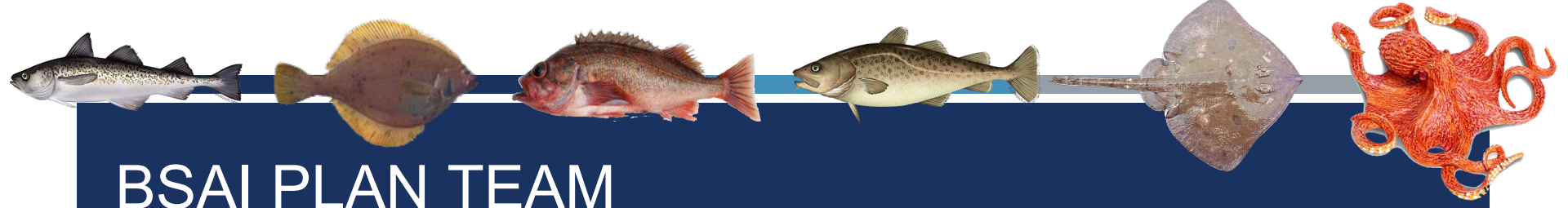
REPORT OF THE NOVEMBER 2023 BSAI GROUNDFISH PLAN TEAM MEETING

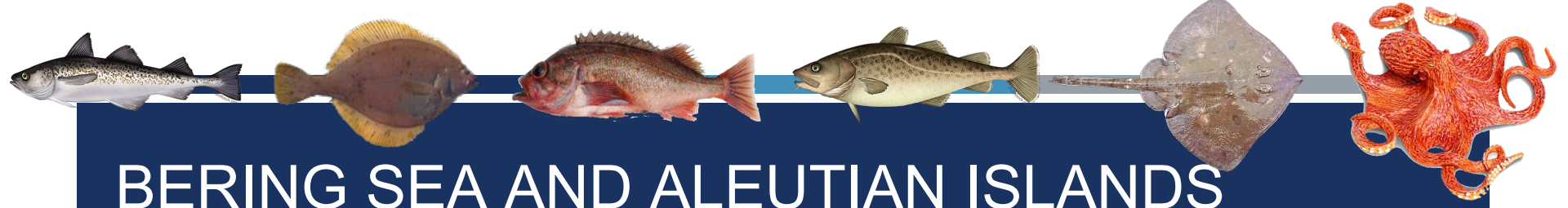
STEVE BARBEAUX (CO-CHAIR), KALEI SHOTWELL (CO-CHAIR), CINDY TRIBUZIO (VICE-CHAIR). DIANA STRAM (COORDINATOR)

DECEMBER 6, 2023



BSAI PLAN TEAM MEETING OVERVIEW

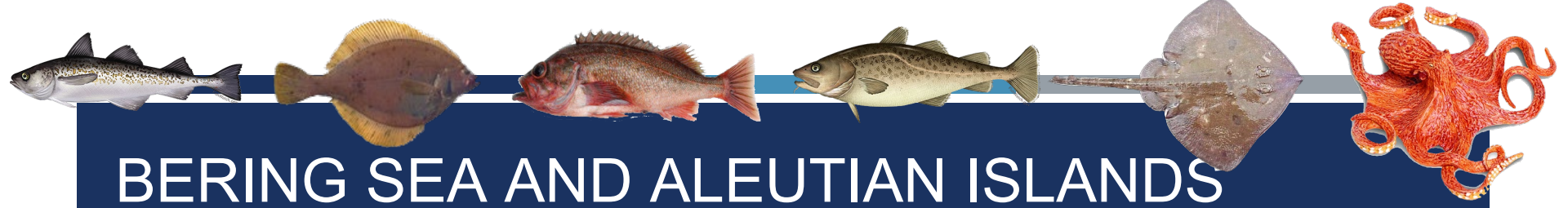
- Dates: November 13-17
- Place: AFSC Seattle
- Leaders: Steve Barbeaux, Kalei Shotwell (co-chairs); Cindy Tribuzio (vice-chair); Diana Stram (coordinator)
- Participation:
  - Steven Whitney (NMFS AKRO)
  - Allan Hicks (IPHC)
  - Lisa Hillier (WDFW)
  - Kirstin Holsman (AFSC REFM)
  - Phil Joy (ADF&G)
  - Andy Kingham (AFSC FMA)
  - Beth Matta (AFSC REFM)
  - Andy Seitz (UAF)
  - Jane Sullivan (AFSC)
  - Lucas De Filippo (AFSC ABL)
  - AFSC and AKRO staff and members of the public



BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE

- Assessments of 26 stocks/complexes – (3 **Full**, 5 Update; 10 Harvest projection; 5 Catch report; 2 Ecosystem report; 1 “none”)
- Total of 23 models, including Tier 5/6 methods:
  - 8 base models/methods
  - 15 additional models/methods
- The Team agreed with authors’ recommendations regarding preferred models/methods and harvest specifications in all but one stock (AI Pacific cod)
- 2 new reductions from maximum permissible ABC recommended (5 total)
- Of the 15 stocks/complexes in Tiers 1 or 3, only 1 is in sub-tier “b”
- No stocks/complexes were subjected to overfishing in 2022, and no Tier 1 or 3 stocks/complexes are overfished/approaching as of 2023

- 19 Team recommendations



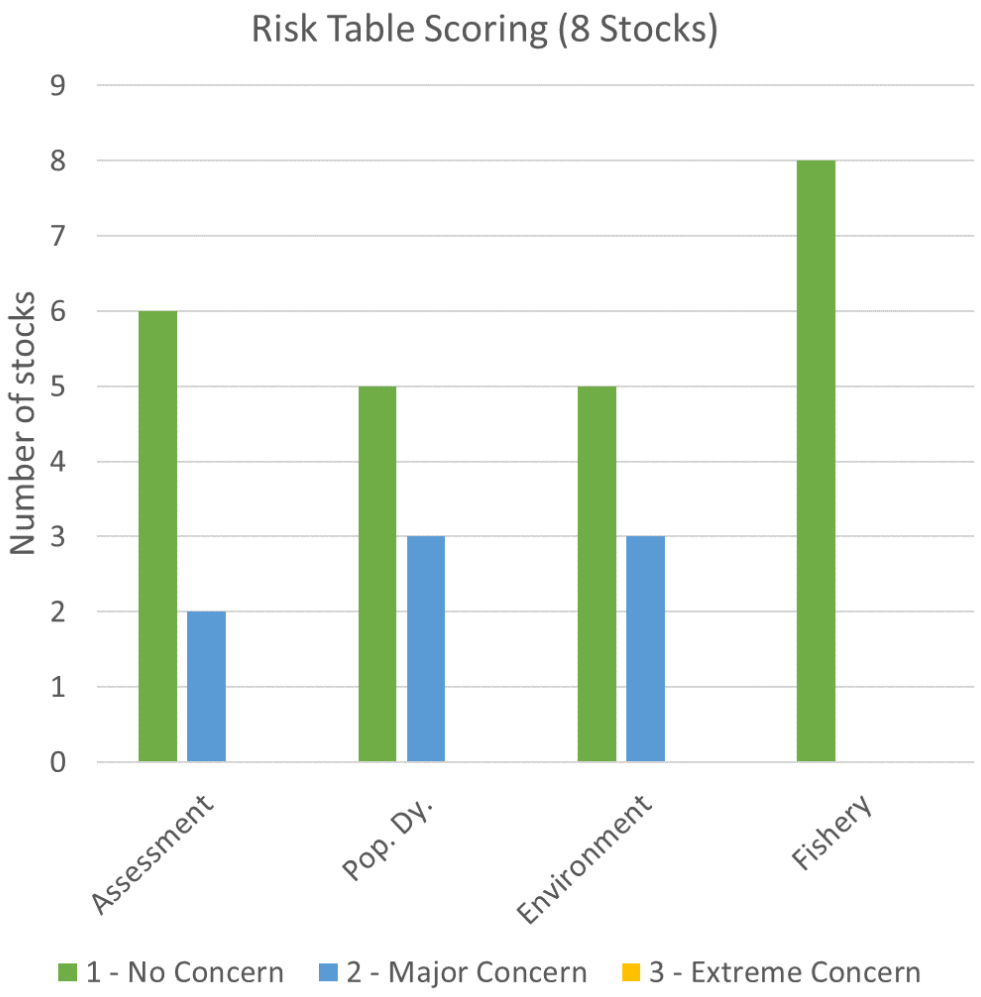
BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE (TINY FONT)

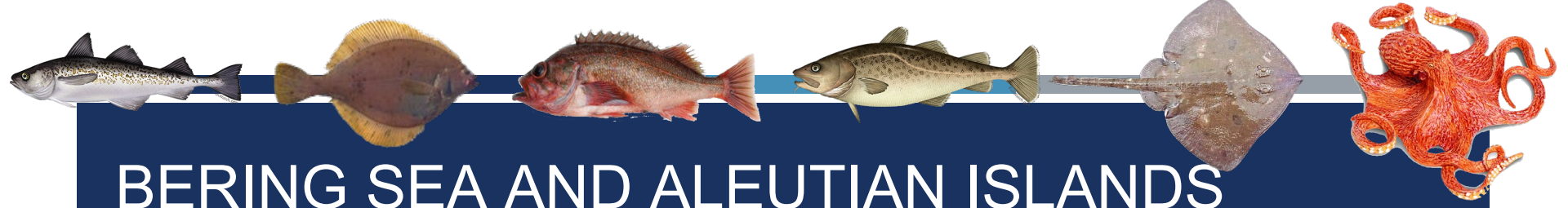
Chapter	Assessment	Author	Tier	Type	Risk*	% Reduction
1	Eastern Bering Sea pollock	Ianelli	1a	**Full**	1,1,2,1	18%
1A	Aleutian Islands pollock	Barbeaux	3a	H-Proj		
1B	Bogoslof Island pollock	Ianelli	5	C-Rep		
2	Eastern Bering Sea Pacific cod	Barbeaux	3b	**Full**	1,1,1,1	
2A	Aleutian Islands Pacific cod	Spies	5	**Full**	1,2,2,1	8%
3	Sablefish	Goethel	3a	**Update**	1,1,1,1	
4	Yellowfin sole	Spies/Bryan	1a	**Update**	1,2,2,1	
5	Greenland turbot	Bryan	3a	H-Proj		
6	Arrowtooth flounder	Shotwell	3a	H-Proj		
7	Kamchatka flounder	Bryan	3a	H-Proj		
8	Northern rock sole	McGilliard	1a	H-Proj		36%
9	Flathead sole	Kapur	3a	H-Proj		
10	Alaska plaice	Cronin-Fine	3a	C-Rep		
11	Other flatfish	Monnahan	5	H-Proj		
12	Pacific ocean perch	Spencer	3a	H-Proj		
13	Northern rockfish	Spencer	3a	**Update**	2,2,1,1	
14	Rougheye & blackspotted rockfish	Spencer	3a/5	H-Proj		12%
15	Shortraker rockfish	Shotwell	5	C-Rep		
16	Other rockfish	Sullivan	5	C-Rep		
17	Atka mackerel	Sullivan/Lowe	3a	H-Proj		
18	Skates	Tribuzio	3a/5	**Update**	(2,1),1,1,1	
19	Sharks	Tribuzio	6	C-Rep		13%
22	Octopus	Cronin-Fine	6	**Update**	1,1,1,1	
Appendix 1	Forage Species (including Squid)	Szulwaski	eco	**E-Rep**		
Appendix 2	Sculpins	Spies	eco	**E-Rep**		

* Assessment, Pop Dy., Environment, Fishery

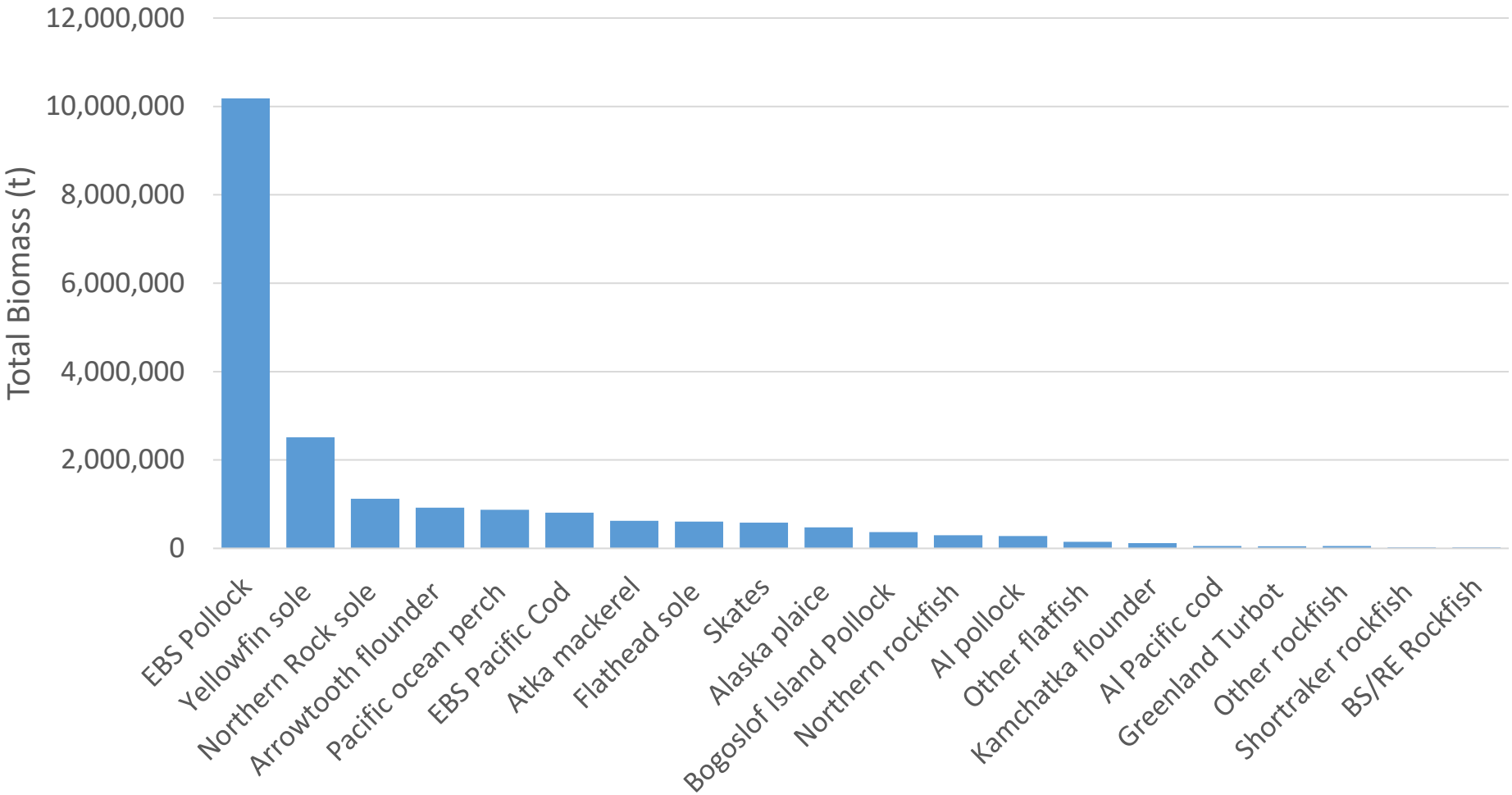
BERING SEA AND ALEUTIAN ISLANDS RISK TABLE AND REDUCTIONS

- New three level rating system with no categories or stocks with extreme concern
- Two of the five recommendations for reduction from maximum permissible ABC were from this year's deliberations.
- Three of the five reductions were carried over from 2022 determinations.

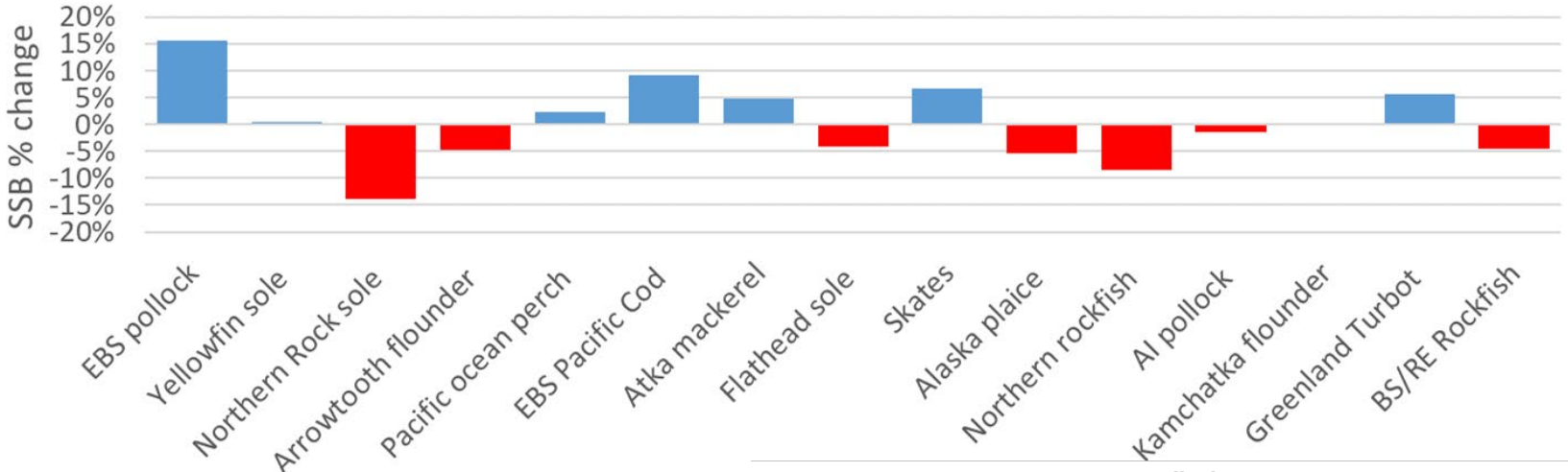


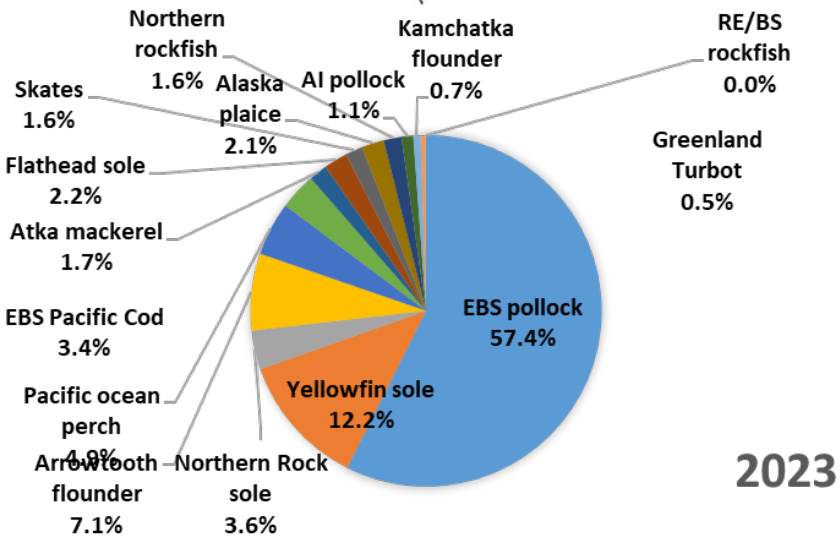


BERING SEA AND ALEUTIAN ISLANDS TOTAL BIOMASS (TIER 1, 3, AND 5)

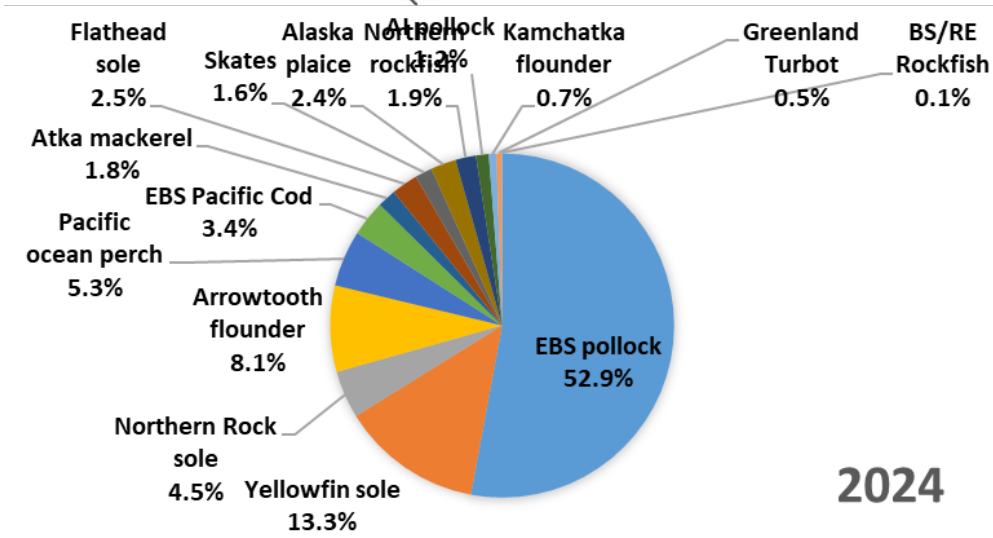


BERING SEA AND ALEUTIAN ISLANDS SPAWNING BIOMASS (TIERS 1 AND 3)



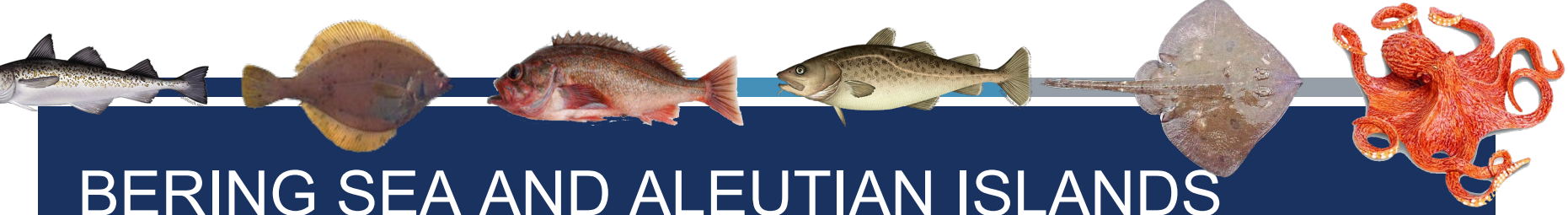


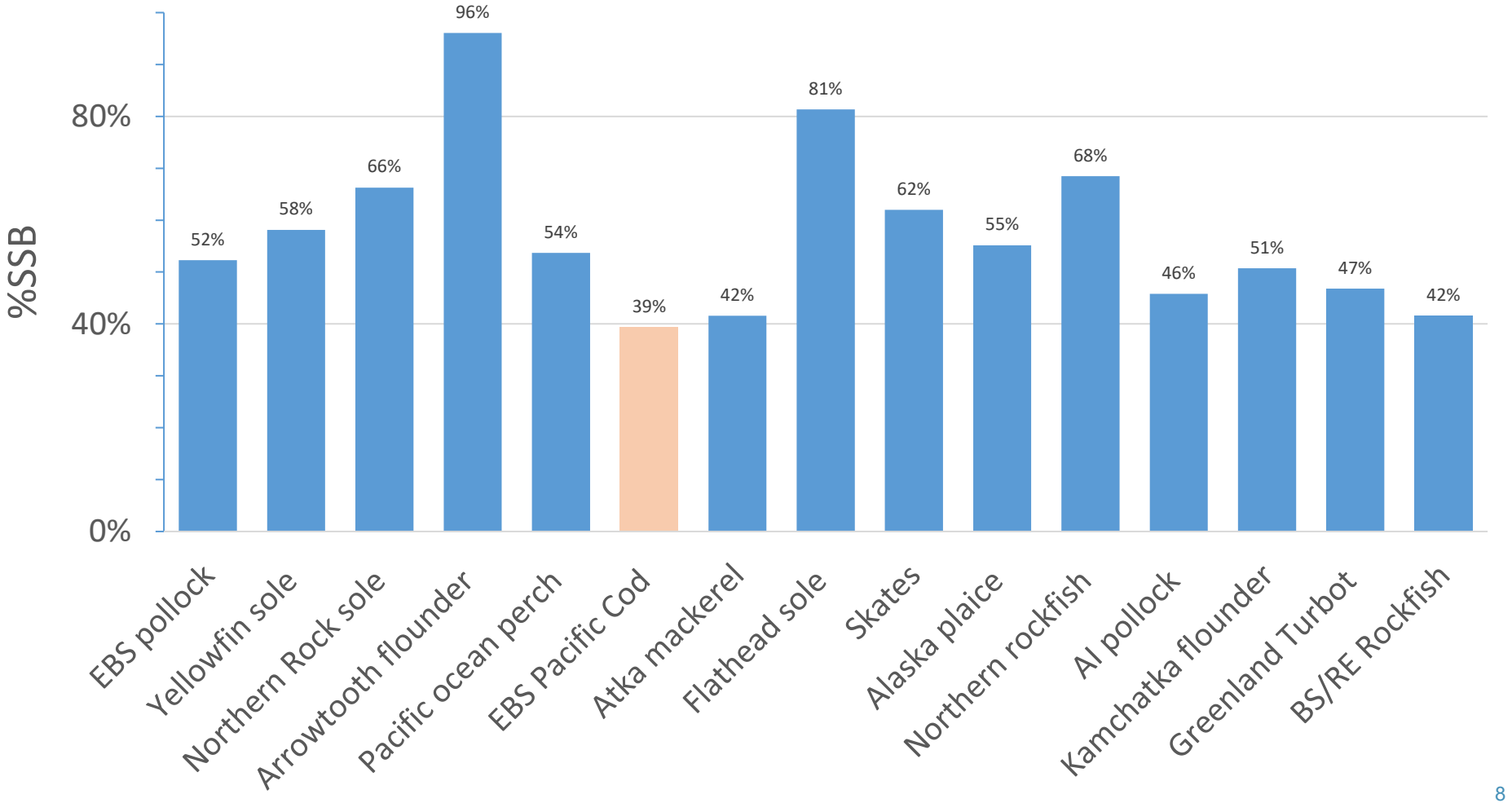
2023



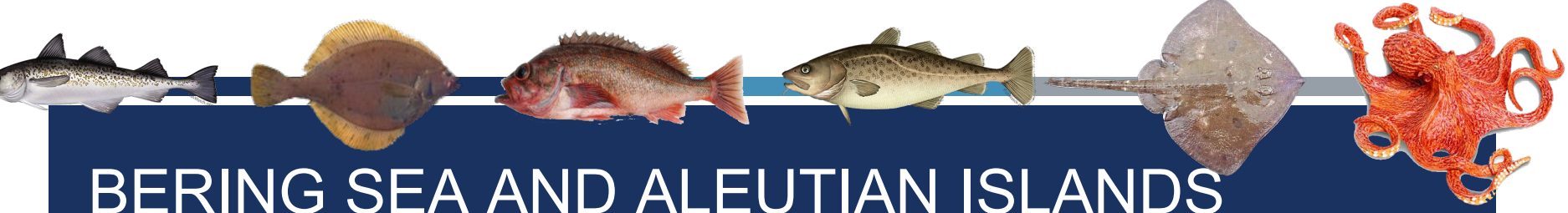
2024

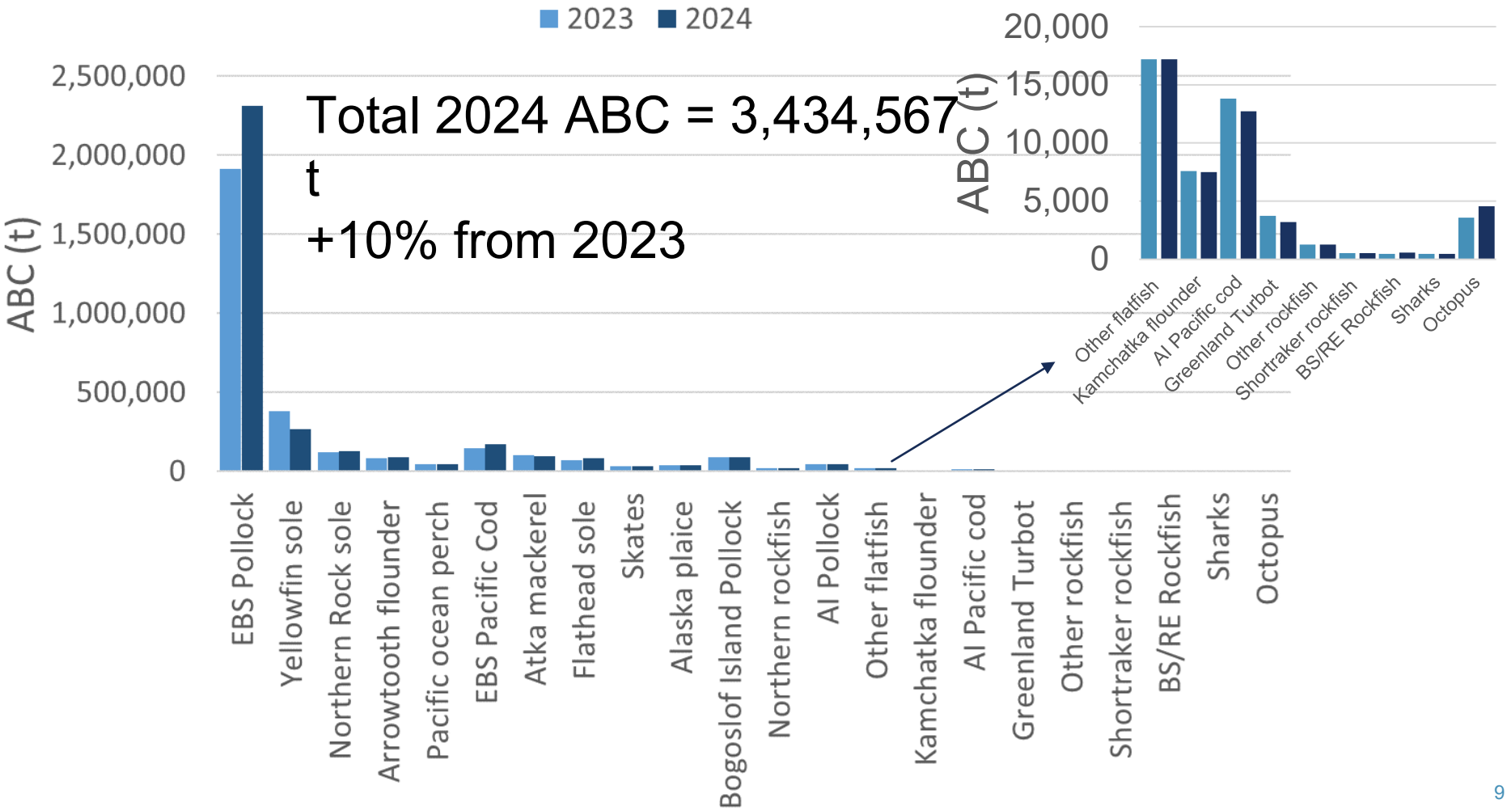
BERING SEA AND ALEUTIAN ISLANDS SPAWNING BIOMASS (TIERS 1 AND 3)

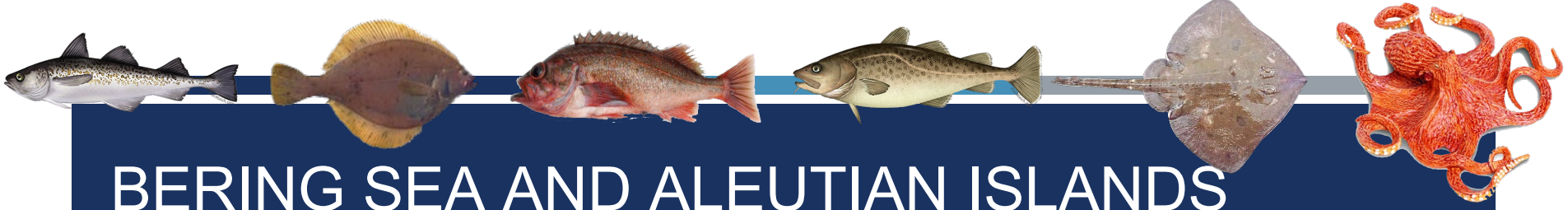




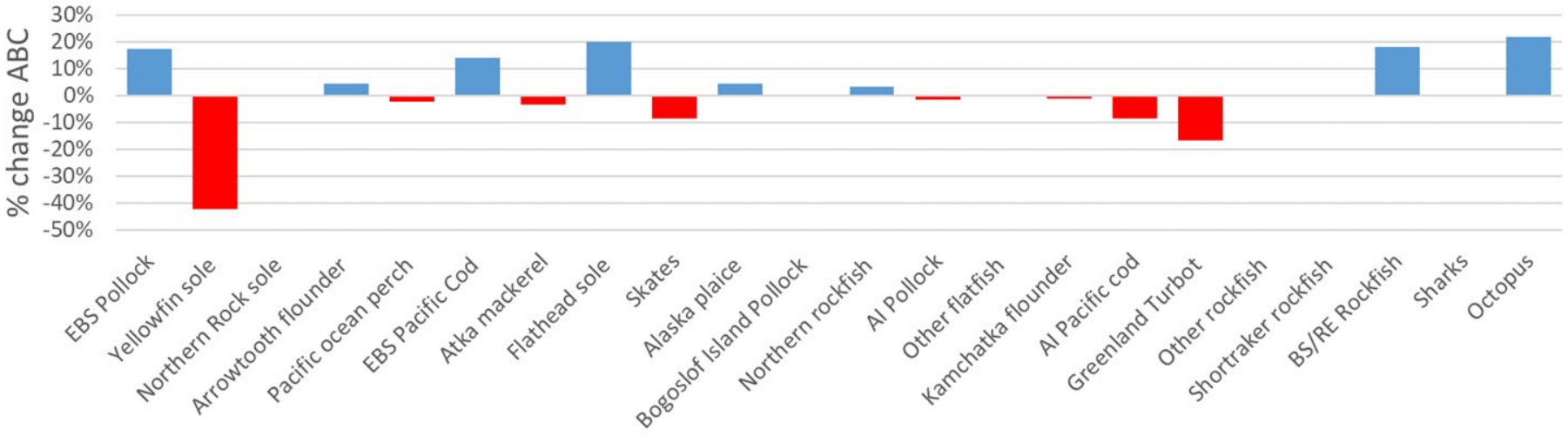
BERING SEA AND ALEUTIAN ISLANDS ALLOWABLE BIOLOGICAL CATCH (ABC)

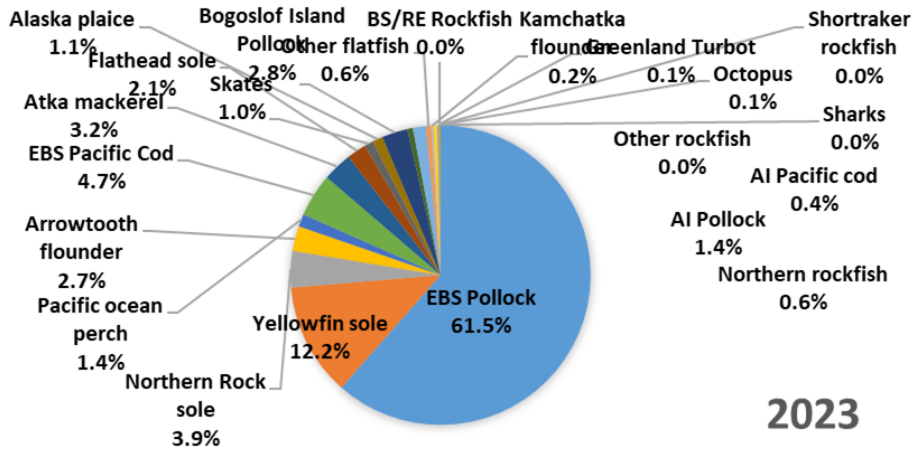


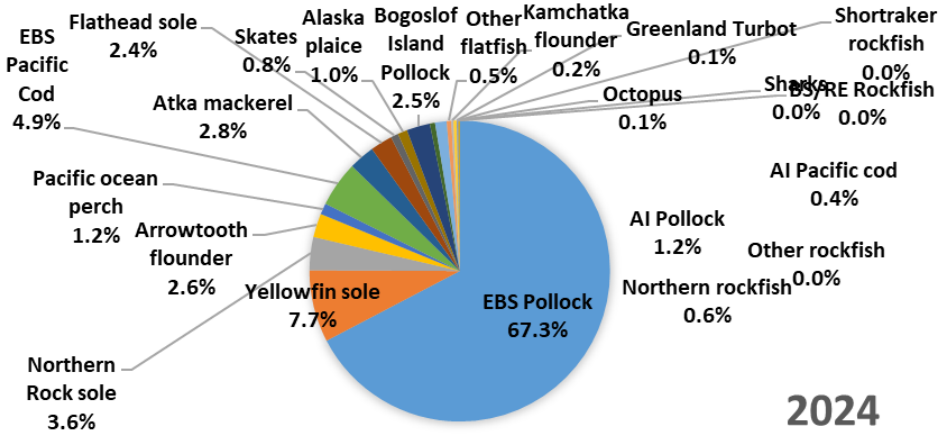




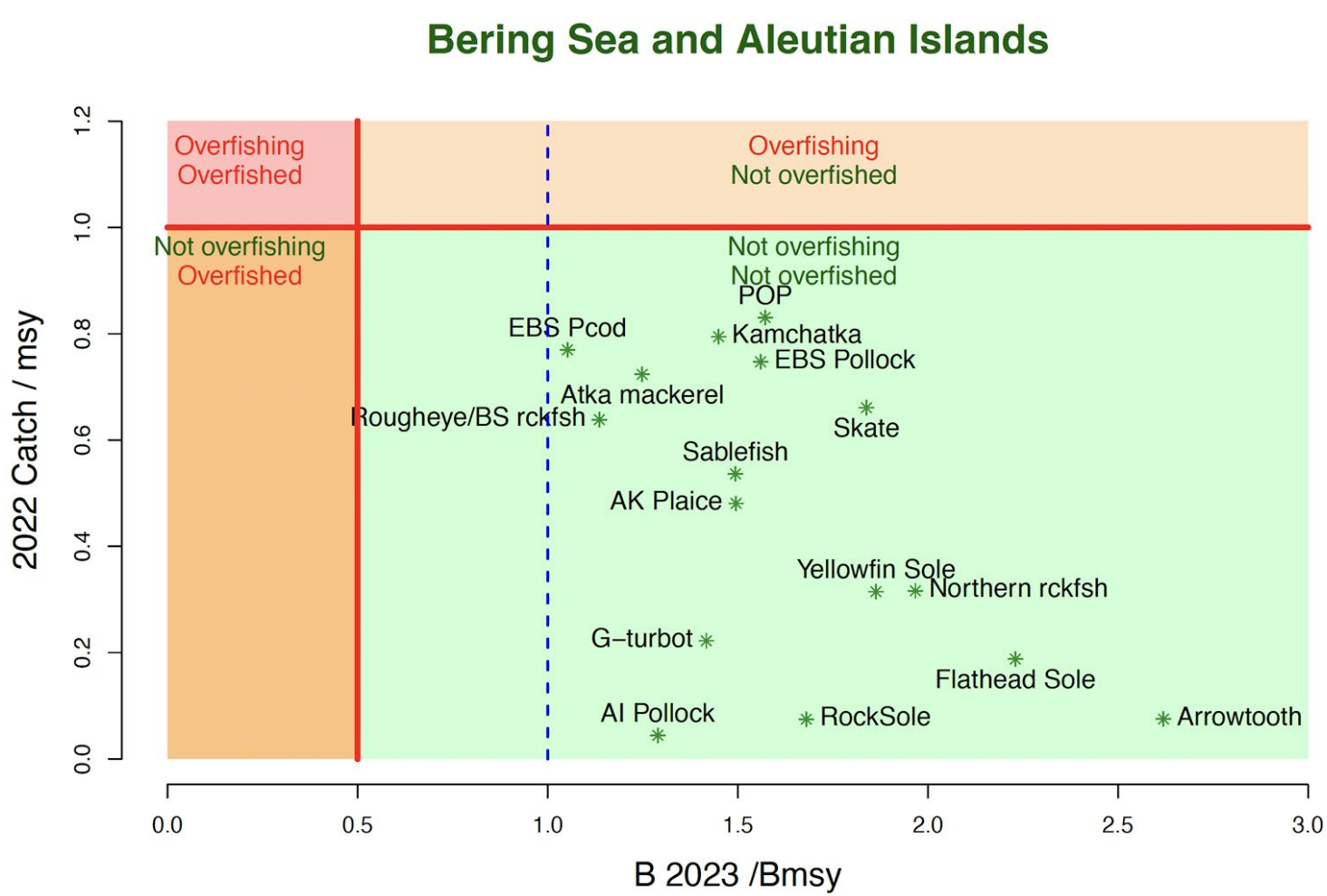
BERING SEA AND ALEUTIAN ISLANDS CHANGE IN 2023 ABC *PROJECTION*







BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE – STOCK STATUS



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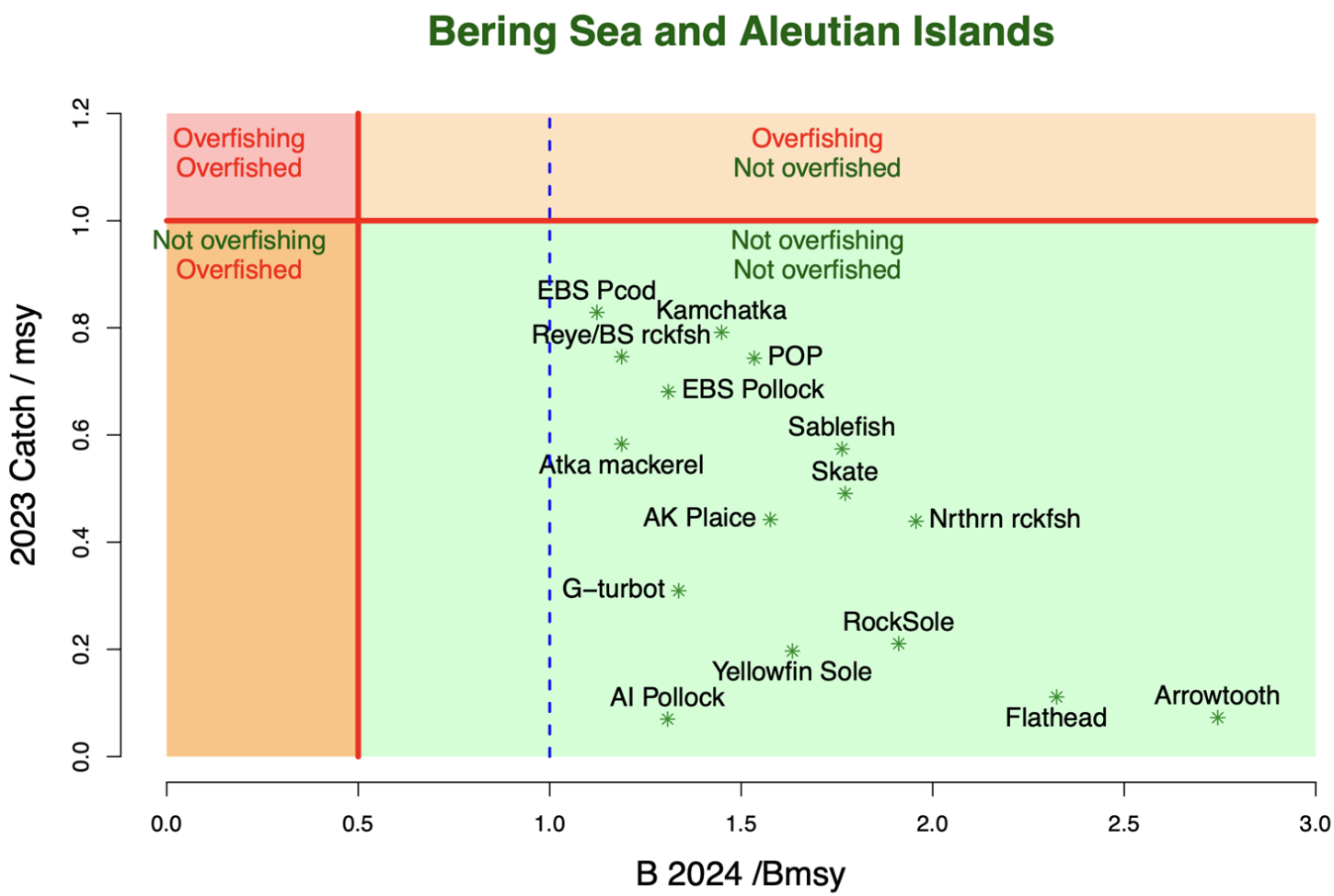
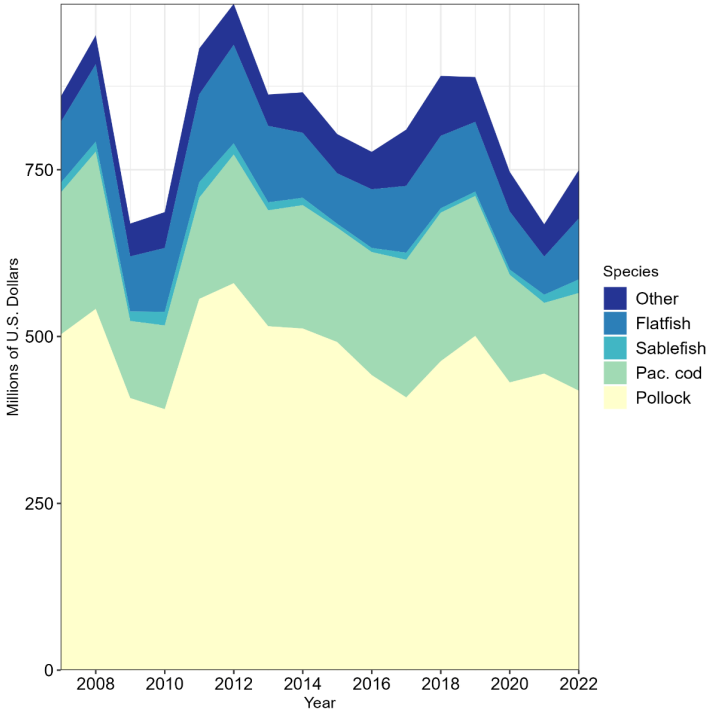
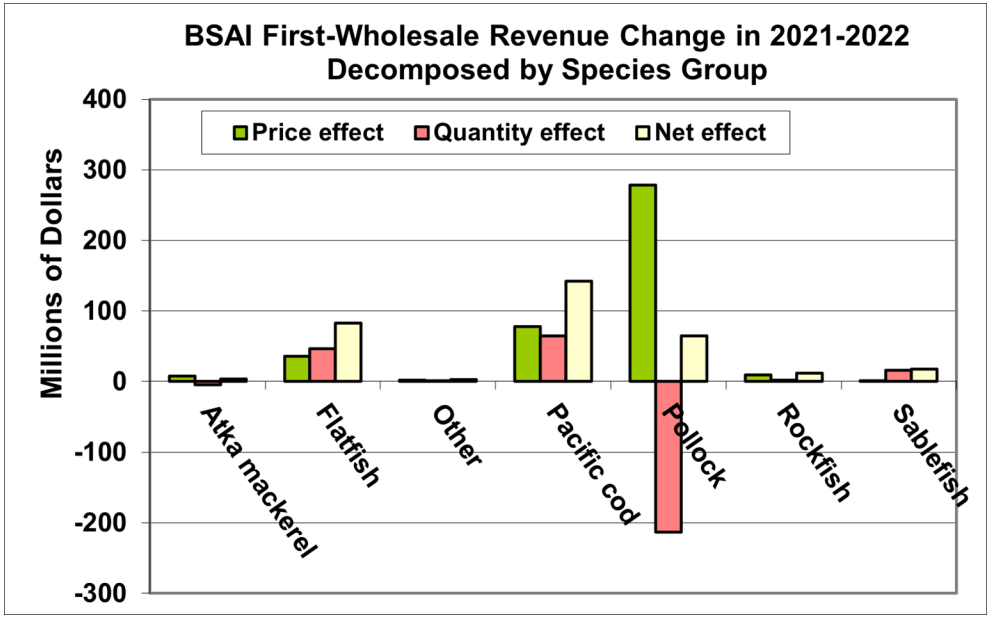


BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE – ECONOMICS

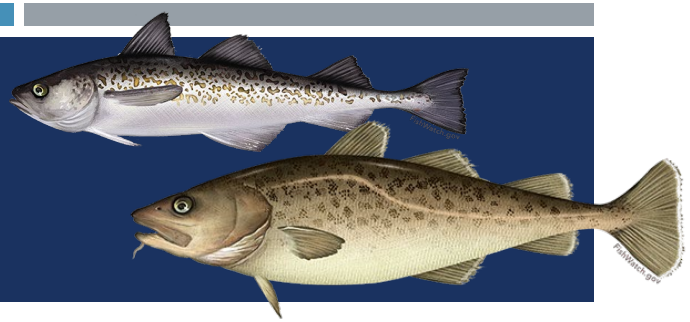
- Increase in value of BSAI harvested species from 2021 to 2022

Real exvessel value





POLLOCK AND PACIFIC COD SUMMARY



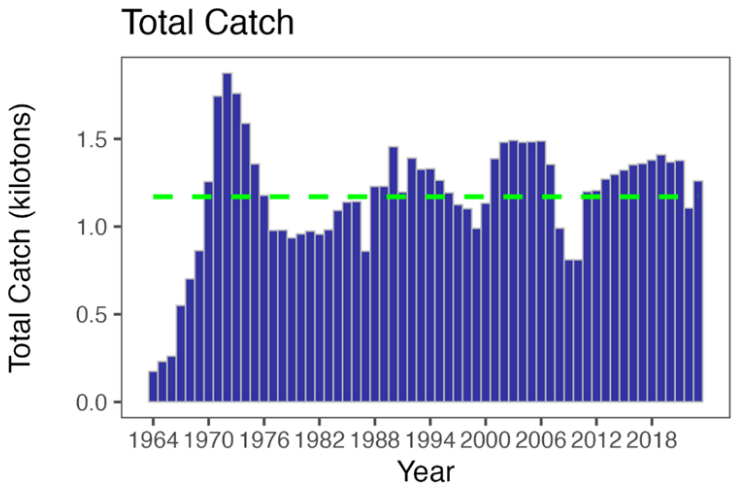
Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
EBS Pollock (Full)	1a	**2,313,000*(18%)**	3,162,000	21%
AI Pollock (H-Proj)	3a	42,654	51,516	-2%
Bogoslof Poll. (C-Rep)	5	86,360	115,146	0%
EBS Pacific cod (Full)	3b	167,952	200,995	16%
AI Pacific cod (Full)	5	**12,732*(8%)**	18,416	-8%

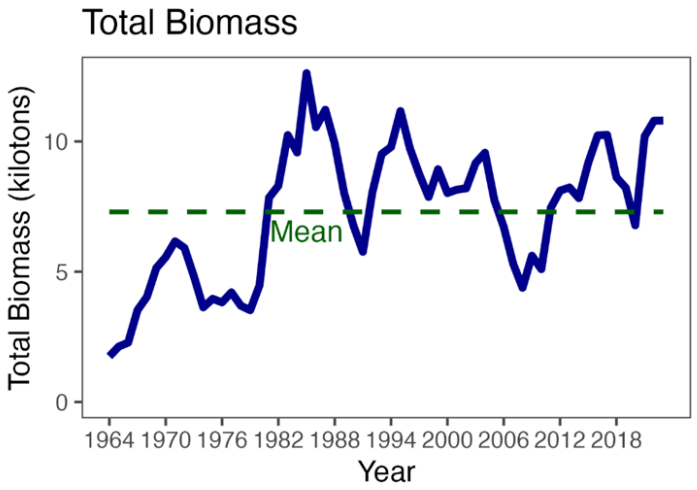
*xx% Reduced from maximum permissible ABC

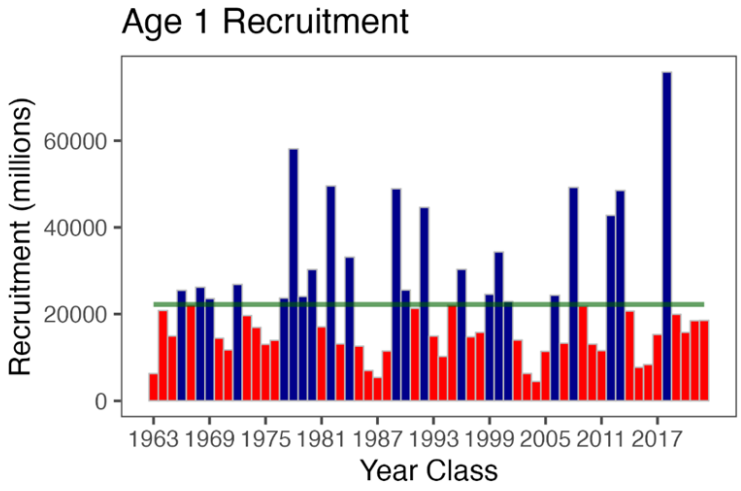
CHAPTER 1
EBS WALLEYE POLLOCK

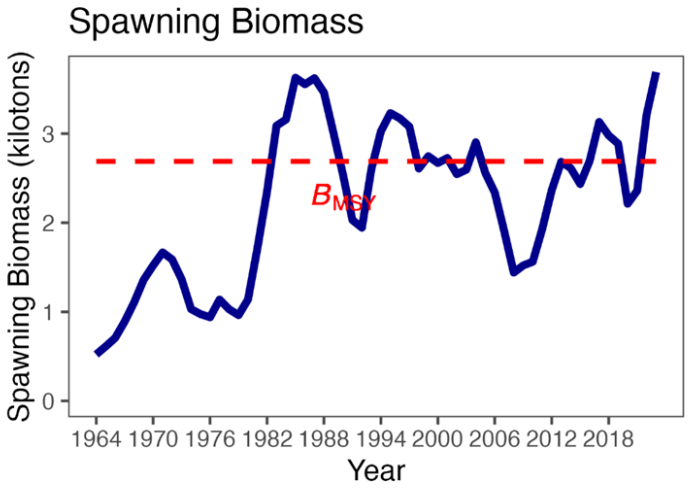
- Full Assessment; new model; Risk table (1, 2, 1)

CHAPTER 1
EBS WALLEYE POLLOCK









CHAPTER 1
EBS WALLEYE POLLOCK

- Full Assessment; 1 new model; Risk table (1,1,2,1)

- Team agreed with author's recommendation on assessment model and reduction from maximum permissible ABC

- ABCs to be reduced by 18% from Tier 1 maximum permissible ABC based on risk table assessment
  - Multiple indicators of primary and secondary productivity show adverse signals borne out in continued declining trends in juvenile and adult fish condition.

Quantity	Last asmt.	This asmt.	Change
M	0.3	0.3	0%
2023 Tier	1a		
2024 Tier	1a	1a	
2023 age+ biomass	12,389,000		-18%
2024 age+ biomass	11,445,000	10,184,000	-11%
2023 spawning biomass	4,171,000		-16%
2024 spawning biomass	3,944,000	3,518,000	-11%
B_0	6,653,000	6,728,000	1%
B_{msy}	2,674,000	2,689,000	1%
2024 F_{OFL}	0.491	0.422	-14%
2024 F_{ABC}	0.365	0.365	0%
2023 OFL	3,381,000		-6%
2024 OFL	4,639,000	3,162,000	-32%
2023 ABC	1,910,000		21%
2024 ABC	2,275,000	2,313,000	2%

CHAPTER 1
EBS WALLEYE POLLOCK

- Full Assessment; 1 new model; Risk table (1,1,2,1)

- The Team recommended continuing to evaluate projection bias due to selectivity assumptions, and the examination of new methods that may reduce that bias.
- The Team recommended that the authors clearly state where MLE estimates are being used and where MCMC estimates are being used.
- The Team recommended using posterior distributions from the MCMC to determine probabilities in the decision table and expanding the table to at least include the recommended ABC.

Quantity	Last asmt.	This asmt.	Change
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2023 Tier	1a		
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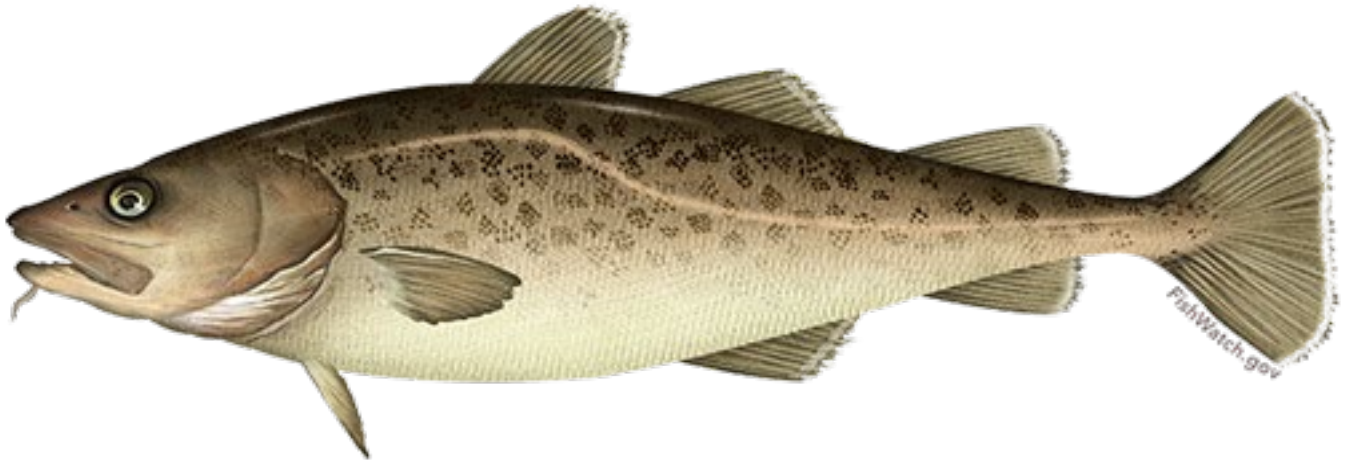
2024 OFL	4,639,000	3,162,000	-32%
2023 ABC	1,910,000		21%
2024 ABC	2,275,000	2,313,000	2%

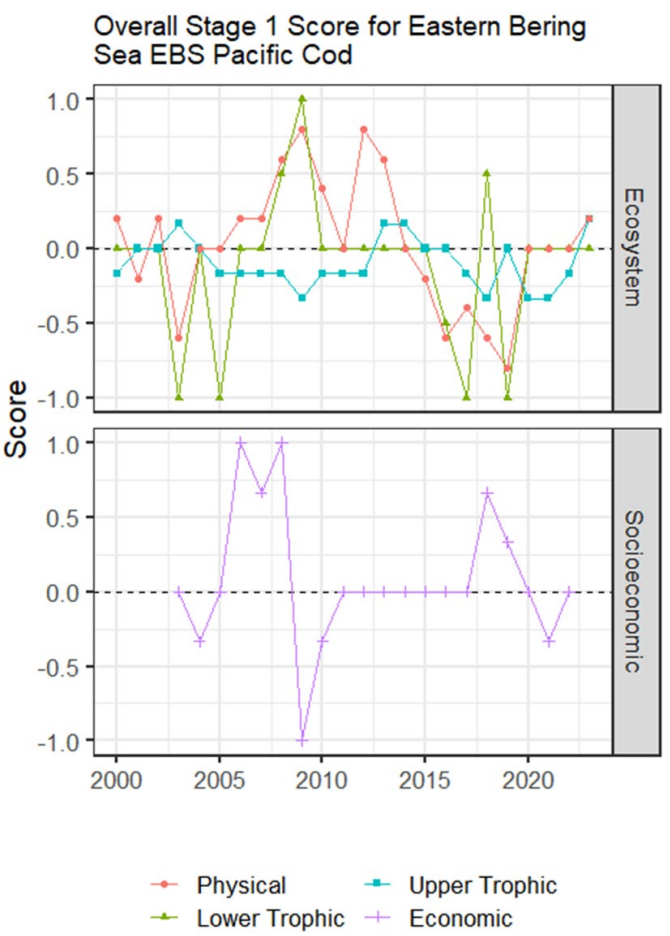
CHAPTER 2
EBS PACIFIC COD

- Full Assessment; 3 new models; Risk table (1,1,1,1)



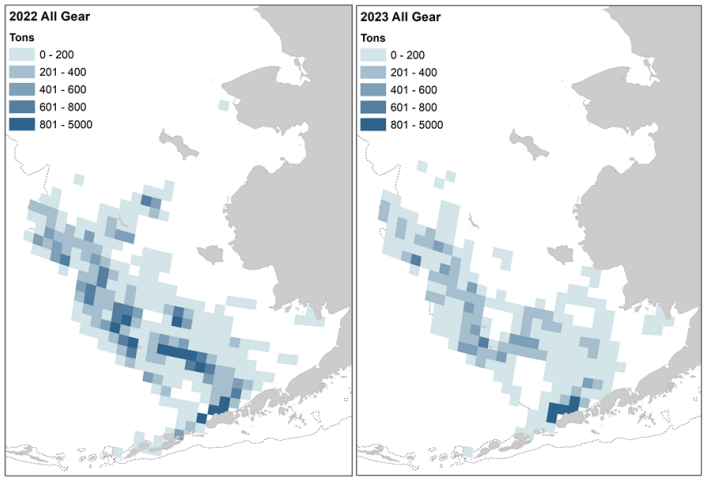
CHAPTER 2 - EBS PACIFIC COD ECOSYSTEM AND SOCIOECONOMIC PROFILE

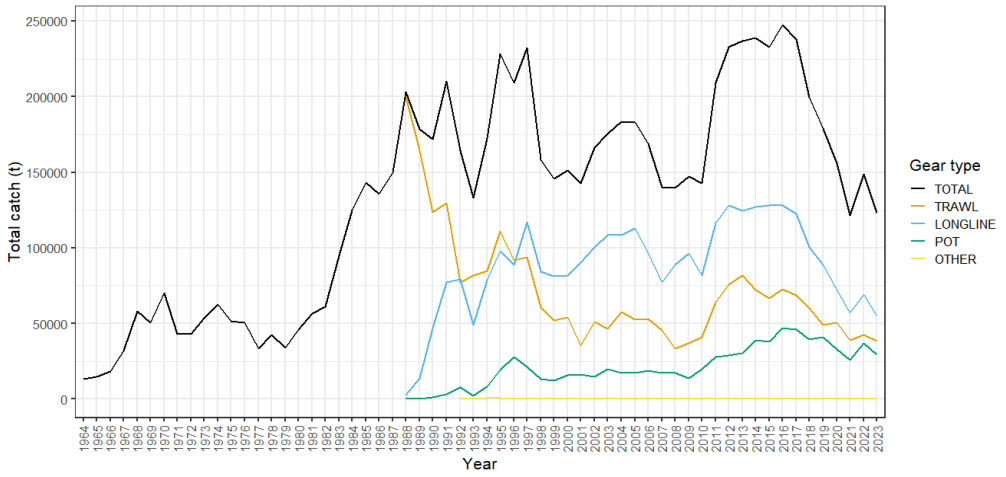
- Management Summary:
  - Sea ice advance and retreat below average, surface temperatures average and bottom temperature below average, calmer cooler conditions
  - Spring bloom timing average but match depends on spawning and movement of Pacific cod
  - Condition of juveniles above average, adult below average, suggesting sufficient prey, population continues to move southeast, and more spread out
  - Arrowtooth biomass has steadily increased over time, near time series peak
  - Ex-vessel value increased but still below average, price and revenue/effort increased to average in 2022
- Modeling Summary:
  - One potential covariate for recruitment, summer bottom temperature from ROMS-NPZ model, 1985-2019 year class
  - CEATTLE model update: age-1 M decreased and remains below mean, total biomass consumed above average, ration decreased but still above average



Fishery data

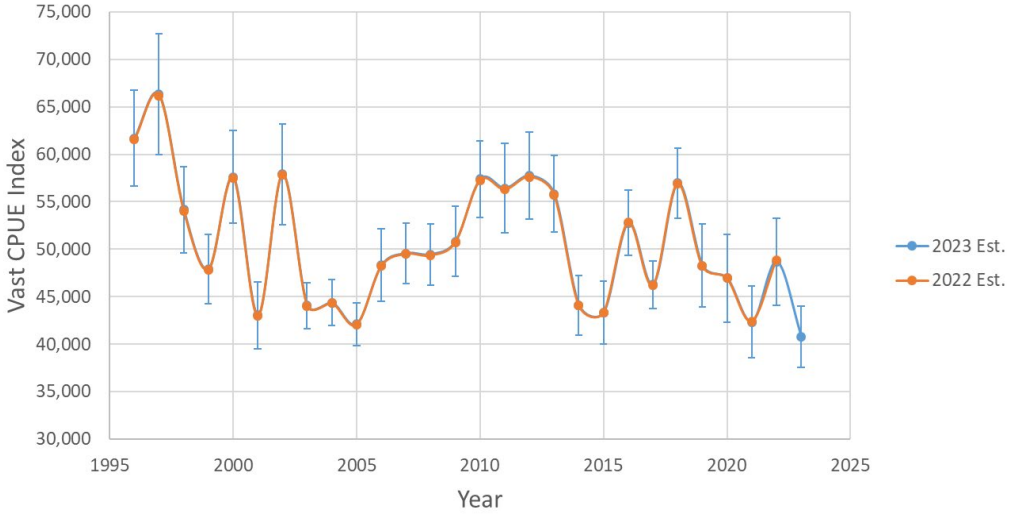
- 2023 ABC is 144,834 t and catch as of Dec. 5 = 139,528 t
  - Longline is the highest proportion
  - Continued southward shift in fishery
  - Little observed fishing north of St. Matthew Island in 2023

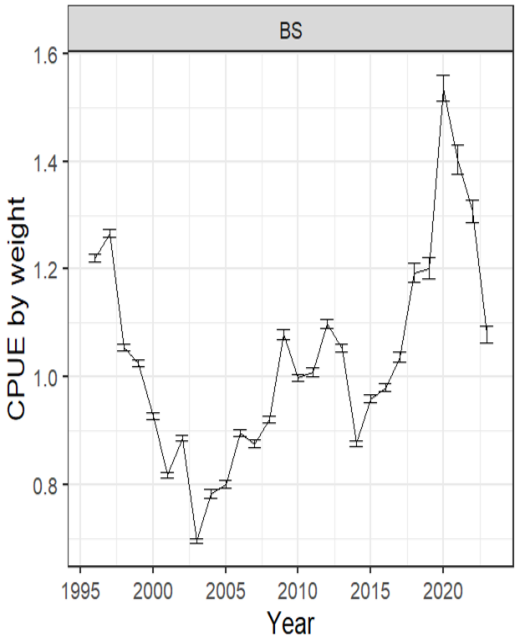




CPUE indices

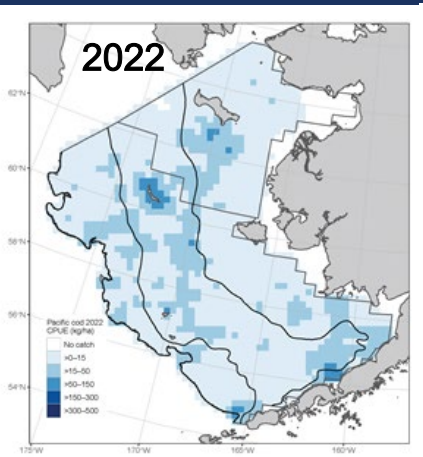
- VAST longline winter CPUE index
  - Downward trend overall with 16% drop from 2022
- All gear naïve CPUE index
  - Downward trend to near average since all-time high in 2020

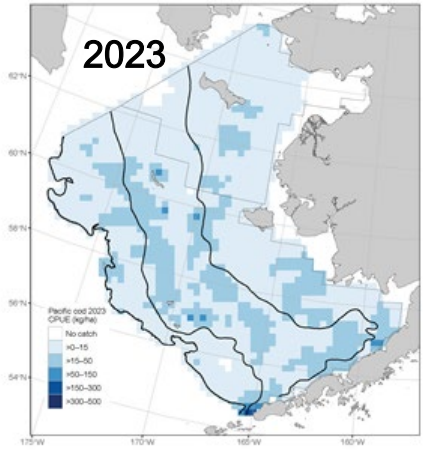


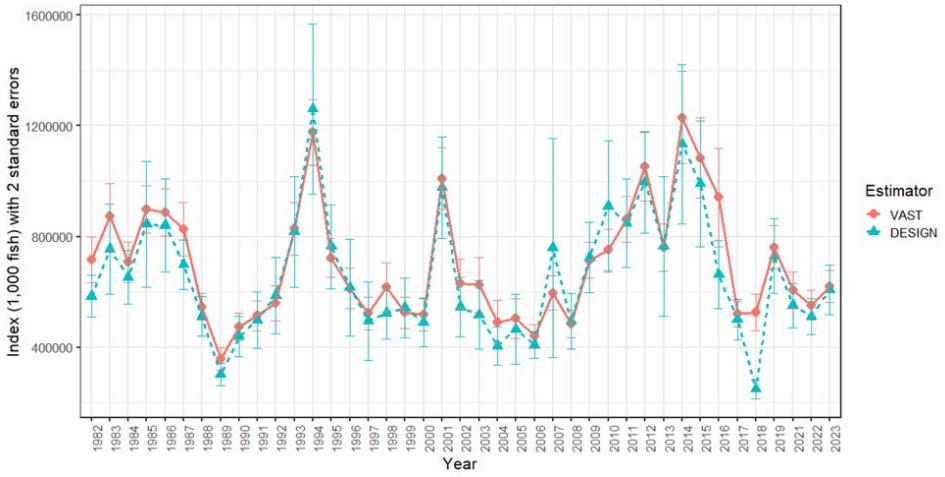


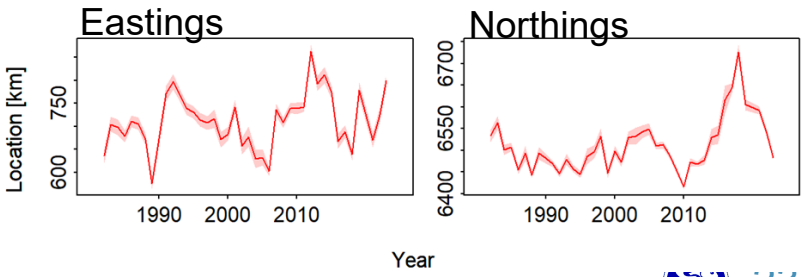
Bottom trawl survey

- Increase in abundance (+12%)
- Small decline in biomass (-4%)
- Southeastern shift in distribution



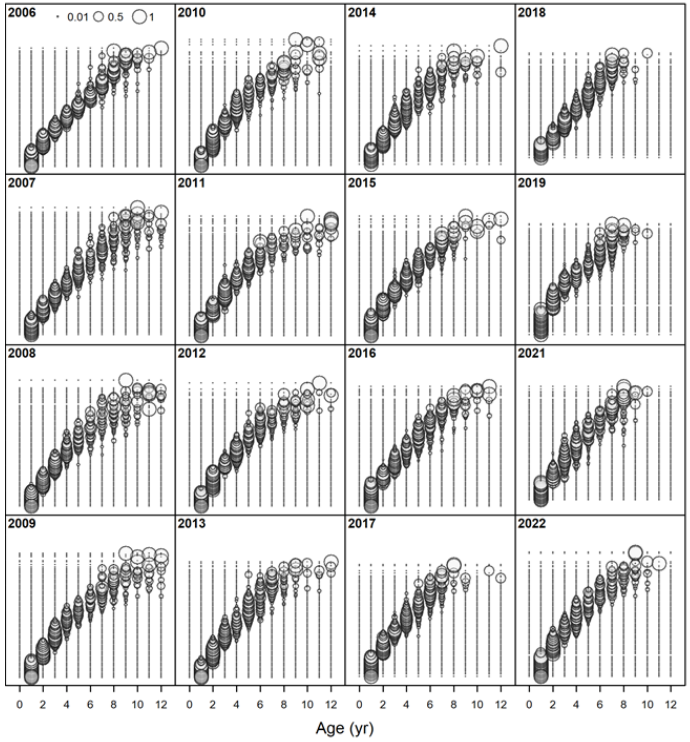


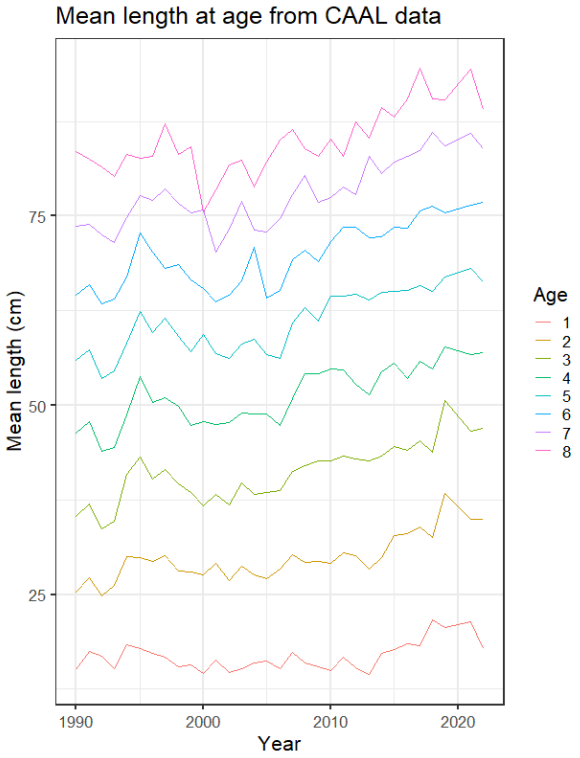




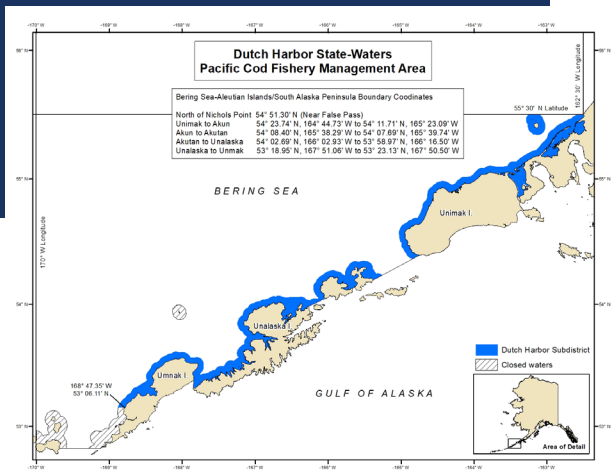
Bottom trawl survey CAAL

- Demonstrates change in aging post-2007, and
- Increasing growth trend since 2008

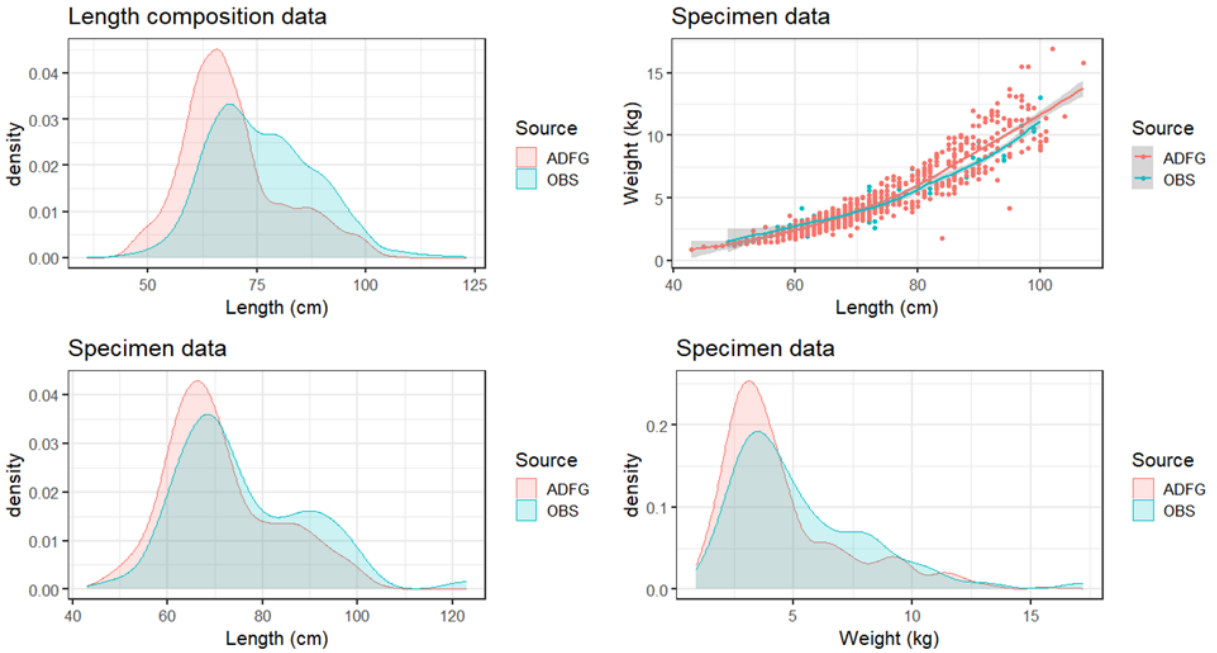




Area O state fishery



- GHL = 12% of BSAI ABC, 98% harvested so far in 2023 (pot and jig)
- ADF&G port sampling provided data on length and weight of cod catch in Feb-Apr
- Higher proportion of smaller fish in Dutch Harbor Subdistrict (DHS)



Assessment Models

https://afsc-assessments.github.io/EBS_PCOD/2023_ASSESSMENT/NOVEMBER_MODELS/

- 2022 Ensemble
  - Same models and weighting as 2022 New Ensemble
    - Updated data
- 2023 new models
  - Model 23.1.0.a
    - Non-time varying parameters for growth and selectivity
    - Aging bias fixed
    - Generic multinomial instead of Dirichlet multinomial
    - Input sample sizes based on bootstrap
    - Francis TA1.8 iterative weighting
  - Model 23.1.0.d
    - Model 23.1.0.a with time varying growth and selectivity
  - Model 23.2
    - Model 23.1.0.d with survey conditional age-at-length data

Model Evaluation: Ensemble vs. 2023

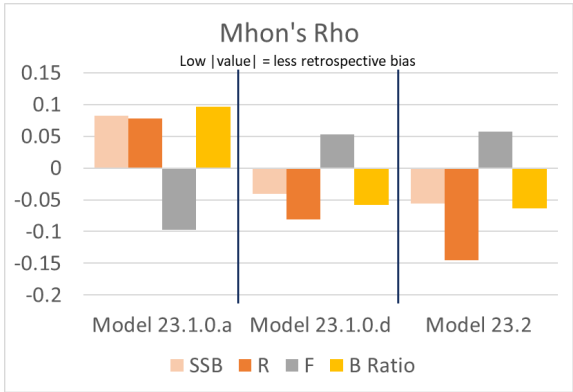
- For the Ensemble the Dirichlet multinomial log(Θ) continued to tend to the upper bound for length comp data and needed to be fixed there for the models to converge.

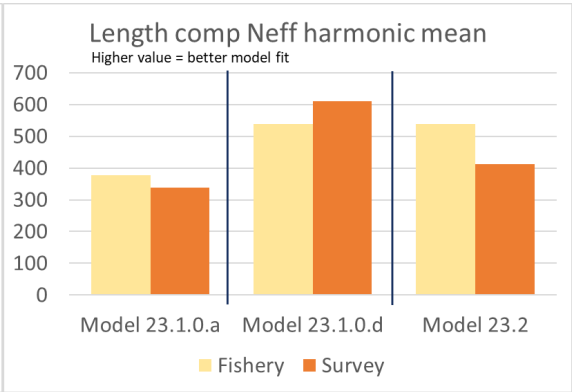
- 2022 Ensemble models consistently failed jitter tests (50 jitters at 0.1)
  - For all Ensemble models **no** jitter run converged to the same MLE or even the same objective function suggesting complex likelihood surface with substantial local minima.
  - For the three 2023 models > 76% of runs converged to MLE

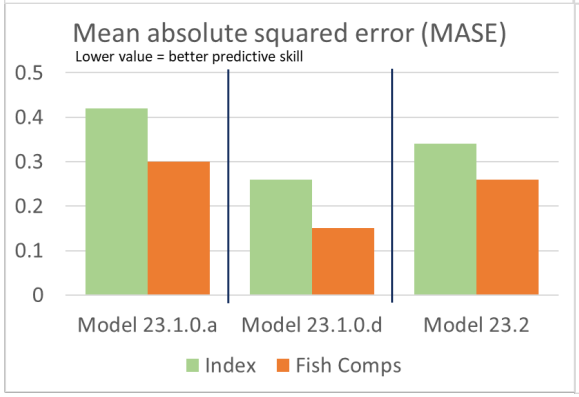
- **In the Authors' opinion the failure of the Ensemble models to consistently converge at the MLE is enough to disqualify them for consideration for use in management**

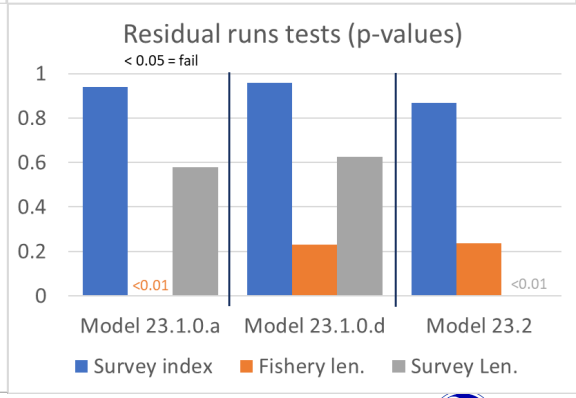
2023 Model Diagnostic Comparison

- Model 23.1.0.d best overall performance
  - Least retrospective bias
  - Best overall fit to comp and index data
  - Best MASE predictive skill
  - Passed all residual runs tests
  - Index RMSSR closest to 1.0
- Model 23.1.0.a best jitter performance with 98% convergence at the MLE
  - Model 23.1.0.d at 86%
  - Model 23.2 at 76%



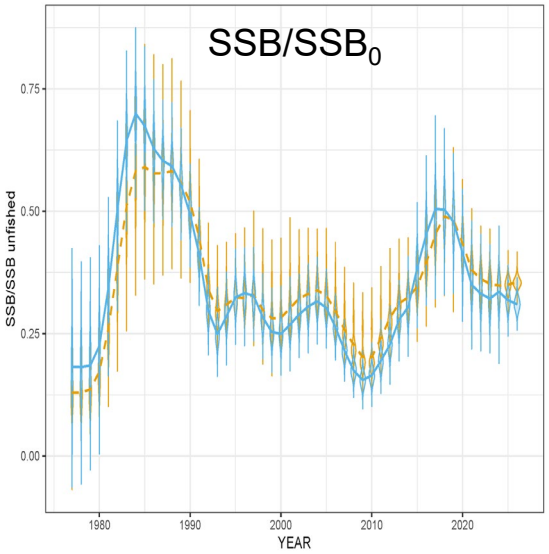


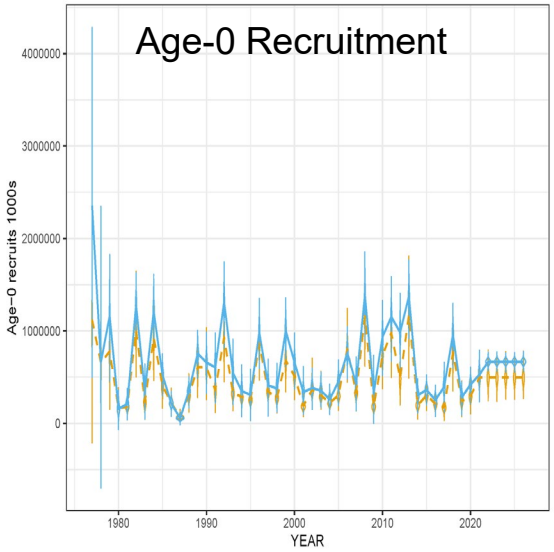


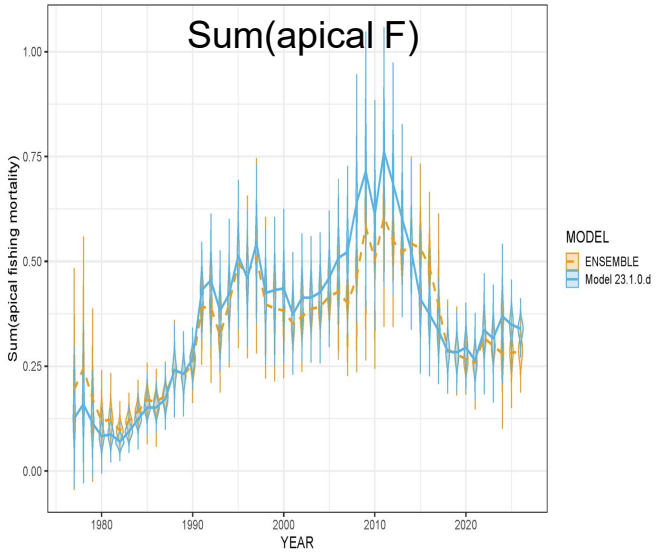


Model 23.1.0.d Timeseries

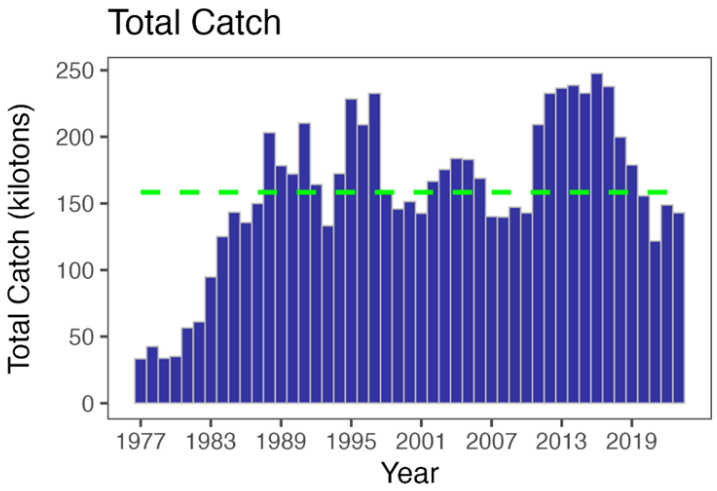
- SSB - Similar trends to 2022 ensemble
  - Higher peaks and lower troughs
- R - Same peaks and valleys to 2022 ensemble
  - Strong 2018 year class w/ low surrounding year classes
- F - Similar to 2022 ensemble but some key differences
  - Higher F 1991-2015
  - Lower F 2016-2021

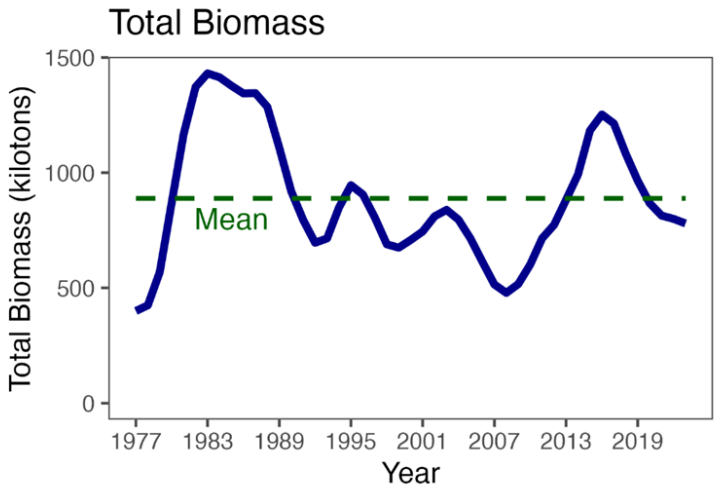


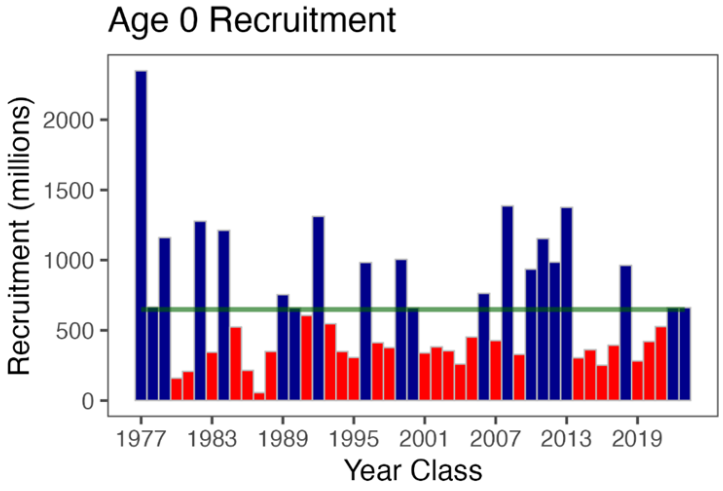


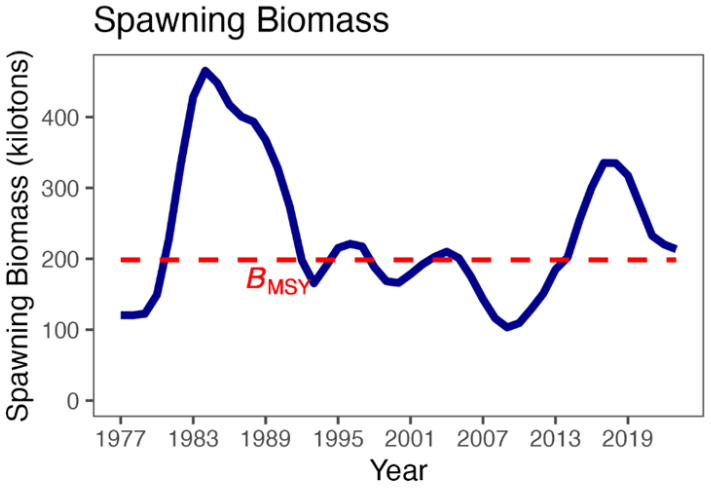


CHAPTER 2
EBS PACIFIC COD









CHAPTER 2
EBS PACIFIC COD

- Full Assessment; 3 new models; Risk table (1,1,1,1)

- Move from ensemble to single model approach
- Team agreed with author's recommendation of using Model 23.1.0.d
- No reduction from maxABC
- The Team recommended expanding the discussion of uncertainty around M in the risk table. For example, the interplay between M and q, and what may elevate the risk to a level 2 categorization.

Quantity	Last asmt.	This asmt.	Change
M	0.34	0.3866	14%
2023 Tier	3b		
2024 Tier	3b	3b	
2023 age+ biomass	844,578		-4%
2024 age+ biomass	831,566	808,203	-3%
2023 spawning biomass	245,594		-9%
2024 spawning biomass	242,911	223,107	-8%
B_0	668,477	567,465	-15%
2024 F_{OFL}	0.35	0.46	31%
2024 F_{ABC}	0.29	0.37	28%
2023 OFL	172,495		17%
2024 OFL	166,814	200,995	20%
2023 ABC	144,834		16%
2024 ABC	140,159	167,952	20%

CHAPTER 2
EBS PACIFIC COD

- Full Assessment; 3 new models; Risk table (1,1,1,1)

- The Team recommended expanding the discussion of uncertainty around M in the risk table. For example, the interplay between M and q, and what may elevate the risk to a level 2 categorization.

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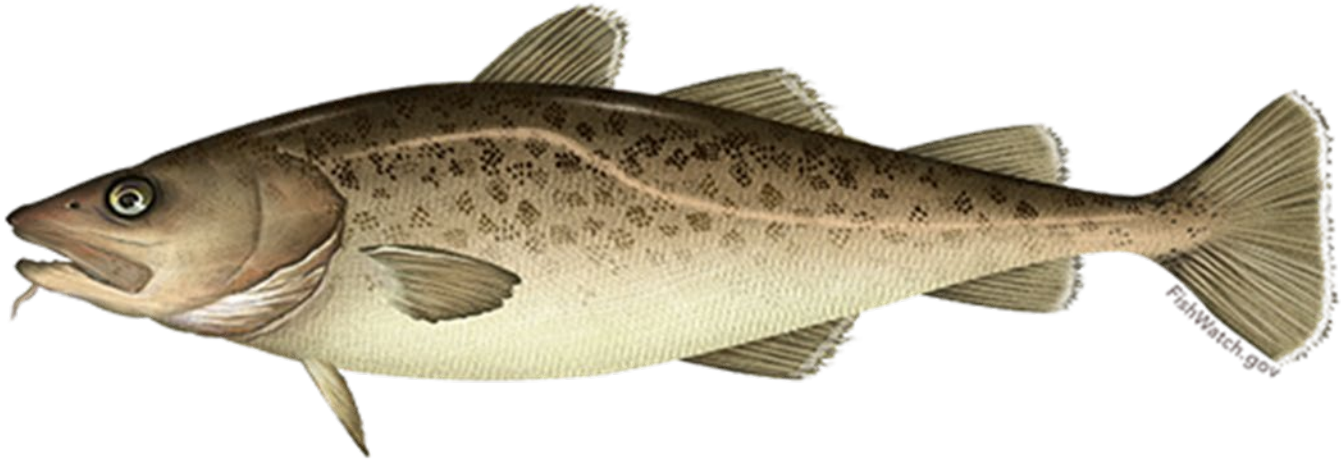
CHAPTER 2A
ALEUTIAN ISLANDS PACIFIC COD

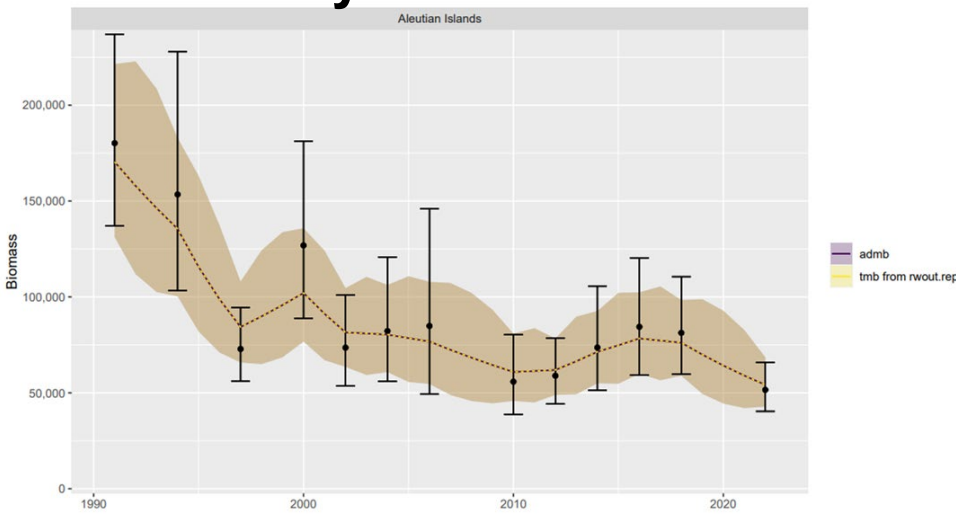
- Full Assessment; 3 new models; Risk table (1,2,2,1)



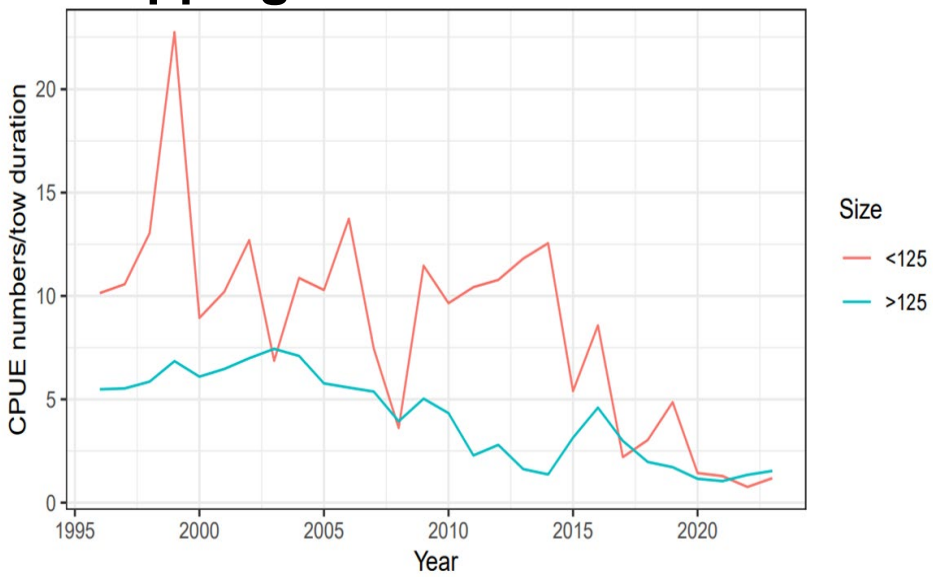
CHAPTER 2A
ALEUTIAN ISLANDS PACIFIC COD

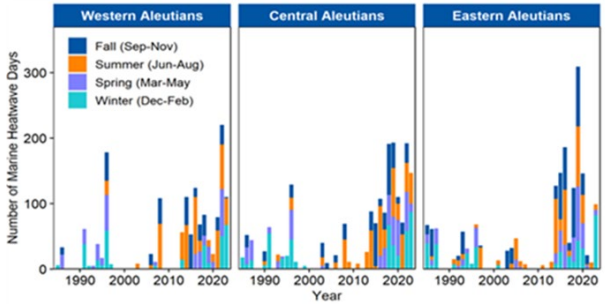
- Full Assessment; 3 new models; Risk table (1,2,2,1)

Low survey biomass



Dropping CPUE





Continued heatwave conditions in the Aleutian Islands

CHAPTER 2A: AI PACIFIC COD

- Full Assessment; 3 new models; Risk table (1,2,2,1)

- The Team did not recommend the author's Tier 3 model, but recommended management continue under Tier 5 model.
- Due to risk table concerns the Team recommended an 8% reduction from maximum ABC.

Quantity	Last asmt.	This asmt.	Change
M	0.34	0.34	0
2023 tier	5		
2024 tier	5	5	0
Biomass	54,165	54,165	0%
2024 F_{OFL}	0.34	0.34	0%
2024 F_{ABC}	0.255	0.255	0%
2023 OFL	18,416		0%
2024 OFL	18,416	18,416	0%
2023 ABC	13,812		-8%
2024 ABC	13,812	12,732	-8%

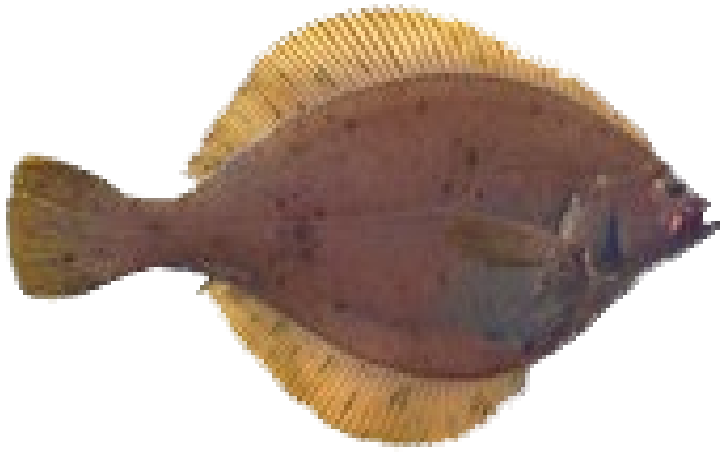
FLATFISH SUMMARY

Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
Yellowfin sole (Update)	1a	265,913	305,298	-30%
Greenland turb. (H-Proj)*	3a	3,188	3,705	-19%
Arrowtooth fl (H-Proj)	3a	87,690	103,280	5%
Kamchatka fl. (H-Proj)	3a	7,498	8,850	-1%
Northern rsole (H-Proj)	1a	122,091*(36%)	197,828	<1%
Flathead sole (H-Proj)	3a	67,289	81,605	3%
Alaska plaice (H-Proj)	3a	35,494	42,695	5%
Other flatfish (C-Rep)	5	17,189	22,919	0%

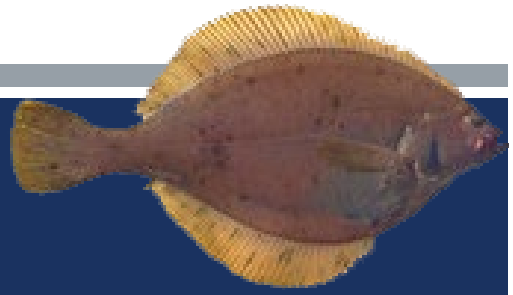
* Team recommendation made even though it was a harvest projection year

CHAPTER 4
YELLOWFIN SOLE

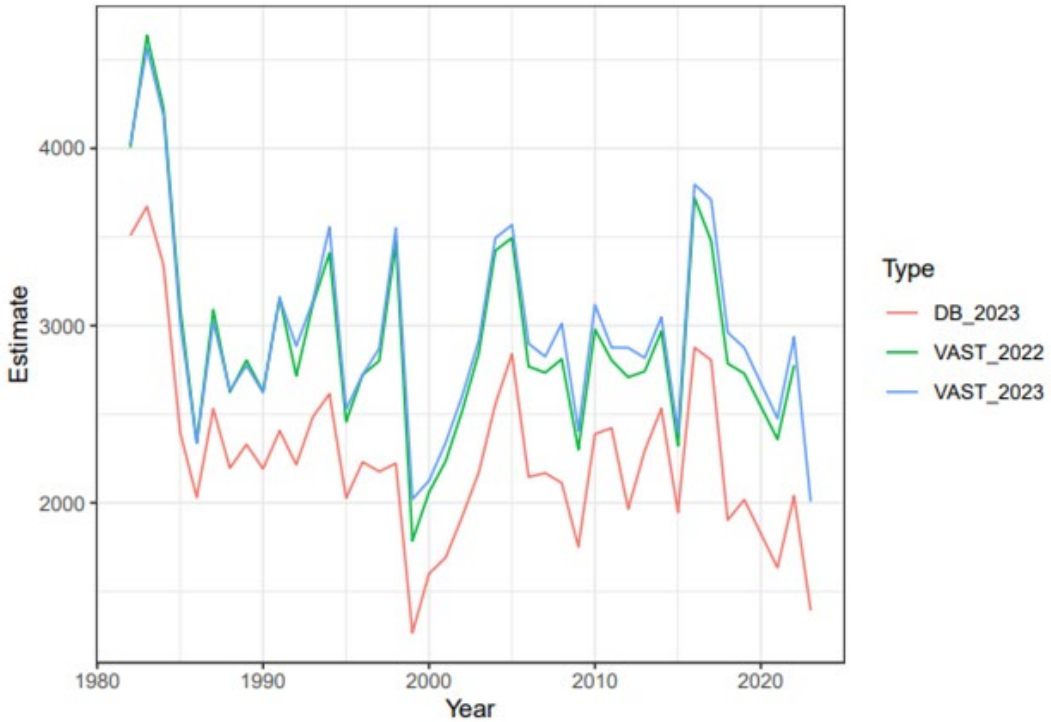
- Tier 1a; Update Assessment, 1 new model; Risk table (1,**2**,**2**,1)



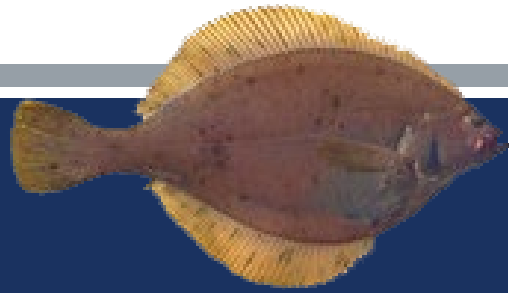
CHAPTER 4
YELLOWFIN SOLE



- Tier 1a; Update Assessment, 1 new model; Risk table (1,**2**,**2**,1)
  - Large decrease (-46%) in 2023 bottom trawl survey biomass estimate

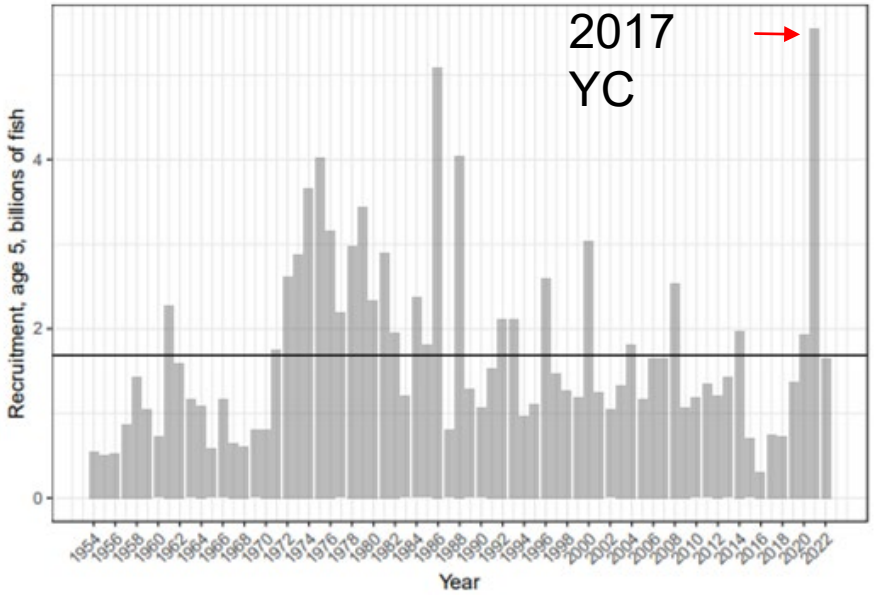


CHAPTER 4
YELLOWFIN SOLE

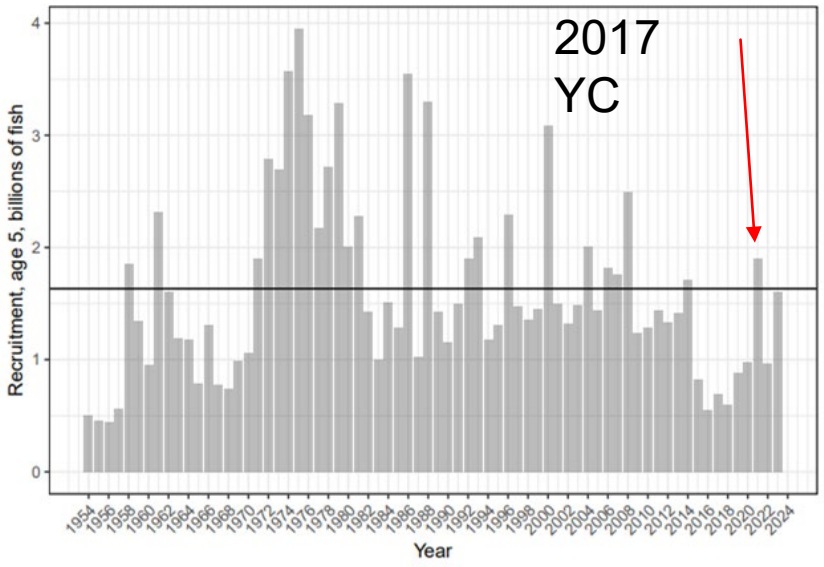


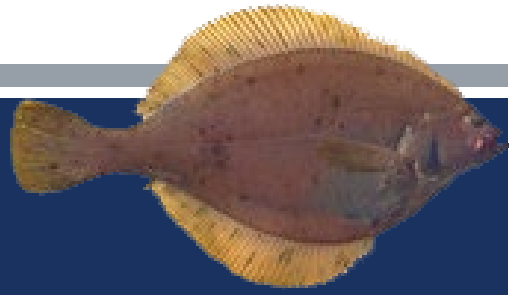
- Tier 1a; Update Assessment, 1 new model; Risk table (1,**2**,**2**,1)
  - Substantial reduction in 2017 and surrounding year classed from previous assessment

Age 5 recruitment for Model 22.1 in 2022



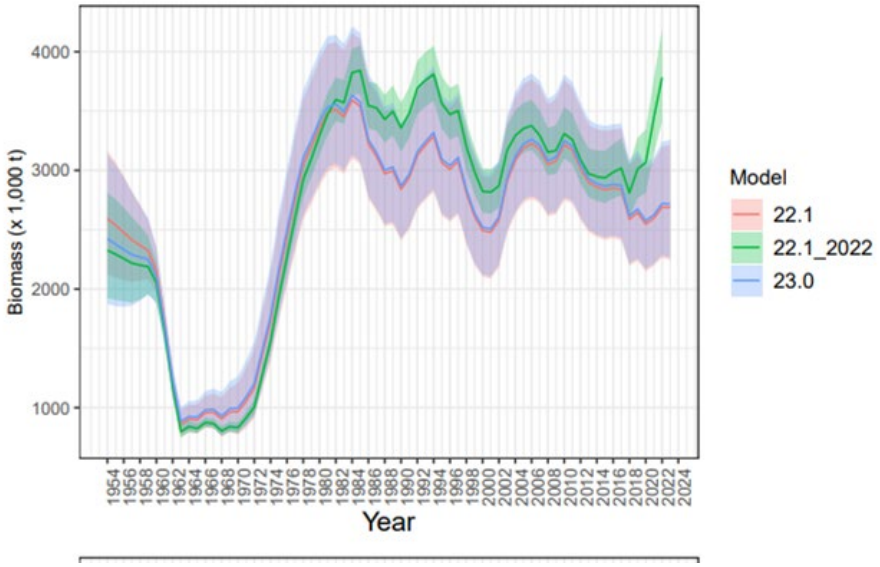
Age 5 recruitment for Model 23.0 in 2023

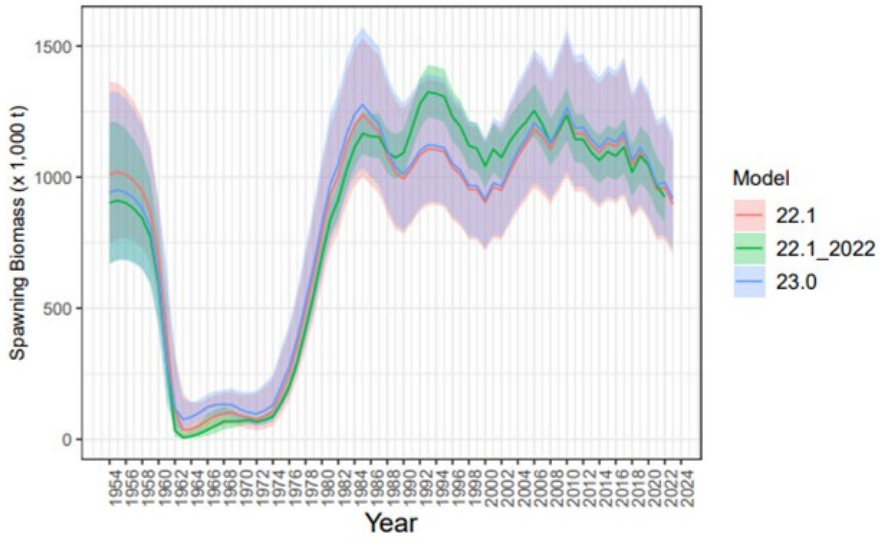




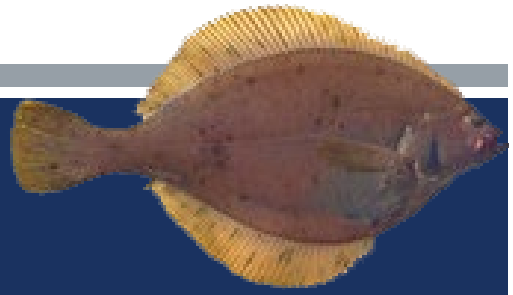
CHAPTER 4
YELLOWFIN SOLE

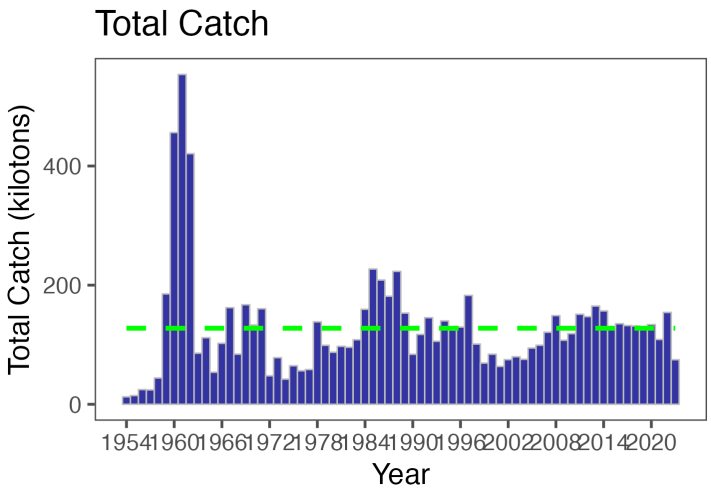
- Tier 1a; Update Assessment, 1 new model; Risk table (1,**2**,**2**,1)
  - Large reduction in total biomass (-62%) from 2022
  - Similar female spawning biomass (-2%)

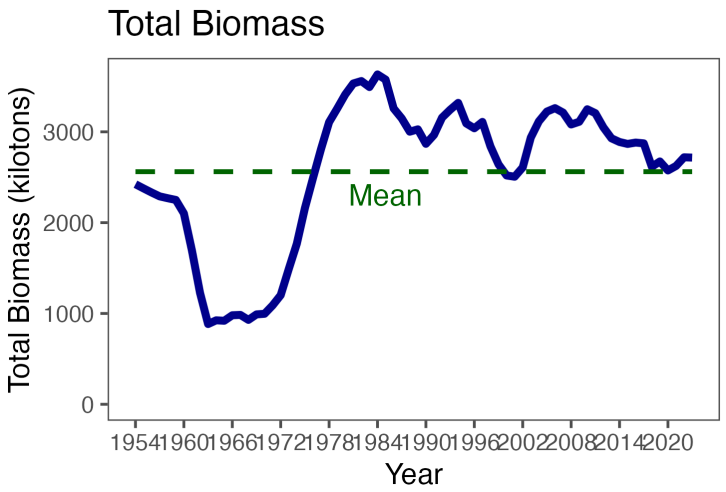


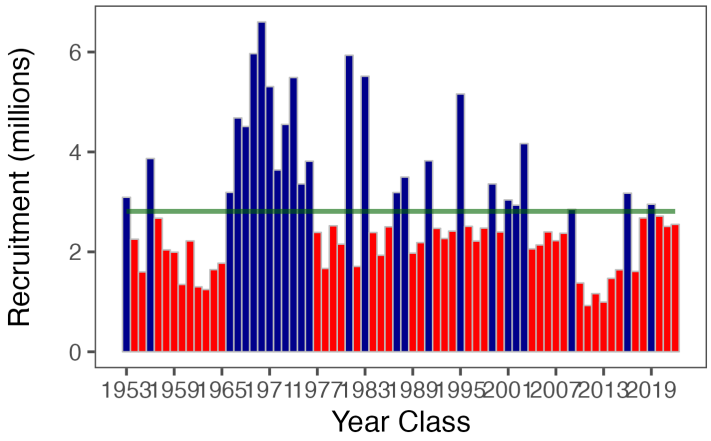


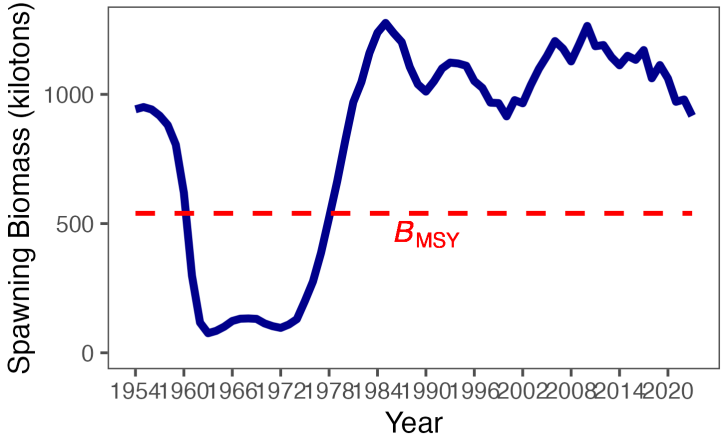
CHAPTER 4
YELLOWFIN SOLE



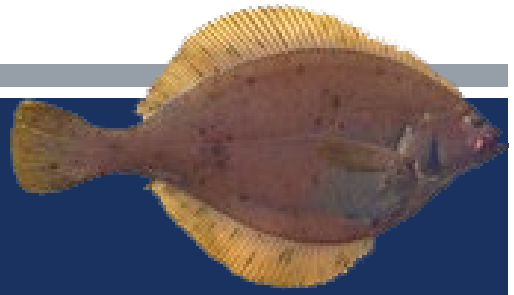








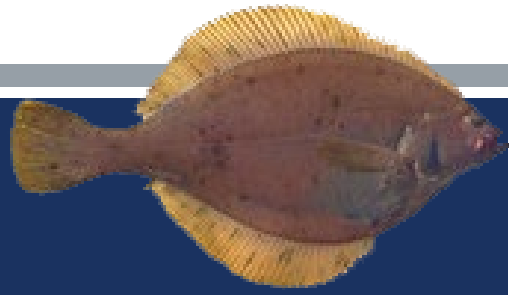
CHAPTER 4
YELLOWFIN SOLE



- Tier 1a; Update Assessment, 1 new model; Risk table (1,**2**,**2**,1)
  - Fishery catches a large portion of younger/immature fish.
  - Yellowfin sole females are 82% selected to the fishery by age 10 whereas they have been found to be only 40% mature at this age
  - Large reduction in OFL and ABC, but still well above catch.

Quantity	Last asmt.	This asmt.	Change
M	0.12/0.125	0.12/0.137	
2023 Tier	1a		
2024 Tier	1a	1a	
2023 age 6+ biomass	3,321,640		-24%
2024 age 6+ biomass	4,062,230	2,512,810	-38%
2023 spawning biomass	885,444		0%
2024 spawning biomass	897,062	881,640	-2%
B_0	1,407,000	1,516,980	8%
B_{msy}	475,199	539,657	14%
2024 F_{OFL}	0.122	0.121	-1%
2024 F_{ABC}	0.114	0.106	-7%
2023 OFL	404,882		-25%
2024 OFL	495,155	305,298	-38%
2023 ABC	378,499		-30%
2024 ABC	462,890	265,913	-43%

CHAPTER 4
YELLOWFIN SOLE



- Tier 1a; Update Assessment, 1 new model; Risk table (1,**2**,**2**,1)
- Team accepted the authors' recommendation including no reduction from maximum ABC
- The Team recommended that the author conduct a model sensitivity analysis to evaluate the current approach and the effect it has on model performance and results.

Quantity	Last asmt.	This asmt.	Change
M	0.12/0.125	0.12/0.137	
2023 Tier	1a		
2024 Tier	1a	1a	
2023 age 6+ biomass	3,321,640		-24%
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ROCKFISH SUMMARY

Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
Pacific ocean perch (H-Proj)	3a	41,096	49,010	-2%
Northern rockfish (Update)	3a	19,274	23,556	3%
Blackspotted/rougheye (H-Proj)	3b/5	511*(12%)	684	9%
Shortraker rockfish (C-Rep)	5	530	706	0%
Other rockfish (C-Rep)	5	1,260	1,680	0%

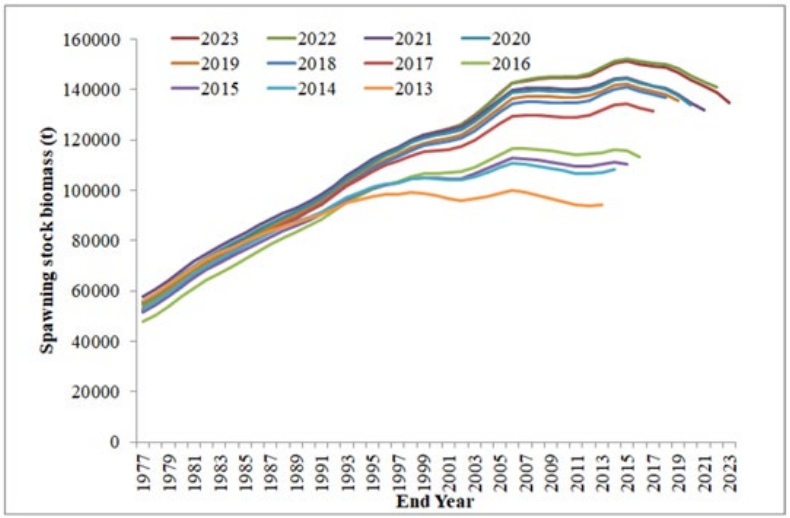
*xx% Reduced from maximum permissible ABC

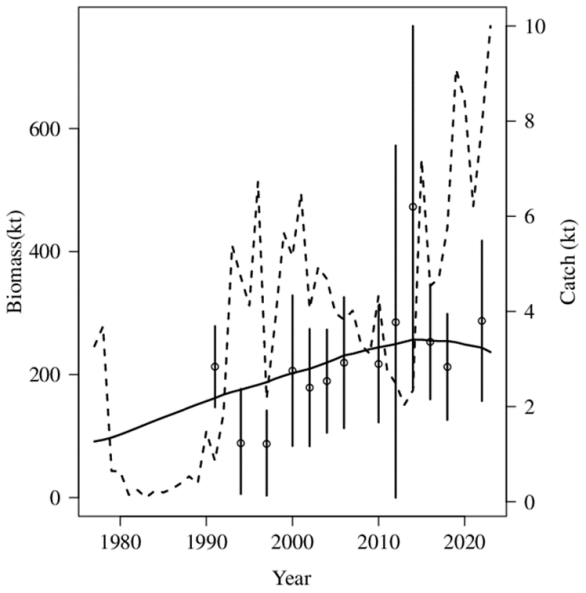
CHAPTER 13
NORTHERN ROCKFISH

- Tier 3a; Update Assessment; No new models; Risk table (**2**,**2**,1,1)

CHAPTER 13
NORTHERN ROCKFISH

- Tier 3a; Update Assessment; No new models; Risk table (2,2,1,1)
  - Same model, data update
    - Negative retrospective pattern (Mohn's rho = -0.16)
  - Fishery
    - Continued development of target fishery
    - Rapidly increasing catches

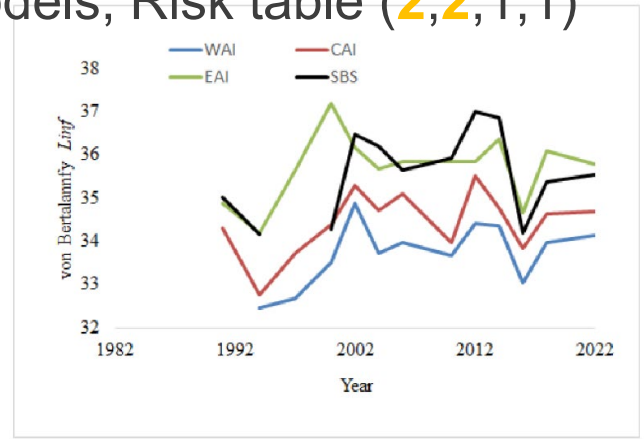


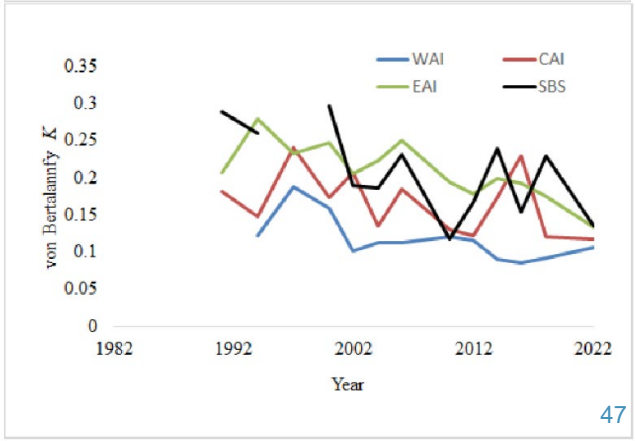


CHAPTER 13
NORTHERN ROCKFISH

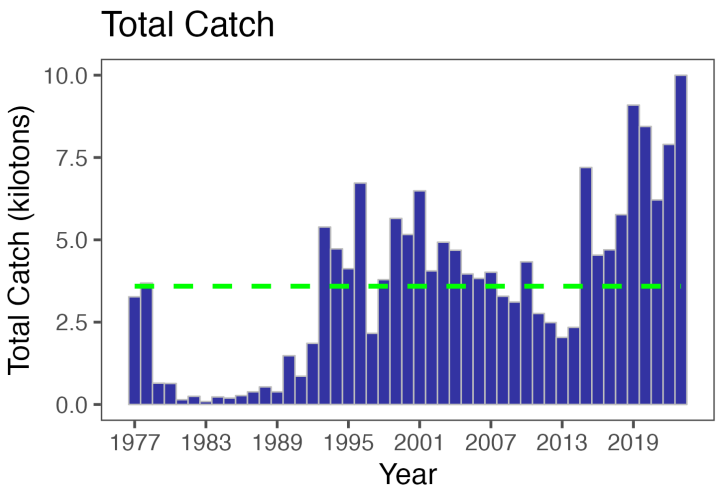
- Tier 3a; Update Assessment; No new models; Risk table (2,2,1,1)

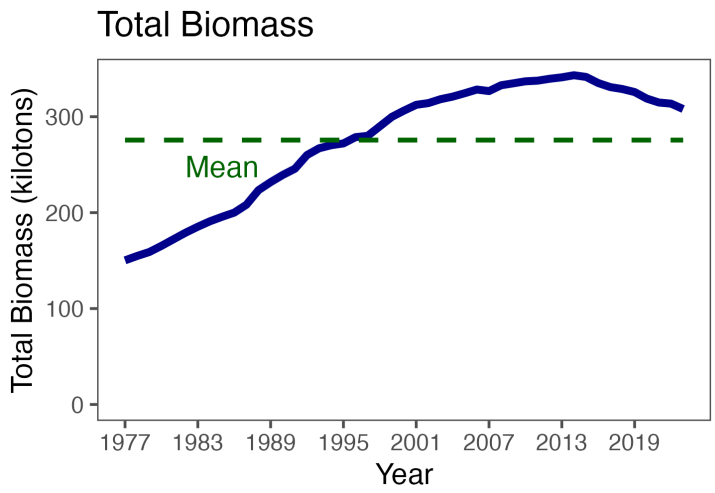
- Stock Structure
  - Update of stock structure information requested by SSC
  - Spatial patterns in growth, and spatial genetic structure (Larson September PT presentation)
- Management
  - Mismatch between spatial scale of management and spatial population structure
- Risk table
  - Catch << ABC. Do not recommend reductions from maxABC, but monitor stock and fishery

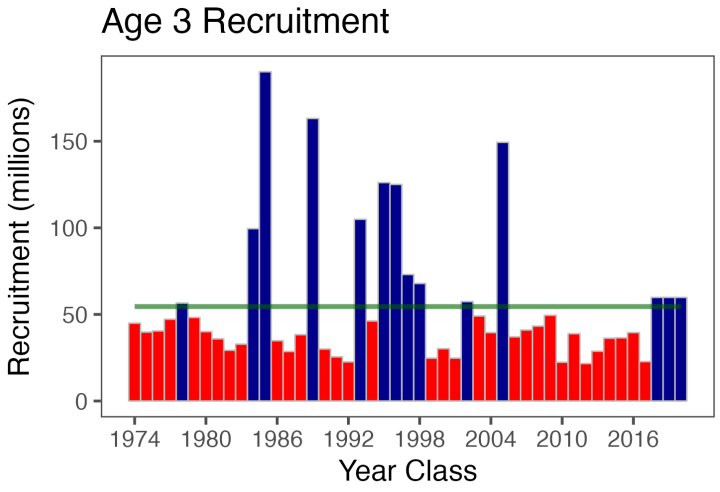


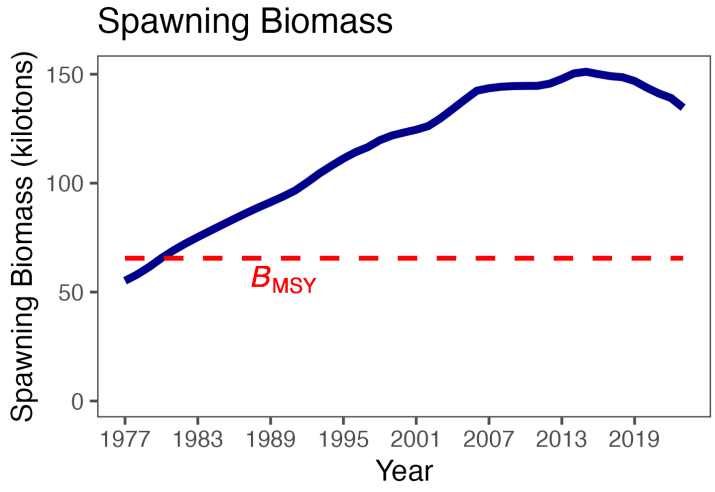


CHAPTER 13
NORTHERN ROCKFISH









CHAPTER 13
NORTHERN ROCKFISH

- Tier 3a; Update Assessment; No new models; Risk table (2,2,1,1)
- Team agreed with author's recommendation and stayed with base model
- No additional recommendations

Quantity	Last asmt.	This asmt.	Change
M	0.054	0.052	-4%
2023 Tier	3a		
2024 Tier	3a	3a	
2023 age+ biomass	277,133		7%
2024 age+ biomass	273,414	297,189	9%
2023 spawning biomass	118,251		8%
2024 spawning biomass	115,209	128,229	11%
B_0	171,768	187,268	9%
2024 F_{OFL}	0.085	0.086	1%
2024 F_{ABC}	0.069	0.070	1%
2023 OFL	22,776		3%
2024 OFL	22,105	23,556	7%
2023 ABC	18,687		3%
2024 ABC	18,135	19,274	6%

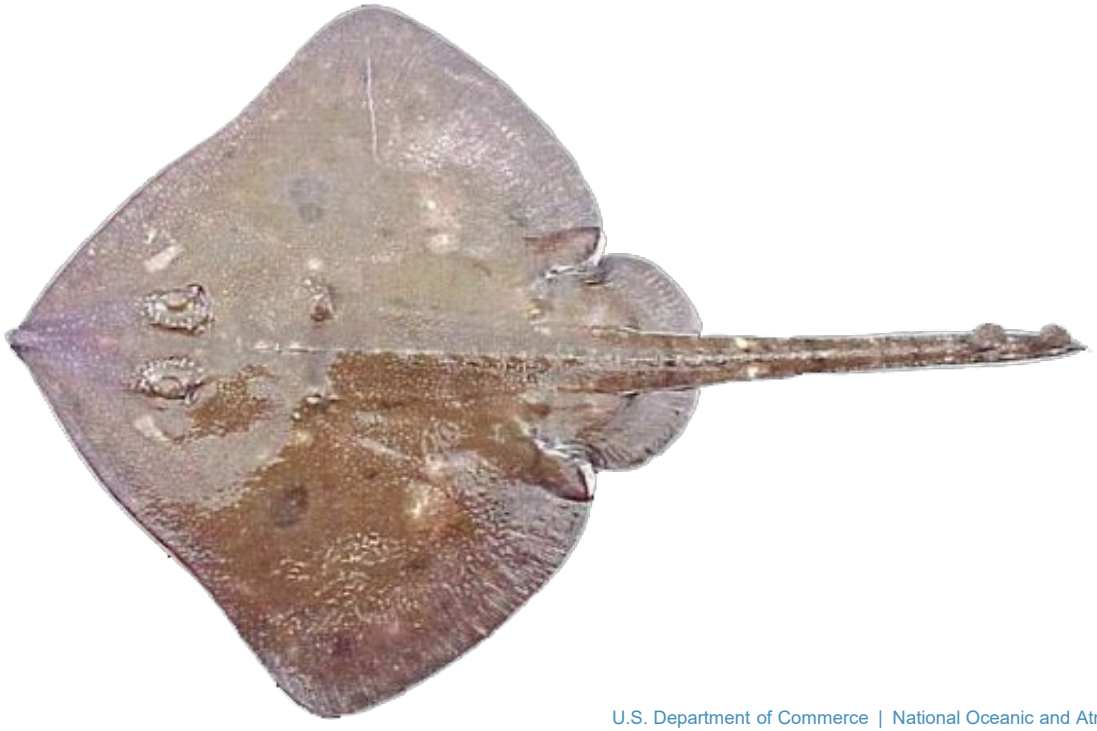
OTHER SUMMARY

Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
Atka mackerel (H-Rep)	3a	95,358	111,684	-3%
Skates (Update)	3a/5	37,808	45,574	-2%
Sharks (C-Rep)	6	450*(13%)	689	0%
Octopus (Update)	6	4,560	6,080	28%

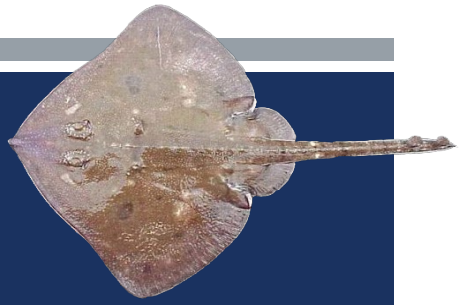
*xx% Reduced from maximum permissible ABC

CHAPTER 18
SKATES

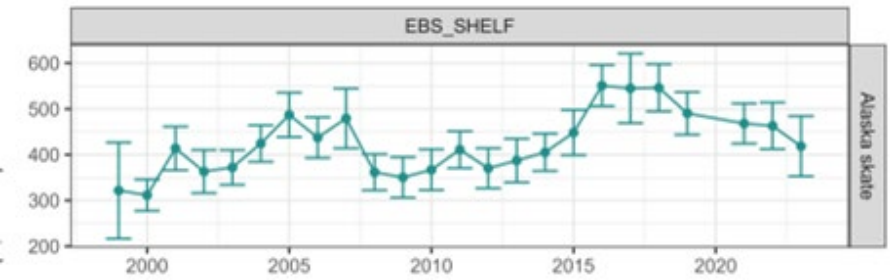
- Tier 3a and 5; Update Assessment; No new models; Risk table ((**2**,**1**),1,1,1)
  - Alaska Skate Tier 3a
  - Other Skates Tier 5



CHAPTER 18
SKATES – Alaska Skate

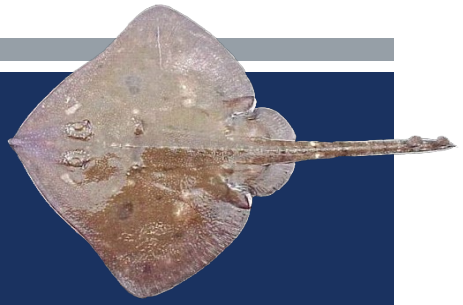


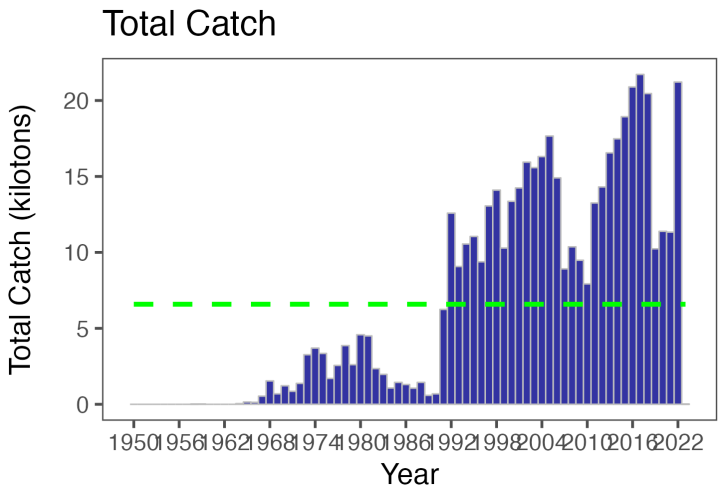
- Tier 3a; Update Assessment, No new models; Risk table (**2**,1,1,1)
- Alaska Skate Tier 3a
  - Update to catch and survey data
  - Migration from older version of stock synthesis
  - Continued poor retrospective bias

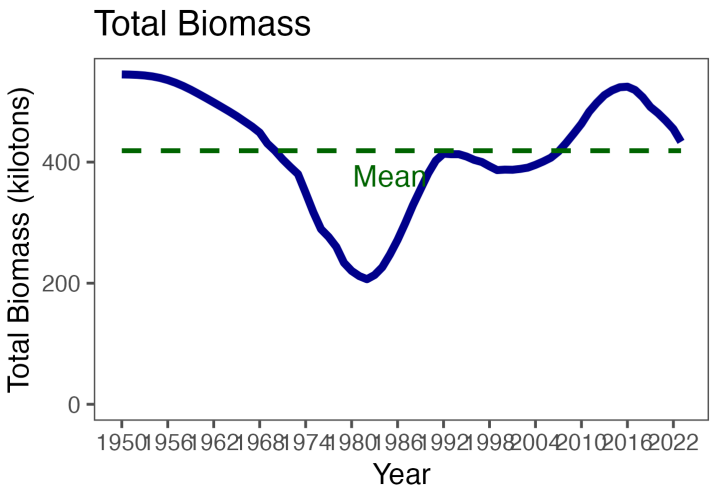


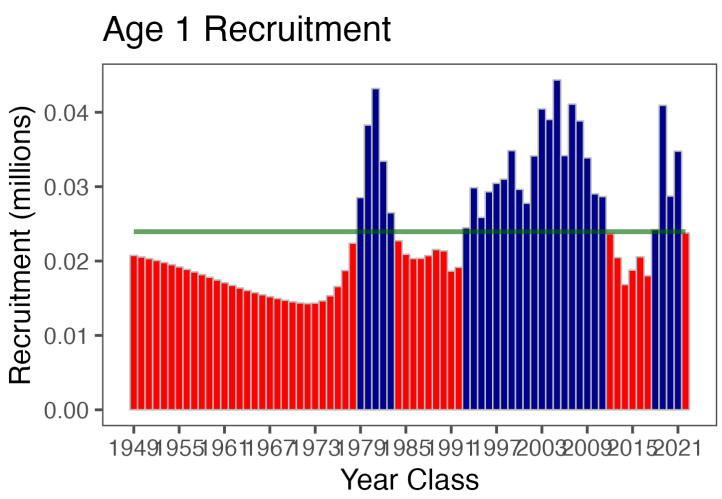
Quantity	Last asmt.	This asmt.	Change
M	0.13	0.13	0%
2023 Tier	3a		
2024 Tier	3a	3a	
2023 age+ biomass	473,527		-4%
2024 age+ biomass	450,679	455,367	1%
2023 spawning biomass	114,804		-7%
2024 spawning biomass	105,595	107,197	2%
B_0	178,425	172,881	-3%
2024 F_{OFL}	0.092	0.093	1%
2024 F_{ABC}	0.079	0.080	1%
2023 OFL	35,503		-9%
2024 OFL	33,451	32,429	-3%
2023 ABC	30,567		-9%
2024 ABC	28,799	27,950	-3%

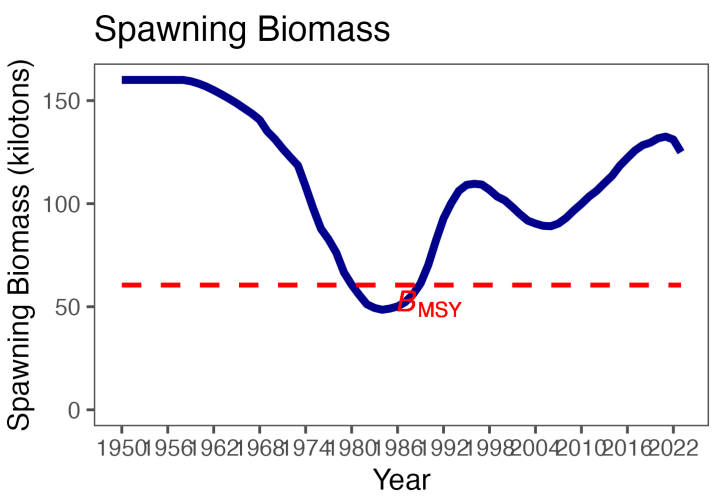
CHAPTER 18
SKATES



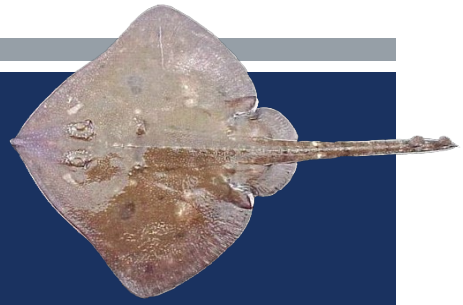




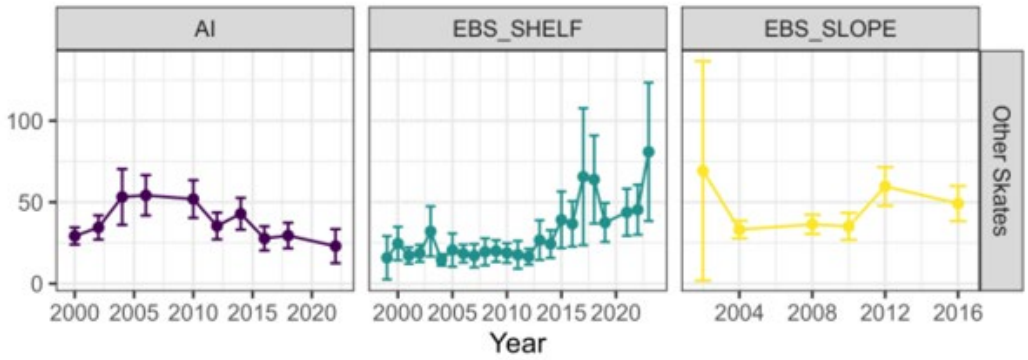




CHAPTER 18
SKATES – Other Skates

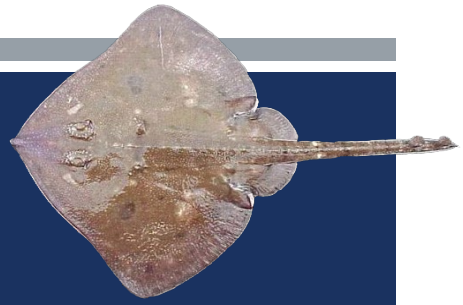


- Tier 5; Update Assessment; Risk table (1,1,1,1)
- Other Skates Tier 5
  - Update to survey biomass estimates
  - New REMA model run



Quantity	Last asmt.	This asmt.	Change
M	0.1	0.1	0%
2023 Tier	5		
2024 Tier	5	5	
2023 age+ biomass	107,174		23%
2024 age+ biomass	107,174	131,446	23%
2024 F_{OFL}	0.1	0.1	0%
2024 F_{ABC}	0.075	0.075	0%
2023 OFL	10,717		23%
2024 OFL	10,717	13,145	23%
2023 ABC	8,038		23%
2024 ABC	8,038	9,858	23%

CHAPTER 18
SKATES – Combined



- Combined Tier 3A and Tier 5; Risk table ((2,1),1,1,1)

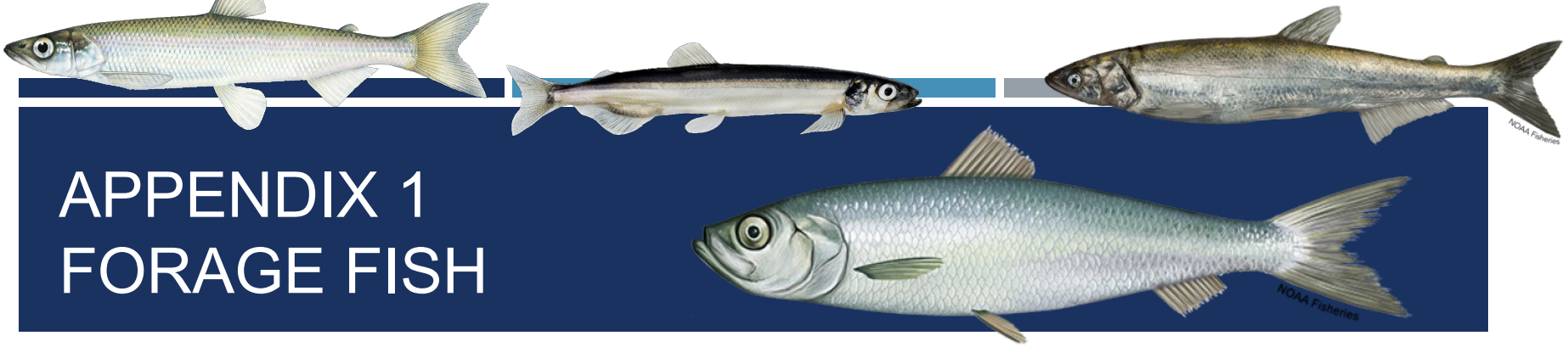
- Team accepted recommended model with no reduction from maximum ABC.
- The Team recommends the authors examine using a catchability that is tuned to temperature.
- The Team applauded the authors' approach to not change the methodology for this first assessment cycle after the change in authorship, and gave the authors leeway to explore the data and assessment methodology in more detail to come up with the improvements that should be incorporated into the model for the next assessment cycle. The Team recommended this approach be used as the model for how authorship transfers be conducted going forward.

Quantity	Last asmt.	This asmt.	Change
2023 OFL	46,220		-1%
2024 OFL	44,168	45,574	3%
2023 ABC	38,608		-2%
2024 ABC	36,837	37,808	3%

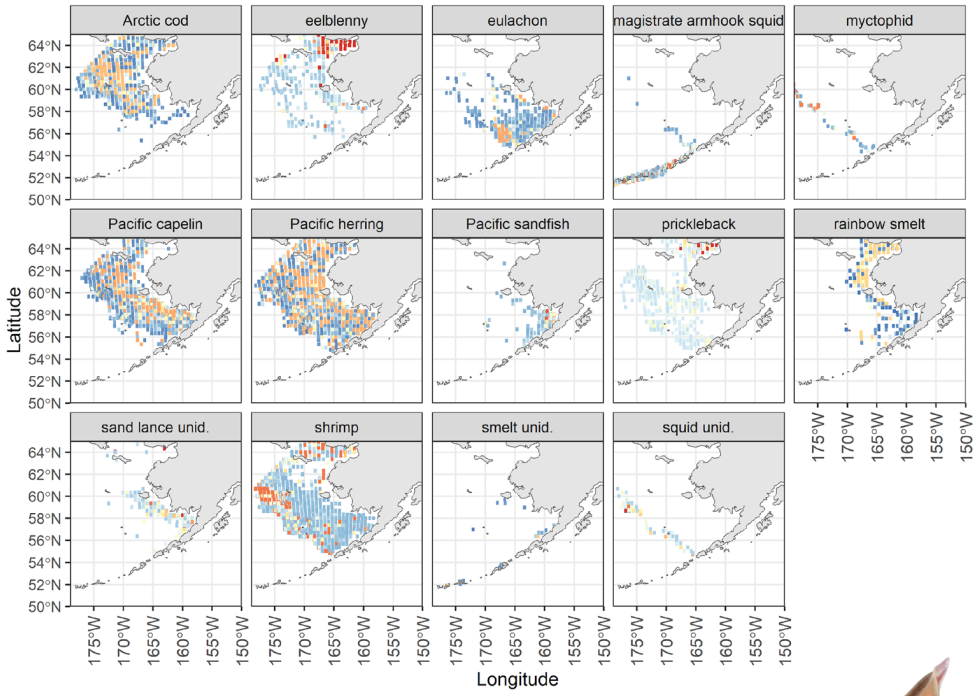
CHAPTER 22
OCTOPUS

- Tier 6; Update assessment; No new model; Risk table (1,1,1,1)
- Consumption model last updated in 2011
  - 13,614 additional Pacific cod stomach samples collected from 2012-2013 and 2016-2023 added for this year's update
- Team accepted authors recommendation with no reduction from maximum ABC

Quantity	Last asmt.	This asmt.	Change
2023 Tier	6		
2024 Tier	6	6	
2023 OFL	4,769		27%
2024 OFL	4,769	6,080	27%
2023 ABC	3,576		28%
2024 ABC	3,576	4,560	28%



APPENDIX 1
FORAGE FISH



Bottom trawl survey

- Capelin and eulachon **down**.
- Herring and shrimp **up**.
- BASIS survey **down**.

Fisheries

- Squid and herring catches **up**.
- All other catches **down**.

Future

- Spatiotemporal models + environmental linkages
- Synthetic indices of forage

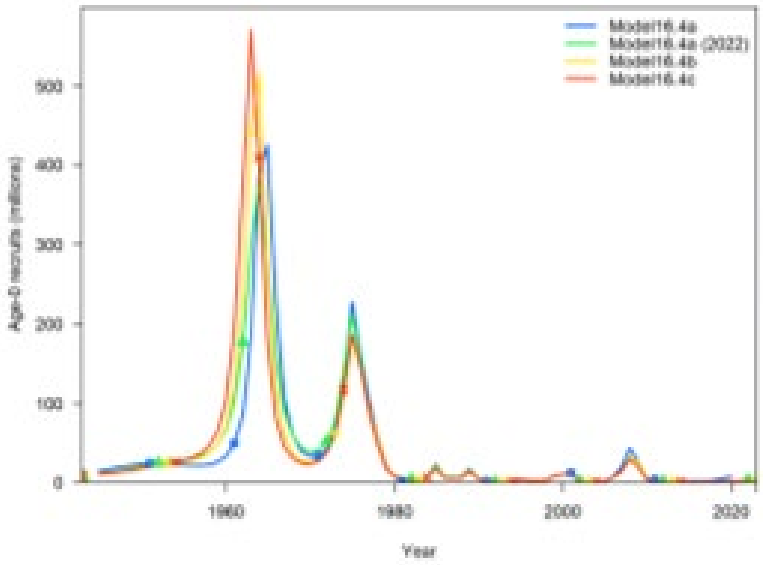
HARVEST PROJECTION SUMMARY

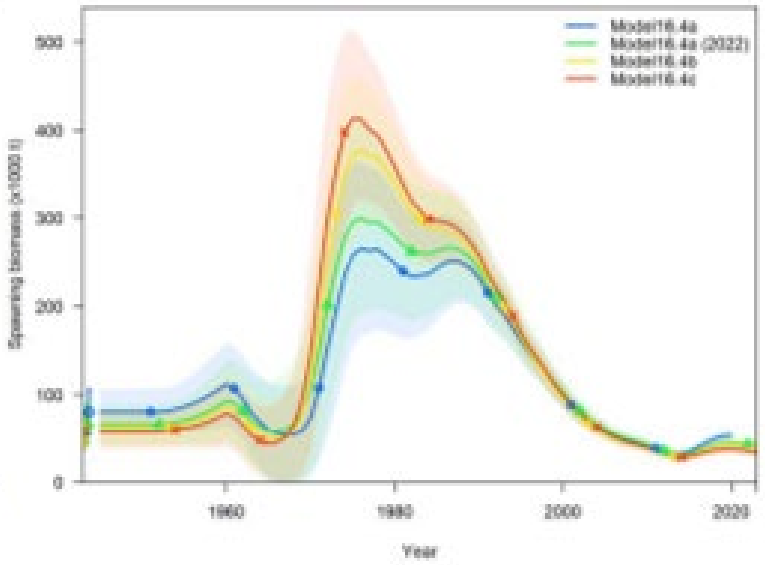
Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
AI pollock (H-Proj)	3a	42,654	51,516	-2%
Greenland turb. (H-Proj)*	3a	3,188	3,705	-19%
Arrowtooth fl (H-Proj)	3a	87,690	103,280	5%
Kamchatka fl. (H-Proj)	3a	7,498	8,850	-1%
Northern rsole (H-Proj)	1a	122,091*(36%)	197,828	<1%
Flathead sole (H-Proj)	3a	67,289	81,605	3%
Alaska plaice (H-Proj)	3a	35,494	42,695	5%
Pacific ocean perch (H-Proj)	3a	41,096	49,010	-2%
Blackspotted/rougheye (H-Proj)	3b/5	511*(12%)	684	9%
Atka mackerel (H-Proj)	3a	95,358	111,684	-3%

* Team recommendation made even though it was a harvest projection year

CHAPTER 4
GREENLAND TURBOT RECOMMENDATIONS

- **Greenland Turbot (Harvest Projection)**
  - The Team was concerned about the status of Greenland turbot and recommended an operational full assessment due to concerns with continued long term declines in survey indices as well as the inability of the model to fit the indices.



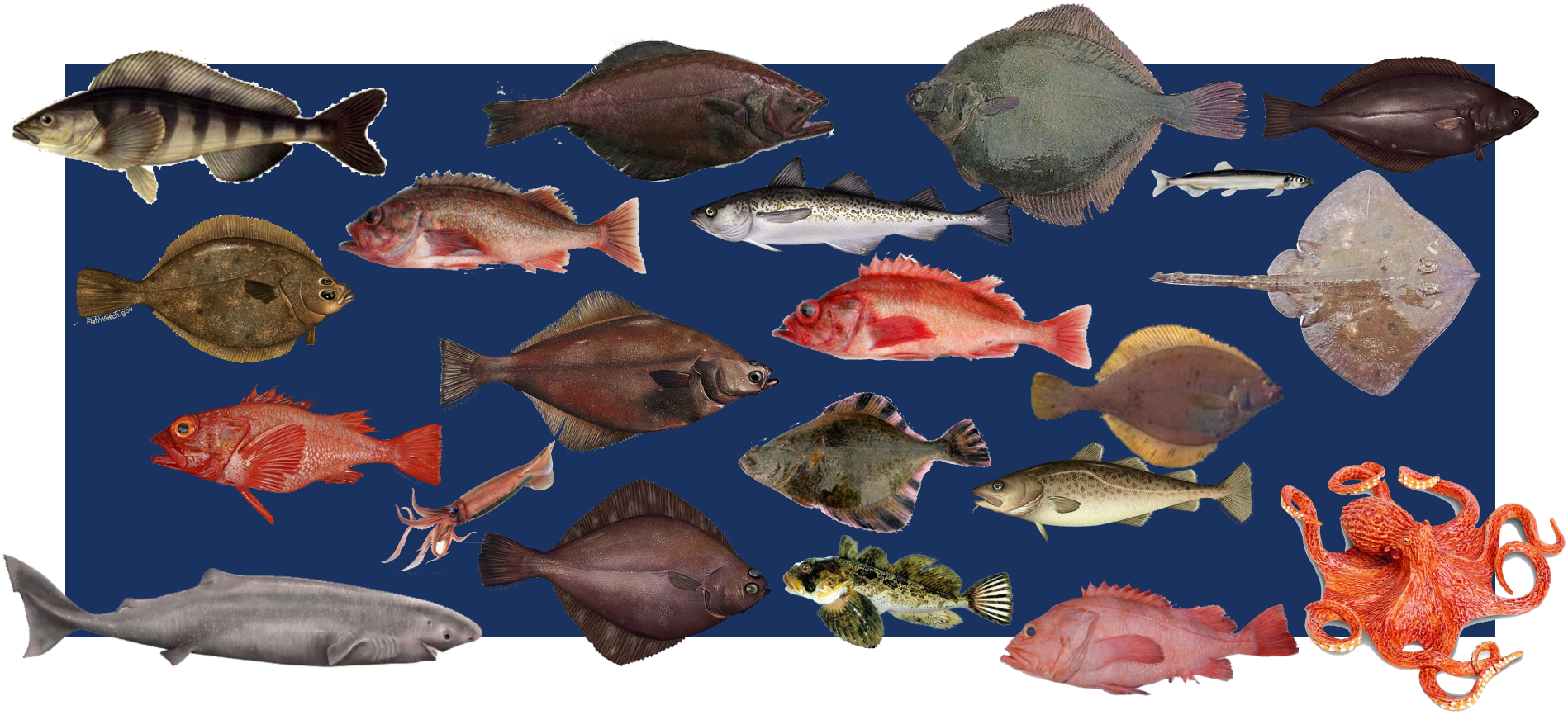


CATCH REPORT SUMMARY

Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
Bogoslof poll. (C-Rep)	5	86,360	115,1460	0%
Other flatfish (C-Rep)	5	17,189	22,919	0%
Shortraker rockfish (C-Rep)	5	530	706	0%
Other rockfish (C-Rep)	5	1,260	1,680	0%
Sharks (C-Rep)	6	450*(13%)	689	0%

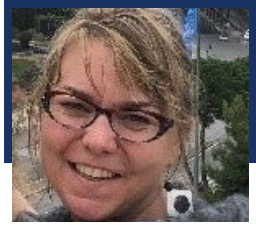
*xx% Reduced from maximum permissible ABC

THANK YOU



C3 Council Actions for BSAI specifications

Diana Stram, December, 2024



Species	Area	2023 OFL	2023 ABC	2023 TAC	Catch as of 11/5/2023	2024 OFL	2024 ABC	2025 OFL	2025 ABC
Pollock	EBS	3,381,000	1,910,000	1,314,500	1,307,997	3,162,000	2,313,000	3,449,000	2,401,000
	AI	52,383	43,413	4,500	3,665	51,516	42,654	53,030	43,863
	Bogoslof	115,146	86,360	300	118	115,146	86,360	115,146	86,360
Pacific cod	BS	172,495	144,834	127,409	112,963	200,995	167,952	180,798	150,876
	AI	18,416	13,812	8,425	3,750	18,416	12,431	18,416	12,431
	BSAI/GOA	47,390				55,084	47,146	55,317	47,350
Sablefish	BS		8,417	7,996	5,164		11,450		11,499
	AI		8,884	8,440	2,319		13,100		13,156
Yellowfin sole	BSAI	404,882	378,499	230,000	105,682	305,298	265,913	317,932	276,917
Greenland turbot	BSAI	4,645	3,960	3,722	1,272	3,705	3,188	3,185	2,740
	BS		3,338	3,180	793		2,687		2,310
	AI		622	592	479		501		430
Arrowtooth flounder	BSAI	98,787	83,852	15,000	6,948	103,280	87,690	104,270	88,548
Kamchatka flounder	BSAI	8,946	7,579	7,579	6,926	8,850	7,498	8,687	7,360
Northern rock sole	BSAI	166,034	121,719	66,400	26,907	197,828	122,091	264,789	122,535
Flathead sole	BSAI	79,256	65,344	35,100	8,759	81,605	67,289	82,699	68,203
Alaska plaice	BSAI	40,823	33,946	17,875	15,018	42,695	35,494	45,182	37,560
Other flatfish	BSAI	22,919	17,189	4,500	2,994	22,919	17,189	22,919	17,189
Pacific Ocean perch	BSAI	50,133	42,038	37,703	34,720	49,010	41,096	48,139	40,366
	BS		11,903	11,903	10,196		11,636		11,430
	EAI		8,152	8,152	7,255		7,969		7,828
	CAI		5,648	5,648	5,461		5,521		5,423
	WAI		16,335	12,000	11,807		15,970		15,685
Northern rockfish	BSAI	22,776	18,687	11,000	10,308	23,556	19,274	22,838	18,685
Blackspotted/Rougheye Rockfish	BSAI	703	525	525	523	761	569	813	607
	EBS/EAI		359	359	207		388		412
	CAI/WAI		166	166	316		181		195
Shortraker rockfish	BSAI	706	530	530	224	706	530	706	530
Other rockfish	BSAI	1,680	1,260	1,260	1,179	1,680	1,260	1,680	1,260
	BS		880	880	618		880		880
	AI		380	380	560		380		380
Atka mackerel	BSAI	118,787	98,588	69,282	65,527	111,684	95,358	99,723	84,676
	EAI/BS		43,281	27,260	23,776		41,723		37,049
	CAI		17,351	17,351	17,210		16,754		14,877
	WAI		37,956	24,671	24,541		36,882		32,750
Skates	BSAI	46,220	38,605	27,441	24,605	45,574	37,808	44,203	36,625
Sharks	BSAI	689	450	333	320	689	450	689	450
Octopuses	BSAI	4,769	3,576	400	151	6,080	4,560	6,080	4,560
Total	BSAI	4,859,585	3,132,067	2,000,270	1,748,036	4,609,077	3,454,205	4,946,241	3,527,996

ACTION ITEMS FOR THE AP FOR BSAI SPECIFICATIONS: SSC CHANGE FROM BSAI PT HIGHLIGHTED IN YELLOW (AI COD ABC)

RECOMMEND TACS FOR 2024-2025:

Set cod and Sablefish TACs to consider State Waters fisheries

Bering Sea cod, AI cod

	2024		
BS cod	**ABC**	**GHL**	**TAC**
	167,952	20,199	147,753
	2025		
BS cod	**ABC**	**GHL**	**TAC**
	150,876	19,659	131,217
	2024		
AI cod	**ABC**	**GHL**	**TAC**
	12,431	4,351	8,080
	2025		
AI cod	**ABC**	**GHL**	**TAC**
	12,431	4,351	8,080

BS GHL = 12% of ABC +45 t to Area O jig
[note assume increase to 13% in 2025]
AI GHL = 35% of ABC

BS Sablefish, AI Sablefish

State waters GHL set at 5% of the combined BS and AI ABC in 2024 and 2025

Based on the 2023 GHL fishery most of the catch in 2024-2025 expected to occur in State waters adjacent to the federal BS subarea therefore AP may consider recommending that the BS TACs account for the reduction due to State waters GHLs

Set ABC reserves for flathead sole, rock sole and yellowfin sole

- ABC reserve:
  - Consider ABC surplus (ABC – TAC for all 3 species) and consider whether or not to set a discretionary buffer by reducing the available surplus in establishing an ABC reserve

PSC LIMITS AND APPORTIONMENTS: BBRKC, TANNER CRAB, SNOW CRAB, HERRING, HALIBUT TABLES 14-18

Table 14

Table 14–Final 2024 and 2025 Apportionment of Prohibited Species Catch Allowances to Non-Trawl Gear, the CDQ Program, Amendment 80, and the BSAI Trawl Limited Access Sectors

PSC species and area and zone[1]	Total PSC	Non-trawl PSC	CDQ PSQ reserve[2]	Trawl PSC remaining after CDQ PSQ	Amendment 80 sector[3,4]	BSAI trawl limited access sector[3,4]	BSAI PSC limits not allocated to Amendment 80[3]
Halibut mortality (mt) BSAI	3,166	710	315	n/a	1,396	745	
Herring (mt) BSAI	2,535	n/a	n/a	n/a	n/a	n/a	-
Red king crab (animals) Zone 1	97,000	n/a	10,379	86,621	43,293	26,489	16,839
C. opilio (animals) COBLZ	4,350,000	n/a	465,450	3,884,550	1,909,256	1,248,494	726,799
C. bairdi crab (animals) Zone 1	980,000	n/a	104,860	875,140	368,521	411,228	95,390
C. bairdi crab (animals) Zone 2	2,970,000	n/a	317,790	2,652,210	627,778	1,241,500	782,932

Halibut: Changes due to Amd 122 (Trawl PCTC-Table 16-17) and Amd 123 (A80 ABM)

PSC species and area and zone[1]	Total PSC	Non-trawl PSC	CDQ PSQ reserve[2]	Trawl PSC remaining after CDQ PSQ	Amendment 80 sector[3,4]	BSAI trawl limited access sector[3,4]	BSAI PSC limits not allocated to Amendment 80[3]
Halibut mortality (mt) BSAI	3,166	710	315	n/a	1,396	745	

BSAI trawl limited access sector fisheries	Prohibited species and area[1]				
	Halibut mortality (mt) BSAI	Red king crab (animals) Zone 1	*C. opilio* (animals) COBLZ	*C. bairdi* (animals)	
				Zone 1	Zone 2
Yellowfin sole	265	23,337	1,192,179	346,228	1,185,500
Rock sole/flathead sole/other flatfish[2]	-	-	-	-	-
Greenland turbot/arrowtooth flounder/Kamchatka flounder/sablefish	-	-	-	-	-
~~Rockfish, April 15-December 31~~	5	-	1,006	-	1,000
Total Pacific cod[3]	300	2,955	50,281	60,000	50,000
AFA CP Pacific cod	6	278	4,726	5,640	4,700
PCTC Program Pacific cod, A and B season	244	1,653	28,130	33,567	27,973
Trawl CV Pacific cod, C season	15	134	2,278	2,718	2,265
PCTC Program unallocated reduction	35	890	15,147	18,075	15,062
Pollock/Atka mackerel/other species[4]	175	197	5,028	5,000	5,000
Total BSAI trawl limited access sector PSC	745	26,489	1,248,494	411,228	1,241,500

Herring PSC limit

Herring PSC limit = 1% total estimated Bering Sea herring biomass

Spawning area	2016	2017	2018	2019	2020	2021	2022	2023	2024
Norton Sound	48,794	31,007	31,007	31,007	31,007	31,007	31,007	31,007	31,007
Cape Romanzof	4,366	4,678	4,678	3,300	3,300	3,300	3,300	3,300	3,300
Nunivak Island	140	3,540	3,540	4,464	4,464	4,464	4,464	4,464	4,464
Nelson Island	27,422	4,785	4,785	4,916	4,916	4,916	4,916	4,916	4,917
Cape Avinof	9,456	3,126	3,126	1,890	1,890	1,890	1,890	1,890	1,890
Goodnews Bay	8,263	4,724	4,724	4,724	4,724	4,724	4,724	4,724	4,724
Security Cove	8,540	4,781	4,781	4,762	4,762	4,762	4,762	4,762	4,762
Togiak	147,185	142,453	124,062	197,355	195,793	214,768	324,350	286,853	195,984
Port Moller/ Port Heiden	8,932	2,184	2,268	2,291	2,350	2,449	2,463	2,463	2,463
Total	263,098	201,278	182,971	254,709	253,207	272,281	381,876	344,379	253,511

Change in methodology in 2023:

- No 2023 directed fishery
  - lack of fishery-dependent age and weight data to inform the assessment model.

Biomass estimate based on aerial survey data(only)

Therefore PSC limit in 2024 = 2535 t
(compared to 3444 t in 2023)

Cape Avinof	9,456	3,126	3,126	1,890	1,890	1,890	1,890	1,890	1,890
Goodnews Bay	8,263	4,724	4,724	4,724	4,724	4,724	4,724	4,724	4,724
Security Cove	8,540	4,781	4,781	4,762	4,762	4,762	4,762	4,762	4,762
Togiak	147,185	142,453	124,062	197,355	195,793	214,768	324,350	286,853	195,984
Port Moller/ Port Heiden	8,932	2,184	2,268	2,291	2,350	2,449	2,463	2,463	2,463
Total	263,098	201,278	182,971	254,709	253,207	272,281	381,876	344,379	253,511

Crab PSC Table 14

- BBRKC
- Tanner crab
- Snow crab

PSC species and area and zone[1]	Total PSC
Red king crab (animals) Zone 1	97,000
C. opilio (animals) COBLZ	4,350,000
C. bairdi crab (animals) Zone 1	980,000
C. bairdi crab (animals) Zone 2	2,970,000

Table 15:
Fishery Allowances for Herring (can recommend modification) Zone 1 RKC PSC limit; RKCSS PSC limit in 2024

Table 15–Final 2024 and 2025 Herring and Red King Crab Savings Subarea Prohibited Species Catch Allowances for all Trawl Sectors

Fishery Categories	Herring (mt) BSAI	Red king crab (animals) Zone 1
Yellowfin sole	147	n/a
Rock sole/flathead sole/Alaska plaice/other flatfish [1]	74	n/a
Greenland turbot/arrowtooth flounder/Kamchatka flounder/sablefish	8	n/a
Rockfish	8	n/a
Pacific cod	13	n/a
Midwater trawl pollock	2,256	n/a
Pollock/Atka mackerel/other species [2,3]	30	n/a
Red king crab savings subarea non-pelagic trawl gear [4]	n/a	24,250
Total trawl PSC	2,535	97,000

Halibut Discard Mortality Rates (DMRs)- Table 19

Table 18–2024 and 2025 Pacific Halibut Discard Mortality Rates (DMR) for the BSAI

Gear	Sector	Halibut discard mortality rate (percent)
Pelagic trawl	All	100
Non-pelagic trawl	Mothership and catcher/processor	85
Non-pelagic trawl	Catcher vessel	63
Hook-and-line	Catcher/processor	7
Hook-and-line	Catcher vessel	7
Pot	All	26

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.

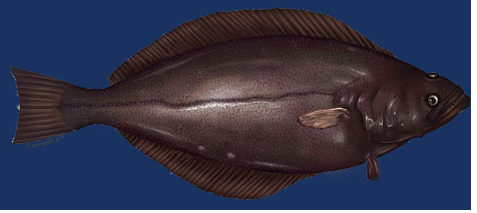
BSAI TEAM POLLOCK RECOMMENDATIONS

- **EBS Pollock**
  - The Team recommended continuing to evaluate projection bias due to selectivity assumptions, and the examination of new methods that may reduce that bias.
  - The Team recommended that the authors clearly state where MLE estimates are being used and where MCMC estimates are being used.
  - The Team recommended using posterior distributions from the MCMC to determine probabilities in the decision table and expanding the table to at least include the recommended ABC.
- **EBS Multi-species Model**
  - Kirstin intends to communicate with authors earlier in next year's assessment cycle to help facilitate risk assessment, which is further recommended by the Team.

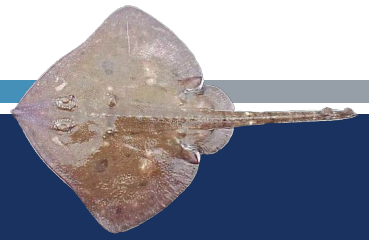
BSAI TEAM
PACIFIC COD RECOMMENDATIONS

- **Pacific cod - EBS**
  - The Team recommended expanding the discussion of uncertainty around M in the risk table. For example, the interplay between M and q, and what may elevate the risk to a level 2 categorization.
- **Pacific cod - Aleutian Islands**
  - The Team recommended that authors refrain from reusing model names previously reviewed and provide unique model names for any new model configurations up for review by the Team.
  - The Team recommended that the authors investigate length-weight data and look for changes over time.
  - The Team also recommended that a sensitivity analysis on M similar to what was provided in the eastern Bering sea Pacific cod assessment be presented given the high uncertainty in that value.
  - The Team recommended that the authors conduct a sensitivity analysis and provide the probability of being under $B_{20\%}$ given the three projection scenarios similar to what was provided in the Bering Sea Pacific cod stock assessment.

BSAI TEAM FLATFISH RECOMMENDATIONS



- **Yellowfin sole**
  - The Team recommended that the author conduct a model sensitivity analysis to evaluate the current approach used for natural mortality and the effect it has on model performance and results.
- **Greenland Turbot**
  - The Team was concerned about the status of Greenland turbot and recommended an operational full assessment due to concerns with continued long term declines in survey indices as well as the inability of the model to fit the indices.



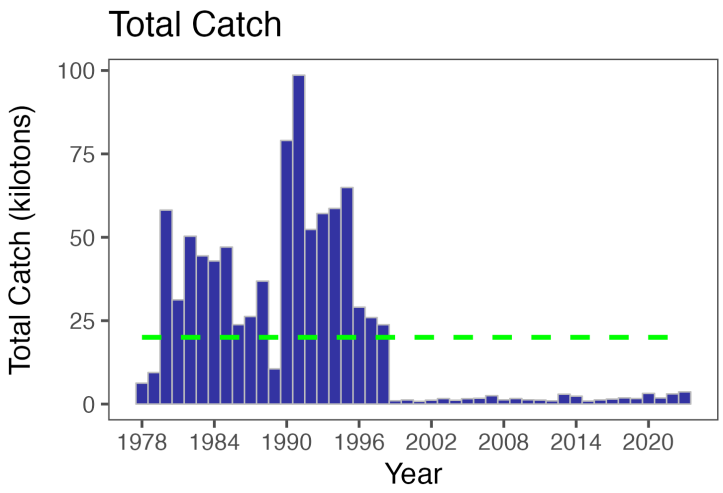
BSAI TEAM
OTHER FISHES RECOMMENDATIONS

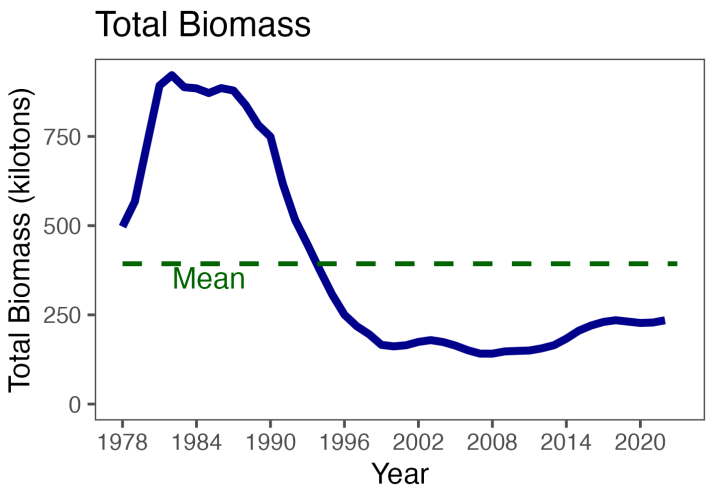
- **Skates**
  - The Team recommends the authors examine using a catchability that is tuned to temperature.
  - The Team applauded the authors' approach to not change the methodology for this first assessment cycle after the change in authorship, and gave the authors leeway to explore the data and assessment methodology in more detail to come up with the improvements that should be incorporated into the model for the next assessment cycle. The Team recommended this approach be used as the model for how authorship transfers be conducted going forward.
- **Octopus**
  - The Team recommends that the next assessment contain a link to the original consumption methodology employed in the 2012 analysis.

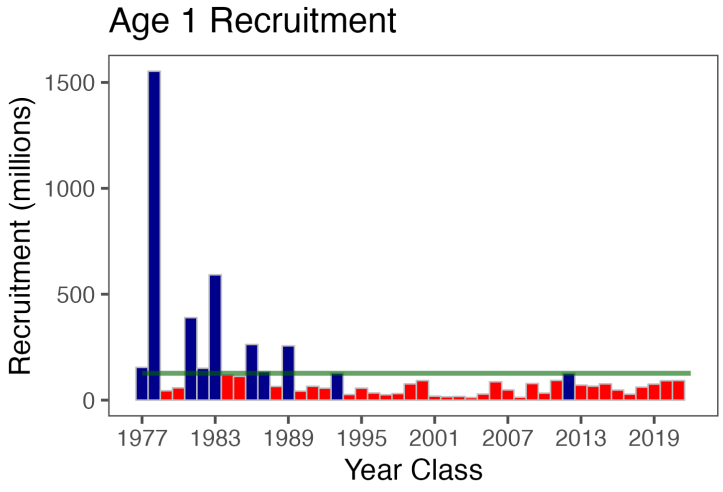
BSAI TEAM ECOSYSTEM COMPONENTS

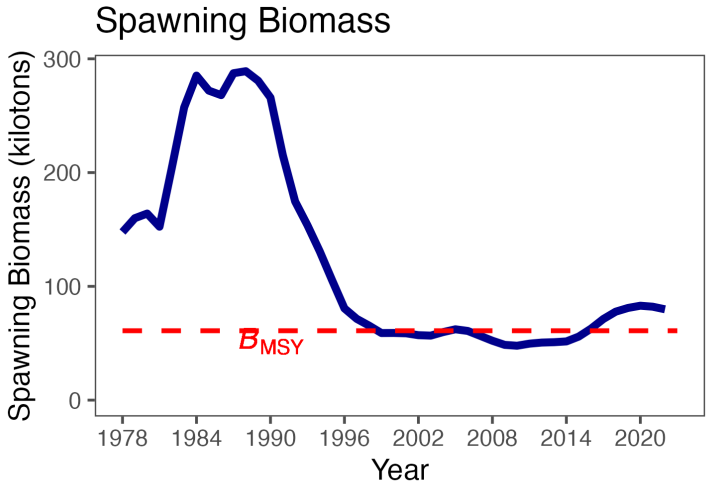
- **Forage Species**
  - The Team recommended providing some indication on future plots of reference levels across years to show consistent comparative information across years and trends.
  - The Team recommended working in collaboration with the ESR team and to consider how to contribute forage information to other initiatives such as ESP and ESR as time allows including the consideration of what is the best index of forage and how and where it can be reported on an annual basis.

Aleutian Islands pollock



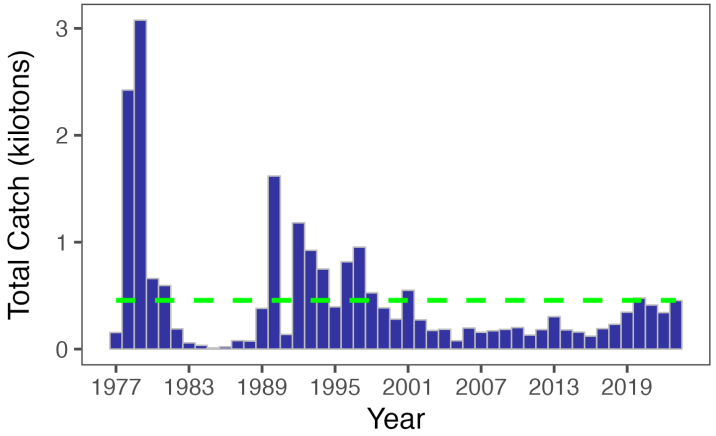




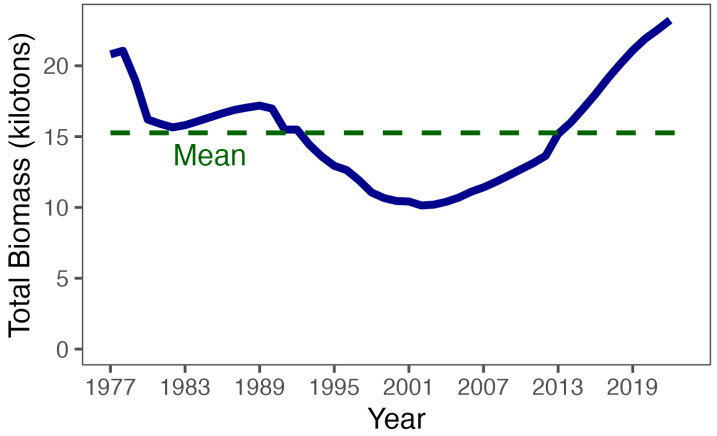


Blackspotted/Rougheye Rockfish

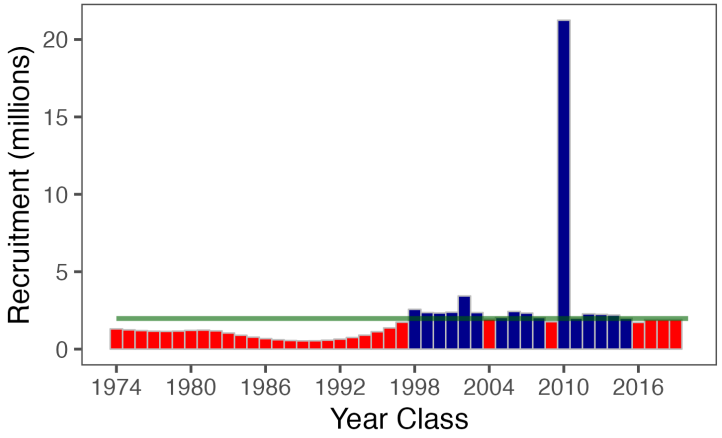
Total Catch



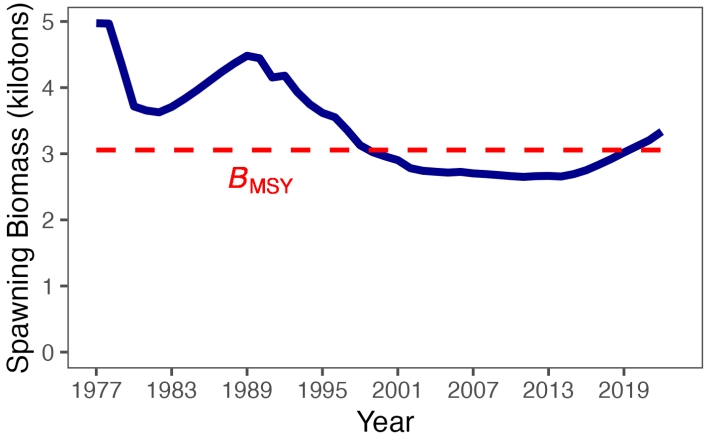
Total Biomass



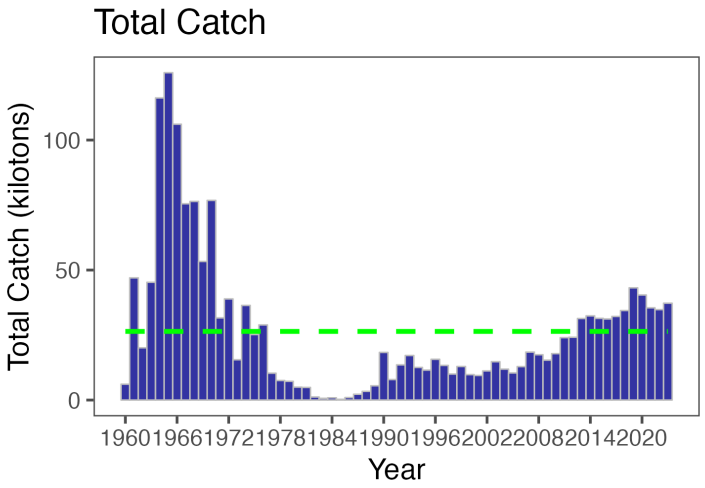
Age 3 Recruitment

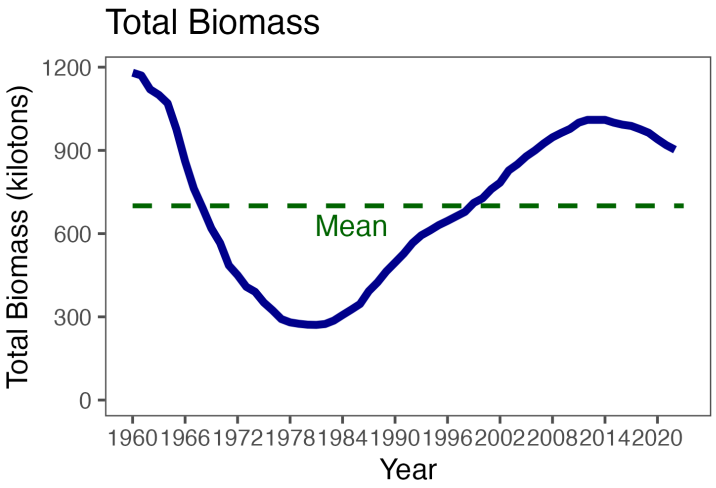


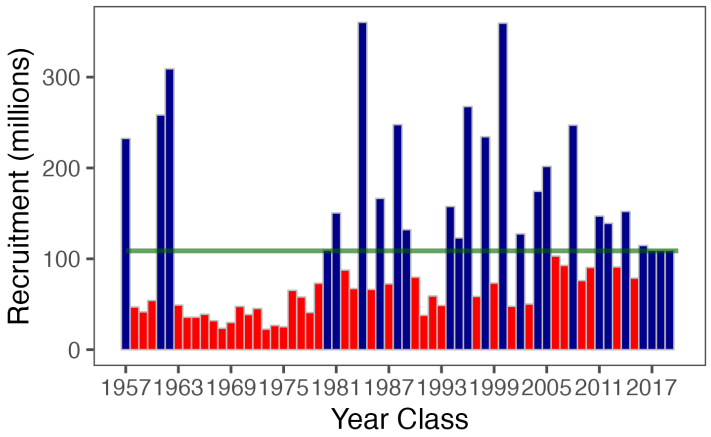
Spawning Biomass

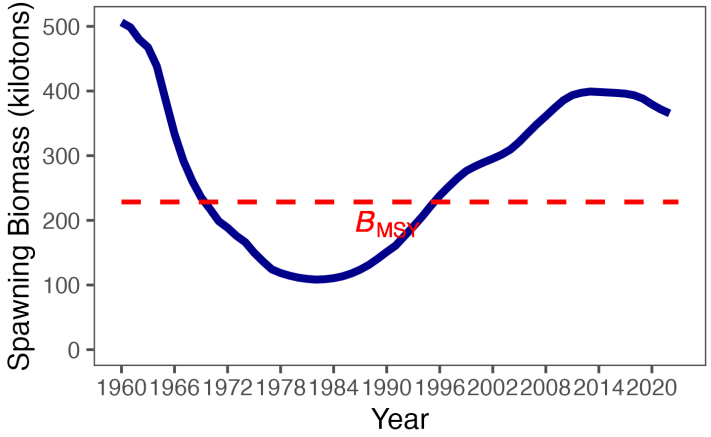


Pacific ocean perch



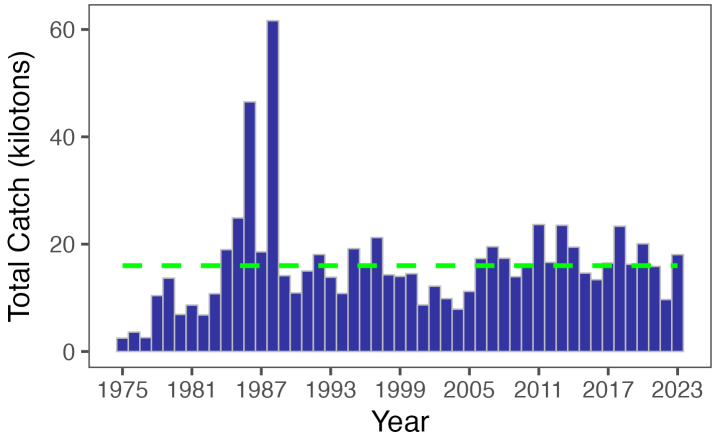




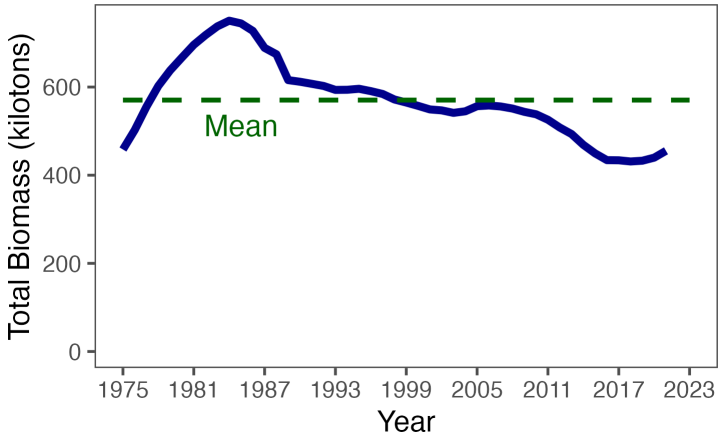


Alaska Plaice

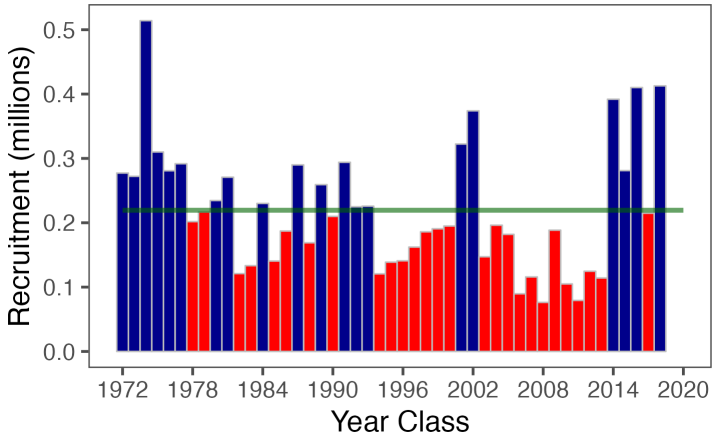
Total Catch



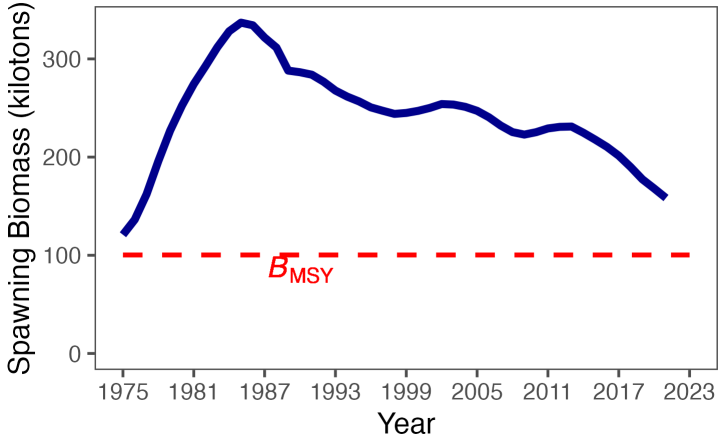
Total Biomass



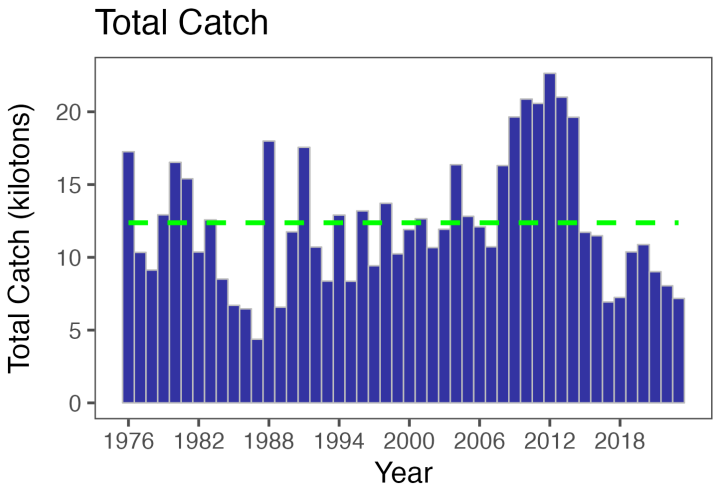
Age 3 Recruitment

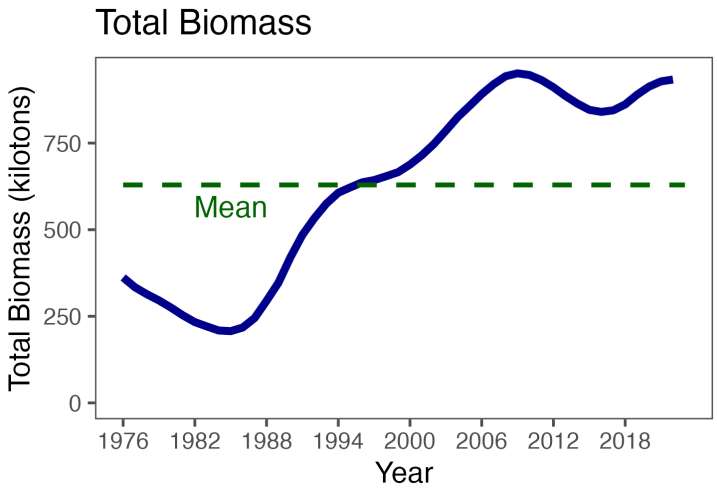


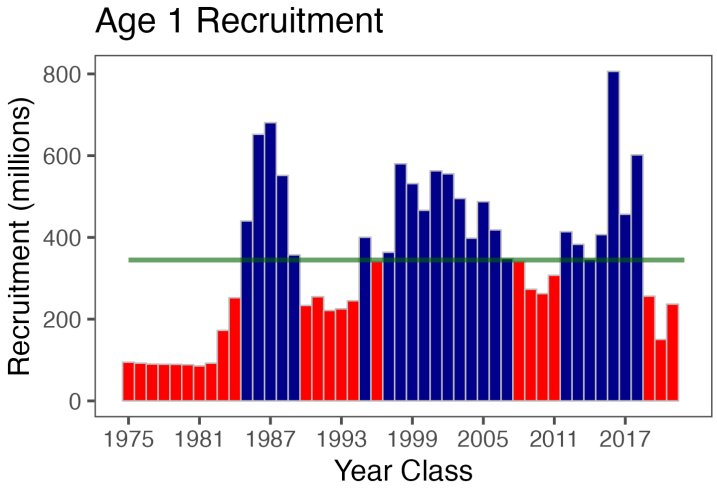
Spawning Biomass

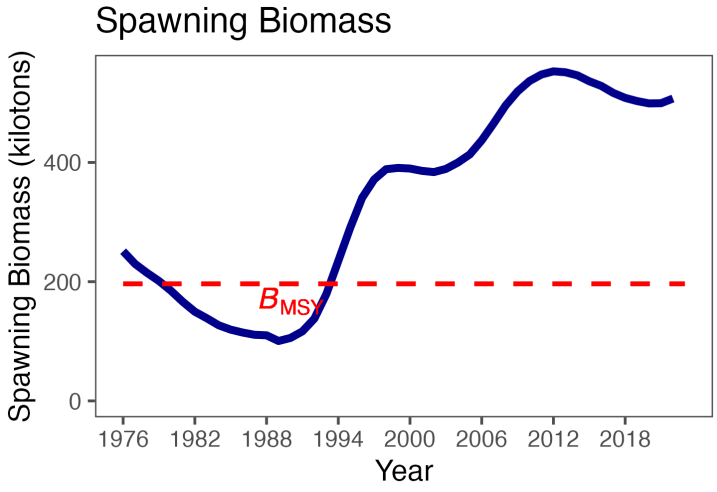


Arrowtooth Flounder

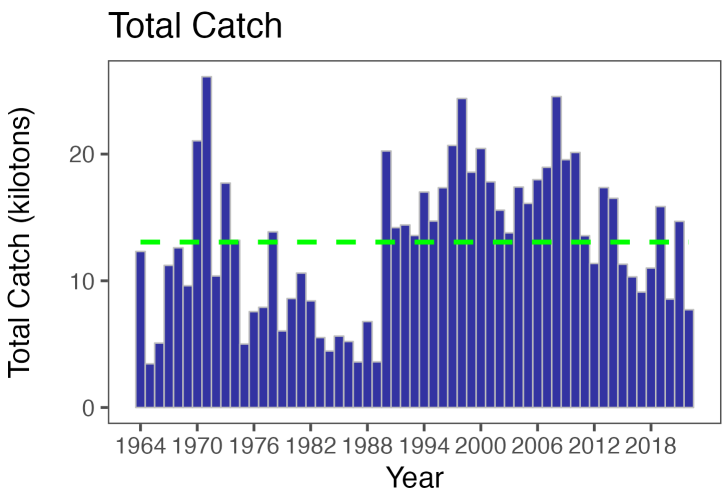


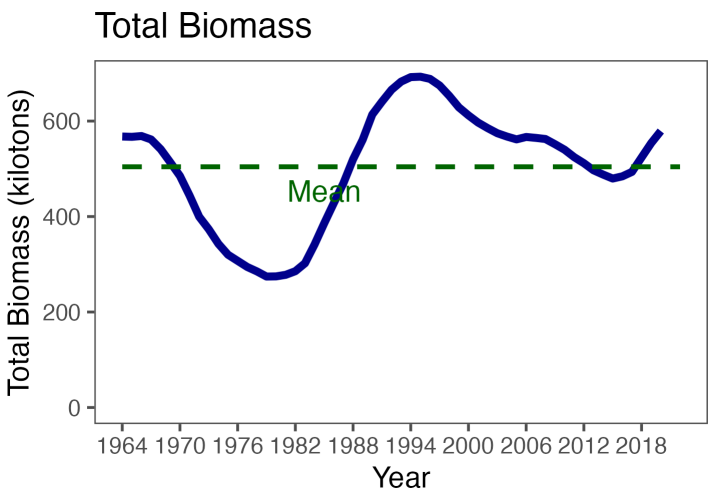


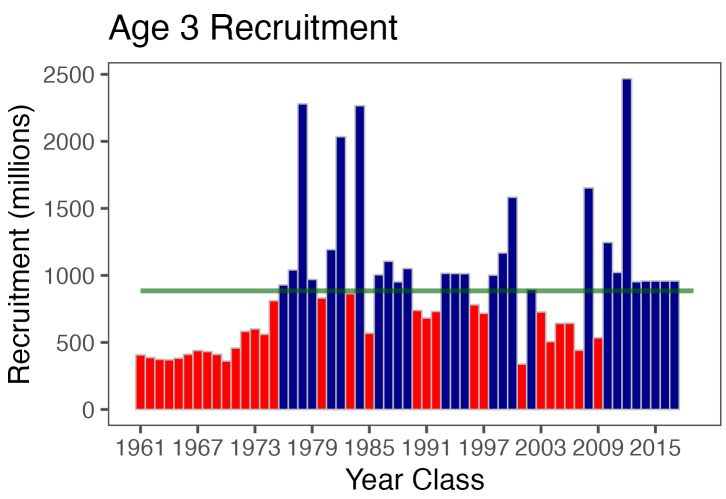


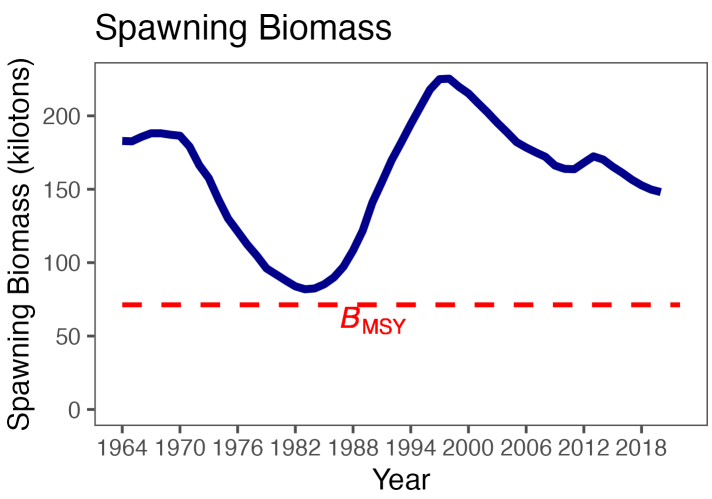


Flathead sole



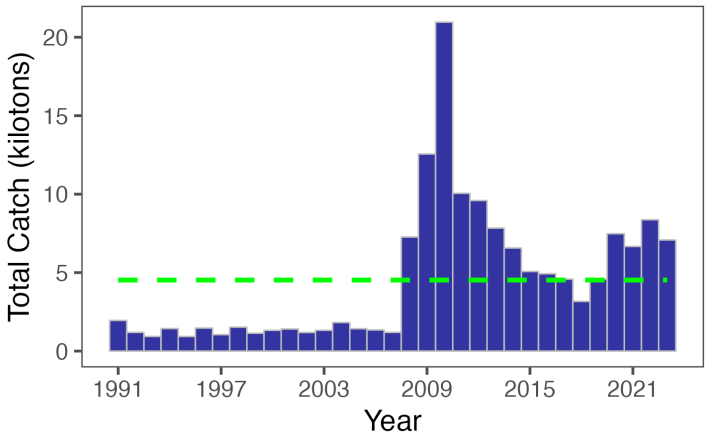




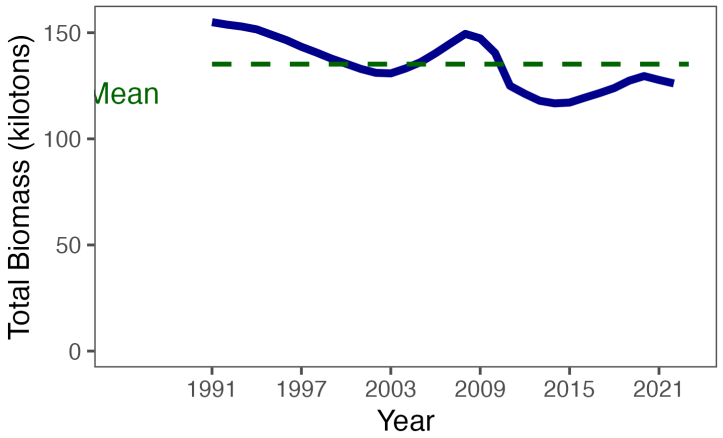


Kamchatka flounder

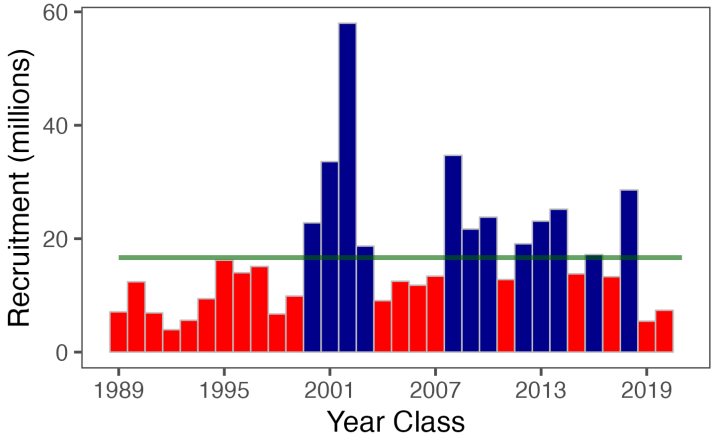
Total Catch



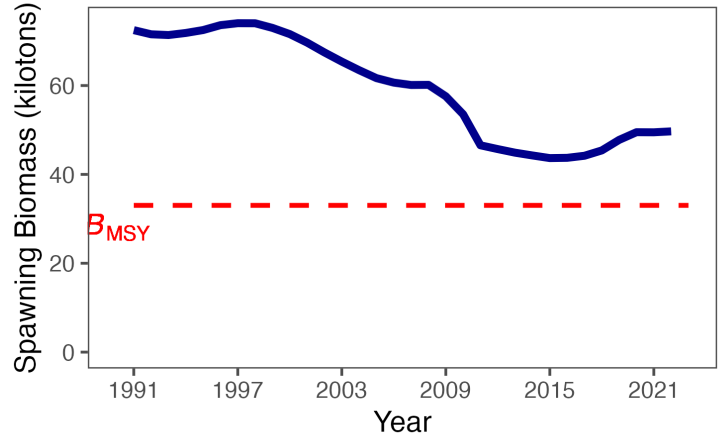
Total Biomass



Age 2 Recruitment

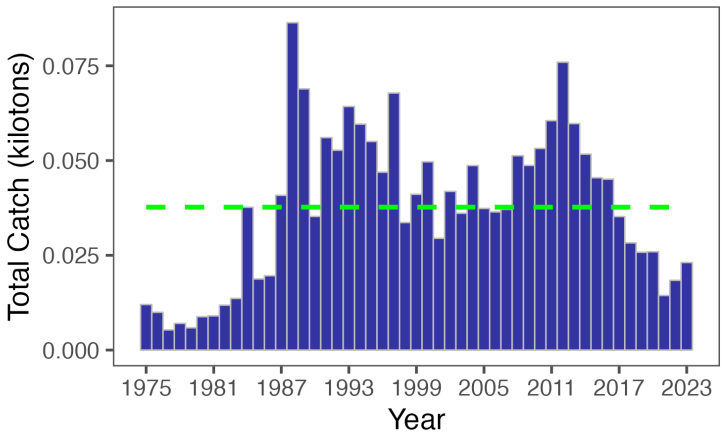


Spawning Biomass

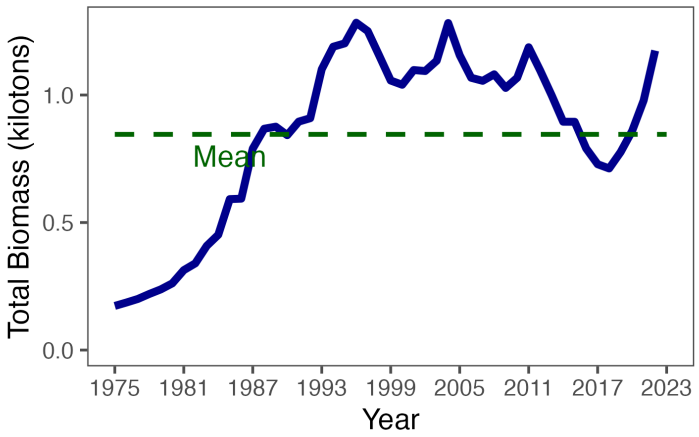


Northern rocksole

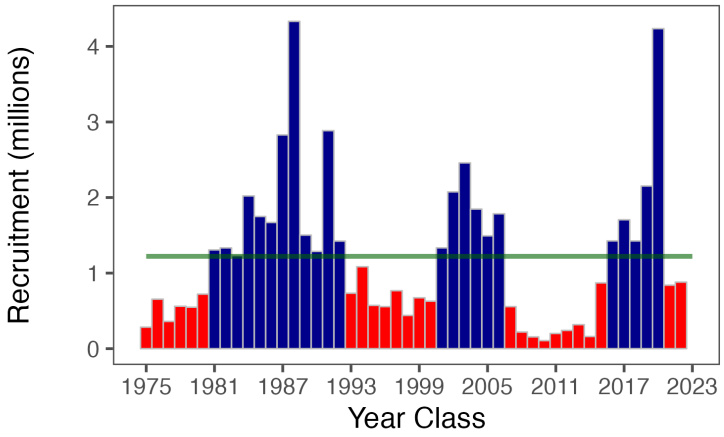
Total Catch



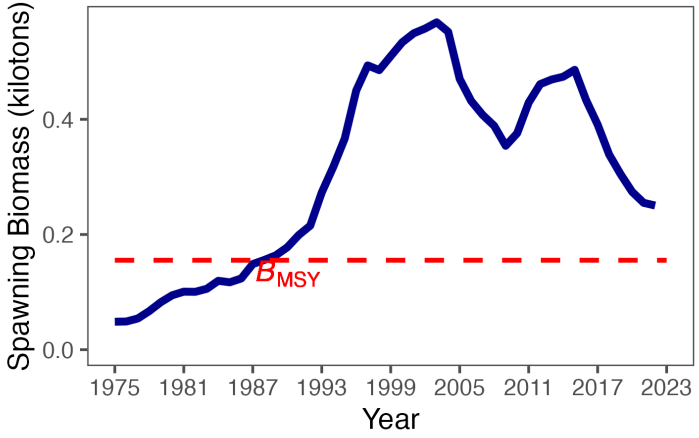
Total Biomass



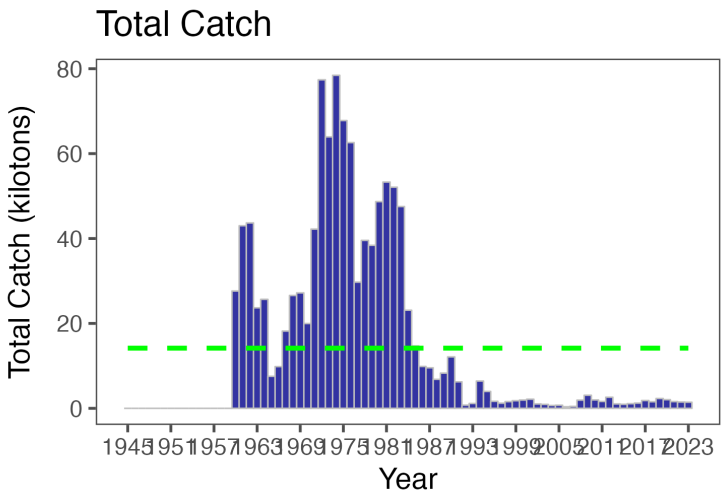
Age 0 Recruitment

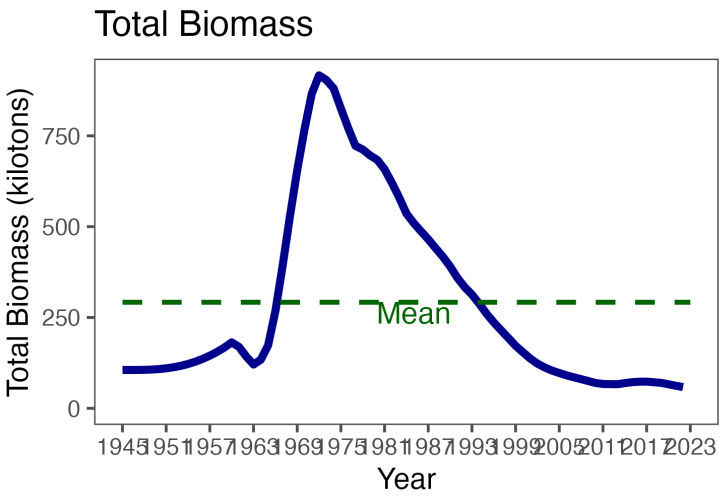


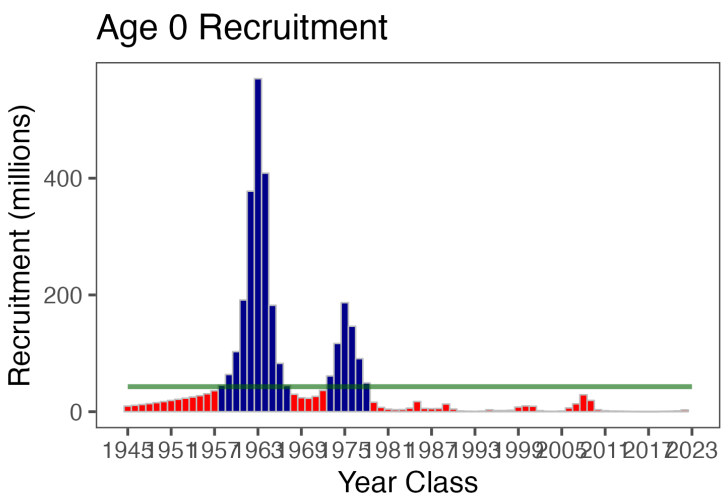
Spawning Biomass

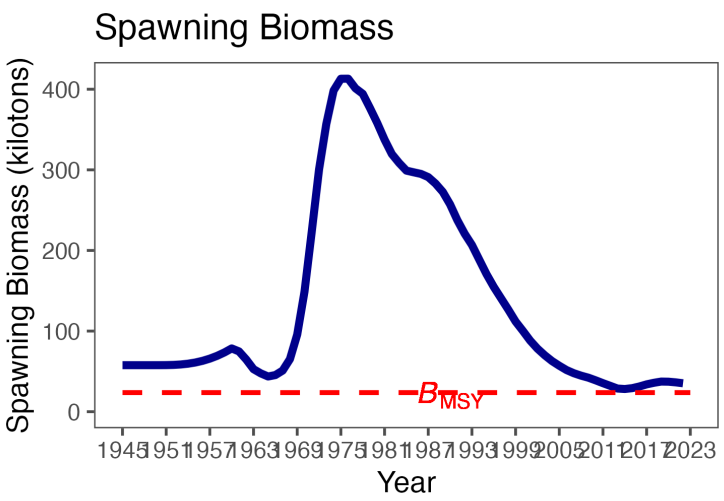


Greenland Turbot









Atka Mackerel