



NOAA
FISHERIES
SEFSC, Miami

SEDAR 61: US Gulf of Mexico Red Grouper

Gulf of Mexico Fishery Management Council
Reef Fish Advisory Panel
Assessment Review

October 2, 2019



Outline

- Review of data inputs
- Model results
- Projections
 - 2018 red tide
 - Stakeholder input

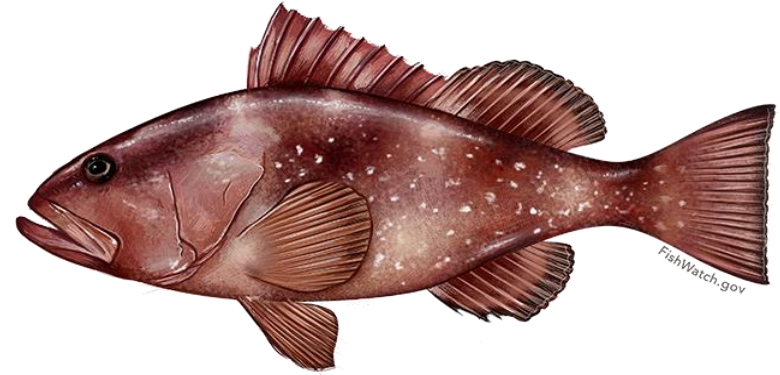


Photo Credit: Ed Walker, Venice Area, August 2018

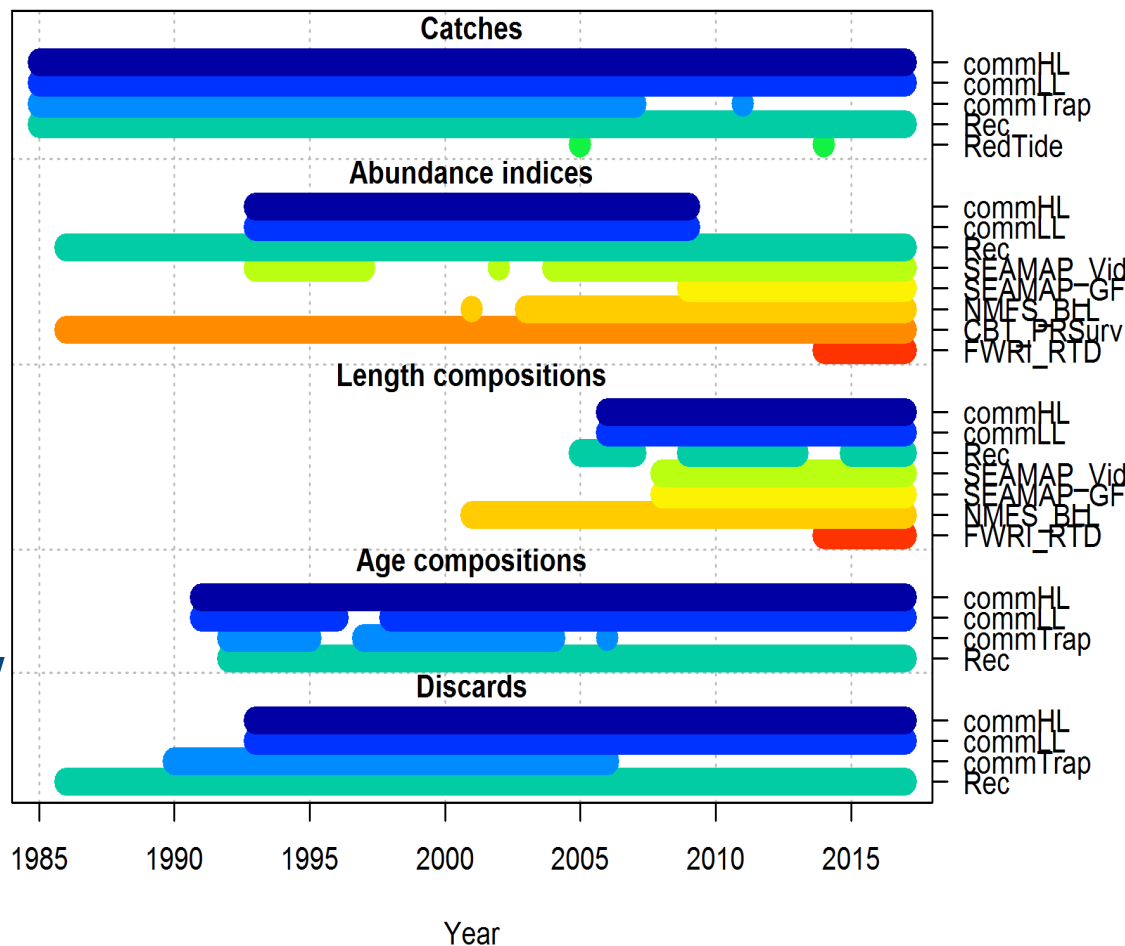
Review of Data & Updates

Data Updates:

- Recreational data
- Commercial discards
- Combined video index & length composition
- Recreational age composition
- Growth and natural mortality
- Fecundity

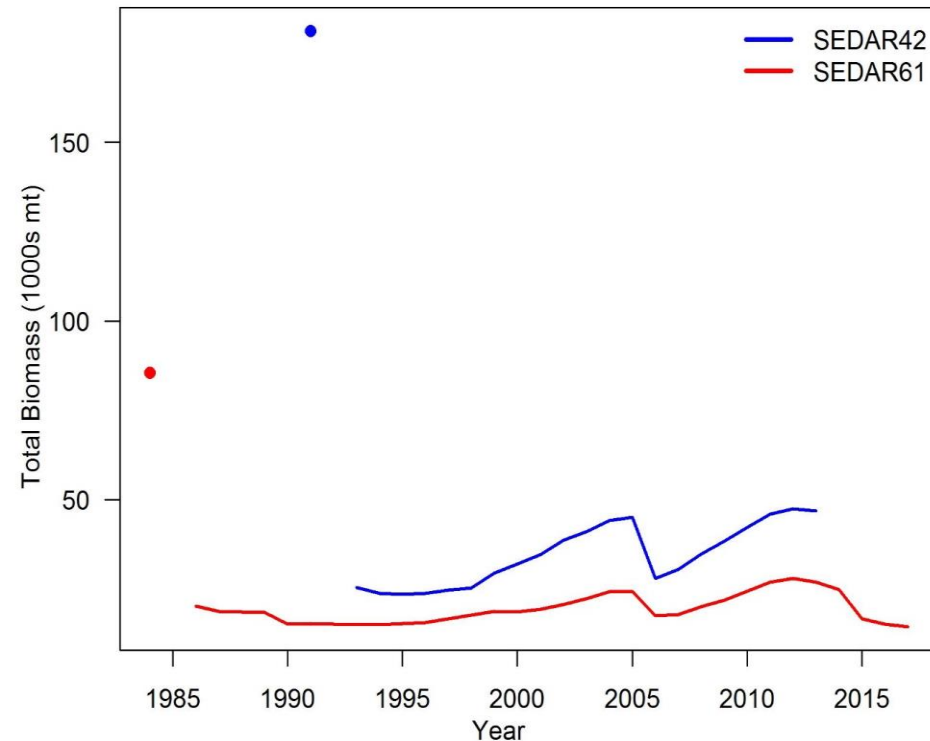
New Data:

- FWRI repetitive time drop index and length composition

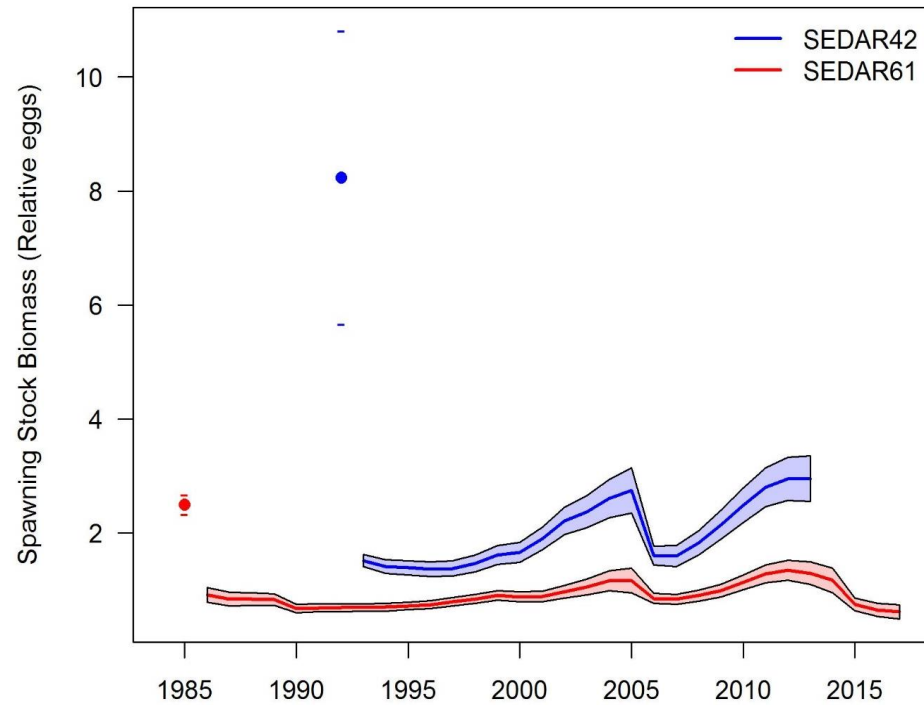


Biomass

Total Biomass (mt)



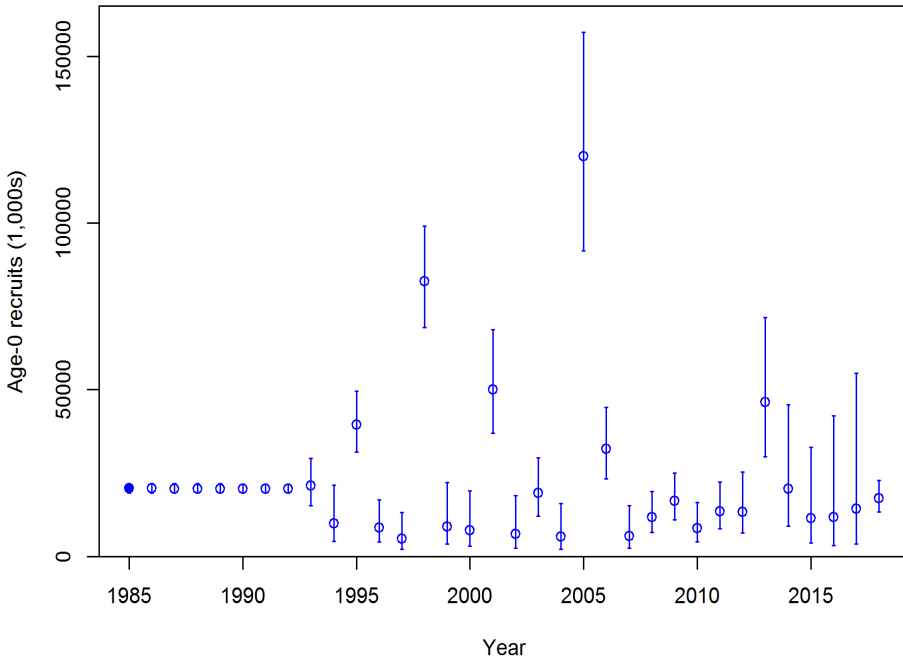
SSB (scaled # of eggs)



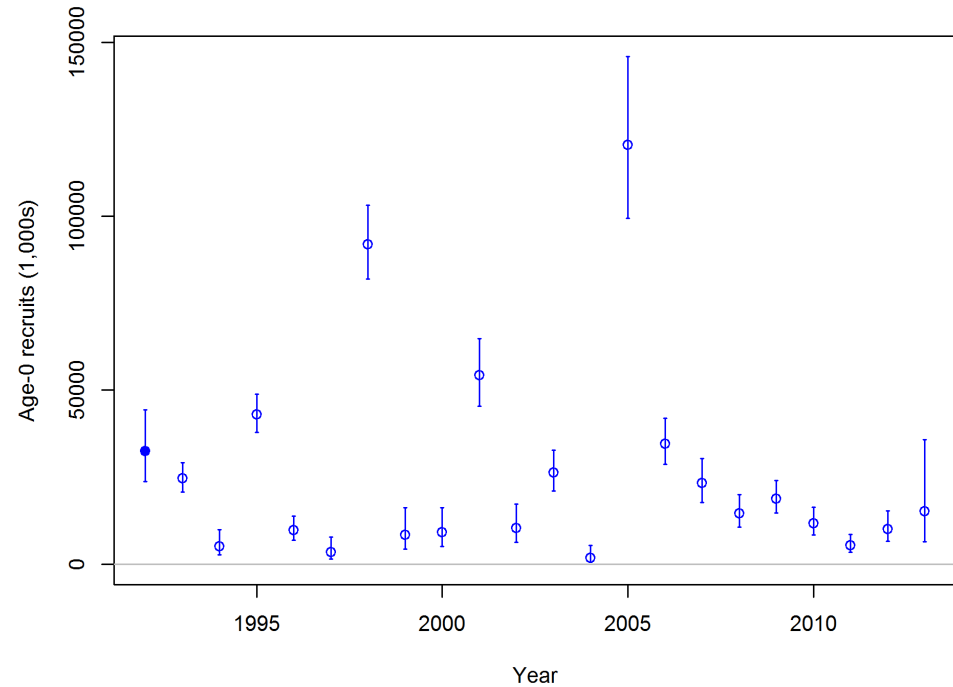
- Higher biomass in SEDAR42 model was a computational error
- Declines in 2005 and 2014 following severe red tides

Recruitment

SEDAR61



SEDAR42

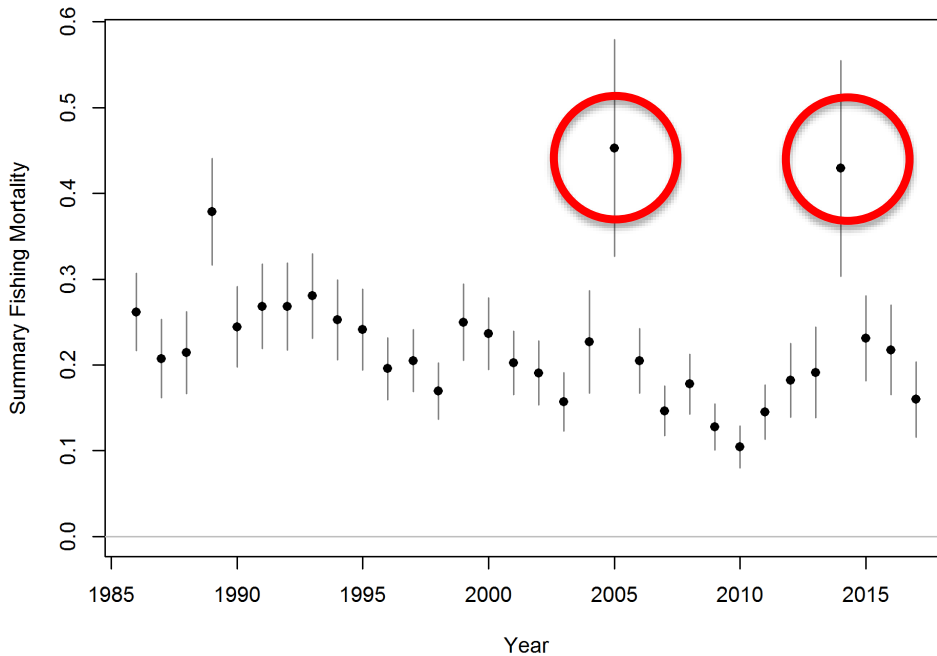


- Strong recruitment events in 1995, 1998, 2001, 2005, and 2013

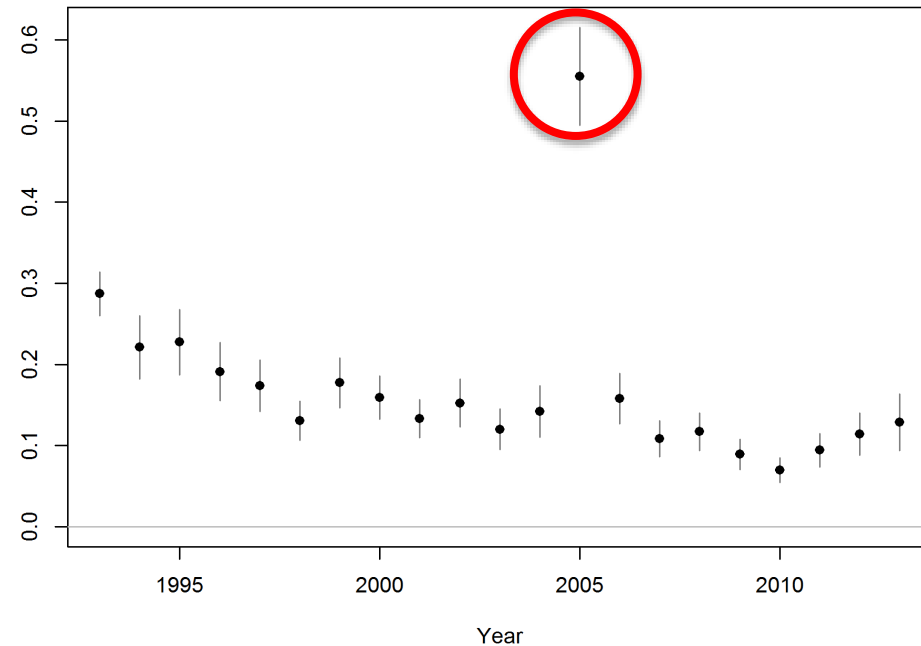
Exploitation Rate

- Fraction of population removed in biomass

SEDAR61



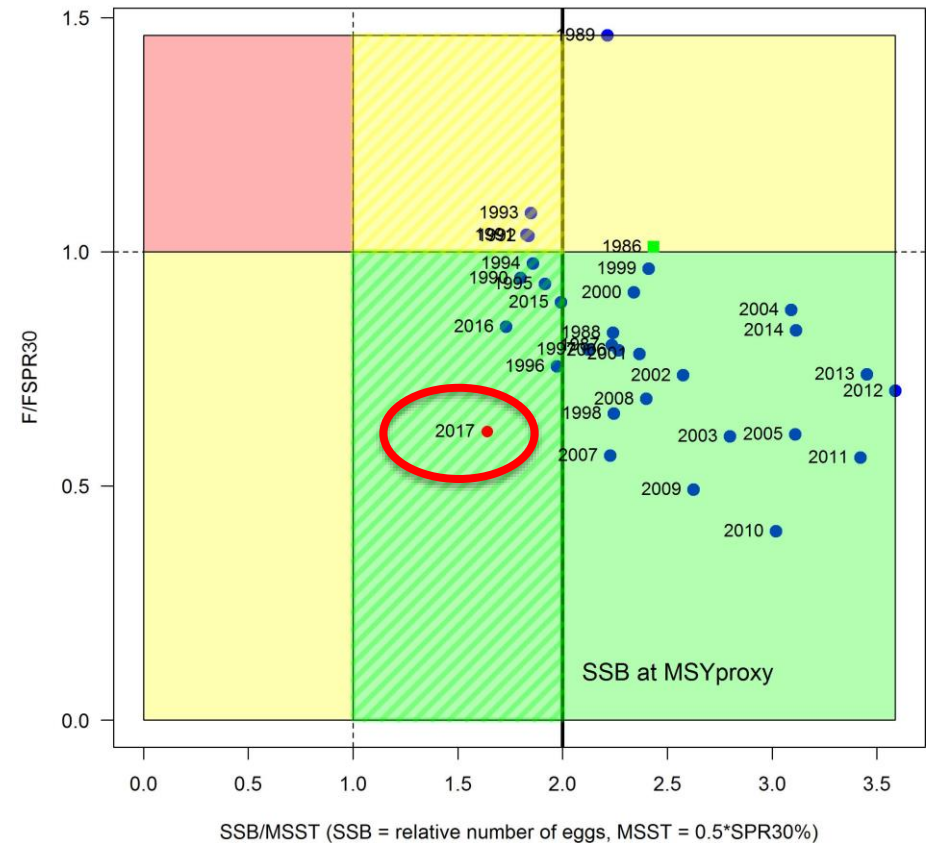
SEDAR42



- Red tide mortality included
- Recent fishing mortality rate one of lowest in time series

Gulf Red Grouper Stock Status in 2017

- In 2017:
 - Overfishing is not occurring
 - Not overfished but remains below the target
 - Would be considered overfished under previous Minimum Stock Size Threshold defined as: $(1 - M) * SSB_{SPR30\%}$



Projection Settings

- Constant recruitment, selectivity, retention, and discard mortality based on recent period (2010-2017)
- Catch allocation by fleet: 76% Commercial, 24% Recreational

Fleet	Landings	Landings (pounds)	ACL	Breakdown of landings (2017 ratio)
2018 (Final Landings Estimates)				
Commercial vertical line	296 (mt)	652,360	8,190,000	
Commercial longline	759 (mt)	1,673,305		
Recreational	210,613 (Number)	-	2,580,000	
2019 (Emergency Rule effective 5/17/2019)				
Commercial vertical line	430 (mt)		3,160,000	948,000 (30%)
Commercial longline	1,003 (mt)			2,212,000 (70%)
Recreational	210,613 (Number)		1,000,000	

Stakeholder Observations

2018, GMFMC “Something’s Fishy with Red Grouper”

Keepers:

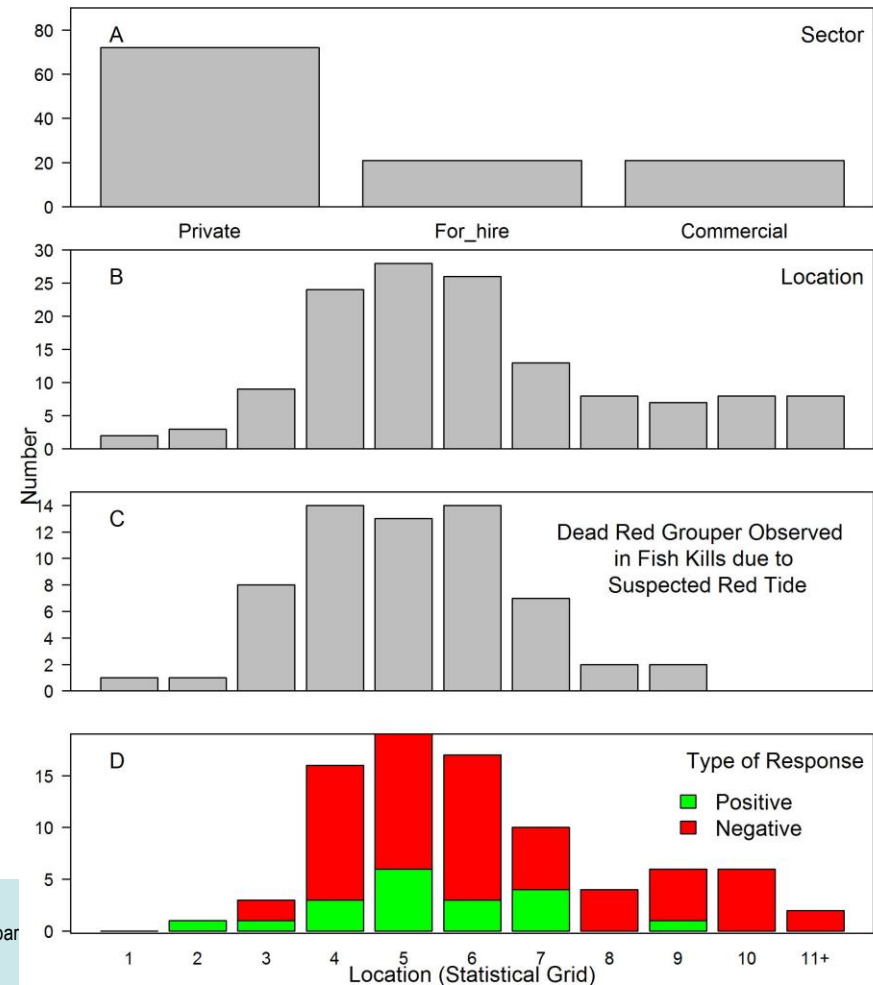
- Deeper than historically
- Fewer in recent years

Recruitment:

- Recent increase in smalls

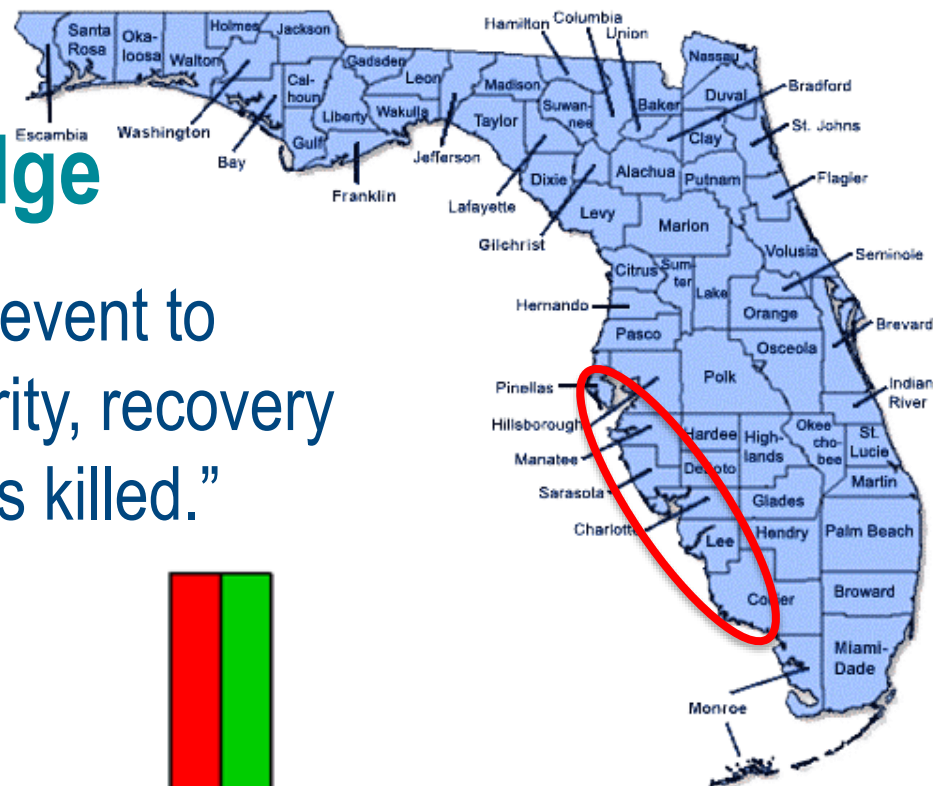
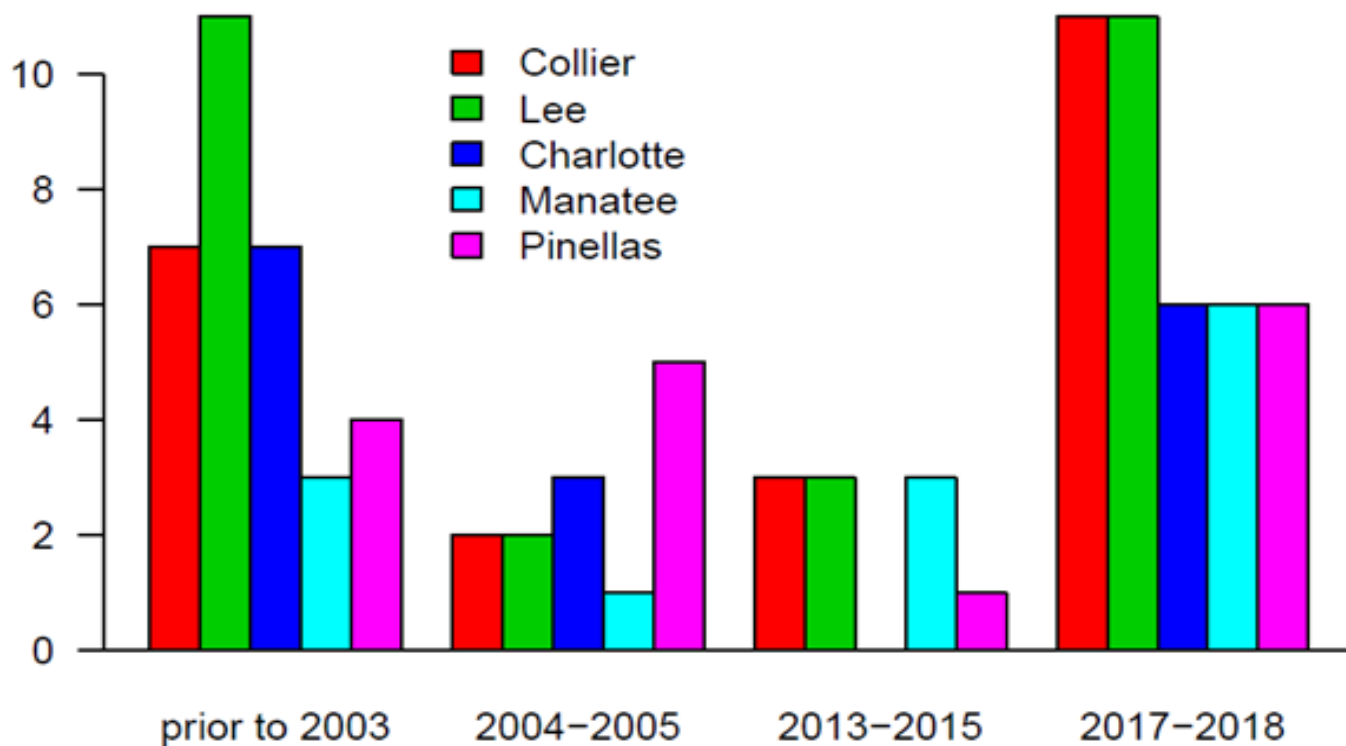
Environment:

- May shift location due to storms
- Being displaced by red snapper
- Depredation on discards is increasing
- Population hasn’t recovered since the 2014 red tide event



Local Ecological Knowledge

- “Compare the recent 2017-2019 event to previous events in terms of severity, recovery time, temporal extent and species killed.”



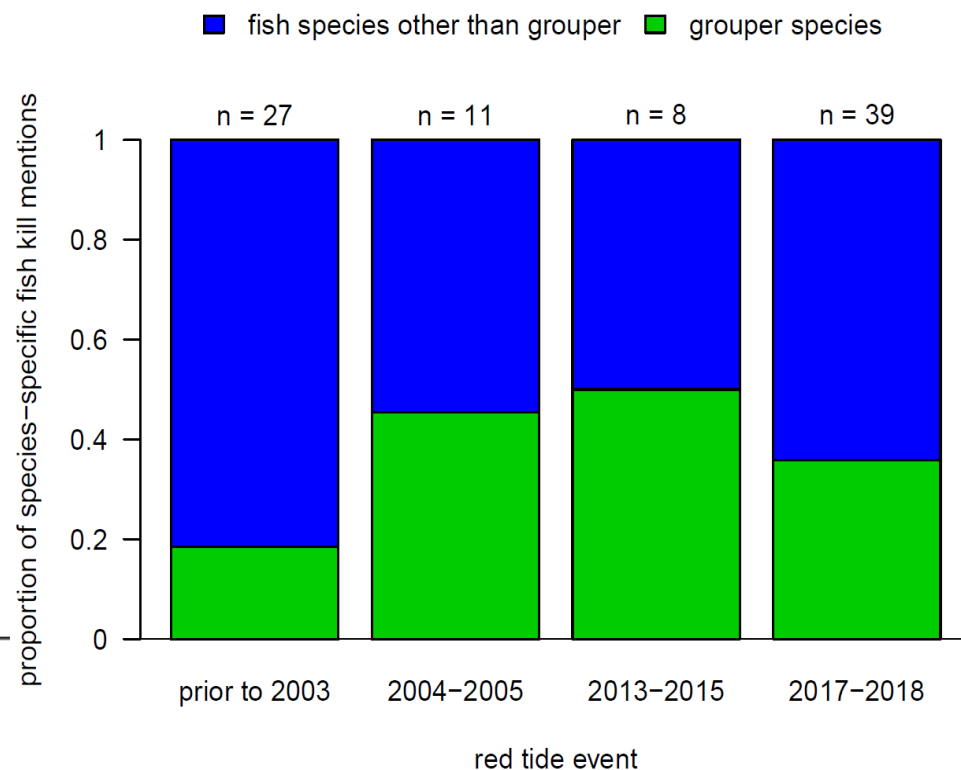
County Image:
<http://edr.state.fl.us/content/area-profiles/county/index.cfm>

Local Ecological Knowledge

By Event



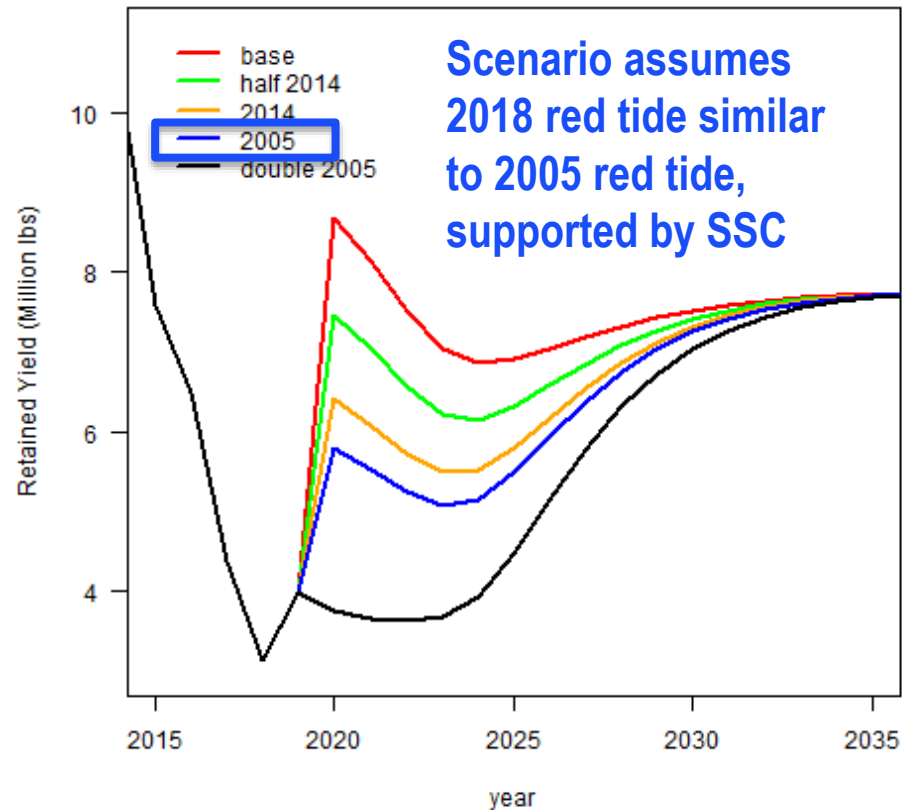
By Species Type



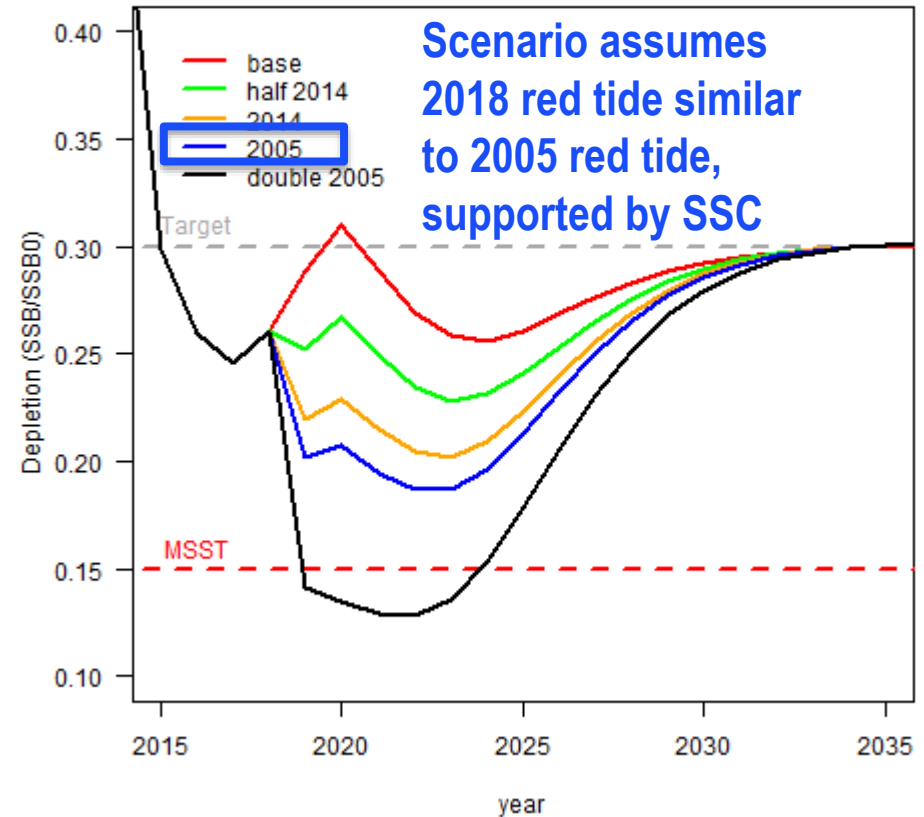
- 2018 frequently ranked as devastating across regions and lasted longer than previous red tide events

Projections: $F = F_{30\%SPR}$

Retained Yield



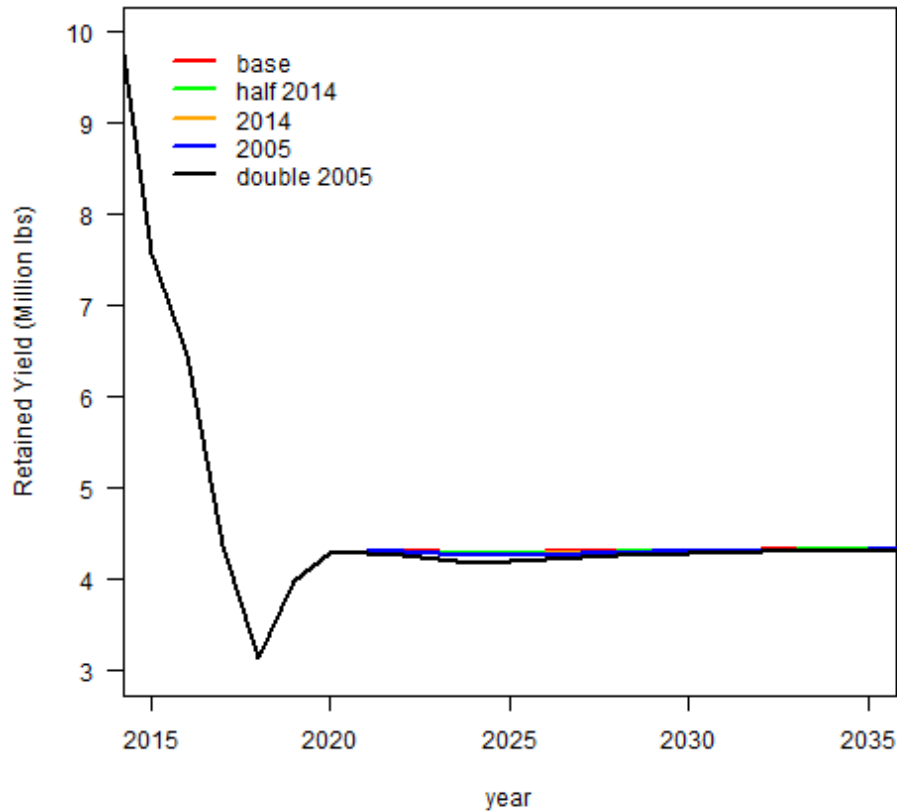
Depletion



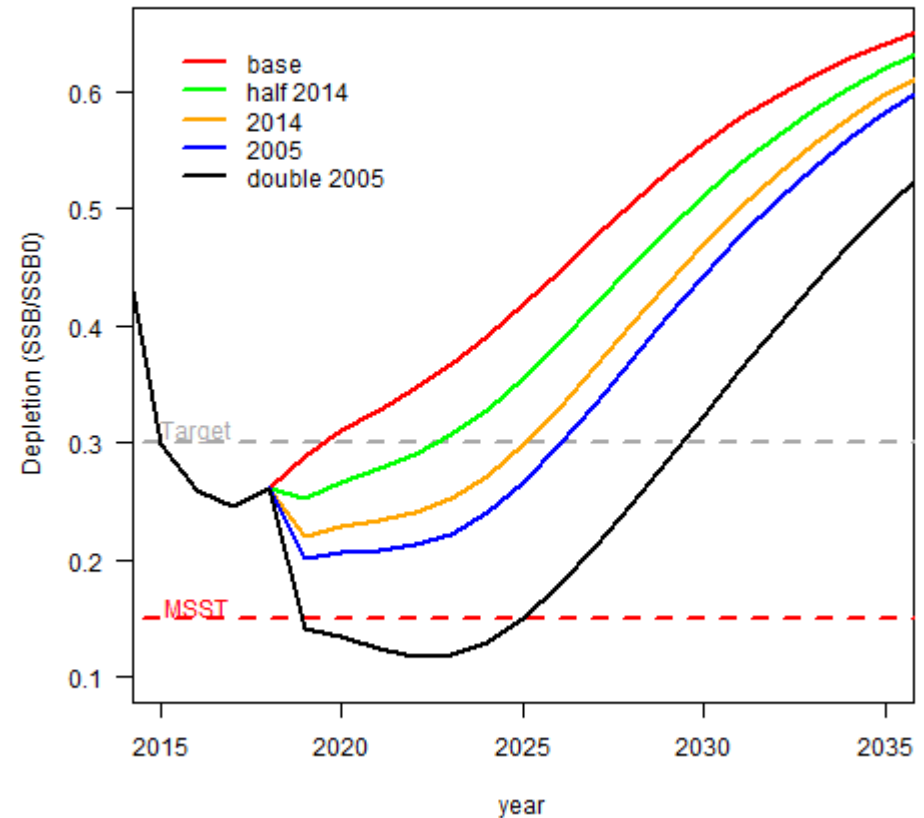
- 2020: below SSB Target if 2018 red tide event was severe
- Reach SSB Target after 2035 for all scenarios

Projections: Landings fixed at 2017 target

Retained Yield

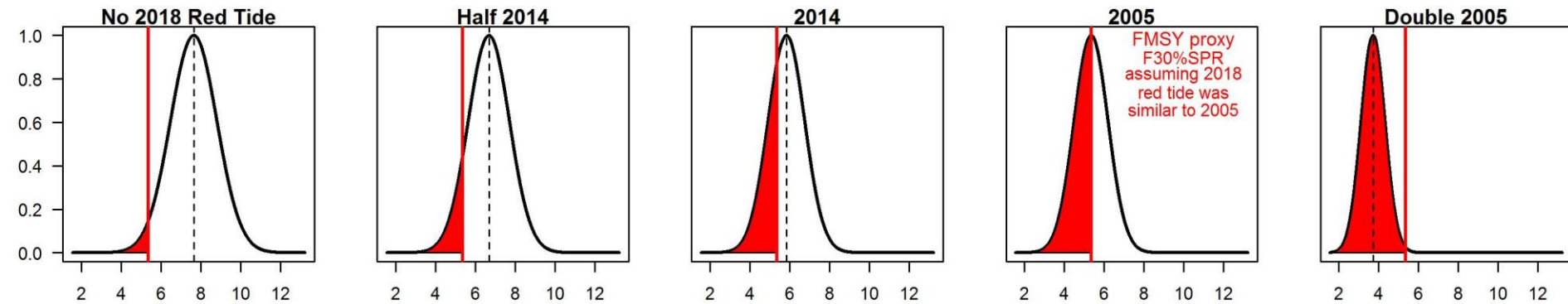


Depletion



- 2020: below SSB Target if 2018 red tide event was severe
- Reach SSB Target between 2023 to 2029 depending on severity

Probability of Overfishing



Scenario	Catch (Lbs)	No 2018 Red Tide	Half 2014	2014	2005	Double 2005
F30SPR	5,348,324	0.03	0.10	0.30	0.50	1.00
	5,190,960	0.02	0.08	0.24	0.43	0.99
	5,130,000	0.02	0.07	0.22	0.40	0.99
	4,900,000	0.01	0.04	0.16	0.30	0.98
2017 Landings	4,305,711	0.00	0.01	0.05	0.11	0.83

Summary

- SSC recommended setting OFL and ABC under the assumption that the 2018 red tide event was similar in magnitude to the 2005 red tide event
 - Growing evidence suggests 2018 had a large impact on population, largely from stakeholder input and updated indices of abundance from fishery-independent surveys.
- Maintaining current catch levels reduces this risk.

Scenario	No 2018 Red Tide	Half 2014	2014	2005	Double 2005
Landings fixed at 2017 target	0.00	0.01	0.05	0.11	0.83

Questions?

**Thank you to all SEDAR61 data providers
and for your attention!**