Beaver Lake Surveys -Summer 2022-

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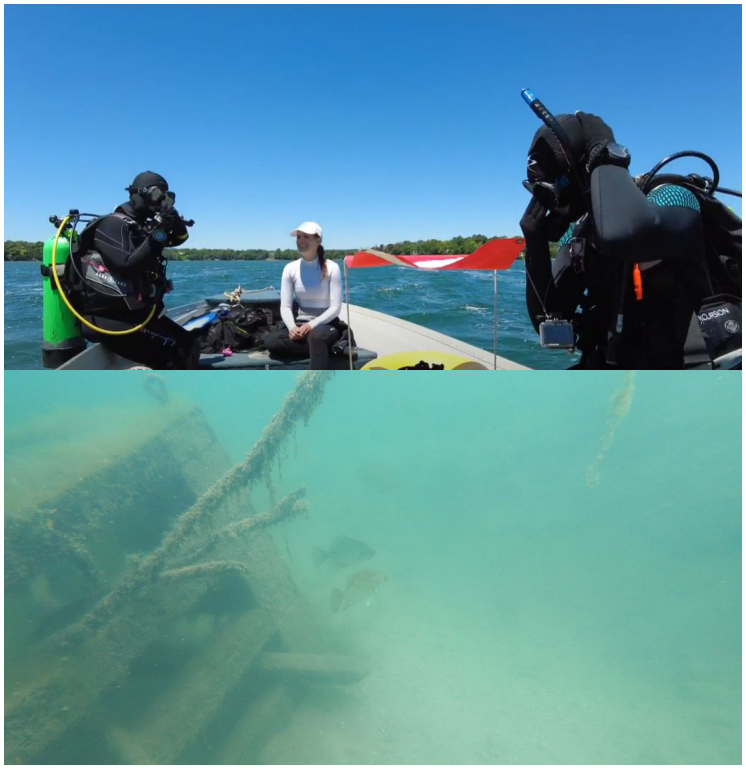
WISCONSIN LUTHERAN COLLEGE

Overview

- Scuba videography
- Fish surveys
- Vegetation surveys
- Limnology and water chemistry
- Zooplankton analysis

Scuba surveys and videography

https://youtu.be/gjuVgR8htsc



Fish Survey Locations

Key:
- Fyke Net
- Seine Net

Fish Surveys: Seine

Forage Fish Captured:

Sand shiner Bluntnose minnow Brook silverside Rainbow darter Iowa darter

Seine Net Results

	Station 1	Station 2	Station 3	Totals	Fish per haul	Forage fish per meter effort	Forage fish per meter effort (2021)
Bluntnose Minnow	32	0	289	321	107	3.57	4.26
Brook Silverside	3	13	24	40	13	0.44	1.56
Sand Shiner	0	0	82	82	27	0.91	3.32
Rainbow Darter	6	0	3	9	3	0.10	0.01
Iowa Darter	0	1	0	1	0.3	0.01	0
Totals	**41**	**14**	**398**	**453**	**151**	**5.03**	**9.14**

Fish surveys: Fyke net

Species captured similar to 2021 surveys

Bluegill Rock bass Green sunfish Pumpkinseed sunfish
Largemouth bass Smallmouth bass Longnose gar

Pumpkinseed

Longnose gar

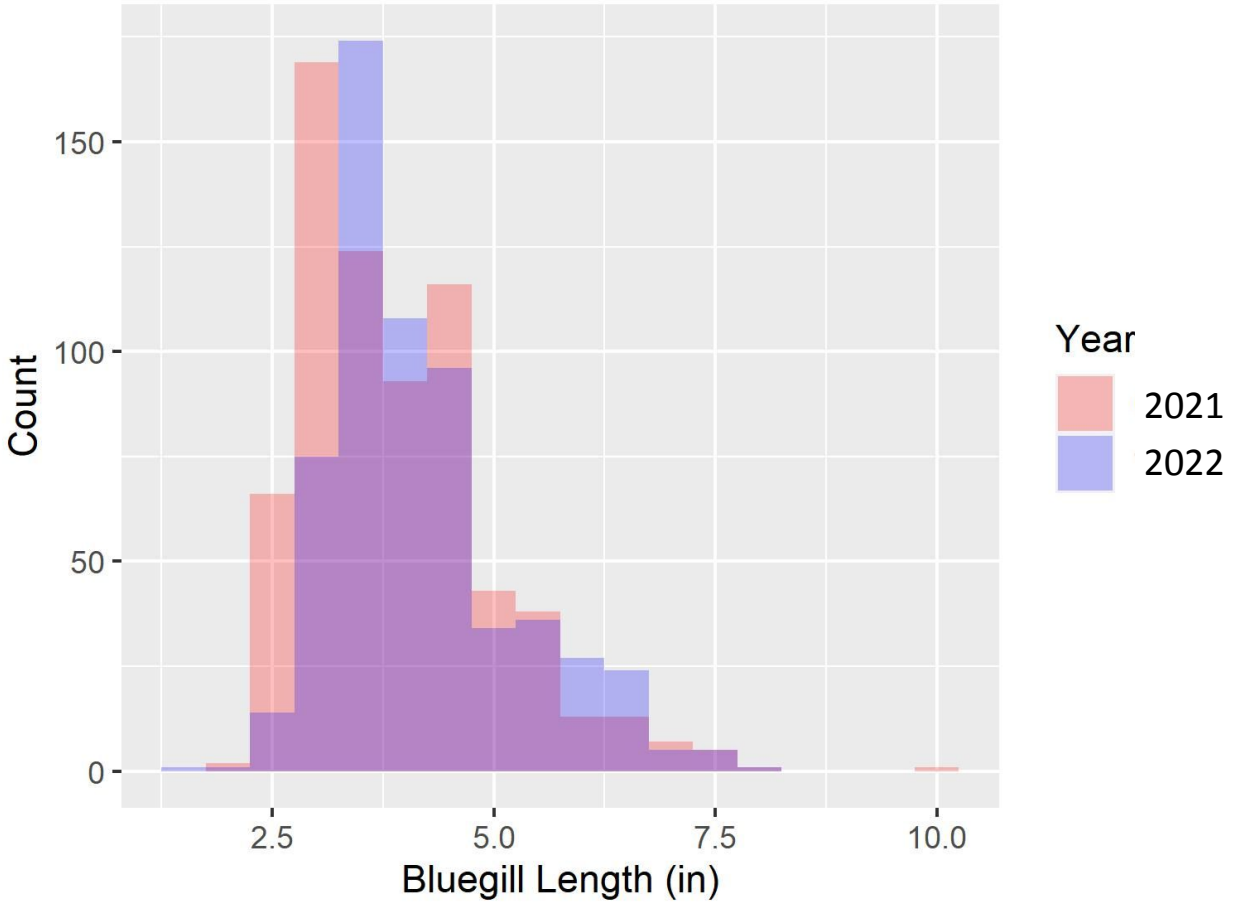
Largemouth bass (with deformity)

Smallmouth bass

Fyke Net Results

	Station 1	Station 2	Station 3	Totals	Average per trap	Average per trap 2021
Bluegill	174	348	223	745	248	230
Rock Bass	5	5	2	12	4	5
Pumpkinseed	1	0	0	1	0.3	0.3
Green Sunfish	7	5	7	19	6	4
Longnose Gar	0	0	4	4	1	5
Largemouth Bass	5	3	3	11	4	5
Smallmouth Bass	1	2	10	13	4	4
Totals	**193**	**363**	**249**	**805**	**268**	**260**

No substantial change in bluegill size distribution



Fish Surveys Summary

Forage fish base:

- Fewer forage fish sampled from 2021 to 2022
- Indicator Species: Rainbow darter

Game/non-game fish:

- Majority of fish bluegill
- Only 4 longnose gar sampled (vs 15 in 2021)

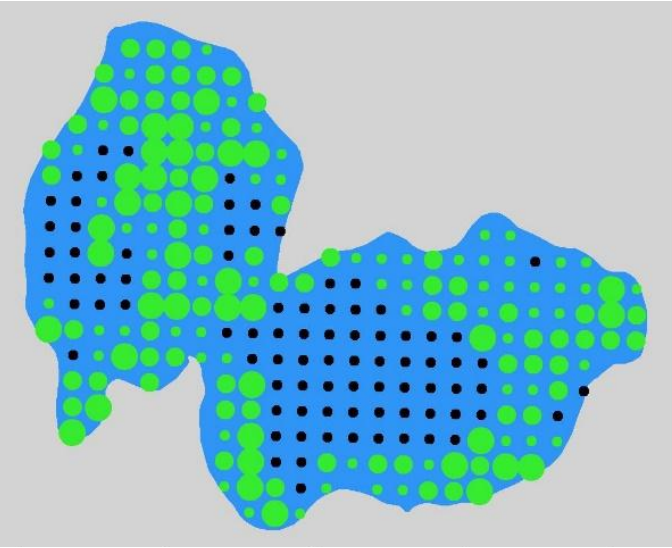
- Other species observed (during scuba, as deceased fish, etc) include:
  - o yellow perch
  - o walleye
  - o northern pike
  - o common carp
  - o black crappie

Vegetation Surveys

Conducted in August

255 pt survey visited established points on whole lake

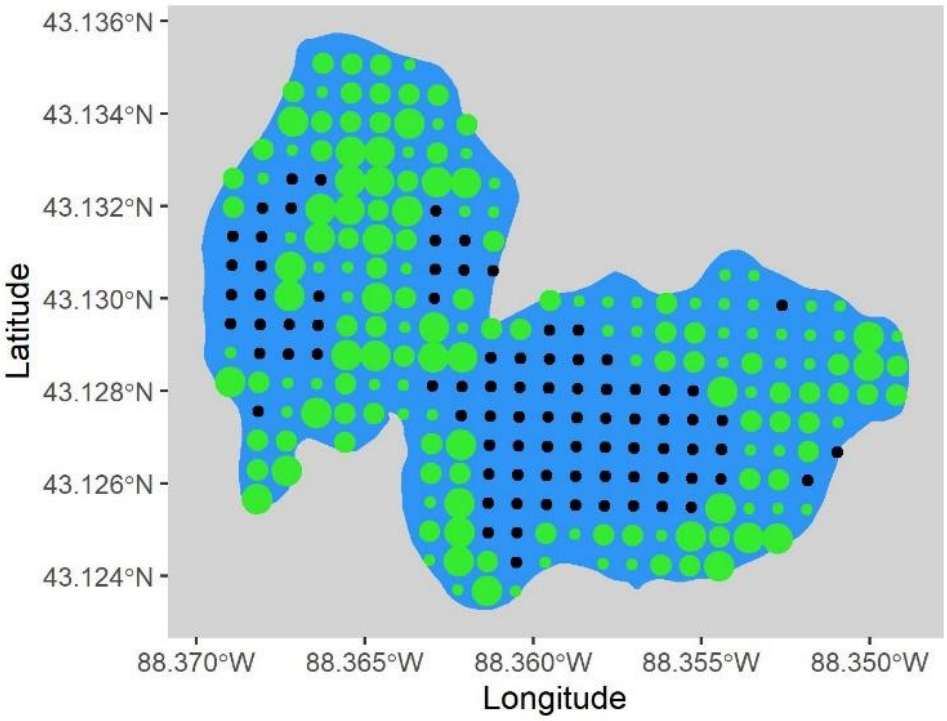
Meandering survey focused on perimeter, searching for plants not present in the point survey (especially Eurasian water milfoil)



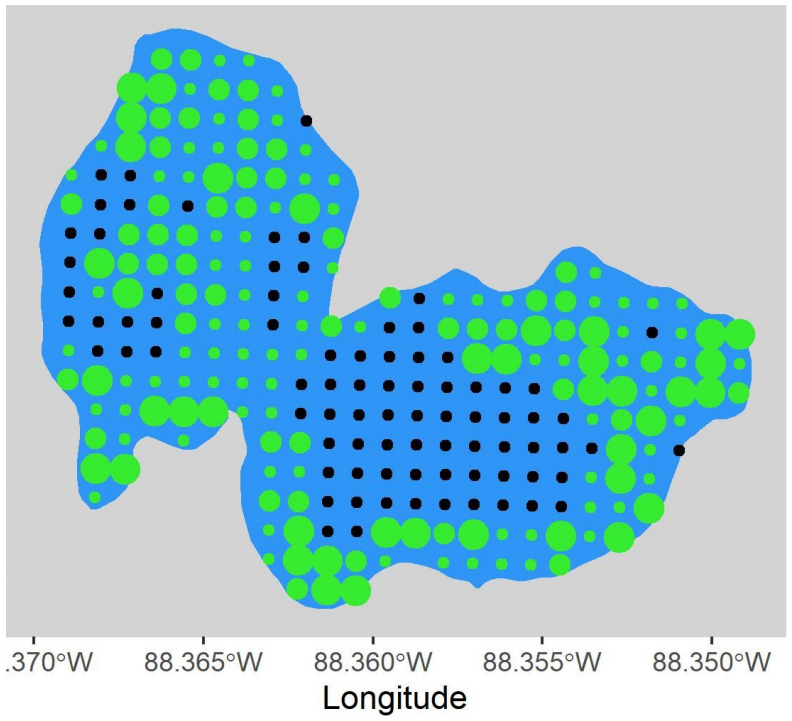
Key:
- None of that species present
- Species present
- ½ of rake full
- Full rake

Year-over-year plant community is similar

Chara density 2021

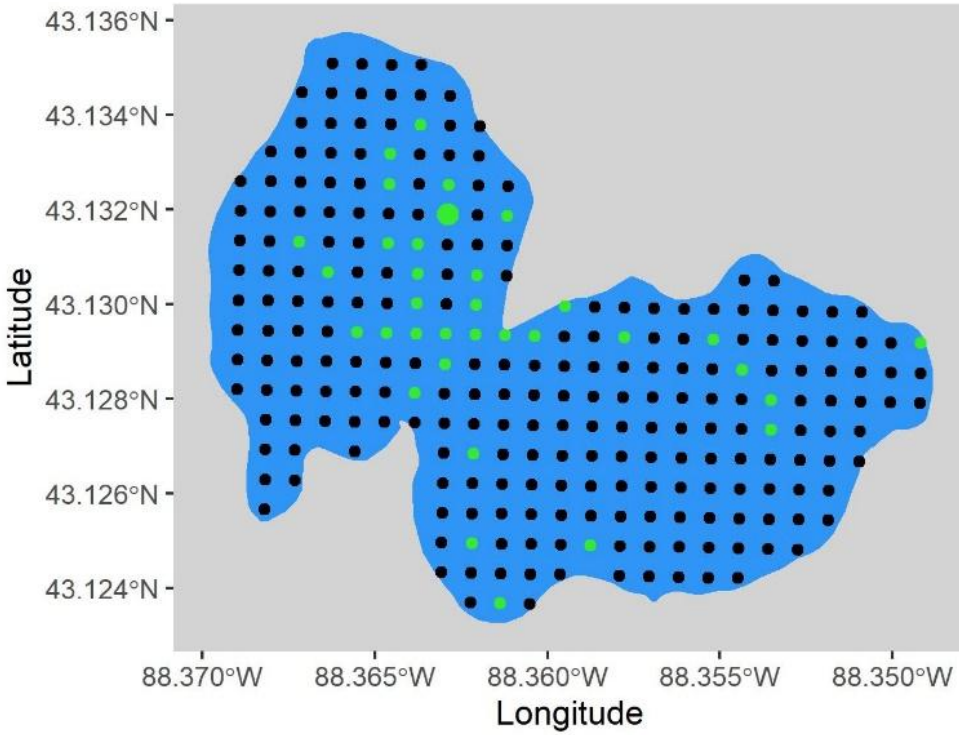


Chara density 2022

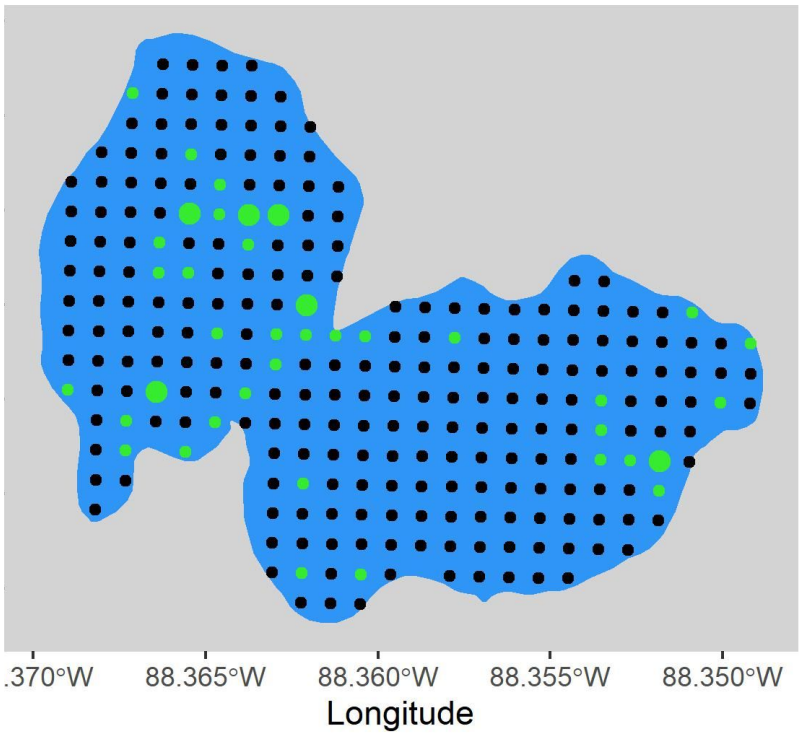


Year-over-year plant community is similar

Spiny naiad density 2021

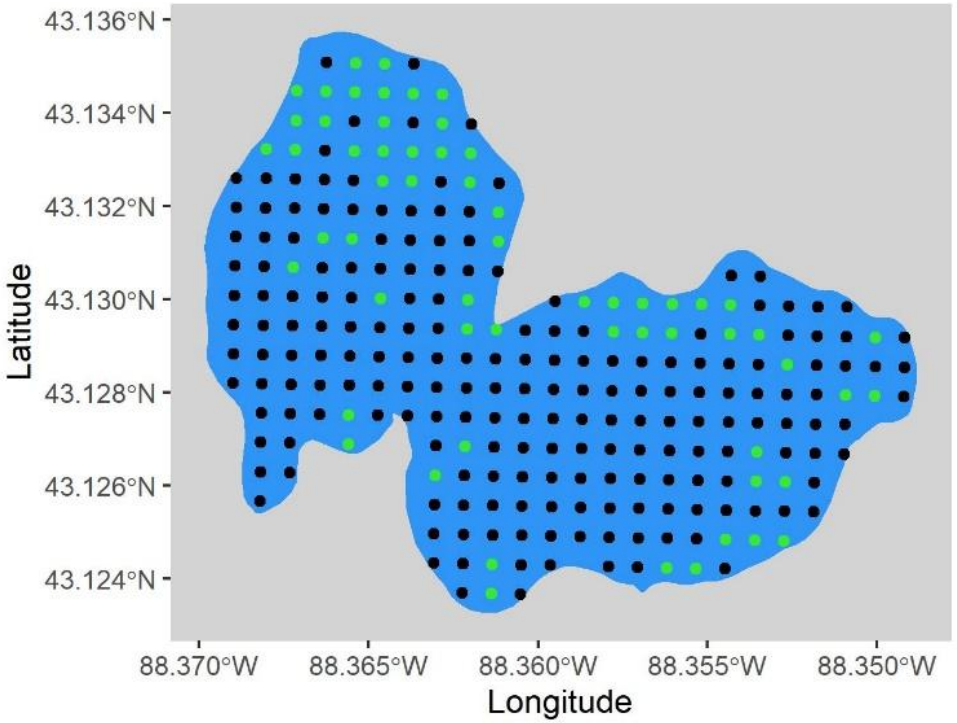


Spiny naiad density 2022

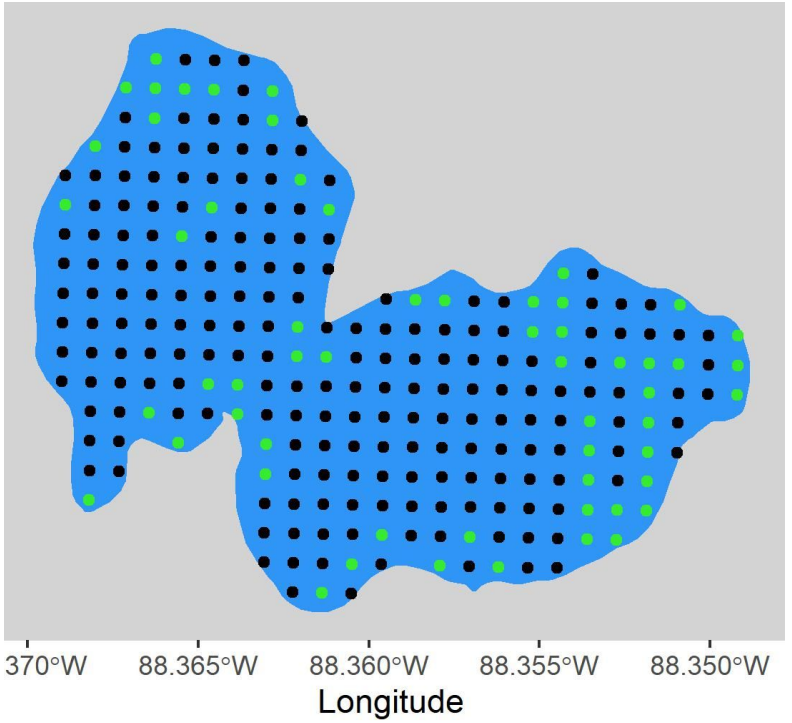


Year-over-year plant community is similar

Slender naiad density 2021



Slender naiad density 2022



Meandering Boat Survey

Given abundance of *Chara*, naiads, and pondweeds in point-intercept survey, only emergent and milfoil species were mapped

Additional species found along shoreline:

- Eurasian water milfoil (invasive)
- Spatterdock (native)
- White water lily (native)
- Common Arrowhead (native)

Milfoil found at ~5 times more sites than 2021

- Rooted milfoil*
  - 24 sightings (compared to 5 in 2021)
- Floating milfoil fragment
  - 4 sightings
- Emergent native species
  - Spatterdock
  - White Water Lily
  - Common Arrowhead

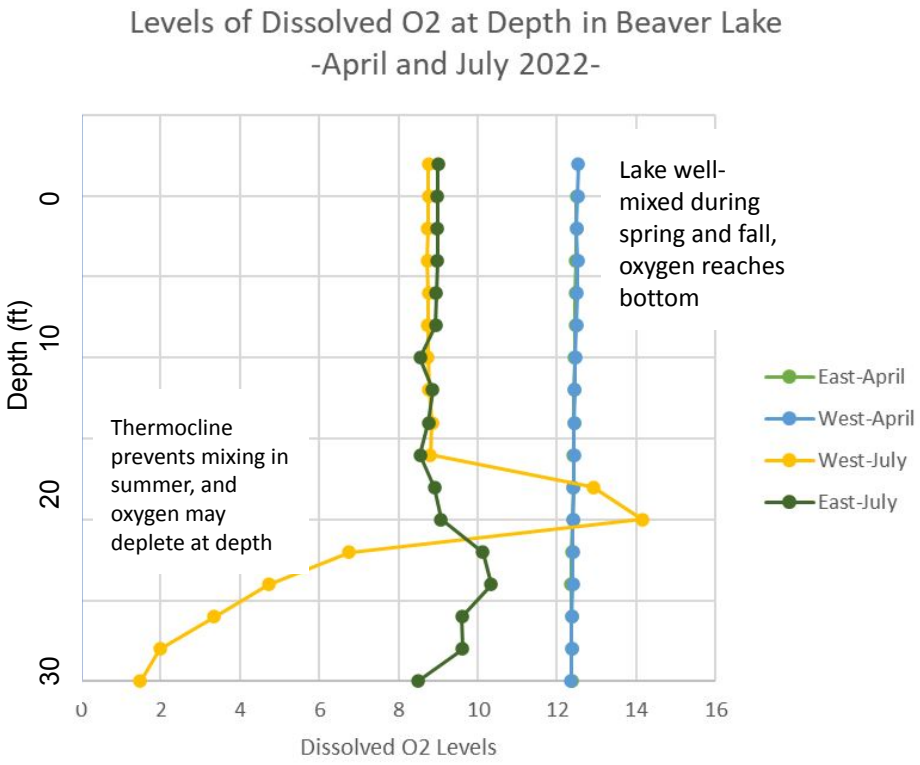
*Most likely Eurasian water milfoil or hybrid milfoil

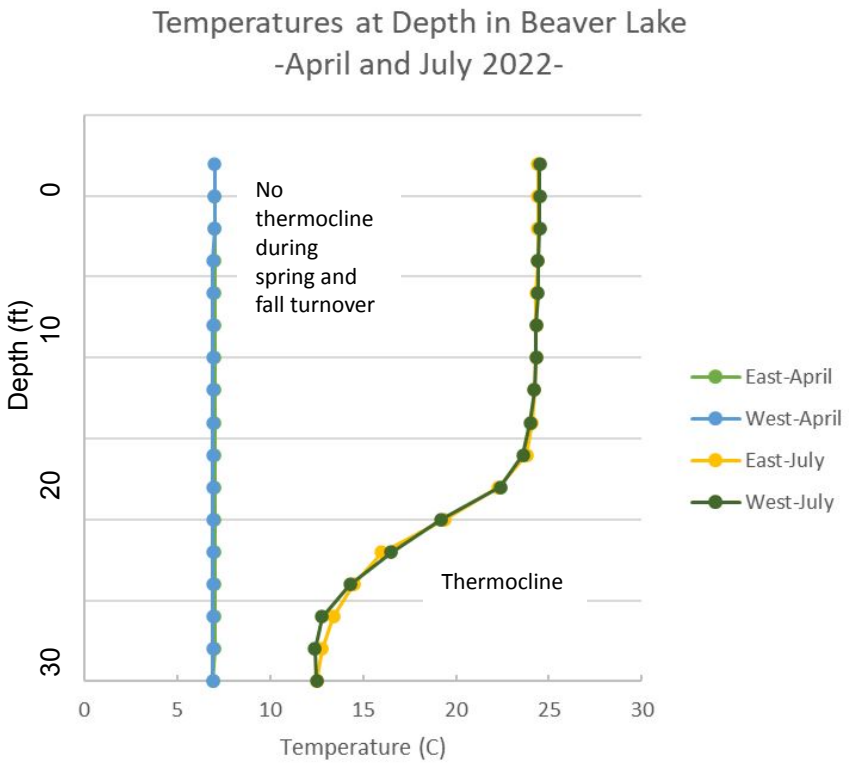
Plant Survey Takeaways

- Still lots of *Chara*
- No EWM *in 255-point* survey, but higher prevalence in meandering survey
- Little change in rest of community

Limnological sampling

Temperature and dissolved oxygen profiles taken in spring and summer demonstrate lake stratification and mixing

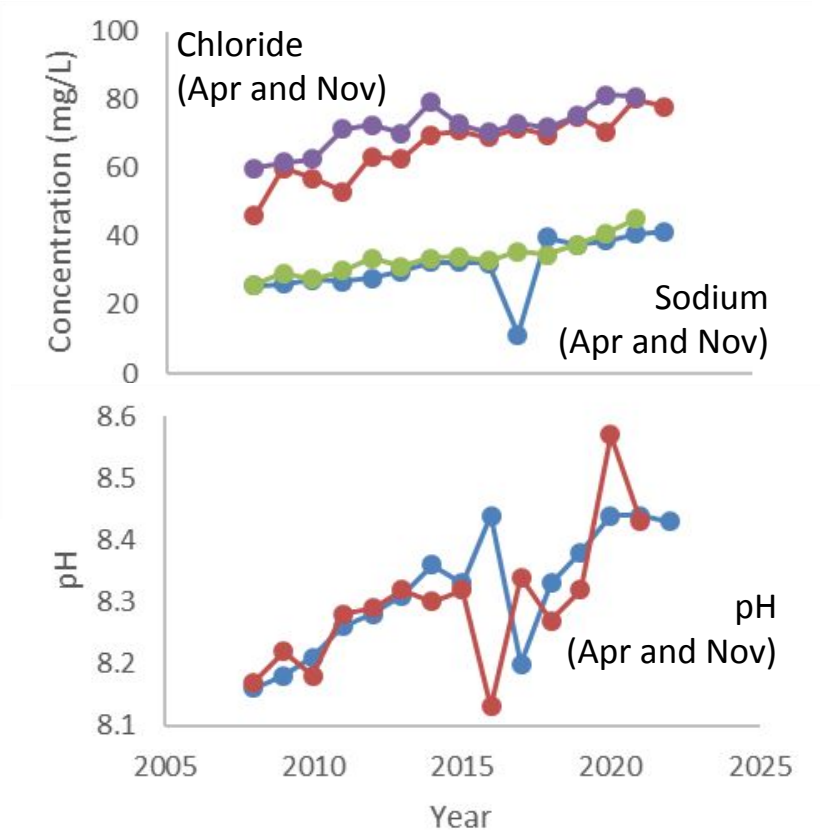




Water chemistry samples comprehensively tested by UW-SP lab

Sample collected each April and November by Mike Hipp. Thanks Mike!

- Most parameters stable
- Increasing sodium and chloride
- pH more variable, but possibly increasing



Zooplankton Sampling

Zooplankton Analysis

High proportion of calanoid copepods (orange) correlates with lower nutrient levels.

Year-over-year ratio similar for west basin but not east basin.