



**NOAA**  
**FISHERIES**

SEFSC

# SEDAR 100: US Gulf of America Gray Triggerfish

## Data Workshop Introduction

August 18, 2025

Tampa, FL



Photo courtesy of F. Forrestal

# Outline

- Data Workshop Goals
- Review data concerns from [SEDAR 62](#)
- Discuss data requirements for model inclusion
  - Life history
  - Shrimp bycatch
  - Recreational data
  - Discard mortality
  - Indices
  - Sargassum

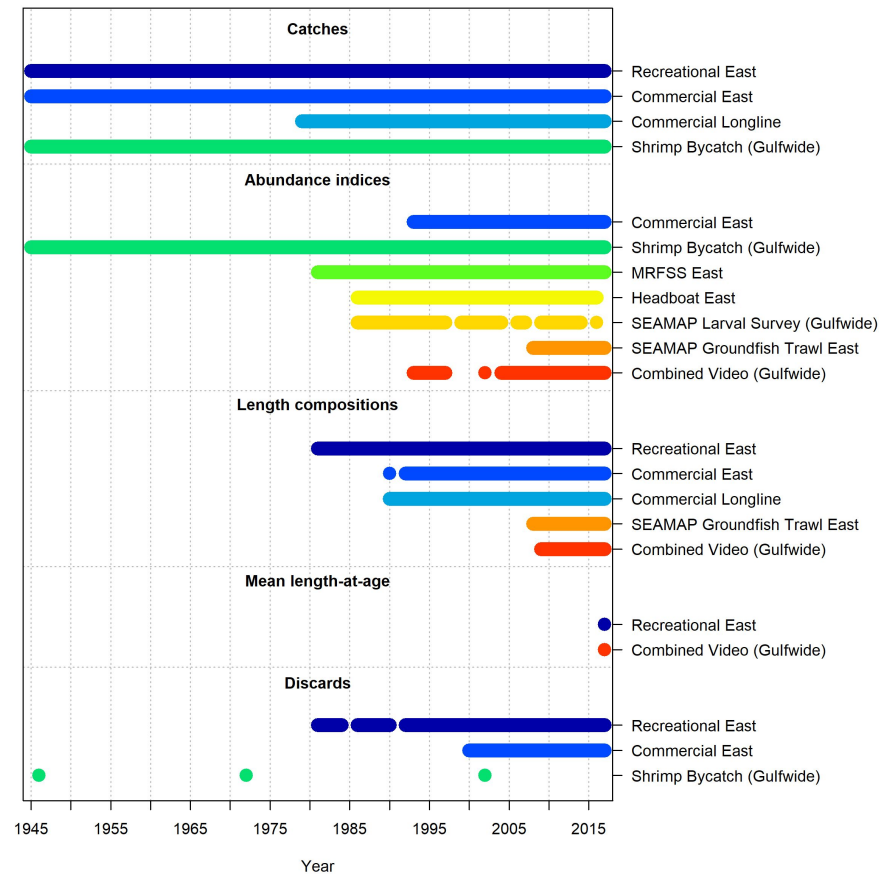
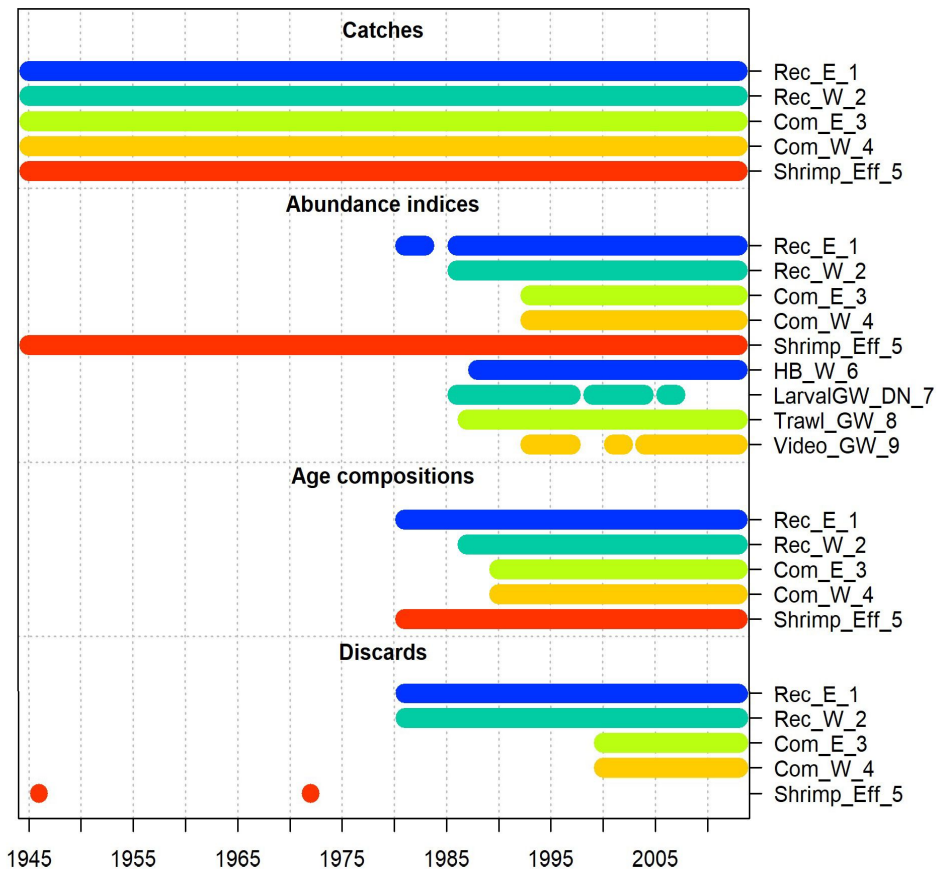
# Analyst Goals for Data Workshop (DW)

- Following [SEDAR 98](#), ensure quality over quantity:
  - Convey model specifics and issues from past assessments to participants (e.g. data providers and stakeholders)
  - Help data providers understand the implications of their data
  - Encourage data providers to share their expert opinions when discussing data quality timelines for use in a stock assessment
  - Ensure documentation of timelines for changes and uncertainty in the data are clear in the DW report

# Previous assessments (standard approach)

- Last accepted assessment: [SEDAR 43](#)

- [SEDAR 62](#) was halted due to data issues



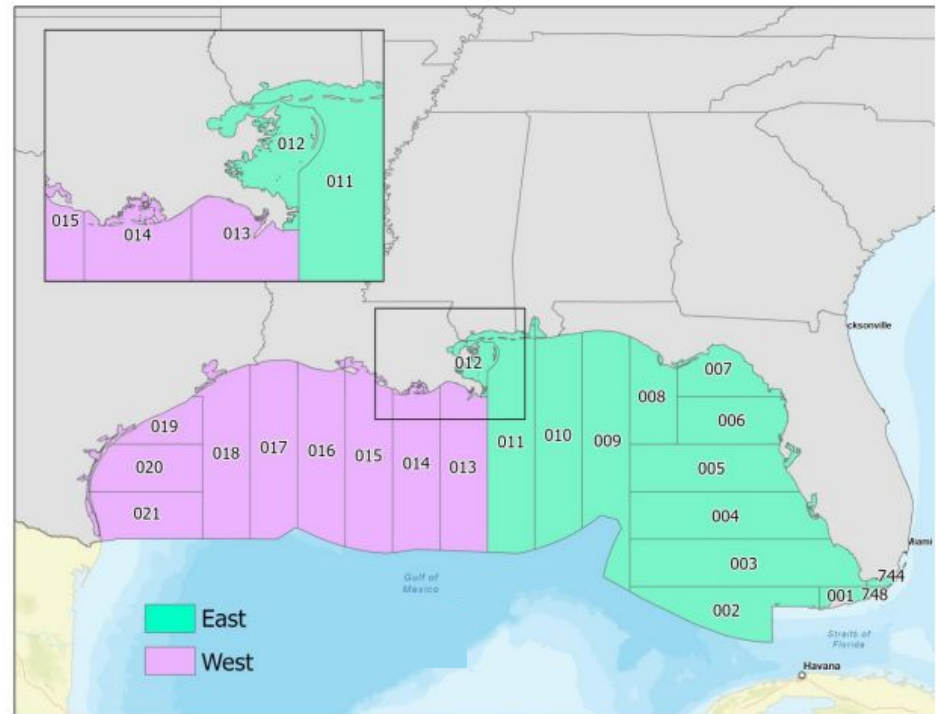
# Stock structure (unchanged since [SEDAR 9](#))

- Considered a single stock based on the species' prolonged, indeterminate larval stage



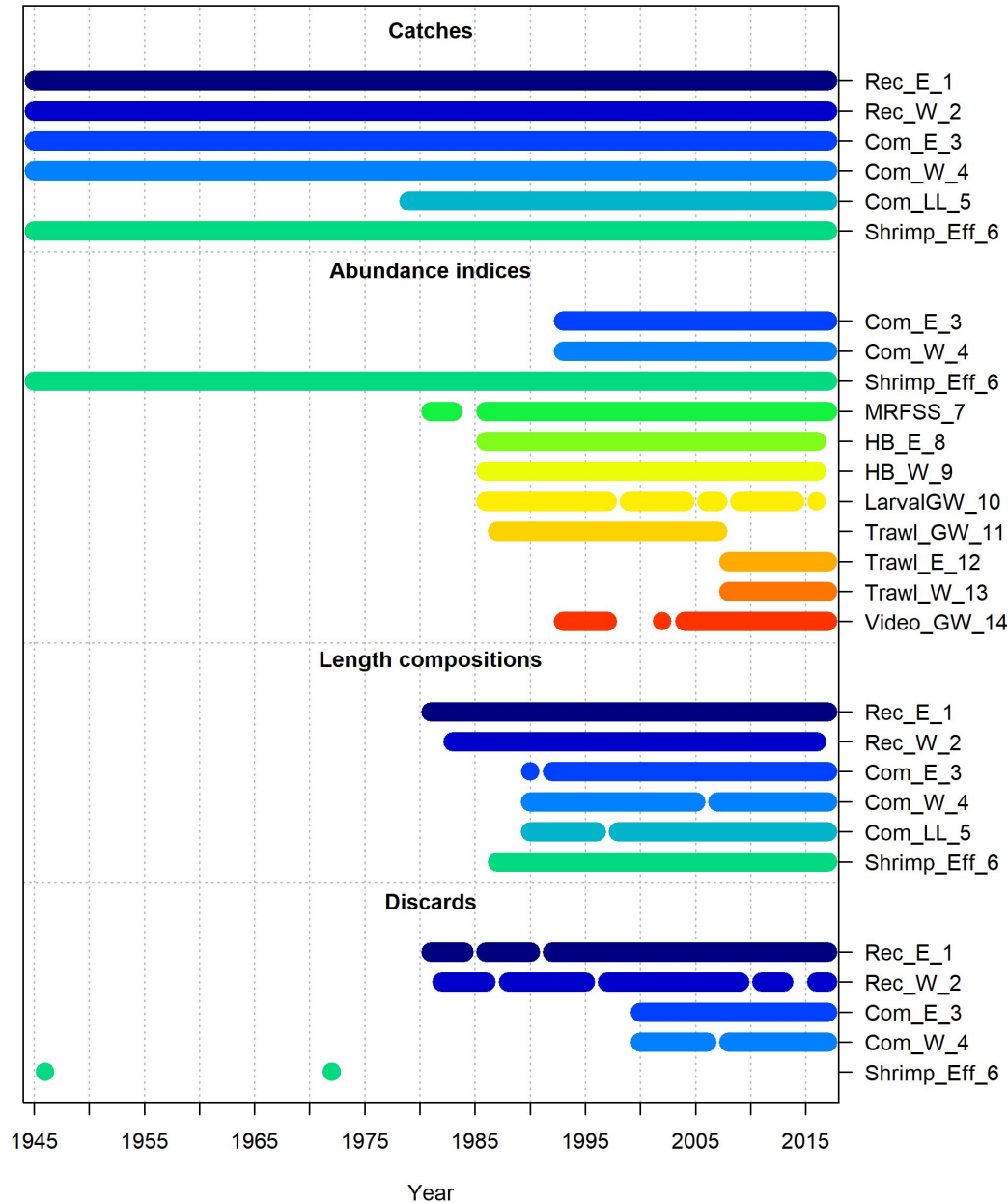
# Spatial domain (since SEDAR 9)

- Gulf-wide (1 area) model but treats fishing fleets as areas:
  - All fishery-dependent data split into **West** and **East** to capture differences in fishing mortality
  - Majority of data come from East



# SEDAR 62 overview

- Major overhaul of model was attempted, but proved too difficult to complete
  - Gulf-wide model showed poor diagnostics due to conflicts in the data
  - Stratification of data complicated model development



# Issues during SEDAR 62

- Age readings from spines were biased and therefore age data were not recommended for use
  - Fit to length compositions instead, which required a switch from age-based to length-based selectivity
  - Fixed growth parameters at Patterson *et al.* values which were derived from otolith data
- Model struggled to fit the inter-annual variability within the shrimp bycatch estimates

# SEDAR 100 expectations

- Anticipate lots of **changes to data inputs** given time since last accepted assessment (terminal year of 2013) and improvements to data provision and analyses
  - Re-ageing of spines (all 5+ years) to reduce bias
    - Derived life history inputs
  - Composition development
  - Commercial discard estimation
  - Uncertainty estimates in removals
  - Shrimp bycatch estimation
  - **G-FISHER** survey

# SEDAR 100 expectations

- Anticipate lots of changes to model structure to address SEDAR 100 Terms of Reference and modeling issues identified during SEDAR 62
  1. Composition data inputs
  2. Start year
  3. Regional stratification

1. Explore the appropriateness of an age-based, length-based, and hybrid (age- and length-based) approaches for describing fleet and survey selectivity.

- Explore fleet-specific length compositions

- Model configuration will be highly dependent upon which composition data inputs are recommended for use

Data Input	Fishing Fleet	Survey
Length compositions	X	X
Age compositions	X	X (if possible)
Conditional age-at-length	X	X (if possible)
Mean length-at-age (of landings)	X	

# Re-evaluating composition data inputs

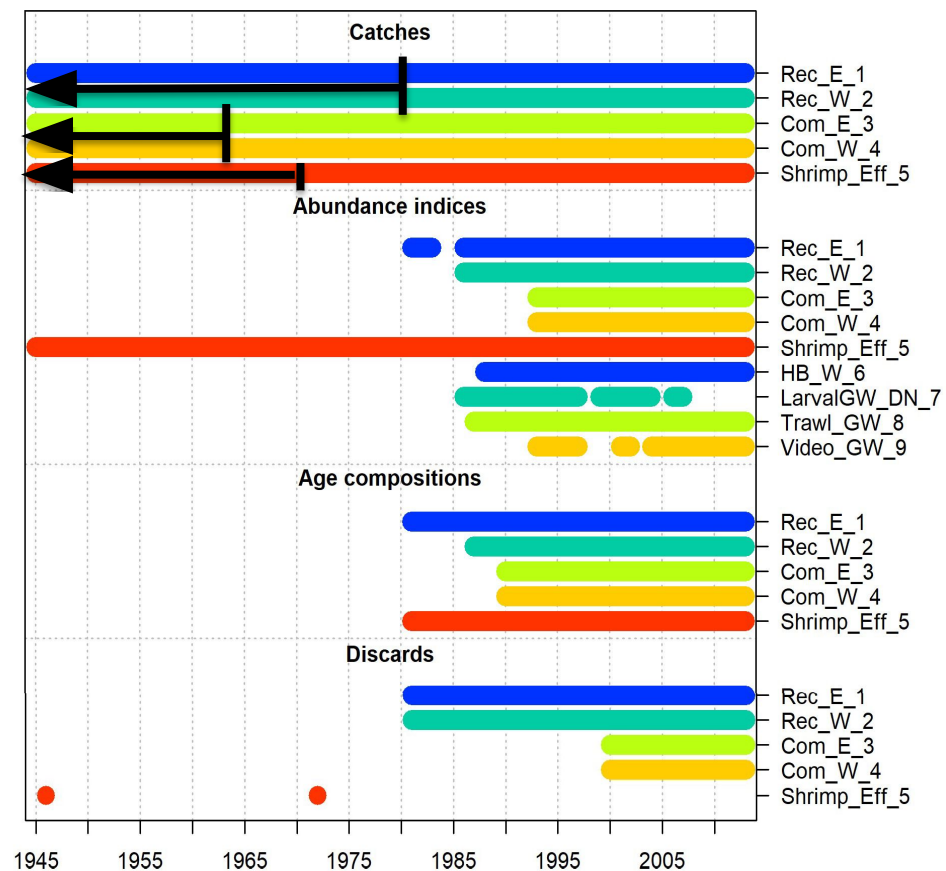
- Previous assessments used age-length keys to convert length compositions into age compositions for input into the assessment model
  - Improved composition development has enabled additional inputs for consideration
- **Needs:** thorough evaluation of composition data (length, age, conditional age-at-length) is needed to determine which are most representative and appropriate for inclusion into the stock assessment

# Re-evaluating start year

- Evaluate the start year and initial  $F$ s used in the assessment model.
- SEDAR 43 and 62 assumed the stock was at virgin conditions in 1945 (negligible removals prior)
  - Considered start in 1881 but not supported by SEDAR 43 DW/AW panel
- Some Gulf assessments start later
- **Need:** provide data stream as early as possible, and make recommendations on when data streams are most reliable

# Starting condition of the stock

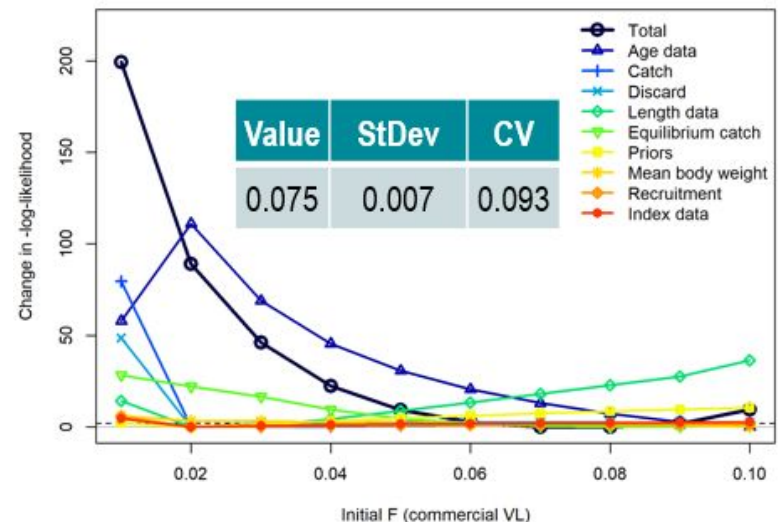
- Best practice is to develop a time series of removals all the way back to the beginning of the fishery
- Requires interpolation of landings and shrimp bycatch:
  - SEDAR 62:
    - Commercial: <1963
    - Recreational: <1981
    - Shrimp bycatch: <1972



# Starting condition of the stock

- Where data (or reliability) are limited, we may be able to start in a later year where the stock is in a fished state
  - Specify initial equilibrium catch for each fleet
    - ~ Mean catch of first 5 years
  - Estimate initial  $F$  values for each fleet

Example diagnostic for initial  $F$  from [SEDAR 68](#) Gulf Scamp/Yellowmouth Grouper Assessment which starts in 1986



# Re-evaluating regional stratification

- During SEDAR 100 Data Scoping call, requested that all data streams be provided Gulf-wide, East, and West
- Potential model configurations:

	Continuity	Alternate 1	Alternate 2
Number of Areas	1, but fleets treated as areas: Fleet 1 = ComE Fleet 2 = ComW ...	1	2 (East and West)
Data Needs	Fishery-dependent data by region	All data inputs provided Gulf-wide	All data inputs provided East and West

# Re-evaluating regional stratification

- Model configuration will ultimately depend upon data
  - Two-area model:
    - Is there strong evidence to support different stock structure between East and West (e.g., growth)? Can all data be split?
  - One-area model (all fleets and surveys):
    - Can we simplify model structure?
- **Needs: For each data input**, do we see similar trends between East vs West?
  - Differing trends would help justify a true two-area model or retaining the areas-as-fleets approach for fisheries

# Regional comparison of fishery data

Type of data	Rec West	Rec East	Com* West	Com* East
Landings (numbers or weights*)	9%	<b>91%</b>	28%	<b>72%</b>
Discards (numbers)	4%	<b>96%</b>	15%	<b>85%</b>
Landings lengths (raw data)	19% N, 21% Trips	<b>81% N, 79% Trips</b>	37% N, 32% Trips	<b>63% N, 68% Trips</b>
Landings ages (raw data)	5% N, 5% Trips	<b>95% N, 95% Trips</b>	<b>67% N, 51% Trips</b>	33% N, 49% Trips
Discard length comp	NA	<b>100% N, 100% Trips</b>	7% N, 12% Trips	<b>93% N, 88% Trips</b>

	West	East
<b>Shrimp Effort</b>	<b>75% days</b>	25% days

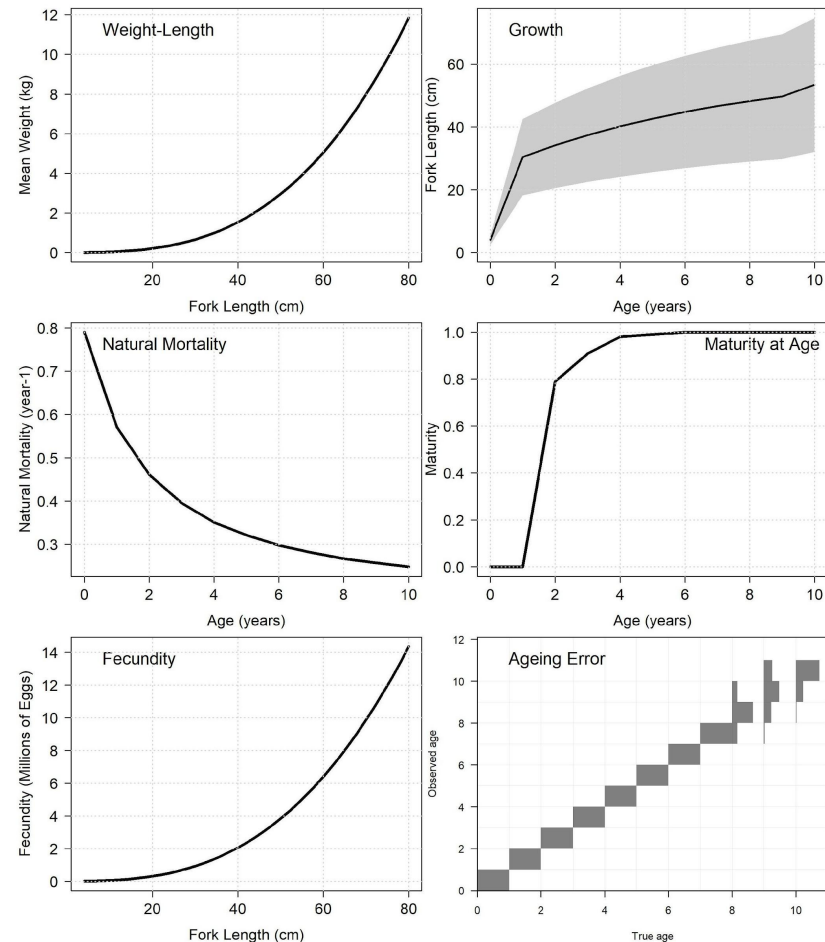
# Life History



3. Review available life history information, including the ageing methodology. Update growth curves, age and length data, and the natural mortality estimates.
    - Summarize, describe, and tabulate length and age data by year and fleet/survey and area through the terminal year of the assessment where possible.
    - Explore the validity and representativeness of length and age data and ageing methodology across ageing facilities and cooperators.
    - Explore differences in growth parameters if length and/or age sampling methods differ from the previous assessment. Utilize appropriate models and diagnostics to describe sex, population and region-specific growth, as warranted and applicable.
    - Develop age-length keys and Conditional Age at Length as appropriate.
    - Evaluate and discuss the sources of uncertainty and error, and data limitations (such as temporal and spatial coverage) for each data source.
    - Provide estimates or ranges of uncertainty for length and age data as a whole and by area and source.
- 
- Review ageing validation and ageing structures studies and consider their appropriateness for inclusion in the assessment model.
    - i. Update life history data/analyses (e.g., maximum age, growth, mortality, ageing error matrix, reproduction) given revised age data following recent ageing studies as needed.

# Needs from Life History

- Updates given changes in ageing protocols
  - Raw age data
  - Maximum age
  - Growth
    - East vs West?
    - Female vs Male (if we trust sex determination)?
  - Natural mortality
  - Ageing error matrix



**SEDAR 43**

# Needs from Life History

- Recommendations\* on representative composition data (length, age, conditional age-at-length)
  - Any changes in sampling dynamics, behavior or management to take note of?
  - Appropriate spatial and temporal coverage?
    - Are there any gaps to be aware of?
  - Spatially balanced and consistent sampling?
    - Provide weighted and in frequencies
  - If sample sizes are low, could some years be pooled?

\*As done for SEDAR 98 Red Snapper?

# Shrimp Bycatch



6. Utilize the new estimates of shrimp fishery effort and bycatch, as appropriate, based on the peer review of such data from SEDAR 87 and subsequent analyses.
7. Document any change in start year from previous assessments
  - Evaluate the existing composition data and recommend whether the data are sufficient to represent the bycatch by the fleet.

- Explore shrimp trawl bycatch magnitude and age-structure, if data are available using new effort and bycatch methodologies (e.g., SEAMAP Summer and Fall Groundfish trawls and shrimp observer data).

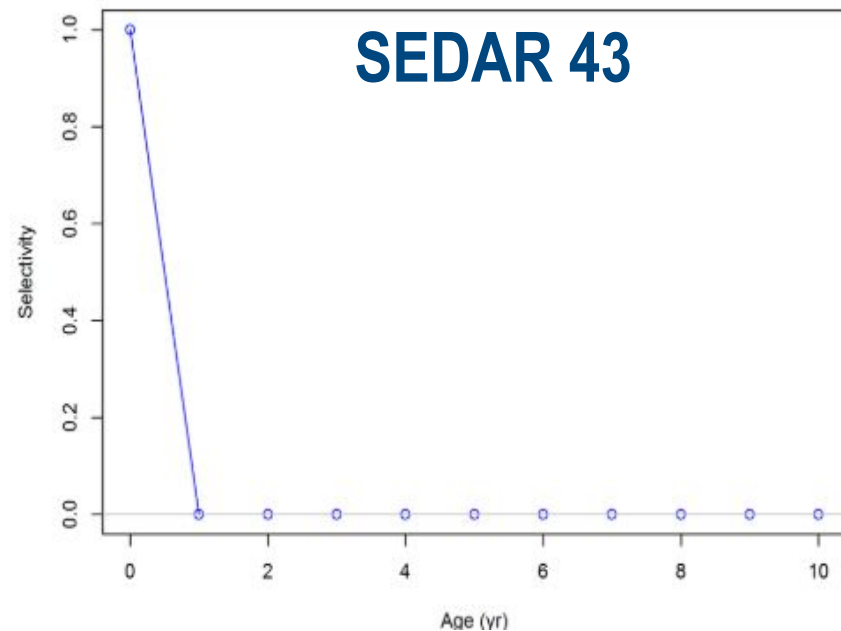
- Old bycatch estimation approach no longer supported
- New methodology being proposed for estimation of gray triggerfish (a “stop-gap” approach)
  - Unable to use method developed for red snapper

# Needs from Shrimp Bycatch

- Removals
  - Are new bycatch estimates recommended for use?
    - Do we use annual estimates (with accompanying uncertainty estimates), or should new bycatch estimates be averaged across years?
  - How far back can shrimp bycatch be estimated?
    - Previous shrimp bycatch estimates started in 1972, and were back-calculated to 1945 for SEDAR 43/62
    - Recommendations for handling early part of the time-series that no longer have direct estimates?

# Needs from Shrimp Bycatch

- Size/age structure (to parameterize selectivity)
  - Shrimp bycatch previously assumed to be composed of age-0 gray triggerfish only
- Data to evaluate this assumption?
  - SEAMAP groundfish trawl
  - Shrimp observer data
  - Any additional information to help make recommendations for fixed selectivity form?



# Recreational data

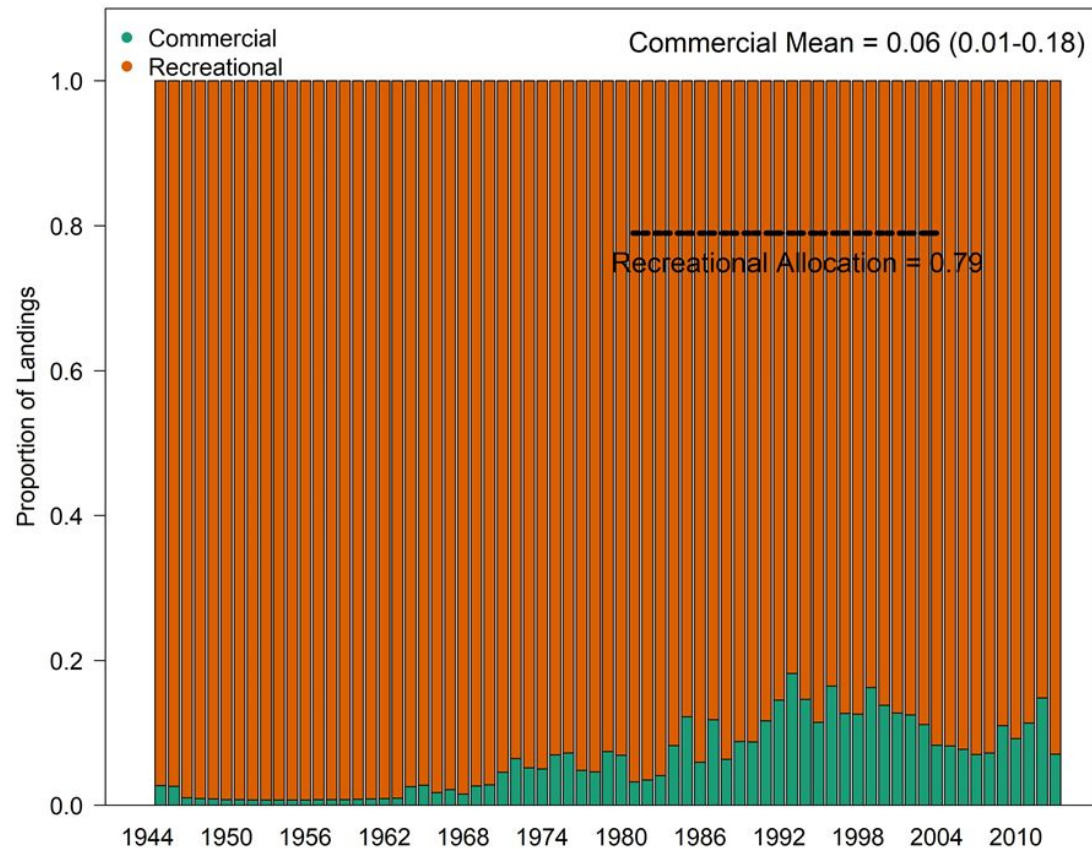


2. Use the Marine Recreational Information Program's Access Point Angler Intercept Survey and Fishing Effort Survey to inform catch and effort for the recreational sector. Consider state-specific catch, effort, and discards from state surveys as applicable (Florida: State Reef Fish Survey; Alabama: Snapper Check; Mississippi: Tails 'n Scales [effort]; Louisiana: LA Creel; Texas: TPWD Creel).
  - Describe any annual differences in the magnitude of landings from the previous assessment greater than 10%, with assistance from the NOAA Office of Science and Technology.

- Re-evaluate whether commercial and recreational fleets should be separated by East and West by reviewing all available data (landings, discards, indices, compositions).
- Provide estimates of uncertainty around each set of landings and discard estimates.

# Recreational data

- Removals (landings and dead discards) are critical sources of data
  - Primarily recreational



- **Needs:** continuous and consistent time-series
  - Consistency of the data is important whether within a survey (e.g., MRIP APAIS and FHS calibrations) or between surveys (e.g., MRIP to State or between States)

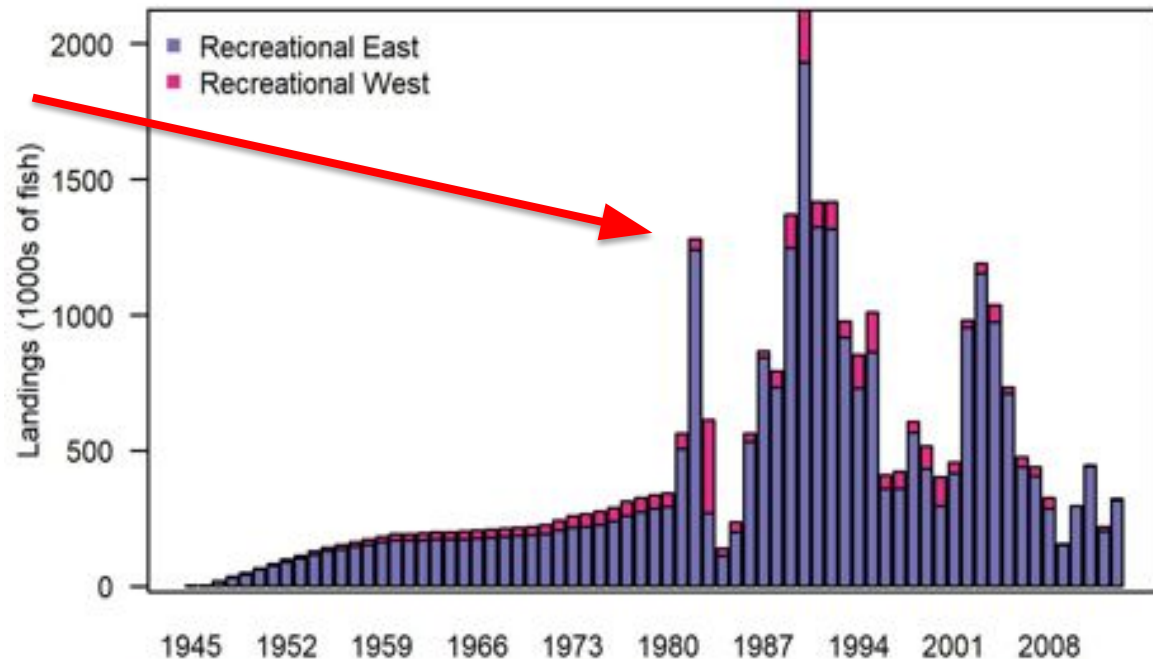
# Needs from Recreational

- Identify the range of plausible and defensible recreational statistics time-series
  - Preferably there will be a “base” case we can agree to and sensitivities as needed
- All sources of potential bias and uncertainty should be highlighted for each time-series in the report
  - Make recommendations on start year or provide justification for what data should not be used in the assessment (e.g., historical estimates?)

# Needs from Recreational

- Outlier data years for all time-series should be identified and smoothing options recommended
- Spikes in the early time period will be very influential on historic recreational landings estimates

## SEDAR 43 Data



# Discard Mortality



# Discard mortality (all fleets)

- Consider recent discard mortality studies and analytical results and incorporate updated discard mortality rate(s) as appropriate.

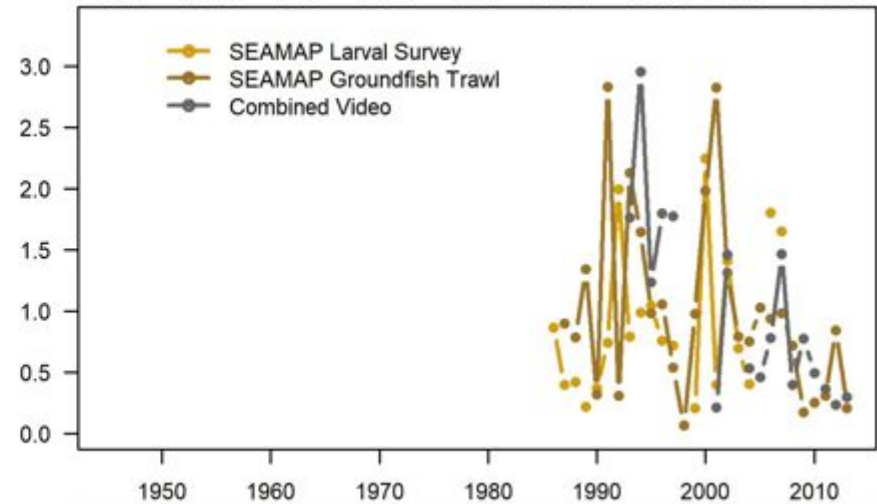
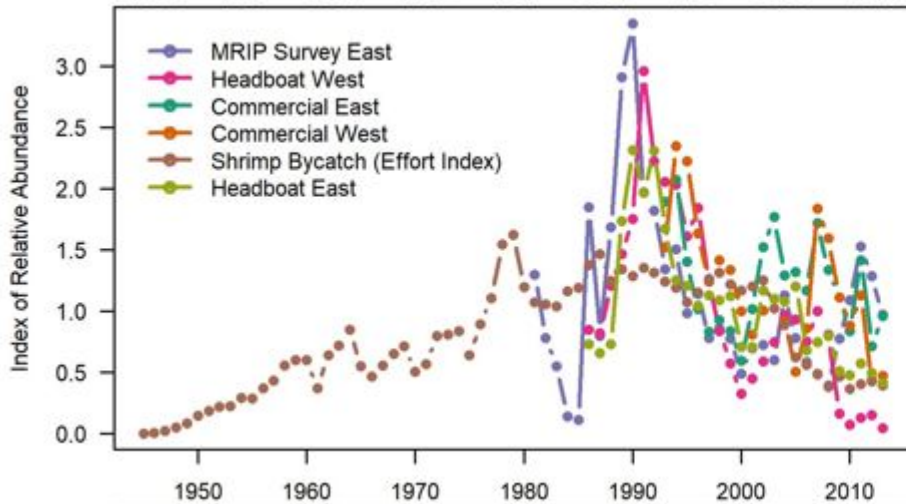
- New recommendations for SEDAR 100 based on more recent data?
- SEDAR 43: 5% base case (10% sensitivity)
- SEDAR 62: 25% base case (66% sensitivity)
  - Recreational for-hire fishery could be as high as 66% but assessment panel felt this was too high given specific fishing tactics in the Gulf recreational fishery

# Indices

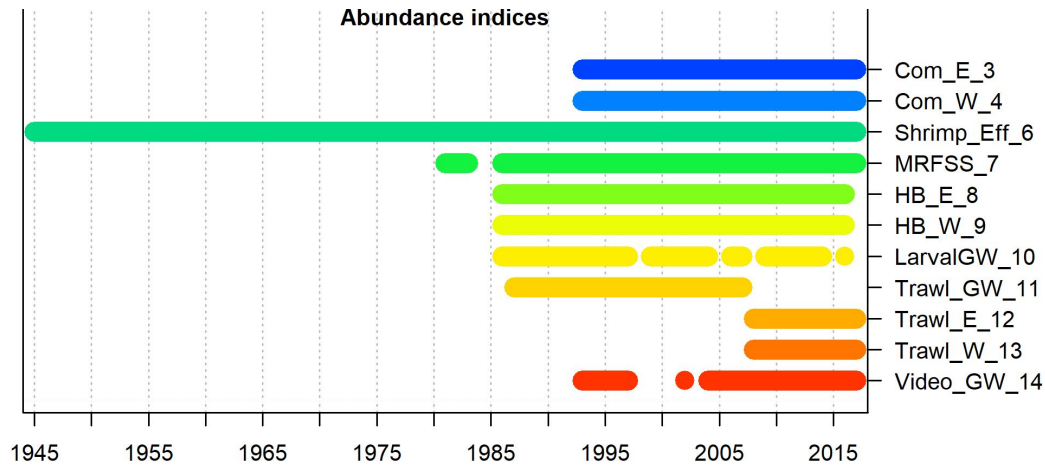
4. Provide fishery-independent measures of population abundance developed through the terminal year where possible.
    - Evaluate the G-FISHER composite video index for use in the assessment.
    - Consider any changes to the fishery-independent indices comprising the GFISHER index as provided for the previous assessment and evaluate the representativeness through time of the composition data.
    - Evaluate the compositions available. Recommend modifications needed to inform differences in catchability and selectivity of the surveys.
    - Provide appropriate measures of uncertainty for all fishery-independent abundance indices and effort time series considered.
- 
- Explore the use of a combined video index from the FWRI, Pascagoula, and Panama City video surveys (e.g., G-FISHER). Recommend modifications needed to inform differences in catchability and selectivity of the surveys.

# Indices

## SEDAR 43



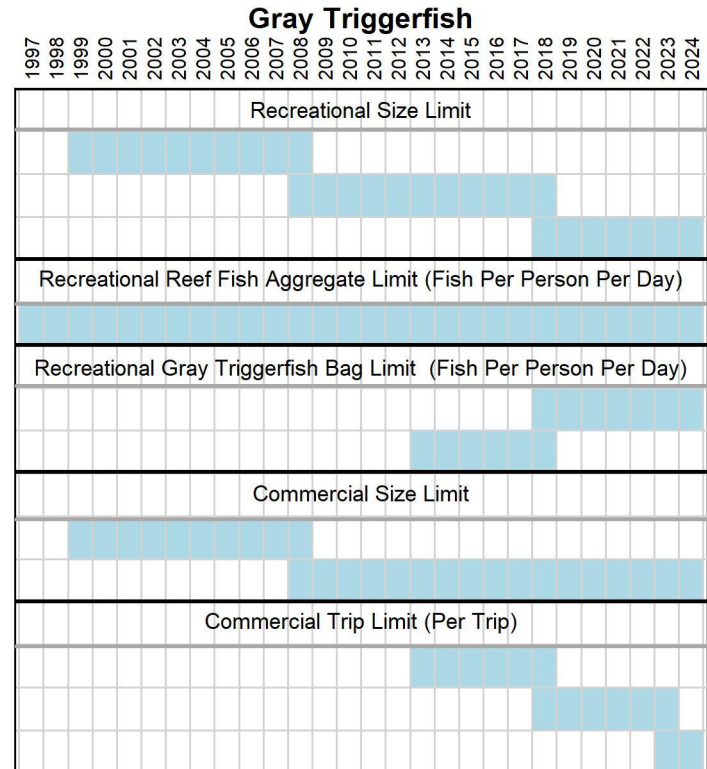
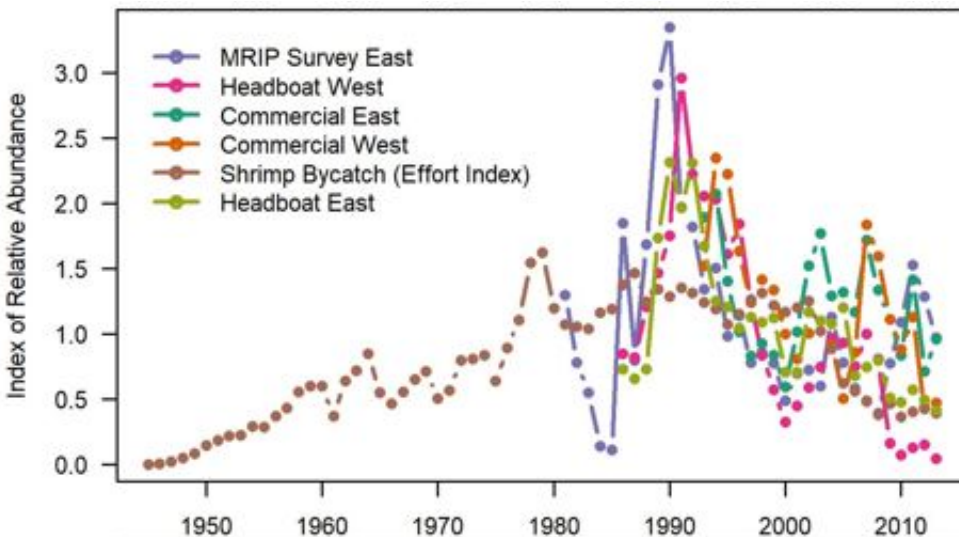
## SEDAR 62



# Needs from Indices: Fishery-dependent

- Are fishery-dependent indices still supported for use?
  - Is there support for truncating any of the indices (e.g., due to regulations or changes in the fishery)?

## SEDAR 43



# Needs from Indices: Fishery-independent

- Which fishery-independent indices are recommended for use?
  - Account for changes in sampling design
    - What years are important to note, how did they change the index or the composition data?
  - Account for the addition of surveys over time
  - Age/length composition of samples over time and space (provide maps of sample sizes proportions, if possible)

# Needs from Indices: All

- Make recommendations on which indices are appropriate for use in the assessment
  - Compare trends between West vs East to help inform regional stratification within the assessment model
  - Provide uncertainty estimates
- Provide accompanying composition data (lengths, ages?)
- Detail any changes in the survey/fishery that could impact the index or composition data
  - Will help with parameterizing the assessment model

# Environmental Considerations: Sargassum

- remote sensing data for sargassum coverage as a potential index of recruitment.

**Linking habitat to recruitment: Evaluating the importance of pelagic *Sargassum* to fisheries management in the Gulf of Mexico**

*This project evaluated the importance of sargassum as a nursery habitat for fish in the northern Gulf of Mexico.*

RESTORE  
project

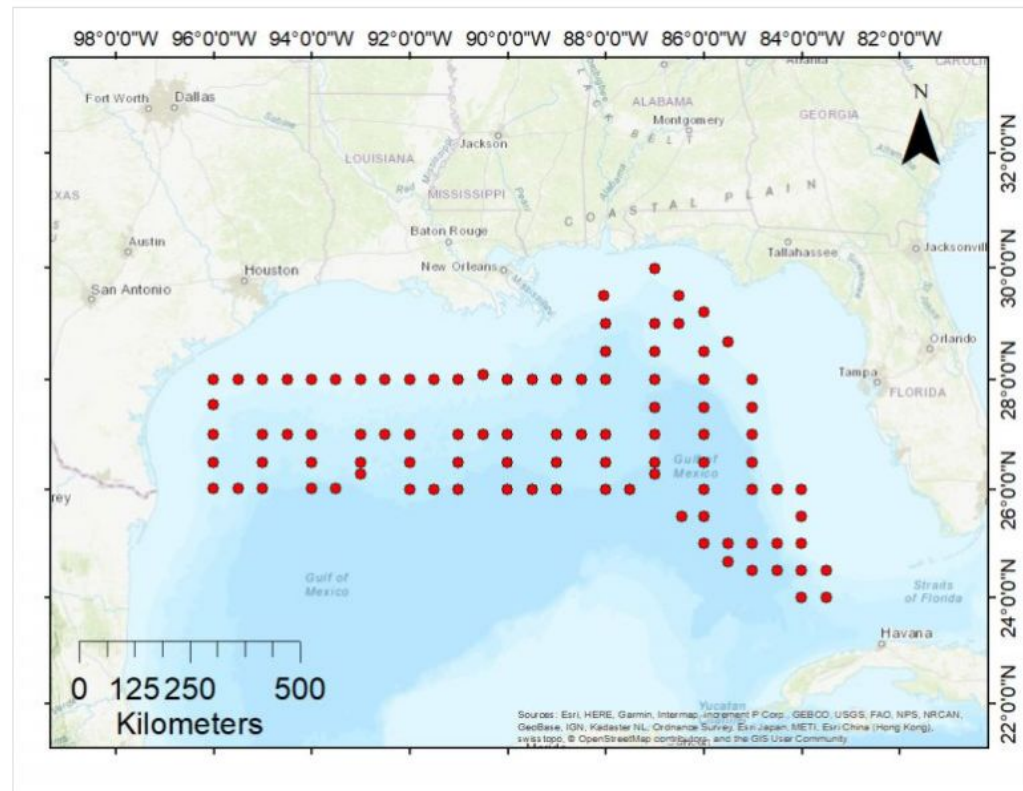


Figure showing potential locations of Sargassum collection (red circles). Locations based on SEAMAP Plankton survey.

# Sargassum Questions

- What life stage of gray triggerfish is associated with sargassum?
  - Larvae?
  - Age-0?
  - Juveniles?
- What is the relationship, and how strong is it?
  - Does larger spatial coverage/biomass of sargassum mean increased abundance of the affected life stage?

# Commercial



5. Provide commercial catch statistics for both the Eastern and Western Gulf, including both landings and discards in both pounds and number extended through the terminal year. Provide a corresponding working paper for the data and analyses with the following:
- Evaluate and discuss the adequacy of available data for accurately characterizing landings and discards by fishery sector or gear in pounds whole weight.
  - Provide length and age distributions for both landings and discards, if feasible.
  - Provide estimates of uncertainty around each set of landings and discard estimates.

- Re-evaluate whether commercial and recreational fleets should be separated by East and West by reviewing all available data (landings, discards, indices, compositions).
- Provide estimates of uncertainty around each set of landings and discard estimates.

# Questions?

## Contacts\*:

- Data Compiler – Sascha Cushner / Vivian Matter  
(Sascha.Cushner@noaa.gov, vivian.matter@noaa.gov)
- Lead Analyst – Skyler Sagarese  
(skyler.sagarese@noaa.gov)

\*please send data inputs to all of the above email addresses