

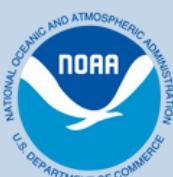
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FISHERIES**



# Pacific Ocean Perch GOA Plan Team

Nov 2023

Maia Sosa Kapur  
Pete Hulson  
Ben Williams  
Bridget Ferriss



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# Stock Overview

GOA  
Pacific Ocean Perch  
(*Sebastes alutus*)

**Tier**

3a

**Area**

GOA (mostly central & western)

**Status**

Not overfished/not overfishing

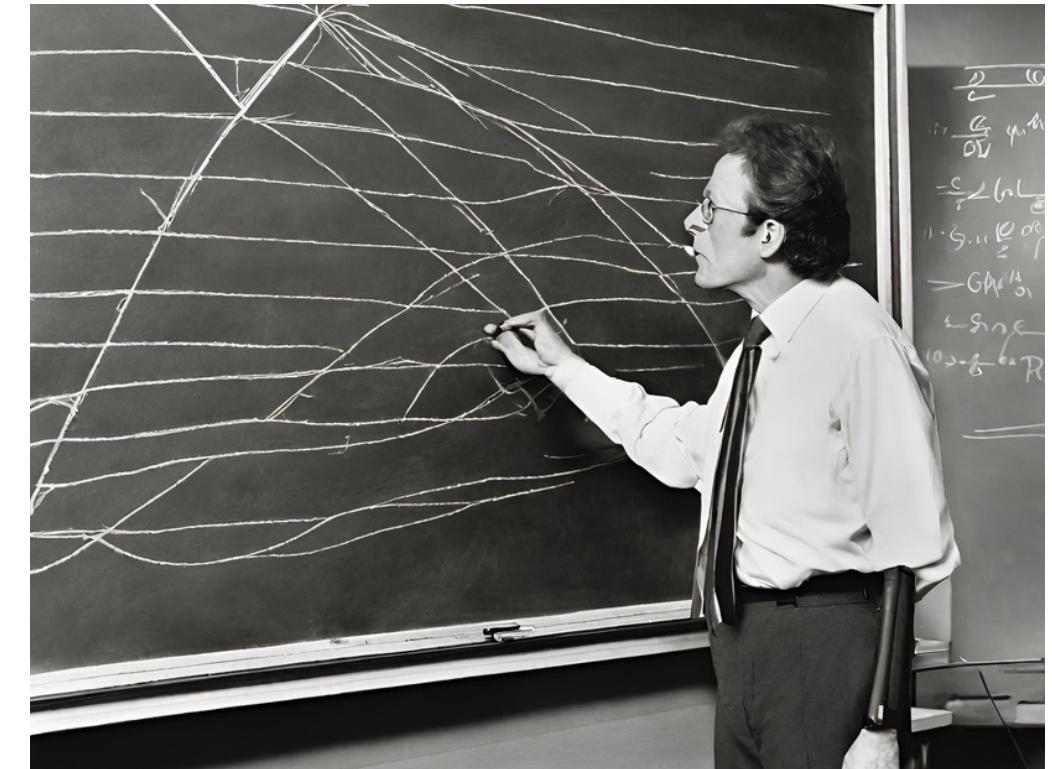
**Assessment  
Type**

Operational Update



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# SSC/CIE Comments



**Explore Selex**

**Explore M**

**Think about...**

Compositional data weights  
Design vs. Model-Based  
Surveys  
Weight-at-age inputs

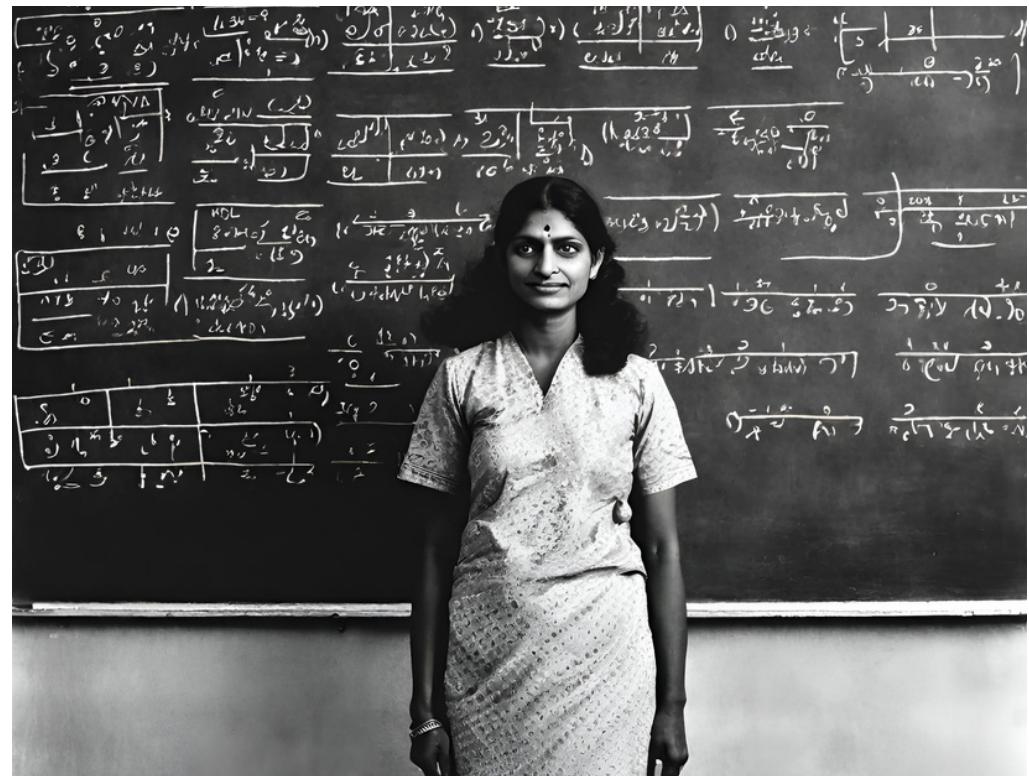


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# highlighting reproducibility



afscassess package(s)



standalone  
2023\_analysis.R

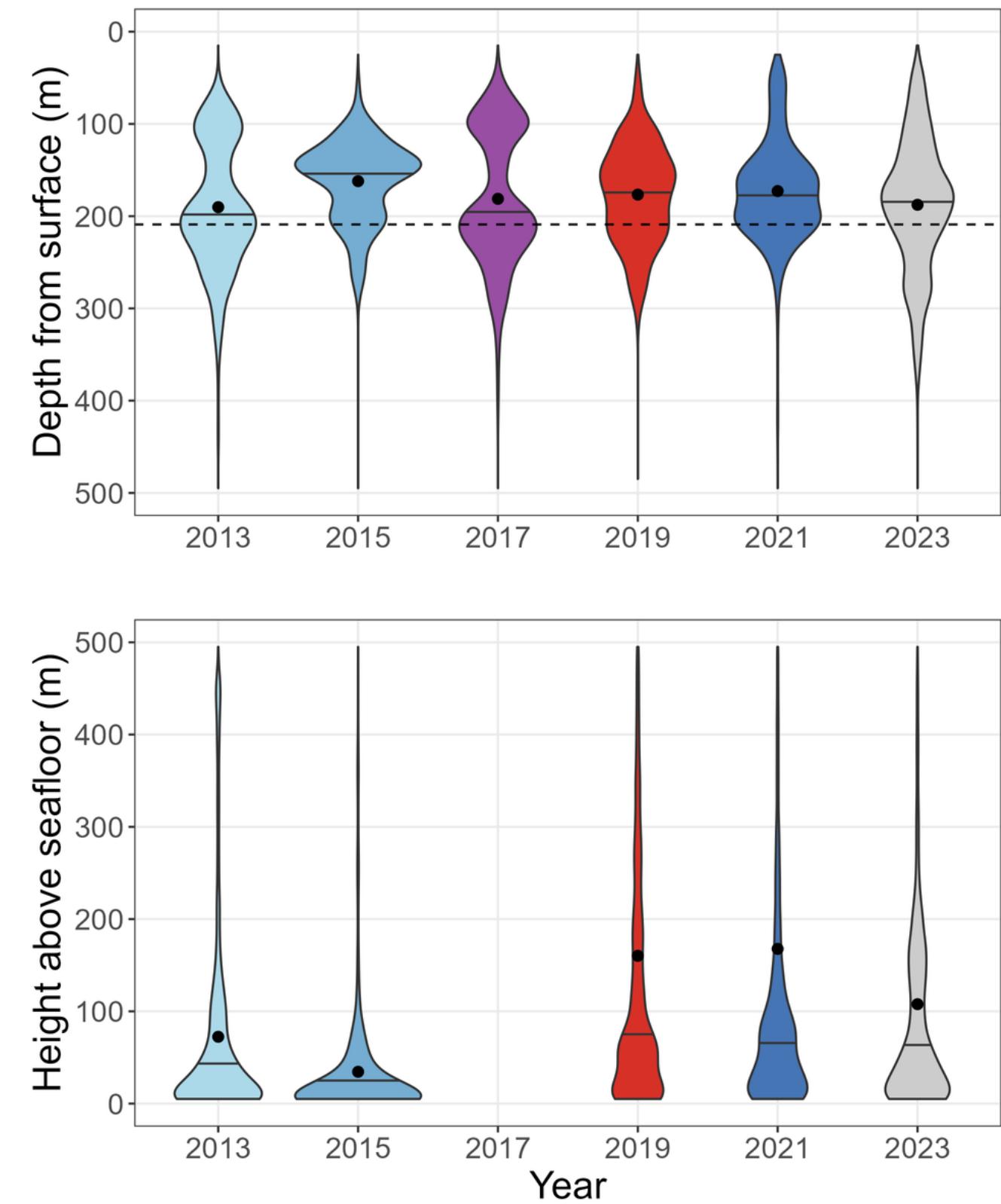
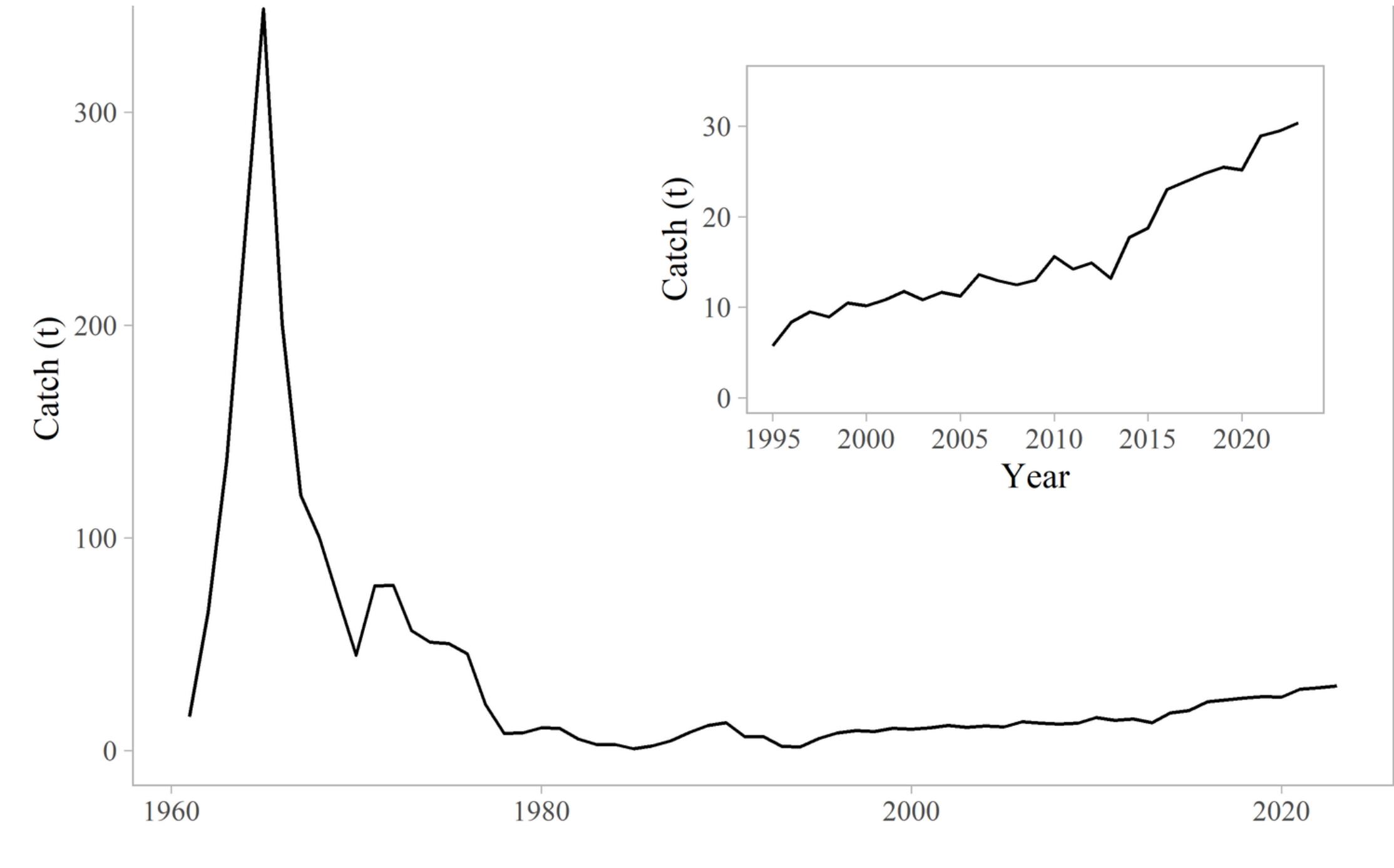


templated .Rmd

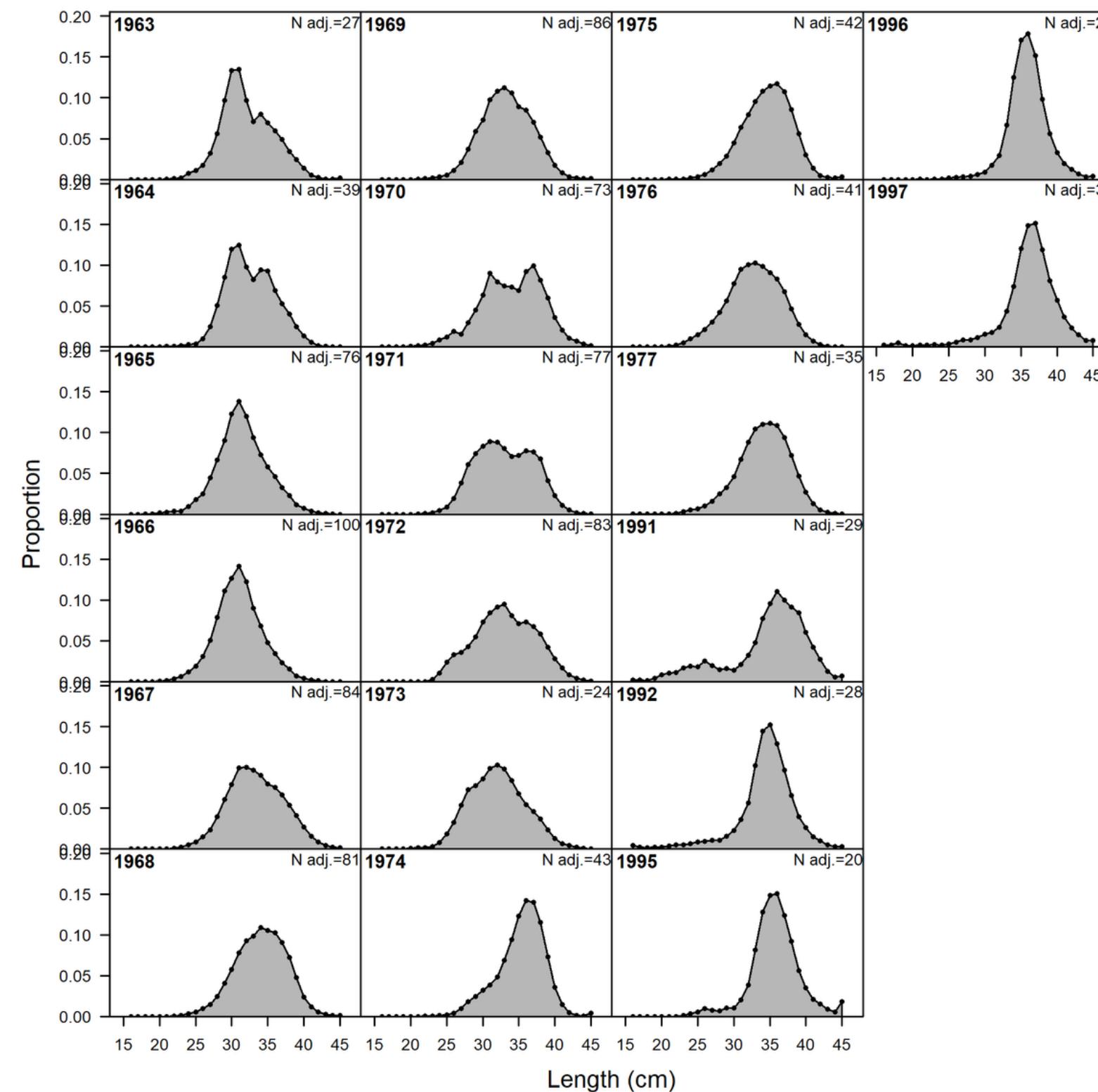
# Data Summary

Source	Data	Years
U.S. trawl fishery	Catch biomass	1977- <a href="#">2023</a>
	Catch length composition	1963-1977, 1991-1997
	Catch age composition	1990, 1998-2002, 2004, 2005, 2006, 2008, 2010, 2012, 2014, 2016, 2018, 2020, <a href="#">2022</a>
GOA bottom trawl survey	Survey biomass (design-based)	1990-1999 (triennial), 2001- <a href="#">2023</a> (biennial)
	Survey age composition	1990, 1993, 1996, 1999, 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017, 2019, <a href="#">2021</a>

# Catches

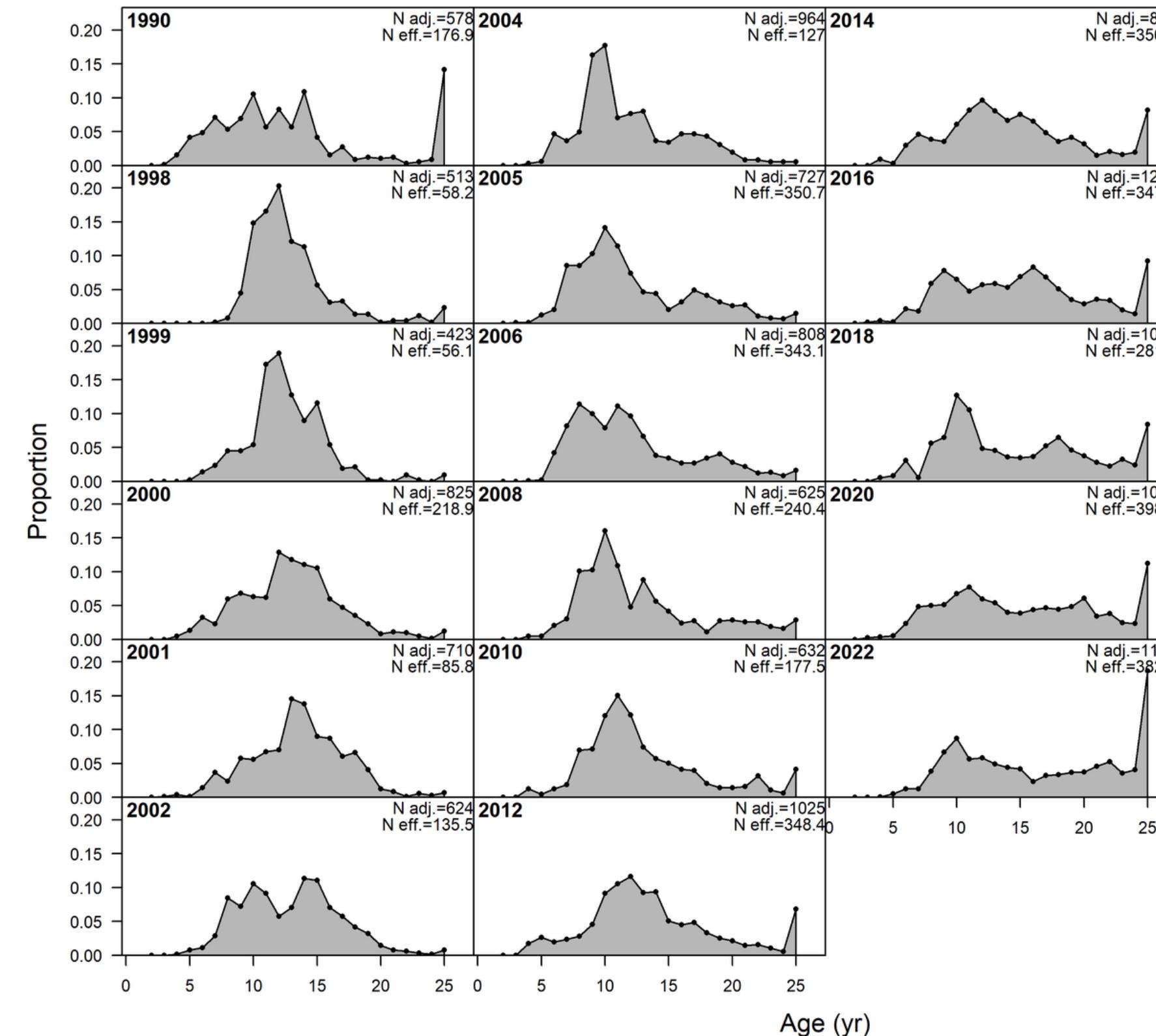


# Fishery Length Composition Data

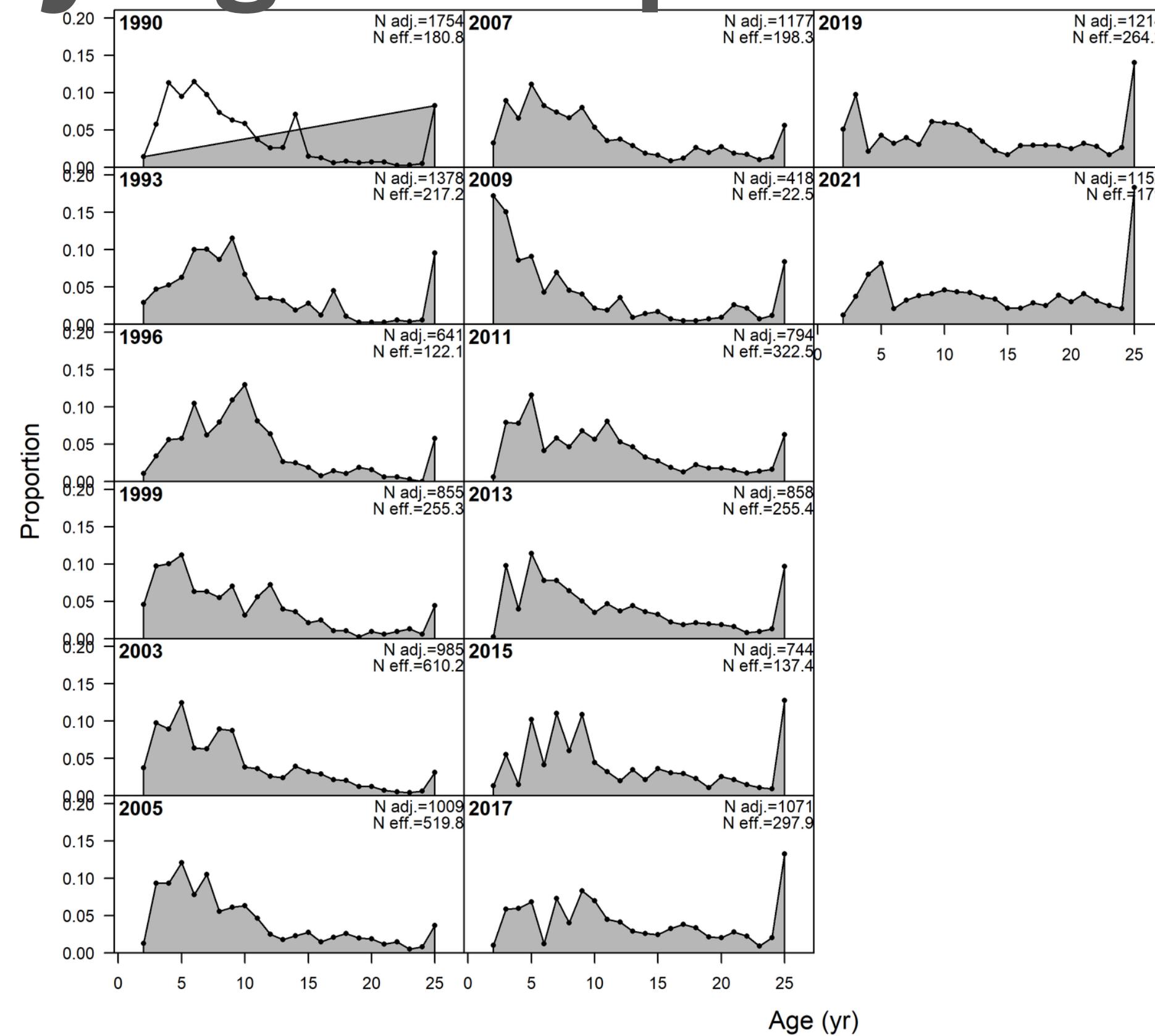


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# Fishery Age Composition Data

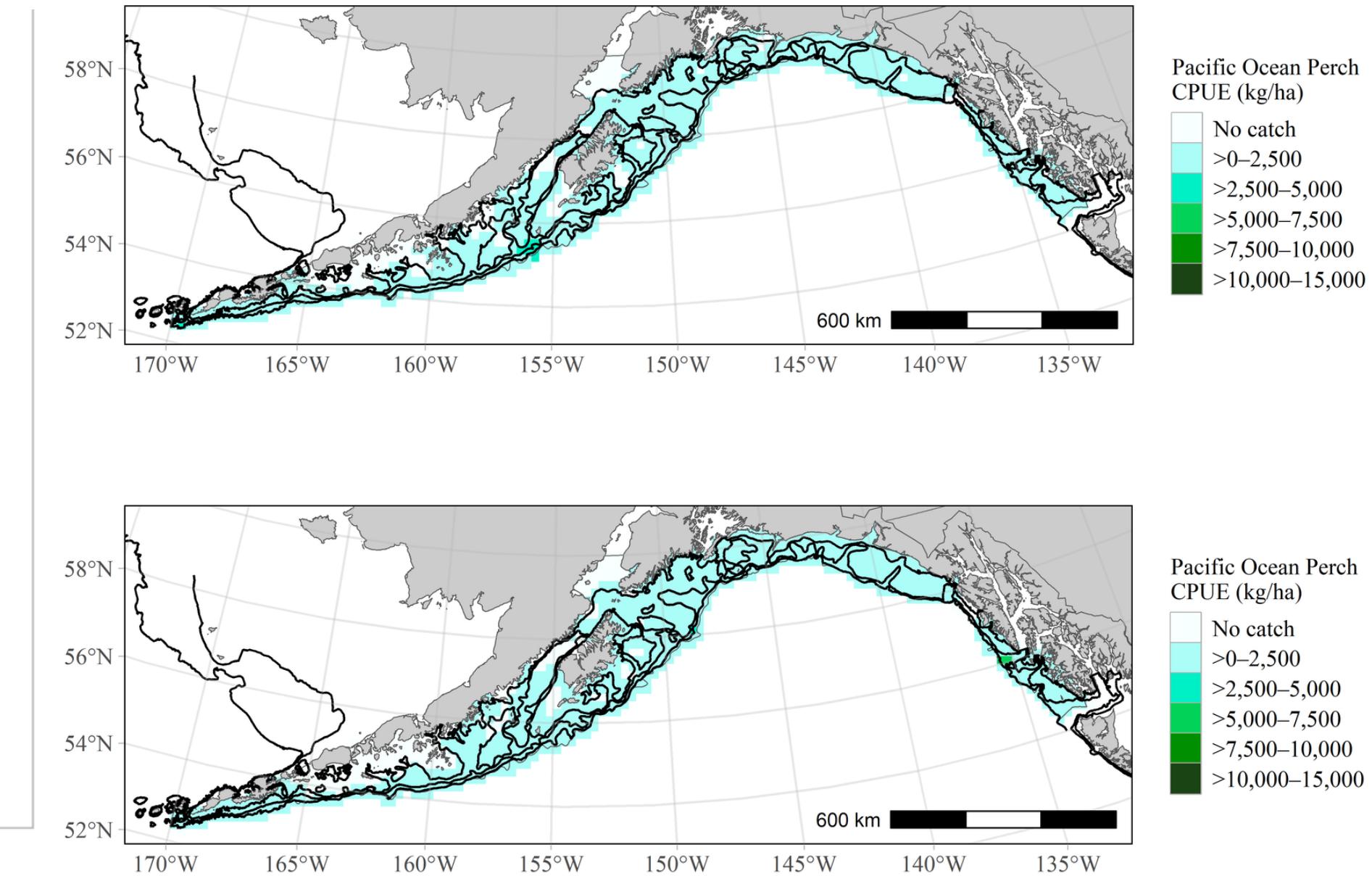
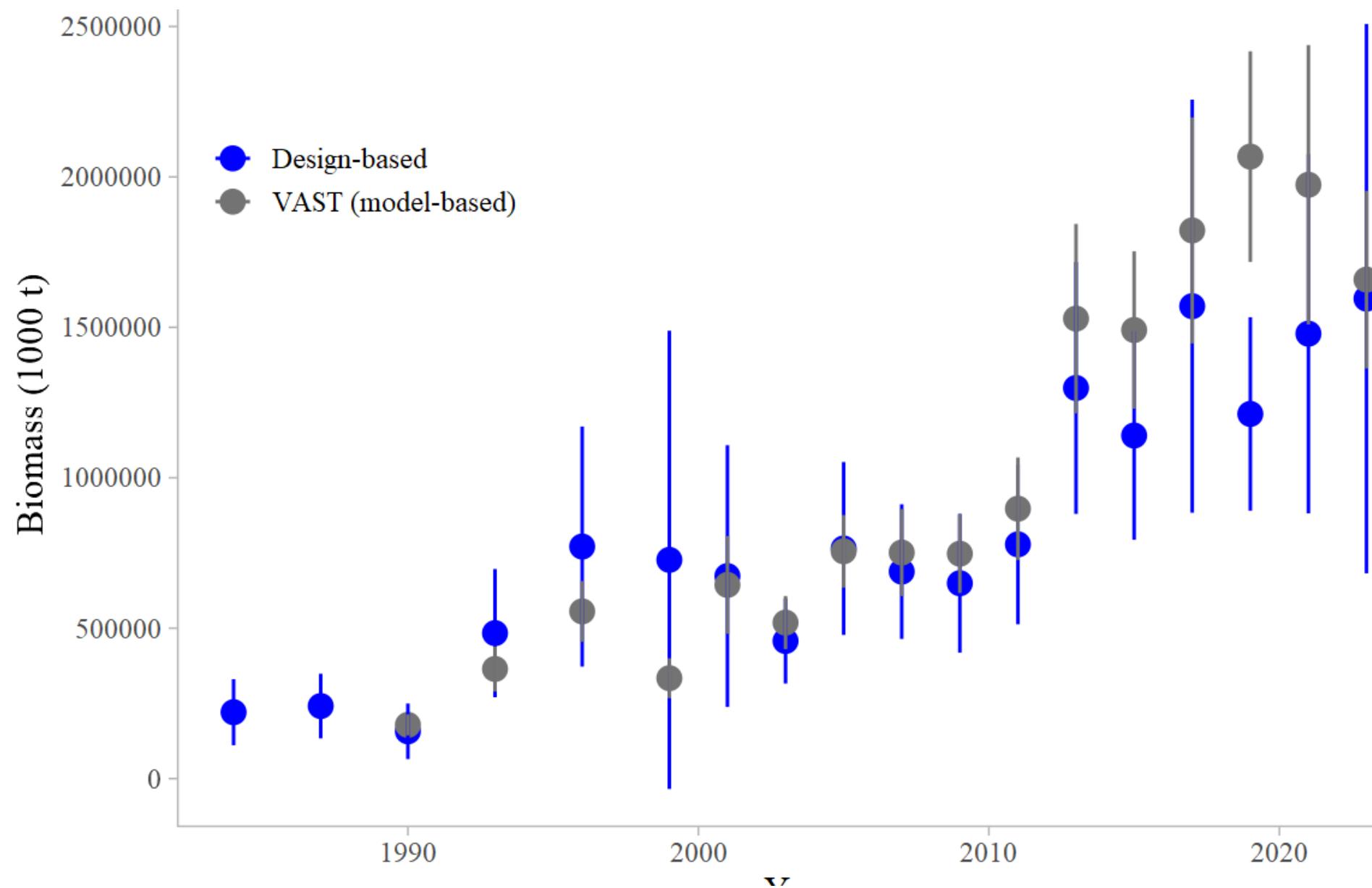


# Survey Age Composition Data



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# GOA Trawl Survey Data



# Model Summary

No changes  
from 2021  
(Hulson et. al)

## Software

Bespoke ADMB Model

Single-sex, age  
structured (29+)

Logistic maturity, fit to  
data

Time blocked fishery  
selex

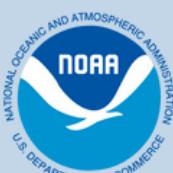
## General

Operational update

Size-age matrices  
updated

## Approach

Time on SS explorations



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# Model Results

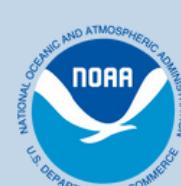
Model fits

Parameters & Derived Quants

Retrospectives, sensitivities

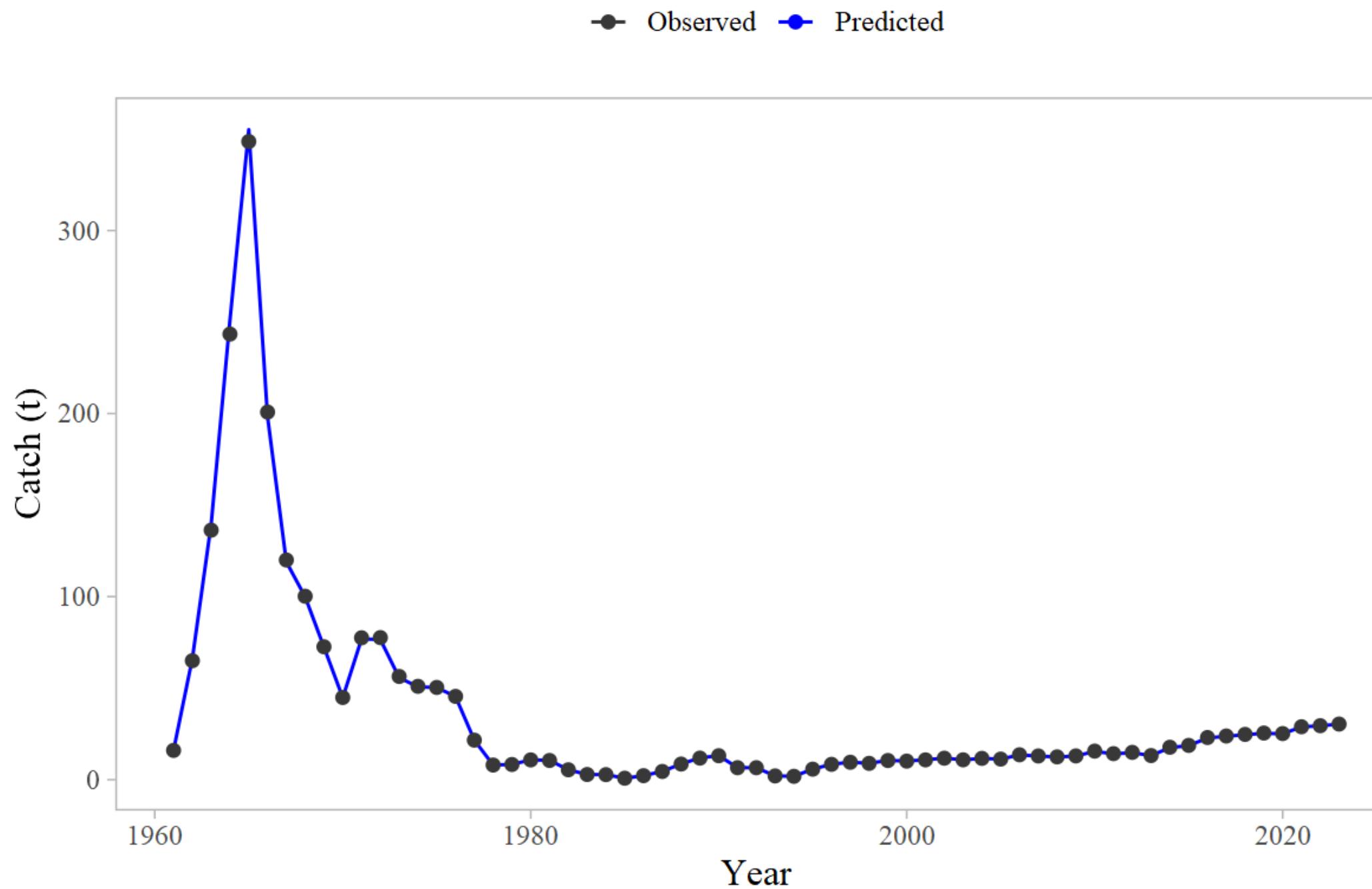
Projections &  
Risk Table

Gaps/Research

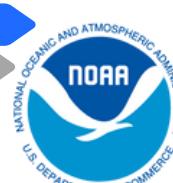
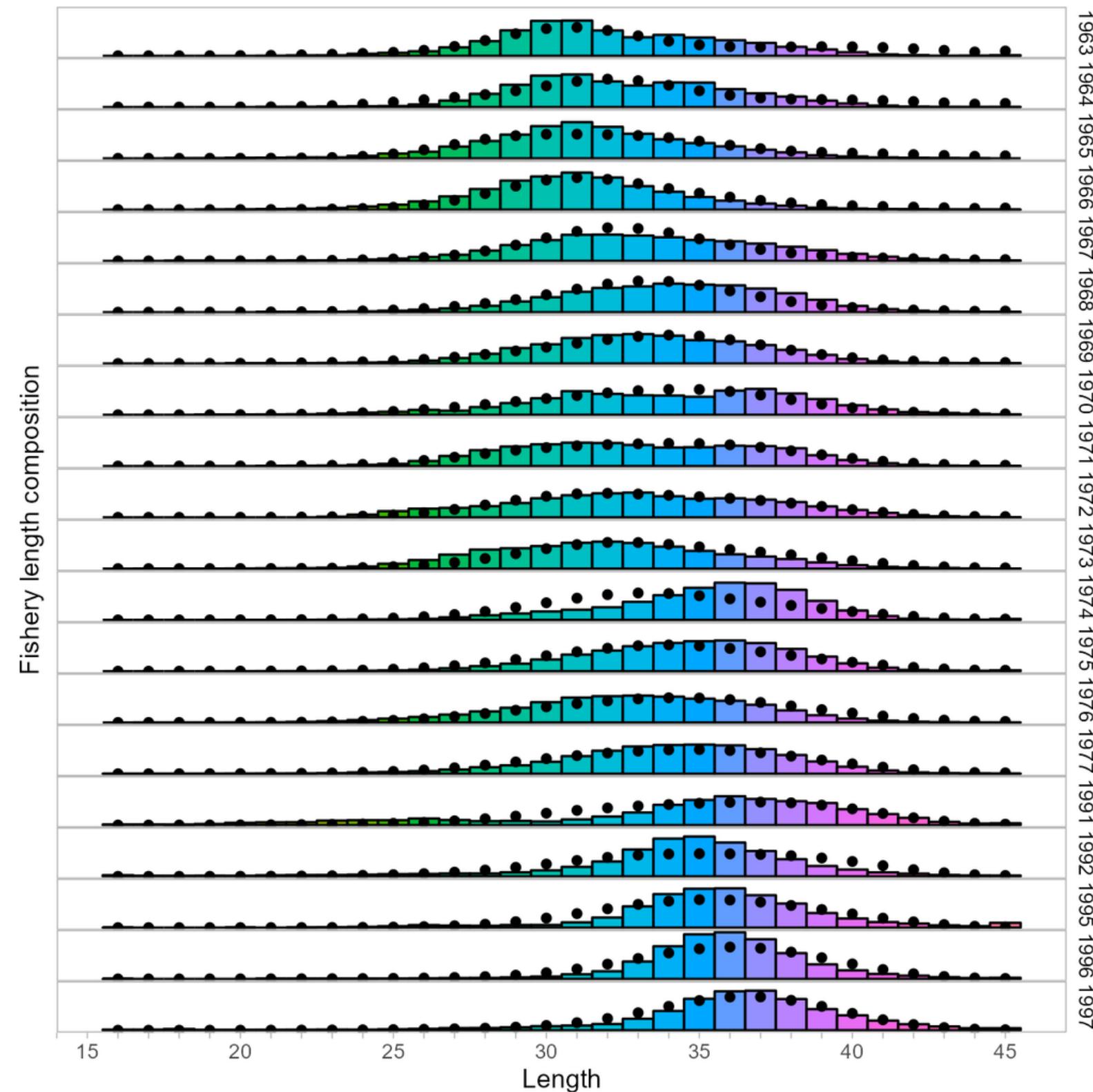


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# Model Fit: Catches

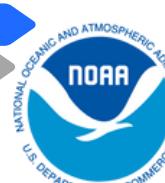
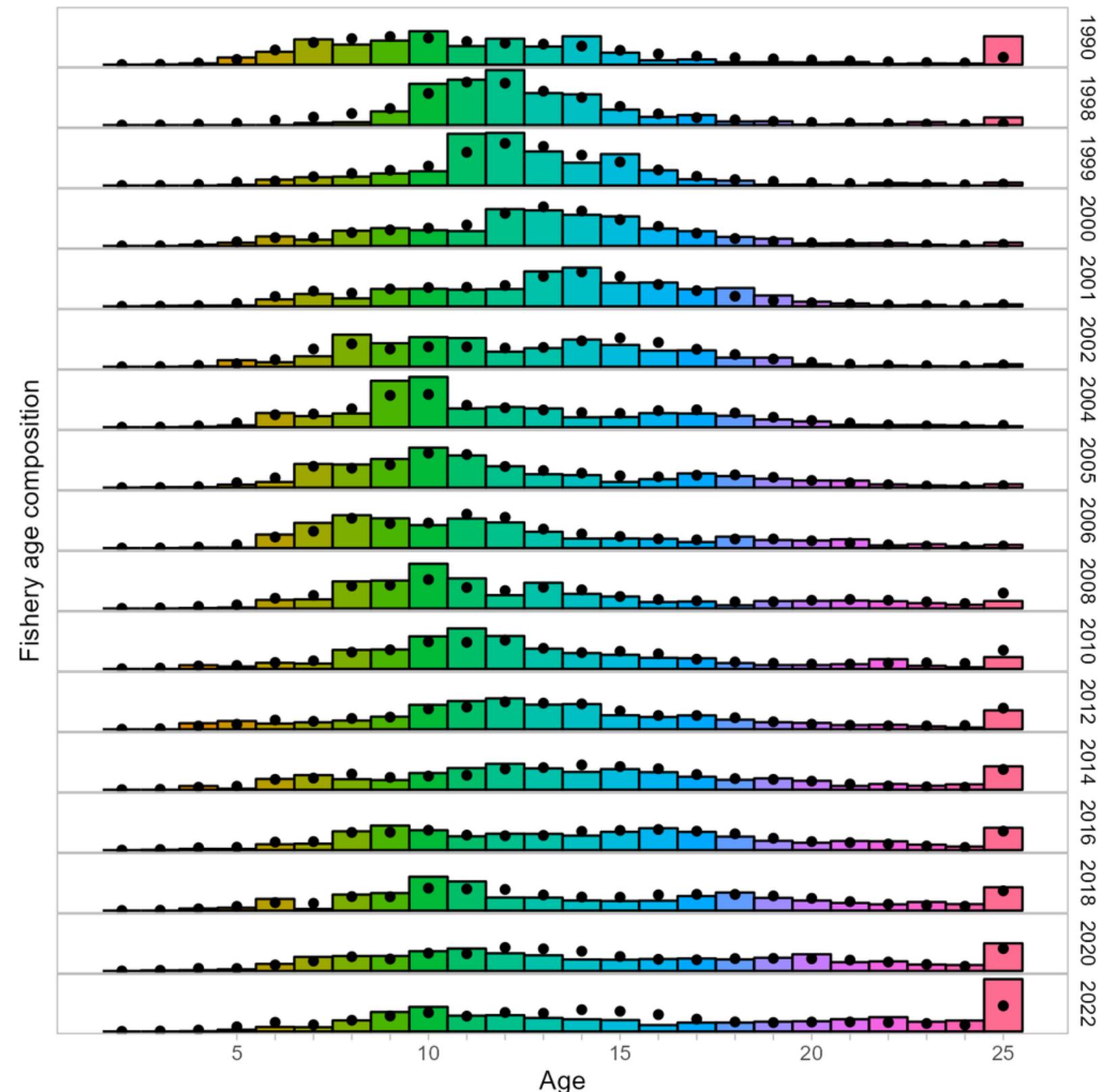


# Model Fit: Fishery Lengths



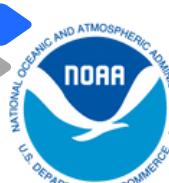
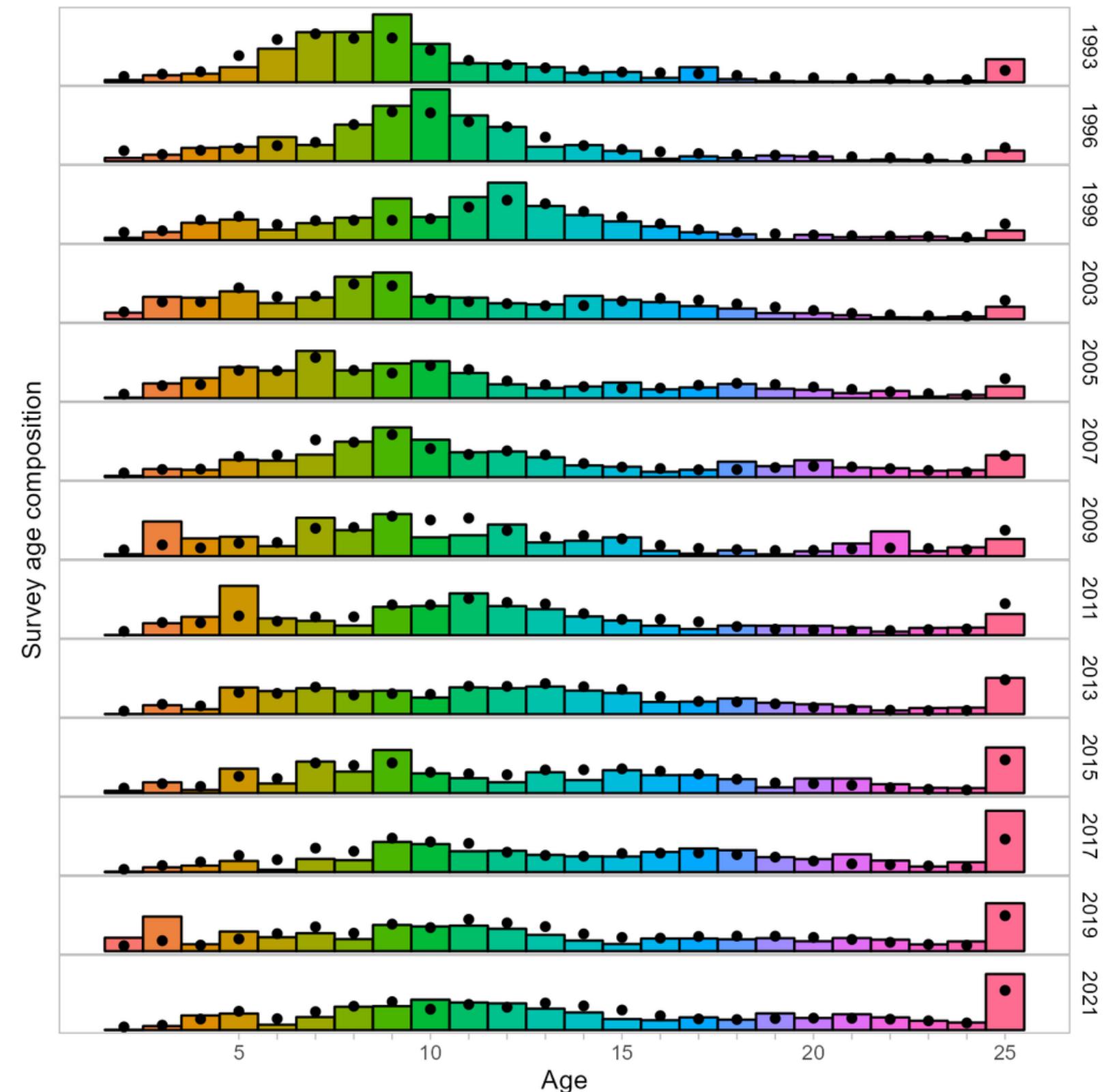
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# Model Fit: Fishery Ages



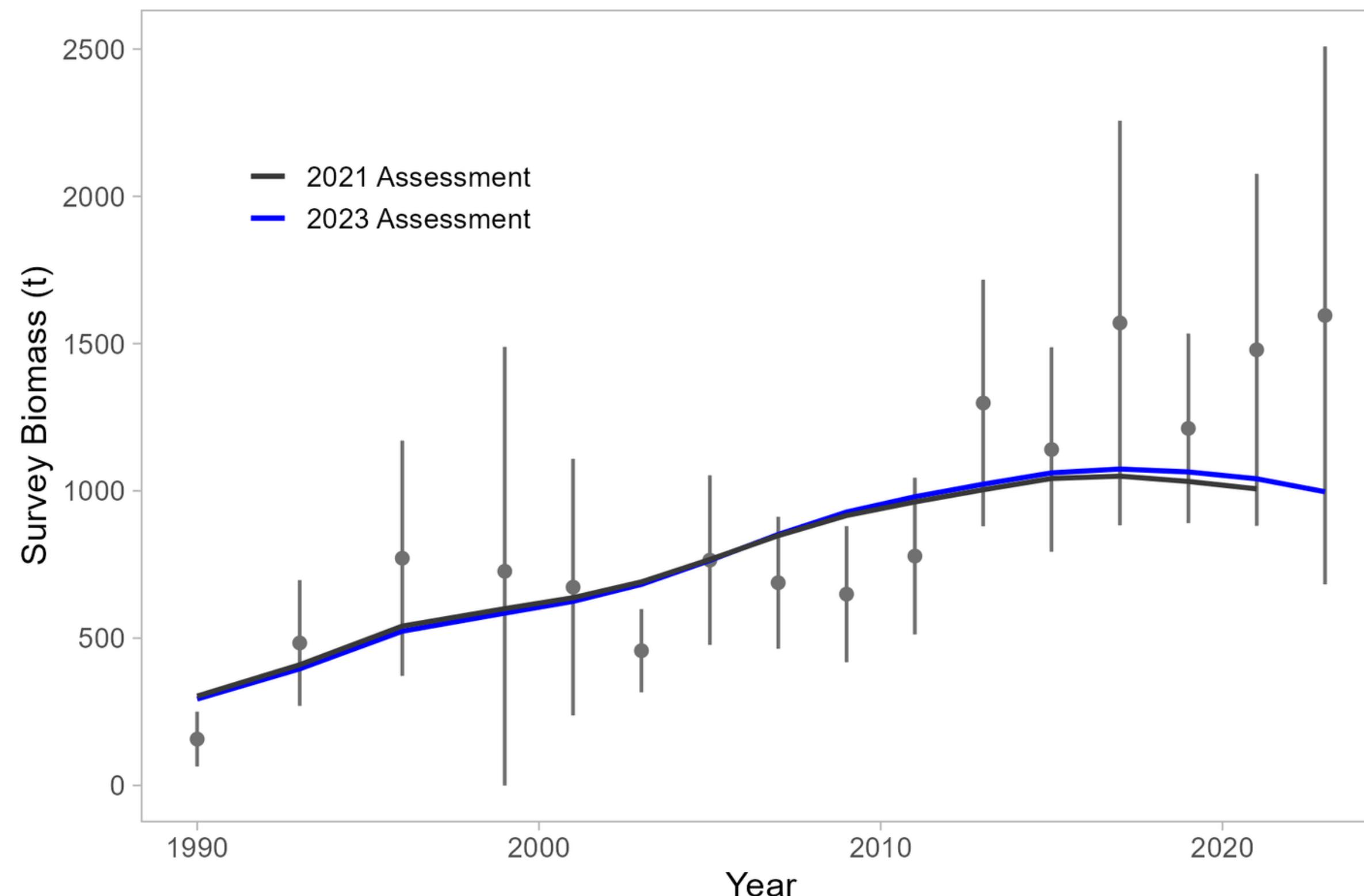
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# Model Fit: Survey Ages

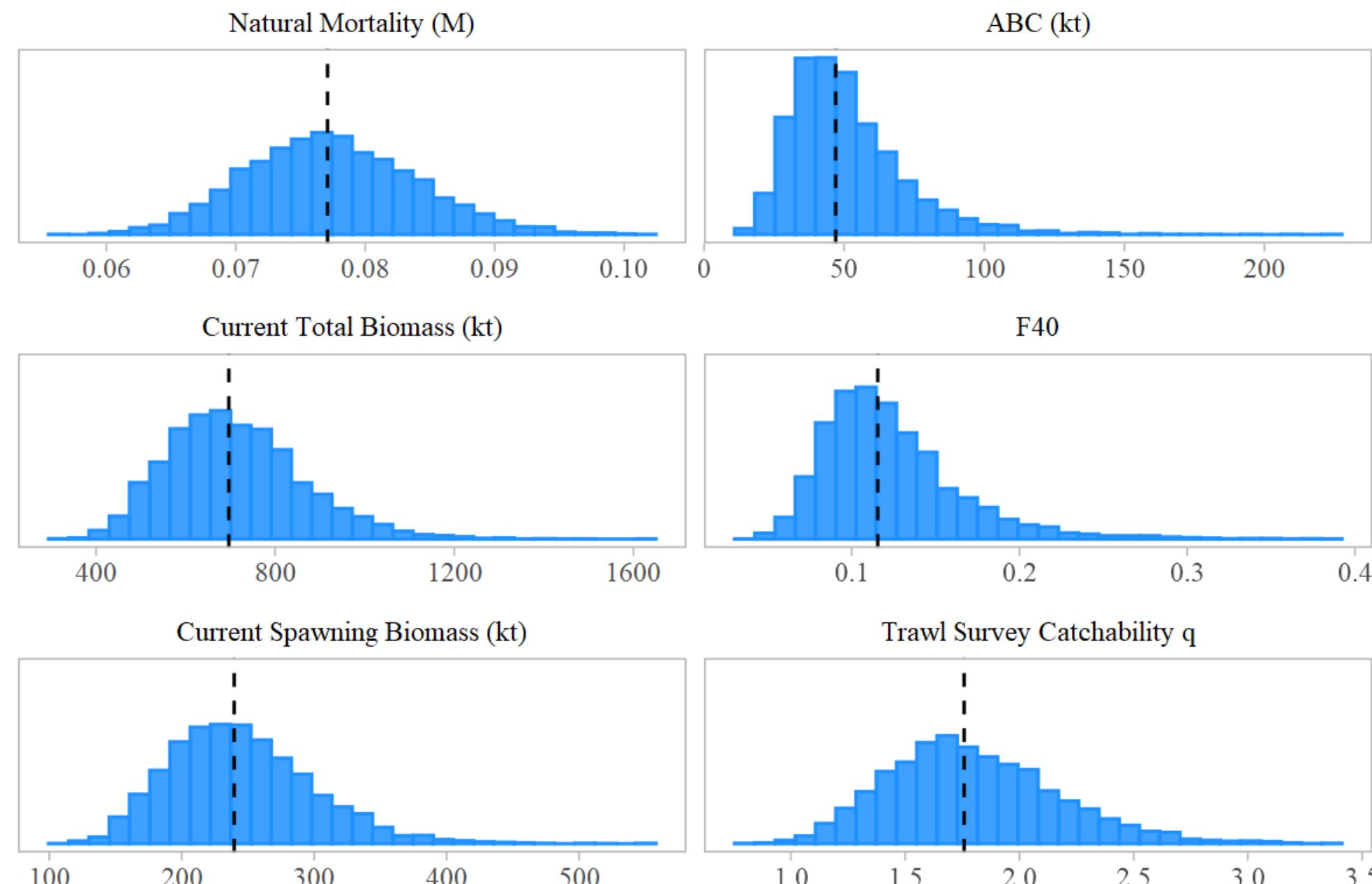


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# Model Fit: Survey Biomass

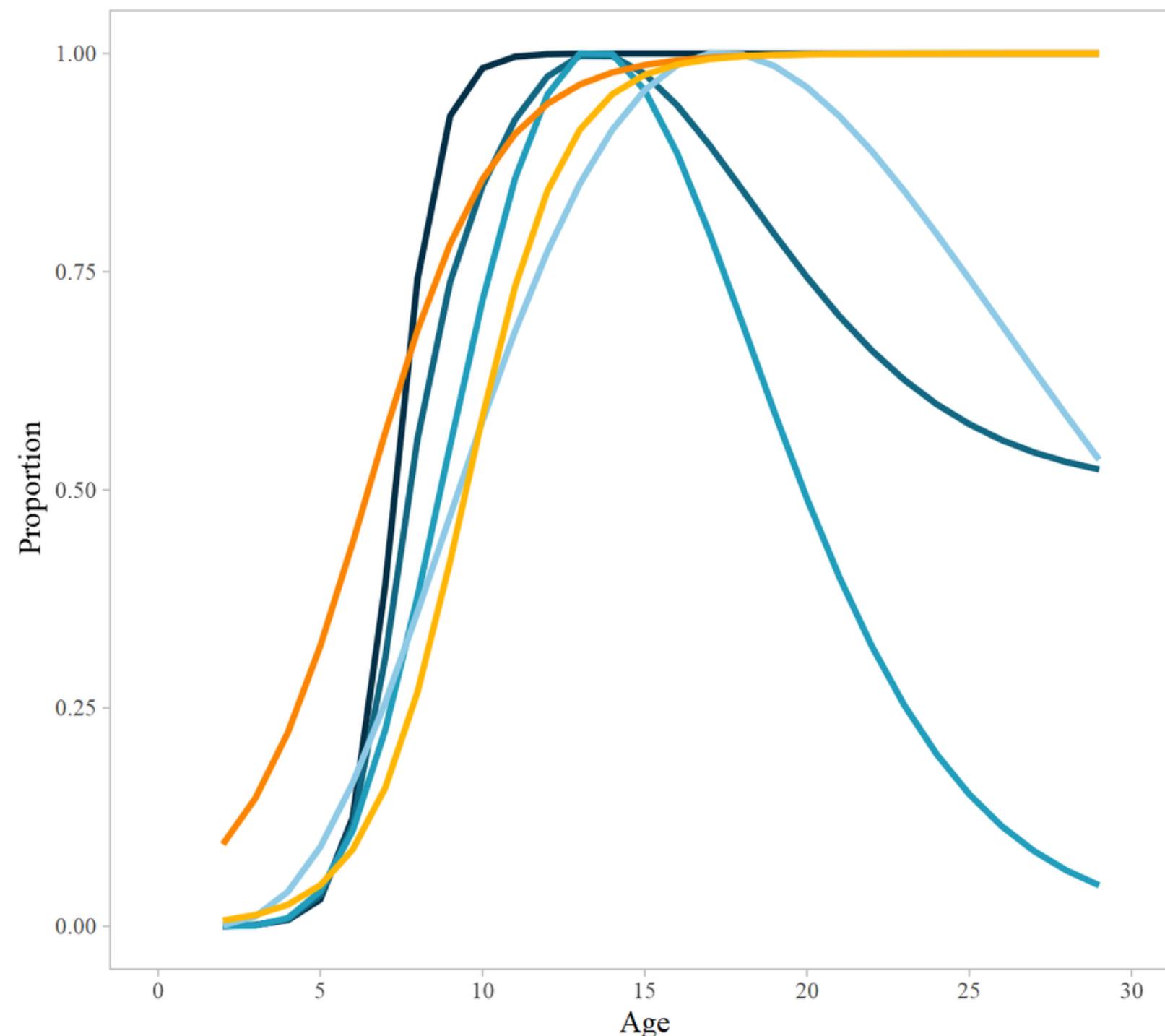


# Key Parameters

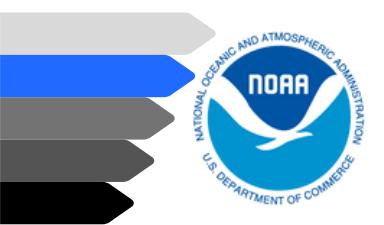
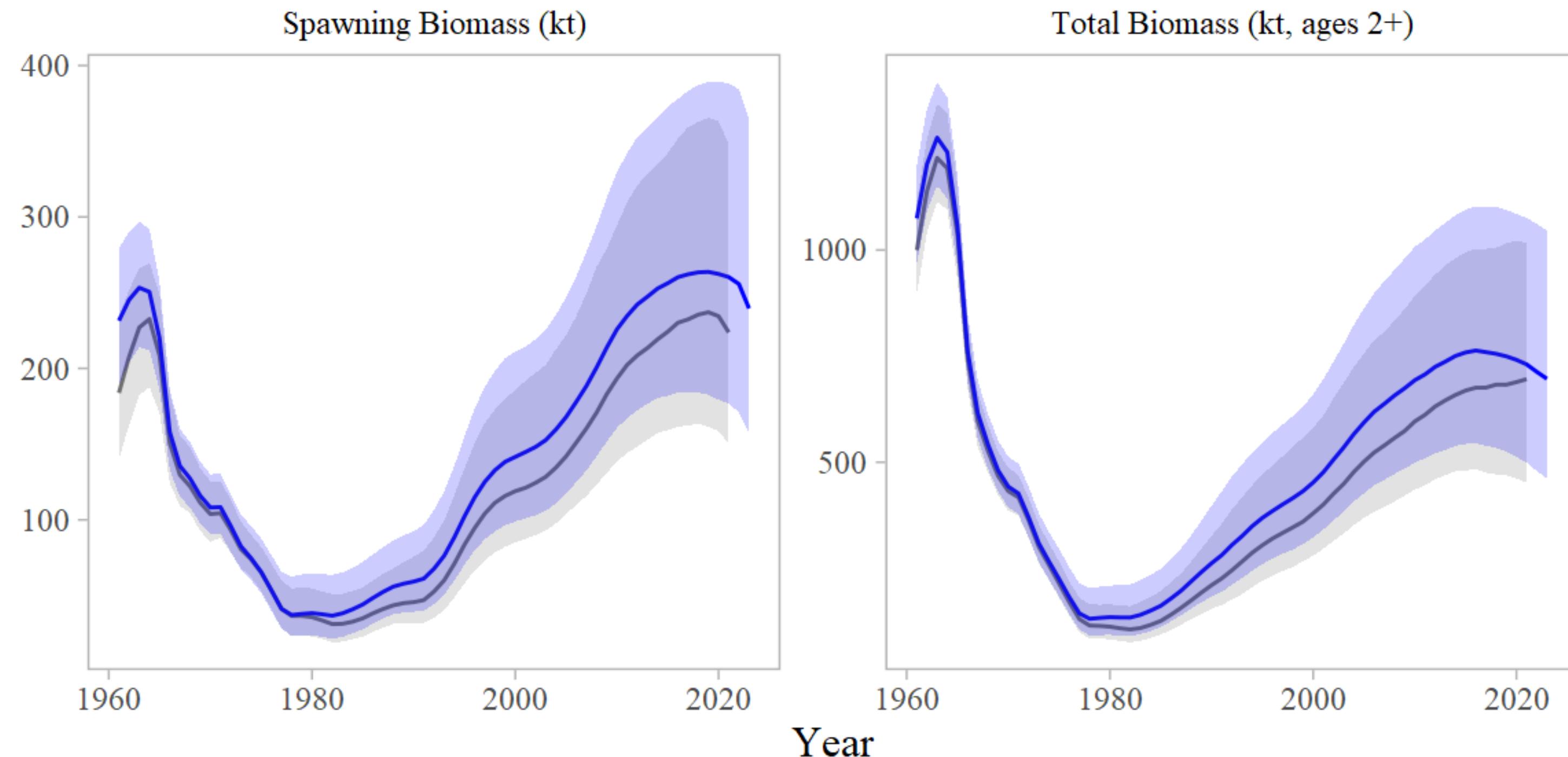


# Selectivity Curves

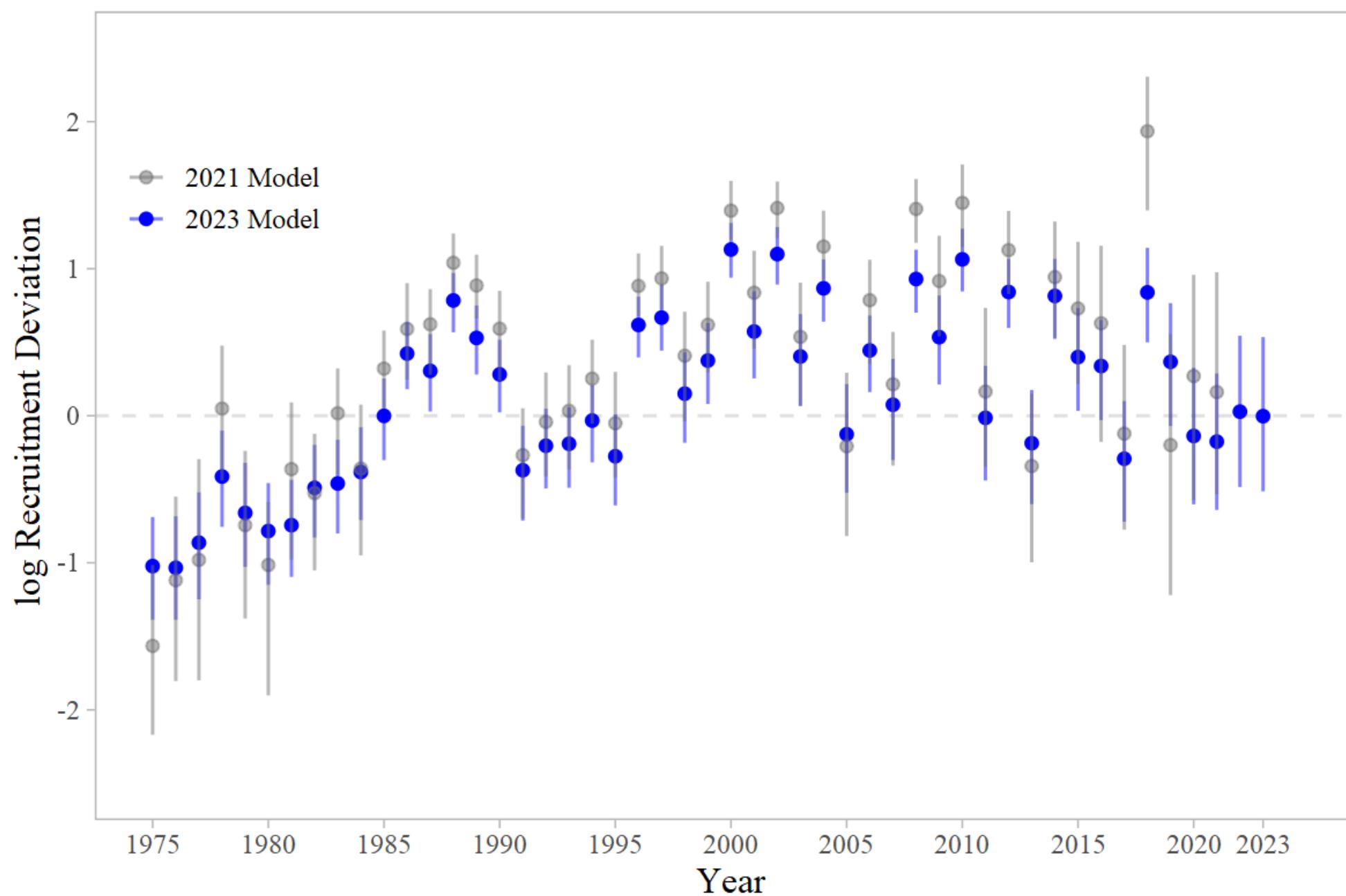
— Fishery 1967-1976   — Fishery 1996-2006   — Survey  
— Fishery 1977-1995   — Fishery 2007-2023   — Maturity



# Time Series: SSB & Total Biomass

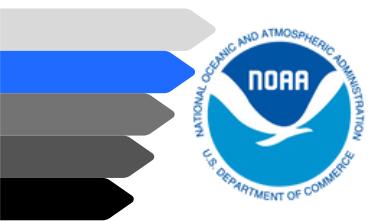
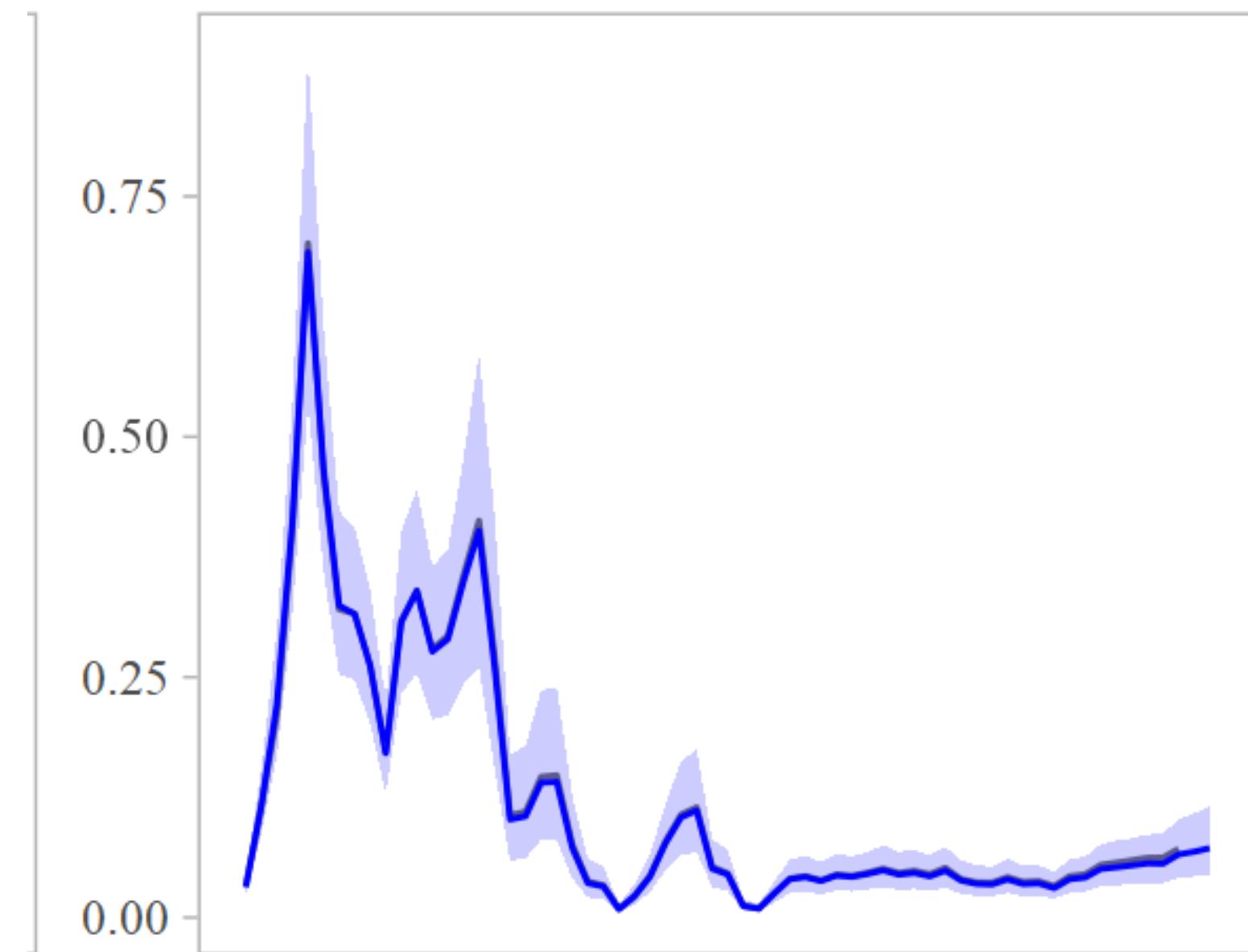


# Time Series: Recruitment

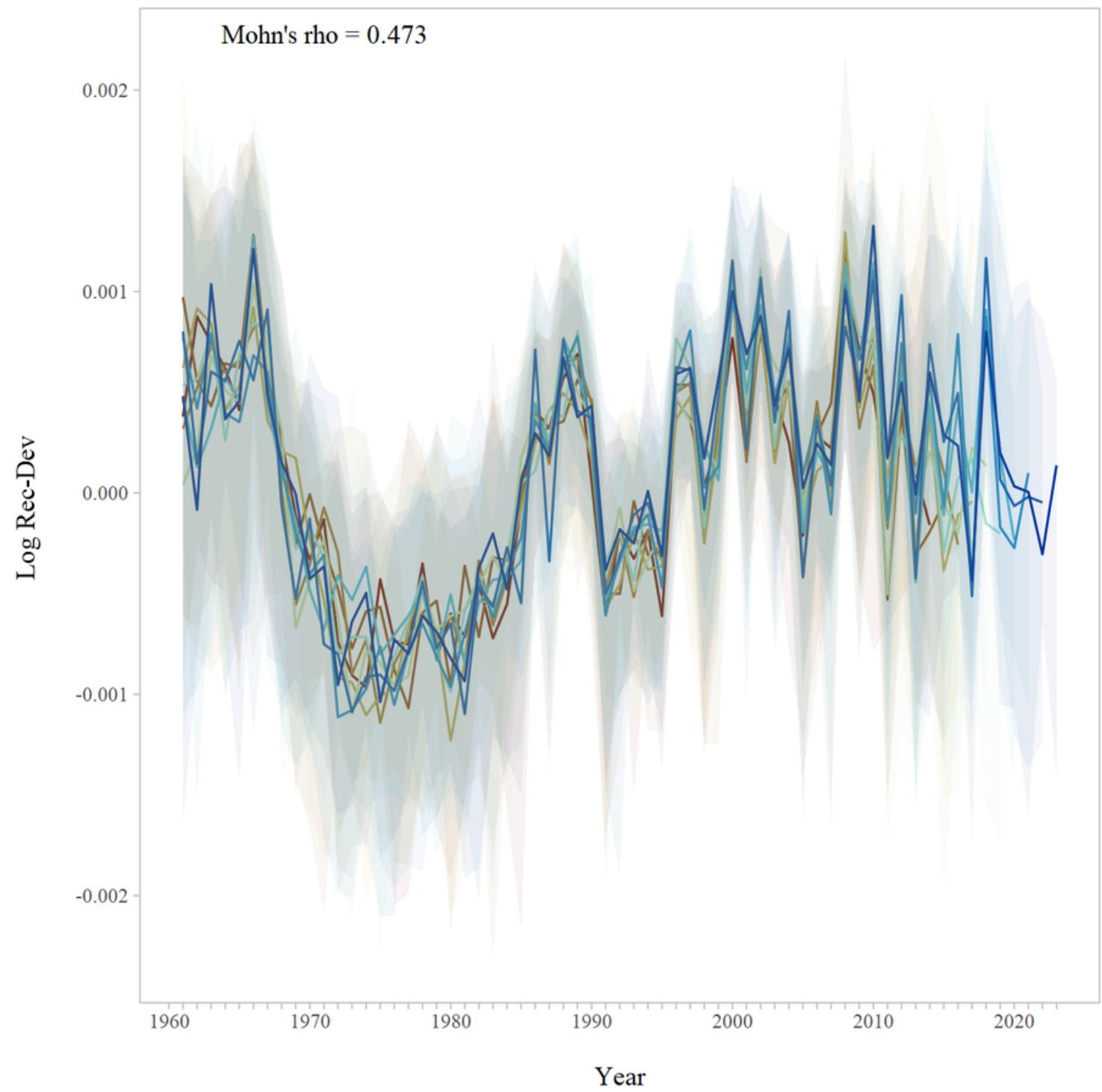
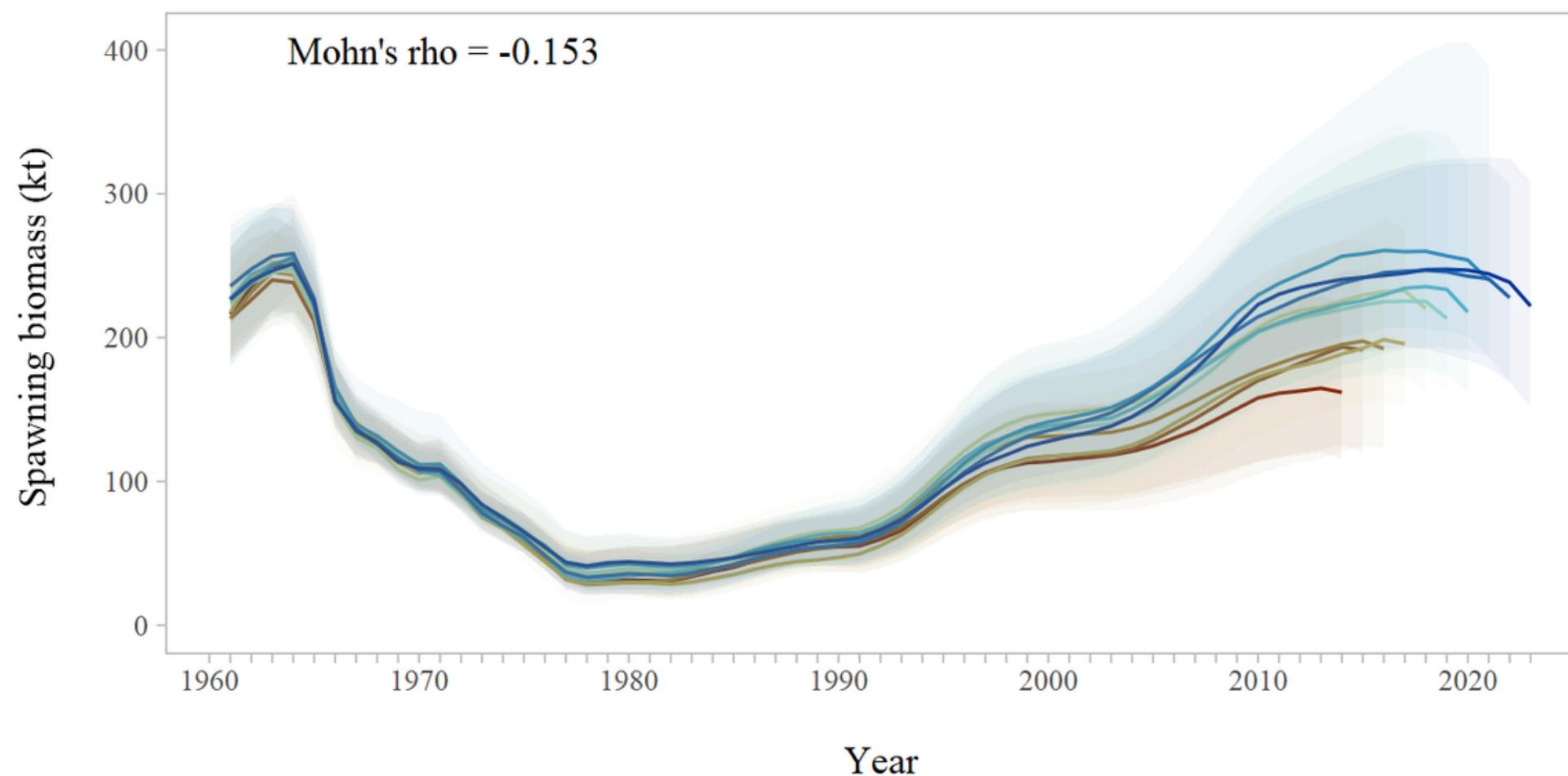


# Time Series: Fishing Mortality

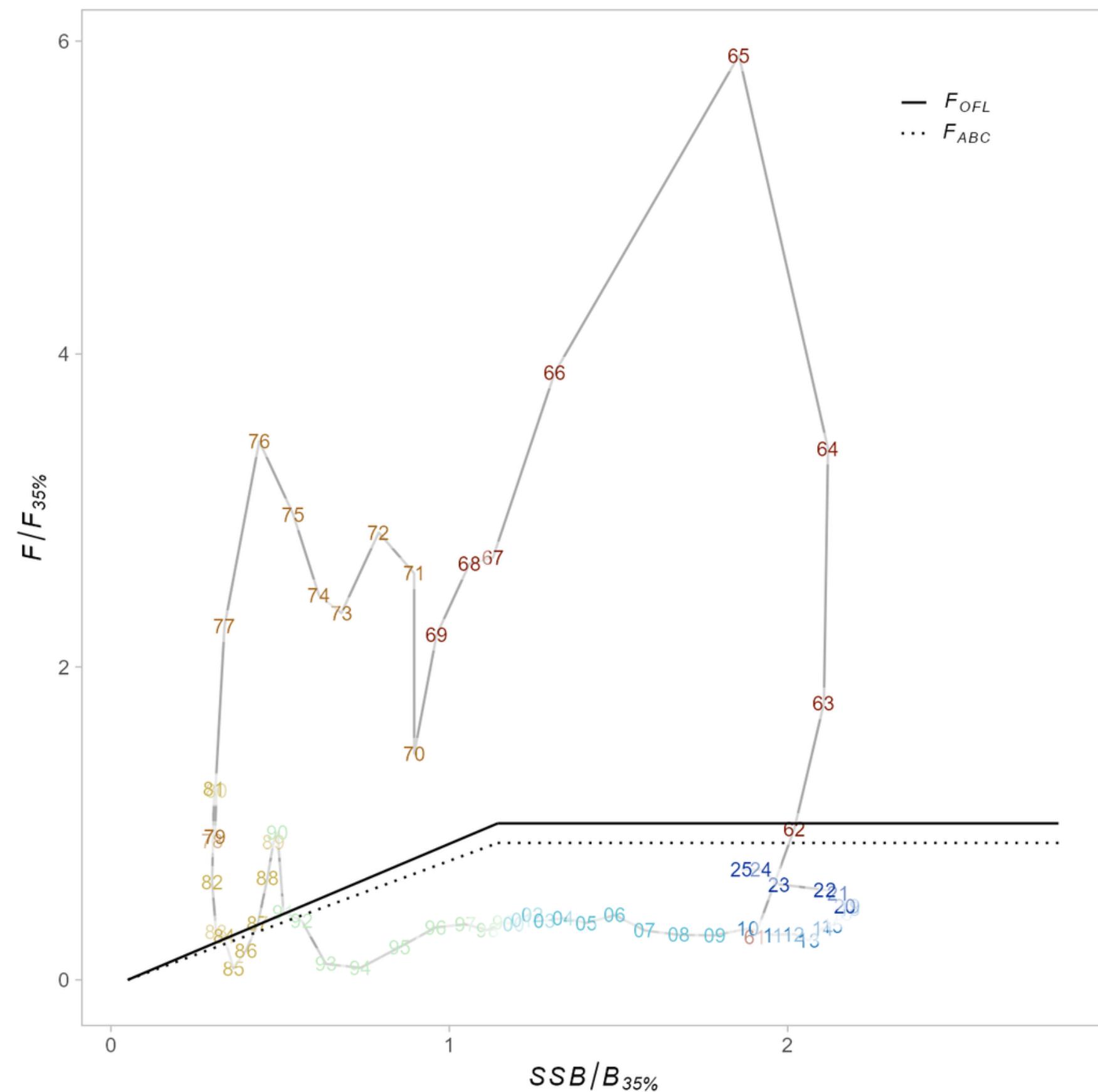
Fishing Mortality



# 10-year Retrospectives



# Phase Plane



# Risk Table



## Assessment

### Level 2

strong, negative retro



## PopDy & Fishery

### Level 2

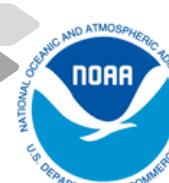
above-avg. recruitment,  
underfit surveys



## Environment

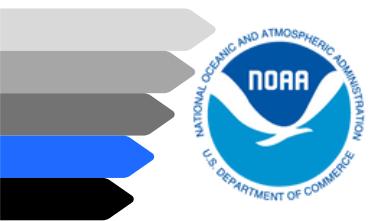
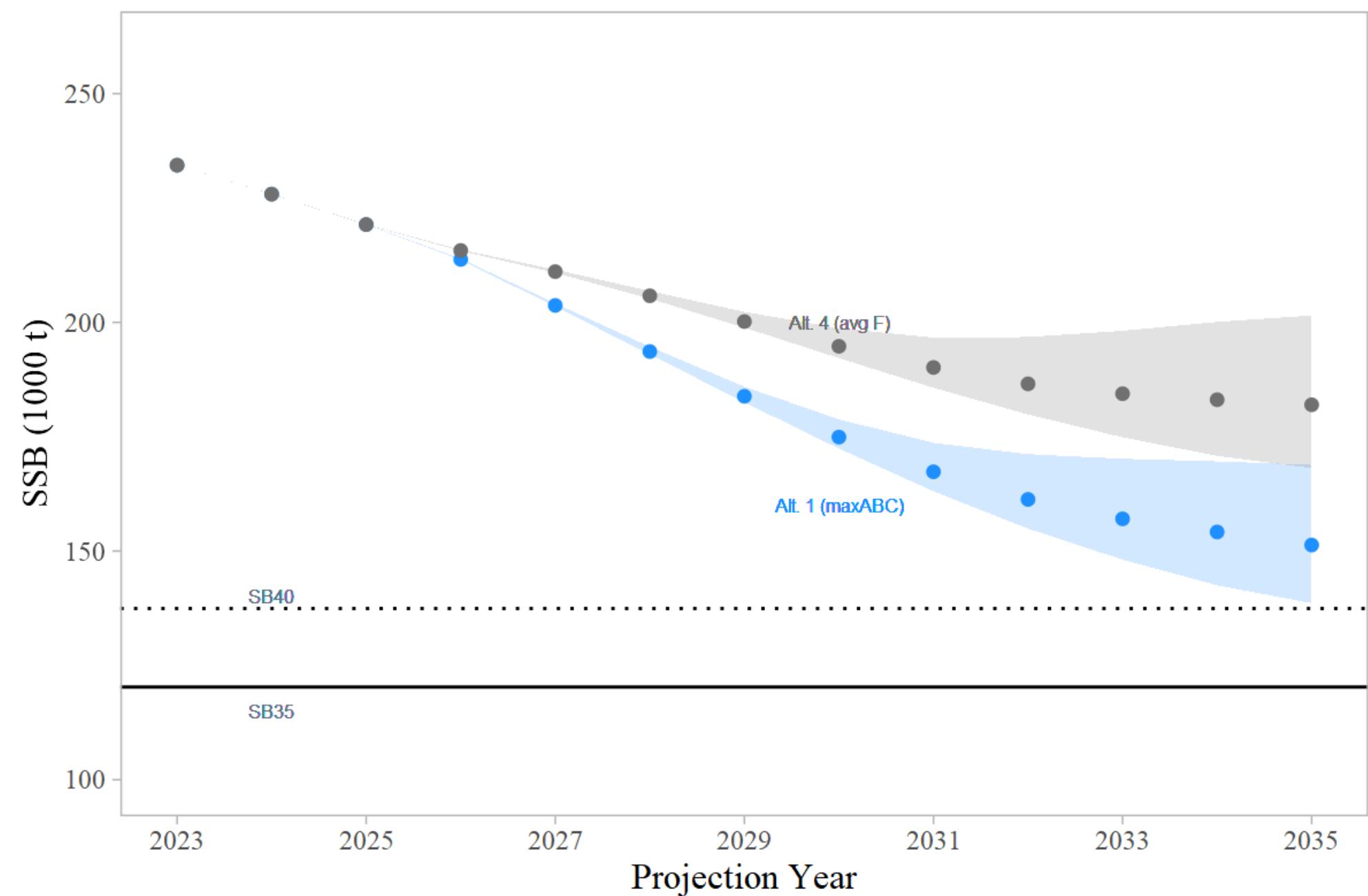
### Level 1

moderate thermal conditions



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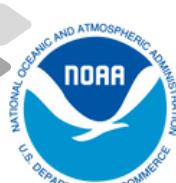
# Projection



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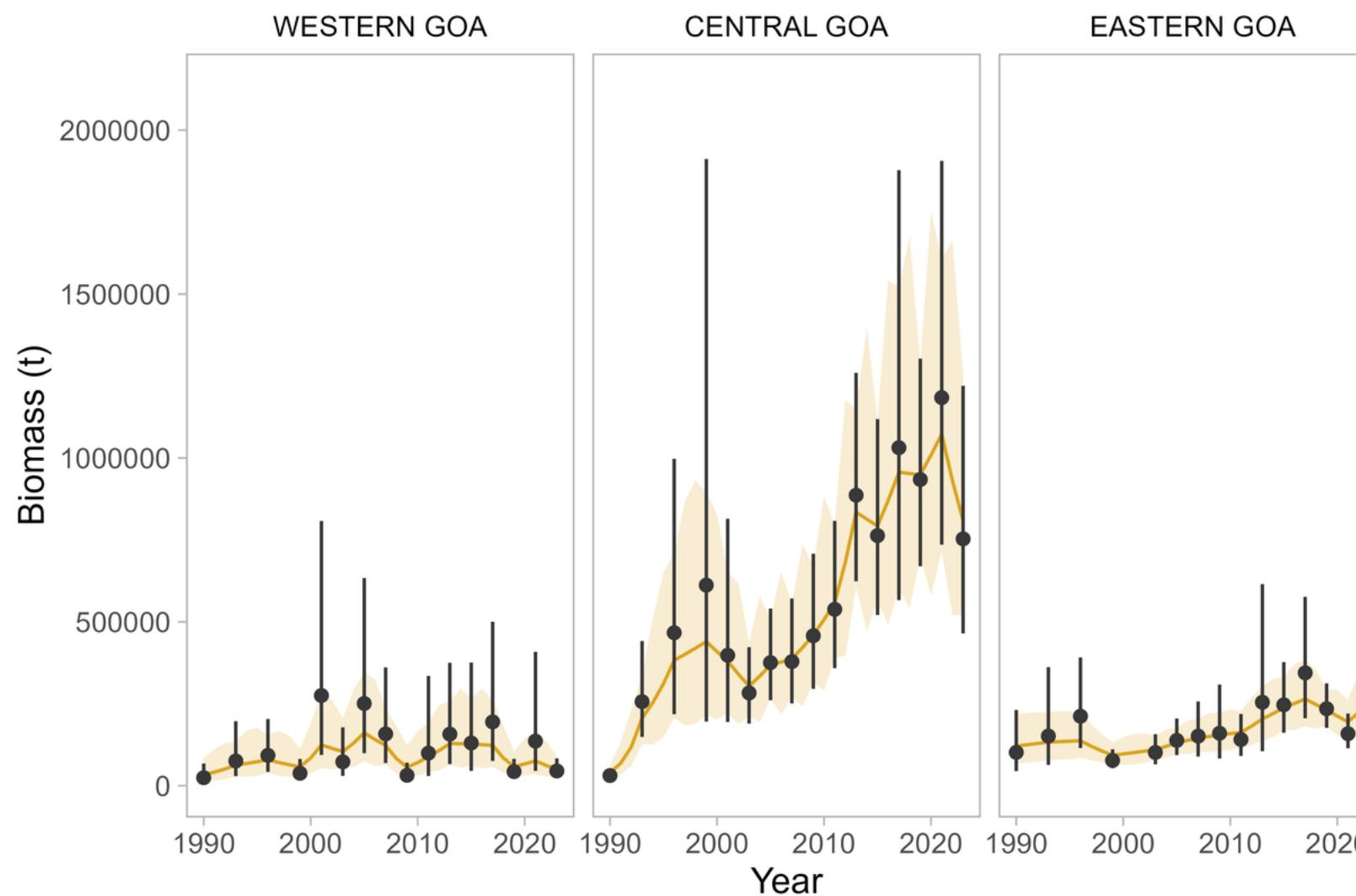
# Harvest Recommendation

Quantity/Status	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this</i> <i>year for:</i>	
	2023	2024	2024*	2025*
M (natural mortality)	0.075	0.075	0.074	0.074
Tier	3a	3a	3a	3a
Projected total (age 2+) biomass (t)	636,129	621,249	650,027	628,753
Projected female spawning biomass (t)	210,795	205,713	228,030	221,384
B <sub>100%</sub>	331,917	331,917	343,618	343,618
B <sub>40%</sub>	132,767	132,767	137,447	137,447
B <sub>35%</sub>	116,171	116,171	120,266	120,266
F <sub>OFL</sub>	0.12	0.12	0.12	0.12
maxF <sub>ABC</sub>	0.10	0.10	0.10	0.10
F <sub>ABC</sub>	0.10	0.10	0.10	0.10
OFL (t)	44,302	43,117	<b>47,466</b>	45,835
maxABC (t)	37,193	36,196	39,719	38,354
ABC (t)	37,193	39,196	<b>39,719</b>	38,354
Status	As determined <i>last</i> year for:		As determined <i>this</i> year for:	
	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



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# Apportionment



REMA-derived apportionment (%)		4.5	72.4	23.1	100	
Year	Quantity	Western	Central	W. Yakutat	E. Yakutat/ SEO	Total
2024	ABC (t)	1,787	28,757	2,110	7,065	39,719
2025	ABC (t)	1,726	27,768	2,038	6,822	38,354
2024	OFL (t)		39,023		8,443	47,466
2025	OFL (t)		37,682		8,153	45,835

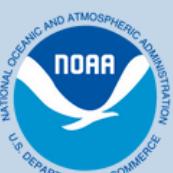


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[github.com/afsc-assessments/rema](https://github.com/afsc-assessments/rema)

# Data Gaps & Future Research

- Transition to SS Model
- Deeper exploration of selex & data weighting



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Thank you  
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