

Genetic Stock Composition of Chum Salmon Harvested in Commercial Salmon Fisheries of the South Alaska Peninsula, 2022

UPDATED 2-21-2023

Oral Report: RC #3; Tab #9

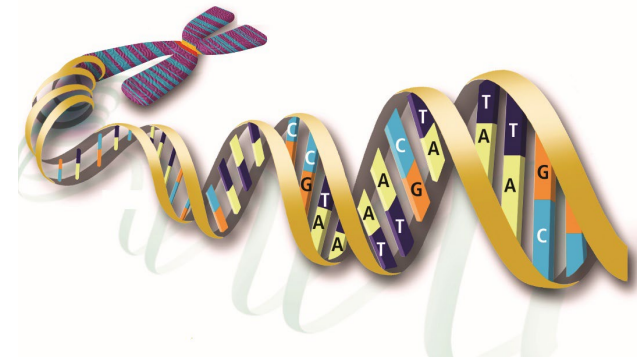


**A Report to the Alaska Board of
Fisheries**

February 2023

Division of Commercial Fisheries

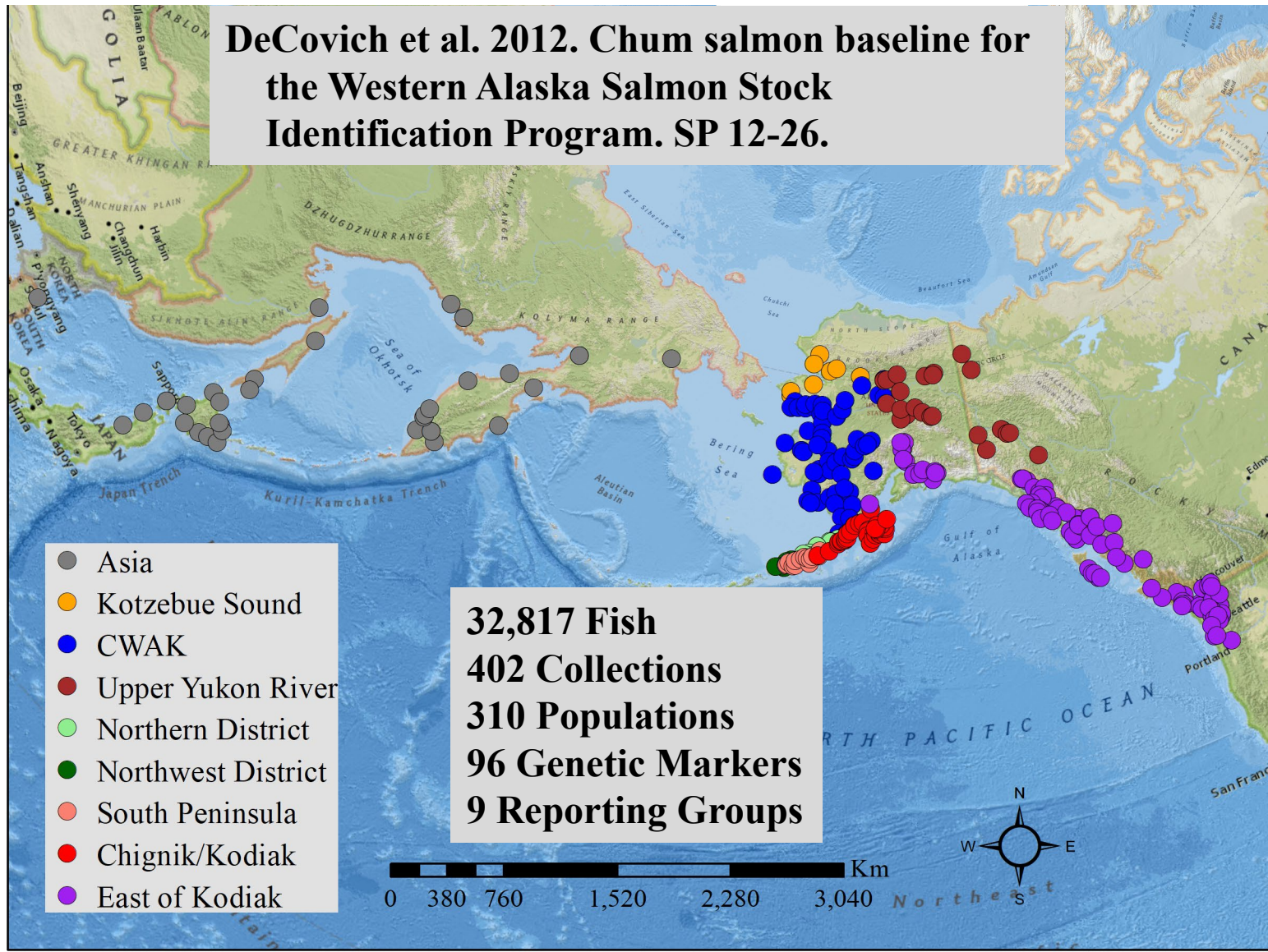
Tyler H. Dann



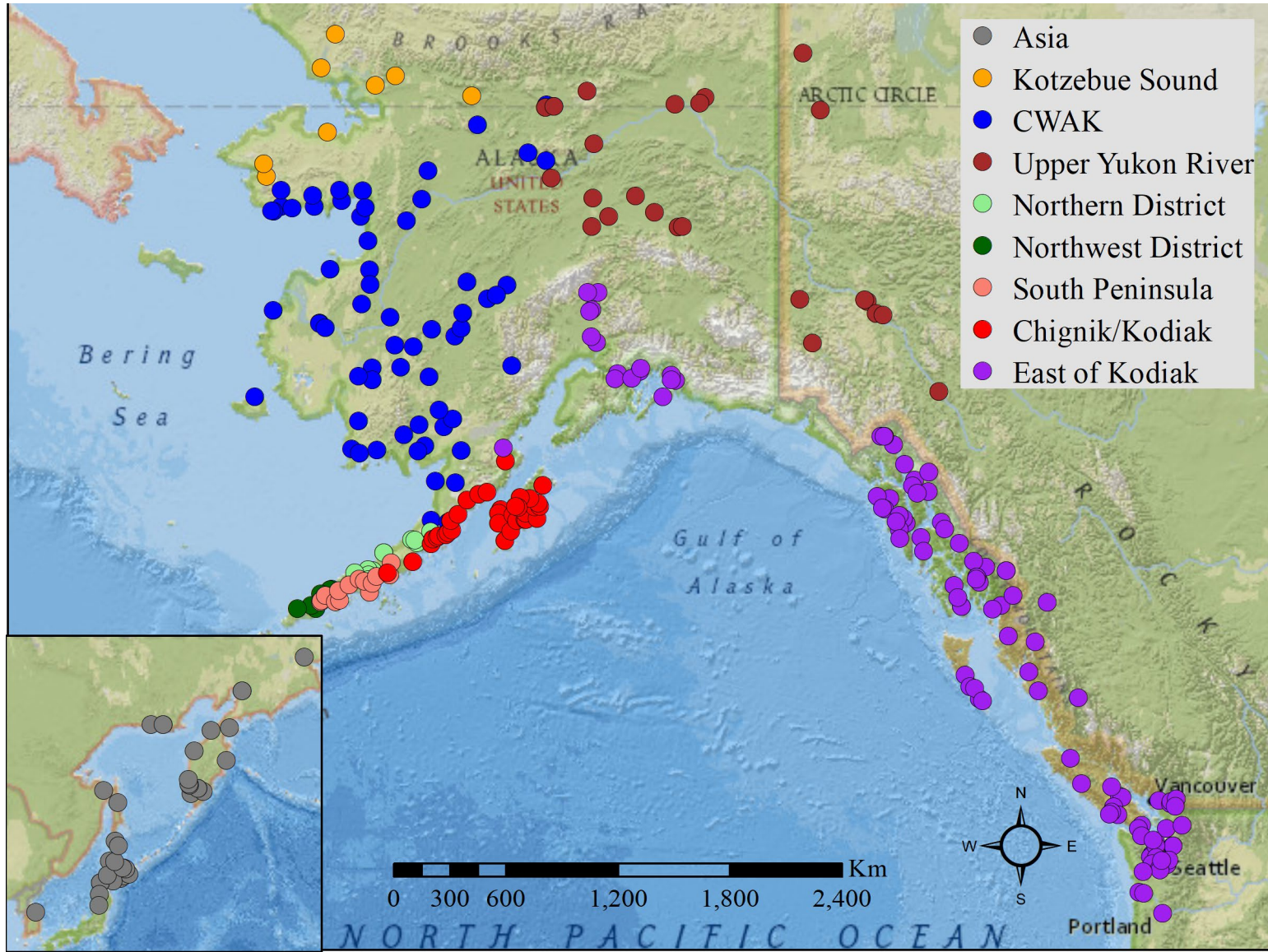
Overview

- Baseline Summary
- Summary of Harvests among Areas and Gear Types
- Summary of Strata Definitions
- Sample Selection
- Guide to Results in Report
- Key Summary Results
- Next Steps and Questions

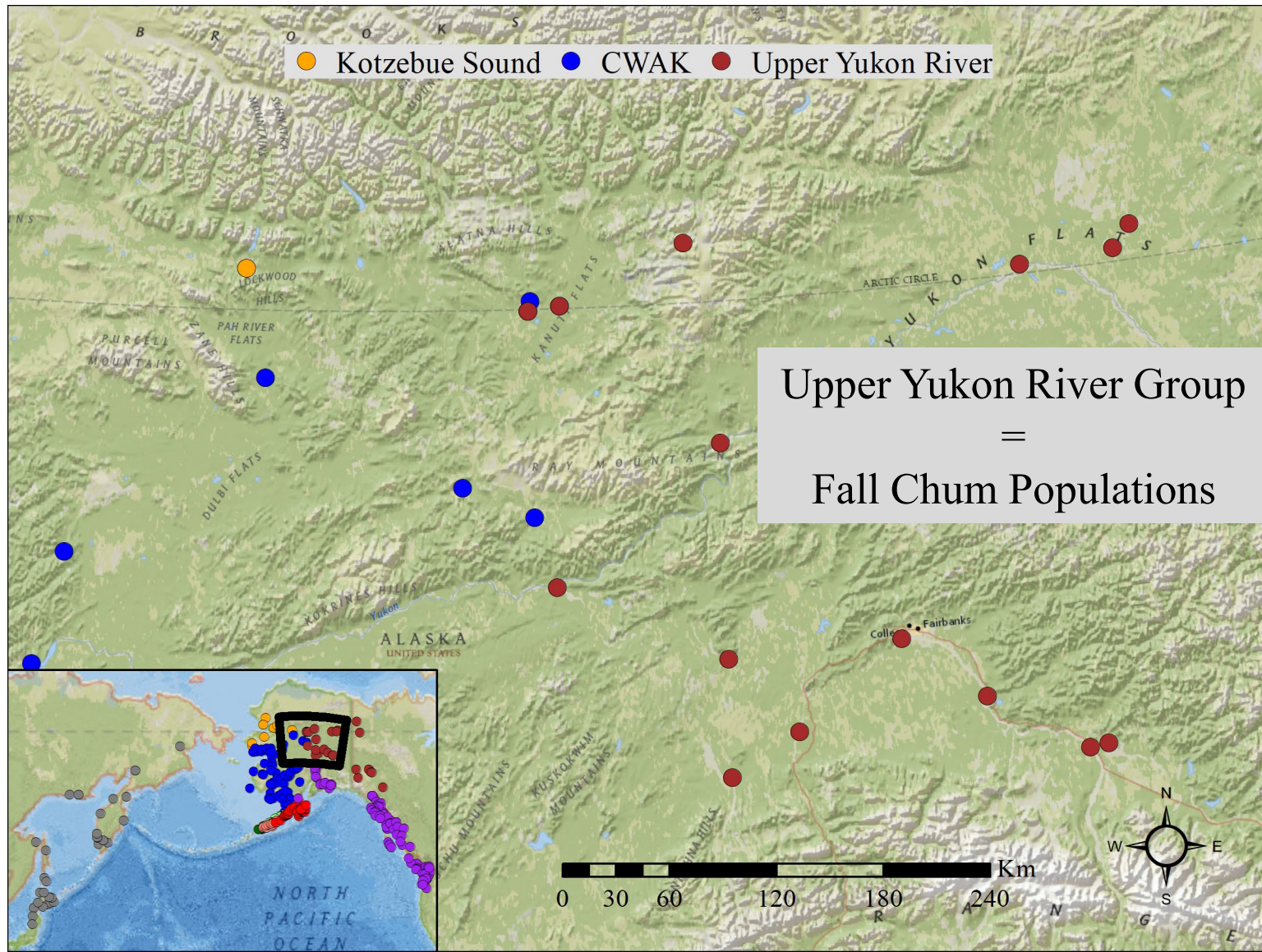
Baseline Summary



Baseline Summary



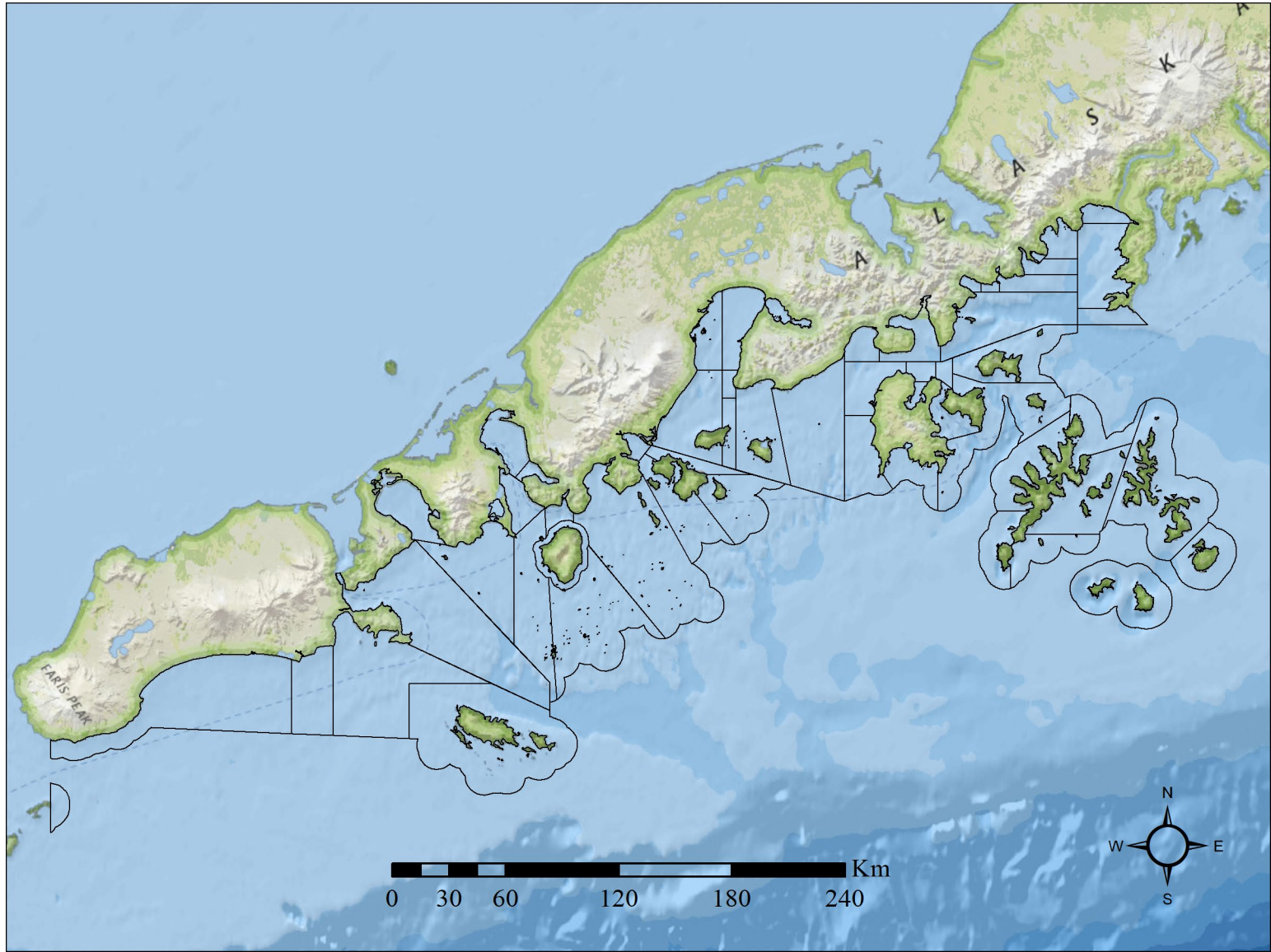
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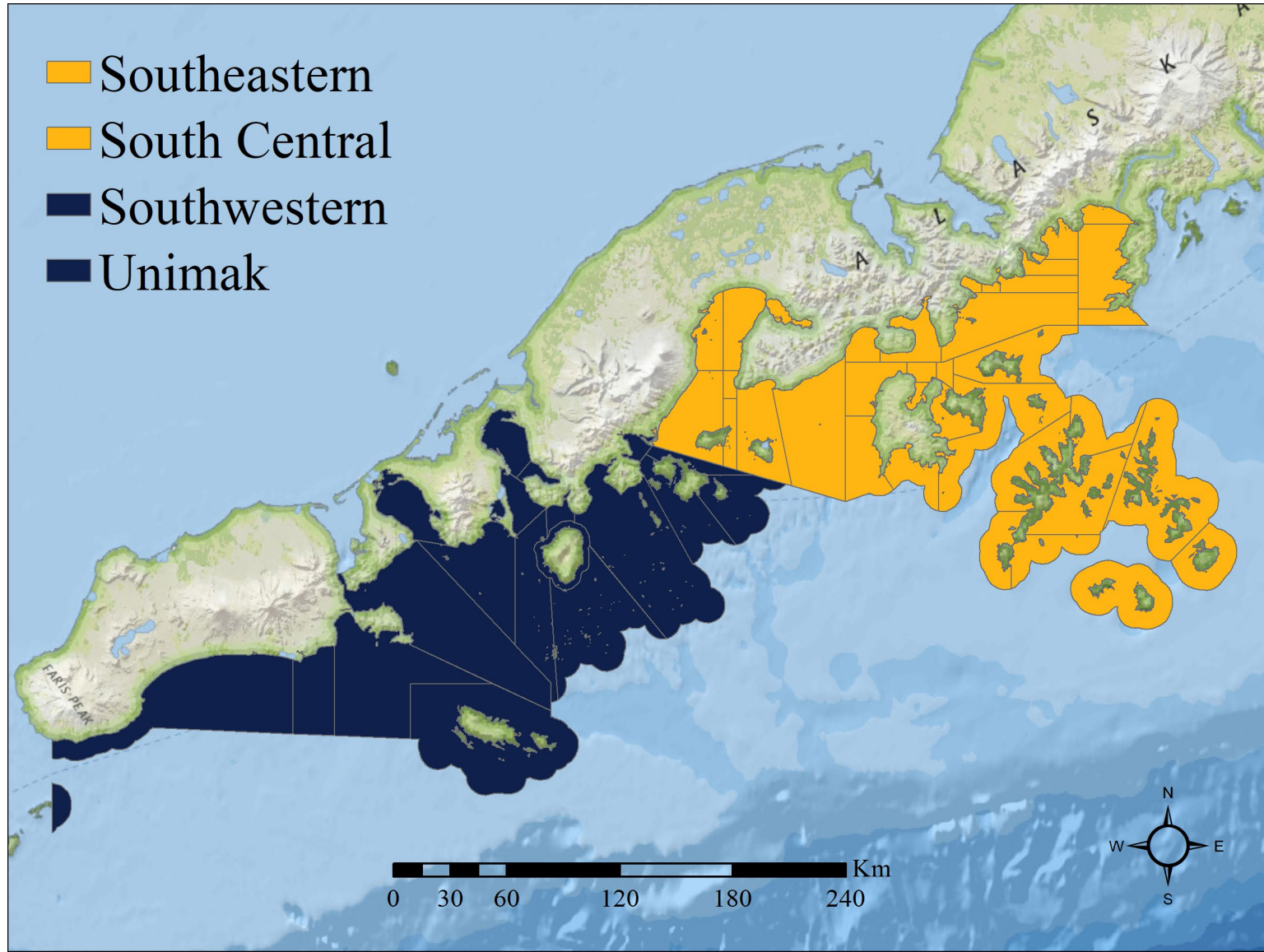
Summary of Harvests among Areas and Gear Types



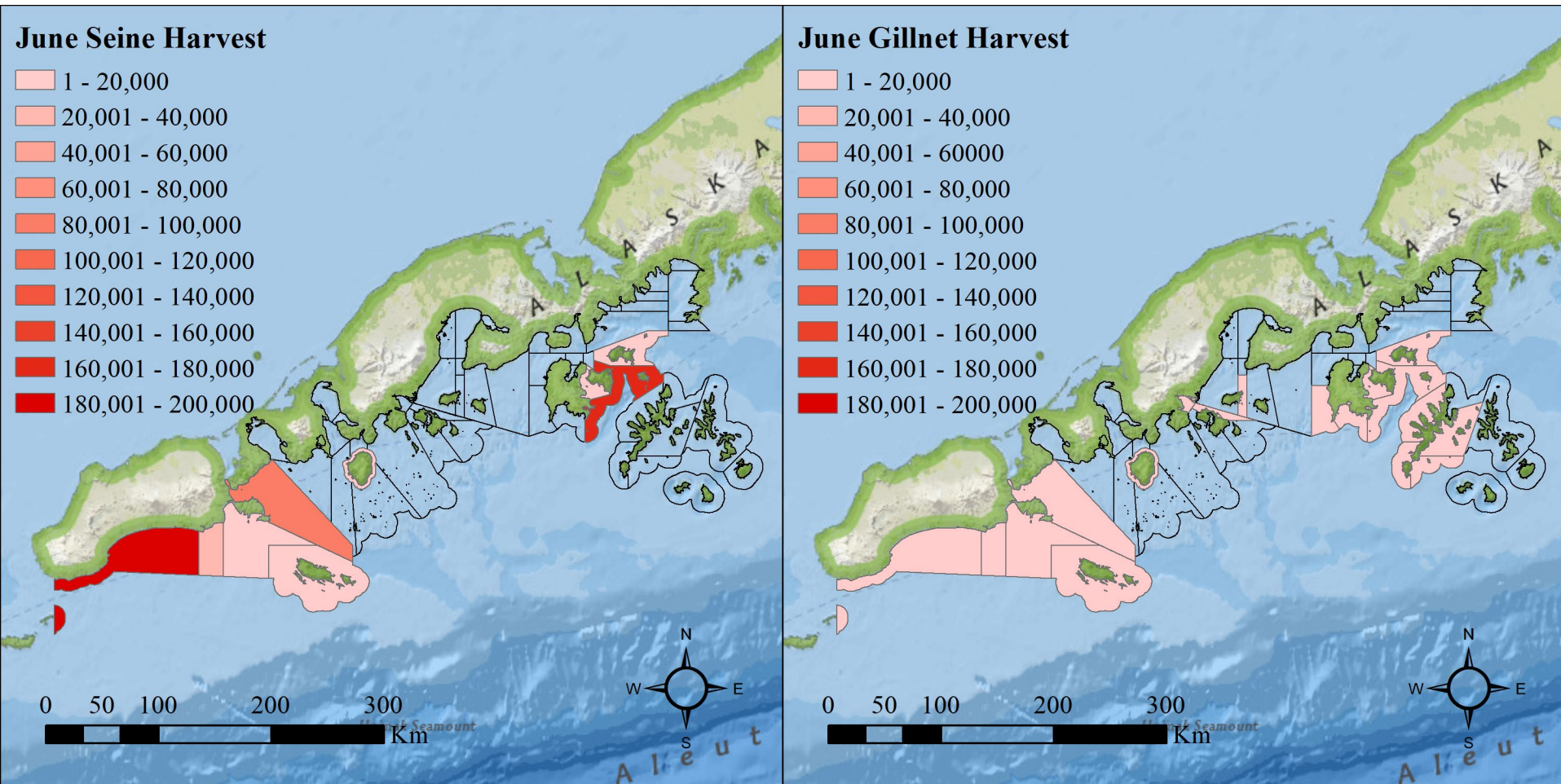
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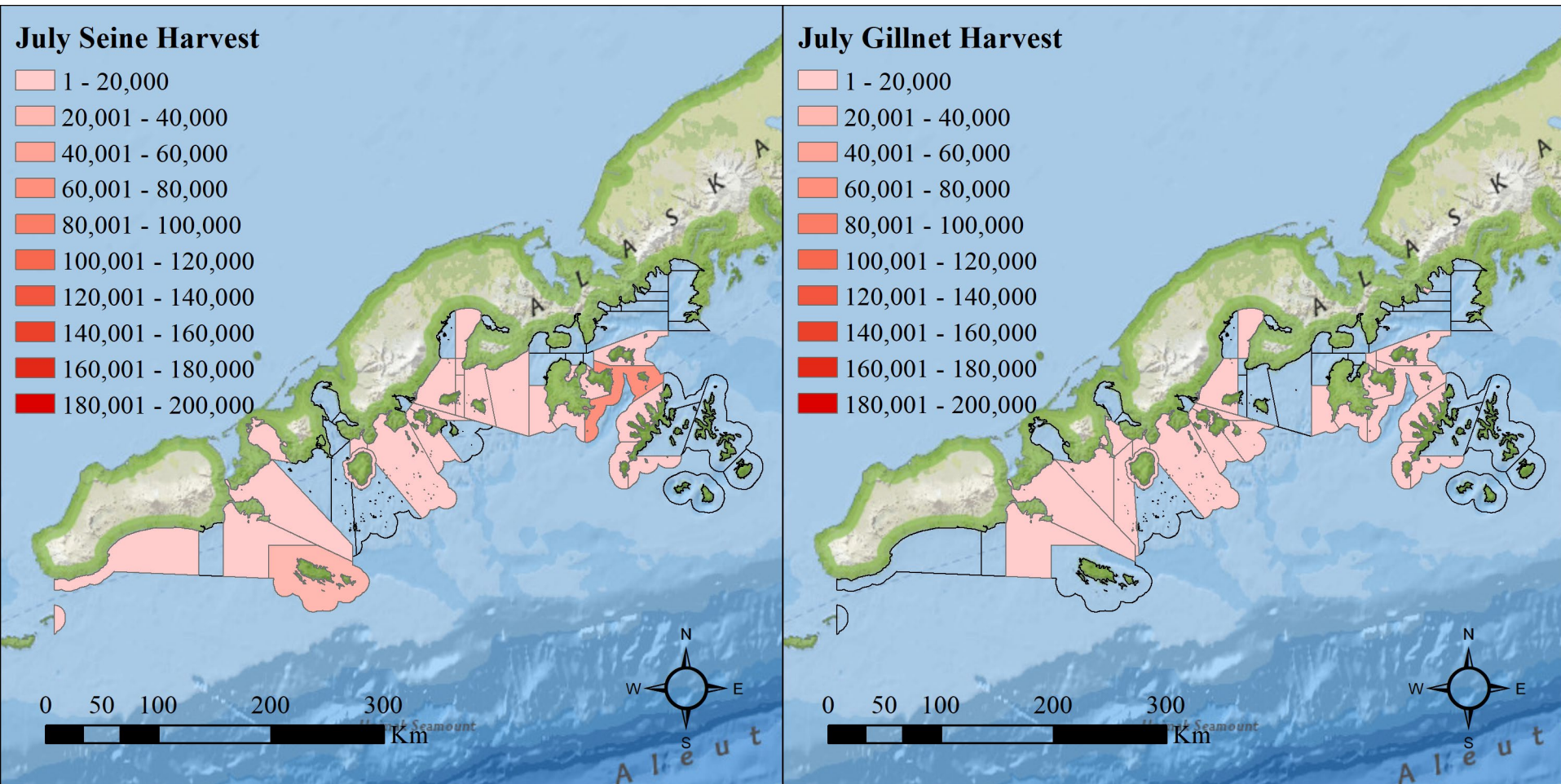
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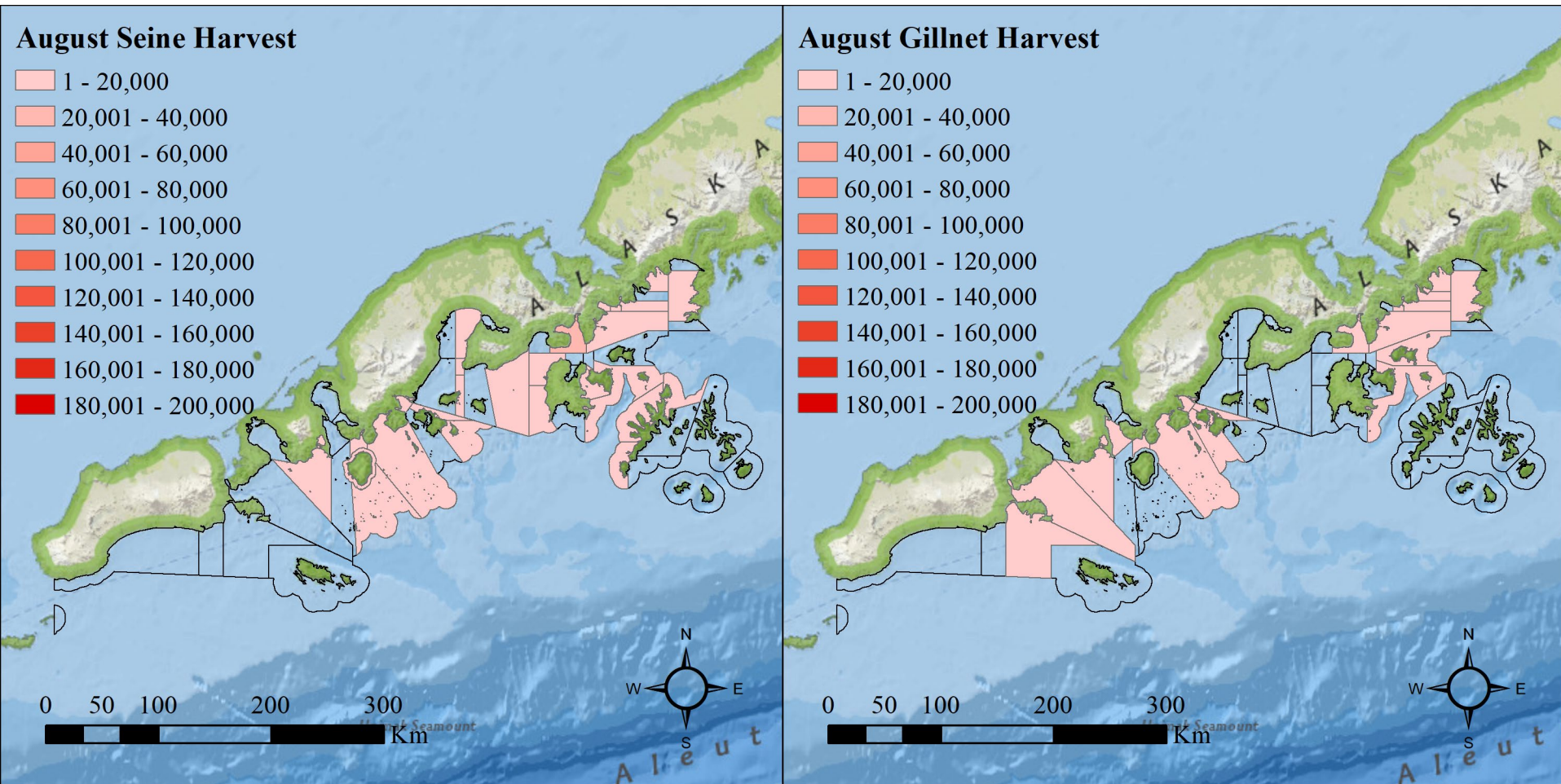
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Summary of Harvests among Areas and Gear Types



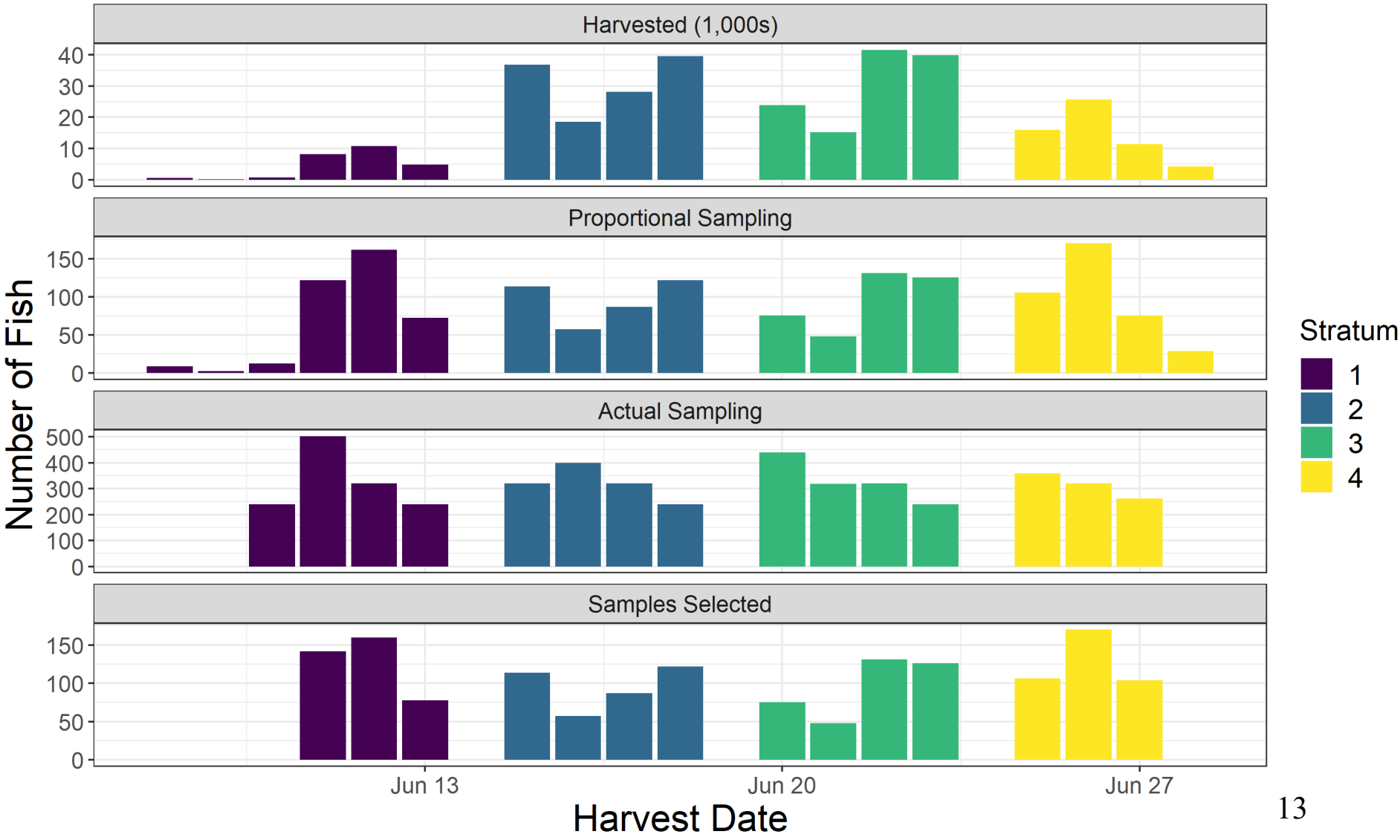
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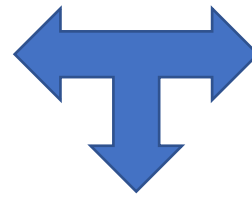
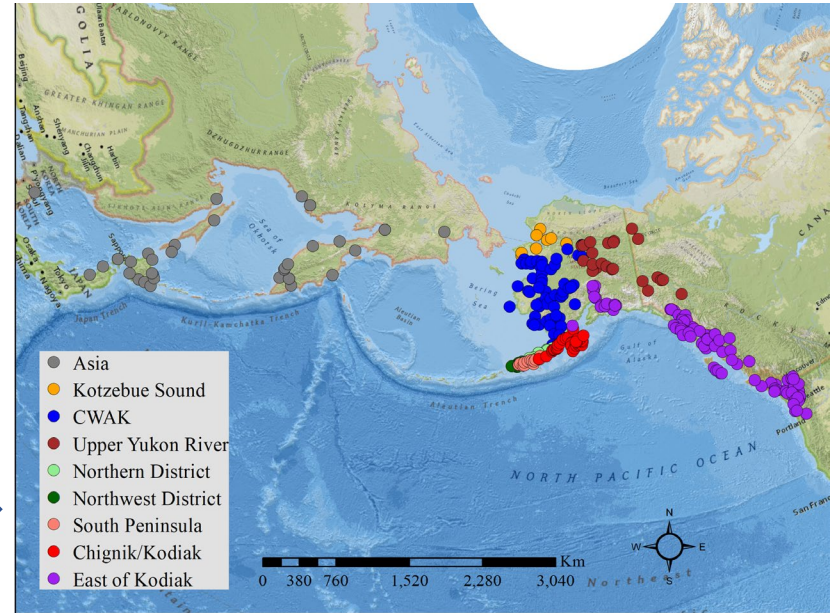
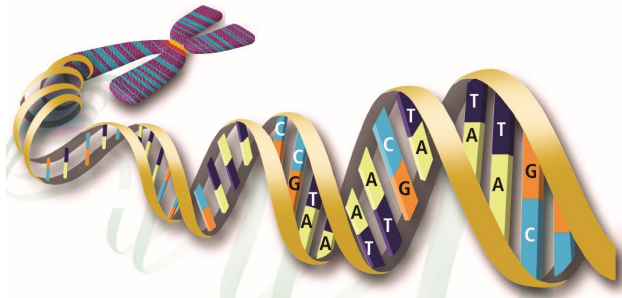
Summary of Strata Definitions

- 2 Areas
 - Unimak and Southwestern Districts
 - Southeastern and South Central Districts
- 2 Gear Types
 - Seine
 - Gillnet (Drift and Set)
- 3 Months (28 Strata)
 - June (13 Strata)
 - Post-June
 - July (10 Strata)
 - August (5 Strata)
 - Overall 2022 South Alaska Peninsula

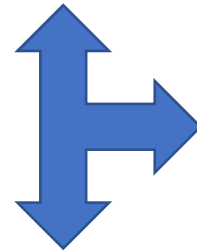
Sample Selection – June Unimak Seine



Mixed Stock Analysis



Stock Composition Estimates (%)



**Stock-specific Harvest
(1,000s of Fish)**

Harvest Represented

Stratified Estimates of Stock-Specific Harvest

- Weighted each set of stock composition estimates by represented harvest
- Summed stock-specific harvests hierarchically
- Temporal strata within gear types, areas, months
 - Gear types within areas, months
 - Areas within months
 - Months within June and post-June
 - South Alaska Peninsula as a whole

Stratified Estimates of Stock-Specific Harvest

**Unimak/SW
June
366,126**

**Unimak/SW
June
Seine
321,875**

**Unimak/SW
June
Gillnet
44,251**

**Unimak/SW
June
Gillnet
Strata 1-4**

**Unimak/SW
June
Seine 1 (6/11-13)
24,254**

**Unimak/SW
June
Seine 2 (6/15-18)
123,139**

**Unimak/SW
June
Seine 3 (6/20-23)
120,443**

**Unimak/SW
June
Seine 4 (6/25-28)
54,039**

Stratified Estimates of Stock-Specific Harvest

Table 4 in Report

Harvest column is Harvest in each Stratum

Overall	June/Post-June	Post-June Months	Areas	Area/Gear	Spatiotemporal Strata	Harvest		
% is % of Total South Peninsula Harvest represented by each Grouping South Peninsula (100%)	June (67%)		Unimak/SW (45%)	Unimak/SW Seine (40%)	June Seine 1	24,254		
					June Seine 2	123,139		
					June Seine 3	120,443		
					June Seine 4	54,039		
				Unimak/SW Gillnet (5%)	June Gillnet 1	10,797		
			June Gillnet 2		15,665			
			June Gillnet 3		16,302			
			SE/SC (22%)				June Gillnet 4	1,487
							June Seine 1	16,419
							June Seine 2	41,246
	June Seine 3	34,281						
	SE/SC Gillnet (1%)				June Seine 4	75,336		
					June Gillnet	10,729		
	Post-June (33%)	July (23%)	Unimak/SW (6%)	Unimak/SW Seine (5%)	July Seine 1	30,008		
					July Seine 2	12,708		
				Unimak/SW Gillnet (1%)	July Gillnet 1	2,027		
			SE/SC (17%)	SE/SC Seine (15%)	July Gillnet 2	3,812		
					July Seine 1	32,704		
					July Seine 2	36,682		
July Seine 3				56,716				
SE/SC Gillnet (2%)		July Gillnet 1	4,092					
		July Gillnet 2	4,833					
		July Gillnet 3	5,189					
August (10%)		Unimak/SW (4%)	Unimak/SW Seine (4%)	August Seine 1	18,807			
				August Seine 2	10,017			
		SE/SC (6%)	SE/SC Seine (6%)	August Seine 1	35,706			
	August Seine 2			9,793				
	South Pen (1%)	Gillnet (1%)	August	7,048				

Guide to Results in Report

- Organizational Tables and Figures
 - Summary of Historical Harvests (Table 1)
 - Summary of WASSIP Estimates (Table 2)
 - Summary of Recent Harvests and Proposed Design (Table 3)
 - Summary of Daily Harvests and Sampling (Tables 5-6, Appendix A1-4)
 - Design of Analysis among Strata (Table 8)
 - Design of Stratified Estimates (Table 4)
 - Laboratory Results (Table 9)

Dann, T. H., H. A. Hoyt, E. M. Lee, E. K. C. Fox, and M. B. Foster. 2023. Genetic stock composition of chum salmon harvested in commercial salmon fisheries of the South Alaska Peninsula, 2022. Alaska Department of Fish and Game, Special Publication No. 23-07, Anchorage. <https://www.adfg.alaska.gov/FedAidPDFs/SP23-07.pdf>

Guide to Results in Report

- Organizational Tables and Figures
- Age and Length Compositions
 - Table 7 and Appendix C1-37

Example Table

Table 7.—South Alaska Peninsula area, all strata ($n = 14,869$). Estimates of age composition and mean length (from mid eye to tail fork [METF] in mm), 90% confidence interval, and estimated SE or SD.

Age Class	Age composition					Length (mm) METF				
	Number	Percent	90% CI		SE	Number	Mean	90% CI		SD
			5%	95%				5%	95%	
0.1	1	0.0	0.0	0.0	0.0	1	415.0	415.0	415.0	—
0.2	806	6.3	5.9	6.6	0.2	806	519.8	517.5	522.1	39.0
0.3	8,182	63.9	63.2	64.6	0.4	8,182	552.6	551.9	553.3	36.4
0.4	3,761	29.4	28.7	30.0	0.4	3,761	566.2	565.2	567.1	36.2
0.5	59	0.5	0.4	0.6	0.1	59	592.2	583.0	601.3	42.7
0.6	1	0.0	0.0	0.0	0.0	1	587.0	587.0	587.0	—
Unknown						2,059	555.1	553.9	556.4	35.3
Total	12,810					14,869	553.9	553.4	554.4	38.7

Guide to Results in Report

- Organizational Tables and Figures
- Age and Length Compositions
- Single Stratum Stock Compositions and Stock-Specific Harvests
 - Appendix B1-28

Example Table

Appendix B6.–Unimak and Southwestern Districts, South Alaska Peninsula area, June stratum 1, 2022, seine (June 11–13; harvest = 24,254; $n = 346$). Estimates of stock composition (%) and stock-specific harvest including median, 90% credibility interval, mean and standard deviation (SD).

Reporting group	Stock composition					Stock-specific harvest						
	Median	90% CI			Mean	SD	Median	90% CI			Mean	SD
		5%	95%	5%				95%				
Asia	48.8	44.3	53.3	48.8	2.8	11,829	10,747	12,930	11,838	667		
Kotzebue Sound	2.4	0.7	4.7	2.5	1.2	582	160	1,152	609	299		
CWAK	23.9	19.8	28.0	23.9	2.5	5,786	4,810	6,800	5,796	607		
Upper Yukon	0.3	0.0	1.2	0.4	0.4	68	3	290	98	96		
Northern Dist.	0.0	0.0	0.4	0.1	0.2	0	0	107	20	56		
Northwestern Dist.	0.2	0.0	1.6	0.4	0.6	55	0	396	108	138		
South Peninsula	1.6	0.0	5.4	2.0	1.9	389	0	1,318	475	451		
Chignik/Kodiak	3.5	0.0	7.1	3.6	2.1	858	8	1,720	862	511		
East of Kodiak	18.2	14.8	22.1	18.3	2.2	4,423	3,594	5,357	4,448	530		
								Total	24,254			

Note: Stock composition means may not sum to 100% and stock-specific harvest means may not sum to the total harvest due to rounding error.

Guide to Results in Report

- Organizational Tables and Figures
- Age and Length Compositions
- Single Stratum Stock Compositions and Stock-Specific Harvests
- Stratified Estimates of Stock-Specific Harvest
 - Tables 10-27

Example Table

Table 14.—Unimak and Southwestern Districts, South Alaska Peninsula area, June 2022, all strata. Reporting group-specific stock composition and harvest estimates. Median, 90% credibility intervals, means, and SDs are reported.

Reporting group	Proportions (%)					Harvest = 366,590; 8 strata				
	Median	90% CI		Mean	SD	Median	90% CI		Mean	SD
		5%	95%				5%	95%		
Asia	59.1	56.8	61.4	59.1	1.4	216,593	204,169	229,320	216,680	7,611
Kotzebue Sound	3.4	2.0	4.9	3.4	0.9	12,325	7,304	18,145	12,479	3,337
CWAK	19.7	17.7	22.1	19.8	1.3	72,275	64,375	81,073	72,561	5,099
Upper Yukon	0.3	0.1	0.8	0.4	0.2	1,208	297	3,008	1,367	860
Northern Dist.	1.3	0.8	2.1	1.4	0.4	4,938	3,081	7,610	5,065	1,414
Northwestern Dist.	2.1	1.4	3.1	2.1	0.5	7,668	4,964	11,347	7,849	1,971
South Peninsula	1.9	0.9	3.4	2.0	0.8	7,078	3,229	12,360	7,368	2,821
Chignik/Kodiak	1.3	0.5	2.4	1.3	0.6	4,588	1,806	8,629	4,782	2,133
East of Kodiak	10.5	9.2	11.9	10.5	0.9	38,393	33,188	44,091	38,440	3,297
Total									366,590	

Note: Harvest is the number of chum salmon reported to have been harvested in the June fisheries of the Unimak and Southwestern Districts. Harvest total may differ from totals in experimental design table due to rounding error.

Guide to Results in Report

- Organizational Tables and Figures
- Age and Length Compositions
- Single Stratum Stock Compositions and Stock-Specific Harvests
- Stratified Estimates of Stock-Specific Harvest
- **Summary of Asia and CWAK Estimates**
 - Table 28

Guide to Results in Report

- Organizational Tables and Figures
- Age and Length Compositions
- Single Stratum Stock Compositions and Stock-Specific Harvests
- Stratified Estimates of Stock-Specific Harvest
- Summary of Asia and CWAK Estimates
- **Comparison with WASSIP Results**
 - Table 29

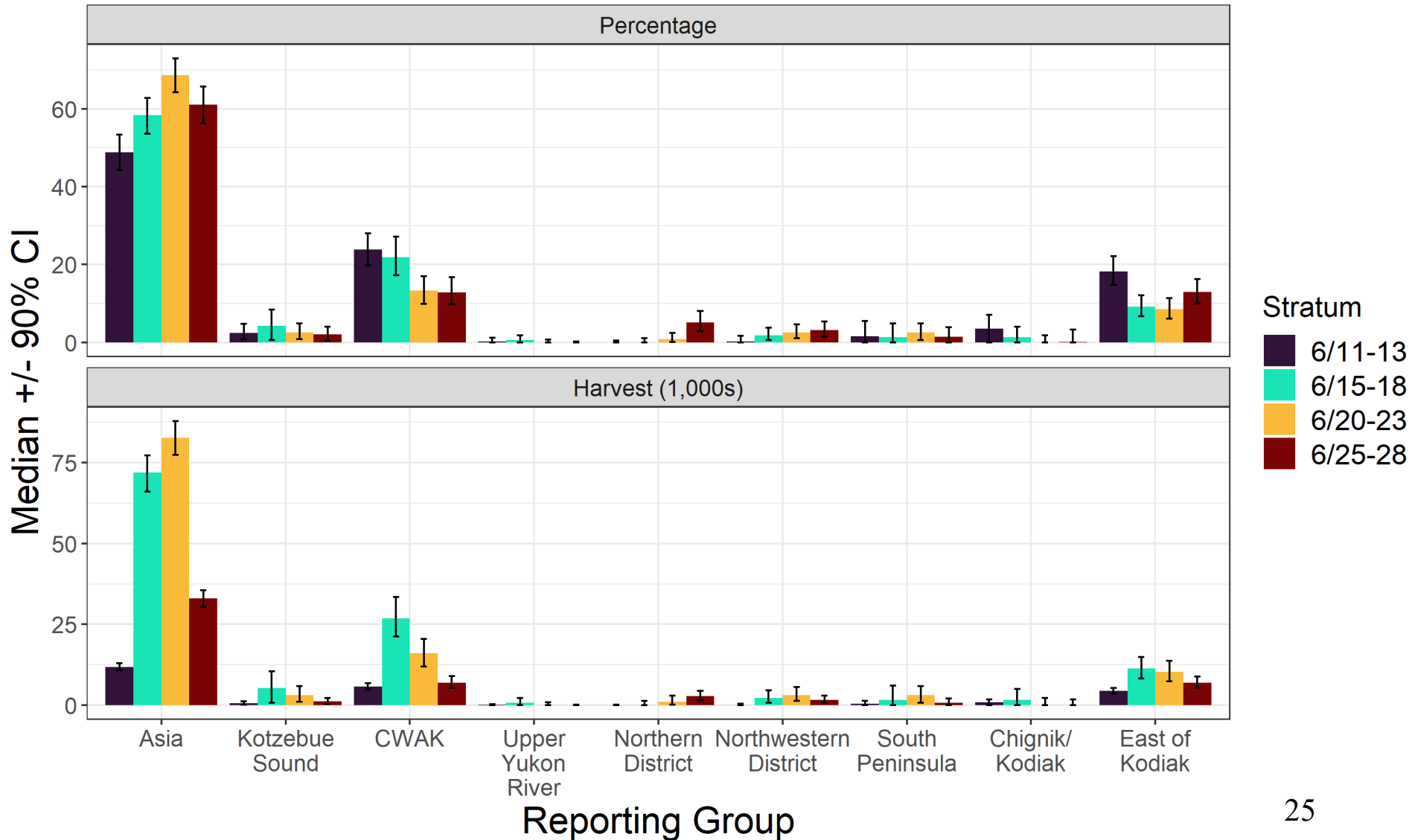
Key Summary Results

Unimak/Southwestern June Seine

Overall	June/Post-June	Post-June Months	Areas	Area/Gear	Spatiotemporal Strata	Harvest
South Peninsula (100%)	June (67%)		Unimak/SW (45%)	Unimak/SW Seine (40%)	June Seine 1	24,254
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					June Seine 2	41,246
					June Seine 3	34,281
					June Seine 4	75,336
	SE/SC Gillnet (1%)	June Gillnet	10,729			
	Post-June (33%)	July (23%)	Unimak/SW (6%)	Unimak/SW Seine (5%)	July Seine 1	30,008
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					July Seine 3	56,716
				SE/SC Gillnet (2%)	July Gillnet 1	4,092
		July Gillnet 2	4,833			
		July Gillnet 3	5,189			
August (10%)		Unimak/SW (4%)	Unimak/SW Seine (4%)	August Seine 1	18,807	
	August Seine 2			10,017		
	SE/SC (6%)	SE/SC Seine (6%)	August Seine 1	35,706		
			August Seine 2	9,793		
	South Pen (1%)	Gillnet (1%)	August	7,048		

Key Summary Results

Unimak/Southwestern June Seine



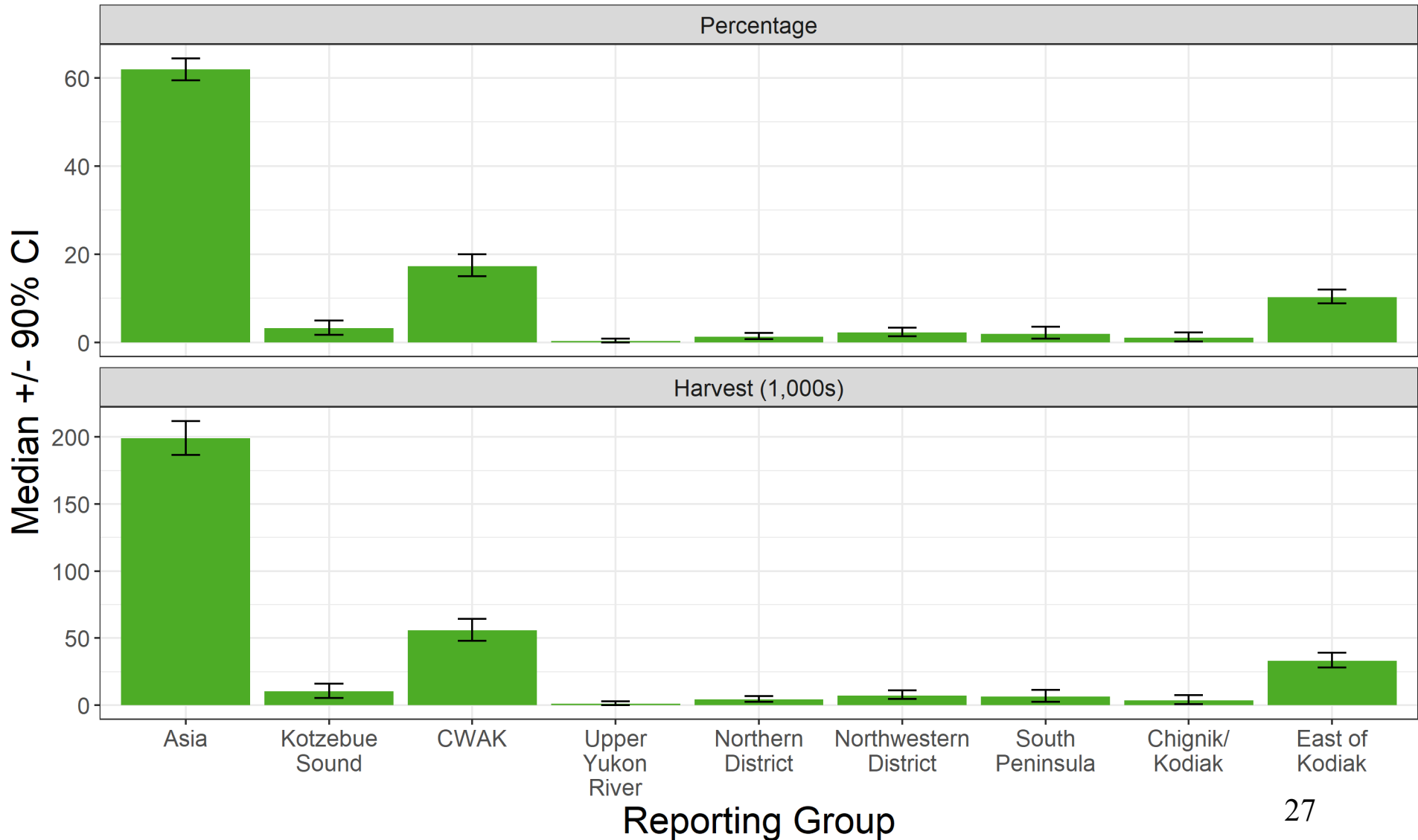
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Key Summary Results

Unimak/Southwestern June Seine



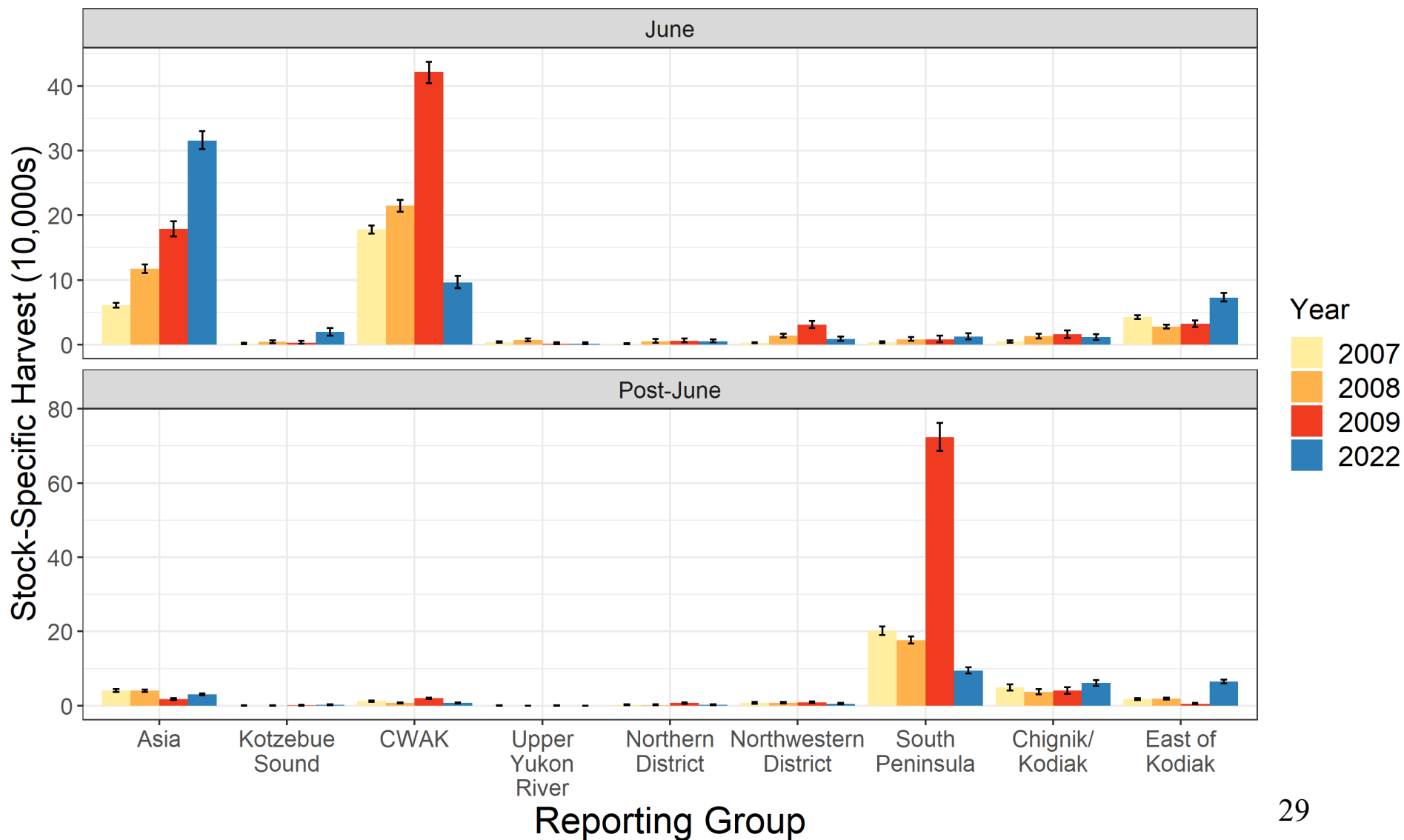
Key Summary Results

June/Post-June Stratified Estimates

Overall	June/Post-June	Post-June Months	Areas	Area/Gear	Spatiotemporal Strata	Harvest
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		South Pen (1%)	Gillnet (1%)	August		7,048

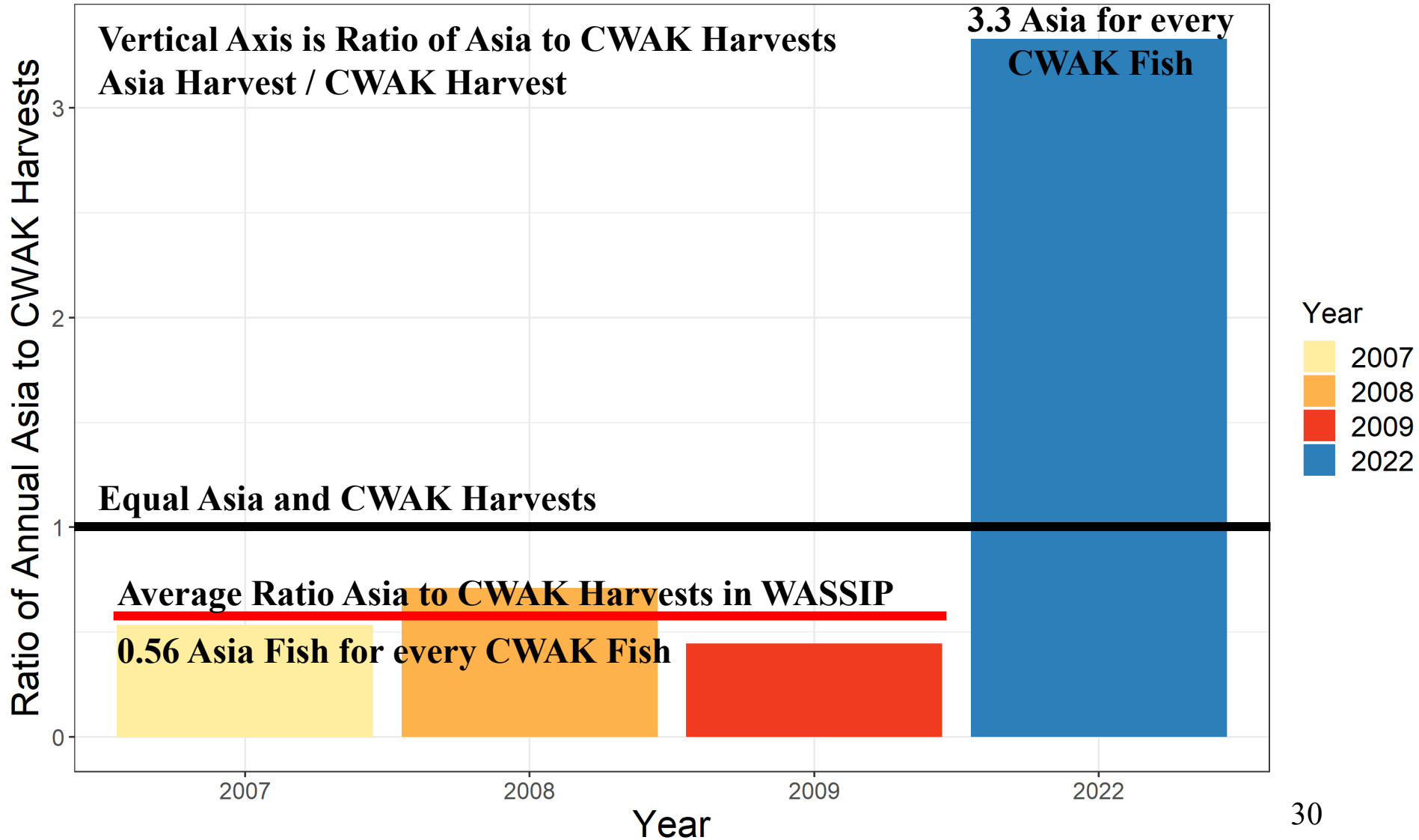
Key Summary Results

June/Post-June Stratified Estimates



Key Summary Results

Asia and Coastal Western Alaska



Next Steps

- Continue Sampling and Analysis in 2023
- Analysis of Trends in Age and Stock Compositions
- Estimate Stock-Specific Cohort Abundances
- Updated Coastwide Genetic Baseline in Development

Conclusions

- Total 2022 South Pen Harvest: 817,279 chum
 - 78% of 10-year average
- June: 544,137 (67% of total South Peninsula)
 - Majority in June Unimak Seine (321,875 – 40% of total)
 - Groups > 5%: Asia (315,162 – 58%), CWAK (96,466 – 18%) and East of Kodiak (72,812 – 13%)
- Post-June: 270,142 (33% of total South Peninsula)
 - Majority in July SE/SC Seine (126,102 – 15% of total)
 - Groups > 5%: South Peninsula (95,237 – 35%), East of Kodiak (65,242 – 24%), Chignik/Kodiak (60,864 – 23%), and Asia (30,674 – 11%)
- Stock-specific harvest used to inform harvest rate analysis

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