



EVALUATION OF POTENTIAL AGE STRUCTURES FOR RED KING AND SNOW CRAB

April Rebert

Crab Plan Team Meeting

May 8, 2018

“DEVELOP AND VALIDATE AGING METHODS FOR CRABS”- NPFMC 2017



Paralithodes camtschaticus



Chionoecetes opilio

STRUCTURES



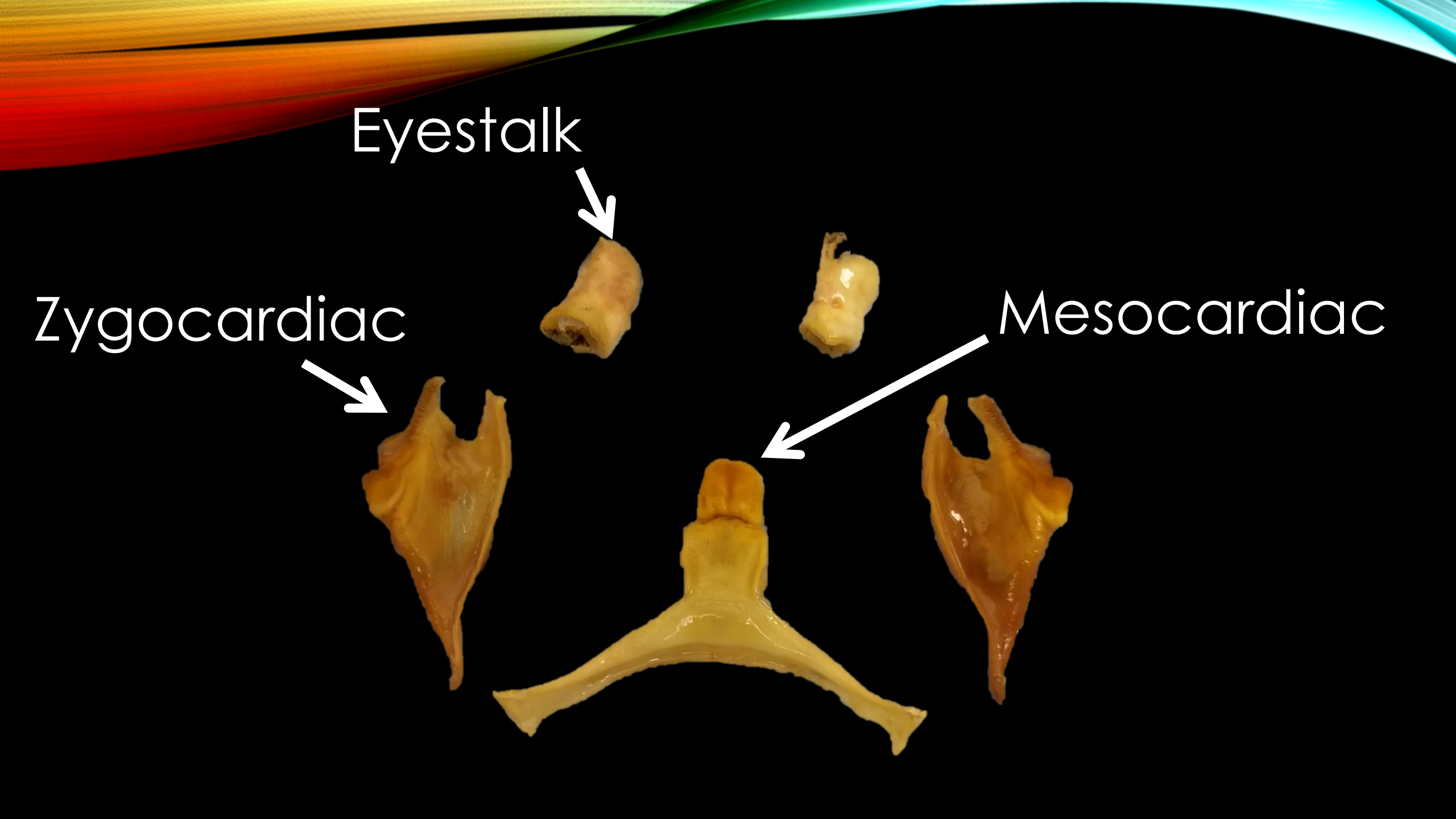
Eyestalk



Zygocardiac



Mesocardiac





Research Question

What is an efficient, precise method for processing potential age determination structures of red king and snow crab?

METHODS

N=5

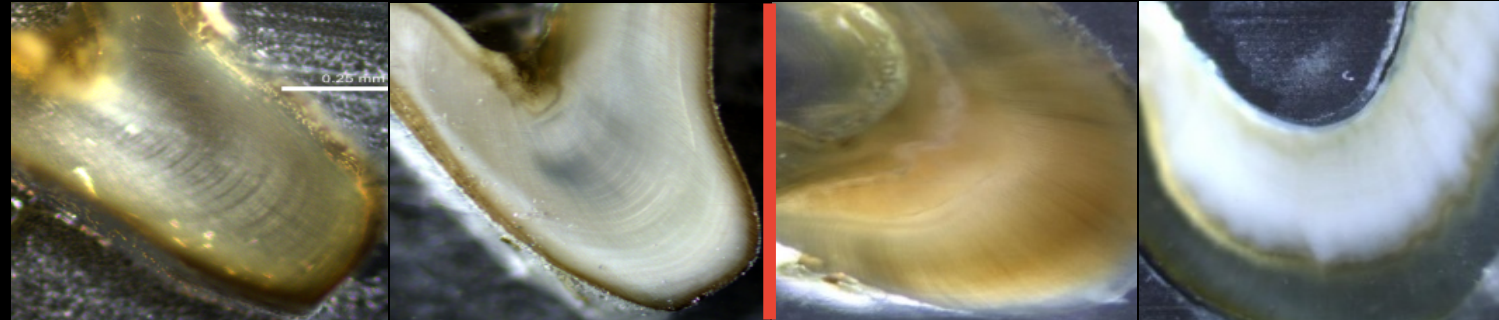
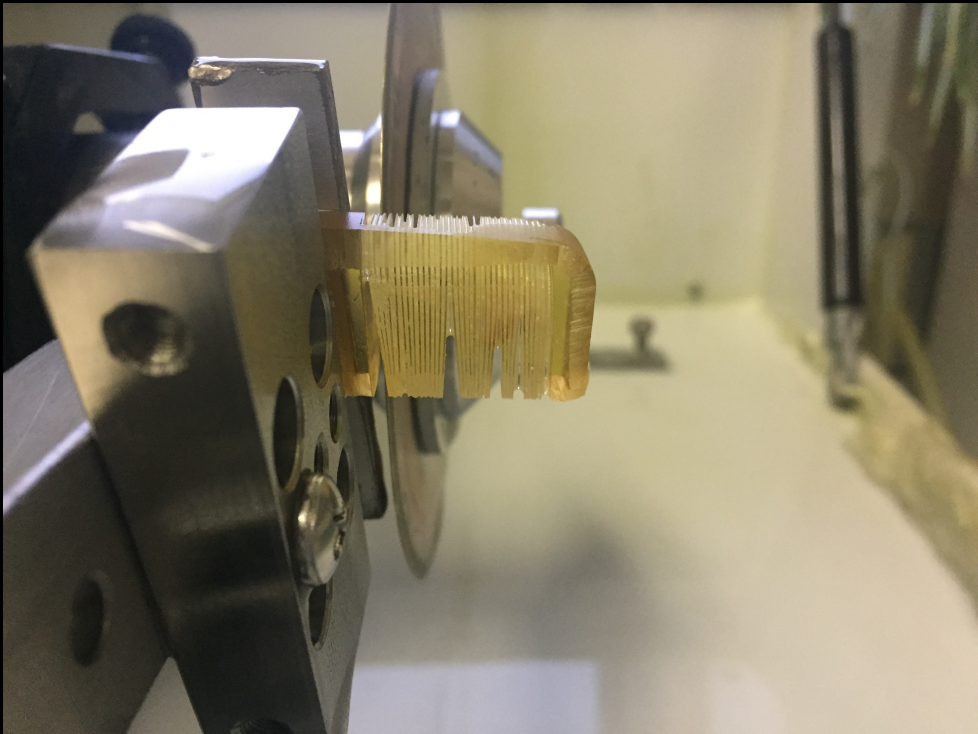


Newsell male

N=5



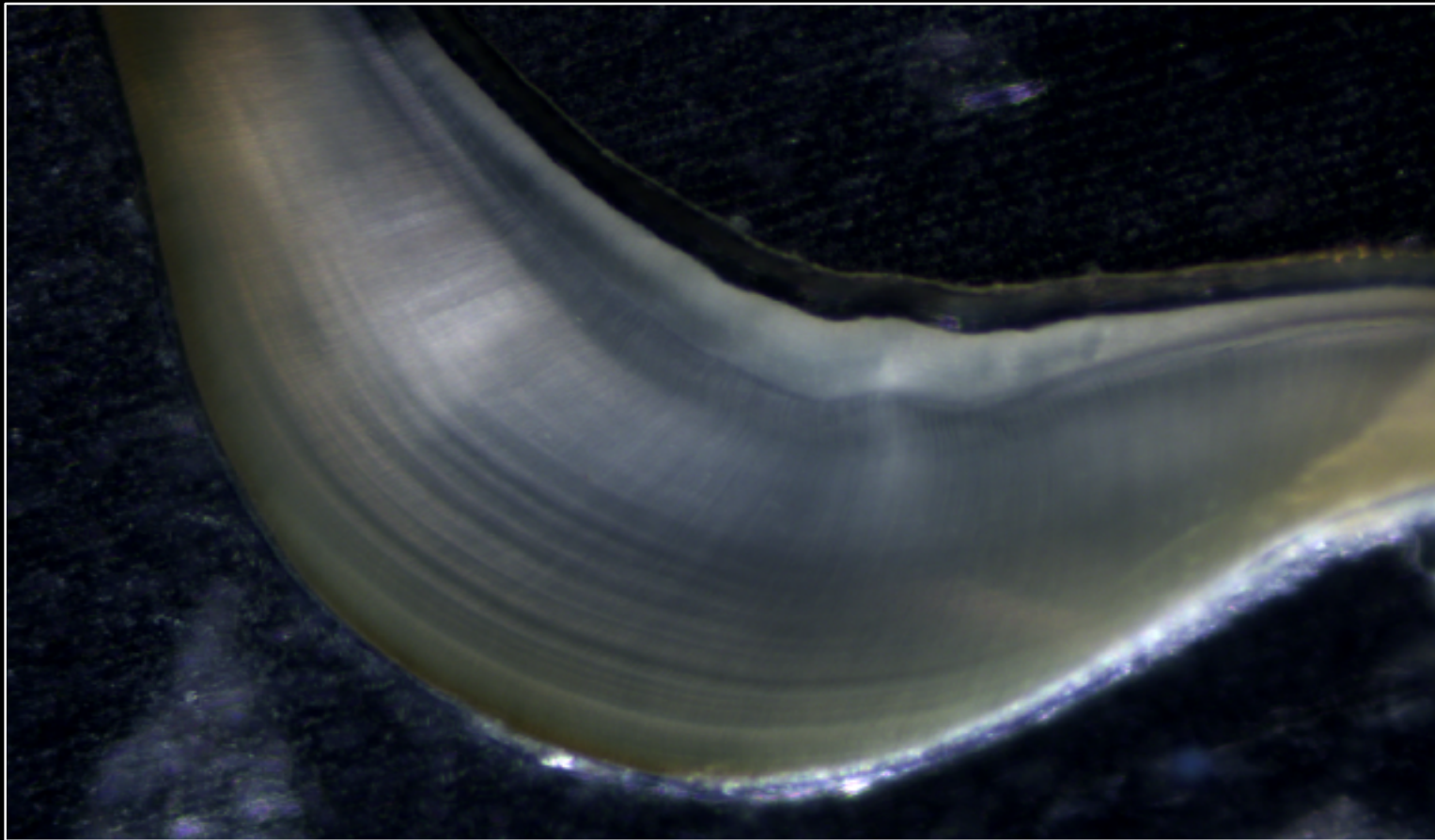
METHODS



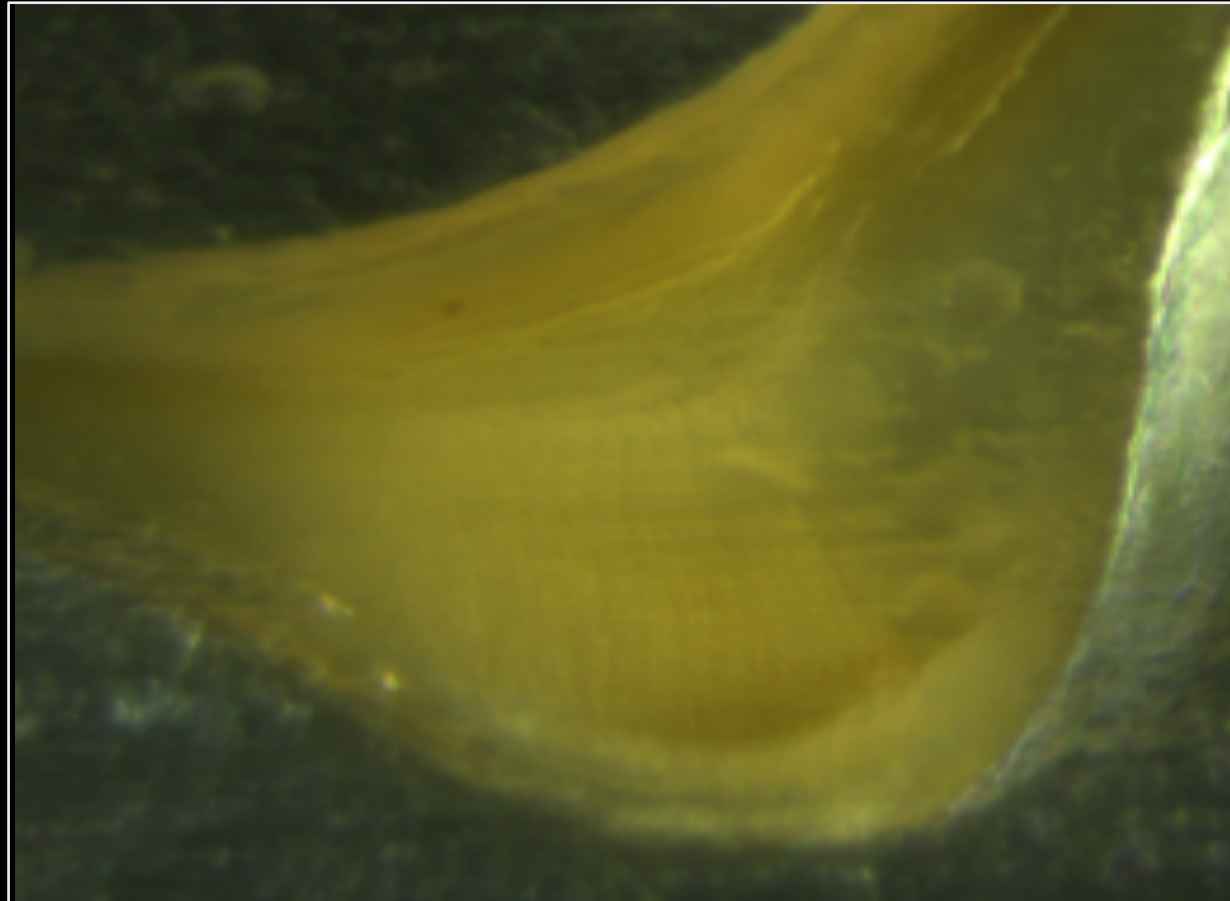
Readable

Unreadable

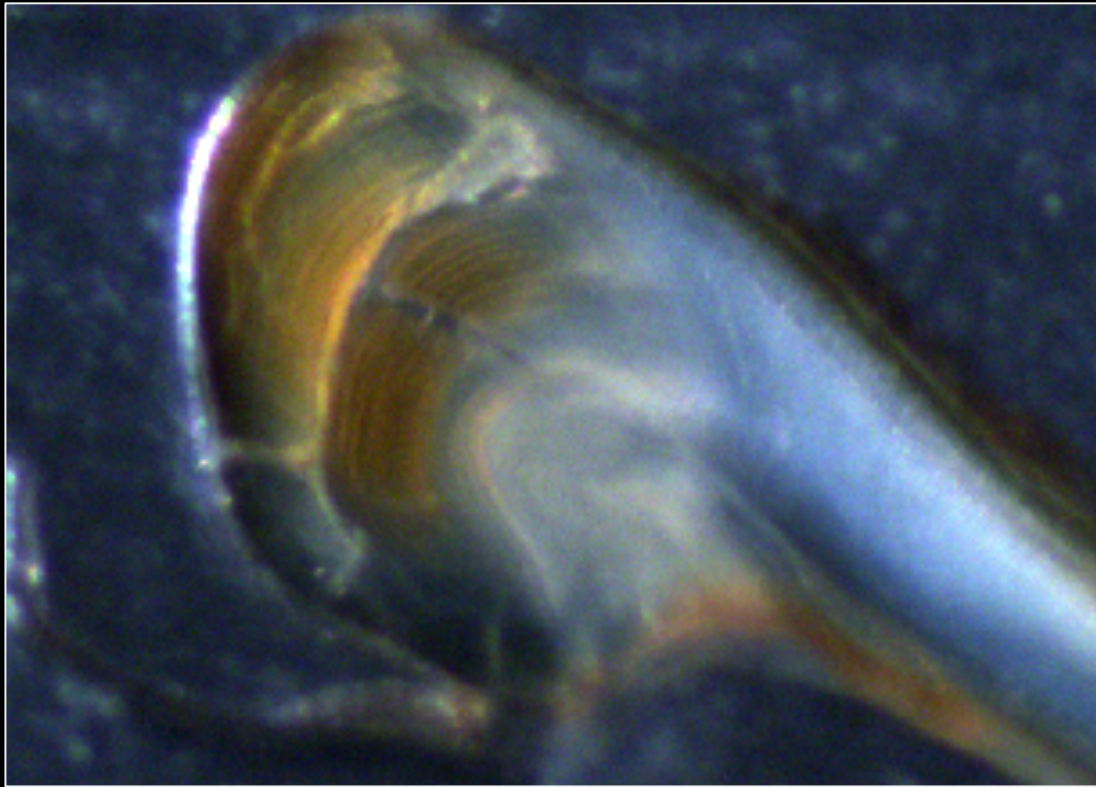
Clear = Readable



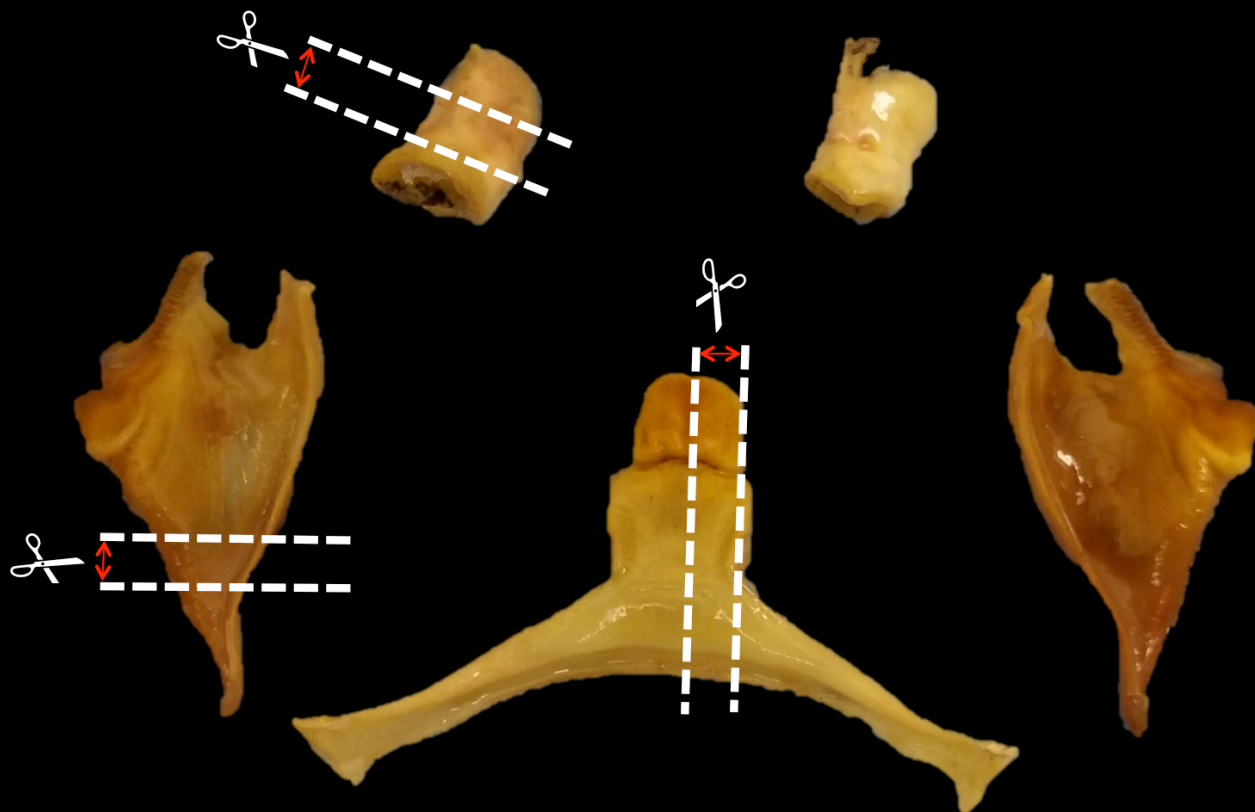
Yuk = Unreadable



Damaged = Excluded



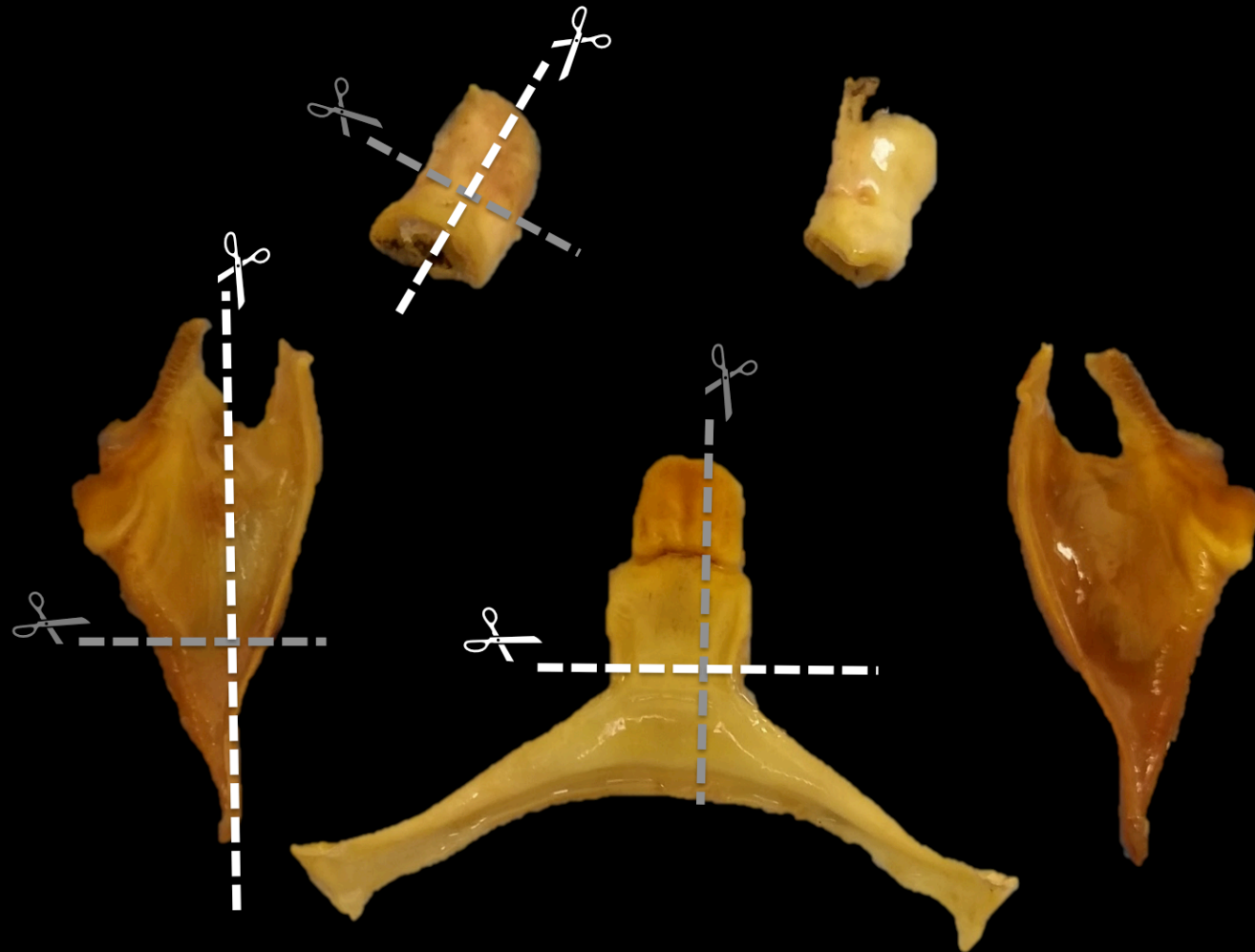
SECTION THICKNESS



$\longleftrightarrow = 120 - 200 \mu m$

(Leland et al 2011, Kilada et al 2012)

SECTION ORIENTATION



(Leland et al 2011, Kilada et al 2012)

WHERE EXACTLY



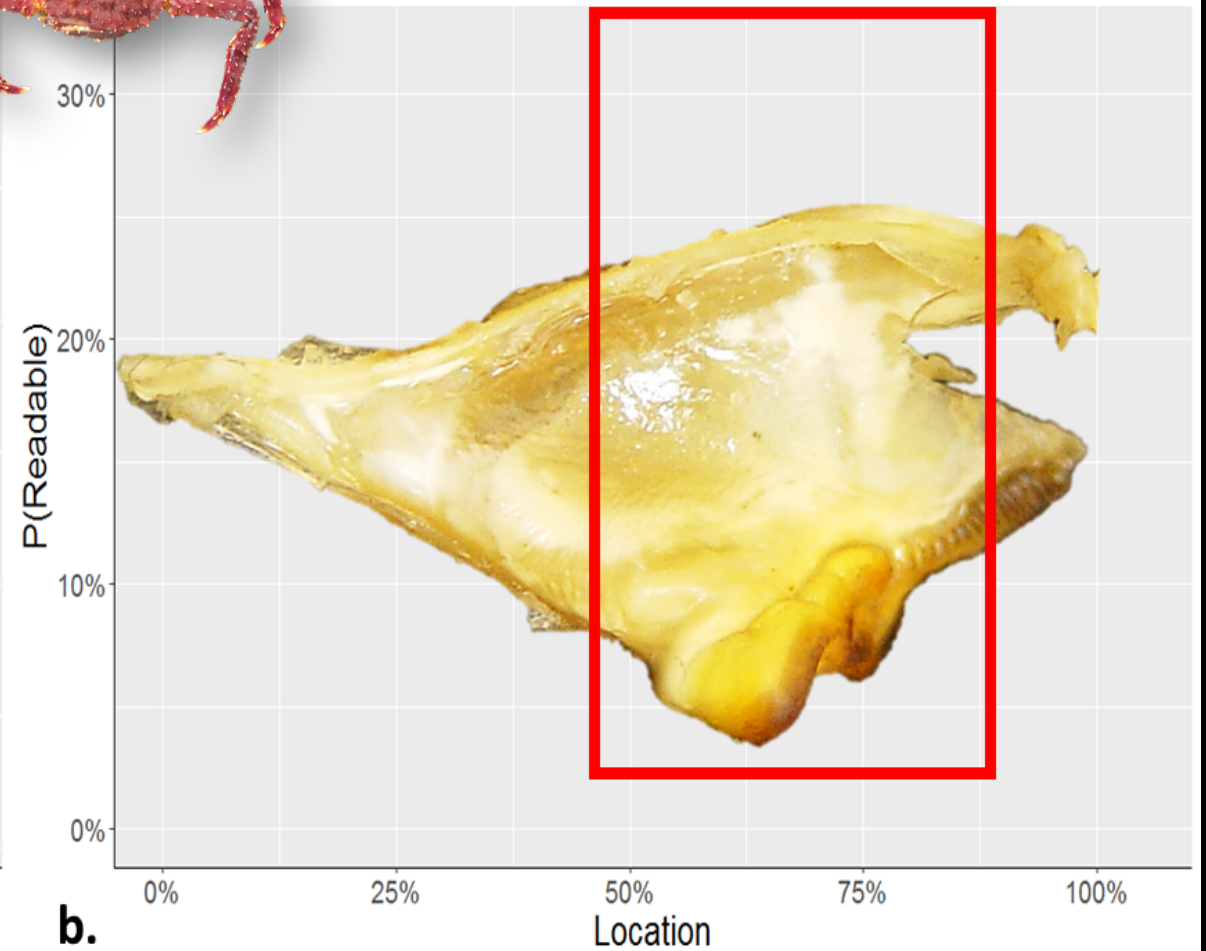
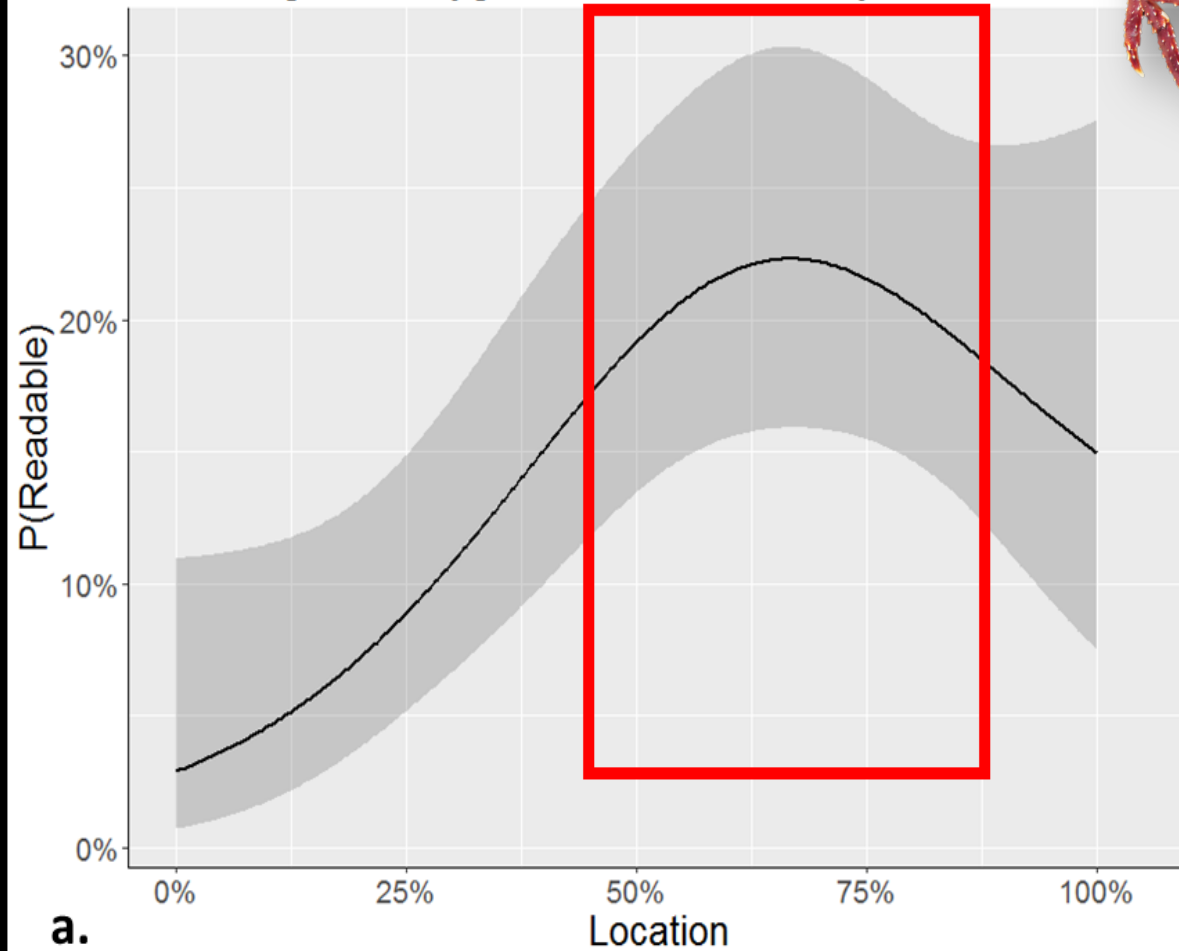
WHERE EXACTLY



WHERE EXACTLY



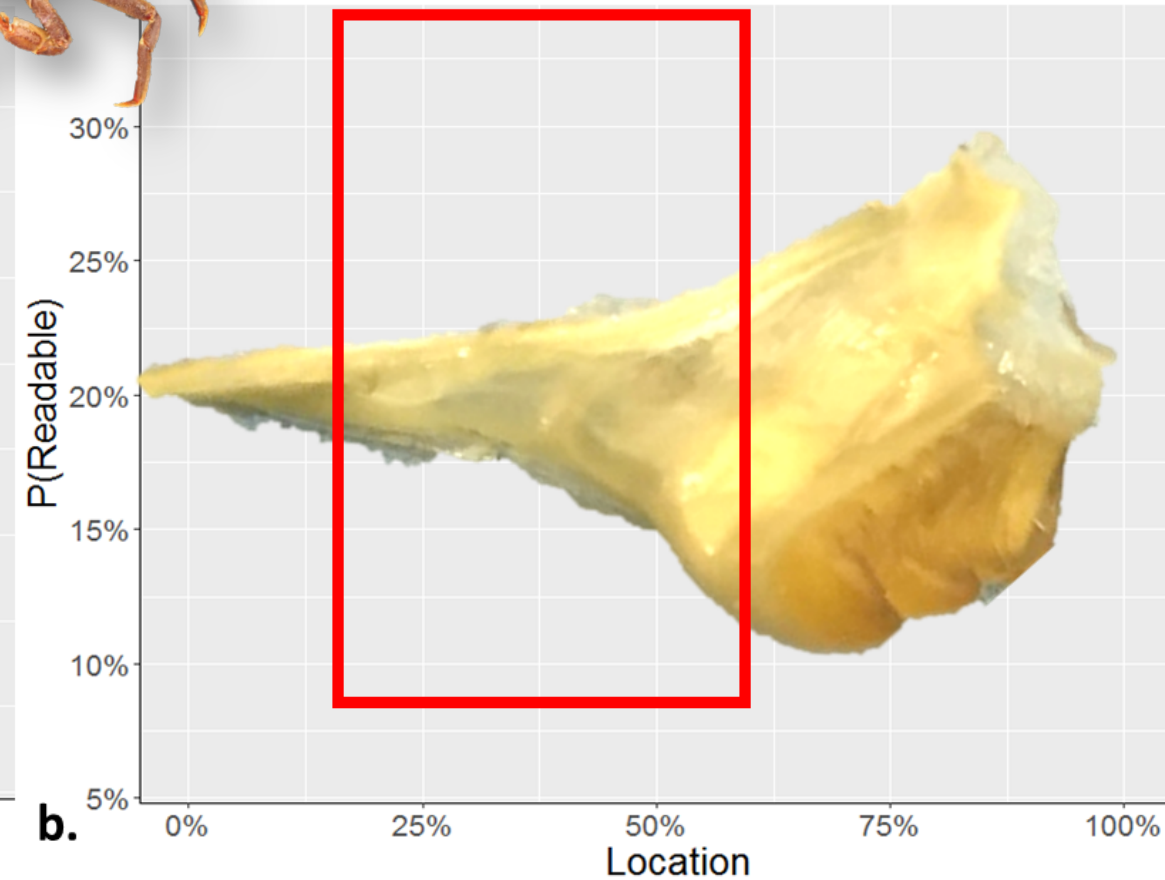
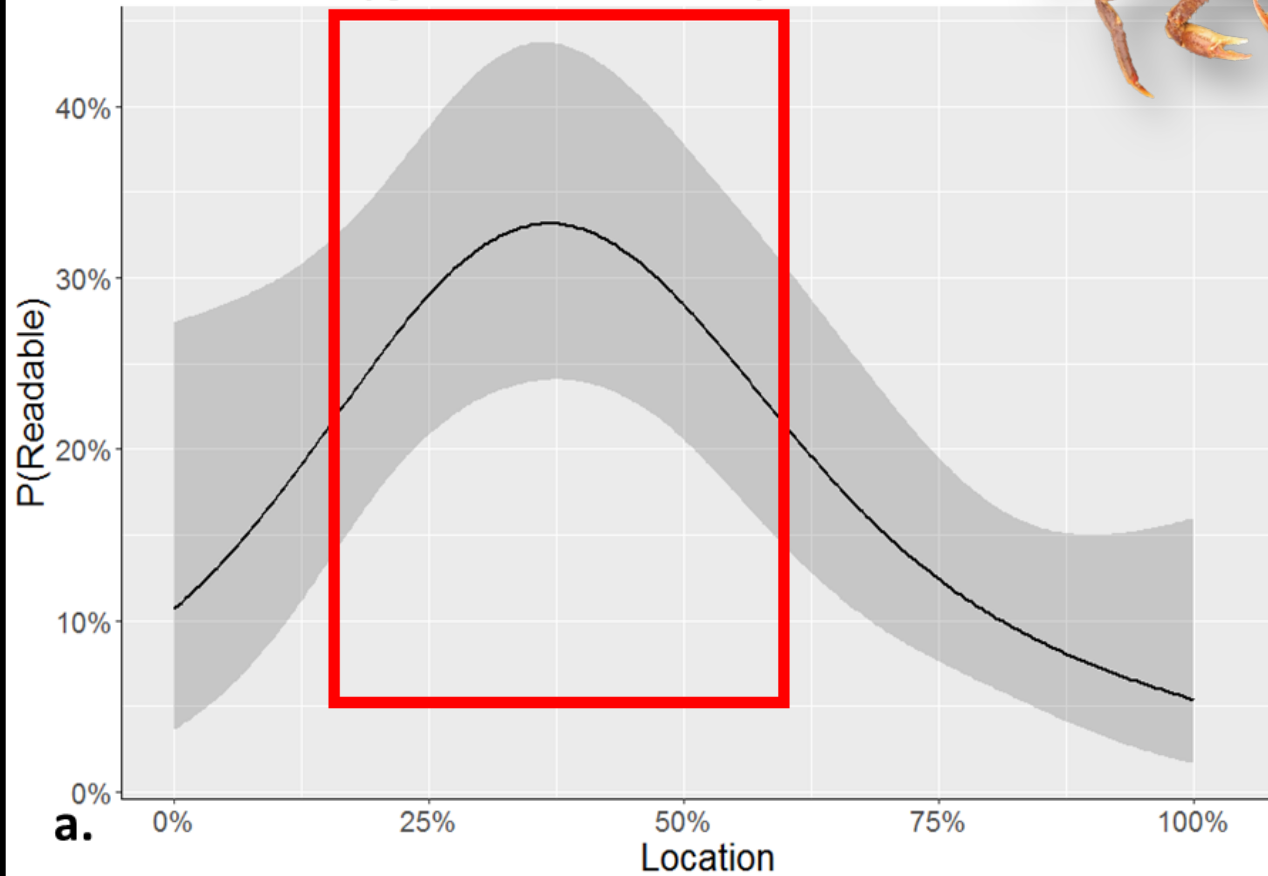
Red King Crab Zygocardiac Readability at Location



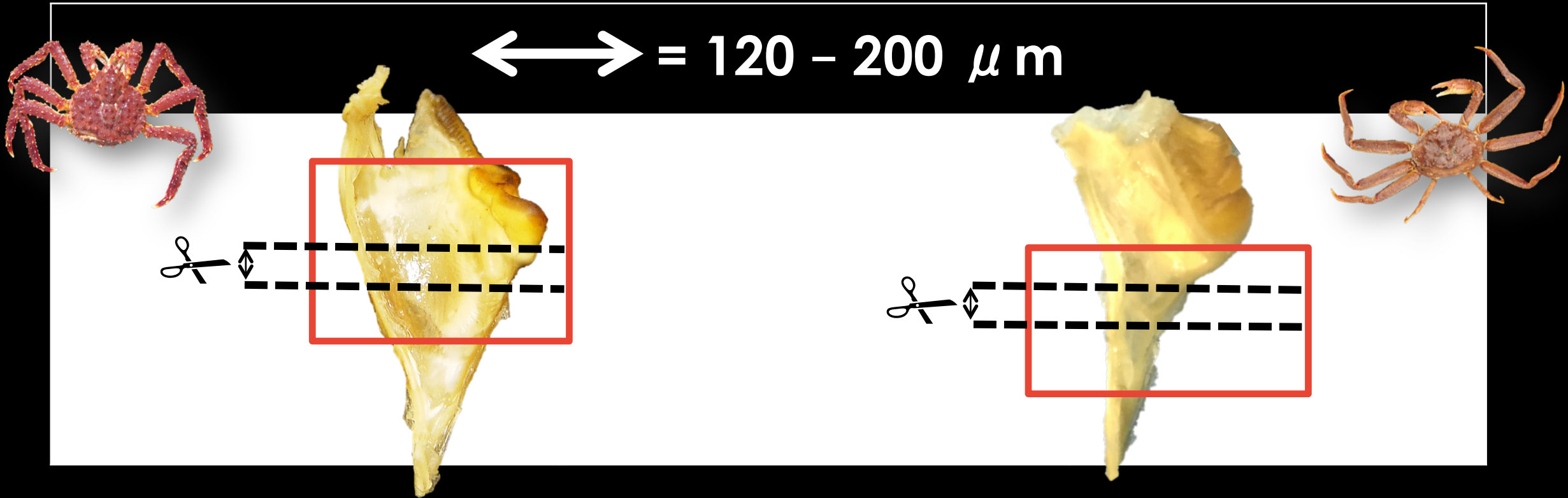
WHERE EXACTLY

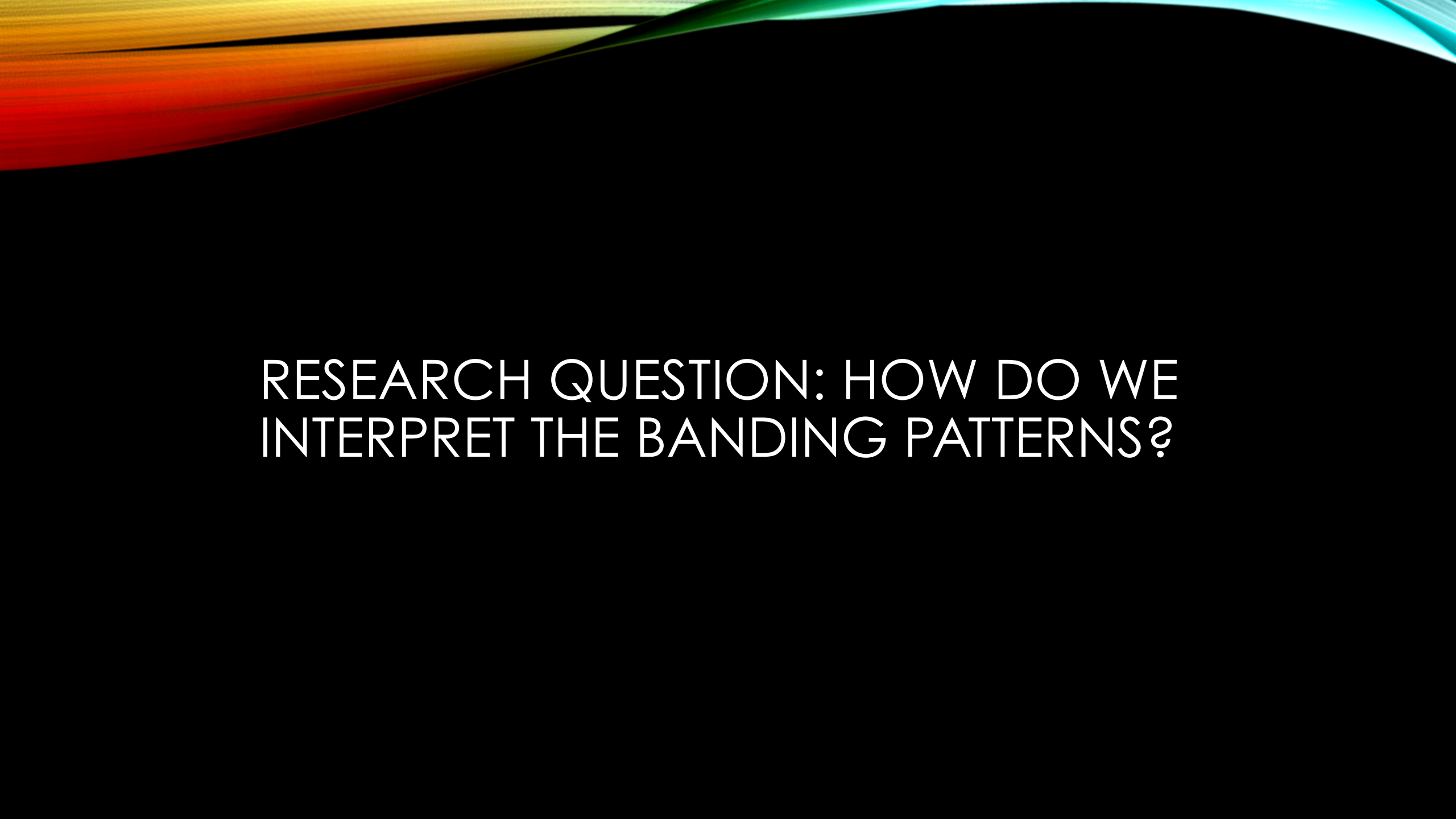


Snow Crab Zygocardiac Readability at Location



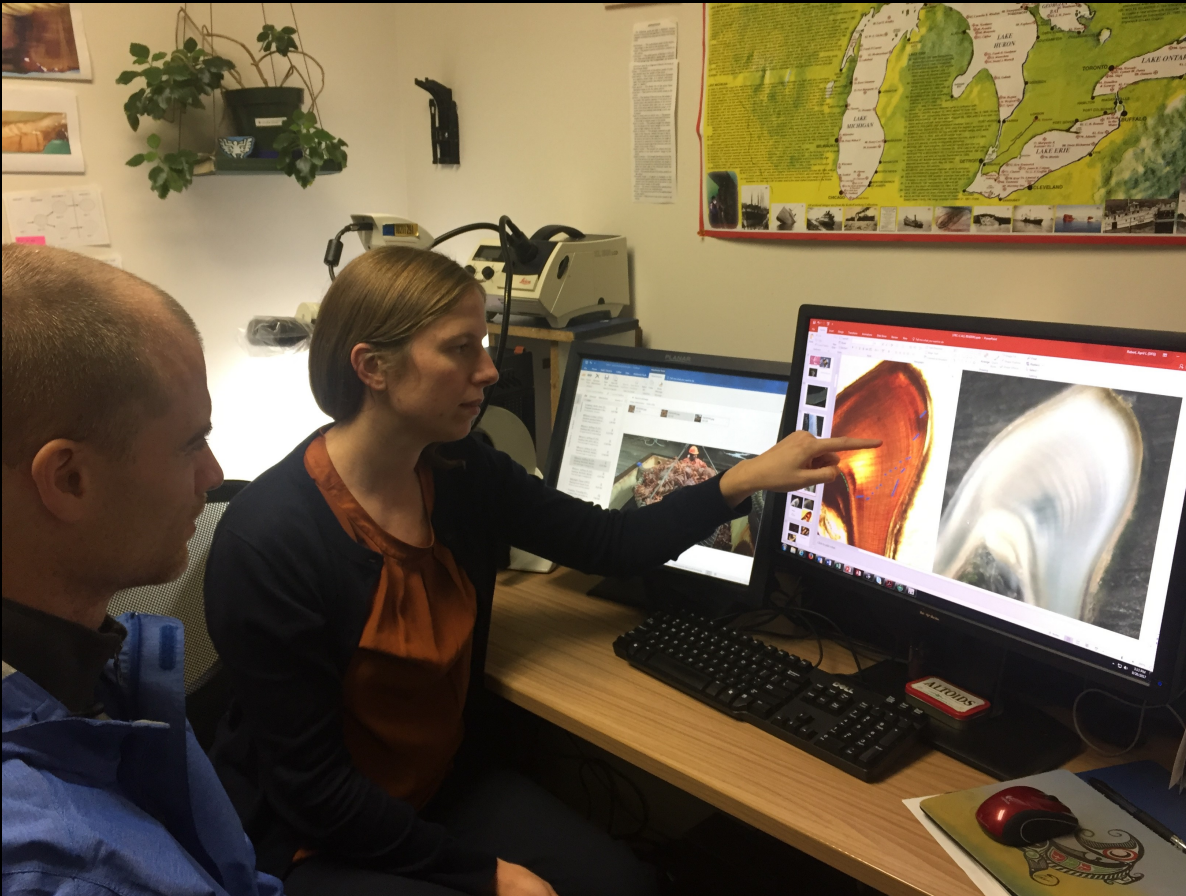
SPECIES-SPECIFIC PROCEDURES





RESEARCH QUESTION: HOW DO WE
INTERPRET THE BANDING PATTERNS?

METHODS



Band Criteria Review Leland Complete.pptx - Saved to V: Drive

File Home Insert Design Transitions Animations Slide Show Review View Help Tell me what you want to do

Clipboard Font Paragraph Drawing Editing

4

5

6

7

8

This one shows the cb better. It looks like you have counted the cb as the first mark. Re. the single mark here (not counted on other) not sure if this is 'real'. Difficult (without knowing the species), but I think the spacing would be too narrow, judging by the others. This light litter for cb identification, but I'd use the other for the count (this one could be misleading). Again my count is a bit lower – only because of first and last mark.

cb →

cb →

cb → cb →

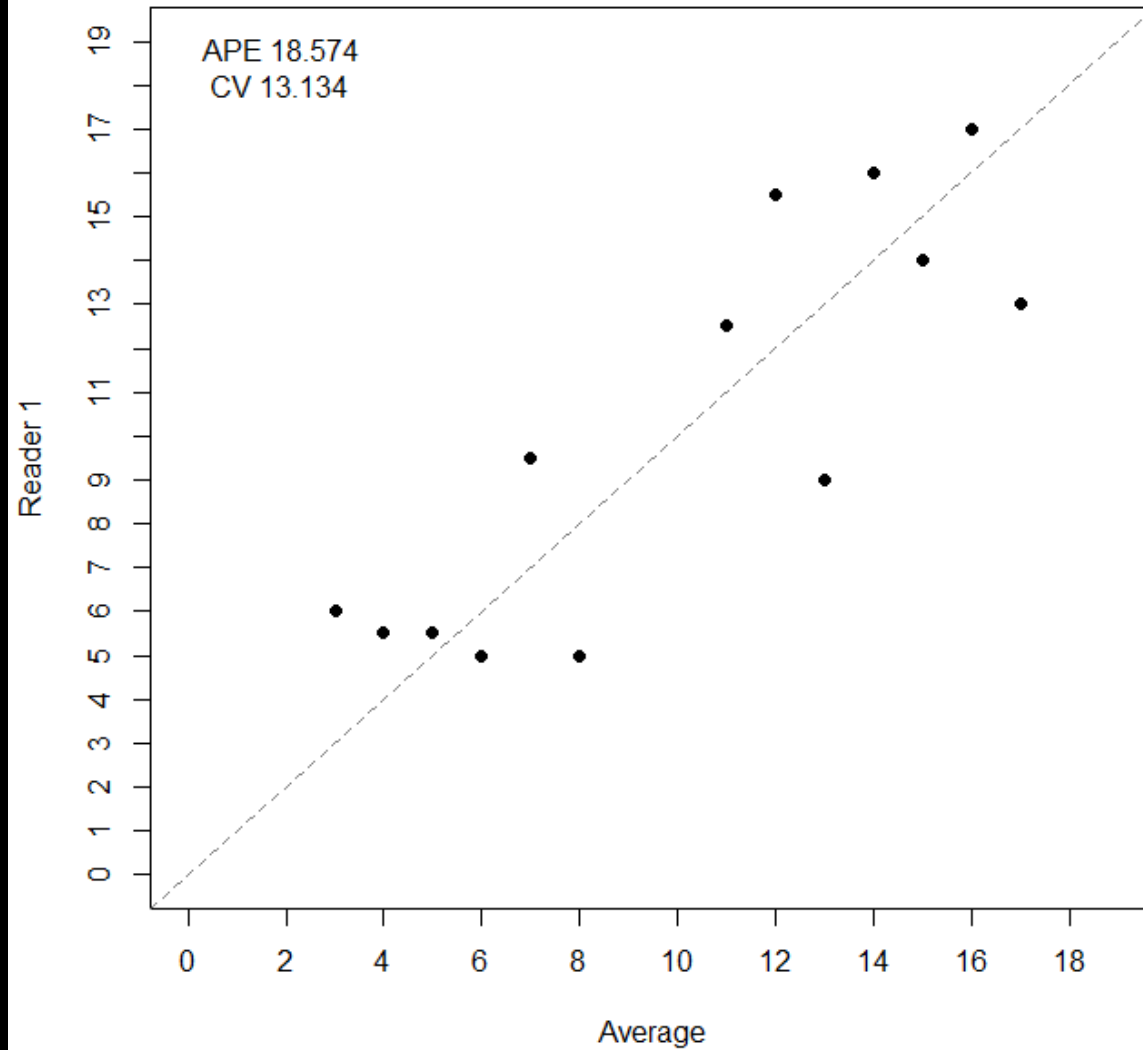
0.25 mm

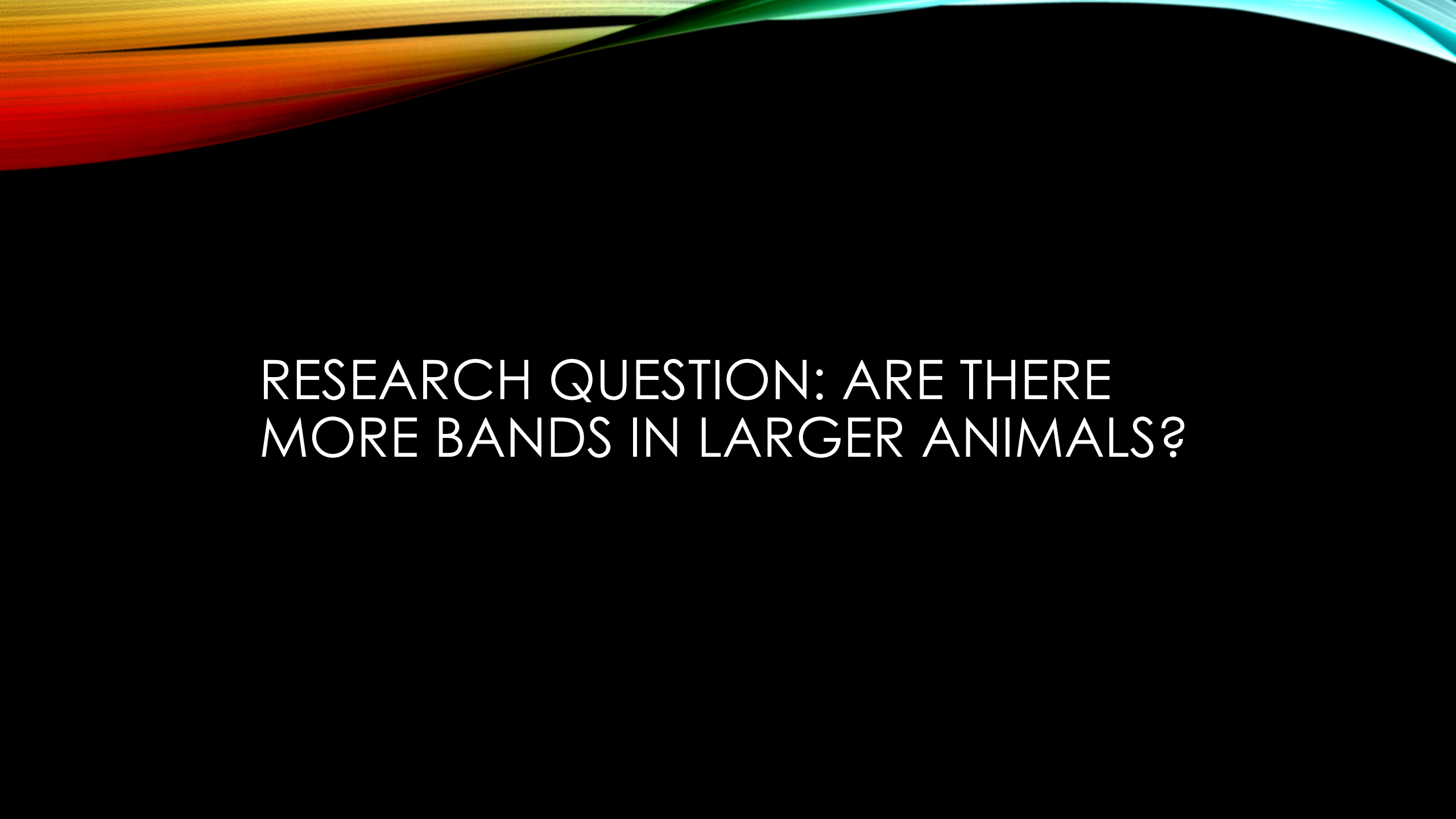
JL: 4

Left Zygodiac Section E

Click to add notes

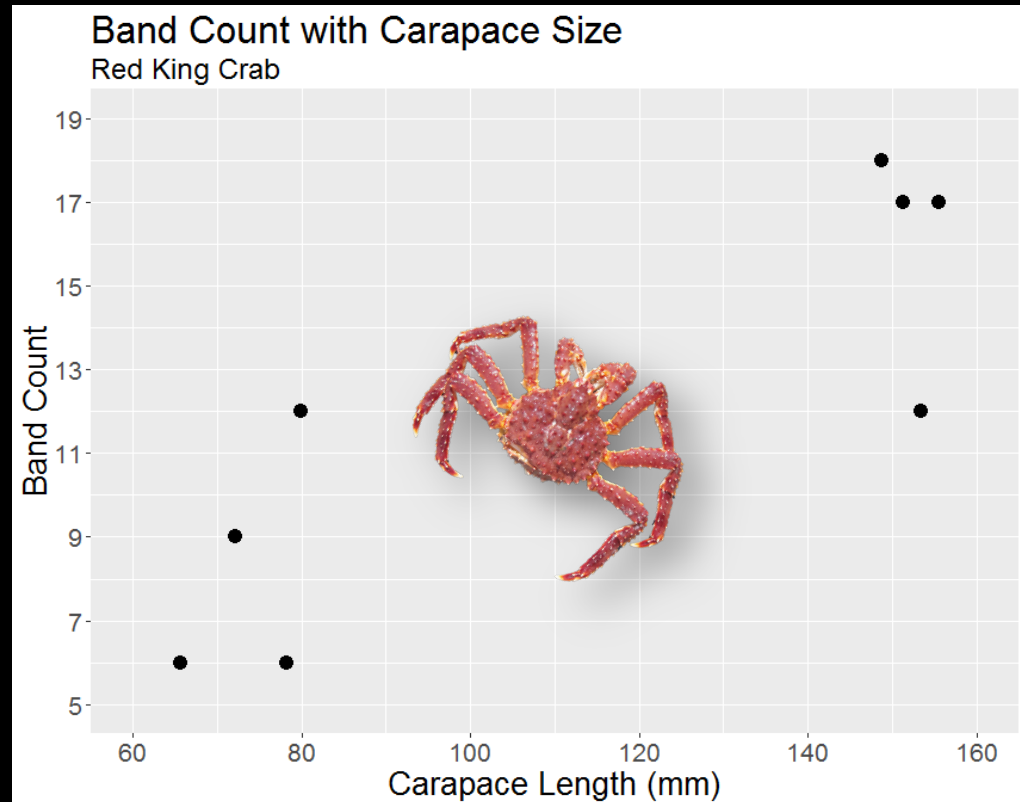
TESTED CRITERIA



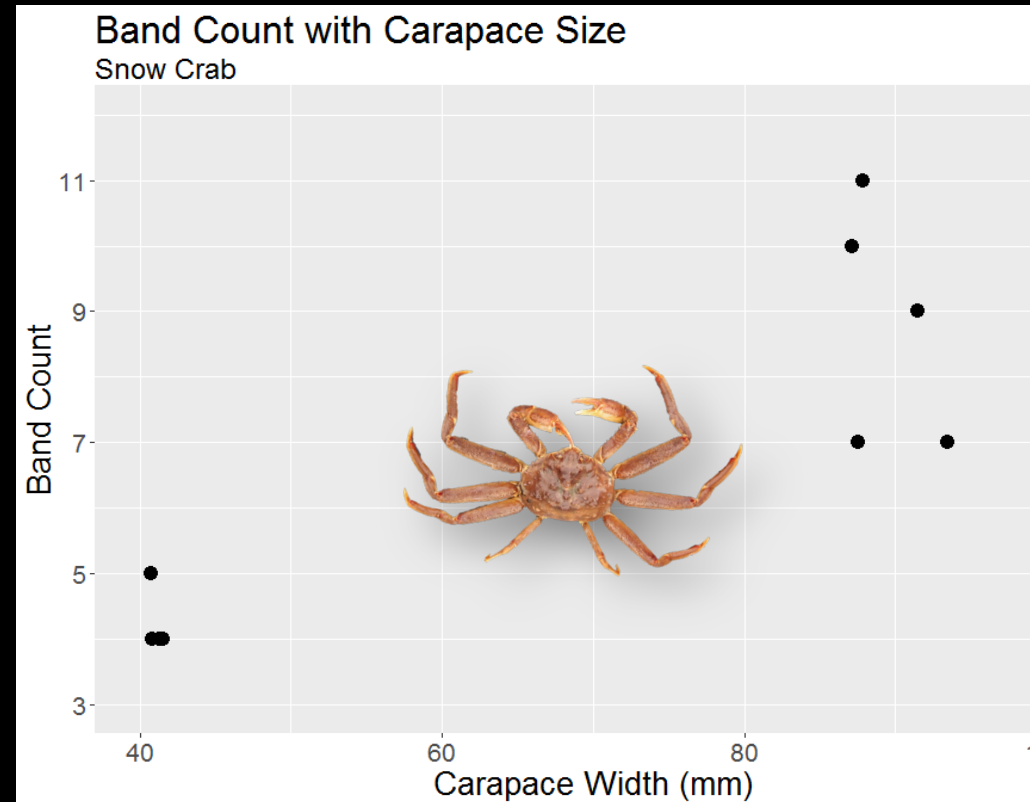


RESEARCH QUESTION: ARE THERE
MORE BANDS IN LARGER ANIMALS?

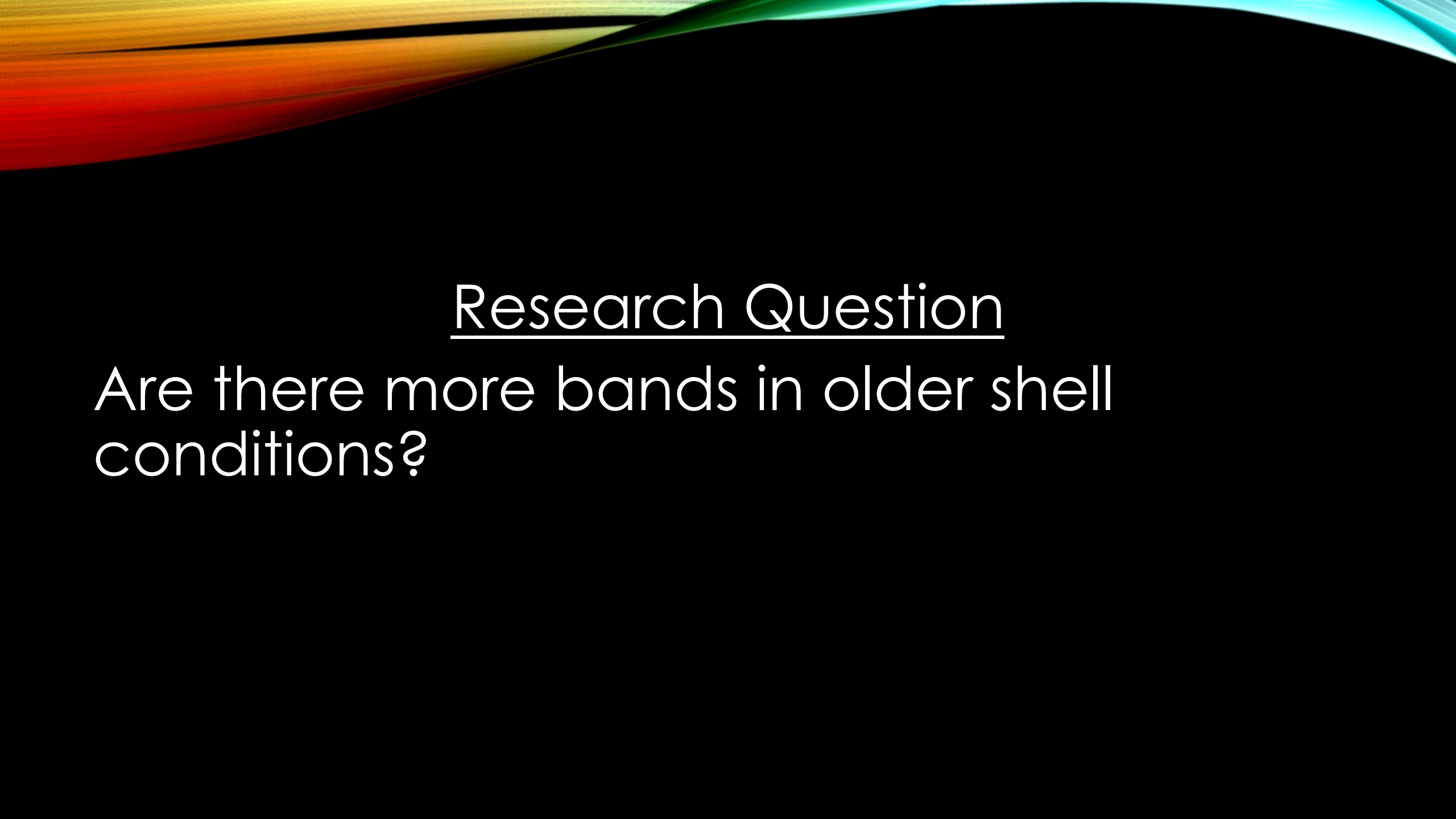
BAND COUNT AND SIZE



T test: $p = 0.0078$



T test: $p = 0.0033$



Research Question

Are there more bands in older shell conditions?

METHODS

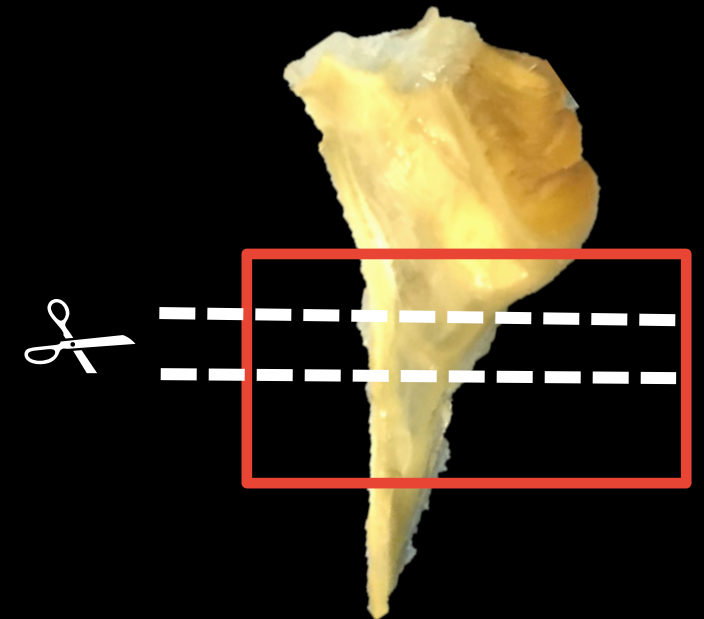
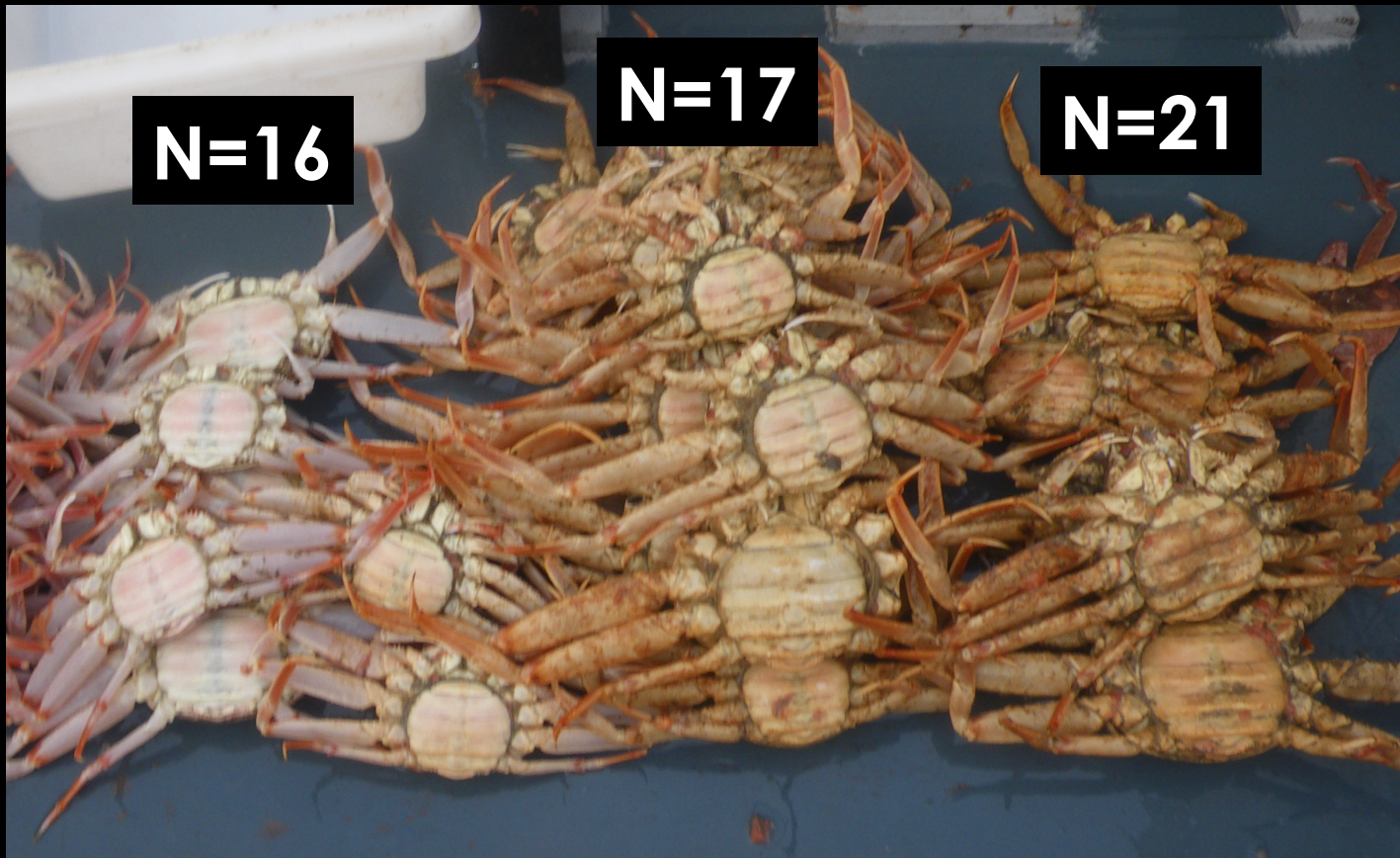
Up to 7 years

0.5y
post

4.5y
post

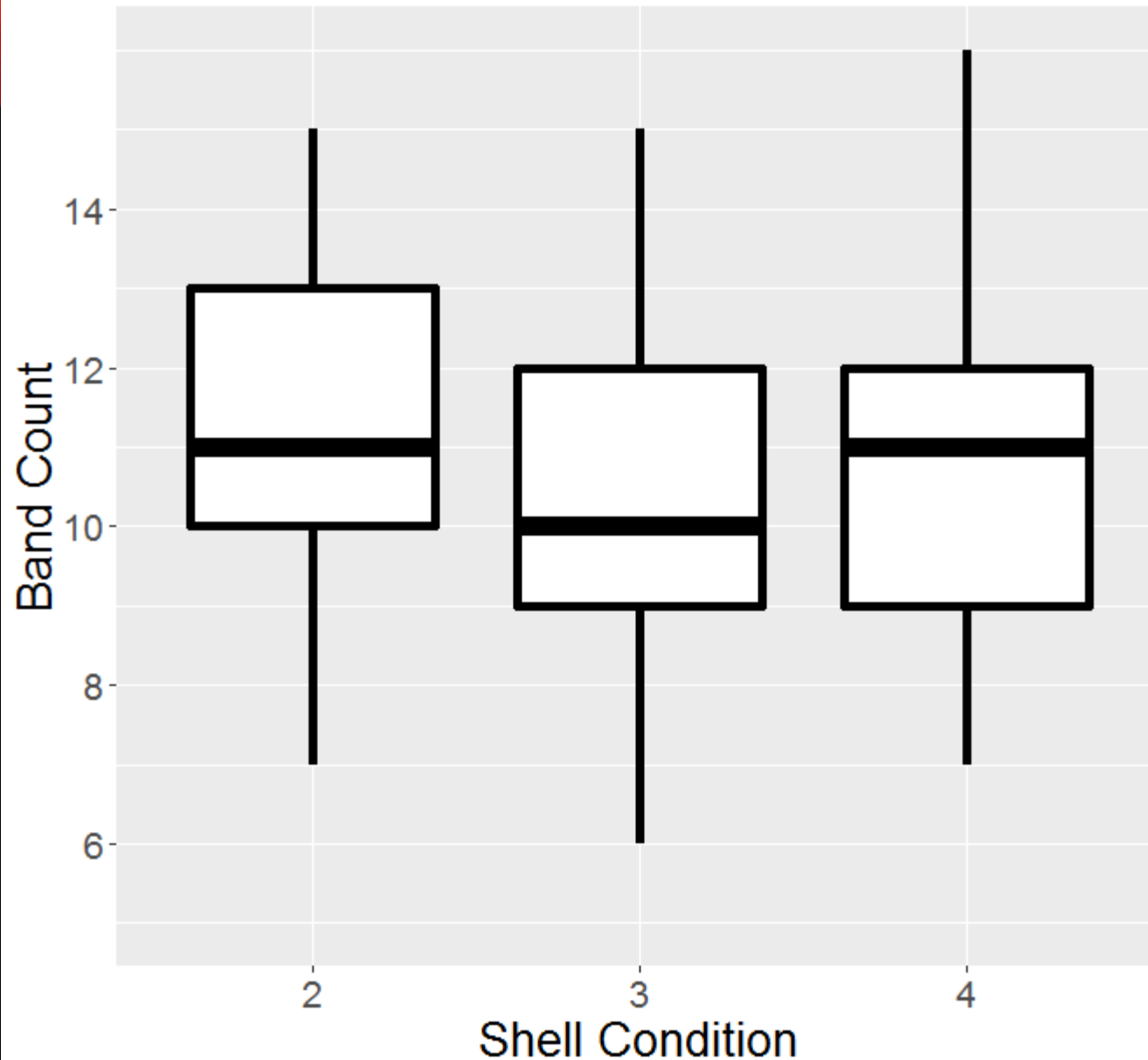
(Comeau et al. 1992;
Fonesca et al. 2008,
Jadamec et al. 1999)

METHODS



Shell Condition with Band Count

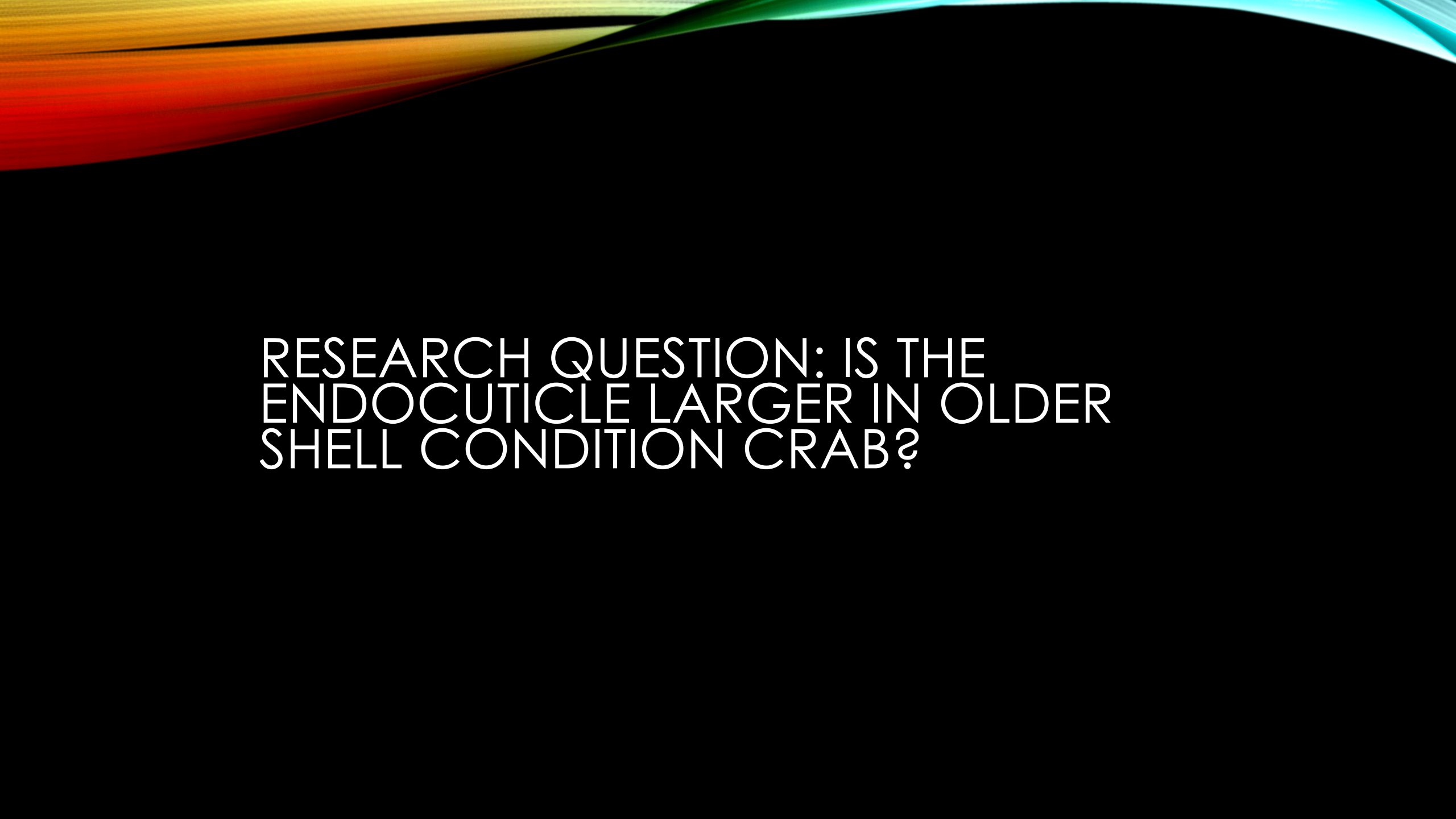
Snow Crab



ANOVA

Band Count ~ Shell Condition

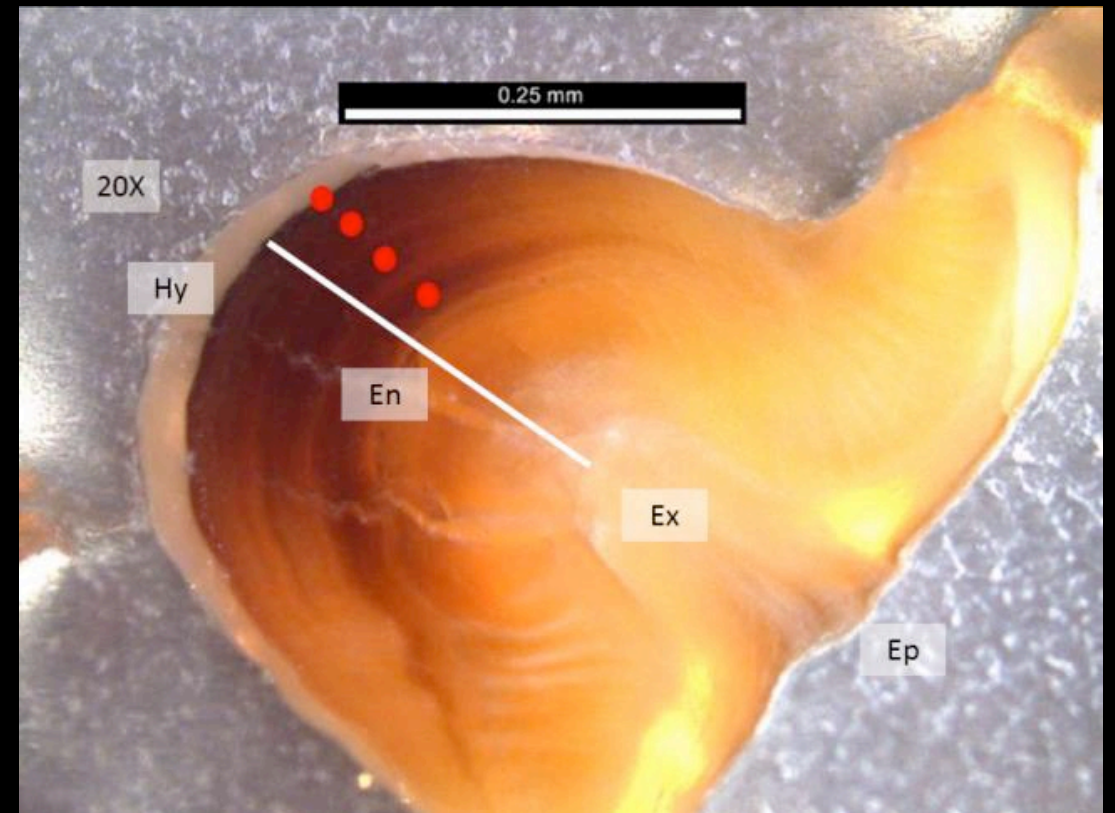
p=0.8921

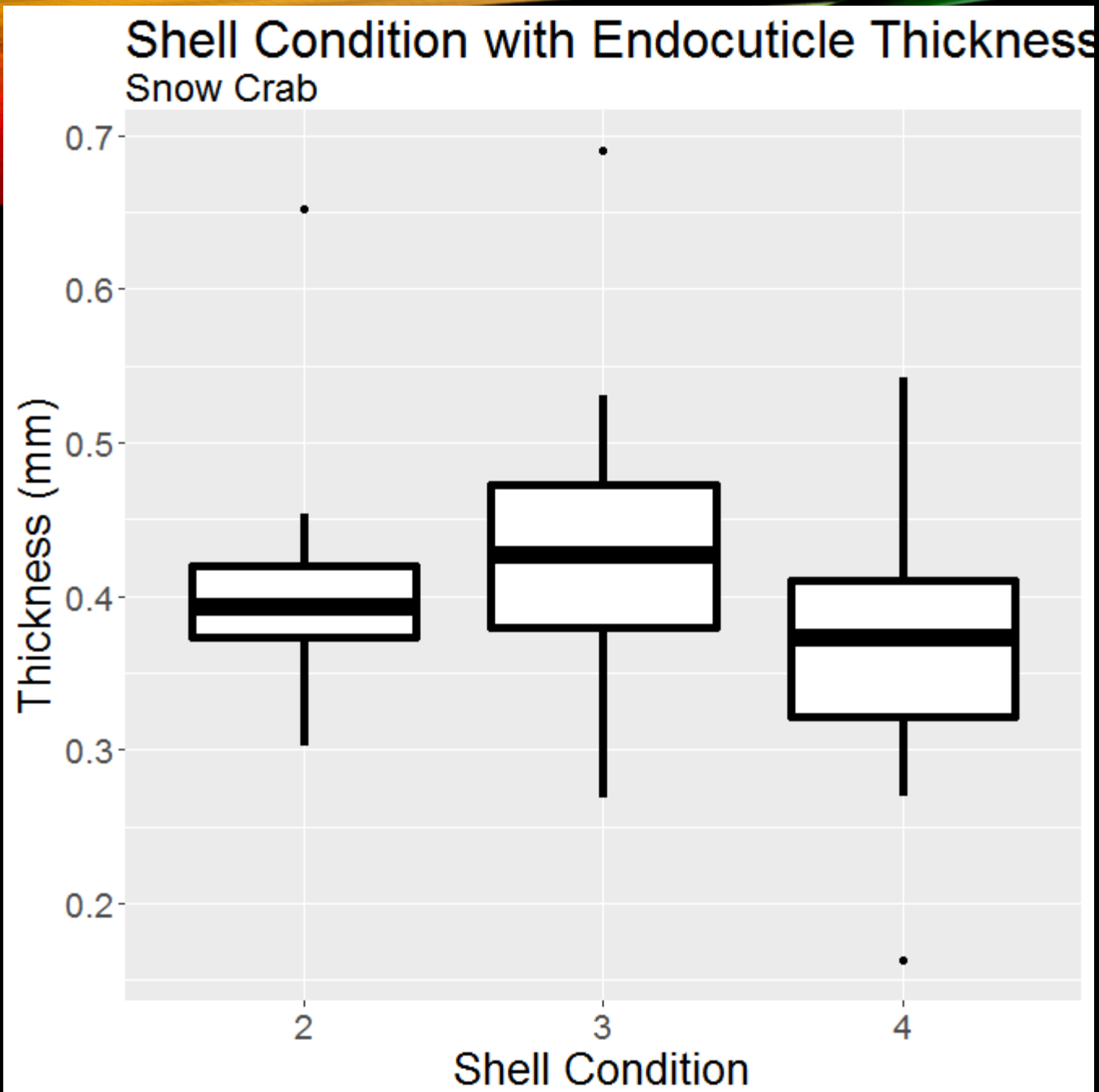


RESEARCH QUESTION: IS THE
ENDOCUTICLE LARGER IN OLDER
SHELL CONDITION CRAB?

METHODS

- Image at standard location
- Measure cuticle thickness





ANOVA
Thickness~ Shell Condition

p=0.1716



SUMMARY

- Methods and band counts
- Histology work
- What are the bands?
 - Related to size (age?)
 - Independent of shell condition (molting?)
- Variability in band width
- Should we care about this topic?
- Is this important for stock assessment models in the next 10 years?



CONCLUSIONS

- Use developed methods from this study
- Investigate validation



College of
Fisheries and
Ocean Sciences



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Consultation:

● Raouf Kilada ● Jesse Leeland ● Franz Mueter ● Laura Slater



QUESTIONS

