

A rangewide genetic baseline for improved resolution of Chinook salmon bycatch stock identification



NOAA
FISHERIES



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Fisheries and Oceans
Canada



Templin et al. 2011 Baseline

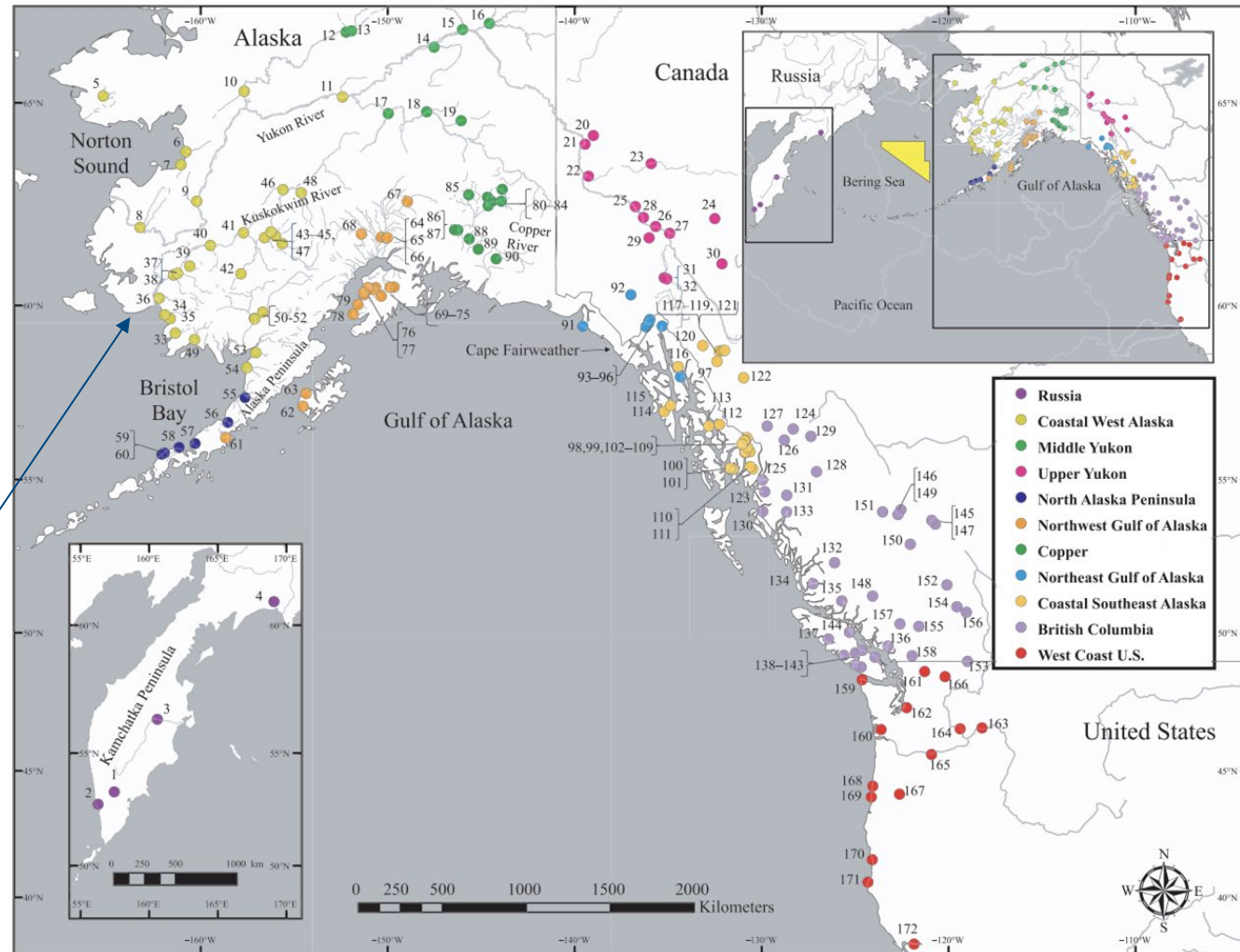
<https://doi.org/10.1111/j.1755-0998.2010.02968.x>

172 collections

37 loci

11 groups

CWAK (yellow)



Barclay et al. (*in prep*) Baseline(s)

Coastwide:

508 populations

81 loci

73 reporting groups

Alaska:

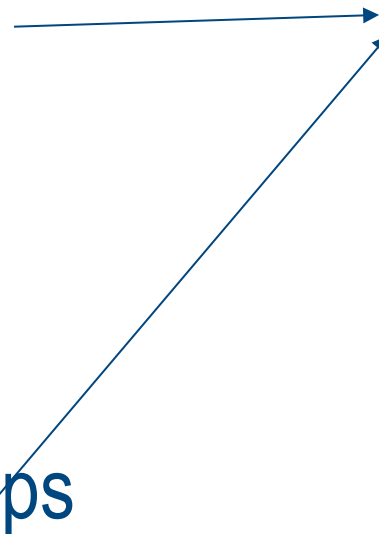
258 populations

233 SNPs

40 reporting groups

**82 fine-scale
reporting groups**

*Able to roll up these
groups into Templin's
11 reporting groups



Coastwide Baseline

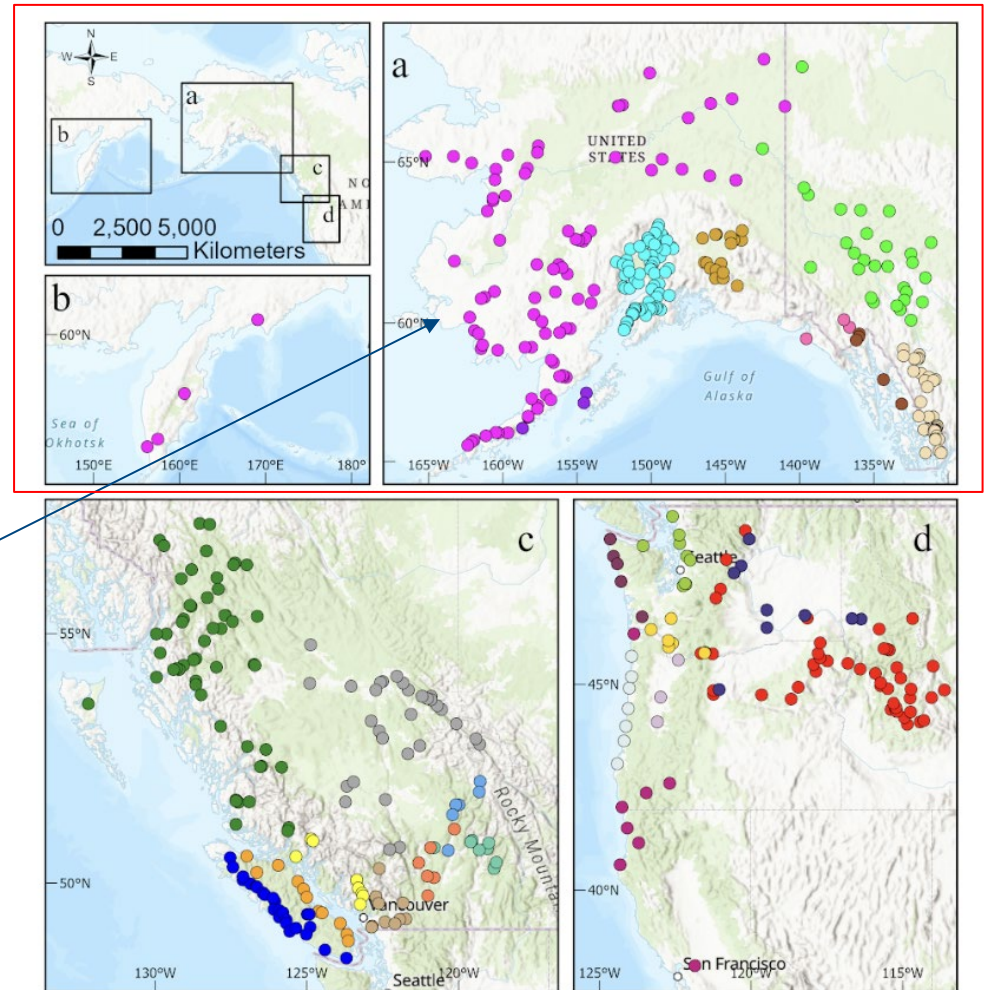
508 populations

81 loci

73 reporting groups

25 broad scale (displayed)

CWAK (pink)



Alaska Baseline

258 populations

233 SNPs

40 reporting groups

14 broad scale

CWAK

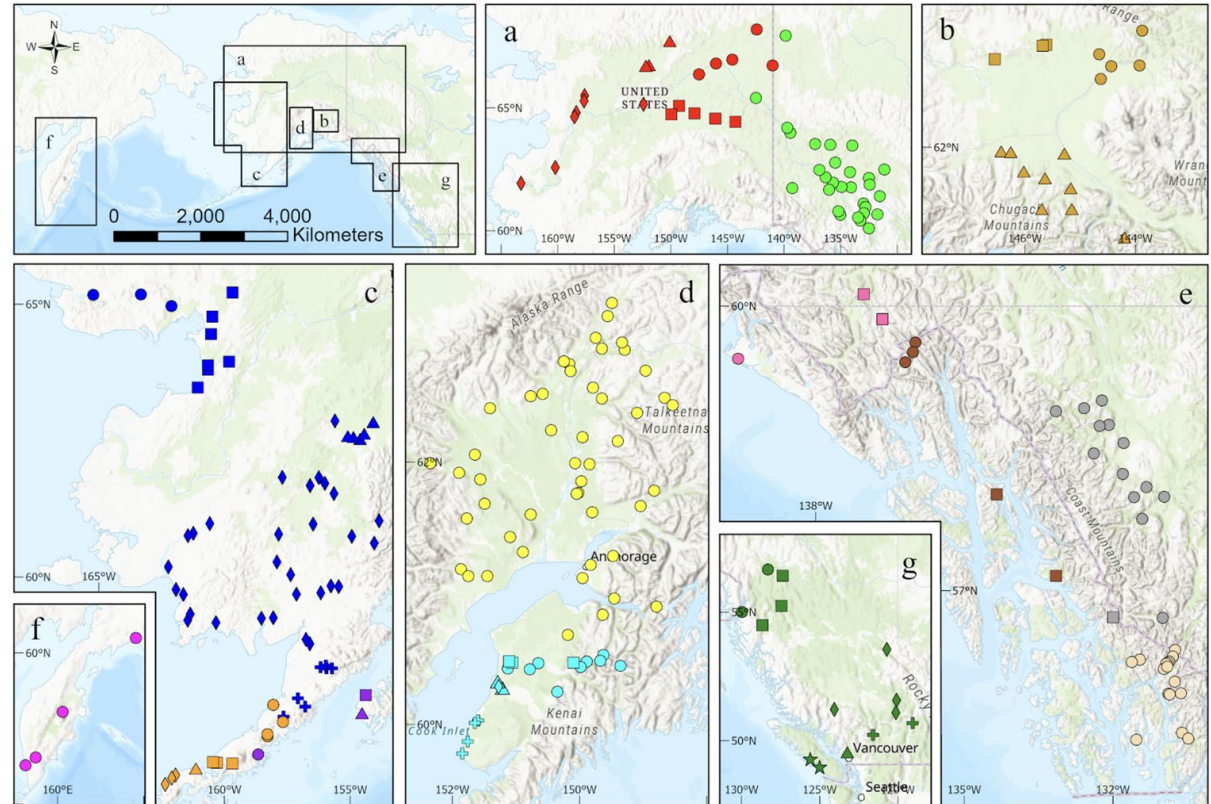
8 groups

N AK Pen

3 groups

NE GOA / SEAK

7 groups



Integrated Multistage GSI

Hsu and Habicht 2024

<https://doi.org/10.1111/eva.13621>

Ms.GSI R package

<https://github.com/boppingshoe/Ms.GSI>

Western Alaska

Yukon Tanana

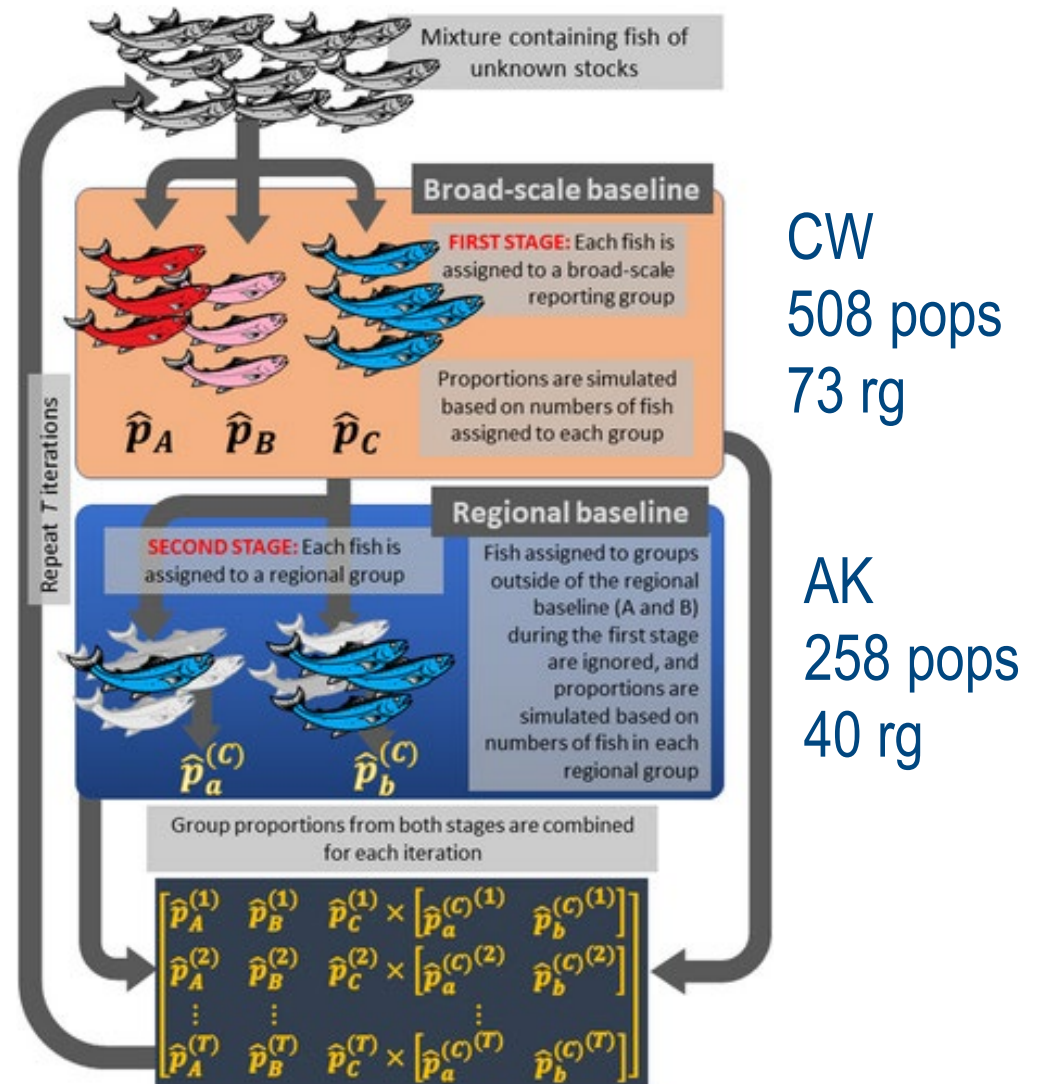
Yukon Koyakuk

Yukon Lower AK

Seward Pen.

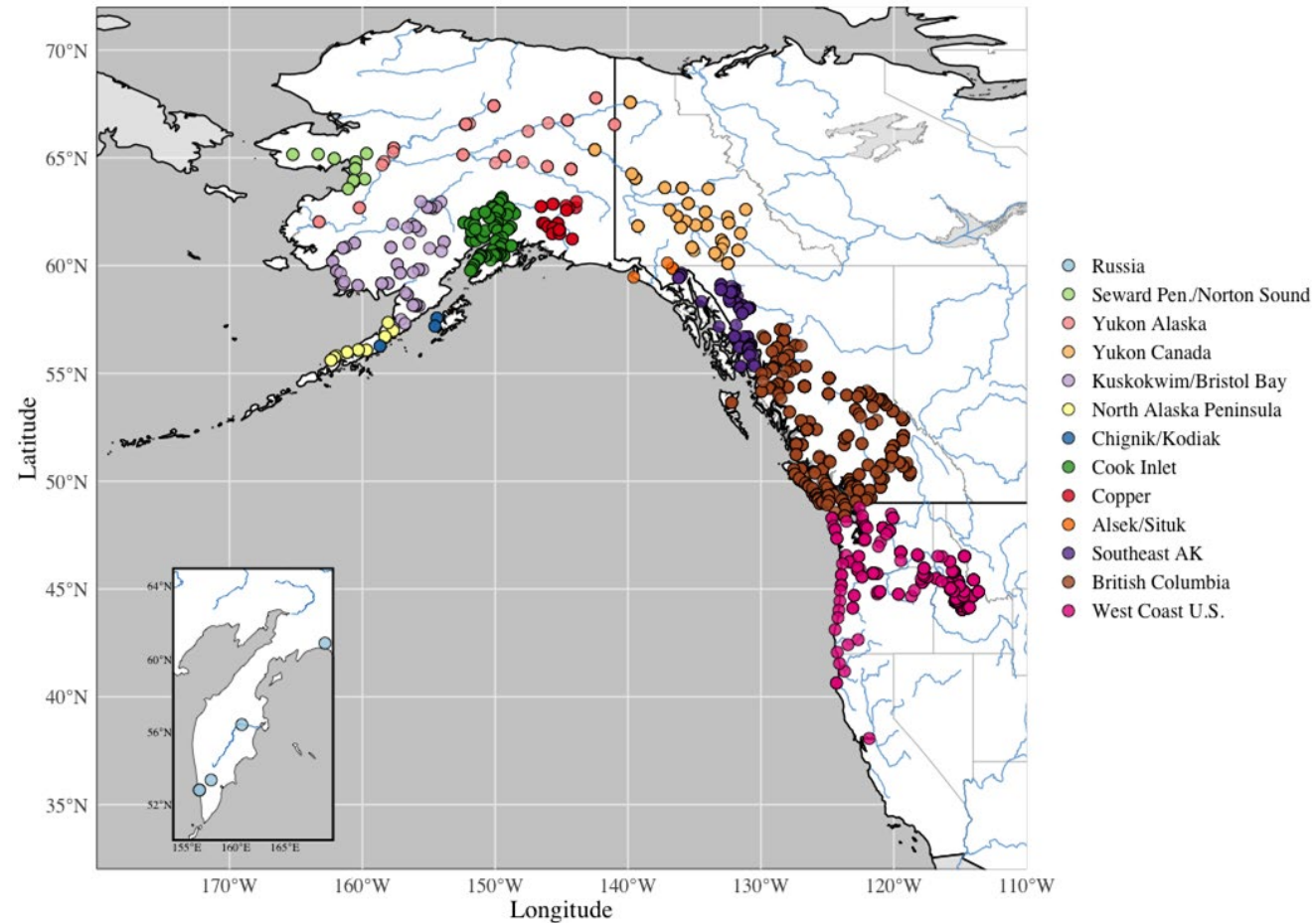
Norton S.

Kuskokwim/Bristol Bay



Baseline Reporting for Bycatch 2024 & 2025

- Baseline is *in prep* for publication
- R package undergoing **active development**
- Prior to publication we will use 13 reporting groups
- Allows for some additional QC before full launch in 2026





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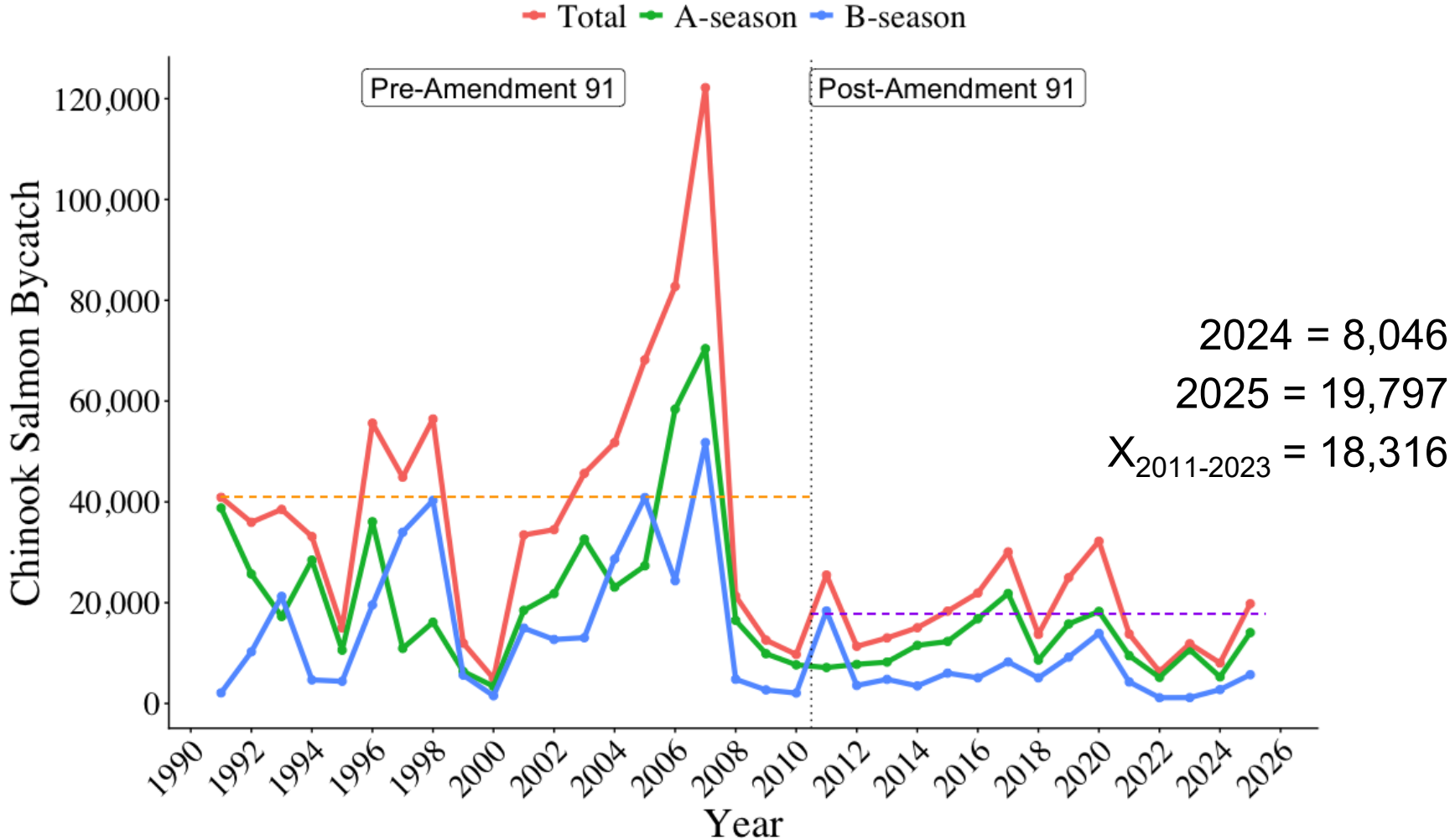
Genetics
Program

Genetic Stock Composition Analysis of Chinook Salmon from the **2024 & 2025** Prohibited Species Catch of the **Bering Sea and Gulf of Alaska** Walleye Pollock Trawl Fisheries

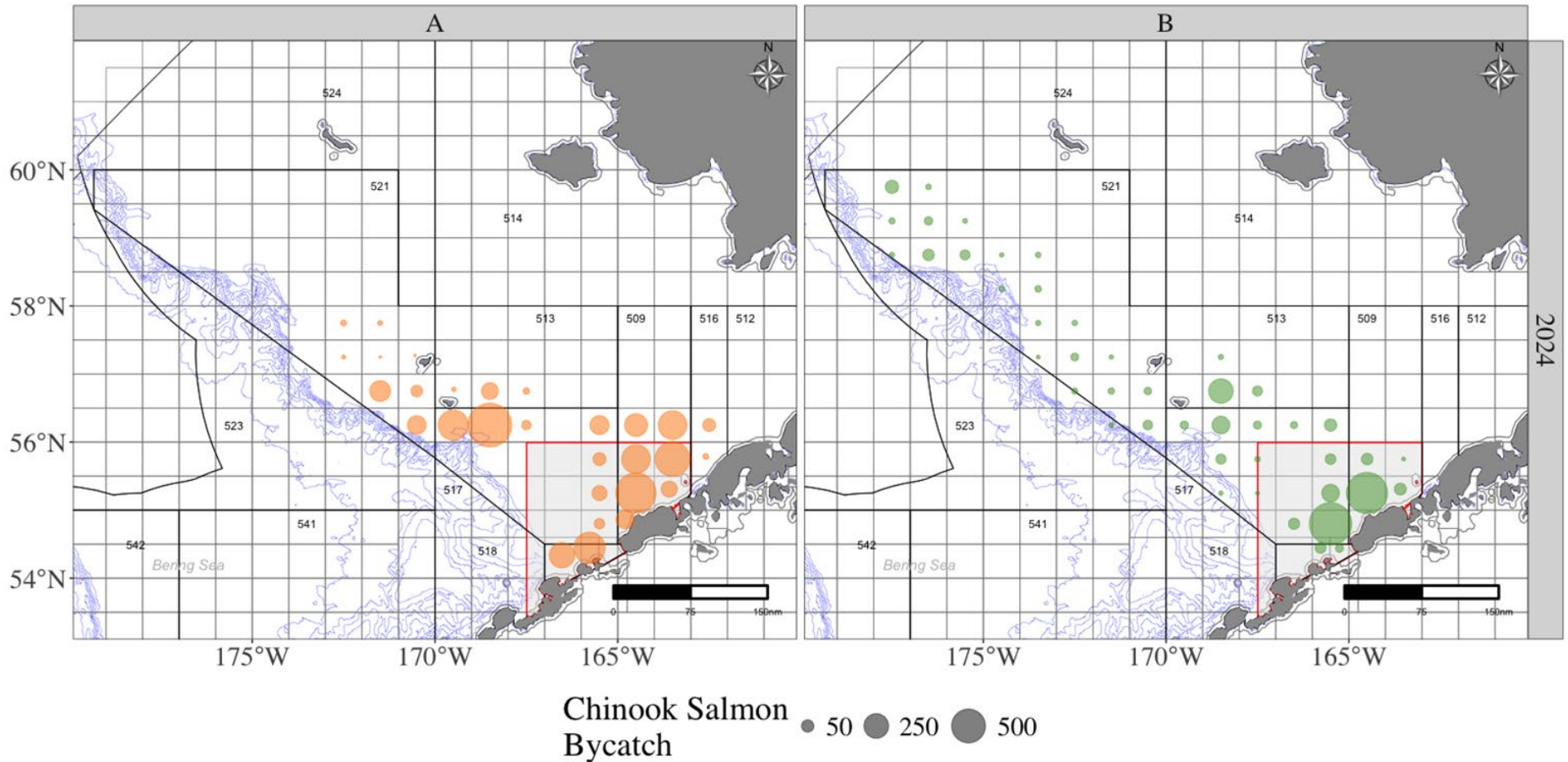


P. Barry, K. D'Amelio, J. Whittle, A. Terpin-Lewis, E.
Boyd-Tucker, J. Whitney, J. Cornett & W. Larson

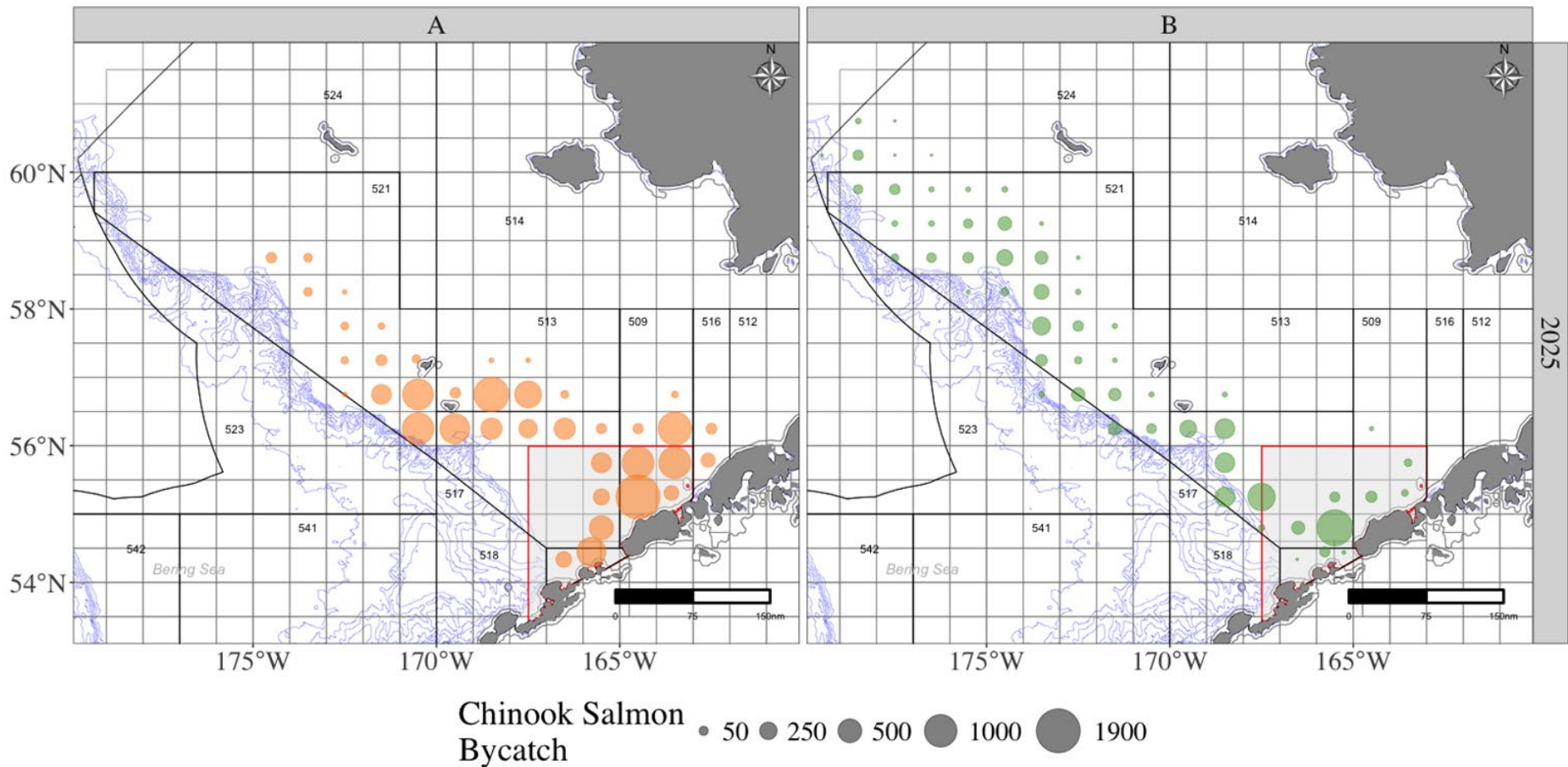
BSAI Chinook Prohibited Species Catch



BSAI 2024 - Spatial distribution of Chinook salmon bycatch



BSAI 2025 - Spatial distribution of Chinook salmon bycatch



BSAI - A season Chinook salmon

Region	2024 (PSC= 5,287, n=512)		
	Est. Number	90% CI	Mean
Russia	10	1-30	0.002
Seward Pen./Norton Sound	46	0-147	0.009
Yukon Alaska	10	0-43	0.002
Yukon Canada	31	10-63	0.006
Kuskokwim/Bristol Bay	2,853	2,645-3,052	0.540
North Alaska Peninsula	1,811	1,634-1,992	0.343
Chignik/Kodiak	1	0-5	0.000
Cook Inlet	2	0-9	0.000
Copper	1	0-5	0.000
Alsek/Situk	1	0-3	0.000
Southeast AK	93	54-145	0.018
British Columbia	364	271-468	0.069
West Coast U.S.	65	29-111	0.012

BSAI - A season Chinook salmon

Region	2024 (PSC= 5,287, n=512)			2025 (PSC= 13,984, n=1228)		
	Est. Number	90% CI	Mean	Est. Number	90% CI	Mean
Russia	10	1-30	0.002	45	17-85	0.003
Seward Pen./Norton Sound	46	0-147	0.009	331	154-515	0.024
Yukon Alaska	10	0-43	0.002	623	440-962	0.045
Yukon Canada	31	10-63	0.006	431	329-546	0.031
Kuskokwim/Bristol Bay	2,853	2,645-3,052	0.540	9,052	8,643-9,423	0.647
North Alaska Peninsula	1,811	1,634-1,992	0.343	2,541	2,295-2,790	0.182
Chignik/Kodiak	1	0-5	0.000	1	0-5	0.000
Cook Inlet	2	0-9	0.000	30	7-64	0.002
Copper	1	0-5	0.000	1	0-5	0.000
Alsek/Situk	1	0-3	0.000	1	0-4	0.000
Southeast AK	93	54-145	0.018	207	137-296	0.015
British Columbia	364	271-468	0.069	589	453-735	0.042
West Coast U.S.	65	29-111	0.012	133	79-202	0.010

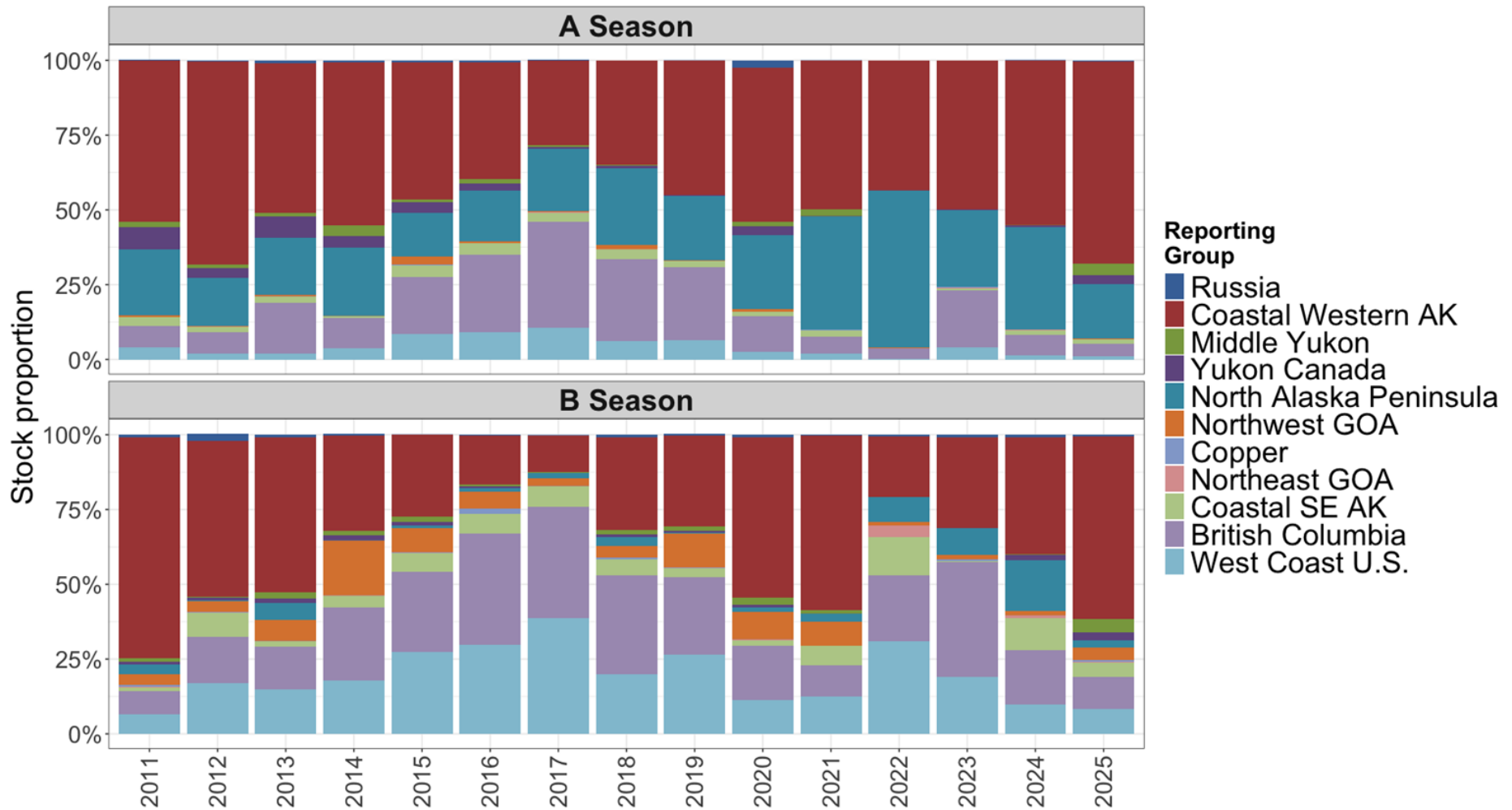
BSAI - B season Chinook salmon

Region	2024 (PSC= 2,762, n=233)		
	Est. Number	90% CI	Mean
Russia	23	5-53	0.008
Seward Pen./Norton Sound	60	0-168	0.022
Yukon Alaska	18	0-69	0.007
Yukon Canada	46	17-86	0.017
Kuskokwim/Bristol Bay	1,011	849-1,173	0.366
North Alaska Peninsula	469	364-582	0.170
Chignik/Kodiak	12	1-34	0.004
Cook Inlet	31	7-67	0.011
Copper	1	0-6	0.000
Alsek/Situk	23	5-53	0.008
Southeast AK	291	217-375	0.105
British Columbia	504	396-622	0.183
West Coast U.S.	272	192-363	0.099

BSAI - B season Chinook salmon

Region	2024 (PSC= 2,762, n=233)			2025 (PSC= 5,813, n=317)		
	Est. Number	90% CI	Mean	Est. Number	90% CI	Mean
Russia	23	5-53	0.008	37	7-86	0.006
Seward Pen./Norton Sound	60	0-168	0.022	4	0-24	0.001
Yukon Alaska	18	0-69	0.007	276	166-410	0.047
Yukon Canada	46	17-86	0.017	152	78-246	0.026
Kuskokwim/Bristol Bay	1,011	849-1,173	0.366	3,529	3,267-3,782	0.607
North Alaska Peninsula	469	364-582	0.170	132	63-221	0.023
Chignik/Kodiak	12	1-34	0.004	37	8-87	0.006
Cook Inlet	31	7-67	0.011	203	117-306	0.035
Copper	1	0-6	0.000	48	11-104	0.008
Alsek/Situk	23	5-53	0.008	9	0-42	0.002
Southeast AK	291	217-375	0.105	272	158-409	0.047
British Columbia	504	396-622	0.183	622	449-816	0.107
West Coast U.S.	272	192-363	0.099	491	356-646	0.085

BSAI - Time Series (Templin et al. Groups)

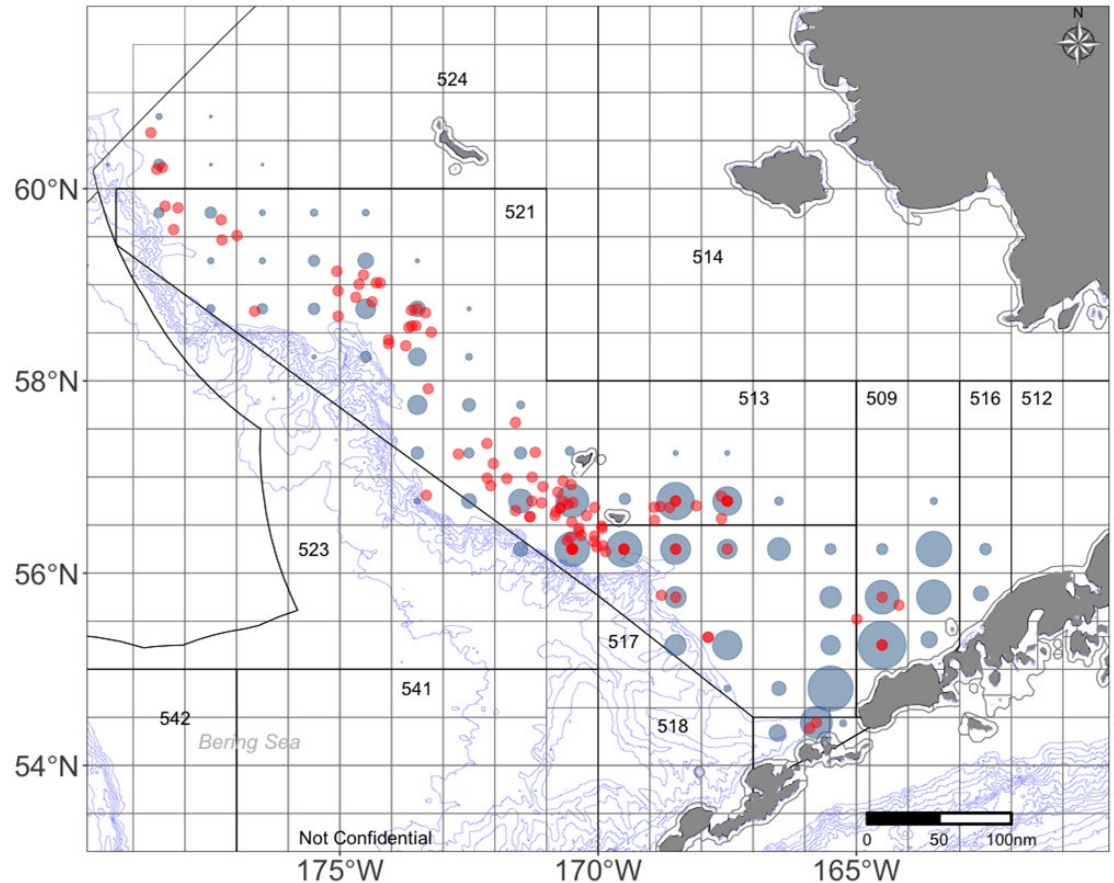


2025 Yukon Chinook Salmon Distribution

Larger proportion of
Yukon fish in 2025
than 2024

Individual Assignment
Yukon (Probability > 0.8)

Mostly West of 170°



Chinook Salmon Bycatch

- 50
- 250
- 500
- 1000
- 1900

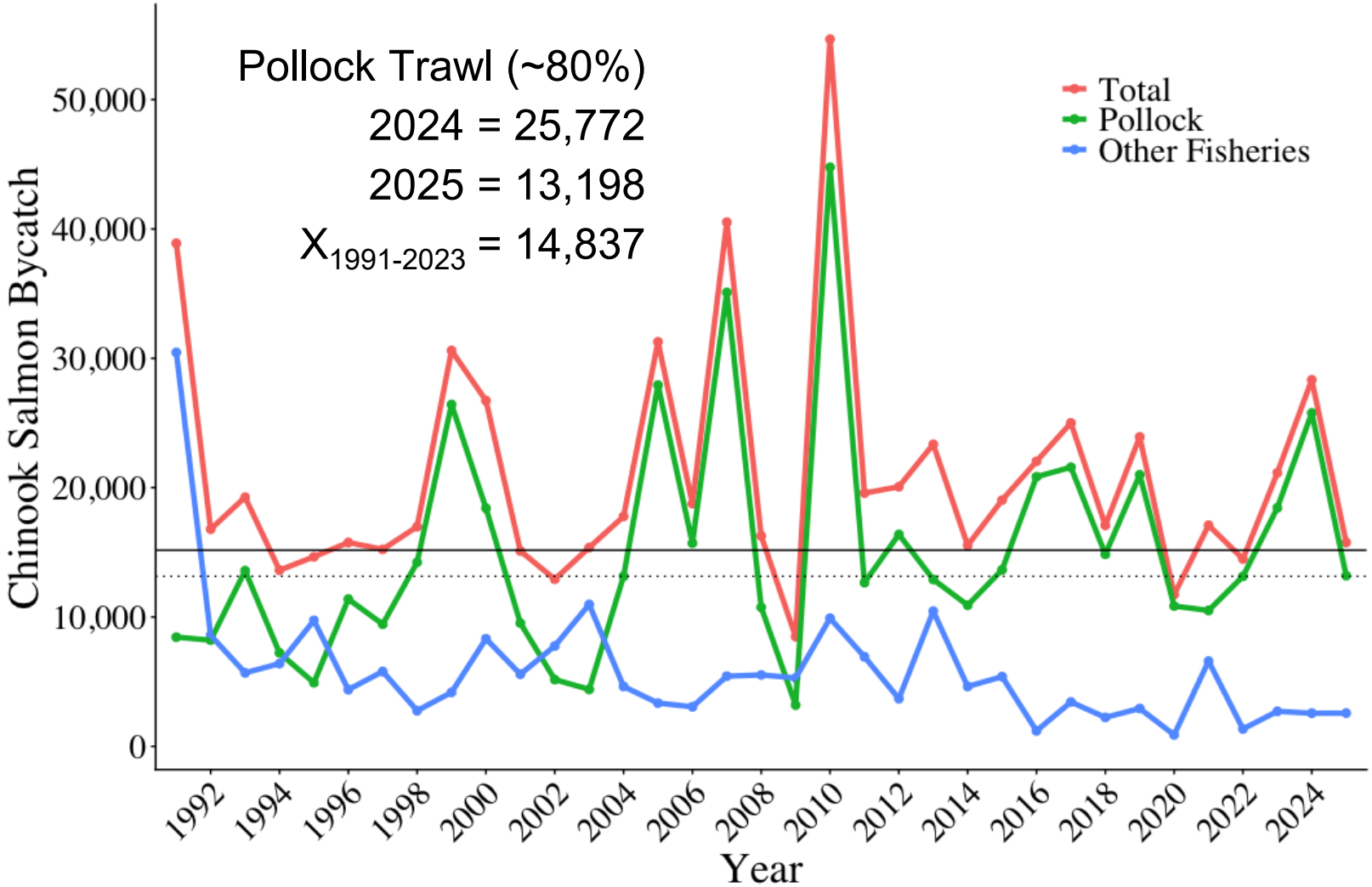
BSAI Summary - Chinook Salmon

Majority of bycatch comes from

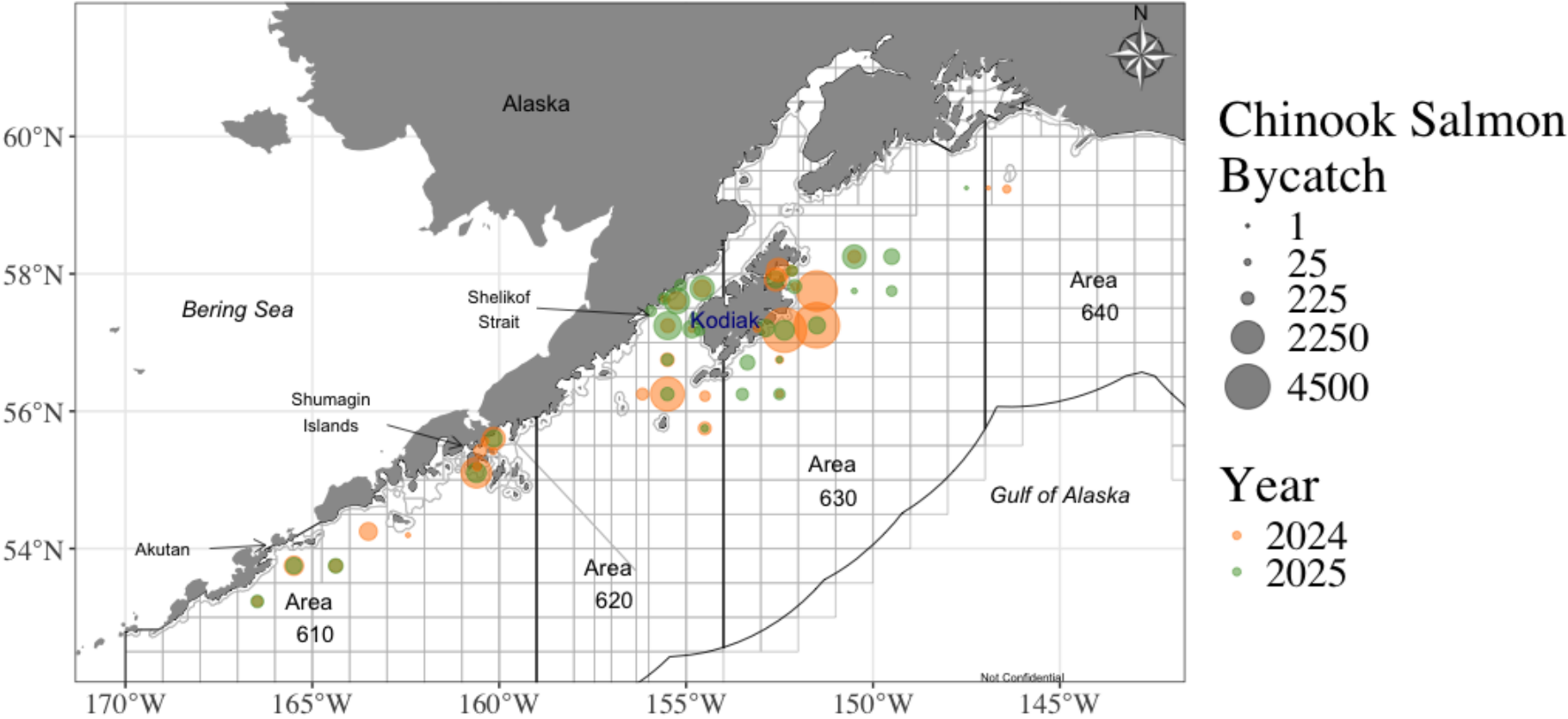
- Lower Kuskokwim/Bristol Bay
- North Alaska Peninsula

Overall similar composition to prior years, with new baseline.

GOA Chinook Prohibited Species Catch



GOA - Spatial distribution of Chinook salmon bycatch



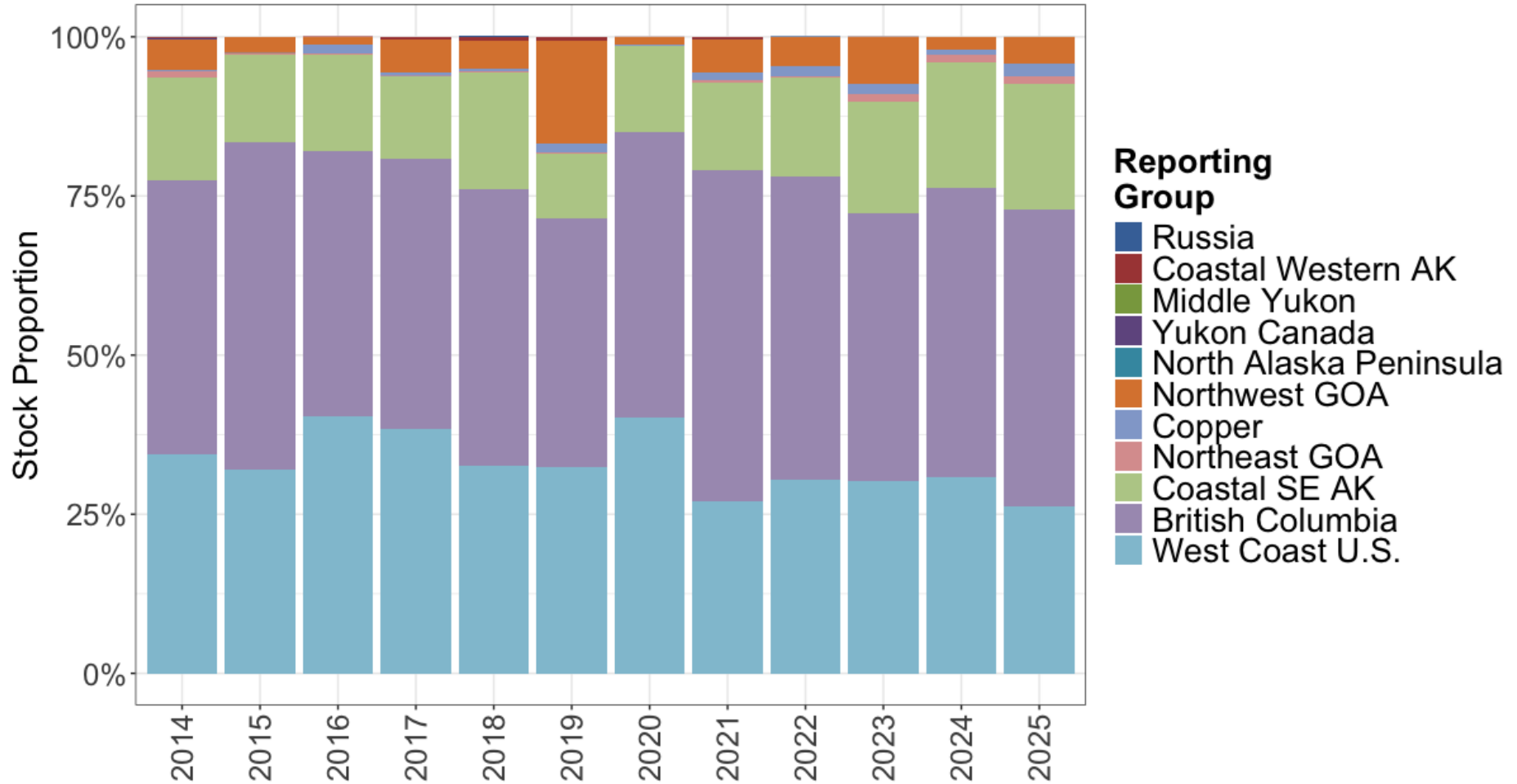
GOA - Chinook salmon bycatch

Region	2024 (PSC= 25,771,n=2542)		
	Est. Number	90% CI	Mean
Russia	0	0-1	0.000
Seward Pen./Norton Sound	0	0-2	0.000
Yukon Alaska	1	0-4	0.000
Yukon Canada	0	0-1	0.000
Kuskokwim/Bristol Bay	1	0-3	0.000
North Alaska Peninsula	1	0-4	0.000
Chignik/Kodiak	42	20-71	0.002
Cook Inlet	457	372-552	0.018
Copper	205	150-268	0.008
Alsek/Situk	69	40-107	0.003
Southeast AK	5,329	4,960-5,713	0.207
British Columbia	11,710	11,236-12,186	0.454
West Coast U.S.	7,955	7,584-8,330	0.309

GOA - Chinook salmon bycatch

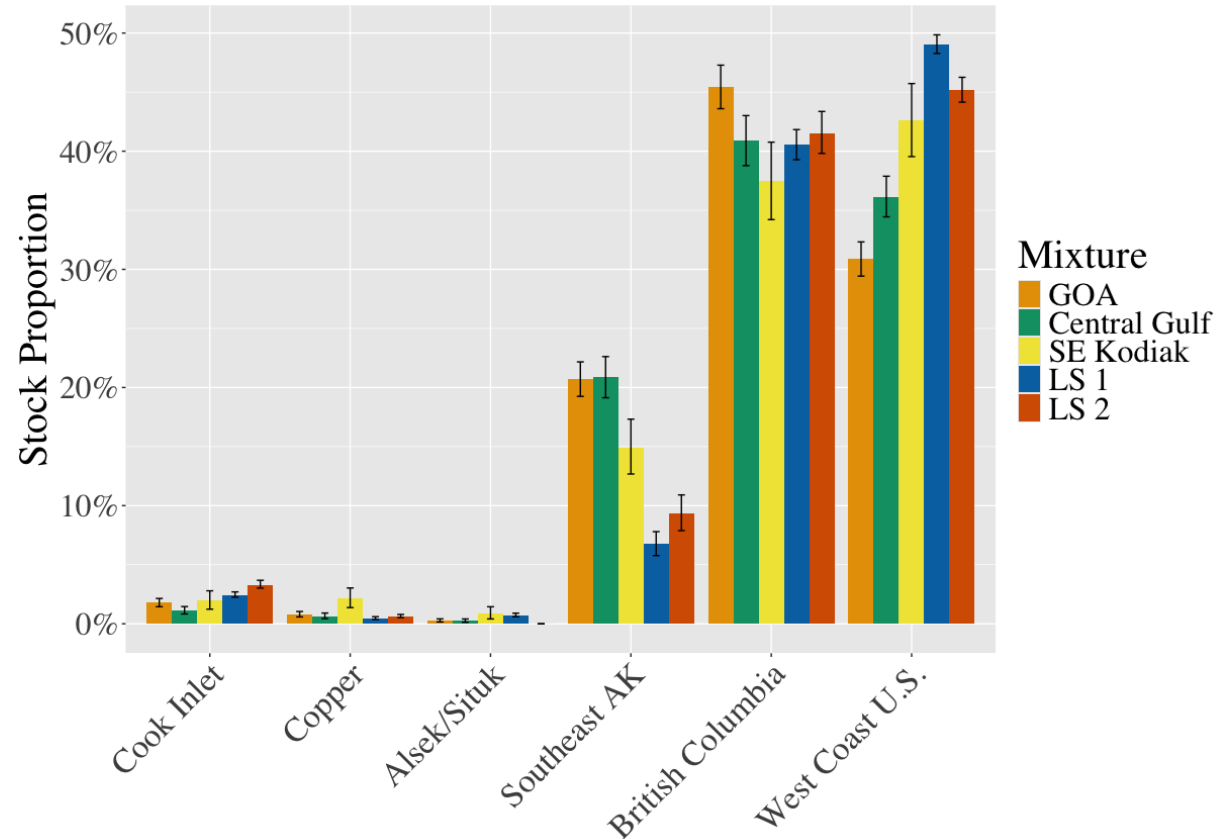
Region	2024 (PSC= 25,771,n=2542)			2025 (PSC= 13,197,n=1099)		
	Est. Number	90% CI	Mean	Est. Number	90% CI	Mean
Russia	0	0-1	0.000	0	0-1	0.000
Seward Pen./Norton Sound	0	0-2	0.000	1	0-3	0.000
Yukon Alaska	1	0-4	0.000	1	0-6	0.000
Yukon Canada	0	0-1	0.000	0	0-1	0.000
Kuskokwim/Bristol Bay	1	0-3	0.000	1	0-4	0.000
North Alaska Peninsula	1	0-4	0.000	1	0-6	0.000
Chignik/Kodiak	42	20-71	0.002	29	9-59	0.002
Cook Inlet	457	372-552	0.018	531	425-647	0.040
Copper	205	150-268	0.008	243	174-322	0.018
Alsek/Situk	69	40-107	0.003	28	8-59	0.002
Southeast AK	5,329	4,960-5,713	0.207	2,751	2,506-3,002	0.208
British Columbia	11,710	11,236-12,186	0.454	6,157	5,824-6,496	0.467
West Coast U.S.	7,955	7,584-8,330	0.309	3,453	3,182-3,738	0.262

GOA - Chinook salmon bycatch 2014-2025



‘Lightning strike’ hauls that closed the central gulf fishery in 2024

- Press Release by AGDB described events
- Fish similar in size; potentially same cohort of single stock
- Lightning strike (LS) catches similar in composition to larger spatial/temporal aggregation of hauls



GOA Summary - Chinook Salmon

Majority (95%) of bycatch comes from

- SEAK (~21%)
- BC (~46%)
- West Coast US (~28%)
- Cook Inlet & Copper comprise remainder (3-5%)
- No bycatch of AYK stocks

Overall similar composition to prior years, with new baseline.

Acknowledgements

Fisheries Observers: Over 140 observers deployed sampling over 17,500 haul/deliveries

FMA: M. Concepcion, M. Ruge, B. Mason, R. Ramirez, M. Vector

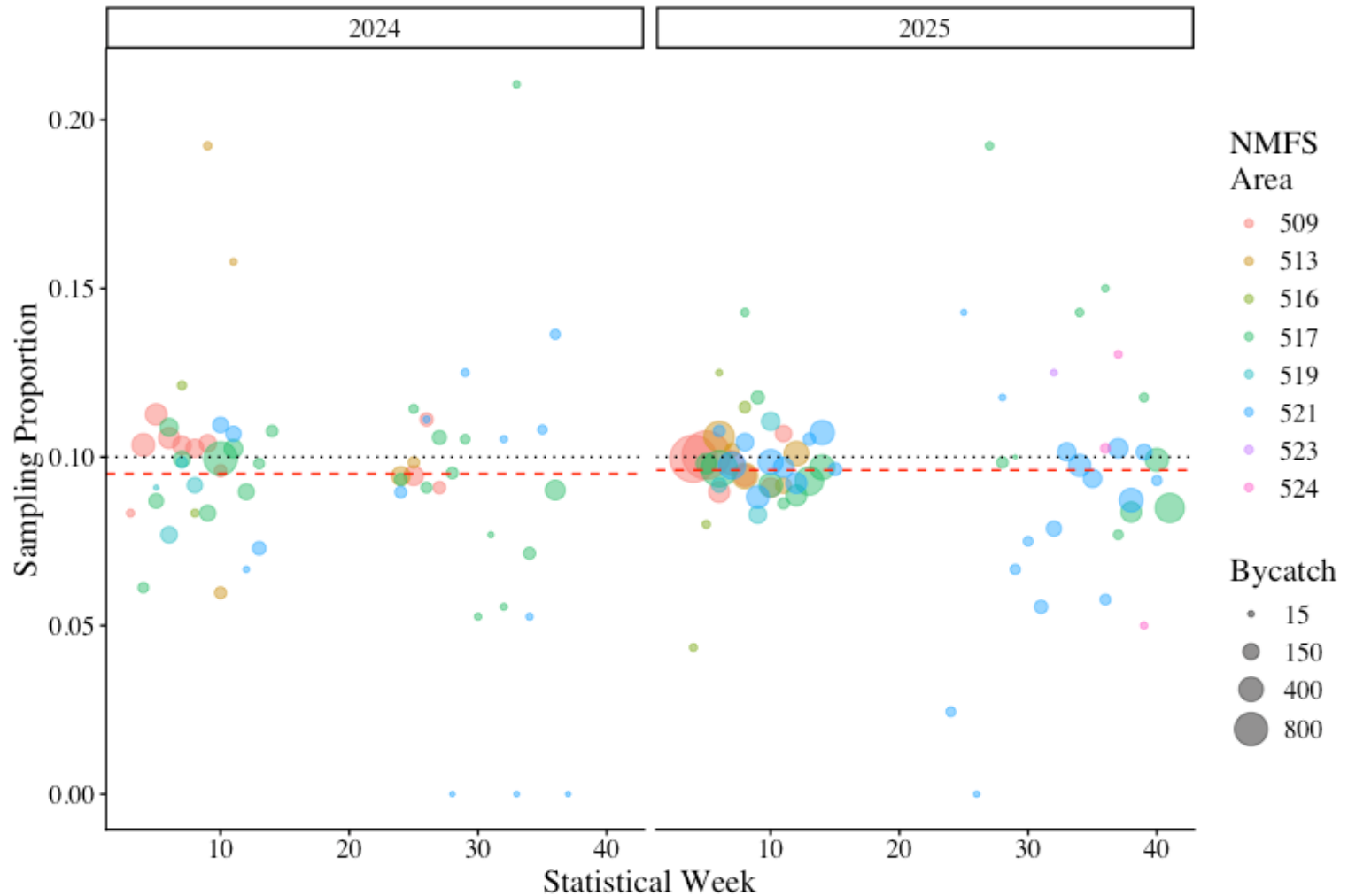
AKFIN: R. Ames, C. Kohler, M. Callahan, R. Ryzner

ADF&G GCL: L. Lee, A. Barclay, S. Gilk-Baumer, K. Shedd, B. Hsu

Chinook Salmon GSI 2024 & 2025

Extra Slides

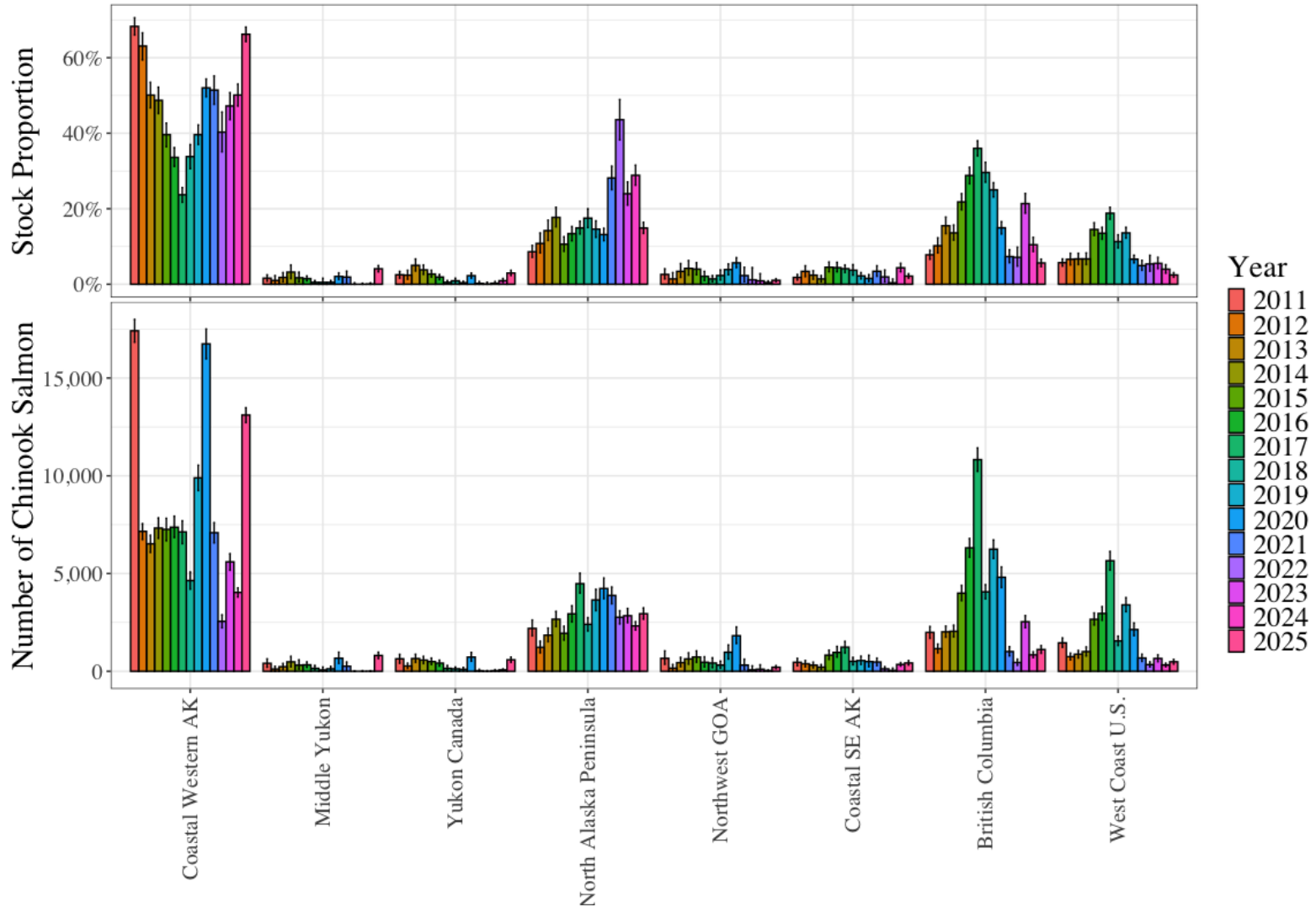
BSAI Sampling Coverage



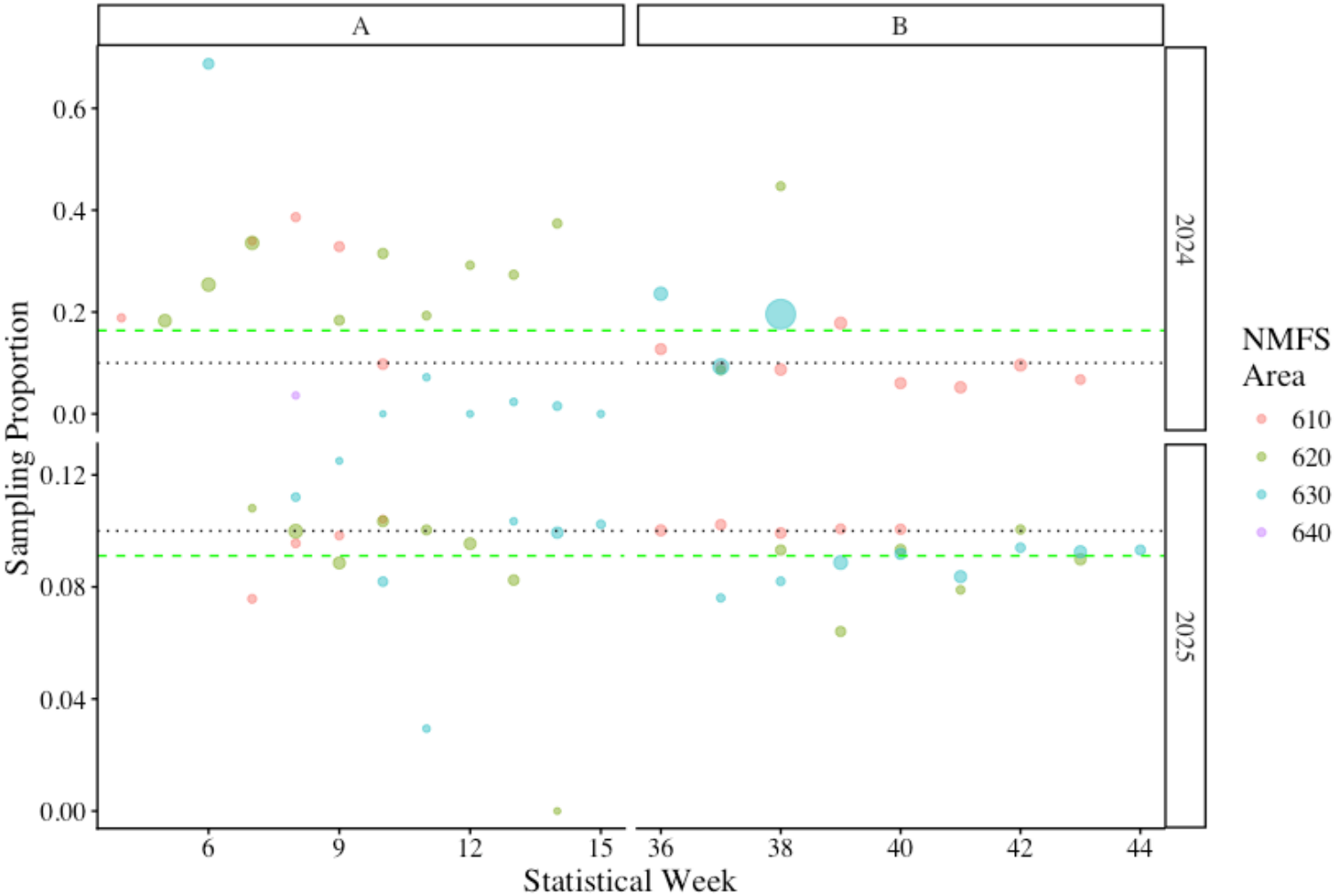
BSAI Chinook Annual Estimates

Region	Est. num.	Est. CI	Mean	5%	95%	Z=0
2024: PSC = 8,049, n = 745						
Russia	32	10-65	0.004	0.001	0.008	0.00
Seward Pen./Norton Sound	106	0-269	0.013	0.000	0.033	0.15
Yukon Alaska	12	0-55	0.002	0.000	0.007	0.40
Yukon Canada	74	37-123	0.009	0.005	0.015	0.00
Kuskokwim/Bristol Bay	3,920	3,645-4,189	0.487	0.453	0.520	0.00
North Alaska Peninsula	2,322	2,110-2,540	0.288	0.262	0.316	0.00
Chignik/Kodiak	11	1-32	0.001	0.000	0.004	0.00
Cook Inlet	24	5-54	0.003	0.001	0.007	0.00
Copper	1	0-5	0.000	0.000	0.001	0.81
Alsek/Situk	21	4-49	0.003	0.000	0.006	0.00
Southeast AK	362	274-460	0.045	0.034	0.057	0.00
British Columbia	842	696-1,000	0.105	0.086	0.124	0.00
West Coast U.S.	321	235-417	0.040	0.029	0.052	0.00
2025: PSC = 19,797, n = 1,545						
Russia	77	36-131	0.004	0.002	0.007	0.00
Seward Pen./Norton Sound	442	225-676	0.022	0.011	0.034	0.00
Yukon Alaska	856	661-1,116	0.043	0.033	0.056	0.00
Yukon Canada	588	456-731	0.030	0.023	0.037	0.00
Kuskokwim/Bristol Bay	12,619	12,153-13,062	0.637	0.614	0.660	0.00
North Alaska Peninsula	2,945	2,662-3,247	0.149	0.134	0.164	0.00
Chignik/Kodiak	27	6-62	0.001	0.000	0.003	0.00
Cook Inlet	180	113-262	0.009	0.006	0.013	0.00
Copper	34	7-75	0.002	0.000	0.004	0.00
Alsek/Situk	6	0-29	0.000	0.000	0.001	0.51
Southeast AK	426	318-553	0.022	0.016	0.028	0.00
British Columbia	1,113	919-1,316	0.056	0.046	0.066	0.00
West Coast U.S.	485	367-613	0.025	0.019	0.031	0.00

BSAI - Templin Groups 2011-2025



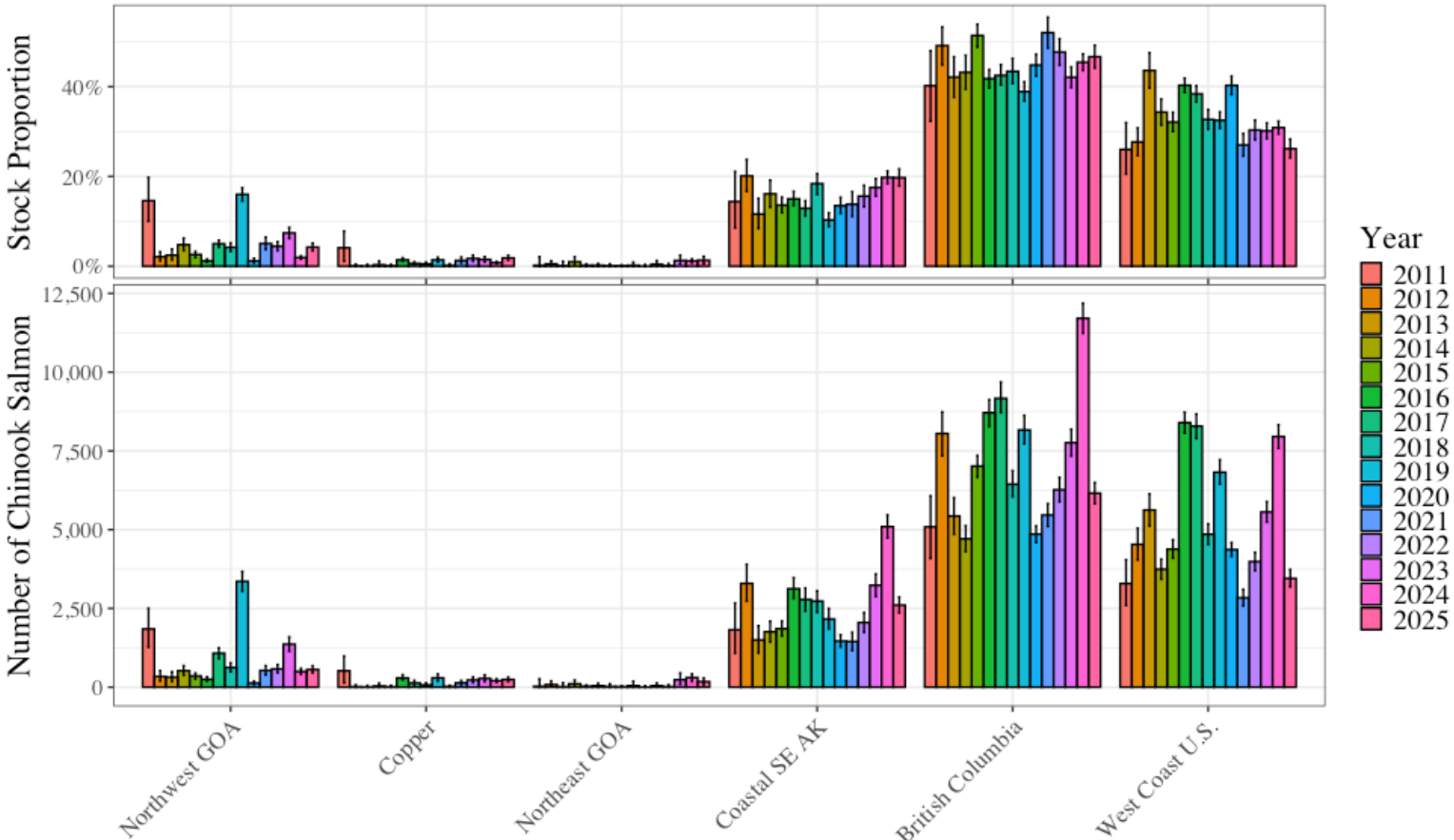
GOA Sampling Coverage



GOA Annual

Region	Est. num.	Est. CI	Mean	5%	95%	Z=0
2024: PSC = 25,771, n = 2,542						
Russia	0	0-1	0.000	0.000	0.000	0.94
Seward Pen./Norton Sound	0	0-2	0.000	0.000	0.000	0.89
Yukon Alaska	1	0-4	0.000	0.000	0.000	0.80
Yukon Canada	0	0-1	0.000	0.000	0.000	0.94
Kuskokwim/Bristol Bay	1	0-3	0.000	0.000	0.000	0.84
North Alaska Peninsula	1	0-4	0.000	0.000	0.000	0.80
Chignik/Kodiak	42	20-71	0.002	0.001	0.003	0.00
Cook Inlet	457	372-552	0.018	0.014	0.021	0.00
Copper	205	150-268	0.008	0.006	0.010	0.00
Alsek/Situk	69	40-107	0.003	0.002	0.004	0.00
Southeast AK	5,329	4,960-5,713	0.207	0.192	0.222	0.00
British Columbia	11,710	11,236-12,186	0.454	0.436	0.473	0.00
West Coast U.S.	7,955	7,584-8,330	0.309	0.294	0.323	0.00
2025: PSC = 13,197, n = 1,099						
Russia	0	0-1	0.000	0.000	0.000	0.94
Seward Pen./Norton Sound	1	0-3	0.000	0.000	0.000	0.87
Yukon Alaska	1	0-6	0.000	0.000	0.000	0.78
Yukon Canada	0	0-1	0.000	0.000	0.000	0.93
Kuskokwim/Bristol Bay	1	0-4	0.000	0.000	0.000	0.82
North Alaska Peninsula	1	0-6	0.000	0.000	0.000	0.77
Chignik/Kodiak	29	9-59	0.002	0.001	0.004	0.00
Cook Inlet	531	425-647	0.040	0.032	0.049	0.00
Copper	243	174-322	0.018	0.013	0.024	0.00
Alsek/Situk	28	8-59	0.002	0.001	0.004	0.00
Southeast AK	2,751	2,506-3,002	0.208	0.190	0.227	0.00
British Columbia	6,157	5,824-6,496	0.467	0.441	0.492	0.00
West Coast U.S.	3,453	3,182-3,738	0.262	0.241	0.283	0.00

GOA – Templin Groups 2011-2025



GOA Spatial

