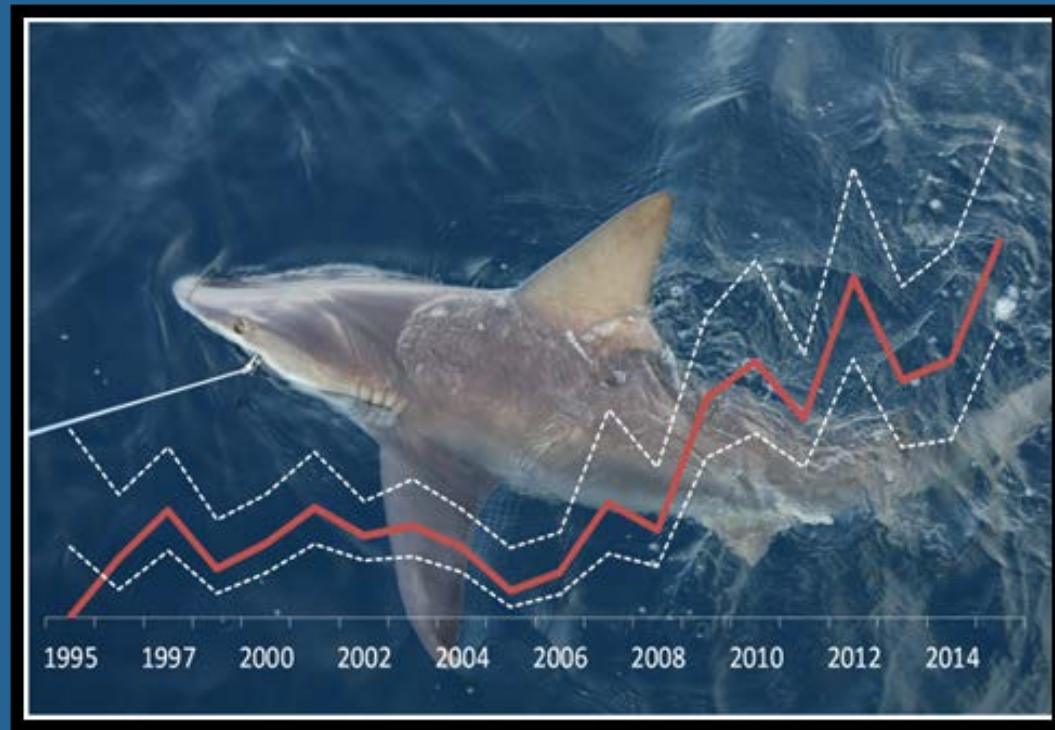




**NOAA  
FISHERIES**



## SEFSC Longline Surveys Mississippi Laboratories



# SEFSC Bottom Longline Survey

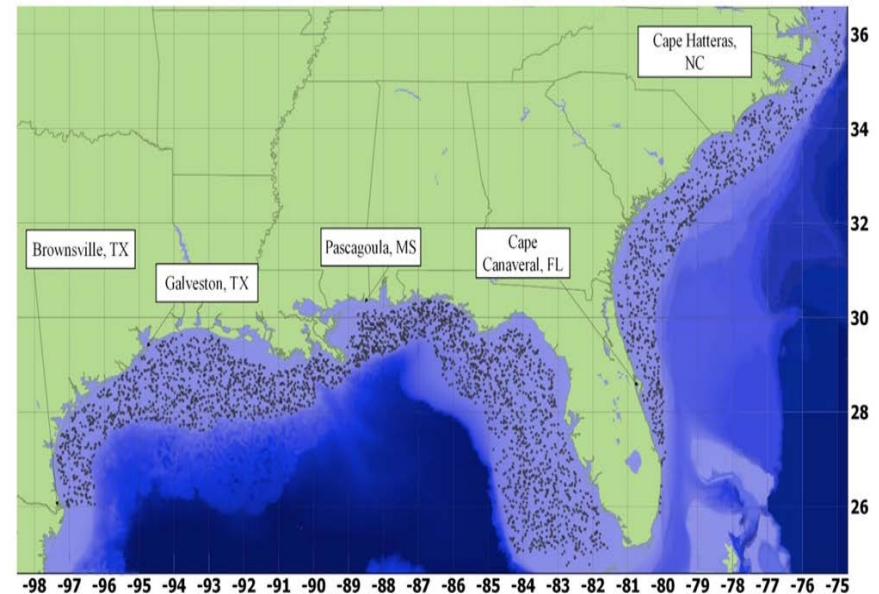
The NMFS SEFSC MS Labs annual bottom longline survey is designed to monitor trends in abundance and distribution of coastal shark , snapper, grouper and tilefish species within the U.S. waters of the western North Atlantic Ocean.

The survey has the broadest geographical range of any fishery-independent longline survey.

Started in 1995, with the current protocol in use since 2001.

# Survey area

- Cape Hatteras, NC to West Palm Beach, FL; Dry Tortugas to Brownsville, TX



# SEFSC Bottom Longline Survey

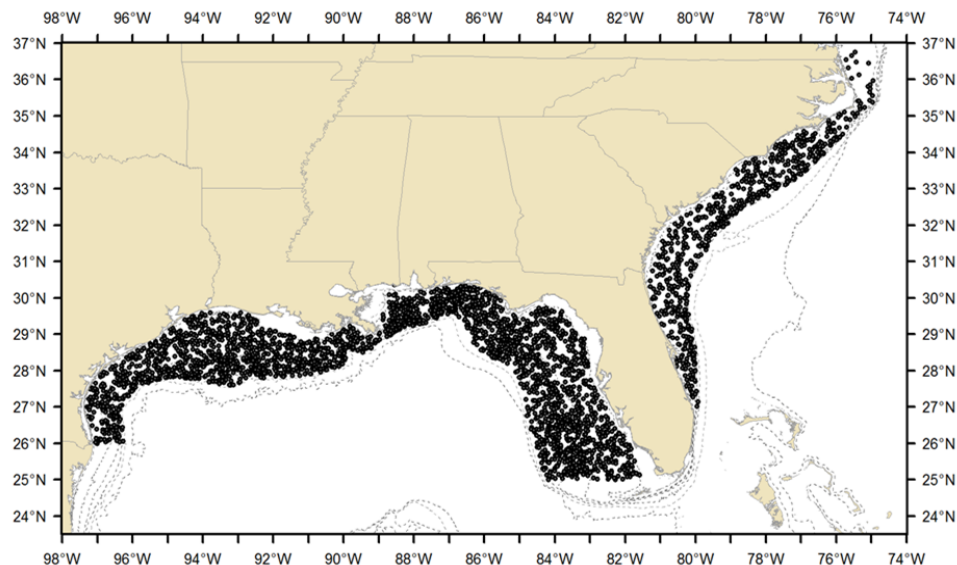
- Time series: 1995-present
- Number of stations: 200-300 per year
- Days at sea: 60 days: Four two-week legs.
- Timeframe: Late July – September



# SEFSC Bottom Longline Survey

## Experimental Design

- Stratified- random sampling with proportional allocation based on continental shelf area
- Depth: East Coast: 9 – 55 m (60%), 55 – 183 m (40%)  
Northern Gulf of Mexico: 9 – 55 m (50%), 55 – 183 m (40%),  
183 – 366 m (10%)
- Sampling effort: East Coast: 1,016 sets, Gulf: 3,651 sets (1995-2018)





# Gear characteristics:

- Gear: 1 nautical mile mainline (4mm monofilament) with 100, 3.7 m. gangions (3mm monofilament with 15/0 non-offset circle hook baited with Atlantic mackerel). One hour soak time, defined s time from deployment of second highflyer until retrieval of first highflyer.
- 1995-2000: Used #3 J-hooks. 2001- current: 15/0 circle hooks. Change due to increase in snapper/grouper catch with circle hooks.

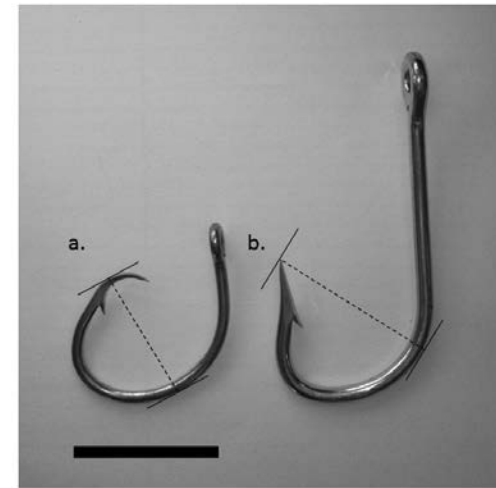
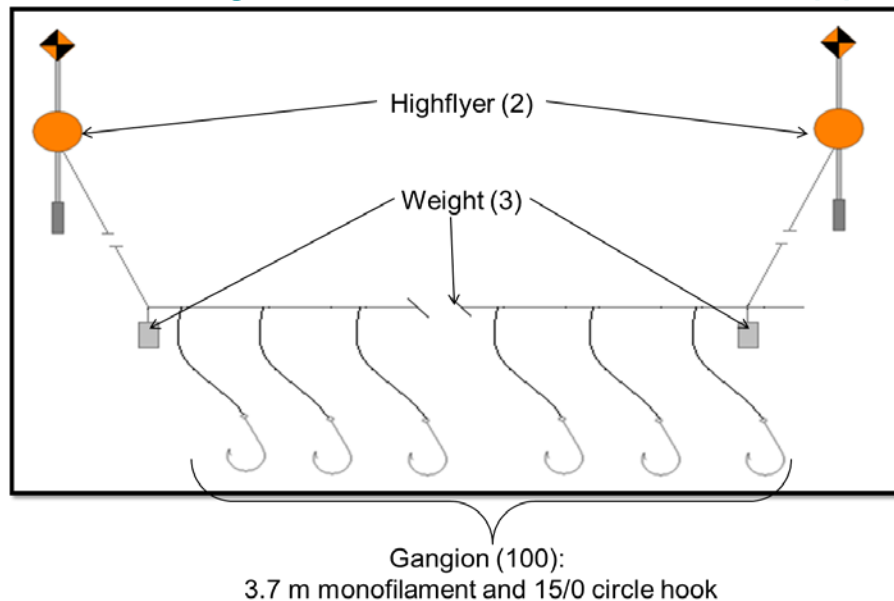


Fig. 1. (a) 15/0 circle (Mustad, model no. 39960D) and (b) #3 J (Mustad, model no. 34970D) hooks used in study. Dashed line indicates minimum width of each hook. Scale bar represents 5 cm.

# Setting gear:

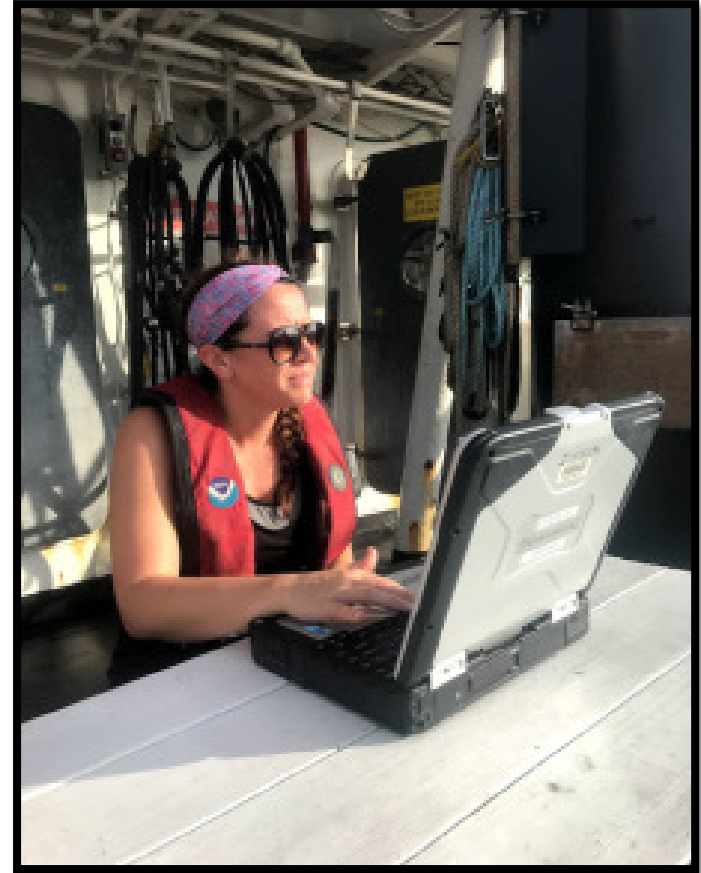
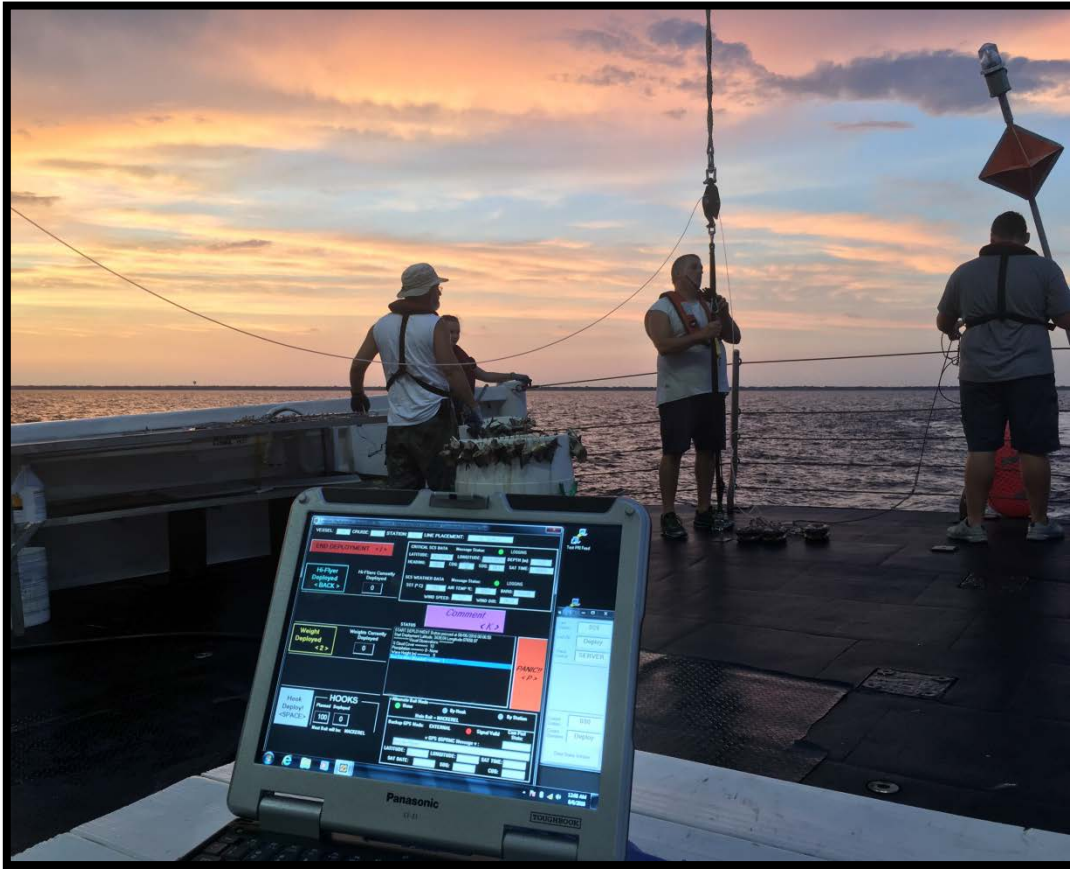


# SEFSC Bottom Longline Survey

- Gear monitored via SELLIT (SouthEast LongLine Input Technology) developed at Chuck Schroeder at MSLABS
- Multiple aspects of gear configuration are monitored during setting and haulback
- Each gear element deployed and retrieved has individual data associated with time, position, depth, environmental data, etc.
- A similar biological sampling program is used for data entry
- Data are ingested directly into ACCESS to remove possibility of transcription errors and runs real time QA/QC checks



# Setting gear:



# Setting gear:

Deploy Module - Station: 015    Current time is Wednesday, July 10 2019 15:31:37 Central Daylight Time

VESSEL: **04 - OREGON II**    CRUISE: **0333**    STATION: **015**    LINE PLACEMENT: **BL-Bottom Longline**

---

**END DEPLOYMENT** < / >

**Hi-Flyer Deployed**  
< BACK >


Hi-Fliers Currently Deployed  
**0**

**Weight Deployed**  
< 2 >

Weights Currently Deployed  
**0**

**Hook Deployed**  
< SPACE >

Hooks Planned: **100**    Hooks Deployed: **0**

Next Bait Type Will Be:  **MACKEREL**

**Change Bait Type** < Z >

**PANIC!!**  
< P >

**Sensor Data Monitoring**  
SCS Sensor Data < F2 >    Backup GPS Data < F6 >

SEND MESSAGE STATUS: **DOWN**    Last Update: **0 Second(s) Ago**



PRIMARY SENSORS:  
LATITUDE: **---**    LONGITUDE: **---**    NAV DEPTH (M): **---**  
HEADING: **---**    SOG: **---**    COG: **---**    SCI DEPTH (M): **---**  
SAT TIME: **---**

WEATHER SENSORS:  
SST (°C): **---**    AIR TEMP (°C): **---**    BARO: **---**  
WIND SPEED: **---**    WIND DIR: **---**

STATUS:  
07/10/2019 20:31:04 UTC, ERROR: No Sensor Output in past 30 Seconds!  
07/10/2019 20:31:04 UTC, 30 Second Recovery Cycle Allowed by USER  
No Visual Data Recorded for Station 015  
START DEPLOYMENT Button pressed at 07/10/2019 08:31:22  
Starting Position was unavailable  
07/10/2019 20:31:35 UTC, ERROR: No Sensor Output in past 30 Seconds!  
07/10/2019 20:31:35 UTC, 30 Second Recovery Cycle Allowed by USER

**Comment**  
< K >

Alternate Bait Mode  
☐ NONE    ☒ BY HOOK    ☐ BY STATION

Odd Bait Type = **MACKEREL**     Even Bait Type = **SQUID** 

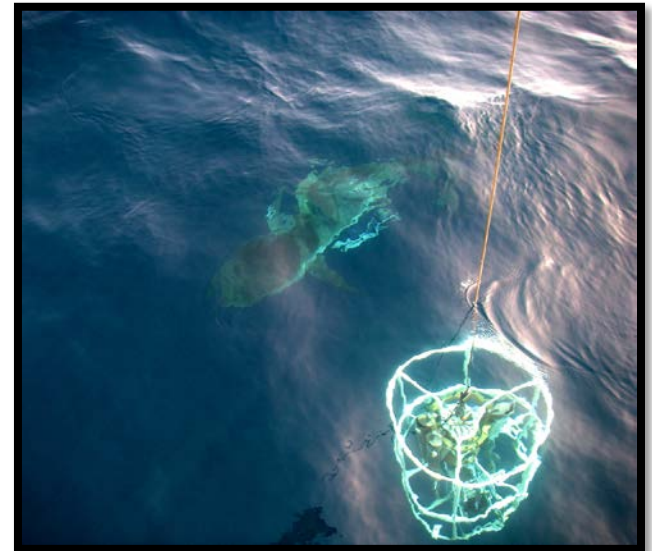
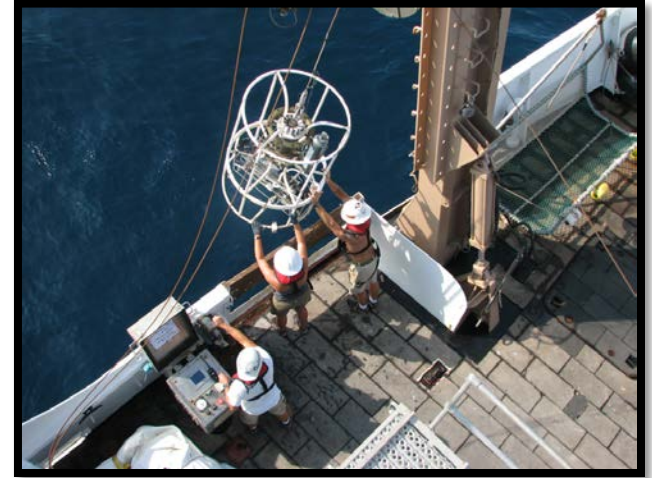
Wireless Signal Status  
Signal Strength: **0 %**    Connected to: **NO CONNECTION**  
**NONE/POOR**

SELLIT.NET - DEPLOY | Current Station: 015 | Last Station: 014 | Last Operation: ABORT-DEPLOY | Status Source: SERVER | Rec. Data...5 characters | Current Time UTC is :20:31:37

# Environmental Data

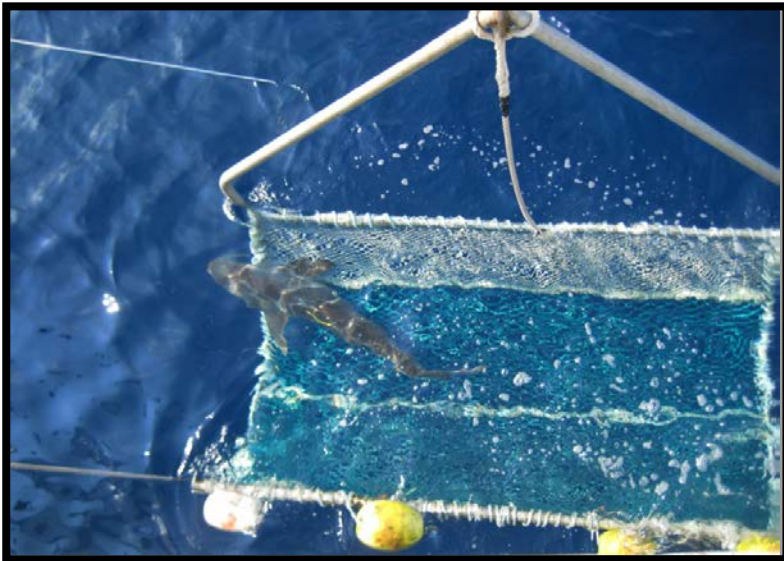
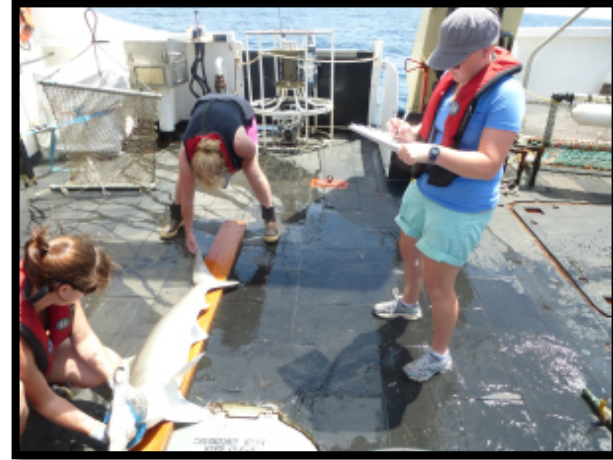
## Collect a suite of environmental data at each sampling location

- Temperature
- Salinity
- Transmissivity (water clarity)
- Dissolved oxygen
- Chl a concentration (fluorometer)
- Bottom type
- Weather conditions (air temperature, barometric pressure, wind speed and direction)
- Cast data collected throughout water column





# Haulback:



- Biological data collected: Species, length, weight, sex, disposition, state of maturity, brood size, hard parts for ageing (FMP teleosts, some sharks), movement patterns (tagging), tissues for genetic analyses, etc.
- All captured fishes, unless moribund, are released alive, with the exception of teleosts retained for life history studies.
- Most shark species are tagged prior to release.

# Haulback:

Retrieve Module - Station: 024 Current time is Monday, August 12 2019 14:37:05 Central Daylight Time [RETRIEVAL MODE = FULL]

VESSEL: **04 - OREGON II** CRUISE: **0333** STATION: **024** LINE PLACEMENT: **BL-Bottom Longline**

---

**Retrieve Hi-Fliers**

Hi-Fliers Deployed	Hi-Fliers Retrieved	Last Flyer ID
2	2	2

**Hi-Flyer Retrieved** < BACK >

**END RETRIEVAL** < / >

**Retrieval Order**

**Ascending** < 7 > **Descending** < D > **Other** < O >

Current Retrieval Mode is : Ascending

**Watch Leader** < M >

---

**Retrieve Weights**

Weights Deployed	Weights Retrieved	Last Weight ID
2	2	2

**Weight Retrieved** < Z >

**STATUS:**

08/12/2019 19:36:58 UTC , ERROR: No Sensor Output Detected in past 30  
08/12/2019 19:36:58 UTC , 30 Second Recovery Cycle Allowed by USER  
Weight No. 2 retrieved at 08/12/2019 19:37:01  
Weight No. 2 retrieved at Latitude: --- Longitude: ---  
Position Data for Weight No. 2 was unavailable  
Hi Flyer No. 2 retrieved at 08/12/2019 19:37:04  
Hi Flyer No. 2 retrieved at Latitude: --- Longitude: ---  
Position Data for Hi Flyer No. 2 was unavailable

**Comment** < K >

---

**Retrieve Hooks**

Hooks Deployed	Hooks Retrieved	Last Hook Number
3	3	3

**Hook Retrieved!** < SPACE >

**Gangion Missing!** < G >

Current Hook Retrieval Order: ASCENDING

**RETRIEVAL MODE**

**Number of Hooks where FISH were caught** 1 **Fish on Hook!** < ENTER >

**Wireless Signal Status**

Signal Strength: 0 % **NONE/POOR** Connected to: NO CONNECTION

---

**Sensor Data Monitoring**

**SCS Sensor Data** < F2 > **Backup GPS Data** < F6 >

**SEND MESSAGE STATUS:** DOWN Last Update: 4 Second(s) Ago

**PRIMARY SENSORS:**

**LATITUDE:** --- **LONGITUDE:** --- **NAV DEPTH (M):** ---

**HEADING:** --- **SOG:** --- **COG:** --- **SAT TIME:** ---

**WEATHER SENSORS:**

**SST (°C):** --- **AIR TEMP (°C):** --- **BARO:** ---

**WIND SPEED:** --- **WIND DIR:** ---

SELLIT.NET | Current Station: 024 Last Station: 024 | Last Operation: DEPLOY | Status Source: LOCAL | Rec. Data...5 characters | Current Time UTC is :19:37:05

Monitor the status of each hook (e.g. time retrieved, lat, lon, depth, catch, bait condition, hook timer data, etc.)



# Haulback cont.

Hook\_Status

Hook Number: **1** Time of Hook Retrieval: **08/12/2019 19:26:18**

Click the WHITE HH Entry or MM Entry area  
or press appropriate Hot key to enable entry keypad

Hook Timer Reading

HH **00** **< Z >**

MM **00** **< B >**

**TIMER MISSING!**  
**< F12 >**

**TDR MISSING!**  
**< F8 >**

**Hook Condition**

**Hook Status Buttons**

**Hook Missing**  
**< F2 >**

**Hook Damaged**  
**< F5 >**

**Bait Condition Buttons**

**Bait Whole**  
**< W >**

**Bait Damaged**  
**< L >**

**Bait Missing**  
**< M >**

**FISH ON HOOK!**  
**< ENTER >**

**RETURN TO RETRIEVAL**  
**< BACK >**

# Biological sampling module:

The screenshot shows a software window titled "Sampling" with a dark background. At the top, it displays "VESSEL: 04 - OREGON II", "CRUISE: 0329", "STATION: 002", and "HOOK #: 004". Below this, a "Species Control Panel" on the left contains three buttons: "Full Species List", "Short List", and "Quick List". The main area is titled "Current Species is:" and lists "ARIOPSIS FELIS", "RHINOPTERA BONASUS", "SCIAENOPS OCELLATUS", and "SQUALUS CUBENSIS". To the right of this list are fields for "SPECIMEN ID:" (with a "NEW" button and a value of "105") and "HOOK ID:" (with a "Hook Status" table showing "REMAINING: 1" and "AVAILABLE: 1"). Below these are sections for "Mortality" (with buttons for A - ALIVE, D - DEAD, AD - ALIVE DAMAGE, DD - DEAD DAMAGE), "Sex" (with buttons for MALE, FEMALE, UNKNOWN, SKIPPED), and "Stage" (with buttons for 1 - UNKNOWN, 2 - RESTING, 3 - DEVELOPING, 4 - RIPE, 5 - SPENT, 6 - ELASMOBRANCH MATURE, 7 - ELASMOBRANCH IMMATURE, and 8 - NOT TAKEN). The "Length(s) and Weight" section includes input fields for "WEIGHT in Kg." (with a "Weight Estimated" checkbox), "Length(s) in mm" (with fields for TOTAL, FORK, and STD.), and a "Length Estimated" checkbox. At the bottom, there is a "Touchscreen Entry Interface" section with a "Disabled" button and an "Enable Interface" button, and a "Brood Count" section with fields for "Brood Count", "MALE Count", and "FEMALE Count". A "Comments" text area is at the bottom left. On the bottom right, there are three buttons: "Special Sampling", "TAG ENTER", and "EXIT".

Sampling

VESSEL: 04 - OREGON II CRUISE: 0329 STATION: 002 HOOK #: 004

Species Control Panel

Full Species List

Short List

Quick List

Current Species is:

ARIOPSIS FELIS  
RHINOPTERA BONASUS  
SCIAENOPS OCELLATUS  
SQUALUS CUBENSIS

Length(s) and Weight

WEIGHT in Kg.  ☒ Weight Estimated

Length(s) in mm

TOTAL  ☒

FORK  ☒

STD.  ☒

☒ Length Estimated Length Category:

HOOK ID: Hook Status

SPECIMEN ID:  NEW REMAINING: 1

105 AVAILABLE: 1

Mortality

A - ALIVE D - DEAD AD - ALIVE DAMAGE DD - DEAD DAMAGE

Sex

MALE FEMALE UNKNOWN SKIPPED

Stage

1 - UNKNOWN 2 - RESTING 3 - DEVELOPING 4 - RIPE

5 - SPENT 6 - ELASMOBRANCH MATURE 7 - ELASMOBRANCH IMMATURE

8 - NOT TAKEN

Touchscreen Entry Interface

Disabled Enable Interface

Brood Count

Brood Count:  MALE Count:  FEMALE Count:

Comments

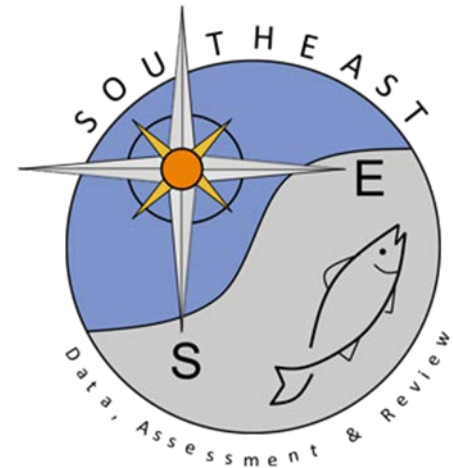
Special Sampling TAG ENTER EXIT

Includes popup widows to enter tag numbers and track samples with barcodes.

# Longline Assessment Support

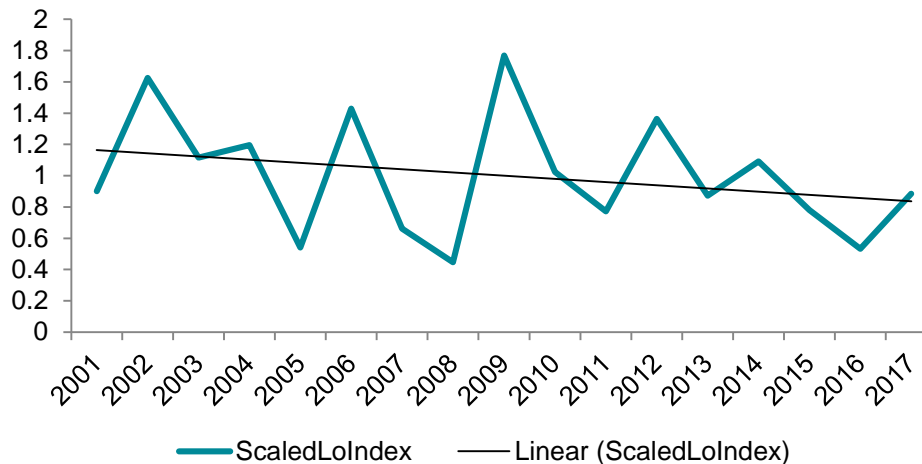
Data presented to 13 SEDARs and used in base model for 14 assessments for stocks/species complexes

- GOM and Atlantic Large coastal sharks (SEDAR 11)
  - GOM and Atlantic Small coastal sharks (SEDAR 13)
  - GOM Sandbar shark, Atlantic sandbar shark (SEDAR 11, 21, 54)
  - GOM Blacknose shark, Atlantic blacknose shark (SEDAR 13, 21)
  - GOM Blacktip shark, Atlantic blacktip shark (SEDAR 11, 29, 65)
  - Atlantic sharpnose shark (SEDAR 13, 34)
  - Smoothhound sharks (SEDAR 39)
  - Red Grouper (SEDAR 12, 42, 61)
  - Red Snapper (SEDAR 7, 31)
  - Tilefish (SEDAR 22)
  - Yellowedge grouper (SEDAR 22)
- 
- 139 species captured during survey



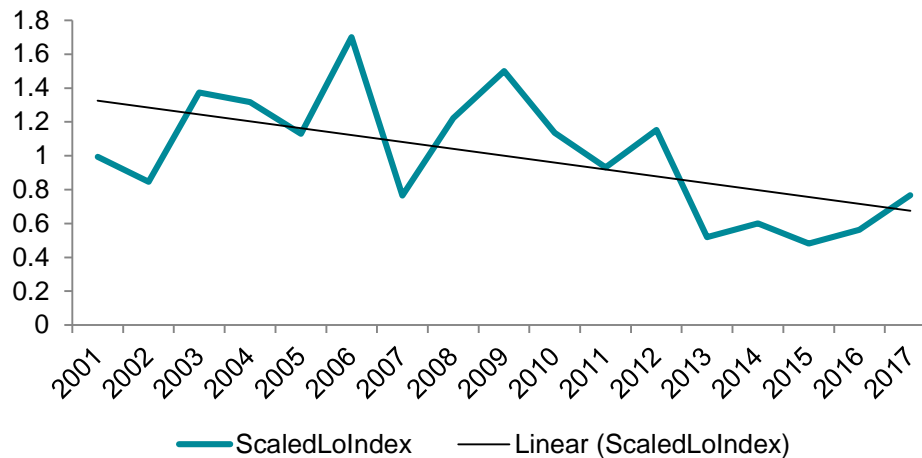
# Indices of abundance 2001-2017:

## Atlantic sharpnose shark



# Indices of abundance 2001-2017:

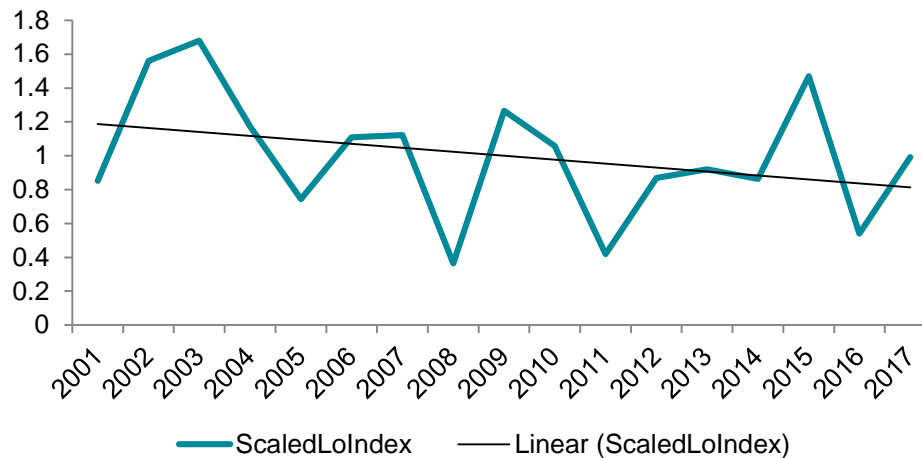
## Blacknose shark





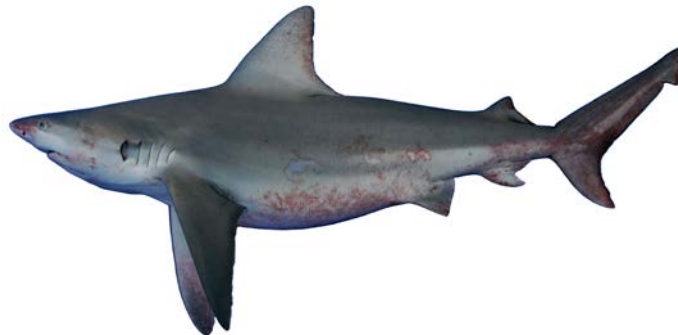
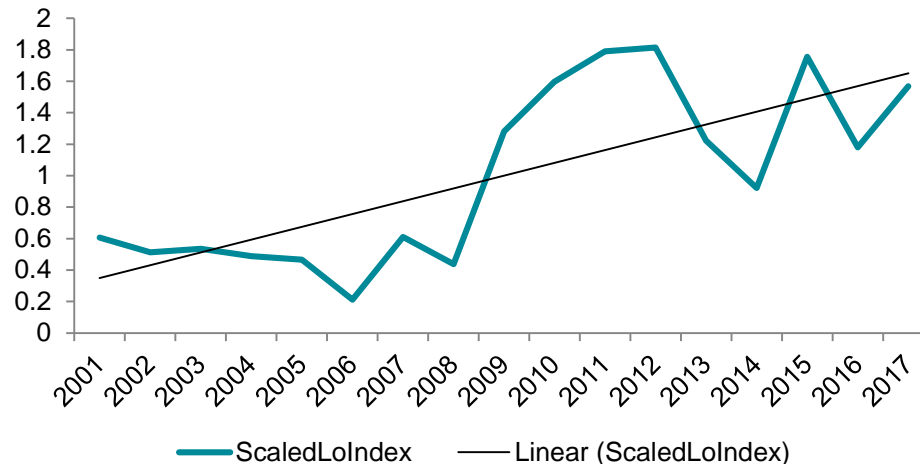
# Indices of abundance 2001-2017:

## Blacktip shark



# Indices of abundance 2001-2017:

## Sandbar shark



# Questions?

Contact William Driggers  
[William.driggers@noaa.gov](mailto:William.driggers@noaa.gov) or 228-549-1630





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# Depredation in Research



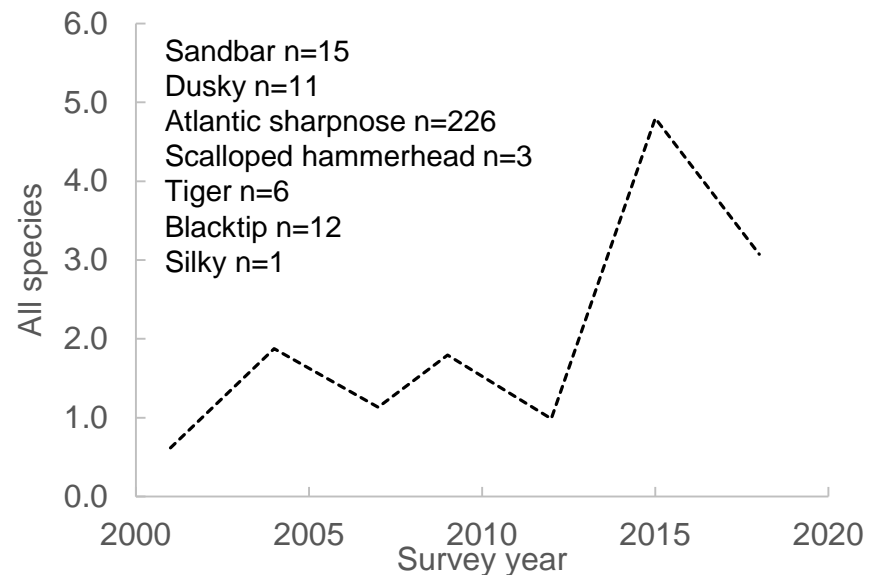
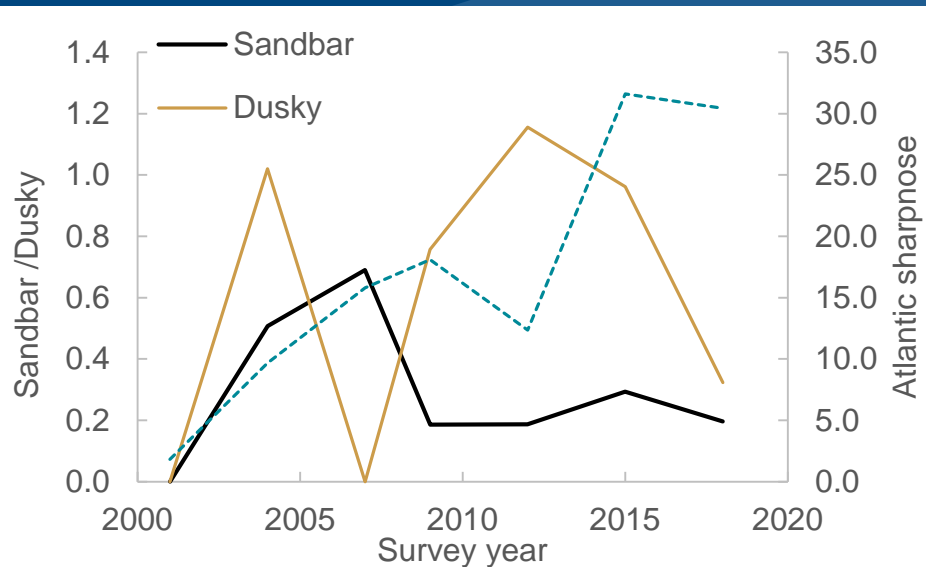


# Caught in the act!

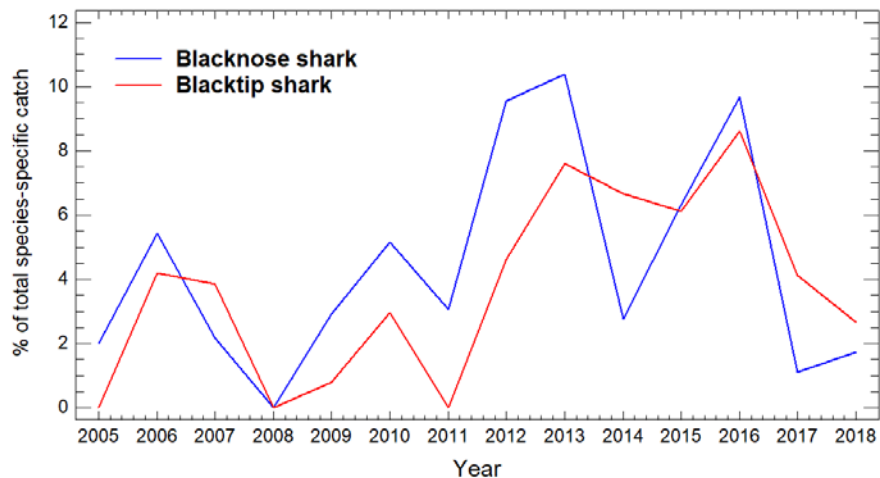
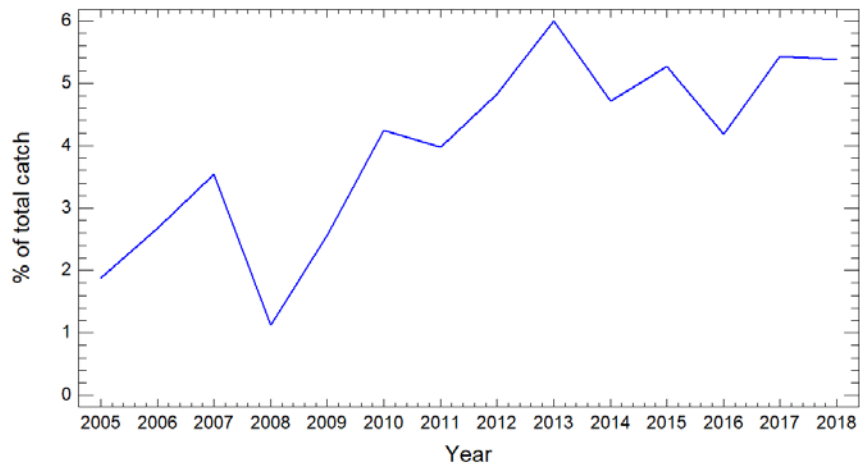




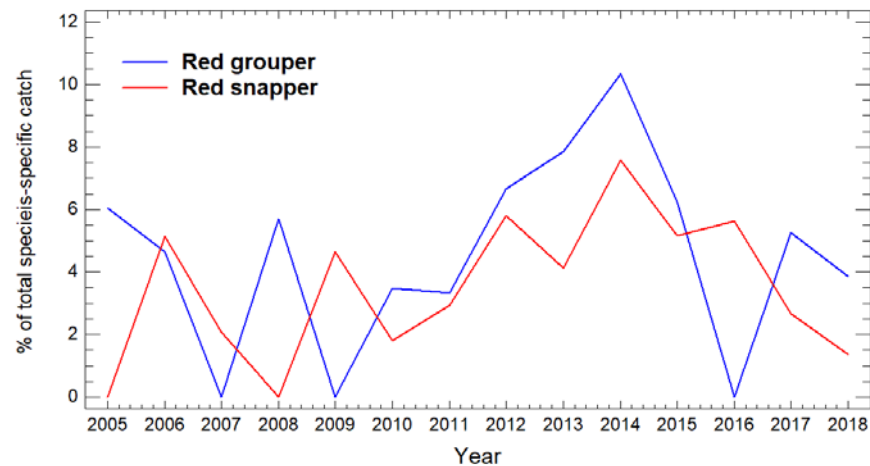
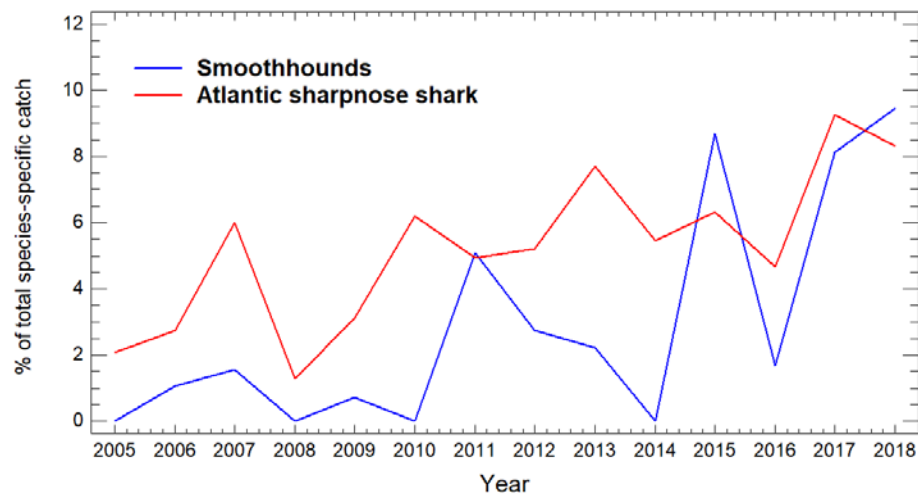
# Apex Predators depredation data



# Pascagoula depredation data

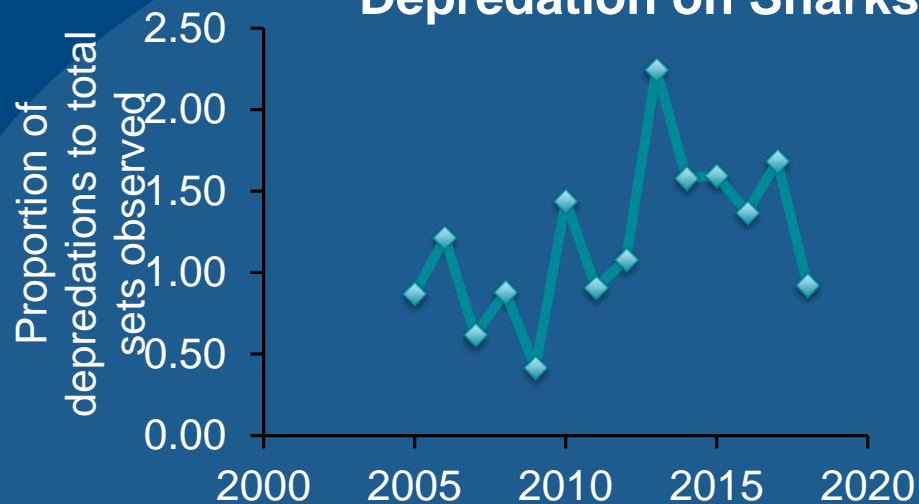


# Pascagoula continued



# Bottom longline observer program

## Depredation on Sharks



## Depredation on Teleosts

