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FISHERIES

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SEDAR 42 Investigations: US Gulf of Mexico Red Grouper

Initial Conditions and MRIP-FES

Gulf of Mexico Fishery Management Council
Scientific and Statistical Committee



May 11, 2022

Revised initial conditions in SEDAR 42 model

- Since removals occurred prior to start year, the model was started in a non-equilibrium state and estimated:
 - Initial fishing mortality for each fleet
- Starting year of assessment model changed from 1986 to 1993 at SEDAR 42 Review Workshop
 - Initial equilibrium catch inputs during the Review Workshop were too high due to a computational error

SEDAR 42 model comparison

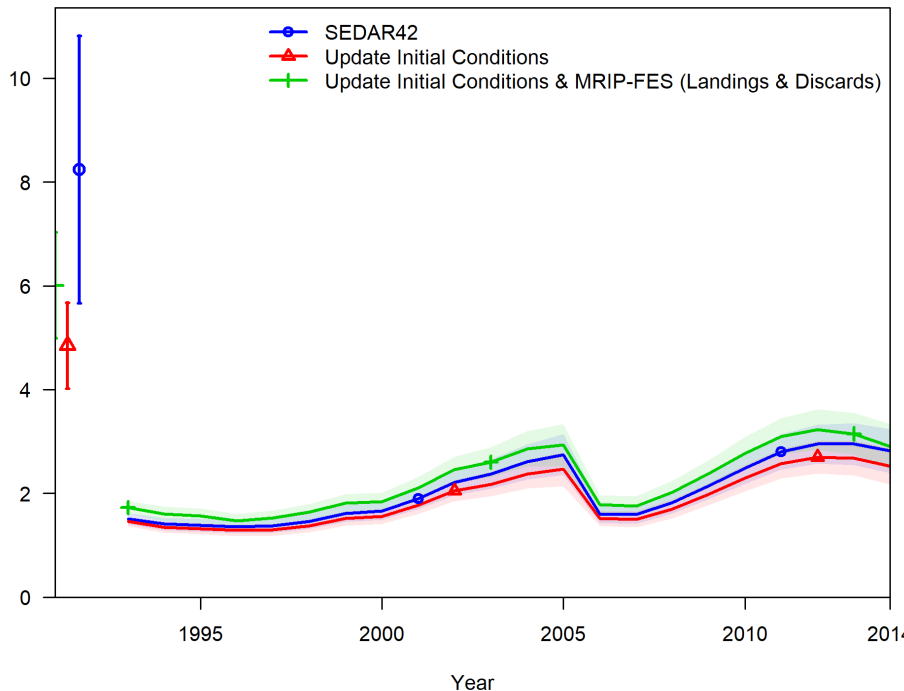
Model	NLL	Gradient	Estimated Parameters (Bounded)	Correlation > 0.7 (>0.95)	Parameter CVs > 1
SEDAR 42 Final Model	2257.95	0.0003	250 (4)	152 (142)	64
+ Update Initial Conditions	2263.41	0.0031	250 (4)	144 (139)	64
+ Incorporate MRIP FES data (landings + discards)	2277.74	0.0002	250 (4)	146 (142)	65

- Used SEDAR 42 model converted to Stock Synthesis 3.3
 - Compatible with improved projection methodology
 - Note: full suite of diagnostics were not run for either sensitivity run due to time constraints

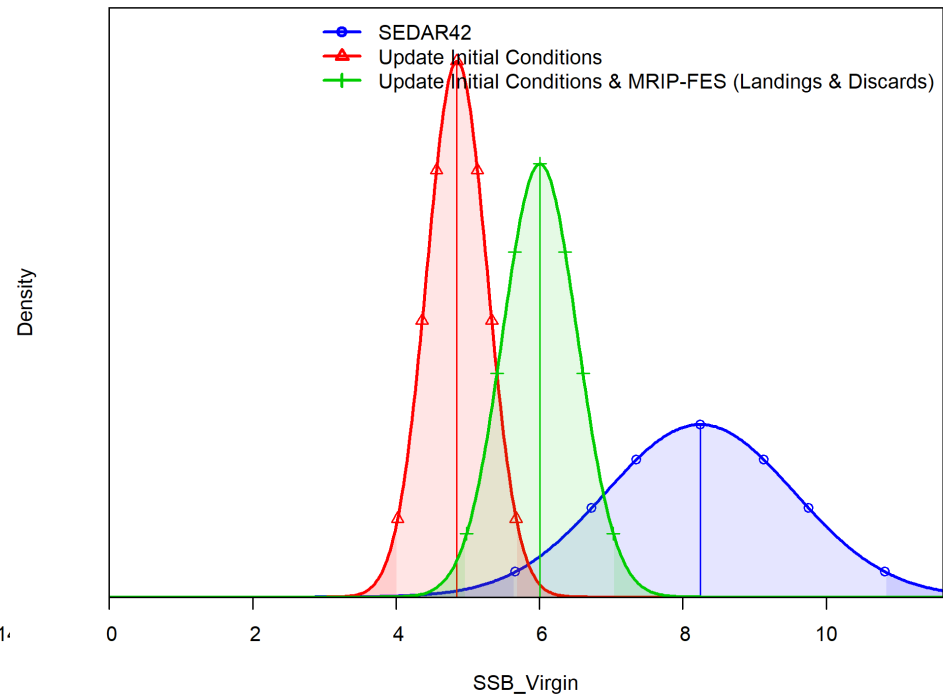
SEDAR 42 model comparison

- Updated initial equilibrium catches for all fleets to reflect average of first 5 years, then added MRIP-FES landings and discards

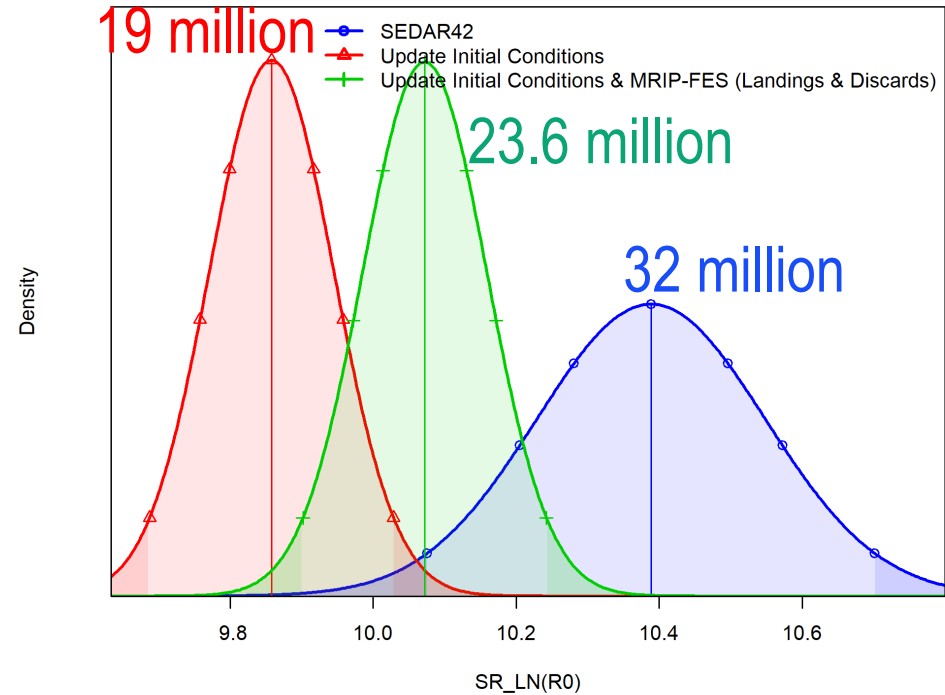
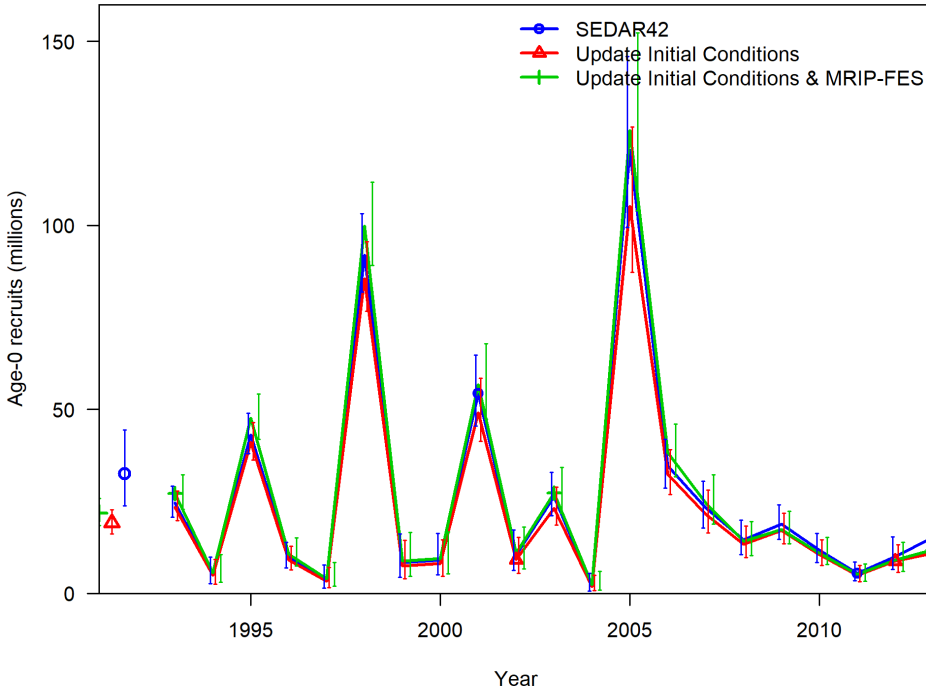
SSB (scaled number of eggs)



Virgin SSB



SEDAR 42 model comparison

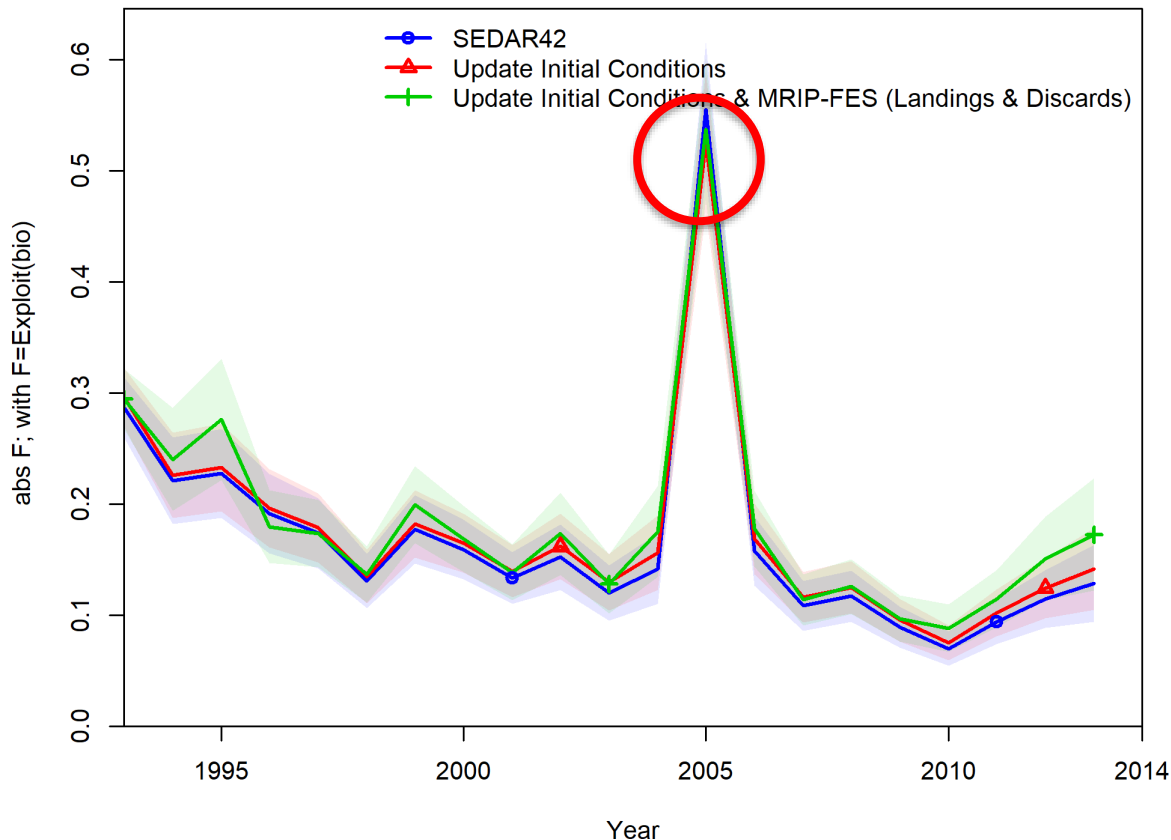


- SigmaR abnormally high in SEDAR 42 model

Model	$\sigma_R \pm CV$
SEDAR 42	1.24 ± 0.12
SEDAR 42 Initial Update	0.80 ± 0.12
SEDAR 42 MRIP-FES	0.80 ± 0.12

SEDAR 42 model comparison

- Exploitation rate = fraction of population removed in biomass
 - Red tide mortality included in 2005



SEDAR 42 projections

- Projections were run for the two sensitivity runs using:
 - Improved projection methodology which holds allocations constant at 76% commercial and 24% recreational

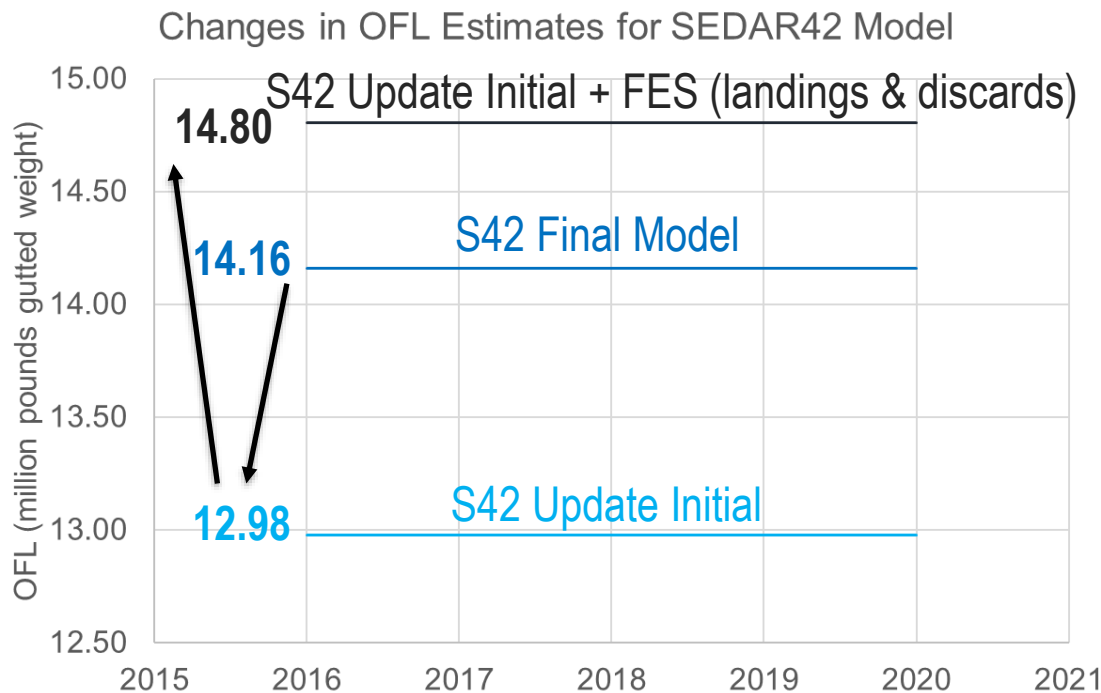
Parameter	Value	Comment
Relative F	Average from 2011 – 2013	Average relative fishing mortality over terminal three years (2011-2013) of model
Selectivity	Average from 2010 – 2013	Average fleet specific selectivity estimated over most recent time block (2010-2013) of model
Retention	Average from 2010 – 2013	Average fleet specific retention estimated over most recent time block (2010-2013) of model
Recruitment		From spawner-recruit curve (note: steepness fixed at 0.99)
2014 Landings	2014 landings as provided by fleet	-
2015 Landings	2015 recreational ACL or 2015 MRIP-FES	ACL assumed in non-FES runs
Allocation Ratio	76:24	commercial:recreational

Comparison of Catch Advice

Year	SEDAR 42 Final Model	S42 Update Initial	S42 Update Initial + FES (Landings & Discards)
OFL (million pounds gutted weight)			
2016	20.44	16.93	18.95
2017	15.73	14.62	16.51
2018	12.55	12.46	14.22
2019	11.12	10.92	12.64
2020	10.98	9.96	11.70
Average	14.16	12.98	14.80
ABC (million pounds gutted weight)			
2016	20.10	16.64	18.59
2017	15.48	14.39	16.22
2018	12.34	12.27	13.99
2019	10.93	10.74	12.42
2020	10.77	9.78	11.47
Average	13.92	12.76	14.54

Summary

- Correcting the initial equilibrium catch error led to lower estimates of sigmaR, virgin SSB, and virgin recruitment
- Using MRIP-FES landings and discards led to higher overall SSB and recruitment



Questions?

**Thank you to all SEDAR42/61 data providers
and for your attention!**

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