

Science, Service, Stewardship



NMFS-AFSC-365

<https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-365.pdf>

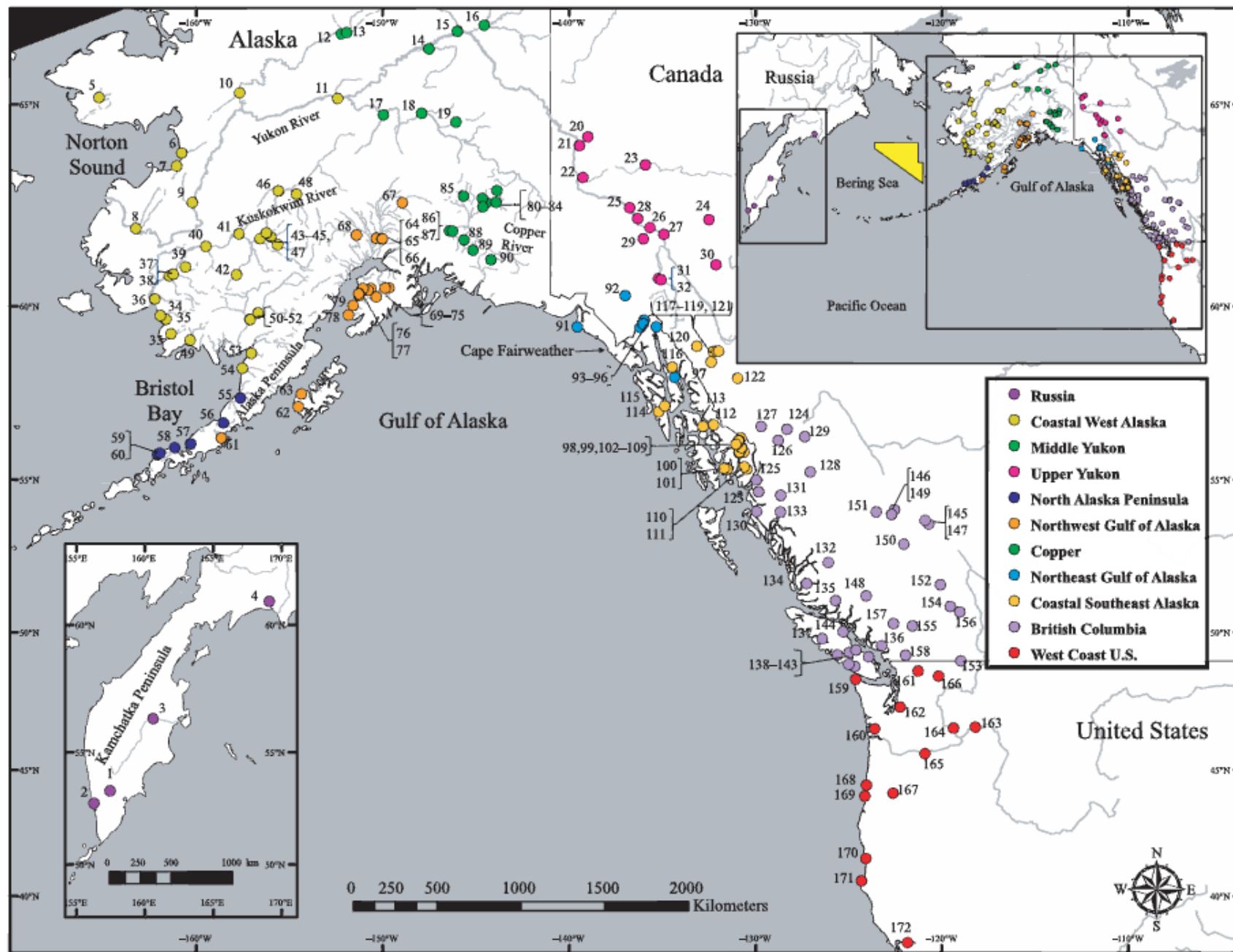
Genetic Stock Composition Analysis of the Chinook Salmon (*Oncorhynchus tshawytscha*) Bycatch from the 2016 Bering Sea Walleye Pollock (*Gadus chalcogrammus*) Trawl Fishery

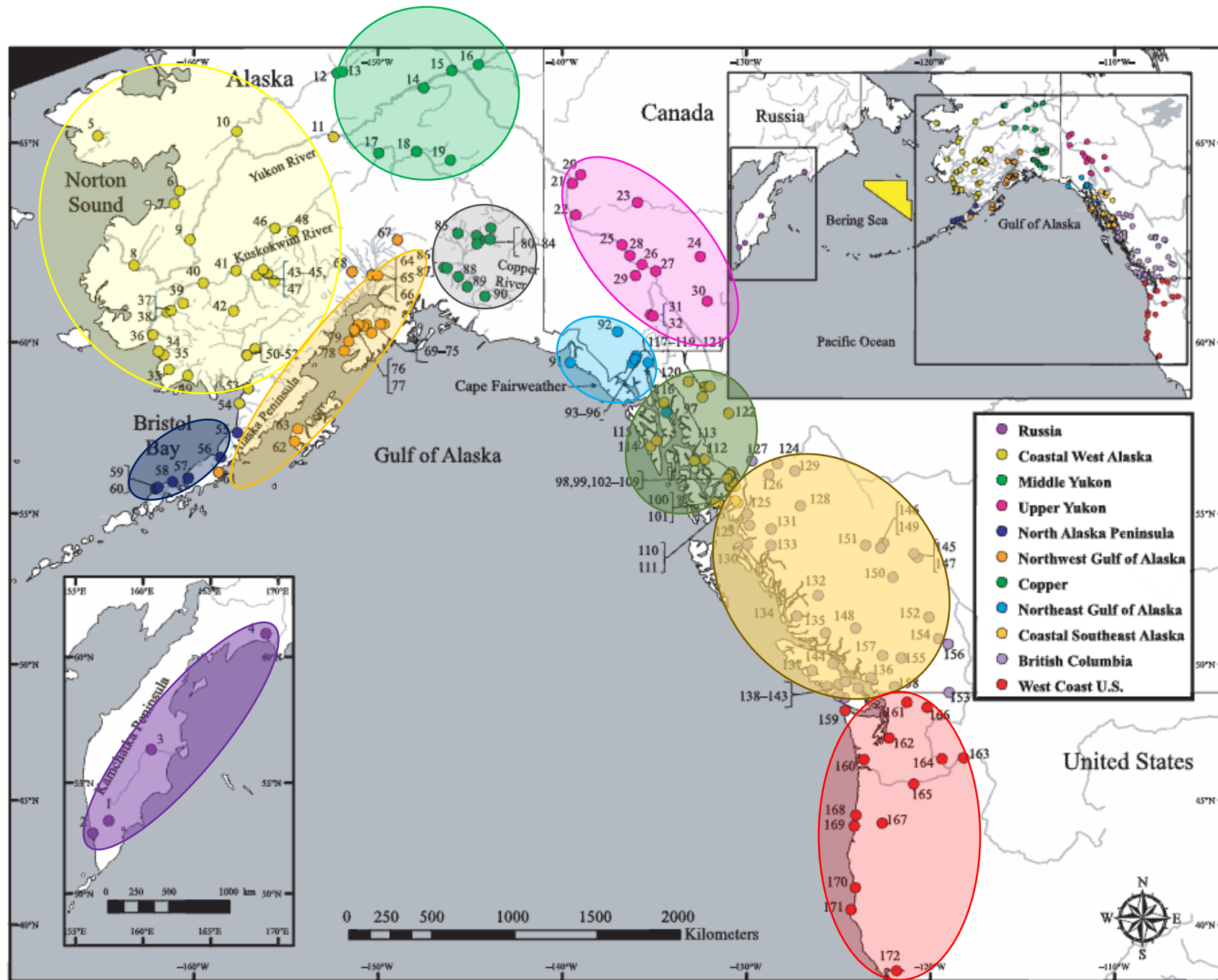
**C. M. Guthrie III, H.v. T. Nguyen, A. E. Thomson, K. Hauch,
and J. R. Guyon**

Genetics Program
Auke Bay Laboratories
Juneau, AK

**NOAA
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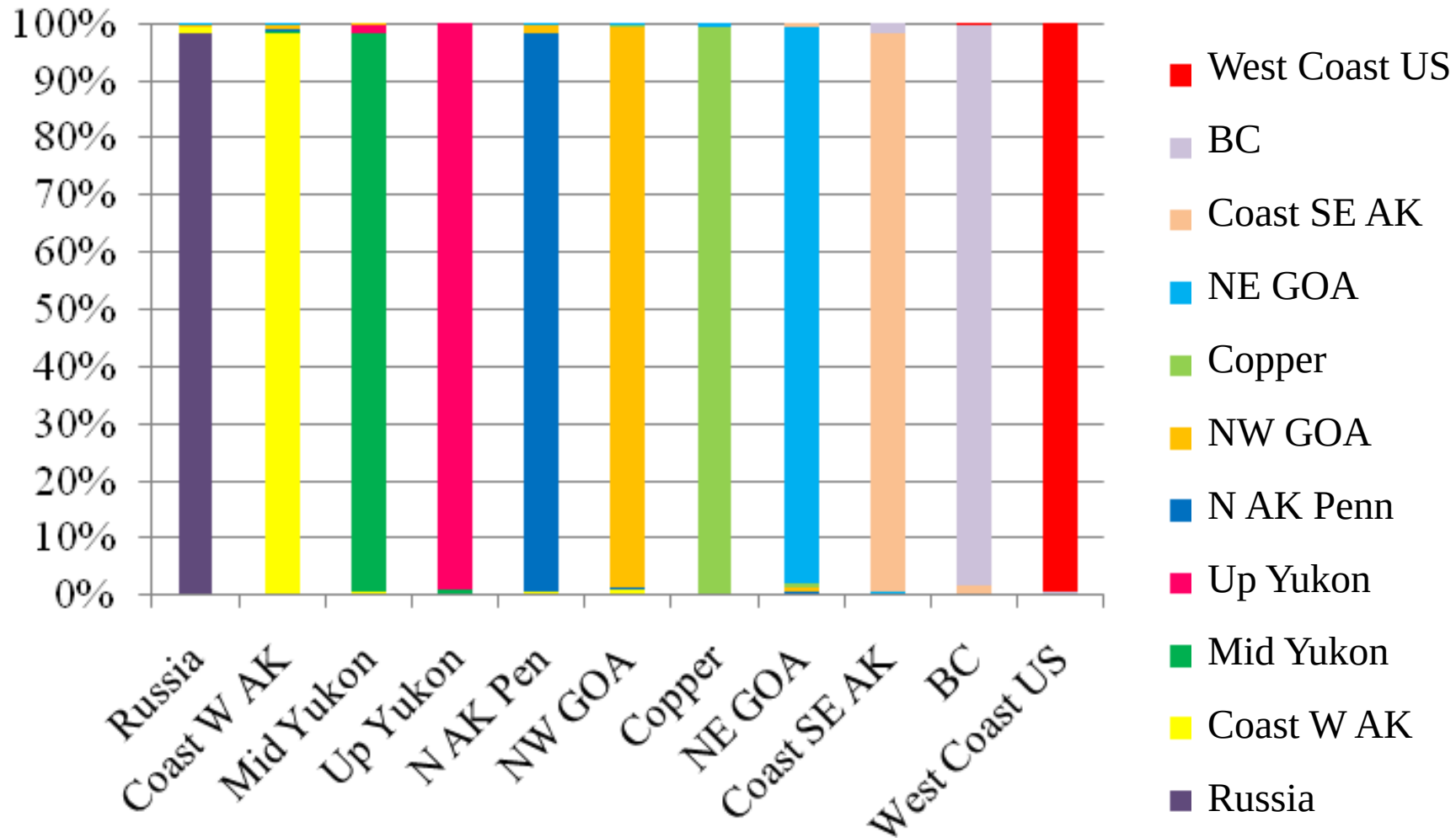
April 2, 2018

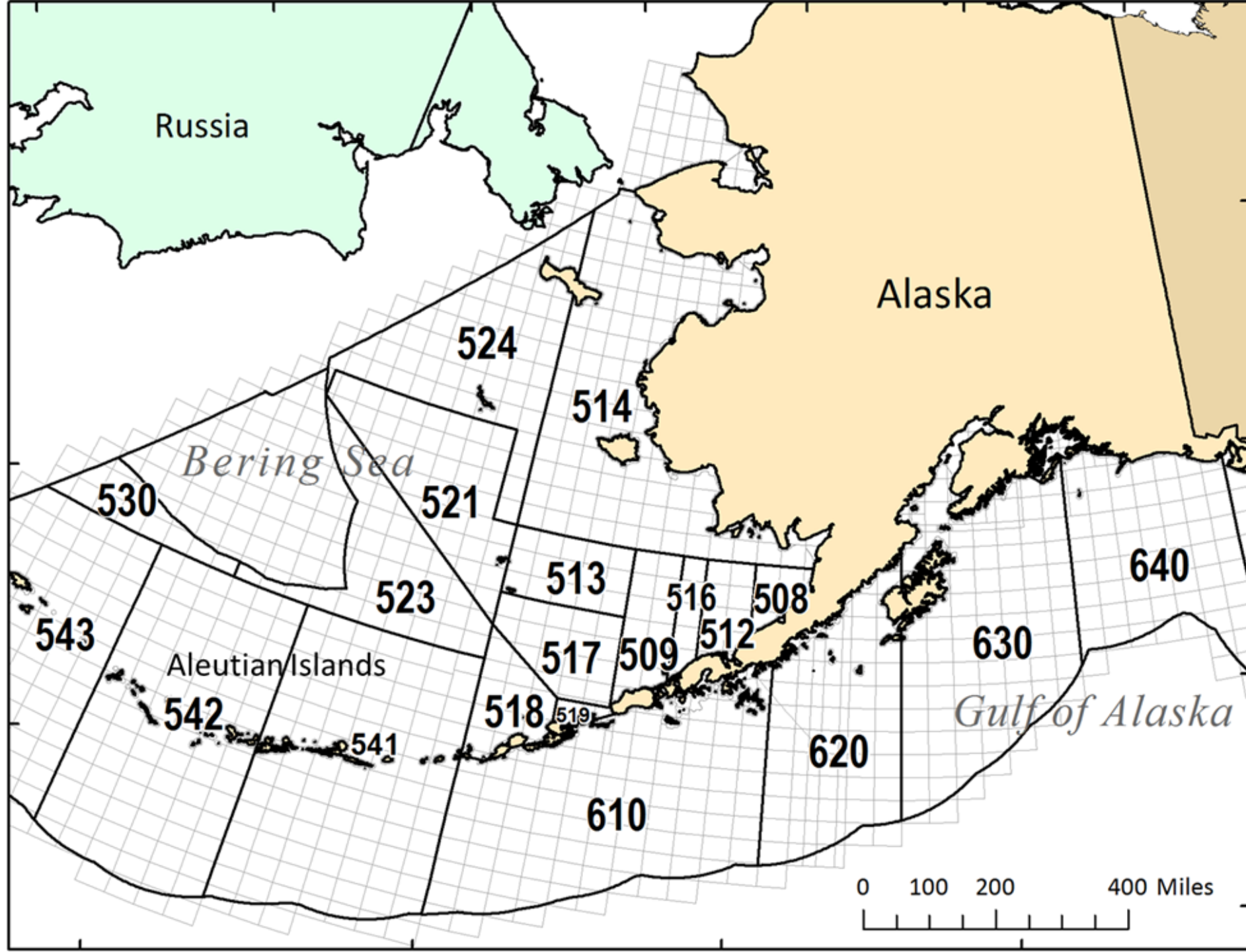




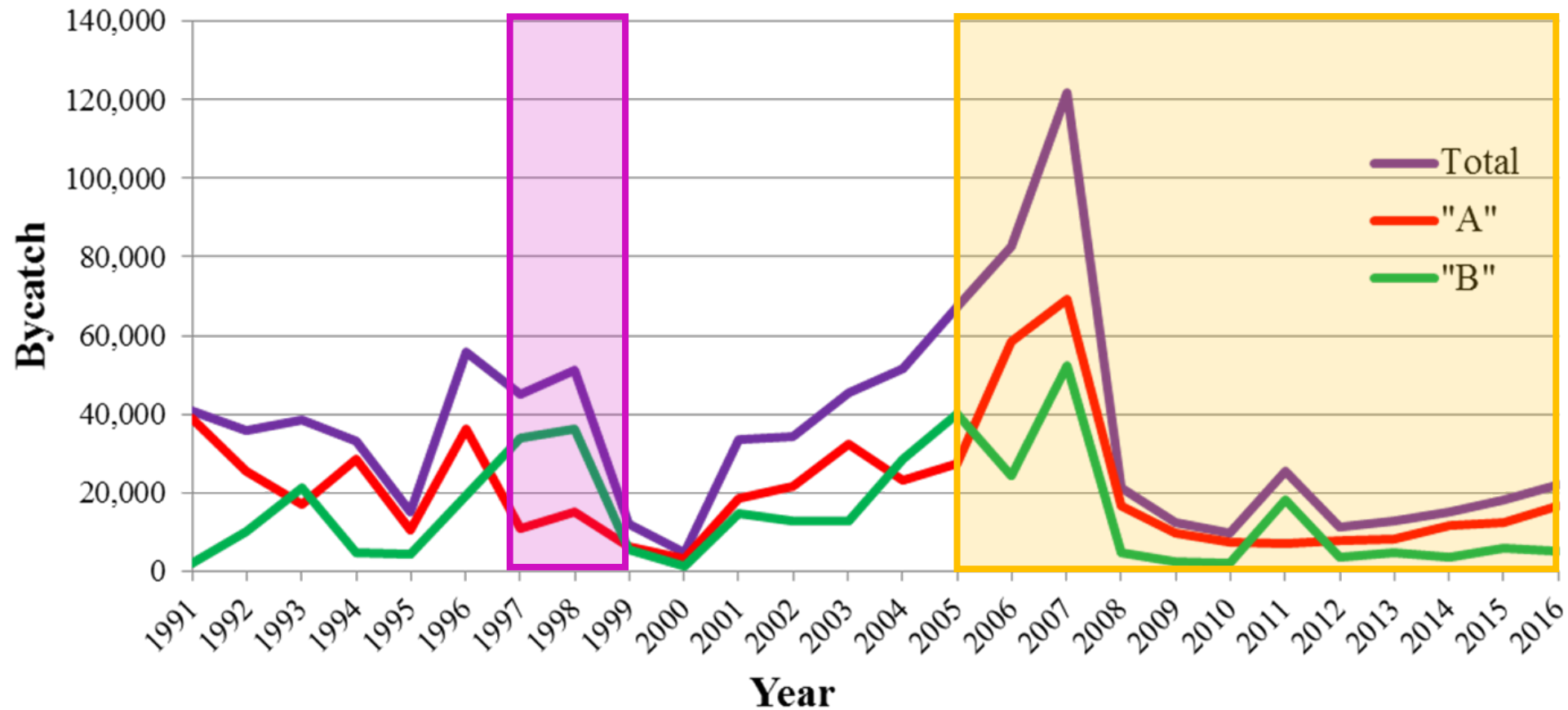
Baseline Analysis – 100% Simulations

43 SNPs





2016 Chinook Salmon Bering Sea Bycatch



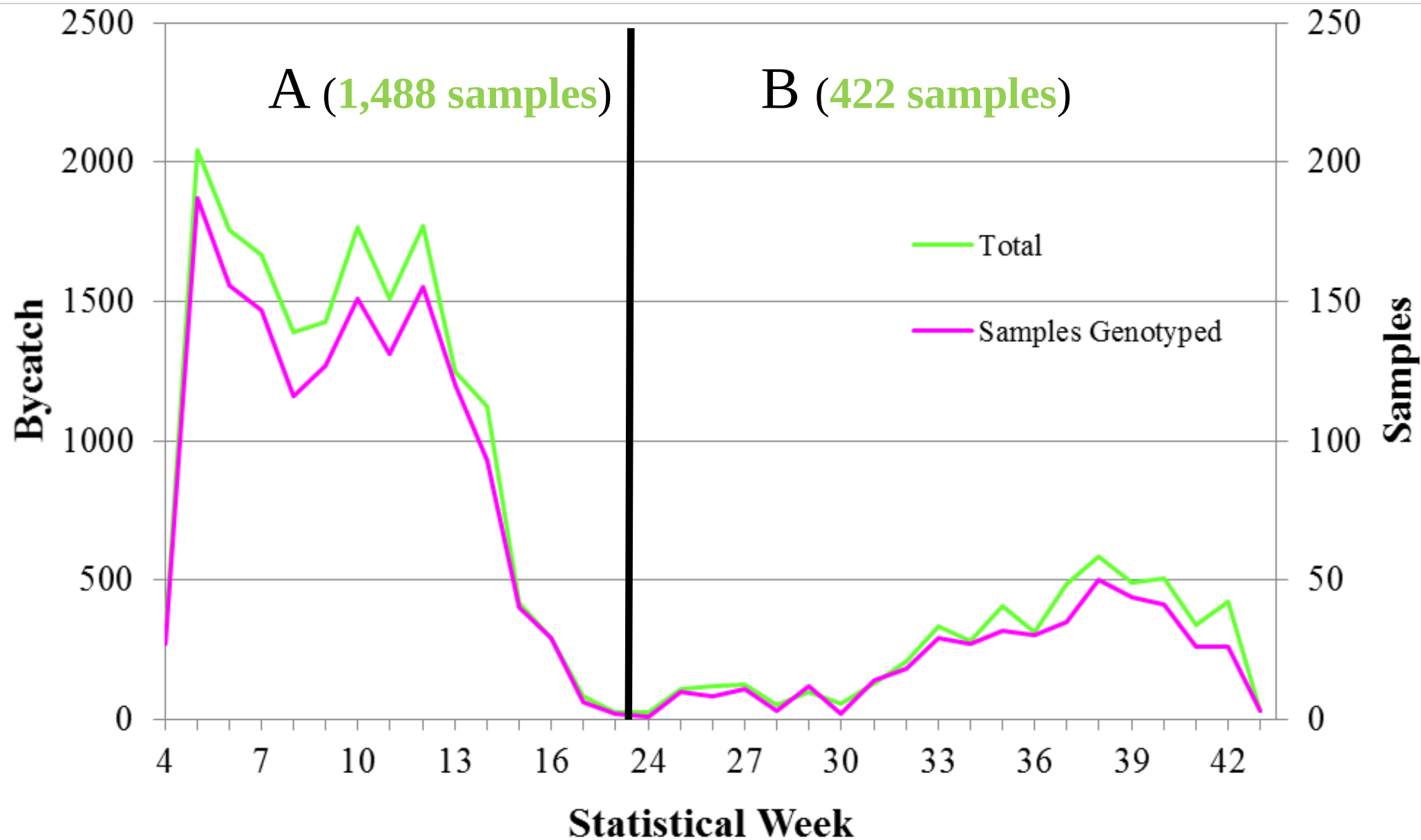
1979-1982: Scales (Myers & Rogers, 1988)

1997-1999: Scales (Myers et al., 2004)

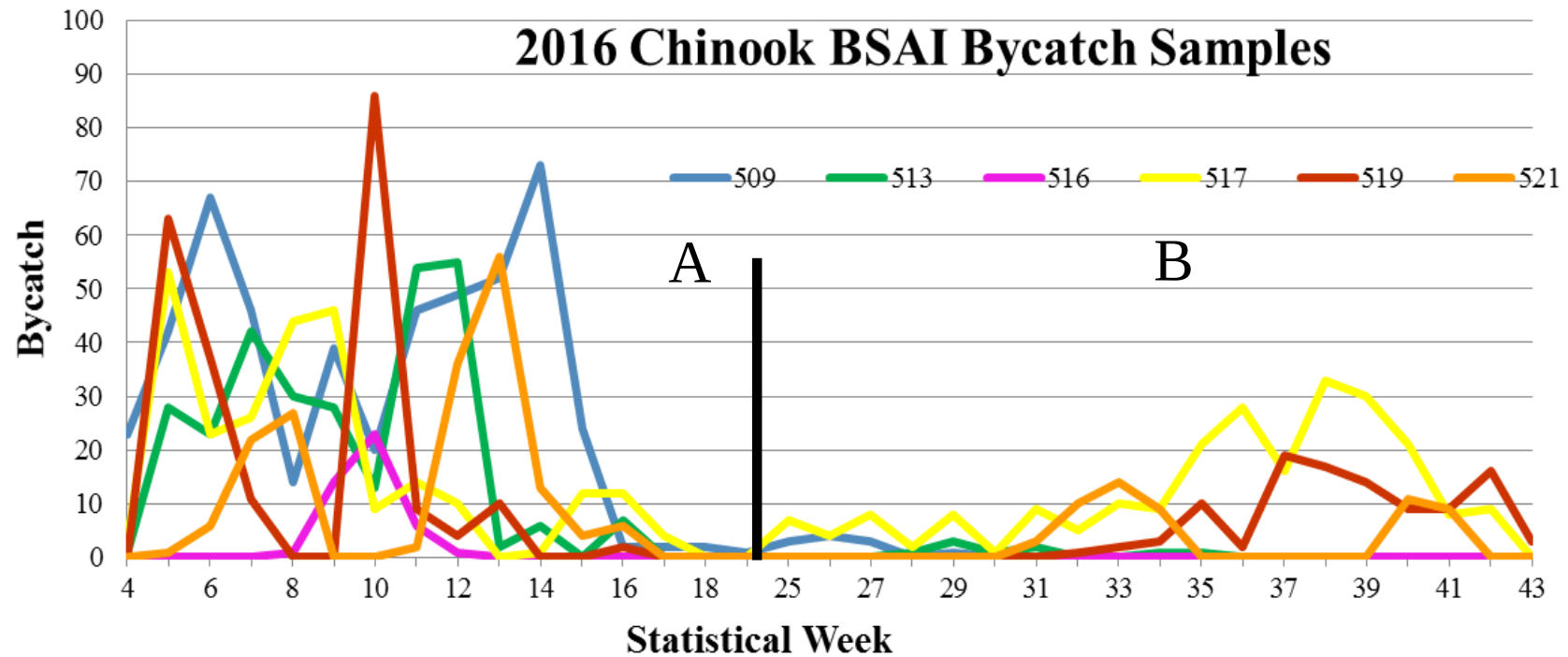
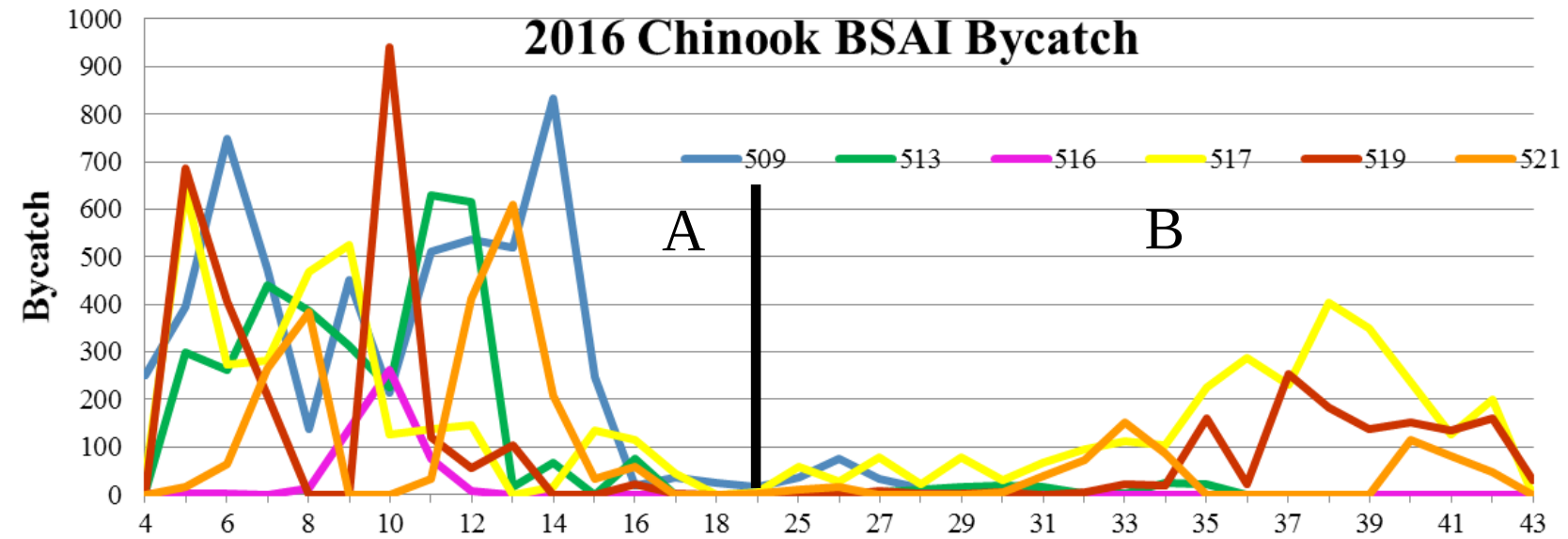
2005 “B” - 2006: SNPs (ADF&G, Chinook Salmon EIS)

2007-16: SNPs – 867 (2007 “B”), 863 (2008), 386 (2009), 826 (2010), 2,473 (2011), 1,111 (2012), 1,246 (2013), 1,385 (2014), 1,757 (2015), 1,910 (2016) samples.

2016 Bering Sea Bycatch/Sample Distribution



2016 Chinook Salmon Bering Sea Bycatch



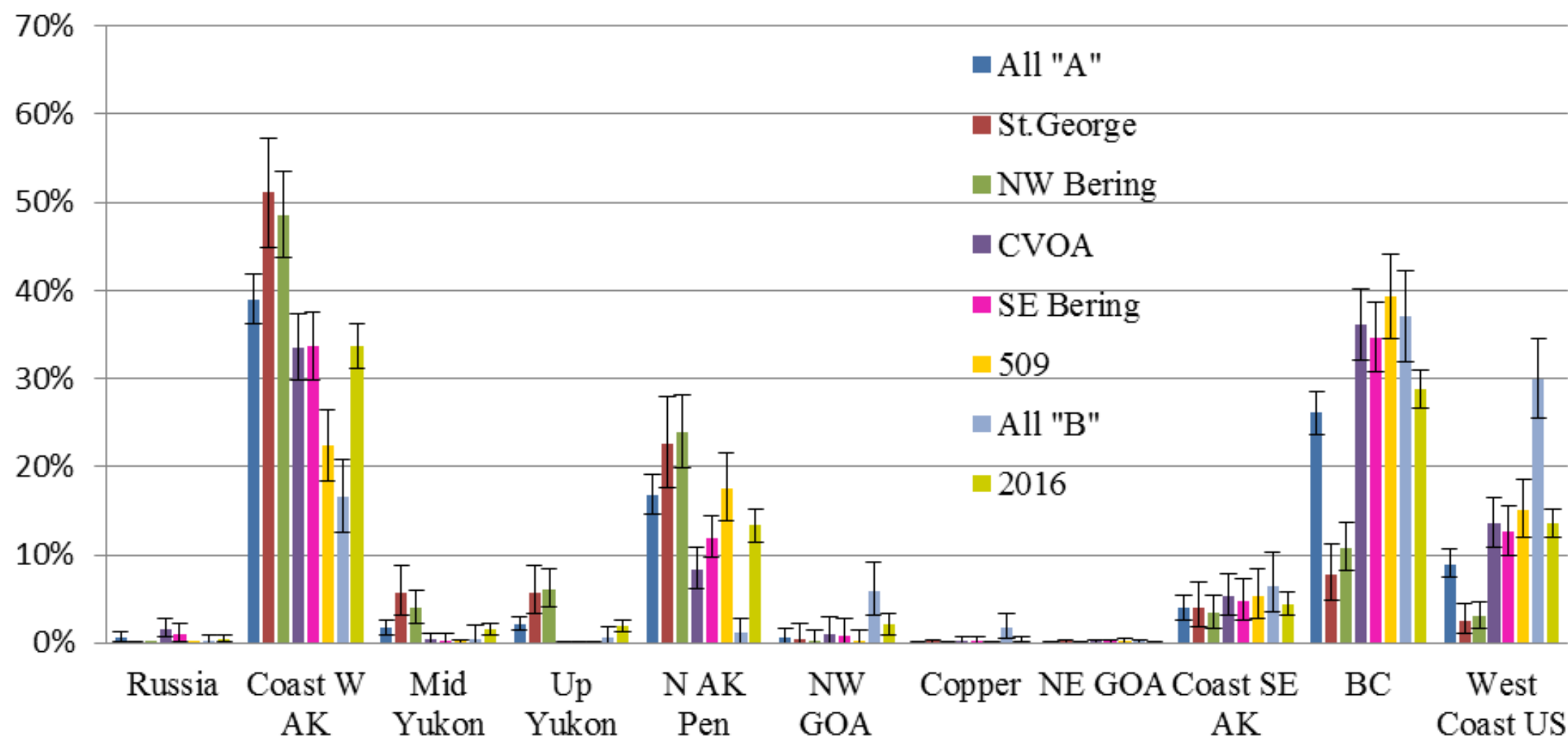
Region	"A" Season (N=1,488)					"B" Season (N=422)					Bering Sea all (N=1,910)				
	Est. #	Mean	SD	95% Est. #		Est. #	Mean	SD	95% Est. #		Est. #	Mean	SD	95% Est. #	
Russia	108	0.6	0.25	40	202	12	0.2	0.24	1	45	114	0.5	0.19	46	208
Coast W AK	6,570	39.0	1.46	6,092	7,056	843	16.5	2.14	637	1,061	7,372	33.6	1.28	6,832	7,928
Mid Yukon	283	1.7	0.40	165	426	18	0.4	0.60	0	103	327	1.5	0.34	197	485
Up Yukon	365	2.2	0.43	237	515	34	0.7	0.48	1	94	406	1.9	0.35	270	568
N AK Pen	2,839	16.9	1.17	2,460	3,231	56	1.1	0.72	2	143	2,927	13.4	0.96	2,519	3,346
NW GOA	94	0.6	0.46	0	273	298	5.9	1.54	159	465	458	2.1	0.62	219	750
Copper	3	0.0	0.06	0	34	90	1.8	0.73	30	174	75	0.3	0.18	18	167
NE GOA	2	0.0	0.07	0	27	2	0.0	0.13	0	15	2	0.0	0.07	0	29
Coast SE AK	663	3.9	0.72	443	910	333	6.5	1.70	184	522	971	4.4	0.64	713	1,263
BC	4,394	26.1	1.26	3,982	4,811	1,888	37.0	2.68	1,623	2,156	6,312	28.8	1.14	5,826	6,804
West Coast US	1,506	9.0	0.81	1,249	1,785	1,524	29.9	2.33	1,297	1,760	2,960	13.5	0.82	2,616	3,317
Total Catch	16,828					5,098					21,926				

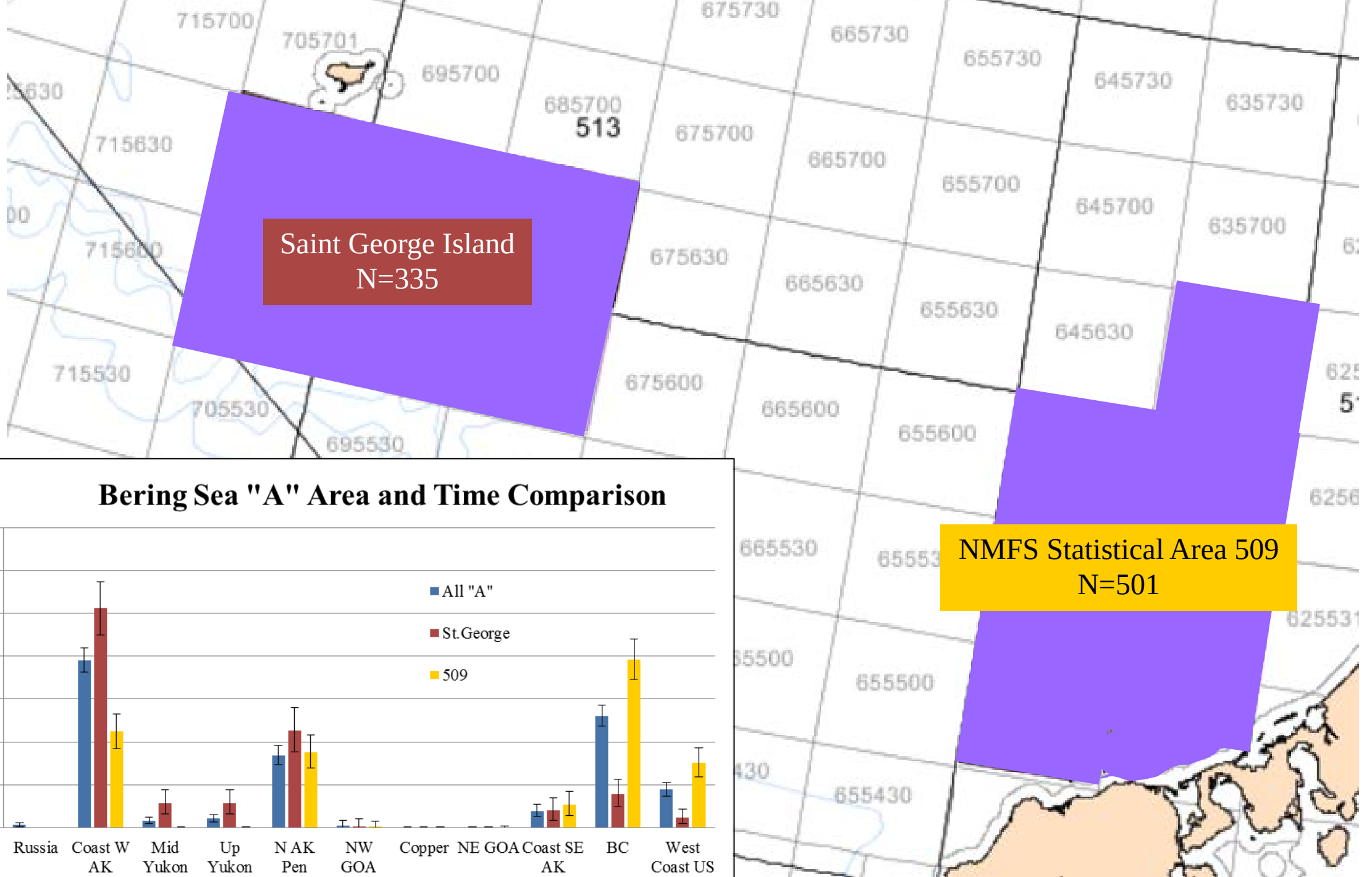
60% from Alaskan river systems flowing into the Bering Sea for “A” Season

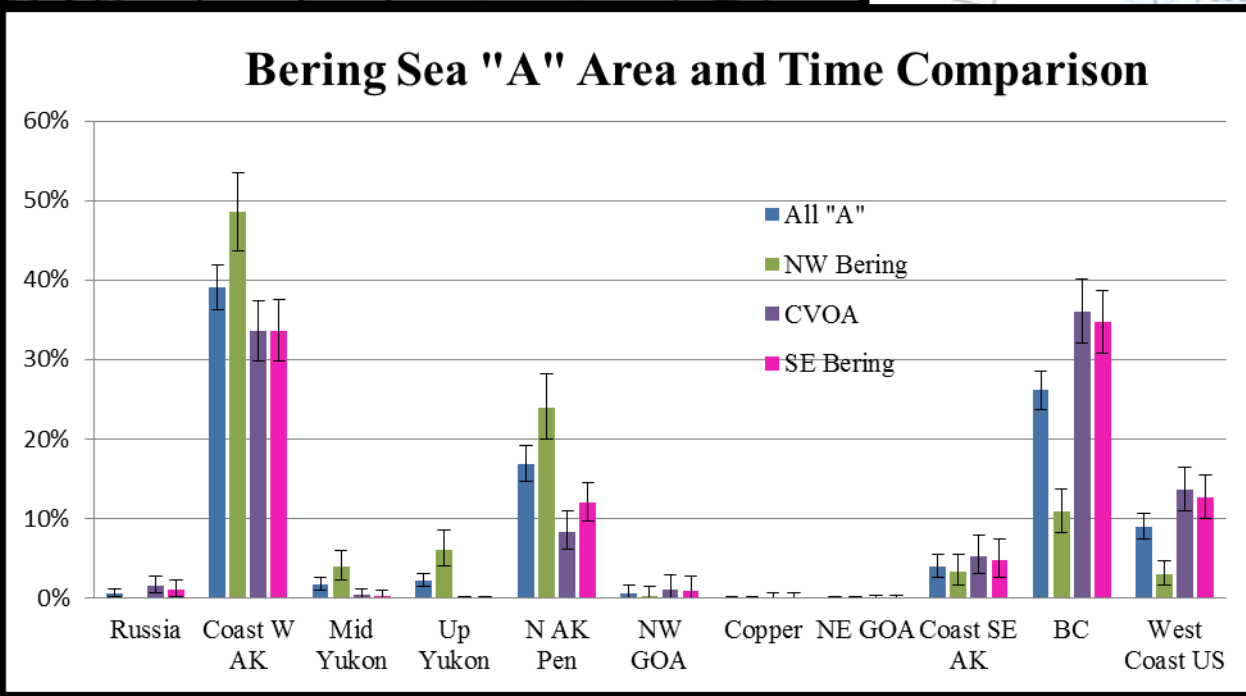
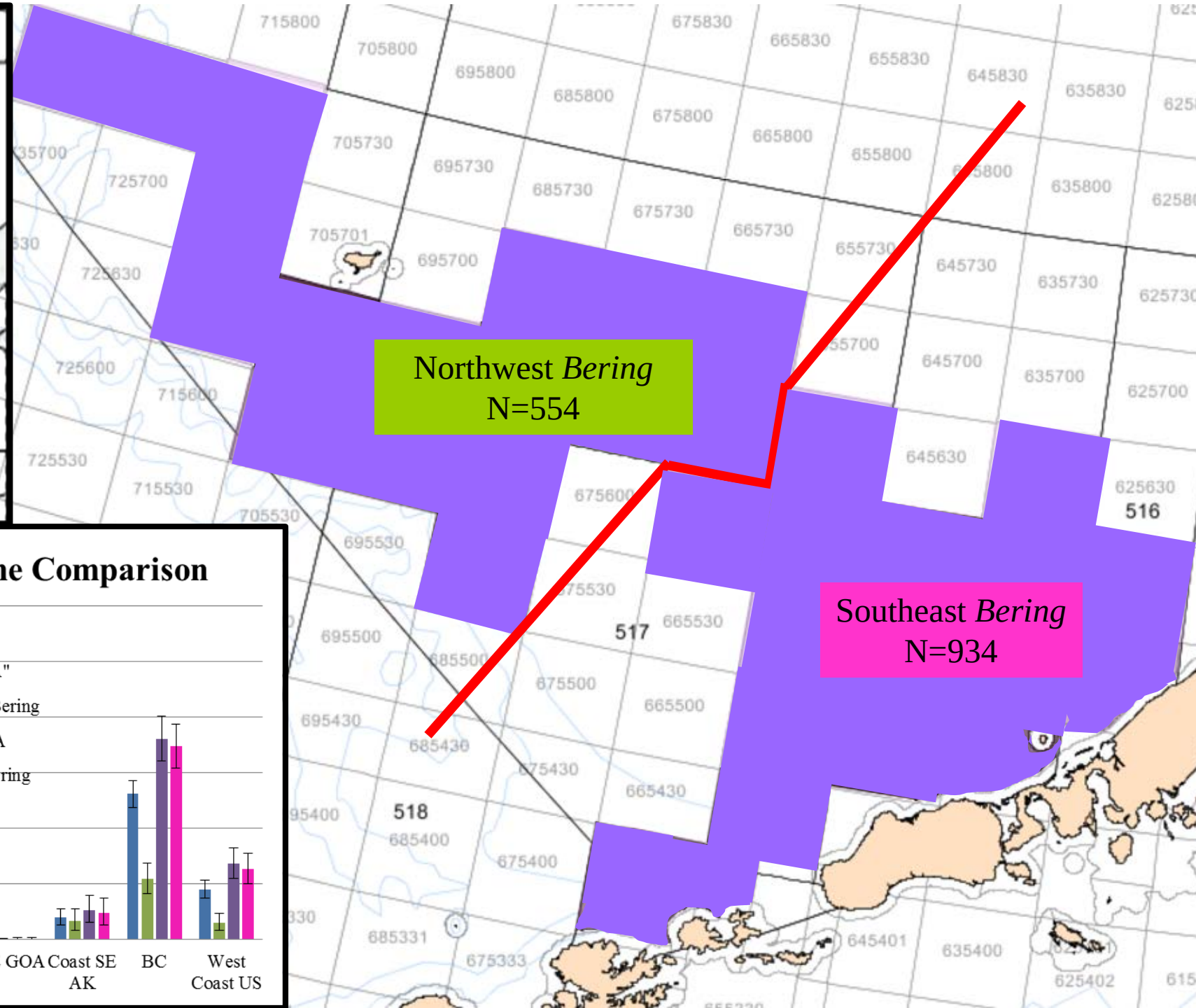
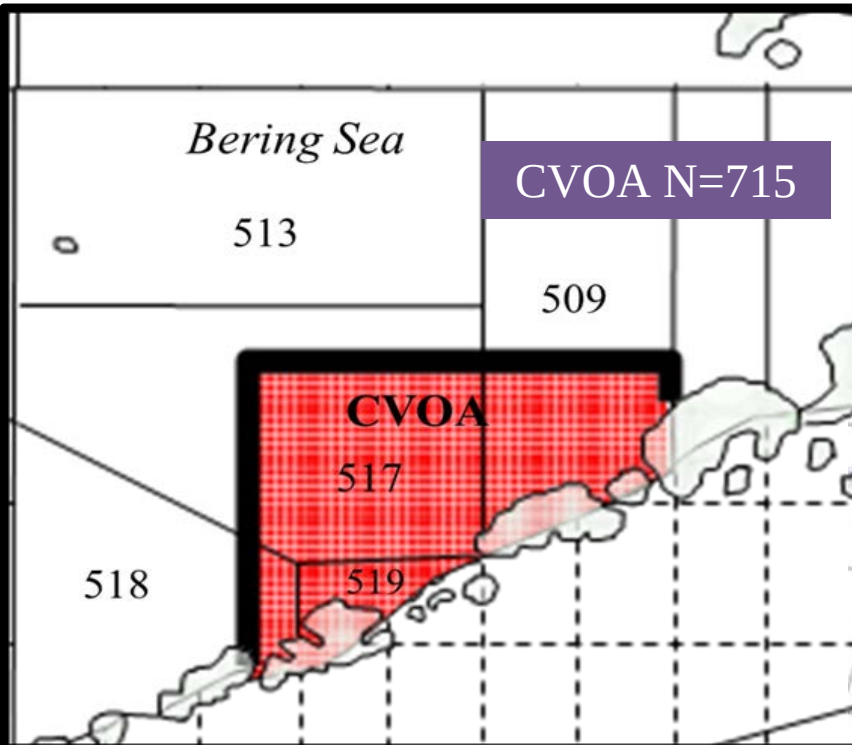
19% from Alaskan river systems flowing into the Bering Sea for “B” Season

50% from Alaskan river systems flowing into the Bering Sea for entire year

Bering Sea "A" Area and Time Comparison

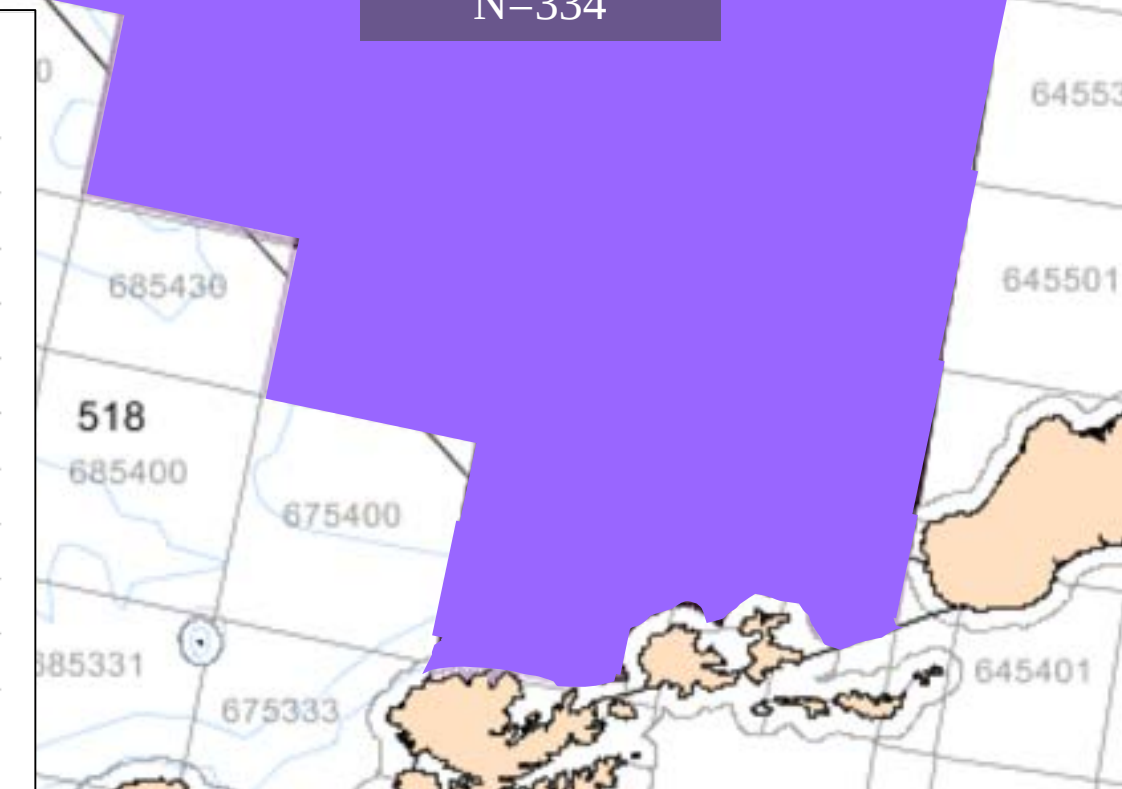
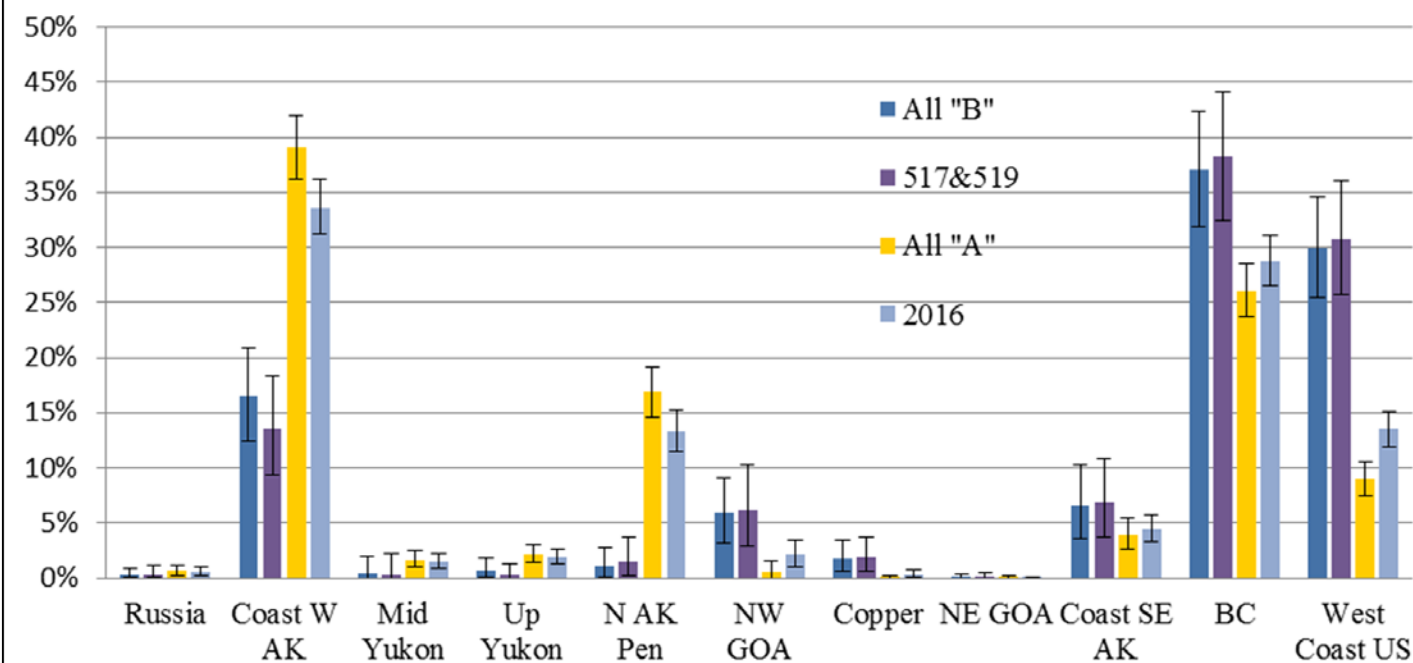






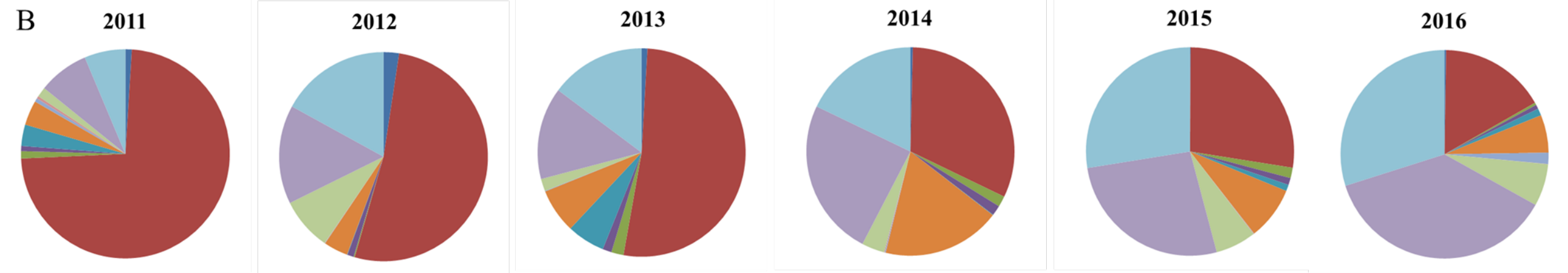
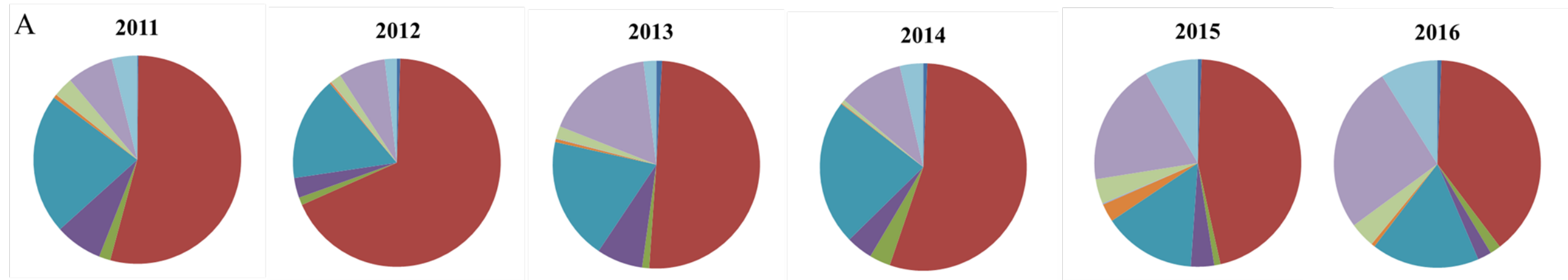


Bering Sea "B" Area and Time Comparison

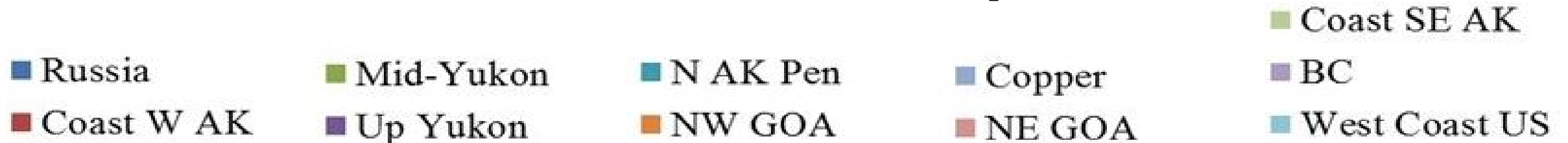


Chinook Salmon Bering Sea Bycatch Seasonal Stock Differences:

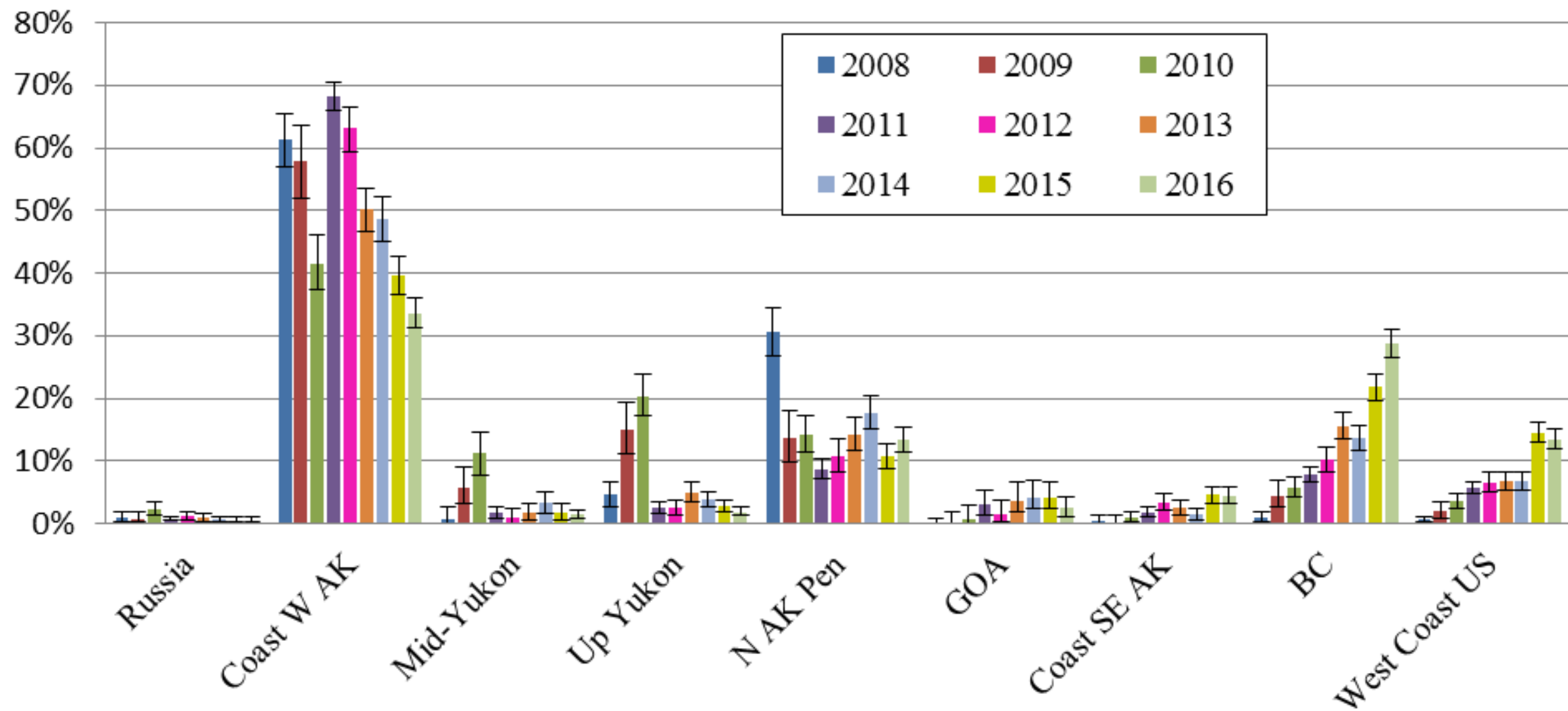
2016 A Season: 1,488 samples



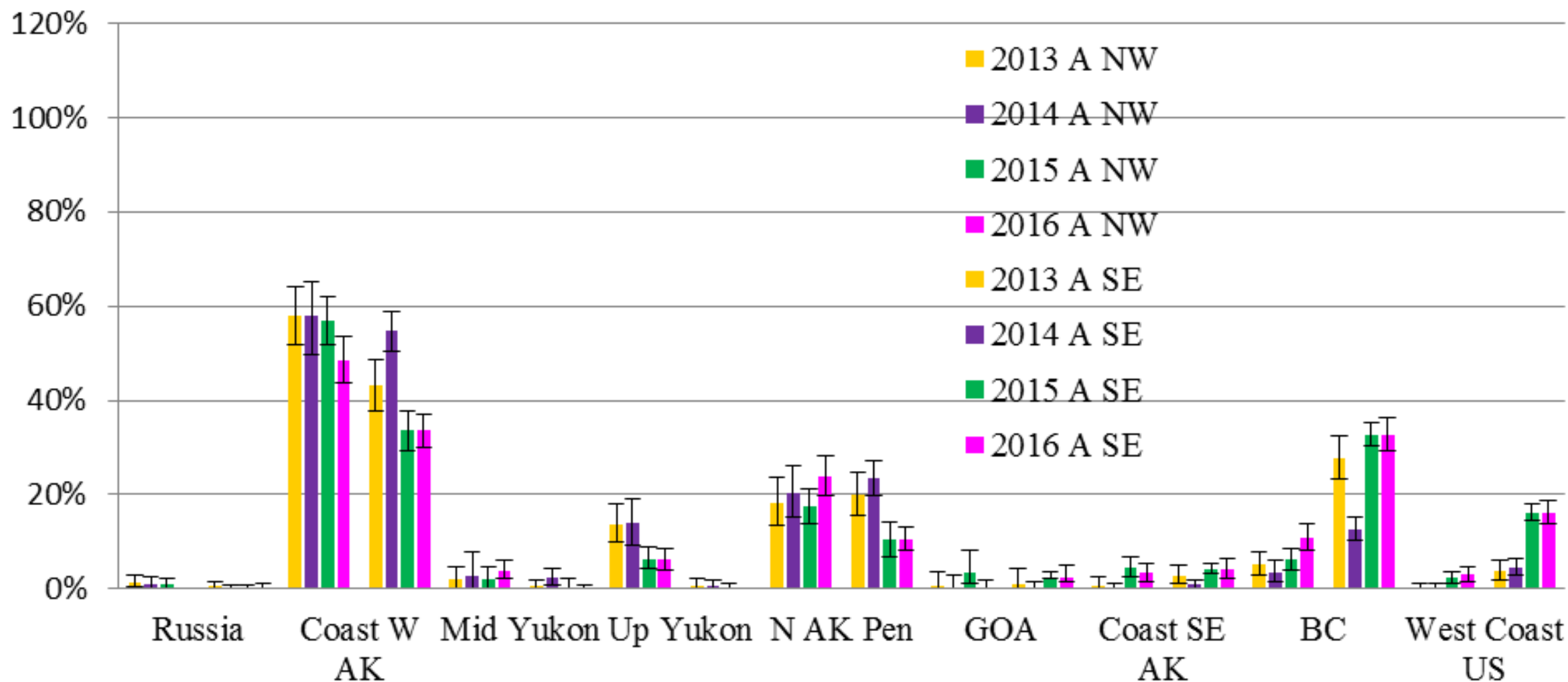
2016 B Season: 422 samples

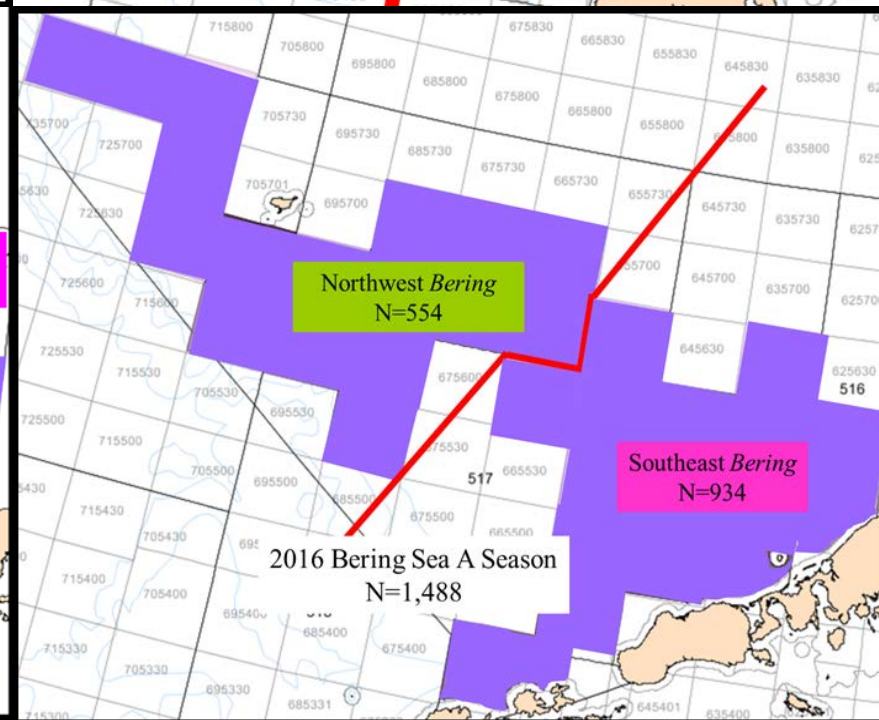
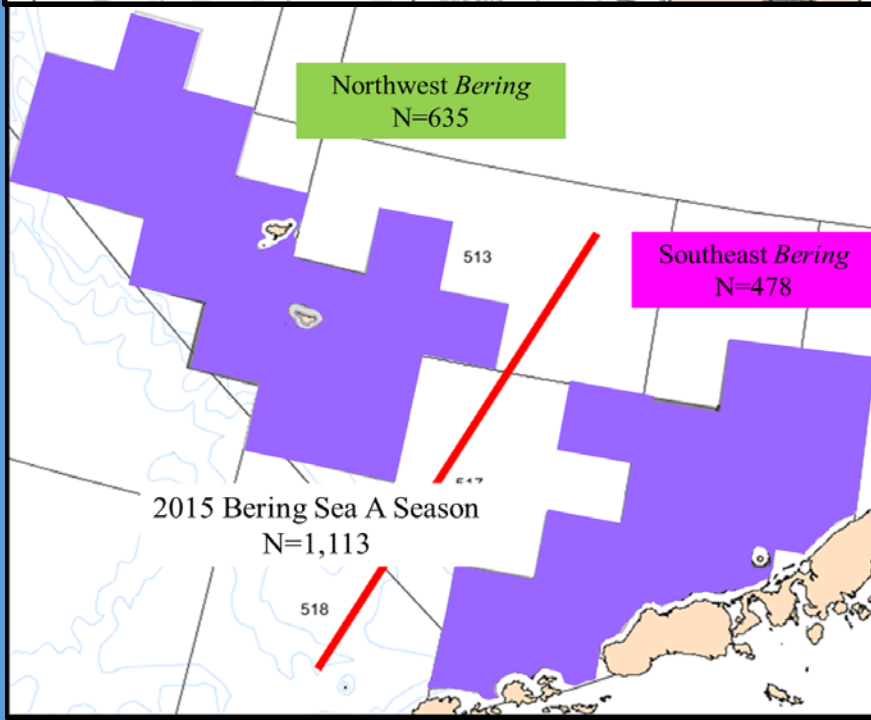
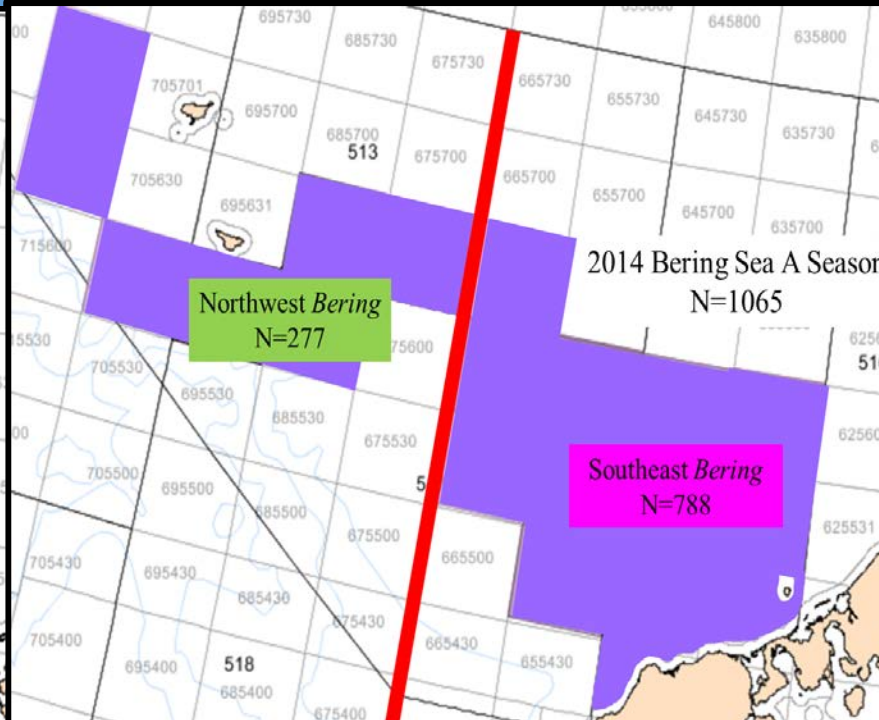
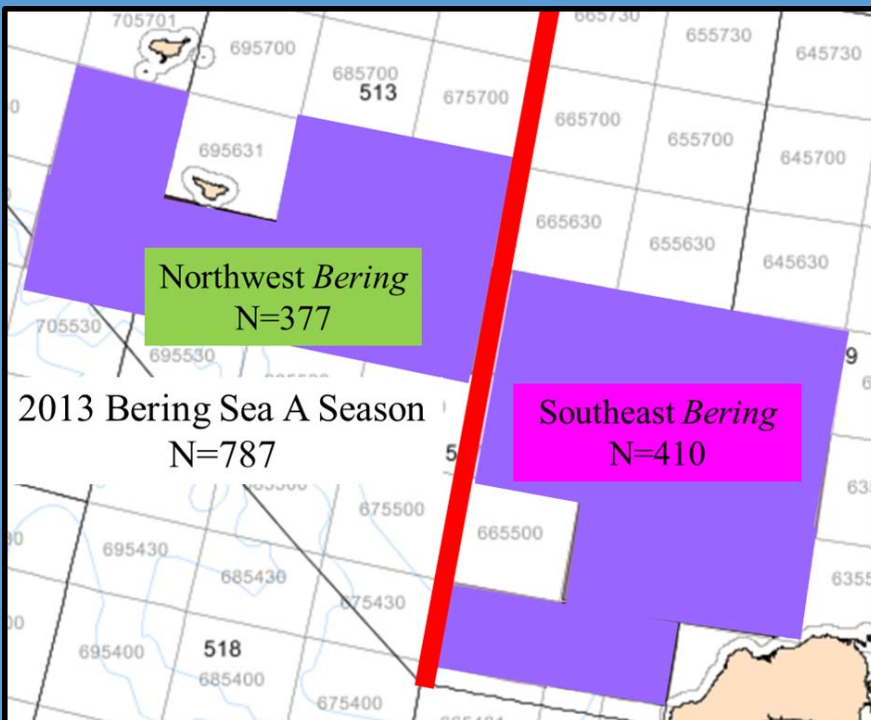


BSAI Chinook Bycatch by Year



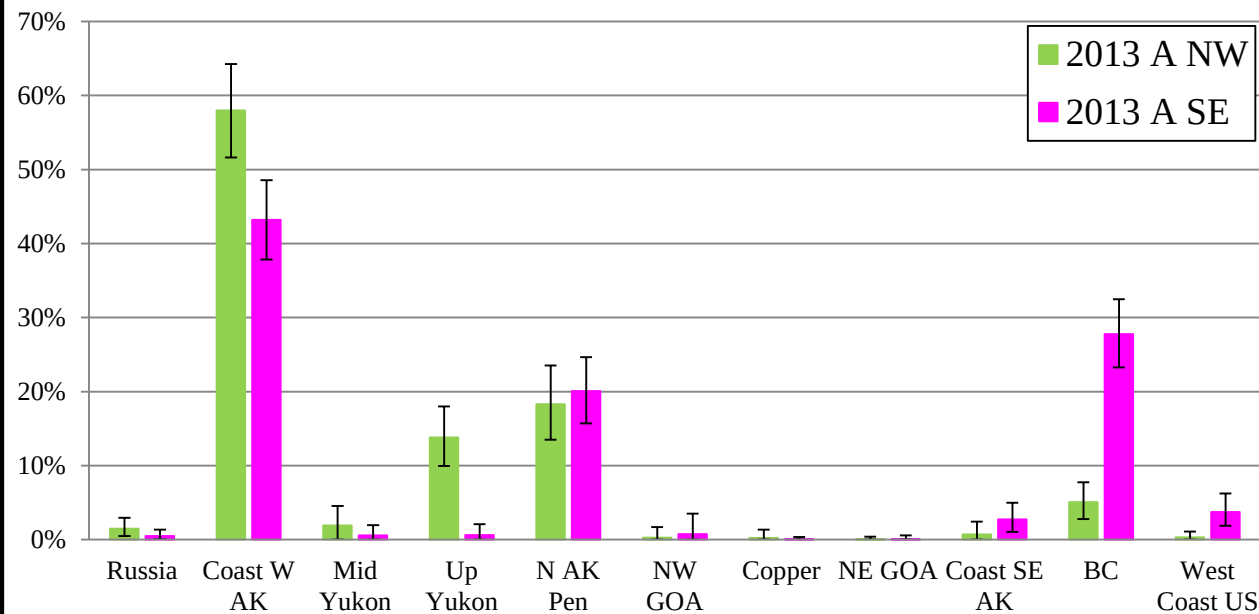
Bering Sea "A" Area and Time Comparison



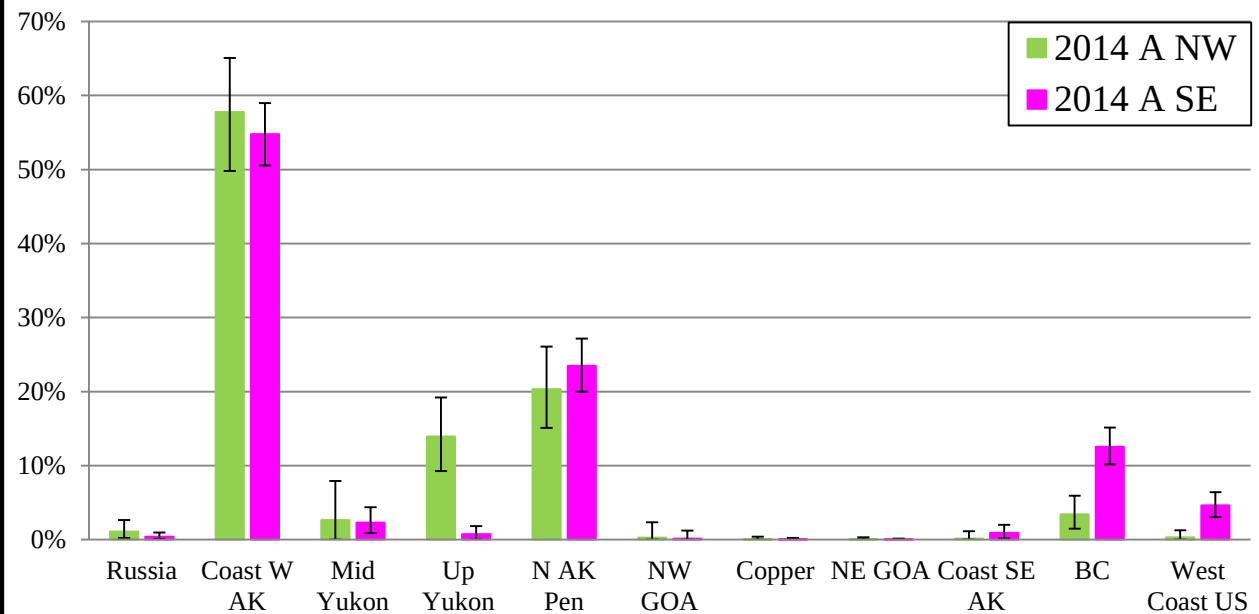


Locations of the
Northwest Bering and
Southeast Bering
Chinook genetic samples
2013-2016

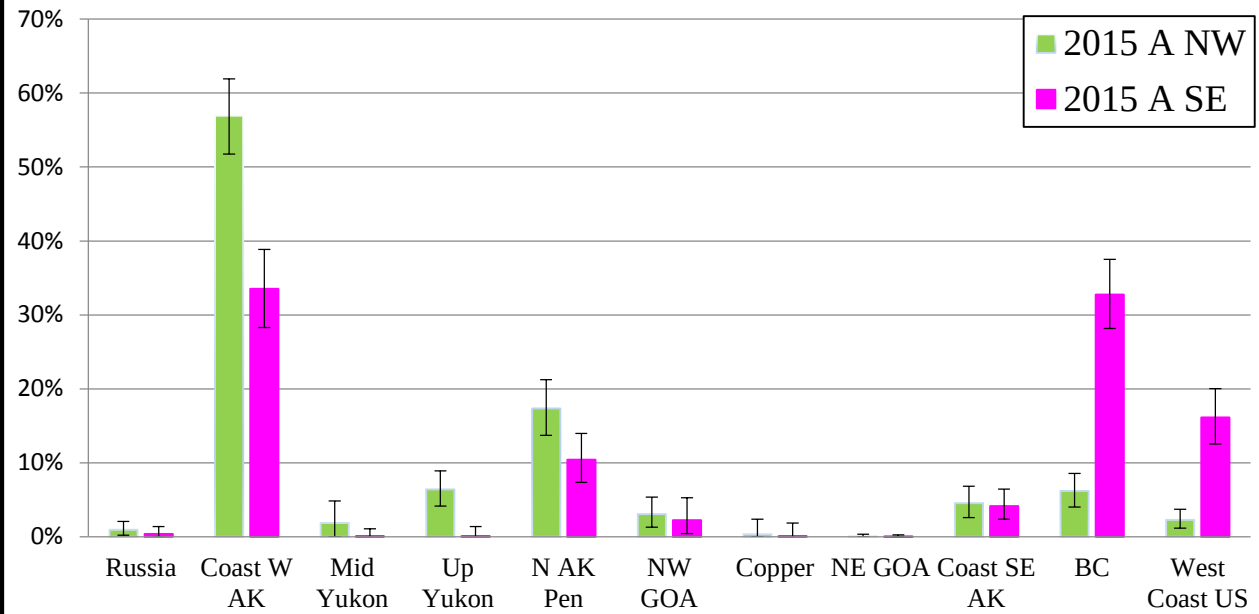
2013



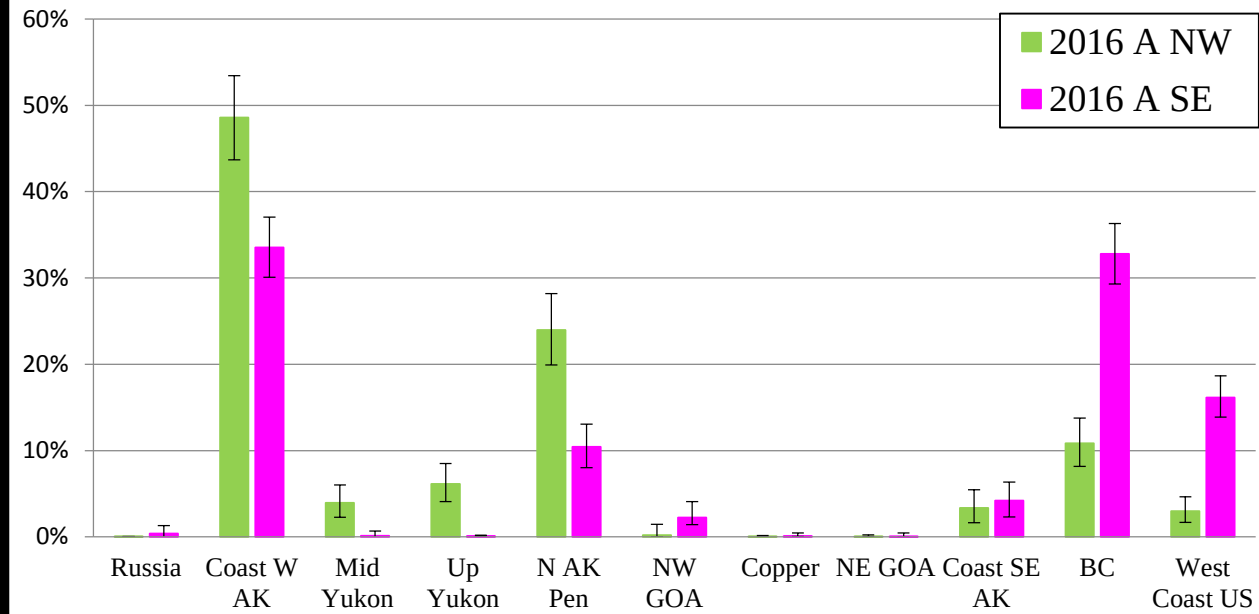
2014



2015



2016



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NMFS-AFSC-370

<http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-370.pdf>

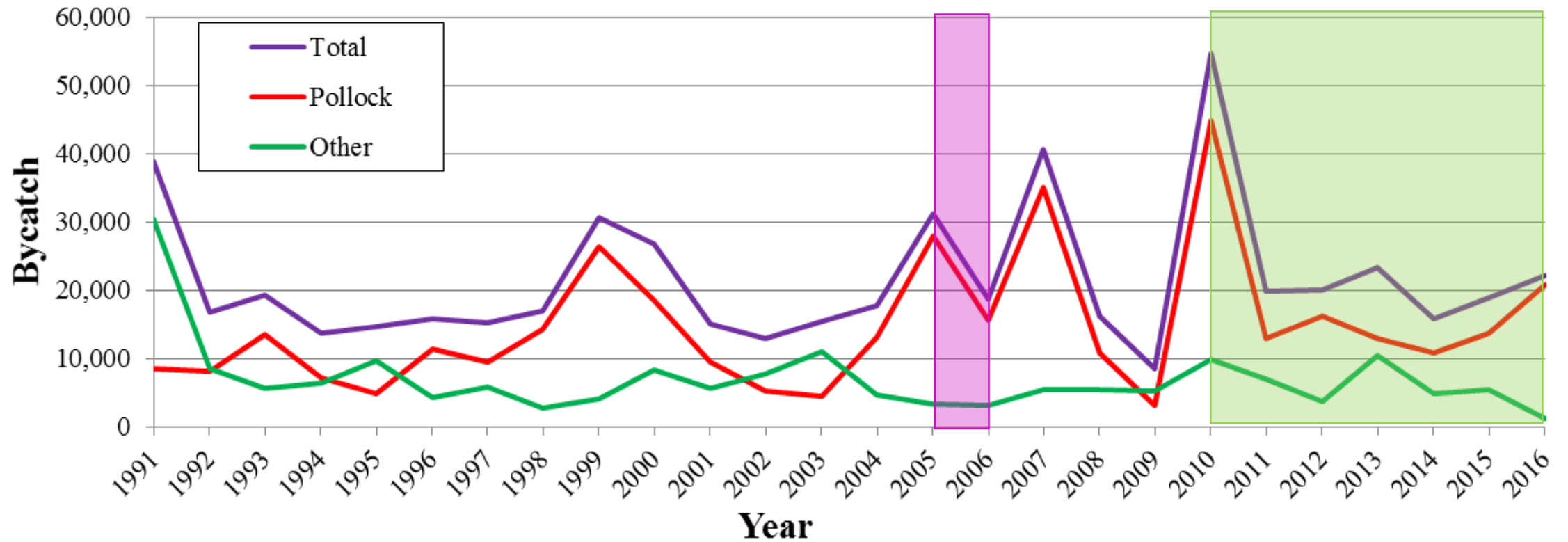
Genetic Stock Composition Analysis to the Chinook Salmon Bycatch Samples from the 2016 *Gulf of Alaska* Trawl Fisheries

**C.M. Guthrie, III, Hv. T. Nguyen, A. E. Thomson, K. Hauch,
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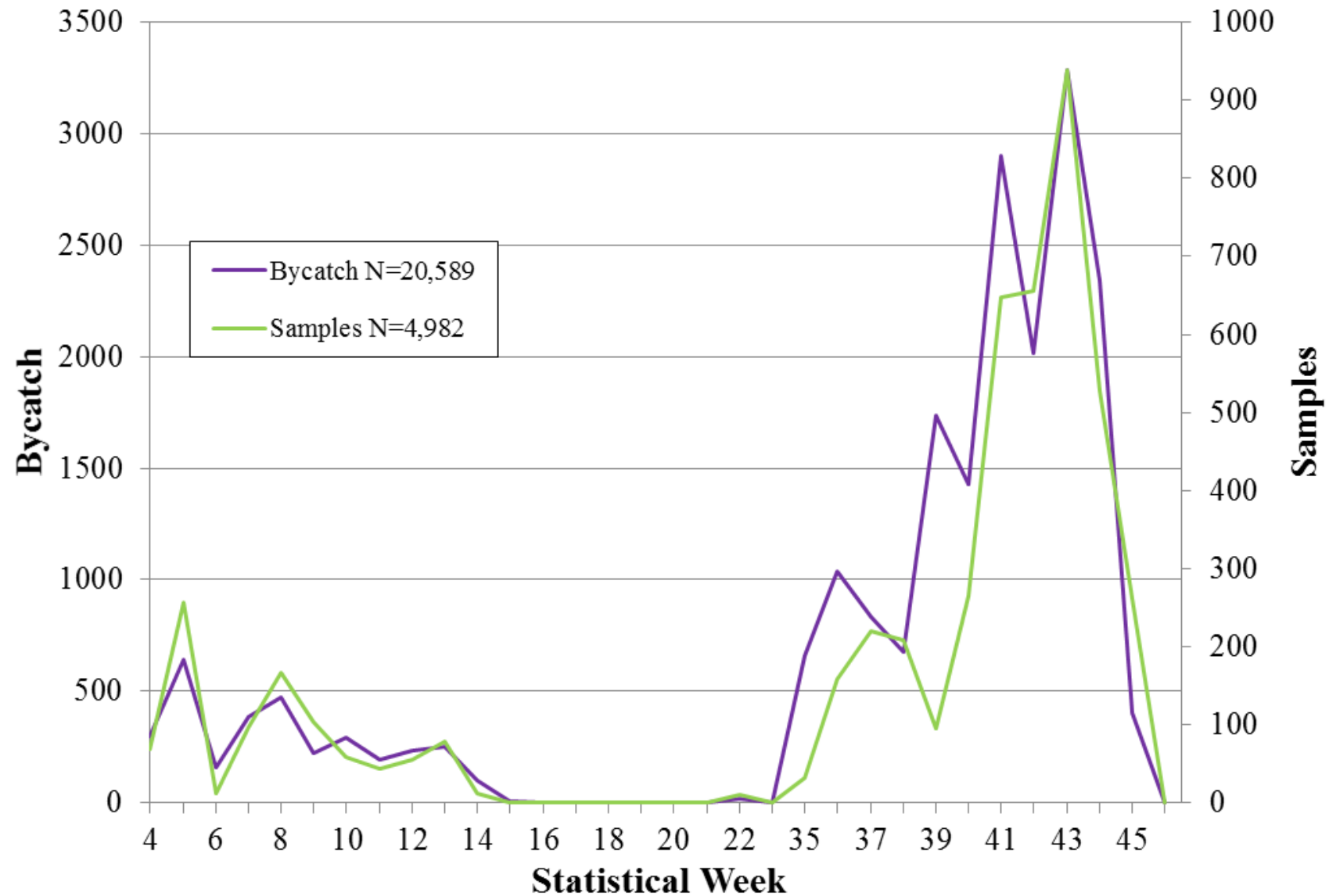
2016 Chinook Salmon GOA Bycatch



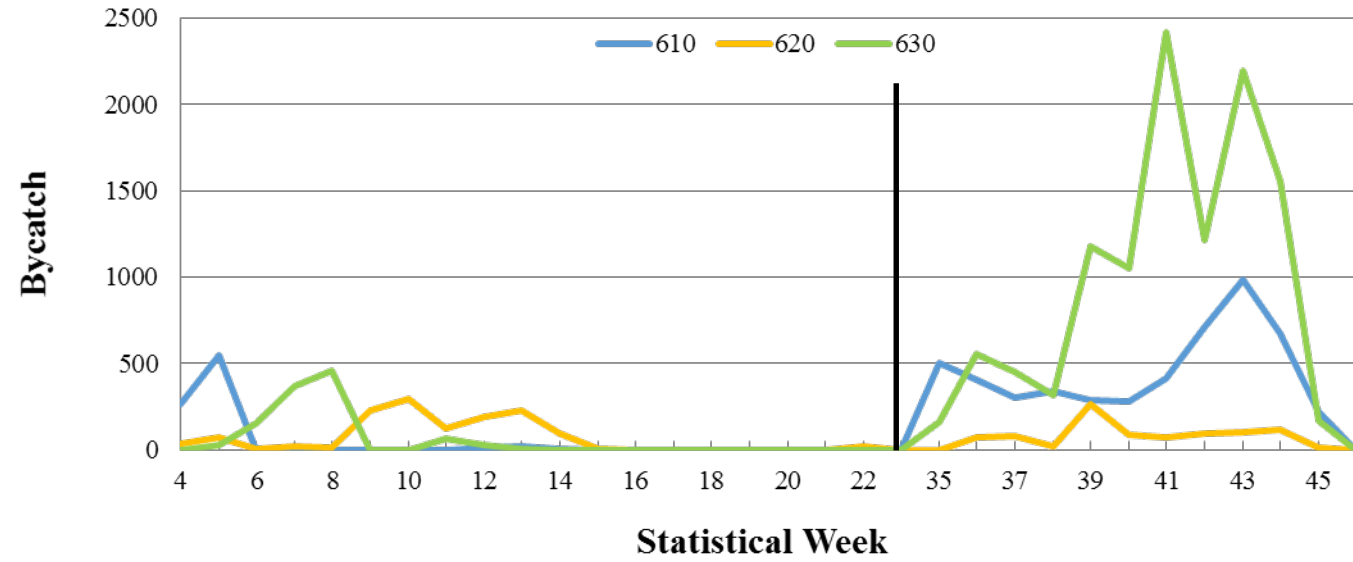
2005 – 2006: SNPs – 219 (Winter 2006), 62 (Summer 2005-6), 127 (Fall 2005-6) samples.

2010–16: SNPs – 161 (2010), 240 (2011), 948 (2012), 693 (2013), 1,163 (2014), 2,414 (2015), and 4,962 (2016) samples.

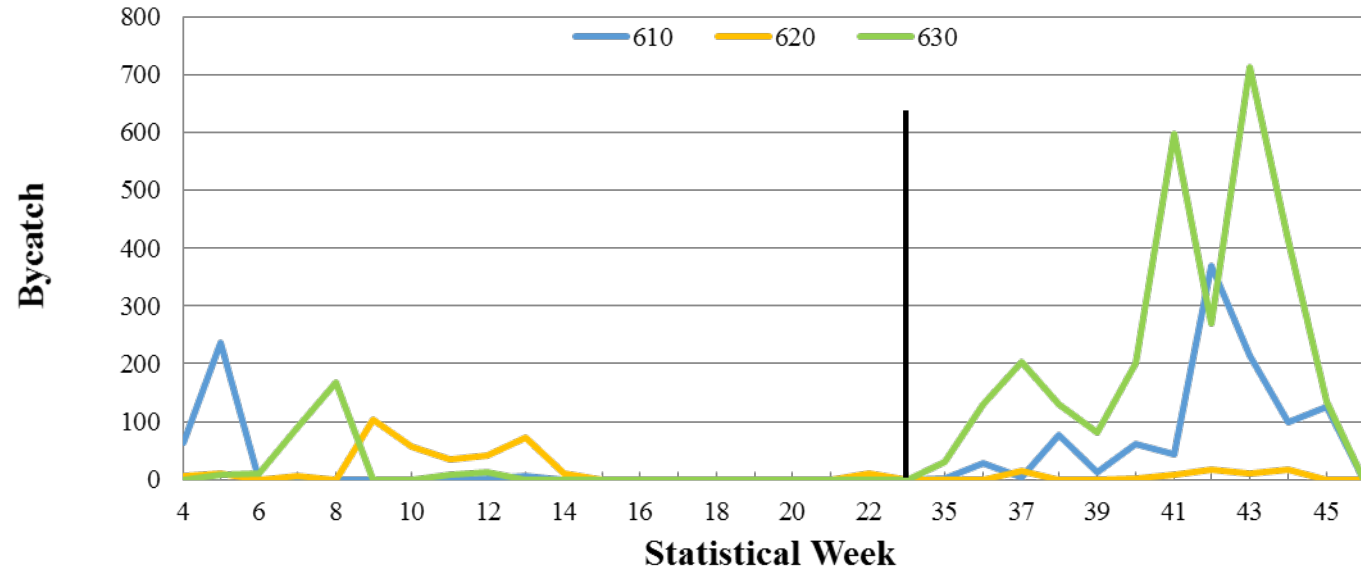
2016 GOA Pollock Bycatch/Sample Distribution



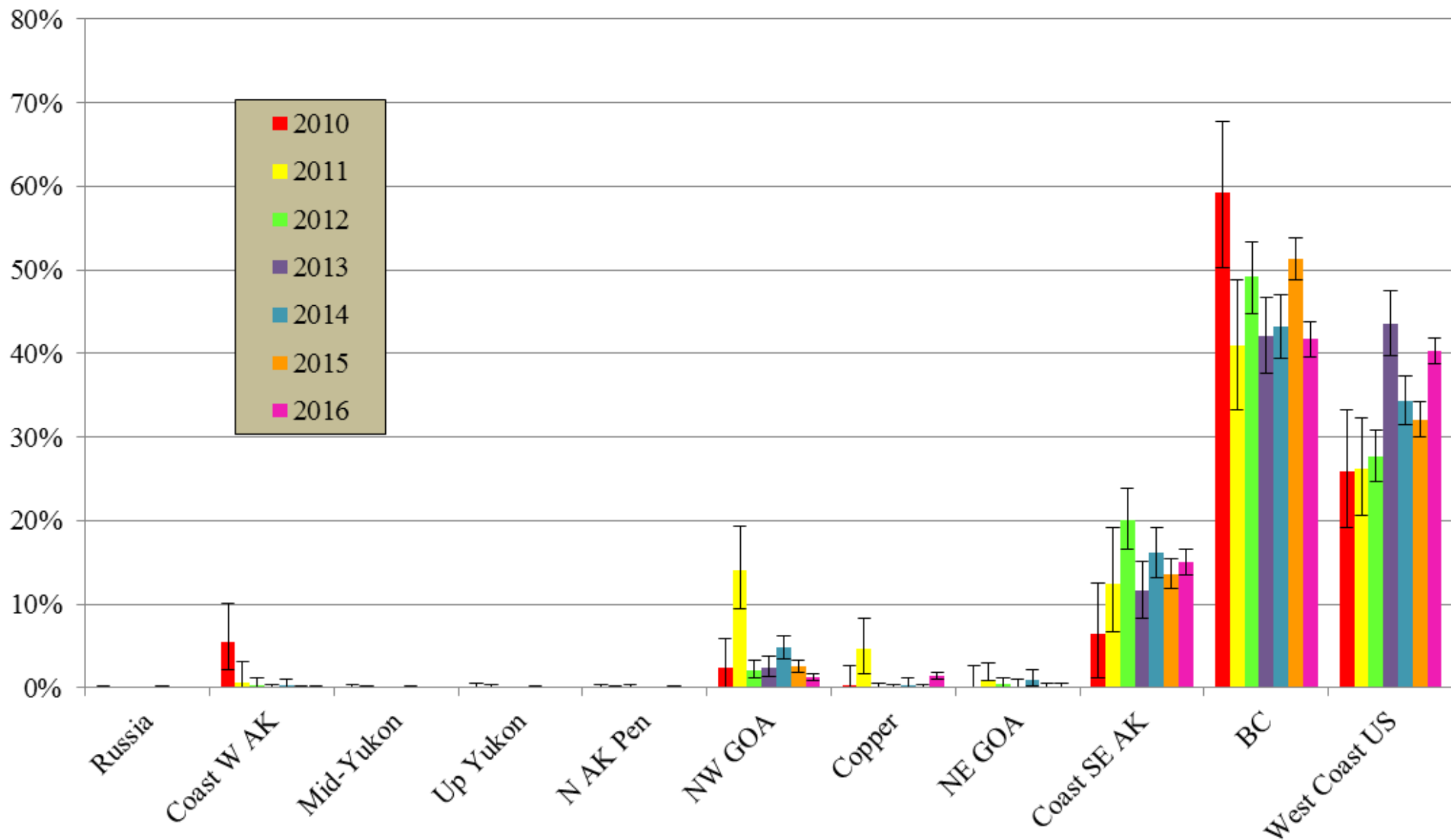
2016 Chinook GOA Bycatch



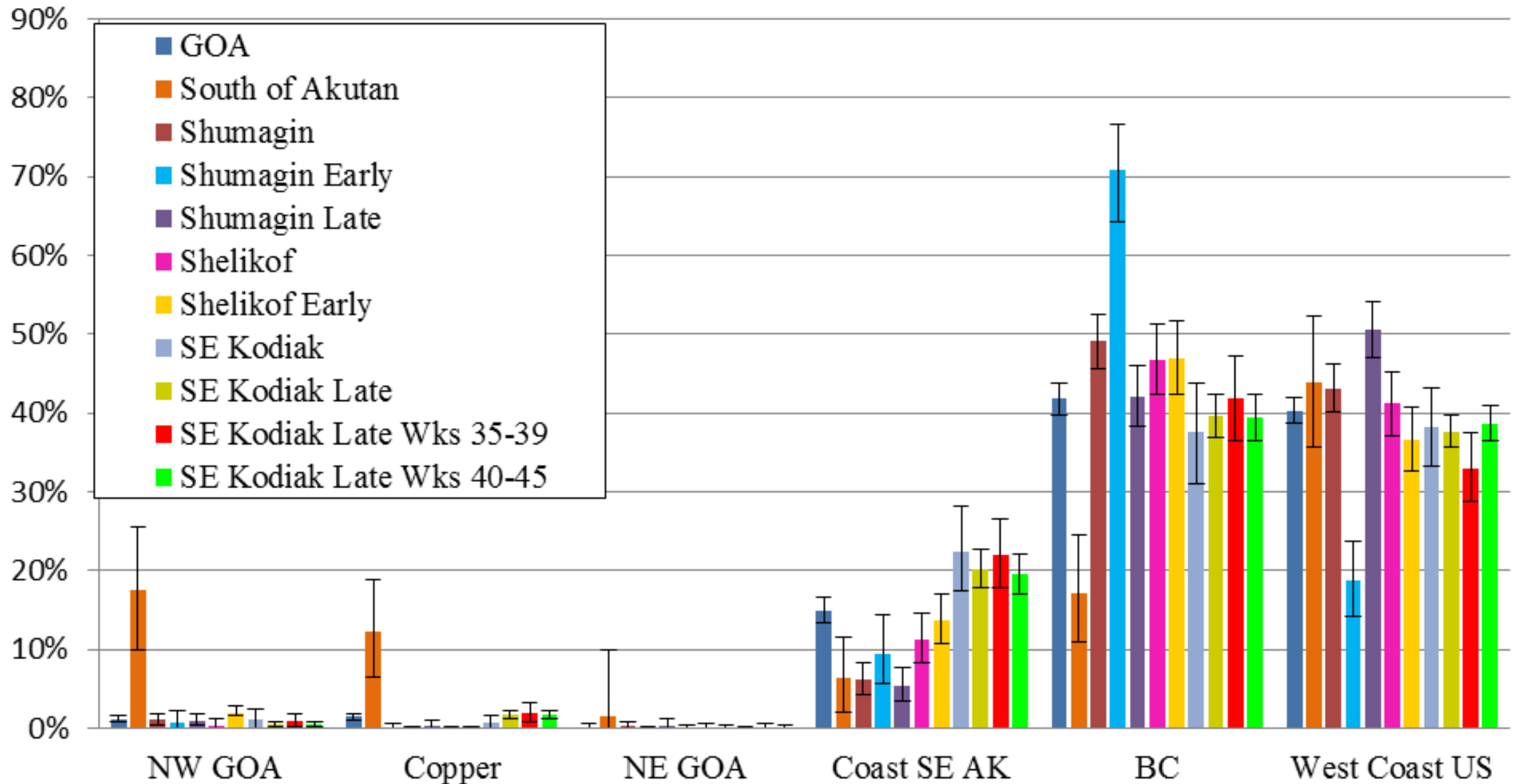
2016 Chinook GOA Samples

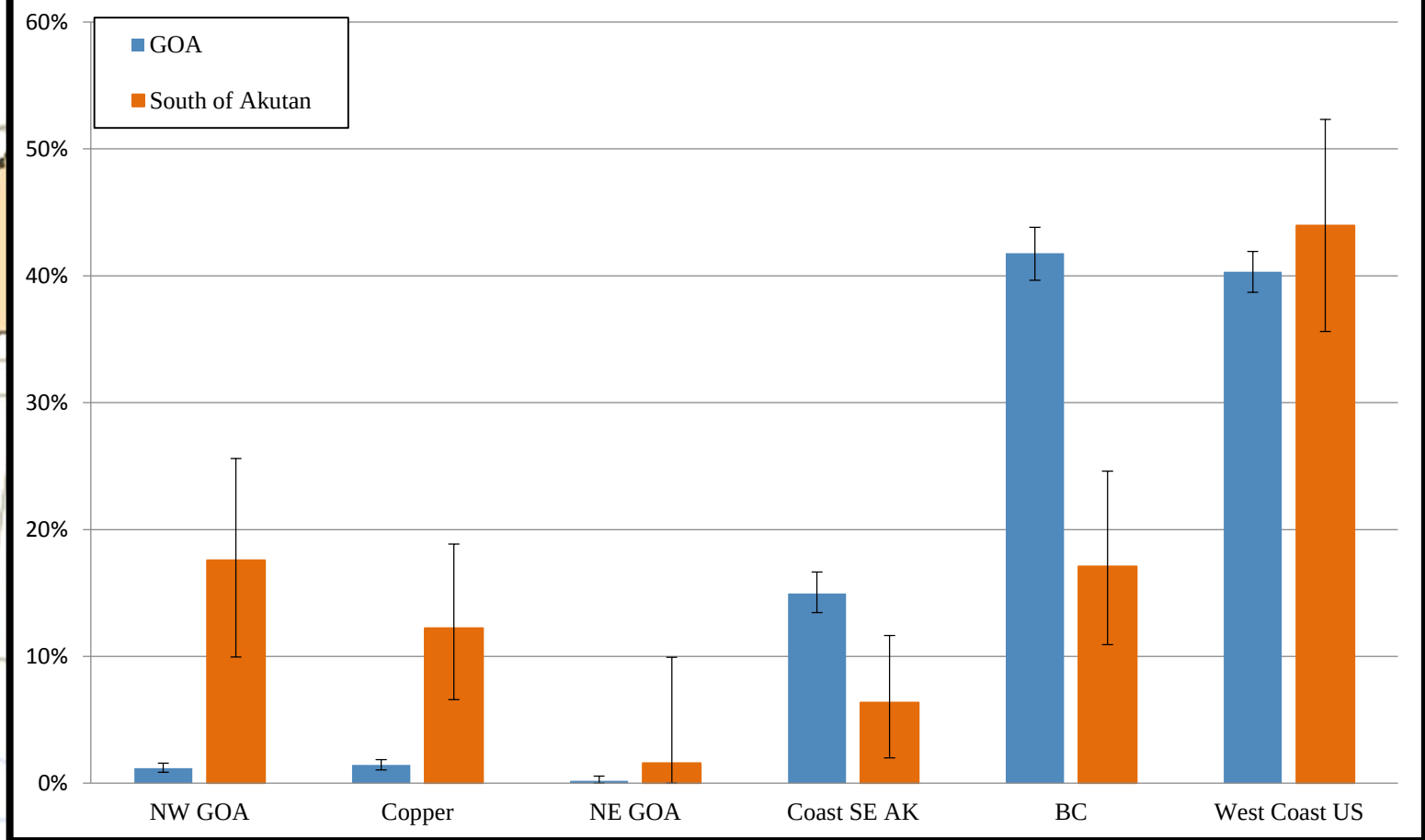
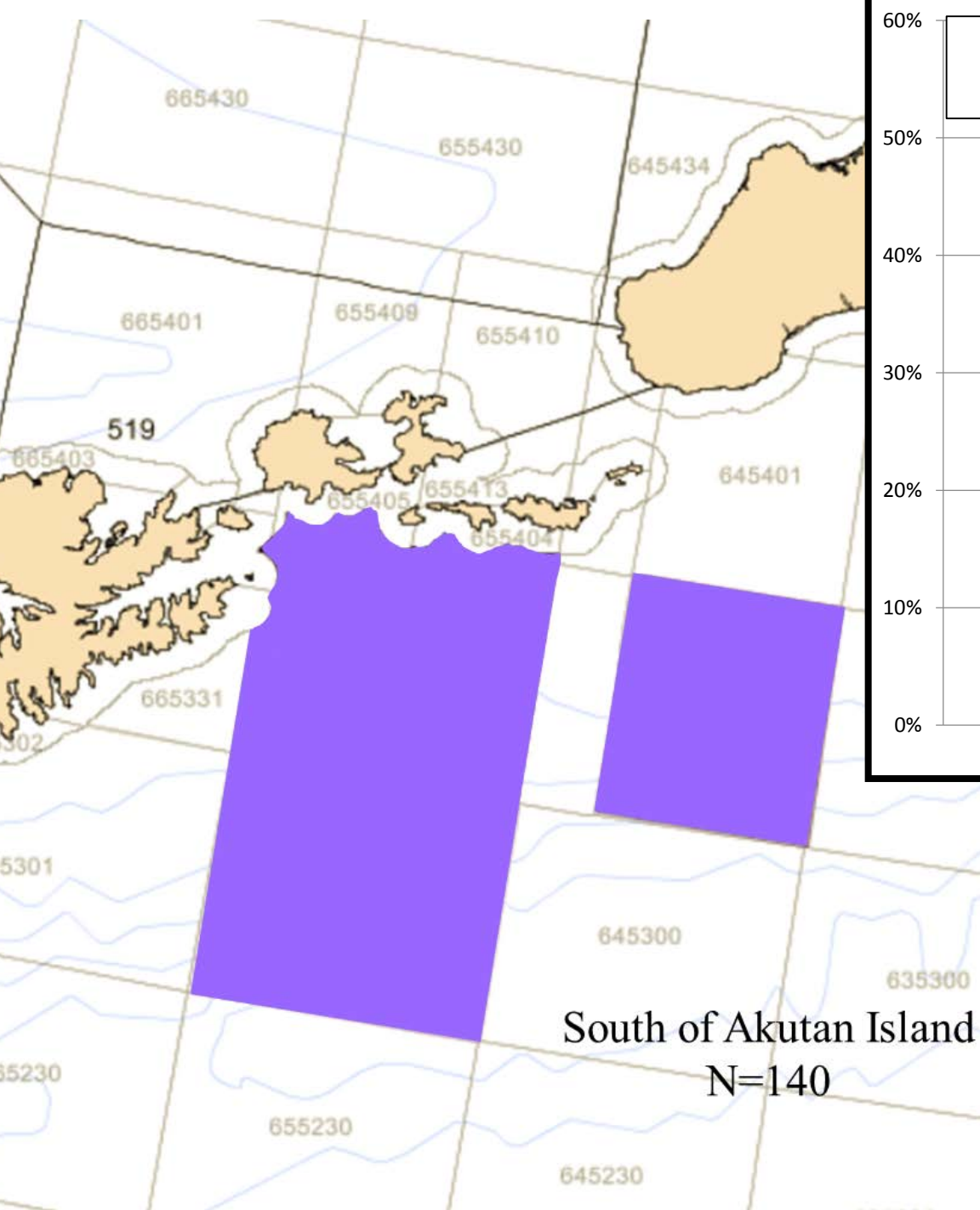


2016 Chinook Salmon GOA Bycatch - Pollock



2016 GOA Chinook Salmon Bycatch

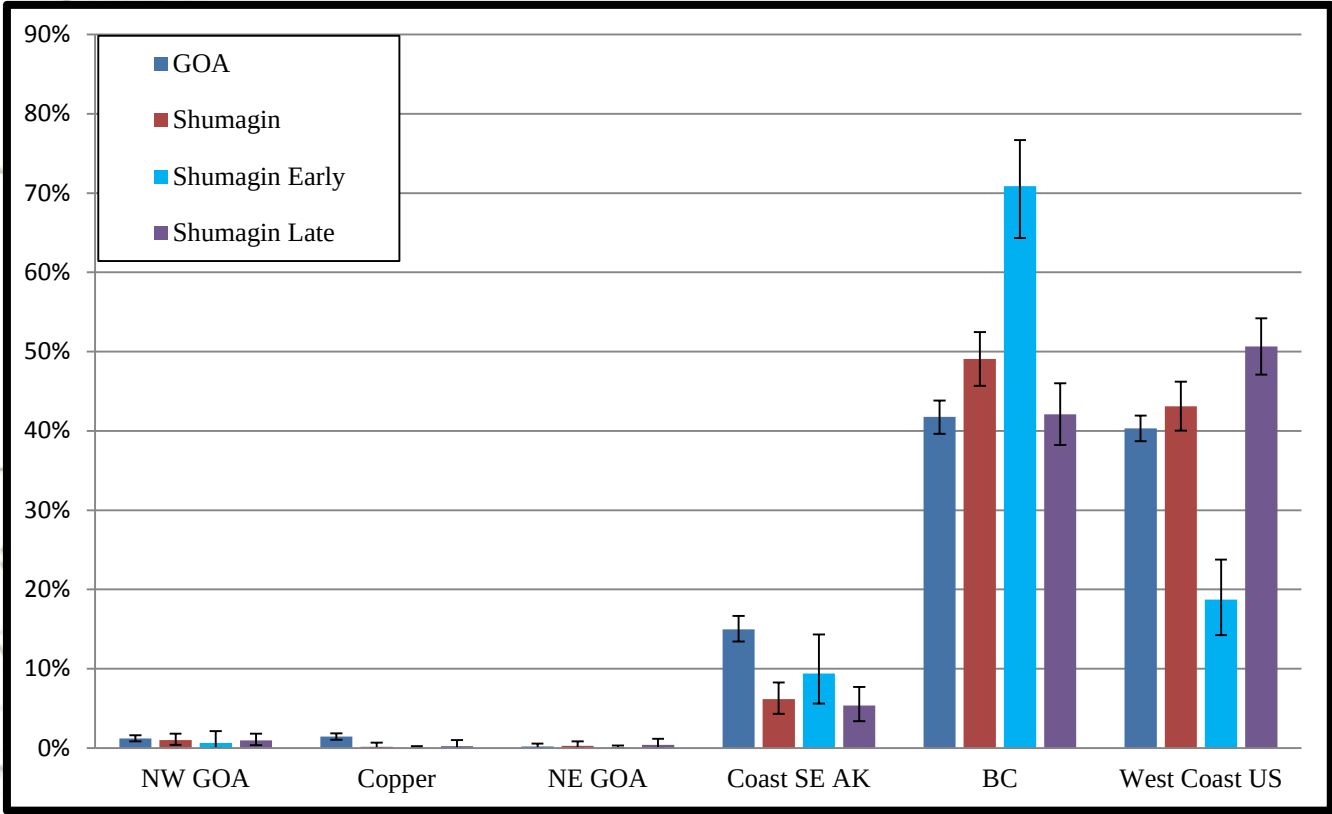
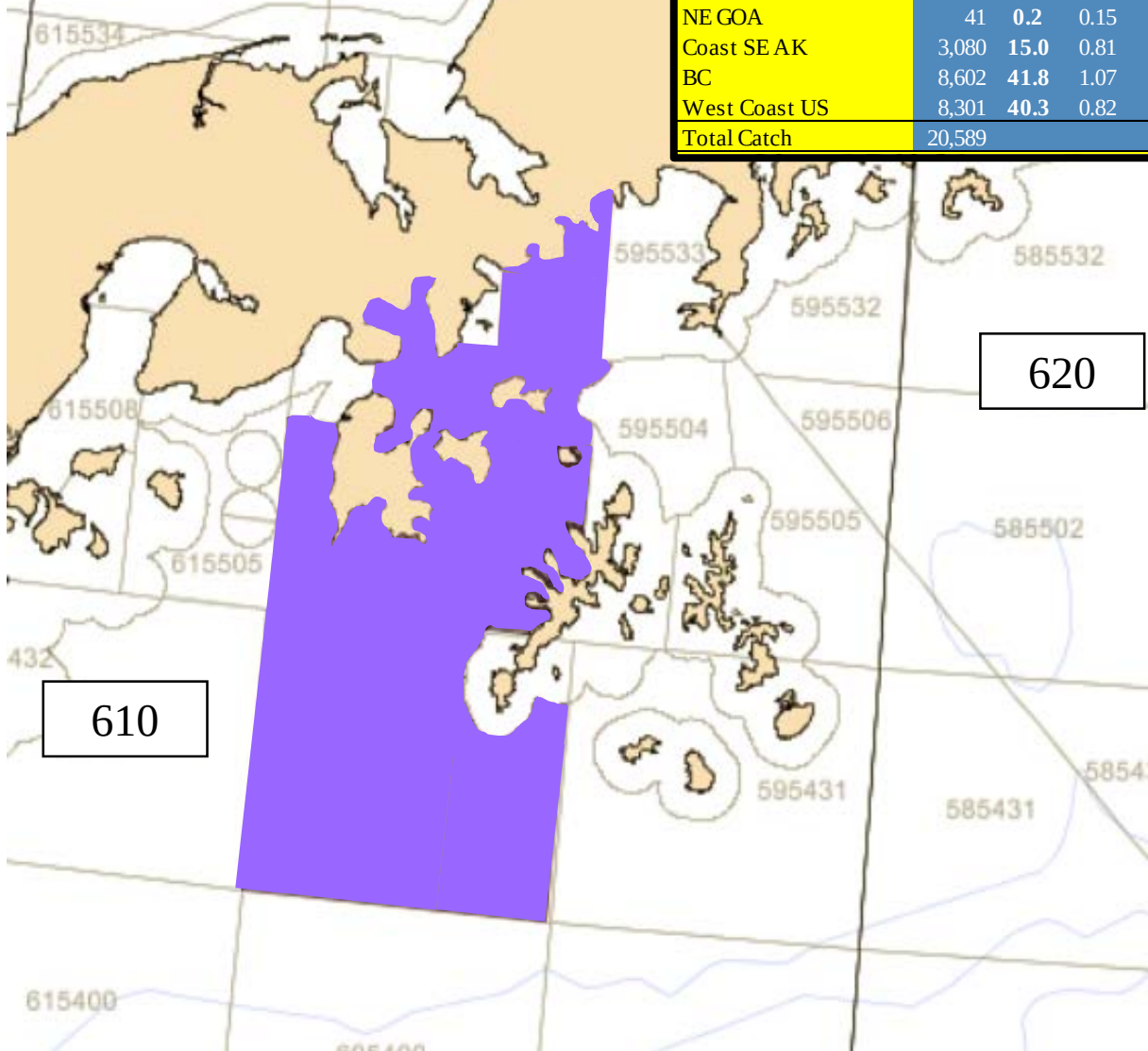




Region	Gulf of Alaska, pollock (N=4,962)				South of Akutan Island (N=140)			
	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	8	0.0	0.03	(0.0,0.1)	0	0.0	0.11	(0.0,0.2)
Coast W AK	10	0.1	0.07	(0.0,0.2)	17	1.1	1.44	(0.0,5.0)
Mid Yukon	0	0.0	0.00	(0.0,0.0)	1	0.0	0.18	(0.0,0.4)
Up Yukon	0	0.0	0.01	(0.0,0.0)	1	0.1	0.23	(0.0,0.7)
N AK Pen	0	0.0	0.01	(0.0,0.0)	1	0.0	0.20	(0.0,0.5)
NW GOA	247	1.2	0.18	(0.9,1.6)	280	17.6	3.98	(10.0,25.6)
Copper	296	1.4	0.21	(1.1,1.9)	195	12.2	3.14	(6.6,18.9)
NE GOA	41	0.2	0.15	(0.0,0.6)	25	1.6	2.93	(0.0,9.9)
Coast SE AK	3,080	15.0	0.81	(13.5,16.7)	101	6.4	2.46	(2.0,11.6)
BC	8,602	41.8	1.07	(39.7,43.8)	272	17.1	3.49	(10.9,24.6)
West Coast US	8,301	40.3	0.82	(38.7,41.9)	700	44.0	4.27	(35.6,52.3)
Total Catch	20,589				1,593			

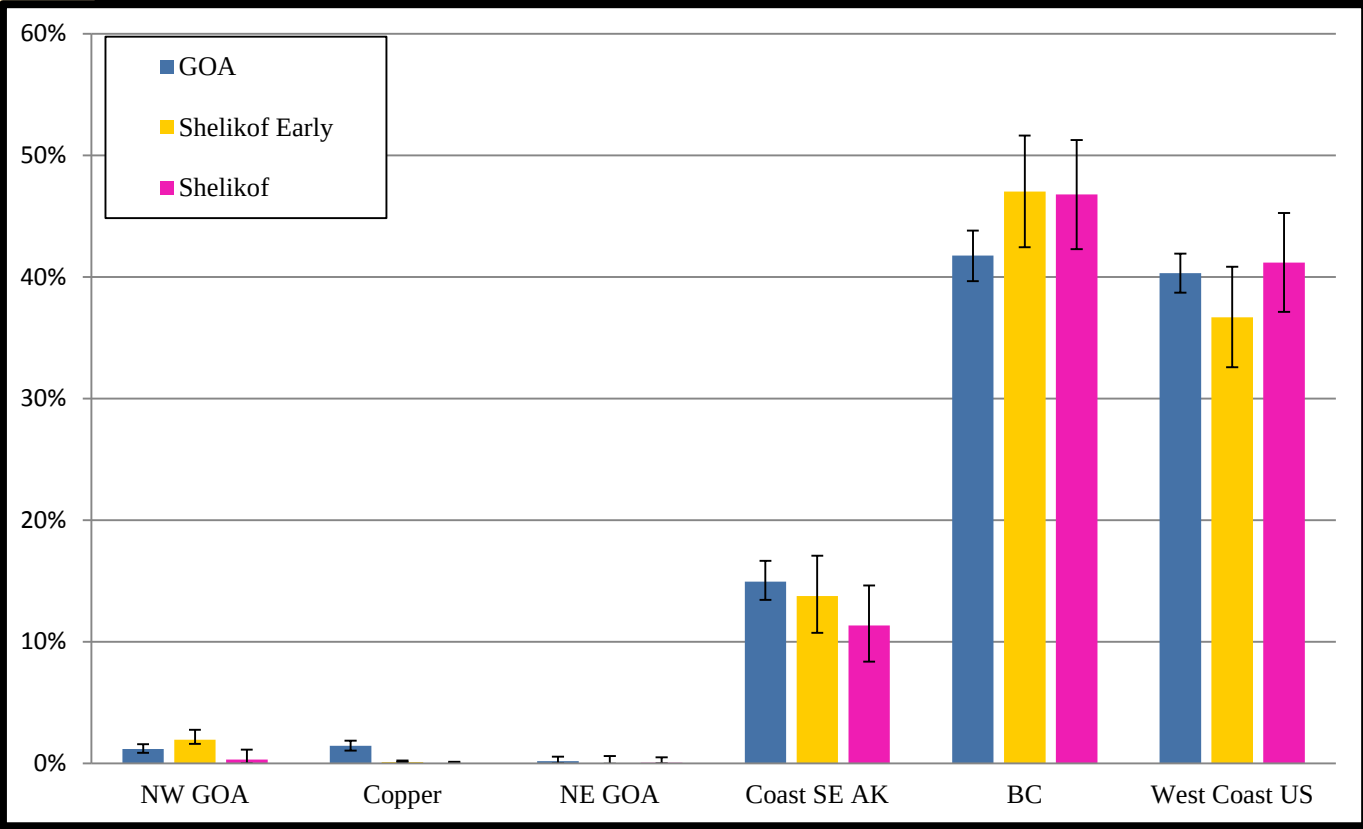
Shumagin Islands
Early 1/21/-3/25/16 N=295
Late 8/28-11/01/16 N=896
Total N=1,191

Region	Gulf of Alaska, pollock (N=4,962)				Shumagin Islands Early (N=295)				Shumagin Islands Late (N=896)				Shumagin Islands (N=1,191)			
	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	8	0.0	0.03	(0.0,0.1)	0	0.0	0.05	(0.0,0.1)	0	0.0	0.02	(0.0,0.0)	0	0.0	0.01	(0.0,0.0)
Coast W AK	10	0.1	0.07	(0.0,0.2)	1	0.1	0.21	(0.0,0.7)	9	0.3	0.28	(0.0,1.0)	6	0.2	0.20	(0.0,0.7)
Mid Yukon	0	0.0	0.00	(0.0,0.0)	0	0.0	0.08	(0.0,0.2)	0	0.0	0.03	(0.0,0.1)	0	0.0	0.02	(0.0,0.1)
Up Yukon	0	0.0	0.01	(0.0,0.0)	0	0.0	0.09	(0.0,0.3)	0	0.0	0.03	(0.0,0.1)	0	0.0	0.02	(0.0,0.1)
N AK Pen	0	0.0	0.01	(0.0,0.0)	1	0.2	0.33	(0.0,1.2)	0	0.0	0.03	(0.0,0.1)	0	0.0	0.05	(0.0,0.2)
NW GOA	247	1.2	0.18	(0.9,1.6)	4	0.6	0.61	(0.0,2.2)	32	1.0	0.38	(0.3,1.8)	41	1.0	0.37	(0.4,1.8)
Copper	296	1.4	0.21	(1.1,1.9)	0	0.0	0.09	(0.0,0.2)	8	0.3	0.28	(0.0,1.0)	6	0.2	0.19	(0.0,0.7)
NE GOA	41	0.2	0.15	(0.0,0.6)	0	0.0	0.12	(0.0,0.3)	13	0.4	0.33	(0.0,1.2)	11	0.3	0.24	(0.0,0.8)
Coast SE AK	3,080	15.0	0.81	(13.5,16.7)	66	9.4	2.22	(5.6,14.3)	179	5.4	1.11	(3.4,7.7)	250	6.2	1.00	(4.3,8.3)
BC	8,602	41.8	1.07	(39.7,43.8)	498	70.9	3.15	(64.4,76.7)	1,409	42.1	1.98	(38.2,46.0)	1,987	49.1	1.72	(45.7,52.5)
West Coast US	8,301	40.3	0.82	(38.7,41.9)	132	18.7	2.43	(14.3,23.8)	1,695	50.7	1.83	(47.1,54.2)	1,746	43.1	1.57	(40.1,46.2)
Total Catch	20,589				703				3,347				4,049			

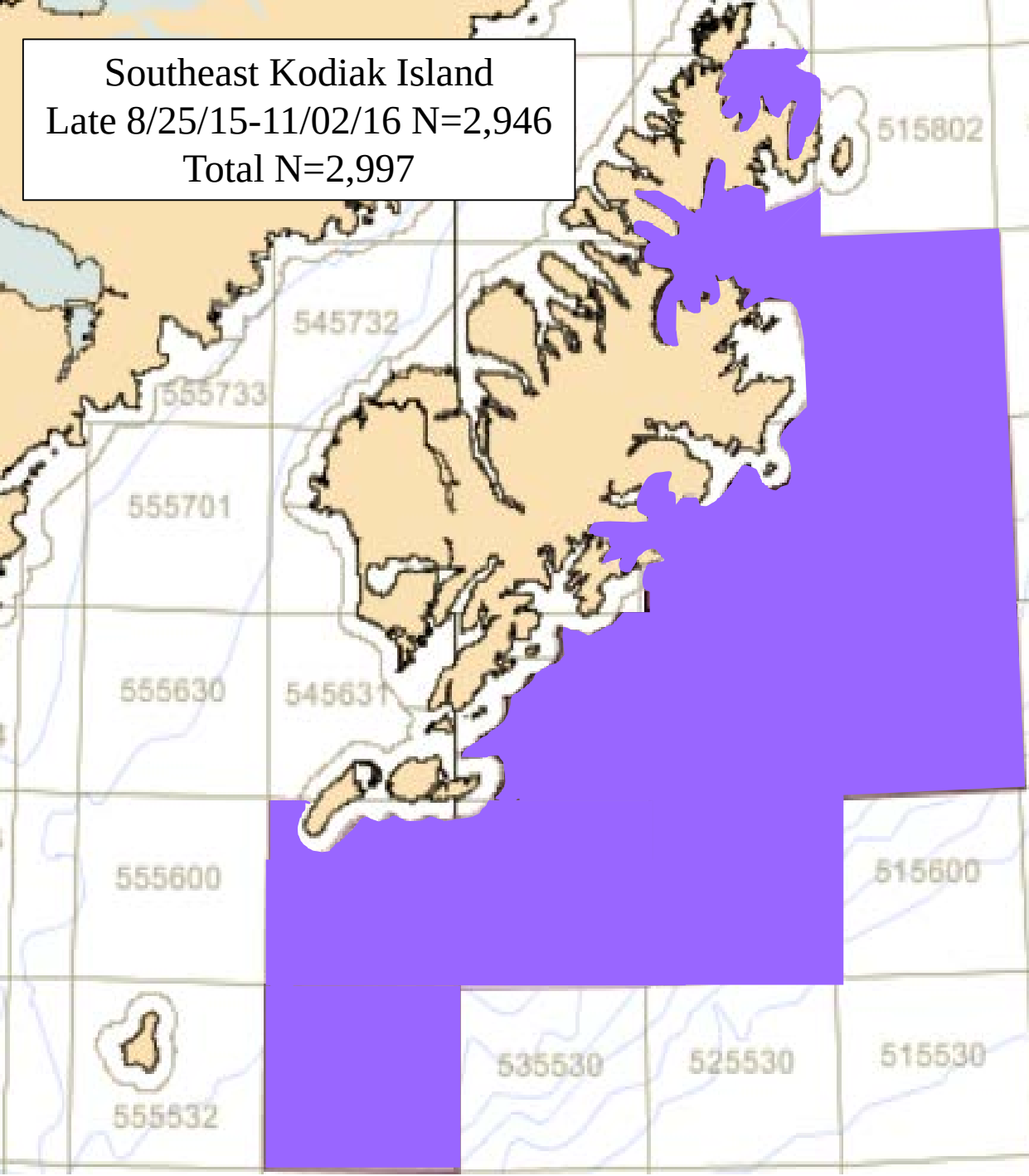


Shelikof Strait
Early 1/23/16-3/30/16 N=586
Total N=608

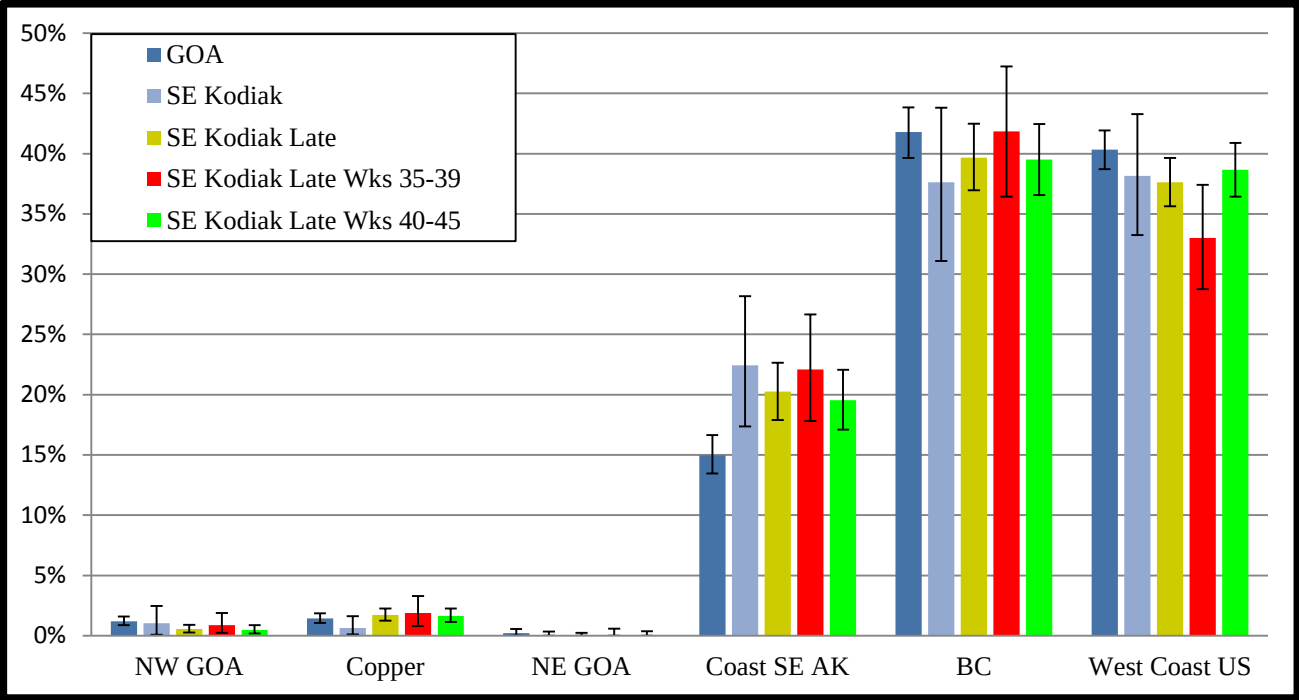
Region	Gulf of Alaska, pollock (N=4,962)				Shelikof Strait Early (N=586)				Shelikof Strait (N=608)			
	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	8	0.0	0.03	(0.0,0.1)	0	0.0	0.03	(0.0,0.0)	0	0.0	0.03	(0.0,0.0)
Coast W AK	10	0.1	0.07	(0.0,0.2)	6	0.3	0.34	(0.0,1.2)	8	0.3	0.32	(0.0,1.1)
Mid Yukon	0	0.0	0.00	(0.0,0.0)	0	0.0	0.04	(0.0,0.1)	0	0.0	0.04	(0.0,0.1)
Up Yukon	0	0.0	0.01	(0.0,0.0)	0	0.0	0.05	(0.0,0.1)	0	0.0	0.05	(0.0,0.1)
N AK Pen	0	0.0	0.01	(0.0,0.0)	0	0.0	0.04	(0.0,0.1)	0	0.0	0.04	(0.0,0.1)
NW GOA	247	1.2	0.18	(0.9,1.6)	7	0.3	0.34	(0.0,1.2)	11	0.3	0.33	(0.0,1.1)
Copper	296	1.4	0.21	(1.1,1.9)	0	0.0	0.05	(0.0,0.1)	0	0.0	0.05	(0.0,0.1)
NE GOA	41	0.2	0.15	(0.0,0.6)	1	0.1	0.18	(0.0,0.6)	2	0.1	0.15	(0.0,0.5)
Coast SE AK	3,080	15.0	0.81	(13.5,16.7)	234	11.0	1.62	(8.0,14.3)	365	11.4	1.59	(8.4,14.6)
BC	8,602	41.8	1.07	(39.7,43.8)	998	47.0	2.34	(42.4,51.6)	1,506	46.8	2.29	(42.3,51.3)
West Coast US	8,301	40.3	0.82	(38.7,41.9)	877	41.3	2.11	(37.2,45.5)	1,325	41.2	2.08	(37.1,45.3)
Total Catch	20,589				2,124				3,217			



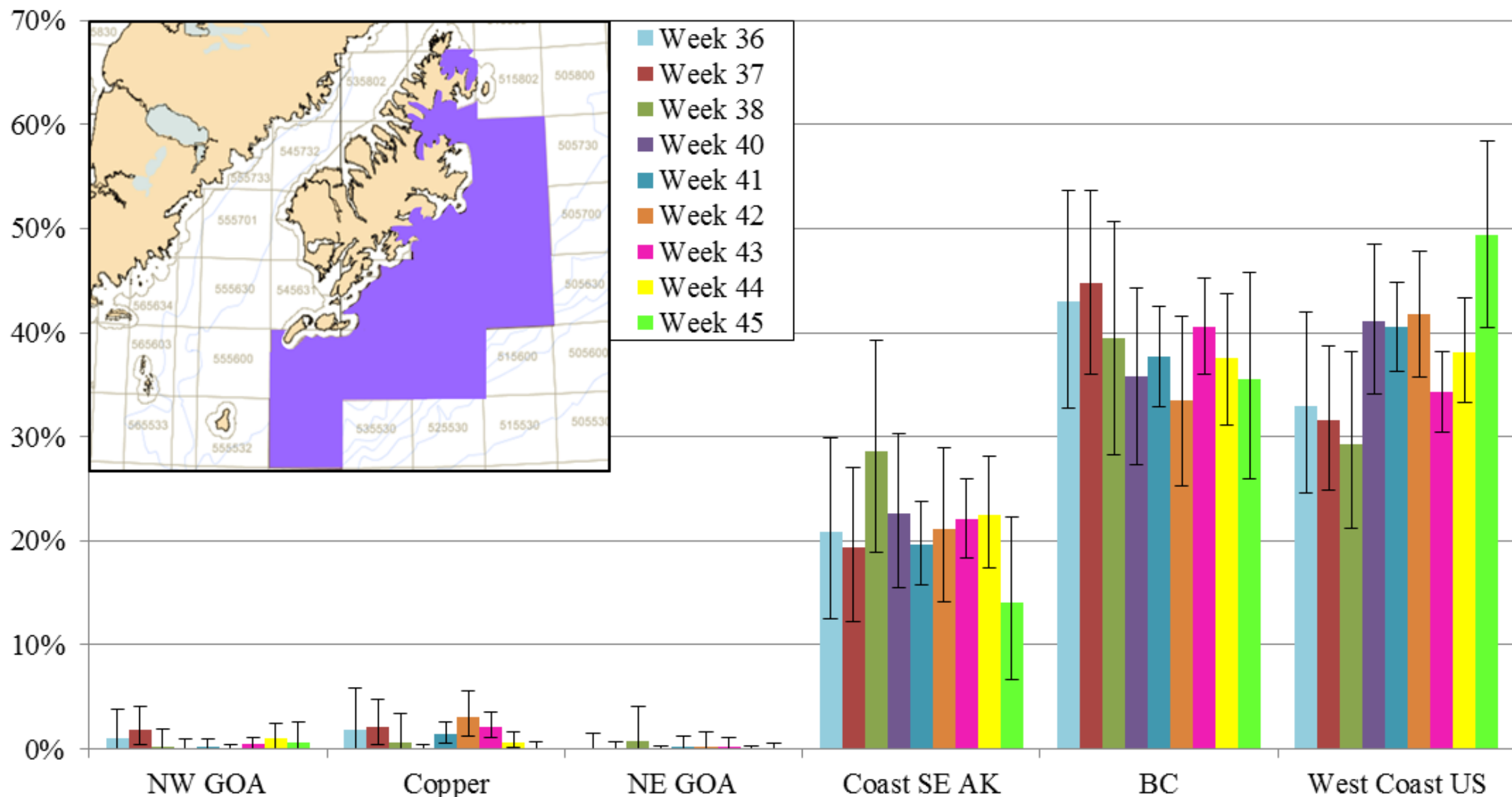
Southeast Kodiak Island
Late 8/25/15-11/02/16 N=2,946
Total N=2,997

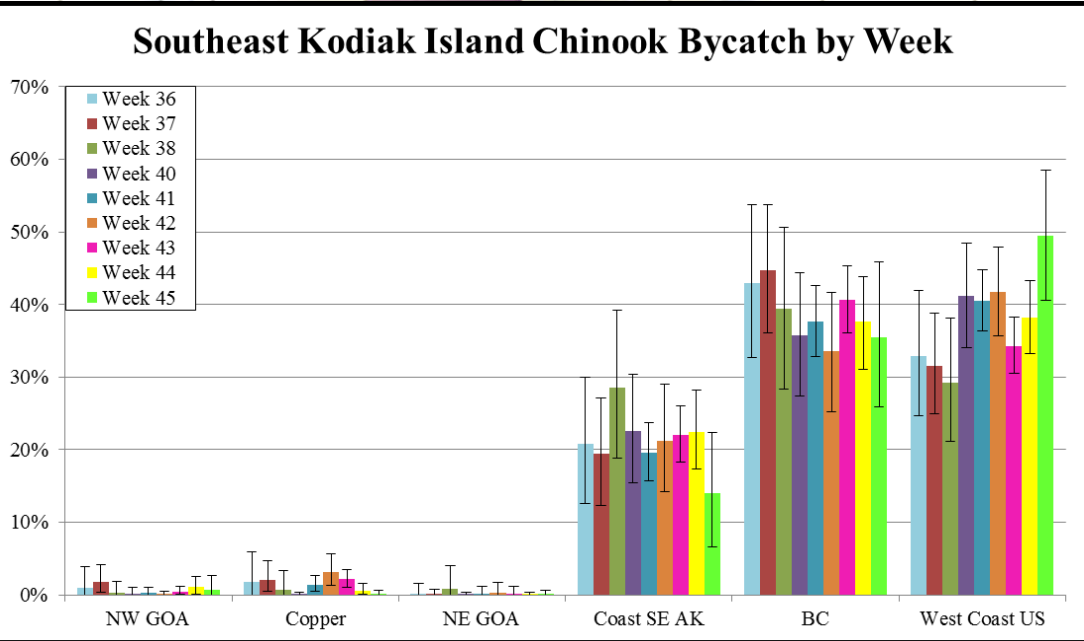
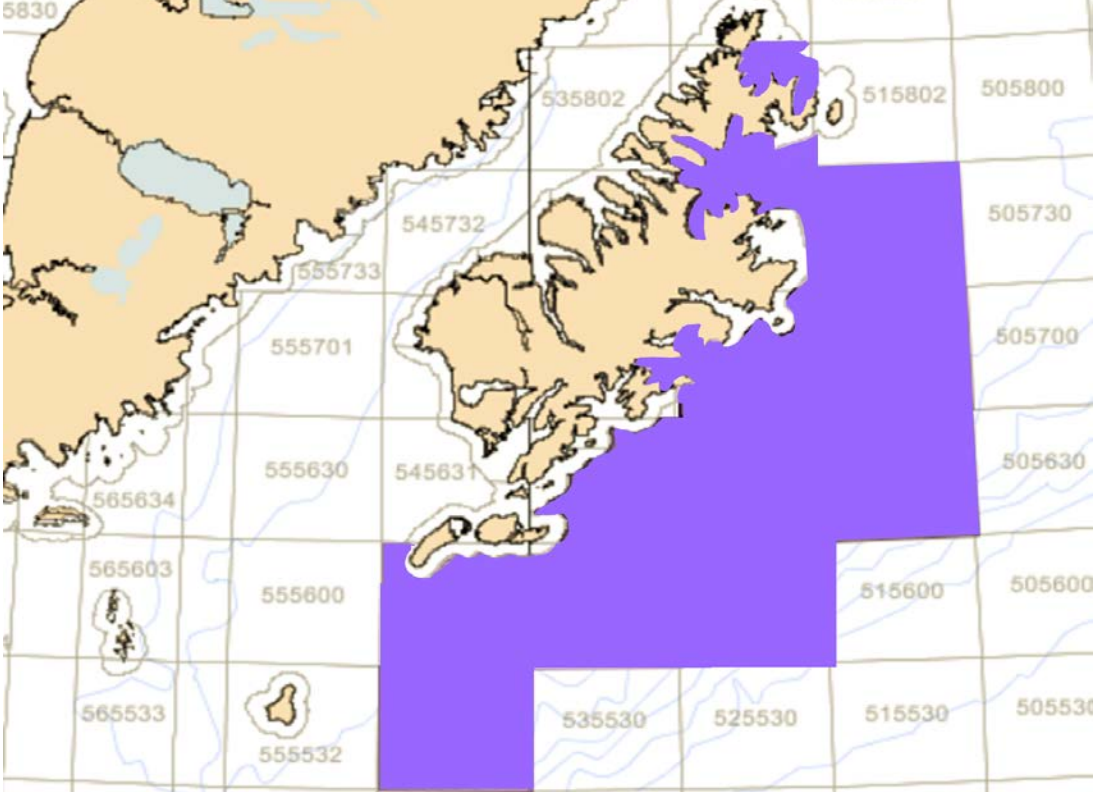


Region	Gulf of Alaska, pollock (N=4,962)				Southeast Kodiak Island (N=2,997)				Southeast Kodiak I. Late (N=2,946)			
	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	8	0.0	0.03	(0.0,0.1)	1	0.0	0.04	(0.0,0.1)	9	0.1	0.05	(0.0,0.2)
Coast W AK	10	0.1	0.07	(0.0,0.2)	7	0.1	0.14	(0.0,0.5)	6	0.1	0.06	(0.0,0.2)
Mid Yukon	0	0.0	0.00	(0.0,0.0)	1	0.0	0.05	(0.0,0.1)	0	0.0	0.01	(0.0,0.0)
Up Yukon	0	0.0	0.01	(0.0,0.0)	2	0.0	0.06	(0.0,0.2)	0	0.0	0.01	(0.0,0.0)
N AK Pen	0	0.0	0.01	(0.0,0.0)	1	0.0	0.05	(0.0,0.1)	0	0.0	0.01	(0.0,0.0)
NW GOA	247	1.2	0.18	(0.9,1.6)	123	1.0	0.63	(0.1,2.5)	64	0.6	0.16	(0.3,0.9)
Copper	296	1.4	0.21	(1.1,1.9)	74	0.6	0.41	(0.1,1.6)	199	1.7	0.26	(1.2,2.3)
NE GOA	41	0.2	0.15	(0.0,0.6)	4	0.0	0.12	(0.0,0.3)	3	0.0	0.06	(0.0,0.2)
Coast SE AK	3,080	15.0	0.81	(13.5,16.7)	2,660	22.4	2.75	(17.4,28.2)	2,348	20.3	1.21	(17.9,22.6)
BC	8,602	41.8	1.07	(39.7,43.8)	4,462	37.6	3.24	(31.1,43.8)	4,596	39.7	1.41	(37.0,42.5)
West Coast US	8,301	40.3	0.82	(38.7,41.9)	4,525	38.2	2.56	(33.3,43.3)	4,360	37.6	1.02	(35.6,39.6)
Total Catch	20,589				11,858				11,586			
				SE Kodiak I. Weeks 35-39 (N=577)								
Region	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI				
Russia	5	0.2	0.18	(0.0,0.7)	4	0	0	(0.0,0.2)				
Coast W AK	1	0.1	0.12	(0.0,0.4)	4	0	0	(0.0,0.2)				
Mid Yukon	0	0.0	0.04	(0.0,0.1)	0	0	0	(0.0,0.0)				
Up Yukon	0	0.0	0.05	(0.0,0.1)	0	0	0	(0.0,0.0)				
N AK Pen	0	0.0	0.03	(0.0,0.1)	0	0	0	(0.0,0.1)				
NW GOA	23	0.9	0.43	(0.2,1.9)	42	0	0	(0.2,0.9)				
Copper	51	1.9	0.64	(0.8,3.3)	146	2	0	(1.1,2.2)				
NE GOA	1	0.0	0.17	(0.0,0.6)	5	0	0	(0.0,0.4)				
Coast SE AK	591	22.1	2.26	(17.8,26.7)	1,740	20	1	(17.1,22.1)				
BC	1,120	41.8	2.75	(36.4,47.2)	3,522	40	2	(36.6,42.5)				
West Coast US	883	33.0	2.21	(28.8,37.4)	3,444	39	1	(36.4,40.9)				
Total Catch	2,676				8,911							



Southeast Kodiak Island Chinook Bycatch by Week

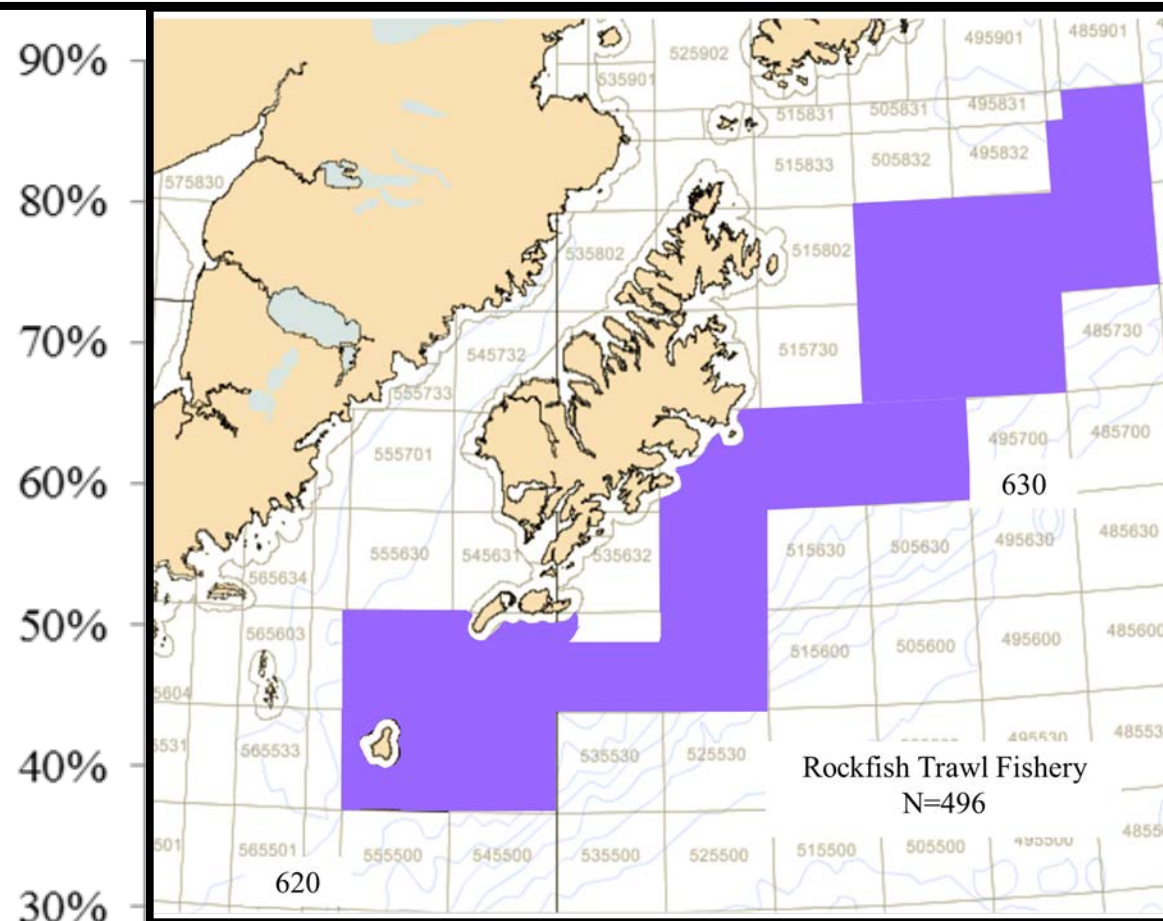




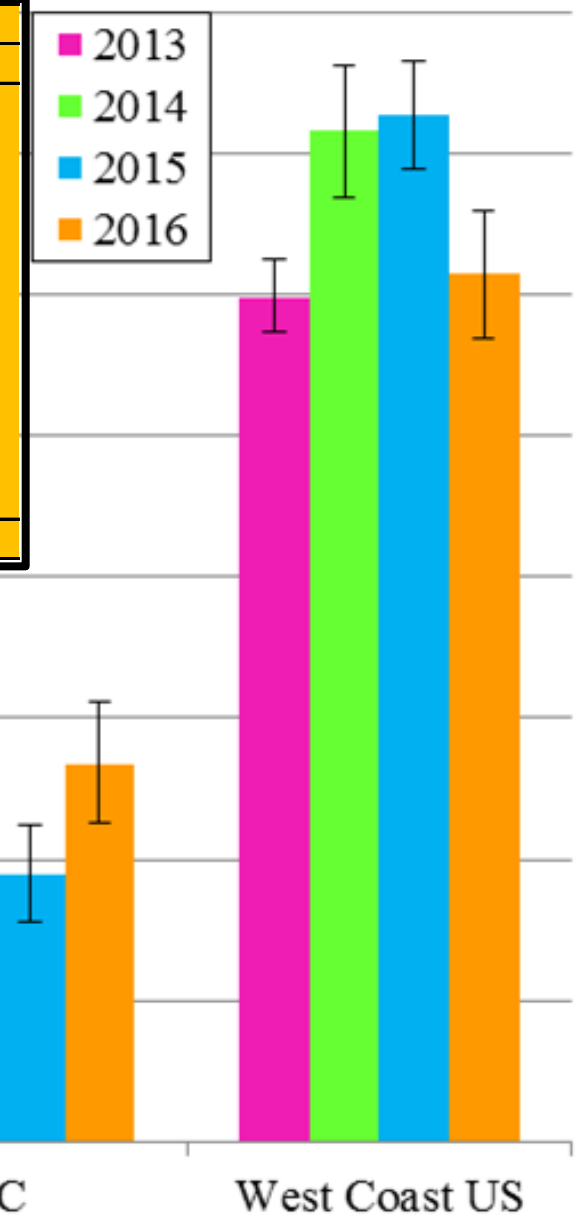
Region	Week 36 (N=130)				Week 37 (N=203)				Week 38 (N=131)			
	Est. #	Mean	SD	95% PI	Est. #	Mean	SD	95% PI	Est. #	Mean	SD	95% PI
Russia	0	0.0	0.16	(0.0,0.3)	0	0.0	0.08	(0.0,0.1)	3	0.8	0.78	(0.0,2.9)
Coast W AK	1	0.2	0.43	(0.0,1.5)	1	0.3	0.47	(0.0,1.7)	1	0.2	0.40	(0.0,1.4)
Mid Yukon	0	0.0	0.17	(0.0,0.4)	0	0.0	0.11	(0.0,0.3)	0	0.0	0.16	(0.0,0.4)
Up Yukon	0	0.1	0.22	(0.0,0.6)	0	0.0	0.14	(0.0,0.4)	0	0.1	0.21	(0.0,0.6)
N AK Pen	0	0.0	0.20	(0.0,0.4)	0	0.0	0.10	(0.0,0.2)	0	0.0	0.15	(0.0,0.3)
NW GOA	5	1.0	1.11	(0.0,3.9)	8	1.8	0.97	(0.4,4.1)	1	0.2	0.54	(0.0,1.9)
Copper	10	1.8	1.68	(0.0,5.9)	9	2.1	1.12	(0.4,4.7)	2	0.7	0.98	(0.0,3.4)
NE GOA	1	0.1	0.49	(0.0,1.6)	0	0.1	0.24	(0.0,0.7)	3	0.8	1.19	(0.0,4.0)
Coast SE AK	116	20.9	4.46	(12.5,30.0)	88	19.4	3.78	(12.3,27.1)	95	28.6	5.20	(18.9,39.3)
BC	238	42.9	5.36	(32.7,53.7)	203	44.7	4.53	(36.0,53.7)	131	39.4	5.70	(28.3,50.6)
West Coast US	182	32.9	4.42	(24.6,42.0)	143	31.6	3.54	(24.9,38.8)	97	29.3	4.35	(21.2,38.1)
Total Catch	554				453				333			
Region	Week 40 (N=200)				Week 41 (N=598)				Week 42 (N=284)			
	Est. #	Mean	SD	95% PI	Est. #	Mean	SD	95% PI	Est. #	Mean	SD	95% PI
Russia	0	0.0	0.08	(0.0,0.1)	7	0.3	0.23	(0.0,0.9)	0	0.0	0.05	(0.0,0.1)
Coast W AK	1	0.1	0.28	(0.0,1.0)	1	0.0	0.09	(0.0,0.3)	1	0.1	0.16	(0.0,0.6)
Mid Yukon	0	0.0	0.10	(0.0,0.3)	0	0.0	0.04	(0.0,0.1)	0	0.0	0.08	(0.0,0.2)
Up Yukon	0	0.0	0.14	(0.0,0.4)	0	0.0	0.04	(0.0,0.1)	0	0.0	0.10	(0.0,0.3)
N AK Pen	1	0.1	0.35	(0.0,1.2)	0	0.0	0.07	(0.0,0.2)	0	0.0	0.08	(0.0,0.2)
NW GOA	1	0.1	0.30	(0.0,1.0)	7	0.3	0.28	(0.0,1.0)	1	0.1	0.15	(0.0,0.5)
Copper	0	0.0	0.13	(0.0,0.4)	35	1.4	0.54	(0.5,2.6)	40	3.1	1.12	(1.3,5.6)
NE GOA	0	0.0	0.12	(0.0,0.3)	4	0.2	0.33	(0.0,1.2)	3	0.3	0.48	(0.0,1.7)
Coast SE AK	238	22.6	3.79	(15.4,30.4)	482	19.6	2.05	(15.7,23.8)	267	21.2	3.75	(14.2,29.0)
BC	377	35.8	4.32	(27.4,44.3)	926	37.7	2.48	(32.8,42.6)	423	33.5	4.17	(25.3,41.6)
West Coast US	434	41.2	3.68	(34.1,48.4)	997	40.6	2.17	(36.3,44.8)	527	41.7	3.10	(35.7,47.8)
Total Catch	1,055				2,459				1,262			
Region	Week 43 (N=723)				Week 44 (N=429)				Week 45 (N=135)			
	Est. #	Mean	SD	95% PI	Est. #	Mean	SD	95% PI	Est. #	Mean	SD	95% PI
Russia	0	0.0	0.02	(0.0,0.0)	0	0.0	0.04	(0.0,0.1)	0	0.0	0.11	(0.0,0.2)
Coast W AK	7	0.3	0.26	(0.0,1.0)	1	0.1	0.14	(0.0,0.5)	0	0.1	0.32	(0.0,1.1)
Mid Yukon	0	0.0	0.03	(0.0,0.1)	0	0.0	0.05	(0.0,0.1)	0	0.0	0.17	(0.0,0.4)
Up Yukon	0	0.0	0.04	(0.0,0.1)	0	0.0	0.06	(0.0,0.2)	0	0.1	0.20	(0.0,0.6)
N AK Pen	0	0.0	0.03	(0.0,0.1)	0	0.0	0.05	(0.0,0.1)	0	0.0	0.19	(0.0,0.4)
NW GOA	10	0.4	0.29	(0.0,1.1)	17	1.0	0.63	(0.1,2.5)	1	0.6	0.75	(0.0,2.6)
Copper	48	2.1	0.63	(1.0,3.5)	10	0.6	0.41	(0.1,1.6)	0	0.1	0.23	(0.0,0.7)
NE GOA	4	0.2	0.32	(0.0,1.1)	1	0.0	0.12	(0.0,0.3)	0	0.1	0.22	(0.0,0.6)
Coast SE AK	504	22.1	1.96	(18.3,26.0)	374	22.4	2.75	(17.4,28.2)	25	14.1	4.04	(6.6,22.3)
BC	928	40.6	2.36	(36.0,45.3)	628	37.6	3.24	(31.1,43.8)	64	35.5	5.09	(25.9,45.8)
West Coast US	783	34.3	1.96	(30.5,38.2)	637	38.2	2.56	(33.3,43.3)	89	49.4	4.61	(40.5,58.4)
Total Catch	2,285				1,669				181			

2016 Rockfish GOA Chinook Bycatch

493 samples genotyped, May 2, to Nov 15, 2016



Region	Rockfish Trawl Fishery (N=493)			
	Est. #	Mean	SD	95% CI
Russia	0	0.0	0.04	(0.0,0.1)
Coast W AK	3	0.5	0.55	(0.0,1.9)
Mid Yukon	0	0.0	0.05	(0.0,0.1)
Up Yukon	0	0.0	0.06	(0.0,0.2)
N AK Pen	0	0.0	0.10	(0.0,0.3)
NW GOA	19	3.7	1.00	(2.0,5.9)
Copper	1	0.3	0.37	(0.0,1.3)
NE GOA	1	0.3	0.44	(0.0,1.6)
Coast SE AK	34	6.9	1.34	(4.4,9.6)
BC	133	26.8	2.20	(22.6,31.2)
West Coast US	305	61.5	2.32	(56.9,66.0)
Total Catch	496			



CHINOOK SALMON BYCATCH ASSESSMENT:

MARK LAB, ADF&G COMPONENT

by

Bev Agler and Lorna Wilson

Alaska Department of Fish and Game Division Commercial Fisheries, Juneau

Mark types of Chinook salmon collected during the 2017 fishing season
on the high seas near Kodiak, AK.

Mark type	#	%
Coded wire tagged (CWT) ¹	14	4.7%
Thermal mark	24	8.1%
No thermal mark or CWT	257	86.2%
Missing otoliths, no CWT	2	0.7%
Otoliths not readable, no CWT	1	0.3%
Total	298	100%

Origin of thermal-marked Chinook salmon otoliths collected in 2017 on
the high seas near Kodiak, AK.

Country	State/Province	Area	#
U.S.	Alaska	Southcentral	1
U.S.	Alaska	Southeast	9
U.S.	Washington	Central	1
U.S.	Oregon	Willamette	2
Canada	British Columbia	Vancouver Island	9
Unknown	Unknown		2
Total			24

Release and recovery information for coded-wire tagged Chinook salmon captured as bycatch in the 2017 Gulf of Alaska trawl fishery for rockfish as sampled by Alaska Groundfish Data Bank. The number of Chinook salmon with readable coded-wire tags (CWTs) and clipped adipose fins (ad-clipped) is in parentheses.

From Michele Masuda – NOAA-Auke Bay Labs

Detection method	Number sampled	Number ad-clipped	Number with readable CWTs
Electronic wand	299	42	14 (12)

Release state	Number of CWTs
Alaska	2
British Columbia	2
Washington	7
Oregon	3

Rearing type	Number of CWTs	Ad-clipped	Not ad-clipped
Hatchery	12	10	2
Wild	2	2	0

2016 Genetic Sample Collection

Two Sources:

Observer Program and Industry (Chinook Salmon Only)

Observer program samples shipped from four locations:

Anchorage 2 shipments:

Bering Sea “A” season, Gulf of Alaska “A” & “B” seasons received 07/19/2016

Bering Sea “B” season, Gulf of Alaska “C” & “D” seasons received 12/12/2016

Dutch Harbor 2 shipments:

Bering Sea “A” season received 06/03/2016

Bering Sea “B” season received 01/04/2017

Kodiak 2 shipments:

Gulf of Alaska “A” & “B” seasons received 06/15/2016

Gulf of Alaska “C” & “D” seasons received 12/14/2016

Seattle 1 shipment:

Bering Sea and Gulf of Alaska all seasons received 02/16/17

CV Rockfish Bycatch Alaska AGDB and CP Arrowtooth Bycatch Alaska Seafood Co-op

Rockfish Gulf of Alaska received 11/17/16

Arrowtooth received 11/28/16

Timeline for processing 2016 Bering Sea Chinook bycatch samples

2,148 samples received (1,664 A-season, 484 B-season)

1,910 samples genotyped:

1,488 A-season Bering Sea samples genotyped

422 B-season Bering Sea samples genotyped

A Season

Samples rec'd at ABL	Tissue plated/DNA extracted	Genotyped Quantstudio/MALDI-TOF	Genotypes scored	Data analyses	Tech memo
June - July 2016	June - July 2016	July-August 2016	Sept. 2016 - Feb. 2017	preliminary March 2017 final August 2017	Sep 2017 - Jan 2018

B Season

Samples rec'd at ABL	Tissue plated/DNA extracted	Genotyped Quantstudio/MALDI-TOF	Genotypes scored	Data analyses	Tech memo
November 2016 - Feb. 2017	January 2017 - March 2017	May - June 2017	July - August 2017	August 2017	Sep 2017 - Jan 2018

Timeline for processing 2016 Gulf of Alaska Chinook bycatch samples

5,511 observer samples received (5,473 pollock)

4,973 samples genotyped Observer, (4,962 pollock)

495 rockfish samples receive AGDB

493 rockfish samples genotyped

114 samples Arrowtooth CP Alaska Seafood Coop

82 Arrowtooth samples genotyped but not analyzed due to small sample size

GOA/Rockfish

Samples rec'd at ABL	Tissue plated/DNA extracted	Genotyped Quantstudio/MALDI-TOF	Genotypes scored	Data analyses	Tech memo
June 2016 - Feb. 2017	June - July 2016	July-August 2016	July - September 2017	preliminary March 2017 final December 2017	Oct 2017 - Feb 2018
	June 2017 - March 2017	April - Sept 2017			

Timeline for processing 2016 chum bycatch samples

11,673 samples received (509 GOA, 121 A-season, 11,043 B-season)

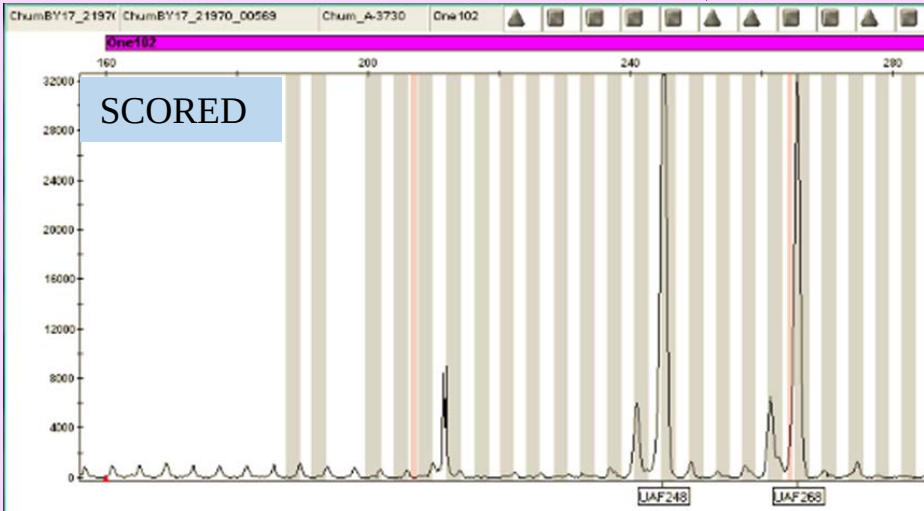
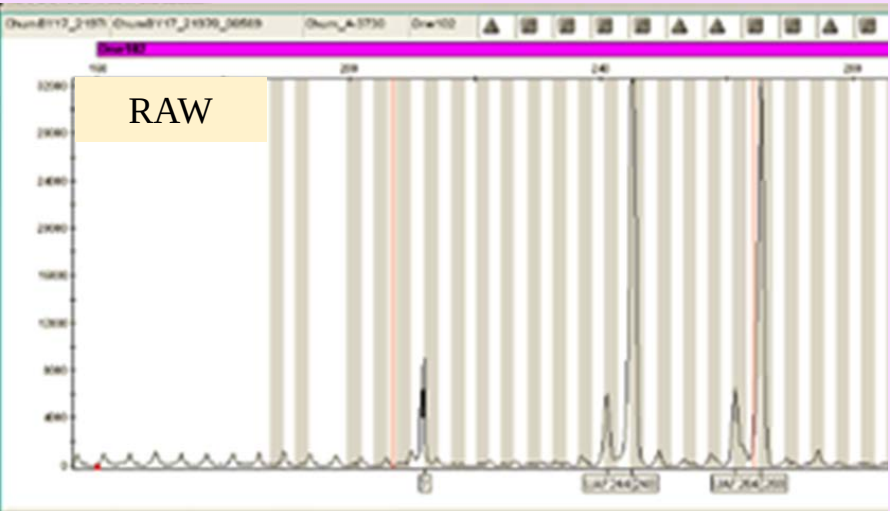
3,965 samples genotyped:

509 GOA samples genotyped

121 A-season Bering Sea samples genotyped

3,335 B-season Bering Sea samples genotyped (one of four B-season + finer-scale cluster samples)

Samples rec'd at ABL	Tissue plated/DNA extracted	PCR/Genotyped on 3730xl	Genotypes scored	Data analyses	Tech memo
Dec 2016 - Feb 2017	Jan - Apr 2017	Apr - May 2017	May - Aug 2017	Sep - Oct 2017	Sep 2017 - Jan 2018



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