

Science, Service, Stewardship



SEDAR 22 Review Workshop: Tilefish Stock Synthesis Assessment



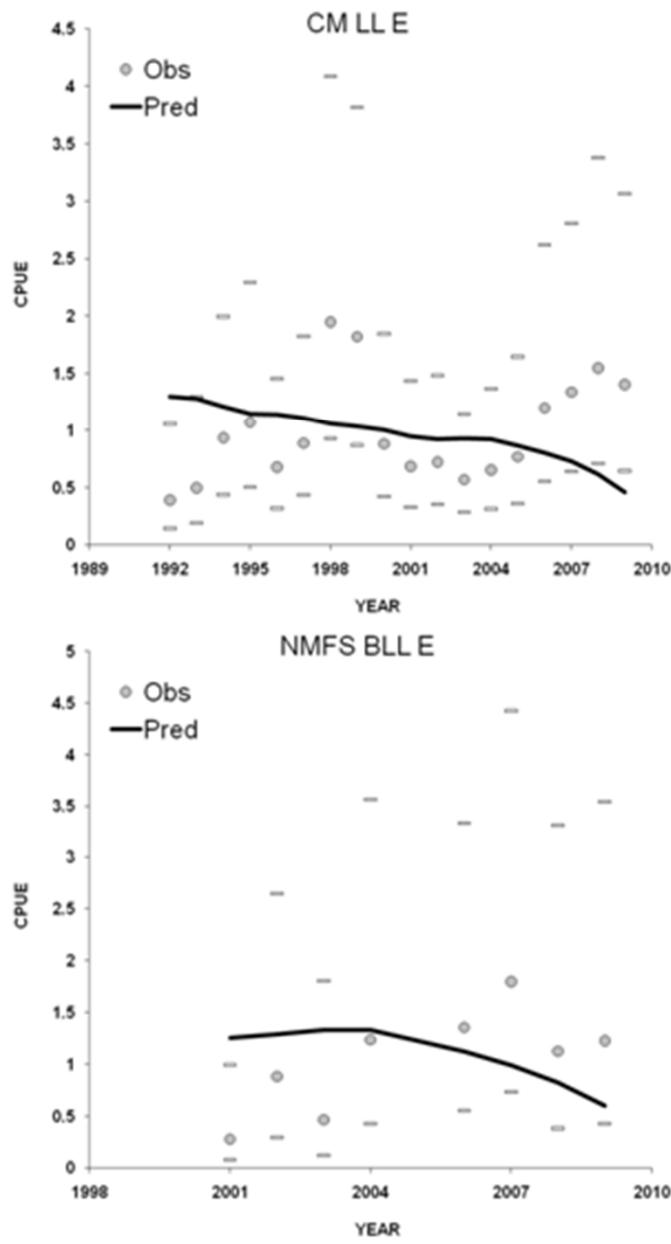
Tampa, FL
Feb. 14-17, 2011

**NOAA
FISHERIES
SERVICE**



SS Run 1: Central Model

- 2 regions and 2 genders
- 4 growth morphs w/ von B growth functions
- Lorenzen $M = 0.14$ (M_{ref}) at age-4 (M_{ref} age)
- Sex transition modeled as cum. normal function of age
- BH S-R function w/ recruitment SD (σ_R) = 0.15
 - Rec. distribution parameter splits recruits b/w regions
- Asymptotic selectivity for all fisheries/surveys
 - Selectivity mirrored across regions

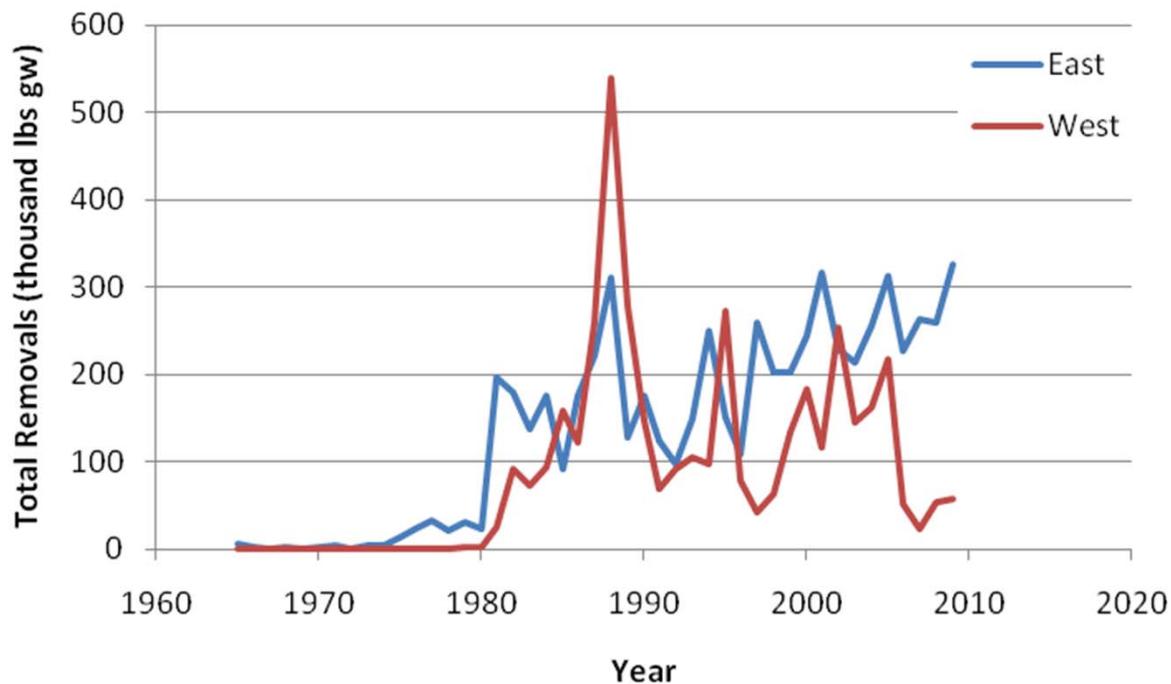


Poor fit to indices, except CM LL W

Due to signals from catch, age and length comps



Total Removals by Region



Record high
removals in East in
most recent years

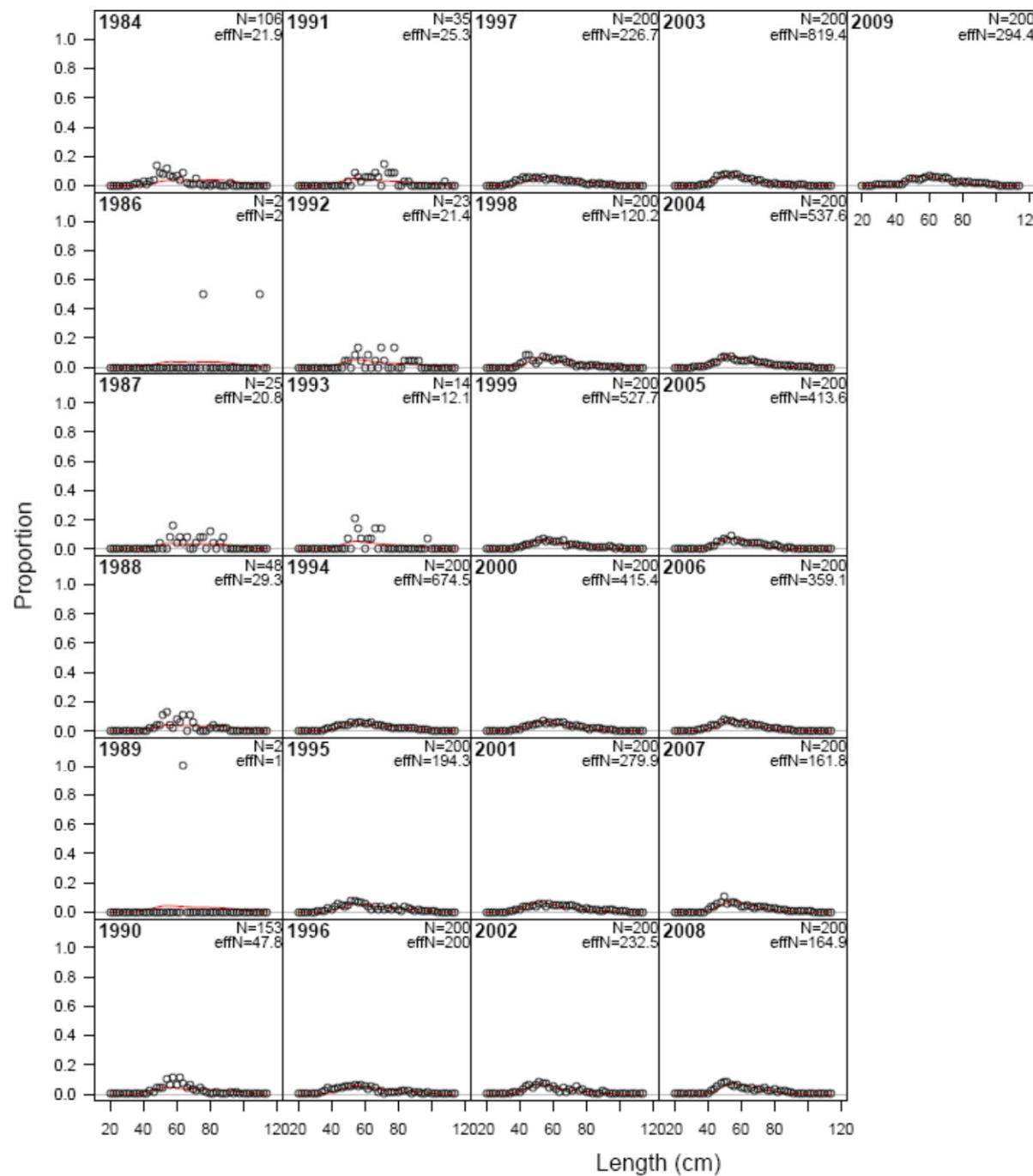
Stable or declining
trend in West



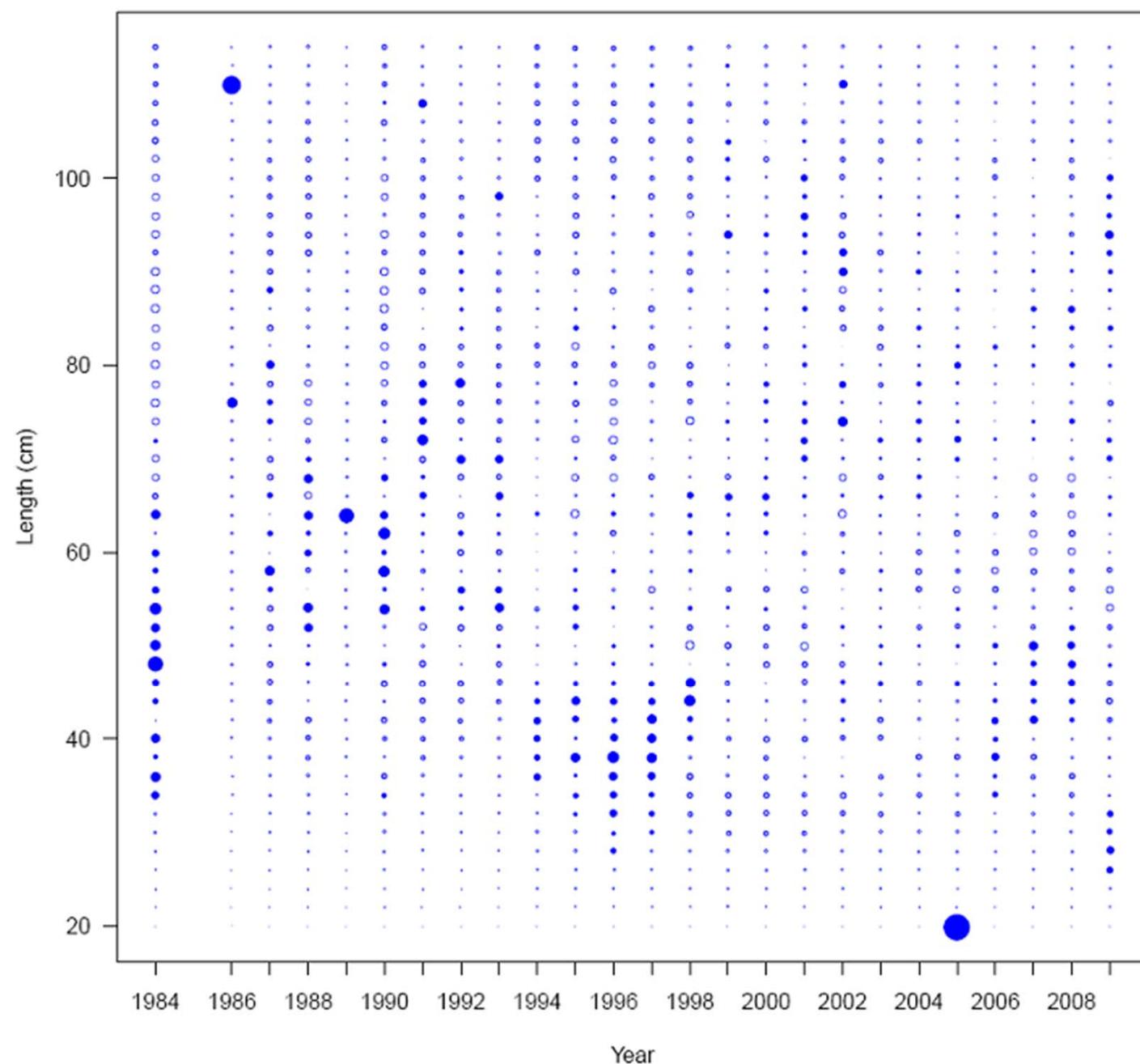
Length Composition

- Poor fits to length composition data
- No obvious residual patterns
- Eastern commercial longline (unknown gender) fits and residuals shown as example

length comps, sexes combined, retained, LLE



Pearson residuals, sexes combined, retained, LLE (max=22.91)

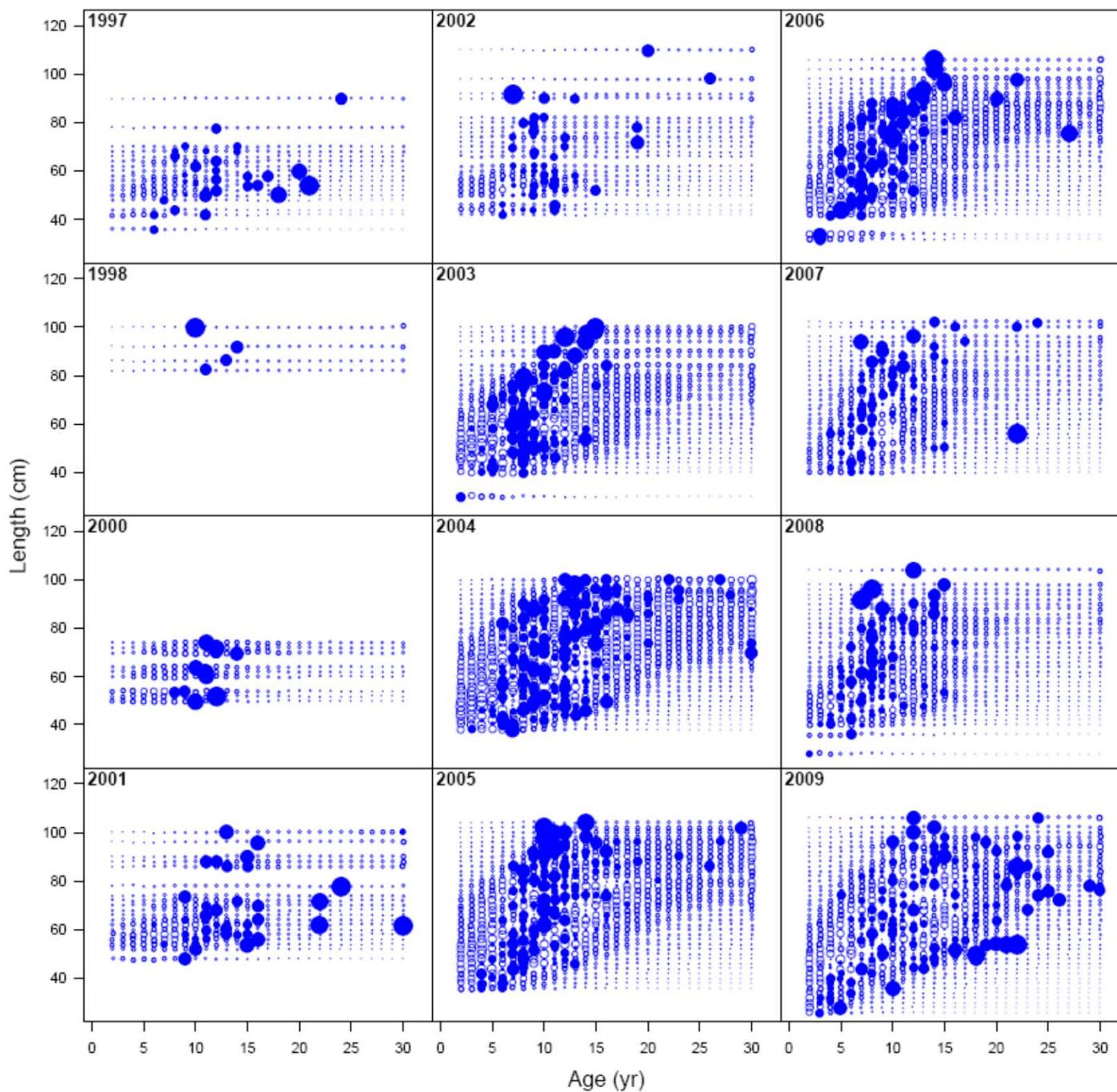




Age Composition

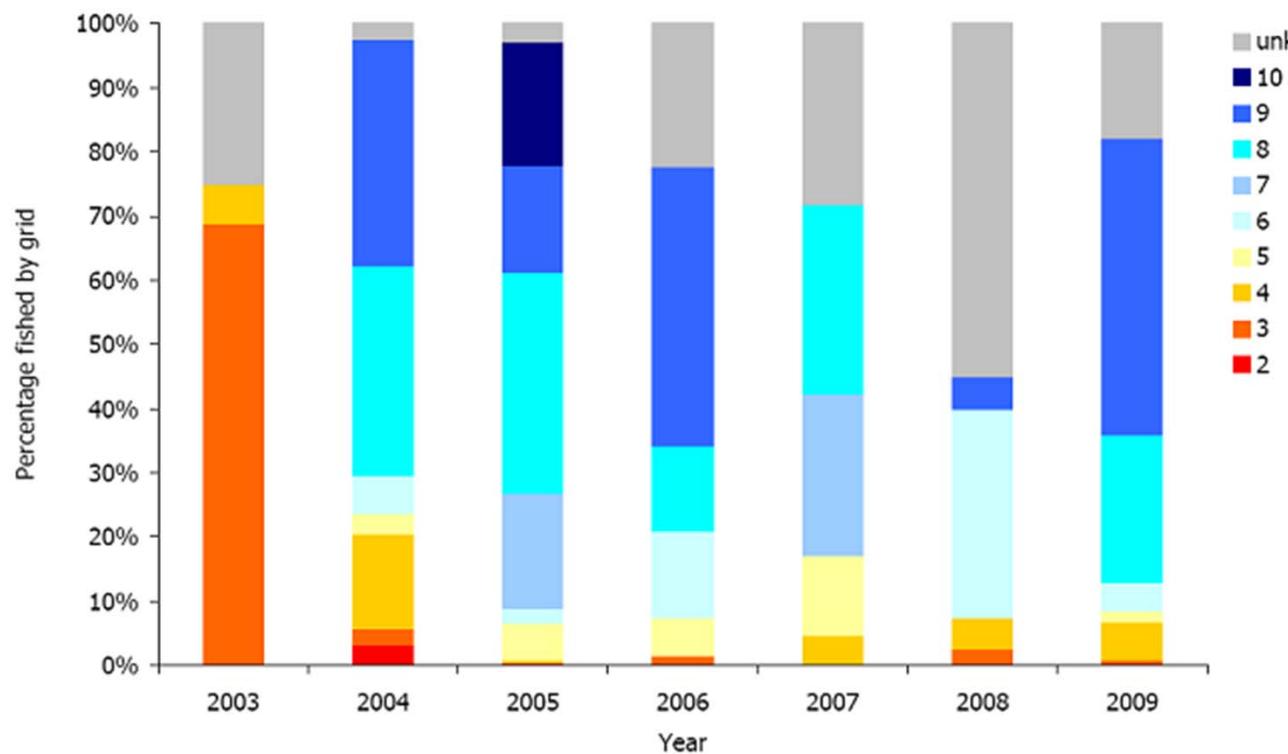
- Poor fits to age composition data
- Consistent underestimation of age 10-15 yr old fish in 2000s
- Eastern commercial longline (unknown gender) residuals shown as example

Pearson residuals, sexes combined, retained, LLE (max=13.89)





Age Composition Samples

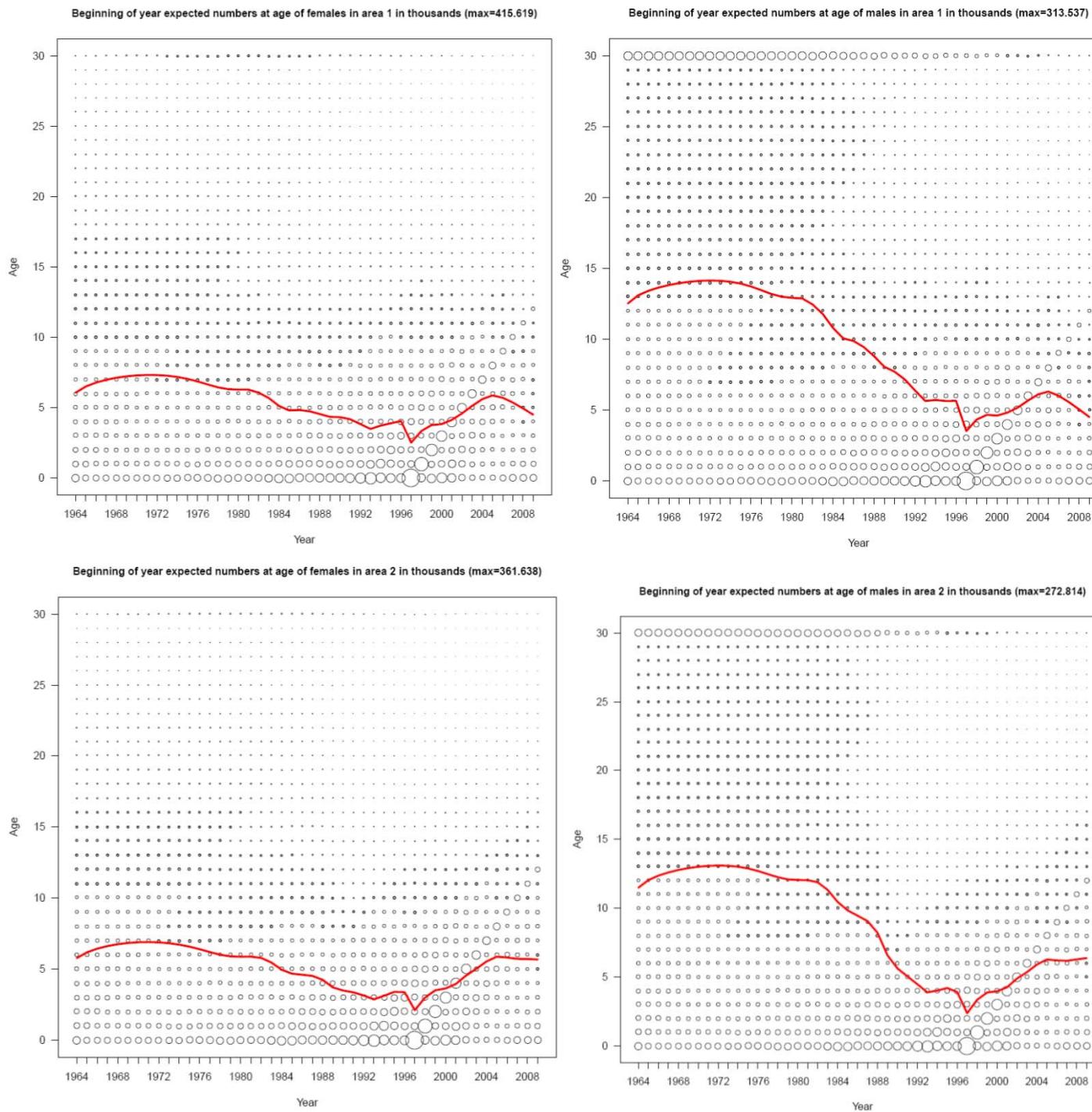


Shift in stat area where samples collected

Shift in vessels from which samples collected

Changes
due to

- 1) increased harvest in 80s and
- 2) increased recruitment in 90s



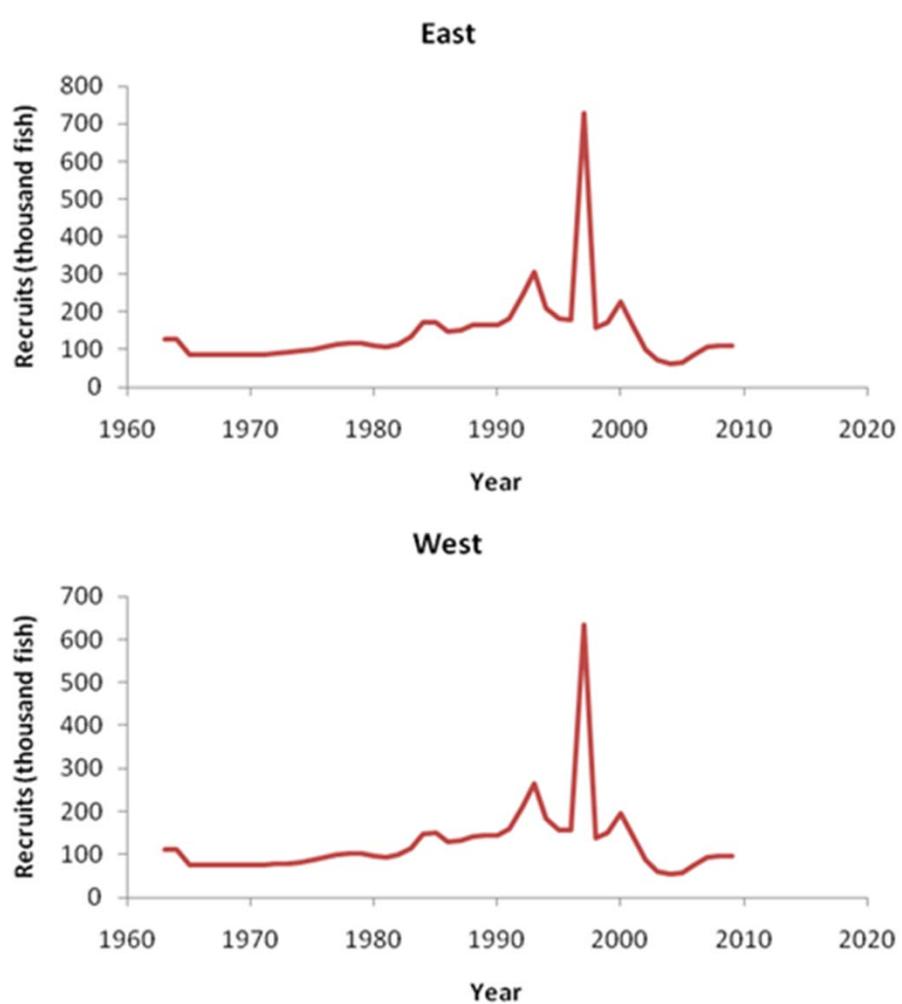


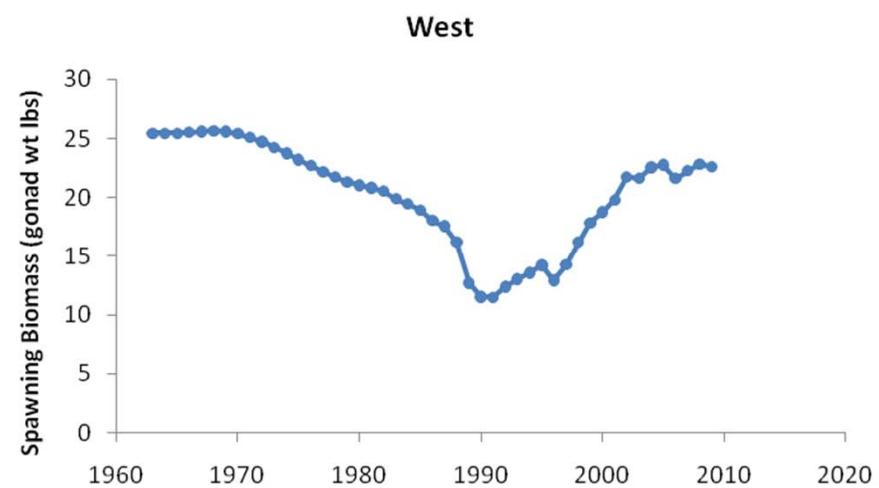
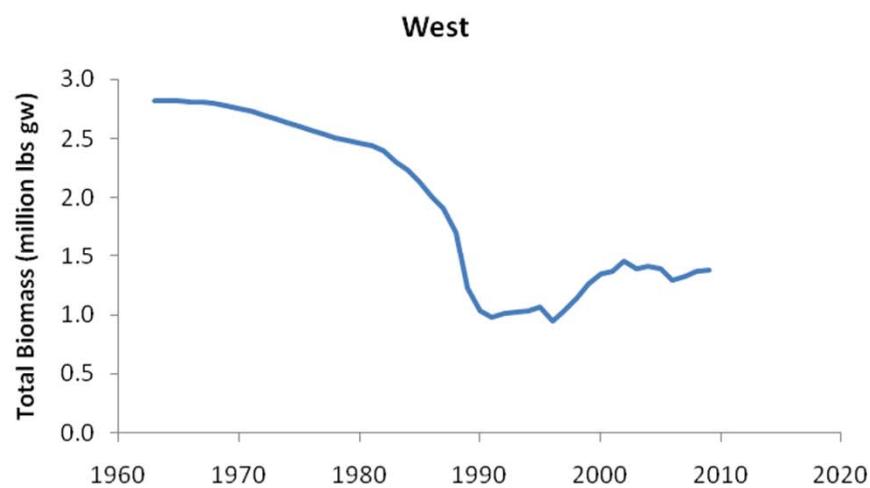
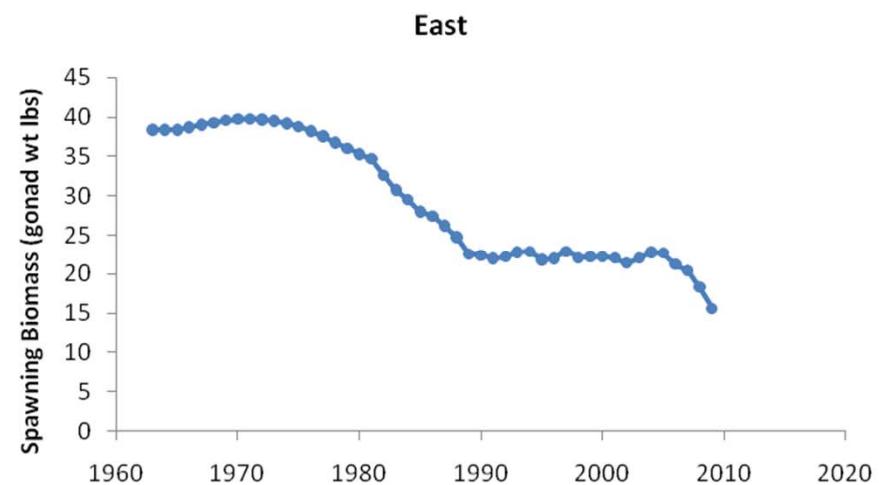
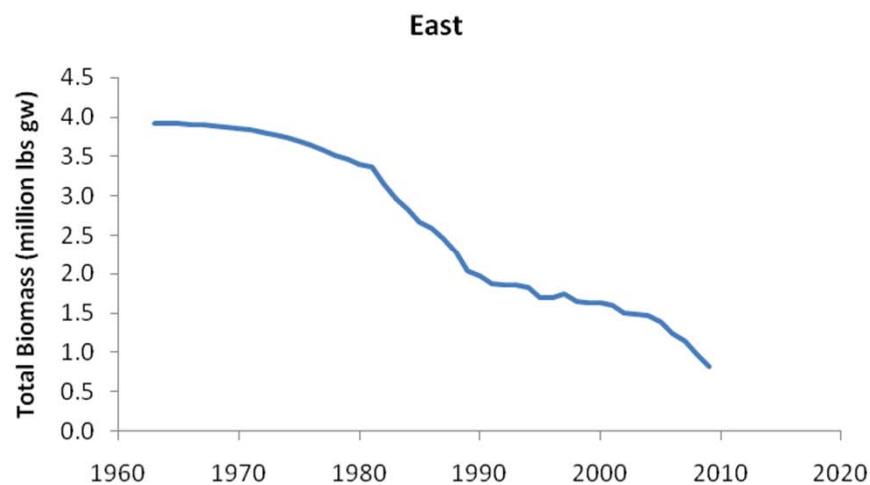
Recruitment

Below avg. rec. from
1965-1982

Above avg. rec. from
1983-2001

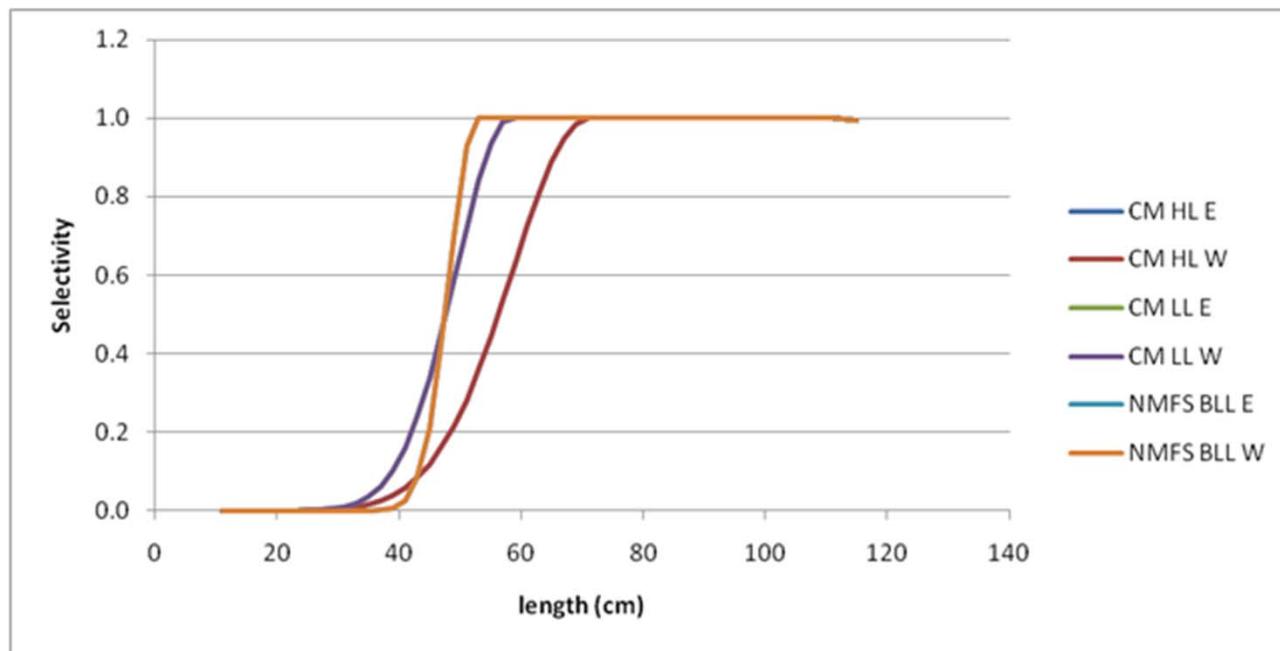
Below avg. rec. from
2002-2009





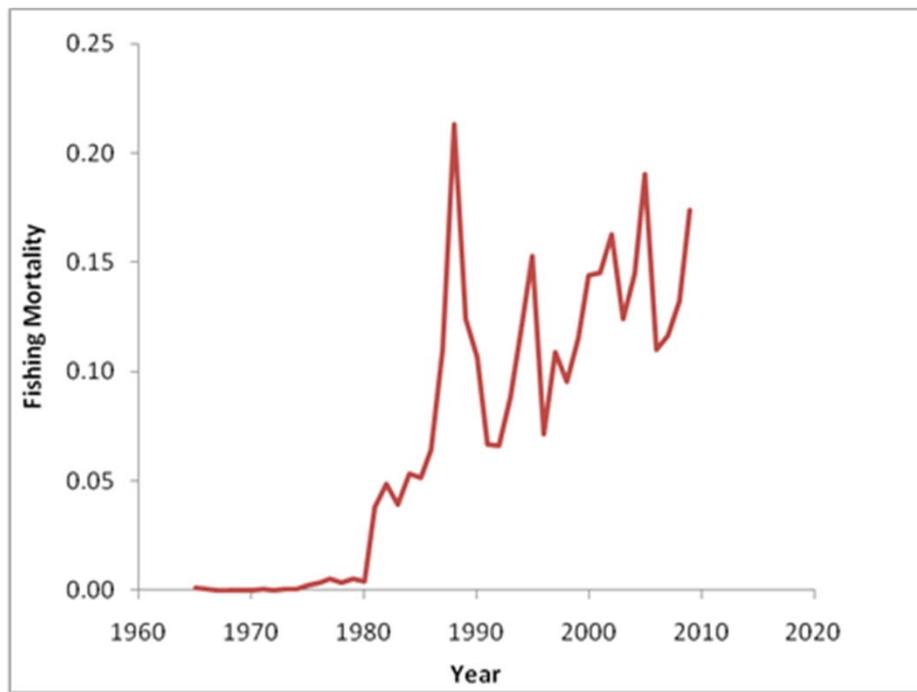


Selectivity





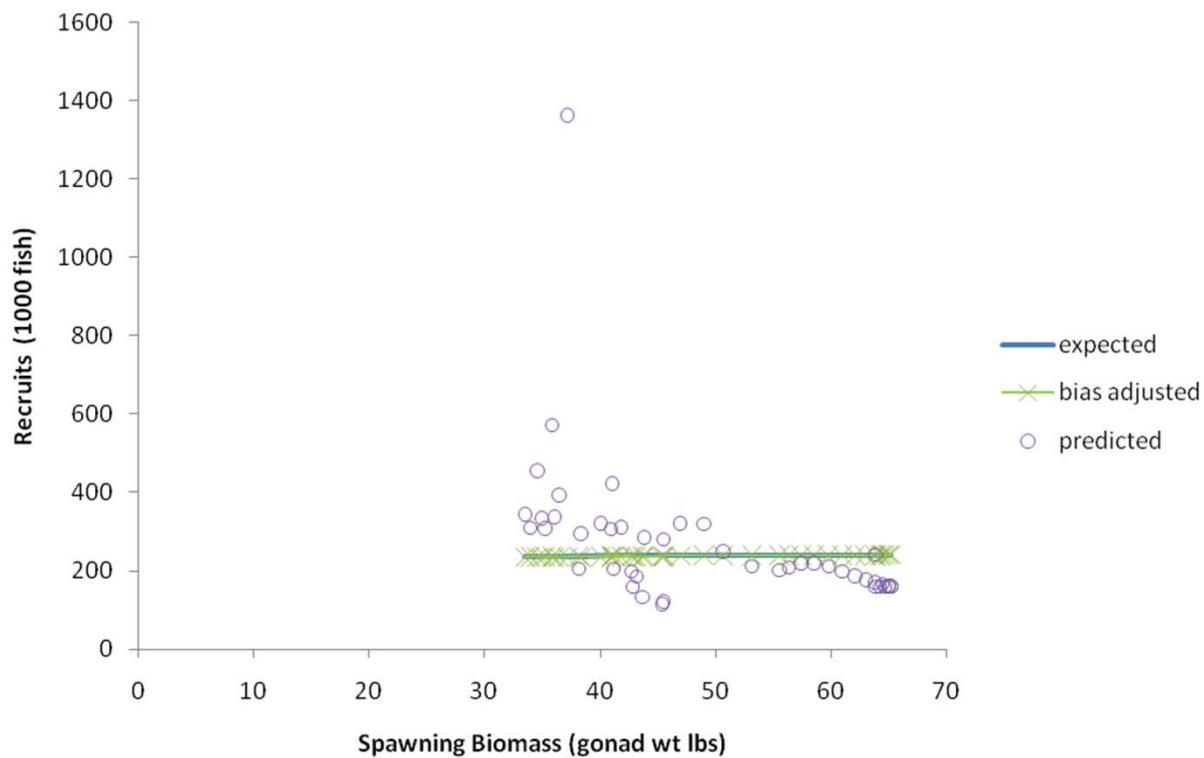
Fishing Mortality



Approaching record high Fs in recent yrs

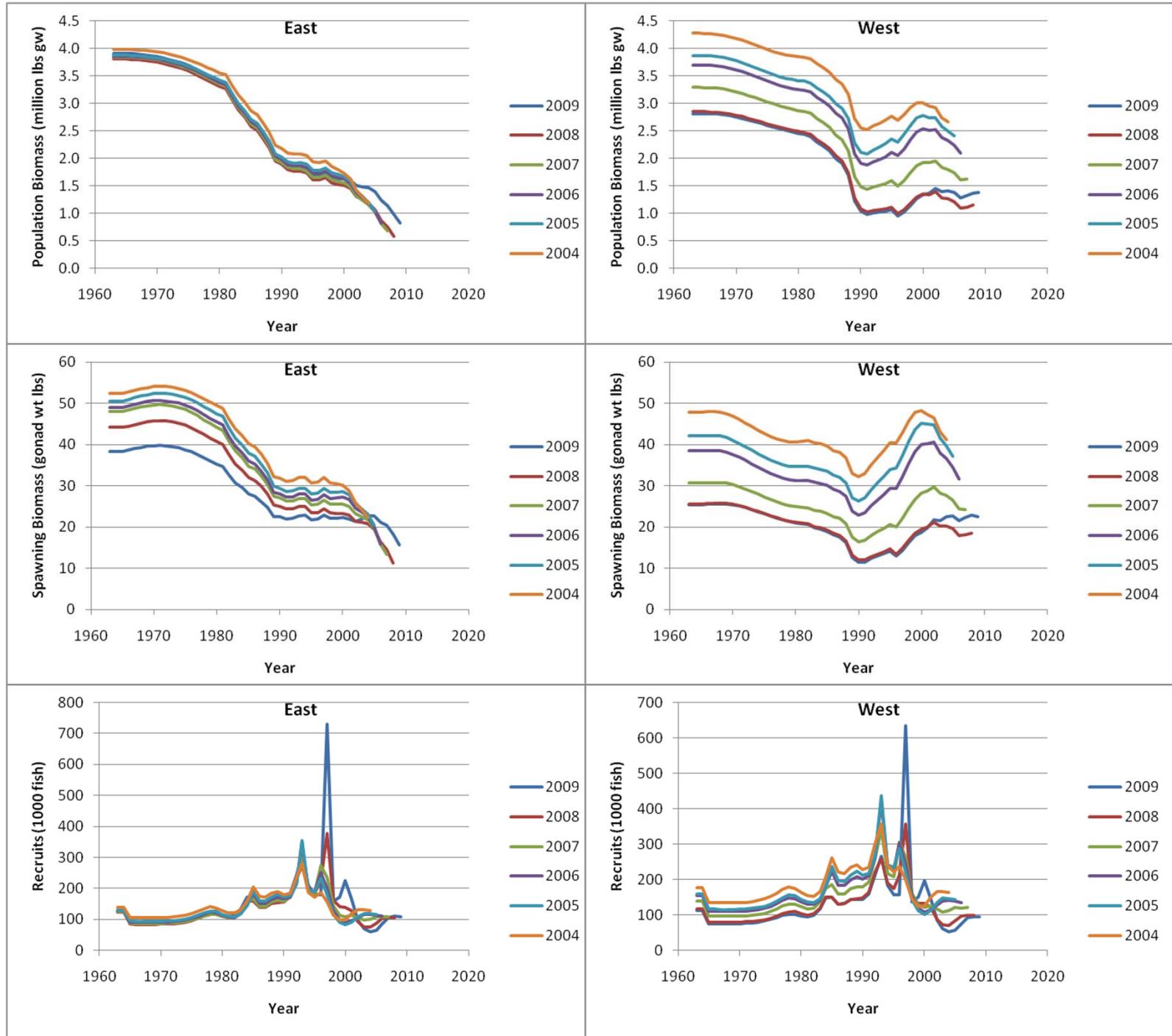


Stock-Recruitment Relationship



High estimated steepness (0.93)

Highest recruits at lowest SSBs





Sensitivity Runs

Run	Description	R0	Steepness	B0		Bcurrent		SSB0		SSBcurrent		SPRcurrent
				East	West	East	West	East	West	East	West	
1	Central	240	0.93	3,915,863	2,815,303	822,035	1,379,450	38.4	25.4	15.6	22.6	0.37
2	Mref=0.03	17	0.92	3,268,649	2,376,190	481,452	790,655	39.2	9.6	15.2	13.7	0.11
3	Mref=0.09	87	0.94	3,904,997	2,728,674	639,917	1,145,323	31.3	20.3	12.6	19.1	0.31
4	Mref=0.19	582	0.92	3,846,122	2,828,649	993,805	1,568,440	42.1	27.6	18.2	24.5	0.42
5	Mref=0.24	1,412	0.89	3,783,861	2,866,029	1,220,178	1,793,663	43.8	28.3	21.2	26.0	0.47
6	Mref age=15	377	0.94	3,839,036	2,724,245	827,521	1,175,357	37.4	25.5	14.4	19.8	0.36
7	Mref age=25	622	0.93	3,771,381	2,591,613	829,405	990,490	35.7	10.6	13.7	7.4	0.25
8	sigmaR=0.01	311	0.94	4,567,329	3,283,825	856,655	1,141,381	41.4	27.7	12.1	15.3	0.37
9	sigmaR=0.3	166	0.84	3,059,170	2,215,725	844,343	1,654,658	31.9	19.9	18.0	28.4	0.37
10	Dome-shaped sel.	430	0.91	12,958,183	9,775,455	6,696,522	5,918,074	115.0	50.7	72.6	46.7	0.44
11	Region-specific sel.	239	0.93	3,903,068	2,707,001	836,723	1,314,646	38.1	21.8	15.6	21.0	0.36
12	Fit CPUE indices	362	0.88	5,597,734	2,591,692	4,269,607	1,931,023	68.2	38.9	69.7	38.8	0.66
13	steepness=0.75	244	0.75	3,955,940	2,847,448	807,685	1,364,232	38.4	25.6	15.2	22.2	0.37
14	alternate landings	250	0.94	4,403,656	2,796,151	847,855	1,267,908	43.6	25.0	16.4	20.7	0.34

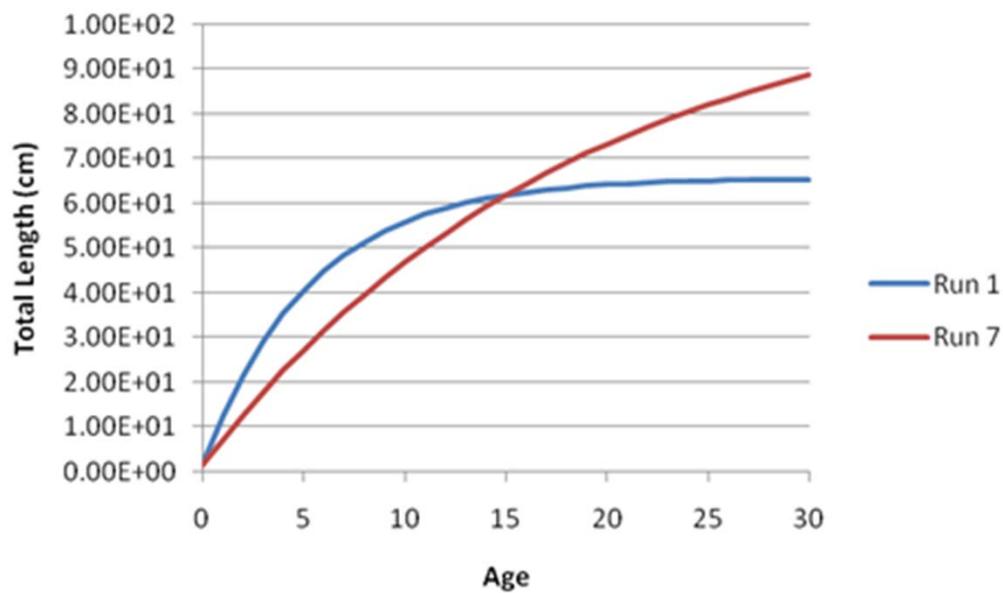


Sensitivity Runs

Run	Description	SPR30%								SPR40%							
		Fcurrent	SSBcurrent	Yref	Fref	SSBref	MSST	Fratio	SSBratio	Yref	Fref	SSBref	MSST	Fratio	SSBratio		
1	Central	0.17	38.2	159,816	0.12	18.3	16.0	1.48	2.39	151,641	0.08	24.8	21.6	2.32	1.77		
2	Mref=0.03	0.30	28.9	51,886	0.03	13.9	12.1	9.22	2.39	52,432	0.03	18.9	16.4	11.58	1.76		
3	Mref=0.09	0.21	31.7	111,042	0.09	14.9	13.0	2.30	2.45	107,563	0.06	20.2	17.5	3.67	1.81		
4	Mref=0.19	0.15	42.7	200,894	0.14	19.8	17.2	1.10	2.48	187,900	0.09	26.9	23.4	1.69	1.82		
5	Mref=0.24	0.13	47.2	243,091	0.15	20.1	17.5	0.83	2.70	225,547	0.10	27.5	23.9	1.26	1.97		
6	Mref age=15	0.19	34.2	170,476	0.12	18.1	15.8	1.54	2.17	162,458	0.08	24.5	21.3	2.34	1.60		
7	Mref age=25	0.21	21.1	163,827	0.09	13.3	11.6	2.42	1.82	154,565	0.06	18.0	15.7	3.35	1.35		
8	sigmaR=0.01	0.19	27.3	209,288	0.14	20.0	17.4	1.40	1.57	201,751	0.09	27.0	23.5	2.13	1.16		
9	sigmaR=0.3	0.15	46.3	101,316	0.10	13.7	12.0	1.58	3.87	98,022	0.06	19.2	16.7	2.50	2.78		
10	Dome-shaped sel.	0.03	119.3	248,575	0.04	46.7	40.7	0.77	2.93	229,952	0.03	63.7	55.4	1.16	2.15		
11	Region-specific sel.	0.18	36.7	158,015	0.12	17.2	14.9	1.48	2.45	149,973	0.08	23.3	20.3	2.38	1.81		
12	Fit CPUE indices	0.06	108.5	307,362	0.19	29.4	25.6	0.33	4.24	304,122	0.13	40.5	35.2	0.47	3.08		
13	steepness=0.75	0.18	37.4	133,448	0.12	15.1	13.2	1.48	2.84	136,619	0.08	22.1	19.2	2.33	1.94		
14	alternate landings	0.18	37.1	166,790	0.11	19.8	17.2	1.62	2.16	159,789	0.07	26.7	23.3	2.46	1.59		



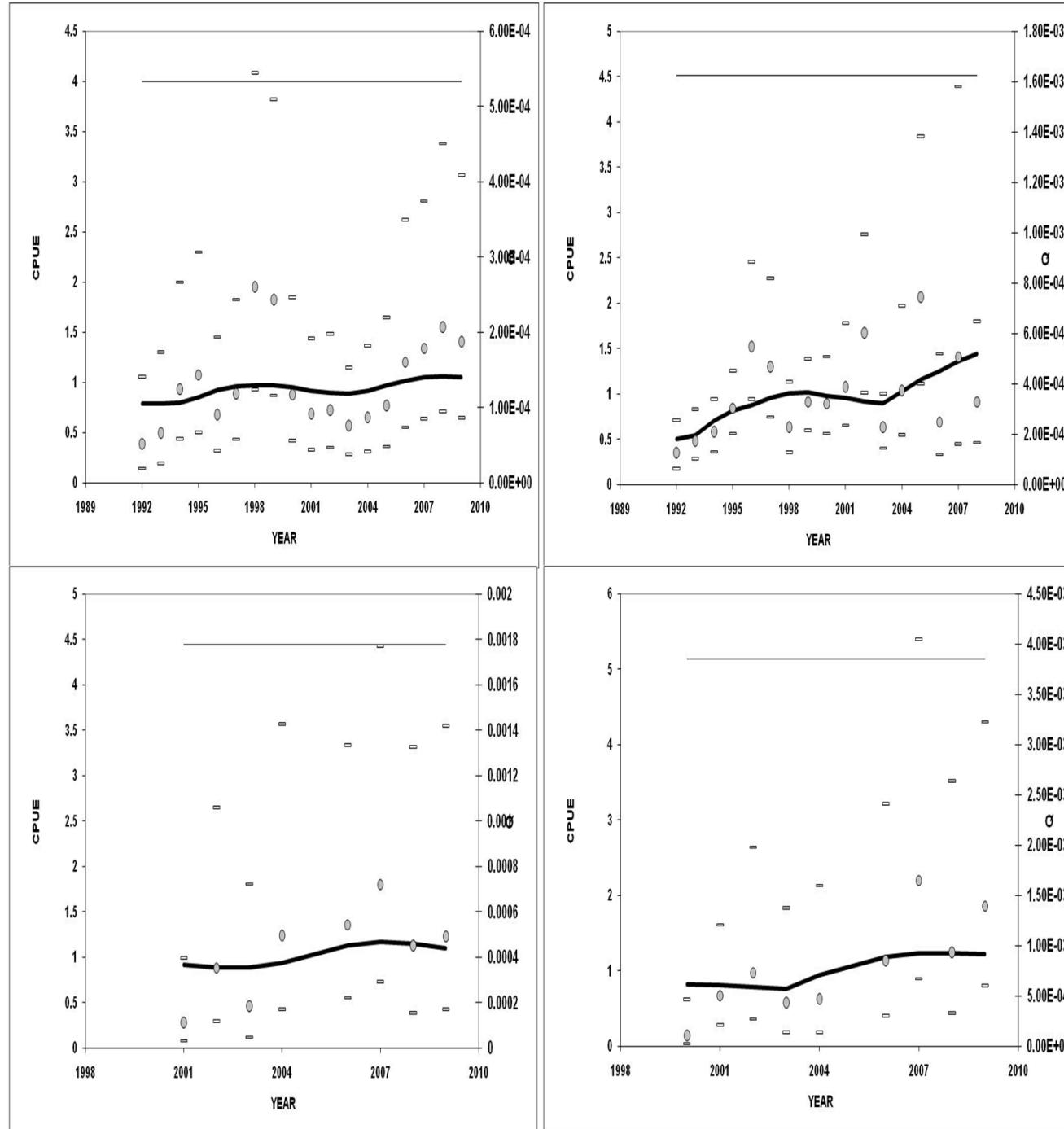
West Female Growth: Run 1 vs. Run 7



Smaller size at age translates to lower SSB, including virgin SSB

Run 12

Improved fit to indices





Total Biomass: Run 12

Only SS run to show increase in eastern total biomass in recent yrs

