



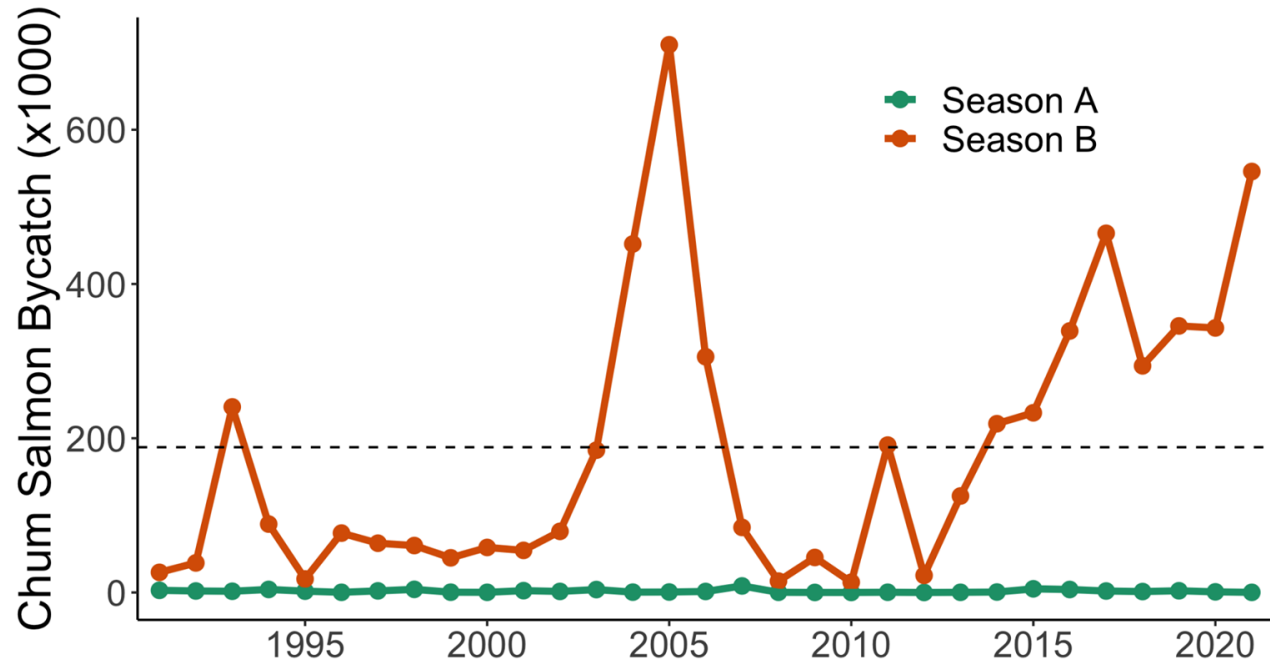
NOAA
FISHERIES

Genetic Stock Composition Analysis of Chum Salmon from the 2020 & 2021 Bering Sea Walleye Pollock Trawl Fishery

P. Barry, C. Kondzela, J. Whittle, J. Watson, K. Karpan, K. D'Amelio &
W. Larson

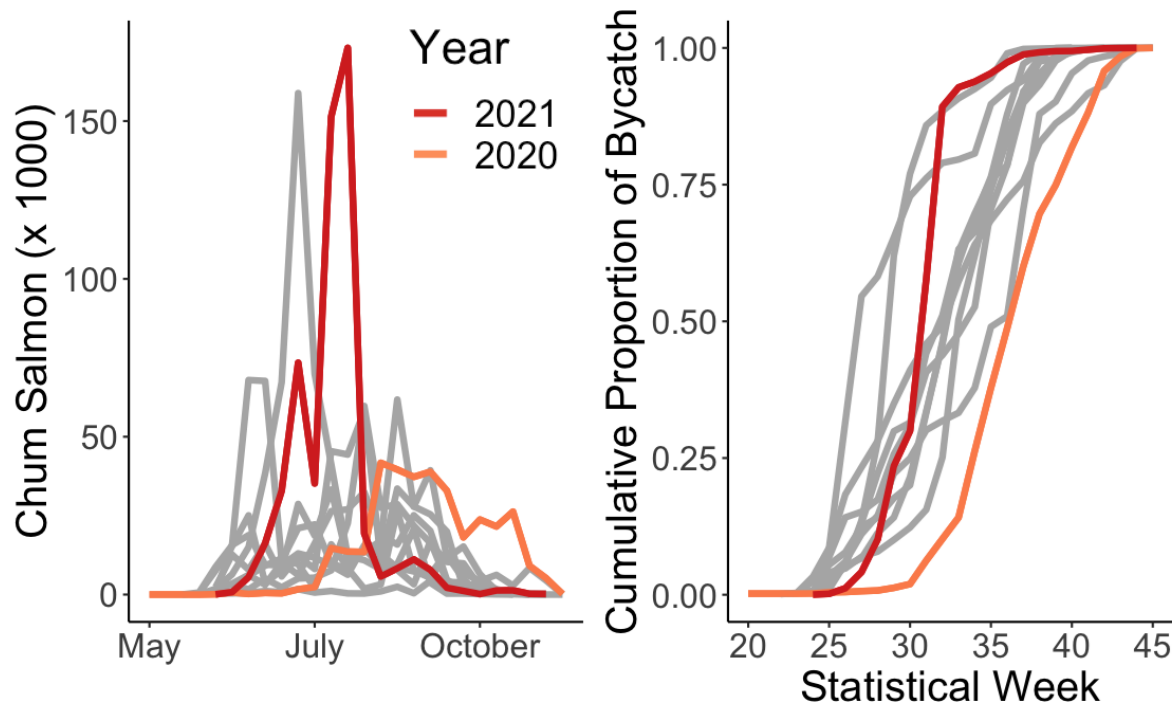
NOAA Alaska Fisheries Science Center

Chum Salmon Prohibited Species Catch



Source: https://www.fisheries.noaa.gov/sites/default/files/akro/chum_salmon_mortality2022.html

Timing of the chum bycatch



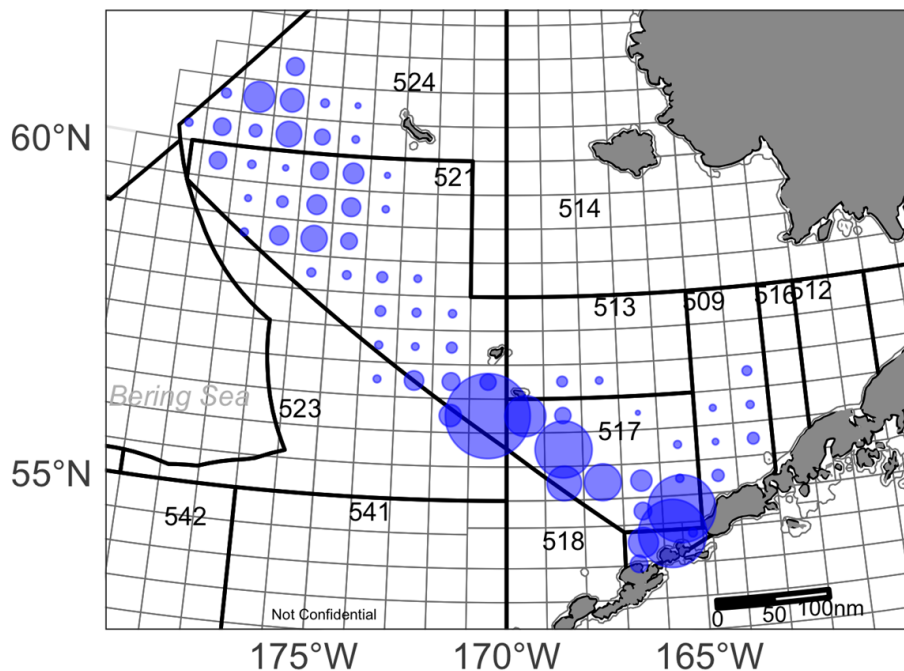
2020

- Late

2021

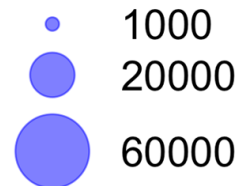
- Spiked weeks
29/32

Spatial distribution of chum bycatch 2020

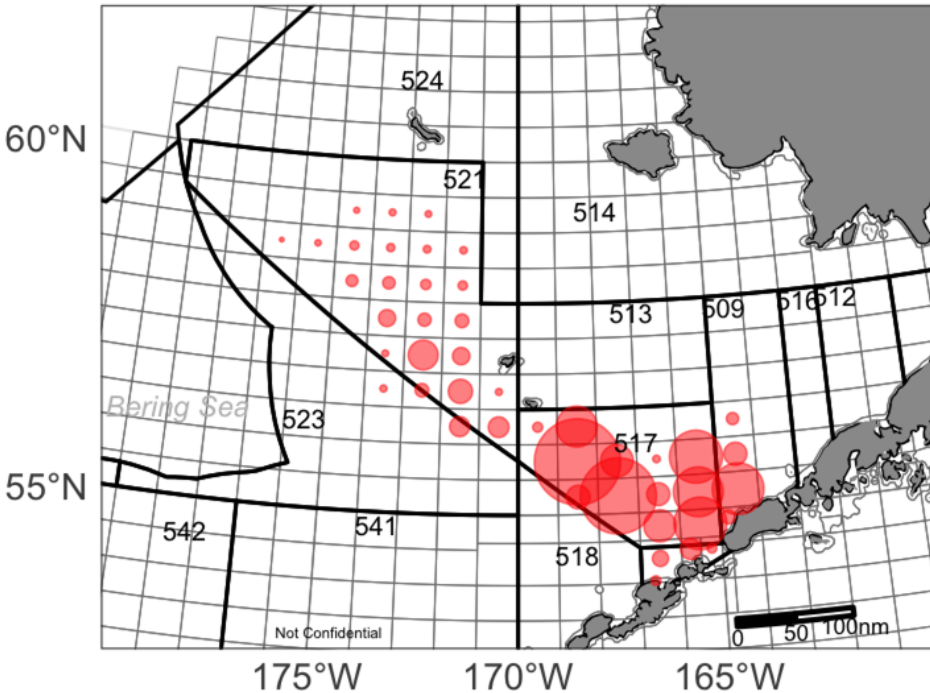


Further West

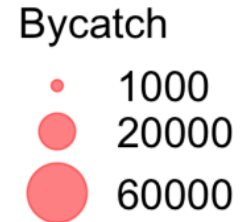
Bycatch



Spatial distribution of chum bycatch 2021

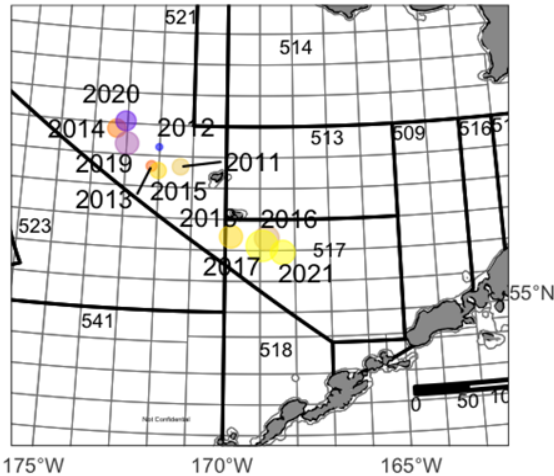


Concentrated next to AK peninsula

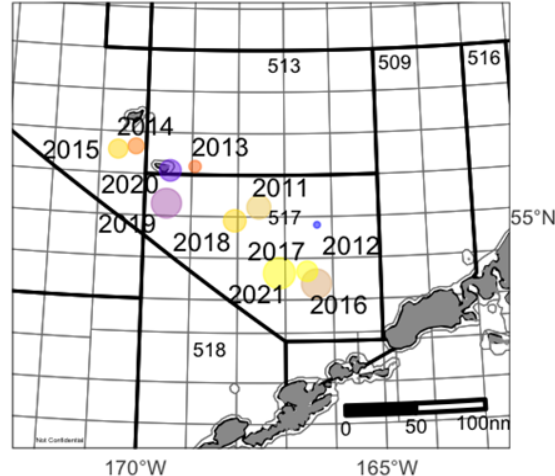


Changes in spatial distribution

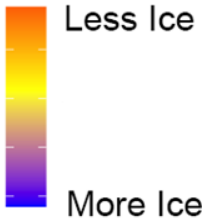
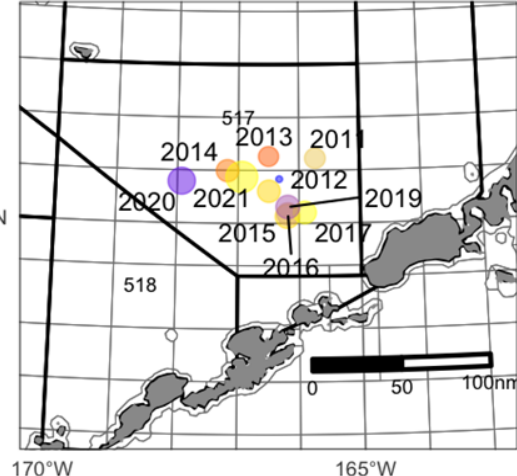
Catcher Processor



Mothership

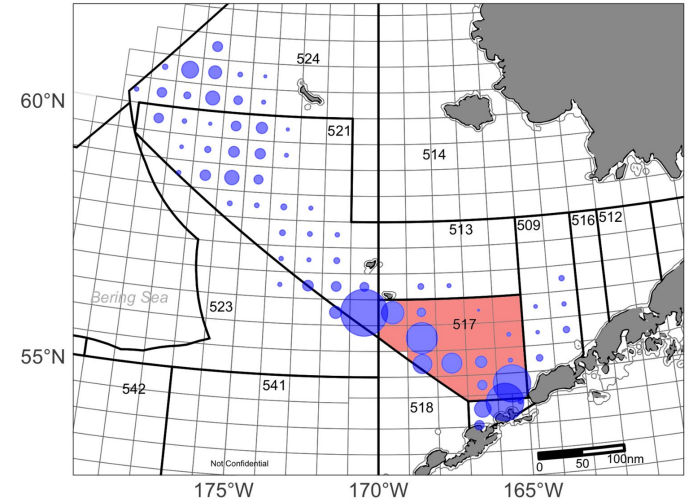
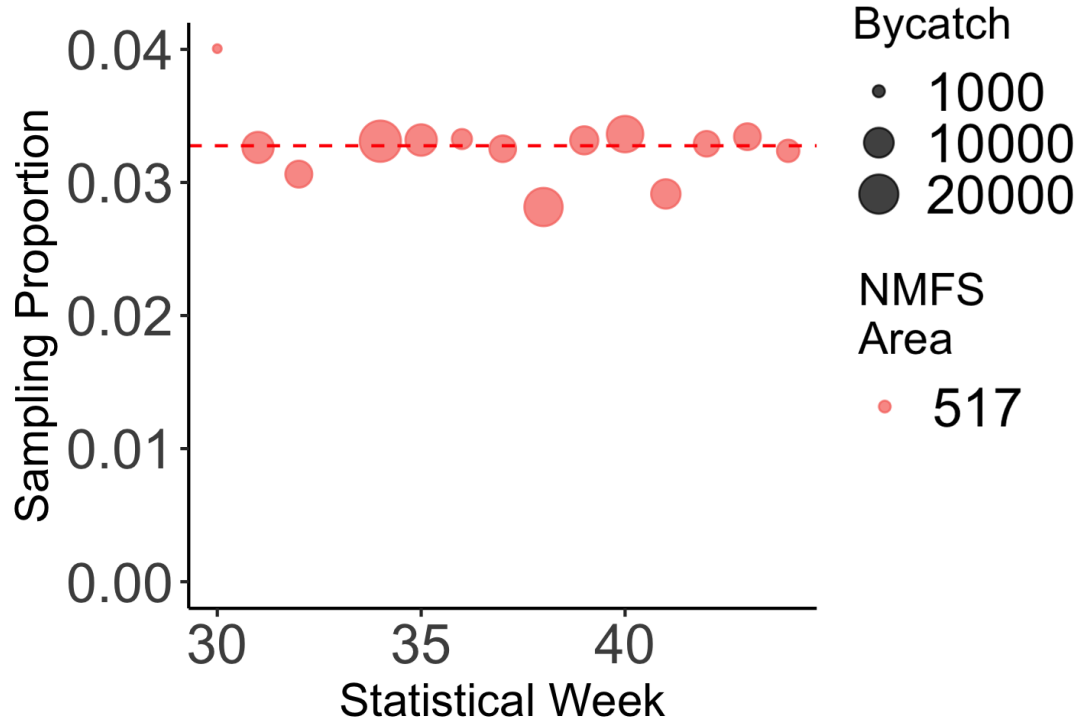


Shoreside

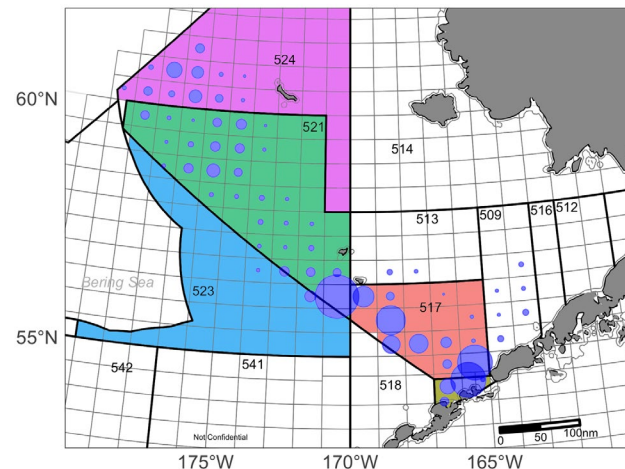
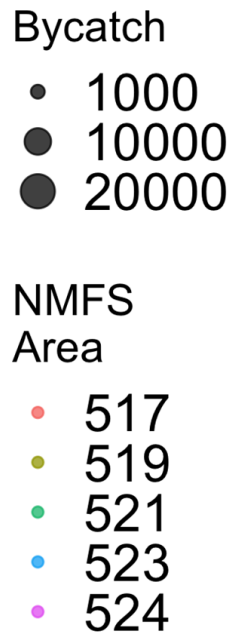
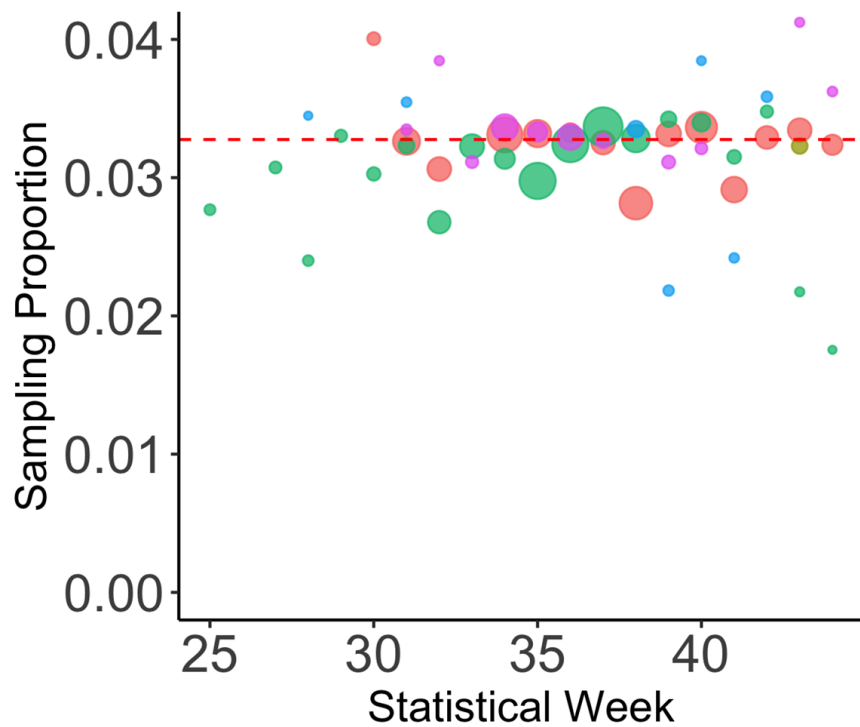


<https://psl.noaa.gov/data/climateindices/>

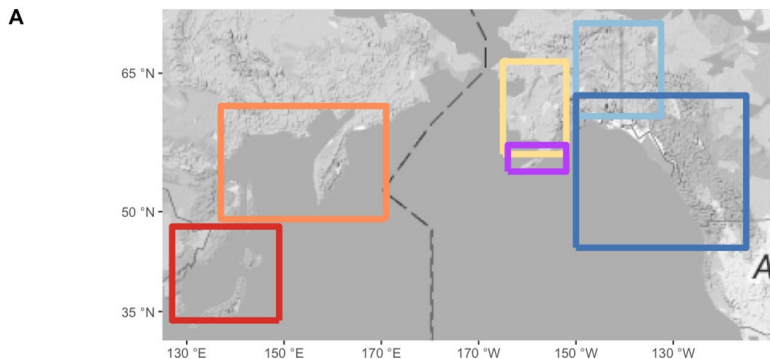
Chum Salmon Genetic Sampling 2020 by Week and NMFS area



Chum Salmon Genetic Sampling 2020



Genetic Baseline



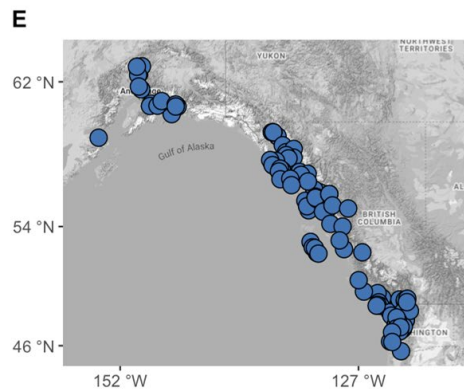
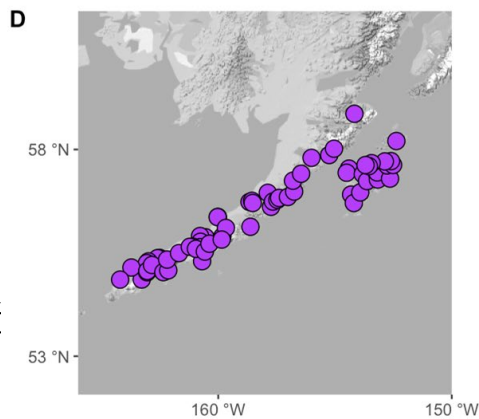
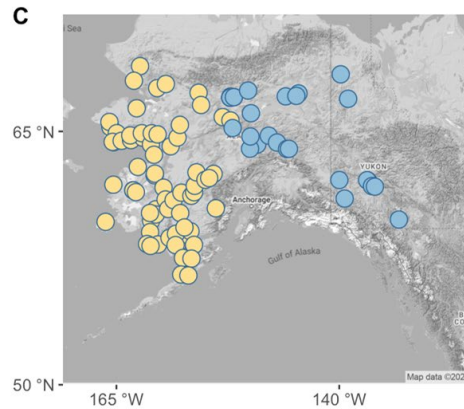
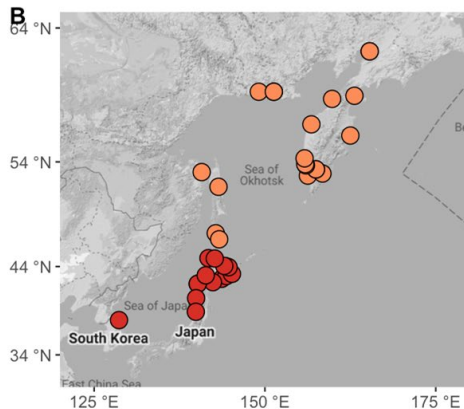
6 reporting groups

B. SE Asia, NE Asia

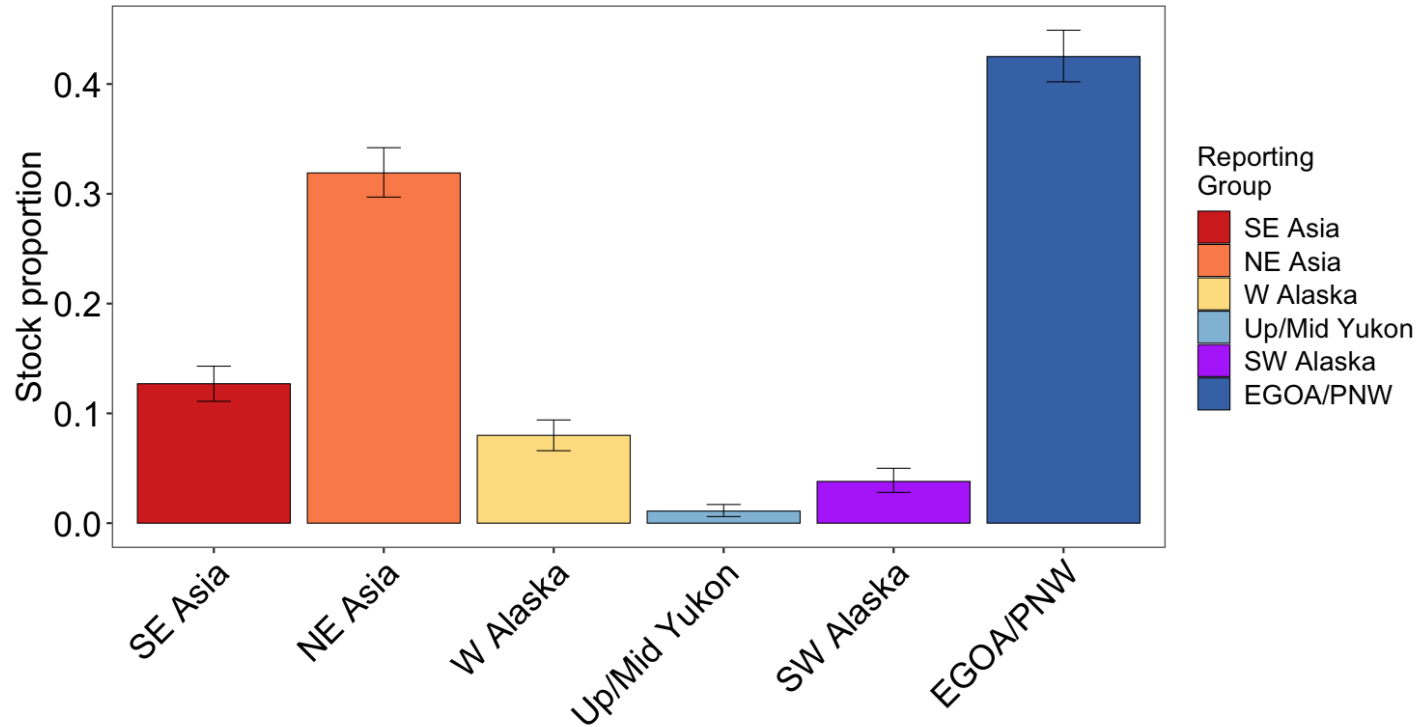
C. Coastal Western Alaska, Upper Mid Yukon

D. Southwest Alaska

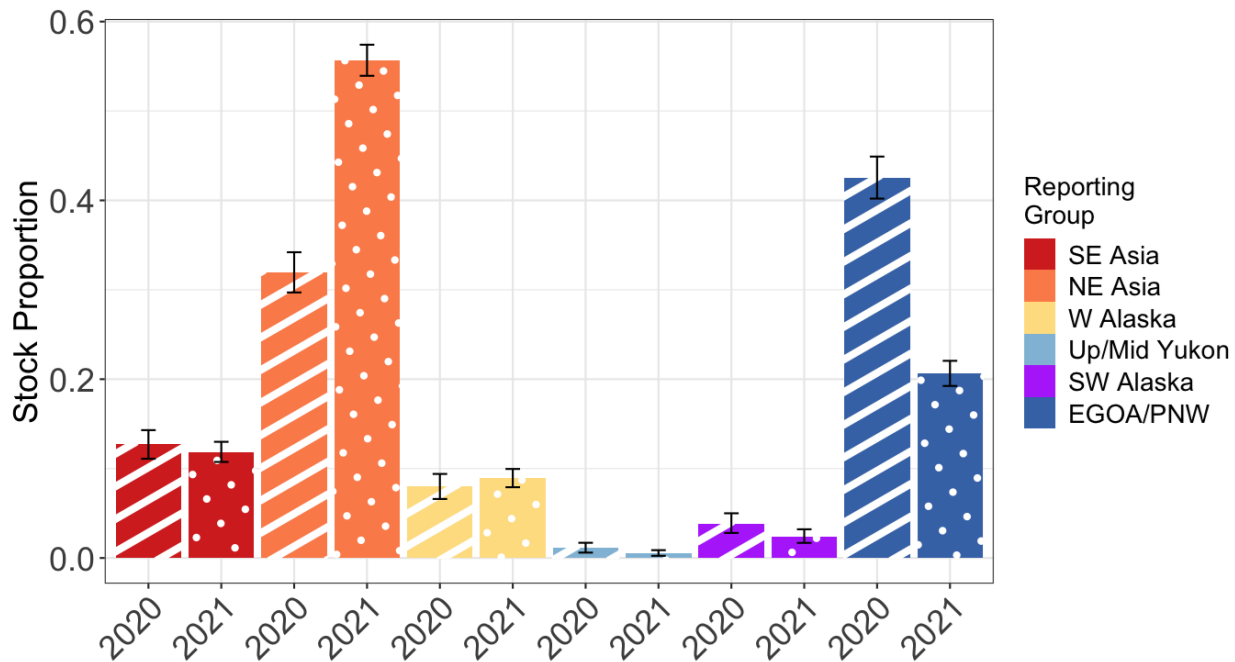
E. EGOA / PNW



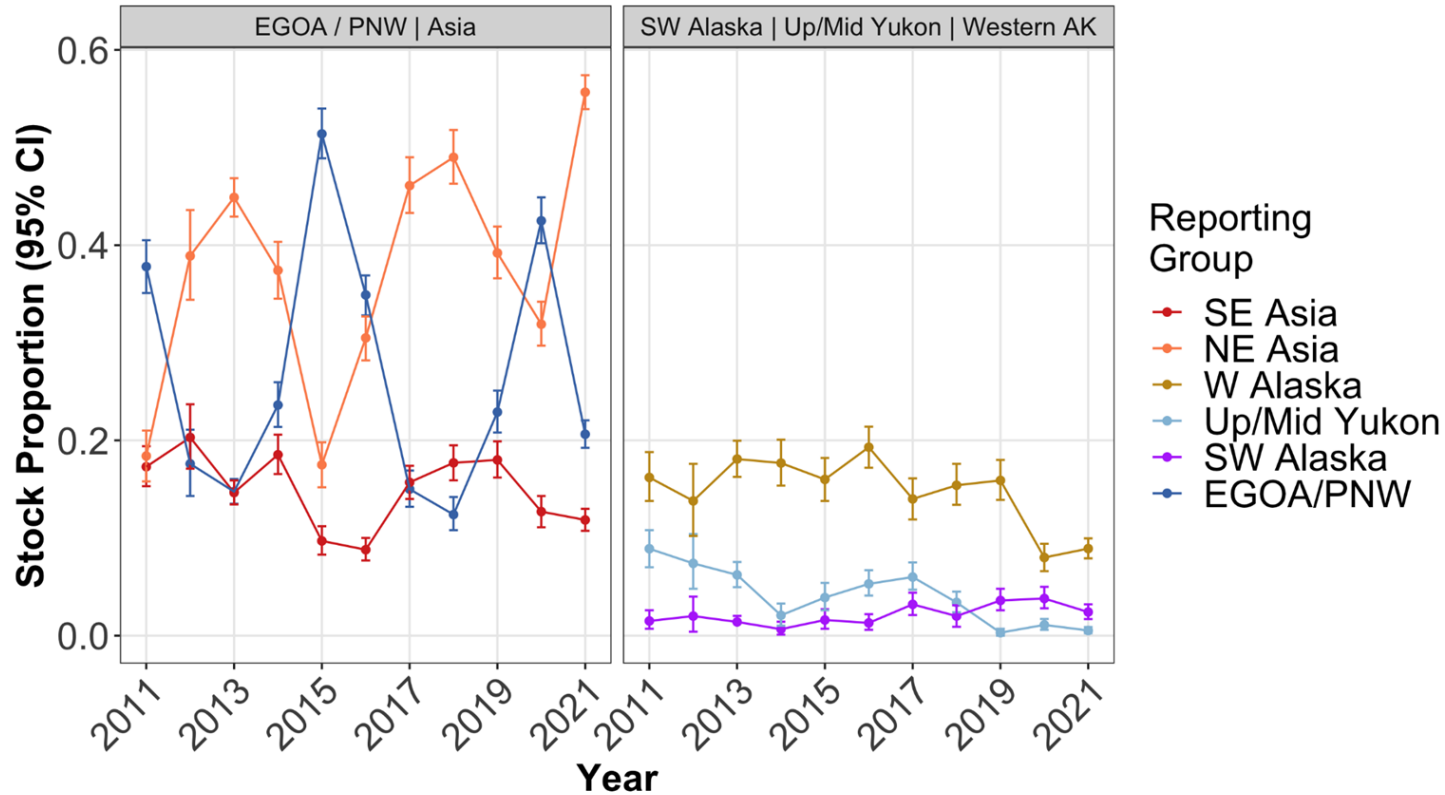
Chum Salmon Stock Proportions - 2020 B-season



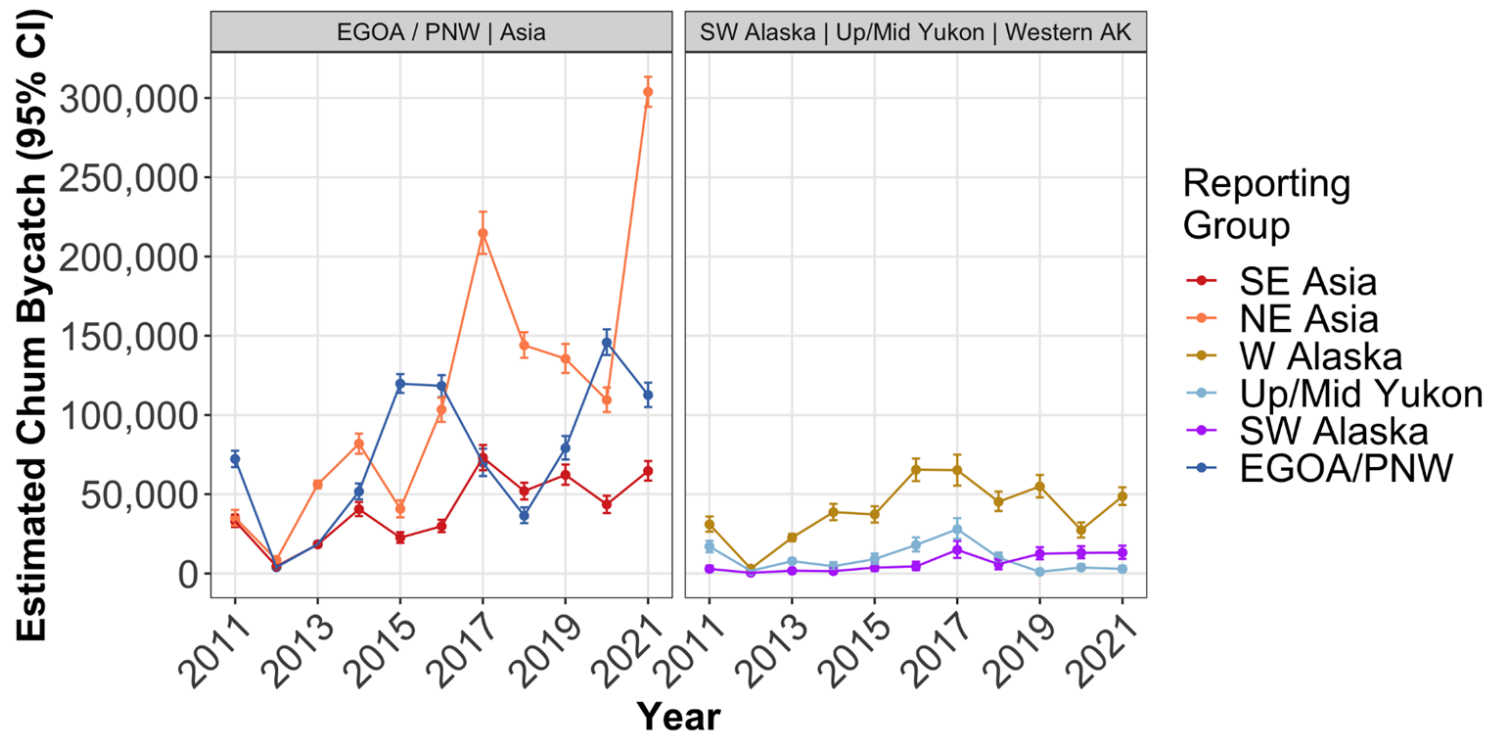
Chum Salmon Stock Proportions - 2020 & 2021 B-season



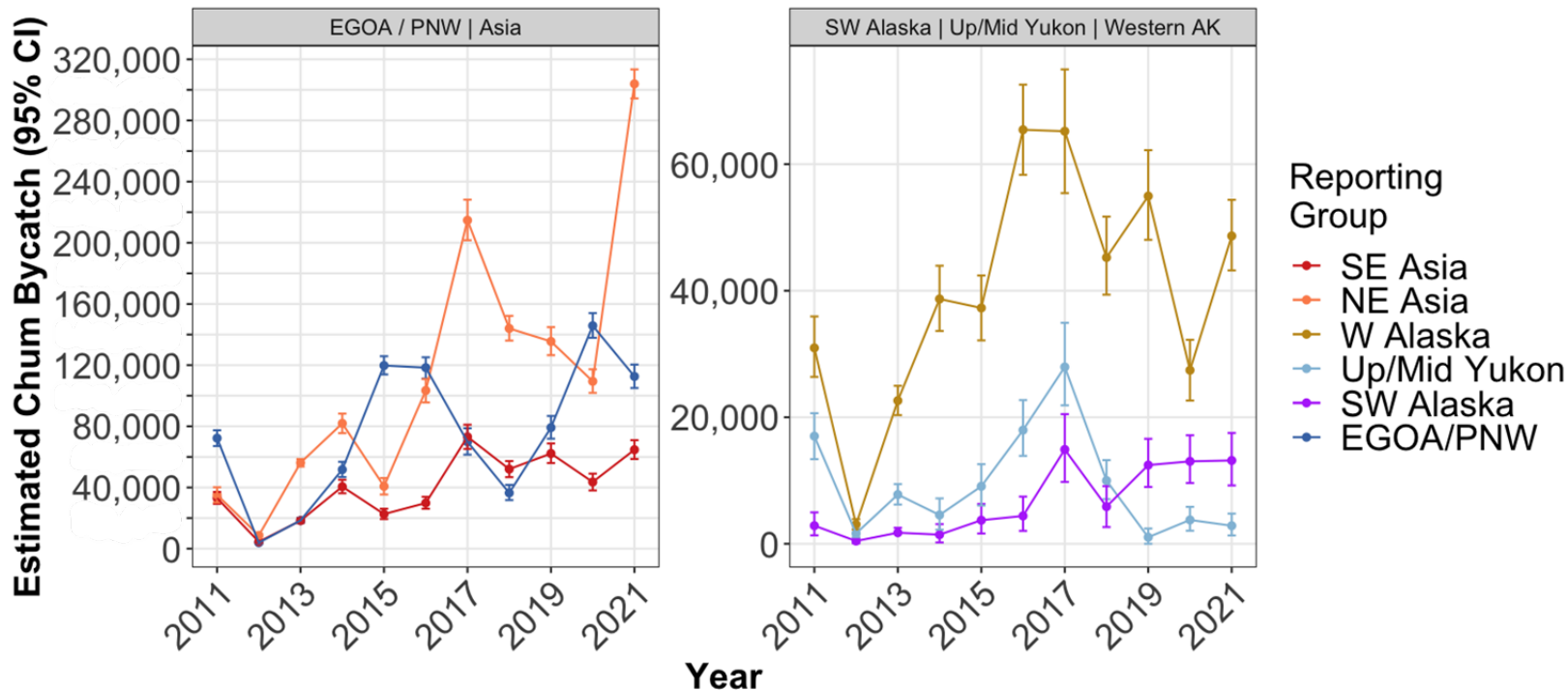
Historical Trends - Stock Composition



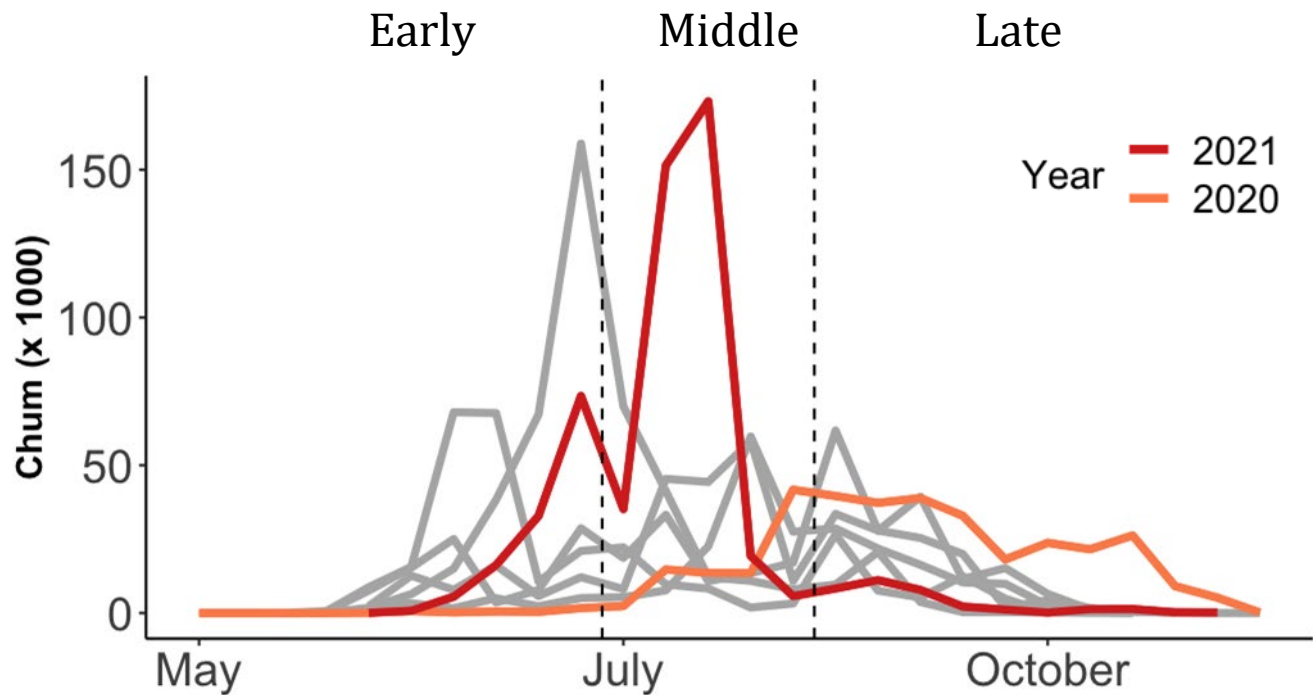
Historical Trends - Number of Chum Salmon



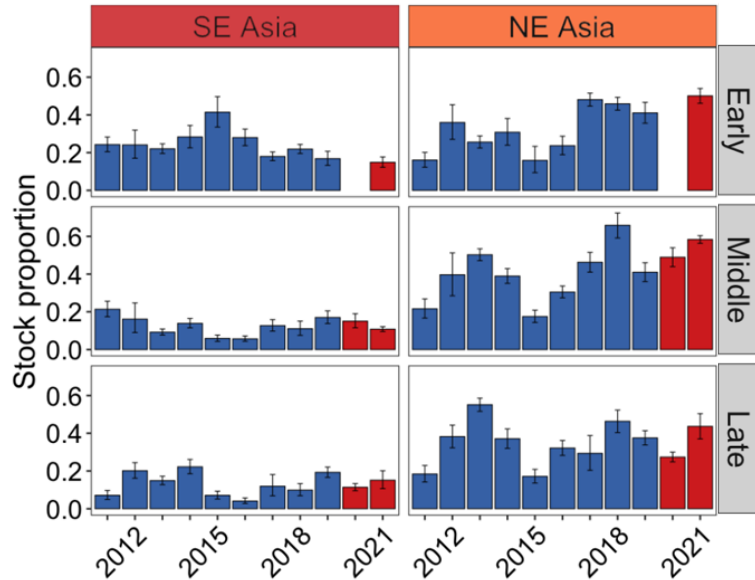
Historical Trends - Number of Chum Salmon



Temporal Variation - Chum Salmon Bycatch



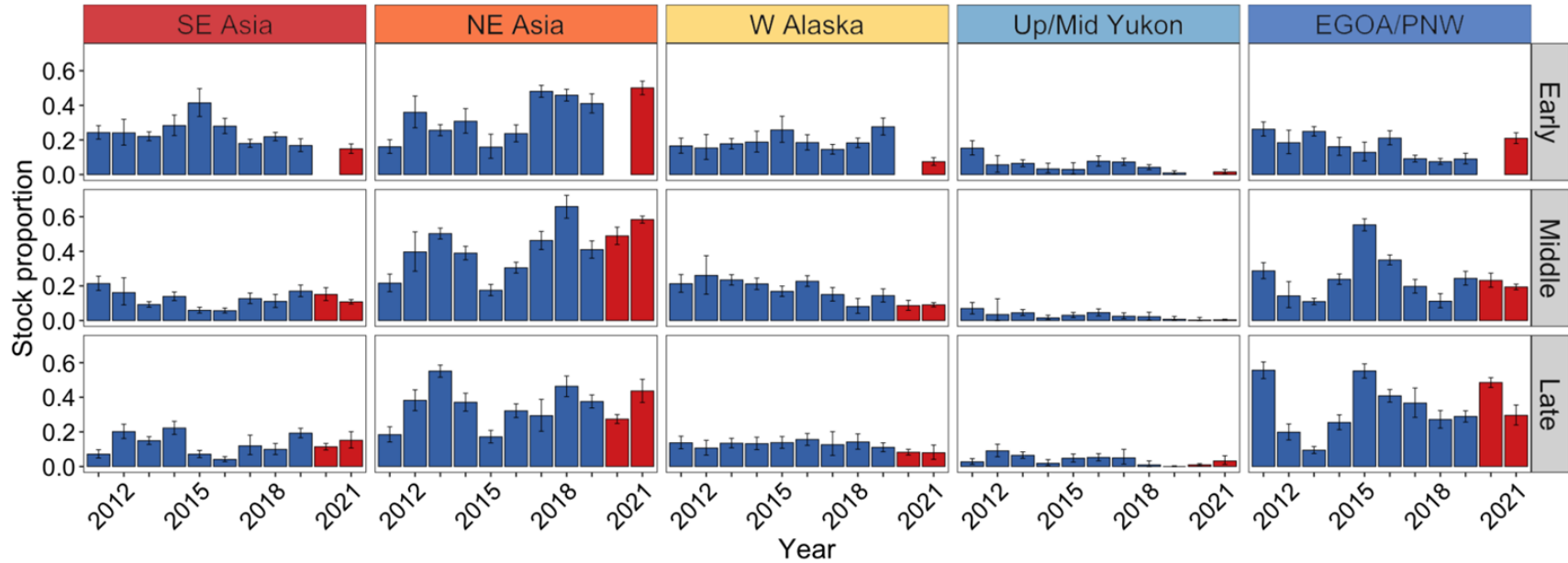
Temporal Variation Chum Salmon



Decreases

Middle Peak

Temporal Variation Chum Salmon



Decreases

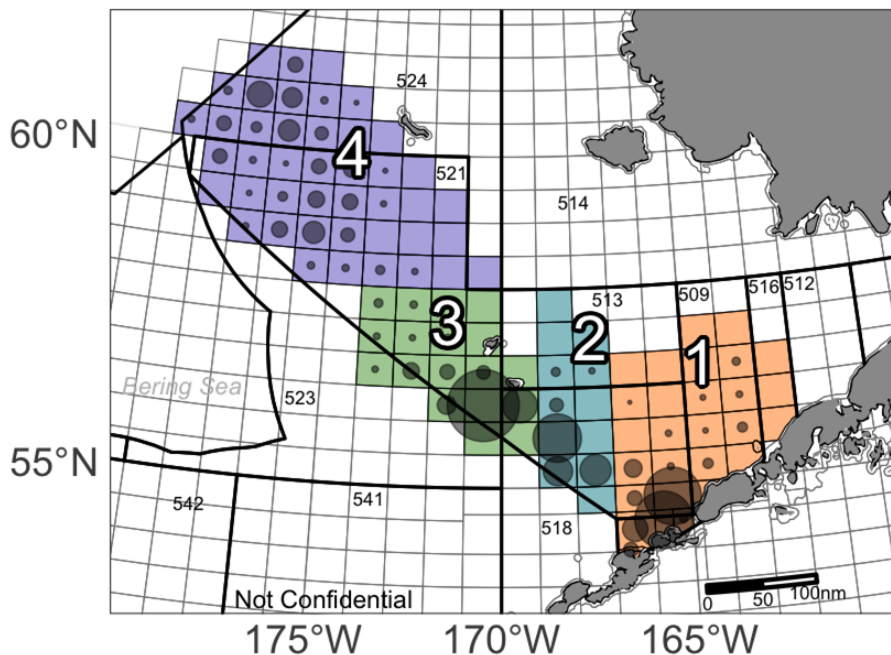
Middle Peak

Decreased

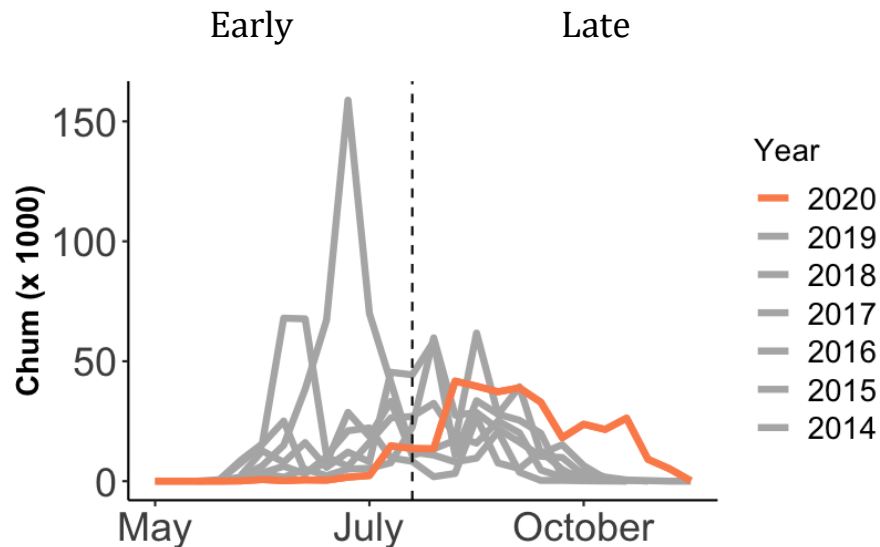
Decreased

Increases

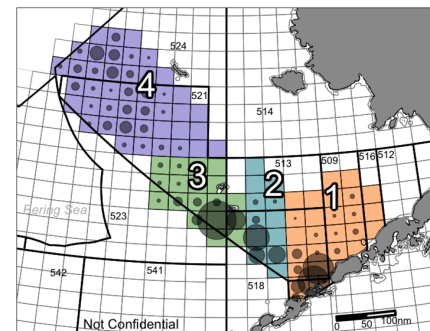
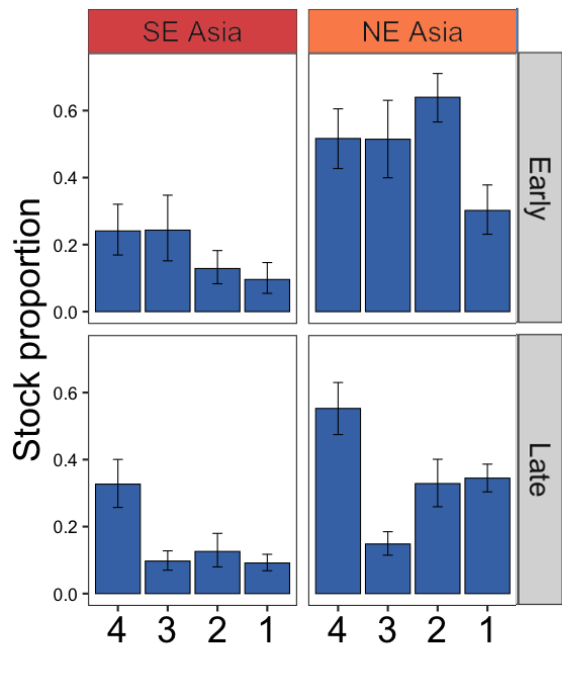
Spatio-temporal Variation 2020



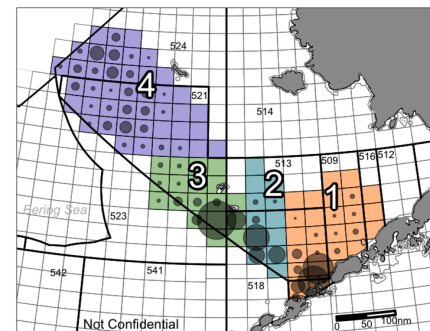
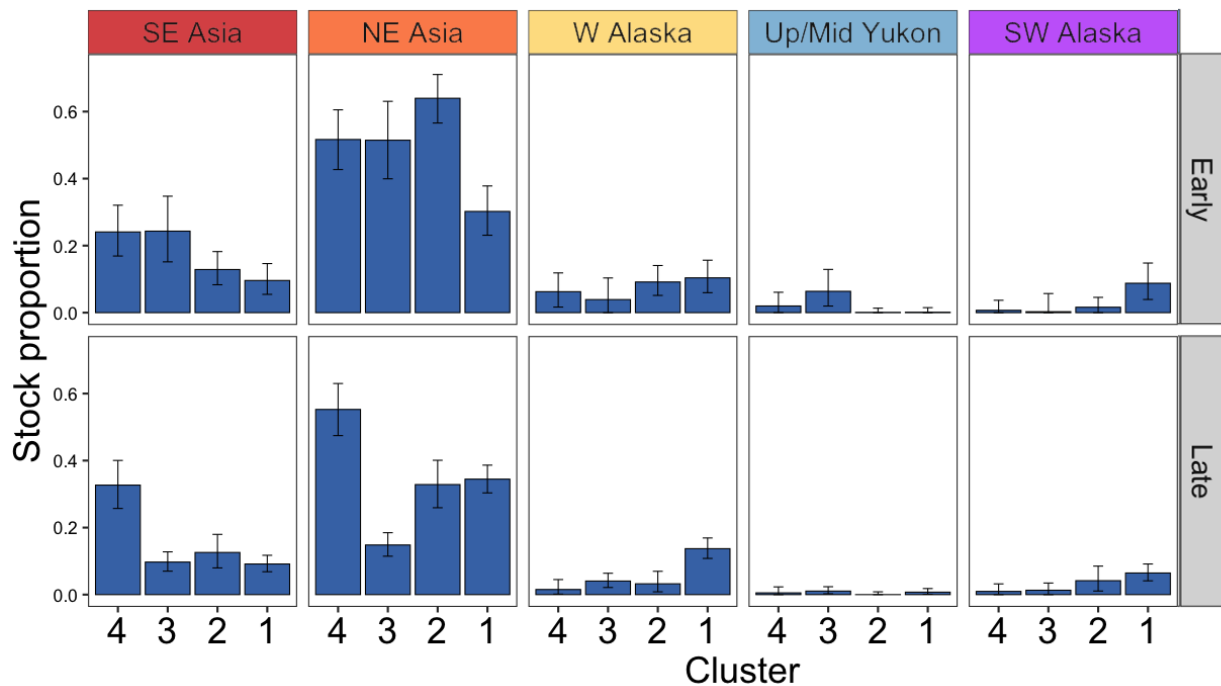
Bycatch • 1000 ● 20000 ● 60000



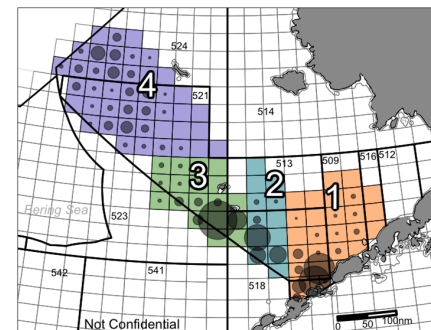
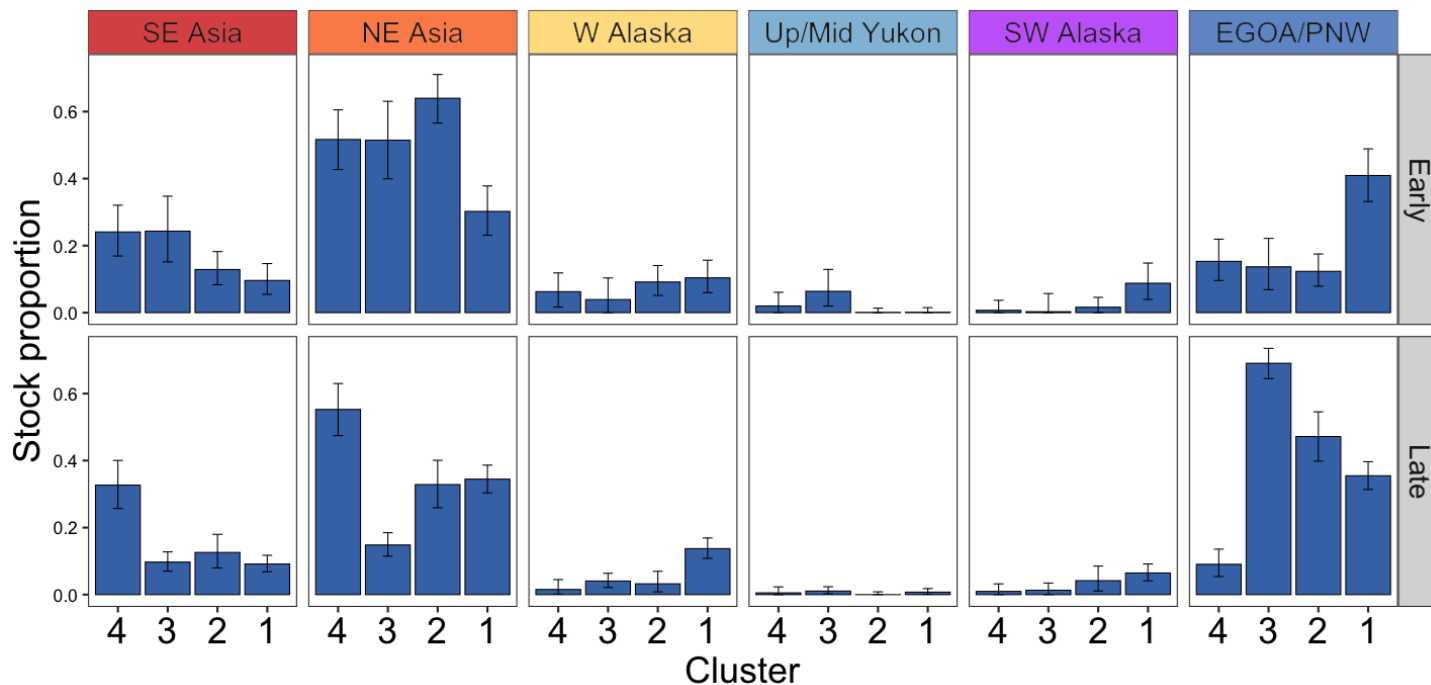
Spatio-temporal variation 2020



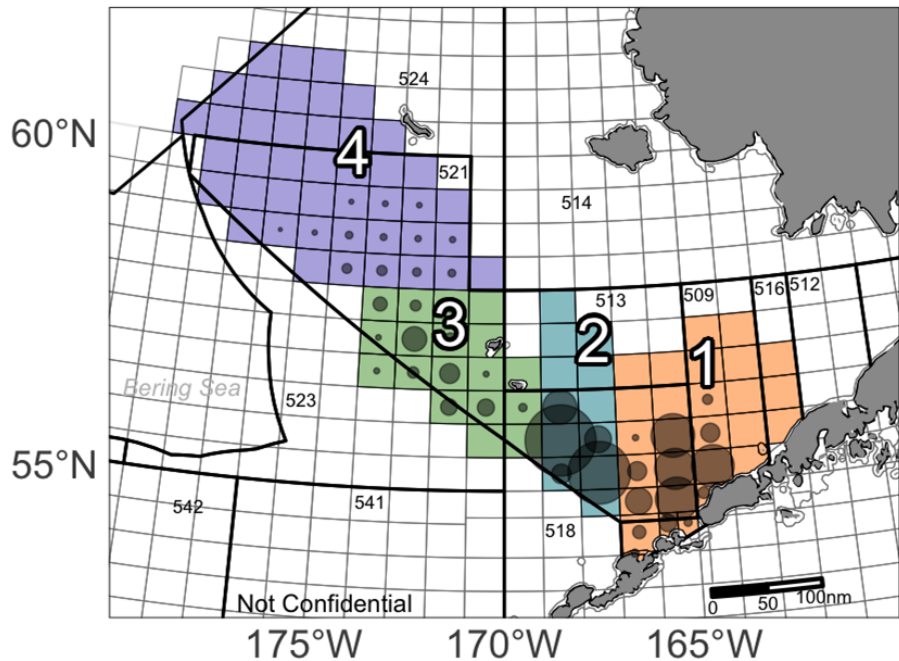
Spatio-temporal variation 2020



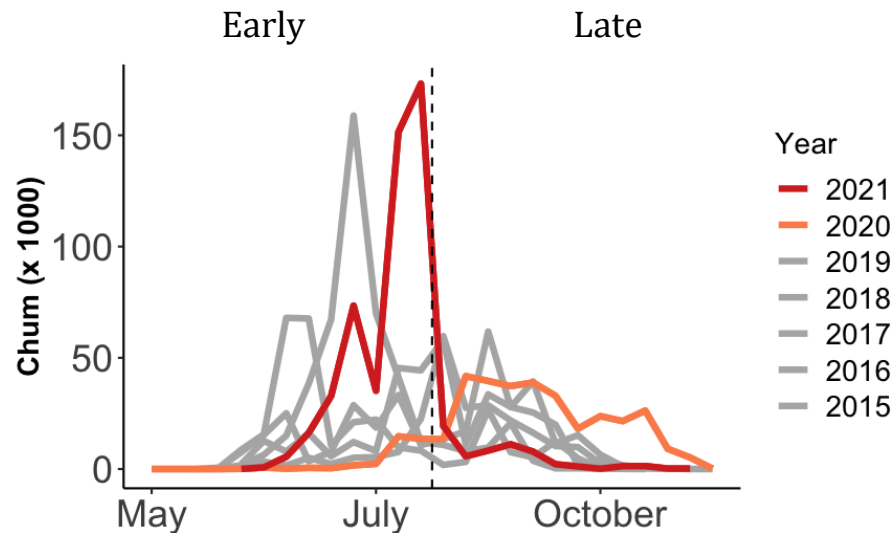
Spatio-temporal variation 2020



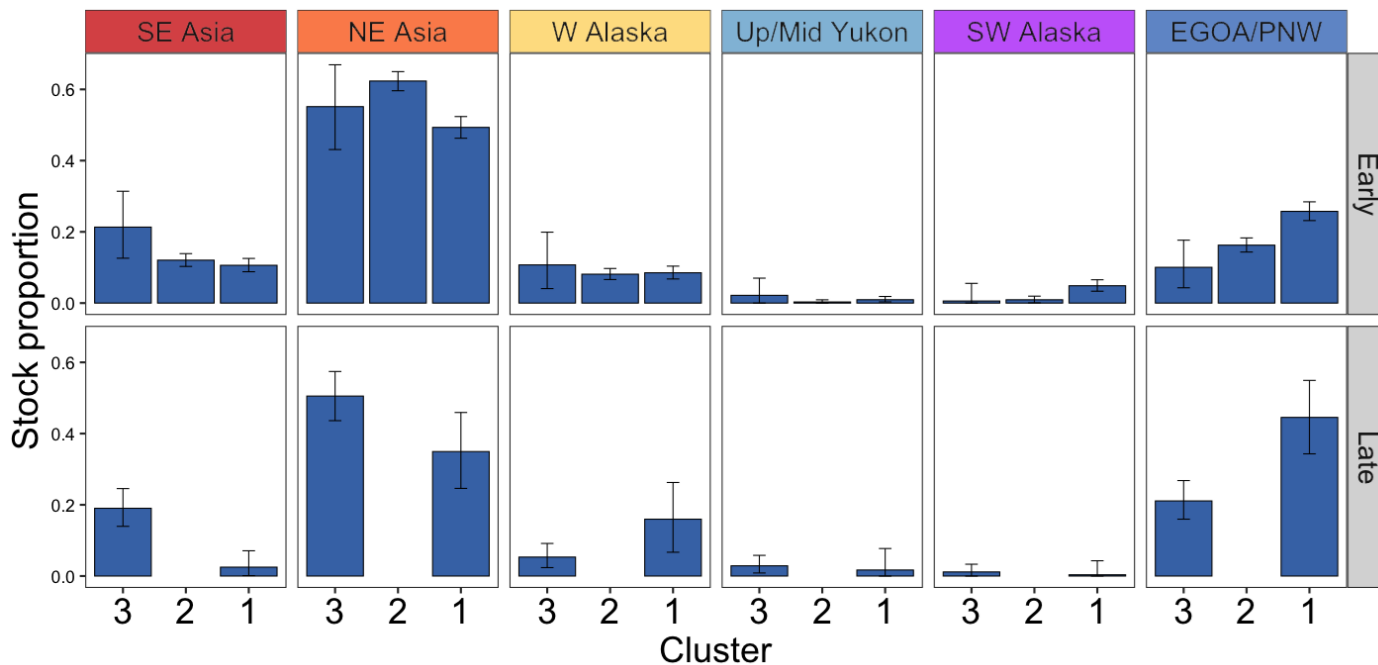
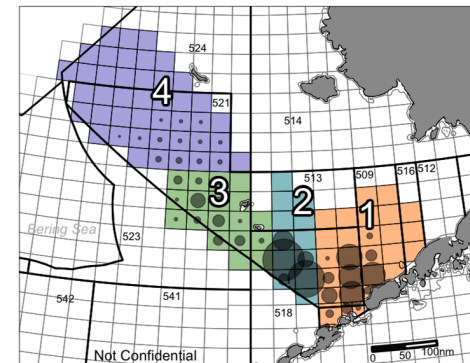
Spatio-temporal Variation 2021



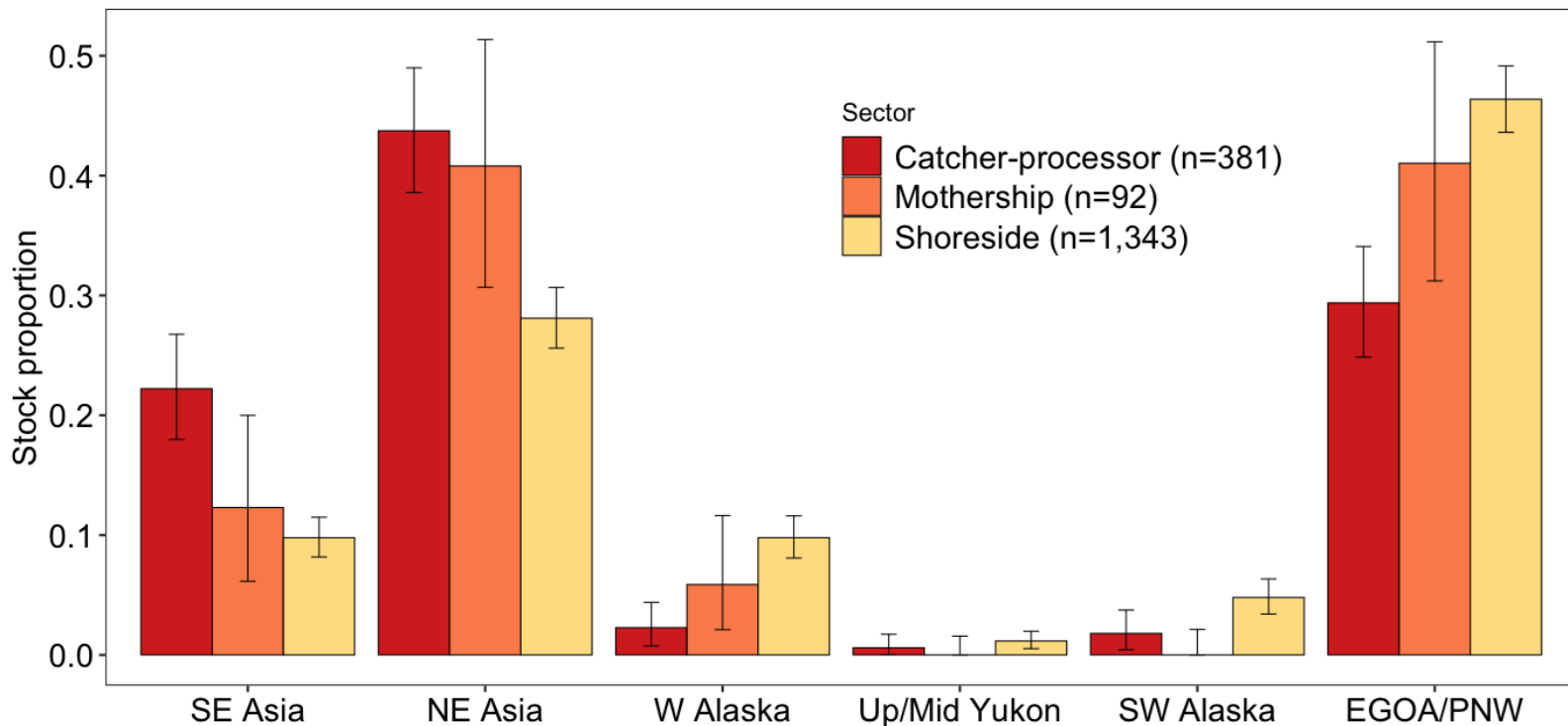
Bycatch • 1000 ● 20000 ● 60000



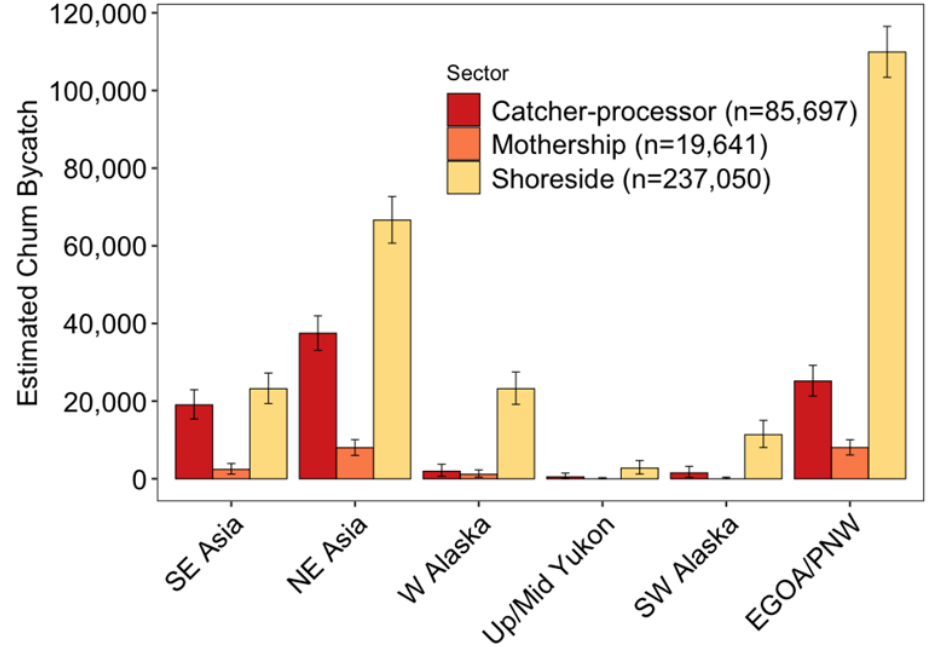
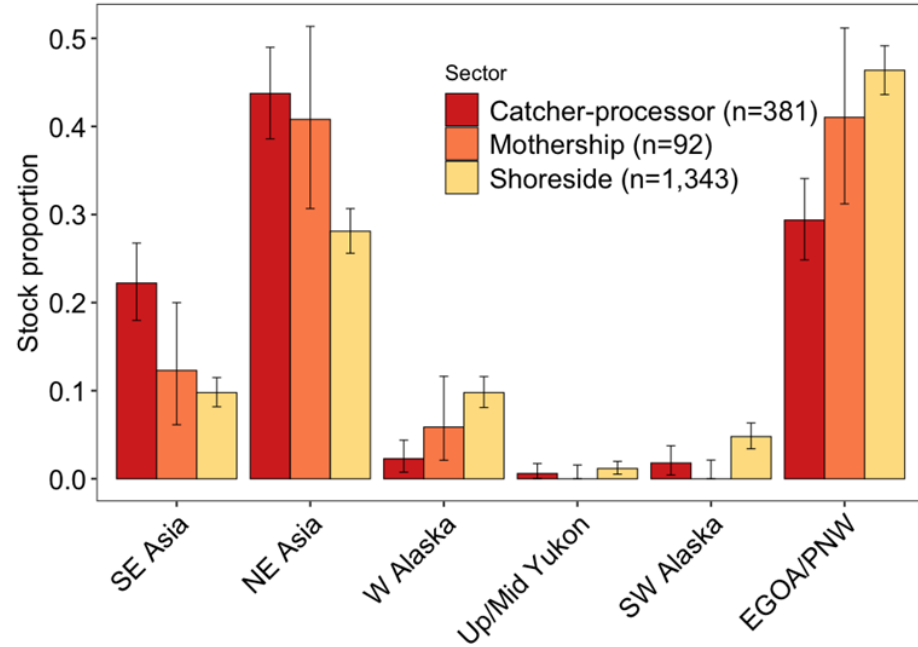
Spatio-temporal variation 2021



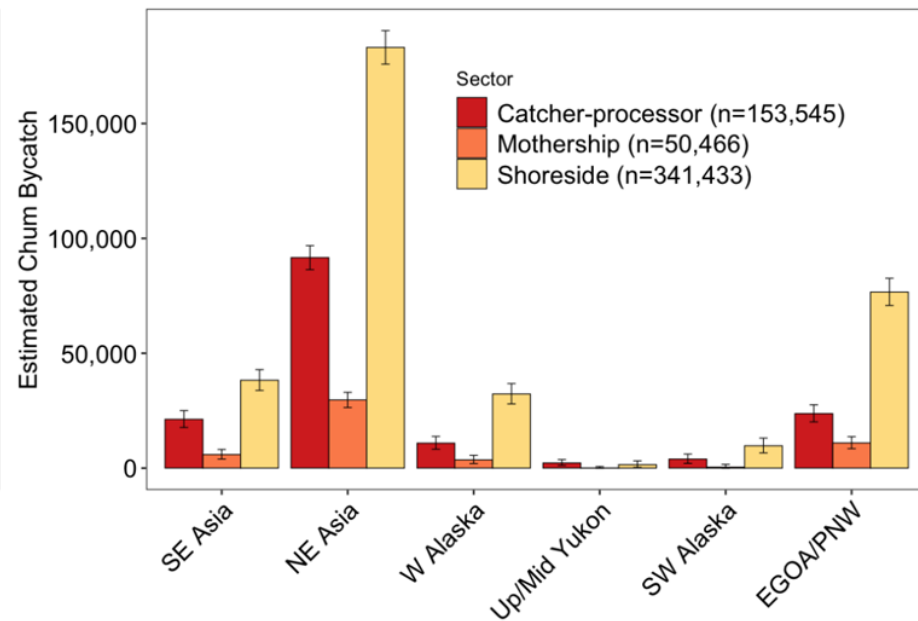
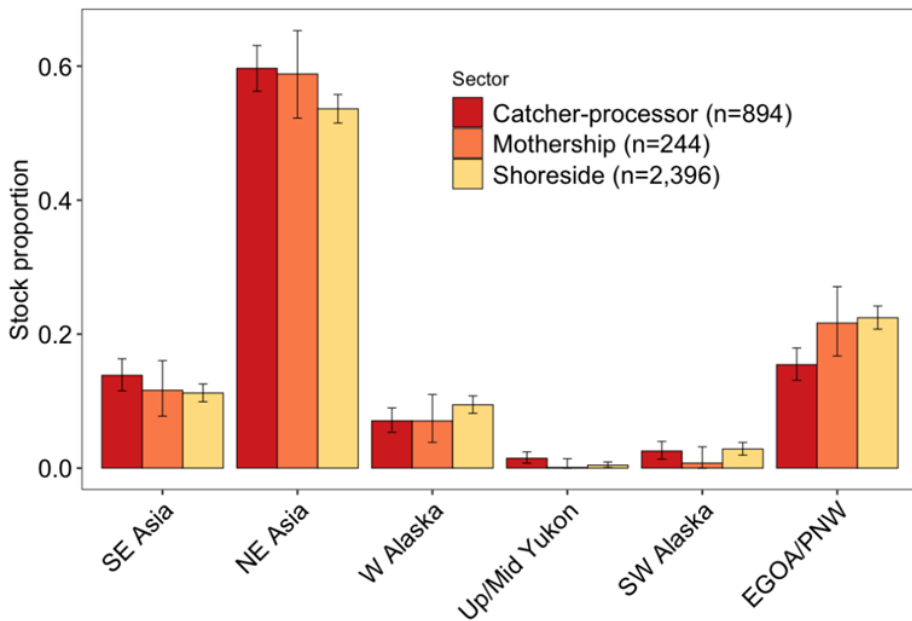
Fishing Sector - 2020 Chum Salmon



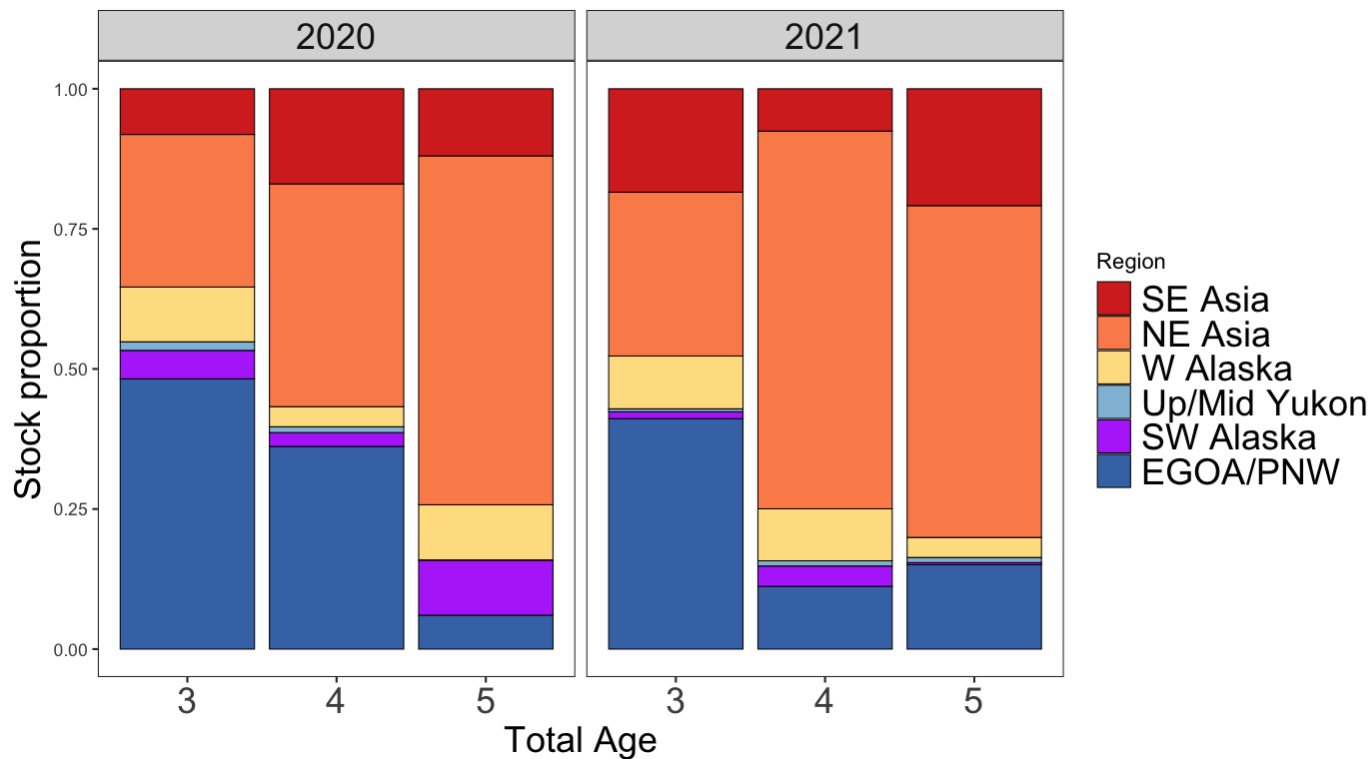
Fishing Sector - Estimated number of 2020 Chum



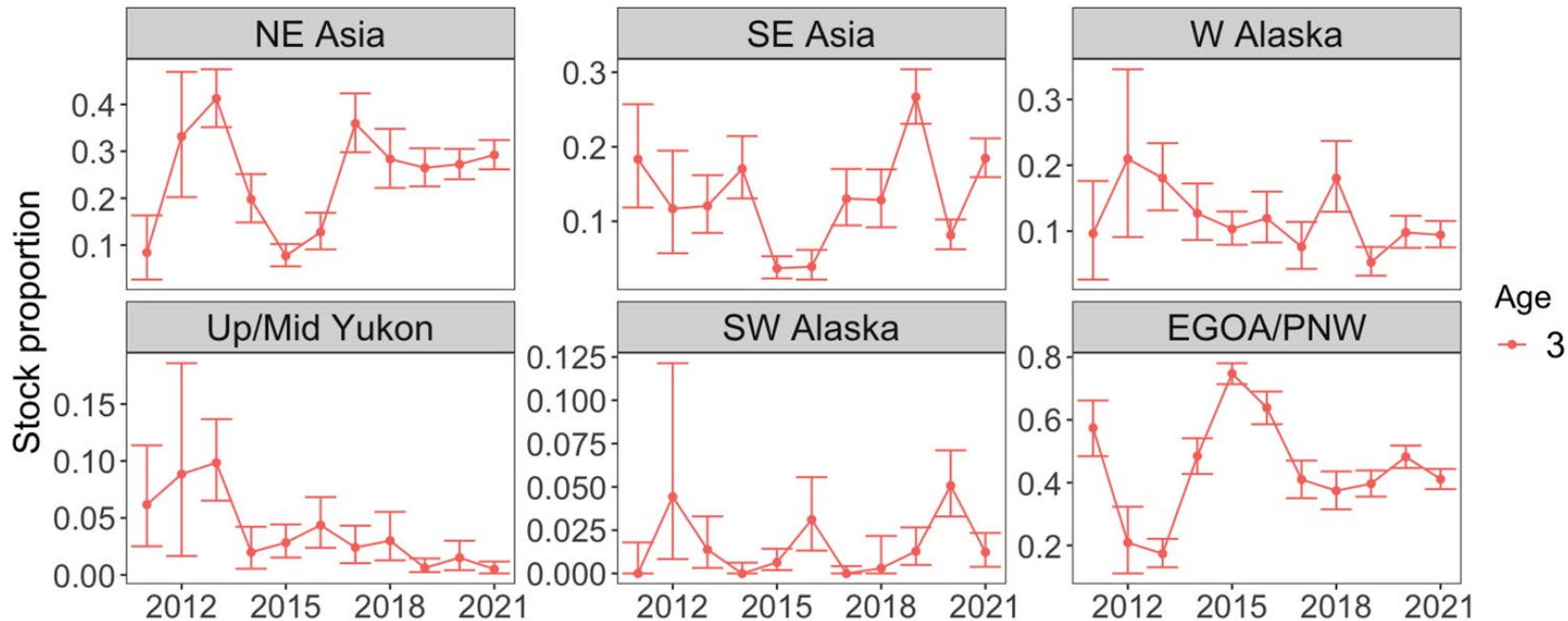
Fishing Sector - 2021 Chum Salmon



Age-specific Stock Composition Chum

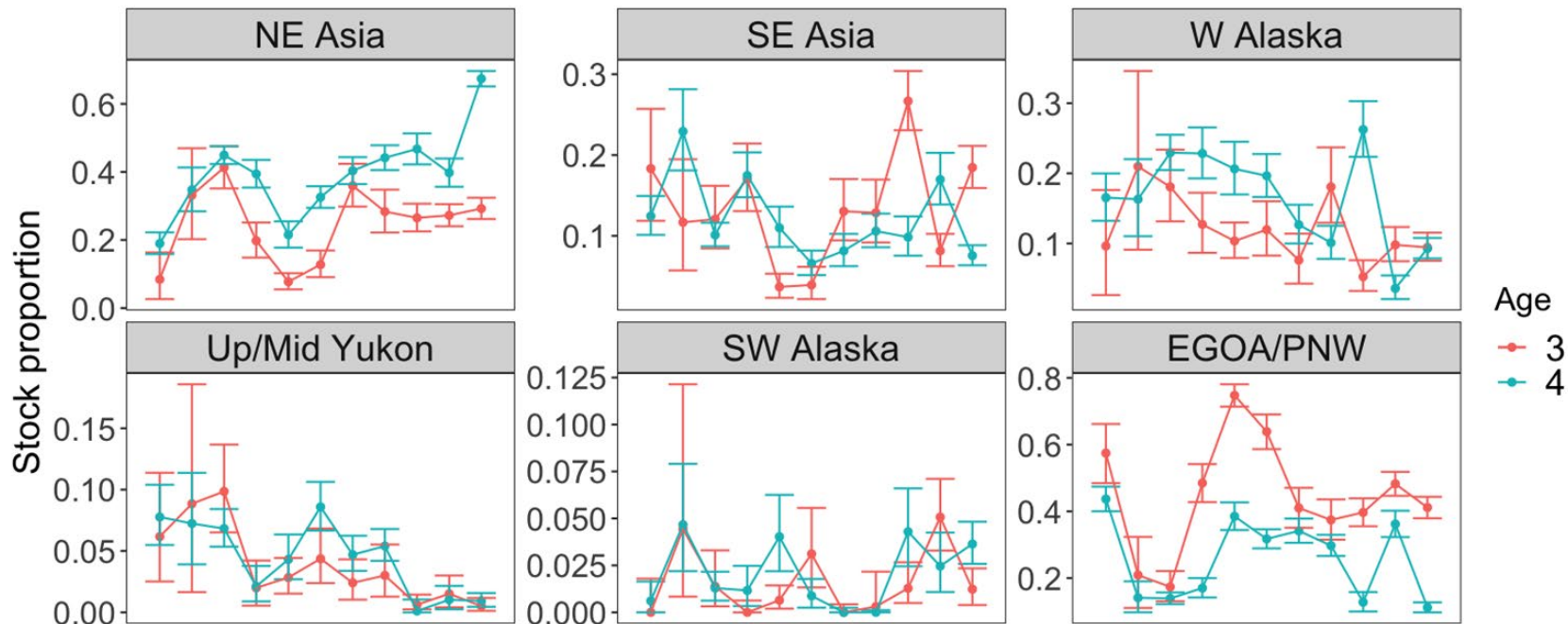


Age-specific analyses

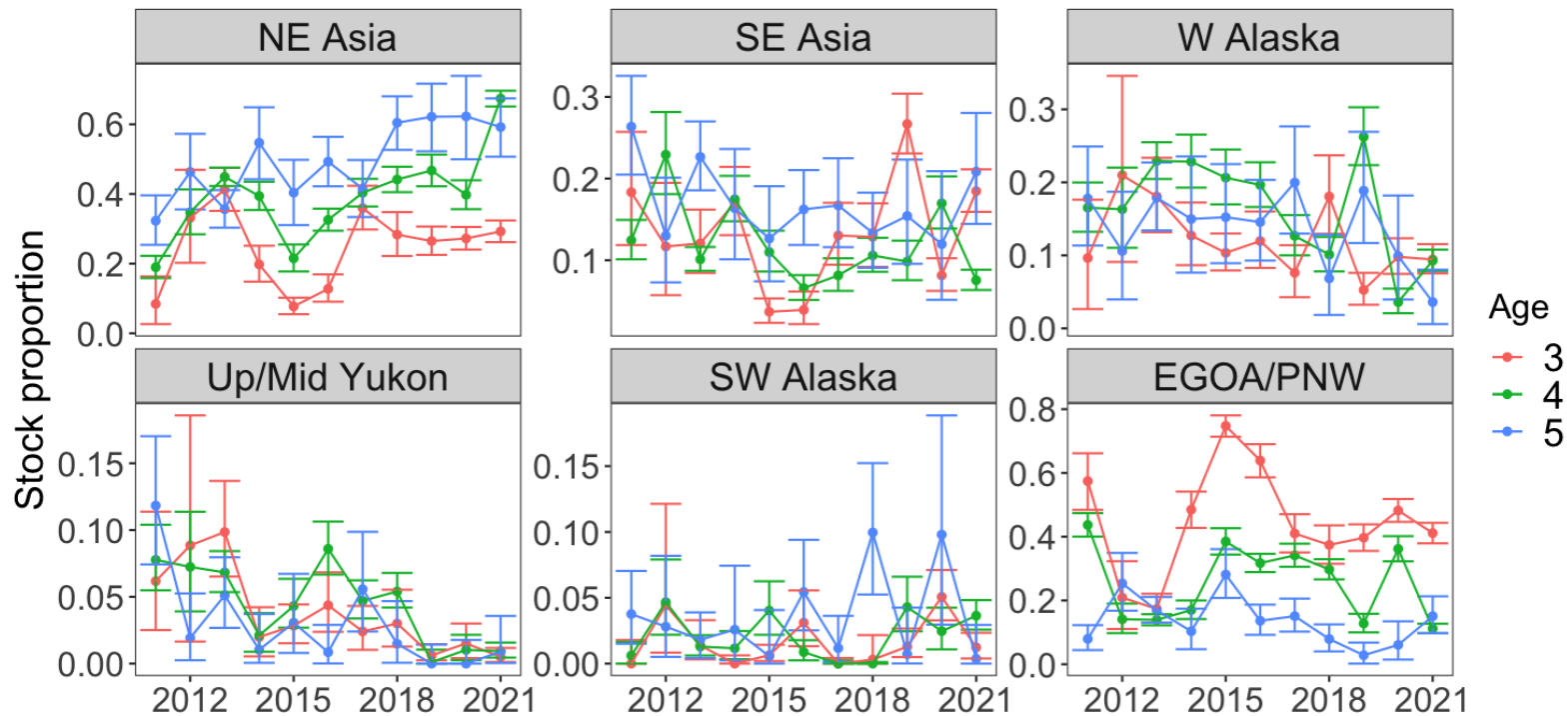


Age
—●— 3

Age-specific analyses



Age-specific analyses



2021 Salmon Excluder Device

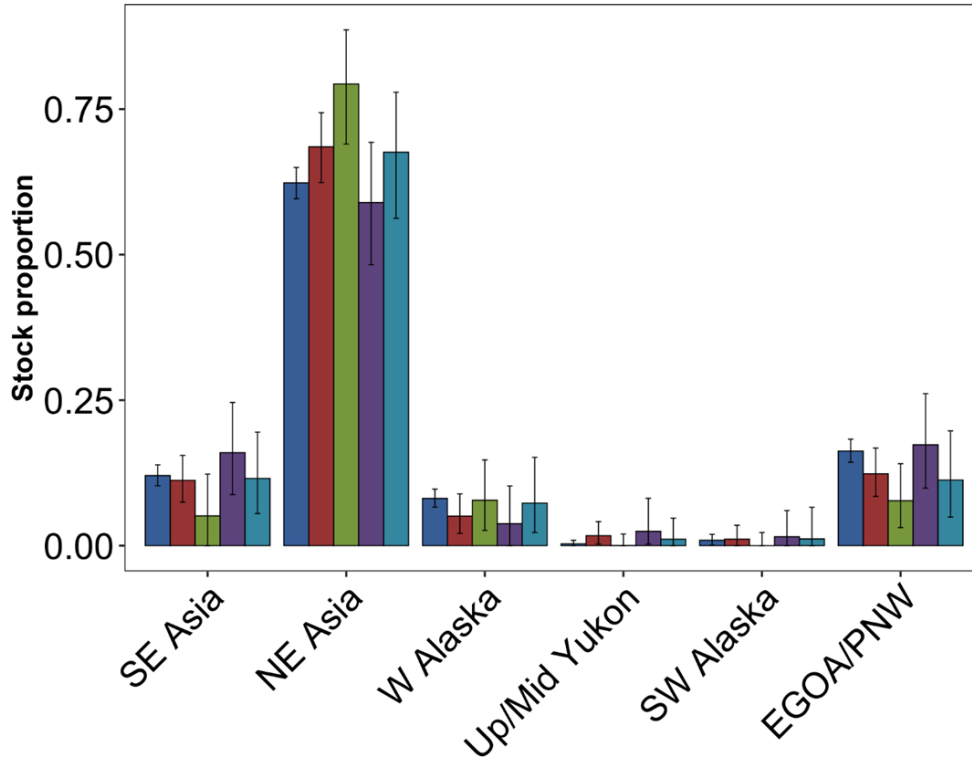
Scientific cruise

July 2021 (Early)

3 Cruises; 7 tows

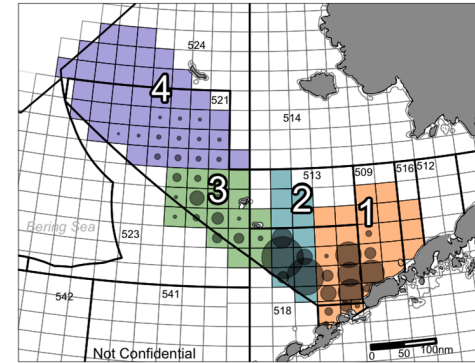
- Are individual tows made up of primarily one reporting group?

Salmon Excluder Device / Single tow estimates



2021 Bering Sea Excluder Samples

- Cluster 2 Early (n=1,457)
- Cruise 4 (n=261)
- Cruise 4 Tow 1 (n=90)
- Cruise 4 Tow 2 (n=93)
- Cruise 4 Tow 3 (n=78)



Summary

Temporal Trends (Early to Late):

- Alaska groups historically decrease; not 2020, 2021
- GOA/PNW fish increase

Spatial Trends (East to West):

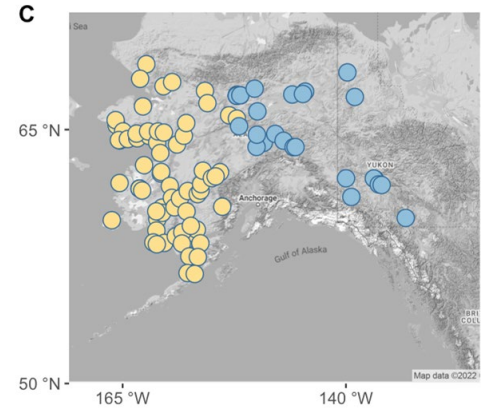
- Asian increase
- EGOA/PNW decrease
- Alaska groups historically decrease; not 2020, 2021

Age Trends:

- GOA/PNW fish are high proportion of younger fish
- NE Asia fish higher proportion of older fish

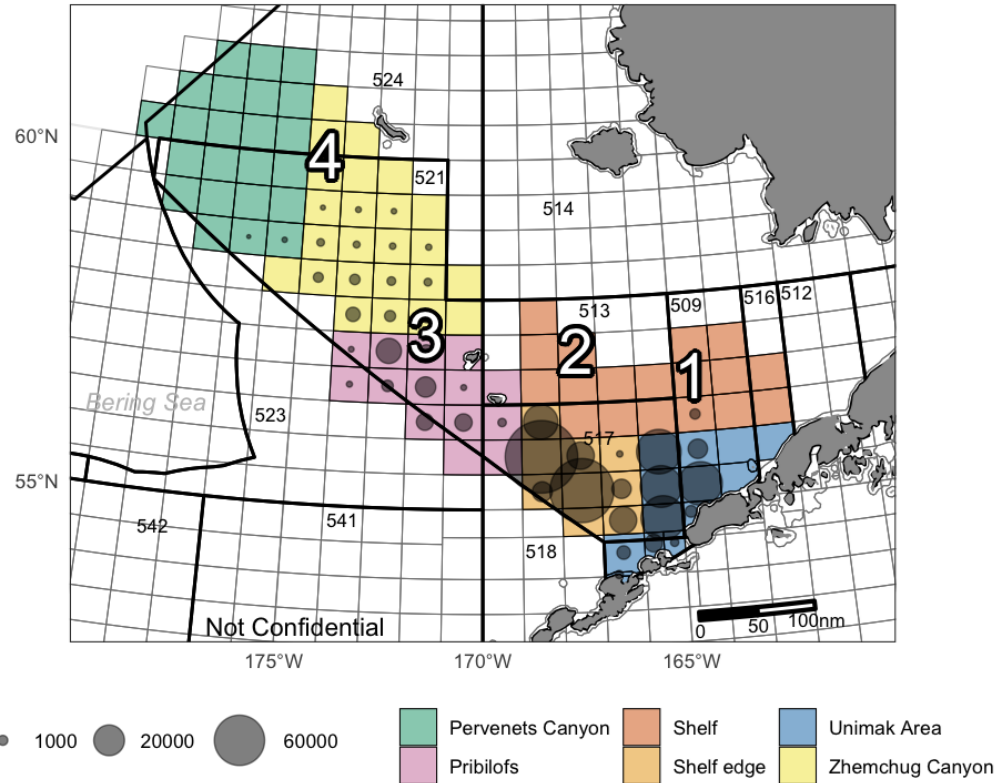
W Alaska & Up/Mid Yukon Summary

- Lower contribution in 2020 and 2021 (9%) than historic average (~20%).
- Mean Bycatch 2011–2019
51,168 (43,081 – 59,788)
- 2020: 30,908 (24,697 – 38,075)
- 2021: 51,510 (44,217 – 59,501)



Future Work

- Analyze new strata - based on fleet fishing behavior
- Stock specific distribution modeling



Collaborative Research

- AFSC ABL - C. Guthrie, Hv. T. Nguyen, E. Yasumiishi
- AFSC FMA - M. Concepcion, B. Mason, J. Cahalan, and a village
- AFSC RACE - Noelle Yochum
- AKFIN - C. Kohler, R. Ames, R. Ryznar, M. Callahan
- ADFG GCL - C. Habicht, K. Shedd, C. Jalbert, E. Lee
- ADFG MTAL - J. Neil, D. Oxman, B. Agler, T. Frawley
- Funding-Pollock conservation cooperative research center, NOAA, additional proposals in progress (AYKSSI)

Questions

patrick.barry@noaa.gov



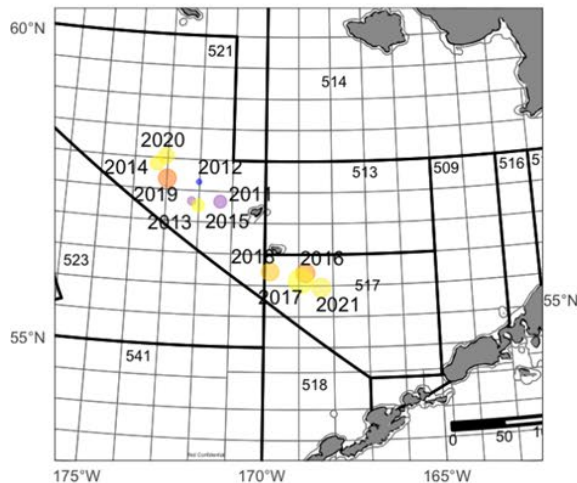
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Extra Slides

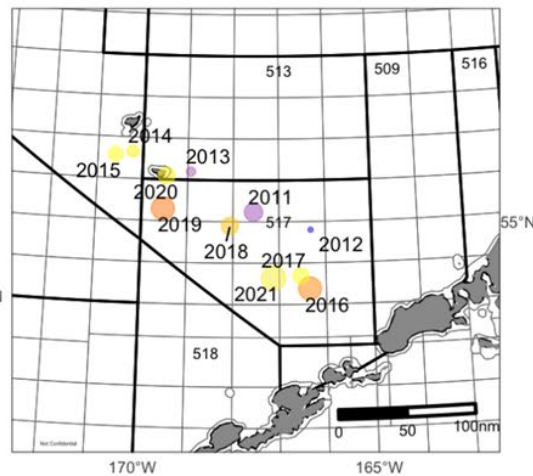


Spatial Distribution SST

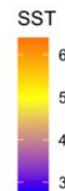
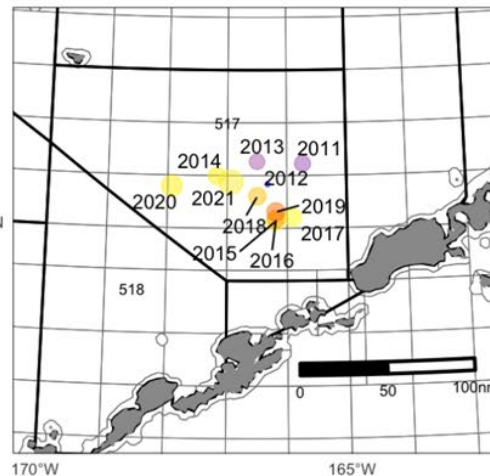
Catcher Processor



Mothership

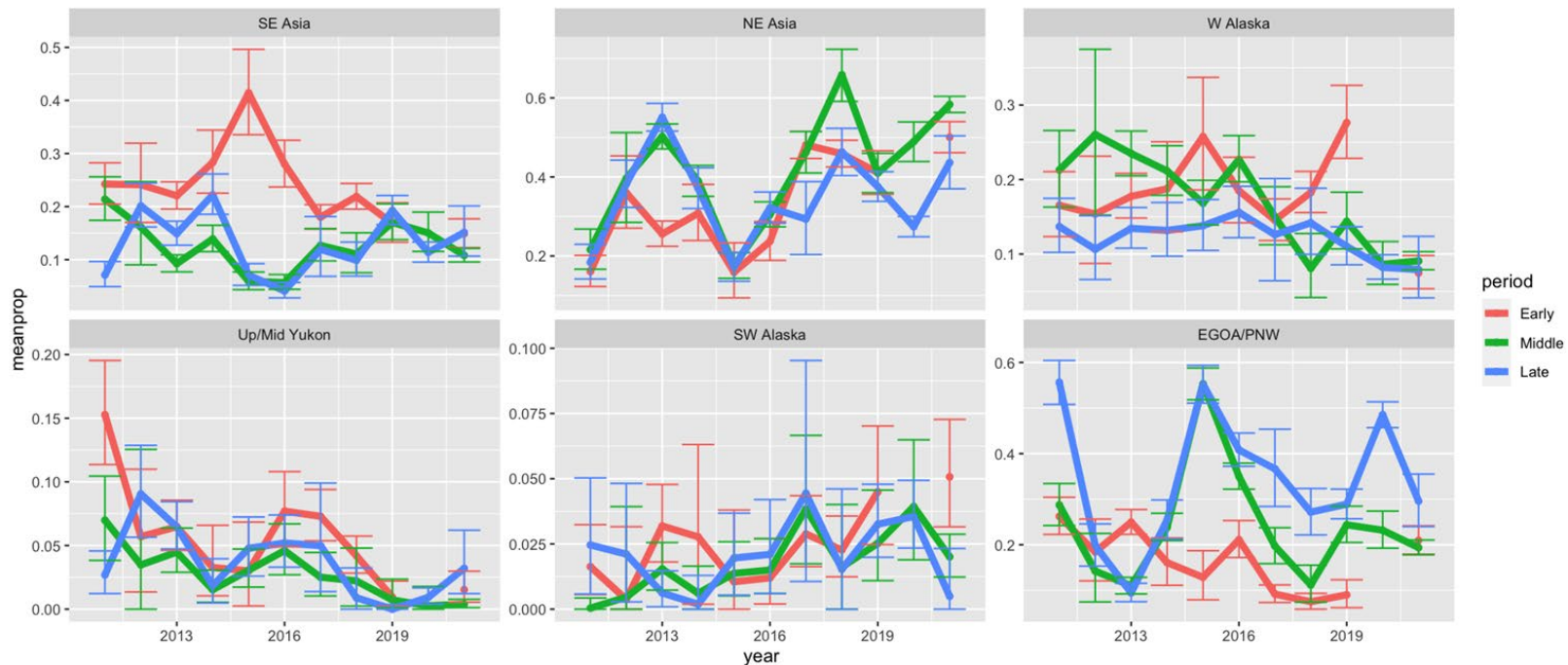


Shoreside



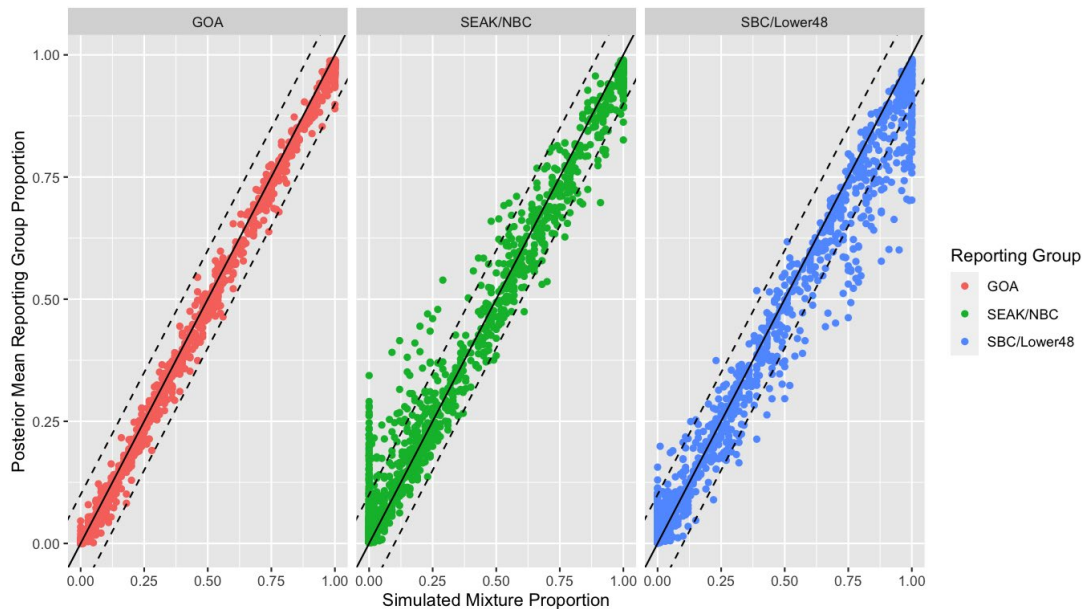
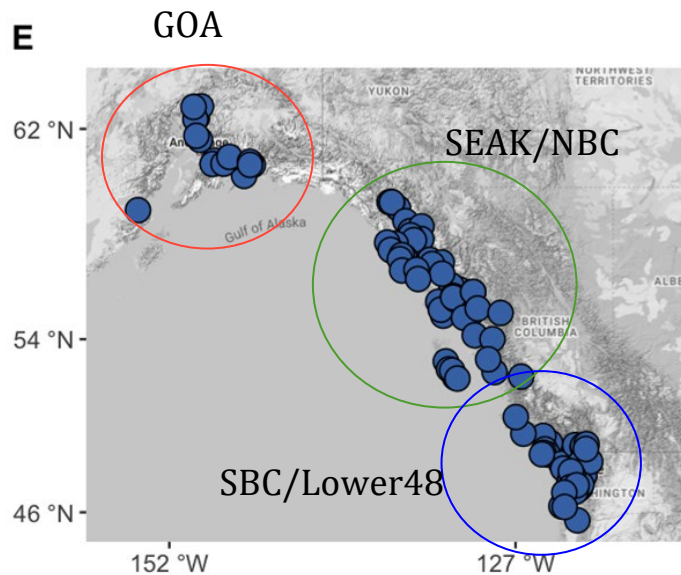
<https://psl.noaa.gov/data/climateindices/>

Temporal Estimates - Early Middle Late



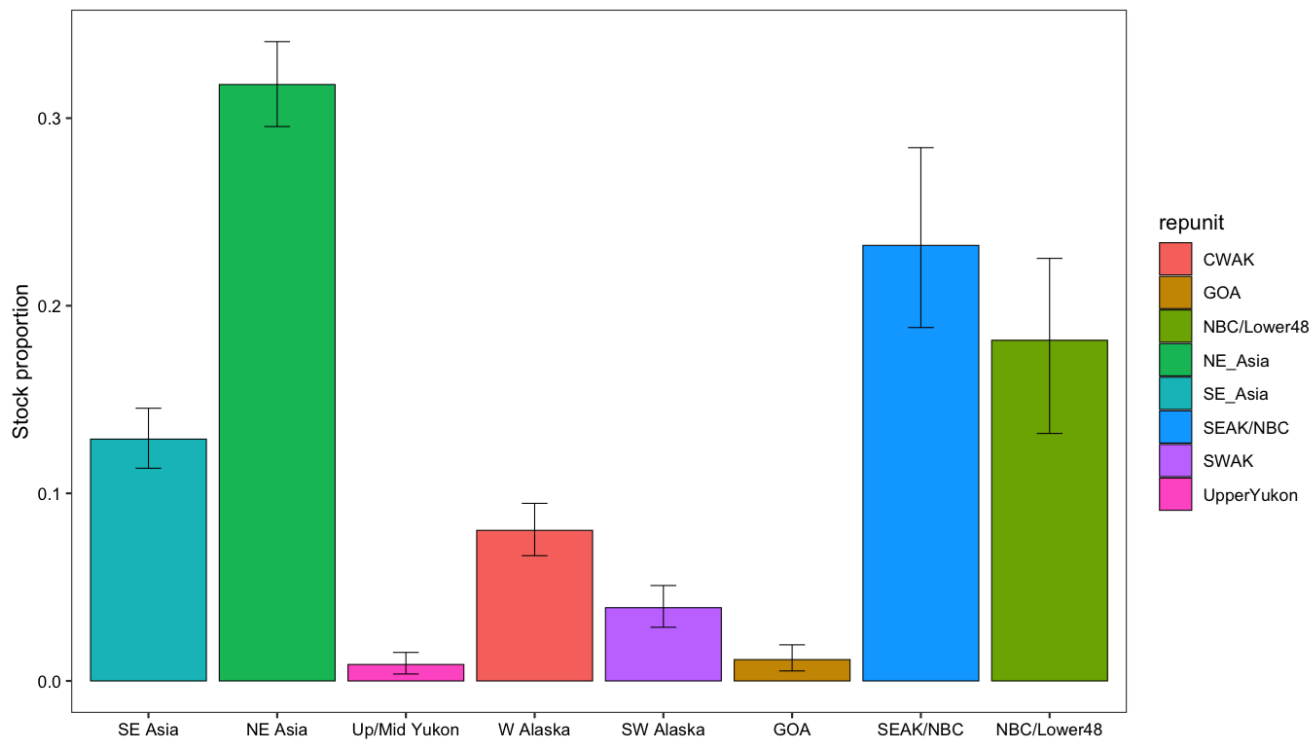
Break Apart EGOA/PNW

E

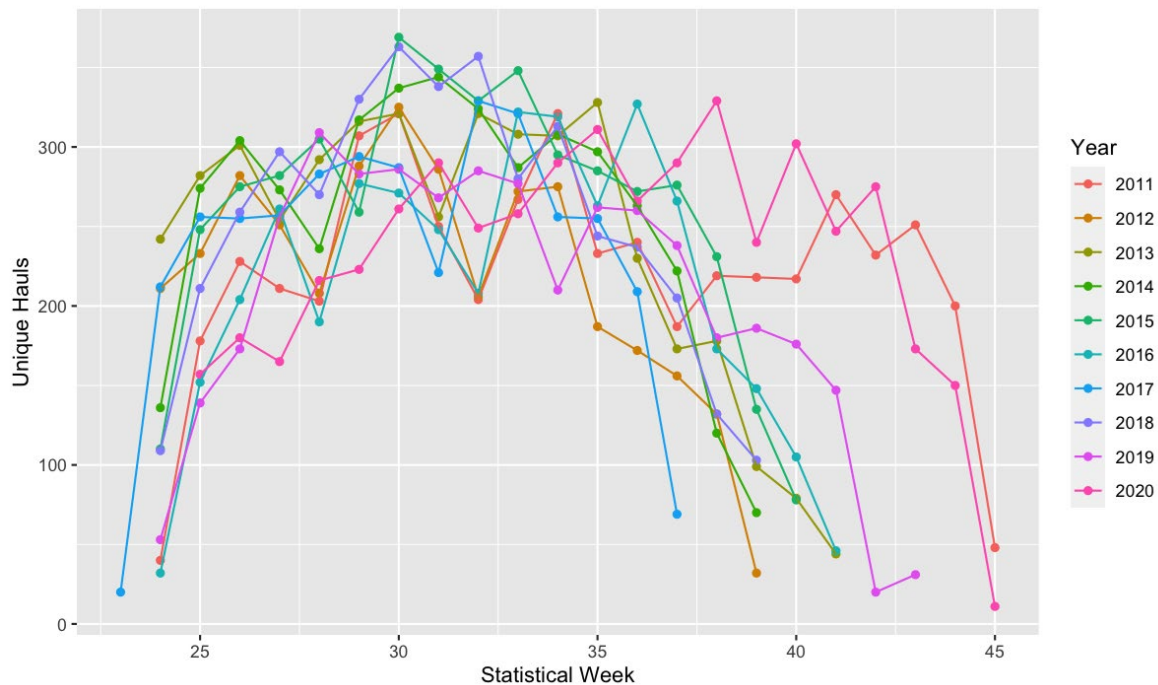


V

SEAK/NBC



Unique Hauls



Chum Salmon 2020 genetic sampling by Vessel

