Science, Service, Stewardship

Southeast Fisheries Science Center
SAFMC Update – September 2011
Report on the
SEFSC Fisheries Independent Monitoring Program

Southeast Fishery-Independent Survey (SEFIS)

NOAA
FISHERIES
SERVICE

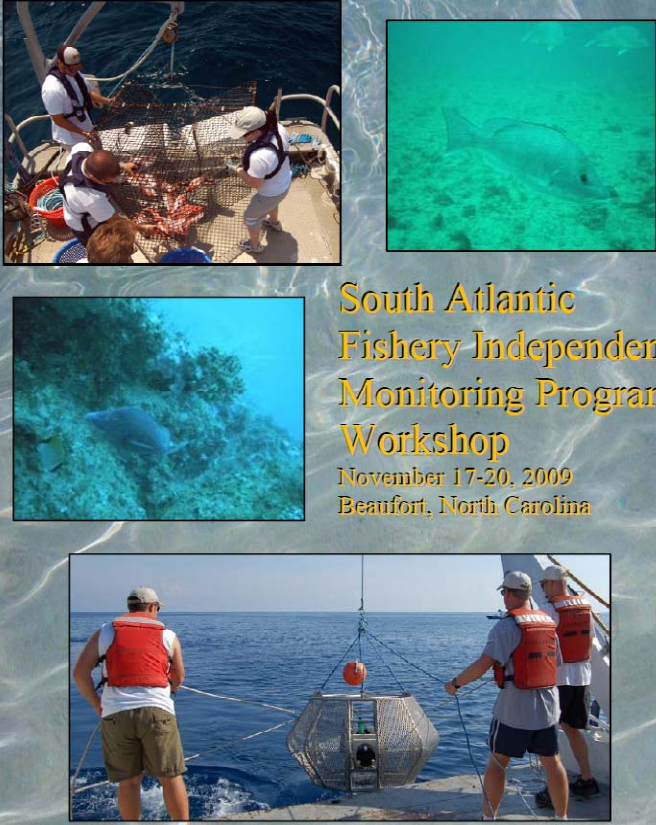Science, Service, Stewardship

SouthEast Fishery-Independent Survey (SEFIS)

- **Background / History**
- **SEFIS program overview**
- **2010-2011 accomplishments**
- **Video as a survey gear; implications for assessments**

# South Atlantic Fishery Independent Monitoring Program Workshop

- November 2009
- Decreasing availability of fishery-dependent data
- Diverse participants
- Provided recommendations for fishery-independent survey approaches and levels of effort
- > $10M in funding recommended for full survey
- Led to the creation of the SouthEast Fishery-Independent Survey (SEFIS) in 2010

South Atlantic Fishery Independent Monitoring Program Workshop
November 17-20, 2009
Beaufort, North Carolina

Sponsored by:
South Atlantic Fishery Management Council
and
**NOAA Fisheries, Southeast Fisheries Science Center**
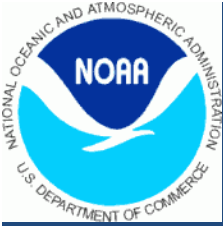
Specific objectives of SEFIS

- Focus on hardbottom-associated species on the continental shelf and shelf-break

- Work cooperatively with MARMAP to increase the number and spatial distribution of samples in US South Atlantic

- Implement video cameras as a survey gear to develop indices of abundance and address trap selectivity

- Map hardbottom habitats to improve survey design

- Perform applied research to inform survey methods and address management issues
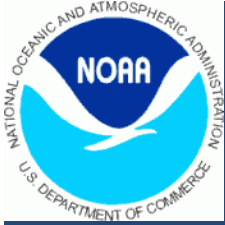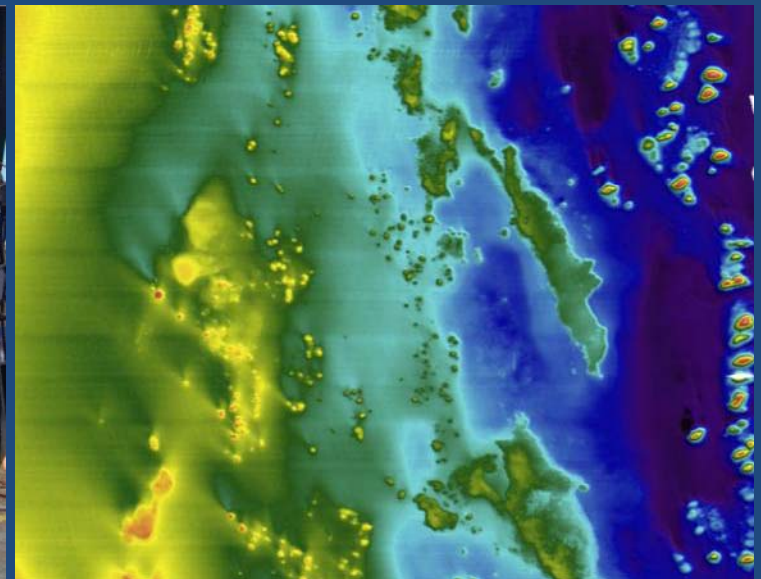
Sampling universe
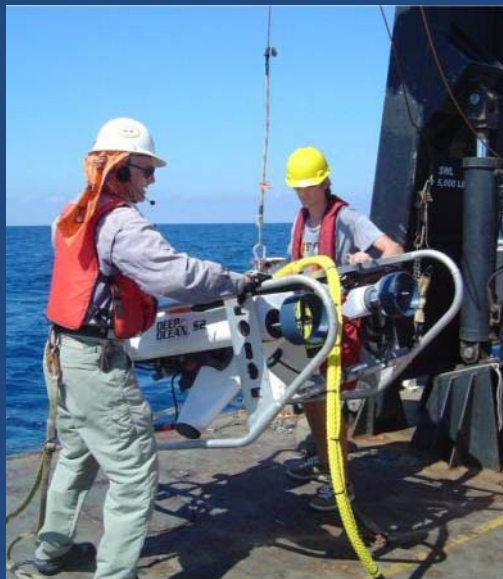
- Cape Hatteras, NC to Port St. Lucie, FL
- Continental shelf and shelf-break (~ 20-75m depth)
- SEFIS focus in 2010 and 2011 = GA and FL

Red dots = historical MARMAP sampling sites
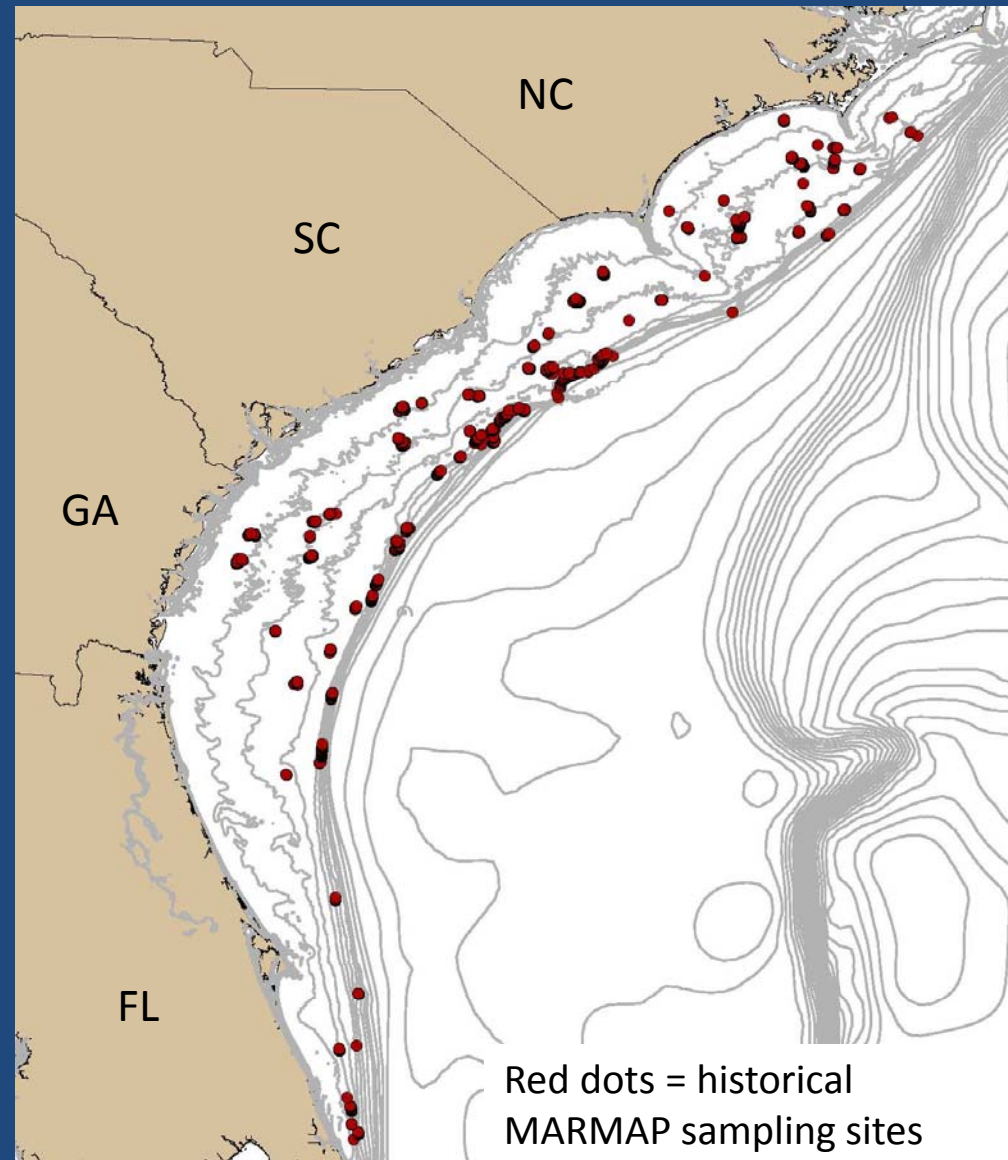
SEFIS sampling approach

- Chevron trapping
- Video cameras affixed to traps
- Multibeam habitat mapping
- Research
  - ROV, longline, fisheries acoustics

SEFIS 2010 results

- 63 days at-sea
- 480 traps deployed
- 97% of SEFIS traps affixed with video cameras
- 37 areas mapped (377 km^2) with multibeam sonar
- 32 ROV dives; red snapper longline survey
- > 200 hours of split-beam sonar surveys

SEFIS 2011 Plans and Progress

- 12 days at sea on NOAA ship *Pisces* completed in Florida
  - Mapped hardbottom habitats, which expands sampling universe
  - 130 trap-video samples
- 31 days accomplished on *R/V Savannah*, 10-20 more planned
- ~ 800-1000 trap-video samples likely (from SEFIS and MARMAP sampling combined) each year between NC and FL
- SEFIS resulting in > 100% expansion over recent South Atlantic trap sampling levels (MARMAP)
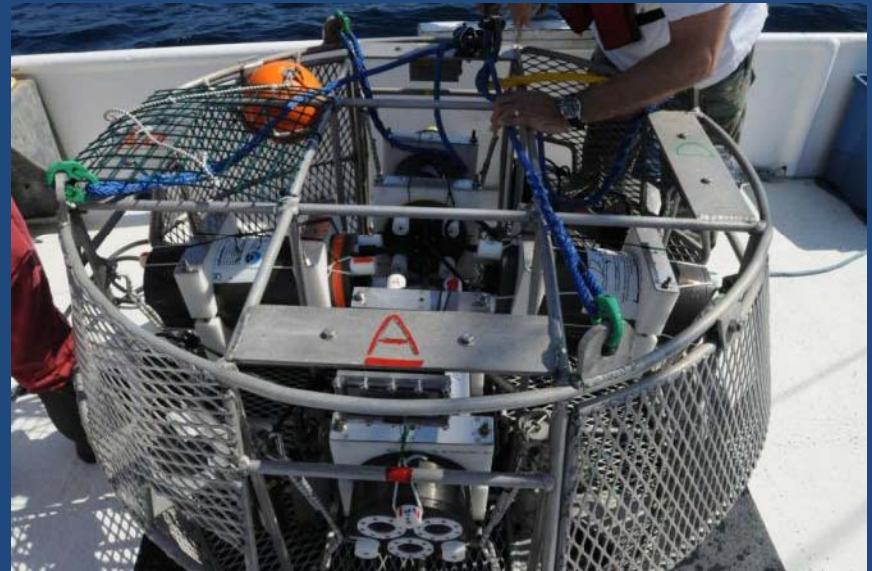- Video: used only by SEFIS in 2010; SEFIS and MARMAP beginning in 2011
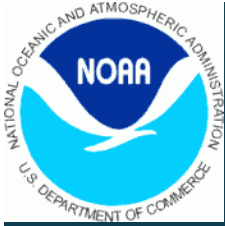
Video as a survey gear

- Recommended by 2009 SAFIMP workshop
- Addresses trap selectivity issues
- Used by NMFS and state of Florida in the Gulf of Mexico
- Not previously used as a survey gear in the South Atlantic

9

Video in the Gulf of Mexico

- NMFS: Pascagoula, Panama City
- State of Florida
- Video arrays, stereo cameras
- Video-based indices of abundance developed for many species
  - Red, gag, and scamp grouper
  - Red, mutton, and vermilion snapper
  - Gray triggerfish
- Length information available
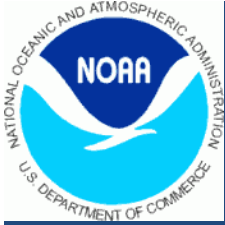
Video in the US South Atlantic

- Used by SEFIS in 2010, SEFIS and MARMAP in 2011 and beyond

- Cameras on traps, not arrays

- 800-1000 video samples collected each year

- Between Cape Hatteras, NC, and St. Lucie Inlet, FL

- 10 – 90 m deep

- No length information yet

- Only reading for priority species (n = 107)

Show 1-2 video clips

Counting fish on video clip

Goal: linear relationship between fish counted on video and true abundance around the trap

Methods for counting fish on video:

1. Count all fish seen
2. Time to first arrival
3. Maximum number seen in a single frame
4. Mean number from a series of frames

Comparison of traps and videos

- 2010, from GA and FL
- 247 valid trap-video samples
- Presence-absence only

| Common name	Scientific name	No. traps present, N (%)	No. videos present, N (%)	% increase on videos	P
Higher frequency on videos					
Almaco jack	*Seriola rivoliana*	2 (1)	32 (13)	1500	<0.001
Gray snapper	*Lutjanus griseus*	0 (0)	38 (15)	inf	<0.001
Greater amberjack	*Seriola dumerili*	2 (1)	33 (13)	1550	<0.001
Gray triggerfish	*Balistes capriscus*	72 (29)	99 (40)	38	0.046
Hogfish	*Lachnolaimus maximus*	0 (0)	9 (4)	inf	<0.01
Lionfish	*Pterois volitans*	0 (0)	8 (3)	inf	<0.01
Nurse shark	*Ginglymostoma cirratum*	0 (0)	11 (4)	inf	<0.001
Red porgy	*Pagrus pagrus*	52 (21)	88 (36)	69	<0.01
Red snapper	*Lutjanus campechanus*	40 (16)	83 (34)	108	<0.001
Scamp	*Mycteroperca phenax*	1 (1)	29 (12)	2800	<0.001
Vermilion snapper	*Rhomboplites aurorubens*	67 (27)	107 (43)	60	<0.01
No statistical difference					
Black sea bass	*Centropristis striata*	82 (33)	63 (26)	-23	0.13
Gag grouper	*Mycteroperca microlepis*	3 (1)	3 (1)	0	1.00
Red grouper	*Epinephelus morio*	2 (1)	5 (2)	150	0.45
White grunt	*Haemulon plumieri*	8 (3)	4 (2)	-50	0.39

Challenges of underwater video

- Changes in turbidity and light availability
  - Exclude highly turbid or dark videos
  - Include index of visibility in GLM model
  - Measure visibility directly in the future?
- Videos are selective
  - Miss small fish
  - Cryptic fish difficult to observe
- Video cameras expensive, can be lost in strong currents
- "Reading" videos takes considerable time and thus personnel support
 - 1 video = 1-8 hrs

How will videos be used to benefit assessments in the US South Atlantic?

- Variance levels and population dynamics will dictate the minimum number of years needed for a usable species specific index

- Indices of abundance likely for a number of species
  - Red snapper, vermilion snapper, red porgy, gray triggerfish, black sea bass, groupers

- Additional species likely with more comprehensive sampling in 2011
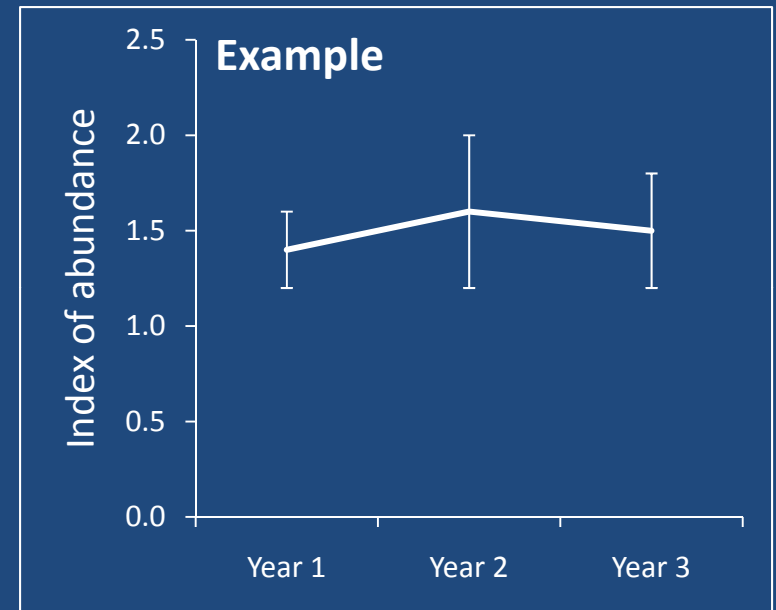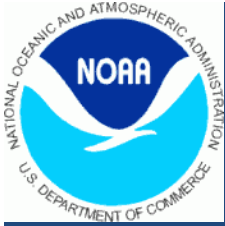
Conclusions

- >100% increase in sample sizes with SEFIS sampling
- Expanded spatial distribution of sampling
- Underwater video will result in improved abundance indices for multiple species
- Must have realistic expectations
  - Current survey efforts are below those recommended by SAFIMP 2009
  - Number of species that will benefit
  - Reading videos = labor intensive
  - Multiple years needed for a robust index