

# Water Quality Testing for Lake Quannapowitt, 1988 - 2023

*Water Quality Testing Committee, Lee Danielson, presenting*

**Nov. 7, 2023**

## **Measurements**

**Total Phosphorus**

**Nitrate (NO<sub>3</sub>)**

**Dissolved Oxygen**

**Alkalinity**

**pH**

**Chloride**

**Total Dissolved Solids**

**Chlorophyll**

**Secchi Disk**

**Sample Temperature**

**Trophic State Index (calculated)**

Cyanobacteria and microcystins are not included in this presentation

# Six Sampling Locations (through 2019)

FOLO - WATER QUALITY COMMITTEE  
WATER QUALITY TESTING LOCATIONS  
2023

DEP Berm (inside)  
DEP Berm (outside)  
Drain pipe entering DEP Berm

Yacht Club Dock

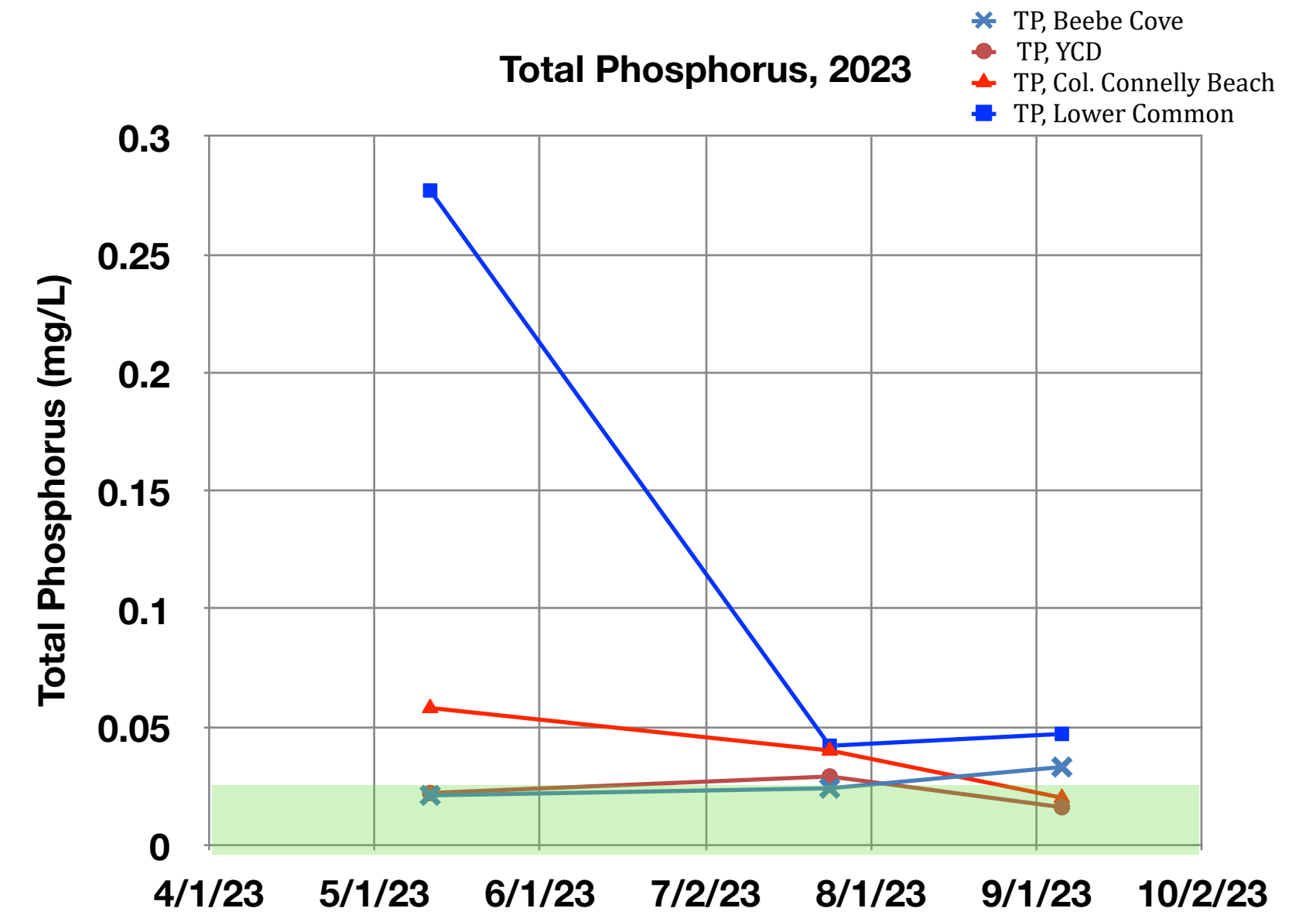
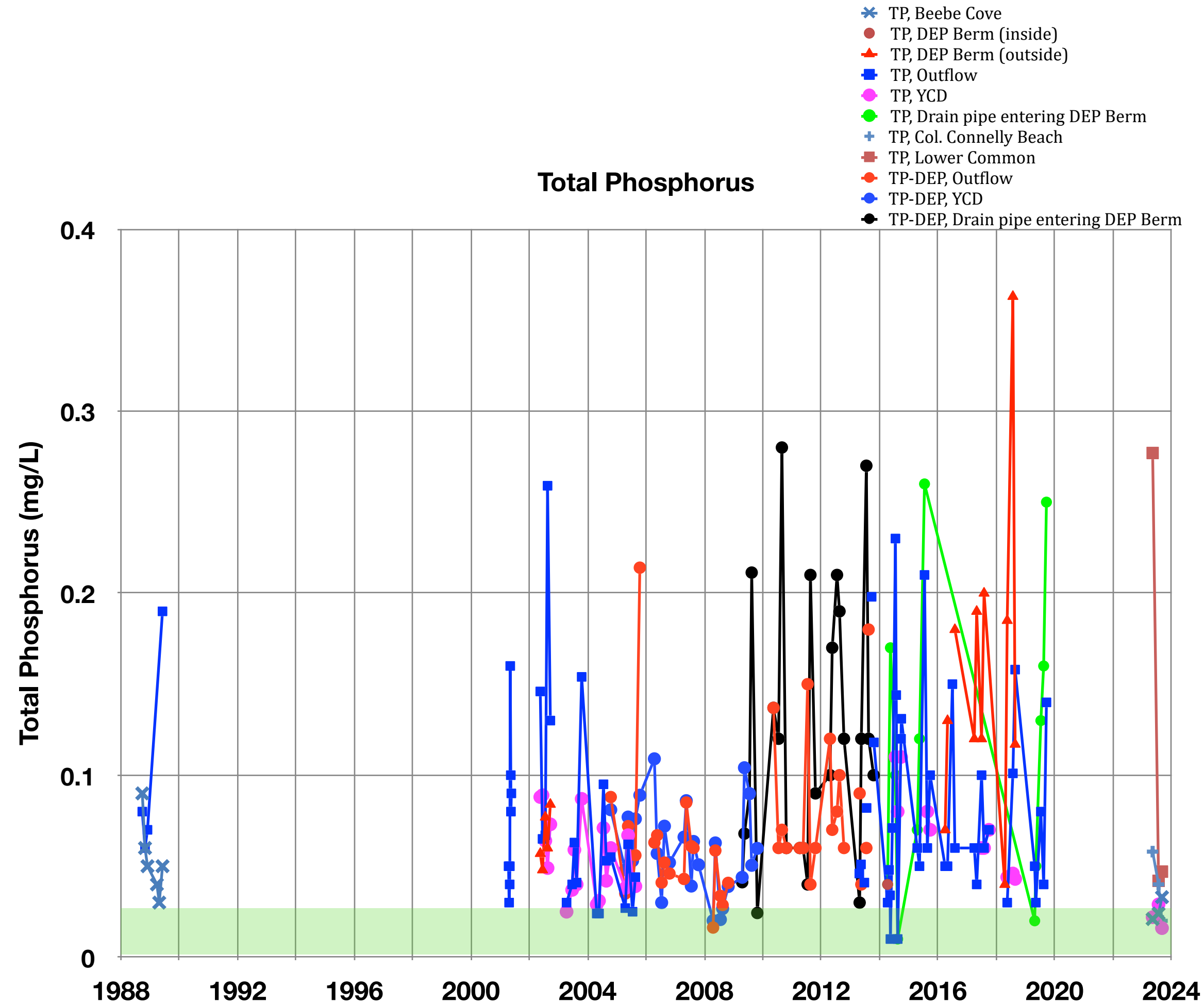


Outflow, Lowell Street

Beebe Cove

Lower Common (LC) - Walk out near drain outlet, to where water is 3 feet deep  
Yacht Club (YC) - Take from end of first dock  
COL Connelly Beach (CC) - Walk out from beach, to where water is 3 feet deep  
Beebe Cove (BC) - Kayak/canoe, to where lake is 11 feet deep. Location determined by extending a line off YC dock towards BC

# Total Phosphorus

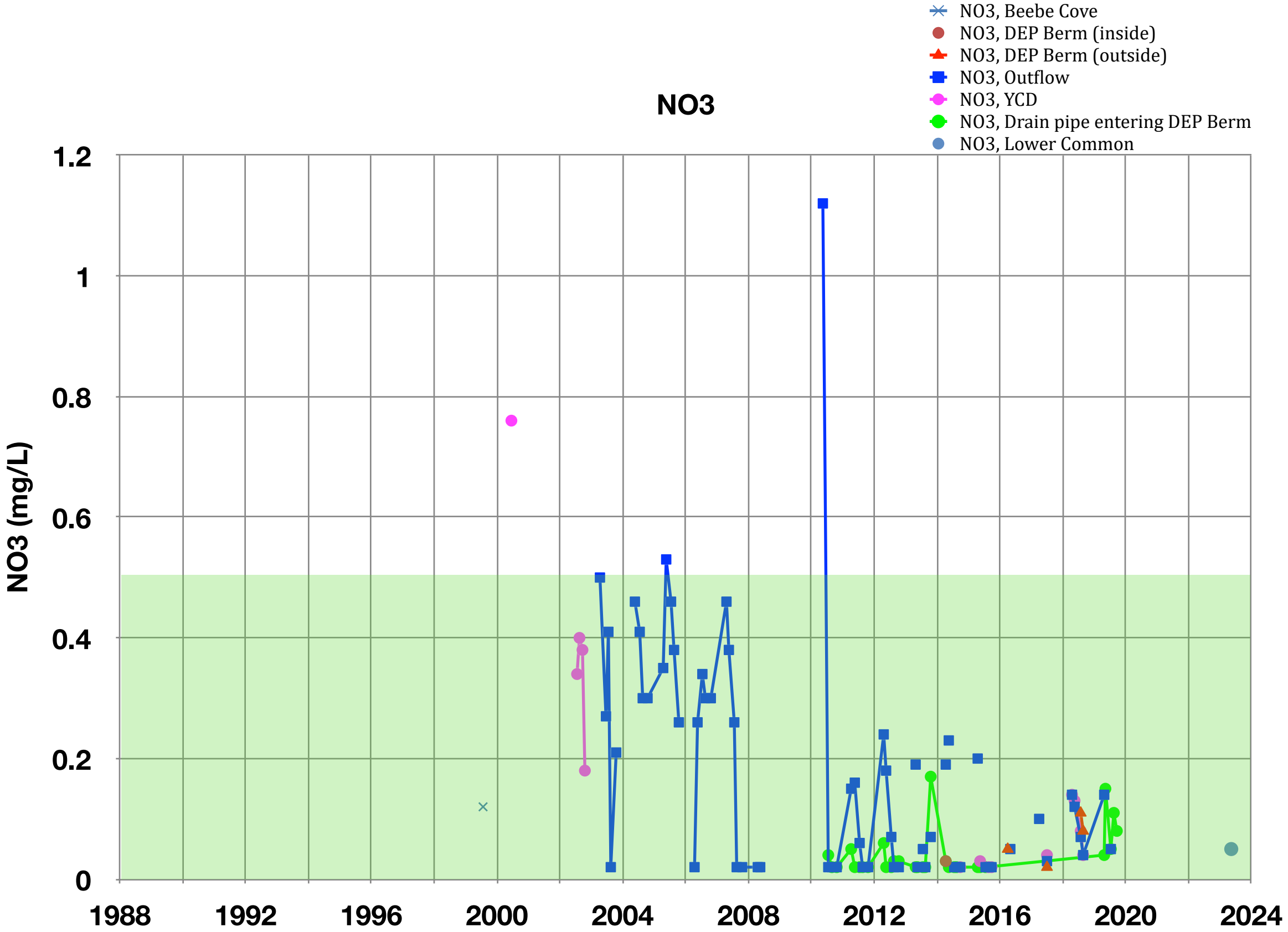


Phosphate Level (mg/L)	Note
0.005 - 0.05	Natural Level
0.05*	USEPA Limit
0.08 -0.1	Possible Algae Blooms

\*Recommended limit for streams that enter lakes

**Phosphorus levels are high, often exceeding 0.05 mg/L**  
**A good goal for phosphorus level would be 0.01 - 0.03 mg/L.**

# Nitrate (NO3)

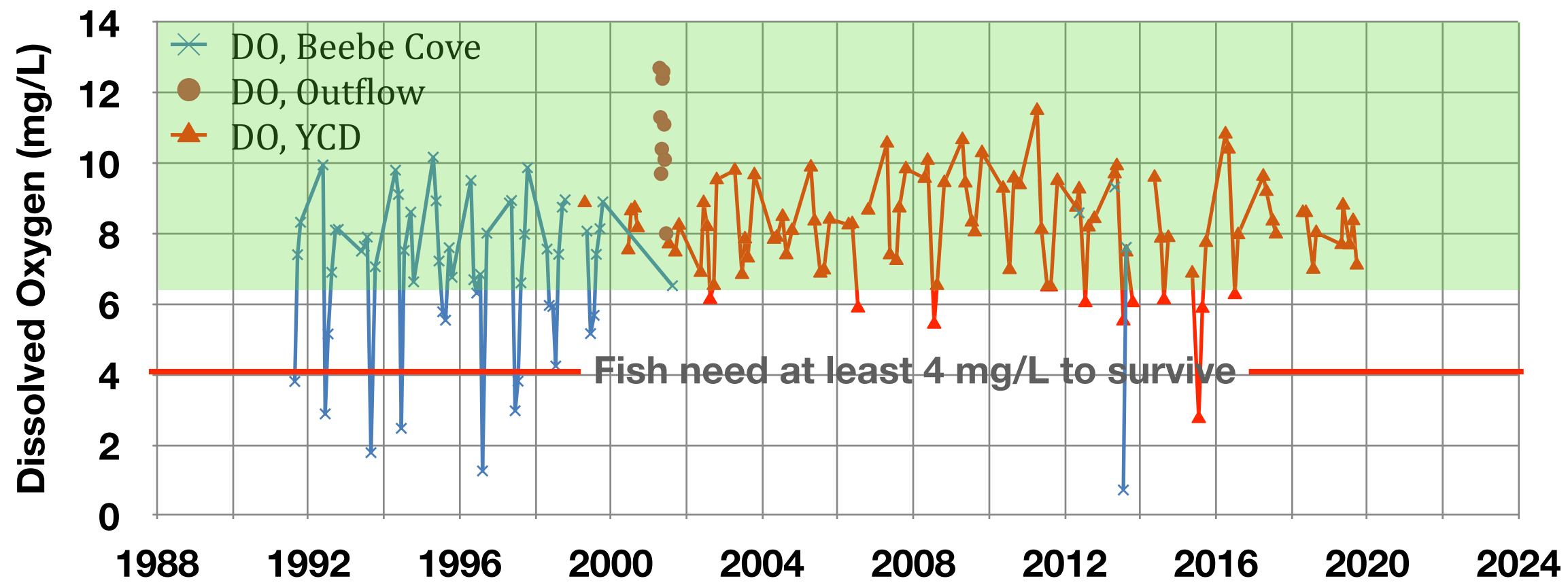


Date	CC (mg/L)	BC (mg/L)	YC (mg/L)	LC (mg/L)
5/12/23	ND	ND	ND	0.05
7/25/23	ND	ND	ND	ND
9/6/23	ND	ND	ND	ND

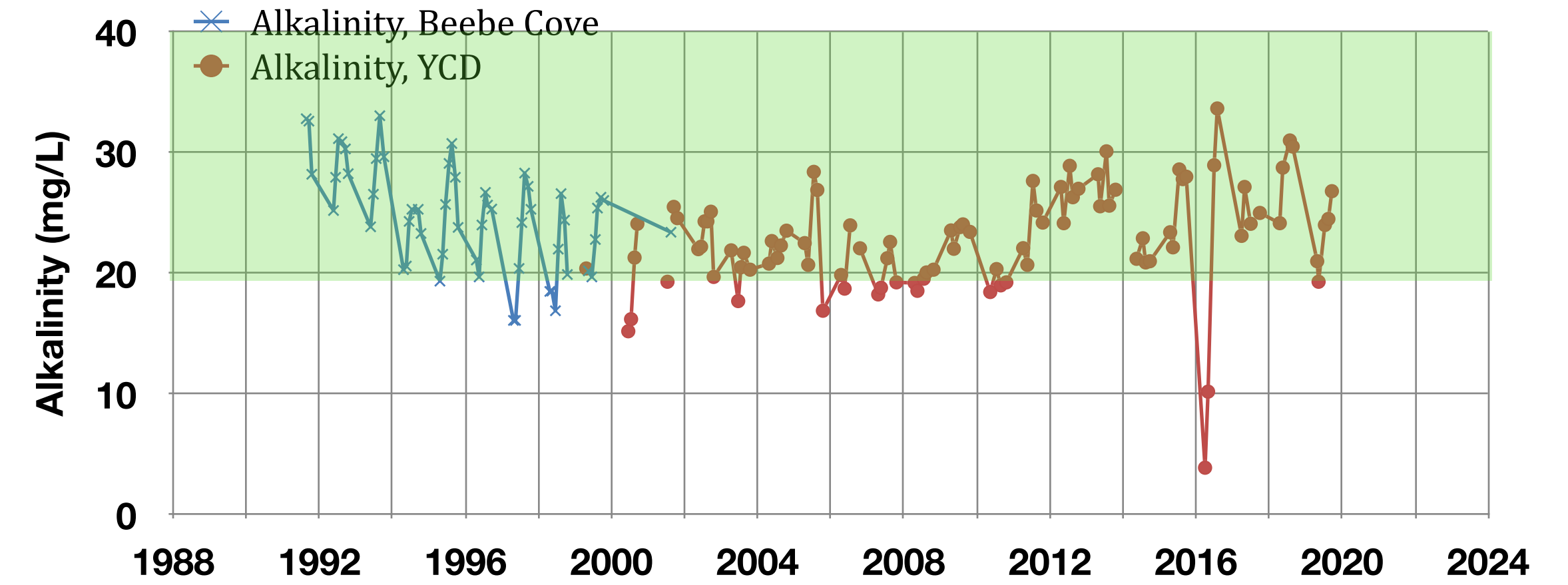
Nitrate Level (mg/L)	Note
<1	Natural Levels in Lakes
<10	OK for drinking

**Nitrate levels are acceptable**

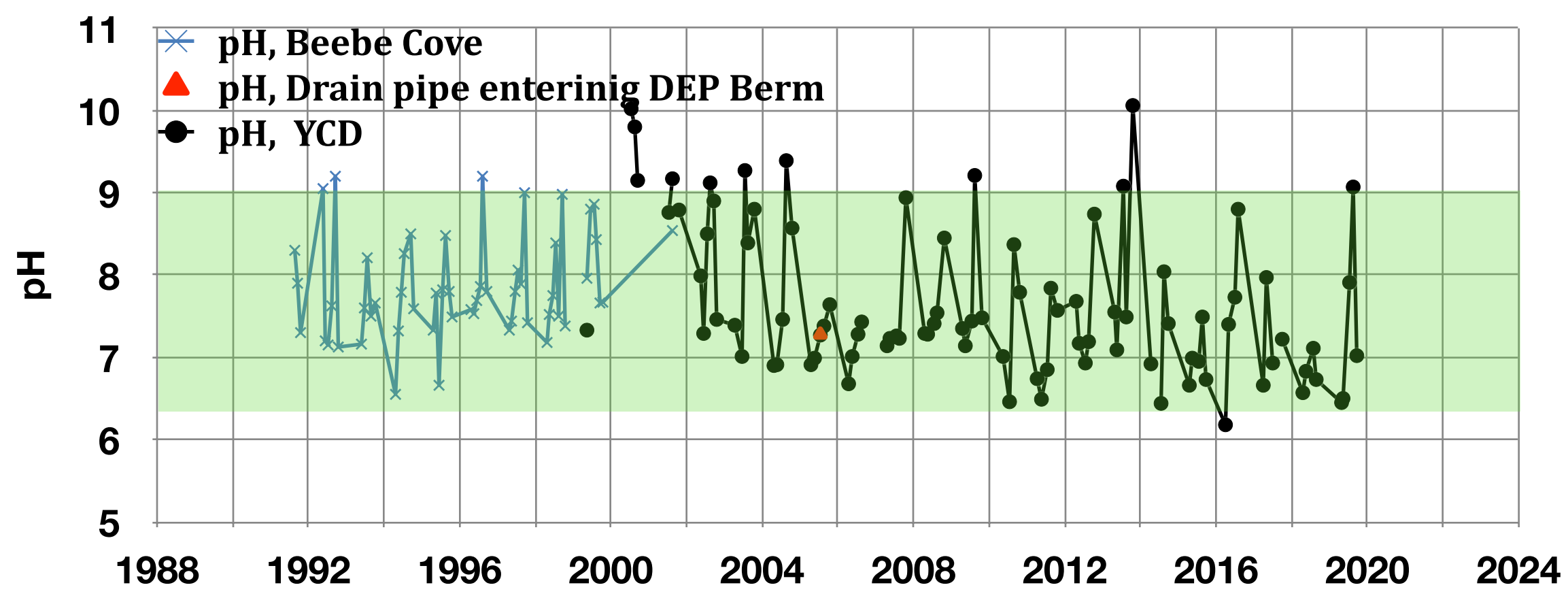
# Levels That Are Acceptable or Better



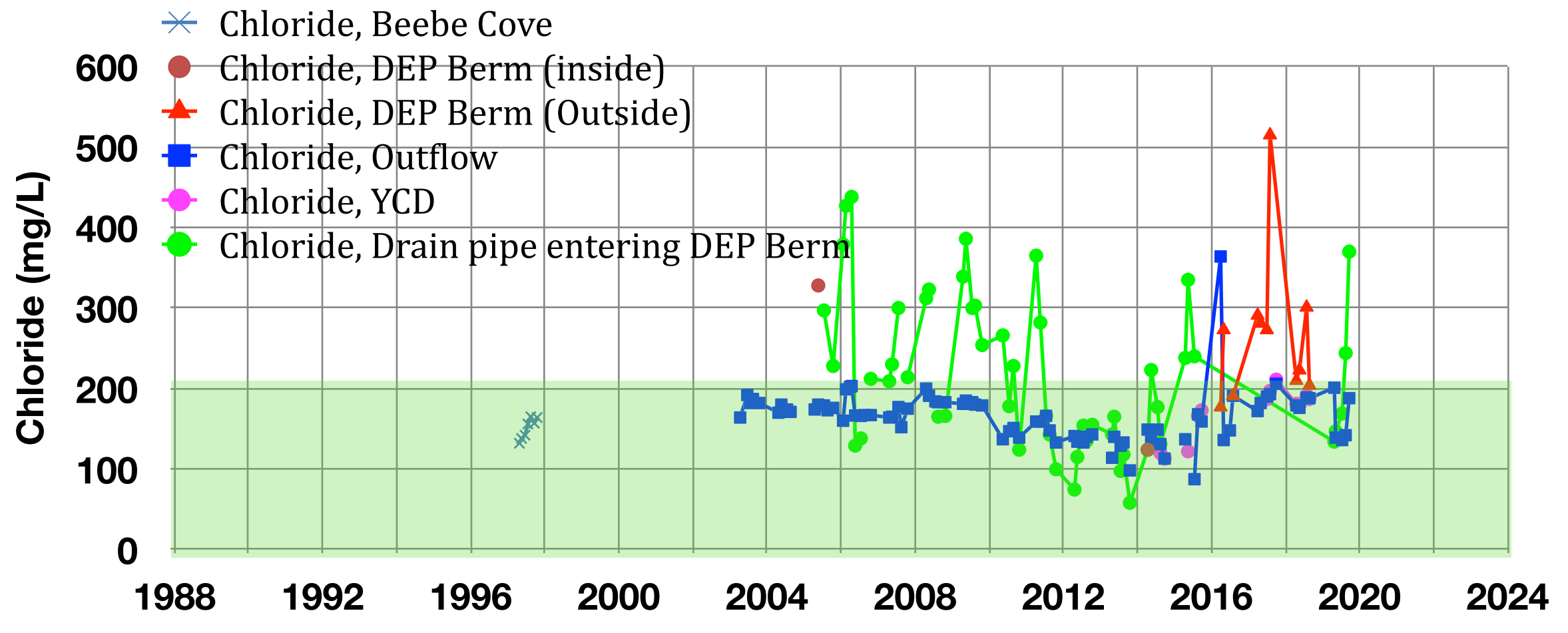
Dissolved oxygen levels are very good



Alkalinity is very good

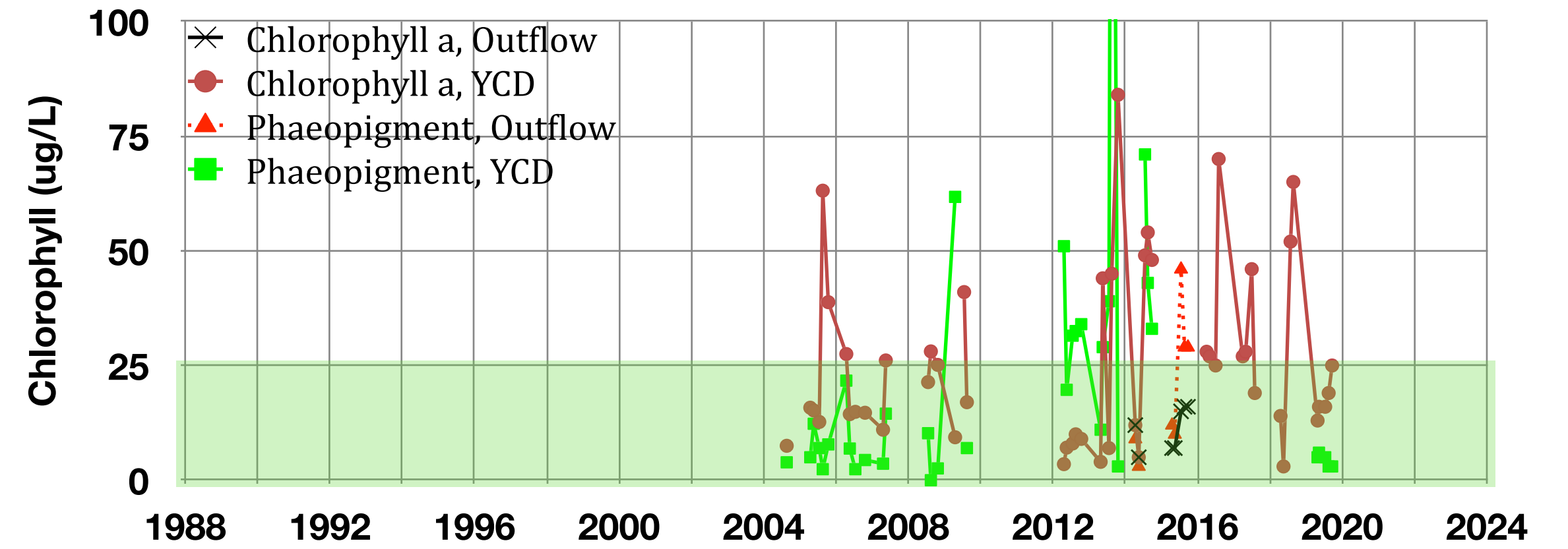
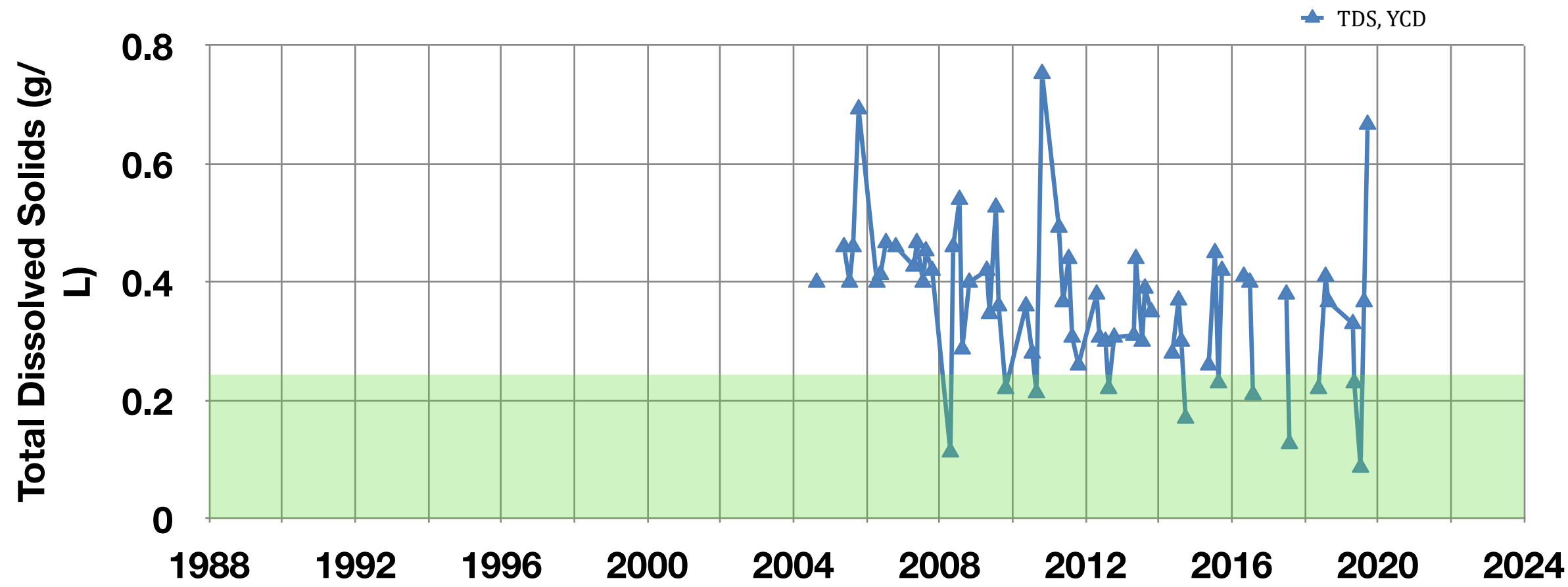


pH is in normal range



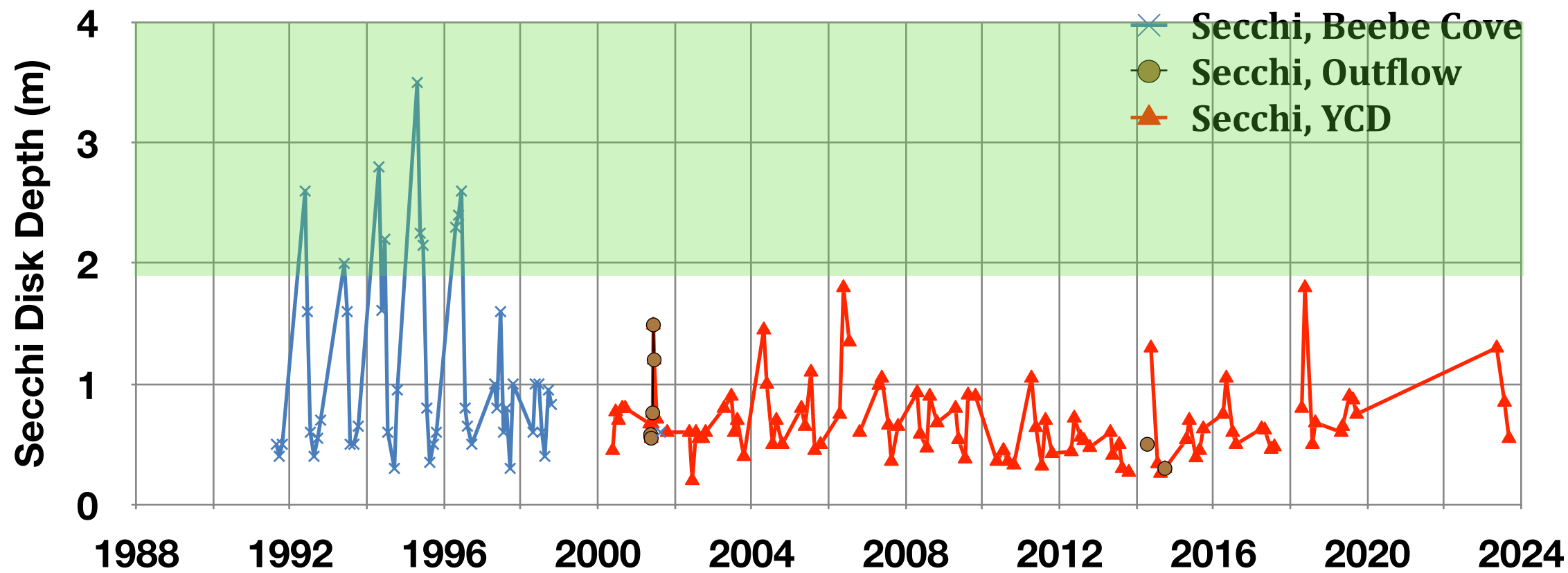
Chloride level is generally OK

# Other Measurements

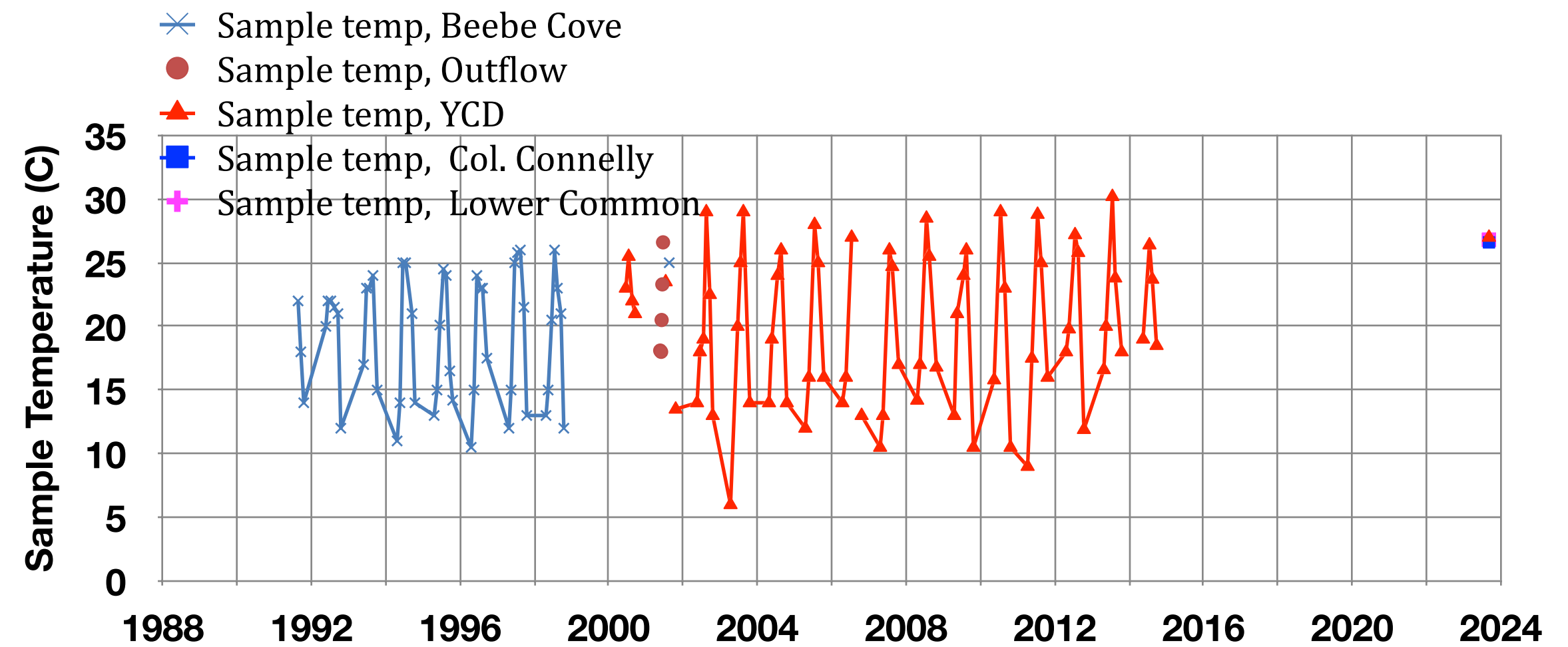


Total Dissolved Solids are higher than typical for lakes

Chlorophyll levels are higher than desired

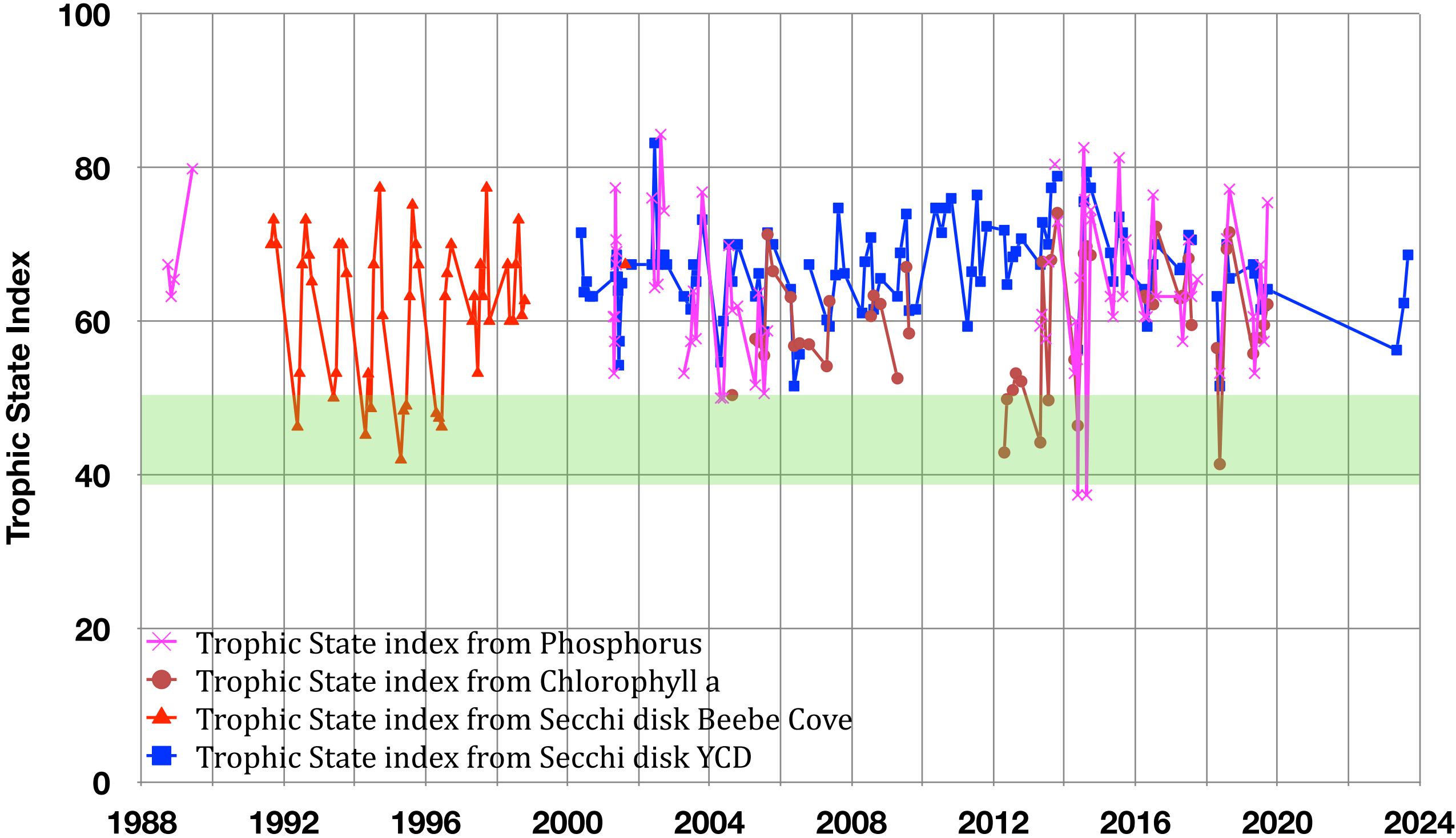


Secchi Disk depths are lower than desirable



Water temperature varies from about 10C (50F) to about 28C (82F), depending on the month

# Trophic State Index (TSI)



Lake Condition

Trophic State	TSI	Secchi Disk (m)
Oligotrophic	< 30 - 40	4 - 8+
Mesotrophic	40 - 50	2 - 4
Eutrophic	50 - 70	0.5 - 2
Hypereutrophic	70 - 100+	<0.25 - 0.5

Lake Quannapowitt is a Eutrophic Lake (rich in nutrients and having a high level of biologic productivity)

# Conclusions

- 1. The lake remains eutrophic due to high levels of phosphorus**
- 2. In general, only fairly minor changes in lake constituents in the past 35 years**
- 3. The lake has very good levels of dissolved oxygen and alkalinity**