Eastern Bering Sea Pollock assessment

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November 10th 2015

Catch by season and area

Stacked area chart of Catch (t) by Year from 1991 to 2015. Y-axis: Catch (t) from 0 to 1,600,000. X-axis: Year. Areas labeled: B Season NW of 170W, B Season SE of 170W, A Season SE of 170W, A Season NW of 170W.

Winter **2014** fishery
Eastern Bering Sea (EBS)
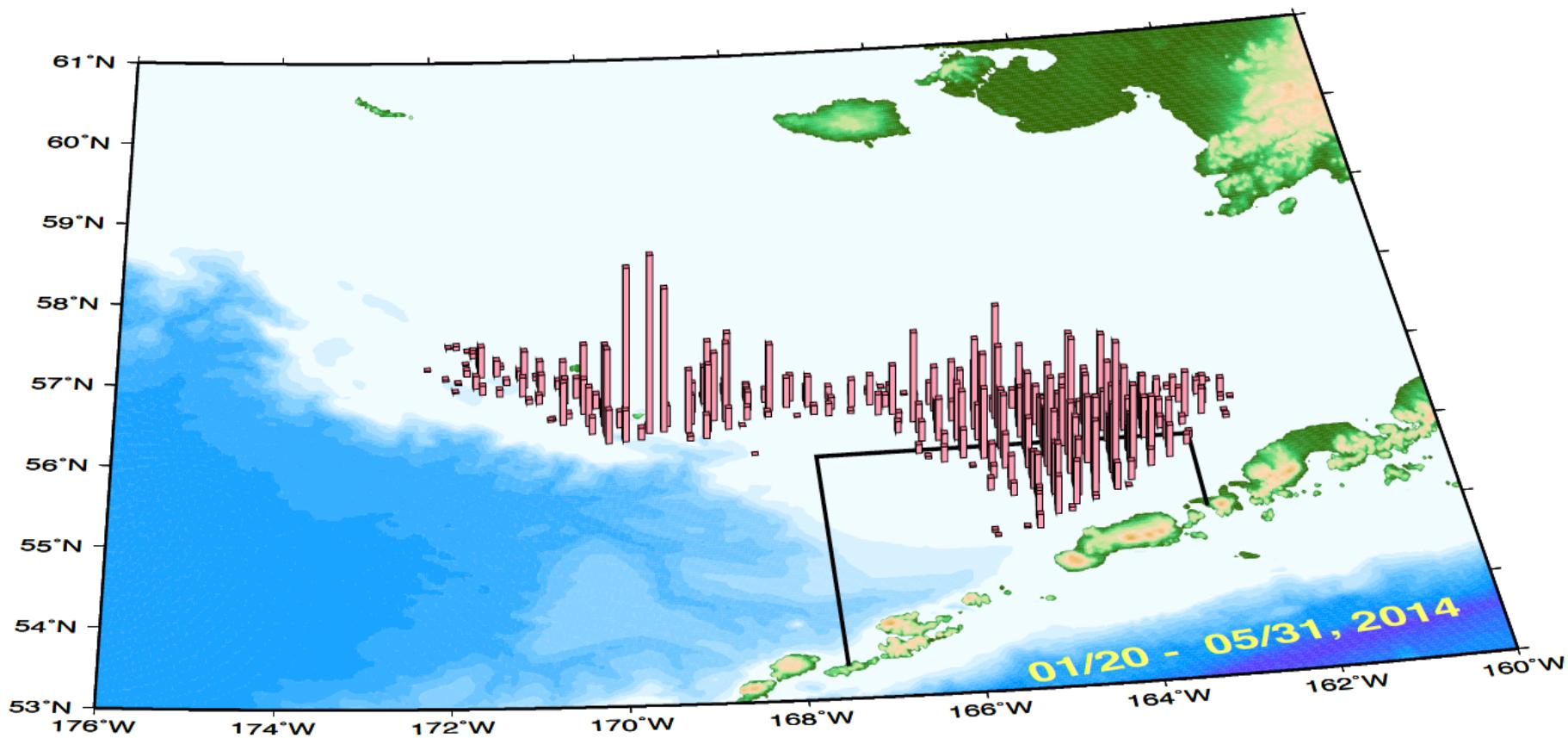
Winter 2015 fishery
Eastern Bering Sea (EBS)

01/20 - 05/31, 2015
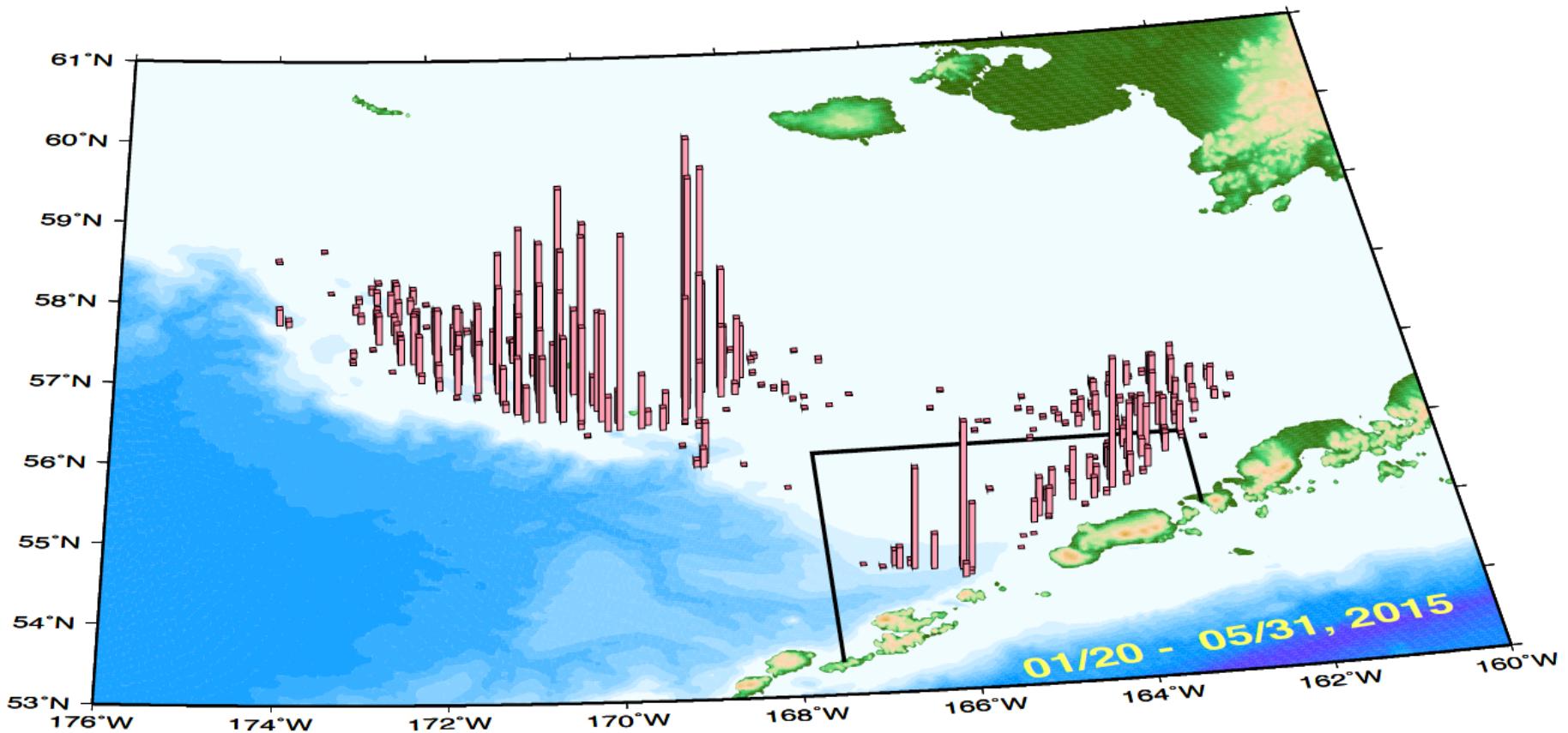
Eastern Bering Sea pollock fishery

Recent summer patterns...

Summer 2013 fishery
Eastern Bering Sea (EBS)

06/01 - 10/31, 2013
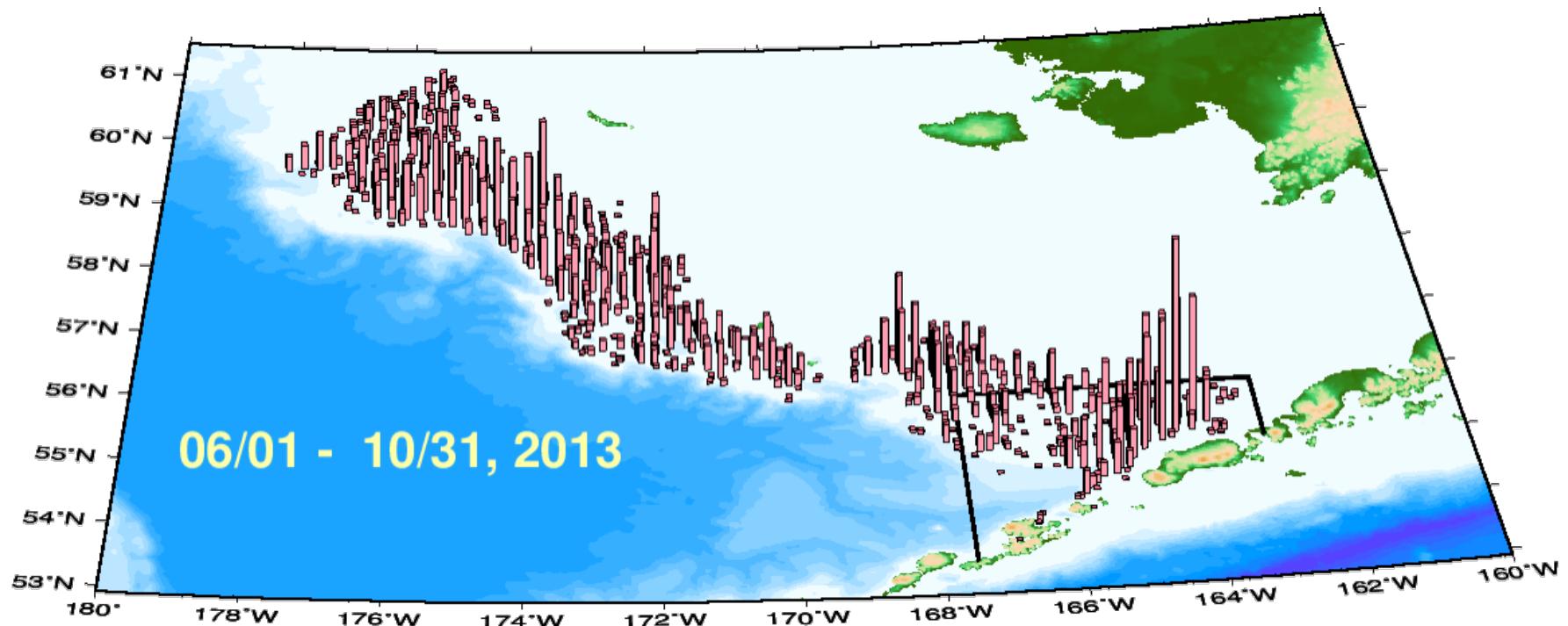
Summer 2014 fishery
Eastern Bering Sea (EBS)

06/10 - 10/31, 2014
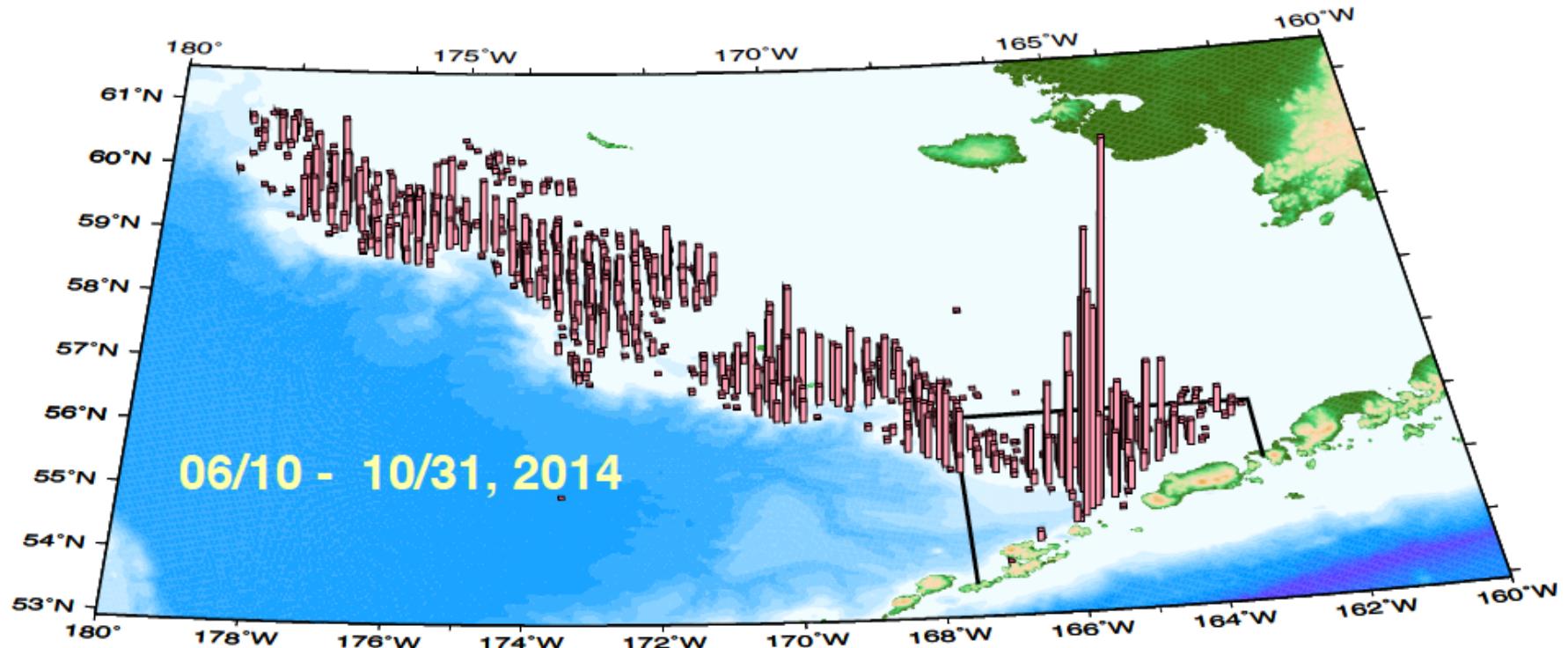
Summer 2015 fishery
# Eastern Bering Sea (EBS)

06/10 - 10/31, 2015
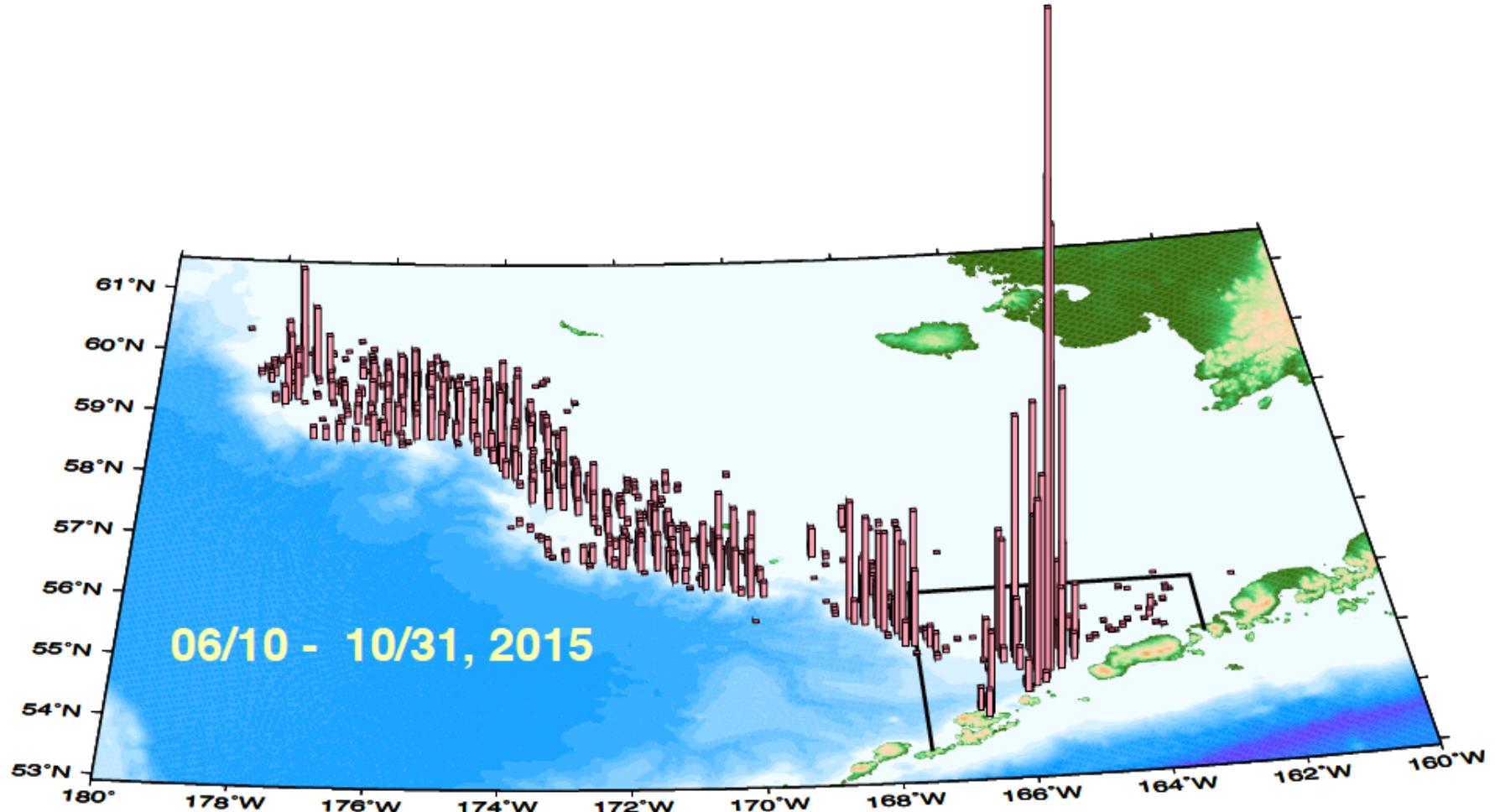
Table 1.7.   Numbers of pollock fishery samples measured for lengths and for length-weight by sex and strata, 1977-2014, as sampled by the NMFS observer program.

| | Length Frequency samples | | | | | | |
| | A Season | | B Season SE | | B Season NW | | |
Year	Males	Females	Males	Females	Males	Females	Total
1977	26,411	25,923	4,301	4,511	29,075	31,219	121,440
1978	25,110	31,653	9,829	9,524	46,349	46,072	168,537
1979	59,782	62,512	3,461	3,113	62,298	61,402	252,568
1980	42,726	42,577	3,380	3,464	47,030	49,037	188,214
1981	64,718	57,936	2,401	2,147	53,161	53,570	233,933
1982	74,172	70,073	16,265	14,885	181,606	163,272	520,273
1983	94,118	90,778	16,604	16,826	193,031	174,589	585,946
1984	158,329	161,876	106,654	105,234	243,877	217,362	993,332
1985	119,384	109,230	96,684	97,841	284,850	256,091	964,080
1986	186,505	189,497	135,444	123,413	164,546	131,322	930,727
1987	373,163	399,072	14,170	21,162	24,038	22,117	853,722
1991	160,491	148,236	166,117	150,261	141,085	139,852	906,042
1992	158,405	153,866	163,045	164,227	101,036	102,667	843,244
1993	143,296	133,711	148,299	140,402	27,262	28,522	621,490
1994	139,332	147,204	159,341	153,526	28,015	27,953	655,370
1995	131,287	128,389	179,312	154,520	16,170	16,356	626,032
1996	149,111	140,981	200,482	156,804	18,165	18,348	683,890
1997	124,953	104,115	116,448	107,630	60,192	53,191	566,527
1998	136,605	110,620	208,659	178,012	32,819	40,307	707,019
1999	36,258	32,630	38,840	35,695	16,282	18,339	178,044
2000	64,575	58,162	63,832	41,120	40,868	39,134	307,689
2001	79,333	75,633	54,119	51,268	44,295	45,836	350,483
2002	71,776	69,743	65,432	64,373	37,701	39,322	348,347
2003	74,995	77,612	49,469	53,053	51,799	53,463	360,390
2004	75,426	76,018	63,204	62,005	47,289	44,246	368,188
2005	76,627	69,543	43,205	33,886	68,878	63,088	355,225
2006	72,353	63,108	28,799	22,363	75,180	65,209	327,010
2007	62,827	60,522	32,945	25,518	75,128	69,116	326,054
2008	46,125	51,027	20,493	23,503	61,149	64,598	266,894
2009	46,051	44,080	19,877	18,579	50,451	53,344	232,379
2010	39,495	41,054	19,194	20,591	40,449	41,323	202,106
2011	58,822	62,617	60,254	65,057	51,137	48,084	345,971
2012	53,641	57,966	45,044	46,940	50,167	53,224	306,982
2013	52,303	62,336	37,434	44,709	49,484	49,903	296,168
2014	55,954	58,097	46,568	51,950	46,643	46,202	305,414

Eastern Bering Sea
Pollock

Fishery age composition
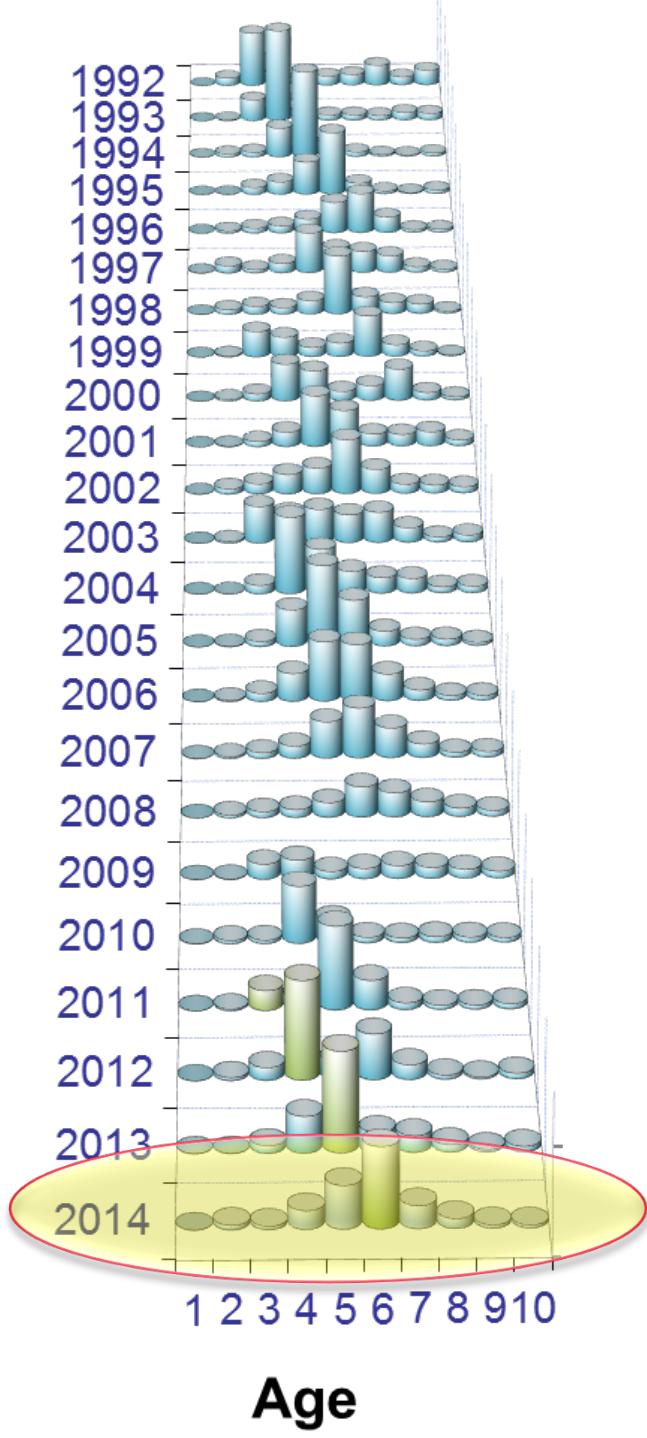
Estimating fishery wt-at-age variability

Observed Data

	3	4	5	6	7	8	9	10	11	12	13	14	15
1991	0.28	0.48	0.61	0.73	0.85	0.89	1.01	1.14	1.13	1.25	1.23	1.30	1.24
1992	0.40	0.47	0.65	0.71	0.81	0.98	1.03	1.20	1.24	1.28	1.21	1.37	1.45
1993	0.49	0.61	0.66	0.77	0.93	1.05	1.20	1.23	1.41	1.54	1.65	1.67	1.56
1994	0.40	0.65	0.73	0.75	0.73	1.05	1.38	1.32	1.32	1.39	1.39	1.30	1.35
1995	0.38	0.50	0.73	0.84	0.85	0.98	1.23	1.31	1.41	1.46	1.40	1.12	1.34
1996	0.33	0.44	0.68	0.79	0.95	0.95	1.02	1.10	1.40	1.49	1.51	1.73	1.52
1997	0.33	0.46	0.55	0.74	0.89	1.08	1.10	1.24	1.35	1.47	1.63	1.40	1.49
1998	0.36	0.58	0.63	0.62	0.78	1.03	1.17	1.25	1.32	1.42	1.44	1.54	1.55
1999	0.40	0.50	0.64	0.70	0.73	0.89	1.03	1.26	1.26	1.40	1.01	0.56	1.24
2000	0.35	0.53	0.63	0.73	0.78	0.81	0.97	1.01	1.25	1.29	1.11	1.21	1.46
2001	0.33	0.50	0.66	0.79	0.96	0.99	1.06	1.14	1.32	1.45	1.56	1.48	1.46
2002	0.38	0.51	0.67	0.80	0.91	1.03	1.11	1.10	1.28	1.45	1.59	1.33	1.63
2003	0.49	0.55	0.65	0.77	0.86	0.95	1.08	1.21	1.21	1.20	1.38	1.27	1.70
2004	0.40	0.58	0.66	0.76	0.89	0.93	1.03	1.18	1.13	1.17	1.33	1.28	1.22
2005	0.35	0.51	0.64	0.74	0.88	0.95	1.07	1.09	1.23	1.28	1.26	1.07	1.40
2006	0.31	0.45	0.60	0.75	0.86	0.96	1.06	1.12	1.22	1.24	1.30	1.39	1.42
2007	0.34	0.51	0.64	0.78	0.96	1.10	1.19	1.27	1.31	1.47	1.44	1.73	1.51
2008	0.33	0.52	0.65	0.77	0.90	1.04	1.11	1.22	1.30	1.41	1.49	1.50	1.53
2009	0.35	0.55	0.69	0.89	1.02	1.15	1.41	1.49	1.63	1.64	1.82	2.18	2.30
2010	0.38	0.49	0.67	0.92	1.11	1.26	1.34	1.60	1.61	1.85	1.94	2.06	2.21
2011	0.29	0.51	0.66	0.81	0.97	1.22	1.34	1.50	1.57	1.62	2.12	1.74	2.26
2012	0.27	0.41	0.64	0.82	0.97	1.18	1.31	1.53	1.61	1.65	1.73	2.03	2.12
2013	0.29	0.44	0.57	0.78	1.12	1.28	1.43	1.70	1.85	1.82	1.94	2.12	2.09
2014	0.32	0.46	0.62	0.75	0.89	1.15	1.32	1.38	1.68	1.80	1.75	1.68	2.21
2015	?	?	?	?	?	?	?	?	?	?	?	?	?
2016	?	?	?	?	?	?	?	?	?	?	?	?	?
2017	?	?	?	?	?	?	?	?	?	?	?	?	?

Model Estimates

	3	4	5	6	7	8	9	10	11	12	13	14	15
1991	0.35	0.46	0.60	0.72	0.84	0.89	1.02	1.12	1.13	1.17	1.25	1.35	1.26
1992	0.40	0.48	0.59	0.73	0.85	0.97	1.03	1.15	1.22	1.23	1.25	1.35	1.41
1993	0.46	0.61	0.68	0.81	0.95	1.09	1.25	1.29	1.39	1.48	1.47	1.51	1.58
1994	0.40	0.59	0.73	0.78	0.88	1.03	1.18	1.33	1.32	1.43	1.49	1.50	1.49
1995	0.35	0.51	0.72	0.85	0.86	0.97	1.13	1.26	1.37	1.36	1.45	1.53	1.49
1996	0.38	0.46	0.62	0.82	0.94	0.94	1.06	1.20	1.30	1.41	1.38	1.49	1.52
1997	0.40	0.49	0.55	0.72	0.92	1.03	1.03	1.14	1.25	1.36	1.44	1.43	1.49
1998	0.38	0.51	0.59	0.64	0.80	1.01	1.11	1.11	1.17	1.29	1.37	1.48	1.42
1999	0.39	0.51	0.64	0.71	0.73	0.90	1.13	1.25	1.17	1.25	1.35	1.45	1.52
2000	0.38	0.51	0.62	0.75	0.79	0.81	1.00	1.23	1.30	1.23	1.29	1.41	1.47
2001	0.40	0.53	0.67	0.79	0.91	0.95	0.97	1.17	1.39	1.48	1.36	1.44	1.53
2002	0.42	0.53	0.66	0.80	0.89	1.02	1.06	1.06	1.23	1.45	1.53	1.44	1.47
2003	0.44	0.55	0.66	0.79	0.91	1.01	1.15	1.17	1.13	1.32	1.53	1.62	1.47
2004	0.40	0.56	0.66	0.76	0.86	0.98	1.09	1.21	1.19	1.16	1.32	1.56	1.59
2005	0.36	0.49	0.66	0.73	0.81	0.91	1.04	1.12	1.20	1.19	1.13	1.31	1.49
2006	0.35	0.47	0.60	0.77	0.82	0.89	1.00	1.12	1.16	1.26	1.22	1.17	1.31
2007	0.37	0.52	0.64	0.79	0.96	1.02	1.11	1.22	1.31	1.37	1.45	1.42	1.32
2008	0.34	0.49	0.64	0.77	0.90	1.09	1.15	1.22	1.30	1.40	1.44	1.54	1.46
2009	0.38	0.53	0.70	0.89	1.01	1.18	1.43	1.47	1.51	1.61	1.70	1.76	1.83
2010	0.33	0.50	0.66	0.84	1.01	1.14	1.33	1.57	1.56	1.61	1.67	1.79	1.80
2011	0.30	0.47	0.65	0.82	1.00	1.20	1.35	1.54	1.75	1.75	1.76	1.86	1.93
2012	0.30	0.41	0.59	0.80	0.96	1.16	1.39	1.52	1.67	1.91	1.87	1.91	1.95
2013	0.31	0.44	0.57	0.78	1.00	1.19	1.44	1.68	1.78	1.97	2.20	2.18	2.16
2014	0.33	0.45	0.60	0.74	0.97	1.23	1.47	1.73	1.94	2.07	2.23	2.53	2.43
2015	0.36	0.35	0.44	0.57	0.67	0.87	1.11	1.28	1.46	1.65	1.72	1.88	2.06
2016	0.36	0.49	0.44	0.53	0.66	0.76	0.99	1.23	1.37	1.57	1.73	1.83	1.94
2017	0.36	0.49	0.61	0.53	0.61	0.74	0.86	1.10	1.31	1.47	1.65	1.85	1.89

CVs of Observed Data

	3	4	5	6	7	8	9	10	11	12	13	14	15
1991	2%	2%	2%	2%	1%	4%	2%	7%	3%	7%	4%	7%	5%
1992	1%	2%	3%	2%	2%	2%	4%	3%	4%	5%	14%	8%	9%
1993	1%	0%	2%	3%	3%	4%	3%	5%	6%	10%	11%	11%	12%
1994	3%	1%	1%	2%	5%	13%	7%	7%	6%	7%	8%	15%	8%
1995	2%	2%	1%	1%	2%	4%	7%	8%	7%	14%	8%	53%	9%
1996	2%	4%	2%	1%	2%	2%	4%	6%	18%	11%	9%	12%	13%
1997	3%	1%	1%	1%	2%	2%	4%	8%	14%	14%	23%	9%	9%
1998	2%	3%	2%	1%	2%	3%	2%	6%	11%	13%	18%	24%	22%
1999	0%	1%	1%	1%	1%	3%	3%	5%	15%	27%	43%	57%	27%
2000	1%	1%	1%	2%	1%	1%	3%	6%	6%	13%	52%	76%	70%
2001	2%	1%	1%	1%	3%	3%	2%	5%	7%	9%	13%	14%	47%
2002	1%	1%	1%	1%	2%	3%	3%	3%	6%	7%	11%	34%	35%
2003	1%	1%	1%	1%	1%	2%	4%	6%	5%	7%	14%	36%	22%
2004	2%	1%	1%	1%	2%	2%	3%	8%	6%	6%	14%	18%	11%
2005	2%	1%	0%	1%	2%	3%	3%	5%	8%	8%	25%	37%	28%
2006	1%	1%	1%	1%	2%	3%	4%	4%	9%	14%	12%	19%	11%
2007	1%	1%	1%	1%	2%	2%	4%	5%	7%	13%	14%	12%	10%
2008	1%	1%	1%	1%	2%	2%	3%	4%	7%	7%	8%	22%	8%
2009	1%	1%	3%	2%	2%	3%	4%	6%	10%	12%	9%	30%	16%
2010	2%	0%	1%	3%	3%	4%	4%	5%	7%	10%	15%	13%	11%
2011	1%	1%	0%	1%	3%	4%	5%	5%	6%	9%	29%	16%	21%
2012	1%	0%	1%	1%	2%	5%	8%	11%	9%	10%	13%	21%	45%
2013	1%	0%	0%	2%	3%	4%	8%	9%	10%	12%	13%	18%	16%
2014	2%	1%	1%	1%	2%	3%	6%	14%	16%	19%	16%	22%	17%
2015	?	?	?	?	?	?	?	?	?	?	?	?	?
2016	?	?	?	?	?	?	?	?	?	?	?	?	?
2017	?	?	?	?	?	?	?	?	?	?	?	?	?

Residuals & *CVs of projected estimates*

1.609

	3	4	5	6	7	8	9	10	11	12	13	14	15
1991	-3.2	0.8	0.7	0.3	0.5	0.0	-0.7	0.2	0.0	1.1	-0.3	-0.7	-0.4
1992	-1.1	-0.1	1.7	-0.6	-1.4	0.5	0.1	1.5	0.5	0.9	-0.3	0.2	0.4
1993	3.4	-0.1	-1.1	-1.0	-0.5	-1.0	-1.8	-1.3	0.3	0.6	1.6	1.0	-0.2
1994	0.0	4.7	-0.1	-1.4	-2.9	0.2	2.7	-0.1	0.1	-0.7	-1.3	-1.3	-1.7
1995	1.1	-0.8	1.1	-0.5	-0.3	0.2	1.5	0.6	0.6	0.7	-0.6	-0.4	-1.7
1996	-2.1	-0.4	2.6	-2.4	0.9	0.5	-0.8	-1.7	0.6	0.7	1.4	2.0	0.0
1997	-2.4	-2.2	-0.2	1.4	-1.8	2.1	1.7	1.4	0.8	0.8	0.8	-0.3	-1.5
1998	-0.9	2.4	1.7	-2.7	-1.1	0.9	1.5	2.6	1.3	1.0	0.4	0.2	0.6
1999	2.7	-0.7	-0.1	-0.5	-0.4	-0.4	-3.1	0.2	0.6	0.5	-0.8	-1.6	-1.0
2000	-2.1	2.8	1.0	-1.2	-1.0	-1.1	-3.8	-0.9	0.4	-0.3	-0.3	0.0	
2001	-5.2	-2.3	-1.2	0.0	2.0	1.6	4.4	-0.7	-1.0	-0.3	1.5	0.3	-0.1
2002	-2.3	-2.8	0.7	-0.2	1.4	0.3	1.4	1.3	0.8	-0.3	0.6	-0.3	0.4
2003	8.4	-0.2	-1.4	-1.6	-4.1	-2.6	-1.8	0.7	1.5	-1.7	-1.0	-1.0	1.0
2004	0.4	3.5	-2.3	0.5	1.7	-3.2	-1.7	-0.5	-1.0	0.2	0.1	-1.6	-3.3
2005	-0.4	2.5	-3.9	0.7	4.3	1.5	1.0	-0.8	0.3	1.2	0.5	-0.6	-0.3
2006	-3.5	-2.9	0.7	-1.4	2.9	2.5	1.5	-0.1	0.7	-0.1	0.7	1.2	1.1
2007	-2.5	-1.0	0.1	-1.2	-0.4	3.5	2.0	1.0	0.1	0.8	-0.1	2.6	2.0
2008	-1.2	2.9	0.8	1.1	-0.3	-2.8	-1.8	0.0	0.1	0.1	0.7	-0.2	0.4
2009	-3.2	1.5	-0.6	0.1	0.4	-0.9	-0.4	0.3	1.2	0.3	1.4	1.4	3.0
2010	1.9	-3.5	0.9	2.4	3.3	3.0	0.3	0.5	0.7	2.5	1.8	2.0	3.5
2011	-2.6	3.3	2.0	-1.5	-1.0	0.5	-0.2	-0.7	-2.7	-1.4	1.3	0.6	1.6
2012	-4.0	-1.5	3.2	3.2	0.7	0.3	-0.9	0.0	-0.6	-2.6	-1.1	0.6	0.4
2013	-2.1	-0.5	-0.6	0.2	4.5	2.4	-0.2	0.1	0.6	-1.1	-1.9	-0.3	-0.4
2014	-0.8	1.0	2.1	3.0	-4.8	-2.7	-2.7	-2.5	-1.6	-1.4	-3.0	-3.9	-1.3
2015	*19%*	*12%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*
2016	*19%*	*19%*	*12%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*
2017	*19%*	*19%*	*19%*	*12%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*

E. Bering Sea Pollock
Survey data

Types:

1. Bottom trawl

2. ~~Acoustic + mid-water trawl~~ To come in 2016

3. Opportunistic acoustic data collection

Collected onboard chartered bottom-trawl survey

Bottom-trawl survey

Pollock survey biomass trend
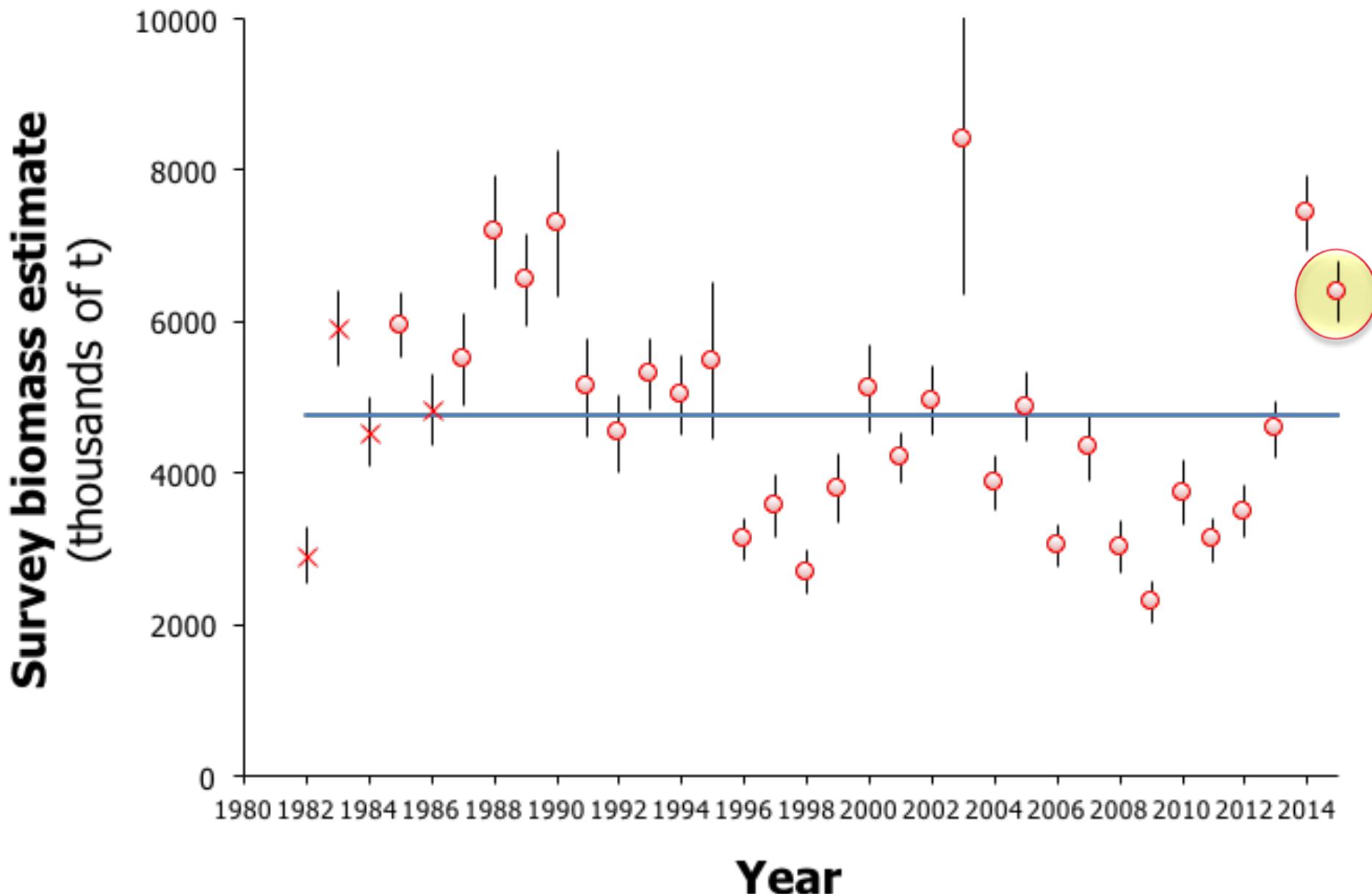
2013 pollock survey—4.6 million t

BTS CPUE 2013
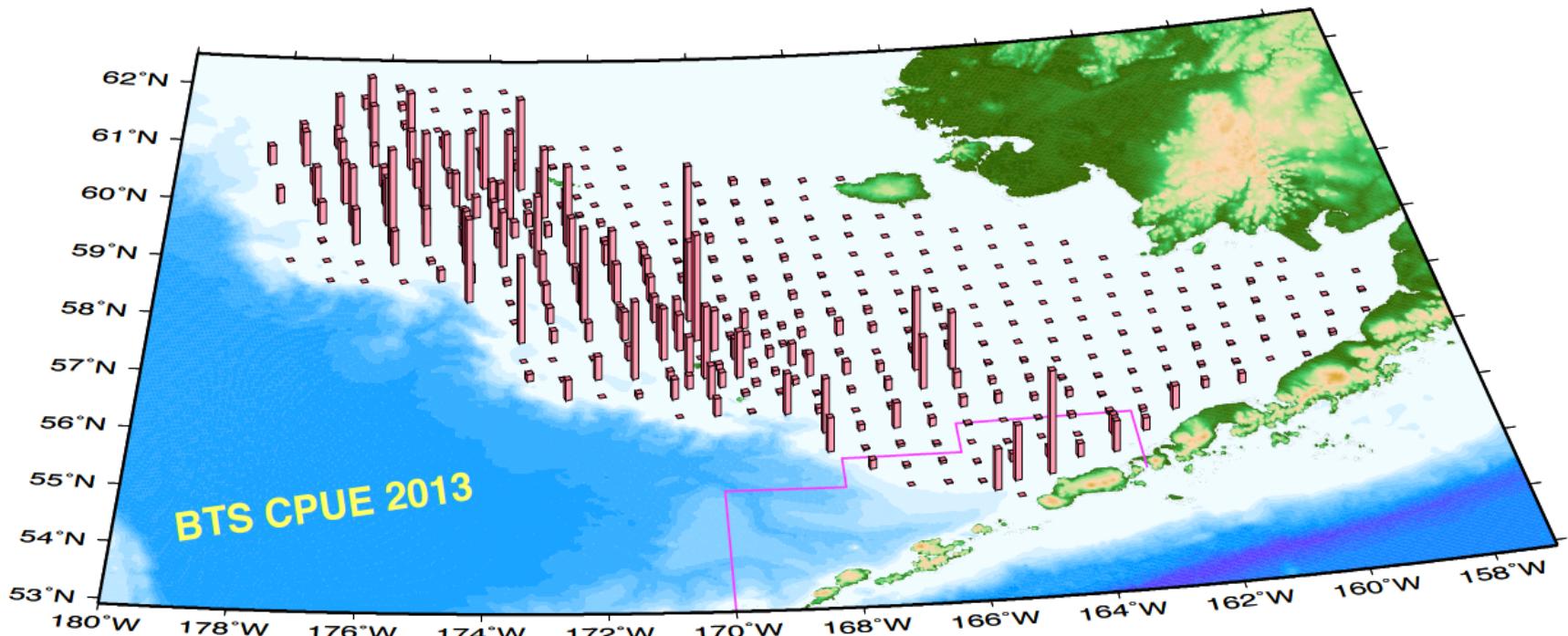
2014 pollock survey—7.4 million t
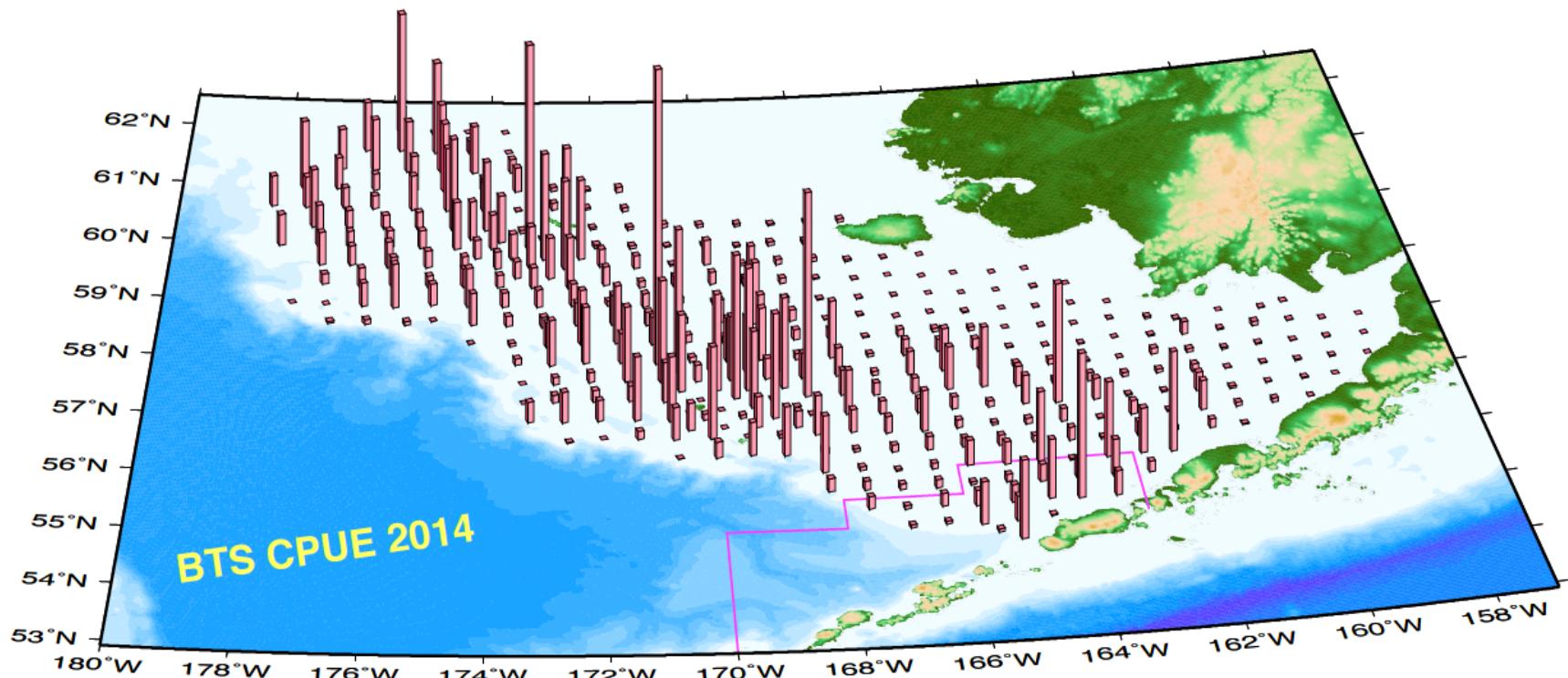
2015 pollock survey—6.4 million t

BTS CPUE 2015
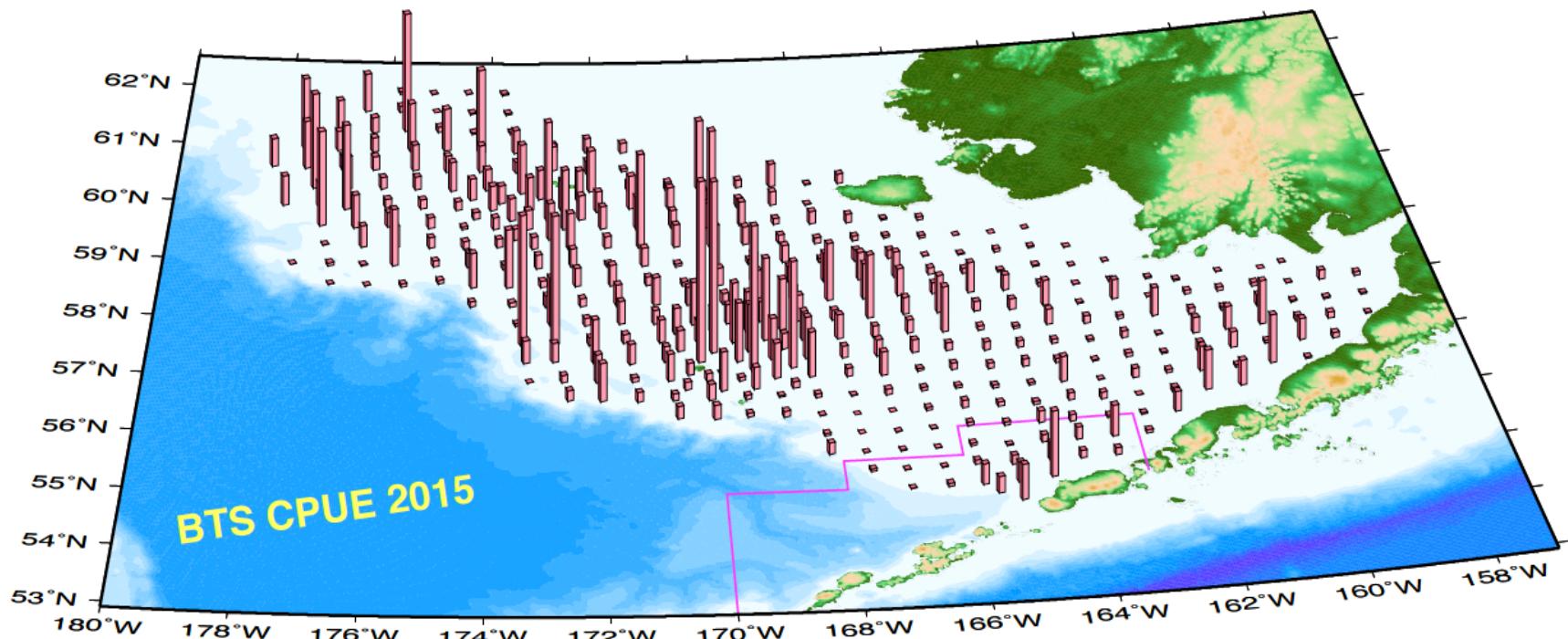
Pollock density and bottom temperatures

Pollock

2008	2009
2010	2011
2012	2013
2014	2015

Relative CPUE

0.00   0.25   0.50   0.75   1.00
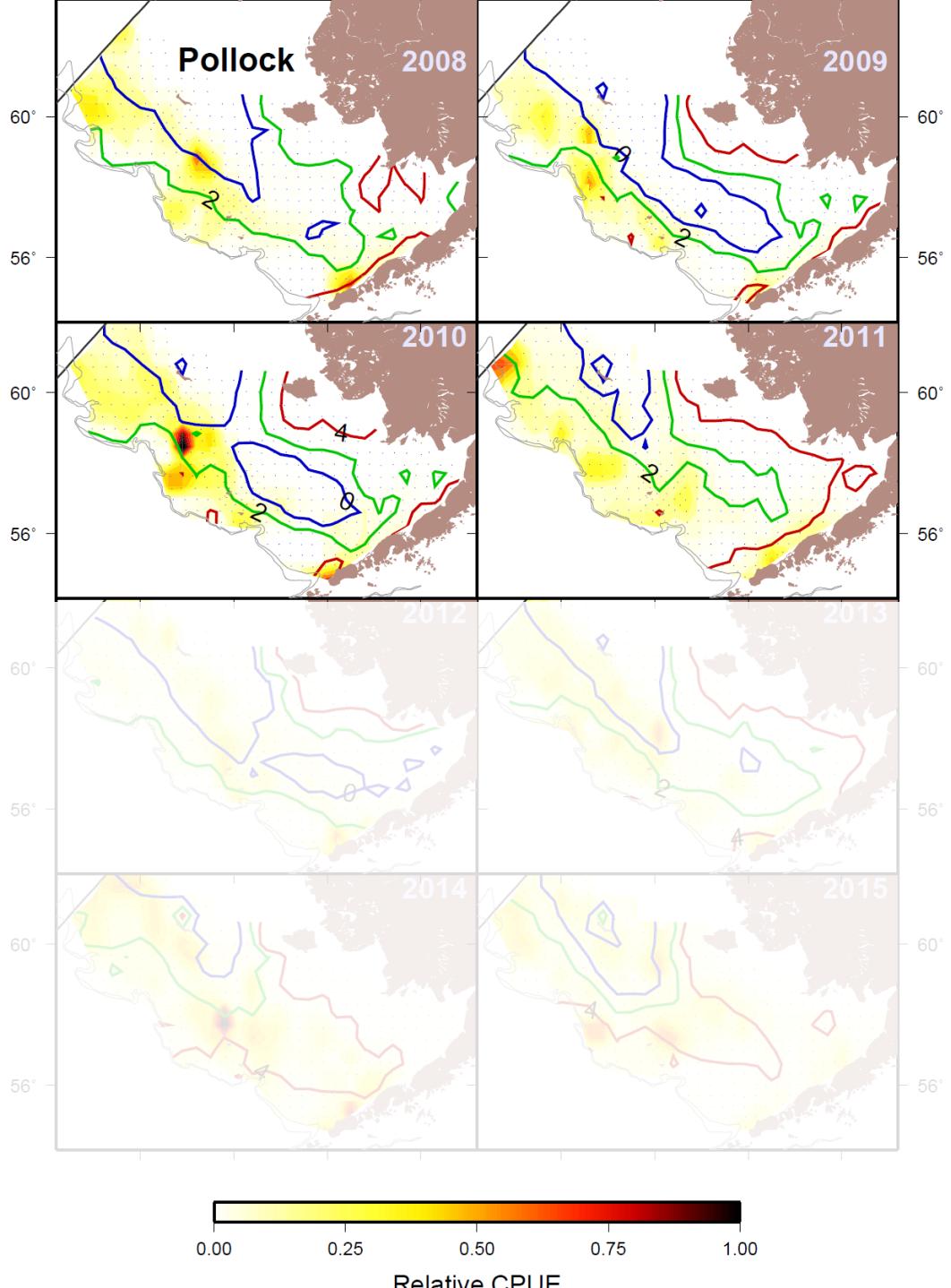
Bottom trawl survey numbers-at-age
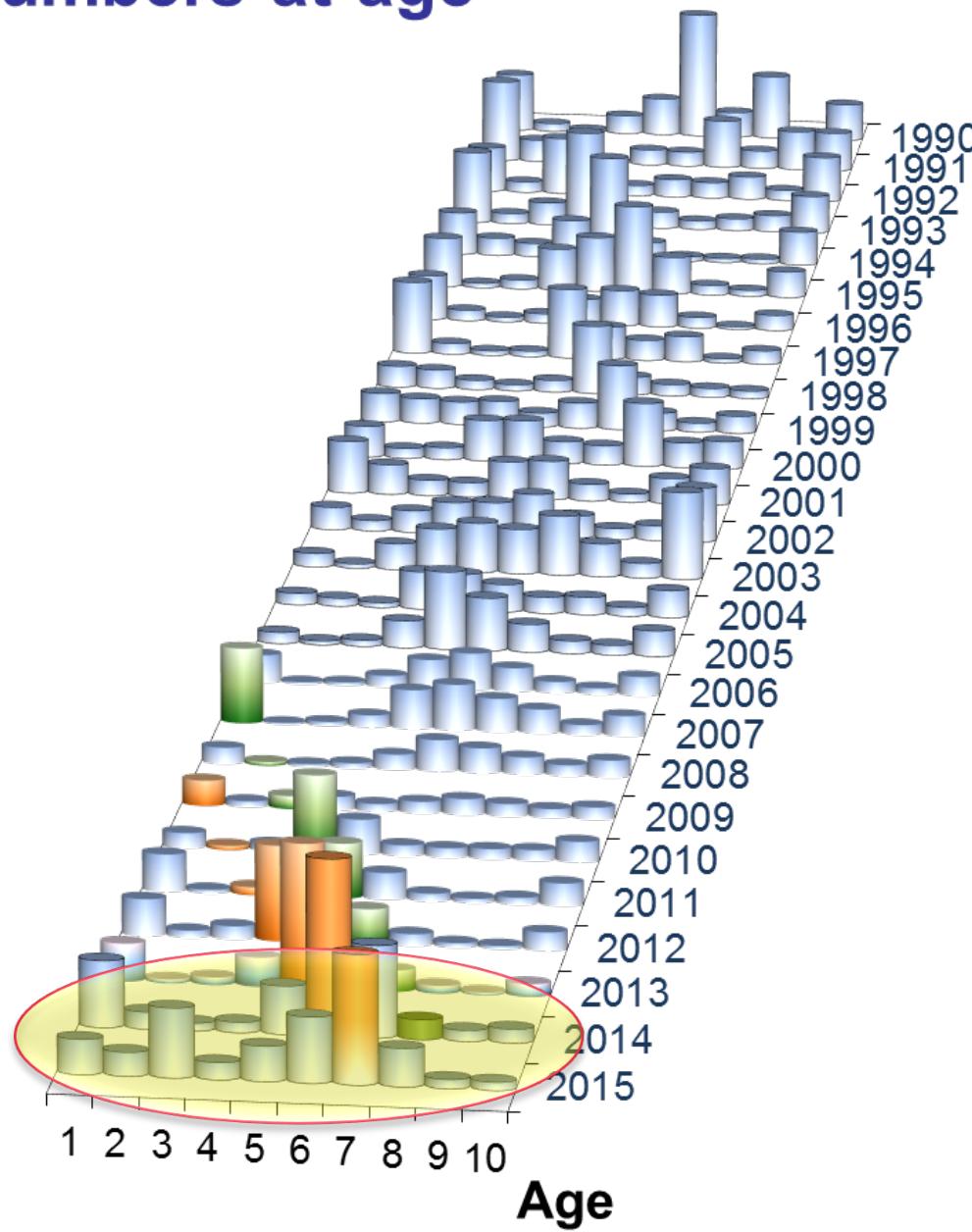
Bottom-trawl survey
+ Acoustic index

2014 Acoustic sign
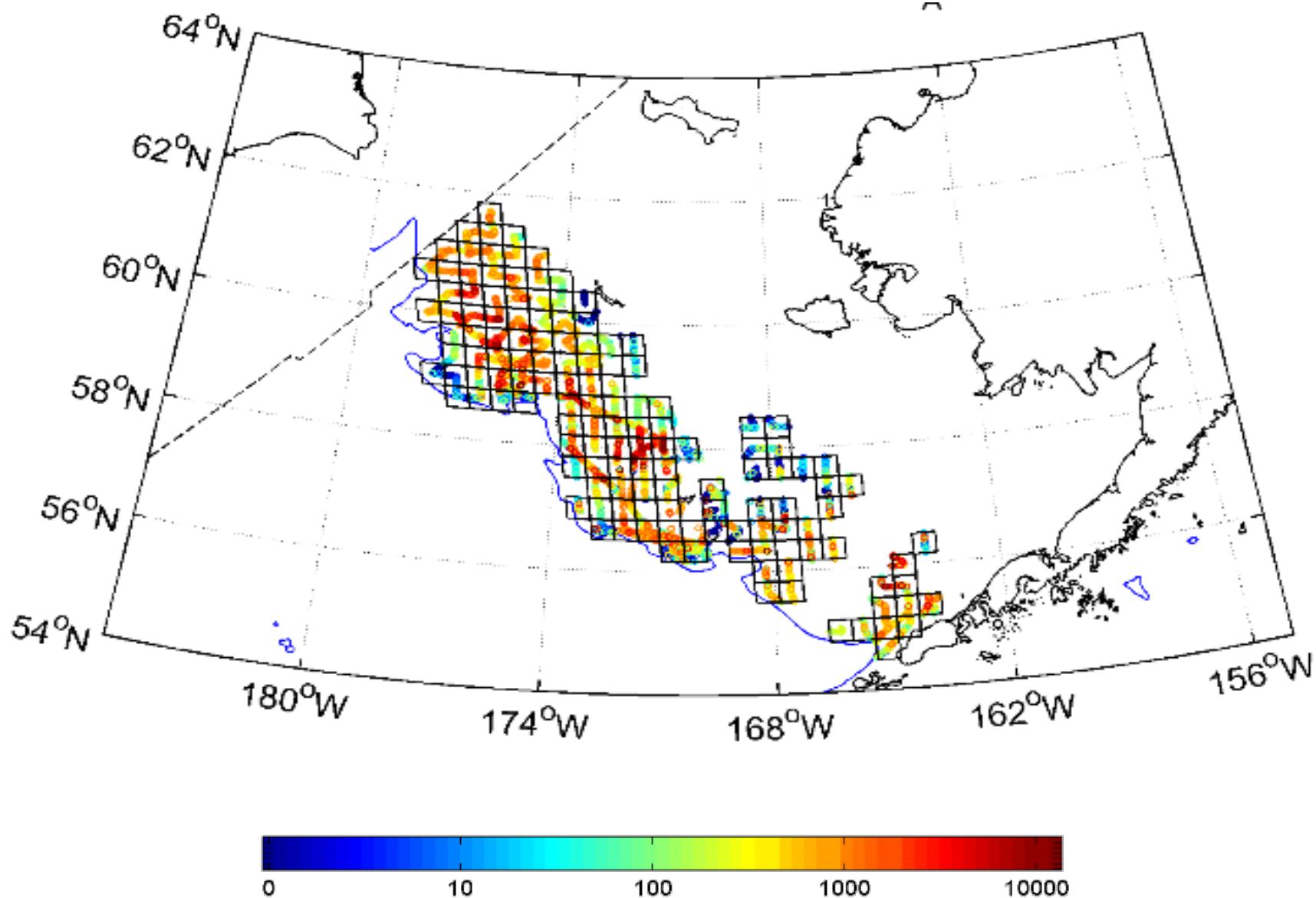
2015 Acoustic sign
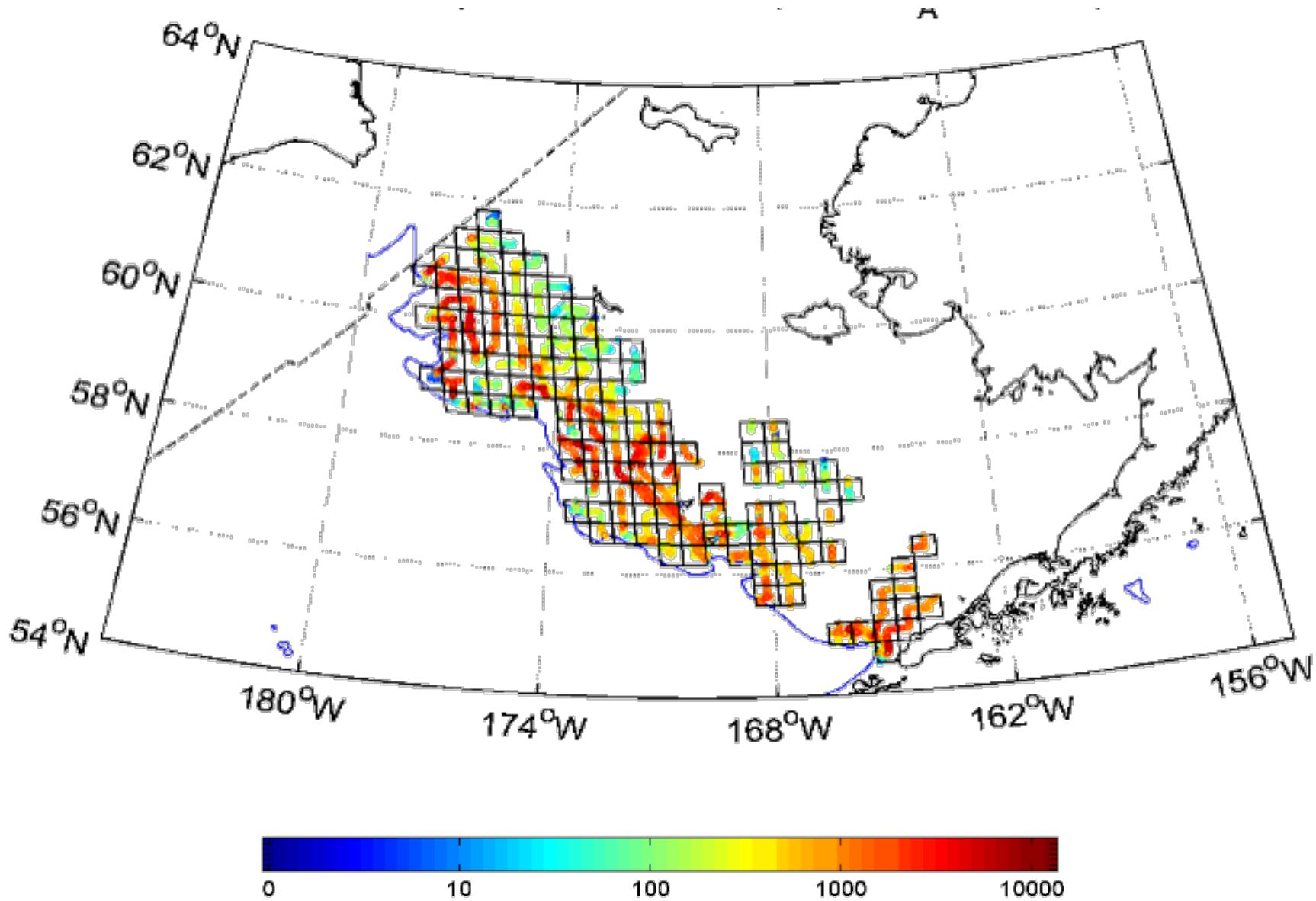
Opportunistic Acoustic survey index

AVO backscatter
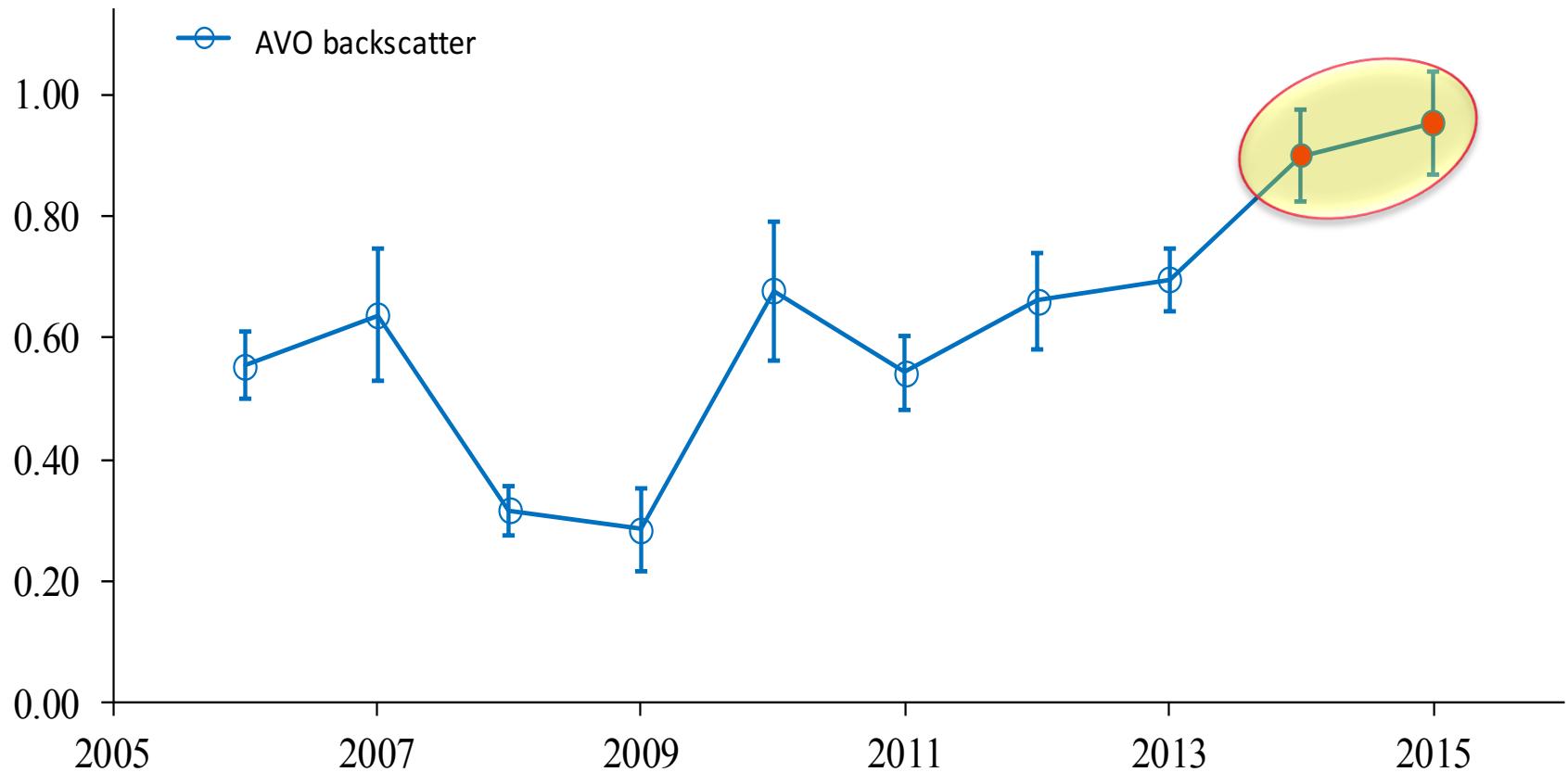
Model results

Sequential add of new data

Model evaluation

A sequence of models were developed that evaluated sensitivities to new data which included updating the catch biomass for 2014 and estimated levels for 2015 along with the 2014 fishery mean weights-at-age. As in past years, a set of models showing the impact of new data was constructed, this year with a summary of the impact of these changes on the relative spawning biomass (last column):

Model		2015 catch	AT Age revised	2014 Fish Ages	BTS Std Index	BTS Alt Index	AVO Update	Spawning biomass relative to the average from 1995-2015
0.0	2014 assessment							
0.1	With updated catch and extended to 2015	X						
0.2	As 0.1 but with updated AT Age data	X	X					
0.3	As 0.2 but with 2014 fishery age	X	X	X				
0.4	As 0.3 but with standard BTS data added	X	X	X	X			
0.5	As 0.3 but with corrected BTS index data added	X	X	X		X		
0.6	As 0.4 but with AVO data added	X	X	X	X		X	
0.7	As 0.5 but with AVO data added	X	X	X		X	X	

Spawning biomass in thousands of tons

Effect of new data for 2015
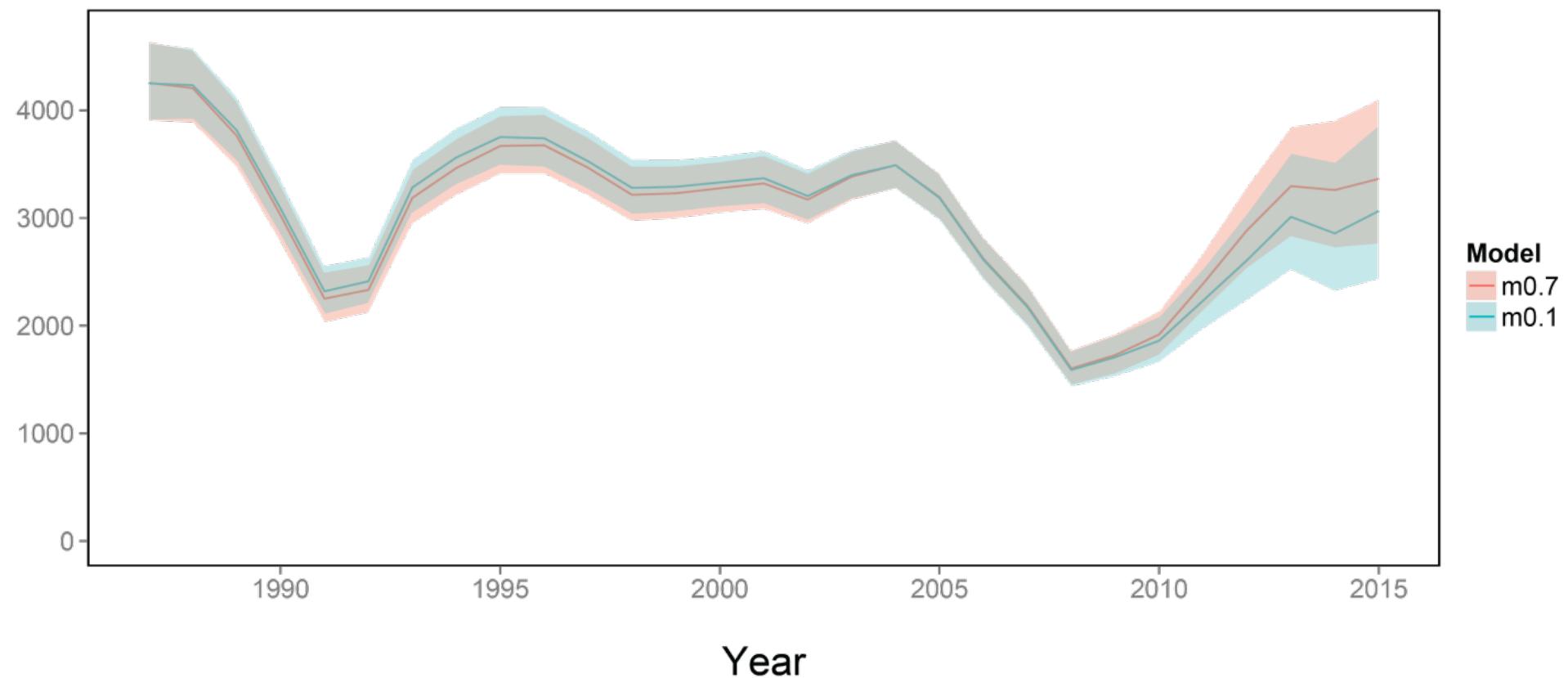
EBS pollock fishery age composition data
(2015 Assessment)

Bottom Trawl Survey numbers (age 2+)
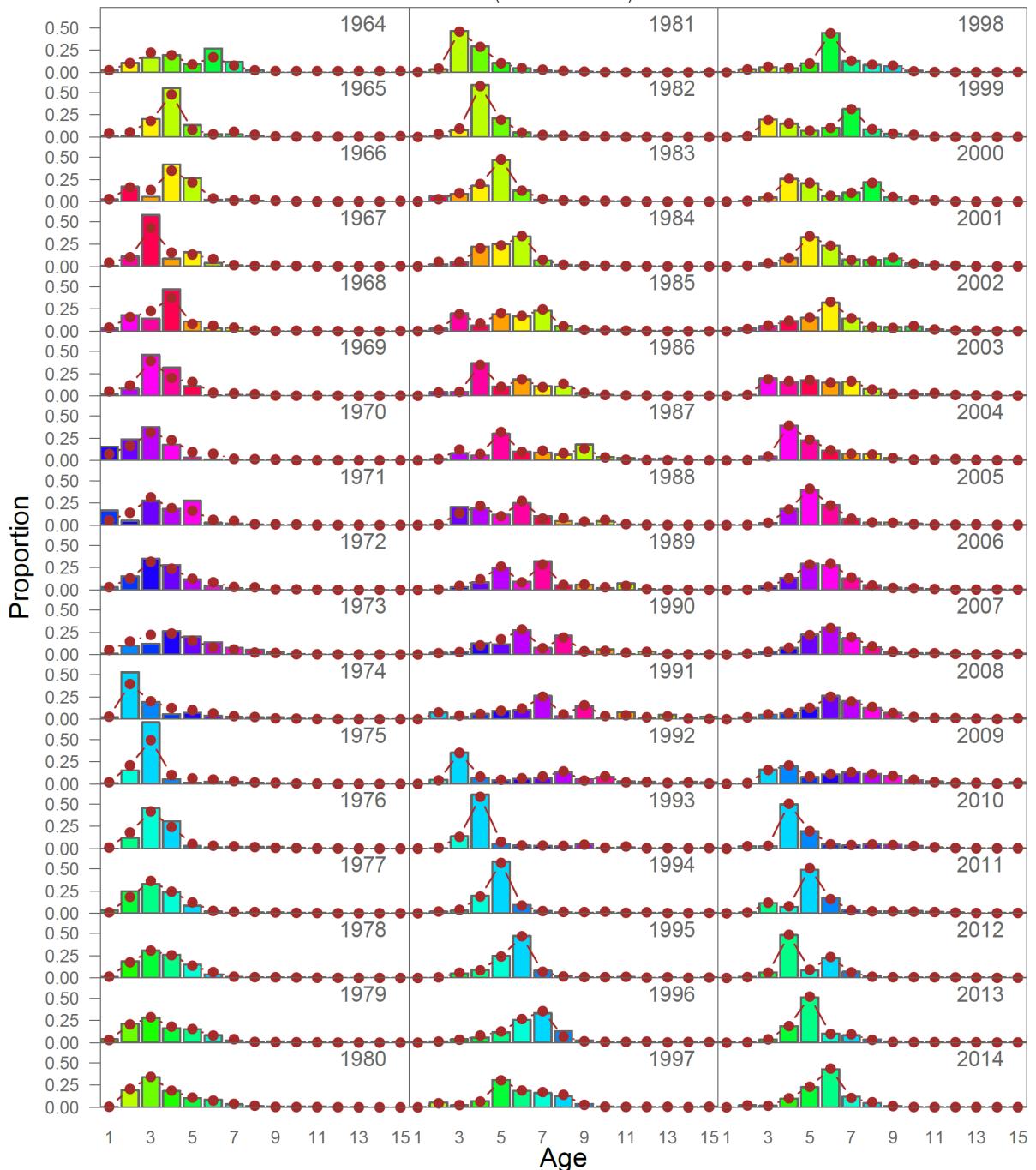
Survey age composition fits
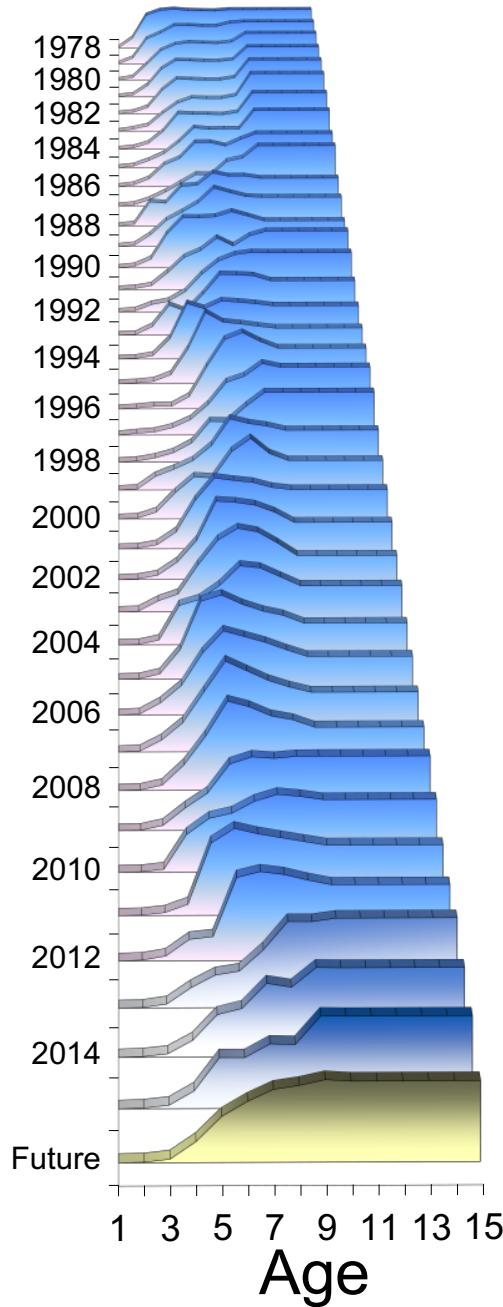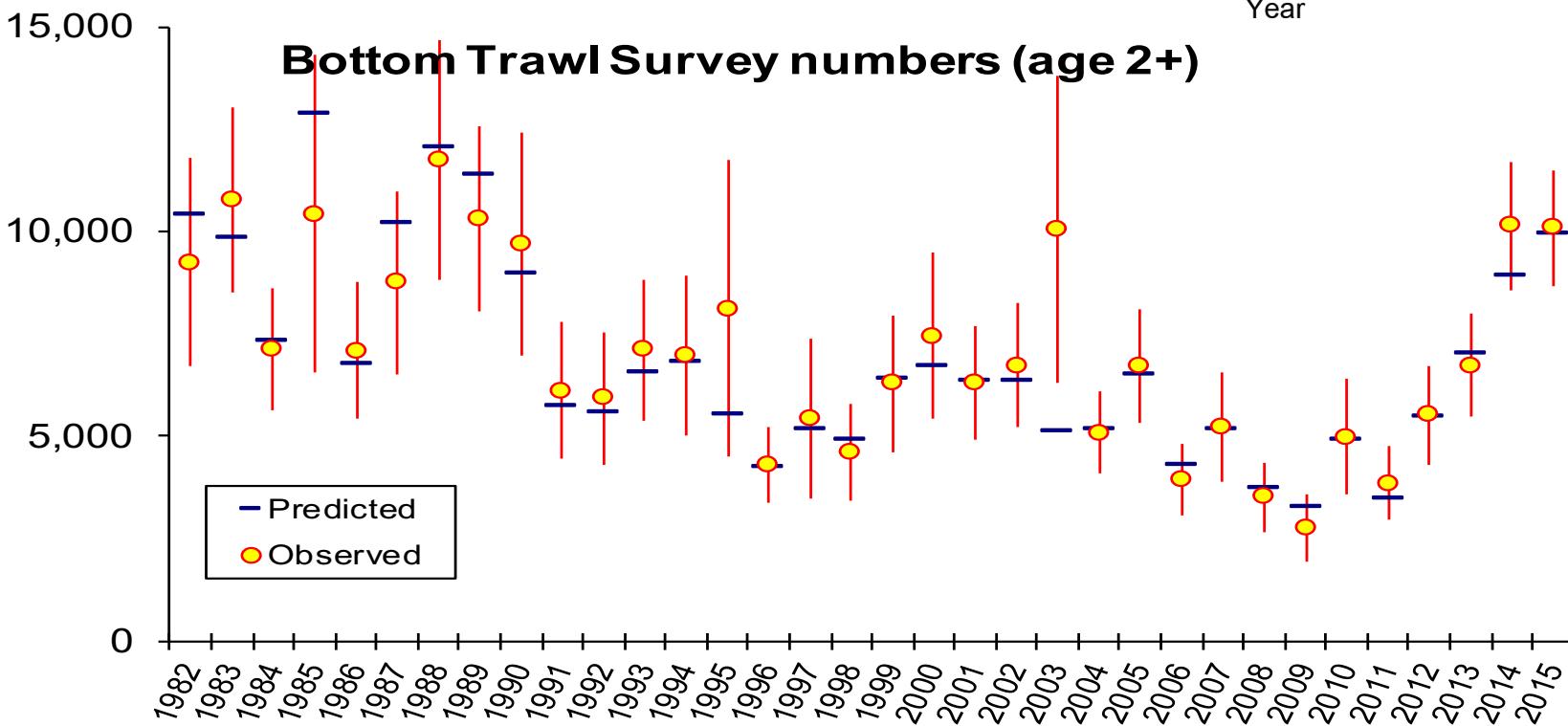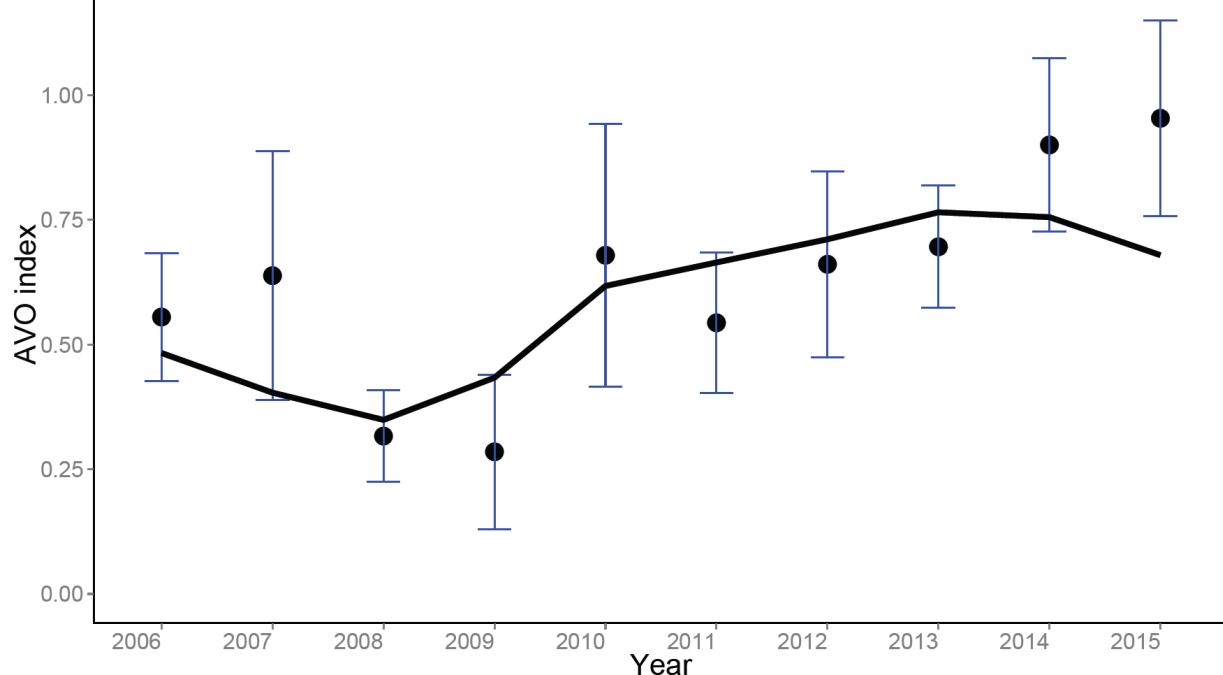
EBS pollock survey age composition data
(2015 Assessment)
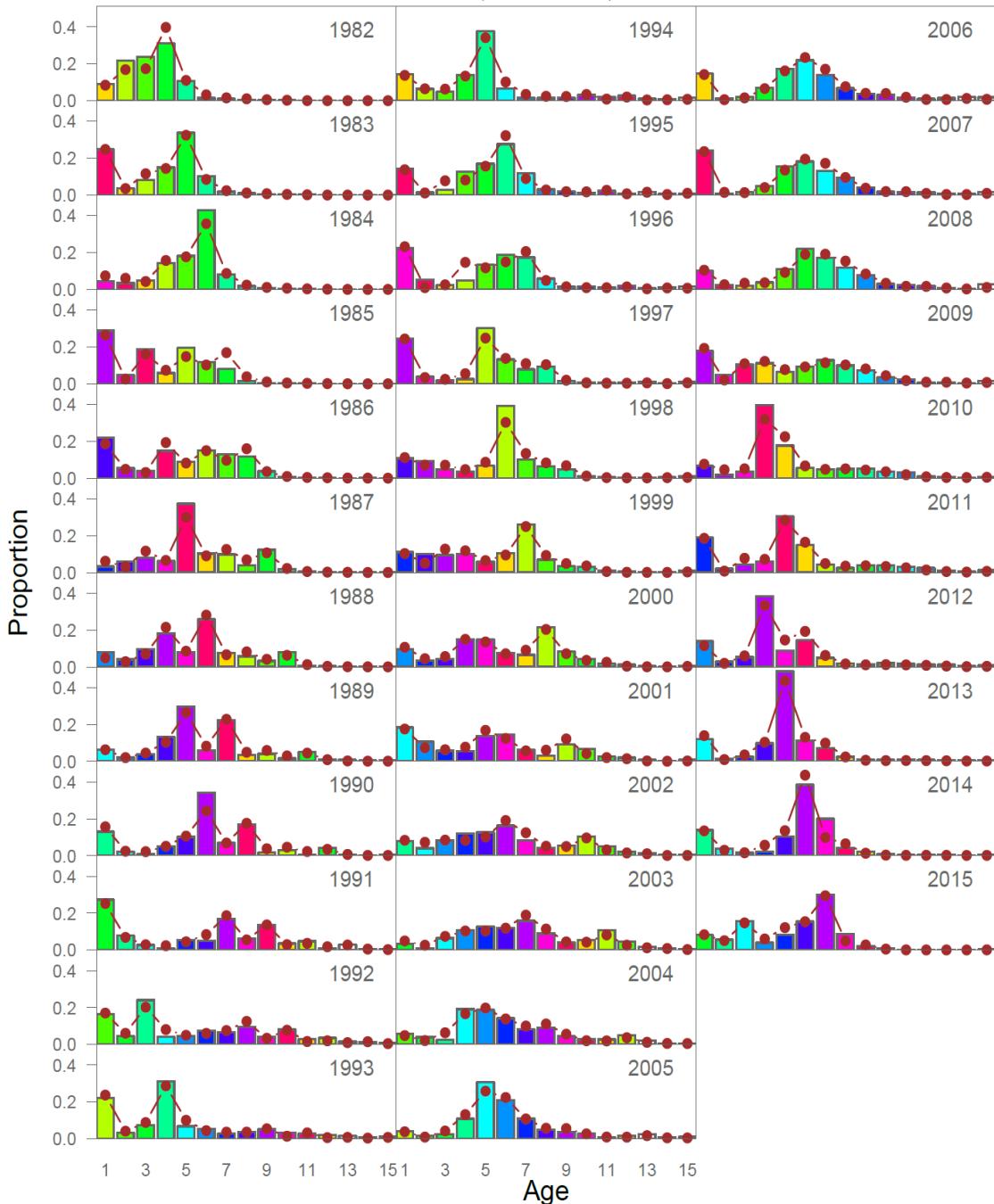
Year class estimates
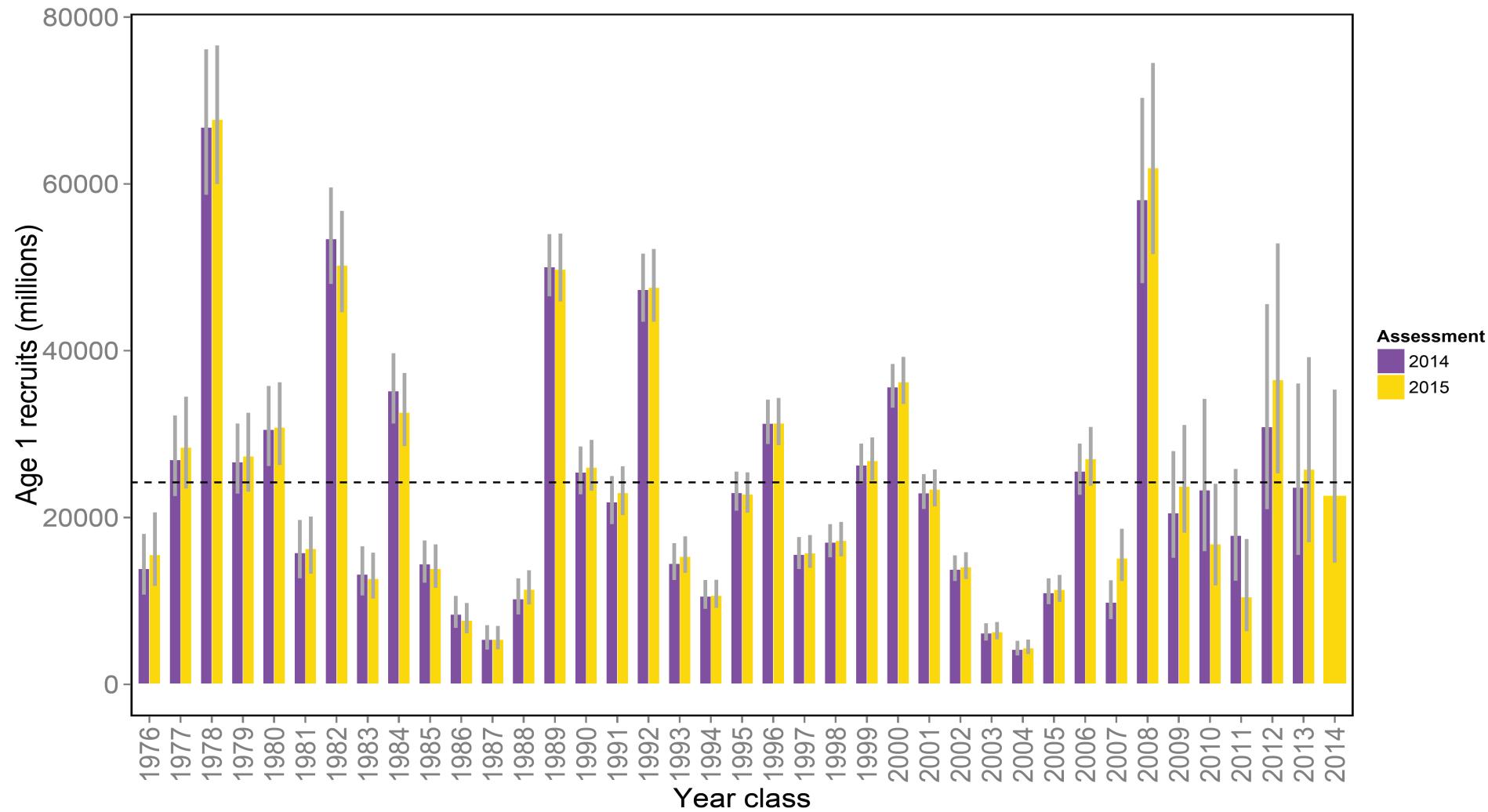
E. Bering Sea pollock spawning biomass
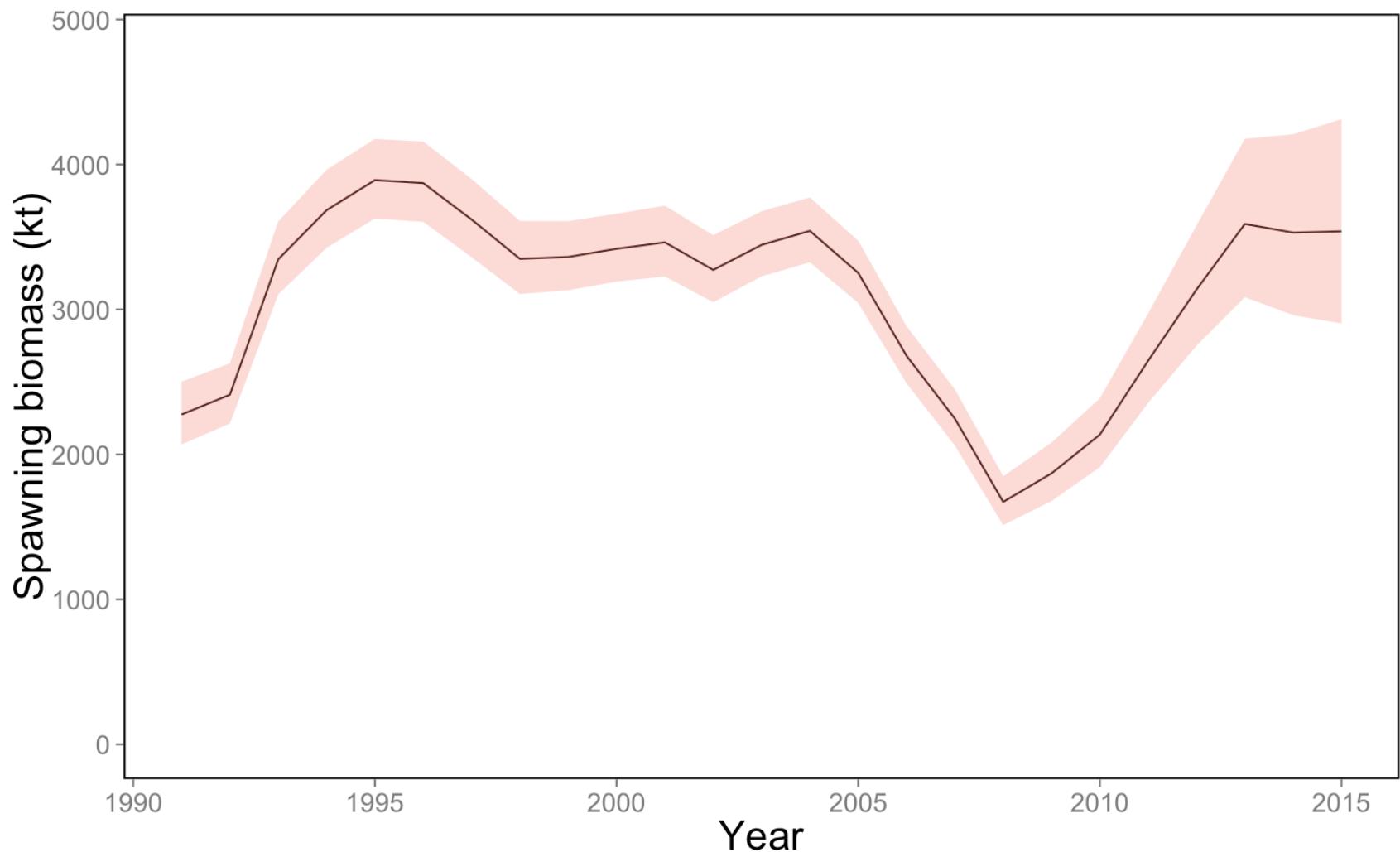
Fishing mortality
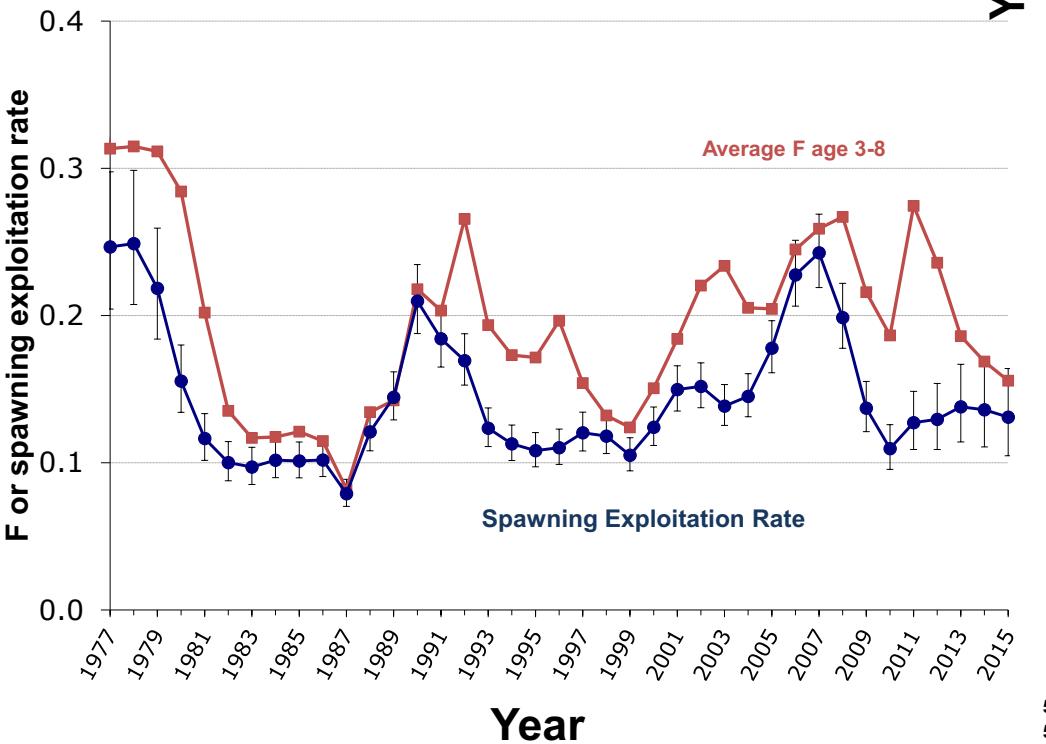
Year	Age 2	3	4	5	6	7	8	9	10
1964	0.01	0.03	0.16	0.17	0.17	0.17	0.16	0.16	0.15
1965	0.01	0.04	0.17	0.16	0.15	0.15	0.14	0.13	0.13
1966	0.01	0.05	0.15	0.14	0.14	0.13	0.12	0.12	0.12
1967	0.03	0.13	0.20	0.21	0.21	0.21	0.21	0.20	0.20
1968	0.03	0.11	0.22	0.21	0.21	0.20	0.20	0.20	0.19
1969	0.03	0.16	0.20	0.20	0.19	0.19	0.19	0.19	0.19
1970	0.06	0.22	0.22	0.24	0.24	0.26	0.28	0.29	0.36
1971	0.08	0.26	0.30	0.36	0.35	0.35	0.39	0.40	0.56
1972	0.13	0.34	0.39	0.39	0.38	0.38	0.42	0.44	0.55
1973	0.16	0.37	0.47	0.47	0.47	0.47	0.51	0.51	0.59
1974	0.22	0.48	0.48	0.48	0.48	0.48	0.52	0.53	0.53
1975	0.12	0.47	0.45	0.43	0.42	0.41	0.42	0.44	0.48
1976	0.09	0.36	0.42	0.40	0.38	0.38	0.38	0.38	0.40
1977	0.10	0.26	0.33	0.33	0.32	0.32	0.32	0.32	0.32
1978	0.09	0.28	0.32	0.33	0.32	0.32	0.32	0.33	0.33
1979	0.05	0.23	0.28	0.35	0.34	0.34	0.34	0.37	0.38
1980	0.02	0.14	0.26	0.32	0.33	0.33	0.32	0.34	0.41
1981	0.01	0.07	0.18	0.24	0.24	0.24	0.24	0.25	0.33
1982	0.01	0.03	0.11	0.17	0.17	0.16	0.16	0.18	0.26
1983	0.01	0.03	0.08	0.13	0.16	0.15	0.15	0.17	0.27
1984	0.01	0.02	0.08	0.15	0.15	0.15	0.15	0.16	0.24
1985	0.01	0.03	0.06	0.11	0.18	0.17	0.17	0.17	0.25
1986	0.01	0.03	0.08	0.10	0.16	0.16	0.15	0.17	0.20
1987	0.00	0.02	0.05	0.07	0.10	0.10	0.15	0.16	0.20
1988	0.01	0.08	0.08	0.14	0.14	0.19	0.17	0.18	0.17
1989	0.01	0.04	0.10	0.13	0.16	0.22	0.20	0.19	0.18
1990	0.01	0.04	0.18	0.26	0.26	0.27	0.29	0.27	0.24
1991	0.01	0.02	0.11	0.21	0.25	0.34	0.28	0.35	0.38
1992	0.01	0.06	0.09	0.18	0.33	0.44	0.50	0.52	0.51
1993	0.00	0.04	0.16	0.12	0.21	0.31	0.31	0.31	0.28
1994	0.00	0.01	0.09	0.24	0.21	0.25	0.24	0.23	0.23
1995	0.00	0.01	0.04	0.15	0.31	0.27	0.26	0.25	0.24
1996	0.01	0.01	0.02	0.07	0.24	0.40	0.44	0.39	0.35
1997	0.01	0.02	0.04	0.08	0.17	0.29	0.32	0.39	0.37
1998	0.00	0.02	0.04	0.09	0.19	0.19	0.26	0.32	0.32
1999	0.00	0.04	0.06	0.09	0.13	0.22	0.20	0.19	0.18
2000	0.00	0.02	0.09	0.14	0.14	0.23	0.28	0.22	0.20
2001	0.00	0.02	0.07	0.19	0.28	0.27	0.27	0.25	0.24
2002	0.00	0.02	0.08	0.18	0.36	0.35	0.34	0.31	0.26
2003	0.00	0.05	0.08	0.21	0.32	0.38	0.36	0.31	0.25
2004	0.00	0.02	0.16	0.18	0.24	0.32	0.31	0.27	0.24
2005	0.00	0.02	0.11	0.28	0.30	0.27	0.25	0.23	0.20
2006	0.00	0.05	0.13	0.27	0.37	0.34	0.31	0.28	0.25
2007	0.00	0.05	0.13	0.27	0.41	0.37	0.32	0.29	0.27
2008	0.00	0.03	0.12	0.26	0.43	0.40	0.36	0.34	0.30
2009	0.00	0.02	0.11	0.17	0.31	0.34	0.34	0.35	0.35
2010	0.00	0.01	0.14	0.20	0.22	0.26	0.29	0.28	0.27
2011	0.00	0.01	0.06	0.36	0.43	0.40	0.38	0.36	0.35
2012	0.00	0.02	0.10	0.11	0.38	0.41	0.39	0.37	0.35
2013	0.00	0.02	0.09	0.15	0.17	0.27	0.40	0.40	0.42
2014	0.00	0.01	0.07	0.17	0.19	0.29	0.28	0.35	0.35
2015	0.00	0.01	0.07	0.19	0.19	0.24	0.24	0.34	0.34
5-yr Aver	0.00	0.02	0.08	0.20	0.27	0.32	0.34	0.37	0.36
5-yr Max	0.00	0.02	0.10	0.36	0.43	0.41	0.40	0.40	0.42
5-yr Min	0.00	0.01	0.06	0.11	0.17	0.24	0.24	0.34	0.34
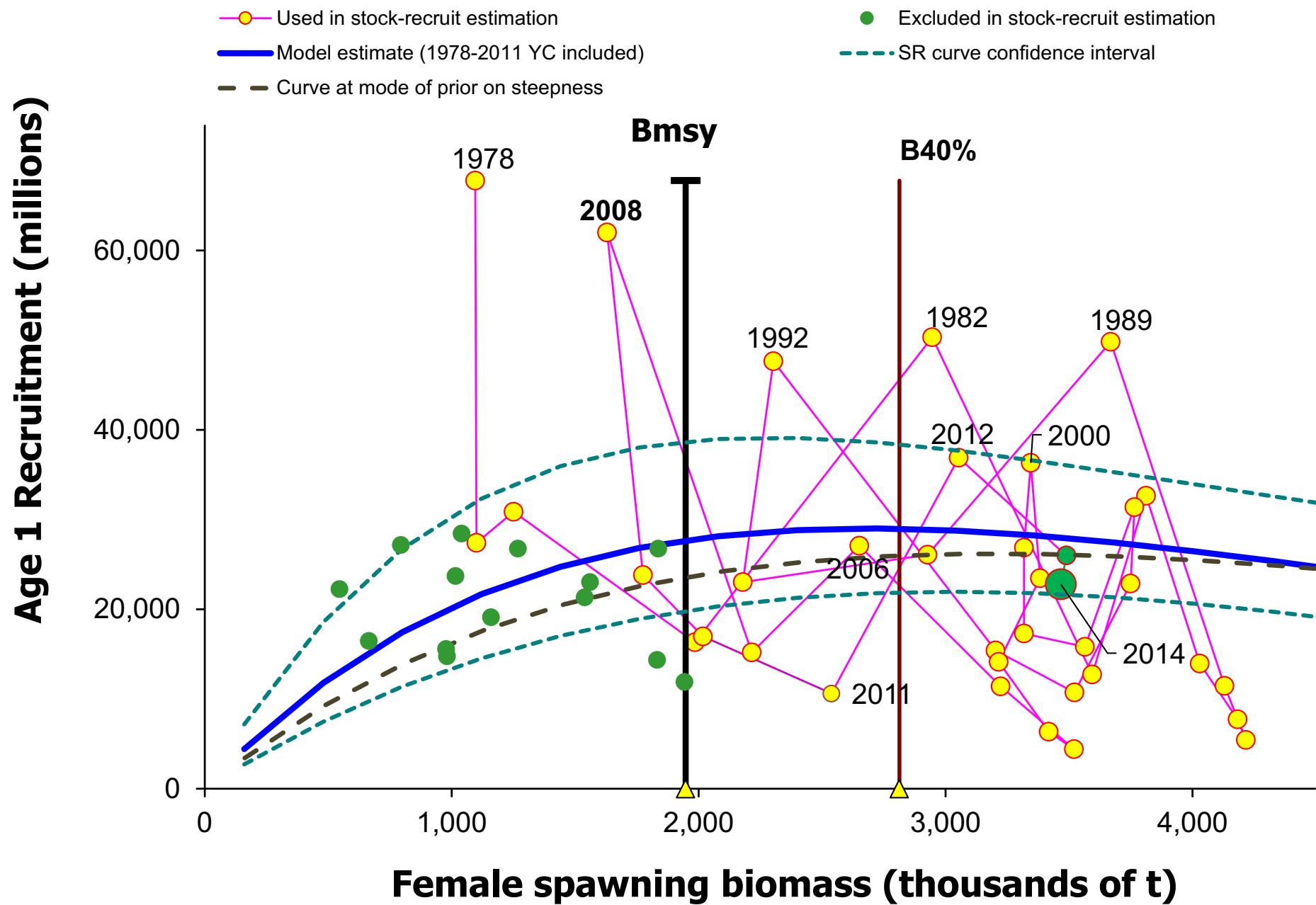
What fraction of the catch was immature?

Proportion of catch that is immature

1964-2015
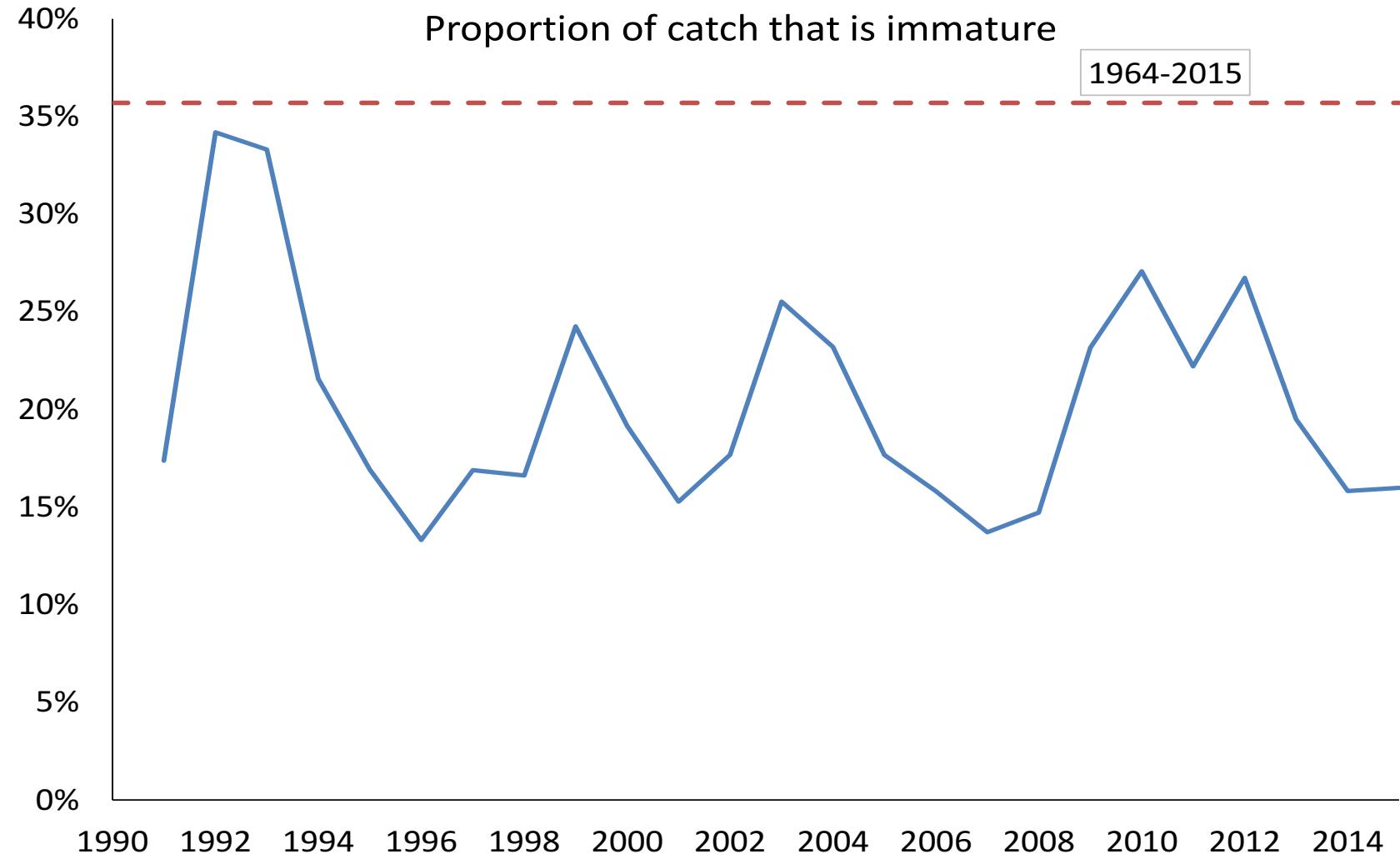
Quantity	As estimated or *specified last* year for: 2015	2016	As estimated or *recommended this* year for: 2016	2017
M (natural mortality rate, ages 3+)	0.3	0.3	0.3	0.3
Tier	1a	1a	1a	1a
Projected total (age 3+) biomass (t)	9,203,000 t	11,000,000 t	11,300,000 t	11,000,000 t
Projected female spawning biomass (t)	**2,850,000 t**	**2,950,000 t**	**3,540,000 t**	**3,500,000 t**
B_0	5,162,000 t	5,162,000 t	5,676,000 t	5,676,000 t
B_{MSY}	1,948,000 t	1,948,000 t	1,984,000 t	1,984,000 t
F_{OFL}	0.587	0.587	0.514	0.514
$maxF_{ABC}$	0.512	0.512	0.401	0.401
F_{ABC}	0.24	0.25	0.27	0.26
OFL (t)	3,330,000 t	3,490,000 t	3,910,000 t	3,540,000 t
maxABC (t)	2,900,000 t	3,040,000 t	3,050,000 t	2,760,000 t
ABC (t)	1,637,000 t	1,554,000 t	2,090,000 t	2,019,000 t
Status	2013	2014	As determined *this* year for: 2014	2015
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No