10.4	10.4	10.6	10.7	9.8	10.2	8.9	8.7	9.1	9.6	10.4	10.4	10.4	10.7	9.9	9.8	9.9	8.9
30	10.4	10.3	10.5	10.6	10.1	10.2	9.9	9.5	9.1	9.6	10.1	10.7	10.5	10.6	10.0	9.8	9.7	8.9
40	10.3	10.3	10.3	10.4	10.0	10.1	9.9	9.2	9.1	9.1	10.0	10.4	10.4	10.6	9.7	9.5	9.6	8.8
50	10.3	10.2	10.2	10.2	9.8	9.9	9.6	8.9	9.0	8.7	9.2	9.6	10.4	10.4	9.9	9.5	9.3	8.6
60	10.3	10.1	10.1	10.0	9.7	9.7	9.5	8.8	8.9	8.7	8.7	9.4	9.0	10.4	9.8	9.4	9.2	8.6
70	10.3	9.5	9.9	9.6	9.5	9.5	9.4	8.7	8.7	8.6	8.3	9.1	8.9	10.3	9.7	9.3	9.0	8.6
80	8.6	8.2	9.5	9.1	9.2	9.3	9.2	8.6	8.6	8.4	8.2	9.1	8.6	10.3	9.0	9.2	9.0	8.5
90	8.5	7.9	9.3	8.8	9.1	9.1	9.1	8.4	8.6	8.0	7.8	8.8	8.5	8.1	8.6	9.2	9.0	8.6
100	8.3	7.4	8.9	8.5	9.1	8.9	8.9	8.3	8.6	8.0	7.7	8.5	8.2	7.9	7.3	9.2	8.9	8.6
110	8.3	7.4	8.5	8.3	8.8	8.9	8.7	8.2	8.5	8.0	7.5	8.2	8.1	7.5	7.1	9.1	8.9	8.6
120	8.2	7.4	7.7	8.0	8.6	8.8	8.3	7.9	8.3	7.9	7.4	8.2	8.0	7.4	6.8	9.1	8.9	8.3
130	8.2	7.4	7.6	7.8	8.4	8.6	8.1	7.7	8.1	7.7	7.3	8.1	7.7	7.3	6.7	9.0	8.8	7.9
140	8.1	7.4	7.4	7.6	8.2	8.4	7.9	7.5	7.9	7.5	7.2	7.8	7.4	7.1	6.7	8.9	8.7	7.5
150	8.1	7.4	7.4	7.6	8.0	8.2	7.7	7.3	7.7	7.3	7.0	7.5	7.3	6.9	6.4	8.9	8.6	7.5

Secchi depth

	28-7-98	22-8-98	29-9-98	1-11-98	26-11-98	22-12-98	12-2-99	3-3-99	14-4-99	30-4-99	19-5-99	1-6-99	17-6-99	13-7-99	6-8-99	3-9-99	29-9-99	18-10-99
Depth (m)	10.0	10.5	10.4	13.5	15.0	14.5	12.5	14.3	13.0	12.2	15.0	15.0	15.0	16.0	14.5	10.0	10.0	14.9

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **1997-1998**
For the period starting 16 September 1997

Temperature												
Date	**16-9-97**	**11-10-97**	**28-10-97**	**02-12 -97**	**21-1 -98**	**04-3-98**	**24-3-98**	**26-3-98**	**07-4-98**	**29-5-98**	**28-7-98**	**22-8-98**
Depth (m)												
1	10.8	11.8	12.2	14.5	17.7	20.0	19.3	18.6	17.7	14.2	11.4	11.49
10	10.5	11.4	12.0	13.7	17.6	19.9	18.6	18.6	17.7	14.3	11.6	11.32
20	10.5	11.1	11.5	13.6	16.5	19.7	18.5	18.5	17.7	14.0	11.6	11.27
30	10.5	10.8	11.5	13.1	14.3	16.4	18.0	18.1	17.5	13.1	11.6	11.27
40	10.5	10.6	11.4	12.5	12.0	13.3	13.0	12.6	13.7	12.0	11.6	11.27
50	10.5	10.5	11.1	11.5	11.2	12.0	11.9	11.7	11.5	11.2	11.6	11.26
60	10.5	10.5	11.1	11.0	11.0	11.5	11.1	11.1	11.0	10.9	11.6	11.26
70	10.5	10.5	10.8	10.8	10.8	11.0	10.7	10.8	10.8	10.8	11.6	11.12
80	10.5	10.5	10.7	10.7	10.7	10.8	10.6	10.7	10.6	10.6	10.6	10.90
90	10.5	10.5	10.6	10.6	10.6	10.7	10.5	10.6	10.6	10.6	10.6	10.86
100	10.5	10.5	10.5	10.5	10.6	10.7	10.5	10.6	10.6	10.6	10.5	10.82
110	10.5	10.5	10.4	10.5	10.6	10.6	10.5	10.5	10.5	10.6	10.5	10.5
120	10.5	10.5	10.5	10.5	10.5	10.6	10.5	10.5	10.5	10.5	10.5	10.5
130	10.5	10.5	10.5	10.5	10.5	10.6	10.5	10.5	10.5	10.5	10.5	10.5
140	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
150	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
Dissolved Oxygen (g m^{-3})												
Depth (m)												
1	10.55	10.37	10.68	9.89	9.27	9.17	9.43	9.10	9.14	9.92	10.60	10.64
10	10.52	10.51	10.22	9.86	9.38	9.19	9.53	9.07	9.10	9.88	10.46	10.50
20	10.50	10.46	10.24	9.86	9.46	9.22	9.61	8.95	9.07	9.87	10.40	10.36
30	10.29	10.46	10.00	9.74	9.81	9.30	9.78	8.97	9.09	9.68	10.35	10.27
40	10.31	10.39	9.96	9.66	9.85	9.32	9.73	9.47	9.32	9.40	10.32	10.26
50	10.27	10.36	9.89	9.47	9.53	9.16	9.55	9.45	9.34	9.26	10.30	10.20
60	10.16	10.31	9.77	9.44	9.37	9.17	9.30	9.47	9.30	9.18	10.28	10.10
70	10.08	10.24	9.76	9.19	9.30	9.11	9.21	9.38	9.24	9.20	10.25	9.54
80	10.06	10.15	9.85	9.04	9.13	9.04	9.14	9.30	9.13	9.12	8.58	8.15
90	10.03	10.09	9.33	9.00	9.10	8.93	9.03	9.24	9.05	9.08	8.52	7.90
100	9.99	10.06	9.23	8.96	9.01	8.89	8.39	9.16	8.97	8.94	8.34	7.36
110	9.96	10.02	9.03	8.87	8.89	8.83	8.38	8.98	8.94	8.78	8.26	7.36
120	9.91	10.00	8.96	8.87	8.84	8.75	8.38	8.87	8.88	8.69	8.21	7.36
130	9.86	9.92	8.76	8.84	8.68	8.63	8.38	8.38	8.79	8.41	8.21	7.36
140	9.82	9.87	8.76	8.71	8.45	8.30	8.38	8.38	8.58	8.41	8.14	7.36
150	9.56	9.69	8.76	8.65	8.38	8.22	8.38	8.38	8.40	8.41	8.14	7.36
Secchi depth data (m)												
Depth (m)	12.0	13.7	12.5	14.5	14.7	11.5	13.5	13.5	13.5	15.5	10.0	10.5

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **1996-1997**

For the period starting 3 September 1996

Temperature

Date	**3-9-96**	**17-9-96**	**27-9-96**	**17-10-96**	**24-10-96**	**6-11-96**	**28-11-96**	**11-12-96**	**23-12-96**	**8-1-97**	**29-1-97**	**26-3-97**	**2-4-97**	**15-4-97**	**20-5-97**	**29-5-97**	**7-7-97**	**29-7-97**
Depth (m)																		
1	10.5	10.7	12.5	13.3	12.6	13.5	13.6	14.8	16.3	17.9	17.8	17.7	17.3	16.7	14.1	14.2	11.7	10.9
10	10.4	10.6	11.6	12.0	12.3	13.6	13.6	14.8	15.3	16.8	17.6	17.6	17.3	16.7	14.0	14.1	11.7	11.0
20	10.3	10.4	11.1	11.9	12.3	13.4	13.3	14.4	15.1	16.5	17.4	17.2	17.2	16.7	14.0	14.1	11.7	11.0
30	10.3	10.3	11.0	11.8	12.3	13.3	13.3	14.2	15.0	15.6	14.8	16.6	17.2	16.7	12.6	14.1	11.7	11.0
40	10.3	10.3	10.5	11.7	11.9	11.7	11.6	12.7	13.5	13.0	13.4	13.8	14.5	14.0	11.5	14.0	11.7	11.0
50	10.4	10.3	10.4	11.5	11.6	10.8	10.9	12.5	12.4	11.9	11.8	12.4	11.5	11.9	11.0	12.1	11.7	11.0
60	10.3	10.3	10.4	10.9	11.1	10.6	10.9	11.7	11.3	11.2	10.9	11.2	10.9	11.1	10.5	11.8	11.7	11.0
70	10.3	10.3	10.3	10.6	10.6	10.5	10.5	11.7	10.7	10.8	10.7	10.7	10.6	10.9	10.5	11.1	11.7	11.0
80	10.3	10.3	10.3	10.5	10.5	10.4	10.4	11.1	10.6	10.6	10.6	10.5	10.5	10.7	10.5	10.8	10.9	11.0
90	10.3	10.3	10.3	10.4	10.4	10.4	10.4	10.4	10.5	10.5	10.4	10.5	10.5	10.6	10.5	10.6	10.8	10.9
100	10.3	10.3	10.3	10.3	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.5	10.5	10.5	10.5	10.6	10.7
110	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.4	10.4	10.4	10.4	10.4	10.4	10.5	10.5	10.5	10.5	10.6
120	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.4	10.4	10.4	10.4	10.4	10.4	10.5	10.5	10.5	10.5	10.5
130	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.4	10.4	10.4	10.4	10.4	10.4	10.5	10.5	10.5	10.5	10.5
140	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.4	10.3	10.3	10.3	10.4	10.4	10.5	10.5	10.5	10.5	10.5
150	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.4	10.4	10.5	10.4	10.4	10.5	10.5

Dissolved Oxygen (g m^{-3})

Depth (m)																		
1	8.81	9.08	10.03	9.78	10.32	9.96	9.99	10.03	9.10	8.71	8.80	9.70	9.40	9.06	9.09	9.3	9.9	10.53
10	9.17	9.17	10.43	9.85	10.27	9.84	9.87	9.97	9.30	8.70	8.80	9.30	9.25	8.95	9.10	9.2	9.8	10.42
20	9.14	8.98	10.32	9.84	10.15	9.80	9.80	9.90	9.30	8.70	8.70	8.93	8.94	8.91	9.06	9.2	9.8	10.45
30	8.98	8.95	10.16	9.84	9.89	9.79	9.81	9.76	9.30	8.80	9.10	8.80	8.82	8.87	9.01	9.2	9.8	10.43
40	8.90	8.93	9.98	9.80	9.89	9.73	9.77	9.70	9.30	9.00	8.90	8.78	8.79	8.82	8.94	9.1	9.8	10.46
50	8.78	8.87	9.69	9.76	9.80	9.29	9.35	9.10	9.30	8.80	8.90	8.51	8.58	8.65	8.86	9.1	9.7	10.40
60	8.73	8.80	9.54	9.67	9.67	9.19	9.14	9.04	9.15	8.60	8.70	8.49	8.56	8.71	8.70	9.0	9.7	10.36
70	8.74	8.80	9.45	9.56	9.44	9.14	9.09	9.03	9.07	8.60	8.60	8.47	8.52	8.71	8.64	8.9	9.7	10.34
80	8.70	8.77	9.37	9.42	9.33	9.03	9.01	9.01	9.00	8.60	8.50	8.36	8.46	8.69	8.48	8.5	8.6	10.34
90	8.63	8.70	9.24	9.29	9.30	8.99	8.96	8.92	8.98	8.60	8.50	8.30	8.45	8.63	8.32	8.3	8.2	10.24
100	8.59	8.61	9.11	9.22	9.21	8.94	8.93	8.88	8.95	8.60	8.40	8.27	8.40	8.54	8.29	8.2	8.1	8.70
110	8.48	8.49	9.13	9.15	9.20	8.90	8.87	8.80	8.89	8.50	8.30	8.18	8.29	8.48	8.27	8.1	8.0	8.02
120	8.44	8.33	9.07	8.91	8.98	8.77	8.74	8.73	8.85	8.40	8.20	8.08	8.20	8.41	8.22	8.1	8.0	8.05
130	8.19	8.27	9.07	8.83	8.98	8.71	8.69	8.69	8.66	8.30	8.30	7.96	8.02	8.20	8.19	8.1	7.9	8.09
140	8.39	8.35	9.05	8.89	8.89	8.62	8.65	8.60	8.33	8.20	8.20	7.40	7.60	7.87	7.97	7.8	7.4	7.79
150	8.81	8.84	8.98	8.49	8.94	8.48	8.43	8.47	8.25	8.10	8.10	7.40	7.50	7.71	7.88	7.7	7.2	7.13

Secchi depth data (m)

Secchi d	13.1	14..2	11.2	12.6	13.4	14.9	14.1	14.7	17.7	15.1	15.2	15.3	16.0	17.7	14.6	14.5	12.5	13.5

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **1995-1996**

For the period starting 12 September 1995

Temperature															
Date	**12-9-95**	**25-9-95**	**30-10-95**	**24-11-95**	**06-12-95**	**12-1-96**	**31-1-96**	**13-2-96**	**29-2-96**	**20-3-96**	**28-3-96**	**18-4-96**	**19-5-96**	**14-6-96**	**9-7-96**
Depth (m)															
1	10.7		13.7		17.7	21.1	21.7	22.7	20.5	18.2	16.8	17.7	14.8	12.2	11.2
10	10.7		11.9		16.2	20.7	20.7	21.0	20.1	18.2	16.7	17.4	14.8	12.2	11.2
20	10.7		11.4		15.3	18.1	18.5	20.6	20.0	18.2	16.6	17.3	14.8	12.1	11.2
30	10.7		11.2		12.4	14.8	13.5	15.1	15.5	18.1	13.7	17.0	14.8	12.1	11.2
40	10.7		10.9		11.4	12.4	12.3	12.2	11.9	12.3	12.4	12.6	14.7	12.0	11.2
50	10.7		10.8		11.0	11.5	11.6	11.6	11.3	11.4	11.6	11.4	11.6	11.2	11.2
60	10.7		10.7		10.7	11.0	11.2	11.0	11.0	11.1	11.4	11.1	11.1	10.9	11.2
70	10.7		10.5		10.6	10.9	10.8	10.8	10.8	10.9	11.6	11.1	10.9	10.8	11.2
80	10.5		10.5		10.6	10.9	10.7	10.7	10.7	10.8	11.2	10.9	10.8	10.8	11.2
90	10.4		10.5		10.6	10.7	10.7	10.7	10.7	10.7	11.3	10.8	10.7	10.8	10.8
100	10.4		10.5		10.5	10.6	10.6	10.7	10.7	10.7	10.9	10.8	10.7	10.7	10.8
110	10.4		10.5		10.5	10.5	10.6	10.7	10.7	10.6	10.8	10.8	10.7	10.7	10.8
120	10.4		10.5		10.5	10.5	10.5	10.6	10.6	10.6	10.7	10.7	10.7	10.7	10.8
130	10.4		10.5		10.5	10.5	10.5	10.7	10.6	10.6	10.7	10.7	10.7	10.7	10.8
140	10.4		10.5		10.5	10.5	10.5	10.6	10.6	10.6	10.7	10.7	10.7	10.7	10.8
150	10.4		10.5		10.5	10.5	10.5	10.6	10.6	10.6	10.6	10.7	10.7	10.7	10.8
160	10.4		*		10.5	10.5	10.5	*	*	*	*	*	*	*	*
Dissolved oxygen (g m^{-3})															
Depth (m)															
1	9.6		10.3		9.5	8.5	8.5	8.1	8.2	8.4	8.7	8.6	9.0	9.2	9.3
10	9.6		10.5		9.9	8.7	8.5	8.1	8.2	8.3	8.7	8.6	9.0	9.2	9.1
20	9.6		10.6		10.0	9.1	9.1	8.2	8.1	8.3	8.8	8.6	8.9	9.2	9.1
30	9.6		10.7		10.5	9.7	10.1	9.2	9.0	8.1	9.0	8.4	8.9	9.1	9.0
40	9.7		10.7		10.5	10.1	10.2	9.5	9.1	8.7	8.8	8.7	8.9	9.0	8.9
50	9.6		10.3		10.3	9.9	9.9	9.0	9.0	8.6	8.6	8.4	8.7	8.4	8.8
60	9.5		10.3		10.0	9.6	8.9	8.7	8.8	8.5	8.5	8.4	8.5	8.1	8.7
70	9.4		10.2		10.0	9.6	8.9	8.6	8.6	8.5	8.5	8.4	8.3	7.9	8.7
80	9.4		10.2		9.9	9.6	8.8	8.5	8.5	8.4	8.3	8.4	8.3	7.8	8.6
90	9.0		10.1		9.8	9.5	8.8	8.4	8.4	8.3	8.2	8.3	8.2	7.7	8.1
100	9.0		10.0		9.7	9.4	8.8	8.3	8.3	8.3	8.2	8.3	8.1	7.7	7.5
110	9.0		9.9		9.6	9.4	8.8	8.1	8.3	8.2	8.1	7.9	7.8	7.6	7.3
120	8.8		9.9		9.4	9.3	8.3	8.1	8.3	8.1	8.3	7.9	7.8	7.5	7.1
130	8.8		9.8		9.3	9.2	8.3	7.9	8.2	7.8	8.3	7.8	7.8	7.5	7.1
140	8.7		9.6		9.1	8.9	7.9	7.6	8.2	7.5	8.0	7.6	7.7	7.4	7.0
150	8.7		9.2		8.9	8.7	7.9	7.6	8.0	7.4	7.8	7.4	7.5	7.4	7.0
Secchi depth															
Depth (m)	11.9	11.9	13.0	13.6	15.1	16.3	15.7	17.8	18.4	14.1	14.6	14.4	14.7	14.4	12.9

Lake Taupo Temperature, Dissolved Oxygen, and Secchi Depth Database. **1994-1995**
Started 27 October 1994

Date	27-10-94	21-11-94	01-12-94	13-12 -94	27-12 -94	13-1 -95	25-1 -95	09-2 -95	26-2 -95	08-3 -95	24-3-95	12-4-95	19-4-95	04-5-95	21-5-95	08-6-95	14-7-95	30-7-95
Temperature																		
Depth (m)																		
1	11.7	12.8	15.7	17.5	17.8	18.6	19.9	20.6	20.9	20.9	18.5	19.4	18.4	17.0	15.0	13.4	11.3	10.8
10	11.5	12.6	14.2	16.4	17.3	18.4	19.9	20.0	19.9	19.8	18.4	18.6	18.2	16.9	15.0	13.5	11.3	10.8
20	11.5	12.6	13.2	15.5	16.9	18.0	17.8	19.6	19.9	19.7	18.4	18.4	18.2	16.8	15.0	13.4	11.3	10.8
30	11.3	12.6	13.0	13.2	13.3	15.9	15.6	15.0	15.0	15.1	18.4	15.7	16.5	14.6	15.0	13.4	11.3	10.8
40	10.9	12.6	12.1	12.5	12.2	13.1	13.3	12.9	13.0	12.8	12.7	13.0	12.5	12.2	12.7	13.3	11.3	10.8
50	10.9	12.4	11.4	11.7	11.6	12.0	11.8	11.9	11.9	11.8	12.0	11.8	11.6	11.3	11.7	12.8	11.2	10.8
60	10.8	11.8	10.7	11.1	*	11.4	11.5	11.4	11.1	11.2	11.3	11.3	11.1	11.2	11.3	11.7	11.2	10.8
70	10.7	10.9	10.6	10.8	*	*	11.2	11.0	10.9	10.9	11.0	10.9	10.9	10.9	11.0	11.2	11.2	10.8
80	10.6	10.7	10.5	10.7	*	*	11.0	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	11.0	10.9	10.8
90	10.5	10.6	10.5	10.6	*	*	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.8	10.8	10.8	10.8
100	10.5	10.5	10.5	10.5	*	*	10.7	10.6	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.8	10.7	10.8
110	10.5	10.5	10.4	10.4	*	*	10.6	10.6	10.6	10.6	10.7	10.7	10.7	10.7	10.7	10.8	10.7	10.8
120	10.4	10.4	10.4	10.4	*	*	10.6	10.5	10.6	10.6	10.6	10.7	10.7	10.7	10.7	10.8	10.7	10.8
130	10.4	10.4	10.4	10.3	*	*	10.5	10.5	10.6	10.6	10.6	10.6	10.7	10.7	10.7	10.8	10.7	10.8
140	10.4	10.3	10.4	10.3	*	*	10.5	10.5	10.6	10.6	10.6	10.6	10.7	10.6	10.7	10.8	10.7	10.8
150	10.3	10.3	10.3	10.3	*	*	10.5	10.5	10.6	10.6	10.6	10.6	10.6	10.6	10.7	10.8	10.7	10.8
160	10.3	10.3	10.3	10.3	*	*	10.5	10.5	10.6	10.6	10.6	10.6	10.6	10.7	*	10.7	*	*
Dissolved oxygen (g m^{-3})																		
Depth (m)																		
1	10.5	9.6	9.8	9.2	9.0	8.0	8.9	8.4	8.5	8.5	8.7	*	9.2	9.3	9.0	9.0	9.6	9.6
10	10.6	9.4	10.3	9.4	10.6	10.4	10.2	8.5	8.4	8.0	*	*	9.3	9.1	8.8	9.1	9.6	9.5
20	10.8	9.4	10.3	9.4	11.0	10.5	11.5	8.5	8.4	8.0	*	*	9.2	9.0	8.8	9.1	9.4	9.4
30	10.7	9.4	10.2	9.7	12.5	11.2	11.4	9.8	9.6	9.7	*	*	9.3	9.2	8.7	9.0	9.4	9.3
40	10.5	9.3	10.1	9.6	12.5	11.9	12.0	9.7	9.4	9.7	*	*	9.7	9.3	8.6	9.0	9.3	9.3
50	10.4	9.3	9.9	9.5	12.6	11.9	12.0	9.4	9.4	9.5	*	*	9.5	9.2	8.5	8.8	9.2	9.3
60	10.4	9.4	9.9	9.5	*	10.3	11.9	9.4	9.3	9.4	*	*	9.5	9.2	8.5	8.3	9.2	9.2
70	10.4	*	9.8	9.5	*	*	11.7	9.3	9.3	9.3	*	*	9.5	9.2	8.4	8.3	9.2	9.2
80	10.4	*	9.8	9.5	*	*	11.6	9.3	8.9	9.1	*	*	9.0	9.2	8.3	8.3	8.5	9.1
90	10.4	*	9.7	9.5	*	*	11.4	9.2	8.8	9.0	*	*	8.7	9.0	8.1	7.9	8.3	9.0
100	10.2	*	9.6	9.4	*	*	11.3	9.0	8.6	8.8	*	*	8.6	8.6	8.0	7.6	7.8	8.9
110	10.3	*	9.7	9.3	*	*	11.1	9.0	8.3	8.7	*	*	8.3	8.2	8.0	7.5	7.4	8.8
120	10.2	*	9.4	9.2	*	*	10.9	8.7	8.2	8.4	*	*	8.2	7.9	7.8	7.1	7.2	8.6
130	9.8	*	9.2	9.0	*	*	10.6	8.5	7.9	8.3	*	*	8.0	7.7	7.6	7.0	7.2	8.4
140	9.8	*	8.9	9.0	*	*	10.5	8.3	7.6	8.1	*	*	8.0	7.5	7.4	7.0	7.1	8.4
150	9.9	*	8.6	8.7	*	*	10.4	8.3	7.3	7.9	*	*	7.5	7.3	7.0	7.0	7.1	8.3
160	*	*	8.5	8.5	*	*	10.0	8.2	7.5	7.7	*	*	6.6	7.2	*	6.8	*	*
Secchi depth																		
Depth (m)	11.7	11.4	12.5	12.9	15.6	17.8	15.7	17.0	16.5	17.1	14.7	15.7	16.1	15.1	14.3	15.0	12.5	15.7

* = missing or invalid data

11. Appendix 4. Nutrient data

Includes accumulated data since 1994. Blank cells represent missing data.

For completeness, data collected from the Kuratau Basin (Site B) and Western Bays (Site C) from January 2002 to December 2004 are included as separate sheets following the mid-lake data from Site A for those years.

In the spring/autumn profile data, two different analytical methods are used to measure particulate nitrogen: (1) A wet digestion method involving high temperature refluxing in digestion mixture [persulphate / sulphuric acid / Selenium catalyst] for 3 hours followed by colorimetric determination of the nitrogen as the ammoniacal form, and (2) a CHN combustion method which converts all nitrogen compounds to N_2 gas in a furnace at ~1000°C to be measured in a thermal conductivity detector.

Particulate nitrogen analysed by the wet digestion method may not include some refractory nitrogen components which may be detected by the CHN combustion furnace method. Consequently the PN value from the CHN combustion furnace method should always be greater than or equal to the PN value obtained by the wet digestion method. Occasionally they are reported as less than the wet digestion method value in which case the wet digestion value should be regarded as correct. The cause of this difference is unknown but may be associated with the presence of low molecular weight organic nitrogen compounds lost during the drying step before combustion. The PN values for the time series data are all from wet digestion method analyses and hence are directly comparable with the profile data.

Low level NH_4-N results are likely to be subject to interference from low molecular weight DON and hence may not be biologically available for phytoplankton growth.

From February 2002, DRP, NO_3-N, and NH_4-N were measured on a Lachat Flow Injection Analysis (FIA) system but using essentially the same chemistry as previously used on the Technical Auto-Analyzer system. The reported detection limits for these nutrients remains the same at 0.5 mg m^{-3} for DRP and NO_3-N, and 1 mg m^{-3} for NH_4-N, however, the greater precision of the FIA system provides confidence in reporting results to a lower level as an indication of likely absolute values near zero. Such values are provided as an indication only and the true value should be expressed as less than the detection limit. TN and TP values are the sum of all other N and P components, excluding Urea-N which is part of the DON component. All analytical values 'on-the-day' are used wherever possible or <DL = DL/2 for summation.

The DON value for 5/08/2000 was corrected from 12 to 43.5 in March 2006. This was a transcription error from the original analytical result sheet.

Lake Taupo cumulative database of 10m tube sample data from October1994 to September 2002.
Samples collected from central lake site.

Date Collected	Temp. ^{o}C	Secchi m	DRP $mg\ m^{-3}$	DOP $mg\ m^{-3}$	PP $mg\ m^{-3}$	TP $mg\ m^{-3}$	NH_4-N $mg\ m^{-3}$	NO_3-N $mg\ m^{-3}$	DON $mg\ m^{-3}$	PN $mg\ m^{-3}$	TN $mg\ m^{-3}$	Chlorophyll *a* $mg\ m^{-3}$	PC $mg\ m^{-3}$
27/10/1994	11.7	11.7	1.2	0.7	2.5	4.4	1.1	0.2	56	16.6	73.4	1.16	
24/11/1994	12.8	11.4	0.5	2.7	1.7	4.8	1.7	1.0	51	12.6	66.5	0.41	
1/12/1994	15.7	12.5	0.6	2.4	2.4	5.4	2.2	1.2	56	18.5	78.0	0.41	
13/12/1994	17.5	12.9	0.8	4.2	1.4	6.4	<0.2	0.9	51	9.3	60.8	0.24	
28/12/1994	17.8	15.6	0.5	1.7	1.9	4.1	1.1	1.3	51	16.7	69.6	0.41	
13/01/1995	18.6	17.8	0.1	2.2	1.6	3.8	<0.2	0.8	53	11.6	64.9	0.22	
24/01/1995	19.9	15.7	0.2	2.1	1.2	3.6	<0.2	0.8	57	13.3	71.0	0.25	
10/02/1995	20.6	17.0	0.3	2.2	1.2	3.6	<0.2	1.5	62	10.2	73.3	0.32	
27/02/1995	20.9	16.5	0.4	<0.5	2.5	2.8	1.9	1.5	71	16.5	90.8	0.35	
9/03/1995	20.9	17.1	0.4	1.7	1.7	3.7	0.2	0.7	55	11.6	67.5	0.28	
24/03/1995	18.5	14.7			1.9	1.9				13.0		0.37	
12/04/1995	19.4	15.7	0.2	1.4	1.7	3.2	0.3	0.7	51	17.3	69.6	0.57	
19/04/1995	18.4	16.1	2.8	1.5	1.4	5.7	4.0	0.9	71	14.1	90.0	0.92	
4/05/1995	17.0	15.1	1.4	1.1	3.0	5.5	1.4	2.3	76	24.7	104.4	0.96	
21/05/1995	15.0	14.3	1.2	0.9	2.2	4.3	0.4	2.1	50	29.2	81.8	0.98	
8/06/1995	13.4	15.0	0.7	0.4	1.8	2.9	0.2	0.6	54	15.4	70.2	1.05	
14/07/1995	11.3	12.5	0.3	2.5	1.7	4.5	0.3	2.1	53	15.0	70.8	1.32	
30/07/1995	10.8	15.7	0.7	0.7	1.9	3.3	<0.2	4.6	35	17.3	57.3		
13/08/1995			0.5	0.4	1.9	2.8	<0.2	4.6	39	14.2	57.4	0.99	
12/09/1995	10.7	11.9	0.5	2.2	2.2	4.9	1.0	40.9	177	19.1	237.6	1.37	
25/09/1995	11.5	11.9	<0.2	0.7	2.1	2.8	<0.2	0.1	84	17.6	101.6	0.64	
30/10/1995	13.0	13.0	<0.2	2.4	1.9	4.3	<0.2	<0.1	56	14.7	70.4	0.93	
24/11/1995	13.7	13.6	0.8	1.8	1.6	4.3	1.9	<0.1	59	12.6	73.3	0.29	
6/12/1995	17.7	15.1	2.2	0.4	1.2	3.9	1.7	<0.1	58	11.3	70.8	0.20	
12/01/1996	21.1	16.3	2.6	0.6	1.2	4.4	3.6	<0.1	64	10.1	77.8	0.24	
31/01/1996	21.7	15.7	1.3	1.6	1.3	4.2	4.2	<0.1	59	11.9	75.5	0.29	
13/02/1996	22.7	17.8	2.1	3.3	1.2	6.6	7.4	<0.1	81	10.4	98.9	0.15	
29/02/1996	20.5	18.4	1.9	2.2	1.2	5.3	4.2	<0.1	61	10.8	76.3	0.31	
20/03/1996	18.2	14.1	0.8	2.2	1.4	4.5	5.4	<0.1	76	14.2	95.3	0.56	
28/03/1996	16.8	14.6	1.3	1.8	1.4	4.5	4.7	<0.1	91	12.6	108.3	0.81	
18/04/1996	17.7	14.4	0.8	2.2			4.3	<0.1	61			0.41	
19/05/1996	14.8	14.7	0.8	3.0			6.8	<0.1	59			0.70	
14/06/1996	12.2	14.4	1.6	3.2			5.7	<0.1	71				
19/06/1996	12.2	14.4	1.0	1.2			4.0	<0.1	49			0.70	
9/07/1996	11.2	12.9	3.0		1.9		4.0	<0.1	47	11.3		0.80	
3/09/1996	10.5	13.1	0.7	2.0	3.0	5.7	2.5	0.2	52	17.0	71.7	1.03	
18/09/1996	10.7	14.2	1.3	1.2	2.4	4.9	2.1	0.2	42	14.0	58.3	0.75	
30/09/1996	12.5	11.2	0.9	1.6	1.8	4.3	3.3	0.2	58	11.0	72.5	0.28	
17/10/1996	13.3	12.6	0.6	2.1	2.6	5.3	2.9	2.5	64	19.0	88.4	0.59	
24/10/1996	12.6	13.4	0.7	2.3	2.2	5.2	2.4	0.4	64	15.0	81.8	0.47	
6/11/1996	13.5	14.9	0.8	2.6	2.2	5.6	3.2	1.0	64	17.0	85.2	0.45	
28/11/1996	13.6	14.1	0.4	1.9	2.4	4.7	2.6	0.4	49	20.0	72.0	0.90	
11/12/1996	14.8	14.7	1.3	1.7	1.3	4.3	6.2	0.8	98	17.0	122.0	0.33	
23/12/1996	16.3	17.7	1.3	1.1			5.2	0.3	46			0.23	
8/01/1997	17.9	15.1	0.7	1.7	1.9	4.3	2.0	0.6	50	15.0	67.6	0.33	
29/01/1997	17.8	15.2	0.7	1.8	1.6	4.1	1.9	0.4	54	17.0	73.3	0.21	
26/03/1997	17.7	15.3	0.6	1.7	2.1	4.4	2.4	1.8	57	19.0	80.2	0.46	
2/04/1997	17.3	16.0	0.9	1.3	1.6	3.8	1.7	0.3	51	16.0	69.0	0.69	
15/04/1997	16.7	17.7	0.7	2.5	1.5	4.7	3.2	0.8	57	12.0	73.0	0.40	
1/05/1997	15.6	16.0	0.6				1.7	0.1				0.58	
21/05/1997	14.2	14.6	1.0	8.8	1.7	11.5	4.5	0.3	92	15.0	111.8	1.05	
29/05/1997	14.3	14.5	1.1	1.1			3.3	1.0	51			0.89	
7/07/1997	11.6	12.5	0.6	0.9			4.7	2.1	53			0.90	
29/07/1997	10.9	13.5	0.5	1.6			1.5	2.1	39			1.13	
2/09/1997	10.6	14.1	1.4	1.1	1.7	4.2	7.0	1.8	47.0	13.1	68.9	1.08	
16/09/1997	10.6	12.0	0.5	1.1			1.3	0.7	35			2.16	
11/10/1997	11.6	13.7	2.4	2.8	1.7	6.9	4.8	0.9	63.3	16.2	85.2	1.14	
29/10/1997	12.1	12.5	0.7	1.9	1.9	4.5	1.3	7.3	32	19.0	59.6	1.49	
2/12/1997	14.5	14.5	0.2	2.3			3.2	1.7	55			0.83	
21/01/1998	17.7	14.7	1.4	1.1	1.2	3.7	2.8	1.5	46.0	10.0	60.3	0.48	
4/03/1998	20.0	11.5	1.5	1.7	2.6	5.8	6.4	4.0	76.0	19.8	106.2	0.58	
24/03/1998	19.3	13.5	1.0	1.4	1.8	3.2	2.1	1.1	48.0	13.2	64.4	1.25	
7/04/1998	17.7	13.5	0.9	1.4	1.8	4.1	1.9	2.5	52.0	13.7	70.1	1.04	
29/05/1998	14.2	15.5	1.0	1.9	1.9	4.8	5.0	3.5	51.0	16.4	75.9	1.36	
28/07/1998	11.4	10.0	1.2	1.0	3.1	5.3	2.1	1.4	45.0	26.0	74.5	1.19	
29/09/1998	12.9	10.5	1.5	1.0			2.2	0.5	41.0	20.3	64.0	0.70	
8/10/1998	12.9	10.4	1.5	<1			2.4	2.4	46.0	37.6	88.4	1.00	
1/11/1998	13.6	13.5	0.6	1.3	2.6	4.5	2.4	<0.5	36.0	15.2	53.6	0.90	
26/11/1998	18.4	15.0	1.3	2.6	2.1	6.0	9.6	1.6	42.0	16.4	69.6	0.61	
22/12/1998	18.5	14.5	1.1	0.4	2.5	4.0	2.7	1.1	36.0	17.7	61.5	0.25	
12/02/1999	20.1	12.5	0.8	2.8	1.7	5.3	4.0	1.6	39.0	11.4	56.0	0.60	165
3/03/1999	20.9	14.3	0.6	2.9	2.0	5.5	1.6	1.1	40.0	16.8	59.5	0.82	203
14/04/1999	18.3	13.0	0.6	<1	1.8	2.4	3.0	<0.5	41.0	19.0	61.6	1.20	250
30/04/1999	16.4	12.2	1.1	1.5	1.7	4.3	2.1	<0.5	38.0	19.6	60.2	0.94	198
19/05/1999	14.4	15.0	0.8	<1	1.5	5.1	1	<1	46.0	16.2	63.7	1.2	166
8/06/1999	14.1	14.5	1.0	<1	3.9	4.9	1	<1	48.0	25.4	74.9	1.1	
18/06/1999	13.0	15.0	0.8	<1	2.0	5.0	2	5	42.0	16.5	65.5	1.7	
20/07/1999	12.0	16.0	0.5	<1	3.1	3.6	1	<1	45.0	28.3	74.3	1.0	
9/08/1999	11.5	14.5	1.3	1.7	2.3	5.3	4	8	45.0	18.4	75.4	1.7	
6/09/1999	11.1	10.0	<0.5	2.5	2.1	5.1	2	1	60	16.2	79.2	0.5	
29/09/1999	11.5	10.0	0.7	1	4	5.7	3	1	54	32.6	90.6	1.8	
18/10/1999	12.7	14.9	0.5	3	2.5	6	<1	<1	41	19.4	60.4	0.4	
20/12/1999	16.4	18.0	0.7	2.3	5	8	4	2	39	38	83	1.6	
18/01/2000	17.6	19.1	0.9	2	2	4	5	2	52	18.5	70.5	0.6	
12/04/2000	17.3	15.0	0.8	3	2	5	1	1	61	22	83	0.8	
4/05/2000	15.8	14.0	1	3	2	5	1	2	48	17	68	1.3	
25/05/2000	14.3	14.0	1	4	1	6	2	<1	55	17	65	0.6	
20/06/2000	12.3	14.0	<1	4	0	4.0	2	2	52	16	72.0	1.7	194
11/07/2000	11.9	11.0	<1	4	3	7.0	3	2	46	22.5	73.5	1.65	198
5/08/2000	11.3	12.0	2	2	3	7.0	1	3.5	43.5	19.5	66.0	2.5	154
22/08/2000	11.2	15.0	2	2	2	6.0	2	4	49	16.5	71.5	1.65	159
12/09/2000	11.5	12.0	2	5	3.5	10.5	2	<1	63	23.5	88.5	1	148
29/09/2000	11.5	13.0	2	4	2	8.0	1	1	54	21	77.0	1.15	237
26/10/2000	13.1	11.0	0.8	4.2	3	8.0	1.0	0.4	41.6	25	68.0	1.3	237
14/11/2000	13.1	12.0	<1	4	2	6.0	1	<1	41	14.5	56.5	0.9	171
7/12/2000	15.1	17.0	2	2	1.55	5.6	7	4	63	14.75	88.8	0.6	166
4/01/2001	18.0	14.5	<1	2	1.5	3.5	1	<1	40	11	52.0	0.5	127
16/01/2001	19.0	18.0	0.5	2.5	1.5	4.5	1	0.5	53.5	13	68.0	0.5	119
21/02/2001	20.5	17.0	0.9	1.1	1.5	3.5	<1	0.5	46.5	12.5	59.5	0.6	191
2/03/2001	20.7	14.5	<1	2	2	4.0	2	<1	53	18	73.0	0.9	193
20/03/2001	19.0	17.0	<1	3	1.4	4.4	<1	<1	46	14.25	60.3	0.9	154
9/04/2001	17.0	13.5	0.8	1.2	2.15	4.2	<1	3	62	19.45	84.5	1.05	199
8/05/2001	15.8	17.0	0.8	3.2	1.7	5.7	2	<1	61	23	86.0	1.1	248
30/05/2001	13.6	14.5	1.5	1.5	2	5.0	1	<1	57	12	70.0	1.4	203
2/07/2001	12.1	12.0	<1	3	2.3	5.3	1	1	50	18.3	70.3	1.5	156
25/07/2001	11.3	14.5	2	1	2.65	5.7	<1	6	45	19.75	70.8	2.2	188
13/08/2001	11.2	13.5	1	1	2.85	4.9	1	<1	41	21.9	63.9	2.1	225
3/09/2001	10.2	17.5	1	1	2.6	4.6	<1	<1	37	19	56.0	1.7	203
25/09/2001	11.6	11.0	1.1	0.9	2.8	4.8	1	<1	56	24.5	81.5	0.9	283
25/10/2001	13.0	14.5	0.8	1.2	2.4	4.4	<1	<1	46	19.4	65.4	1.1	246
12/11/2001	14.3	15.5	0.7	<1 (0.3)	5.15	6.2	<1 (0.5)	<0.5 (0)	34	35.0	69.5	1.7	403
10/12/2001	15.5	16.0	1.0	2	2.55	5.6	<1 (0.9)	<0.5 (0.1)	48	17.6	65.6	0.5	228
20/12/2001	17.0	13.0	0.6	2.7	2.05	5.4	1.3	<0.5 (0.1)	48	14.85	64.2	0.5	204
8/01/2002	18.3	13.0	<0.5 (0.3)	2	2.2	4.2	<1 (0)	<0.5	50	17.15	67.2	0.8	247
22/01/2002	19.3	15.0	<0.5 (0)	7	2.25	9.3	<1 (0)	<0.5	40	20.35	60.4	0.9	188
6/03/2002	18.7	14.5	1.2	0.8	2.05	4.1	<1 (0)	<0.5 (0.4)	74	17.7	91.7	1.7	227
4/04/2002	17.4	19.0	0.6	3	1.45	5.1	1.1	<0.5 (0.1)	46	10.7	57.8	0.8	138
17/04/2002	17.4	22.0	<0.5 (0)	3	1.65	4.7	<1 (0.5)	0.5	47	13.1	60.6	0.9	157
22/04/2002	17.05	22.0	-	-	-	-	-	-	-	-	-	-	-
5/05/2002	15.5	16.4	0.7	1			3.1	0.7	48			1	
16/05/2002			0.9	1.1	1.5	3.5	<1	<0.5	49	15.1	64.1	0.7	153
19/06/2002	12.6	17.0	1.2	1.8	1.9	4.9	<1 (0.5)	1.4	43.6	15.8	60.8	1.1	165
1/07/2002	12.1	16.0	1.2	1.8	1.8	4.8	<1 (0.9)	1.7	37.3	14.3	53.3	1.5	214
17/07/2002	11.4	15.5	2.3	2.7	1.7	6.7	2.3	7.8	41.9	14.6	66.6	1.5	154
31/07/2002	11.2	12.0	2.3	2.7	2.5	7.5	<1 (0.9)	5.9	177.2	16.7	199.8	2.2	193
29/08/2002	11.1	9.5	1.6	1.4	3.1	6.1	<1 (0)	<0.5 (0)	90	23	113.0	2.6	196
5/09/2002		6.7	-	-	-	-	-	-	-	-	-	-	-

Special repeat analyses. Detection limit <0.1 $mg\ m^{-3}$

Detection limits prior to 14 April 1999 were

	DL
DRP	0.2 $mg\ m^{-3}$
NH4-N	0.5 $mg\ m^{-3}$
NO3-N	0.5 $mg\ m^{-3}$

Values reported less than the DL were special estimates of low samples.

Detection limits from 14 April 1999 on are

	DL
DRP	0.5 $mg\ m^{-3}$
NH4-N	1 $mg\ m^{-3}$
NO3-N	1 $mg\ m^{-3}$

Values reported less than the DL were special estimates of low samples.

New LACHAT Flow Injection Analysis
Detection limits from 1 Dec 2001 on are

	DL
DRP	0.5 $mg\ m^{-3}$
NH4-N	1 $mg\ m^{-3}$
NO3-N	0.5 $mg\ m^{-3}$

High precision and confidence in the FIA results allow estimates below the nominal DL. Data in brackets are given as an indication of the likely absolute concentration

Lake Taupo cumulative database of 10 m tube sample data from June 2000 on
Samples collected from Mid Lake (Site A)

Date Collected	Temp. ºC	Secchi (m)	DRP (mg m^{-3})	DOP (mg m^{-3})	PP (mg m^{-3})	TP (mg m^{-3})	NH_4-N (mg m^{-3})	NO_3-N (mg m^{-3})	DON (mg m^{-3})	PN (mg m^{-3})	TN (mg m^{-3})	Chlorophyll *a* (mg m^{-3})	PC (mg m^{-3})
20/06/2000	12.3	14.0	<1	4	0	4.0	2	2	52	16	72.0	1.7	193.5
11/07/2000	11.9	11.0	<1	4	3	7.0	3	2	46	22.5	73.5	1.65	198
5/08/2000	11.3	12.0	2	2	3	7.0	1	3.5	43.5	19.5	36.0	2.5	153.5
22/08/2000	11.2	15.0	2	2	2	6.0	2	4	49	16.5	71.5	1.65	158.5
12/09/2000	11.5	12.0	2	5	3.5	10.5	2	<1	63	23.5	88.5	1	148
29/09/2000	11.5	13.0	2	4	2	8.0	1	1	54	21	77.0	1.15	236.5
26/10/2000	13.1	11.0	0.8	4.2	3	8.0	1.0	0.4	41.6	25	68.0	1.3	237
14/11/2000	13.1	12.0	<1	4	2	6.0	1	<1	41	14.5	56.5	0.9	171
7/12/2000	15.1	17.0	2	2	1.55	5.6	7	4	63	14.75	88.8	0.6	165.5
4/01/2001	18.0	14.5	<1	2	1.5	3.5	1	<1	40	11	52.0	0.5	127
16/01/2001	19.0	18.0	0.5	2.5	1.5	4.5	1	0.5	53.5	13	68.0	0.5	118.5
21/02/2001	20.5	17.0	0.9	1.1	1.5	3.5	<1	0.5	46.5	12.5	59.5	0.6	190.5
2/03/2001	20.7	14.5	<1	2	2	4.0	2	<1	53	18	73.0	0.9	193
20/03/2001	19.0	17.0	<1	3	1.4	4.4	<1	<1	46	14.25	60.3	0.9	154
9/04/2001	17.0	13.5	0.8	1.2	2.15	4.2	<1	3	62	19.45	84.5	1.05	199
8/05/2001	15.8	17.0	0.8	3.2	1.7	5.7	2	<1	61	23	86.0	1.1	248
30/05/2001	13.6	14.5	1.5	1.5	2	5.0	1	<1	57	12	70.0	1.4	203
2/07/2001	12.1	12.0	<1	3	2.3	5.3	1	1	50	18.3	70.3	1.5	155.5
25/07/2001	11.3	14.5	2	1	2.65	5.7	<1	6	45	19.75	70.8	2.2	188
13/08/2001	11.2	13.5	1	1	2.85	4.9	1	<1	41	21.9	63.9	2.1	225
3/09/2001	10.2	17.5	1	1	2.6	4.6	<1	<1	37	19	56.0	1.7	203
25/09/2001	11.6	11.0	1.1	0.9	2.8	4.8	1	<1	56	24.5	81.5	0.9	283
25/10/2001	13.0	14.5	0.8	1.2	2.4	4.4	<1	<1	46	19.4	65.4	1.1	246
12/11/2001	14.3	15.5	1.0	2	2.55	5.6	0.9	0.1	48	17.6	66.6	0.5	227.5
10/12/2001	15.5	16.0	1.0	2	2.55	5.6	0.9	0.1	48	17.6	66.6	0.5	227.5
20/12/2001	17.0	13.0	0.6	2.7	2.05	5.4	1.3	0.1	48	14.85	64.3	0.5	203.5
8/01/2002	18.3	13.0	0.3	2	2.2	4.5	0	<1	50	17.15	67.2	0.8	246.5
22/01/2002	19.3	15.0	0	7	2.25	9.3	0	<1	40	20.35	60.4	0.9	188
6/03/2002	18.7	14.5	1.2	0.8	2.05	4.1	0.0	0.4	74	17.7	92.1	1.7	226.5
4/04/2002	17.4	19.0	0.6	3	1.45	5.1	1.1	0.1	46	10.7	57.9	0.8	138
17/04/2002	17.4	22.0	0.0	3	1.65	4.7	0.5	0.5	47	13.1	61.1	0.9	157
5/05/2002	15.5	16.4	0.7	1			3.1	0.7	48			1	
19/06/2002	12.6	17.0	1.2	1.8	1.9	4.9	0.5	1.4	43.6	15.8	61.3	1.1	165.0
1/07/2002	12.1	16.0	1.2	1.8	1.8	4.8	0.9	1.7	37.3	14.3	54.2	1.5	214
17/07/2002	11.4	15.5	2.3	2.7	1.7	6.7	2.3	7.8	41.9	14.6	66.6	1.5	153.5
31/07/2002	11.2	12.0	2.3	2.7	2.5	7.5	0.9	5.9	177.2	16.7	200.7	2.2	193

Date Collected	Temp. ºC	Secchi (m)	DRP (mg m^{-3})	DOP (mg m^{-3})	PP (mg m^{-3})	TP (mg m^{-3})	NH_4-N (mg m^{-3})	NO_3-N (mg m^{-3})	DON (mg m^{-3})	PN (mg m^{-3})	TN (mg m^{-3})	Chlorophyll *a* (mg m^{-3})	PC (mg m^{-3})
29/08/2002	11.1	9.5	1.6	1.4	3.1	6.1	0.0	0	90	23	113.0	2.6	196
18/09/2002	11.4	12	1.3	1.7	2	5.0	0	0.3	47	13	60.3	0.9	196.5
9/10/2002	11.6	15.5	1.3	2.7	2.1	6.1	2.9	0	29	12	43.9	0.6	159.5
13/11/2002	12.6	18	0.9	1.1	2.4	4.4	1.7	1.3	41	14.0	58.0	0.7	158.5
28/11/2002	14.1	12.7	0.7	2.3	2.7	5.7	0.1	0.0	43.0	22.0	65.1	0.7	201.5
18/12/2002	15.0	13.5	0.6	1.8	2.5	4.9	0.2	0.1	47.0	14.0	61.3	0.4	123.0
30/01/2003	17.8	18	0.4	3.6	1.9	5.9	0.4	0.1	56.5	12.0	69.0	0.7	166.0
13/02/2003	19.3	19	0.5	2.5	1.6	4.6	0.0	0.4	43.6	8.0	52.0	0.5	146.0
17/03/2003	18.5	15	0.8	2.2	1.7	4.7	<1	0.4	45.6	13.0	59.0	1.0	212
3/04/2003	19.3	13.5	1.1	2.9	1.8	5.8	<1	0.5	78.5	17.7	96.7	1.1	234.5
28/04/2003	16.7	14	0.3	3.7	1.9	5.9	<1	0.3	73.7	15.6	89.6	1.5	208.5
15/05/2003	15.6	16.5	0.1	3.9	2.2	6.2	0.3	0.3	50.4	19.5	70.5	1.4	228.5
12/06/2003	13.5	11	1.3	2.7	2.2	6.2	0.3	0.4	40.3	13.7	54.7	1.3	111.0
14/07/2003	11.8	14.5	2.2	1.8	2.6	6.6	1.1	1.1	34.8	18.0	55.0	1.8	102.0
31/07/2003	11.4	14	2.4	1.6	2.4	6.4	1.3	3.7	46.0	16.7	67.7	2.0	89.5
14/08/2003	11.2	13.5	1.8	2.2	3.1	7.1	0.7	0.2	46.1	21.1	68.1	2.9	91.5
26/08/2003	11.2	13	3.0	1.0	4.0	8.0	1.0	0.2	42.8	21.7	65.7	2.9	135.5
8/09/2003	11.1	12.5	2.6	0.4	3.3	6.3	0.4	0.2	45.2	17.4	63.2	1.5	199.5
7/10/2003	11.4	13.0	2.6	1.6	2.8	7.0	0.3	0.2	54.5	17.8	72.8	1.2	157.5
21/10/2003	13.0	17.0	2.0	1.0	2.3	5.3	0.1	1.3	39.6	14.0	55.0	0.6	146.0
19/11/2003	13.9	16.0	1.7	1.3	2.8	5.8	0.3	0.1	45.6	20.0	66.0	0.8	148.0
4/12/2003	16.0	18.5	1.6	2.4	1.8	5.8	0.2	0.1	53.7	13.4	67.4	0.3	106.5
18/12/2003	17.7	17.5	1.1	3.9	3.1	8.1	0.0	0.0	49.0	20.6	69.6	0.4	151.5
13/01/2004	20.3	19.0	0.5	3.5	1.6	5.6	0.0	0.3	52.0	12.5	64.8	0.4	127.0
26/02/2004	17.2	17.0	1.4	1.7	1.6	4.7	0.0	0.1	40.9	15.5	56.5	0.7	139.0
8/03/2004	17.5	15.0	0.6	2.4	2.0	5.0	0.4	0.1	42.5	12.4	55.4	0.6	177.5
31/03/2004	16.4	16.0	0.8	5.2	1.9	7.9	0.2	0.2	78.6	11.5	90.5	1.2	159.5
14/04/2004	15.3	15.0	1.0	3.0	2.4	6.4	0.1	0.3	46.6	16.0	63.0	1.3	187.5
10/05/2004	14.7	18.0	0.6	4.4	1.8	6.8	0.1	0.2	64.7	16.8	81.8	1.2	215.0
10/06/2004	13.6	13.5	0.9	2.1	2.1	5.1	0.0	0.6	63.4	17.8	81.8	1.0	371.5
13/07/2004	11.6	12.0	1.8	3.2	2.4	7.4	0.3	4.5	37.2	19.4	61.4	1.6	193.3
26/07/2004	11.3	11.0	1.6	2.4	3.0	7.0	0.5	2.4	38.1	23.4	64.4	2.7	196.0
24/08/2004	10.9	12.5	0.8	3.2	2.7	6.7	0.0	0.5	58.5	18.6	77.6	2.3	181.5
7/09/2004	10.7	12.0	0.6	2.4	2.7	5.7	0.0	0.1	40.9	15.5	56.5	1.4	162.5
21/10/2004	11.6	15.0	1.0	3.0	2.0	6.0	0.0	0.0	33.0	13.0	46.0	0.7	185.0
2/11/2004	12.9	16.0	1.0	3.0	1.9	5.9	2.2	0.8	62.0	14.7	79.7	0.6	147.0
22/11/2004	15.1	16.0	0.7	2.3	2.1	5.1	0.1	0.2	49.7	16.4	66.4	0.4	195.0
15/12/2004	14.1	19.5	0.7	3.3	2.2	6.2	0.0	0.2	45.8	14.7	60.7	0.2	127.5

Date Collected	Temp. ºC	Secchi (m)	DRP (mg m^{-3})	DOP (mg m^{-3})	PP (mg m^{-3})	TP (mg m^{-3})	NH_4-N (mg m^{-3})	NO_3-N (mg m^{-3})	DON (mg m^{-3})	PN (mg m^{-3})	TN (mg m^{-3})	Chlorophyll *a* (mg m^{-3})	PC (mg m^{-3})
11/01/2005	16.0	20	0.4	2.6	1.4	4.4	0	0.1	42.9	12.5	55.5	0.2	137
25/01/2005	19.3	19.5	0.5	2.5	1.5	4.5	0.0	0.1	54.9	14.5	69.5	0.3	131.0
9/02/2005	20.7	18	2.2	0.8	1.4	4.4	0.5	0.0	38.5	12.7	51.7	0.2	136.0
22/02/2005	20.0	21.5	0.8	5.2	1.7	7.7	1.5	0.5	58.0	15.8	75.8	0.2	159.0
10/03/2005	19.3	18.5	0.2	2.8	1.4	4.4	1.8	0.2	34.0	14.5	50.5	0.4	158.0
21/03/2005	19.3	20	0.8	3.2	1.2	5.2	0.5	0.1	43.4	10.0	54.0	0.5	140.0
14/04/2005	17.9	17.2	0.9	2.1	1.6	4.6	0.8	0.2	54.0	14.0	69.0	0.7	177.0
18/05/2005	14.3	16	0.8	2.2	1.9	4.9	0.0	0.5	46.5	13.9	60.9	1.3	177.5
9/06/2005	13.0	14.1	0.6	3.4	2.2	6.2	0.1	1.6	41.3	17.4	60.4	1.3	140.5
20/06/2005	12.7	13.8	0.6	3.4	2.0	6.0	0.1	1.0	39.9	18.5	59.5	1.2	158.5
20/07/2005	11.5	13	3.9	6.1	2.5	12.5	0.8	0.8	97.4	19.1	118.1	2.1	169
3/08/2005	11.1	14	2.6	1.4	2.3	6.3	2.0	1.4	61.6	20.3	85.3	1.2	116
17/08/2005	11.2	13	3.1	1	3.2	7.3	0.3	2.1	49.6	26.4	78.4	1.7	172.5
31/08/2005	11.7	13	2	1	2.4	5.4	<1	1	69	22.2	92.2	1.3	330
14/09/2005	12.4	13	1	1	2.5	4.5	<1	<1	60	19.9	79.9	0.8	243
29/09/2005	11.9	14	1	1	2.4	4.4	<1	<1	67	18	85	0.8	253.5
12/10/2005	11.9	14	0.7	2.3	2.7	5.7	0.0	0.7	56.3	23.2	80.2	0.8	301
25/10/2005	13.4	15	0.8	4.2	1.8	6.8	0.6	0.7	54.7	16.8	72.8	0.6	193
10/11/2005	16.3	17.5	1.2	3.8	1.5	6.5	0.2	0.1	52.7	15.6	68.6	0.5	160
1/12/2005	15.1	19.3	0.6	2.4	1.4	4.4	0	0.3	39.7	16.1	56.1	0.4	141
10/01/2006	17.4	19	1	2	1.4	4.4	0.1	1	49.9	17.8	68.8	0.5	167
2/02/2006	20.2	15.5	1.1	8.9	1.5	11.5	0.0	0.0	54	18	72	1.1	193.5
1/03/2006	19.5	15.3	0.3	7.7	1.6	9.6	0.0	1.3	38.7	18.5	58.5	0.9	160.5
12/04/2006	16.7	15.8	0.6	2.4	1.6	4.6	0.0	0.0	43	20.4	63.4	1.0	230
27/04/2006	16.3	17	1.0	2	1.6	4.6	0.1	0.0	52.9	17.6	70.6	1.1	196.5
9/05/2006	15.7	17.5	0.7	2.3	1.6	4.6	0.7	0.1	46.2	17.2	64.2	0.9	233
30/05/2006	14.2	18.2	0.8	2.2	1.6	4.6	1.8	0.9	61.3	16.6	80.6	1.3	233
27/06/2006	11.9	15.2	0.8	3.2	1.9	5.9	0.8	1.3	61.9	23.2	87.2	2	243
11/07/2006	11.5	13.5	1.4	5.6	2.3	9.3	0.2	1.7	93.1	21	116	1.7	209
25/07/2006	11.1	12	1.0	0	2.1	3.1	0.9	7.4	48.7	17.6	74.6	2.8	192
4/09/2006	11.1	11	1.8	1.2	2.5	5.5	0.0	0.6	31.4	24.5	56.5	2.8	218
26/09/2006	11.9	17.5	1.0	0.8	2.3	4.1	0.0	0.1	39.9	18.6	58.6	0.8	347

Lake Taupo cumulative database of 10 m tube sample data
Samples collected from Kuratau Basin (Site B)

Date Collected	Temp. ^{o}C	Secchi m	DRP mg m^{-3}	DOP mg m^{-3}	PP mg m^{-3}	TP mg m^{-3}	NH_4-N mg m^{-3}	NO_3-N mg m^{-3}	DON mg m^{-3}	PN mg m^{-3}	TN mg m^{-3}	Chlorophyll *a* mg m^{-3}	PC mg m^{-3}
8/01/2002	18.1	13.5	0.4	2	2.2	4.6	0.4	1.3	48	16.7	66.4	0.9	233
22/01/2002	18.8	12	0.9	2	2.6	5.5	0.9	0.3	41	19.9	62.1	0.9	221
6/03/2002	18.6	14.5	0.3	2	2.3	4.6	1.4	0.5	73	18.3	93.2	0.9	207
4/04/2002	17.4	19.5	0.6	2	1.5	4.1	0.4	0.1	40	11.2	51.7	0.9	162
17/04/2002	16.8	19	0.0	3	1.6	4.6	0.5	0.1	45	12.3	57.9	0.9	143
5/05/2002	15.1	13.2	0.3	1.1			1.6	0.4	40			0.9	
19/06/2002	12.5	15	1.0	1	2.2	4.2	0.4	0.8	48.2	17.4	66.8	1.5	182
1/07/2002	12.1	16	1.5	1.5	1.8	4.8	0.8	1.7	41.5	14.2	58.2	1.6	146
17/07/2002	11.5	12.5	1.8	2.2	2	6	0.8	5.1	51.1	16.1	73.1	1.5	156.5
31/07/2002	11.3	10.5	2.0	3	2.5	7.5	1.5	2.2	81.5	18.5	103.7	2.6	194.5
29/08/2002	11.0	8	1.2	4.8	3.3	9.3	0	0.2	184.0	22.9	207.1	2.3	221
18/09/2002	11.1	11	1.9	2.1	2.1	6.1	0.4	0.6	43.4	14	58.4	1.1	149
9/10/2002	11.7	16	1.4	1.6	1.7	4.7	4.4	0.2	19.6	11.7	35.9	0.5	149
13/11/2002	12.0	14	1	3	2.5	6.5	0.3	0	35	15.2	50.5	1.8	478
28/11/2002	13.8	12.7	0.9	2.9	2	5.8	0	0	40	16.7	56.7	0.7	203.5
18/12/2002	15.2	14	0.6	1.4	2.1	4.1	0	0.1	36	11.2	47.3	0.4	143
30/01/2003	16.8	18	0.5	2.5	1.7	4.7	<1	0.8	43	12.1	55.9	0.6	148.5
13/02/2003	18.8	11	0.7	1.3	1.6	3.6	0.4	0.2	45	9.3	54.9	0.7	131
17/03/2003	18.7	14	0.5	3.5	2	6	<1	0.7	49	16.3	66.0	1.0	208
3/04/2003	19.0	12.8	0.6	3.4	2.1	6.1	<1	0.1	50	19.6	69.7	1.1	239.5
28/04/2003	16.7	13.5	0.6	3.4	1.6	5.6	<1	0.2	57	13.1	70.3	1.4	218.5
15/05/2003	15.7	15.5	0.4	3.6	1.8	5.8	<1	0.2	63	13.5	76.7	1.7	229.5
12/06/2003	12.5	12	1.7	1.3	2.2	5.2	0.1	2.8	39.1	13.9	55.9	1.3	
14/07/2003	11.8	12	1.7	2.3	2.2	6.2	0.9	1.9	39.4	15.9	58.1	1.7	96.5
31/07/2003	11.3	13	2.1	1.9	2.7	6.7	1.2	2.0	43.8	18.0	65.0	2.1	108.5
14/08/2003	11.4	13	1.8	2.2	3.3	7.3	0.3	0.3	33	22.3	55.9	2.5	112.0
26/08/2003	11.3	11.5	3.1	0.9	4.0	8	0.4	0.1	37	22.4	59.9	3.1	148.0
8/09/2003	11.1	11	2.5	1.5	3.3	7.3	0.4	0.1	36	23.5	60.0	1.4	196.5
7/10/2003	11.7	9.5	2.3	1.7	3.0	7.0	0.0	0.1	49.9	20.5	70.5	1.2	185.5
21/10/2003	13.2	15.0	2.2	0.8	2.7	5.7	0.3	0.2	38.5	14.9	53.9	0.8	155.5
19/11/2003	13.8	17.0	1.6	2.4	2.4	6.4	0.0	0.1	51.0	14.6	65.7	0.6	139.5
4/12/2003	15.6	17.0	1.8	2.2	1.8	5.8	0.2	0.1	44.7	13.5	58.5	0.4	126.5
18/12/2003	17.0	15.0	0.5	3.5	1.9	5.9	0.0	0.2	56.0	12.4	68.6	0.5	145.5
13/01/2004	20.3	16.0	0.4	4.6	1.8	6.8	0.0	0.2	54.0	13.7	67.9	0.5	125.0

Date Collected	Temp. ºC	Secchi (m)	DRP (mg m^{-3})	DOP (mg m^{-3})	PP (mg m^{-3})	TP (mg m^{-3})	NH_4-N (mg m^{-3})	NO_3-N (mg m^{-3})	DON (mg m^{-3})	PN (mg m^{-3})	TN (mg m^{-3})	Chlorophyll *a* (mg m^{-3})	PC (mg m^{-3})
26/02/2004	16.8	13.5	1.1	1.9	1.8	4.8	0.6	0.1	42.3	15.8	58.8	0.8	157.0
8/03/2004	17.6	5.0	0.8	2.2	3.1	6.1	1.0	0.3	41.7	17.5	60.5	0.9	172.0
31/03/2004	15.9	11.0	0.8	3.2	1.8	5.8	0.7	0.2	45.1	9.9	55.9	1.4	124.5
14/04/2004	15.0	14.0	0.9	4.1	2.2	7.2	0.6	0.3	52.1	14.9	67.9	1.3	171.5
10/05/2004	14.7	15.5	0.8	2.2	1.7	4.7	0.0	0.2	59.8	15.9	75.9	1.3	179.0
10/06/2004	12.9	12.0	1.4	2.6	2.1	6.1	0.0	0.2	108.8	18.6	127.6	1.2	183.0
13/07/2004	11.4	11.0	2.1	2.9	2.5	7.5	0.0	8.4	40.6	19.3	68.3	1.4	154.0
26/07/2004	11.2	10.0	1.3	2.7	3.2	7.2	0.2	5.8	38.0	25.0	69.0	2.7	204.0
24/08/2004	10.9	10.0	0.7	3.3	3.1	7.1	0.0	0.0	47.0	20.9	67.9	2.5	158.0
7/09/2004	10.8	11.0	0.7	2.3	2.6	5.6	0.0	0.2	44.8	17.1	62.1	1.5	172.5
21/10/2004	11.7	11.0	1.2	1.8	2.1	5.1	0.2	0.0	30.8	16.1	47.1	0.8	172.5
2/11/2004	13.1	15.0	1.0	2.0	1.7	4.7	0.2	0.1	42.7	11.0	54.0	0.5	152.0
22/11/2004	14.9	15.0	0.6	3.4	1.6	5.6	0.6	0.0	33.4	9.5	43.5	0.5	141.5
15/12/2004	13.2	17.2	0.6	3.4	1.6	5.6	0.4	0.1	39.5	12.6	52.6	0.2	120.0

Lake Taupo cumulative database of 10 m tube sample data

Samples collected from Western Bays (Site C)

Date Collected	Temp.	Secchi	DRP	DOP	PP	TP	NH_4-N	NO_3-N	DON	PN	TN	Chlorophyll *a*	PC
	°C	m	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
8/01/2002	18.72	14.5	0.9	4	2.3	7.2	0.9	0.6	88	16.1	105.6	0.8	213
22/01/2002	18.82	15.5	0.7	2	2.2	4.9	0.7	0.0	37	16.8	54.5	0.8	221
6/03/2002	18.68	16	0.2	2	2	4.2	0	0.1	45	16	61.1	0.7	177
4/04/2002	17.47	19	0.6	2	1.4	4	0.0	0.0	38	8.8	46.8	0.9	152
17/04/2002	16.88	18.5	0	3	1.6	4.6	0.7	0.2	44	11.8	56.7	0.9	167
5/05/2002	15.6	15.6	0.4	1			2	0.2	45			1.1	
19/06/2002	12.58	16	0.9	2.1	2	5	0.3	1.2	38.8	15.9	56.2	0.9	161
1/07/2002	12.22	14	1.3	1.7	1.9	4.9	0.3	0.4	45	15	60.7	1.4	148
17/07/2002	11.52	12.5	1.9	2.1	2	6	0.9	4.9	46.1	16.3	68.2	1.5	160
31/07/2002	11.6	12	2.3	2.7	2.3	7.3	1.7	4.0	113.3	16.7	135.7	2.3	150
29/08/2002	11.4	8	1	3	3.2	7.2	0	0	177	22.3	199.3	2.4	217
18/09/2002	11.24	12	2.8	2.2	2	7	1.7	0.4	45.3	11.7	59.1	0.9	152
9/10/2002	12.10	19	1.5	1.5	1.7	4.7	0.3	0.2	28	10.2	38.7	0.4	116
13/11/2002	12.60	16	1.1	2.9	2	6	0.1	0	51	12.2	63.3	0.6	141
28/11/2002	13.90	15.5	0.9	2.1	2	5	0.4	0.4	40	14.4	55.2	0.8	125.5
18/12/2002	15.10	13.5	0.8	2.2	1.9	4.9	0	0.3	45	10.2	55.5	0.5	136.5
30/01/2003	17.60	18.5	0.5	2.5	1.5	4.5	<1	0.1	46	8.6	54.7	0.4	141.5
13/02/2003	19.50	19	0.6	1.4	1.6	3.6	0	0.1	42	8.4	50.5	0.5	104
17/03/2003	18.70	15	0.5	2.5	1.7	4.7	<1	0.4	46	14.6	61.0	1.1	215
3/04/2003	18.80	14.5	0.5	2.5	1.6	4.6	<1	0.4	49	16.5	65.9	1.2	204
28/04/2003	17.00	14.5	0.4	2.6	1.4	4.4	<1	0.4	54	12.2	66.6	1.5	191
15/05/2003	15.60	17	0.1	3.9	2.2	6.2	<1	0.1	56	18	74.1	1.3	197
12/06/2003	13.70	11	1.3	1.7	2	5	0.1	0.9	40	13.8	54.8	1.3	
14/07/2003	11.80	14	1.9	2.1	2	6	1	4.7	39.3	14.9	59.9	1.5	85.0
31/07/2003	11.40	12	3.1	5.9	2.8	11	0.1	4.0	55	20.3	79.4	2.3	101.5
14/08/2003	11.50	14.5	2.4	2.6	2.9	7.9	1.1	3.8	46.1	19.5	70.5	2.8	92.5
26/08/2003	11.30	13	2.8	2.2	3.8	8.8	0.5	0.2	39	25.0	64.7	3.2	174.5
8/09/2003	11.30	12	2.6	0.4	3	6	0.1	0.1	40	19.5	59.7	1.3	233.0
7/10/2003	11.7	12.5	2.7	1.3	2.8	6.8	0.0	0.3	44.7	18.4	63.4	1.5	157.5

Date Collected	Temp. ºC	Secchi (m)	DRP (mg m^{-3})	DOP (mg m^{-3})	PP (mg m^{-3})	TP (mg m^{-3})	NH_4-N (mg m^{-3})	NO_3-N (mg m^{-3})	DON (mg m^{-3})	PN (mg m^{-3})	TN (mg m^{-3})	Chlorophyll *a* (mg m^{-3})	PC (mg m^{-3})
21/10/2003	13.0	12.0	1.5	1.5	3.1	6.1	0.3	0.0	44.7	17.4	62.4	1.1	195.0
19/11/2003	14.3	17.2	1.5	1.5	2.3	5.3	0.8	0.0	38.2	14.4	53.4	0.7	123.0
4/12/2003	15.5	17.0	1.7	3.3	1.7	6.7	0.0	0.2	46.8	11.2	58.2	0.5	129.0
18/12/2003	17.0	19.0	0.5	4.5	1.5	6.5	0.0	0.0	47.0	9.9	56.9	0.4	124.5
13/01/2004	20.2	17.5	0.7	4.3	1.6	6.6	0.0	0.1	53.0	11.9	65.0	0.4	118.5
26/02/2004	16.9	14.0	0.9	2.1	2.2	5.2	0.8	0.4	40.8	17.2	59.2	0.7	156.0
8/03/2004	18.4	13.0	0.8	2.2	2.0	5.0	0.7	0.1	34.2	11.1	46.1	0.6	124.0
31/03/2004	16.4	12.5	0.6	3.4	2.0	6.0	0.7	0.3	51.0	12.3	64.3	1.2	175.5
14/04/2004	15.4	16.5	0.9	3.1	2.3	6.3	0.6	0.3	50.1	14.2	65.2	1.2	159.0
10/05/2004	14.9	16.0	0.8	3.2	1.6	5.6	0.0	0.2	48.8	15.4	64.4	1.1	153.0
10/06/2004	13.1	14.0	0.8	2.2	2.0	5.0	0.0	0.2	41.8	16.6	58.6	1.0	151.0
13/07/2004	11.6	12.5	1.3	2.7	2.5	6.5	0.0	5.9	39.1	19.9	64.9	1.6	156.5
26/07/2004	11.5	11.0	1.5	2.5	2.9	6.9	0.3	2.7	46.0	22.2	71.2	2.4	180.5
24/08/2004	10.9	10.0	1.0	3.0	2.9	6.9	0.0	0.4	37.6	18.5	56.5	2.5	161.0
7/09/2004	11.1	12.0	1.2	3.8	2.6	7.6	0.0	0.0	54.0	16.8	70.8	1.5	202.0
21/10/2004	11.7	12.0	1.1	1.9	1.9	4.9	0.2	0.0	35.8	14.8	50.8	0.6	167.5
2/11/2004	12.4	17.0	1.0	3.0	1.7	5.7	0.3	1.2	45.5	16.3	63.3	0.4	173.0
22/11/2004	14.8	16.0	0.5	3.5	1.7	5.7	0.0	0.2	37.8	10.8	48.8	0.5	149.0
15/12/2004	14.2	20.8	0.9	4.1	1.4	6.4	0.0	0.0	42.0	12.2	54.2	0.2	131.0

Lake Taupo biannual nutrient database **2005-2006** Started 27 October 1994

Collection date 25 October 2005 Secchi depth = 15.0 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4-N	NO_3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		mS cm^{-1}	^oC	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
QD1	1	7.81	119	13.40	10.1	<0.5	<0.5	0.4	1.0	3.0	1.3	5.3	0.6	0.3	51.1	4	8.5	60.5	613	132.5	11.0
QD2	10	7.88	119	12.88	10.0	0.5	<0.5	0.5	0.7	2.3	1.9	4.9	0.1	0.0	52.9	3	12.8	65.8	623	169.0	13.5
QD3	20	7.74	119	12.17	10.1	0.6	<0.5	0.7	0.6	2.4	2.7	5.7	0.4	0.2	43.4	2	17.0	61.0	625	216.5	20.0
QD4	30	7.77	118	11.65	9.9	0.7	<0.5	0.6	0.6	5.4	2.6	8.6	0.7	0.0	57.3	2	17.3	75.3	566	212.0	16.0
QD5	40	7.68	119	11.49	9.8	<0.5	<0.5	0.9	0.6	3.4	3.1	7.1	0.0	0.2	49.8	2	22.2	72.2	581	229.5	20.5
QD6	50	7.59	119	11.29	9.5	<0.5	<0.5	1.4	0.8	1.2	2.2	4.2	1.4	0.1	35.5	2	15.9	52.9	599	172.5	14.0
QD7	60	7.46	120	11.18	9.2	0.7	<0.5	0.7	1.7	2.3	1.6	5.6	1.7	9.6	41.7	2	9.8	62.8	503	103.5	6.5
QD8	70	7.37	120	11.07	9.0	0.5	<0.5	0.8	1.9	2.1	1.5	5.5	1.6	12.8	56.6	2	9.2	80.2	482	101.5	6.0
QD9	80	7.35	120	11.01	8.8	0.6	<0.5	0.6	2.5	1.5	1.4	5.4	0.6	15.3	30.1	13	9.0	55.0	521	86.5	6.0
QD10	90	7.36	121	10.97	8.8	0.7	<0.5	0.4	2.8	1.2	1.4	5.4	0.3	17.1	47.6	2	7.3	72.3	478	62.5	4.0
QD11	100	7.29	121	10.97	8.6	<0.5	<0.5	0.5	2.8	1.2	1.4	5.4	0.4	17.4	39.2	2	7.8	64.8	476	77.5	4.5
QD12	110	7.34	120	10.94	8.5	<0.5	<0.5	0.5	3.0	1.0	1.3	5.3	1.5	18.7	48.8	2	7.4	76.4	462	92.5	3.0
QD13	120	7.29	121	10.94	8.5	<0.5	<0.5	0.5	2.8	2.2	1.2	6.2	0.8	20.4	42.8	2	6.2	70.2	549		5.0
QD14	130	7.32	120	10.93	8.4	<0.5	<0.5	0.5	2.7	1.3	1.3	5.3	0.1	20.3	35.6	3	5.9	61.9	504	69.5	6.0
QD15	140	7.34	121	10.93	8.4	<0.5	<0.5	0.6	3.0	2.0	1.4	6.4	1.4	20.9	34.7	1	7.8	64.8	352	77.5	6.5
QD16	150	7.26	120	10.92	8.2	<0.5	<0.5	0.5	3.8	1.2	1.5	6.5	0.9	23.5	29.6	3	7.1	61.1	533	66.0	6.0

Collection date 12 April 2006 Secchi depth = 15.8 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4-N	NO_3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		mS cm^{-1}	^oC	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
ZD1	1	7.9	119	16.72	9.6	<0.5	<0.5	1.2	1.1	0.9	1.9	3.9	0.0	0.2	50.8	2	19.2	70.2		213.5	19.0
ZD2	10	7.9	118	16.72	9.2	<0.5	<0.5	1.3	0.8	1.2	1.6	3.6	0.0	0.0	38.0	2	16.6	54.6		196.0	13.5
ZD3	20	7.9	116	16.72	9.0	0.5	<0.5	1.1	0.7	0.3	1.3	2.3	0.0	0.0	42.0	<1	15.65	57.7		235.0	15.5
ZD4	30	7.88	120	16.71	9.4	<0.5	<0.5	1.2	0.6	1.4	1.6	3.6	0.1	0.0	50.9	<1	15.45	66.5		172.0	13.5
ZD5	40	7.9	116	16.64	9.2	0.8	0.7	1.3	0.5	1.5	1.55	3.6	0.0	0.0	41.0	2	15.45	56.5		224.5	13.0
ZD6	50	7.6	119	12.11	8.7	<0.5	<0.5	1.0	0.7	2.3	1.2	4.2	0.0	0.1	33.9	8	11.4	45.4		133.0	8.5
ZD7	60	7.43	121	11.52	8.5	<0.5	<0.5	1.0	0.7	2.3	1.05	4.1	0.0	0.5	44.5	2	9.15	54.2		171.5	8.0
ZD8	70	7.49	121	11.31	8.3	<0.5	<0.5	0.9	0.7	2.3	1.15	4.2	0.0	0.7	37.3	6	9.55	47.6		130.5	9.0
ZD9	80	7.9	120	11.18	8.3	<0.5	<0.5	1.1	0.5	2.5	1.4	4.4	0.3	0.0	50.7	5	16.1	67.1		182.0	12.5
ZD10	90	7.31	122	11.11	8.1	<0.5	<0.5	0.2	3.0	1	0.45	4.5	0.0	23.0	28.0	2	4.1	55.1		62.5	6.0
ZD11	100	7.31	122	11.08	8.1	<0.5	<0.5	0.3	3.2	0.8	0.5	4.5	0.1	22.8	24.1	<1	4.95	52.0		68.5	6.5
ZD12	110	7.91	119	11.05	8.0	0.7	0.5	1.1	3.2	1.8	1.5	6.5	0.1	22.2	25.7	3	16.5	64.5		196.0	15.0
ZD13	120	7.42	122	11.03	7.9	<0.5	<0.5	0.3	3.1	1.9	0.5	5.5	0.0	21.6	27.4	<1	5.2	54.2		86.5	7.0
ZD14	130	7.5	121	11.02	7.7	<0.5	<0.5	0.3	3.0	2	0.55	5.6	0.0	19.9	32.1	2	5.45	57.5		69.5	6.5
ZD15	140	7.3	119	11.02	7.3	<0.5	<0.5	0.2	3.4	1.6	0.55	5.6	0.0	23.1	31.9	2	6.5	61.5		87.0	7.5
ZD16	150	7.24	122	11.02	7.2	<0.5	<0.5	0.3	2.9	1.1	0.55	4.6	0.2	21.0	28.8	5	5.85	55.9		77.5	7.0

NH_4, NO_3, DON, Urea all as N * = PN by wet digestion method, ** = PN by combustion furnace method.

Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 mg m^{-3}

New Analytical instrument (Flow Injection Analysis) from January 2002, gives greatly improved resolution at low levels.

FIA instrument results are given as a better indication of likely absolute low levels of DRP, NO_3-N, and NH_4-N below nominal detection limit.

Lake Taupo biannual nutrient database **2004-2005** Started 27 October 1994

Collection date 21 October 2004 Secchi depth = 15.0 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4-N	NO_3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		mS cm^{-1}	^{o}C	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
VZ1	1	7.88	122	11.75	10.4	0.6	0.5	0.6	1.3	2.7	1.6	5.6	0.1	0.4	39.5	19	9.7	49.7	500	110.0	8
VZ2	10	7.82	120	11.61	10.2	0.8	0.6	0.8	1.1	2.9	2.0	6.0	0.2	0.1	35.7	24	12.8	48.8	447	157.0	8.5
VZ3	20	7.87	120	11.59	10.1	0.9	0.7	0.8	1.0	3.0	1.9	5.9	0.0	0.0	33.0	16	11.3	44.3	440	153.0	8.5
VZ4	30	7.91	123	11.59	10.2	1.5	1.0	0.7	1.0	2.0	1.9	4.9	0.0	0.0	34.0	15	11.3	45.3	490	157.5	8
VZ5	40	7.82	117	11.58	10.1	1.1	0.6	0.7	1.4	3.6	2.0	7.0	0.2	0.1	33.7	7	11.2	45.2	445	155.0	10
VZ6	50	7.83	120	11.58	9.9	1.1	0.7	0.9	1.0	4.0	2.1	7.1	0.0	0.1	33.9	9	13.2	47.2	494	197.5	15
VZ7	60	7.79	119	11.15	9.9	1.1	0.7	1.0	1.6	2.4	2.3	6.3	0.5	0.4	34.1	11	26.0	61.0	585	167.0	16
VZ8	70	7.66	118	10.79	9.7	0.7	0.5	1.0	1.9	1.1	1.9	4.9	2.4	0.8	40.8	21	11.5	55.5	468	114.0	11.5
VZ9	80	7.63	118	10.74	9.6	0.6	<0.5	0.9	2.0	1.0	1.7	4.7	2.8	1.3	47.9	16	8.9	60.9	440	103.0	9.5
VZ10	90	7.61	119	10.72	9.5	0.6	<0.5	0.7	2.0	2.0	1.6	5.6	3.9	2.2	28.9	9	9.1	44.1	633	100.5	10
VZ11	100	7.53	118	10.70	9.4	0.7	0.5	0.7	2.3	1.7	1.5	5.5	5.1	3.6	34.3	7	9.0	52.0	570	93.0	10
VZ12	110	7.56	119	10.68	9.4	0.5	<0.5	0.7	2.0	5.0	1.6	8.6	5.3	2.8	28.9	9	9.2	46.2	514	101.5	9
VZ13	120	7.49	119	10.66	9.3	0.5	<0.5	0.7	2.1	1.9	1.5	5.5	5.3	3.9	35.8	6	8.5	53.5	391	91.5	11
VZ14	130	7.48	118	10.65	9.3	<0.5	<0.5	0.6	2.5	1.5	1.6	5.6	5.8	5.3	34.9	5	8.6	54.6	366	73.5	8.5
VZ15	140	7.58	118	10.61	9.2	<0.5	<0.5	0.6	2.9	1.1	1.6	5.6	5.9	7.3	33.8	13	9.1	56.1	491	93.5	10.5
VZ16	150	7.58	119	10.56	9.1	<0.5	<0.5	0.6	2.4	1.6	1.5	5.5	4.5	3.3	35.2	21	8.7	51.7	464	78.0	9

Collection date 14 April 2005 Secchi depth = 17.2 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4-N	NO_3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		mS cm^{-1}	^{o}C	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
GC1	1	7.85	119	17.92	9.1	0.4	0.4	0.7	0.8	1.2	1.9	3.9	1.2	0.2	64.6	7	15.1	81.1	690	176.0	19.0
GC2	10	7.86	118	17.96	9.0	0.3	0.4	0.9	0.8	2.2	1.9	4.9	0.0	0.0	46	3	14.1	60.1	580	199.5	19.0
GC3	20	7.9	119	17.95	9.0	0.3	0.3	0.9	0.8	2.2	2.0	5.0	0.0	0.1	55.9	1	14.5	70.5	580	179.0	17.0
GC4	30	7.82	118	15.13	8.4	0.3	0.3	0.9	0.8	2.2	1.8	4.8	0.0	0.3	49.7	2	12.8	62.8	570	176.5	17.0
GC5	40	7.58	121	12.92	8.7	0.2	0.2	0.8	2.3	0.7	1.2	4.2	0.3	0.6	31.1	2	8.9	40.9	510	109.5	14.0
GC6	50	7.51	120	12.00	8.3	0.1	0.1	0.6	3.1	0.9	1.0	5.0	0.0	6.4	39.6	3	6.8	52.8	480	84.0	9.0
GC7	60	7.47	121	11.33	8.2	0.1	0.1	0.5	3.6	1.4	1.1	6.1	0.0	8.3	40.7	2	8.2	57.2	510	78.5	7.5
GC8	70	7.48	120	10.99	8.2	0.1	0.1	0.3	4.2	0.8	0.9	5.9	0.0	15.7	38.3	2	6.5	60.5	490	96.0	7.0
GC9	80	7.39	121	10.88	8.2	0.2	0.2	0.3	3.8	0.2	0.8	4.8	0.1	15.7	36.2	1	4.3	56.3	480	72.5	7.5
GC10	90	7.21	121	10.82	8.3	0.0	0.1	0.1	5.6	1.4	0.9	7.9	0.2	23.8	38	2	5.6	67.6	480	64.0	7.0
GC11	100	7.31	121	10.78	8.0	0.0	0.1	0.1	5.7	1.3	0.8	7.8	0.2	23.6	53.2	2	5.0	82.0	460	78.5	7.0
GC12	110	7.32	121	10.76	7.8	0.1	0.1	0.1	5.7	1.3	0.8	7.8	0.0	25.9	47.1	2	5.6	78.6	470	43.5	6.0
GC13	120	7.33	121	10.76	7.7	0.1	0.1	<0.1	6.4	1.6	0.8	8.8	0.3	26.8	37.9	1	4.9	69.9	450	56.0	6.5
GC14	130	7.33	121	10.74	7.7	0.1	0.1	<0.1	6.1	0	0.8	6.8	0.3	26.7	57	1	4.4	88.4	470	43.5	5.5
GC15	140	7.34	121	10.74	7.6	0.1	0.1	<0.1	6.6	0.4	0.9	7.9	0.2	28.8	39	2	5.8	73.8	490	54.5	6.0
GC16	150	7.36	121	10.72	7.5	0.3	0.1	0.1	7.8	0.2	1.1	9.1	0.0	32.1	51.9	1	6.9	90.9	490	46.0	7.5

NH_4, NO_3, DON, Urea all as N * = PN by wet digestion method, ** = PN by combustion furnace method.

Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 mg m^{-3}

New Analytical instrument (Flow Injection Analysis) from January 2002, gives greatly improved resolution at low levels.

FIA instrument results are given as a better indication of likely absolute low levels of DRP, NO_3-N, and NH_4-N below nominal detection limit.

Lake Taupo biannual nutrient database **2003-2004** Started 27 October 1994

Collection date 19 November 2003 Secchi depth = 16.0 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4-N	NO_3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		mS cm^{-1}	^oC	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
EU1	1	7.84	119	13.96	9.9	<0.5	<0.5	0.8	1.7	2.3	2.3	6.3	8.0	0.8	42.2	1	14.8	65.8	476	90.5	10.5
EU2	10	7.84	120	13.79	9.9	<0.5	<0.5	0.9	1.6	1.4	2.5	5.5	0.3	0.3	52.4	1	14.4	67.4	461	147.5	15.0
EU3	20	7.83	120	13.78	9.8	<0.5	<0.5	0.7	1.8	1.2	3.4	6.4	0.4	0.1	46.5	1	19.4	66.4	466	151.0	20.5
EU4	30	7.84	120	13.70	9.5	<0.5	<0.5	0.9	1.8	2.2	3.8	7.8	0.4	0.3	42.3	1	26.3	69.3	450	133.0	18.5
EU5	40	7.69	120	12.30	9.3	<0.5	<0.5	1.5	2.6	1.4	3.3	7.3	0.7	0.2	35.1	1	20.6	56.6	437	133.0	17.0
EU6	50	7.63	121	11.35	9.0	<0.5	<0.5	1.2	2.8	1.2	1.9	5.9	0.4	0.5	37.1	1	11.9	49.9	470	92.5	11.0
EU7	60	7.58	121	11.28	8.9	<0.5	<0.5	0.7	3.3	0.7	1.5	5.5	1.0	3.2	27.8	2	9.6	41.6	503	69.5	8.0
EU8	70	7.59	121	11.23	8.7	<0.5	<0.5	0.6	3.5	0.5	1.1	5.1	3.4	4.8	25.8	1	6.2	40.2	465	47.0	<6
EU9	80	7.6	121	11.19	8.6	<0.5	<0.5	0.5	3.6	0.4	1.1	5.1	0.6	5.9	29.5	2	5.1	41.1	430	65.0	<6
EU10	90	7.57	121	11.16	8.6	<0.5	<0.5	0.5	3.9	0.1	1.2	5.2	1.0	7.0	27	3	6.4	41.4	391	39.5	<6
EU11	100	7.59	121	11.15	8.6	<0.5	0.7	0.4	4.1	0.9	1.2	6.2	0.8	7.8	33.4	2	4.0	46.0	405	46.5	<6
EU12	110	7.6	121	11.12	8.4	<0.5	<0.5	0.4	4.1	0.9	1.1	6.1	1.1	11.8	29.1	3	3.4	45.4	428	45.5	<6
EU13	120	7.57	120	11.11	8.4	<0.5	<0.5	0.4	4.6	0.4	1.2	6.2	0.7	13.6	32.7	2	3.0	50.0	439	37.0	<6
EU14	130	7.53	121	11.09	8.3	<0.5	<0.5	0.3	5.1	0.4	1.2	6.7	0.8	16.1	32.7	3	3.7	53.3	408	33.0	<6
EU15	140	7.57	121	11.09	8.2	<0.5	<0.5	0.3	5.3	0.7	1.2	7.2	0.4	18.1	32.5	3	5.1	56.1	440	54.5	<6
EU16	150	7.54	120	11.09	8.0	0.5	<0.5	0.5	5.6	1.4	1.5	8.5	2.4	20.7	32.9	4	6.4	62.4	481	44.0	<6

Collection date 31 March 2004 Secchi depth = 16.0 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4-N	NO_3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		mS cm^{-1}	^oC	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
MB1	1	7.86	118	16.49	9.2	<0.5	<0.5	0.7	0.9	4.1	1.4	6.4	1	0	69	-	9.7	79.7	622	91.0	-
MB2	10	7.83	118	16.29	9.1	<0.5	<0.5	1.2	0.5	3.5	2.0	6.0	0	0	47	-	12.4	59.4	548	141.5	17.0
MB3	20	7.83	118	16.23	9.0	<0.5	<0.5	1.1	0.6	3.4	2.1	6.1	1	0.2	47.8	-	14.8	63.8	561	140.5	17.0
MB4	30	7.83	118	16.19	9.0	<0.5	<0.5	1.1	0.8	3.2	1.9	5.9	1	0.2	50.8	-	13.5	65.5	749	131.5	15.5
MB5	40	7.66	118	16.15	8.9	<0.5	<0.5	0.9	1.5	1.5	1.9	4.9	1	2.8	71.2	-	11.6	86.6	560	114.5	14.0
MB6	50	7.46	120	12.51	8.2	<0.5	<0.5	0.5	3.3	2.7	1.5	7.5	1	12.1	58.9	-	7.2	79.2	467	109.0	7.5
MB7	60	7.41	121	11.59	8.0	<0.5	<0.5	0.3	4.7	2.3	1.0	8.0	1	18.0	41	-	4.2	64.2	394	54.5	7.0
MB8	70	7.36	121	11.40	8.0	<0.5	<0.5	0.2	4.5	1.5	0.8	6.8	1	19.1	36.9	-	3.7	60.7	404	45.0	<4
MB9	80	7.42	121	11.34	8.0	<0.5	<0.5	0.2	5.0	1.0	0.8	6.8	1	20.2	31.8	-	5.3	58.3	464	41.0	<4
MB10	90	7.36	121	11.30	7.9	<0.5	<0.5	0.1	5.2	1.8	0.7	7.7	3	22.1	35.9	-	3.9	64.9	453	52.0	<4
MB11	100	7.31	122	11.27	7.8	<0.5	<0.5	0.1	5.6	2.4	0.8	8.8	2	23.9	38.1	-	3.0	67.0	477	36.5	<4
MB12	110	7.29	122	11.26	7.7	<0.5	<0.5	<0.1	5.8	2.2	1.0	9.0	1	25.0	30	-	6.2	62.2	392	36.5	5.5
MB13	120	7.31	121	11.24	7.6	<0.5	<0.5	0.1	5.9	3.1	0.8	9.8	1	25.0	59	-	3.6	88.6	373	53.5	<4
MB14	130	7.3	121	11.22	7.5	<0.5	<0.5	<0.1	6.3	2.7	0.9	9.9	0	27.0	35	-	3.3	65.3	393	61.0	<4
MB15	140	7.3	121	11.21	7.4	<0.5	<0.5	<0.1	6.6	3.4	0.8	10.8	0	27.8	46.2	-	3.3	77.3	356	35.0	<4
MB16	150	7.31	120	11.21	7.1	<0.5	<0.5	0.1	7.2	2.8	1.0	11.0	0	30.1	48.9	-	4.0	83.0	394	34.0	<4

NH_4, NO_3, DON, Urea all as N

* = PN by wet digestion method, ** = PN by combustion furnace method.

Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 mg m^{-3}

New Analytical instrument (Flow Injection Analysis) from January 2002, gives greatly improved resolution at low levels.

FIA instrument results are given as a better indication of likely absolute low levels of DRP, NO_3-N, and NH_4-N below nominal detection limit.

Lake Taupo biannual nutrient database **2002-2003** Started 27 October 1994

Collection date 13 November 2002 Secchi depth = 18.0 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4-N	NO_3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		mS cm^{-1}	^oC	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
NZ1	1	7.87	122	12.58	10.2	0.6	<0.5	0.6	1.3	1.7	2.2	5.2	0.8	0.6	65.6	2	15.3	82.3	620	160.0	12.5
NZ2	10	7.86	120	12.58	10.3	0.5	<0.5	0.7	1.2	1.8	2.1	5.1	0.7	0.0	49.3	1	13.7	63.7	573	180.5	13.5
NZ3	20	7.93	120	12.49	10.2	1.0	<0.5	0.7	1.1	1.9	2.2	5.2	0.5	0.1	61.4	1	15.8	77.8	536	157.5	12.0
NZ4	30	7.85	121	12.38	10.2	<0.5	<0.5	0.8	0.9	3.1	2.6	6.6	0.7	0.5	74.8	2	17.7	93.7	657	242.0	14.0
NZ5	40	7.81	119	12.16	10.1	<0.5	<0.5	0.7	1.2	1.8	1.9	4.9	0.6	0.7	58.7	1	12.9	72.9	506	164.5	8.0
NZ6	50	7.83	120	12.00	10.1	<0.5	<0.5	0.7	1.6	1.4	1.7	4.7	1.6	0.0	55.4	1	11.5	68.5	505	170.0	9.5
NZ7	60	7.78	119	11.81	10.0	<0.5	<0.5	0.6	1.5	1.5	1.5	4.5	1.2	0.0	64.8	2	9.5	75.5	531	108.5	6.5
NZ8	70	7.72	120	11.51	9.9	<0.5	<0.5	0.6	2.8	1.2	1.3	5.3	3.4	2.2	42.4	7	7.1	55.1	514	53.5	5.0
NZ9	80	7.67	120	11.32	9.7	<0.5	<0.5	0.4	2.7	1.3	1.1	5.1	3.3	0.9	38.8	2	5.9	48.9	578	61.0	4.5
NZ10	90	7.77	121	11.13	9.6	<0.5	<0.5	0.4	2.8	1.2	1.0	5.0	3.7	0.4	44.9	4	6.6	55.6	487	41.0	<2
NZ11	100	7.53	122	11.08	9.4	<0.5	<0.5	0.2	3.0	2.0	0.8	5.8	4.2	3.7	65.1	5	6.1	79.1	525	31.0	<2
NZ12	110	7.64	121	11.05	9.4	<0.5	<0.5	0.1	3.3	1.7	0.7	5.7	3.4	5.4	57.2	4	4.4	70.4	472	38.0	<2
NZ13	120	7.55	122	11.01	9.3	<0.5	<0.5	0.2	3.6	0.4	1.0	5.0	3.0	7.0	51.0	6	5.9	66.9	473	64.5	4.0
NZ14	130	7.32	123	10.99	9.2	<0.5	<0.5	0.1	3.6	0.4	1.0	5.0	2.9	7.5	45.6	5	6.7	62.7	555	70.5	3.5
NZ15	140	7.47	121	10.97	9.1	0.5	<0.5	0.1	3.7	1.3	0.9	5.9	2.5	10.5	60.0	16	6.7	79.7	460	54.5	3.0
NZ16	150	7.46	121	10.96	9.0	<0.5	<0.5	0.2	4.3	1.7	1.0	7.0	0.5	12.9	58.6	4	6.4	78.4	461	52.5	3.0

Collection date 3 April 2003 Secchi depth = 13.5 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4-N	NO_3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		mS cm^{-1}	^oC	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
UJ1	1	8.01	119	19.20	8.8	3.0	0.5	0.7	0.8	3.2	1.8	5.8	5	0.4	75.6	5	18.8	99.8	546	219.0	19.5
UJ2	10	8.07	146	18.71	8.8	0.7	1.0	1.4	0.9	4.1	2.5	7.5	<1	0.6	45.4	1	24.0	70.0	511	304.5	29.0
UJ3	20	8.15	120	18.60	8.6	1.0	0.7	1.3	0.6	3.4	2.3	6.3	<1	0.6	40.4	1	23.7	64.7	520	270.0	31.5
UJ4	30	7.93	119	16.93	8.3	<0.5	<0.5	1.5	0.8	3.2	1.8	5.8	<1	0.3	39.7	1	20.4	60.4	503	181.0	39.0
UJ5	40	7.66	118	13.31	8.0	<0.5	<0.5	1.3	1.7	3.3	1.7	6.7	<1	0.8	39.2	1	12.2	52.2	443	115.0	54.0
UJ6	50	7.61	122	12.39	7.9	<0.5	1.0	0.7	2.9	2.1	1.3	6.3	<1	4.8	35.2	3	8.6	48.6	410	92.5	5.5
UJ7	60	7.57	138	11.80	7.7	<0.5	<0.5	0.5	3.9	2.1	1.1	7.1	<1	10.7	32.3	1	5.9	48.9	366	86.5	4.5
UJ8	70	7.42	121	11.50	7.6	<0.5	<0.5	0.2	4.4	1.6	0.9	6.9	<1	16.3	27.7	1	6.1	50.1	404	109.5	4.0
UJ9	80	7.39	121	11.32	7.5	<0.5	<0.5	0.1	4.5	1.5	1.0	7.0	<1	19.3	41.7	1	6.2	67.2	365	37.0	4.0
UJ10	90	7.32	121	11.20	7.3	<0.5	<0.5	0.1	4.7	1.3	0.8	6.8	<1	21.9	24.1	2	4.5	50.5	360	40.0	<4
UJ11	100	7.29	121	11.19	7.3	<0.5	<0.5	<0.1	5.3	2.7	0.9	8.9	<1	23.9	27.1	2	4.6	55.6	387	92.5	<4
UJ12	110	7.26	120	11.12	7.2	<0.5	<0.5	<0.1	5.5	0.5	0.7	6.7	<1	25.2	30.8	1	2.9	58.9	366	28.5	<4
UJ13	120	7.33	122	11.11	7.0	<0.5	<0.5	<0.1	6.6	0.4	0.7	7.7	<1	28.8	36.2	5	2.5	67.5	409	40.0	<4
UJ14	130	7.27	123	11.09	6.9	<0.5	<0.5	<0.1	7.7	0.3	0.9	8.9	<1	30.9	29.1	3	3.2	63.2	382	15.5	<4
UJ15	140	7.28	122	11.10	6.8	<0.5	<0.5	<0.1	7.6	0.4	0.8	8.8	<1	30.4	47.6	4	4.3	82.3	384	47.5	<4
UJ16	150	7.29	122	11.09	6.5	<0.5	<0.5	<0.1	9.0	5.0	1.6	15.6	<1	36.4	30.6	2	6.5	73.5	371	38.5	<4

NH_4, NO_3, DON, Urea all as N

* = PN by wet digestion method, ** = PN by combustion furnace method.

Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 mg m^{-3}

New Analytical instrument (Flow Injection Analysis) from January 2002, gives greatly improved resolution at low levels.

FIA instrument results are given as a better indication of likely absolute low levels of DRP, NO_3-N, and NH_4-N below nominal detection limit.

Lake Taupo biannual nutrient database **2001-2002** Started 27 October 1994

Collection date 12 November 2001 Secchi depth = 15.5 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_a	DRP	DOP	PP	TP	NH4-N	NO3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		μS cm^{-1}	^{o}C	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
XH1	1	7.85	122	14.23	9.5	0.5	<0.5	0.6	0.9	1.1	1.55	3.6	<1	<0.5	29	2	6	35	500	146.5	12.0
XH2	10	7.86	122	14.16	9.8	0.5	<0.5	0.7	1.1	0.9	4.3	6.3	<1	<0.5	32	2	16.5	49	520	212.0	31.3
XH3	20	7.82	119	13.37	9.4	<0.5	<0.5	1.0	1.1	<0.5	3.5	4.6	<1	<0.5	28	1	20	48	510	340.5	26.8
XH4	30	7.6	116	12.85	9.4	0.6	0.7	1.3	1.6	<0.5	3.1	4.7	<1	1.0	29	1	14.5	45	480	264.5	24.7
XH5	40	7.44	122	11.87	8.9	<0.5	<0.5	1.3	2.2	<0.5	2.8	5.0	1	2.5	25.5	2	11.5	41	470	200.5	21.7
XH6	50	7.46	121	11.57	9.0	<0.5	<0.5	0.9	2.6	<0.5	1.75	4.4	<1	7.2	26.8	2	6	40	470	136.5	12.6
XH7	60	7.41	121	11.24	8.7	1.3	1.2	0.7	2.6	<0.5	1.4	4.0	<1	8.0	24	2	<2	32	440	104.5	9.1
XH8	70	7.4	122	11.13	8.8	<0.5	<0.5	0.5	2.9	<0.5	1.15	4.1	<1	12.3	21.7	2	<2	34	450	142.0	7.2
XH9	80	7.38	122	11.03	8.6	<0.5	<0.5	0.4	3.2	<0.5	1.15	4.4	<1	13.6	29.4	4	<2	43	440	103.0	8.1
XH10	90	7.4	119	11.01	8.8	<0.5	<0.5	0.4	3.2	<0.5	1.05	4.3	<1	15.1	21.9	2	<2	37	420	79.0	6.2
XH11	100	7.35	120	10.99	8.6	<0.5	<0.5	0.3	3.8	<0.5	1.05	4.9	<1	17.8	25.2	2	4	47	460	98.0	6.6
XH12	110	7.36	122	10.97	8.6	<0.5	<0.5	0.3	4.0	<0.5	1.1	5.1	<1	19.5	24.5	2	<2	44	490	116.5	5.8
XH13	120	7.35	126	10.95	8.4	<0.5	<0.5	0.3	4.5	<0.5	1.3	5.8	<1	22.0	22	2	<2	44	490	93.5	5.6
XH14	130	7.38	127	10.94	8.4	<0.5	<0.5	0.3	4.4	<0.5	1.1	5.5	<1	21.1	21.9	2	<2	43	420	113.5	5.5
XH15	140	7.34	126	10.94	8.2	<0.5	<0.5	0.3	5.2	<0.5	1.3	6.5	<1	24.7	25.3	2	<2	50	440	93.5	7.3
XH16	150	7.38	127	10.94	8.1	1.3	0.6	0.3	5.3	<0.5	1.3	6.6	<1	25.2	26.8	3	<2	52	480	83.5	7.7

Collection date 4 April 2002 Secchi depth = 19.0 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_a	DRP	DOP	PP	TP	NH4-N	NO3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		μS cm^{-1}	^{o}C	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}
EJ1	1	7.91	119	17.45	8.8	<0.5	<0.5	0.72	0.5	0.5	1	2.0	1.1	0.3	44.6		7.85	53.9	0.5	187.0	10.0
EJ2	10	7.94	118	17.38	8.9	<0.5	<0.5	0.96	0.6	1.4	1.4	3.4	0.2	0.1	44.7		9.4	54.4	0.6	164.5	10.5
EJ3	20	7.88	119	17.18	8.8	<0.5	<0.5	1.02	0.5	1.5	1.35	3.4	0.3	0.0	38.7		9.45	48.5	0.8	154.5	11.0
EJ4	30	7.85	119	16.83	8.7	<0.5	<0.5	0.95	0.7	2.3	1.45	4.5	0.4	0.1	40.5		8.4	49.4	0.5	136.5	10.5
EJ5	40	7.65	121	12.9	8.3	<0.5	<0.5	0.89	1.4	0.6	1.2	3.2	0.4	0.8	32.8		7.95	42.0	0.4	100.0	8.0
EJ6	50	7.66	120	12.09	8.2	<0.5	<0.5	0.85	2.1	0.9	1.3	4.3	0.4	3.5	35.1		7.8	46.8	0.4	114.0	9.0
EJ7	60	7.60	123	11.51	8.1	<0.5	<0.5	0.50	3.9	2.1	1	7.0	0.9	12.3	30.8		5.7	49.7	0.4	75.0	6.0
EJ8	70	7.42	123	11.3	8.0	<0.5	<0.5	0.26	4.5	0.5	0.95	6.0	0.0	20.9	30.1		5.65	56.7	0.5	49.5	4.0
EJ9	80	7.46	121	11.24	7.9	<0.5	<0.5	0.24	4.6	0.4	1.1	6.1	0.2	24.8	29		7.55	61.6	0.3	50.0	5.0
EJ10	90	7.38	121	11.19	7.8	<0.5	<0.5	0.19	5.3	<0.5	0.75	6.1	0.3	28.1	23.6		4.45	56.5	0.4	48.0	4.0
EJ11	100	7.33	121	11.17	7.8	<0.5	<0.5	0.11	5.4	0.6	0.8	6.8	0.1	28.6	30.3		5.05	64.1	0.3	76.0	5.5
EJ12	110	7.37	122	11.14	7.7	<0.5	<0.5	0.10	6.0	<0.5	0.8	6.8	0.5	31.7	23.8		6.15	62.2	0.6	67.5	7.5
EJ13	120	7.36	122	11.14	7.7	<0.5	<0.5	0.10	6.3	<0.5	0.6	6.9	0.2	32.2	24.6		3.25	60.3	0.3	46.5	4.0
EJ14	130	7.32	122	11.13	7.6	<0.5	<0.5	0.09	6.5	<0.5	0.45	7.0	0.1	32.2	26.7		0.8	59.8	0.5	48.0	5.5
EJ15	140	7.34	122	11.13	7.1	<0.5	<0.5	0.07	7.0	<0.5	0.7	7.7	1.1	34.0	29.9		4.9	69.9	0.4	44.0	4.0
EJ16	150	7.44	122	11.13	7.0	<0.5	<0.5	0.09	8.7	<0.5	0.9	9.6	0.8	36.3	24.9		4.45	66.5	0.4	75.5	4.0

NH_4, NO_3, DON, Urea all as N * = PN by wet digestion method, ** = PN by combustion furnace method.

Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 mg m^{-3}

New Analytical instrument (Flow Injection Analysis) from January 2002, gives greatly improved resolution at low levels.
FIA instrument results are given for Autumn as an indication of likely absolute low levels of DRP, NO_3-N, and NH_4-N.

Lake Taupo biannual nutrient database **2000-2001** **Started 27 October 1994**

Collection date 26 October 2000 Secchi depth = 11 m

Code	Depth	pH	EC @25°C	Temp	DO	SS	VSS	Chlor_a	DRP	DOP	PP	TP	NH4-N	NO3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		$\mu S\ cm^{-1}$	°C	$g\ m^{-3}$	$g\ m^{-3}$	$g\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$
FX1	1	7.87	120	12.5	9.1	0.5	<0.5	0.4	<1	3	2	5.0	1	<1	25	4	9	35	0.5	104.5	4.0
FX2	10	7.85	120	11.5	8.7	0.8	0.5	1.1	1	4	3	8.0	<1	<1	33	2	23	56	0.5	196.0	12.0
FX3	20	7.79	120	11.4	8.7	<0.5	<0.5	1.3	<1	2	4	6.0	<1	<1	41	2	29	70	0.5	237.0	19.0
FX4	30	7.74	120	11.3	8.7	1.1	0.5	1.3	<1	2	3	5.0	<1	<1	36	1	24	60	0.5	183.0	11.0
FX5	40	7.69	119	11.3	9.1	0.9	0.5	1.5	<1	2	3	5.0	1	<1	38	2	18	57	0.5	90.5	7.0
FX6	50	7.63	120	11.3	9.1	0.8	<0.5	1.4	1	2	2	5.0	2	<1	64	2	14	80	0.4	79.5	6.0
FX7	60	7.54	120	11.3	8.7	0.9	<0.5	1.2	1	1	2	4.0	<1	<1	45	2	14	59	0.4	58.0	5.0
FX8	70	7.52	120	11.2	8.7	<0.5	<0.5	1.2	1	1	2	4.0	4	1	38	4	14	57	0.5	61.5	5.0
FX9	80	7.52	120	11.2	8.7	0.9	<0.5	1.1	2	2	2.5	6.5	5	2	44	2	13	64	0.5	44.5	<4
FX10	90	7.59	120	11.2	8.7	0.9	<0.5	1.1	2	2	2	6.0	6	3	37	2	14	60	0.5	58.5	5.5
FX11	100	7.47	120	11.1	8.7	<0.5	<0.5	1.4	1	1	3	5.0	3	4	39	4	16	62	0.4	48.5	6.0
FX12	110	7.41	121	11.1	8.7	0.9	<0.5	1.2	2	2	3	7.0	3	4	38	3	15	60	0.4	29.5	<4
FX13	120	7.40	121	11.0	8.2	0.5	<0.5	0.8	2	2	2	6.0	6	7	38	5	8	59	0.4	104.0	5.5
FX14	130	7.42	121	11.0	8.5	0.6	<0.5	0.2	2	2	2	6.0	6	7	41	4	11	65	0.4	71.0	6.5
FX15	140	7.36	121	11.0	8.6	0.8	<0.5	0.6	4	1	3	8.0	5	11	40	3	11	67	0.4	65.5	5.0
FX16	150	7.32	121	11.0	8.5	0.6	<0.5	1.4	4	2	4	10.0	8	13	47	9	18	86	0.4	110.5	8.0

Collection date 8 April 2001 Secchi depth = 13.5 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_a	DRP	DOP	PP	TP	NH4-N	NO3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		$\mu S\ cm^{-1}$	°C	$g\ m^{-3}$	$g\ m^{-3}$	$g\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$
NZ1	1	7.94	120	17.0	8.3	<0.5	<0.5	1.0	<1	2	2	4.0	2	1	40	7	20.0	63.0	0.6	201.0	15.5
NZ2	10	7.97	120	16.9	8.3	<0.5	<0.5	1.4	<1	1	2	3.0	<1	<1	29	1	19.0	48.0	0.6	189.0	13.0
NZ3	20	7.99	120	16.8	8.4	<0.5	<0.5	1.5	<1	1	2	3.0	<1	<1	36	1	19.0	55.0	0.6	208.5	14.5
NZ4	30	7.96	124	15.8	8.0	<0.5	<0.5	1.2	<1	2	2	4.0	1	<1	42	1	16.0	59.0	0.6	156.0	10.5
NZ5	40	7.76	120	13.1	7.8	<0.5	<0.5	1.2	<1	1	1.5	2.5	1	1	22	2	12.0	36.0	0.5	145.0	8.5
NZ6	50	7.69	119	12.4	7.5	<0.5	<0.5	1.0	2	0	1	3.0	1	2	22	2	10.0	35.0	0.5	100.0	5.5
NZ7	60	7.60	120	11.8	7.2	<0.5	<0.5	0.8	1	1	1	3.0	<1	9	16	2	7.0	32.0	0.5	82.0	<2
NZ8	70	7.57	120	11.7	7.1	<0.5	<0.5	0.4	3	0	<1	3.0	<1	19	25	2	5.5	49.5	0.4	80.5	<2
NZ9	80	7.44	121	11.5	6.9	<0.5	<0.5	0.3	3	0	<1	3.0	2	24	15	3	5.0	46.0	0.6	70.0	<2
NZ10	90	7.39	121	11.5	6.9	<0.5	<0.5	0.2	3	1	<1	4.0	2	26	14	4	4.0	46.0	0.5	57.5	<2
NZ11	100	7.38	122	11.4	6.8	<0.5	<0.5	0.2	4	0	<1	4.0	2	29	16	1	4.0	51.0	0.5	47.5	<2
NZ12	110	7.39	122	11.4	6.8	<0.5	<0.5	0.1	4	1	<1	4.0	2	31	18	4	3.5	54.5	0.5	42.5	<2
NZ13	120	7.41	121	11.3	6.7	<0.5	<0.5	0.1	5	0	<1	5.0	1	33	16	4	5.0	55.0	0.4	40.0	<2
NZ14	130	7.42	122	11.3	6.6	<0.5	<0.5	0.1	5	0	<1	5.0	1	33	20	4	5.0	59.0	0.5	42.5	<2
NZ15	140	7.34	123	11.3	6.4	<0.5	<0.5	0.1	6	1	<1	7.0	2	38	12	5	4.5	56.5	0.5	55.0	<2
NZ16	146	7.30	123	11.3	6.3	<0.5	<0.5	0.1	7	2	1	10.0	2	43	22	5	6.5	73.5	0.5	70.5	<2

NH_4, NO_3, DON, Urea all as N Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 $mg\ m^{-3}$
* = PN by wet digestion method, ** = PN by combustion furnace method.

Lake Taupo biannual nutrient database **1999-2000** **Started 27 October 1994**

Collection date 18 October 1999 Secchi depth = 14.9 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_a[++]	DRP	DOP	PP	TP	NH_4-N	NO_3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		$\mu S\ cm^{-1}$	^oC	$g\ m^{-3}$	$g\ m^{-3}$	$g\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$
PX1	1	7.71	119	12.8	8.9	0.5	<0.5	0.14	0.5	3	3.7	7.2	<1	<1	41	16	19.4	60.4	441	105.7	8.8
PX2	10	7.74	117	12.7	8.9	<0.5	<0.5	0.39	0.5	4	3.2	7.7	<1	<1	36	4	19.9	55.9	411	160.8	12.9
PX3	20	7.73	122	12.4	8.9	0.6	<0.5	0.80	1	2	5.5	8.5	<1	<1	34	1	37.8	71.8	437	254.7	37.3
PX4	30	7.76	120	11.6	8.9	<0.5	1.9	1.06	1	2	3.9	6.9	<1	<1	36	<1	26.7	62.7	413	198.3	24.2
PX5	40	7.57	117	11.4	8.8	<0.5	<0.5	3.14	2	2	2.4	6.4	5	<1	44	22	14.6	63.6	392	117.2	9.7
PX6	50	7.48	119	11.3	8.6	<0.5	<0.5	2.90	2.5	2	1.7	6.2	8	2	33	5	9.1	52.1	417	87.0	6.6
PX7	60	7.49	118	11.1	8.6	0.5	<0.5	1.45	3	1	1.5	5.5	7	9	36	5	12.6	64.6	449	95.0	11.1
PX8	70	7.41	117	11.1	8.6	<0.5	<0.5	0.65	3.5	1	1.5	6.0	4	15	27	9	5.6	51.6	421	49.9	4.9
PX9	80	7.39	117	11.0	8.5	<0.5	<0.5	0.75	3.5	2	1.4	6.9	4	17	31	7	5.7	57.7	398	42.7	5.7
PX10	90	7.36	118	11.0	8.6	<0.5	<0.5	0.54	4	2	1.3	7.3	3	17	29	2	5.8	54.8	393	51.2	5.7
PX11	100	7.36	118	11.0	8.6	<0.5	<0.5	0.63	4	1	1.6	6.6	4	18	30	2	7.3	59.3	492	56.1	5.8
PX12	110	7.35	118	11.0	8.6	0.5	<0.5	0.65	4	2	1.8	7.8	5	18	46	10	20.1	89.1	547	129.5	21.4
PX13	120	7.33	119	11.0	8.3	0.8	0.7	0.71	4	2	1.7	7.7	6	19	47	20	45.3	117.3	530	222.3	44.3
PX14	130	7.33	119	11.0	7.9	0.6	0.5	0.59	4	2	1.7	7.7	5	19	40	12	15.3	79.3	461	112.9	19.7
PX15	140	7.32	123	11.0	7.5	0.6	<0.5	0.90	4	1	2.3	7.3	4	19	53	12	16.5	92.5	514	84.5	9.7
PX16	150	7.29	119	11.0	7.5	1.6	<0.5	0.67	4.5	2	2.1	8.6	3	19	34	7	9.6	65.6	783	63.9	6.8

Collection date 12 April 2000 Secchi depth = 15 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_a	DRP	DOP	PP	TP	NH_4-N	NO_3-N	DON	UREA	PN*	TN	DOC	PC	PN**
	m		$\mu S\ cm^{-1}$	^oC	$g\ m^{-3}$	$g\ m^{-3}$	$g\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$
YX1	1	7.86	118	17.4	9.2	0.6		1.3	<1	4	2	6.0	6	2	72	8	16	96.0	542	255.0	31.0
YX2	10	7.88	118	17.3	9.2	1.1		1.3	<1	3	2	5.0	3	1	57	1	21	82.0	472	198.5	16.5
YX3	20	7.88	118	17.2	9.2	1.0		1.4	<1	3	2	5.0	1	<1	59	3	15.5	75.5	599	166.5	12.0
YX4	30	7.79	118	16.7	9.0	1.1		1.3	<1	3	2	5.0	1	<1	59	2	17	77.0	608	154.0	17.5
YX5	40	7.29	119	12.6	8.3	0.6		1.1	2	2	1	5.0	2	2	57	6	9.5	70.5	396	72.0	6.0
YX6	50	7.17	120	11.7	8.0	1.0		0.8	3	2	1	6.0	2	7	42	7	8.5	59.5	403	94.5	7.5
YX7	60	7.18	119	11.4	8.0	0.5		1.0	4	1	<1	5.0	1	16	44	1	4	65.0	402	48.5	<4
YX8	70	7.1	120	11.3	8.0	0.6		<0.1	6	1	<1	7.0	6	29	35	1	6.5	76.5	418	41.0	4.0
YX9	80	7.14	120	11.2	7.9	1.0		<0.1	6	1	<1	7.0	2	32	46	1	12	92.0	451	105.5	8.0
YX10	90	7.11	120	11.2	7.9	0.7		<0.1	7	<1	<1	7.0	1	35	34	2	11	81.0	428	67.5	5.0
YX11	100	7.12	125	11.2	7.7	0.7		<0.1	7	2	<1	9.0	2	37	41	1	8.5	88.5	417	68.5	<4
YX12	110	7.12	120	11.2	7.7	0.9		<0.1	7	2	<1	9.0	2	37	50	3	11	100.0	439	65.0	5.5
YX13	120	7.06	120	11.1	7.7	0.6		<0.1	8	1	<1	9.0	3	39	47	1	6.5	95.5	431	40.5	0.0
YX14	130	7.12	120	11.1	7.5	1.2		<0.1	8	1	<1	9.0	2	40	47	3	9	98.0	453	57.0	5.0
YX15	140	7.08	120	11.1	7.5	1.2		<0.1	9	<1	<1	9.0	2	42	45	2	8	97.0	415	50.5	<4
YX16	146	7.04	120	11.1	7.2	1.7		0.1	10	3	1	14.0	4	43	42	2	10	99.0	429	92.0	4.0

NH_4, NO_3, DON, Urea all as N Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 $mg\ m^{-3}$

* = PN by wet digestion method, ** = PN by combustion furnace method. [++] = from calibrated chlorophyll fluorescence profiler (filters damaged)

Lake Taupo biannual nutrient database **1998-1999** **Started 27 October 1994**

Collection date 1 November 1998 Secchi depth = 13.5 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_a	DRP	DOP	PP	TP	NH4-N	NO3-N	DON	PN*	TN	DOC	PC	PN**
	m		$\mu S\ cm^{-1}$	°C	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}
DM1	1	7.91	118	13.6	10.4	0.8	<0.5	0.8	0.7	1.5	2.0	4.2	3.4	<0.5	35	10.8	49.2		133.5	12.0
DM2	10	7.87	117	13.2	10.7	0.8	<0.5	1.0	0.6	1.3	2.6	4.5	2.4	<0.5	36	15.2	53.6		180.5	15.0
DM3	20	7.82	118	12.7	10.7	0.5	<0.5	1.4	0.6	1.4	2.9	4.9	1.9	1.1	37	18.0	58.0		215.0	23.3
DM4	30	7.80	118	12.4	10.6	<0.5	<0.5	1.1	0.5	1.3	2.3	4.1	1.9	<0.5	34	14.1	50.0		128.0	13.5
DM5	40	7.75	118	12.4	10.4	<0.5	<0.5	0.6	0.6	1.2	1.7	3.5	2.5	<0.5	34	9.2	45.7		118.0	10.4
DM6	50	7.70	118	12.2	10.2	<0.5	<0.5	0.6	0.6	1.2	1.7	3.5	2.6	0.6	31	8.1	42.3		114.5	7.9
DM7	60	7.46	119	11.7	10.0	<0.5	<0.5	0.4	2.1	1.0	1.4	4.5	1.6	9.5	32	6.0	49.1		73.0	6.0
DM8	70	7.30	120	11.2	9.6	<0.5	<0.5	0.3	3.3	0.9	1.0	5.2	2.7	16.0	32	3.8	54.5		56.0	2.7
DM9	80	7.15	121	11.1	9.1	<0.5	<0.5	0.2	3.9	0.8	0.9	5.6	1.5	20.5	29	5.0	56.0		64.5	2.7
DM10	90	7.07	122	11.1	8.8	<0.5	<0.5	0.2	4.9	0.5	0.9	6.3	2.6	24.8	32	5.0	64.4		45.0	2.9
DM11	100	7.16	121	11.0	8.5	<0.5	<0.5	0.2	5.0	0.5	0.9	6.4	3.3	26.2	34	3.6	67.1		42.5	2.0
DM12	110	7.16	122	11.0	8.3	<0.5	<0.5	0.1	6.2	0.4	0.8	7.4	2.0	29.2	30	4.0	65.2		54.0	2.9
DM13	120	7.11	122	11.0	8.0	<0.5	<0.5	0.1	6.4	0.3	0.8	7.5	2.2	30.6	29	3.3	65.1		63.0	1.8
DM14	130	7.08	122	11.0	7.8	<0.5	<0.5	0.1	7.0	0.2	0.8	8.0	2.2	31.4	28	3.1	64.7		48.5	2.0
DM15	140	7.07	123	10.9	7.6	<0.5	<0.5	0.1	7.9	0.0	0.9	8.8	2.0	33.8	32	5.0	72.8		54.0	2.0
DM16	150	7.10	123	10.9	7.6	2.5	<0.5	0.2	8.2	0.4	3.7	12.3	2.7	35.4	34	12.8	84.9		140.5	10.5

Collection date 14 April 1999 Secchi depth = 13 m

Code	Depth	pH	EC @25oC	Temp	DO	SS	VSS	Chlor_a	DRP	DOP	PP	TP	NH4-N	NO3-N	DON	PN*	TN	DOC	PC	PN**
	m		$\mu S\ cm^{-1}$	°C	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}
II1	1		119	18.3	8.9	<0.5	<0.5	1.2	0.6		1.8	2.4	3	<0.5	43	19.0	65.0	0.6	221.4	19.5
II2	10		118	18.3	8.8	<0.5	<0.5	1.2	0.5		1.8	2.3	1	<0.5	40	19.3	60.3	0.5	216.3	17.6
II3	20		118	18.3	8.8	<0.5	<0.5	1.2	0.5		1.7	2.2	1	2	41	19.0	63.0	0.5	132.3	8.9
II4	30		118	18.1	8.7	<0.5	<0.5	1.2	1.1		1.4	2.5	1	3	34	14.0	52.0	0.6	136.8	9.7
II5	40		118	12.9	8.4	<0.5	<0.5	0.7	2.3		0.9	3.2	1	6	31	8.9	46.9	0.7	91.2	6.5
II6	50		119	11.9	8.1	<0.5	<0.5	0.4	3.1		0.7	3.8	1	14	28	7.9	50.9	0.5	63.1	4.8
II7	60		121	11.6	8.0	<0.5	<0.5	0.3	4.3		0.7	5.0	1	19	33	7.3	60.3	0.6	42.3	5.0
II8	70		121	11.4	8.0	<0.5	<0.5	0.2	5.5		0.8	6.3	1	23	27	8.6	59.6	0.4	48.4	7.0
II9	80		122	11.3	7.8	<0.5	<0.5	0.1	5.9		0.8	6.7	2	28	29	8.3	67.3	0.5	51.5	6.1
II10	90		123	11.2	7.6	<0.5	<0.5	0.1	6.1		0.6	6.7	1	30	31	6.4	68.4	0.5	62.1	4.2
II11	100		122	11.2	7.4	<0.5	<0.5	0.1	6.1		0.5	6.6	2	27	28	6.1	63.1	0.6	33.1	1.5
II12	110		120	11.2	7.2	<0.5	<0.5	0.1	6.6		0.5	7.1	2	28	27	6.1	63.1	0.5	35.7	2.9
II13	120		122	11.2	7.1	<0.5	<0.5	0.1	6.4		0.5	6.9	2	24	26	5.2	57.2	0.6	34.1	2.2
II14	130		122	11.1	6.8	<0.5	<0.5	<0.1	7.5		0.5	8.0	2	28	31	6.3	67.3	0.6	46.9	5.5
II15	140		122	11.1	6.3	<0.5	<0.5	0.1	8.8		0.9	9.7	2	33	31	6.4	72.4	0.5	63.4	3.0
II16	150		116	11.1	5.9	<0.5	<0.5	<0.1	8.6		0.9	9.5	4	28	60	7.7	99.7	0.9	51.1	1.1

NH_4, NO_3, DON, Urea all as N Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 mg m^{-3}

* = PN by wet digestion method, ** = PN by combustion furnace method.

Lake Taupo biannual nutrient database **1997-1998** **Started 27 October 1994**

Collection Date 30 October 1997 Secchi depth = 12.5 m

ID	Depth	pH	EC @25°C	Temp	DO	SS	VSS	Chlor_a	DRP	DOP	PP	TP	NH_4	NO_3	DON	UREA	PN*	TN	DOC	PC	PN**	SO_4
	m		µS cm^{-1}	C	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	g m^{-3}
TT1	1	7.70	116.9	12.2	10.7	0.61	0.30	1.28	1.0	1.3	1.5	3.8	2.1	2.9	36	1.1	14.3	55.3	0.71	168.3	17.2	
TT2	10	7.71	117.8	12.0	10.2	0.54	0.29	1.49	0.7	1.9	1.9	4.5	1.3	7.3	32	1.1	18.7	59.7	0.82	160.7	18.8	
TT3	20	7.65	118.1	11.5	10.2	0.59	0.32	1.58	0.8	1.6	1.7	4.0	1.6	0.7	36	1.1	14.0	52.0	0.60	133.0	16.5	
TT4	30	7.64	118.2	11.5	10.0	0.52	0.25	1.19	0.4	1.5	1.9	3.8	1.5	1.3	31	0.9	15.8	49.8	0.60	146.9	16.0	
TT5	40	7.62	117.1	11.4	10.0	0.55	0.28	1.31	0.6	1.5	1.6	3.7	1.7	0.3	33	1.0	14.1	49.1	0.62	126.3	13.4	
TT6	50	7.63	116.9	11.1	9.9	0.37	0.20	1.10	0.4	1.5	1.4	3.2	2.2	0.3	32	0.8	12.3	46.3	0.51	112.1	12.1	
TT7	60	7.54	117.7	11.1	9.8	0.21	0.10	0.93	1.4	0.7	1.5	3.5	3.3	0.7	34	1.6	14.3	52.3	0.74	80.6	9.0	
TT8	70	7.45	117.8	10.8	9.8	0.41	0.12	0.79	1.1	1.1	1.1	3.2	8.2	1.3	31	1.5	7.9	47.9	0.65	58.4	4.8	
TT9	80	7.36	118.3	10.7	9.9	0.31	0.04	0.54	1.5	1.1	0.8	3.3	6.1	2.3	31	0.6	6.0	45.0	0.57	57.6	9.0	
TT10	90	7.48	117.8	10.6	9.3	0.44	0.27	0.74	1.1	1.2	1.2	3.5	7.9	4.8	33	0.7	12.4	58.4	0.52	69.3	12.2	
TT11	100	7.29	118.5	10.5	9.2	0.25	0.11	0.40	2.0	1.2	0.8	4.1	8.4	5.0	30	1.1	5.7	48.7	0.63	64.5	8.3	
TT12	110	6.97	119.3	10.4	9.0	0.21	0.06	0.29	2.3	1.0	1.1	4.3	10.8	5.6	29	2.5	6.7	51.7	0.59	53.0	5.5	
TT13	120	7.00	119.1	10.5	9.0	0.29	0.26	0.27	2.0	1.2	1.0	4.1	9.9	6.7	31	6.1	5.8	53.8	0.58	37.5	5.3	
TT14	130	6.80	119.8	10.5	8.8	0.28	0.26	0.28	2.2	1.2	1.3	4.7	10.6	7.1	32	1.5	8.2	58.2	0.56	49.0	6.4	
TT15	140	7.23	117.9	10.4	8.8	0.25	0.20	0.26	2.7	1.4	1.1	5.2	10.8	9.5	37	2.0	10.9	67.9	0.63	66.0	8.5	
TT16	150	7.29	118.9	10.4	8.8	0.50	0.27	0.32	2.5	1.1	1.0	4.5	11.6	9.6	37	3.0	7.6	65.6	0.54	69.0	9.2	

Collection Date:- 7 April 1998 Secchi depth = 13.5 m

ID	Depth	pH	EC @25°C	Temp	DO	SS	VSS	Chlor_a	DRP	DOP	PP	TP	NH_4	NO_3	DON	UREA	PN*	TN	DOC	PC	PN**	SO_4
	m		µS cm^{-1}	C	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	g m^{-3}
YE1	1	8.00	118	17.7	9.1	0.40	0.10	0.67	0.8	1.4	1.3	3.5	2.9	4.6	53	3.7	9.9	70.4	0.83	156.5	14.4	7.7
YE2	10	7.99	119	17.7	9.1	0.49	0.12	1.04	0.9	1.4	1.8	4.1	1.9	2.5	52	4.6	13.7	70.1	0.78	179.5	16.0	8.1
YE3	20	8.00	119	17.7	9.1	0.32	0.32	1.07	0.7	1.5	1.7	3.9	2.4	1.5	48	3.7	12.6	64.5	0.71	162.5	15.2	8.5
YE4	30	7.99	120	17.5	9.1	0.30	0.20	1.06	0.7	1.7	1.6	4.0	2.0	1.2	48	3.7	12.7	63.9	0.78	138.5	14.5	8.0
YE5	40	7.60	120	13.7	9.3	0.13	0.13	1.18	1.2	1.0	1.2	3.4	2.0	3.1	39	4.2	8.2	52.3	0.69	112.5	8.2	7.7
YE6	50	7.50	120	11.5	9.3	0.34	0.00	0.75	2.4	0.9	0.9	4.2	2.5	4.5	52	3.2	6.5	65.5	0.65	88.0	6.7	7.8
YE7	60	7.38	120	11.0	9.3	0.11	0.00	0.49	3.0	0.7	0.8	4.5	1.5	11.7	32	3.2	5.3	50.5	0.72	74.5	5.8	7.7
YE8	70	7.32	121	10.8	9.2	0.20	0.00	0.33	3.1	0.9	0.6	4.6	1.0	17.7	38	3.7	4.0	60.7	0.78	57.5	4.1	7.9
YE9	80	7.23	120	10.6	9.1	0.24	0.24	0.24	3.5	0.6	0.8	4.9	1.4	23.1	43	6.9	5.7	73.2	0.69	49.5	4.5	7.9
YE10	90	7.27	121	10.6	9.1	0.31	0.21	0.17	4.4	0.6	0.7	5.7	1.3	24.1	41	6.5	5.6	72.0	0.68	47.5	4.9	7.9
YE11	100	7.29	121	10.6	9.0	0.32	0.11	0.16	4.5	0.7	0.8	6.0	1.0	24.5	39	3.7	6.8	71.3	0.57	58.0	7.4	7.8
YE12	110	7.29	121	10.5	8.9	0.35	0.35	0.12	4.8	0.7	0.5	6.0	1.3	25.1	40	5.5	6.5	72.9	0.63	52.5	2.6	7.8
YE13	120	7.35	121	10.5	8.9	0.24	0.08	0.37	3.4	0.6	1.2	5.2	1.0	18.9	35	4.6	4.1	59.0	0.75	63.5	3.8	7.7
YE14	130	7.24	122	10.5	8.8	0.32	0.16	0.11	5.7	0.6	0.7	7.0	1.0	27.0	39	6.0	3.5	70.5	0.63	52.0	3.9	7.9
YE15	140	7.21	122	10.5	8.6	0.45	0.05	0.15	6.4	0.6	1.0	8.0	4.2	29.1	65	10.6	6.7	105.0	0.74	60.5	5.9	7.8
YE16	150	7.49	121	10.5	8.4	0.80	0.15	0.62	3.3	1.1	1.6	6.0	2.5	13.0	62	9.7	14.2	91.7	0.70	135.5	13.6	7.9

NH_4, NO_3, DON, Urea all as N Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 mg m^{-3}

* = PN by wet digestion method, ** = PN by combustion furnace method.

Lake Taupo biannual nutrient database **1996-1997** **Started 27 October 1994**

Collection Date 24 October 1996 Secchi depth = 12.6 m

ID	Depth	pH	EC @25°C	Temp	DO	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4	NO_3	DON	UREA	PN*	TN	DOC	PC	PN**	SO4
	m		$\mu S\ cm^{-1}$	C	$g\ m^{-3}$	$g\ m^{-3}$	$g\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-3}$
IG1	1			12.4	10.3	0.45	0.34	0.27	0.6	2.1	1.7	4.4	3.0	0.5	59.3	1.4	13.9	76.7	0.86	171	14.5	7.82
IG2	10			12.3	10.3	0.72	0.42	0.47	0.7	2.3	2.2	5.2	2.4	0.4	64.5	1.0	14.5	81.8	0.88	201	16.8	7.90
IG3	20			12.3	10.2	0.67	0.40	0.45	0.8	2.8	2.9	6.5	2.6	0.4	75.8	0.6	18.7	97.5	0.91	232	19.8	7.87
IG4	30			12.3	9.9	0.85	0.49	0.64	0.6	2.3	3.1	6.0	3.3	0.5	73.6	0.4	20.6	98.0	0.95	198	15.7	7.86
IG5	40			11.9	9.9	0.71	0.46	0.56	0.5	1.8	2.5	4.8	2.6	1.2	64.8	0.3	14.6	83.2	0.80	183	12.8	7.84
IG6	50			11.6	9.8	0.62	0.34	0.45	1.1	3.1	2.1	6.3	2.9	0.6	71.2	0.9	13.2	87.9	0.92	157	14.9	7.95
IG7	60			11.1	9.7	0.77	0.32	0.70	0.9	1.8	2.3	5.0	4.4	13.2	175.4	3.5	14.3	207.3	1.29	151	14.1	10.67
IG8	70			10.6	9.4	0.65	0.28	0.54	0.8	1.5	1.9	4.2	2.9	0.8	59.3	1.5	9.2	72.2	0.78	116	10.2	7.85
IG9	80			10.5	9.3	0.51	0.27	0.55	0.9	2.5	1.8	5.2	3.0	3.0	76.1	1.3	9.8	91.9	0.95	103	10.8	7.80
IG10	90			10.4	9.3	0.49	0.23	0.50	0.6	1.8	1.8	4.2	2.1	1.0	52.3	1.4	10.9	66.3	0.73	95	11.0	7.69
IG11	100			10.4	9.2	0.50	0.21	0.51	0.5	1.5	1.8	3.8	1.8	3.6	53.9	4.5	9.6	68.9	1.04	106	12.8	7.85
IG12	110			10.4	9.2	0.43	0.23	0.49	0.4	1.3	2.0	3.7	2.5	5.2	54.0	6.0	9.3	71.0	0.80	94	11.5	7.85
IG13	120			10.4	9.0	0.47	0.21	0.47	0.8	1.4	1.8	4.0	3.7	9.6	61.9	6.9	8.0	83.2	0.78	78	9.7	7.97
IG14	130			10.3	8.9	0.44	0.18	0.38	1.1	1.5	2.3	4.9	4.5	9.7	52.4	4.6	12.0	78.6	1.00	83	8.7	7.99
IG15	140			10.3	8.9	0.49	0.22	0.51	1.5	1.6	2.5	5.6	4.3	12.9	57.8	5.0	10.4	85.4	0.99	80	8.9	8.14
IG16	150			10.3	8.9	1.13	0.26	0.57	1.2	2.3	3.5	7.0	5.1	13.6	65.9	4.8	14.5	99.1	0.91	121	13.4	8.15

Collection Date:- 2 April 1997 Secchi depth = 16.0 m

ID	Depth	pH	EC @25°C	Temp	DO	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4	NO_3	DON	UREA	PN*	TN	DOC	PC	PN**	SO4
	m		$\mu S\ cm^{-1}$	C	$g\ m^{-3}$	$g\ m^{-3}$	$g\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-3}$
NA1	1	8.02	118.4	17.3	9.4	0.30	0.30	0.63	0.9	2.2	1.5	4.6	4.0	0.6	67.4	4.9	18.1	90.1	0.82	186.5	17.3	7.80
NA2	10	8.01	118.3	17.3	9.2	0.20	0.10	0.69	0.9	1.3	1.6	3.8	1.7	0.3	51.0	3.3	14.4	67.4	0.77	190.0	17.1	7.86
NA3	20	8.03	118.2	17.2	8.9	0.40	0.30	0.63	0.6	1.2	1.6	3.4	1.8	0.3	51.8	2.2	17.6	71.5	0.75	192.0	19.1	7.85
NA4	30	7.98	118.4	17.2	8.8	0.40	0.40	0.52	0.7	1.0	1.5	3.2	2.5	0.6	47.5	2.7	15.2	65.8	0.56	207.5	20.3	7.90
NA5	40	7.52	118.5	14.2	8.8	0.20	0.20	0.72	0.8	1.8	1.4	4.0	2.7	0.3	53.2	4.1	13.3	69.5	0.69	158.0	15.2	7.91
NA6	50	7.32	119.3	11.3	8.6	0.00	0.00	0.39	1.5	1.4	1.0	3.9	11.2	3.1	54.7	4.5	9.7	78.7	0.62	116.5	10.6	7.88
NA7	60	7.18	120.2	10.9	8.6	0.20	0.20	0.16	1.7	1.3	0.8	3.8	3.7	10.1	48.9	2.1	10.5	73.2	0.86	100.0	13.8	7.88
NA8	70	7.13	119.6	10.6	8.5	0.10	0.10	0.12	1.9	1.7	0.8	4.4	4.3	11.8	58.3	2.2	8.0	82.4	0.83	75.0	8.7	7.87
NA9	80	7.12	120.1	10.5	8.5	0.10	0.10	0.05	3.3	1.4	0.7	5.4	6.9	26.9	82.4	16.9	6.7	122.9	0.98	77.5	9.9	7.90
NA10	90	7.12	120.4	10.5	8.5	0.00	0.00	0.25	3.6	2.2	0.7	6.5	28.9	22.9	108.3	7.4	8.1	168.2	0.63	110.5	8.8	8.00
NA11	100	7.10	120.4	10.5	8.4	0.20	0.20	0.04	4.4	1.2	0.8	6.4	10.7	22.5	72.0	5.2	7.1	112.3	0.85	71.0	8.3	7.97
NA12	110	7.07	120.6	10.4	8.3	0.20	0.20	0.02	3.7	2.0	0.8	6.5	2.9	21.9	52.5	3.8	6.4	83.7	1.01	77.0	9.6	7.93
NA13	120	7.07	120.5	10.4	8.2	0.30	0.20	0.02	3.3	2.4	0.8	6.5	6.4	22.8	56.4	4.2	13.0	98.6	0.70	113.5	15.4	7.88
NA14	130	7.08	120.4	10.4	8.0	0.20	0.20	0.01	4.3	1.6	0.8	6.7	6.2	27.9	56.7	6.2	8.2	99.0	0.81	118.5	11.0	7.97
NA15	140	7.10	121.1	10.4	7.6	0.40	0.40	0.04	4.5	1.7	1.2	7.4	3.9	28.9	58.5	7.9	24.7	116.0	0.80	212.5	28.8	7.91
NA16	150	7.10	122.1	10.4	7.5	1.20	0.40	0.07	5.0	1.0	2.7	8.7	8.6	29.0	61.5	11.8	20.2	119.3	2.07	234.5	22.1	7.97

NH_4, NO_3, DON, Urea all as N Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 $mg\ m^{-3}$

* = analysed by wet digestion method, ** = analysed by CHN combustion furnace method.

Lake Taupo biannual nutrient database **1995-1996**

Collection Date:- 30 October 1995 Secchi depth = 13.0 m

ID	Depth	pH	EC @25°C	Temp	DO	BOD$_5$	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH$_4$	NO$_3$	DON	UREA	PN*	TN	DOC	PC	PN**
	m		µS cm^{-1}	C	g m^{-3}	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}
ZH1	1	7.40	115.1	13.7	10.3	0.80	0.60	0.38	0.45	<0.2	2.4	1.27	3.67	<0.2	<0.1	55.7	3	6.89	62.69	0.75	123	10.3
ZH2	10	7.59	116.1	11.9	10.5	0.40	0.95	0.53	0.96	<0.2	0.8	1.94	2.74	<0.2	<0.1	48.0	3	14.69	62.69	0.61	217	18.0
ZH3	20	7.39	117.8	11.4	10.6	-0.05	1.09	0.59	1.18	0.3	1.5	2.41	4.21	0.2	<0.1	51.5	4	19.47	71.17	0.58	285	22.3
ZH4	30	7.58	116.6	11.2	10.7	-0.15	1.15	0.58	1.26	0.2	0.7	2.21	3.11	<0.2	<0.1	44.6	2	17.83	62.43	0.45	242	19.4
ZH5	40	7.48	116.2	10.9	10.7	0.00	0.91	0.57	1.22	<0.2	1.1	1.88	2.98	<0.2	<0.1	41.9	2	13.00	54.90	0.44	183	15.8
ZH6	50	7.36	117.0	10.8	10.3	0.25	0.69	0.42	1.10	<0.2	0.8	1.71	2.51	<0.2	<0.1	41.7	3	8.55	50.25	0.43	116	10.3
ZH7	60	7.28	117.2	10.7	10.3	0.70	0.49	0.28	1.03	<0.2	0.8	1.55	2.35	<0.2	0.1	41.1	3	7.75	48.95	0.40	110	10.3
ZH8	70	7.25	117.8	10.5	10.2	0.50	0.64	0.43	1.03	<0.2	0.6	1.50	2.10	<0.2	0.2	40.4	2	7.27	47.87	0.38	108	9.9
ZH9	80	7.25	117.5	10.5	10.2	0.40	0.72	0.43	1.19	<0.2	0.8	1.58	2.38	<0.2	0.7	41.4	2	7.19	49.39	0.48	115	12.1
ZH10	90	7.30	118.0	10.5	10.1	0.00	0.72	0.40	1.27	0.3	0.6	1.59	2.49	<0.2	1.5	38.5	3	7.30	47.30	0.47	101	12.1
ZH11	100	7.25	117.5	10.5	10.0	0.15	0.71	0.39	1.30	<0.2	0.2	1.77	1.97	<0.2	2.4	36.4	3	10.67	49.47	0.49	107	12.5
ZH12	110	7.25	117.5	10.5	9.9	0.35	0.71	0.38	1.32	<0.2	0.9	1.69	2.59	0.5	4.6	44.3	3	10.26	59.66	0.52	93	13.1
ZH13	120	7.23	117.3	10.5	9.9	0.30	0.70	0.41	1.35	<0.2	1.3	1.55	2.85	0.5	5.6	51.3	9	7.99	65.39	0.51	99	12.9
ZH14	130	7.25	117.3	10.5	9.8	0.20	0.69	0.47	1.32	<0.2	0.4	1.89	2.29	1.3	6.6	49.7	7	13.42	71.02	0.55	112	18.5
ZH15	140	7.25	117.3	10.5	9.6	0.40	0.97	0.47	1.60	<0.2	0.2	2.54	2.74	5.7	11.7	60.6	9	11.77	89.77	0.57	113	15.8
ZH16	150	7.25	117.5	10.5	9.2	0.40	1.77	0.91	1.77	0.7	0.4	3.05	4.15	8.3	13.2	90.9	15	48.30	160.70	0.69	357	55.1

Collection Date:- 28 March 1996 Secchi depth = 14.6 m

ID	Depth	pH	EC @25°C	Temp	DO	BOD$_5$	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH$_4$	NO$_3$	DON	UREA	PN*	TN	DOC	PC	PN**
	m		µS cm^{-1}	C	g m^{-3}	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}
DR1	1	8.02	117.4	16.8	8.7	0.15	0.31	0.18	0.48	1.3	1.8	0.93	4.03	<0.2	4.7	91.0	1.4	12.69	108.39	0.35	118	9.7
DR2	10	8.02	117.4	16.7	8.7	0.20	0.44	0.25	0.81	1.3	1.5	1.43	4.23	<0.2	7.4	111.0	6.2	12.60	131.00	0.42	149	12.3
DR3	20	7.95	117.6	16.6	8.8	0.25	0.34	0.23	0.76	1.0	1.8	1.30	4.10	0.6	<0.1	60.0	2.0	11.70	72.30	0.35	126	11.7
DR4	30	7.59	119.0	13.7	9.0	0.25	0.39	0.15	1.13	1.5	1.7	1.51	4.71	0.5	0.2	64.0	2.0	11.72	76.42	0.26	101	12.8
DR5	40	7.43	118.9	12.4	8.8	0.25	0.35	0.16	0.97	1.3	1.4	1.41	4.11	1.1	<0.1	51.0	2.2	11.77	63.87	0.22	68	8.6
DR6	50	7.34	119.5	11.6	8.6	0.10	0.32	0.14	0.71	1.8	1.5	1.17	4.47	0.8	5.0	68.0	3.5	8.76	82.56	0.18	60	6.4
DR7	60	7.32	119.4	11.4	8.5	0.25	0.27	0.10	0.48	2.2	1.0	1.06	4.26	1.8	5.9	59.0	1.8	8.32	75.02	0.17	46	5.7
FR8	70	7.29	120.4	11.6	8.5	0.25	0.23	0.13	0.28	2.3	1.5	0.80	4.60	<0.2	14.1	87.0	3.4	6.65	107.75	0.26	48	6.4
DR9	80	7.20	120.8	11.2	8.3	0.20	0.30	0.14	0.17	2.9	1.3	0.83	5.03	1.5	10.0	68.0	1.4	5.15	84.65	0.23	45	5.5
DR10	90	7.20	121.2	11.3	8.2	0.20	0.39	0.14	0.12	2.7	2.1	0.89	5.69	2.5	11.5	55.0	1.4	5.34	74.34	0.17	51	6.7
DR11	100	7.24	121.3	10.9	8.2	0.05	0.45	0.19	0.10	2.8	1.8	0.93	5.53	2.2	11.4	72.0	8.1	9.25	94.85	0.22	46	6.9
DR12	110	7.32	122.1	10.8	8.1	0.25	0.25	0.15	0.08	2.7	1.8	0.88	5.38	1.0	11.5	68.0	1.6	5.86	86.36	0.23	52	8.1
DR13	120	7.39	120.2	10.7	8.3	0.15	0.24	0.11	0.09	2.8	1.2	0.74	4.74	2.2	11.2	75.0	3.8	3.91	92.31	0.26	34	5.3
DR14	130	7.47	120.3	10.7	8.3	0.25	0.31	0.15	0.08	3.1	1.5	0.70	5.30	1.5	12.4	70.0	2.5	3.43	87.33	0.27	45	3.8
DR15	140	7.43	121.1	10.7	8.0	0.15	0.33	0.15	0.08	4.6	1.4	0.96	6.96	2.9	16.0	88.0	5.7	4.28	111.18	0.26	51	7.4
DR16	150	7.52	120.1	10.6	7.8	0.75	0.75	0.63	0.07	4.7	1.5	2.13	8.33	3.2	15.9	140.0	32.4	69.74	228.84	0.52	349	70.7

NH_4, NO_3, DON, UREA all as N   Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 mg m^{-3}

* = analysed by wet digest method, ** = analysed by CHN combustion furnace method.

Lake Taupo biannual nutrient database **1994-1995**

Collection date:- 27 October 1994 Secchi Depth = 11.7 m

ID	Depth	Temp	DO	BOD_5	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4	NO_3	DON	UREA	PN*	TN	DOC	PC	PN**	Total LEAD
	m	C	g m^{-3}	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
MM1	1	11.7	10.5	0.30	0.93	0.55	1.16	1.6	0.7	2.5	4.8	1.1	0.2	61	0.1	16.6	78.9	0.67	193.3	20.3	0.22
MM2	10	11.5	10.6	0.35	0.86	0.49	0.97	1.5	0.4	2.5	4.4	2.2	0.1	50	<0.1	15.2	67.5	0.42	203.8	19.0	
MM3	20	11.5	10.8	0.70	0.87	0.58	0.92	1.2	1.1	2.8	5.1	5.1	<0.1	49	0.2	17.4	71.5	0.40	254.5	19.6	
MM4	30	11.3	10.7	0.30	0.86	0.54	0.99	1.2	0.0	2.3	3.5	<0.4	2.5	88	8.3	13.7	104.2	0.64	199.1	18.9	
MM5	40	10.9	10.5	0.05	0.83	0.49	0.97	1.0	1.4	2.1	4.5	0.4	<0.1	49	1.6	12.4	61.8	0.55	193.7	17.5	
MM6	50	10.9	10.4	0.15	0.85	0.48	0.83	1.0	0.9	2.2	4.1	<0.4	1.1	70	6.4	14.9	86.0	0.37	182.0	16.6	
MM7	60	10.8	10.4	0.00	1.04	0.53	0.88	1.1	0.9	2.1	4.1	<0.4	<0.1	47	1.0	13.6	60.6	0.46	184.6	20.0	
MM8	70	10.7	10.4	0.10	1.23	0.54	1.18	1.1	1.2	2.3	4.6	2.6	0.4	57	1.6	14.7	74.7	0.96	198.7	23.0	
MM9	80	10.6	10.4	0.35	1.07	0.45	1.37	1.0	1.4	2.4	4.8	1.2	0.1	47	1.0	15.3	63.6	0.51	154.4	22.6	
MM10	90	10.5	10.4	0.10	1.24	0.48	1.79	1.0	1.1	1.9	4.0	1.5	<0.1	43	1.3	15.6	60.1	0.48	152.0	22.0	
MM11	100	10.5	10.2	0.10	1.22	0.49	1.76	1.2	1.0	2.5	4.7	1.5	0.4	58	1.8	17.9	77.8	1.21	183.7	33.9	
MM12	110	10.5	10.3	0.45	1.15	0.48	1.78	1.4	0.4	3.0	4.8	1.4	0.4	52	1.9	16.8	70.6	0.65	105.8	28.4	
MM13	120	10.4	10.2	0.00	0.96	0.41	1.94	1.1	0.7	2.8	4.6	<0.4	0.6	61	1.6	16.7	78.4	1.00	106.7	29.8	
MM14	130	10.4	9.8	0.00	1.07	0.41	2.37	1.0	1.2	2.6	4.8	6.8	0.9	73	5.5	20.8	101.5	0.53	157.6	23.7	
MM15	140	10.4	9.8	0.00	1.63	0.57	2.32	1.1	1.1	2.3	4.5	3.7	0.9	61	1.9	20.6	86.2	0.44	176.0	19.2	0.36
MM16	150	10.3	9.9	0.25	1.73	0.75	2.49	1.8	0.8	2.3	4.9	4.2	1.9	60	12.1	39.6	105.7	0.57	303.6	44.0	1.09
MM17	Tube				0.99	0.53	0.84	1.3	1.0	2.0	4.3	0.5	0.2	39	3.1	15.9	55.6	0.53			

Collection date:- 19 April 1995 Secchi Depth = 16.1 m

ID	Depth	Temp	DO	BOD_5	SS	VSS	Chlor_*a*	DRP	DOP	PP	TP	NH_4	NO_3	DON	UREA	PN*	TN	DOC	PC	PN**	Total LEAD
	m	C	g m^{-3}	g m^{-3}	g m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	g m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
SZ1	1	18.4	9.2	0.10	0.22	0.22	0.95	3.3	1.7	1.3	6.3	3.6	0.9	83	7.7	14.6	102.1	0.70	160.5	16.8	<0.5
SZ2	10	18.2	9.3	0.15	0.28	0.28	0.89	2.2	1.2	1.5	4.9	2.0	0.8	59	6.5	13.5	75.3	0.68	189.0	18.1	<0.5
SZ3	20	18.2	9.2	0.25	0.24	0.24	0.80	1.3	0.0	1.4	2.7	1.0	1.0	56	4.5	10.7	68.7	0.60	153.5	14.5	
SZ4	30	16.5	9.3	0.50	0.26	0.26	1.35	1.3	1.0	1.6	3.9	1.2	0.7	55	8.4	13.4	70.3	0.60	151.5	14.7	<0.5
SZ5	40	12.5	9.7	0.45	0.16	0.16	0.98	1.1	0.2	1.2	2.5	2.0	1.0	47	4.4	8.0	58.0	0.60	111.0	8.6	
SZ6	50	11.6	9.5	0.60	0.10	0.10	0.86	2.0	0.5	1.2	3.7	1.7	1.3	47	5.3	8.8	58.8	0.60	119.0	10.5	
SZ7	60	11.1	9.5	0.30	0.07	0.07	0.73	1.0	1.1	1.2	3.3	0.5	5.4	40	5.3	7.0	52.9	0.50	83.8	9.0	
SZ8	70	10.9	9.5	0.55	0.04	0.04	0.45	1.4	0.7	1.3	3.4	0.5	7.7	39	6.2	8.7	55.9	0.55	97.4	11.1	
SZ9	80	10.8	9.0	0.40	0.10	0.10	0.35	1.6	0.0	1.0	2.6	0.5	11.3	36	3.2	6.1	53.9	0.53	75.5	8.2	
SZ10	90	10.7	8.7	0.30	0.07	0.07	0.25	1.3	0.5	1.4	3.2	0.5	15.7	40	6.1	9.8	66.0	0.50	92.5	9.6	
SZ11	100	10.7	8.6	0.75	0.01	0.01	0.23	2.8	0.1	0.8	3.7	0.4	18.4	37	6.3	8.2	64.0	0.60	68.7	6.3	
SZ12	110	10.7	8.3	0.50	0.09	0.09	0.20	2.1	1.0	1.3	4.4	0.5	20.4	41	4.4	12.4	74.3	0.55	99.0	14.0	
SZ13	120	10.7	8.2	0.40	0.05	0.05	0.16	2.5	0.0	0.9	3.4	0.5	22.0	37	3.5	4.8	64.3	0.50	62.1	4.5	
SZ14	130	10.7	8.0	0.70	0.00	0.00	0.17	3.1	0.0	1.0	4.1	0.6	26.5	45	3.5	5.9	78.0	0.55	77.0	7.4	
SZ15	140	10.6	7.8	1.00	0.28	0.25	0.17	4.1	0.0	1.7	5.8	0.5	30.7	44	3.6	11.2	86.4	0.60	133.5	12.4	<0.5
SZ16	150	10.6	7.5	2.05	49.47	5.58	64.05	38.9	1.4	*	40.3	1.7	40.9	48	11.4	*	90.6	0.75	*	*	<0.5
Surficial sediment																					10.5

* = Sediment contamination, sample not filtered for analysis.

NH_4, NO_3, DON, UREA all as N

Detection limits: DRP 0.5; NO_3-N 0.5; NH_4-N 1.0 mg m^{-3}

* = analysed by wet digestion method, ** = analysed by CHN combustion furnace method.

12. Appendix 5. Phytoplankton data

(Note: totals may vary by 1 due to rounding).

Lake Taupo phytoplankton species composition and biovolume (µm^3) 2005-2006

From Site A (Mid Lake)

Sample Code	**QD1**	**QD2**	**QD3**	**QD6**	**QD8**	**QD11**	**QD16**
25/10/2005	Surface	10m	20m	50m	70m	100m	150m
Blue greens (Cyanophyceae)							
Anabaena sp	1022	715	334	4754	360	0	0
Greens (Chlorophyceae)							
Monoraphidium sp/ Ankistrodesmus falcatus	3759	2761	587	2350	352	352	162
Botryococcus braunii	115539	0	10320	41278	0	0	0
Chlorosarcinopsis sp.	54	54	0	0	0	0	0
Lagerheimia longiseta	481	481	0	96	96	0	0
Oocytsis sp.	4325	2884	2083	320	320	160	121
Scenedesmus sp.	0	0	214	0	0	0	0
Westella botryoides	0	0	143	0	0	0	0
Diatoms (Bacillariophyceae)							
Asterionella formosa	4801	2400	11257	29549	8277	4387	498
Aulacoseira granulata	0	0	3807	1159	545	1407	623
Aulacoseira granulata var. angustissima	579	7118	19534	36170	22879	11275	2035
Cyclotella stelligera	1282	812	2136	1324	684	470	43
Fragilaria crotonensis	8735	32484	27298	34941	0	10100	1301
Eunotia sp.	0	0	0	0	0	0	44
Desmids (Mesotaeniaceae, Desmidiaceae)							
Closterium acutum var. variable	267	134	0	0	0	0	34
Staurodesmus unicorns var. gracilis	0	0	0	0	0	935	0
Chrysophtya (Chrysophyceae)							
Dinobryon sp.	110858	107975	58313	25632	0	0	0
Dinoflagellates (Dinophyceae)							
Gymnodinium sp.	0	0	0	0	10830	3044	0
Flagellates 5µm							
Flagellates < 5µm/unicells	1281	1310	670	1786	141	217	72
Total biovolume (µm^3) per ml	252983	159126	136694	179360	44484	32348	4934

Sample Code 12/04/2006	ZD4 Surface	ZD2 10m	ZD3 20m	ZD6 50m	ZD8 70m	ZD11 100m	ZD16 150m
Species							
Blue greens (Cyanophyceae)							
Pseudanabaena limnetica	0	0	2563	0	0	0	0
Anabaena sp.	1346	0	0	0	10125	0	769
Aphanothece sp.	250	0	0	0	229	0	0
Aphanothece sp.	250	0	0	0	0	0	0
Aphanizomenon sp.	64	0	0	0	0	0	0
Greens (Chlorophyceae)							
Monoraphidium sp/ Ankistrodesmus falcatus	11337	4699	3113	1880	705	176	352
Kirchneriella contorta	0	59	0	59	0	0	0
Botryococcus braunii	60115	0	0	0	0	0	0
Gloeocystis planctonica	0	60	0	60	0	0	0
Elakotothrix gelatinosa	547	0	0	0	0	0	0
Lagerheimia longiseta	577	0	288	0	48	0	192
Oocytsis sp.	7610	3524	2563	1202	240	160	0
Tetraedon gracile	0	0	235	0	0	0	0
Chlorosarcinopsis sp.	0	1781	713	119	238	0	0
Diatoms (Bacillariophyceae)							
Asterionella formosa	0	0	0	414	2897	0	0
Aulacoseira granulata	0	993	0	248	0	0	0
Aulacoseira granulata var. angustissima	0	0	1324	3311	1738	1573	3311
Cyclotella stelligera	299	171	256	128	171	128	85
Nitzschia sp.	4378	3127	2085	1563	834	0	104
Synedra sp.	0	0	12	0	6	6	0
Eunotia sp.	0	0	160	0	208	0	0
Desmids (Mesotaeniaceae, Desmidiaceae)							
Closterium acutum	0	0	0	0	0	0	401
Closterium acutum var. *variable*	0	0	534	401	534	267	134
Staurodesmus unicorns var. *gracilis*	0	1869	0	935	0	0	0
Dinoflagellates (Dinophyceae)							
Dinobryon sp.	32360	22428	16020	18583	0	0	0
Cryptomonas sp.	0	0	278	0	486	0	0
Dinoflagellates (Dinophyceae)							
Gymnodinium sp.	26700	21360	21360	10680	0	0	0
Flagellates 5µm							
Flagellates < 5µm/unicells	4277	1251	1820	626	512	0	11
Total biovolume (μm^3) per ml	150108	61323	53324	40207	18970	2310	5359

Lake Taupo phytoplankton dominance 2005-06

(1 = dominant,…10 = rare)

Data from 10 m integrated tube samples on each sampling date (sample code included)

17/08/2005 ML3	Site A
Aulacoseira granulata var. *angustissima*	1
Fragilaria crotonensis	2
Asterionella formosa	3
Anabaena sp. (flos-aquae dominant)	5
Cyclotella stelligera	6
Closterium acutum var. *variable*	6
Eudorina elegans	7
Oocytsis sp.	8
Flagellates < 5µm/unicells	8
Botryococcus braunii	9
Anabaena planktonica	10
Anabaena flos-aquae	10
Pseudanabaena limnetica	10
Monoraphidium sp/ Ankistrodesmus falcatus	10
Lagerheimia longiseta	10
Quadrigula lacustrus	10
Sphaerocystis schroeteri	10

31/08/2005 NN1	Site A
Fragilaria crotonensis	1
Aulacoseira granulata var. *angustissima*	2
Asterionella formosa	3
Anabaena sp. (flos-aquae dominant)	6
Botryococcus braunii	6
Oocytsis sp.	7
Chlorosarcinopsis sp.	7
Closterium acutum var. *variable*	7
Dinobryon sp.	7
Gymnodinium sp.	7
Flagellates < 5µm/unicells	8
Monoraphidium sp/ Ankistrodesmus falcatus	9
Closterium acutum	9
Aphanothece sp.	10
Pseudanabaena limnetica	10
Sphaerocystis schroeteri	10

14/09/2005 NN3	Site A
Aulacoseira granulata var. *angustissima*	1
Fragilaria crotonensis	2
Asterionella formosa	3
	3
Oocytsis sp.	6
Chlorosarcinopsis sp.	7
Dinobryon sp.	7
Gymnodinium sp.	7
Anabaena sp. (flos-aquae dominant)	8
Flagellates < 5µm/unicells	8
Botryococcus braunii	9
Closterium acutum var. *variable*	9
Monoraphidium sp/ Ankistrodesmus falcatus	9
Closterium acutum	9
Aphanothece sp.	10
Pseudanabaena limnetica	10
Sphaerocystis schroeteri	10

29/09/05 NN5	
Asterionella formosa	1
Aulacoseira granulata var. *angustissima*	2
Fragilaria crotonensis	3
Anabaena sp. (flos-aquae dominant)	4
Oocytsis sp.	6
Cyclotella stelligera	6
Eudorina elegans	7
Monoraphidium sp/ Ankistrodesmus falcatus	8
Closterium acutum	8
Flagellates < 5µm/unicells	8
Botryococcus braunii	9
Chlorosarcinopsis sp.	9
Pseudanabaena limnetica	10
Closterium acutum var. *variable*	10

12/10/2005 PO2	
Aulacoseira granulata var. *angustissima*	1
Asterionella formosa	2
Dinobryon sp.	3
Anabaena sp. (flos-aquae dominant)	4
Fragilaria crotonensis	5
Cyclotella stelligera	6
Oocytsis sp.	7
Staurastrum sp.	8
Flagellates < 5µm/unicells	9
Chlorosarcinopsis sp.	9
Nephrocytium agardhianum	10

25/10/05 PO4	
Aulacoseira granulata var. *angustissima*	1
Fragilaria crotonensis	2
Asterionella formosa	3
Dinobryon sp.	4
Cyclotella stelligera	5
Oocytsis sp.	6
Closterium acutum var. *variable*	6
Closterium acutum	7
Flagellates < 5µm/unicells	8
Chlorosarcinopsis sp.	8
Anabaena sp. (flos-aquae dominant)	9
Nephrocytium agardhianum	10

11/11/2005 QZ2

Dinobryon sp.	1
Aulacoseira granulata var. *angustissima*	2
Asterionella formosa	3
Anabaena sp. (flos-aquae dominant)	4
Closterium acutum	5
Cyclotella stelligera	6
Oocytsis sp.	7
Flagellates < 5µm/unicells	7
Chlorosarcinopsis sp.	8
Westella botryoides	9
Staurastrum sp.	10

1/12/2005 SB2

Dinobryon sp.	1
Aulacoseira granulata var. *angustissima*	2
Asterionella formosa	3
Cyclotella stelligera	5
Closterium acutum	6
Botryococcus braunii	6
Oocytsis sp.	7
Closterium acutum var. *variable*	7
Flagellates < 5µm/unicells	8
Gymnodinium sp.	8
Anabaena sp. (flos-aquae dominant)	10
Quadrigula lacustrus	10

10/01/2006 TZ

Botryococcus braunii	1
Aulacoseira granulata var. *angustissima*	2
Asterionella formosa	3
Dinobryon sp.	4
Oocytsis sp.	5
Flagellates < 5µm/unicells	5
Gymnodinium sp.	5
Cyclotella stelligera	7
Elakotothrix gelatinosa	7
Closterium acutum var. *variable*	8
Anabaena sp. (flos-aquae dominant)	9
Monoraphidium sp/ Ankistrodesmus falcatus	9
Pseudanabaena limnetica	10

20/02/2006 VC

Botryococcus braunii	1
Aulacoseira granulata var. *angustissima*	3
Dinobryon sp.	3
Gymnodinium sp.	4
Asterionella formosa	5
Flagellates < 5µm/unicells	5
Oocytsis sp.	6
Cyclotella stelligera	7
Anabaena sp. (flos-aquae dominant)	7
Closterium acutum var. *variable*	8
Monoraphidium sp/ Ankistrodesmus falcatus	8
Aphanizomenon sp.	8

12/04/2006 ZI1

Dinobryon sp.	1
Gymnodinium sp.	2
Asterionella formosa	2
Anabaena sp. (flos-aquae dominant)	4
Fragilaria crotonensis	5
Flagellates < 5µm/unicells	6
Closterium acutum var. *variable*	7
Monoraphidium sp/ Ankistrodesmus falcatus	7
Aphanizomenon sp.	9
Oocytsis sp.	10
Lagerheimia longiseta	10

27/04/2006 ZI3

Dinobryon sp.	1
Asterionella formosa	2
Gymnodinium sp.	4
Monoraphidium sp/ Ankistrodesmus falcatus	5
Flagellates < 5µm/unicells	6
Closterium acutum var. *variable*	7
Anabaena sp. (flos-aquae dominant)	8
Fragilaria crotonensis	9
Lagerheimia longiseta	10

9/05/2006 BD2

Botryococcus braunii	1
Dinobryon sp.	2
Aulacoseira granulata var. *angustissima*	3
Flagellates < 5µm/unicells	4
Monoraphidium sp/ Ankistrodesmus falcatus	5
Nitzschia sp.	6
Oocytsis sp.	7
Quadrigula lacustrus	8
Gymnodinium sp.	9
Anabaena sp. (flos-aquae dominant)	10

30/05/2006 BD4

Aulacoseira granulata var. *angustissima*	1
Asterionella formosa	2
Dinobryon sp.	3
Gymnodinium sp.	5
Botryococcus braunii	6
Eudorina elegans	6
Anabaena sp. (flos-aquae dominant)	7
Flagellates < 5µm/unicells	8
Monoraphidium sp/ Ankistrodesmus falcatus	8
Oocytsis sp.	9
Nephrocytium lunatum	9
Closterium acutum	10

27/06/2006 DV2

Aulacoseira granulata var. *angustissima*	1
Aulacoseira granulata	2
Asterionella formosa	3
Fragilaria crotonensis	4
Cyclotella stelligera	5
Dinobryon sp.	6
Flagellates < 5µm/unicells	8
Anabaena sp. (flos-aquae dominant)	9
Oocytsis sp.	9
Closterium acutum var. *variable*	9
Monoraphidium sp/ Ankistrodesmus falcatus	10
Pseudanabaena limnetica	10
Chlorosarcinopsis sp.	10
Staurodesmus unicorns var. *gracilis*	10

11/07/2006 EM2		25/07/2006 EM4		5/08/2006 EN5	
Asterionella formosa	1	*Aulacoseira granulata* var. *angustissima*	1	*Asterionella formosa*	1
Aulacoseira granulata var. *angustissima*	2	*Aulacoseira granulata*	2	*Aulacoseira granulata* var. *angustissima*	2
Aulacoseira granulata	3	*Asterionella formosa*	3	*Aulacoseira granulata*	3
Fragilaria crotonensis	4	*Fragilaria crotonensis*	4	*Fragilaria crotonensis*	4
Cyclotella stelligera	5	*Cyclotella stelligera*	5	*Cyclotella stelligera*	5
Closterium acutum	6	*Closterium acutum*	6	Flagellates < 5µm/unicells	6
Dinobryon sp.	7	Flagellates < 5µm/unicells	7	*Oocytsis* sp.	7
Flagellates < 5µm/unicells	7	*Botryococcus braunii*	7	*Anabaena* sp. (flos-aquae dominant)	8
Monoraphidium sp/ Ankistrodesmus falcatus	8	*Monoraphidium sp/ Ankistrodesmus falcatus*	8	*Closterium acutum* var. *variable*	8
Gymnodinium sp.	8	*Gymnodinium* sp.	8	*Monoraphidium sp/ Ankistrodesmus falcatus*	9
Oocytsis sp.	9	*Oocytsis* sp.	8	*Gymnodinium* sp.	9
Aphanothece sp.	9	*Dinobryon* sp.	9	*Dinobryon* sp.	10
Kirchneriella contorta	9	*Kirchneriella contorta*	9	*Aphanothece* sp.	10
Staurodesmus unicorns var. *gracilis*	10	*Aphanothece* sp.	10		
Aphanocapsa sp.	10	*Staurodesmus unicorns* var. *gracilis*	10		

13. Appendix 6. Historical data

Historical data held by NIWA has frequently been referred to and included in some analysis or comparison of the data from the long-term monitoring programme. To ensure that this data is always readily available, copies of the relevant historical data are included in this report. These data are the spring and autumn profiles of NO_3-N and DRP from 1974 to 1990 extracted from archived data books. The nitrate data for 27 September 1979 was taken from Vincent (1983). Subsequent data can be found in the appendices above.

Note that the profiles given are aligned with the spring data above the corresponding autumn data, by date. Note also that the early profiles were to a depth of 110 m rather than 150 m. Also, as there was no March or April data collected in 1976, for completeness, the last valid profile in that series (12 January 1976) has been included.

The elapsed time given is the number of days between the spring profile in about October and the autumn profile in March/April of the following year. The average elapsed time between the two samplings across all data from 1974 to 2006 is 165 days.

The historical data also include an un-paired profile from July 1987. As there were no data for April 1987 and the lake was still stratified in July, when the next period of monitoring began, the July 1987 may be used as an indication of the total mass of nutrient accumulation in that year. Because these data are for an un-paired profile in July and not April, if the data are converted to rate estimates the assumption must be made that there was no spring carryover and the elapsed time is longer being estimated as the average elapsed time plus three months.

Because the 1976 and 1987 data are for periods other than spring (October/November) to autumn (March/April), these data points have been excluded from any regression analysis of time-series data although the data points have been plotted as an indication of levels/rates for those years.

Historical data from Site A in Lake Taupo

Nitrate concentrations (mg m^{-3})

Spring

Date	18/11/1974	16/10/1975	4/10/1977	10/10/1978	27/09/1979		5/10/1987	17/10/1988	6/10/1989
Depth (m)									
0	0.8	0.3	1.1	0.0	0.0		0.3	2.6	1.2
10	0.3	0.4	1.2	1.4	0.0		0.4	2.7	1.8
20	0.0	0.0	0.6	0.8	0.5		0.5	2.8	1.0
30	0.3	0.4	0.0	0.7	0.5		0.4	2.8	1.4
40	0.8	0.0	0.1	0.6	1.0		0.6	3.0	1.3
50	2.1	0.3	0.6	0.7	1.0		0.8	2.9	1.0
60	4.9	0.0	1.0	0.8	0.5		1.2	2.5	0.8
70	4.1	0.4	1.1	0.8	1.0		1.0	2.9	1.6
80	5.3	0.0	3.2	1.2	1.5		1.4	2.9	1.6
90	5.4	0.0	1.3	1.2	1.0		1.5	2.5	1.7
100	8.4	1.8	3.3	1.4	1.5		1.2	2.6	1.7
110	12.0	4.1	2.8	1.4	1.5		6.0	2.4	0.8
120			2.8	1.7	2.5		0.7	2.7	1.6
130			2.7	2.1	5.0		1.2	2.7	1.1
140			1.7	2.1	6.0		1.2	3.1	1.1
150			1.4	2.5	7.0		1.1	2.4	0.3

Autumn

Date	14/04/1975	12/01/1976	14/03/1978	10/04/1979	10/03/1980	7/07/1987	5/04/1988	4/04/1989	10/04/1990
Depth (m)									
0	0.8	0.5	0.0	0.3	0.0	2.0	1.1	2.1	0.1
10	0.4	1	0.0	0.0	0.3	1.6	1.3	2.5	0.6
20	0.2	0.2	0.0	0.0	0.0	1.0	1.3	2.4	1.3
30	0.1	0	0.0	0.0	0.0	0.2	1.1	2.5	1.2
40	0.3	0.2	0.0	0.3	0.2	0.9	2.2	2.4	1.7
50	0.5	0.3	0.0	1.0	0.8	1.1	4.0	4.9	4.9
60	4.2	1.3	0.0	7.3	4.9	14.5	12.3	5.2	3.4
70	5.6	1.5	2.2	11.1	6.2	16.4	14.6	5.1	12.0
80	9.2	8.3	4.9	12.7	9.4	16.1	16.9	10.9	11.2
90	11.2	11.1	5.8	13.5	13.5	18.5	19.0	13.5	12.4
100	12.4	14	7.4	15.0	14.4	19.8	20.7	17.1	17.1
110	16.0		9.2	14.8	15.7	20.2	19.1	20.4	16.2
120			10.1	15.0	16.7	20.9	18.6	23.3	18.2
130			8.0	16.6	18.9	21.9	21.5	24.2	17.9
140			11.0	17.3	19.4	22.1	25.4	27.1	22.4
150			14.2	19.7	19.9	21.5	27.0	28.6	24.2

DRP concentrations (mg m^{-3})

Spring

Date	18/11/1974	16/10/1975	4/10/1977	10/10/1978			5/10/1987	17/10/1988	6/10/1989
Depth (m)	???								
0	8.7	1.1	0.3	0.6			0.2	0.2	0.0
10	8.0	1.2	0.0	0.6			0.1	0.1	0.2
20	8.3	1.1	0.1	0.5			0.2	0.0	0.1
30	7.5	0.9	0.0	0.3			0.3	0.1	0.0
40	8.4	0.8	0.3	0.2			0.2	0.1	0.0
50	7.6	0.8	0.2	0.3			0.4	0.1	0.0
60	8.3	0.7	0.0	0.3			0.3	0.2	0.0
70	7.7	0.7	1.1	0.4			0.3	0.2	0.0
80	8.1	0.8	0.7	0.5			0.3	0.2	0.3
90	7.9	1.0	0.8	0.4			0.2	0.3	0.1
100	8.5	1.7	0.4	0.4			0.2	0.3	0.1
110	9.8	1.6	0.4	0.4			0.4	0.5	0.1
120			0.5	0.4			0.4	0.4	0.0
130			0.4	0.3			0.4	0.4	0.2
140			0.6	0.3			0.4	0.5	0.3
150			0.5	0.4			0.3	0.5	0.2

Autumn

Date	14/04/1975	12/01/1976	14/03/1978	10/04/1979	10/03/1980	7/07/1987	5/04/1988	4/04/1989	10/04/1990
Depth (m)									
0	0.8	1.4	0.2	0.1	0.7	1.9	0.1	0.0	0.2
10	0.5	1.4	0.2	0.1	0.4	2.2	0.1	0.0	0.0
20	0.5	7.0	0.2	0.1	0.3	0.9	0.2	0.0	0.1
30	0.5	2.5	0.2	0.1	0.2	1.0	0.2	0.0	0.2
40	0.5	0.2	0.2	0.4	0.5	0.9	0.6	0.2	0.5
50	0.5	0.9	0.7	1.0	0.7	0.7	1.1	0.5	1.1
60	1.0	0.1	0.7	1.6	1.0	3.4	2.0	0.6	0.9
70	1.0	0.8	1.0	2.0	1.1	3.7	2.2	0.9	1.9
80	1.7	1.2	1.5	2.2	1.6	3.6	2.7	1.1	1.7
90	2.0	2.0	1.8	2.4	2.2	4.1	2.9	1.3	1.8
100	2.2	3.3	1.9	2.7	2.4	4.6	3.1	1.9	2.6
110	2.9		2.4	2.8	2.6	4.5	2.9	2.7	2.1
120			2.7	2.9	2.7	4.7	3.0	3.4	2.5
130			2.1	3.0	3.7	5.1	3.4	3.8	2.4
140			2.8	3.6	3.6	5.3	4.4	4.5	3.5
150			0.9	3.8	3.8	5.0	4.6	4.8	4.0
Elapsed period (days)	147	88	161	182	165	270*	183	169	186

??? = possible analytical problem (e.g., Si interference)

* = average period of 165 days plus 3 months