

Chapter 4

Results

Physico-chemicals parameters of water were tested from three sampling sites and all of parameters were estimated individually.

4.1 Physical parameters

4.1.1 Temperature

Air temperature were same in all sampling sites because sample sites more or less 200m distant from each other, as all samples were done from same lake and it has not a big area that air temperature may vary. Temperature ranges from 28°C to 31.4°C. Highest temperature was recorded in July and average temperature was 29.34°C. Water temperature ranges from 25.7°C to 29.3°C, 26.2°C to 29°C and 26.3°C to 29.5°C from site S₁, S₂ and S₃ respectively. Highest temperature was recorded from site S₃ in July and lowest temperature was recorded from site S₁ in September. Average temperature was 27.76°C, 27.95°C and 28°C from site S₁, S₂ and S₃ respectively.

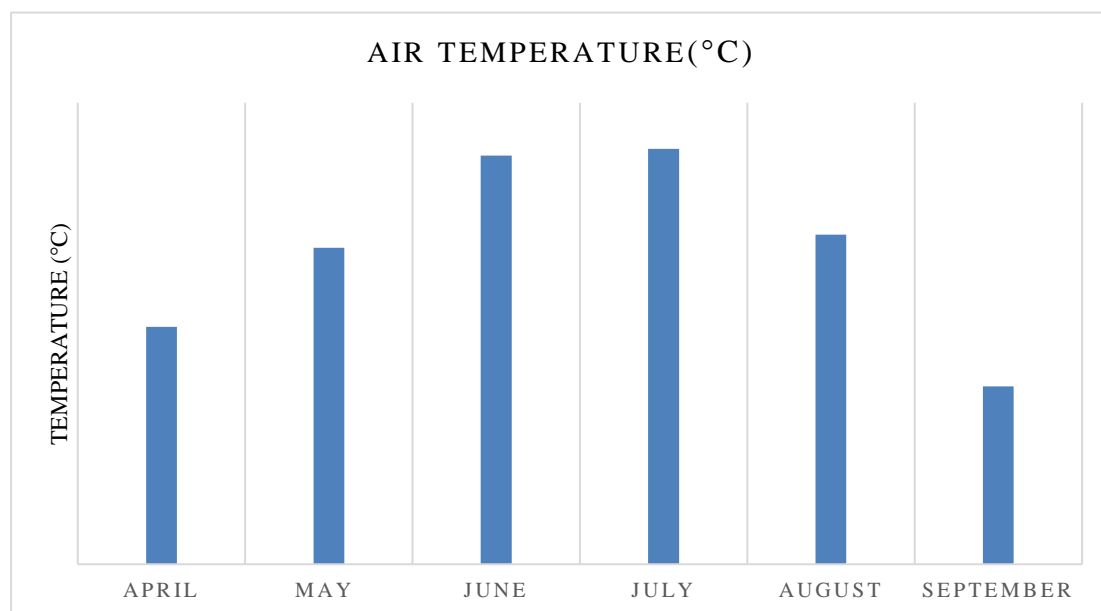


Figure 1: Monthly variation of air temperature in Foy's Lake

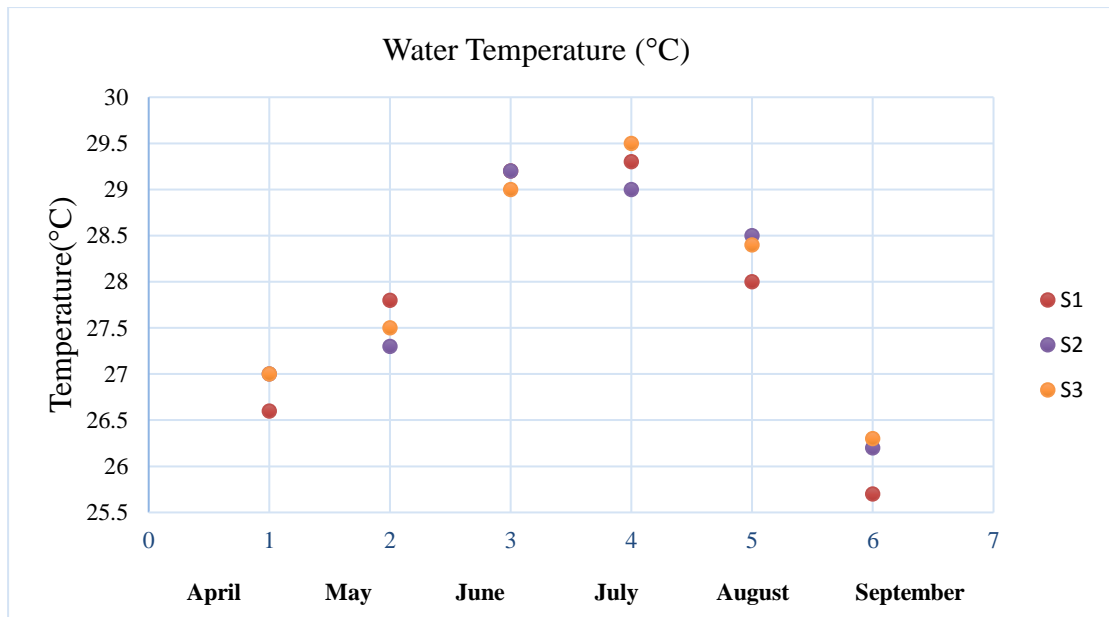


Figure 2: Monthly variation of water temperature

4.1.2 Transparency

Water transparency varied spatially and temporally. It ranges from 66 cm to 110 cm, 68 cm to 110 cm and 67 cm to 111 cm in S₁, S₂ and S₃ respectively. The highest transparency was recorded from S₃ in July and the lowest transparency was recorded from S₁ in April. (Figure 3)

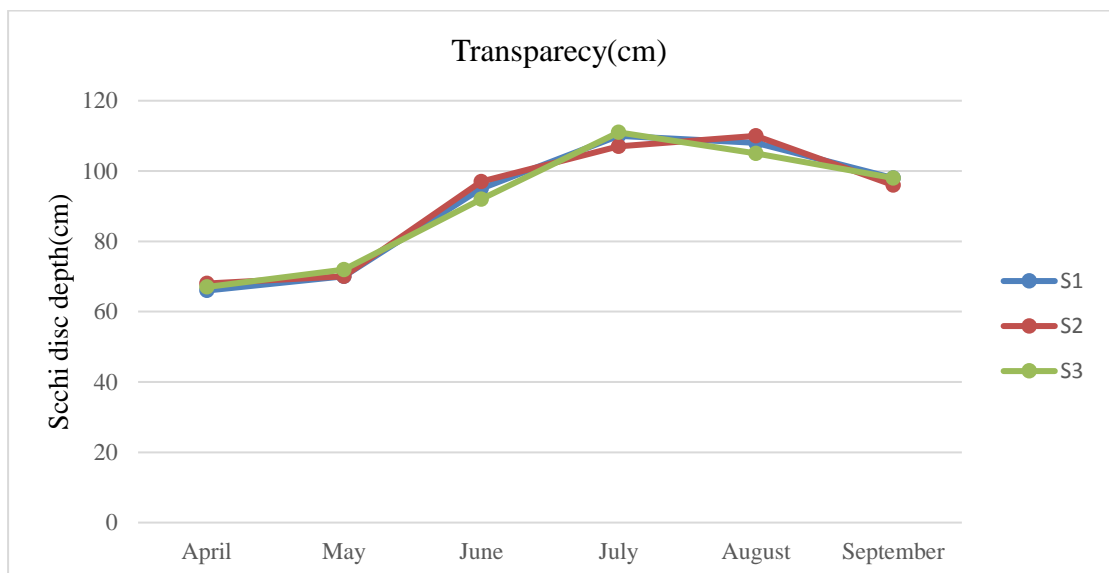


Figure 3: Monthly variation of water transparency

4.1.3 Water depth

As bottom of lake is not level or flat depth showed spatial variation and due to precipitation, it also showed seasonal variation. Depth ranges from 33.2 ft to 43 ft, 27.8 ft to 37.2 ft and 30 ft to 40 ft. S₁ showed highest depth in August and September and S₂ showed lowest depth in April.

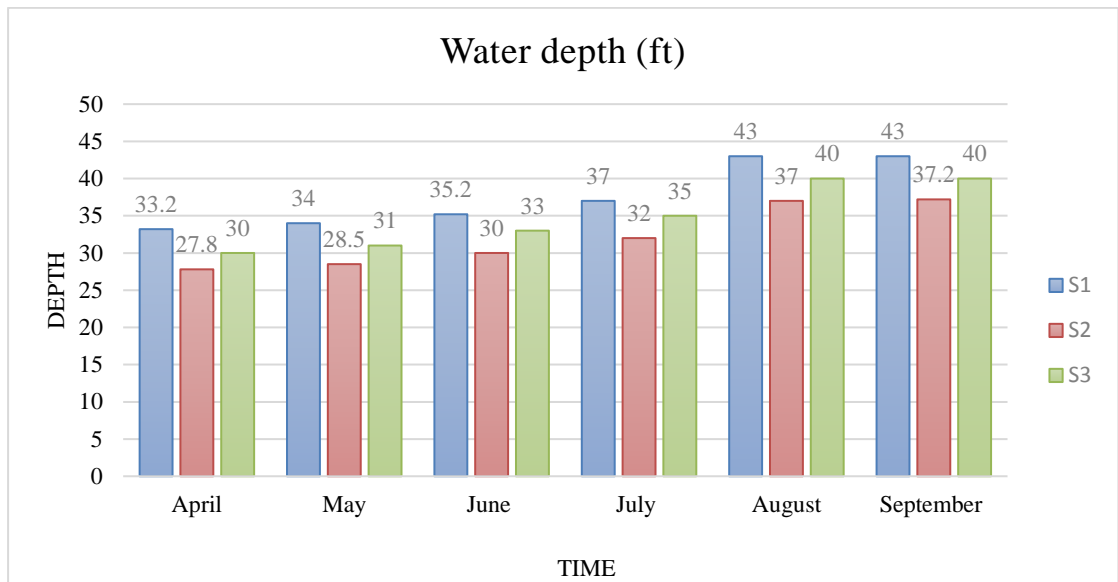


Figure 4: Spatial and Monthly variation of water depth

4.2 Chemical parameters

4.2.1 Dissolve oxygen

Dissolve oxygen (DO) was recorded 7.3 mg^l⁻¹ to 8.2 mg^l⁻¹ in site S₁, 7.2 mg^l⁻¹ to 8.2 mg^l⁻¹ from S₂ and 7.3 mg^l⁻¹ to 8.4 mg^l⁻¹ from S₃ respectively. Maximum DO was recorded 8.2 mg^l⁻¹ and minimum DO was recorded 7.2 mg^l⁻¹.

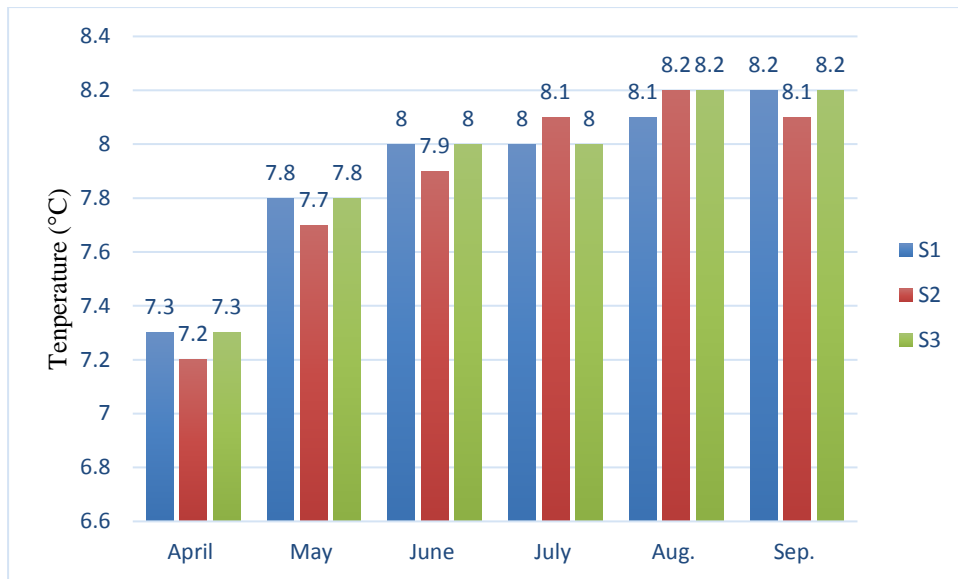


Figure 5: Monthly variation of dissolve oxygen

4.2.2 pH

Estimated value of pH ranges from 7.5 to 8.7, 7.4 to 8.57 and 7.5 to 8.6 in site S₁, S₂ and S₃ respectively. Highest pH was estimated from S₁ in April and lowest pH was estimated from S₂ in August.

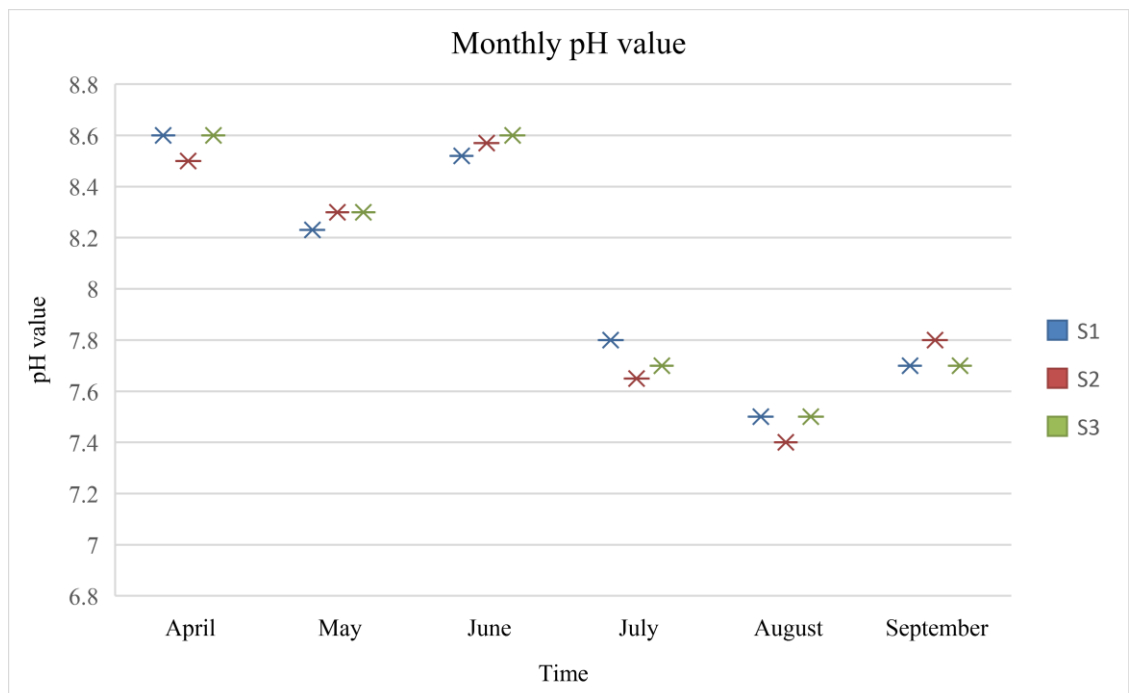


Figure 6: Monthly variation of pH

4.2.3 Total alkalinity

Total alkalinity ranges from 48.2 mg/l to 55.6 mg/l, 49 mg/l to 55.5 mg/l and 49.2 mg/l to 56 mg/l in S₁, S₂ and S₃ respectively. Maximum alkalinity was estimated 56 mg/l from S₃ in August and minimum alkalinity was estimated from S₁ in April.

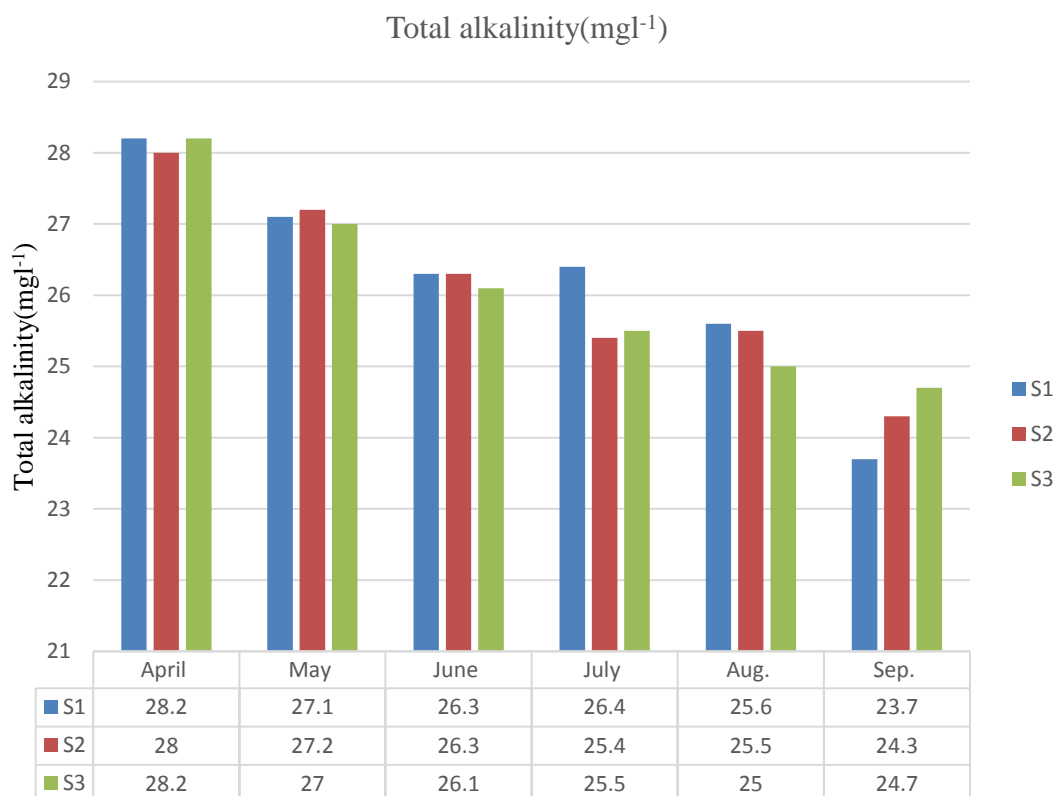


Figure 7: Monthly variation of total alkalinity

4.2.4 Ammonia

Ammonia was ranged from .1 mg l⁻¹ to 0.3 mg l⁻¹, 0.1 mg l⁻¹ to 0.2 mg l⁻¹ and 0.11 mg l⁻¹ to 0.2 mg l⁻¹ from S₁, S₂ and S₃ respectively. High ammonia was recorded from S₁ in April and lowest was recorded from S₁ and S₂ in Jun, July and August.

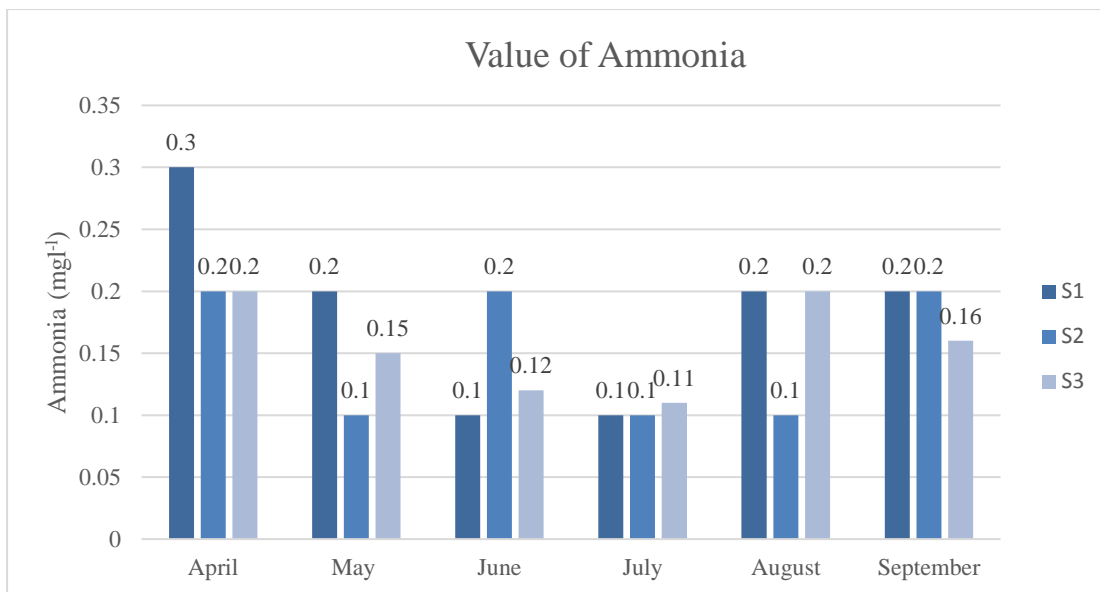


Figure 8: Monthly variation of ammonia

4.2.5 Free carbon dioxide (CO₂)

The value of free carbon dioxide ranged from 3.3mg^l⁻¹ to 4.1mg^l⁻¹, 3.7mg^l⁻¹ to 4.6 mg^l⁻¹ and 3.5mg^l⁻¹ to 4.6mg^l⁻¹ from S₁, S₂ and S₃ respectively. Maximum value was recorded from S₂ and S₃ which were in April and May and minimum value was recorded from S₁ August.

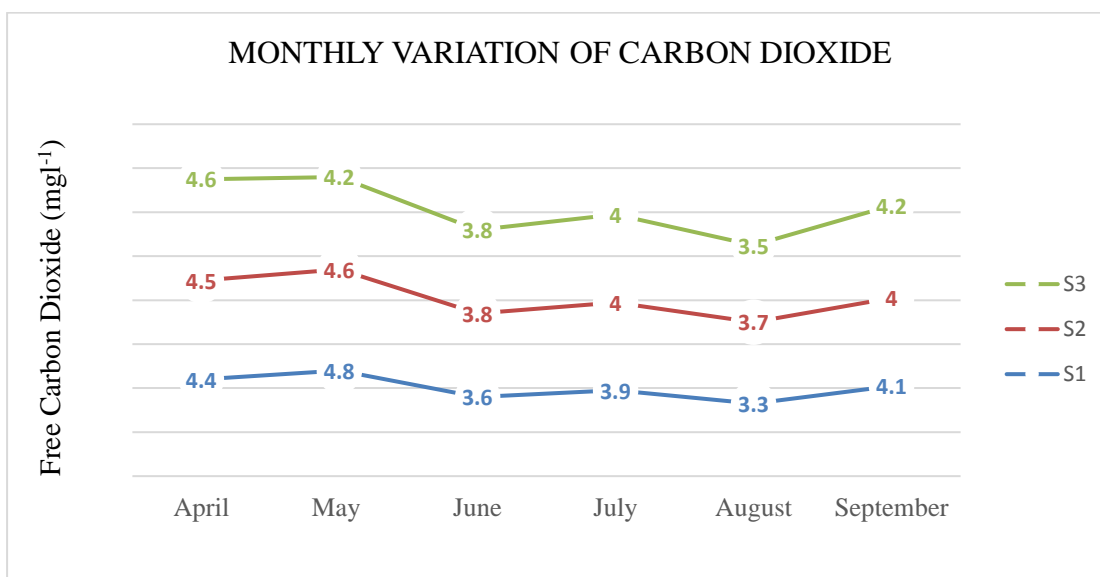


Figure 9: Monthly variation of Carbon dioxide

4.2.6 Nitrate

Estimated value of nitrate ranged from 0.01 mg^l⁻¹ to 0.08 mg^l⁻¹, 0.04 mg^l⁻¹ to 0.07 mg^l⁻¹, 0.07 mg^l⁻¹ to 0.1 mg^l⁻¹ from S₁, S₂ and S₃ respectively. Highest value was estimated from S₃ in April and lowest value was estimated from S₁ in July.

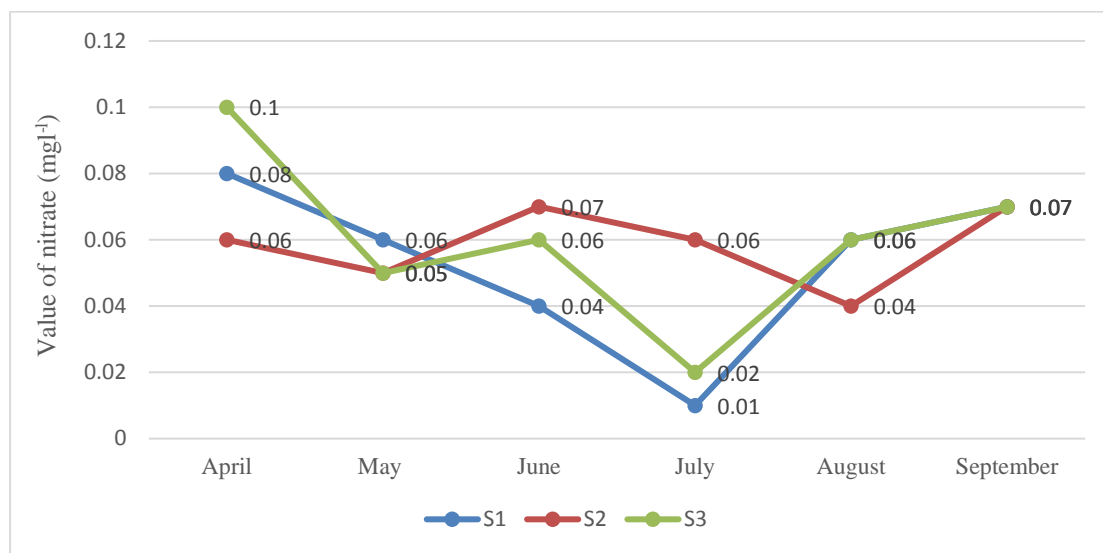


Figure 10: Monthly variation of nitrate

4.3 Primary productivity

4.3.1 Gross primary productivity

Value of gross primary productivity (GPP) ranged from 0.30 gCm⁻³h⁻¹ to 0.60 gCm⁻³h⁻¹, 0.30 gCm⁻³h⁻¹ to 0.65 gCm⁻³h⁻¹ and 0.30 gCm⁻³h⁻¹ to 0.65 gCm⁻³h⁻¹ from S₁, S₂ and S₃ respectively. Highest gross primary productivity (GPP) was recorded from S₂ and S₃ in September. Lowest gross primary productivity was recorded from all three stations in April.

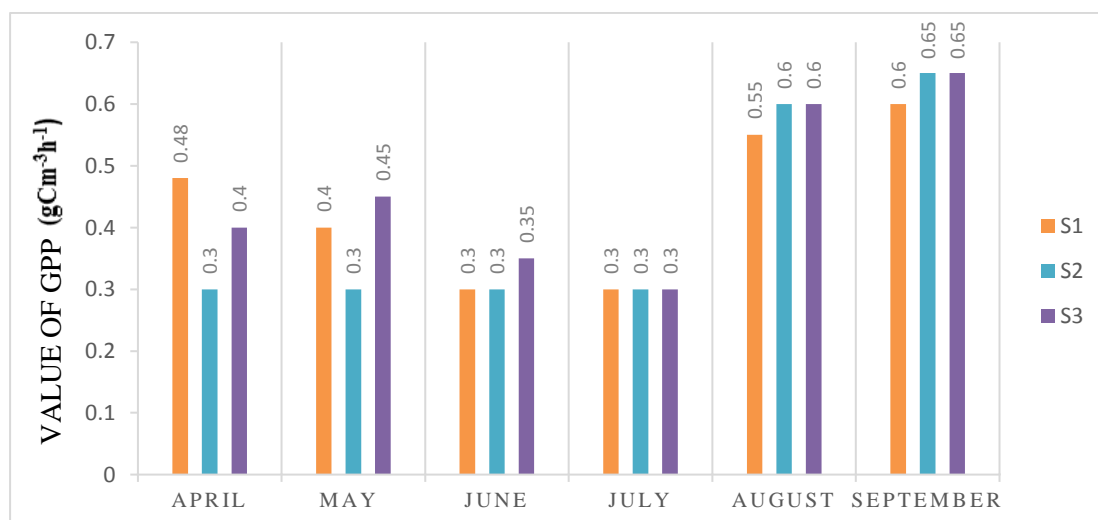
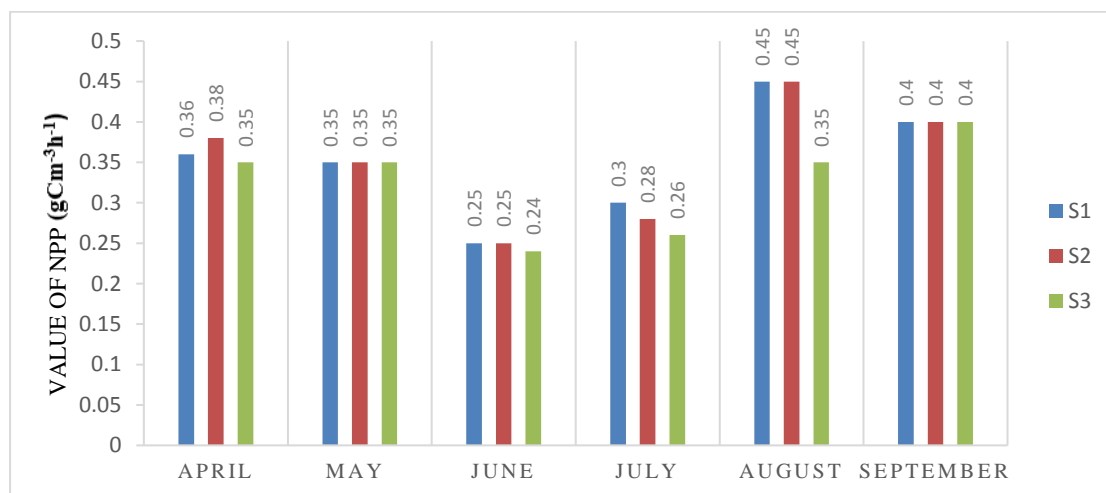


Figure 11: Comparative estimation of gross primary productivity**4.3.2 Net primary productivity**

Net primary productivity (NPP) ranged from $0.25 \text{ gCm}^{-3}\text{h}^{-1}$ to $0.45 \text{ gCm}^{-3}\text{h}^{-1}$ in S_1 and S_2 and $0.24 \text{ gCm}^{-3}\text{h}^{-1}$ to $0.40 \text{ gCm}^{-3}\text{h}^{-1}$ all in S_3 . The highest net productivity was estimated in S_1 and S_2 in September and lowest net productivity was estimated in S_3 in June.

**Figure 12: Monthly variation of net primary productivity****4.3.3 Community respiration**

Community respiration ranged from $0.1 \text{ gCm}^{-3}\text{h}^{-1}$ to $0.2 \text{ gCm}^{-3}\text{h}^{-1}$, $0.05 \text{ gCm}^{-3}\text{h}^{-1}$ to $0.18 \text{ gCm}^{-3}\text{h}^{-1}$ and $0.05 \text{ gCm}^{-3}\text{h}^{-1}$ to $0.2 \text{ gCm}^{-3}\text{h}^{-1}$ in S_1 , S_2 and S_3 respectively. The lowest community respiration was estimated in S_2 and S_3 in August and the highest community respiration S_1 in September.

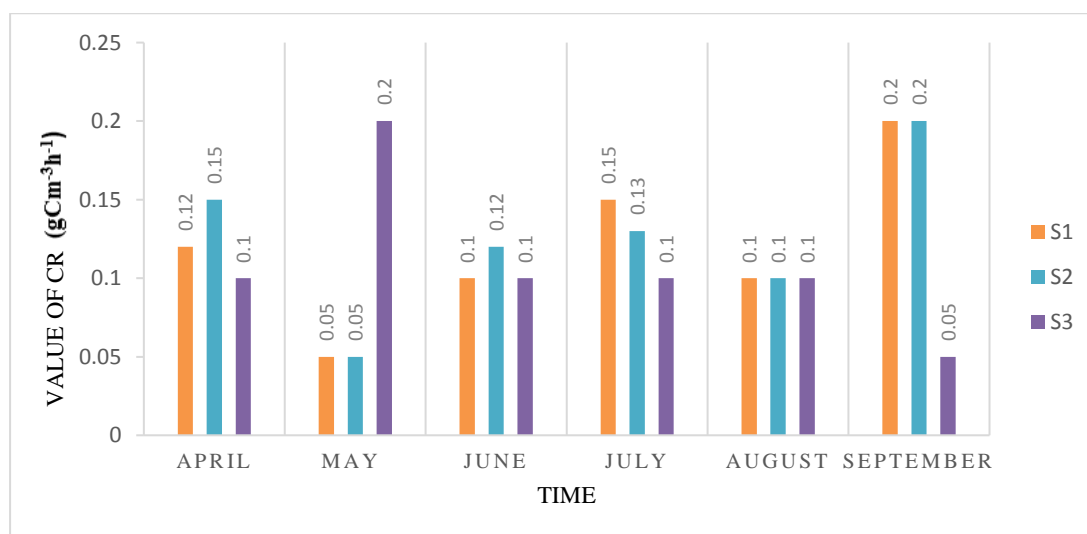
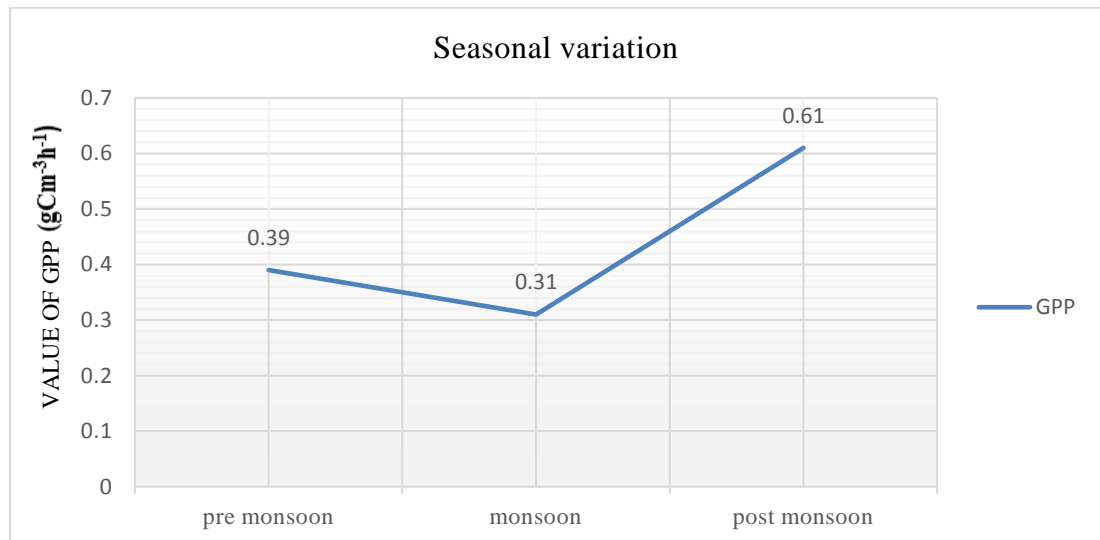


Figure 13: Monthly variation of Community respiration**4.3.4 Seasonal variation of gross primary productivity**

Average gross primary productivity was estimated $0.39 \text{ gCm}^{-3}\text{h}^{-1}$, $0.31 \text{ gCm}^{-3}\text{h}^{-1}$ and $0.61 \text{ gCm}^{-3}\text{h}^{-1}$ in pre monsoon, monsoon and post monsoon. The highest gross primary productivity was estimated in post monsoon and the lowest gross primary productivity was estimated in monsoon.

**Figure 14: Seasonal variation of gross primary productivity****4.3.5 Seasonal variation of net primary productivity**

Value of net primary was estimated $0.35 \text{ gCm}^{-3}\text{h}^{-1}$, $0.26 \text{ gCm}^{-3}\text{h}^{-1}$ and $0.41 \text{ gCm}^{-3}\text{h}^{-1}$ in pre monsoon, monsoon and post monsoon. Highest net productivity was estimated in post monsoon and lowest net productivity was estimated in monsoon.

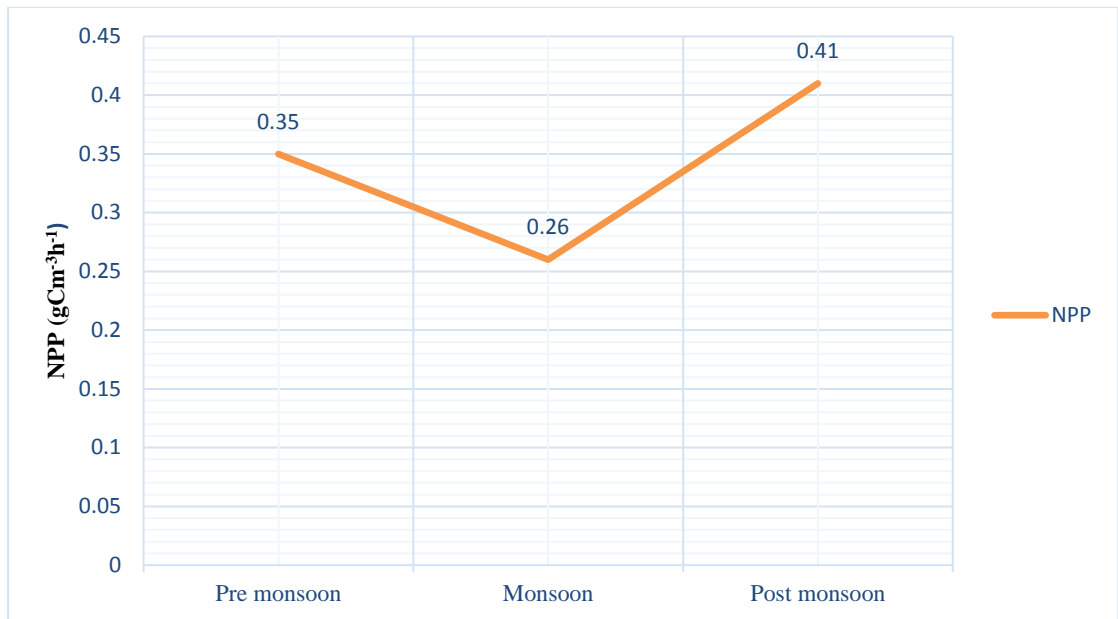


Figure 15: Seasonal variation of net primary productivity

4.4 Phytoplankton analysis

Phytoplankton population were counted and identified up to genus. Nine species of phytoplankton were identified which were under five classes namely Chlorophyceae, Bacillariophyceae, Cyanophyceae, Euglenophyceae and Dinophyceae. The highest 4 species were identified under Chlorophyceae. Maximum eight species of phytoplankton were identified in May and July. The number of phytoplanktons were varied from 15 cell/L to 26 cell/L, 13 cell/L to 25 cell/L and 14 cell/L to 28 cell/L. The highest number of phytoplankton were counted from S₃ in September and lowest number of phytoplankton were identified from S₂ in July.

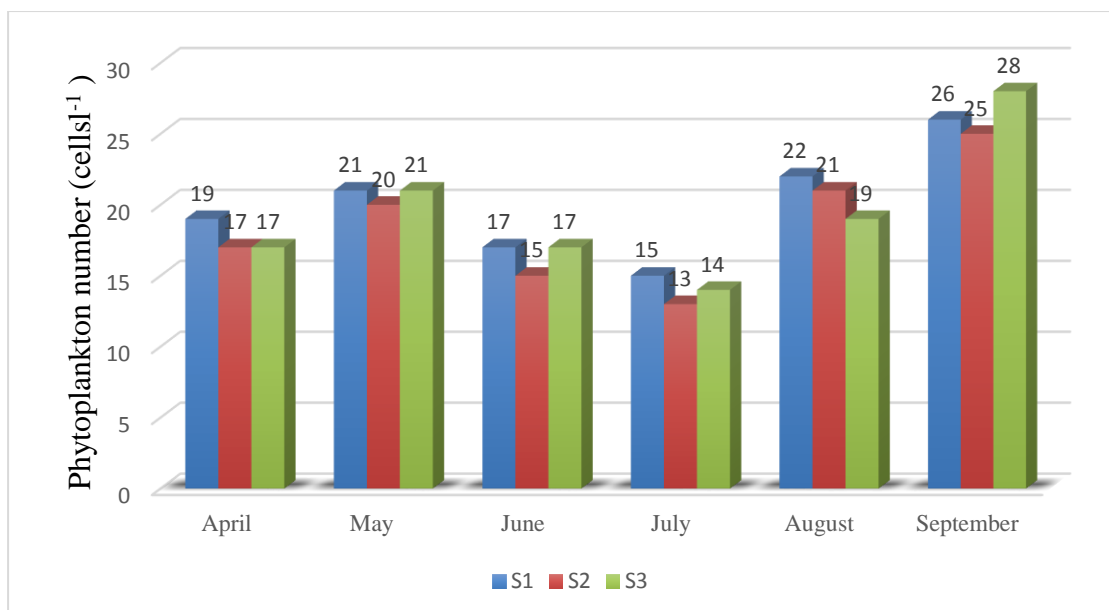


Figure 16: Monthly variation of phytoplankton number

Table 1: Presence of phytoplankton during study period

Class	Genus	Apr.	May	Jun.	Jul.	Aug.	Sep.
Bacillariophyceae	<i>Cyclotella</i>	+	+	+	+	+	
	<i>Navicula</i>		+	+	+		
Chlorophyceae	<i>Chlorella</i>	+	+	+	+	+	+
	<i>Dictyosphaerium</i>	+	+			+	+
	<i>Westella botryoides</i>		+	+	+	+	+
	<i>Ulothrix</i>	+	+	+	+		+
Euglenophyceae	<i>Euglena</i>	+	+	+	+		+
Cyanophyceae	<i>Gloeocapsa</i>	+	+	+	+	+	+
	<i>Aphanizomenon</i>		+	+	+	+	+
Dinophyceae	<i>Alexandrium</i>	+				+	+
Total no. genus		7	9	8	8	7	8

N: B: (+) sign indicate the presence of plankton

4.4.1 Percentage of phytoplankton species in study area

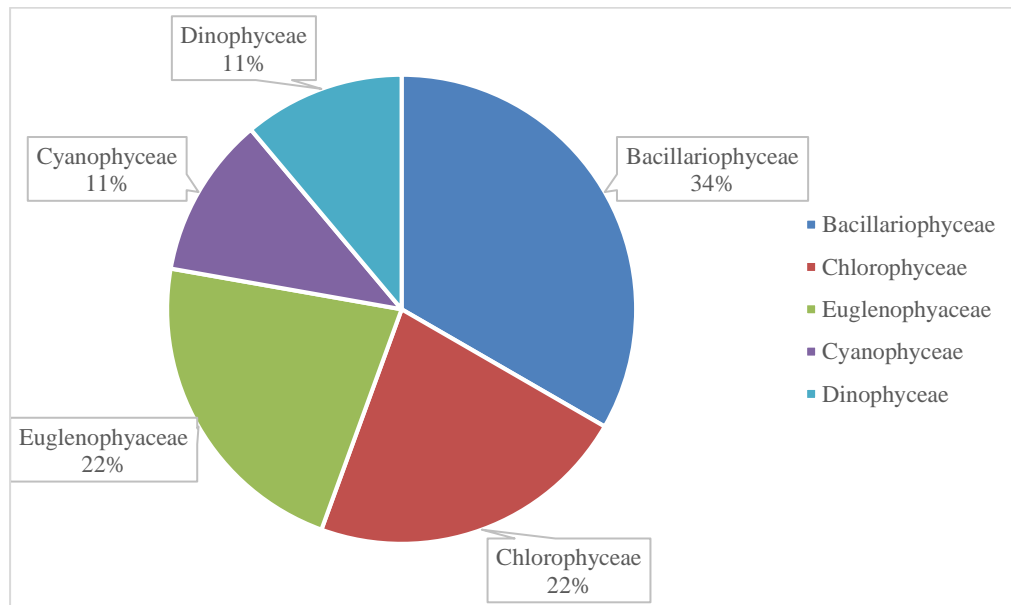


Figure 17: Presence of phytoplankton species in study area

4.5 Zooplankton

Five species of zooplankton were identified namely *Cyclops*, *Daphnia*, *Moina*, *Brachionus* and *Padina* under classes copepod, Cladocera and rotifer.

Table 2: Presence of zooplankton in study area during study period

Class	Genus	April	May	June	July	Aug.	Sep.
Copepod	<i>Cyclops sp.</i>		+		+	+	
Cladocera	<i>Daphnia sp.</i>			+	+		+
	<i>Moina sp.</i>	+	+	+		+	+
Rotifer	<i>Brachionus sp.</i>		+	+	+	+	+
	<i>Philodina sp.</i>	+	+	+	+	+	+
Total species		2	4	4	4	4	4