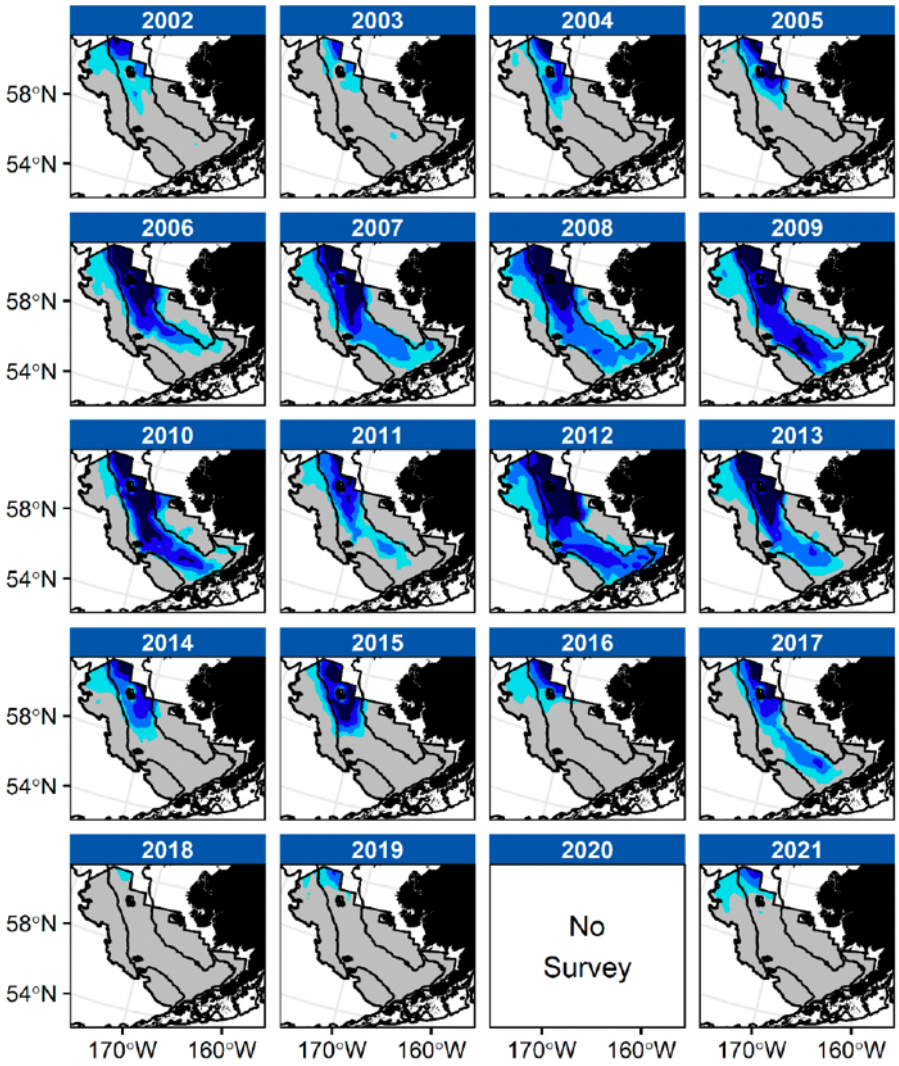
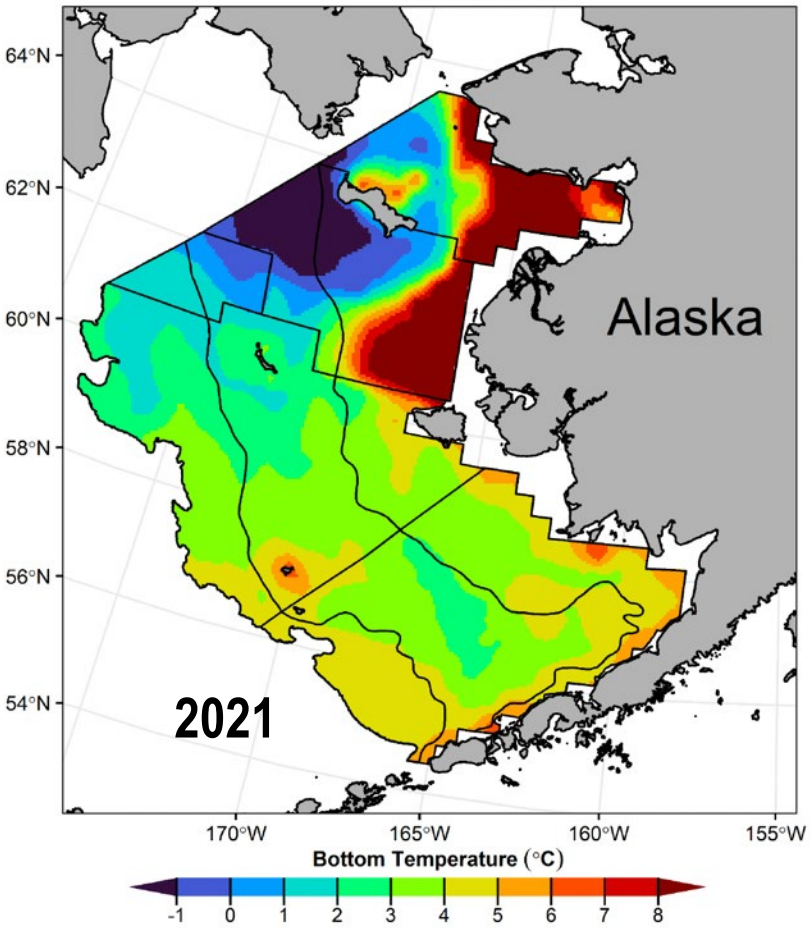
Assessment of walleye pollock in the Eastern Bering Sea

NOAA FISHERIES
Alaska Fisheries Science Center

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

December 3rd, 2021

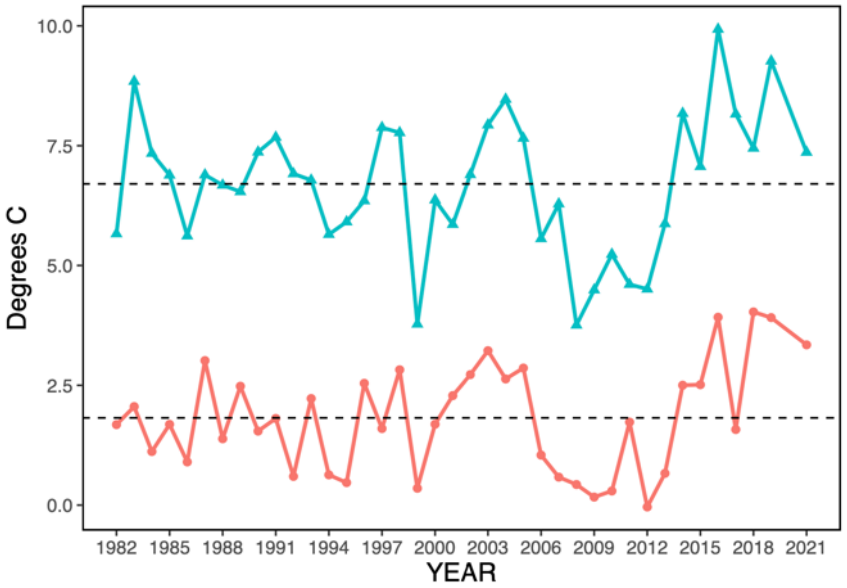


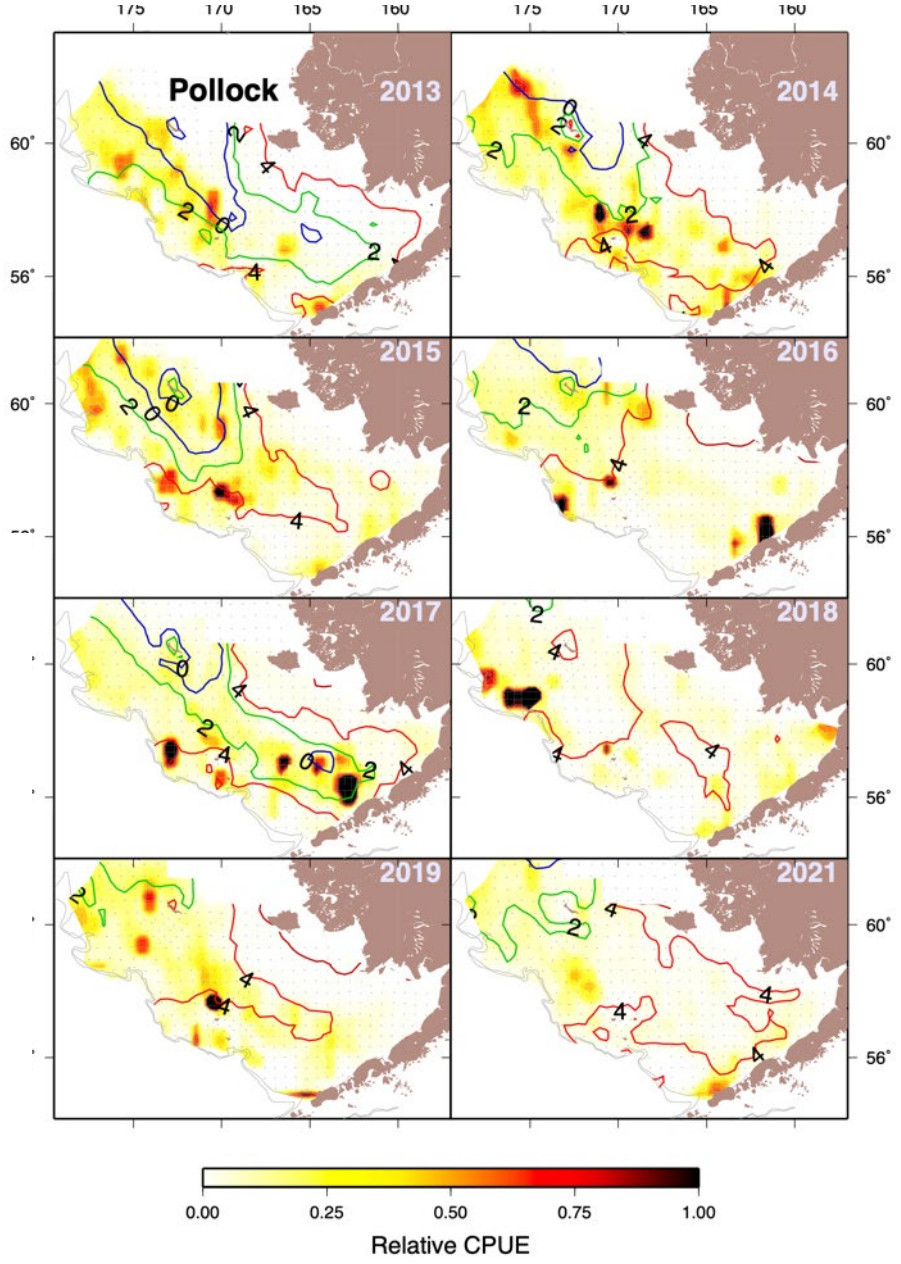


This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Pollock density and bottom temperatures

- From the bottom trawl survey





This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
ot been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

New genetics information

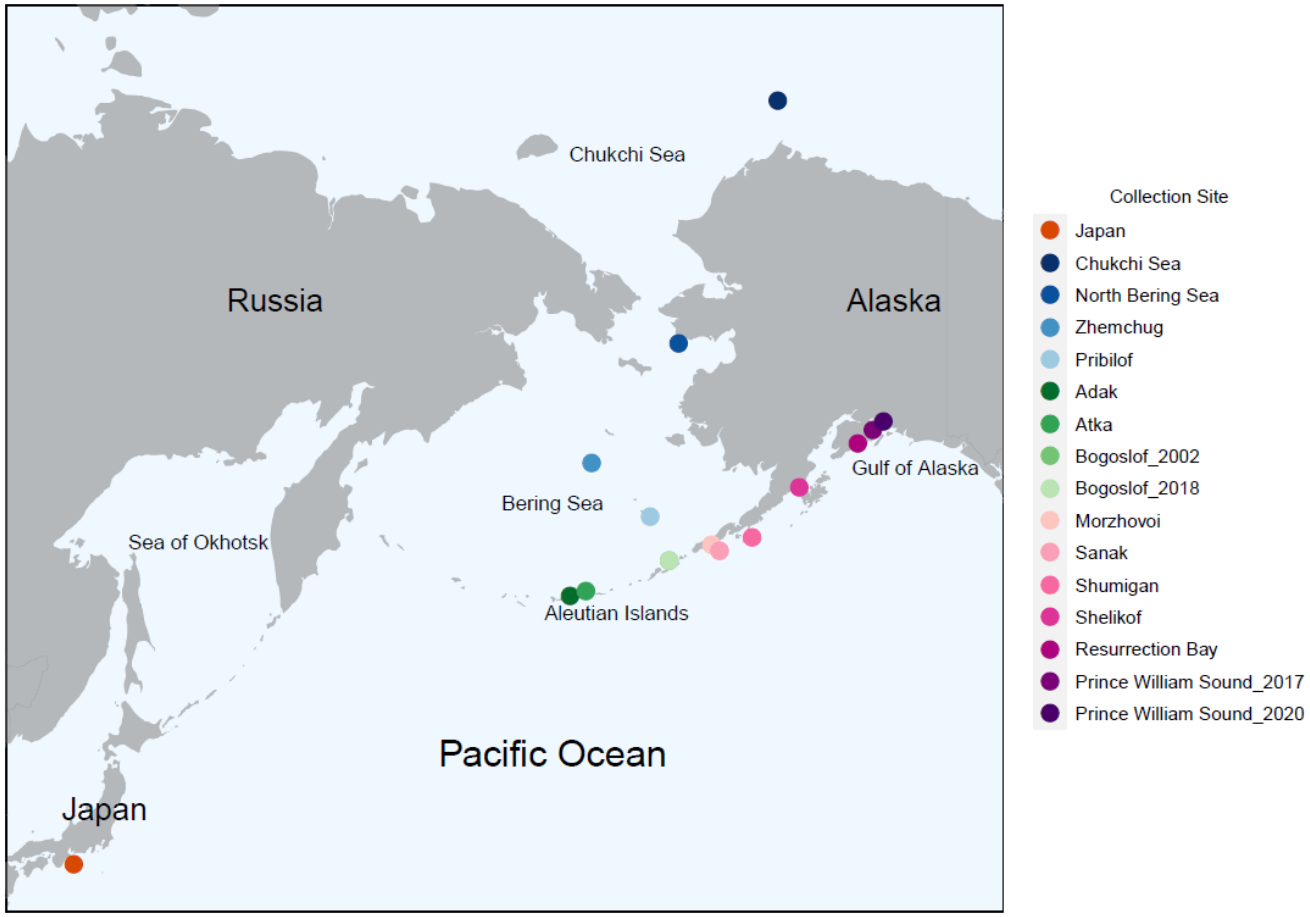
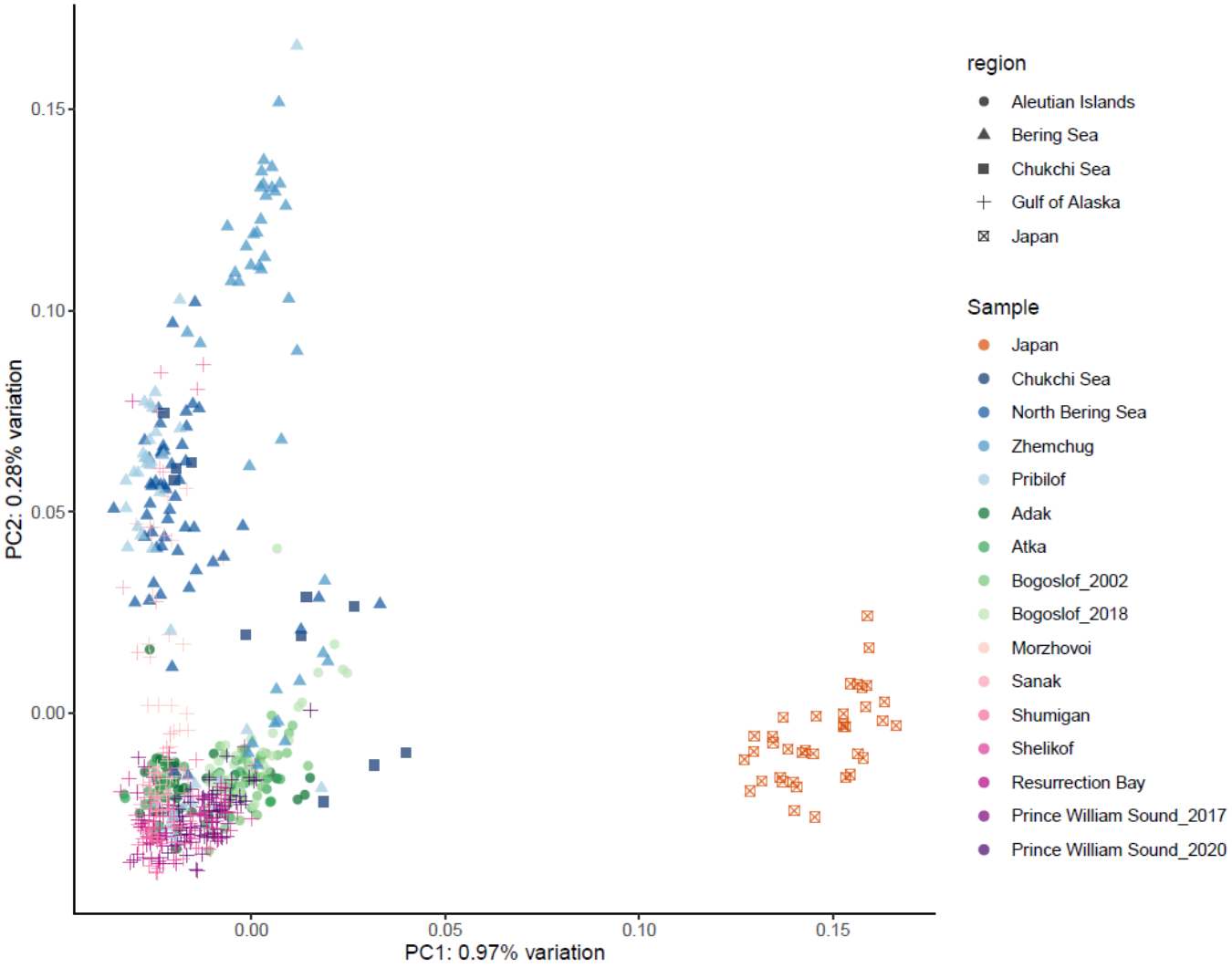


Figure 1. Sampling locations of pollock collected in Japan (orange point), Chukchi Sea and Bering Sea (blue points), Aleutian Islands (green points), Alaska Peninsula and Gulf of Alaska (pink and purple points).

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

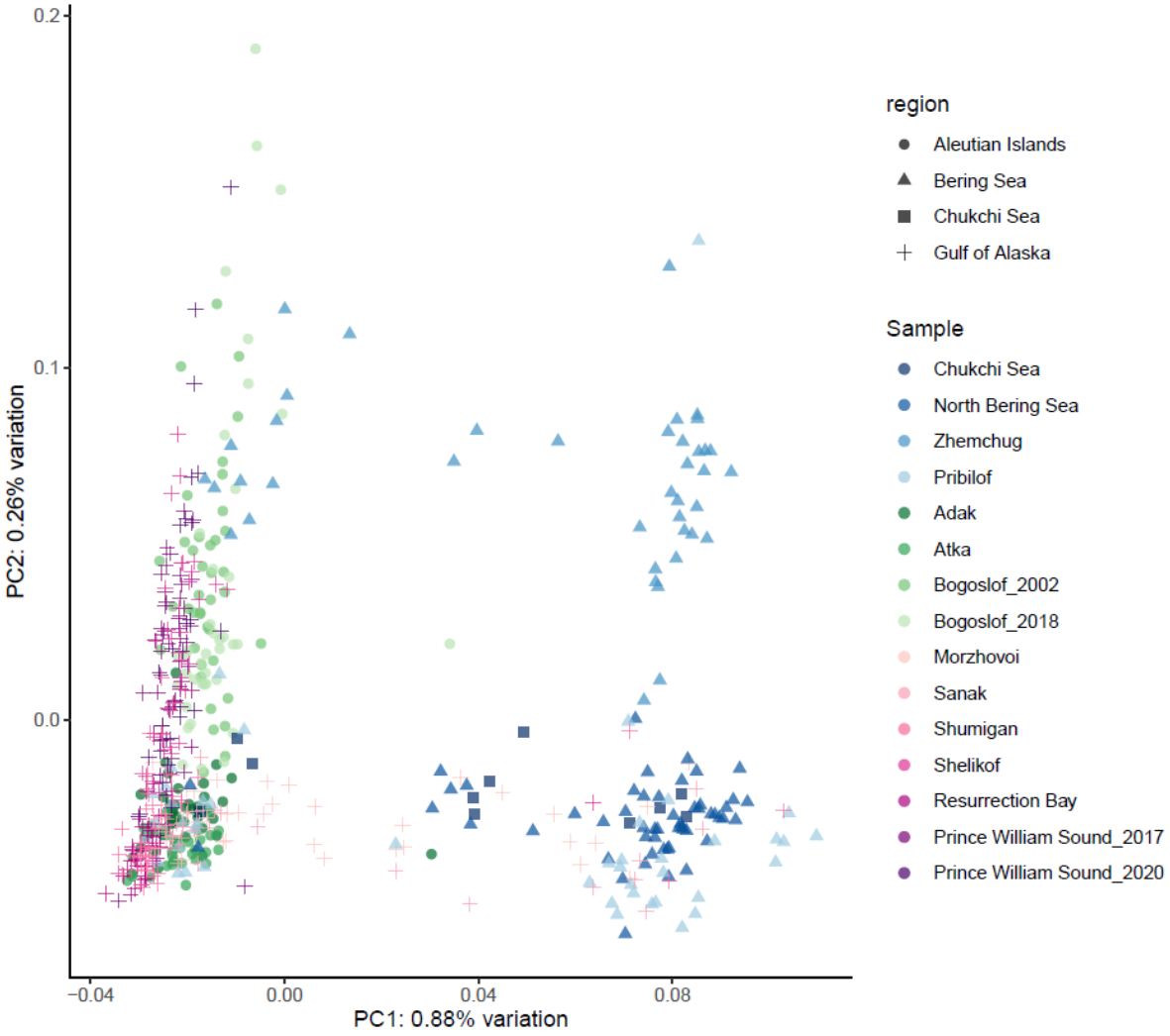
New genetics information



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

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

New genetics information



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

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

New genetics information

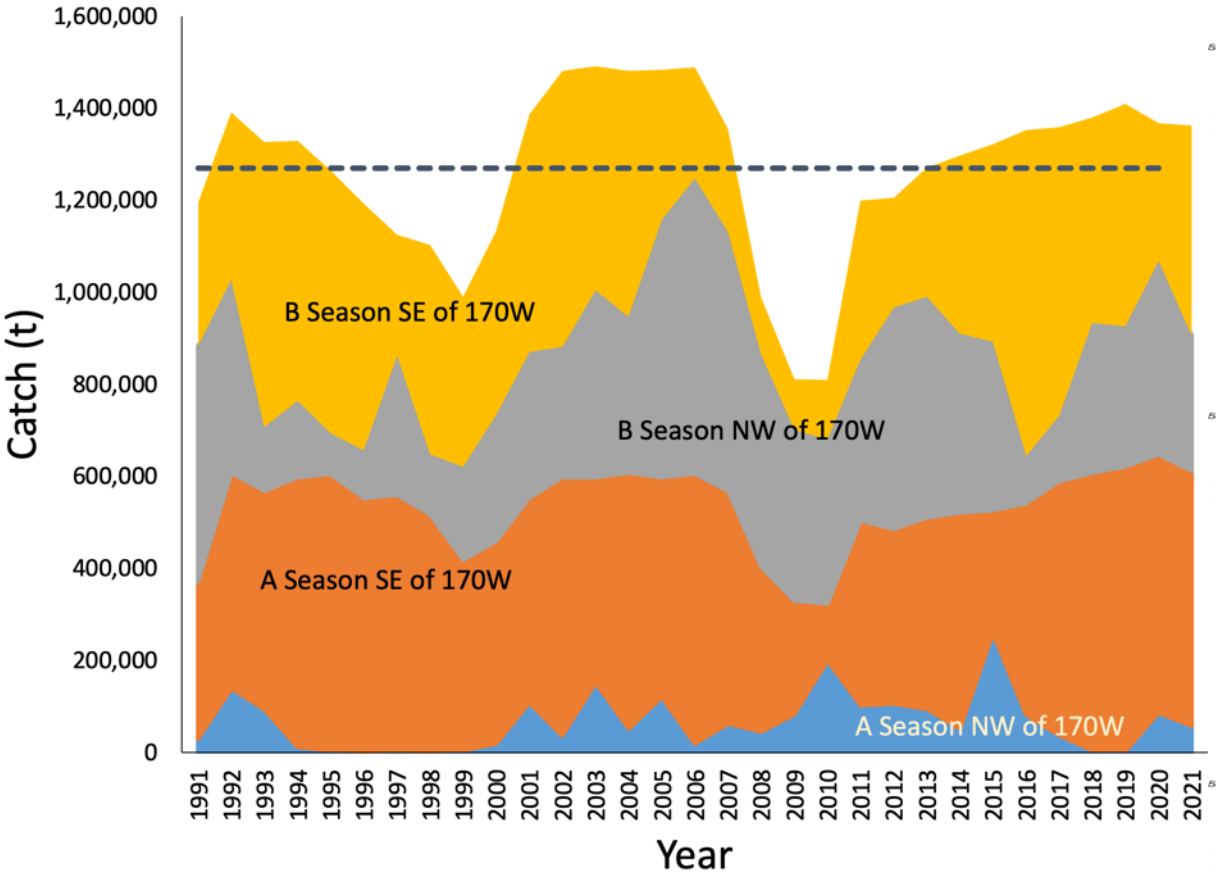
- Results promising and consistent with our current management areas
- Future source-spawning ID possible

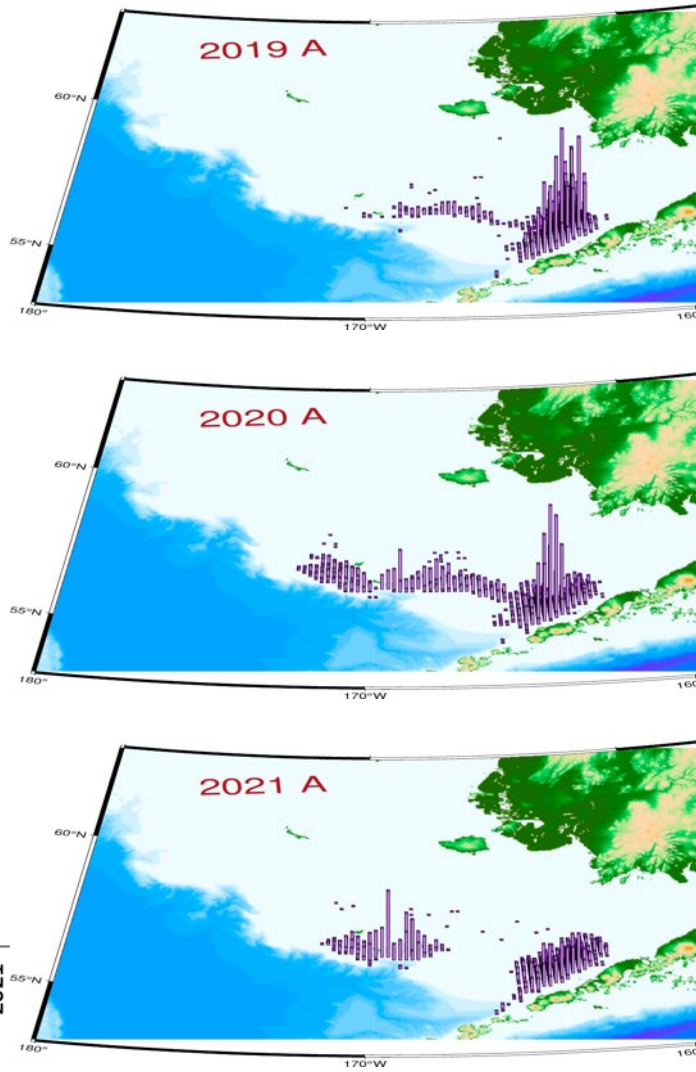
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Data

Seasonal and area catch patterns

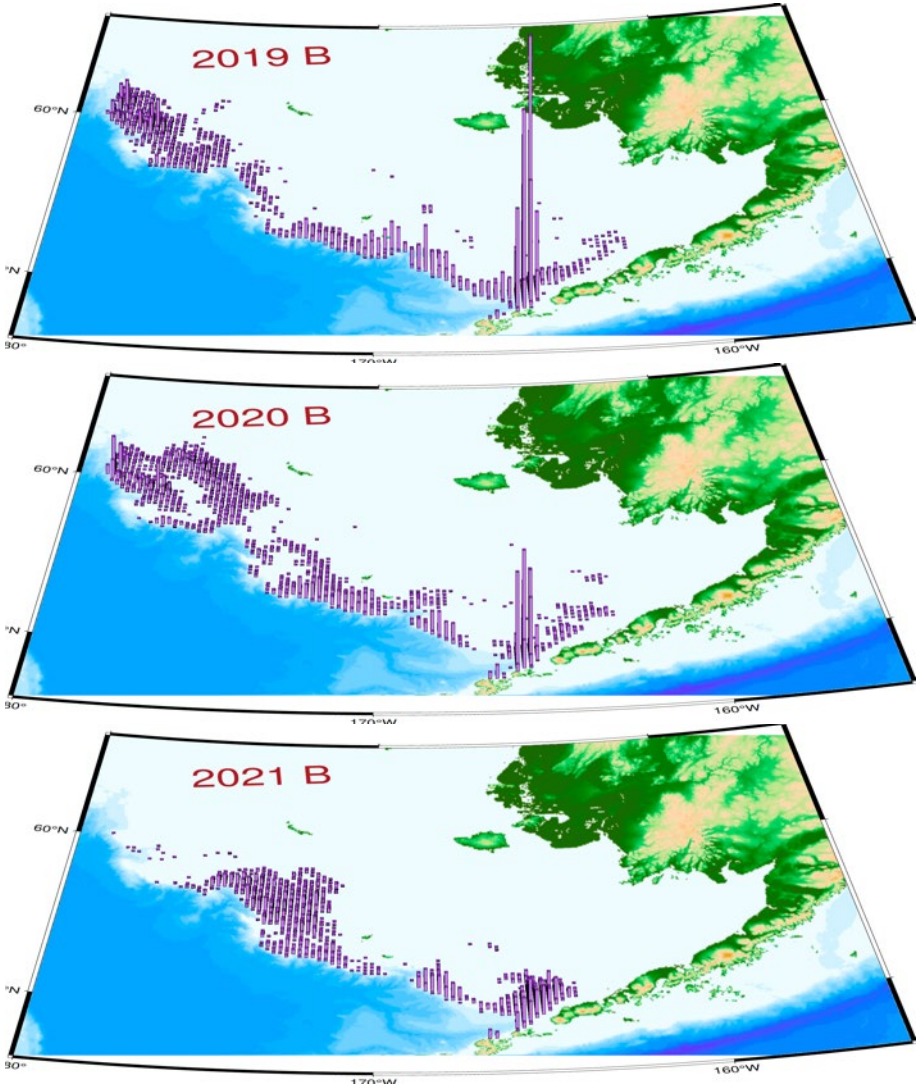
Eastern Bering Sea pollock





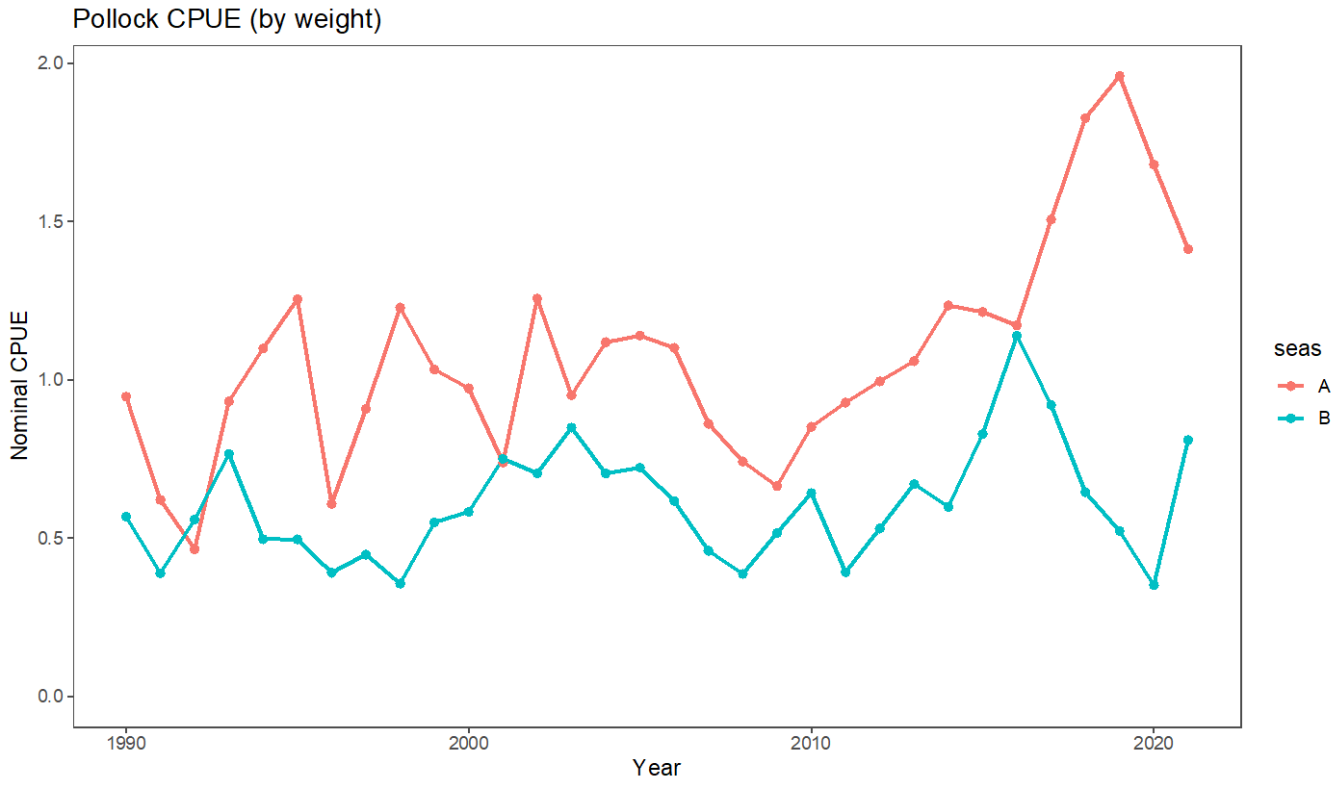
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

B-season fishery distributions



This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
ot been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

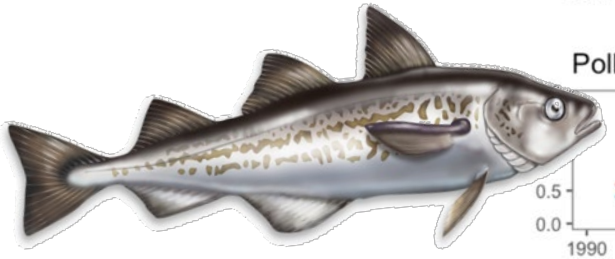
Pollock fishery CPUE season

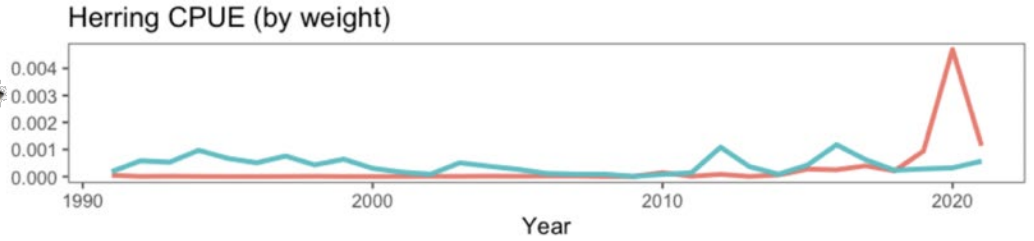


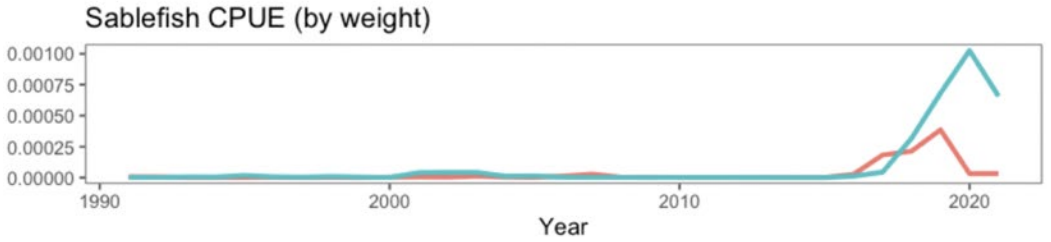
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
ot been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

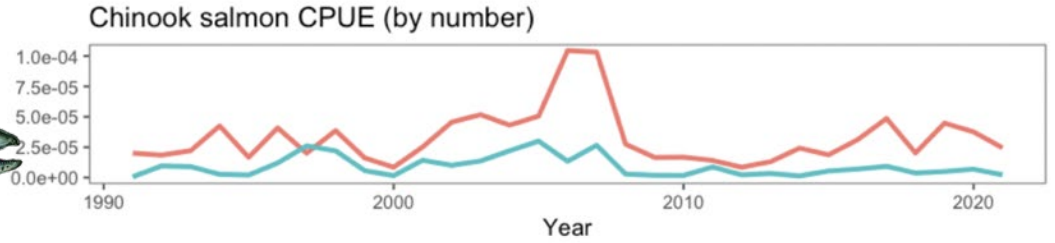
Fishery conditions

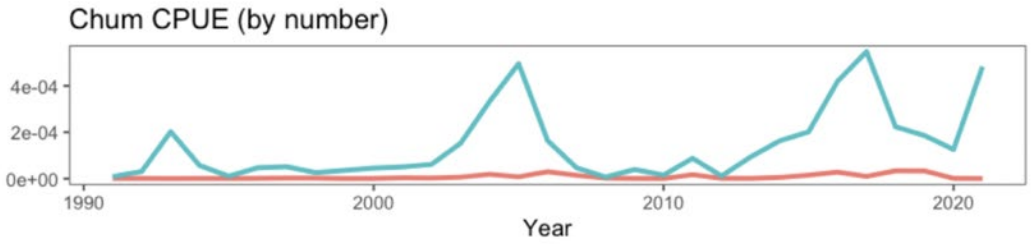
Catch rates of pollock and selected bycatch species

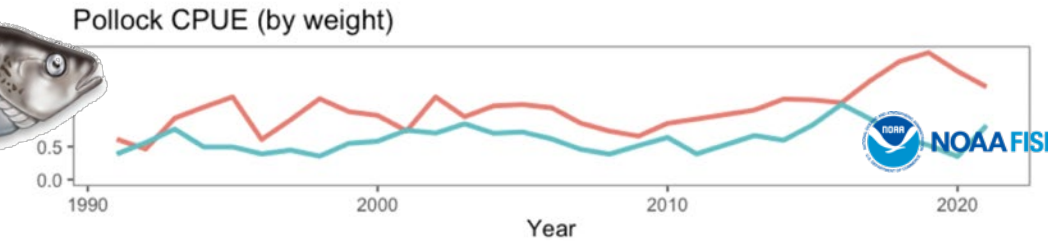








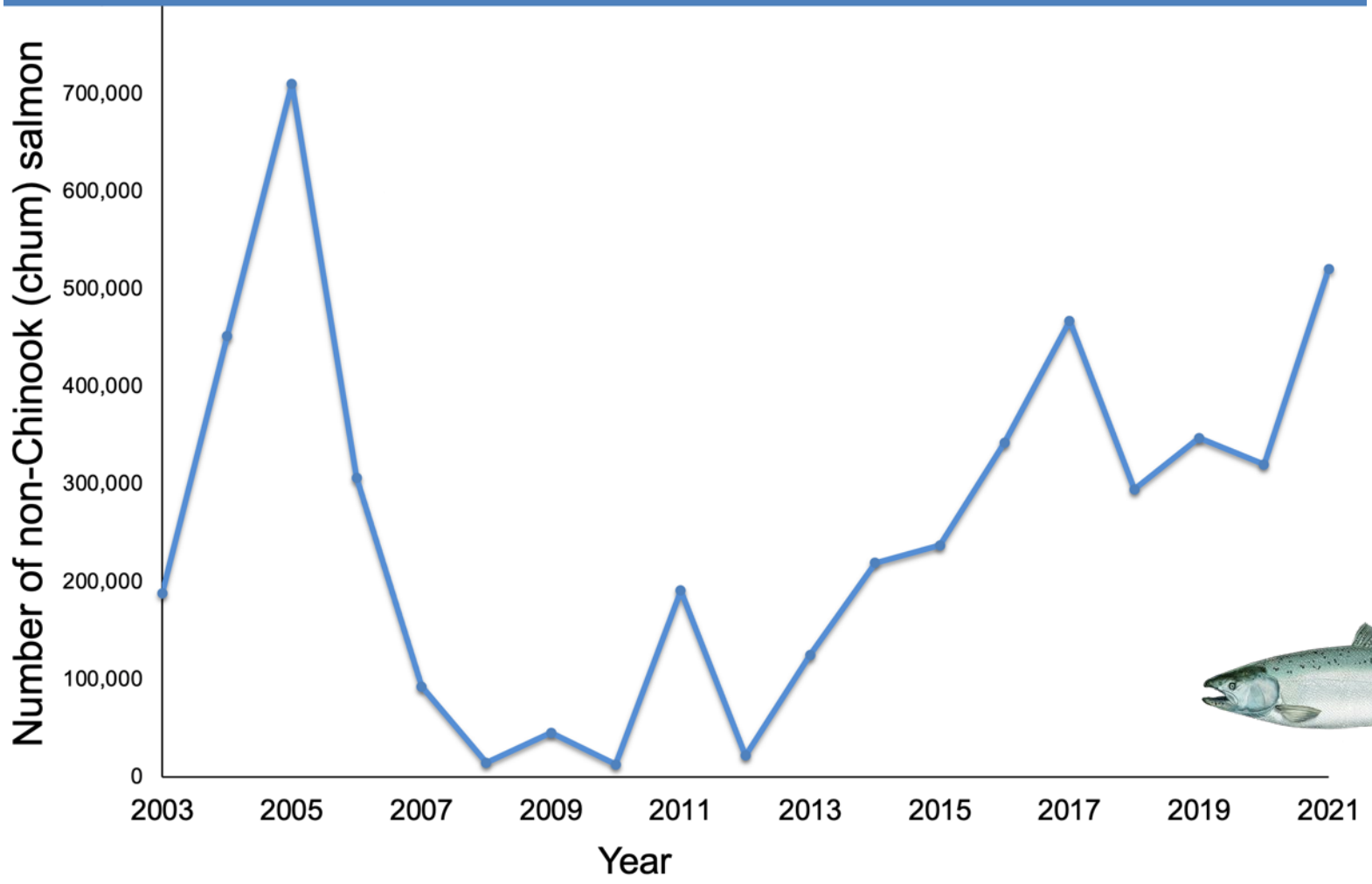




NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
ot been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

2003-2021 Bering Sea Chum Salmon Bycatch



This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

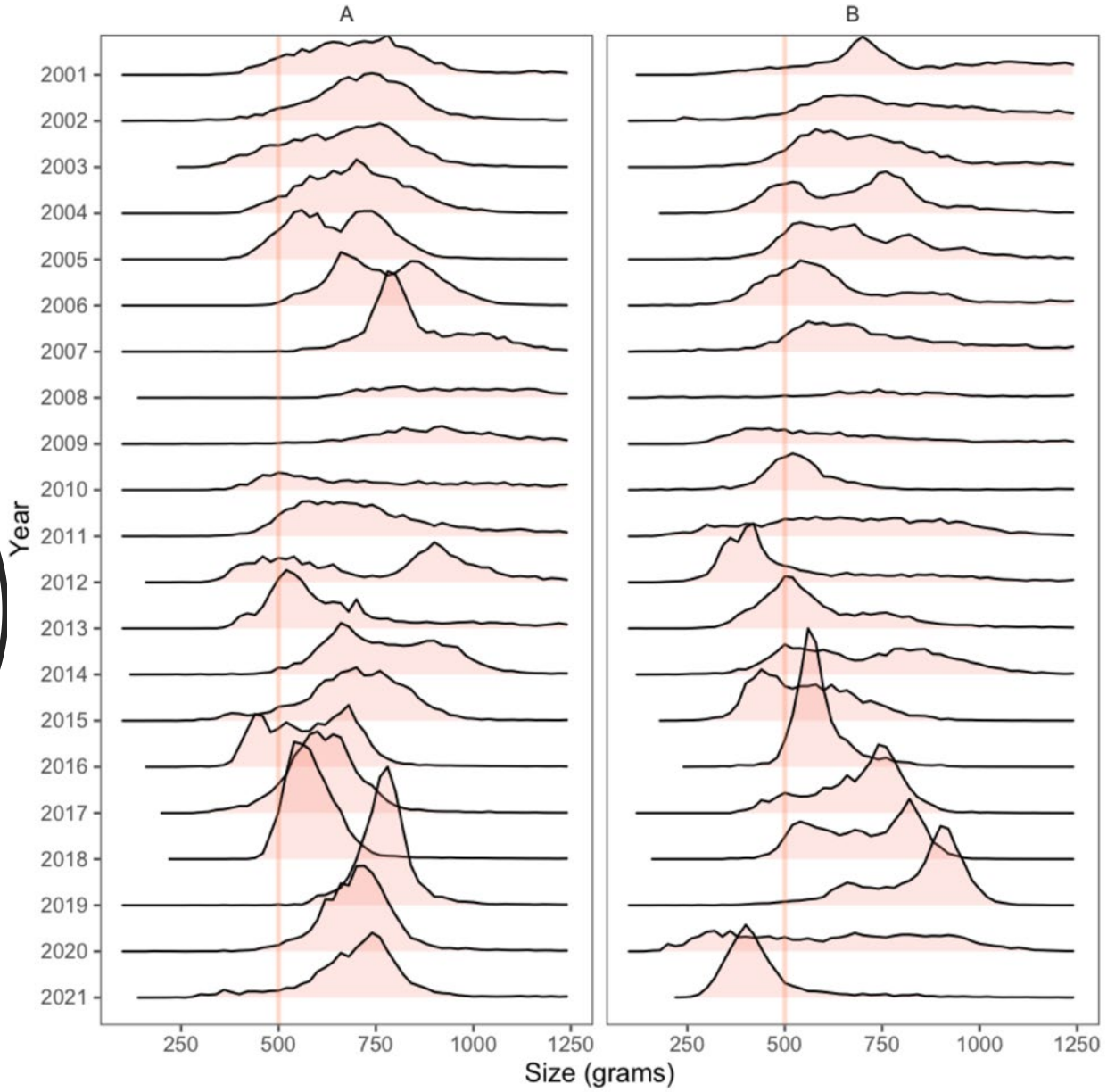
Fish size

NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

By season & year

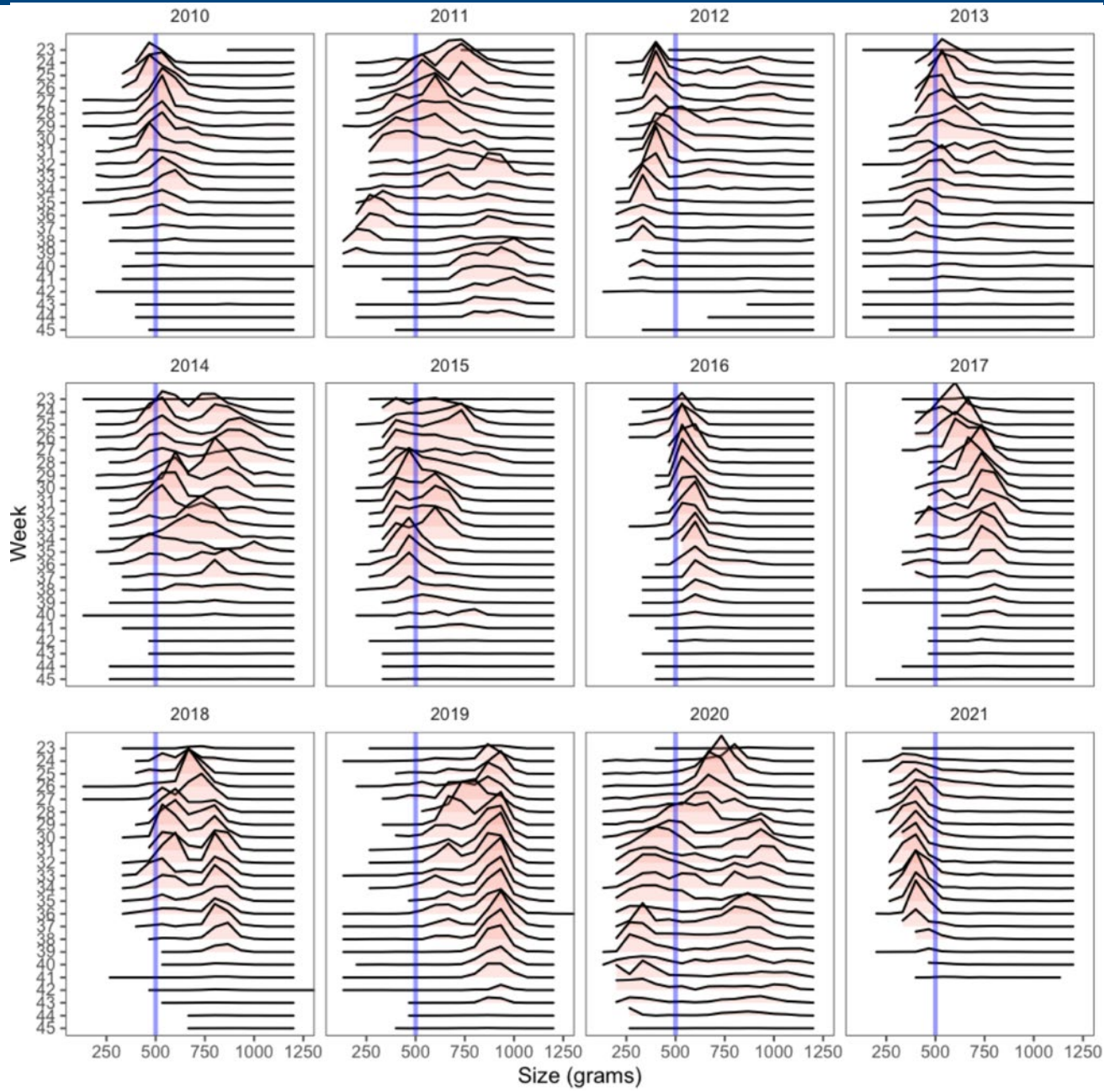
Pollock fishery mean weight in tows



This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

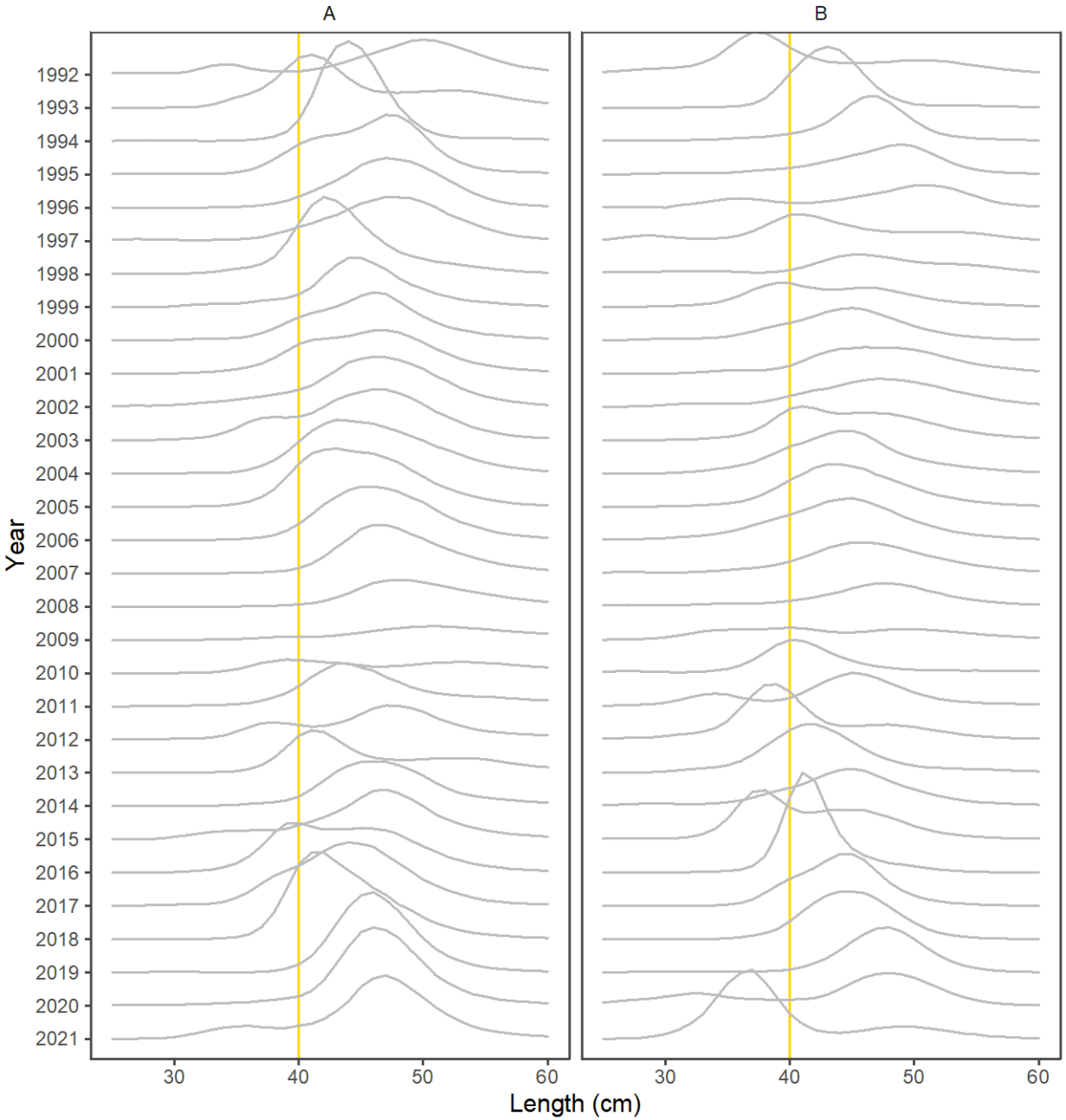
B-season Weekly catch

Pollock fishery mean weight in tows



This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

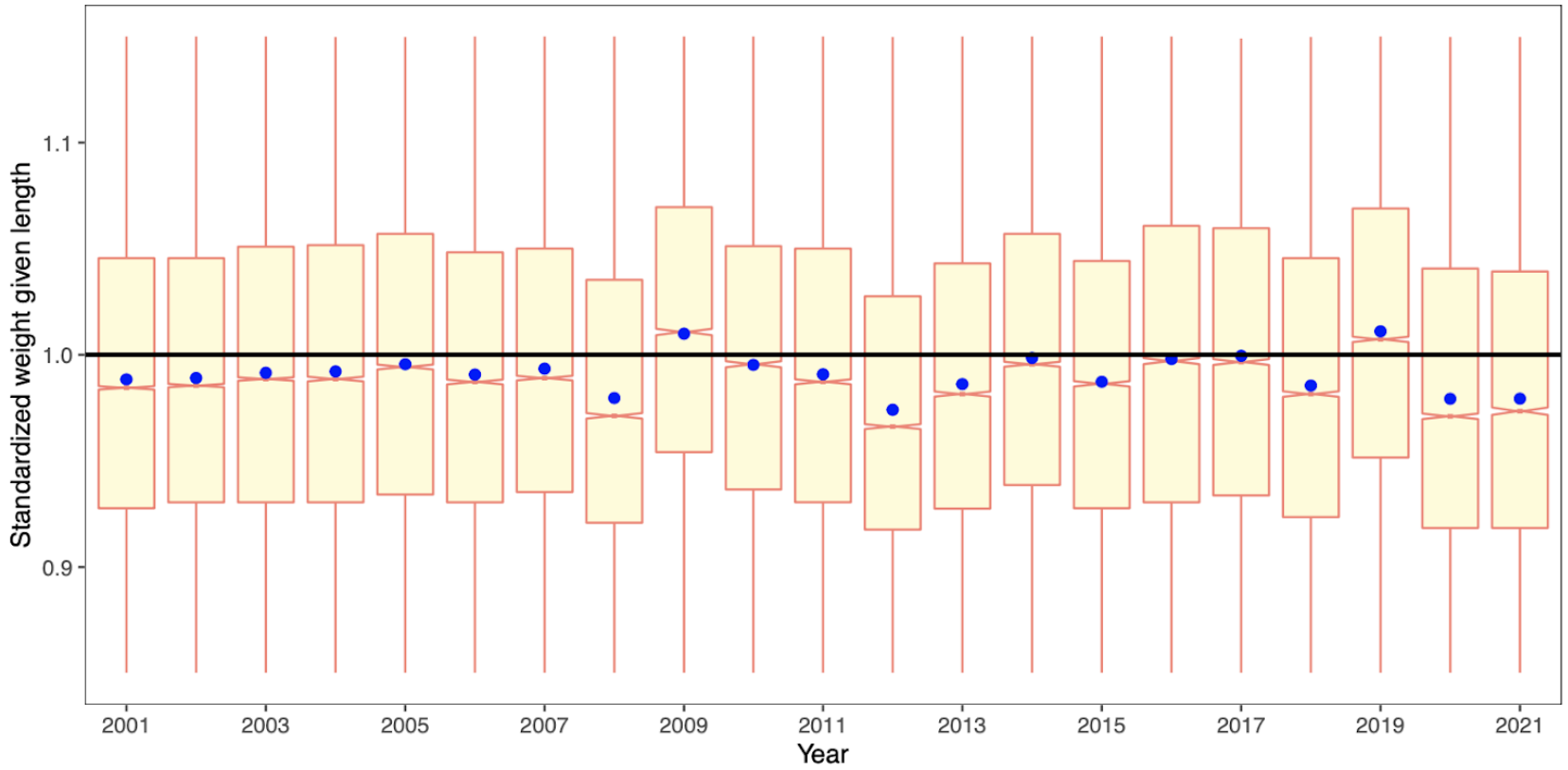
Pollock fishery length frequency by season



This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

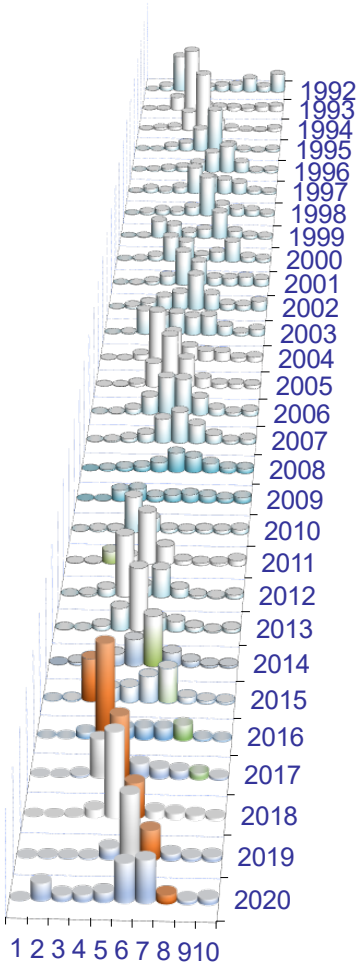
Weight given length—fishery data

Skinny again in 2021!



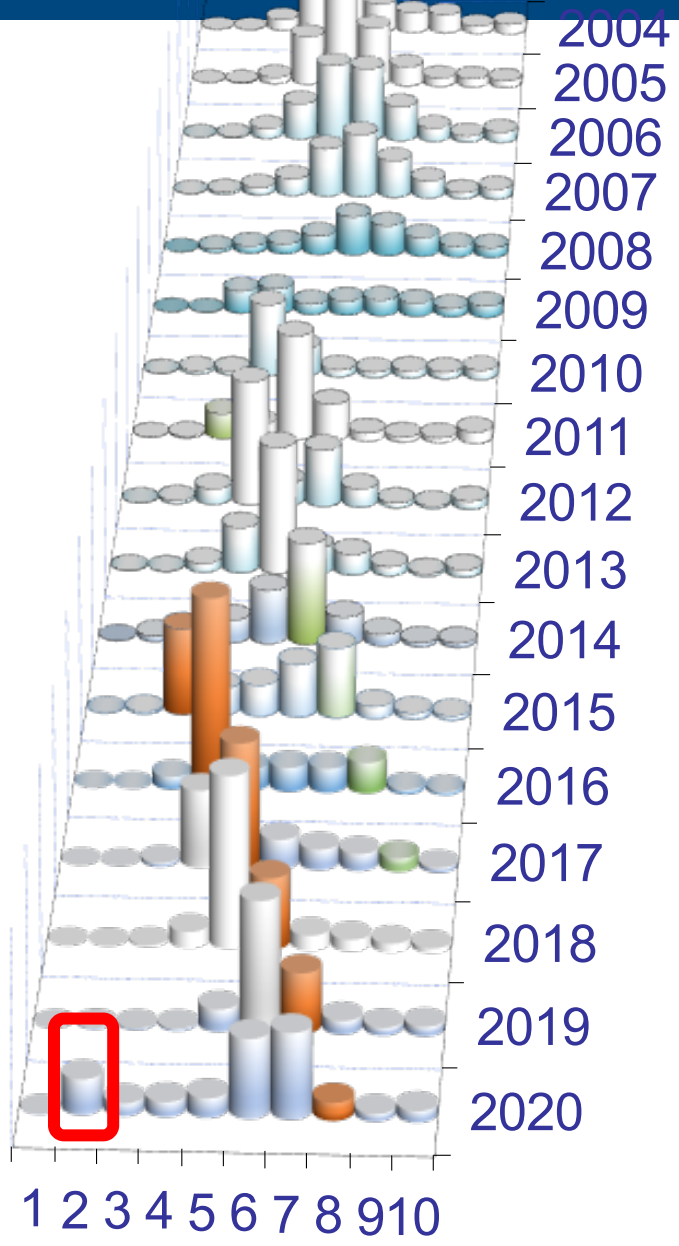
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Fishery catch-at-age



This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Fishery catch-at-age



NOAA FISHERIES

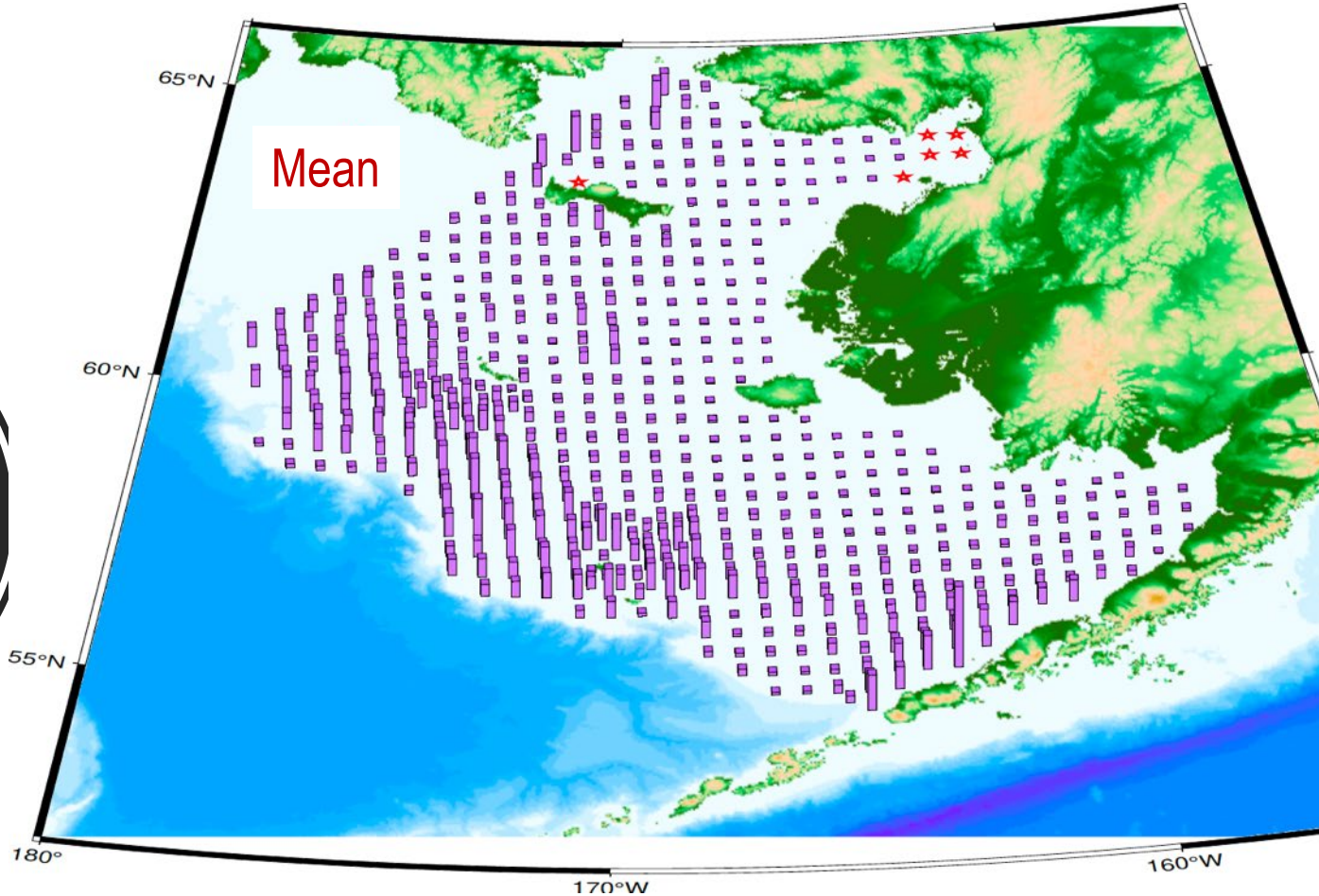
Age

Survey work

2020 and **2021**

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

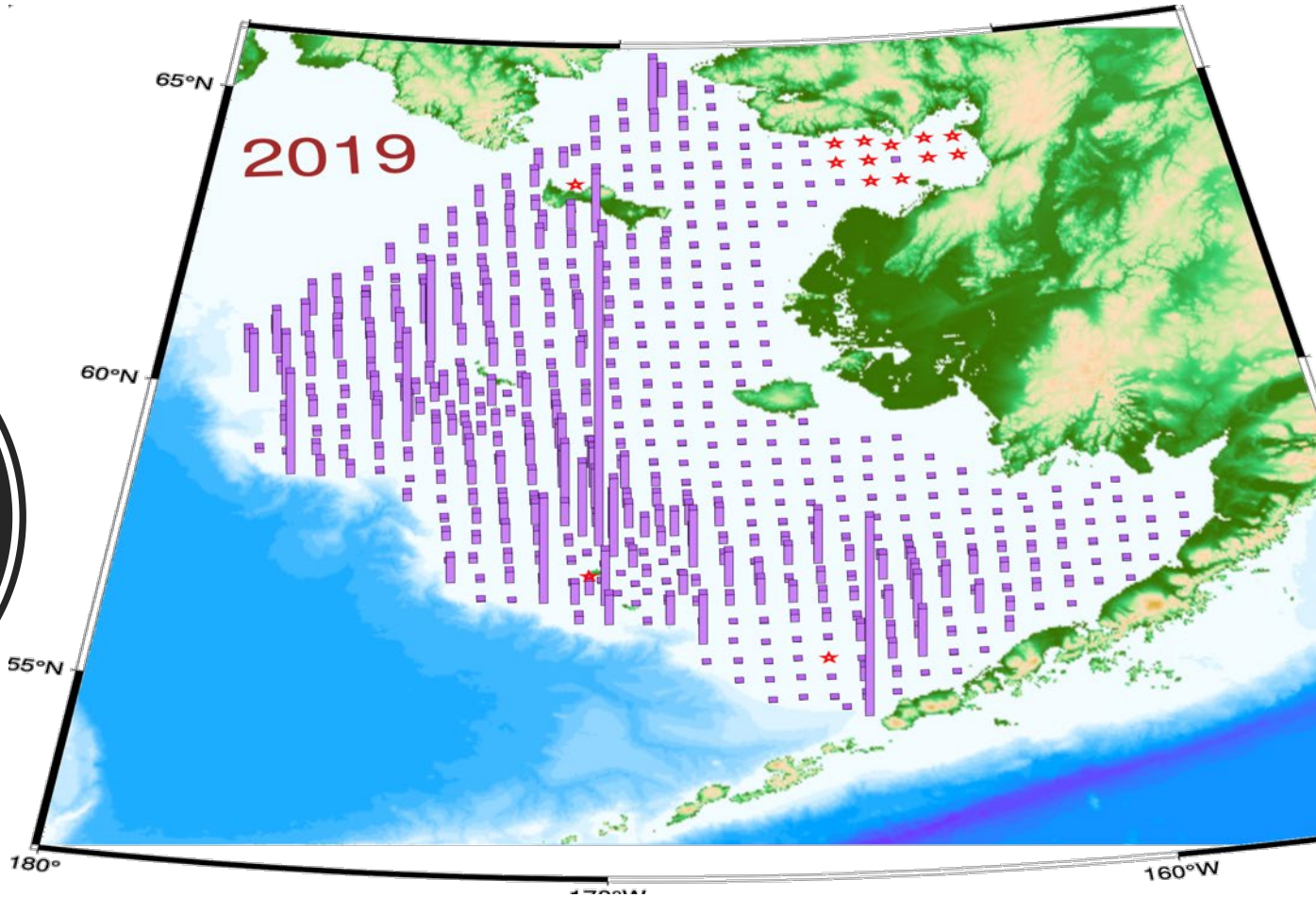
Pollock survey mean density by station



NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

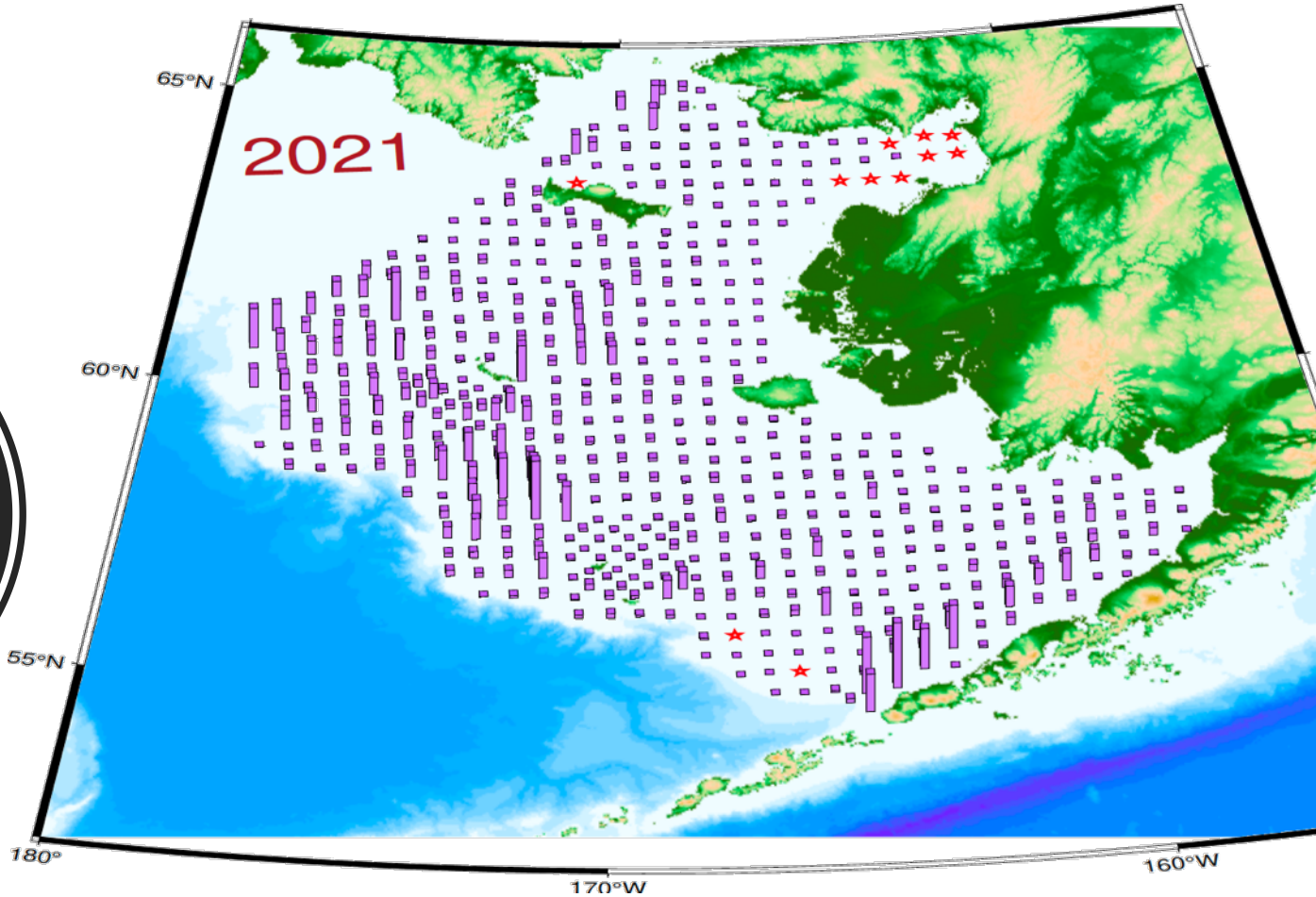
Pollock Survey 2019



NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

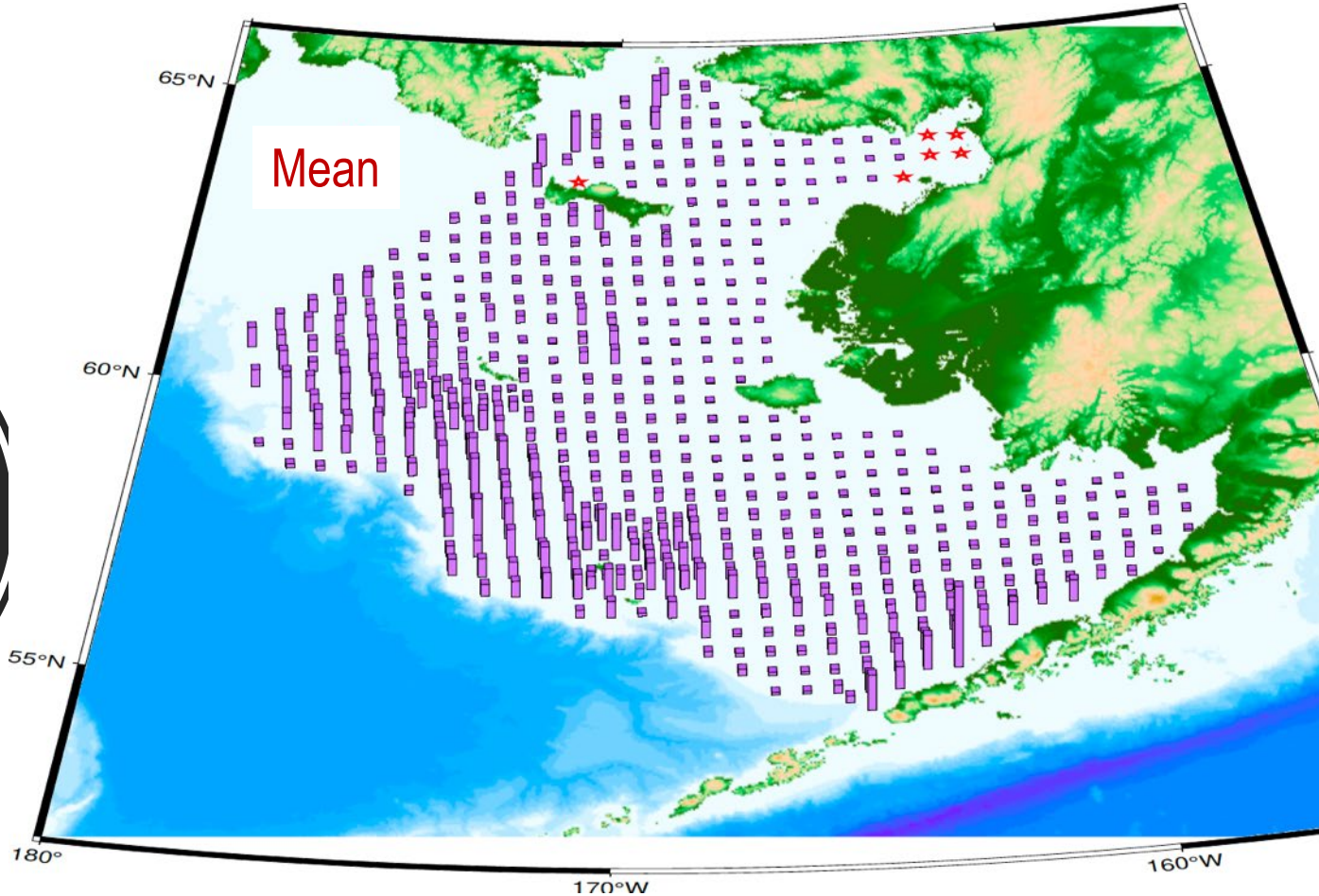
Pollock Survey 2021



NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

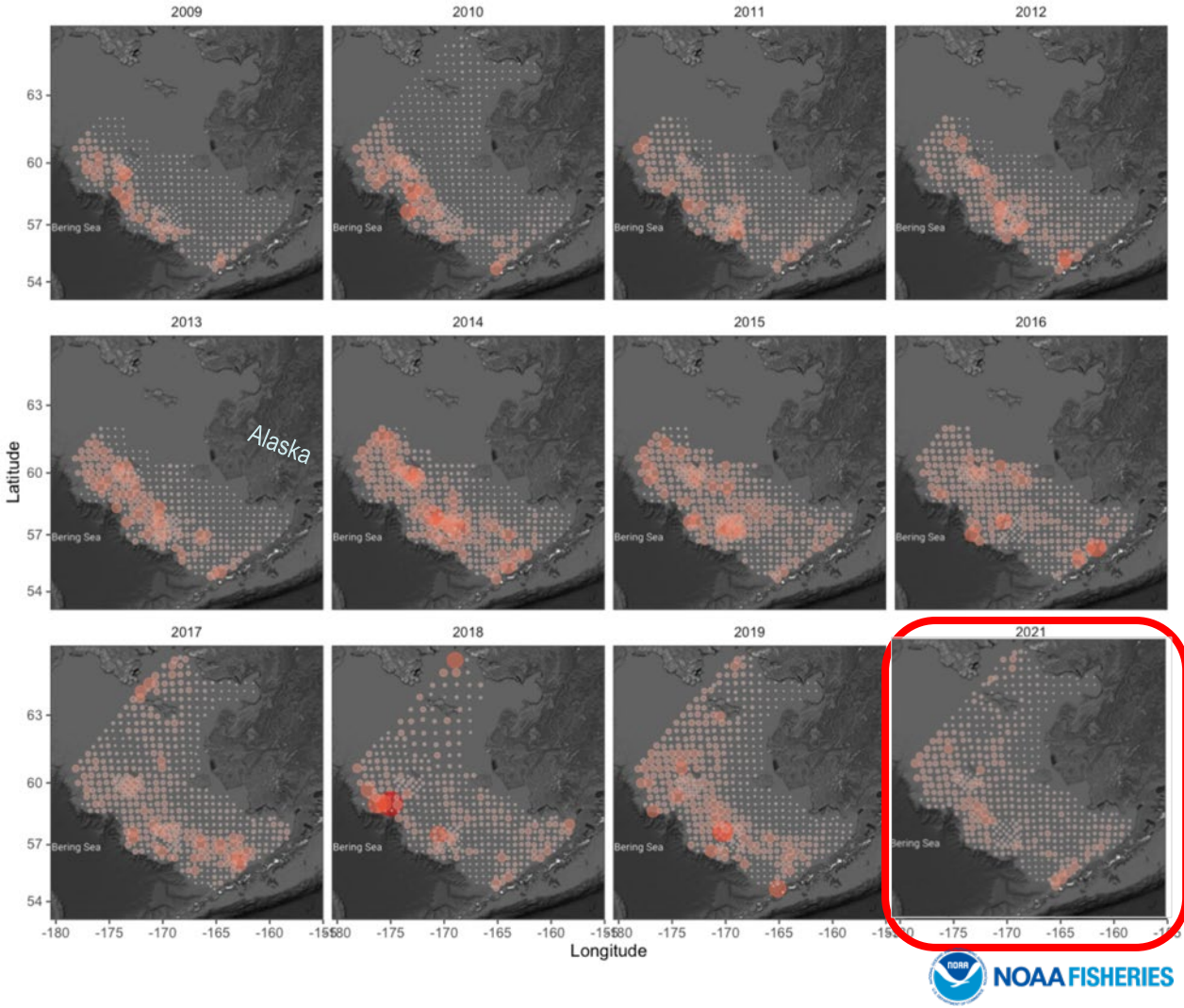
Pollock survey mean density by station



NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

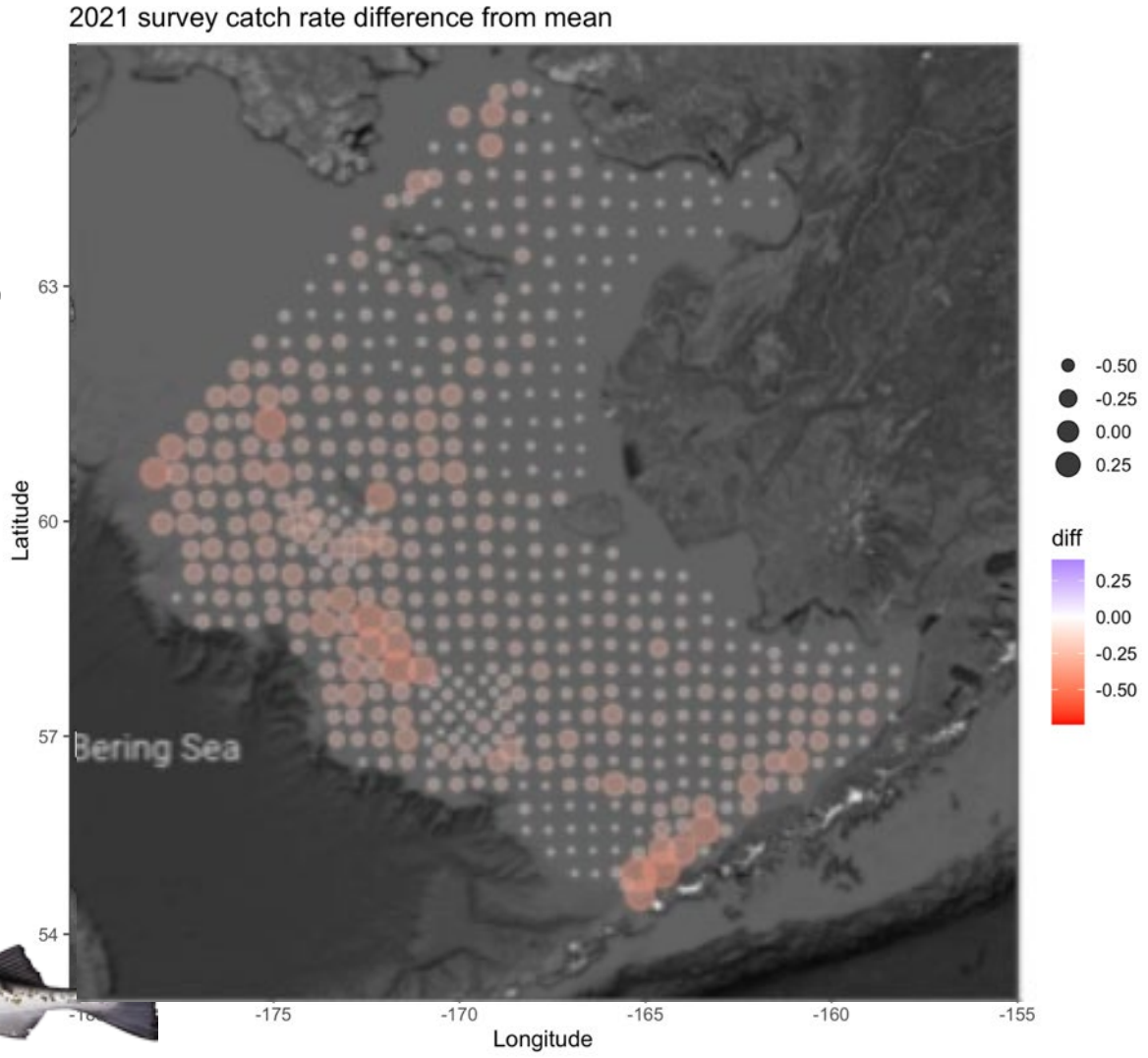
Recent bottom trawl surveys



NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

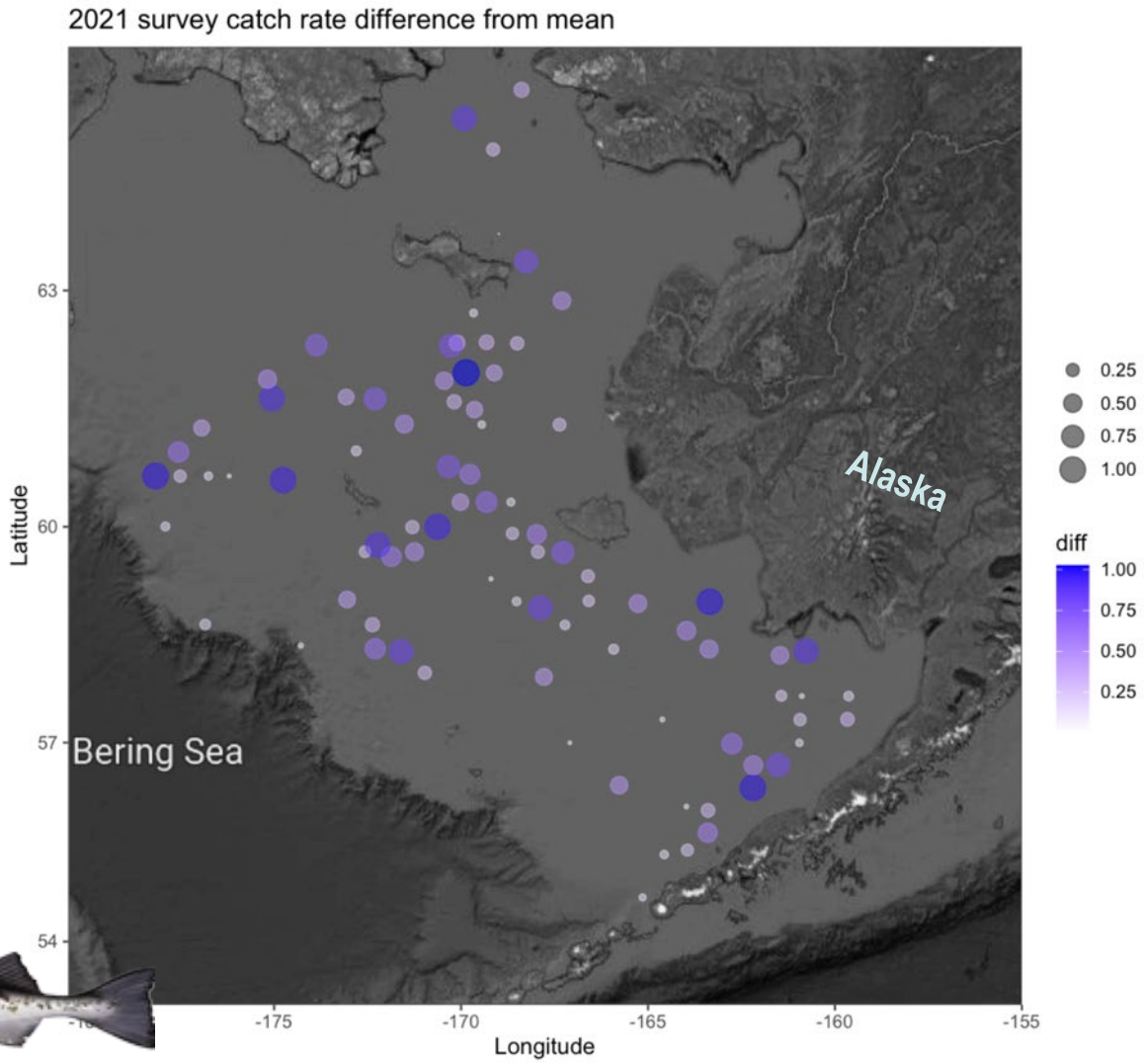
NOAA's 2021 bottom trawl survey relative to the average



NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

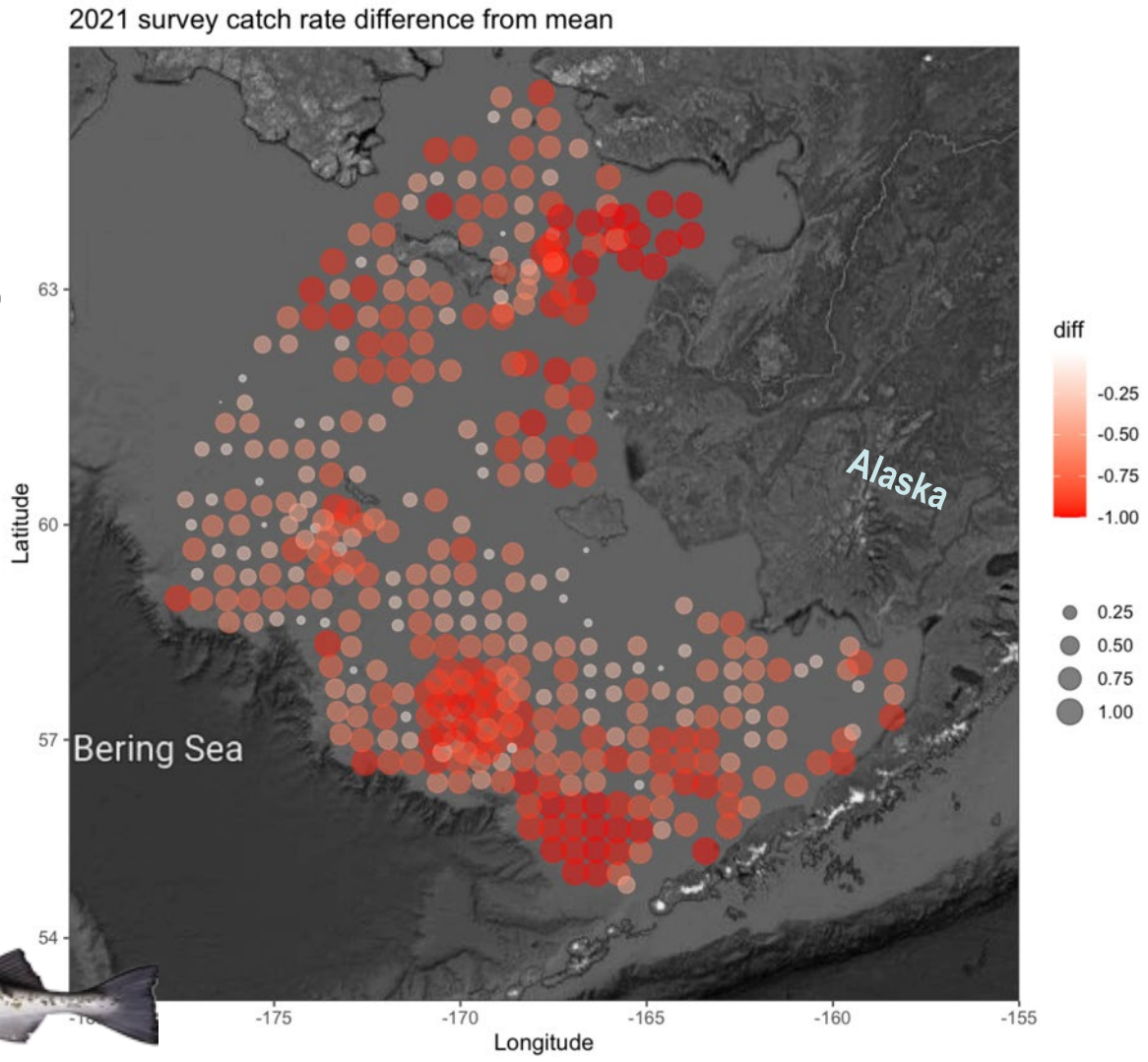
NOAA's 2021 bottom trawl survey relative to the average



NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

NOAA's 2021 bottom trawl survey relative to the average

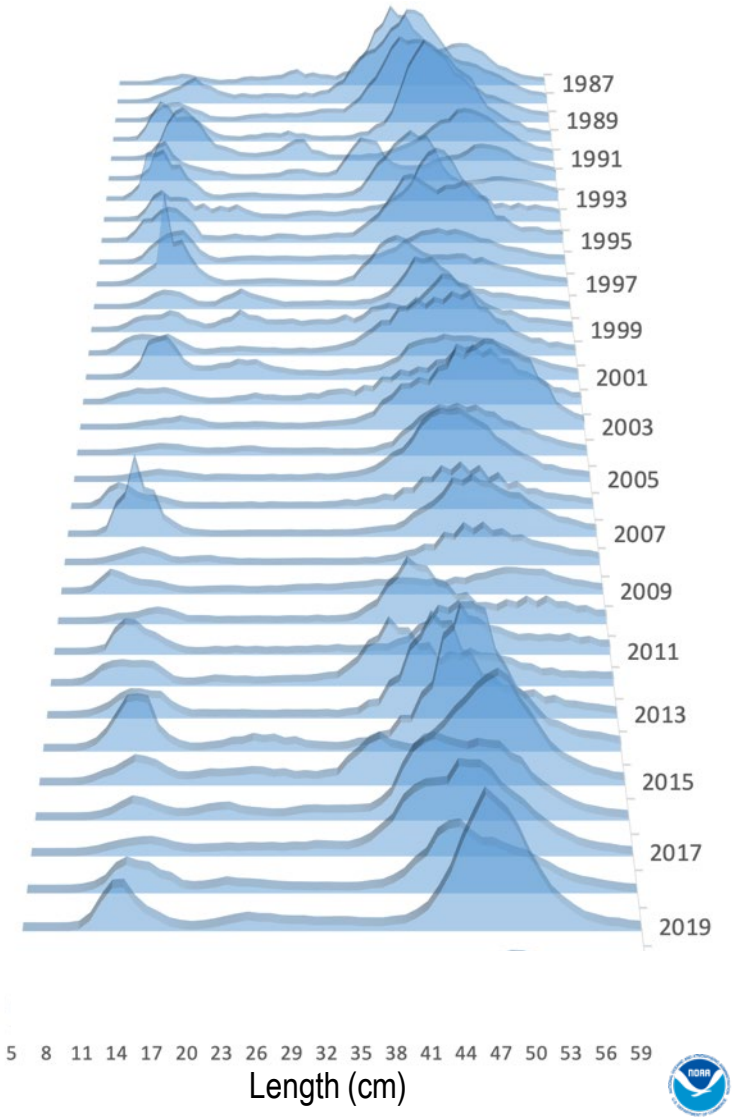


NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Size distribution

- From NOAA's bottom-trawl survey

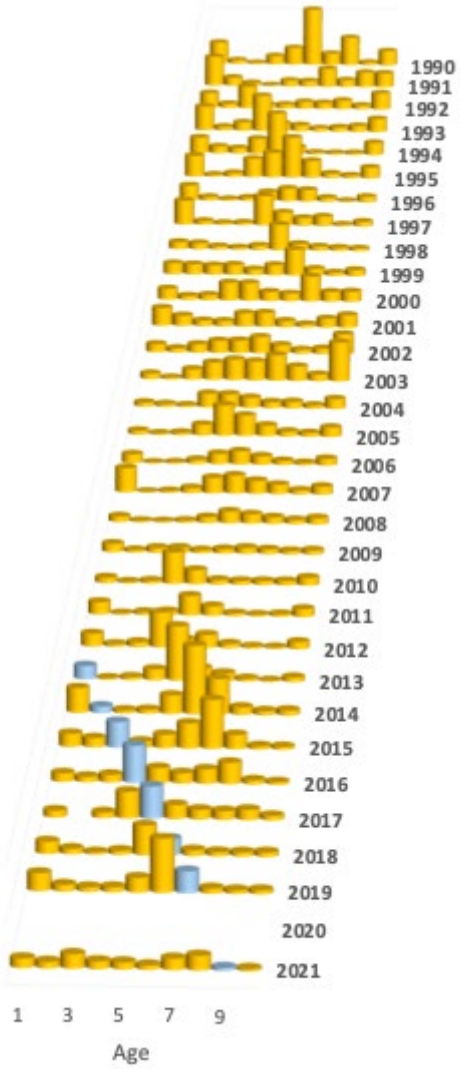


NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Age composition

- From NOAA's bottom-trawl survey



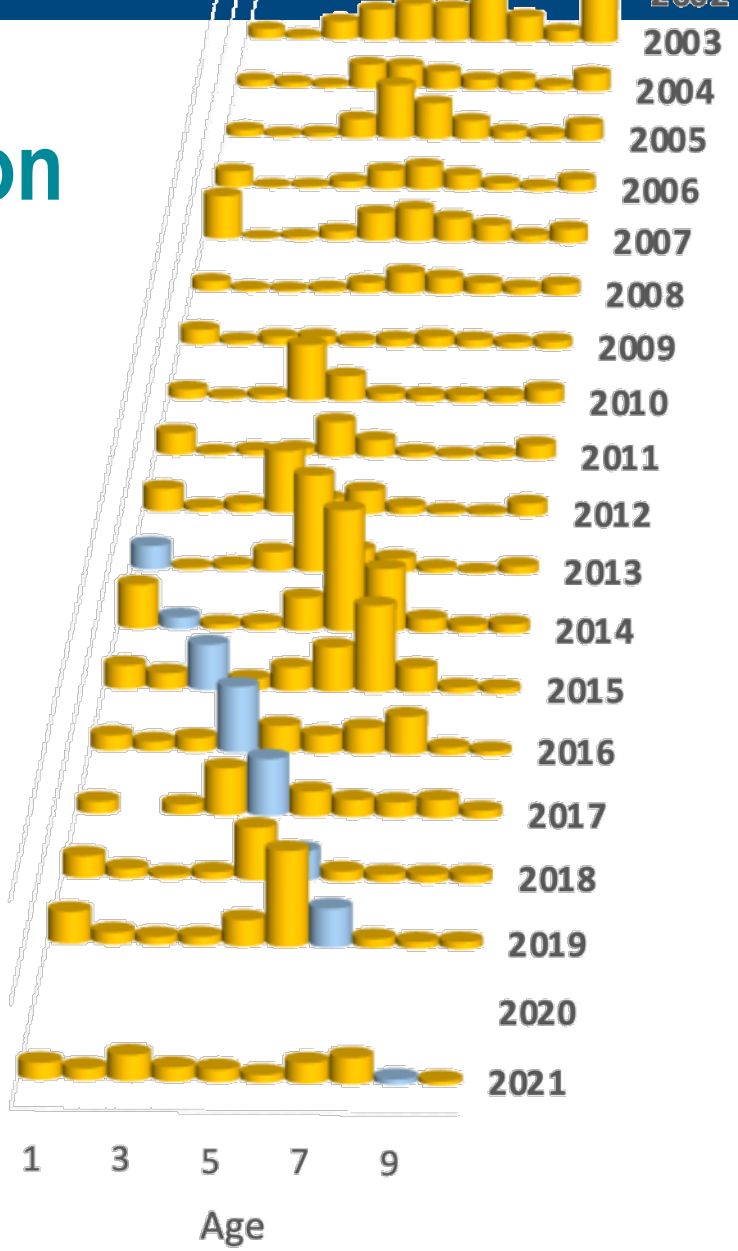
Vertical scale is relative to survey population estimate

NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Age composition

- From NOAA's bottom-trawl survey



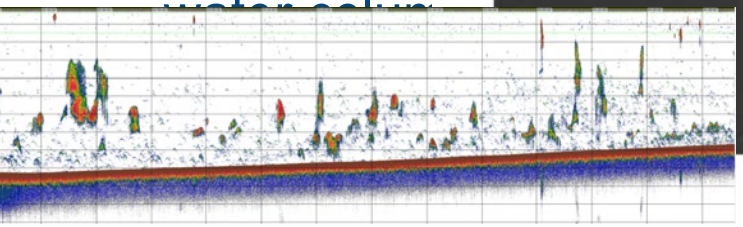
Vertical scale is relative to survey population estimate

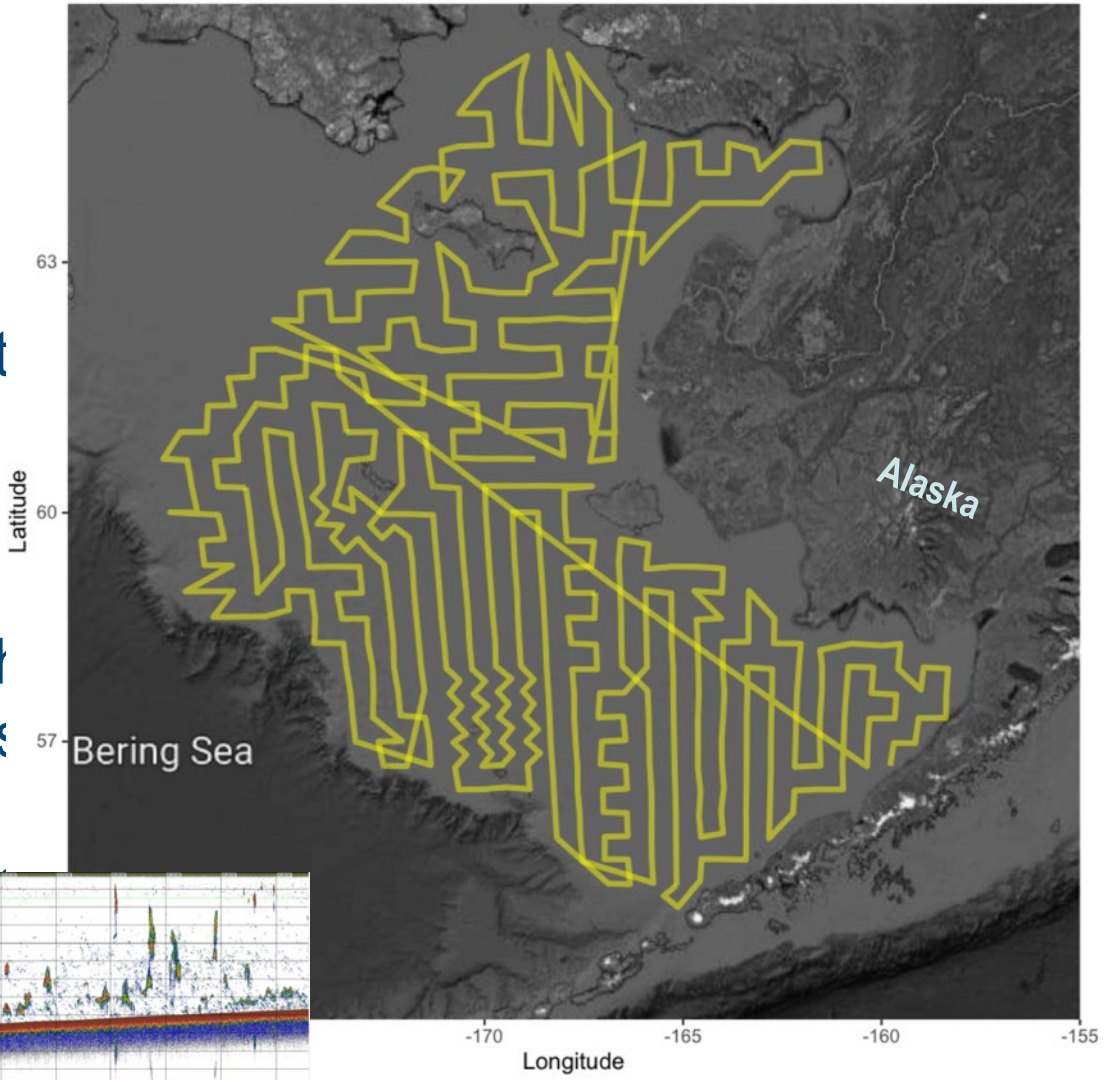
NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Survey

- Opportunist acoustic data collections
- Gives insigh on young fis abundance





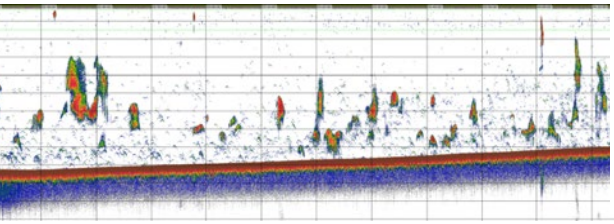
NOAA FISHERIES

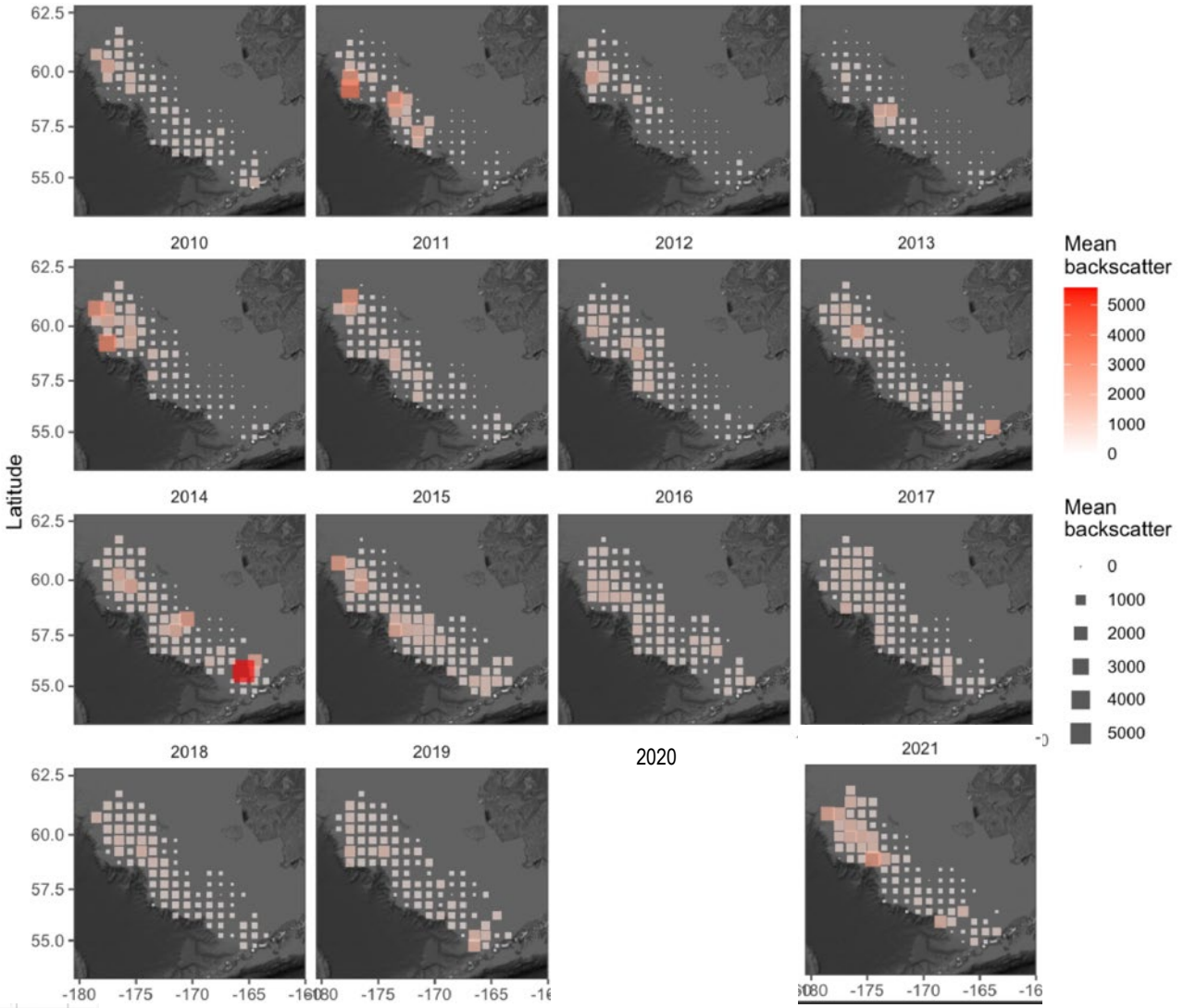
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Acoustic data

Opportunistically collected from chartered bottom-trawl survey boats

The AVO index



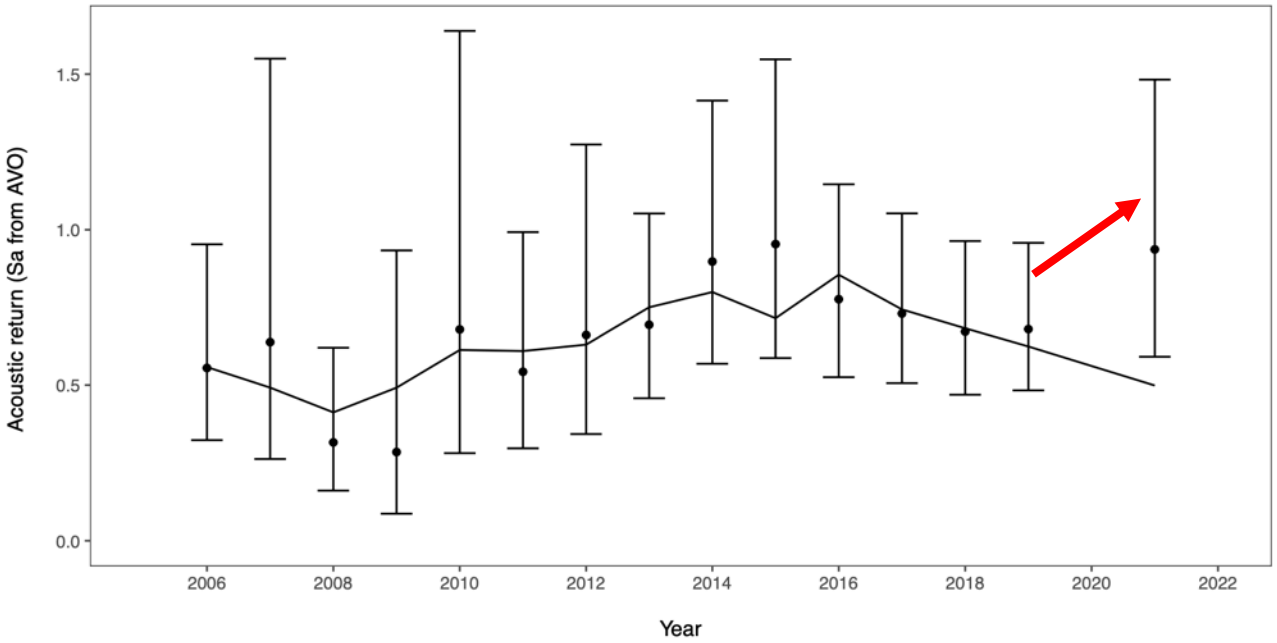


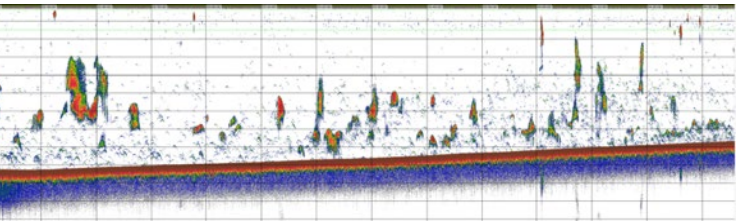
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Acoustic dat

Opportunistically collected from chartered bottom-trawl survey boats

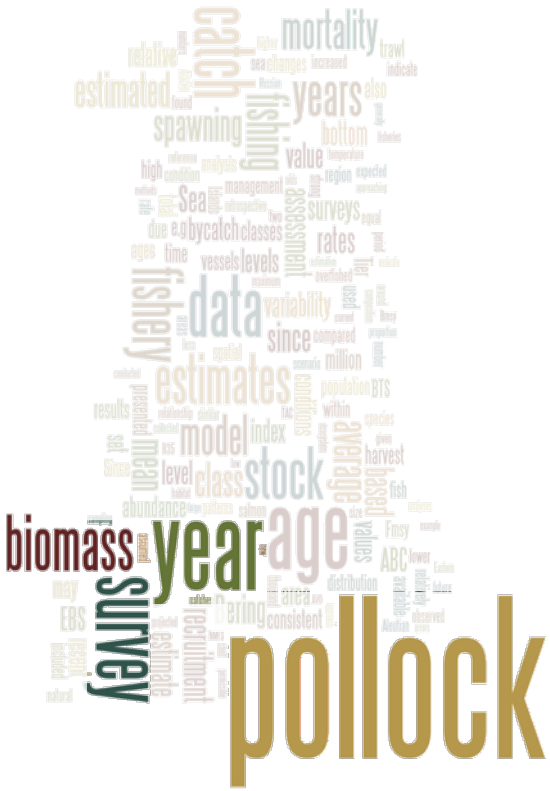
The AVO index





NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.



EBS pollock

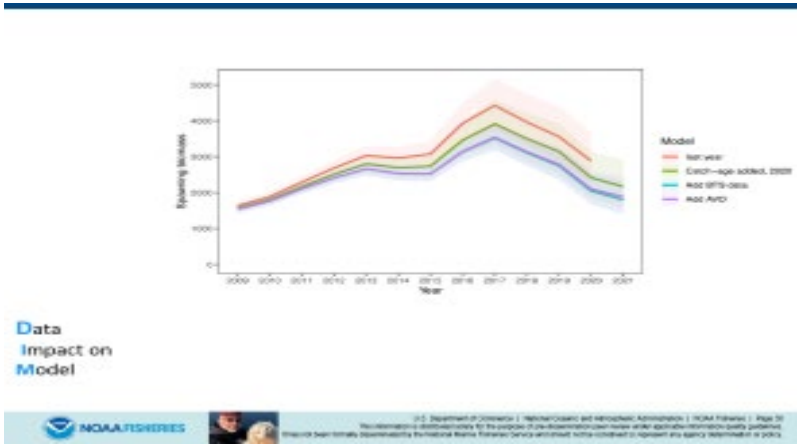
Assessment

Results

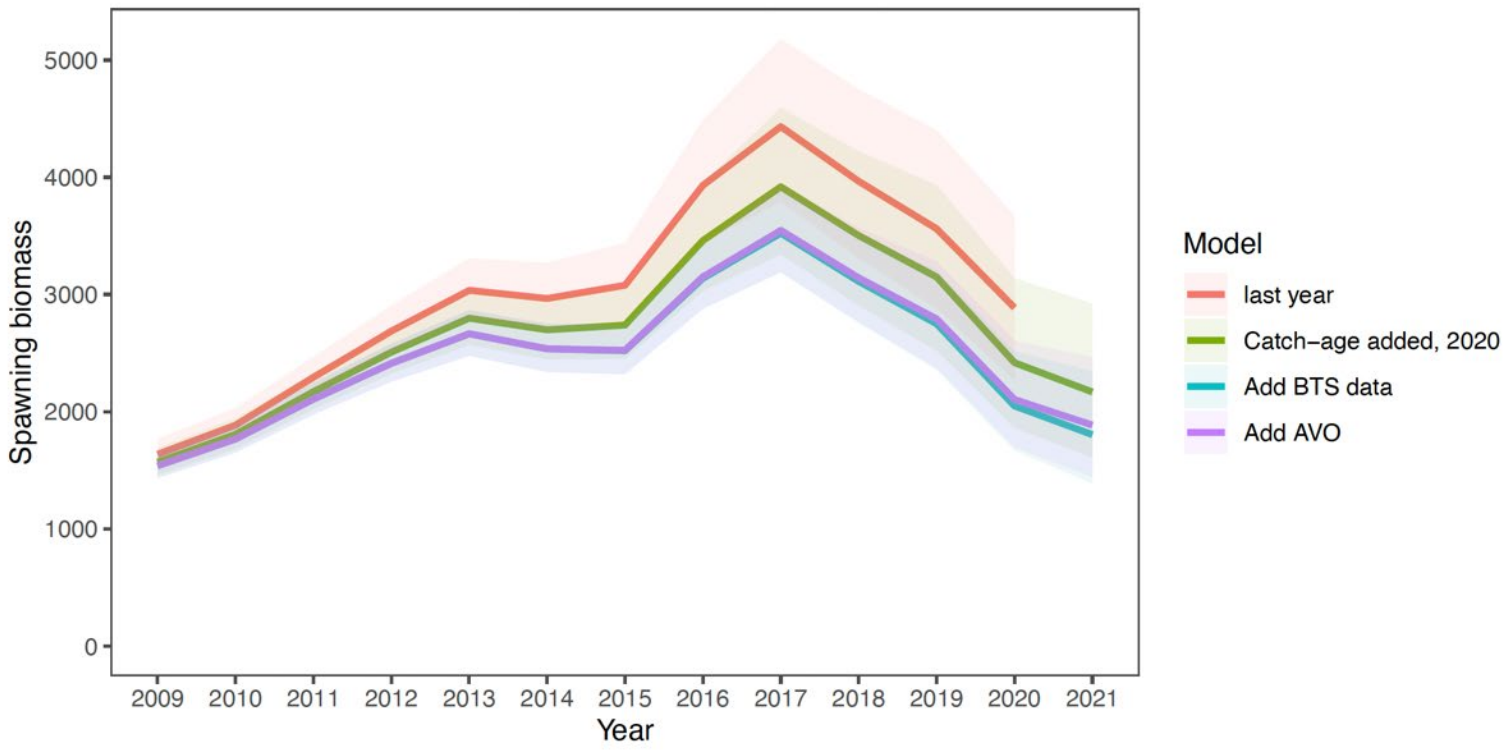
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

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



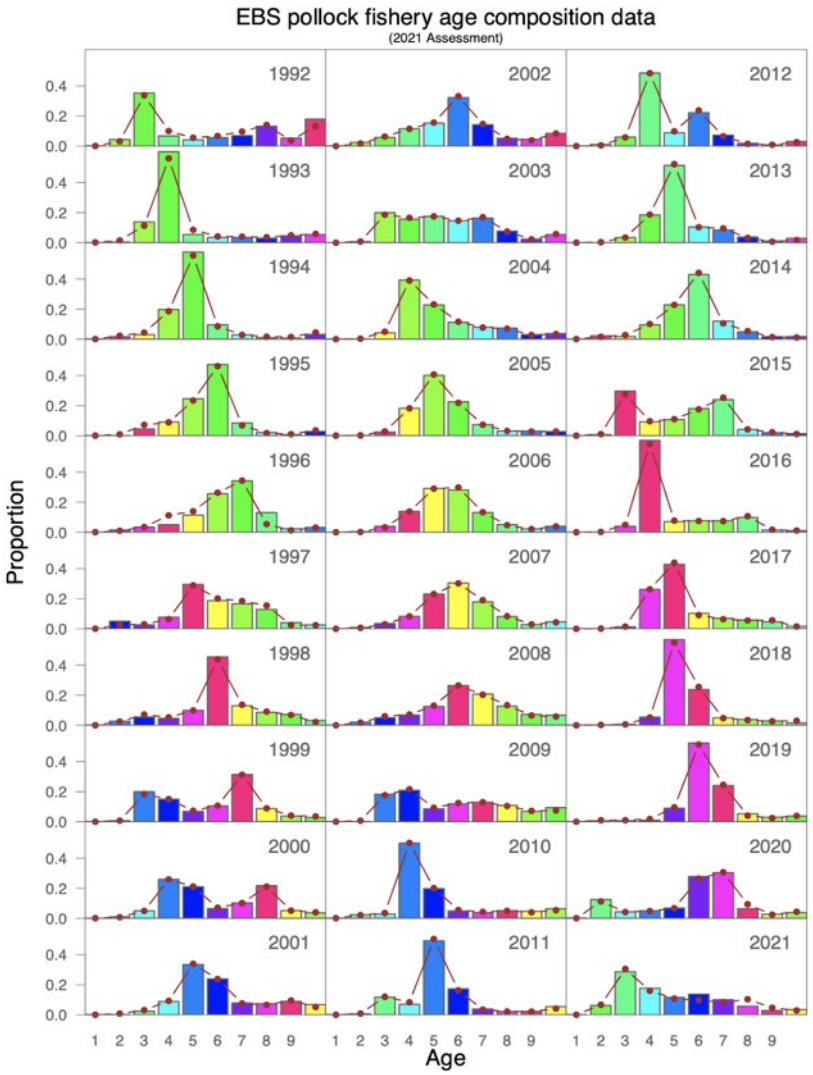
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

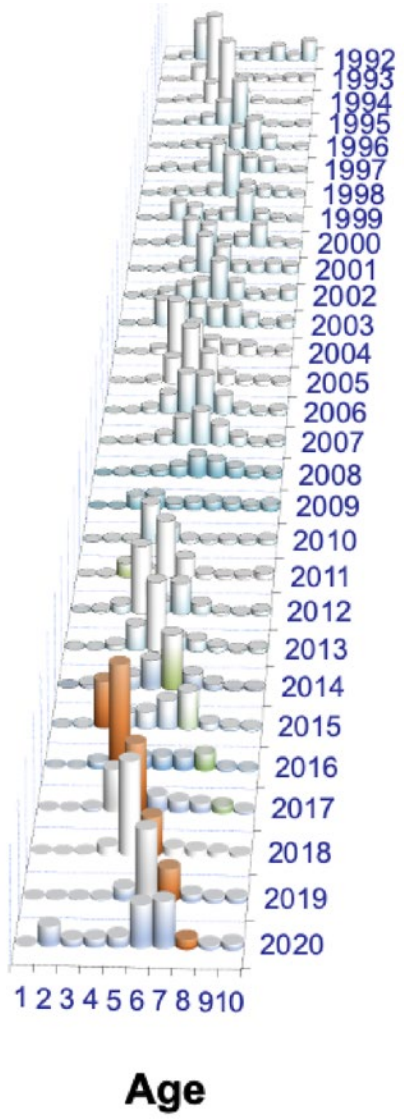


Data
Impact on
Model

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Fishery catch-age

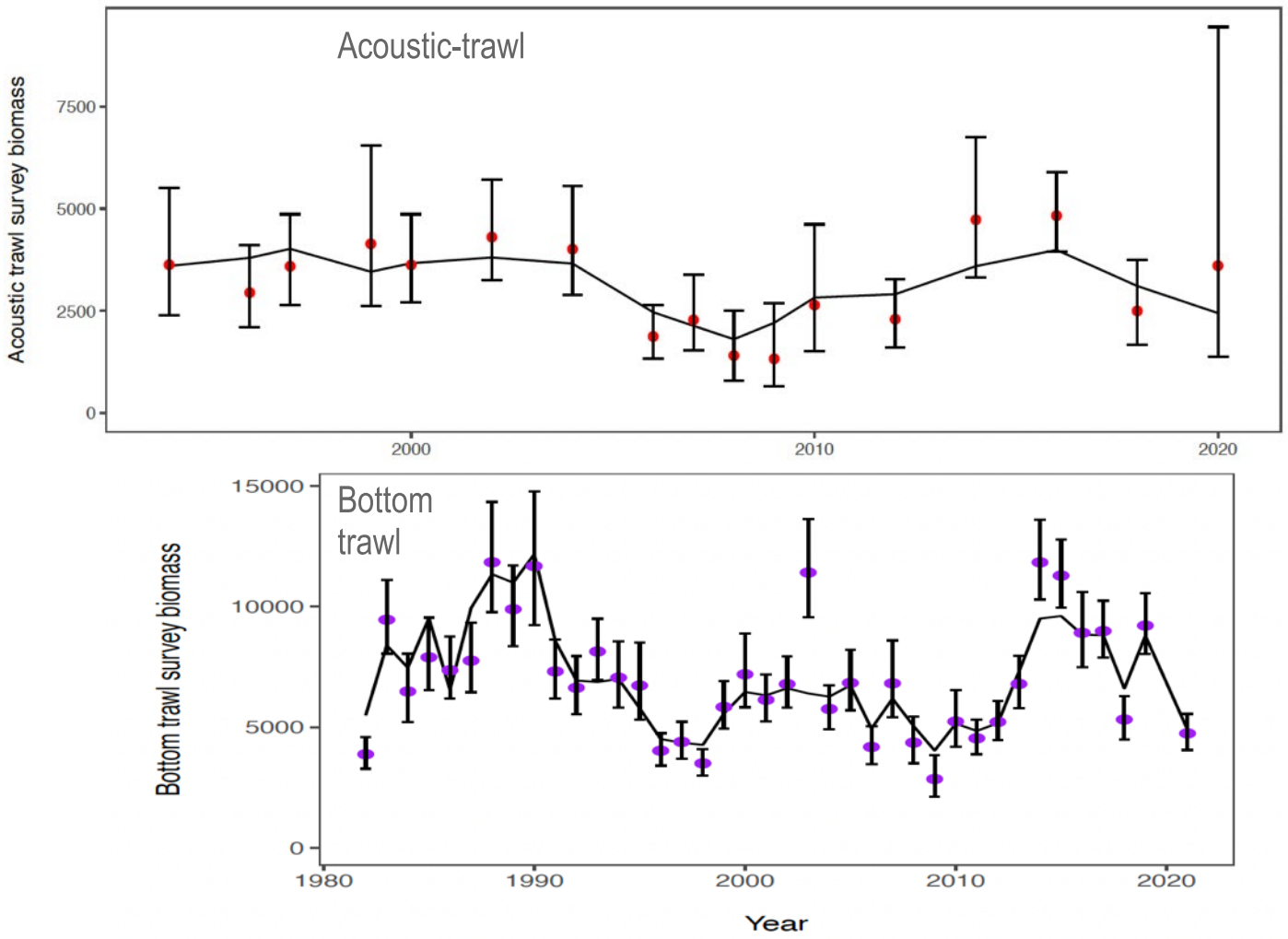




2-year olds in 2020!!

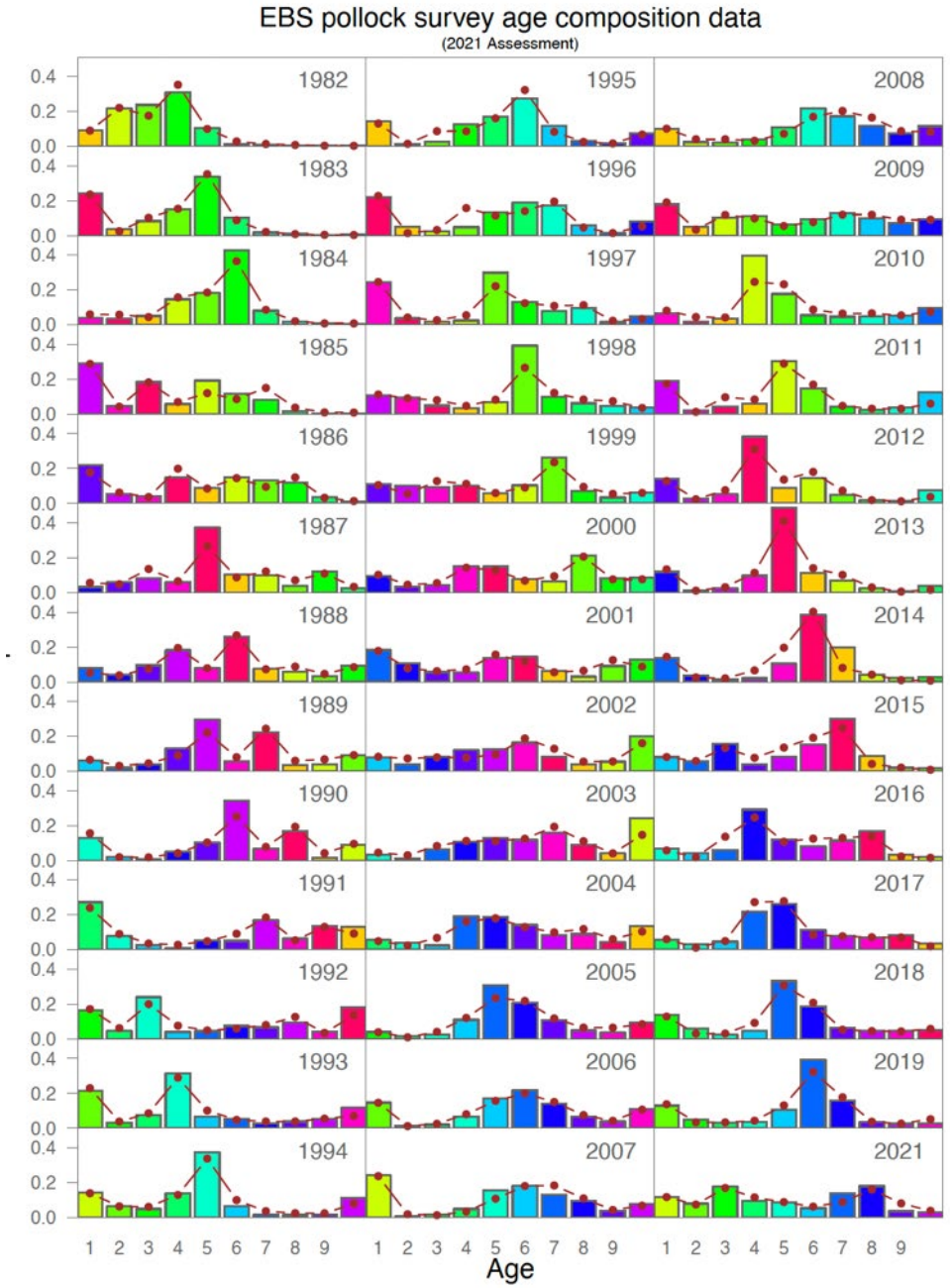
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Fit to survey indices



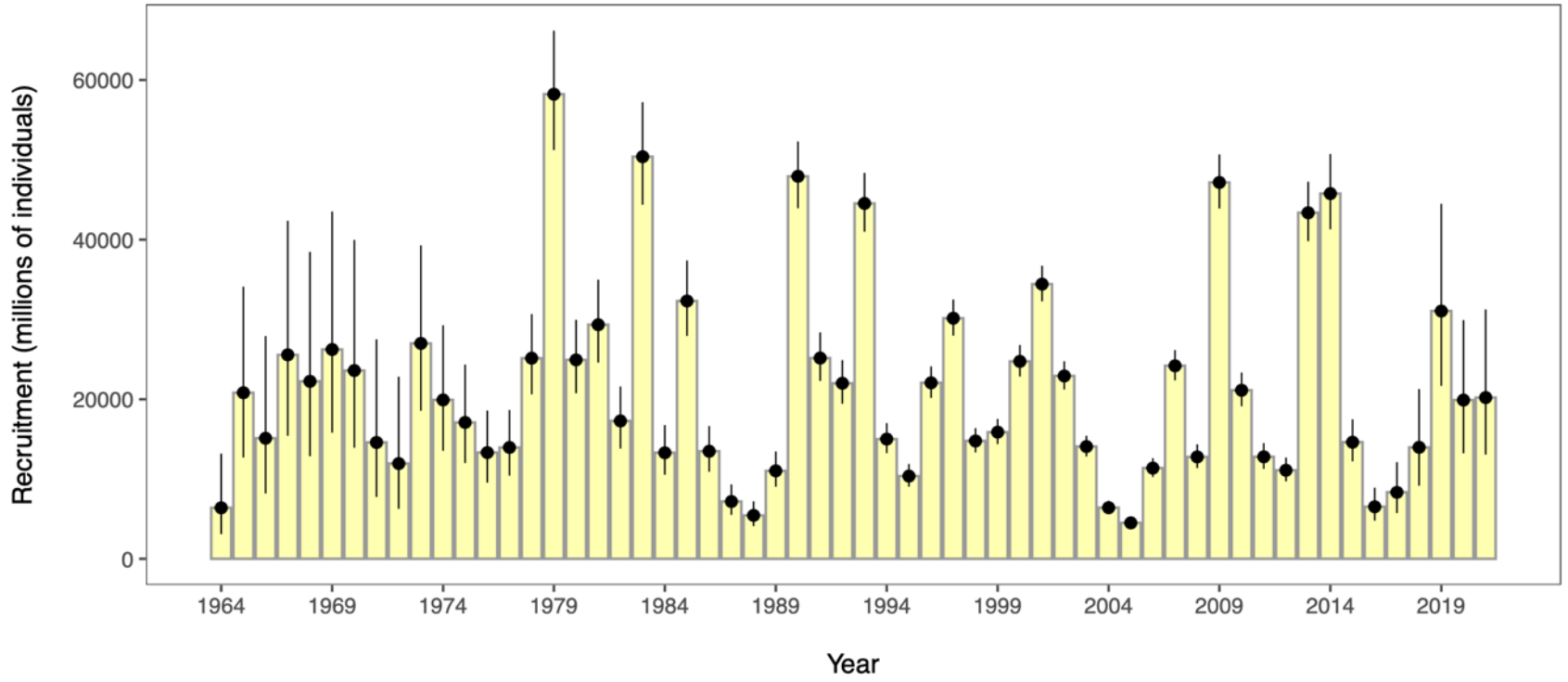
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Fit to survey age compositions



This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

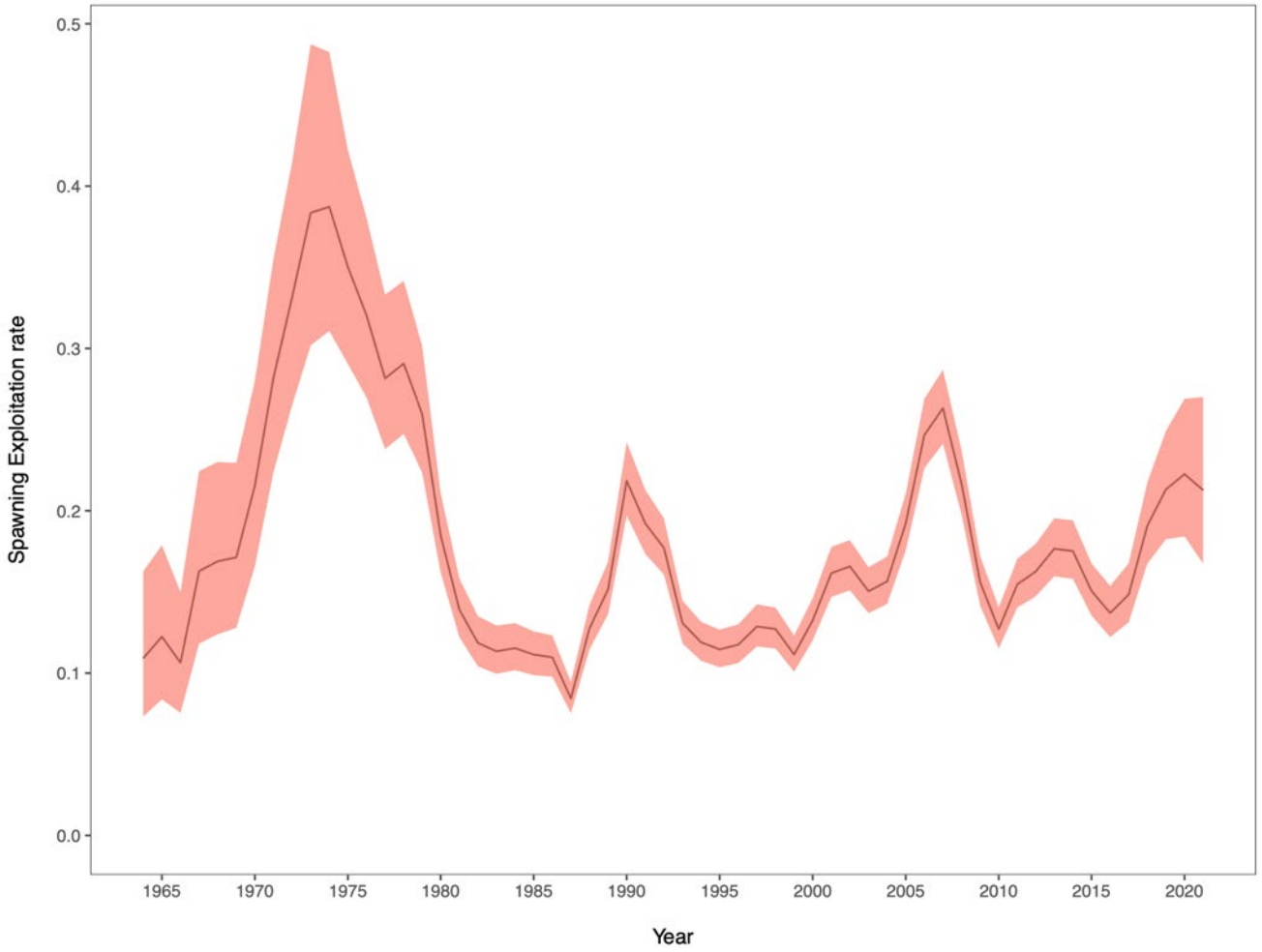
Recruitment



NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

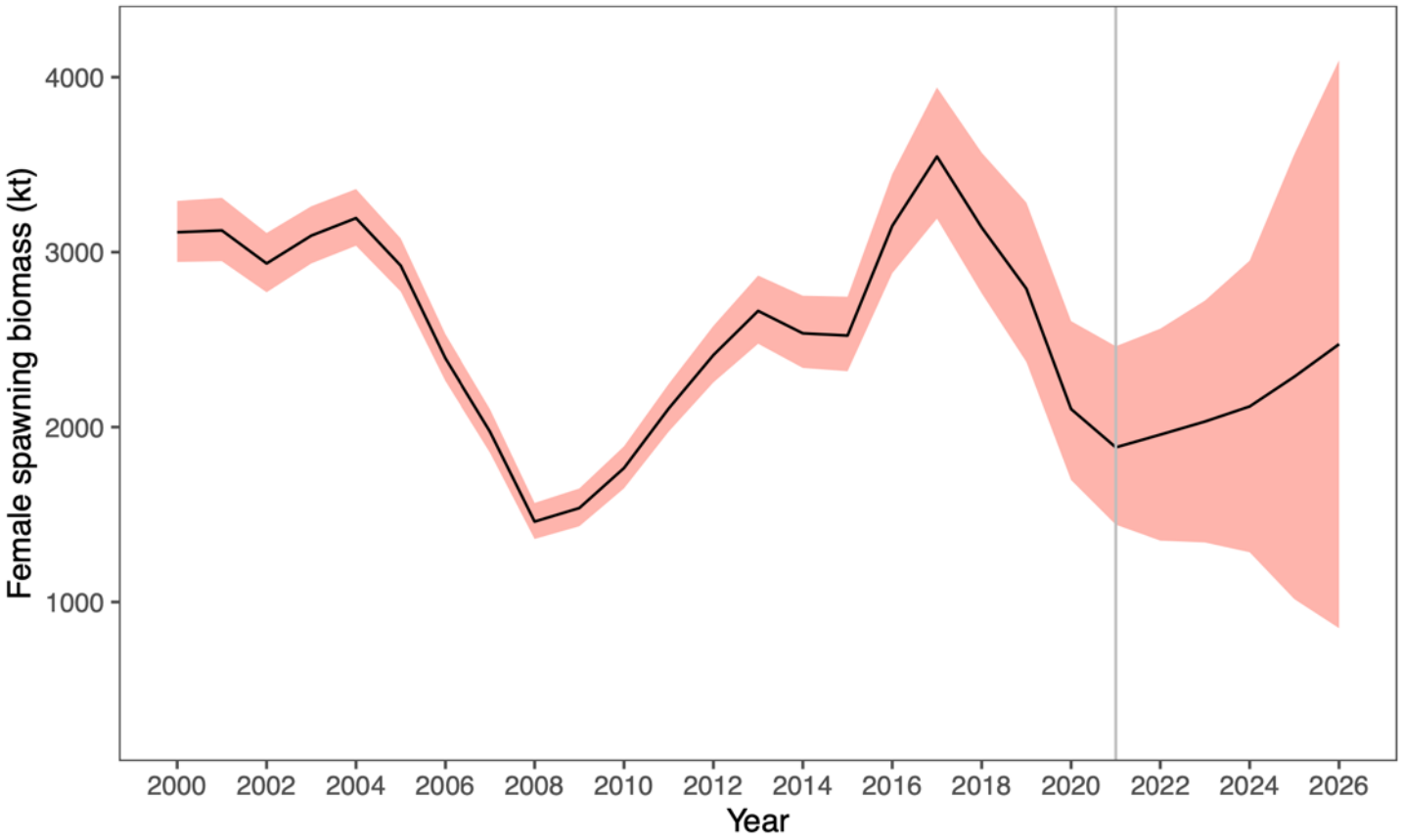
Exploitation rate trend



NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Biomass trend



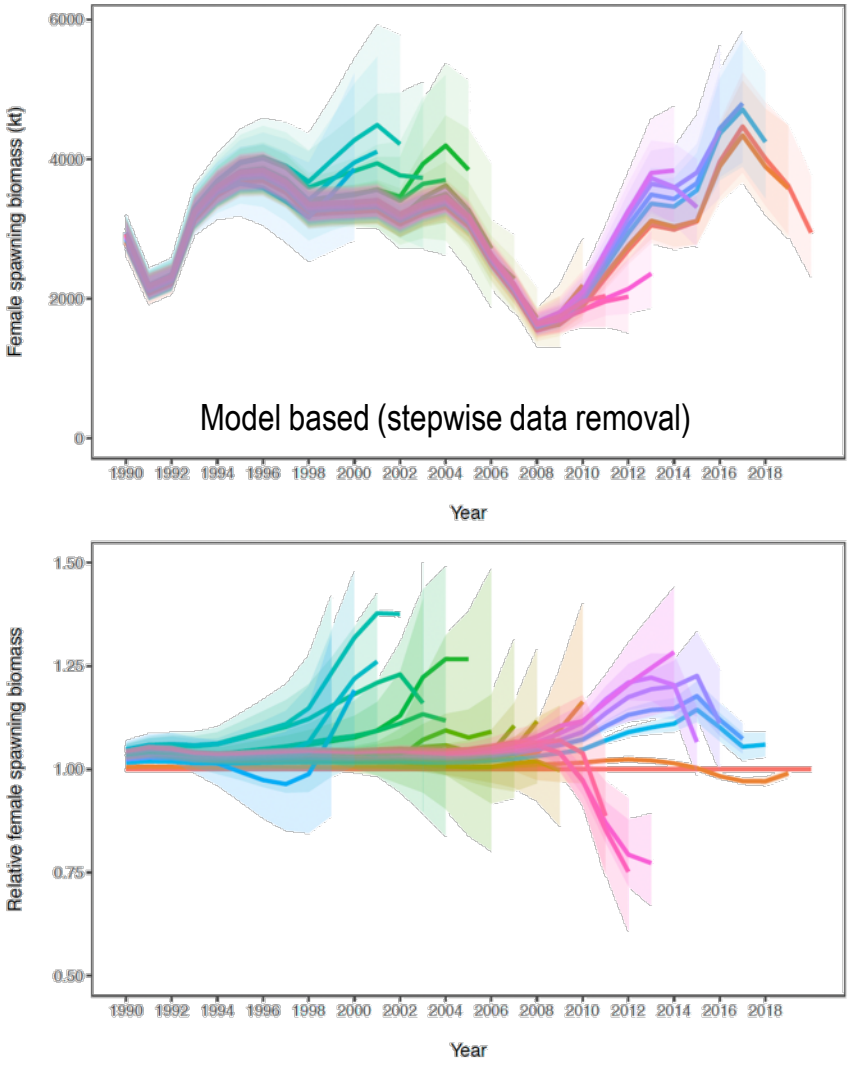
NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

EBS pollock
Assessment
Results

Retrospectives

2020 assessment

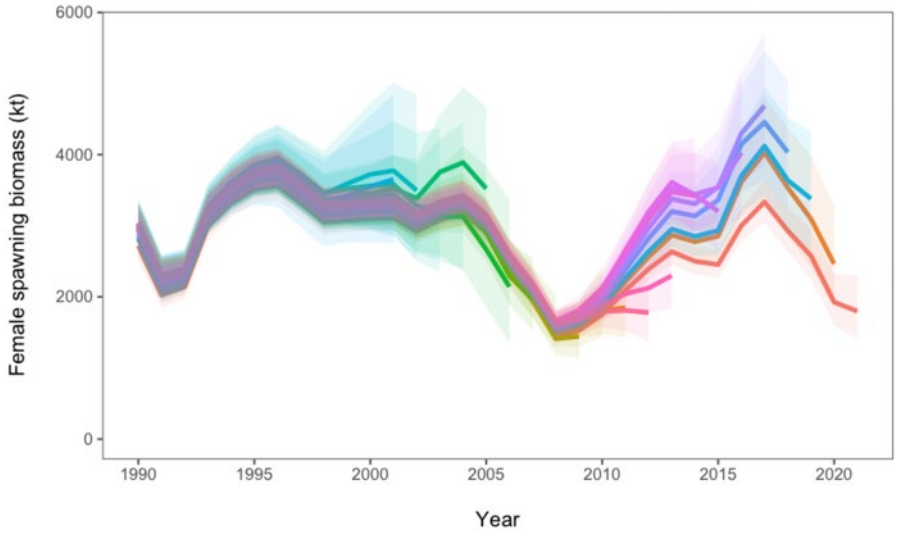


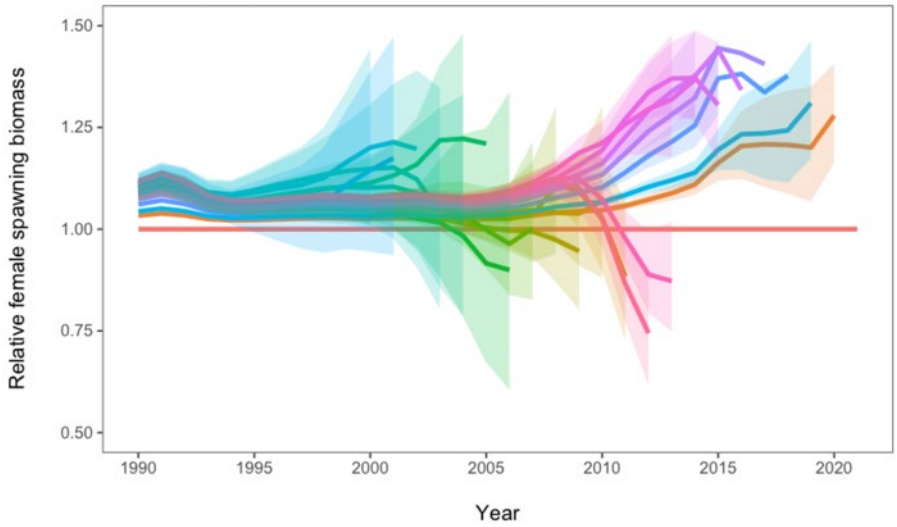
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

EBS pollock
Assessment
Results

Retrospectives

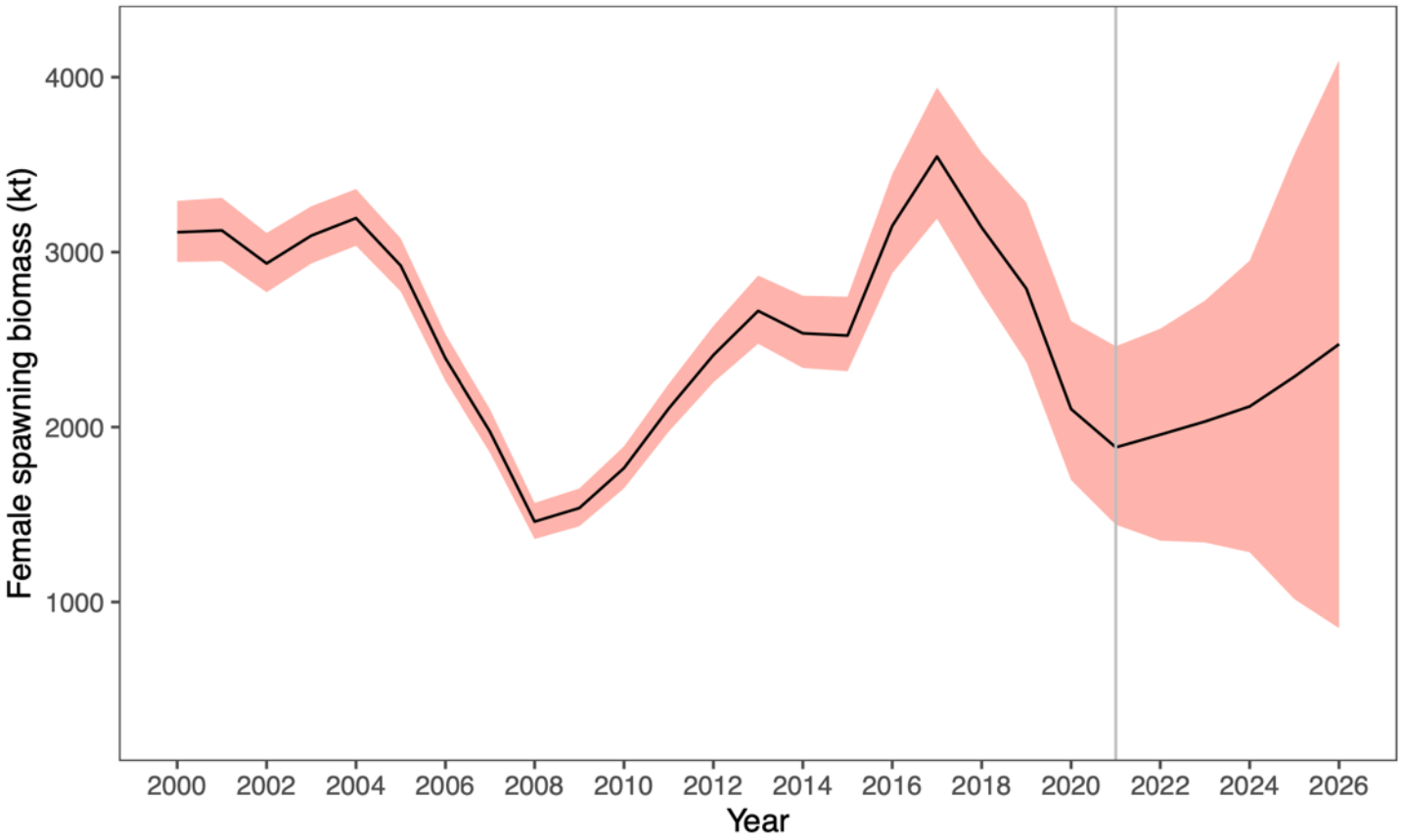
This year!





This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Biomass trend



NOAA FISHERIES

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

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

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

Risk table summary

Considerations			
Assessment-related	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

Coincidetentally same (similar to) constant F from 2021

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.

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

This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination or policy.