

# South Carolina Chapter of the American Fisheries Society Ageing Workshop

## Saltwater Fishes

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# What is an otolith?

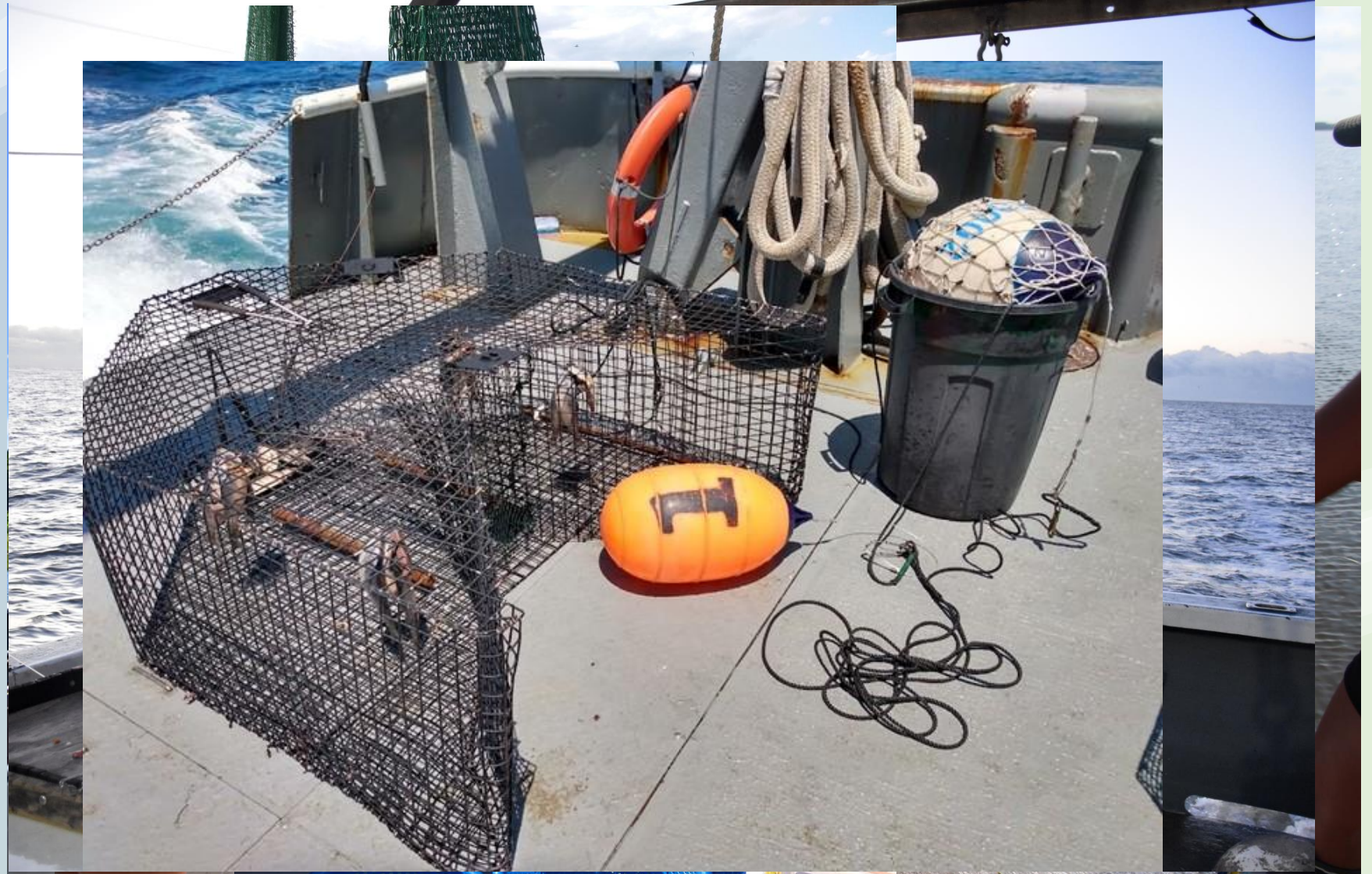
- Primary method of ageing fish accurately and repeatedly
- Latin Oto “hearing”  
Lith “stone”
- Seasonal temperature changes cause the metabolic rates of cold-blooded fish to fluctuate, which in turn affects the density with which the crystalline bonds of the otolith form
- While fish is growing fast during the warm months of summer this latticework is much less dense, and the opposite is true during winter
- When backlit the alternating densities gives an effect like growth rings in a cross-section of a tree





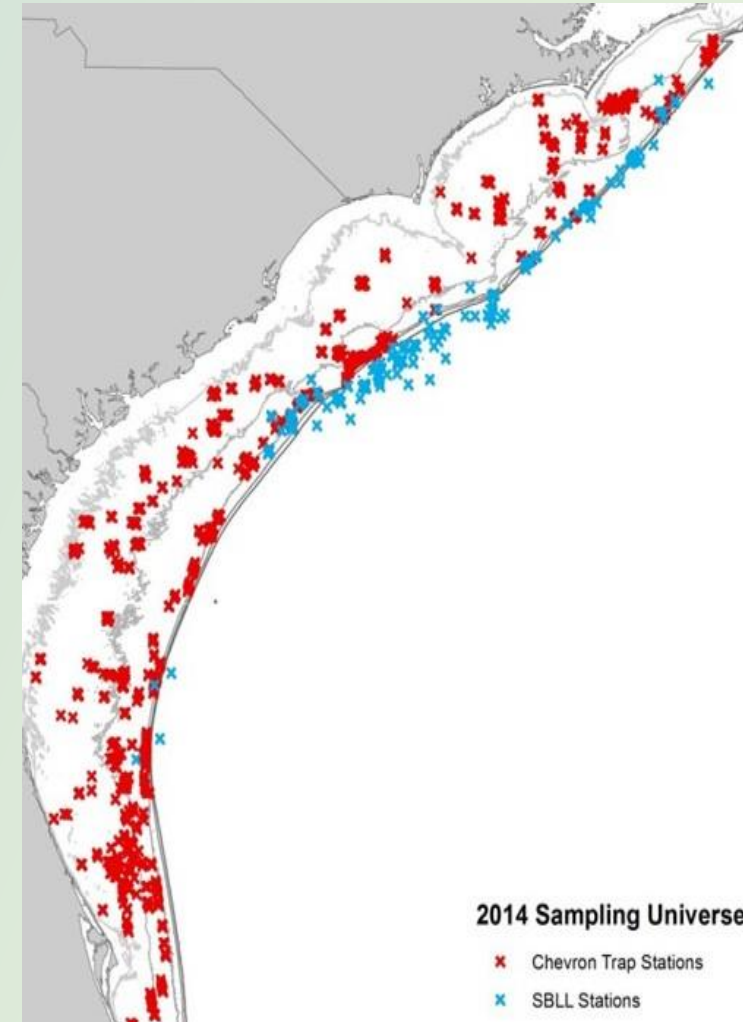
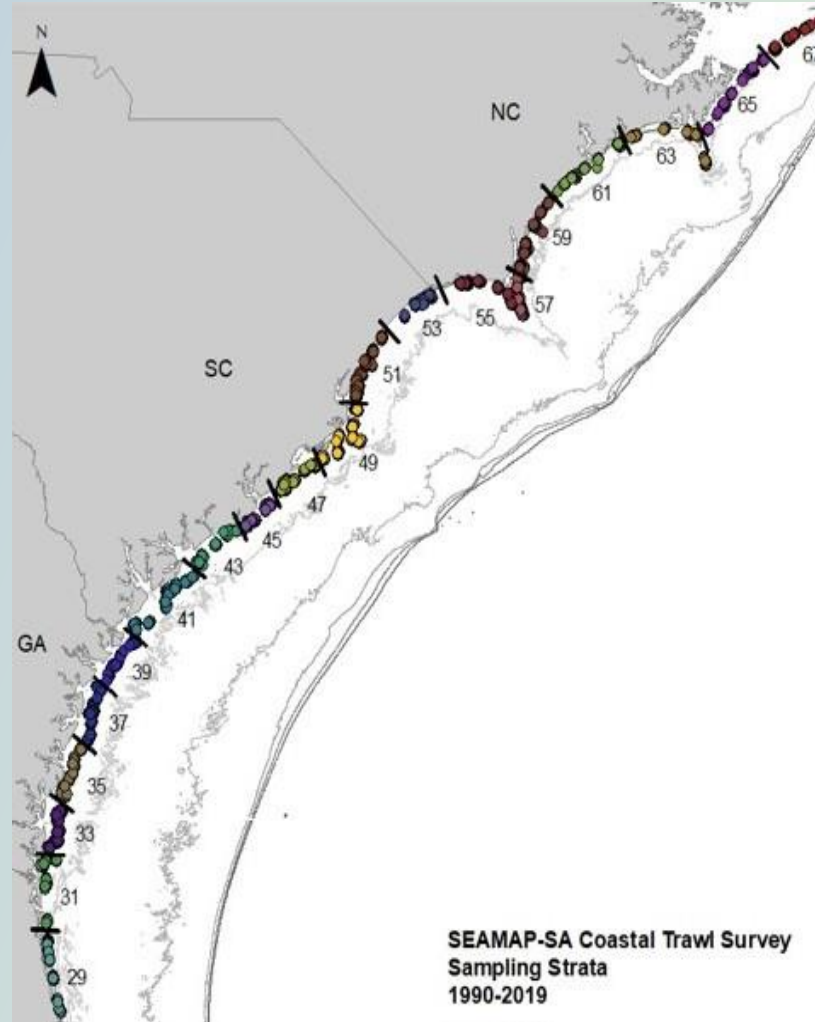
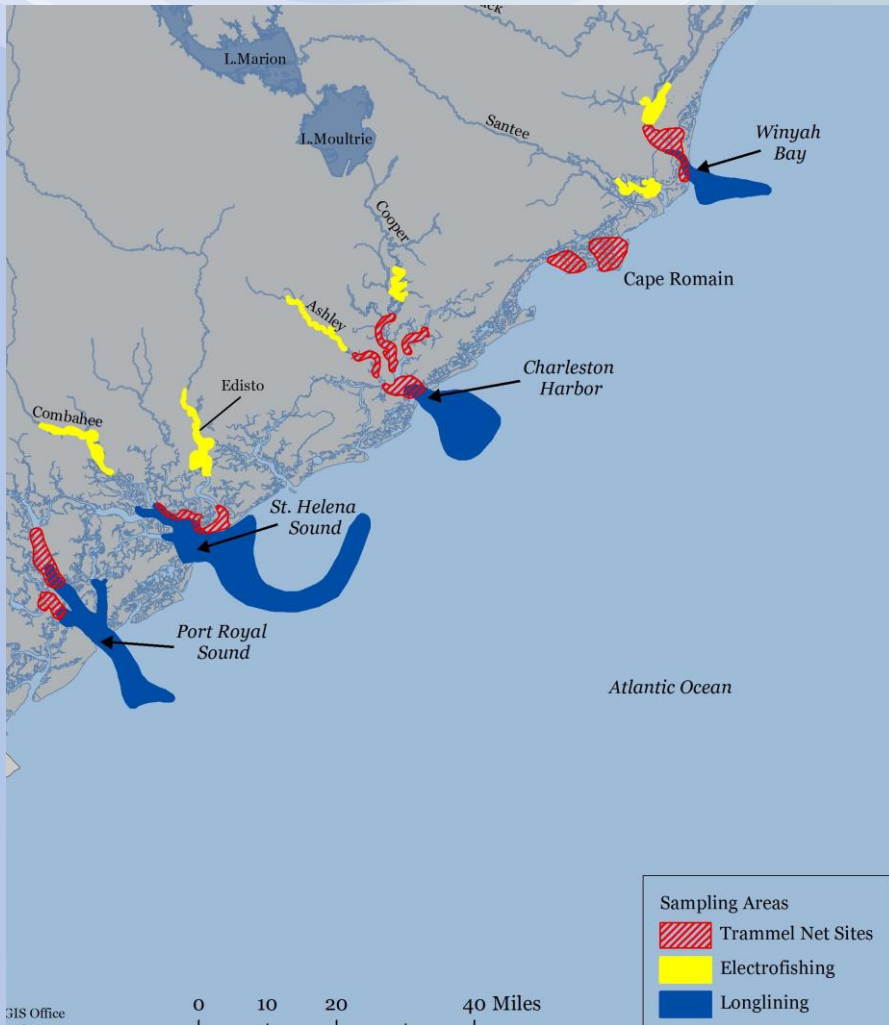
# How Marine Resource Division collects fish samples

- Electrofishing
- Trammel net
- Longlines
- Trawls
- Chevron trap



# Where Marine Resource Division collects fish samples

From freshwater to edge of the continental shelf





Variety of habits and fish



Variety of otoliths



- Size of otolith can be different for offshore vs inshore species
- Whole life in turbid estuary where hearing is used to find mate
- Higher visibility at reefs or in pelagic waters may not require oversized otoliths
- All age 4
- Size doesn't equate age, so have to section

# Check off sheet

TRAMMEL SURVEY BIOLOGICAL SAMPLING: January - March 2024									
<b>RED DRUM</b>									
TL (mm)		TL (mm)		TL (mm)		TL (mm)		TL (mm)	
<200		360-379		540-559		720-739		900-919	
200-219		380-399		560-579		740-759		920-939	
220-239		400-419		580-599		760-779		940-959	
240-259		420-439		600-619		780-799		960-979	
260-279		440-459		620-639		800-819		980-999	
280-299		460-479		640-659		820-839		1000-1019	
300-319		480-499		660-679		840-859		1020-1039	
320-339		500-519		680-699		860-879		1040-1059	
340-359		520-539		700-719		880-899		≥ 1060	
<b>SOUTHERN FLOUNDER</b>									
TL (mm)		TL (mm)		TL (mm)		TL (mm)		TL (mm)	
<160		220-239		300-319		380-399		460-479	
160-179		240-259		320-339		400-419		480-499	
180-199		260-279		340-359		420-439		500-519	
200-219		280-299		360-379		440-459		≥ 520	
<b>SHEEPSHEAD</b>									
TL (mm)		TL (mm)		TL (mm)		TL (mm)		TL (mm)	
<220		280-299		360-379		440-459		520-539	
220-239		300-319		380-399		460-479		540-559	
240-259		320-339		400-419		480-499		560-579	
260-279		340-359		420-439		500-519		≥ 580	
<b>BLACK DRUM</b>									
TL (mm)		TL (mm)		TL (mm)		TL (mm)		TL (mm)	
<180		240-259		320-339		400-419		480-499	
180-199		260-279		340-359		420-439		500-519	
200-219		280-299		360-379		440-459		520-539	
220-239		300-319		380-399		460-479		≥ 540	
<b>SPOT</b>									
TL (mm)									
<160									
160-179									
180-199									
200-219									
220-239									
240-259									
≥ 260									
<b>SOUTHERN KINGFISH</b>									
TL (mm)									
<260									
260-279									
280-299									
300-319									
320-339									
340-359									
≥ 360									
<b>ATLANTIC CROAKER</b>									
TL (mm)									
<180									
180-199									
200-219									
220-239									
240-259									
260-279									
≥ 280									

- Make sure to represent all the different sizes of fish
- Get whole range of ages for each species
- Helpful to find maximum ages and age at maturity for stock assessments



# Extract otoliths

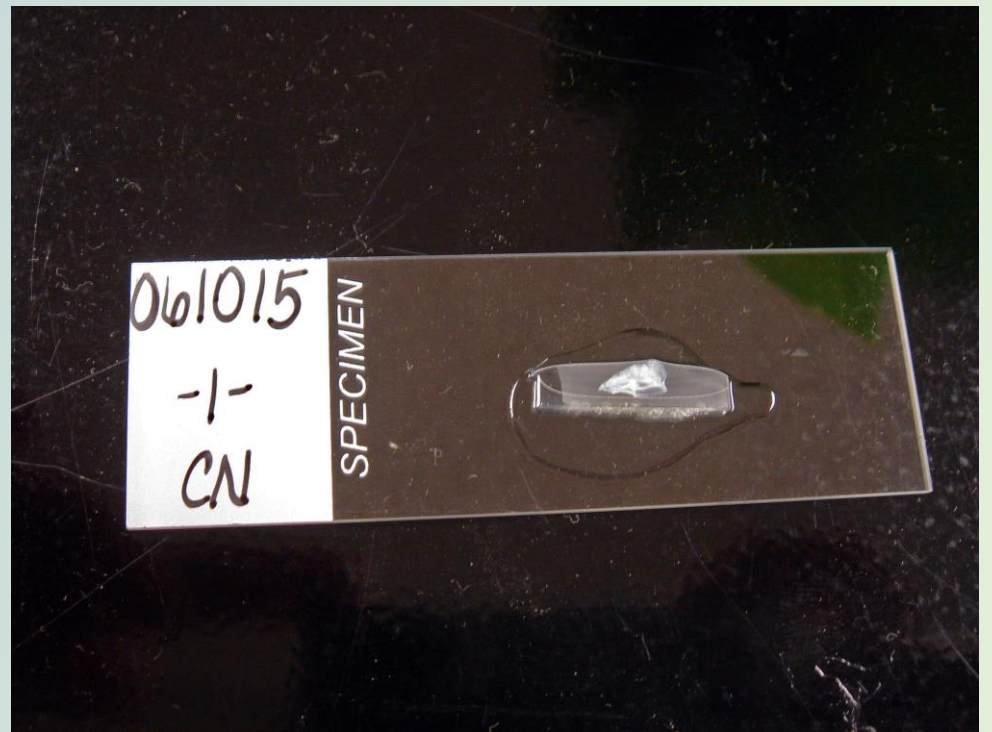
- Saw open cranium
- Extract with forceps
- Clean and store until ready to process





# Processing otoliths

- Embed in epoxy resin to protect during cutting
- Cut section with low-speed saw to get thin section through core of otolith
- Mount on microscope slide with liquid coverslip
- Optional: polish tiny otoliths with fine sandpaper to get desired thinness and improve surface for ease of reading (daily ages or eels)





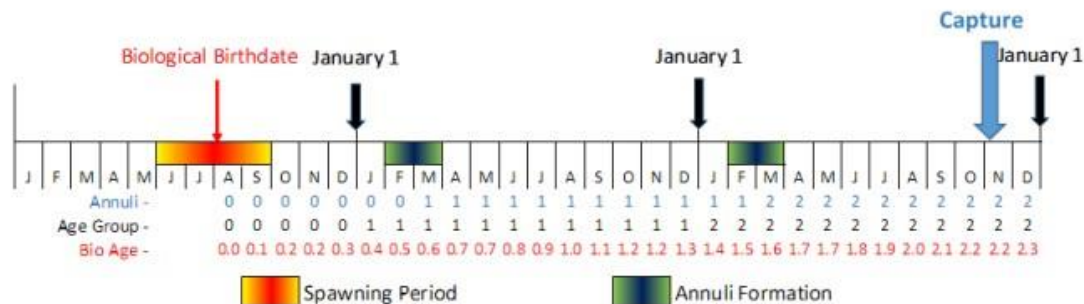
# Ageing

Fish ID	Read Date	Reader	# Annuli	Margin Code	Readability Code	Comments	Capture Date	Age Group	Biological Age
MS00001	12/12/2016	Joe Smith	2	4	E	Use for example in manual	11/8/2016	2	
MS00002									
MS00003									



Figure 8.17 Example data sheet with age group estimate for the sciaenid otolith section with two annuli and a margin code of 4.

8-12



- View through microscope and count annuli
- Two readers to agree or come to consensus
- Even if fish has 40 annuli you can still follow same pattern to find when it was born
- Cohort based on birth year is usually what is tracked in population models

# Red Drum

- Max 42
- Regularly into 30's
- Mature 4-5





# Spotted Seatrout

- Max 10
- Regularly 5-6
- Mature 1





# Southern Flounder

- Max 7
- Regularly 5
- Mature 2





# Sheepshead

- Max 26
- Regularly early 20s
- Mature 1.5



# Red Snapper

- Max 51
- Regularly 10
- Mature 1.5

