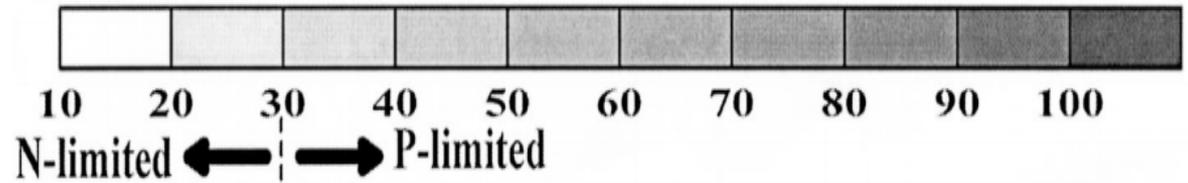
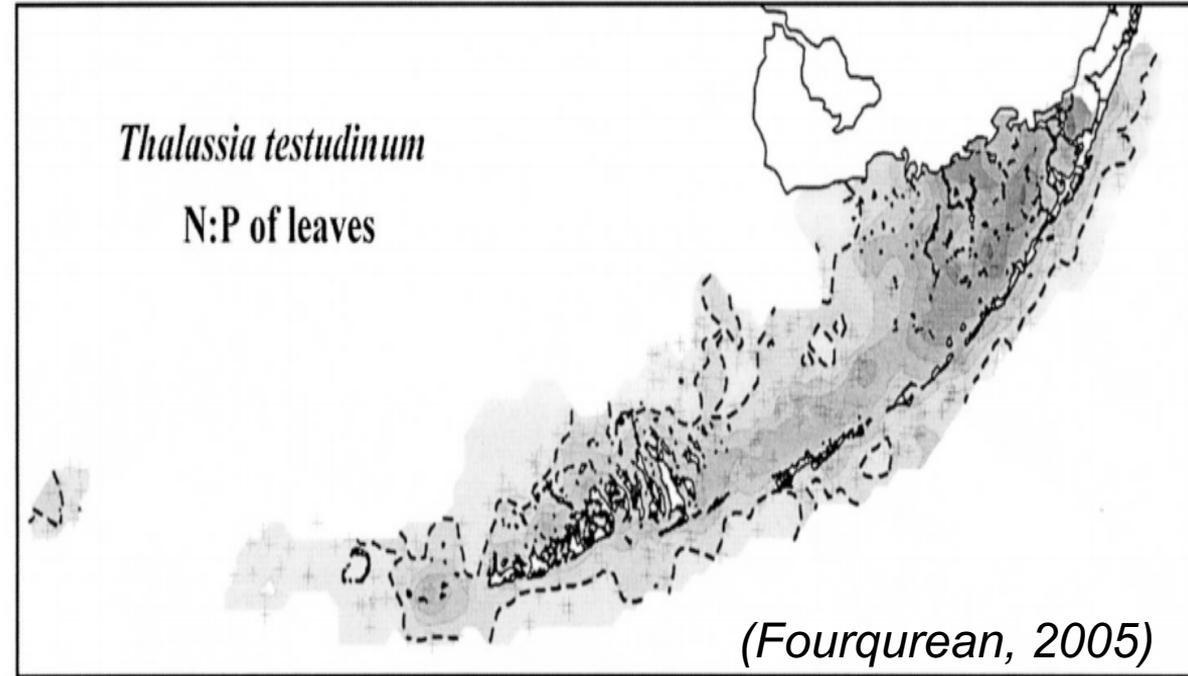


Analysis of Macroalgae in the Middle and Lower Bolton Lakes

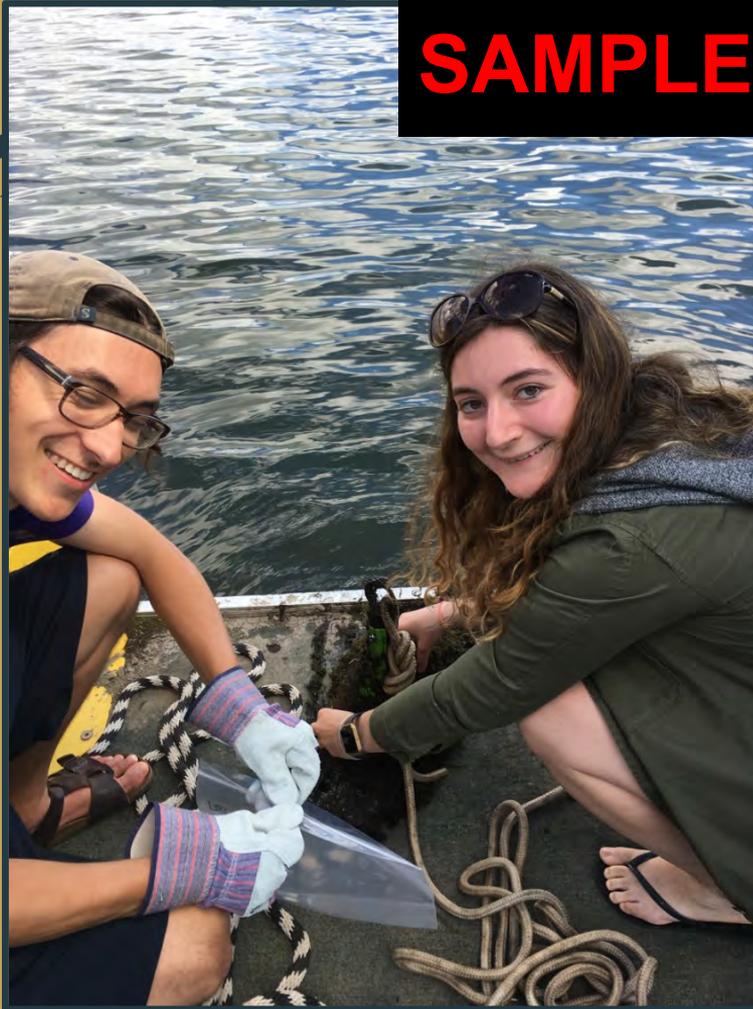
Hannah Sonnenberg and Matt Butrim



Macrophytes are monitors of their environment

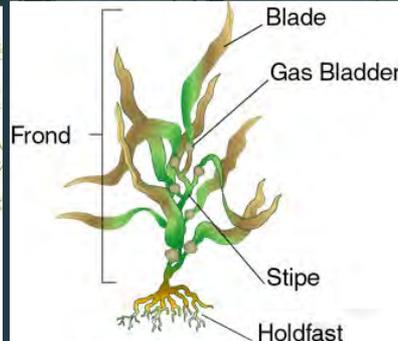


SAMPLE COLLECTION



Chara Sp.

- Macroalgae of the Characeae family
- Grow attached to lake bottom, but not rooted.
- Famous for smelling bad, giving the common name “Muskwort”



Nitella Sp.

- Macroalgae of the Characeae family
Can grow either attached to lake floor or floating just above lake floor
- Distinguishable from Chara because branchlets fork



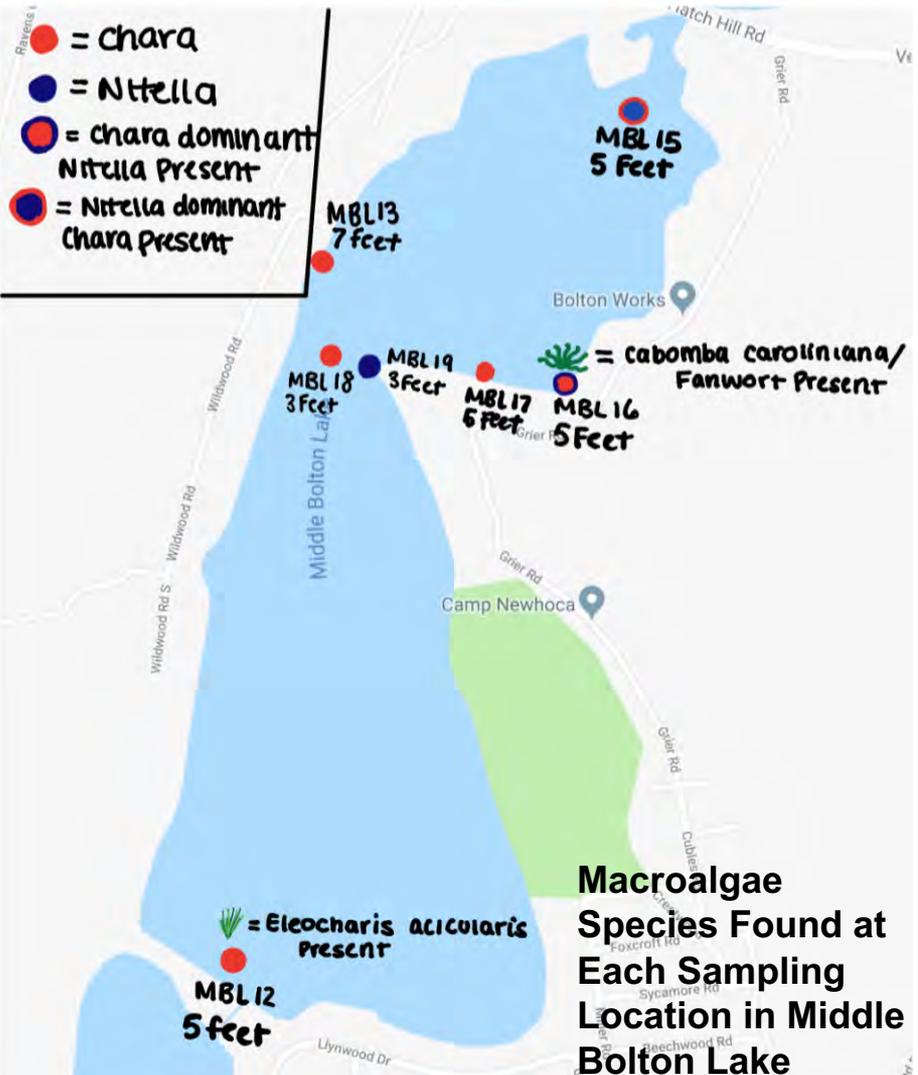
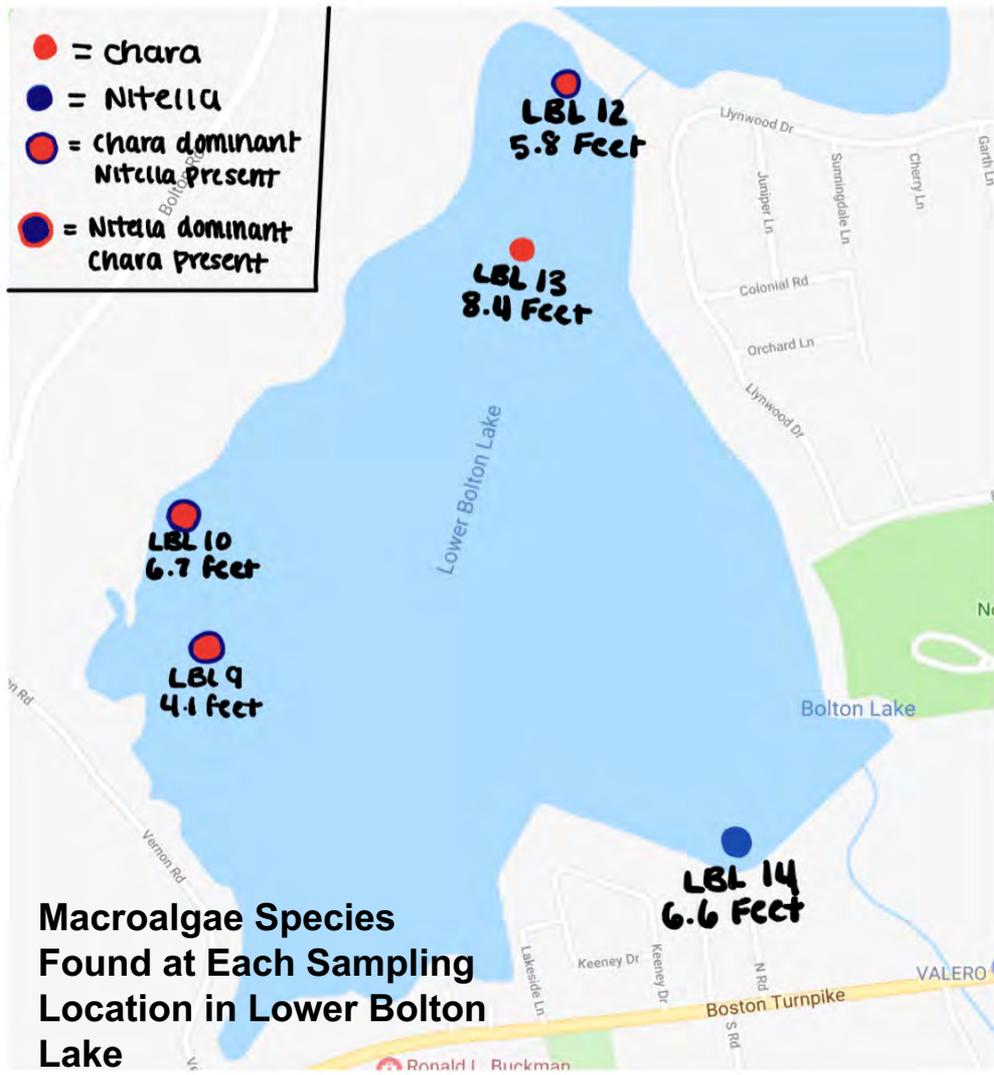
Cabomba caroliniana



Eleocharis acicularis



- = chara
- = Nitella
- = chara dominant Nitella Present
- = Nitella dominant Chara Present



1

**Cleaning and
Photographing**



2

Drying: (90°C for 3 days)



3

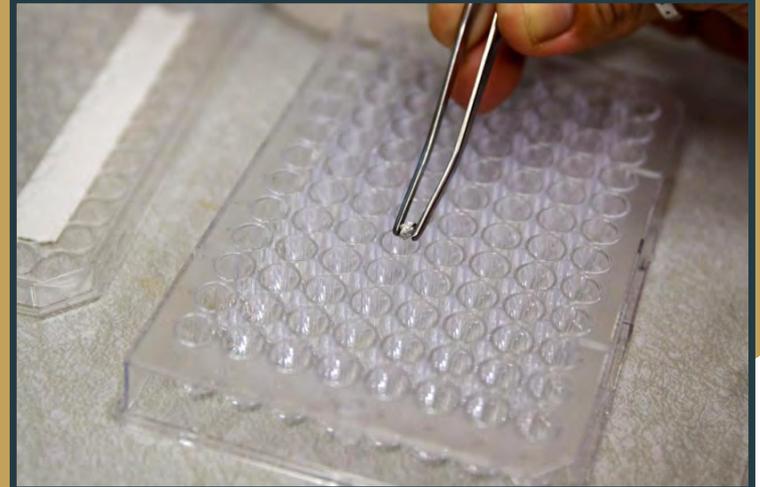
Wrapping Samples



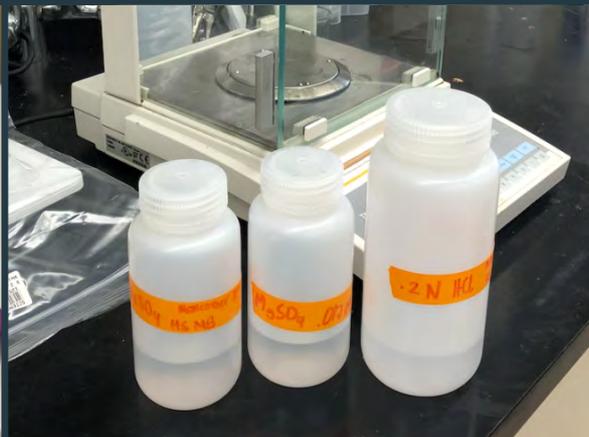
Elemental Analyzer: carbon and nitrogen concentrations



Nitrogen Isotope Analysis



Preparing Samples for Phosphorus Analysis



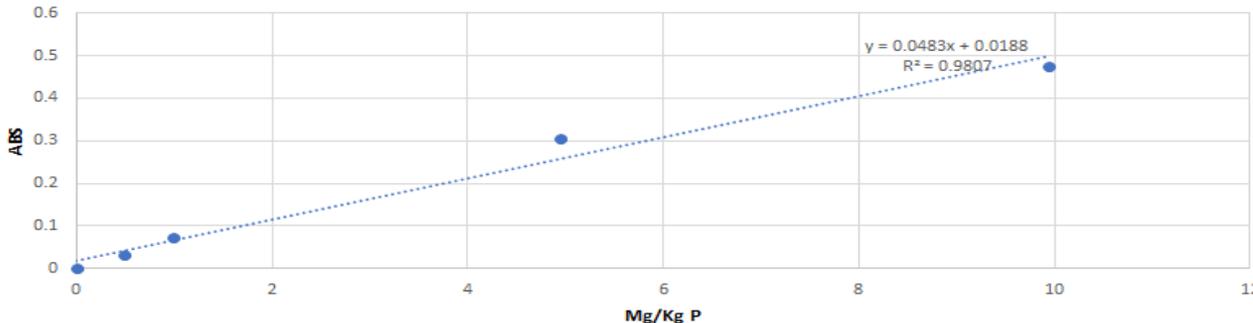
Phosphorus Analysis



Spectrophotometer



Phosphorus Concentration of Solution

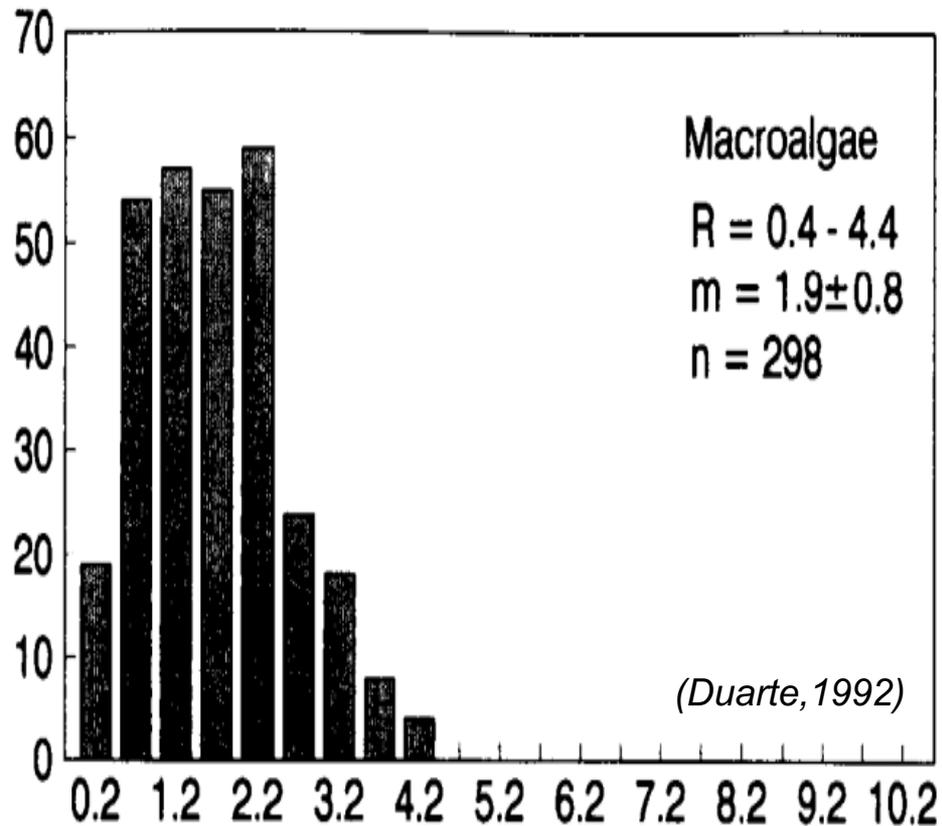


	ABS	mg/kg p
LBL9	0.08	1.267081
LBL10	0.079	1.246377
LBL12	0.094	1.556936
LBL13	0.085	1.3706
LBL14	0.08	1.267081
MBL12	0.069	1.039337
MBL13	0.095	1.57764
MBL15	0.106	1.805383
MBL16	0.167	3.068323
MBL17	0.121	2.115942
MBL18	0.077	1.204969
MBL19	0.075	1.163561
Blank	0.091	1.494824
LBL9	0.444	8.803313
LBL9	0.133	2.364389
MBL18	0.078	1.225673
MBL18	0.089	1.453416

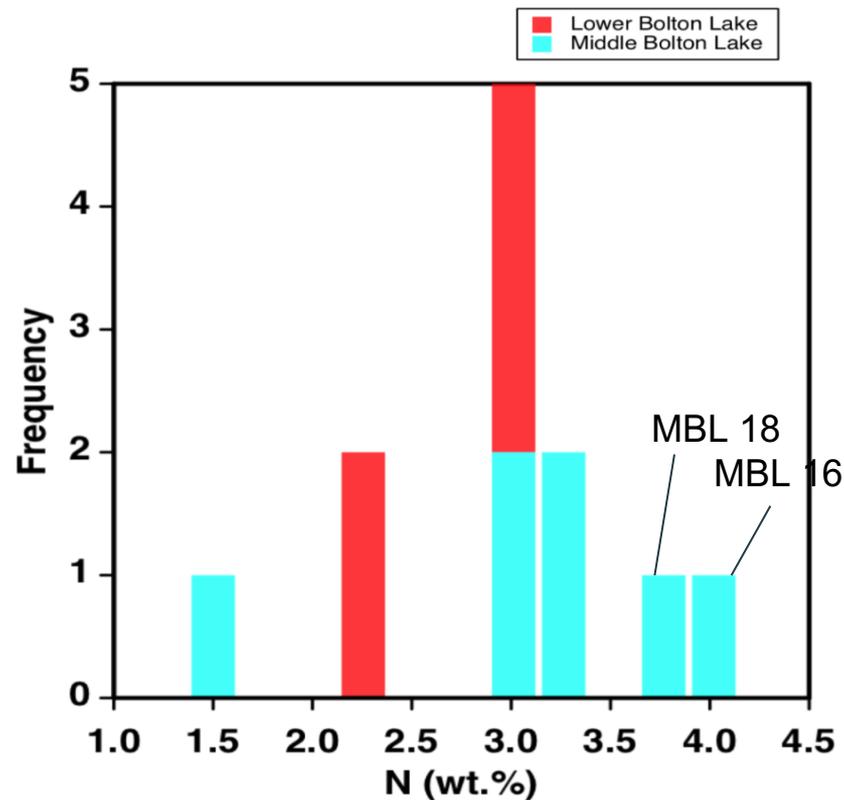


RESULTS!

Expected Nitrogen Concentrations for Macroalgae (wt.%)

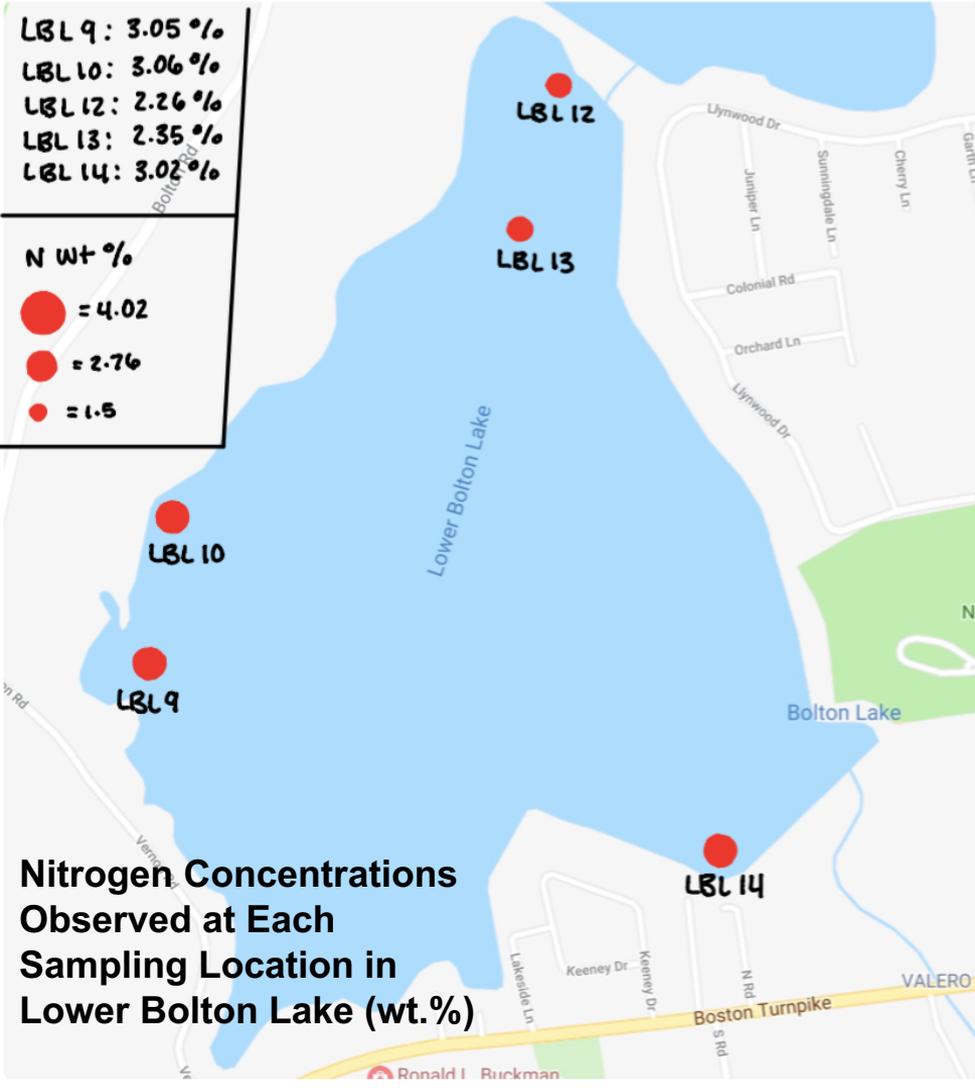


Observed Nitrogen Concentrations in Lower and Middle Bolton Lakes (wt.%)



LBL 9: 3.05 %
 LBL 10: 3.06 %
 LBL 12: 2.26 %
 LBL 13: 2.35 %
 LBL 14: 3.02 %

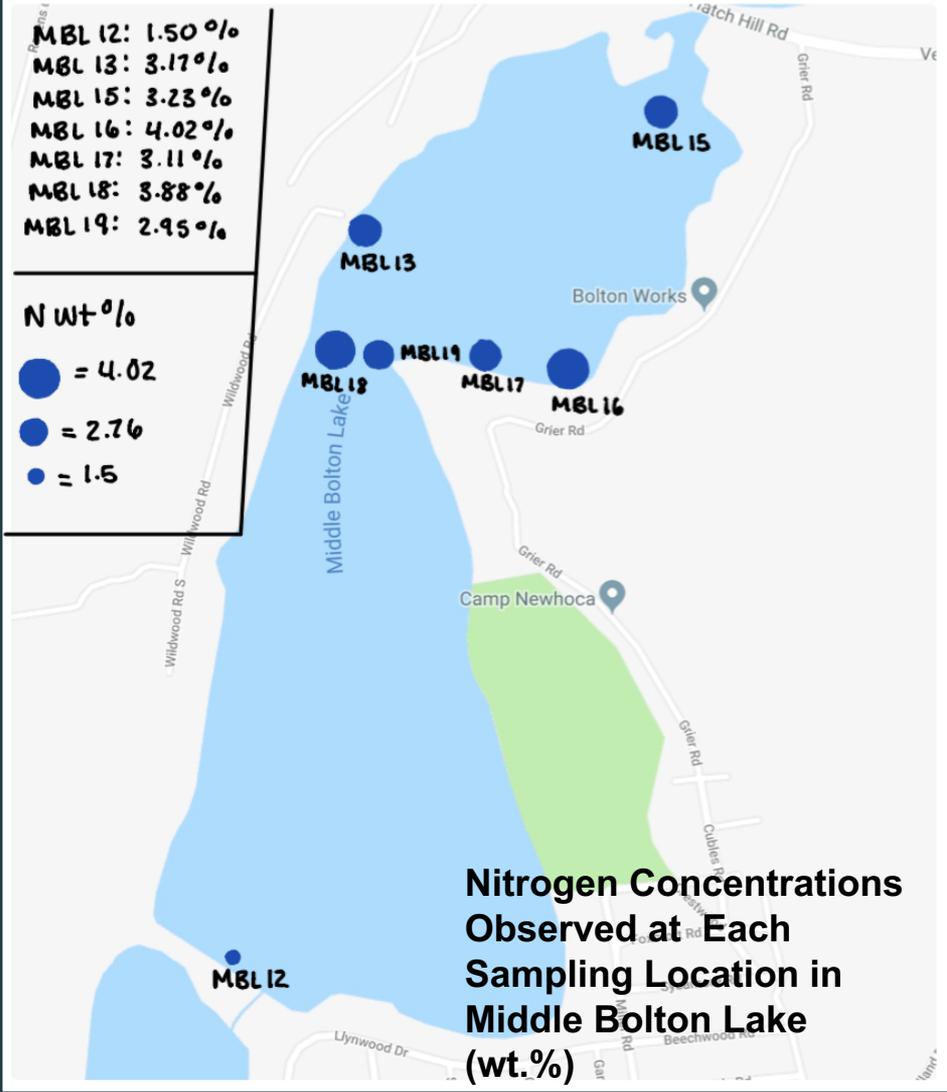
N wt %
 ● = 4.02
 ● = 2.76
 ● = 1.5



**Nitrogen Concentrations
 Observed at Each
 Sampling Location in
 Lower Bolton Lake (wt.%)**

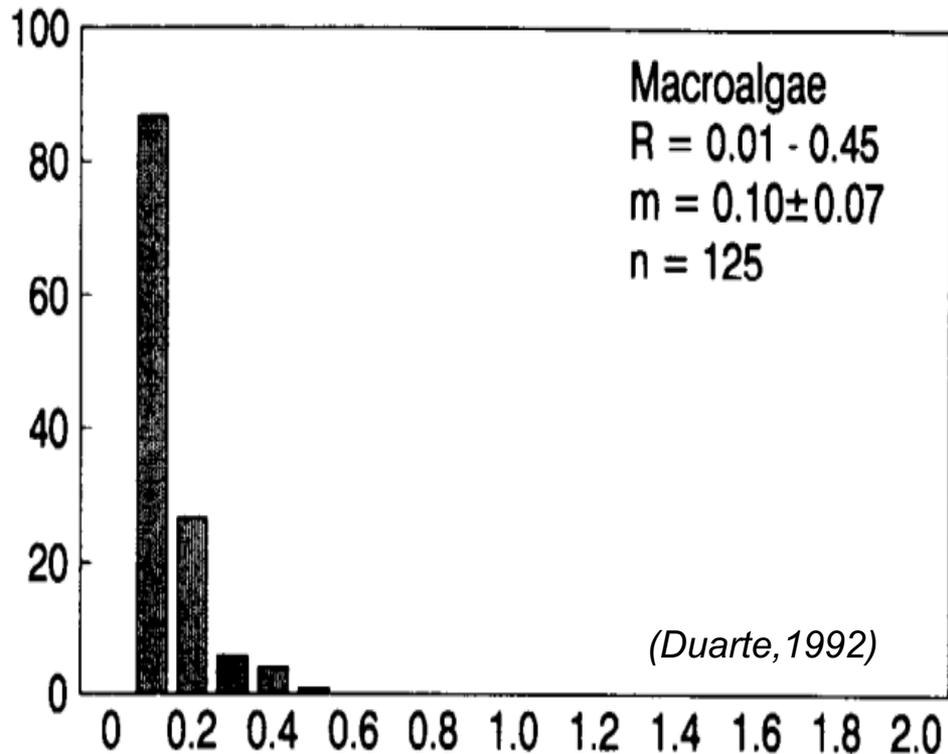
MBL 12: 1.50 %
 MBL 13: 3.17 %
 MBL 15: 3.23 %
 MBL 16: 4.02 %
 MBL 17: 3.11 %
 MBL 18: 3.88 %
 MBL 19: 2.95 %

N wt %
 ● = 4.02
 ● = 2.76
 ● = 1.5

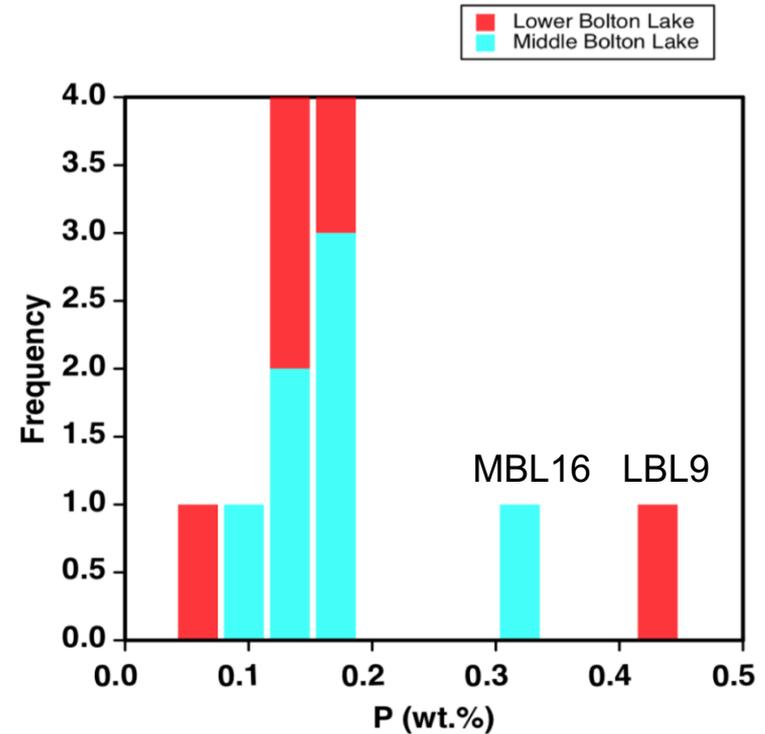


**Nitrogen Concentrations
 Observed at Each
 Sampling Location in
 Middle Bolton Lake
 (wt.%)**

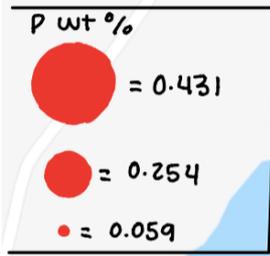
Expected Phosphorus Concentrations for Macroalgae (wt.%)



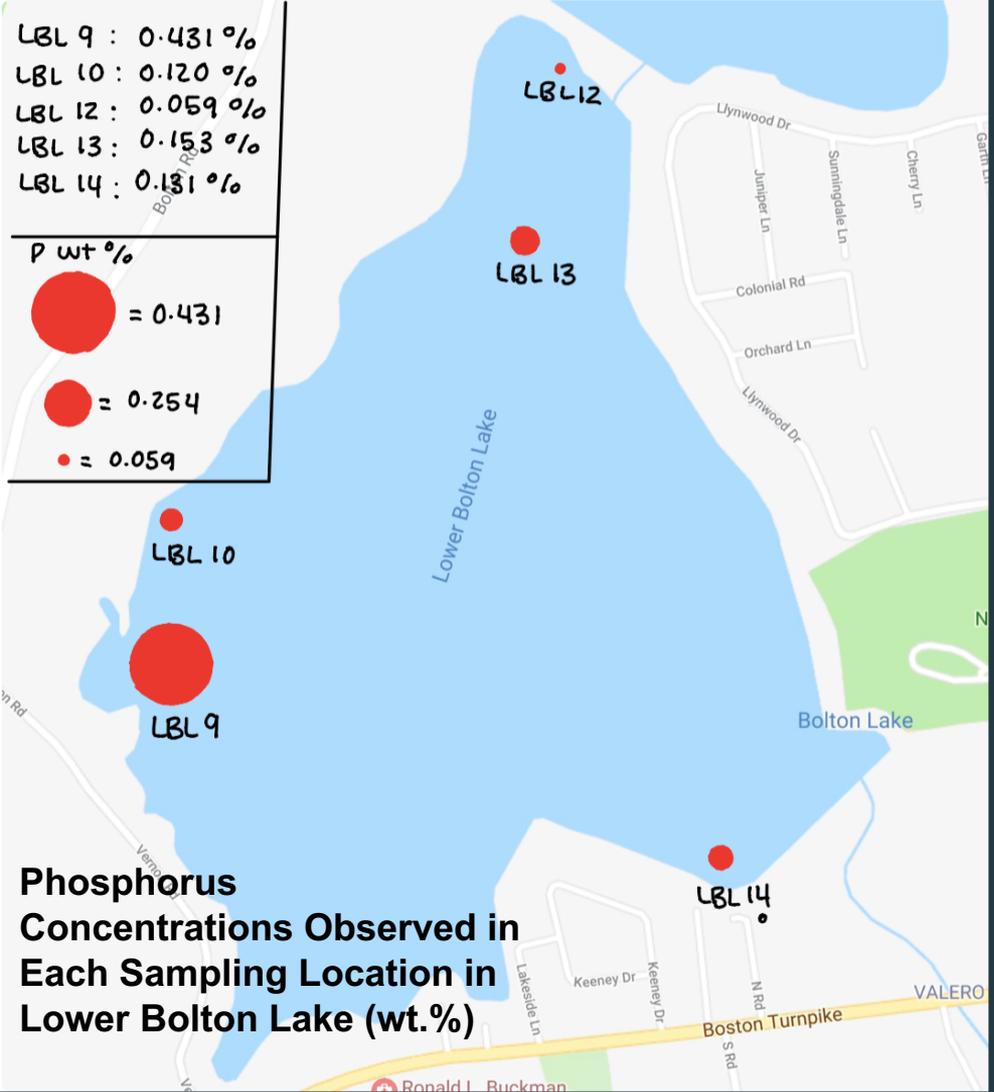
Observed Phosphorus Concentrations in the Lower and Middle Lakes (wt.%)



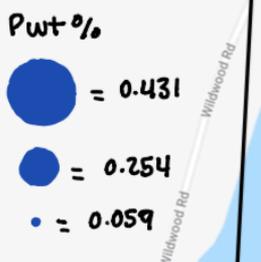
LBL 9 : 0.431 %
 LBL 10 : 0.120 %
 LBL 12 : 0.059 %
 LBL 13 : 0.153 %
 LBL 14 : 0.131 %



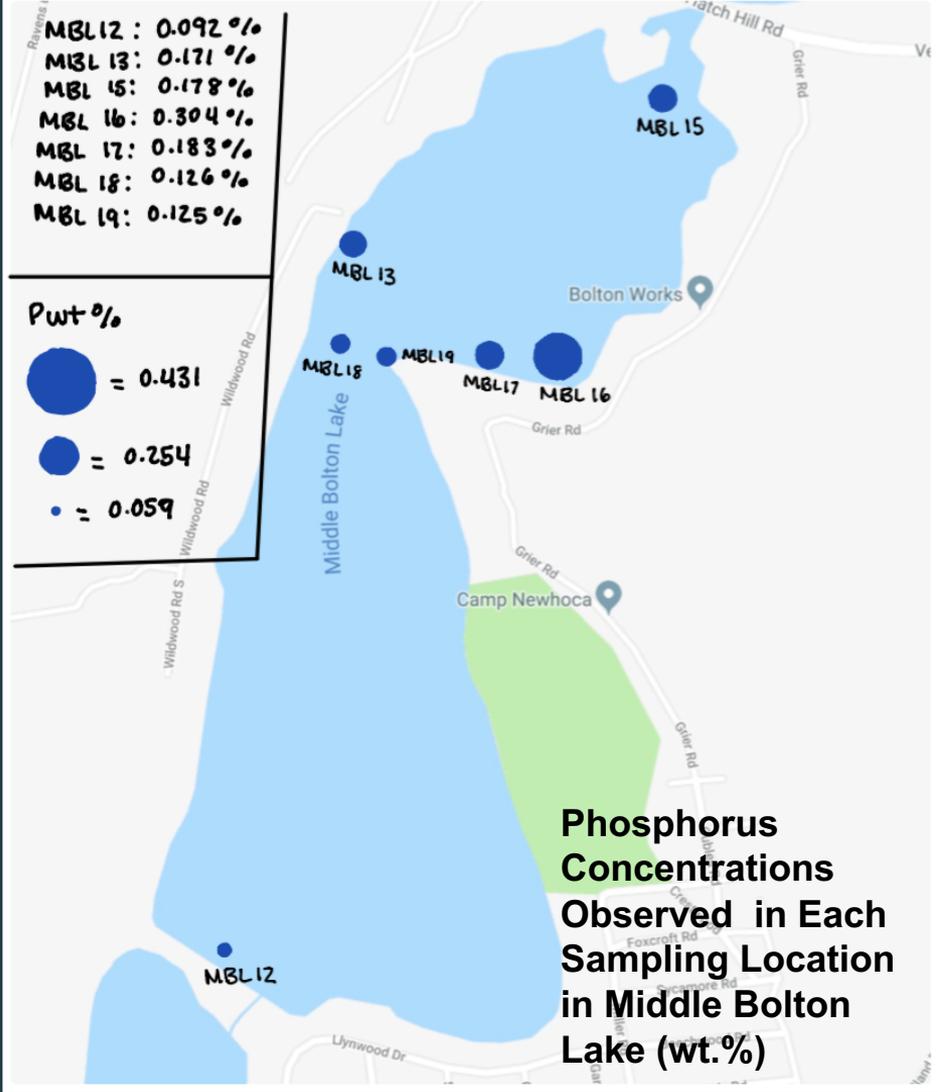
Phosphorus Concentrations Observed in Each Sampling Location in Lower Bolton Lake (wt.%)



MBL 12 : 0.092 %
 MBL 13 : 0.171 %
 MBL 15 : 0.178 %
 MBL 16 : 0.304 %
 MBL 17 : 0.183 %
 MBL 18 : 0.126 %
 MBL 19 : 0.125 %

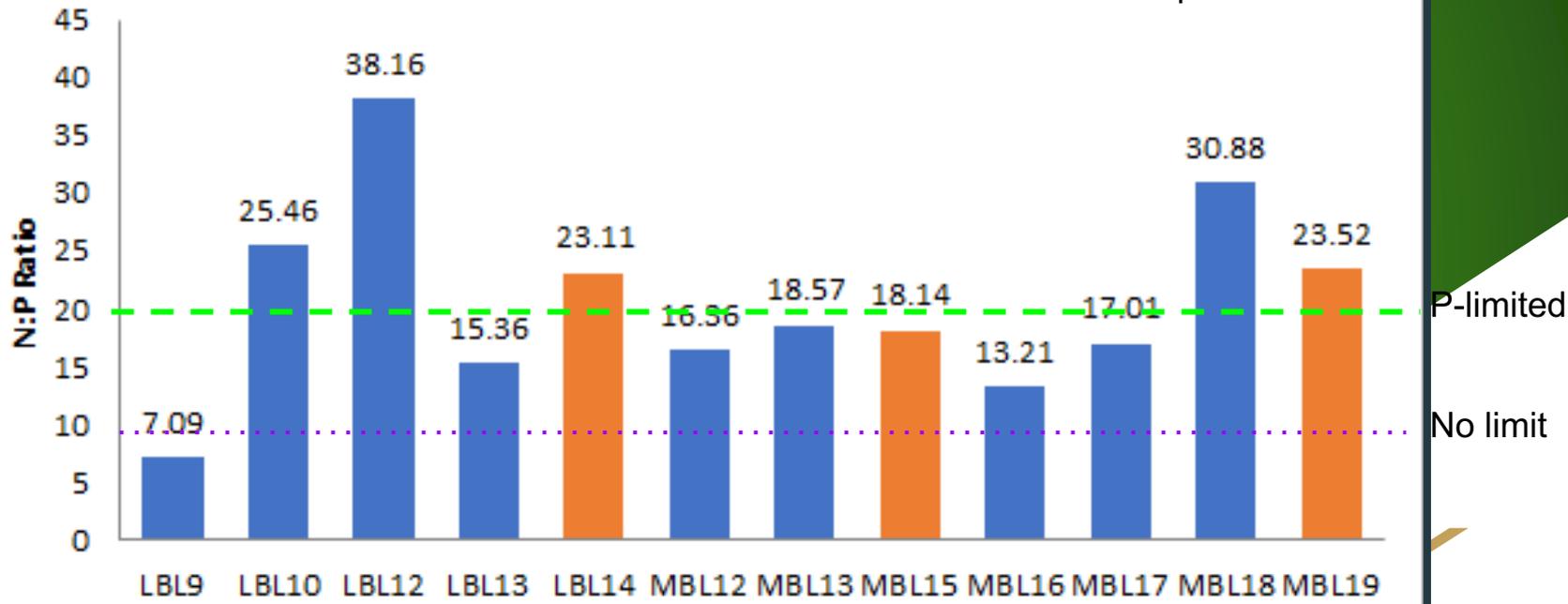


Phosphorus Concentrations Observed in Each Sampling Location in Middle Bolton Lake (wt.%)



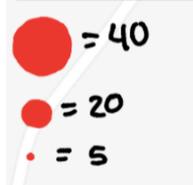
N:P Weight Ratio

■ =Chara sp. dominated
■ =Nitella sp. dominated

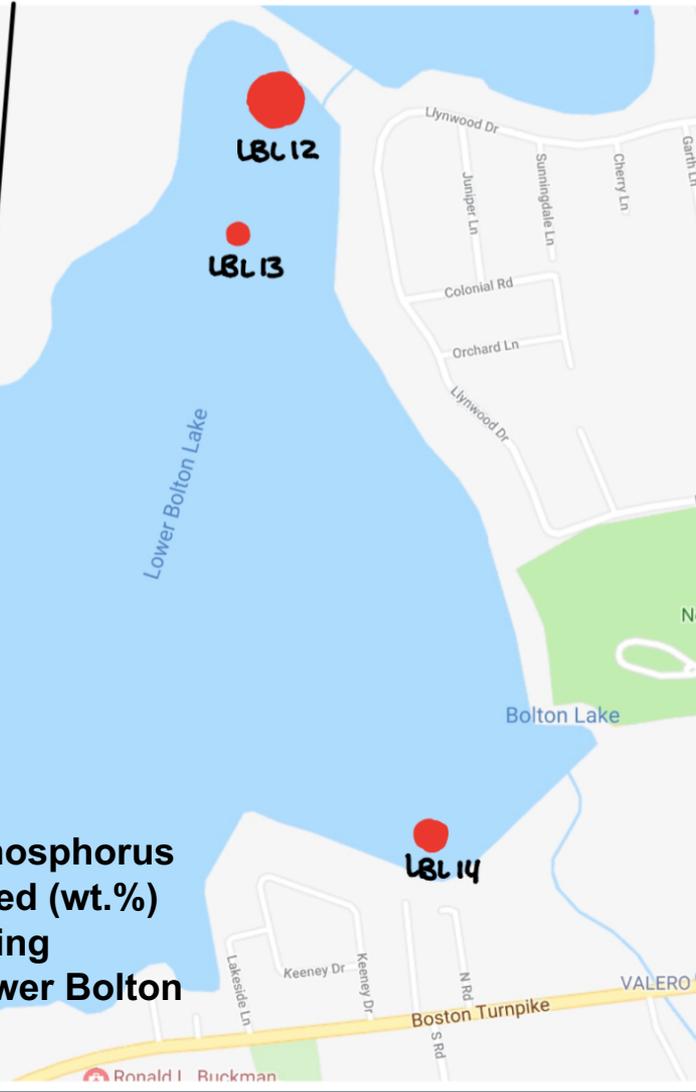


WT Ratio N/P

LBL 9: 7.09
LBL 10: 25.46
LBL 12: 38.16
LBL 13: 15.36
LBL 14: 23.11

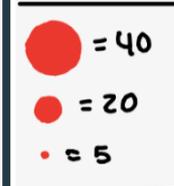


Nitrogen to Phosphorus Ratios observed (wt.%) at each sampling location in Lower Bolton Lake

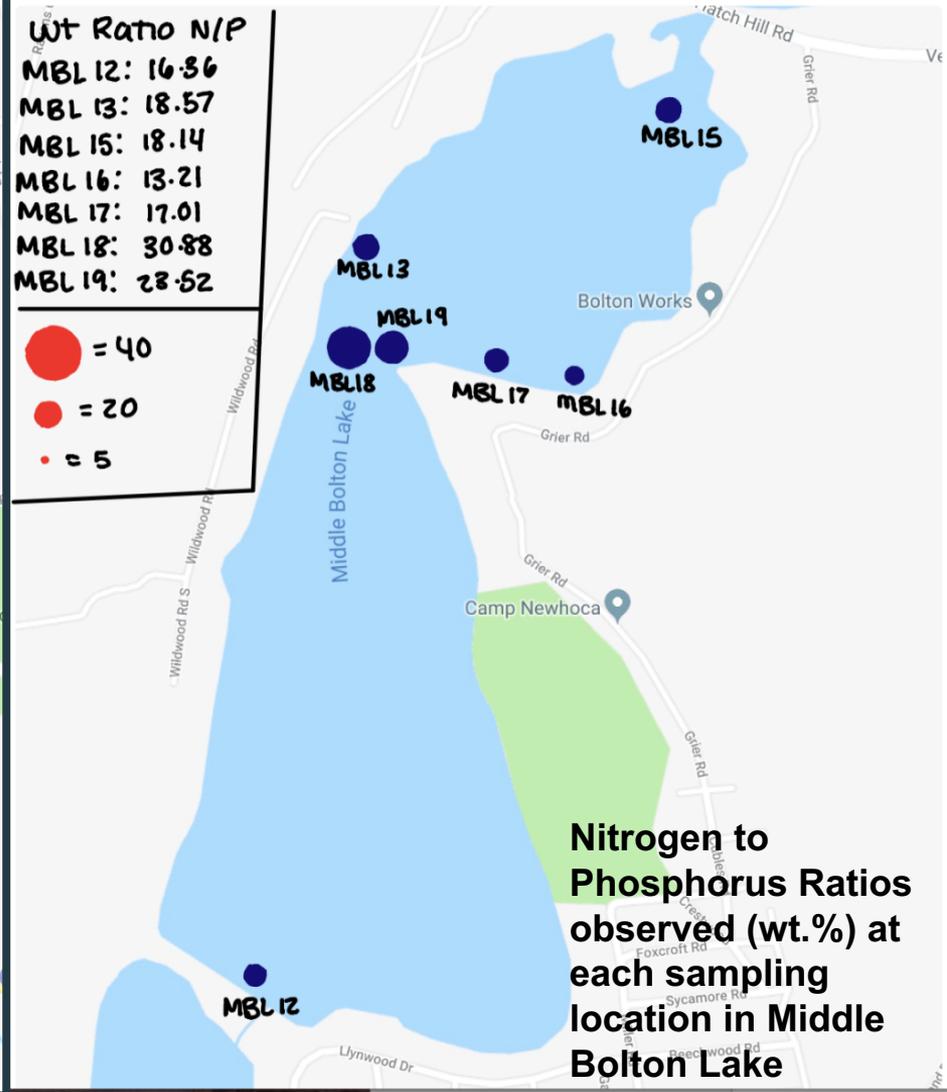


WT Ratio N/P

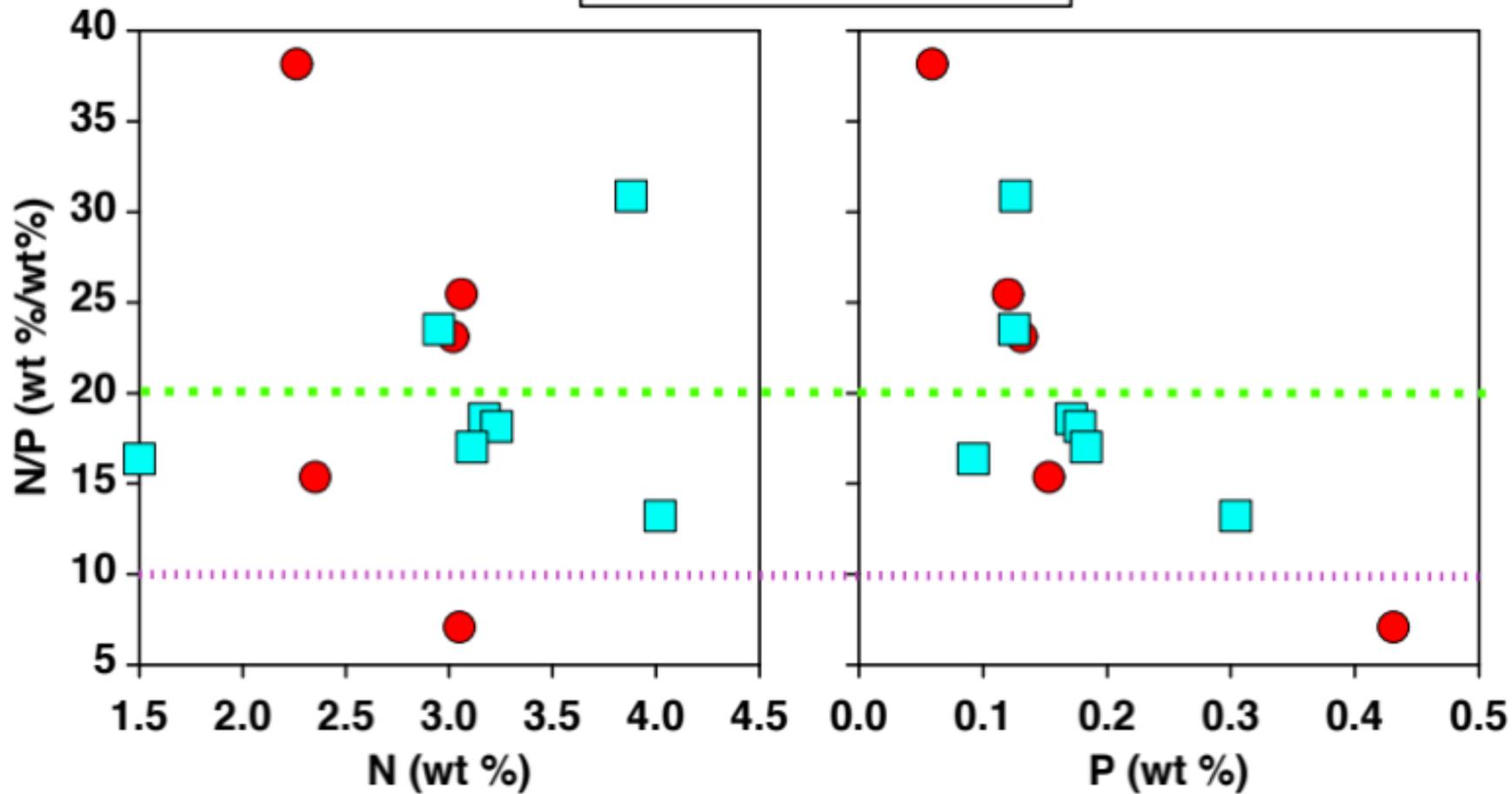
MBL 12: 16.36
MBL 13: 18.57
MBL 15: 18.14
MBL 16: 13.21
MBL 17: 17.01
MBL 18: 30.88
MBL 19: 23.52



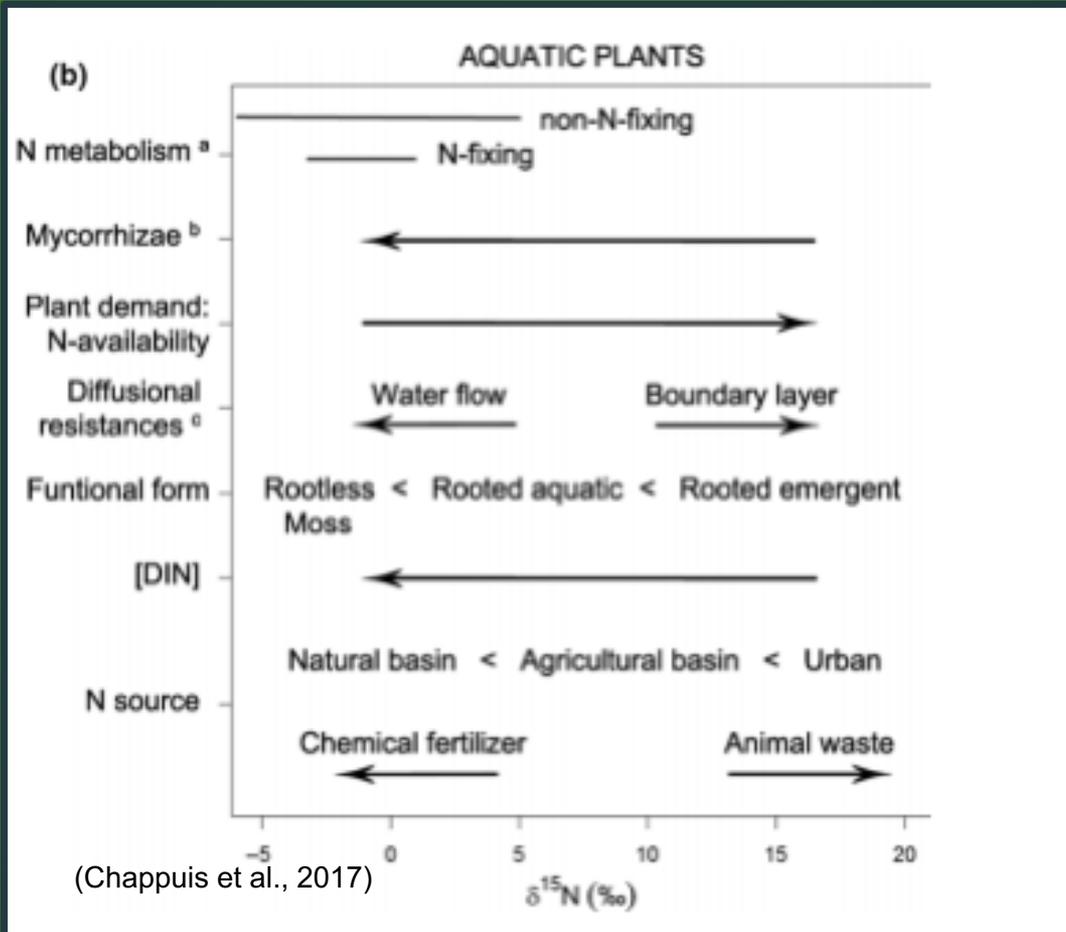
Nitrogen to Phosphorus Ratios observed (wt.%) at each sampling location in Middle Bolton Lake



- Lower Bolton Lake
- Middle Bolton Lake

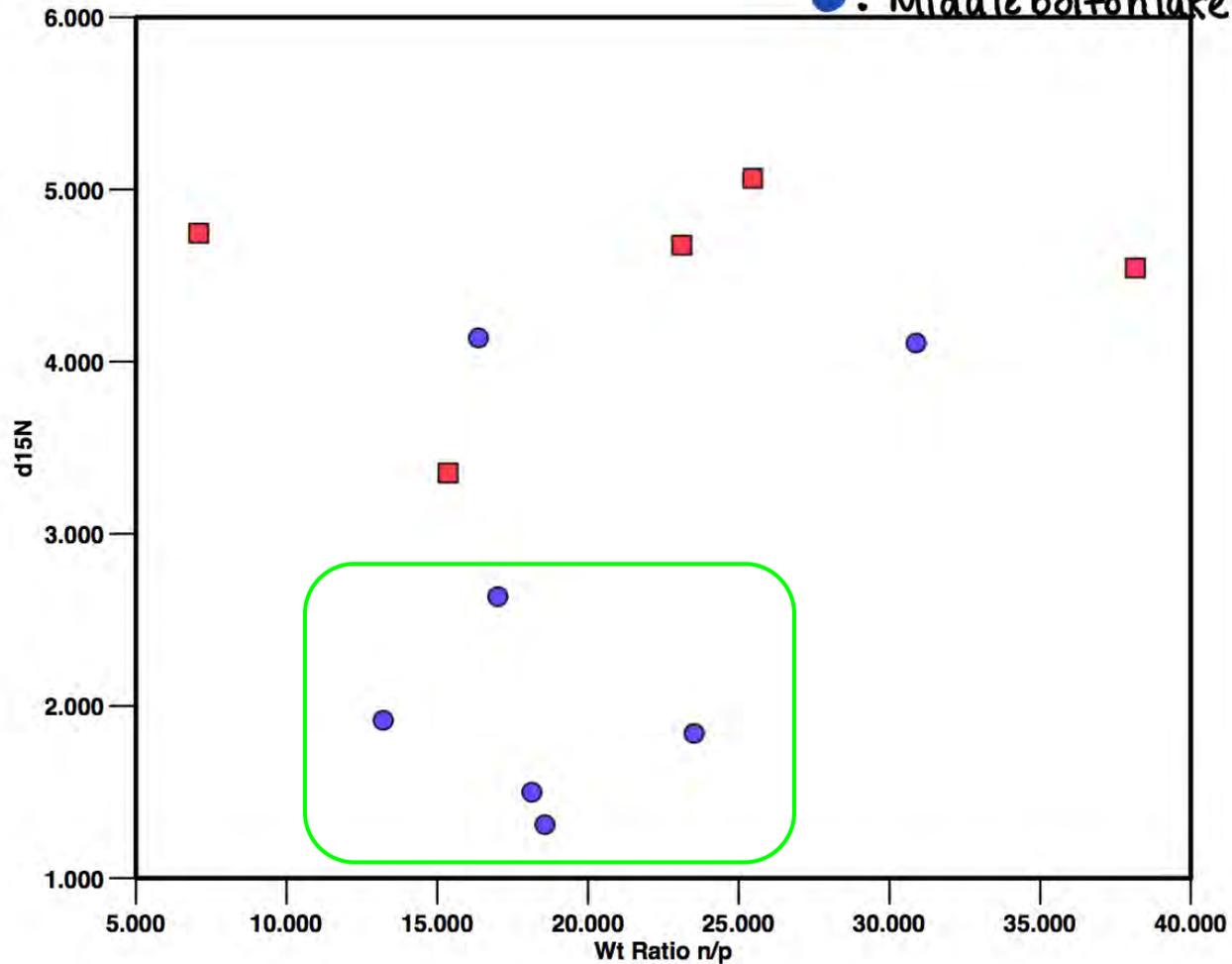


Nitrogen Isotopes: $\delta^{15}\text{N}$



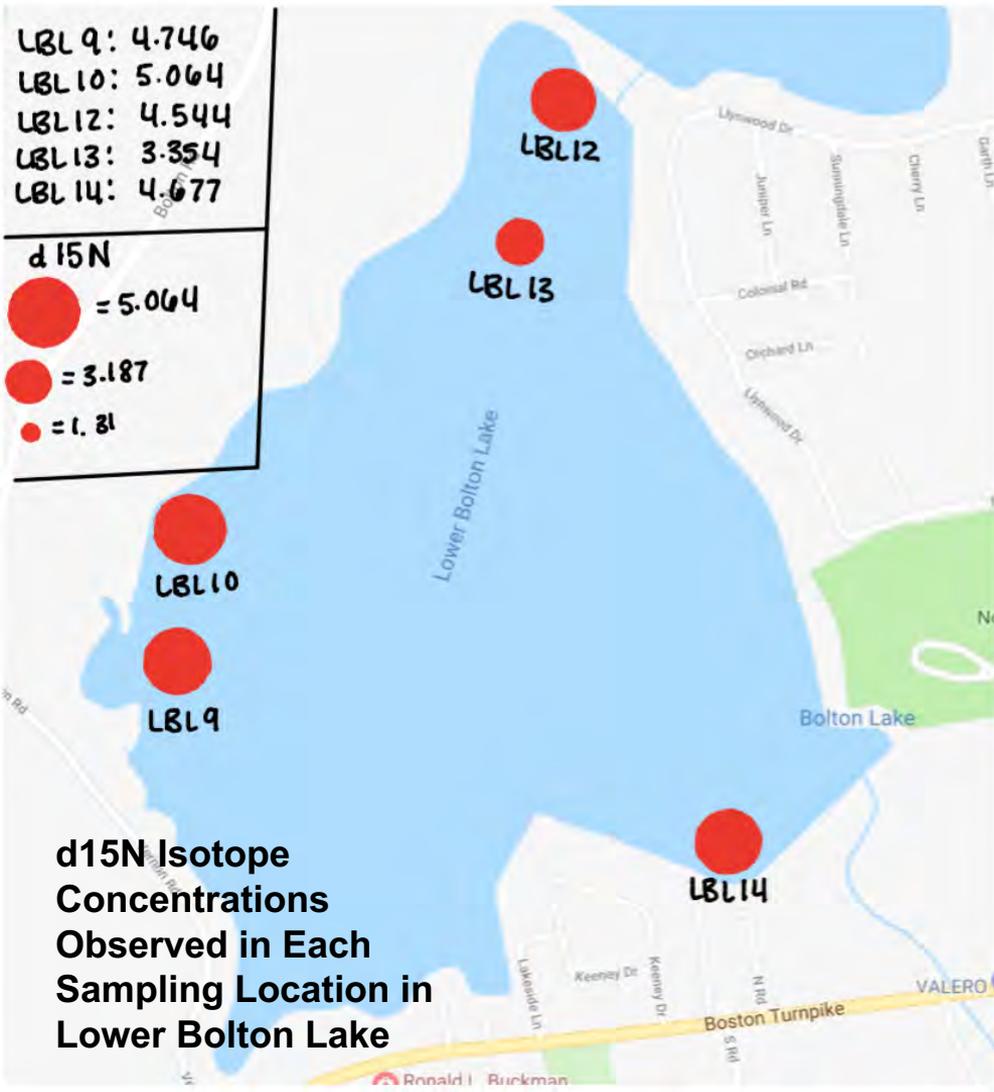
Nitrogen Isotope Difference Between Lakes

■ : Lower bottom lake
● : Middle bottom lake



LBL 9: 4.746
 LBL 10: 5.064
 LBL 12: 4.544
 LBL 13: 3.354
 LBL 14: 4.677

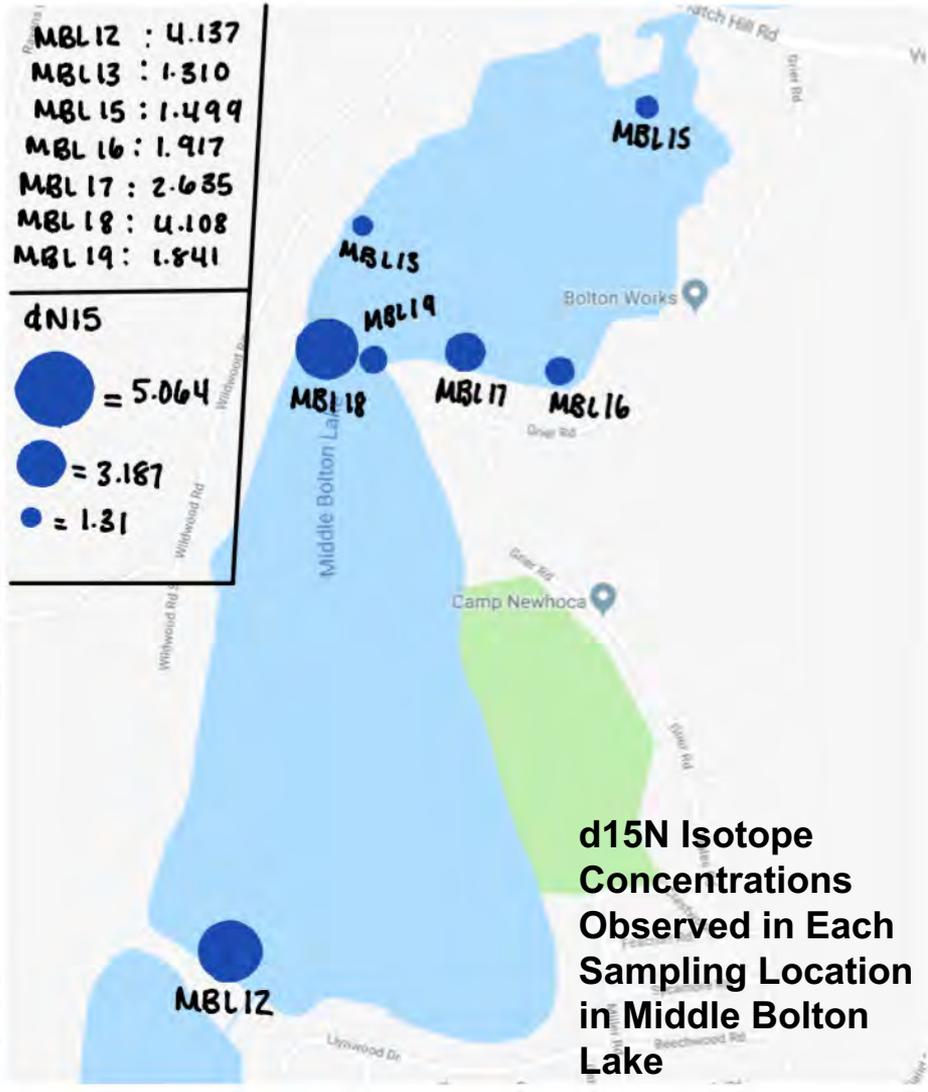
d15N
 ● = 5.064
 ● = 3.187
 ● = 1.31



d15N Isotope Concentrations Observed in Each Sampling Location in Lower Bolton Lake

MBL 12 : 4.137
 MBL 13 : 1.310
 MBL 15 : 1.499
 MBL 16 : 1.917
 MBL 17 : 2.635
 MBL 18 : 4.108
 MBL 19 : 1.841

dN15
 ● = 5.064
 ● = 3.187
 ● = 1.31



d15N Isotope Concentrations Observed in Each Sampling Location in Middle Bolton Lake

References

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