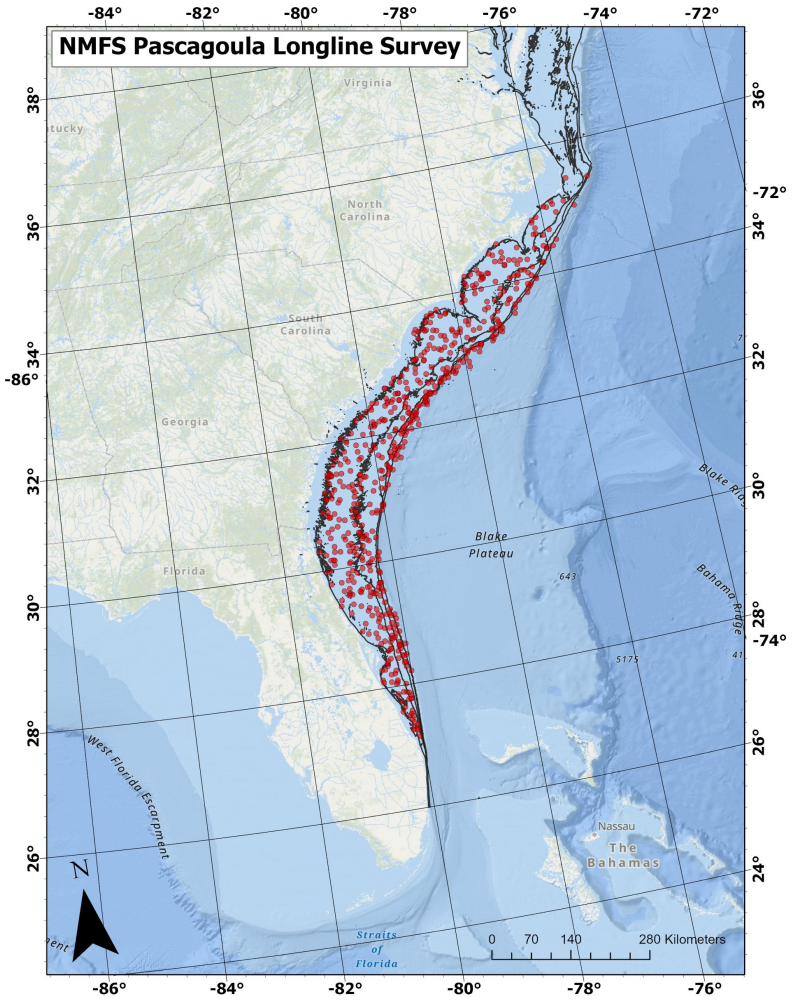
South Atlantic Deepwater Longline Survey (SADL)

- Background and need
- Methodology
- Results from 2020
- Plans for 2021

South Atlantic Deepwater Longline Survey (SADL)

- SEFSC Bottom Longline Survey
  - GoM and South Atlantic
  - South Atlantic component
  - 1995 - present
  - 9 m to 183 m
  - Deeper depth limit due to current-driven gear loss in greater depths
  - Few demersal non-shark species caught
- Trap-video survey effective samples most demersal species in depths to ~ 85 m
- Limited data available for the deeper-water, demersal species complex

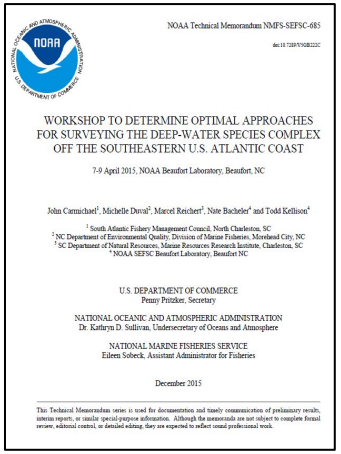


South Atlantic Deepwater Longline Survey (SADL)

- Cooperative-with-industry survey
- Anticipated to become an annual survey
- Multiple focal species
  - Golden tilefish
  - Blueline (gray) tilefish
  - Snowy grouper
  - Speckled hind
  - Warsaw grouper
  - Yellowedge grouper
- Objective: generate indices of abundance and other information (e.g., from otolith and reproductive samples) to support stock assessments and management

South Atlantic Deepwater Longline Survey (SADL)

- Survey methodology
  - 2015 South Atlantic Deepwater Survey Workshop (Carmichael et al. 2015)
  - Results from recent cooperative research and survey projects
  - Discussions during a one-day planning meeting held in February 2020



NOAA Technical Memorandum NMFS-SEFSC-685

WORKSHOP TO DETERMINE OPTIMAL APPROACHES FOR SURVEYING THE DEEP-WATER SPECIES COMPLEX OFF THE SOUTHEASTERN U.S. ATLANTIC COAST

7-9 April 2015, NOAA Beaufort Laboratory, Beaufort, NC

John Carmichael[1], Michelle Duval[2], Marcel Reichert[3], Nate Bacheler[4] and Todd Kellison[4]

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[2] NC Department of Environmental Quality, Division of Marine Fisheries, Morehead City, NC
[3] SC Department of Natural Resources, Marine Resources Research Institute, Charleston, SC
[4] NOAA SEFSC Beaufort Laboratory, Beaufort NC

U.S. DEPARTMENT OF COMMERCE
Penny Pritzker, Secretary

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Dr. Kathryn D. Sullivan, Undersecretary of Oceans and Atmosphere

NATIONAL MARINE FISHERIES SERVICE
Eileen Sobeck, Assistant Administrator for Fisheries

December 2015

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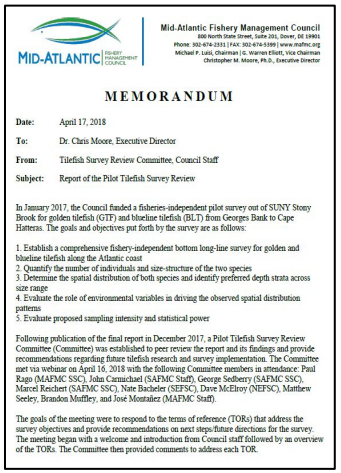

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

Mid-Atlantic Fishery Management Council
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Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: April 17, 2018

To: Dr. Chris Moore, Executive Director

From: Tilefish Survey Review Committee, Council Staff

Subject: Report of the Pilot Tilefish Survey Review

In January 2017, the Council funded a fisheries-independent pilot survey out of SUNY Stony Brook for golden tilefish (GTF) and blueline tilefish (BLT) from Georges Bank to Cape Hatteras. The goals and objectives put forth by the survey are as follows:

1. Establish a comprehensive fishery-independent bottom long-line survey for golden and blueline tilefish along the Atlantic coast
2. Quantify the number of individuals and size-structure of the two species
3. Determine the spatial distribution of both species and identify preferred depth strata across size range
4. Evaluate the role of environmental variables in driving the observed spatial distribution patterns
5. Evaluate proposed sampling intensity and statistical power

Following publication of the final report in December 2017, a Pilot Tilefish Survey Review Committee (Committee) was established to peer review the report and its findings and provide recommendations regarding future tilefish research and survey implementation. The Committee met via webinar on April 16, 2018 with the following Committee members in attendance: Paul Rago (MAFMC SSC), John Carmichael (SAFMC Staff), George Sedberry (SAFMC SSC), Marcel Reichert (SAFMC SSC), Nate Bacheler (SEFSC), Dave McElroy (NEFSC), Matthew Seeley, Brandon Muffley, and José Montañez (MAFMC Staff).

The goals of the meeting were to respond to the terms of reference (TORs) that address the survey objectives and provide recommendations on next steps/future directions for the survey. The meeting began with a welcome and introduction from Council staff followed by an overview of the TORs. The Committee then provided comments to address each TOR.

South Atlantic Deepwater Longline Survey (SADL)

Survey methodology - 2020

- NC to FL Keys
- 75 - 366 m (246 - 1201 feet; 41 - 200 fathoms)
- Stratified by depth (75-146 and 146-366 m) and latitude (one-degree bands)
- Gear
  - 4-mile mainline
  - 150 hooks per mile
  - 12/0 offset circle hooks
  - Bait = squid (2-inch squares)

South Atlantic Deepwater Longline Survey (SADL)

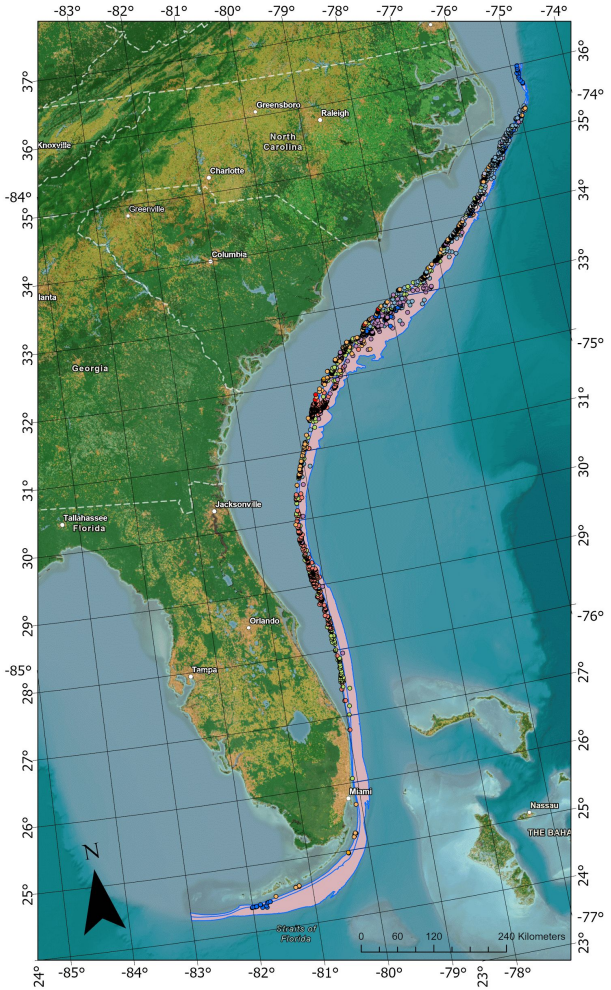
Survey methodology - 2020

- Deployment and retrieval: last hook in = first hook out
  - Vessel always connected to gear to avoid current-driven gear loss
  - 15-20 minutes between end of deployment and beginning of retrieval
- Sunrise to sunset

South Atlantic Deepwater Longline Survey (SADL)

Survey methodology - 2020

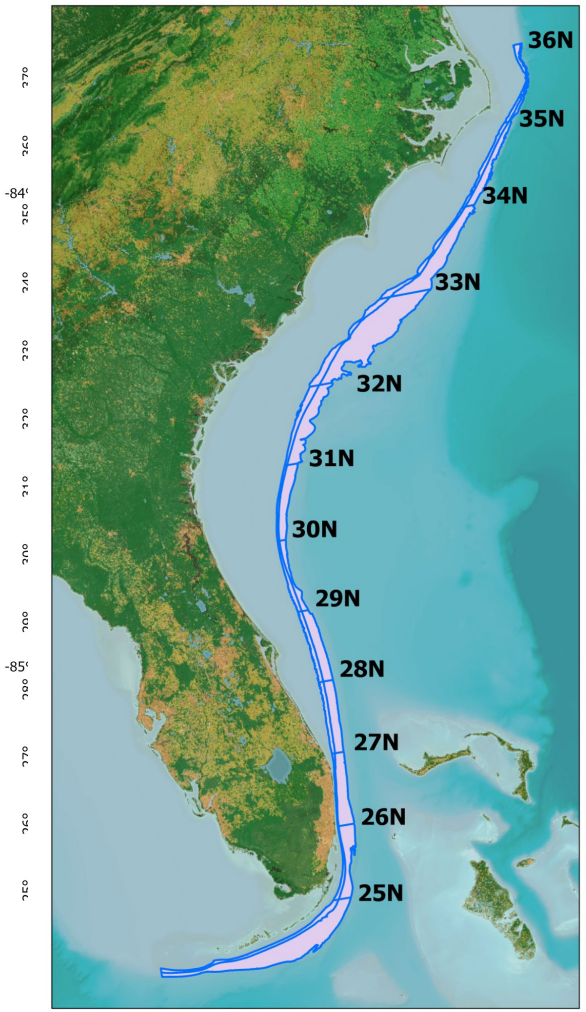
- Site selection - background
  - Focal species utilize both hardbottom and unstructured / sand / mud habitats
  - Poor knowledge of habitat distributions in survey domain
  - Relatively large number of SEFSC and/or SCDNR sites in survey domain, predominantly in the shallow depth stratum



South Atlantic Deepwater Longline Survey (SADL)

Survey methodology - 2020

- Site selection - three site types
  - Random
  - Universe random
  - Captain's choice
- Shallow cells - one random, one universe random, one captain's choice
- Deep cells - two random, one captain's choice
- Target sample size = 72 deployments



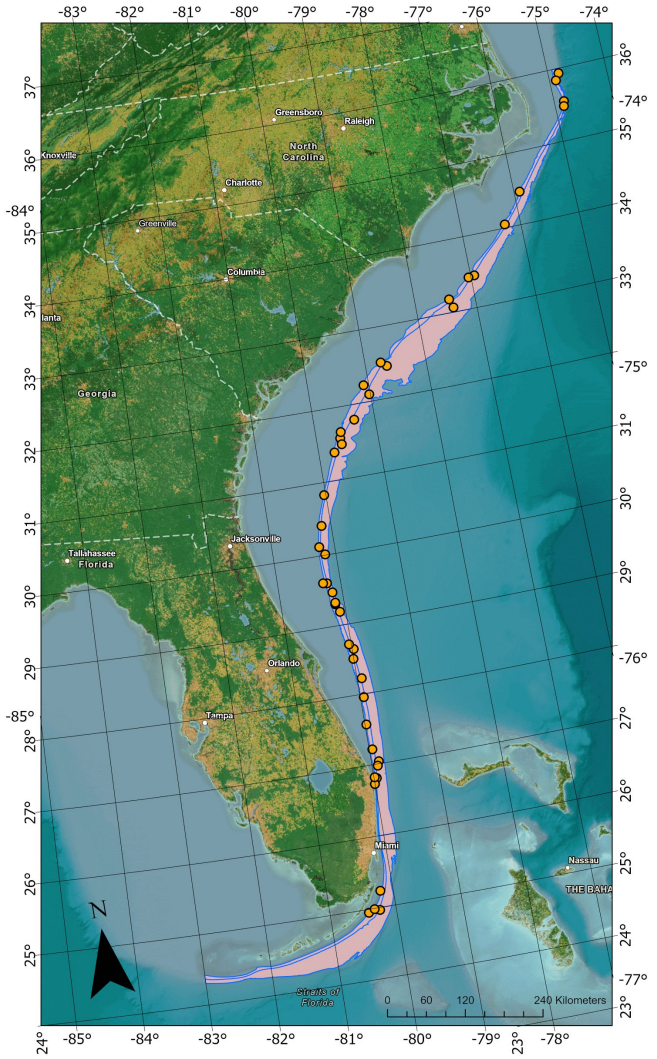
South Atlantic Deepwater Longline Survey (SADL)

- Industry participants - contracted by survey partner SCDNR
  - One in SC - sampled northern portion of the survey area (NC - GA waters)
  - One in FL - sampled southern portion of survey area (FL waters)
- Data collection at sea by NMFS observer
  - Site-specific details (date, latitude and longitude, depth, and time of sampling)
  - Species-specific lengths, abundance, and biological samples (otoliths and reproductive samples, when possible and for selected species)

South Atlantic Deepwater Longline Survey (SADL)

Results

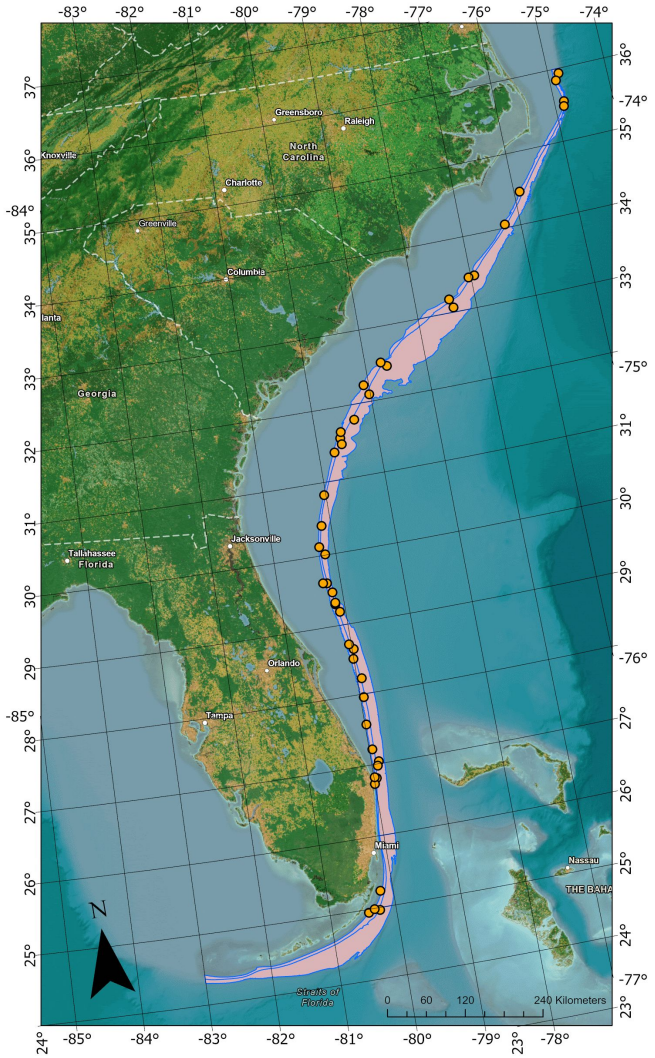
- 46 longline deployments
  - Aug 15 - October 29
  - 70 m (shallowest set) to 362 m (deepest set)
- Overall catch per unit effort (# of fish per 100 hooks) variable
  - Mean = 3.7 ± 2.7 SD



South Atlantic Deepwater Longline Survey (SADL)

Results

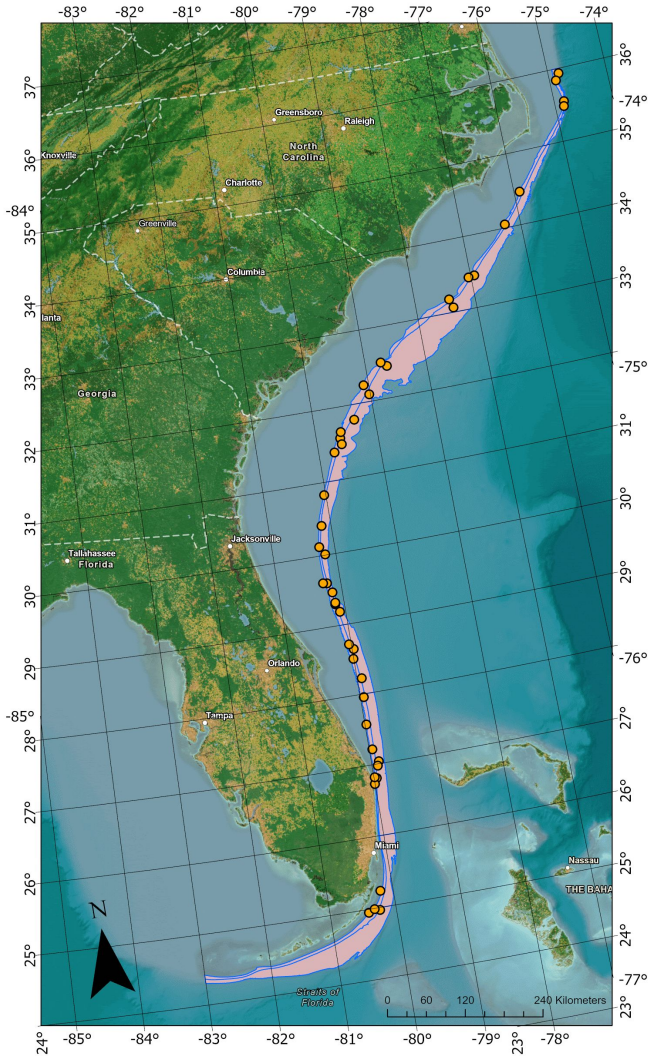
- Multiple species of management importance caught
- 5 of 6 focal species caught
  - Golden tilefish (166)
  - Blueline tilefish (38)
  - Snowy grouper (29)
  - Yellowedge grouper (5)
  - Warsaw grouper (1)
  - Speckled hind (0)



South Atlantic Deepwater Longline Survey (SADL)

Results

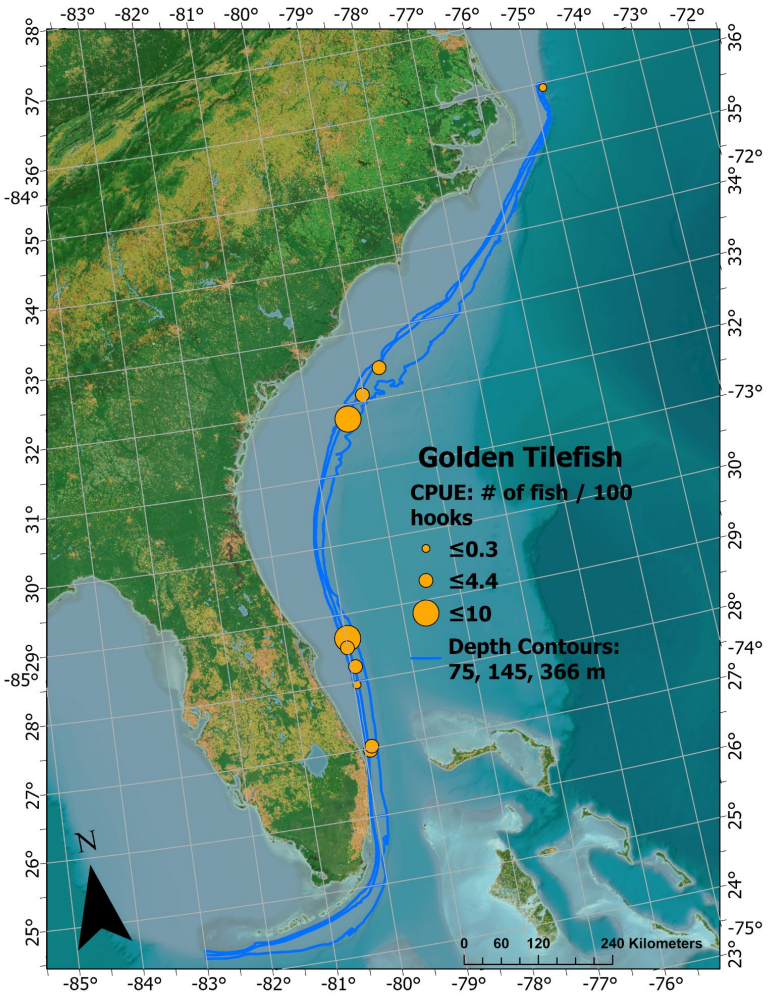
- Other species of management importance
  - Mutton snapper (36)
  - Scamp (16)
  - Vermilion (15)
  - Red porgy (14)
  - Red snapper (11)
  - Gray triggerfish (9)
  - Gag (7)
  - Red grouper (5)



South Atlantic Deepwater Longline Survey (SADL)

Results

- Golden tilefish
- Blueline tilefish
- Snowy grouper



South Atlantic Deepwater Longline Survey (SADL)

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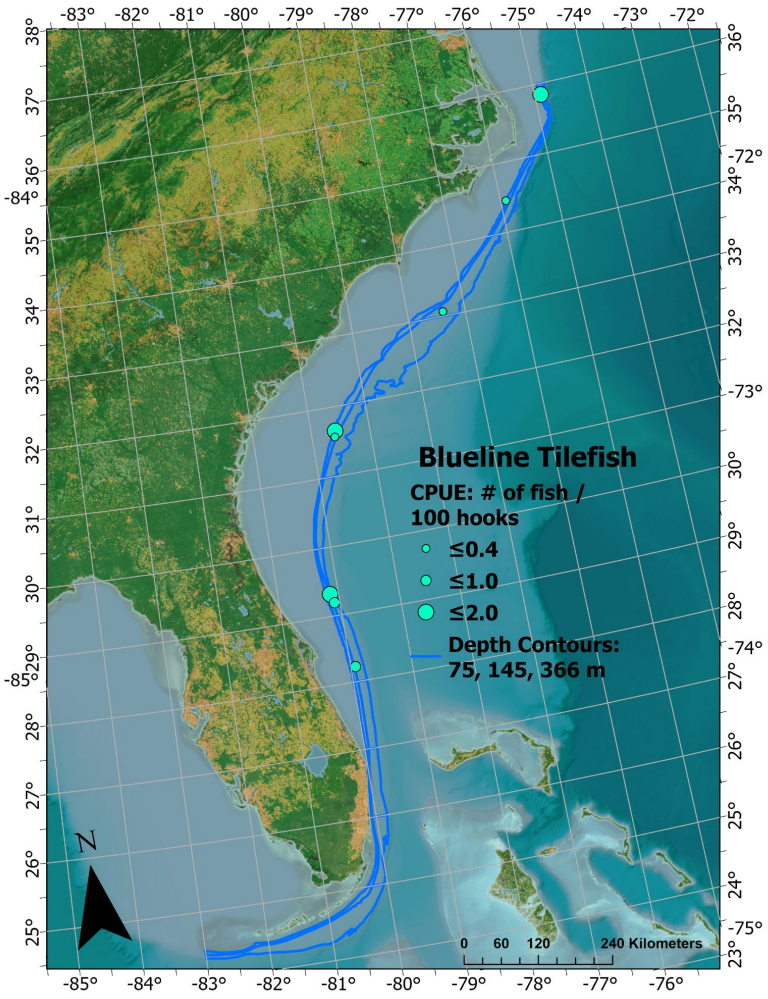

South Atlantic Deepwater Longline Survey (SADL)

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- Golden tilefish
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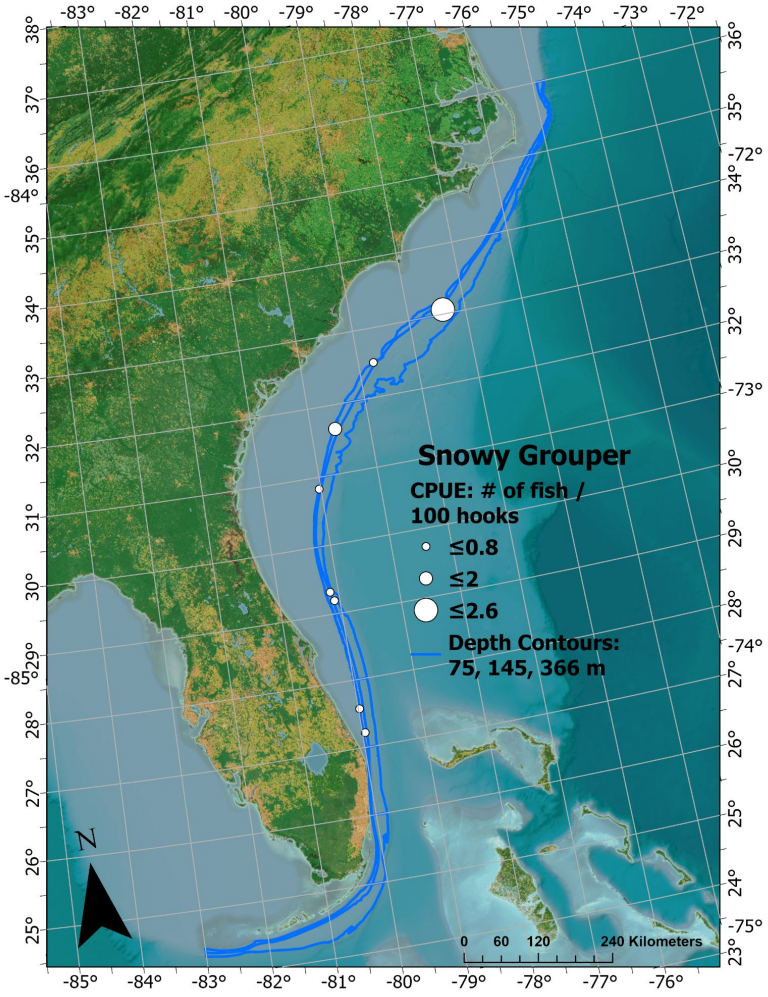
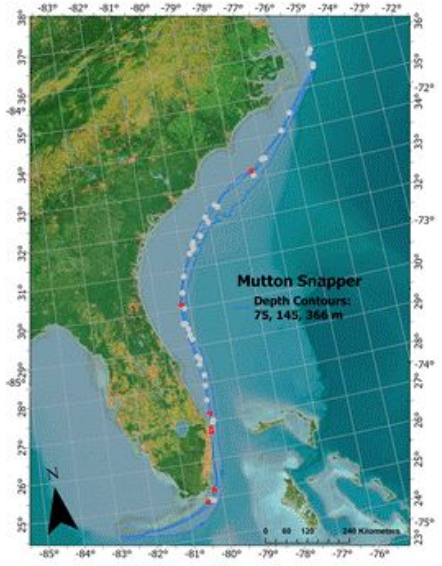
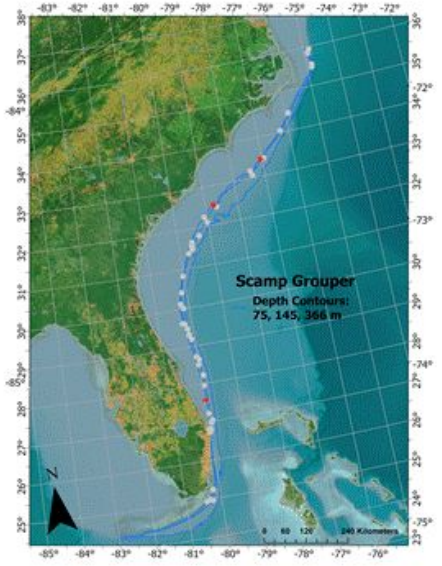
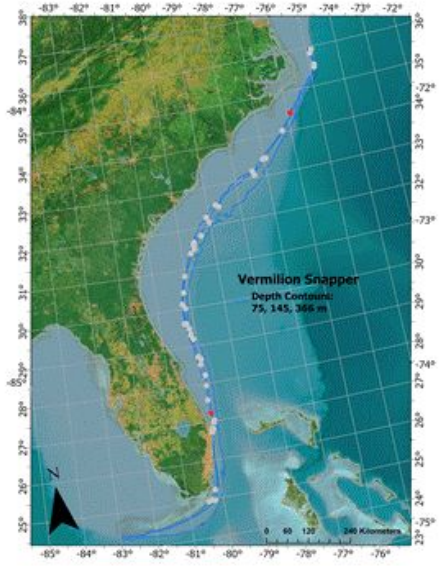
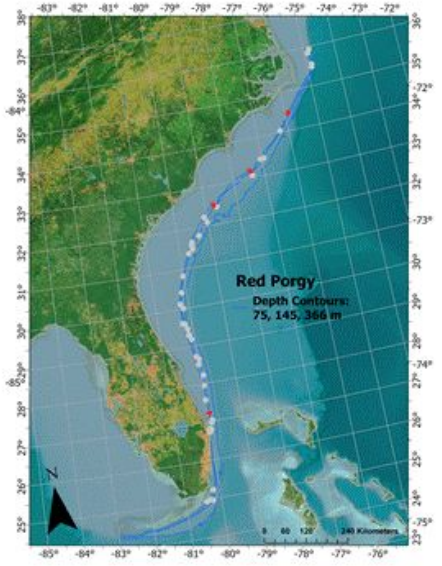


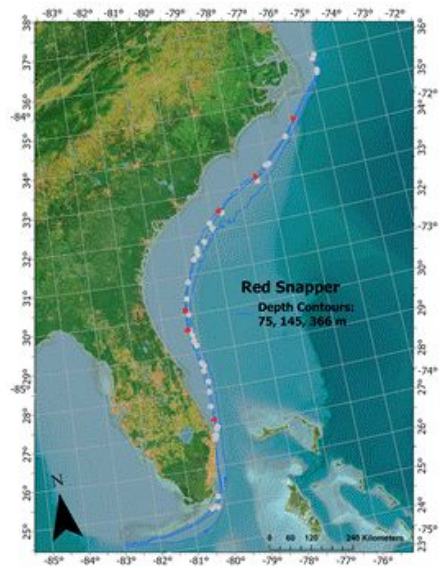
South Atlantic Deepwater Longline Survey (SADL)

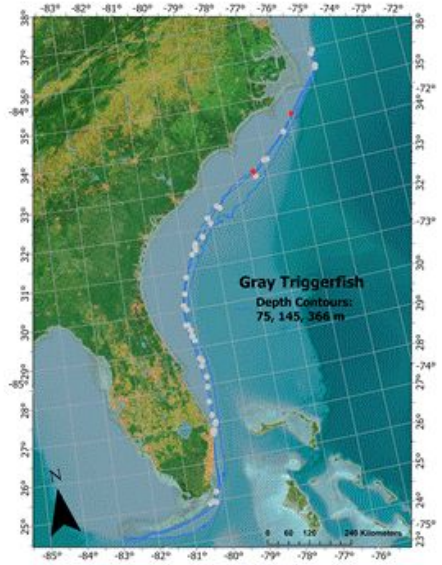


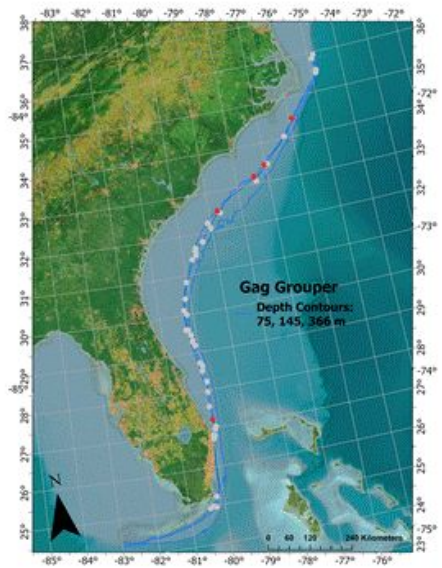


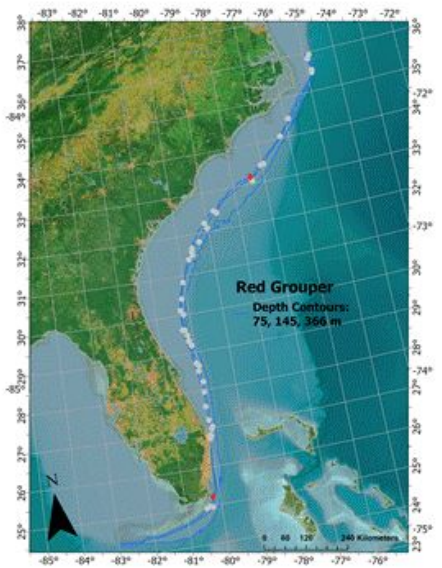












South Atlantic Deepwater Longline Survey (SADL)

- 46 samples
  - 29 random
  - 12 universe random
  - 5 captain's choice
- Proportion of three sites types nearly identical between industry participants (northern and southern portions of survey area)
- CPUE highly variable across site types
  - Difficult to make inferences about relationship between site types and catch

South Atlantic Deepwater Longline Survey (SADL)

- Variation in standardized methodology
- One industry participant, who utilized more than one captain across trips, fished 100 hooks per mile on at least some trips
- CPUE was higher for 100-hook deployments than for 150-hook deployments, which could have been due to the difference in hook density, spatial differences, or some combination of the two
  - 100 hooks: 4.78 ± 2.94 SD
  - 150 hooks: 2.56 ± 2.04 SD
- Steps to assure no variation in methodology in subsequent sampling (2021 and beyond)

South Atlantic Deepwater Longline Survey (SADL)

Outcomes and implications

- Completed during COVID - thanks to industry participants and observers
- Results from 2020 indicate the potential for an effective regional-scale cooperative survey targeting multiple focal species
- Sampling occurred across the targeted sampling area and targeted depths, and five of six focal species were collected, along with multiple other species of management importance

South Atlantic Deepwater Longline Survey (SADL)

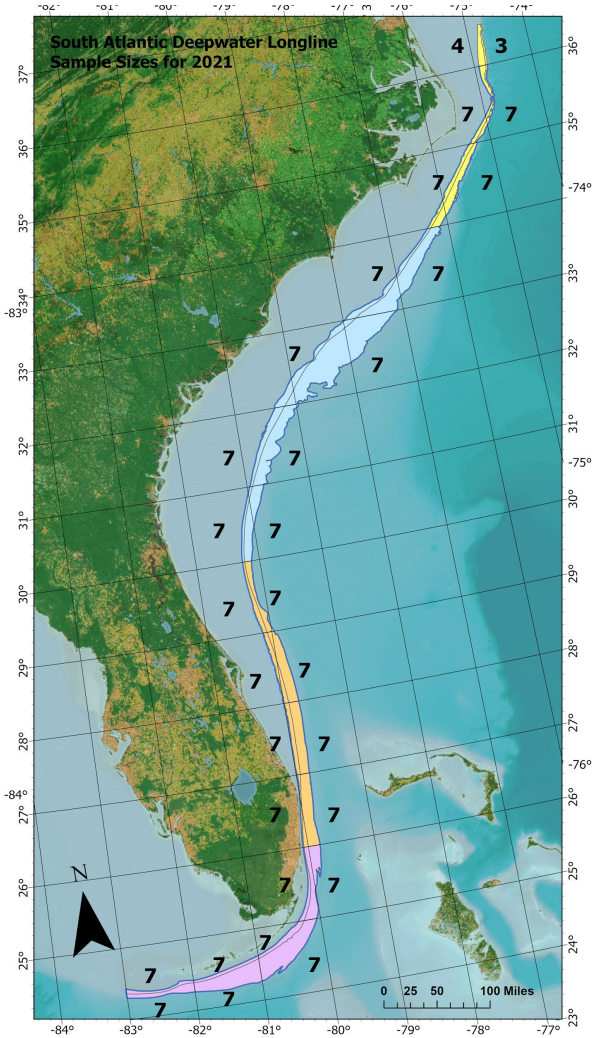
Outcomes and implications

- Sample size (n = 46 longline deployments) was smaller than anticipated, due to a variety of factors
- While smaller than anticipated, sample size was similar in scope to the typical annual sample size of the South Atlantic component of the NMFS bottom longline survey, which is effective in generating indices of abundance for many shark species.
- Increased catches likely with increased sample size

South Atlantic Deepwater Longline Survey (SADL)

Plans for 2021

- Increase sample size by a factor of 3 to 4
  - 175-200 samples
- Increase industry participants from two to four
- Initiate survey earlier in the year, allowing for better weather, longer trips, and increased sampling efficiency
- Objective: considerably increase catches of focal species and other species of management importance



South Atlantic Deepwater Longline Survey (SADL)

Survey considerations

- Multi-species surveys cannot be optimized for all species
  - Species-specific variability in factors such as gear selectivity (including varying hook sizes), depth distribution, and preferred habitat (e.g., natural hardbottom versus unconsolidated bottom)
- Possible that a survey that effectively targets the suite of SADL focal species is not logistically feasible, given funding and logistical constraints, even at increased sampling levels
- MAFMC longline survey example
  - 2018 - paired golden tilefish - blueline tilefish survey
  - 2020 - survey focused solely on golden tilefish (reduced area and depth range, enabling increase in catch rates and decrease in variability)

South Atlantic Deepwater Longline Survey (SADL)

Survey considerations

- Analysis of 2021 data, once available, will allow assessment of the likelihood of effectively indexing multiple species with SADL survey data, given sufficient sample sizes.
- If yes, the multi-species annual survey will be pursued
- If not, options for the survey could include a focus on 1-2 focal species, such as golden tilefish and blueline tilefish

- Potential for cross-regional, Mid-Atlantic survey coordination

South Atlantic Deepwater Longline Survey (SADL)

Thank you.

Questions?