SUMMER FLOUNDER

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A research experience for a high school marine science teacher, summer 2017

About Summer Flounder

- Scientific name *Paralichthys dentatus*
- AKA "fluke" due to left-eyed position on head
- Found from Nova Scotia to Florida
- Winter in deeper water, summer close to shore
- Juveniles eat small crustaceans and are eaten by sharks, cod, hake and sea ravens
- Mature flounder are demersal ambush predators that feed on wide variety of crustaceans and fish
- Reach sexual maturity around age 2 (3)
- Spawn late fall in pelagic waters, eggs buoyant
- Source: https://www.nefsc.noaa.gov/publications/tm/tm151/tm151.pdf

# More About the Fluke

- Fast-growing species, females grow faster than males. Male (up to 2') Females (up to 3')

- Live for about 12-14 years

- 10 inches (25 cm) of growth in one year is not unheard of

- Highly desired for recreational and commercial fishing- under great pressure

- Flavor of flesh is considered "mild" texture as "flaky" and "fine"

- Source: http://www.fishwatch.gov/profiles/summer-flounder

Recreational Fishing

- Fluke are a very popular recreational fish
- Typical season is roughly Memorial Day to Labor Day
- Minimum size in NJ is 18" (45cm) (2017)
- Maximum 3 fish/day (2017)
- Party (head) Boats catch and/or release (discard) large number of fluke each summer day
- Source: NJDEP

Example of "discard" summer flounder (<45cm)
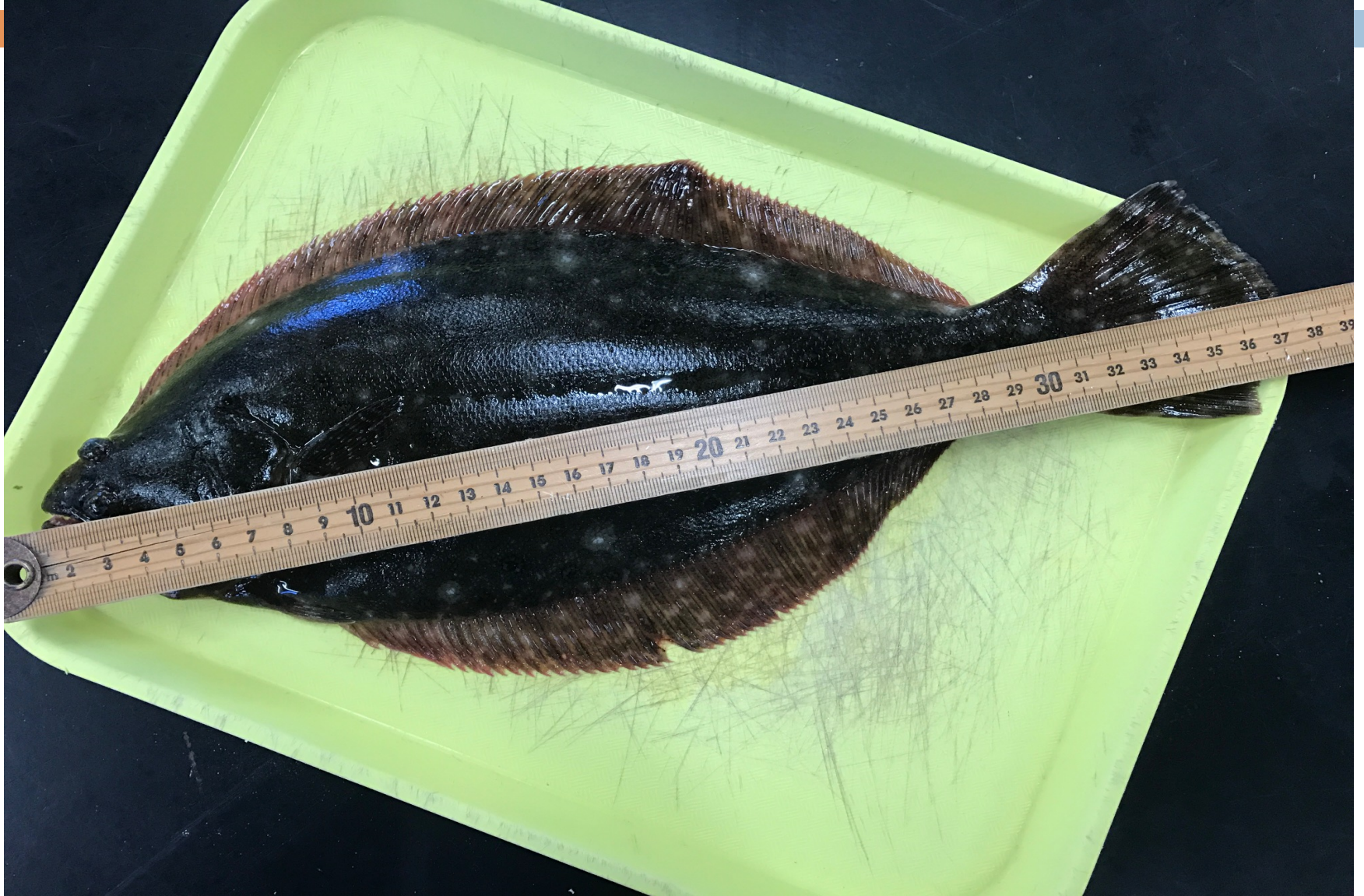
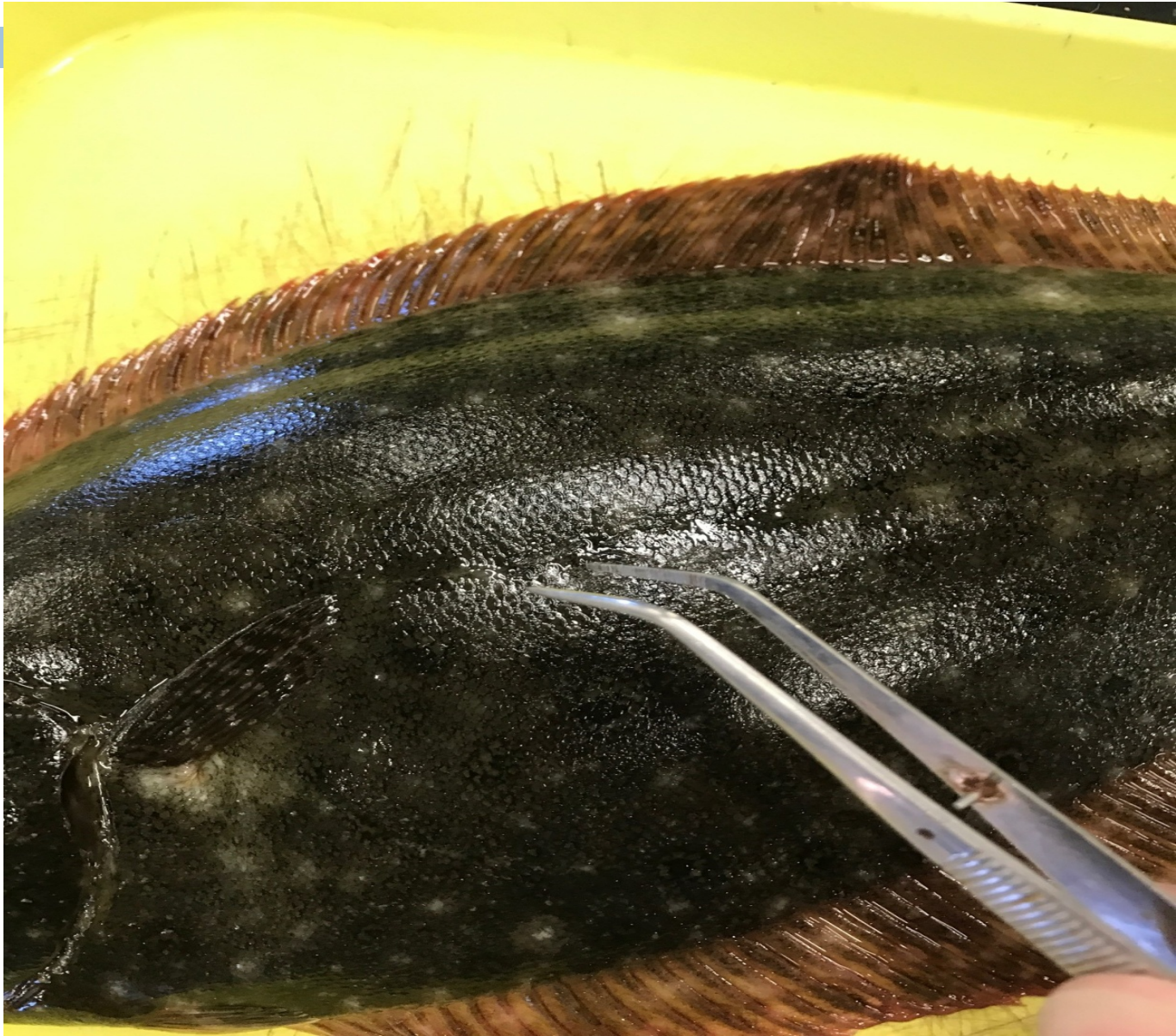# Research Opportunity- Data Gap

- Rutgers HSRL, sponsored by SCeMFiS, in summer 2015 harvested scales and gender data from discarded NJ party boat fluke to perform age-length/sex study-an attempt to fill an identified "data-gap"

- Collections of scales at 6 sites from Atlantic Highlands to Cape May from sub 18" (45cm) fish

- About 6000 samples were collected and processed for examination

- Details about fish catch location, length and sex accompanied each sample

Flounder Collection Sites

Adapted from Morson et al 2017

Point Judith
Montauk
Captree
Atlantic Highlands
Shrewsbury River
Tuckerton Creek
Fortescue
Cape May
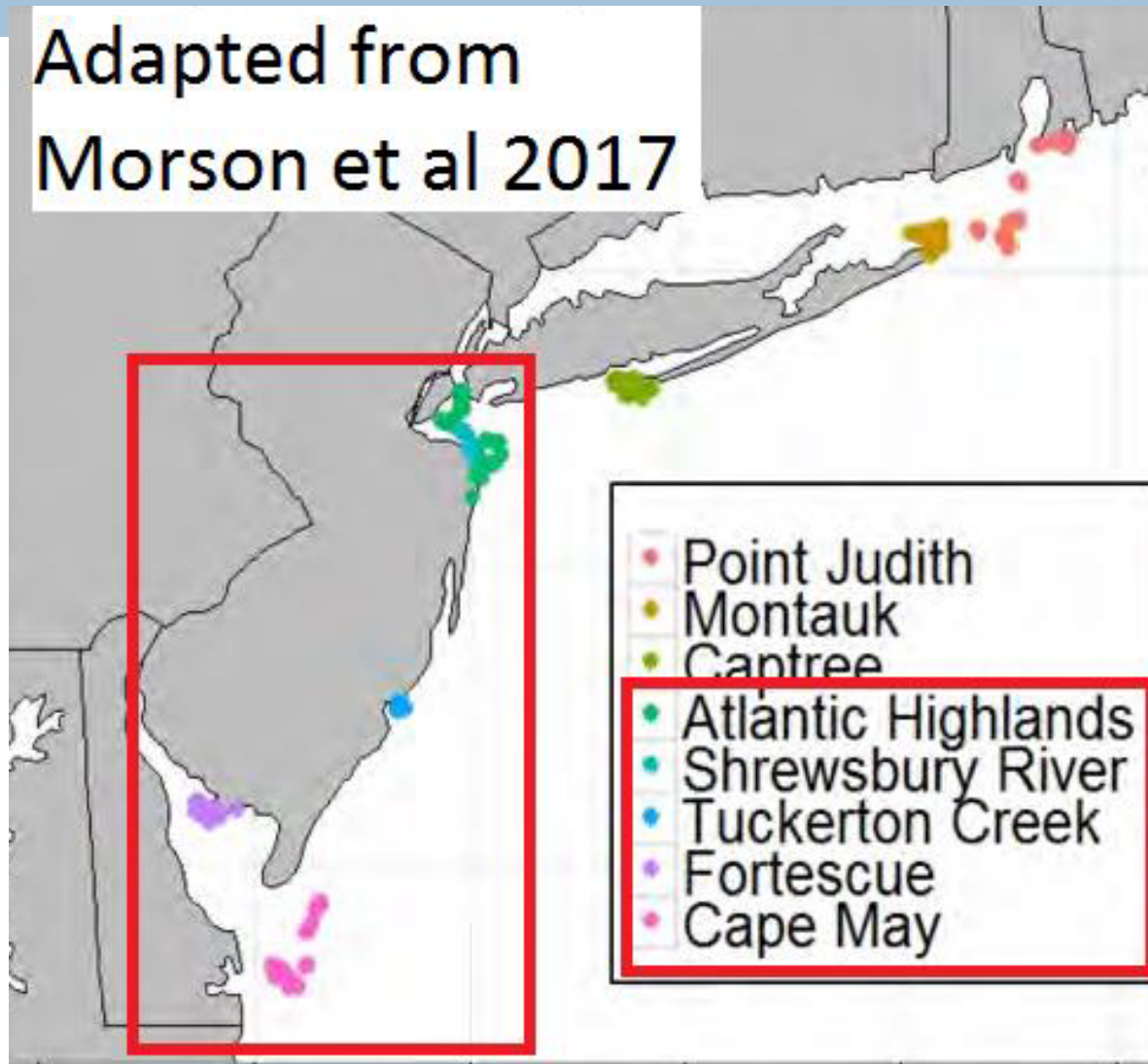
Scale Harvest

Research Focus Questions

□ Are male and female summer flounder reaching the minimum landing size (MLS) at the same age in NJ?

□ Is there a regional difference in age between male and female discards?

□ Does the mean age of male and female discards change throughout the season?

Scale Preparation

- Fluke scales needed proper preparation to be observed accurately

- Raw scales needed to be cleaned of dried mucous and debris

- Clean scales (usually 8) needed to be mounted between 2 acetate slides and pressed in a heated hydraulic press at 6 metric tons for 8 seconds

- Scales were then removed and stored in sealed bag. Plates contained permanent imprint of fish scales, whereas scales degrade over time.

Soaking scales to loosen debris
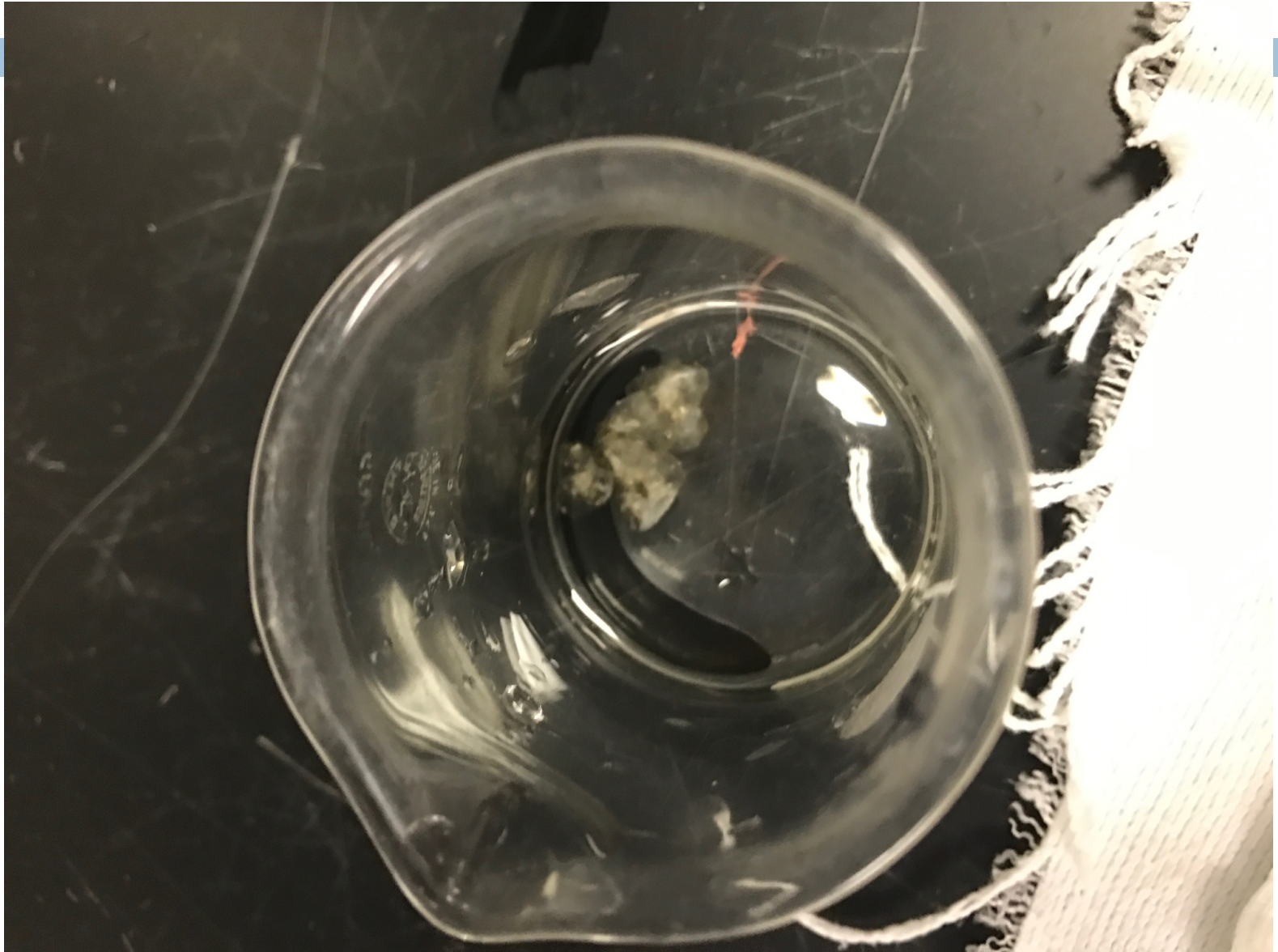
Tedious job of cleaning all debris and mucous off each scale

# Clean scales lined up on slides before being pressed

# Pressing the scales onto the slides

Fish Scale Aging

- A microfiche was utilized to examine imprint of flounder scales on acetate slides

- 2 slides represented 1 fish (both sides of scale)

- The slides were placed on the microfiche stage and inserted into the view area

- The "annuli" (annual rings on scales) were counted and an approximate age was determined

- There is a certain amount of skill (experience) needed to accurately determine what consists of an "annulus"

Suitable scale for aging
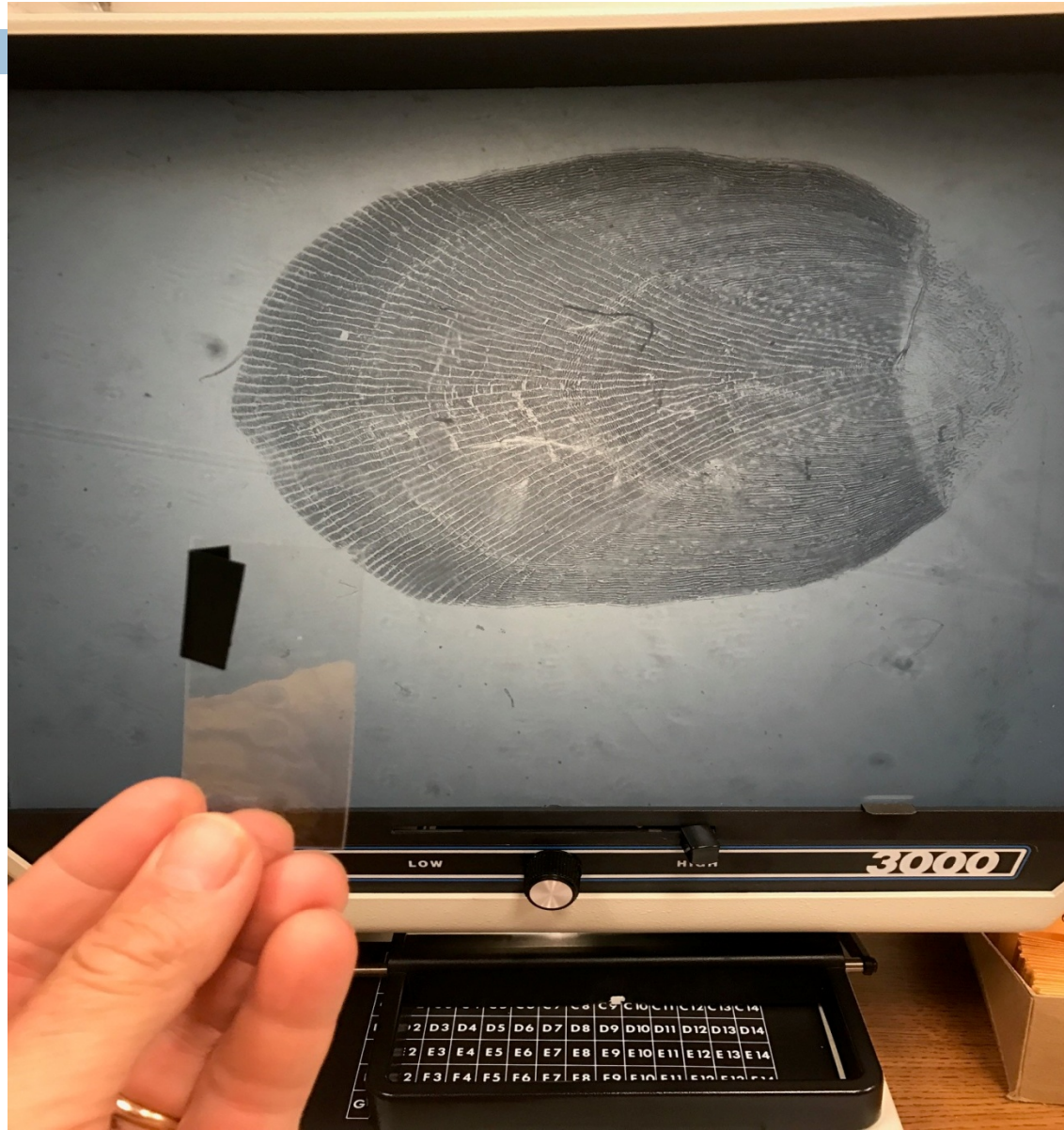
Researcher, Steve Lee, highlights an annulus with the red dot
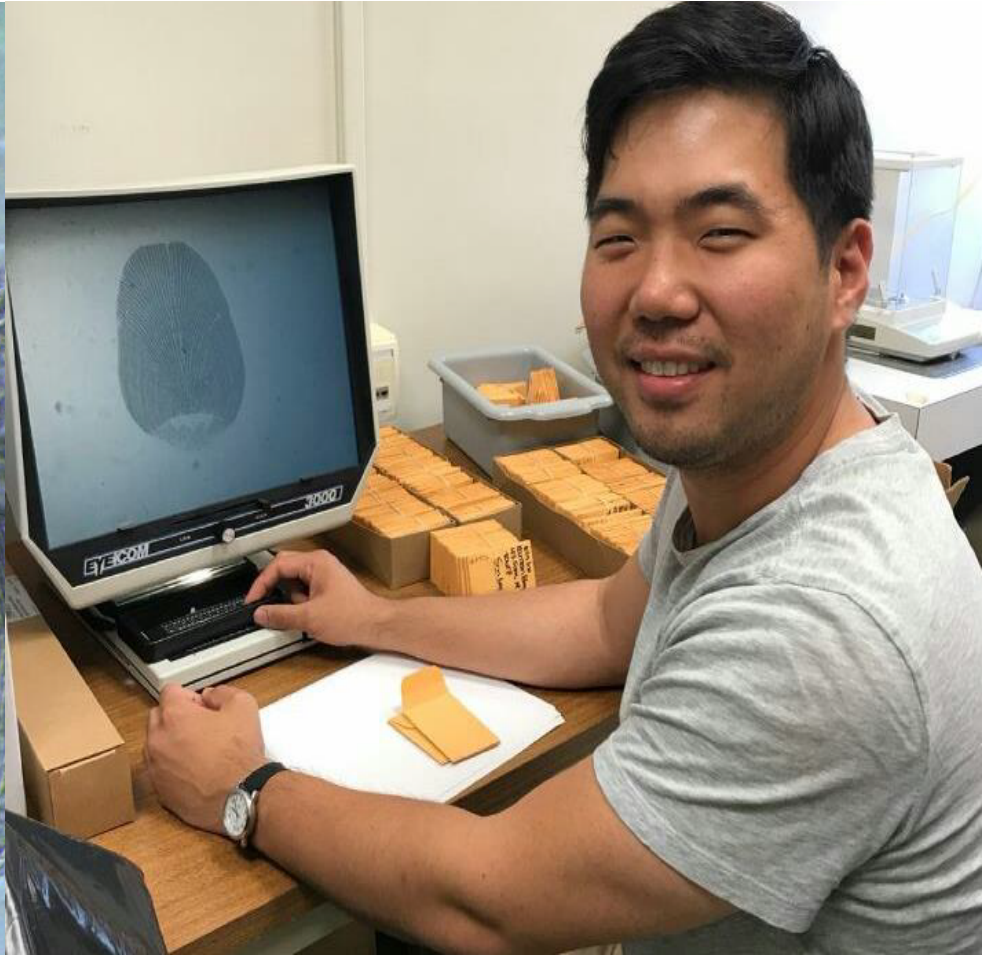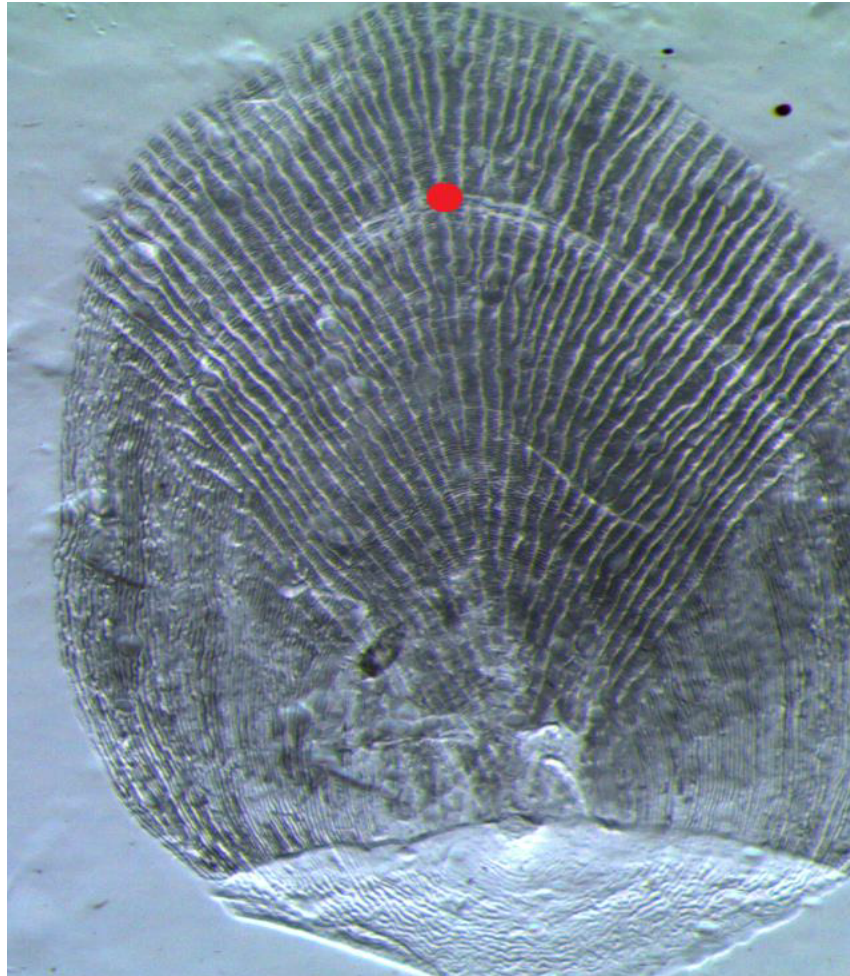
Results of Study

- Clearly females grew faster that males- females approached MLS around age 3, while males closer to age 6

- Length of fish at given age did not significantly differ between 6 different sites

- Mean age of flounder did not change for northern fluke, but females were older in southern range by August

Possible Extensions

- High school students help harvest scales from local fluke and compare age vs. length (possibly gender)

- Study mortality rates of discard summer flounder from recreational fishing

- Possible otolith (ear bone) study to verify accuracy of scale-aging method