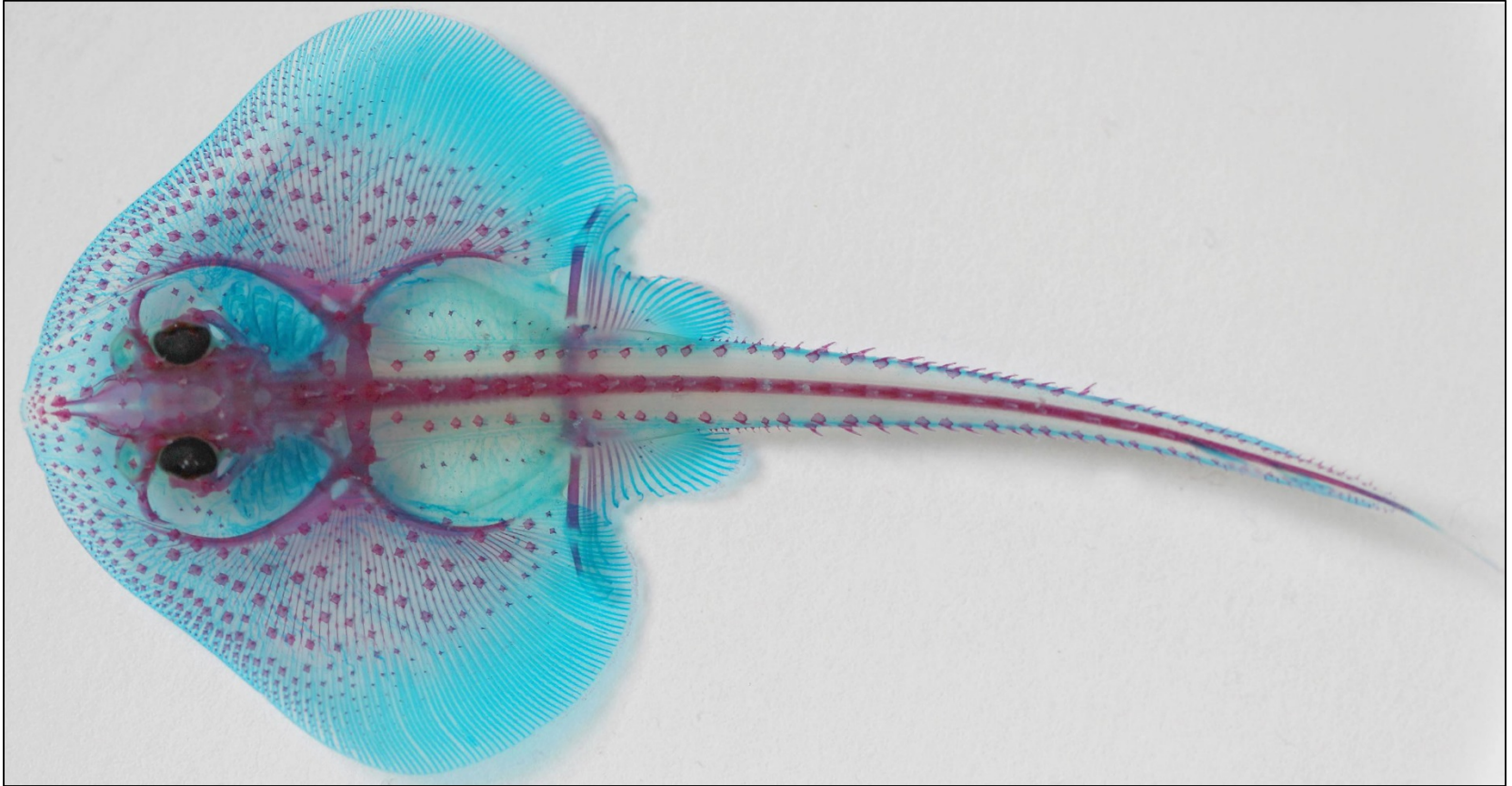


2017 GOA skate complex



Olav A. Ormseth
Alaska Fisheries Science Center
NPFMC Groundfish Plan Team meeting, November 2017

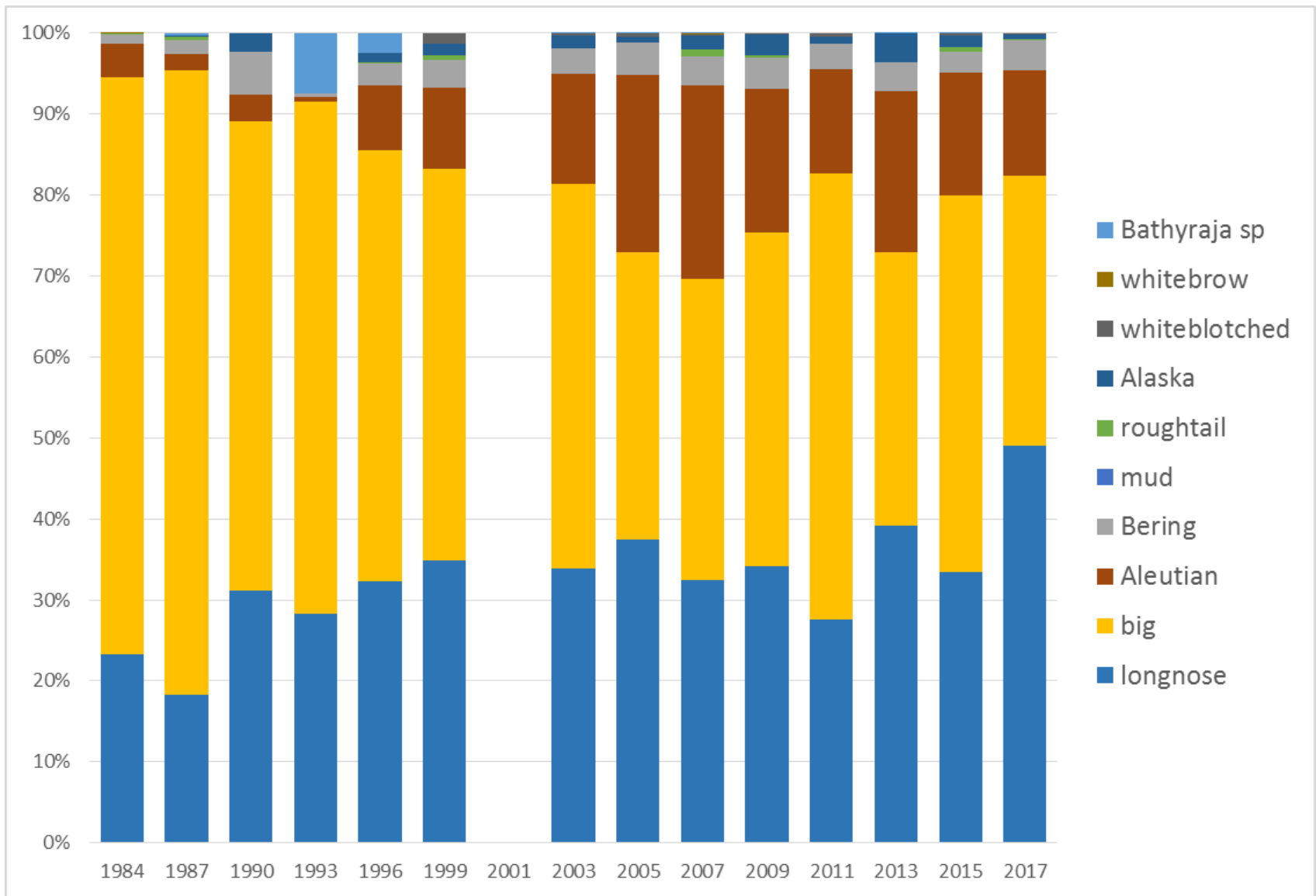
overview

- 1) summary of results
- 2) features of the populations
- 3) status: survey results for skates
- 4) skate catch information
- 5) focus on big skate
- 6) harvest recommendations

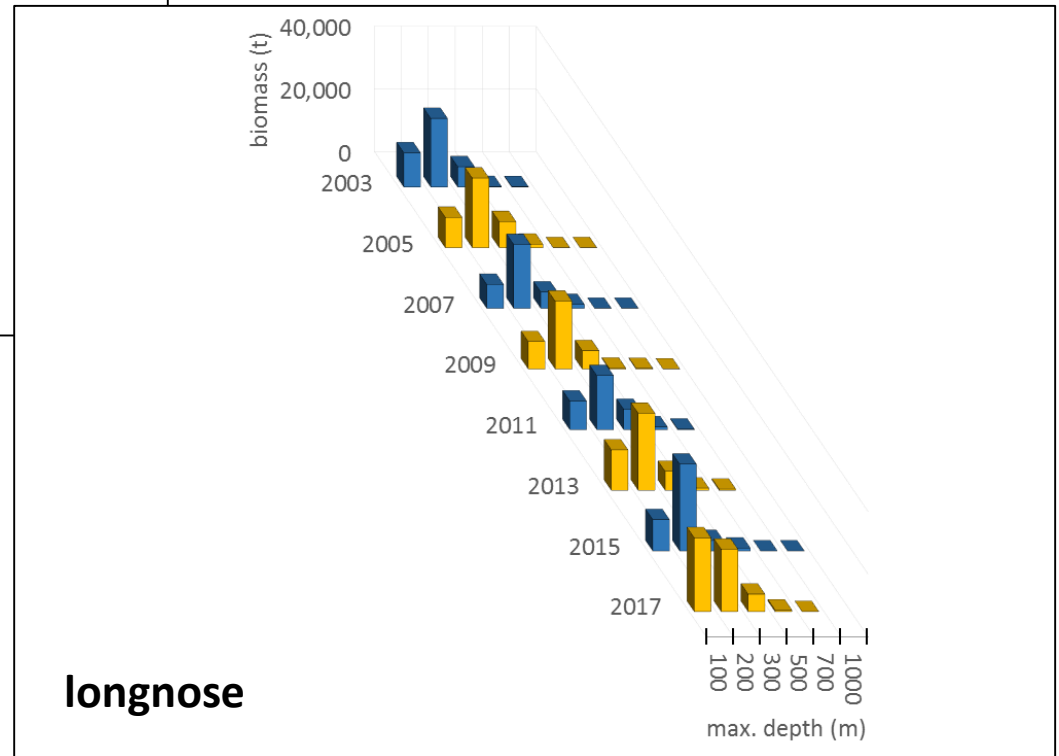
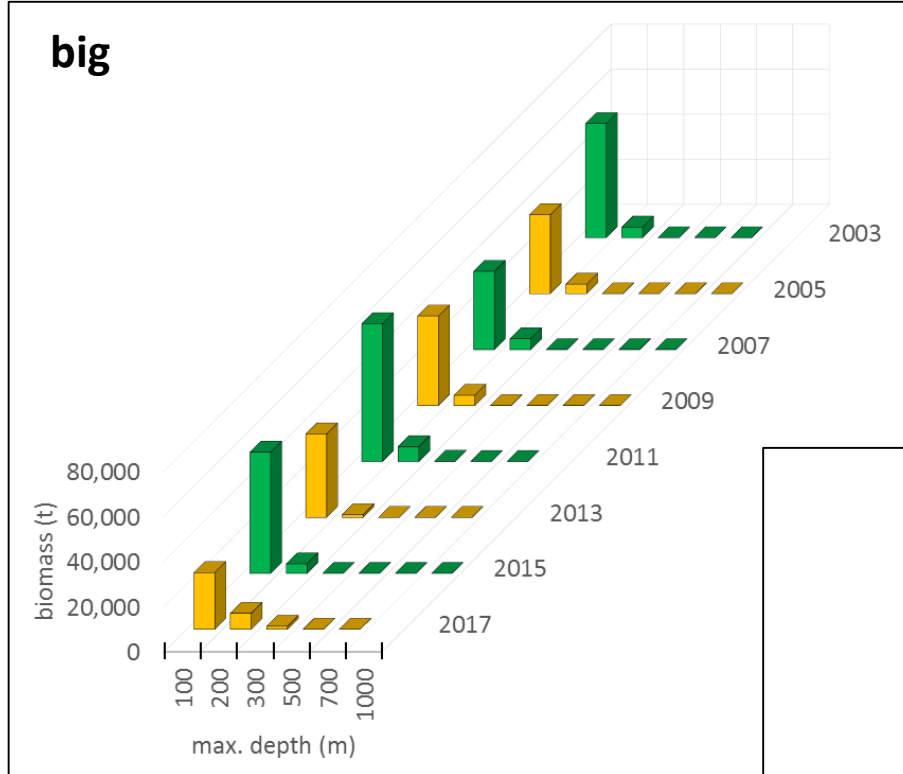
summary of results

- 1) Big skate biomass declined substantially from 2015.
- 2) The 2017 longnose skate biomass increased.
- 3) The biomass of Other Skates declined.
- 4) Fewer large-sized big skates were encountered in the survey and fisheries.
- 5) More small big skates in the central GOA; fewer in the eastern GOA.
- 6) Longnose skate shifted their depth distribution to shallower water.
- 7) Big skate biomass on the eastern Bering Sea shelf is way up & it looks like these skates are from the GOA.

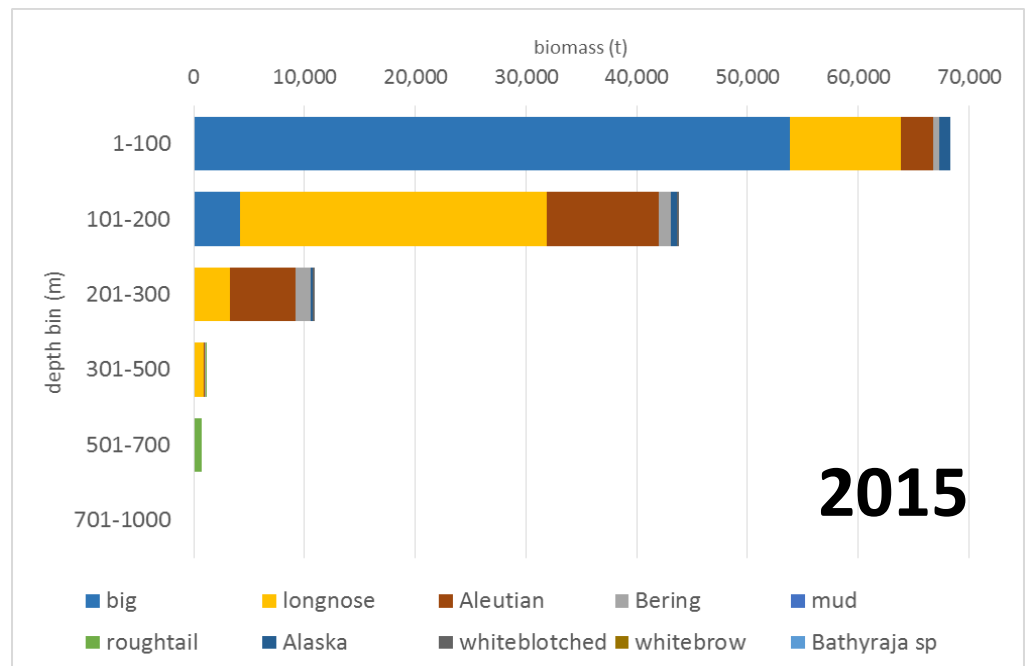
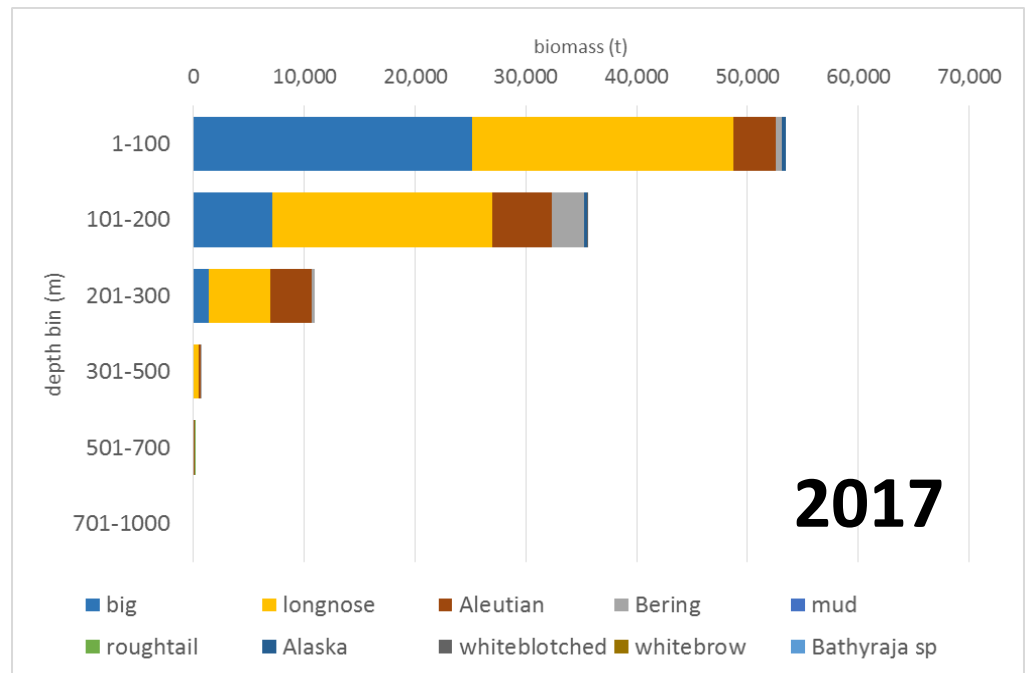
GOA skate species composition



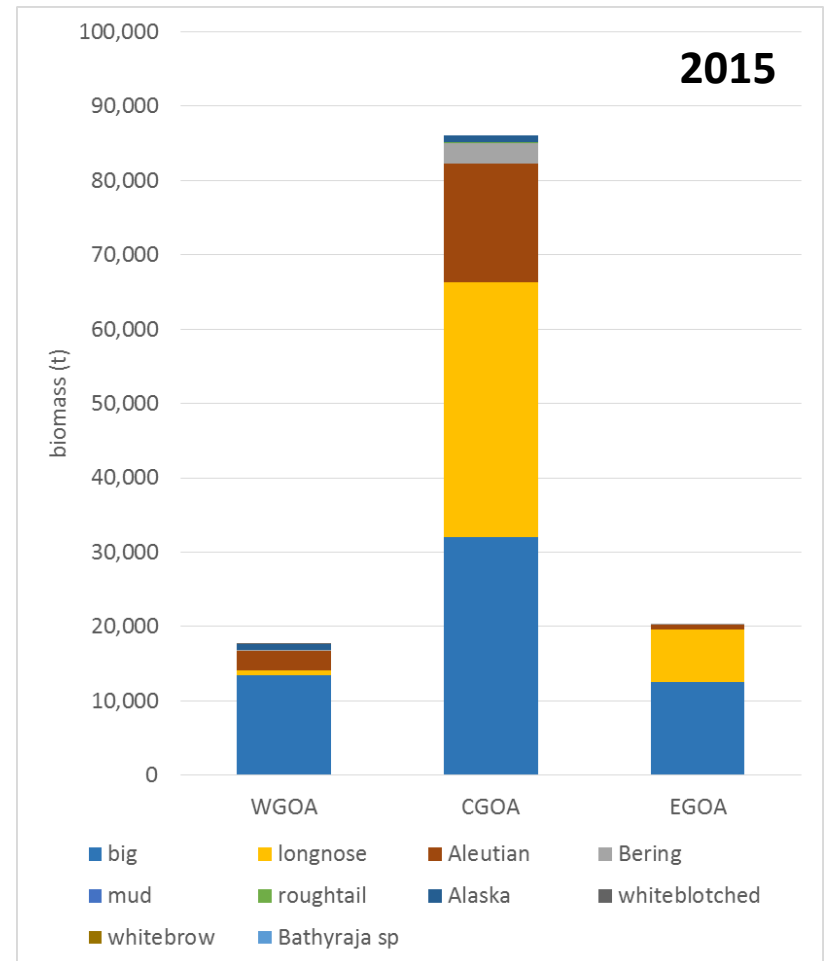
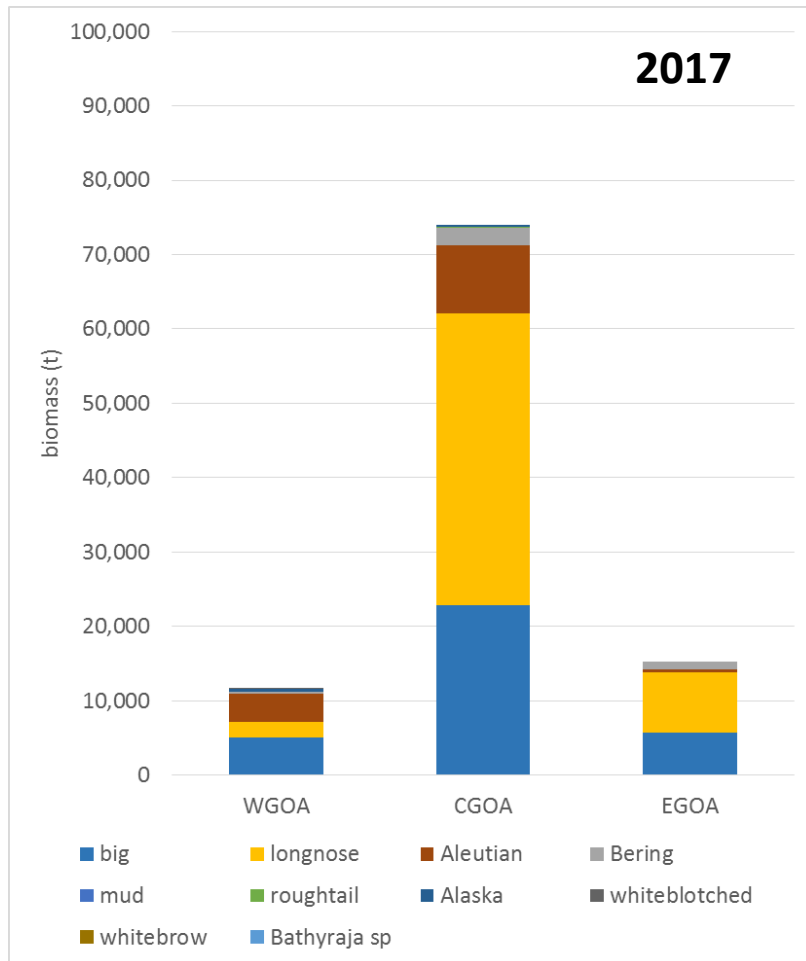
skate distribution by depth



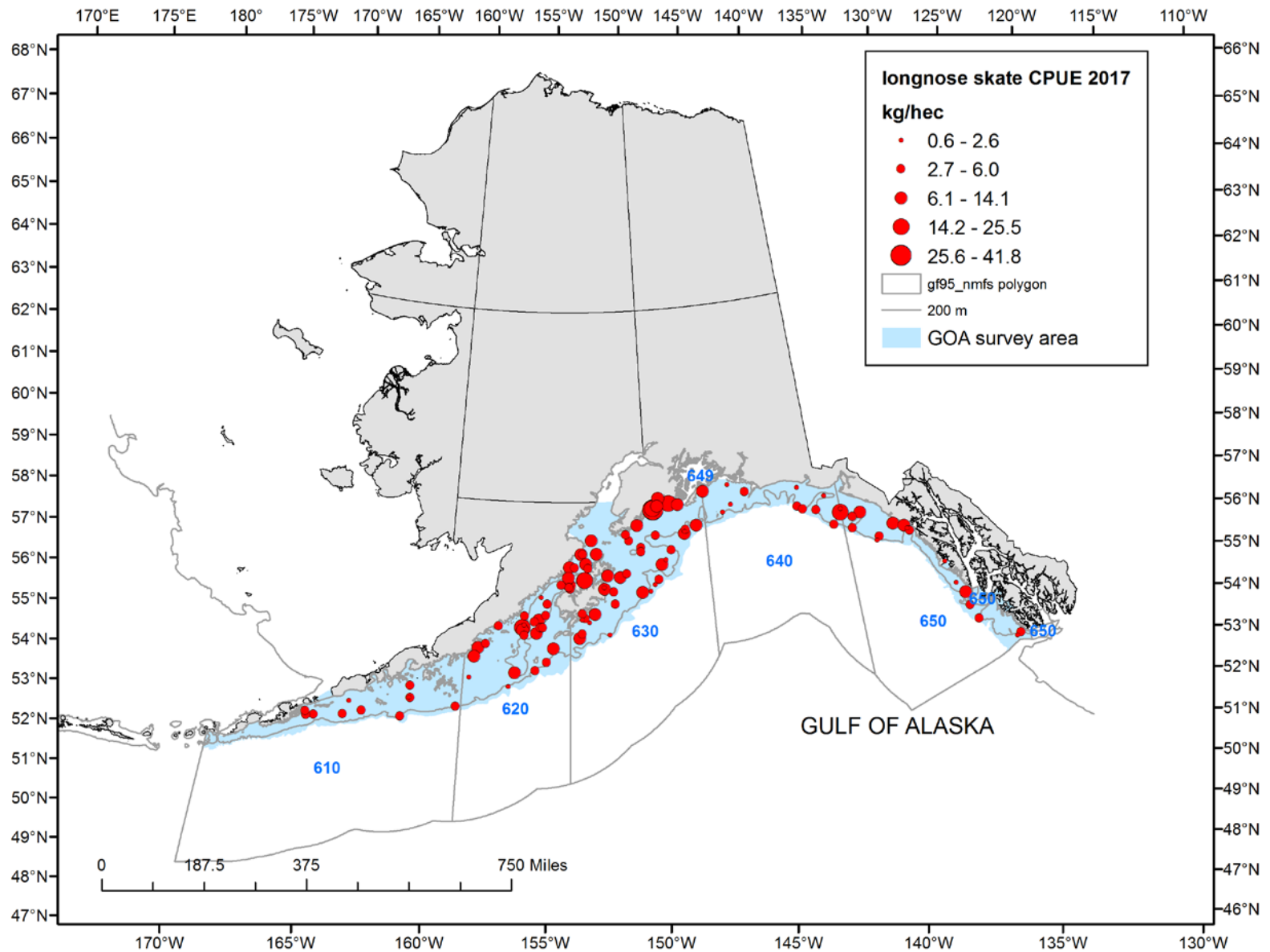
skate distribution by depth



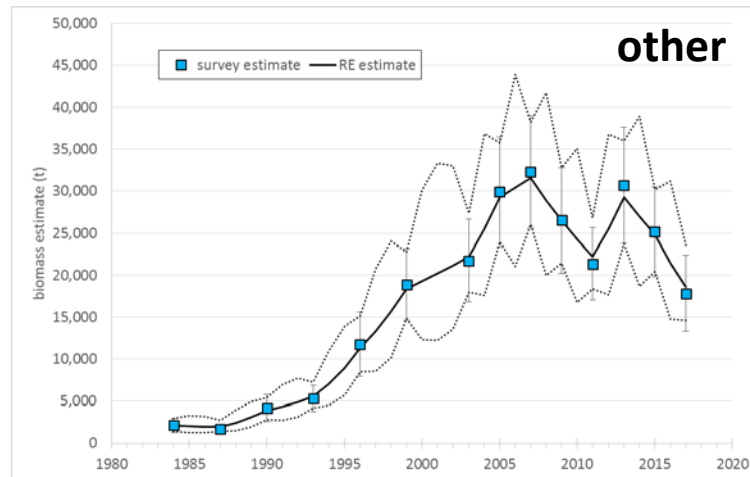
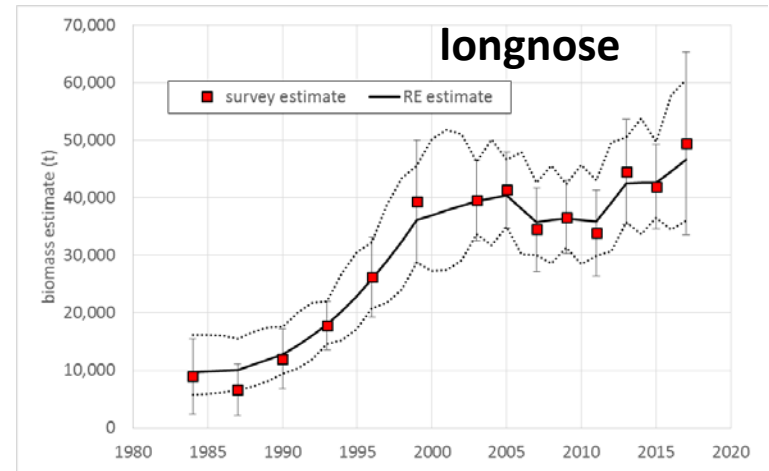
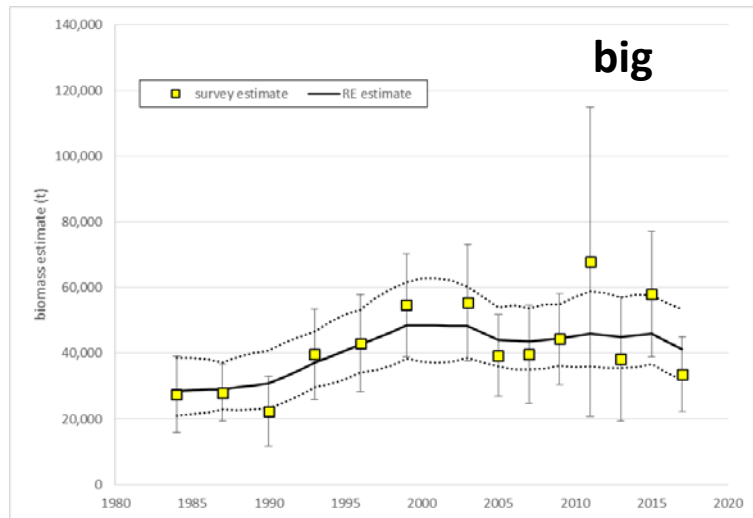
species composition/biomass by area



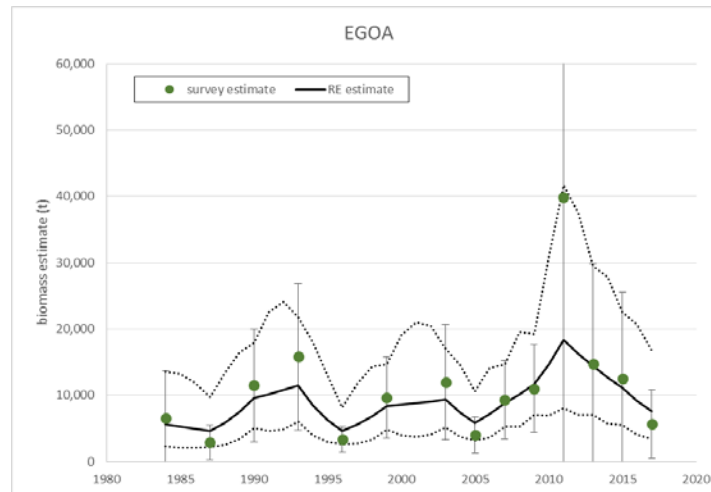
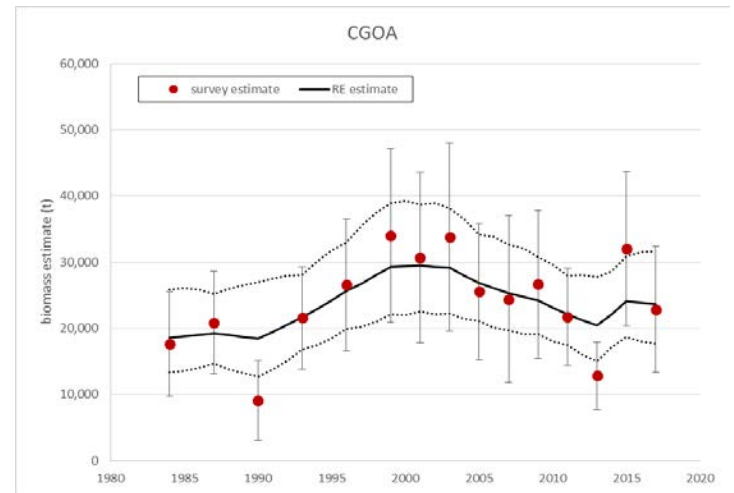
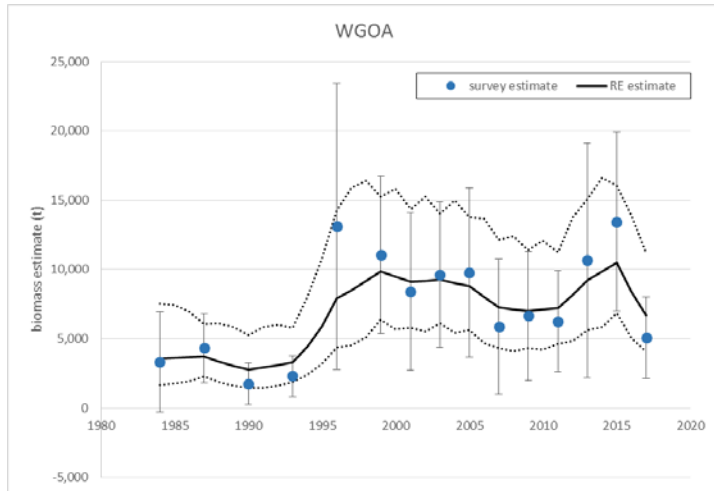
longnose skate spatial distribution 2017



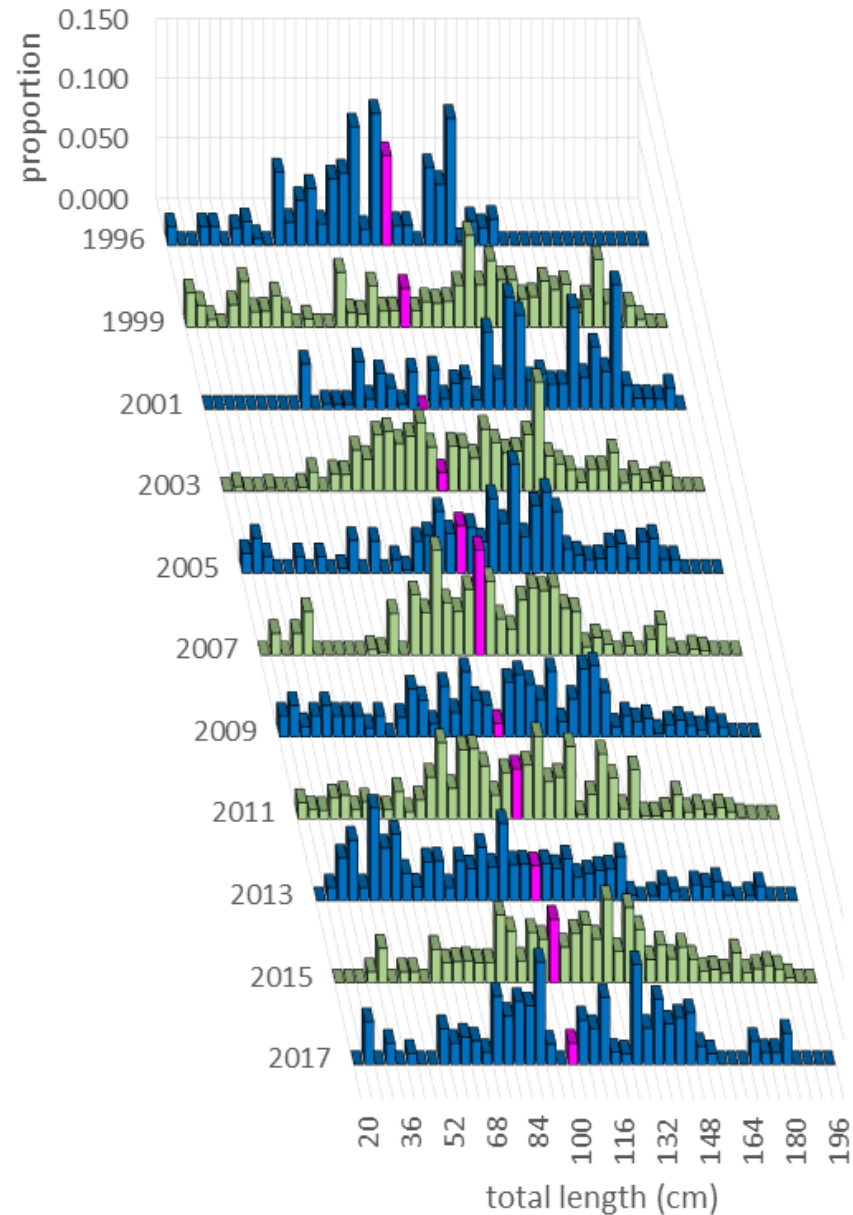
GOA-wide biomass



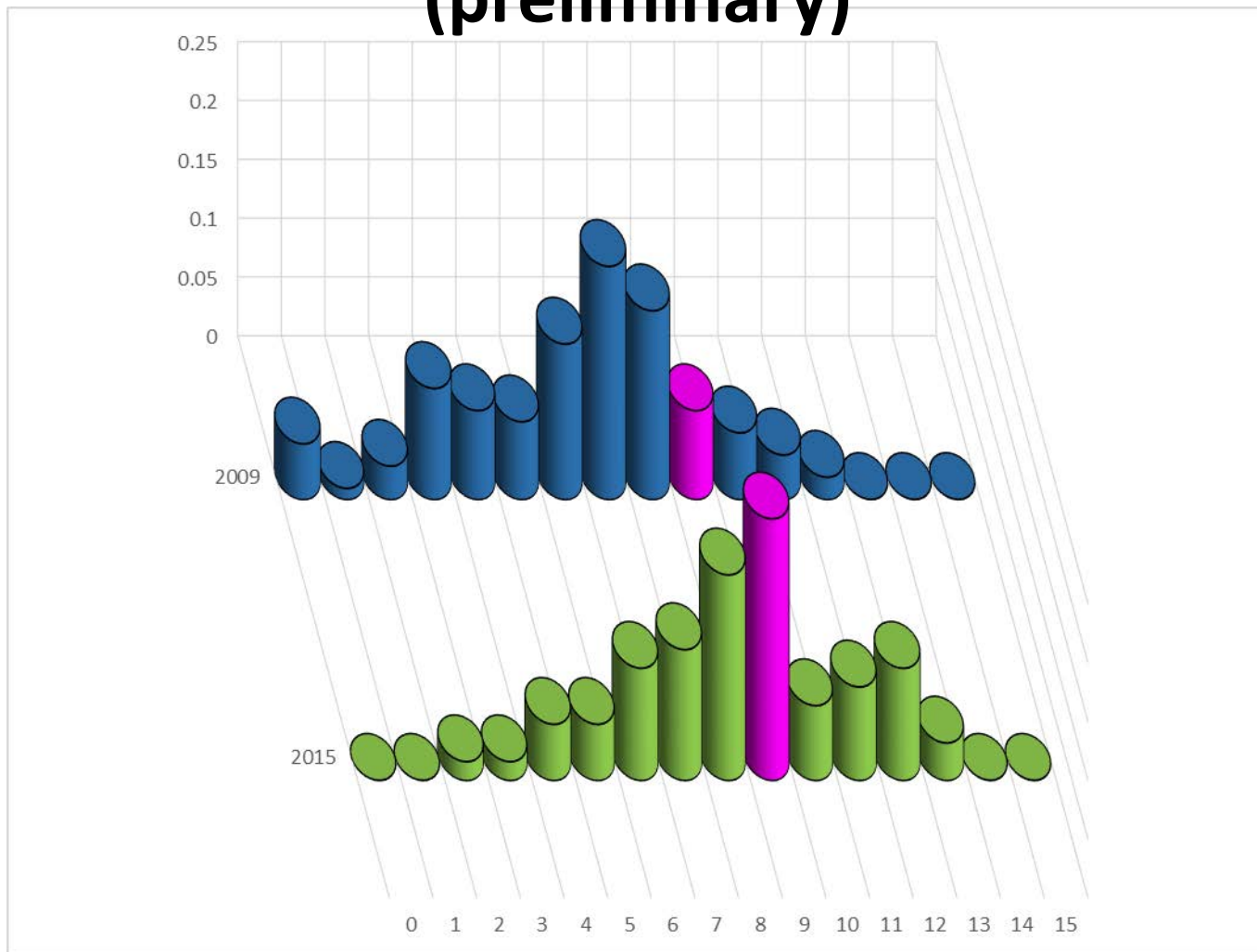
big skate biomass by area



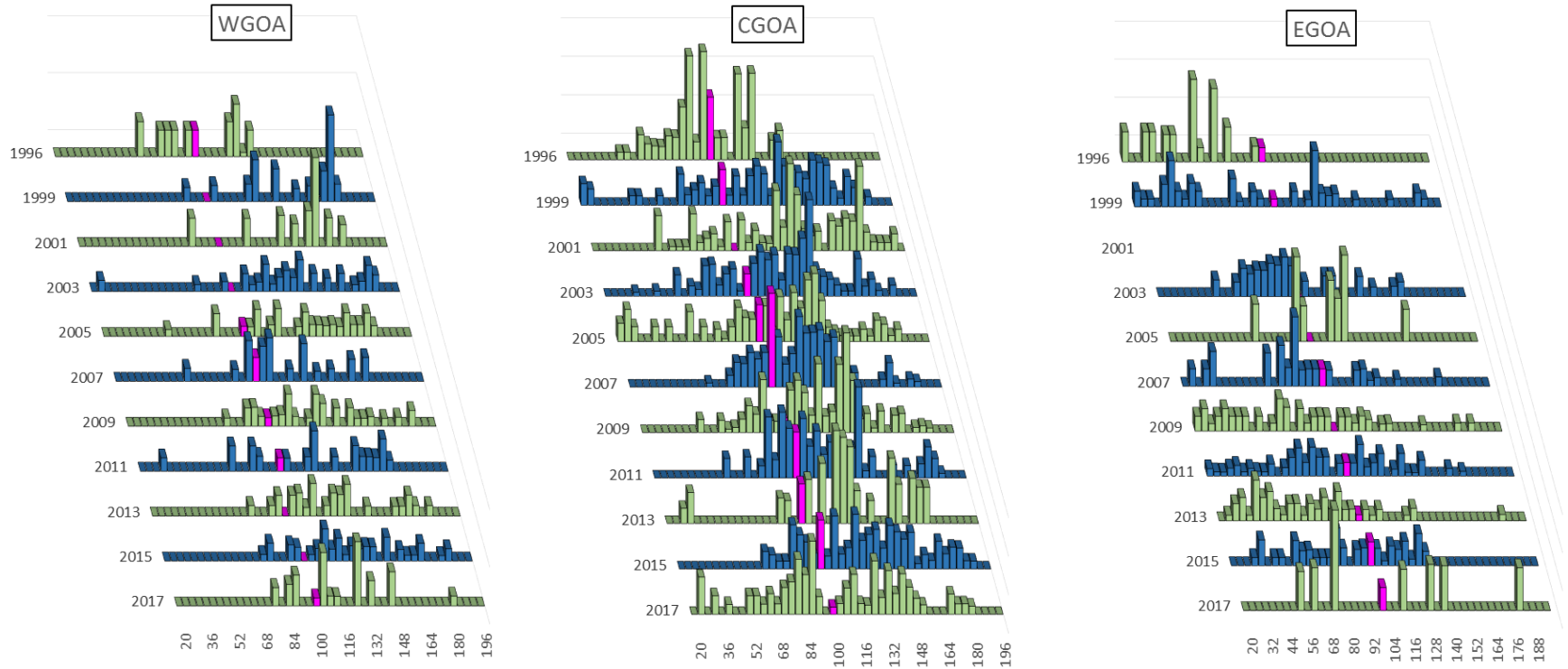
big skate size composition GOA-wide



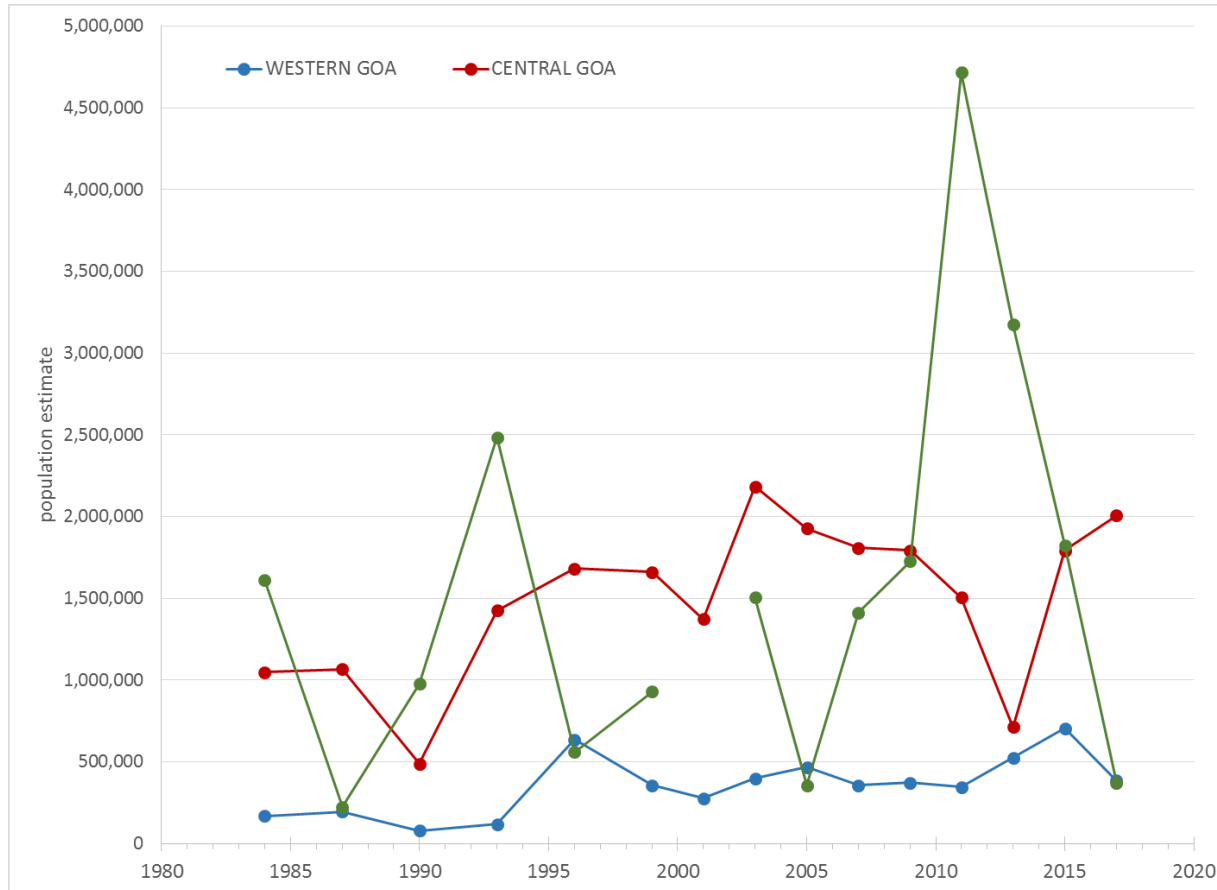
big skate age composition GOA-wide (preliminary)



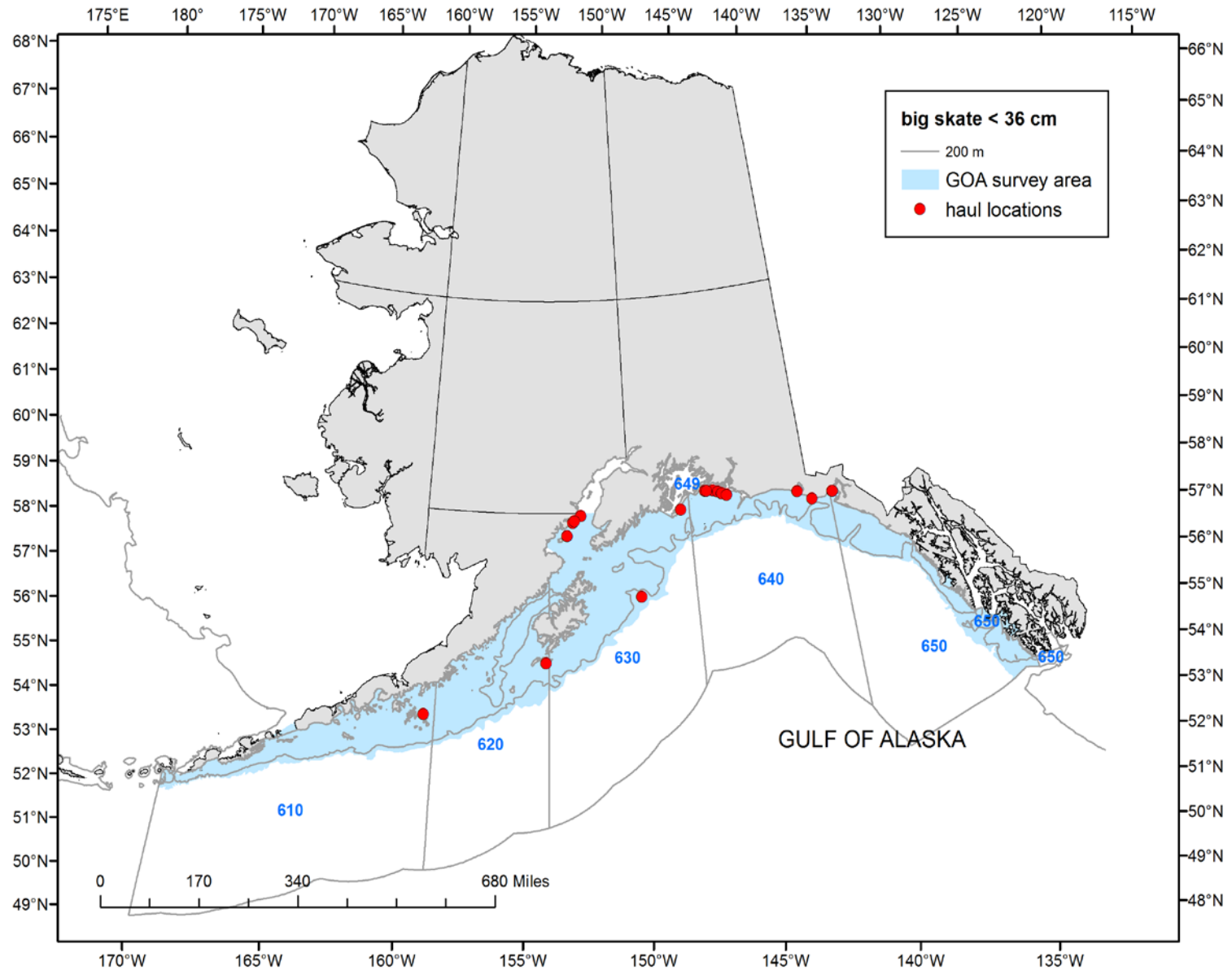
big skate size composition by area



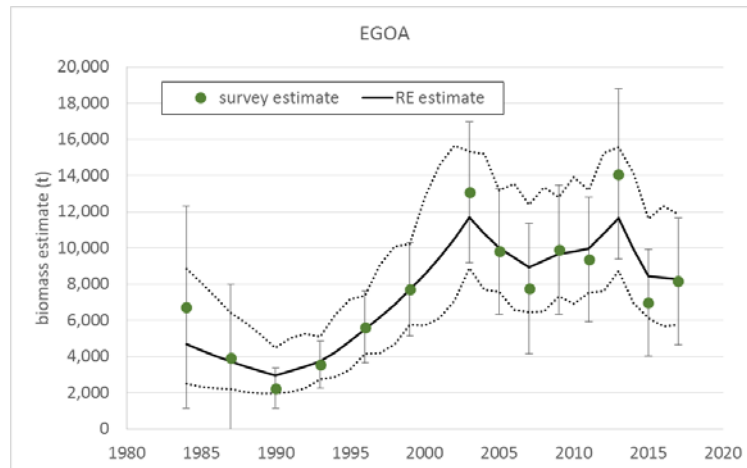
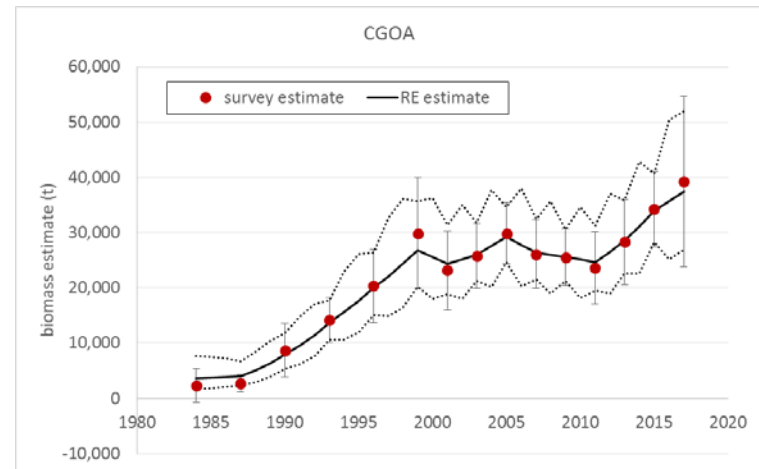
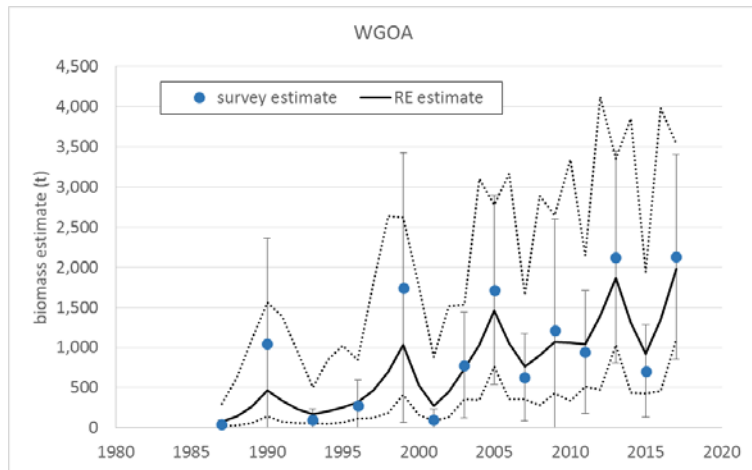
big skate numbers



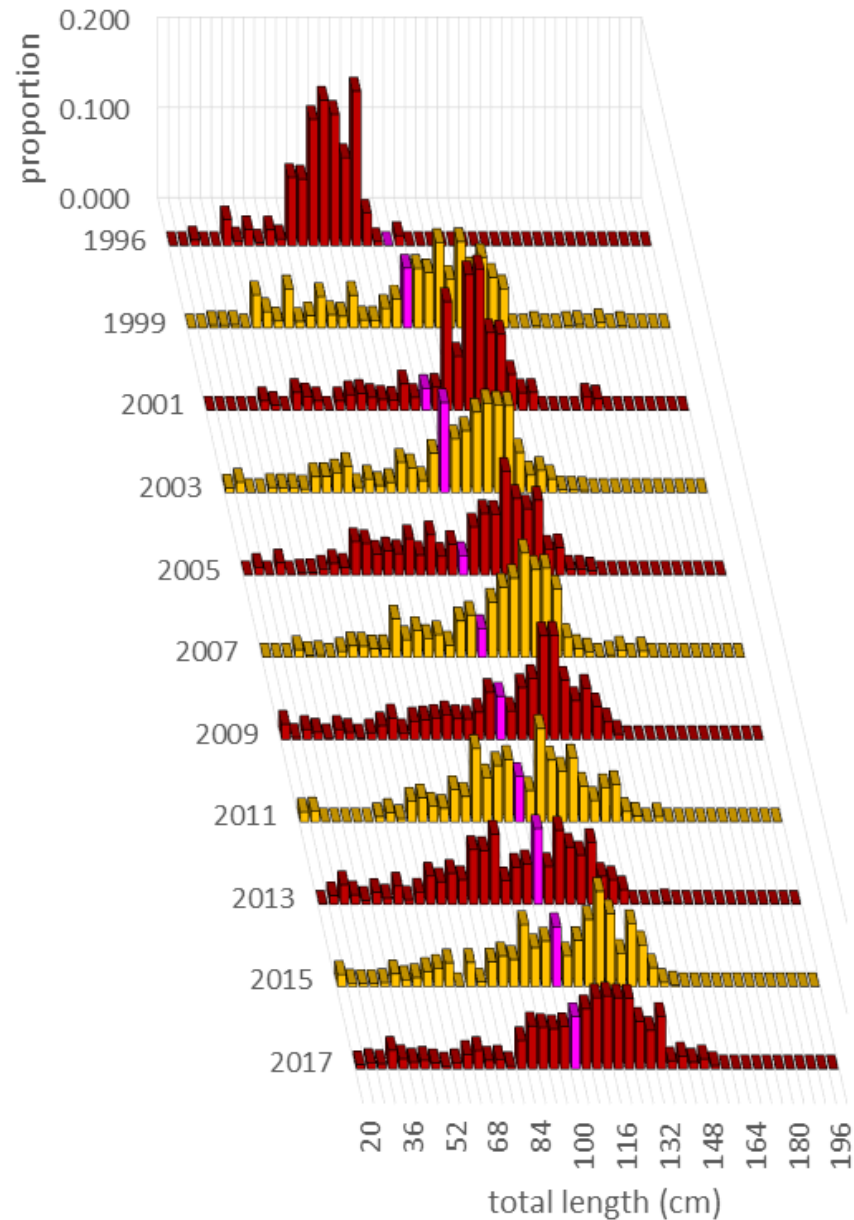
haul locations w/ smallest big skates



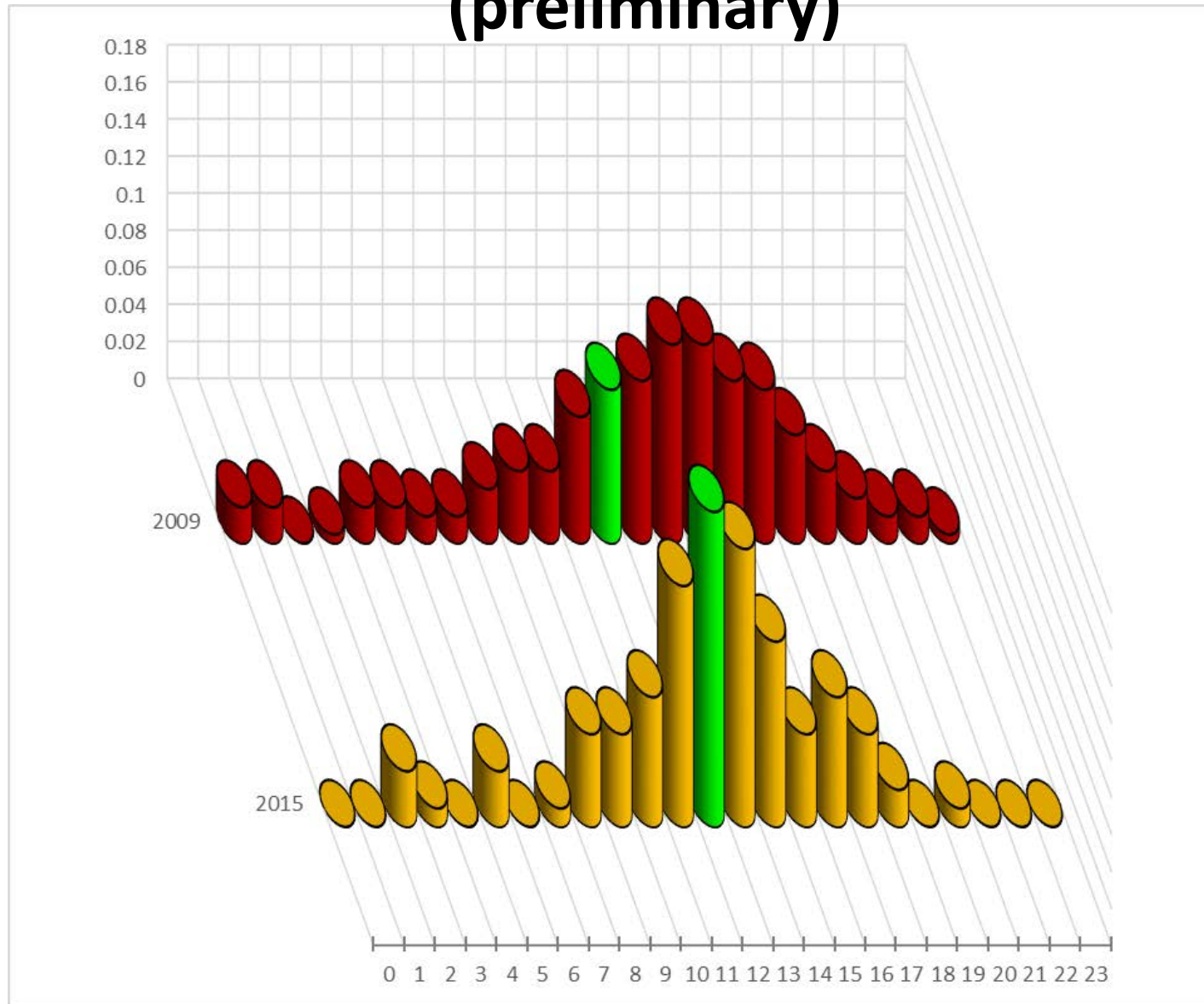
longnose skate biomass by area (RE)



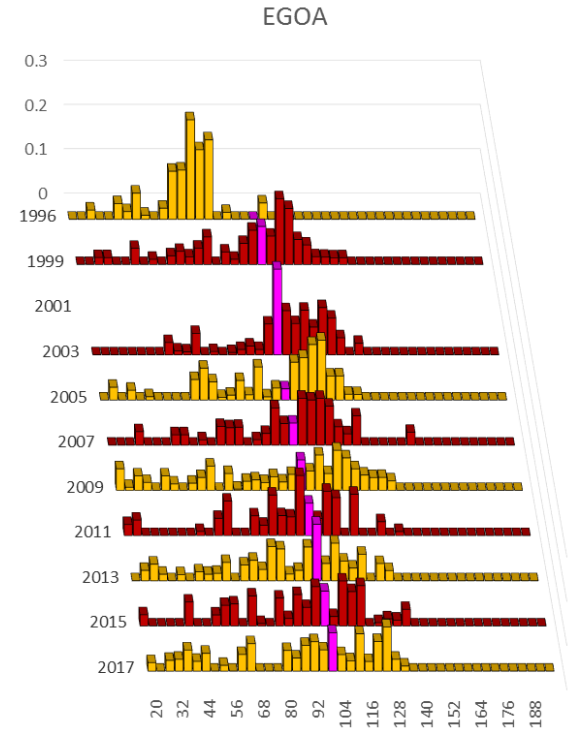
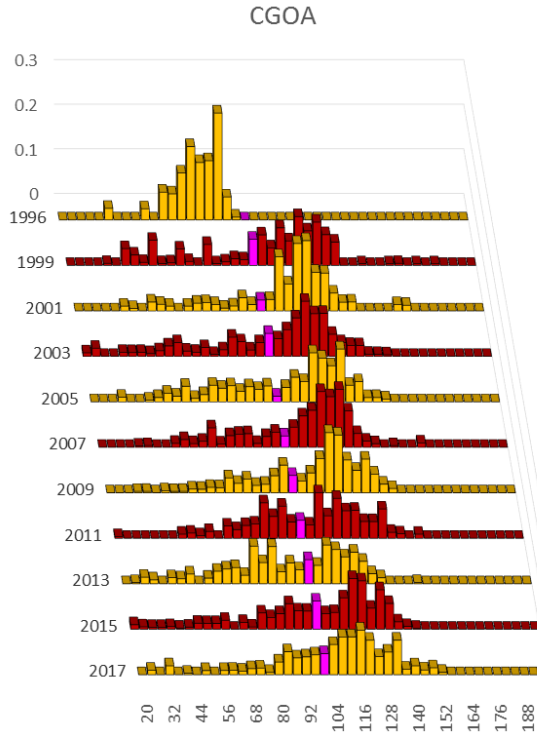
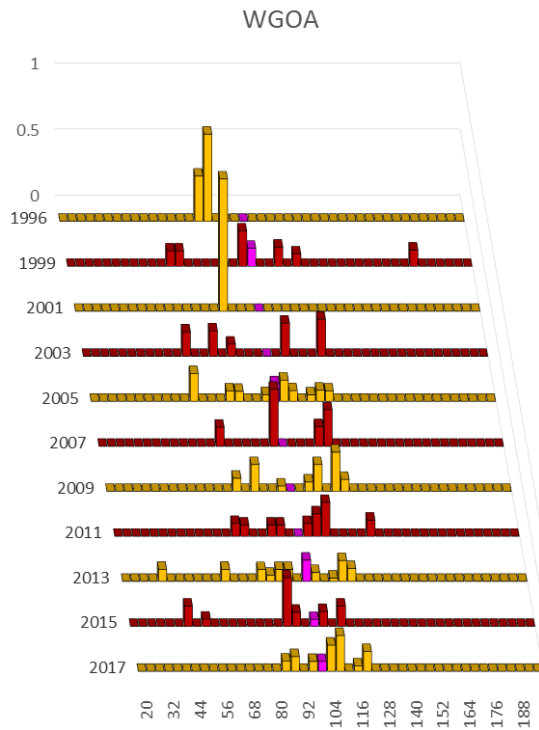
longnose skate size composition GOA-wide



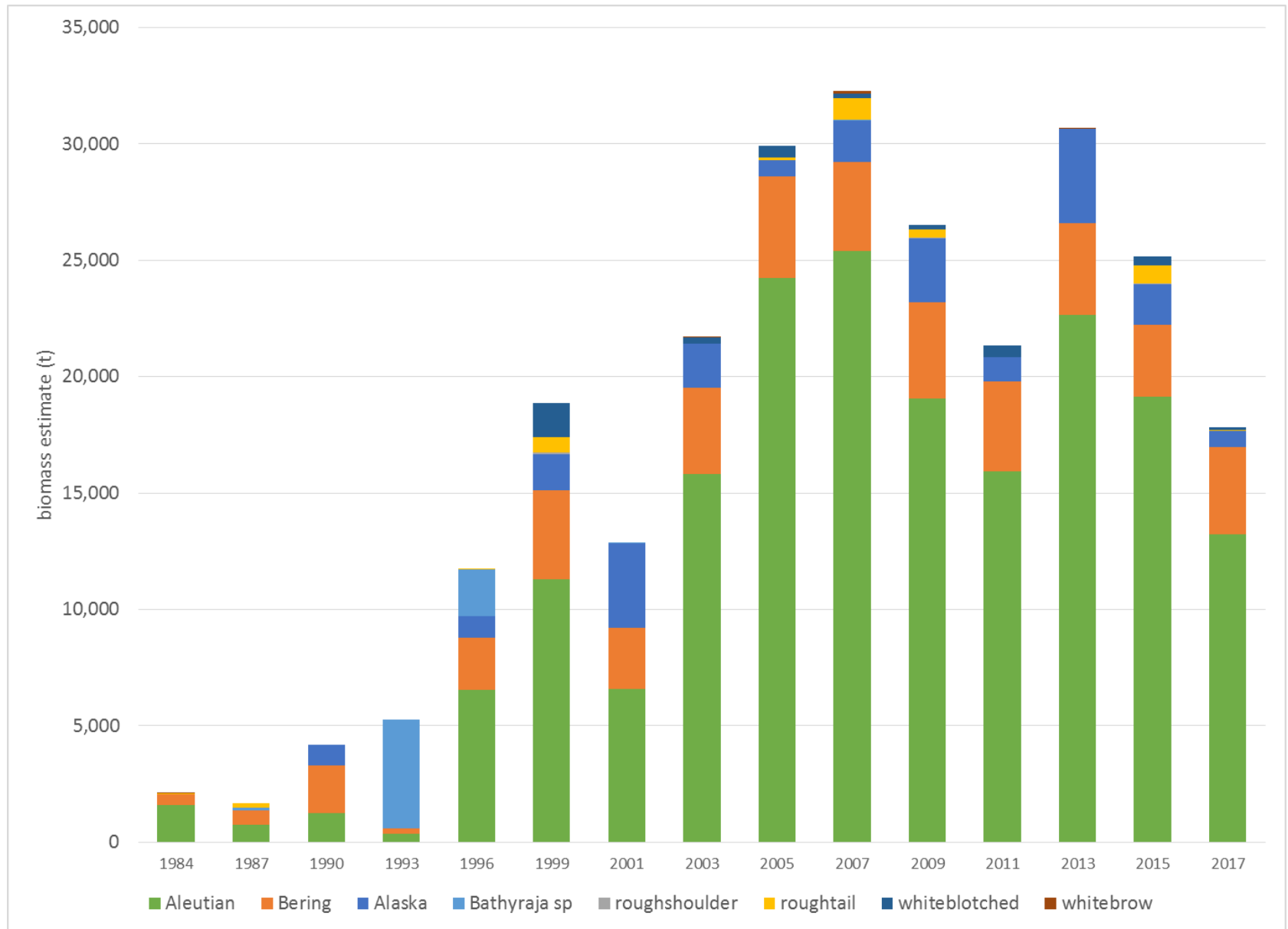
longnose skate age composition GOA-wide (preliminary)



longnose skate size composition by area

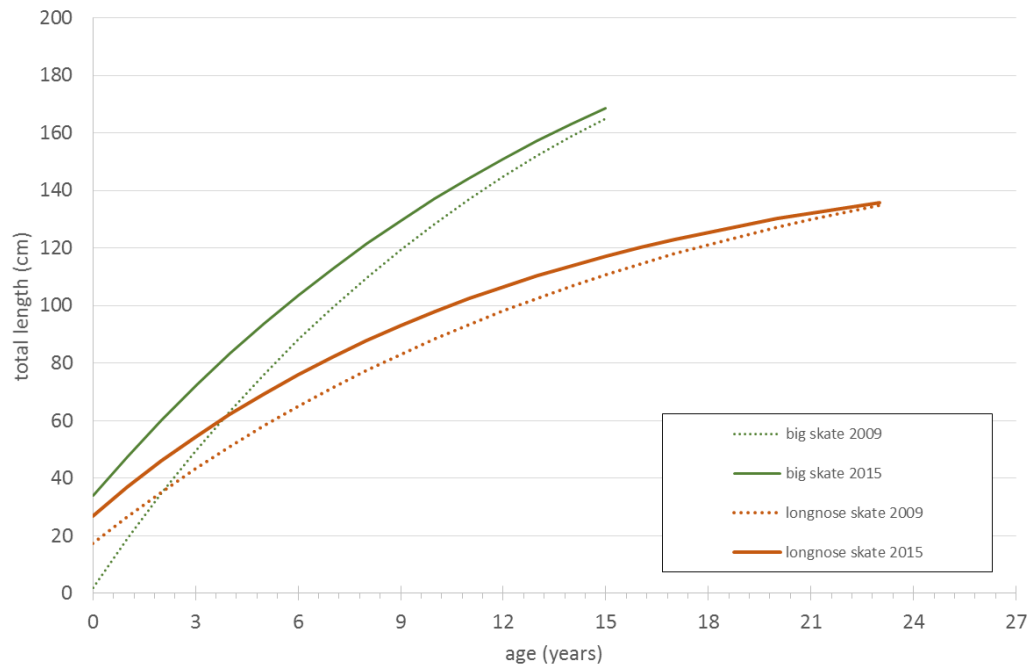


other skate biomass & species comp

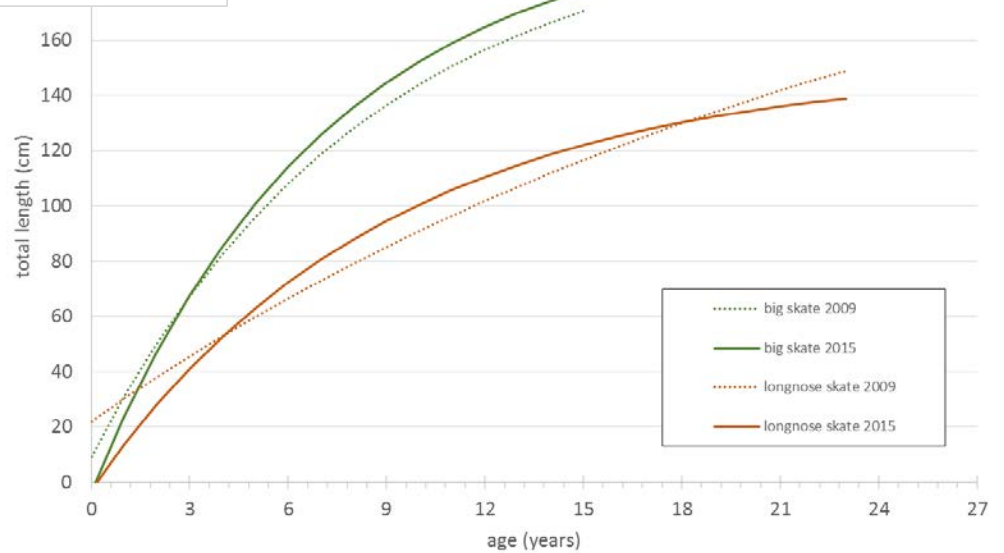


big & longnose growth (preliminary)

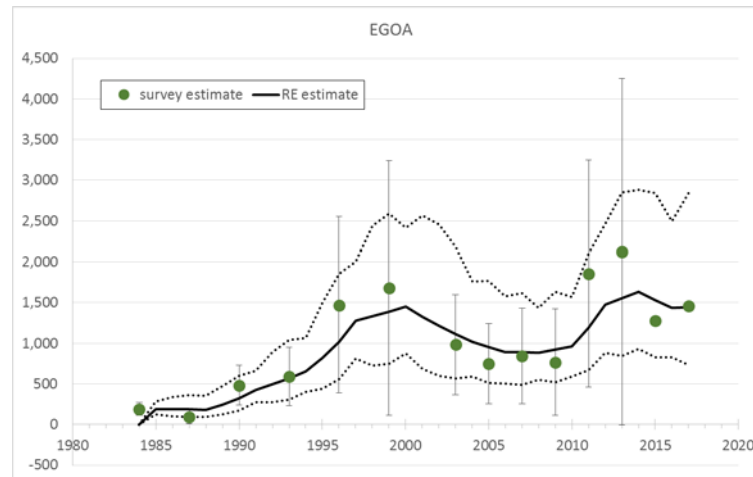
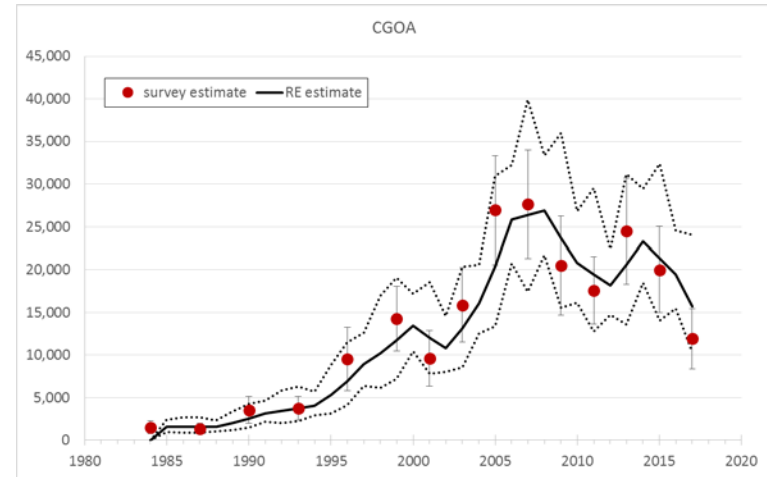
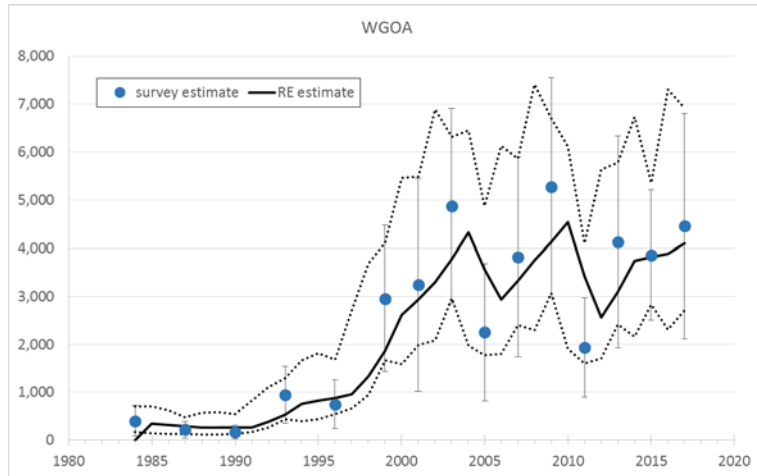
male big skates vs. male longnose skates



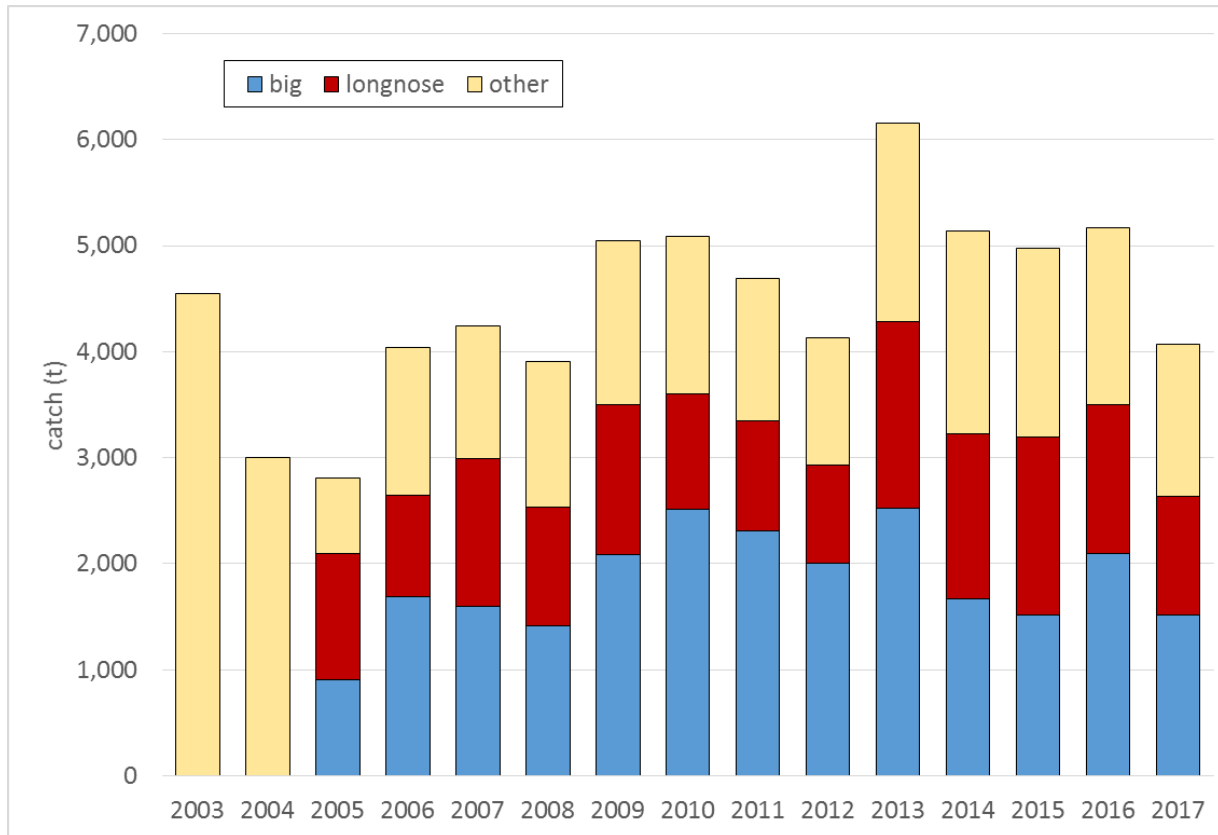
female big skates vs. male longnose skates



other skate biomass

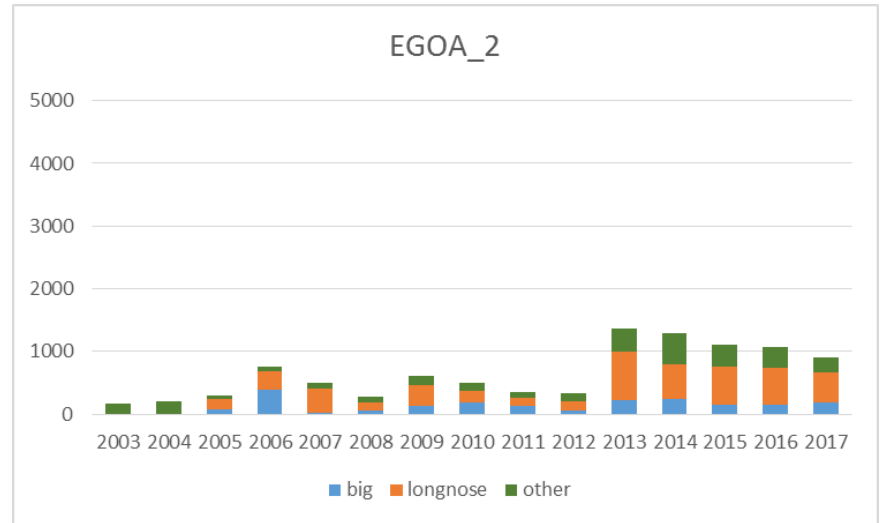
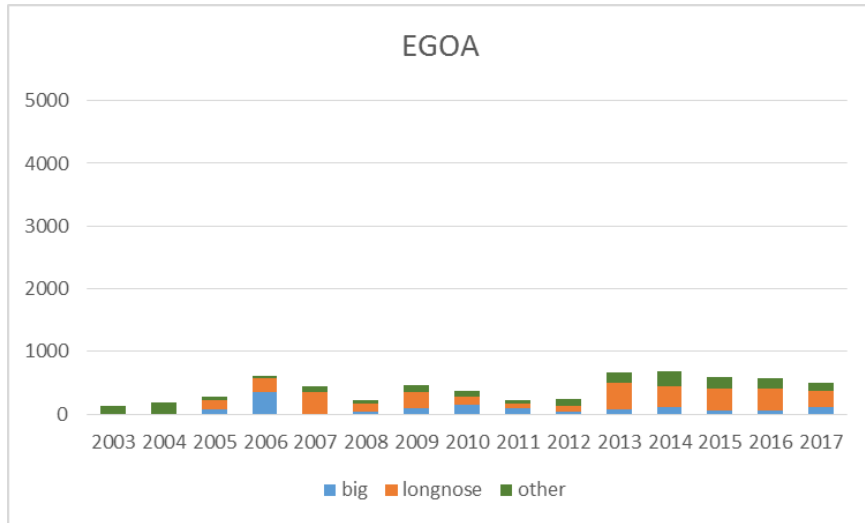
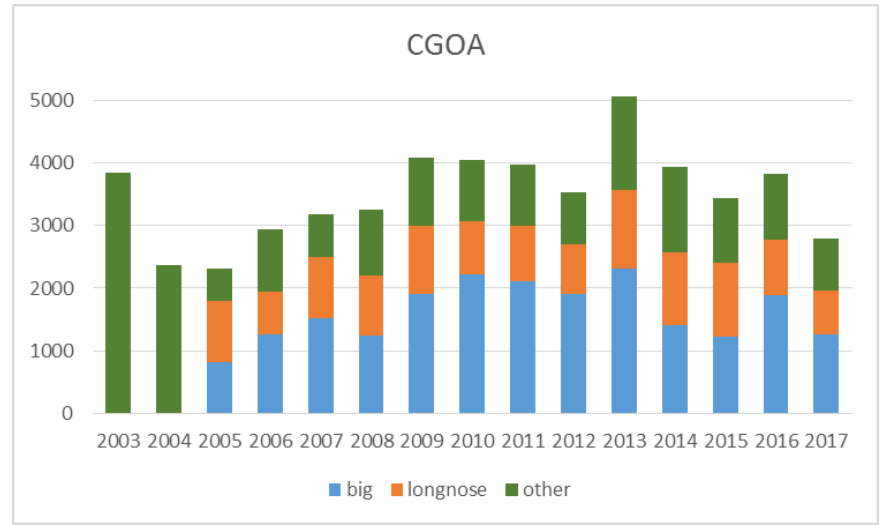
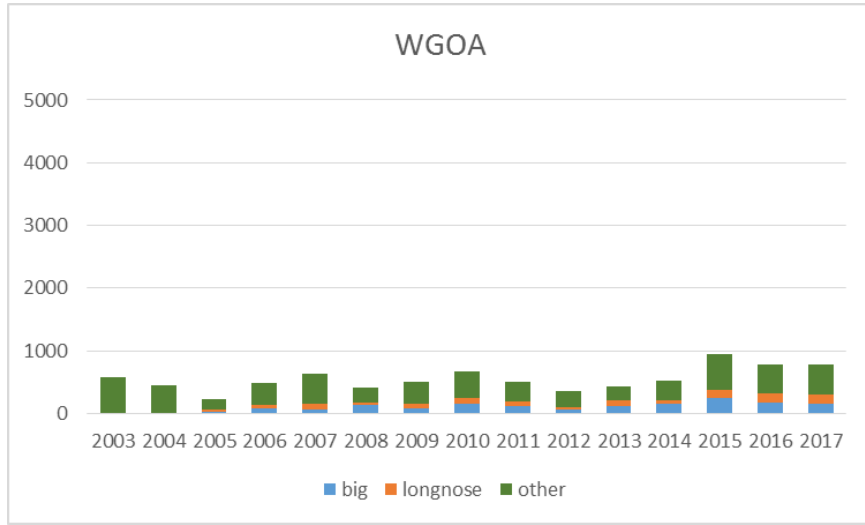


skate catch: gulfwide



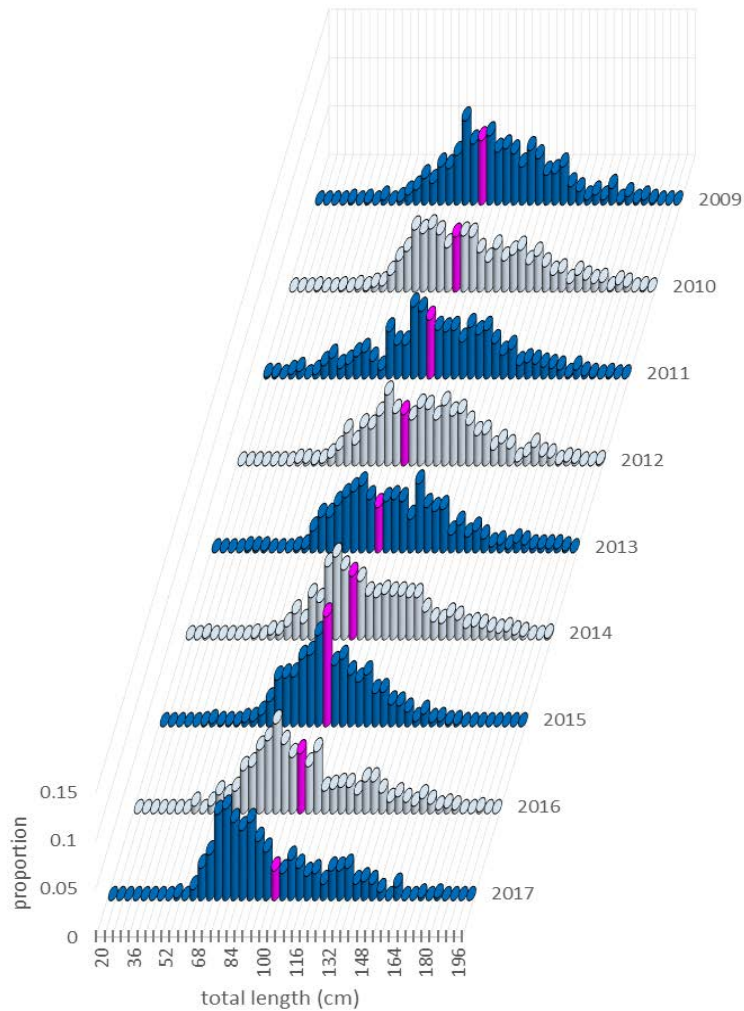
649 & 659 not included

skate catch by area

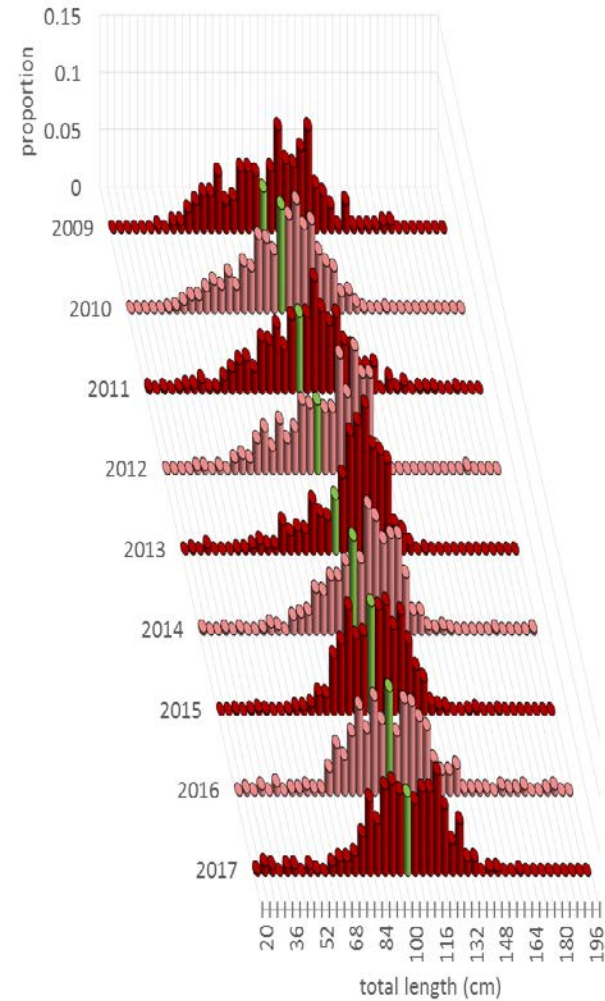


catch size composition (all gears)

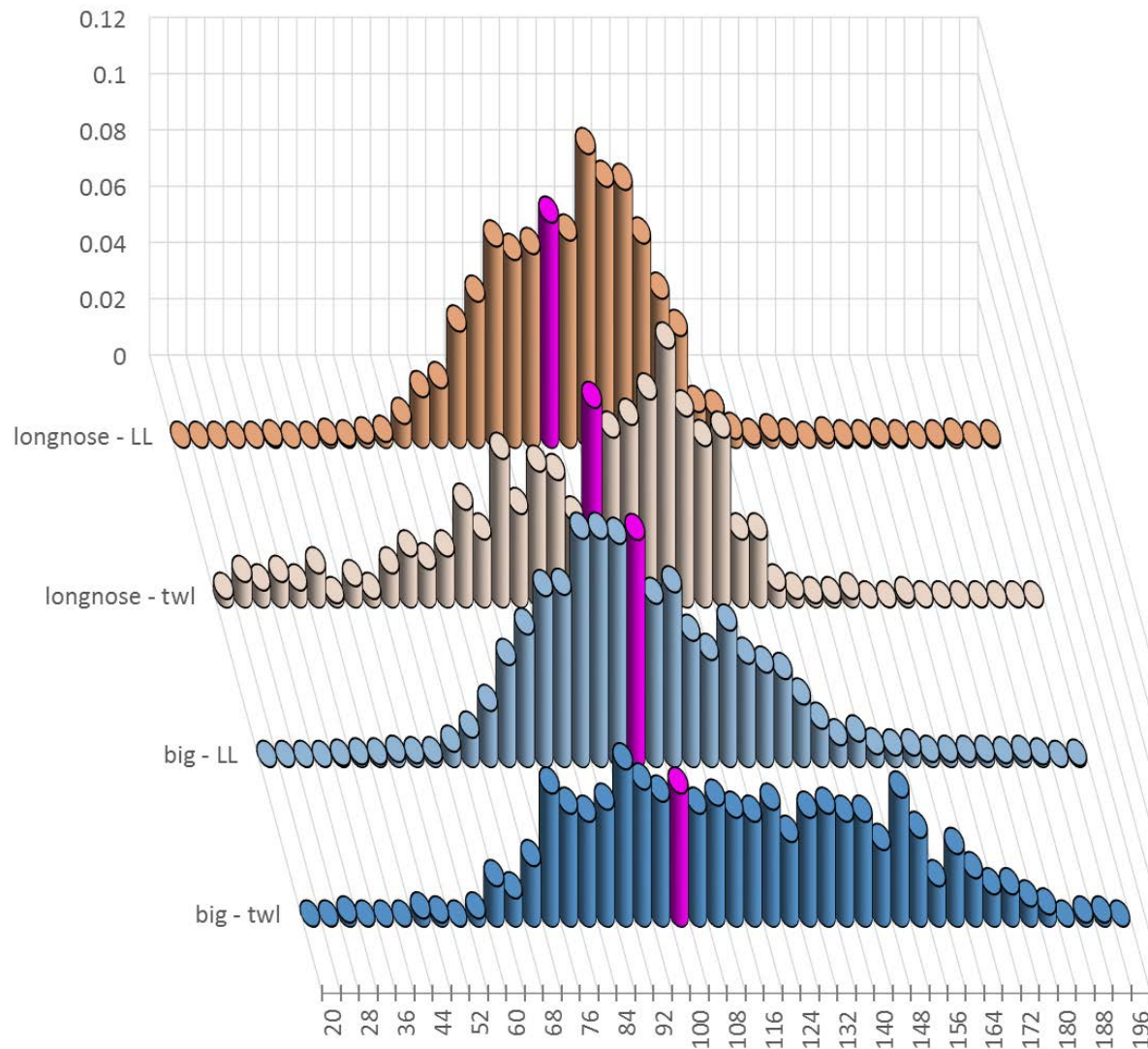
big skate



longnose skate

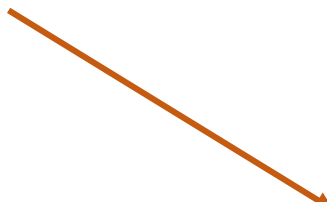


catch size composition (by gear 2013-2017)



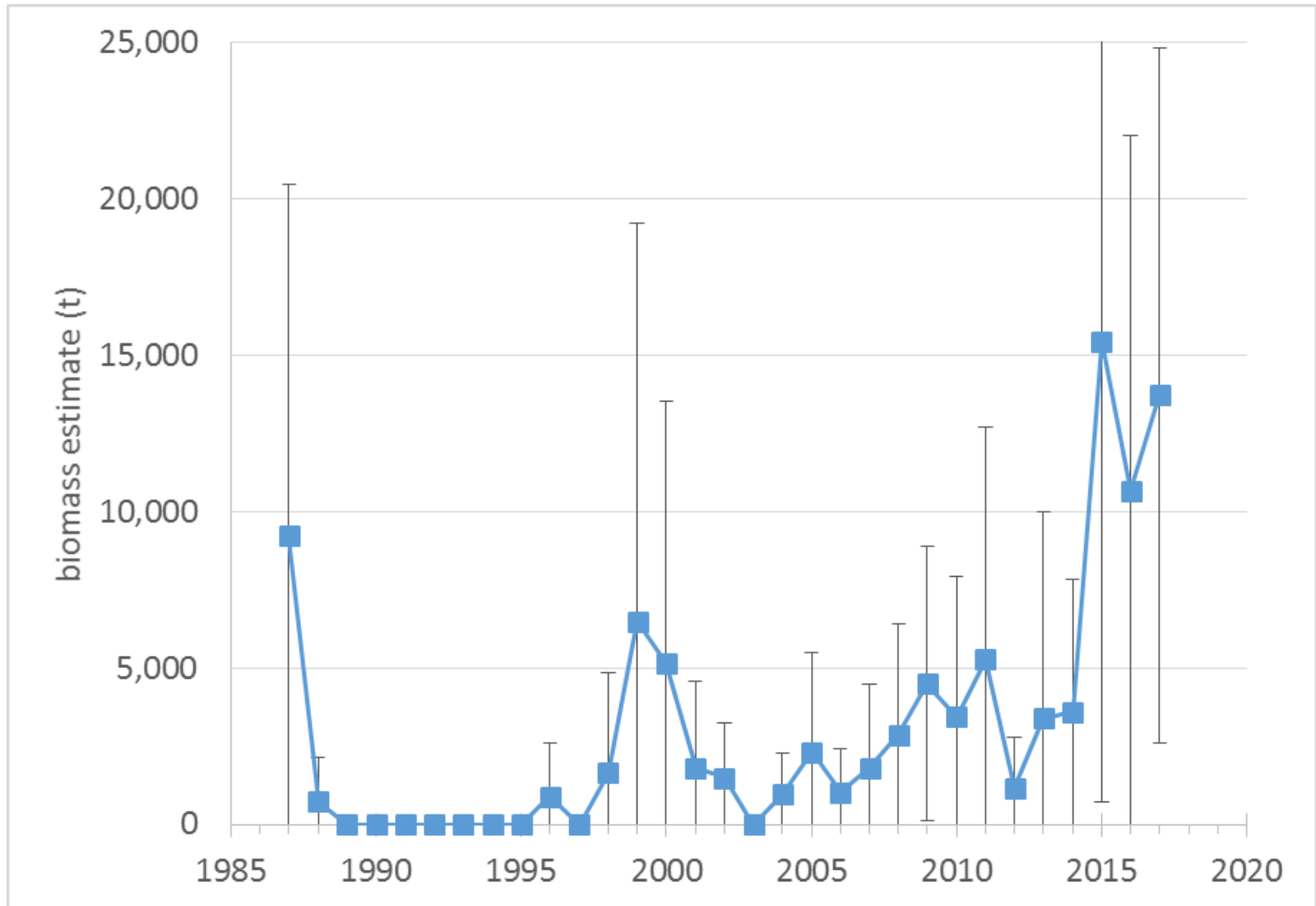
retention rates

multiple regulatory
actions during these
years

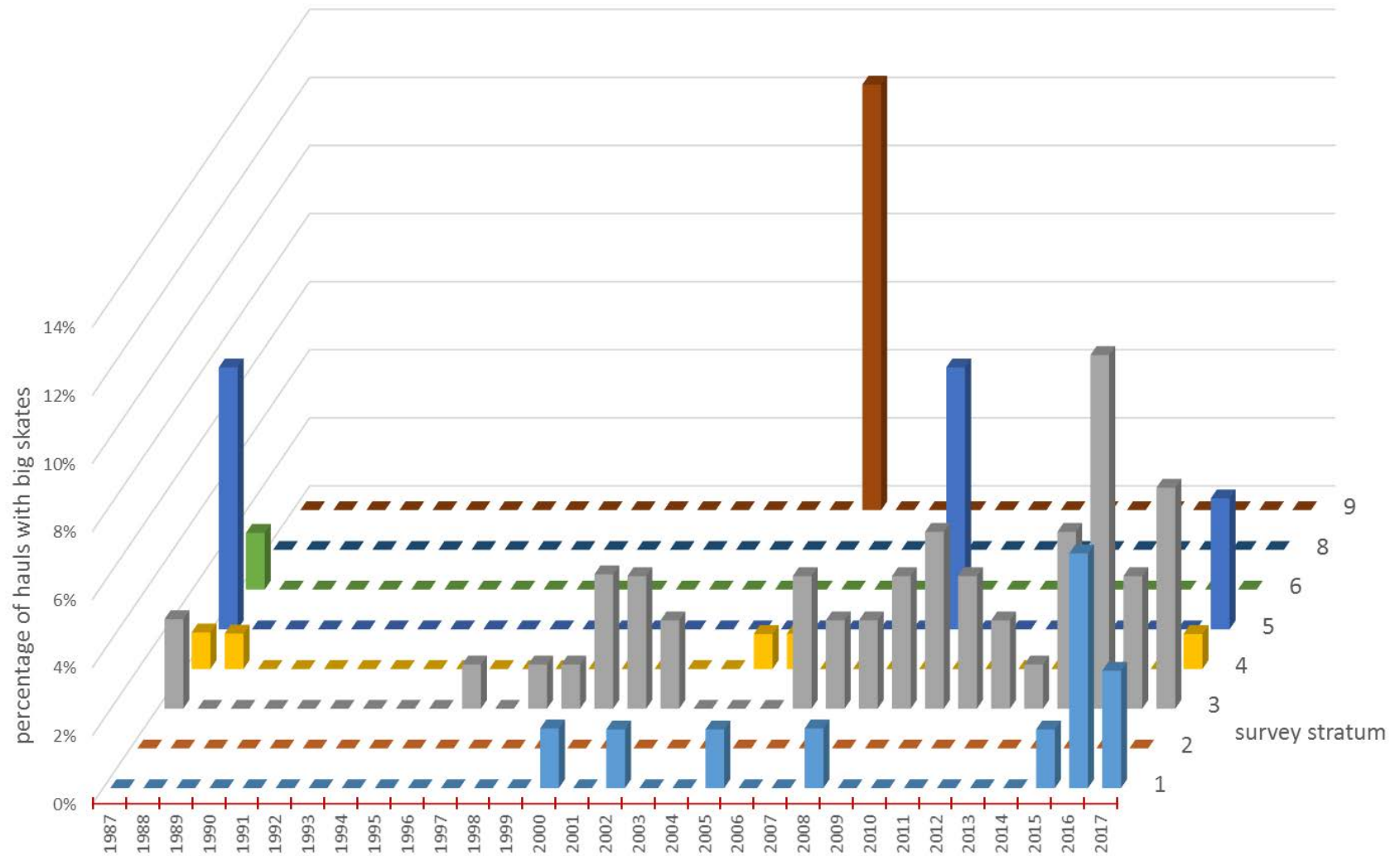


	big	longnose	other
2005	72%	70%	16%
2006	54%	32%	19%
2007	49%	29%	20%
2008	70%	59%	15%
2009	70%	45%	13%
2010	71%	64%	15%
2011	80%	61%	17%
2012	94%	71%	13%
2013 ¹	62%	38%	2%
2014 ²	26%	55%	5%
2015 ³	16%	52%	6%
2016 ⁴⁺	32%	33%	6%
2017 ^{5*}	35%	28%	7%
2005-2017 average	58%	48%	28%

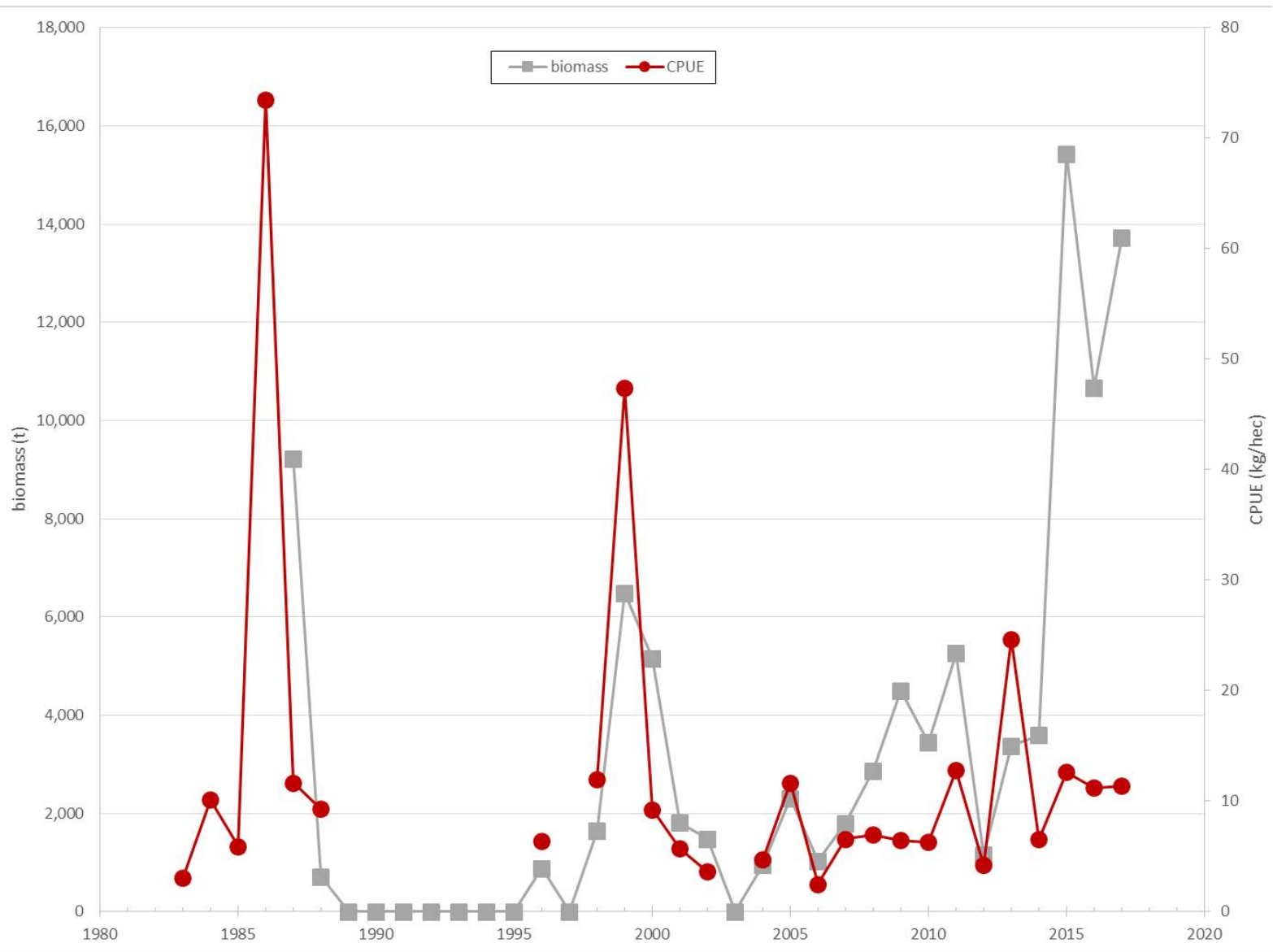
focus on big skate: EBS shelf biomass



big skate: EBS shelf occurrence in hauls

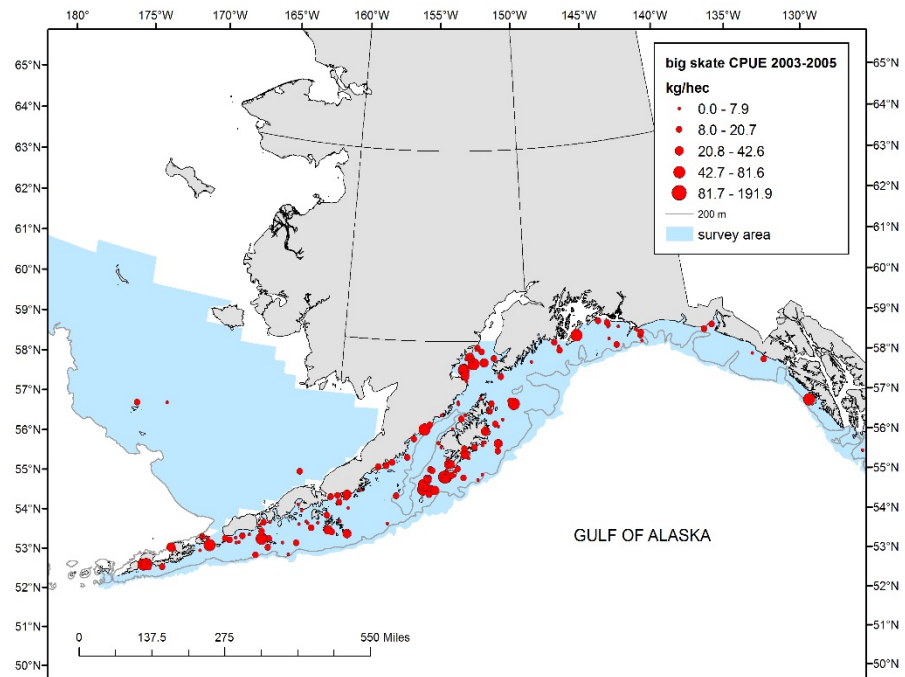


big skate: EBS shelf biomass vs CPUE

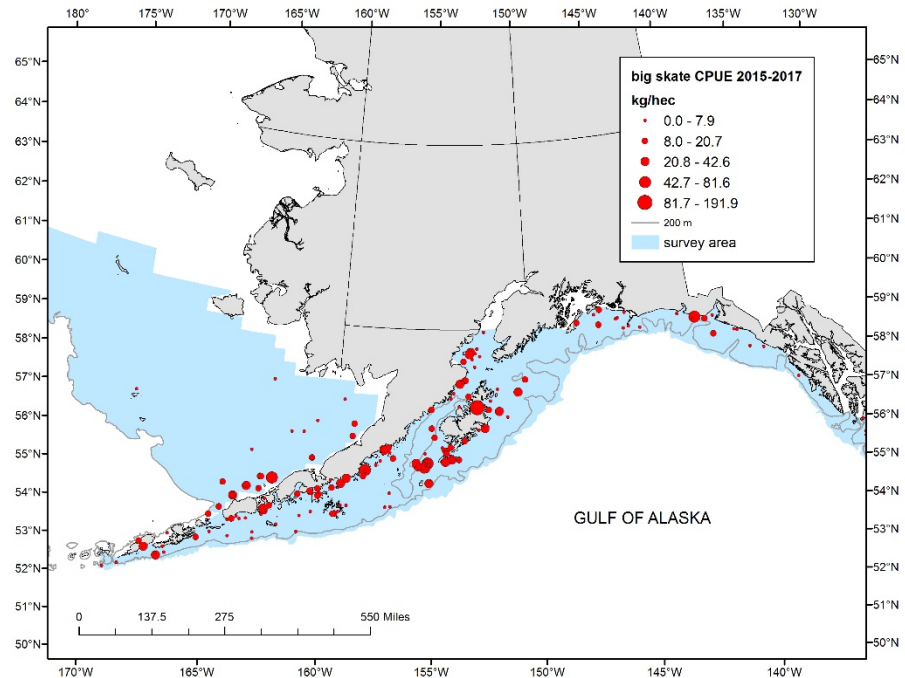


big skate survey CPUE

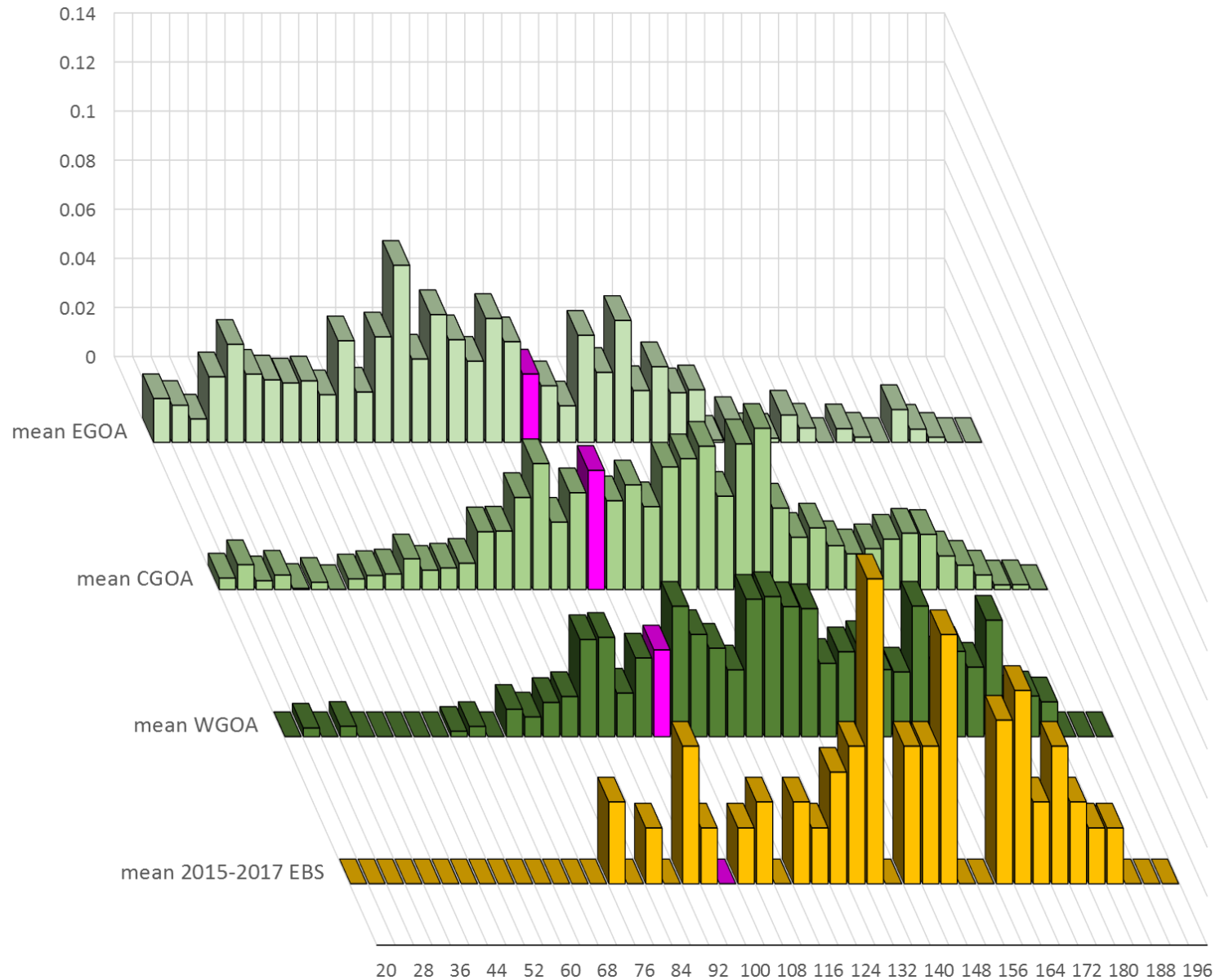
2003-2006



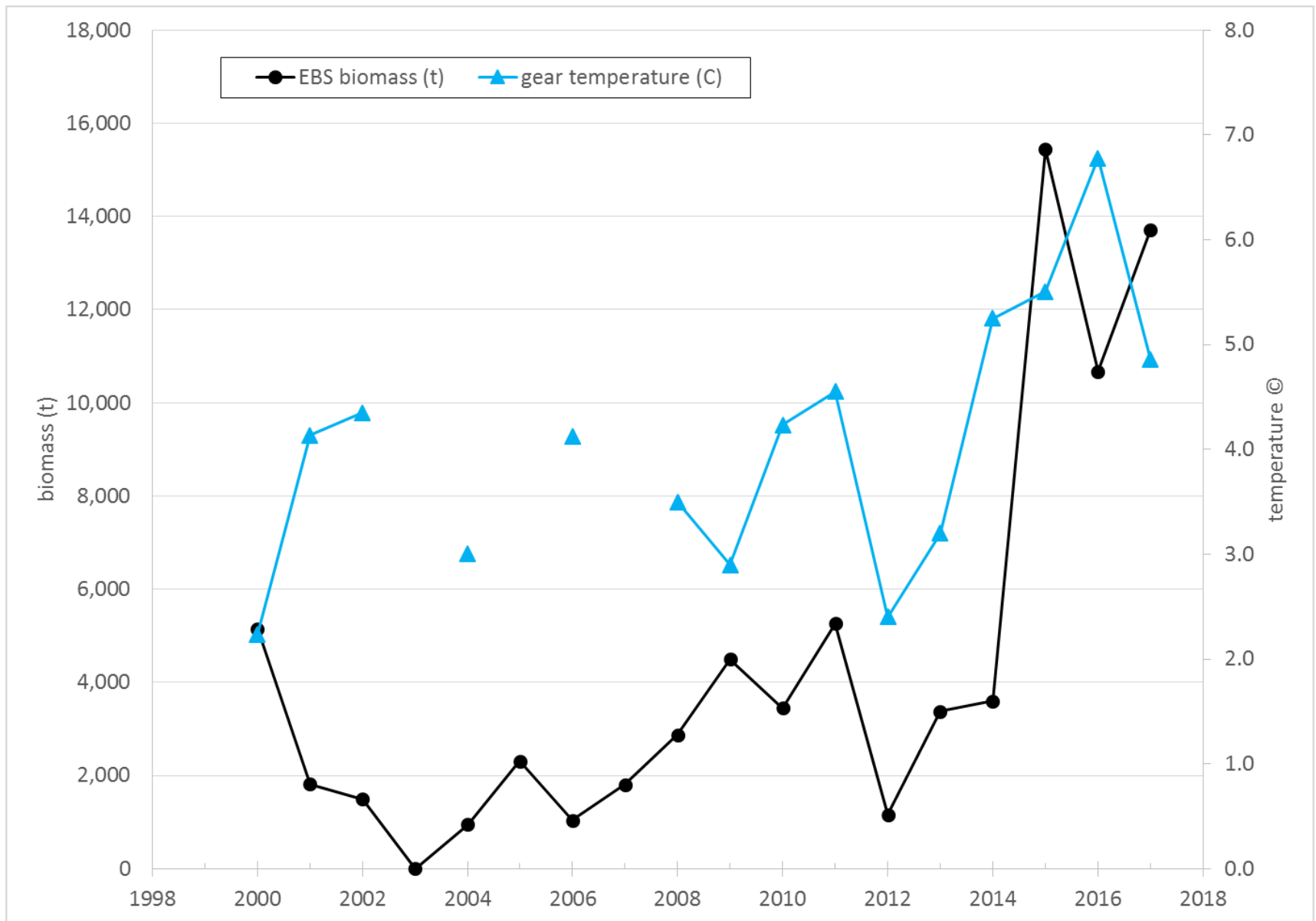
2015-2017



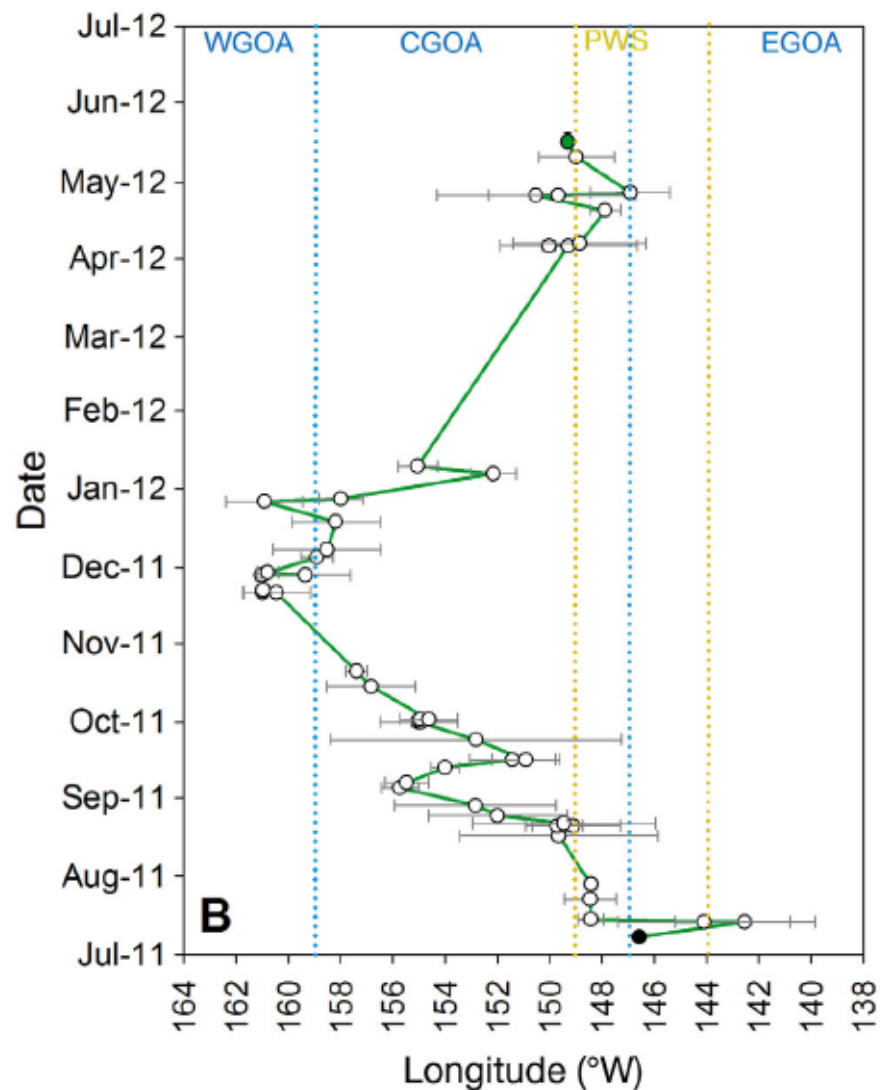
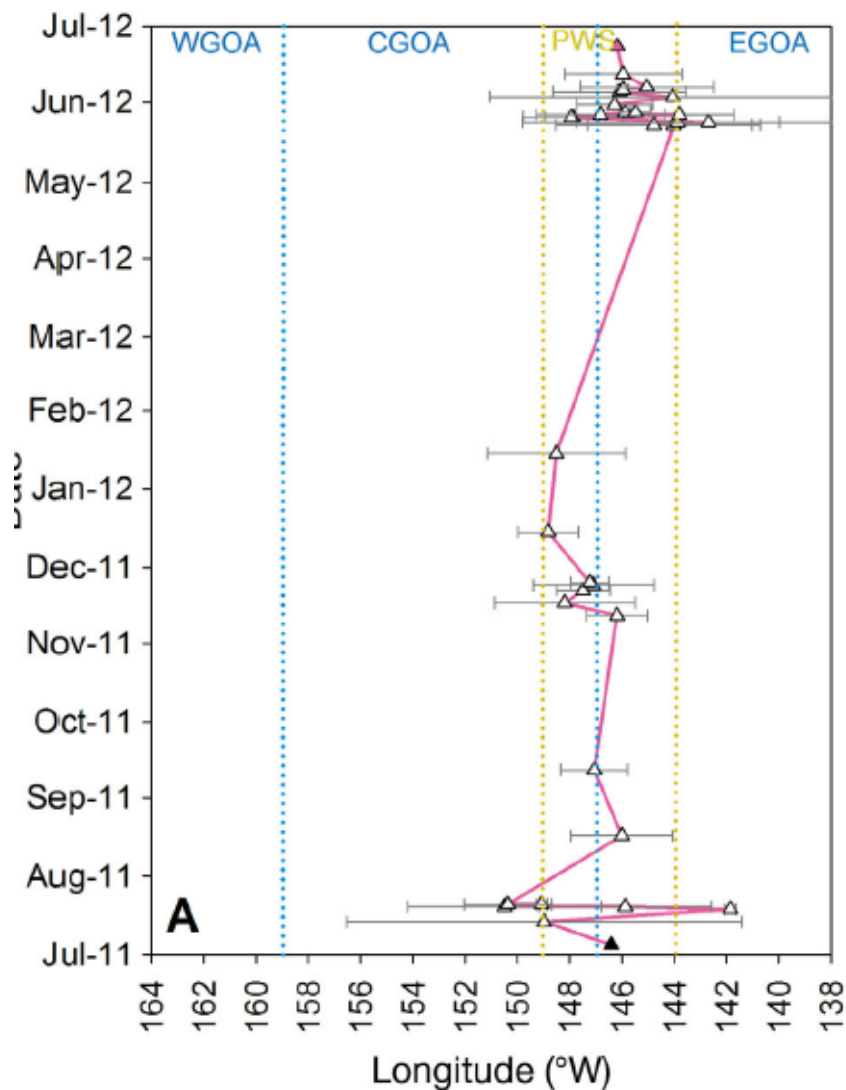
big skate size comp: GOA areas vs EBS shelf



big skate: biomass vs haul temperature



big skate satellite tag data



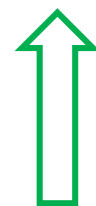
harvest recs – big skate

big skate (<i>Beringraja binoculata</i>)					
Quantity		As estimated or <i>specified</i> <i>last year for</i>		As estimated or <i>recommended this year for:</i>	
		2017	2018	2018	2019
<i>M</i> (natural mortality)		0.1	0.1	0.1	0.1
Specified/recommended					
Tier		5	5	5	5
Biomass (t)	W	12,112	12,112	6,716	6,716
	C	24,666	24,666	23,658	23,658
	E	14,079	14,079	7,601	7,601
	GOA-wide	50,857	50,857	37,975	37,975
<i>F</i> _{OFL} (<i>F</i> = <i>M</i>)		0.1	0.1	0.1	0.1
<i>maxF</i> _{ABC} (<i>F</i> =0.75* <i>M</i>)		0.075	0.075	0.075	0.075
<i>F</i> _{ABC}		0.075	0.075	0.075	0.075
OFL (t)	GOA-wide	5,086	5,086	3,797	3,797
ABC (t; equal to maximum ABC)	W	908	908	504	504
	C	1,850	1,850	1,774	1,774
	E	1,056	1,056	570	570
Status		As determined <i>last year for:</i>		As determined <i>this year for:</i>	
		2015	2016	2016	2017
Overfishing?		no	na	no	na
(for Tier 5 stocks, data are not available to determine whether the stock is in an overfished condition)					



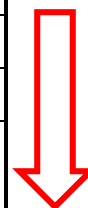
harvest recs – longnose skate

longnose skate (<i>Raja rhina</i>)					
Quantity		As estimated or specified last year for		As estimated or recommended this year for:	
		2017	2018	2018	2019
M (natural mortality)		0.1	0.1	0.1	0.1
Specified/recommended Tier		5	5	5	5
Biomass (t)	W	808	808	1,982	1,982
	C	33,503	33,503	37,390	37,390
	E	8,426	8,426	8,260	8,260
	GOA-wide	42,737	42,737	47,632	47,632
F_{OFL} ($F=M$)		0.1	0.1	0.1	0.1
$max F_{ABC}$ ($F=0.75*M$)		0.075	0.075	0.075	0.075
F_{ABC}		0.075	0.075	0.075	0.075
OFL (t)	GOA-wide	4,274	4,274	4,763	4,763
ABC (t; equal to maximum ABC)	W	61	61	149	149
	C	2,513	2,513	2,804	2,804
	E	632	632	619	619
Status		As determined last year for:		As determined this year for:	
		2015	2016	2016	2017
Overfishing?		no	n/a	no	n/a
(for Tier 5 stocks, data are not available to determine whether the stock is in an overfished condition)					



harvest recs – other skate

Other Skates (<i>Bathyraja</i> sp.)					
Quantity		As estimated or specified last year for		As estimated or recommended this year for:	
		2017	2018	2018	2019
M (natural mortality)		0.1	0.1	0.1	0.1
Specified/recommended Tier		5	5	5	5
Biomass (t)	GOA-wide	25,580	25,580	18,454	18,454
F_{OFL} ($F=M$)		0.1	0.1	0.1	0.1
$maxF_{ABC}$ ($F=0.75*M$)		0.075	0.075	0.075	0.075
F_{ABC}		0.075	0.075	0.075	0.075
OFL (t)	GOA-wide	2,558	2,558	1,845	1,845
ABC (t; equal to maximum ABC)	GOA-wide	1,919	1,919	1,384	1,384
Status		As determined last year for:		As determined this year for:	
		2015	2016	2016	2017
Overfishing?		no	na	no	na
(for Tier 5 stocks, data are not available to determine whether the stock is in an overfished condition)					



GOA skate catch detail

	2009	big	632	2,065	633		4,439	79	1,903	100	(137)	
		longnose	78	2,041	768		3,849	79	1,096	244	(319)	
		other				2,104	2,806	343	1,092	113	(160)	1,548
	2010	big	598	2,049	681		4,438	148	2,220	149	(179)	
		longnose	81	2,009	762		3,803	105	846	131	(197)	
		other				2,093	2,791	421	986	83	(118)	1,491
	2011	big	598	2,049	681		4,438	110	2,111	90	(134)	
		longnose	81	2,009	762		3,803	71	892	69	(118)	
		other				2,093	2,791	313	977	59	(96)	1,349
	2012	big	469	1,793	1,505		5,023	65	1,902	38	(62)	
		longnose	70	1,879	676		3,500	39	793	93	(135)	
		other				2,030	2,706	256	843	105	(141)	1,203
	2013	big	469	1,793	1,505		5,023	122	2,318	80	(224)	
		longnose	70	1,879	676		3,500	90	1,255	414	(774)	
		other				2,030	2,706	218	1,485	175	(370)	1,878
	2014	big	589	1,532	1,641		5,016	156	1,412	103	(233)	
		longnose	107	1,935	834		3,835	59	1,159	338	(559)	
		other				1,989	2,652	305	1,364	236	(492)	1,905
	2015	big	589	1,532	1,641		5,016	237	1,224	58	(139)	
		longnose	107	1,935	834		3,835	138	1,176	357	(618)	
		other				1,989	2,652	571	1,039	175	(342)	1,786
	2016	big	908	1,850	1,056		5,086	166	1,884	50	(146)	
		longnose	61	2,513	632		4,274	154	887	355	(583)	
		other				1,919	2,558	463	1,045	160	(347)	1,667
	2017*	big	908	1,850	1,056		5,086	154	1,259	102	(187)	
		longnose	61	2,513	632		4,274	148	708	266	(476)	
		other				1,919	2,558	481	823	126	(234)	1,430