SSC Report to the Caribbean Fishery Management Council

December 2022

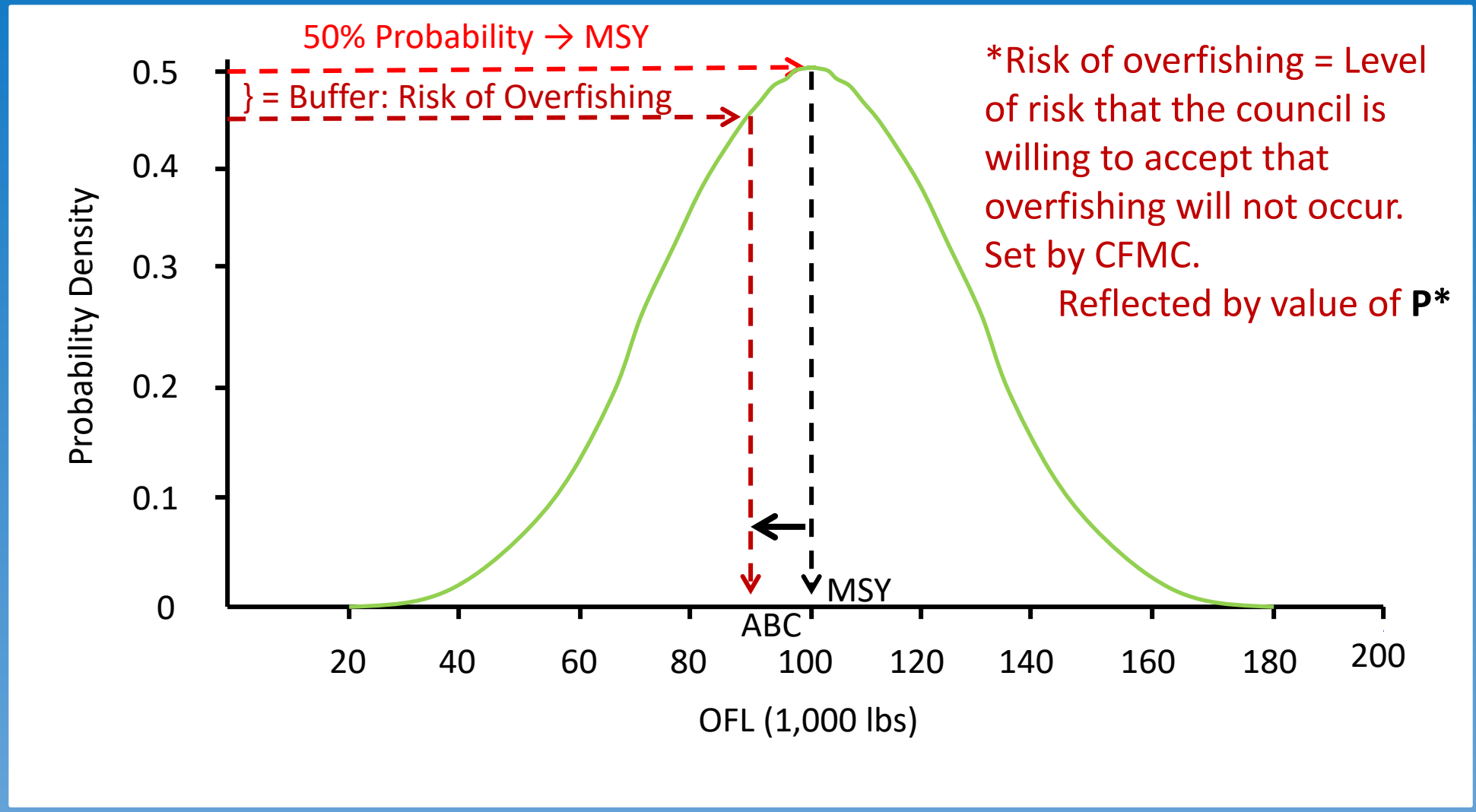
SSC Met:
Oct 4-5
Nov 29 - Dec 1

- SEDAR 80 Queen Triggerfish
- SEDAR 57 Update (spiny lobster)
- SEDAR 84 Terms of Reference & SSC assignments
- SCS7 Review
- Queen conch listing under ESA
- Conflict of Interest

SEDAR 80 (Queen triggerfish)

- Initial discussion on Puerto Rico
- Then how to apply to STT and STX
- Two potential approaches:
  - Choose a base model to estimate center point, then use σ_{min} for variation
  - Use ensemble analysis (sum of variations across all parameters)

Setting MSY, OFL, ABC



SEDAR 80 (Queen triggerfish) Continued

- Sensitivity of L_{∞}
  - SSC wanted full sensitivity analysis.
  - Got comparison between US Caribbean and Carolinas
  - But, maximum age was the key factor – use that of US Caribbean
- Selectivity: logistic vs dome-shaped (gear, market, availability (depth))
  - For PR used logistic (more precautionary)
  - For STT use dome-shaped (to be explored)
- Indices of abundance: CPUE and NCRMP
  - Reject NCRMP-based index of abundance
  - Limited time series, habitat and depth representation

SEDAR 80 (Queen triggerfish) Continued

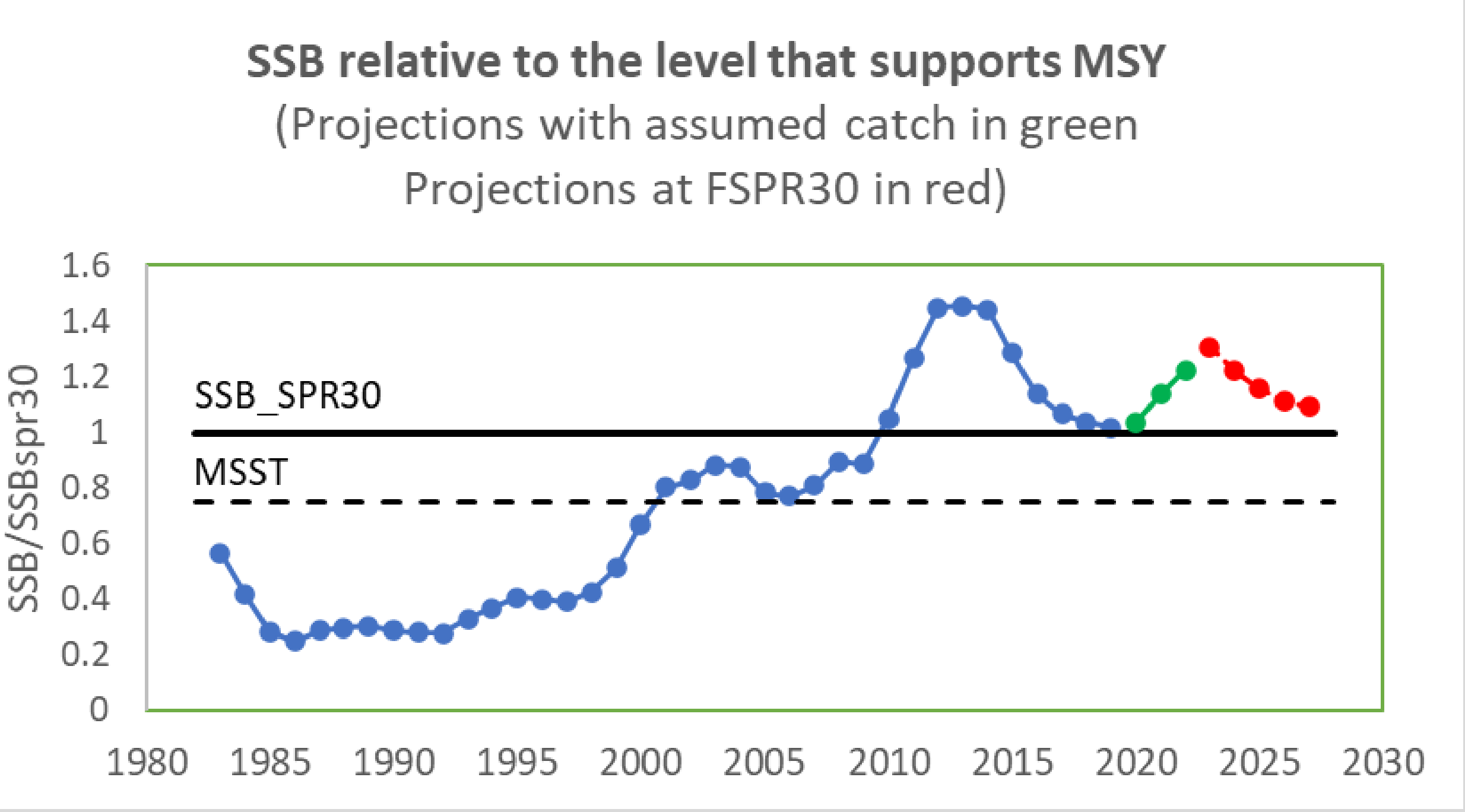
- MSY
  - Initially tried to estimate
  - Final: Used MSY proxy of SPR30%*
- Steepness (strength of a stock-recruitment relationship): fix or estimate
  - Initially tried to estimate
  - Final: tuned steepness to chosen MSY proxy
- Initial Equilibrium Catch
  - Let model chose initial catch based on best model fit

SEDAR 80 (Queen triggerfish) Continued

- Estimates needed for management target recommendations
- Correction factors for most recent catch (CFs not yet estimated)
  - Use average CFs for most recent years
- Projected Catch
  - Use most recent catch (2021) for 2022

SEDAR 80 (Queen triggerfish) Results - PR

- Given decisions above, the SSC accepted the model as being
  - The best available data
  - Acceptable for generating management advice (Short-term only!)
- ABCs were generated over a range of P* values (risk of overfishing): .3-.45
- SSC also looked at 3-yr average scenario
- All ABCs generated would be acceptable to the SSC
- Final depends on Choice of P* by the CFMC
- However, SSC cautions the CFMC that relative to case of Spiny Lobster
  - Uncertainties are large
  - Management uncertainties due to current status as “non-targeted” species
  - When concept of P* originally derived, thinking was P* would be more like .3-.35

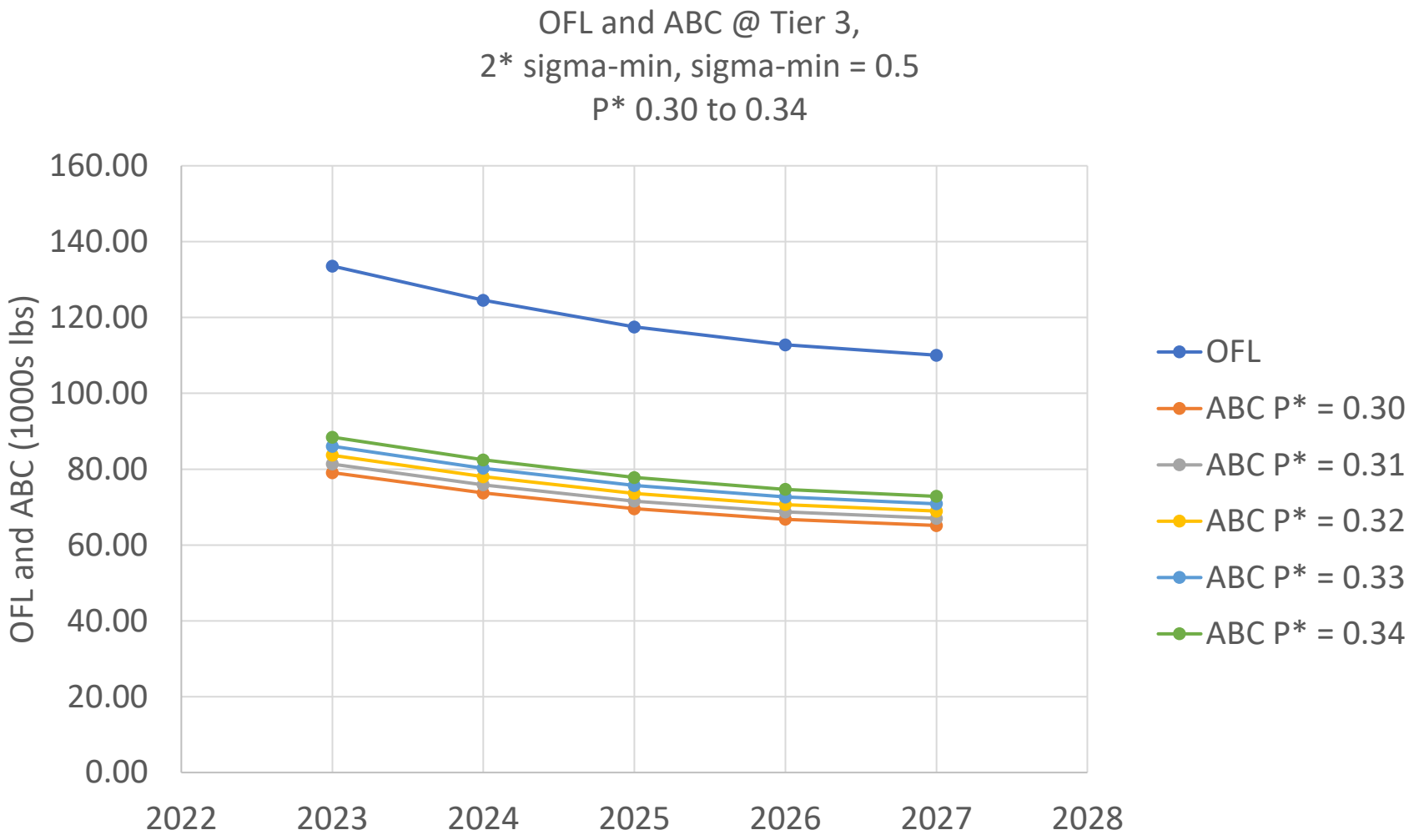

SSB relative to the level that supports MSY
(Projections with assumed catch in green
Projections at FSPR30 in red)
SSB/SSBspr30
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
SSB_SPR30
MSST
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030

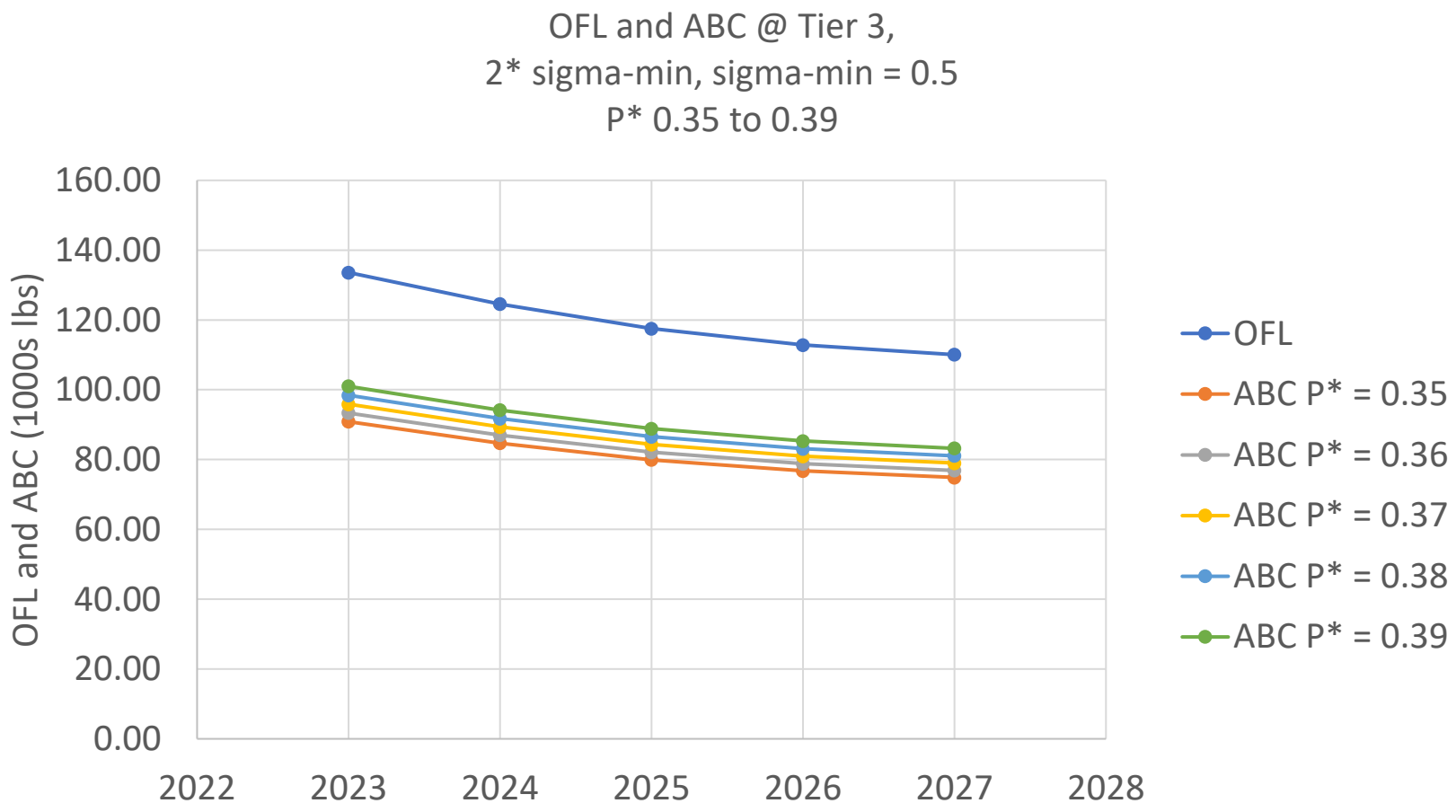
SEDAR 80 (Queen Triggerfish) Puerto Rico - Updated Projections (1000s of lbs)

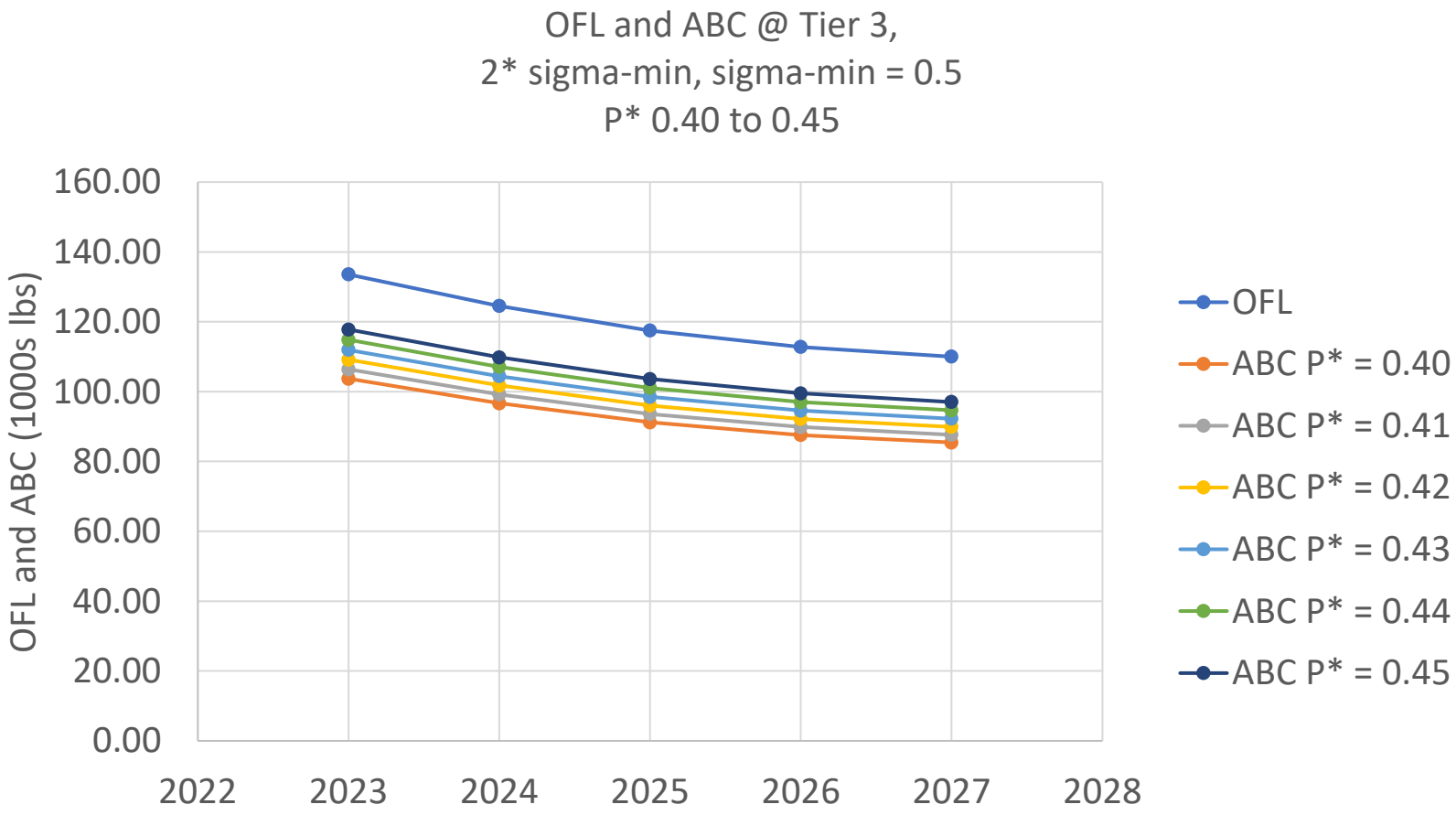
Year	2023	2024	2025	2026	2027	% reduction
OFL	134	125	117	113	110	from 0.45
ABC P* = 0.30	79	74	70	67	65	67.1
ABC P* = 0.31	81	76	72	69	67	69.1
ABC P* = 0.32	84	78	74	71	69	71.0
ABC P* = 0.33	86	80	76	73	71	73.0
ABC P* = 0.34	88	82	78	75	73	75.1
ABC P* = 0.35	91	85	80	77	75	77.1
ABC P* = 0.36	93	87	82	79	77	79.2
ABC P* = 0.37	96	89	84	81	79	81.4
ABC P* = 0.38	98	92	87	83	81	83.5
ABC P* = 0.39	101	94	89	85	83	85.8
ABC P* = 0.40	104	97	91	88	85	88.0
ABC P* = 0.41	106	99	94	90	88	90.3
ABC P* = 0.42	109	102	96	92	90	92.7
ABC P* = 0.43	112	104	99	95	92	95.1
ABC P* = 0.44	115	107	101	97	95	97.5
ABC P* = 0.45	118	110	104	99	97	100.0

Recent Landings

2014	110
2015	100
2016	69
2017	62
2018	75
2019	78
2020	57
2021	64


OFL and ABC @ Tier 3,
2* sigma-min, sigma-min = 0.5
P* 0.30 to 0.34
OFL and ABC (1000s lbs)
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
2022
2023
2024
2025
2026
2027
2028
OFL
ABC P* = 0.30
ABC P* = 0.31
ABC P* = 0.32
ABC P* = 0.33
ABC P* = 0.34


OFL and ABC @ Tier 3,
2* sigma-min, sigma-min = 0.5
P* 0.35 to 0.39
OFL and ABC (1000s lbs)
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
2022
2023
2024
2025
2026
2027
2028
OFL
ABC P* = 0.35
ABC P* = 0.36
ABC P* = 0.37
ABC P* = 0.38
ABC P* = 0.39


OFL and ABC @ Tier 3,
2* sigma-min, sigma-min = 0.5
P* 0.40 to 0.45
OFL and ABC (1000s lbs)
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
2022
2023
2024
2025
2026
2027
2028
OFL
ABC P* = 0.40
ABC P* = 0.41
ABC P* = 0.42
ABC P* = 0.43
ABC P* = 0.44
ABC P* = 0.45

3-Yr Average 2024-2026 (1,000s of Pounds)	
OFL	118.3
ABC P* = 0.30	70.0
ABC P* = 0.31	72.0
ABC P* = 0.32	74.1
ABC P* = 0.33	76.2
ABC P* = 0.34	78.3
ABC P* = 0.35	80.5
ABC P* = 0.36	82.6
ABC P* = 0.37	84.9
ABC P* = 0.38	87.1
ABC P* = 0.39	89.5
ABC P* = 0.40	91.8
ABC P* = 0.41	94.2
ABC P* = 0.42	96.7
ABC P* = 0.43	99.2
ABC P* = 0.44	101.7
ABC P* = 0.45	104.3

SEDAR 80 (Queen triggerfish) Results - USVI

Model for STT needs more exploration

- At the moment – Not deemed suitable for management advice
- But further analysis may prove fruitful

Model for STX was deemed not useful for management

- Data were too limiting
- Calculation of OFL and ABC remains in Tier 4

SEDAR 80 (Queen triggerfish) Results - STT

Model recommendations critical to understand how to move forward:

- Explore the equilibrium catch value by profiling from half to double the current value being used.
- Apply dome-shaped selectivity to the fishery to the reference model. Make sure the model can either estimate this, or fix it to a value that the fishers think make sense.
- Change the CV@ length values from 0.18 to 0.1 for both CV parameters in the reference model.
- Make one composite length composition for the fishery and put it in the terminal year and refit the reference model, with recruitment deviations turned on and turned off.
- Consider a range of index weights for both indices, including dropping each
- Use the Francis weighting option instead of MacCallister-Ianelli to weight the length compositions
- De-weight most recent landings

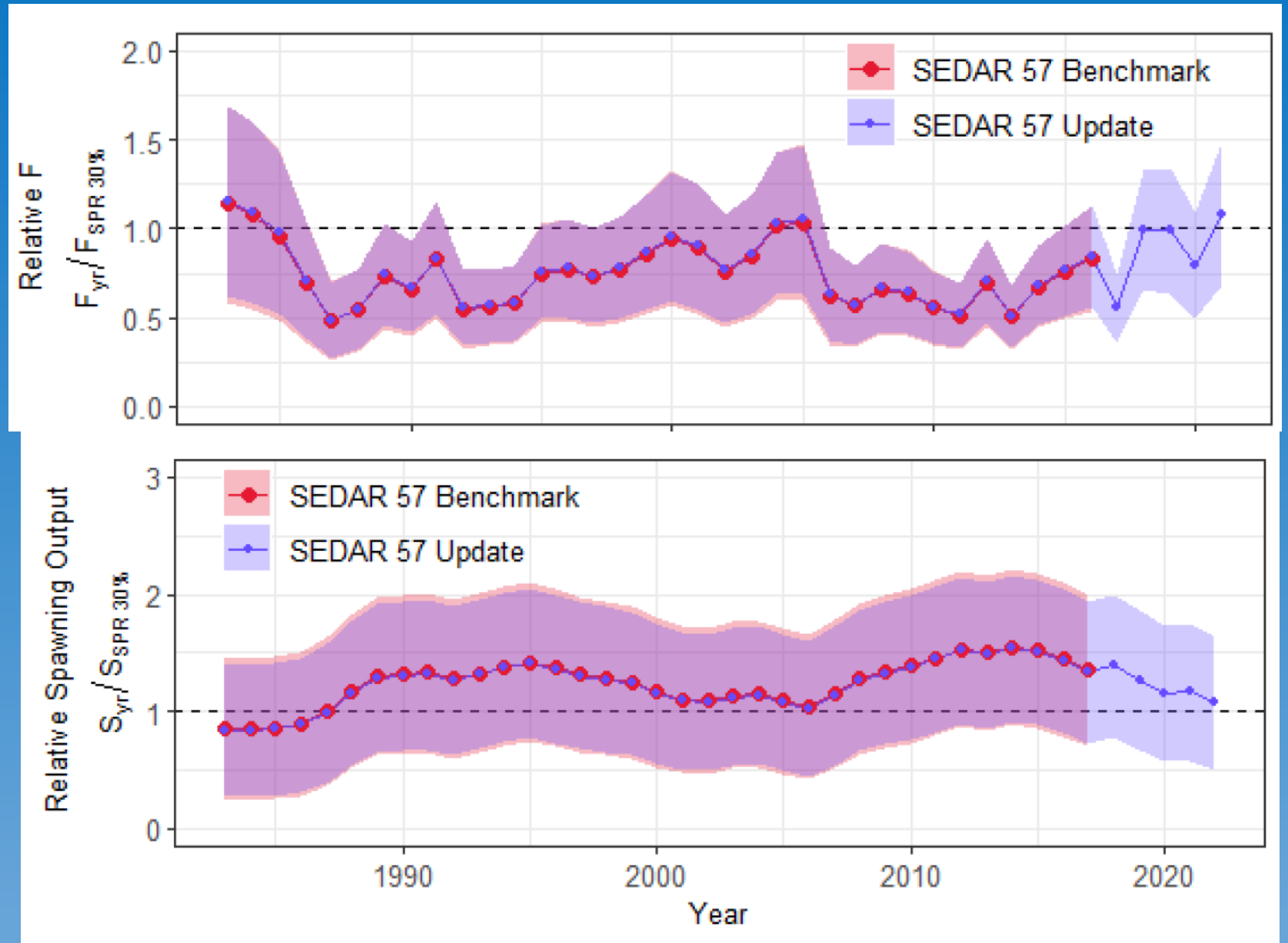
SEDAR 57 Update – Spiny Lobster

Follow past procedure

Use last year of landings to estimate provisional landings

Only marginal changes in OFLs, ABCs, ACLs

Updated Assessment for Puerto Rico Spiny Lobster



Updated OFLs and ABCs for Puerto Rico Spiny Lobster

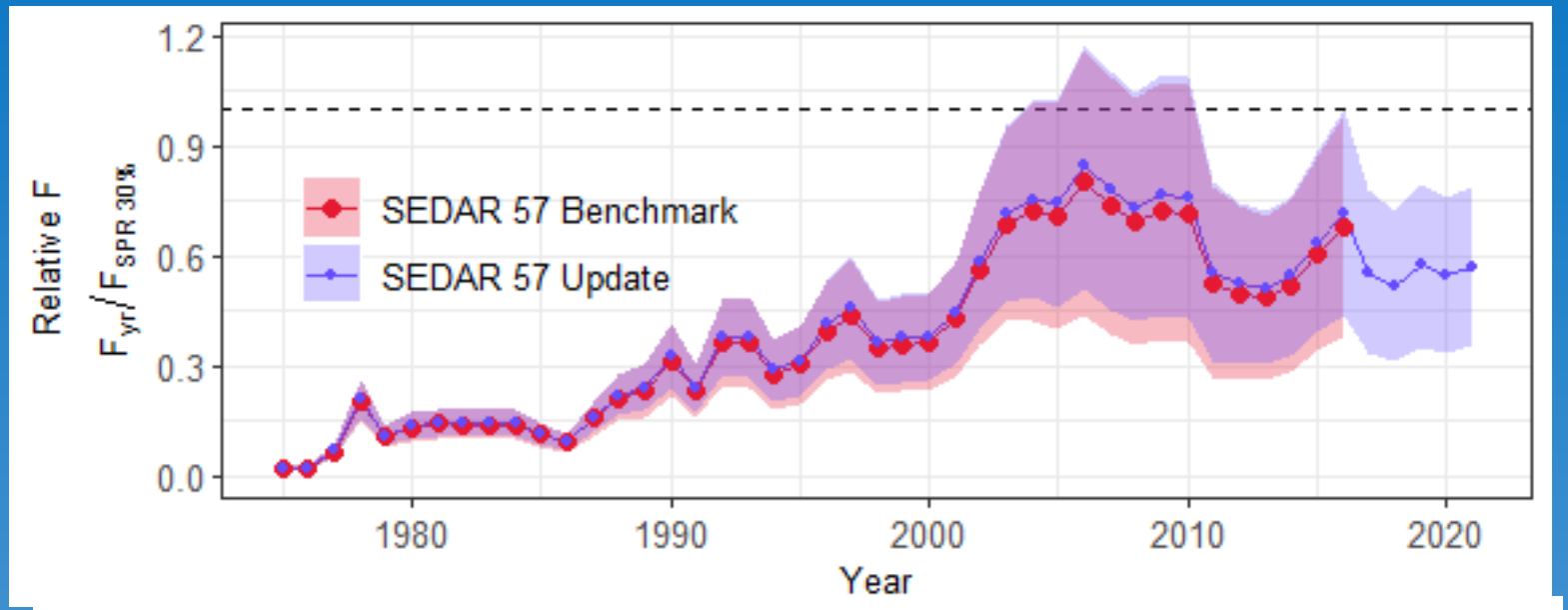
Source	Year	OFL	Avg. OFL	ABC	Avg. ABC
SEDAR 57 Benchmark with input landings through 2020	2021	444,020	440,803	391,587	388,750
	2022	440,387		388,383	
	2023	438,001		386,279	
SEDAR 57 Update with provisional input landings through 2023	2024	428,374	430,413	377,788	379,587
	2025	431,281		380,353	
	2026	431,583		380,619	

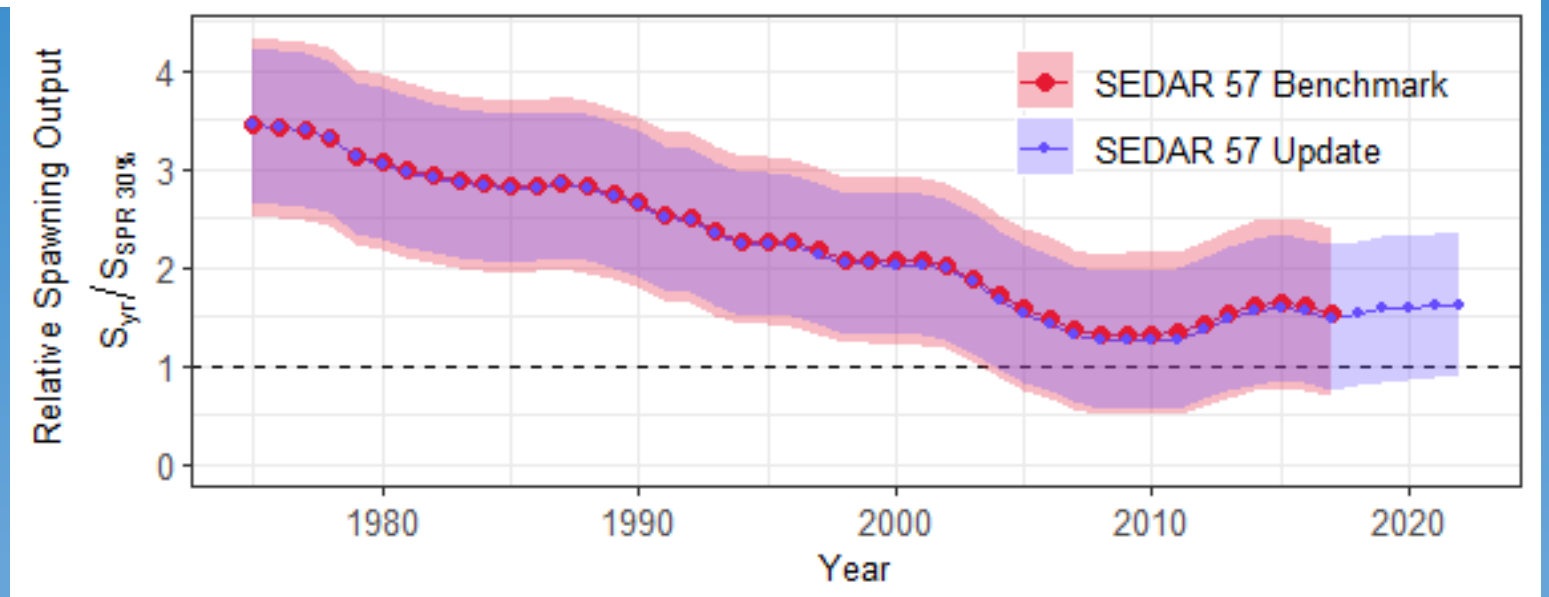
SSC recommends accepting the update

BUT:

- SSC notes that there is little length information in last 2 years
- SSC notes that population is effectively at limit set by biomass
- DAP members are reporting a significant pulse in lobster catch
- May lead to unintentional overage: due to “perverse feedback”
- SSC recommends prioritizing a new benchmark assessment

Updated Assessment for STT-STJ Spiny Lobster



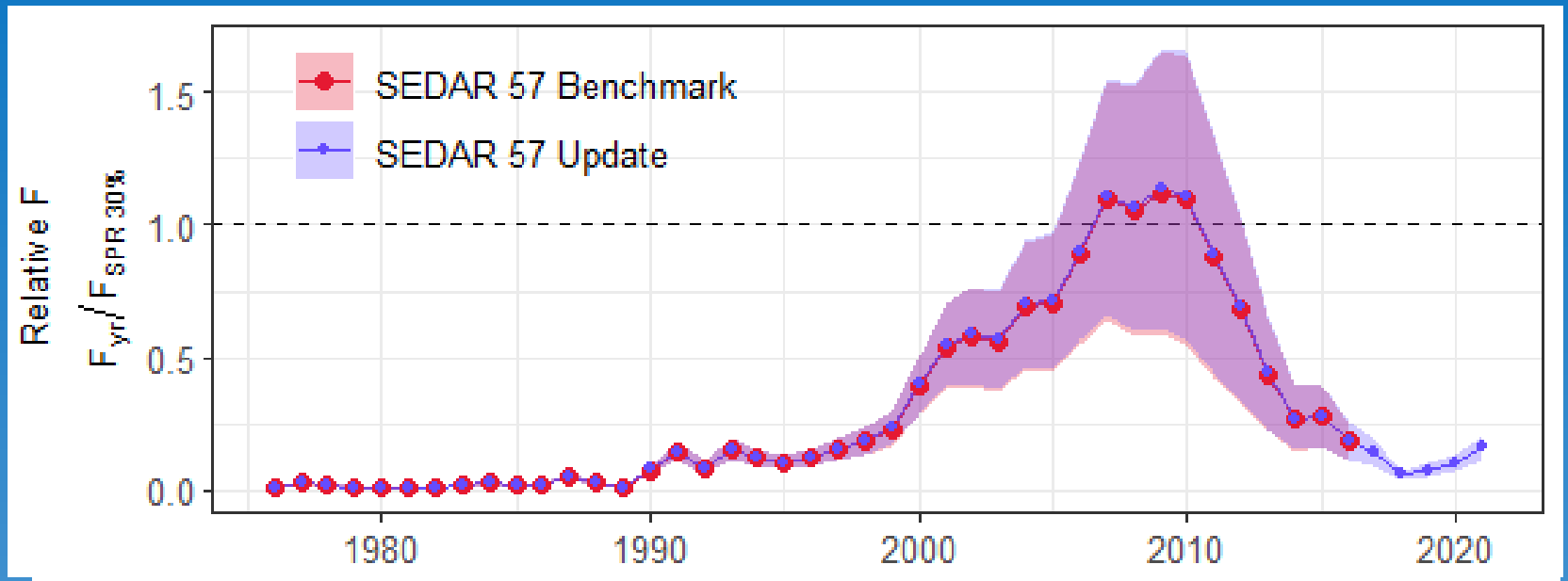


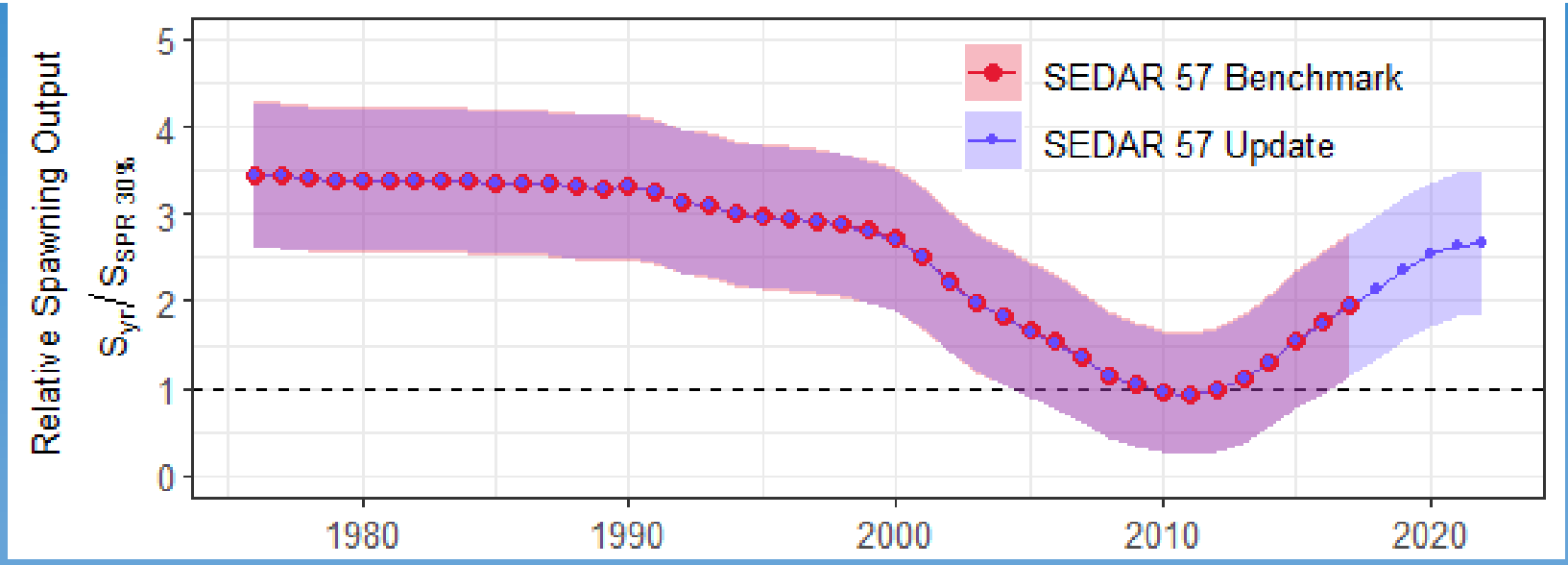
Updated OFLs and ABCs for STT-STJ Spiny Lobster

Source	Year	OFL	Avg. OFL	ABC	Avg. ABC
SEDAR 57 Benchmark with input landings through 2020	2021	195,222	170,246	172,168	150,142
	2022	165,020		145,534	
	2023	150,496		132,725	
SEDAR 57 Update with provisional input landings through 2023	2024	178,418	158,993	157,349	140,218
	2025	155,011		136,707	
	2026	143,550		126,598	

SSC recommends accepting the STT-STJ update

Updated Assessment for STX Spiny Lobster





Updated OFLs and ABCs for STX Spiny Lobster

Source	Year	OFL	Avg. OFL	ABC	Avg. ABC
SEDAR 57 Benchmark with input landings through 2020	2021	200,021	167,898	176,401	148,071
	2022	159,452		140,622	
	2023	144,220		127,189	
SEDAR 57 Update with provisional input landings through 2023	2024	192,631	163,823	169,884	144,478
	2025	156,356		137,893	
	2026	142,483		125,657	

SSC recommends accepting the STX update

7th National Scientific Coordination Subcommittee Meeting

Adapting Fisheries Management to a Changing Ecosystem

Session 1: How to incorporate ecosystem indicators into the stock assessment process?

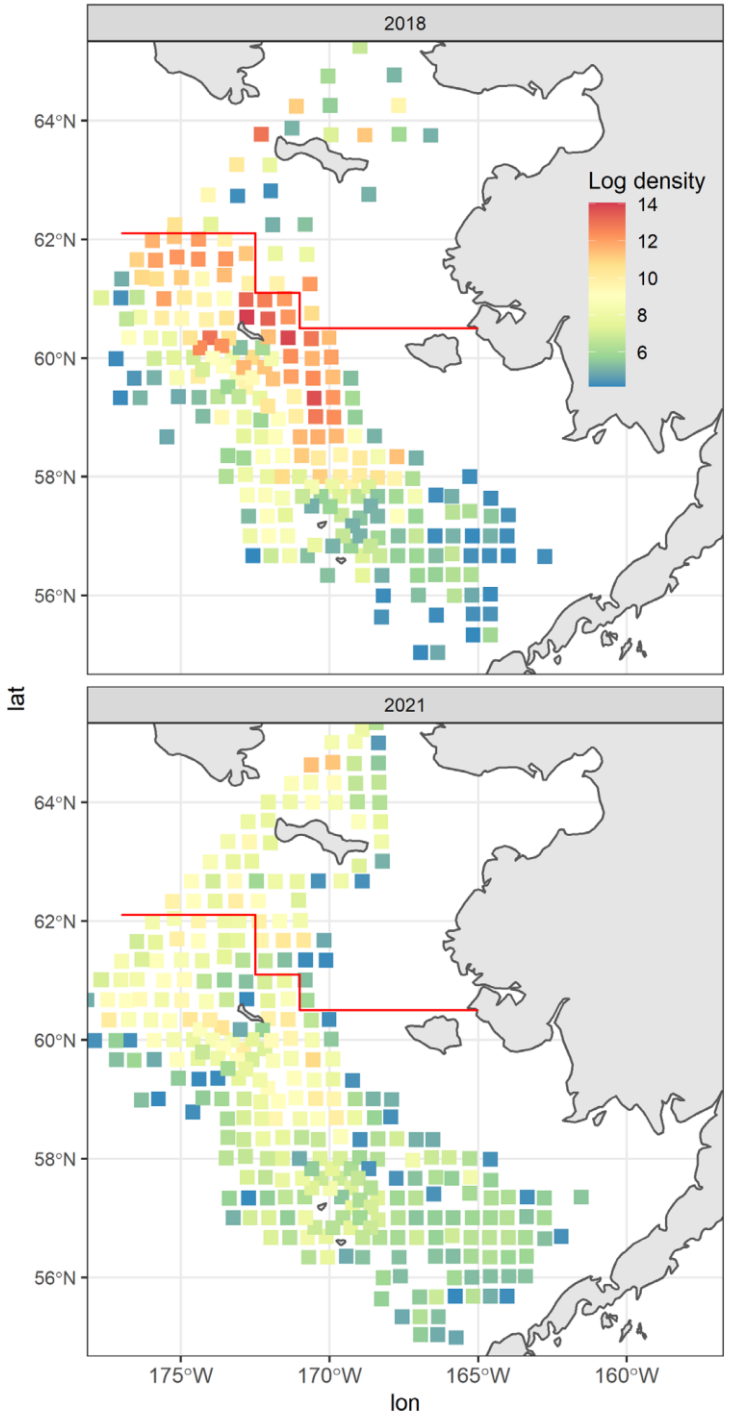
Session 2: Developing information to support management of interacting species in consideration of EBFM?

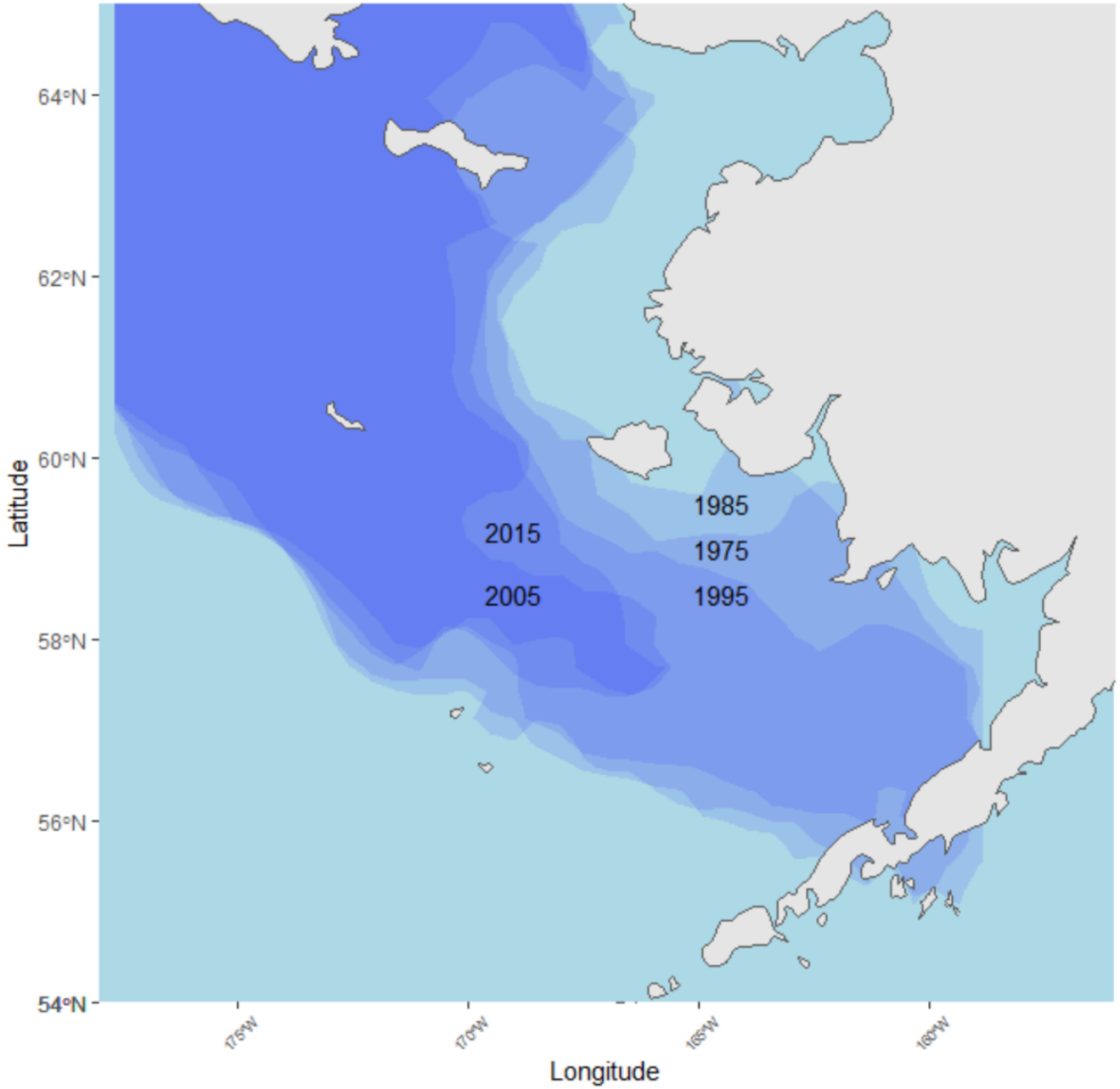
Session 3: How to assess and develop fishing level recommendations for species exhibiting distributional changes

Collapse of eastern Bering Sea snow crab

2018

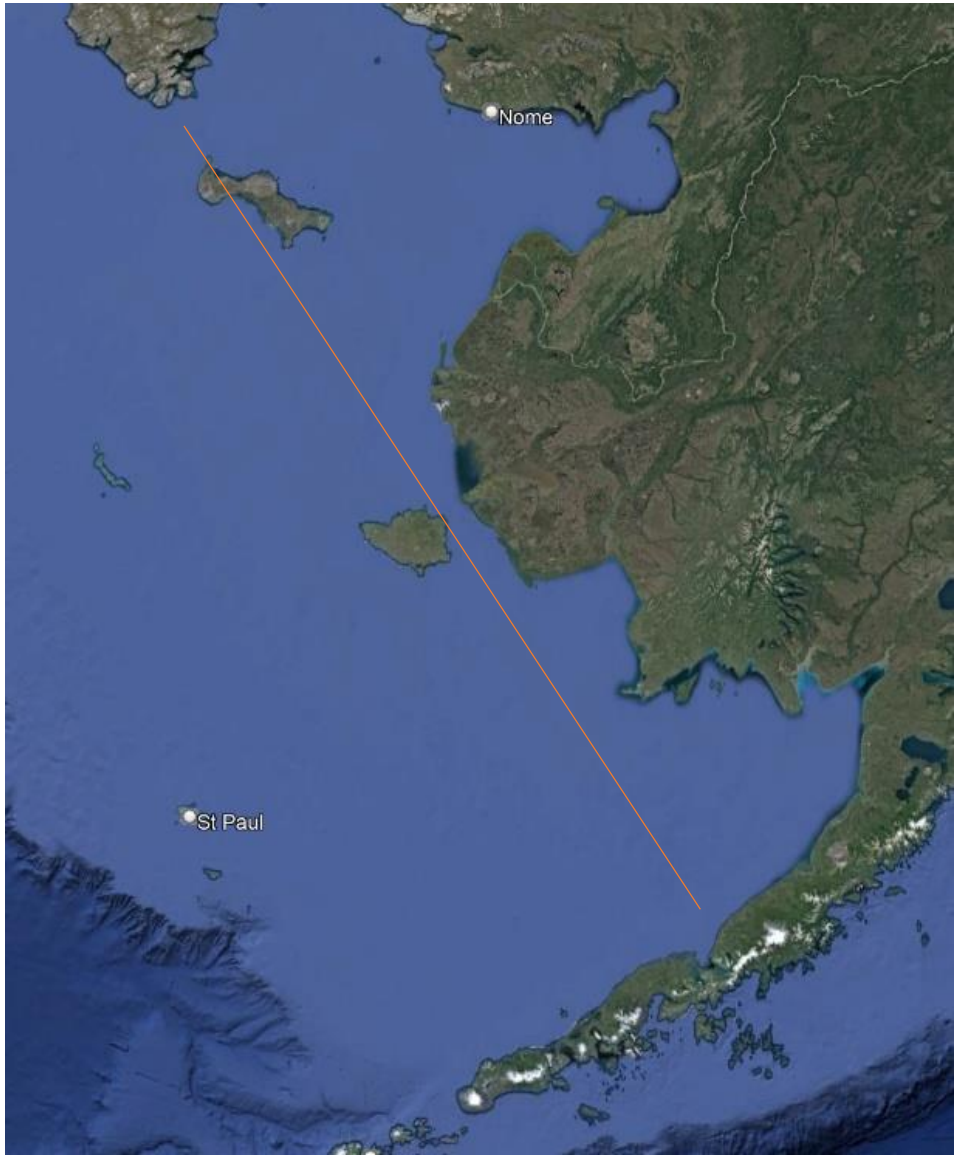
2021





Extent of cold water

670 Miles



55 Miles

Poor recruitment of reef fishes in the southeast Atlantic

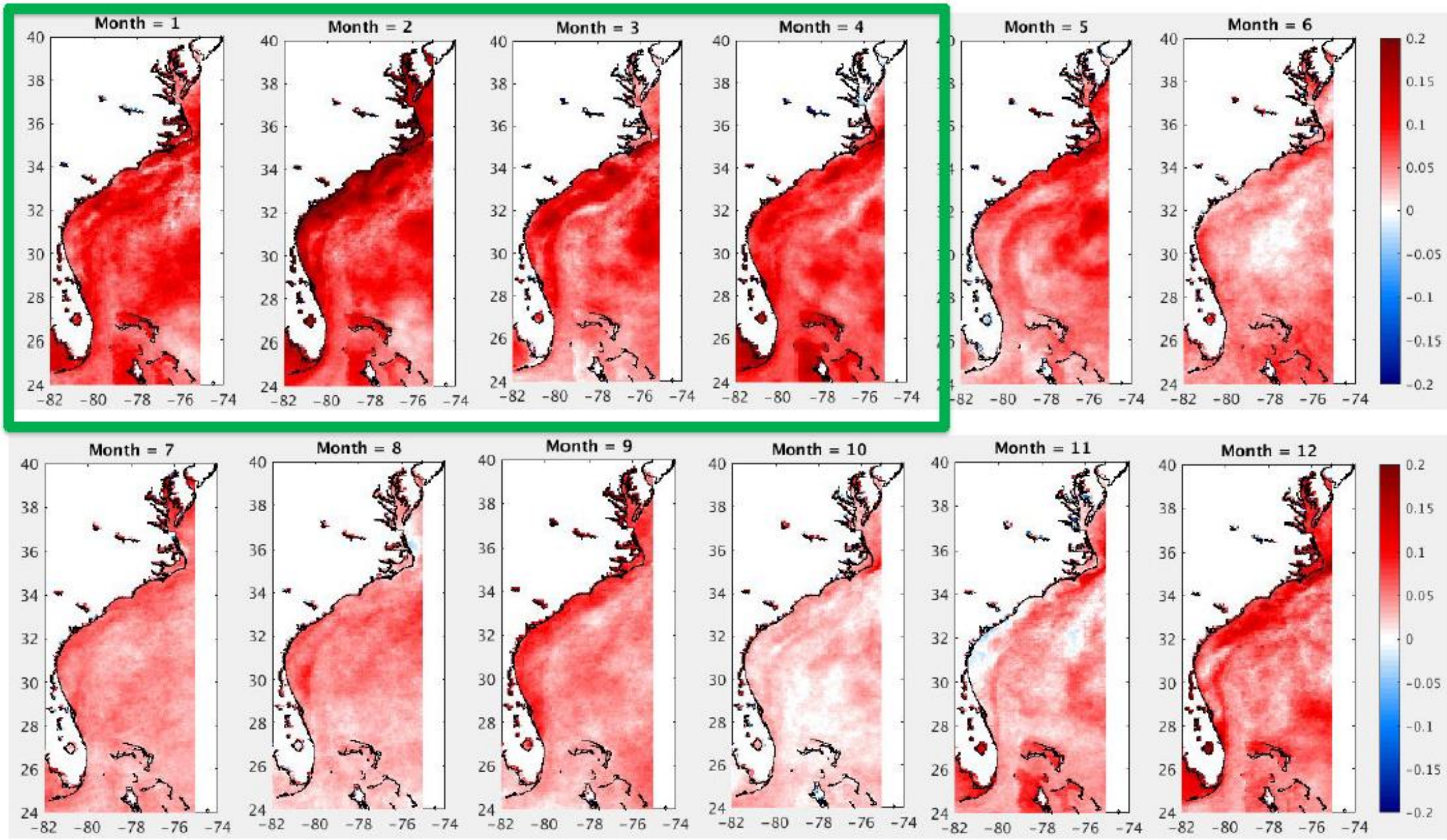
XXX = peak spawning

Abundance decrease,
Evident low recruitment

Abundance increase,
No signs of low recruitment

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Black sea bass		XXX	XXX	XXX								
Gag		XXX	XXX	XXX								
Stenotomous spp.		XXX	XXX									
Red grouper	XXX	XXX	XXX	XXX	XXX							
Red porgy	XXX	XXX	XXX								XXX	XXX
Scamp			XXX	XXX	XXX							
Sand perch					XXX	XXX	XXX					
Almaco jack							XXX					
Lane snapper						XXX	XXX	XXX				
Red snapper						XXX	XXX	XXX	XXX	XXX		
Vermilion snapper						XXX	XXX	XXX				
White grunt					XXX	XXX						
Mutton snapper					XXX	XXX	XXX					
Gray snapper						XXX	XXX					

MODIS SST 2002-2020



Using Ecosystem Information in the Stock Assessment and Advice Process

Sarah Gaichas - Northeast Fisheries Science Center

State of the Ecosystem (SOE) reporting

Improving ecosystem information and synthesis for fishery managers

•Ecosystem indicators linked to management objectives (DePiper, et al., 2017)
- Contextual information
- Report evolving since 2016
- Fishery-relevant subset of full Ecosystem Status Reports

•Open science emphasis (Bastille, et al., 2021)

•Used within Mid-Atlantic Fishery Management Council's Ecosystem Process (Muffley, et al., 2021)
- Risk assessment (Gaichas, et al., 2018)
- Conceptual modeling (DePiper, et al., 2021)
- Management strategy evaluation (MSE)

SSC Recommends inviting Sarah Gaiches to give her presentation to the CFMC

SCS7 Summary: Some observations

- Effects of climate change on US Fisheries is being observed now with more profound implications expected in the next 20 years in several regions.

- Since 2018, several FMCs have started considering models that include ecosystem linkages and / or adopted climate informed risk assessments. However, challenges remain including: pros and cons of shifting biological reference points, carrying capacity, and management units.

- FMCs may (will) encounter new challenges due to competing use of marine systems, abrupt shifts in distribution or abundance, and changes in ecosystem structure and function with impacts on sectors and communities and data collection methodologies. Finding equitable management adaptation pathways will be challenging.

SCS7 Summary: Near term expectations

- Increased consideration of non-stationary spatial shifts in assessments. (Spatial temporal models)
- Monitoring/new technologies (early warning and trend analysis); are we measuring what we need to prepare for the future?
- Communication/dialogue focus - Stakeholder workshops
- MSE scenarios based on ecosystem consideration are standard; testing robustness of mgt rules; data poor ones also useful
- Identify climate ready management scenarios in regions that have high diversity and more complex monitoring challenges

SCS7 Summary: Some Recommendations

- Insure the FMCs have the capacity to “adapt fisheries management to a changing environment”. Continue and expand:
  - Monitoring & new technology (physical, biogeochemical, societal and biological)
  - Process and retrospective studies
  - Modeling (emerging research models, MSEs)
  - Multiple ways of detecting change (LK/TK/S)
  - Evolving Standards
- Interdisciplinary research teams are needed for success; training students to succeed in this setting is needed.

Conflict of Interest

- The SSC implemented at both meetings the new guidelines for conducting meetings
- These were read at the start of each meeting, with reminders each day
- General sense is that these have worked to facilitate more directed and amicable discussion
- However, issues of past accountability remain unaddressed

Resignation of Dr. Appeldoorn as SSC Chair

Effective end of current CFMC Meeting

Various reasons

- There is a fair amount of stress associated with running meetings (conflicts, extracting discussion/decisions)
- Chairing prevents person from acting on a deeper level with the issues
- Position has not changed in ~10 years
- Defense of SSC members and remaining accountability issues

Resignation of Dr. Appeldoorn as SSC Chair

The SSC Chair wants to thank:

- Current and past members of the SSC
- The help of the SEFSC, especially the stock assessment staff
- The assistance of the CFMC staff
- The current and past members of the CFMC

The SSC Chair looks forward to continuing to work with the SSC as an SSC member