CHAPTER 3

PHYSICO- CHEMICAL ENVIRONMENT
Temperature

In Nehrupark station surface water temperature before deweeding ranged from $6^\circ C$ to $25^\circ C$ with an average temperature of $16.75^\circ C$. At the bottom of the lake the temperature was slightly higher with a range of $7^\circ C - 31^\circ C$ and an average value of $17.26^\circ C$. After deweeding there was a slight increase of about $\%$ in the maximum temperature of surface water ($6^\circ C - 29^\circ C$). However, in bottom water there was hardly any change ($7^\circ C - 29^\circ C$). This situation was observed during the first year of the investigations.

During the second year at the Nagin station temperature fluctuated between $8^\circ C - 32^\circ C$ both at surface and at the bottom with an average value of $18.27^\circ C$ and $17.87^\circ C$ respectively. As a result of harvesting operations there was a slight increase of about $\%$ in the overall surface water temperature with an average of $18.56^\circ C$, whereas bottom waters registered decrease of about $\%$ with an average temperature of $17.62^\circ C$.

At the control station during the same period temperature ranged from $7^\circ C - 32^\circ C$ and $7^\circ C - 33^\circ C$ with an average values of $18.68^\circ C$
and 18.51°C both at surface and in bottom respectively. After the harvesting operations at the experimental station surface water reflected slight decrease with a mean value of 18.56°C as against bottom water temperature in which case about 5% decrease was registered (X: 17.62°C).

The 95% confidence limits indicated that the true mean surface temperature during 1988 both before and after deweeding was between 16.75°C ± 4.44 and 17.26°C ± 4.77. In bottom waters it was between 17.26°C ± 4.65 and 17.22°C ± 4.46. As shown in Fig. 3 the water temperature for the year 1989 before and after deweeding at surface ranged from 18.27°C ± 5.77 and 18.56°C ± 6.02 and at bottom from 17.87°C ± 5.37 and 17.62°C ± 5.25.

**Water transparency**

Secchi transparency during 1988 ranged from 25 - 275 cm with an average value of 136.58 cm before deweeding operations and after harvesting the extent of reduction was about 46% with an average Secchi value of 74.08 cm and a range of 15 - 200 cm.

During the subsequent year Secchi transparency
Fig. 3. Mean temperature fluctuations.

1988  .....  I
1989  .....  II
Surface  .....  a
Bottom  .....  b
Before deweeding ..
After deweeding ..
Control surface ...  
Control bottom ...

Vertical bar indicates ± one S. E. of the mean.
values before deweeding fluctuated between 100 - 250 cm with an average value of 139.33 cm. After the commencement of harvesting operations transparency values registered reduction to the extent of about 47% ($\bar{X} : 73.33$ cm).

At the control station Secchi ranged from 50 - 150 cm with a mean value of 109.58 cm. At the experimental station, as a result of deweeding, there was reduction of about 33% in transparency values ($\bar{X} : 73.33$ cm).

Calculations of 95% confidence limits for the Secchi values indicated that the true mean was between 136.58 cm $\pm$ 39.62 before and 74.06 cm $\pm$ 39.98 after deweeding. During 1989 the 95% confidence limits ranged from 139.33 cm $\pm$ 30.18 and 73.33 cm $\pm$ 31.83 as shown in Fig. 4.

**Hydrogen- ion- concentration**

Throughout the present investigations pH values remained within an alkaline range both before and after deweeding operations. At Mehrupark station pH ranged from 7.54 - 9.06 units at surface and 7.35 - 9.30 units at the bottom waters during 1988. The mean values were 8.81 units at surface and
Fig. 4. Mean transparency fluctuations.

1988 \ldots I
1989 \ldots II
Surface \ldots a
Before deweeding \ldots
After deweeding \ldots
Control surface \ldots

Vertical bar indicates \pm one S. E. of the mean.
8.77 units at bottom waters. Immediately after
deweeding the average value for pH both at surface
(8.84 units) and at bottom (8.83 units) depicted a
slight change and ranged from 7.75 - 9.41 units
and 7.70 - 9.07 units.

During the second year of observations
hydrogen- ion- concentration in surface waters ranged
from 7.75 - 9.21 units and in bottom waters
7.35 - 9.50 units (NG). Average values were
8.78 units at surface and 8.84 units at bottom
before weed harvesting. After deweeding commenced
pH did not show any significant change in its
average values. In surface waters pH range was
7.70 - 9.29 units and in bottom waters between
8.00 - 9.16 units.

At the control station, pH ranged from
7.90 to 9.13 units in surface waters and from
7.50 - 9.50 units in bottom waters with an average
values of 8.82 units and 8.74 units respectively.
After deweeding the E.S. registered a slight change
in the pH values. The mean values of 8.78 units and
8.83 units were observed in surface and bottom
waters as shown in Fig. 5.
95% confidence limits depicted that the true mean of surface water pH (Nehrupark station) in 1988 was somewhere between 8.81 units ± 0.33 and 8.84 units ± 0.31 before and after deweeding, whereas in bottom waters it was between 8.77 units ± 0.38 (B.D) and 8.83 units ± 0.31 (A.D). During 1989, the values at Nagin station were between 8.78 units ± 0.31 both before and after deweeding. In bottom waters 95% confidence values were between 8.84 units ± 0.34 (B.D) and 8.83 units ± 0.21 (A.D).

Dissolved oxygen

The mean dissolved oxygen concentration in 1988 was 8.54 mg/l at surface and 6.31 mg/l in bottom waters before deweeding commenced. The dissolved oxygen values ranged from 5.20 - 12.0 mg/l in surface and 3.76 - 10.0 mg/l in bottom waters. Immediately, after deweeding the average values (7.03 mg/l) at surface registered a decrease of about 18% but the bottom waters (6.19 mg/l) registered a decrease of only 2%. Dissolved oxygen values varied from 4.64 - 10.50 mg/l at surface and from 2.00 - 14.68 mg/l in bottom samples.

During 1989 (B.D) dissolved oxygen concentration
of surface water ranged from 7.20 - 20.0 mg/l with an average of 10.32 mg/l. In bottom samples dissolved oxygen concentration ranged from 7.20 - 13.60 mg/l with an average value of 9.25 mg/l. The impact of deweeding resulted in decrease of dissolved oxygen content by 9% in surface and only 0.3% in bottom waters.

During 1989, control station depicted mean value of 8.14 mg/l of D.O at surface and 8.40 mg/l at bottom with monthly values ranging from 5.20 - 10.16 mg/l (surface) and 2.56 - 15.6 mg/l (bottom). After weed harvesting operations at the experimental station the mean value of dissolved oxygen at surface was 9.49 mg/l and in bottom waters 9.28 mg/l thereby showing an increase of about 17% and 10% respectively.

The true mean values for dissolved oxygen content at surface layer during 1988 were between 8.54 mg/l ± 1.43 (B.D) and 7.03 mg/l ± 1.03 (A.D) and 6.31 mg/l ± 1.32 (B.D) and 6.19 mg/l ± 2.01 (A.D) as shown in Fig. 6. During the subsequent year the values before and after deweeding were between 10.32 mg/l ± 2.19 and 9.49 mg/l ± 1.56 at surface and 9.25 mg/l ± 1.27 and 9.28 mg/l ± 1.87 in bottom waters.
Fig. 5. Mean pH fluctuations.

Fig. 6. Mean dissolved oxygen fluctuations.

1988 ...
1989 ...
Surface ...
Bottom ...
Before deweeding ..
After deweeding ..
Control surface ..
Control bottom ..

Vertical bar indicates ± one S. E. of the mean.
Specific conductance in 1988 ranged from 110 - 200 μS (B. D) at surface and from 110 - 210 μS at bottom with mean values of 138 and 146 μS respectively. After the commencement of harvesting operations the average values for specific conductance were 183 μS (surface) showing thereby an increase of 32 %. In bottom waters (186 μS) an increase of about 28 % was registered. The conductivity range after deweeding was 110 - 290 μS.

During the subsequent year conductivity values in surface waters (B. D) ranged from 110 - 230 μS with a mean of 169 μS, whereas in bottom waters it ranged from 120 - 330 μS (X : 195 μS). As a result of harvesting the average values for conductivity increased by about 5 % in surface waters (X : 178 μS) as against about 3 % decrease registered in bottom waters (X : 188 μS).

Control station depicted mean values of 172 μS at surface and 183 μS at bottom. The monthly values ranged from 110 - 230 μS (Surface) and 120 - 290 μS (bottom). After harvesting operations at experimental station the mean value at surface was 178 μS and in bottom waters 188 μS thus registering a slight increase of about 4 % and 3 % respectively.
As depicted in Fig. 7 the 95% confidence limits (Nehrupark station) conveyed that the true mean of the specific conductivity at surface was somewhere between 138.33 μS ± 18.40 (B.D) and 182.92 μS ± 33.71 (A.D). In bottom waters it was between 145.83 μS ± 21.60; 186.25 μS ± 39.25 μS both before and after deweeding. During 1989 the 95% confidence limits at surface both before and after deweeding were 169.17 μS ± 22.76 and 178.33 μS ± 23.14 and at bottom 195.00 μS ± 39.43 and 188.33 μS ± 26.40 respectively.

**Total phosphorus**

Total phosphorus concentrations (B.D) ranged from 28 - 92 μg/l at surface and 30.92 μg/l at bottom. The average values were 58.58 μg/l and 58.42 μg/l respectively. After mechanical harvesting operations during the first year of investigations the average values for total phosphorus in surface waters (73.08 μg/l) registered an increase of about 25% and at bottom (71.58 μg/l) an increase of about 23%. The values ranged between 32 and 98 μg/l and 34 and 95 μg/l respectively.

During the second year the values for total
phosphorus (B. D) ranged from 29 - 98 μg/l and 32 - 96 μg/l (surface and bottom samples). The average values recorded at surface were 62.42 μg/l and in bottom 63.83 μg/l. It was observed that immediately after deweeding the average values for total phosphorus increased by about 11% in surface as against an increase of only 8% in bottom waters. The range for total phosphorus after deweeding was 40 - 99 μg/l (surface) and 39 - 98 μg/l (bottom).

Total phosphorus concentration ranged from 29 - 90 μg/l at surface (μ : 61.83 μg/l) and from 30 - 90 μg/l at bottom (μ : 59.75 μg/l) during 1989 at C.S. After harvesting operations surface water samples of E. S reflected an increase of about 12% with a mean value of 69.25 μg/l as against bottom waters where total phosphorus concentration registered about 16% increase (μ : 69.42 μg/l).

The 95% confidence limits indicated that the true mean for total phosphorus content of surface water during 1988 both before and after deweeding was between 58.58 μg/l ± 12.90 and 73.08 μg/l ± 11.62. At bottom, it was between 58.42 μg/l ± 12.49 and 71.58 μg/l ± 11.92. For the year 1989, total phosphorus before and after deweeding in surface samples ranged from 62.42 μg/l ± 16.67 and 69.25 μg/l ± 14.27 and
at bottom from 63.83 µg/l ± 15.82 and 69.42 µg/l ± 14.30 (Fig. 8).

Nitrate - nitrogen

The nitrate - nitrogen values ranged from 16 - 230 µg/l at surface and 78 - 230 µg/l at bottom during 1988. The mean values were 95.50 µg/l at surface and 123.58 µg/l at bottom. Immediately after harvesting operations the average values for nitrate - nitrogen at surface (138.17 µg/l) depicted an increase of about 45% and in bottom waters (150.25 µg/l) an increase of about 22% was observed.

During the second year of the investigations nitrate- nitrogen concentrations in surface waters varied from 25 - 219 µg/l and in bottom water from 28 - 219 µg/l in NG station. Average values were 129.25 µg/l at surface and 130.42 µg/l at bottom before deweeding. As a result of harvesting operations there was a slight increase of about 5% in the nitrate content of surface samples with an average of 136.33 µg/l; whereas bottom waters depicted an increase of about 8% with an average of 140.25 µg/l.
Fig. 7. Mean specific conductivity fluctuations.

Fig. 8. Mean total phosphorus fluctuations.

1988 ... I
1989 ... II
Surface ... a
Bottom ... b
Before deweeding ... 
After deweeding ... 
Control surface ... 
Control bottom ...

Vertical bar indicates +
one S. E. of the mean.
TOTAL PHOSPHORUS (mg/l) SPECIFIC CONDUCTIVITY (μmhos)

- Graphs showing specific conductivity and total phosphorus for two samples labeled I and II.
- Sample I has a and b labels, while Sample II has a, b, and ab labels.
- The graphs display variability with error bars indicating confidence intervals.
At the C. S during the same period nitrate-nitrogen ranged from 78 - 240 μg/1 and 96 - 264 μg/1 with an average value of 149.50 μg/1 and 173.83 μg/1 at surface and bottom respectively. After deweeding operations at E. S surface waters registered a decrease of about 9% in their NO₃-N content with a mean value of 136.33 μg/1 as against bottom samples where a decrease of about 19% was registered (X : 140.25 μg/1).

The 95% confidence limits for nitrate-nitrogen values of surface waters indicated that the true mean was between 95.50 μg/1 ± 45.45 (B. D) and 138.17 μg/1 ± 43.80 (A. D). Bottom waters depicted a true mean value of 123.58 μg/1 ± 26.96 (B. D) and 150.25 μg/1 ± 26.43 after harvesting. During 1989, NO₃-N values at NG station were between 129.25 μg/1 ± 37.99 (B. D) and 136.33 μg/1 ± 45.73 (A. D) at surface and 130.42 μg/1 ± 44.98 (B. D) and 140.25 μg/1 ± 46.44 after the deweeding was started (Fig. 9).

Ammonical - nitrogen

In Nehrupark station the values for NH₄-N (B. D) ranged from 46 - 191 μg/1 at surface...
(X: 133.67 μg/1) and from 80 - 191 μg/1 at the lake bottom (X: 139.58 μg/1). After deweeding there was a slight increase of about 7% with values at surface water ranging between 49 - 200 μg/1 and at the bottom the increase was to the extent of 8% (range 86 - 187 μg/1).

During the second year the range and mean values for NH₄ - N in surface water of Nagin station were 26 - 174 μg/l and 106.75 μg/l. The NH₄ - N concentration in bottom waters ranged from 26 - 195 μg/l with an average value of 119.00 μg/l. As a result of harvesting ammonium concentration increased by about 13% in surface waters (X: 120.33 μg/l) and about 9% in bottom waters (X: 129.58 μg/l).

During 1989 C. S depicted a mean value of 101.42 μg/l at surface and of 146.32 μg/l at bottom with monthly values ranging from 55 - 152 μg/l (surface) and 86 - 206 μg/l (bottom). After harvesting operations the mean value in surface waters of E. S was 120.33 μg/l and in bottom 129.58 μg/l thereby depicting an increase of about 19% and 11% respectively.

...
Applying 95% confidence limits it has been observed that the true mean values for NH$_4$ – N lie somewhere between 133.67 μg/l ± 28.30 and 143.67 μg/l ± 27.38 at surface before and after deweeding as is reflected in Fig. 10. The values for deep waters were between 139.58 μg/l ± 24.46 and 151.17 μg/l ± 18.54. During the subsequent year the values before and after deweeding were between 106.75 μg/l ± 29.47 and 120.35 μg/l ± 24.43 at surface and 119.00 μg/l ± 30.37 and 129.58 μg/l ± 32.04 in bottom waters.

**Calcium and Magnesium**

The Ca and Mg values taken together presented a range of 27.0 – 97.8 mg/l at surface and from 25.1 – 93.3 mg/l at bottom. The mean values were 54.58 mg/l and 54.23 mg/l during 1988 at Nehrupark. Immediately after deweeding the average values at surface (55.63 mg/l) registered a slight increase of about 2% and in bottom (55.21 mg/l) waters not much change was observed. Temporal variations ranged from 24.4 – 102.9 mg/l in surface waters and 22.5 – 93.3 mg/l in bottom waters.
Fig. 9. Mean nitrate-nitrogen fluctuations.

Fig. 10. Mean ammonical-nitrogen fluctuations.

1988  ...  I
1989  ...  II
Surface  ...  a
Bottom  ...  b
Before deweeding  ...  
After deweeding  ...
Control surface  ...
Control bottom  ...

Vertical bar indicates ± one S. E. of the mean.
During the second year Ca and Mg fluctuated from 27.0 - 69.5 mg/l at surface with an average value of 47.12 mg/l whereas in bottom waters the values varied from 30.2 - 70.1 mg/l with an average of 46.68 mg/l respectively. As a result of harvesting operations there was a slight increase in average value of surface waters (47.74 mg/l); whereas bottom waters depicted an increase of about 7% with an average value of 49.85 mg/l (Fig. 11).

At C. S during the same period Ca and Mg values ranged from 39.2 - 178.8 mg/l and 38.6 - 189.10 mg/l with an average values of 65.77 mg/l and 67.58 mg/l both at surface and bottom respectively. After harvesting surface and bottom waters of E. S reflected decrease about 27% with a mean value of 47.74 mg/l and 49.85 mg/l.

Calculations of 95% confidence limits indicated that the true mean surface Ca and Mg during first year was between 55.58 mg/l ± 16.11 (B. D) and 55.63 mg/l ± 16.32 (A. D). In bottom waters it was between 54.2 mg/l ± 14.84 (B. D) and 55.21 mg/l ± 16.04 (A. D). Ca and Mg values for the year 1989 at surface were between
Fig. 11. Mean Ca + Mg fluctuations.

1988    ...    I
1989    ...    II
Surface    ...    a
Bottom    ...    b
Before deweeding    ...    
After deweeding    ...    
Control surface    ...    
Control bottom    ...

Vertical bar indicates ± one S. E. of the mean.
47.12 mg/l ± 8.69 (B. D) and 47.74 mg/l ± 8.37 (A. D). In bottom waters the values were between 46.68 mg/l ± 8.3 (B. D) and 49.85 mg/l ± 8.67 (A. D).

**Sodium**

At C. S during 1989, sodium values of surface waters ranged from 3.0 - 6.4 mg/l with an average value of 4.79 mg/l. The values of bottom waters varied from 2.1 - 6.4 mg/l with mean values of 4.23 mg/l. After deweeding Na values depicted an increase of about 9% in surface waters of E. S as against only 8% increase registered in bottom waters (Table 4).

Calculations of 95% confidence limits depicted that the true mean of Na in surface waters was between 4.79 mg/l ± 0.86 (C. S) and 5.23 mg/l ± 0.63 (E. S). Bottom waters reflected 95% confidence values of 4.23 mg/l ± 1.06 at the C. S and 4.59 mg/l ± 0.93 at the E. S.
Potassium

Potassium values in surface waters of C. S (NG) ranged from 0.59 - 1.30 mg/1 with an average of 0.97 mg/1 and from 0.30 - 1.25 mg/1 at bottom waters, with an average value of 0.80 mg/1 during 1989. As a result of harvesting the surface waters of E. S registered an increase of about 19% with a mean value of 1.15 mg/1 as against bottom waters where potassium depicted only 4% increase with a mean value of 0.83 mg/1.

As shown in table 5, calculations of 95% confidence limits for potassium values at surface indicated that the true mean was between 0.97 mg/1 ± 0.20 at the C. S and from 1.15 mg/1 ± 0.16 at the E. S. In bottom waters the true mean was between 0.80 mg/1 ± 0.29 at the control station and 0.83 mg/1 ± 0.25 at E. S.

Chlorophyll a

In surface waters the values for Chlorophyll 'a' ranged from 52 - 169 mg/m³ at the C. S. The average value was 72.4 mg/m³. After deweeding operations at E. S the average values for chlorophyll 'a'
Table 4.
Mean values of Na (mg/l) at the Control and the Experimental stations during 1989.

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mean</th>
<th>S.E</th>
<th>95% confidence limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURFACE</td>
<td>CS 3.0 - 6.4</td>
<td>4.79</td>
<td>0.38</td>
<td>4.79 ± 0.86</td>
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<tr>
<td></td>
<td>ES 3.9 - 6.8</td>
<td>5.23</td>
<td>0.28</td>
<td>5.23 ± 0.63</td>
</tr>
<tr>
<td>BOTTOM</td>
<td>CS 2.1 - 6.4</td>
<td>4.23</td>
<td>0.47</td>
<td>4.23 ± 1.06</td>
</tr>
<tr>
<td></td>
<td>ES 2.4 - 6.4</td>
<td>4.59</td>
<td>0.41</td>
<td>4.59 ± 0.93</td>
</tr>
</tbody>
</table>

Table 5.
Mean values of K (mg/l) at the Control and the experimental stations during 1989.

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mean</th>
<th>S.E</th>
<th>95% confidence limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURFACE</td>
<td>CS 0.59 - 1.30</td>
<td>0.97</td>
<td>0.09</td>
<td>0.97 ± 0.20</td>
</tr>
<tr>
<td></td>
<td>ES 0.72 - 1.32</td>
<td>1.15</td>
<td>0.07</td>
<td>1.15 ± 0.16</td>
</tr>
<tr>
<td>BOTTOM</td>
<td>CS 0.30 - 1.25</td>
<td>0.80</td>
<td>0.13</td>
<td>0.80 ± 0.29</td>
</tr>
<tr>
<td></td>
<td>ES 0.37 - 1.35</td>
<td>0.83</td>
<td>0.11</td>
<td>0.83 ± 0.25</td>
</tr>
</tbody>
</table>
depicted an increase of about 50% ($\bar{X} = 108.30 \text{ mg/m}^3$).

The 95% confidence limits indicated that the true mean for chlorophyll 'a' were between 72.4 ± 12.84 at the Control station and 108.3 ± 25.4 at the experimental station (E. S) respectively. The data is set in table 6.

**Total dissolved solids (TDS)**

The range for TDS at the C. S fluctuated from 42.2 - 145.8 mg/l with an average value of 94.38 mg/l. After the commencement of harvesting operations average value depicted an increase of about 11% at E. S.

As seen from table 6 the 95% confidence limits at the C. S was 94.38 mg/l ± 26.26 as against 104.73 mg/l ± 29.11 registered at the E. S.

**Analysis of data**

Data obtained on various parameters were subjected to students 't' test. The null hypothesis (H₀)
Table 6.

Data on Chlorophyll 'a' (mg/m³) and Total Dissolved Solids (mg/l).

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mean</th>
<th>S.E</th>
<th>95% confidence limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorophyll 'a'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.S</td>
<td>52.0 - 169.0</td>
<td>72.4</td>
<td>5.67</td>
<td>72.4 ± 12.81</td>
</tr>
<tr>
<td>E.S</td>
<td>73.0 - 183.0</td>
<td>108.3</td>
<td>11.17</td>
<td>108.3 ± 25.24</td>
</tr>
<tr>
<td>T D S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E.S</td>
<td>56.2 - 192.5</td>
<td>104.73</td>
<td>12.88</td>
<td>104.73 ± 29.11</td>
</tr>
</tbody>
</table>
states that no significant difference exists between the mean values before and after deweeding both at surface and in bottom waters. Alternative hypothesis ($H_1$) postulates that the difference of means between the deweeding operations are significantly different.

The value of 't' was calculated from the field data for both the years as also for the control and the experimental stations covering both the surface and the bottom water samples (Table 7). The calculated value of 't' was significant at 5% level in respect of transparency and specific conductivity during 1988.

To consider whether there is evidence that any differential effect is exerted by weed harvesting on various chemical parameters "Analysis of variance" was carried out and the data is set in table 8. The calculated value of 'z' at 5% level of significance for the given degrees of freedom was observed to be more than the expected value indicating harvesting impacts on transparency, conductivity and chlorophyll 'a' values.
## Table 7: 't' values for various parameters.

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Surface</td>
<td>Bottom</td>
<td>Surface</td>
</tr>
<tr>
<td>Temperature (°C)</td>
<td>0.17</td>
<td>0.01</td>
<td>0.08</td>
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<tr>
<td>Transparency (cm)</td>
<td>2.44</td>
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<tr>
<td>pH (Units)</td>
<td>0.14</td>
<td>0.27</td>
<td>0.00</td>
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<tr>
<td>Dissolved oxygen (mg/l)</td>
<td>1.89</td>
<td>0.11</td>
<td>0.67</td>
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<tr>
<td>Specific conductivity (μS)</td>
<td>2.56</td>
<td>1.98</td>
<td>0.62</td>
</tr>
<tr>
<td>Total phosphorus (μg/l)</td>
<td>1.82</td>
<td>1.67</td>
<td>0.69</td>
</tr>
<tr>
<td>Nitrate-nitrogen (μg/l)</td>
<td>1.48</td>
<td>1.55</td>
<td>0.26</td>
</tr>
<tr>
<td>Ammonical nitrogen (μg/l)</td>
<td>0.56</td>
<td>0.83</td>
<td>0.90</td>
</tr>
<tr>
<td>Parameter</td>
<td>Value 1</td>
<td>Value 2</td>
<td>Value 3</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Ca + Mg (mg/l)</td>
<td>0.10</td>
<td>0.10</td>
<td>0.11</td>
</tr>
<tr>
<td>Sodium (mg/l)</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Potassium (mg/l)</td>
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<tr>
<td>Chlorophyll 'a' (mg/m³)</td>
<td></td>
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</tr>
<tr>
<td>Total Dissolved Solids (mg/l)</td>
<td></td>
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</tr>
</tbody>
</table>

β Significant at 5% level.
Table 8.

'Z' values for various parameters.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (°C)</td>
<td>1.76</td>
<td>2.54</td>
<td>2.56</td>
</tr>
<tr>
<td>Transparency (cm)</td>
<td>0.89^8</td>
<td>1.20^8</td>
<td></td>
</tr>
<tr>
<td>pH (units)</td>
<td>1.61</td>
<td>1.34</td>
<td>2.73</td>
</tr>
<tr>
<td>Dissolved oxygen (mg/l)</td>
<td>0.63</td>
<td>2.19</td>
<td>0.31</td>
</tr>
<tr>
<td>Specific conductivity (μS)</td>
<td>0.94^8</td>
<td>0.69</td>
<td>0.47</td>
</tr>
<tr>
<td>Total phosphorus (μg/l)</td>
<td>0.61</td>
<td>0.52</td>
<td>0.38</td>
</tr>
<tr>
<td>Nitrate-nitrogen (μg/l)</td>
<td>0.40</td>
<td>0.44</td>
<td>1.34</td>
</tr>
<tr>
<td>Ammonical nitrogen (μg/l)</td>
<td>0.58</td>
<td>0.18</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Ca + Mg (mg/l)</td>
<td>Sodium (mg/l)</td>
<td>Potassium (mg/l)</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------</td>
<td>---------------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td>2.29</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2.32</td>
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<tr>
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<tr>
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</tr>
<tr>
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</tr>
<tr>
<td></td>
<td>0.38</td>
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</tr>
</tbody>
</table>

^ Significant at 5% level.