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# Fisheries research at Southeast Fisheries Science Center, Mississippi Laboratories: Internship Experience

Mara Castro – Ortiz

Mentor: Andre DeBose

Internship Location:

NOAA National Marine Fisheries Service  
Mississippi Laboratories



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NORTHERN GULF INSTITUTE

# My background information

- Second year student:  
Environmental Health MS  
program, University of Puerto  
Rico, Medical Sciences Campus
- BS degree: Coastal Marine  
Biology, University of Puerto Rico,  
Humacao Campus



# Mentor's background

- Name: Andre DeBose
- Fisheries Biologist
- Education and Outreach Coordinator
- Chief Scientist on Trawling Surveys





Manages, conserves, and protects  
living marine resources

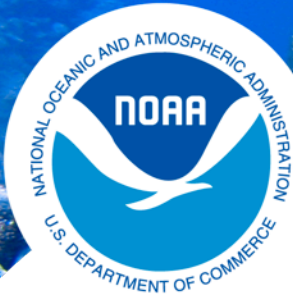
Sharing knowledge with others  
Education and Outreach

Promoting healthy ecosystems  
Summer Groundfish Survey

Ensuring healthy fisheries  
Scientific Research:  
Diet analysis of *Micropogonias undulatus*,  
*Cynoscion nothus* and *Cynoscion arenarius* in  
the Gulf of Mexico

Provide important Source of  
food  
Overview National Seafood  
Inspection Laboratories



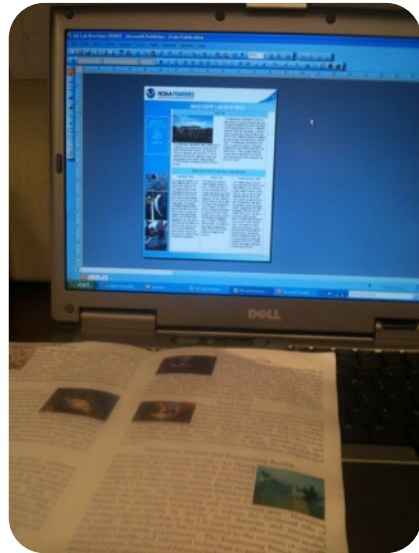


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# Education and Outreach

# Education

- Update Pascagoula Lab educational materials
- Develop environmental activities for students
- Laboratory hands on experience for students



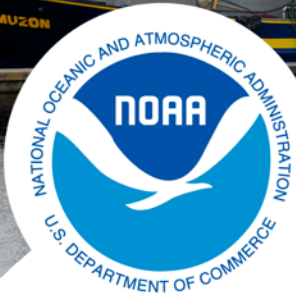
# Outreach

## Environmental Educator:

- Scranton Museum Reopening (closed since 1998)



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# Summer Groundfish Survey

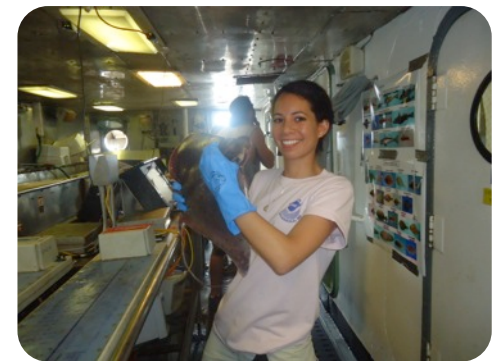


# Summer Groundfish Survey

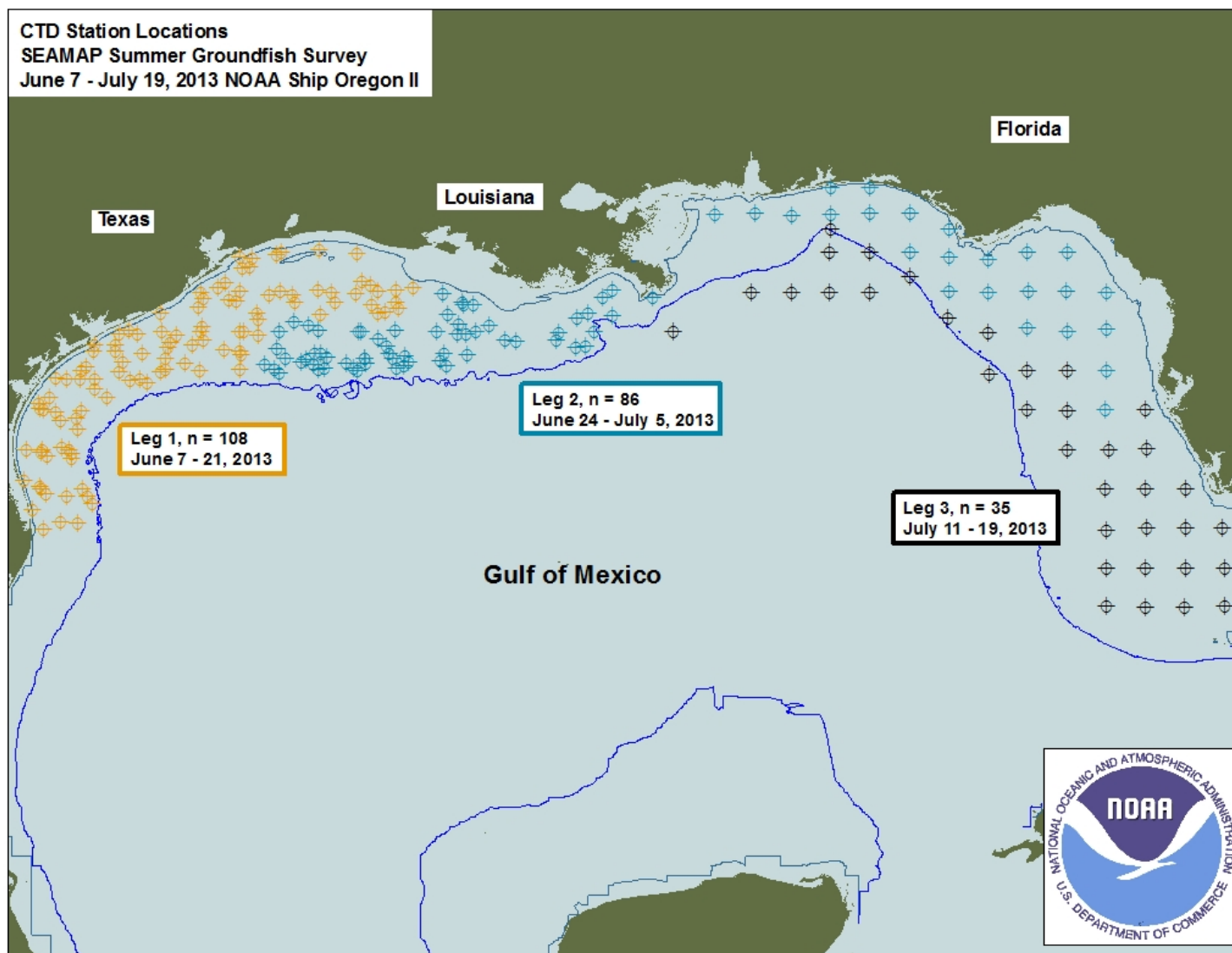
- Running since 1950
- Mission: to monitor annual estimates of relative abundance for bottom species occurring in the Gulf



RV Oregon II



# Stations



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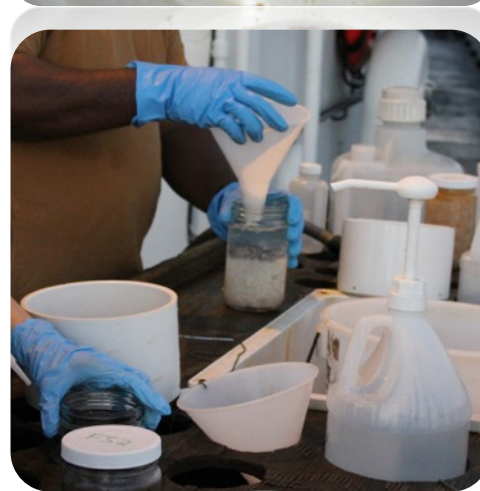
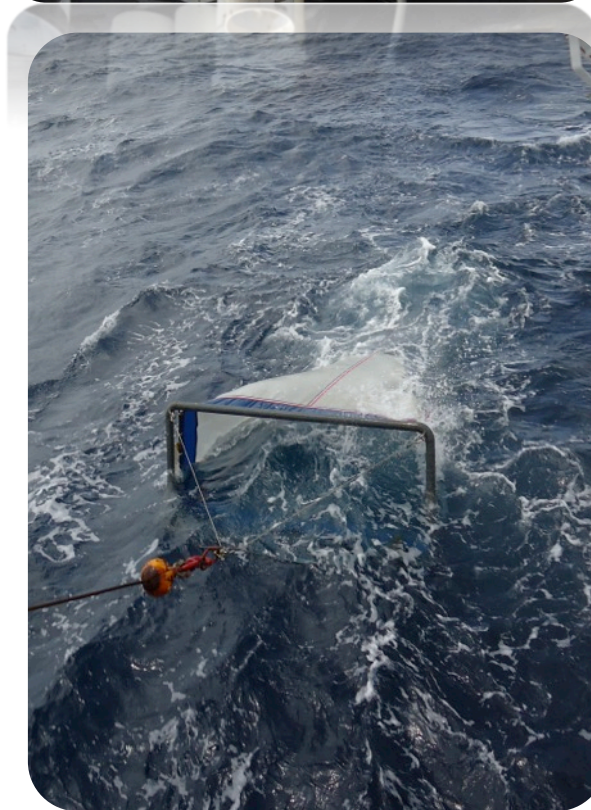
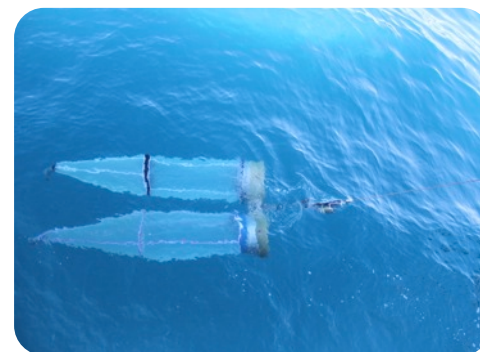
# Trawling

Random survey design to sample fish and invertebrates from the sea bottom



# Plankton

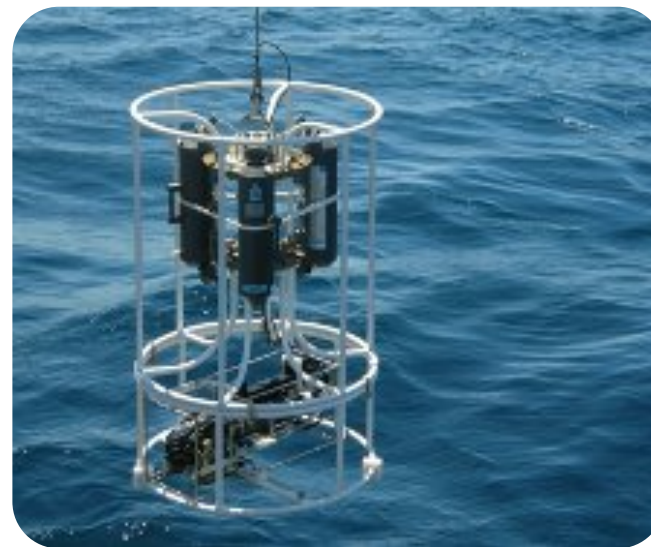
Bongo and neuston nets are used to sample plankton populations in the surface and depth



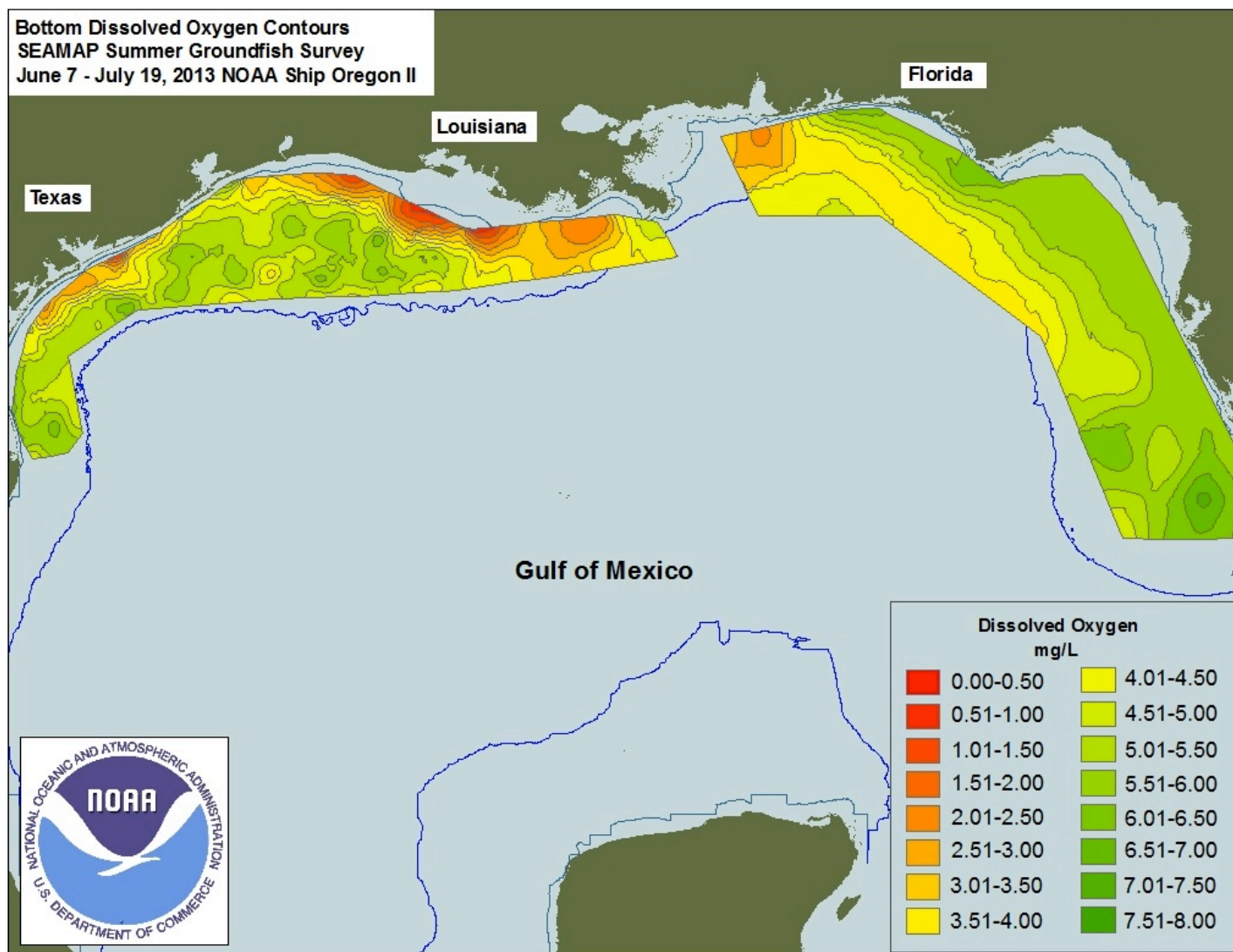
# Water Quality Monitoring with CTD

Record the environmental data:

- temperature
- salinity,
- dissolved oxygen
- fluorometry
- percent of light transmission



# Dissolved Oxygen mg/l





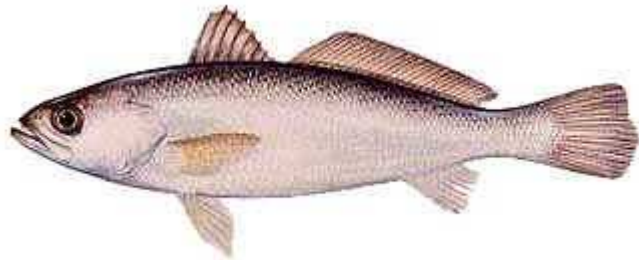
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# Diet analysis of *Micropogonias undulatus*, *Cynoscion nothus* and *Cynoscion arenarius* in the Gulf of Mexico

# Species



Atlantic Croaker  
*Micropogonias undulatus*



Sand Seatrout  
*Cynoscion arenarius*

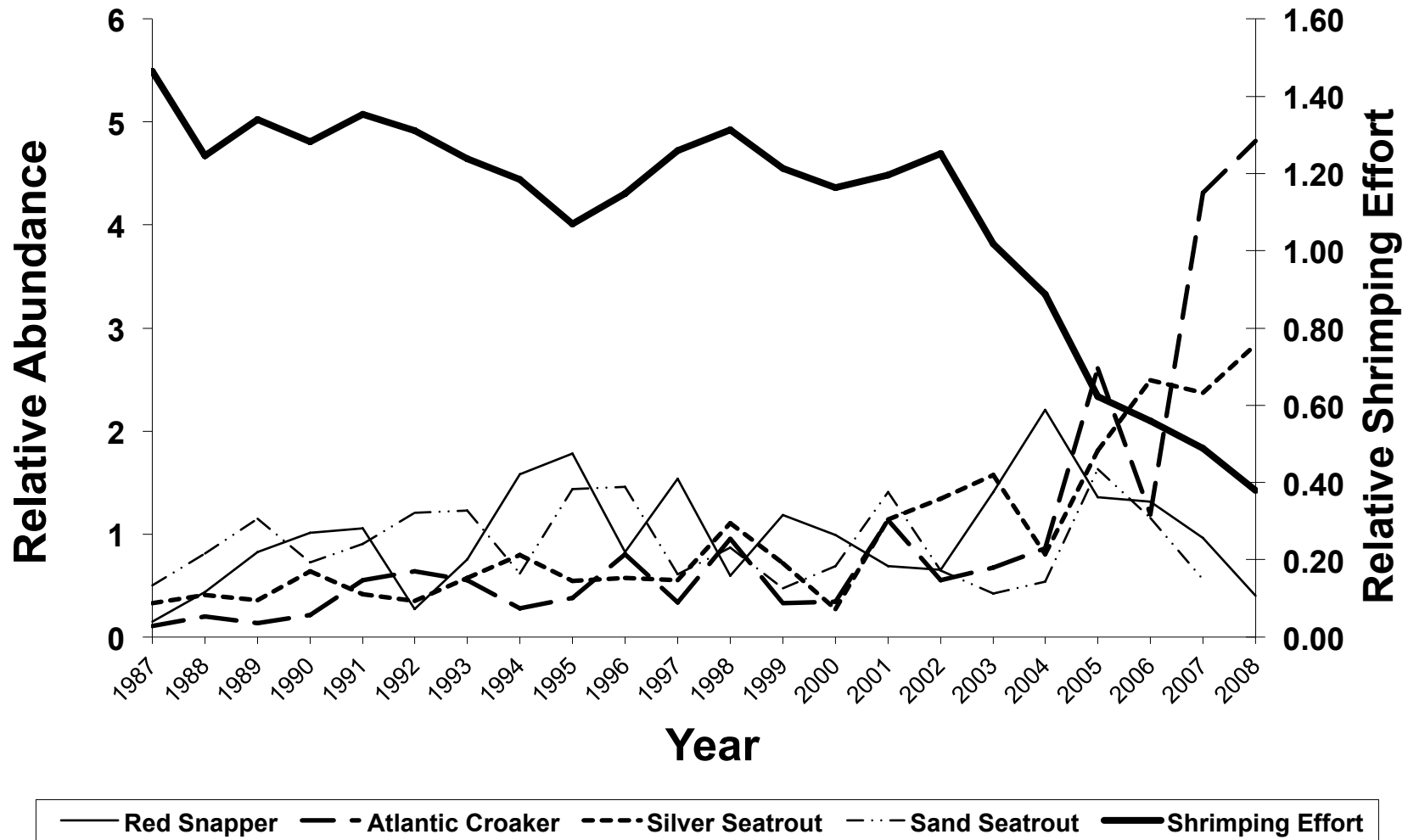


Silver Seatrout  
*Cynoscion nothus*





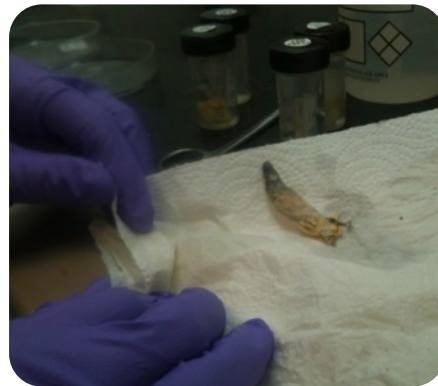
# Species abundance vs. Shrimping effort



# Methodology



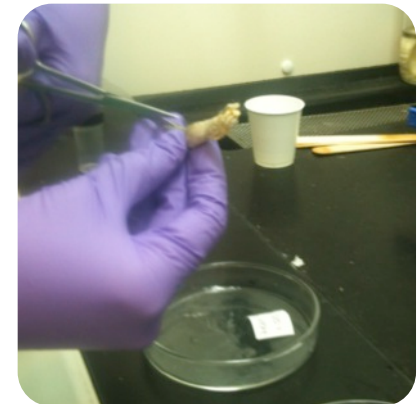
From 2009-2012  
cruises  
2,500 stomach  
samples had been  
preserved in  
ethanol



Remove excess  
of ethanol  
with paper towel



Weight full stomach



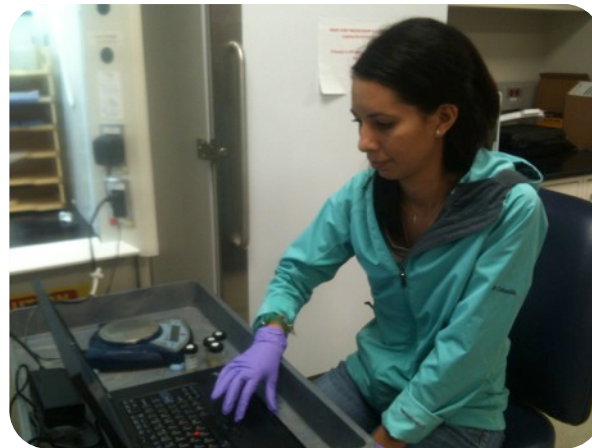
Slice and rinse stomach  
content into dish



# Methodology



Weight empty stomach



Record data



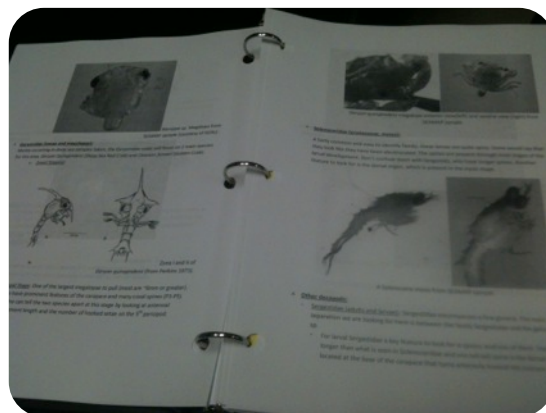
Stomach content for analysis



# Analysis



-Stomach content  
sorting and  
identification



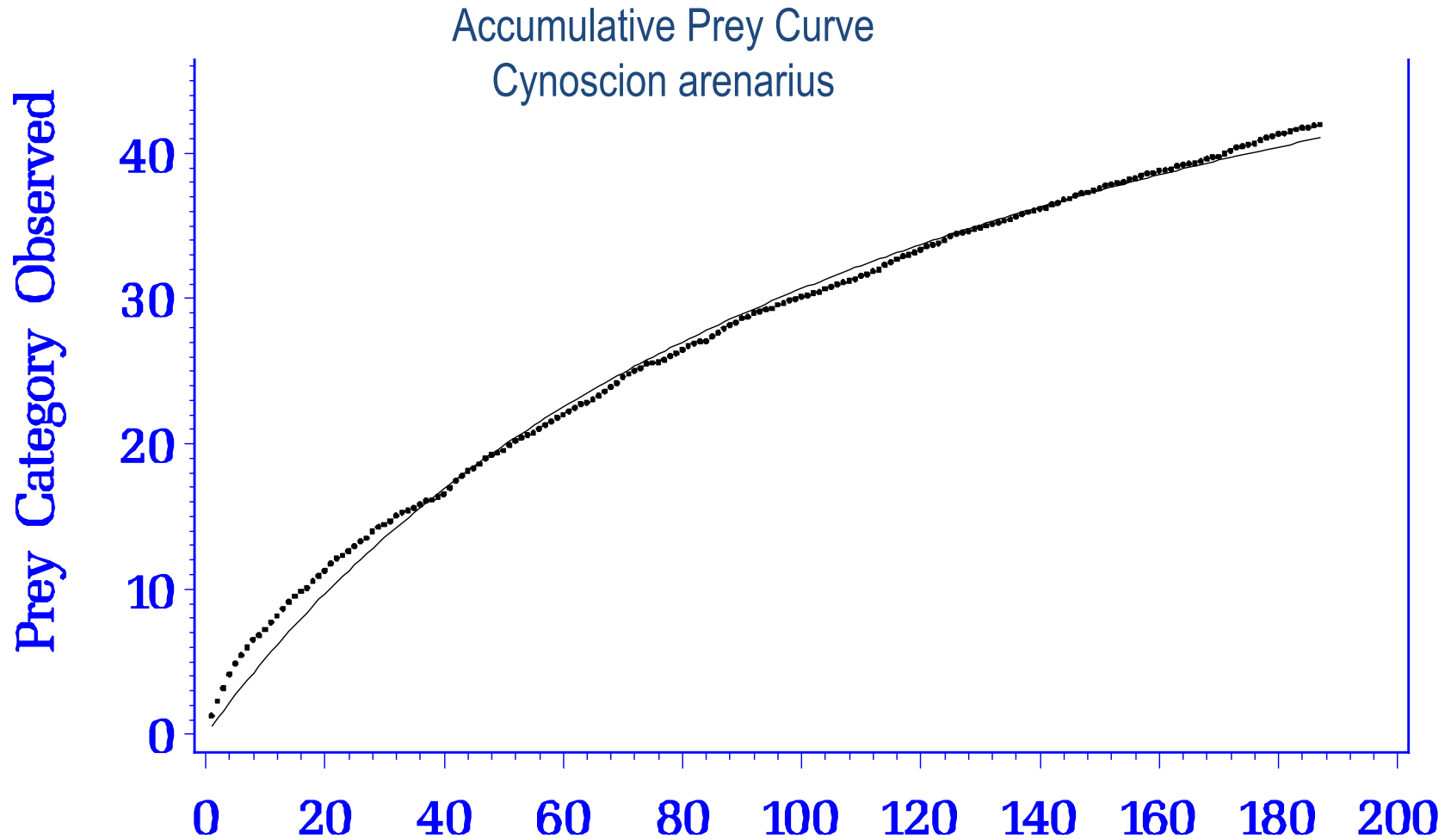
-Identification of prey using  
Species identification  
Guide

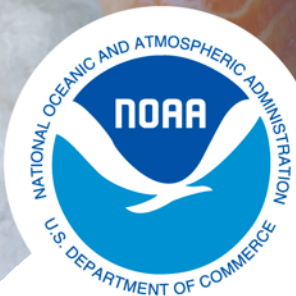


-Weight identified prey  
individuals  
-Pictured and archived



# Preliminary Statistics





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# National Seafood Inspection Laboratories

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# Histamine in seafood

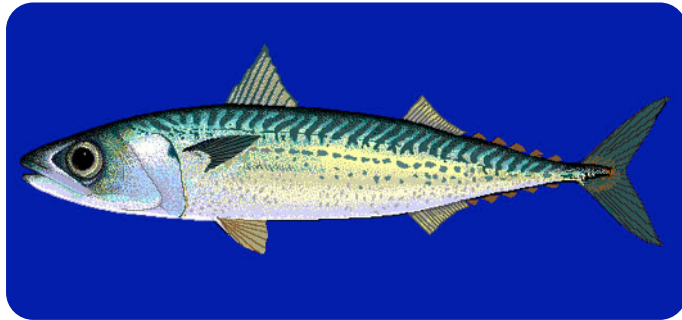
- Foodborne toxin associated with the consumption of mackerel, tuna, mahi mahi, and others
- Produced during process and storage of fish by action of spoilage bacteria

## Health effects

- Tingling sensation
- Skin rash
- Inflammation
- Some cases vomiting and diarrhea

# Qualitative Determination of Histamine in Fish Tissue

Method applied to detect histamine levels  $>50\text{PPM}$  in seafood



Mackerel



Bluefish





# General Procedure

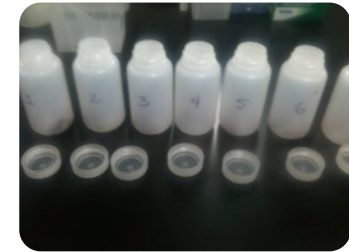
Histamine is extracted from a sample in a quick water extraction process.

Extract is filtered and diluted in a buffer solution.

After a wash step, substrate is added.

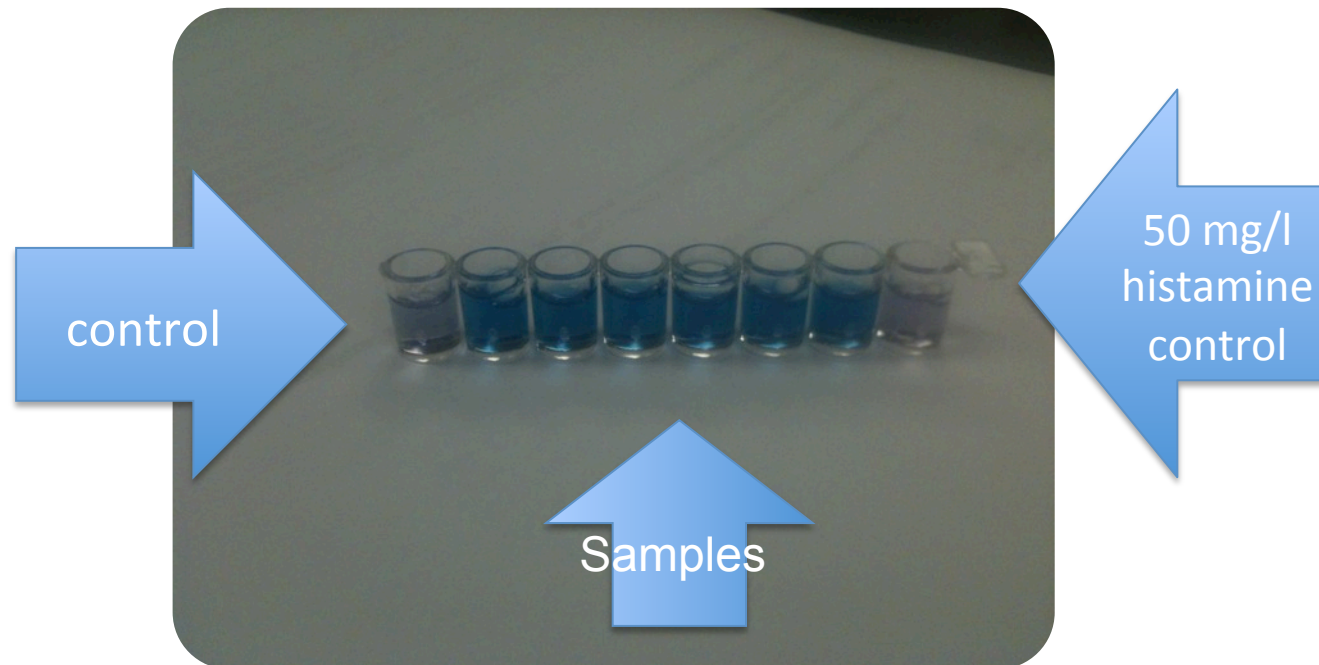
Substrate reacts with bound enzyme conjugate and produces a blue color.

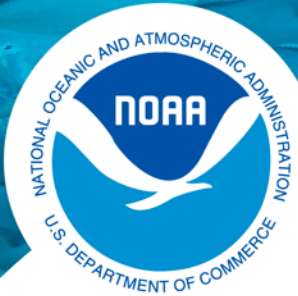
Color of the sample is compared to the color of the control



# Results

- Dark blue, less than 50PPM histamine





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# Conclusions



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# Content learned

- Great opportunity to learn and apply new concepts
  - Develop a better understanding of fisheries research in the Gulf of Mexico
  - Learn more about the effects of hypoxia on fish and other marine organisms
- Have an overview of National Seafood Inspection Program
- Metadata

# Challenges encountered

- Identify species
  - plankton
  - fish
  - invertebrates
- Work aboard research vessel under unstable weather conditions

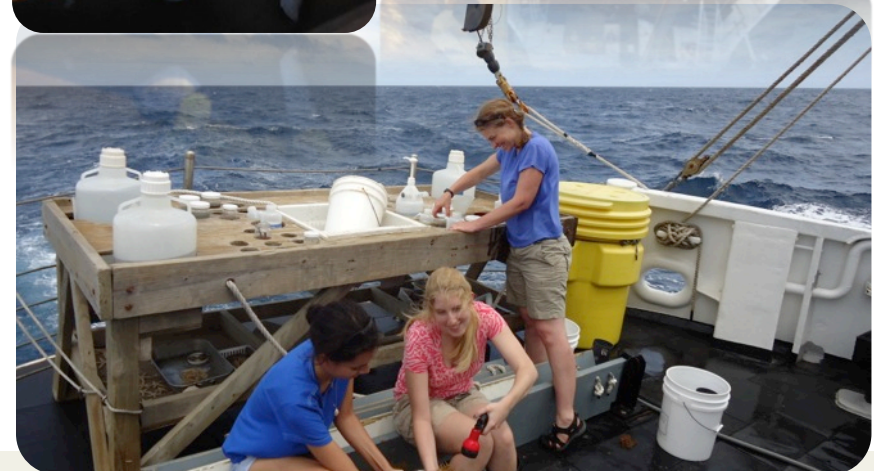


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# Acknowledgements

- NOAA Fisheries, Mississippi Laboratories
  - Brittany Palm
  - Andre DeBose
  - Plankton Unit
  - Cheryl Lassitter
- NOAA-NGI-Diversity Internship Program
  - JoAnn Moody
  - Tina Miller- Way

# Thank you!



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