



**NOAA
FISHERIES**

Alaska Fisheries
Science Center

Assessment of walleye pollock in the Eastern Bering Sea

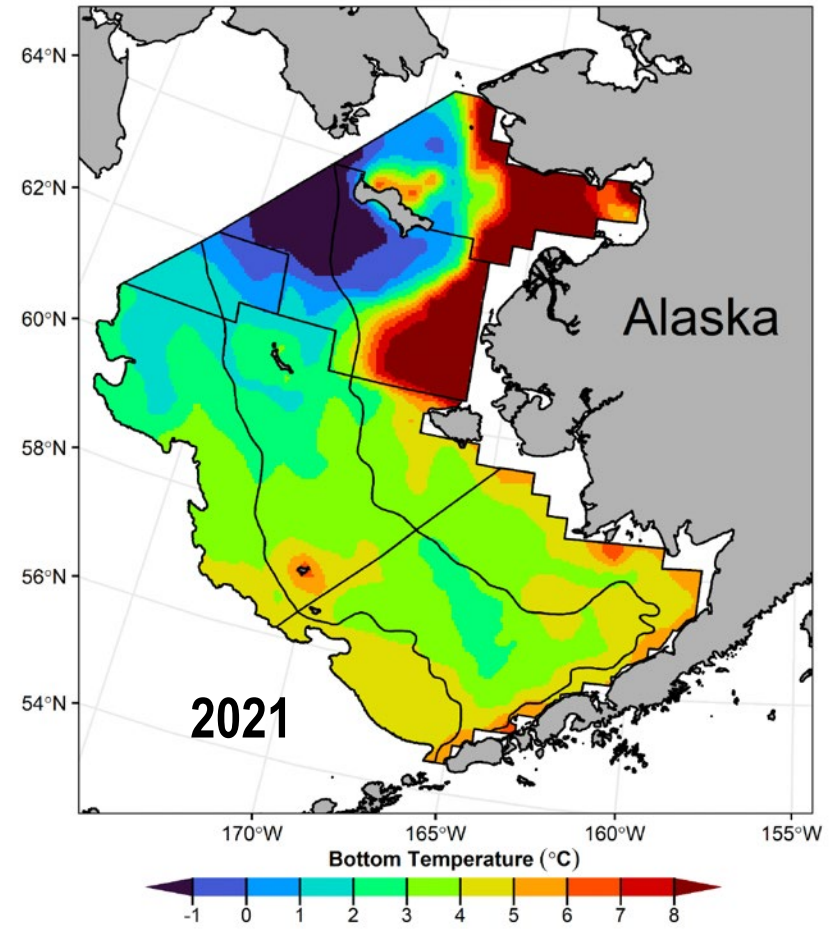
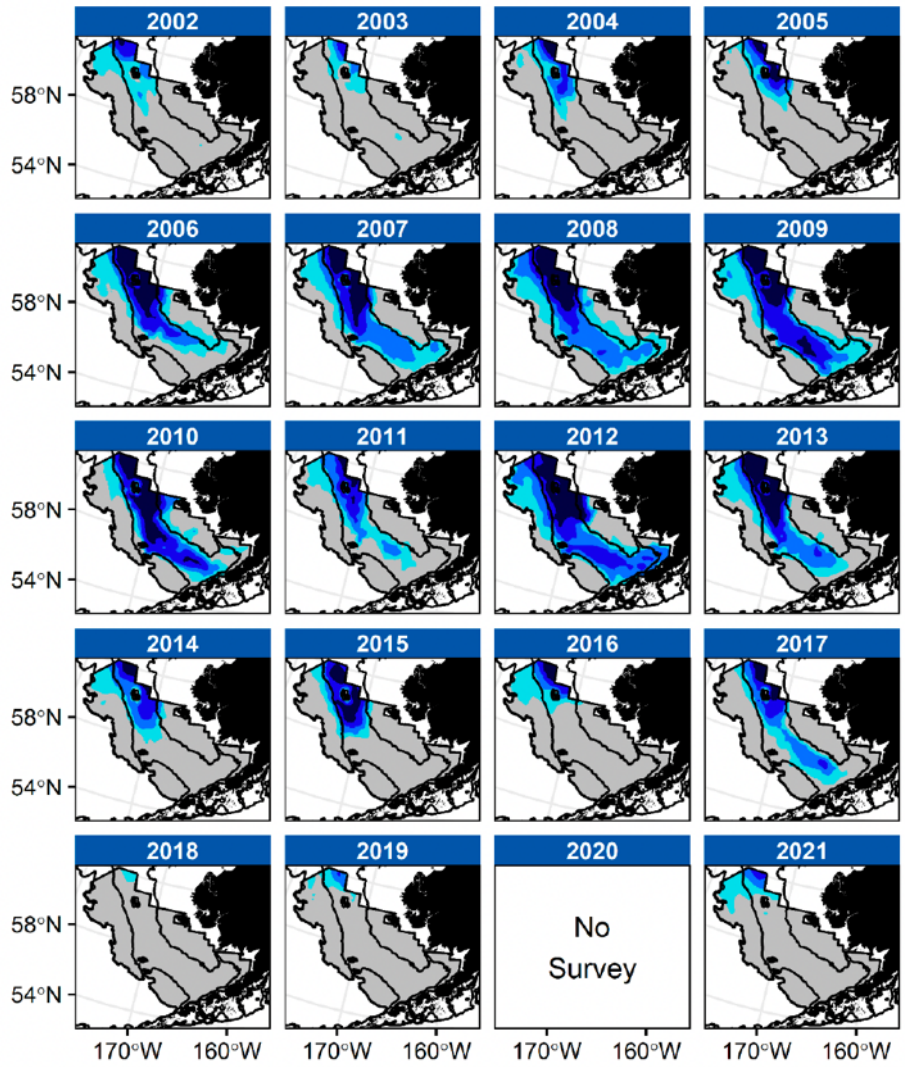
James Ianelli, Ben Fissel,
Sarah Stienessen, Taina Honkalehto,
Elizabeth Siddon, and Caitlin Allen-Akselrud

December 3rd, 2021



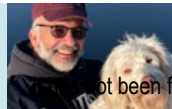
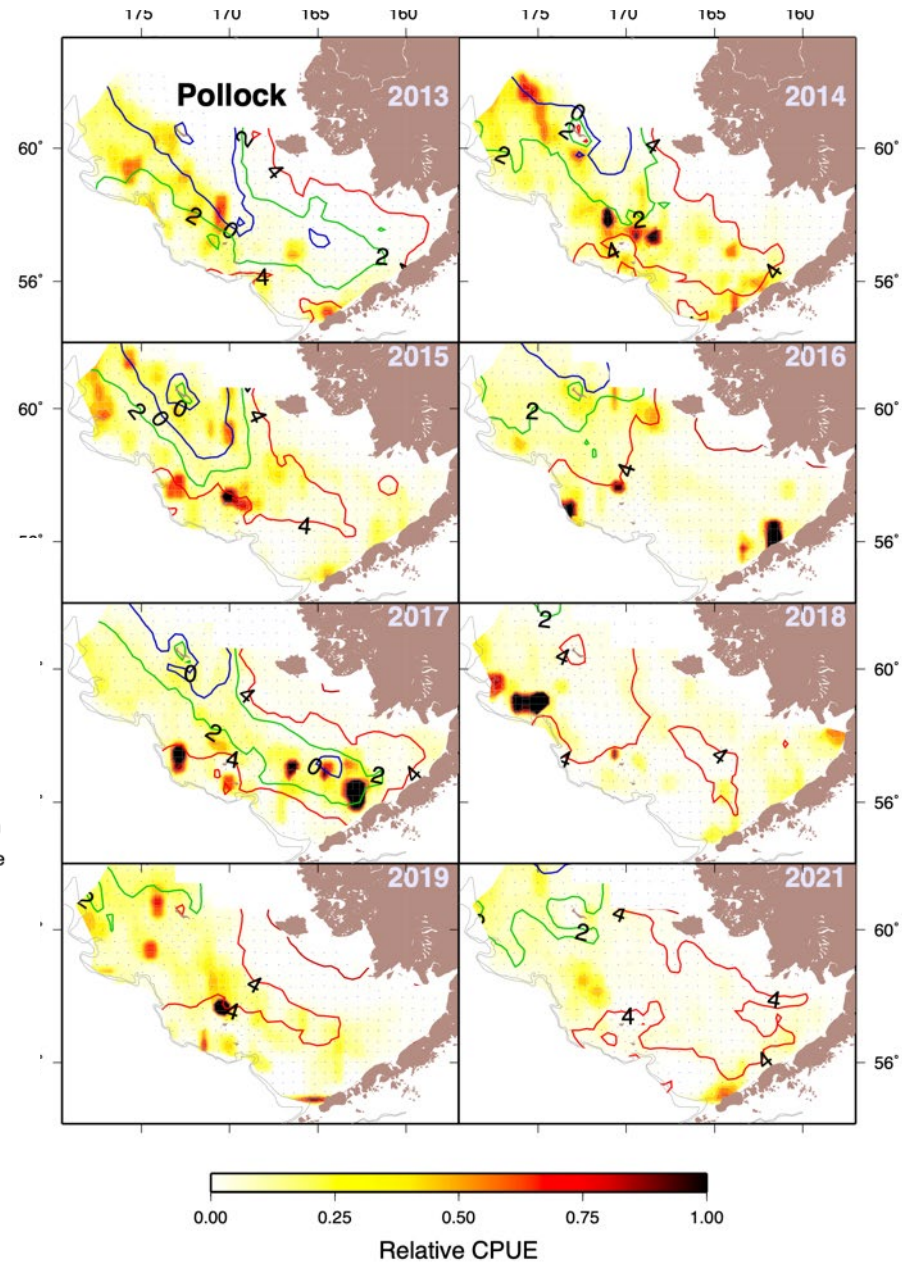
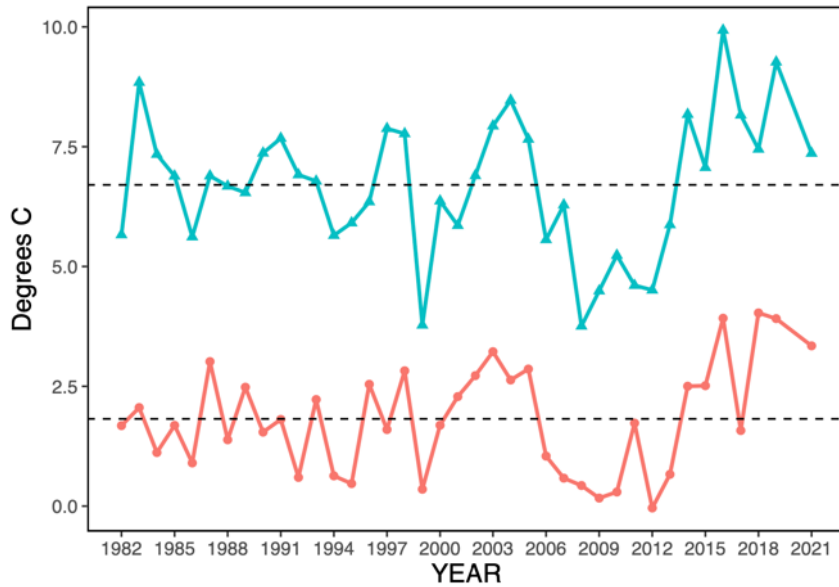
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Pollock density and bottom temperatures

○ From the bottom trawl survey



New genetics information

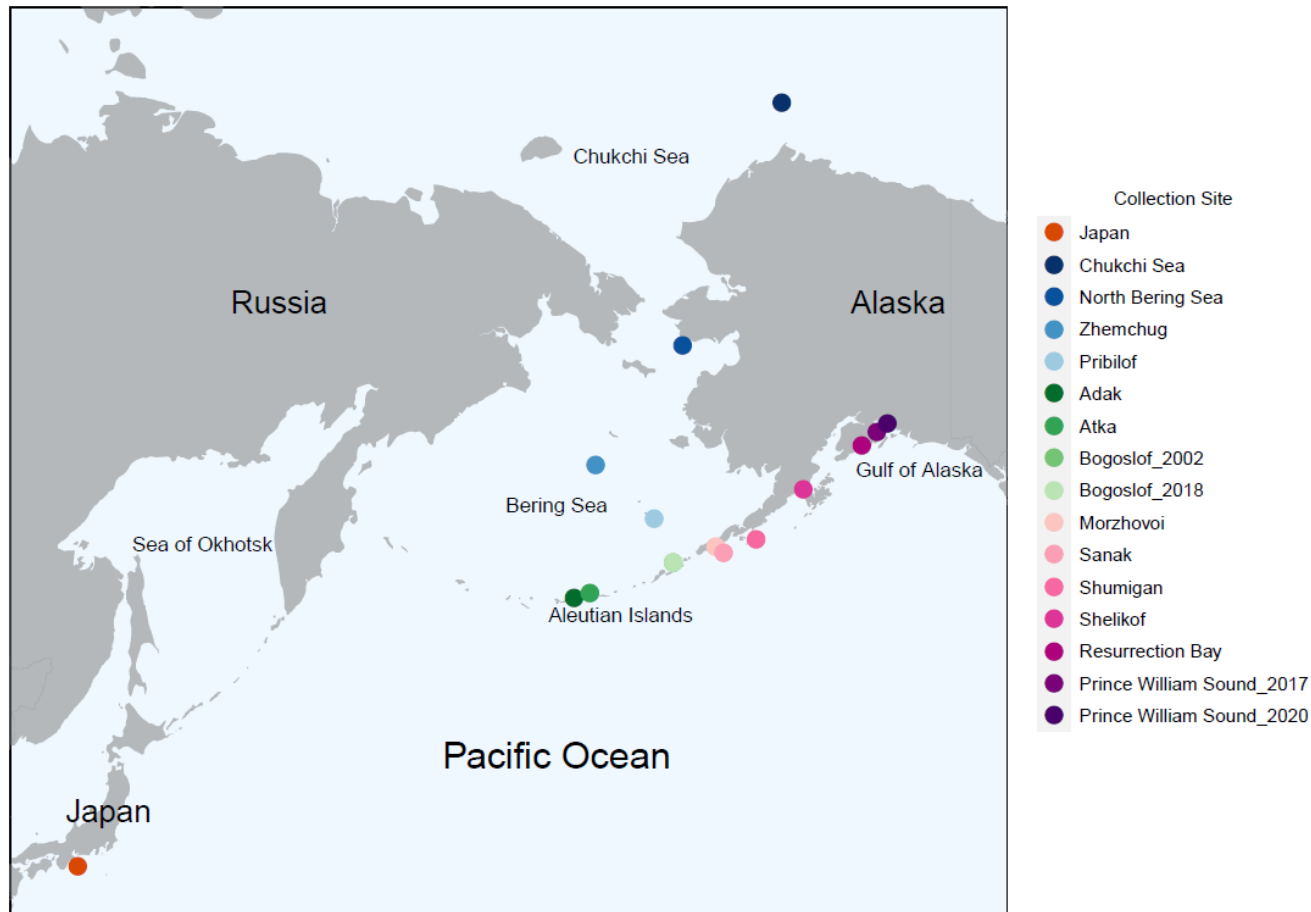
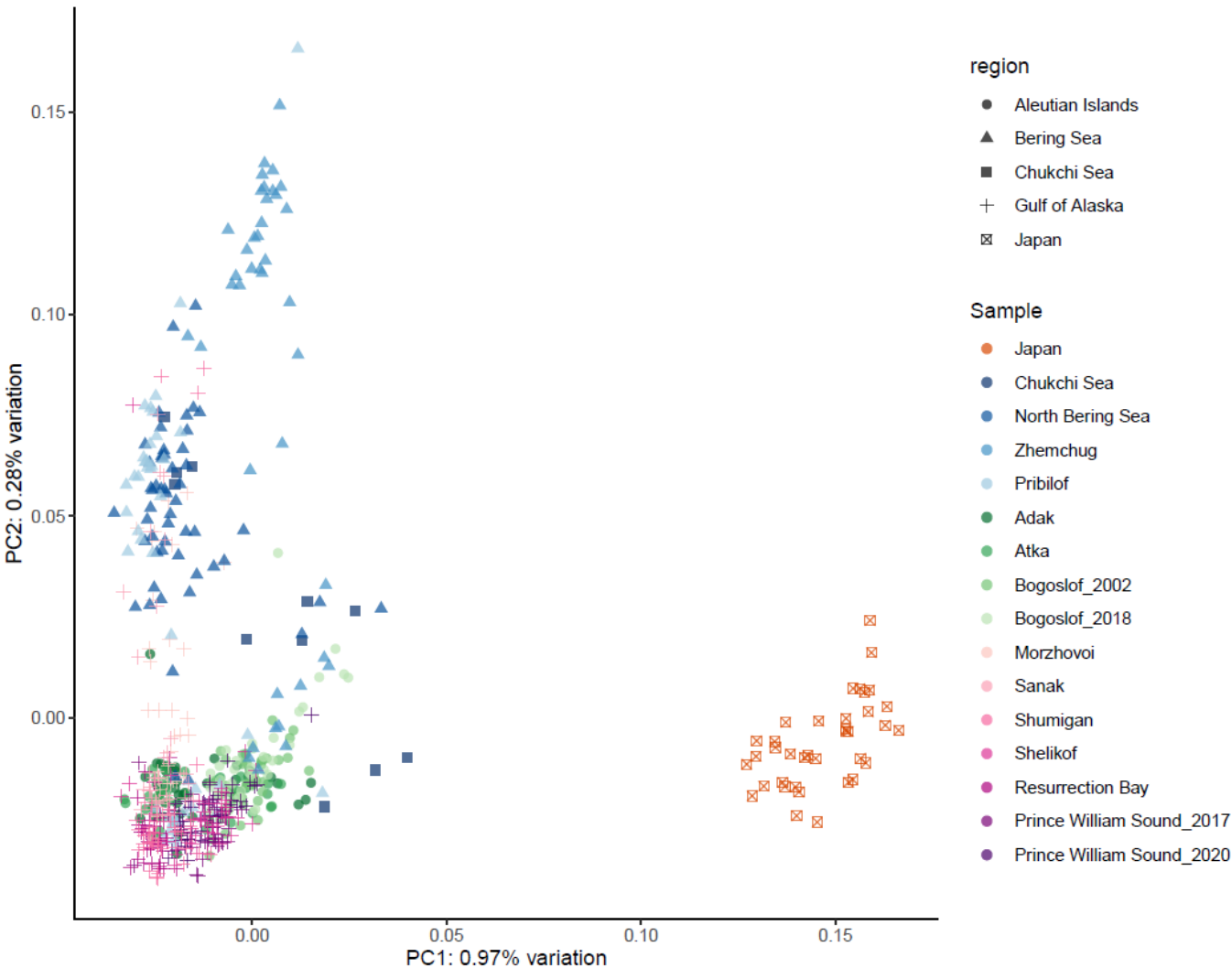


Figure 1. Sampling locations of pollock collected in Japan (orange point), Chukchi Sea and Bering Sea (blue points), Aleutian Islands (green points), Alaska Peninsula and Gulf of Alaska (pink and purple points).



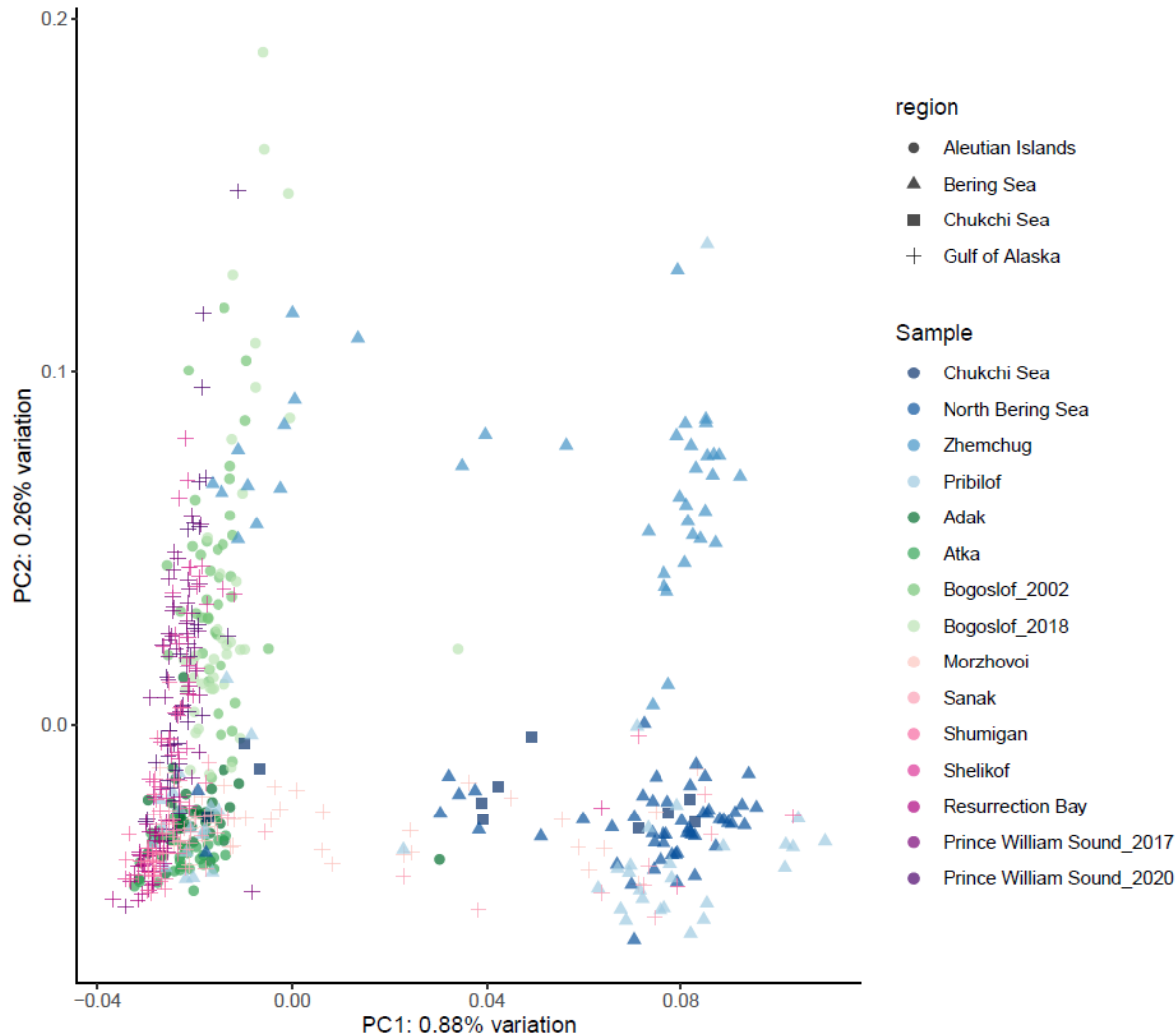
New genetics information



PCA using all samples collected in this study. The color of each point indicates the sampling location and region.



New genetics information



PCA excluding samples collected in Japan. The color of each point indicates the sampling location and region.



New genetics information

- Results promising and consistent with our current management areas
- Future source-spawning ID possible

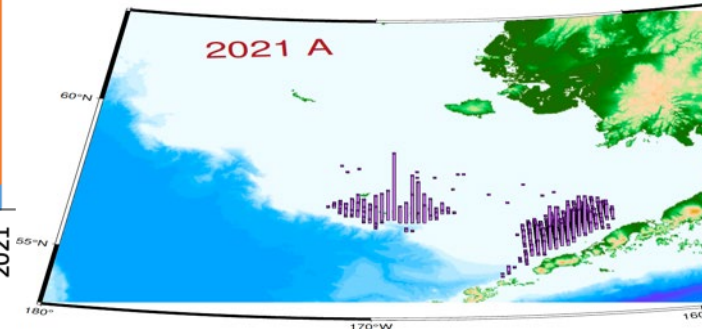
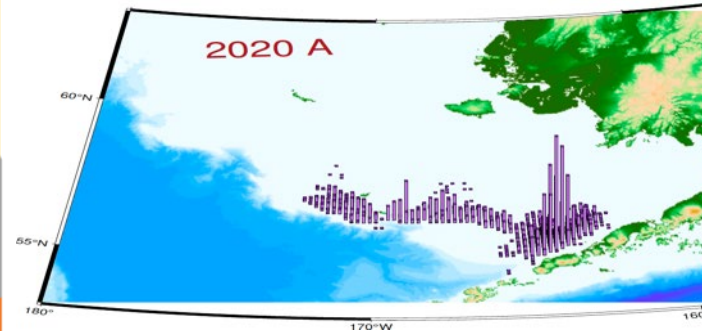
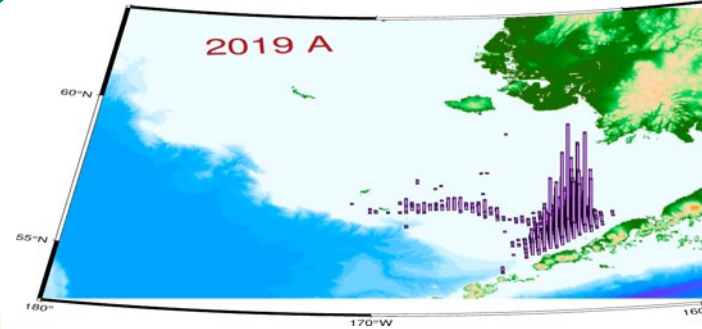
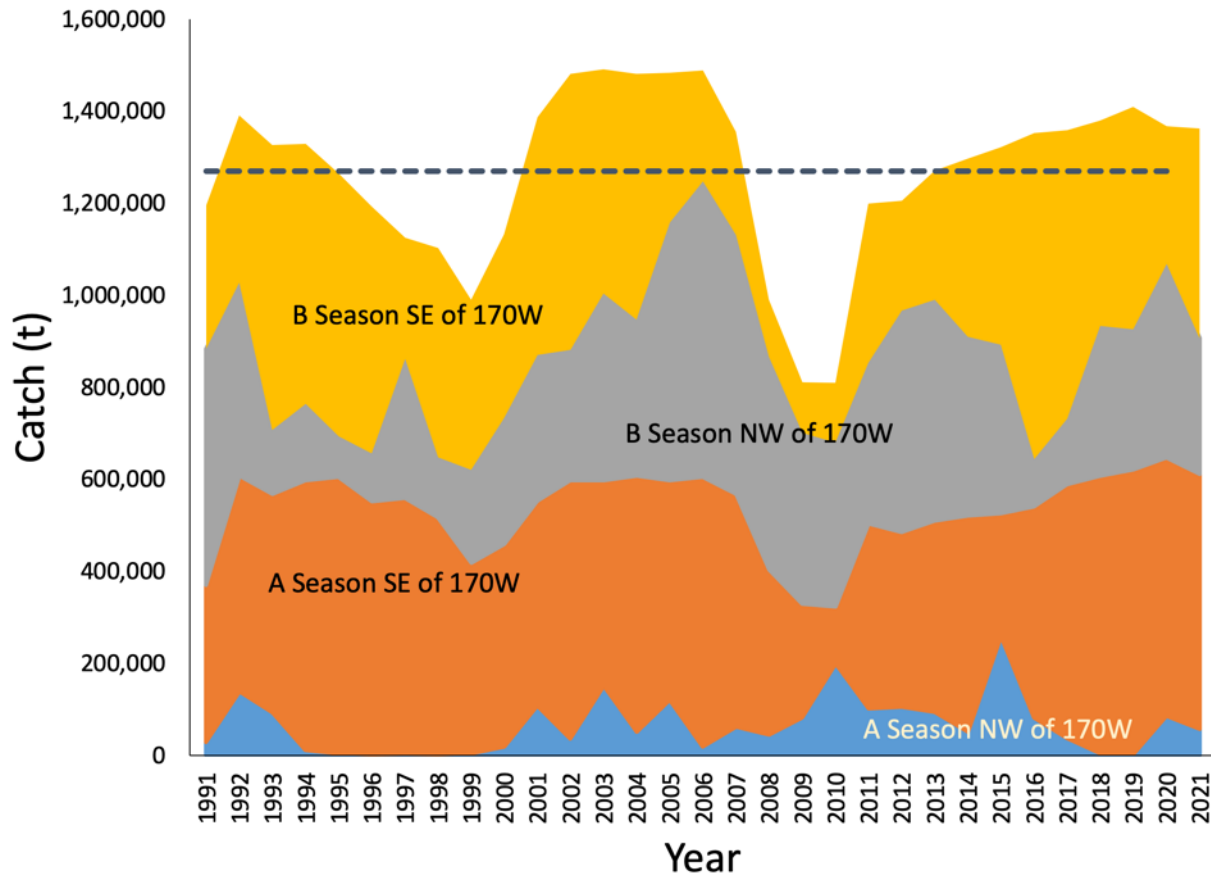


Data

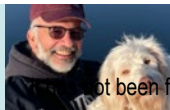
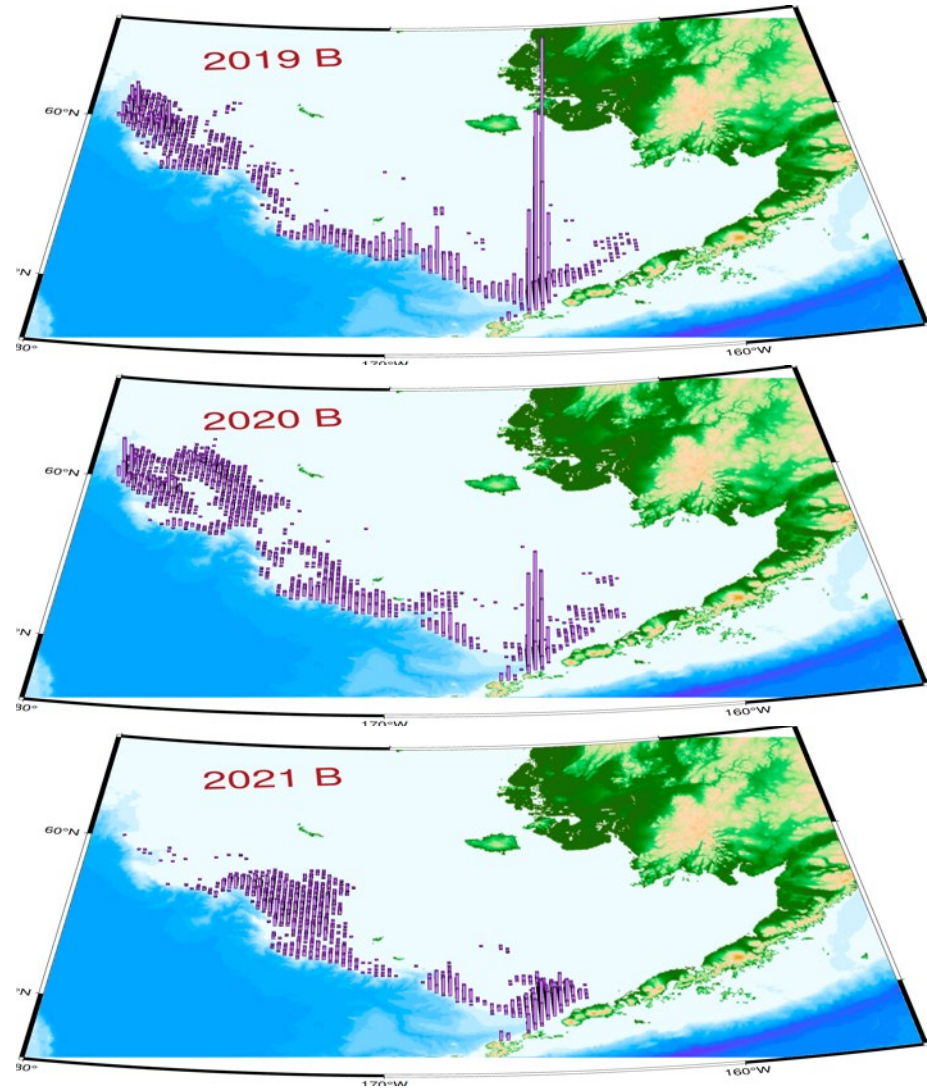


Seasonal and area catch patterns

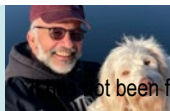
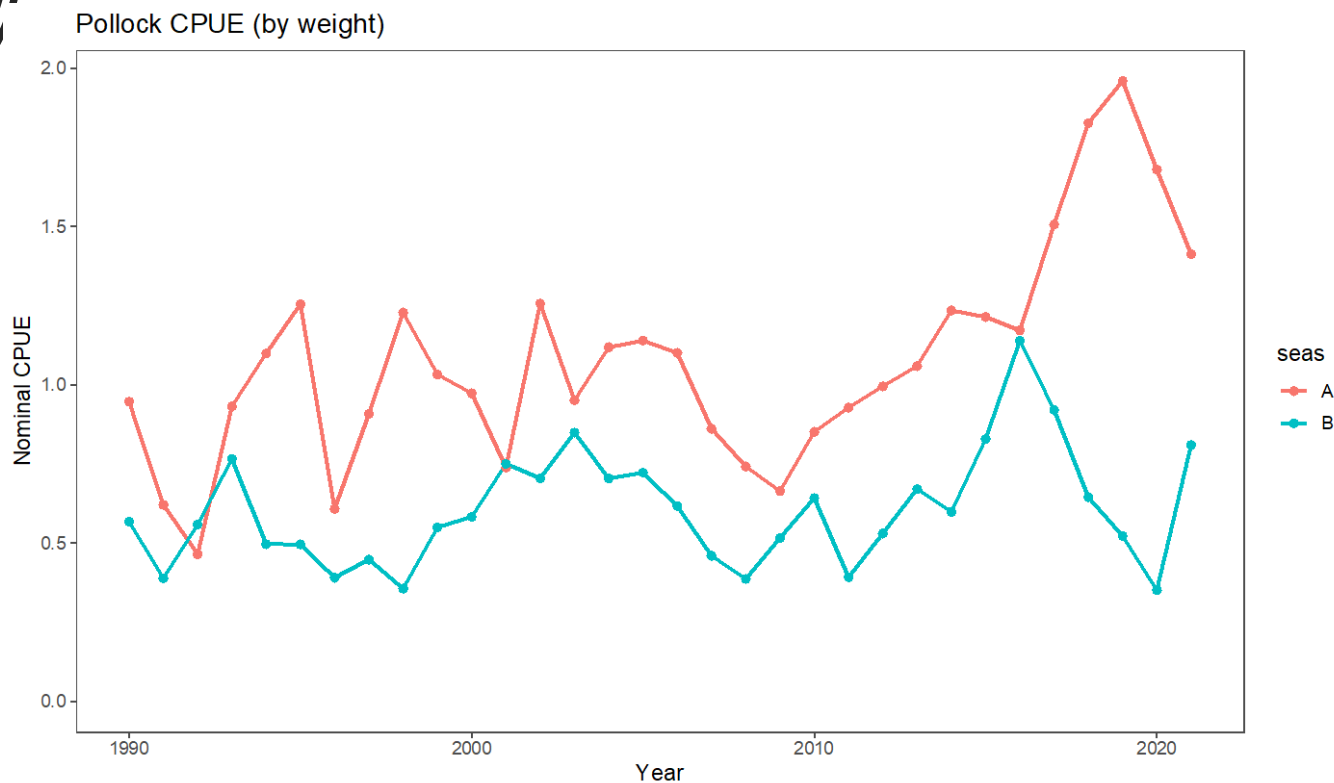
Eastern Bering Sea pollock



B-season fishery distributions



Pollock fishery CPUE season

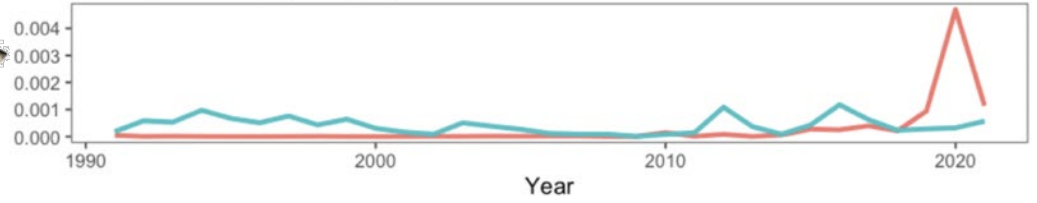


Fishery conditions

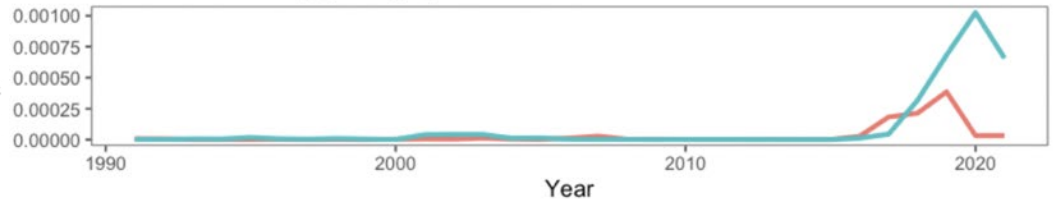
Catch rates of pollock and selected bycatch species



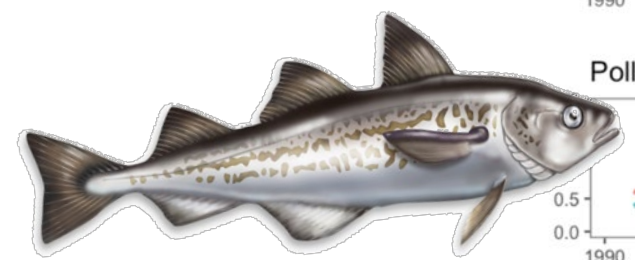
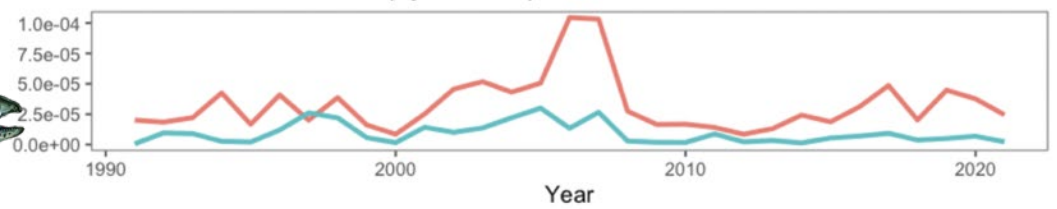
Herring CPUE (by weight)



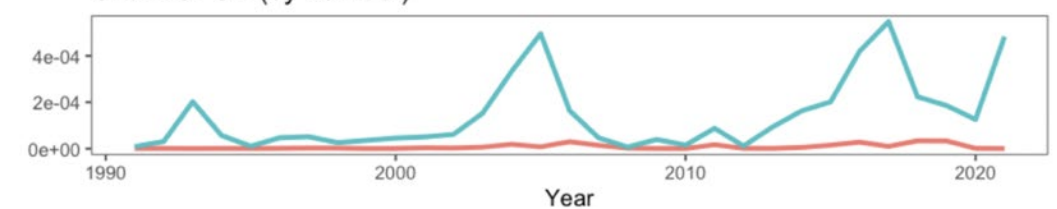
Sablefish CPUE (by weight)



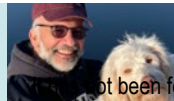
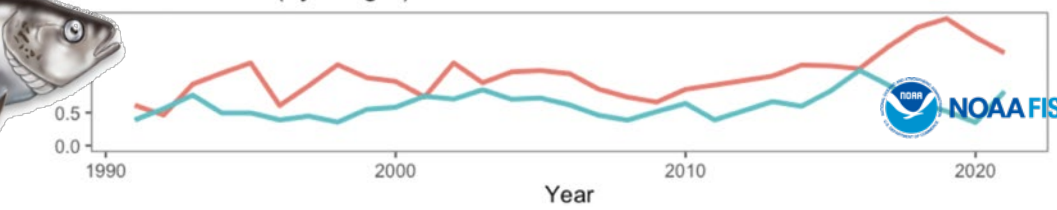
Chinook salmon CPUE (by number)



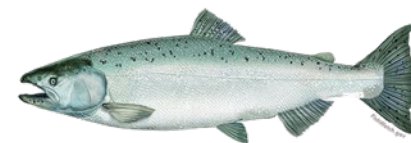
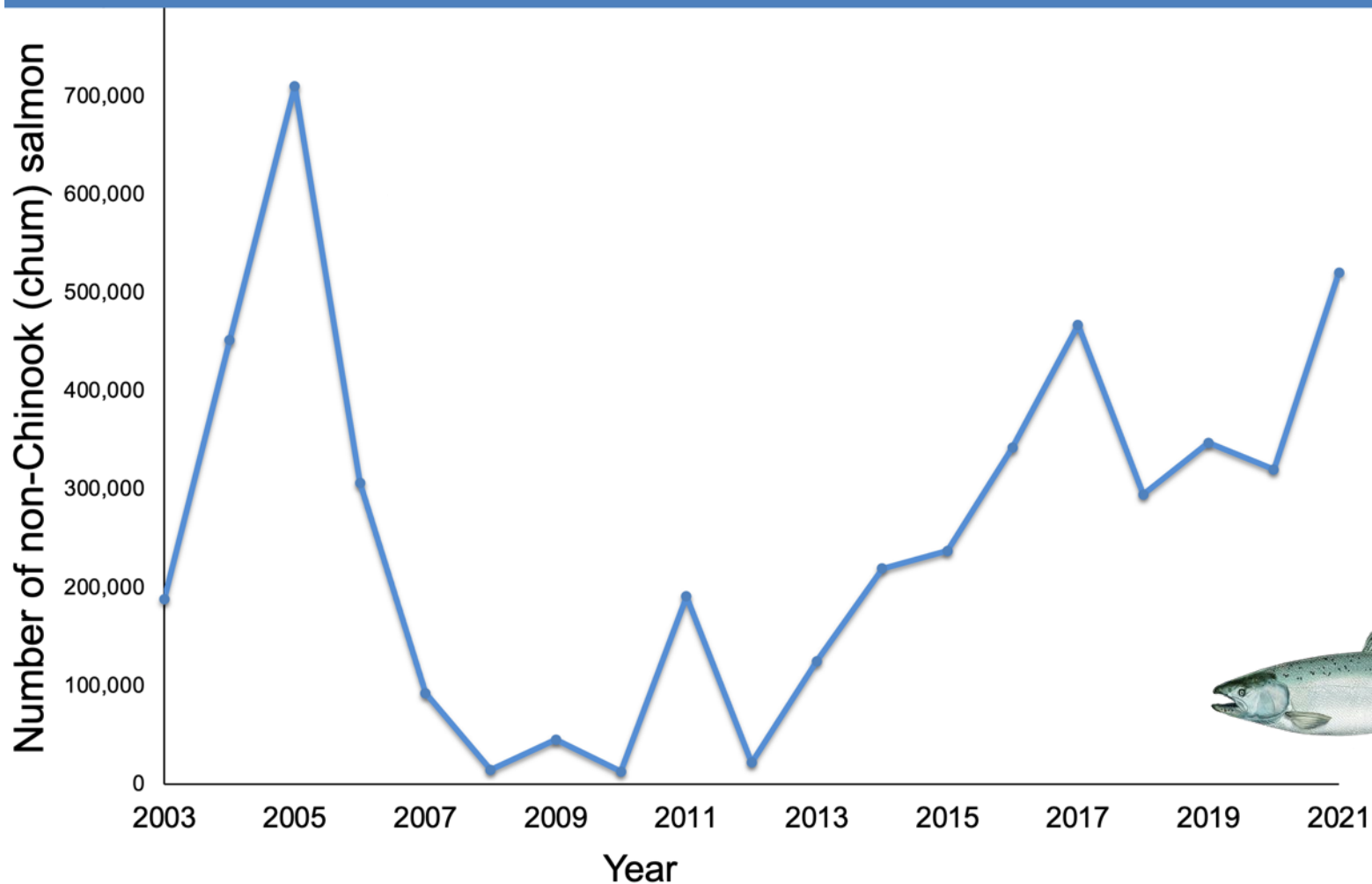
Chum CPUE (by number)



Pollock CPUE (by weight)



2003-2021 Bering Sea Chum Salmon Bycatch



Fish size



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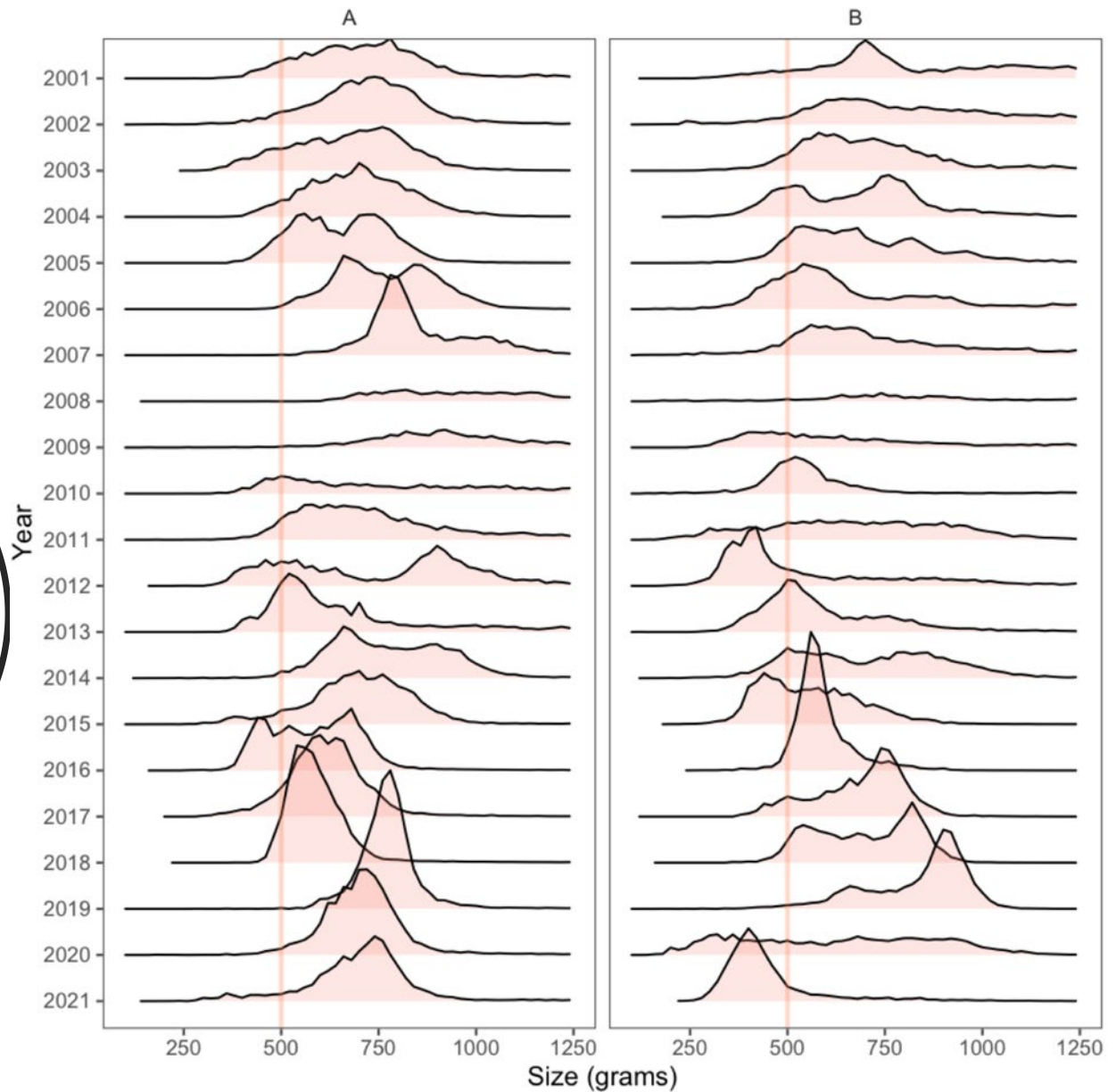


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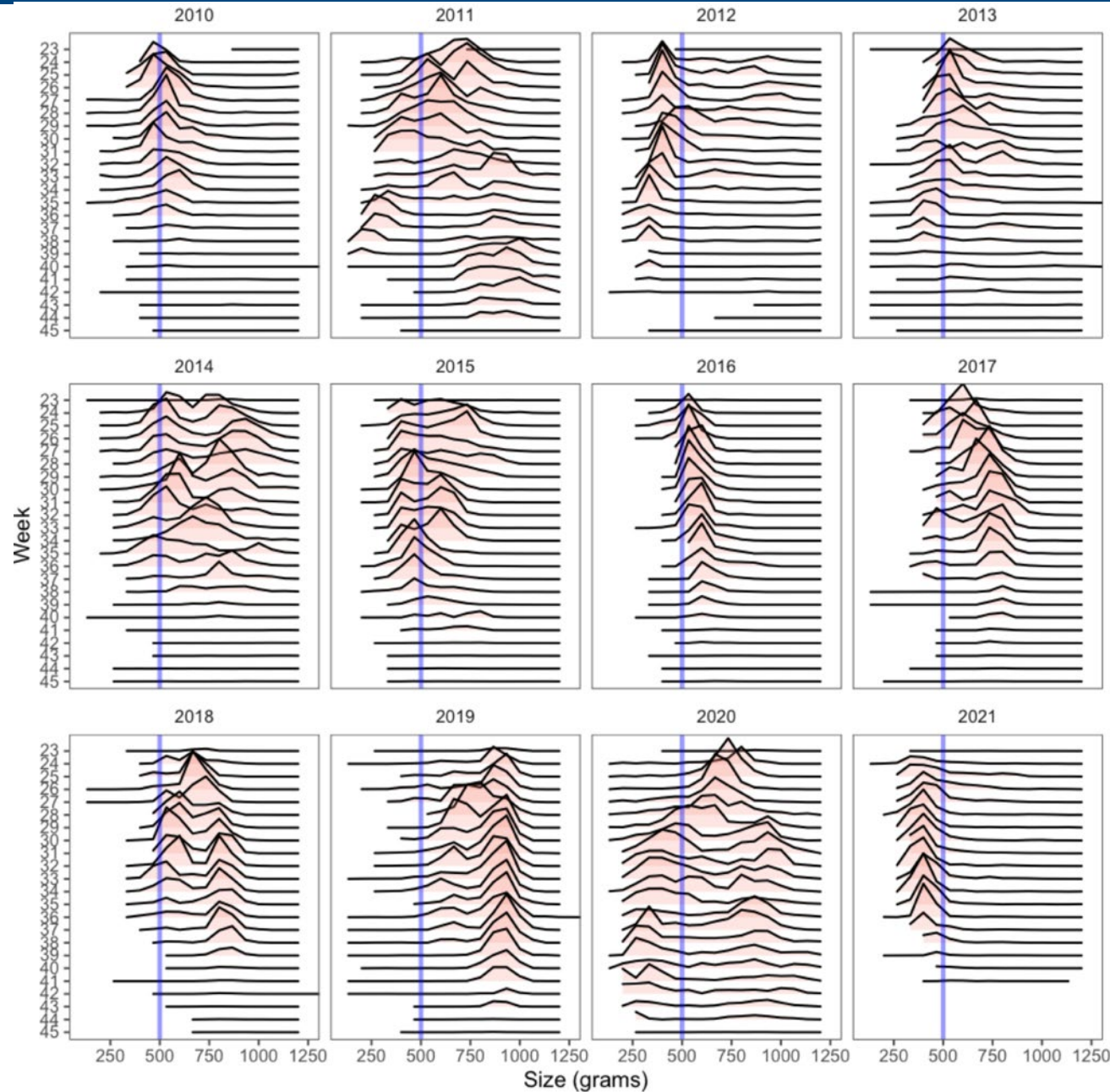
By
season
& year

Pollock
fishery mean
weight in
tows

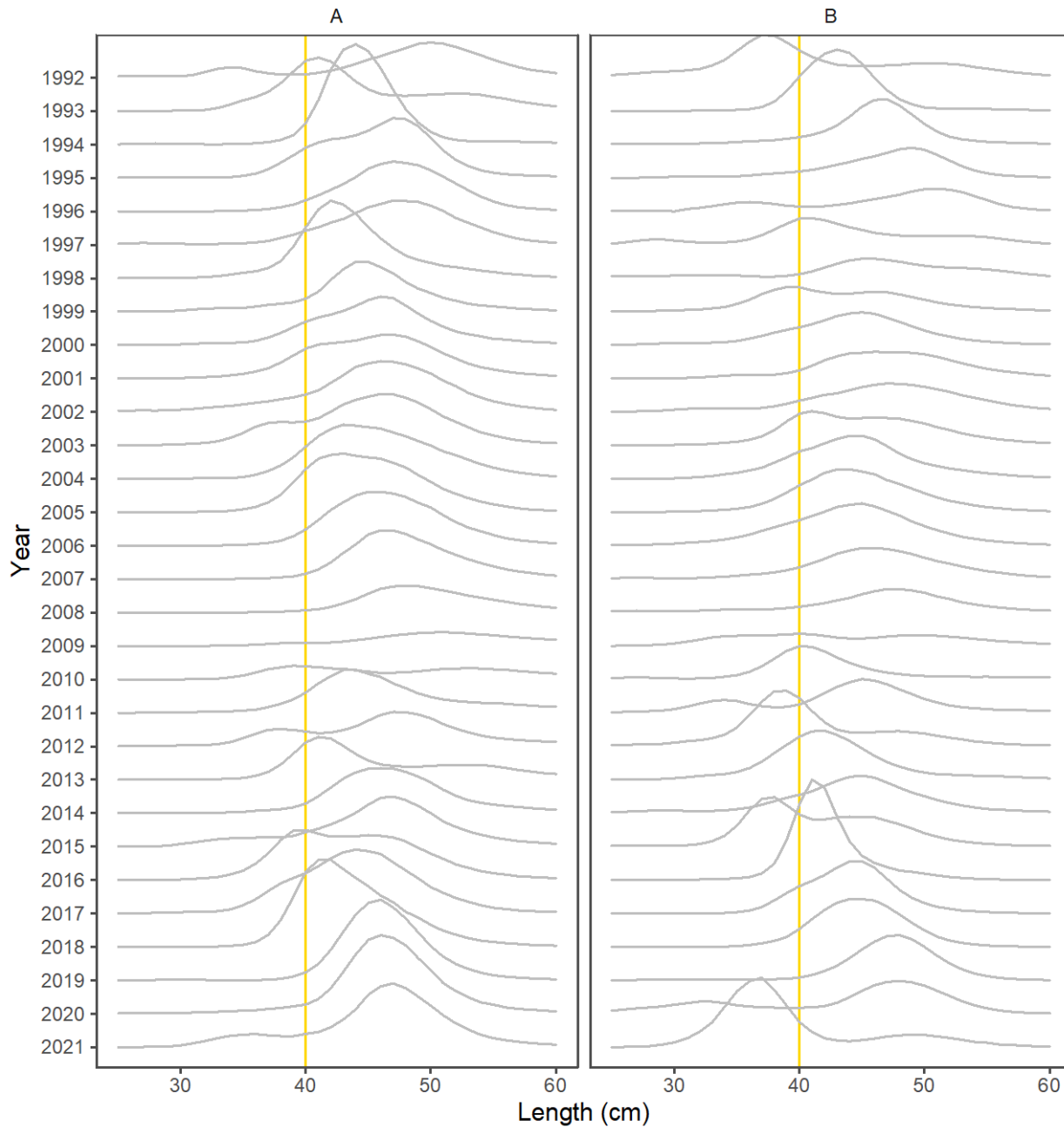


B-season Weekly catch

Pollock
fishery mean
weight in
tows

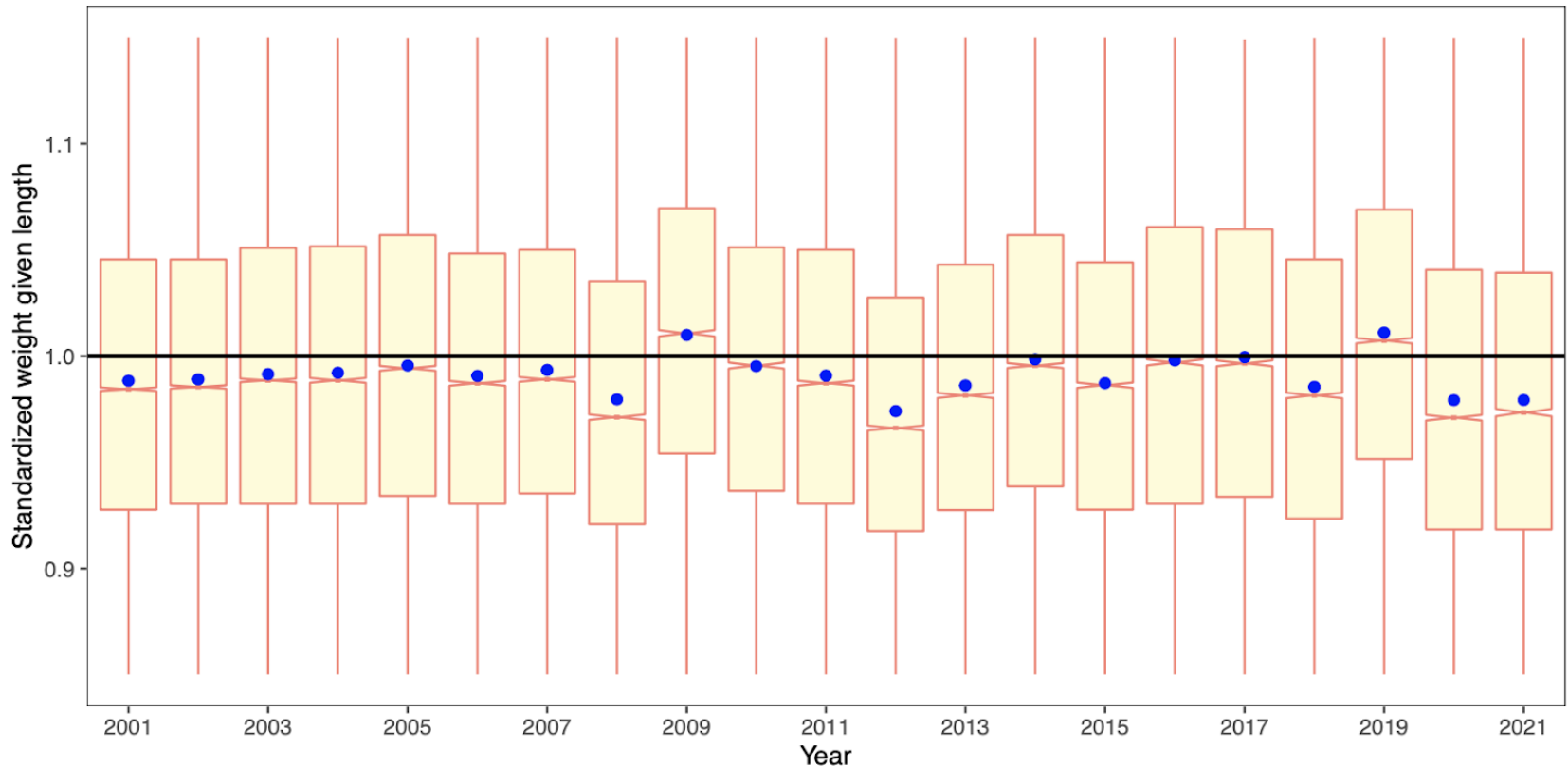


Pollock fishery length frequency by season

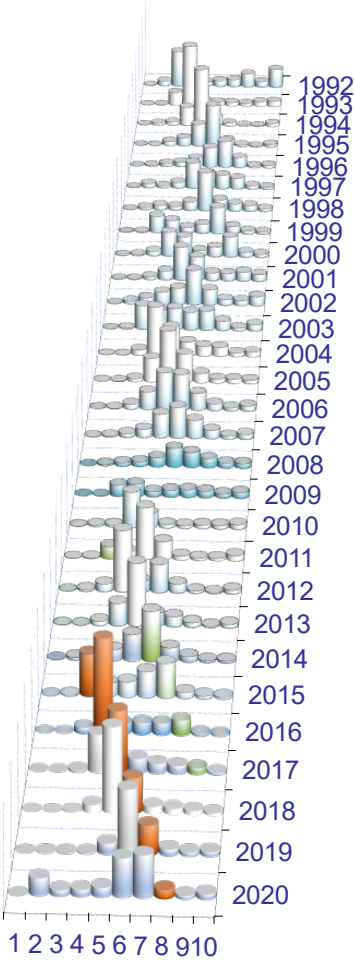


Weight given length—fishery data

Skinny again in 2021!



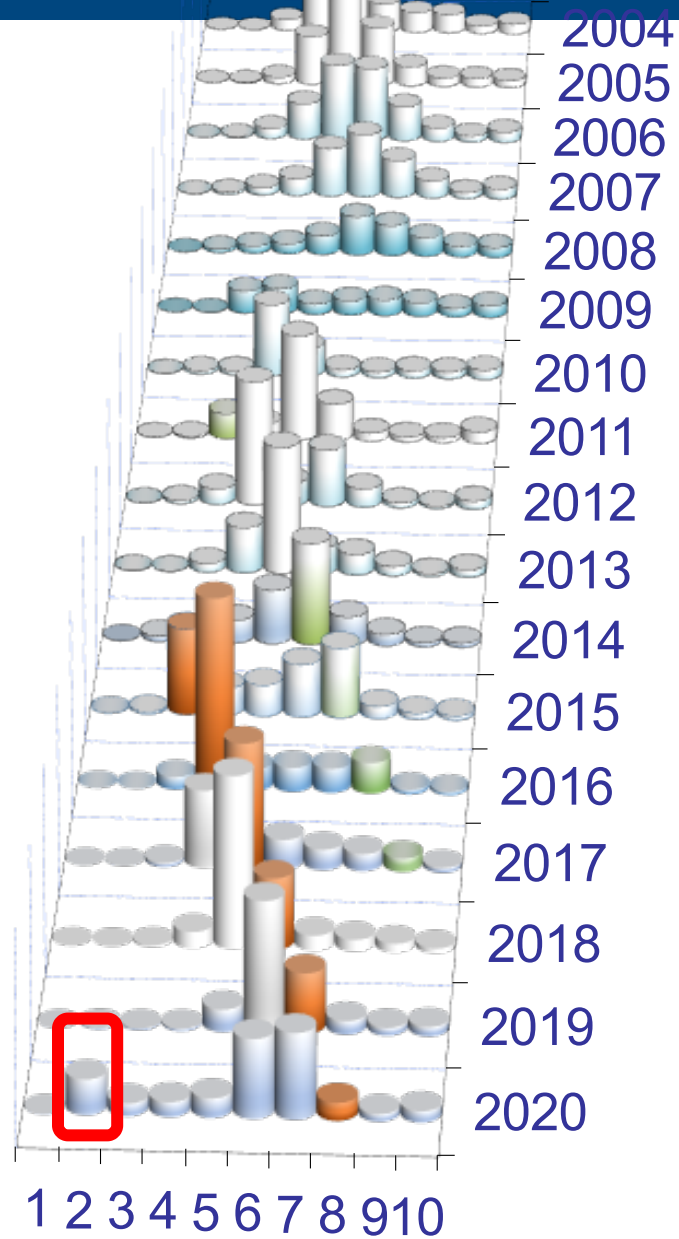
Fishery catch-at-age



Age



Fishery catch-at-age

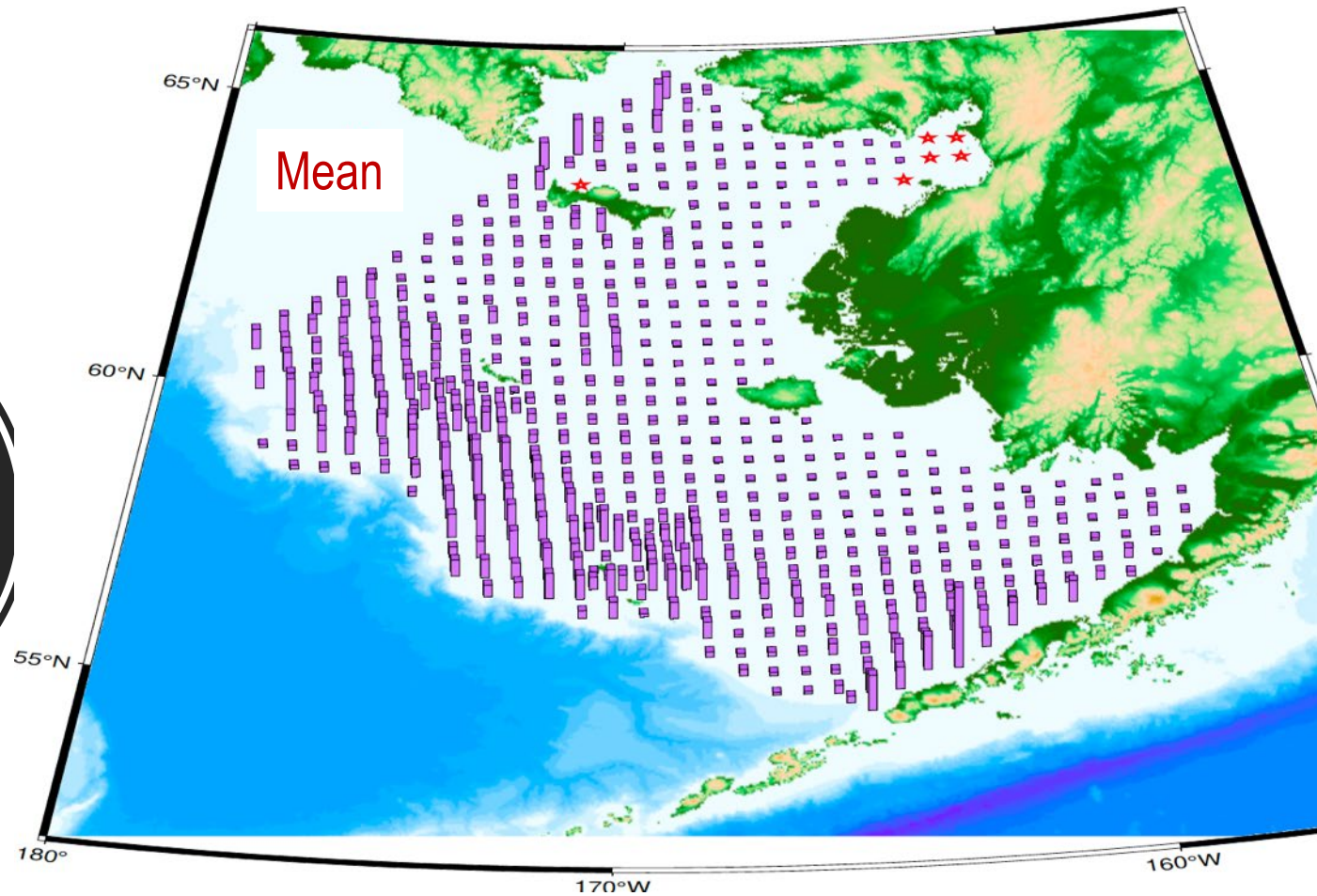


Survey work

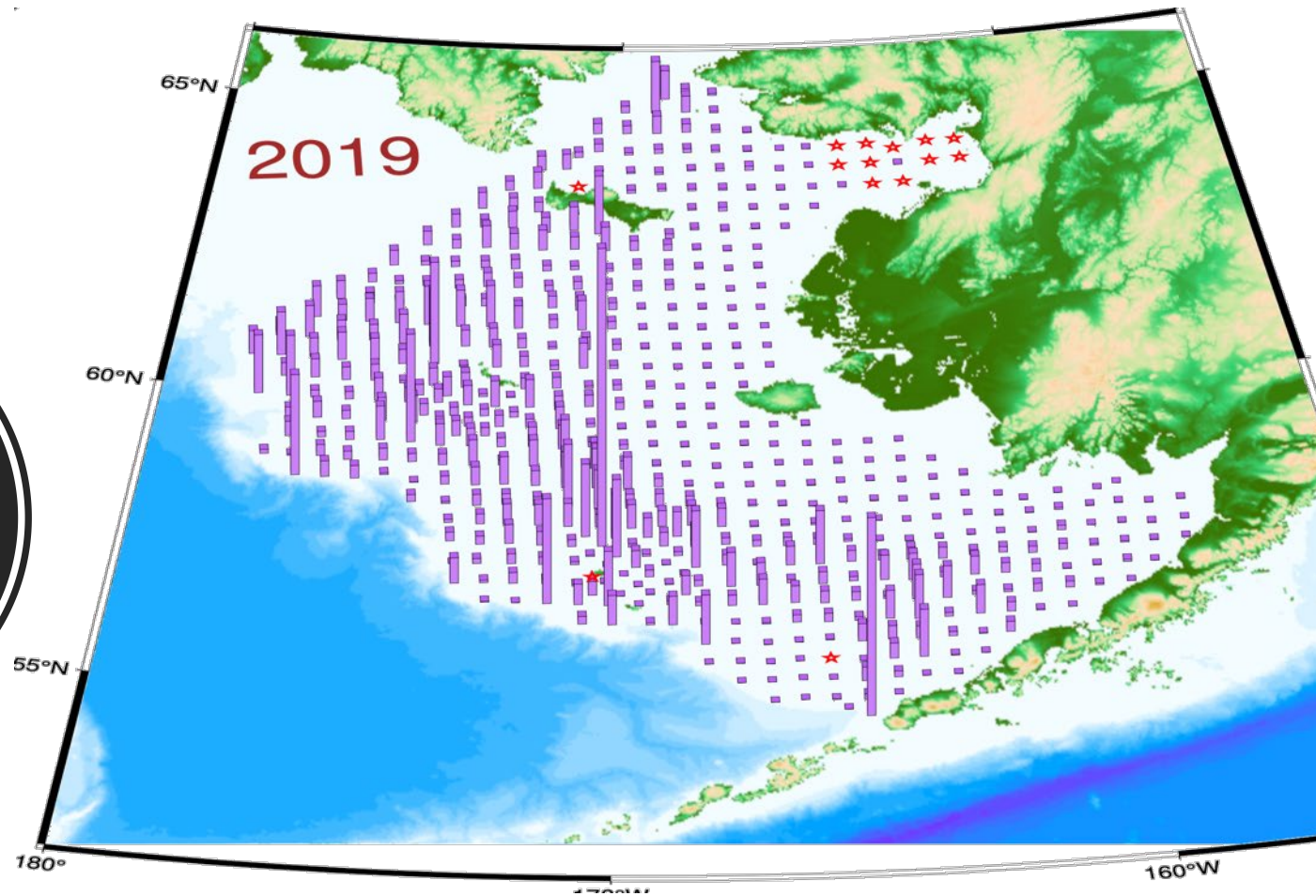
2020 and 2021



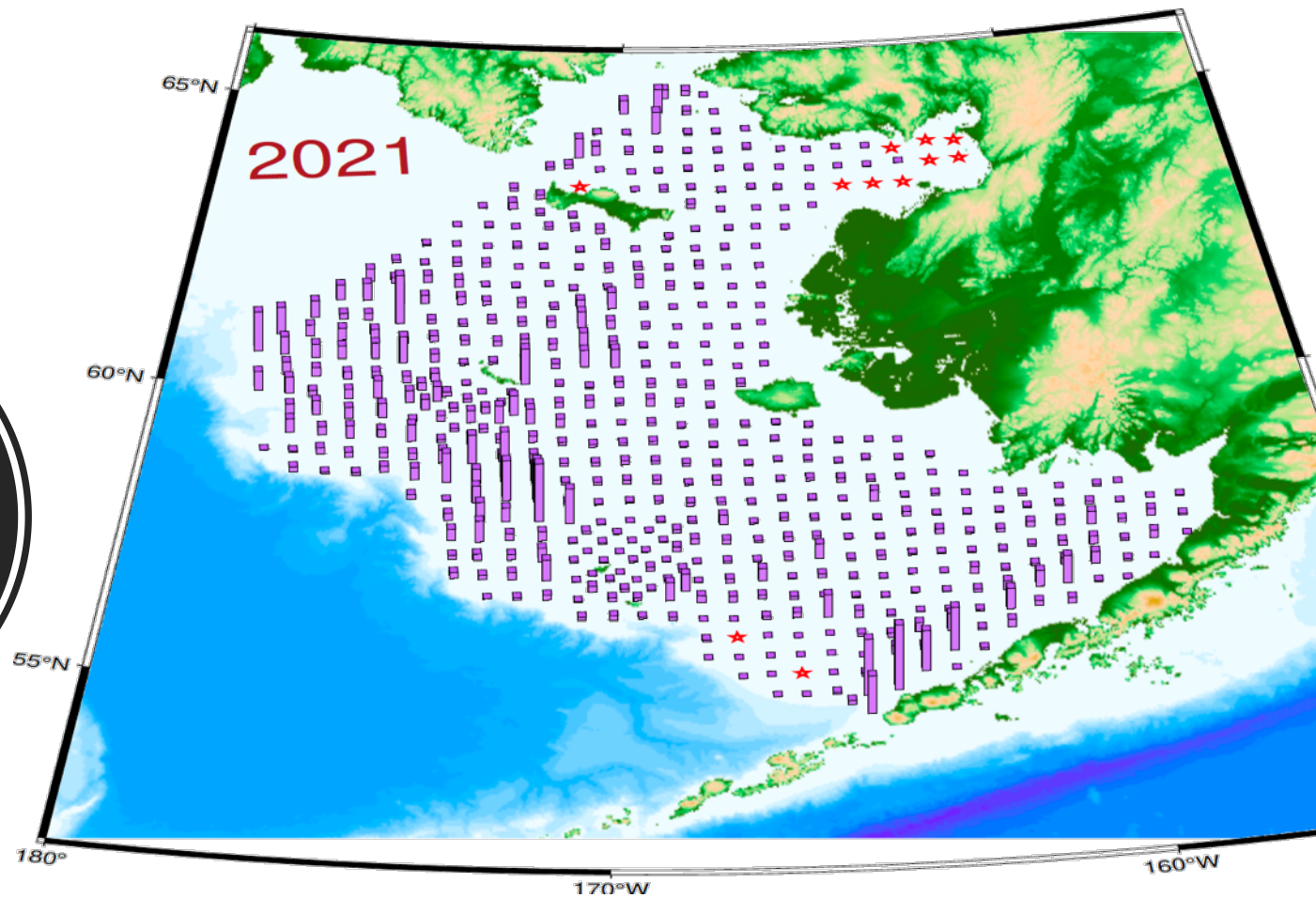
Pollock
survey
mean density
by station



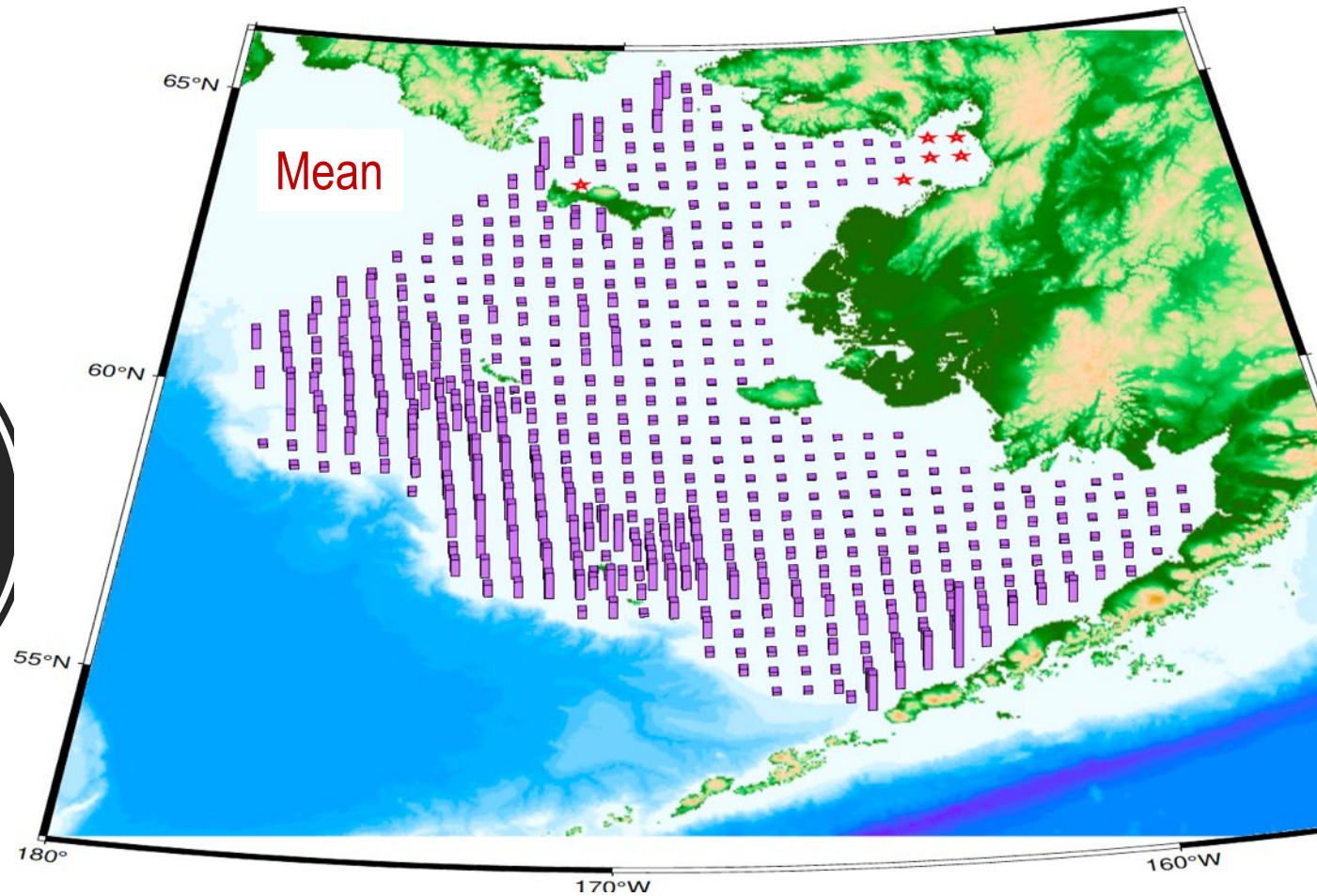
Pollock Survey 2019



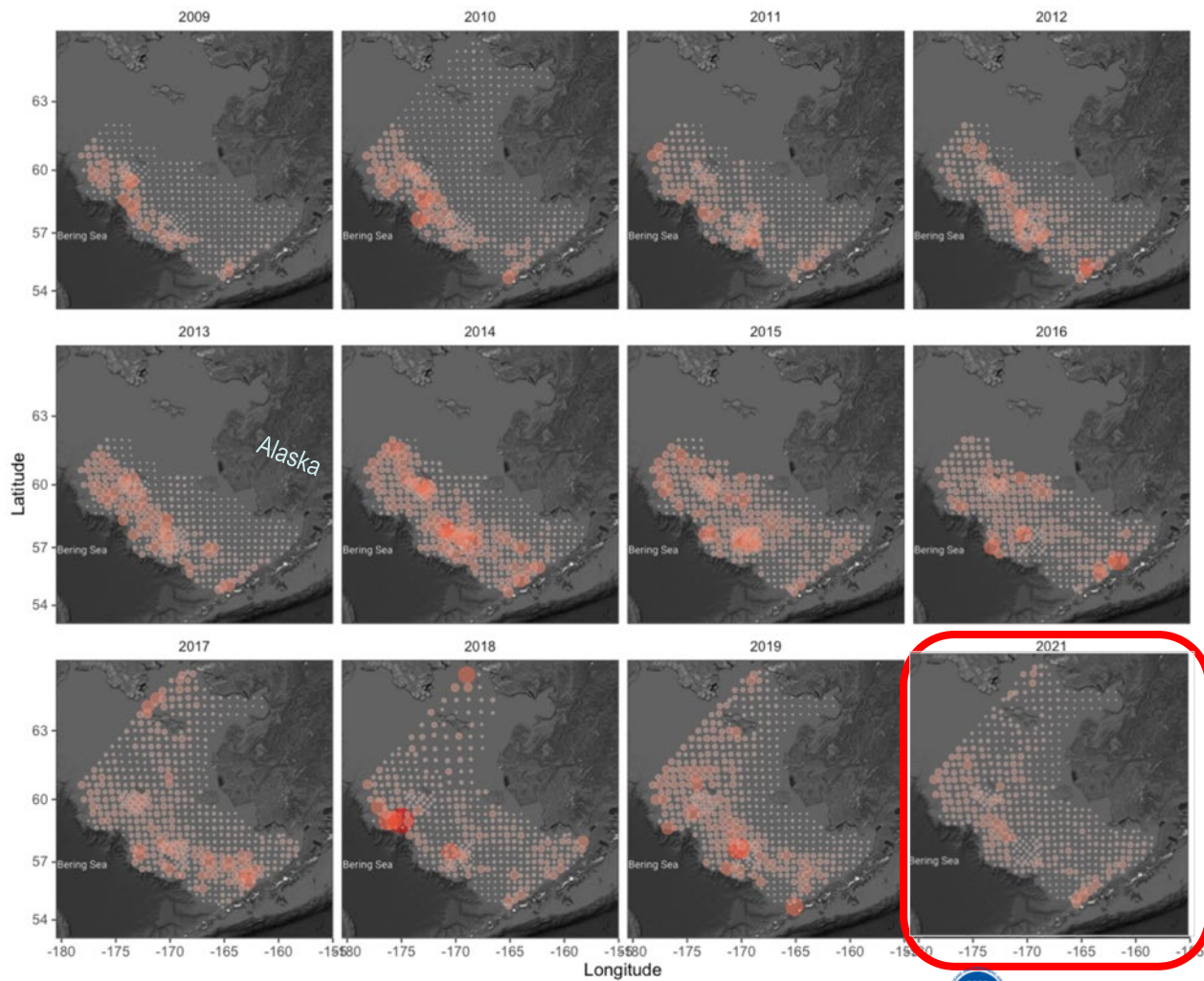
Pollock Survey 2021



Pollock
survey
mean density
by station

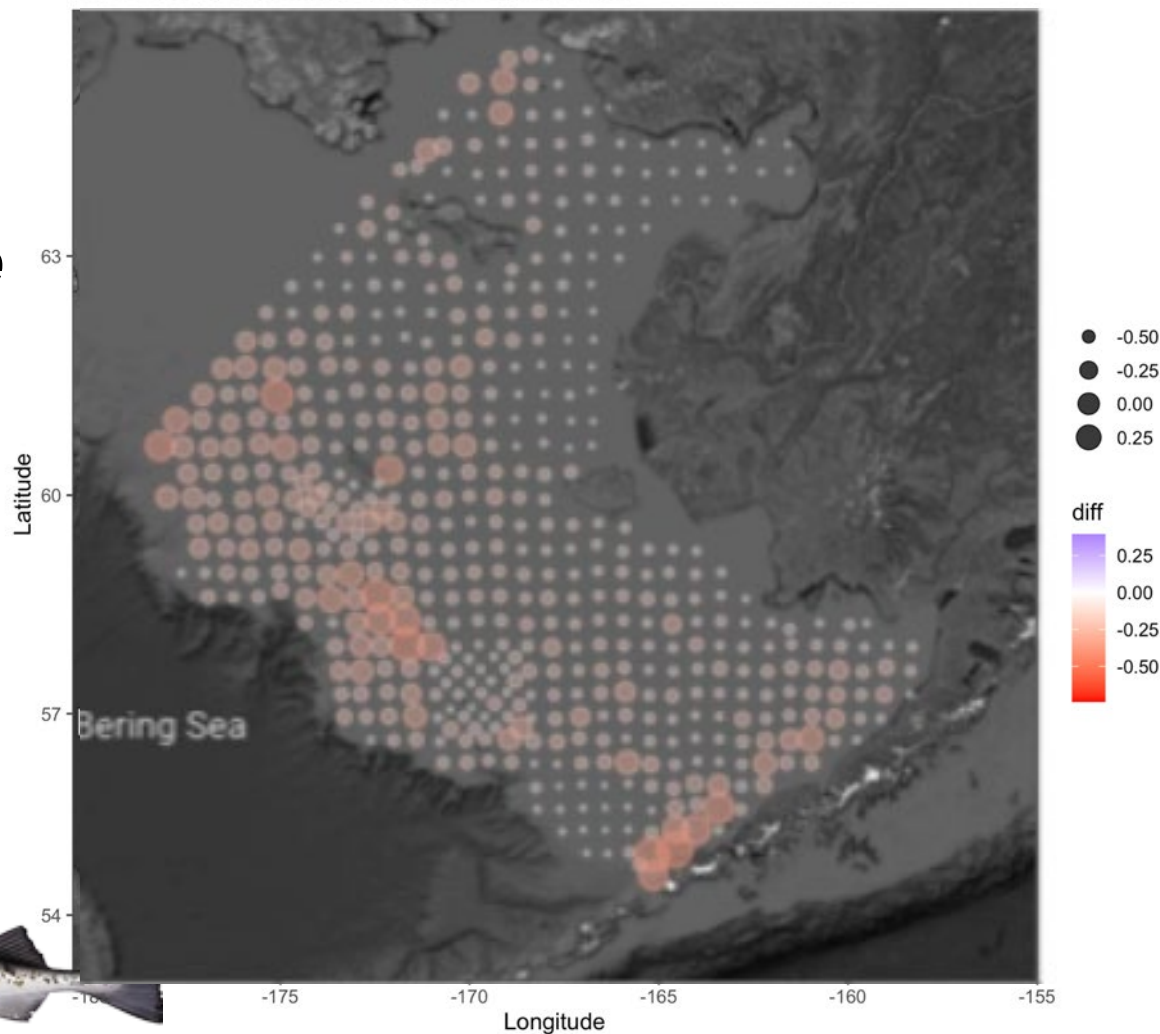


Recent bottom trawl surveys



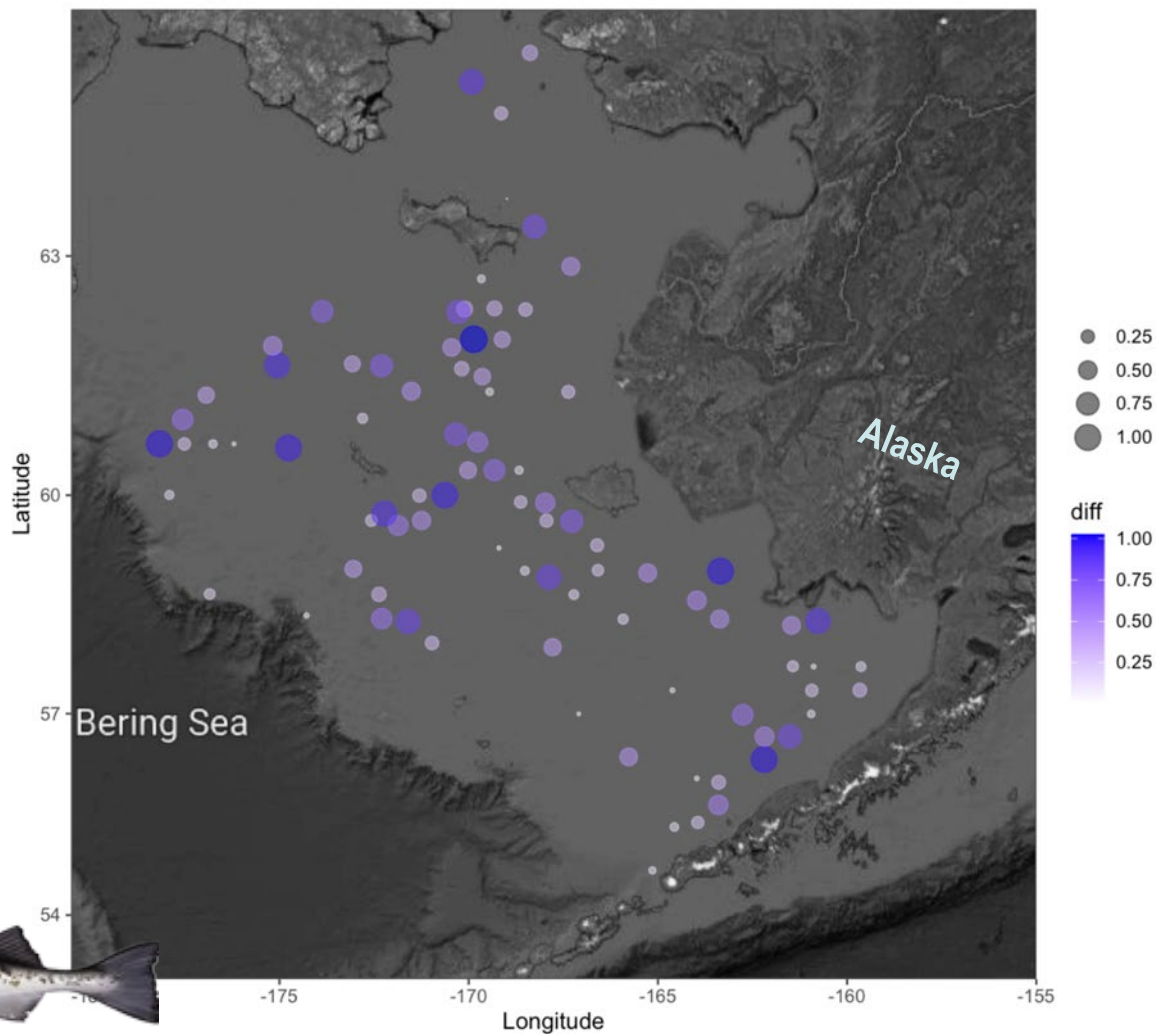
NOAA's 2021 bottom trawl survey relative to the average

2021 survey catch rate difference from mean



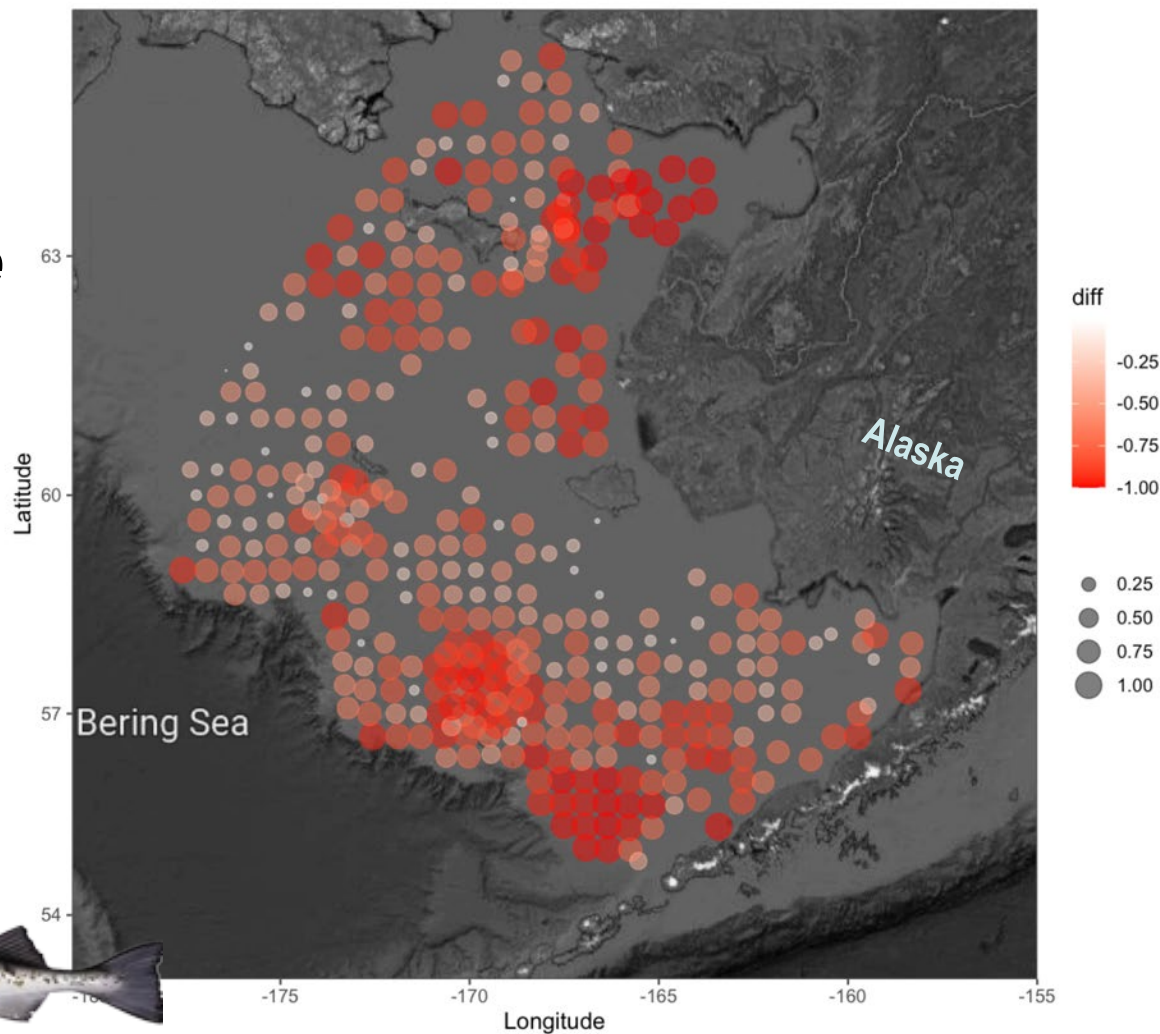
NOAA's 2021 bottom trawl survey relative to the average

2021 survey catch rate difference from mean



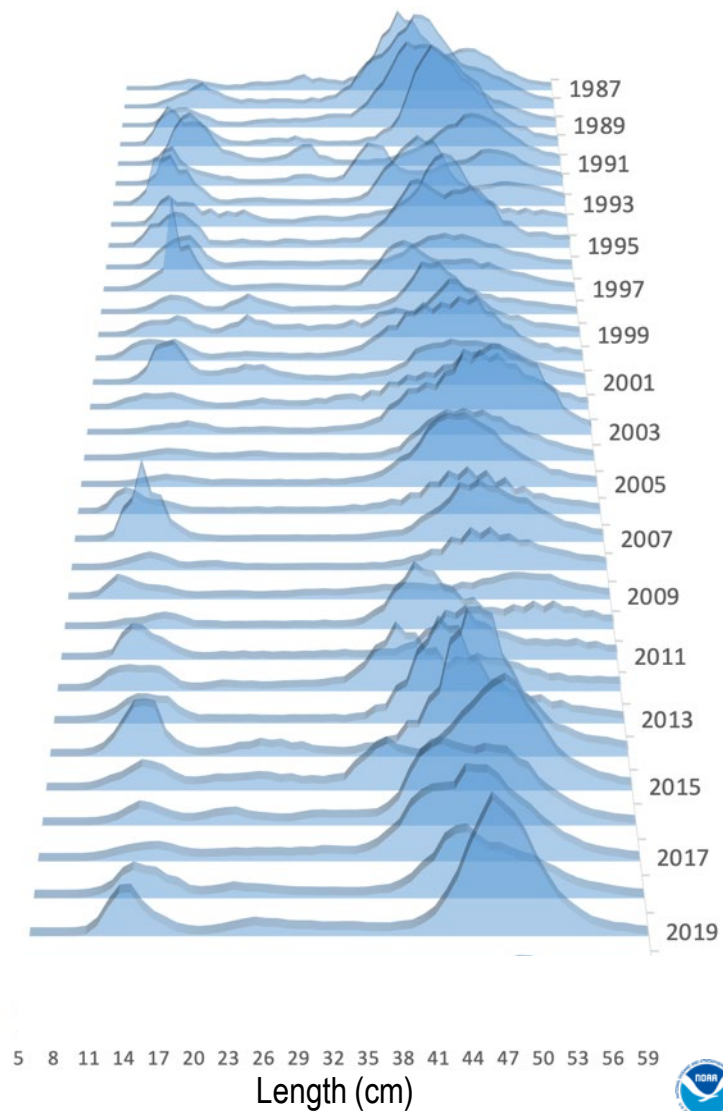
NOAA's 2021 bottom trawl survey relative to the average

2021 survey catch rate difference from mean



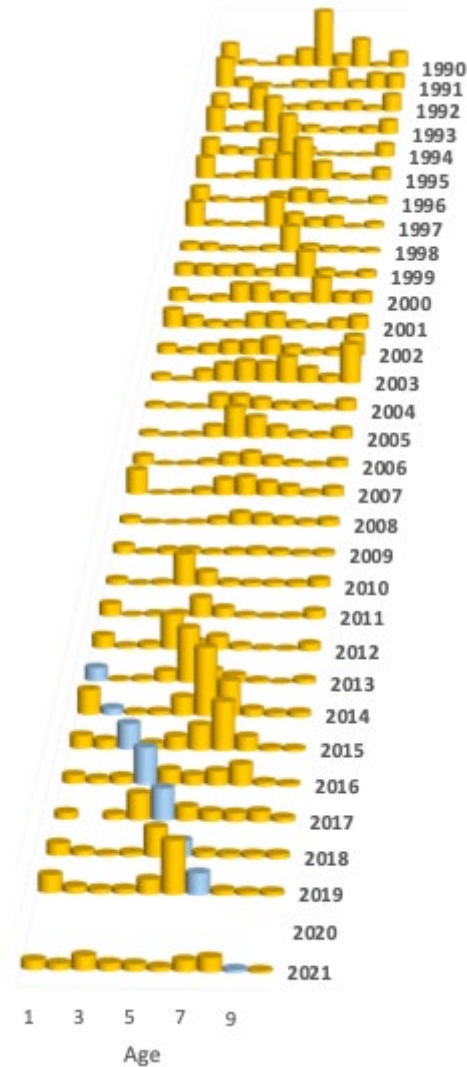
Size distribution

- From NOAA's bottom-trawl survey



Age composition

- From NOAA's bottom-trawl survey

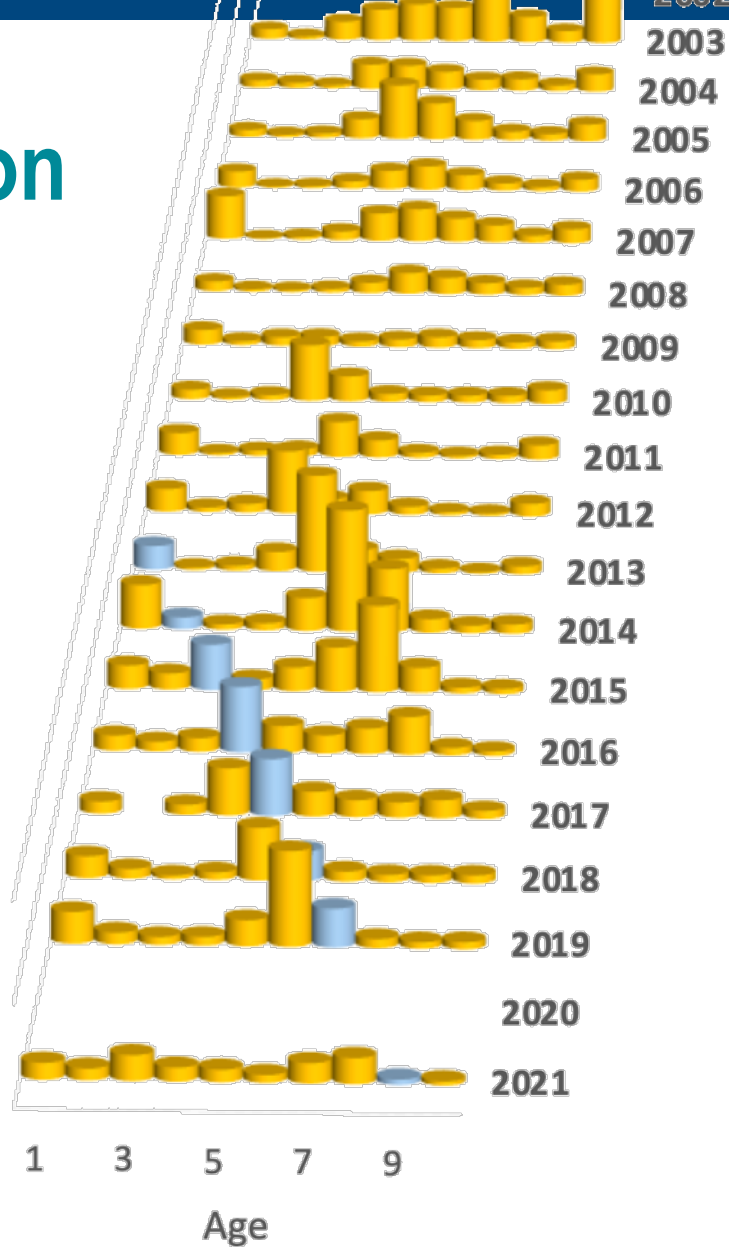


Vertical scale is relative to survey population estimate



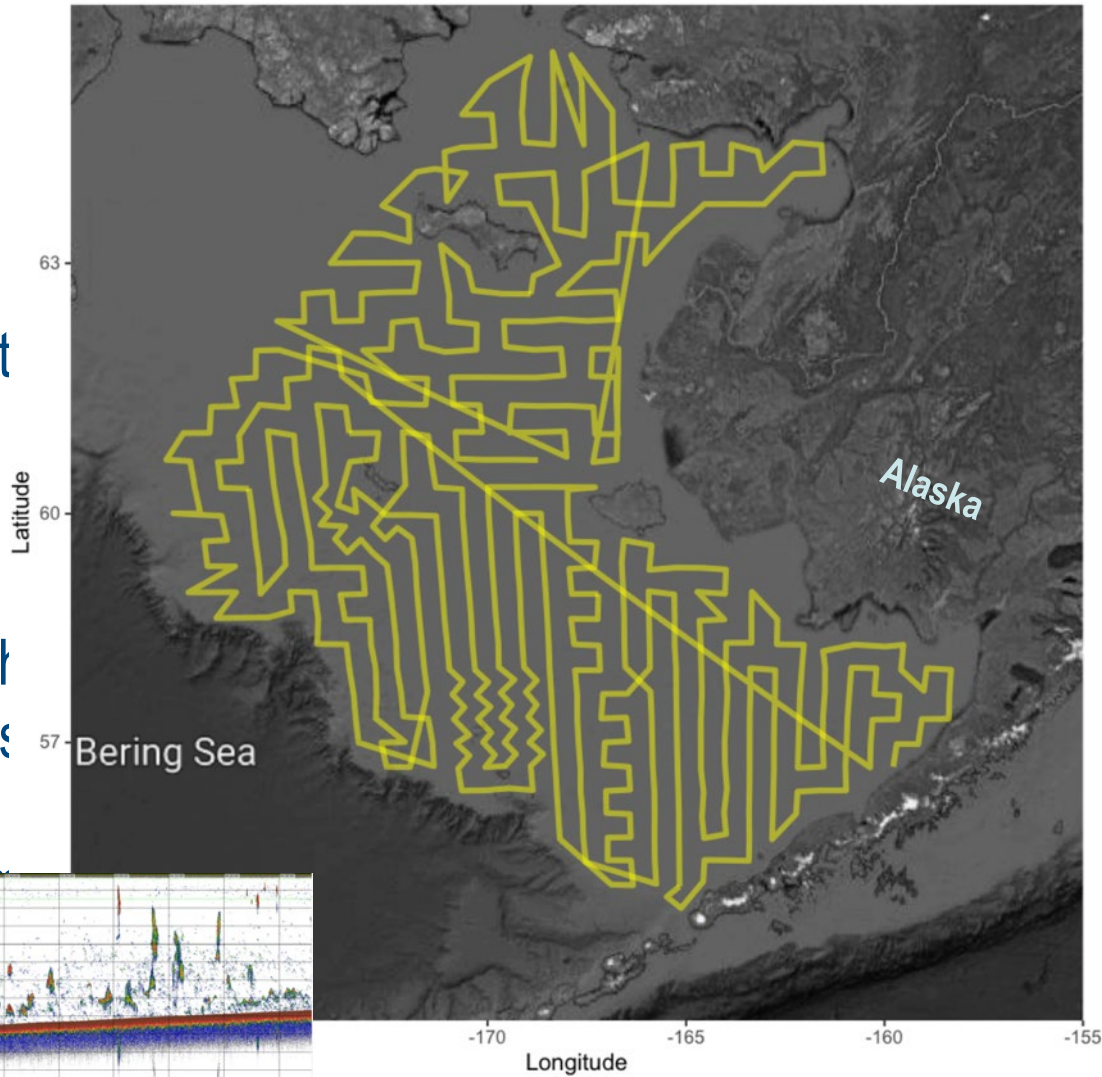
Age composition

- From NOAA's bottom-trawl survey



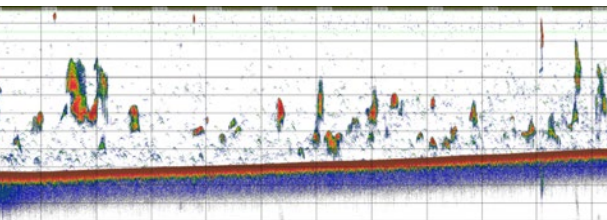
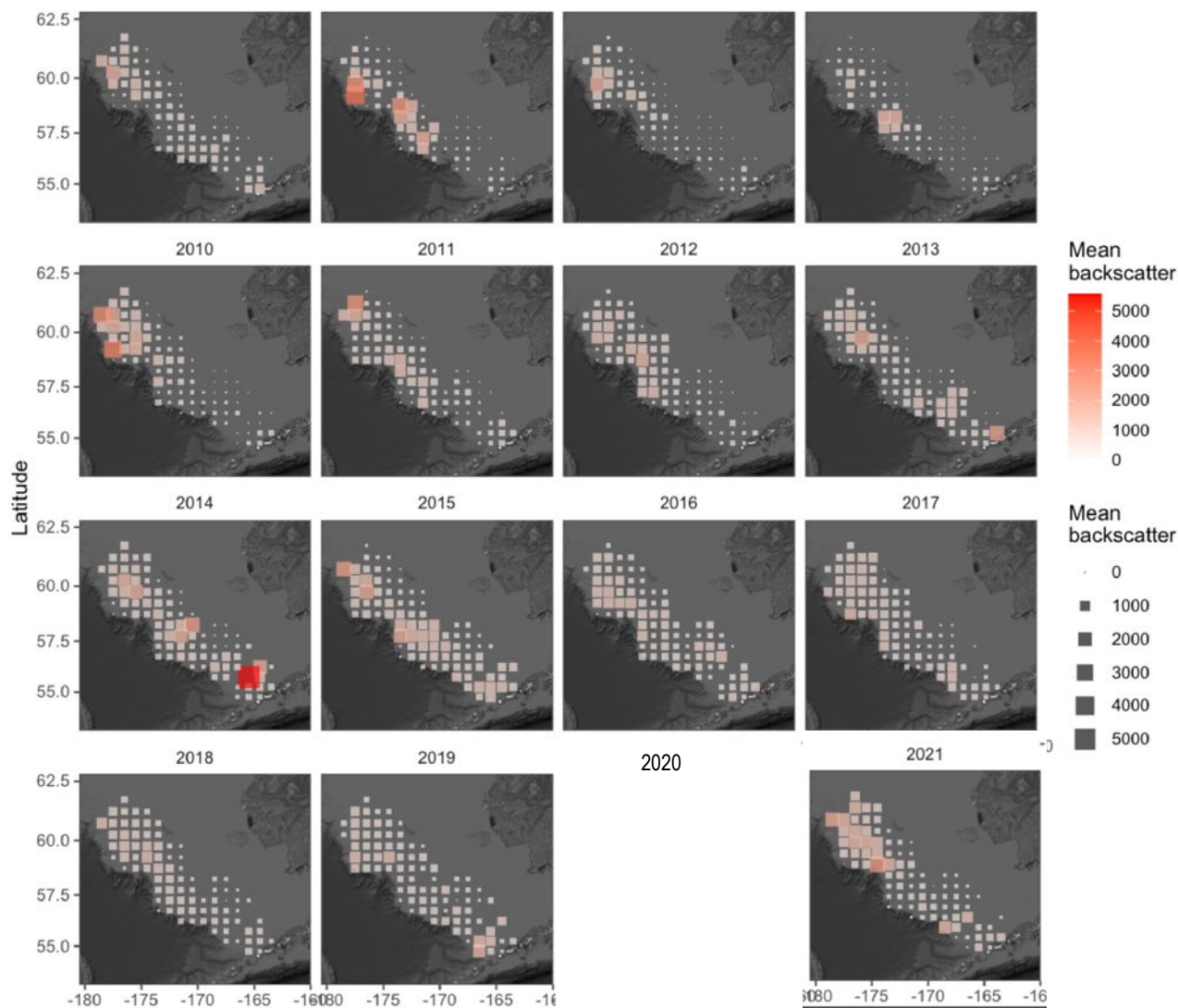
Survey

- Opportunist acoustic data collections
- Gives insight on young fish abundance



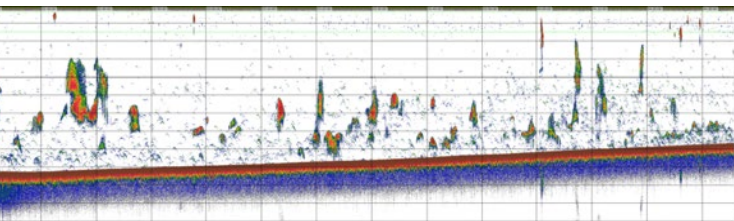
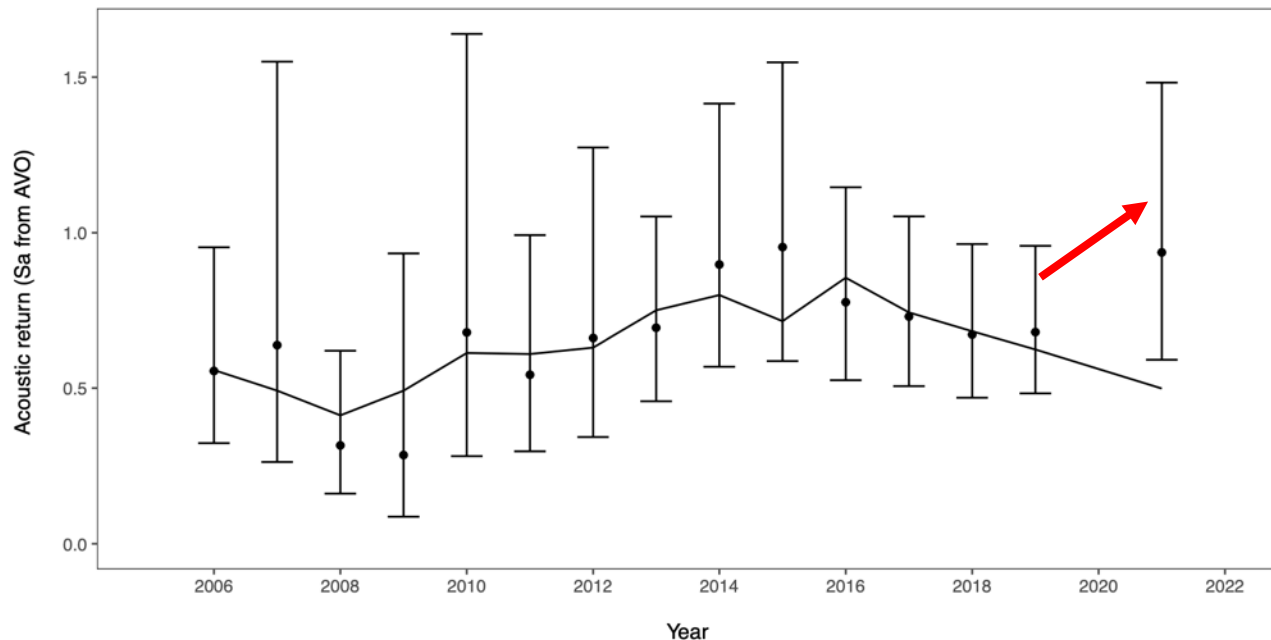
Acoustic data

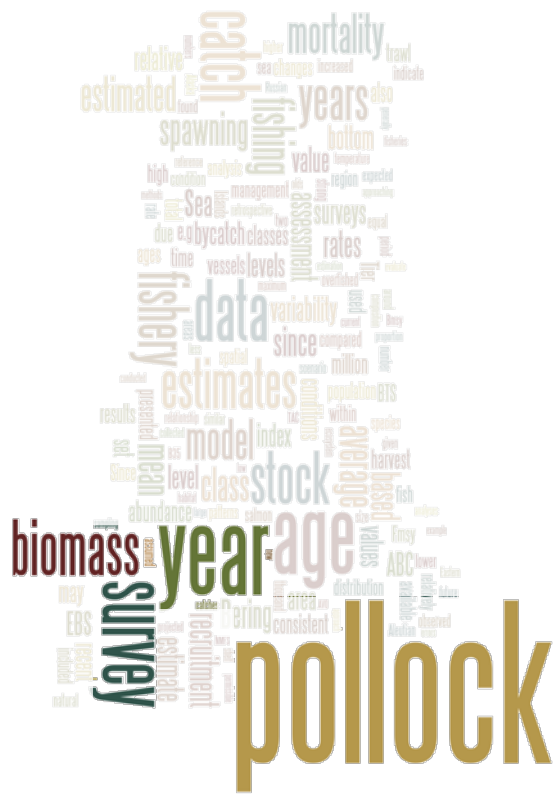
Opportunistically
collected from
chartered bottom-
trawl survey boats
The AVO index



Acoustic data

Opportunistically collected from chartered bottom-trawl survey boats
The AVO index





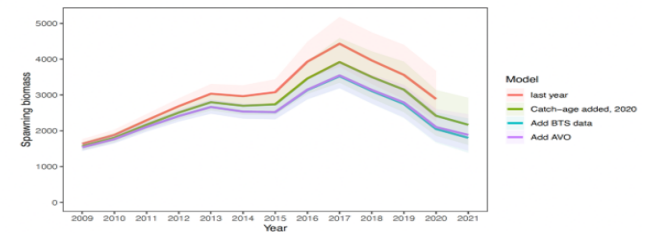
EBS pollock Assessment Results



New data impact on model

Data considerations

Name	Updated catch to 2021	2020 fishery age data	Bottom trawl survey	Acoustic from Bottom trawl transits (AVO)
Fishery	X	X		
+ BTS	X	X	X	
+ AVO	X	X	X	X

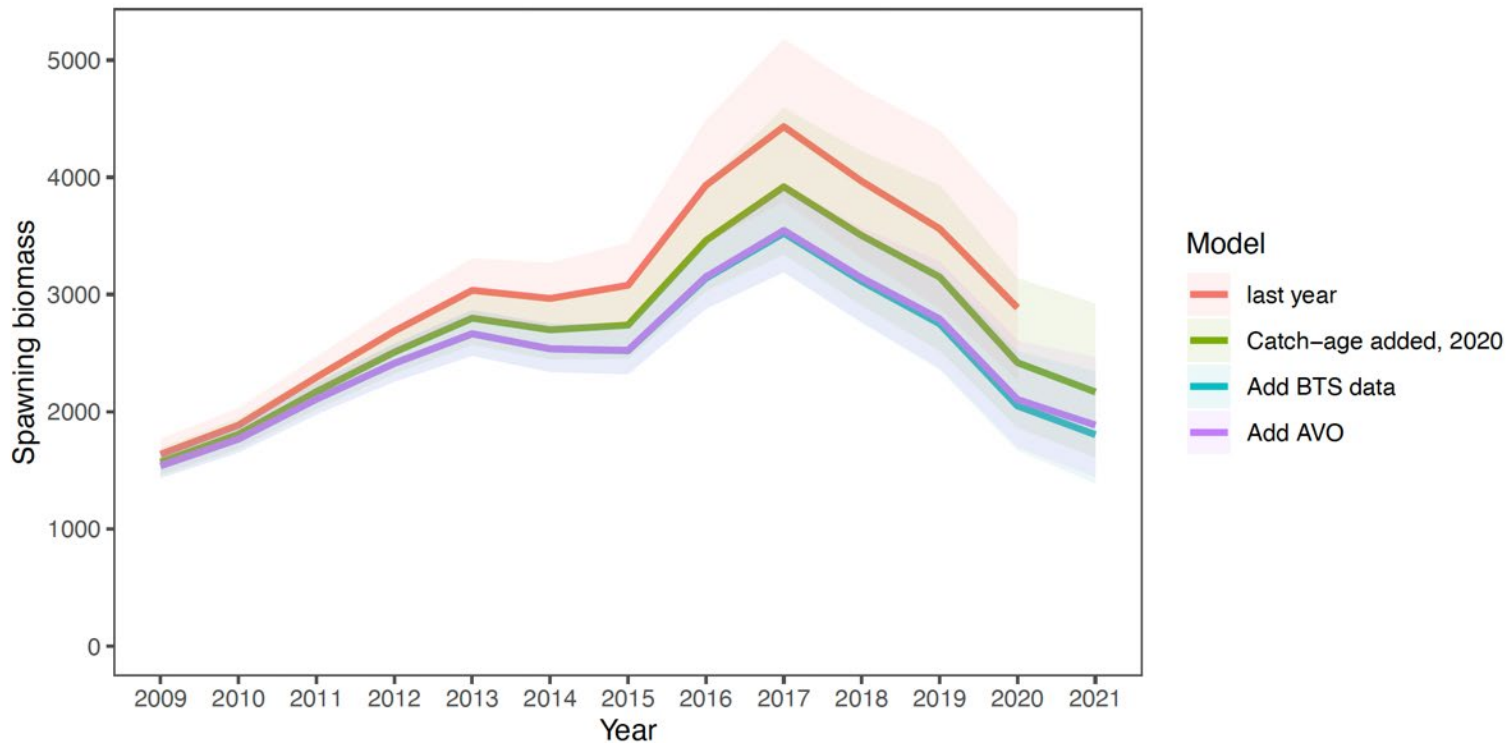


Data
Impact on
Model



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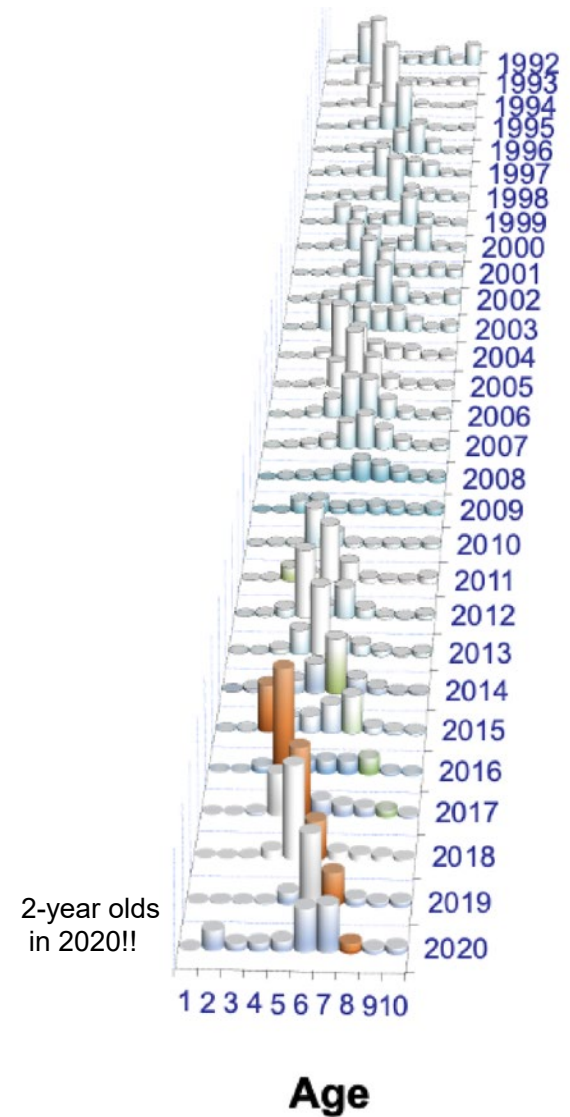
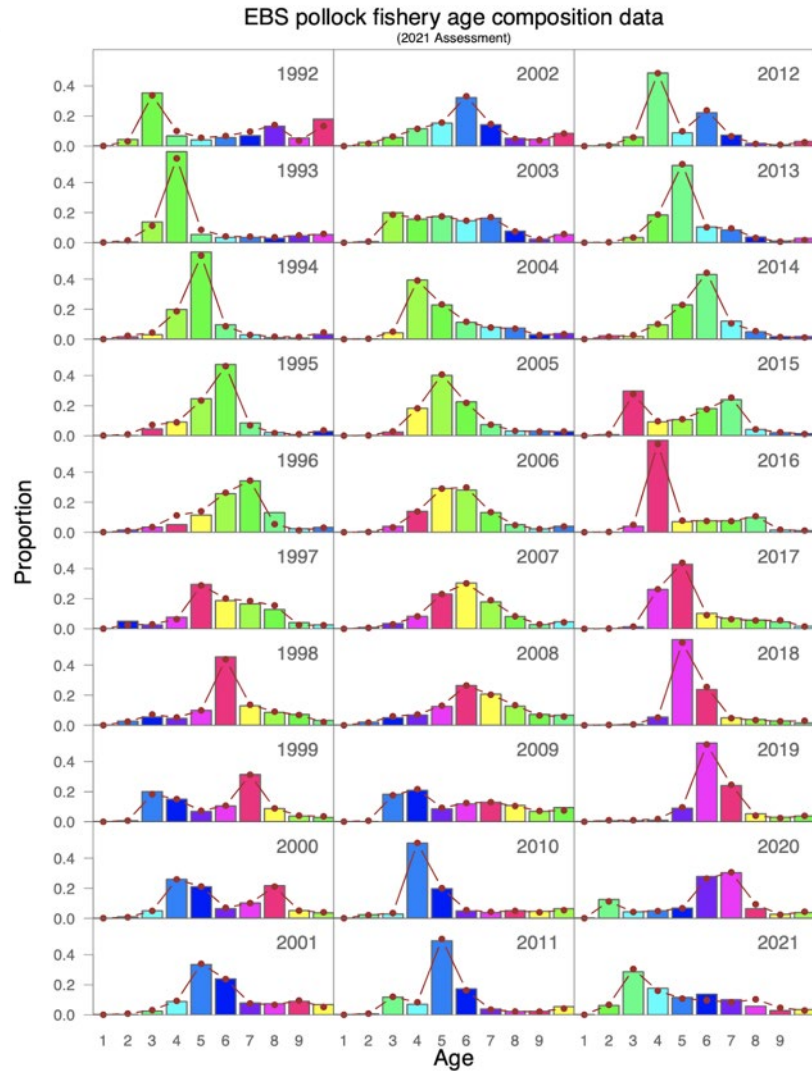




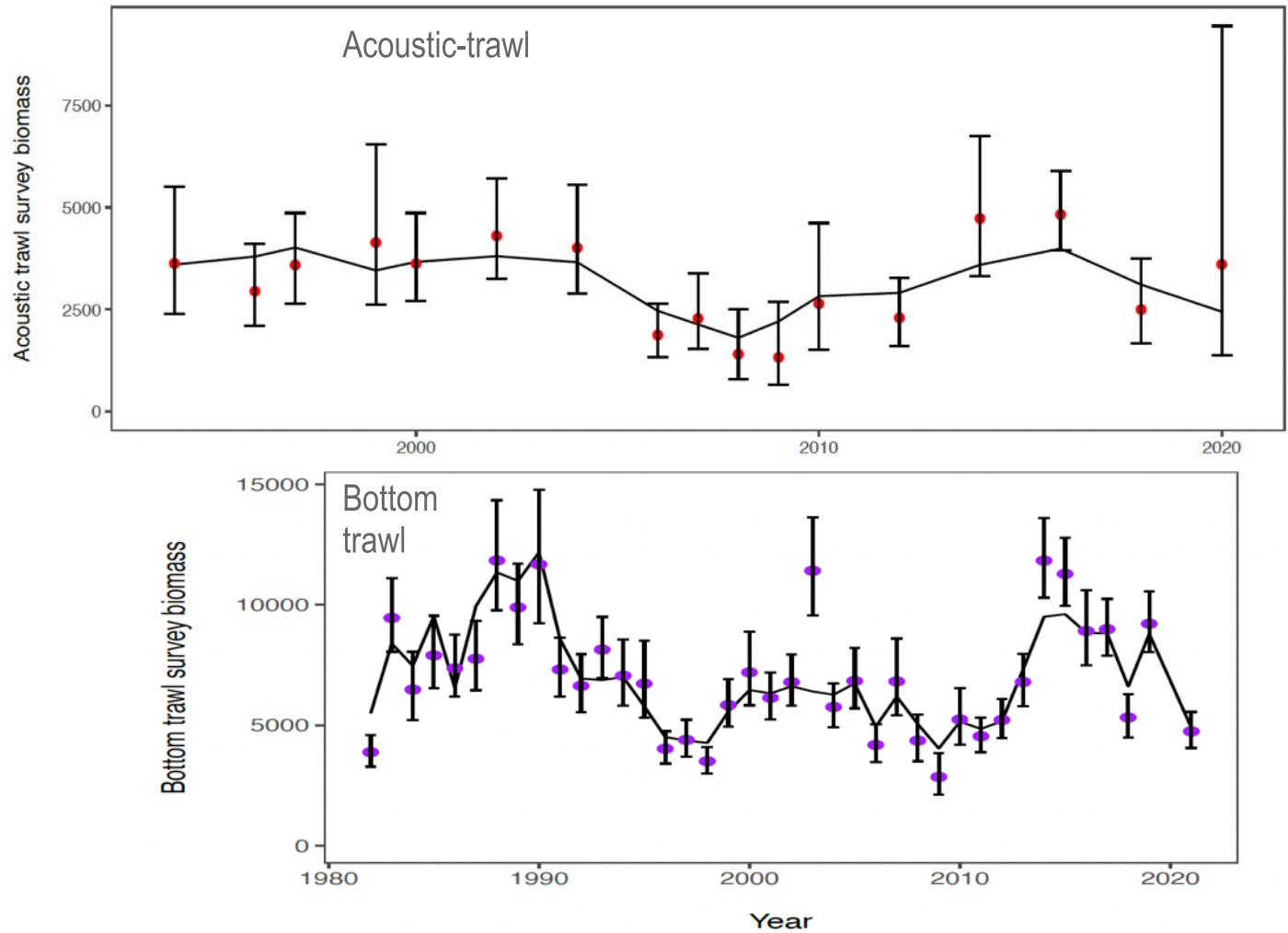
Data
Impact on
Model



Fishery catch-age

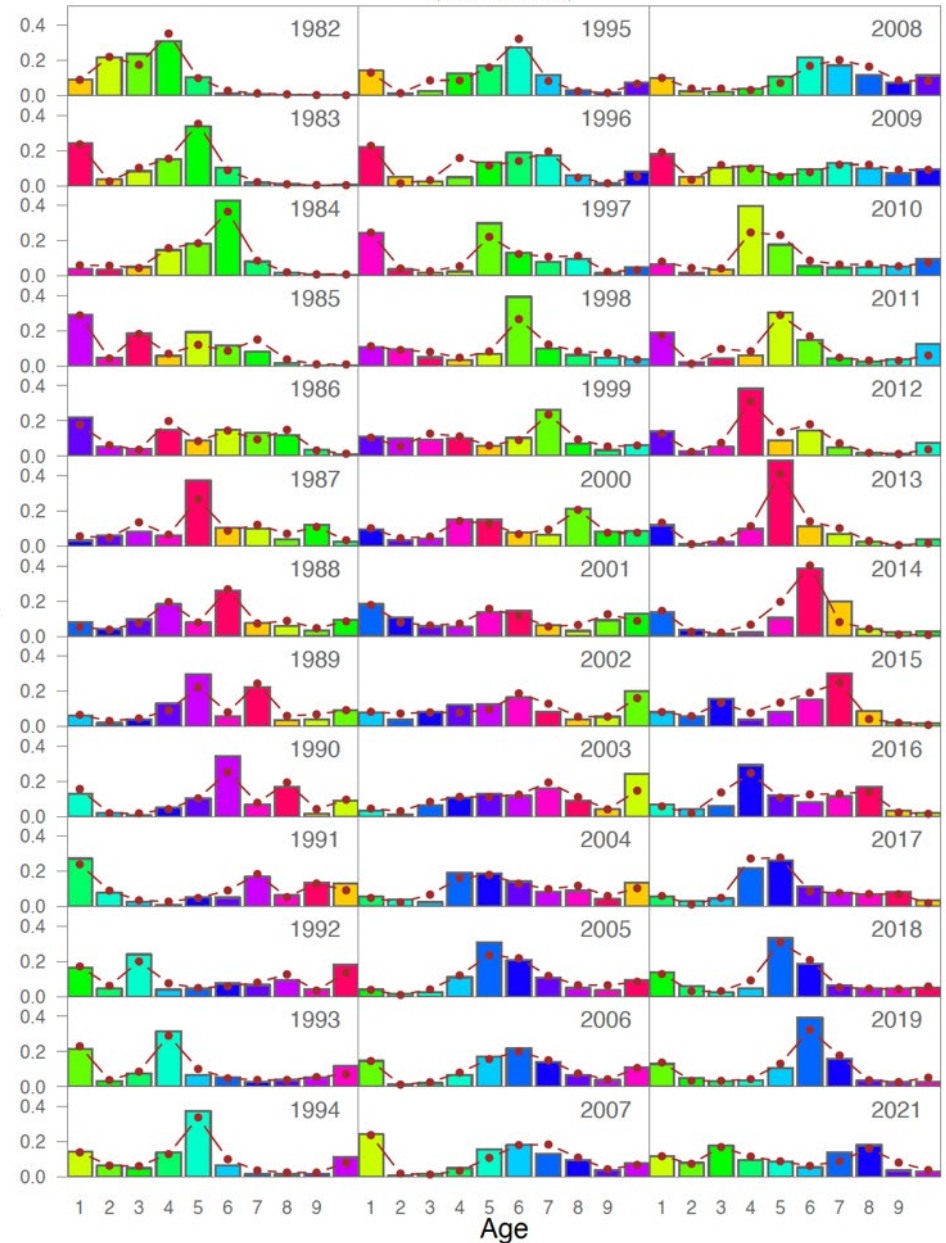


Fit to survey indices

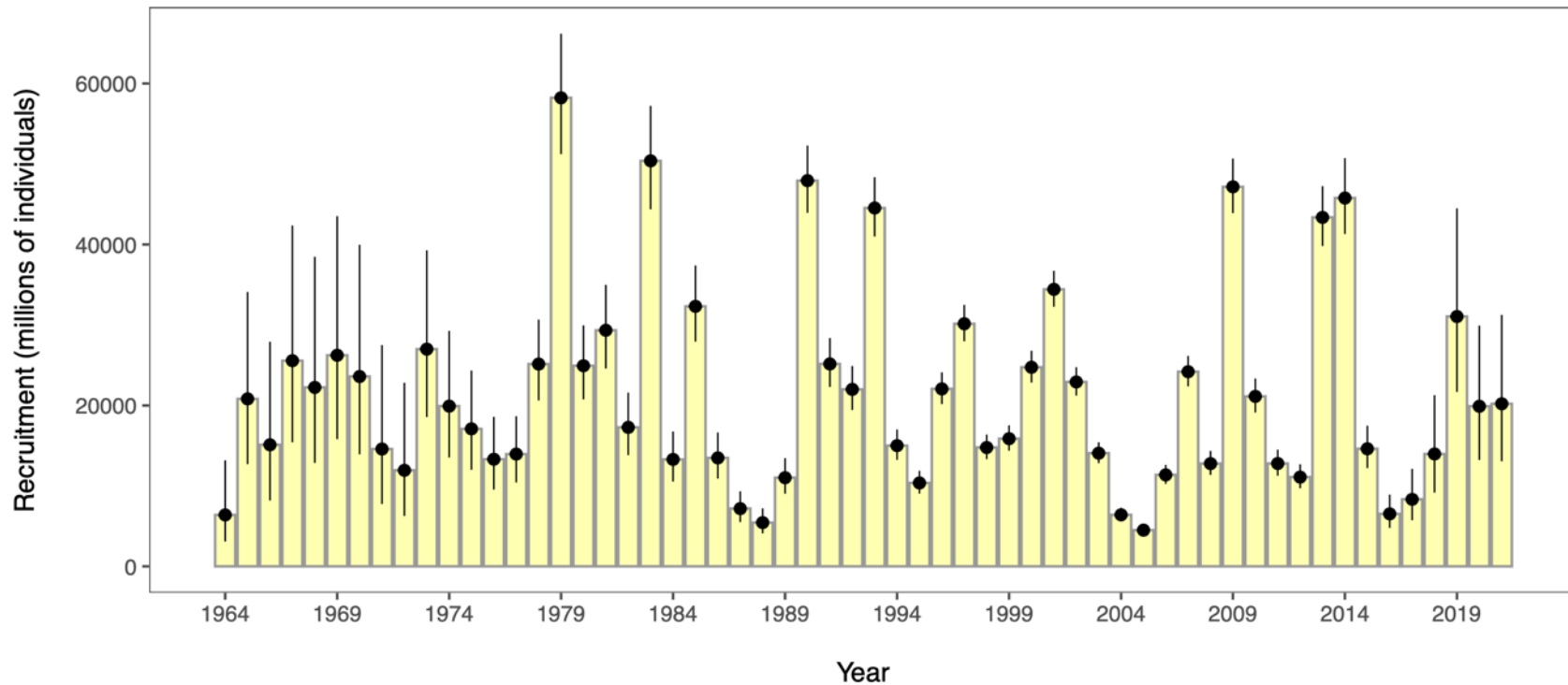


Fit to survey age compositions

EBS pollock survey age composition data
(2021 Assessment)



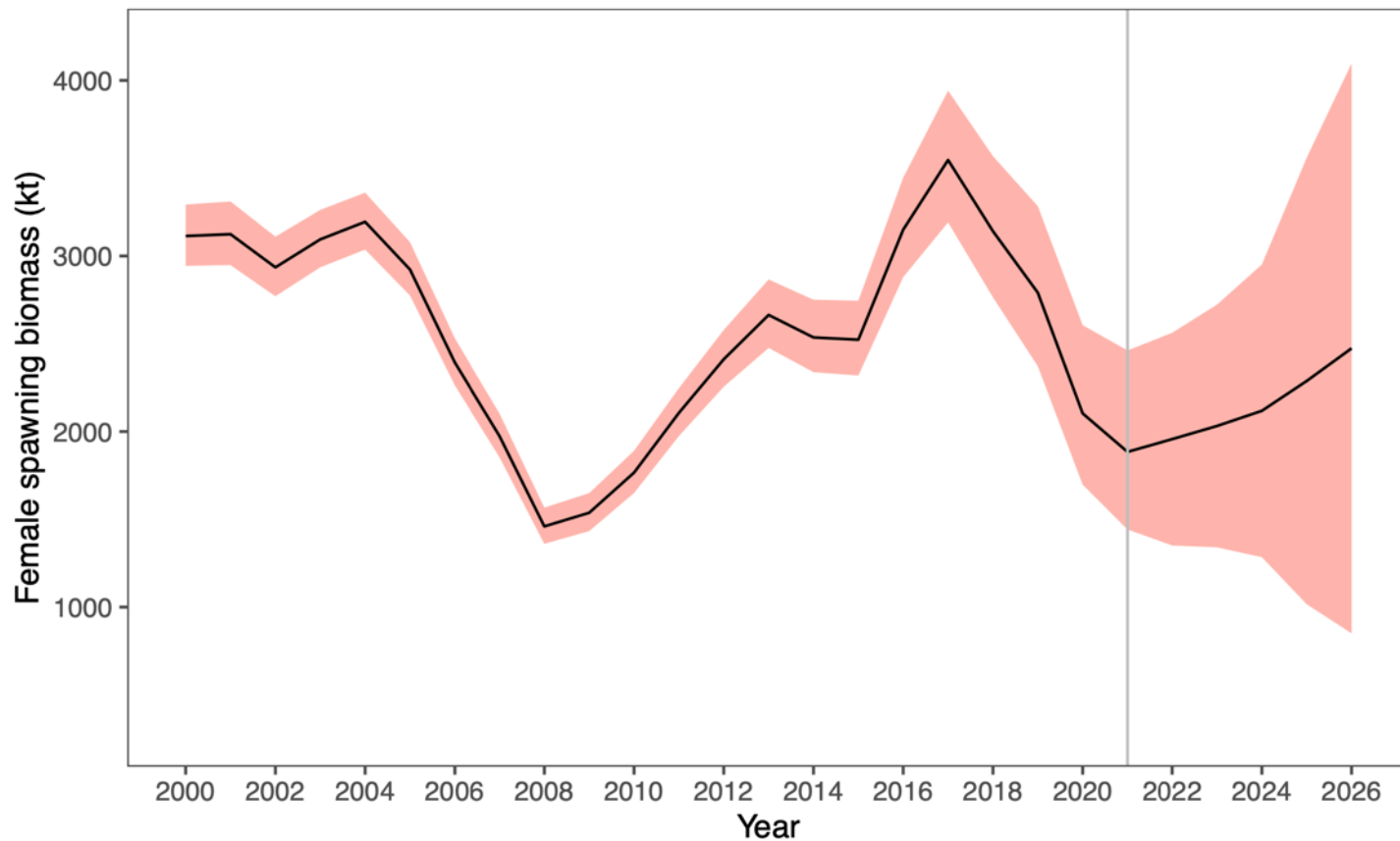
Recruitment



Exploitation rate trend

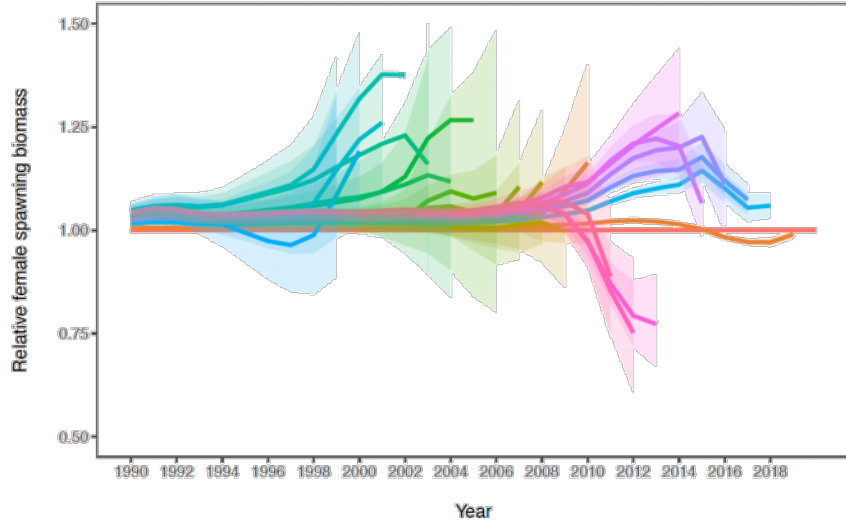
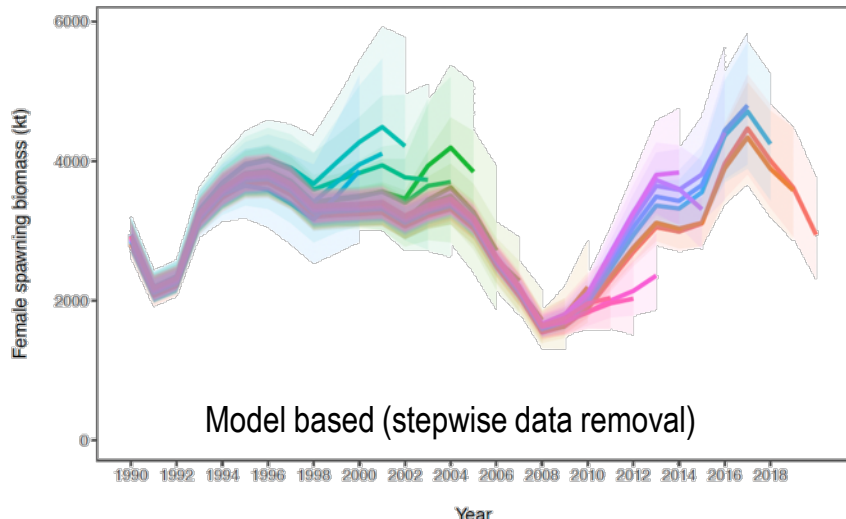


Biomass trend



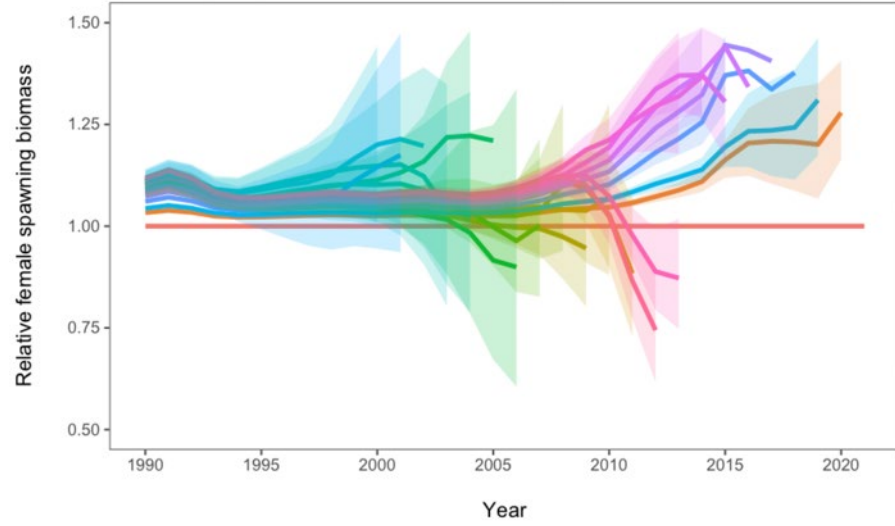
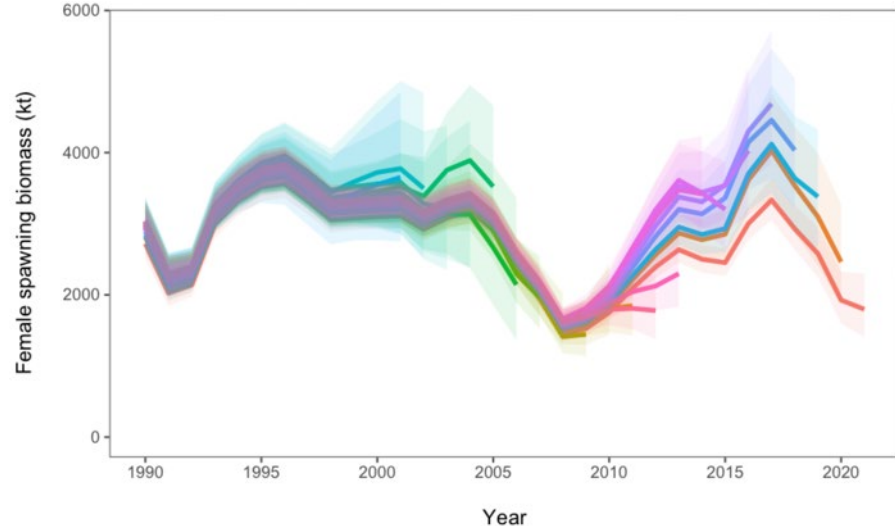
Retrospectives

2020 assessment

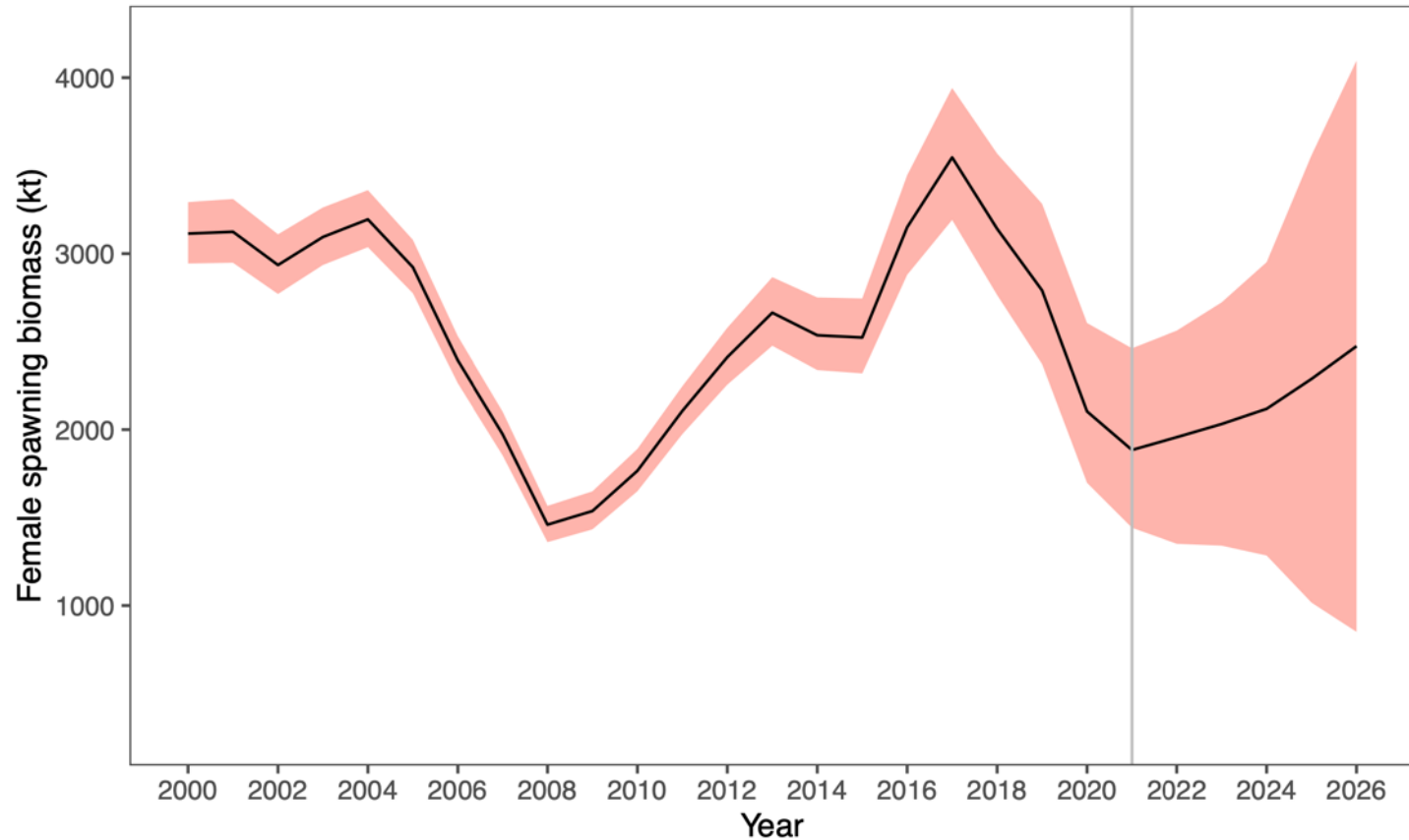


Retrospectives

This year!



Biomass trend



Summary

- New data for 2021:
 - Bottom trawl survey ~65% of mean (8th lowest since 1982)
 - Mid-water pollock (young fish) **Indicate potentially strong recruitment**
 - Fishery 2020 showed poor conditions, improved this year but **small fish**
- Results combining disparate data pending; but
 - Expect decline in spawning biomass through 2022



Risk table summary

Assessment-related	Considerations		
	Population dynamics	Environmental or ecosystem	Fisheries
Level 2: Substantially increased concerns	Level 2: Substantially increased concerns	Level 2: Substantially increased concerns	Level 2: Substantially increased concerns

Tier	Year	MaxABC	OFL
1b	2022	1,251,000	1,469,000
1b	2023	1,451,000	1,704,000
2b	2022	1,111,060	1,469,000
2b	2023	1,288,610	1,704,000
3b	2022	904,000	1,128,000
3b	2023	1,067,000	1,327,000

Coincidentally same (similar to) constant F from 2021



Decision table considerations

Table 1-43. Outcomes of decision (expressed as chances out of 100) given different 2022 catches (first row, in kt). Note that for the 2019 and later year-classes average values were assumed. Constant Fs based on the 2022 catches were used for subsequent years.

	10	850	1000	1150	1375	1300	1450	1600
$P [F_{2022} > F_{MSY}]$	0	1	5	15	33	27	39	50
$P [B_{2023} < B_{MSY}]$	28	53	58	63	71	68	73	78
$P [B_{2024} < B_{MSY}]$	14	43	50	57	68	64	71	77
$P [B_{2023} < \bar{B}]$	51	92	95	97	99	98	99	100
$P [B_{2026} < \bar{B}]$	3	45	54	62	73	70	76	82
$P [B_{2026} < B_{2021}]$	0	16	21	26	34	31	37	42
$P [B_{2024} < B_{20\%}]$	1	3	4	5	8	7	9	11
$P [p_{a_5,2024} > \bar{p}_{a_5}]$	10	72	78	82	86	85	87	89
$P [D_{2023} < D_{1994}]$	2	13	19	25	37	33	42	52
$P [D_{2026} < D_{1994}]$	0	15	24	35	54	48	60	72
$P [E_{2022} > E_{2021}]$	0	1	14	49	87	78	92	97

