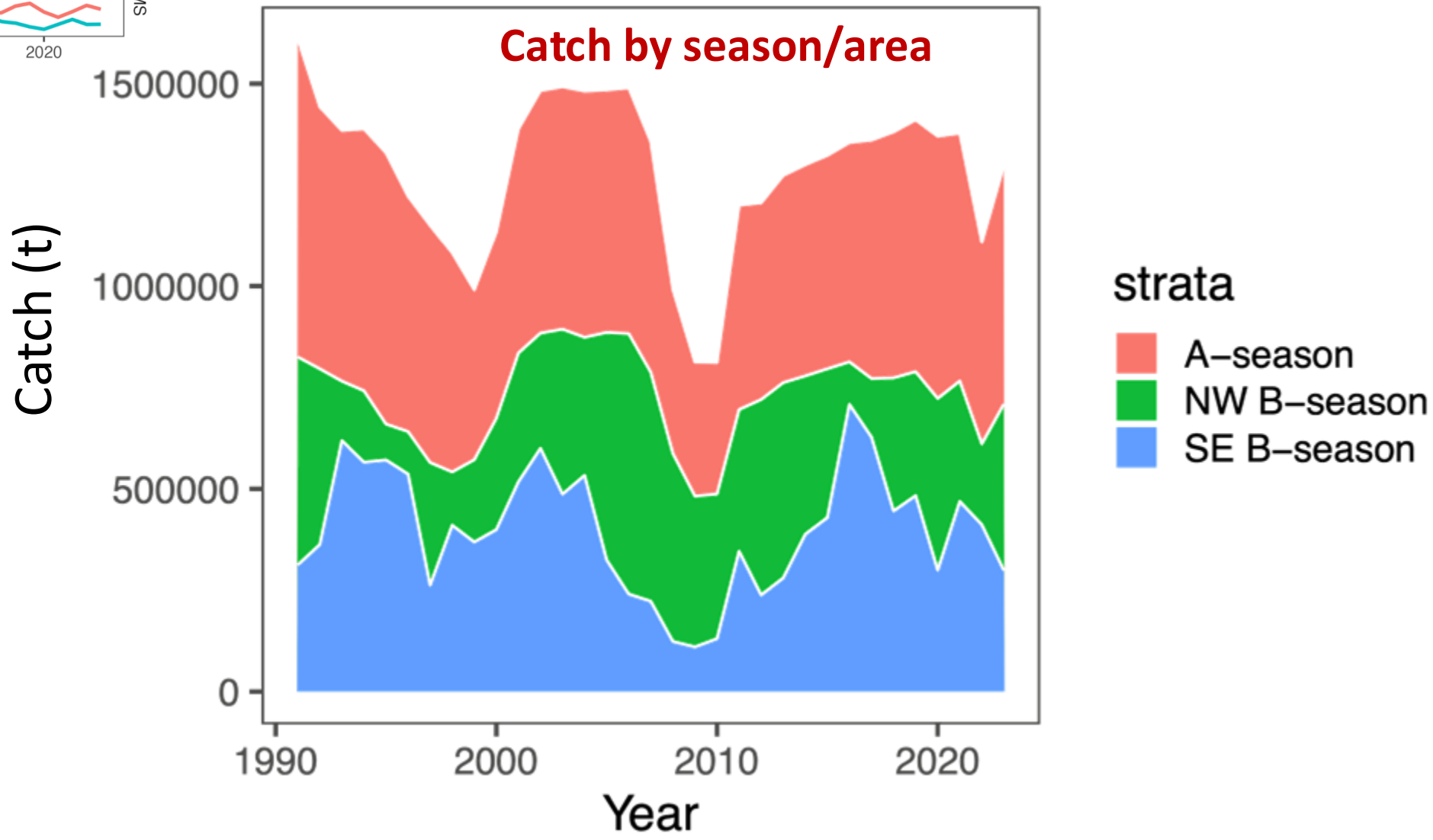
Eastern Bering Sea pollock stock assessment

Jim Ianelli, Taina Honkalehto, Sophia Wassermann, Abigail McCarthy, Sarah Stienessen, Carey McGilliard, Elizabeth Siddon

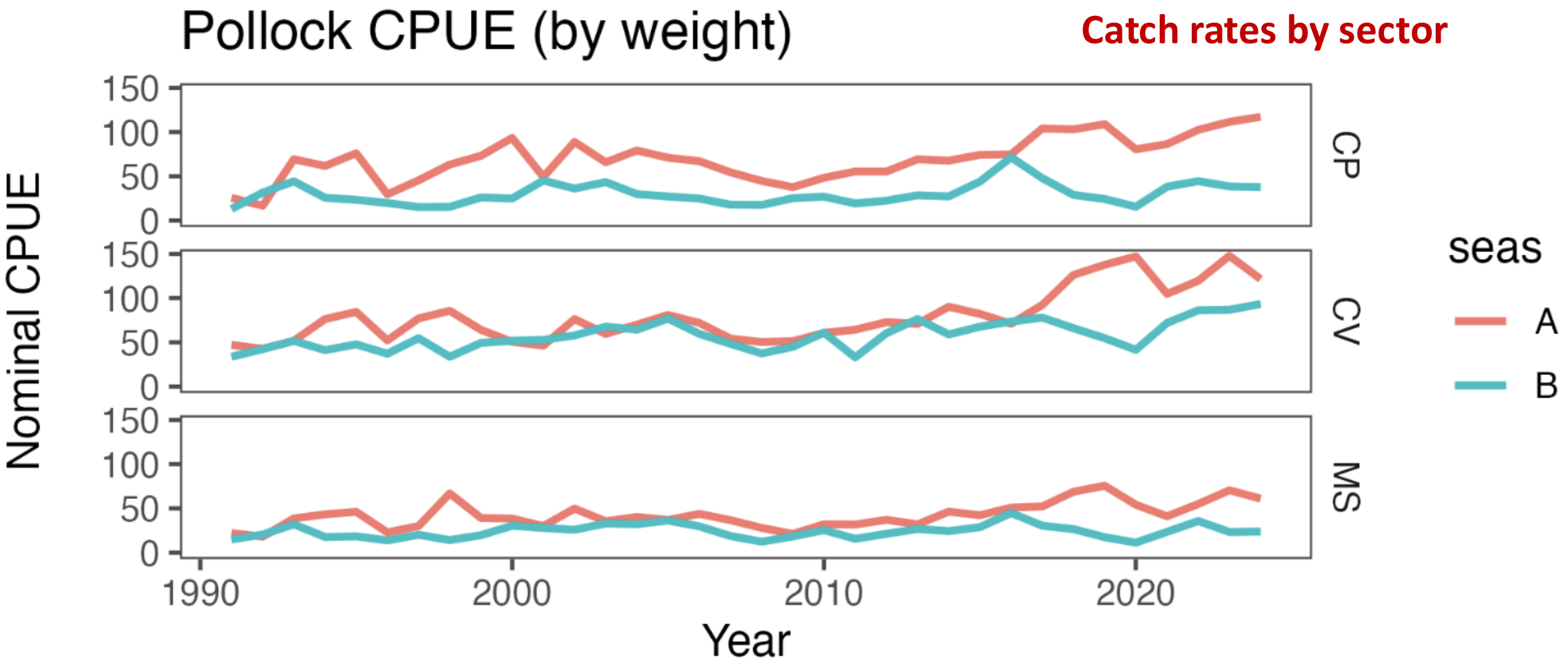
Alaska Fisheries Science Center

Fishing conditions



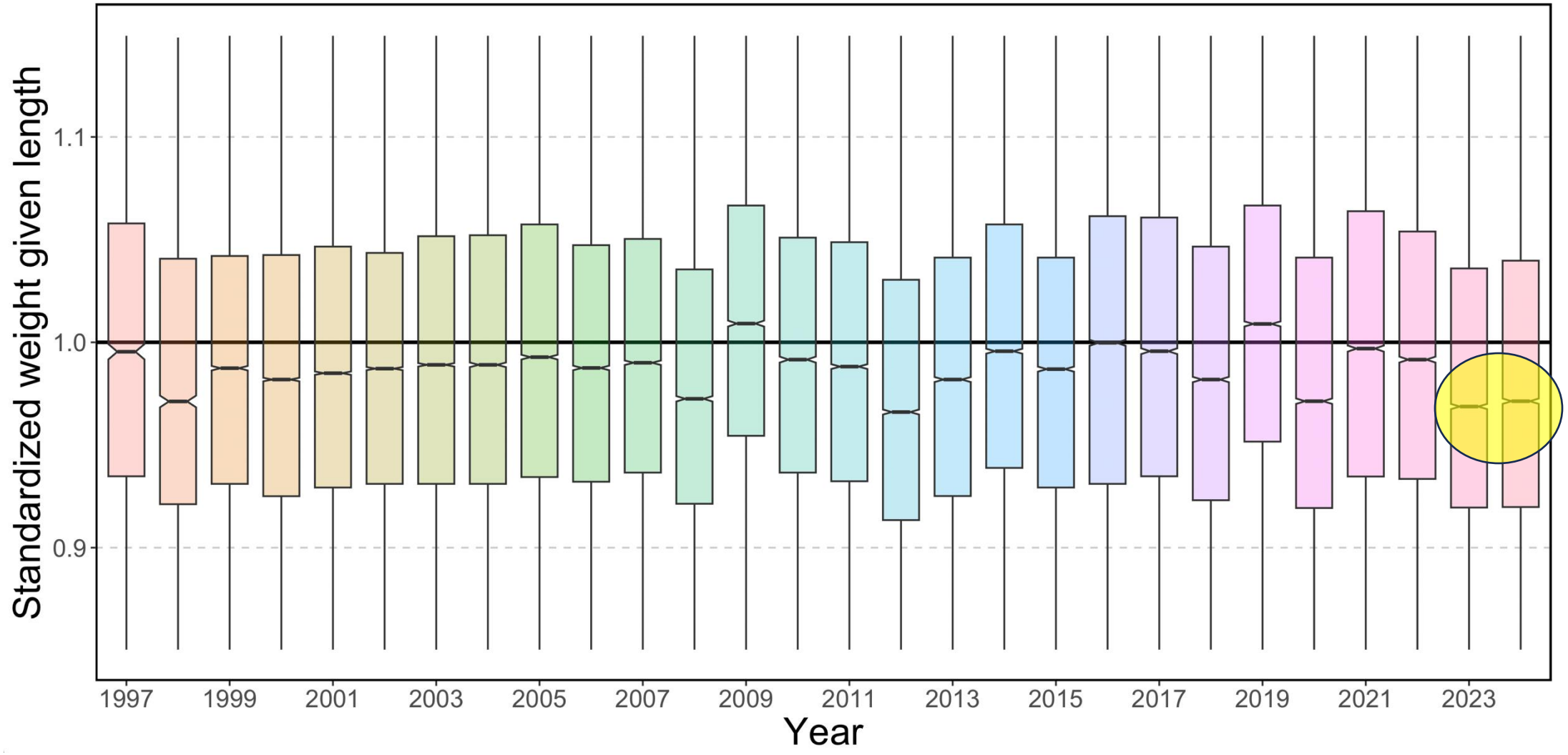
Fishing conditions

Catch rates by sector

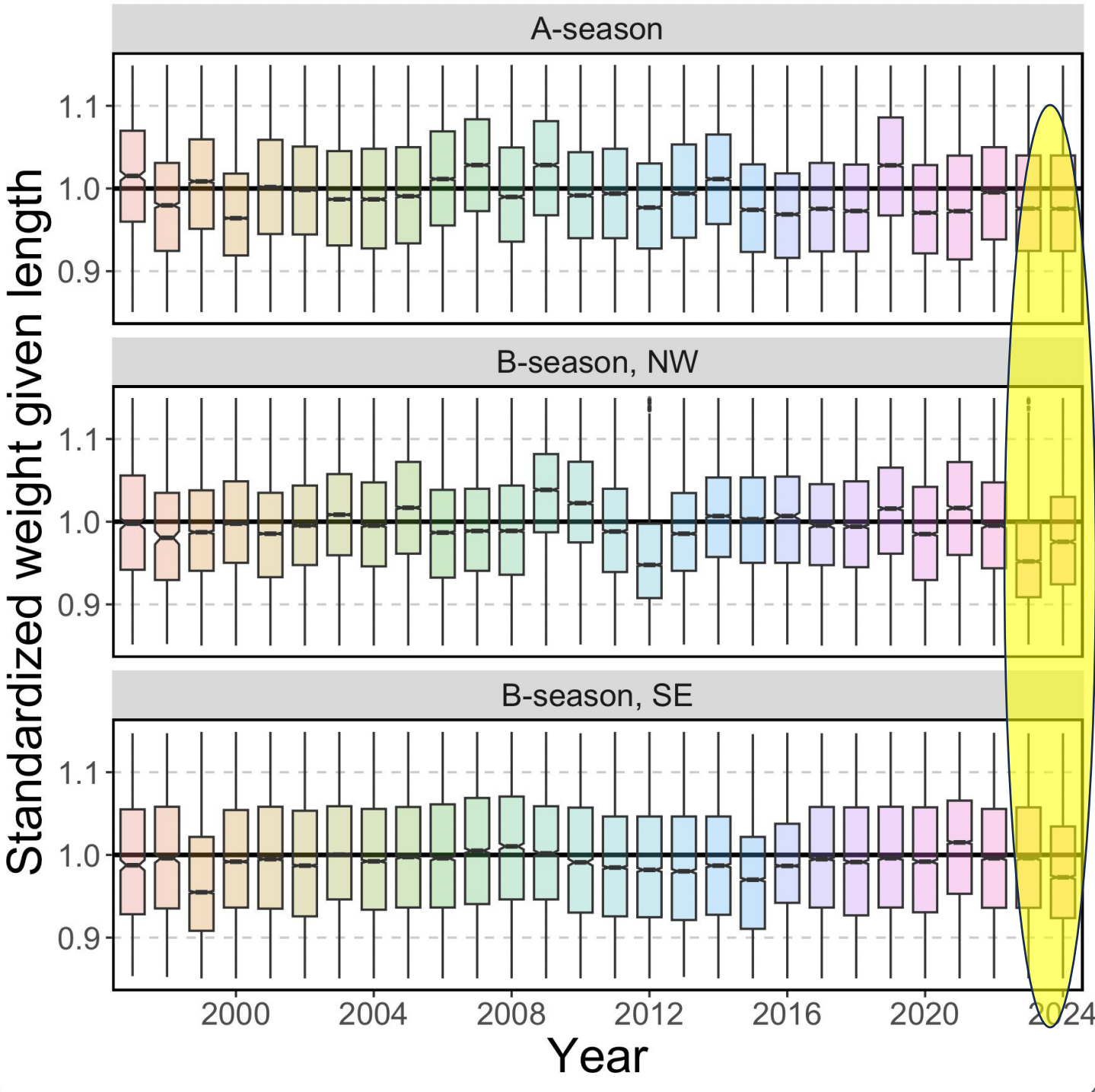


Fishery data on pollock “condition”

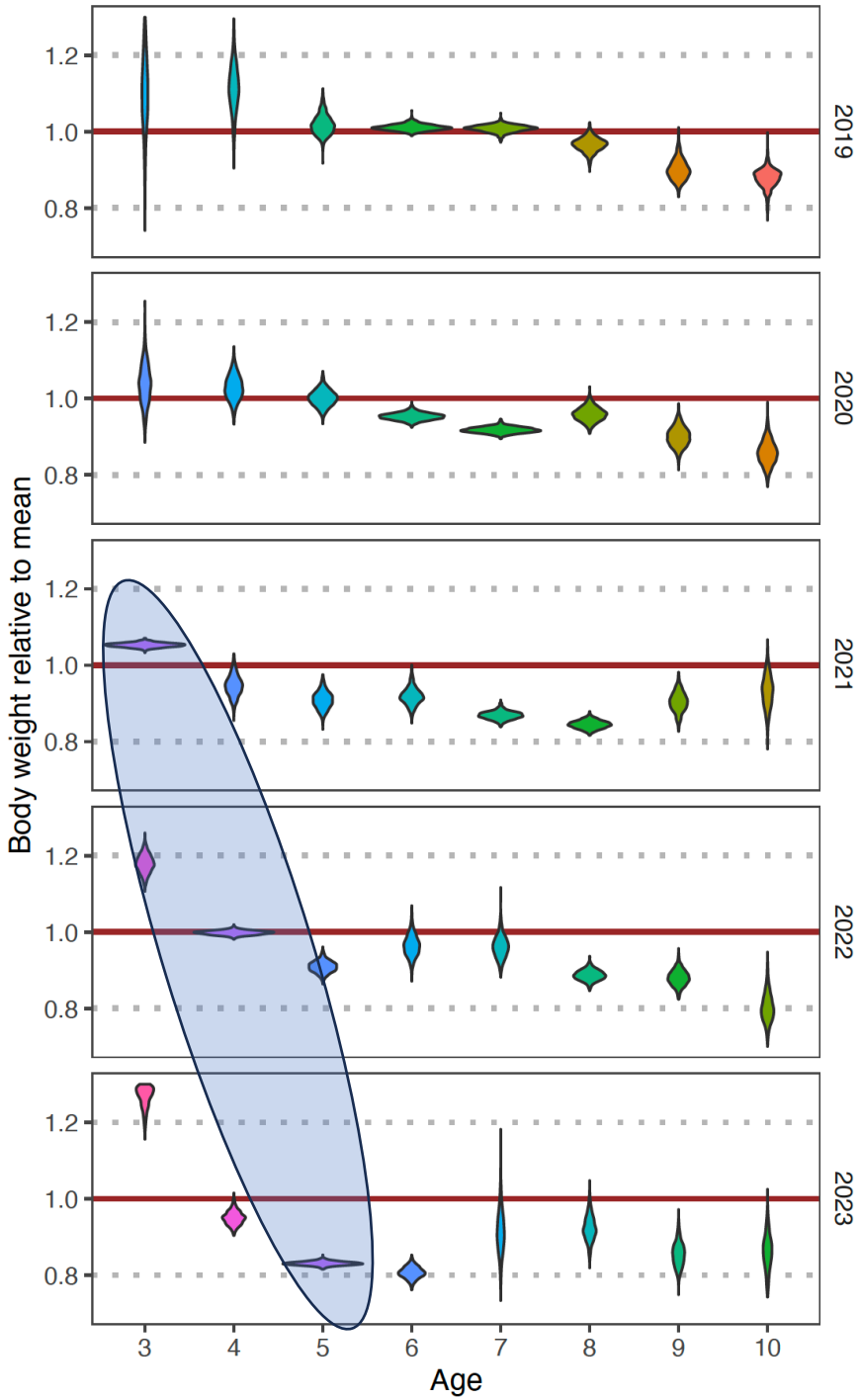
- Relative [figure 26 updated in SAFE chapter]

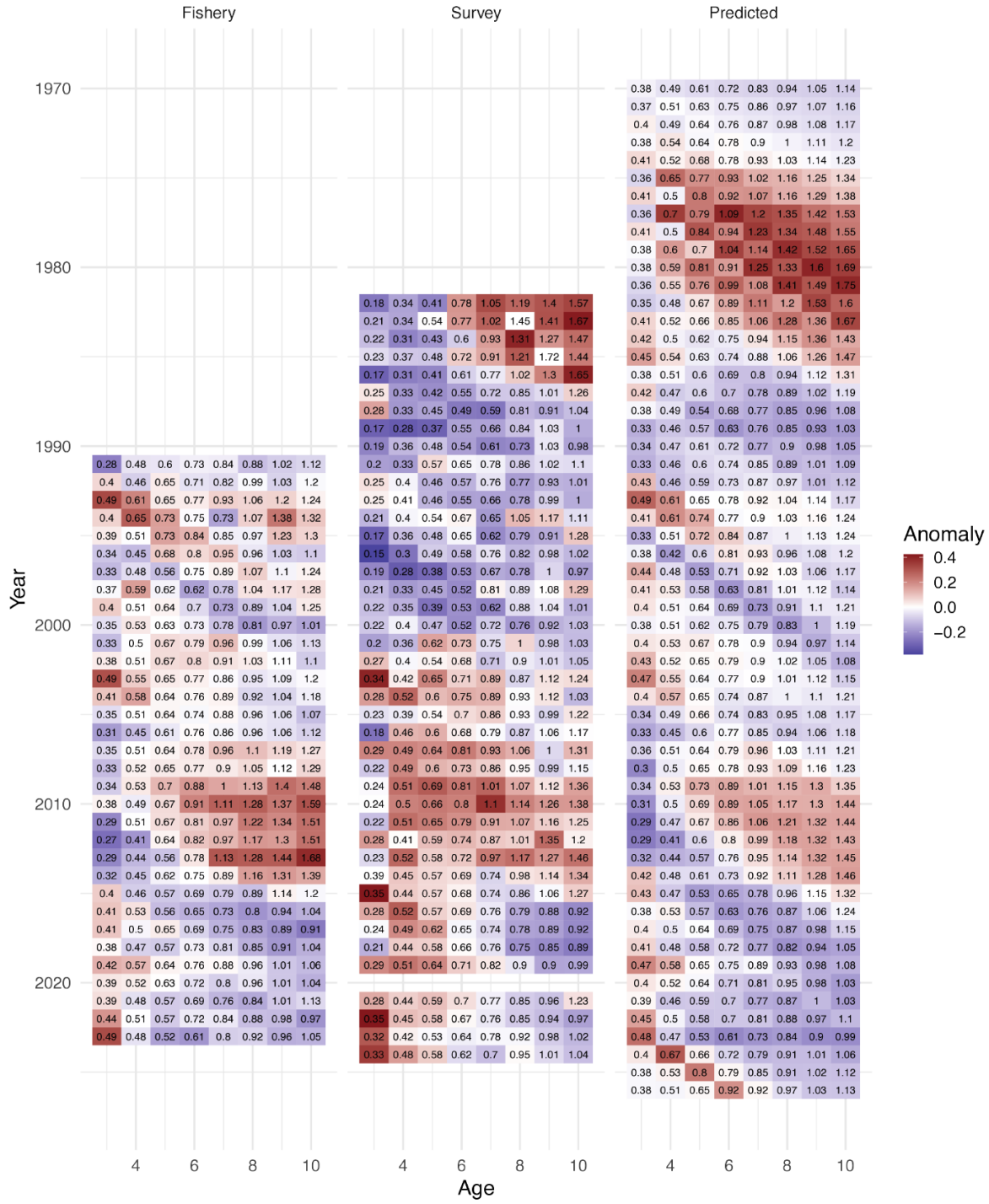


Fishery data on pollock “condition”

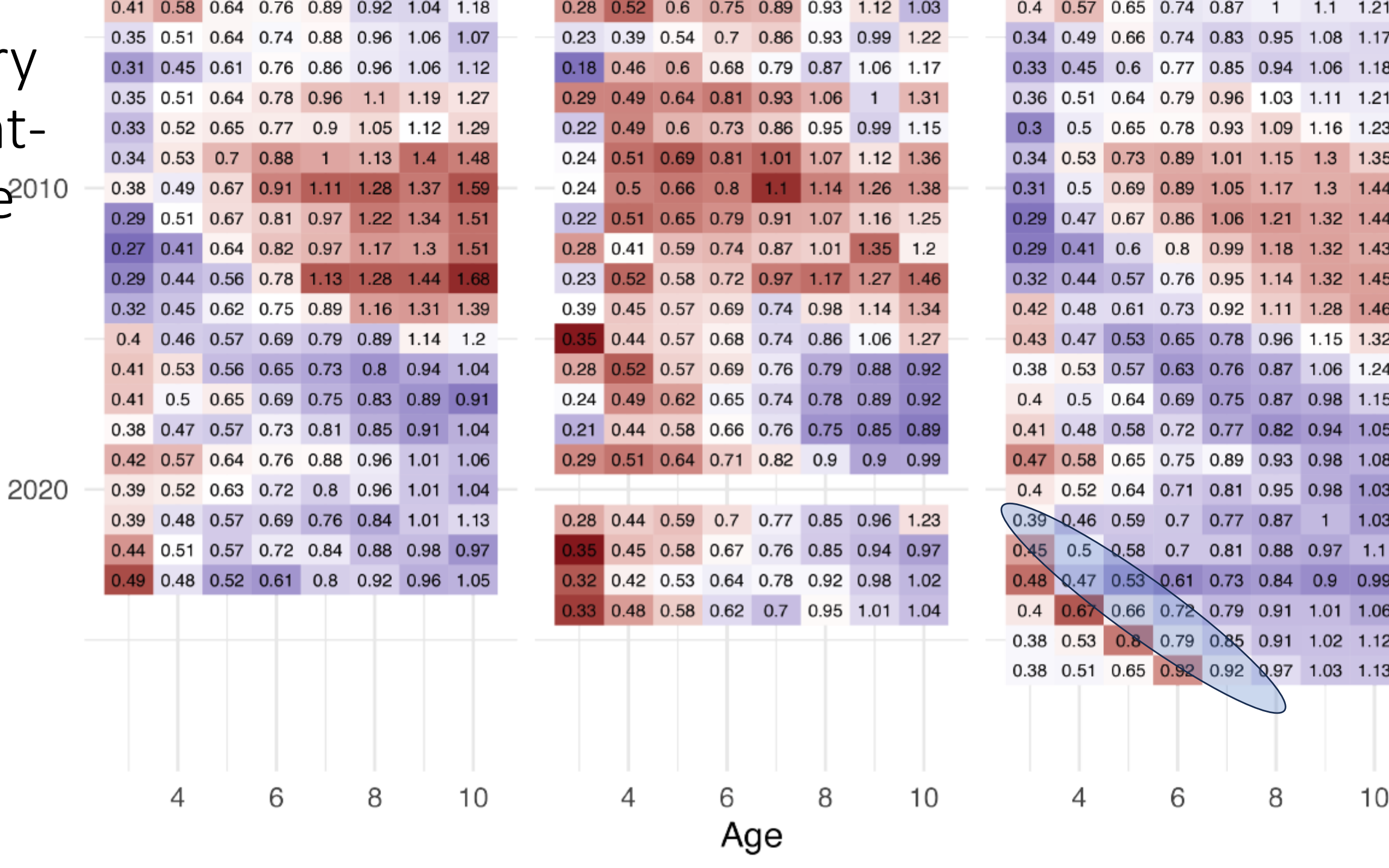


Fishery weight-at-age

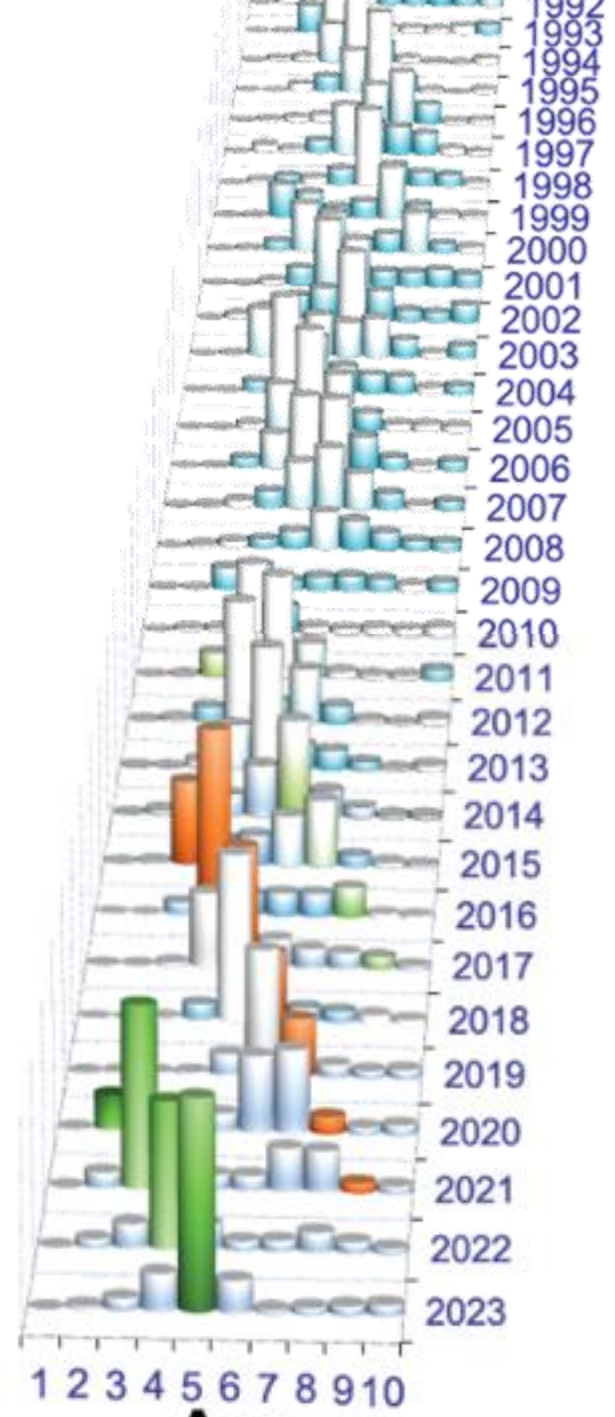




Fishery weight-at-age



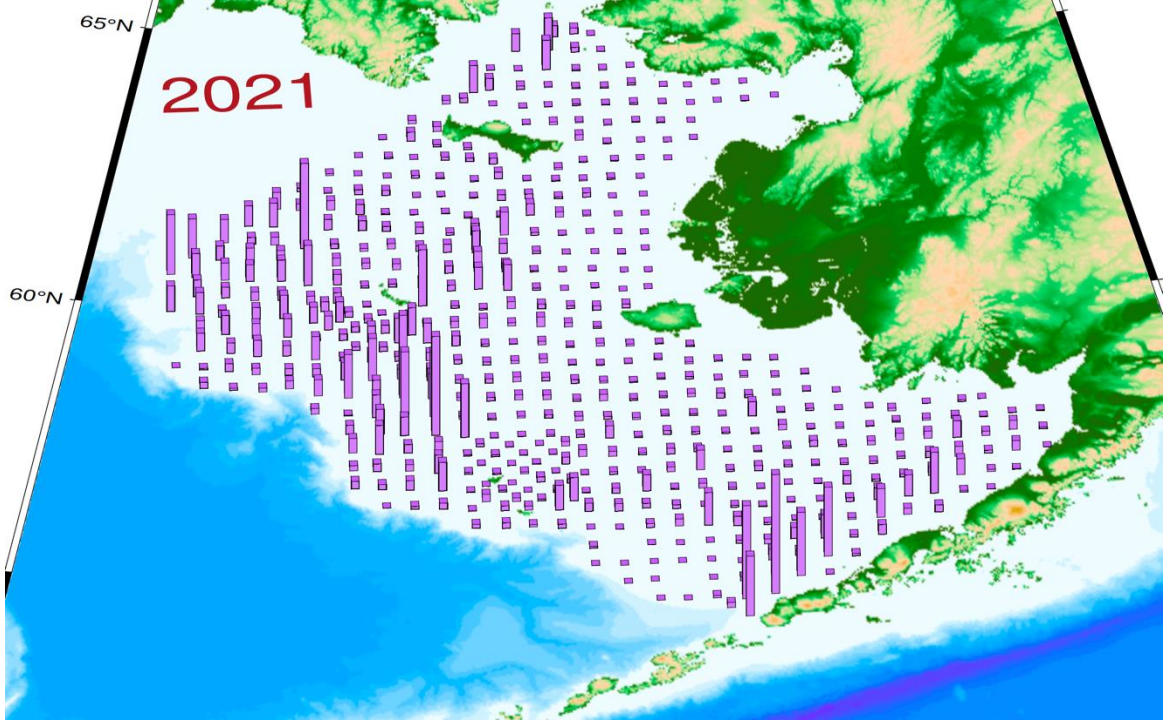
Fishery catch-at-age

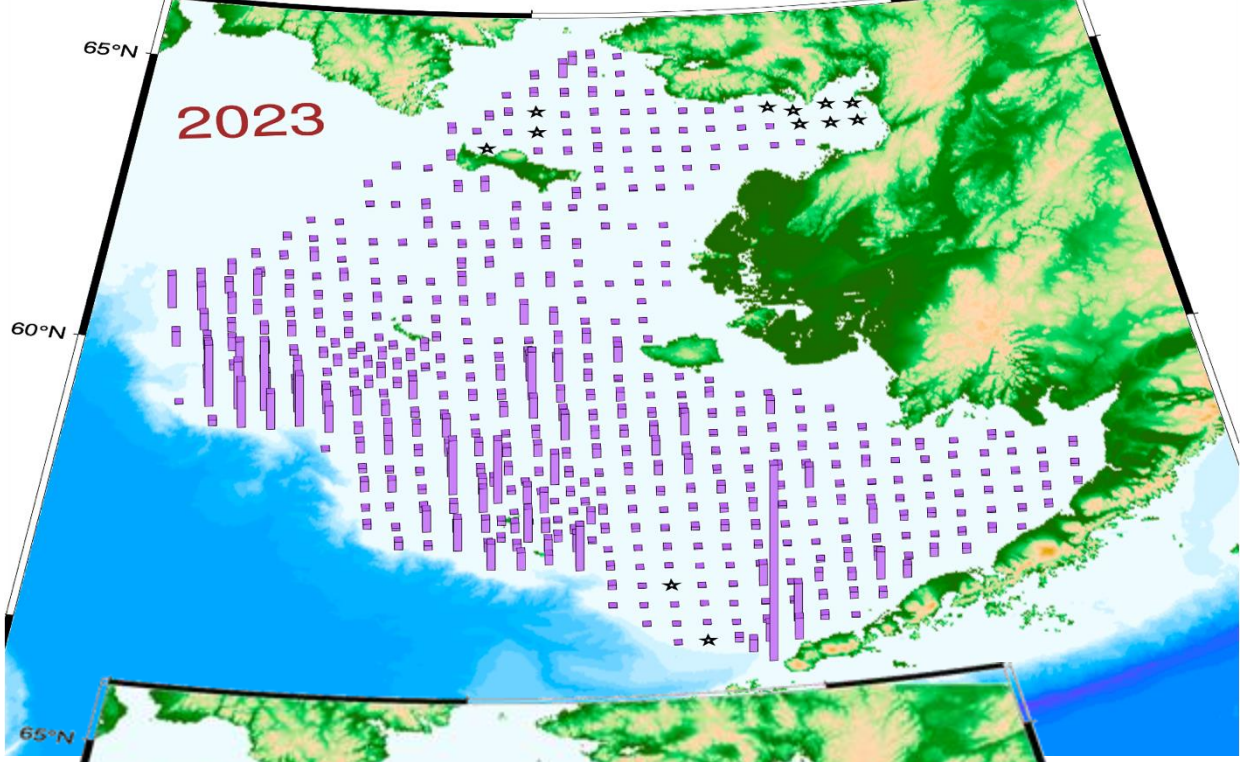


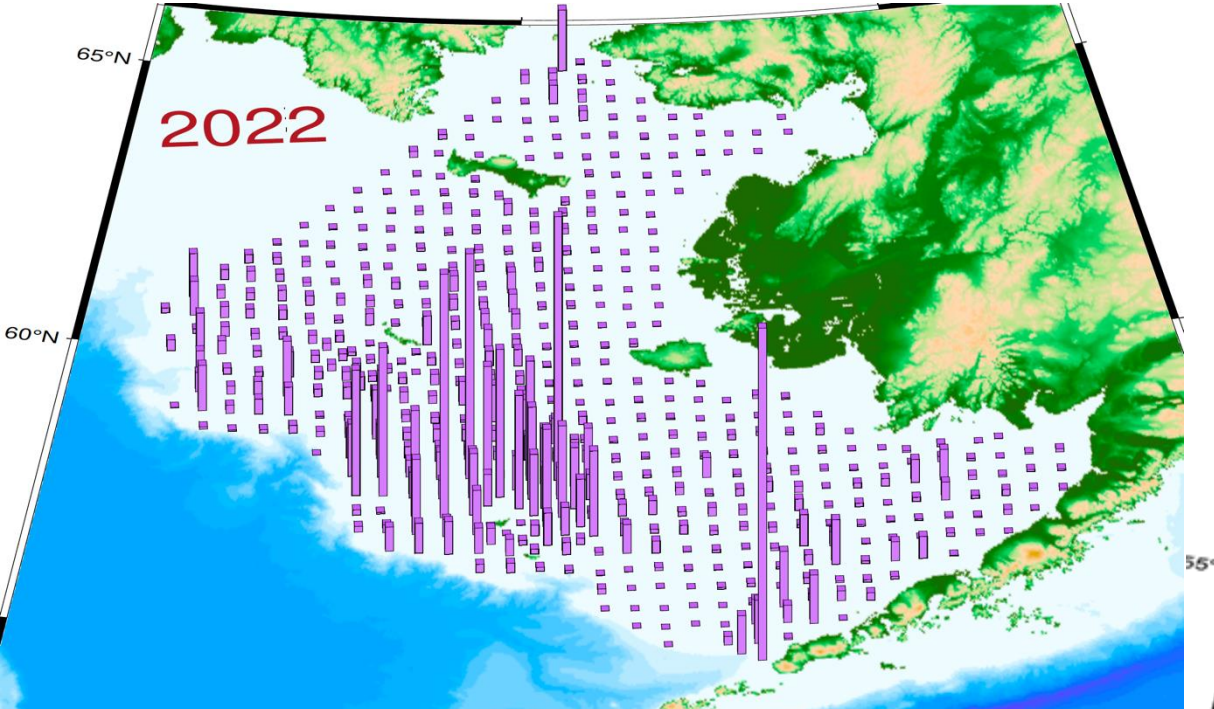
Survey work

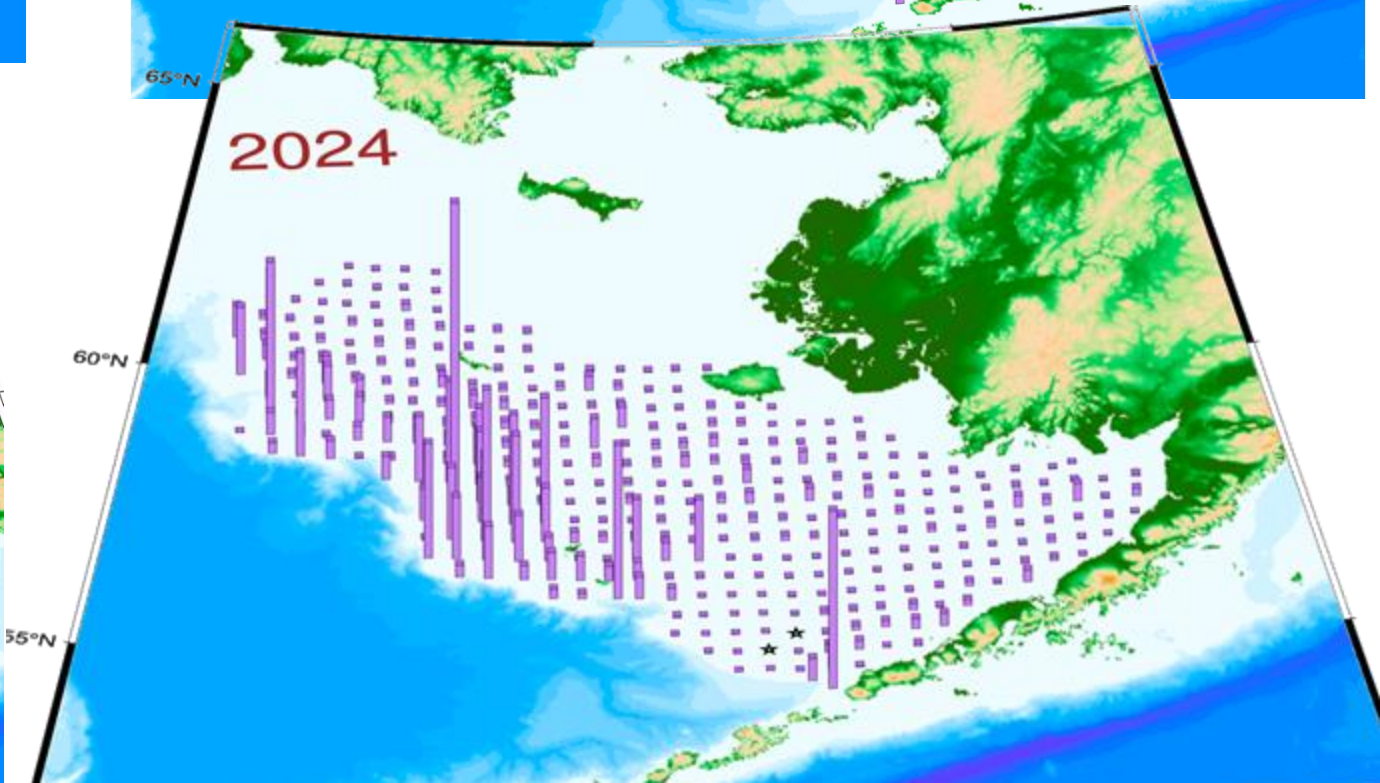
FV *Alaska Knight*
2010-present
12th year

FV *Northwest Explorer*
2023
1st year


65°N
2021
60°N

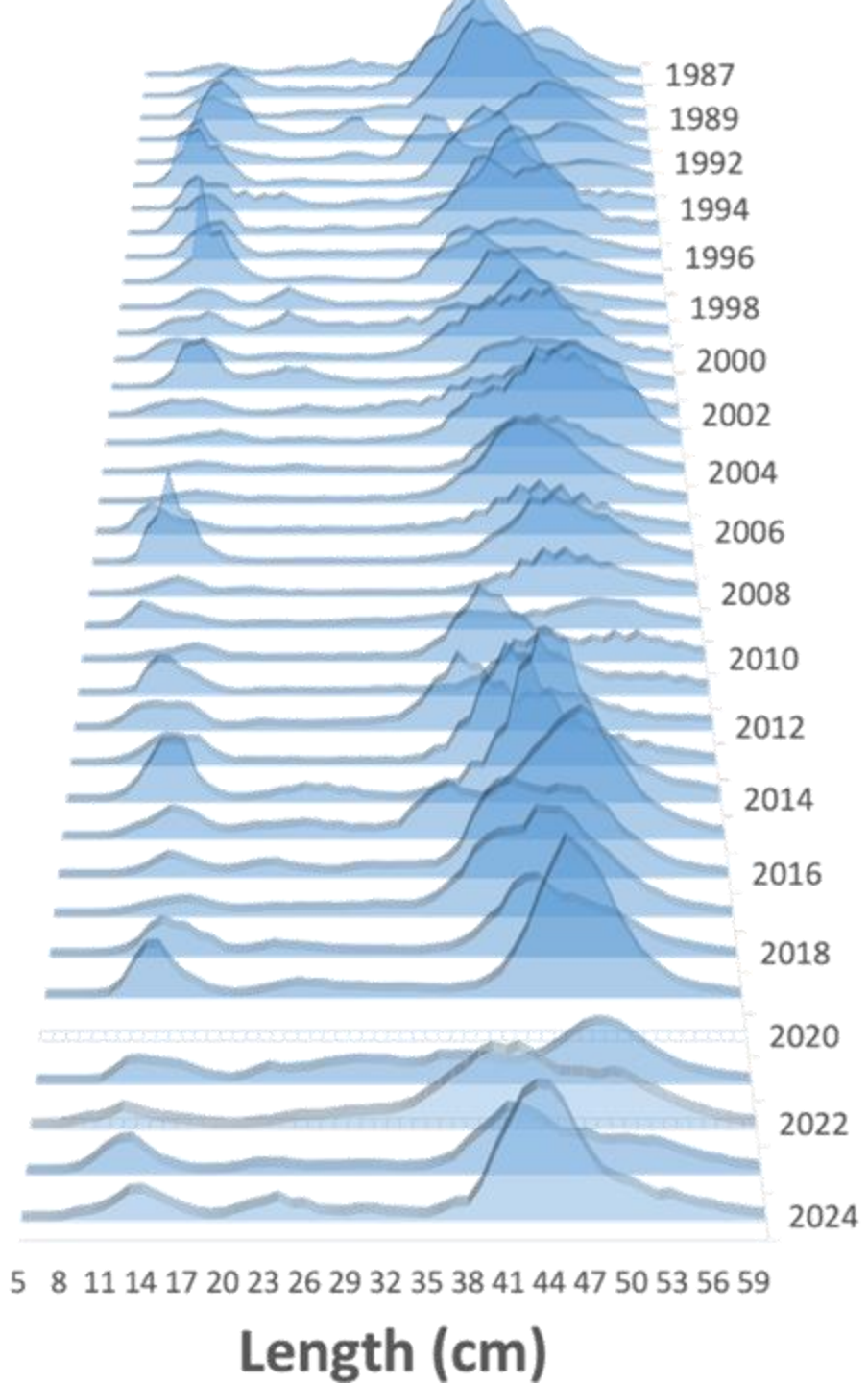

65°N
2023
60°N


65°N
2022
60°N


65°N
2024
60°N
55°N

Bottom-trawl survey

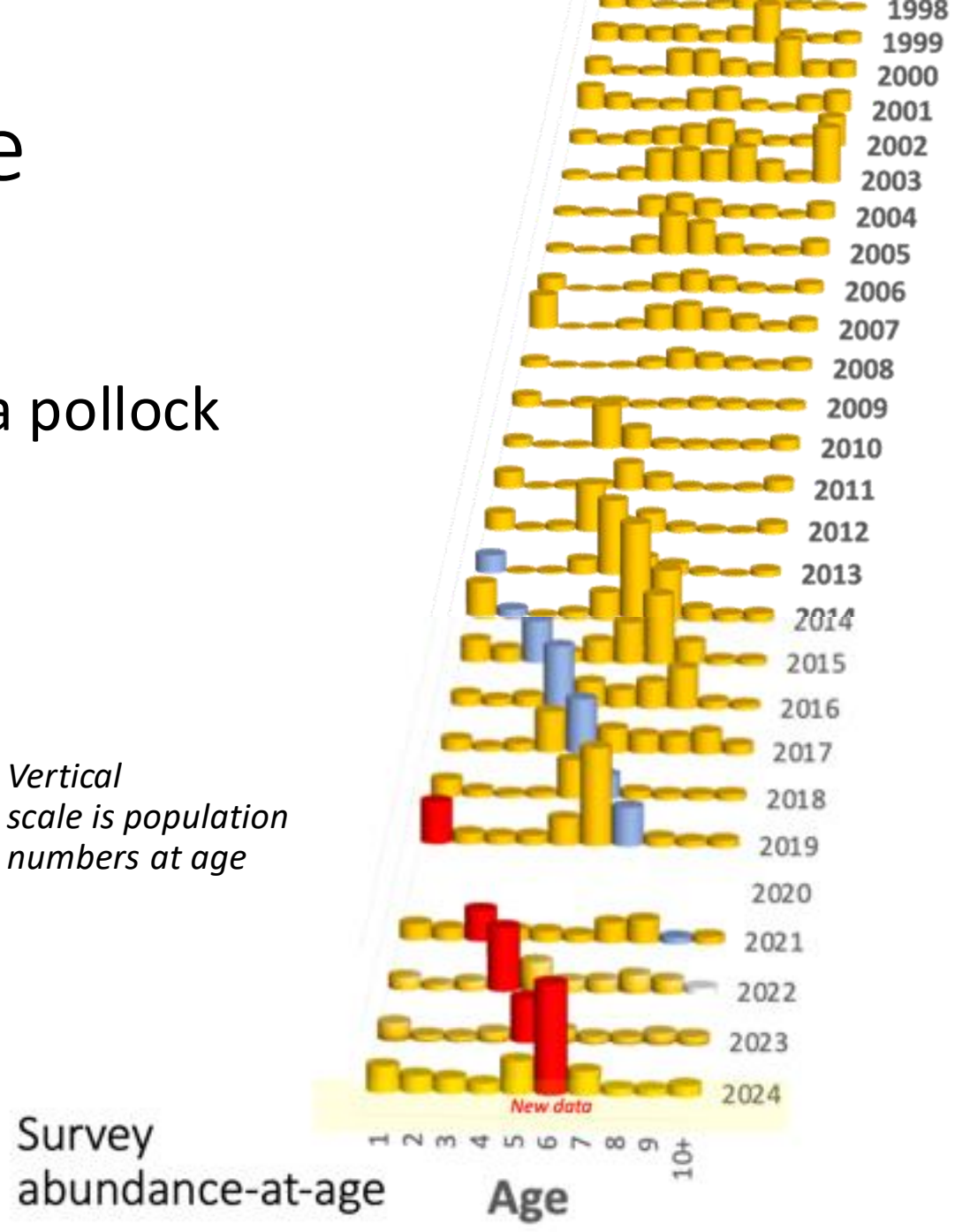
- Abundance at length



Survey abundance-at-age

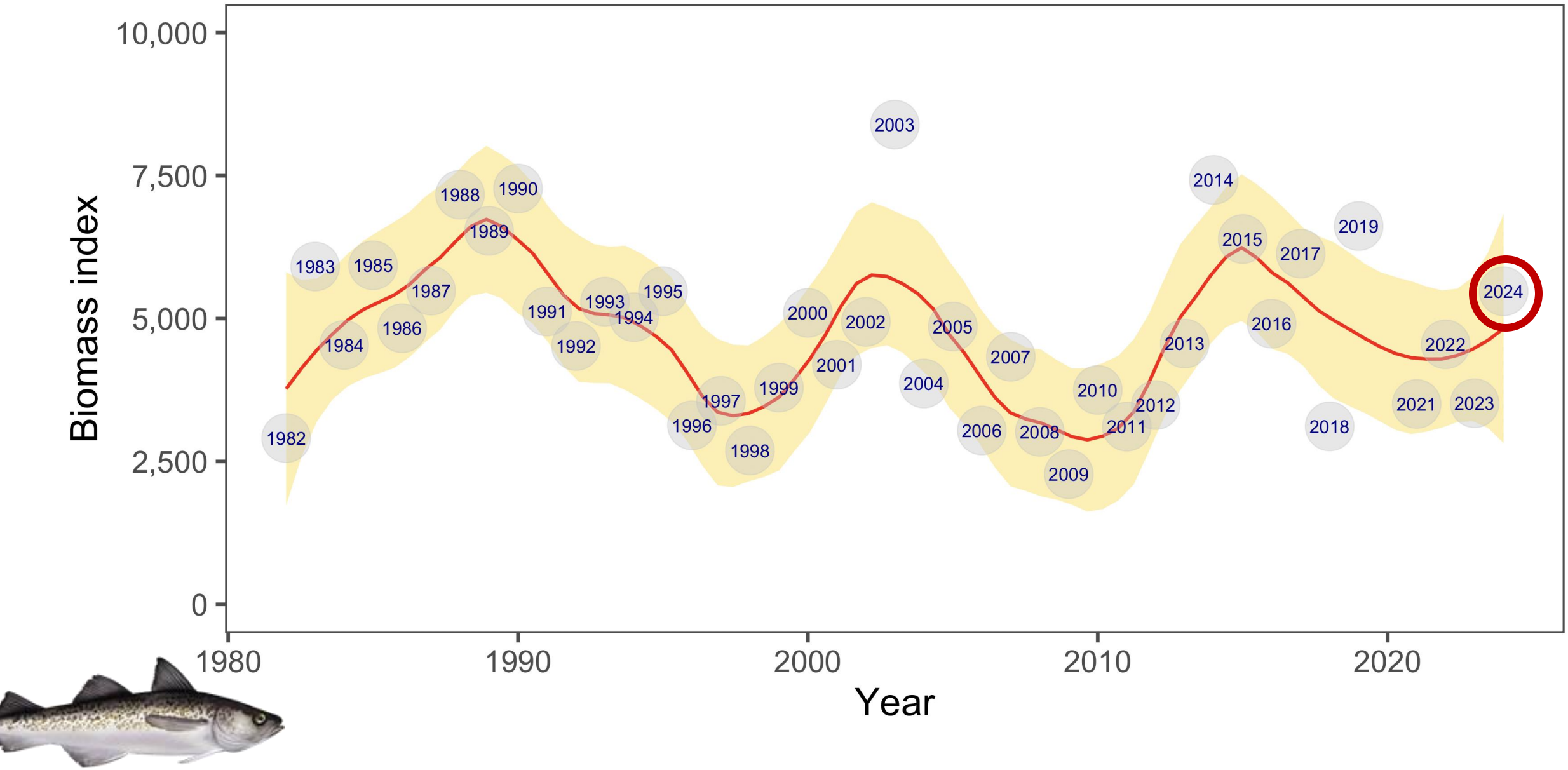
- Eastern Bering Sea pollock

Vertical scale is population numbers at age

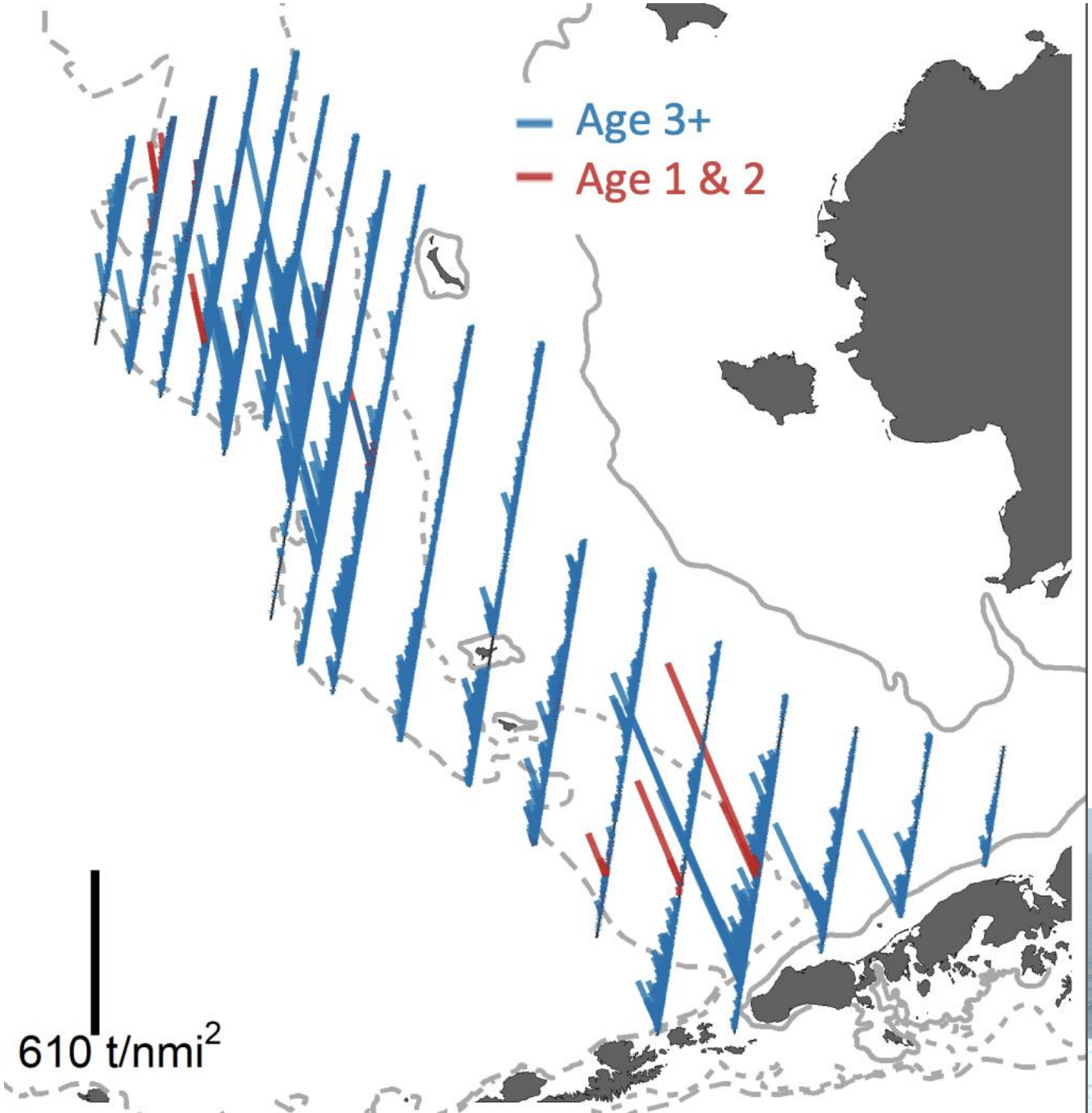


Survey abundance-at-age

E. Bering Sea bottom trawl survey

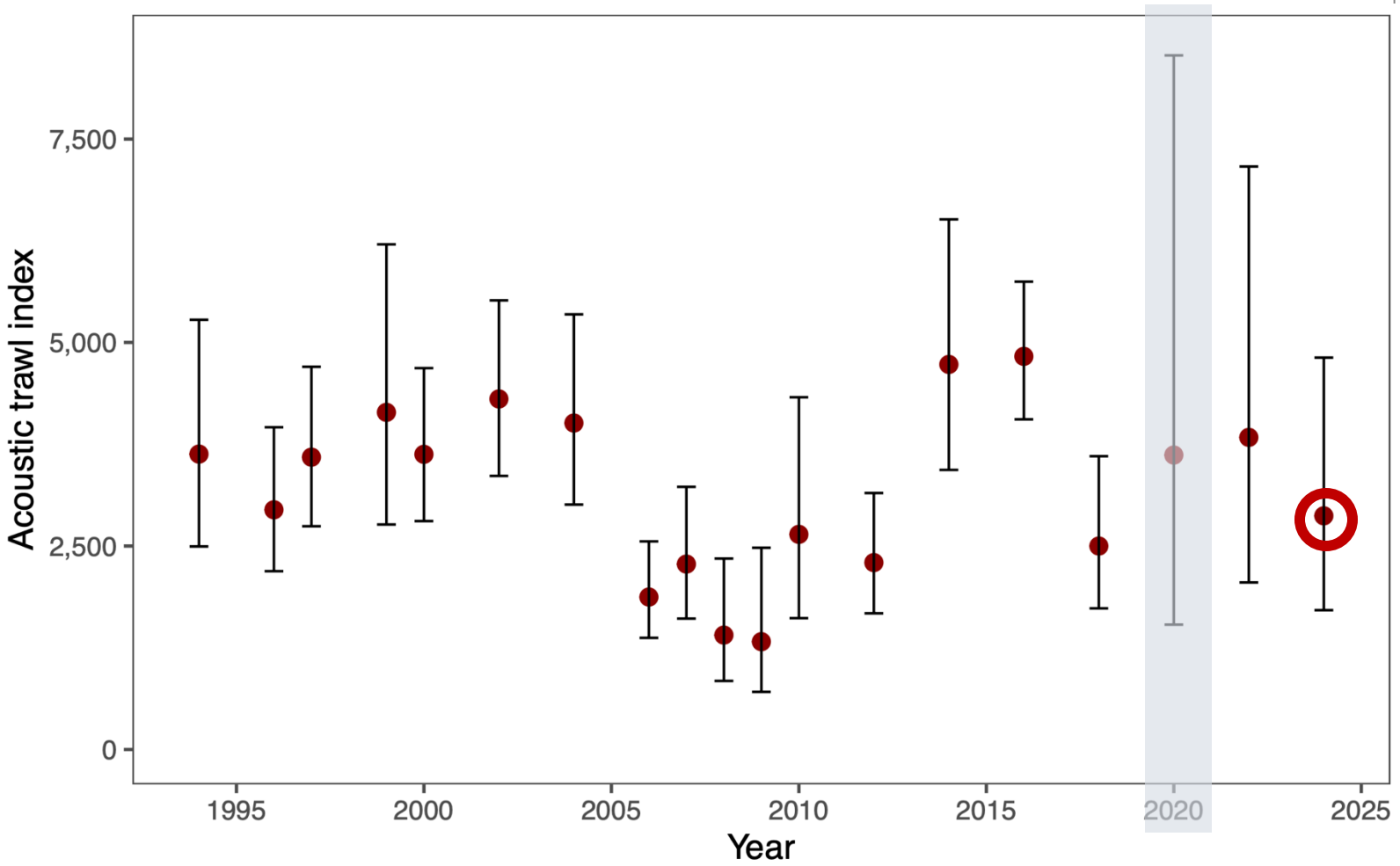


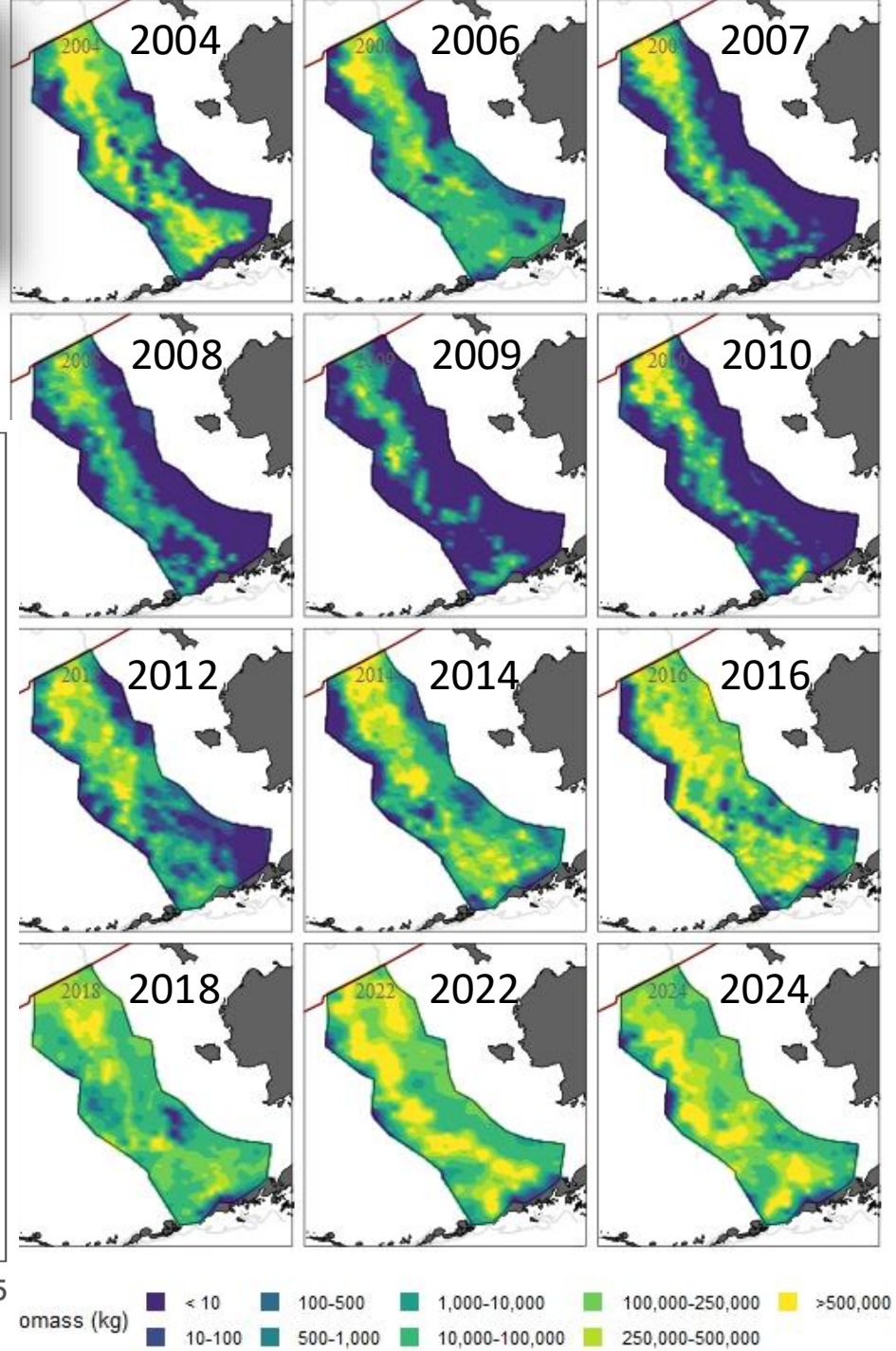
Acoustic survey-NOAA Ship



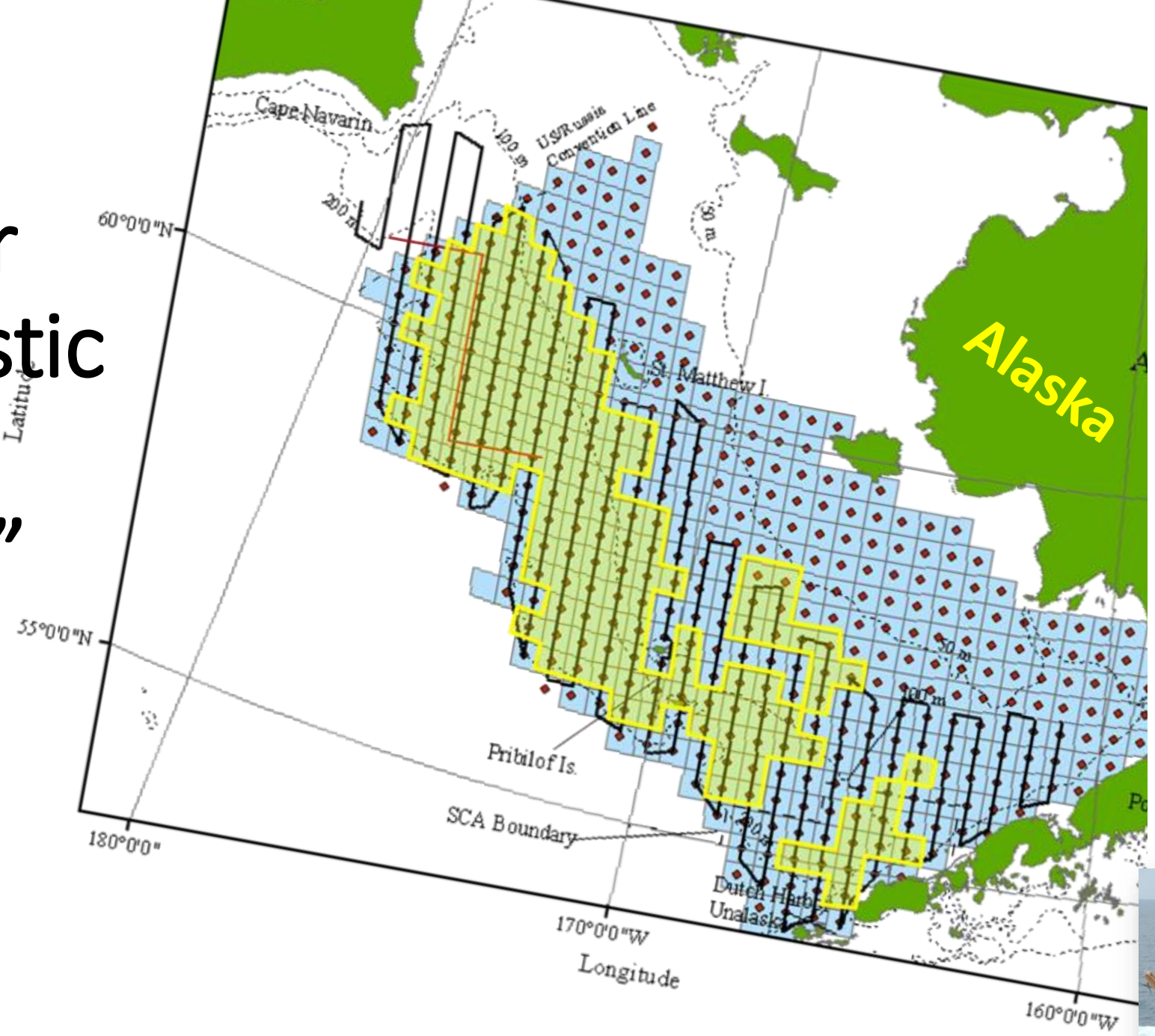
New survey this summer

Acoustic-trawl survey (ATS)

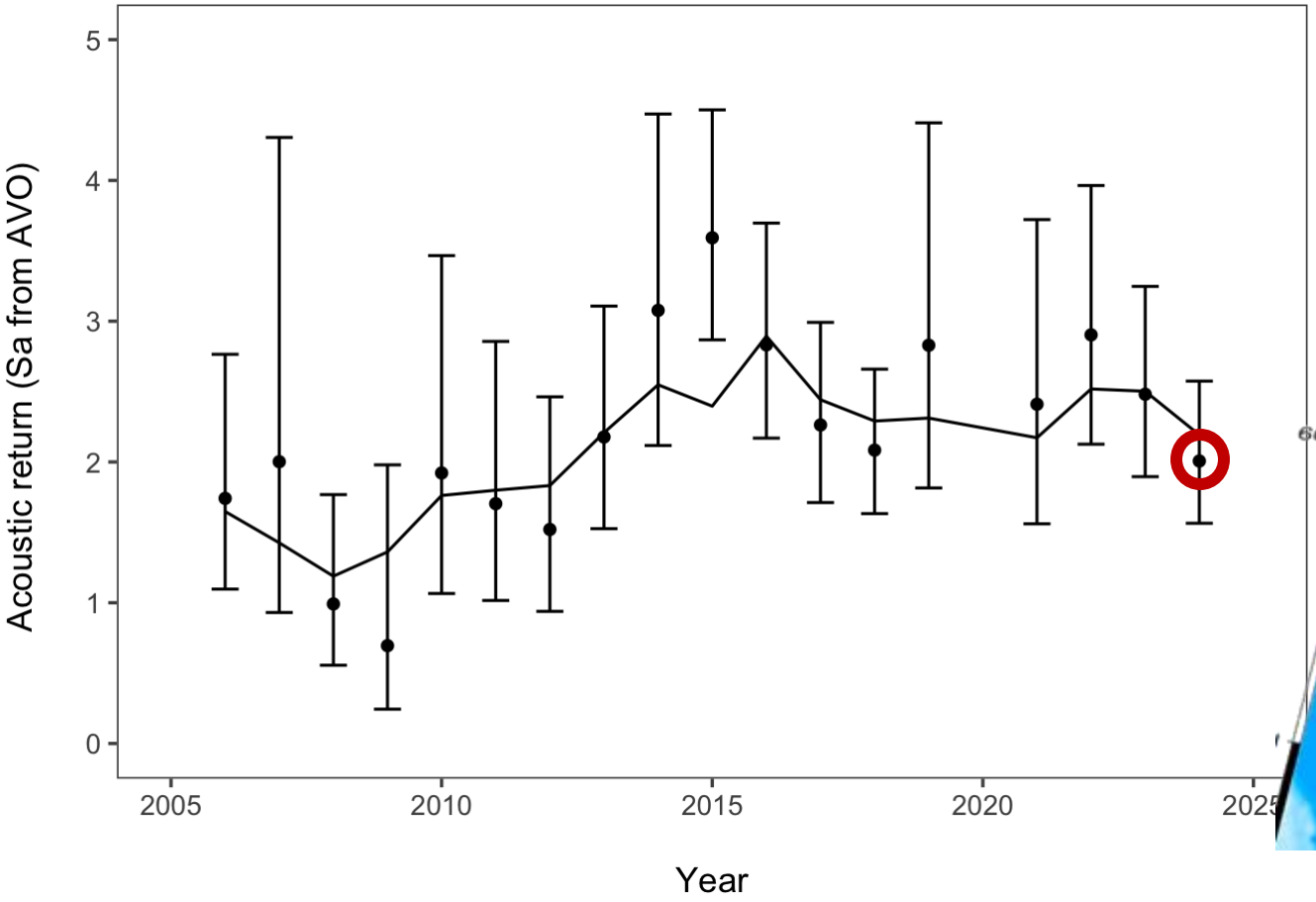


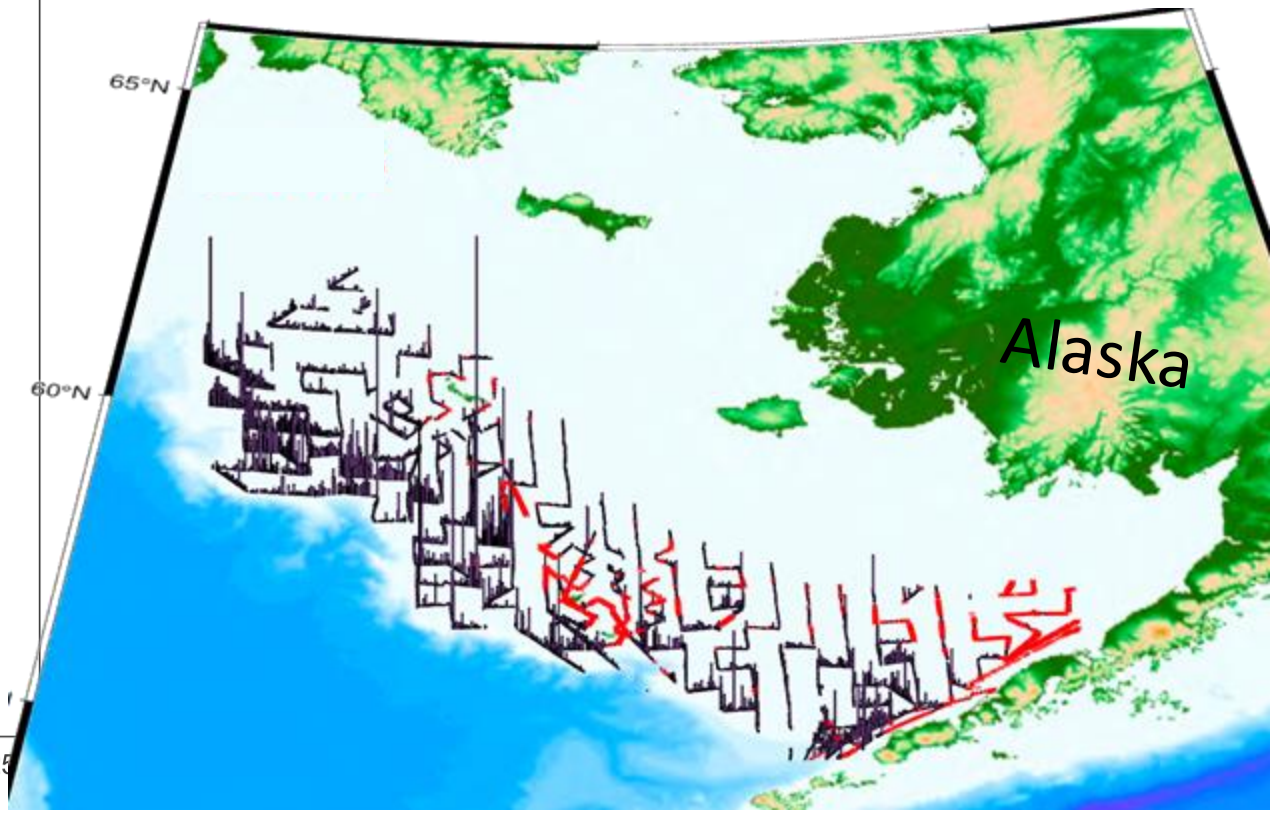


Other acoustic data "AVO"

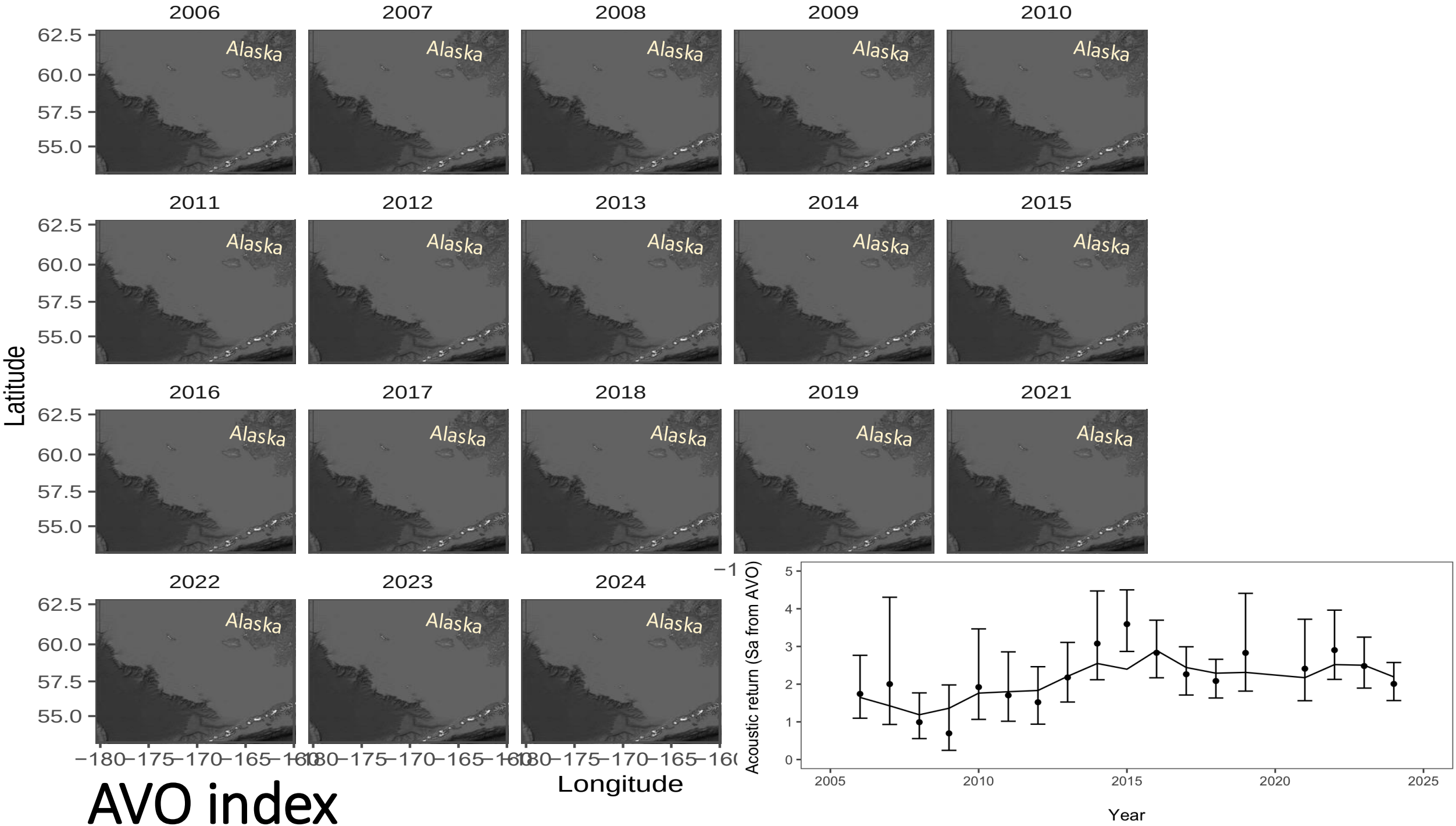


Opportunistic acoustic survey results

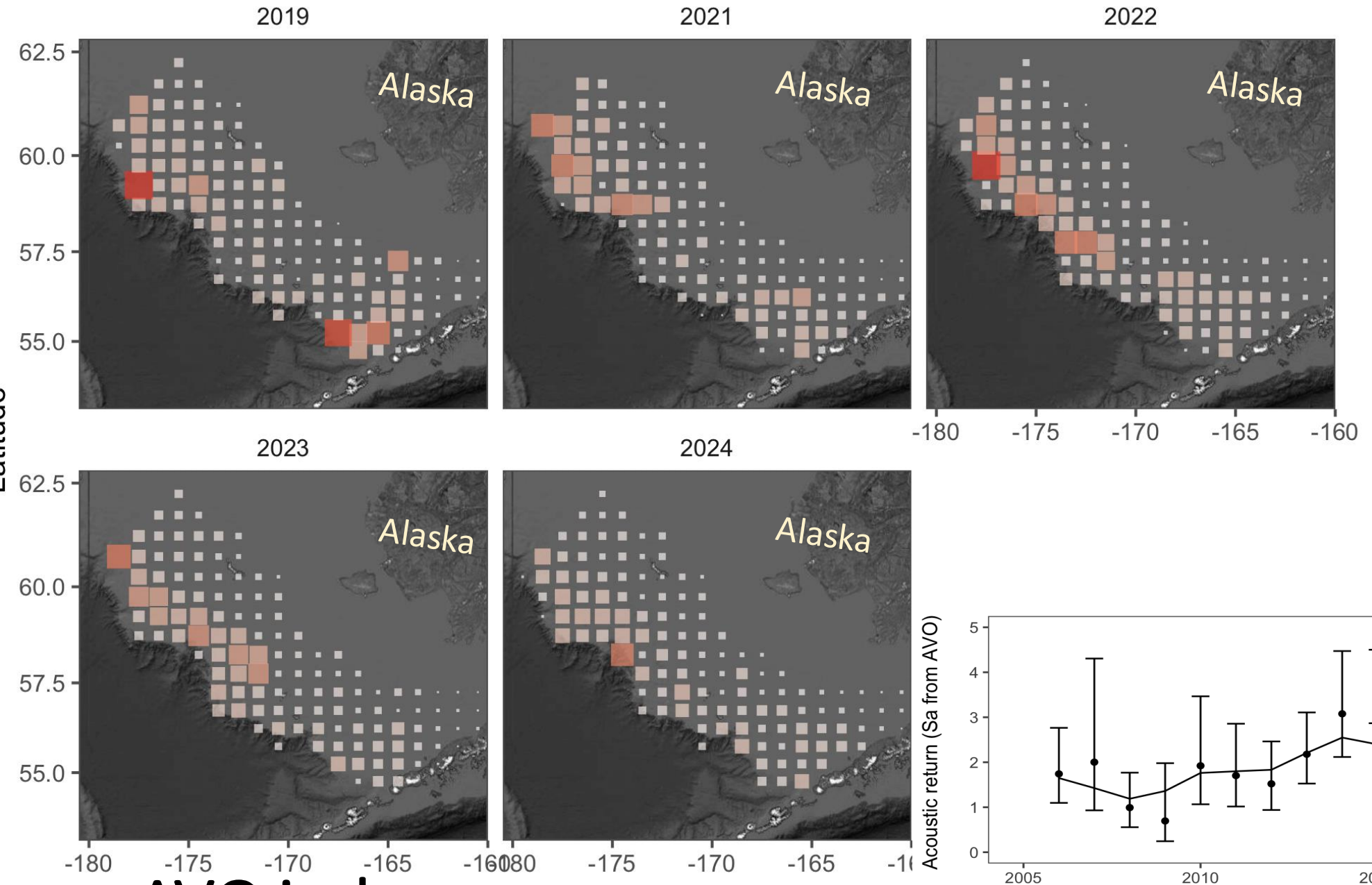


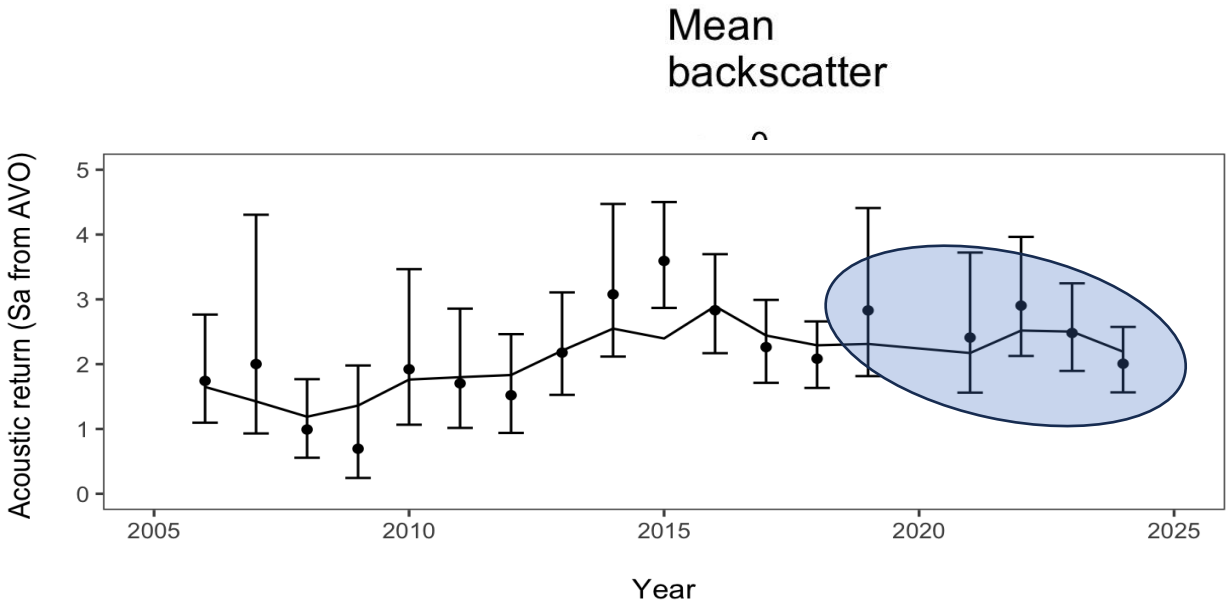


AVO index

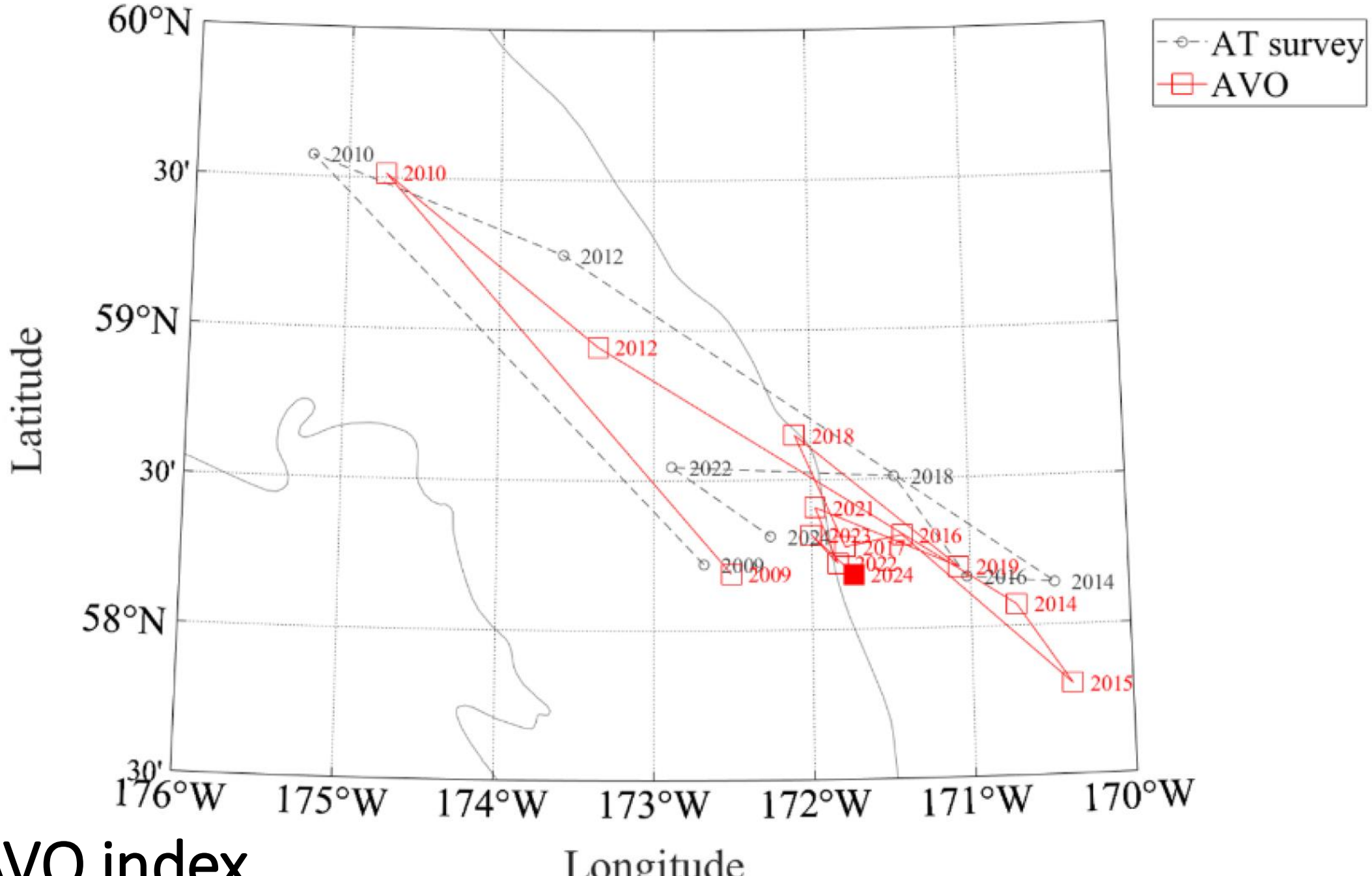

2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2021
2022
2023
2024
Alaska
62.5
60.0
57.5
55.0
Latitude
−180
−175
−170
−165
Longitude
Acoustic return (Sa from AVO)
0
1
2
3
4
5
2005
2010
2015
2020
2025
Year

AVO index


2019
2021
2022
2023
2024
Alaska
62.5
60.0
57.5
55.0
-180
-175
-170
-165
-160
Mean backscatter
2000
1000
0


Mean backscatter
Acoustic return (Sa from AVO)
5
4
3
2
1
0
2005
2010
2015
2020
2025
Year

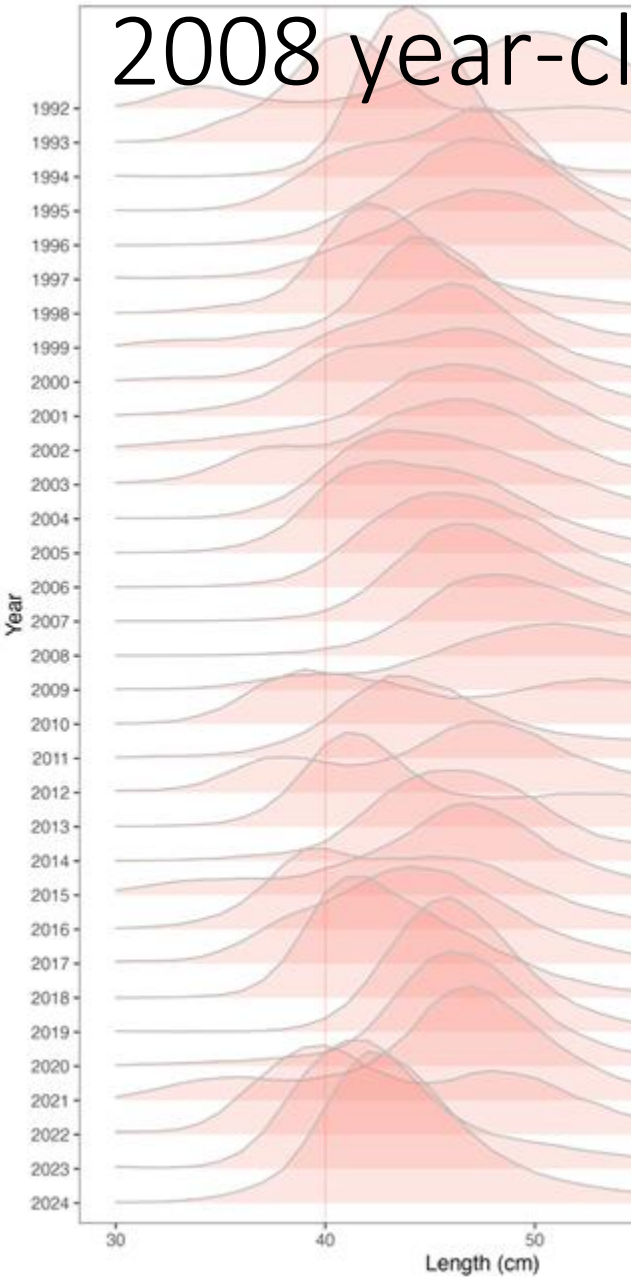
AVO index

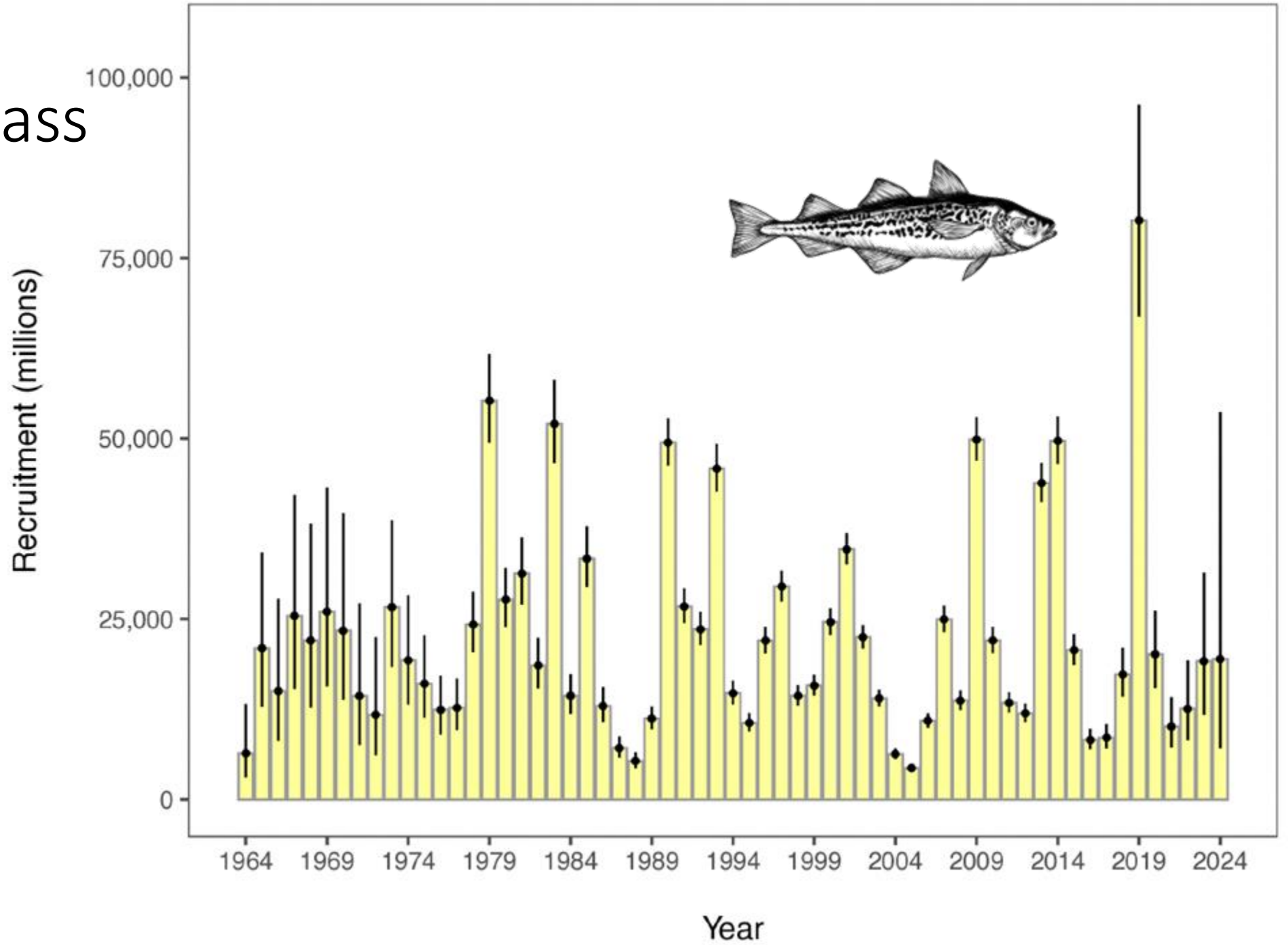

AT survey
AVO
60°N
30'
59°N
30'
58°N
30'
Latitude
176°W
175°W
174°W
173°W
172°W
171°W
170°W
Longitude
2010
2012
2018
2022
2021
2023
2017
2016
2019
2014
2009
2024
2015

AVO index

EBS Pollock

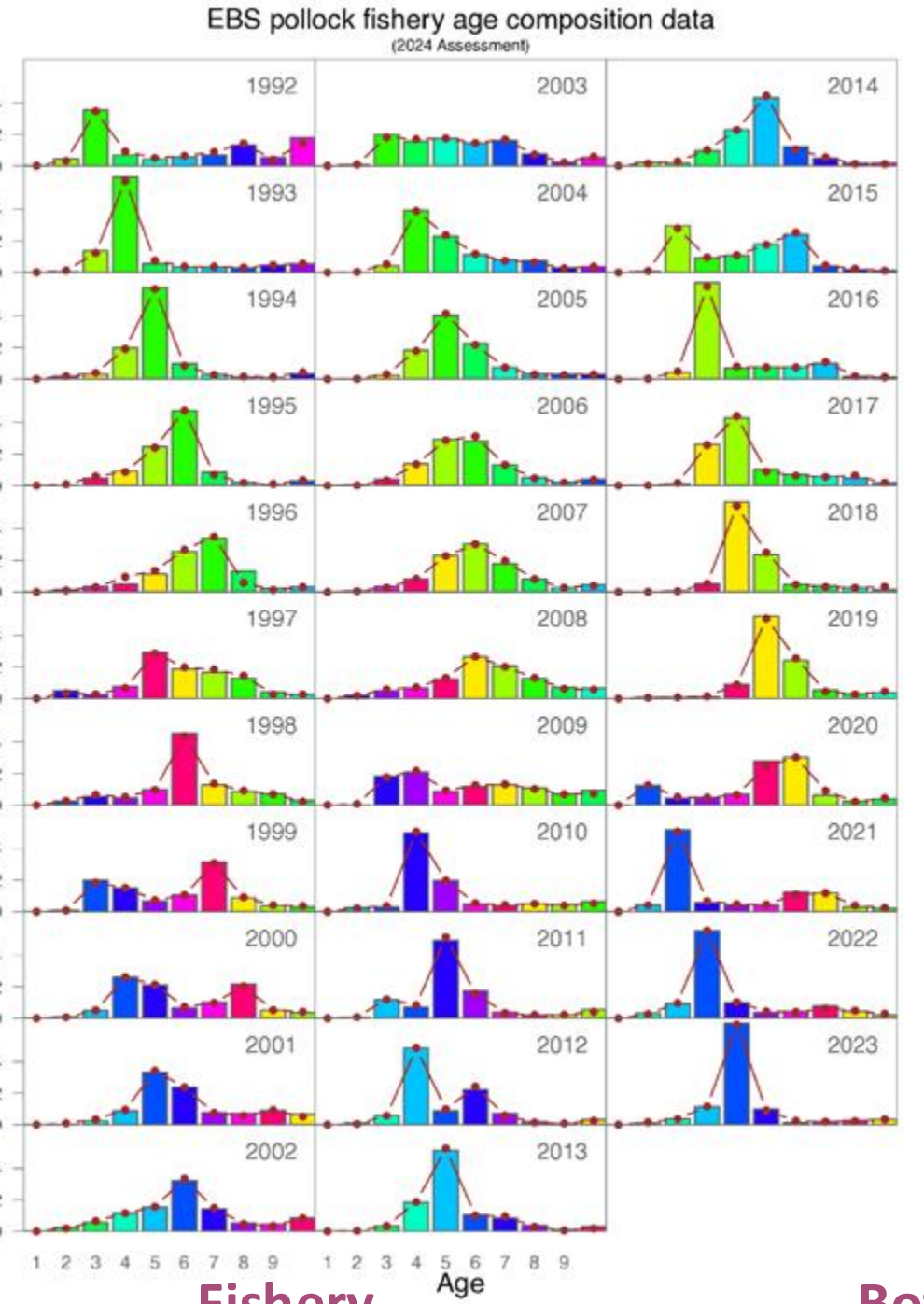
2008 year-class



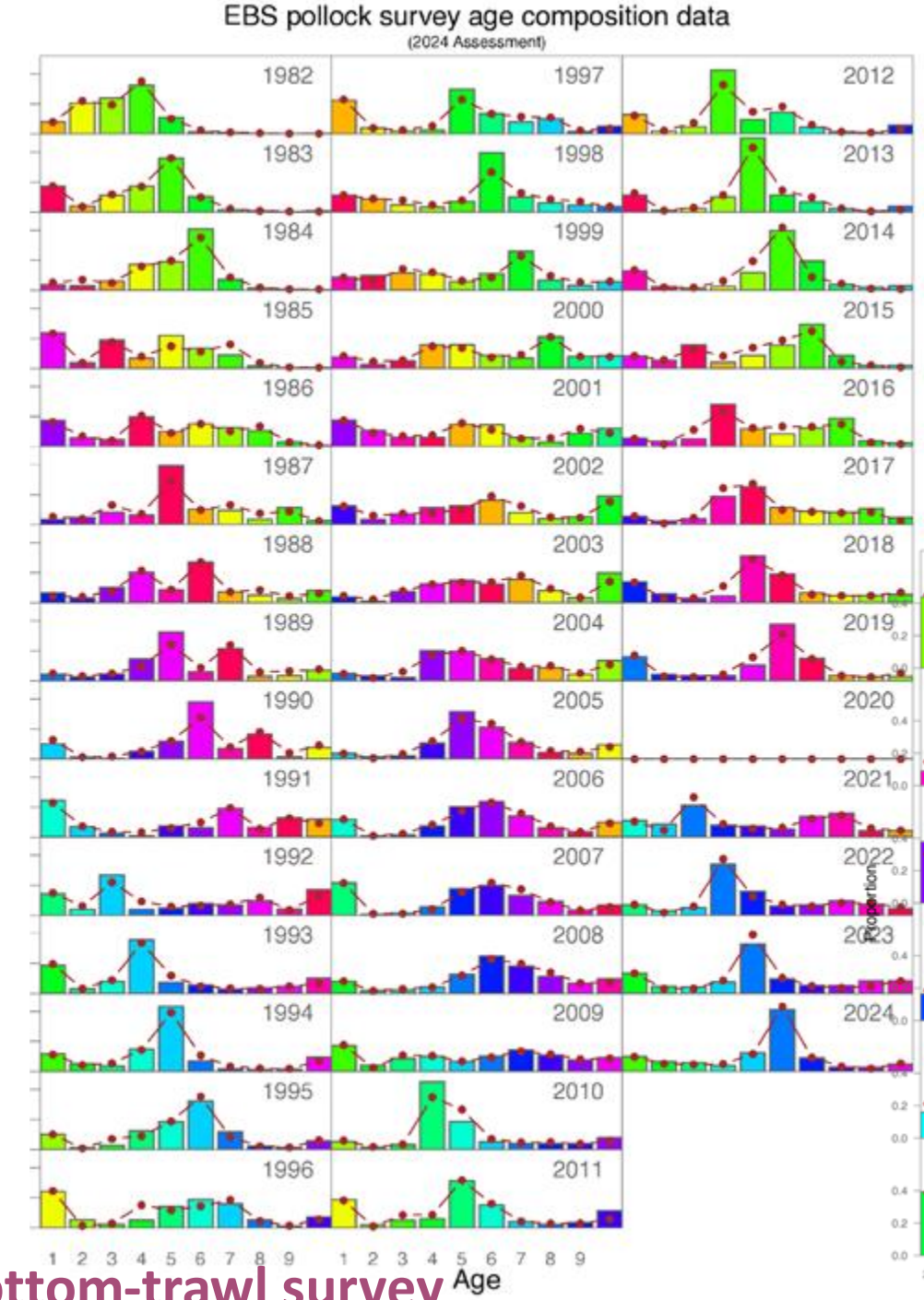


EBS Pollock

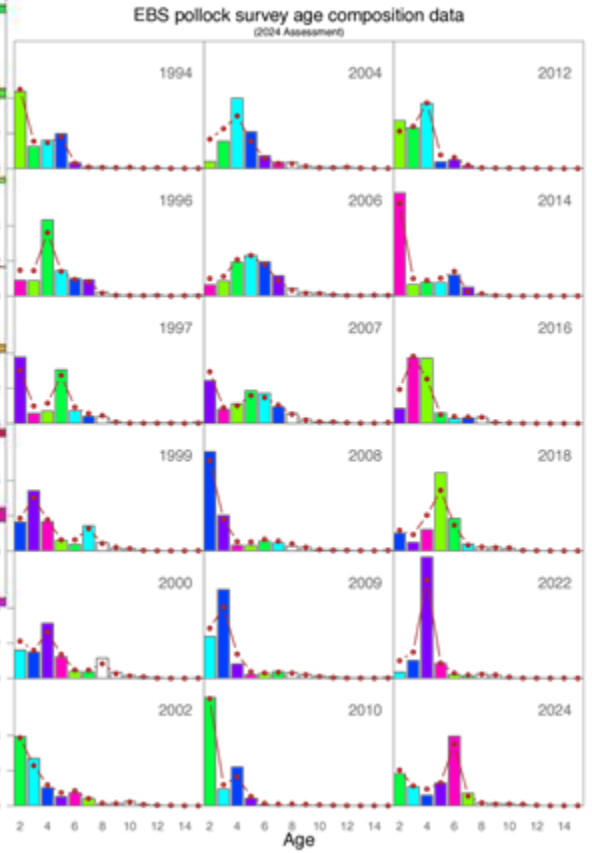
2018 year-class uncertainty impact on 2025 SSB



Fishery

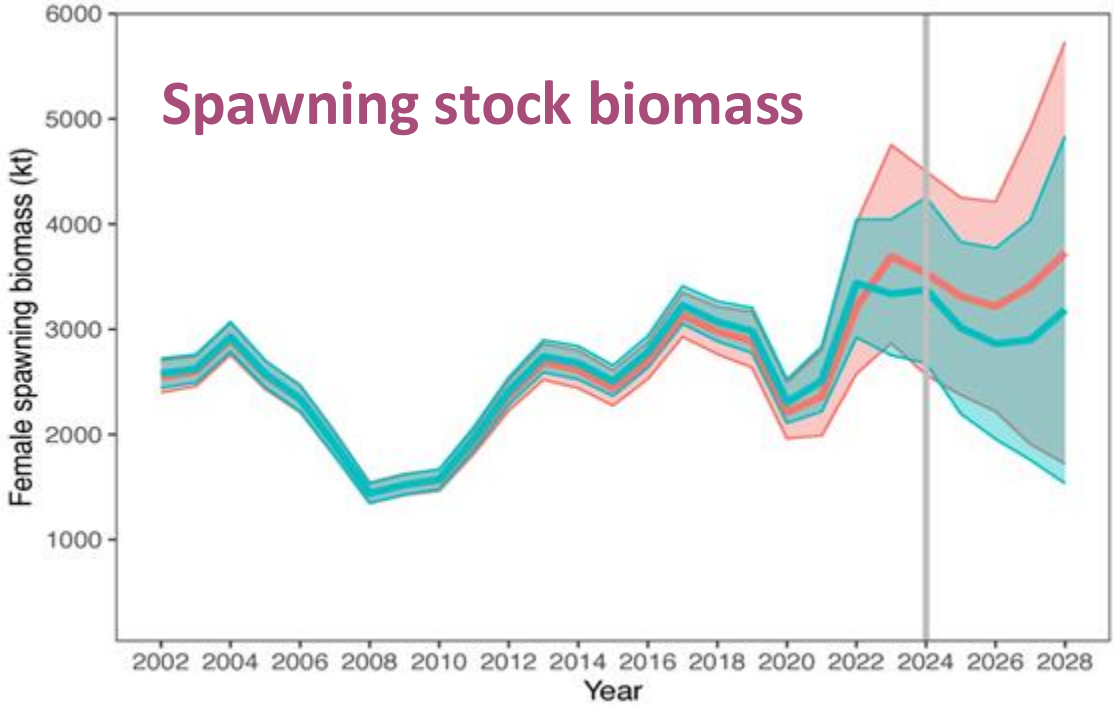


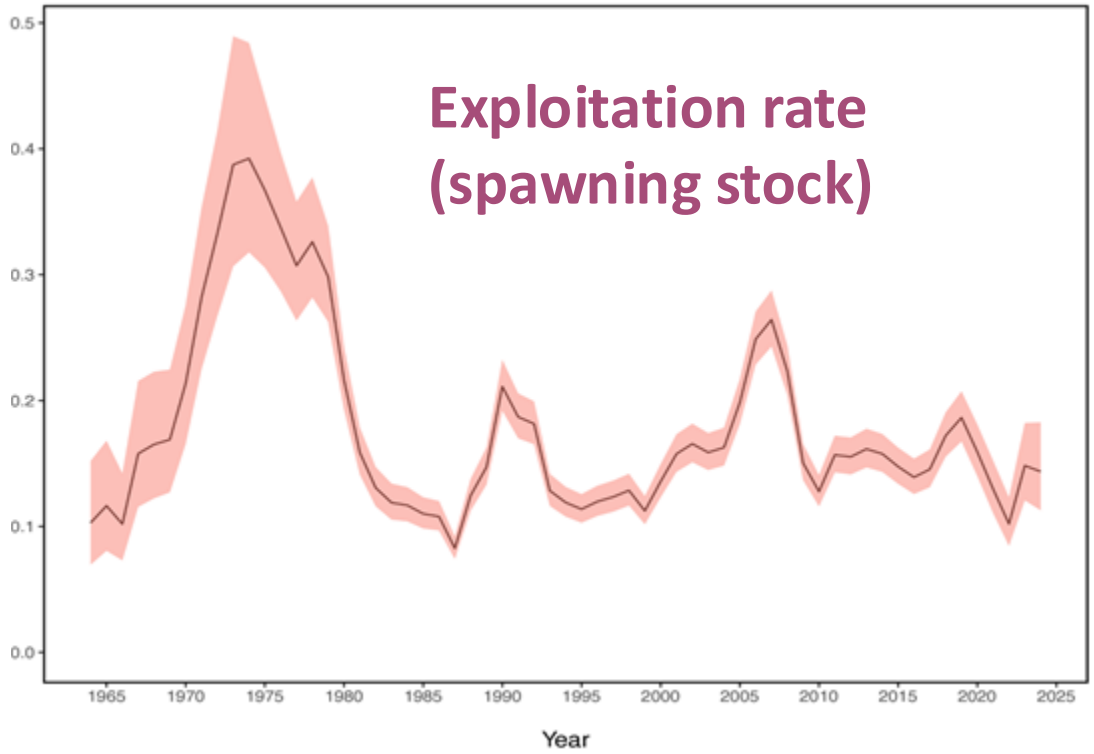
Bottom-trawl survey



EBS Pollock

Stock status

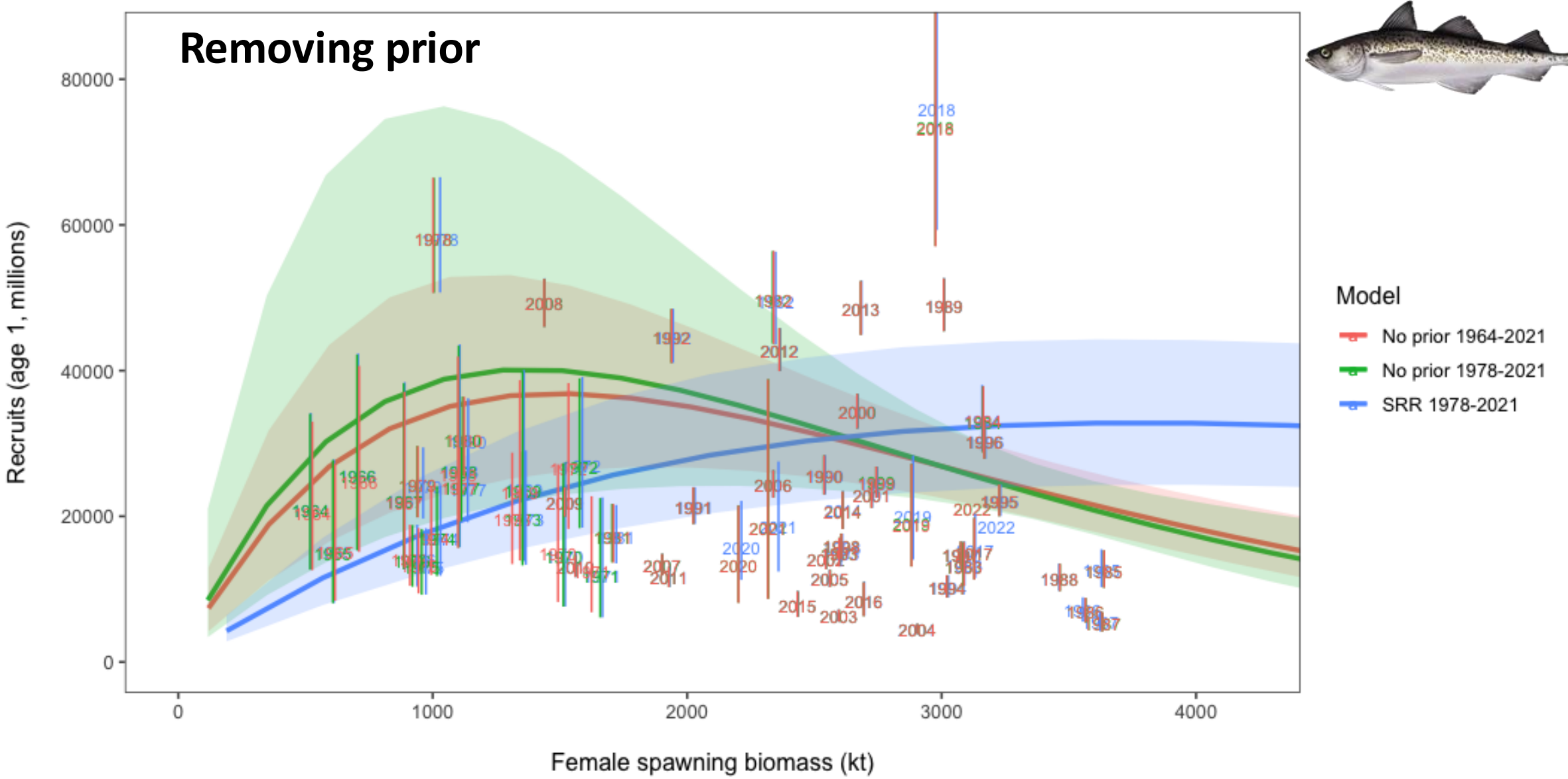




What about productivity estimates?

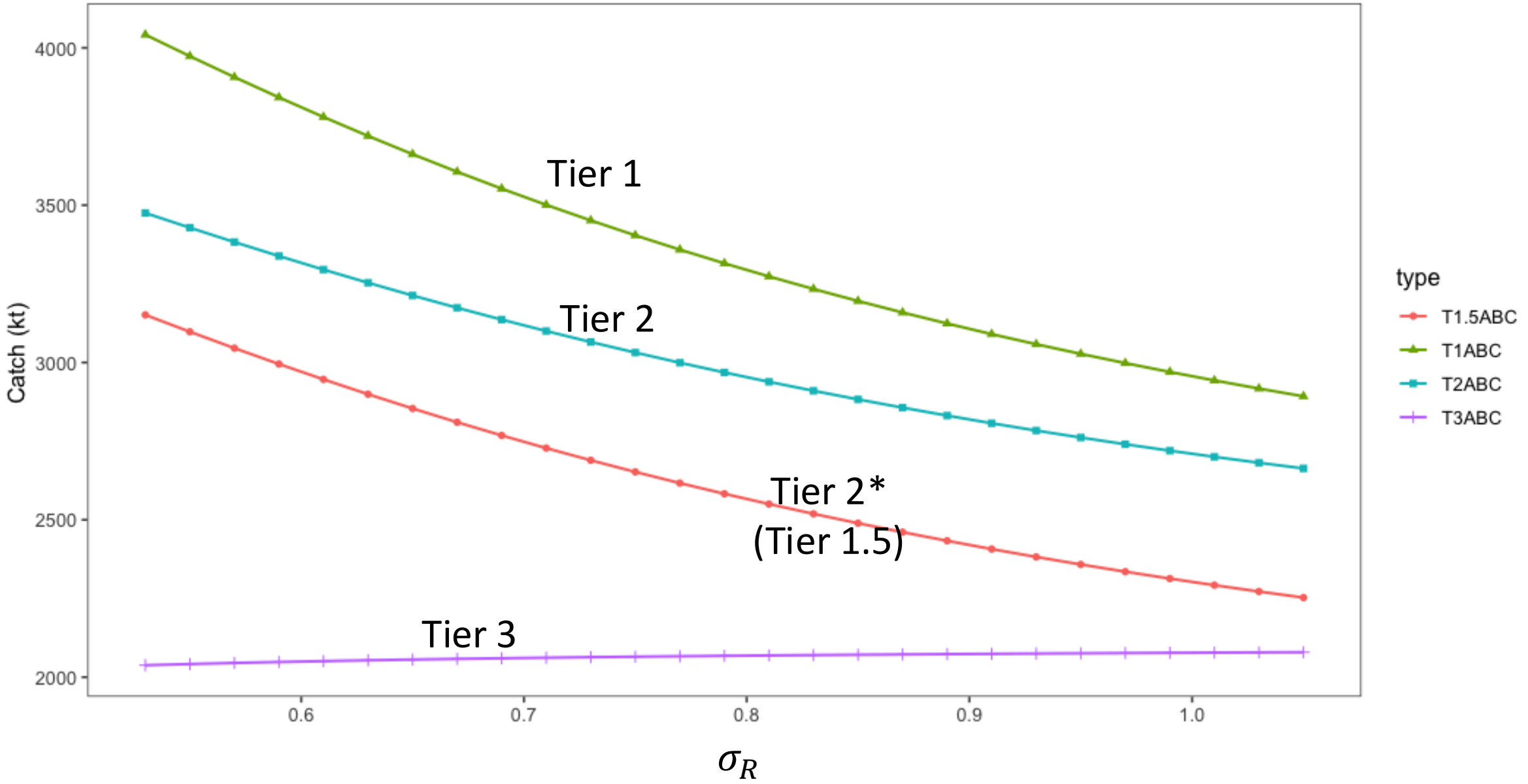
- Tier 1 versus Tier 3?

Removing prior



…and estimation period length

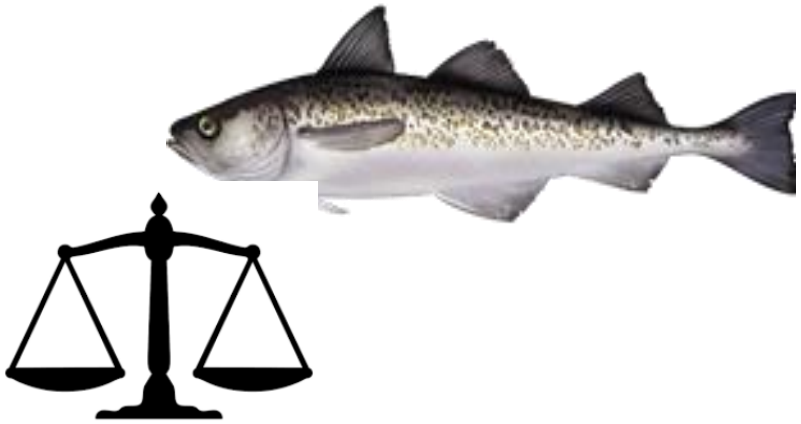
Specified variability about the SRR



Summary

Aspects of SRR suggest Tier 3 more appropriate

- No fault of data extent, rather historical stock and recruitment estimates uninformative
- Tier 1
  - Relies on priors (F_{MSY}~$F_{35\%}$)
  - Production aspect near origin on limited observations
  - Risk aversion basis depends on uncertainty (pdf)
  - Tier 2 has same issues related to SRR



Tier 3 more appropriate?

- No fault of data extent, rather historical stock and recruitment estimates uninformative
- Tier 1
  - Relies on priors (F_{MSY}~$F_{35\%}$)
  - Production aspect near origin on limited observations
  - Risk aversion basis depends on uncertainty (pdf)
- Tier 2
  - Still relies on SRR / steepness at origin

Tier 1 version

	As estimated or *specified* *last* year for:		As estimated or *recommended* *this* year for:	
Quantity	2024	2025	2025	2026
M (natural mortality rate, ages 3+)	0.3	0.3	0.3	0.3
Tier	1a	1a	1a	1a
Projected total (age 3+) biomass (t)	10,184,000 t	9,437,000 t	8,526,000 t	8,075,000 t
Projected female spawning biomass (t)	3,518,000 t	3,255,000 t	3,118,000 t	3,342,000 t
B_0	6,728,000 t	6,728,000 t	5,975,000 t	5,975,000 t
B_{msy}	2,689,000 t	2,689,000 t	2,310,000 t	2,310,000 t
F_{OFL}	0.422	0.422	0.523	0.523
$maxF_{ABC}$	0.379	0.379	0.443	0.443
F_{ABC}	0.33	0.33	0.402	0.402
OFL	3,162,000 t	3,449,000 t	4,383,000 t	3,785,000 t
$maxABC$	2,837,000 t	3,095,000 t	3,715,000 t	3,209,000 t
ABC	2,313,000 t	2,401,000 t	2,417,000 t	2,036,000 t
Status	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

Tier 3 version

	As estimated or *specified* *last* year for:		As estimated or *recommended* *this* year for:	
Quantity	2024	2025	2025	2026
M (natural mortality rate, ages 3+)	0.3	0.3	0.3	0.3
Tier	1a	1a	3a	3a
Projected total (age 3+) biomass (t)	10,184,000 t	9,437,000 t	8,526,000 t	8,075,000 t
Projected female spawning biomass (t)	3,518,000 t	3,255,000 t	3,118,000 t	3,342,000 t
B_0	6,728,000 t	6,728,000 t	5,902,000 t	5,902,000 t
B_{msy}	2,689,000 t	2,689,000 t	2,066,000 t	2,066,000 t
F_{OFL}	0.422	0.422	0.513	0.513
$maxF_{ABC}$	0.379	0.379	0.394	0.394
F_{ABC}	0.33	0.33	0.394	0.394
OFL	3,162,000 t	3,449,000 t	2,957,000 t	2,496,000 t
$maxABC$	2,837,000 t	3,095,000 t	2,417,000 t	2,036,000 t
ABC	2,313,000 t	2,401,000 t	2,417,000 t	2,036,000 t
Status	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

Thanks

CIE review coming 1st half of 2025