

Harmful Algal Blooms at Utah Lake



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Goals

- Evaluate weekly changes in Utah Lake chemistry, which may trigger toxic cyanobacteria blooms
- Determine the temporal variability of multiple phosphorus forms in lake water

Table 1. Locations of sites on Utah Lake

Site	Latitude	Longitude
Pelican Marina	40°17'31.40"N	111°51'56.62"W
Lindon Marina	40°19'38.23"N	111°46'1.83"W
Mouth of Goshen Bay	40° 8'40.57"N	111°52'45.02"W
Mouth of Provo Bay	40°11'6.04"N	111°43'41.25"W
Bird Island (Buoy)	40°10'11.20"N	111°46'42.93"W
Provo Marina (Buoy)	40°14'18.03"N	111°46'3.27"W
Vineyard (Buoy)	40°17'41.40"N	111°48'20.22"W

Fig 1. Map of locations on Utah Lake

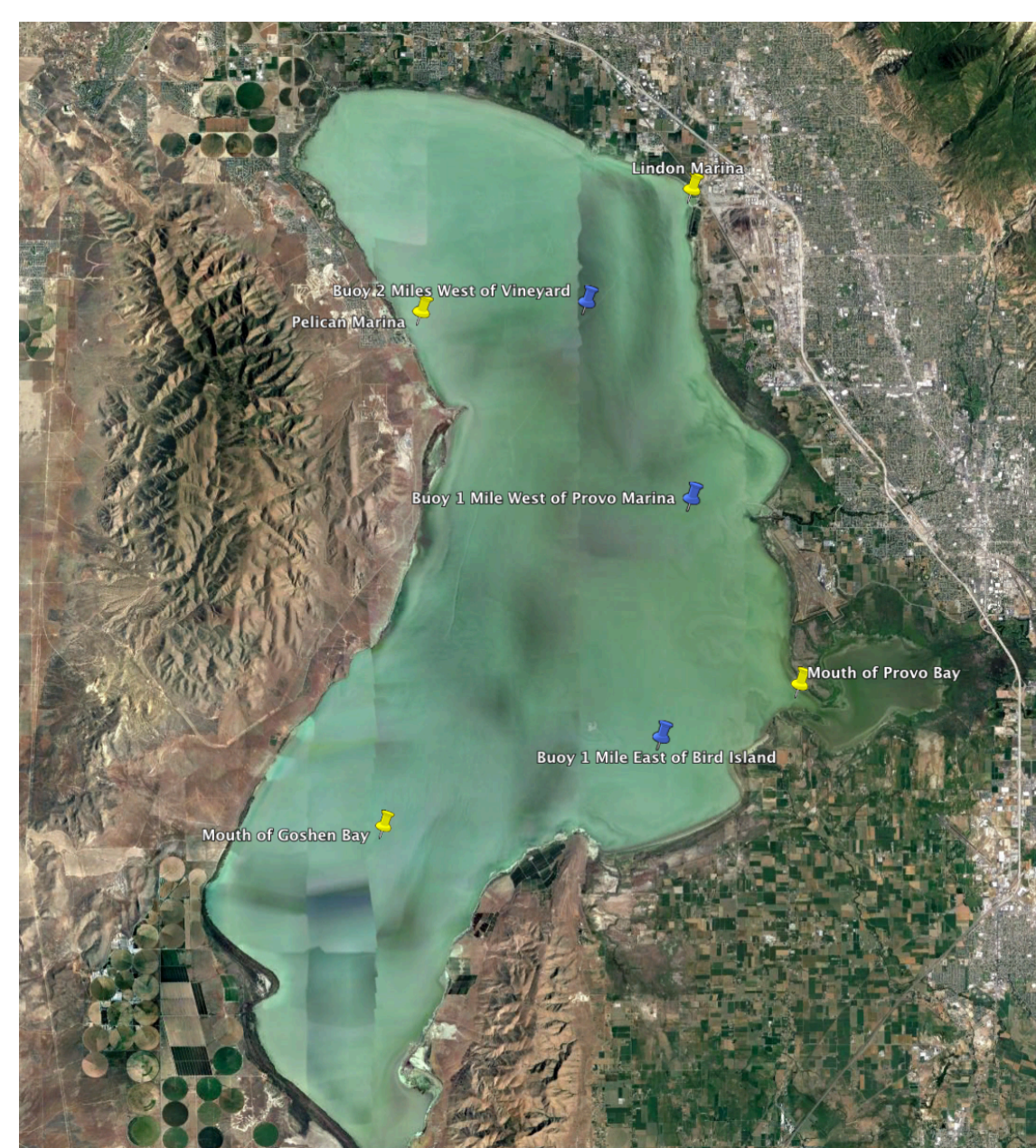


Photo 1. Filtering water samples



Research Methods

- We are evaluating a suite of lake chemistry variables in conjunction with other researchers in the Aanderud lab that are identifying cyanobacteria present in Utah Lake water samples.

Table 2. Water chemistry measurements

Basic lake chemistry
<i>Filtered samples will be analyzed for</i>
Ammonium
Nitrate
Non-purgeable dissolved organic C (NP-DOC) and total N
Total Organic Carbon (TOC)
Dissolved organic N
<i>Measurements from YSI hand-held</i>
Temperature
Dissolved Oxygen
Chlorophyll and phycocyanin
pH

Photo 2. Instruments for water chemistry analyses: spectrophotometer, TOC-L Analyzer, YSI handheld meter



Table 3. Summary of phosphorus fractionation scheme

P fraction	Abbrv	Filtered	Determination	Significance
Total	TP	No	Microwave digestion and ICP-OES	Total P
Particulate	PP	No	= TP - TDP	Indicative of P from sediment sources and erosion
Total dissolved	TDP	Yes	Direct ICP-OES on filtrate	Total dissolved P
Dissolved reactive	DRP	Yes	Direct colorimetry on filtrate	Most bioavailable P to cyanobacteria
Dissolved organic	DOP	Yes	= TDP - DRP	Indicative of P from biological inputs

Why Does This Matter?

- Cyanobacterial blooms may produce cyanotoxins that negatively impacts humans and animals
- Our findings will help lake managers and the Utah Department of Water Quality to better predict blooms as lake chemistry varies during the season and across lake
- Our focus on different P pools will aid in understanding the availability of P for cyanobacteria to exploit

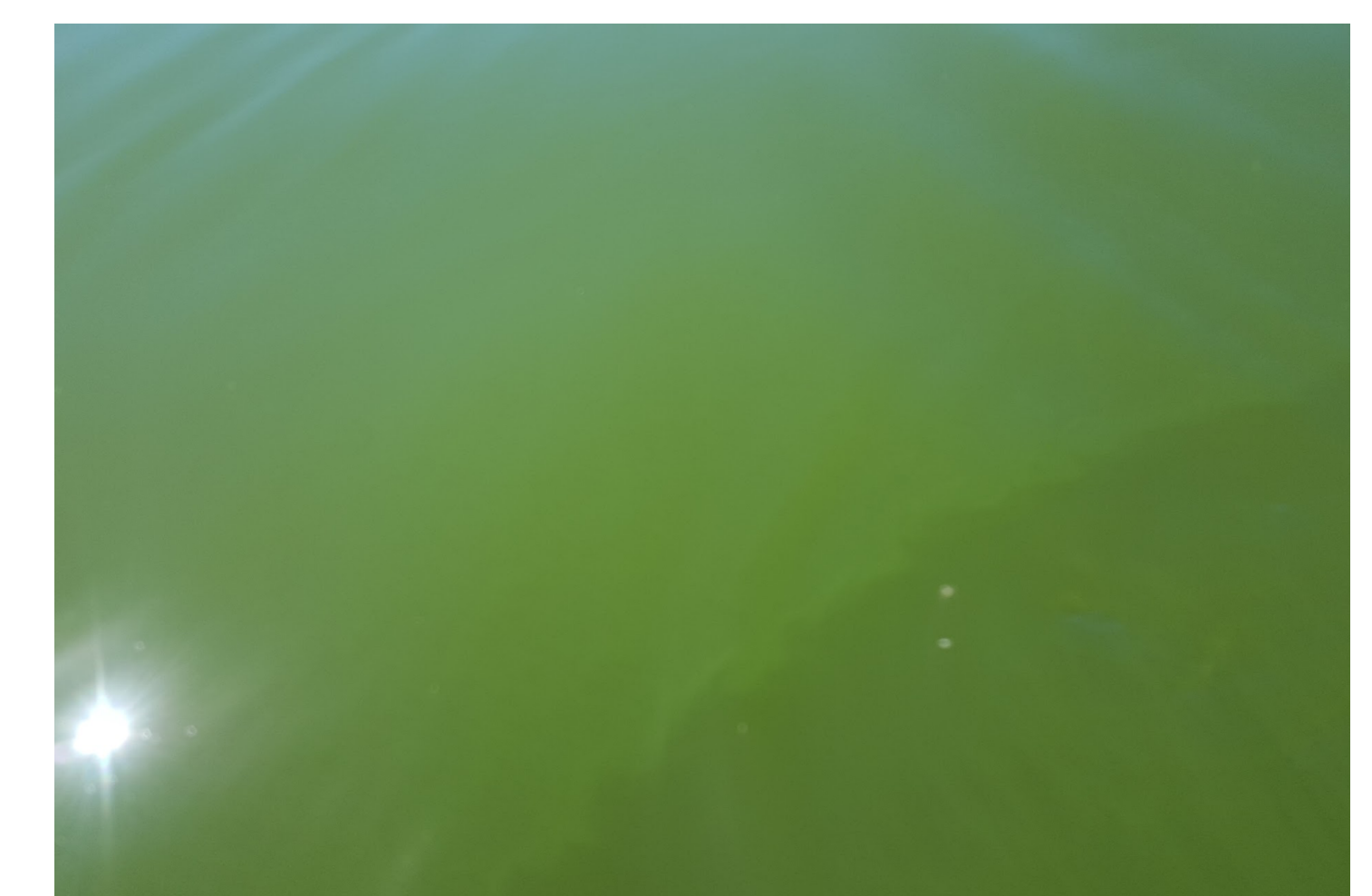


Photo 2. Blooms are occurring-water in the mouth of Provo Bay during our June 23rd sampling

IFELLOWS UNDERGRADUATE RESEARCH PROGRAM

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