The Tully Kettle Lakes Area: What a Unique Watershed!

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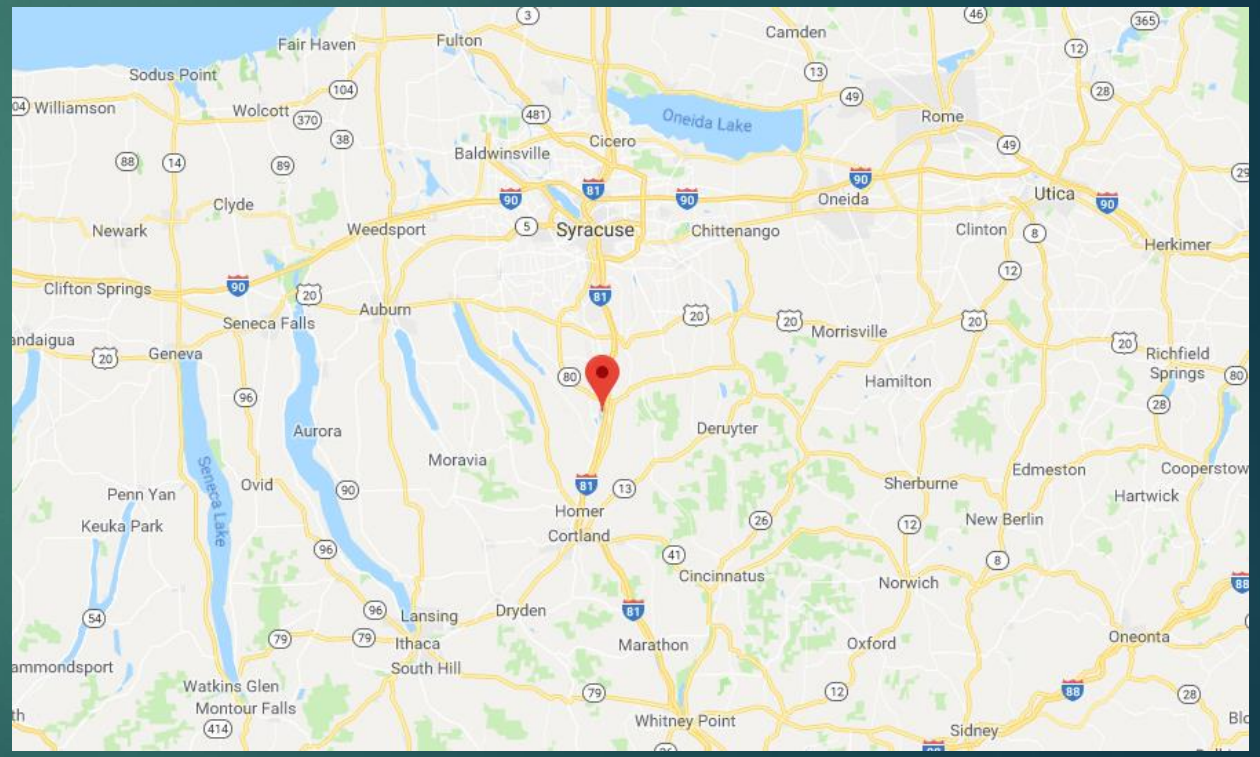
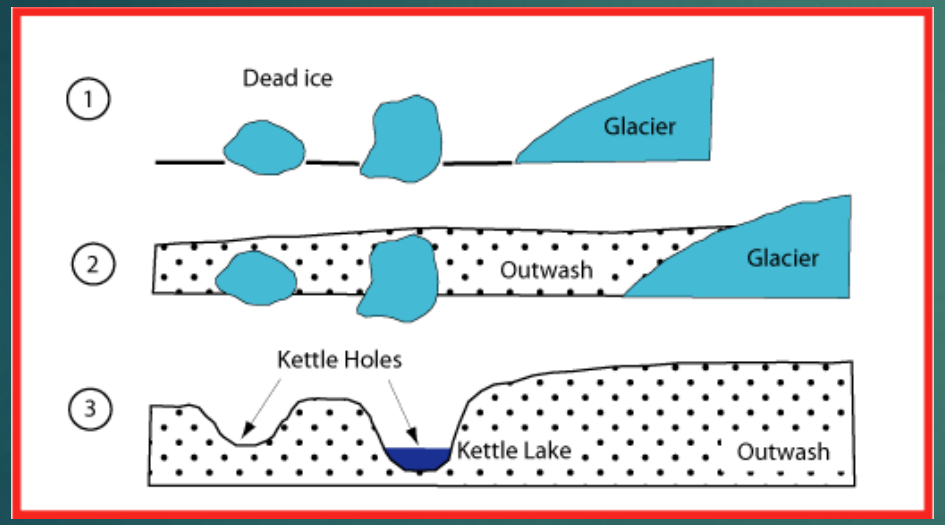
SUNY ONEONTA BIOLOGICAL FIELD STATION

Where are the Tully Kettle Lakes?

- Roughly 25 miles south of Syracuse
- Near the town of Tully
- Located on the border of Onondaga and Cortland counties

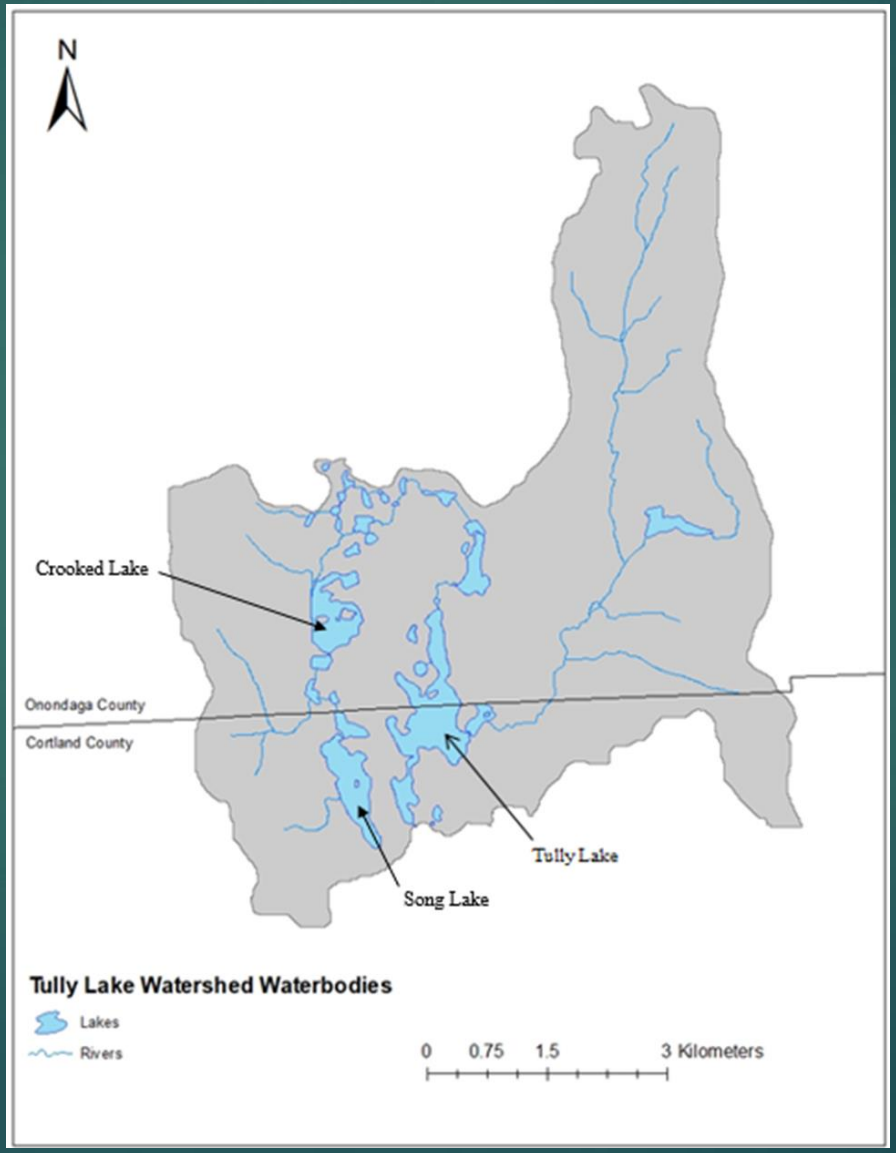


How was this area formed?

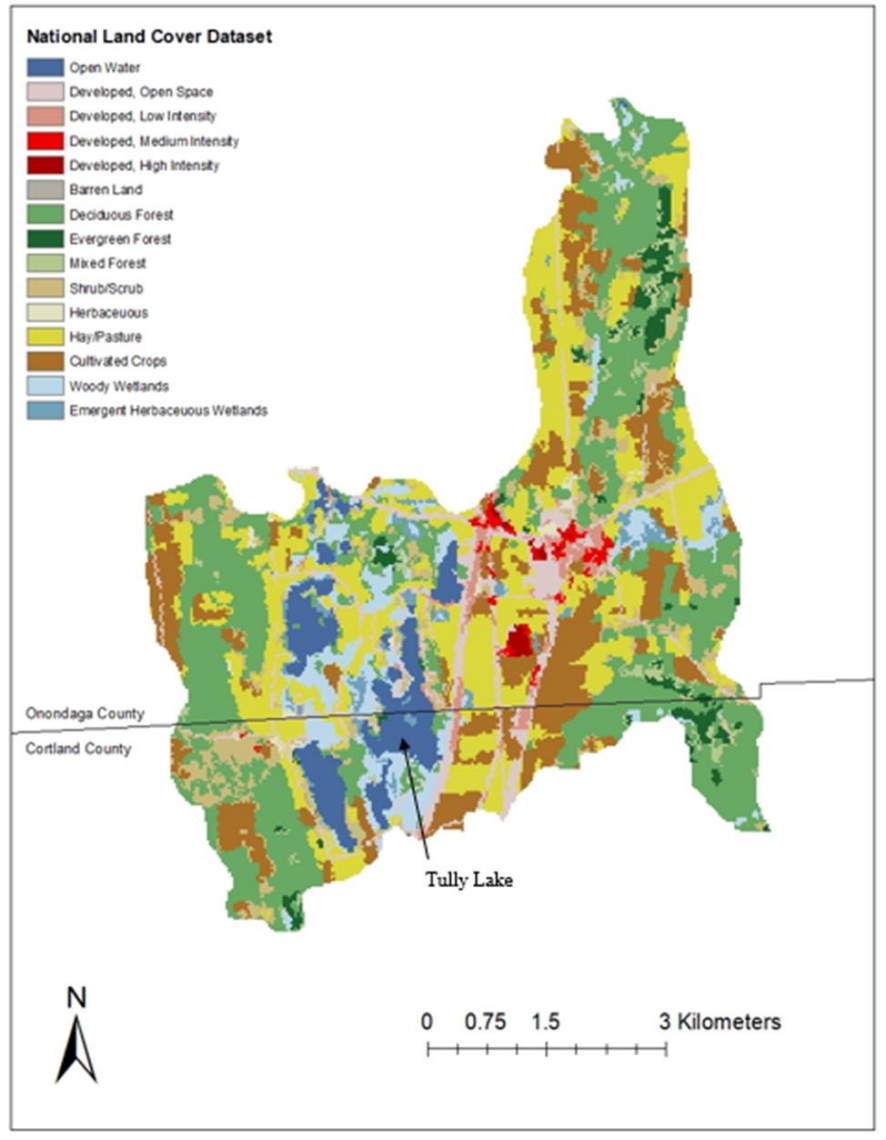


- Formed during the last period of glaciation (Wisconsinan) in NYS
- As glaciers retreated northward, they carved the Tully Valley
- Pockets of ice left behind, as the melted, kettle lakes are formed

What lakes are in the area?

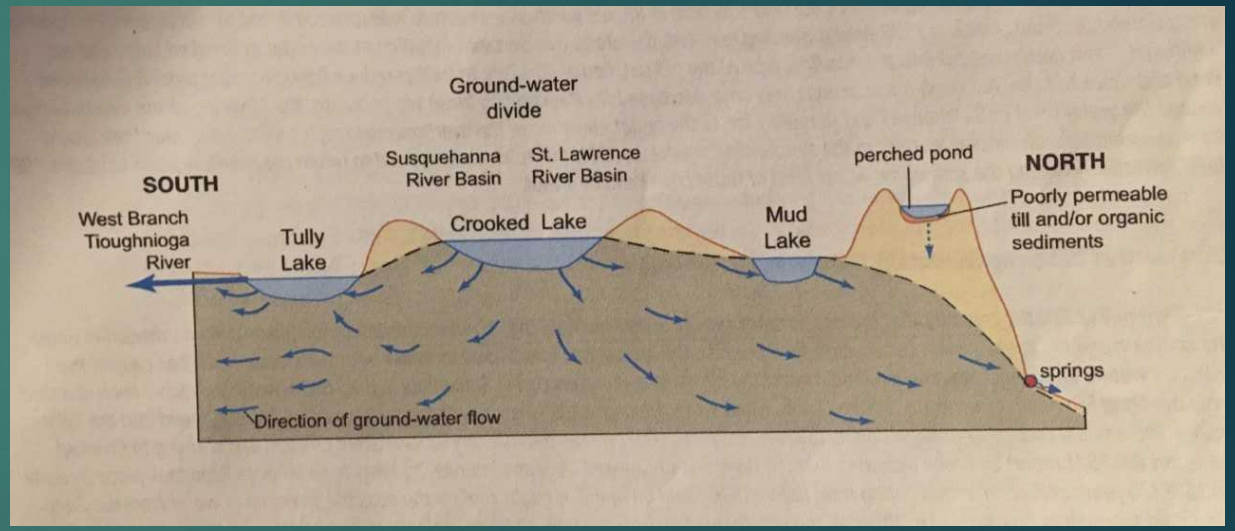


Land uses of the watershed

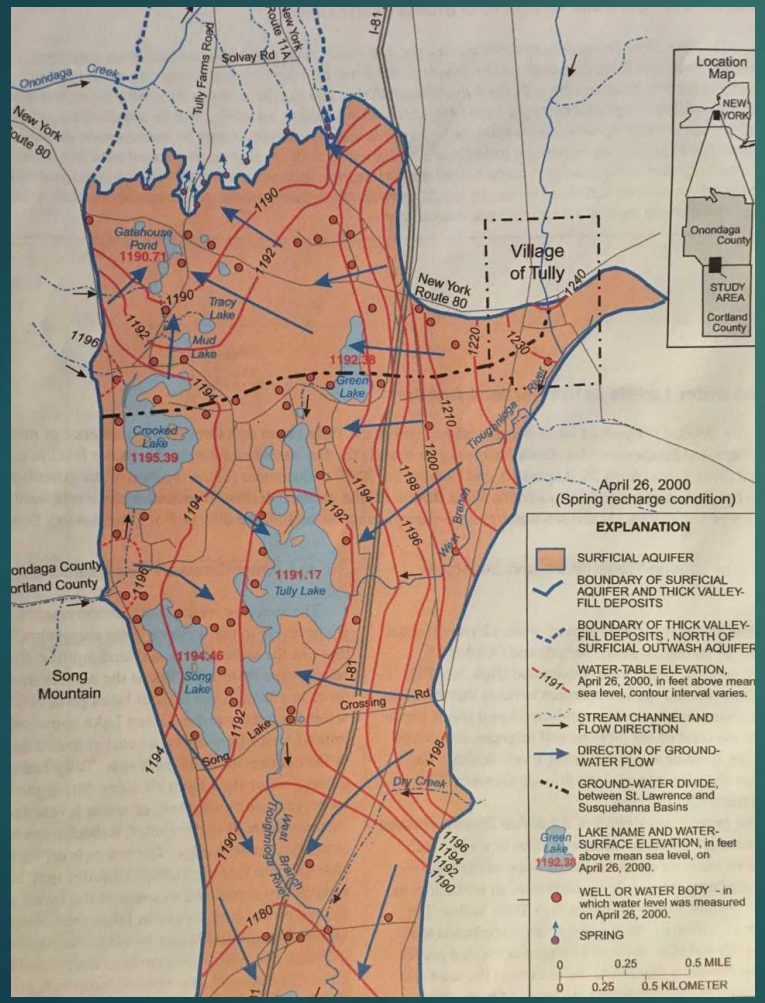


The basics of hydrogeology

- Branch of geology concerned with water occurring underground or on the surface of the earth
- Studied in the area by the USGS
- Groundwater flows can connect waterbodies that are seemingly disconnected on the surface



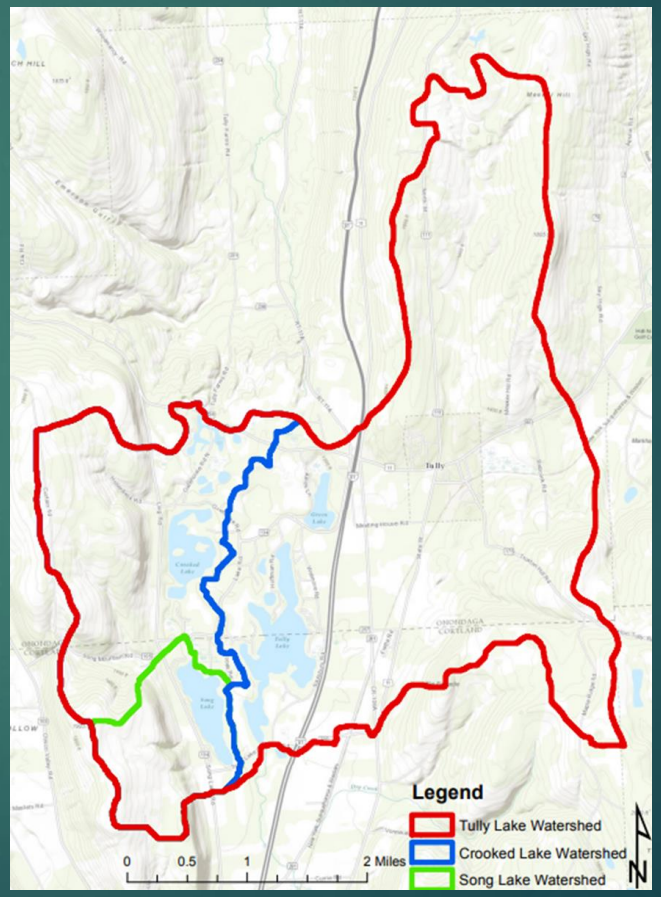
Hydrogeology of the Tully Kettle Lakes Area



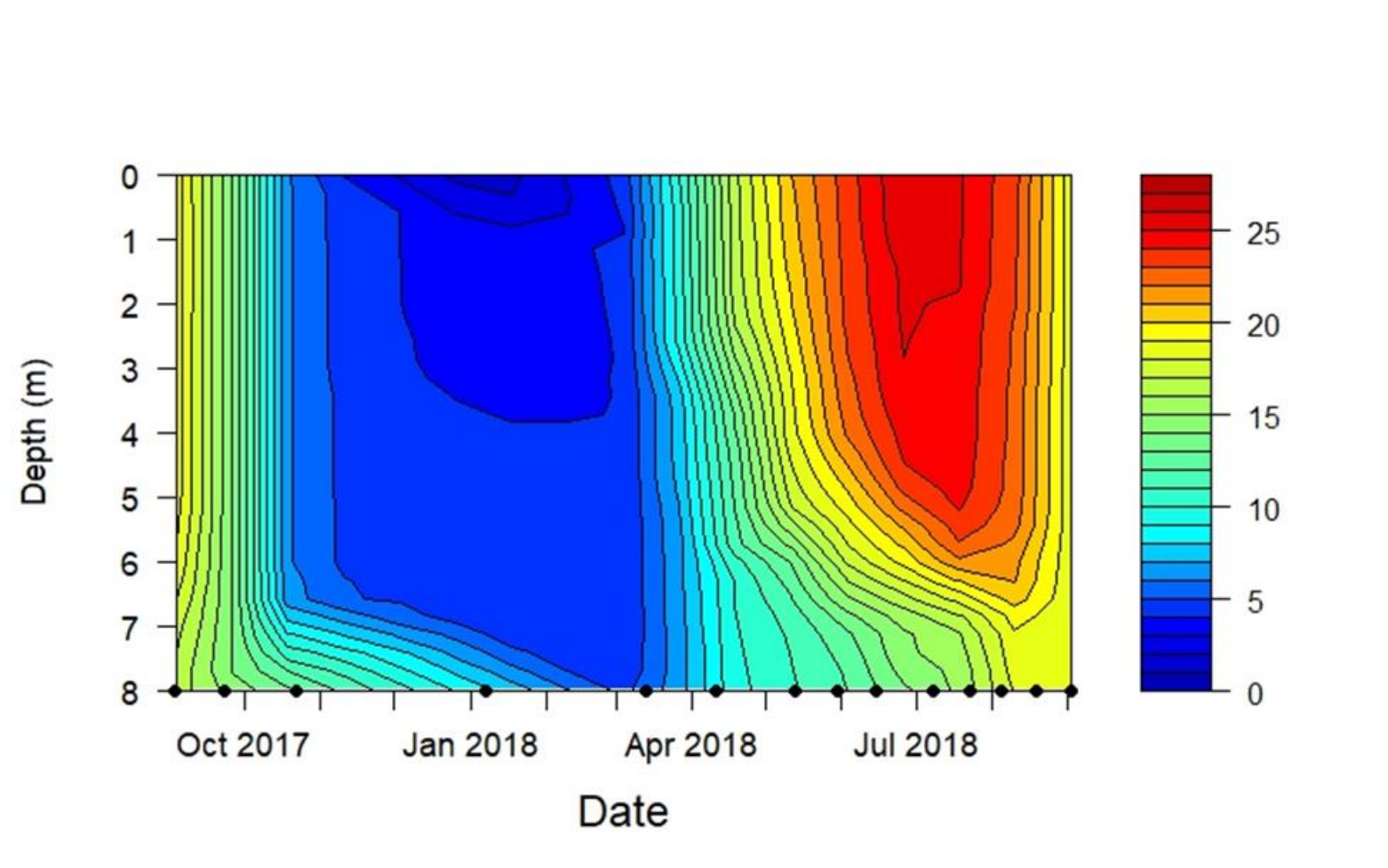
- Groundwater flow patterns in the area (blue arrows)
- Water table elevation (red lines)
- Divide between Susquehanna and St. Lawrence watersheds (black dashed line)

My work: Song, Crooked and Tully lakes

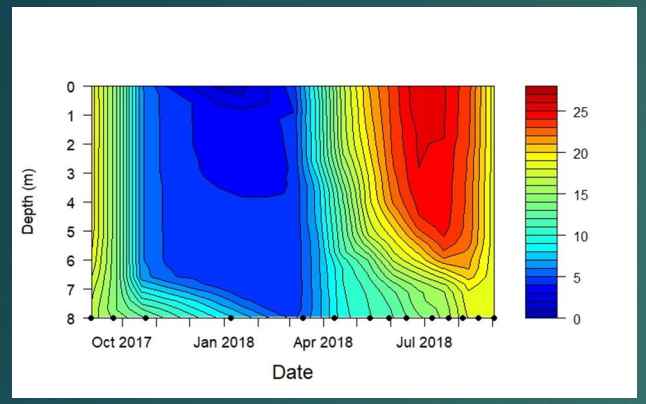
- Create a state of the lake report and management plan for Song, Crooked and Tully lakes
- Characterize the physical and chemical conditions of the lakes
- Summarize the organisms and plants in each lake
- Take all this information, along with historical data and stakeholder inputs, and create a comprehensive management plan



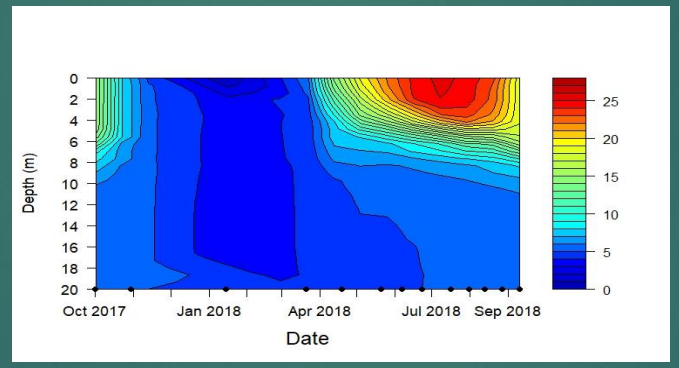
What is an isopleth?



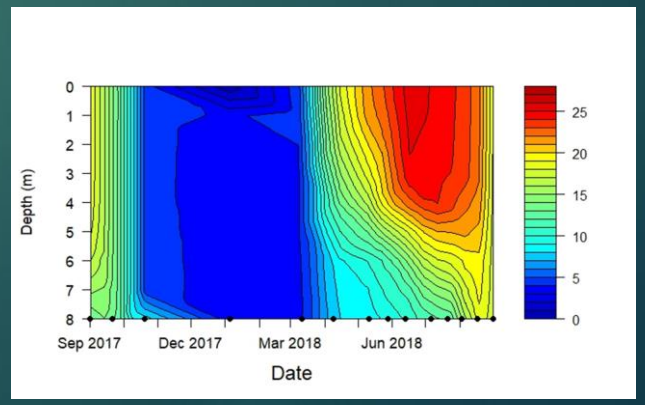
Temperature profiles



Song Lake

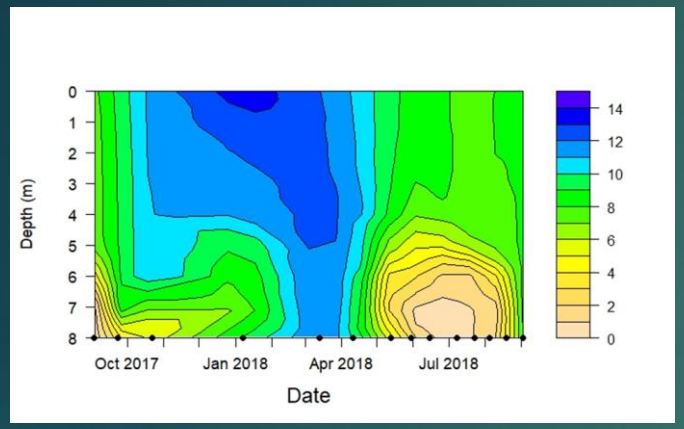


Crooked Lake

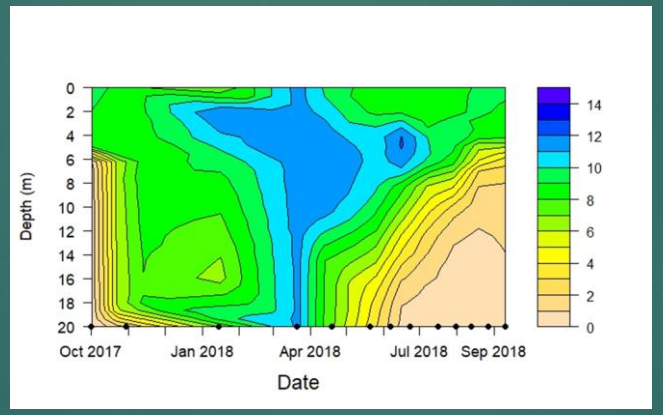


Tully Lake

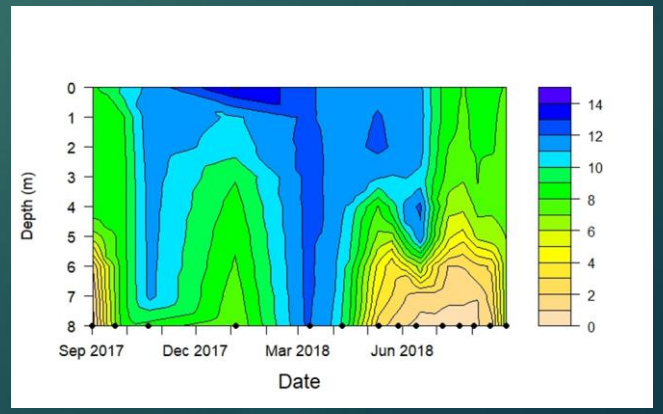
Oxygen concentrations



Song Lake

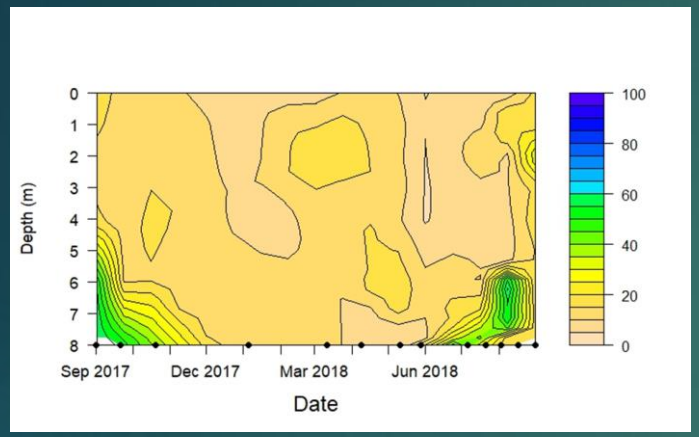


Crooked Lake

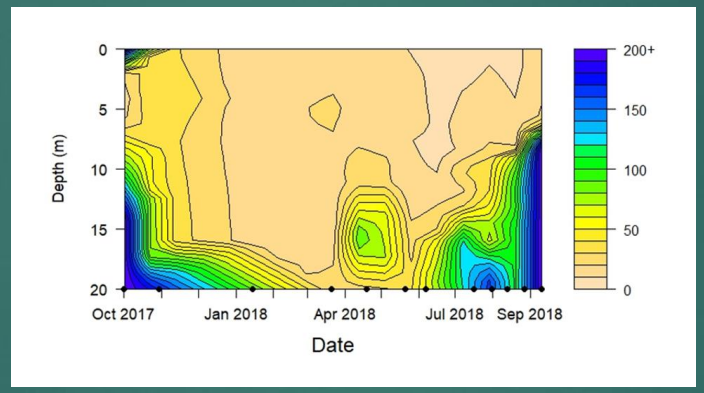


Tully Lake

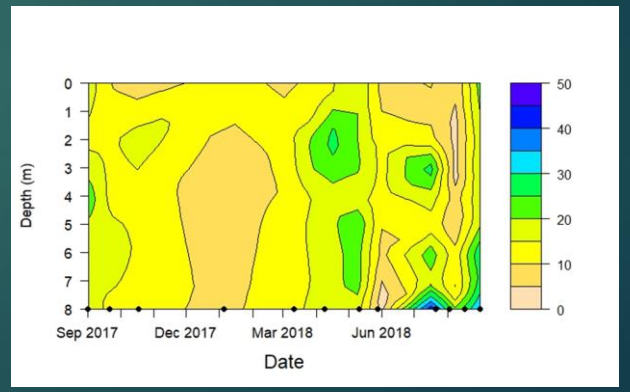
Phosphorus levels (µg/l)



Song Lake

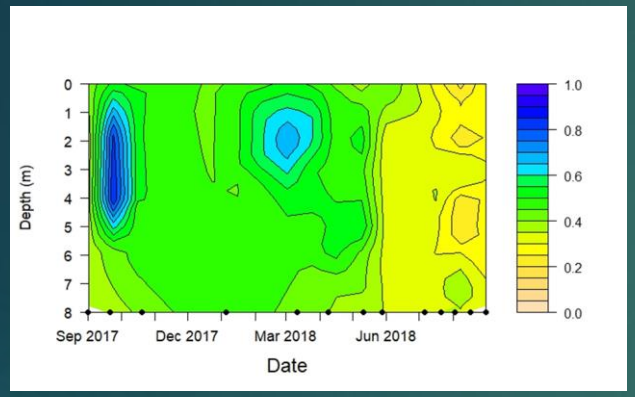


Crooked Lake

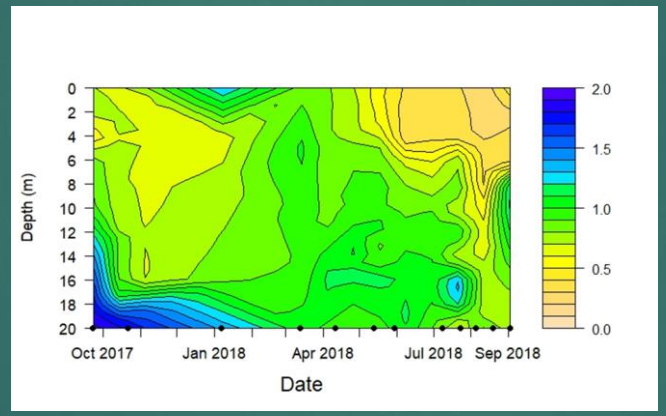


Tully Lake

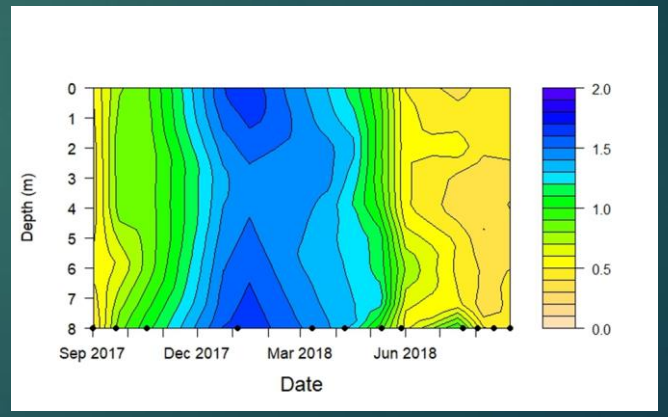
Nitrogen levels (mg/l)



Song Lake



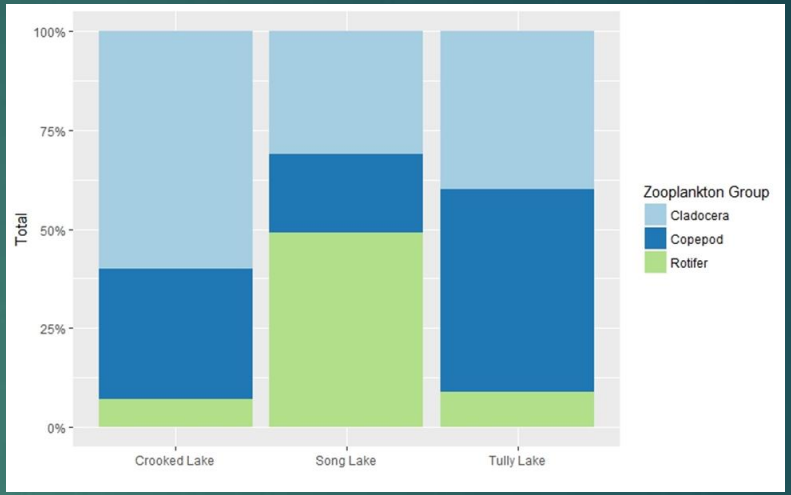
Crooked Lake

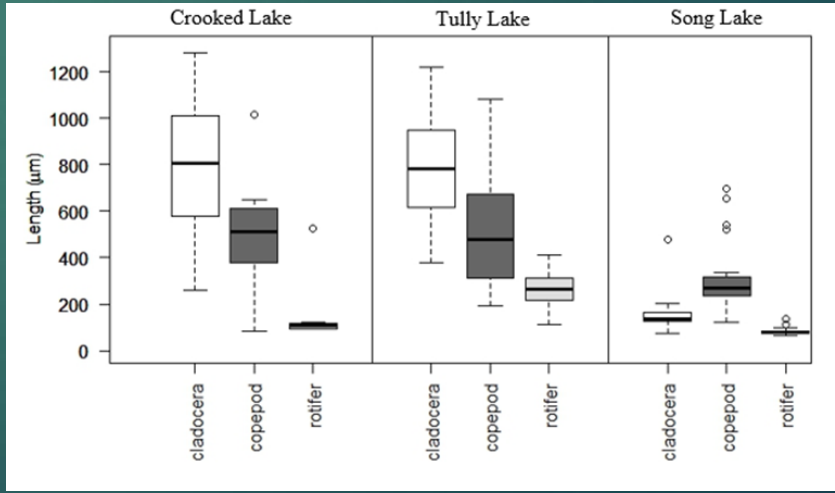


Tully Lake

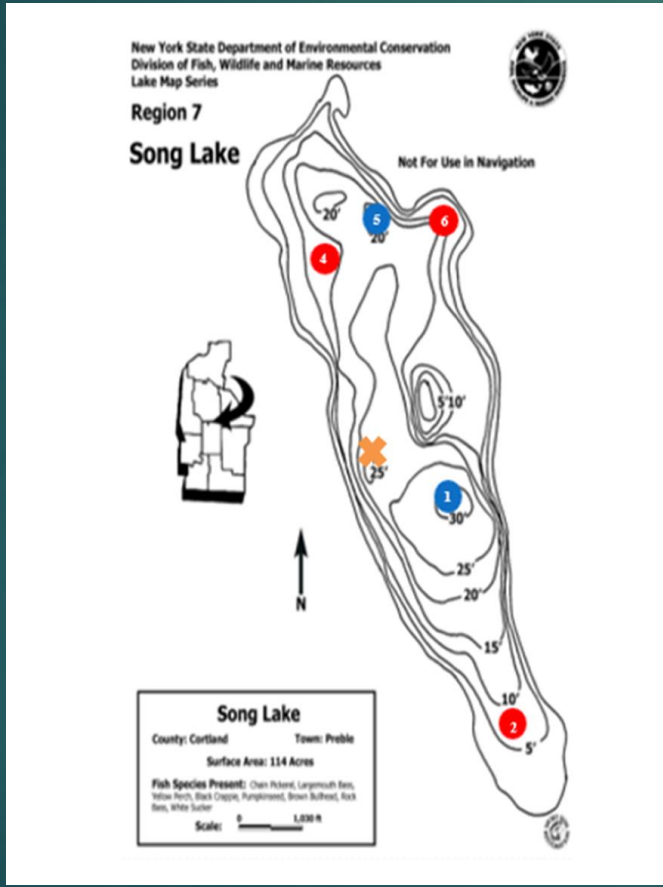
Zooplankton community

- Vertical tows in each lake
  - Done at the deepest location
  - Samples taken during mid-summer
- Samples placed under a microscope
  - Organisms were identified and measured



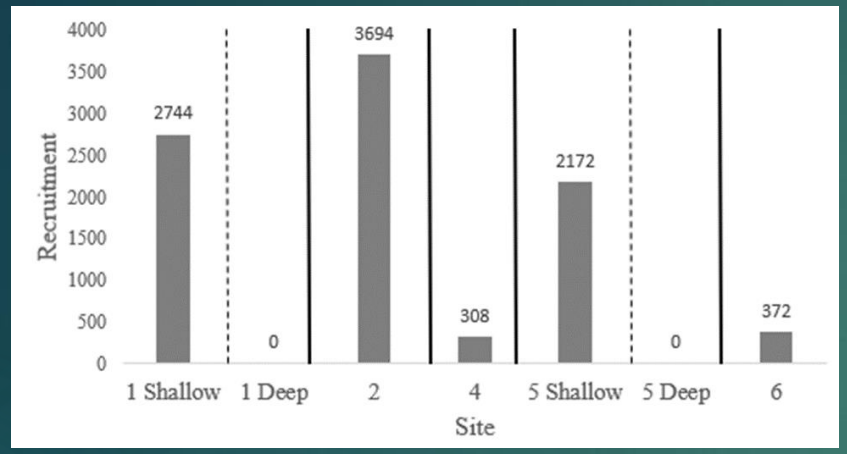


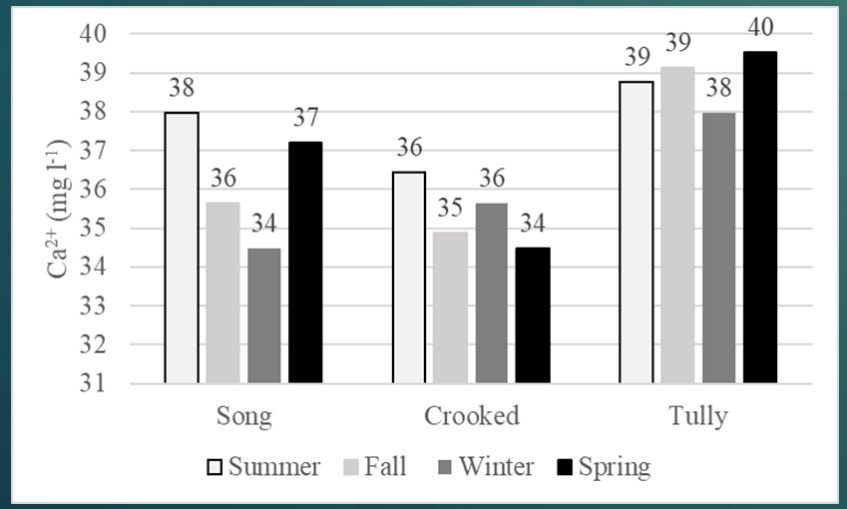
Zebra mussels

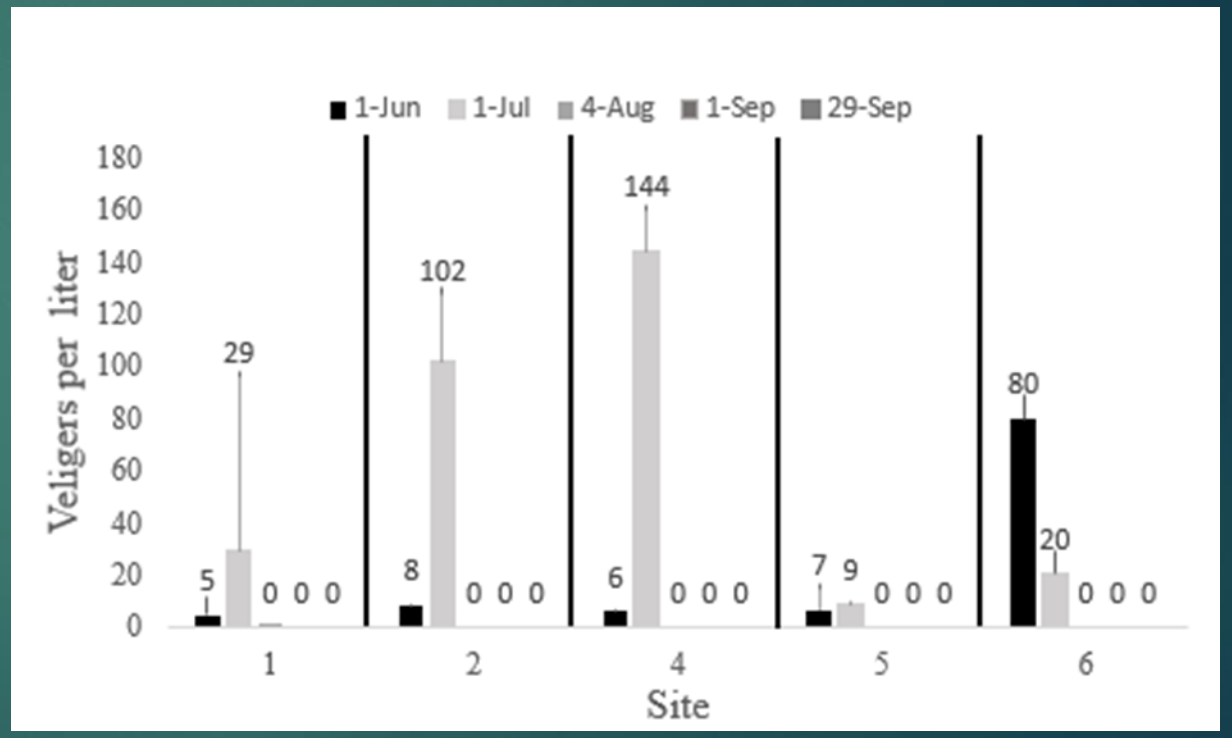


- Zebra mussels first observed in Song Lake in fall 2017
  - No reports in either Crooked Lake or Tully Lake
- Recruitment plates placed around the lake summer 2018
  - Varying locations and different depths
- Plates were retrieved and the adults on the plate were counted
- Planktonic juveniles (veligers) sampled throughout summer 2018

Zebra mussels cont.





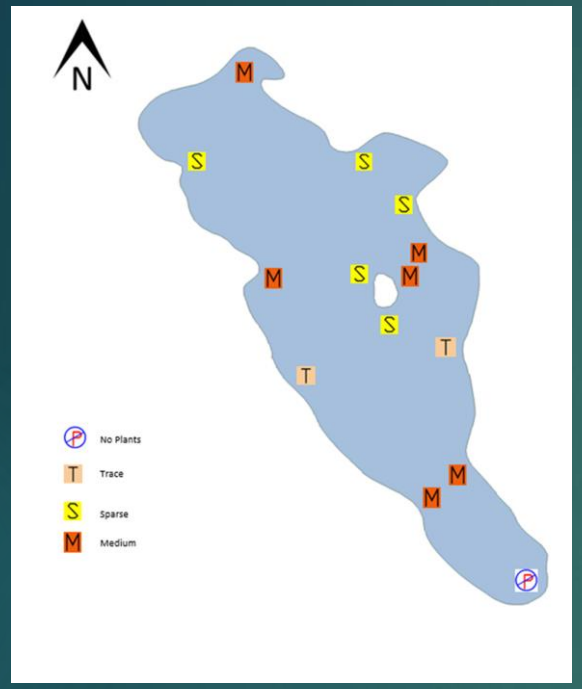


Plants

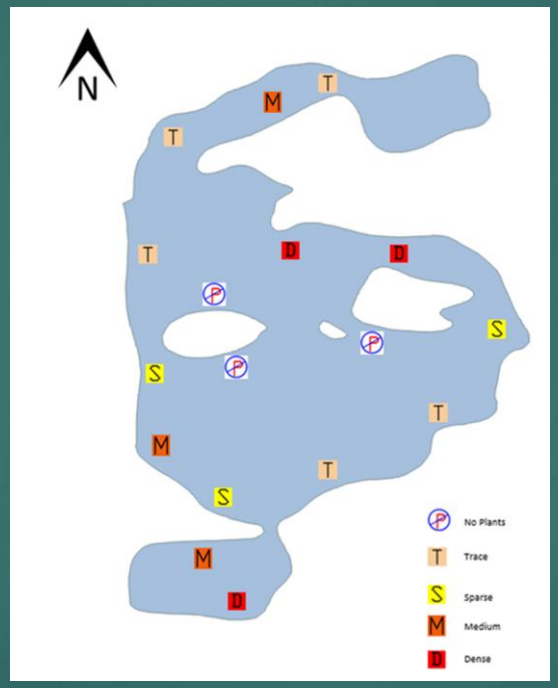
- PIRTRAM plant sampling
- Samples taken during June-July 2018
- 18 species currently and historically described between the 3 lakes
- Song Lake has a NYS Threatened Species
  - Lake cress

Abundance Category	Description
"Z" = no plants	No plants
"T" = trace plants	Fingerful of plants
"S" = sparse plants	Handful of plants
"M" = medium plants	Rakeful of plants
"D" = dense plants	Difficult to bring rake on boat

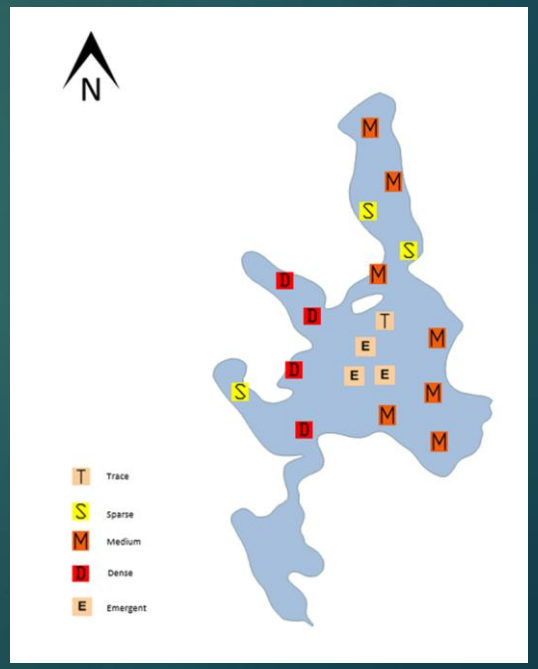
Overall plant abundance



Song Lake



Crooked Lake

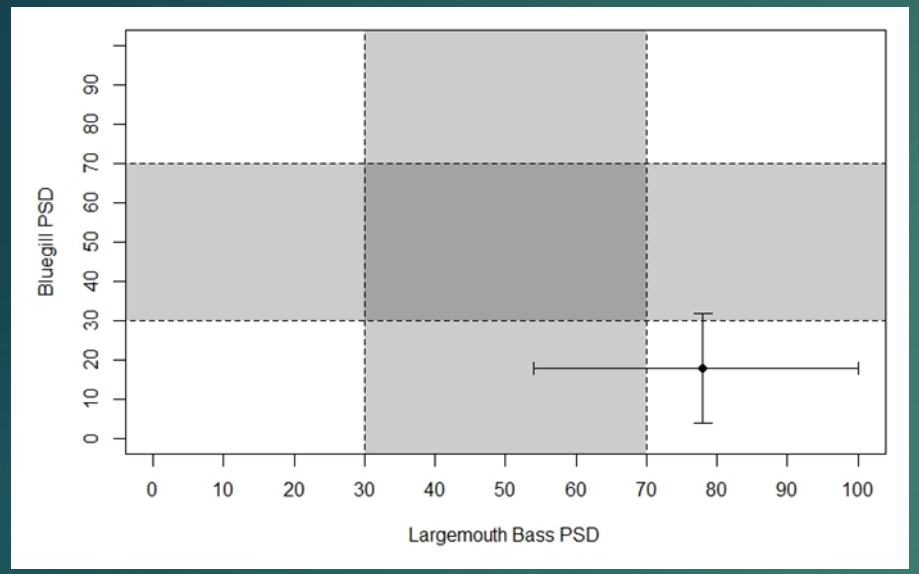


Tully Lake

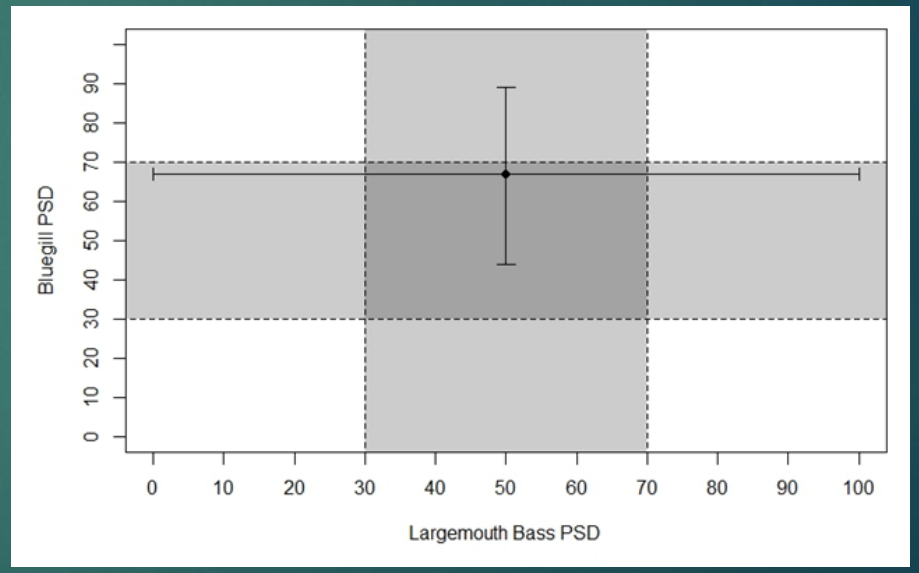
Fisheries

- Surveys on Song and Tully lakes in fall 2018
- 10 species collected in Song Lake
- 12 species in Tully Lake
- Proportional size distribution (PSD)
  - Low values indicate few large fish
  - High values indicate few small fish
- Can use for predator and prey
  - Determine if fishery is in “balance”

Fisheries cont.

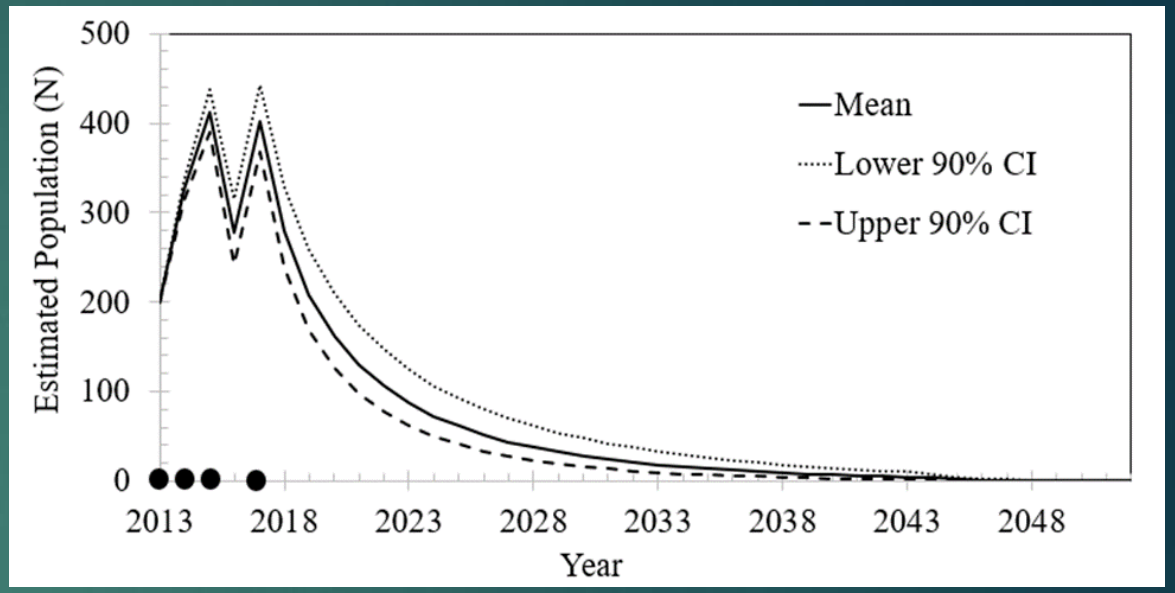


Song Lake



Crooked Lake

Grass carp



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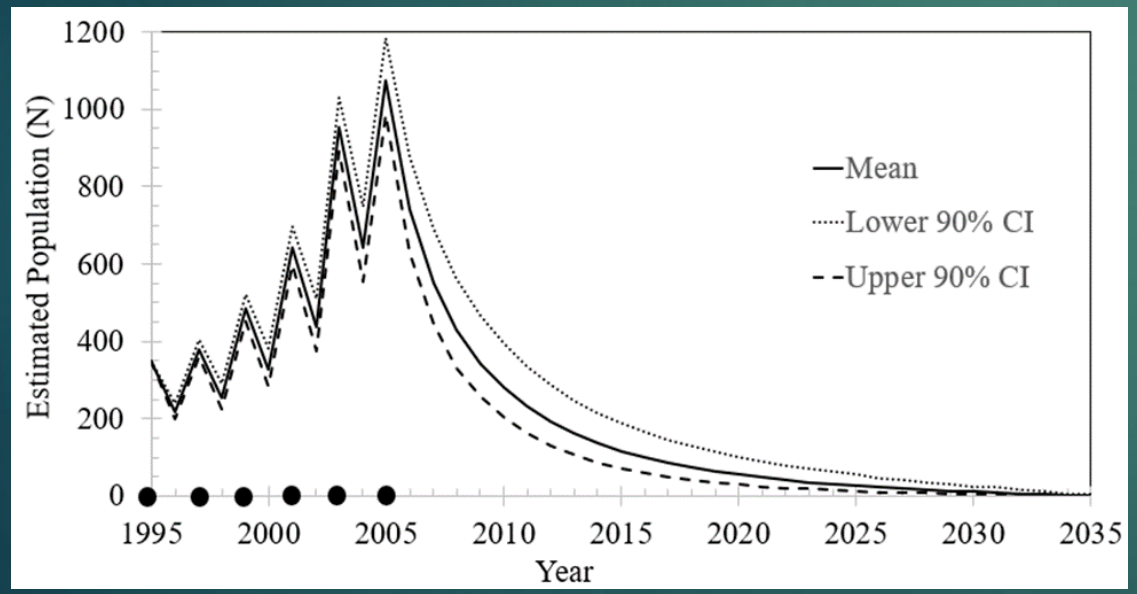

Song Lake

Acknowledgements

- Biological Field Station faculty and staff
- Cortland – Onondaga Federation of Kettle Lakes Association

Questions?