SCAFS Aging Workshop
Age and Growth of Elasmobranchs

Bryan Frazier

SCDNR

Introduction

-Bone? What bone?

-Vertebrae, spines

-Cartilage density varies

-Band appearance varies

-Vertebrae size varies

-Validation is critical

Collection Methods

-Sample sizes generally lower (2 sharks/sex/cm)

-Fishery independent and dependent sources

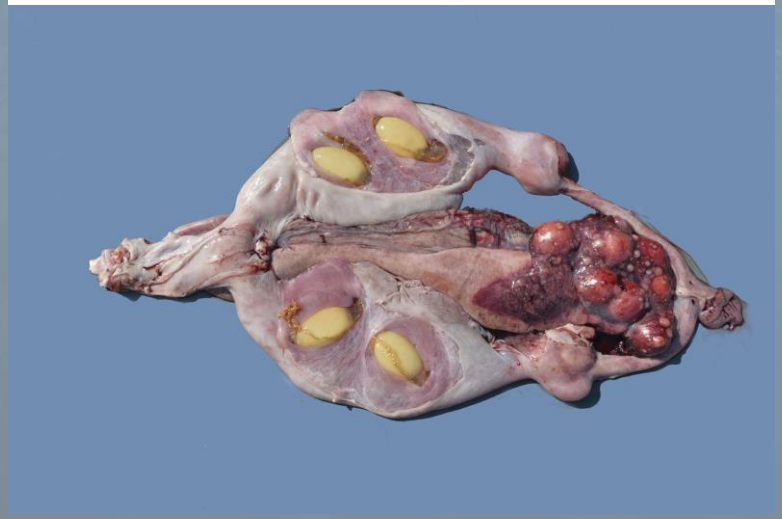
-All sharks sacrificed measured to PCL, FL and STL (mm)

-Skates/rays disc width, length

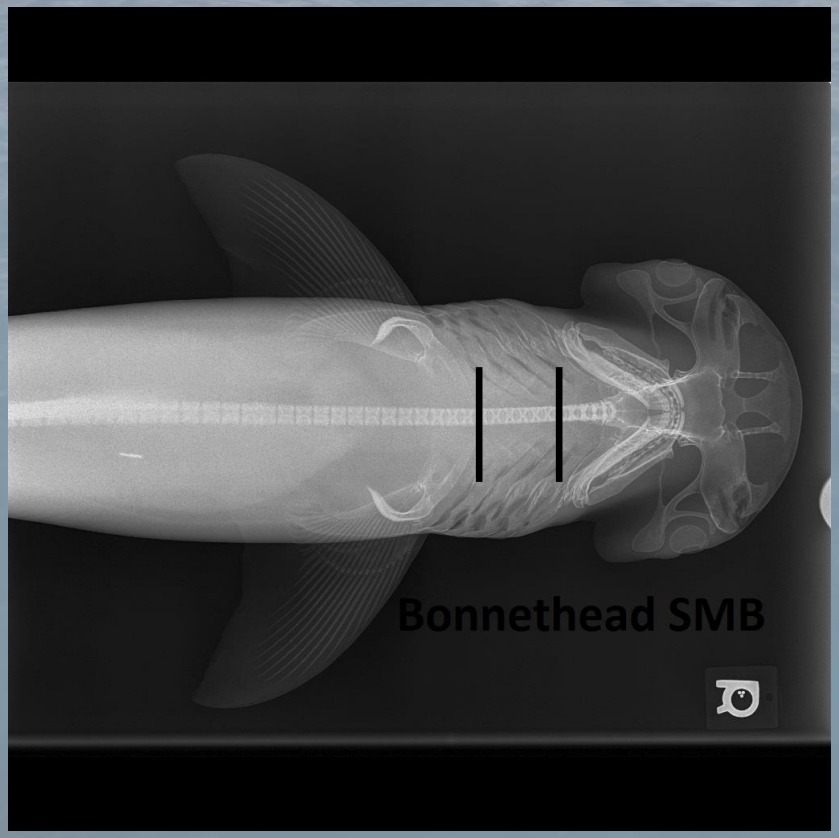
-Weight (kg)

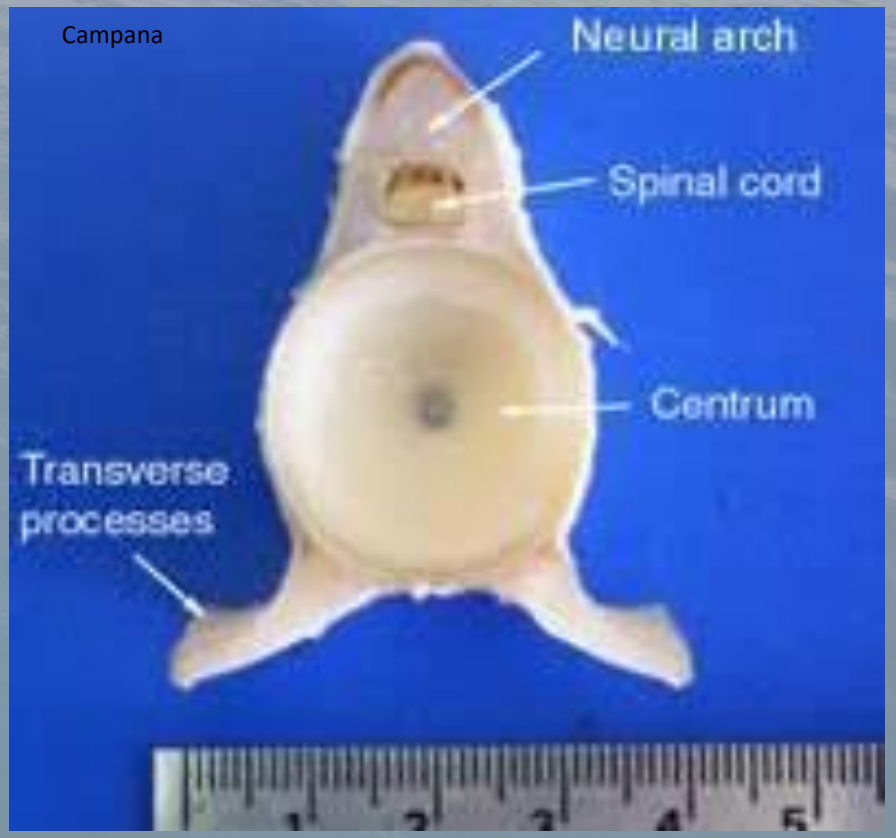
Methods Continued

-Sex and gross maturity

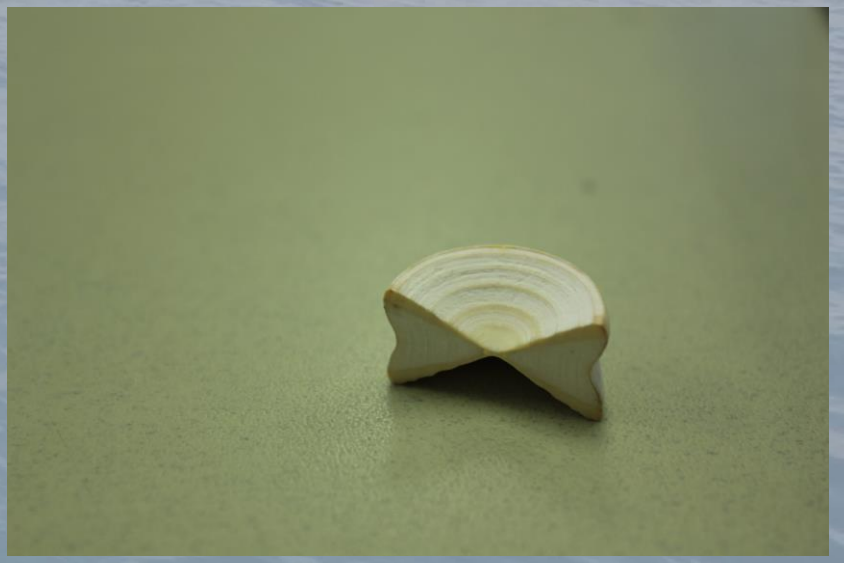


Methods Continued





Methods Continued



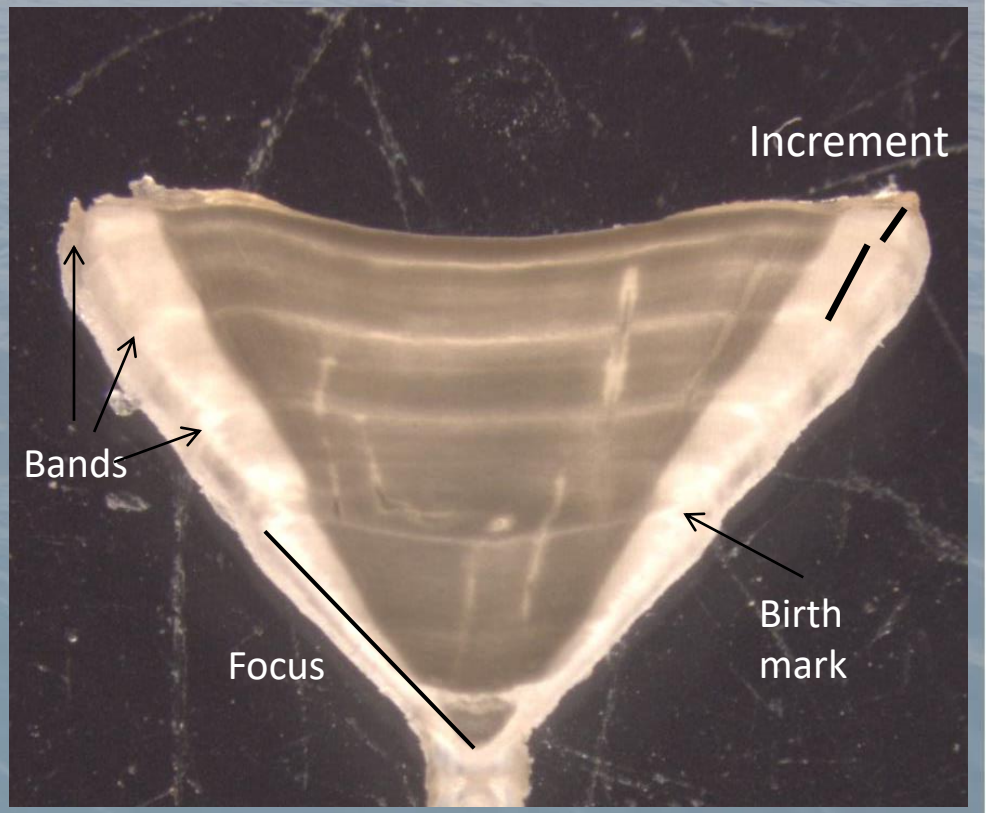
Methods Continued

-Watch while drying

-Read under transmitted light

-Two readers

-Assigned age varies

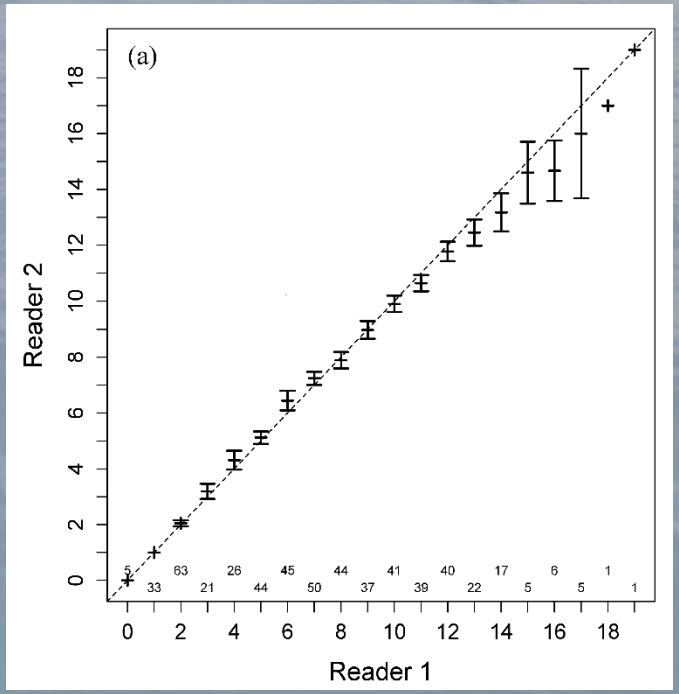


Age=Band count-1.5

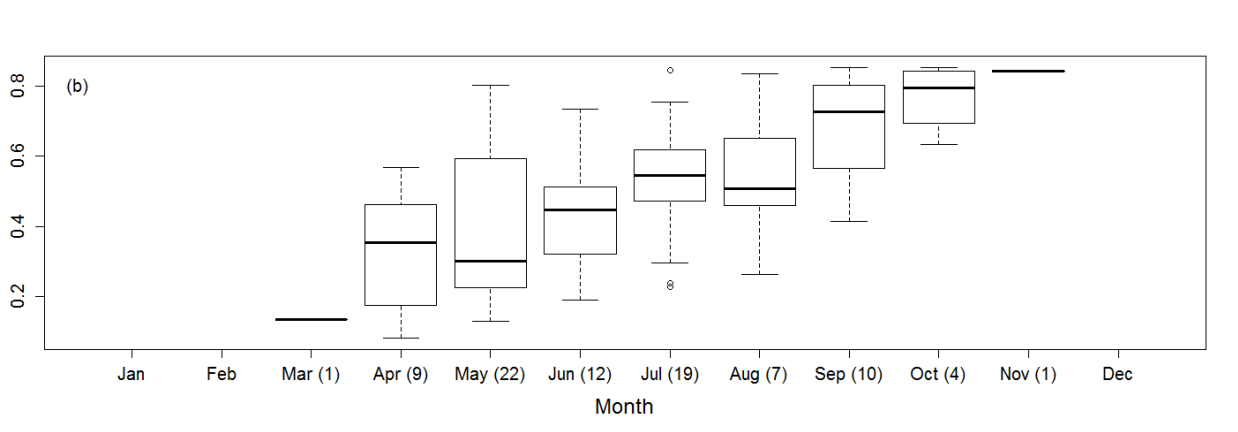
Age=2.5

Age Verification

Age Bias Plots



Marginal Increment

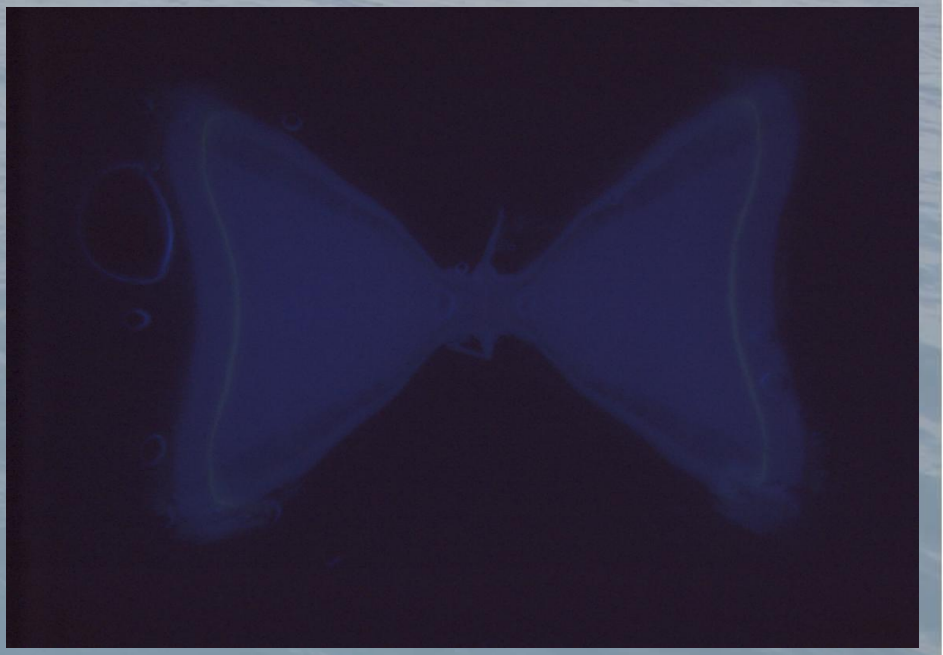


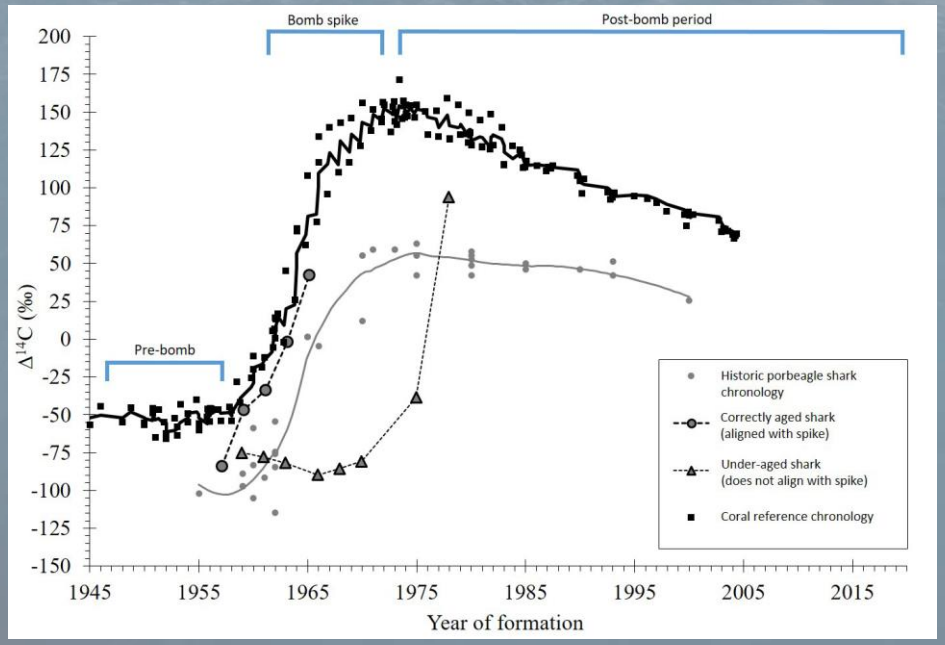
Age validation

-Known age fish (mark recapture)

-Oxytetracycline

-Bomb radiocarbon chronologies





OTC Validation Bonnetheads

-13 recaptures: 6-1 year, 3-2 year, 4-4 year

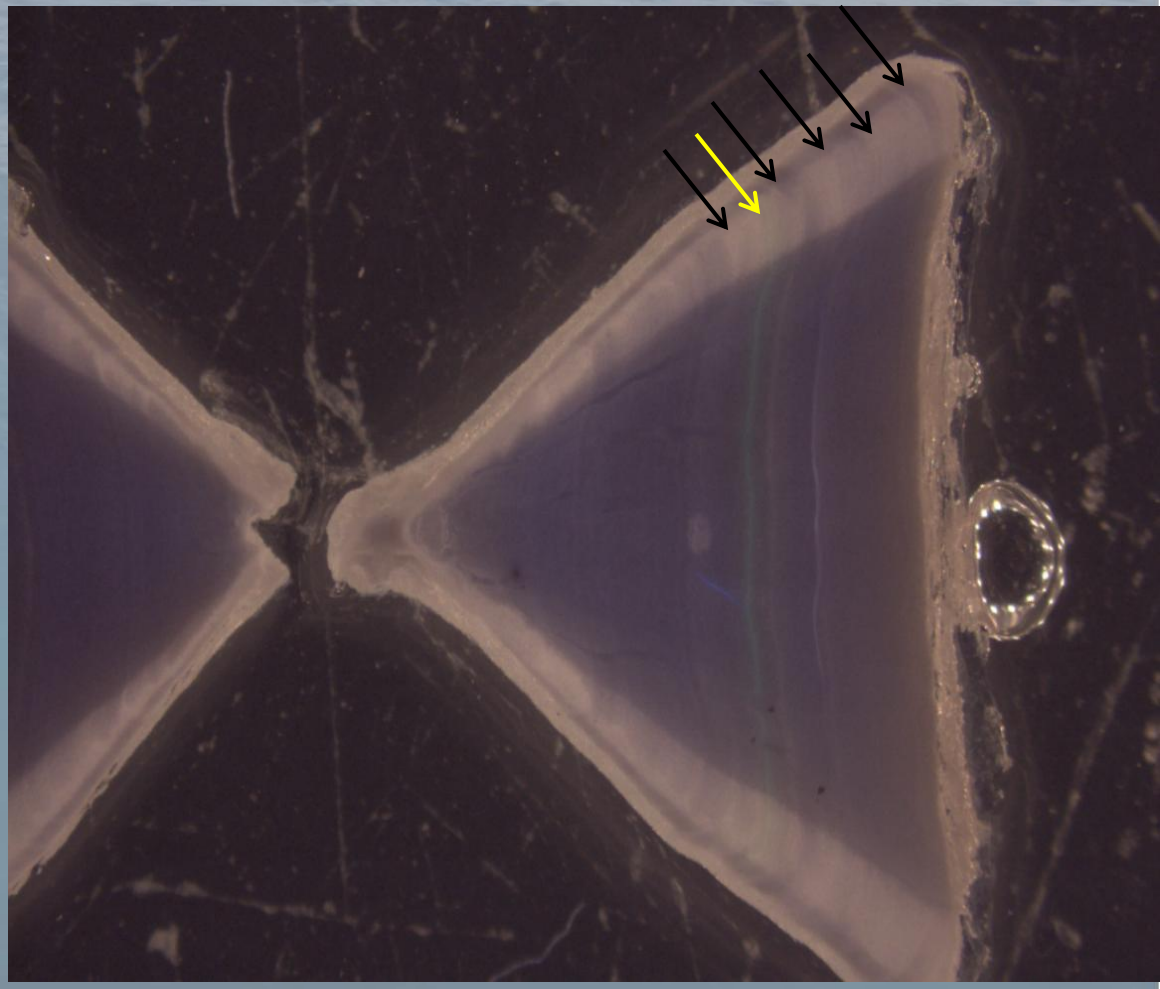
-Most recaptures consistent with annual band deposition*

-670 to 930FL

-1329 days

-Immature to mature

-7.0-10.5 years old



Results cont.

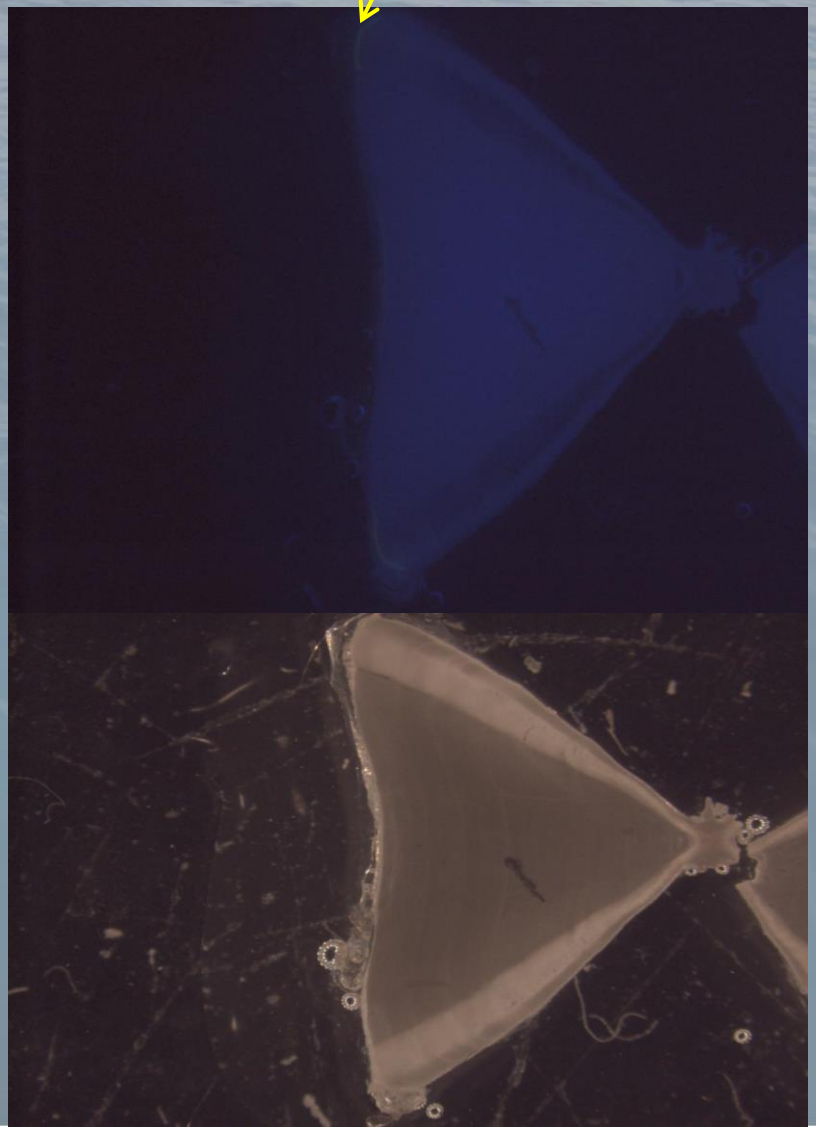
-OTC Validation

-*SC 323: 860 to 876 FL

-722 days liberty

-mature at recapture

-6.7 years old



Growth Model Differences

-Multiple growth curves generated

-Von Bertalanffy (Beverton and Holt 1957)

$$L_t = L_\infty (1 - e^{-k(t-t_0)})$$

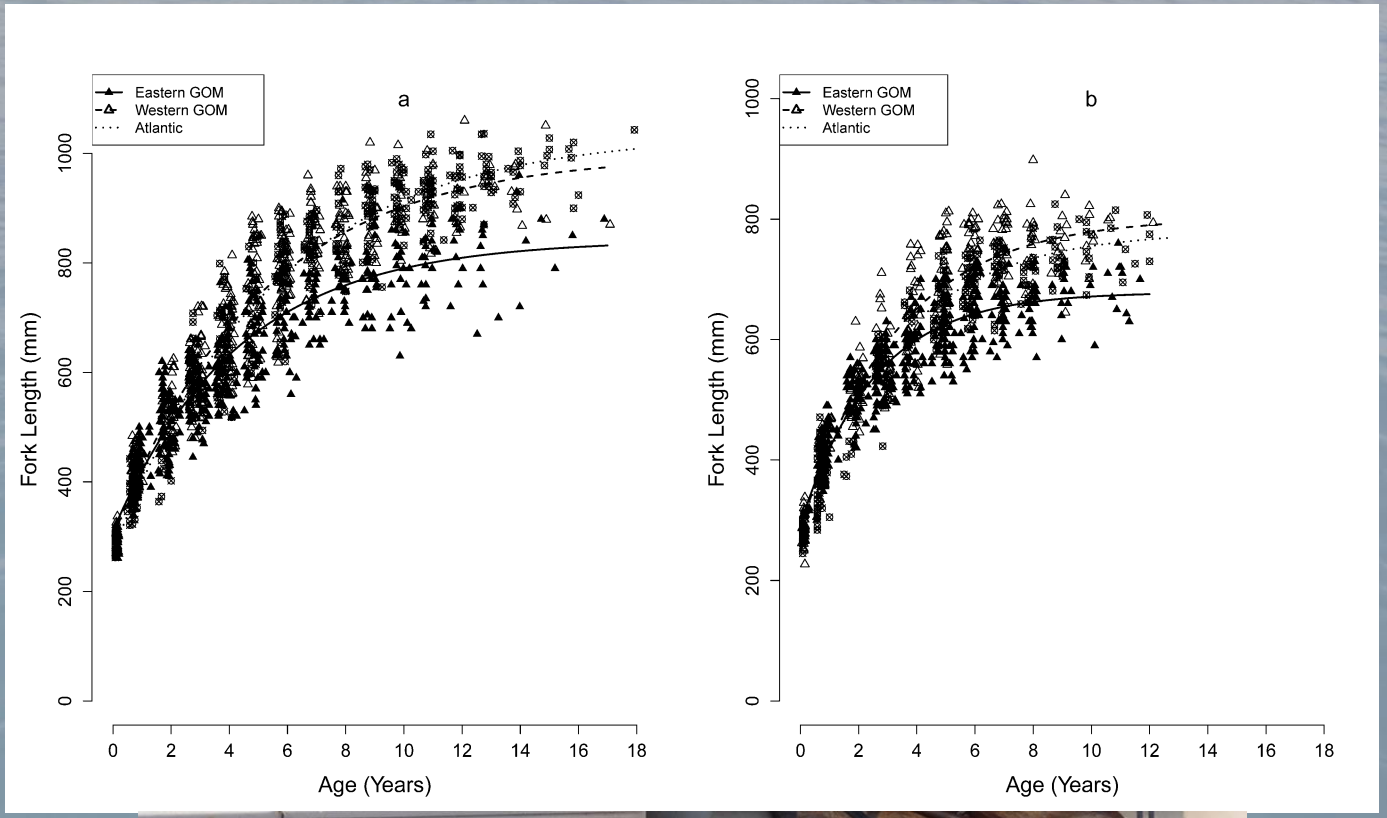
- L_t = length at age *t*
- L_∞ = theoretical asymptotic maximum length
- k = coefficient of growth
- t_0 = theoretical age at which length equals zero

-Original Von Bertalanffy (Calliet et al 2006)

$$L_t = L_\infty - (L_\infty - L_0)e^{-kt}$$

- L_0 = mean length at birth

Bonnetheads



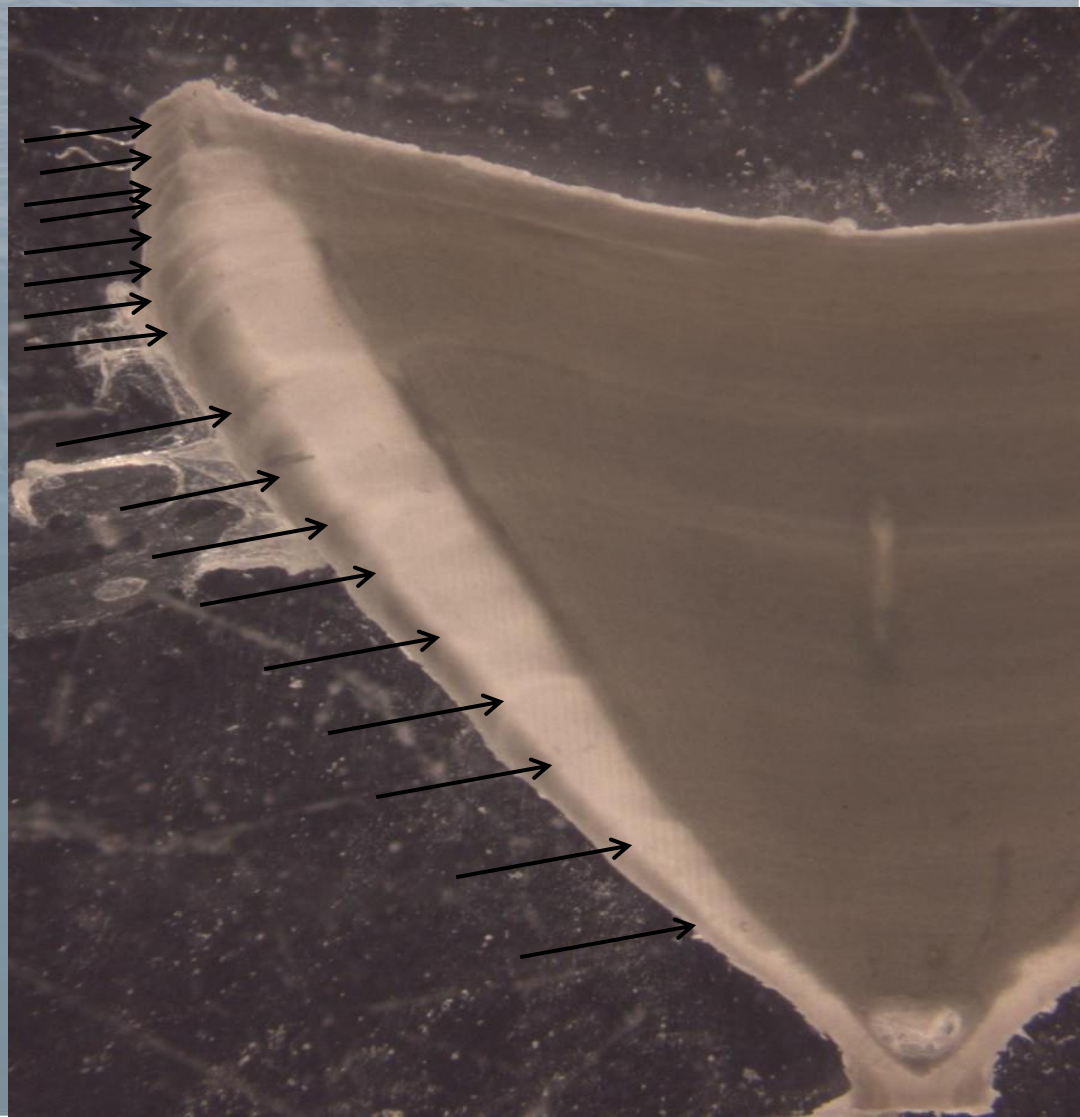
Bonnetheads cont.

-Long Term Recap

-980 to 1008 FL

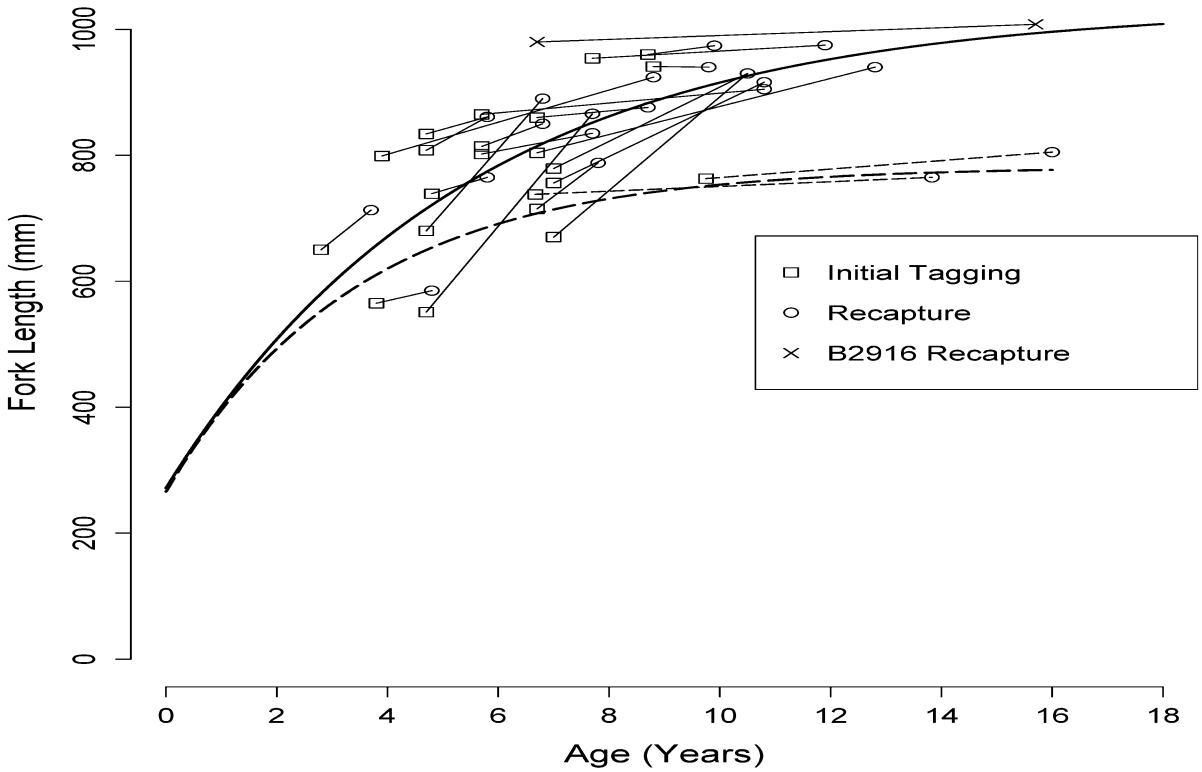
-3236 days at liberty

-17 bands (15.7 yo)

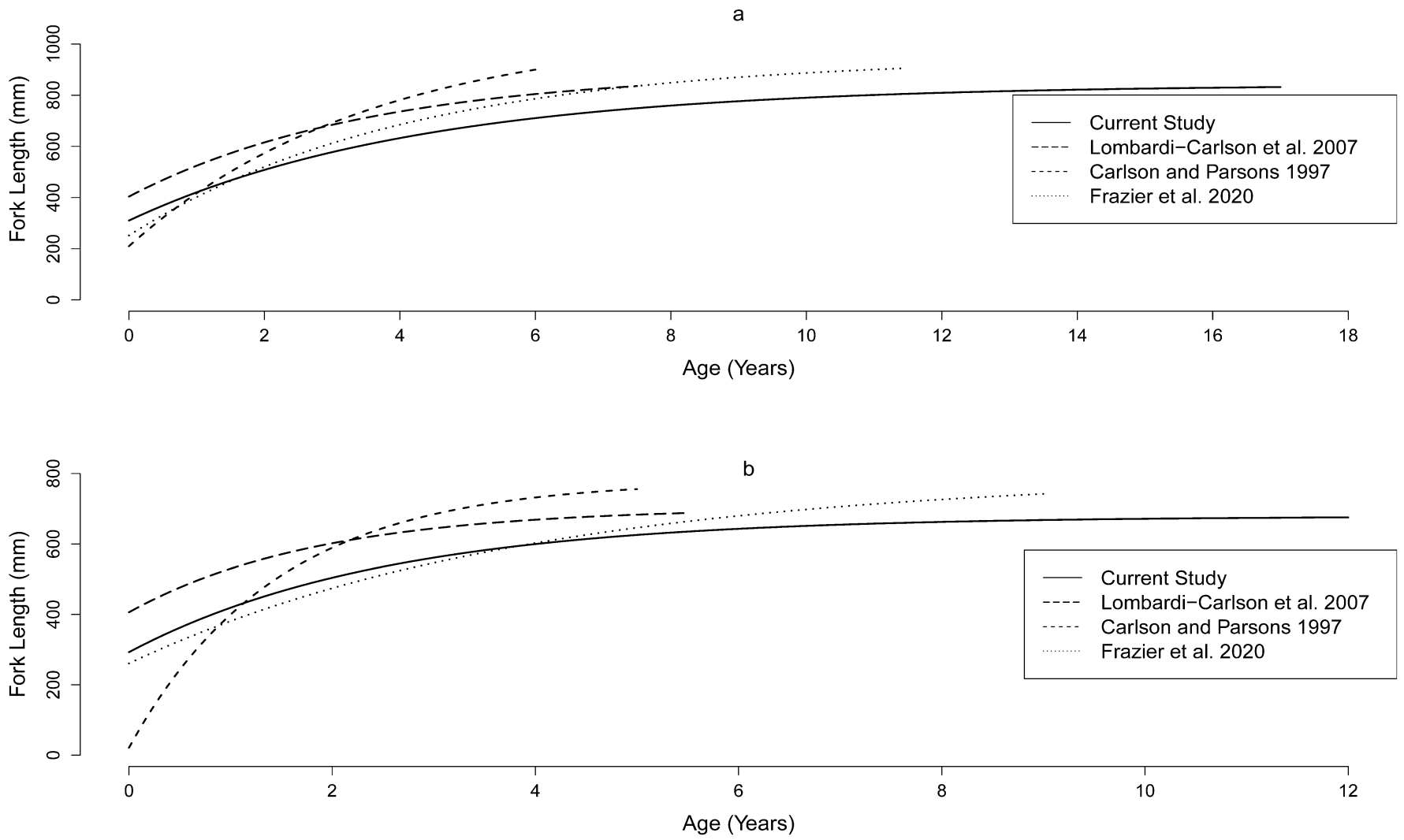


Bonnetheads cont.

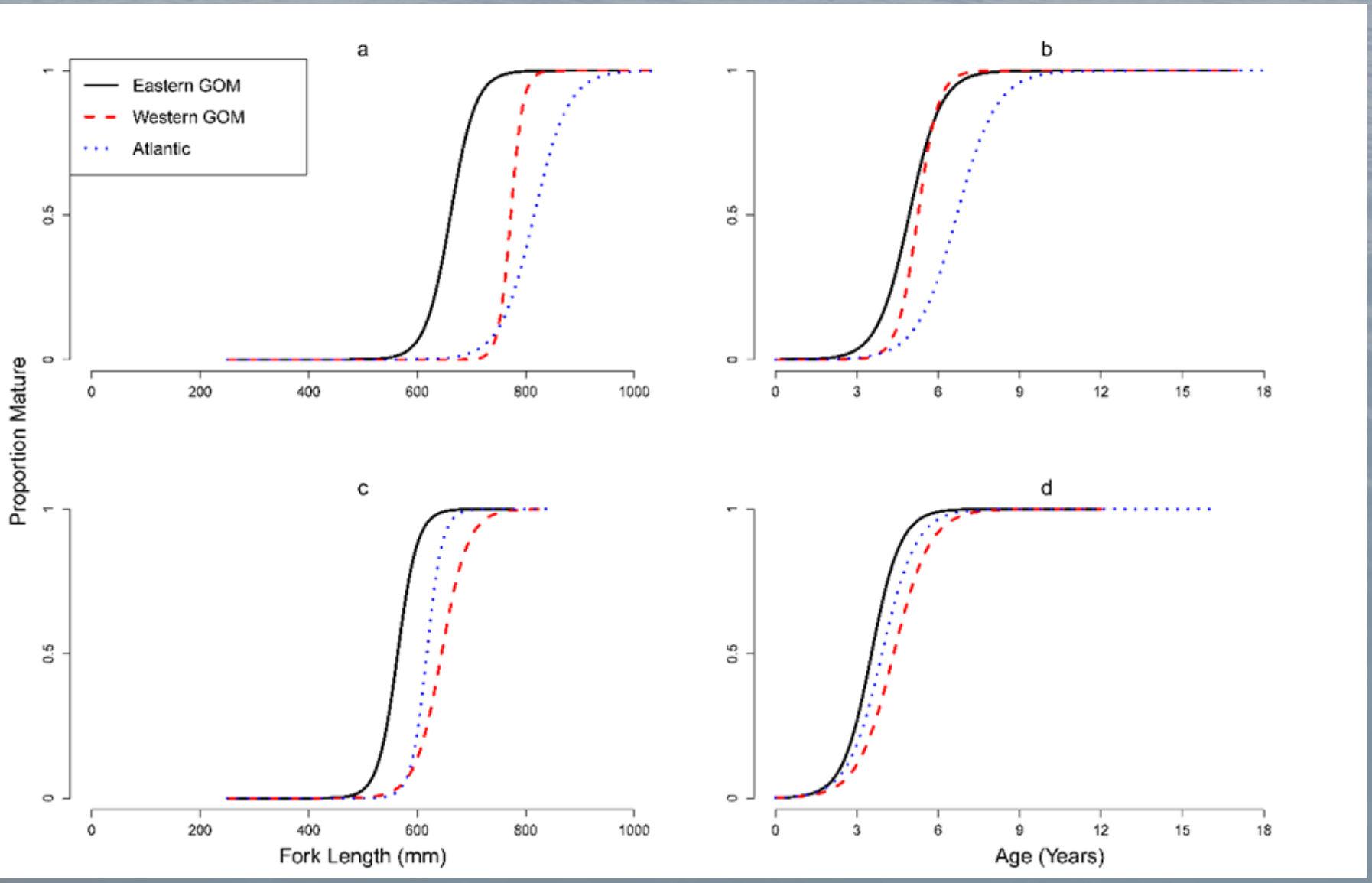
-Long Term Recap



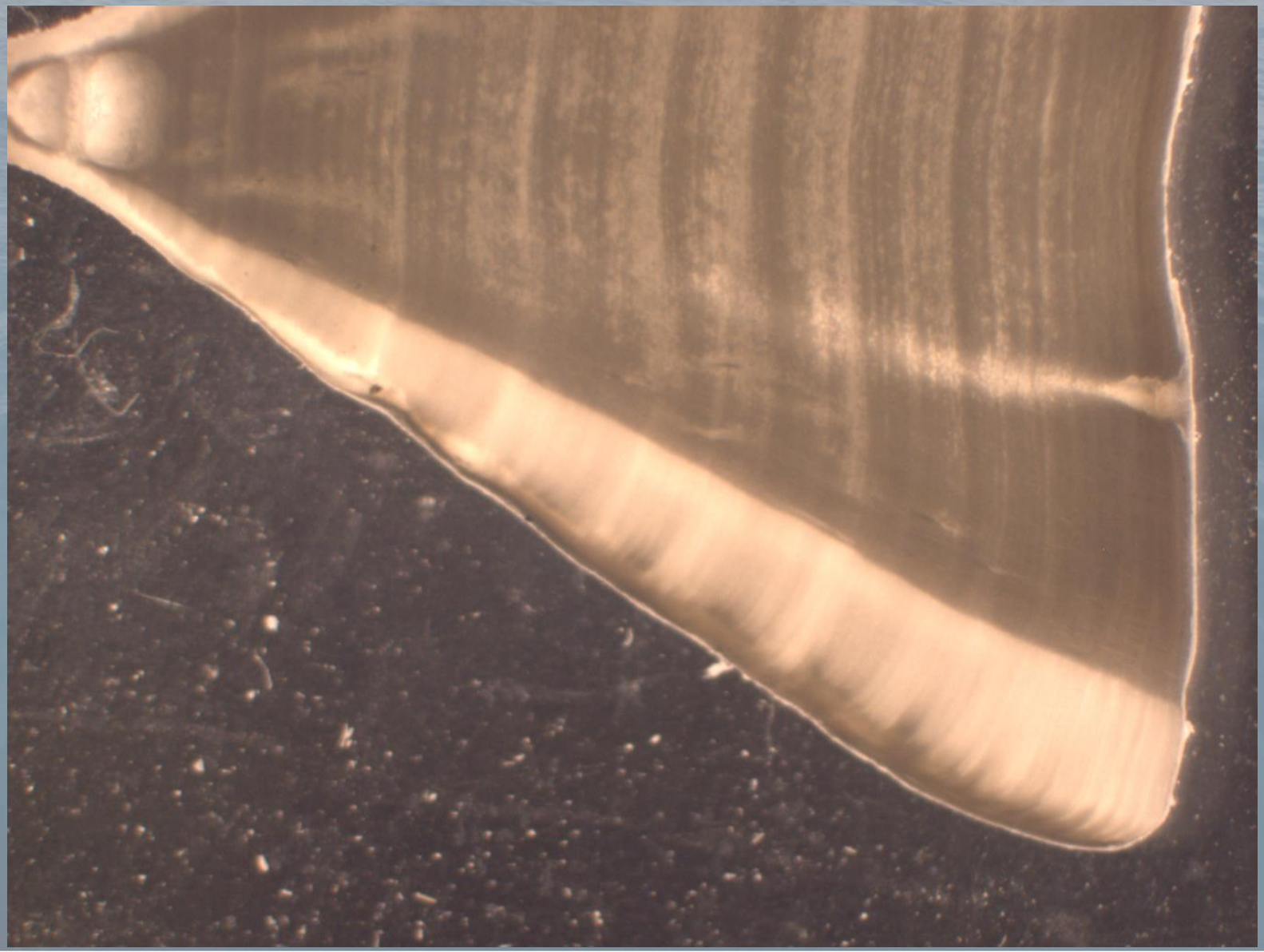
Bonnetheads cont.



Bonnetheads cont.



Scalloped Hammerheads



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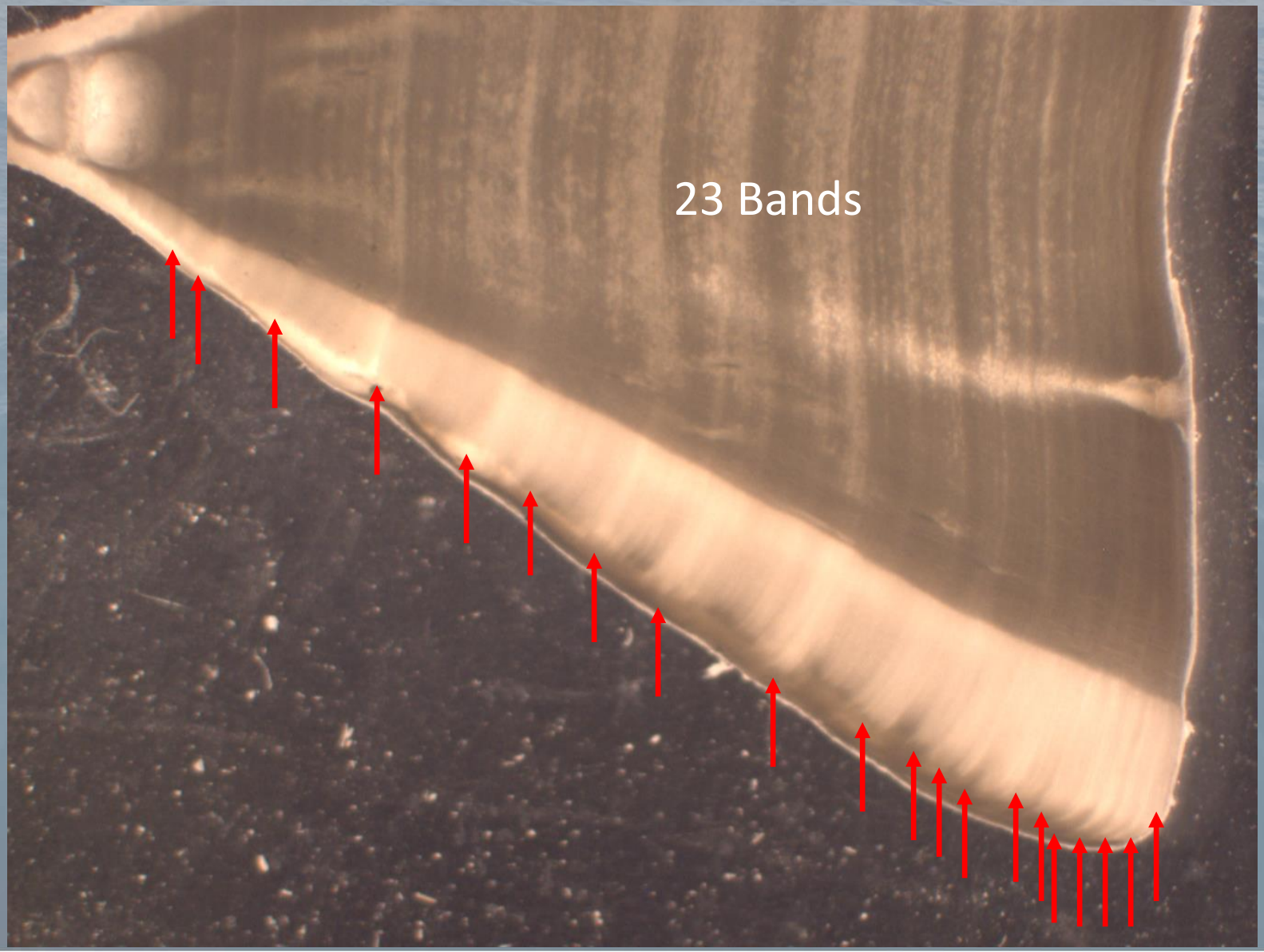

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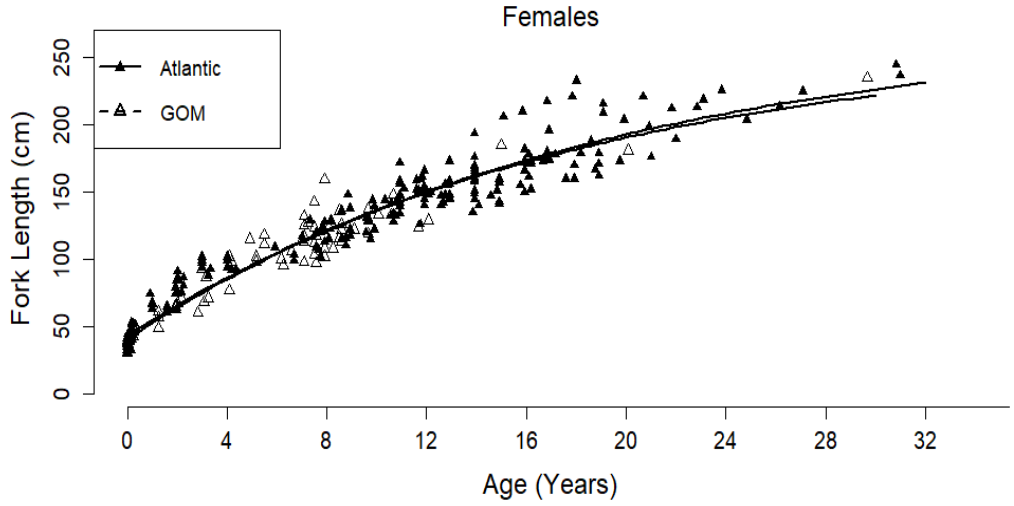
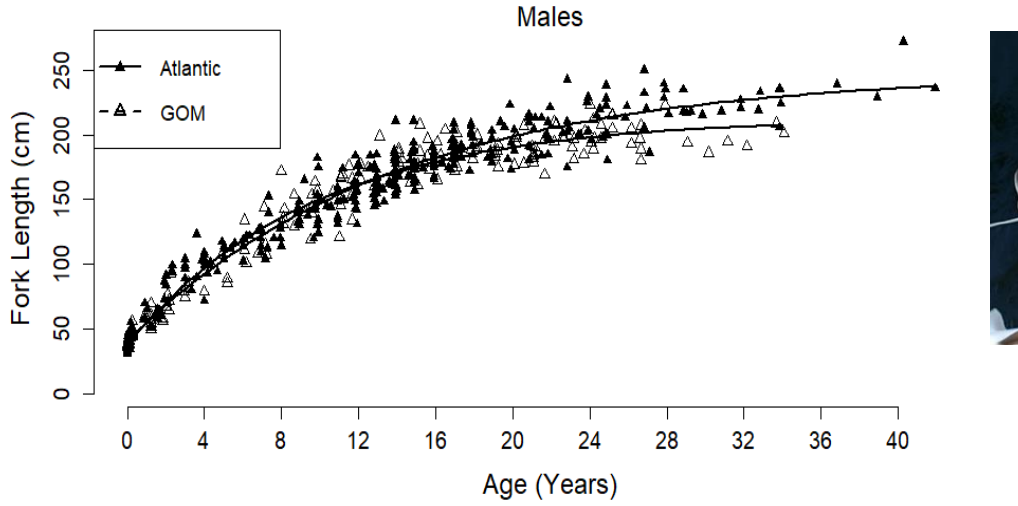
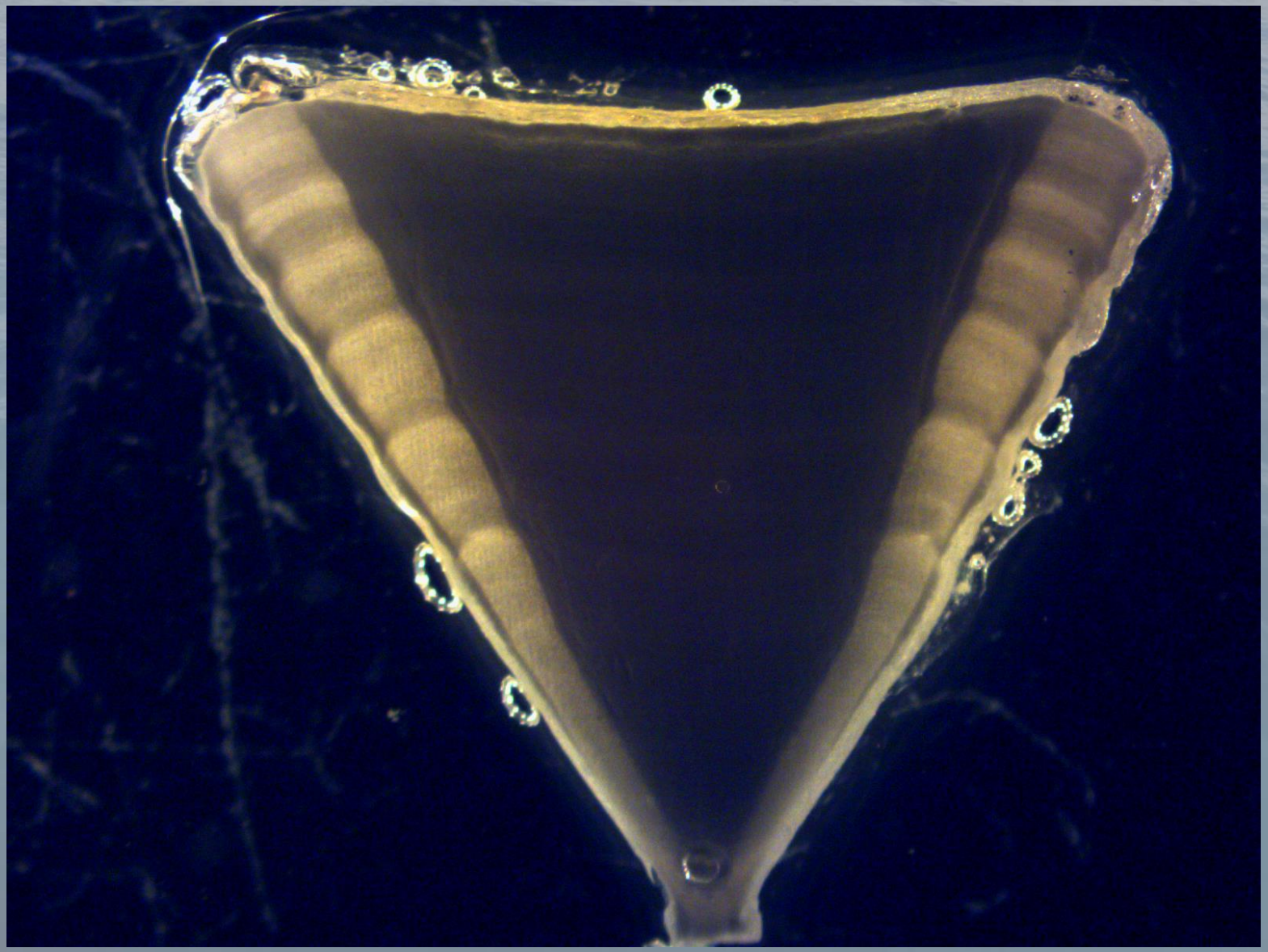
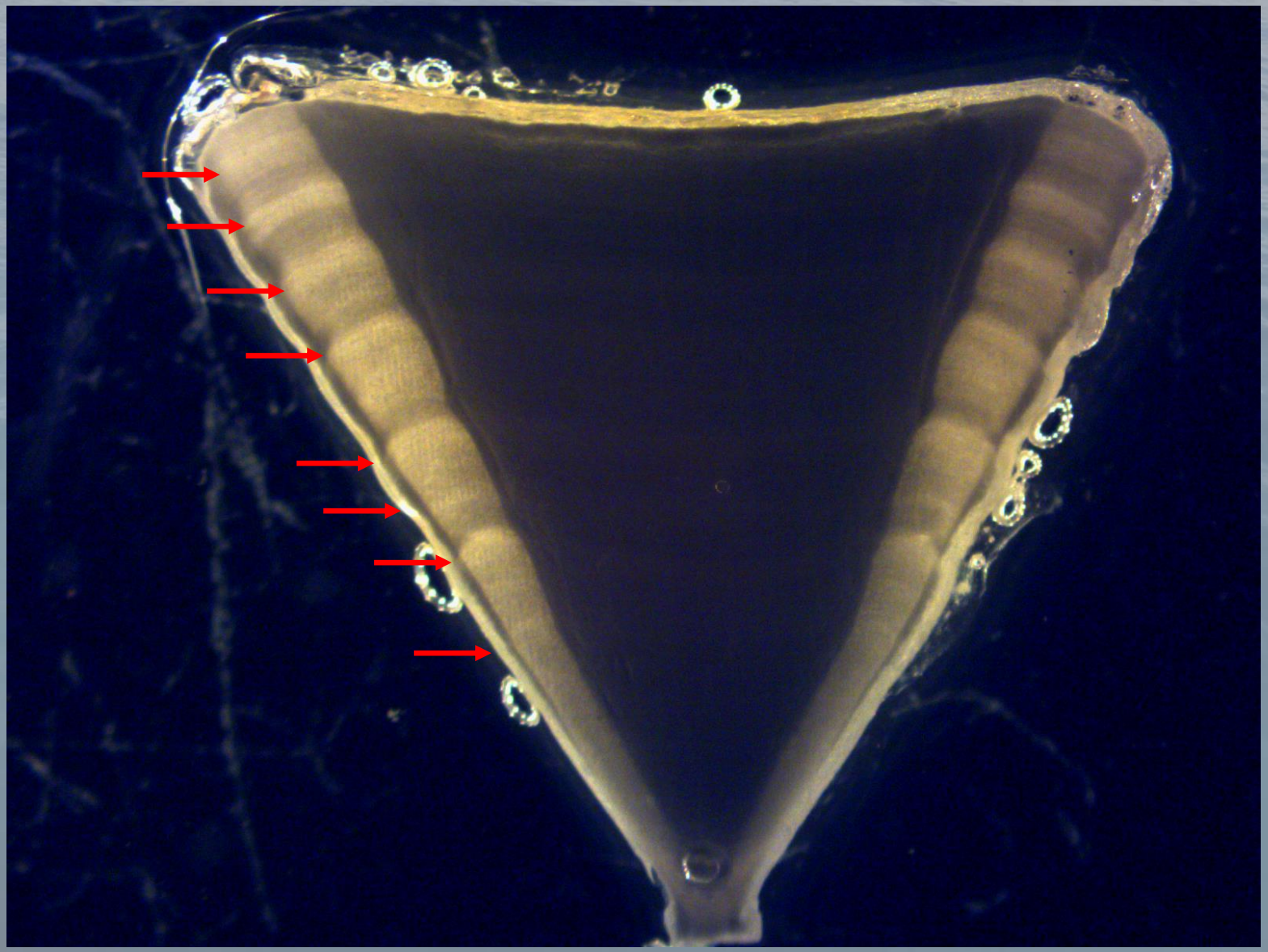




Spinner Sharks



Spinner Sharks



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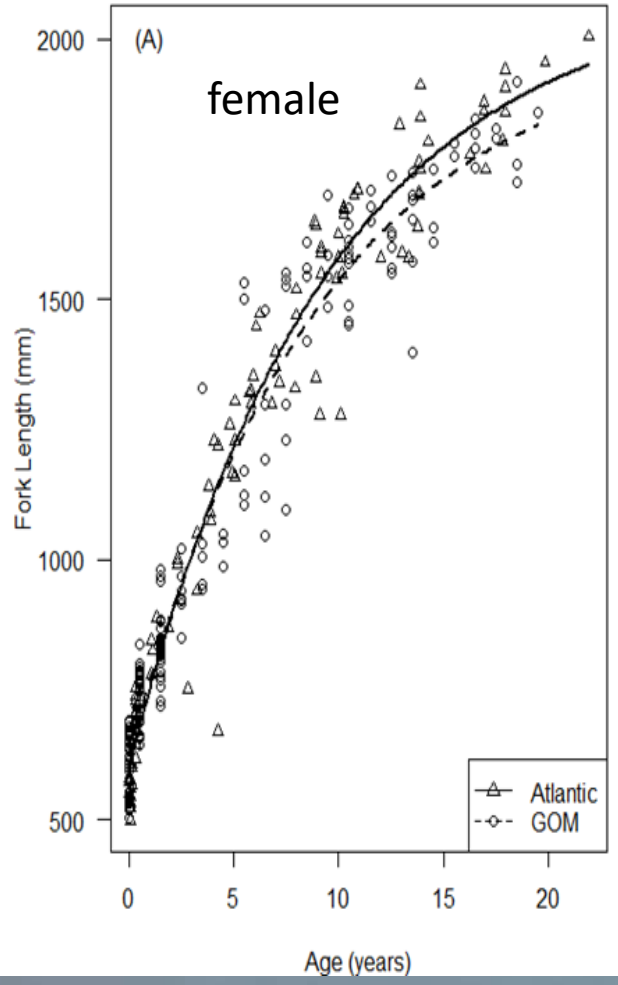

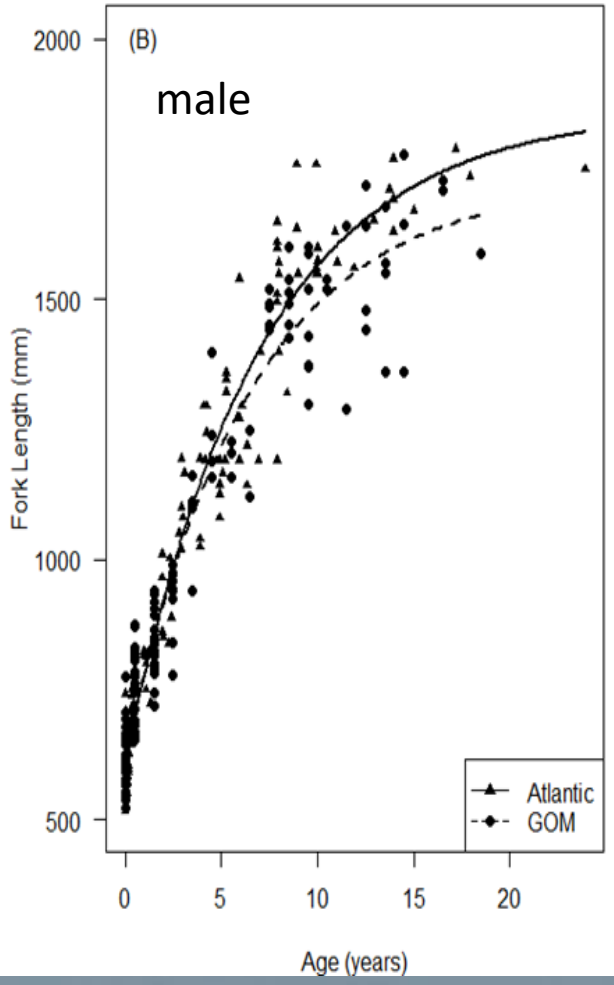

Activity

Katie Anweiler