Lower Bolton Lake

Status Update
Part 1
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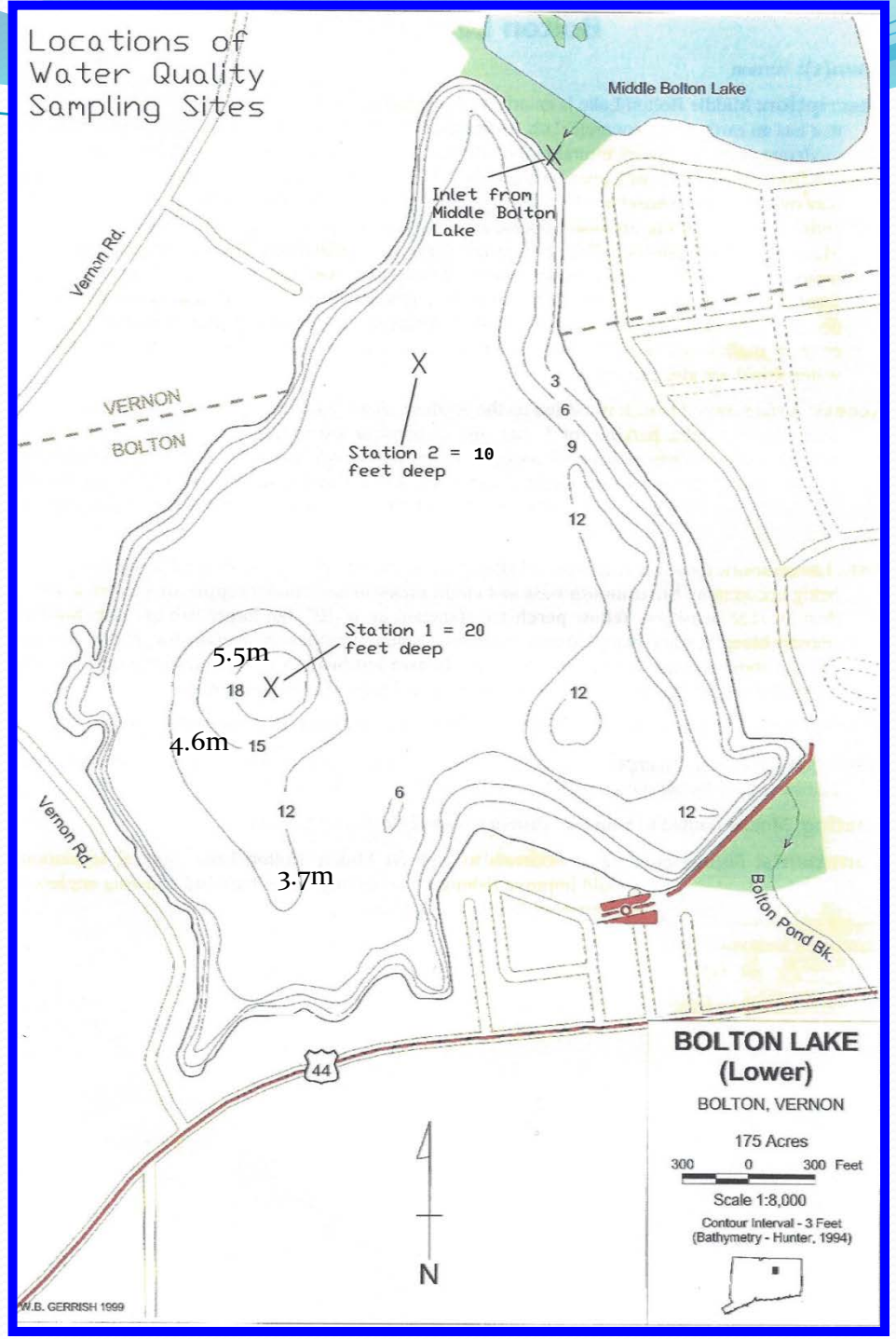
Identified Threats To Lower Bolton Lake

- ~~Proliferation of Southern Naiad~~ (removed in 2016)
- Invasive (Non-native) Aquatic Plants
- Severe Cyanobacteria Blooms

Background

Lake water sampling stations

- Station 1
  - Deep water =
  - Top, middle, bottom
- Station 2
  - Shallow water =
  - Top & bottom
- Outflows from Middle, Upper, and Lower Bolton Lake

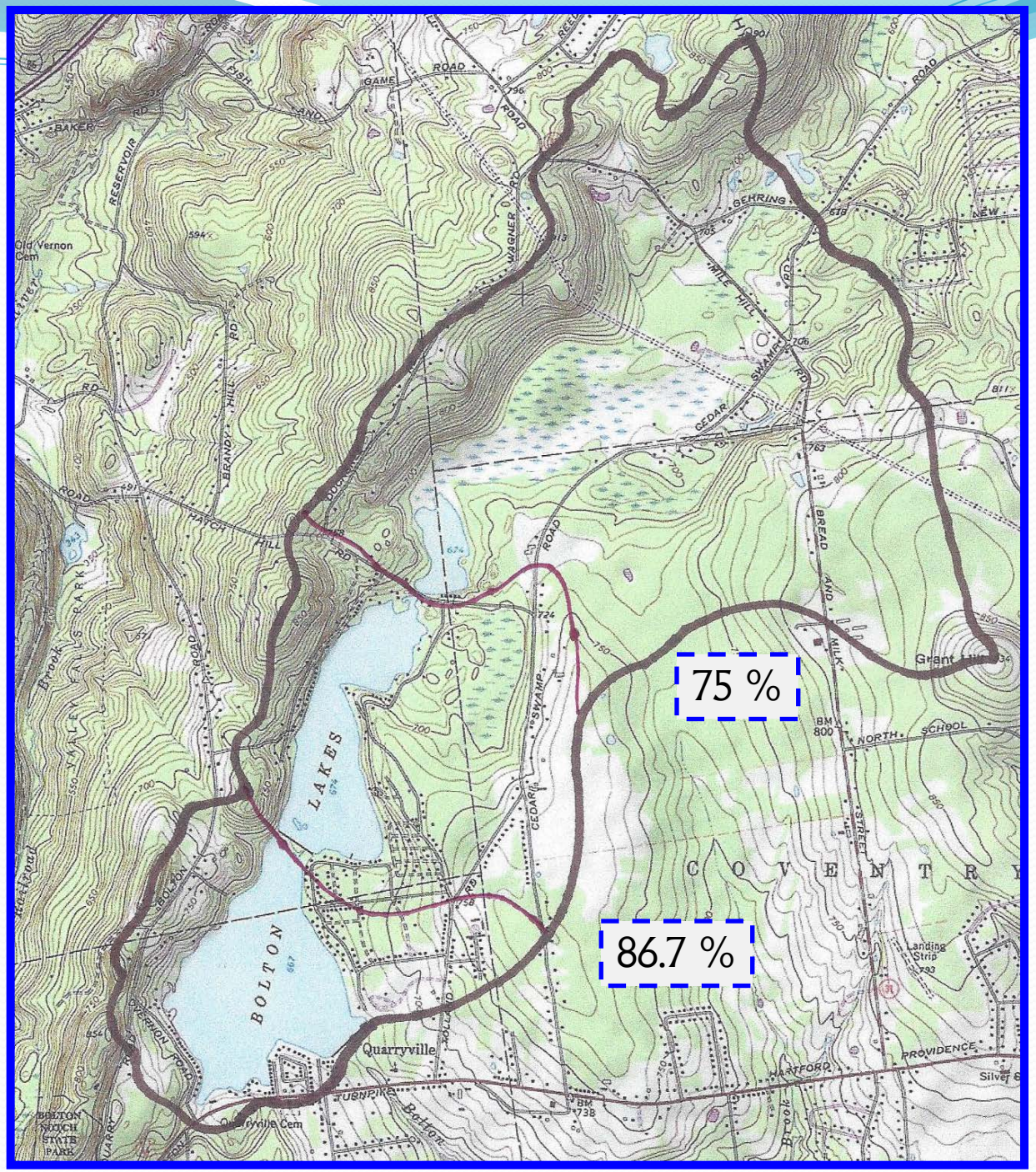


Lower Bolton Lake Watershed

Watershed size of 2,419 acres
= drainage area of 2,244 acres

Watershed of Middle Bolton Lake = 1,945 acres

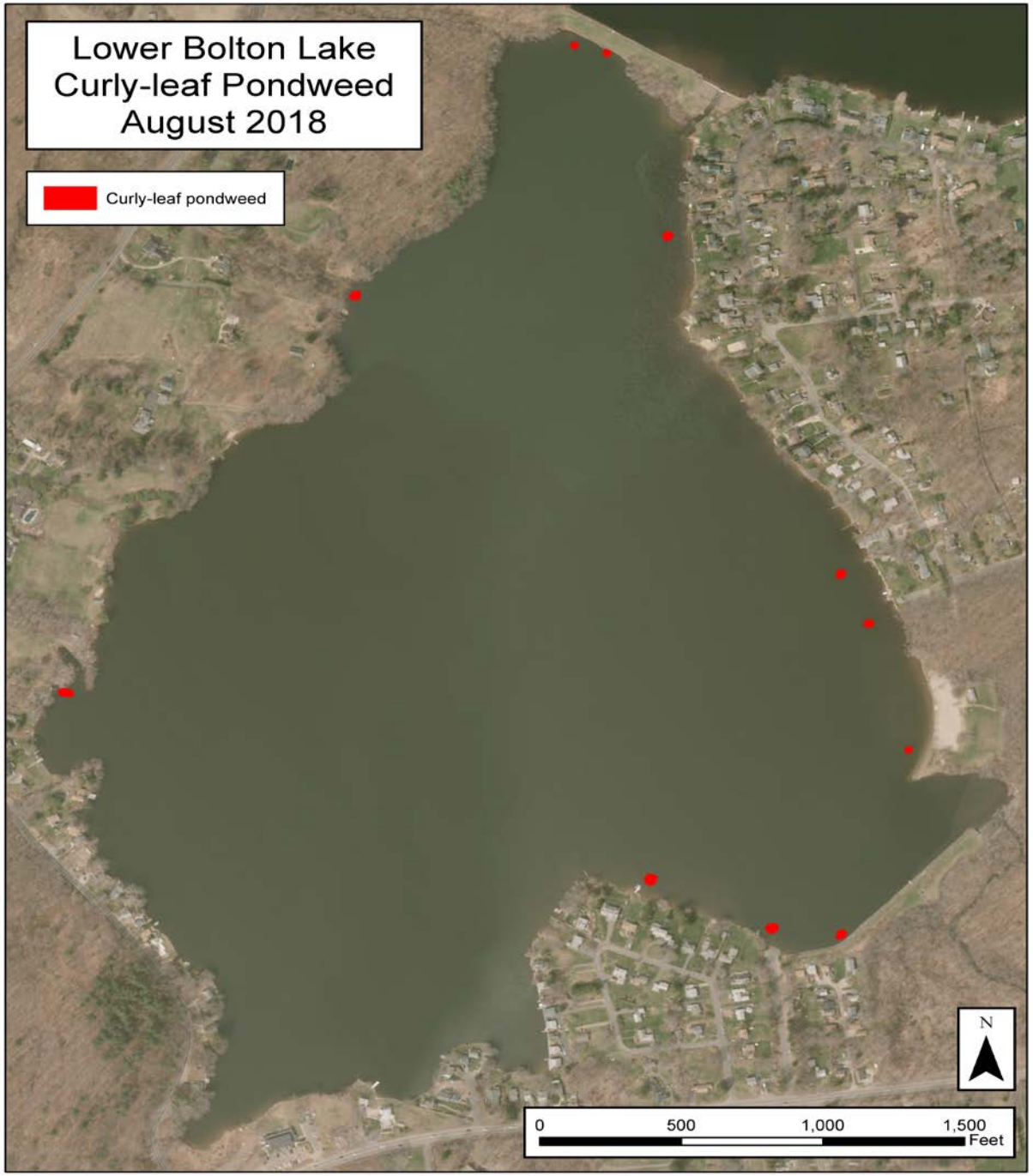
Watershed of Upper Bolton Lake = 1,460 acres



Invasive (Non-native) Aquatic Plants

- Curly-leaf pondweed

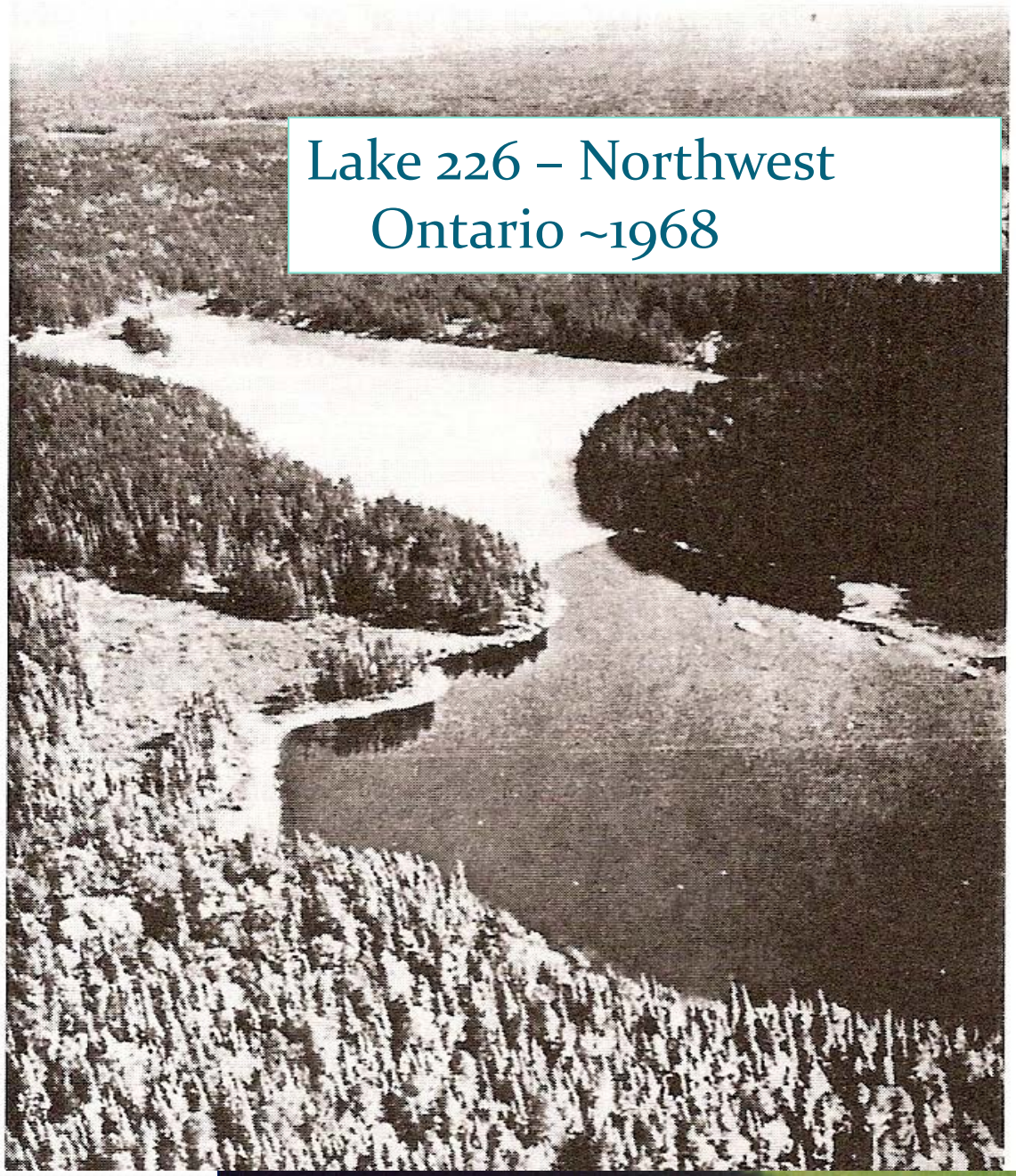
Curly-leaf pondweed found in August 2018



Targets and thresholds used to assess WQ in Lower Bolton Lake

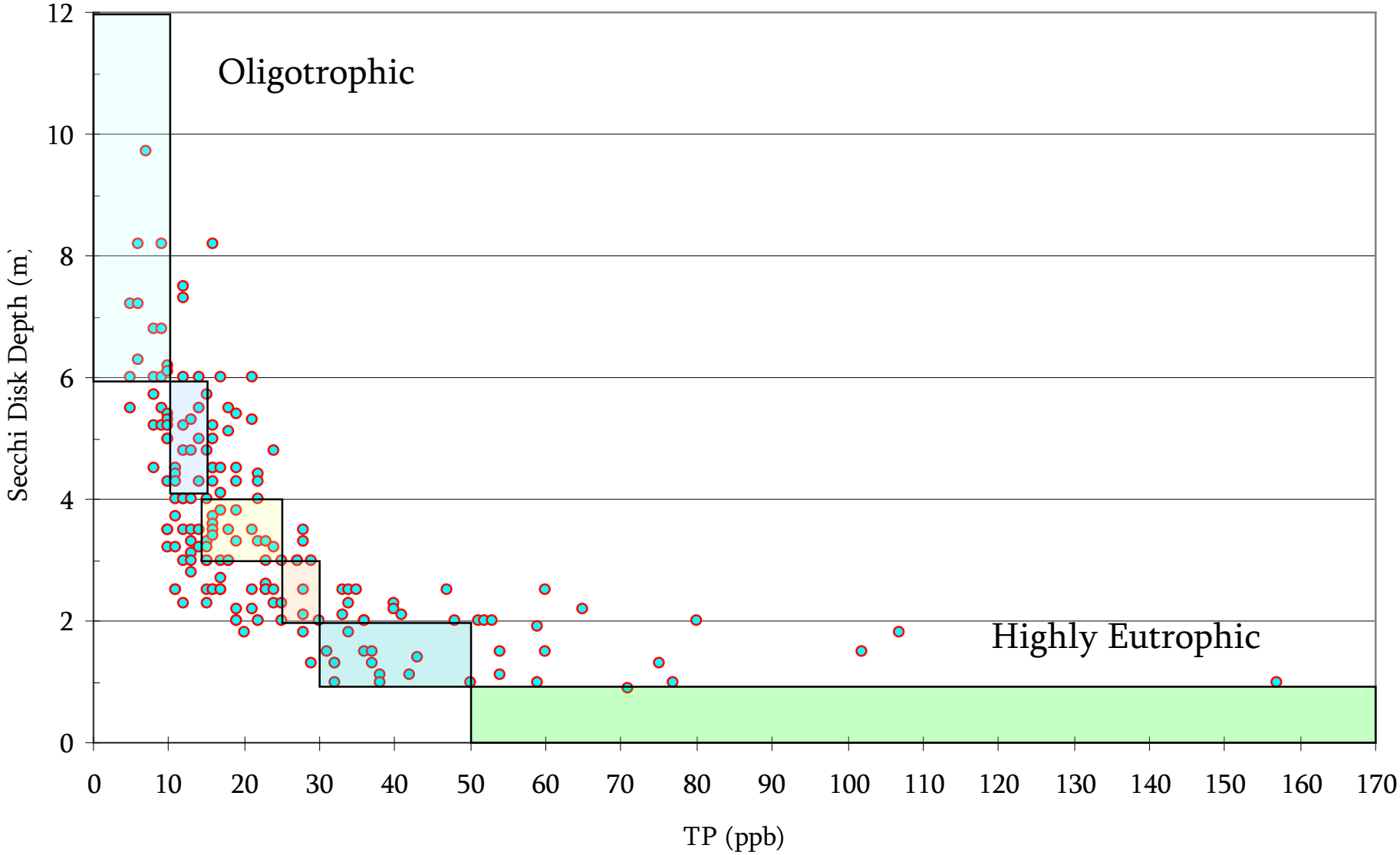
- <u>Nutrients</u>
  - **Phosphorus** – Goal <10ppb / Upper Threshold= 20ppb.
  - **Nitrogen** – Goal <200ppb / Upper Threshold= 600ppb.
  - **Iron** – Goal <50ppb / Upper Threshold= 150ppb.

- <u>Impacts</u>
  - **Water Clarity** – Goal >3m / Upper Threshold= 2m
  - **Cyanobacteria Cells** – Goal <20,000 cells/ mL / Upper Threshold= 70,000 cells/mL
  - **Dissolved Oxygen** – Goal >5 mg/L

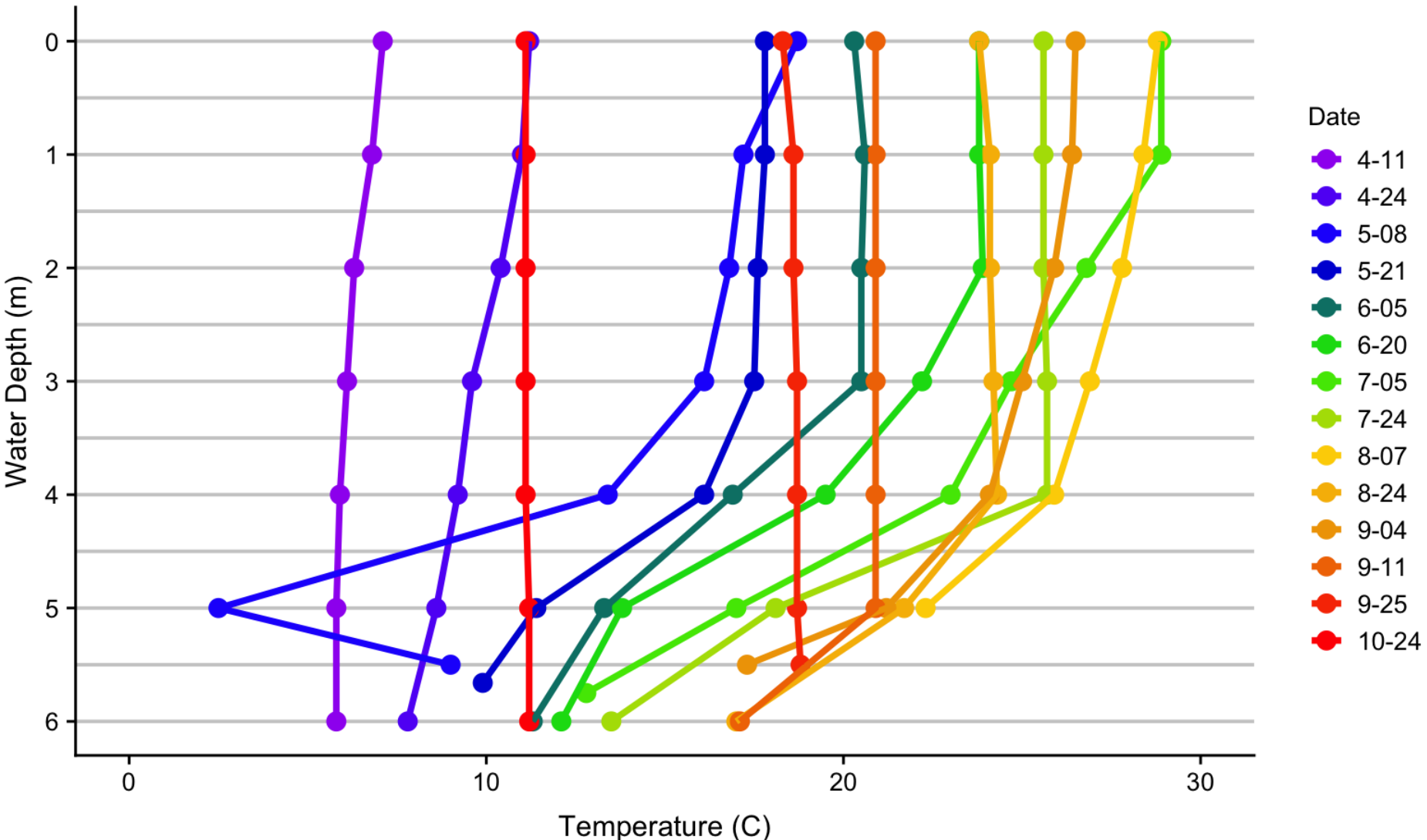

Lake 226 – Northwest
Ontario ~1968

N & C
only
N, C, and P

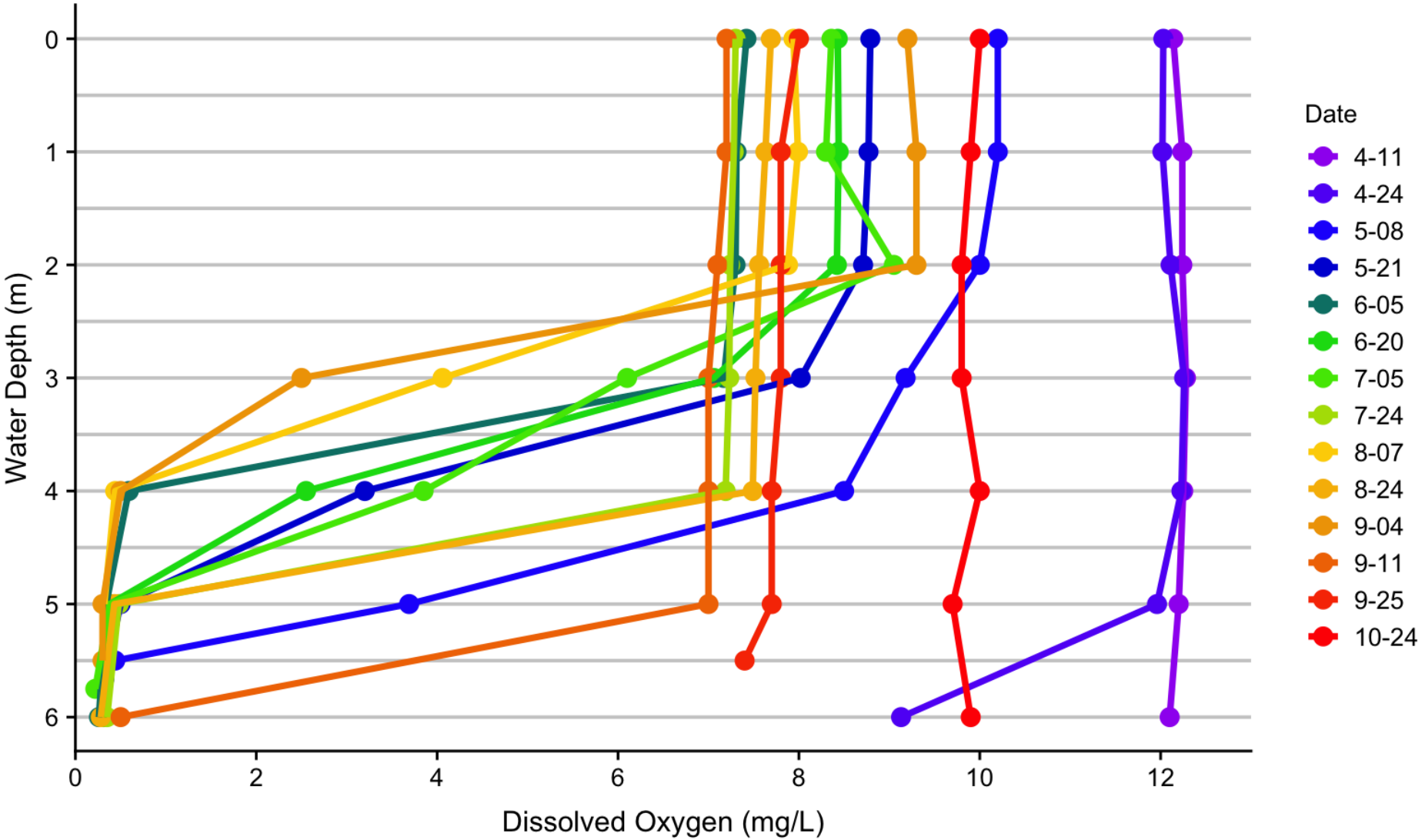
CT DEEP trophic categories and paired total phosphorus and water clarity (Frink and Norvell 1984)



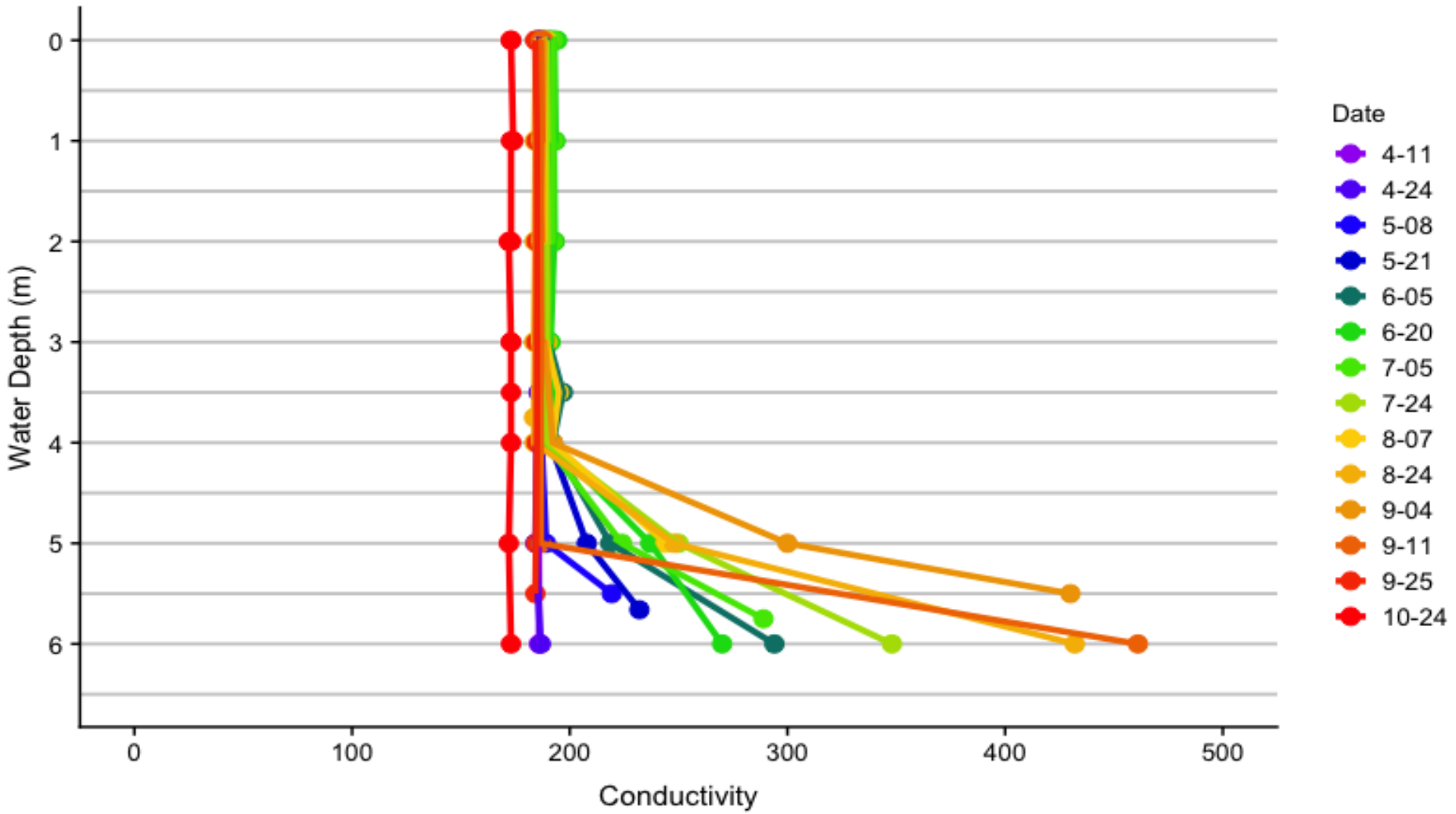
Water Temperature Profiles during 2018



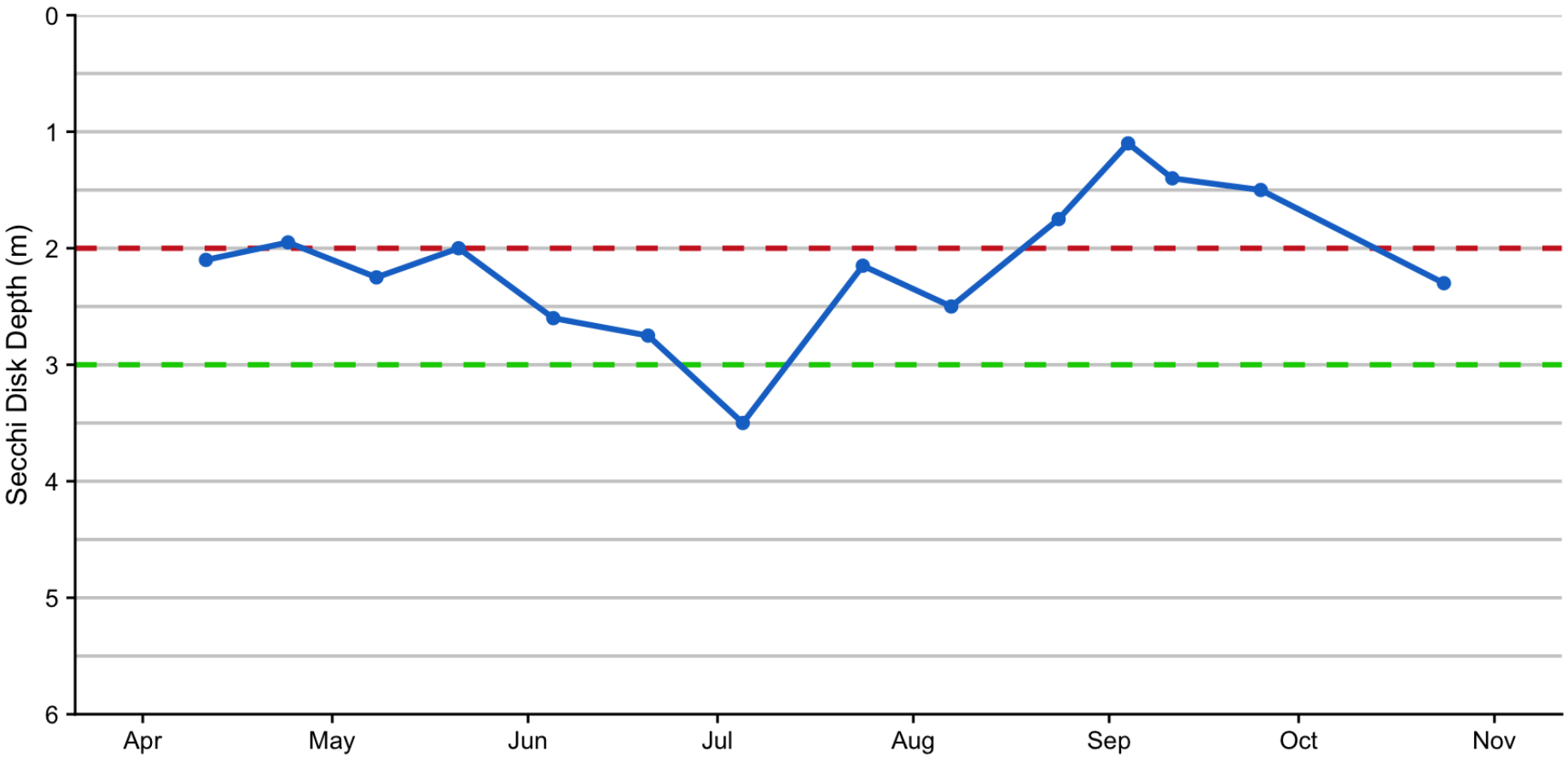
Dissolved Oxygen Profiles during 2018



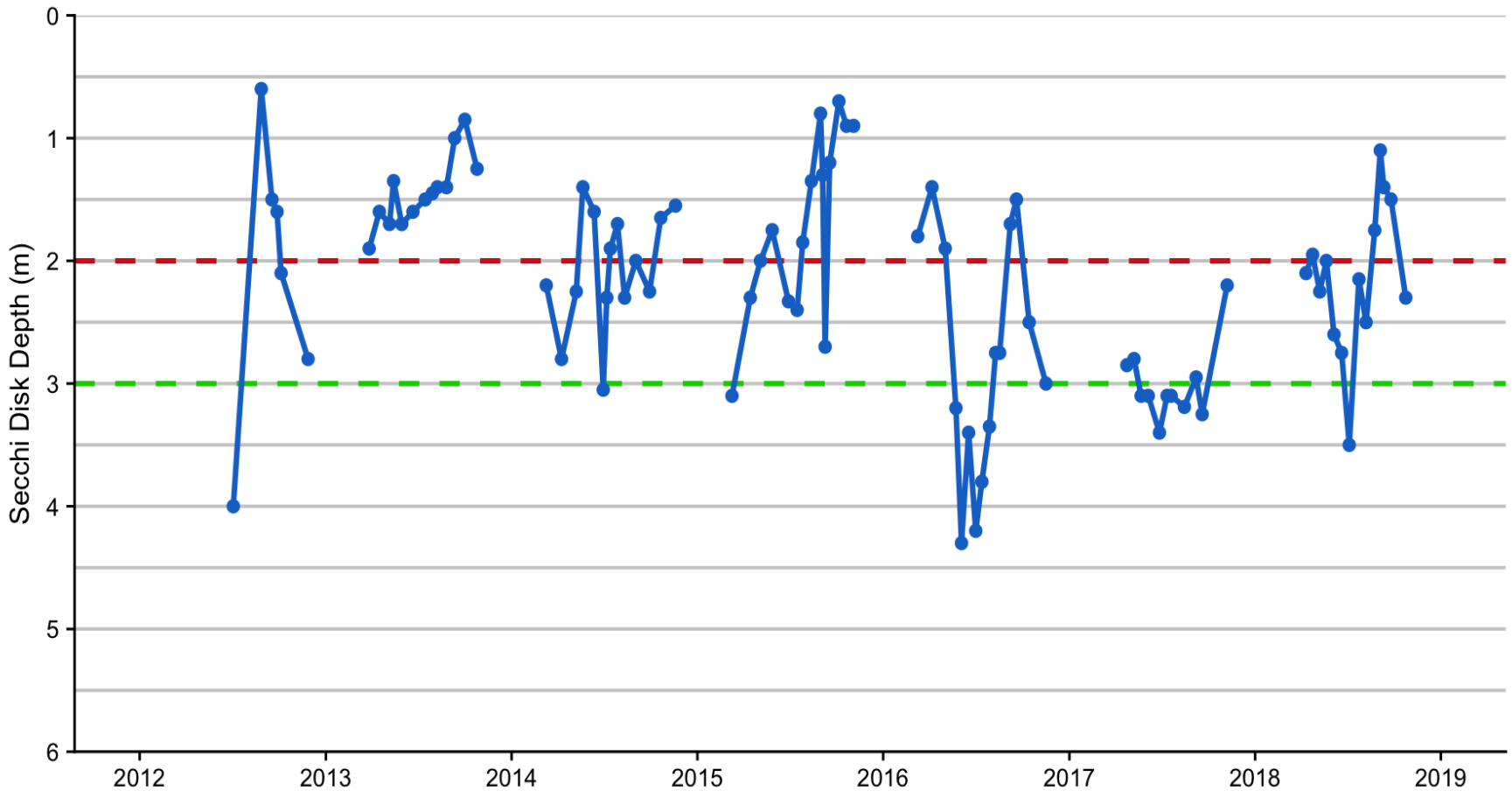
Conductivity of LBL during 2018



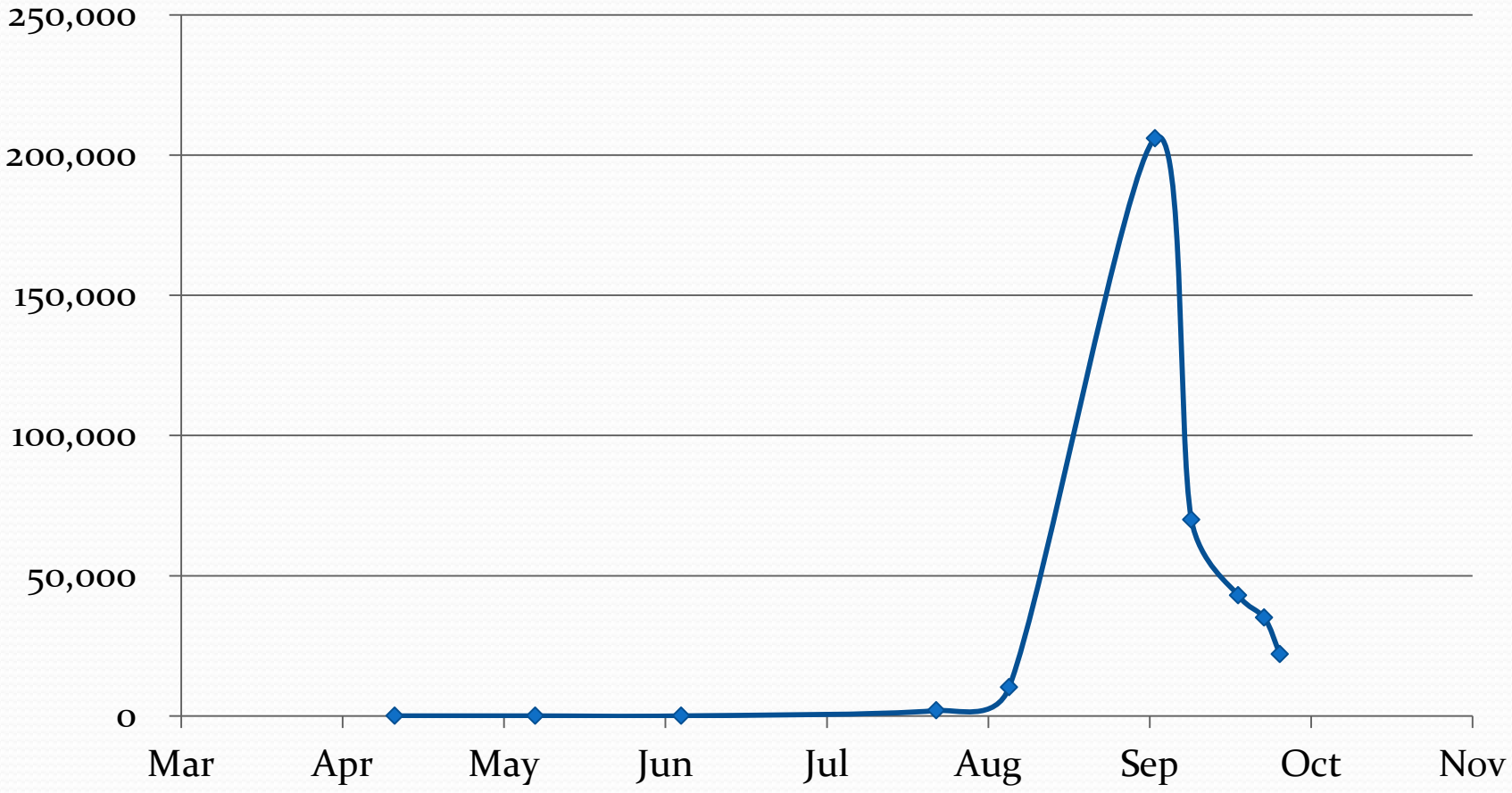
Water Clarity Trend in 2018



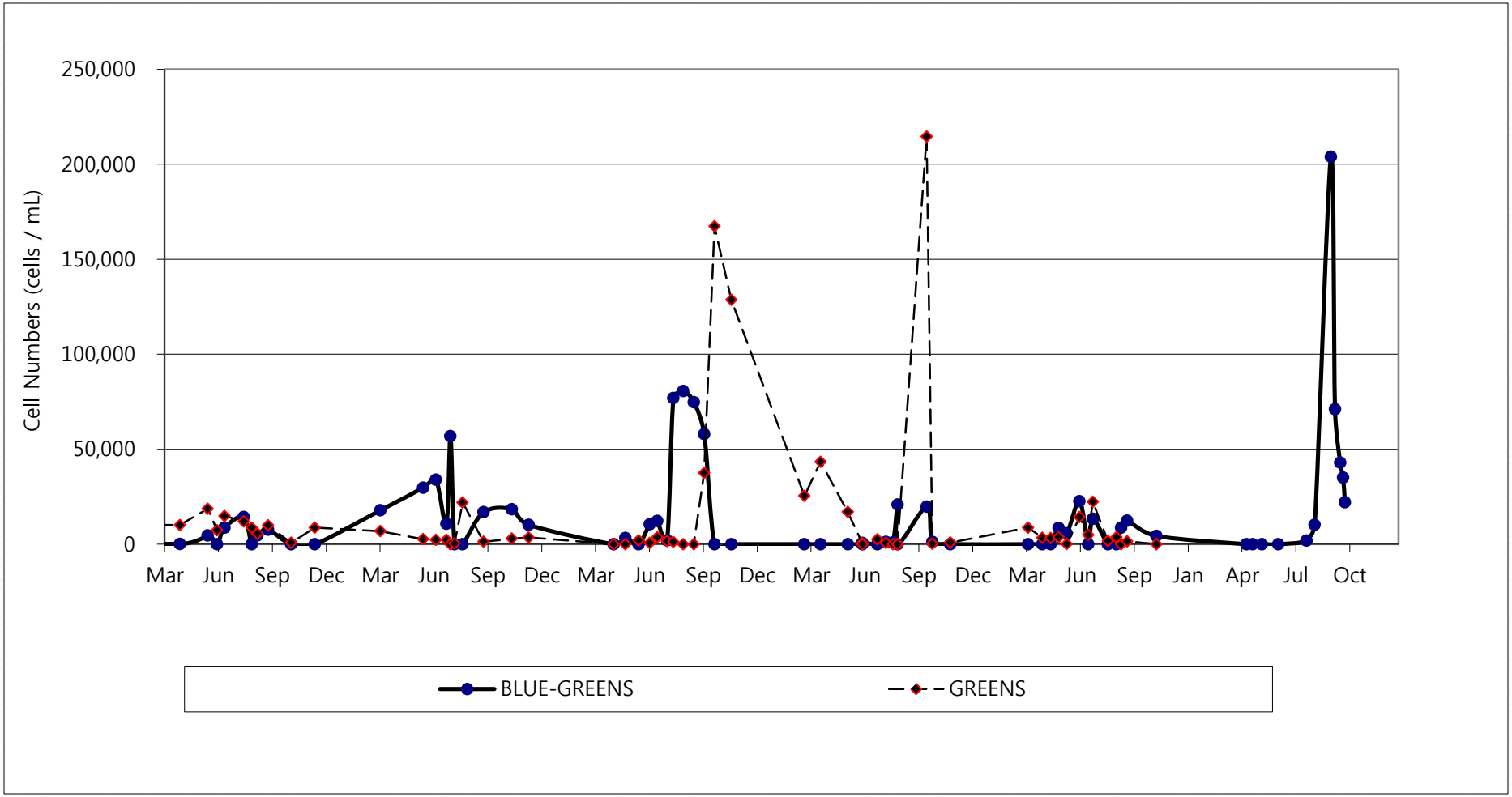
Water clarity at LBL



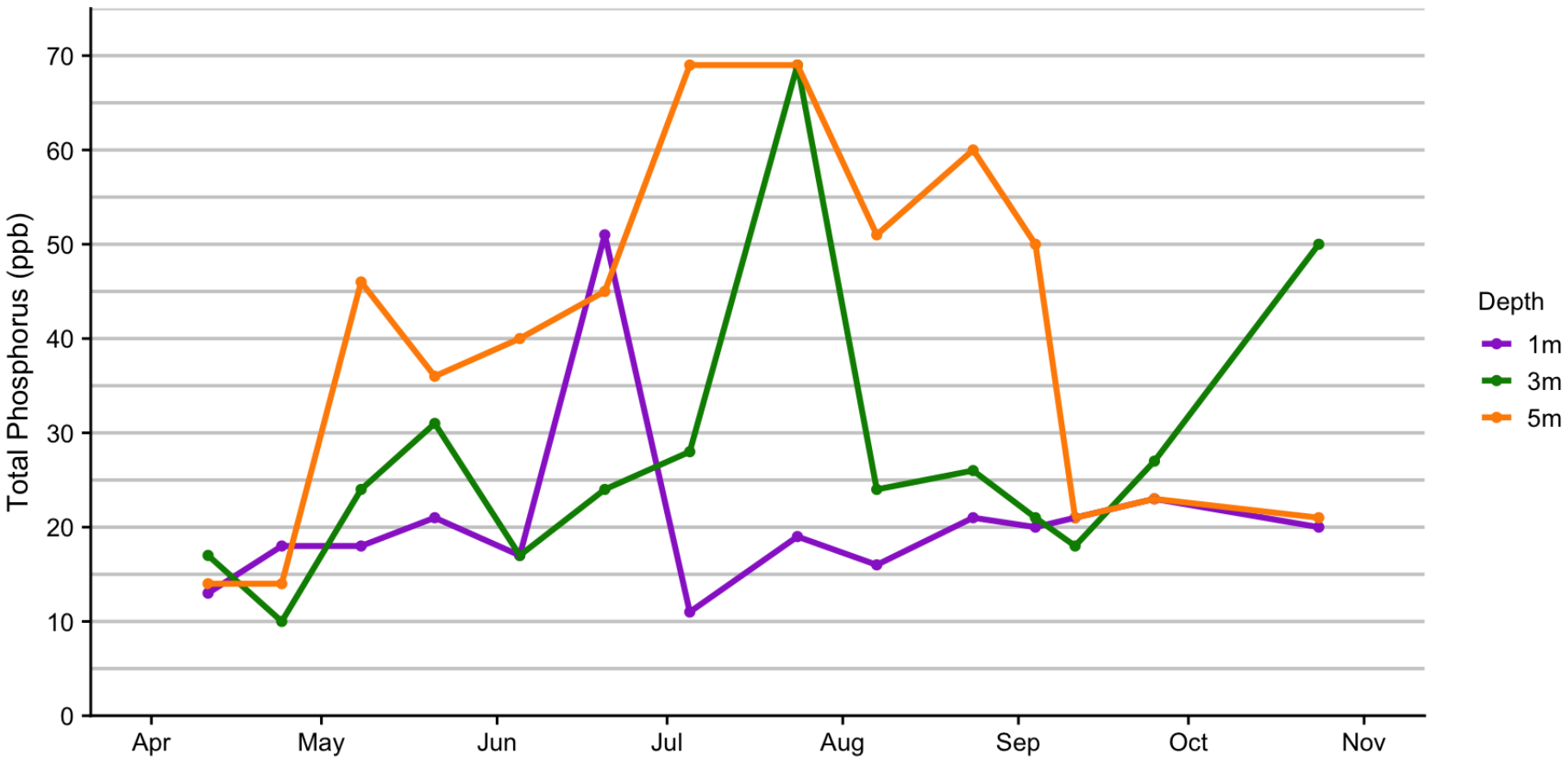
Cyanobacteria cells/mL during 2018



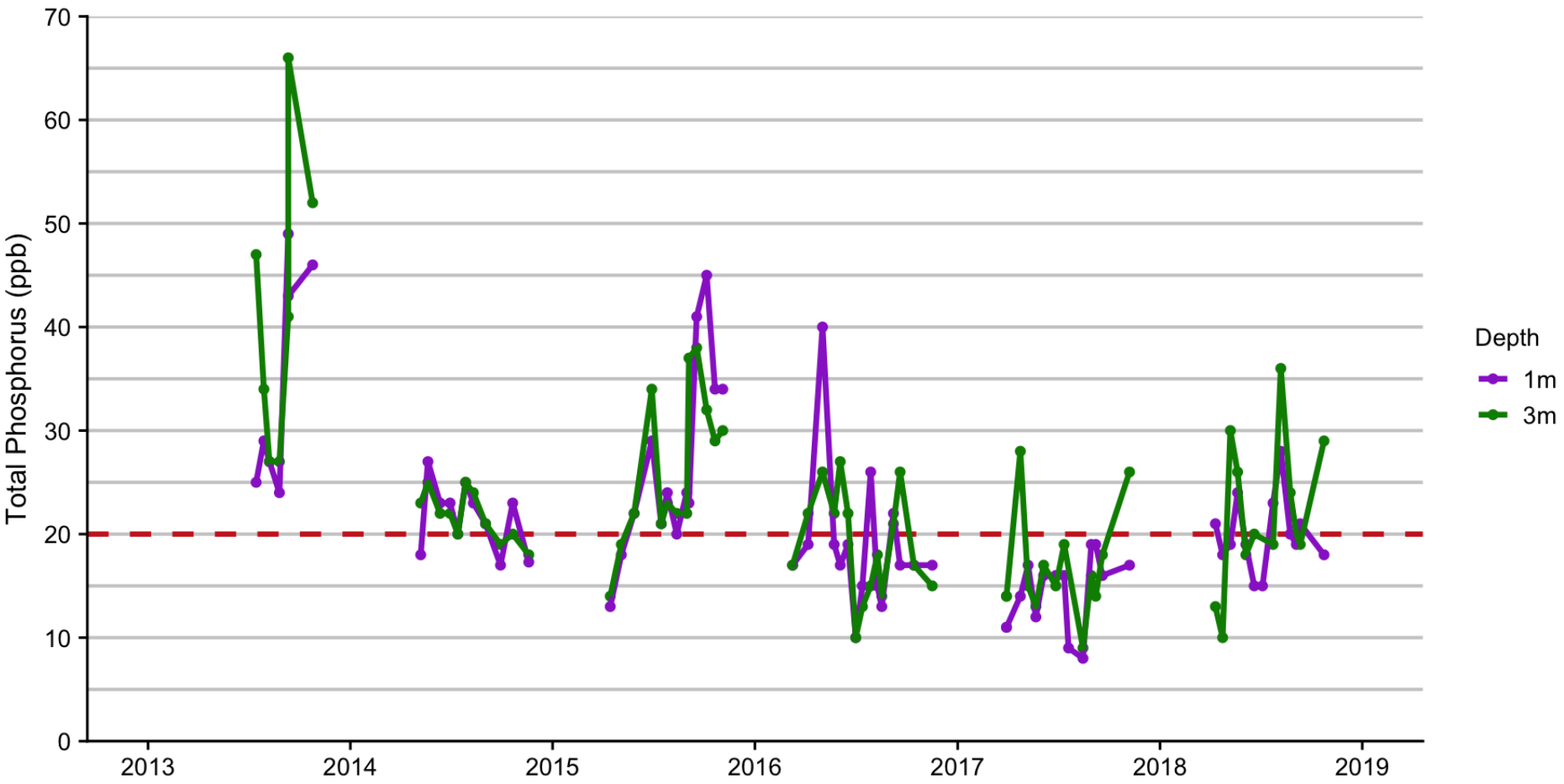
Trends in plankton cell numbers



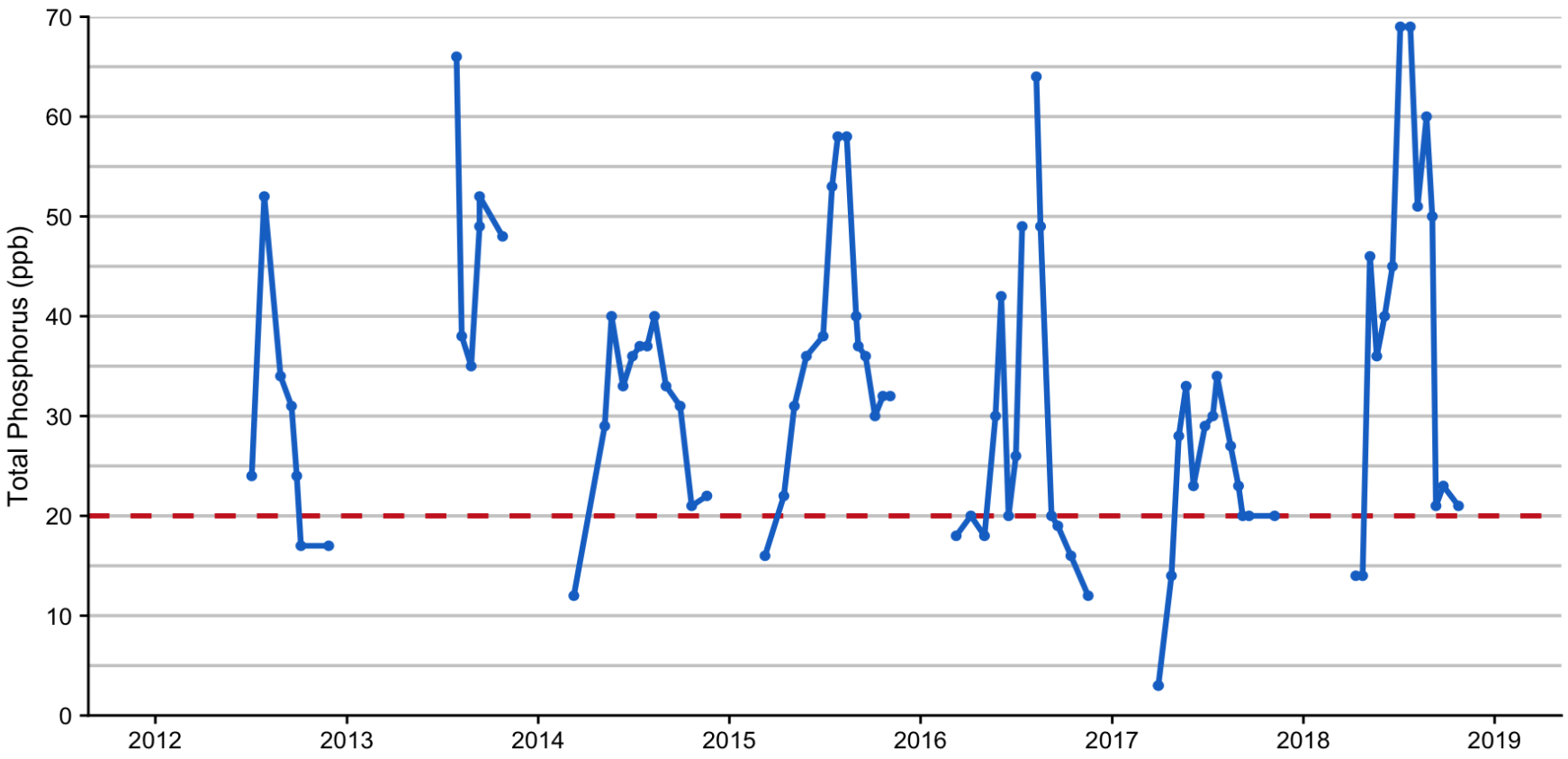
Total Phosphorus in Lower Bolton during 2018



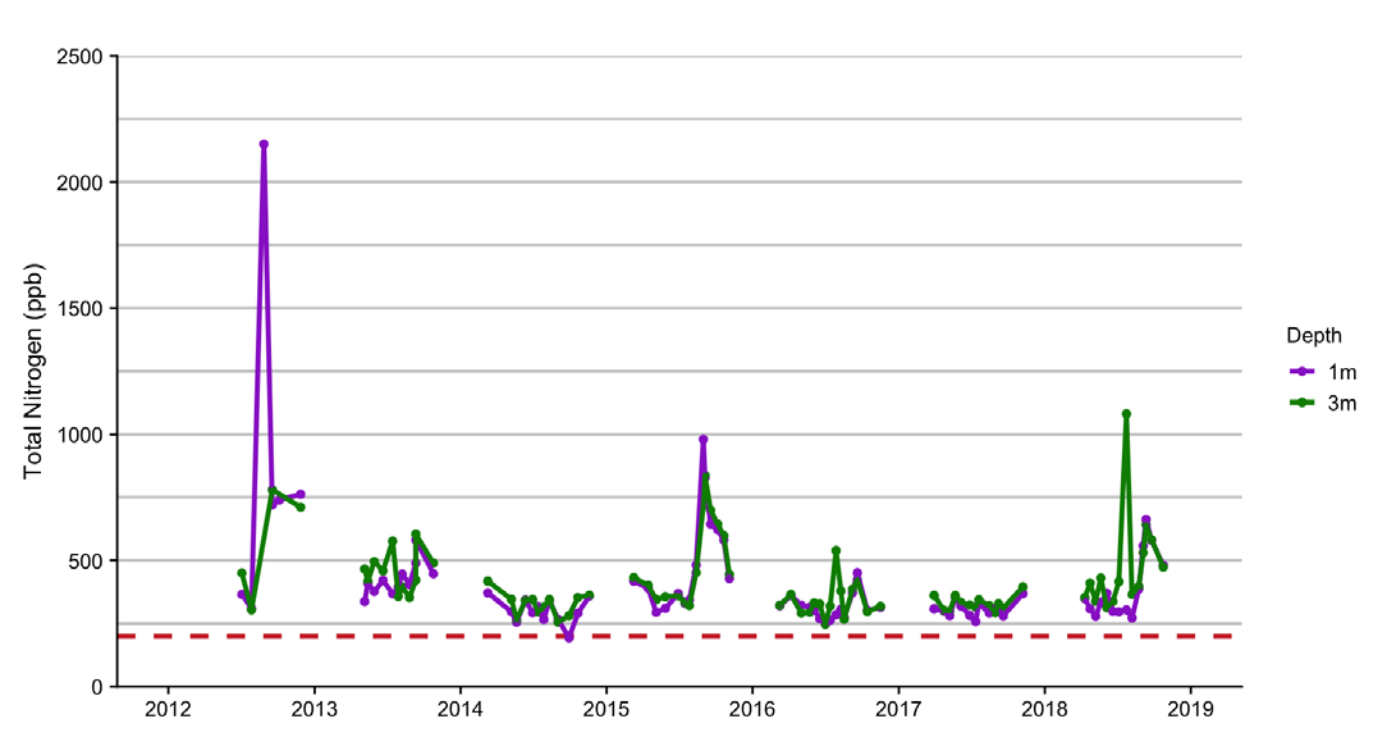
Total phosphorus in upper waters

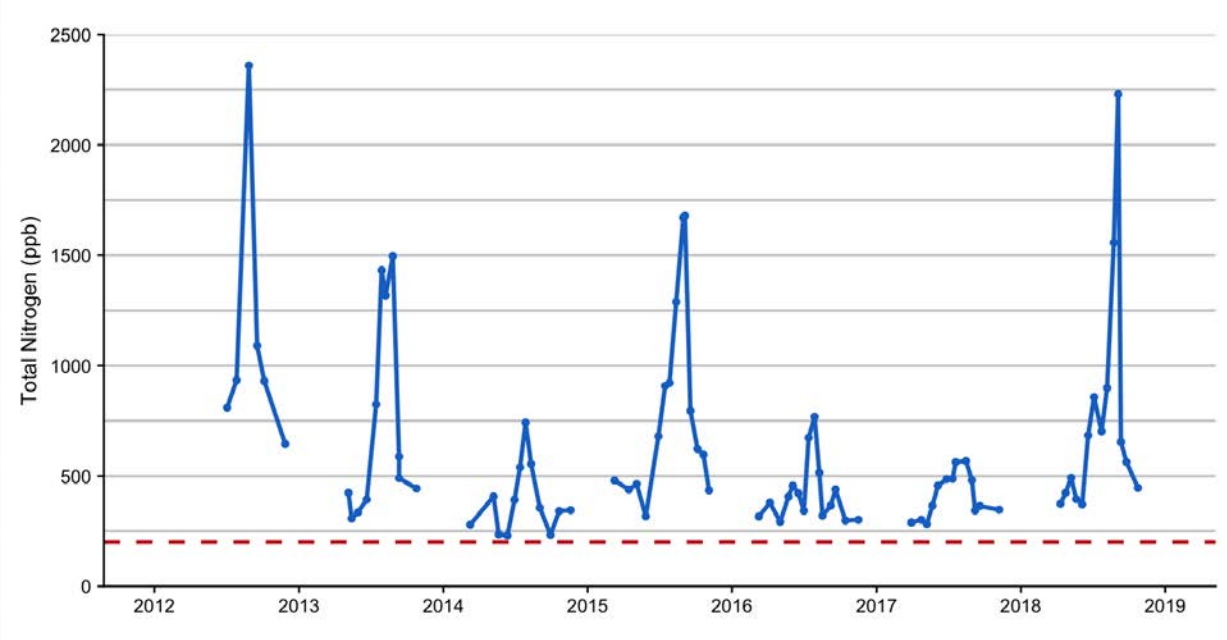


Total Phosphorus in bottom waters

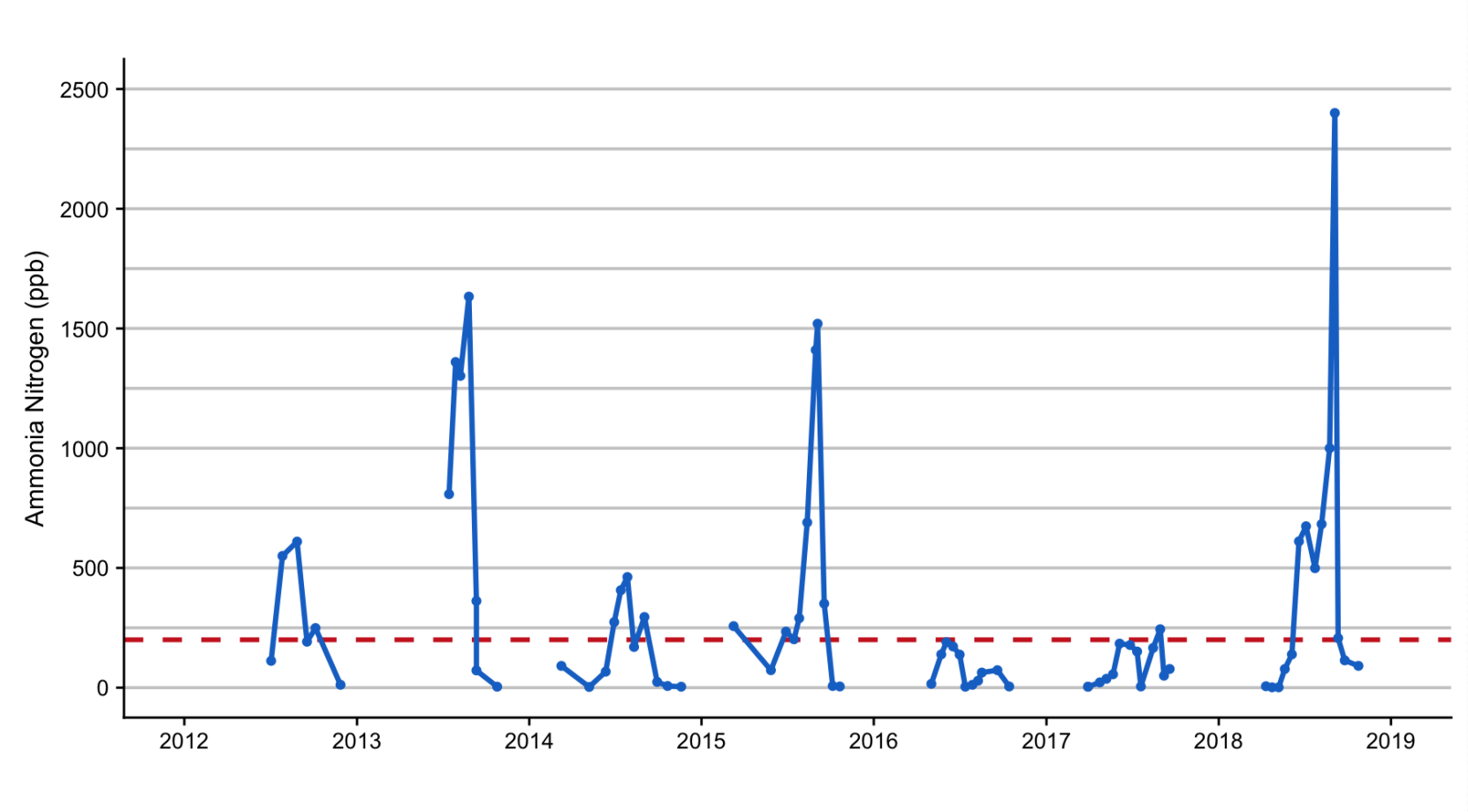


Total Nitrogen in LBL

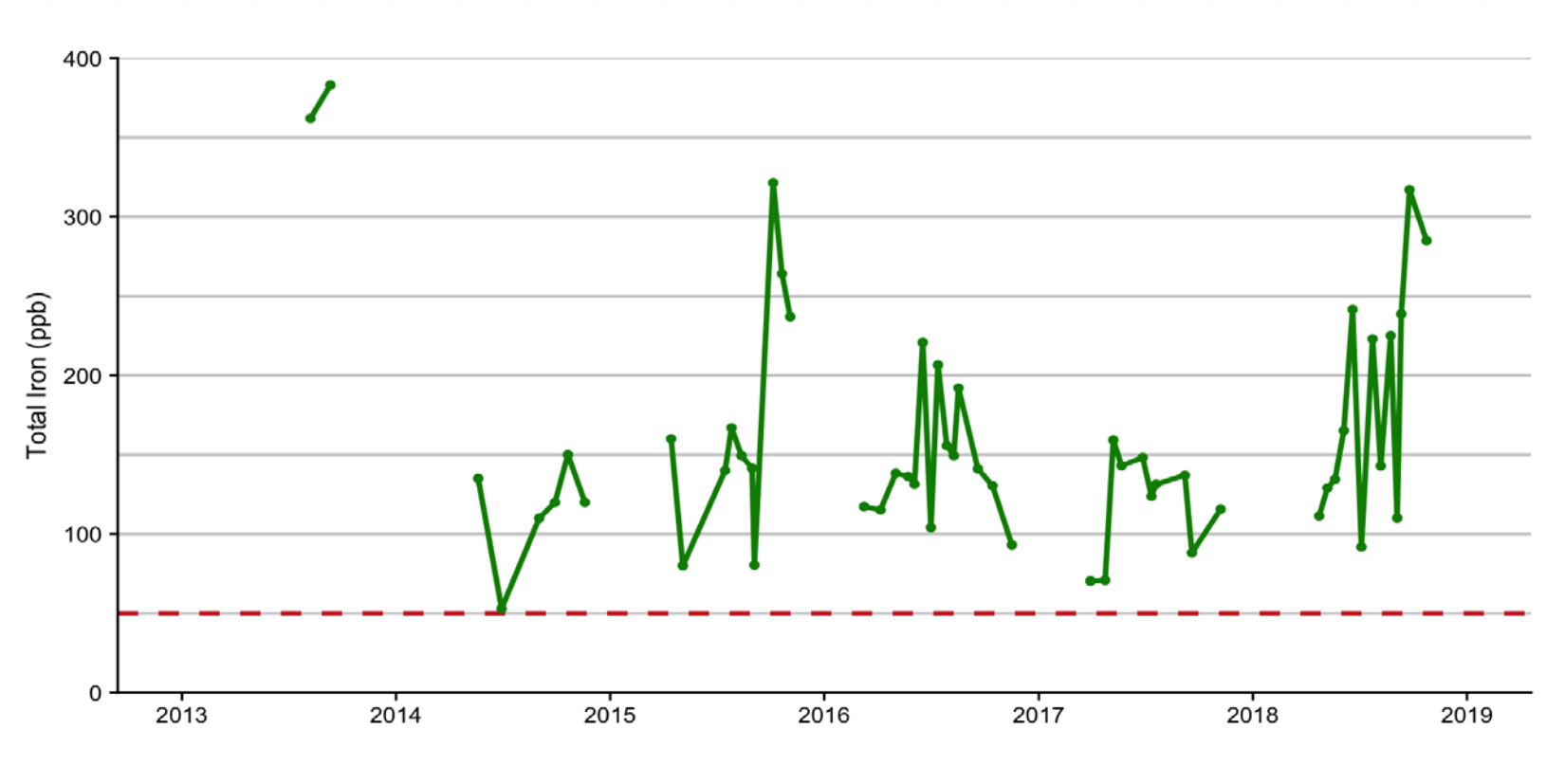




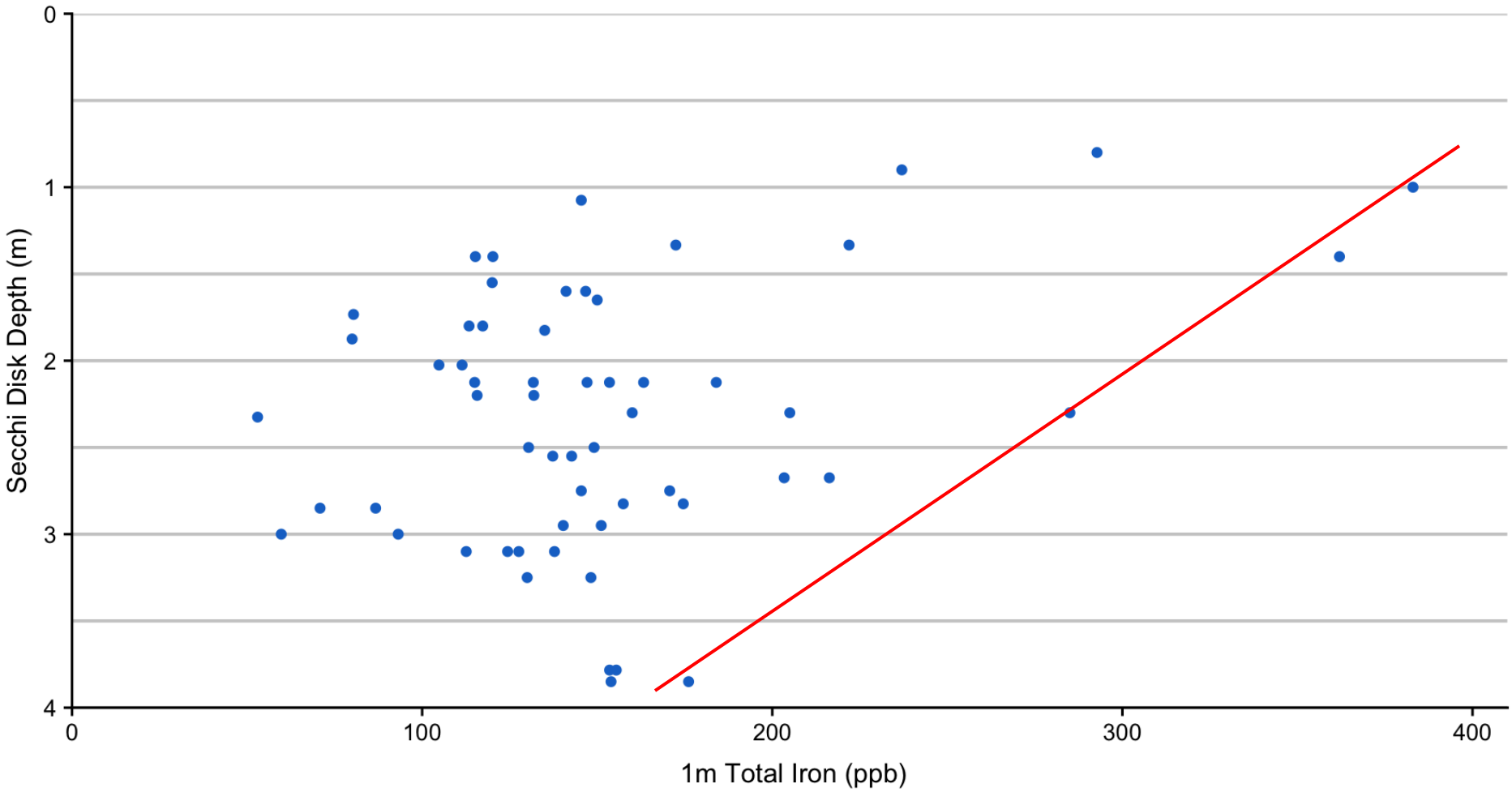
Bottom water ammonium



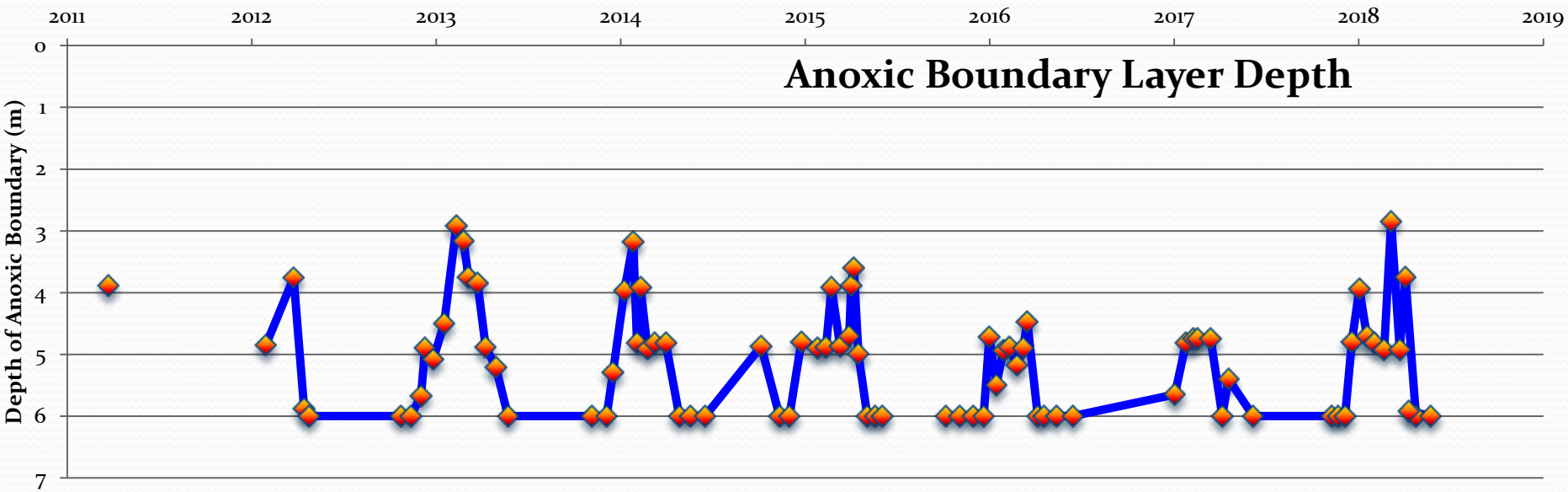
Surface water iron

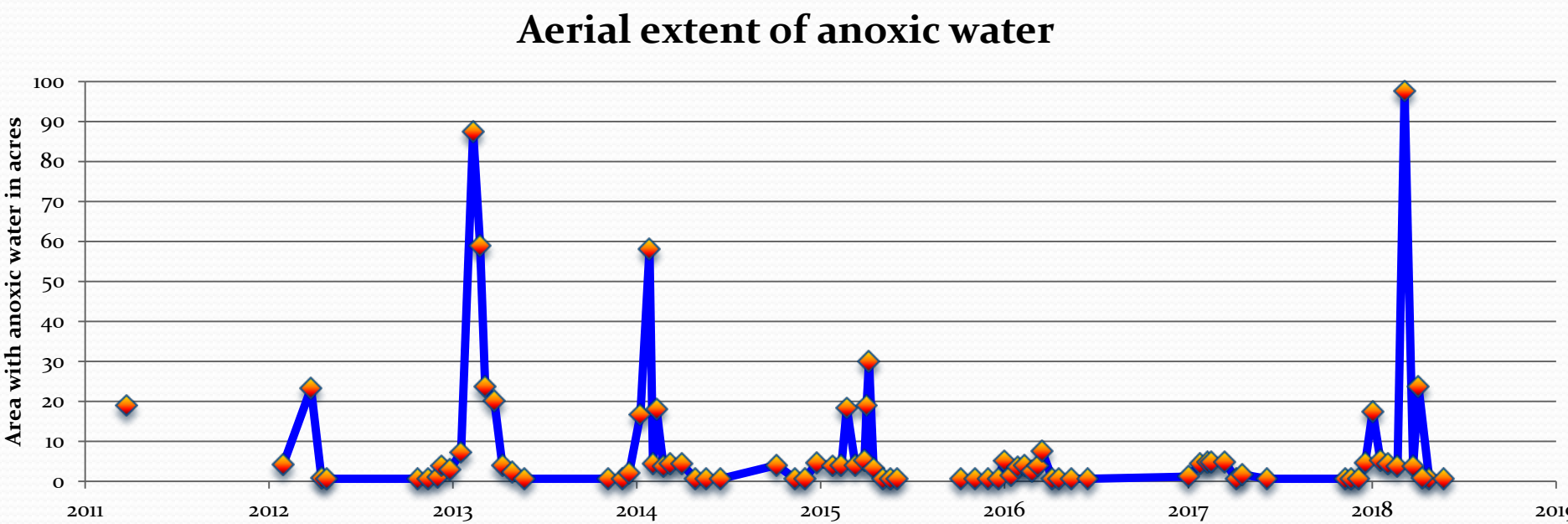


Total iron and water clarity

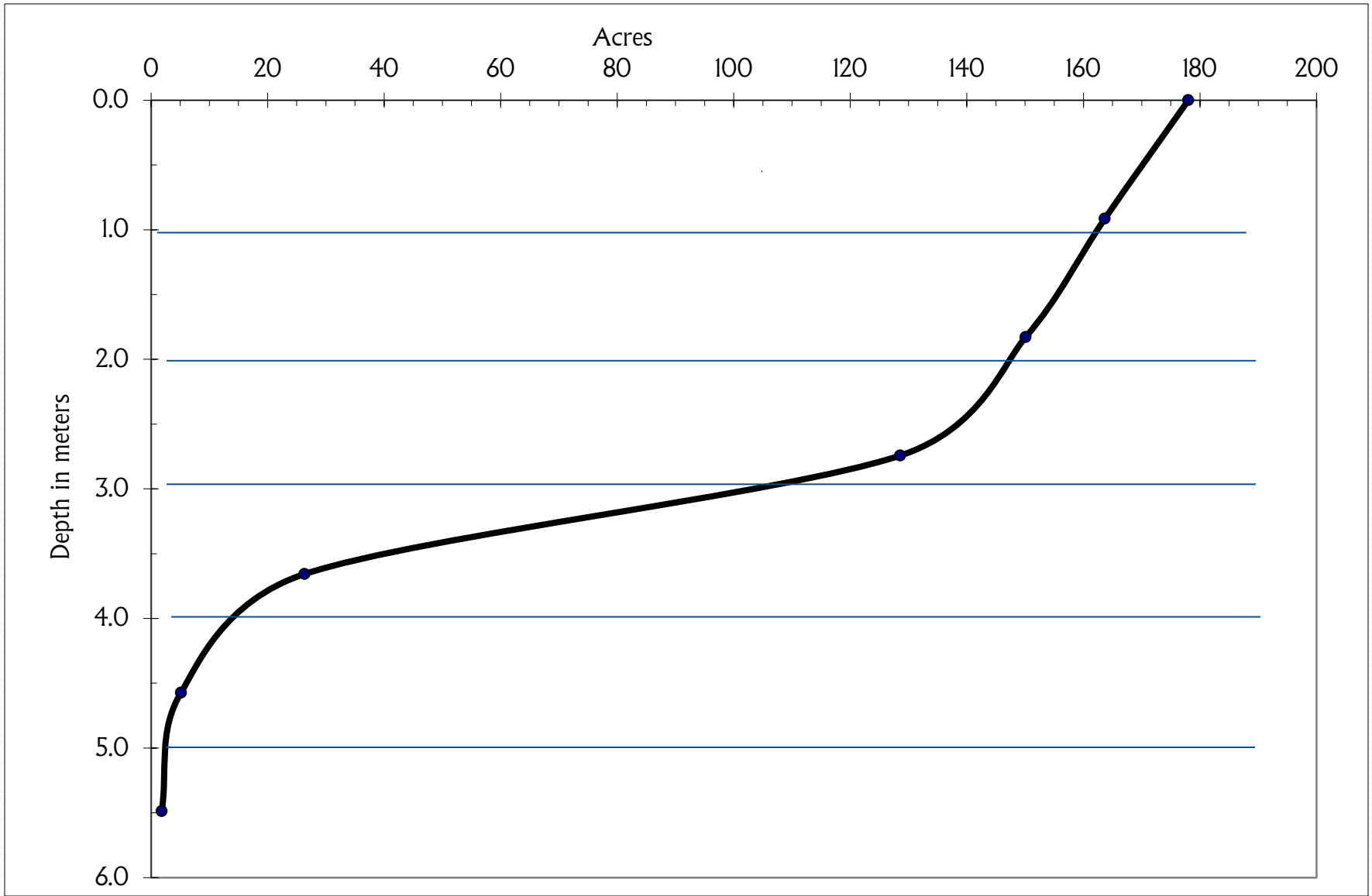


Trends in dissolved oxygen boundary

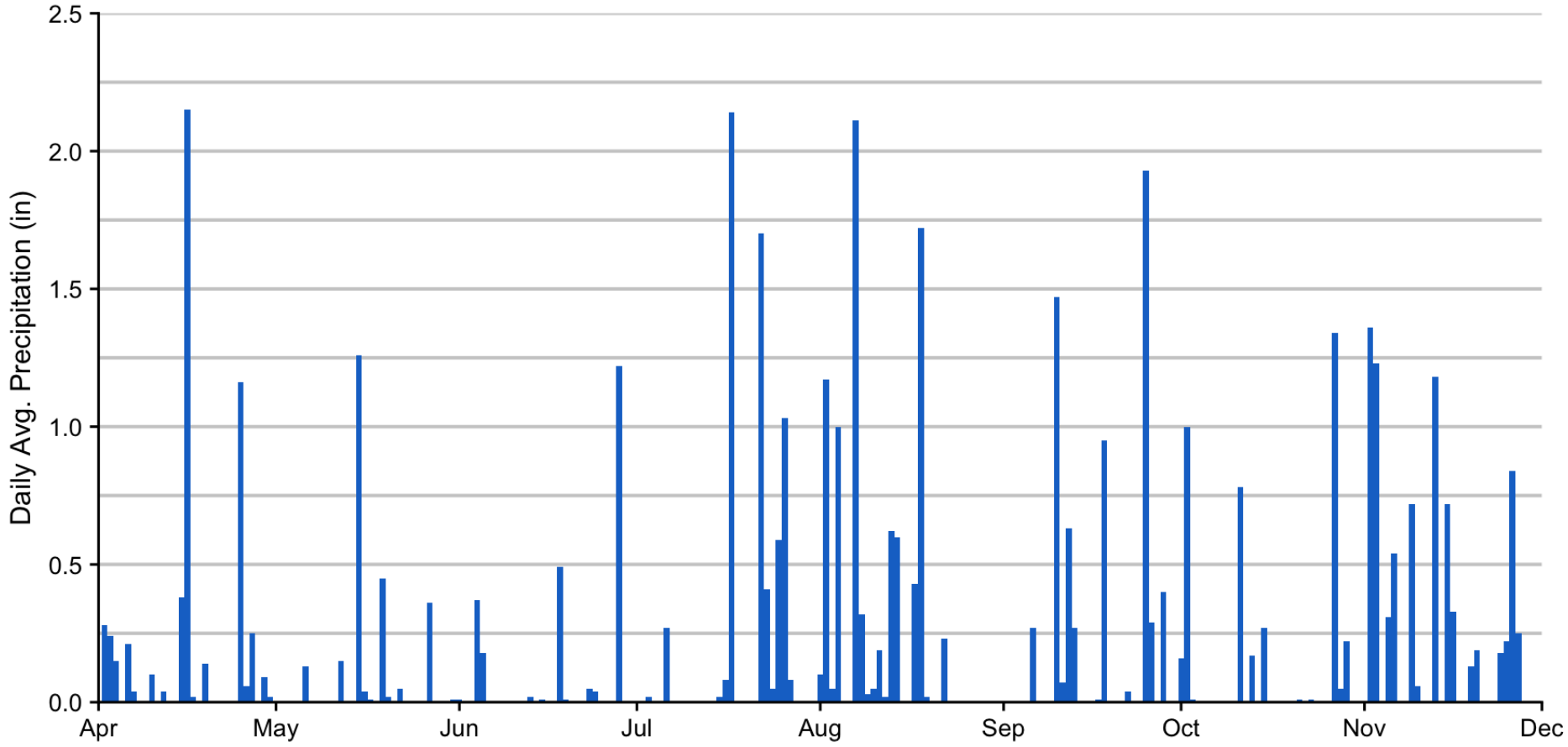




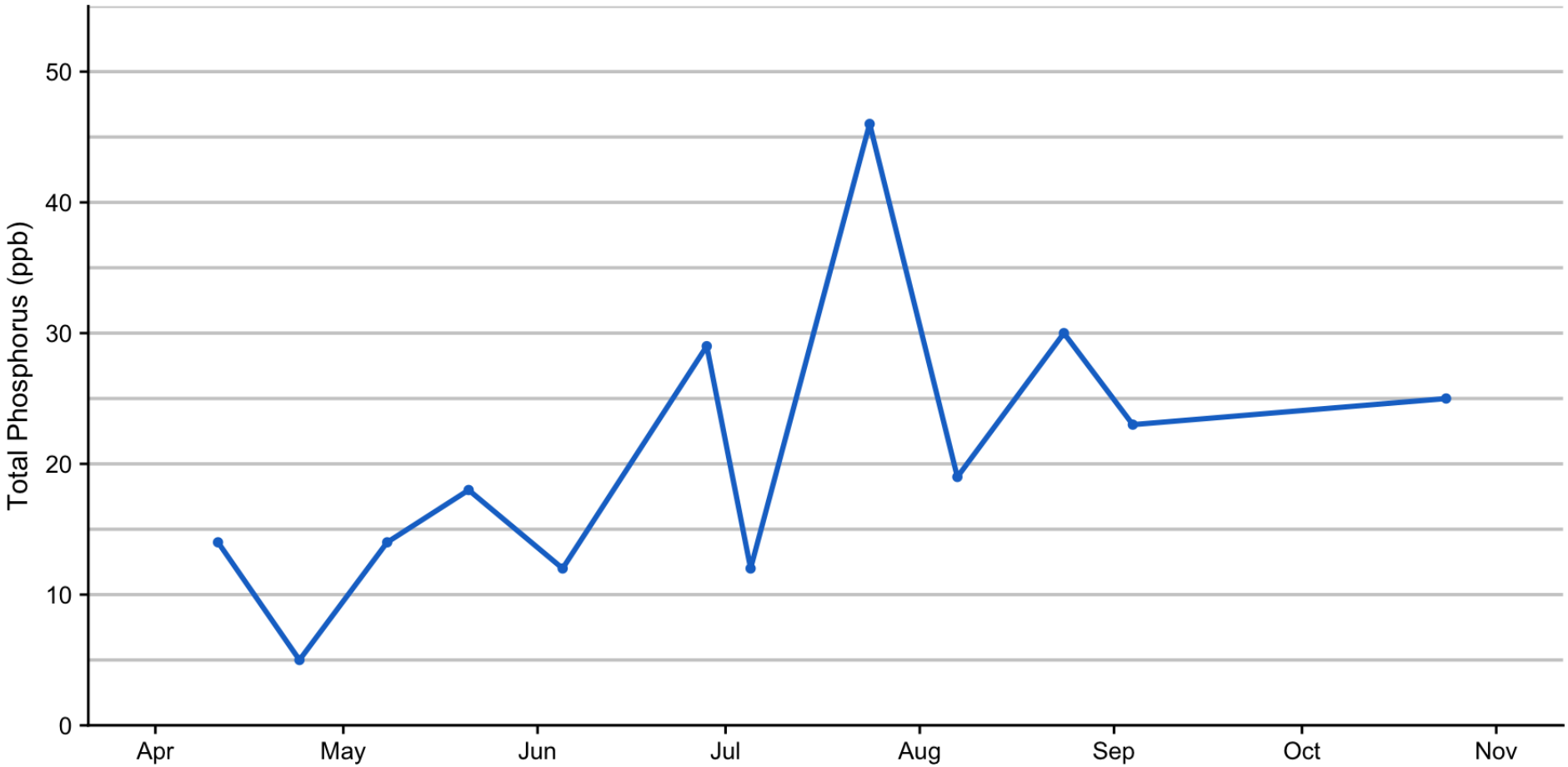
Depth Area Curve for LBL



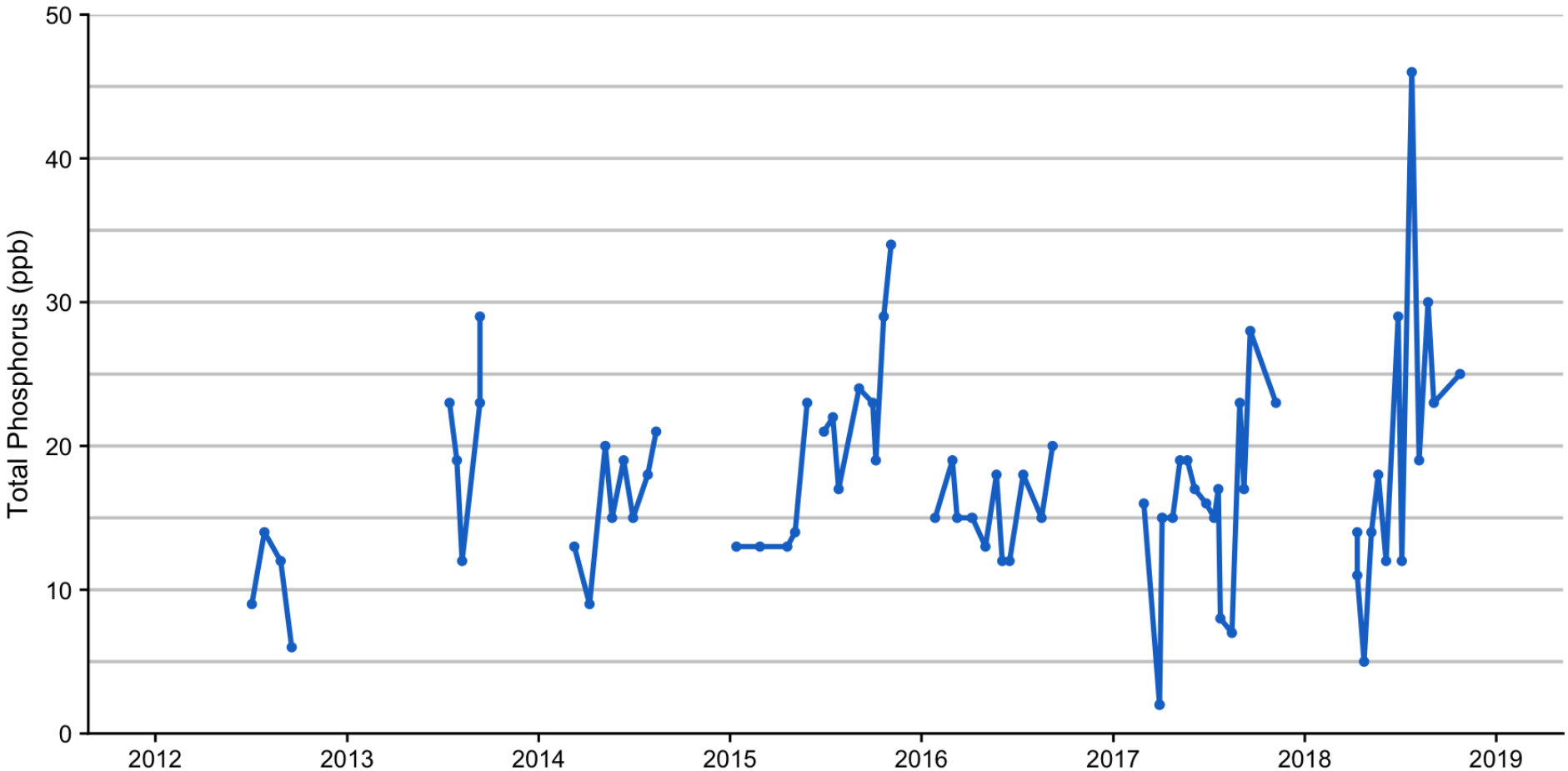
Rainfall during 2018



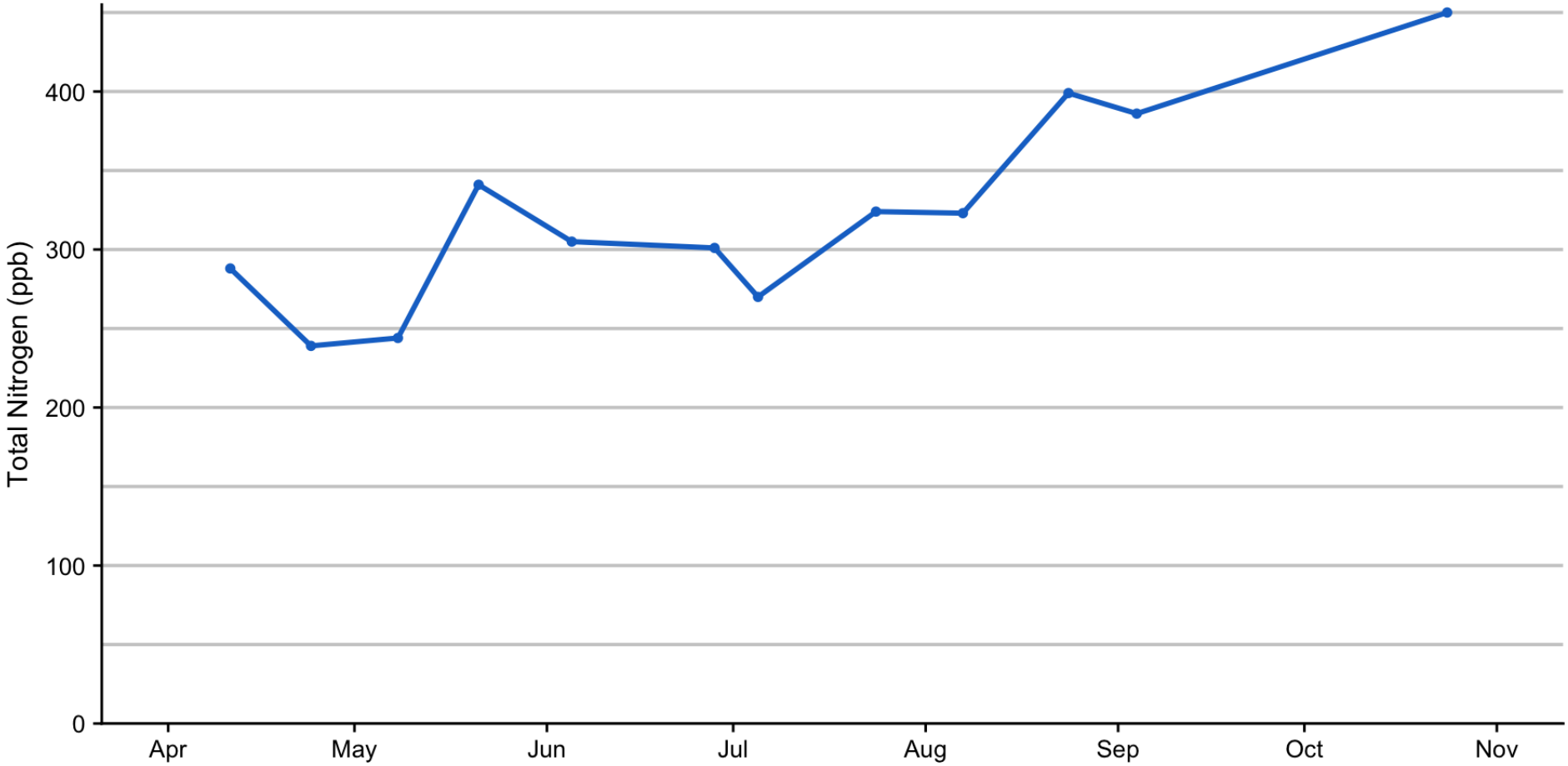
TP at Middle Bolton Dam in 2018



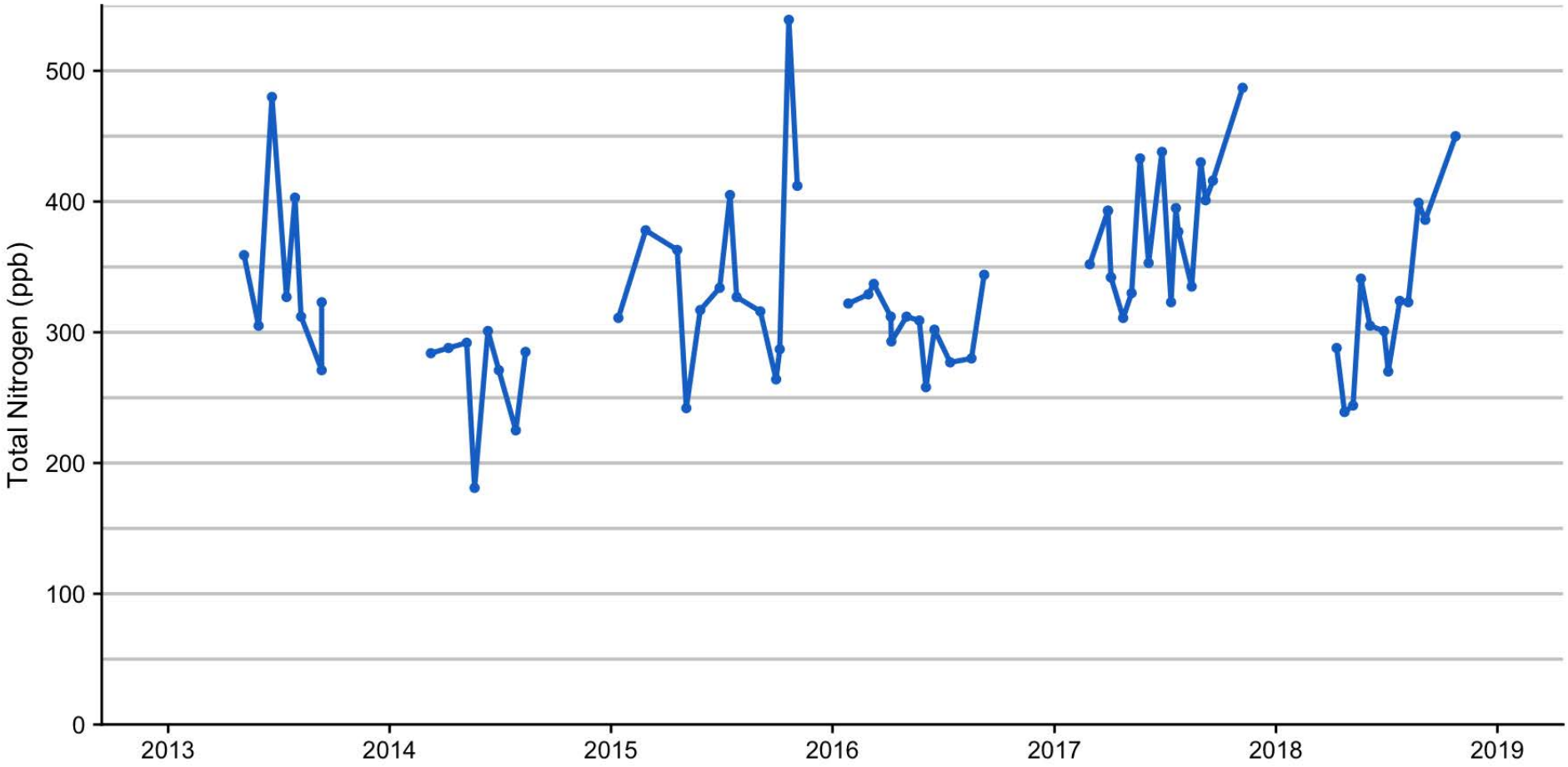
Total Phosphorus at Middle Bolton Lake dam



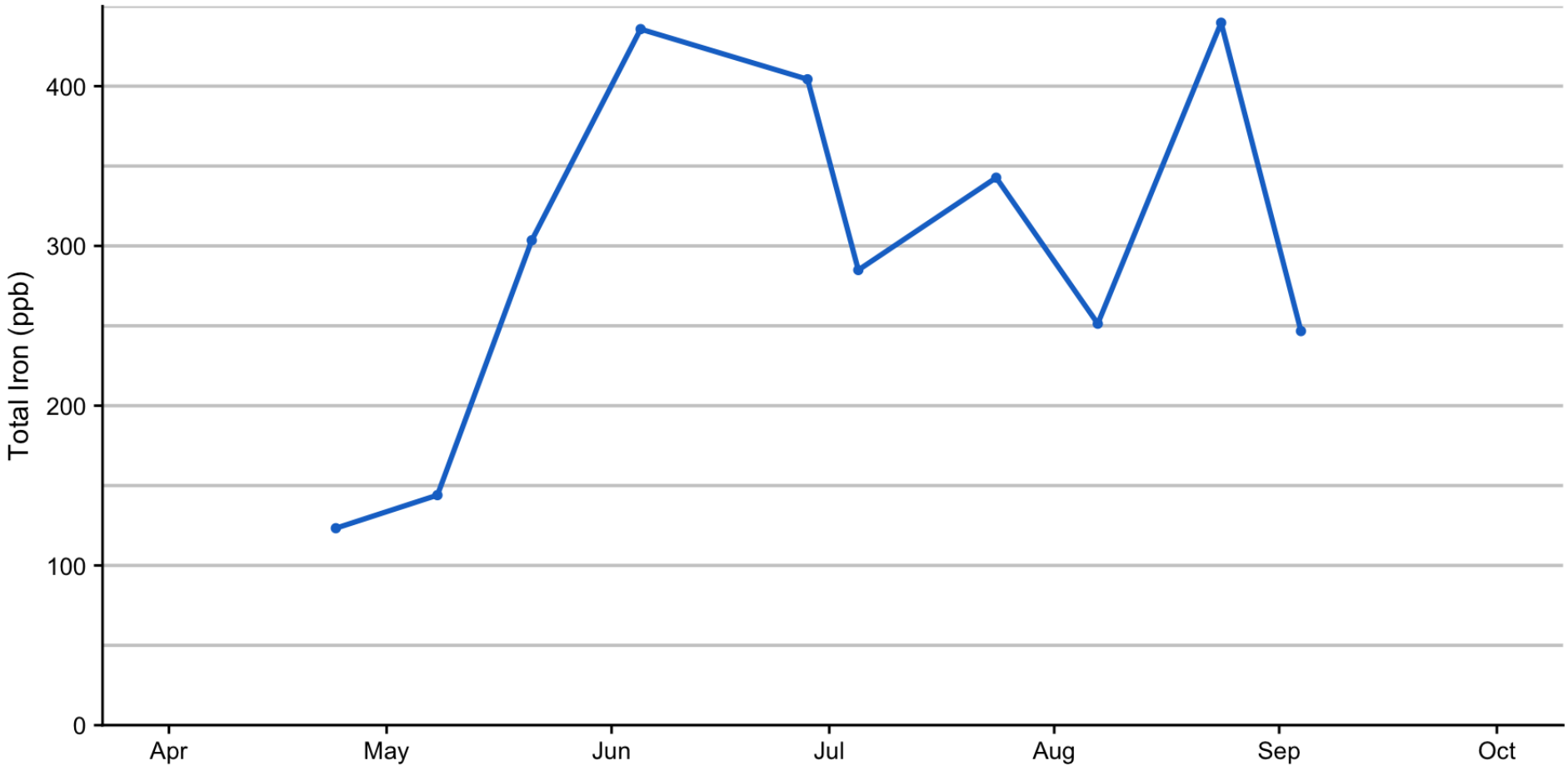
Total Nitrogen at Middle Bolton Lake dam



Total Nitrogen at Middle Bolton Dam



Total Iron at Middle Bolton Dam in 2018



Creeping Normalcy

"Perhaps the commonest circumstance under which societies fail to perceive a problem is when it takes the form of a slow trend concealed by wide up-and-down fluctuations"

- Jared Diamond
Collapse