

Appendix 2: Supplemental Tables and Figures

Appendix A.2.1. EBS Tanner crab initial and estimated parameter values. Tuned values are based off observed numbers-at-size of the virgin biomass in Stockhausen, 2015.

Parameter	Initial Parameter Value	Estimated Parameter Value	Source
Adult Males ¹	0.23 yr ⁻¹	0.35 yr ⁻¹ (0.000003)	
Immature Males (offset)	0	-0.363602 (0.041915)	
Adult Females (offset) ¹	0	-0.308789 (0.031711)	
Immature Females (offset) ¹	0	0.174607 (0.062017)	
Length 1 (male)	37 mm	Fixed	Tuned
Length 2 (male)	177 mm	Fixed	Tuned
Increment length 1 (male)	10 mm	Fixed	Tuned
Increment length 2 (male)	5 mm	Fixed	Tuned
Molt probability length 1 (male) ¹	0.99	Fixed	Tuned
Molt probability length 2 (male) ¹	0.005	Fixed	Tuned
CV (male)	0.5	Fixed	Tuned
Length-weight intercept (male)	0.00027 kg/mm	Fixed	Stockhausen (2015)
Length-weight slope (male)	3.022134 kg/mm	Fixed	Stockhausen (2015)
Length 1 (female)	27 mm	Fixed	Tuned
Length 2 (female)	92 mm	Fixed	Tuned
Increment length 1 (female)	9 mm	Fixed	Tuned
Increment length 2 (female)	2 mm	Fixed	Tuned
Molt probability length 1 (female) ¹	0.9999	Fixed	Tuned
Molt probability length 2 (female) ¹	0.005	Fixed	Tuned
CV (female)	0.5	Fixed	Tuned
Length-weight intercept (female)	0.000441 kg/mm	Fixed	Stockhausen (2015)
Length-weight slope (female)	2.898686 kg/mm	Fixed	Stockhausen (2015)

Length at 50% Maturity (male)	120 mm	Fixed	Stockhausen (2015)
Maturity Slope (male)	0.088113 number mature/mm	Fixed	Stockhausen (2015)
Length at 50% Maturity (female)	75 mm	Fixed	Stockhausen (2015)
Maturity Slope (female)	0.211052 number mature/mm	Fixed	Stockhausen (2015)
R_0	19	4.33136 (0.169531)	
Steepness (h)	1	Fixed	NPFMC (2007)
σ_R	1	Fixed	
α	11.5	21.7868 (2.62193)	
β	4	1 (0.000023)	
Last recruitment class	10 mm	Fixed	Donaldson et al. (1981)
First year of estimation	1953	Fixed	
Last year of estimation	2012	Fixed	
Last year early deviations	1966	Fixed	
Variation in early deviations	0.1	Fixed	
Male inflection point	140 mm	135.953 mm (3.33393)	
Male slope	0.1 number retained/mm	0.0595917 (0.00762)	
Male proportion	1	Fixed	NPFMC (2011)
Survey fleets catchability (male)	0.95 (prior), 0.1 (SD)	0.945681 (1965-1981), 0.939672 (1982-1987), 0.952947 (1988-2013)	Stockhausen (2015)
Survey fleets catchability (female)	0.95 (prior), 0.1 (SD)	0.947752 (1965-1981), 0.946568 (1982-1987), 0.944077 (1988-2013)	Stockhausen (2015)

Appendix A.2.2. Tanner crab selectivity parameters.

Fleet	Sex	Parameter	Initial Value	Estimated Value
Directed	Male	Inflection point ¹	150 mm	137.657 mm (1.61963)
Directed	Male	Inflection point offset	0	0.000127006 (0.00489256)
Directed	Male	Inflection point offset	0	0.0009596 (0.00490183)
Directed	Male	Inflection point offset	0	0.000770258 (0.00496513)
Directed	Male	Inflection point offset	0	0.0000773813 (0.00498381)
Directed	Male	Inflection point offset	0	0.000385501 (0.00499382)

Directed	Male	Inflection point offset	0	-0.000734392 (0.00493009)
Directed	Male	Inflection point offset	0	0.0000685513 (0.00492787)
Directed	Male	Inflection point offset	0	-0.00186241 (0.00491846)
Directed	Male	Inflection point offset	0	0.00226429 (0.00492044)
Directed	Male	Inflection point offset	0	0.0039082 (0.00498299)
Directed	Male	Inflection point offset	0	-0.00783712 (0.00478007)
Directed	Male	Slope ¹	0.79	0.137289 (0.00754788)
Directed	Male	Slope offset	0	0.0000243085 (0.00499605)
Directed	Male	Inflection point offset	0	0.000106028 (0.00499653)
Directed	Male	Inflection point offset	0	0.0000224746 (0.00499917)
Directed	Male	Inflection point offset	0	-0.0000751846 (0.00499937)
Directed	Male	Inflection point offset	0	0.0000185371 (0.00499983)
Directed	Male	Inflection point offset	0	-0.0000764503 (0.00499676)
Directed	Male	Inflection point offset	0	-0.0000954722 (0.00499607)
Directed	Male	Inflection point offset	0	-0.000383591 (0.00499537)
Directed	Male	Inflection point offset	0	0.000423466 (0.00499694)
Directed	Male	Inflection point offset	0	0.000467538 (0.00499864)
Directed	Male	Inflection point offset	0	-0.000728031 (0.00499254)
Directed	Female	Inflection point ¹	117 mm	123.755 mm (2.02293)
Directed	Female	Slope ¹	0.14	0.399975 (0.0137809)
GF Bycatch	Male	Inflection point ¹	140 mm	65.3859 mm (3.595)
GF Bycatch	Male	Inflection point offset	0	0.00117644 (0.0433136)
GF Bycatch	Male	Inflection point offset	0	0.203255 (0.0387782)
GF Bycatch	Male	Slope ¹	0.08	0.0811651 (0.0096676)
GF Bycatch	Male	Slope offset	0	0.00047392 (0.0486221)

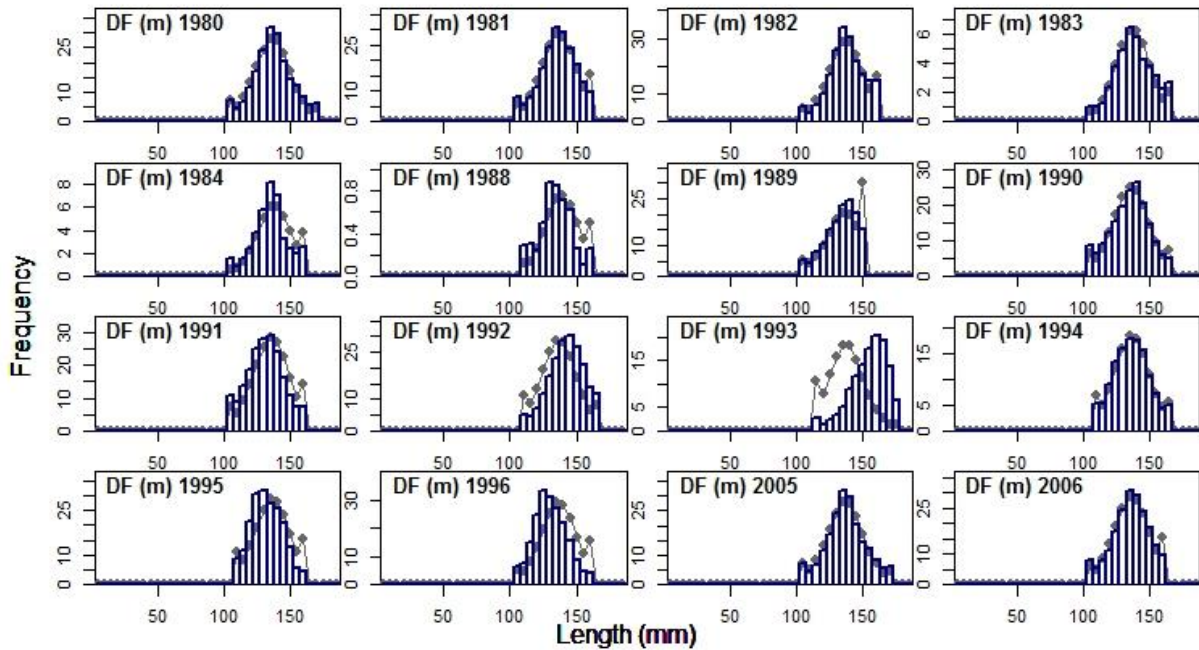
GF Bycatch	Male	Slope offset	0	0.0282627 (0.0483817)
GF Bycatch	Female	Inflection point ¹	70 mm	44.9463 mm (2.7937)
GF Bycatch	Female	Inflection point offset	0	0.0123136 (0.0438345)
GF Bycatch	Female	Inflection point offset	0	0.072171 (0.0462008)
GF Bycatch	Female	Slope ¹	0.03	0.179201 (0.0417886)
GF Bycatch	Female	Slope offset	0	0.00273361 (0.0495758)
GF Bycatch	Female	Slope offset	0	0.00493209 (0.0495764)
RKC Bycatch	Male	Inflection point ¹	150 mm	142.866 mm (10.5435)
RKC Bycatch	Male	Inflection point offset	0	-0.0146605 (0.0469798)
RKC Bycatch	Male	Inflection point offset	0	0.004344 (0.0438213)
RKC Bycatch	Male	Slope ¹	0.09	0.102508 (0.0280522)
RKC Bycatch	Male	Slope offset	0	-0.00346932 (0.0497821)
RKC Bycatch	Male	Slope offset	0	0.000862431 (0.0495951)
RKC Bycatch	Female	Inflection point ¹	125 mm	95.7362 mm (14.5693)
RKC Bycatch	Female	Inflection point offset	0	-0.000870102 (0.0493923)
RKC Bycatch	Female	Inflection point offset	0	0.00076228 (0.0490623)
RKC Bycatch	Female	Slope ¹	0.2	0.228911 (0.270313)
RKC Bycatch	Female	Slope offset	0	-0.000142047 (0.0499876)
RKC Bycatch	Female	Slope offset	0	-0.00000560384 (0.0499816)
SC Bycatch	Male	Peak ¹	95 mm	118.017 (4.98709)
SC Bycatch	Male	Inflection point offset	1	-0.00439821 (0.0379429)
SC Bycatch	Male	Inflection point offset	0	0.057742 (0.0323664)
SC Bycatch	Male	parameter of double-L ¹	-0.35	-2 (0.000928213)
SC Bycatch	Male	Inflection point offset	0	-0.0000834233 (0.0499129)
SC Bycatch	Male	Inflection point offset	0	0.00228685 (0.0497891)
SC Bycatch	Male	parameter of double-L ¹	6	6.18764 (0.377702)

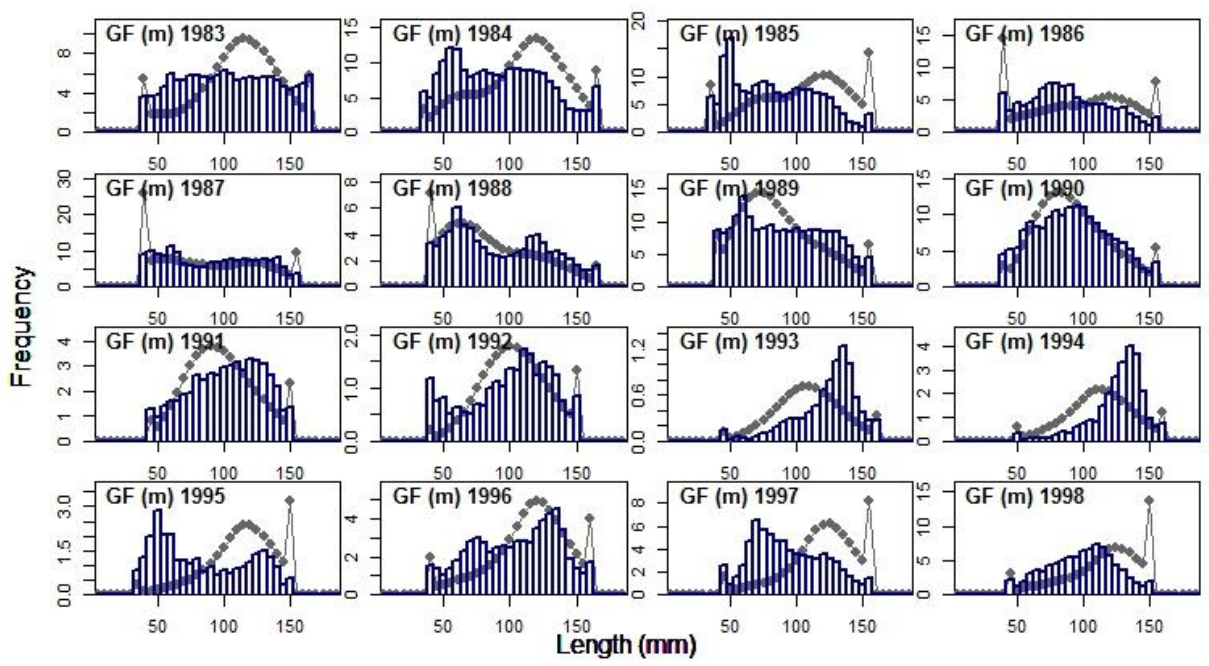
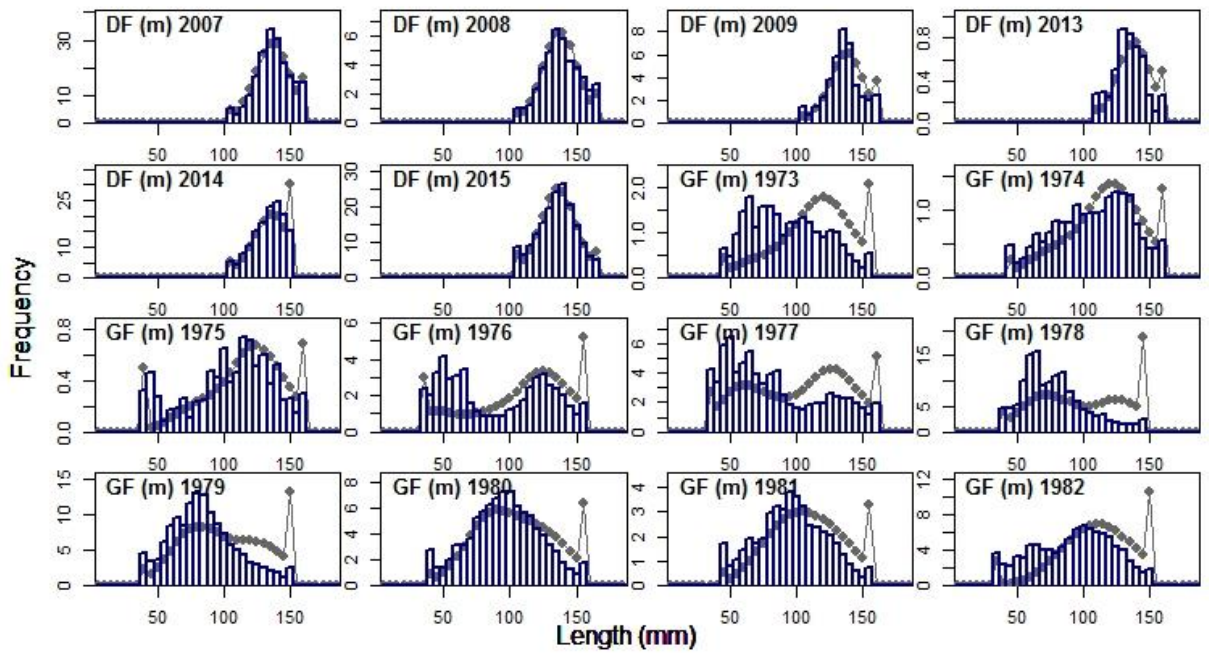
SC Bycatch	Male	Inflection point offset	0	-0.000992444 (0.0458058)
SC Bycatch	Male	Inflection point offset	0	-0.031141 (0.0435829)
SC Bycatch	Male	parameter of double-L1	9	4.12227 (1.33715)
SC Bycatch	Male	Inflection point offset	0	0.000524869 (0.0498533)
SC Bycatch	Male	Inflection point offset	0	-0.000842775 (0.0497734)
SC Bycatch	Male	parameter of double-L1	-0.5	-9.99999 (0.125135)
SC Bycatch	Male	Inflection point offset	0	0.0000387407 (0.0499912)
SC Bycatch	Male	Inflection point offset	0	-0.00000282382 (0.0500002)
SC Bycatch	Male	parameter of double-L1	0.5	-1.83568 (1.01051)
SC Bycatch	Male	Inflection point offset	0	-0.00000816742 (0.0499542)
SC Bycatch	Male	Inflection point offset	0	0.000282781 (0.049921)
SC Bycatch	Female	Inflection point ¹	125 mm	77.6005 mm (7.41107)
SC Bycatch	Female	Inflection point offset	0	-0.000262605 (0.0484924)
SC Bycatch	Female	Inflection point offset	0	0.00556613 (0.0477175)
SC Bycatch	Female	Slope ¹	0.2	0.227249 (0.195268)
SC Bycatch	Female	Slope offset	0	0.0000225645 (0.0499812)
SC Bycatch	Female	Slope offset	0	0.000171964 (0.0499721)
Survey (Males)	Male	Inflection point	120 mm	39.7381 mm (0.848511)
Survey (Males)	Male	Inflection point offset	0	-0.126775 (0.0242101)
Survey (Males)	Male	Inflection point offset	0	-0.189415 (0.0228502)
Survey (Males)	Male	Slope	0.5	0.5 (Fixed)
Survey (Males)	Male	Slope offset	0	-0.0309971 (0.0525)
Survey (Males)	Male	Slope offset	0	-0.0203992 (0.0519708)
Survey (Females)	Female	Inflection point	70 mm	40.8523 (1.16563)
Survey (Females)	Female	Inflection point offset	0	-0.0734707 (0.0271296)
Survey (Females)	Female	Inflection point offset	0	-0.183248 (0.0242746)
Survey (Females)	Female	Slope	0.5	0.241841 (0.023685)

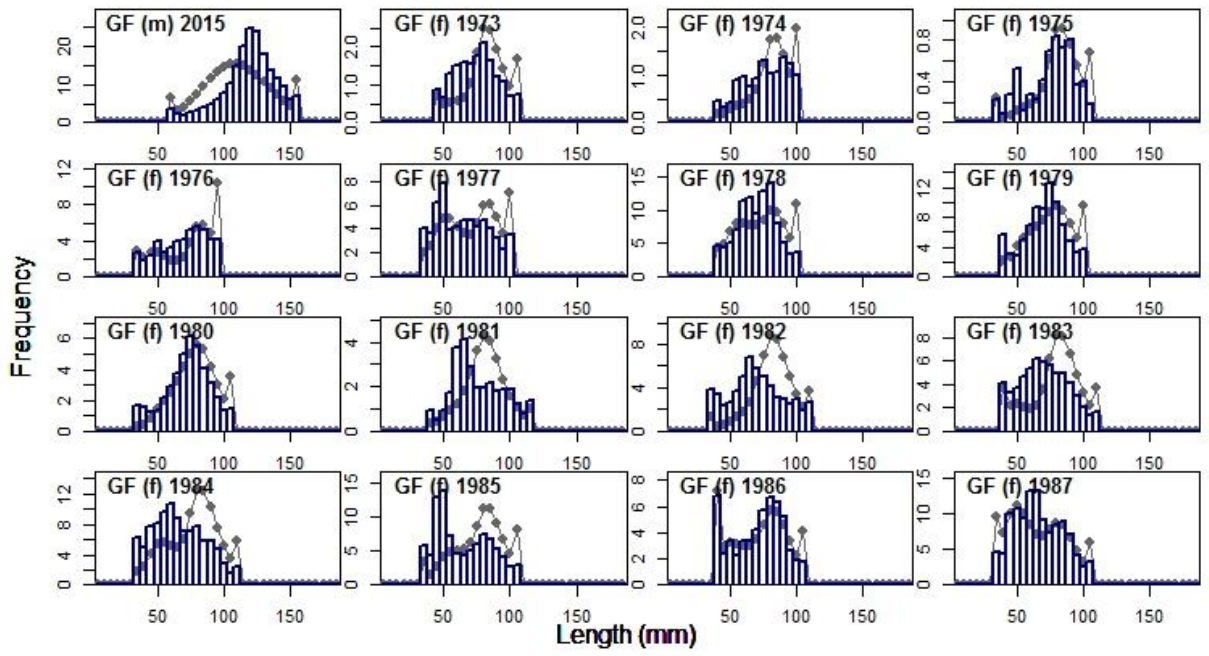
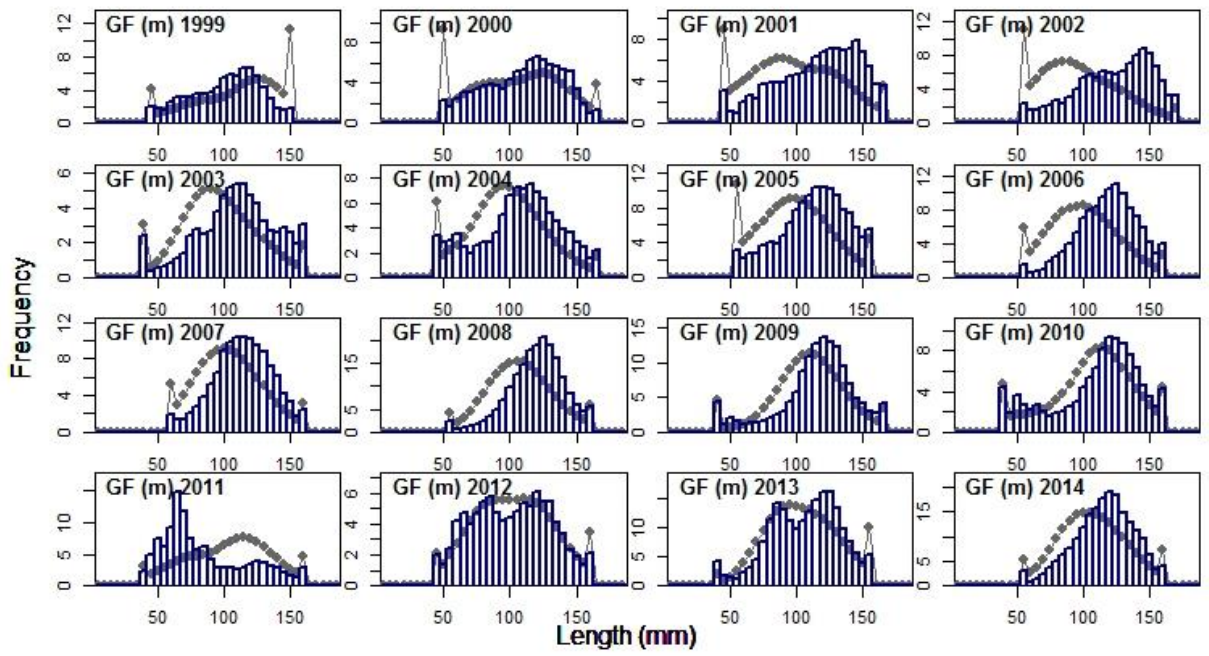
Survey (Females)	Female	Slope offset	0	-0.0157984 (0.0491634)
Survey (Females)	Female	Slope offset	0	40.8523 (1.16563)

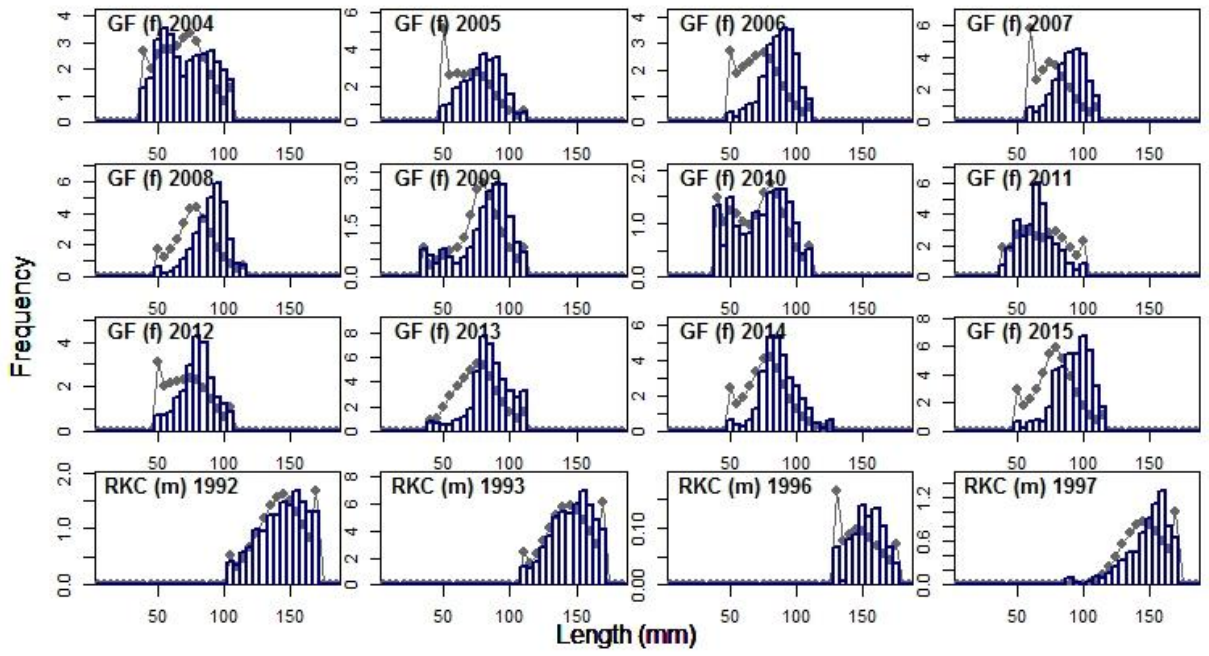
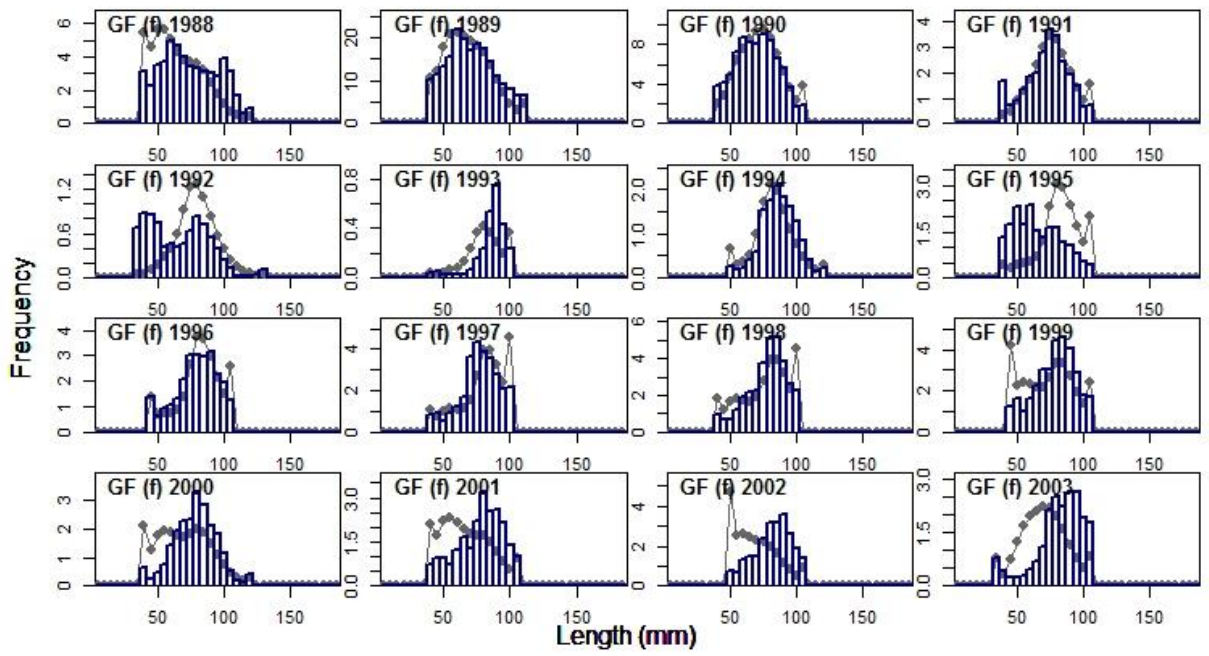
Appendix A.2.3. Tanner crab weights by fleet and data type.

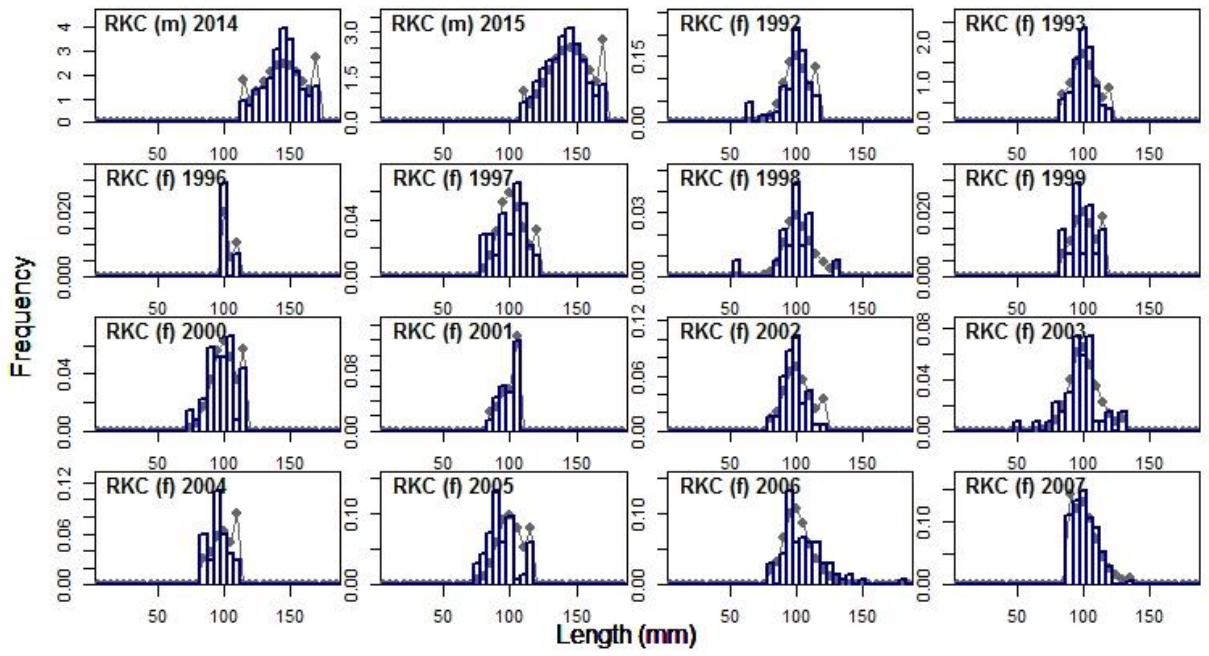
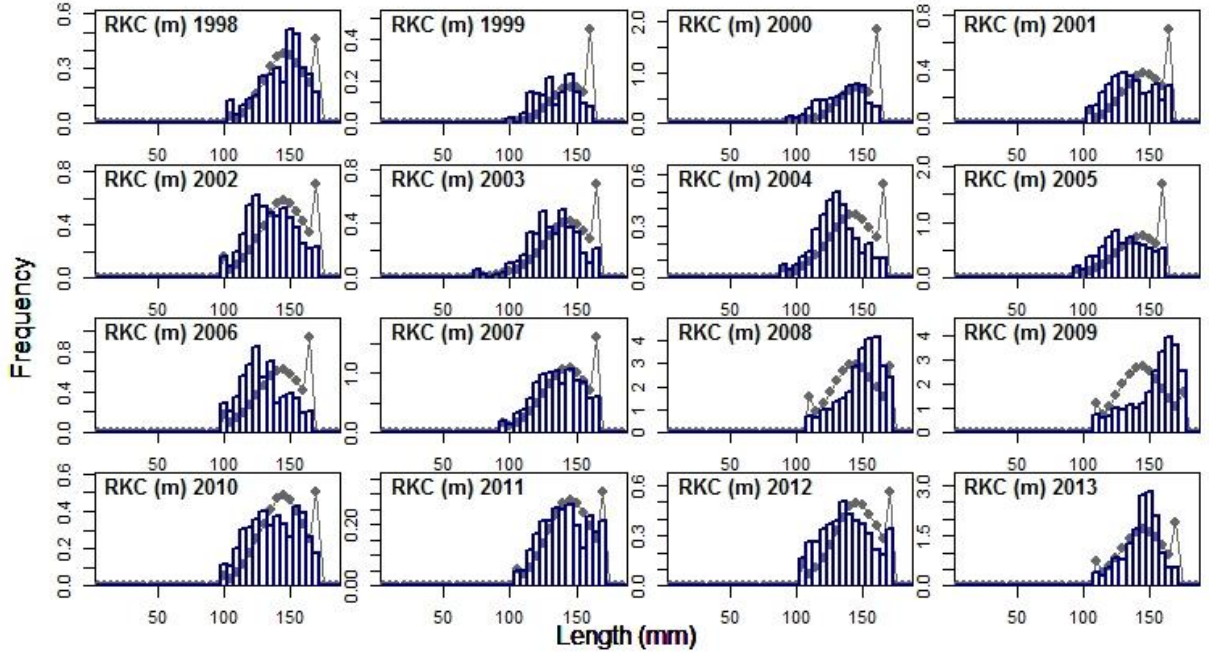
Fleet:	Catch	Discard	Index	Effort	Size	Age- Size
Directed	1	0.1	1	0.1	0.1	1
Groundfish Bycatch	1	NA	1	0.1	0.1	1
RKC Bycatch	1	NA	1	0.1	0.1	1
Snow Crab Bycatch	1	NA	1	0.1	0.1	1
Survey (males)	NA	NA	5	NA	0.5	1
Survey (females)	NA	NA	5	NA	0.5	1

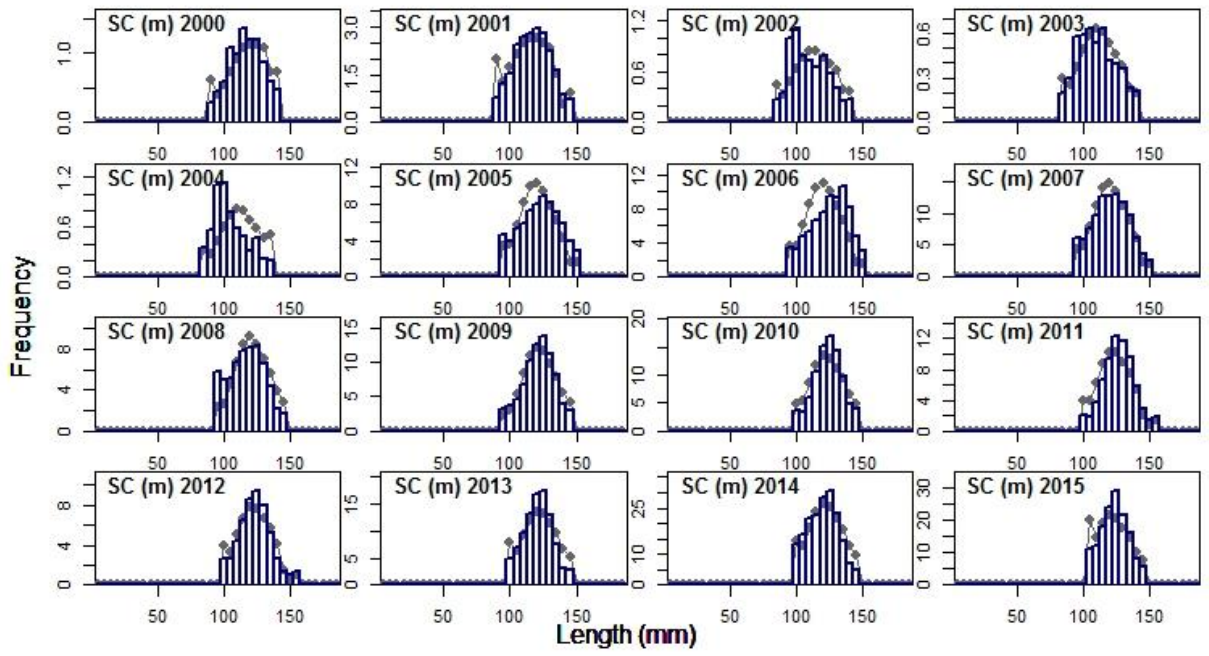
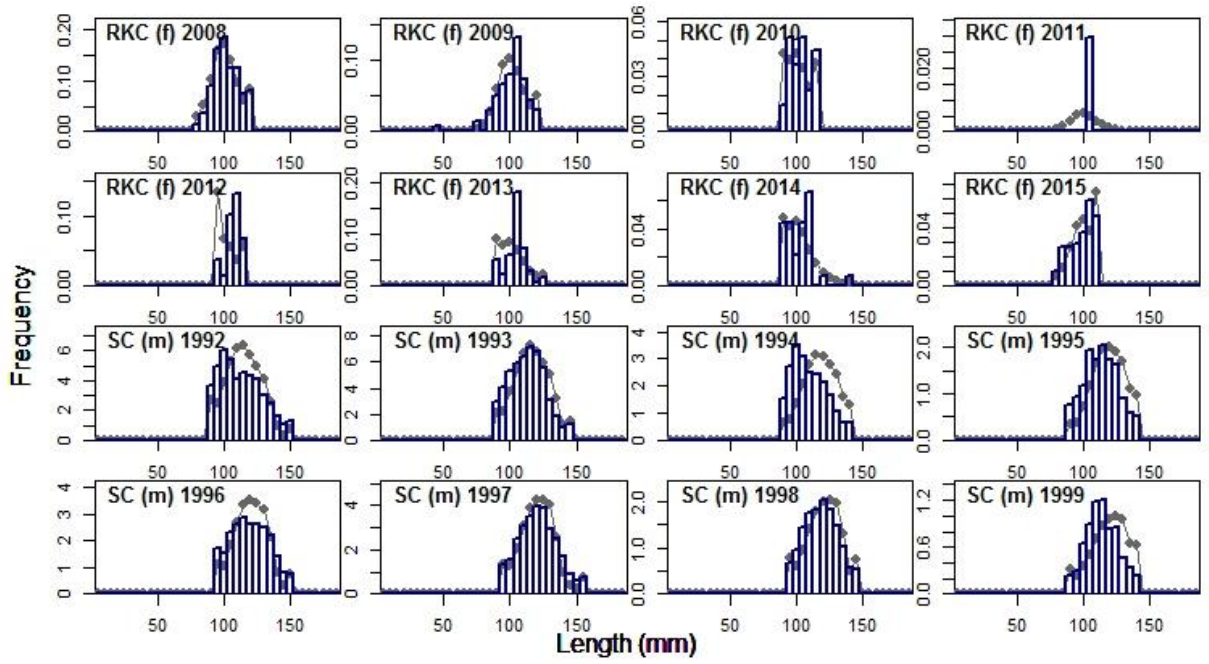


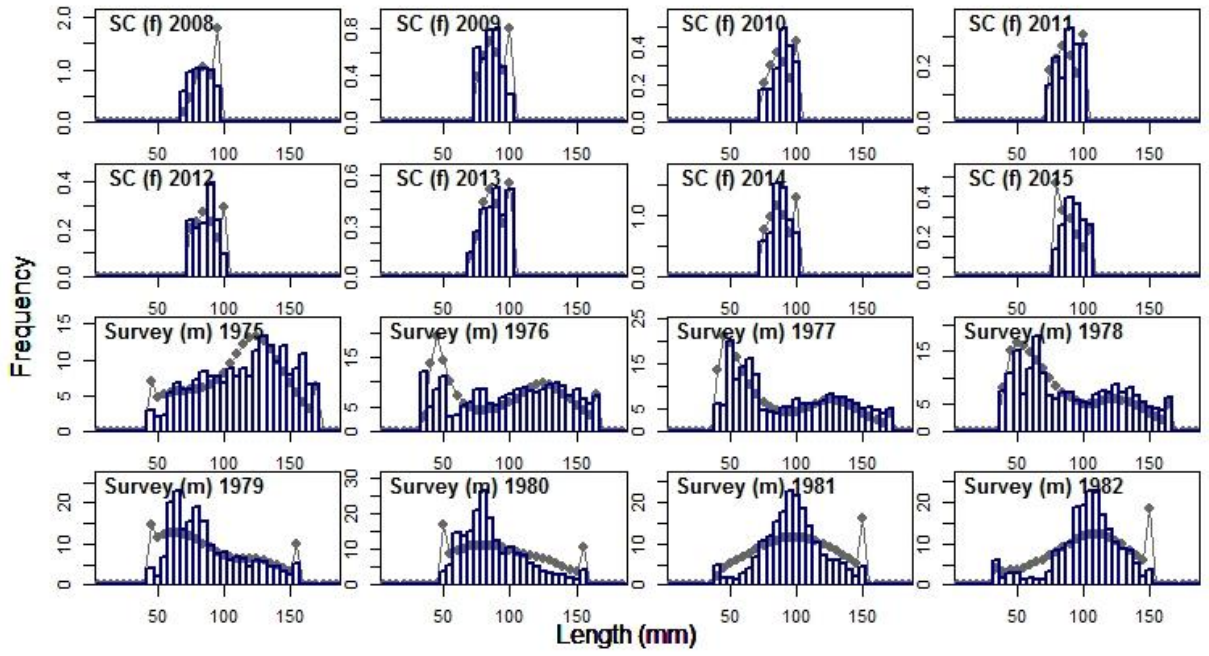
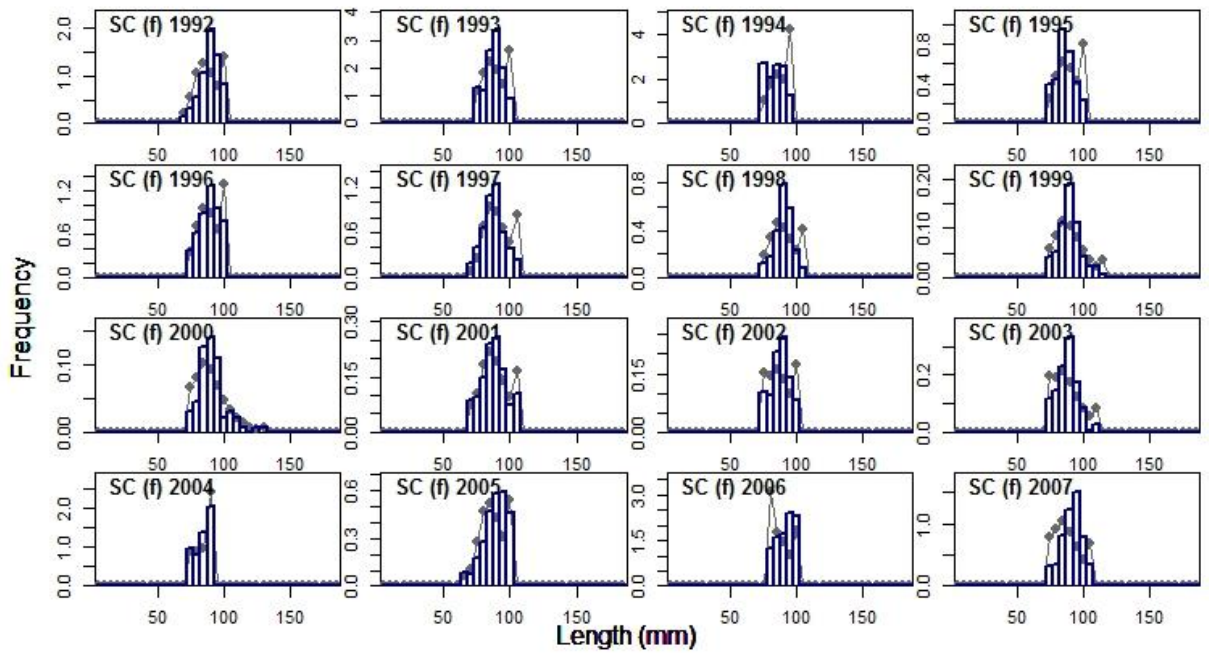


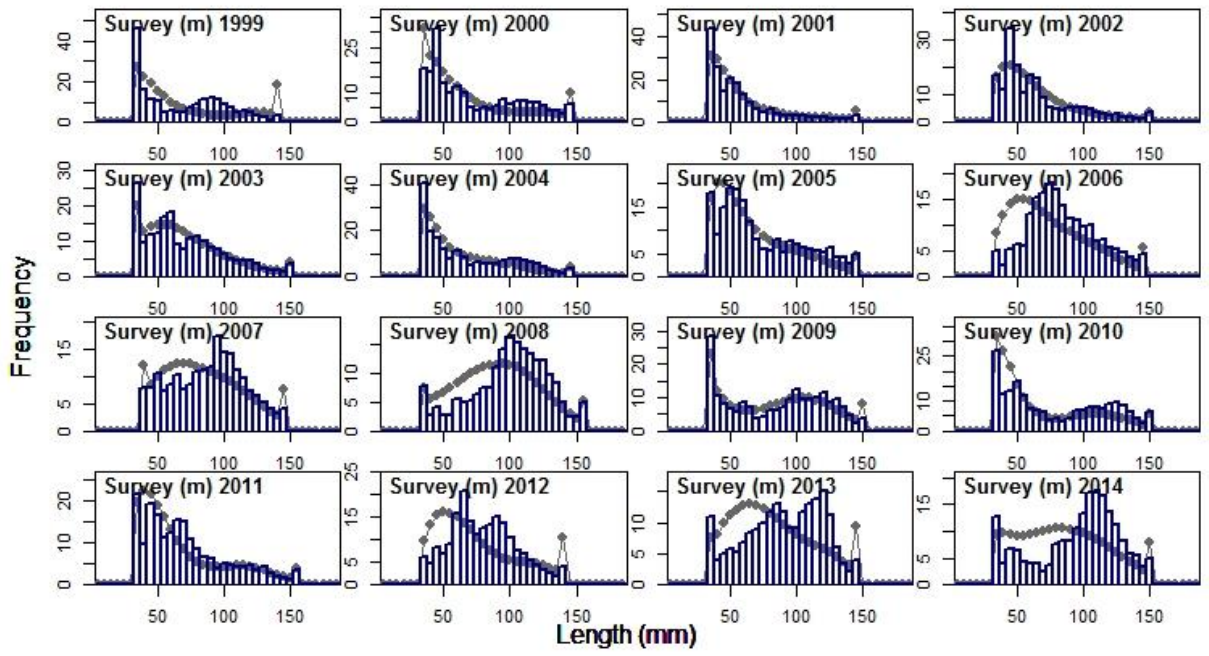
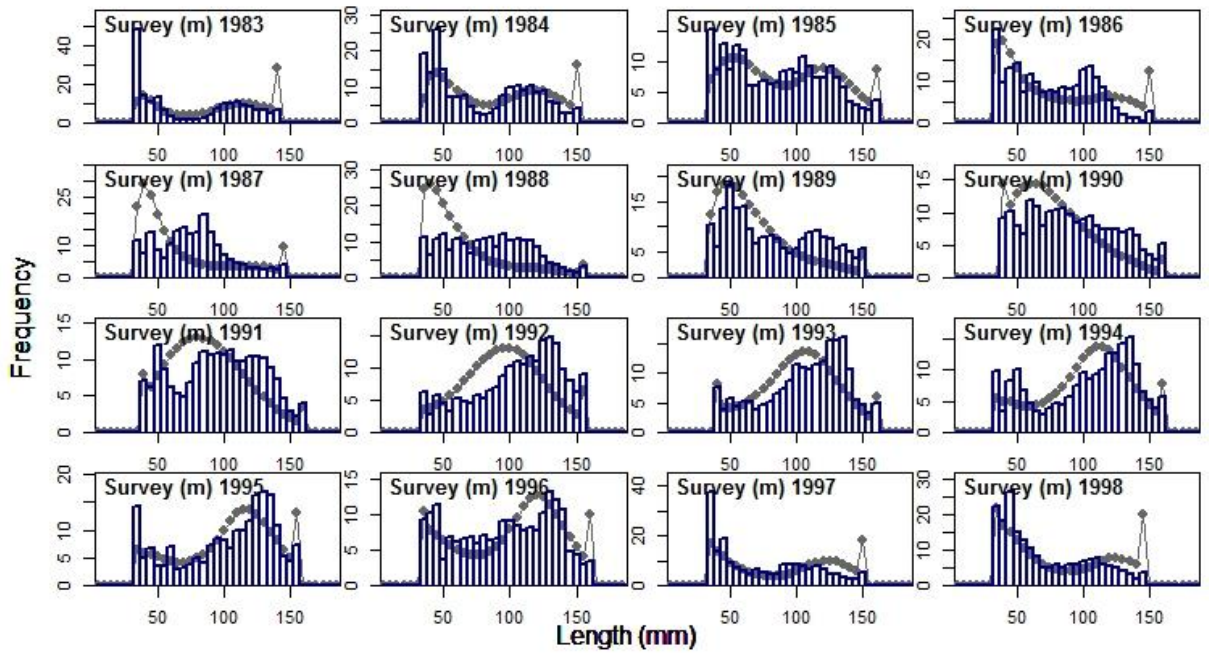


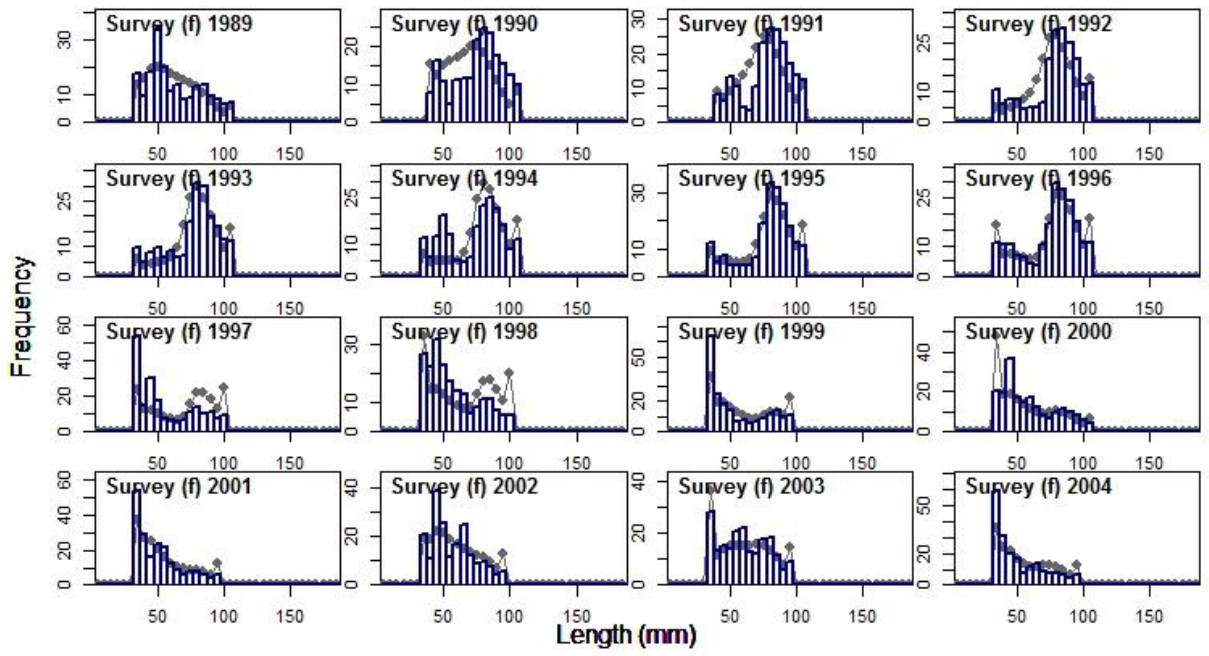
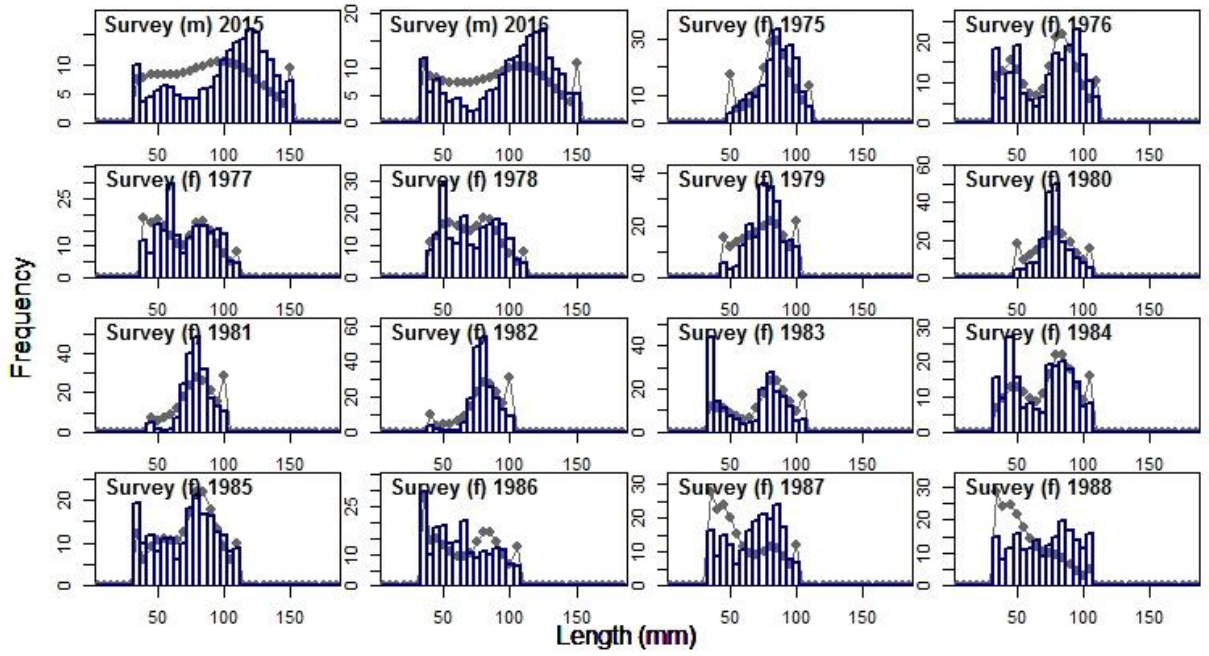


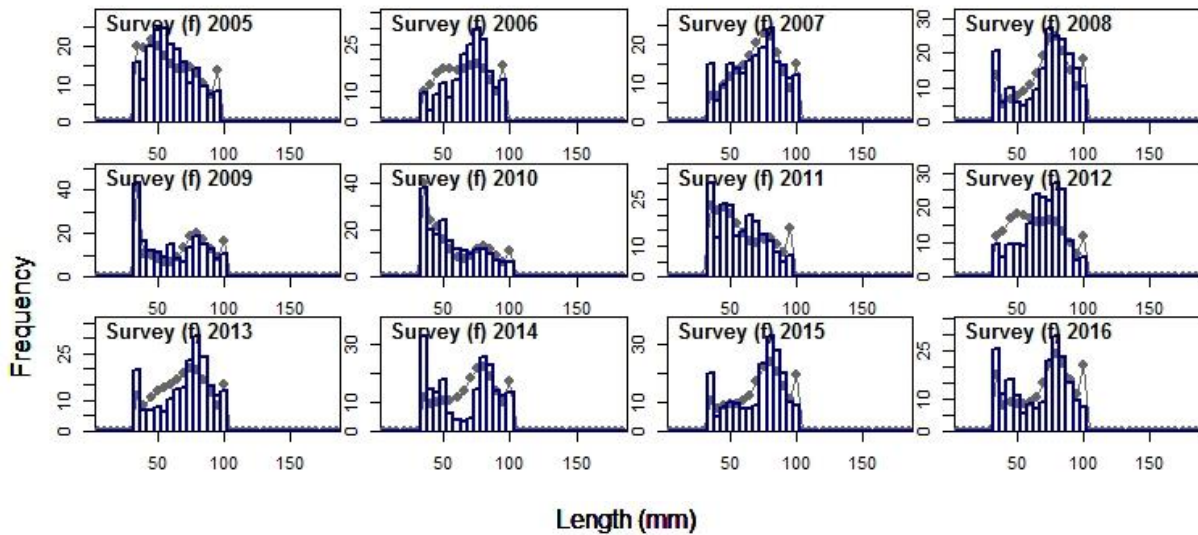












Appendix A.2.4. Fits to the EBS Tanner crab length composition frequency (points) and the data (bars), by year, for all fishery fleets, and for males (m) and females (f). Fleets are denoted as: directed fishery (DF), groundfish bycatch (GF), Red King crab bycatch (RKC), snow crab bycatch (SC), and the NMFS survey (Survey).

Appendix A.2.5. Pacific cod initial and estimated parameter values.

Process	Parameter	Initial Parameter Value	Estimated Parameter Value	Source
Natural Mortality		0.344 yr ⁻¹	Fixed	Thompson (2015)
Growth	L _∞	78.3 cm	89.84 cm (2.22388)	
	K	0.240181 yr ⁻¹	0.204589 yr ⁻¹ (0.007933)	
	CV	0.09	0.1 (0.004346)	Thompson (2015)
	Length-weight intercept	0.000006358 kg/cm	Fixed	Thompson (2015)
	Length-weight slope	3.157 kg/cm	Fixed	Thompson (2015)
Maturity	Length at 50% Maturity	4.882 cm	Fixed	Calculated from Thompson (2015)
	Maturity Slope	0.9654 number mature/cm	Fixed	Thompson (2015)
Recruitment	R ₀	14	13.0718 (0.0999574)	
	R ₀ offset	-1	-0.736411 (0.268902)	
	Steepness (<i>h</i>)	0.99	Fixed	Thompson (2015)
	σ _R	0.57	Fixed	Thompson (2015)
	α	-1.5	-41.7305 (44579.9)	Punt et al. (2017)

	β	-2.34	1.26866 (1218.57)	Punt et al. (2017)
	Last recruitment class	10 cm	Fixed	Estimated from Thompson (2015)
	First year of estimation	1900	Fixed	
	Last year of estimation	2014	Fixed	
	Last year early deviations	1960	Fixed	
	Variation in early deviations	0.01	Fixed	
Catchability	Survey fleet catchability	0.77	Fixed	Thompson (2015)

Appendix A.2.6. Pacific cod selectivity parameters.

Fleet	Parameter: Age Selectivity	Initial Value	Estimated Value
NMFS Survey	Inflection point	1.26 years	3.08617 years (0.245814)
NMFS Survey	2nd parameter double-normal	-2.77	-2.63548 (1.21358)
NMFS Survey	3rd parameter double-normal	-2.42	3.71383 (1.77414)
NMFS Survey	4th parameter double-normal	2.67	3.6723 (0.599497)
NMFS Survey	5th parameter double-normal	-9.999	Fixed
NMFS Survey	6th parameter double-normal	-1.14	-9.99908 (4.11587)

Fleet	Parameter: Length Selectivity	Initial Value	Estimated Value
Trawl: Jan-Apr	Peak	74 cm	87.5223 cm (2.69837)
Trawl: Jan-Apr	Peak offset	0	0.0238234 (0.0379381)
Trawl: Jan-Apr	Peak offset	0	-0.0244624 (0.033069)
Trawl: Jan-Apr	Peak offset	0	0.0191744 (0.0337571)
Trawl: Jan-Apr	Peak offset	0	0.011164 (0.0356916)
Trawl: Jan-Apr	Peak offset	0	-0.0154566 (0.031502)
Trawl: Jan-Apr	2nd parameter of double normal	0	Fixed
Trawl: Jan-Apr	3rd parameter of double normal	6	6.60067 (0.199029)
Trawl: Jan-Apr	3rd parameter offset	0	0.0250594 (0.0346396)
Trawl: Jan-Apr	3rd parameter offset	0	-0.0315831 (0.0326719)
Trawl: Jan-Apr	3rd parameter offset	0	-0.0157644 (0.0323646)
Trawl: Jan-Apr	3rd parameter offset	0	-0.0461868 (0.0349981)
Trawl: Jan-Apr	3rd parameter offset	0	-0.0980185 (0.0333735)
Trawl: Jan-Apr	4th parameter of double normal	0	Fixed
Trawl: Jan-Apr	5th parameter of double normal	-999	Fixed
Trawl: Jan-Apr	6th parameter of double normal	10	Fixed
Trawl: May-Jul	Peak	74 cm	81.0259 cm (6.9419)
Trawl: May-Jul	Peak offset	0	-0.0395619 (0.0415235)
Trawl: May-Jul	Peak offset	0	0.0647099 (0.0369596)

Trawl: May-Jul	Peak offset	0	-0.0121494 (0.0401904)
Trawl: May-Jul	Peak offset	0	0.0235781 (0.0370913)
Trawl: May-Jul	2nd parameter of double normal	0	Fixed
Trawl: May-Jul	3rd parameter of double normal	6	6.60136 (0.263988)
Trawl: May-Jul	4th parameter of double normal	0	Fixed
Trawl: May-Jul	5th parameter of double normal	-999	Fixed
Trawl: May-Jul	6th parameter of double normal	10	Fixed
Trawl: Aug-Dec	Peak	74 cm	100.307 cm (9.33962)
Trawl: Aug-Dec	Peak offset	0	0.000545075 (0.0486986)
Trawl: Aug-Dec	Peak offset	0	0.00262934 (0.0480883)
Trawl: Aug-Dec	Peak offset	0	0.0144228 (0.0495777)
Trawl: Aug-Dec	Peak offset	0	0.00381648 (0.0491568)
Trawl: Aug-Dec	Peak offset	0	-0.0114949 (0.0482445)
Trawl: Aug-Dec	2nd parameter of double normal	0	Fixed
Trawl: Aug-Dec	3rd parameter of double normal	6	7.00044 (0.395421)
Trawl: Aug-Dec	3rd parameter offset	0	-0.0253692 (0.0569615)
Trawl: Aug-Dec	3rd parameter offset	0	-0.0399434 (0.0555787)
Trawl: Aug-Dec	3rd parameter offset	0	-0.197279 (0.142832)
Trawl: Aug-Dec	3rd parameter offset	0	-0.0464894 (0.0623311)
Trawl: Aug-Dec	3rd parameter offset	0	-0.00652506 (0.0499875)
Trawl: Aug-Dec	4th parameter of double normal	0	Fixed
Trawl: Aug-Dec	5th parameter of double normal	-999	Fixed
Trawl: Aug-Dec	6th parameter of double normal	10	Fixed
Longline: Jan-Apr	Peak	67 cm	76.1088 cm (0.924634)
Longline: Jan-Apr	Peak offset	0	0.000335774 (0.00498339)
Longline: Jan-Apr	Peak offset	0	0.00303939 (0.00491517)
Longline: Jan-Apr	Peak offset	0	-0.000455869 (0.00489346)
Longline: Jan-Apr	Peak offset	0	0.000330014 (0.00484763)

Longline: Jan-Apr	Peak offset	0	-0.00396264 (0.00489814)
Longline: Jan-Apr	Peak offset	0	0.000981019 (0.00479137)
Longline: Jan-Apr	2nd parameter of double normal	-4.52345	-9.99995 (0.222865)
Longline: Jan-Apr	3rd parameter of double normal	6	5.97228 (0.263767)
Longline: Jan-Apr	Parameter offset	0	-0.059607 (0.0603416)
Longline: Jan-Apr	Parameter offset	0	-0.110382 (0.0480235)
Longline: Jan-Apr	Parameter offset	0	-0.083522 (0.045109)
Longline: Jan-Apr	Parameter offset	0	-0.0669808 (0.0445397)
Longline: Jan-Apr	Parameter offset	0	-0.0270049 (0.0444056)
Longline: Jan-Apr	Parameter offset	0	-0.0900499 (0.0442403)
Longline: Jan-Apr	4th parameter of double normal	5	4.29419 (0.576962)
Longline: Jan-Apr	5th parameter of double normal	-999	Fixed
Longline: Jan-Apr	6th parameter of double normal	0	-0.754533 (0.427485)
Longline: Jan-Apr	6th parameter offset	0	-0.0319478 (0.484318)
Longline: Jan-Apr	6th parameter offset	0	-0.211945 (0.437914)
Longline: Jan-Apr	6th parameter offset	0	-0.220438 (0.414482)
Longline: Jan-Apr	6th parameter offset	0	-0.051143 (0.421928)
Longline: Jan-Apr	6th parameter offset	0	0.369197 (0.425136)
Longline: Jan-Apr	6th parameter offset	0	0.113478 (0.405127)
Longline: May-Jul	Peak	69 cm	75.3418 cm (2.48157)
Longline: May-Jul	Peak offset	0	0.000539908 (0.0373468)
Longline: May-Jul	Peak offset	0	0.00344359 (0.035869)
Longline: May-Jul	Peak offset	0	0.0114986 (0.0259154)
Longline: May-Jul	Peak offset	0	-0.0357207 (0.0277474)
Longline: May-Jul	Peak offset	0	0.0263402 (0.025831)
Longline: May-Jul	2nd parameter of double normal	-9.23979	-1.72036 (3.13517)
Longline: May-Jul	3rd parameter of double normal	5.00792	5.52859 (0.129936)
Longline: May-Jul	4th parameter of double normal	4.42275	6.01164 (4.17427)

Longline: May-Jul	5th parameter of double normal	-999	Fixed
Longline: May-Jul	6th parameter of double normal	0	-0.658633 (3.42605)
Longline: May-Jul	6th parameter offset	0	0.00357429 (0.500661)
Longline: May-Jul	6th parameter offset	0	0.00559522 (0.500999)
Longline: May-Jul	6th parameter offset	0	-0.0414186 (0.517602)
Longline: May-Jul	6th parameter offset	0	0.0404713 (0.52169)
Longline: May-Jul	6th parameter offset	0	-0.0120348 (0.497487)
Longline: Aug-Dec	Peak	67 cm	78.6965 cm (1.14933)
Longline: Aug-Dec	Peak offset	0	0.00061561 (0.00497105)
Longline: Aug-Dec	Peak offset	0	-0.000818175 (0.00493867)
Longline: Aug-Dec	Peak offset	0	0.00110248 (0.0049465)
Longline: Aug-Dec	Peak offset	0	0.00485441 (0.00490255)
Longline: Aug-Dec	Peak offset	0	-0.00550443 (0.00490384)
Longline: Aug-Dec	Peak offset	0	-0.0000644855 (0.00487094)
Longline: Aug-Dec	2nd parameter of double normal	-4.52345	-5.60531 (55.121)
Longline: Aug-Dec	3rd parameter of double normal	5	5.91047 (0.34522)
Longline: Aug-Dec	3rd parameter offset	0	-0.0765546 (0.0626463)
Longline: Aug-Dec	3rd parameter offset	0	-0.0402741 (0.0586822)
Longline: Aug-Dec	3rd parameter offset	0	-0.0769008 (0.059379)
Longline: Aug-Dec	3rd parameter offset	0	-0.0481007 (0.0581717)
Longline: Aug-Dec	3rd parameter offset	0	-0.0266397 (0.0578923)
Longline: Aug-Dec	3rd parameter offset	0	-0.0458145 (0.0577521)
Longline: Aug-Dec	4th parameter of double normal	5	6.2942 (1.20862)
Longline: Aug-Dec	5th parameter of double normal	-999	Fixed
Longline: Aug-Dec	6th parameter of double normal	0	-1.11697 (0.715011)
Longline: Aug-Dec	6th parameter offset	0	0.0218057 (0.499267)
Longline: Aug-Dec	6th parameter offset	0	0.221763 (0.492934)
Longline: Aug-Dec	6th parameter offset	0	-0.152467 (0.463418)

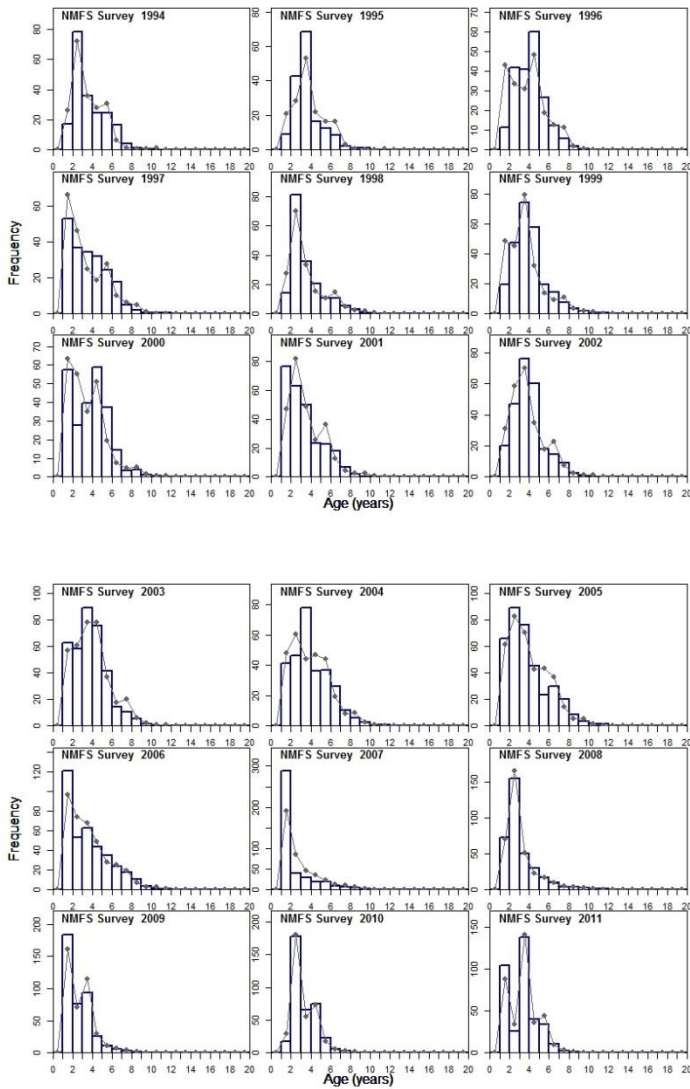
Longline: Aug-Dec	6th parameter offset	0	-0.277584 (0.464774)
Longline: Aug-Dec	6th parameter offset	0	0.534623 (0.504396)
Longline: Aug-Dec	6th parameter offset	0	-0.363892 (0.453897)
Pot: Jan-Apr	Peak	69 cm	76.3724 cm (2.23373)
Pot: Jan-Apr	Peak offset	0	0.00017017 (0.0226394)
Pot: Jan-Apr	Peak offset	0	-0.0150195 (0.0223531)
Pot: Jan-Apr	Peak offset	0	0.0104462 (0.0218557)
Pot: Jan-Apr	2nd parameter of double normal	-9.23979	-9.99956 (1.9862)
Pot: Jan-Apr	3rd parameter of double normal	5.00792	5.14558 (0.158864)
Pot: Jan-Apr	4th parameter of double normal	4.42275	4.44093 (1.58225)
Pot: Jan-Apr	5th parameter of double normal	-999	Fixed
Pot: Jan-Apr	6th parameter of double normal	0	-0.343402 (0.916579)
Pot: Jan-Apr	6th parameter offset	0	0.0104558 (0.496816)
Pot: Jan-Apr	6th parameter offset	0	0.0351168 (0.505077)
Pot: Jan-Apr	6th parameter offset	0	-0.0437227 (0.500904)
Pot: May-Jul	Peak	69 cm	77.2723 cm (3.03725)
Pot: May-Jul	Peak offset	0	0.00370976 (0.0115716)
Pot: May-Jul	2nd parameter of double normal	-9.23979	-1.04456 (0.301461)
Pot: May-Jul	3rd parameter of double normal	5.00792	5.33258 (0.251358)
Pot: May-Jul	4th parameter of double normal	4.42275	-7.9916 (1644.08)
Pot: May-Jul	5th parameter of double normal	-999	Fixed
Pot: May-Jul	6th parameter of double normal	0	0.604771 (1.1118)
Pot: May-Jul	6th parameter offset	0	0.0540599 (0.496665)
Pot: Aug- Dec	Peak	67 cm	75.8536 cm (4.01772)
Pot: Aug- Dec	Peak offset	0	-0.00144167 (0.0450667)
Pot: Aug- Dec	2nd parameter of double normal	0	Fixed
Pot: Aug- Dec	3rd parameter of double normal	6	5.54675 (0.357584)
Pot: Aug- Dec	3rd parameter offset	0	-0.0626668 (0.0618382)
Pot: Aug- Dec	4th parameter of double normal	0	Fixed
Pot: Aug- Dec	5th parameter of double normal	-999	Fixed
Pot: Aug- Dec	6th parameter of double normal	10	Fixed

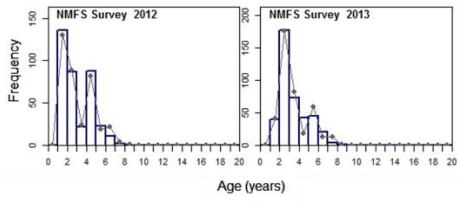
Appendix A.2.7. Pacific cod weights.

Fleet:	Catch	Index	Size	Age
Trawl: Jan-Apr (Seas 1)	1	NA	0.1	NA
Trawl: Jan-Apr (Seas 2)	1	NA	0.1	NA
Trawl: May-Jul (Seas 3)	1	NA	0.1	NA
Trawl: Aug-Dec (Seas 4)	1	NA	0.1	NA
Trawl: Aug-Dec (Seas 5)	1	NA	0.1	NA
Longline: Jan-Apr (Seas 1)	1	NA	0.1	NA

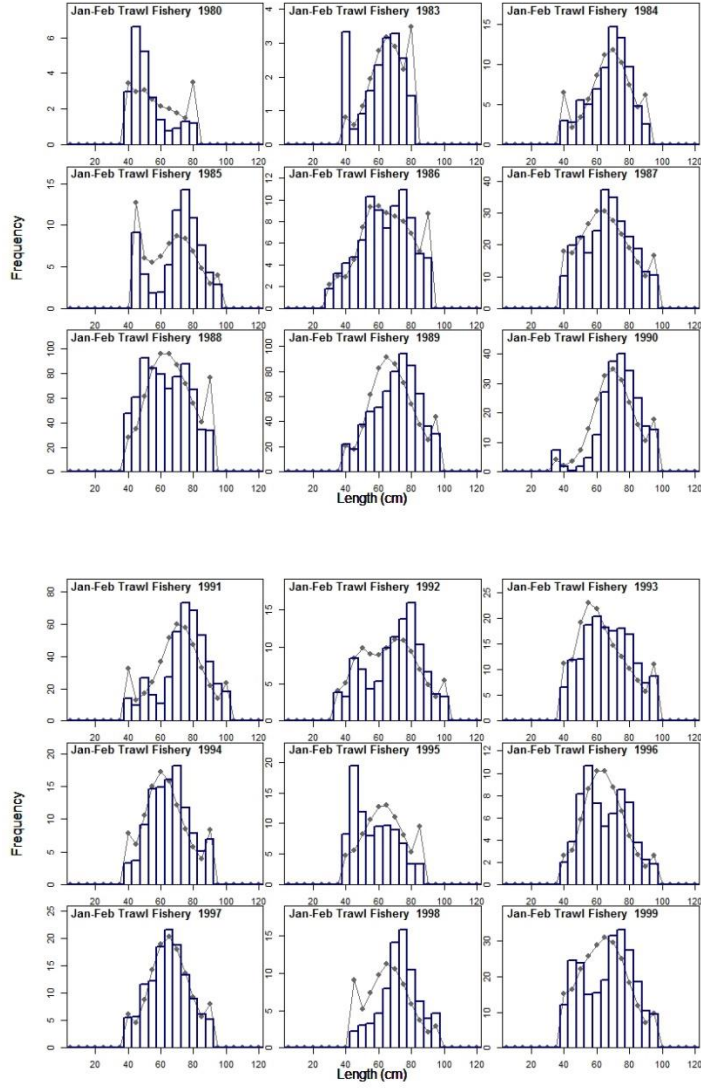
Longline: Jan-Apr (Seas 2)	1	NA	0.1	NA
Longline: May-Jul (Seas 3)	1	NA	0.1	NA
Longline: Aug-Dec (Seas 4)	1	NA	0.1	NA
Longline: Aug-Dec (Seas 5)	1	NA	0.1	NA
Pot: Jan-Apr (Seas 1)	1	NA	0.1	NA
Pot: Jan-Apr (Seas 2)	1	NA	0.1	NA
Pot: May-Jul (Seas 3)	1	NA	0.1	NA
Pot: Aug-Dec (Seas 4)	1	NA	0.1	NA
Pot: Aug-Dec (Seas 5)	1	NA	0.1	NA
NMFS Survey	NA	1	0.1	0.4

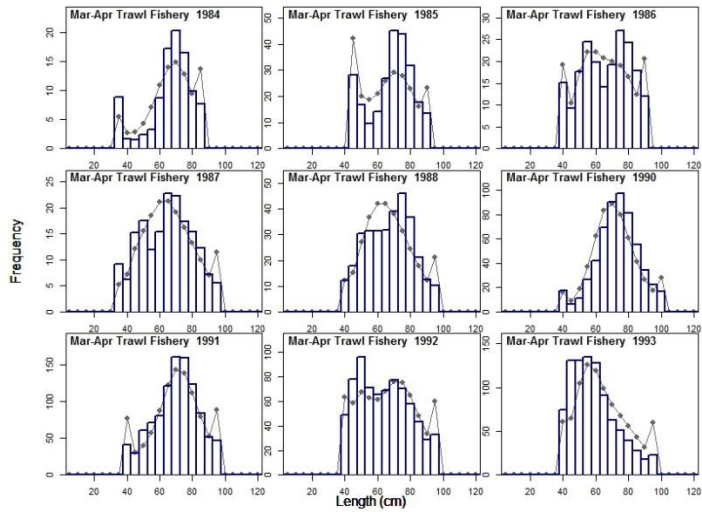
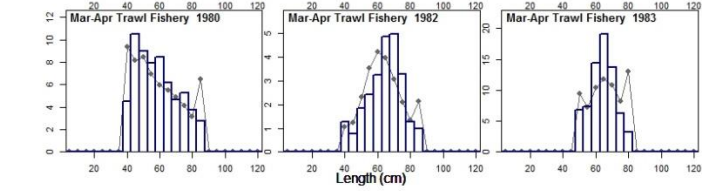
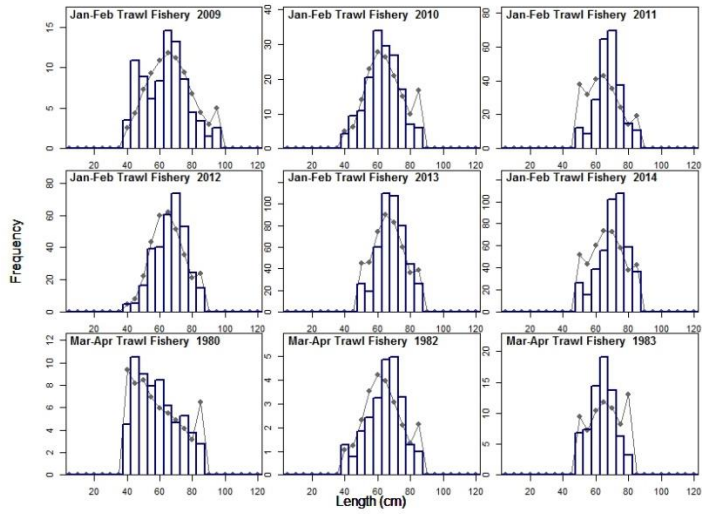
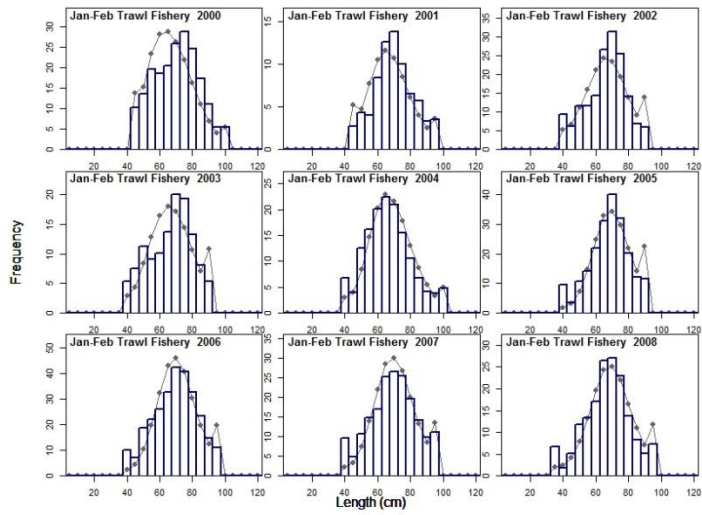
(a) Age Frequencies for Pacific cod

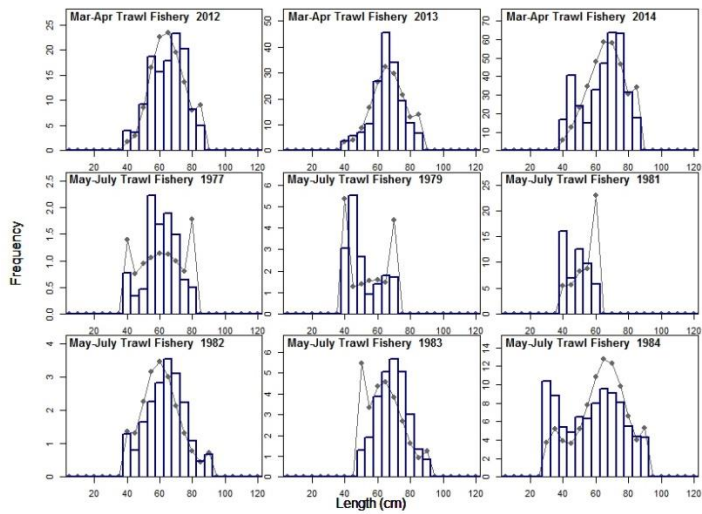
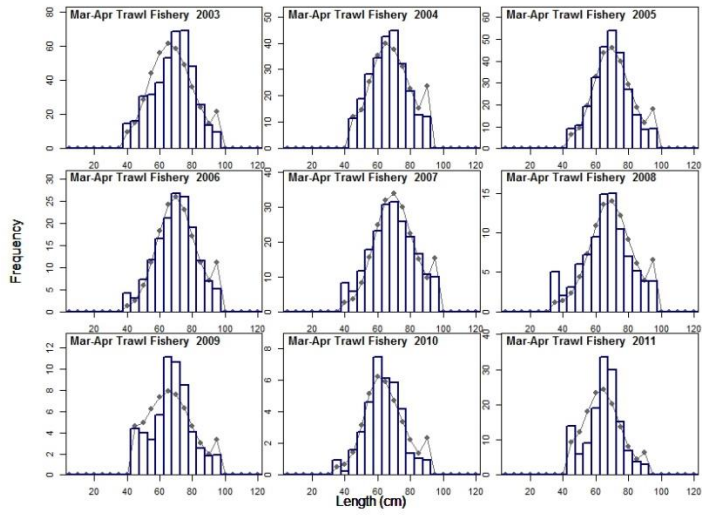
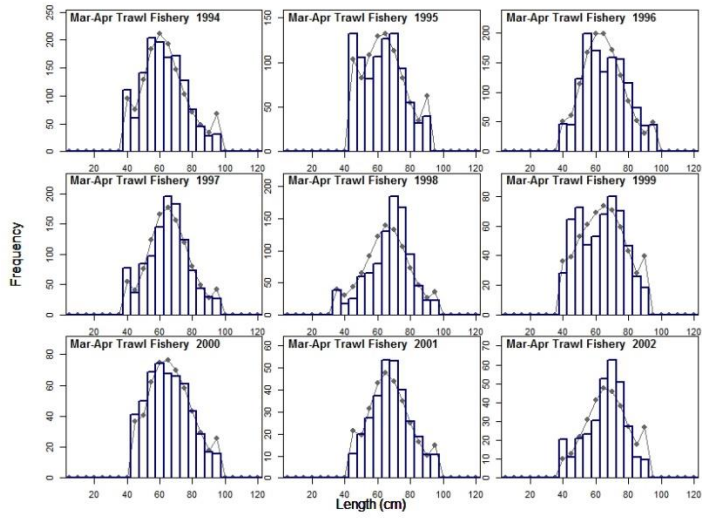


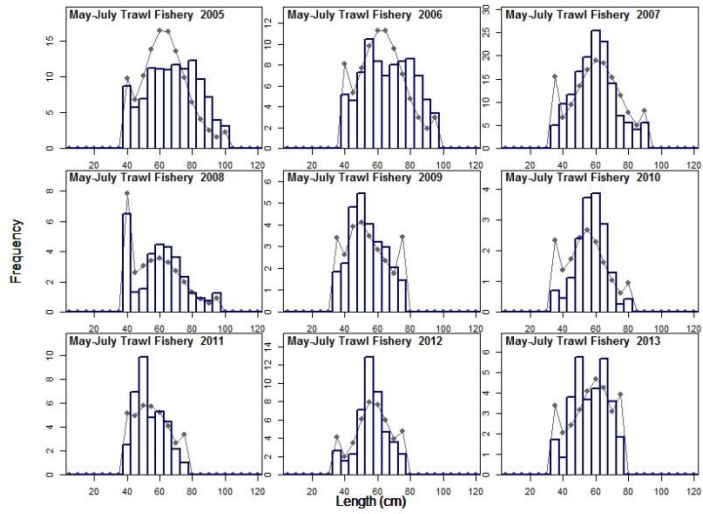
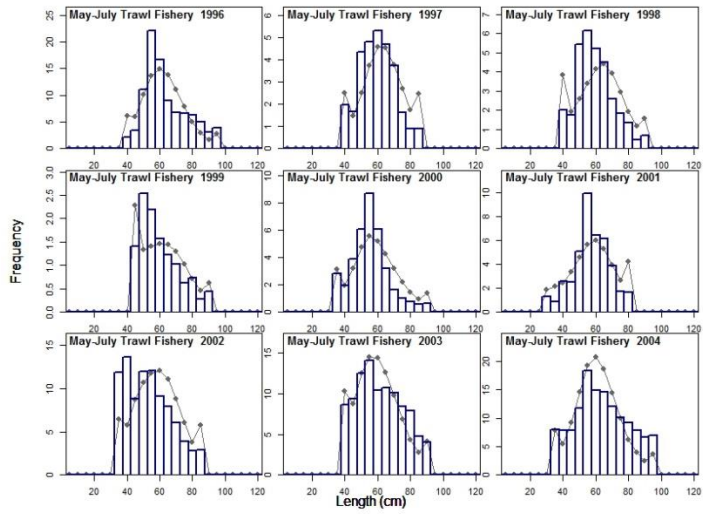
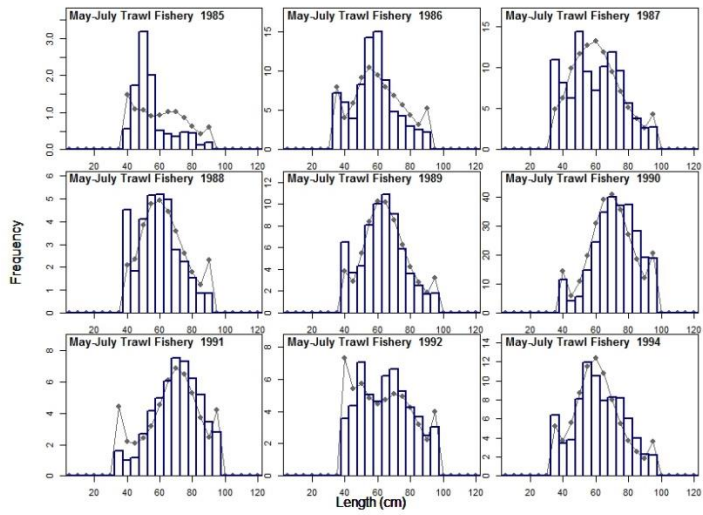


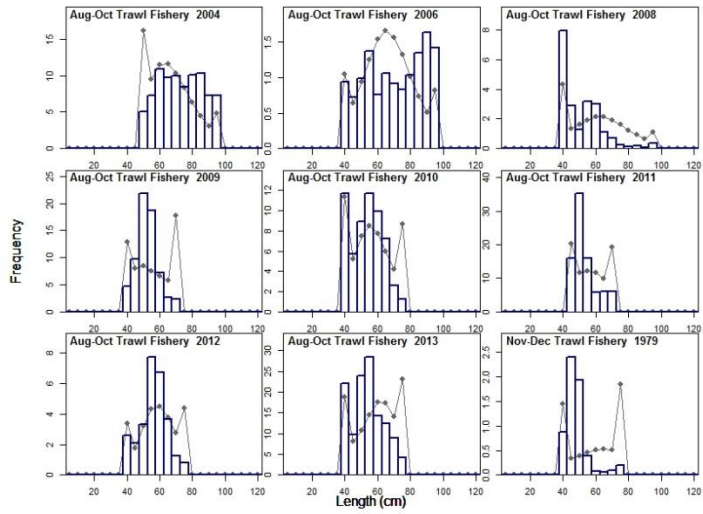
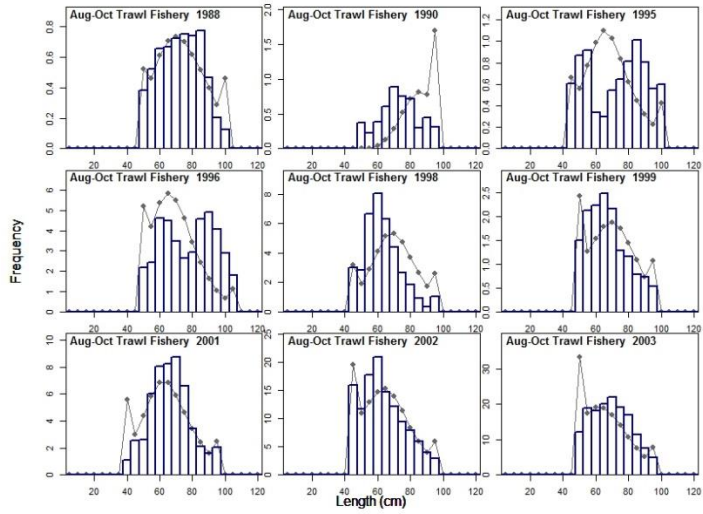
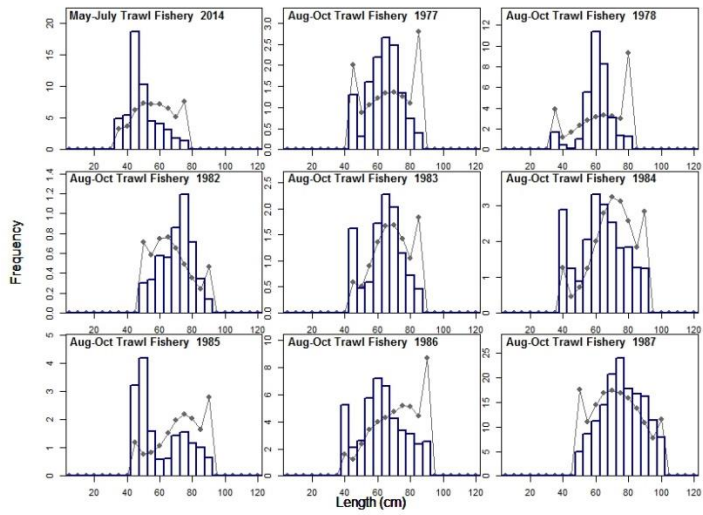
(b) Length Frequencies for Pacific cod

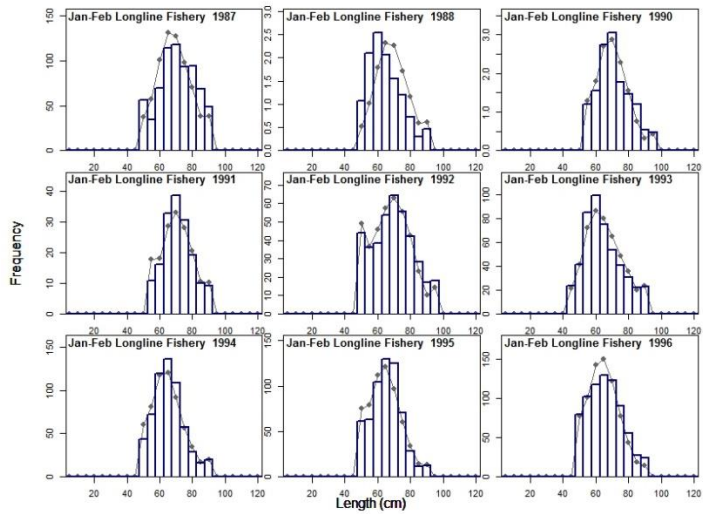
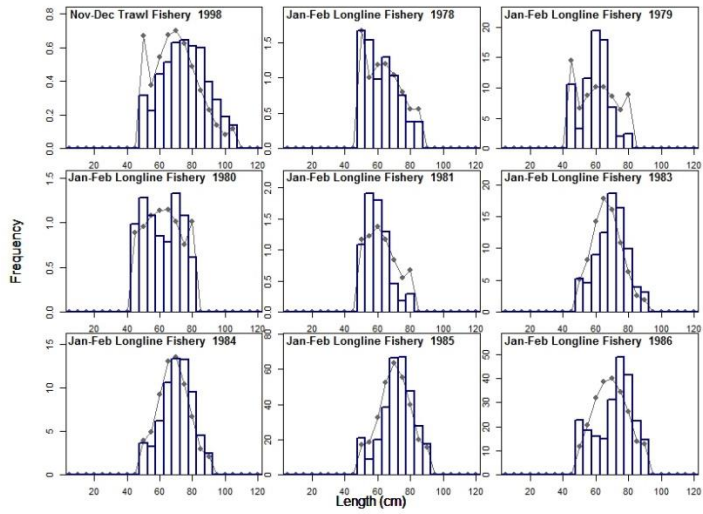
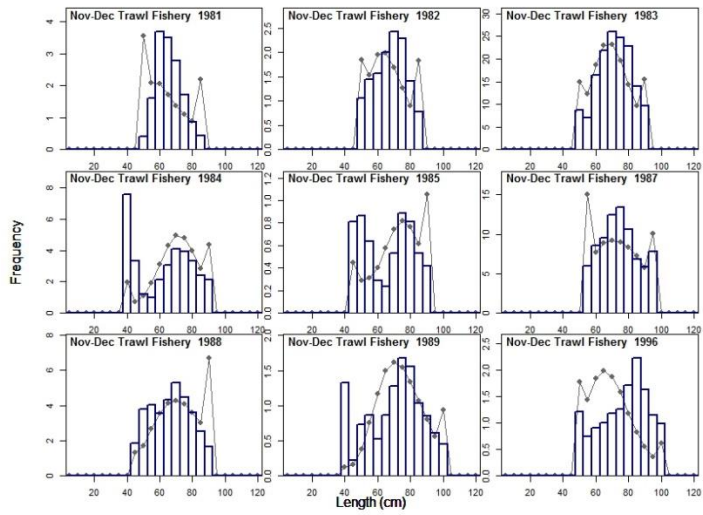


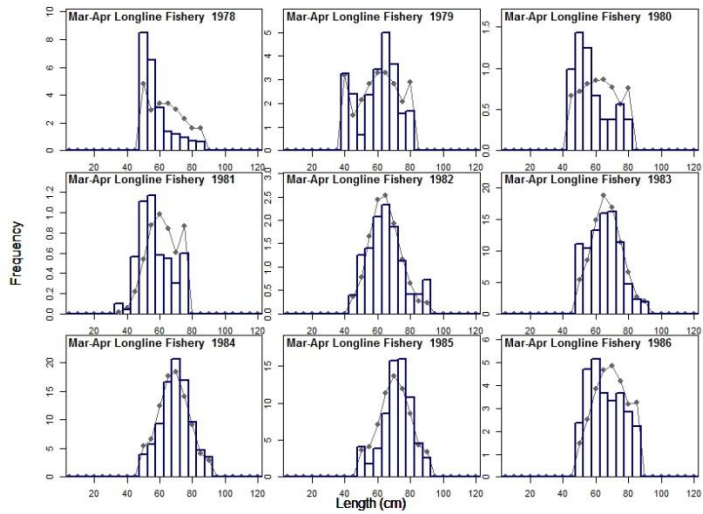
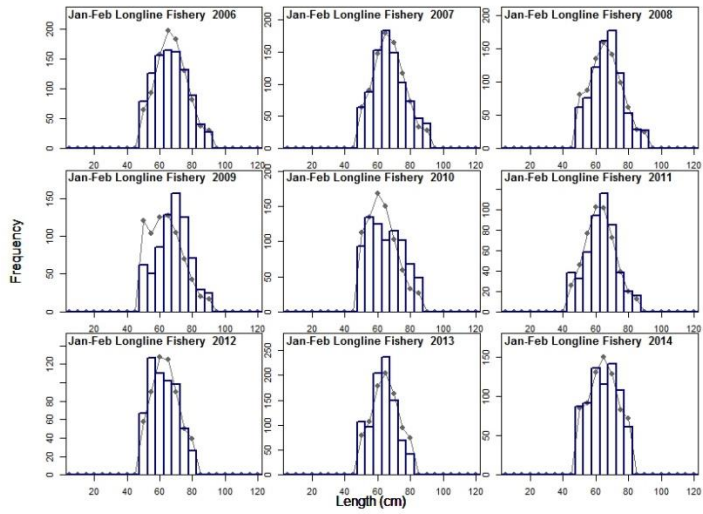
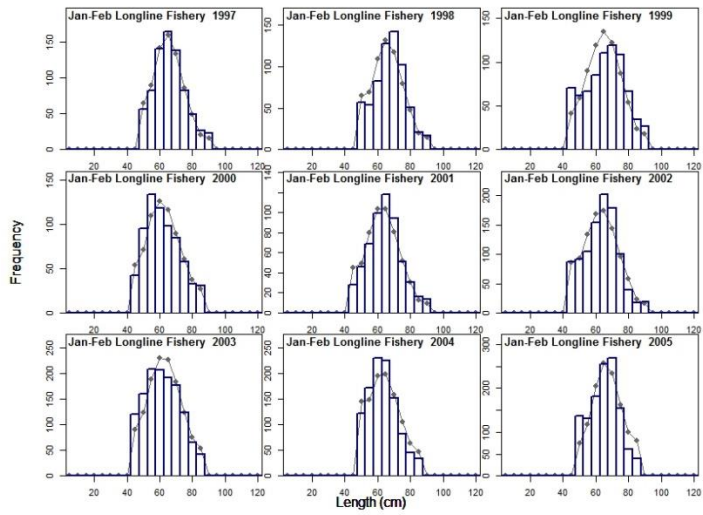


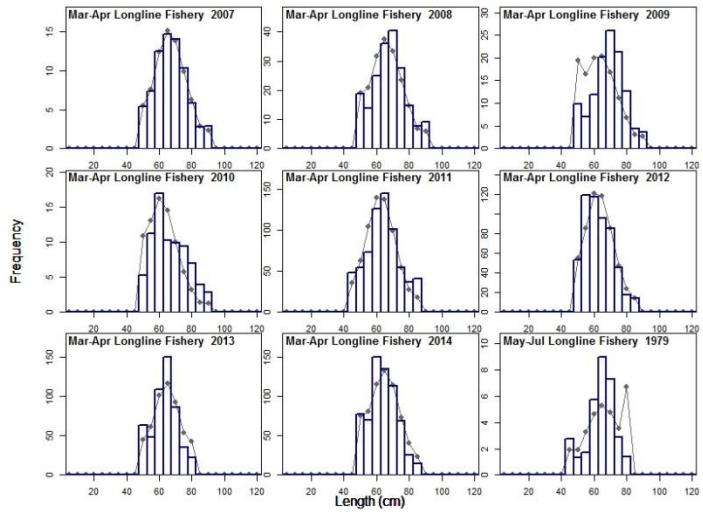
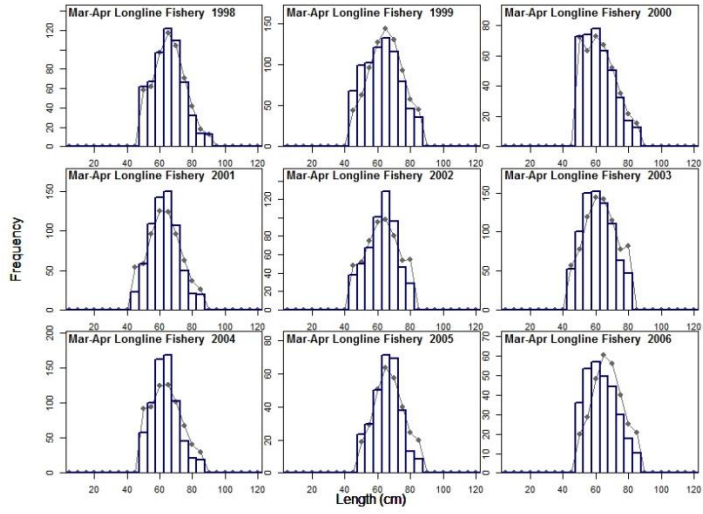
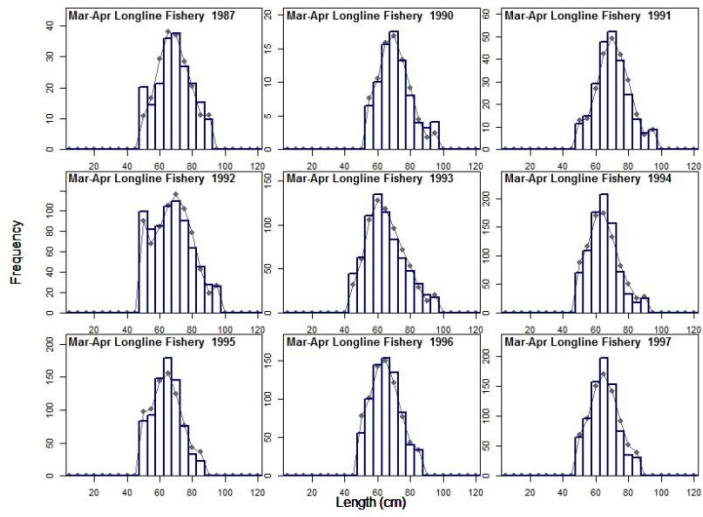


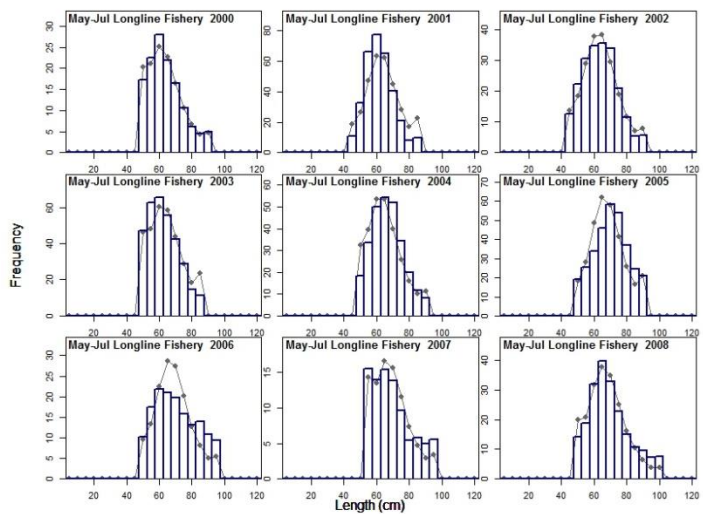
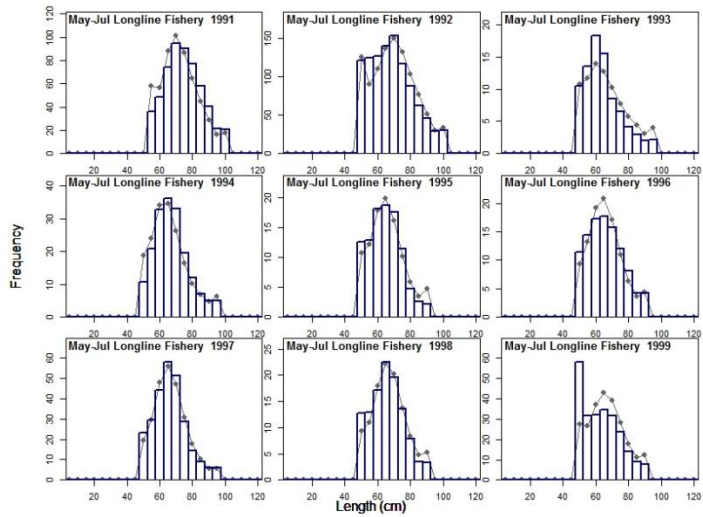
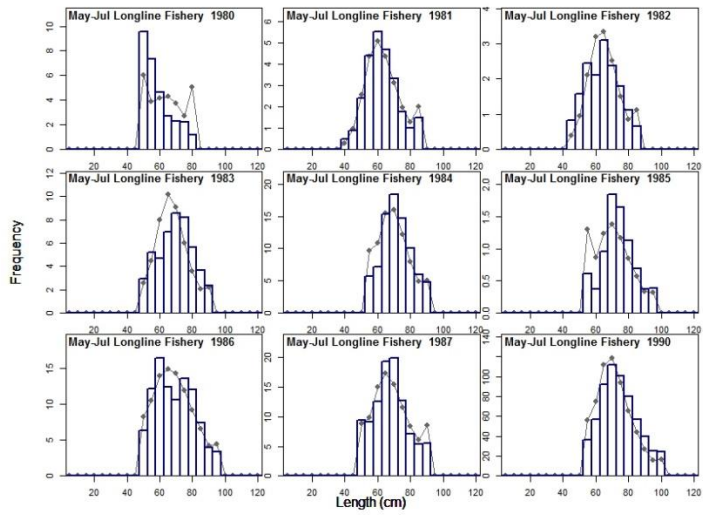


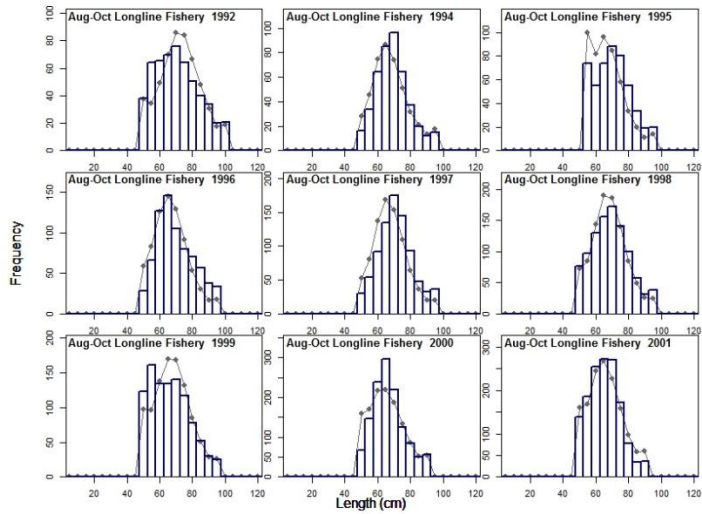
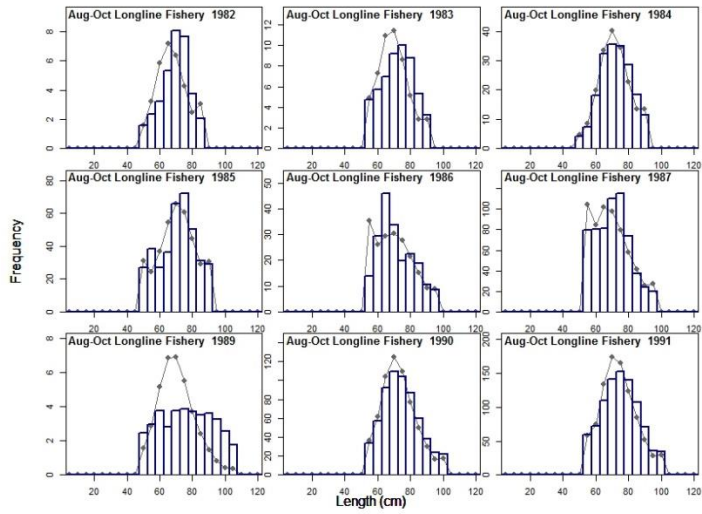
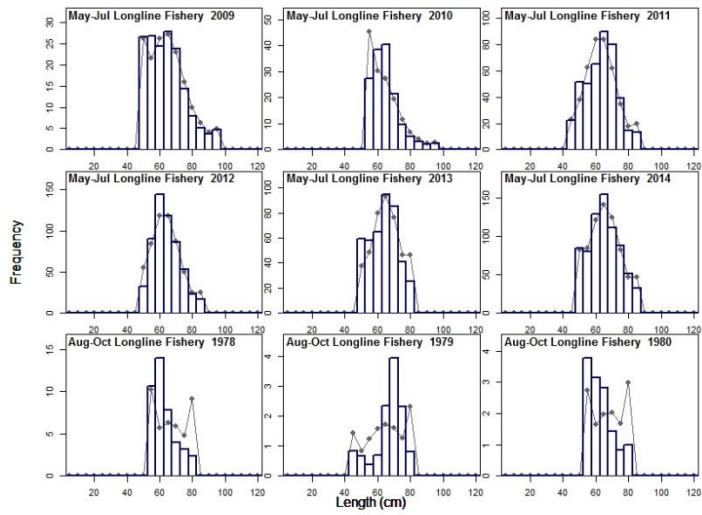


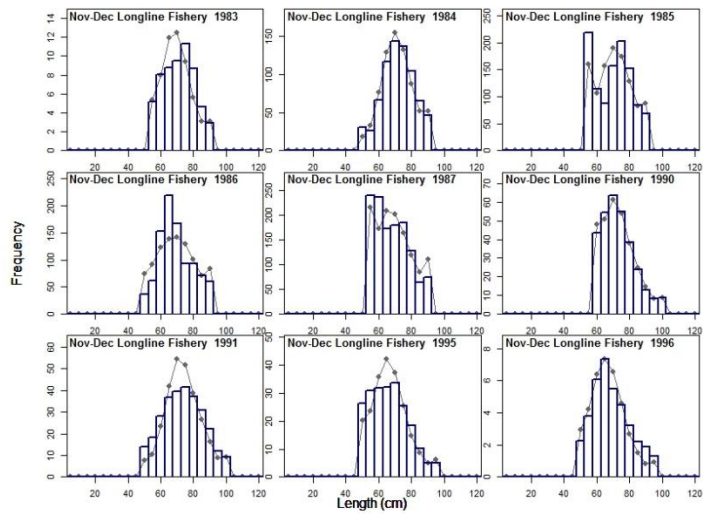
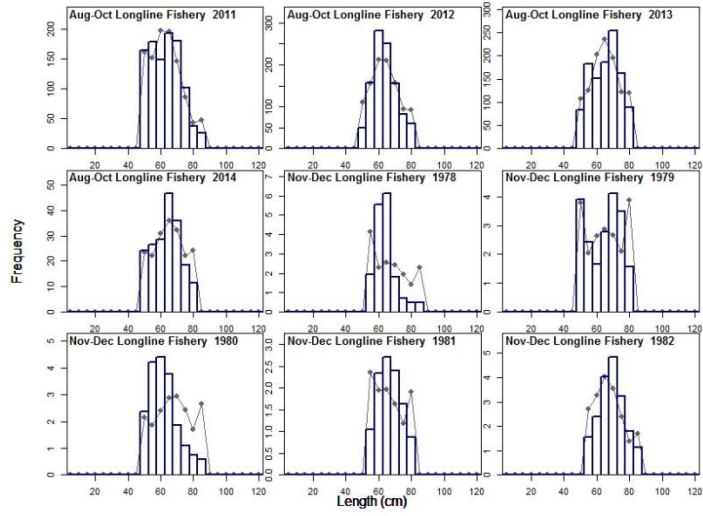
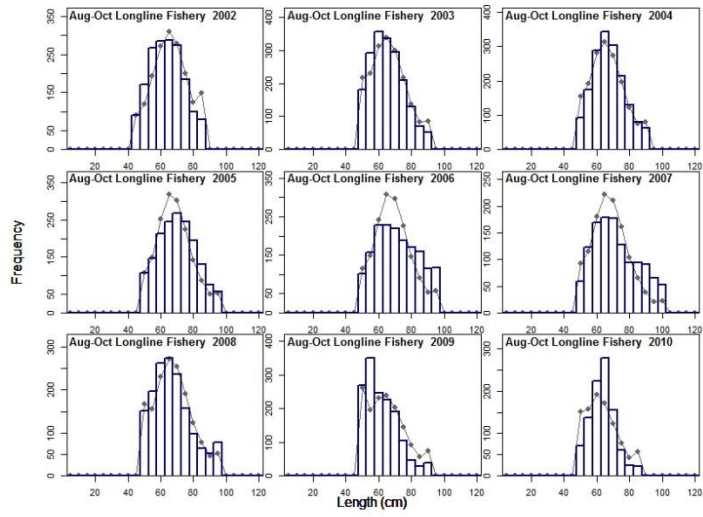


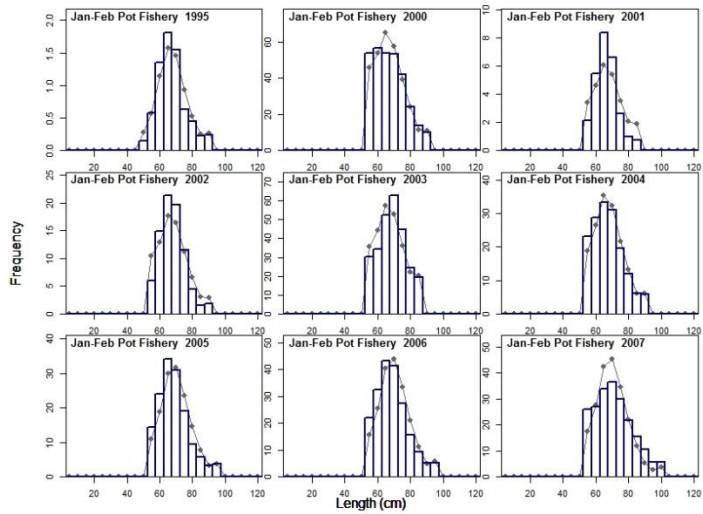
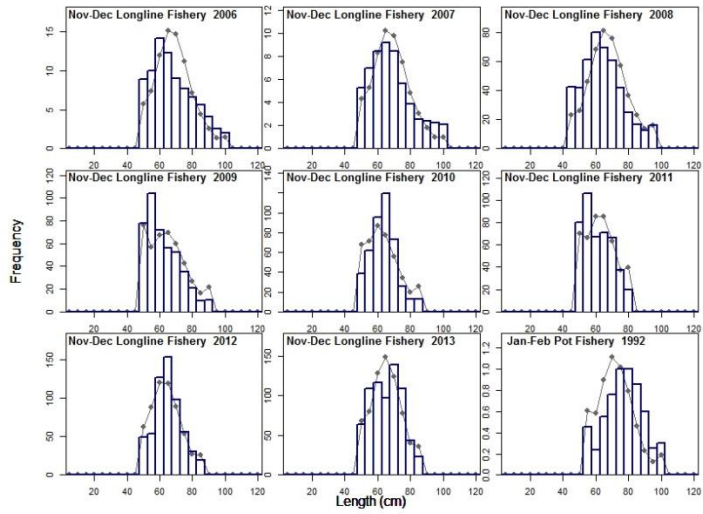
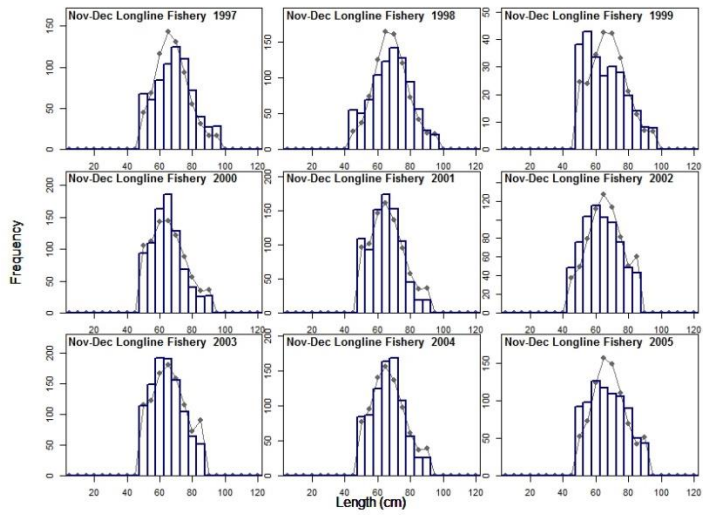


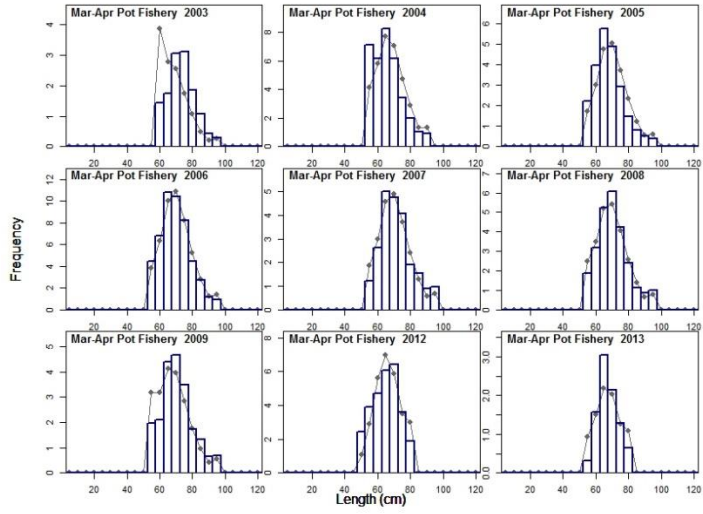
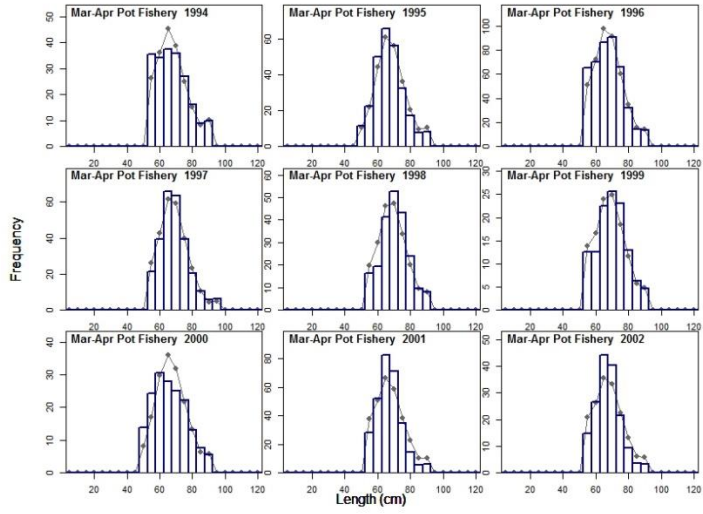
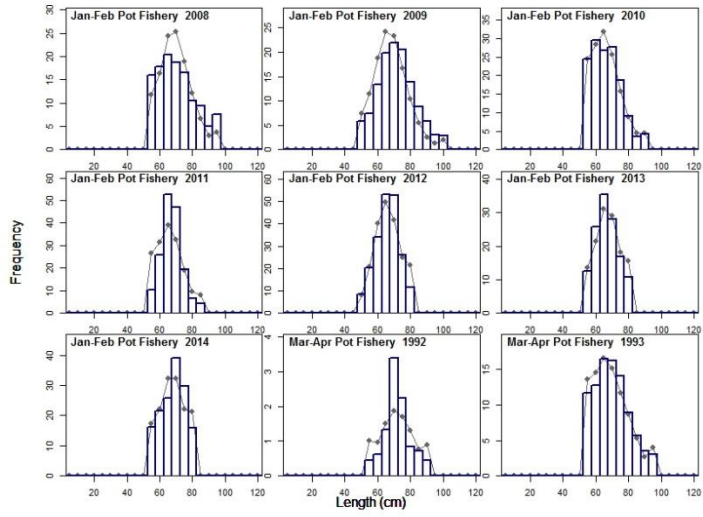


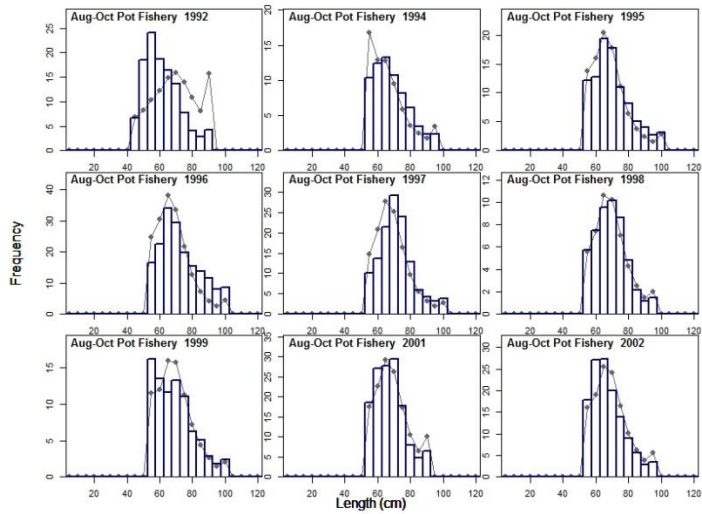
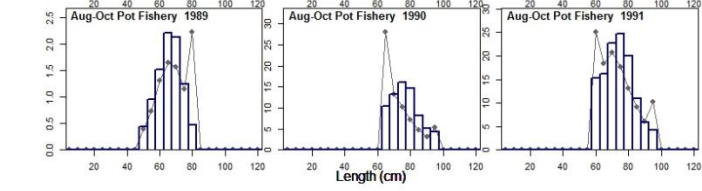
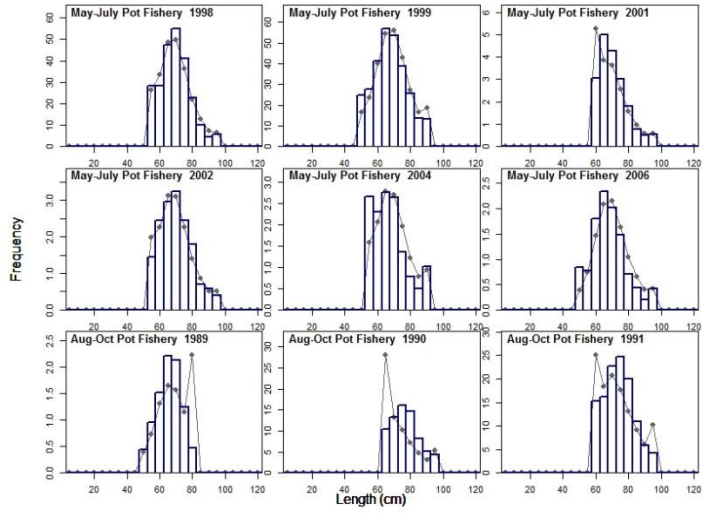
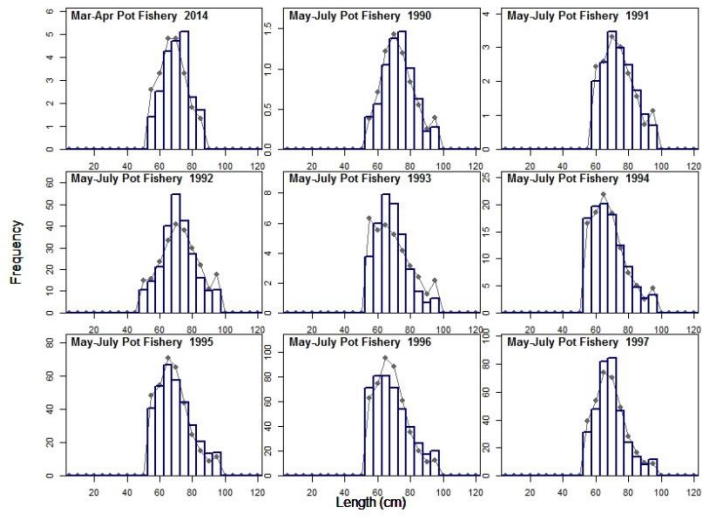


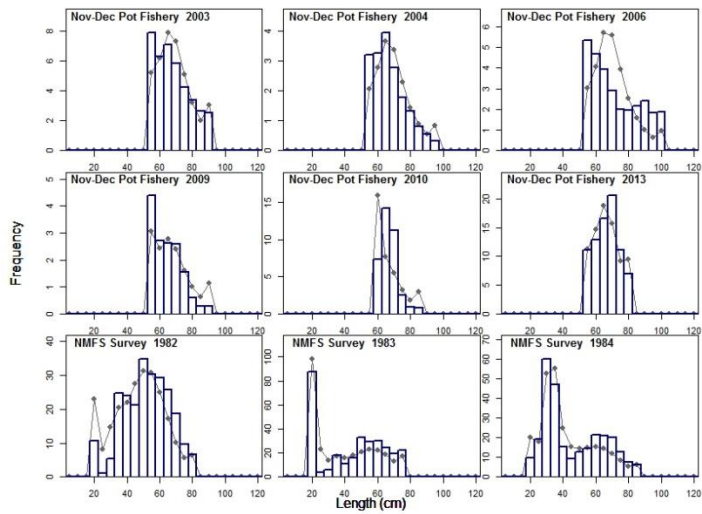
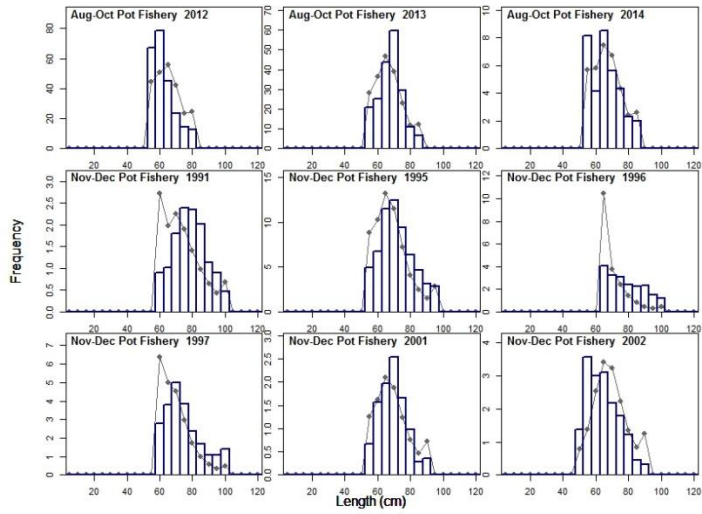
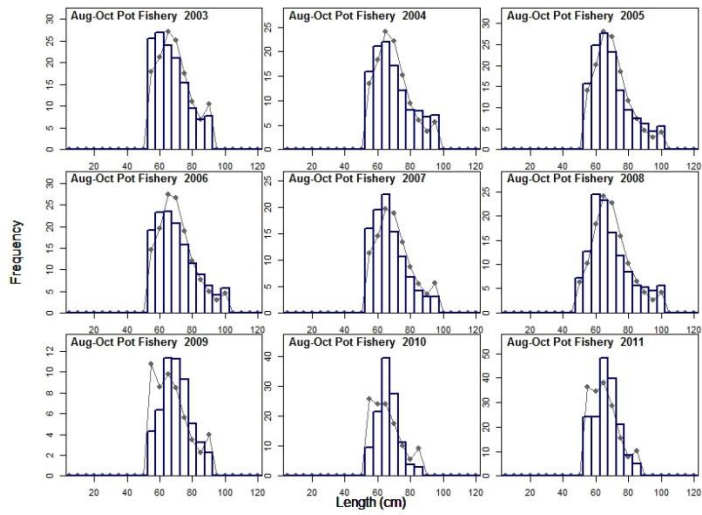


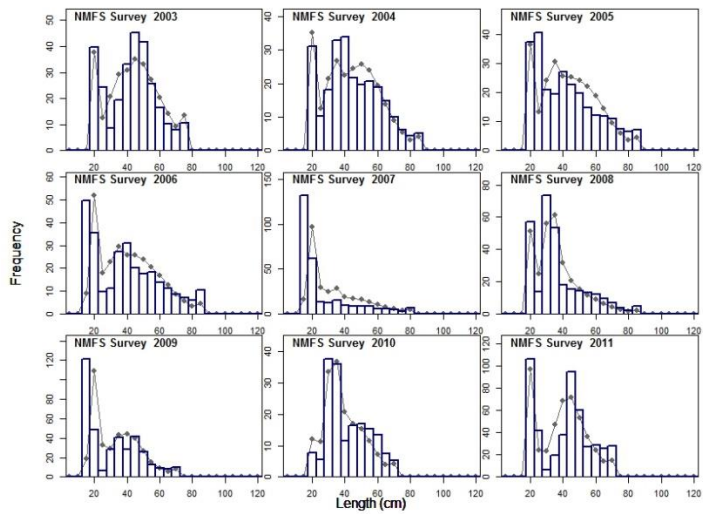
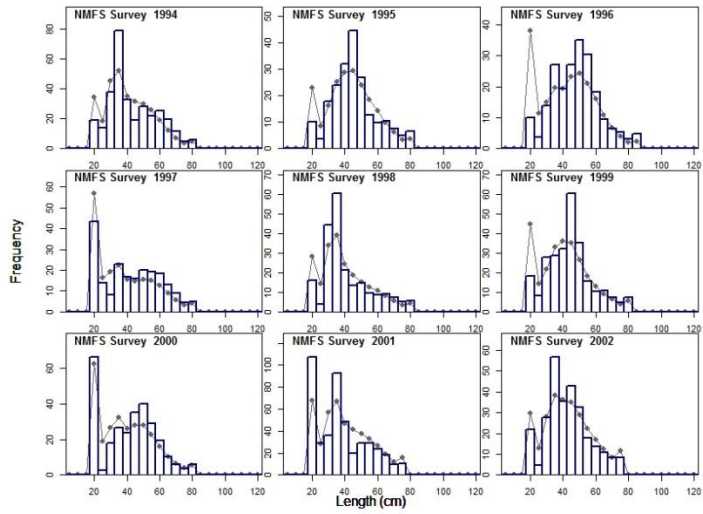
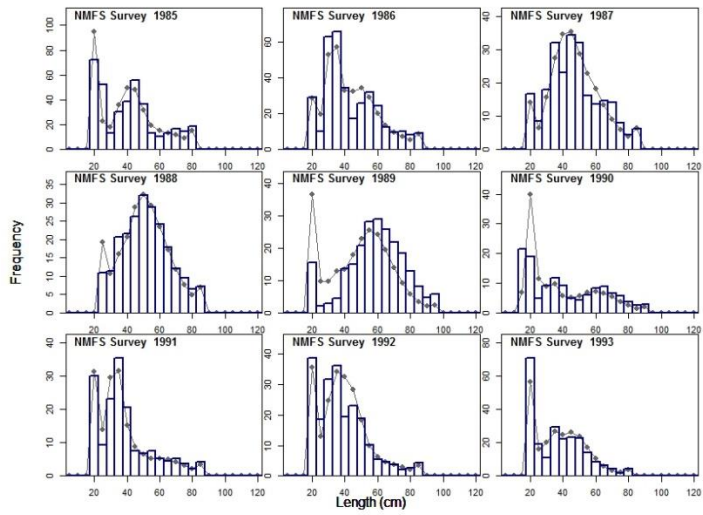


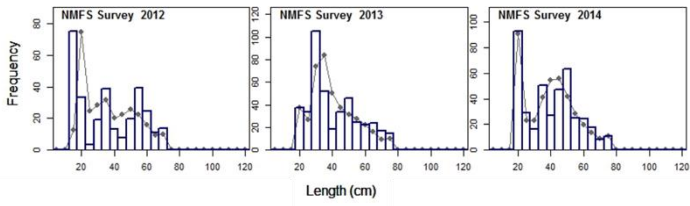












Appendix A.2.8. Observed length composition data (bars) and predicted frequencies (points) for cod for a) age and b) length composition