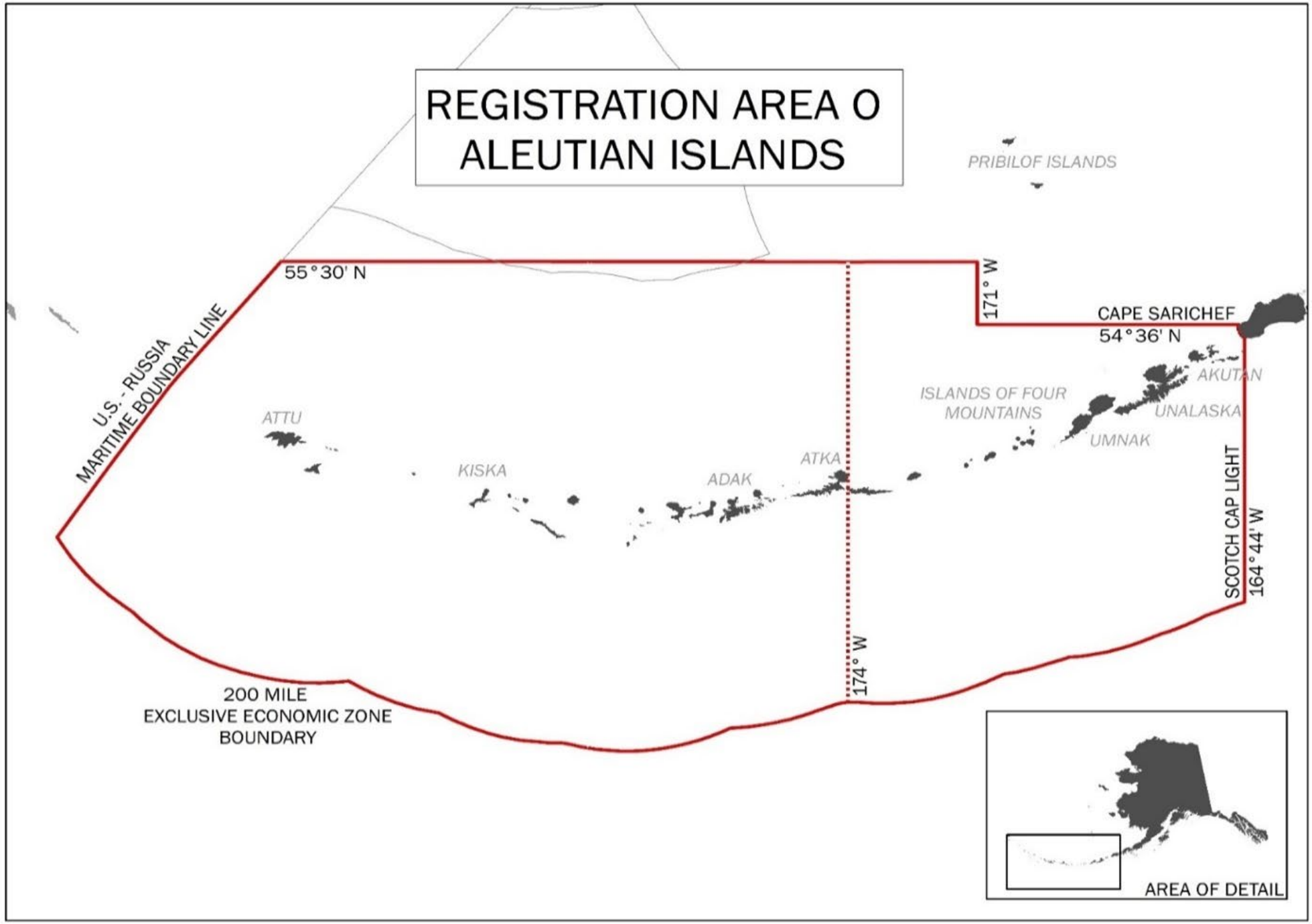
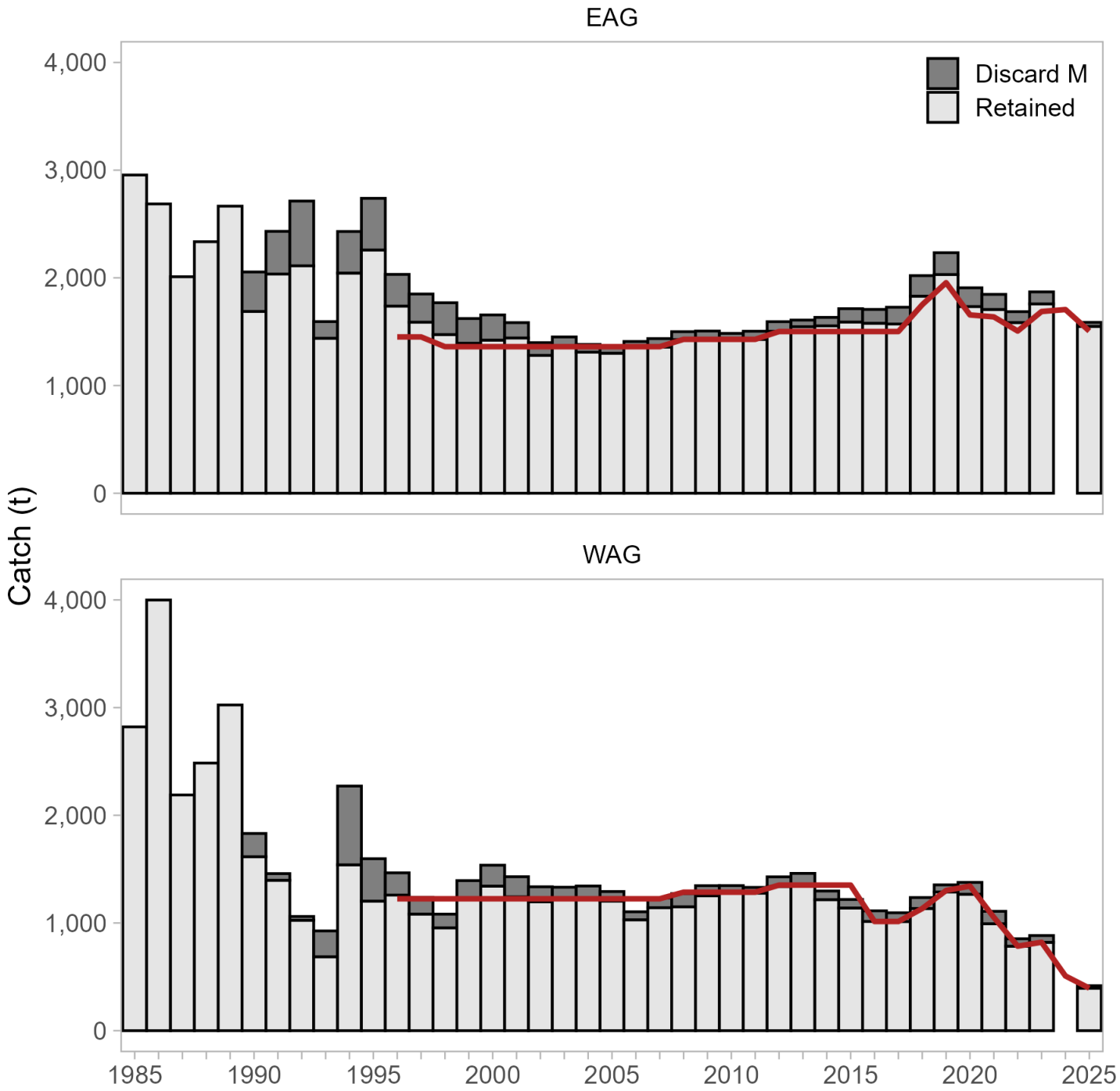
Aleutian Islands Golden King Crab 2026 Final Assessment

Tyler Jackson, ADF&G

May 2026 CPT


REGISTRATION AREA O
ALEUTIAN ISLANDS
PRIBILOF ISLANDS
55°30' N
U.S. - RUSSIA
MARITIME BOUNDARY LINE
171° W
CAPE SARICHEF
54°36' N
AKUTAN
ISLANDS OF FOUR
MOUNTAINS
UNALASKA
UMNAK
ATTU
KISKA
ADAK
ATKA
SCOTCH CAP LIGHT
164°44' W
174° W
200 MILE
EXCLUSIVE ECONOMIC ZONE
BOUNDARY
AREA OF DETAIL

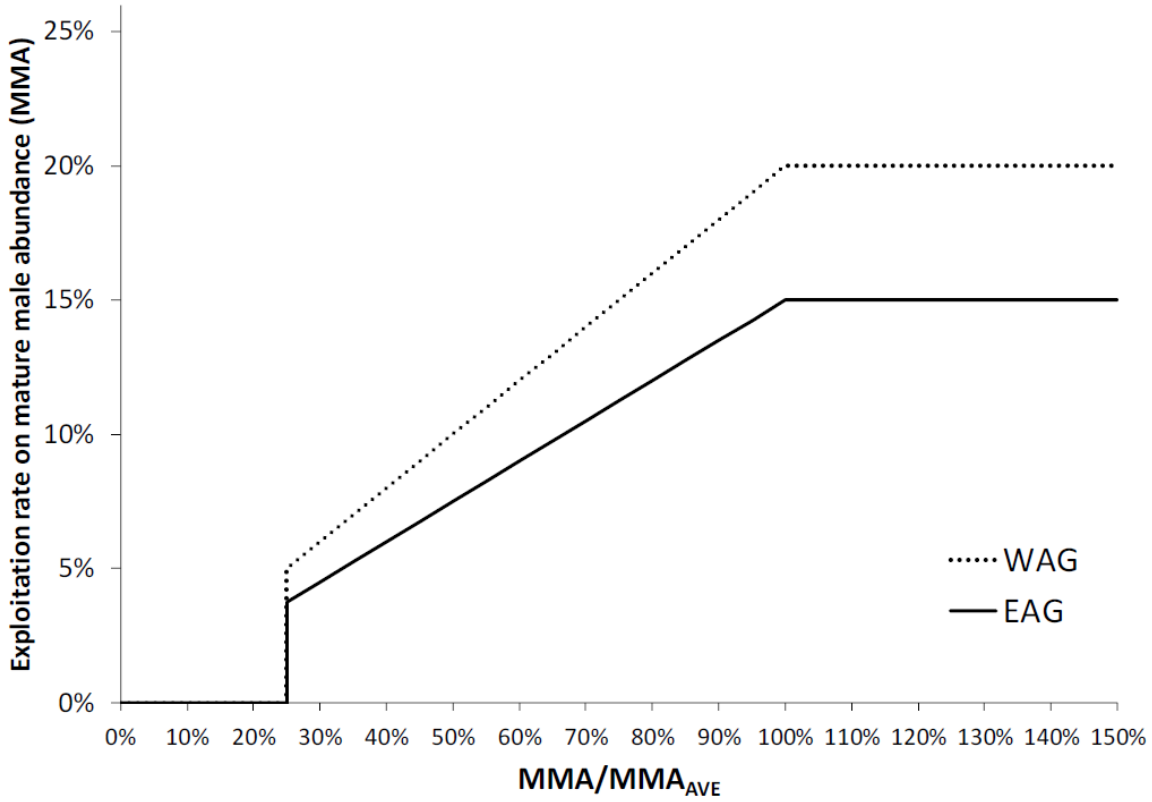


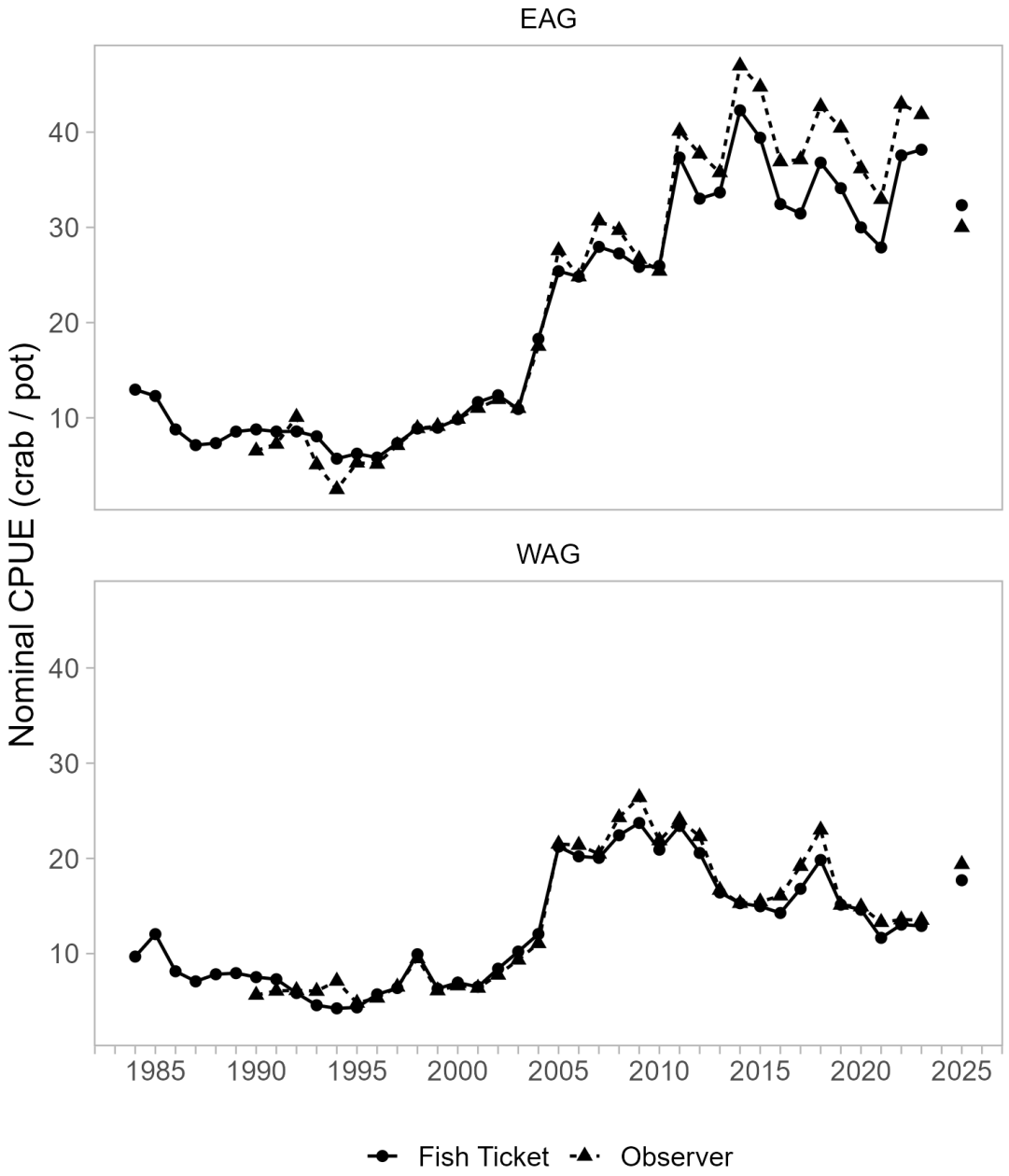
2025/26
OFL = 3,166 t
ABC = 2,374 t

EAG TAC = 1,506 t
Retained = 1,549 t
Disc M = 37.4 t

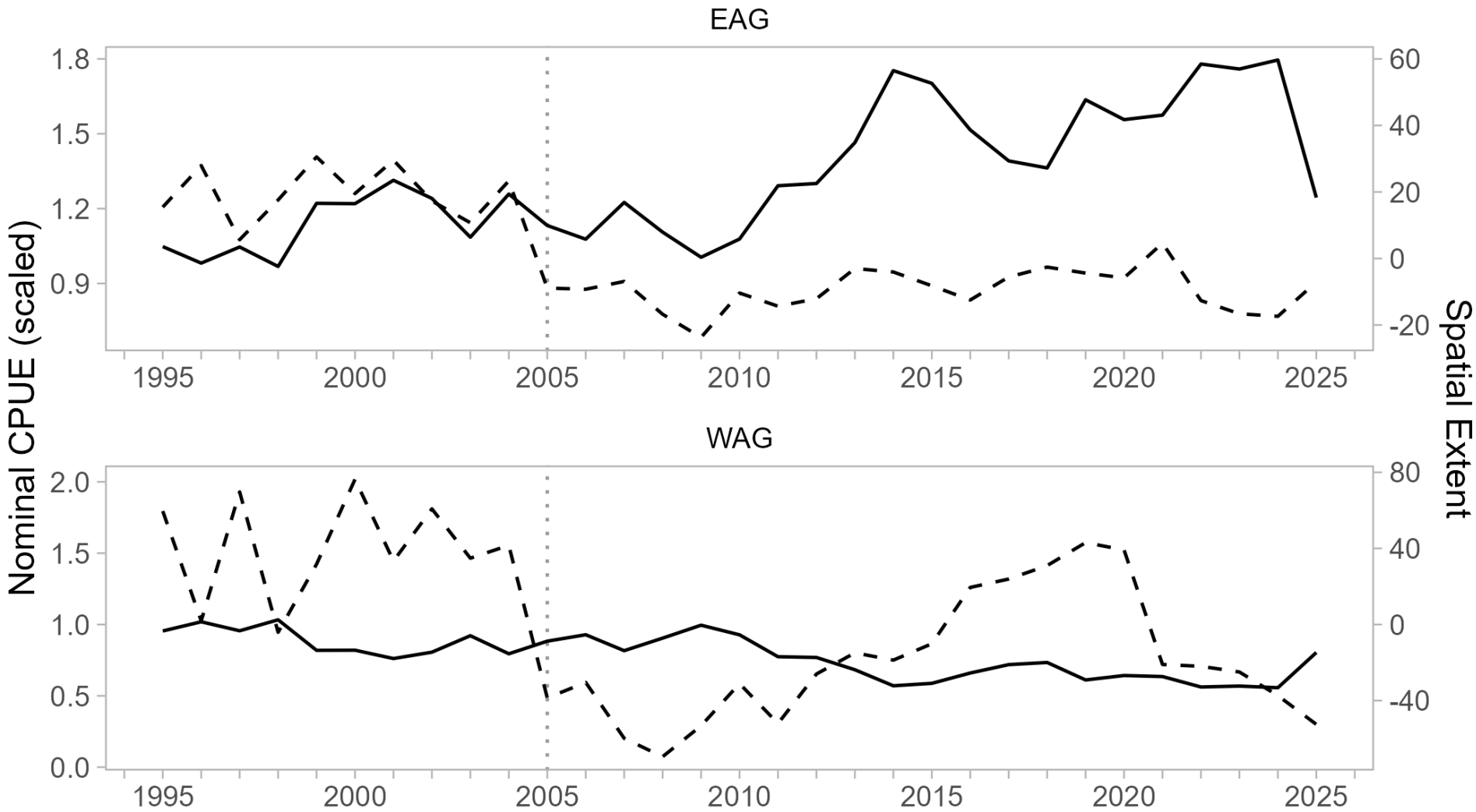
WAG TAC = 395 t
Retained = 394 t
Disc M = 24.0 t

**2024 confidential*

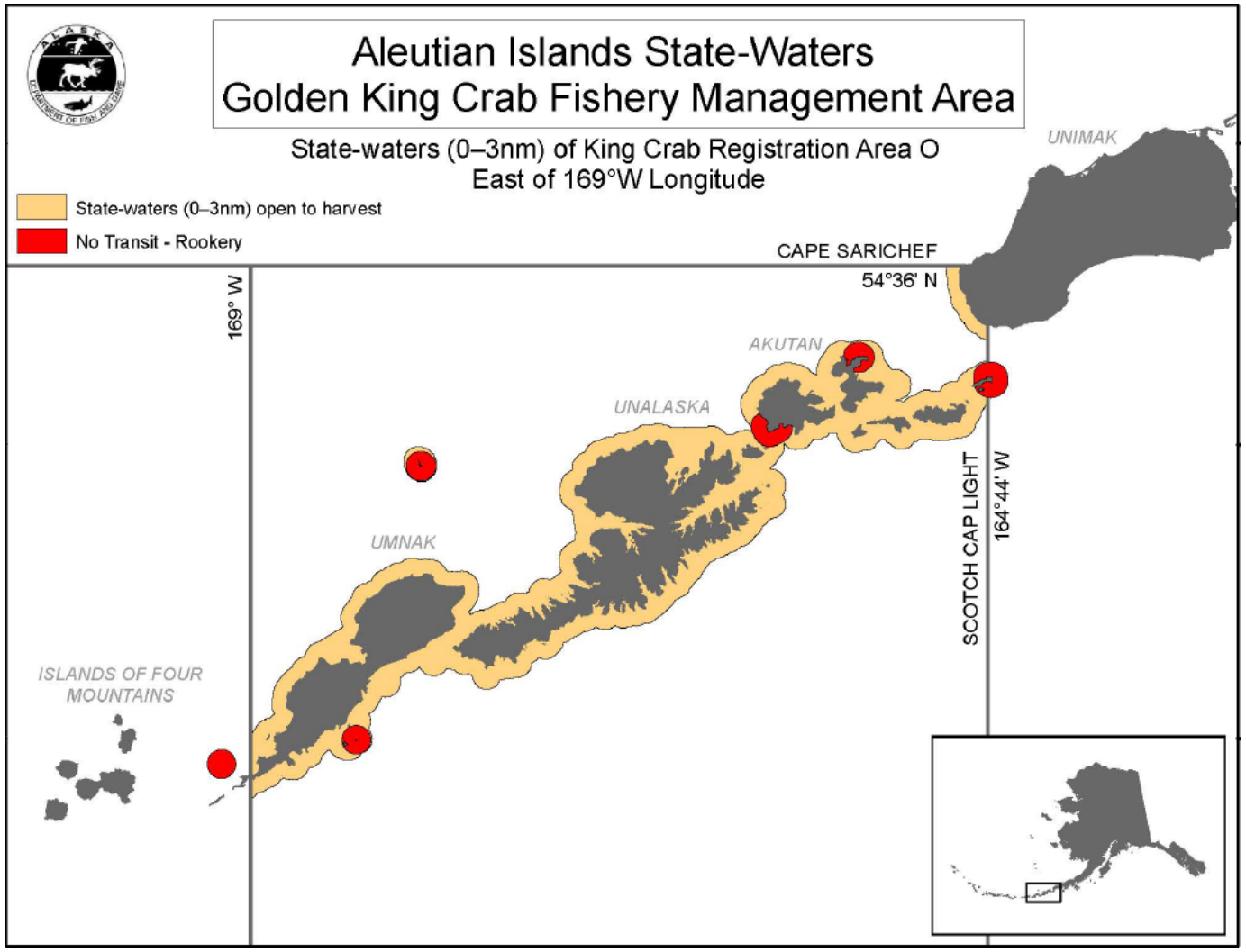




Previous two seasons used 15% ramp in the WAG following poor fishery performance and model advice that management has been disproportionately aggressive


EAG
WAG
Nominal CPUE (scaled)
Spatial Extent
1.8
1.5
1.2
0.9
60
40
20
0
-20
2.0
1.5
1.0
0.5
0.0
80
40
0
-40
1995
2000
2005
2010
2015
2020
2025

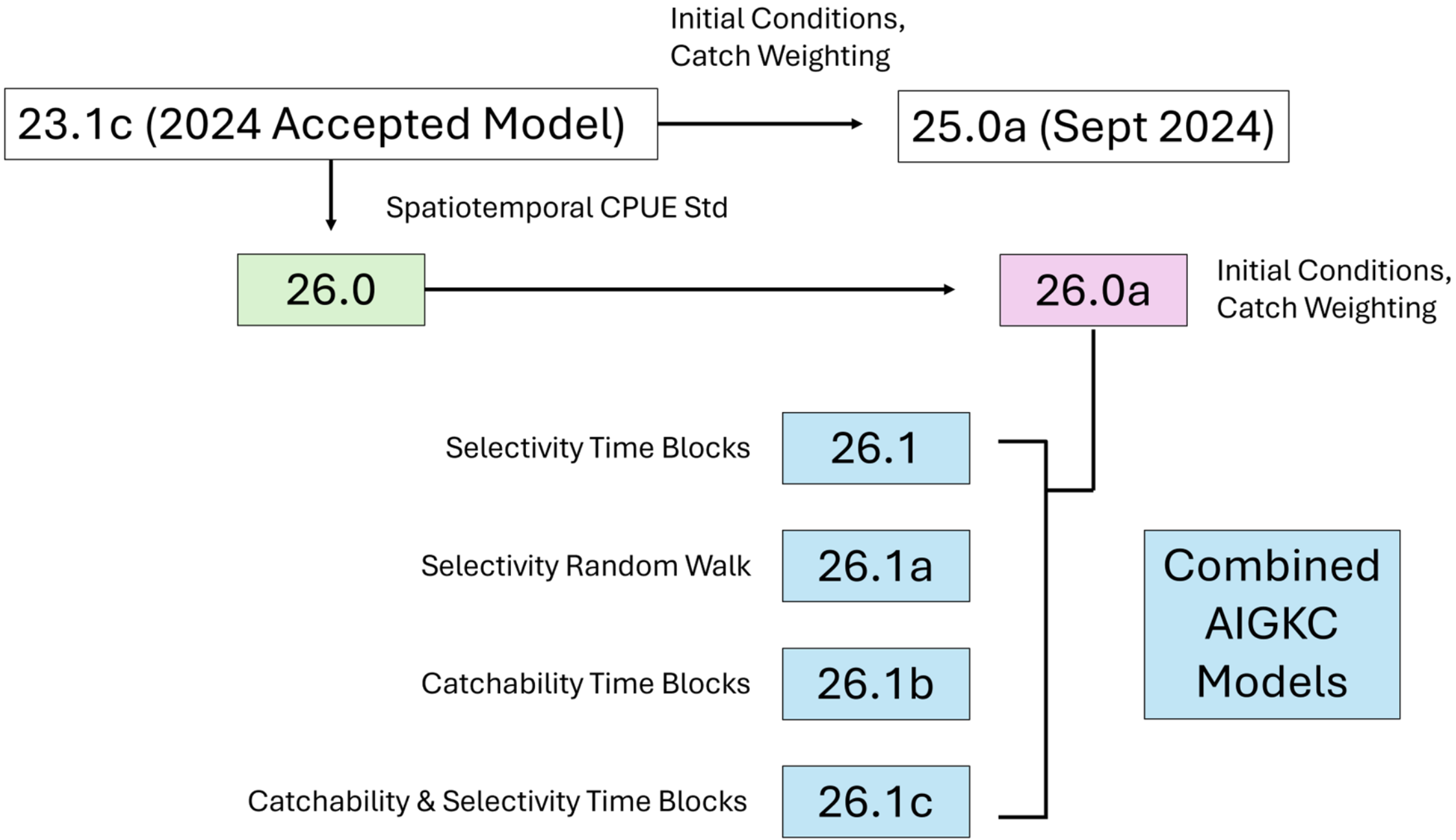
New State Waters Fishery

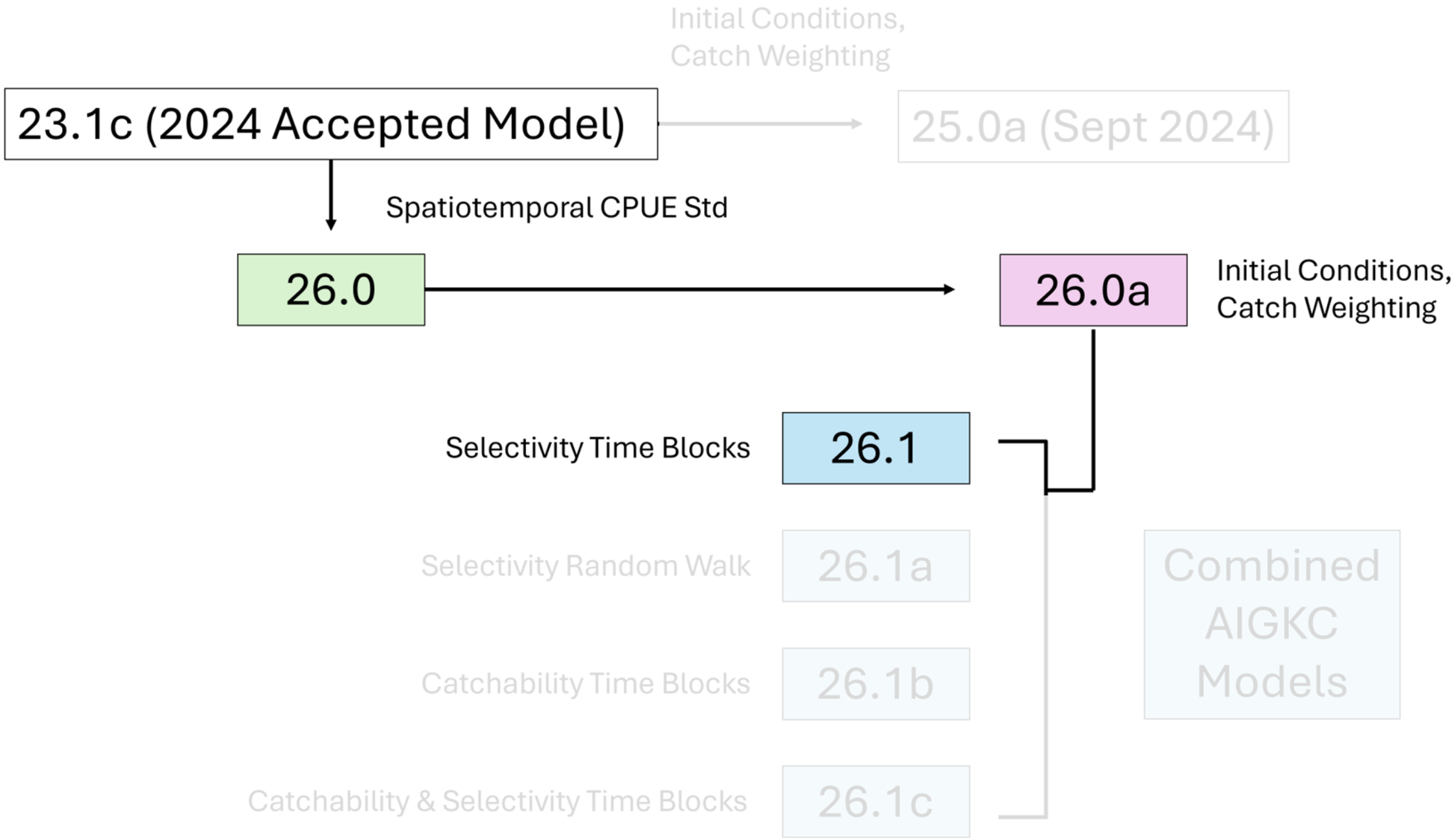


- Limited to vessels < 58 ft
- 400 pot limit across fishery, 90 pots by vessel
- No longlining
- Fishing during 8am – 7:59pm
- Sept 1 – April 30
- 6.0 in CW legal size

Doesn't influence EAG TAC

1 vessel made landings (ie confidential)


Initial Conditions,
Catch Weighting
23.1c (2024 Accepted Model)
25.0a (Sept 2024)
Spatiotemporal CPUE Std
26.0
26.0a
Initial Conditions,
Catch Weighting
Selectivity Time Blocks
26.1
Selectivity Random Walk
26.1a
Catchability Time Blocks
26.1b
Catchability & Selectivity Time Blocks
26.1c
Combined AIGKC Models


Initial Conditions,
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26.0
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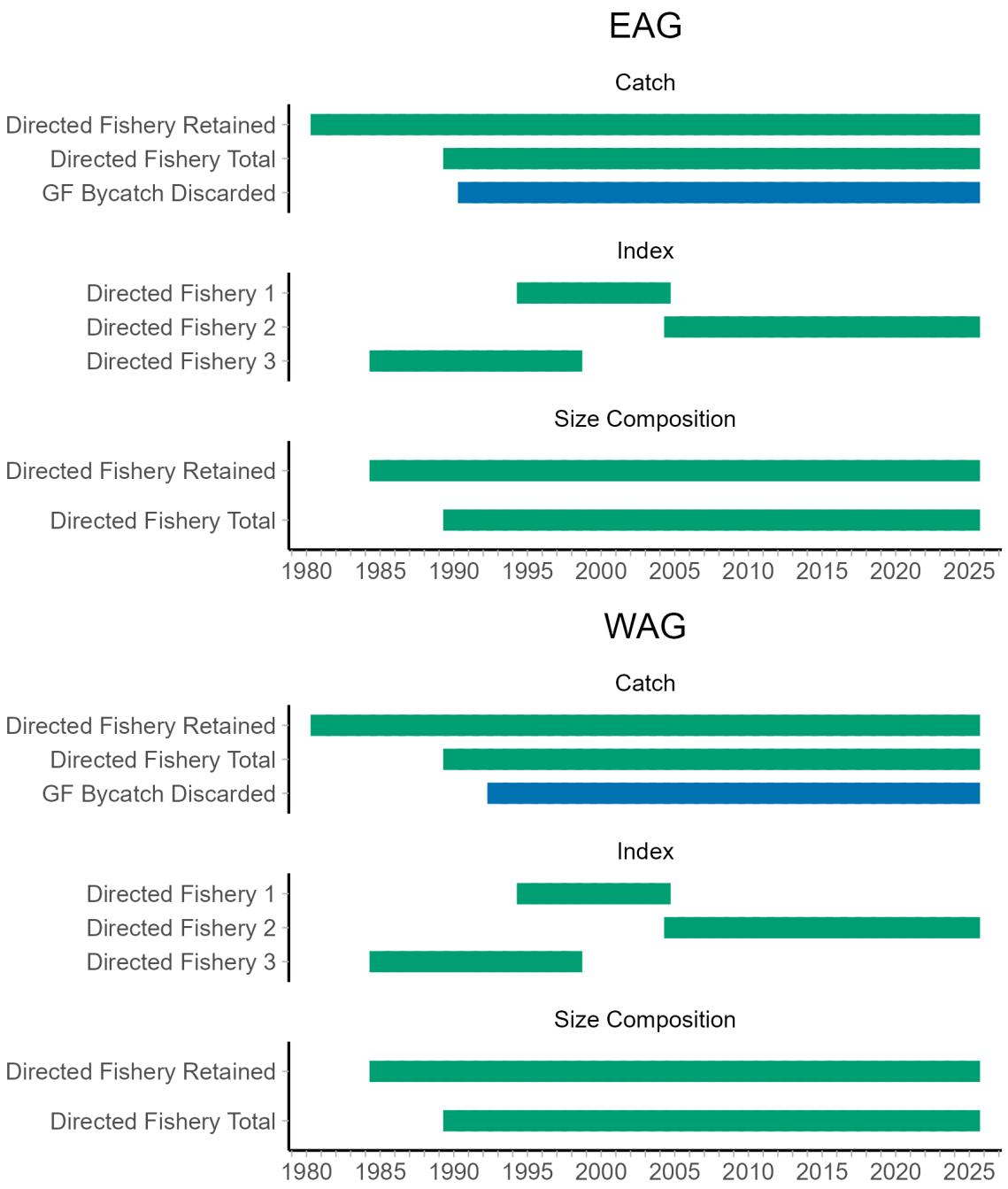
Initial Conditions,
Catch Weighting
Selectivity Time Blocks
26.1
Selectivity Random Walk
26.1a
Catchability Time Blocks
26.1b
Catchability & Selectivity Time Blocks
26.1c
Combined
AIGKC
Models

GMACS Update

Update from v2.20.31 to v2.20.34b

Difference in Total NLL from uniform priors

	EAG		WAG	
Component	v2.20.31	v2.20.34b	v2.20.31	v2.20.34b
Catch	-488.770	-488.770	-467.100	-467.100
Index	-45.632	-45.632	-68.475	-68.475
Size Composition	864.840	864.840	1,053.017	1,053.017
Recruitment	19.319	19.319	23.813	23.813
Tagging	2,698.016	2,698.016	2,697.195	2,697.195
N Parameters	167.000	167.000	165.000	165.000
Total	3,074.719	3,071.105	3,265.318	3,261.705



Updated:

- 2025/26 Retained / Total Catch
- 2024/25, 2025/26 Groundfish Bycatch

- Post Rationalization Std CPUE (23.1c)
- Full Std CUPE Time Series (26.0, 26.0a, 26.1)

- 2025/26 Retained and Total Catch Size Composition

Directed Fishery is COMPLETE!

Model 23.1c – legacy CPUE standardization

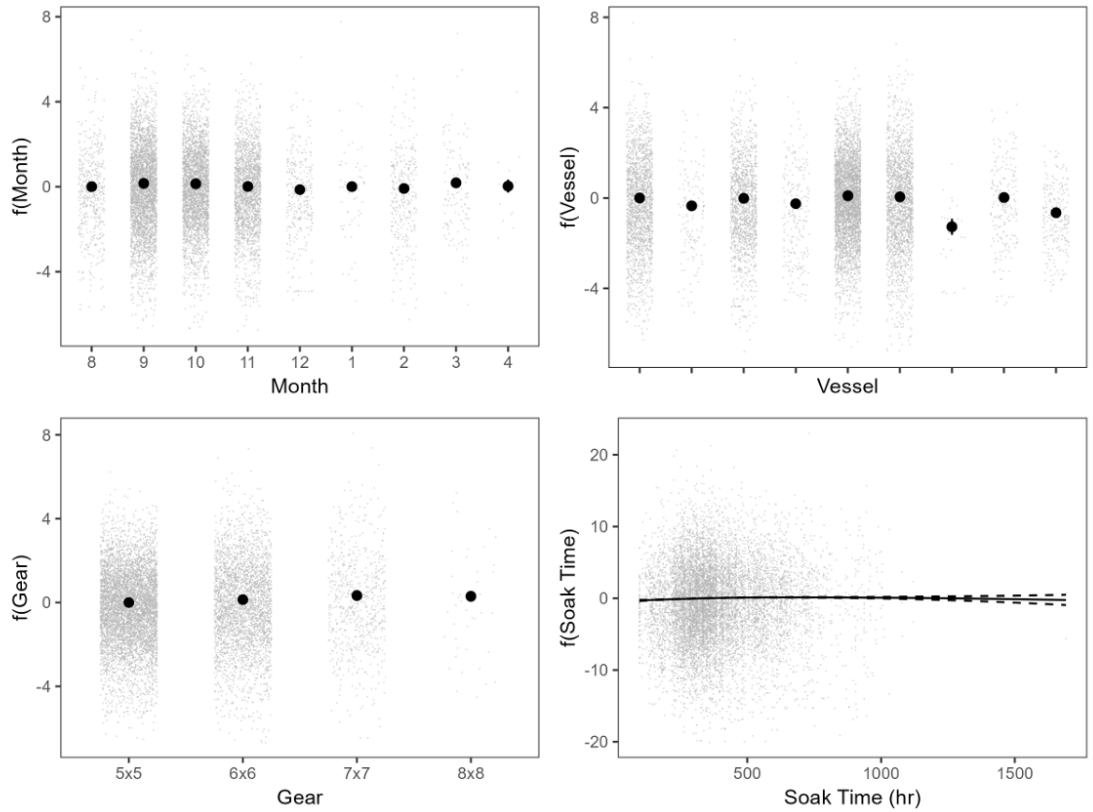
Forward and backward selection Tweedie GAM

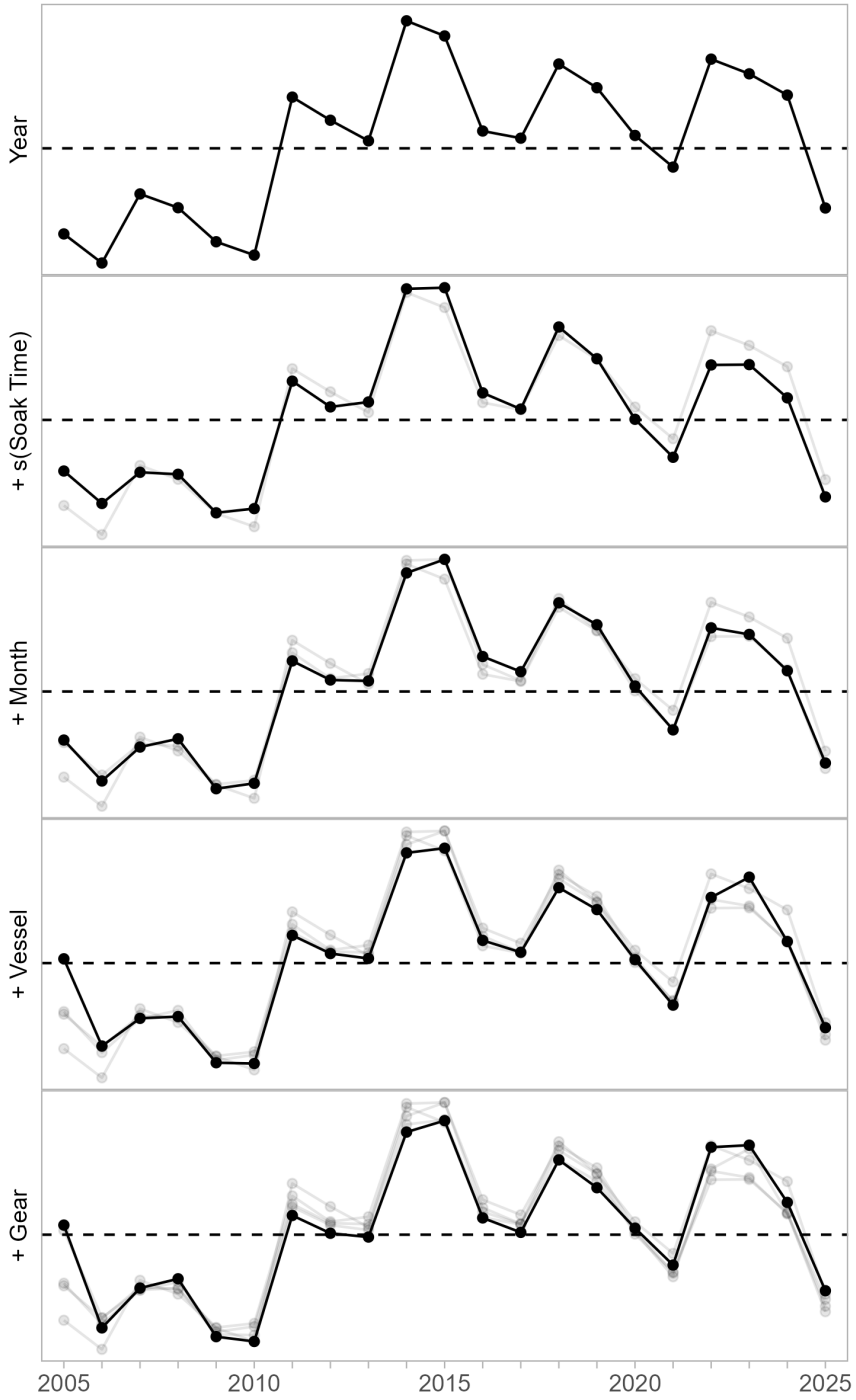
CPUE ~ Year +

- Pot Size
- Month
- Vessel
- Permit Holder (~Captain)
- s(depth)
- s(slope)
- s(soak time)

EAG Post-Rat GAM

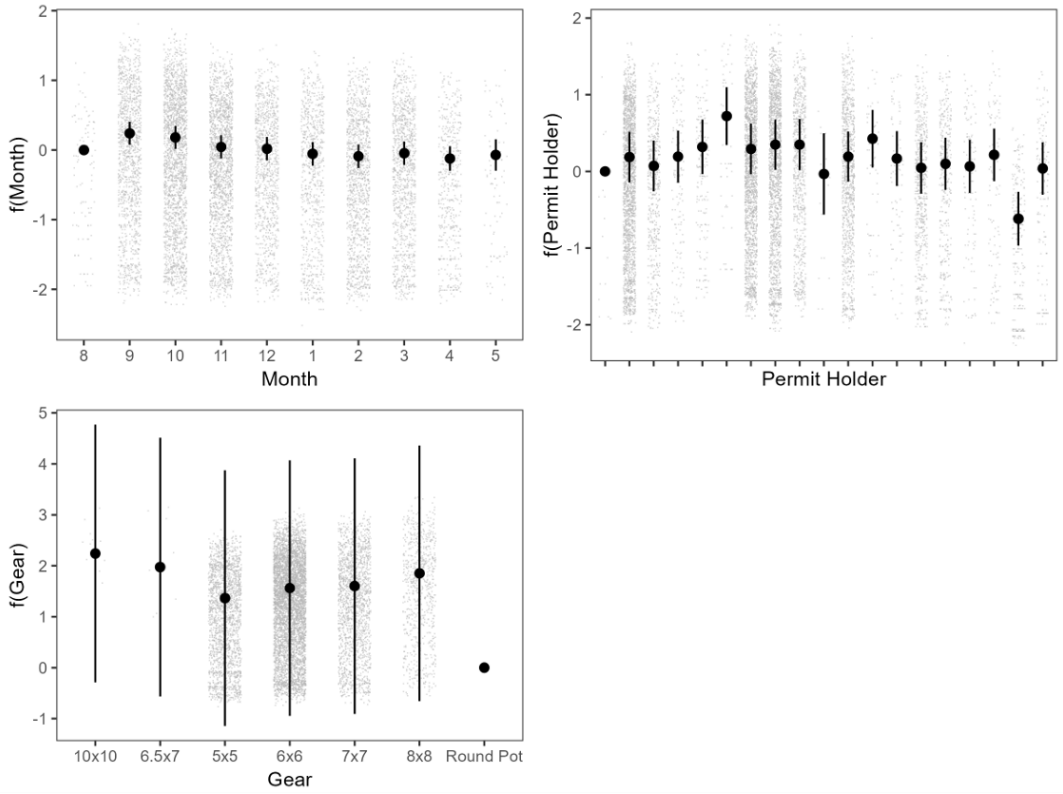
Form ($p = 1.385$)	Residual DF (Δ DF)	AIC (Δ AIC)	R^2 (Δ R^2)
Yr + s(soak time, 4.44) + Mon + Ves + Gr	10,824.73	94,999	0.14
+ s(depth)	-4.02	15.54	0.002
+ s(slope)	-3.08	7.27	0.002
+ Block	-3.00	23.58	0.001
- Permit Holder	-13.4	26	0.008

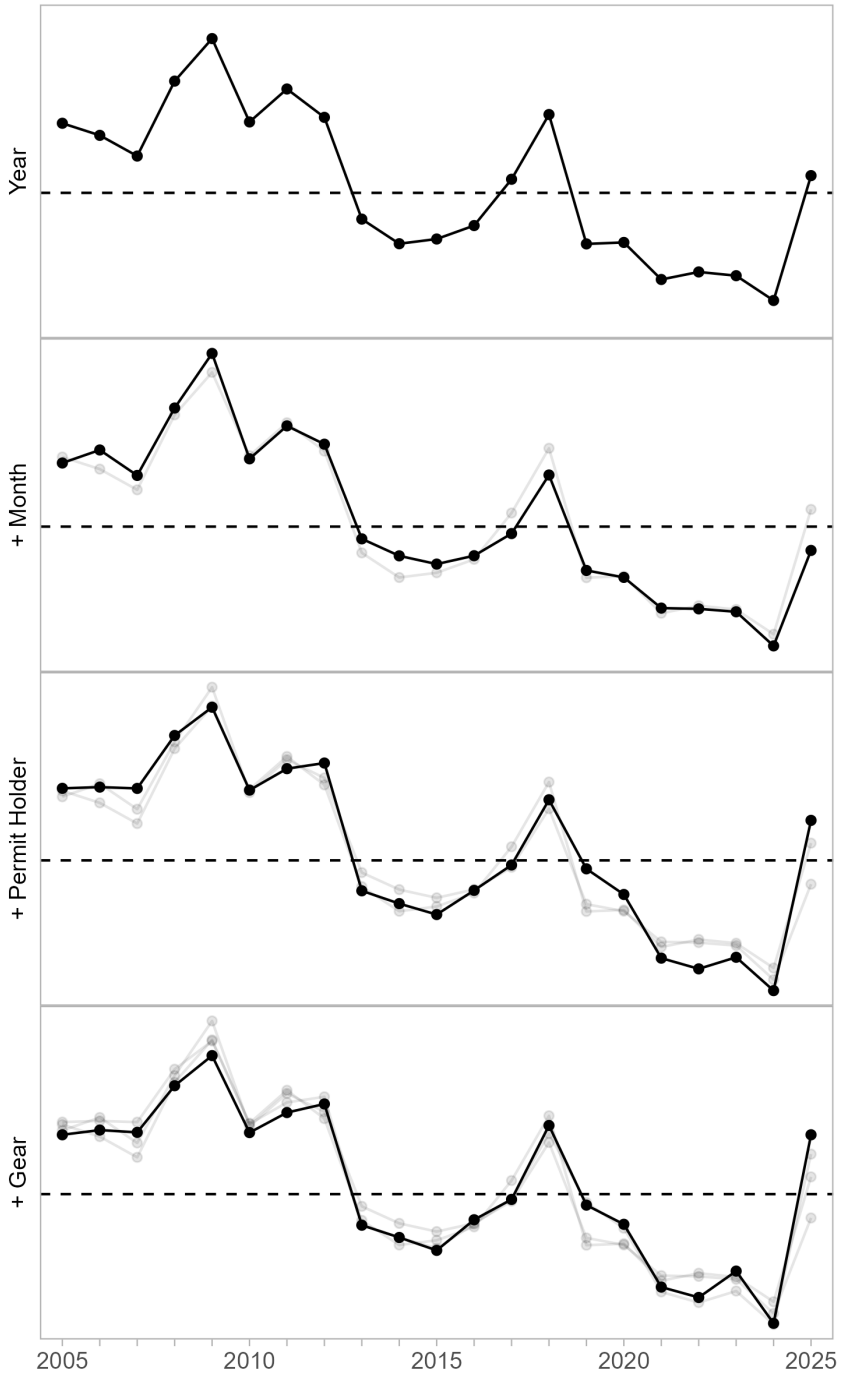




WAG Post-Rat GAM

Form ($p = 1.495$)	Residual DF (Δ DF)	AIC (Δ AIC)	R^2 (Δ R^2)
Yr + Mo + PH + Gr	18,008	142,306	0.097
+ s(soak time)	-8.01	-27.53	0.005
+ s(depth)	-4.17	-33.85	0.003
+ s(slope)	-2.98	4.17	0.001
+ Block	-5.00	16.10	0.002
- Vessel	-3	18.66	0.000





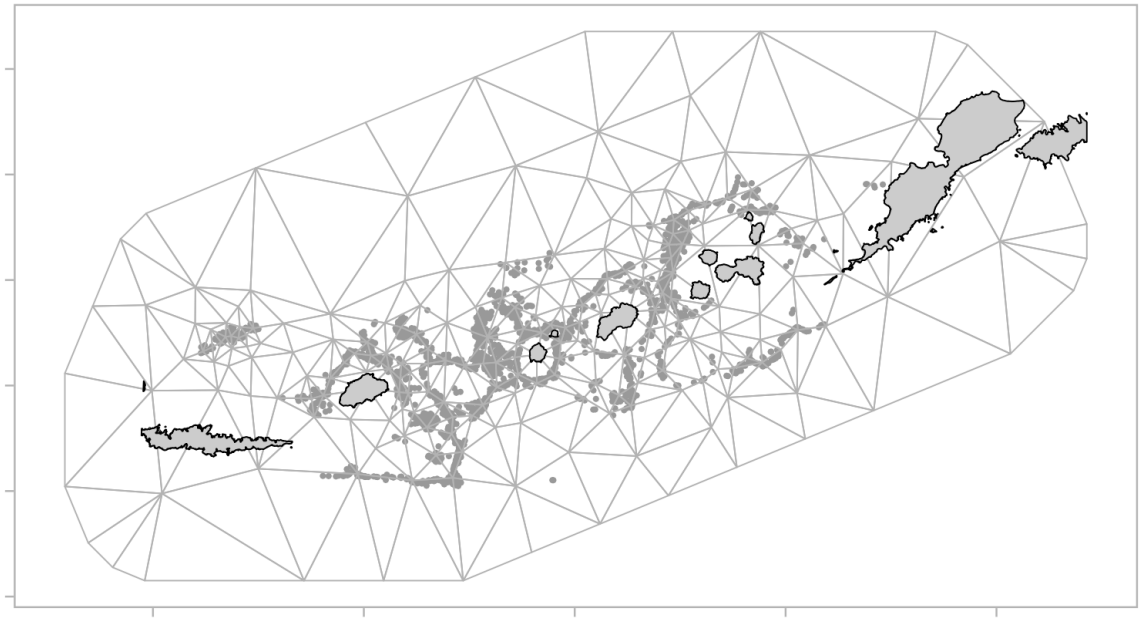
Spatiotemporal CPUE Standardization

Tweedie GLMM *sdmTMB*

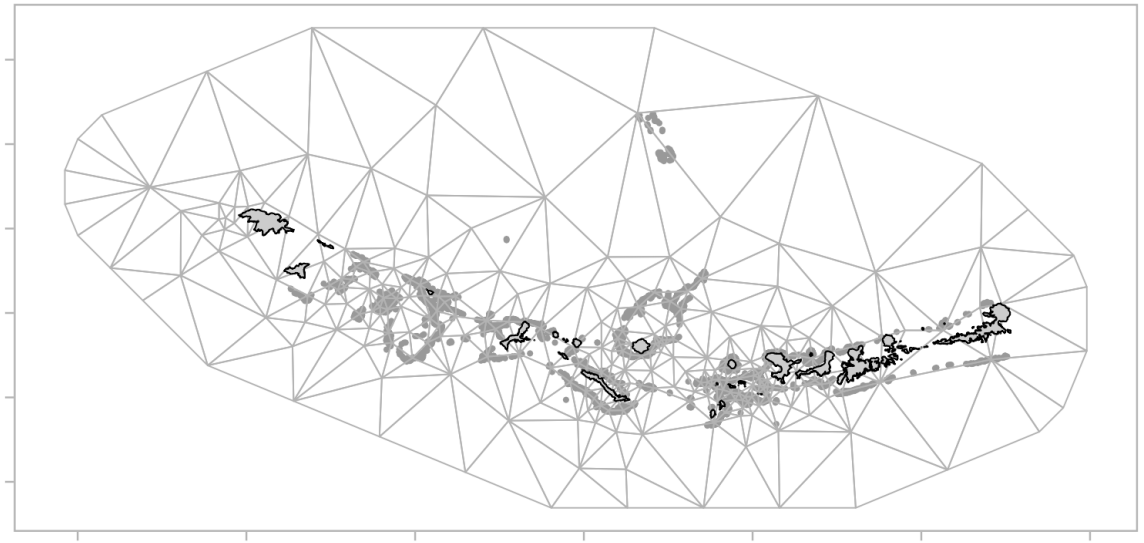
CPUE ~ Year + Pot Size + s(soak time) + s(depth) + (1 | Vessel)

Fit full time series instead of pre- and post-rationalization

EAG

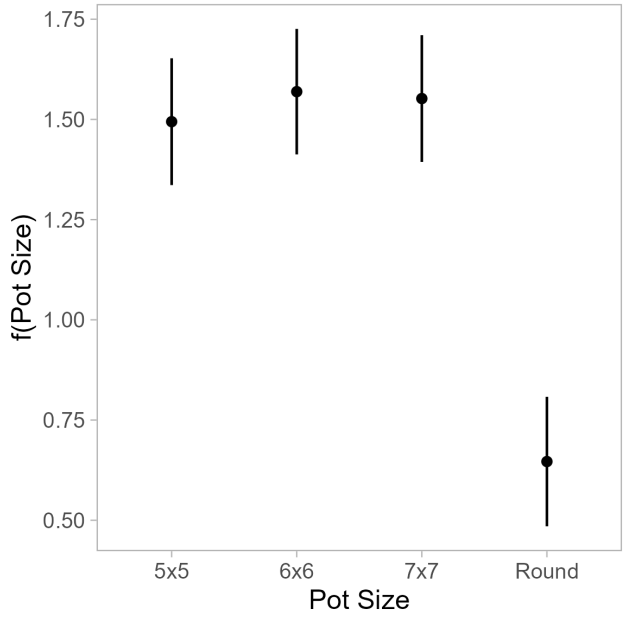


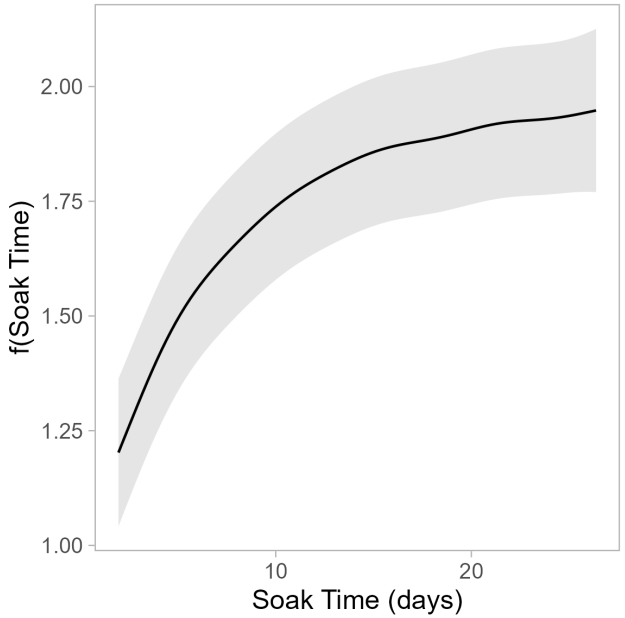
WAG

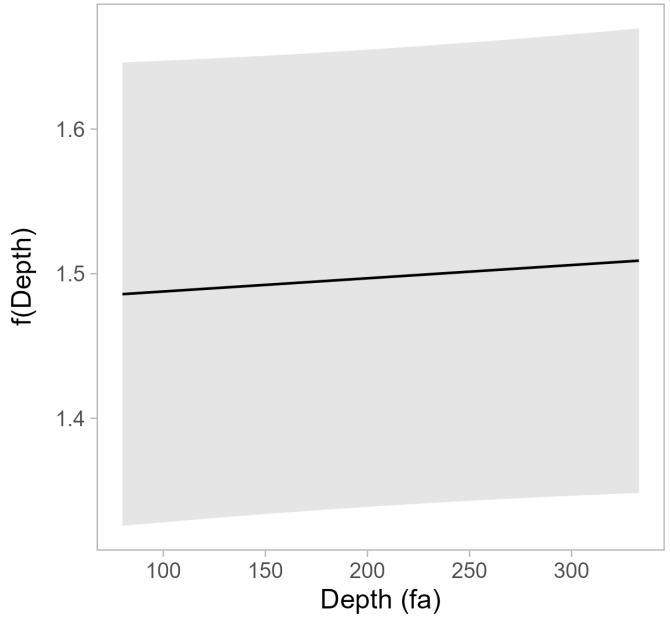


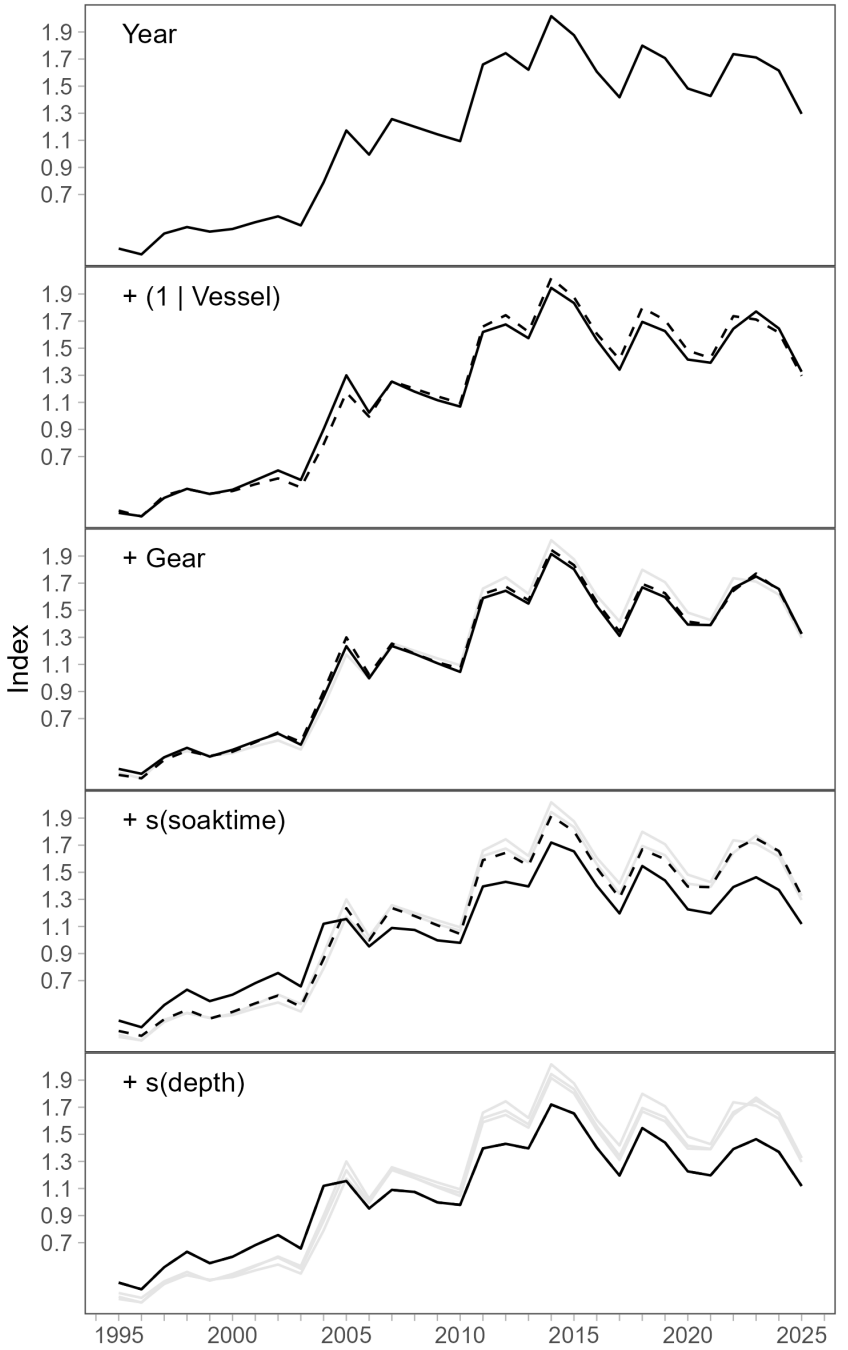
Barrier mesh computed by kmeans w/ 150 knots based on UTM coordinate in zone specific to EAG and WAG

EAG

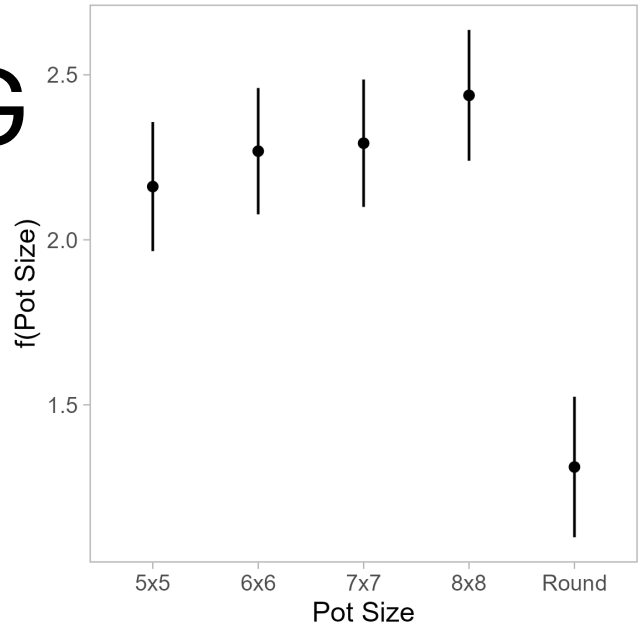

f(Pot Size)
1.75
1.50
1.25
1.00
0.75
0.50
5x5
6x6
7x7
Round
Pot Size

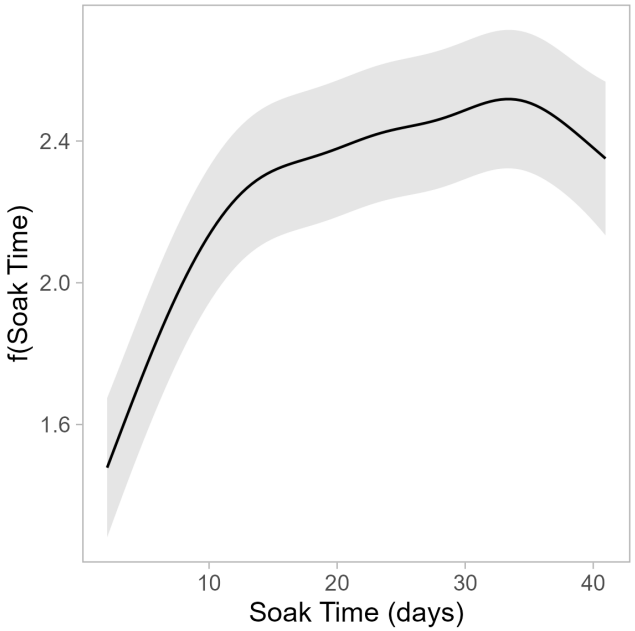

f(Soak Time)
2.00
1.75
1.50
1.25
1.00
10
20
Soak Time (days)

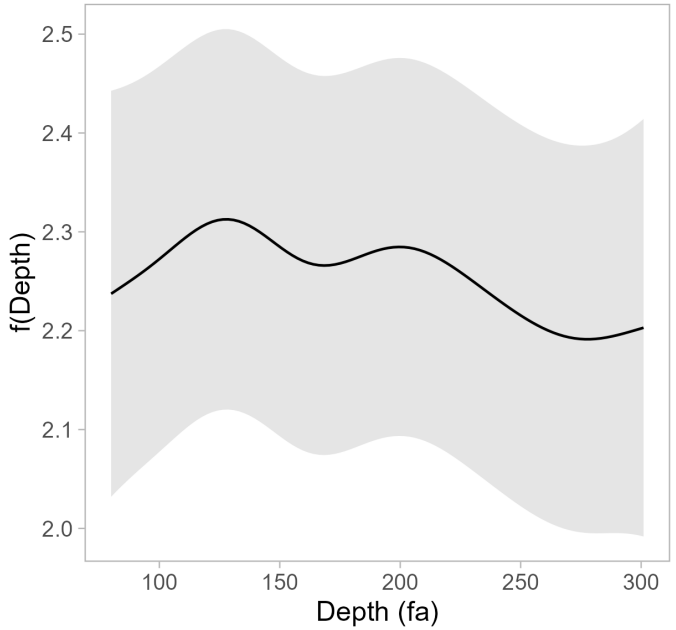

f(Depth)
1.6
1.5
1.4
100
150
200
250
300
Depth (fa)

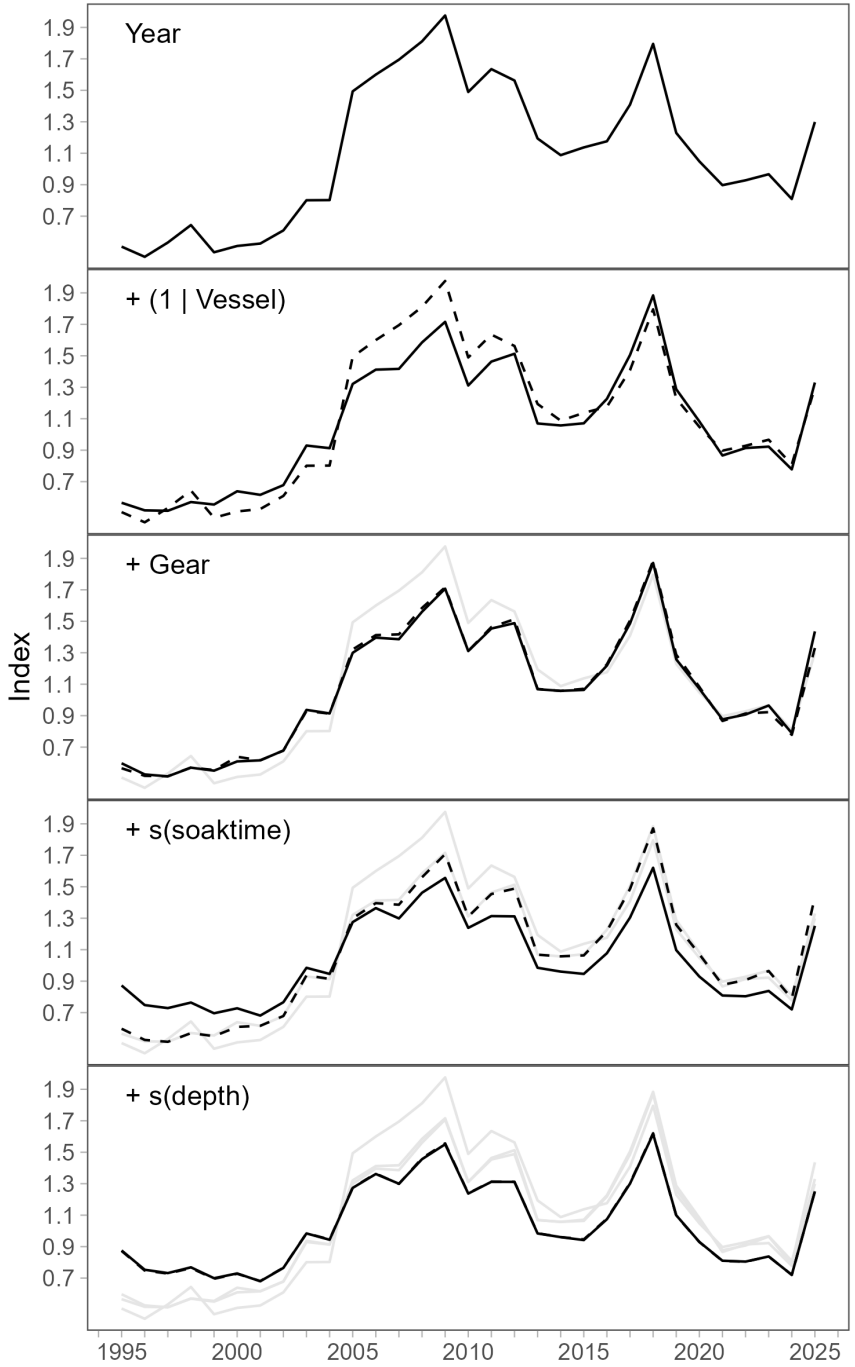

Year
+ (1 | Vessel)
+ Gear
+ s(soaktime)
+ s(depth)
Index
1.9
1.7
1.5
1.3
1.1
0.9
0.7
1995
2000
2005
2010
2015
2020
2025

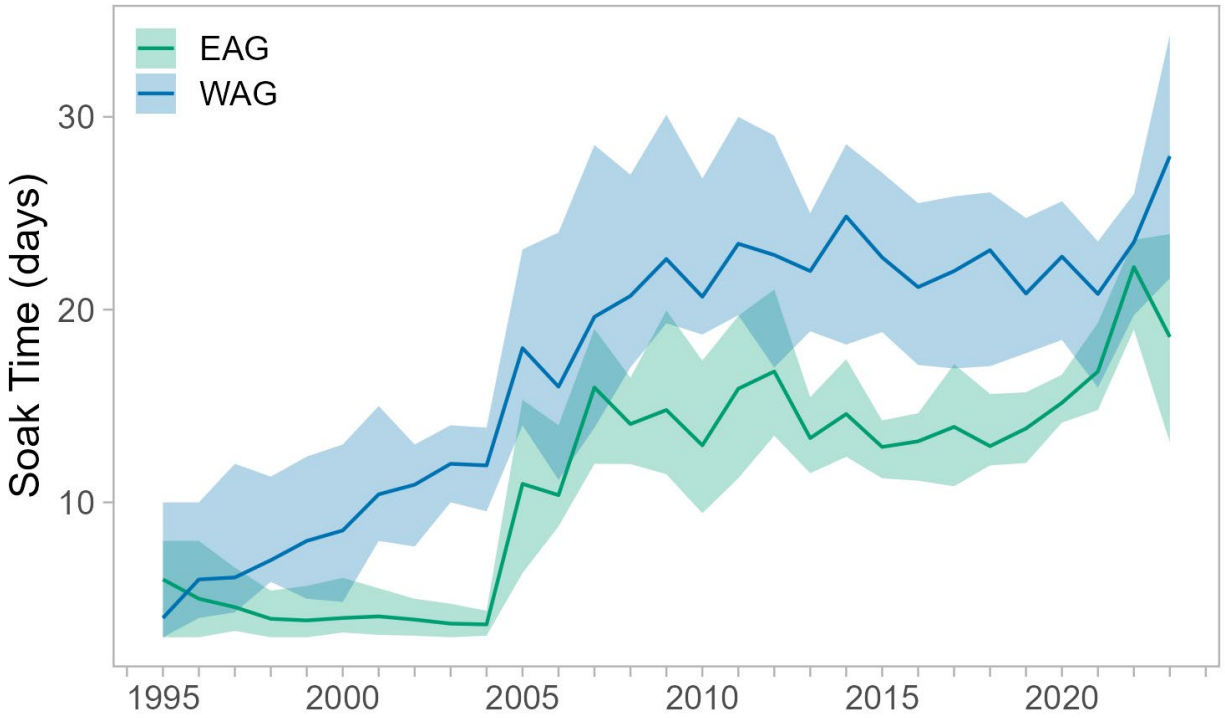
WAG

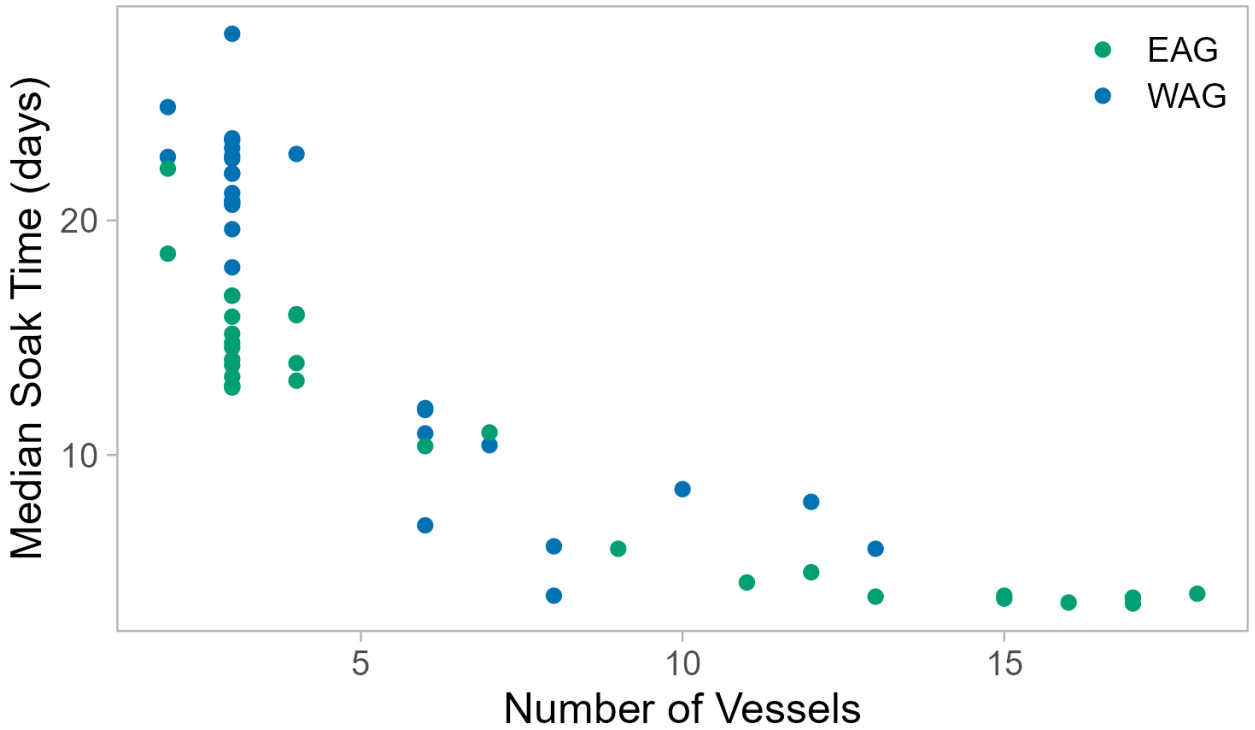

f(Pot Size)
2.5
2.0
1.5
5x5
6x6
7x7
8x8
Round
Pot Size


f(Soak Time)
2.4
2.0
1.6
10
20
30
40
Soak Time (days)


f(Depth)
2.5
2.4
2.3
2.2
2.1
2.0
100
150
200
250
300
Depth (fa)

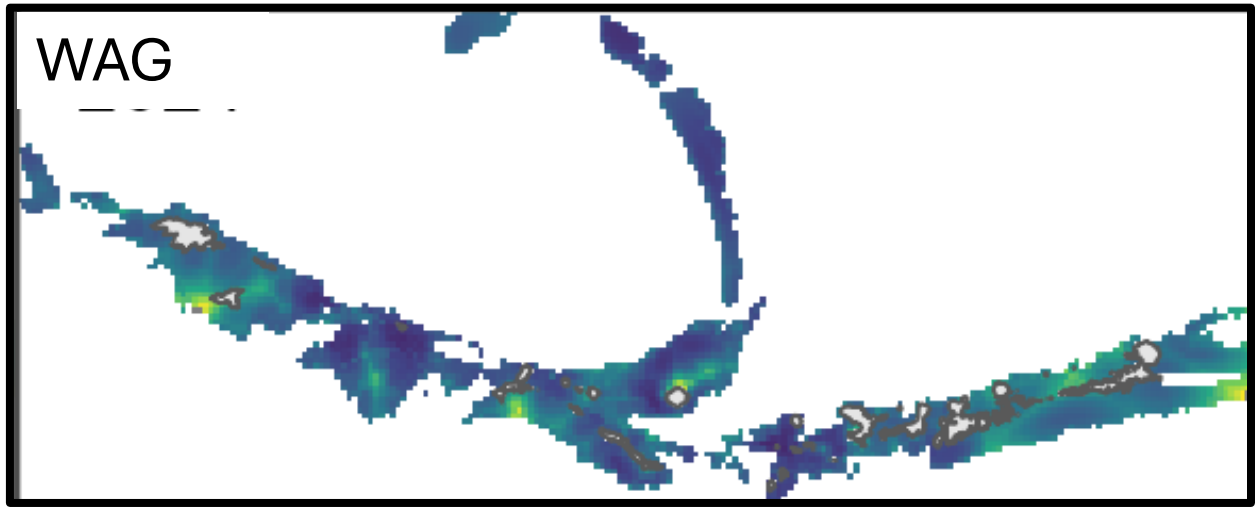

Year
+ (1 | Vessel)
+ Gear
+ s(soaktime)
+ s(depth)
Index
1.9
1.7
1.5
1.3
1.1
0.9
0.7
1995
2000
2005
2010
2015
2020
2025

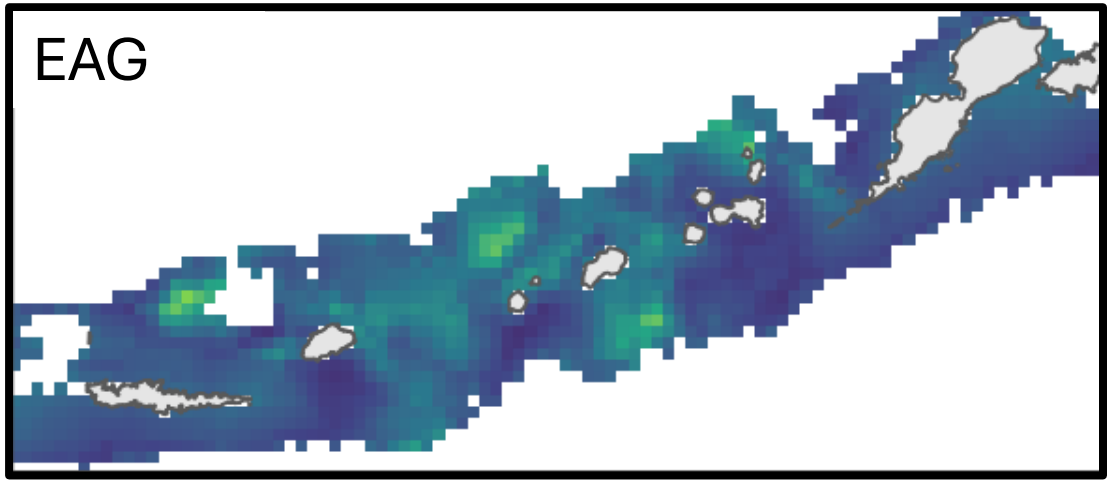

EAG
WAG
Soak Time (days)
30
20
10
1995
2000
2005
2010
2015
2020


EAG
WAG
Median Soak Time (days)
20
10
5
10
15
Number of Vessels

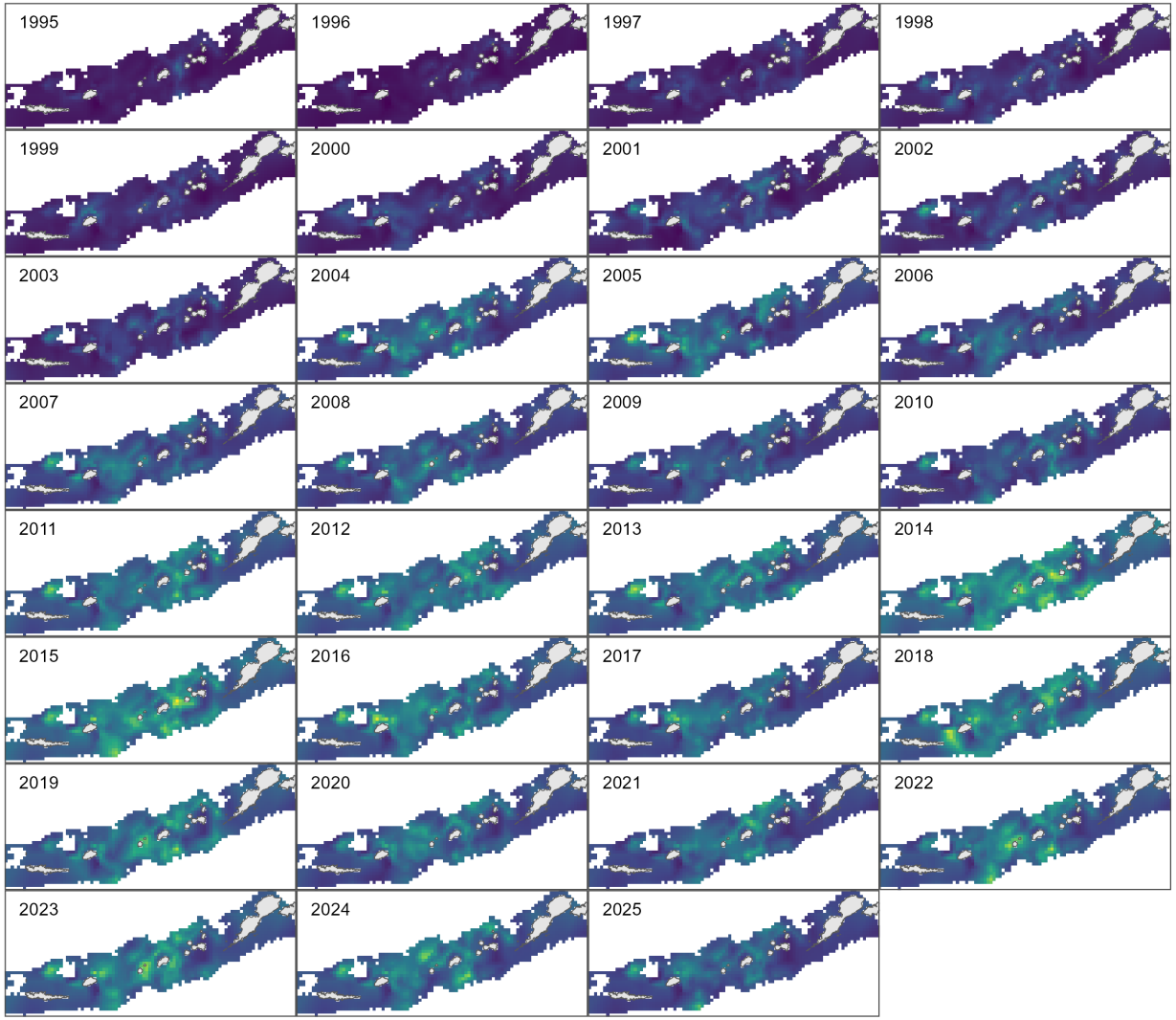
Prediction Grid

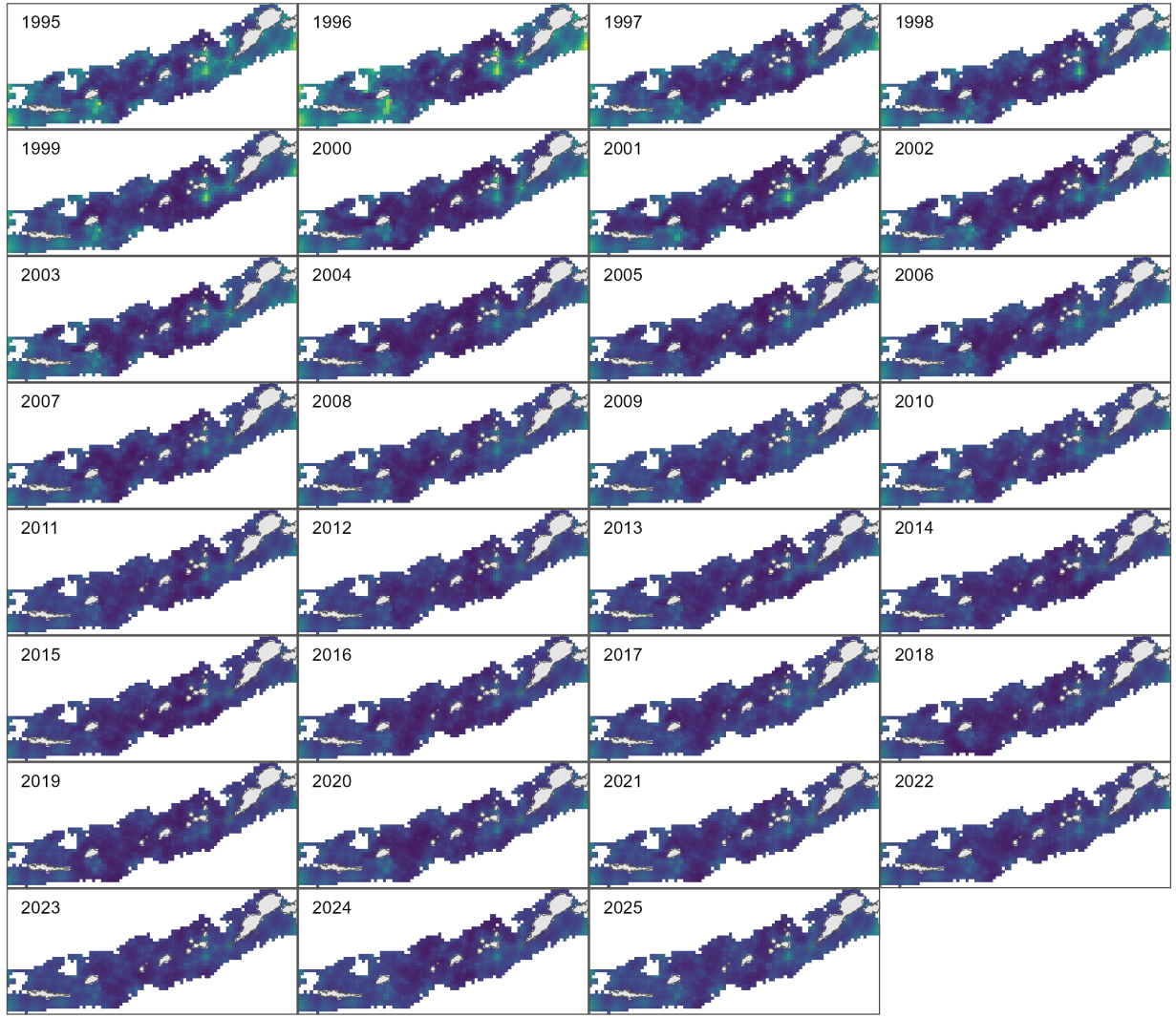
- 5 km2 grid within mesh boundary
- Depth from Aleutian Islands 100 m bathymetry (Zimmerman and Prescott 2021)
- Trimmed depths > 1.5 x max depth in observer data
- Vessel not included

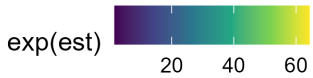


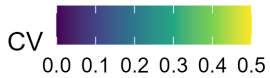


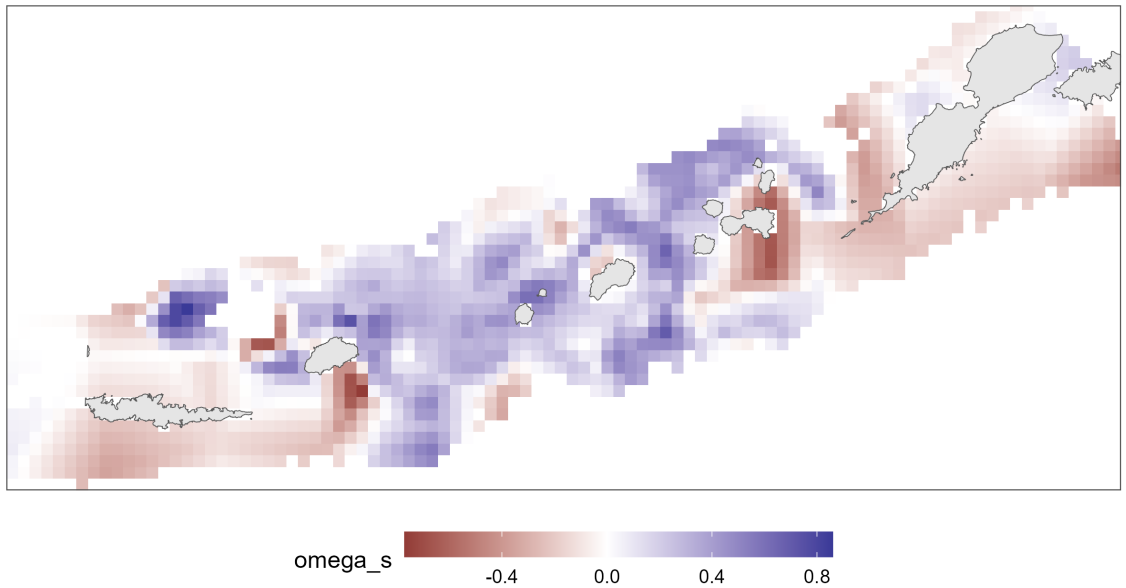
EAG Predictions

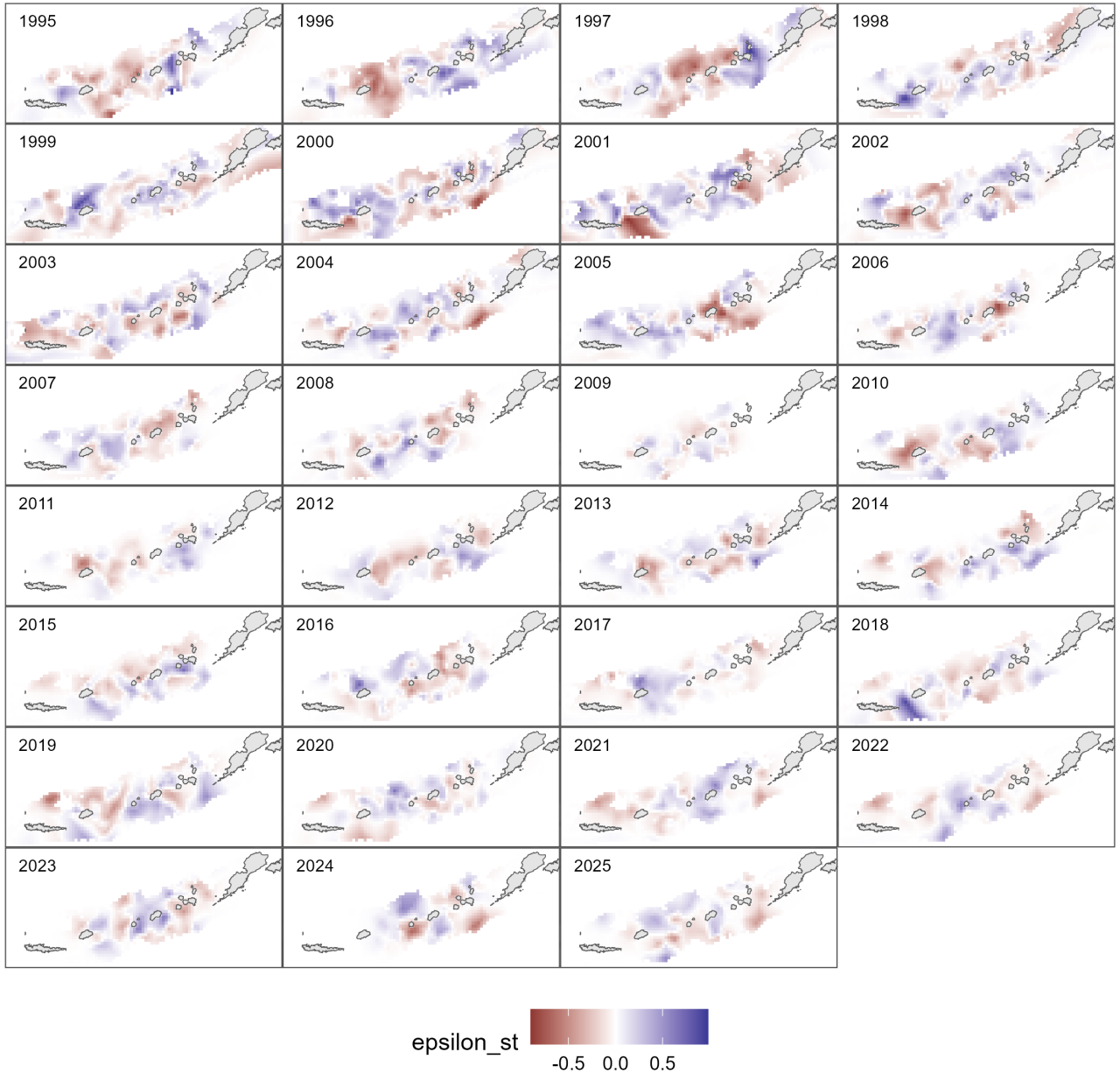









omega_s
-0.4
0.0
0.4
0.8


1995
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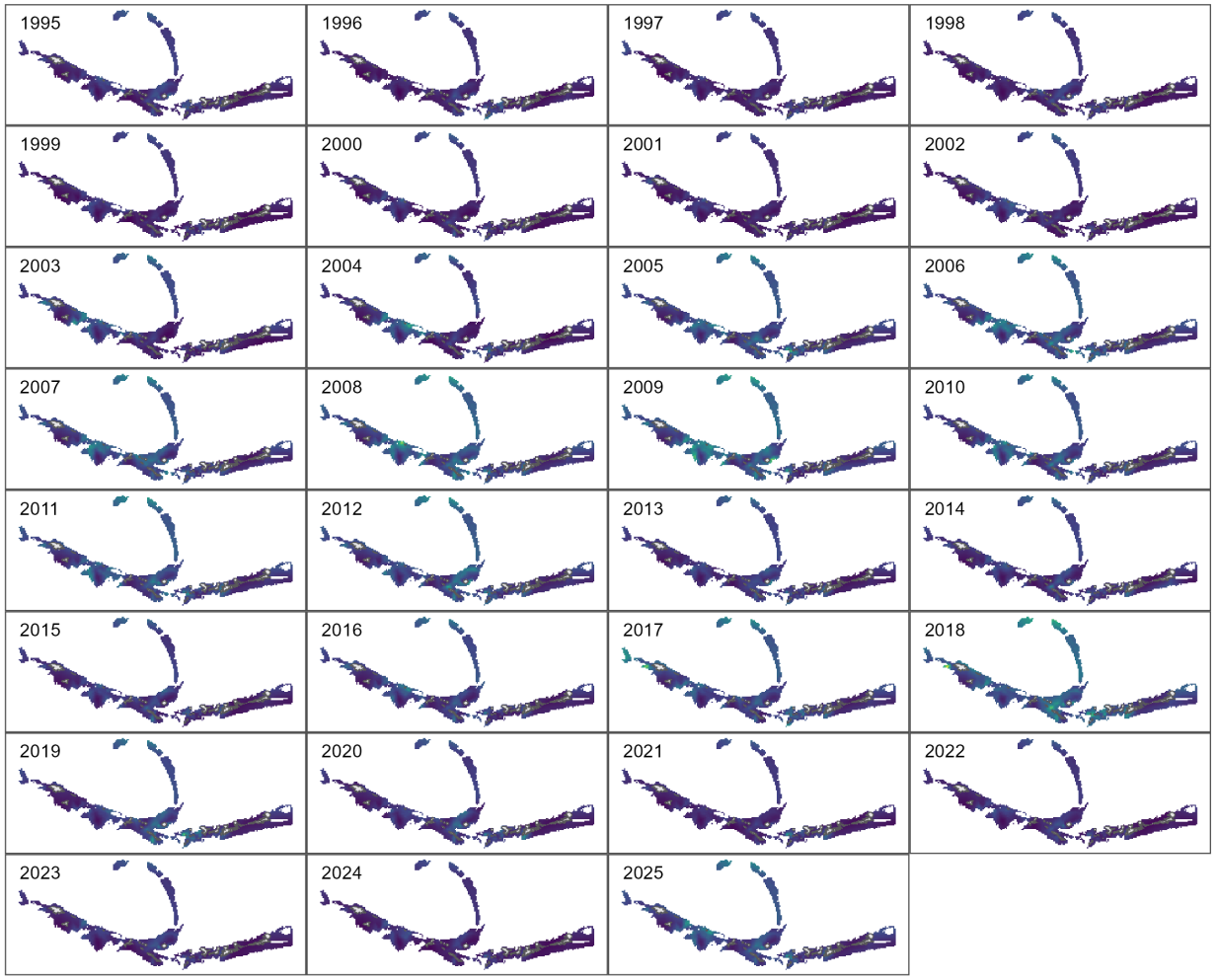
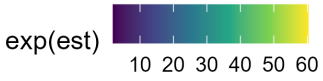
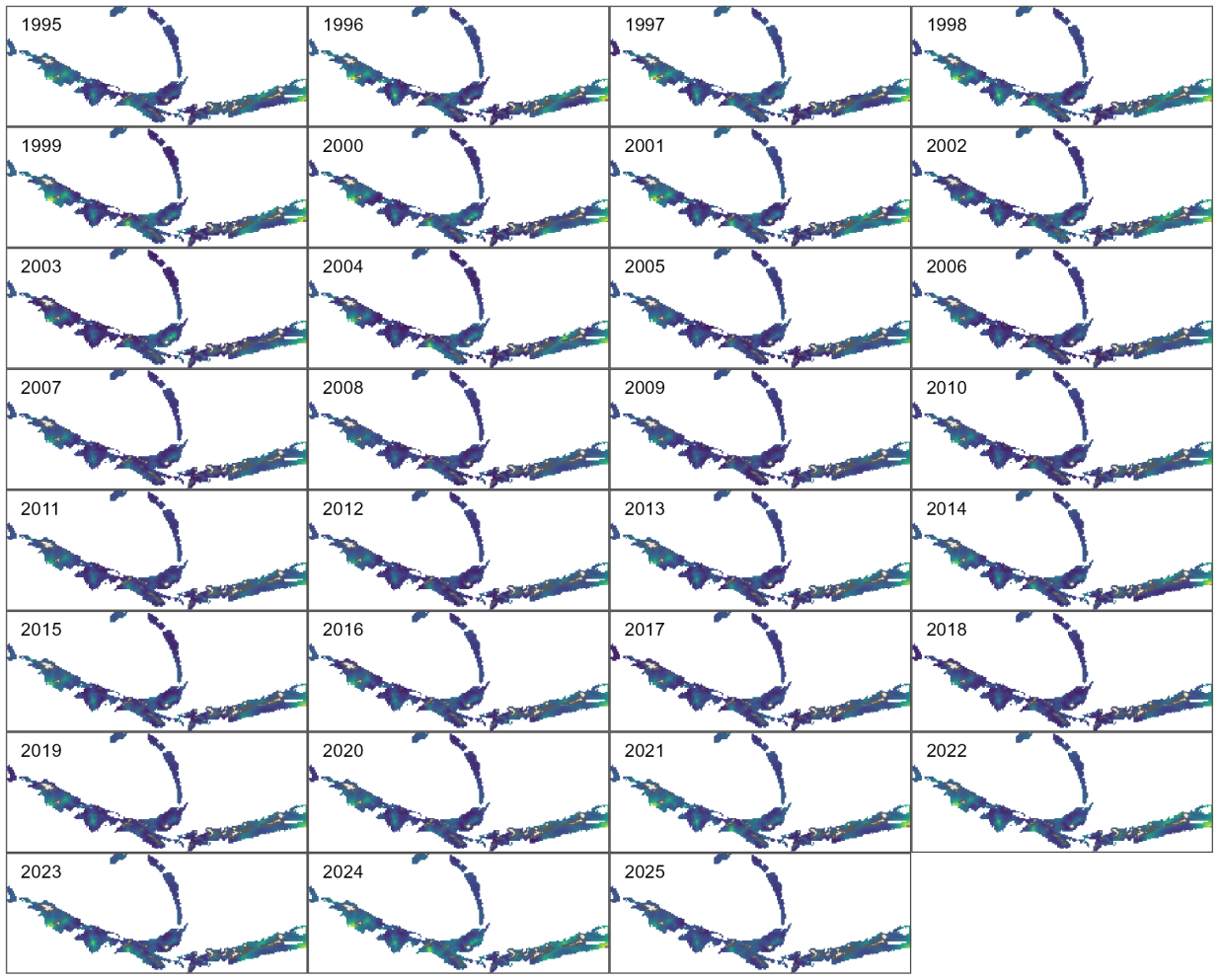
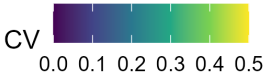
2022
2023
2024
2025
epsilon_st
-0.5
0.0
0.5

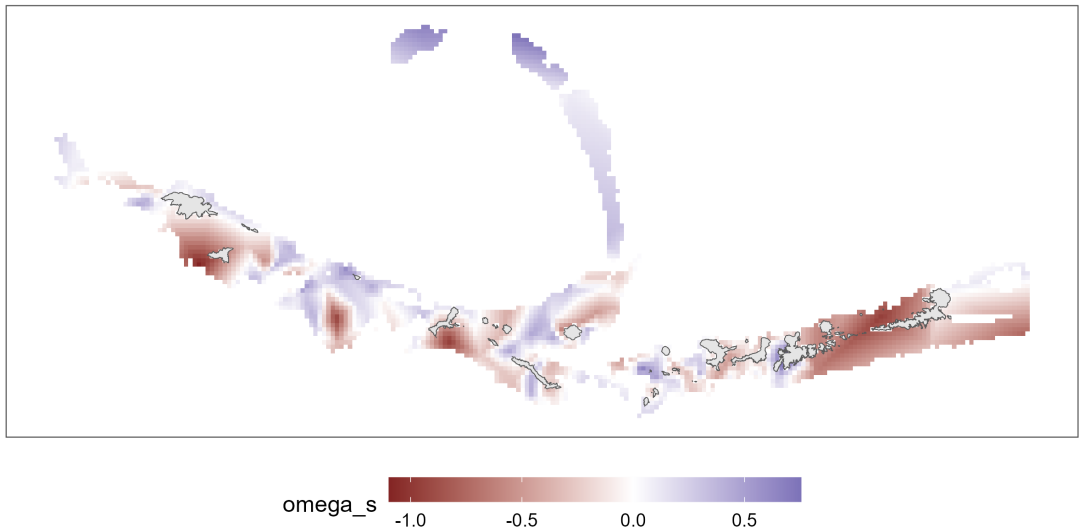
WAG Predictions

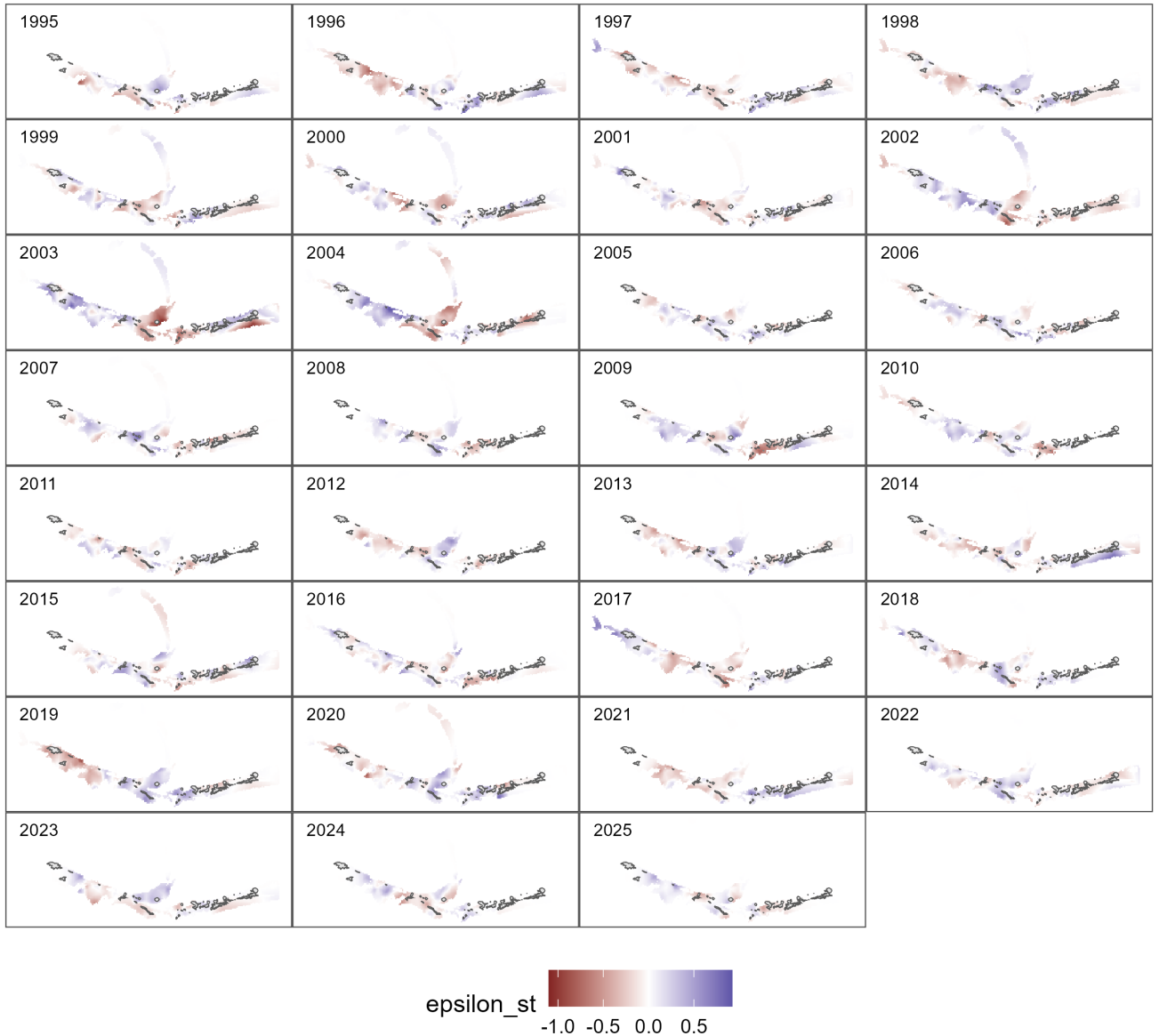









omega_s
-1.0
-0.5
0.0
0.5


1995
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2014
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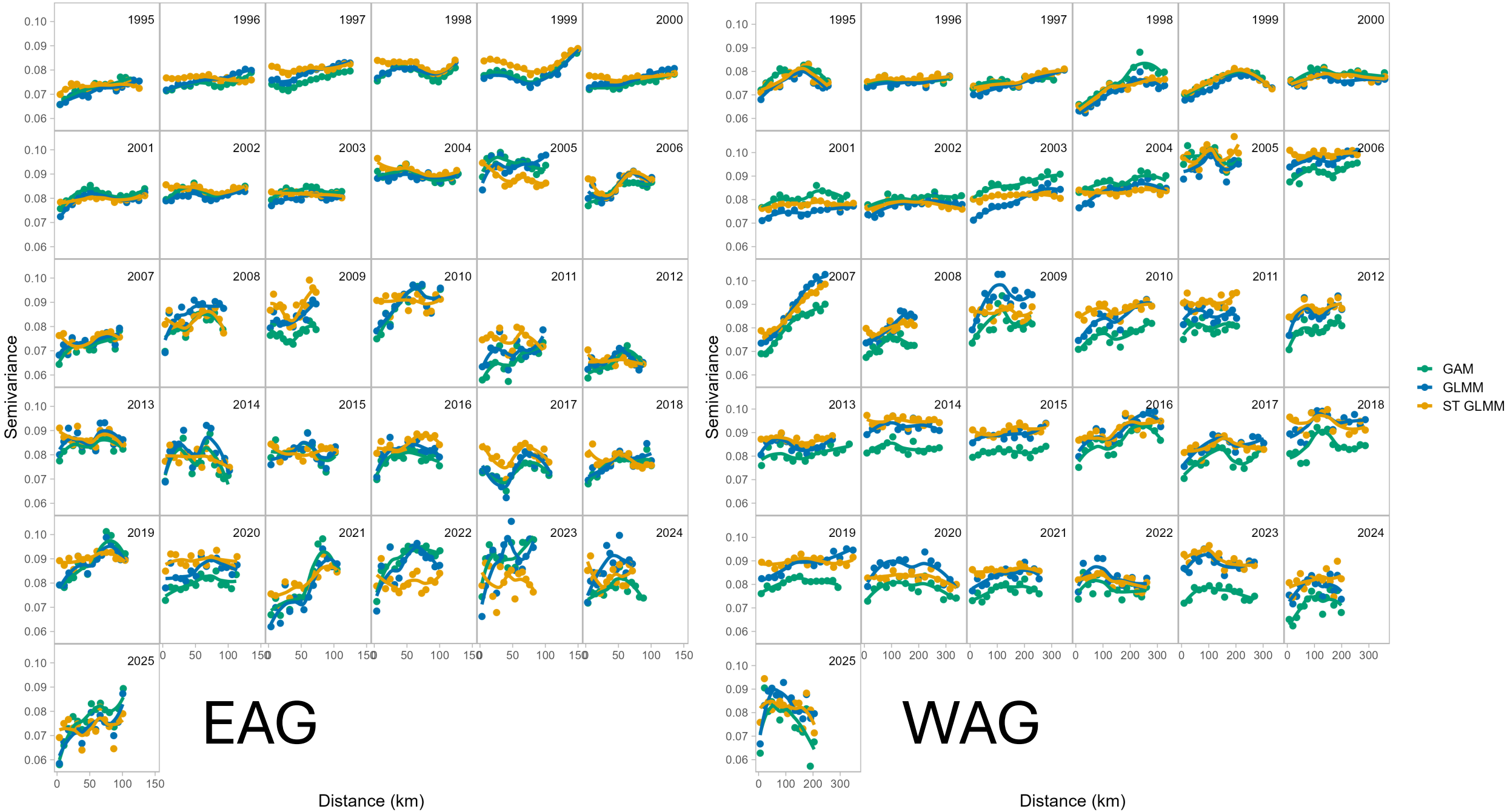
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
epsilon_st
-1.0
-0.5
0.0
0.5

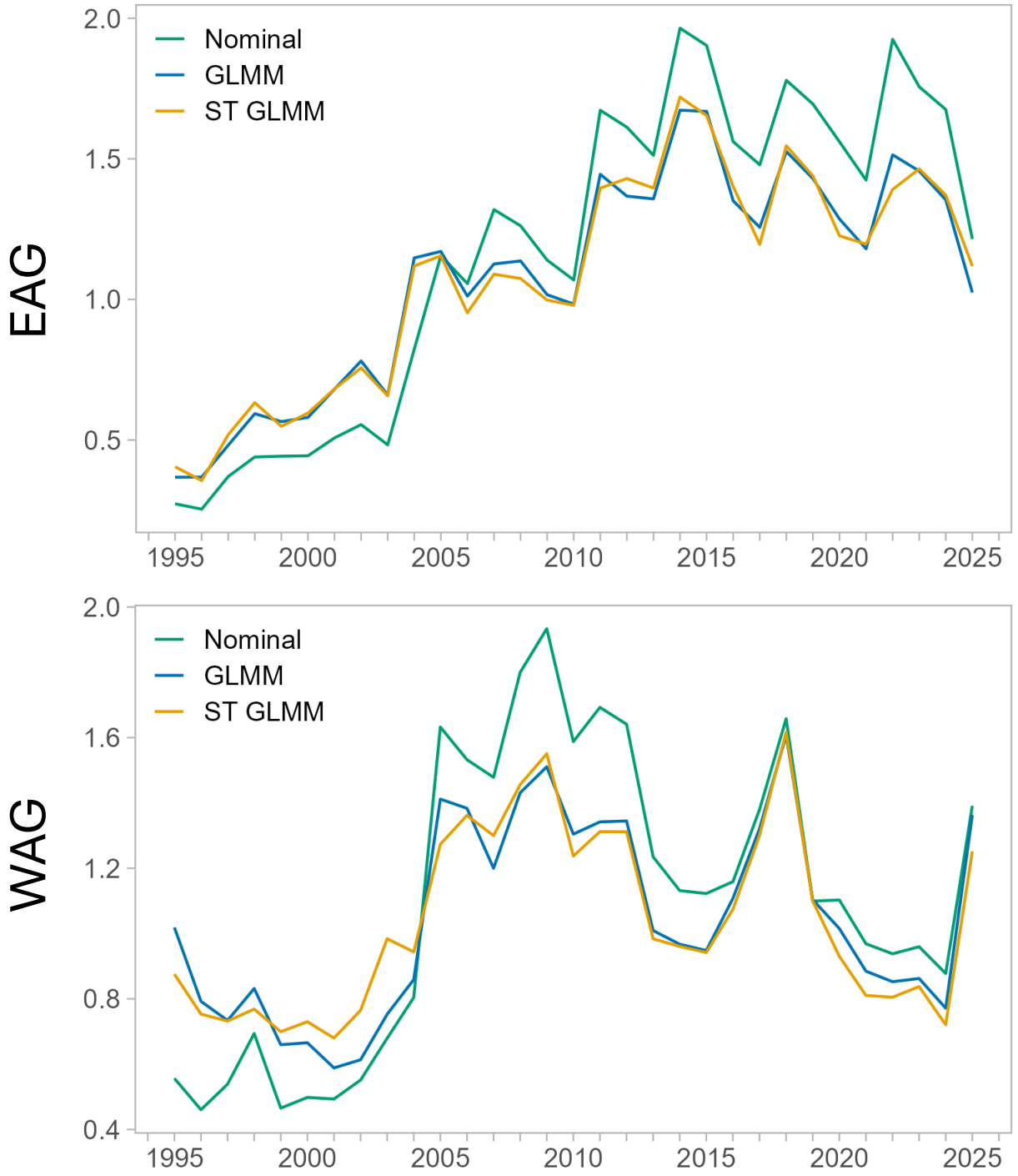
Moran's *I* (Tables A3 – A4)

ST GLMM resolved more spatial autocorrelation than GLMM and GAM

Larger Moran's *I* earlier in time series

Values low, but significant – sample sizes are large


EAG
WAG
Semivariance
Distance (km)
GAM
GLMM
ST GLMM



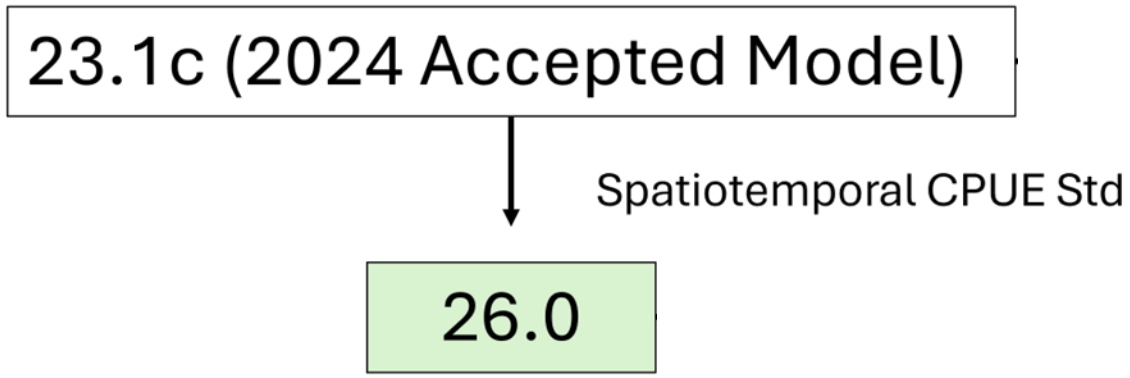
Conclusions

ST GLMM seems more suitable than GAM or GLMM

Unresolved spatial structure

- Revisit covariates?
- Model selection?

- CPUE data are re-weighted in the model….does this really even matter? (ie not really changing trend, just shift pre- post-rationalization scale)

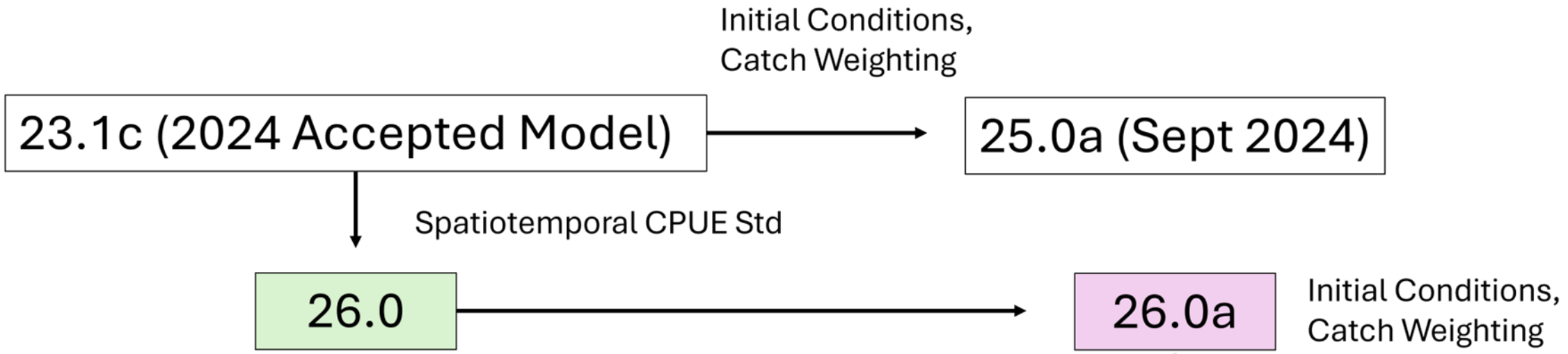


Uses ST GLMM CPUE

Time blocks on catchability corresponding to rationalization

1960-2004
2005-2025

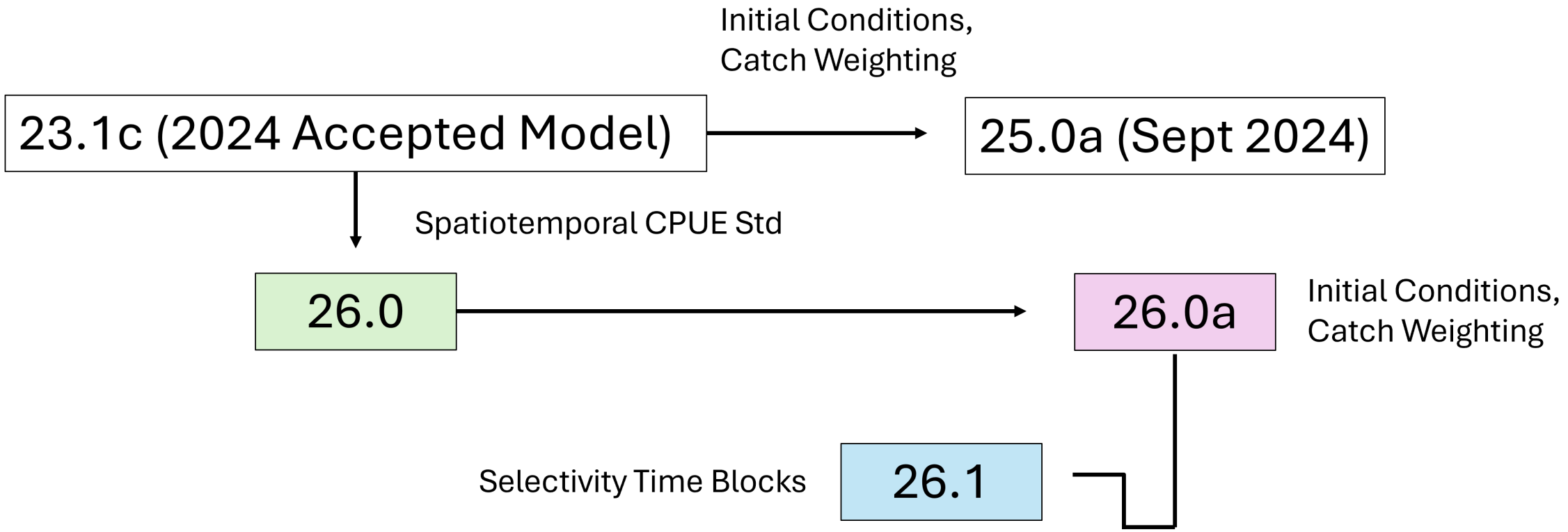
In GMACS as different data series, still having issues with blocks and catchability in retrospective analysis…



Start model in non-equilibrium conditions in 1981

- Remove 22 parameters for R_0 and 1960-1980 recruitment deviations
- Add 18 parameters for R_{init}, N at size deviations, and $\bar{R}$
- 136 – 140 mm CL as reference size class

All catch data components weighted equally (previously: retained = 4x, total = 2x, GF bycatch = 1x)



Add selectivity time blocks to post rationalization based on fleet dynamics and consolidation

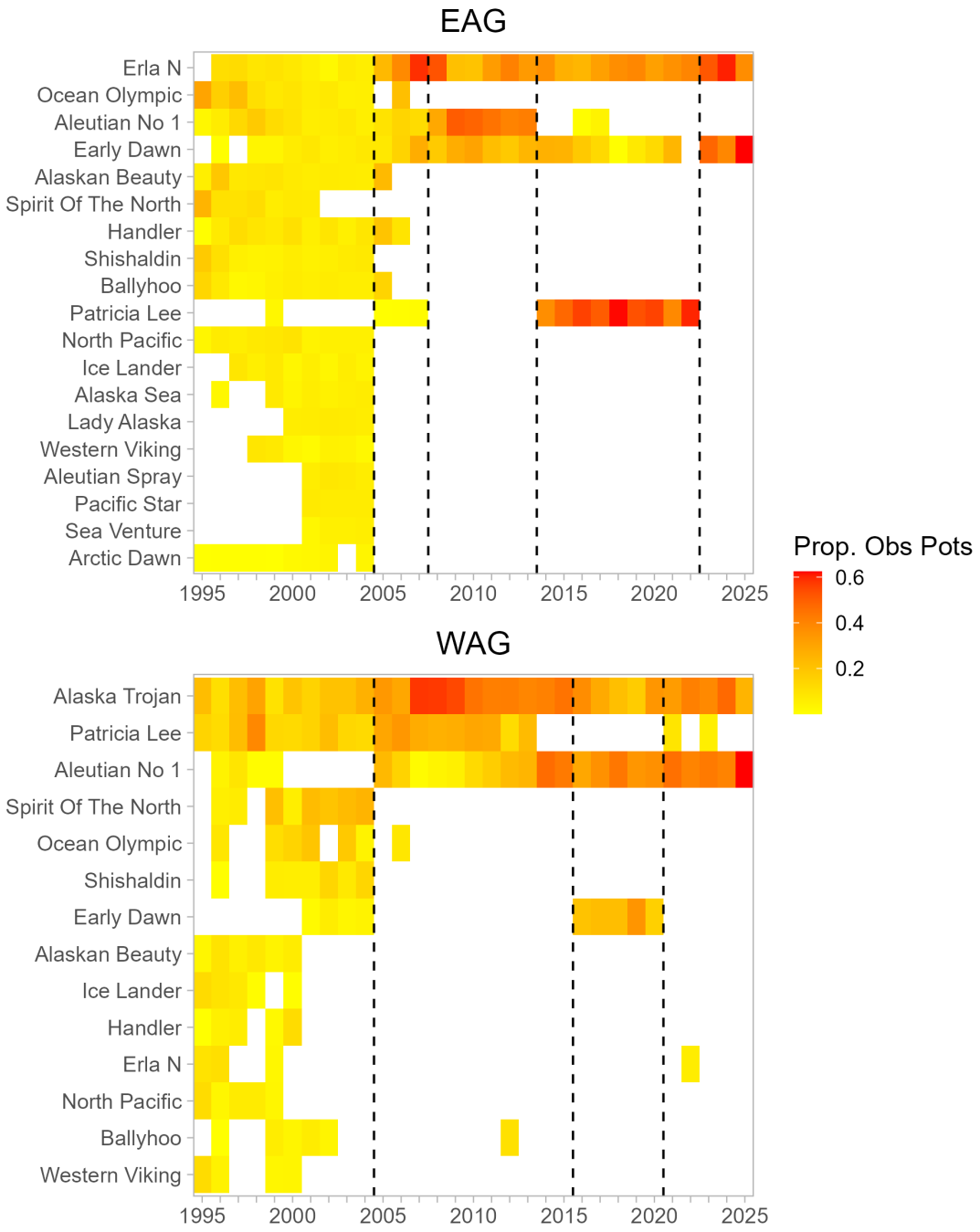
Aiming to address poor fit to index data

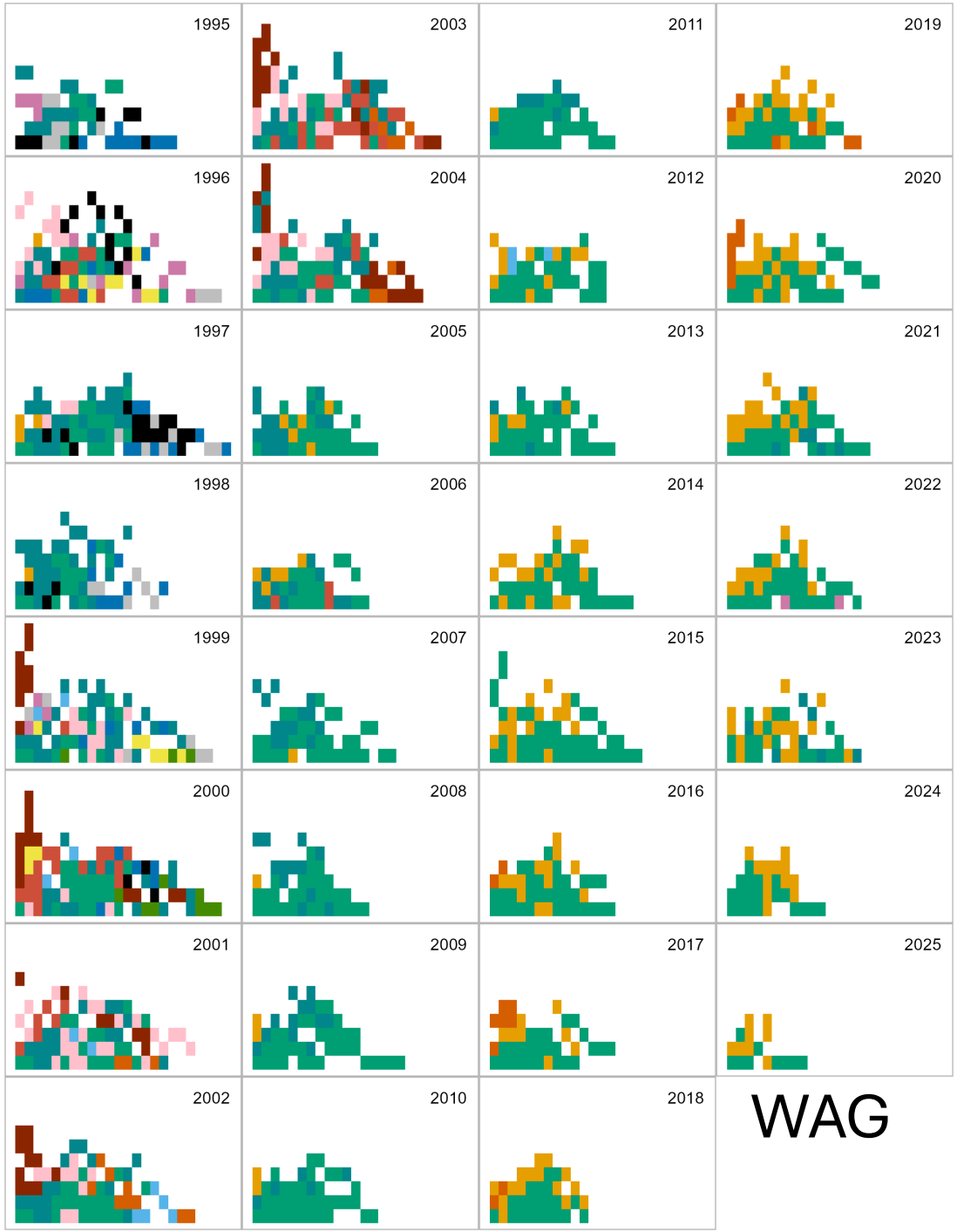
Time varying selectivity is ***likely*** result of changing fleet

Pre-rationalization = many participants, less specific/selective behavior

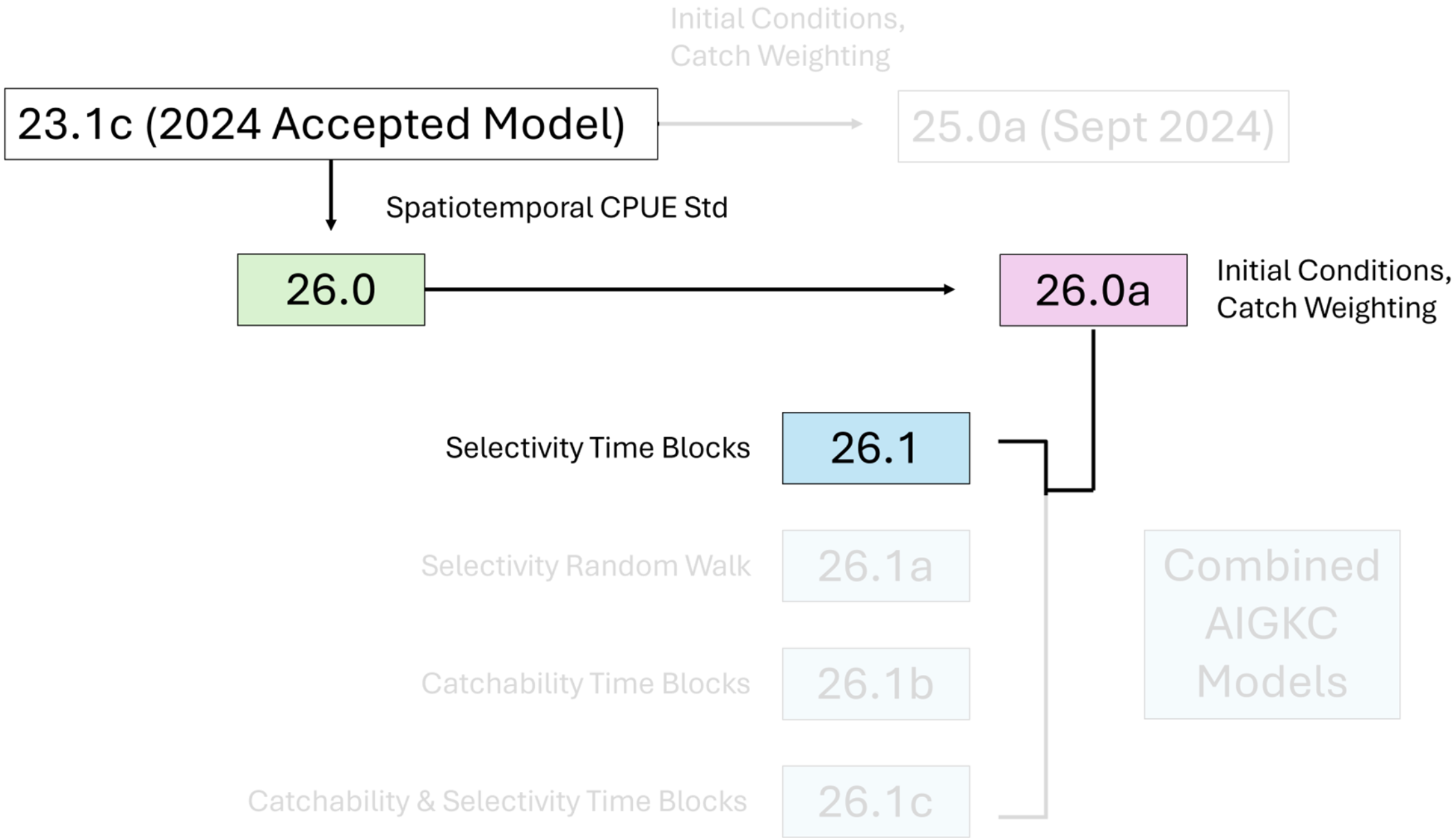
Fleet consolidation post-rationalization happened over several time blocks

EAG	WAG
2005 - 2007	2005 - 2015
2008 - 2013	2016 - 2020
2014 - 2022	2021 - 2025
2023 - 2025	




1995
2003
2011
2019
1996
2004
2012
2020
1997
2005
2013
2021
1998
2006
2014
2022
1999
2007
2015
2023
2000
2008
2016
2024
2001
2009
2017
2025
2002
2010
2018
WAG


1995
2003
2011
2019
1996
2004
2012
2020
1997
2005
2013
2021
1998
2006
2014
2022
1999
2007
2015
2023
2000
2008
2016
2024
2001
2009
2017
2025
2002
2010
2018
EAG


Initial Conditions,
Catch Weighting
23.1c (2024 Accepted Model)
25.0a (Sept 2024)
Spatiotemporal CPUE Std
26.0
26.0a
Initial Conditions,
Catch Weighting
Selectivity Time Blocks
26.1
Selectivity Random Walk
26.1a
Catchability Time Blocks
26.1b
Catchability & Selectivity Time Blocks
26.1c
Combined
AIGKC
Models

Jittering

$$\theta_0 = \begin{cases} \theta_{\text{init}} + \varepsilon \cdot (\theta_{\text{ub}} - \theta_{\text{init}}) \cdot \dfrac{\sigma_J}{4} & \text{if } \varepsilon > 0 \\ \theta_{\text{init}} + \varepsilon \cdot (\theta_{\text{init}} - \theta_{\text{lb}}) \cdot \dfrac{\sigma_J}{4} & \text{if } \varepsilon \leq 0 \end{cases}$$

$\sigma_J = 0.3$

(Table 18)

	Model	Objective Function	Δ NLL	Catch	Index	Size	MMB_{proj}	$B_{35\%}$	Max. Gradient	N
EAG	23.1c	3,071.105	0.000	-488.770	-488.770	-489	6,406	6,630	1.17e-04	72
		3,109.156	38.051	-472.580	-472.580	-473	6,184	7,136	1.70e-04	7
									NA	21
EAG	26.0	3,061.499	0.000	-488.410	-488.410	-488	6,412	6,659	8.88e-05	83
									NA	17
EAG	26.0a	3,076.269	0.000	-487.940	-487.940	-488	6,680	6,687	9.72e-05	85
		3,211.518	135.249	-489.190	-489.190	-489	6,561	6,592	1.95e-02	2
									NA	13
EAG	26.1	3,104.952	0.000	-488.150	-488.150	-488	6,774	6,590	8.69e-05	89
									NA	11

Jittering

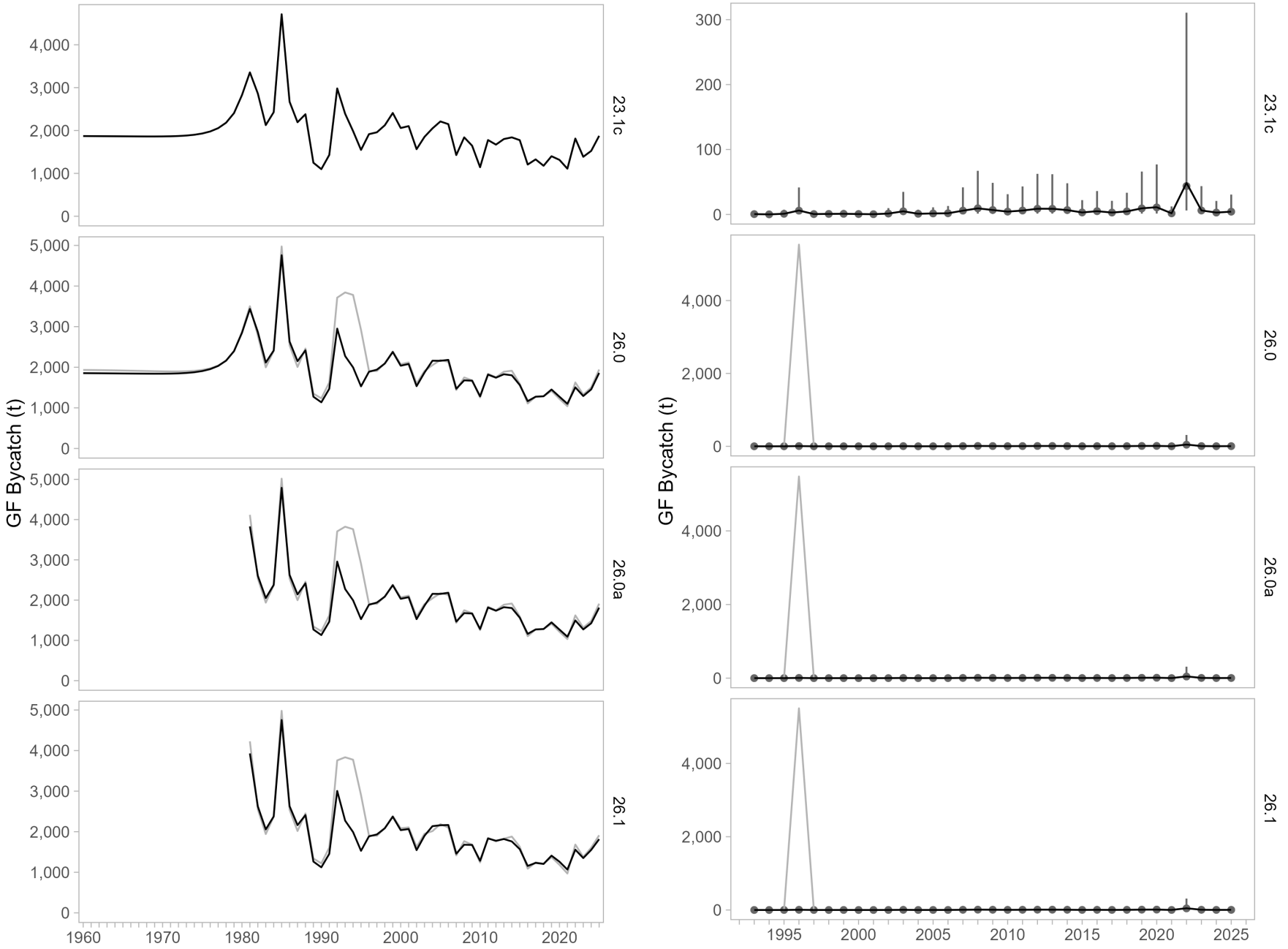
	Model	Objective Function	Δ NLL	Catch	Index	Size	MMB_{proj}	$B_{35\%}$	Max. Gradient	N
WAG	23.1c	3,261.705	0.000	-467.100	-467.100	-467	4,279	4,488	1.50e-05	52
		3,264.779	3.074	-449.520	-449.520	-450	4,420	4,921	1.45e-04	18
		3,269.614	7.909	-465.410	-465.410	-465	4,277	4,436	1.64e-04	6
									NA	24
WAG	26.0	3,213.291	0.000	-445.160	-445.160	-445	4,157	4,863	9.11e-05	23
		3,214.694	1.404	-460.500	-460.500	-460	4,035	4,477	1.41e-05	57
									NA	20
WAG	26.0a	3,264.626	0.000	-445.540	-445.540	-446	4,126	4,852	8.91e-05	40
		3,265.831	1.205	-461.010	-461.010	-461	3,990	4,470	6.58e-05	45
		3,346.922	82.296	-445.710	-445.710	-446	4,040	4,801	6.65e-02	1
		3,348.546	83.920	-461.280	-461.280	-461	3,905	4,410	2.87e-02	1
		3,609.860	345.234	-374.070	-374.070	-374	3,738	4,255	6.38e-04	2
									NA	11
WAG	26.1	3,276.748	0.000	-446.720	-446.720	-447	4,171	4,840	2.39e-04	21
		3,278.601	1.853	-462.060	-462.060	-462	4,075	4,462	1.17e-04	65
		3,363.736	86.988	-446.680	-446.680	-447	4,063	4,786	8.22e-04	2
		3,366.019	89.271	-462.140	-462.140	-462	3,973	4,401	1.23e-02	1
		3,634.549	357.801	-374.930	-374.930	-375	3,878	4,251	1.28e-03	2
									NA	9

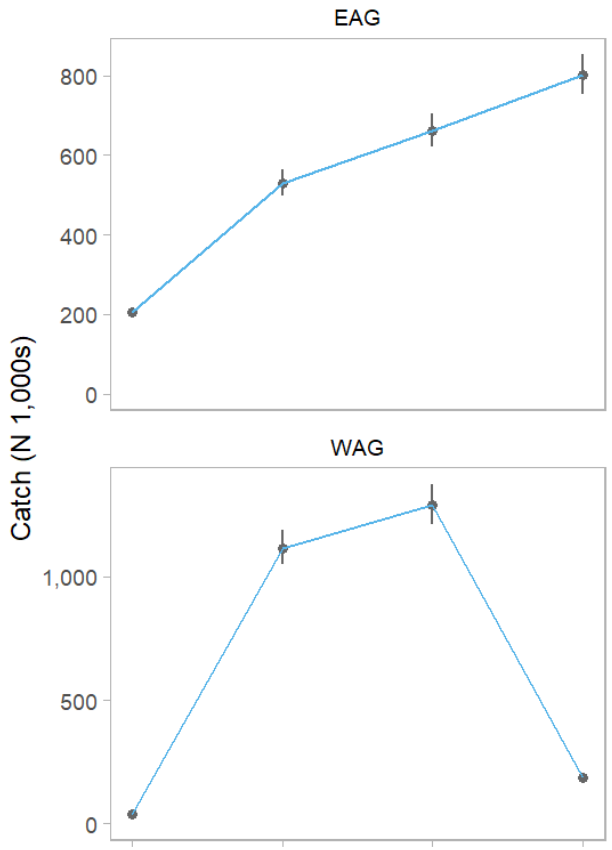
Old GF bycatch issue resurfaced…

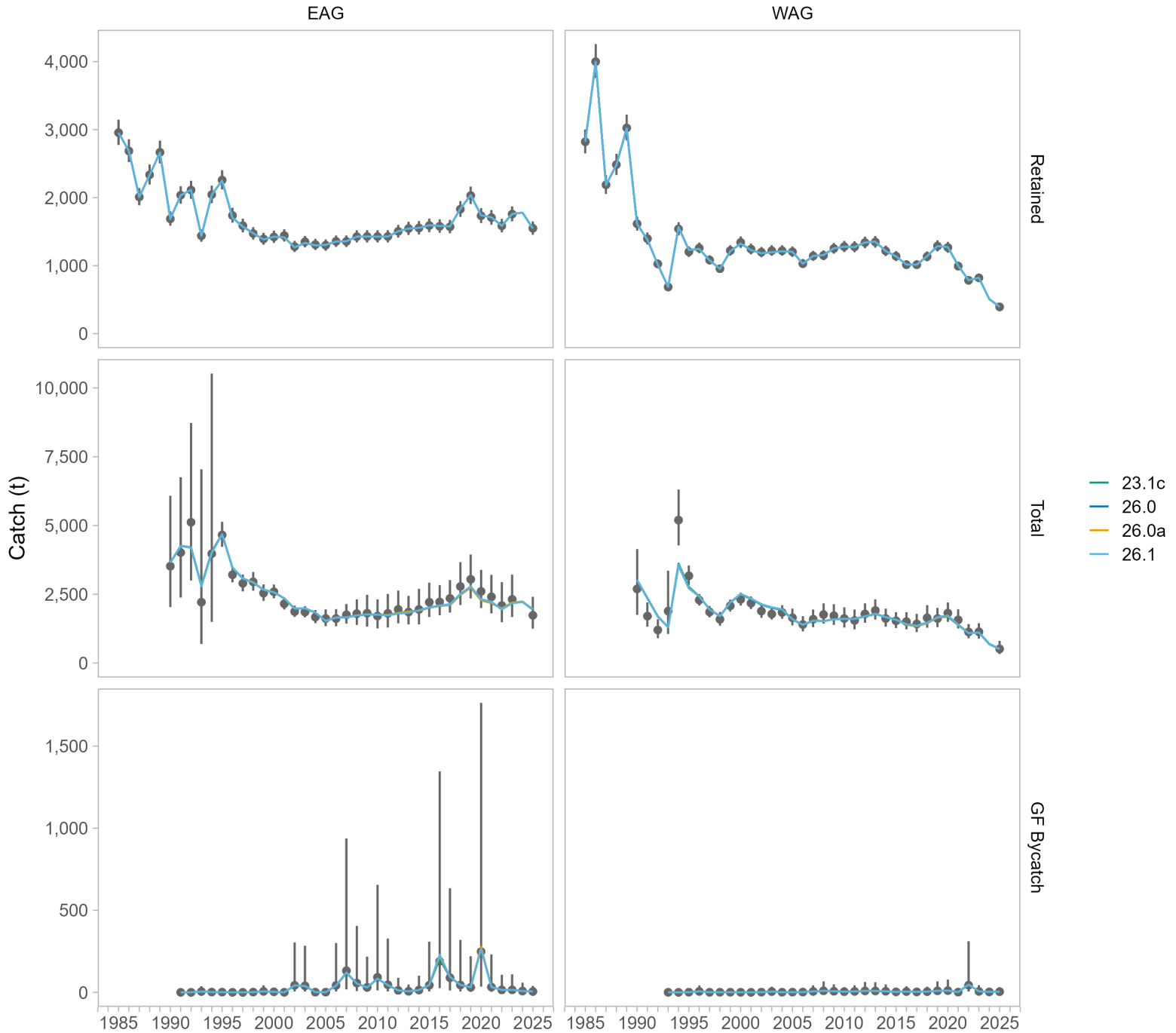
MLE clearly not a suitable outcome

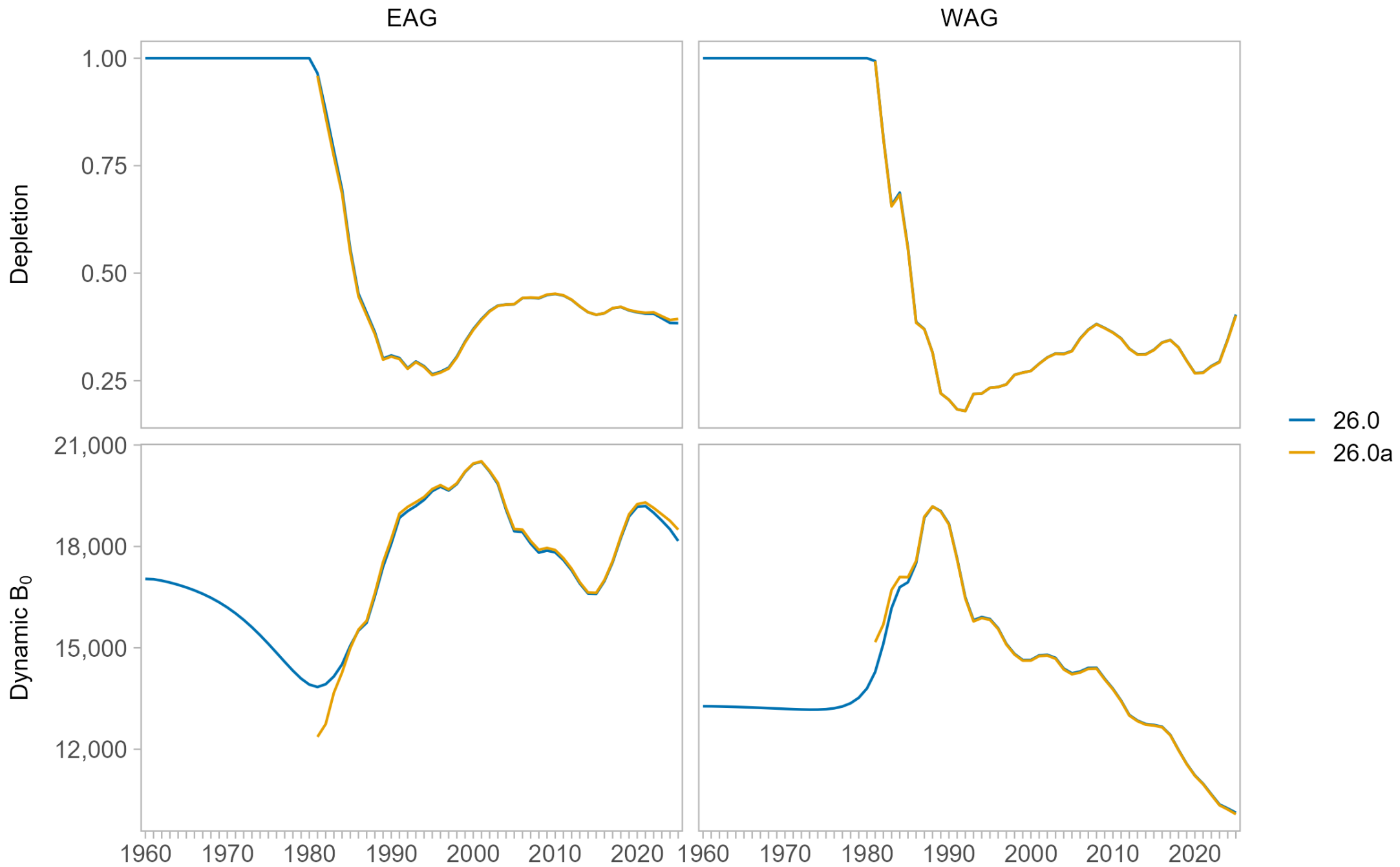
Model estimates large recruitment, has to ‘hide’ crab in bycatch fishery

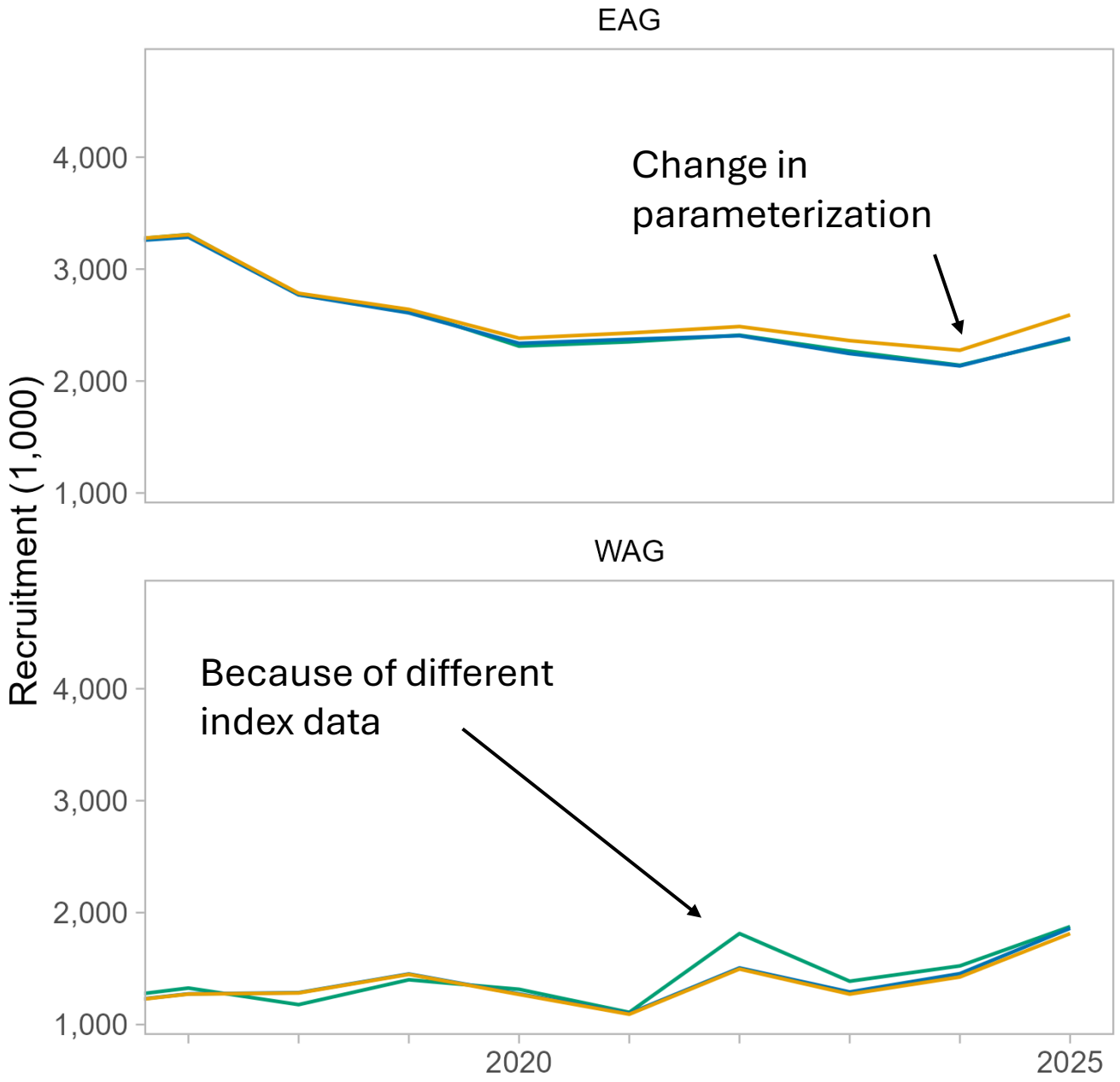
Previously fixed by adjusting mean *F* starting value, penalty caused poorer fit



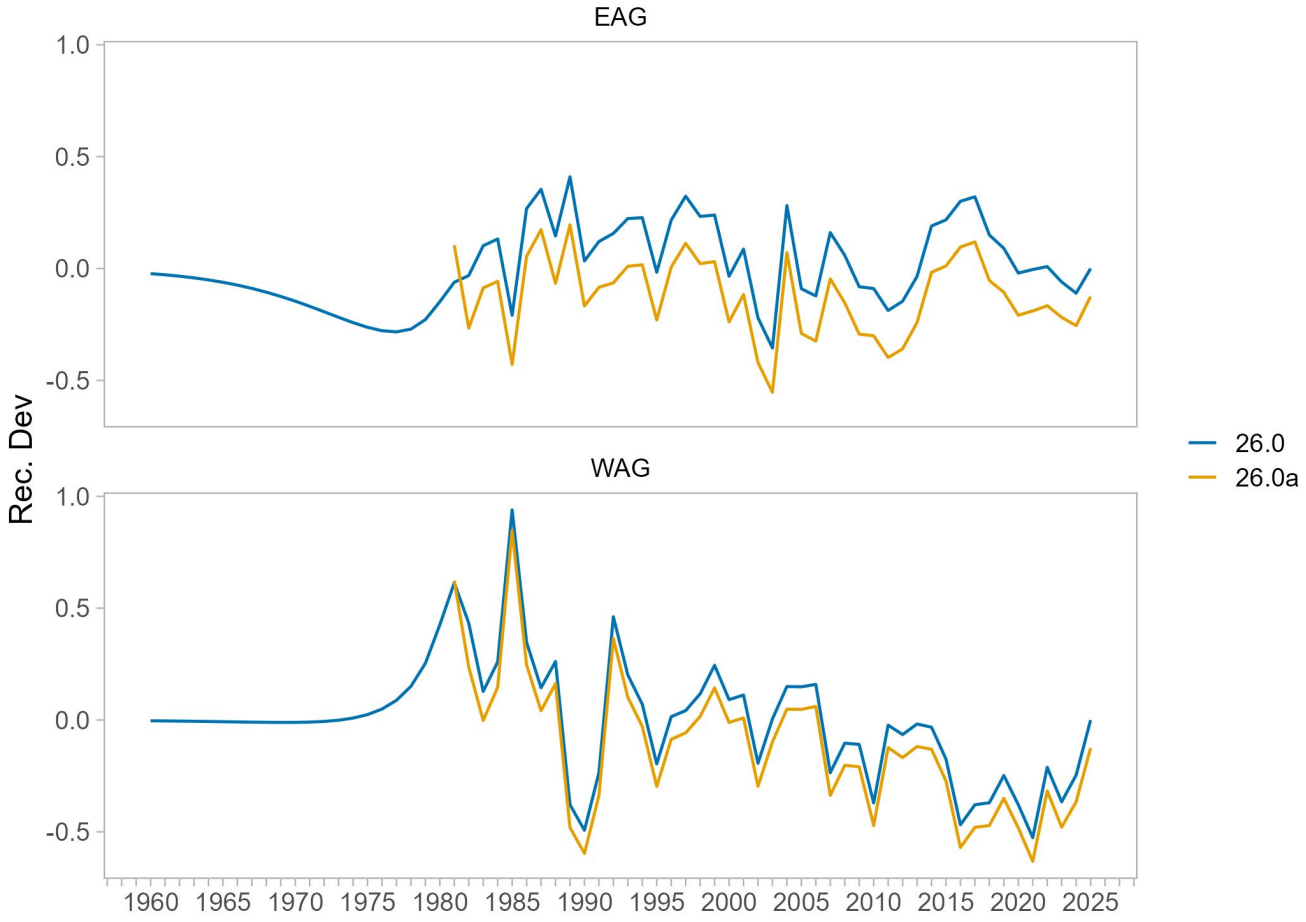

EAG
WAG
Catch (N 1,000s)
800
600
400
200
0
1,000
500
0

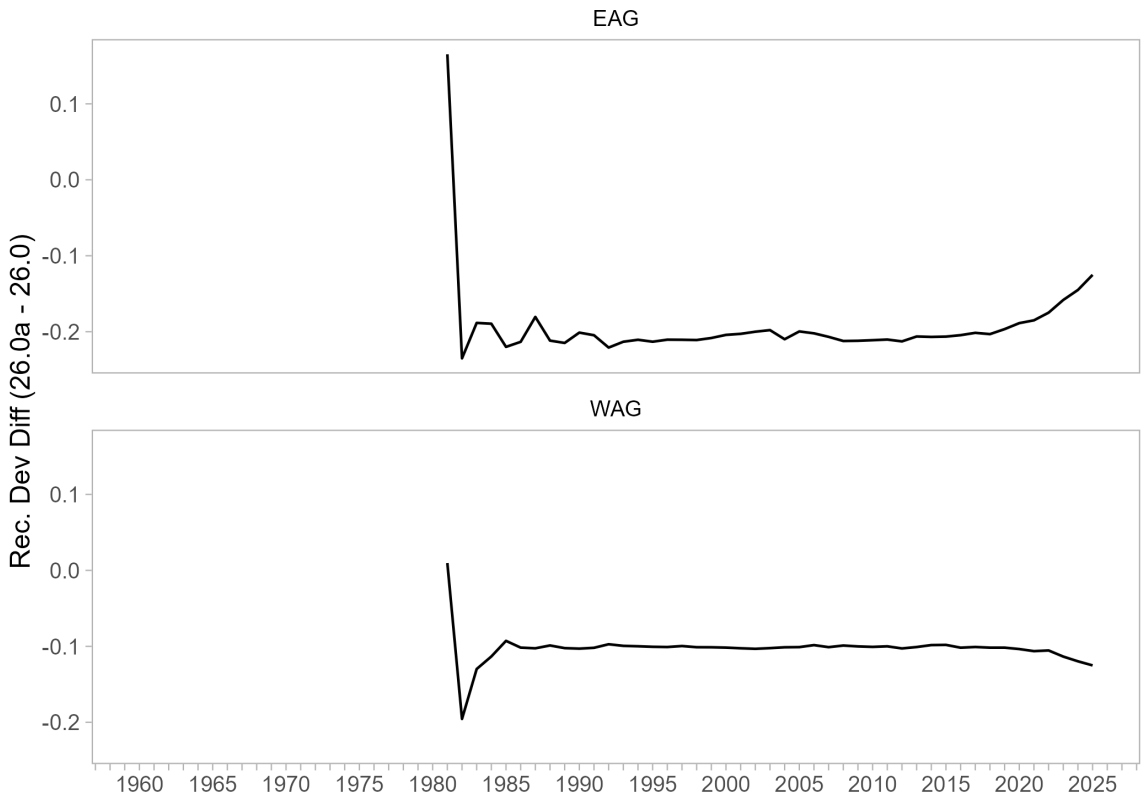

EAG
WAG
Retained
Total
GF Bycatch
Catch (t)
4,000
3,000
2,000
1,000
0
10,000
7,500
5,000
2,500
1,500
500
1985
1990
1995
2000
2005
2010
2015
2020
2025
23.1c
26.0
26.0a
26.1


EAG
WAG
Depletion
1.00
0.75
0.50
0.25
Dynamic B_0
21,000
18,000
15,000
12,000
1960
1970
1980
1990
2000
2010
2020
26.0
26.0a



(see model 25.0, draft models Sept 2024)





$\bar{R}$ (26.0a) is larger than R_0 (26.0)
~ 550,000 crab EAG
~ 200,000 crab WAG

Rec Dev difference not just scale in recent years

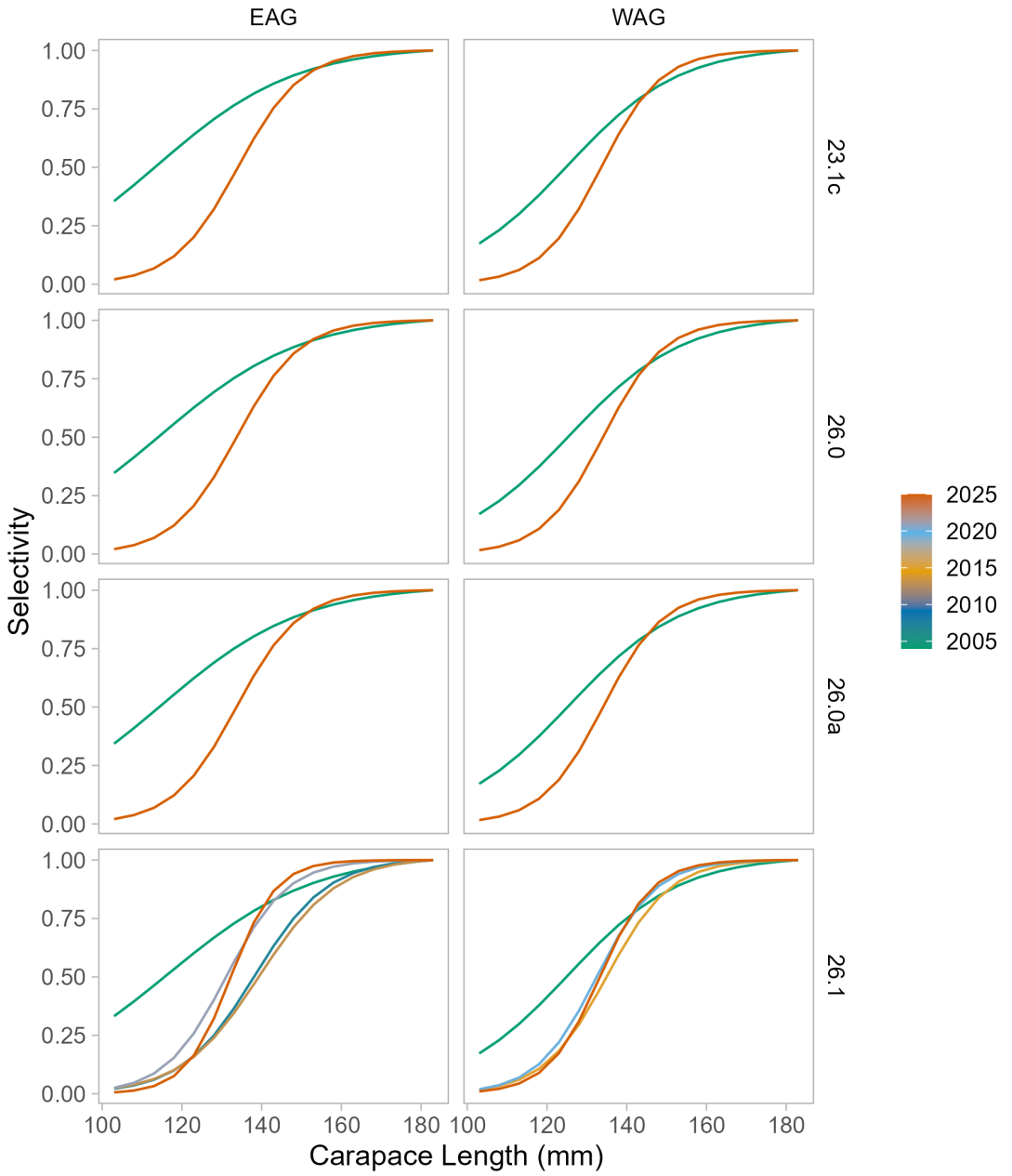
Model 26.0 → 26.0a

Catch weighting seems to be a non-issue

Some amount of catch pre-1981 not included in model

Initial N deviations appear well-estimated despite lack of size data 1981 – 1984

Small difference in derived quantities pre-1985 and marginal difference at end of time series

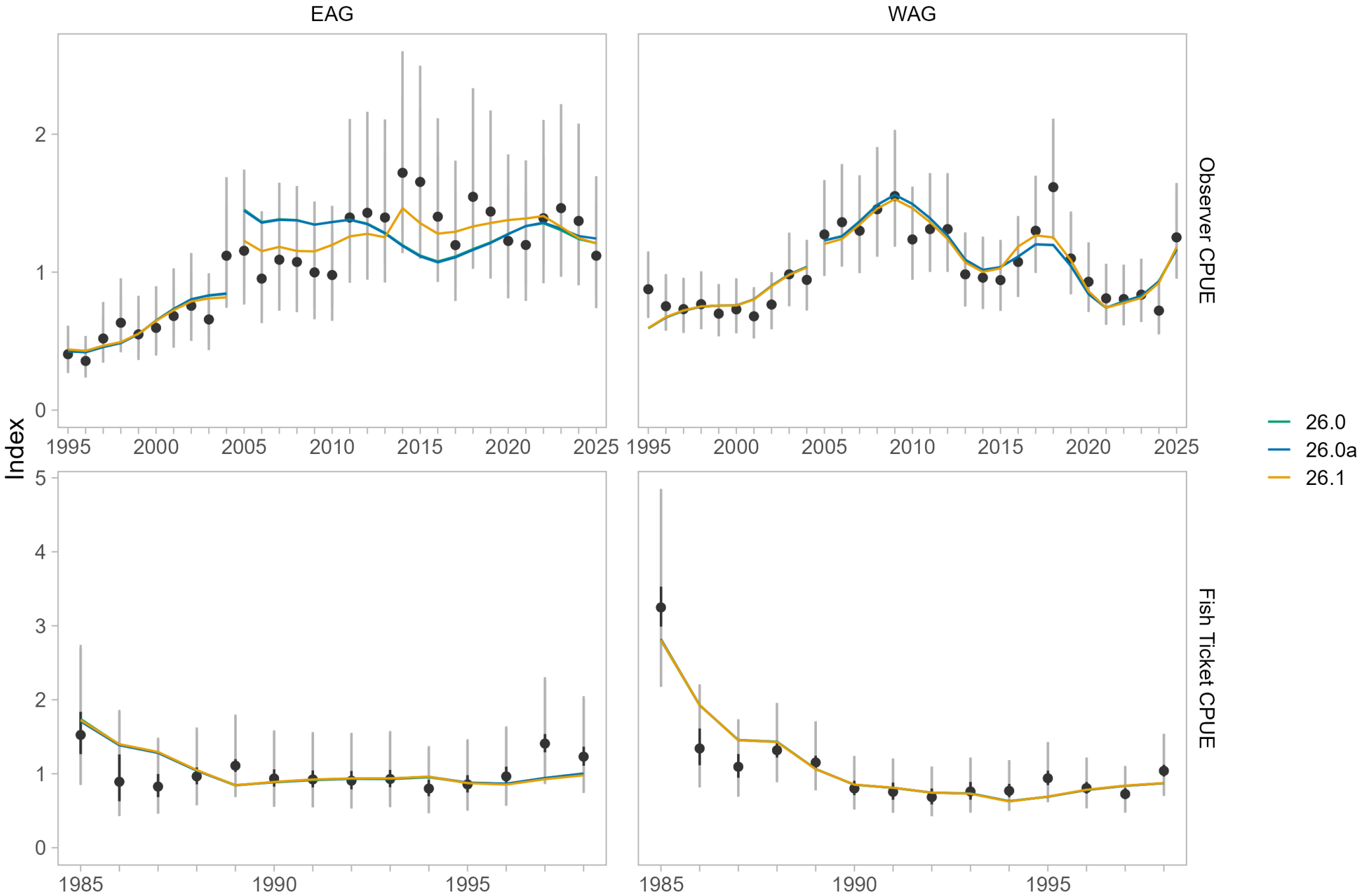


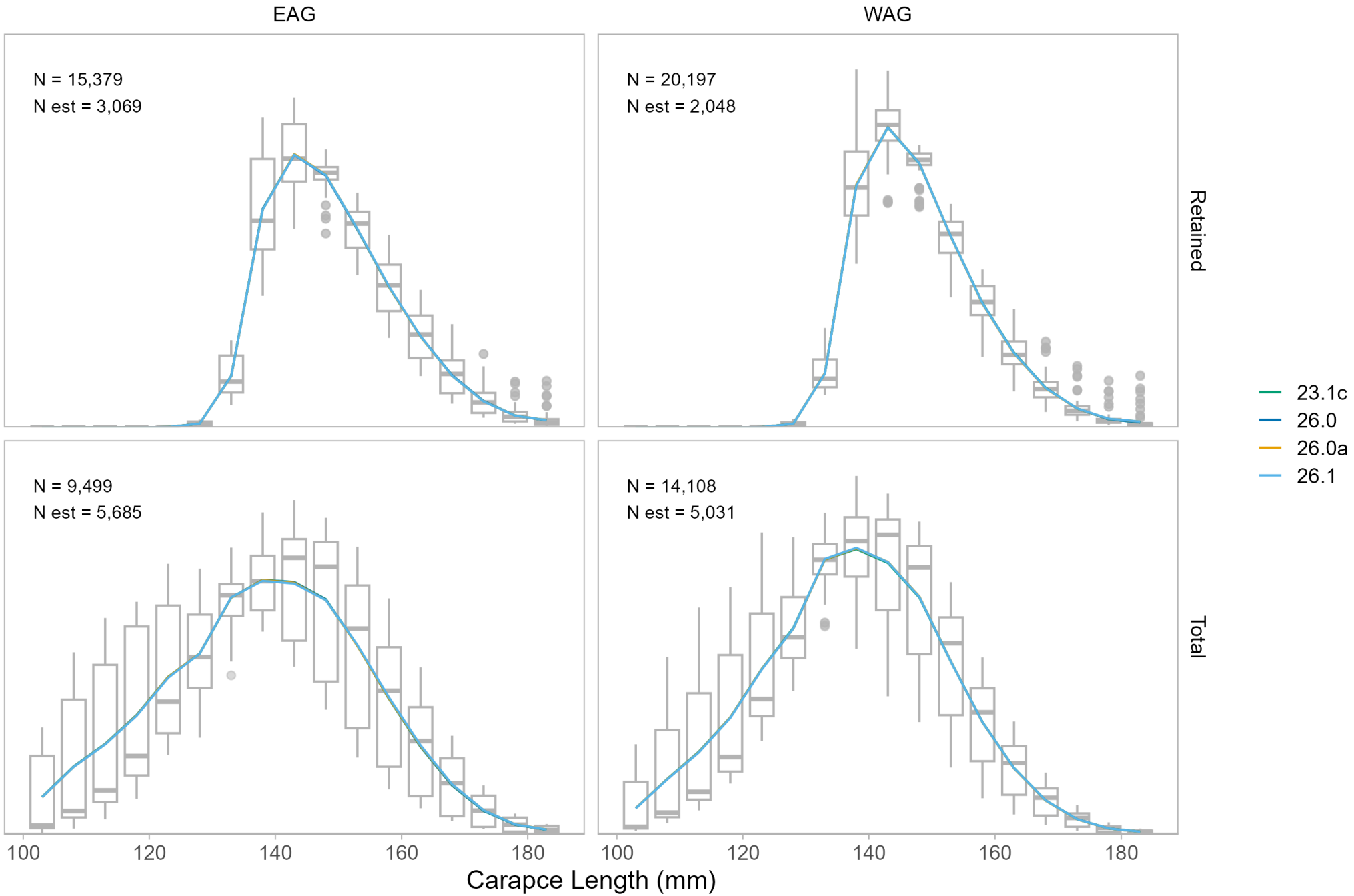
Model 26.1 selectivity blocks

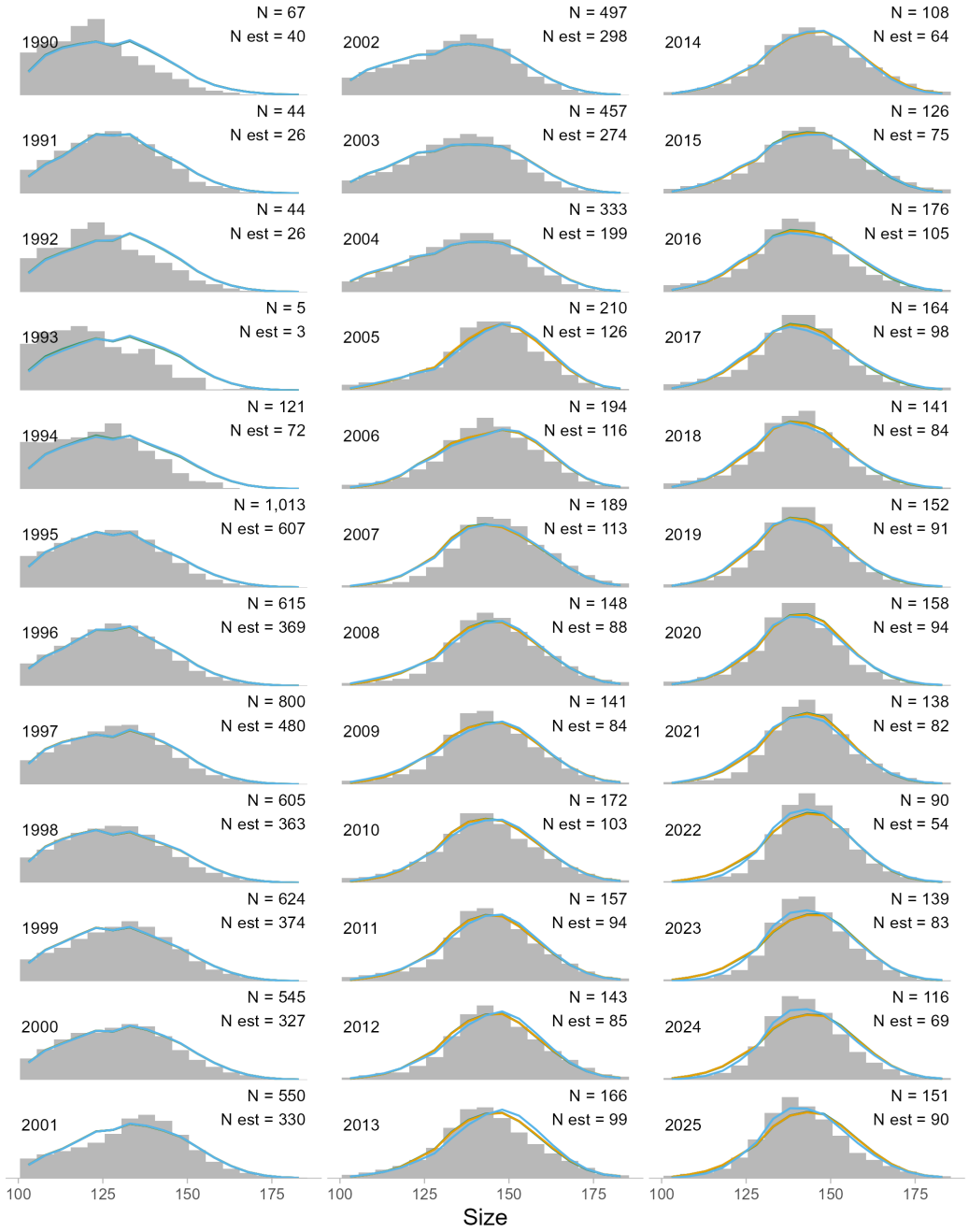
EAG	WAG
2005 - 2007	2005 - 2015
2008 - 2013	2016 - 2020
2014 - 2022	2021 - 2025
2023 - 2025	

EAG selectivity grouped into pre-rat, ~ 1st half post rat, 2nd half post rat

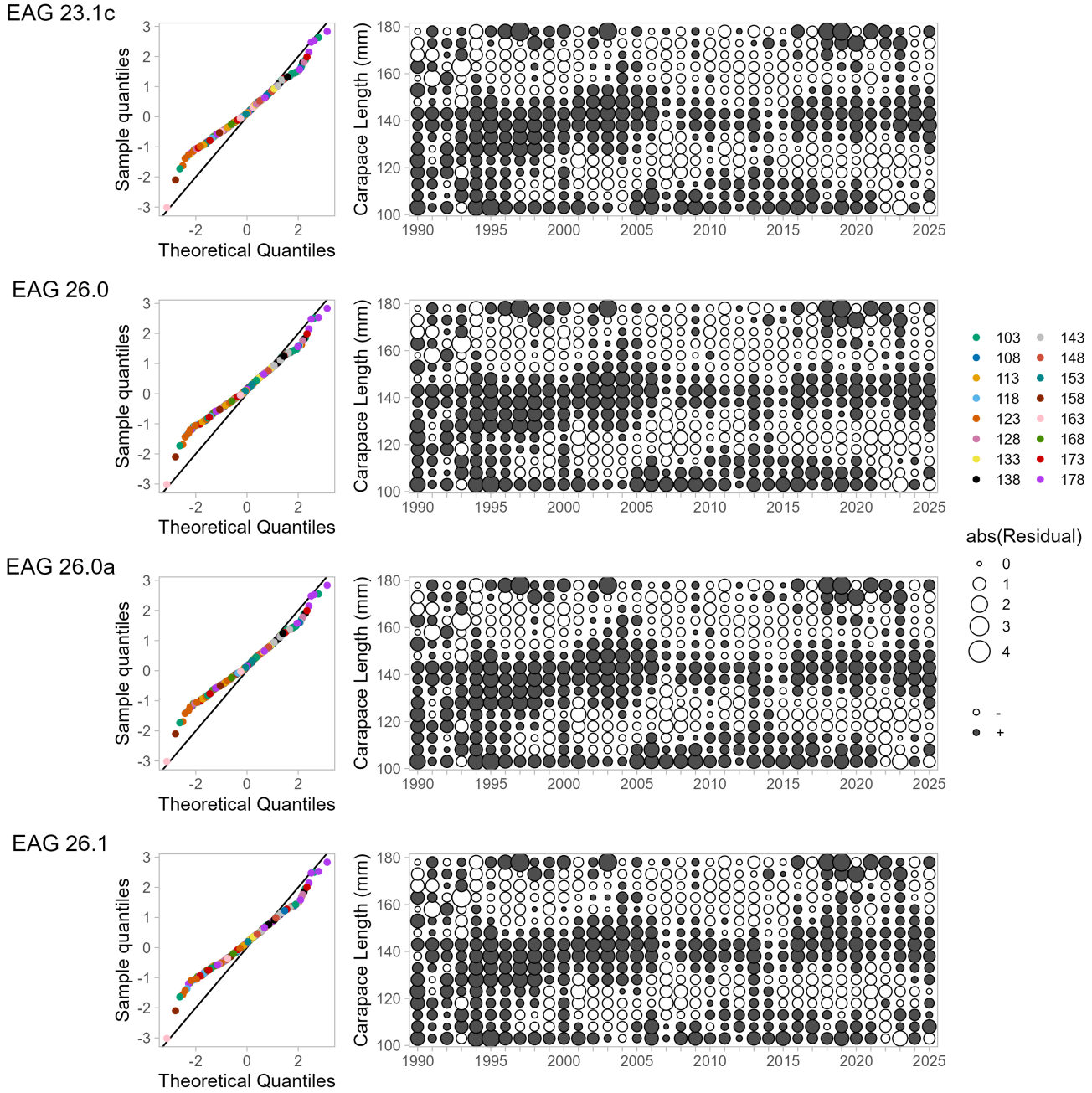
WAG post-rat selectivity blocks weren't that different

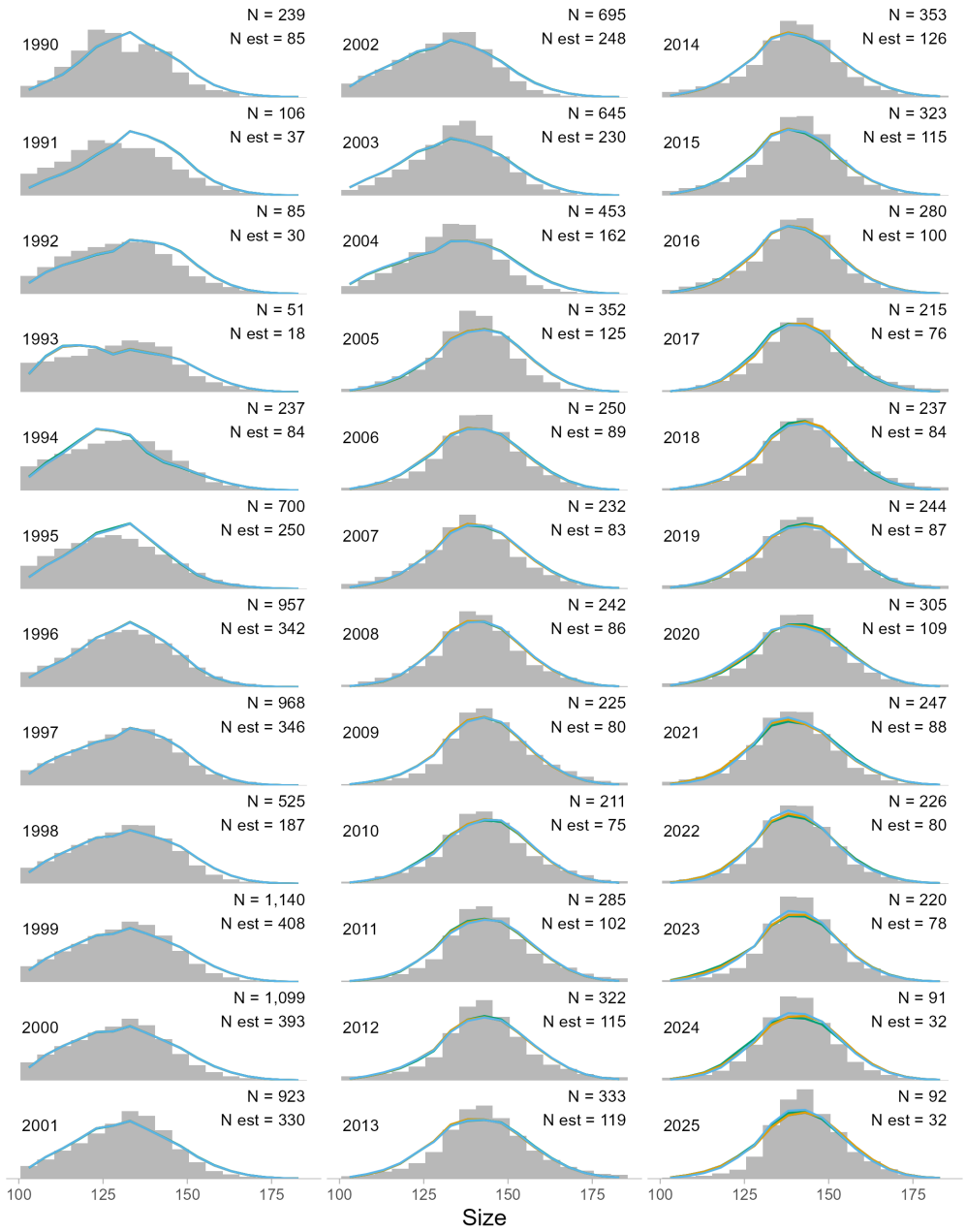

EAG
WAG
Index
Observer CPUE
Fish Ticket CPUE
0
1
2
3
4
5
1985
1990
1995
2000
2005
2010
2015
2020
2025
26.0
26.0a
26.1

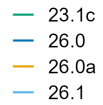

EAG
WAG
N = 15,379
N est = 3,069
N = 20,197
N est = 2,048
N = 9,499
N est = 5,685
N = 14,108
N est = 5,031
Retained
Total
100
120
140
160
180
Carapce Length (mm)
23.1c
26.0
26.0a
26.1

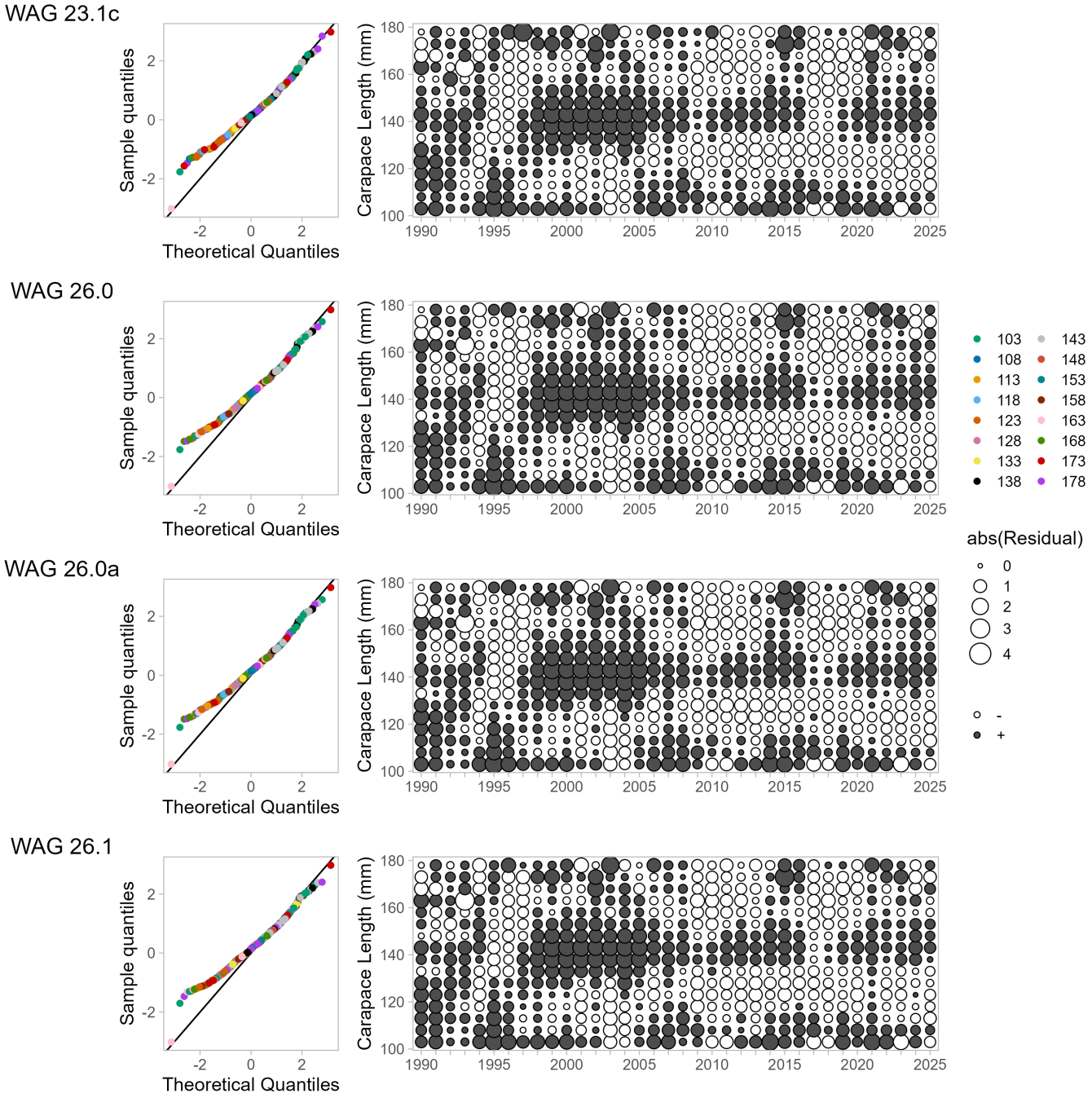

1990 N = 67 N est = 40
1991 N = 44 N est = 26
1992 N = 44 N est = 26
1993 N = 5 N est = 3
1994 N = 121 N est = 72
1995 N = 1,013 N est = 607
1996 N = 615 N est = 369
1997 N = 800 N est = 480
1998 N = 605 N est = 363
1999 N = 624 N est = 374
2000 N = 545 N est = 327
2001 N = 550 N est = 330
2002 N = 497 N est = 298
2003 N = 457 N est = 274
2004 N = 333 N est = 199
2005 N = 210 N est = 126
2006 N = 194 N est = 116
2007 N = 189 N est = 113
2008 N = 148 N est = 88
2009 N = 141 N est = 84
2010 N = 172 N est = 103
2011 N = 157 N est = 94
2012 N = 143 N est = 85
2013 N = 166 N est = 99
2014 N = 108 N est = 64
2015 N = 126 N est = 75
2016 N = 176 N est = 105
2017 N = 164 N est = 98
2018 N = 141 N est = 84
2019 N = 152 N est = 91
2020 N = 158 N est = 94
2021 N = 138 N est = 82
2022 N = 90 N est = 54
2023 N = 139 N est = 83
2024 N = 116 N est = 69
2025 N = 151 N est = 90
100 125 150 175
Size

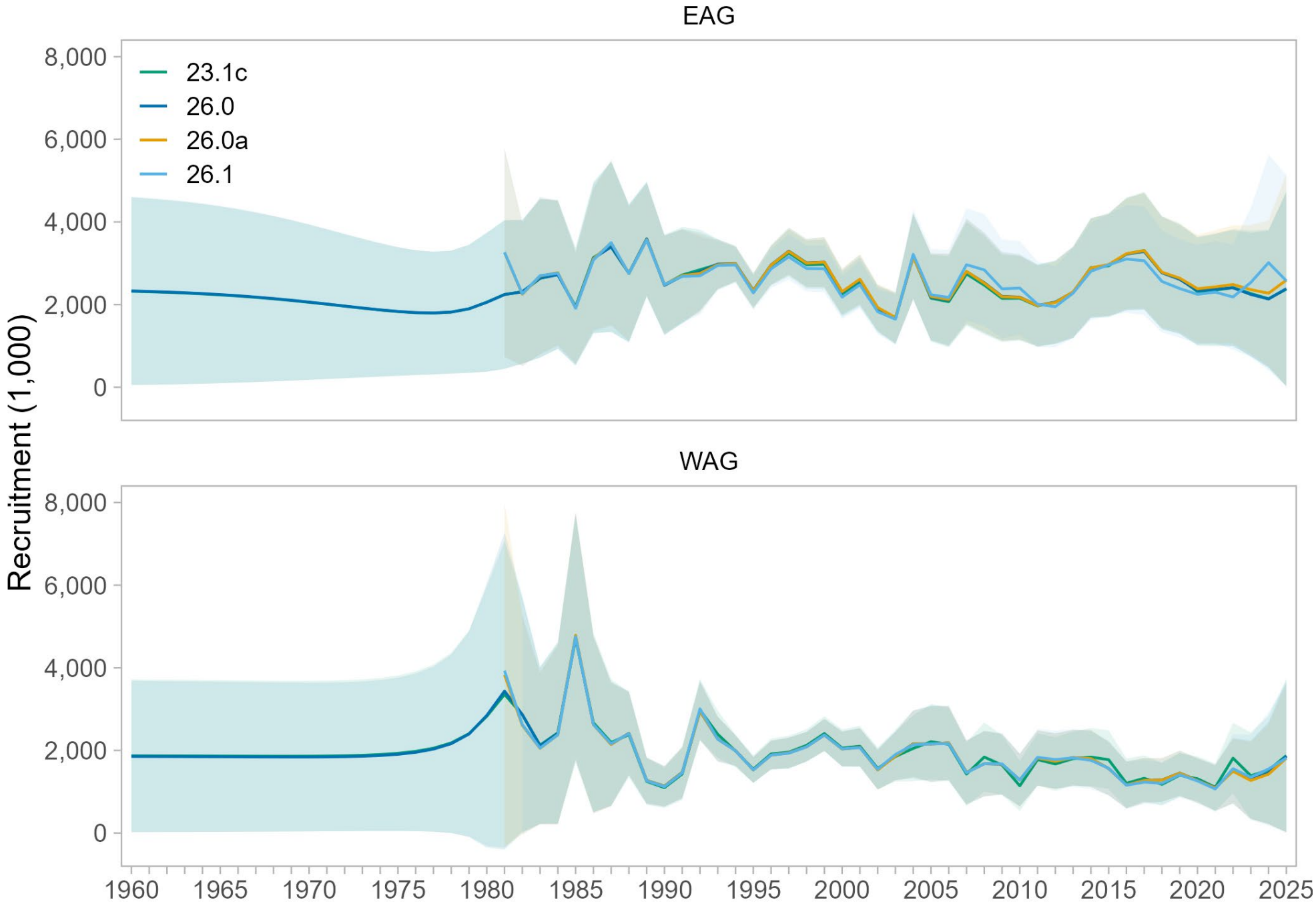

23.1c
26.0
26.0a
26.1

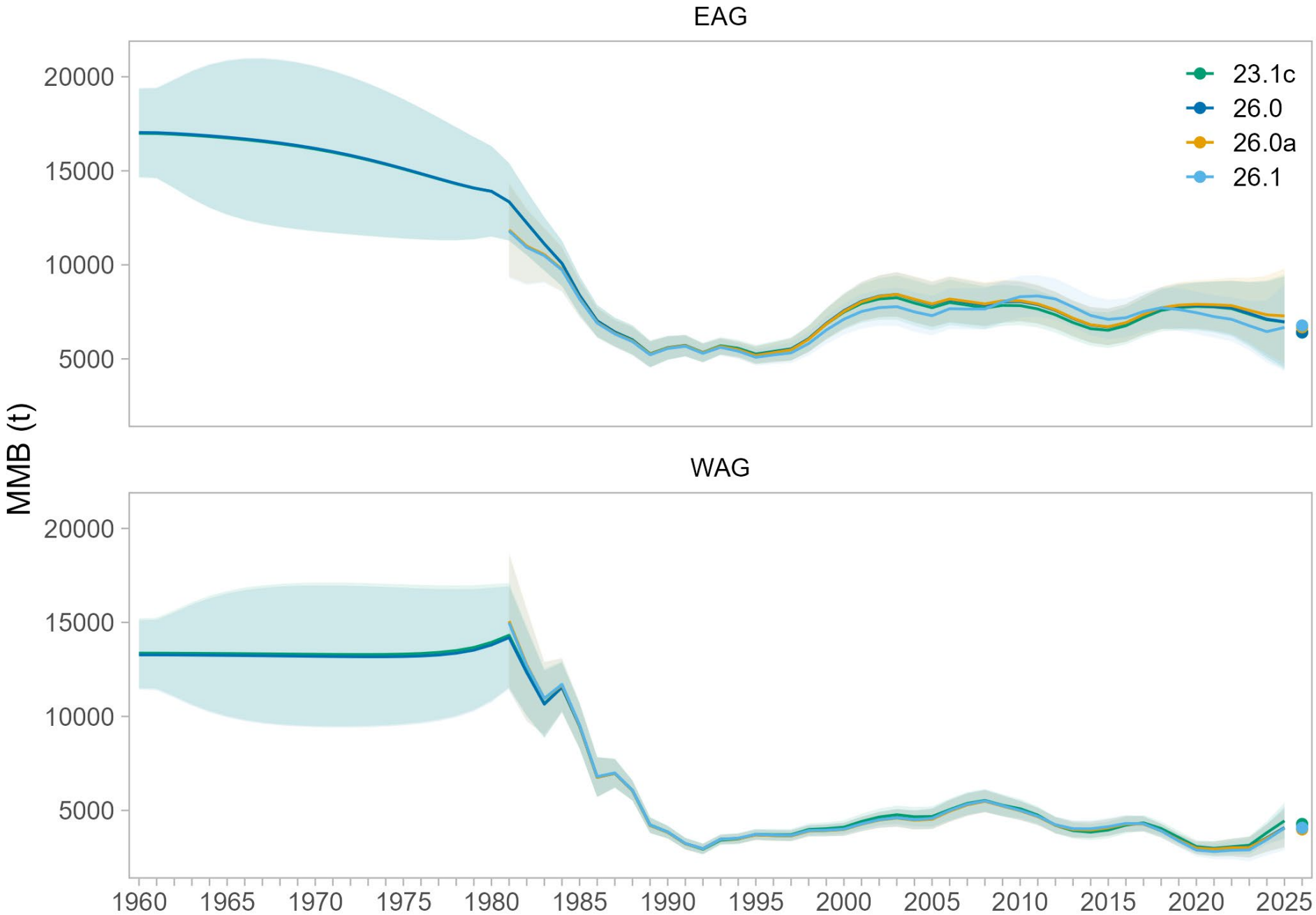

EAG 23.1c
EAG 26.0
EAG 26.0a
EAG 26.1
Sample quantiles
Theoretical Quantiles
Carapace Length (mm)
103 108 113 118 123 128 133 138
143 148 153 158 163 168 173 178
abs(Residual)
0 1 2 3 4
- +

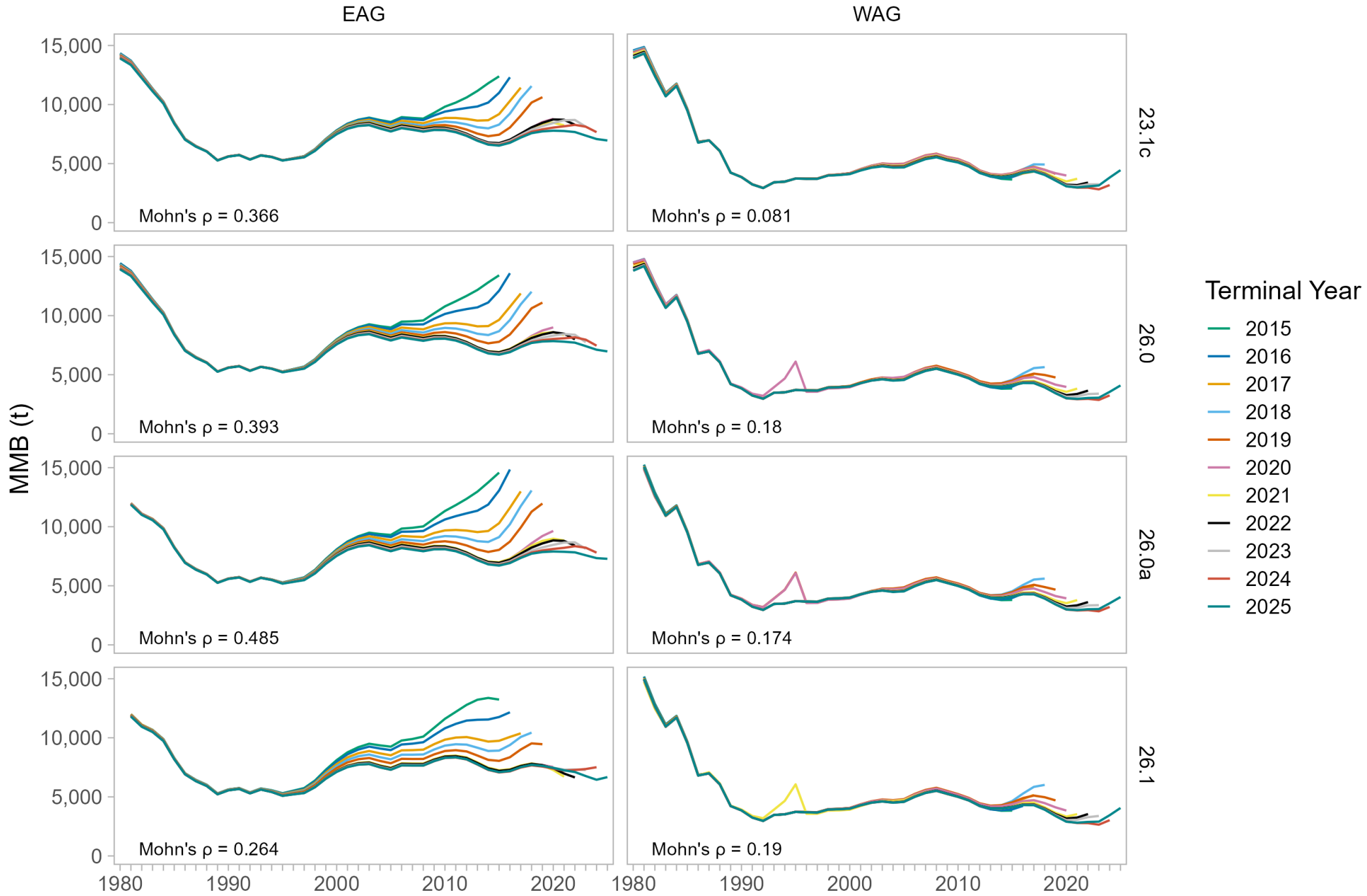

1990 N = 239 N est = 85
1991 N = 106 N est = 37
1992 N = 85 N est = 30
1993 N = 51 N est = 18
1994 N = 237 N est = 84
1995 N = 700 N est = 250
1996 N = 957 N est = 342
1997 N = 968 N est = 346
1998 N = 525 N est = 187
1999 N = 1,140 N est = 408
2000 N = 1,099 N est = 393
2001 N = 923 N est = 330
2002 N = 695 N est = 248
2003 N = 645 N est = 230
2004 N = 453 N est = 162
2005 N = 352 N est = 125
2006 N = 250 N est = 89
2007 N = 232 N est = 83
2008 N = 242 N est = 86
2009 N = 225 N est = 80
2010 N = 211 N est = 75
2011 N = 285 N est = 102
2012 N = 322 N est = 115
2013 N = 333 N est = 119
2014 N = 353 N est = 126
2015 N = 323 N est = 115
2016 N = 280 N est = 100
2017 N = 215 N est = 76
2018 N = 237 N est = 84
2019 N = 244 N est = 87
2020 N = 305 N est = 109
2021 N = 247 N est = 88
2022 N = 226 N est = 80
2023 N = 220 N est = 78
2024 N = 91 N est = 32
2025 N = 92 N est = 32
100 125 150 175
Size


23.1c
26.0
26.0a
26.1


WAG 23.1c
WAG 26.0
WAG 26.0a
WAG 26.1
Sample quantiles
Theoretical Quantiles
Carapace Length (mm)
103 108 113 118 123 128 133 138
143 148 153 158 163 168 173 178
abs(Residual)
0 1 2 3 4
- +


EAG
WAG
Recruitment (1,000)
23.1c
26.0
26.0a
26.1
8,000
6,000
4,000
2,000
0
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025


EAG
WAG
MMB (t)
20000
15000
10000
5000
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
23.1c
26.0
26.0a
26.1


EAG
WAG
23.1c
26.0
26.0a
26.1
MMB (t)
15,000
10,000
5,000
0
Mohn's ρ = 0.366
Mohn's ρ = 0.081
Mohn's ρ = 0.393
Mohn's ρ = 0.18
Mohn's ρ = 0.485
Mohn's ρ = 0.174
Mohn's ρ = 0.264
Mohn's ρ = 0.19
1980
1990
2000
2010
2020
Terminal Year
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025

Reference Points

SSC – *"…bring forward an approach that combines the two areas when considering stock status, but uses area-specific corrections between the F_{MSY} proxy and F_{OFL}."*

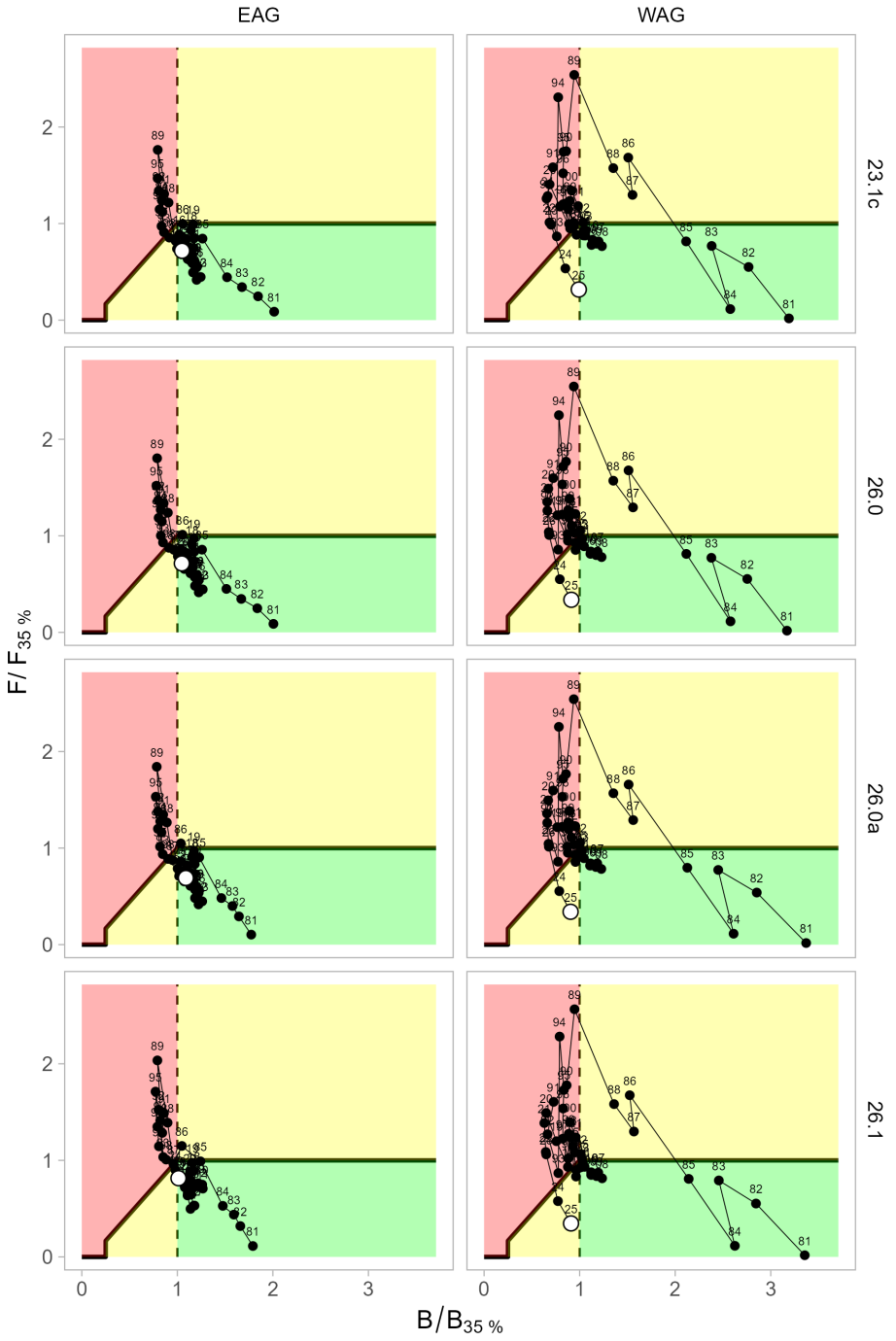
1. Recompute F_{OFL} control rule using area specific $F_{35\%}$, but combined stock status
2. Use combined-status F_{OFL} to compute OFL by area (Eq 5 & 6 SAFE)
3. Sum OFLs

Subdistrict	Model	MMB (t)	$B_{35\%}$ (t)	Status	$\bar{R}_{1987-2022}$	$F_{35\%}$	F_{OFL}	OFL (t)	Total OFL (t)
EAG	23.1c	6,406	6,630	0.96	2,648	0.52	0.50	2,146	3,534
WAG		4,279	4,488		1,799	0.52	0.50	1,388	
EAG	26.0	6,412	6,659	0.94	2,662	0.52	0.48	2,104	3,355
WAG		4,035	4,477		1,793	0.52	0.49	1,251	
EAG	26.0a	6,680	6,687	0.96	2,669	0.52	0.49	2,232	3,493
WAG		3,990	4,470		1,790	0.52	0.50	1,261	
EAG	26.0	6,412	6,659	0.94	2,662	0.52	0.48	2,104	3,355
WAG		4,035	4,477		1,793	0.52	0.49	1,251	

CPT Nov ’25: “*this would misappropriate biomass surplus by area*”

SSC Dec ’25: *“take that up with ABC buffer”*

My take: “…*ADF&G harvest strategy caps area-specific exploitation, this is unlikely to create conservation concern. No action.*”



First year (at least since transition to GMACS) that *F* trajectory doesn't suggest that fishing was in excess of federal control rule in prior year

Conclusions

Risk in assigning variability to processes erroneously (i.e. trading or adding to misspecification) (Fisch et al., 2023; Szuwalksi et al., 2018)

Less risk when correct process is varied, but overparameterized (Cronin-Fine And Punt 2021; Stewart and Monnahan 2017)

- Good case to be made about fishing process changing over time

I think we can do something more objective with respect to designing time blocks, but I don't know what that is yet…

Recommendation

Use model 26.0a

Not big improvement, but perhaps a slightly more manageable model to base future explorations on.

OFL = 3,493 t (7.70 mil lb), stock at 96% $B_{35\%}$


Stock Status
Metric Tonnes
EAG
WAG
Combined
$B_{35\%}$
MMB_{proj}
MMB (26.0a)
2018
2020
2022
2024
2026

Appendix B: Risk Table Summary for Aleutian Islands Golden King Crab

Tyler Jackson, Ivonne Ortiz, Elizabeth Siddon, and Jared Weems

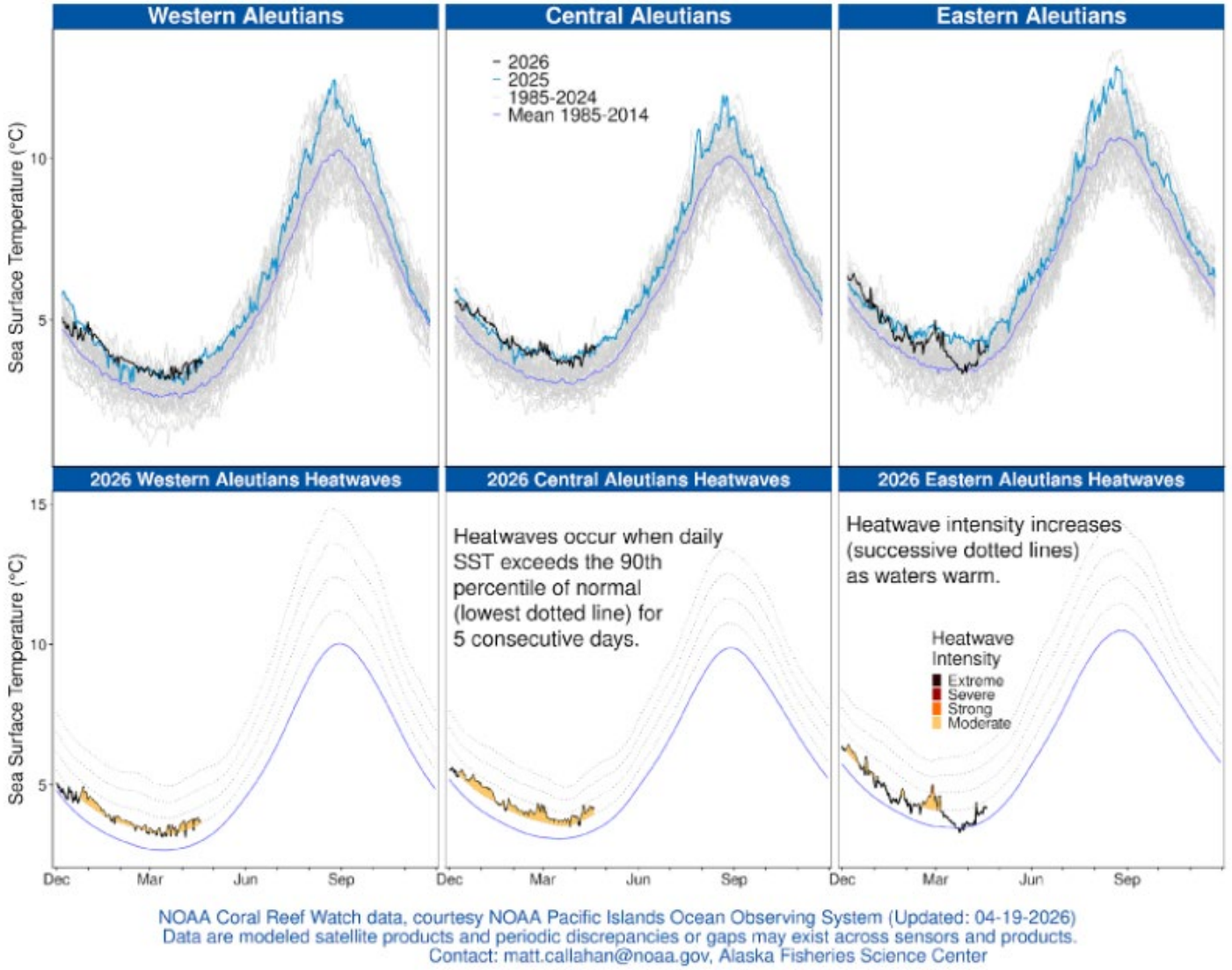
Assessment-related Considerations	Population Dynamics Considerations	Ecosystem Considerations	Fishery-informed Stock Considerations
Level 1: Normal	**Level 1:** Normal	**Level 1:** Normal	**Level 1:** Normal
The AIGKC stock assessment remains to be solely informed by fishery dependent data. *The latest assessment did not resolve poor fit to EAG fishery CPUE data and the associated retrospective pattern in MMB. This is a recurring issue (~2021) likely related to changing fleet dynamics and fishing behavior not captured in CPUE standardization.*	*MMB in the WAG appears to be rebounding following increased recruitment. MMB and recruitment in the EAG remain stationary over time.* *Stock status is at 96% B_{MSY} proxy.* *The stock-specific indicators related to natural mortality and growth suggest no additional concerns.*	*Warm conditions above average, conditions similar to 2025 so far. Warmer than average SST predicted for late summer and fall, potentially faster growth. While temperatures have been increasing they remain within a suitable thermal range.* *Although some prey and structural epifauna have been decreasing across the chain, others have been increasing,*	*CPUE in the EAG decreased from 2024/25, but remains high relative to the time series. CPUE in the WAG underwent a considerable increase from 2024/25. The spatial footprint of WAG fishery was lower than in past years, so it is unclear if increased CPUE is due to population increase or a change in fishing behavior, or both.*

Ecosystem Considerations

No ESP, no ecosystem indicators established for this stock

But we do have an ESR

- SST/BT from satellite and trawl survey
- Some benthic community composition
- Some potential predator composition

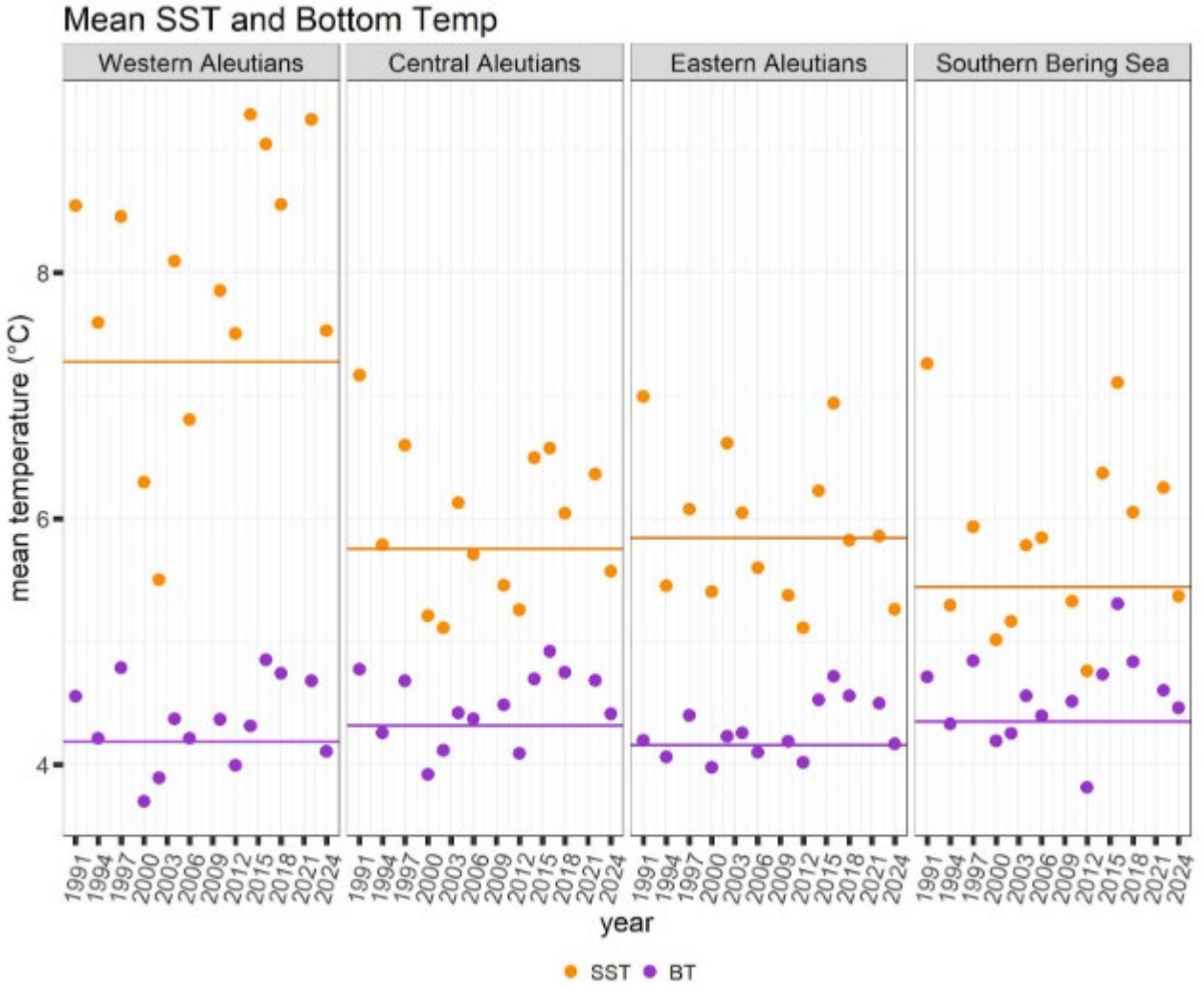


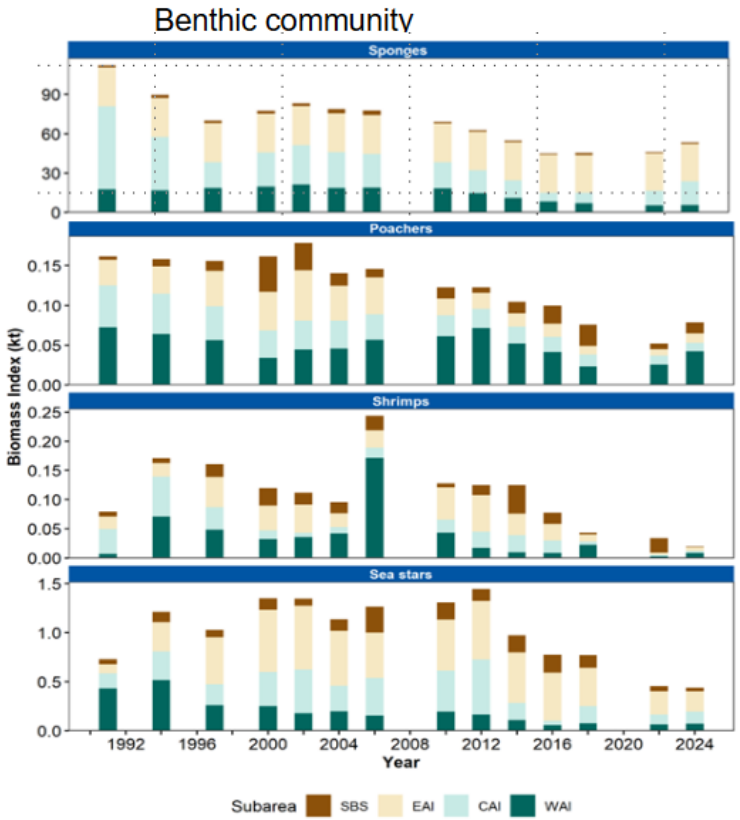
Ecosystem Considerations

SST from the bottom trawl survey has a temporal component, with the survey starting in the East and ending in the West

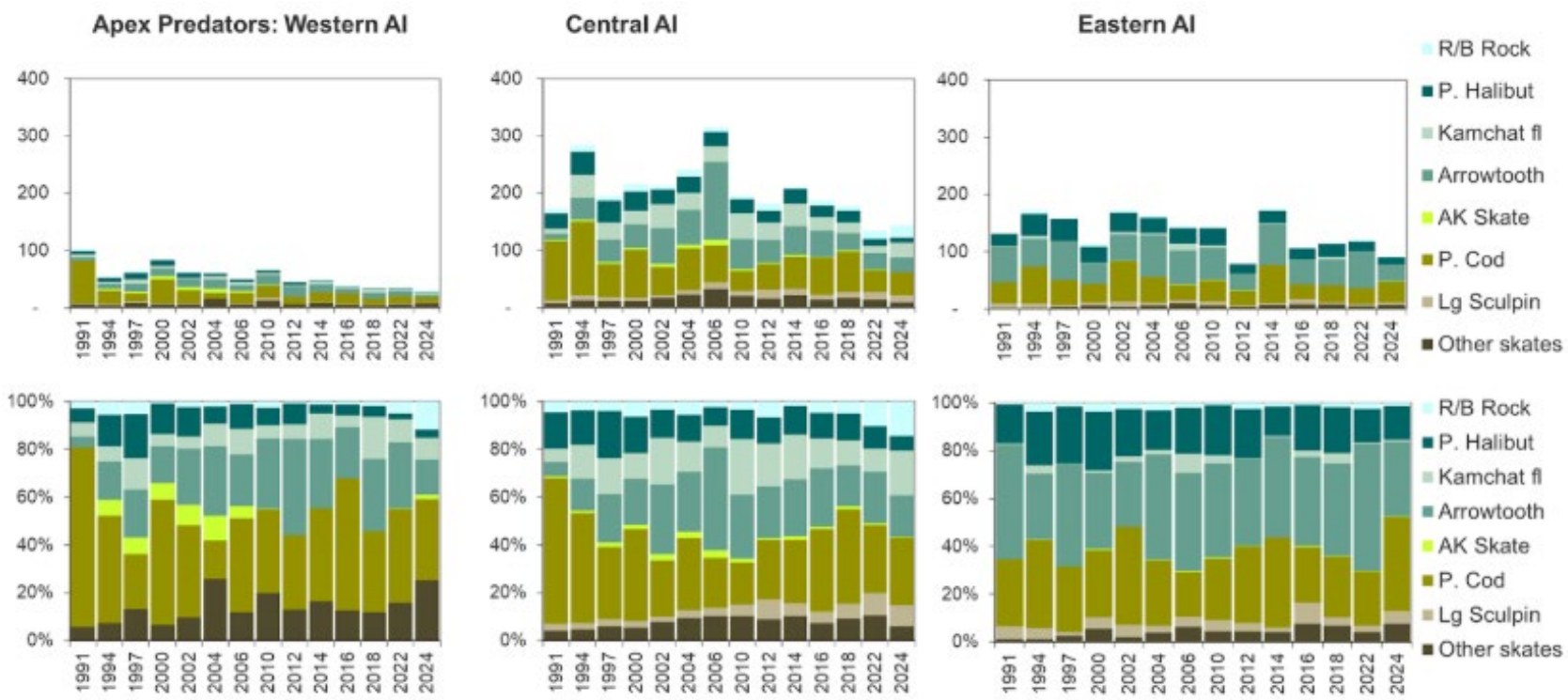
Bottom temperature decreased in 2024 to average levels after remaining above the mean since 2014

Still within normal larval development range (Long and Van Sant 2016)





Sarah Friedman, Ned Laman, and Sean Rohan, ESR 2024

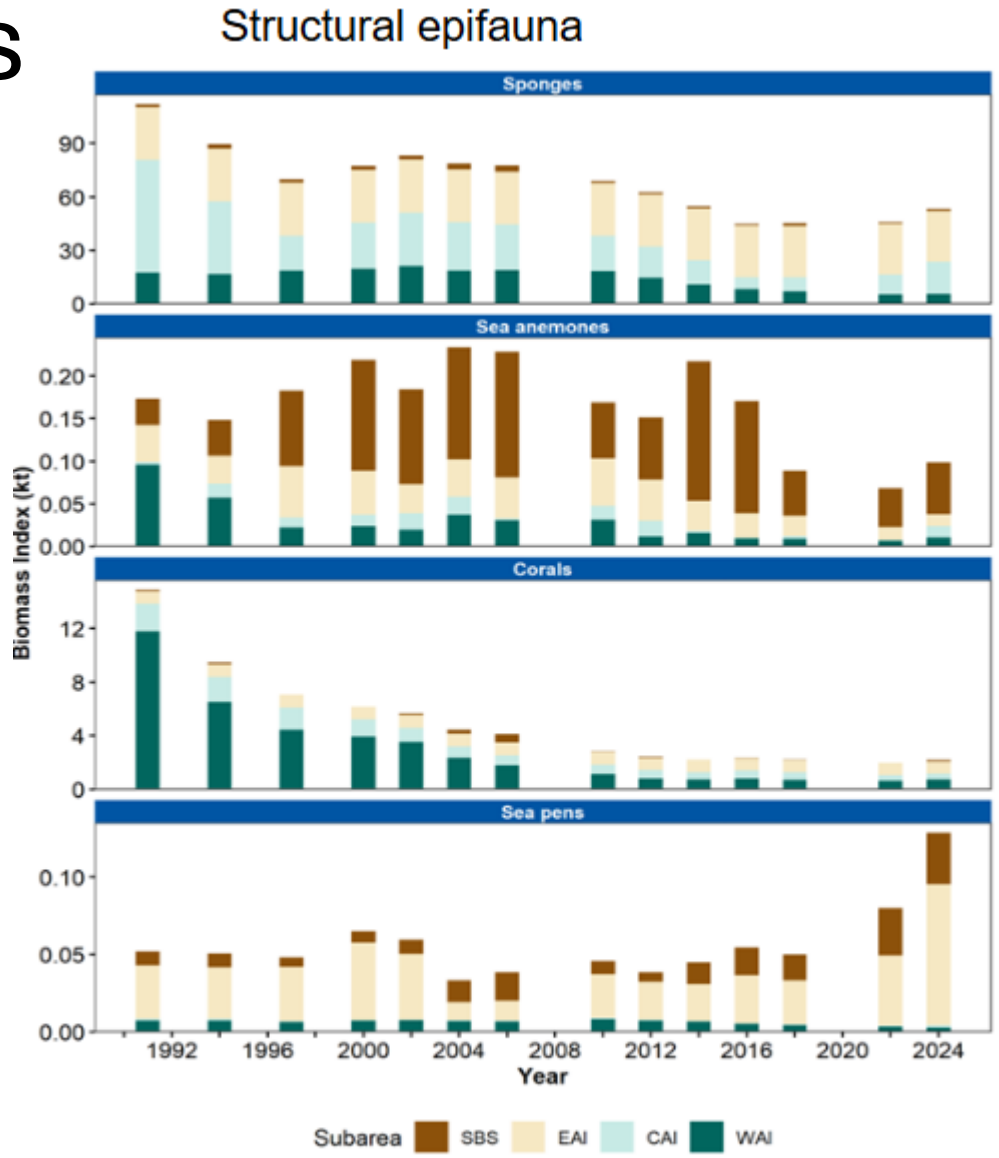


- Generally, benthic community in decline
- Apex foragers (Pacific cod, halibut, large sculpins) have been slowly decreasing and in general are more abundant east of 174°W tan west of 174°W (Ortiz, ESR 2024)

Ecosystem Considerations

Several coral species of structural epifauna may be decreasing, particularly west of 174°W (western AI). But other species, such as sea pens seem to be increasing in the east of 174°W

Results of the coral assessment in the AI should be upcoming in the next year



Christina Conrath, Ned Laman, and Sean Rohan, ESR 2024

ABC Buffer

Recommended buffer – 25%

Concerns raised in previous assessments remain, primarily:

- Assessment solely fishery dependent
- Consolidated fishery
- Retrospective patterns
- Stock is under B_{MSY}

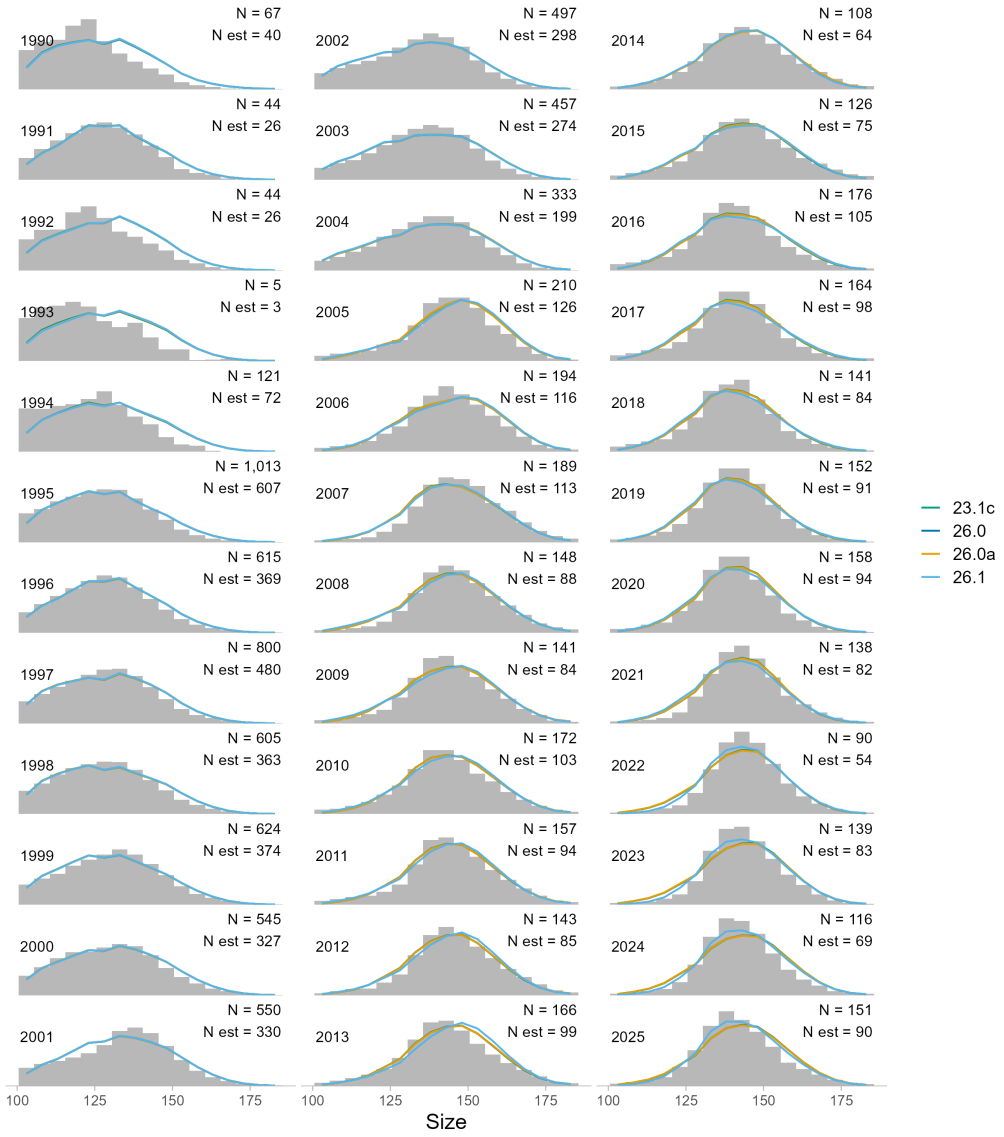
What is the minimum buffer on this stock given its managed as Tier 3 with no survey data?

ABC = 2,620 t (5.776 mil lb)

2025 Buffer Considerations

Concern	year expressed	CPT 2024 concern?	Reason
Only crab assessment that relies entirely on fishery CPUE as an index of abundance	2020	Yes	No change.
Uncertainty in natural mortality	2020	Yes	No change.
The limited spatial coverage of the fishery with respect to the total stock distribution	2020	Yes	No change.
The small number of vessels on which CPUE is based	2020	Yes	No change.
Retrospective pattern for the EAG	2020	Yes	No change
CPUE standardization is still subject to some methodological concerns	2020	Less	The data on which the standardization is based have been checked and improved diagnostics are now available.
Catches from the WAG that were not included in the assessment	2021	Less	Only the total catch was not final at the time of the assessment
Model convergence concerns reflecting potential parameter confounding (jitter analysis resulted in multiple solutions for MMB and $B_{35\%}$ at same likelihood values)	2024	Yes	Some of the models converged to implausible but better fits to the data, which should be explored in future work.
Model does not fit the trend in the index for the EAG.	2024	Yes	The fit to the standardized CPUE index for the EAG remains poor – the retrospective pattern observed for the EAG is likely related to this poor fit.
Abundance trend in the WAG	2025	Yes	CPUE continues to decline in the WAG.
Catches from the EAG that were not included in the assessment	2025	New	The directed and the total catch were not final at the time of the assessment

Next Steps



Little contrast in fishery size composition data (i.e. weak recruitment signal)

Recruitment occurs from 101mm – 125 mm, maturity = 116 mm, legal = 138 mm CL

Recruitment is mainly informed by subtle shifts size composition, catch

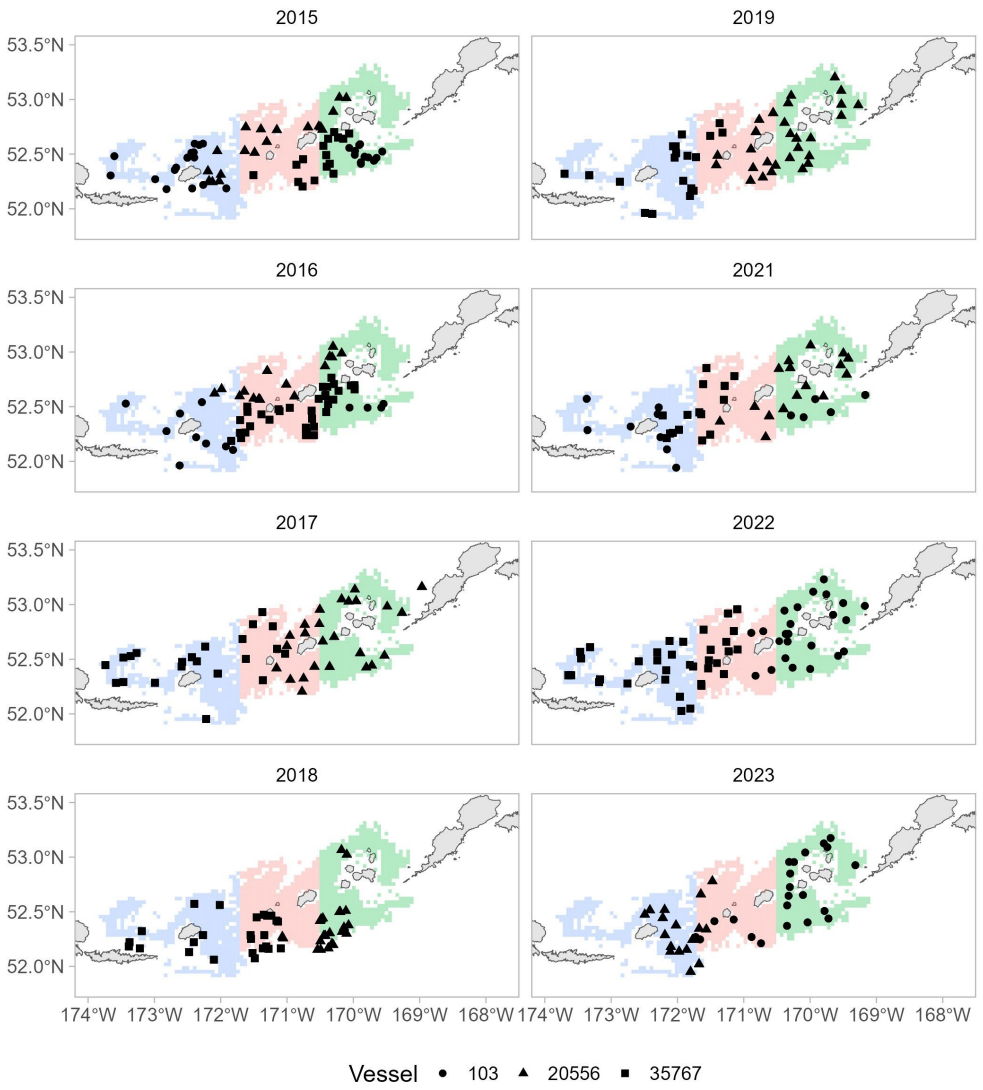
Next Steps – Cooperative Survey

Vessels cover part of EAG, number of vessels vary by year

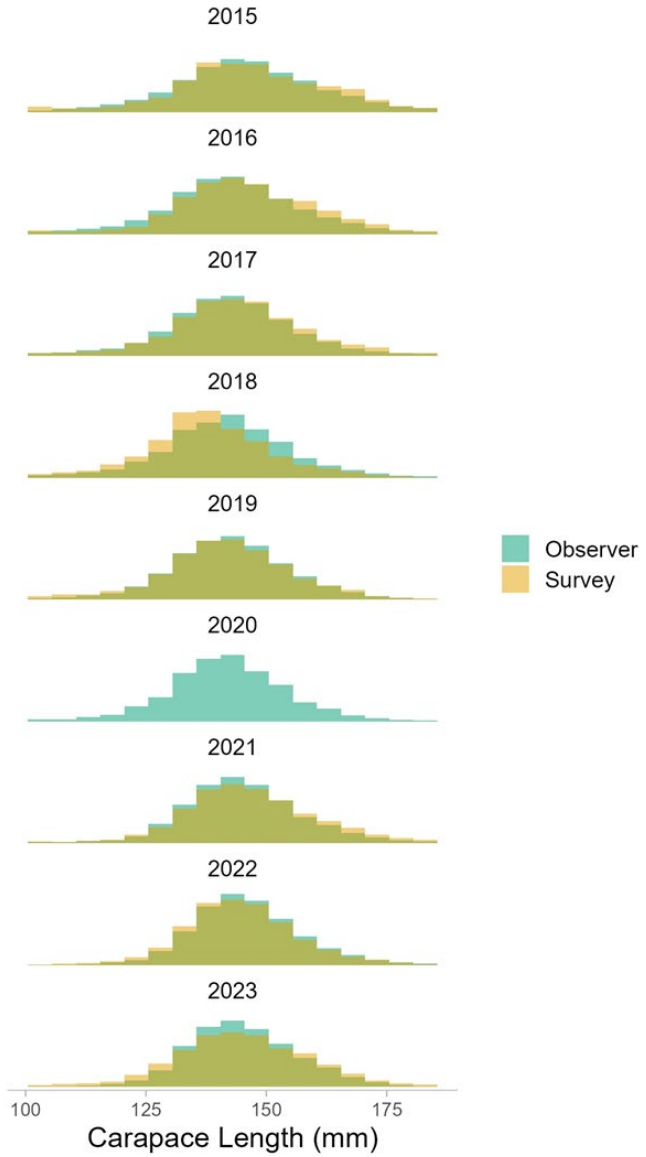
1 nmi x 1 nmi grid divided into 3 strata since 2022

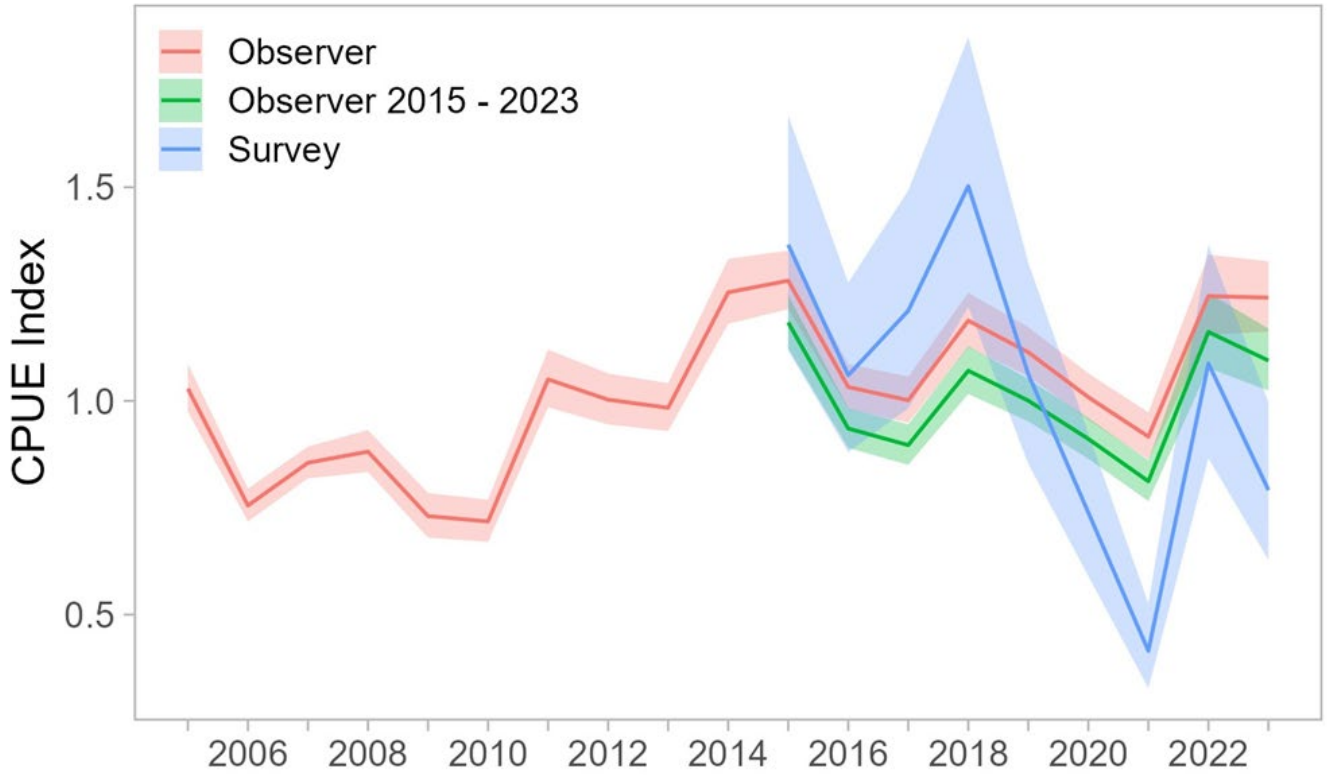
String set in each randomly selected grid cell

Number of strings set has varied, not all strings are hauled



Next Steps – Cooperative Survey





Proposed Re-design

Small mesh pots within ‘index areas’

- Try to identify areas of core biomass, yet avoiding pot saturation

Short soak times

Possibly utilize observer deployments

- Allows vessels greater flexibility
- Allows for sampling at different points in season

Collect empirical recruitment data, hopefully cohort progression

Any comments on that??

2027 Assessment Cycle

Better bridging of combined area model

More objective design of post-rationalization selectivity time blocks

Address CPT/SSC comments on maturity data analysis