Science, Service, Stewardship

Gulf of Mexico Gray Snapper Benchmark Assessment

Review Workshop: Control

Jeff Isely
SEFSC
Miami

NOAA FISHERIES SERVICE

NOAA FISHERIES SERVICE

Control File

- Block design
- Natural mortality
- Fecundity
- Maturity
- Growth
- Recruitment
- F
- Selectivity
- Retention
- Discard mortality
- Data weighting

NOAA FISHERIES SERVICE

Control File

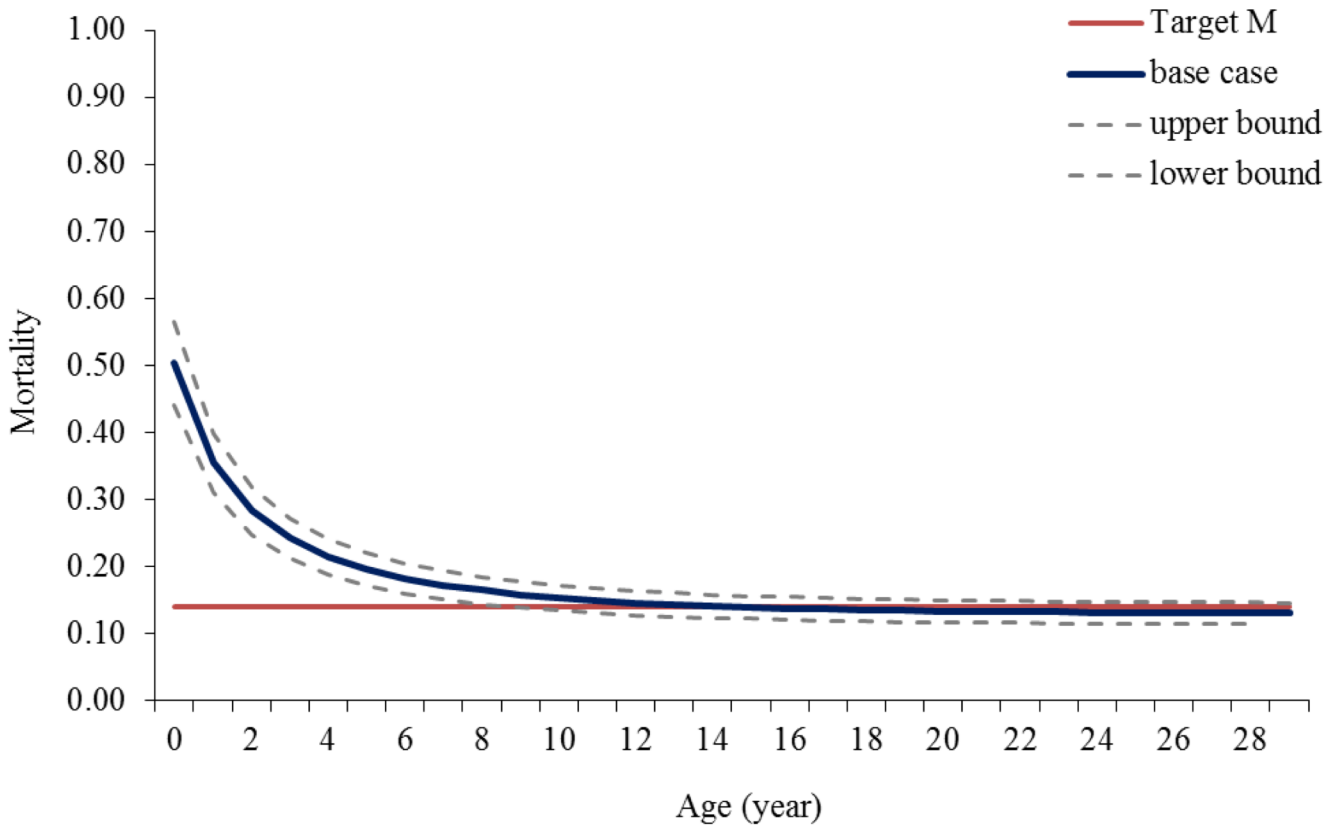
```
#V3.24S
1  #_N_Growth_Patterns
1 #_N_Morphs_Within_GrowthPattern
#
1 #_Nblock_Patterns
 1 #_blocks_per_pattern
# begin and end years of blocks
 1945 1989
#
```

- 2 time periods but 1 block
- Base parameter period (we chose post regulation) and a modified parameter period (the block, pre-regulation)

NOAA FISHERIES SERVICE

Natural Mortality

- Age-based (Lorenzen)
- Target M = 0.1487 (Hoenig)
- Max age = 28



NOAA FISHERIES SERVICE

Growth, Fecundity and Maturity

1 # GrowthModel: 1=vonBert with L1&L2; 2=Richards with L1&L2; 3=age_speciific_K; 4=not implemented

1 #_Growth_Age_for_L1

999 #_Growth_Age_for_L2 (999 to use as Linf)

0 #_SD_add_to_LAA (set to 0.1 for SS2 V1.x compatibility)

1 #_CV_Growth_Pattern: 0 CV=f(LAA); 1 CV=F(A); 2 SD=F(LAA); 3 SD=F(A); 4 logSD=F(A)

1 #_maturity_option: 1=length logistic; 2=age logistic; 3=read age-maturity by GP; 4=read age-fecundity by GP; 5=read fec and wt from wtatage.ss; 6=read length-maturity by GP

#_placeholder for empirical age- or length- maturity by growth pattern (female only)

2 #_First_Mature_Age

3 #_fecundity option:(1)eggs=Wt*(a+b*Wt);(2)eggs=a*L^b;(3)eggs=a*Wt^b; (4)eggs=a+b*L; (5)eggs=a+b*W

0 #_hermaphroditism option: 0=none; 1=age-specific fxn

1 #_parameter_offset_approach (1=none, 2= M, G, CV_G as offset from female-GP1, 3=like SS2 V1.x)

2 #_env/block/dev_adjust_method (1=standard; 2=logistic transform keeps in base parm bounds; 3=standard w/ no bound check)

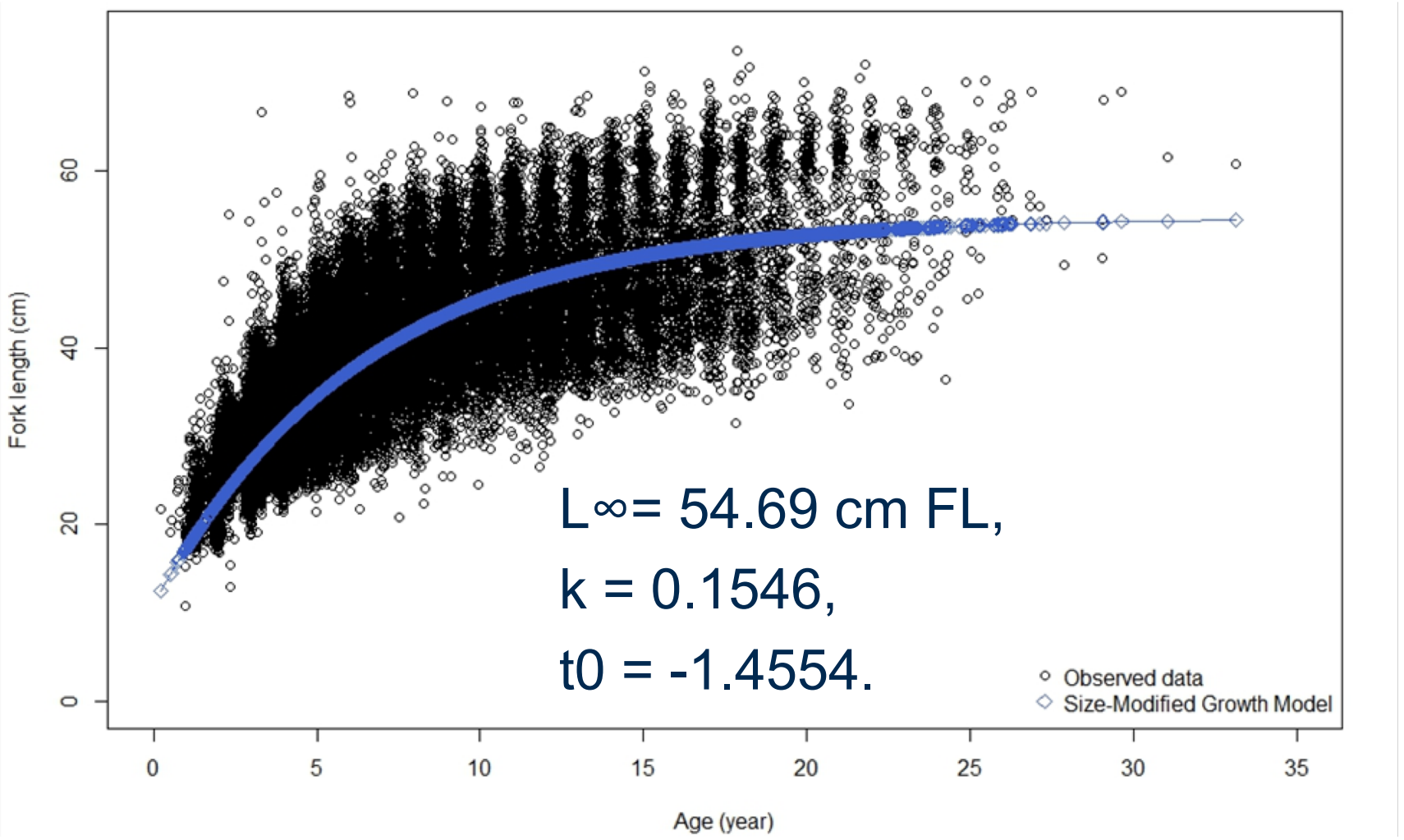
NOAA FISHERIES SERVICE

Growth Parameters

0 40	**15.0091**	15	-1 1 -3 0 0 0 0 0 0 0	# L_at_Amin_Fem_GP_1
4 70	**54.7**	54.7	-1 3.6 -3 0 0 0 0 0.5 0 0	# L_at_Amax_Fem_GP_1
0.01 0.5	**0.1546**	0.1546	-1 0.1514 -3 0 0 0 0 0.5 0 0	# VonBert_K_Fem_GP_1
0.05 0.3	**0.1514**	0.1514	-1 0.2 -6 0 0 0 0 0.5 0 0	# CV_young_Fem_GP_1
0.05 0.3	**0.1922**	0.1922	-1 0.2 -6 0 0 0 0 0.5 0 0	# CV_old_Fem_GP_1
1e-005 2 1.43e-005	**1.43e-005**		-1 0.8 -2 0 0 0 0 0.5 0 0	# Wtlen_1_Fem
2 4	**3.02**	3.02	-1 0.8 -2 0 0 0 0 0.5 0 0	# Wtlen_2_Fem

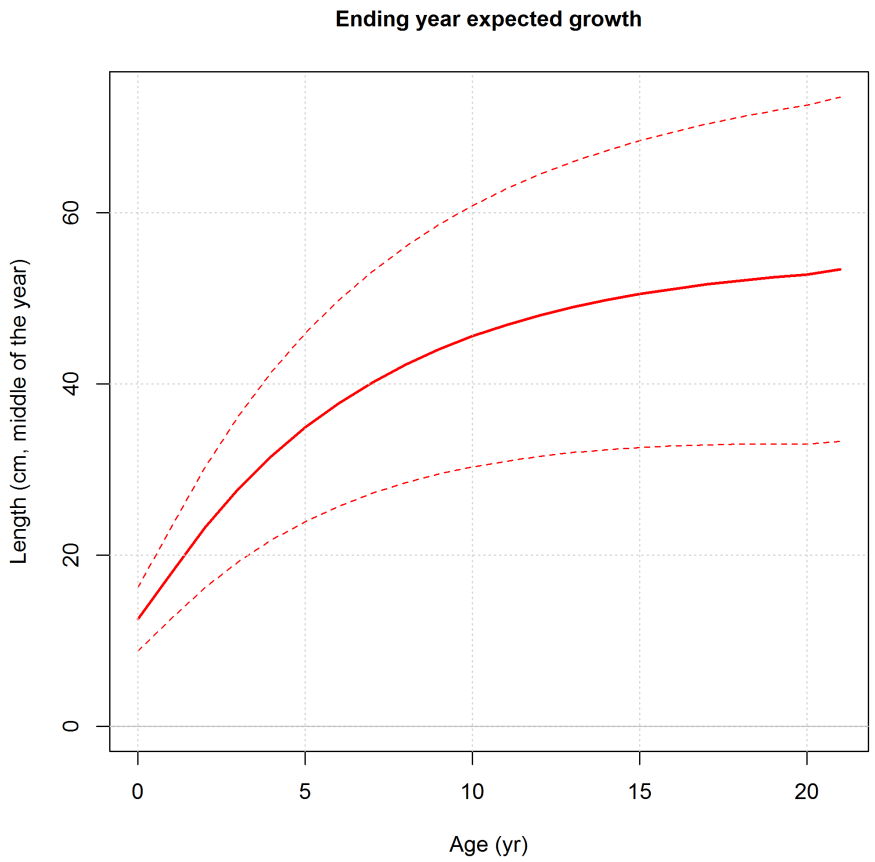
NOAA FISHERIES SERVICE

Growth Curve – All Samples



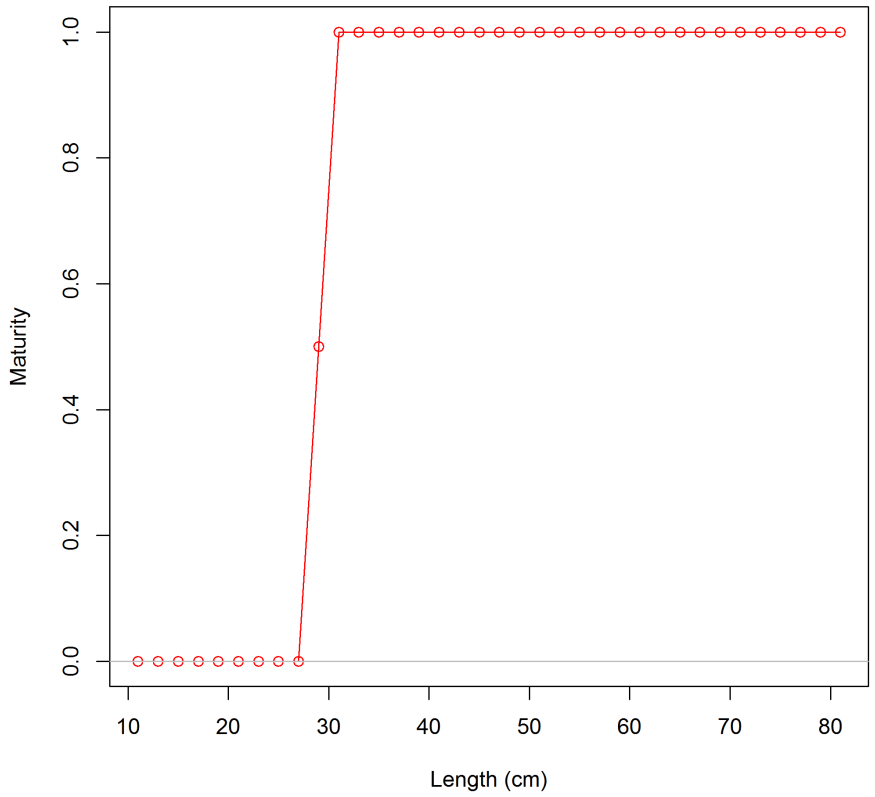
NOAA FISHERIES SERVICE

Predicted Growth Curve



NOAA FISHERIES SERVICE

Maturity – Knife edge at 300mm



NOAA FISHERIES SERVICE

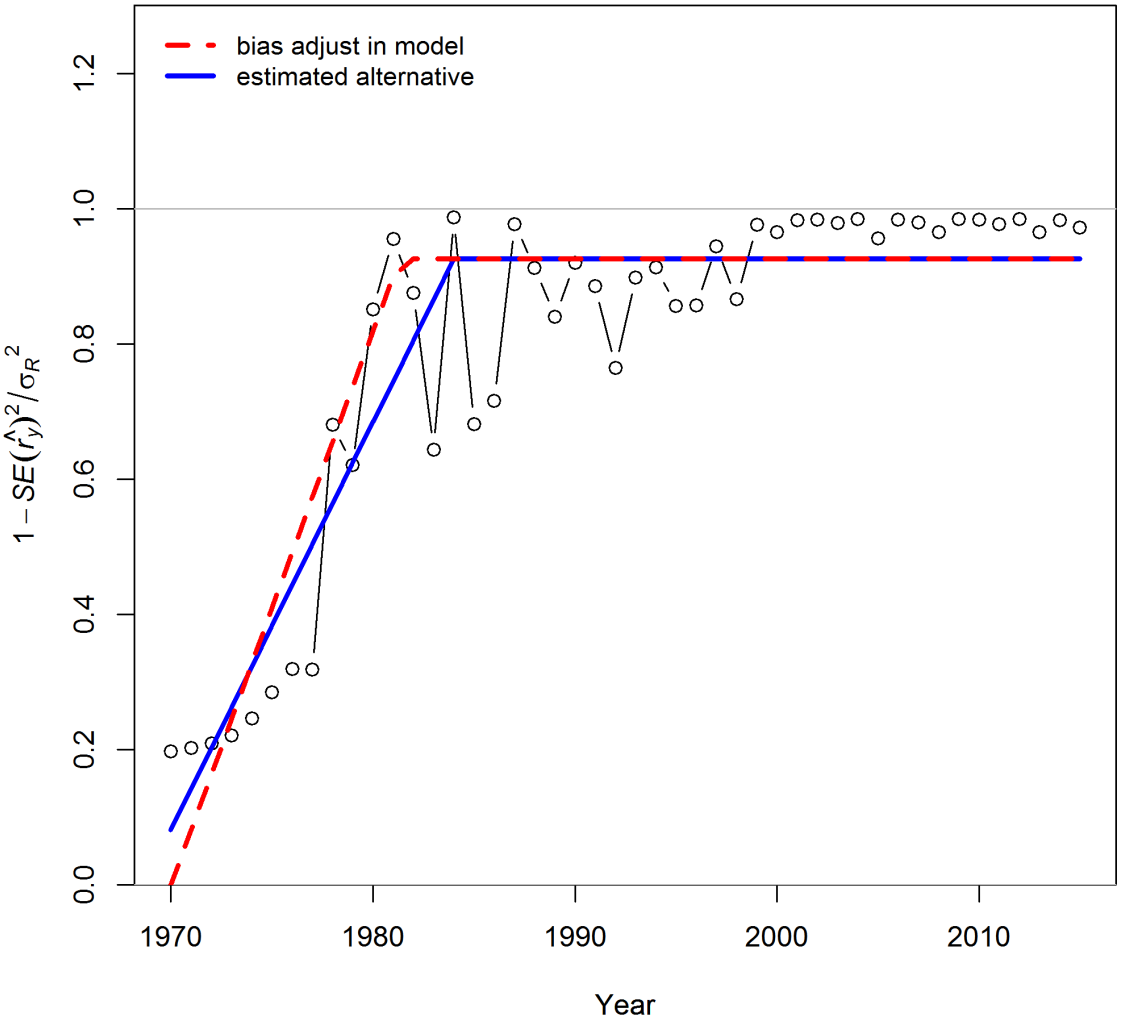
Recruitment Parameters

#_Spawner-Recruitment
3 #_SR_function: 2=Ricker; 3=std_B-H; 4=SCAA; 5=Hockey; 6=B-H_flattop; 7=survival_3Parm

#_LO	HI	INIT	PRIOR	PR_type	SD	PHASE	
5	35	**9.25896**	8	-1	99	**1**	# SR_LN(R0)
0.8	1	**0.99**	0.95	-1	2.5	**-2**	# SR_BH_steep
0.01	2	**0.895405**	0.6	-1	99	**4**	# SR_sigmaR
-5	5	0	0	-1	50	-4	# SR_envlink
-5	5	0	0	-1	50	-4	# SR_R1_offset
0	0.5	0	0	-1	50	-4	# SR_autocorr

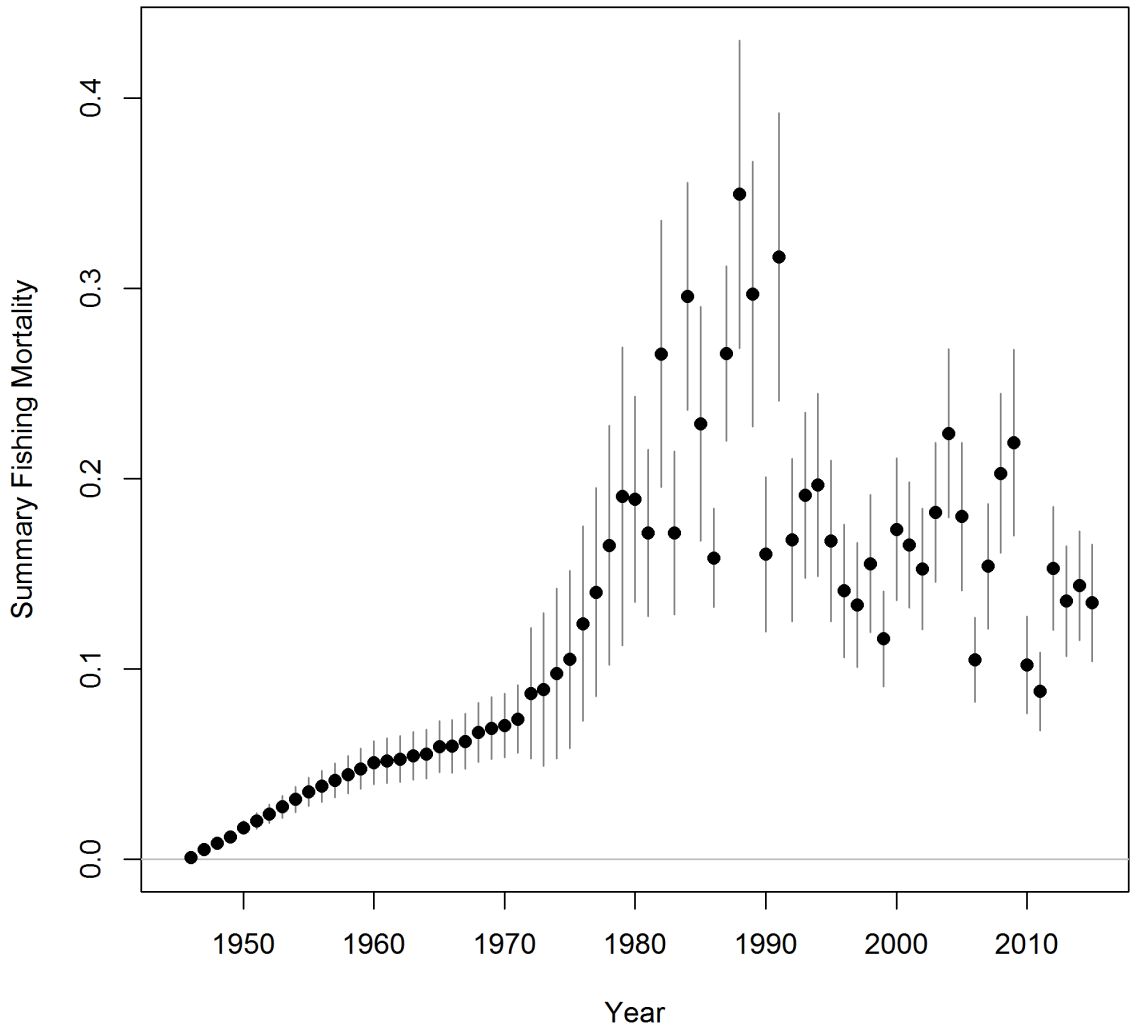
NOAA FISHERIES SERVICE

Recruitment Bias Adjustment



NOAA FISHERIES SERVICE

Fishing Mortality



NOAA FISHERIES SERVICE

Size Selectivity, Retention and Discard Mortality

#_LO HI INIT PRIOR PR_type SD PHASE env-var use_dev dev_minyr dev_maxyr dev_stddev Block Block_Fxn

13	60	31.6912	30	-1	99	2	0	0	0	0	0	0	0	#	**SizeSel_1P_1_CHL_MC_1**
-15	0	-11.469	-5	-1	99	3	0	0	0	0	0	0	0	#	**SizeSel_1P_2_CHL_MC_1**
-25	10	3.54736	3.33	-1	99	3	0	0	0	0	0	0	0	#	**SizeSel_1P_3_CHL_MC_1**
0	15	4.7605	4.7	-1	99	3	0	0	0	0	0	0	0	#	**SizeSel_1P_4_CHL_MC_1**
-15	10	-11.8346	-999	-1	99	2	0	0	0	0	0	0	0	#	**SizeSel_1P_5_CHL_MC_1**
-15	5	-1.45108	-999	-1	99	2	0	0	0	0	0	0	0	#	**SizeSel_1P_6_CHL_MC_1**
13	79	28.8	28.8	-1	1	-3	0	0	0	0	0	1	2	#	Retain_1P_1_CHL_MC_1
-1	30	1	1	-1	1	-3	0	0	0	0	0	1	2	#	Retain_1P_2_CHL_MC_1
-1	2	1	1	-1	1	-4	0	0	0	0	0	0	0	#	Retain_1P_3_CHL_MC_1
-1	2	0	0	-1	1	-4	0	0	0	0	0	0	0	#	Retain_1P_4_CHL_MC_1
-10	10	-5	-5	-1	1	-2	0	0	0	0	0	0	0	#	DiscMort_1P_1_CHL_MC_1
-1	2	1	1	-1	1	-4	0	0	0	0	0	0	0	#	DiscMort_1P_2_CHL_MC_1
0	2	0.14	0.14	-1	1	-2	0	0	0	0	0	0	0	#	DiscMort_1P_3_CHL_MC_1
-1	2	0	0	-1	1	-4	0	0	0	0	0	0	0	#	DiscMort_1P_4_CHL_MC_1

NOAA FISHERIES SERVICE

Size Selectivity, Retention and Discard Mortality

#_LO HI INIT PRIOR PR_type SD PHASE env-var use_dev dev_minyr dev_maxyr dev_stddev Block Block_Fxn

13	60	31.6912	30	-1	99	2	0	0	0	0	0	0	0	#	SizeSel_1P_1_CHL_MC_1
-15	0	-11.469	-5	-1	99	3	0	0	0	0	0	0	0	#	SizeSel_1P_2_CHL_MC_1
-25	10	3.54736	3.33	-1	99	3	0	0	0	0	0	0	0	#	SizeSel_1P_3_CHL_MC_1
0	15	4.7605	4.7	-1	99	3	0	0	0	0	0	0	0	#	SizeSel_1P_4_CHL_MC_1
-15	10	-11.8346	-999	-1	99	2	0	0	0	0	0	0	0	#	SizeSel_1P_5_CHL_MC_1
-15	5	-1.45108	-999	-1	99	2	0	0	0	0	0	0	0	#	SizeSel_1P_6_CHL_MC_1
13	79	28.8	28.8	-1	1	-3	0	0	0	0	0	1	2	#	**Retain_1P_1_CHL_MC_1**
-1	30	1	1	-1	1	-3	0	0	0	0	0	1	2	#	**Retain_1P_2_CHL_MC_1**
-1	2	1	1	-1	1	-4	0	0	0	0	0	0	0	#	**Retain_1P_3_CHL_MC_1**
-1	2	0	0	-1	1	-4	0	0	0	0	0	0	0	#	**Retain_1P_4_CHL_MC_1**
-10	10	-5	-5	-1	1	-2	0	0	0	0	0	0	0	#	DiscMort_1P_1_CHL_MC_1
-1	2	1	1	-1	1	-4	0	0	0	0	0	0	0	#	DiscMort_1P_2_CHL_MC_1
0	2	0.14	0.14	-1	1	-2	0	0	0	0	0	0	0	#	DiscMort_1P_3_CHL_MC_1
-1	2	0	0	-1	1	-4	0	0	0	0	0	0	0	#	DiscMort_1P_4_CHL_MC_1

NOAA FISHERIES SERVICE

Size Selectivity, Retention and Discard Mortality

#_LO HI INIT PRIOR PR_type SD PHASE env-var use_dev dev_minyr dev_maxyr dev_stddev Block Block_Fxn

13	60	31.6912	30	-1	99	2	0	0	0	0	0	0	0	#	SizeSel_1P_1_CHL_MC_1
-15	0	-11.469	-5	-1	99	3	0	0	0	0	0	0	0	#	SizeSel_1P_2_CHL_MC_1
-25	10	3.54736	3.33	-1	99	3	0	0	0	0	0	0	0	#	SizeSel_1P_3_CHL_MC_1
0	15	4.7605	4.7	-1	99	3	0	0	0	0	0	0	0	#	SizeSel_1P_4_CHL_MC_1
-15	10	-11.8346	-999	-1	99	2	0	0	0	0	0	0	0	#	SizeSel_1P_5_CHL_MC_1
-15	5	-1.45108	-999	-1	99	2	0	0	0	0	0	0	0	#	SizeSel_1P_6_CHL_MC_1
13	79	28.8	28.8	-1	1	-3	0	0	0	0	0	1	2	#	Retain_1P_1_CHL_MC_1
-1	30	1	1	-1	1	-3	0	0	0	0	0	1	2	#	Retain_1P_2_CHL_MC_1
-1	2	1	1	-1	1	-4	0	0	0	0	0	0	0	#	Retain_1P_3_CHL_MC_1
-1	2	0	0	-1	1	-4	0	0	0	0	0	0	0	#	Retain_1P_4_CHL_MC_1
-10	10	-5	-5	-1	1	-2	0	0	0	0	0	0	0	#	**DiscMort_1P_1_CHL_MC_1**
-1	2	1	1	-1	1	-4	0	0	0	0	0	0	0	#	**DiscMort_1P_2_CHL_MC_1**
0	2	0.14	0.14	-1	1	-2	0	0	0	0	0	0	0	#	**DiscMort_1P_3_CHL_MC_1**
-1	2	0	0	-1	1	-4	0	0	0	0	0	0	0	#	**DiscMort_1P_4_CHL_MC_1**

NOAA FISHERIES SERVICE

Size Selectivity, Retention and Discard Mortality

#_LO HI INIT PRIOR PR_type SD PHASE env-var use_dev dev_minyr dev_maxyr dev_stddev Block Block_Fxn

13	60	31.6912	30	-1	99	2	0	0	0	0	0	0	0	#	SizeSel_1P_1_CHL_MC_1
-15	0	-11.469	-5	-1	99	3	0	0	0	0	0	0	0	#	SizeSel_1P_2_CHL_MC_1
-25	10	3.54736	3.33	-1	99	3	0	0	0	0	0	0	0	#	SizeSel_1P_3_CHL_MC_1
0	15	4.7605	4.7	-1	99	3	0	0	0	0	0	0	0	#	SizeSel_1P_4_CHL_MC_1
-15	10	-11.8346	-999	-1	99	2	0	0	0	0	0	0	0	#	SizeSel_1P_5_CHL_MC_1
-15	5	-1.45108	-999	-1	99	2	0	0	0	0	0	0	0	#	SizeSel_1P_6_CHL_MC_1
13	79	28.8	28.8	-1	1	-3	0	0	0	0	0	**1**	**2**	#	Retain_1P_1_CHL_MC_1
-1	30	1	1	-1	1	-3	0	0	0	0	0	**1**	**2**	#	Retain_1P_2_CHL_MC_1
-1	2	1	1	-1	1	-4	0	0	0	0	0	0	0	#	Retain_1P_3_CHL_MC_1
-1	2	0	0	-1	1	-4	0	0	0	0	0	0	0	#	Retain_1P_4_CHL_MC_1
-10	10	-5	-5	-1	1	-2	0	0	0	0	0	0	0	#	DiscMort_1P_1_CHL_MC_1
-1	2	1	1	-1	1	-4	0	0	0	0	0	0	0	#	DiscMort_1P_2_CHL_MC_1
0	2	0.14	0.14	-1	1	-2	0	0	0	0	0	0	0	#	DiscMort_1P_3_CHL_MC_1
-1	2	0	0	-1	1	-4	0	0	0	0	0	0	0	#	DiscMort_1P_4_CHL_MC_1

NOAA FISHERIES SERVICE

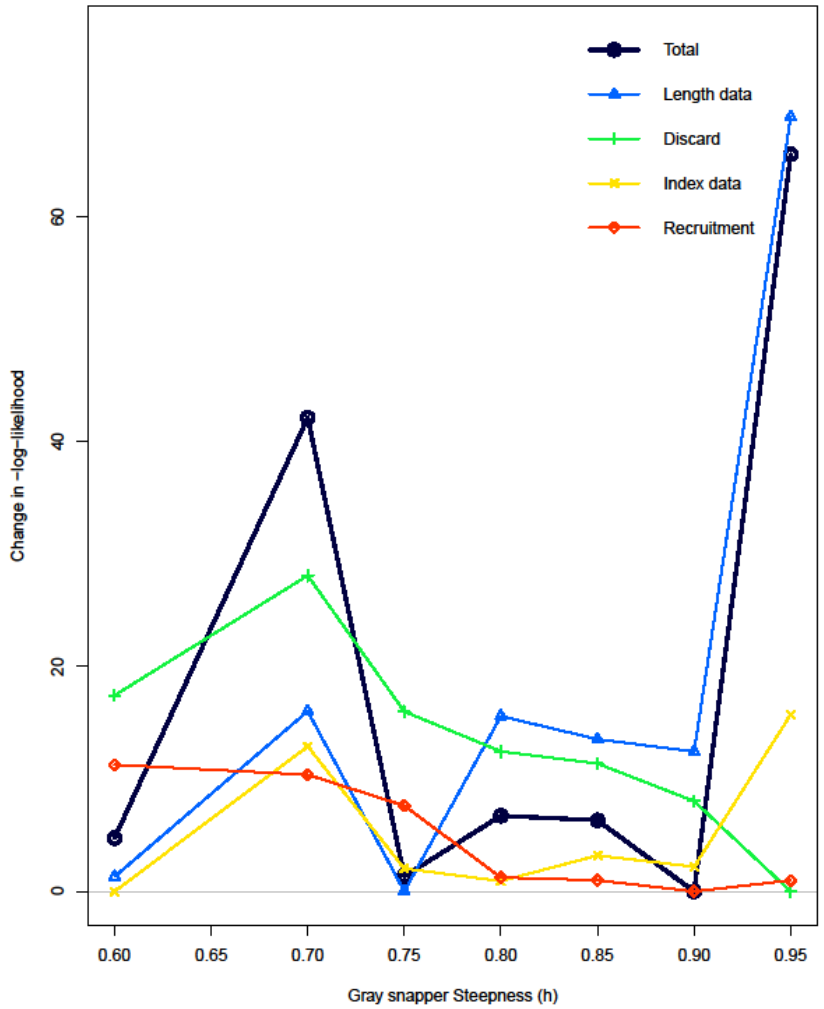
Francis Reweighting – Length Composition

1 #_maxlambdaphase
1 #_sd_offset
#
6 # number of changes to make to default Lambdas (default value is 1.0)
#like_comp fleet/survey phase value sizefreq_method
4 1 1 0.1738 4
4 2 1 0.1584 4
4 3 1 0.2058 4
4 4 1 0.3012 4
4 5 1 0.1439 4
4 6 1 0.1763 4

NOAA
FISHERIES
SERVICE

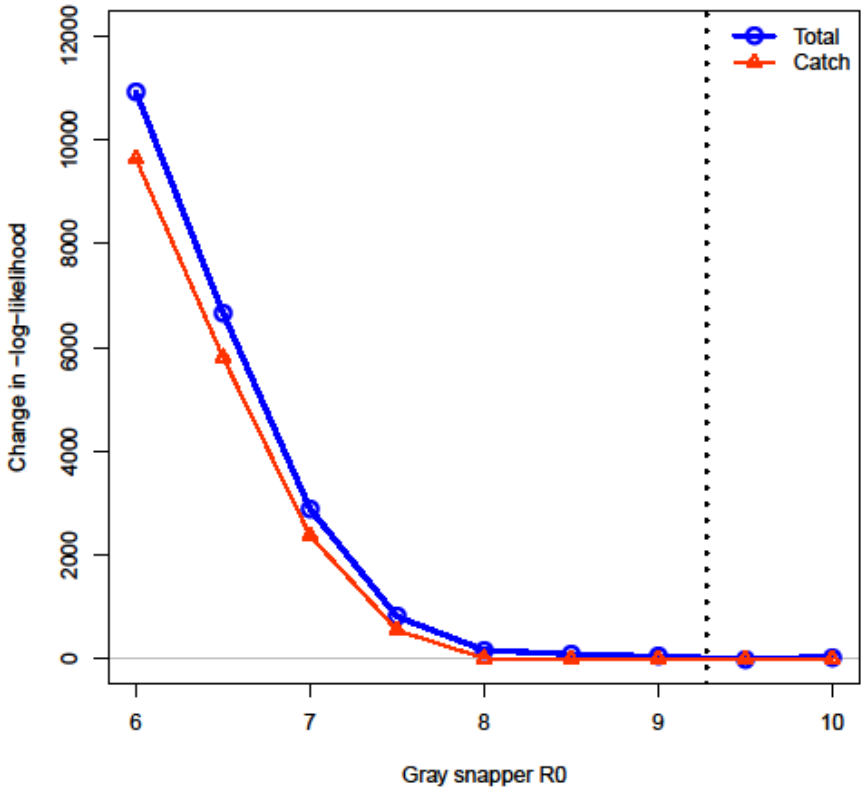
NOAA
FISHERIES
SERVICE

Steepness



NOAA
FISHERIES
SERVICE

R0



NOAA
FISHERIES
SERVICE

Sigma R