

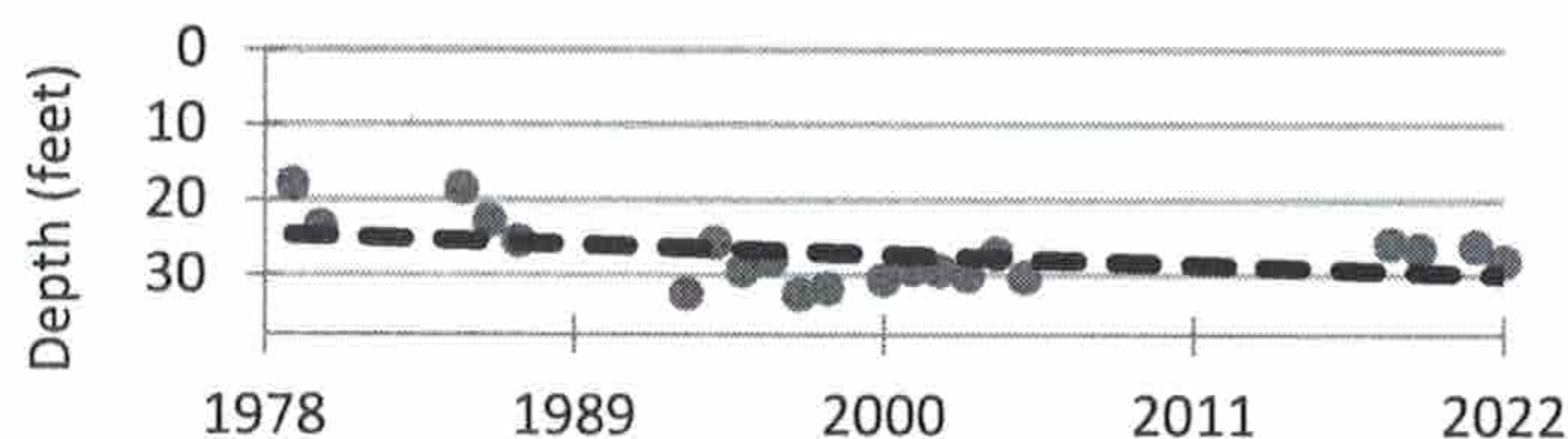
Long Lake, Grand Traverse County

2022 CLMP Results



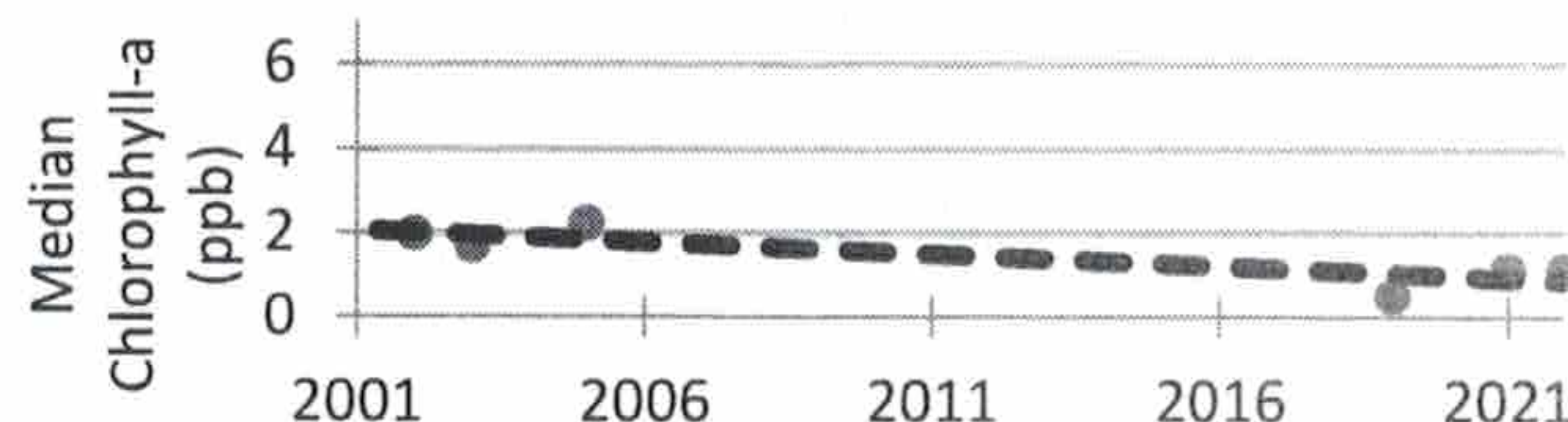
Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Average	Std. Dev	Carlson TSI
2022	17	21.0	41.0	28.1	7.6	29
2017-2021	46	14.5	39.5	28.1	5.0	30
1979-2016	336	10.0	63.0	27.3	8.9	30
2022 All CLMP Lakes	3178	1.0	63.0	11.6	2.5	43



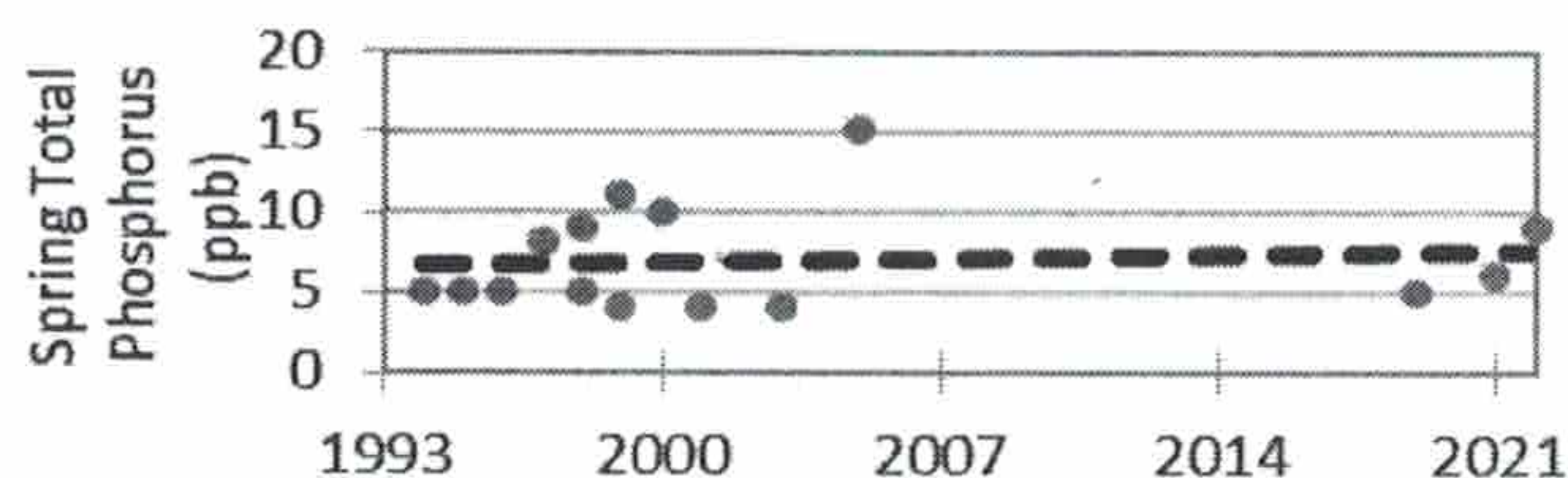
Chlorophyll-a (parts per billion)

Year	# Samples	Min	Max	Median	Std. Dev	Carlson TSI
2022	5	<1.0	1.8	1.1	0.6	32
2017-2021	7	<1.0	1.4	<1.0	0.4	<31
2000-2016	21	<1.0	2.5	<1.0	0.7	37
2022 All CLMP Lakes	687	< 1.0	43.0	3.7	5.3	43



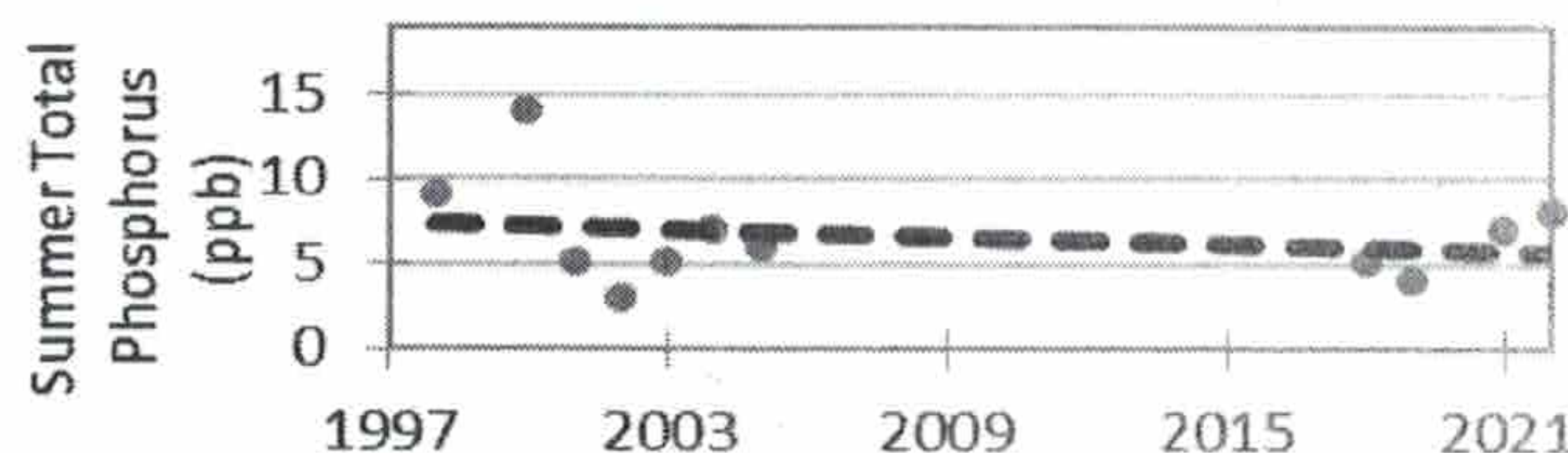
Spring Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev
2022	1	9.0	9.0	9.0	NA
2017-2021	2	5.0	6.0	5.5	0.7
1994-2016	12	<5 T	15.0	7.1	3.5
2022 All CLMP Lakes	220	<5	220.0	20.7	21.3



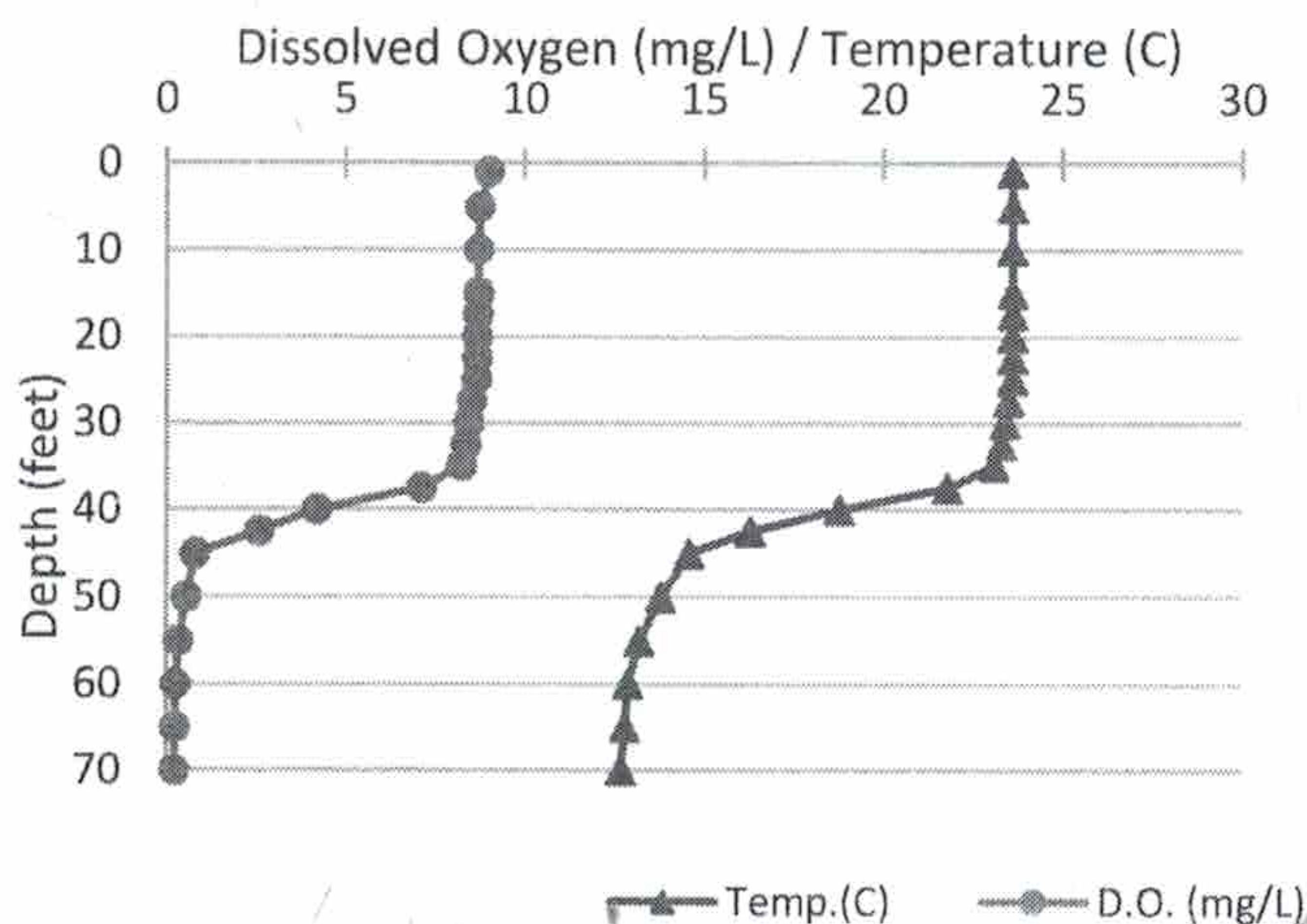
Summer Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev	Carlson TSI
2022	1	8.0	8.0	8.0	NA	34
2017-2021	3	<5 T	7.0	5.3	1.5	28
1998-2016	7	<=3 W	14.0	7.0	3.6	31
2022 All CLMP Lakes	234	<= 3	150.0	17.4	15.3	45



8/22/2022

Dissolved Oxygen and Temperature Profile



Summary

Average TSI	2022	2017-2021	1979-2016
Long Lake	32	30	33
All CLMP Lakes	44	40	42

With an average TSI score of 32 based on 2022 Secchi transparency, chlorophyll-a, and summer total phosphorus data, this lake is rated as an oligotrophic lake.

The lake keeps some dissolved oxygen in the bottom waters through mid-summer, but by late summer the lake has stratified and the bottom water is devoid of oxygen.

While average TSI scores have changed little over the monitoring period, long term monitoring shows slight downward slopes on the parameters. These results indicate a very slow movement towards lower nutrient levels in this lake over time.

* = Minimum # samples not met for average/median/TSI value

<1.0 = Chlorophyll-a: Sample value is less than limit of quantification (<1 ppb).

W= Value is less than the detection limit (<3 ppb) T = Value reported is less than the reporting limit (5 ppb)