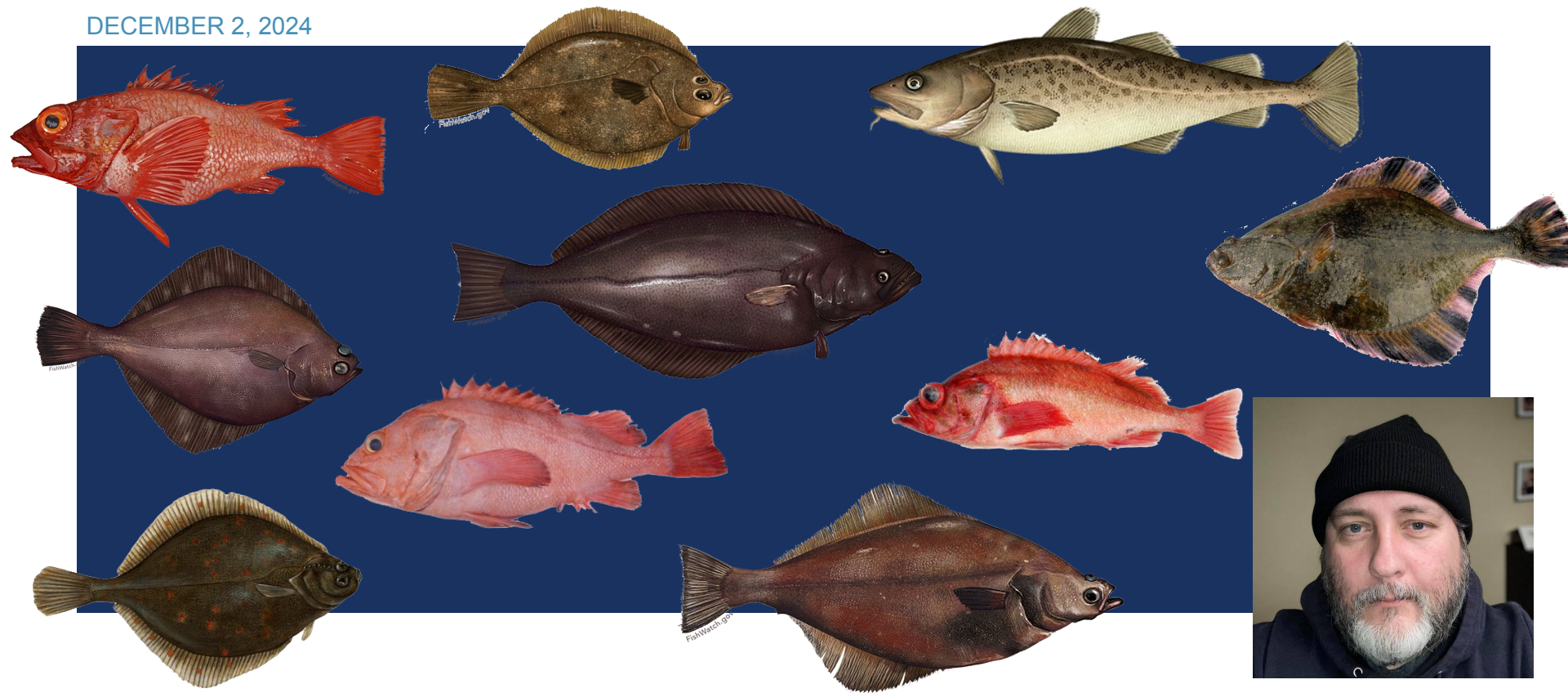
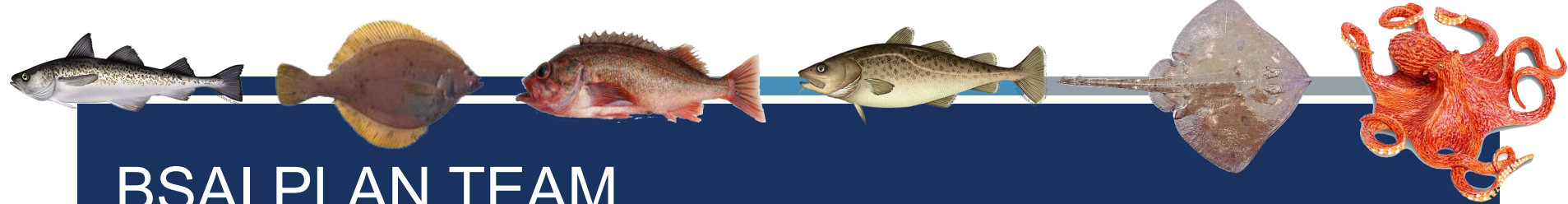


REPORT OF THE NOVEMBER 2024 BSAI GROUND FISH PLAN TEAM MEETING

STEVE BARBEAUX (CO-CHAIR), KALEI SHOTWELL (CO-CHAIR), CINDY TRIBUZIO (VICE-CHAIR), DIANA STRAM (COORDINATOR)

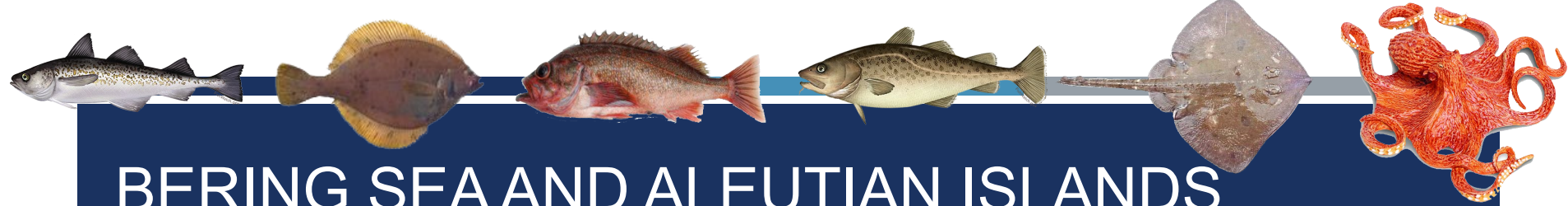
DECEMBER 2, 2024





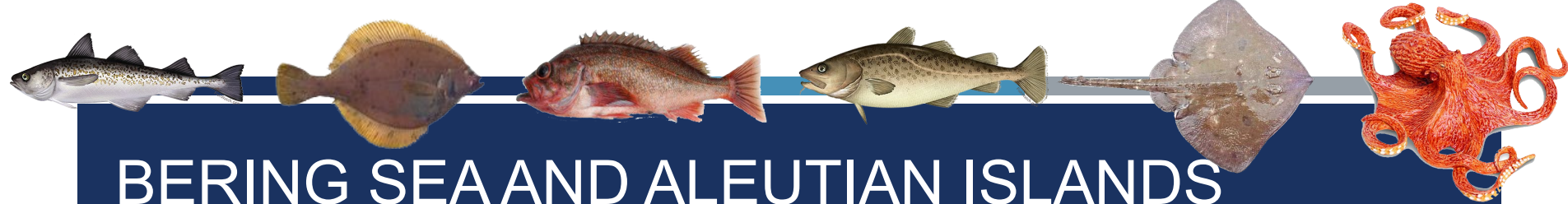
BSAI PLAN TEAM MEETING OVERVIEW

- Dates: November 12-15
- Place: AFSC in Seattle
- Leaders: Steve Barbeaux, Kalei Shotwell (co-chairs); Cindy Tribuzio (vice-chair); Diana Stram (coordinator)
- Participation:
 - Steven Whitney (NMFS AKRO)
 - Allan Hicks (IPHC)
 - Lisa Hillier (WDFW)
 - Kirstin Holsman (AFSC REFM)
 - Phil Joy (ADF&G)
 - Andy Kingham (AFSC FMA)
 - Beth Matta (AFSC REFM)
 - Andy Seitz (UAF)
 - Jane Sullivan (AFSC)
 - Lucas DeFilippo (AFSC ABL)
 - AFSC and AKRO staff and members of the public



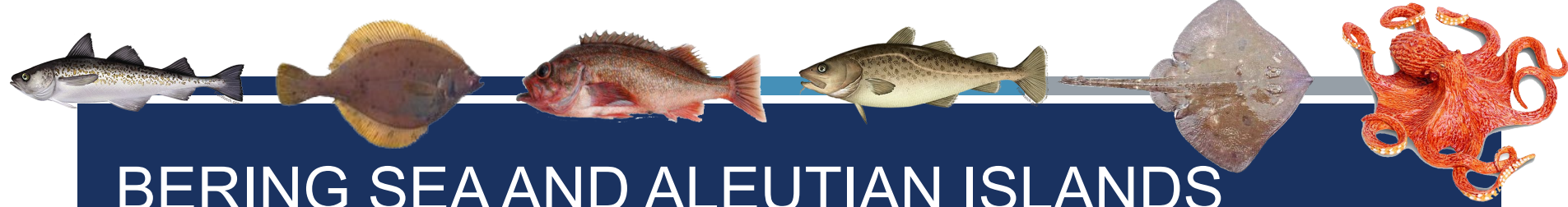
BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE

- Assessments of 26 stocks/complexes – (9 **Full**, 9 Update; 3 Harvest projection; 2 Catch report; 2 Ecosystem report; 1 “none”)
- Total of 28 models, including Tier 5/6 methods:
 - 18 base models/methods
 - 10 additional models/methods
- The Team agreed with authors’ recommendations regarding preferred models/methods and harvest specifications in all stocks
- 1 new reductions from maximum permissible ABC recommended (2 total)
- Of the 15 stocks/complexes in Tiers 1 or 3, only 2 are in sub-tier “b”
- No stocks/complexes were subjected to overfishing in 2023, and no Tier 1 or 3 stocks/complexes are overfished/approaching as of 2024
- 27 additional Team recommendations beyond accepting model recommendations



BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE (TINY FONT)

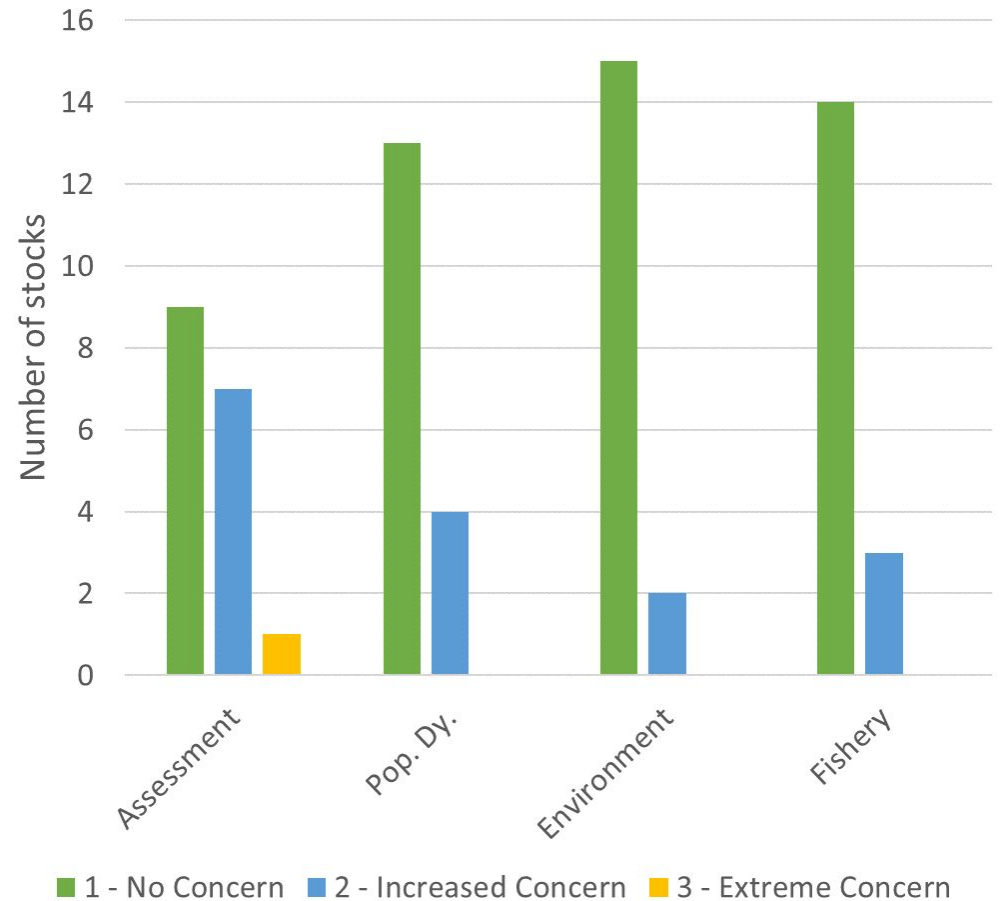
Chapter	Assessment	Author	Tier	Type	Risk	% Reduction
1	Eastern Bering Sea pollock	Ianelli	3a	Full	1,1,1,1	
1A	Aleutian Islands pollock	Barbeaux	3a	Update	1,1,1,1	
1B	Bogoslof Island pollock	Ianelli	5	Update	1,1,1,1	
2	Eastern Bering Sea Pacific cod	Barbeaux	3b	Full	1,1,2,1	
2A	Aleutian Islands Pacific cod	Spies	3b	Full	1,2,2,1	
3	Sablefish	Goethel	3a	Update		
4	Yellowfin sole	Spies/Bryan	1a	Update	1,1,1,1	
5	Greenland turbot	Bryan	3a	Full	3,2,1,2	10%
6	Arrowtooth flounder	Shotwell	3a	H-Proj		
7	Kamchatka flounder	Bryan	3a	Full	2,1,1,1	
8	Northern rock sole	McGilliard	1a	Full	1,1,1,1	
9	Flathead sole	Kapur	3a	Update	1,1,1,1	
10	Alaska plaice	Cronin-Fine	3a	Full	1,1,1,1	
11	Other flatfish	Monnahan	5	Update	1,1,1,1	
12	Pacific ocean perch	Spencer	3a	Full	2,1,1,1	
13	Northern rockfish	Spencer	3a	H-Proj		
14	Rougheye & blackspotted rockfish	Spencer	3a	Full	2,2,1,2	
15	Shortraker rockfish	Shotwell	5	Update	2,1,1,1	
16	Other rockfish	Sullivan	5	Update	2,2,1,2	
17	Atka mackerel	Sullivan/Lowe	3a	Update	1,1,2,1	
18	Skates	Tribuzio	5	H-Proj		
19	Sharks	Tribuzio	6	C-Rep		13%
22	Octopus	Cronin-Fine	6	C-Rep		
Appendix 1	Forage Species (including Squid)	Szulwaski	eco	E-Rep		
Appendix 2	Sculpins	Spies	eco	None		
Appendix 3	Grenadiers	Siwicke	eco	E-Rep		

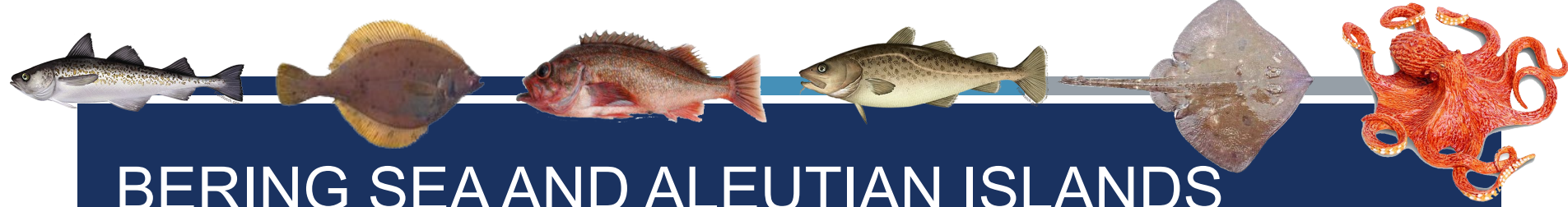


BERING SEA AND ALEUTIAN ISLANDS RISK TABLE AND REDUCTIONS

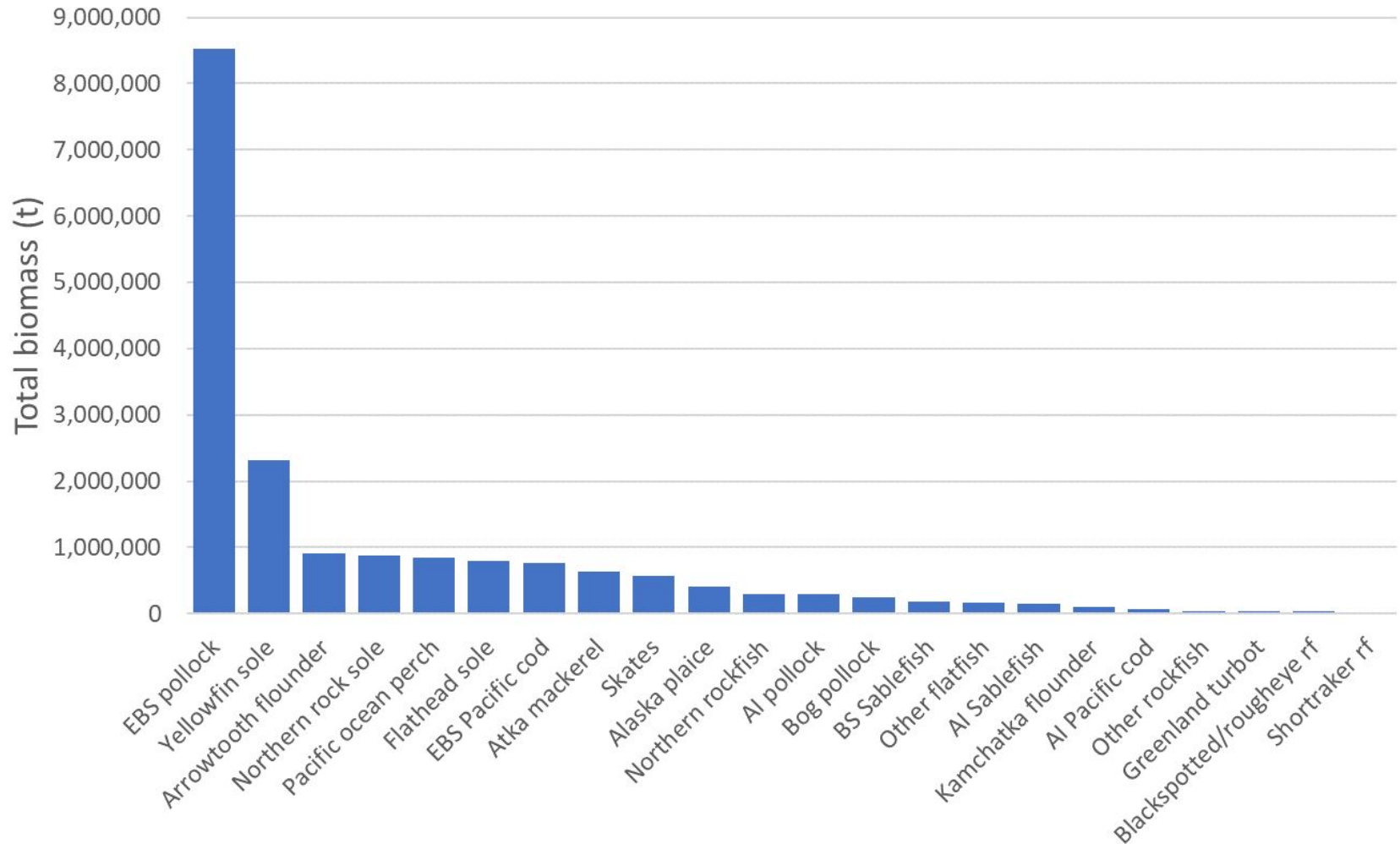
- One category of one stock with extreme concern
- One of the two recommendations for reduction from maximum permissible ABC were from this year's deliberations (Greenland turbot).
- One of the reductions was carried over from 2023 determinations (shark).

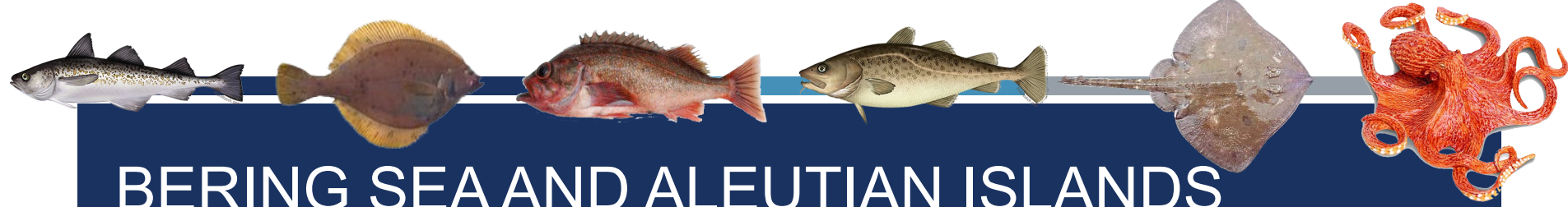
Risk Table Scoring (17 Stocks)



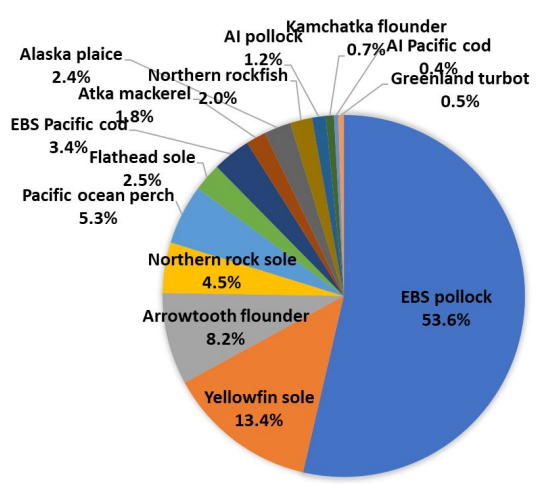
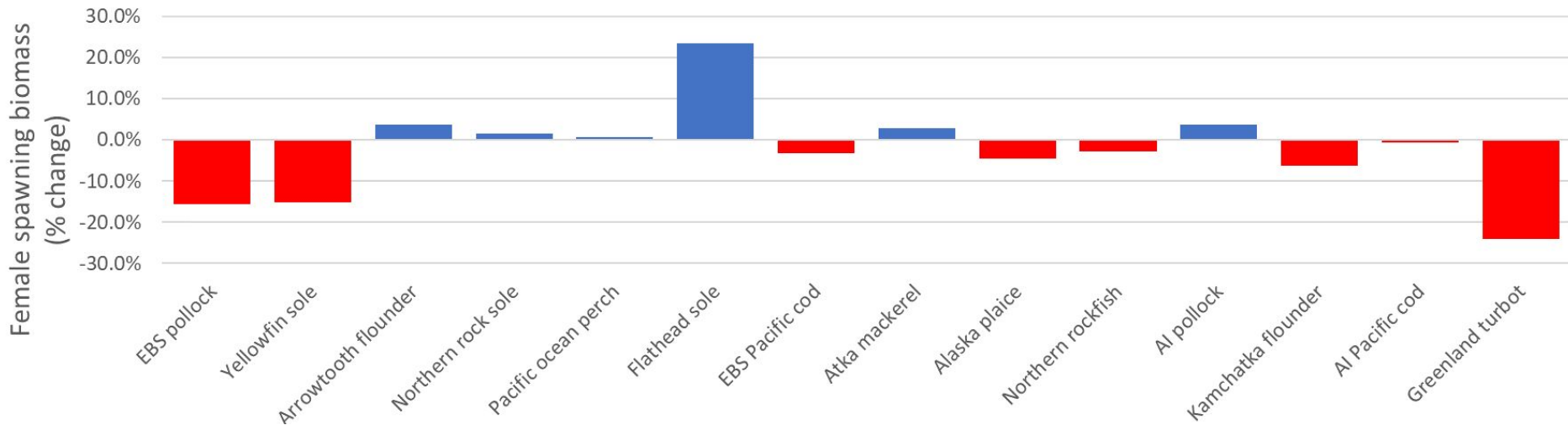


BERING SEA AND ALEUTIAN ISLANDS TOTAL BIOMASS (TIER 1, 3, AND 5)

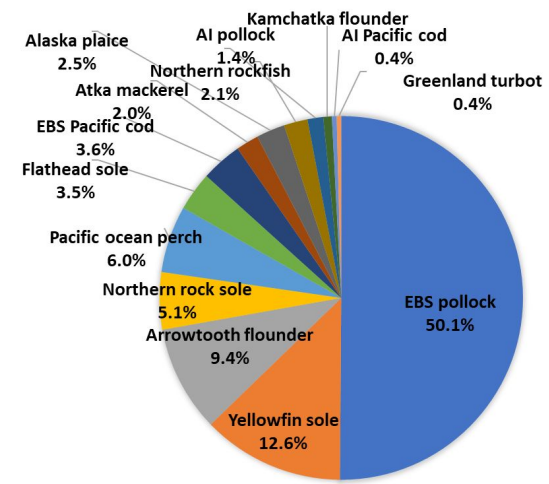




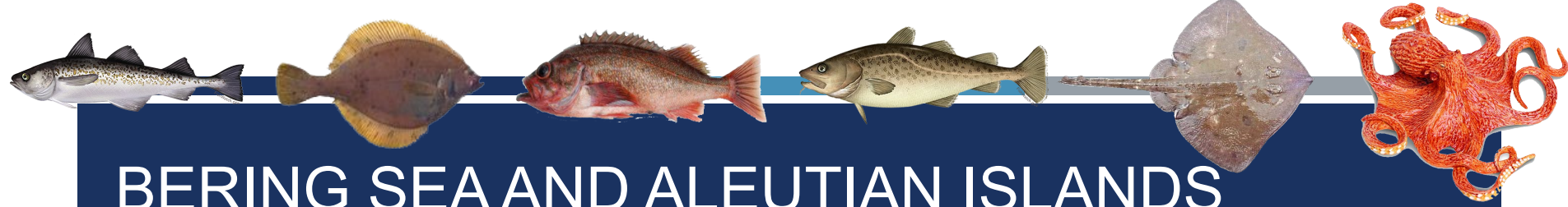
BERING SEA AND ALEUTIAN ISLANDS SPAWNING BIOMASS (TIERS 1 AND 3)



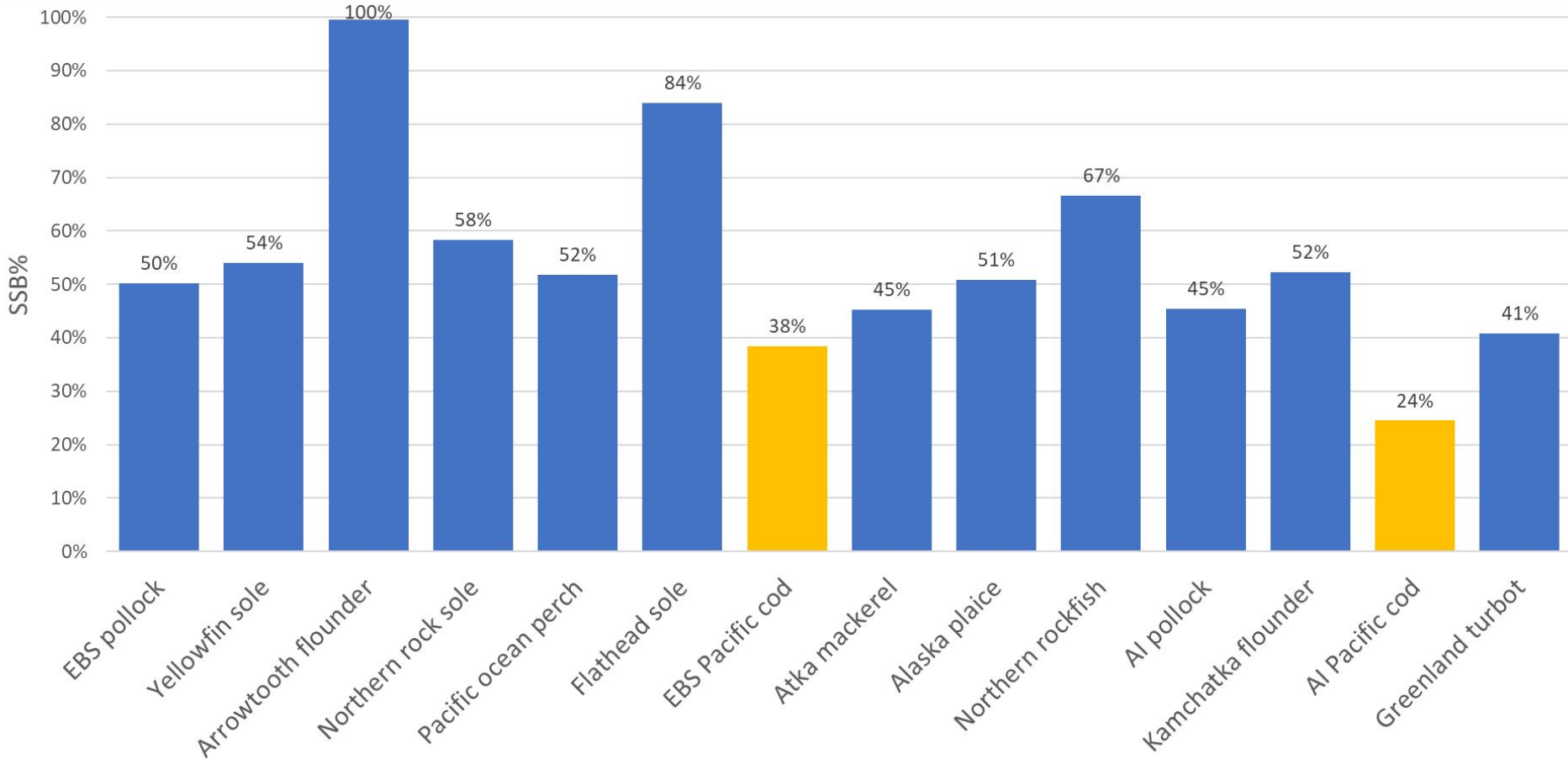
2024

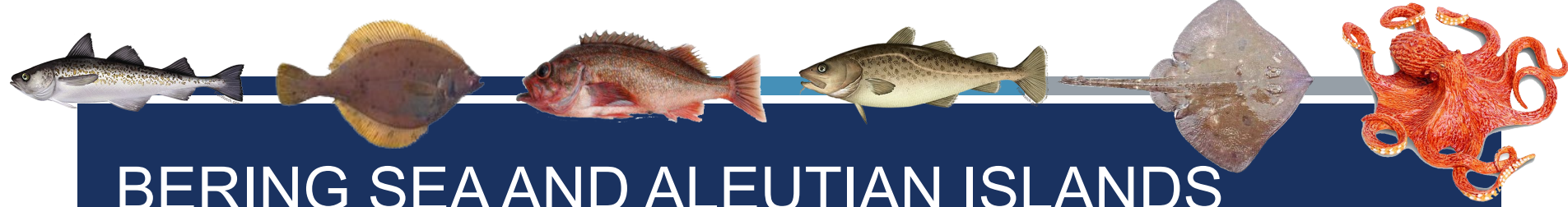


2025

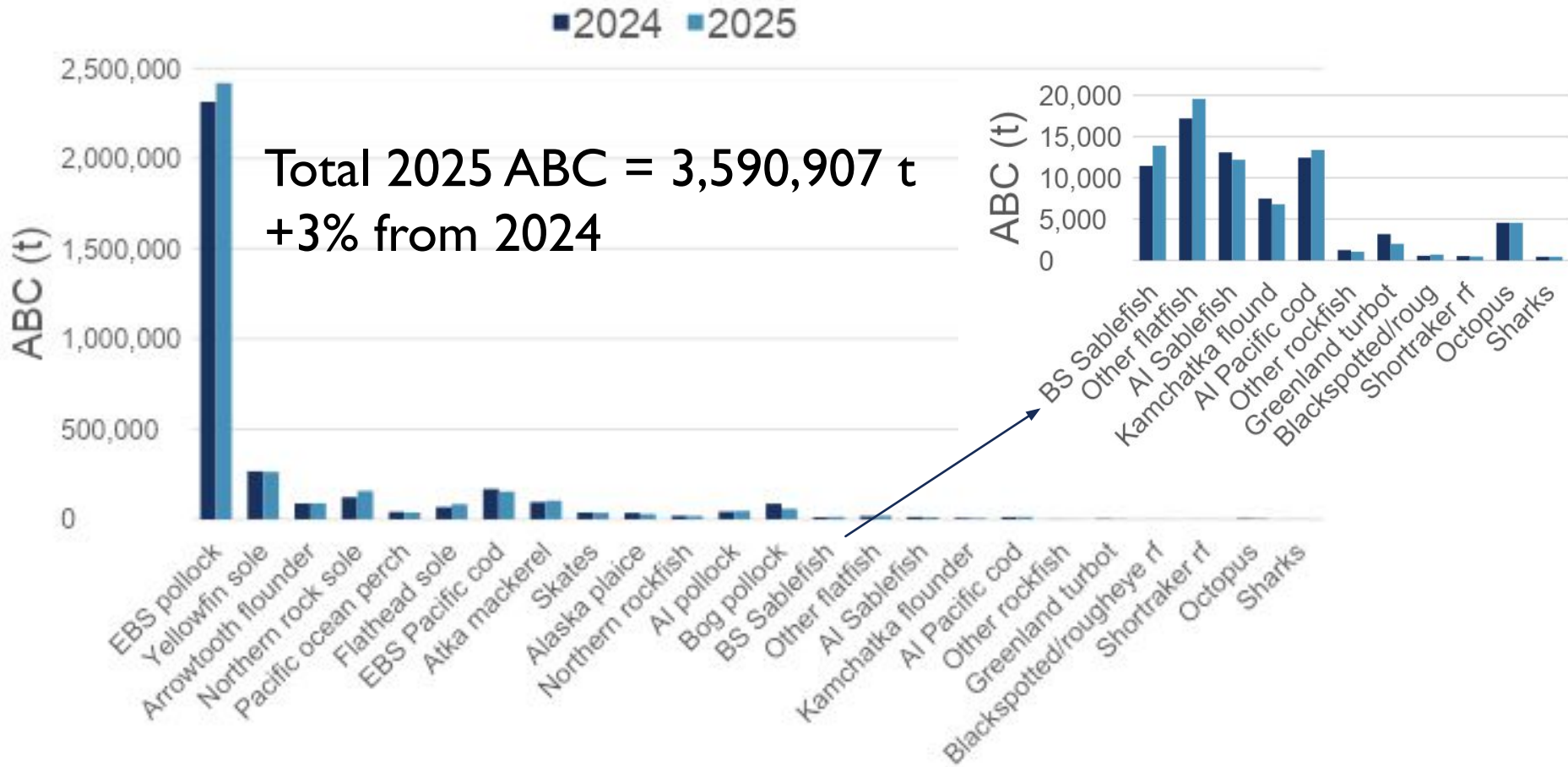


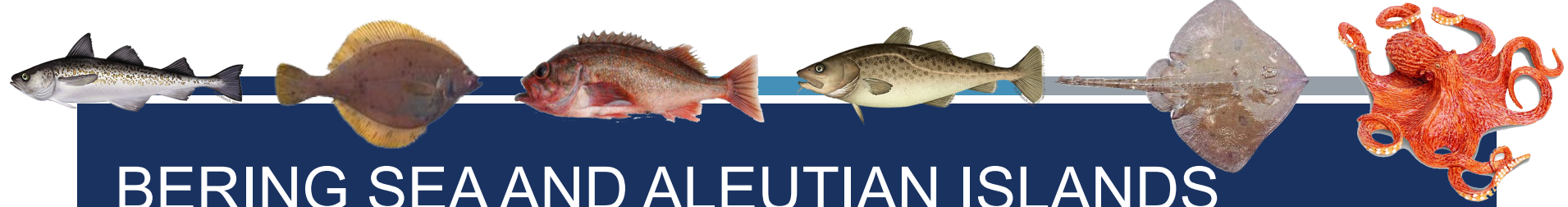
BERING SEA AND ALEUTIAN ISLANDS SPAWNING BIOMASS (TIERS 1 AND 3)



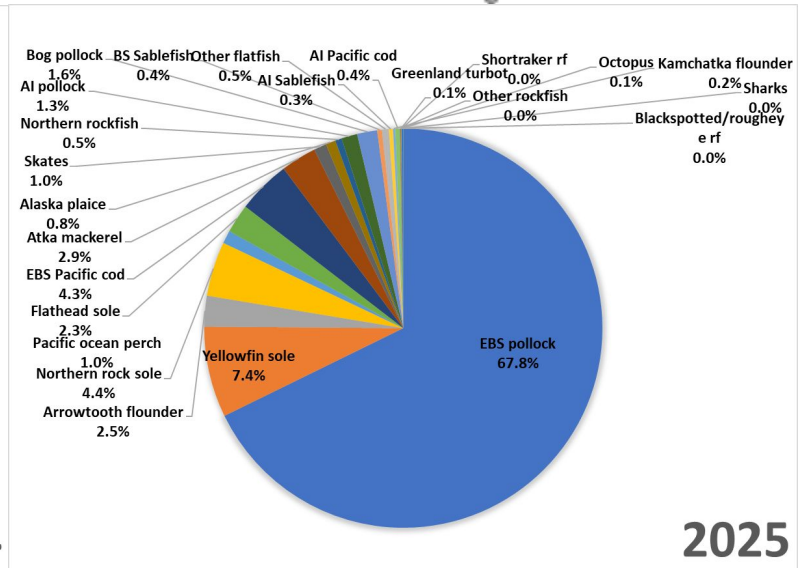
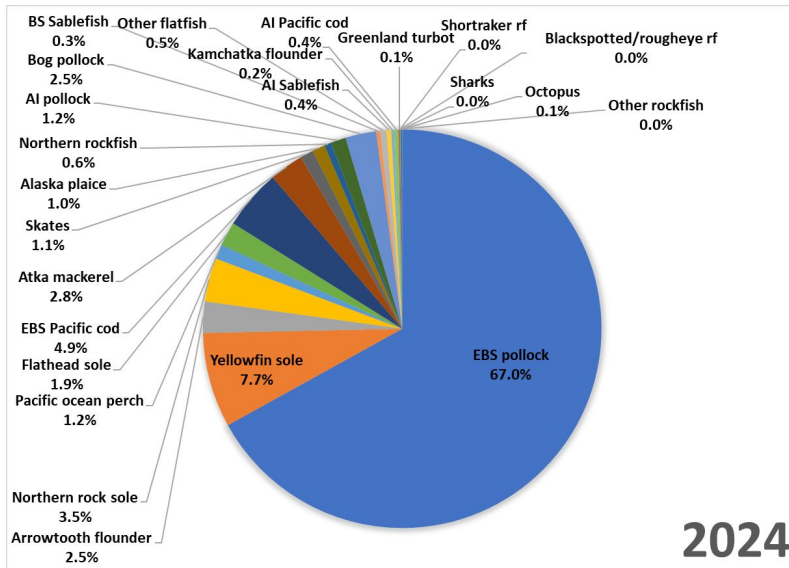
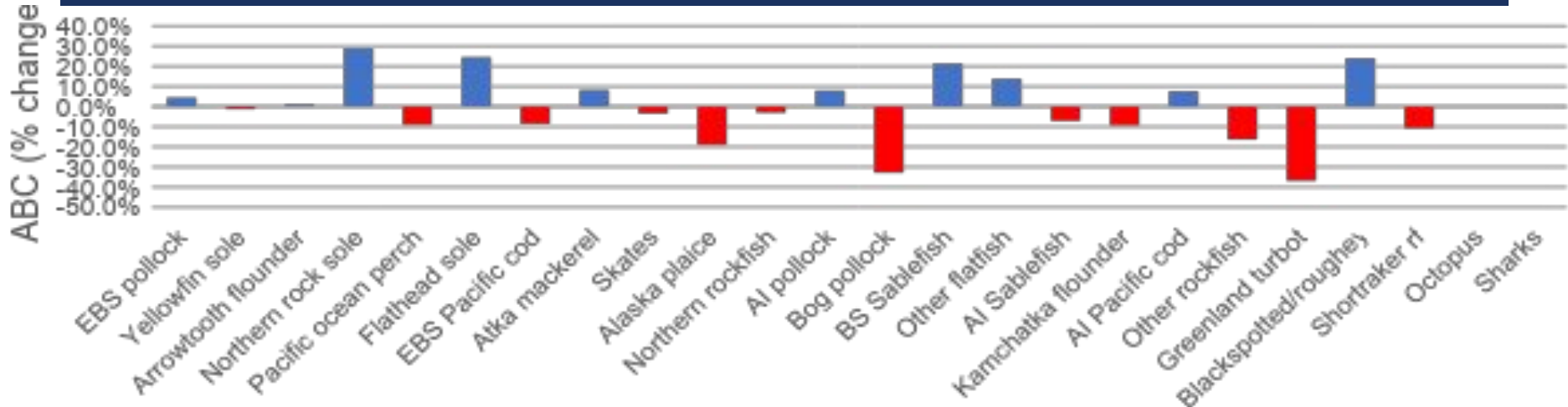


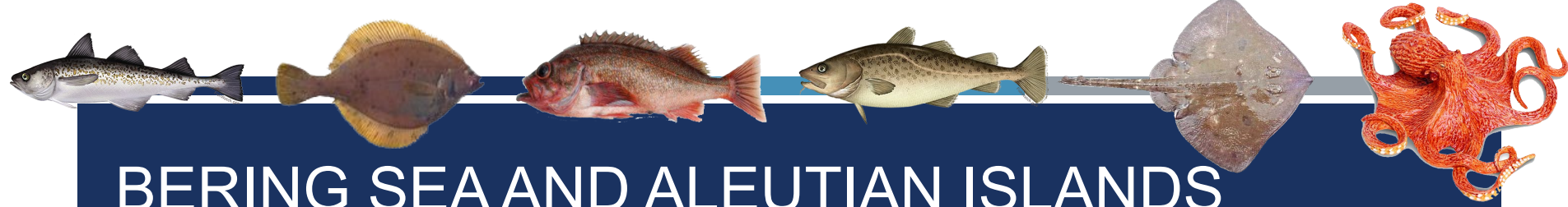
BERING SEA AND ALEUTIAN ISLANDS ALLOWABLE BIOLOGICAL CATCH (ABC)





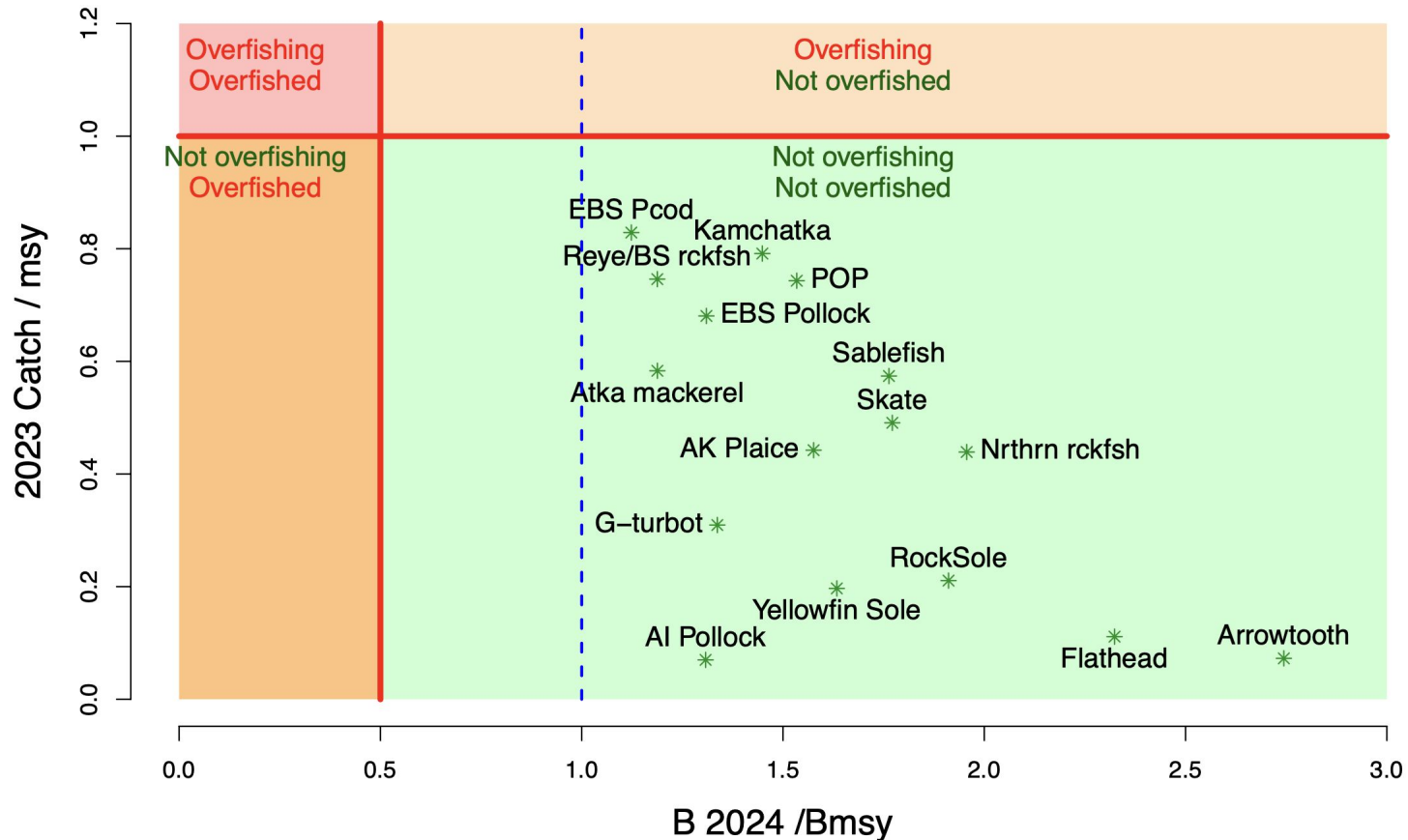
BERING SEA AND ALEUTIAN ISLANDS CHANGE IN 2025 ABC PROJECTION

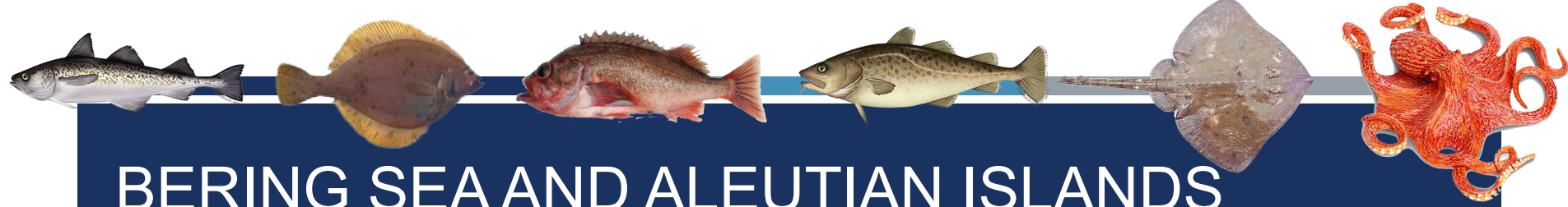




BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE – STOCK STATUS

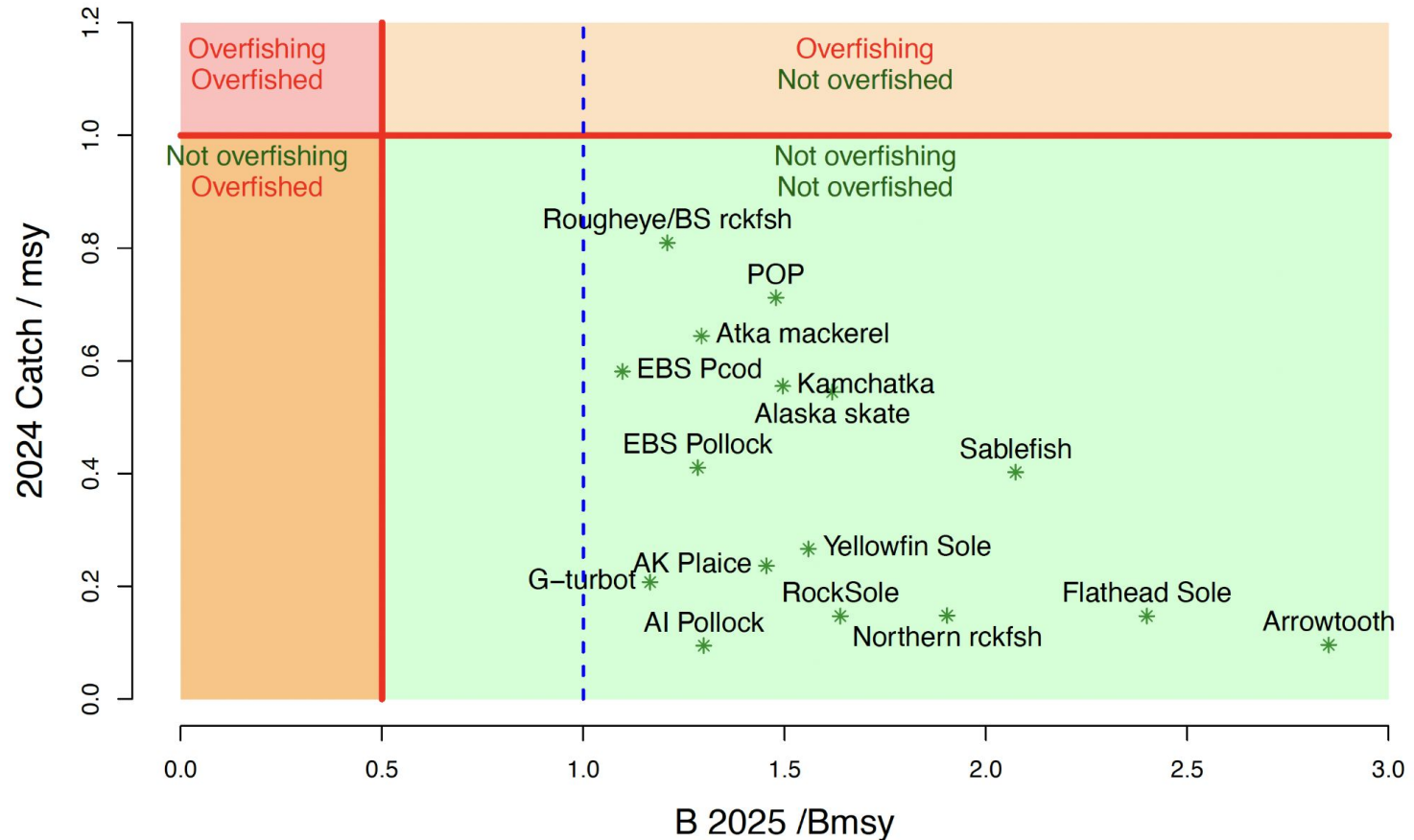
Bering Sea and Aleutian Islands

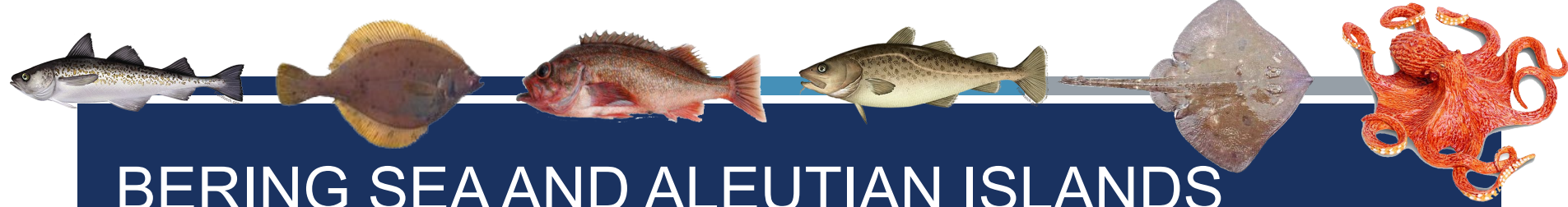




BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE – STOCK STATUS

Bering Sea and Aleutian Islands

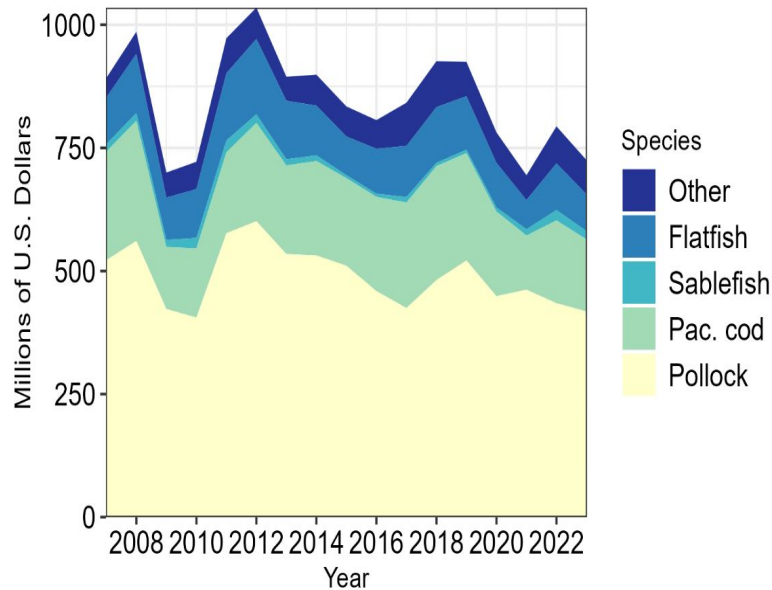




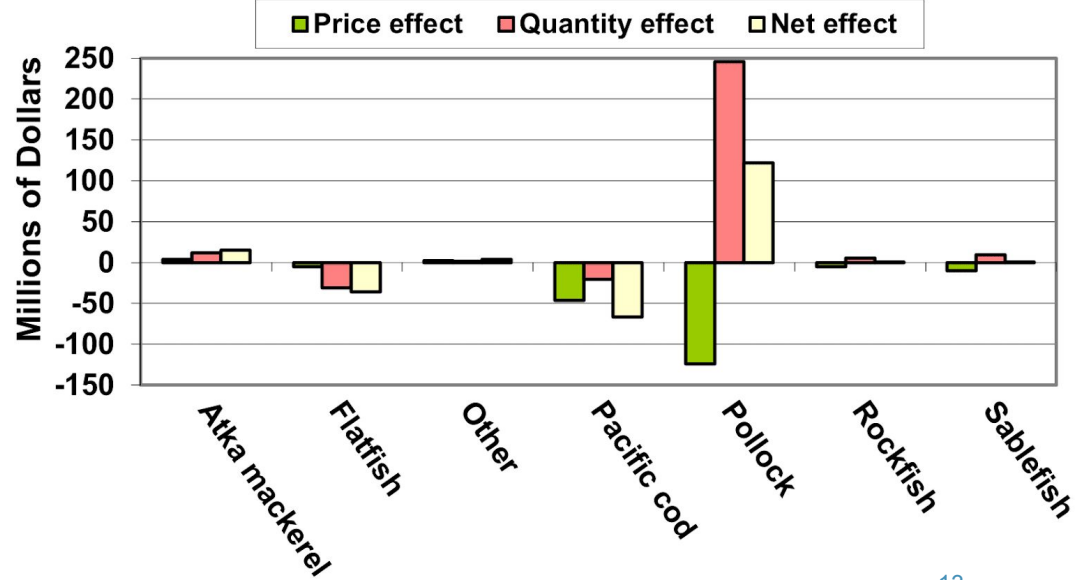
BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE – ECONOMICS

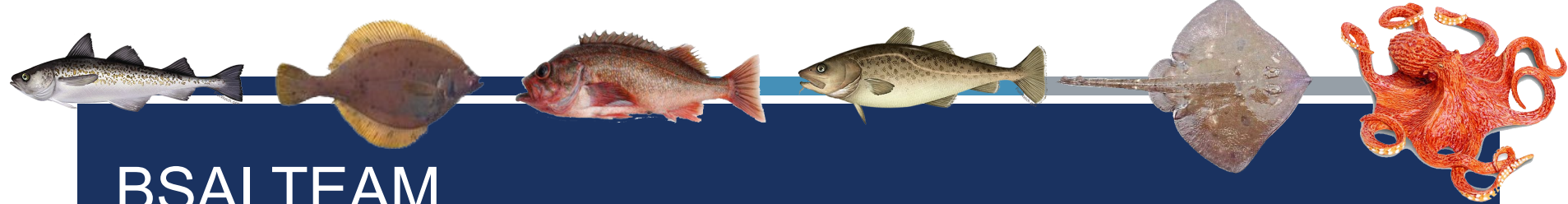
- Increase in value of BSAI harvested species from 2022 to 2023

Real ex-vessel value



BSAI First-Wholesale Revenue Change in 2022-2023
Decomposed by Species Group

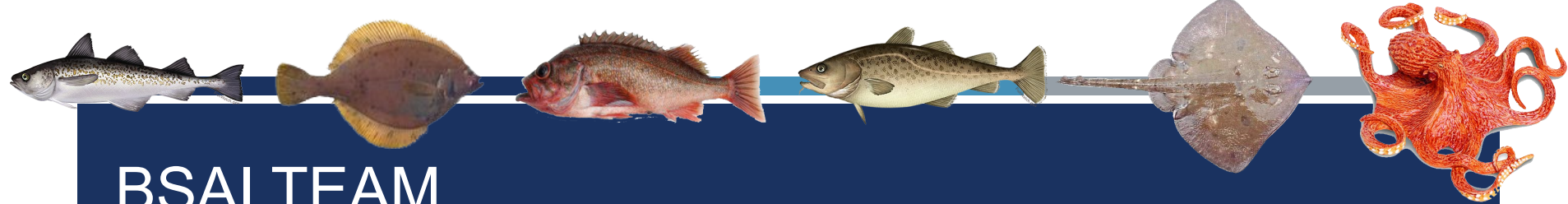




BSAI TEAM DATA LOSS DISCUSSION

Team noted the loss of data in 2024 that will affect stock assessments:

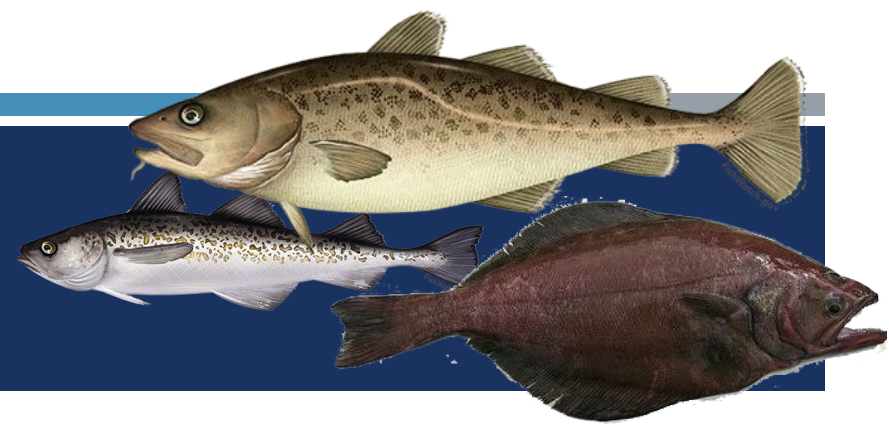
- The 2024 AFSC longline survey did not occur
- The sablefish fishery logbook data stream ended in 2023
- The 2024 AI bottom trawl survey was reduced by 22 vessel days
- The 2024 Northern Bering Sea survey did not occur (it last occurred in 2023)
- There has been no trawl survey on the EBS slope since 2016, which continues to impact several assessments (BSAI Greenland turbot, BSAI POP, BSAI blackspotted/rougheye, BSAI Kamchatka flounder, BSAI shortraker, BSAI other rockfish, and BSAI other flatfish)
- Reduction in Age and Growth Program staff resulted in a loss of regularly scheduled age data sets, including 2023 fishery data for BSAI yellowfin sole and 2022 and 2023 fishery data for BSAI flathead sole



BSAI TEAM GENERAL RECOMMENDATIONS

- The Team recommended that a bullet point be added in harvest projection presentations to explain reductions or changes in max ABC when it occurs.
- The Team recommended that as a best practice that appendices be linked in the front of the document (as with the sablefish assessment) to allow for an easier review of the appendices.

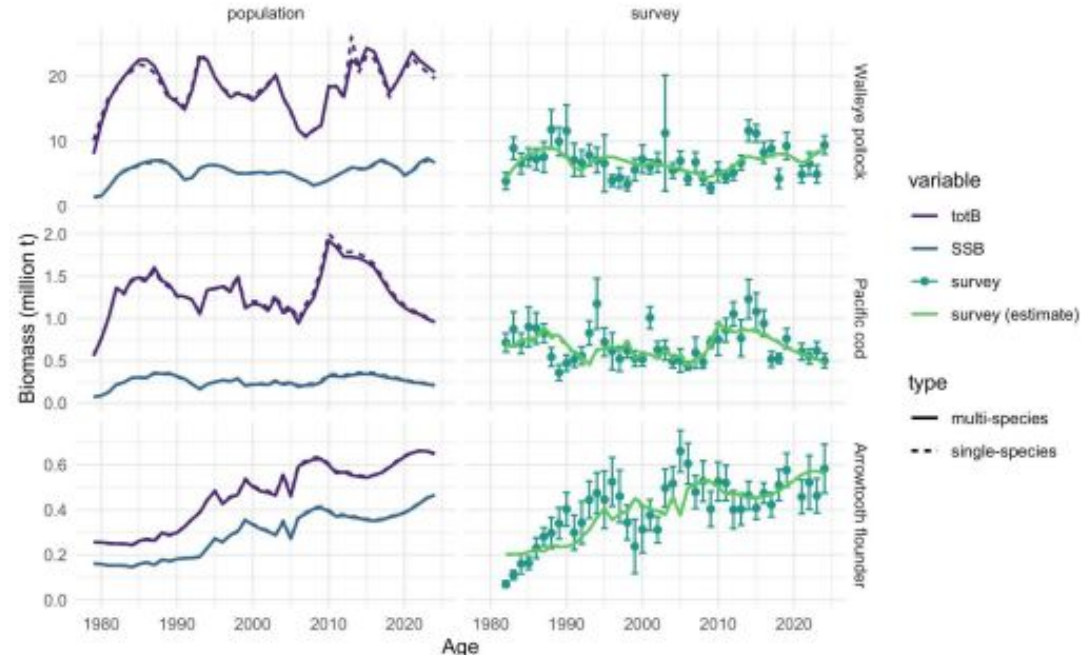
CLIMATE-ENHANCED MULTISPECIES MODEL



● EBS CEATTLE

- Walleye pollock, Pacific cod, and arrowtooth flounder
- Informational only for EBS
- No major model changes from last year

- Trends consistent between single and multi-species modes
- Scale differences due to model specifications (e.g., M at ages)
- Differences in results from single species assessments



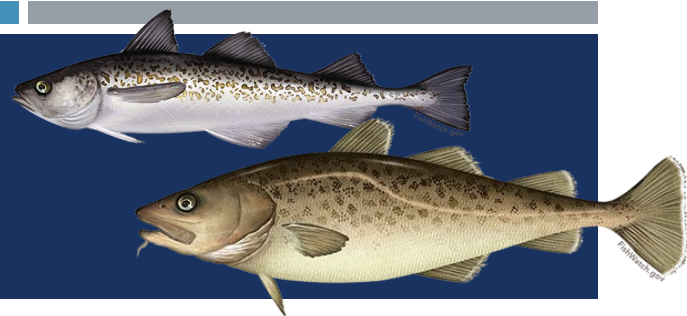


MULTISPECIES RECOMMENDATIONS

■ Multispecies

- The Team recommended that the authors include a comparison of the single-species mode in CEATTLE to the operational single-species stock assessment models to evaluate differences between model results.
- The Team recommended the authors communicate with the ESP teams to explore the duplicative methods.

POLLOCK AND PACIFIC COD SUMMARY



Stock	Tier	2025 ABC (t)	2025 OFL (t)	Change from 2024 ABC
EBS Pollock (Full)	1a	2,417,000	2,957,000	4%
AI pollock (Update)	3a	46,051	55,728	8%
Bogoslof poll. (Update)	5	58,015	77,354	-33%
EBS Pacific cod (Full)	3b	153,617	183,509	9%
AI Pacific cod (Full)	3b	13,376	16,782	8%



CHAPTER 1

EBS WALLEYE POLLOCK

- Full Assessment; Tier 3; risk table (2,1,1,1)
- Switch to authors' presentation (Team comments will follow)





CHAPTER 1

EBS WALLEYE POLLOCK

- Full Assessment; Tier 3; risk table (2,1,1,1)

- The Team concluded that due to the highly sensitive nature of the SRR, the impact on F_{MSY} and the associated uncertainty of F_{MSY} , the reliability of it may be questionable.
- As a well-informed F_{MSY} is a prerequisite for Tier I status under the FMP, the Team determined that this stock should be managed as Tier 3.

Quantity	Last asmt.	This asmt.	Change
M	0.3	0.3	0%
2024 Tier	1a		
2025 Tier	1a	3a	
2024 age+ biomass	10,184,000		-16%
2025 age+ biomass	9,432,000	8,526,000	-10%
2024 spawning biomass	3,518,000		-16%
2025 spawning biomass	3,255,000	2,967,000	-9%
$B_0, B_{100\%}$	6,728,000	5,902,000	-12%
$B_{msy}, B_{35\%}$	2,689,000	2,066,000	-23%
2025 F_{OFL}	0.422	0.513	22%
2025 F_{ABC}	0.379	0.394	4%
2024 OFL	3,162,000		-6%
2025 OFL	3,449,000	2,957,000	-14%
2024 ABC	2,313,000		4%
2025 ABC	2,401,000	2,417,000	1%



CHAPTER 1

EBS POLLOCK RECOMMENDATIONS

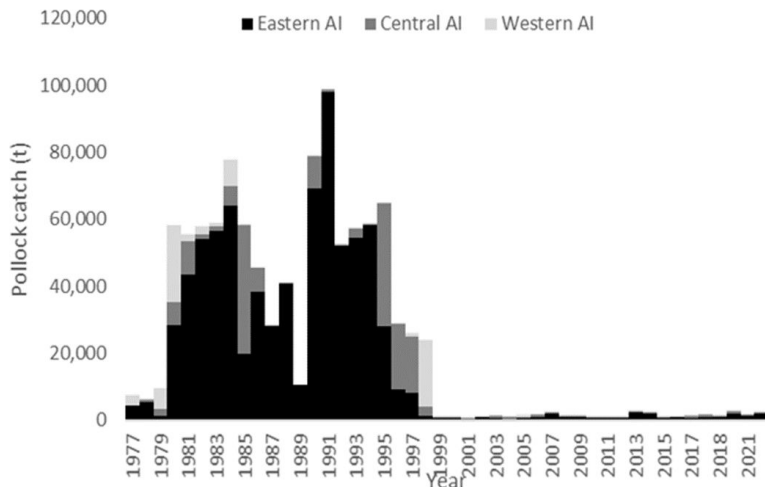
■ EBS Pollock

- The Team supported the continued use of the current model (Model 23) for this year and supported the author's recommendation of managing the EBS walleye pollock stock under Tier 3.



CHAPTER 1A ALEUTIAN ISLANDS WALLEYE POLLOCK

- Update Assessment; Tier 3; risk table (1,1,1,1)
 - Same model since 2015
 - 19,000t cap remains
 - <5,000 t since 1998



Quantity	Last asmt.	This asmt.	Change
M	0.21	0.21	0%
2024 Tier	3a		
2025 Tier	3a	3a	
2024 age+ biomass	279,764		3%
2025 age+ biomass	302,068	288,407	-5%
2024 spawning biomass	79,747		4%
2025 spawning biomass	81,335	82,781	2%
B _{100%}	174,218	182,006	4%
2025 F _{OFL}	0.38	0.406	7%
2025 F _{ABC}	0.305	0.325	7%
2024 OFL	51,516		8%
2025 OFL	53,030	55,728	5%
2024 ABC	42,654		8%
2025 ABC	43,863	46,051	5%

CHAPTER 1A

AI POLLOCK RECOMMENDATIONS



■ AI Pollock

- The Team recommended the author bring forward a Tier 5 model in 2026 to evaluate going to a Tier 5 from Tier 3.



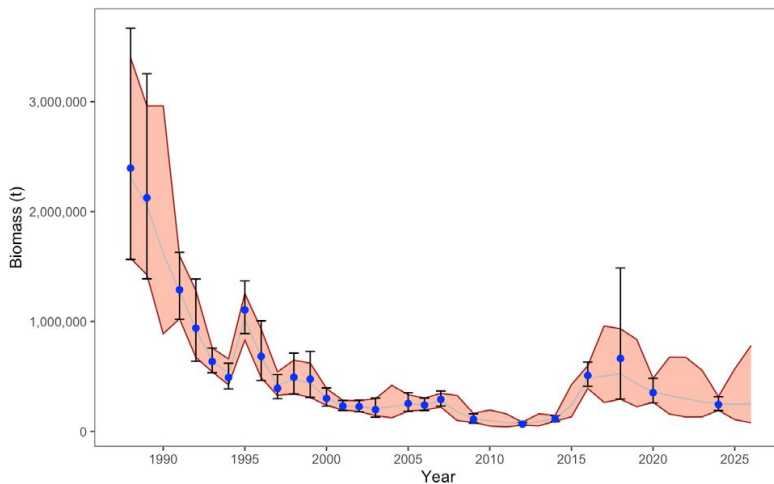
CHAPTER 1B BOGOSLOF WALLEYE POLLOCK



- Update Assessment; Tier 5; risk table (1,1,1,1)

- 2024 Acoustic Survey
 - 31% reduction in biomass from 2020
- rema model
 - 33% reduction in biomass from previous assessment

Quantity	Last asmt.	This asmt.	Change
M	0.313	0.313	0%
2024 Tier	5		
2025 Tier	5	5	
2024 age+ biomass	367,880		-33%
2025 age+ biomass	367,880	247,137	-33%
2025 F _{OFL}	0.313	0.313	0%
2025 F _{ABC}	0.23475	0.235	0%
2024 OFL	115,146		-33%
2025 OFL	115,146	77,354	-33%
2024 ABC	86,360		-33%
2025 ABC	86,360	58,015	-33%





CHAPTER 1A

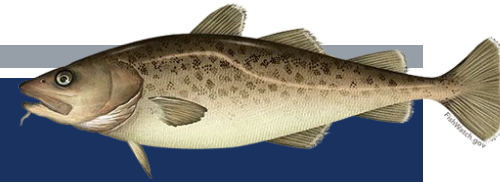
BOGOSLOF POLLOCK RECOMMENDATIONS

■ Bogoslof pollock

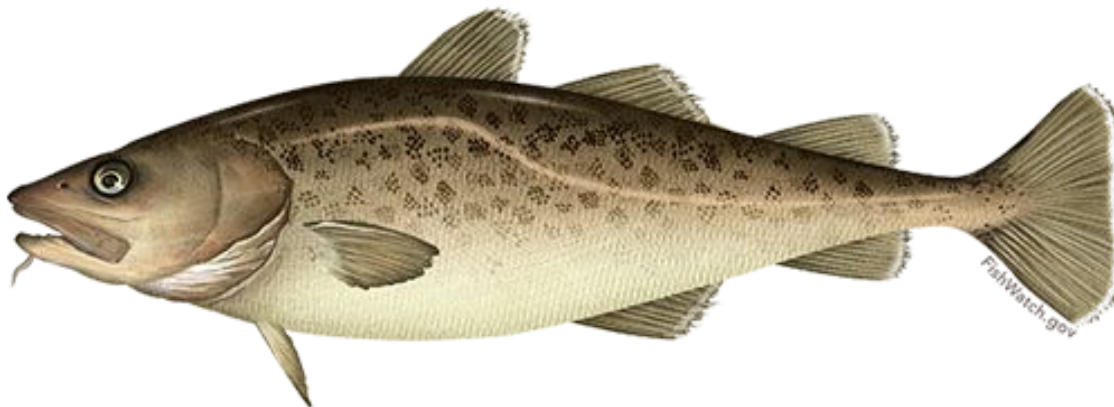
- Given concerns regarding the frequency of the survey, the Team recommended bringing forward the age-structured model in the next full assessment to incorporate the age data.

CHAPTER 2

EBS PACIFIC COD



- Full Assessment; Tier 3; risk table (1,1,2,1)
- Switch to authors' presentation (Team comments will follow)



EBS Pacific cod Ecosystem and Socioeconomic Profile (ESP)



Ecosystem (ABC Information):

- Overall average (YOY ↓, juv ↔, adult ↑)
- North Pacific Index avg signals moderate conditions, surface temperatures cooling
- Low euphausiid prey, below avg juvenile condition
- Sea-ice extent below average, population shifts to the southwest, expanding area
- Above average bioenergetic demand, below avg adult condition, below avg biomass consumed

Socioeconomic (TAC Information):

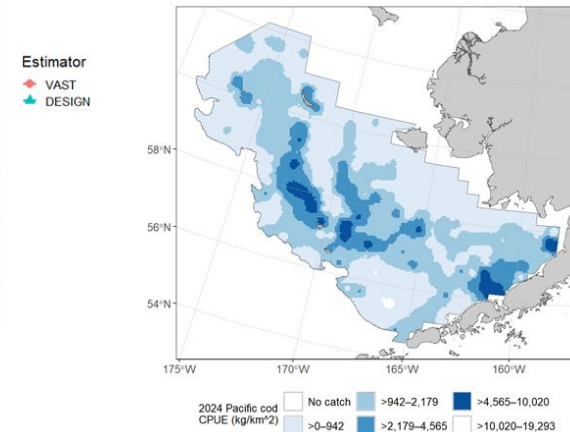
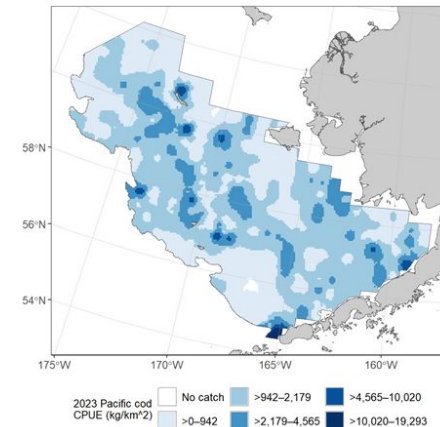
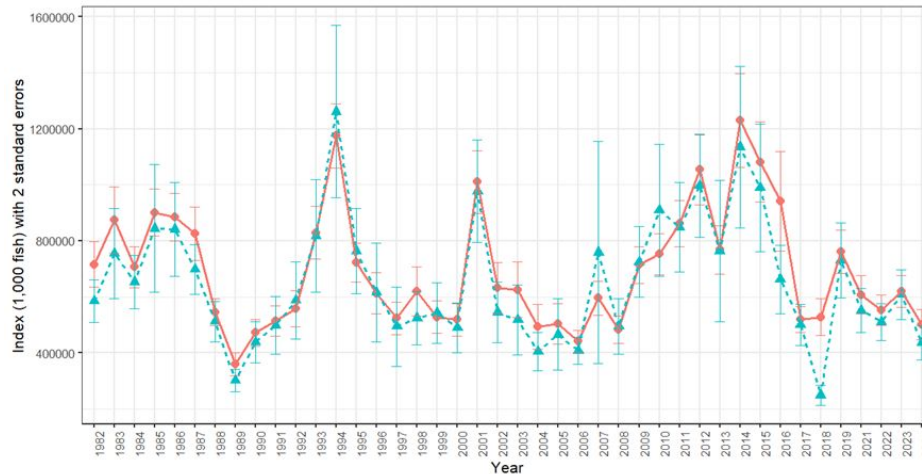
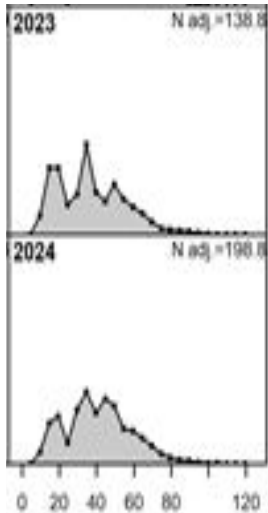
- Low ex-vessel value, price decreased but continues to be above average
- Revenue per unit effort stable and above average





2024 EBS bottom trawl survey

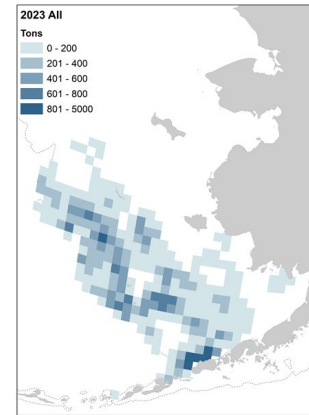
- No Northern Bering Sea extension
- VAST estimate using ice-extent as covariate
 - 19% decline in abundance from 2023
 - 8% decline in biomass from 2023
 - Continued southward shift in distribution



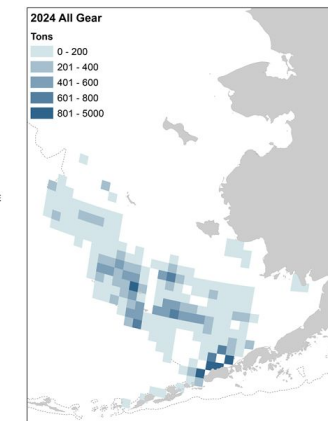
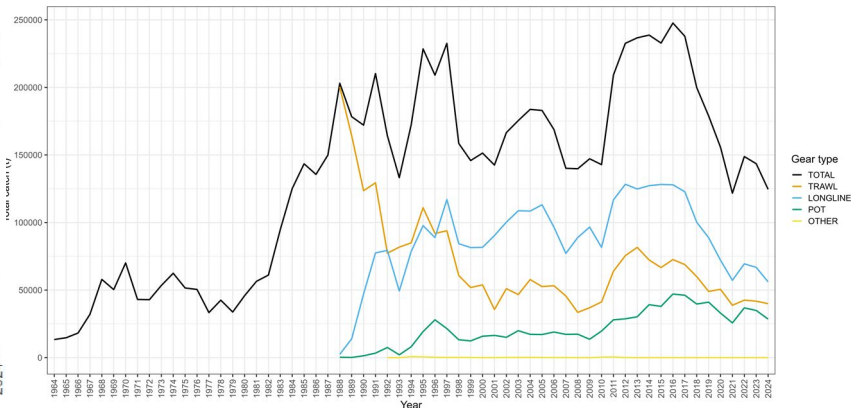
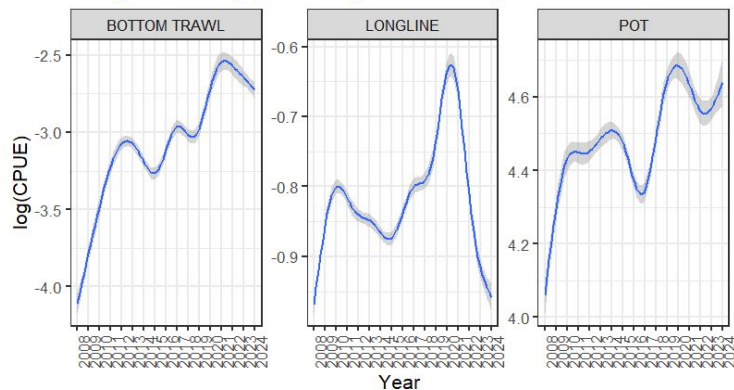


2024 Fishery

- Southward shift in distribution
 - CPUE increase in Pot
 - CPUE decrease in Bottom trawl and Longline
- 2024 Catch at 131,015 t of 167,952 t ABC (78%) as of October 24, compared to 97-99% in previous 5 years at this time
 - Poor market conditions for shoreside sector



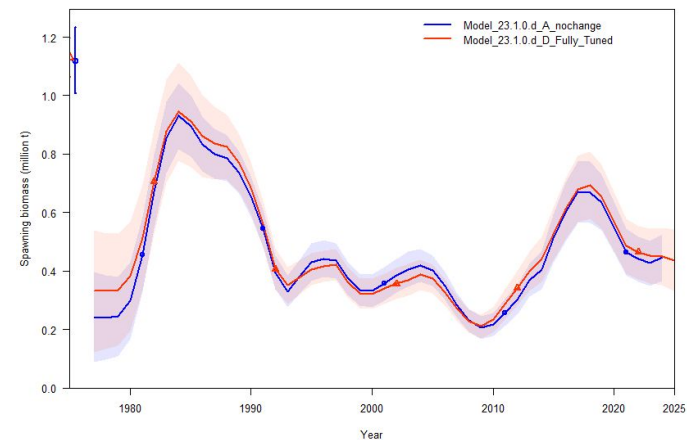
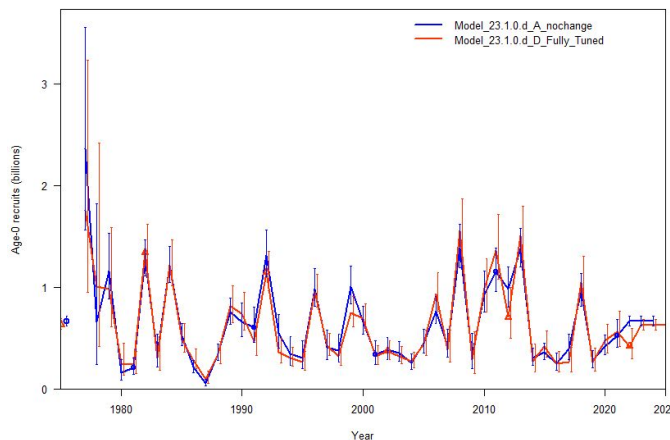
Weight CPUE by year and gear for Bering Sea





Model bridging from 2023

- Addition of 2024 data
 - Aging error and aging bias update
 - Updated survey index with 2024 VAST index abundance estimate
 - Refit SD adjustment to survey index
 - Update survey age comps (2000-2023)
 - Update survey length composition (1982-1999, and 2024)
 - Update fishery length composition (1977-2024)
 - Annual variability in growth limited to 2000-2024
- Retuning of sigmas and Francis tuning of variance adjustment factors





Model development

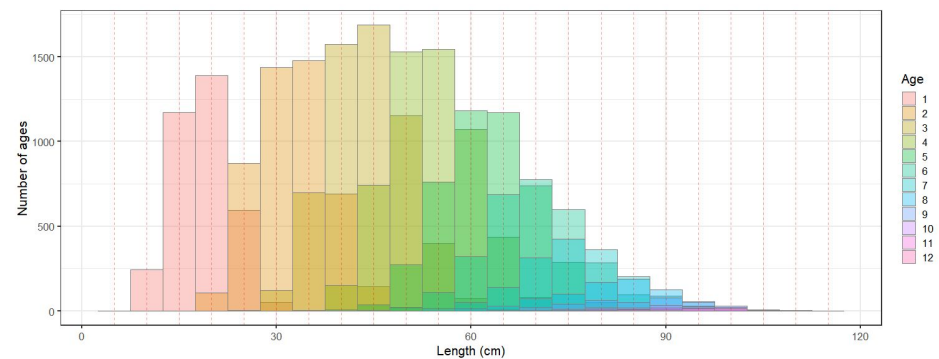
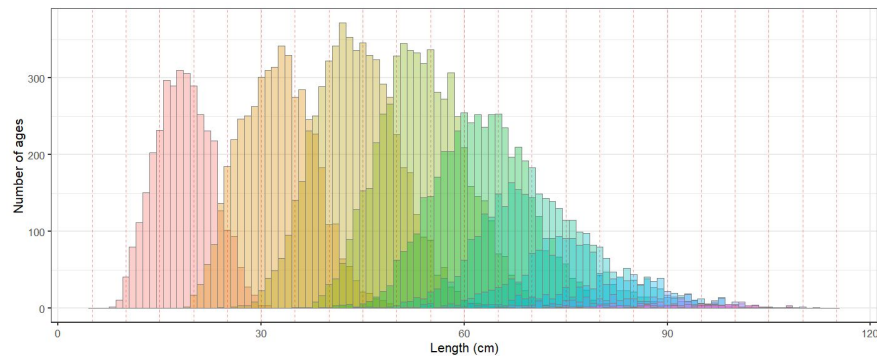
Models	Size bins	Annually varying growth Parameters	Aging error model	Survey selectivity with annually varying ascending width parameter?
M 23.1.0.d	1cm	$L_{1.5}$, Richard's ρ	Linear	Yes
M24.0	5cm	$L_{1.5}$, Richard's ρ	Linear	Yes
M24.1	5cm	$L_{1.5}$, Richard's K	Spline	Yes
M24.3	5cm	$L_{1.5}$, Richard's K	Spline	No

Note: Model 24.2 was for demonstration purposes only, same data and parameterization as Model 24.3, but untuned



1cm to 5cm size bins

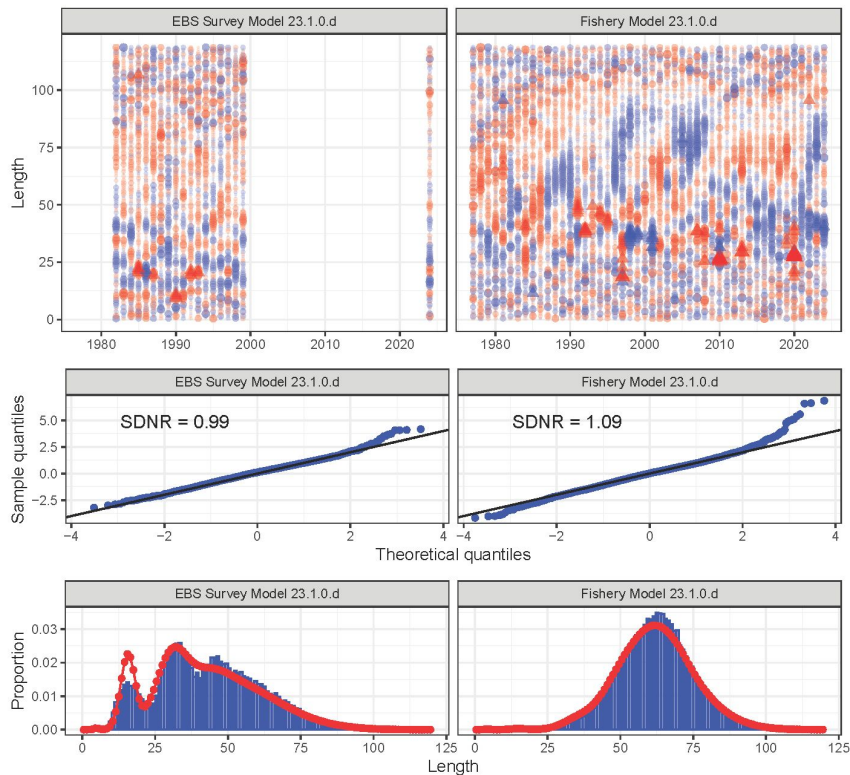
- At least 5 size bins per age class
- Results in new input sample sizes for size and age composition data
- Requires retuning of variance adjustment factors in model which adds some additional variability in results



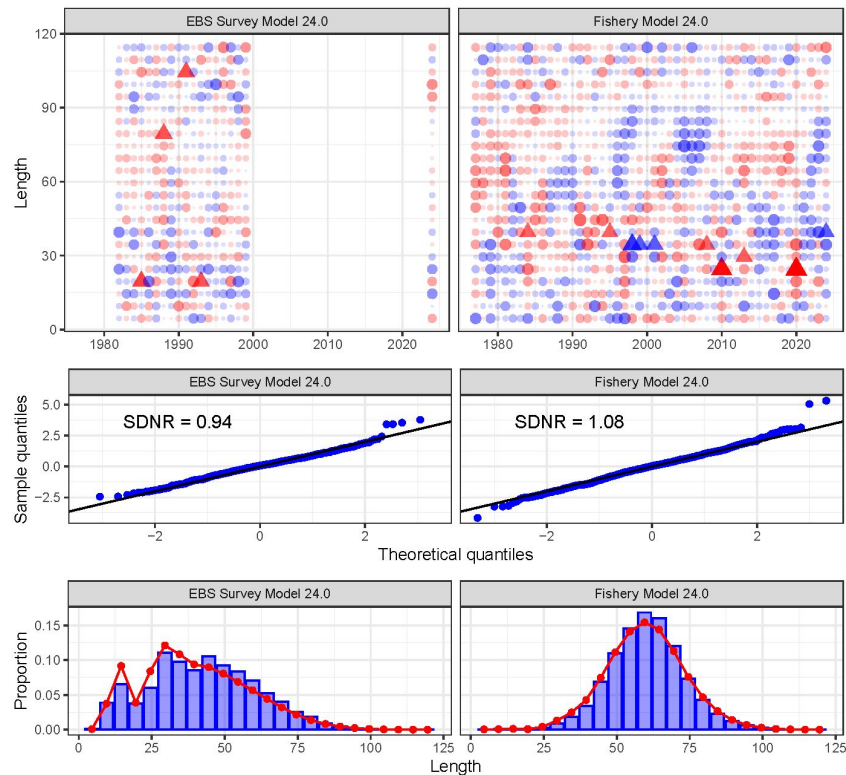


1cm to 5cm size bins OSA Length

Sign ● Neg ● Pos abs(Resid) ● 2 ● 4 ● 6 Outlier ● No ▲ Yes



Sign ● Neg ● Pos Outlier ● No ▲ Yes abs(Resid) ● 1 ● 2 ● 3 ● 4 ● 5

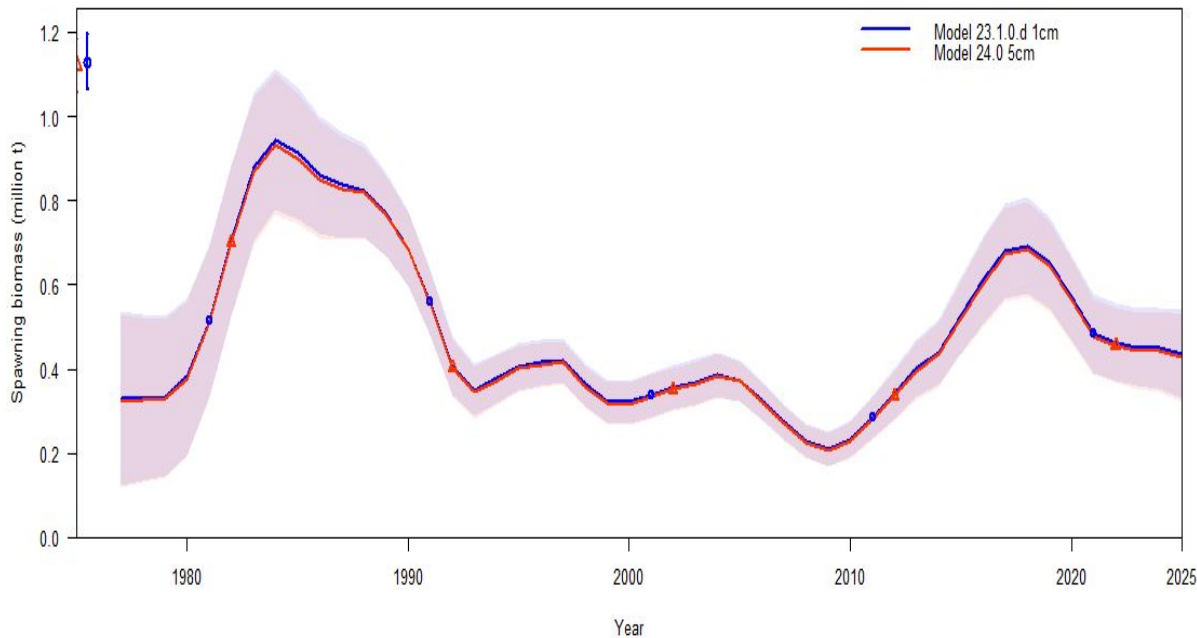




1cm to 5cm size bins

• Differences in results

- | | | | | | |
|-----------------|------------------|------------------|----------------|-------------|-------------|
| • L_{20} | 1cm = 112.78 | 5cm = 113.28 | • $L_{1.5}$ | 1cm = 13.99 | 5cm = 13.87 |
| • $LN(R_0)$ | 1cm = 13.36 | 5cm = 13.35 | • Q | 1cm = 0.97 | 5cm = 0.99 |
| • $B_{100\%}$ | 1cm = 567kt | 5cm = 562kt | • B_{2025} | 1cm = 218kt | 5cm = 213kt |
| • $B_{2025} \%$ | 1cm = $B_{38\%}$ | 5cm = $B_{38\%}$ | • ABC_{2025} | 1cm = 156kt | 5cm = 151kt |





Model 24.0 vs 24.1

- Differences in models
 - Spline aging error instead of linear
 - Annual variability in growth on Richards K instead of Richards ρ
- Differences in model fits
 - Tuning and data the same between models
 - Small improvement in overall fit (-3.7 nll)
 - Marginal survey age composition (-4.3 nll)
 - Marginal length composition (+0.1 nll)
 - Survey Index (+0.3 nll)
 - Parameter deviations (+0.1 nll)
 - Similar Retrospective bias and MASE

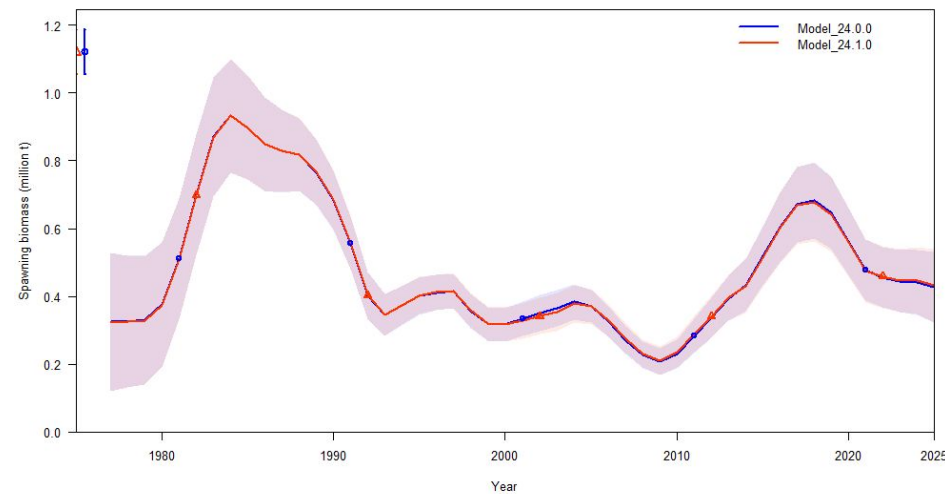
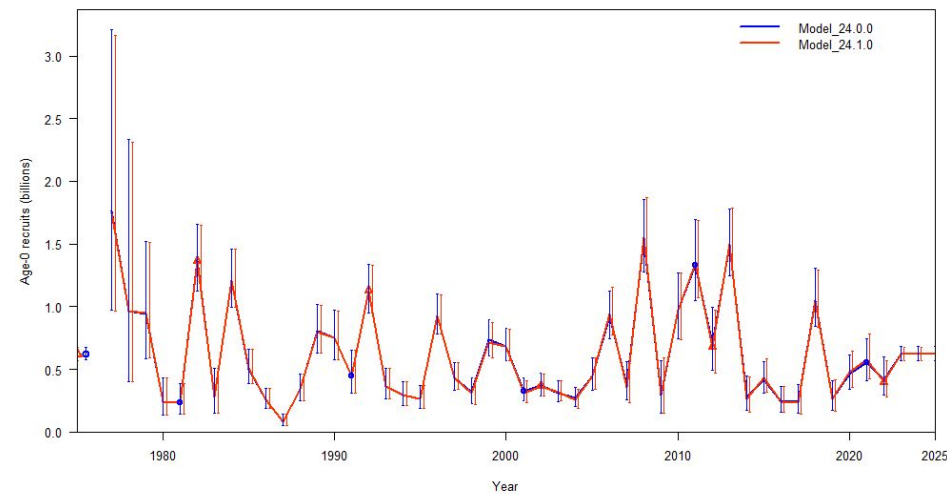
• Mohn's ρ	M24.0 = -0.11	M24.1 = -0.10
• MASE		
• Survey Index	M24.0 = 0.47	M24.1 = 0.45
• Fishery Size Comp	M24.0 = 0.16	M24.1 = 0.15
• Survey Age Comp	M24.0 = 0.15	M24.1 = 0.14



Model 24.0 vs 24.1

• Differences in results

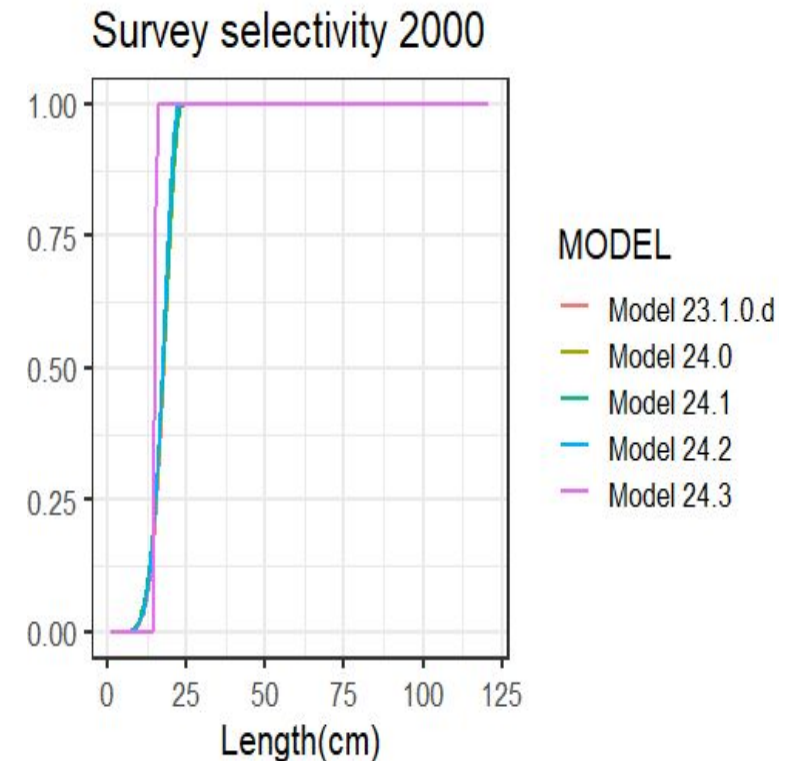
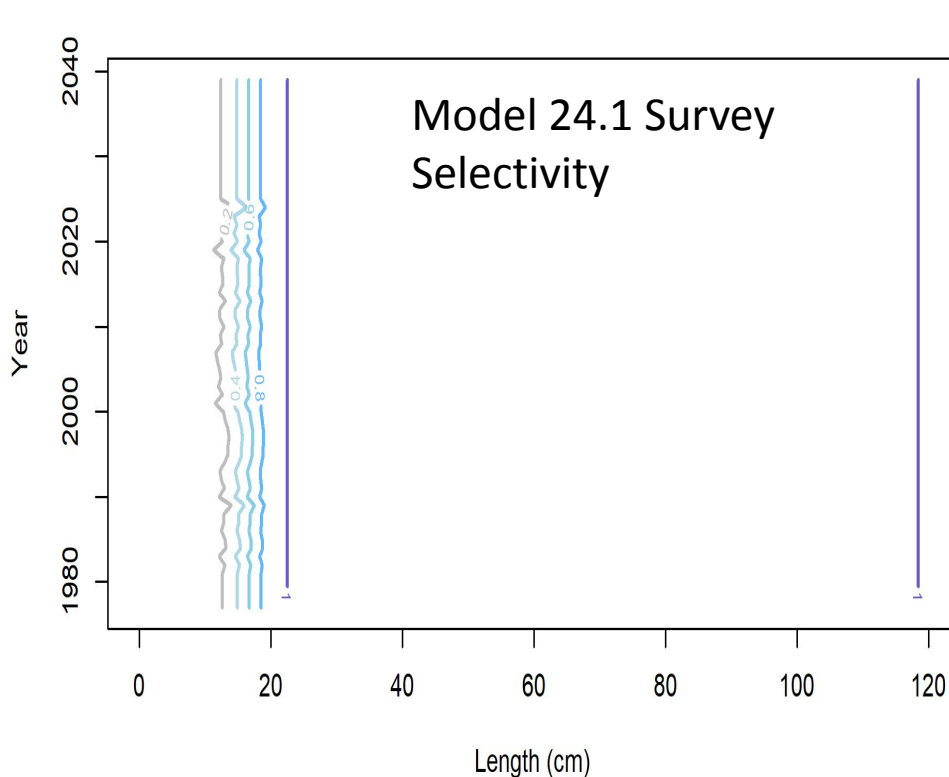
- L_{20} M24.0 = 113.28 M24.1 = 112.26
- $LN(R_0)$ M24.0 = 13.35 M24.1 = 13.34
- $B_{100\%}$ M24.0 = 562kt M24.1 = 562kt
- $B_{2025}\%$ M24.0 = $B_{38\%}$ M24.1 = $B_{38\%}$
- $L_{1.5}$ M24.0 = 13.87 M24.1 = 13.85
- Q M24.0 = 0.99 M24.1 = 0.99
- B_{2025} M24.0 = 213kt M24.1 = 216kt
- ABC_{2025} M24.0 = 151kt M24.1 = 154kt





Model 24.1 vs 24.3

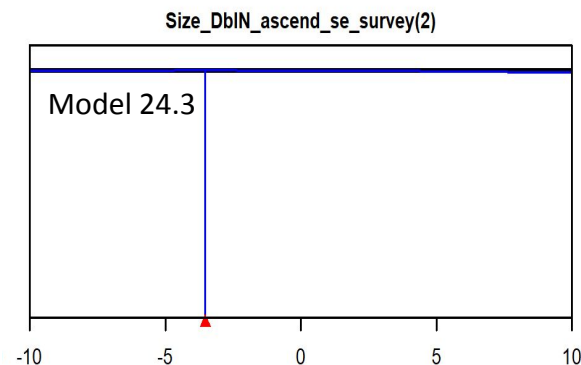
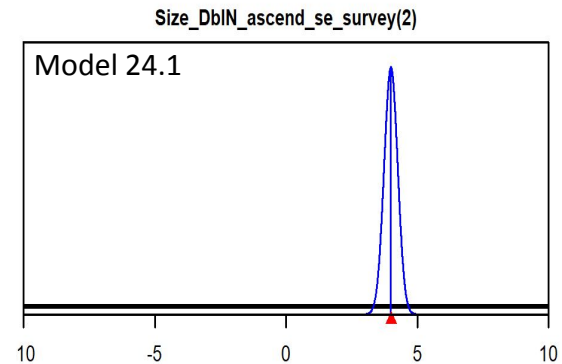
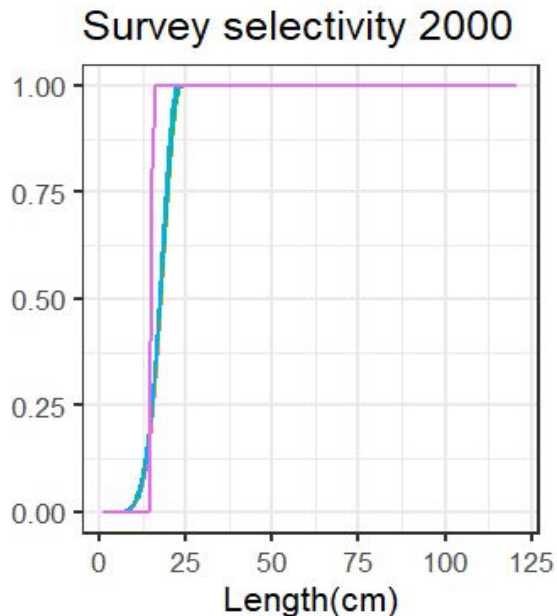
- Differences in models
 - Annually varying survey selectivity
 - Random walk on width of the ascending slope in Model 24.1
 - Annually non-varying survey selectivity for Model 24.3





Model 24.1 vs. 24.3

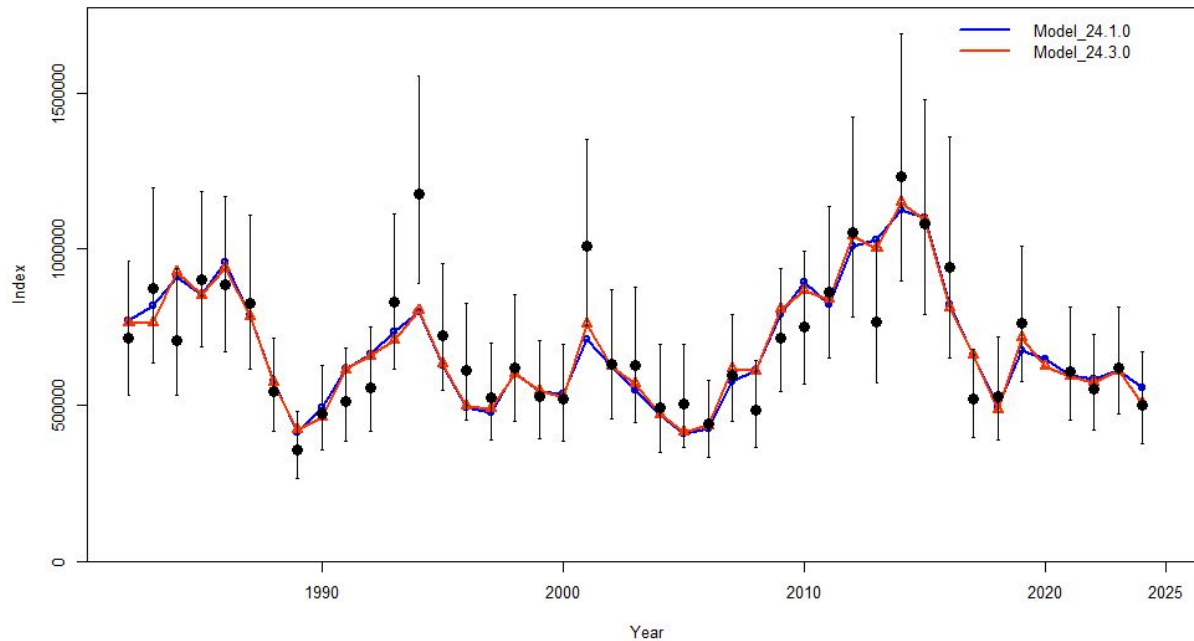
- Model 24.3 width of the ascending slope
 - Knife edge (value = -3.52)
 - Highly uncertain in Model 24.3 (CV = 2781%)
 - Potentially pointing to model misspecification





Model 24.1 vs 24.3 Index fit

- Differences in model fits
 - Model 24.3 slight improvement in fit to survey index (-1.9 nll)

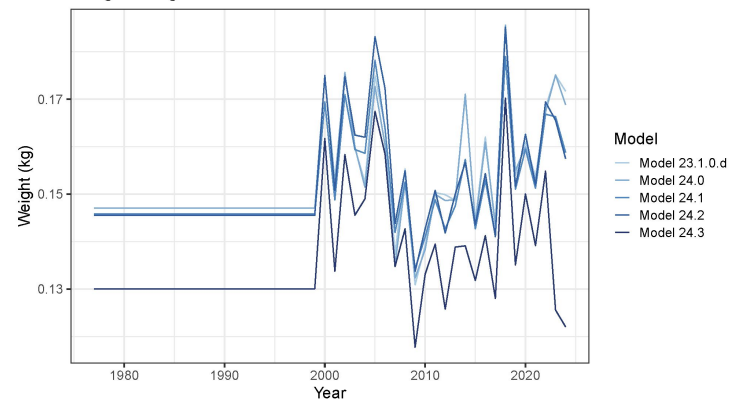




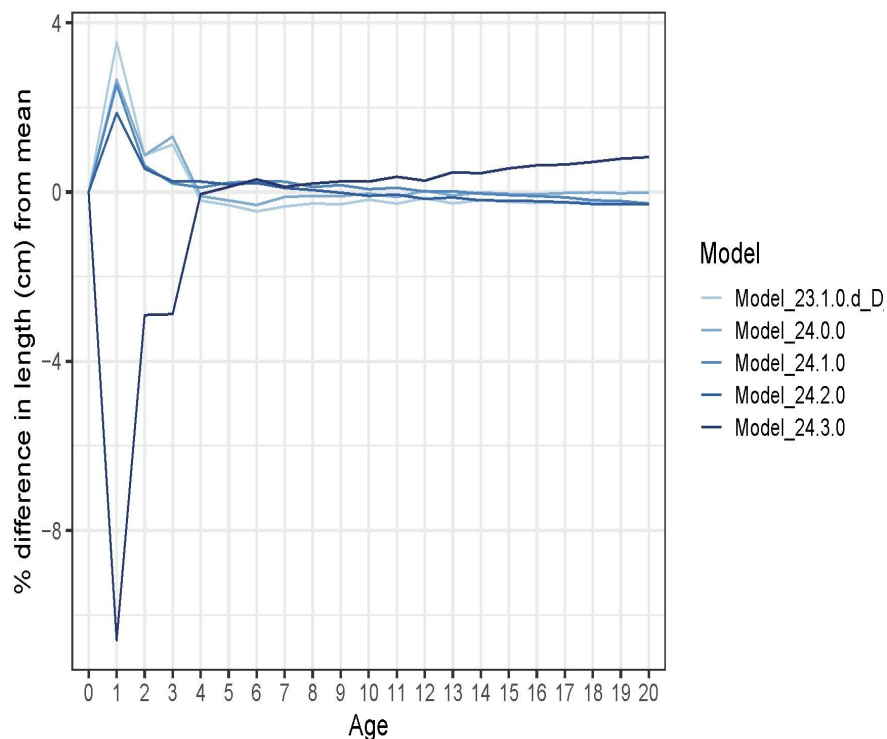
Model 24.1 vs 24.3

- Differences in models
 - Change in growth
 - Smaller fish at younger ages
 - Larger fish at older ages

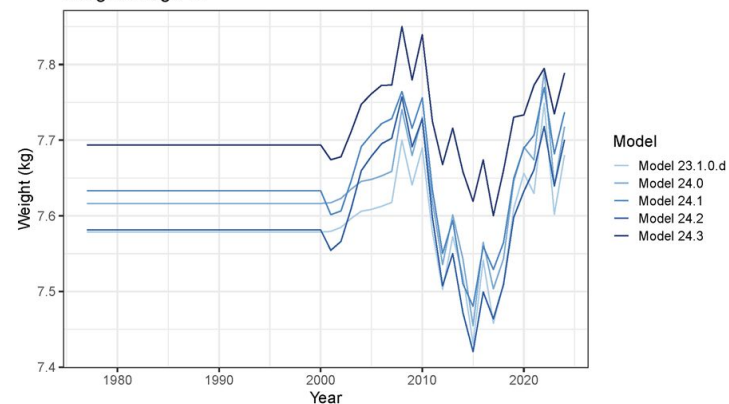
Weight at age 2



% difference in size at age in 2024



Weight at age 10

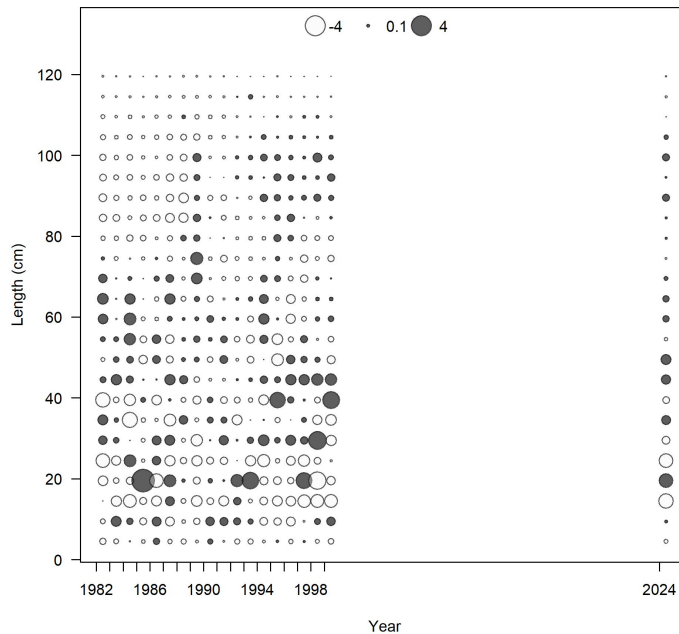




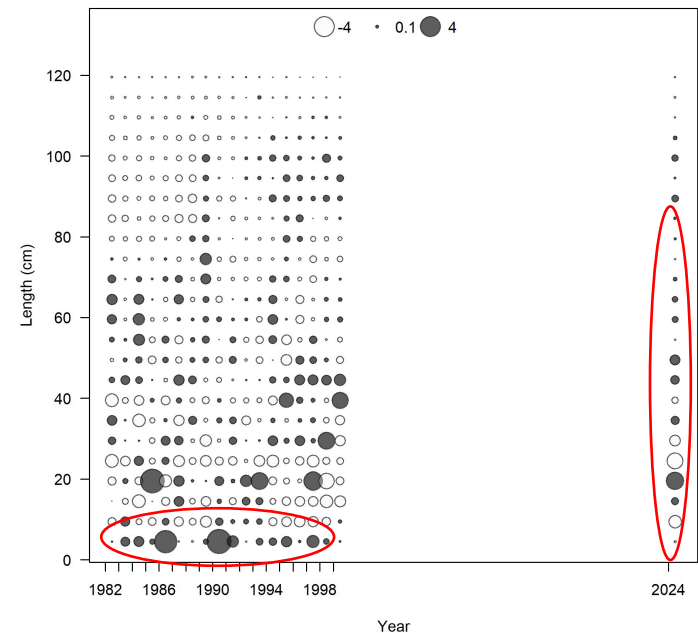
Model 24.1 vs 24.3 Pearson Survey Length

- Differences in model fits
 - Model 24.3 degradation in fit to survey length composition

Model 24.1



Model 24.3

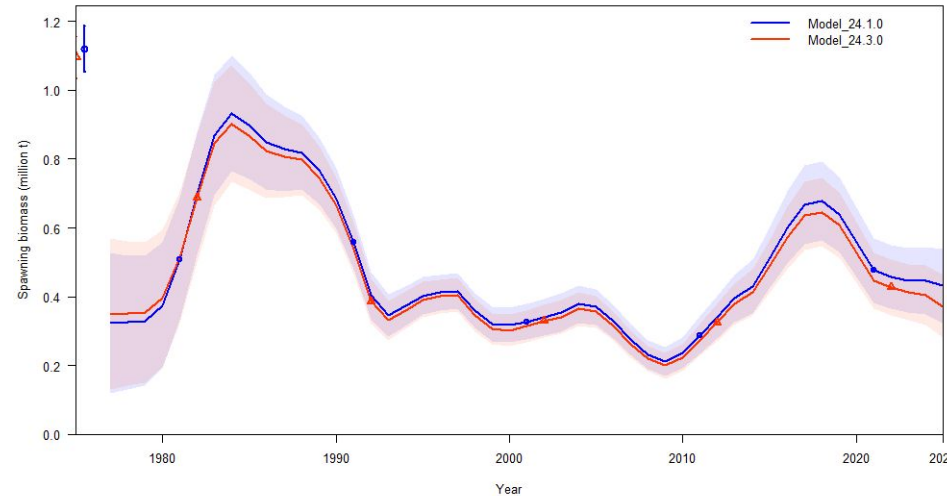
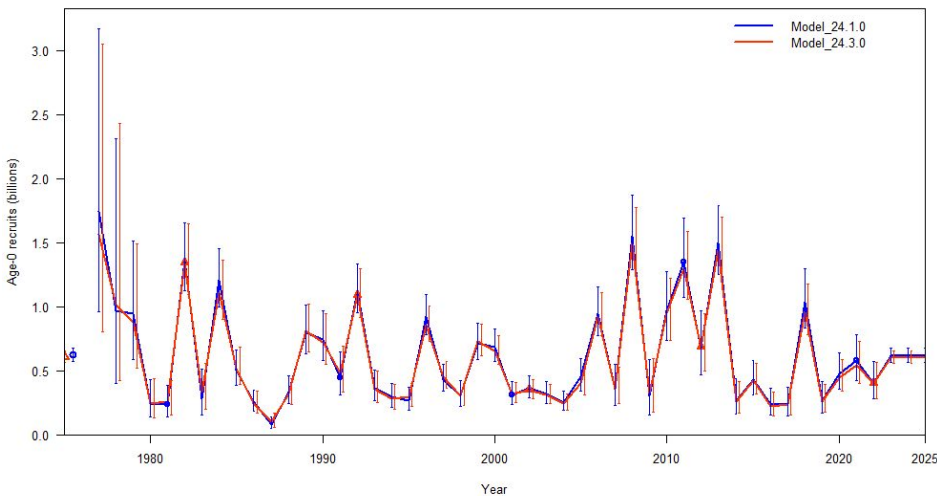




Model 24.1 vs 24.3

• Differences in results

- L_{20} M24.1 = 112.26 M24.3 = 114.73
- $LN(R_0)$ M24.1 = 13.85 M24.3 = 13.32
- $B_{100\%}$ M24.1 = 562kt M24.3 = 552kt
- $B_{2025} \%$ M24.1 = $B_{38\%}$ M24.3 = $B_{34\%}$
- $L_{1.5}$ M24.1 = 13.85 M24.3 = 12.08
- Q M24.1 = 0.99 M24.3 = 1.01
- B_{2025} M24.1 = 216kt M24.3 = 186kt
- ABC_{2025} M24.1 = 154kt M24.3 = 117kt





Why Model 24.1?

- All models had comparable fits, MASE, retrospectives, and jitter results
- Model 24.3 survey selectivity is problematic
 - knife edge, highly uncertain parameter estimate on ascending limb
- Slightly overall better performance in Model 24.1
 - Most in survey length comps
- Results are consistent with last year's model
 - Similar reference points and management values



Model 24.1 Results

- **ABC 2025**
 - 9% decrease from 2024
 - 2% increase from expected for 2025
- **Ecosystem considerations at level 2 Concern**
 - Lower condition
 - Low prey
- **No reduction from Max ABC recommended**

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2024	2025	2025*	2026*
<i>M</i> (natural mortality rate)	0.386	0.386	0.386	0.386
Tier	3b	3b	3b	3b
Projected total (age 0+) biomass (t)	808,203	787,837	769,813	762,206
Projected female spawning biomass				
<i>B</i> _{100%}	567,465		561,915	
<i>B</i> _{40%}	226,986		224,767	
<i>B</i> _{35%}	198,612		196,671	
<i>F</i> _{OFL}	0.46	0.43	0.43	0.41
<u><i>maxF</i>_{ABC}</u>	0.37	0.35	0.35	0.33
<i>F</i> _{ABC}	0.37	0.35	0.35	0.33
OFL (t)	200,995	180,798	183,509	169,243
<u><i>maxABC</i></u> (t)	167,952	150,876	153,617	141,520
ABC (t)	167,952	150,876	153,617	141,520
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2022	2023	2023	2024
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

*Projections are based on assumed catches of 165,659 t, and 153,617 t in 2024 and 2025, respectively.



CHAPTER 2

EBS PACIFIC COD

- Full Assessment; Tier 3; risk table (1,1,2,1)

- Team agreed with author's recommendation using Model 24.1
- No reduction from maximum ABC

Quantity	Last asmt.	This asmt.	Change
M	0.386	0.386	0%
2024 Tier	3b		
2025 Tier	3b	3b	
2024 age+ biomass	808,203		-5%
2025 age+ biomass	787,837	769,813	-2%
2024 spawning biomass	223,107		-3%
2025 spawning biomass	211,131	215,747	2%
$B_{100\%}$	567,465	561,915	-1%
2025 F_{OFL}	0.46	0.43	-7%
2025 F_{ABC}	0.37	0.35	-5%
2024 OFL	200,996		-9%
2025 OFL	180,798	183,509	1%
2024 ABC	167,952		-9%
2025 ABC	150,876	153,617	2%



CHAPTER 2

EBS PACIFIC COD RECOMMENDATIONS

Pacific cod- EBS

- The Team recommended the authors clarify this section of text in the stock assessment (section describing choice of M), specifically justifying the choice of maximum age assumptions in the natural mortality analysis.
- The Team recommended a likelihood profile on the parameter for the survey selectivity ascending limb in Model 24.3 in order to diagnose the estimate of that selectivity parameter and relative influence of the data components on its estimate



CHAPTER 2A

ALEUTIAN ISLANDS PACIFIC COD

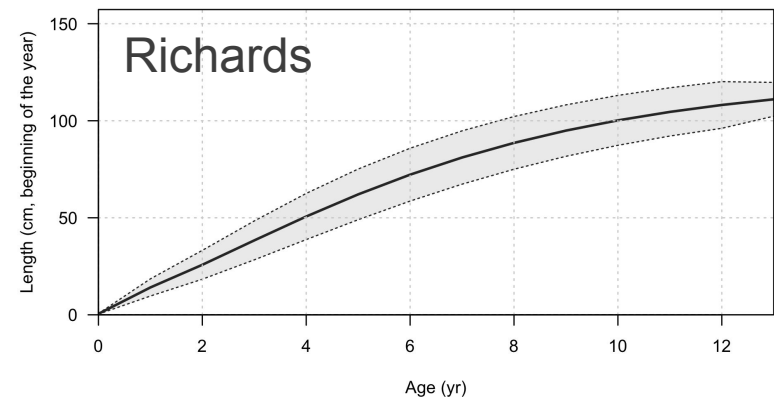
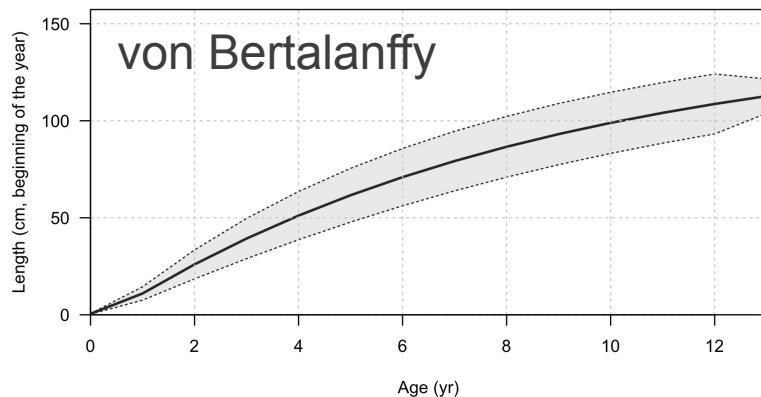
- Full Assessment; Tier 3; risk table (1,2,2,1)
- Previously managed at Tier 5 with random effects model
- Age-structured models developed in Stock Synthesis
 - Model 24.1
 - Same model presented in September/October with minor improvement (F-ballpark turned off)
 - Model 24.1a
 - Sensitivity run: Model 24.1 but with von Bertalanffy growth
 - Results in poorer fit to Index and CAAL data, higher objective function
 - Model 24.0
 - Sensitivity run: Model 24.1 without natural mortality time block
 - Results in poorer fit to survey index and much higher retrospective bias (Mohn's ρ on SSB 0.57 vs. 0.15)



CHAPTER 2A

ALEUTIAN ISLANDS PACIFIC COD

- Full Assessment; Tier 3; risk table (1,2,2,1)
- SSC concerns with Model 24.1
 - Richards vs. von Bertalanffy growth models
 - Issue: large change in objective function (-280 LL) was due to bridging method and multiple changes between models, not specific to change in growth model
 - Improvement due solely to change in growth models was less drastic -13 LL, very subtle, but consistent with EBS.

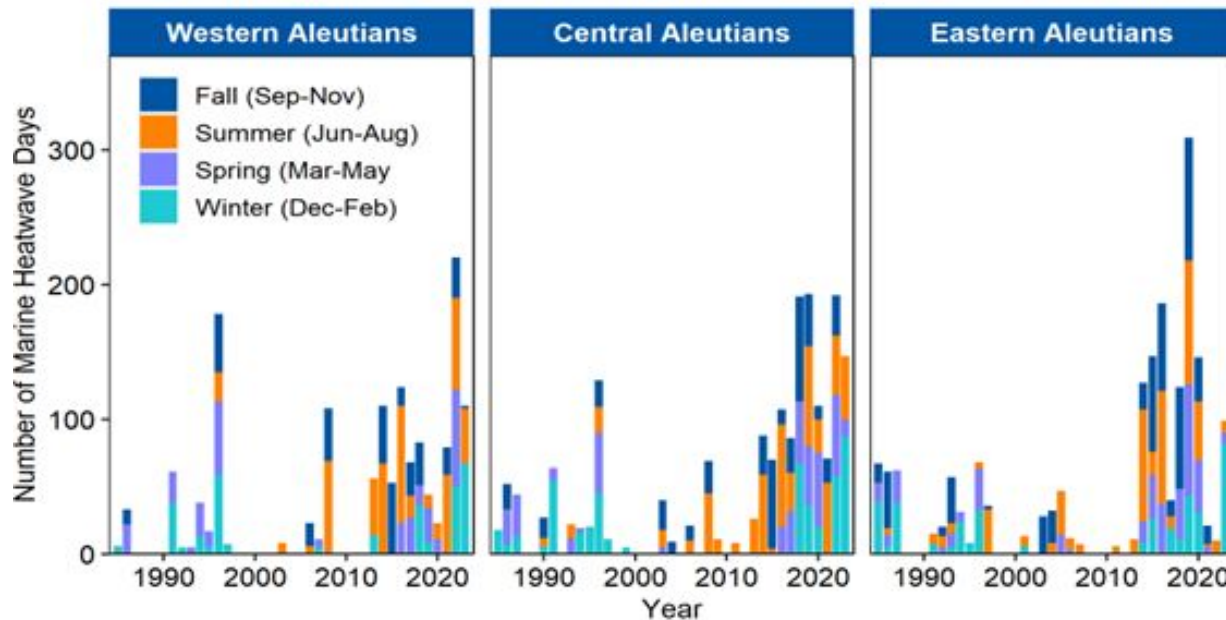




CHAPTER 2A

ALEUTIAN ISLANDS PACIFIC COD

- Full Assessment; Tier 3; risk table (1,2,2,1)
- SSC concerns (continued)
 - Natural mortality timeblock additional justification
 - Documented thermal shift in the Aleutian Islands (Xiao and Ren 2022)
 - Heat stress has been shown to increase bioenergetic consumption rates.
 - Prey may become a limiting factor.

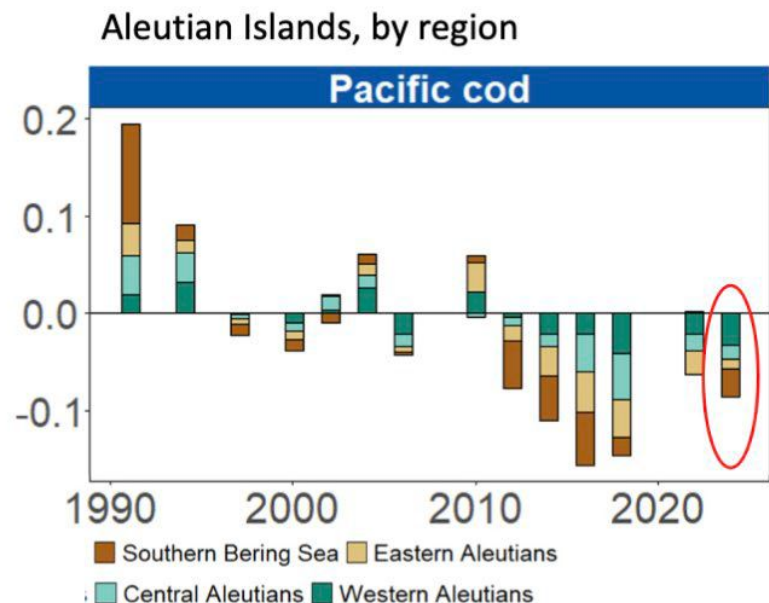
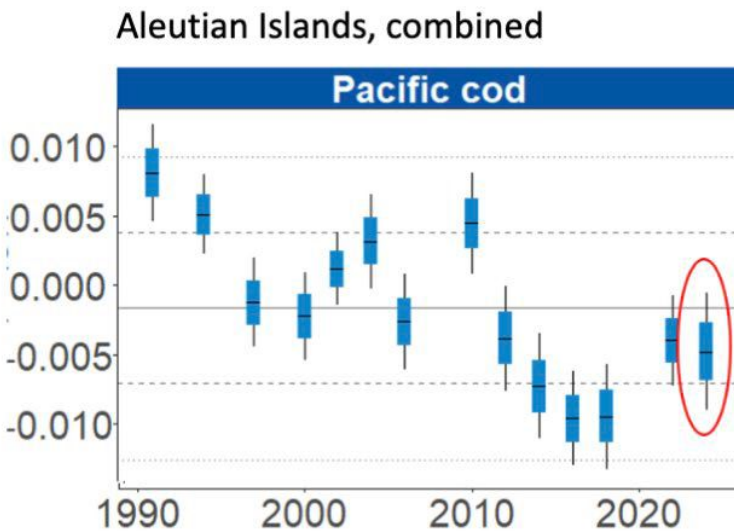




CHAPTER 2A

ALEUTIAN ISLANDS PACIFIC COD

- Full Assessment; Tier 3; risk table (1,2,2,1)
- SSC concerns (continued)
 - Natural mortality timeblock additional justification
 - Low length-weight residuals have been observed in all regions since 2012.
 - Lower fish condition, heatwave conditions, and decline in survey estimates of biomass are consistent with high temperatures having cumulative stress effect on cod in the AI, resulting in climate-induced mortality.

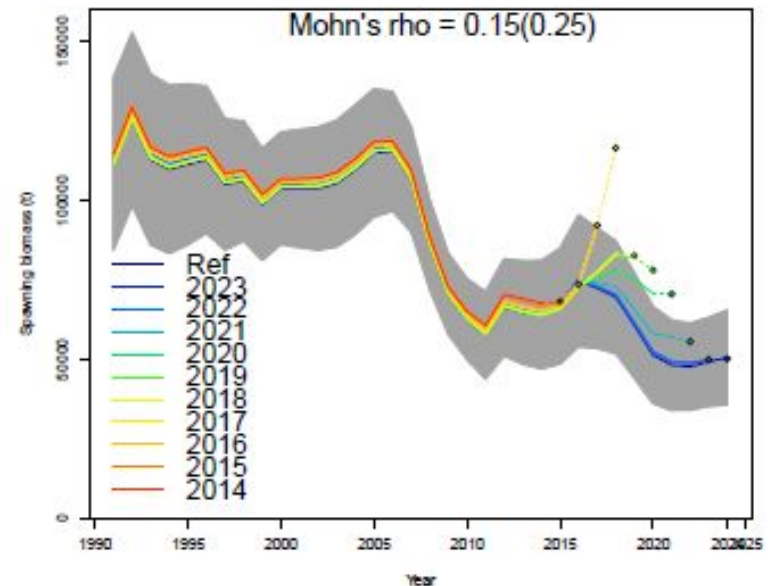
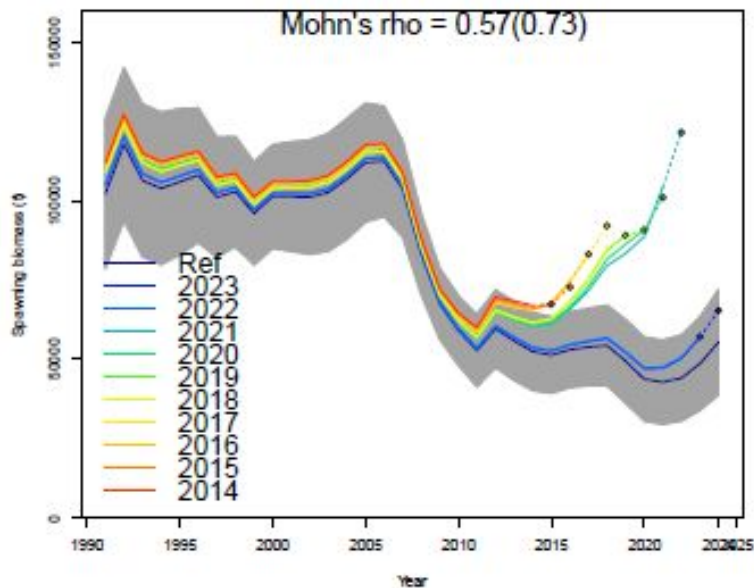


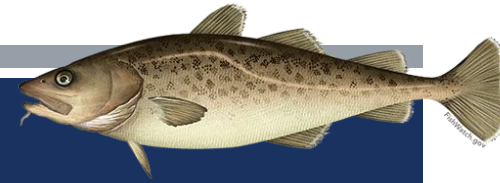


CHAPTER 2A

ALEUTIAN ISLANDS PACIFIC COD

- Full Assessment; Tier 3; risk table (1,2,2,1)
- SSC concerns (continued)
 - Natural mortality timeblock additional justification
 - Heatwave M (0.57) well within bounds of other studies (0.2 - 0.96)
 - Substantial improvement in objective function (-10 LL and -17.7 AIC)
 - Substantial improvement in retrospective bias (0.57 vs 0.15)

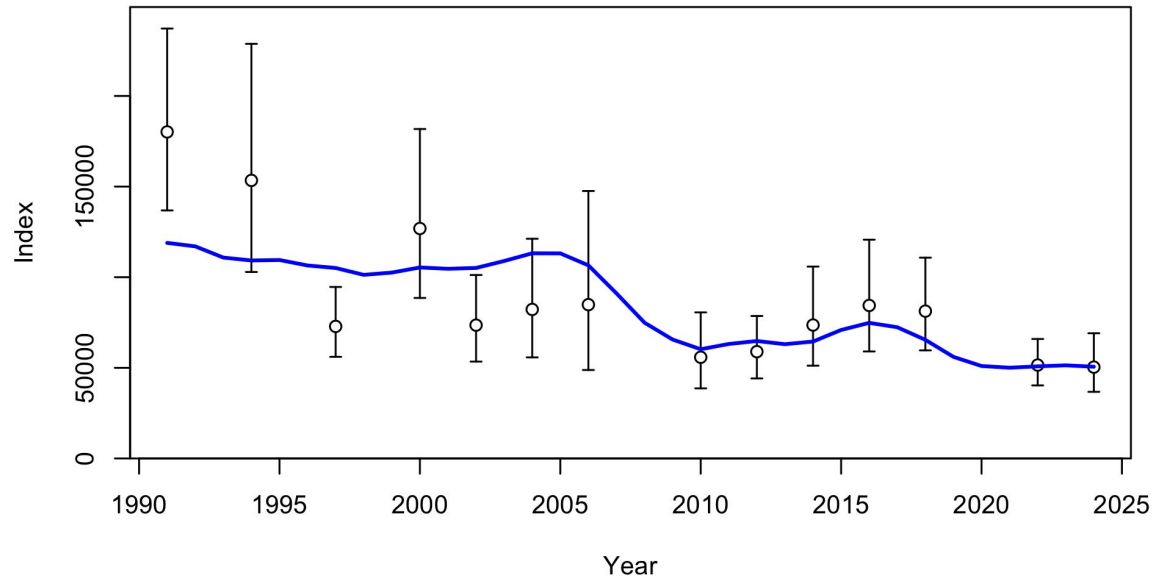
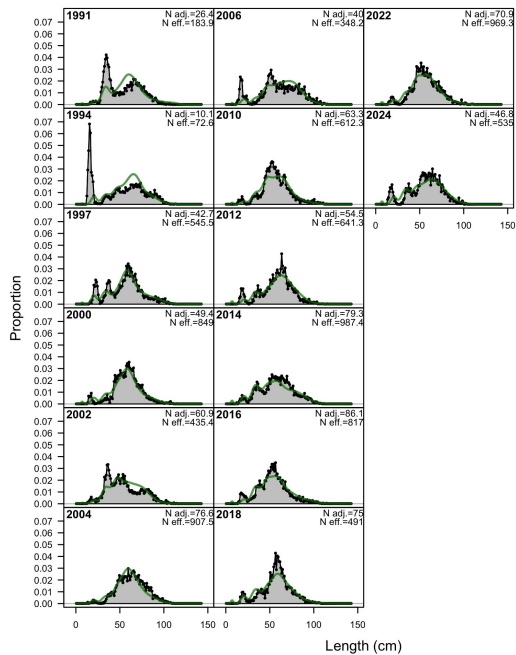




CHAPTER 2A

ALEUTIAN ISLANDS PACIFIC COD

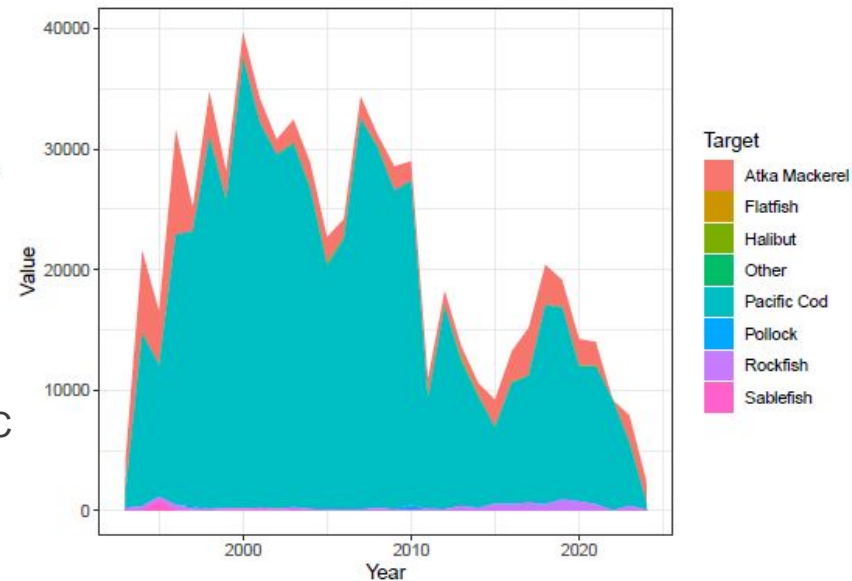
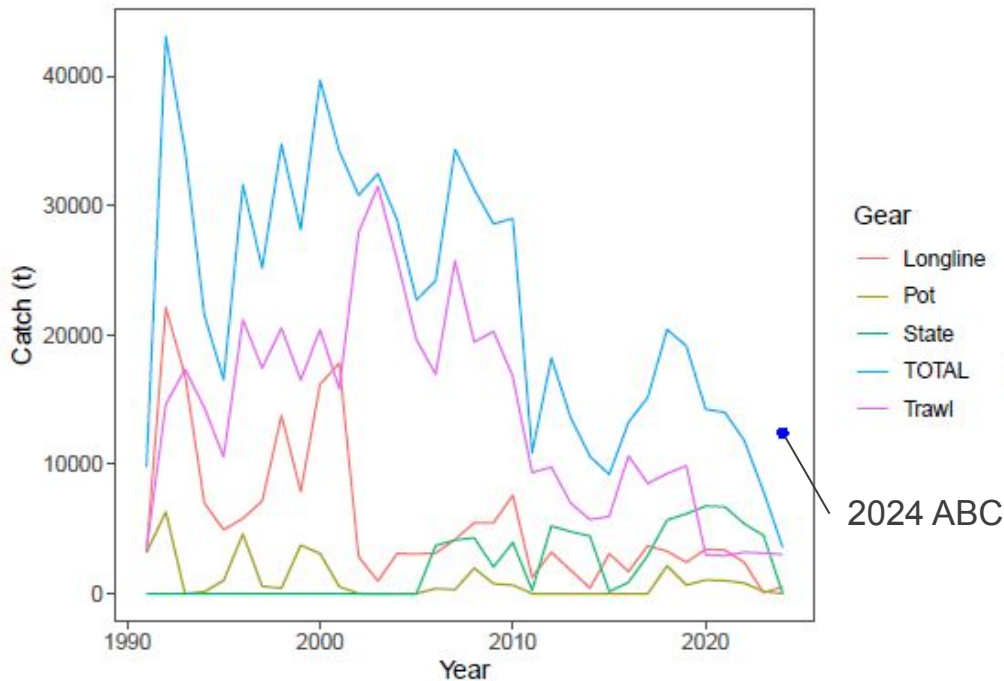
- Full Assessment; Tier 3; risk table (1,2,2,1)
- 2024 AI bottom trawl survey
 - Continued decline from 2022 (-2%)
 - Lowest of time series





CHAPTER 2A ALEUTIAN ISLANDS PACIFIC COD

- Full Assessment; Tier 3; risk table (1,2,2,1)
- Fishery data
 - $ABC > TAC$
 - 2024 Catch ~47% of TAC on November 11

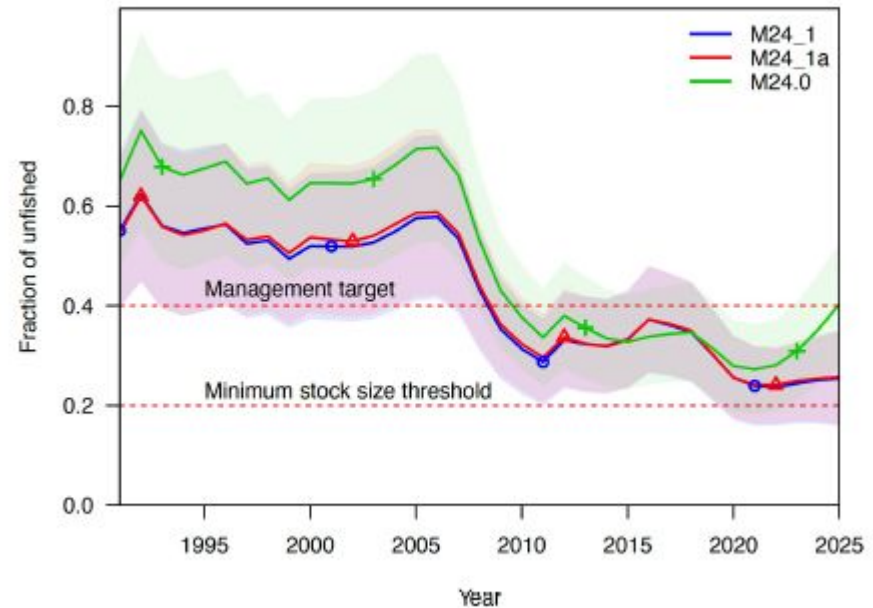
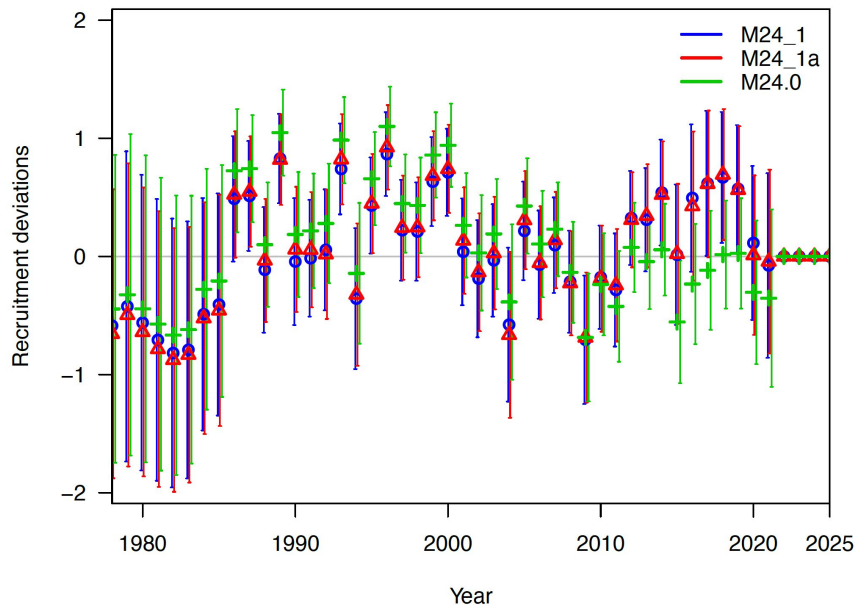


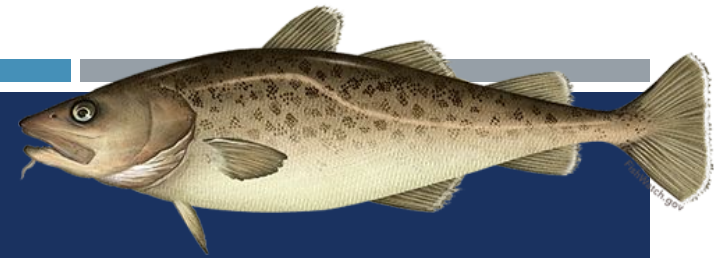


CHAPTER 2A

ALEUTIAN ISLANDS PACIFIC COD

- Full Assessment; Tier 3; risk table (1,2,2,1)
- Recruitment
 - inflated recruitment during heatwave years with higher M
- Spawning biomass
 - continued dropping trend





CHAPTER 2A: AI PACIFIC COD

■ Full Assessment, Tier 3; risk table (1,2,2,1)

- The Team agreed with the authors in moving from Tier 5 to Tier 3.
- The Team also agreed with the authors on using Model 24.1 which includes a time block on M from 2016 - 2024.
- No reduction from maximum permissible ABC

Quantity	Last asmt.	This asmt.	Change
M	0.34	0.42/0.57	
2024 Tier	5		
2025 Tier	5	3a	
2024 age+ biomass	54,165		36%
2025 age+ biomass	54,165	73,679	36%
2024 spawning biomass			
2025 spawning biomass		25,078	
$B_{100\%}$		102,361	
2025 F_{OFL}	0.34	0.655	93%
2025 F_{ABC}	0.255	0.502	97%
2024 OFL	18,416		-9%
2025 OFL	18,416	16,782	-9%
2024 ABC	12,431		8%
2025 ABC	12,431	13,376	8%



CHAPTER 2A

AI PACIFIC COD RECOMMENDATIONS

- The Team recommended continued exploration of covariate approaches to M.
- The Team recommended that the author run a likelihood profile over M for next year on the base M to evaluate the sensitivity of the model to various M values.

FLATFISH SUMMARY



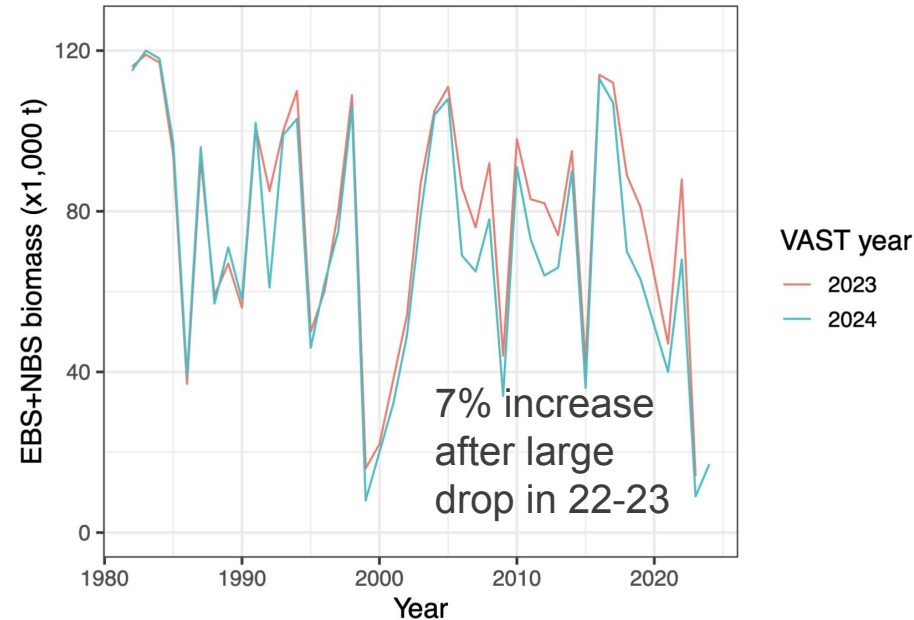
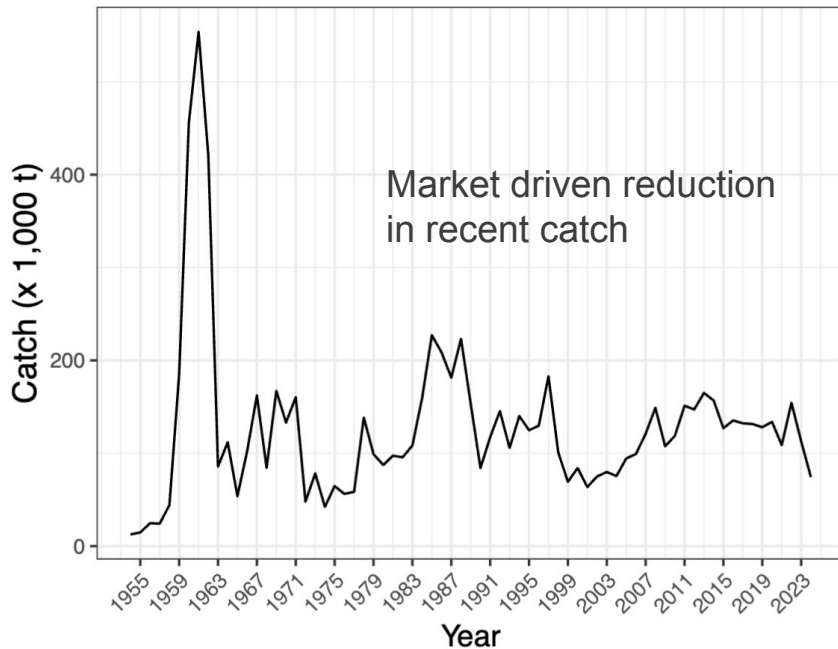
Stock	Tier	2025 ABC (t)	2025 OFL (t)	Change from 2024 ABC
Yellowfin sole (Update)	1a	262,557	299,247	-1%
Greenland turb. (Full)	3a	2,013*(10%)	2,598	-37%
Kamchatka fl. (Full)	3a	6,800	8,019	-9%
Northern rsole (Full)	1a	157,487	165,444	29%
Flathead sole (Update)	3a	83,807	101,624	25%
Alaska plaice (Full)	3a	28,745	34,576	-19%
Other flatfish (Update)	5	19,562	26,083	20%

* xx% Reduced from maximum permissible ABC



CHAPTER 4 YELLOWFIN SOLE

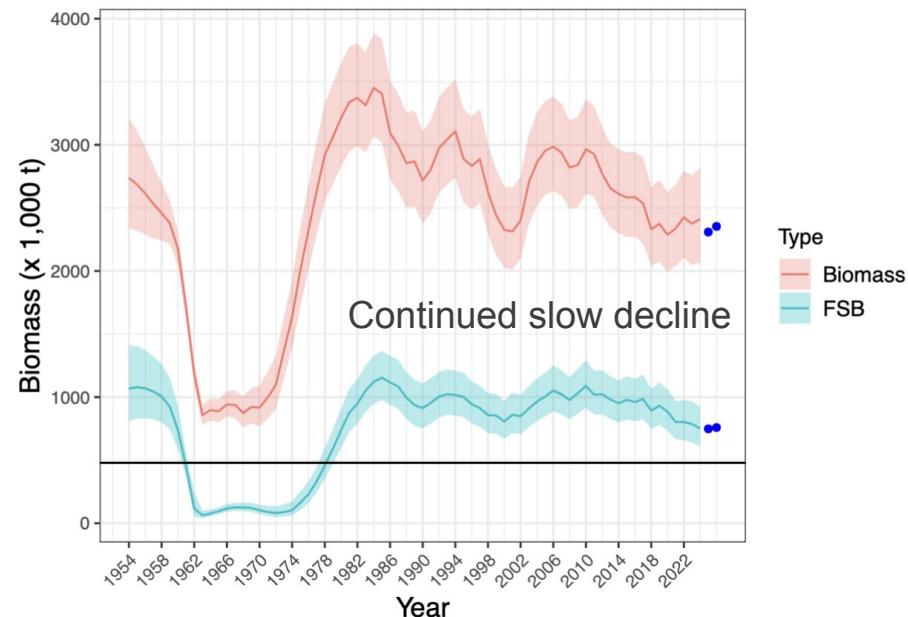
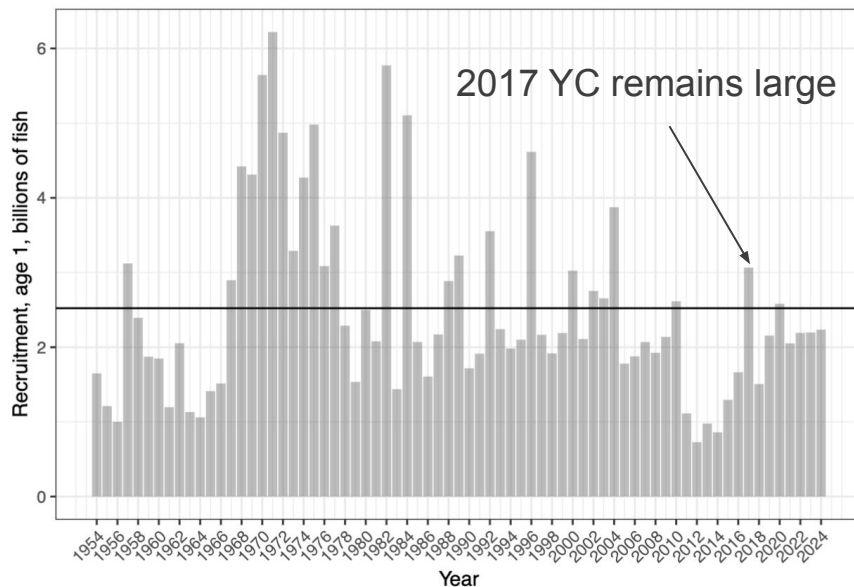
- Update Assessment; Tier 1; risk table (1,1,1,1)
- Model 23.0 updated with new VAST derived bottom trawl survey estimates and catch





CHAPTER 4 YELLOWFIN SOLE

- Update Assessment; Tier 1; risk table (1,1,1,1)
- Model 23.0 still well behaved with good fit to all data and small positive retrospective bias (Mohn's $\rho = 0.06$)





CHAPTER 4 YELLOWFIN SOLE

- Update Assessment; Tier 1; risk table (1,1,1,1)

- Team supports the continued use of Model 23.0
- Team recommended no reduction from maximum permissible ABC

Quantity	Last asmt.	This asmt.	Change
M	0.12/0.125	0.12/0.128	0%/2%
2024 Tier	1a		
2025 Tier	1a	1a	
2024 age+ biomass	2,512,810		-8%
2025 age+ biomass	2,616,800	2,308,550	-12%
2024 spawning biomass	881,640		-15%
2025 spawning biomass	857,354	748,076	-13%
B_0	1,516,980	1,383,020	-9%
B_{msy}	539,657	479,711	-11%
2025 F_{OFL}	0.121	0.13	7%
2025 F_{ABC}	0.106	0.114	8%
2024 OFL	305,298		-2%
2025 OFL	317,932	299,247	-6%
2024 ABC	265,913		-1%
2025 ABC	276,917	262,557	-5%

CHAPTER 4

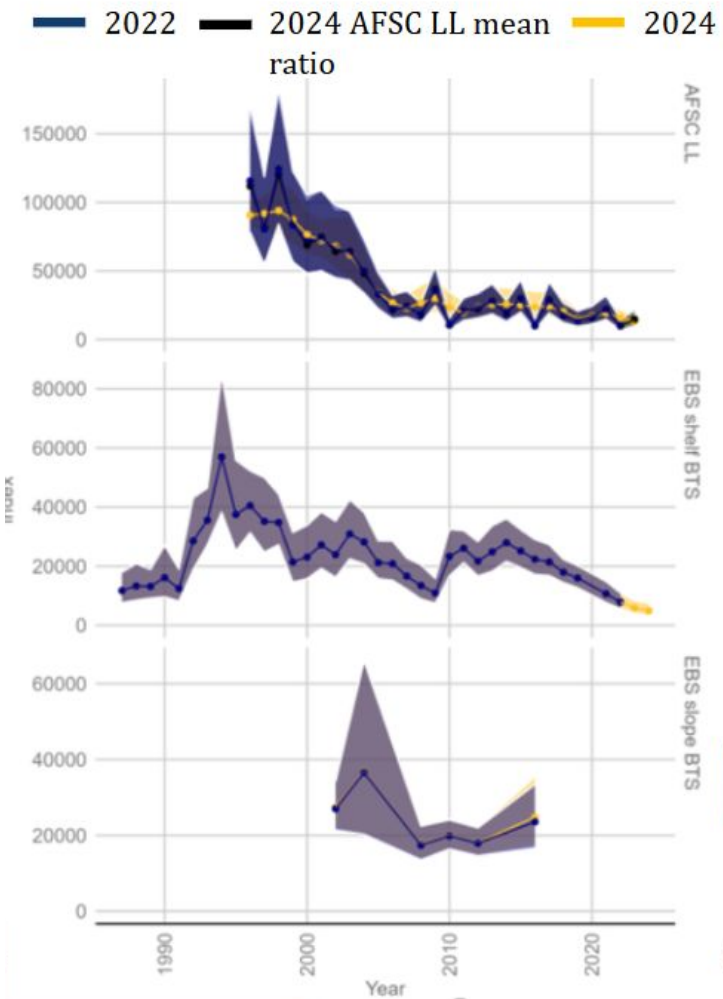
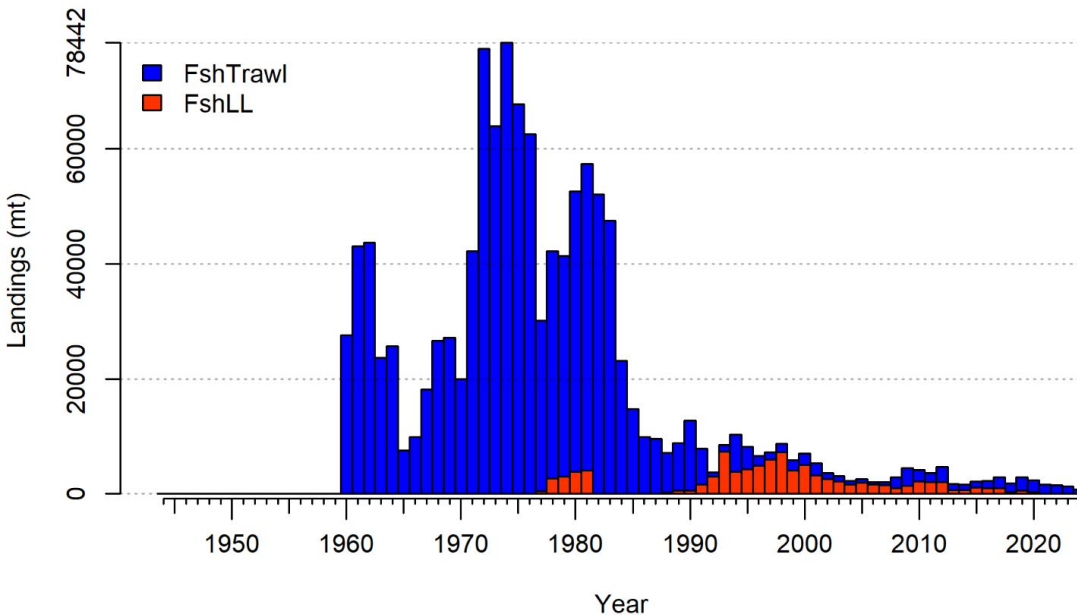
YELLOWFIN SOLE RECOMMENDATIONS

- The Team recommended that the author work with data providers to understand what is driving the VAST time series with trend projections in the southern and northern Bering Sea in years when there were no new data coming from the NBS and the relative influence of the AR1 assumptions in VAST.

CHAPTER 5 GREENLAND TURBOT



- Full Assessment; Tier 3, risk table (3,2,1,2)
- Same model as 2023, Model 16.4c, with updated catch and EBS bottom trawl survey



CHAPTER 5

GREENLAND TURBOT

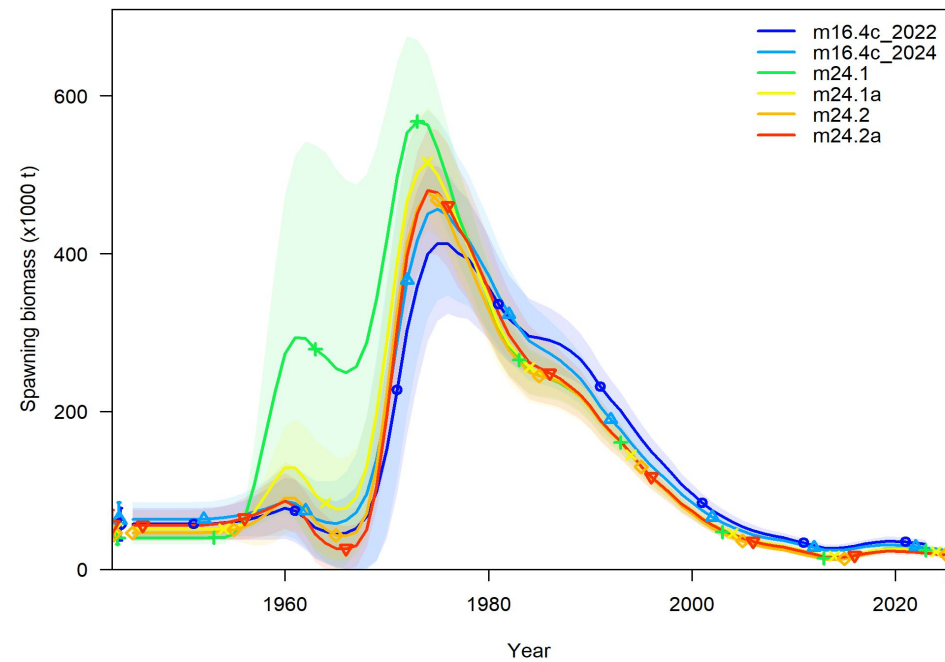
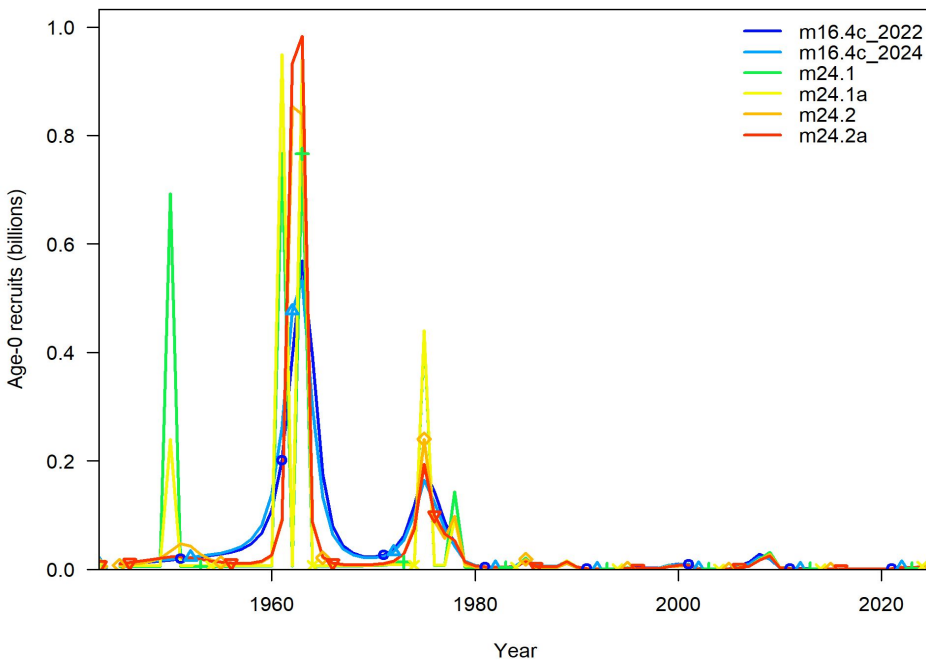


- Full Assessment; Tier 3, risk table (3,2,1,2)
- Author explored 4 alternative models
 - New explorations included:
 - Analytic solution for all survey q
 - afscISS input sample sizes for bottom trawl survey
 - Autocorrelation in SRR alternatives
 - removing time block on slope survey
 - Linear interpolation of AFSC longline survey
 - Francis weight tuning of length composition data
 - Alternatives had lower convergence rates and higher retrospective bias along with poorer fits to some data components.
 - All models agreed on low recruitment and declining biomass
 - Overall poorer performance of the alternatives and slightly better stability led to recommendation of last year's model (Model 16.4c) for management.

CHAPTER 5 GREENLAND TURBOT



- Full Assessment; Tier 3; risk table (3,2,1,2)
 - Continued low recruitment
 - Continued decline in biomass



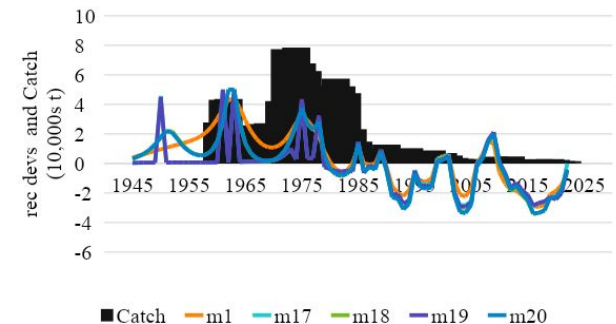
CHAPTER 5 GREENLAND TURBOT



- Full Assessment; Tier 3; risk table (3,2,1,2)
- Risk Table

Assessment-related considerations	Population dynamics considerations	Ecosystem considerations	Fishery-informed stock considerations
Level 3	Level 2	Level 1	Level 2

- Assessment related considerations
 - Uncertainty about stock status
 - Loss of data
- Population dynamics
 - Continued low recruitment
- Fishery-informed stock considerations
 - Continued decline in catch with declining population



CHAPTER 5 GREENLAND TURBOT



- Full Assessment; Tier 3; risk table (3,2,1,2)

- Team supported continued use of Model 16.4c
- Team supported 10% reduction from maximum permissible ABC

Quantity	Last asmt.	This asmt.	Change
M	0.112	0.112	0%
2024 Tier	3a		
2025 Tier	3a	3a	
2024 age+ biomass	50,278		-25%
2025 age+ biomass	47,854	37,615	-21%
2024 spawning biomass	31,653		-24%
2025 spawning biomass	29,439	23,999	-18%
B _{100%}	67,647	58,812	-13%
2025 F _{OFL}	0.18	0.2	11%
2025 F _{ABC}	0.15	0.17	13%
2024 OFL	3,705		-30%
2025 OFL	3,185	2,598	-18%
2024 ABC	3,188		-37%
2025 ABC	2,740	2,013	-27%

CHAPTER 5

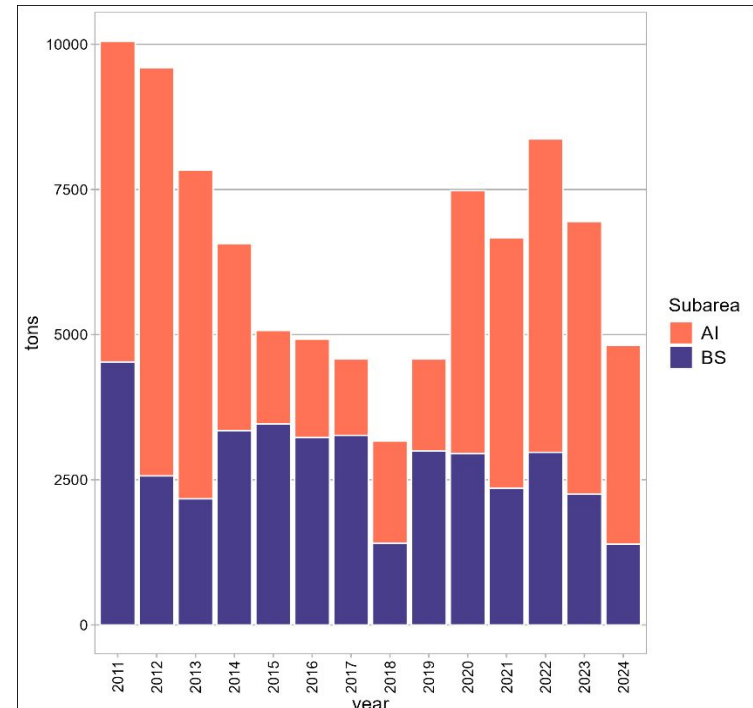
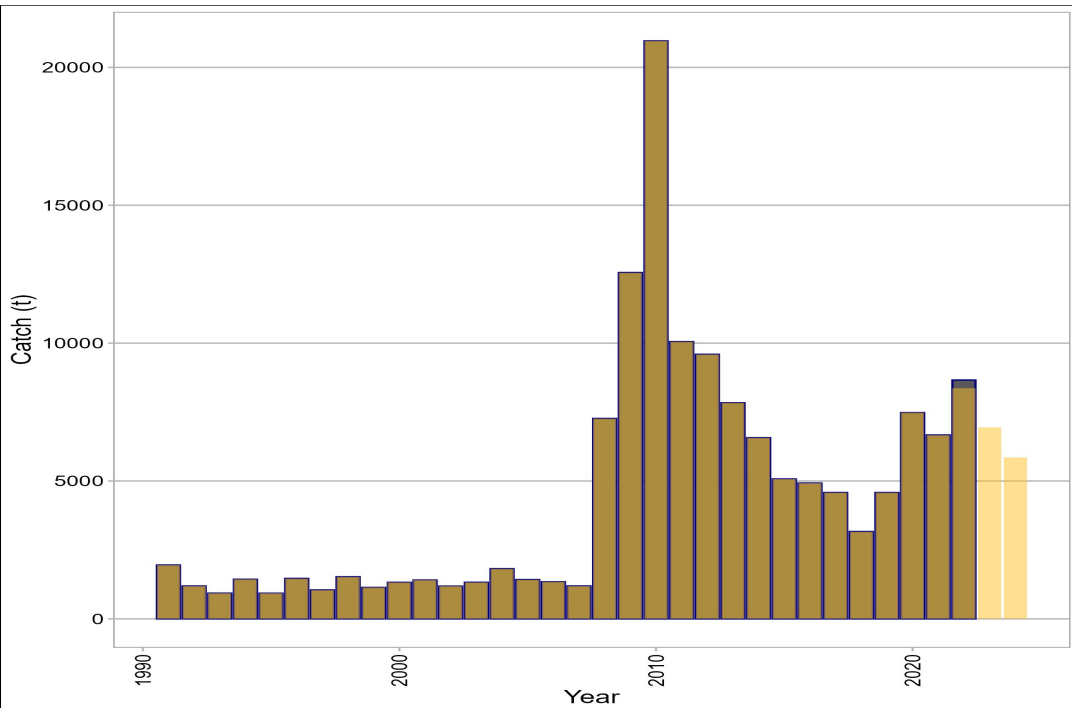
GREENLAND TURBOT RECOMMENDATIONS

- Specific recommendations from the Team for future assessments included:
 - Using interpolated AFSC longline survey RPN data for all future models, following established best practices.
 - Displaying survey mean length-at-age across all model runs to examine interactions with selectivity time blocks and Francis reweighting.
 - Exploring later start years, closer to the 1977 regime shift, for potential insights into recruitment dynamics.
 - Likelihood profiling over M and von Bertalanffy parameters to address retrospective bias in survey catchability (Q).
 - Developing a Tier 5 REMA model to compare with Tier 3 models, given the data losses.

CHAPTER 7 KAMCHATKA FLOUNDER



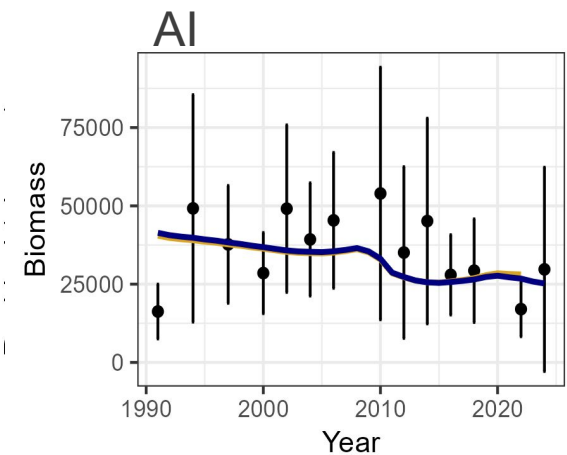
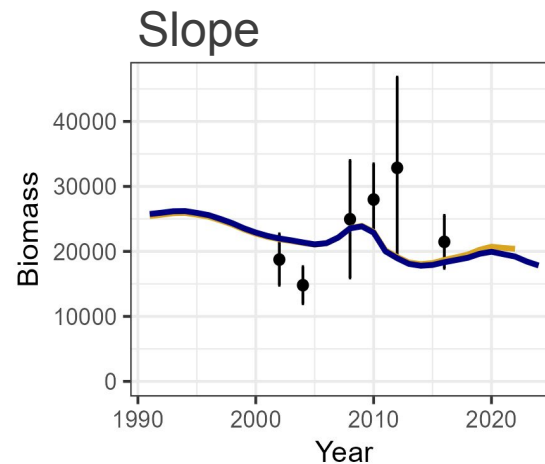
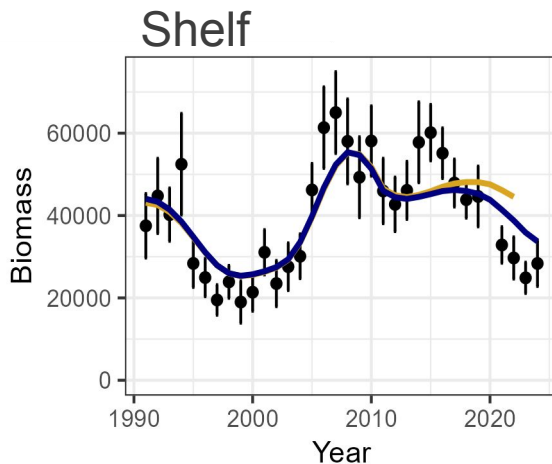
- Full Assessment; Tier 3, risk table (2,1,1,1)
- Model 16.0b same as previous in 2022 with updated catch and surveys
- Catch
 - ABC=TAC since 2021
 - 85% of TAC caught on average (2021-2023)



CHAPTER 7 KAMCHATKA FLOUNDER



- Full Assessment; Tier 3, risk table (2,1,1,1)
- Model 16.0b same as previous in 2022 with updated catch and surveys

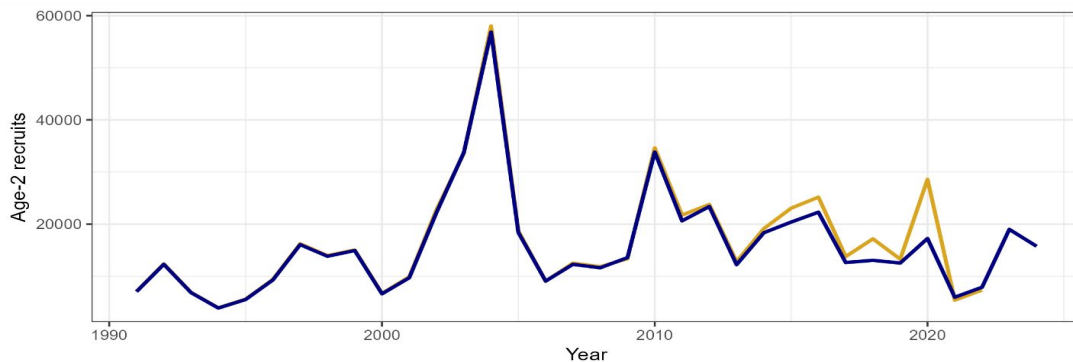


- Declining trend since 2015
 - 2023: -16% from 2022
 - 2024: +14% from 2023
- No survey since 2016
- 2024: +75% from 2022

CHAPTER 7 KAMCHATKA FLOUNDER

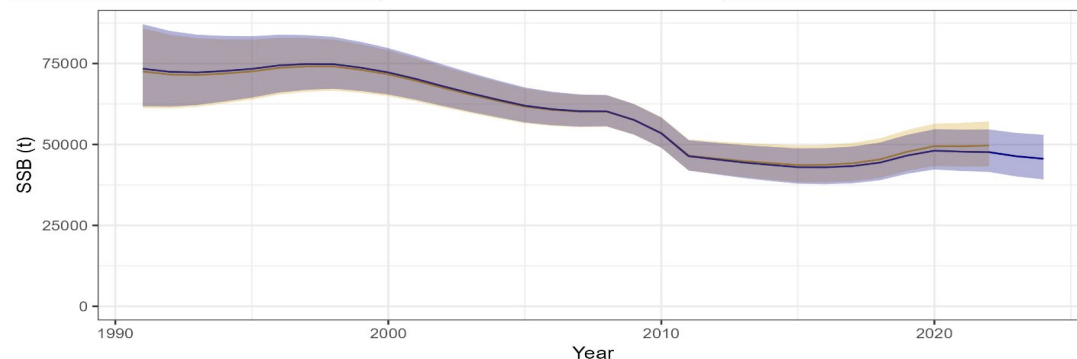


- Full Assessment; Tier 3, risk table (2,1,1,1)
- Model 16.0b same as previous in 2022 with updated catch and surveys



- Reduction in recent recruitment estimates compared to previous assessment

- Continued slow downward trend in biomass estimates



CHAPTER 7 KAMCHATKA FLOUNDER



- Full Assessment; Tier 3, risk table (2,1,1,1)
- Team supported authors recommended use of Model 16.0b with updated data
- No reduction from maximum permissible ABC

Quantity	Last asmt.	This asmt.	Change
M	0.11	0.11	0%
2024 Tier	3a		
2025 Tier	3a	3a	
2024 age+ biomass	119,565		-11%
2025 age+ biomass	116,651	106,850	-8%
2024 spawning biomass	47,849		-6%
2025 spawning biomass	47,330	44,883	-5%
B _{100%}	94,370	85,751	-9%
2025 F _{OFL}	0.103	0.101	-2%
2025 F _{ABC}	0.085	0.085	0%
2024 OFL	8,850		-9%
2025 OFL	8,687	8,019	-8%
2024 ABC	7,498		-9%
2025 ABC	7,360	6,800	-8%

CHAPTER 7

KAMCHATKA FLOUNDER RECOMMENDATIONS

- The Team recommended the authors explore why the model fails to capture the rapid decline of the shelf survey biomass for the most recent years.

CHAPTER 8

NORTHERN ROCK SOLE



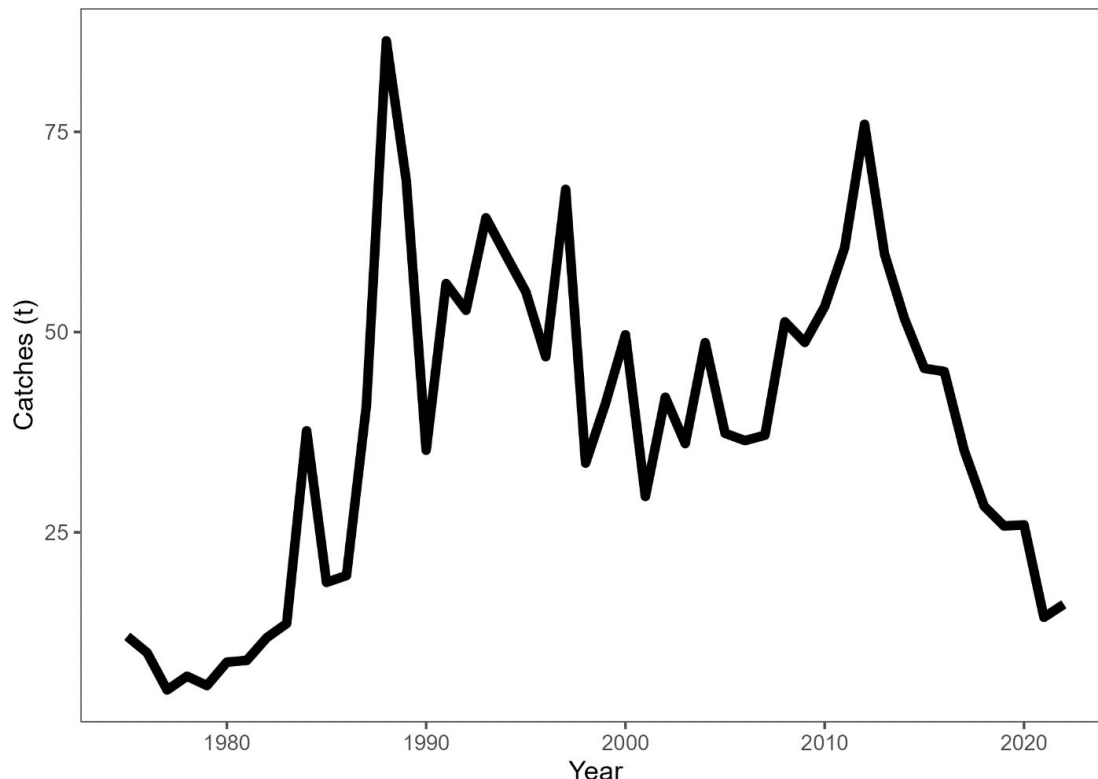
- Full Assessment; Tier 1, risk table (1,1,1,1)
- Alternative Model 24.2 used last cycle to set a reduction in Max ABC
 - Updates survey input sample sizes
 - Re-weights compositional data sources relative to one another
 - Estimates female natural mortality in addition to male natural mortality

CHAPTER 8

NORTHERN ROCK SOLE



- Full Assessment; Tier 1, risk table (1,1,1,1)
- ABC >> TAC >> Catch since 2017
- Drop in catch due to weakening market conditions

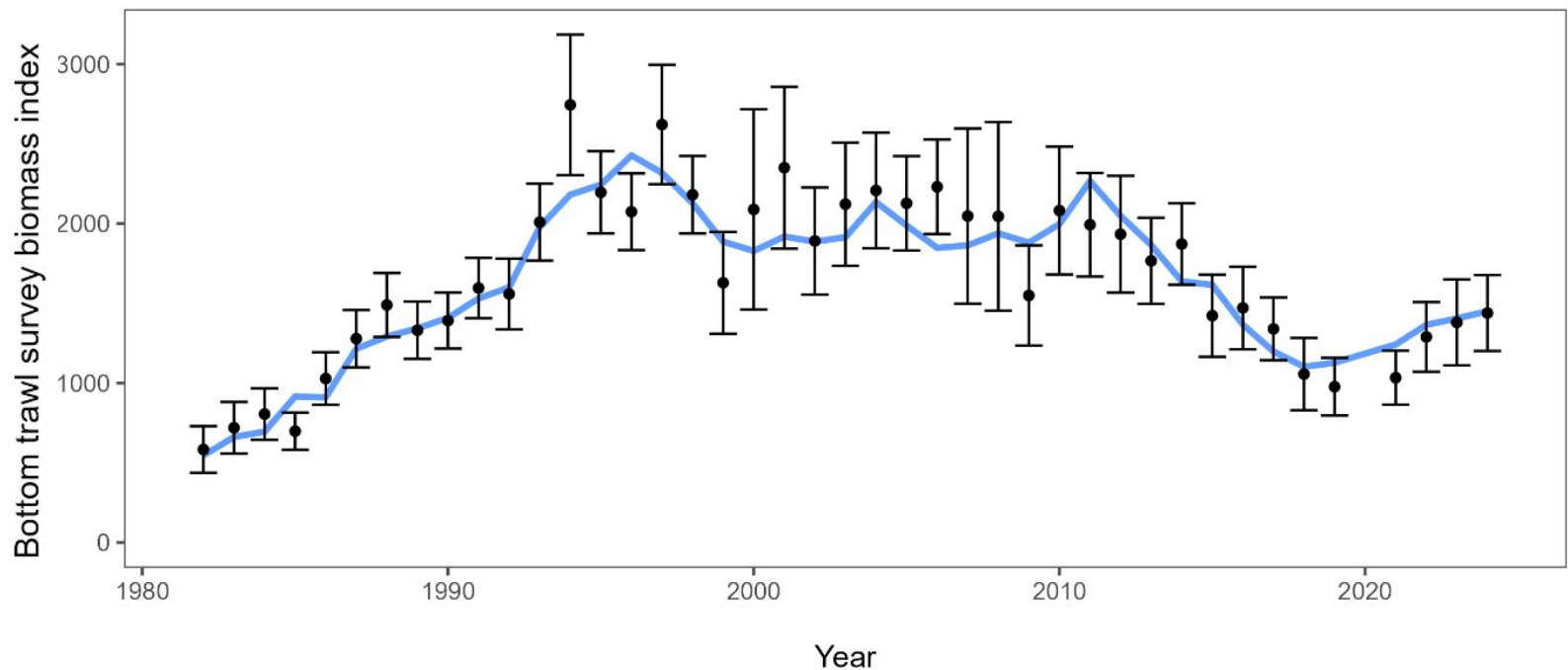


CHAPTER 8

NORTHERN ROCK SOLE



- Full Assessment; Tier 1, risk table (1,1,1,1)
- Increasing survey index since 2019
 - 4% increase from 2023

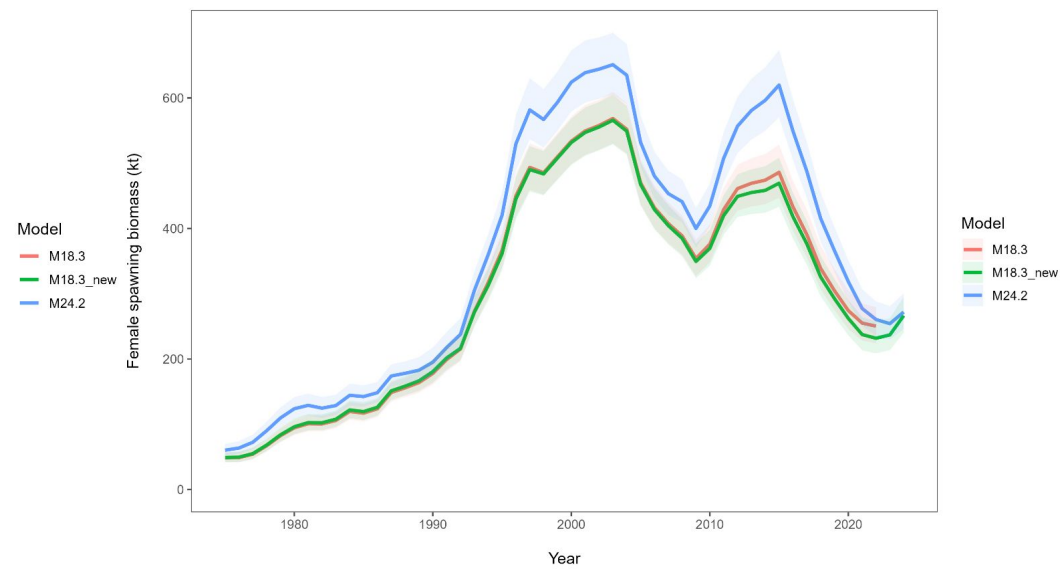
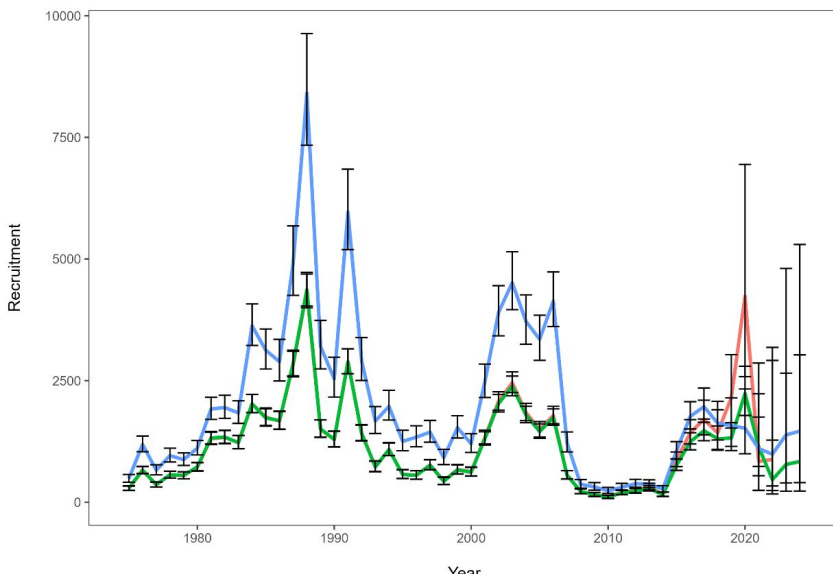


CHAPTER 8

NORTHERN ROCK SOLE



- Full Assessment; Tier 1, risk table (1,1,1,1)
- Increasing recruitment starting in 2015
- Increasing spawning stock biomass beginning in 2022



CHAPTER 8

NORTHERN ROCK SOLE



- Full Assessment; Tier 1, risk table (1,1,1,1)

- Team supported authors recommended use of Model 24.2

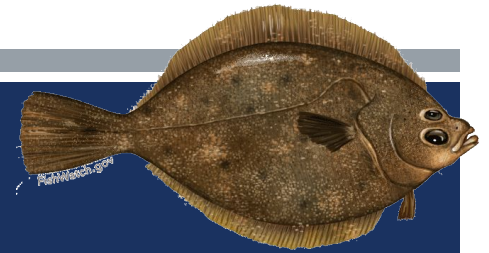
- Large increase in ABC, but large decrease in OFL
 - Different models in 2023 used for ABC versus OFL

- No reduction from maximum permissible ABC

Quantity	Last asmt.	This asmt.	Change
M	0.15/0.17	0.19/0.23	
2024 Tier		1a	
2025 Tier		1a	1a
2024 age+ biomass	1,121,670		-21%
2025 age+ biomass	1,501,330	881,154	-41%
2024 spawning biomass	296,808		1%
2025 spawning biomass	374,811	301,051	-20%
B_0	447,795	516,007	15%
B_{msy}	155,293	183,756	18%
2025 F_{OFL}	0.176	0.188	7%
2025 F_{ABC}	0.129	0.179	39%
2024 OFL	197,828		-16%
2025 OFL	264,789	165,444	-38%
2024 ABC	122,091		29%
2025 ABC	122,535	157,487	29%

CHAPTER 8

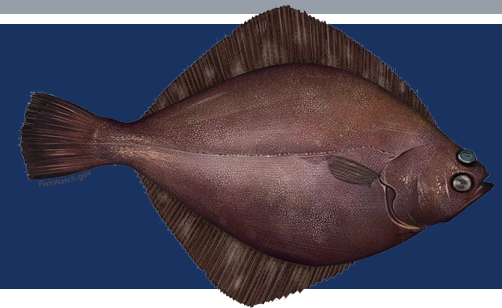
NORTHERN ROCK SOLE RECOMMENDATIONS



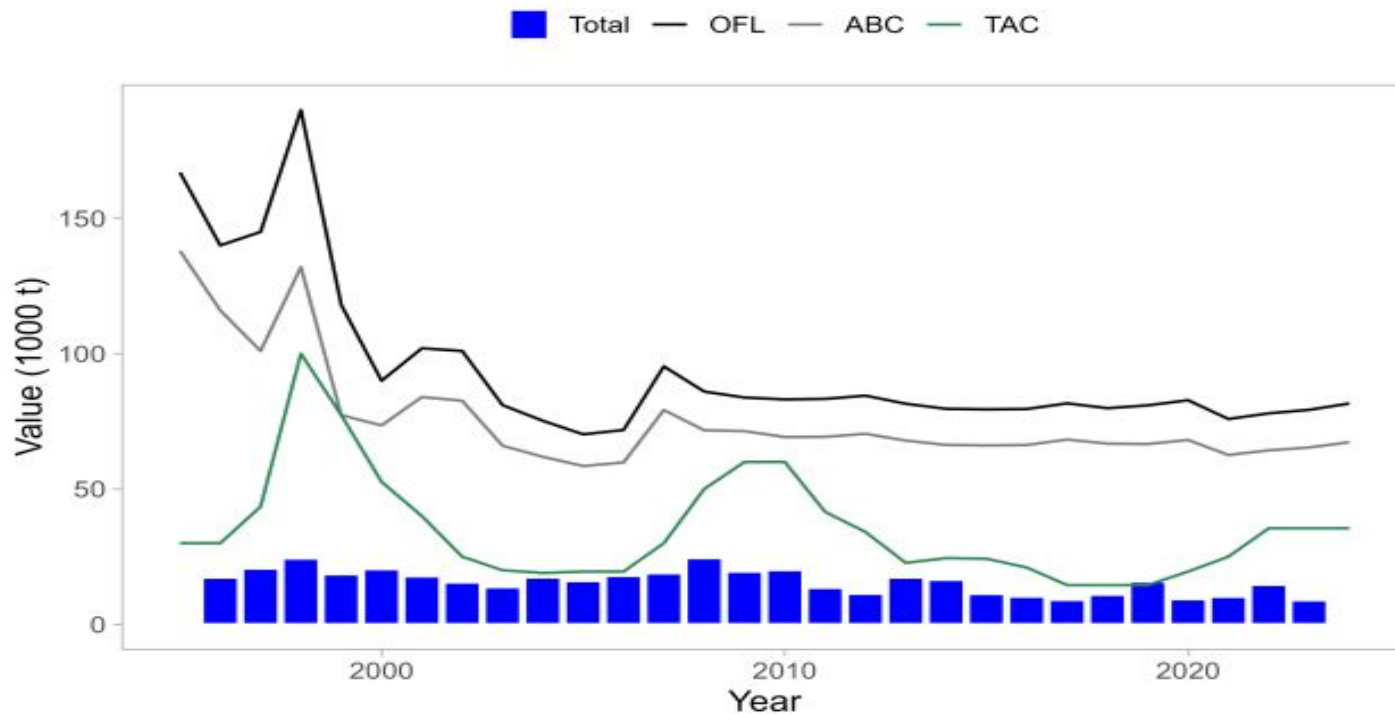
- The Team recommended clarifying when Markov Chain Monte Carlo vs. Maximum Likelihood Estimators are being used in the recommendation table and model diagnostics.

CHAPTER 9

FLATHEAD SOLE

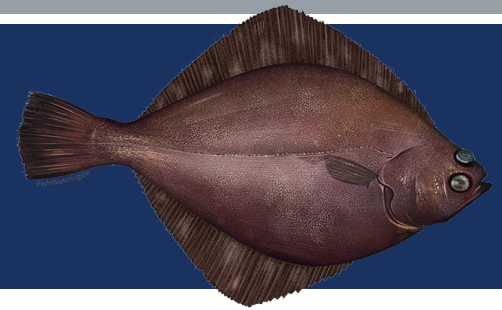


- Update Assessment; Tier 3, risk table (1,1,1,1)
- Model 18.2c with updated catch, fishery, and survey data
- Fishery ABC >> TAC >> catch since 2020

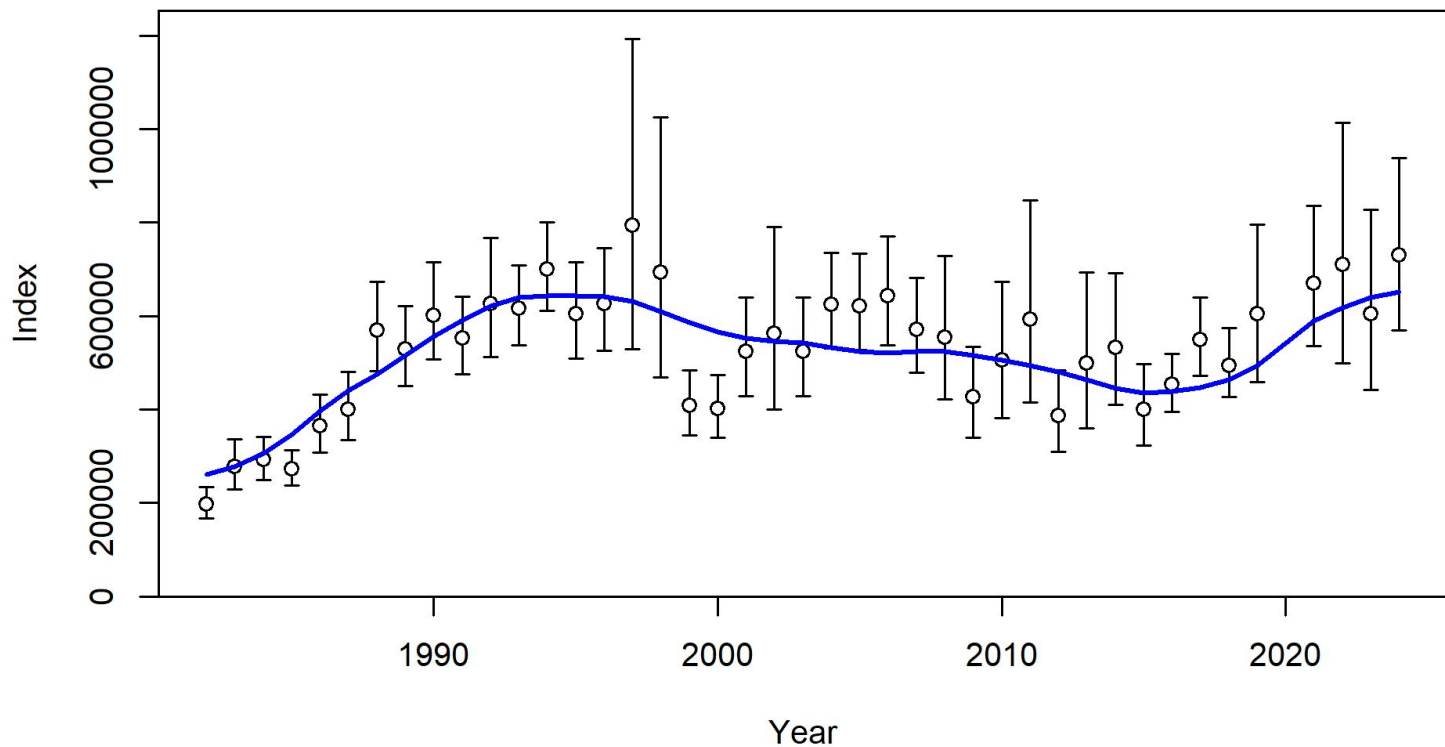


CHAPTER 9

FLATHEAD SOLE

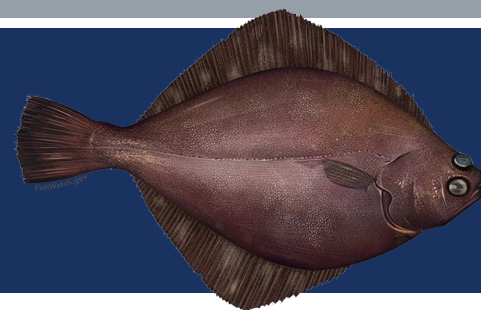


- Update Assessment; Tier 3, risk table (1,1,1,1)
- Bottom trawl survey index increasing trend since 2018

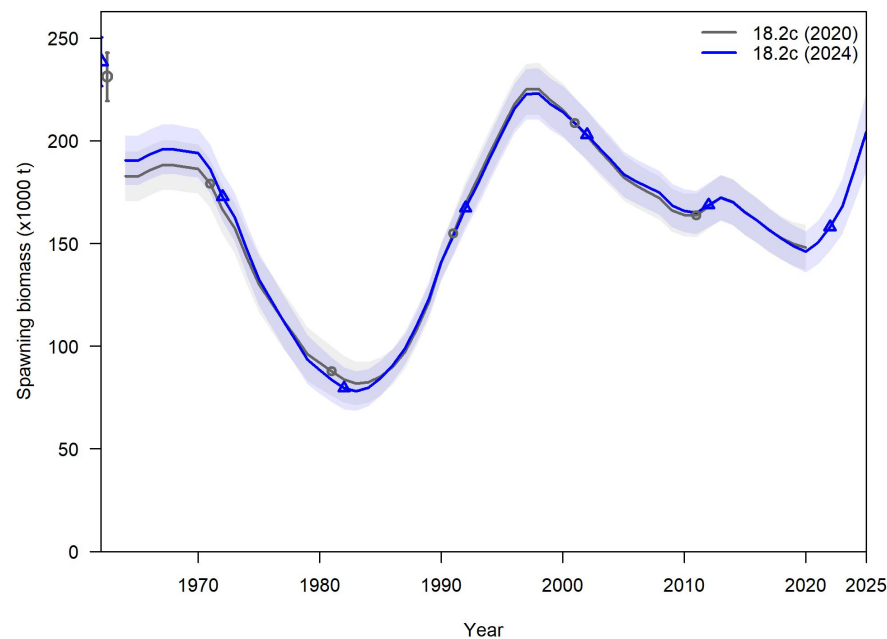
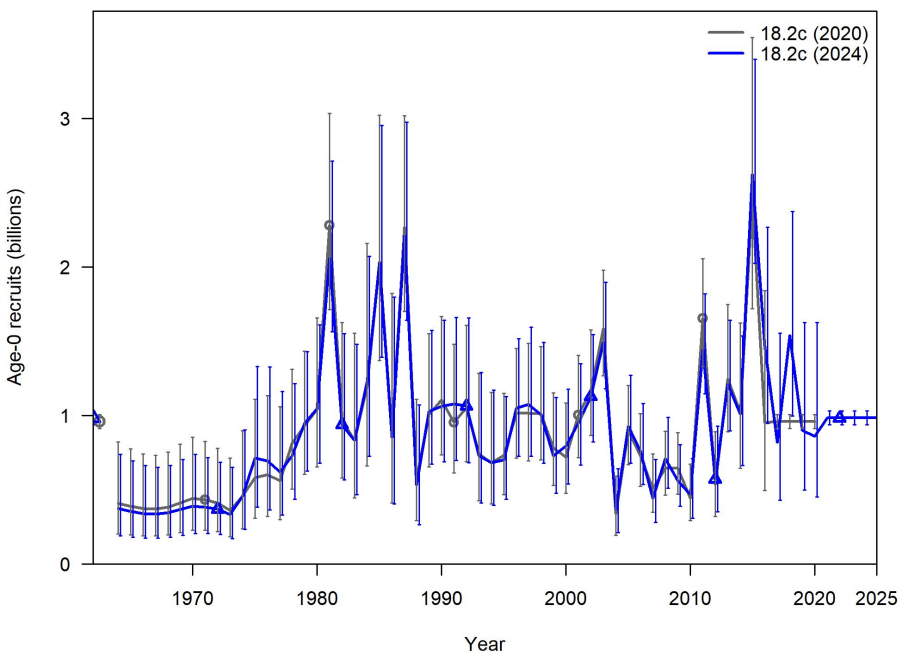


CHAPTER 9

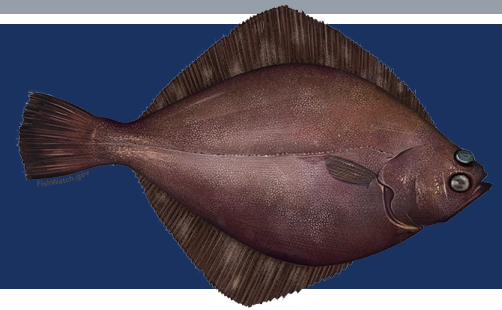
FLATHEAD SOLE



- Update Assessment; Tier 3, risk table (1,1,1,1)
- Large recent recruitments, particularly 2015
- Sharp increasing trend in spawning biomass



CHAPTER 9 FLATHEAD SOLE



- Update Assessment; Tier 3, risk table (1,1,1,1)
- Team supported authors recommended use of Model 18.2c (2020) with updated data
- No reduction from maximum permissible ABC
- No additional recommendations

Quantity	Last asmt.	This asmt.	Change
M	0.2	0.2	0%
2024 Tier	3a		
2025 Tier	3a	3a	
2024 age+ biomass	609,488		31%
2025 age+ biomass	608,230	801,418	32%
2024 spawning biomass	165,629		23%
2025 spawning biomass	169,452	204,323	21%
B _{100%}	203,658	243,288	19%
2025 F _{OFL}	0.46	0.49	7%
2025 F _{ABC}	0.37	0.4	8%
2024 OFL	81,605		25%
2025 OFL	82,699	101,621	23%
2024 ABC	67,289		25%
2025 ABC	68,203	83,807	23%

CHAPTER 9

ALASKA PLAICE



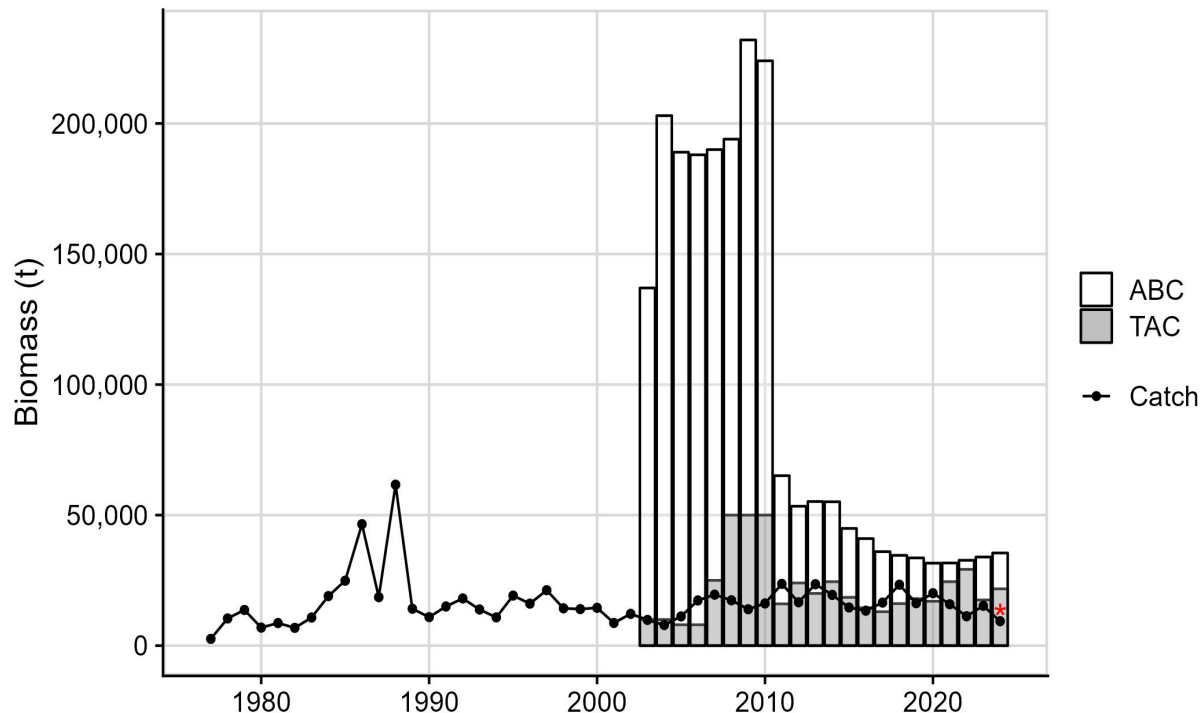
- Full Assessment; Tier 3, risk table (1,1,1,1)
- Transitioned from stand alone ADMB model to a Stock Synthesis model
- 3 updated models examined
 - Updated Input sample sizes
 - age range expanded to 0-25 instead of 3-25
 - weight at age calculated within model
 - CVs on growth parameters updated
 - Francis tuning of length and age composition data
 - Tuned Sigma R within Stock Synthesis using r4ss
- All models performed similarly
- Full Model 24.1b performed best with good convergence and acceptable model fits

CHAPTER 9

ALASKA PLAICE



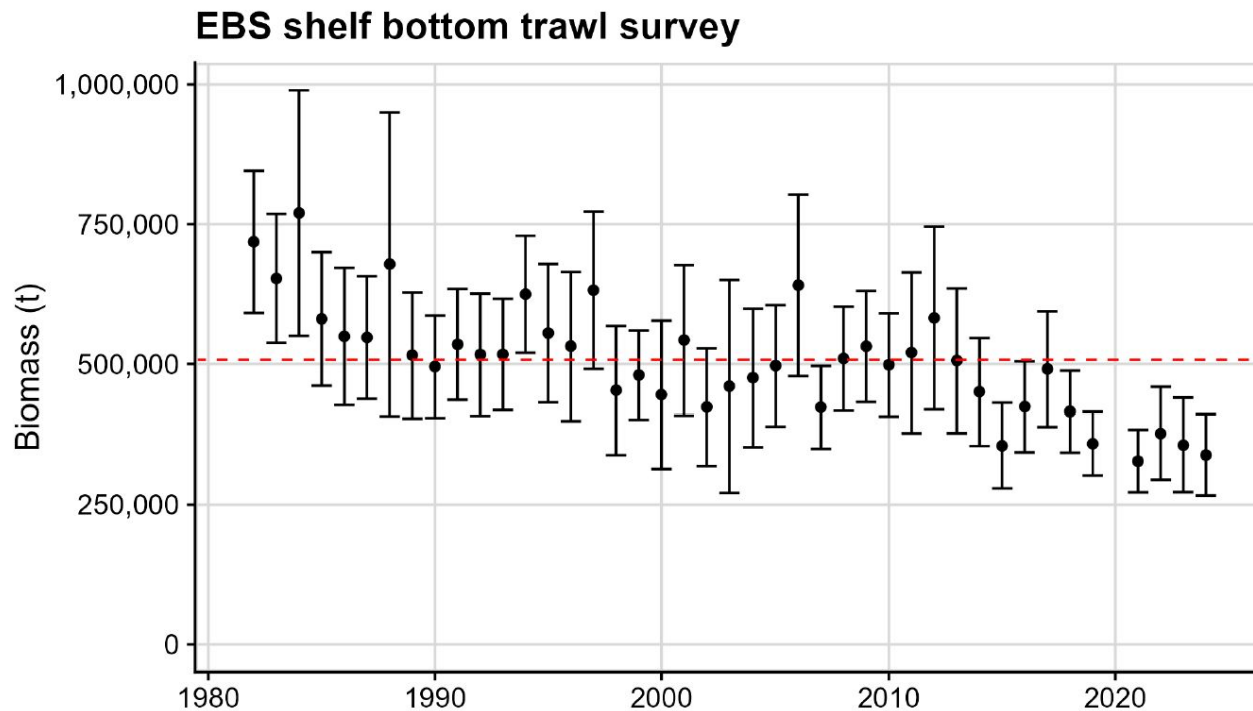
- Full Assessment; Tier 3, risk table (1,1,1,1)
- Bycatch species in Yellowfin sole and rock sole fisheries
- ABC > TAC



CHAPTER 9 ALASKA PLAICE



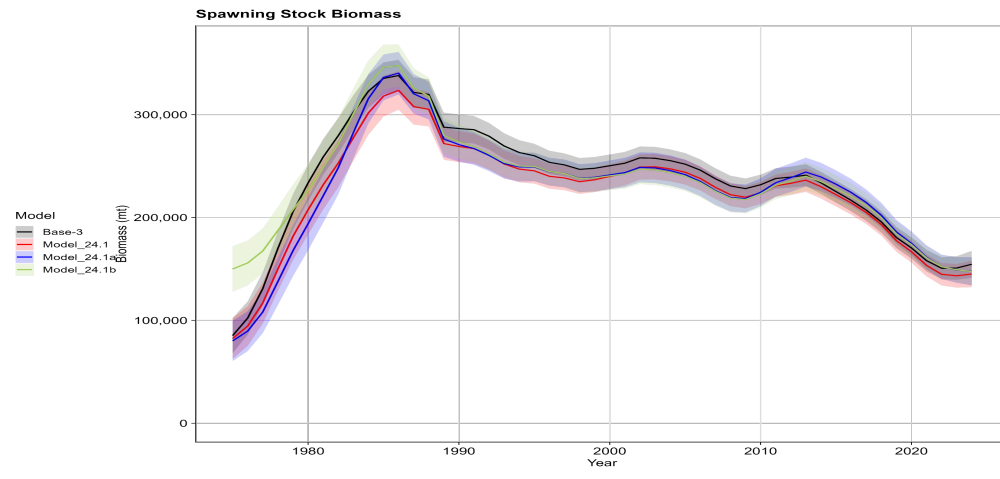
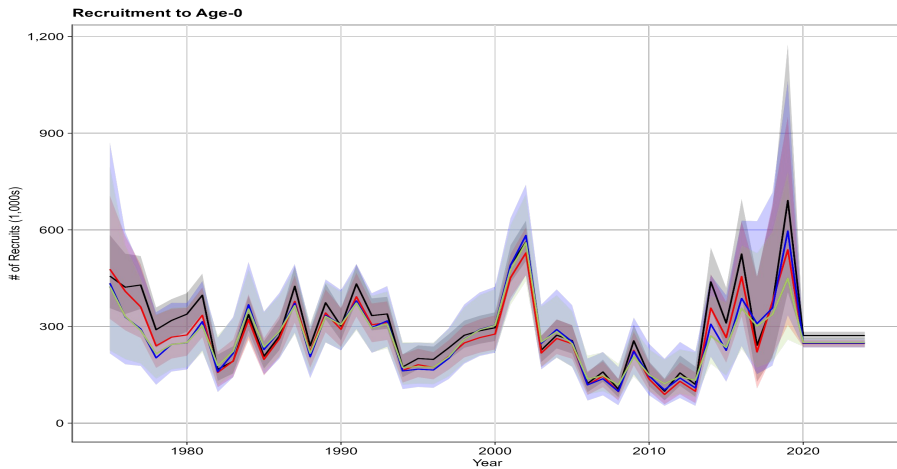
- Full Assessment; Tier 3, risk table (1,1,1,1)
- Declining trend in the EBS shelf bottom trawl survey over full timeseries



CHAPTER 9 ALASKA PLAICE



- Full Assessment; Tier 3, risk table (1,1,1,1)
- Recruitment
 - Recent large recruitments since 2016
- Spawning biomass
 - Downward trend since 1986 peak through 2024
 - Projected increase with maturation of new recruits



CHAPTER 9 ALASKA PLAICE

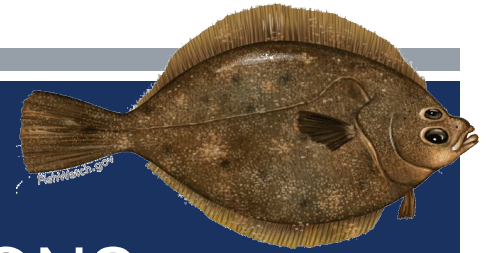


- Full Assessment; Tier 3, risk table (1,1,1,1)
- Team supported authors recommended use of Model 24.1b
- No reduction from maximum permissible ABC

Quantity	Last asmt.	This asmt.	Change
M	0.13	0.13	0%
2024 Tier	3a		
2025 Tier	3a	3a	
2024 age+ biomass	473,125		-14%
2025 age+ biomass	481,959	406,051	-16%
2024 spawning biomass	158,087		-5%
2025 spawning biomass	166,827	150,892	-10%
$B_{100\%}$	286,587	296,407	3%
2025 F_{OFL}	0.17	0.17	0%
2025 F_{ABC}	0.14	0.14	0%
2024 OFL	42,695		-19%
2025 OFL	45,182	34,576	-23%
2024 ABC	35,494		-19%
2025 ABC	37,560	28,745	-23%

CHAPTER 9

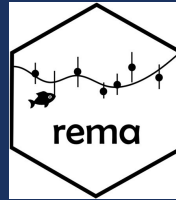
ALASKA PLAICE RECOMMENDATIONS



- The Team recommended that future assessments include NBS biomass estimates, maps showing Alaska plaice distribution in surveys and fisheries, and analyses of distribution and movement patterns over time in response to environmental changes, such as the cold pool area.

CHAPTER 11

OTHER FLATFISH



- Update Assessment; Tier 5, risk table (1,1,1,1)
- Other flatfish has 15 species, however biomass consists primarily of rex sole, Dover sole, and starry flounder
- rema modeling framework
 - 9 rema models summed for ABC
 - (AI, shelf, slope) x (rex, Dover, 'other' other)

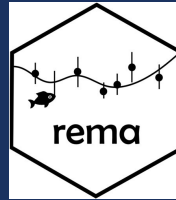
Common Name

Arctic flounder
 butter sole
 curlfin sole
 deepsea sole
 Dover sole
 English sole
 longhead dab
 Pacific sanddab
 petrale sole
 rex sole
 roughscale sole
 sand sole
 slender sole
 starry flounder
 Sakhalin sole

Scientific Name

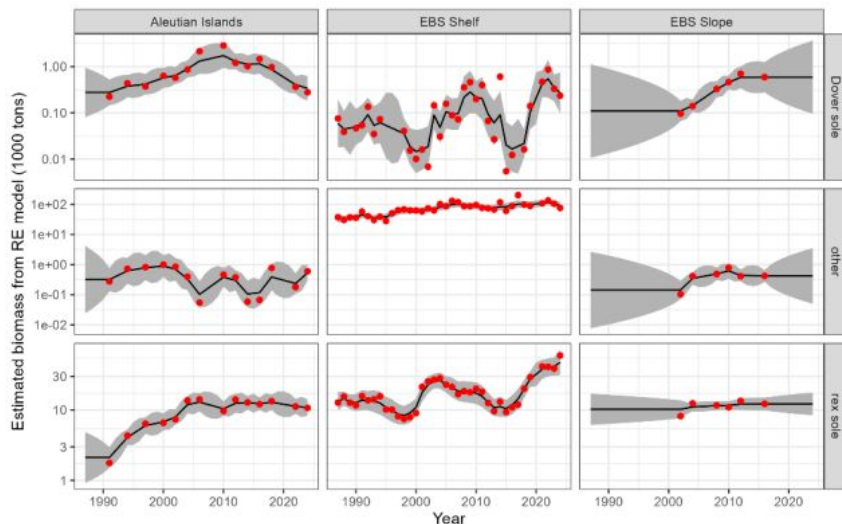
Liopsetta glacialis
Isopsetta isolepis
Pleuronectes decurrens
Embassichthys bathybius
Microstomus pacificus
Parophrys vetulus
Limanda proboscidea
Citharichthys sordidus
Eopsetta jordani
Glyptocephalus zachirus
Clidodoerma asperrimum
Psettichthys melanostictus
Lyopsetta exilis
Platichthys stellatus
Limanda sakhalinensis

CHAPTER 11 OTHER FLATFISH



- Update Assessment; Tier 5; risk table (1,1,1,1)
- Team supported authors recommended approach
- No reduction from maximum permissible ABC

Quantity	Last asmt.	This asmt.	Change
M		0.17	0.17 0%
2024 Tier		5	
2025 Tier		5	5
2024 age+ biomass		141,325	17%
2025 age+ biomass		141,325	164,955 17%
2025 F_{OFL}	0.170/0.085/0.150	0.170/0.085/0.150	
2025 F_{ABC}	0.128/0.064/0.113	0.128/0.064/0.113	
2024 OFL	21,824		20%
2025 OFL	21,824	26,083	20%
2024 ABC	16,368		20%
2025 ABC	16,368	19,562	20%



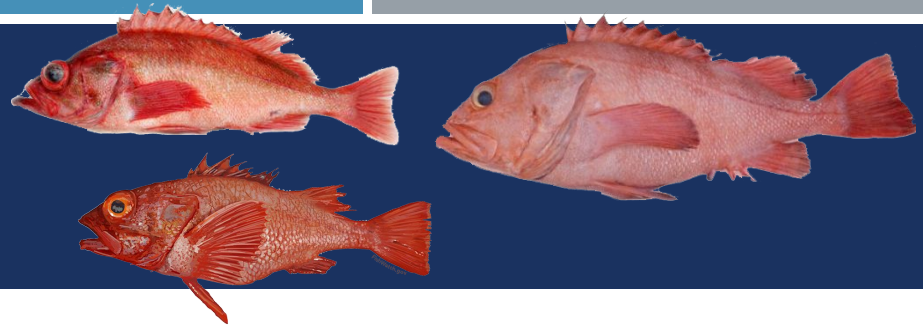
CHAPTER 11

OTHER FLATFISH RECOMMENDATIONS



- Team recommended the authors investigate the potential for use of the AFSC longline survey to supplement the EBS slope time series for the deeper water species (as done in the other rockfish assessment for SST).

ROCKFISH SUMMARY



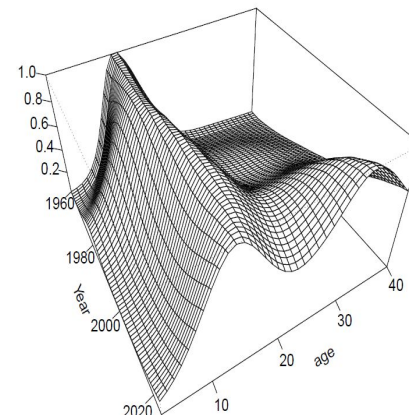
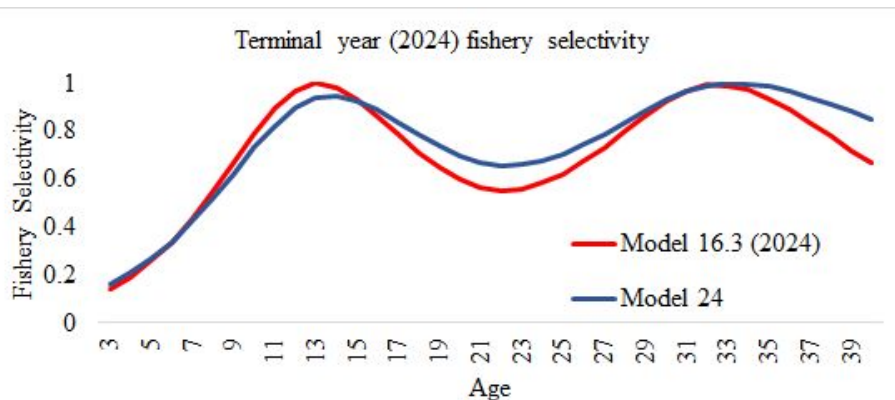
Stock	Tier	2025 ABC (t)	2025 OFL (t)	Change from 2024 ABC
Pacific ocean perch (Full)	3a	37,375	44,594	-9%
Blackspotted/rougheye (Full)	3a/5	652	766	24%
Shorttraker rockfish (Update)	5	473	631	-11%
Other rockfish (Update)	5	1,054	1,406	-16%

CHAPTER 12

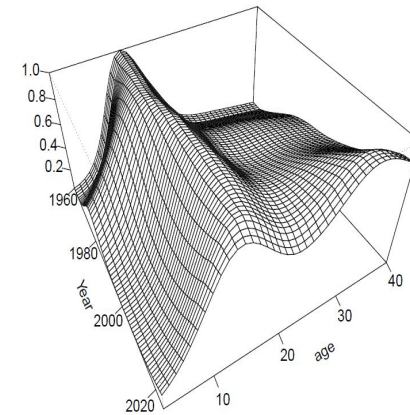
PACIFIC OCEAN PERCH



- Full Assessment; Tier 3; Risk (2,1,1,1)
 - Model 24 - Minor updates from Model 16.3
 - Prior distribution on AI trawl survey catchability (Mean 1.0, CV 0.15)
 - Prior based on field work conducted by Jones et al. (2021).
 - Increase penalty for fishery selectivity dome-shapedness
 - Increases stability in fishery selectivity across ages
 - Changes improve stability and reduces retrospective bias at the cost of a slightly higher objective function



Model 16.3 (2024)



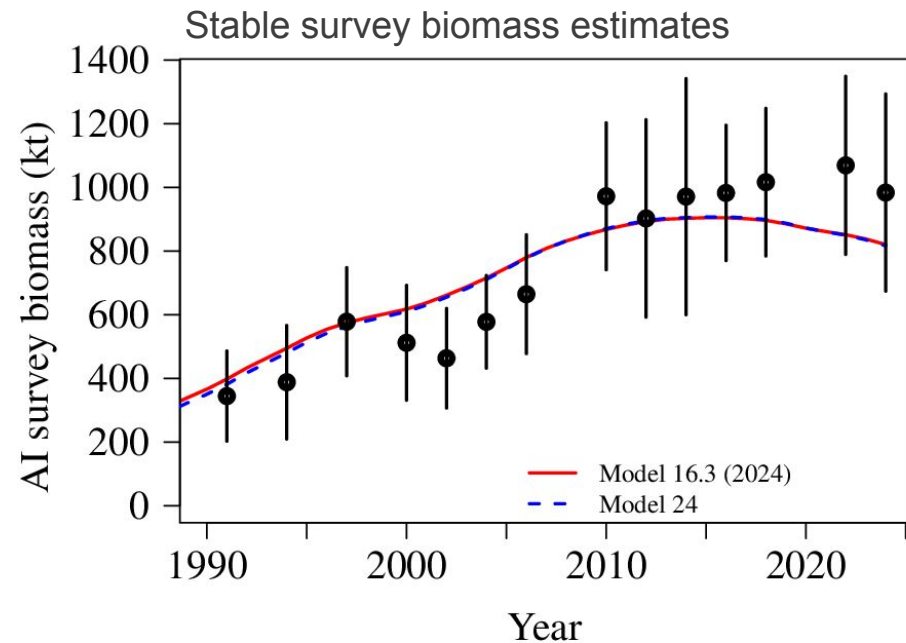
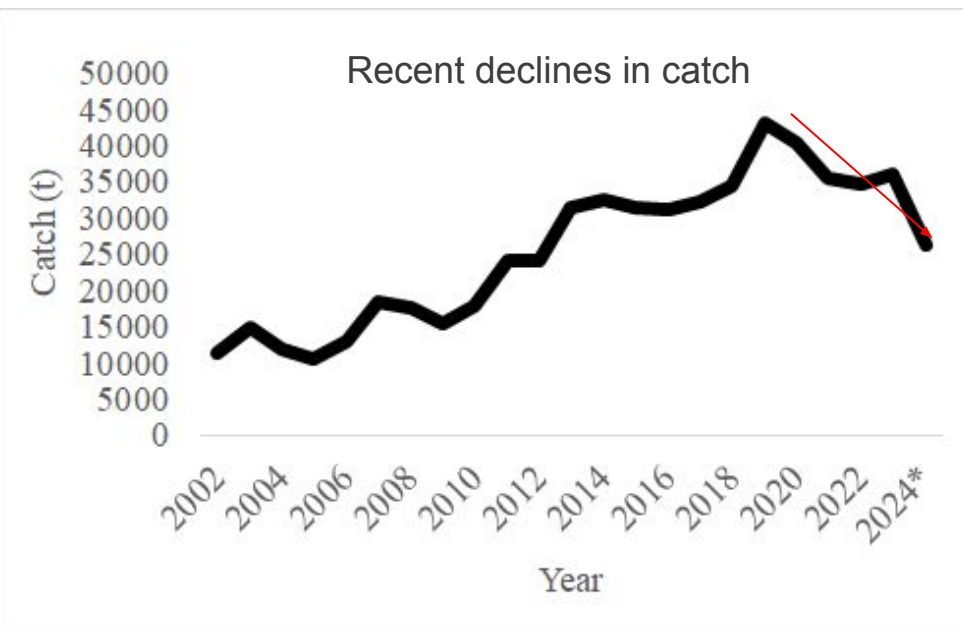
Model 24

CHAPTER 12

PACIFIC OCEAN PERCH



- Full Assessment; Tier 3; Risk (2,1,1,1)
 - Updated catch and AI survey data



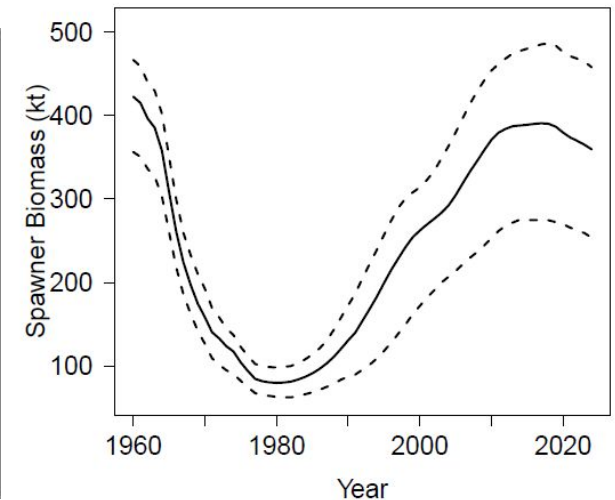
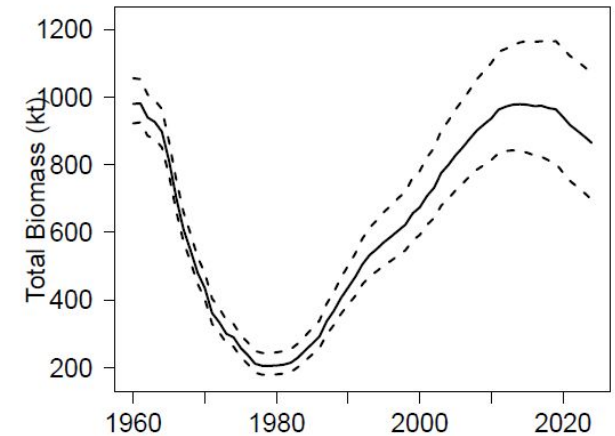
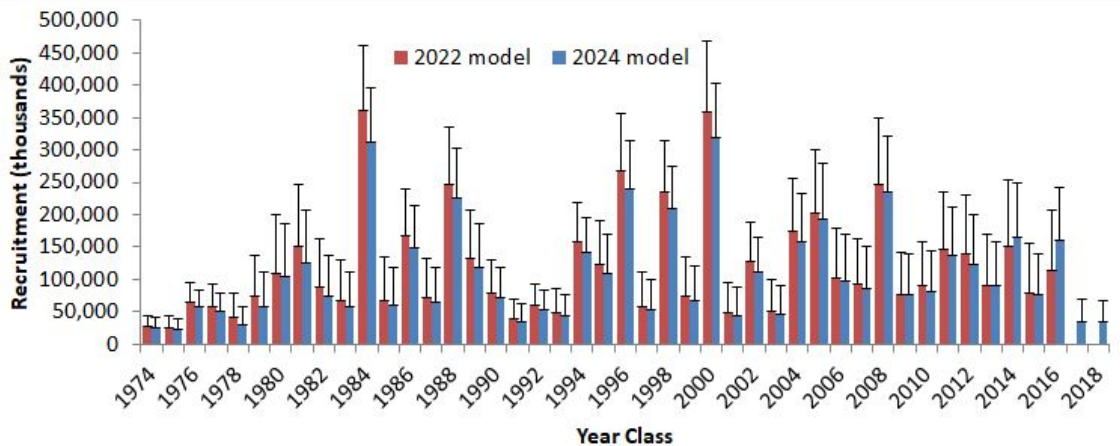
CHAPTER 12

PACIFIC OCEAN PERCH



■ Full Assessment; Tier 3; Risk (2,1,1,1)

- Model 24 estimates above average recruitment in 13 of the last 15 years (2007-2021)
- Model 24 estimates slowly dropping biomass following peaks in total biomass (2014) and spawning biomass (2017)



CHAPTER 12

PACIFIC OCEAN PERCH



■ Full Assessment; Tier 3; Risk (2,1,1,1)

- Team supported authors' recommended Model 24 for management
- Team supported authors' recommended no reduction from maximum permissible ABC
- Apportionment based on Random effects model of AI bottom trawl survey biomass into subarea ABCs

Quantity	Last asmt.	This asmt.	Change
M	0.056	0.051	-9%
2024 Tier	3a		
2025 Tier	3a	3a	
2024 age+ biomass	871,892		-3%
2025 age+ biomass	858,751	847,803	-1%
2024 spawning biomass	350,439		1%
2025 spawning biomass	342,980	352,503	3%
$B_{100\%}$	652,626	681,381	4%
2025 F_{OFL}	0.089	0.072	-19%
2025 F_{ABC}	0.074	0.060	-19%
2024 OFL	49,010		-9%
2025 OFL	48,139	44,594	-7%
2024 ABC	41,096		-9%
2025 ABC	40,366	37,375	-7%

Apportionment	2025	2026
EBS	10,121	9,905
EAI	6,278	6,144
CAI	5,559	5,441
WAI	15,417	16,058

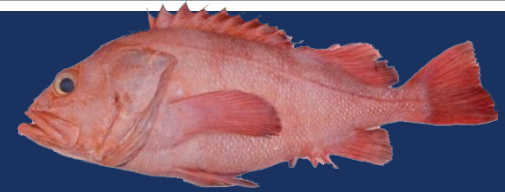
CHAPTER 12

PACIFIC OCEAN PERCH RECOMMENDATIONS

- The Team recommended that the author explore increasing the penalty to smooth out fishery selectivity.
- The team also recommended an exploration of the mechanisms for time-varying nonparametric fishery selectivity specifically related to changes in fleet dynamics.

CHAPTER 14

BLACKSPOTTED/ROUGHEYE



- Full Assessment; Tier 3 (AI) and Tier 5 (BS); Risk (2,2,1,2)
 - Aleutian Islands Tier 3 Model 20 (2024)
 - Age-structured model with updated AI survey and catch data
 - Bering Sea Tier 5
 - BSAI-wide random effects (RE) model with AI shelf survey and BS slope survey
 - BS portion is the summed southern Bering Sea and Slope estimates from the RE model.
 - Apportionment by area using proportions from the RE model
 - Area ABCs
 - Western and Central AI
 - Eastern AI and Bering Sea
 - OFL - BSAI wide
 - Maximum subarea species catch (MSSC)
 - Western AI
 - Central AI

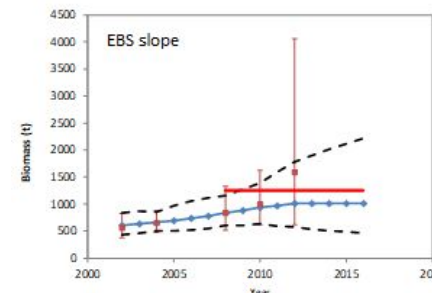
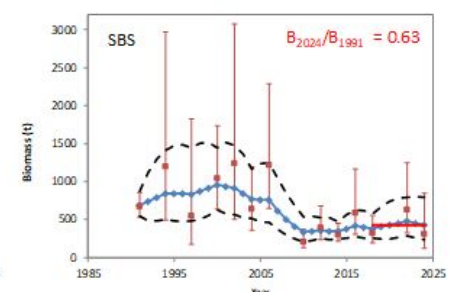
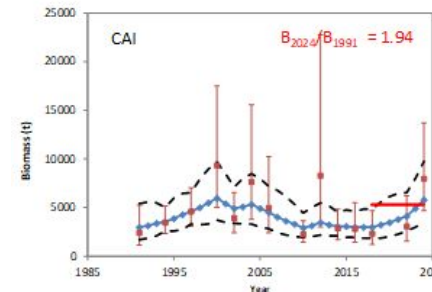
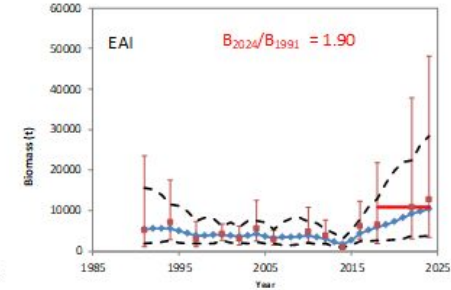
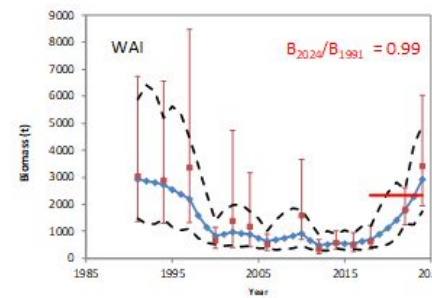
CHAPTER 14

BLACKSPOTTED/ROUGHEYE



■ Full Assessment; Tier 3 (AI) and Tier 5 (BS); Risk (2,2,1,2)

- AI bottom trawl survey
 - Increasing trend in all the AI regions
 - Decreasing to stable in the southern Bering Sea
- Slope survey
 - No new data since 2012
 - 2016 survey estimate not used due to missing stations in the Bering Canyon area



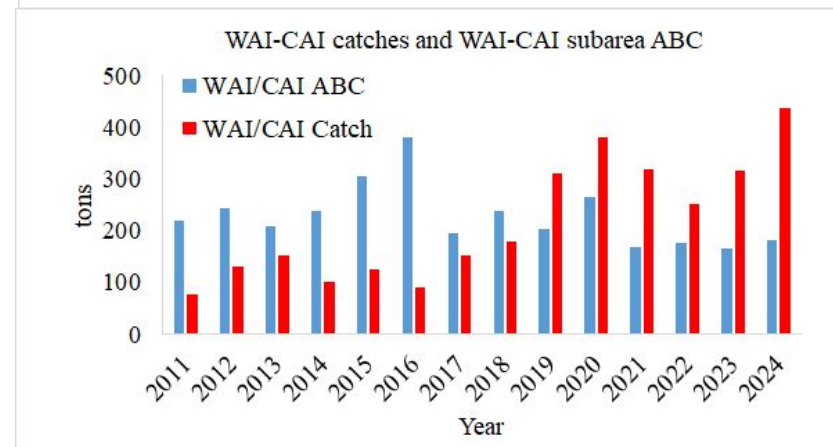
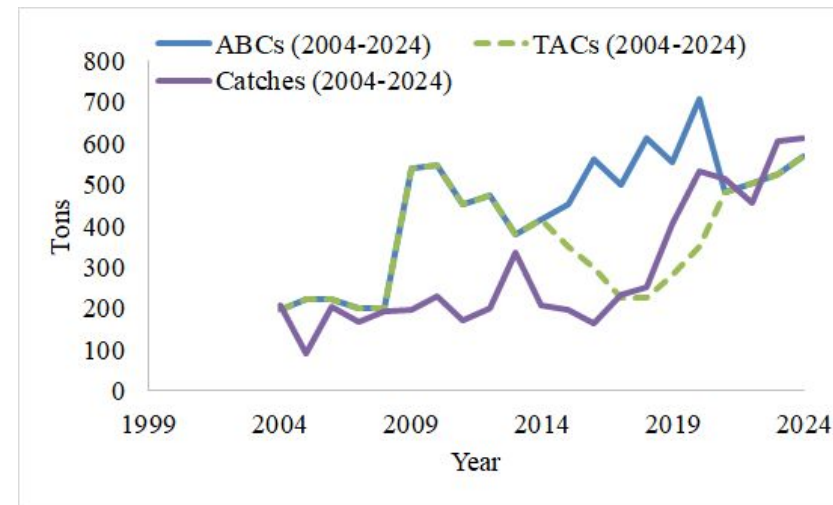
CHAPTER 14

BLACKSPOTTED/ROUGHEYE



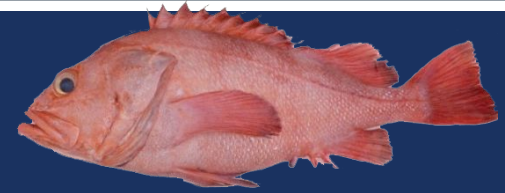
■ Full Assessment; Tier 3 (AI) and Tier 5 (BS); Risk (2,2,1,2)

- Bycatch species in rockfish, Atka mackerel, arrowtooth, and Kamchatka fisheries
- Catch increasing in the AI
- Catch exceeding MSSC in WAI in all but 1 year since being established
- Catch exceeding WAI/CAI ABC in all years since 2019
- **Catch exceeded stock-wide ABC in 2021, 2023, and 2024**



CHAPTER 14

BLACKSPOTTED/ROUGHEYE



- Full Assessment; Tier 3 (AI) and Tier 5 (BS); Risk (2,2,1,2)
 - Team supported authors recommended use of Model 20 with adjusted 2011 year class for AI and the random effects model for BS portions of the stock

Aleutian Islands (Tier 3)

Quantity	Last asmt.	This asmt.	Change
M	0.05	0.05	0%
2024 Tier	3a		
2025 Tier	3a	3a	
2024 age+ biomass	24,315		16%
2025 age+ biomass	24,743	28,314	14%
2024 spawning biomass	3,630		3%
2025 spawning biomass	3,821	3,729	-2%
$B_{100\%}$	8,733	8,813	1%
2025 F_{OFL}	0.04	0.041	2%
2025 F_{ABC}	0.034	0.035	3%
2024 OFL	684		12%
2025 OFL	736	766	4%
2024 ABC	511		28%
2025 ABC	549	652	19%

Bering Sea (Tier 5)

Quantity	Last asmt.	This asmt.	Change
M	0.05	0.05	0%
2024 Tier	5		
2025 Tier	5	5	
2024 age+ biomass	1,544		-6%
2025 age+ biomass	1,544	1,444	-6%
2025 F_{OFL}	0.05	0.05	0%
2025 F_{ABC}	0.037	0.037	0%
2024 OFL	77		-6%
2025 OFL	77	72	-6%
2024 ABC	58		-7%
2025 ABC	58	54	-7%

CHAPTER 14

BLACKSPOTTED/ROUGHEYE



- Full Assessment; Tier 3 (AI) and Tier 5 (BS); Risk (2,2,1,2)

- Combined AI and BS OFL and ABC

Quantity	Last asmt.	This asmt.	Change
2024 OFL	761		10%
2025 OFL	813	838	3%
2024 ABC	569		24%
2025 ABC	607	706	16%

- Subarea apportionment

Quantity	Last asmt.	This asmt.	Change
2024 West/Central AI ABC	181		65%
2025 West/Central AI ABC	195	298	52%
2024 Eastern AI/Eastern BS ABC	388		5%
2025 Eastern AI/Eastern BS ABC	412	408	-1%

- Apportionment within WAI/CAI

Quantity	Last asmt.	This asmt.	Change
2024 WAI MSSC	67		49%
2025 WAI MSSC	71	100	41%
2024 CAI MSSC	114		-4%
2025 CAI MSSC	124	109	-12%

CHAPTER 14

BLACKSPOTTED/ROUGHEYE ROCKFISH RECOMMENDATIONS



- The Team noted that this information (ABC overages) should be conveyed by the Agency to the Council that the BSAI wide ABC has been exceeded three times in the past 4 years

ACLs and Accountability Measures

When an ACL is exceeded > 1 time in 4 years, National Standard 1 guidelines at 50 CFR 600.310(g)(7) require that the ACL and accountability measures (AM) be reevaluated for this stock complex and modified if necessary to address their effectiveness

BSRE overall ABC (= ACL) exceeded 3 of out last 4 years; BSAI Other rockfish ACL exceeded in 2024

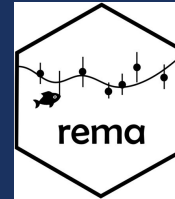
Current AMs refer to in-season management measures and observer coverage

in-season management cannot constrain fisheries at the ABC (ACL) level only when OFL is approached

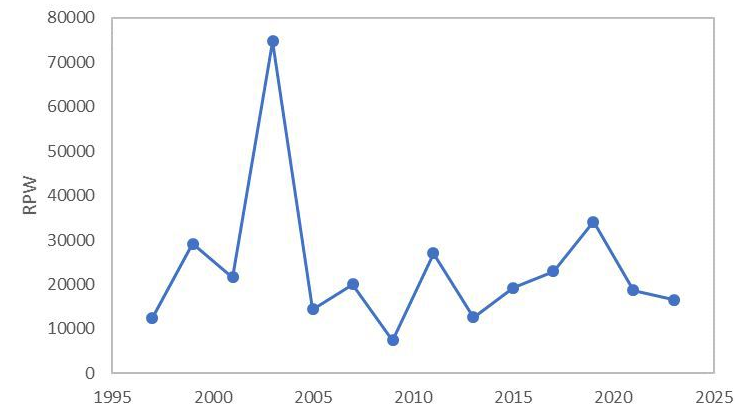
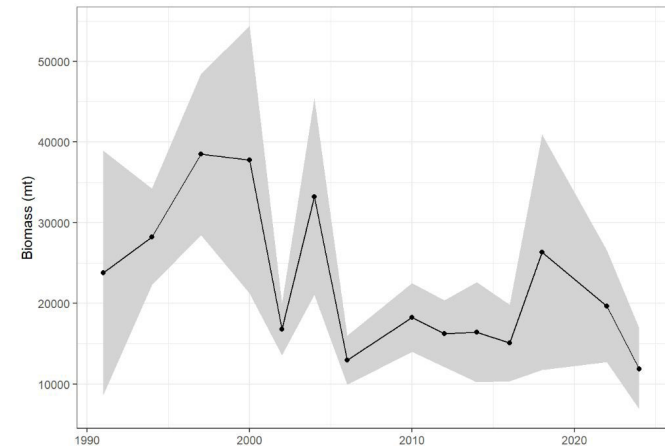
Council may need to consider additional AMs for BSRE stock

CHAPTER 15

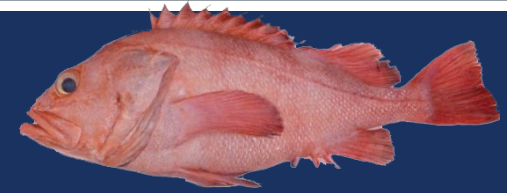
SHORTRAKER ROCKFISH



- Update Assessment; Tier 5; Risk (2,1,1,1)
 - Model 22_2024 - 2022 rema model with updated survey data
 - AI Bottom trawl survey
 - 2024 40% decline in biomass from 2022
 - EBS Longline Survey
 - 2023 11% decline from 2021

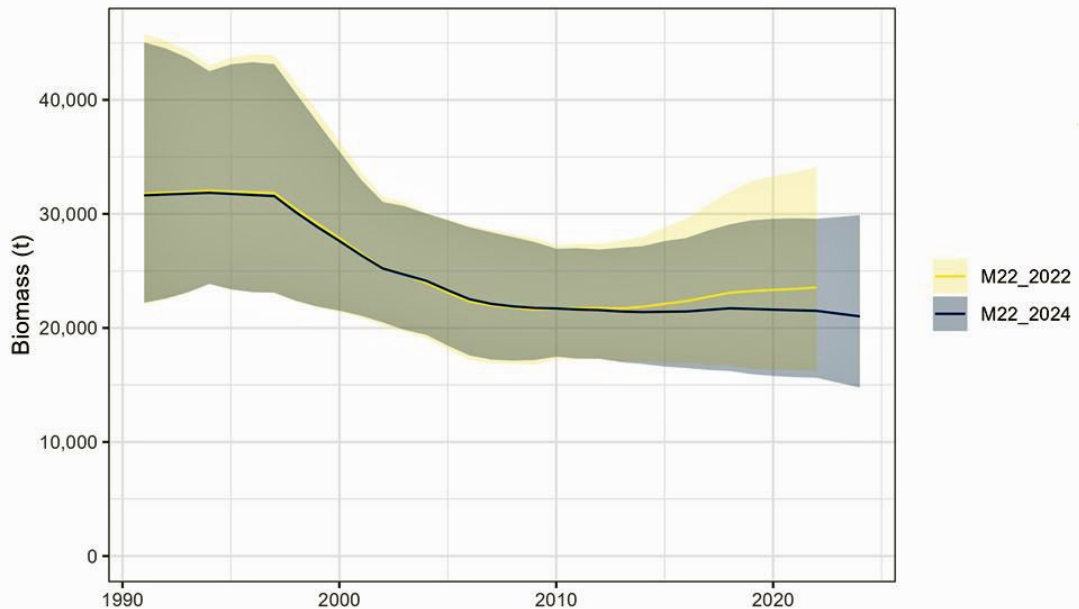


CHAPTER 15 SHORTRAKER ROCKFISH

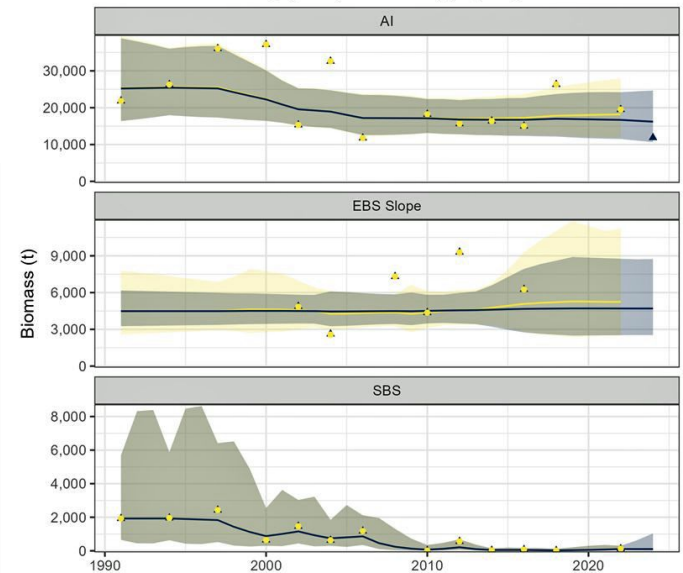


- Update Assessment; Tier 5; Risk (2,1,1,1)
 - rema model framework with updated survey data
 - Dropping biomass trend overall

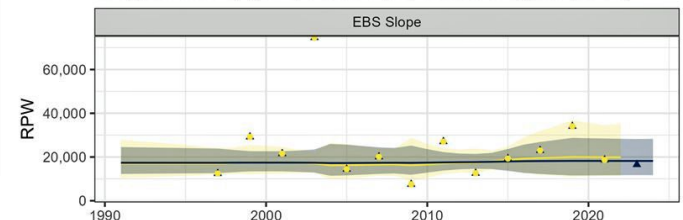
Combined



Bottom trawl survey (BTS) biomass (t) by region

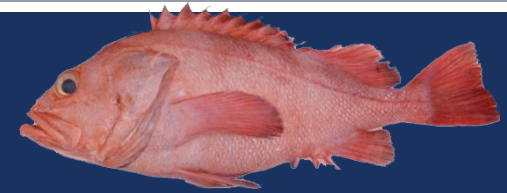
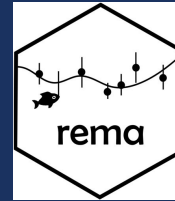


Longline survey (LLS) relative population weights (RPW)



CHAPTER 15

SHORTRAKER ROCKFISH



■ Update Assessment; Tier 5; Risk (2,1,1,1)

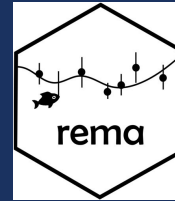
- Team supported authors' recommended Model 22 for management
- Team supported authors' recommended no reduction from maximum permissible ABC

Quantity	Last asmt.	This asmt.	Change
M	0.03	0.03	0%
2024 Tier	5		
2025 Tier	5	5	
2024 age+ biomass	23,547		-11%
2025 age+ biomass	23,547	21,018	-11%
2025 F _{OFL}	0.03	0.03	0%
2025 F _{ABC}	0.0225	0.0225	0%
2024 OFL	706		-11%
2025 OFL	706	631	-11%
2024 ABC	530		-11%
2025 ABC	530	473	-11%

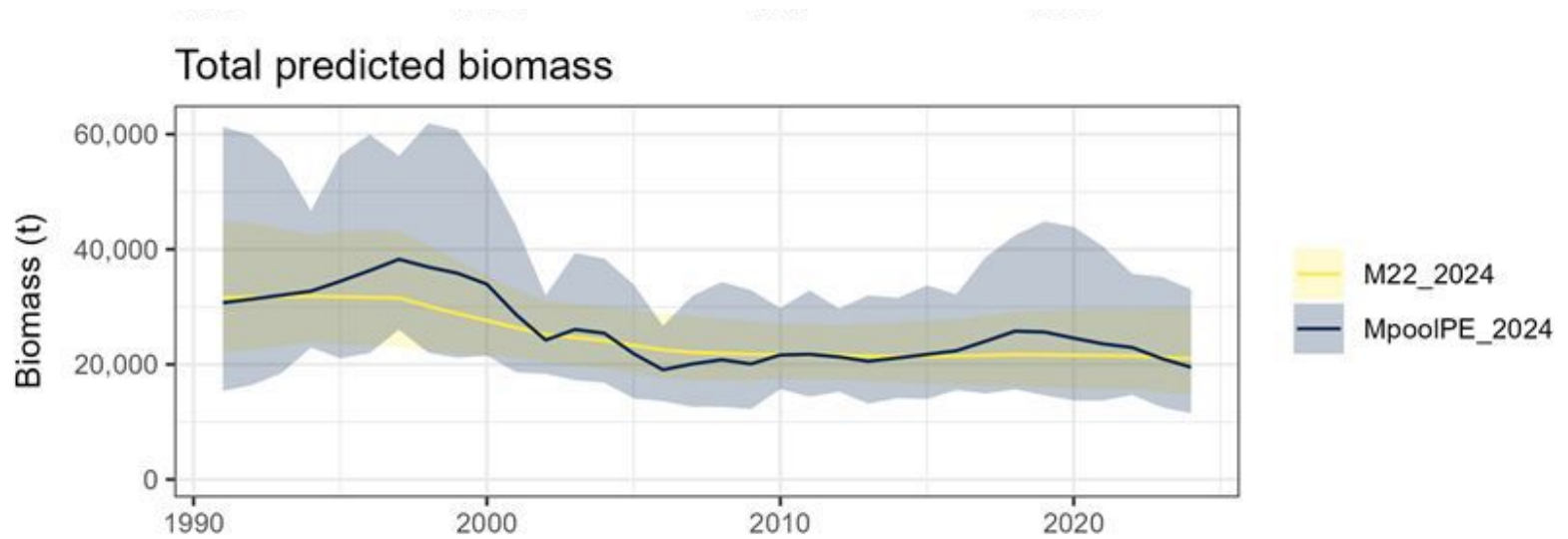
CHAPTER 15

SHORTRAKER ROCKFISH

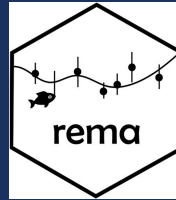
RECOMMENDATIONS



- The Team supported this approach (one strata for REMA model) and recommended simplifying and combining strata for future assessments.



CHAPTER 16 OTHER ROCKFISH



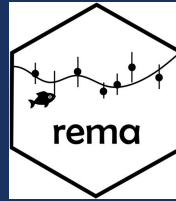
- Update Assessment; Tier 5; Risk (2,2,1,2)
 - Includes all species of *Sebastes* and *Sebastolobus*, except Pacific ocean perch, northern rockfish, roughey rockfish, and shortraker rockfish
 - 2 rema models with survey data updates
 - Shortspine thornyhead
 - non-shortspine thornyhead - Dusky rockfish and at least 11 other species



Photos courtesy of Aaron Baldwin



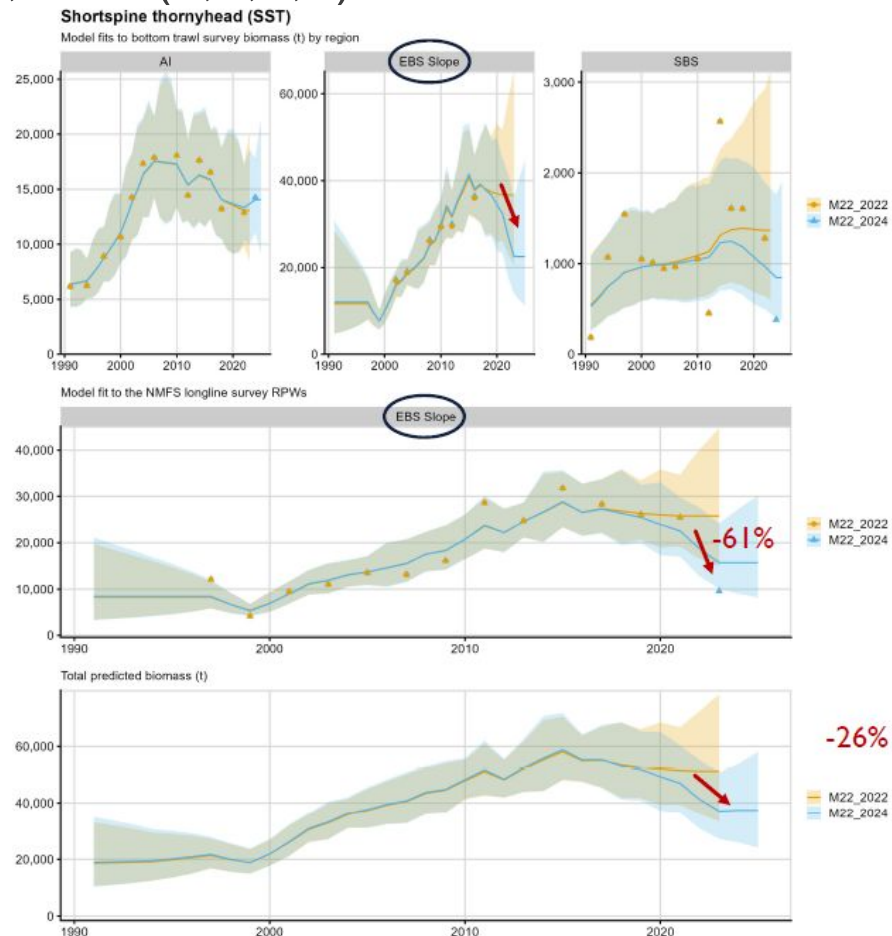
CHAPTER 16 OTHER ROCKFISH



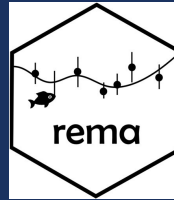
Update Assessment; Tier 5; Risk (2,2,1,2)

SST

- Sharp decline in AFSC longline survey (-61%)
- Overall decreasing biomass (-26%)

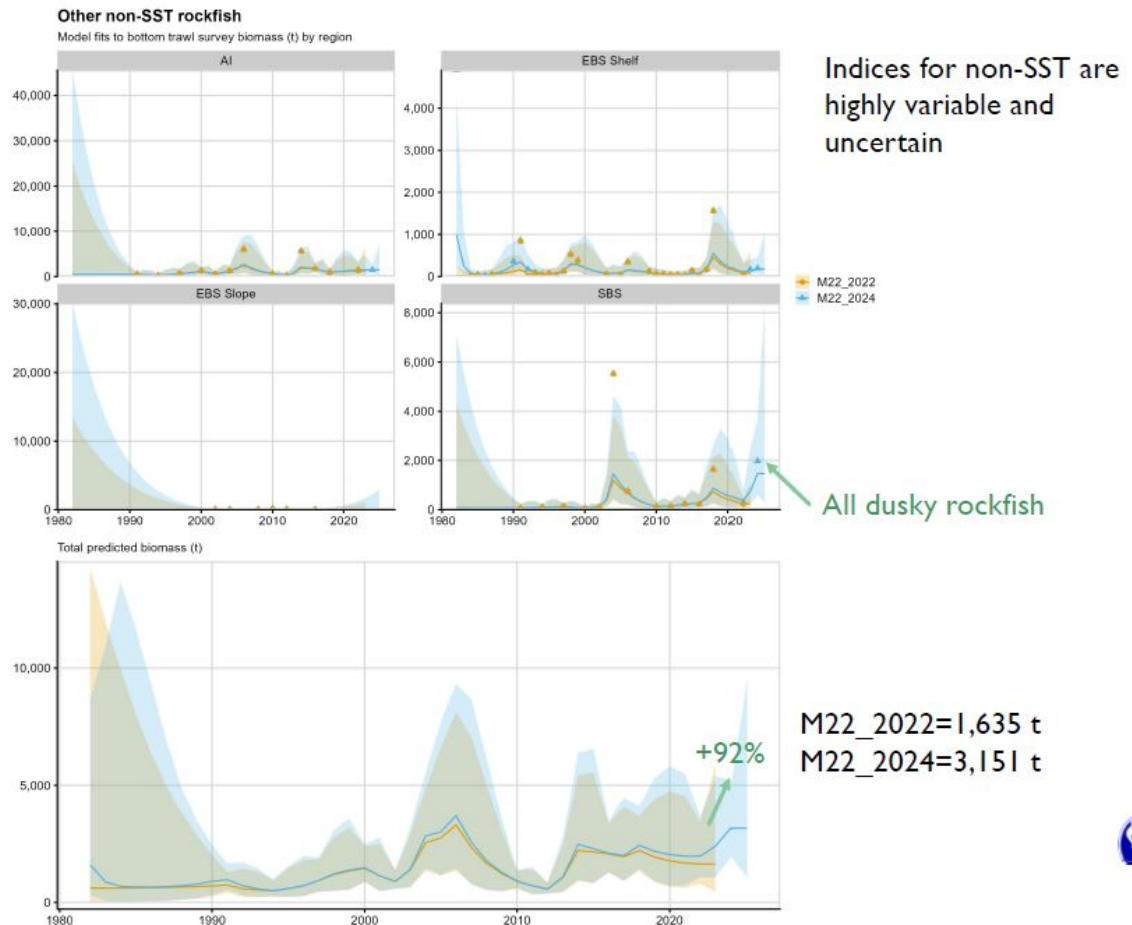


CHAPTER 16 OTHER ROCKFISH

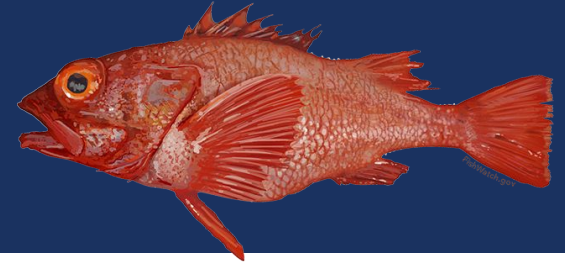
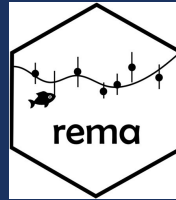


Update Assessment; Tier 5; Risk (2,2,1,2)

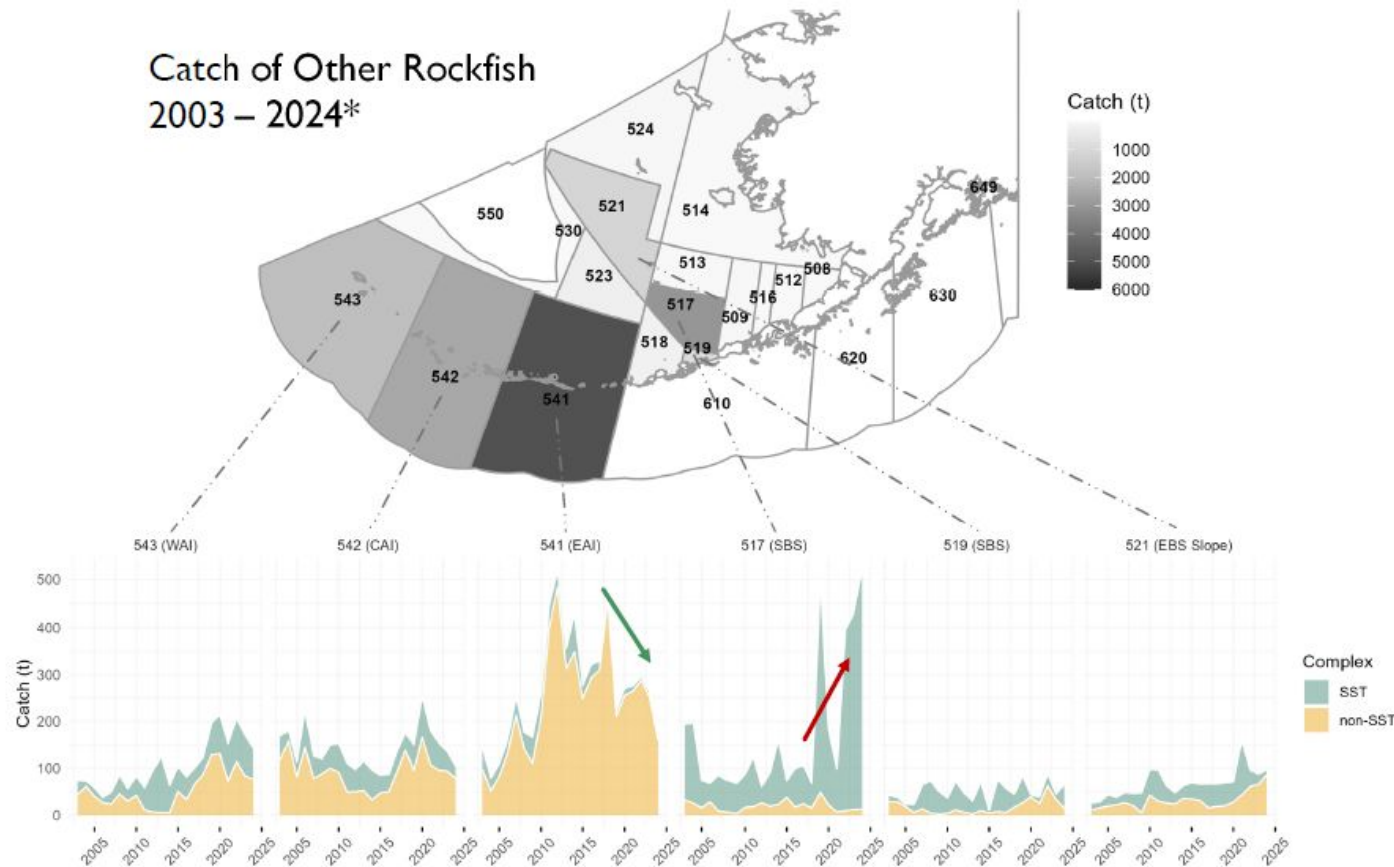
- Non-SST
 - Highly variable surveys
 - Overall increasing biomass (+92%)



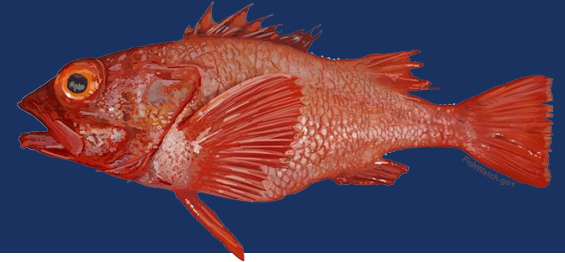
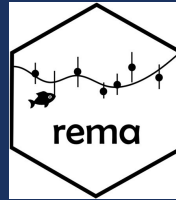
CHAPTER 16 OTHER ROCKFISH



- Update Assessment; Tier 5; Risk (2,2,1,2)
 - Catch has exceeded ABC in 2024



CHAPTER 16 OTHER ROCKFISH



■ Update Assessment; Tier 5; Risk (2,2,1,2)

- Team supported authors' recommended rema approach for management
- Team supported authors' recommended no reduction from maximum permissible ABC
- Apportionment uses ratio of estimated biomass in AI and BS from rema
- No additional recommendations

Quantity	Last asmt.	This asmt.	Change
M	0.03/0.009	0.03/0.09	0%
2024 Tier	5		
2025 Tier	5	5	
2024 age+ biomass	52,733		-23%
2025 age+ biomass	52,733	40,559	-23%
2025 F_{OFL}	0.03/0.09	0.03/0.09	0%
2025 F_{ABC}	0.0225/0.0675	0.0225/0.0675	0%
2024 OFL	1,680		-16%
2025 OFL	1,680	1,406	-16%
2024 ABC	1,260		-16%
2025 ABC	1,260	1,054	-16%

Apportionment	Total
Bering Sea ABC	639
Aleutian Islands ABC	415

OTHER SUMMARY



Stock	Tier	2025 ABC (t)	2025 OFL (t)	Change from 2024 ABC
Atka mackerel (Update)	3a	103,247	122,622	8%

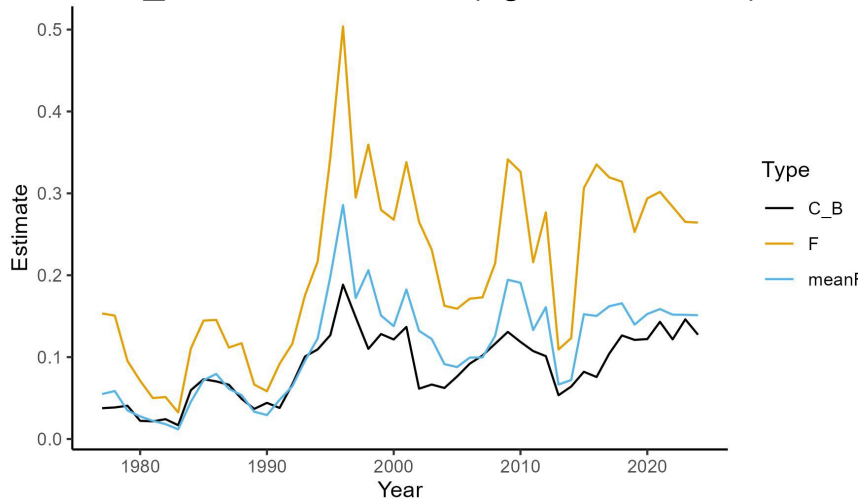
CHAPTER 17

ATKA MACKEREL

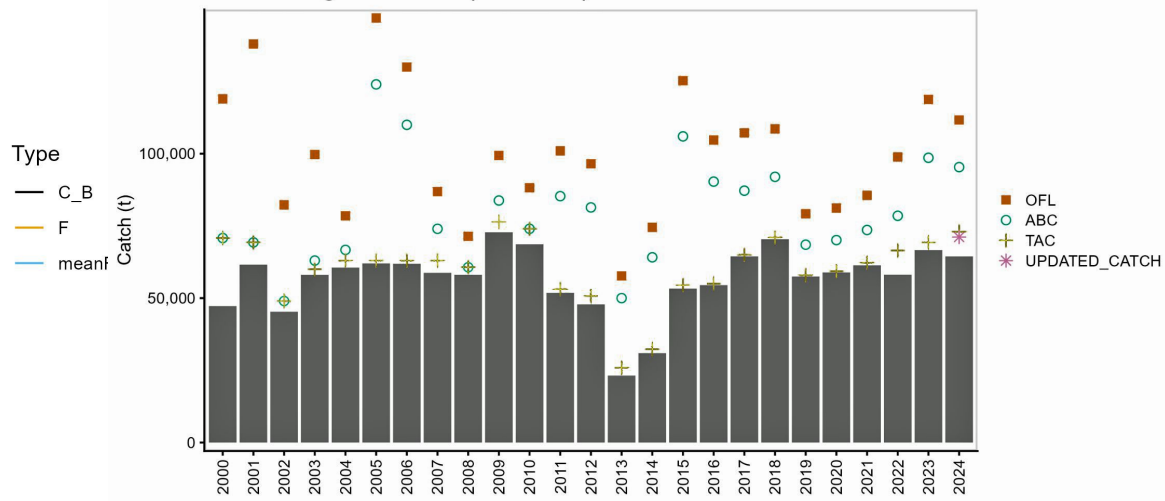


- Update Assessment, Tier 3; risk table (2,1,1,1)
- Same AMAK model since 2016 (Model 16.0b)
 - Updated catch data
 - $ABC > TAC \cong \text{Catch}$

C_B=Catch/biomass (age-3+ biomass)



Catch through 2024-10-05 (2024-11-09)

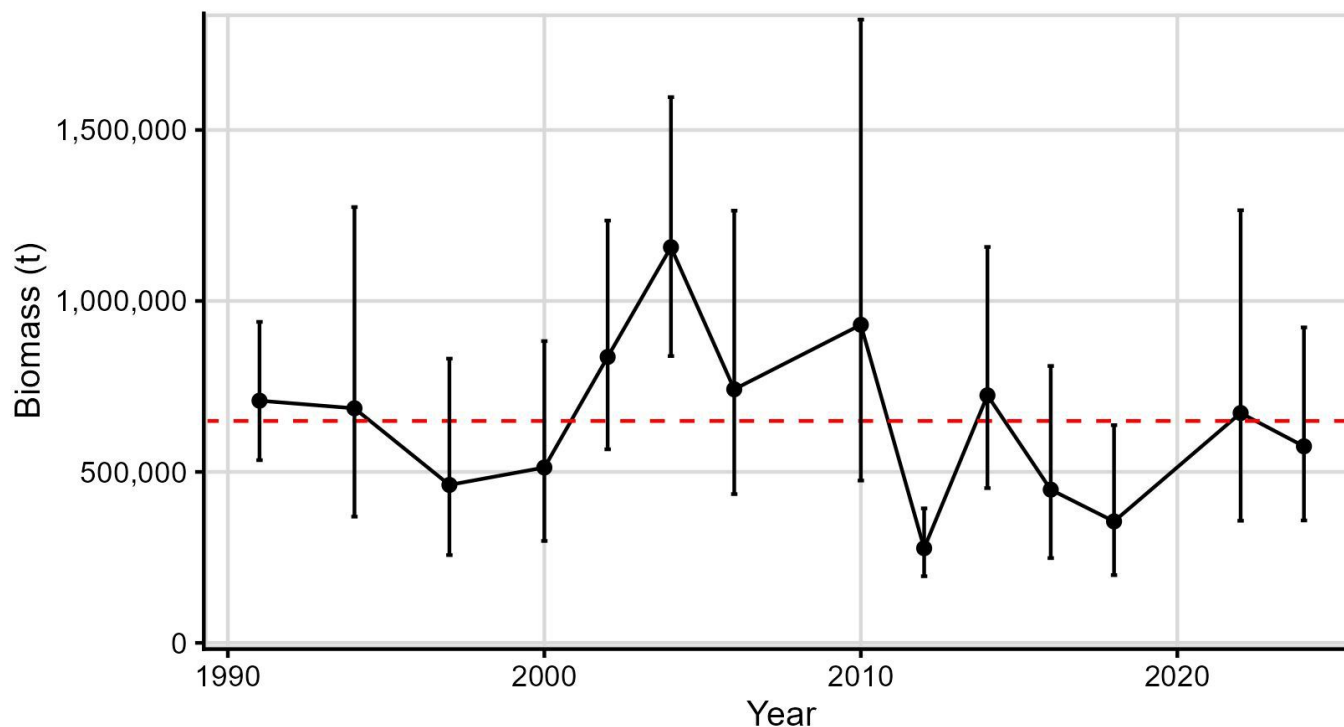


CHAPTER 17

ATKA MACKEREL



- Update Assessment, Tier 3; risk table (2,1,1,1)
- Same AMAK model since 2016 (Model 16.0b)
 - Updated AI bottom trawl survey data
 - 14.5% reduction in AI biomass from 2022

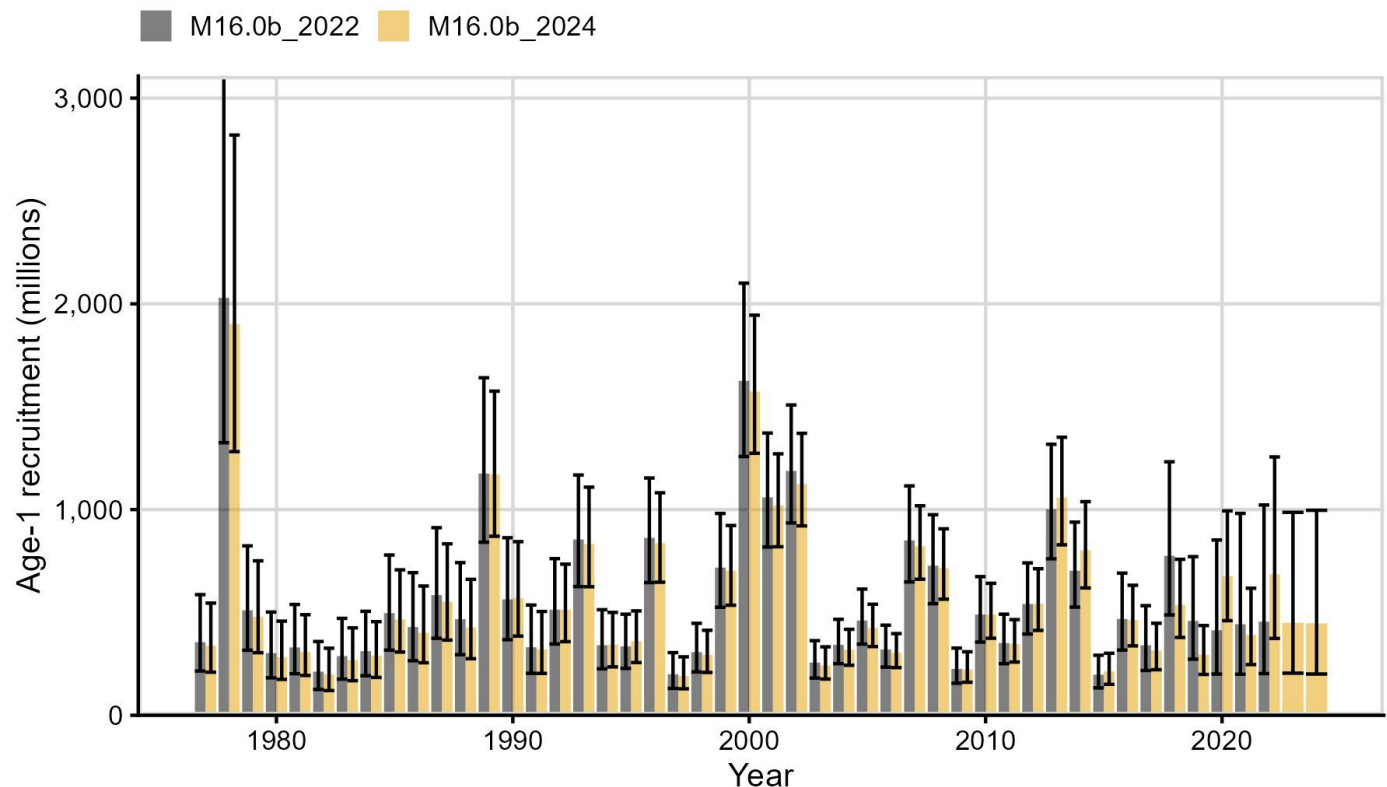


CHAPTER 17

ATKA MACKEREL



- Update Assessment, Tier 3; risk table (2,1,1,1)
- Recruitment
 - Large 2019 year class increase 64% compared to previous assessment



CHAPTER 17

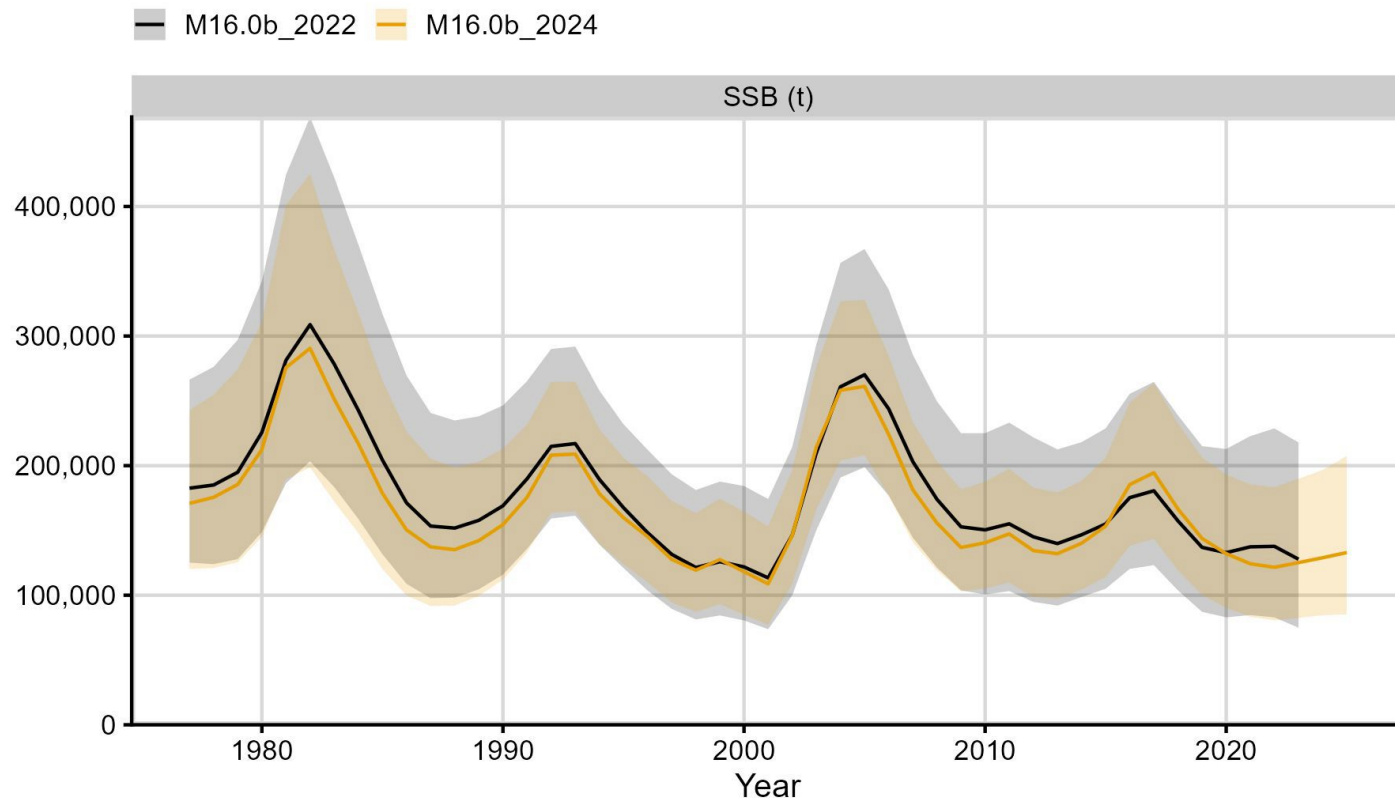
ATKA MACKEREL



■ Update Assessment, Tier 3; risk table (2,1,1,1)

● Biomass

○ Recent increasing trend attributed to the 2019 year class

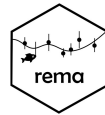


CHAPTER 17

ATKA MACKEREL



- Team supported author recommended Model 16.0.b
- No reduction in maximum permissible ABC
- Apportionment based on random effects model



Apportionment	2025	2026
541+SBS	46,650	41,731
542	26,511	23,716
543	30,087	26914

Quantity	Last asmt.	This asmt.	Change
M	0.3	0.3	0%
2024 Tier	3a		
2025 Tier	3b	3a	
2024 age+ biomass	625,578		0%
2025 age+ biomass	631,261	627,115	-1%
2024 spawning biomass	116,618		3%
2025 spawning biomass	110,694	119,853	8%
$B_{100\%}$	280,456	264,734	-6%
2025 F_{OFL}	0.75	0.64	-15%
2025 F_{ABC}	0.61	0.53	-13%
2024 OFL	111,684		10%
2025 OFL	99,723	122,622	23%
2024 ABC	95,358		8%
2025 ABC	84,676	103,247	22%

CHAPTER 17

ATKA MACKEREL



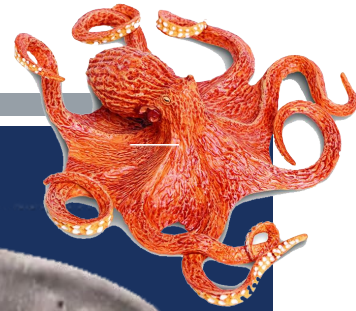
- Recommendations
 - The Team recommended the continued development of an Ecosystem Socioeconomic Profile (ESP) for this stock to be brought forward with the next assessment.

HARVEST PROJECTION SUMMARY

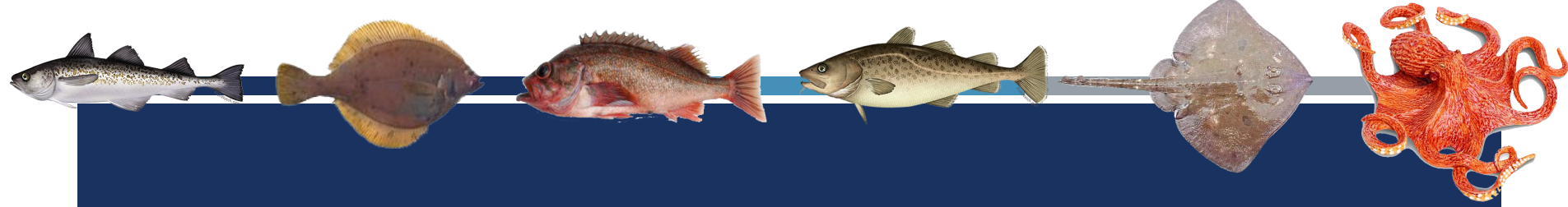


Stock	Tier	2025 ABC (t)	2025 OFL (t)	Change from 2024 ABC
Arrowtooth fl (H-Proj)	3a	88,863	104,428	1%
Northern rkgfish (H-Proj)	3a	18,694	22,848	-3%
Skates (H-proj)	3a/5	36,523	44,086	-3%

CATCH REPORT SUMMARY



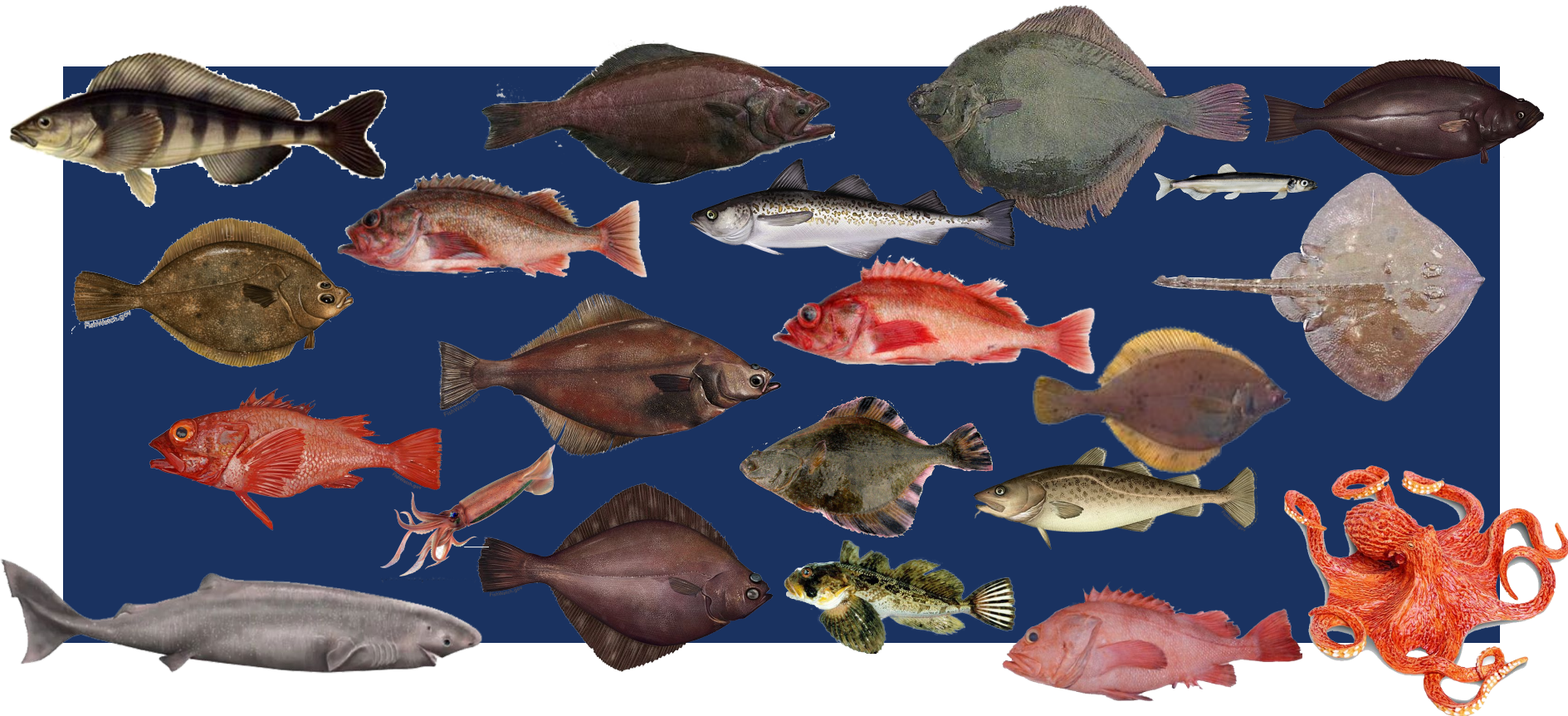
	Year	OFL	ABC	TAC	Catch
Sharks (2026)	2023	689	450	333	320
	2024	689	450	400	173
	2025	689	450		
	2026	689	450		
Octopus (2027)	2023	4,769	3,576	400	151
	2024	6,080	4,560	400	240
	2025	6,080	4,560		
	2026	6,080	4,560		



RECOMMENDED HARVEST SPECIFICATIONS

Species	Area	2024				2025		2026	
		OFL	ABC	TAC	Catch as of 11/11/2024	OFL	ABC	OFL	ABC
Pollock	BS	3,162,000	2,313,000	1,313,580	1,298,531	2,957,000	2,417,000	2,496,000	2,036,000
	AI	51,516	42,654	5,420	4878	55,728	46,051	56,231	46,437
	Bogoslof	115,146	86,360	250	23	77,354	58,015	77,354	58,015
Pacific cod	BS	200,995	167,952	147,753	116791	183,509	153,617	169,243	141,520
	AI	18,416	12,431	8,080	3827	16,782	13,376	16,273	12,973
	BSAI/GOA	55,084	47,146	n/a		58,532	50,111	57,797	49,482
Sablefish	BS	n/a	11,450	7,996	5326	n/a	13,898	n/a	13,723
	AI	n/a	13,100	8,440	1152	n/a	12,175	n/a	12,022
Yellowfin sole	BSAI	305,298	265,913	195,000	81307	299,247	262,557	305,039	267,639
Greenland turbot	BSAI	3,705	3,188	3,188	769	2,598	2,013	2,059	1,594
	BS	n/a	2,687	2,687	464	n/a	1,697	n/a	1,344
	AI	n/a	501	501	305	n/a	316	n/a	250
Arrowtooth flounder	BSAI	103,280	87,690	14,000	9915	104,428	88,683	102,472	87,035
Kamchatka flounder	BSAI	8,850	7,498	7,498	4913	8,019	6,800	7,790	6,606
Northern rock sole	BSAI	197,828	122,091	66,000	29137	165,444	157,487	166,220	158,225
Flathead sole	BSAI	81,605	67,289	35,500	12017	101,621	83,807	106,283	87,700
Alaska plaice	BSAI	42,695	35,494	21,752	10091	34,576	28,745	33,965	28,230
Other flatfish	BSAI	22,919	17,189	4,500	3071	26,083	19,562	26,083	19,562
Pacific Ocean perch	BSAI	49,010	41,096	37,626	34894	44,594	37,375	43,084	36,578
	BS	n/a	11,636	11,636	9742	n/a	10,121	n/a	9,905
	EAI	n/a	7,969	7,969	7594	n/a	6,278	n/a	6,144
	CAI	n/a	5,521	5,521	5250	n/a	5,559	n/a	5,441
	WAI	n/a	15,970	12,500	12308	n/a	15,417	n/a	16,058
Northern rockfish	BSAI	23,556	19,274	16,752	8,775	22,848	18,694	22,284	18,232
Blackspotted/Rougheye Rockfish	BSAI	761	569	569	616	838	706	902	766
	BS/EAI	n/a	388	388	177	n/a	408	n/a	441
	CAI/WAI	n/a	181	181	439	n/a	298	n/a	325
Shortraker rockfish	BSAI	706	530	530	149	631	473	631	473
Other rockfish	BSAI	1,680	1,260	1,260	1337	1,406	1,054	1,406	1,054
	BS	n/a	880	880	770	n/a	639	n/a	639
	AI	n/a	380	380	568	n/a	415	n/a	415
Atka mackerel	BSAI	111,684	95,358	72,987	71937	122,622	103,247	107,889	92,361
	BS/EAI	n/a	41,723	32,260	31530	n/a	46,650	n/a	41,731
	CAI	n/a	16,754	16,754	16616	n/a	26,511	n/a	23,716
	WAI	n/a	36,882	23,973	23791	n/a	30,087	n/a	26,914
Skates	BSAI	45,574	37,808	30,519	24934	44,086	36,523	43,285	35,833
Sharks	BSAI	689	450	400	173	689	450	689	450
Octopuses	BSAI	6,080	4,560	400	240	6,080	4,560	6,080	4,560
Total	BSAI	4,609,077	3,476,801	2,000,000	1,724,804	4,334,715	3,590,907	3,849,059	3,192,295

THANK YOU



BSAI TEAM

GENERAL RECOMMENDATIONS

- The Team recommended that authors using OSA residuals and reporting SDNRs do so with an accompanying 95% confidence interval in order to make it clear when assumptions are violated.

BSAI TEAM

BSAI ECOSYSTEM STATUS REPORTS

- With respect to specific indicators, the Team recommended the authors contact the state demographer to shed insight on the use of school metrics as an index of ecosystem health as this is also connected to educational funding disparities.

BSAI TEAM MULTI-SPECIES MODEL

- The Team recommended that the authors include a comparison of the single-species mode in CEATTLE to the operational single-species stock assessment models to evaluate differences between model results.
- The Team recommended the authors communicate with the ESP teams to explore the duplicative methods.



BSAI TEAM POLLOCK RECOMMENDATIONS

■ **EBS Pollock**

- The Team supported the continued use of the current model (Model 23) for this year and supported the author's recommendation of managing the EBS walleye pollock stock under Tier 3.

■ **AI Pollock**

- The Plan Team recommended the author bring forward a Tier 5 model in 2026 to evaluate going to a Tier 5 from Tier 3.

■ **Bogoslof Pollock**

- Given concerns regarding the frequency of the survey, the Team recommended bringing forward the age-structured model in the next full assessment to incorporate the age data.

BSAI TEAM

PACIFIC COD RECOMMENDATIONS



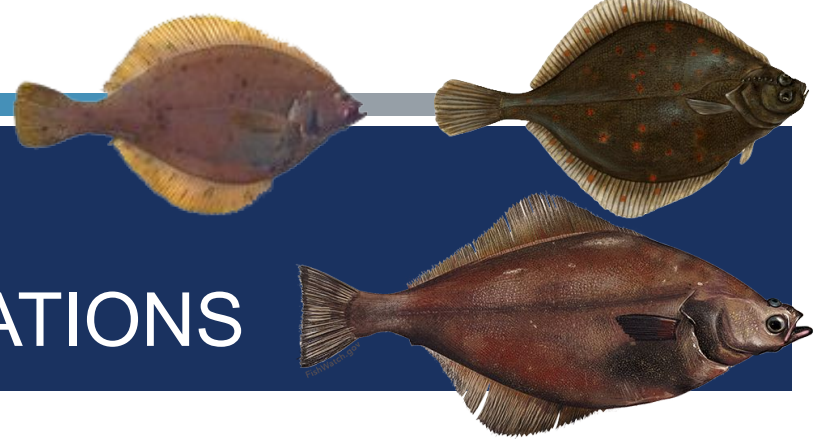
■ Pacific cod - EBS

- The Team recommended the authors clarify this section of text in the stock assessment, specifically justifying the choice of maximum age assumptions in the natural mortality analysis.
- The Team recommended a likelihood profile on the parameter for the survey selectivity ascending limb in Model 24.3 in order to diagnose the estimate of that selectivity parameter and relative influence of the data components on its estimate

■ Pacific cod - Aleutian Islands

- The Team recommended AI Pacific cod be managed under Tier 3 using the Author preferred model, Model 24.1, which includes a time block on M from 2016 - 2024.
- The Team recommended continued exploration of covariate approaches to M.
- The Team recommended that the author run a likelihood profile over M for next year on the base M to evaluate the sensitivity of the model to various M values.

BSAI TEAM FLATFISH RECOMMENDATIONS



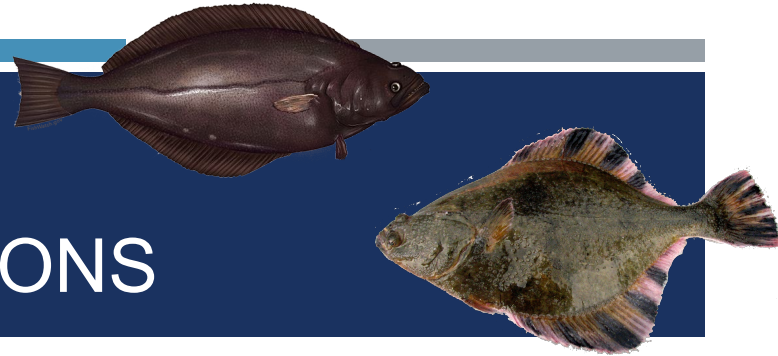
■ Yellowfin sole

- The Team recommended that the author work with data providers to understand what is driving the VAST time series with trend projections in the southern and northern Bering Sea in years when there were no new data coming from the NBS and the relative influence of the AR1 assumptions in VAST.

■ Greenland Turbot

- Specific recommendations from the Team for future assessments included:
 - Using interpolated AFSC longline survey RPN data for all future models, following established best practices.
 - Displaying survey mean length-at-age across all model runs to examine interactions with selectivity time blocks and Francis reweighting.
 - Exploring later start years, closer to the 1977 regime shift, for potential insights into recruitment dynamics.
 - Likelihood profiling over M and von Bertalanffy parameters to address retrospective bias in survey catchability (Q).
 - Developing a Tier 5 REMA model to compare with Tier 3 models, given the data losses.

BSAI TEAM FLATFISH RECOMMENDATIONS



■ Kamchatka flounder

- The Team recommended the authors explore why the model fails to capture the rapid decline of the shelf survey biomass for the most recent years.

■ Alaska plaice

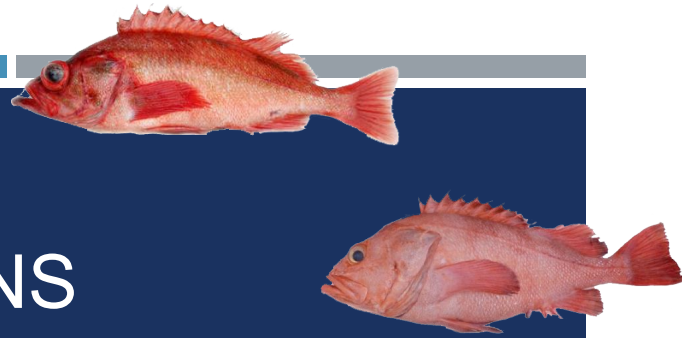
- The Team recommended that future assessments include NBS biomass estimates, maps showing Alaska plaice distribution in surveys and fisheries, and analyses of distribution and movement patterns over time in response to environmental changes, such as the cold pool area.

■ Northern rock sole

- The Team recommended clarifying when Markov Chain Monte Carlo vs. Maximum Likelihood Estimators are being used in the recommendation table and model diagnostics.

■ Other flatfish

- The Team recommended that the author explore increasing the penalty to smooth out fishery selectivity. The team also recommended an exploration of the mechanisms for time-varying nonparametric fishery selectivity specifically related to changes in fleet dynamics.



BSAI TEAM ROCKFISH RECOMMENDATIONS

■ Pacific ocean perch

- The Team recommended that the author explore increasing the penalty to smooth out fishery selectivity.
- The team also recommended an exploration of the mechanisms for time-varying nonparametric fishery selectivity specifically related to changes in fleet dynamics..

■ Blackspotted/rougheye rockfish

- The Team noted that this information should be conveyed by the Agency to the Council that the BSAI wide ABC has been exceeded three times in the past 4 years (whereby the guidance is to reevaluate accountability measures if more than once in 4 years) and, in accordance with National Standard 1 and the BSAI FMP, accountability measures for this stock should be reevaluated by the Council.

■ Shortraker rockfish

- The Team supported this approach (one strata for REMA model) and recommended simplifying and combining strata for future assessments.

BSAI TEAM OTHER FISHES RECOMMENDATIONS



■ Atka mackerel

- The Team recommended the continued development of an Ecosystem Socioeconomic Profile (ESP) for this stock to be brought forward with the next assessment.