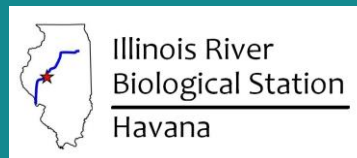
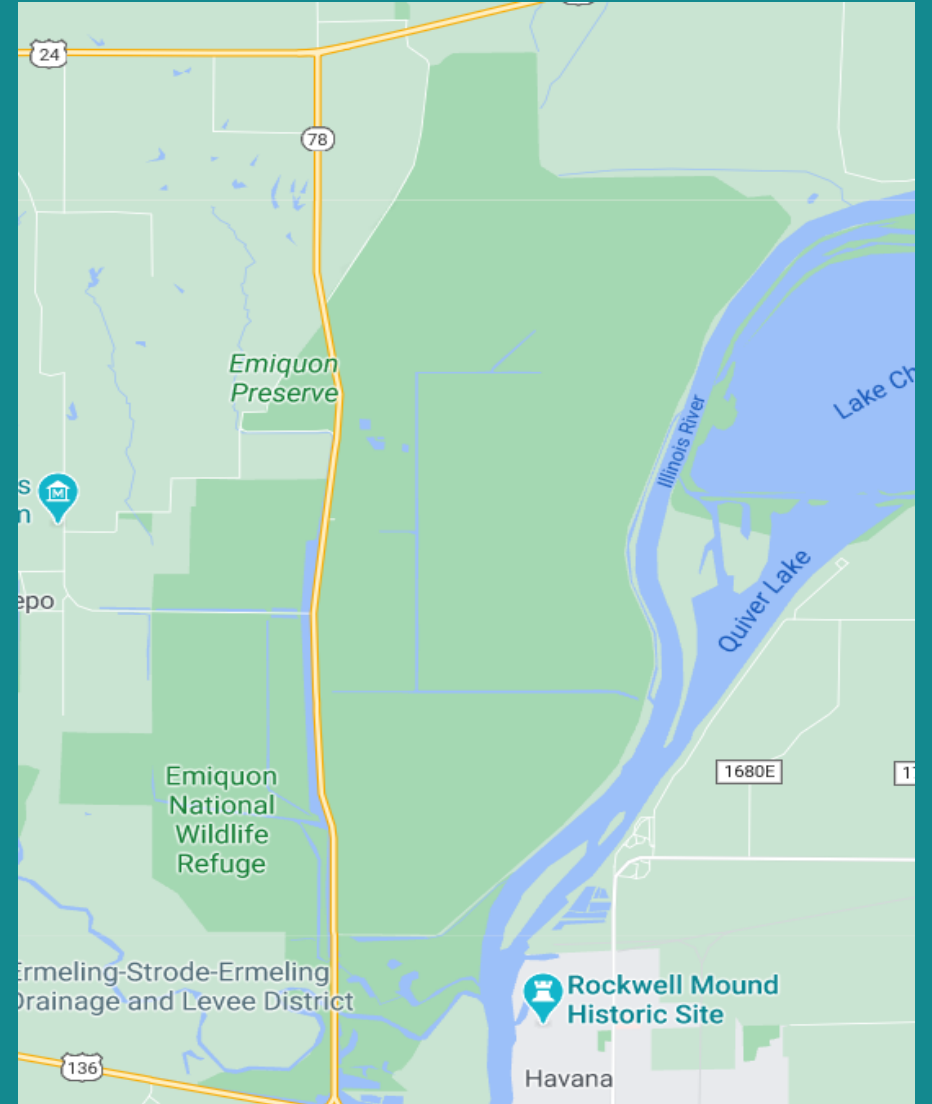


Mortality and Recruitment in Largemouth Bass, Bluegill, and Black Crappie at the Emiquon Preserve

Amber Blackert, Levi Solomon, Jason DeBoer, TD VanMiddlesworth, Rich Pendleton, Mark Fritts, Andrea Fritts, Tih-Fen Ting, and James Lamer



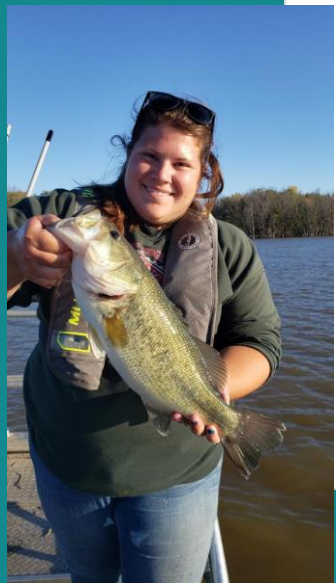
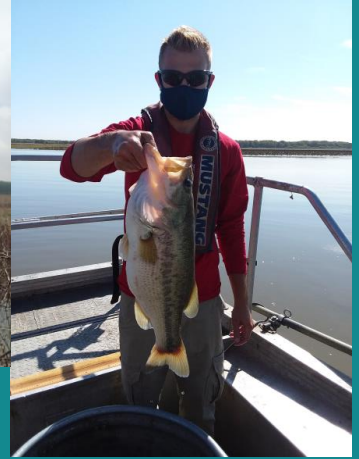
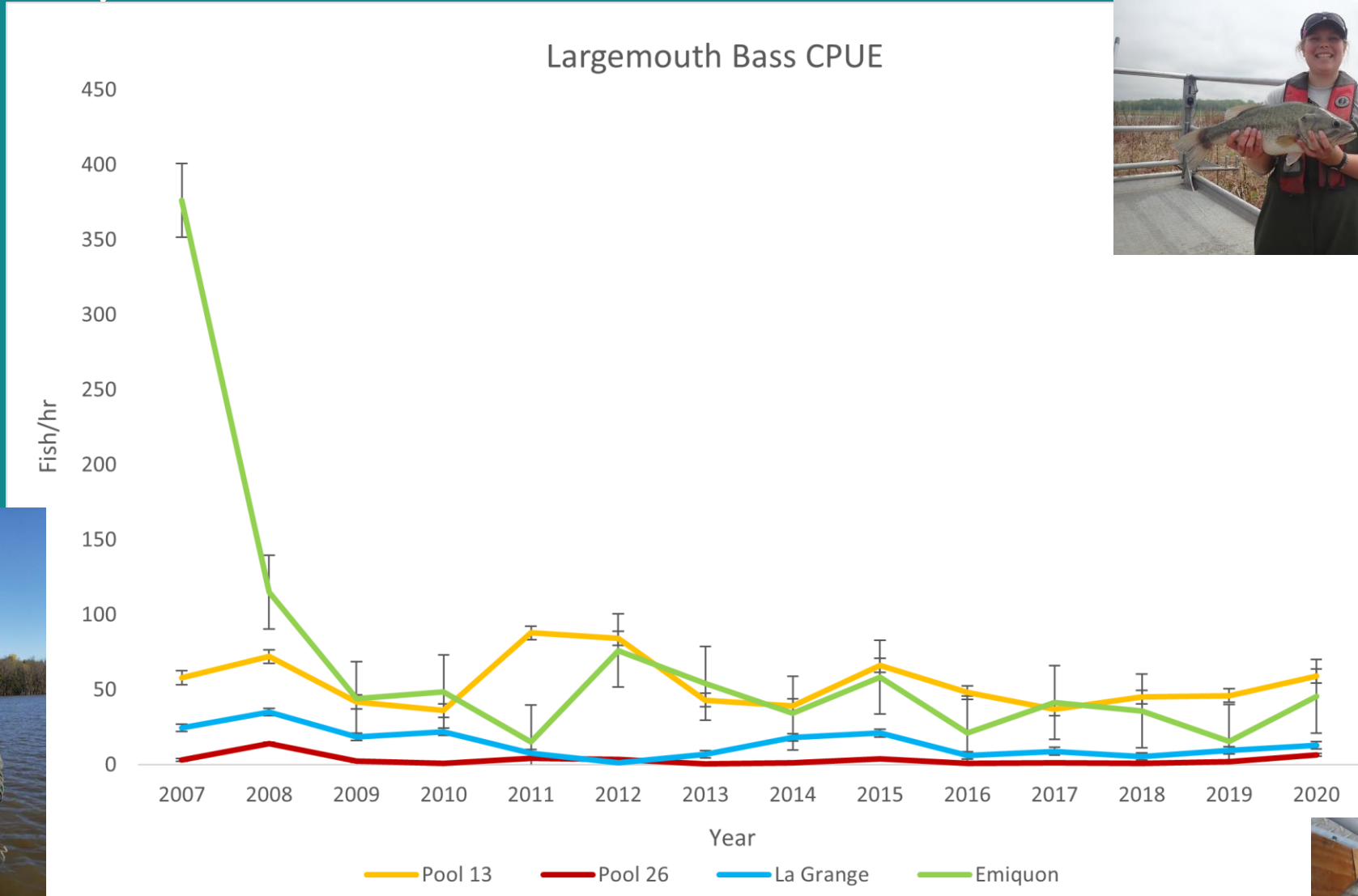
The Emiquon Preserve is a restored backwater of the Illinois River purchased and owned by The Nature Conservancy. Restoration of Thompson and Flag lakes began in 2007



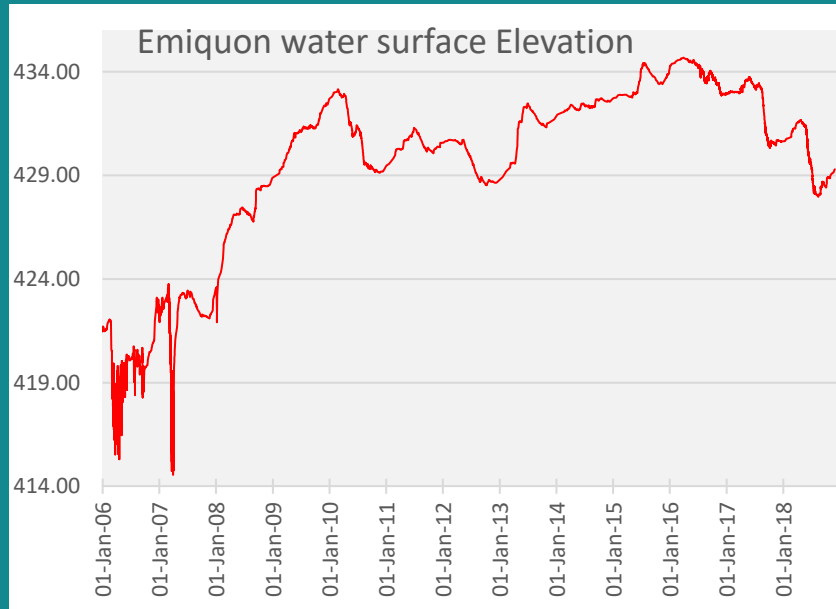
Illinois Department of Natural Resources along with The Nature Conservancy initially stocked 36 fish species over the first two years of restoration



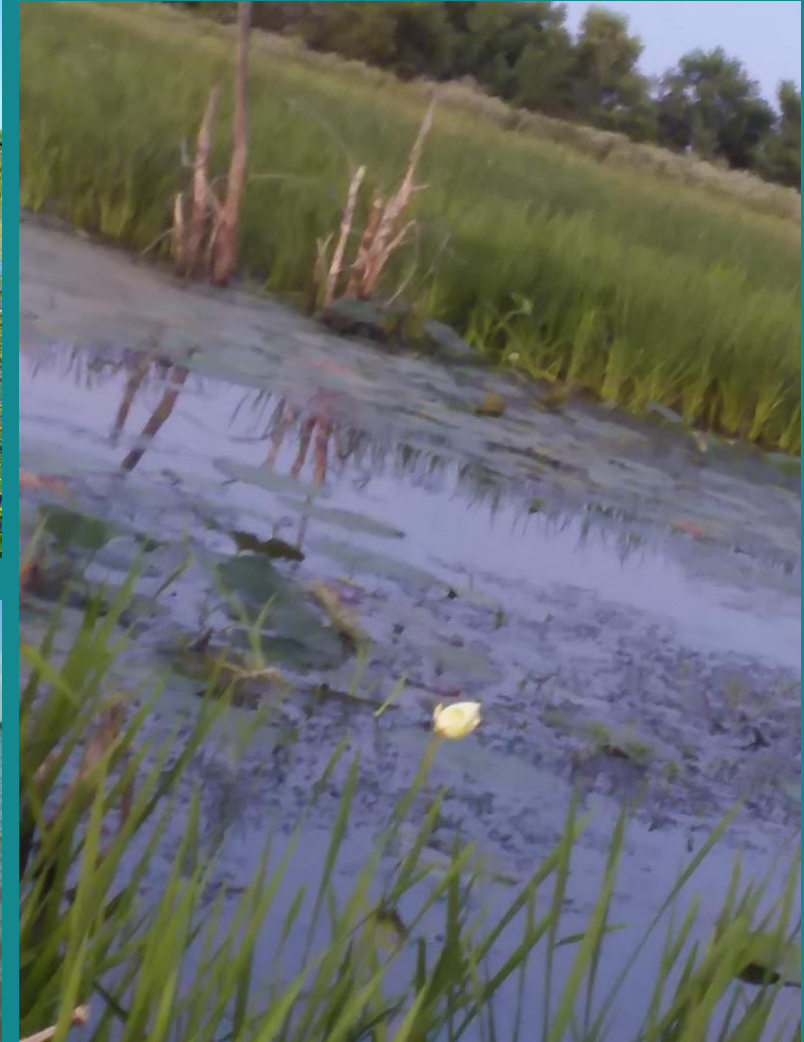
The Emiquon preserve remains an excellent fish habitat and has a strong sportfishery



The water control structure can affect sportfish through the change in water levels and connectivity to the Illinois River



Water level changes have varying effects on vegetation abundance, fish habitat, and prey abundance for sportfish



Objectives:

Using Largemouth Bass, Bluegill, and Black Crappie otoliths and catch data we will be determining what environmental, or management factors are affecting:

- 1) Biochronology or annual growth
- 2) Mortality and individual growth
- 3) Year-class strength

Sampling occurred from the end of May to June 13th due to the pandemic, and from April to May in 2021

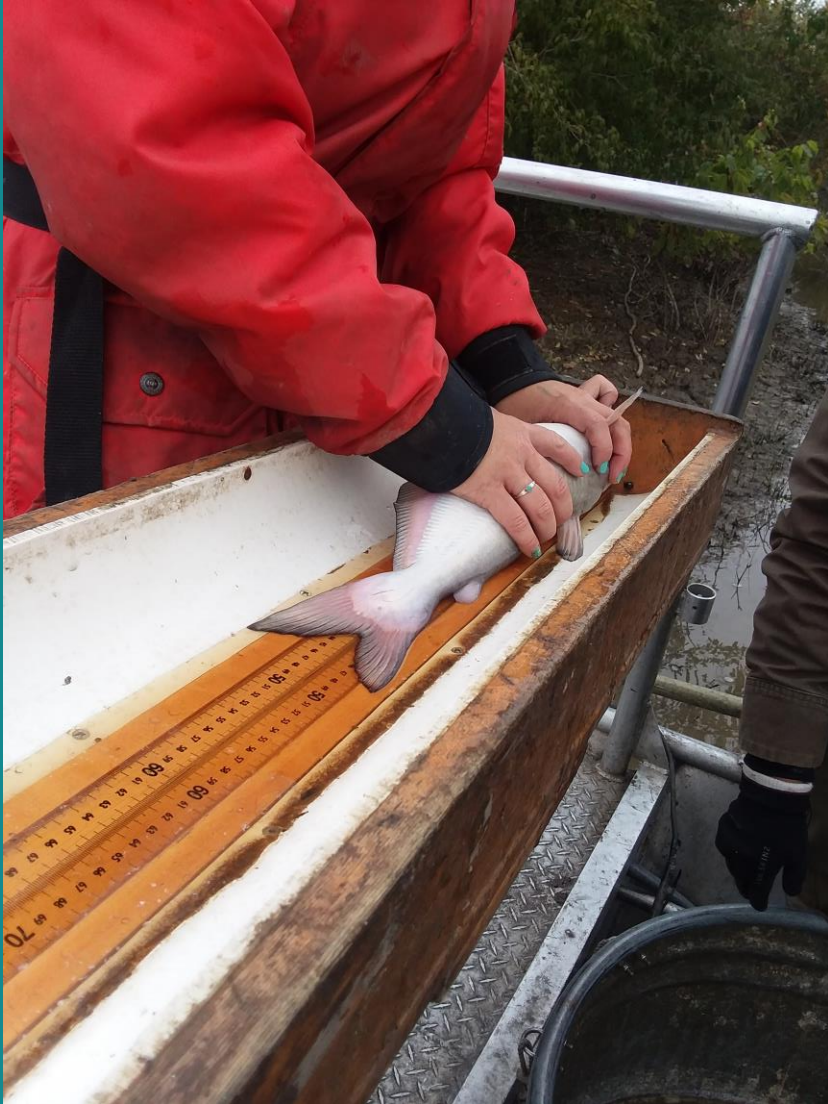


Field Methods

- Electrofishing
- Fyke nets
- Mini fyke nets
- Tandem fyke net set



10 fish from each 10 mm increment bin were collected to gather good representation of sizes, and ages

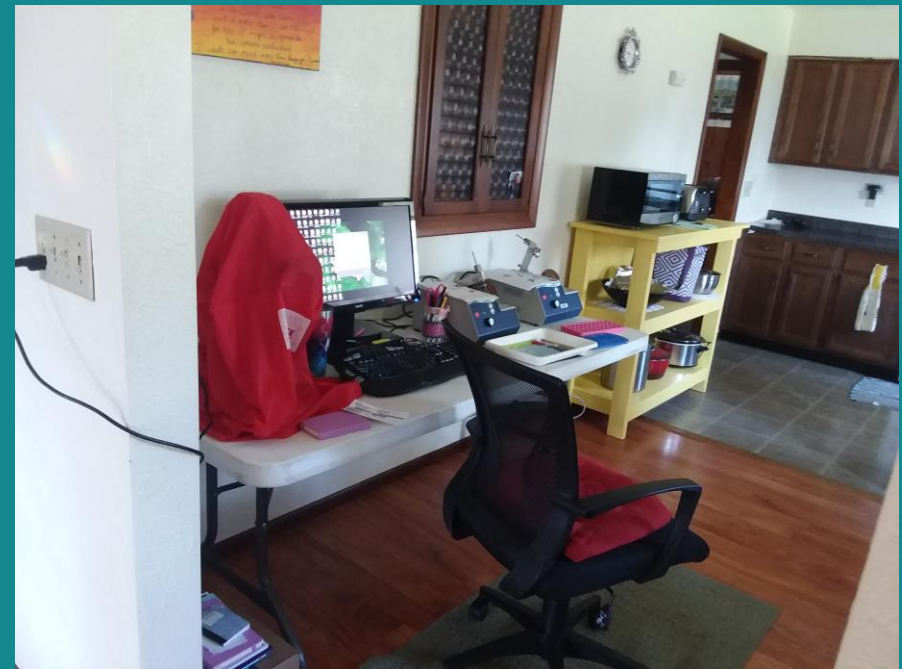
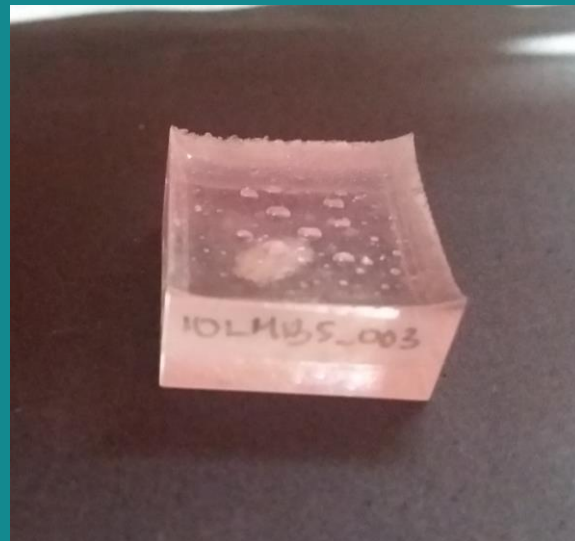


Otoliths are extracted from fish in the lab, and can then be processed

- A grand total of ~1088 samples 2010, 2015-2016, and 2020
 - 2010 total of ~14
 - 2015 total of ~235
 - 2016 total of ~103
 - 2020 total of ~355
 - 2021 total of ~381



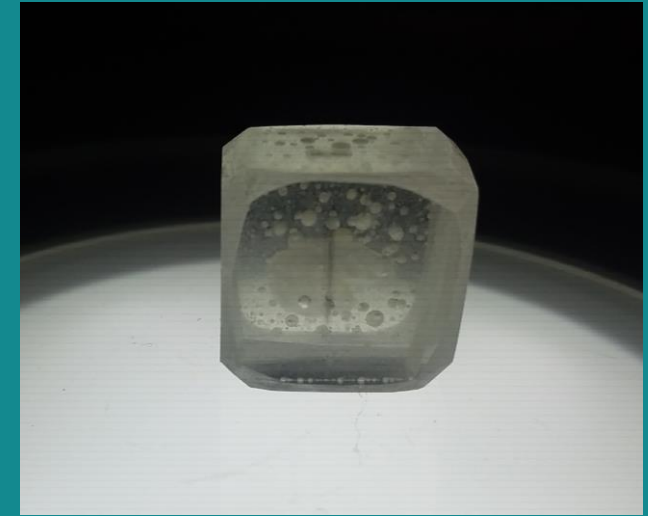
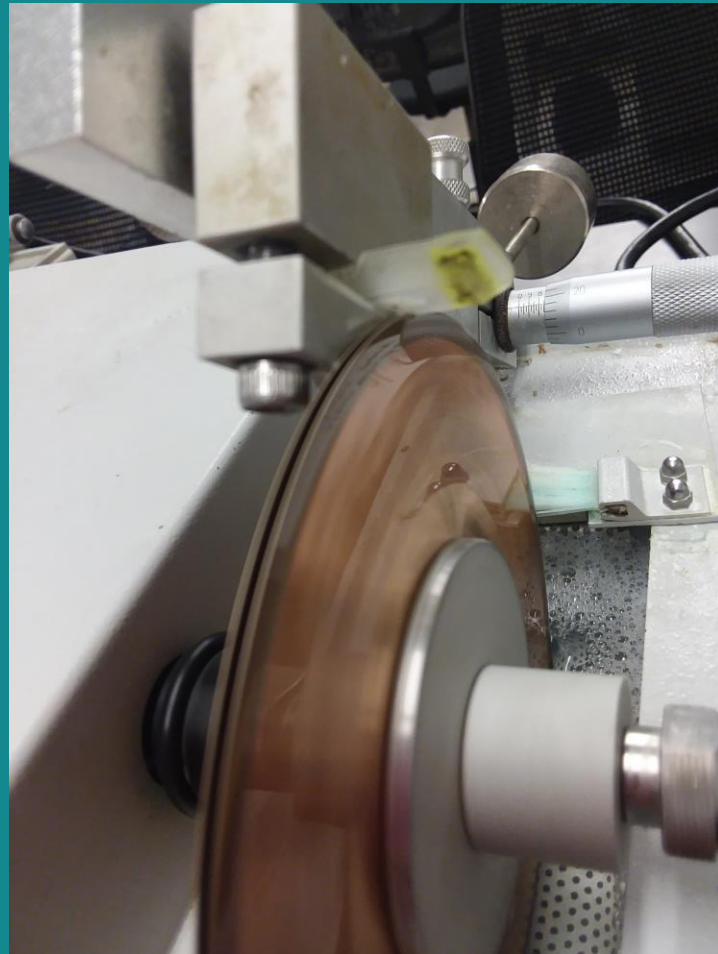
Otoliths are embedded in epoxy, and once set can be removed for aging



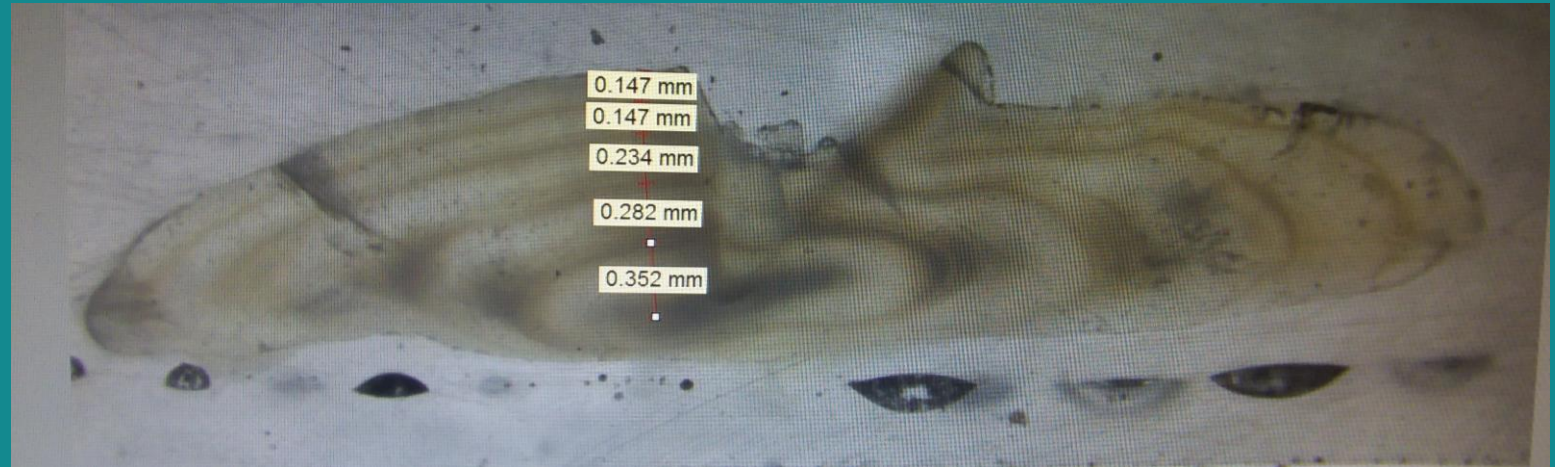
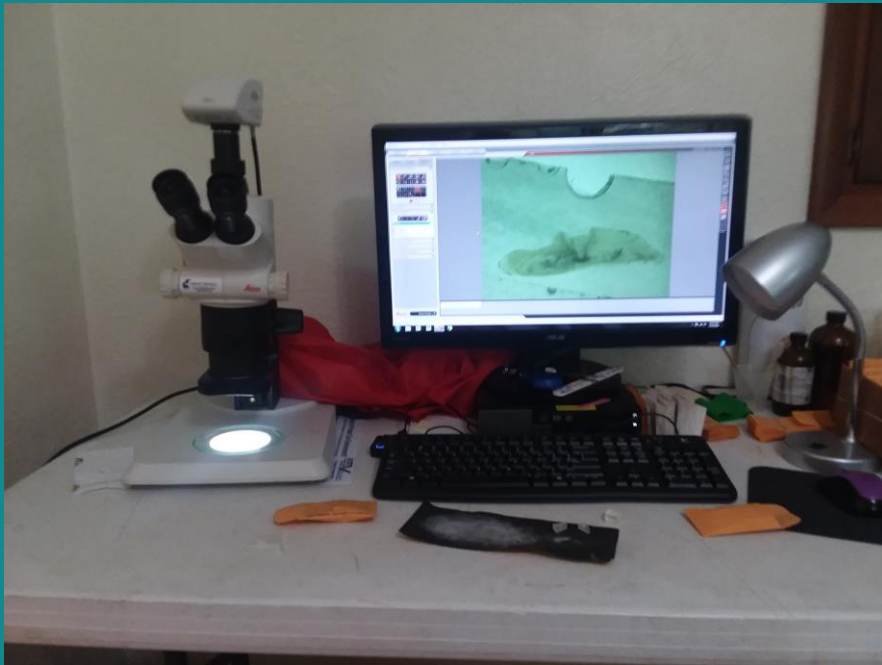
Otoliths are sectioned using a Buehler low speed saw and a double blade method



Double blade set up on an isomet low speed saw



Otoliths are aged, measured and photographed using Lecia software, and a dissecting scope with camera



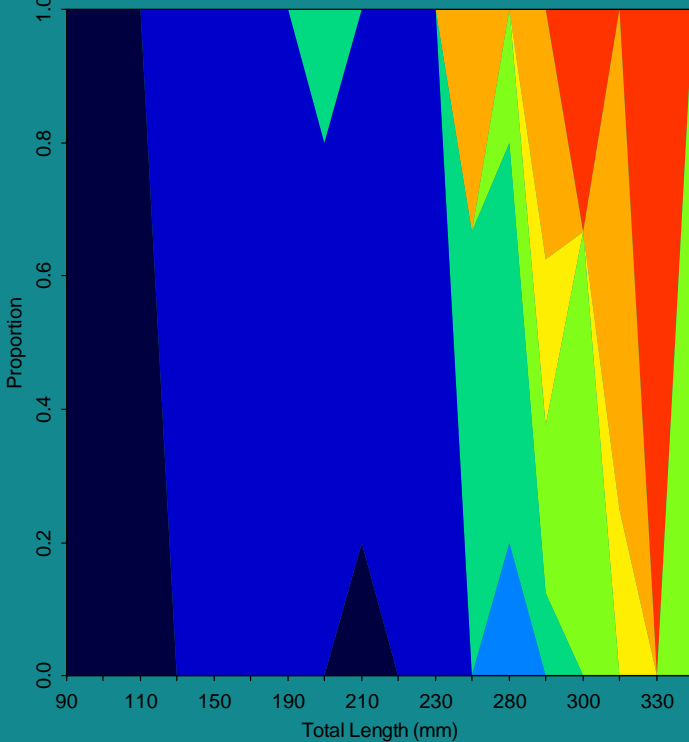
Objectives:

Using Largemouth Bass, Bluegill, and Black Crappie otoliths and catch data we will be determining what environmental, or management factors are affecting:

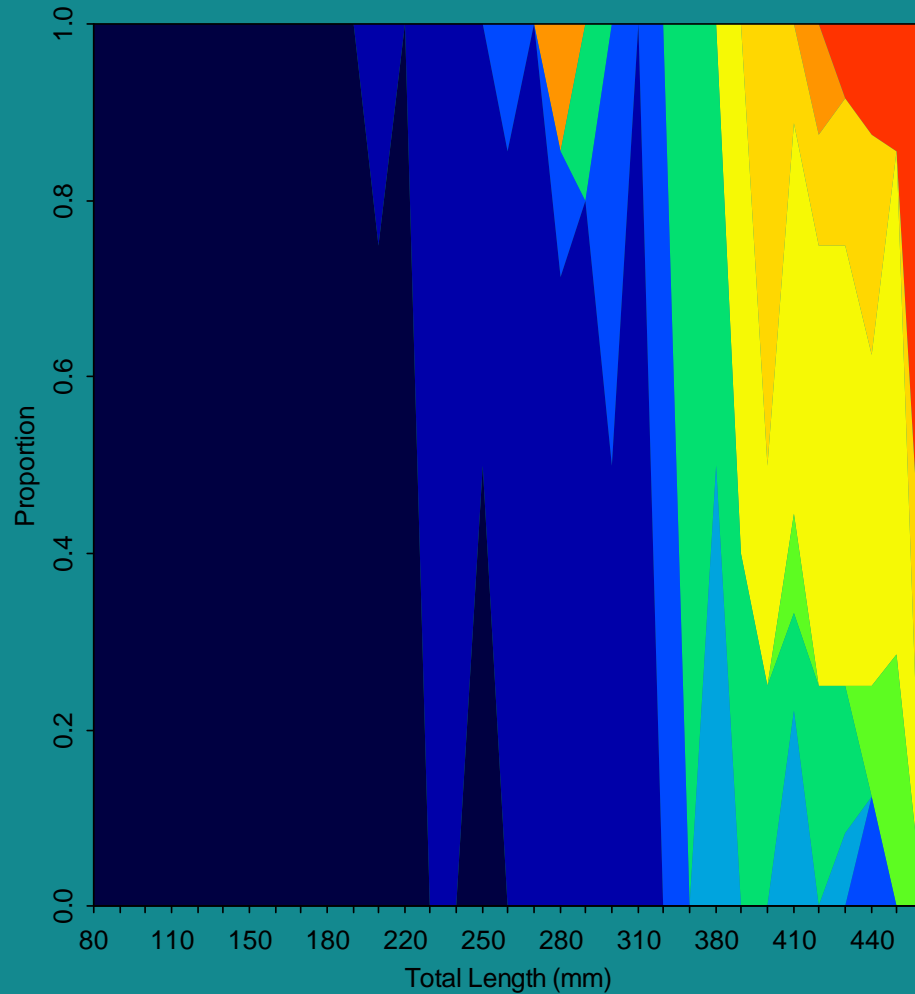
- 1) Biochronology or annual growth
- 2) Mortality and individual growth
- 3) Year-class strength

Age-Length Keys were generated with aged fish, and general monitoring data

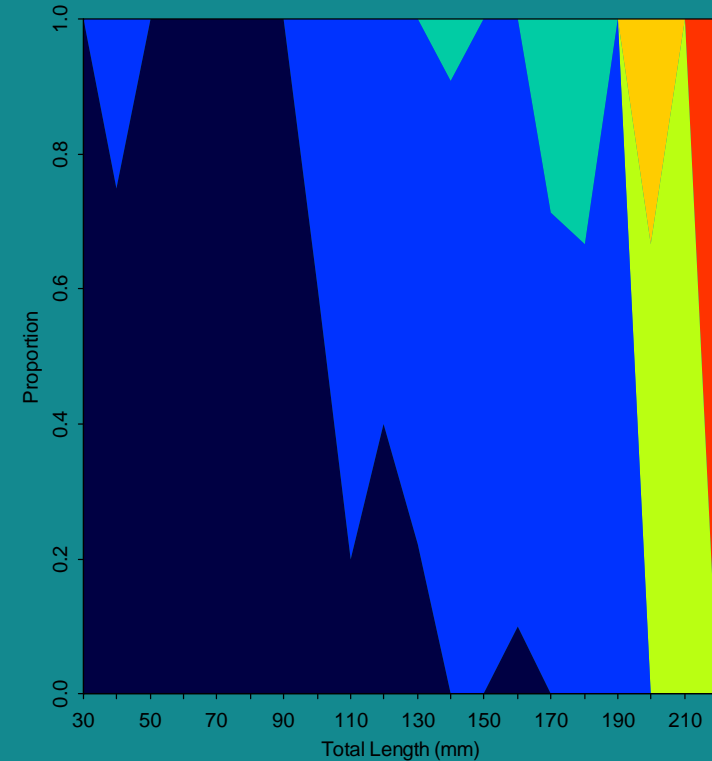
2020 Black Crappie



2020 Largemouth Bass

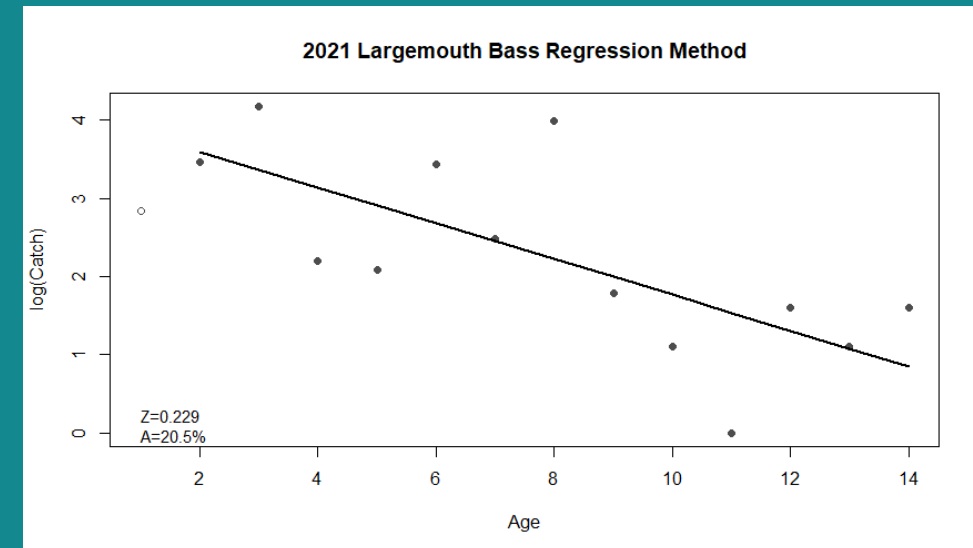


2020 Bluegill



Largemouth bass, Black Crappie, and Bluegill total annual mortality rates (A) and total instantaneous mortality rates (Z) from 2020 and 2021 generated from catch-curves

Year	Species	Z (instantaneous)	A (annual)
2020	Largemouth Bass	0.27	23.7%
2020	Black Crappie	0.24	21.7%
2020	Bluegill	1.51	78%
2021	Largemouth Bass	0.23	20.5%
2021	Black Crappie	0.21	18.8%
2021	Bluegill	0.98	62.4%



Objectives:

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Year-class Strength with management actions

2009: Highest Veg coverage

2016: highest lake water elevation

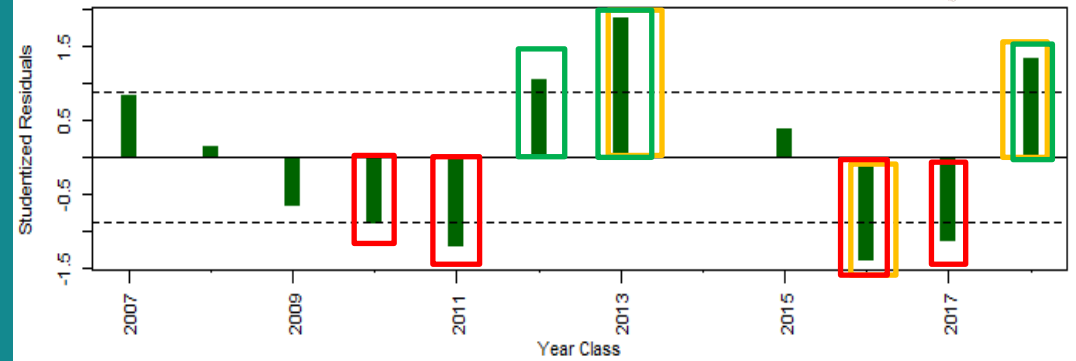
2020: 2nd Drawdown event

2007-08 Initial Stocking

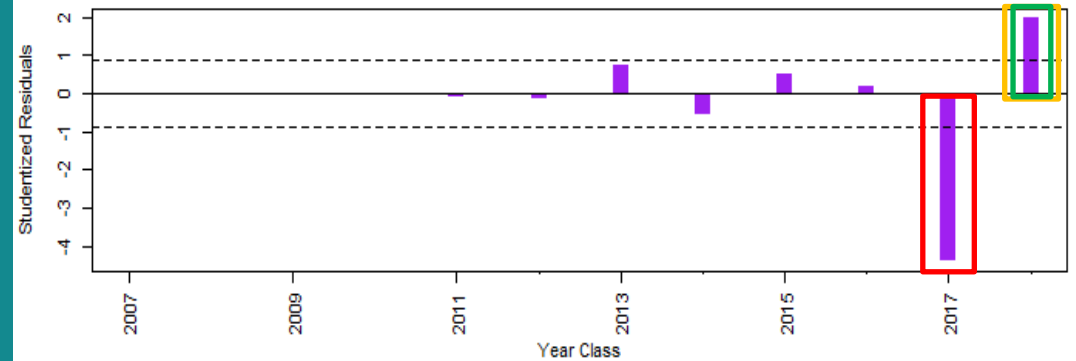
2013: Levee Overtopped

2018: 1st Drawdown event

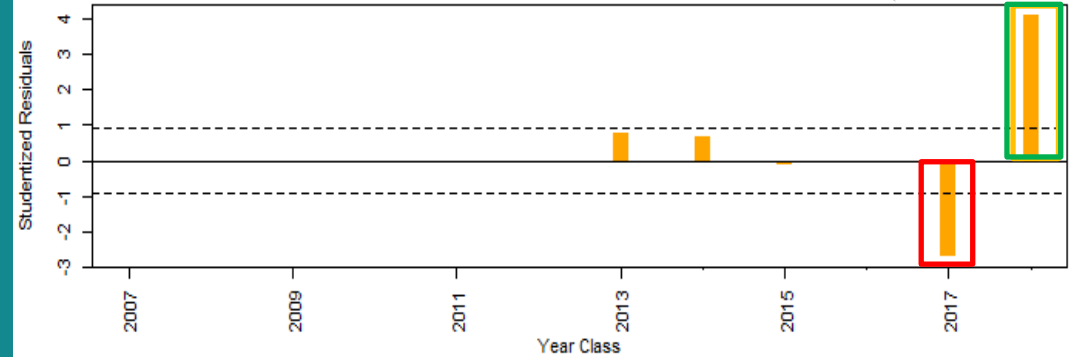
Largemouth Bass Year-Class Strength 2020



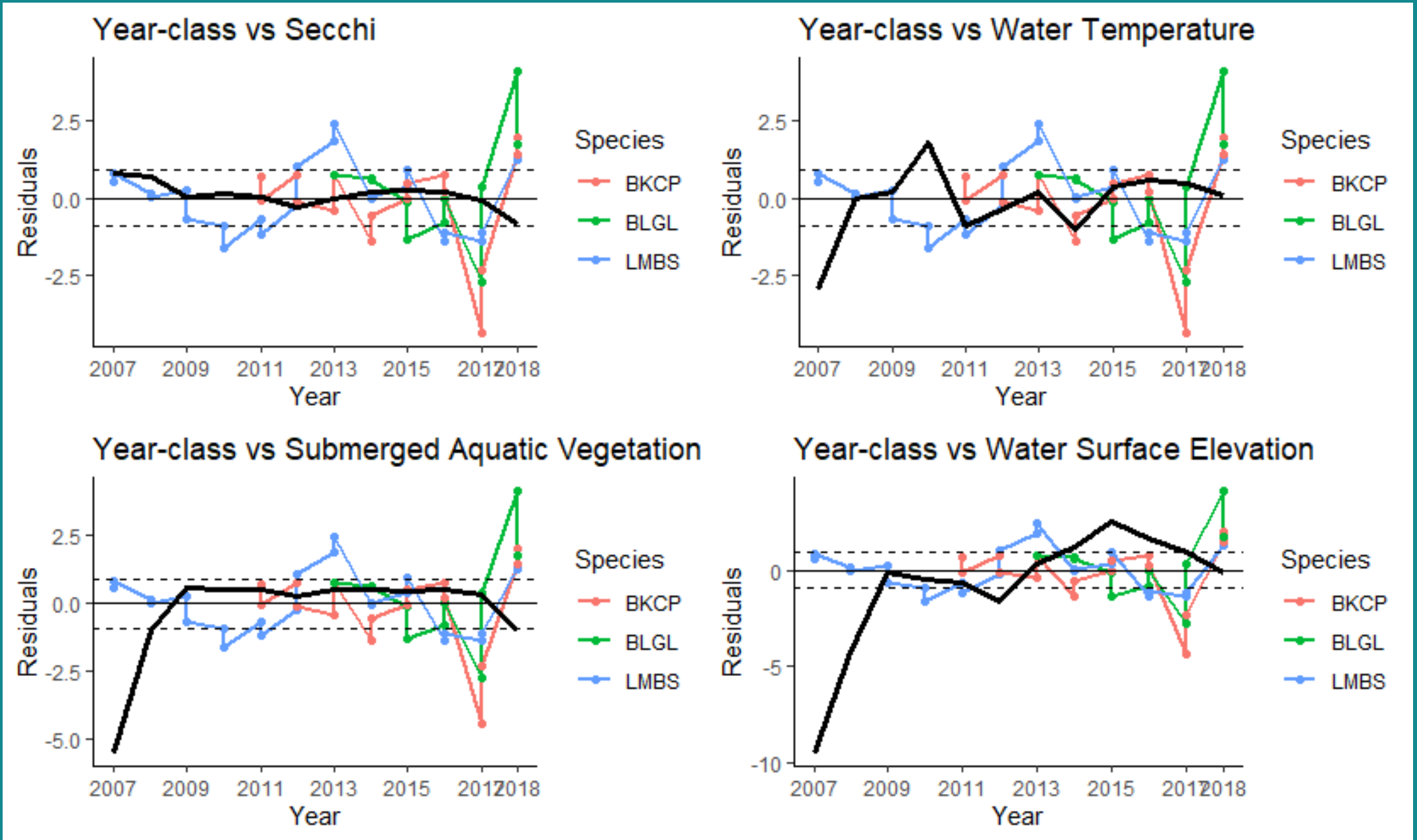
Black Crappie Year-Class Strength 2020



Bluegill Year-Class Strength 2020

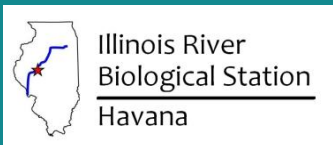


Year-class Strength for all species plotted against four environmental variables



Conclusions

- Mortality rates for Largemouth Bass in Emiquon are 21.3% and are significantly lower compared to a paper by Allen et. al. 2008
- Black Crappie mortality rates in Emiquon are 18.1% lower than the estimate given in Pauket et. al. 2001
- Bluegill mortality rates in Emiquon are 75.7%, much higher than the estimate given in Pauket et. al. 2001 of 30.9%
- All species show a strong year-class in 2018
- There are potential overlaps between year-class strength, management activities, and environmental variables



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Questions?

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