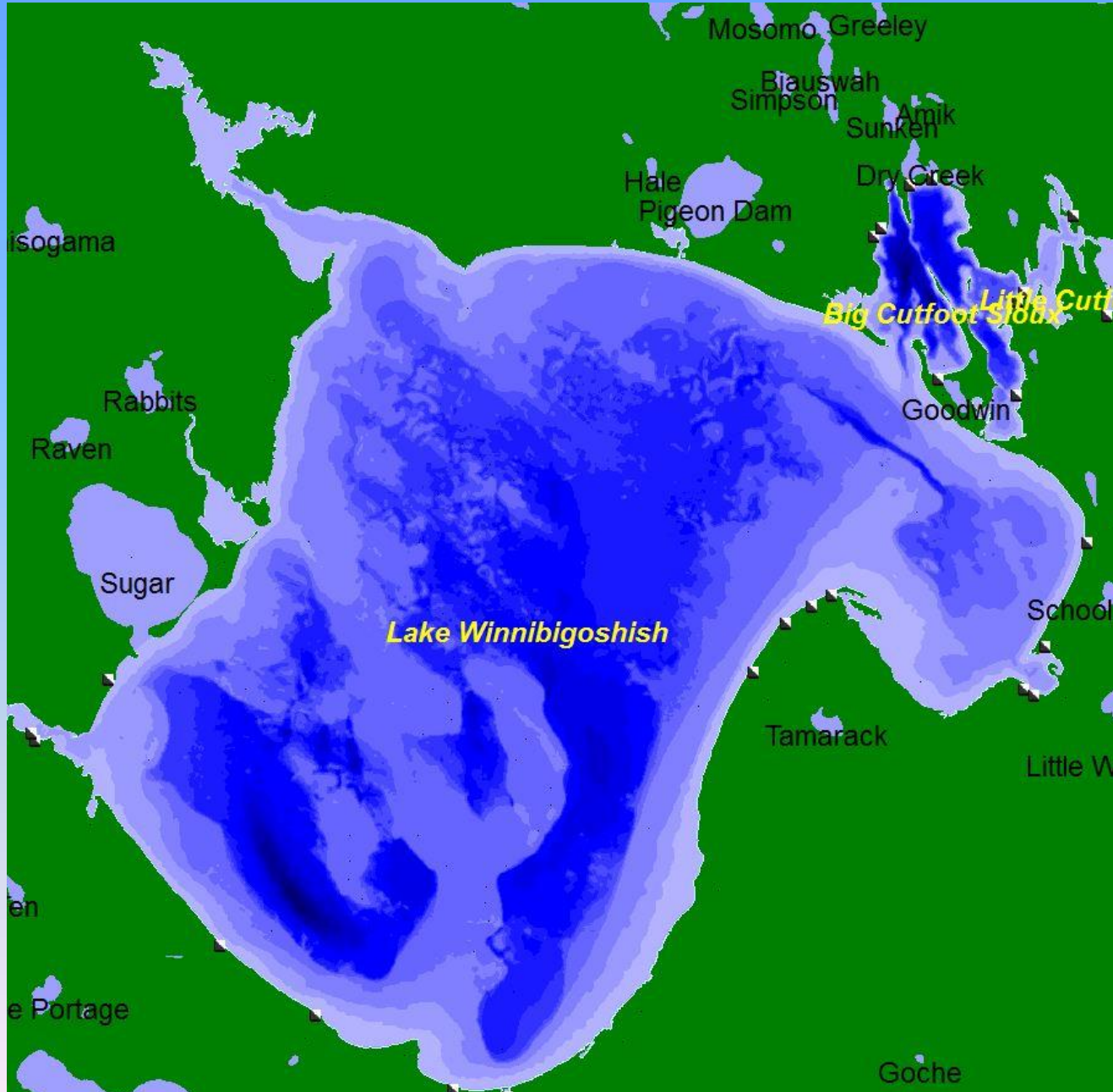


# Lake Winnibigoshish - Times, they are a-changin' (Bob Dylan)



- 1926 – First year of Cut Foot Walleye spawn take
- 1935 – First netting assessment
- 1937 – First Walleye mark recapture study
- 1938 – First creel survey
- 1978 – Yellow Perch possession limit established, 100 fish
- 1983 – Annual large lake assessments begin
- 1985 – Walleye catch and release program
- 1987 – First fisheries RIM project, Highbanks stabilization
- 2000 – Yellow perch daily limit changed to 20
- 2000 – 17 to 26 inch Walleye slot limit implemented
- 2007 – Thousands of ducks die due to parasites
- 2012 – Zebra mussel veligers discovered
- 2015 – 18 to 23 inch Walleye slot limit implemented
- 2016 – Starry stonewort discovered
- 2017 – Zebra mussel cover nearly every hard surface



- Zebra mussel invasion and changes in water quality
- Status of the Winnie Walleye population
- Winnie building blocks needed to support a Walleye population
- Management changes to help support the Walleye population
- Other species

## Terms used in this presentation

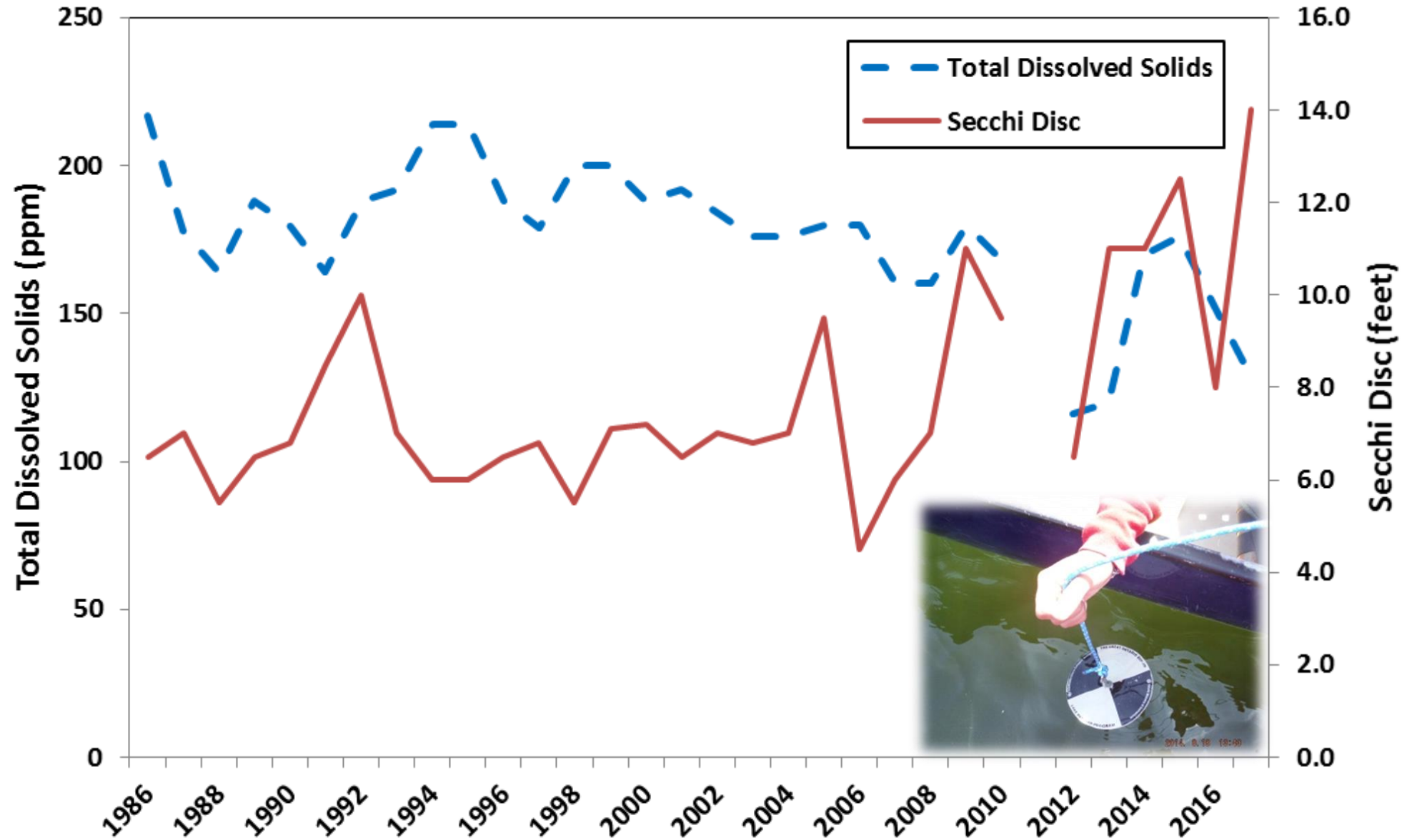
Spawning stock biomass = pounds of adult female walleye

Recruitment = survival of a year class of fish past their first winter

Total dissolved solids = Minerals dissolved in the water

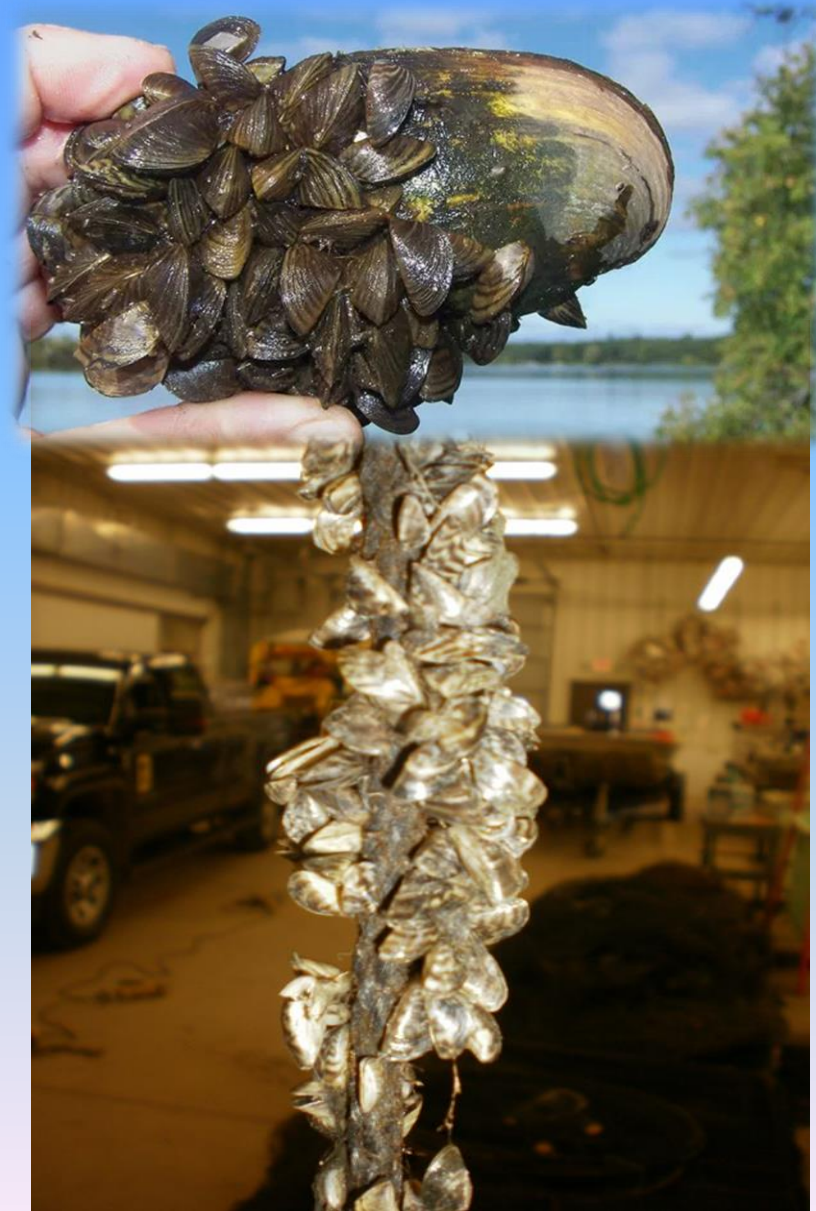
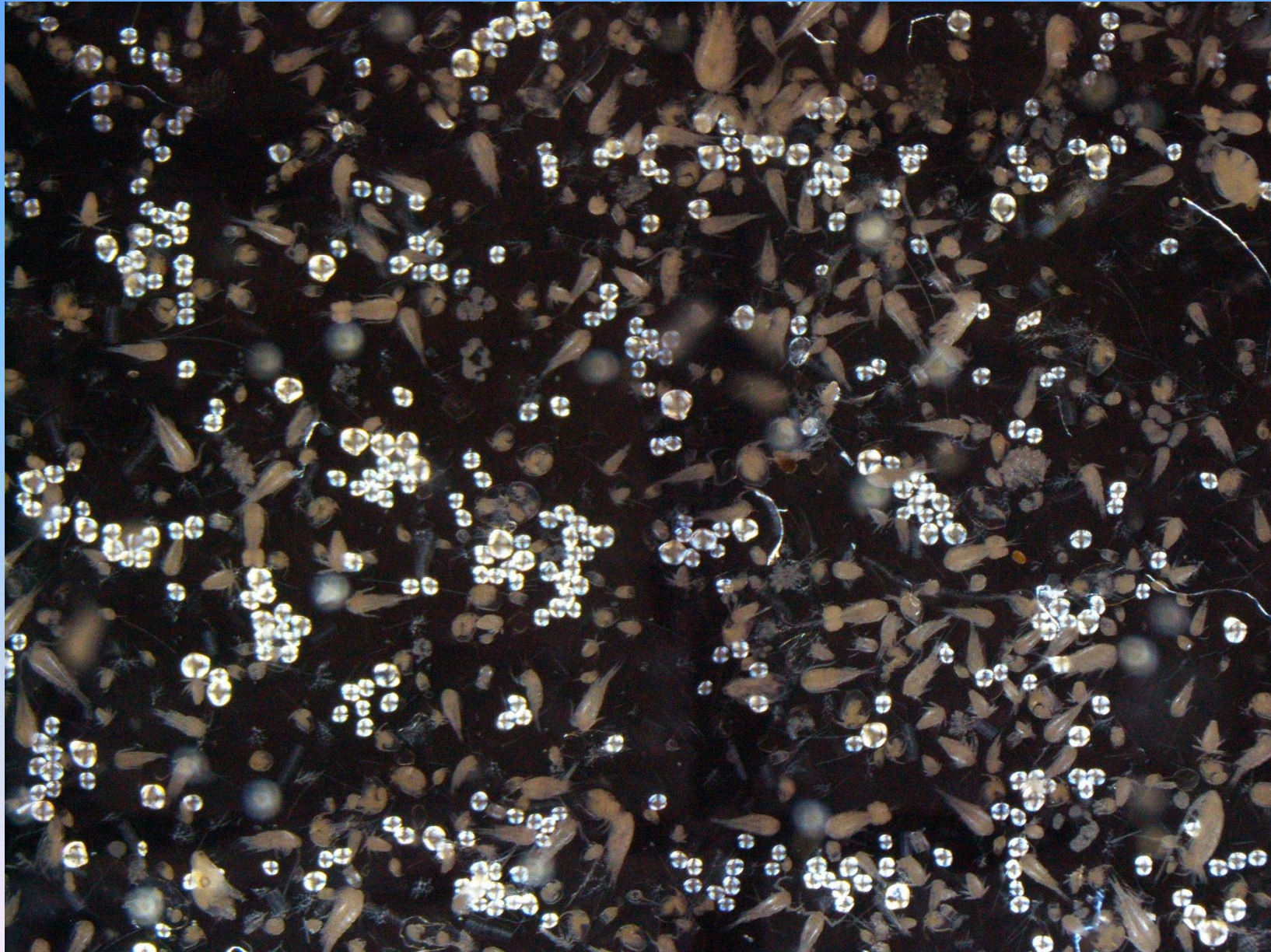
Veliger = Immature zebra mussel

# Lake Winnibigoshish water chemistry





# Lake Winnibigoshish zebra mussel development





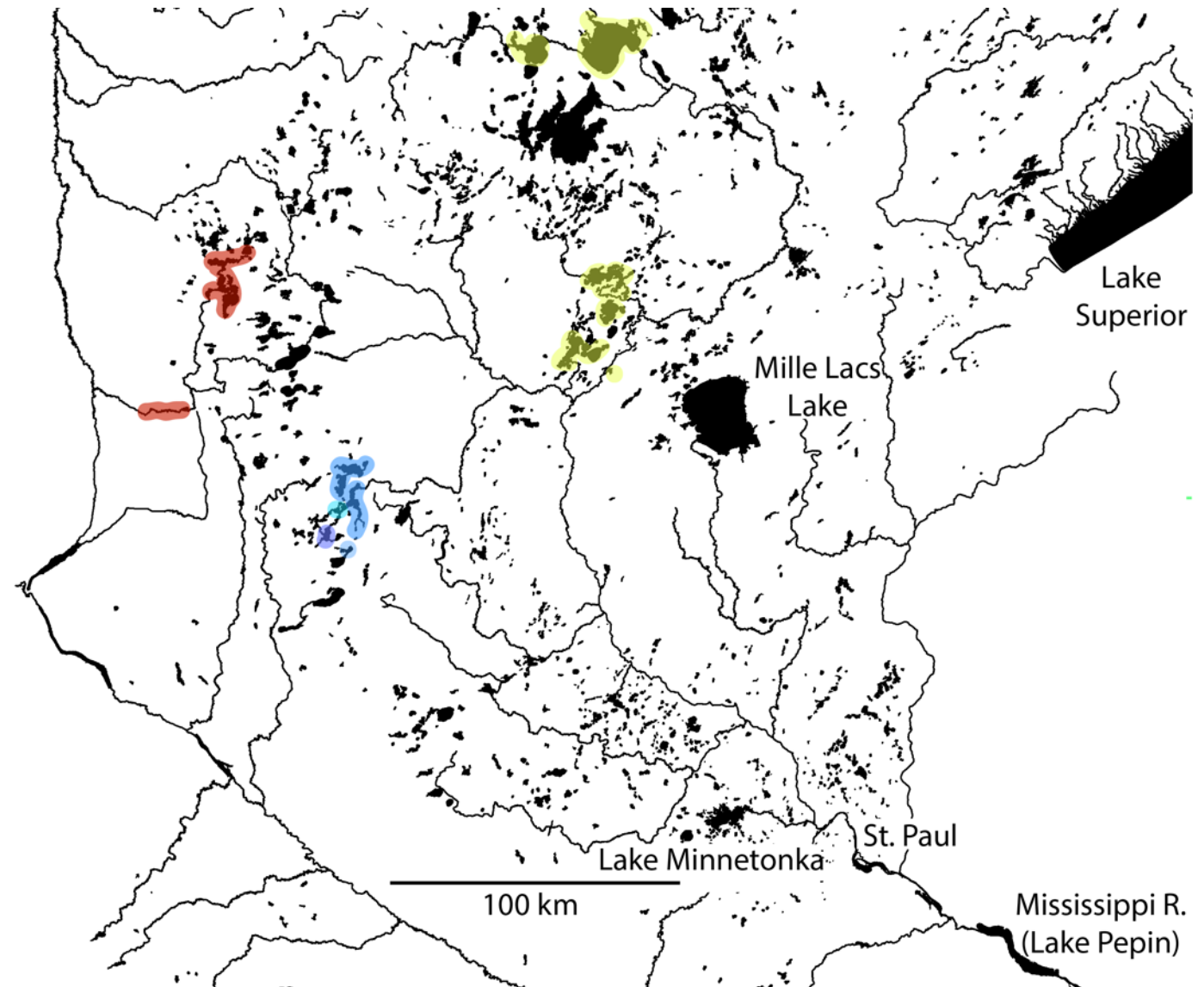
# Most MN zebra mussel invasions are in clustered lake regions

Zebra mussel live 3-5 years.

Produce up to 1 million eggs per year.

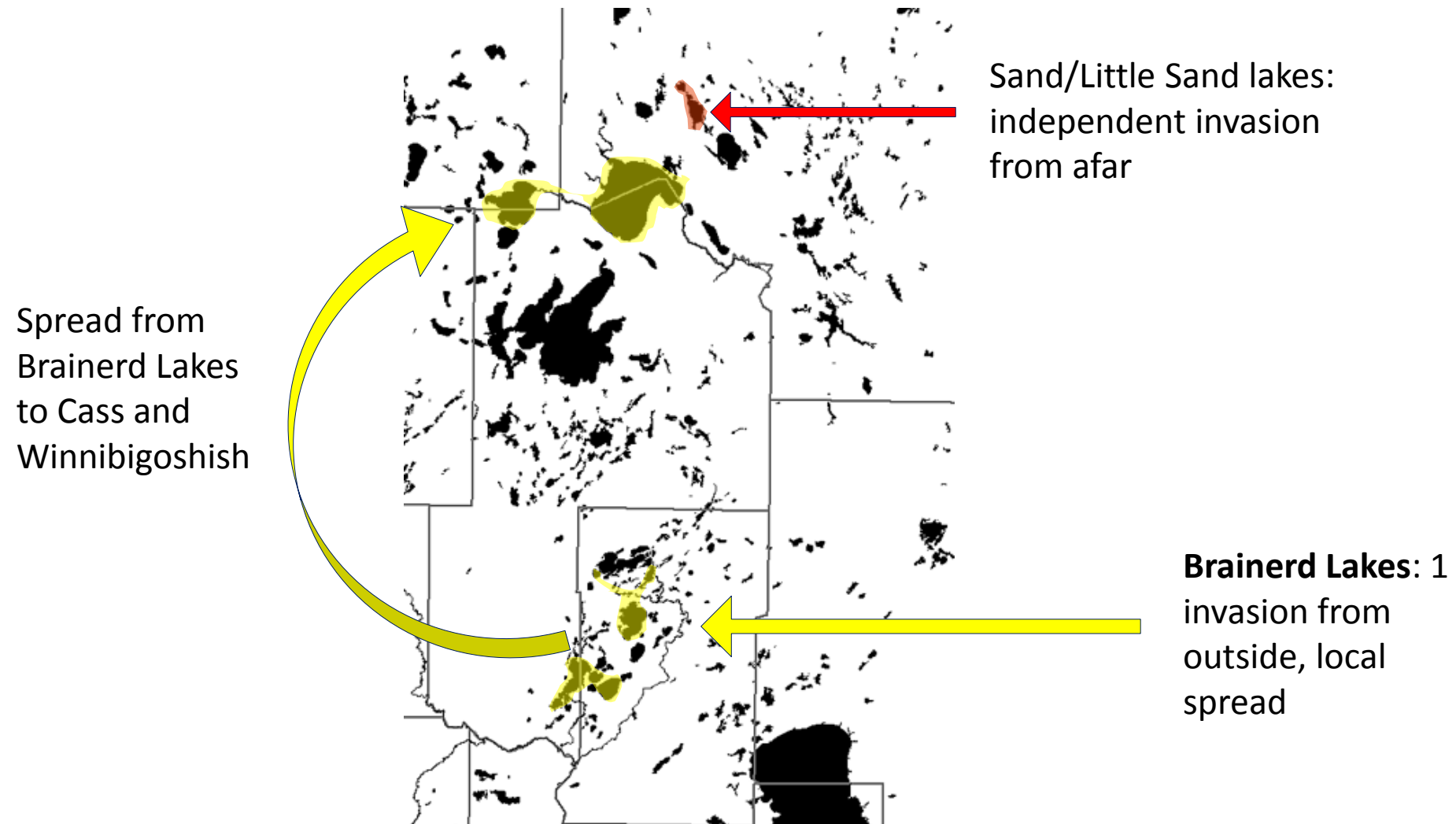
Can filter the entire water volume of a lake in 2-3 days.

As many as seven hundred thousand mussels can occupy one square meter of substrate.

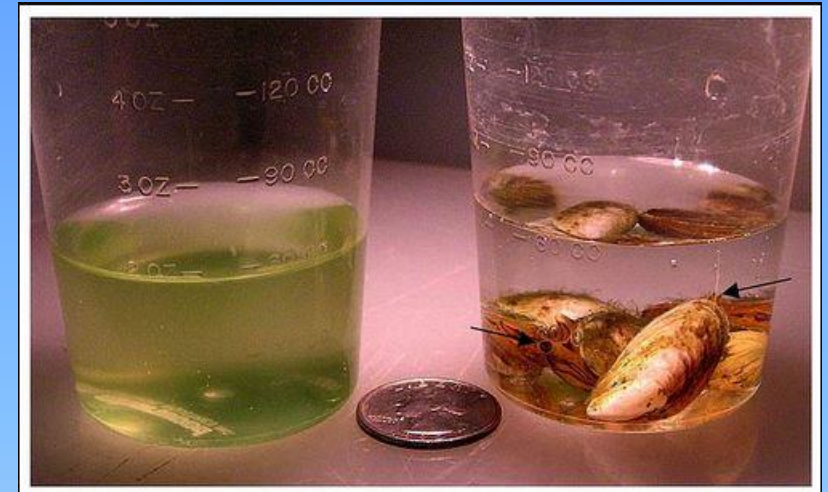
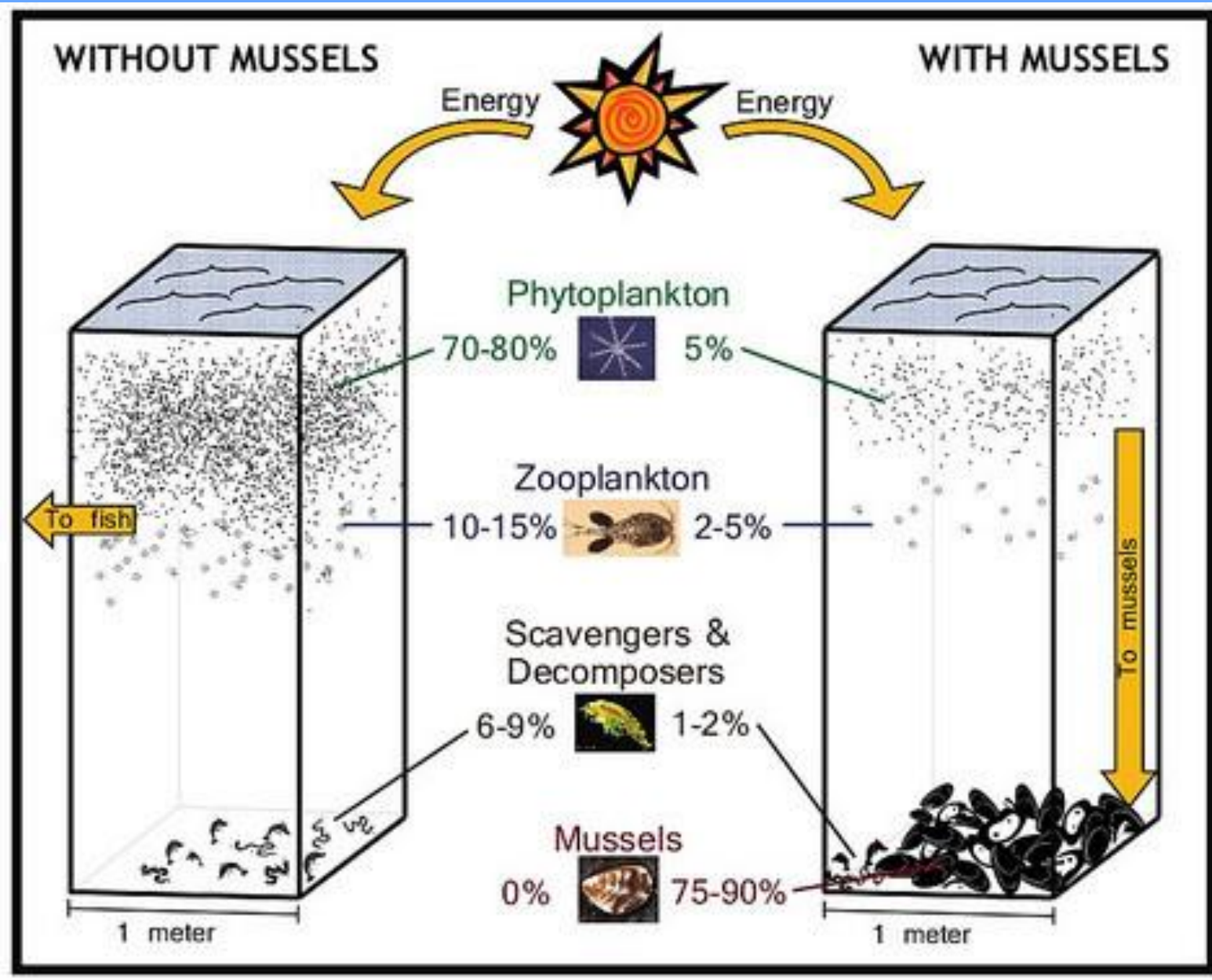


## 2. Local spread

# Invasions in Cass and Itasca Counties



# Lake Michigan changes associated with mussel introduction



## Zebra Mussel

Get *very* abundant

Filter feeders

Feed on plankton

Biological energy sink

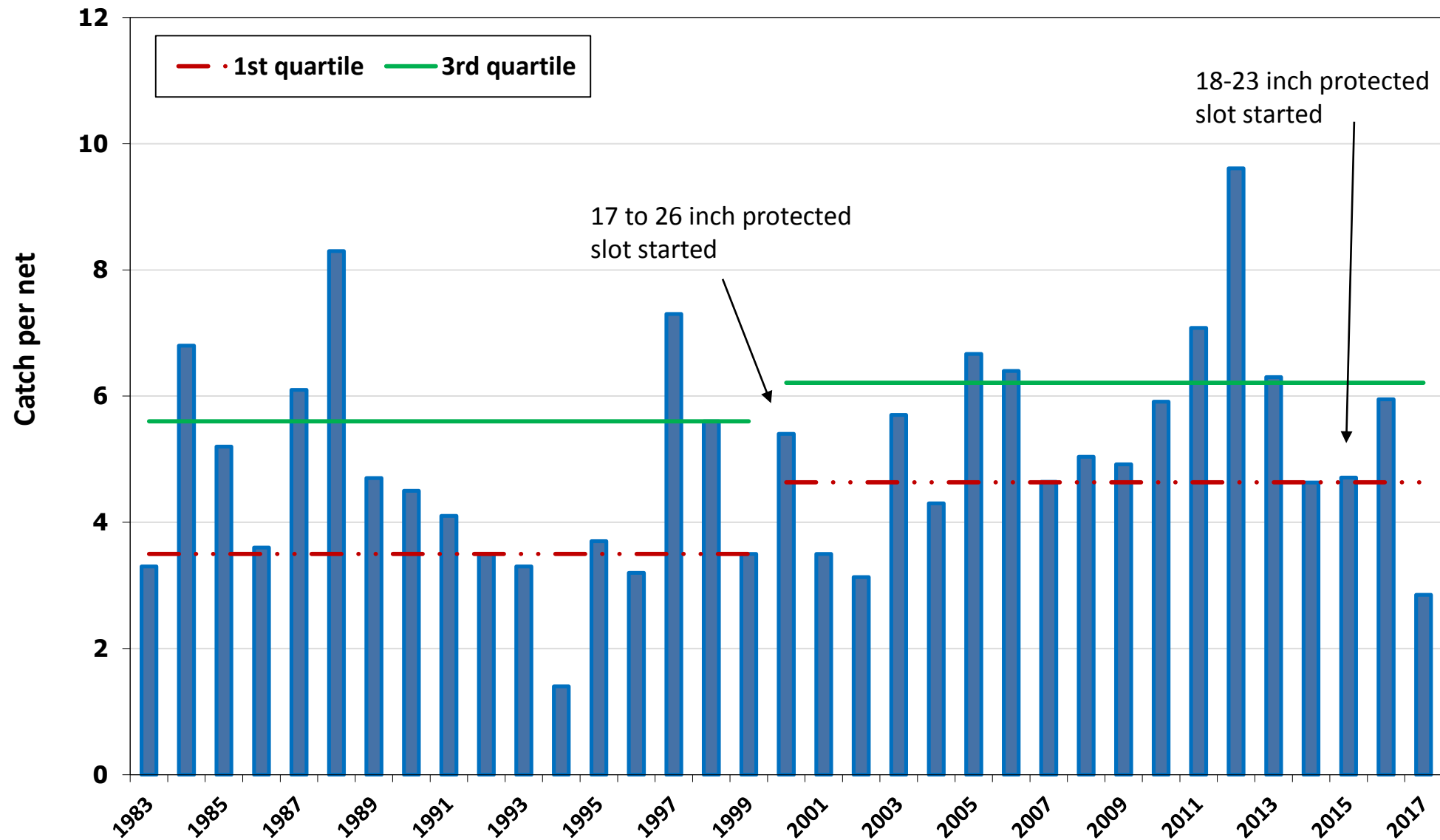
Few predators



## Status of the Winnie Walleye population



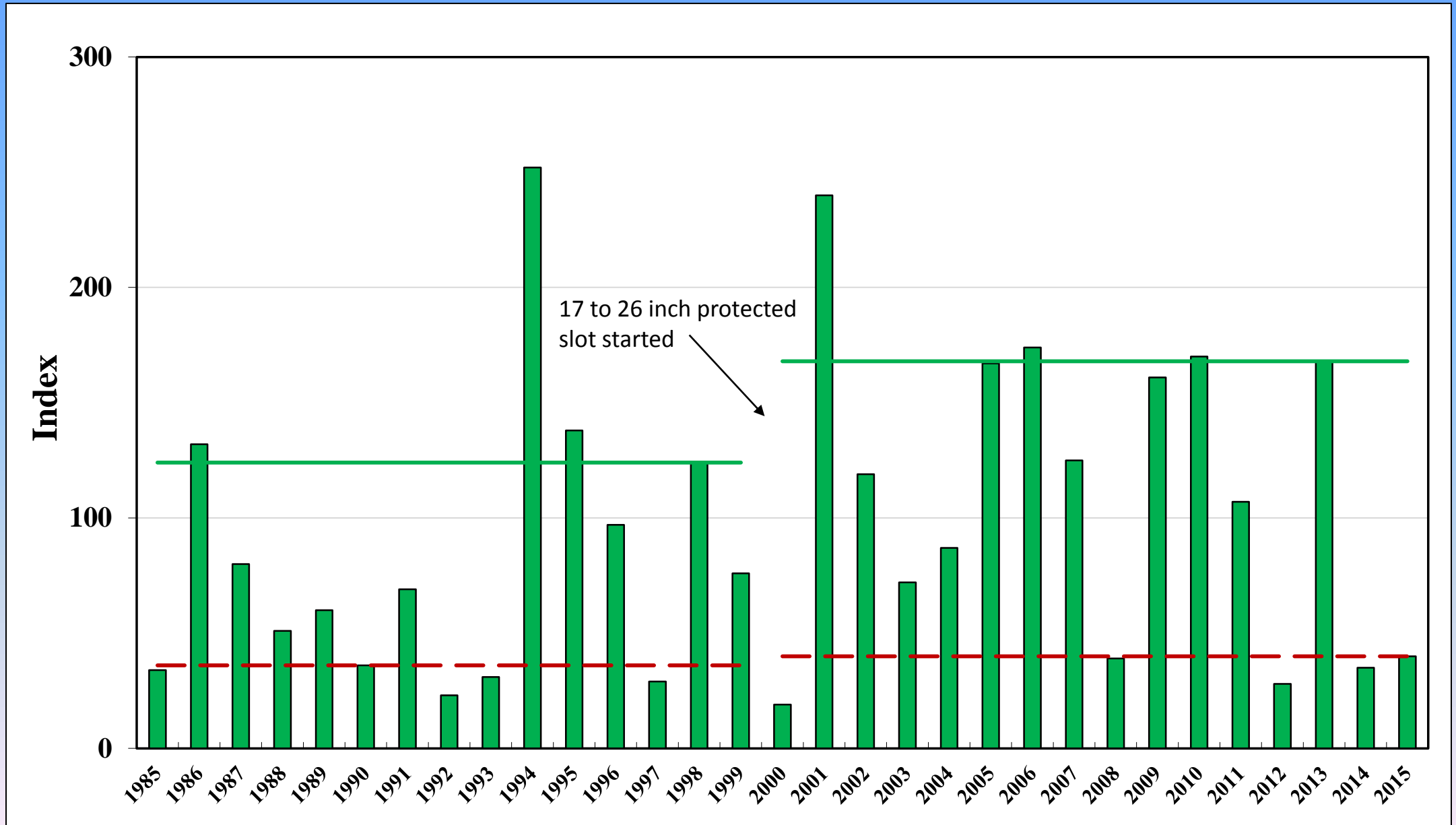
# Walleye catch per Lake Winnibigoshish gill net, 1983-2017



Walleye population data has been collected through annual population assessments since 1983. This data shows that, as in other large lakes, walleye recruitment is variable. What set Winnie apart from most other natural walleye lakes was longer periods of poor recruitment and larger extremes in the walleye population. This resulted in less walleye in the system and poor fishing for anglers.

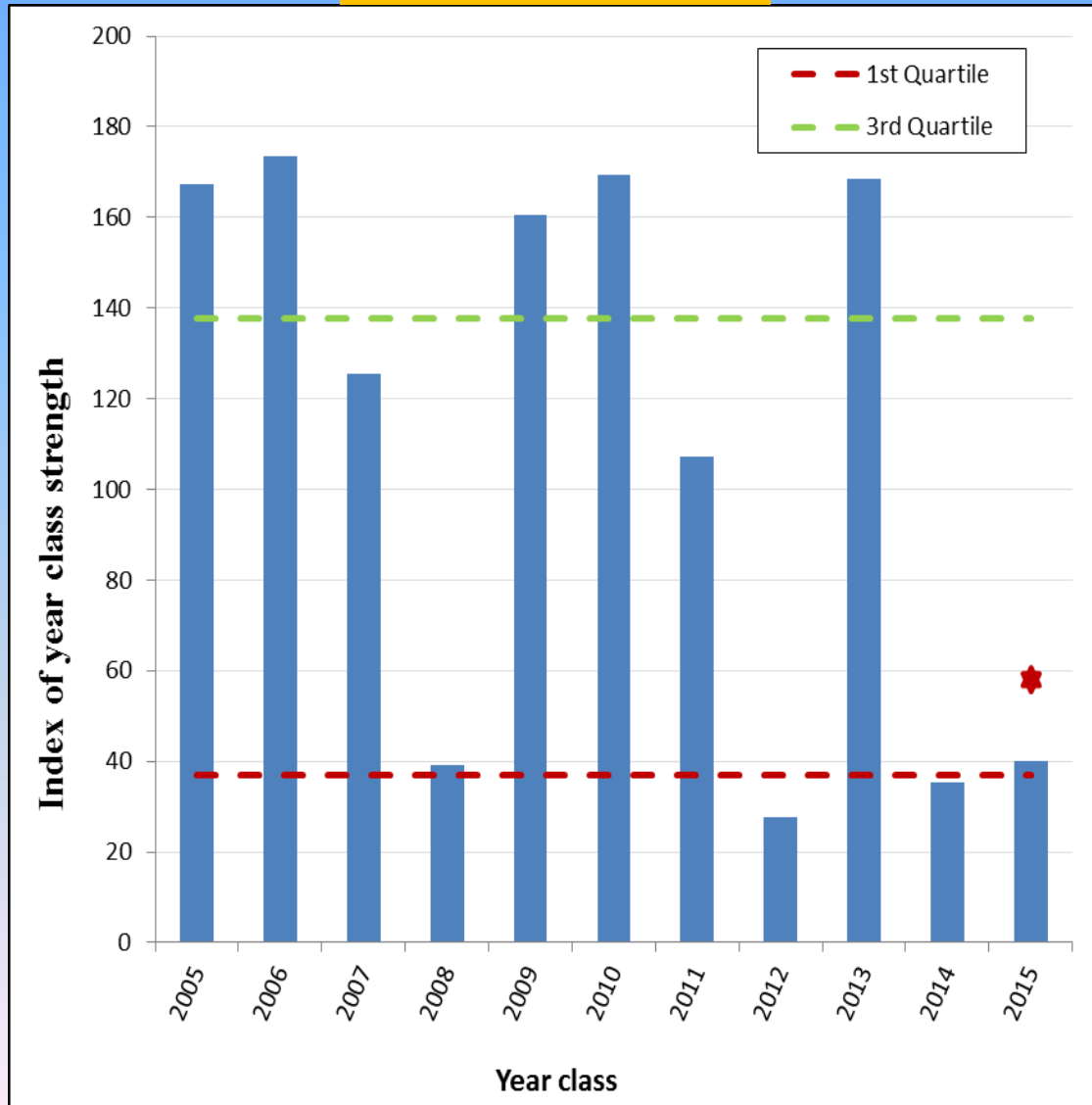


# Index of Walleye year-class strength, Lake Winnibigoshish, 1985-2015

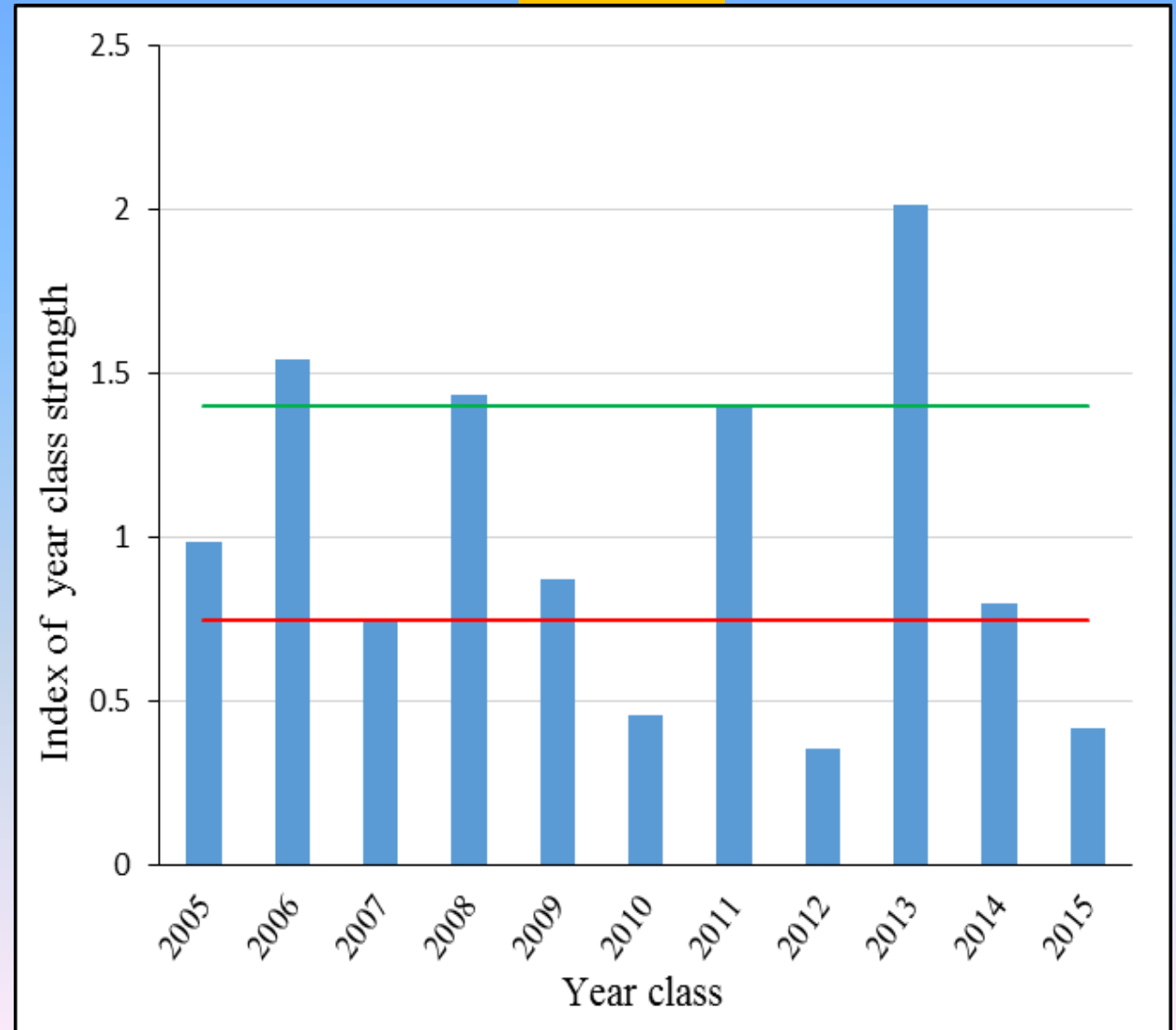


# Comparison of Cass Lake and Lake Winnibigoshish Walleye year class strength, 2005-2015

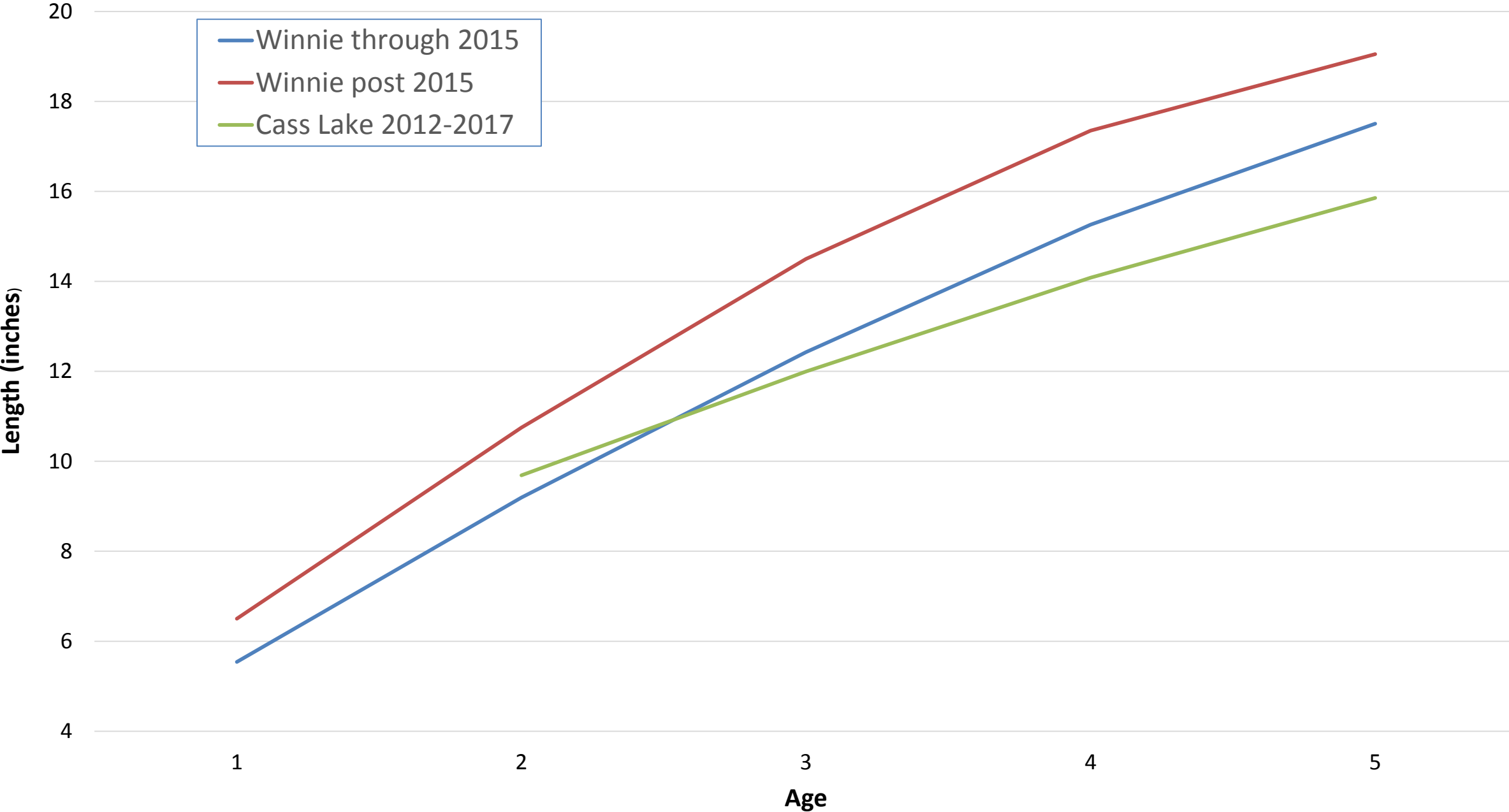
Lake Winnibigoshish



Cass Lake

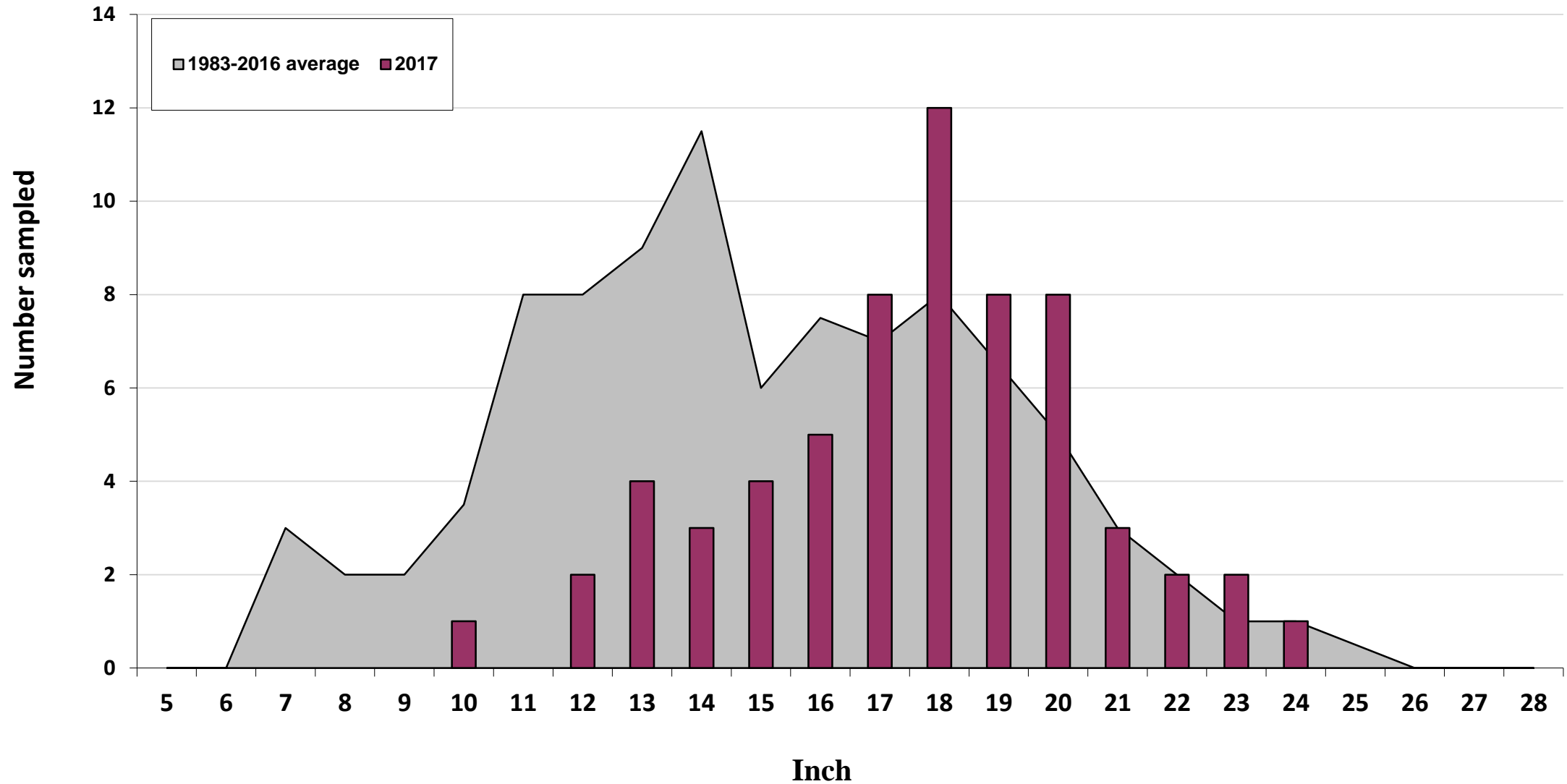


Average Walleye growth rates for Cass Lake and Lake Winnibigoshish

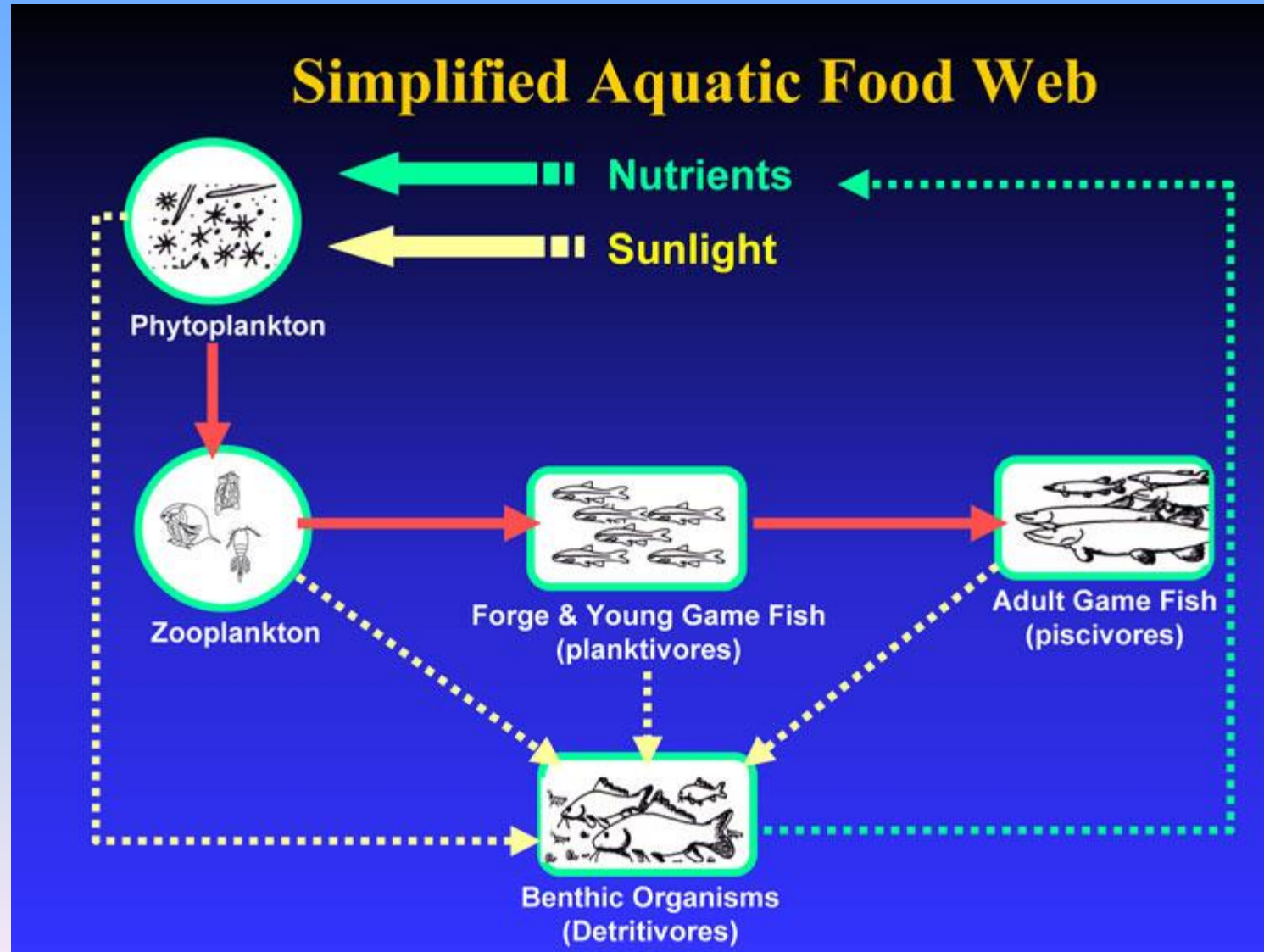




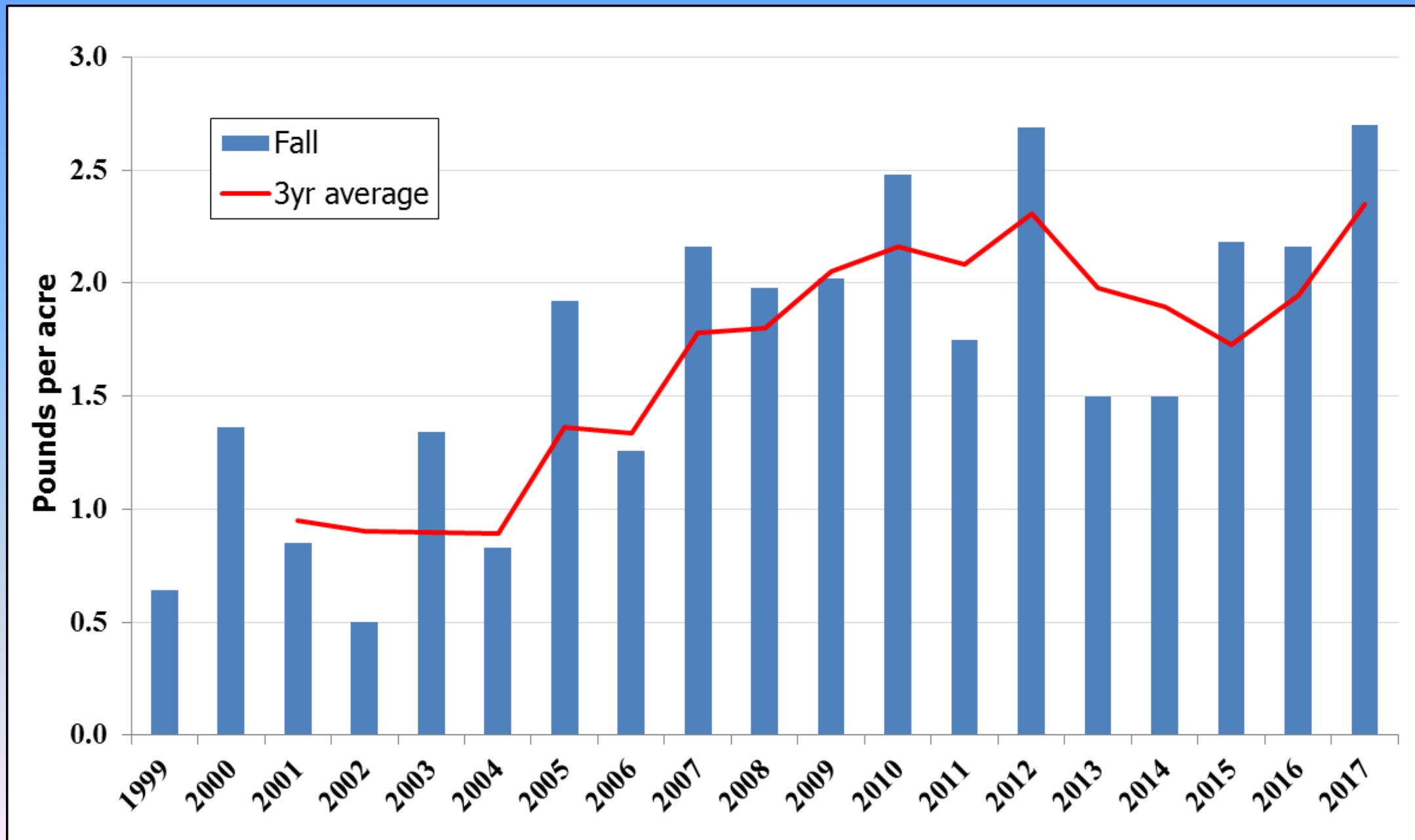
# Comparison of 1983-2016 average and 2017 Walleye catch by length



# Building blocks needed to support a Winnie Walleye population



# Lake Winnibigoshish pounds of mature female Walleye, 1999-2017

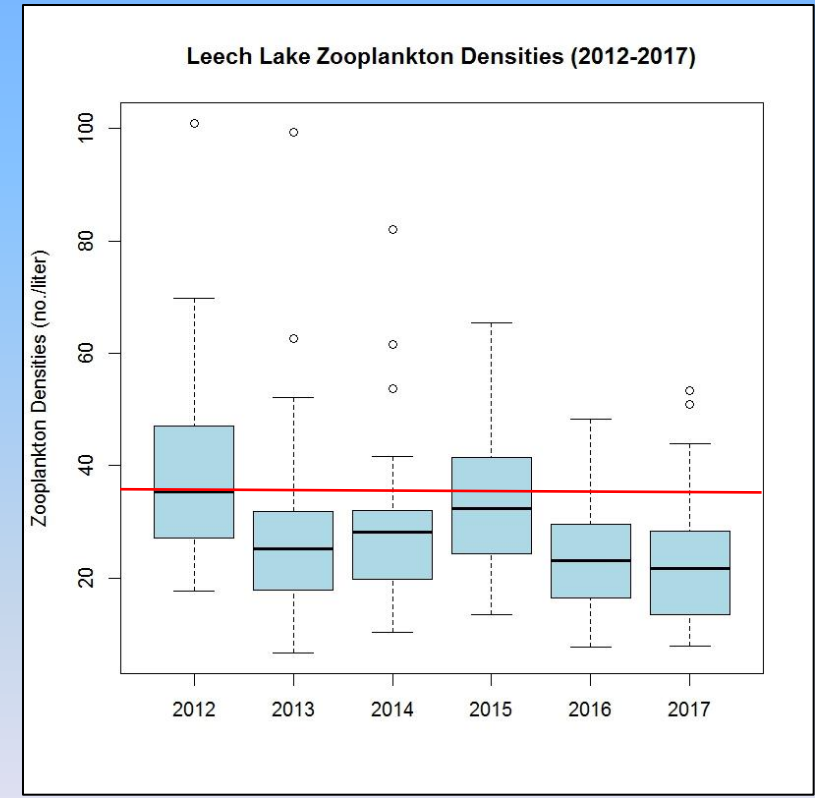
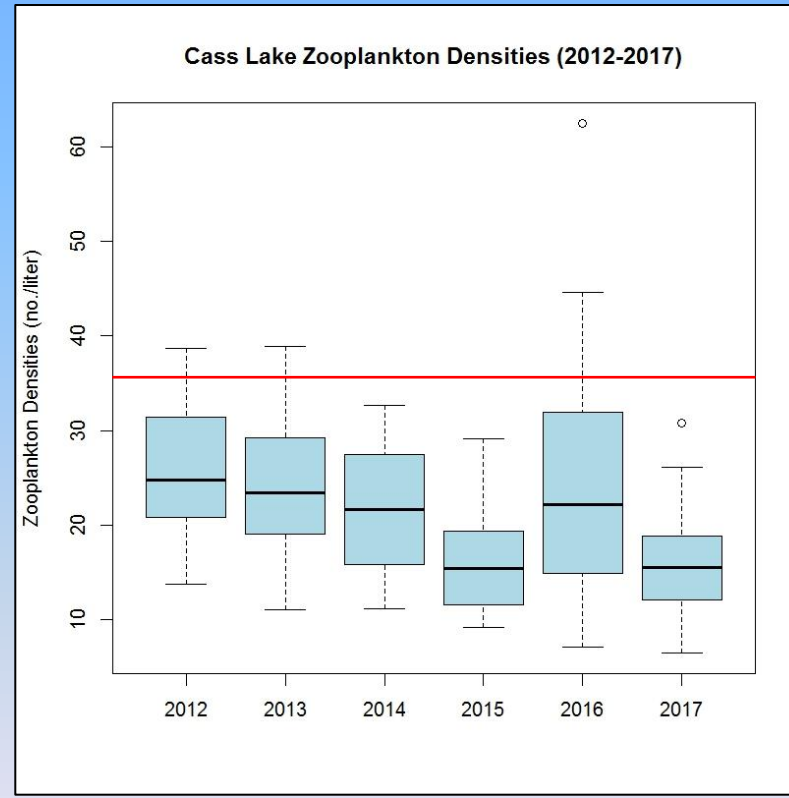
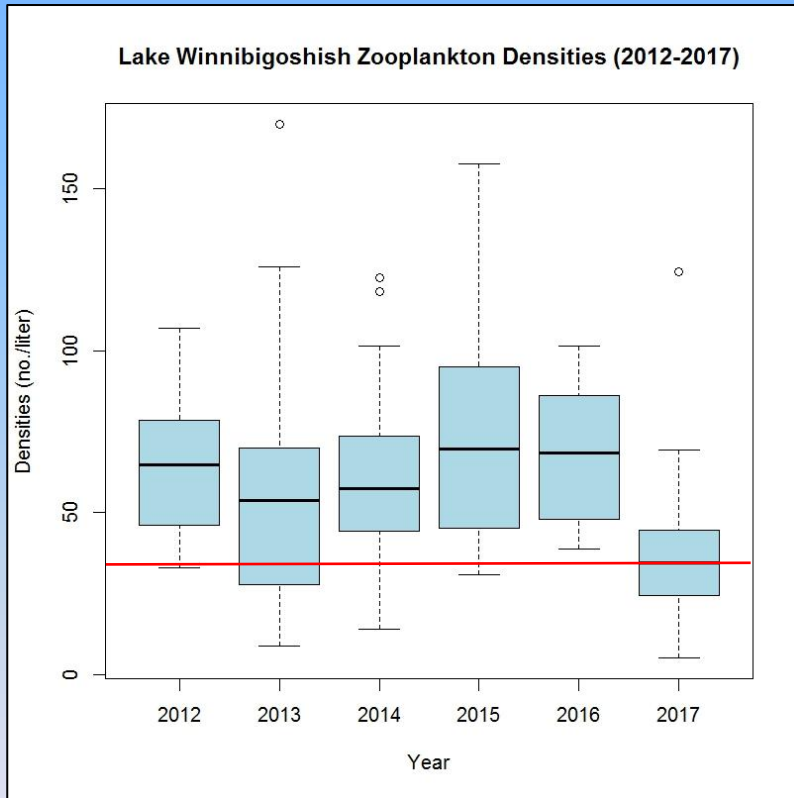




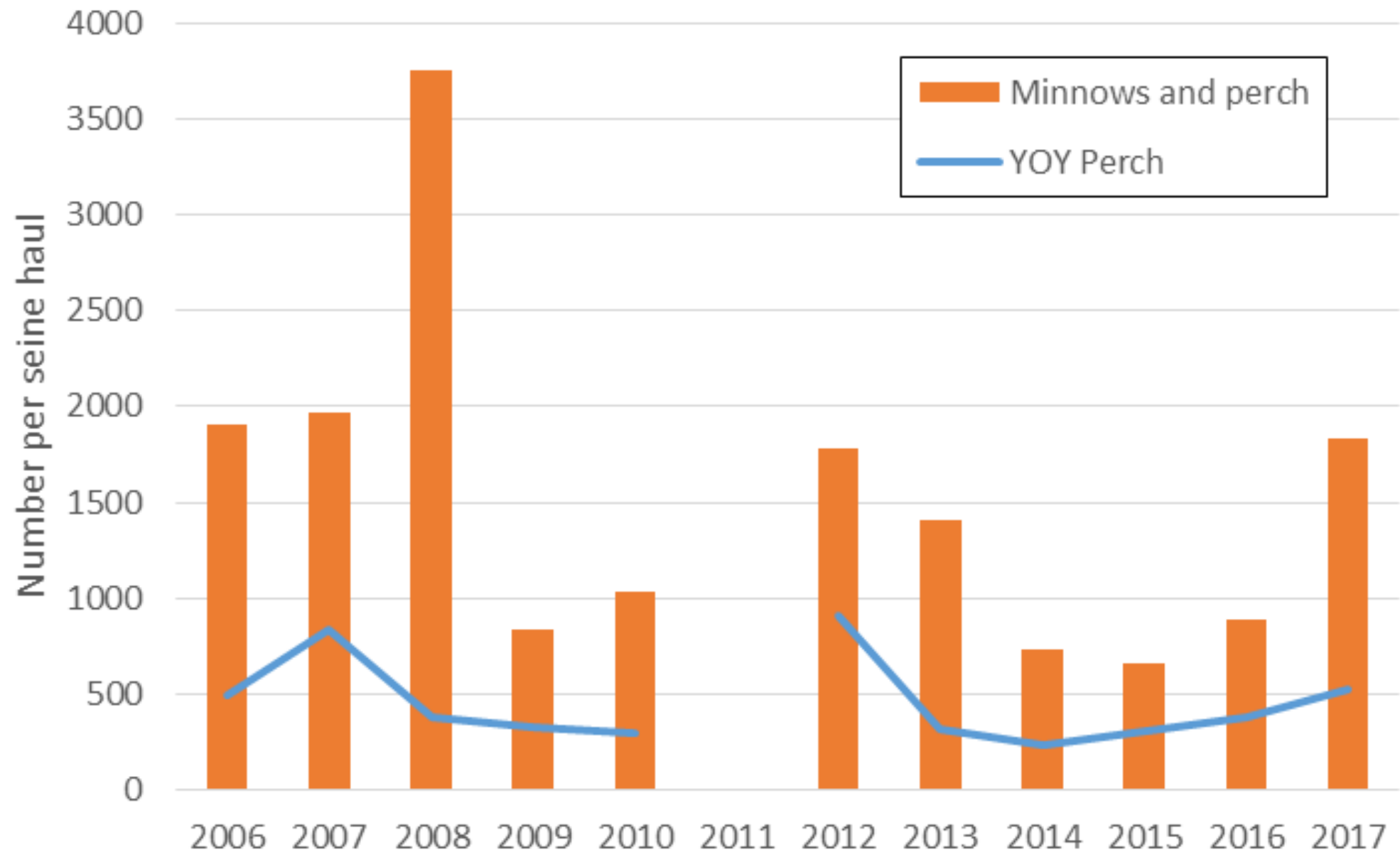
# Walleye fry a few hours after hatching



# Lake Winnibigoshish Zooplankton densities, 2012-2017



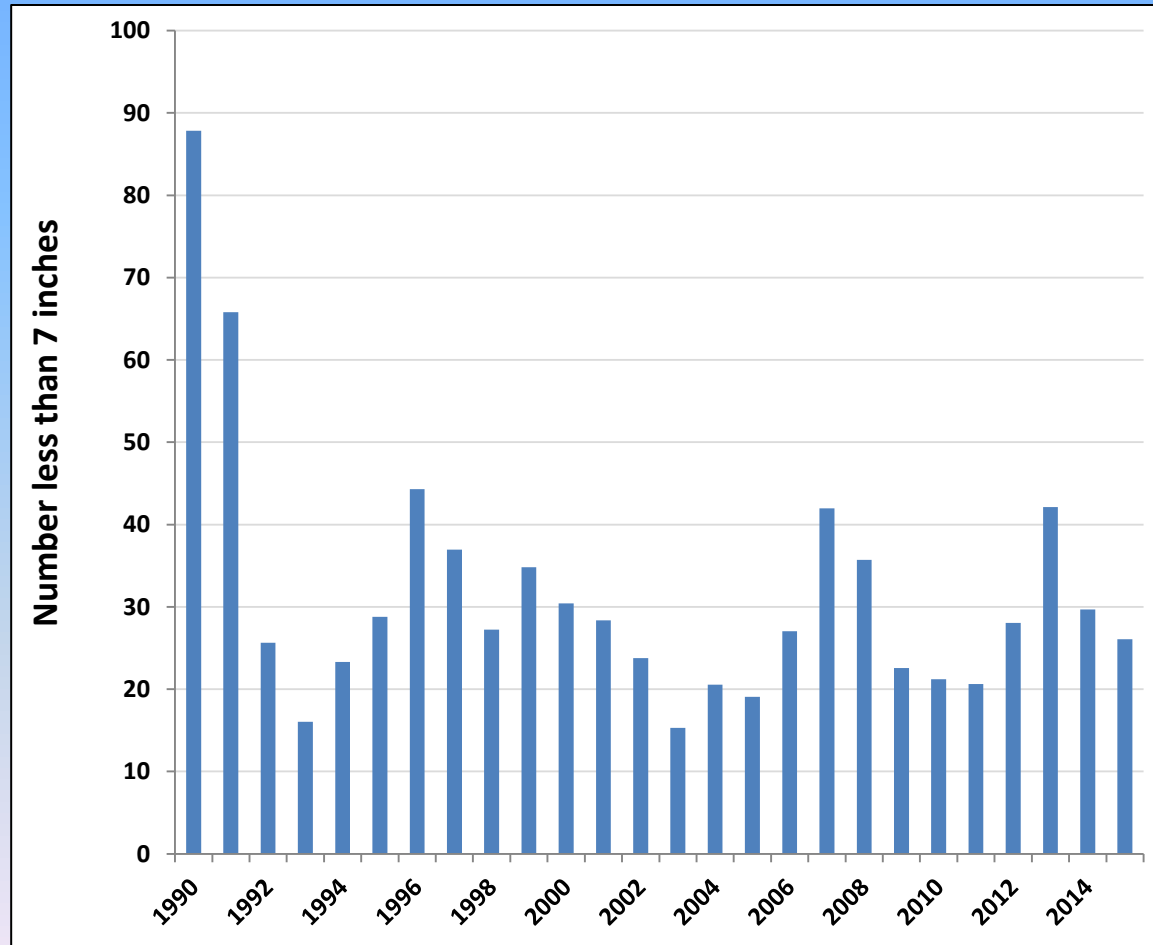
# Seine catch of minnows and young of the year perch



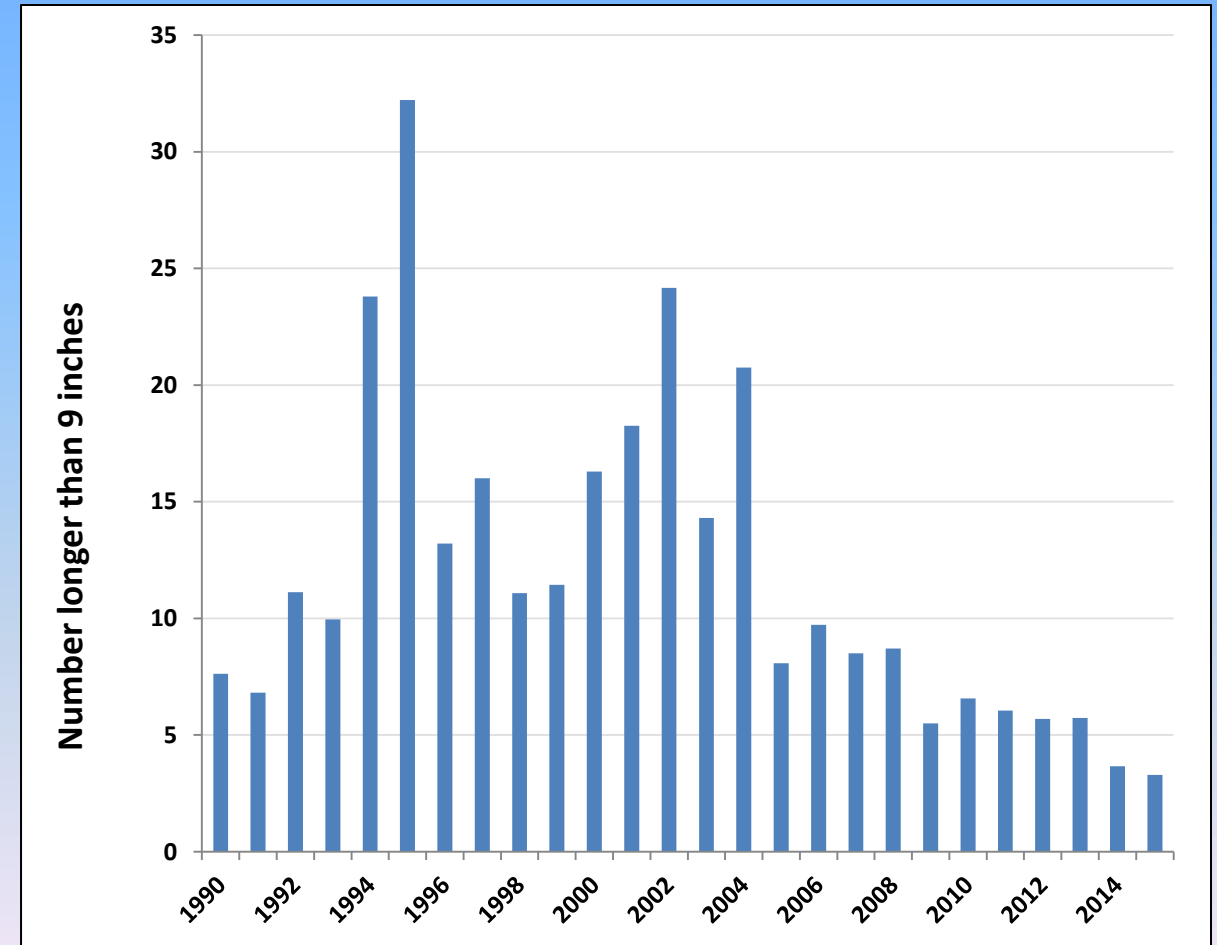


# Lake Winnibigoshish perch statistics

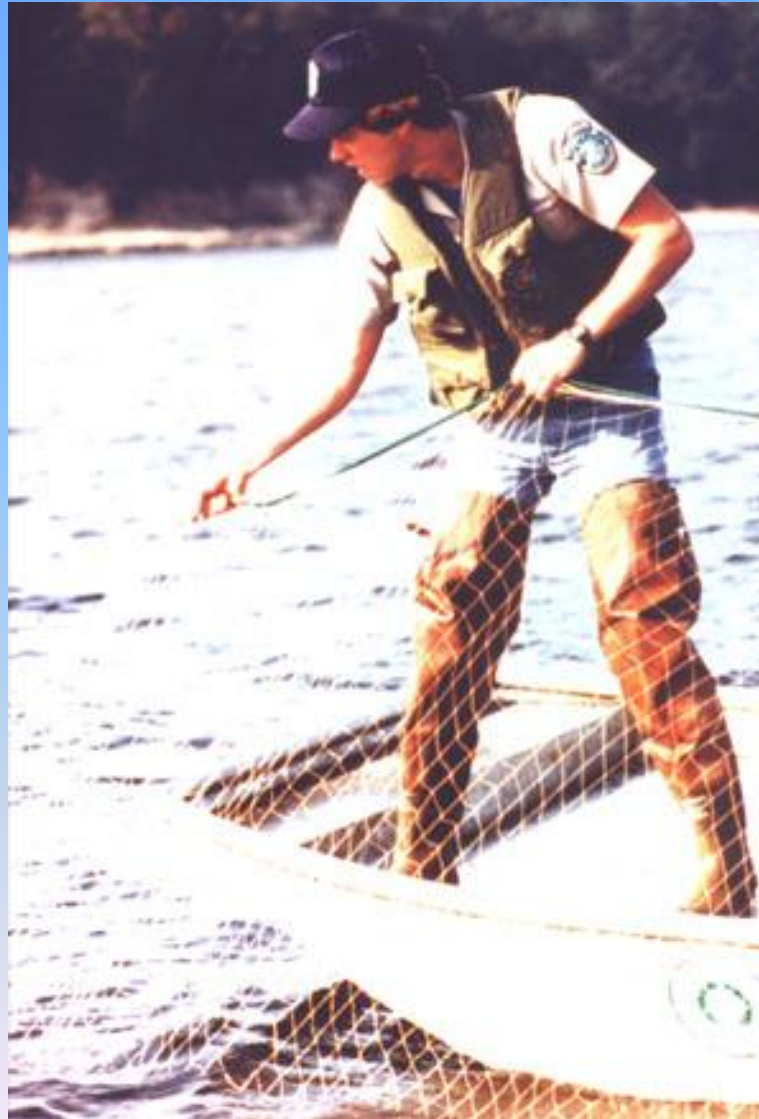
Catch per net less than 7 inches



Catch per net > than 9 inches

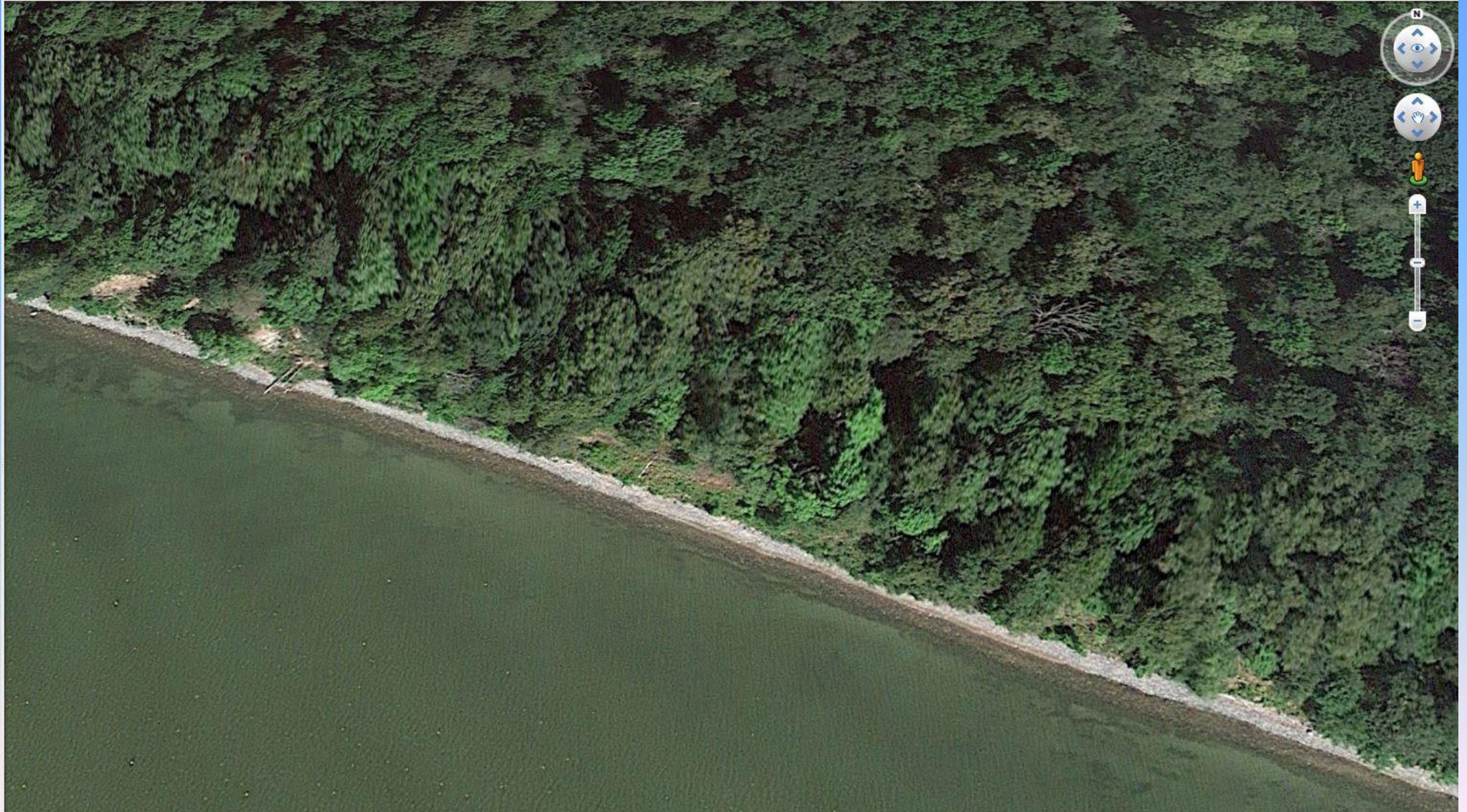


# Management changes to help support the Walleye population



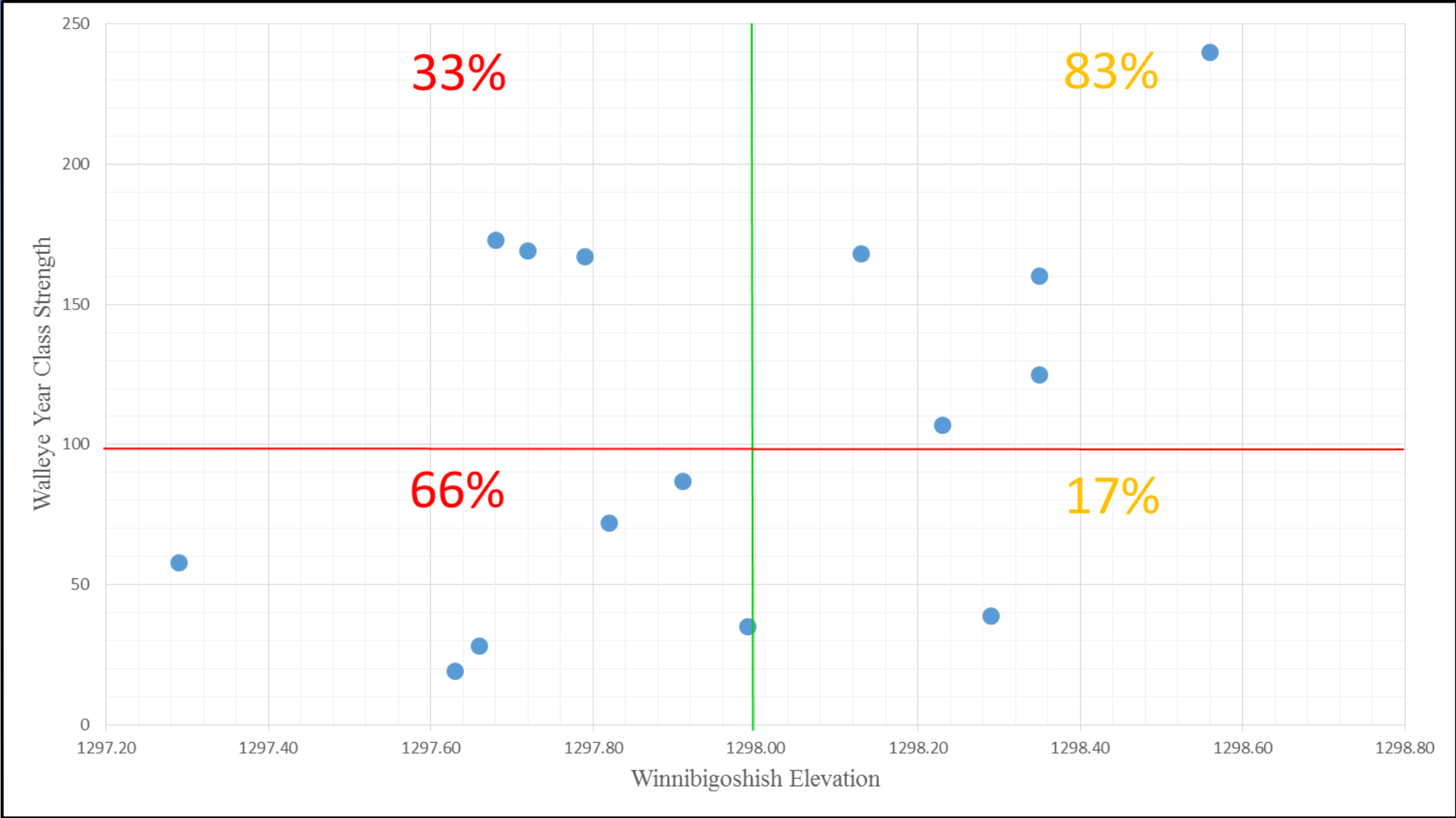


# Lake Winnibigoshish north shore spawning habitat



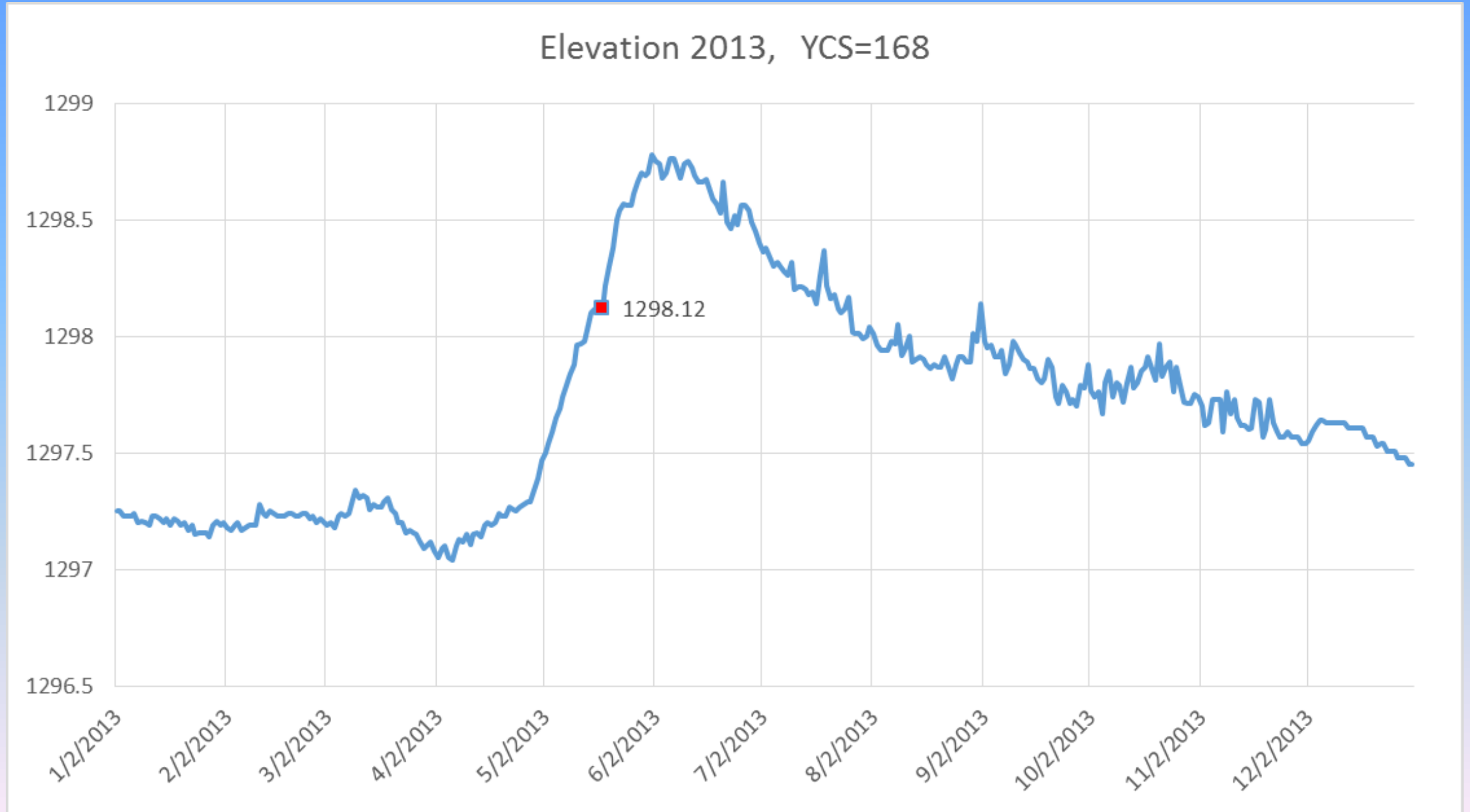


# Comparison of Walleye year class strength and Winnie elevation at ice out

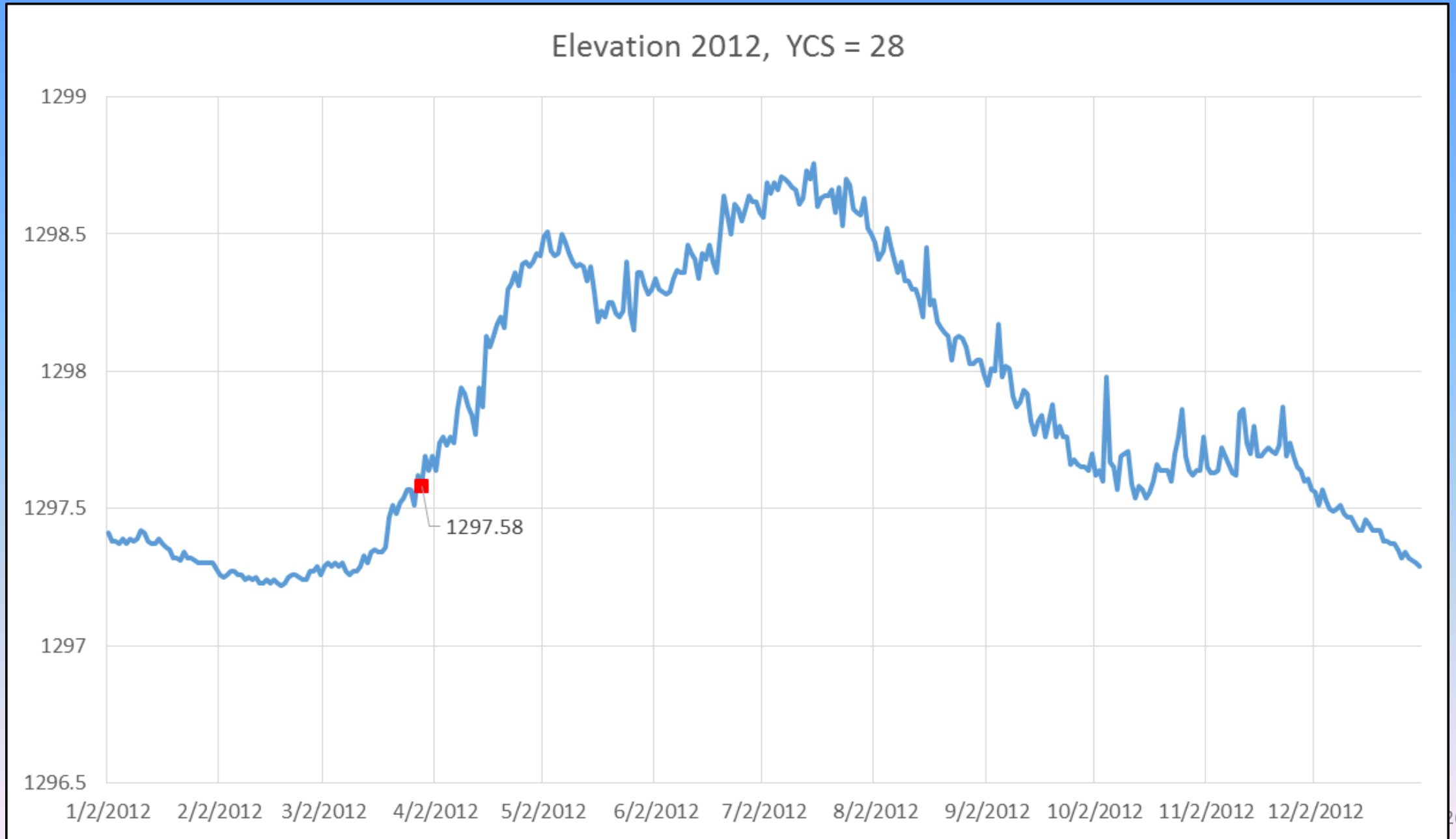




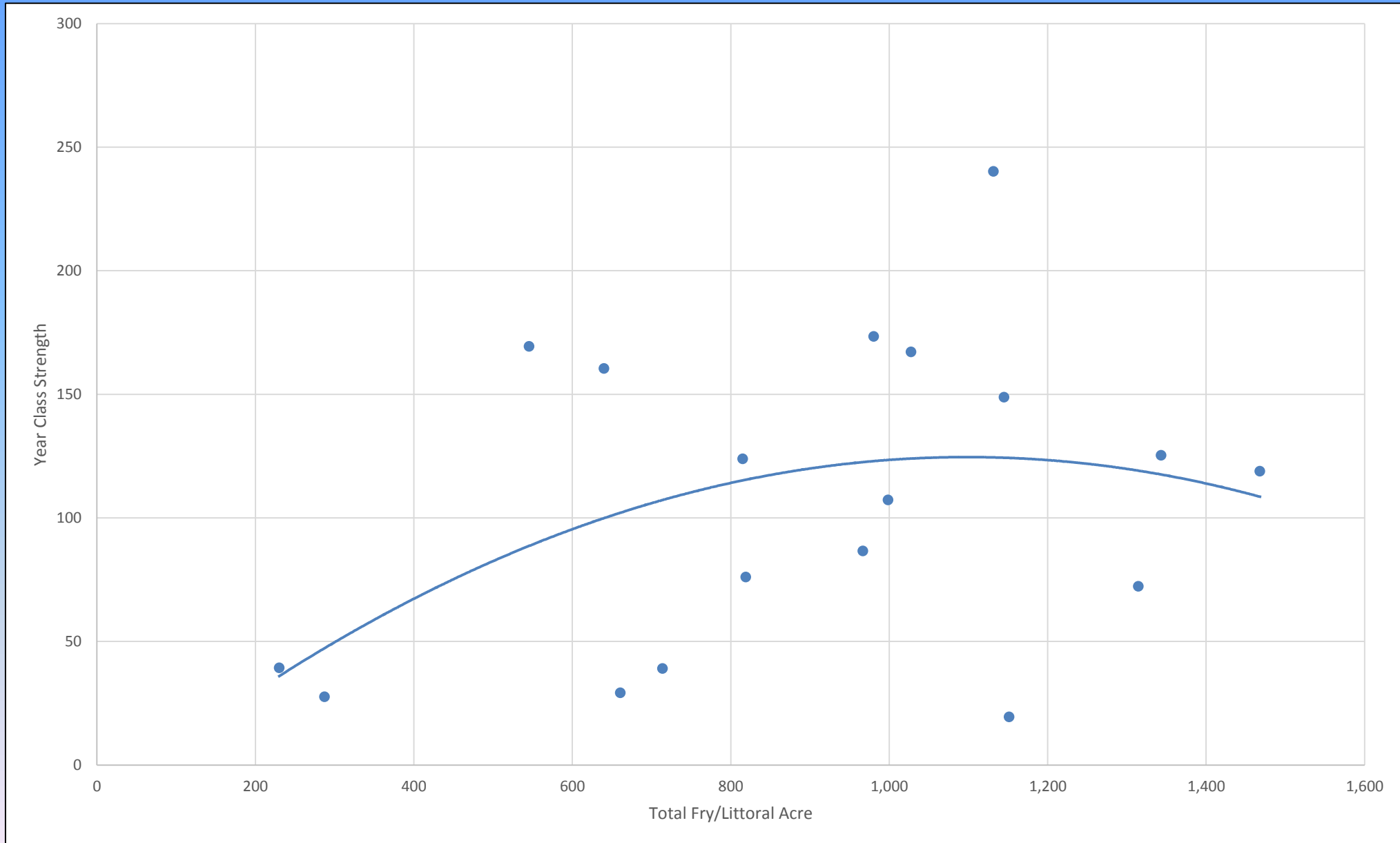
# Example of a strong Walleye year class and water elevation at ice out



# Example of a weak Walleye year class and water elevation at ice out



# Winnibigoshish summer year class strength vs total fry/acre, 1997-2016

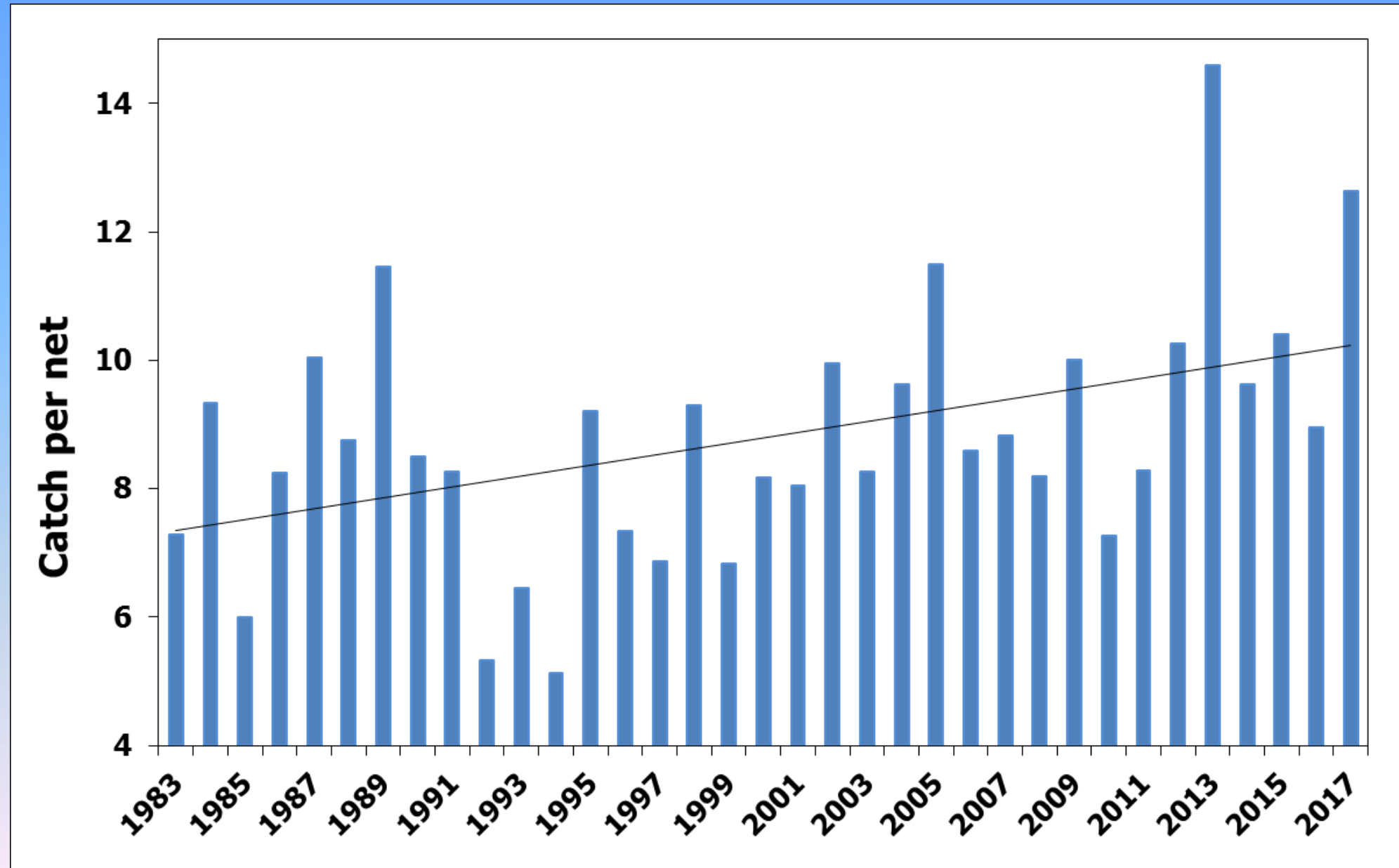


## Other Fish Species

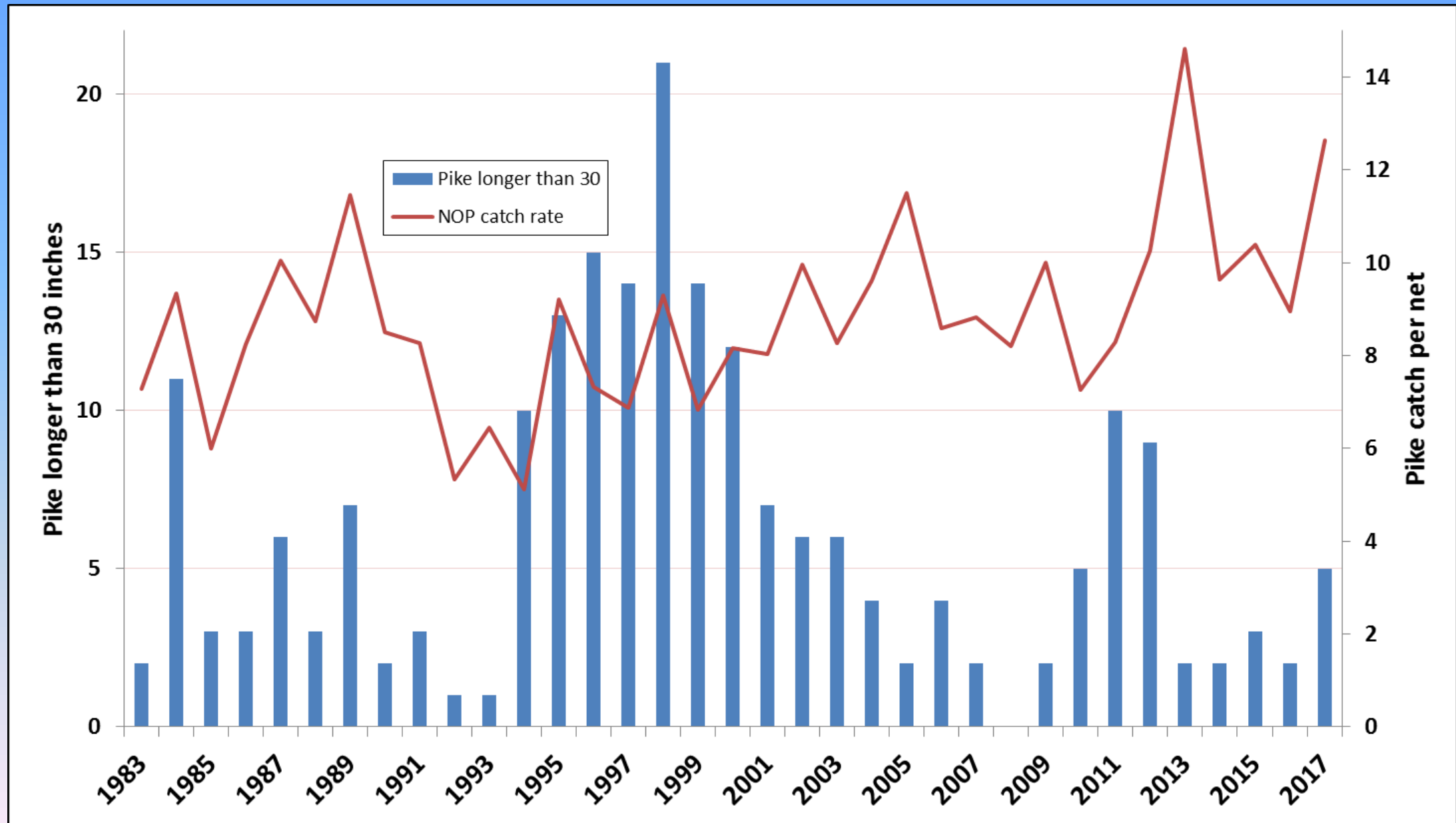




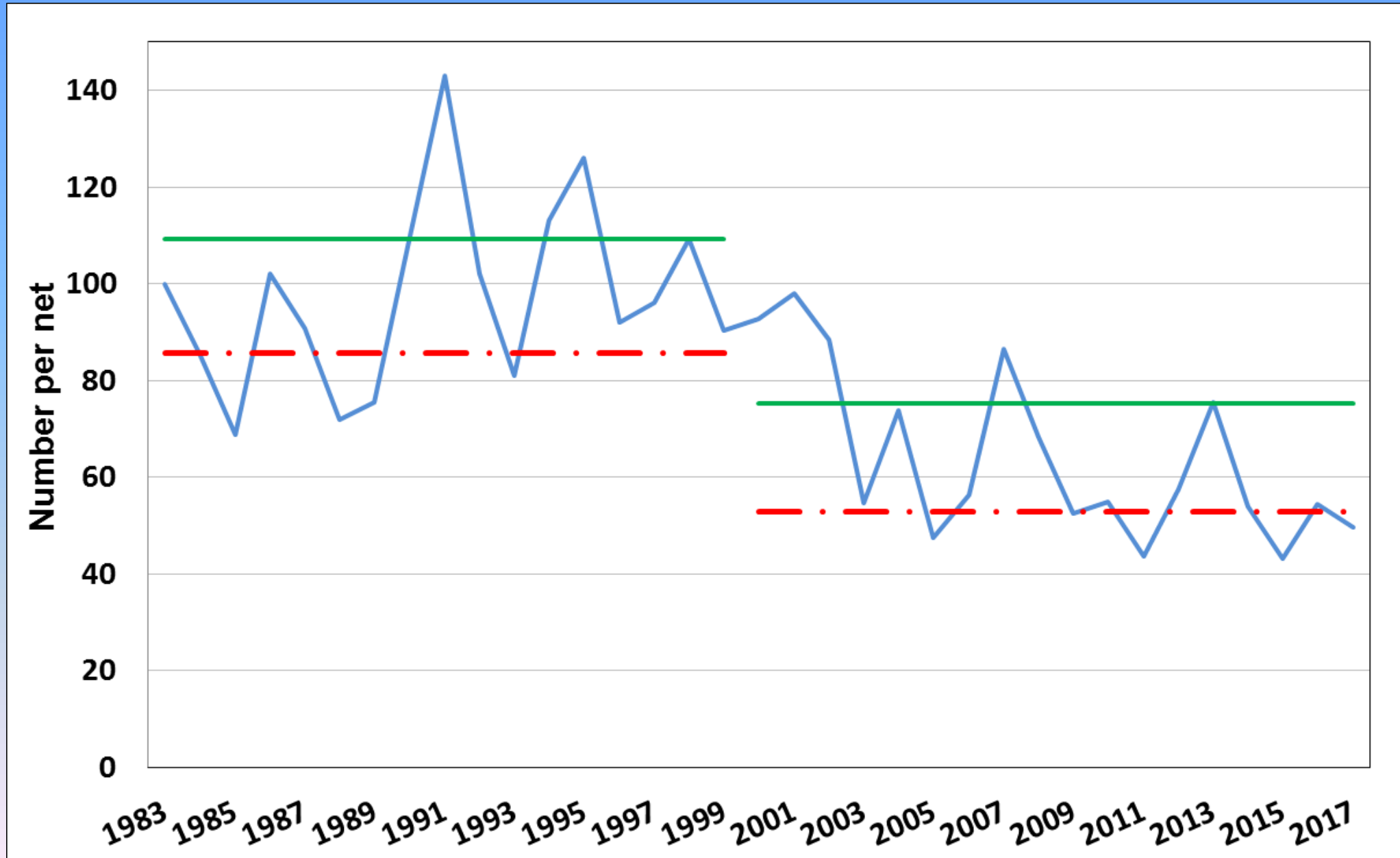
## Average catch of NOP per Lake Winnibigoshish gill net, 1983-2017



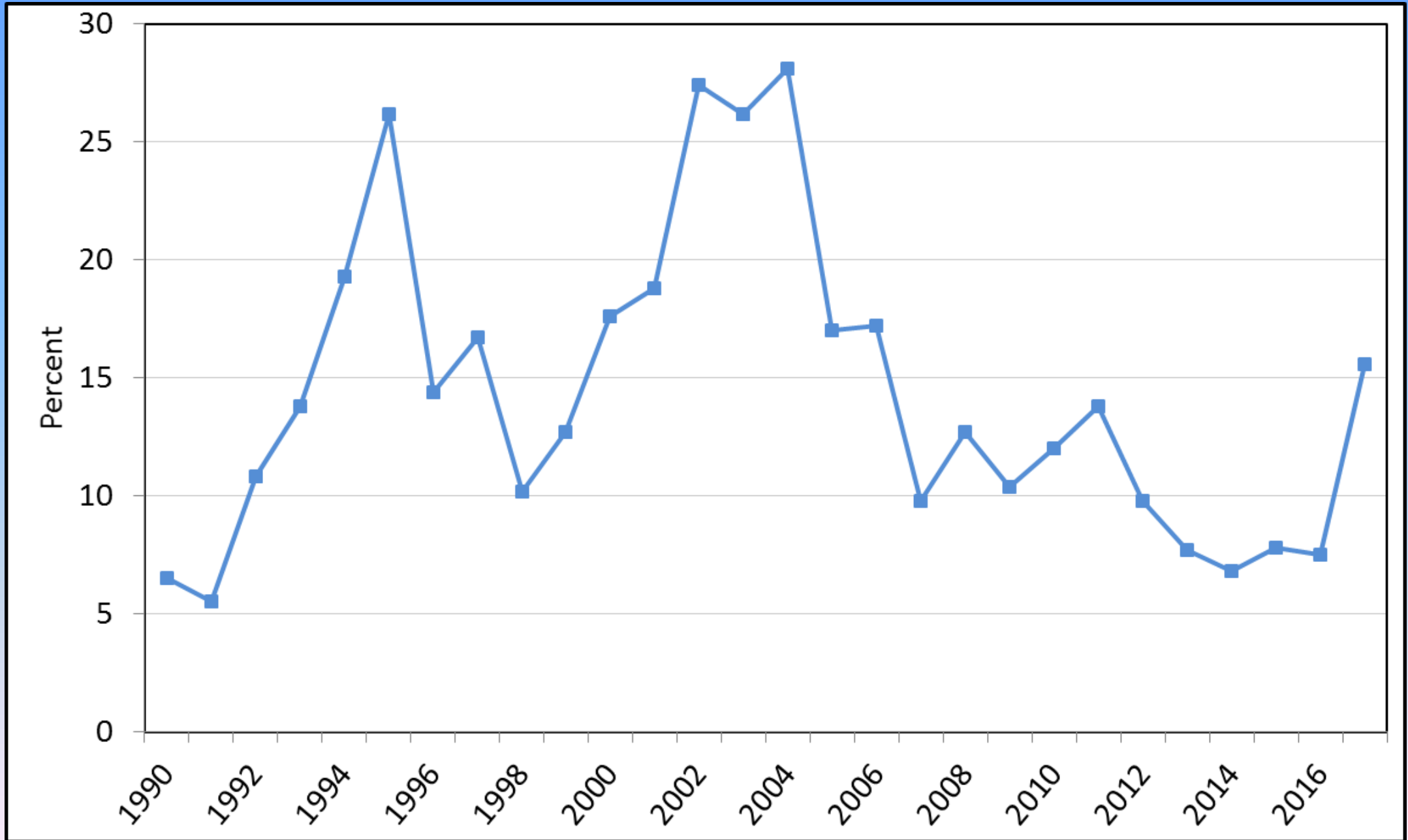
# Lake Winnibigoshish Northern Pike statistics



# Lake Winnibigoshish perch catch per gill net, 1983-2017

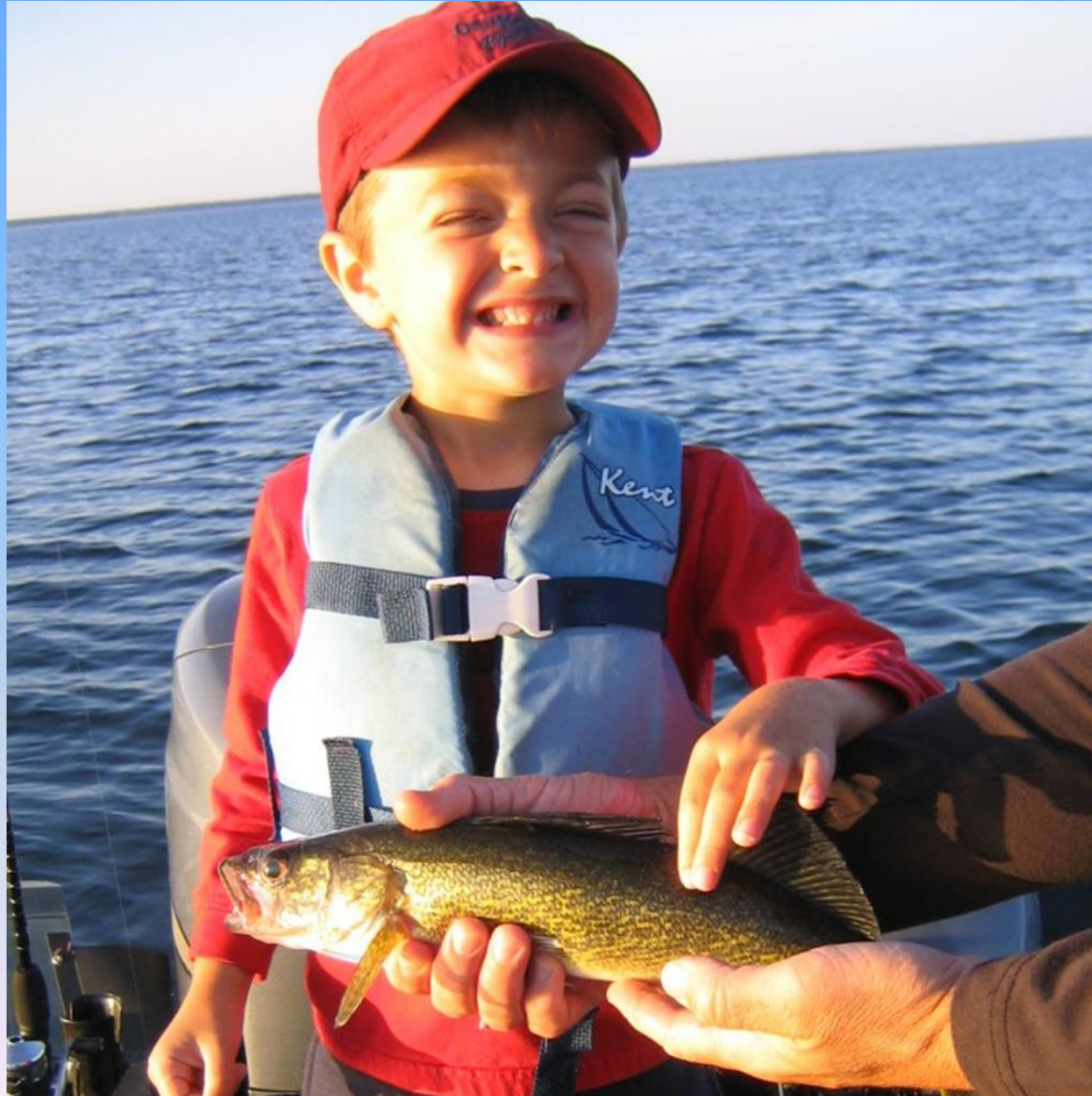


# Percent of Lake Winnibigoshish perch longer than 9 inches





# Questions



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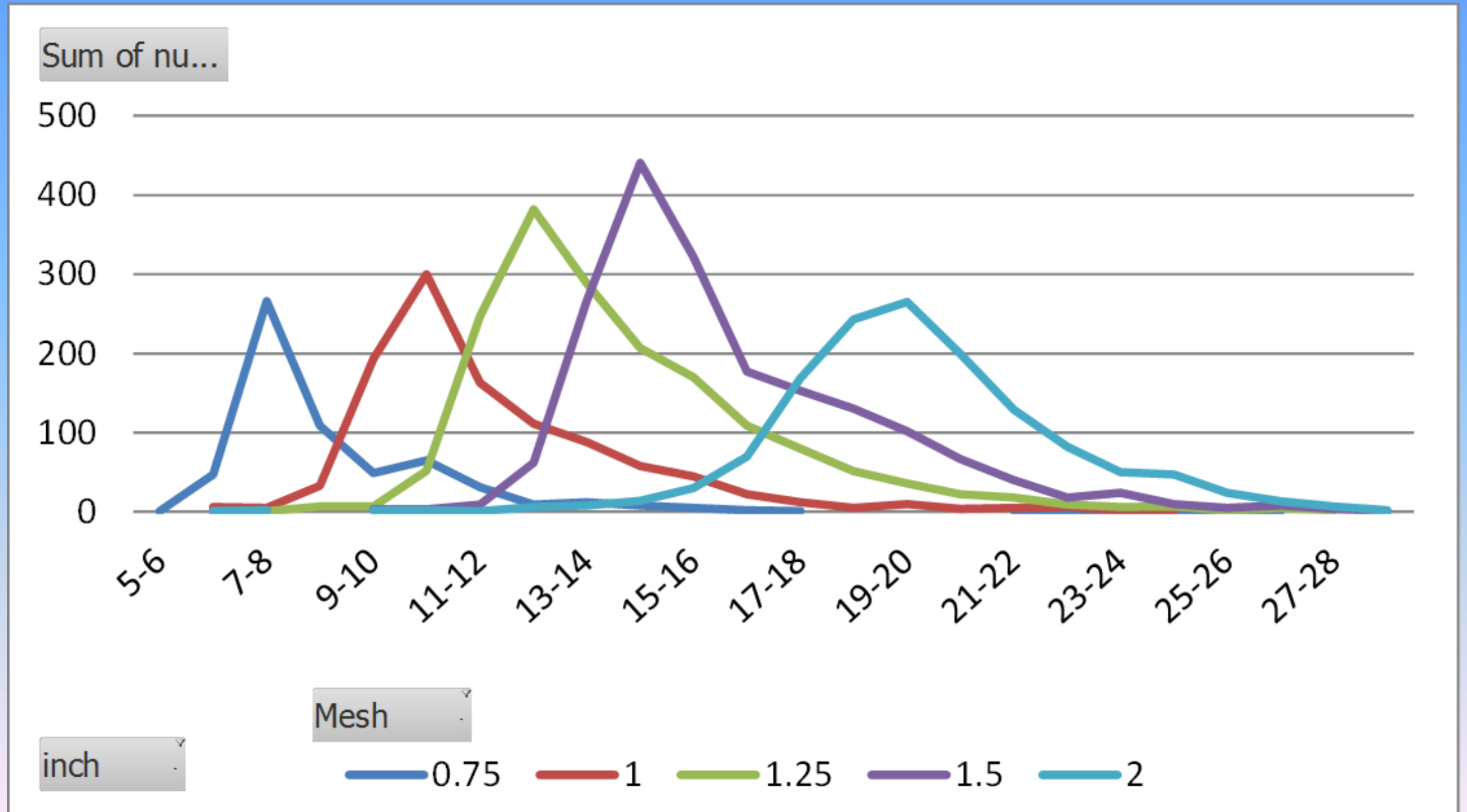
Phone (218) 328-8837

David Weitzel  
Contact Information

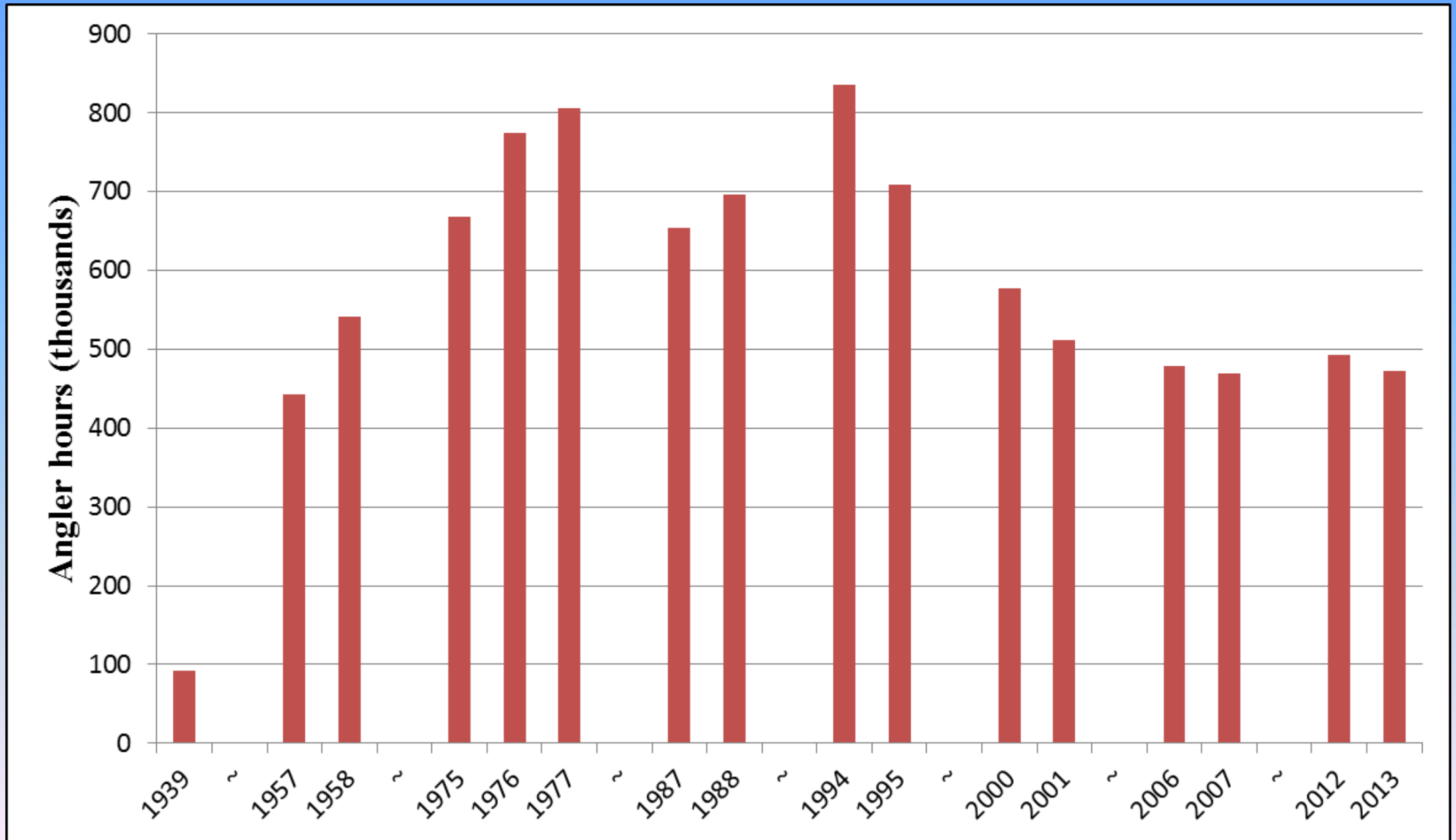
E-mail  
[David.weitzel@state.mn.us](mailto:David.weitzel@state.mn.us)

Phone (218) 328-8835

# Winnie gill net catch curve for walleye caught between 1984 and 2011



# Lake Winnibigoshish Summer fishing effort, 1939-2013



# Lake Winnibigoshish Walleye catch and harvest rates, 1939-2013

