Catch and Release Mortality of Striped Bass (*Morone* saxatilis) in Smith Mountain Lake, VA

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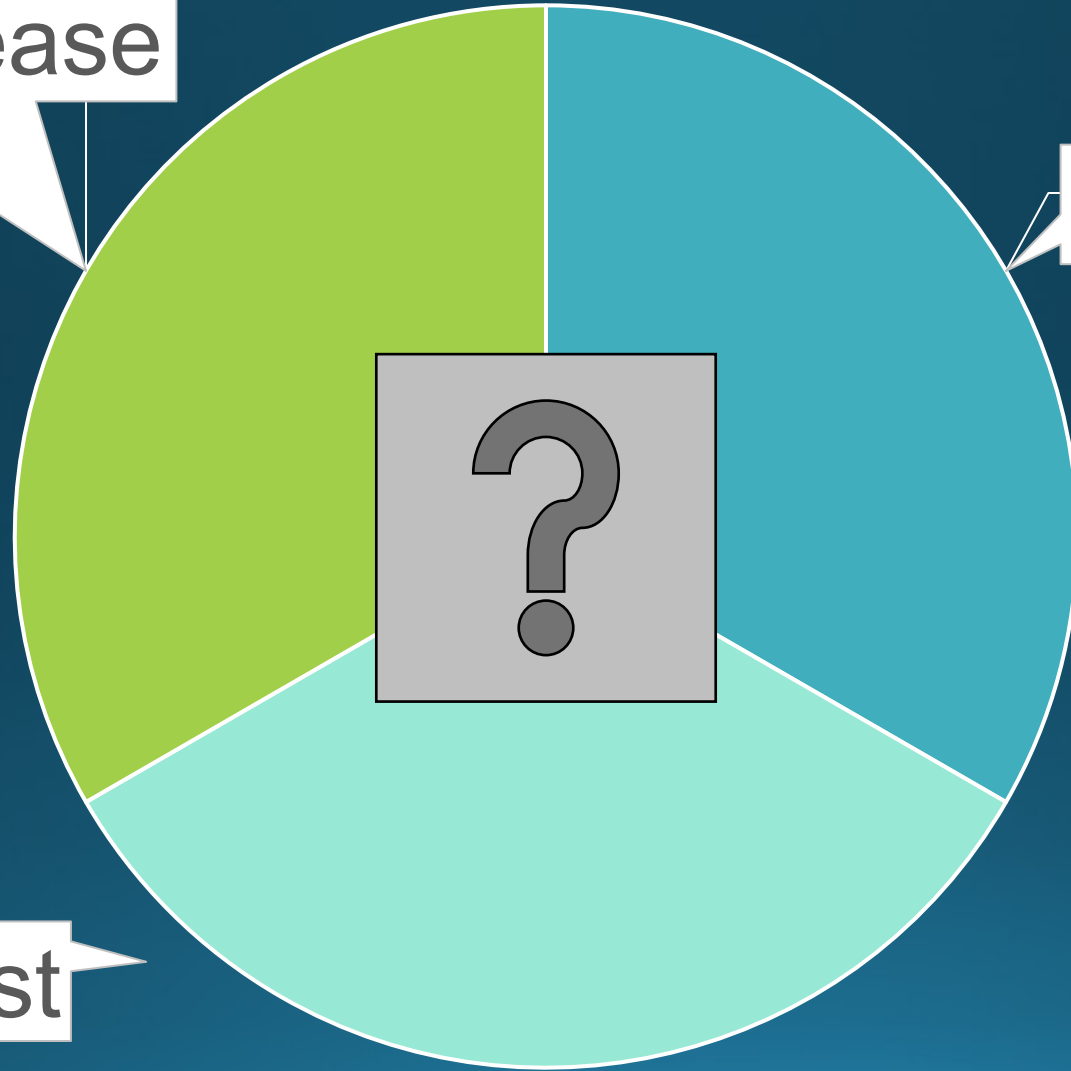
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VDWR

Total Fish Mortality

Catch and Release Mortality (CRM) involves many variables

Anthropogenic

- Fight time
- Hook location
- Gear type
- Handling time

Natural

- Temperature
- Fish age/ maturity
- Depth angled
- Body size

Previous CRM striper studies

- Temperature and gear type seem to be biggest factors

- Increases in mortality have been observed during summer months (40 – 83% in summer vs. 0-21% in spring)

- Proportion of Stripers lost estimated based on temperature and release rates of many different lakes (Including Smith Mountain)

Bettinger and Wilde 2013

Research impacts to striper CR management

- Most State agencies were unsure how much CRM contributes to overall mortality (> 50% of respondents)

- Only 4 of 24 states considered CRM important for management (NY, VA, MD, and SC)

- CRM thought to be a more social issue than biological

Bettinger and Wilde 2013

SML is different than other southern striper reservoirs

	SML, VA	Lake Murray, SC
Avg. Depth (ft)	115	46
Max Depth (ft)	220	200
Surface Area (Acres)	20480	48432
Summer Surface Temperature (°C)	25 - 27	24 - 29
DO below thermocline	Oxygenated	Anoxic in summer
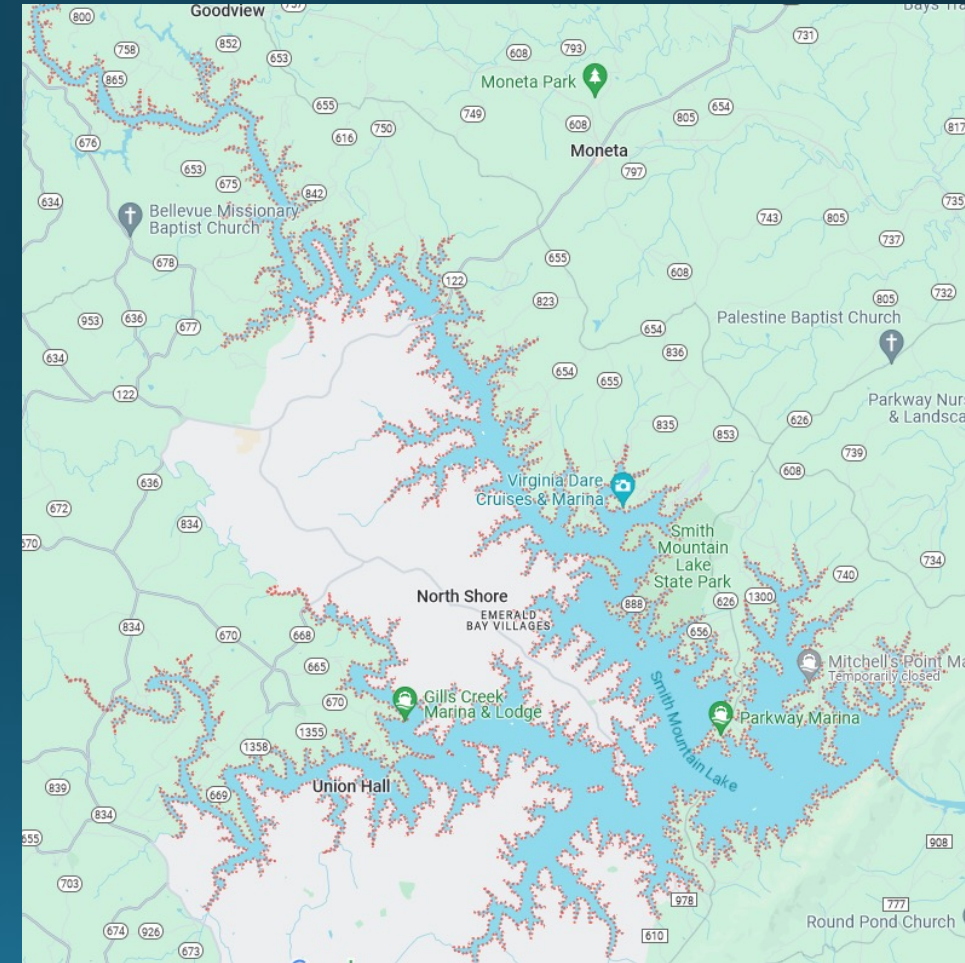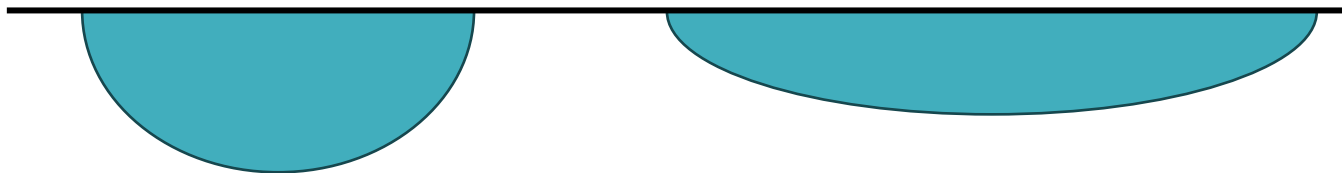
Challenges to inland Striped Bass

- First hypothesized by Coutant in 1985

Donovan 2007
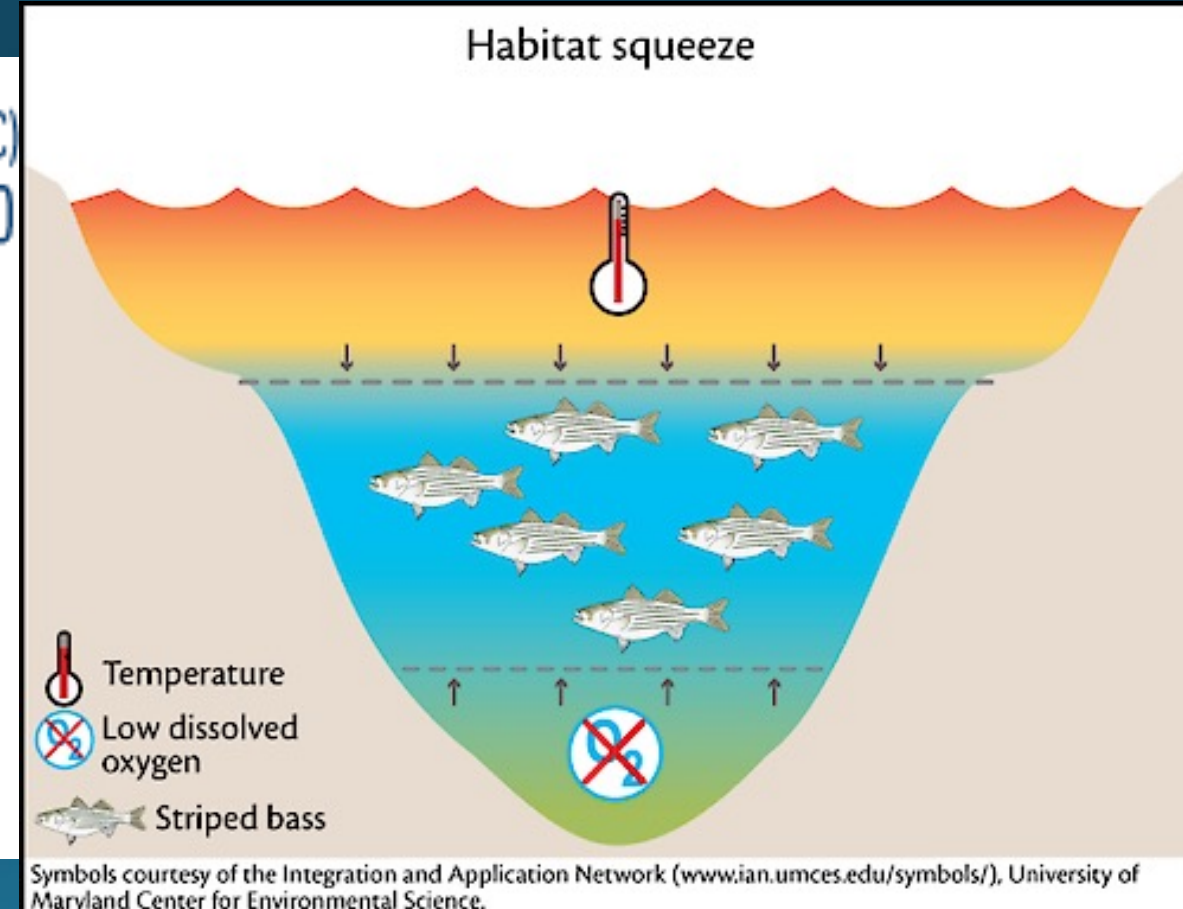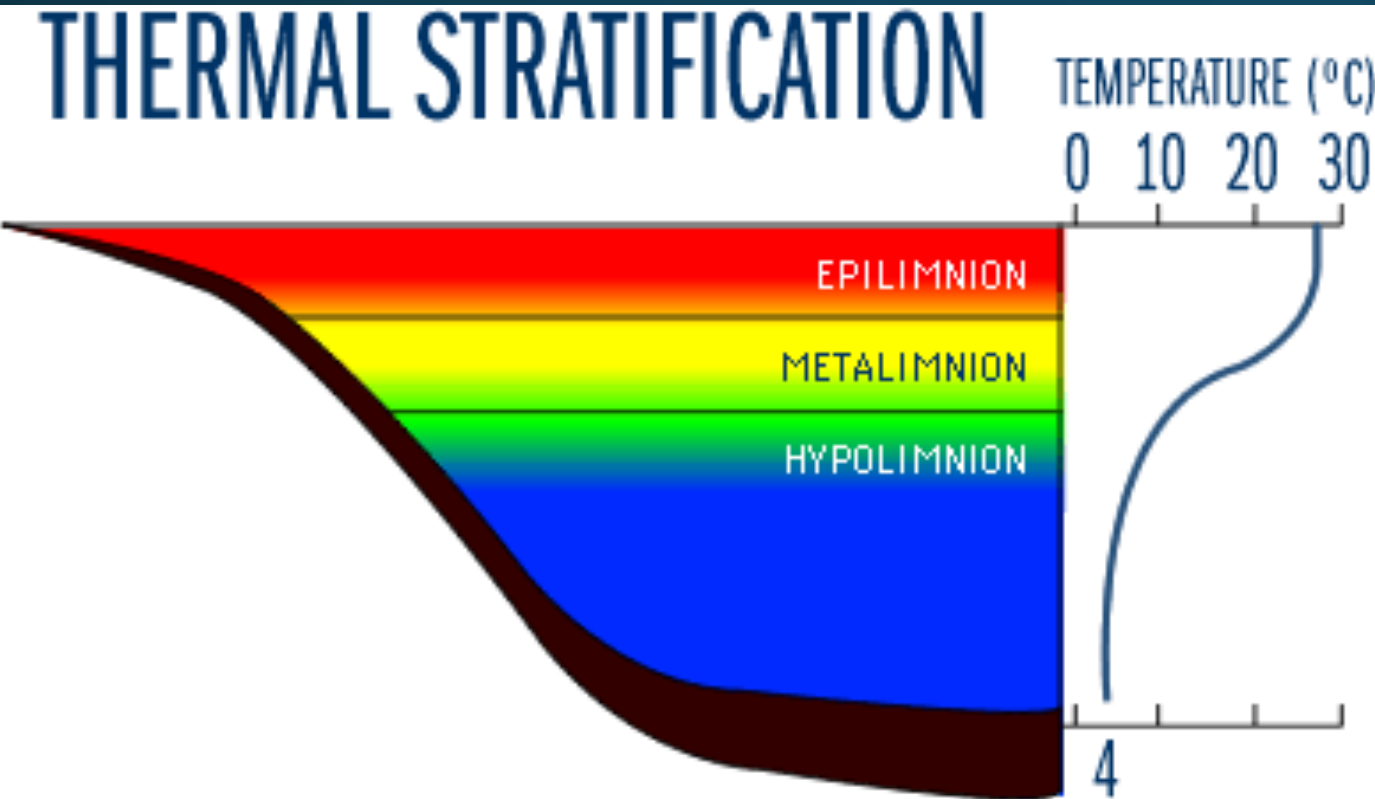
Striper temperature and oxygen requirements

- Stripers are known to prefer Temps <25 °C and >3 mg/L O_2 (Coutant 1985)
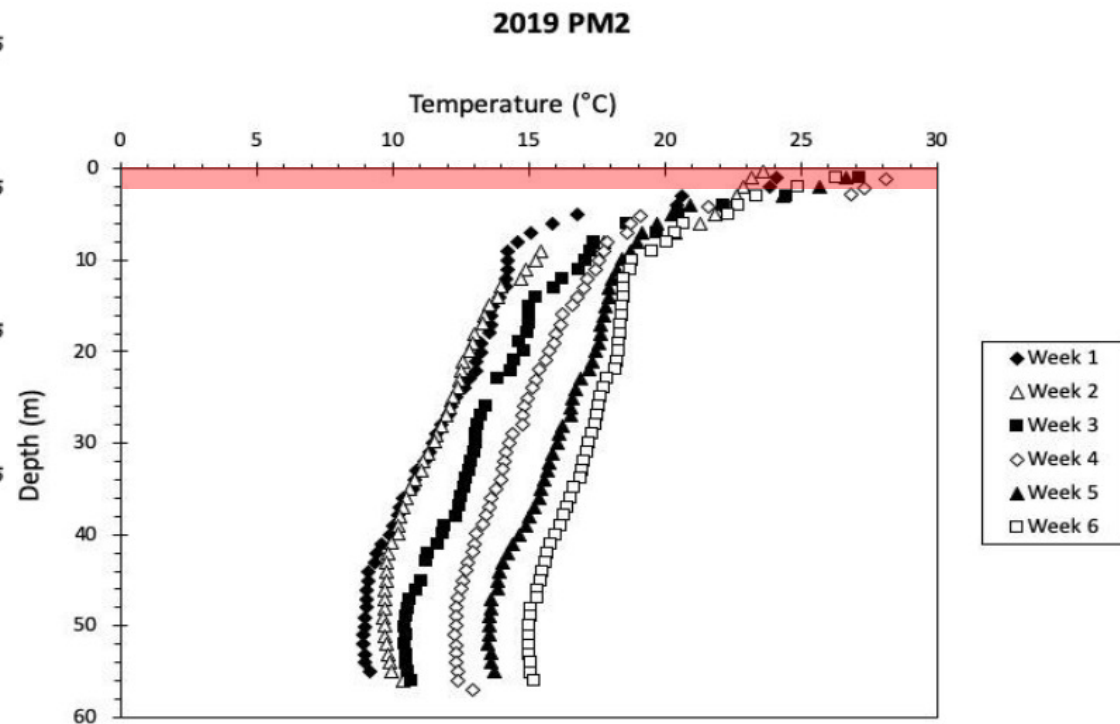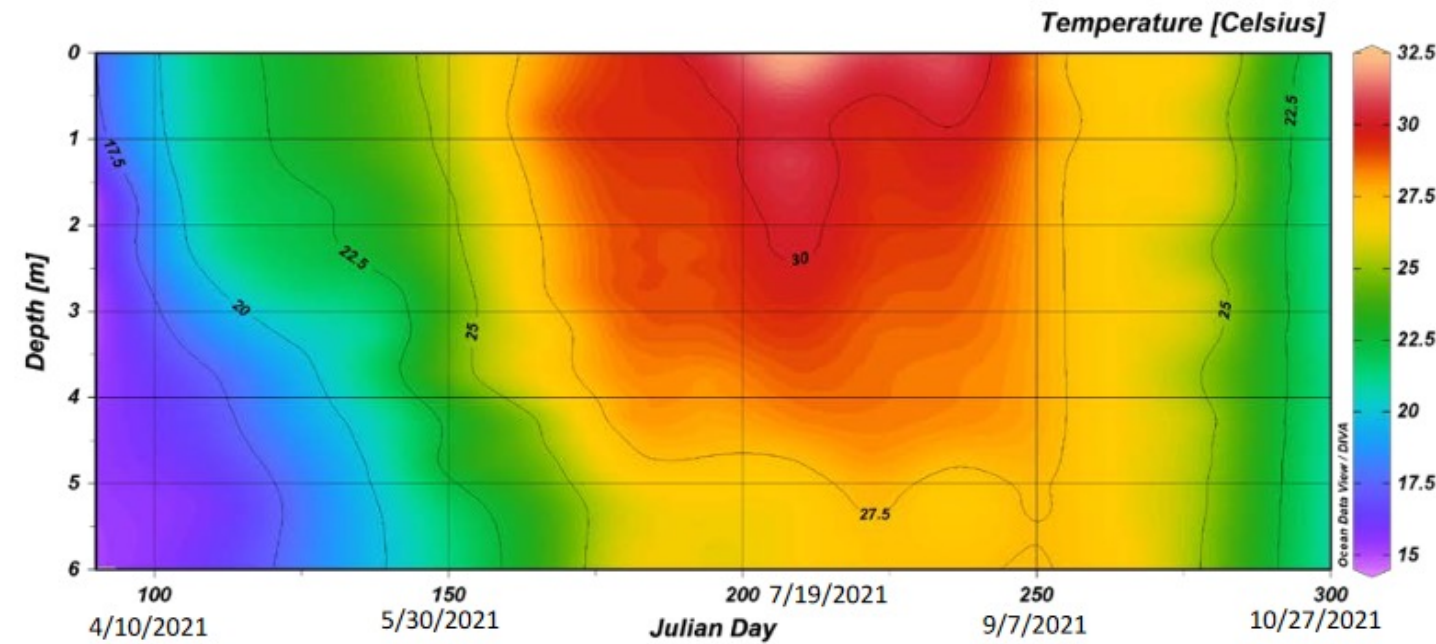
Lake Murray, SC

Smith Mountain Lake, VA

Figure 2. Temperature (°C) section plot for S-326 in the Clouds Creek arm of Lake Murray. Corresponding calendar dates are listed next to Julian Day labels.

Baumann 2022

Heck et al. 2019

TABLE 8. Total catch estimated from summer creel surveys, release rate for caught striped bass, average summer water temperatures, mortality rates based on temperature and bait type, and proportion of total catch lost to catch and release (C&R) angling for seven southeastern impoundments.

Year	System	Total catch	Release rate	Temperature (°C)	C&R mortality rates Natural	C&R mortality rates Artificial	Proportion of total catch lost to C&R mortality Natural	Proportion of total catch lost to C&R mortality Artificial
1998	Smith Mt Lake, VA	15,715	0.60	26.3	0.65	0.32	0.39	0.19
2003	Smith Mt Lake, VA	20,957	0.58	25.8	0.63	0.31	0.37	0.18
2006	Smith Mt Lake, VA	6,167	0.56	27.1	0.68	0.35	0.38	0.20

Lake Murray, SC
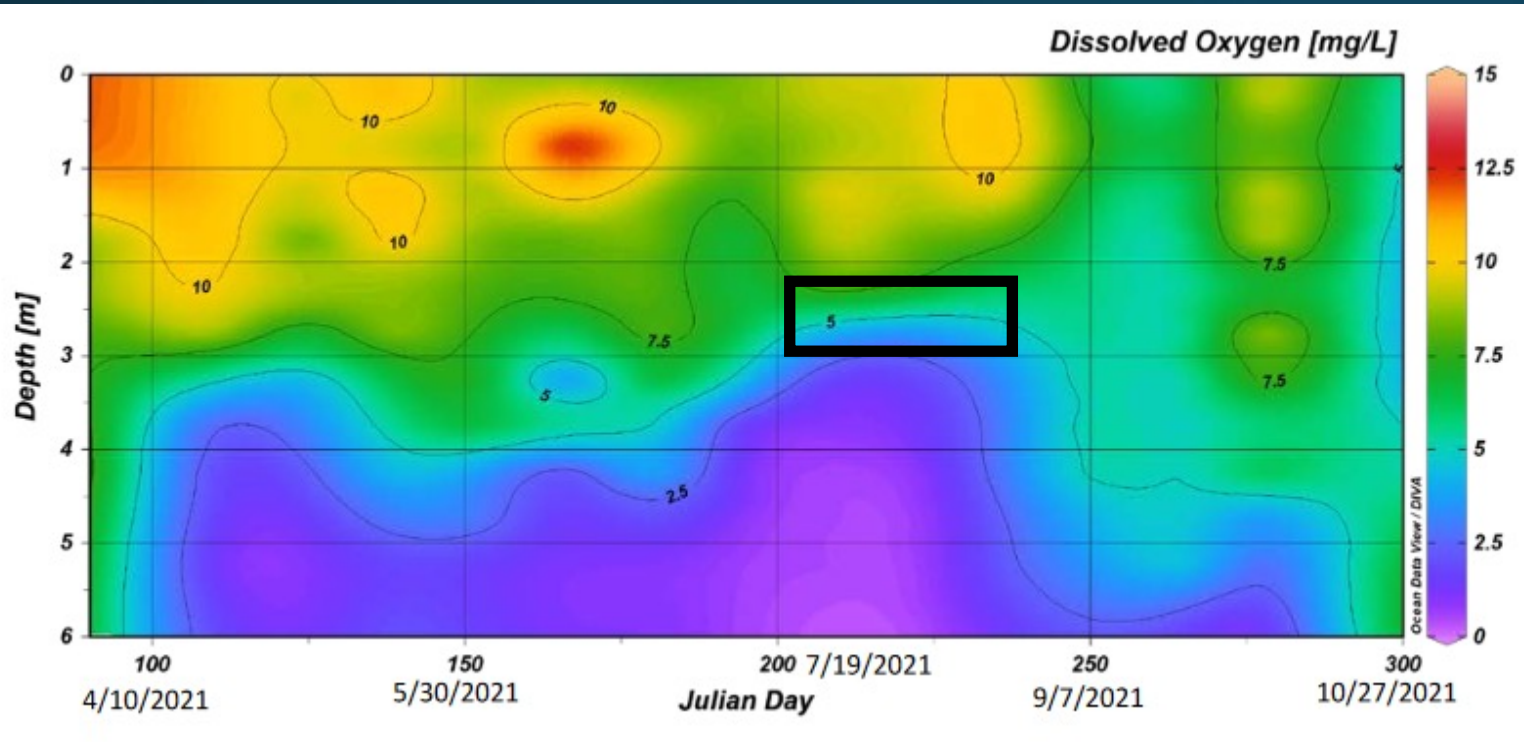
Smith Mountain Lake, VA
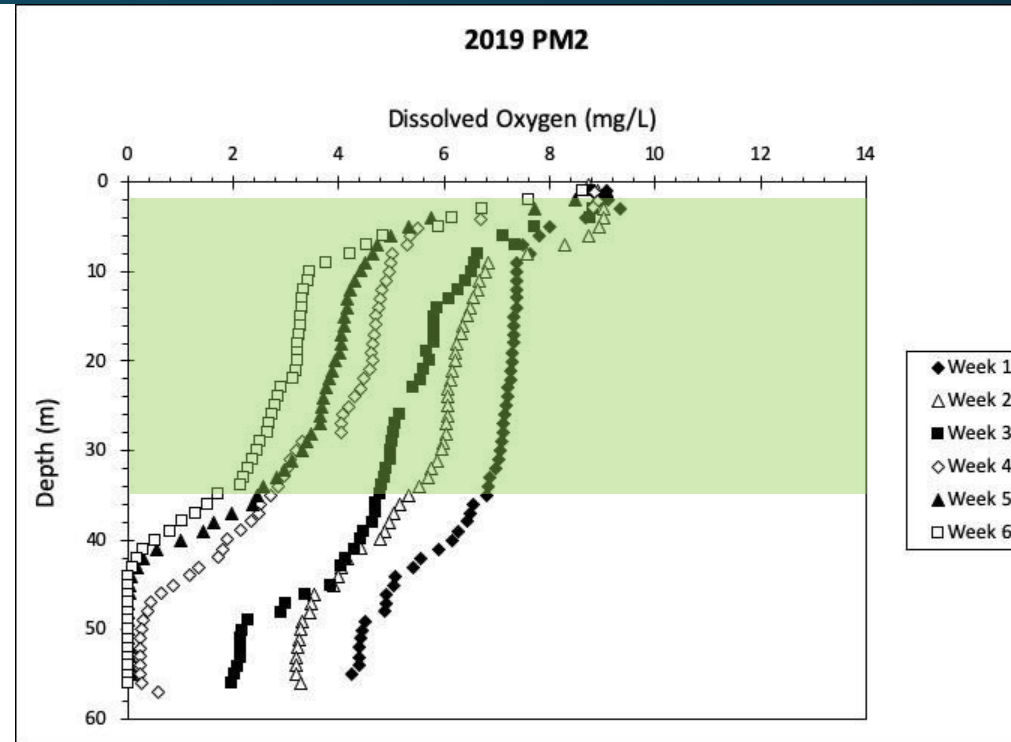
Current VA Guidelines and Regulations

- Regulations
  - Two fish per person per day aggregate (combined)
  - Nov. 1 – May 31: No Striper between 30" and 40"
  - Jun. 1 – Oct. 31: No length limit

- Recommendations
  - Keeping fish wet and limiting unnecessary handling
  - Stop fishing after reaching creel limit

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Do the current management regs and guidelines reflect the SML system?

1. CRM estimate
2. Identify temperatures Stripers are utilizing
3. Modeling different conditions and release rates to compare management effectiveness
4. Evaluate impacts of CRM on trophy potential

Study design – Data Collection

- Stripers caught angling – Artificials, maybe live bait
  - Expected sampling in June (10 fish), July- August (40 fish), and October (10 fish) 2024 and 2025
- Tagged using acoustic transmitters

Study design – Data Collection

- Fish is intensely followed for a week or two via Hydrophone
  - Short term death expected in 72 hours
- Differences in position indicate survival
  - 3 consecutive tracks with no movement presumes fish is dead

Study design - Modeling

- Estimate catch and release mortality in SML
  - How does fight time, hook location, handling time, temperature, body size, and depth angled affect proportion of a fish dying
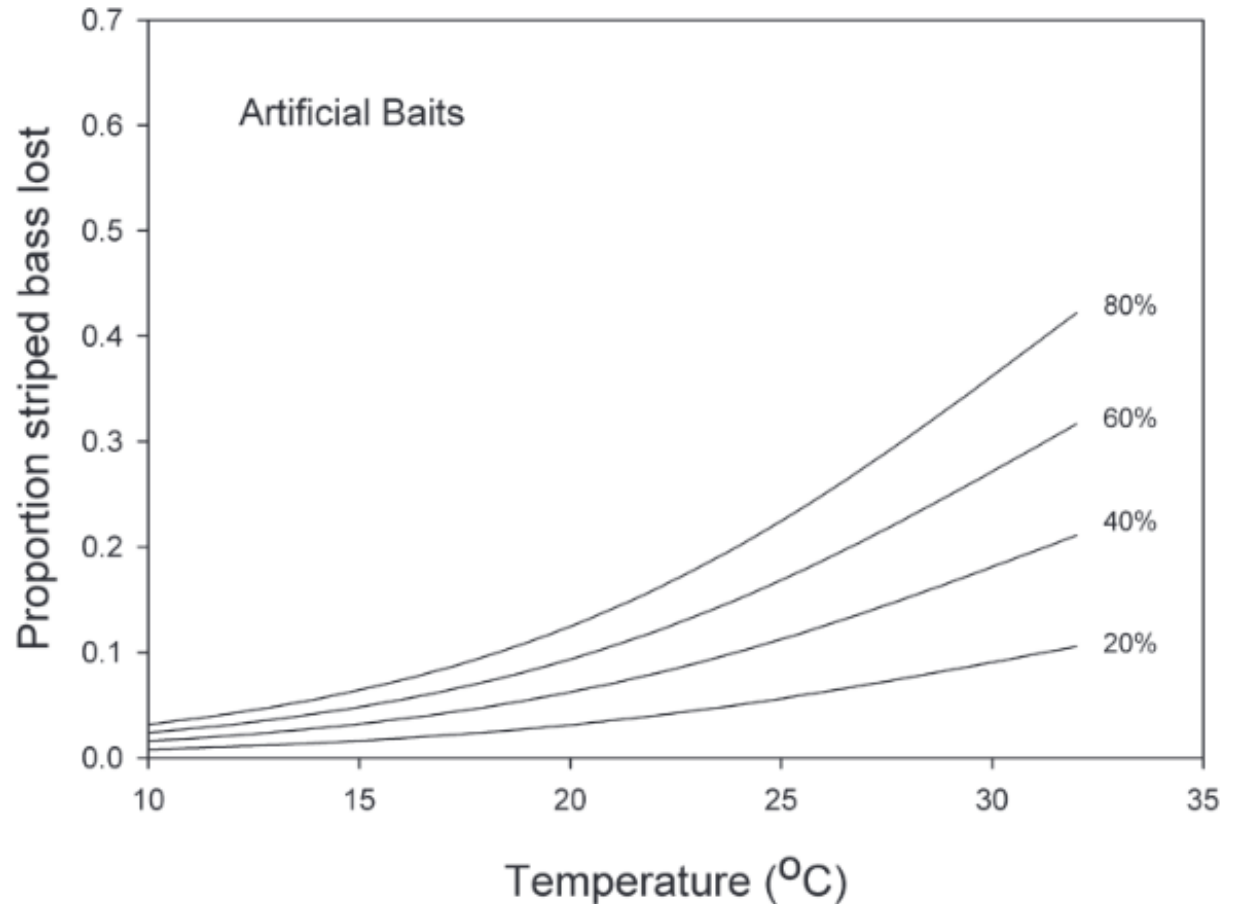
- Run simulations

Bettinger and Wilde 2013

FIGURE 3. Proportion of striped bass total catch that is predicted to die due to catch-and-release mortality based on temperature, and four release rates (20, 40, 60, and 80%) for striped bass caught on natural baits (top panel) and artificial baits (bottom panel). Proportions were estimated by multiplying release rate by the mortality rate estimated from the bait-specific logistic regression equations presented in the text.

Management implications

- Make adjustments to summer fishing guidelines and best practices based on data from this study

- If first year supports enough data, additional analyses with differences in live bait could be evaluated in year two

Acknowledgements

- Coastal Carolina University

- Virginia Department of Wildlife Resources

- Federal Aid in Sport Fish Restoration

- Smith Mountain Striper Club

Questions?