Draft Presentation
For Peer Review Only.
Does not represent
final NOAA Decision/Policy.
5/01/08

Biological Reference Points
White Hake

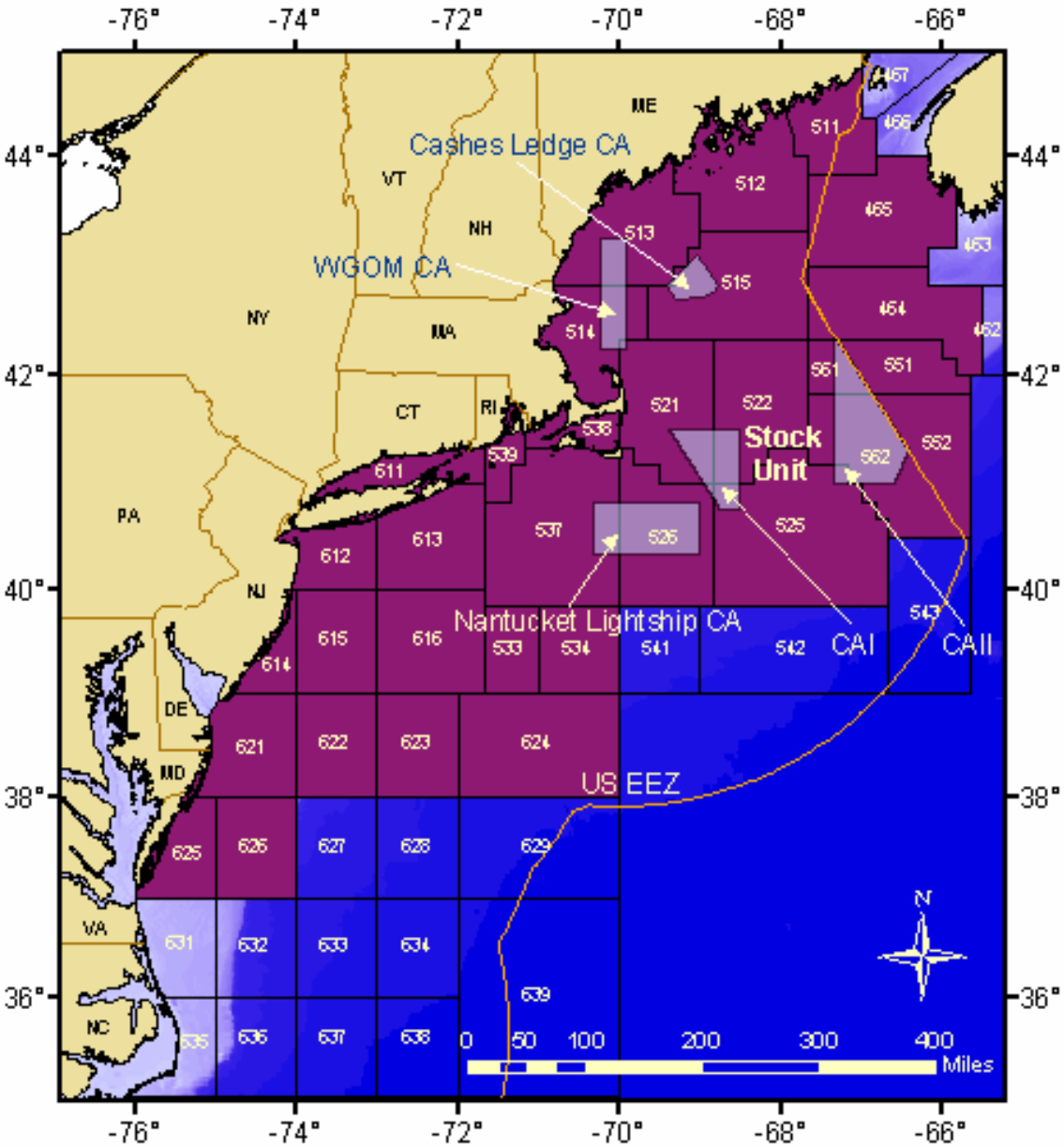
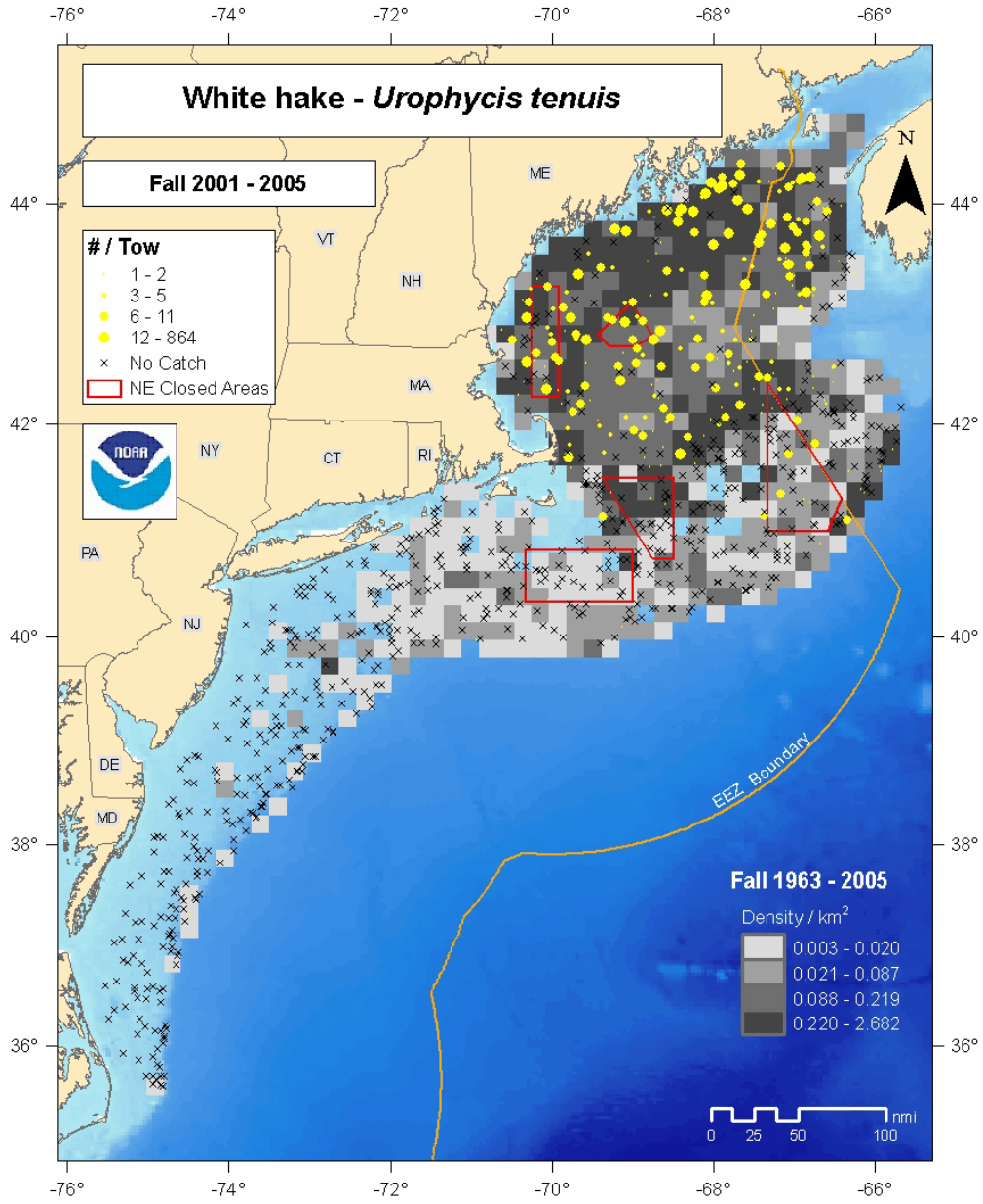


Figure 18.1. Statistical areas used to define the Georges Bank/Gulf of Maine white hake stock.



Relative species abundance and distribution from NEFSC bottom trawl survey by time block and relative species density for the full time series.

Previous Assessments

- SAW 19 - 1994 Collie-Sissenwine Model
- SAW 28 - 1998 VPA Assessment
- 1999 Summer Update - Projection
- 2000 Summer Update - Projection
- SAW 33 - 2001 Biomass Dynamics model
- GARM - 2002 AIM
- GARM -2005 AIM

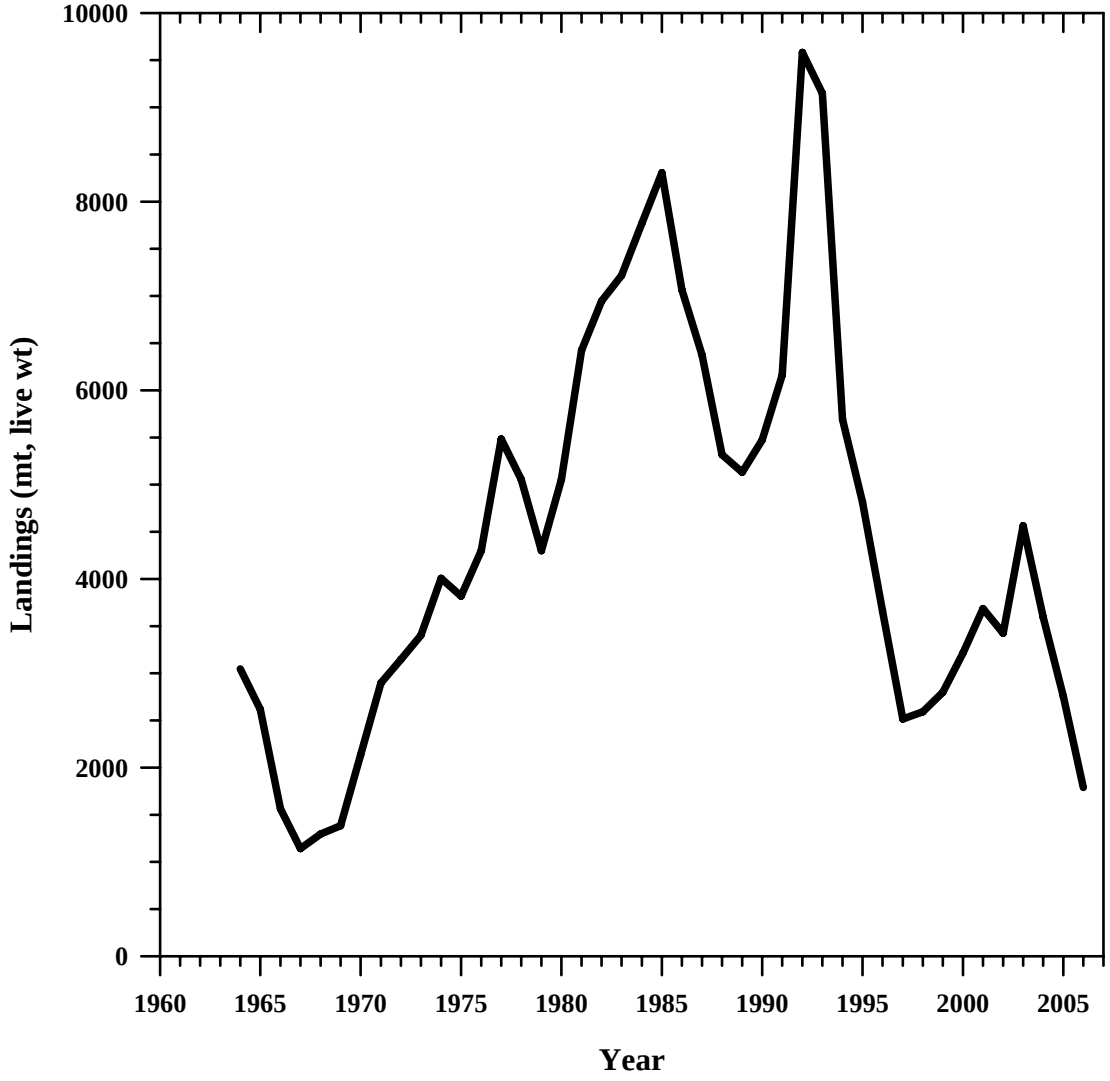


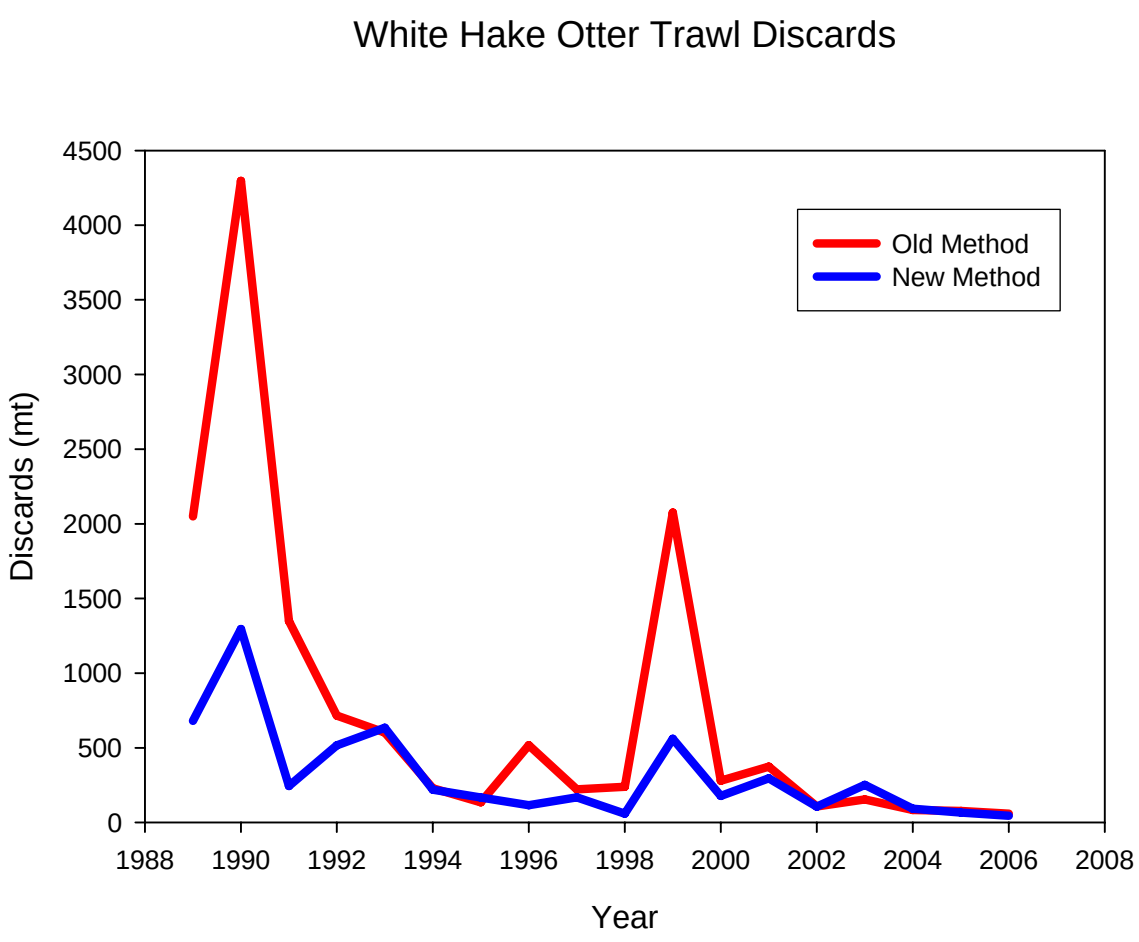
Figure L1. Reported total landings of white hake (mt, live weight) from the Gulf of Maine to Mid-Atlantic region, 1964-2006.

- Methods group suggested using survey proportion to split out red from white hake.

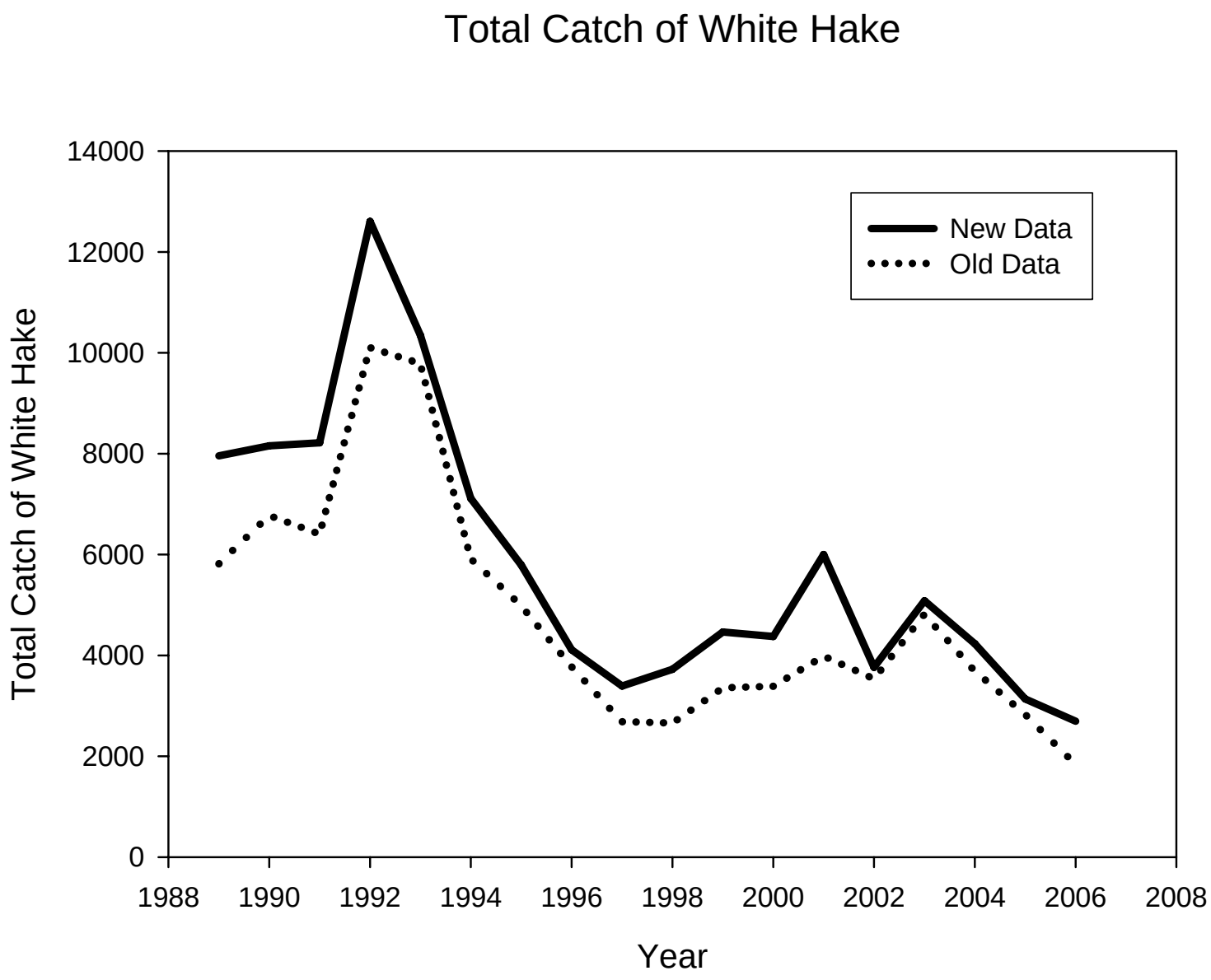
- This requires estimating catch for both species

- Run Biostat for both species to get length composition by half year and market
- Sampling generally adequate
- Estimating LAA in 1996 required using the two red hake samples for both half years

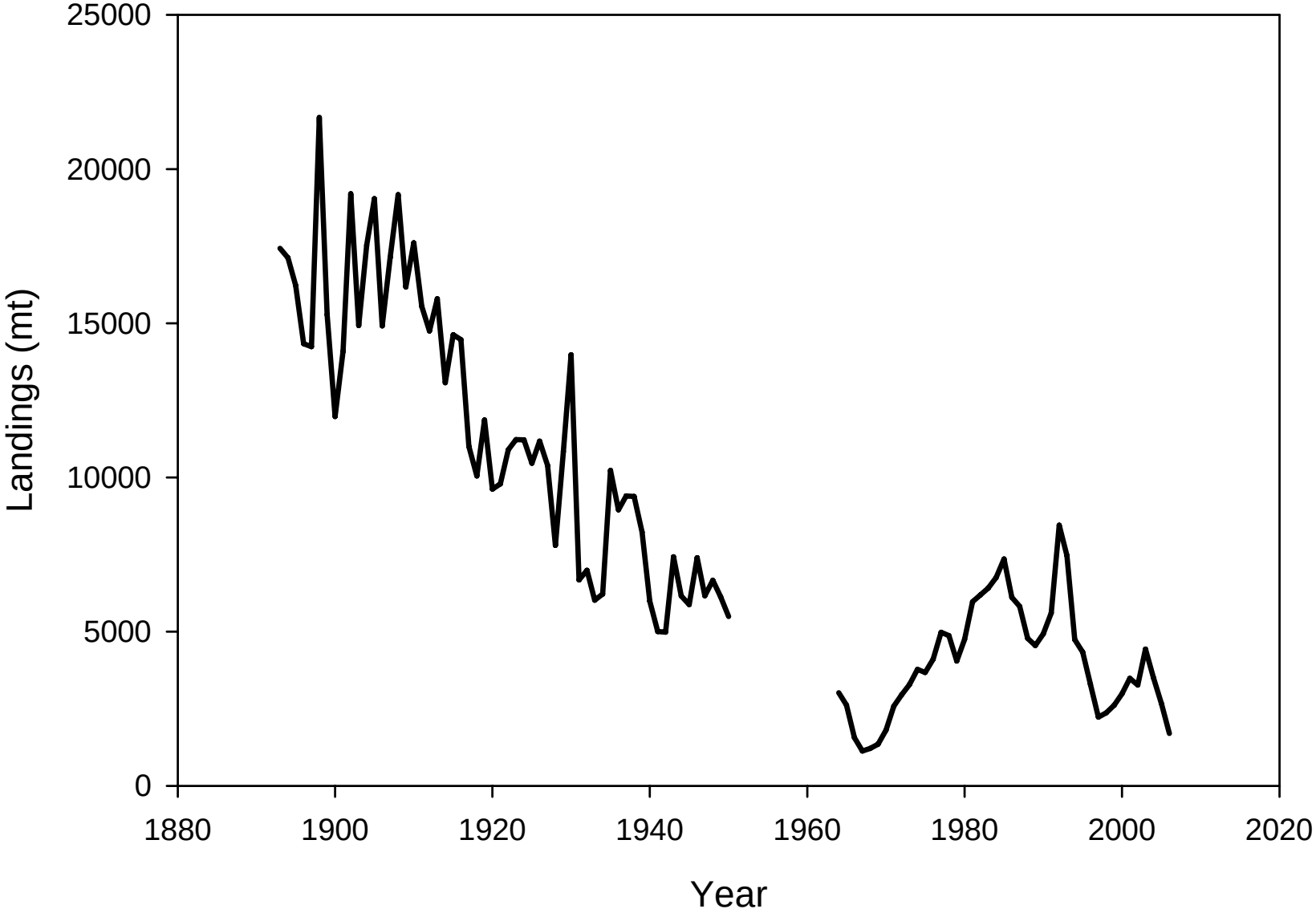
- Estimate discards for both species using D/Kall by half year and gear (not combined ratio)
- Only have length sampling for OT
- Shrimp trawl, gill net and scallop dredge discards are relatively low when estimated so ignore

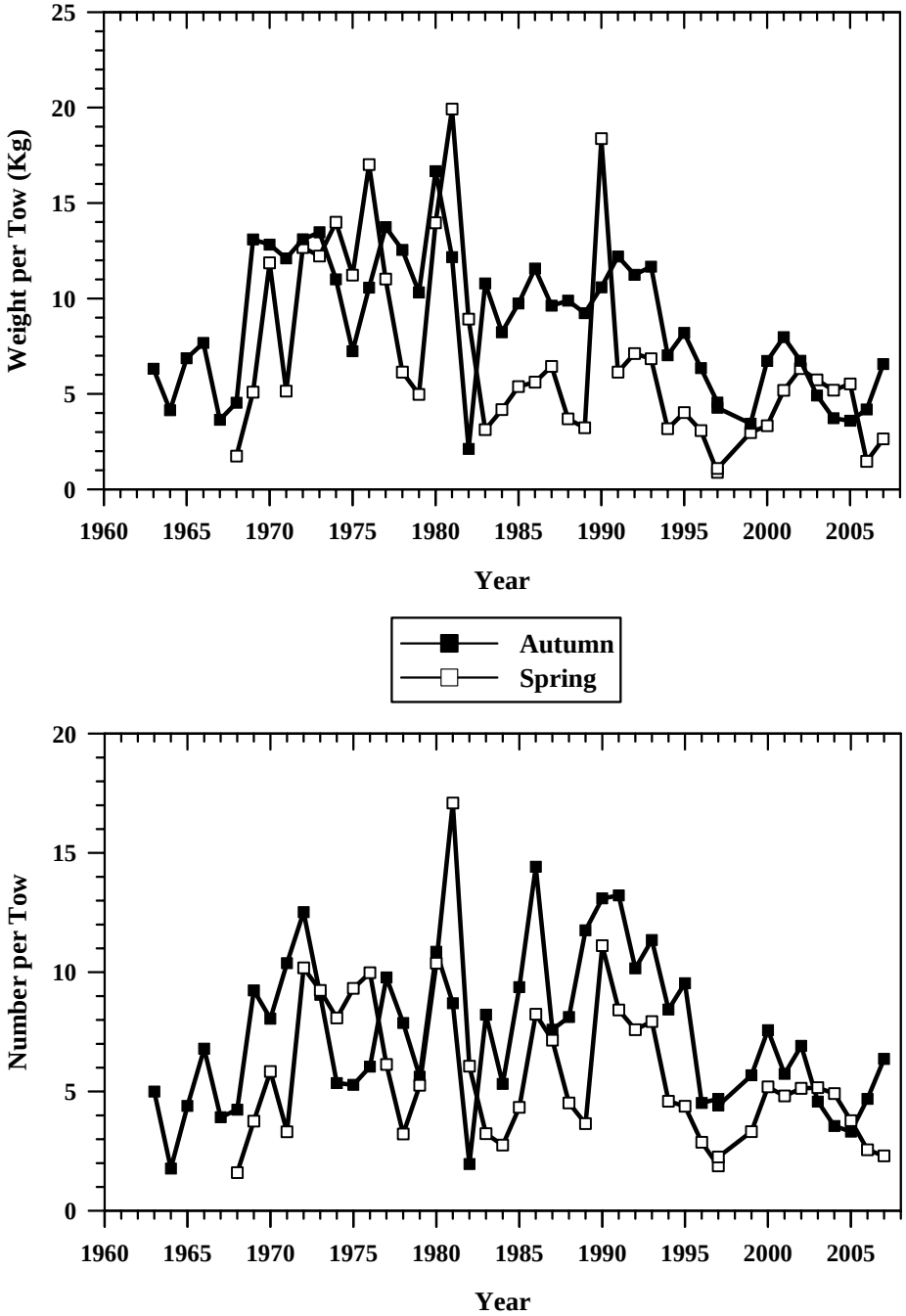

White Hake Otter Trawl Discards
Discards (mt)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
Year
Old Method
New Method

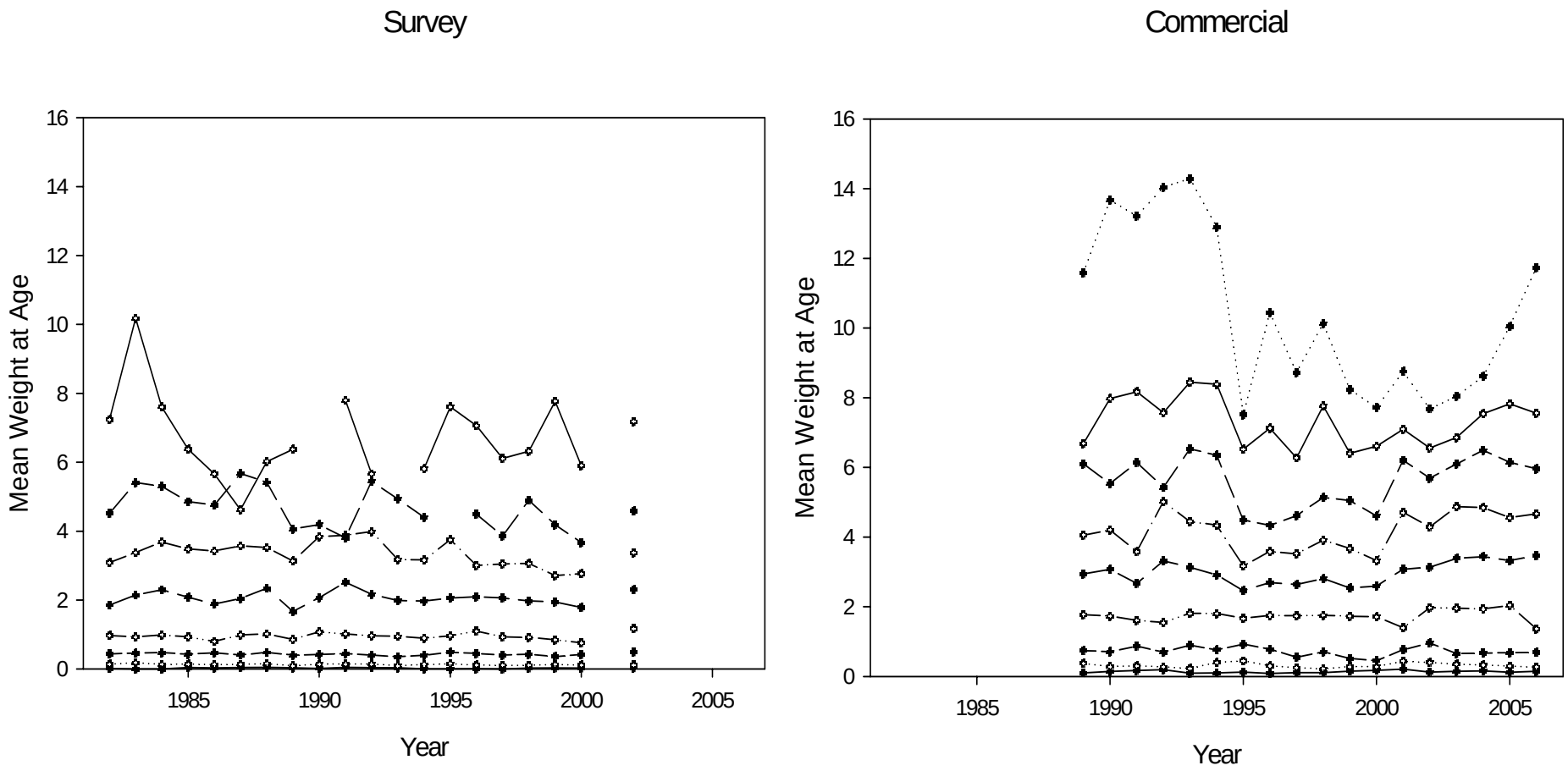
- Add all pieces together to derive one length composition by half year
- Add survey length compositions of both species and derive proportions by survey
- Split out catch-at-length
- Use age-length keys from survey and observer data from 1989-2000
- Use a pooled age-length key for 2001-2006


Total Catch of White Hake
New Data
Old Data
Total Catch of White Hake
Year
0
2000
4000
6000
8000
10000
12000
14000
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008

US White Hake Landings

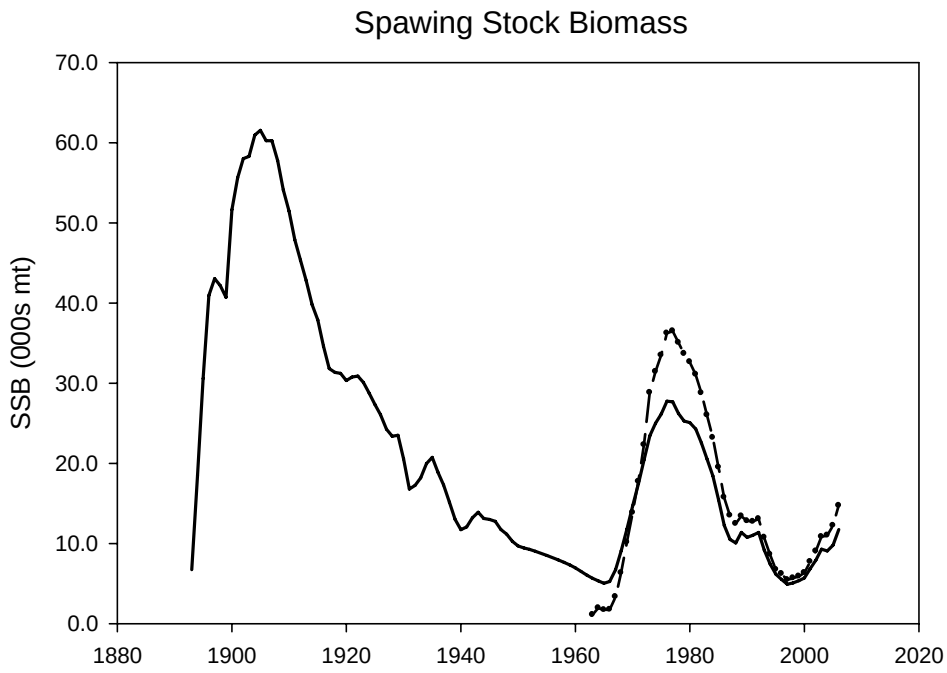


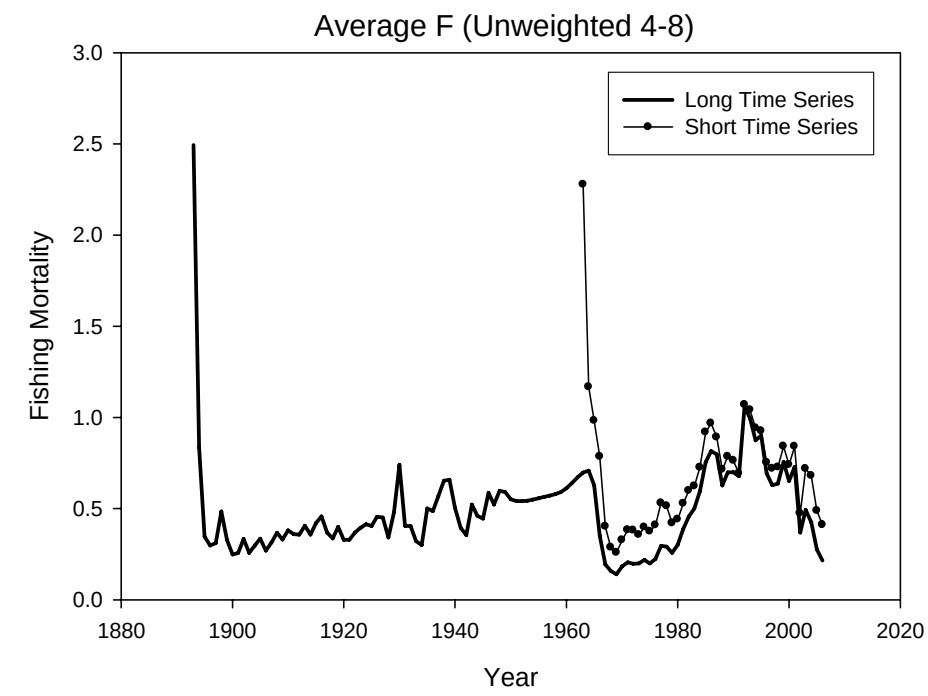

Weight per Tow (Kg)
Year
Autumn
Spring
Number per Tow
Year

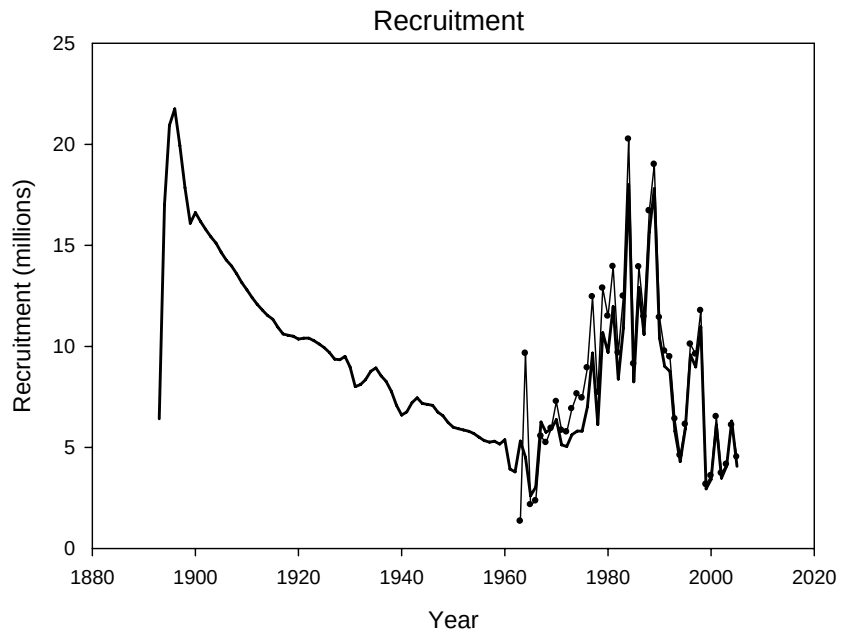

Survey
Commercial
Mean Weight at Age
Year
0
2
4
6
8
10
12
14
16
1985
1990
1995
2000
2005

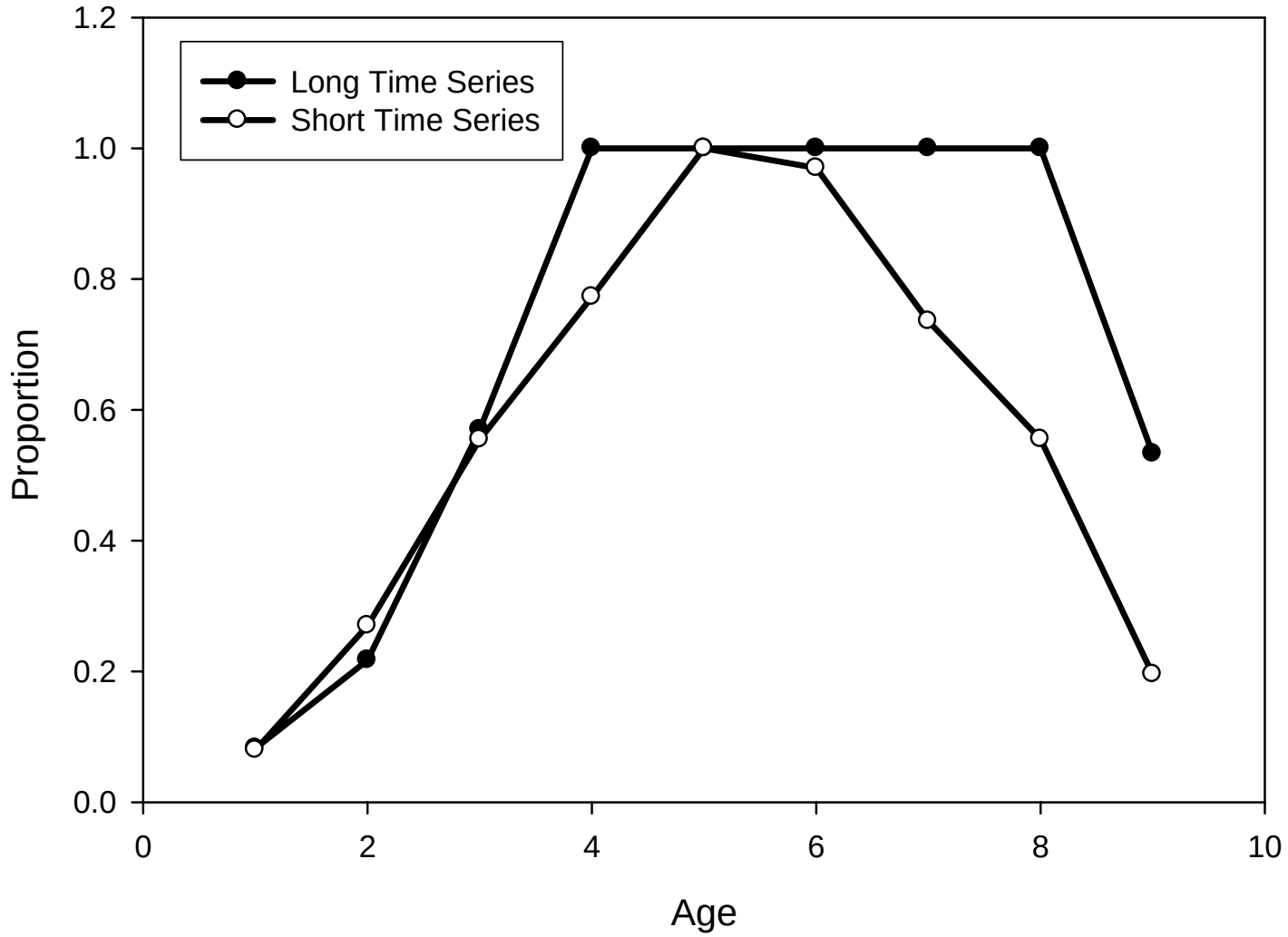
ASAP Model Runs

- Catch from 1893-2006 or 1963-2006
- CAA to 9+ from 1989-2006, Single selectivity
- Autumn Survey abundance 1963-2006
- Spring Survey abundance 1968-2006
- Spring age composition 1982-2001, 2003
- Autumn age composition 1982-2000, 2002
- Recruitment CVS 0.5
- Low CV on q and low lambda on q
- Maturity same as last assessment
- M=0.2

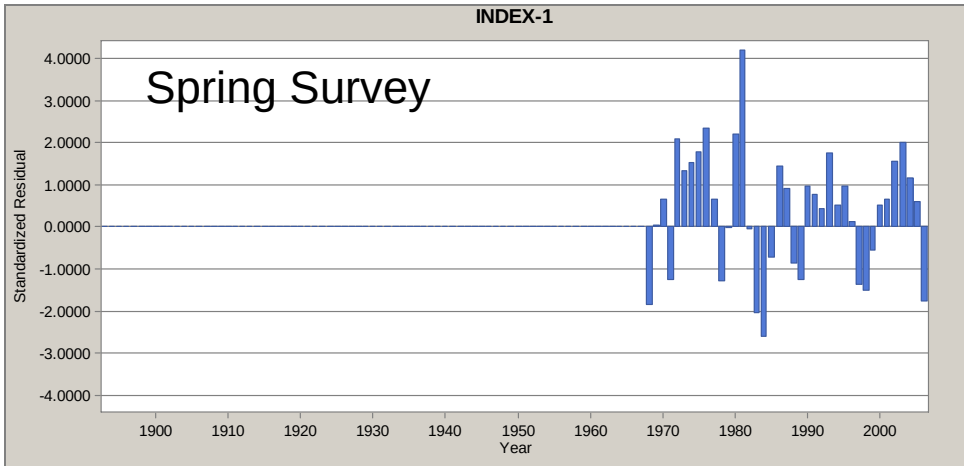

Spawing Stock Biomass
SSB (000s mt)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1880
1900
1920
1940
1960
1980
2000
2020


Average F (Unweighted 4-8)
Long Time Series
Short Time Series
Fishing Mortality
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1880
1900
1920
1940
1960
1980
2000
2020
Year

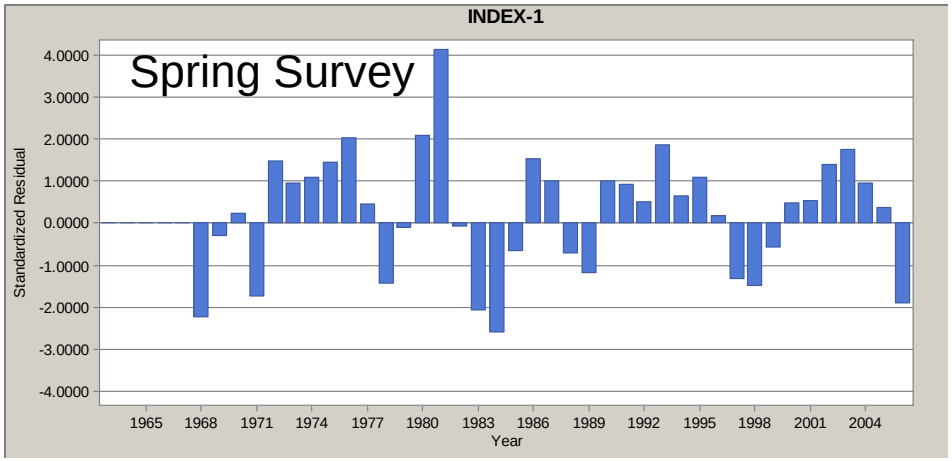

Recruitment
Recruitment (millions)
25
20
15
10
5
0
1880
1900
1920
1940
1960
1980
2000
2020
Year

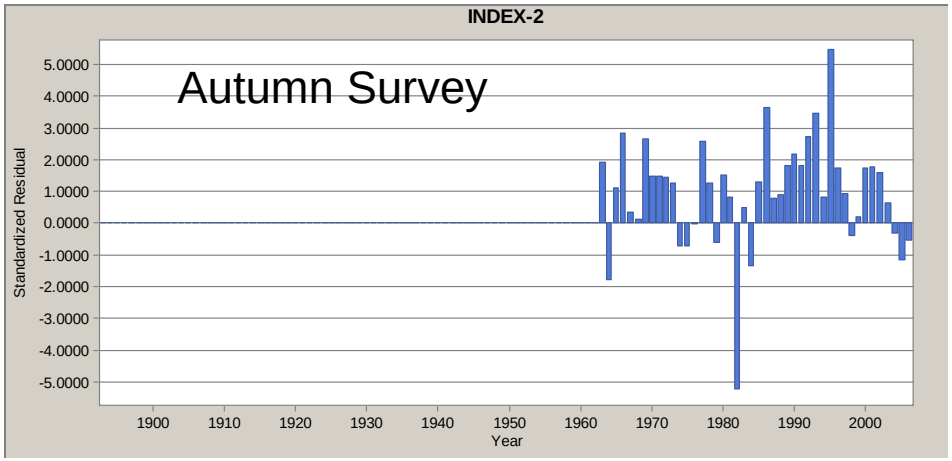

Long Time Series
Short Time Series
Proportion
Age
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
10

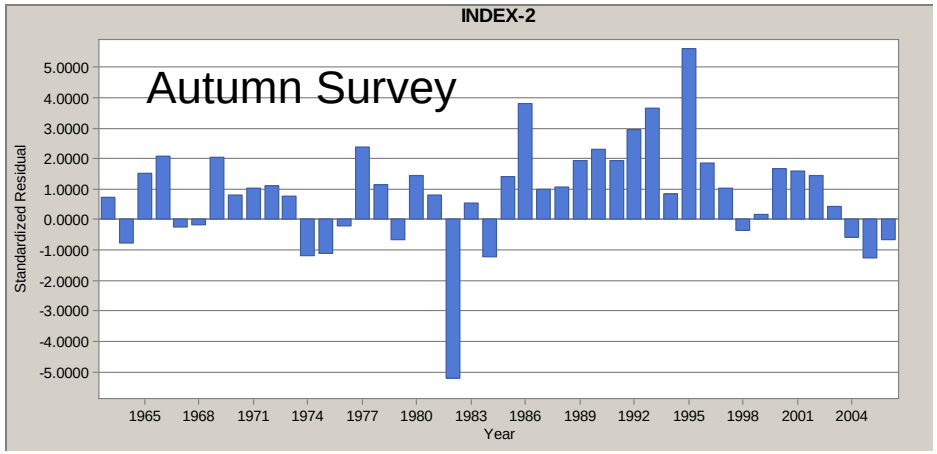
Long Time Series



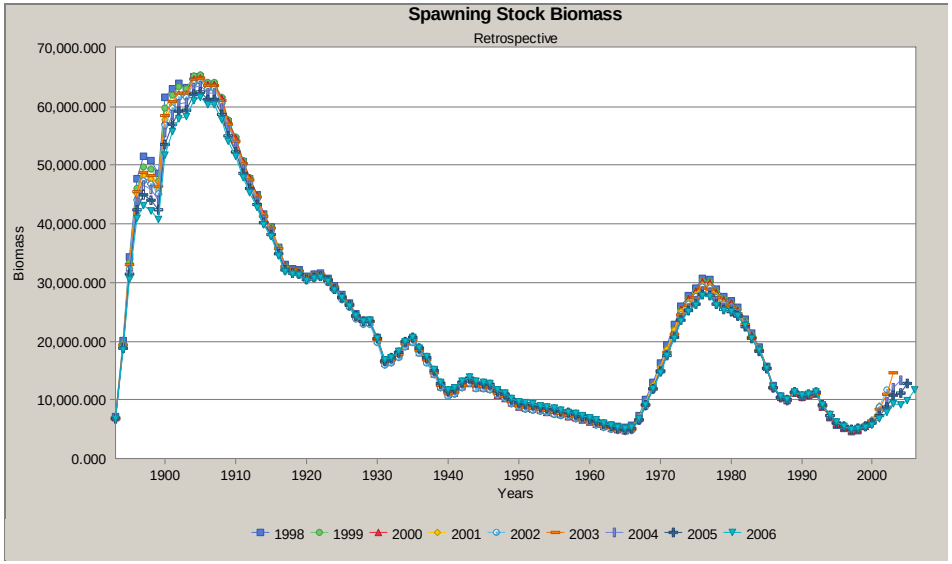
Short Time Series

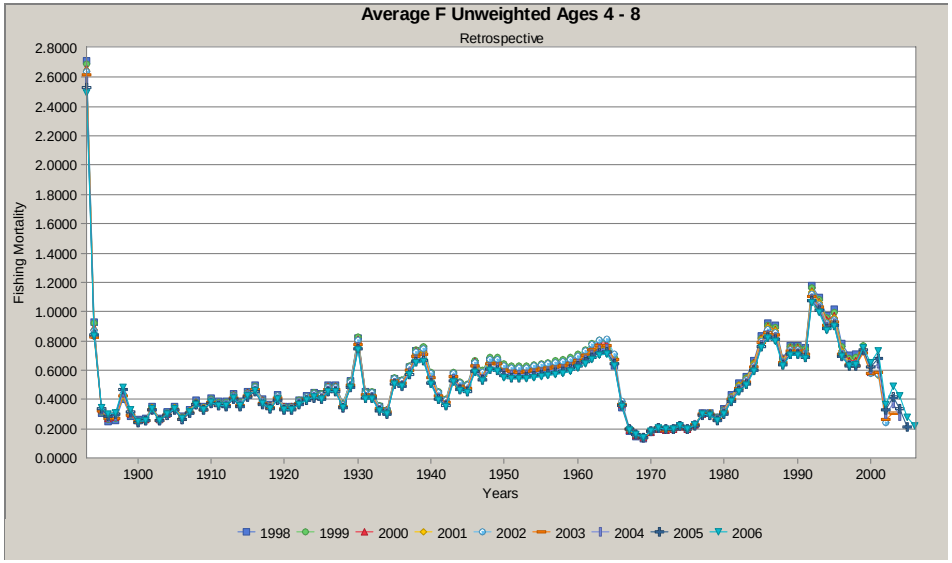




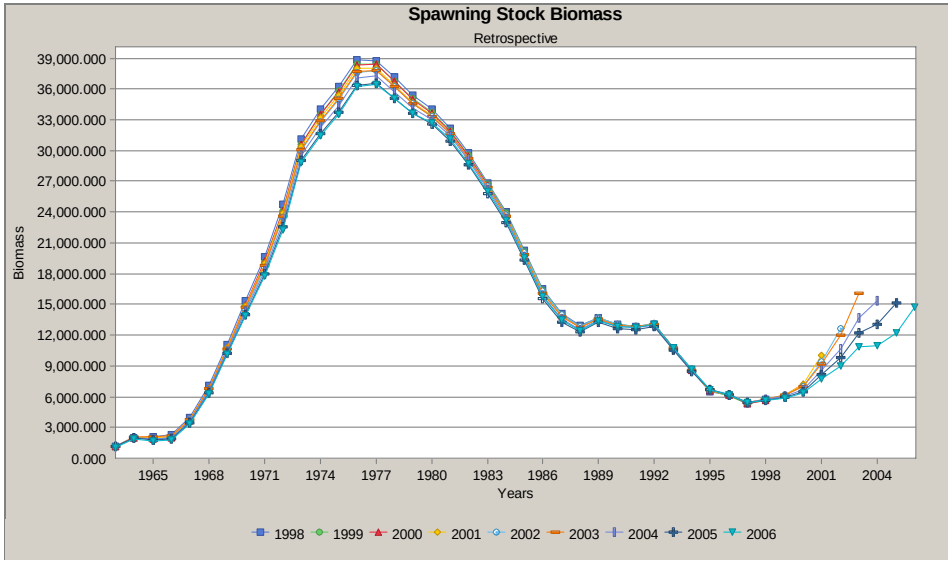


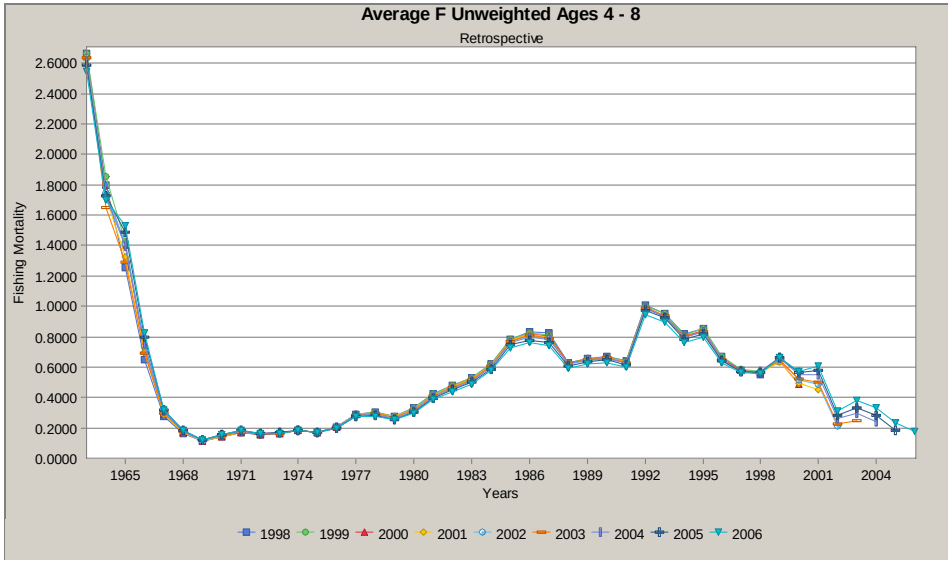
Long Time Series



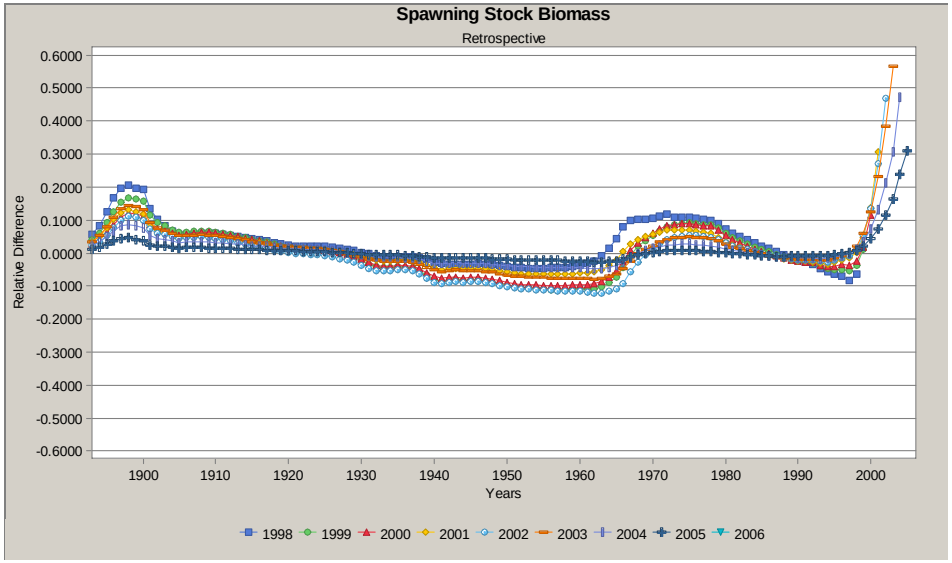


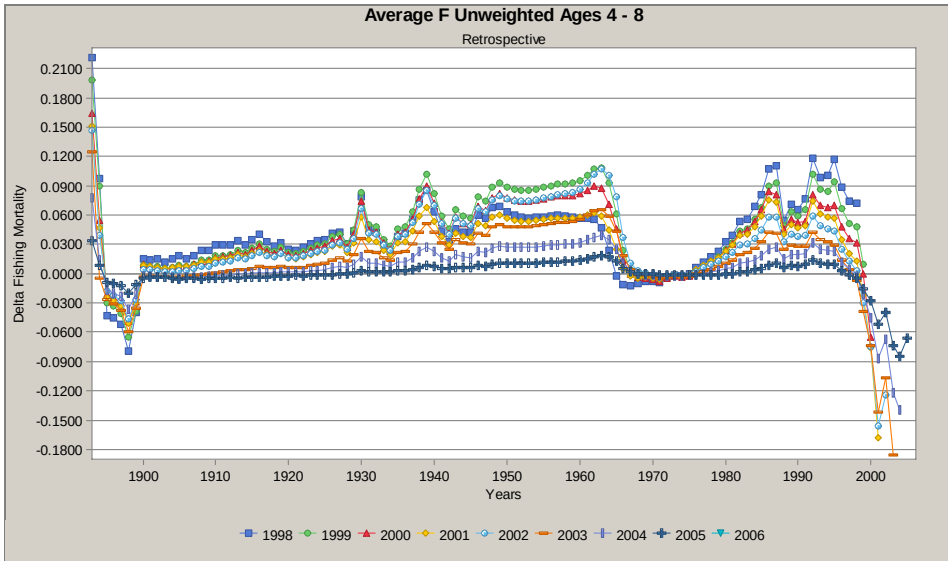
Short Time Series



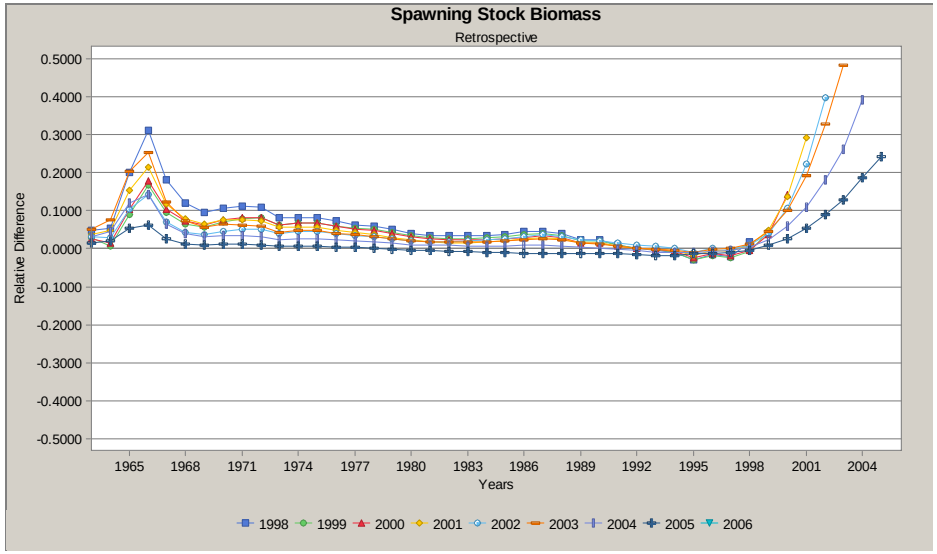


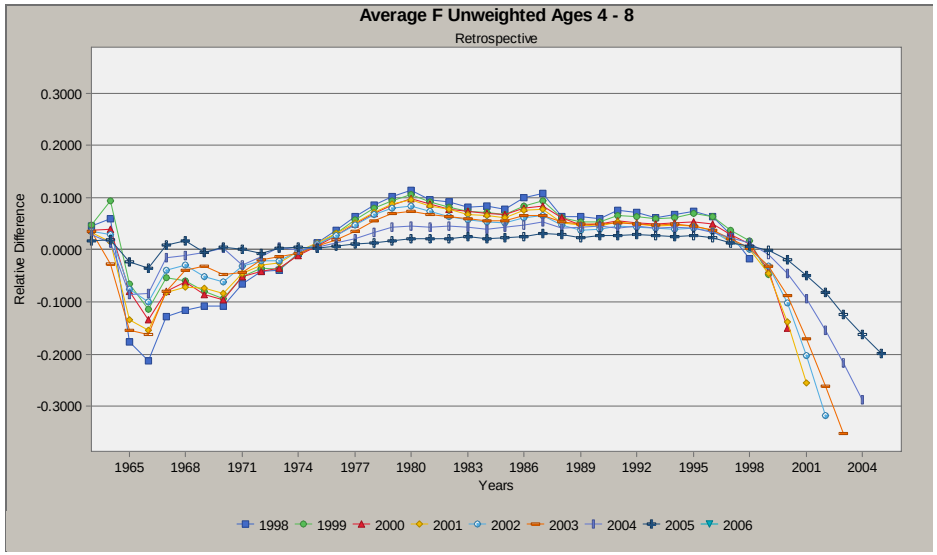
Long Time Series



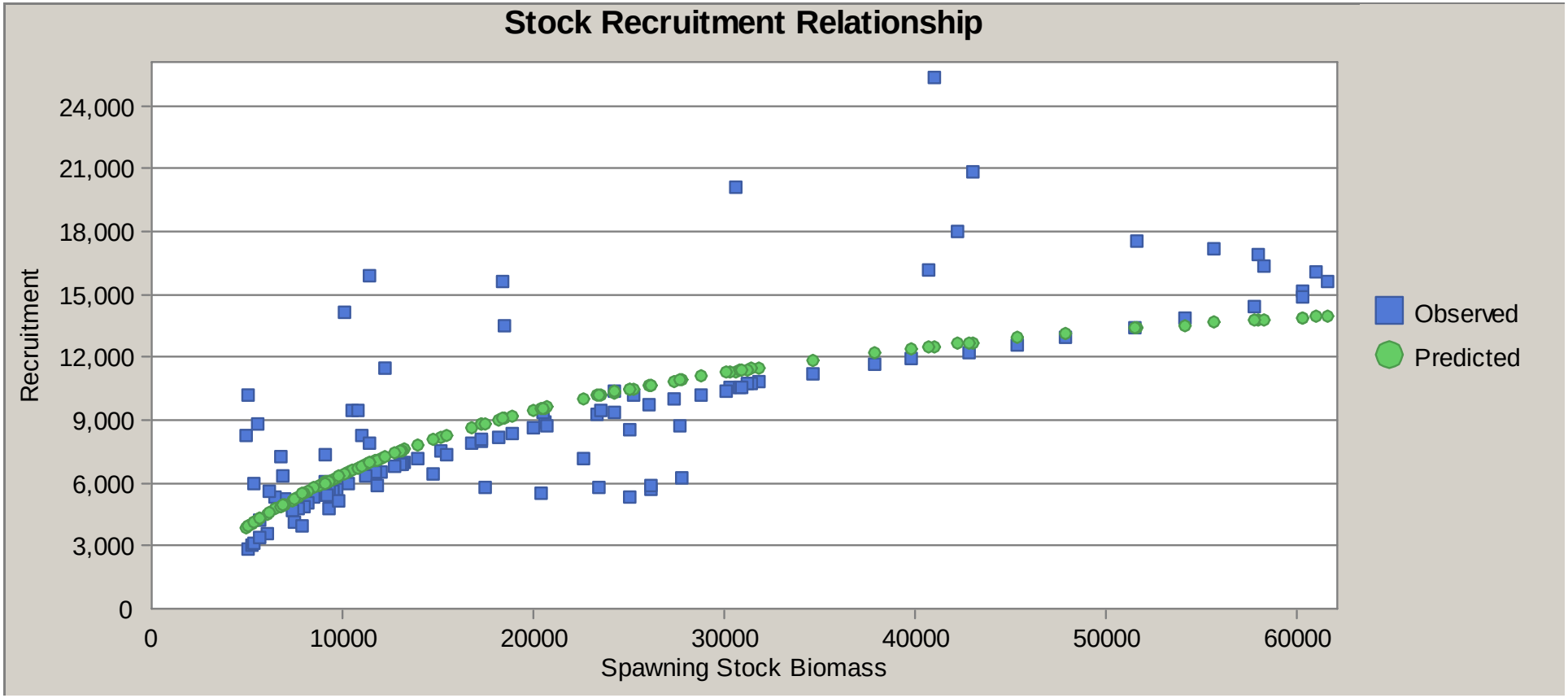


Short Time Series

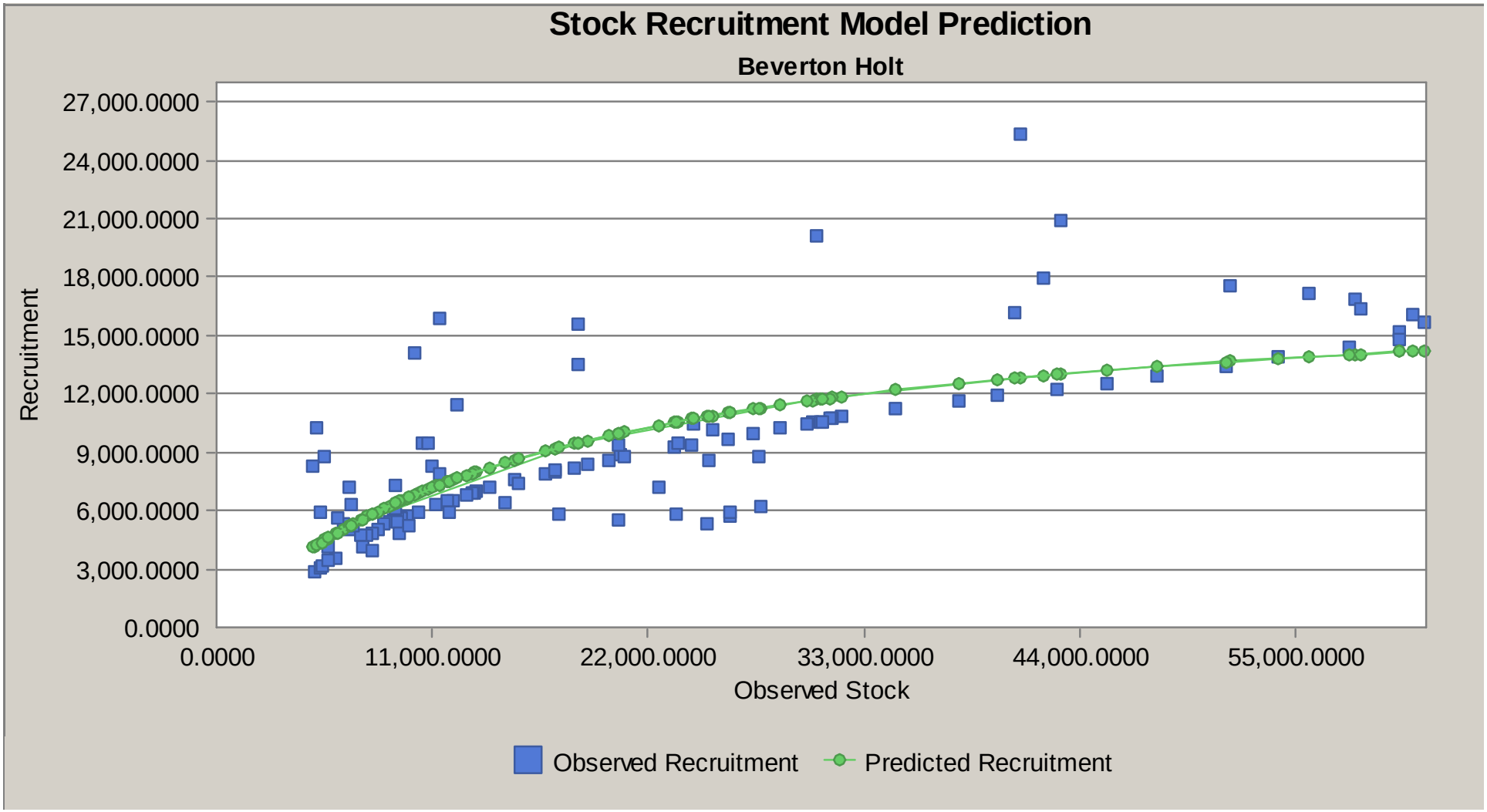




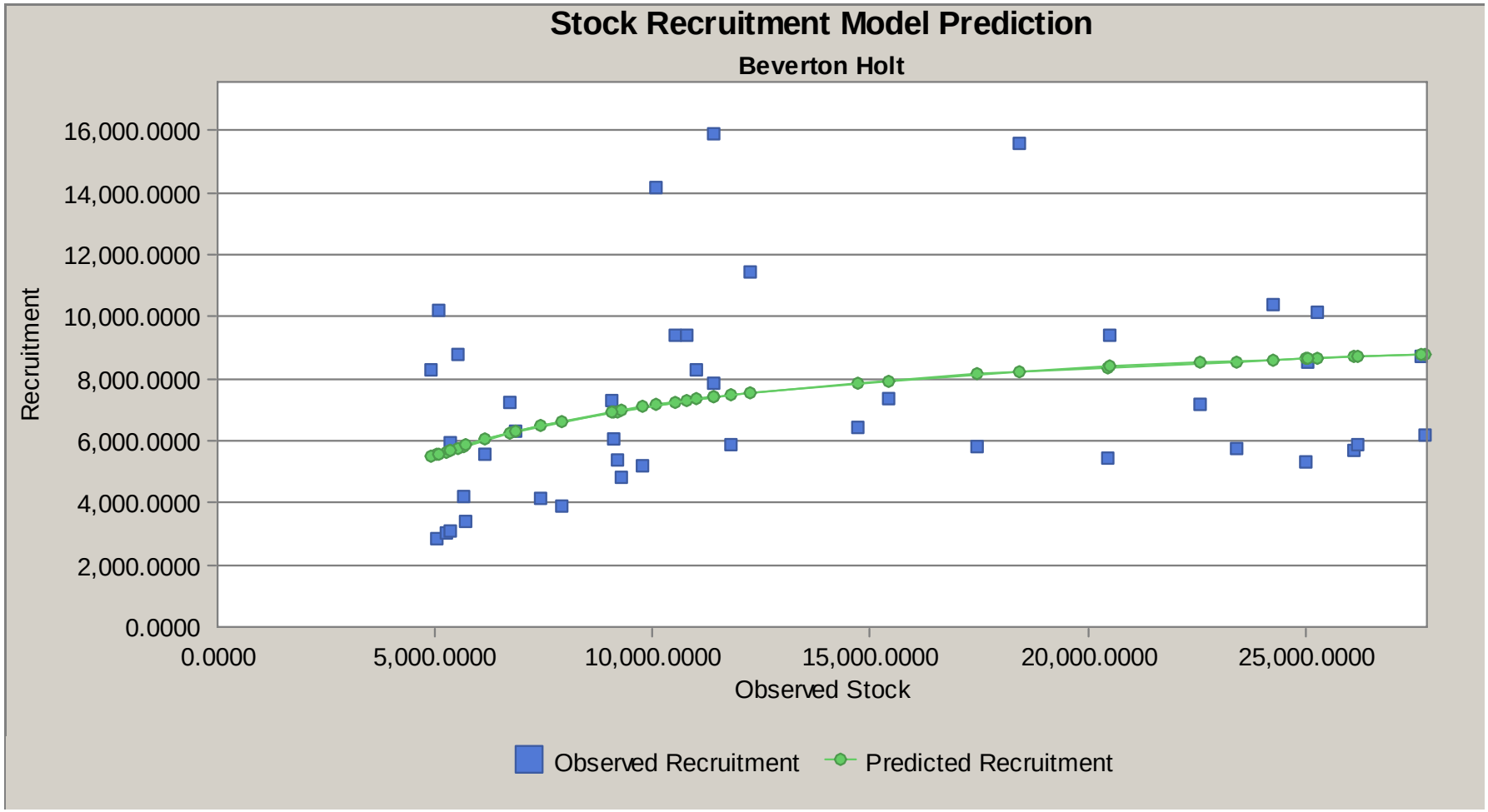
Stock Recruitment curve from long time series ASAP Internal Fit



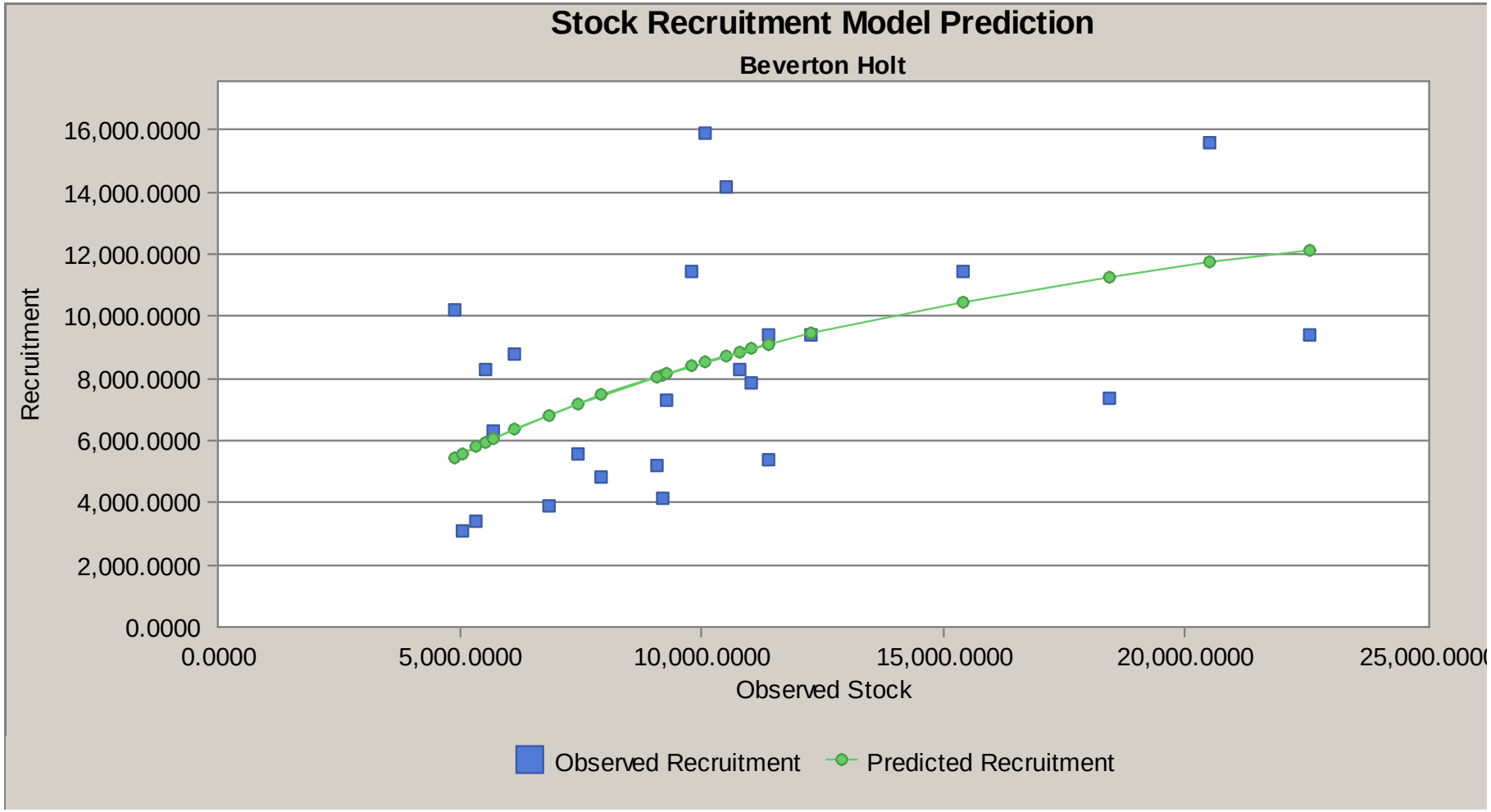
Stock Recruitment curve from long time series ASAP using values from 1893-2005

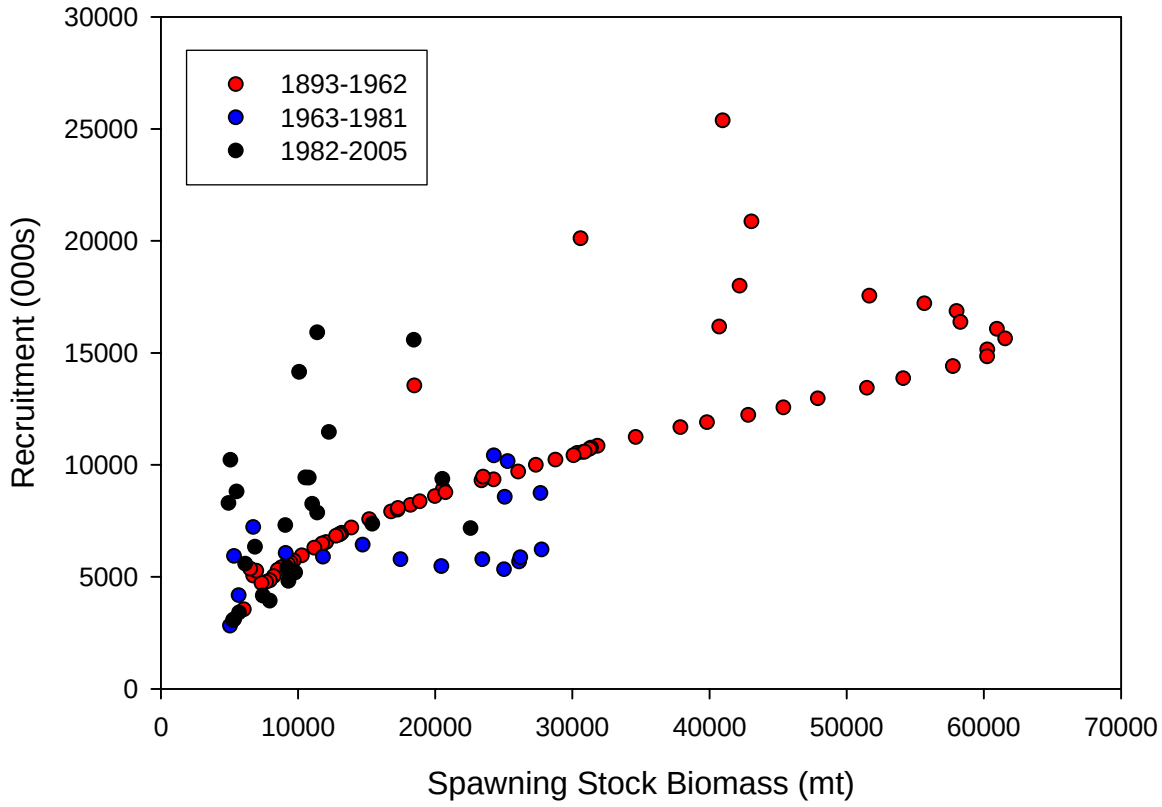


Stock Recruitment curve from long time series ASAP using values from 1963-2005

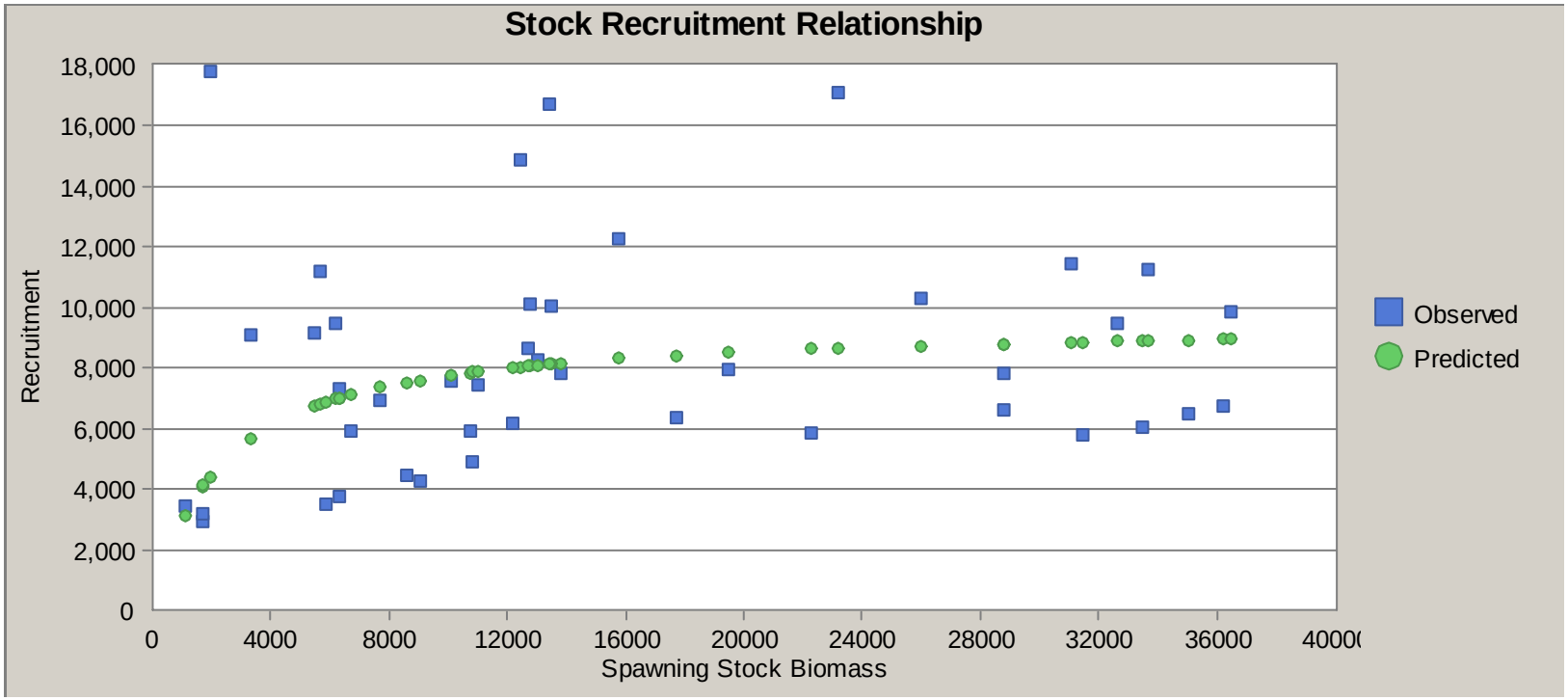


Stock Recruitment curve from long time series ASAP using values from 1982-2005

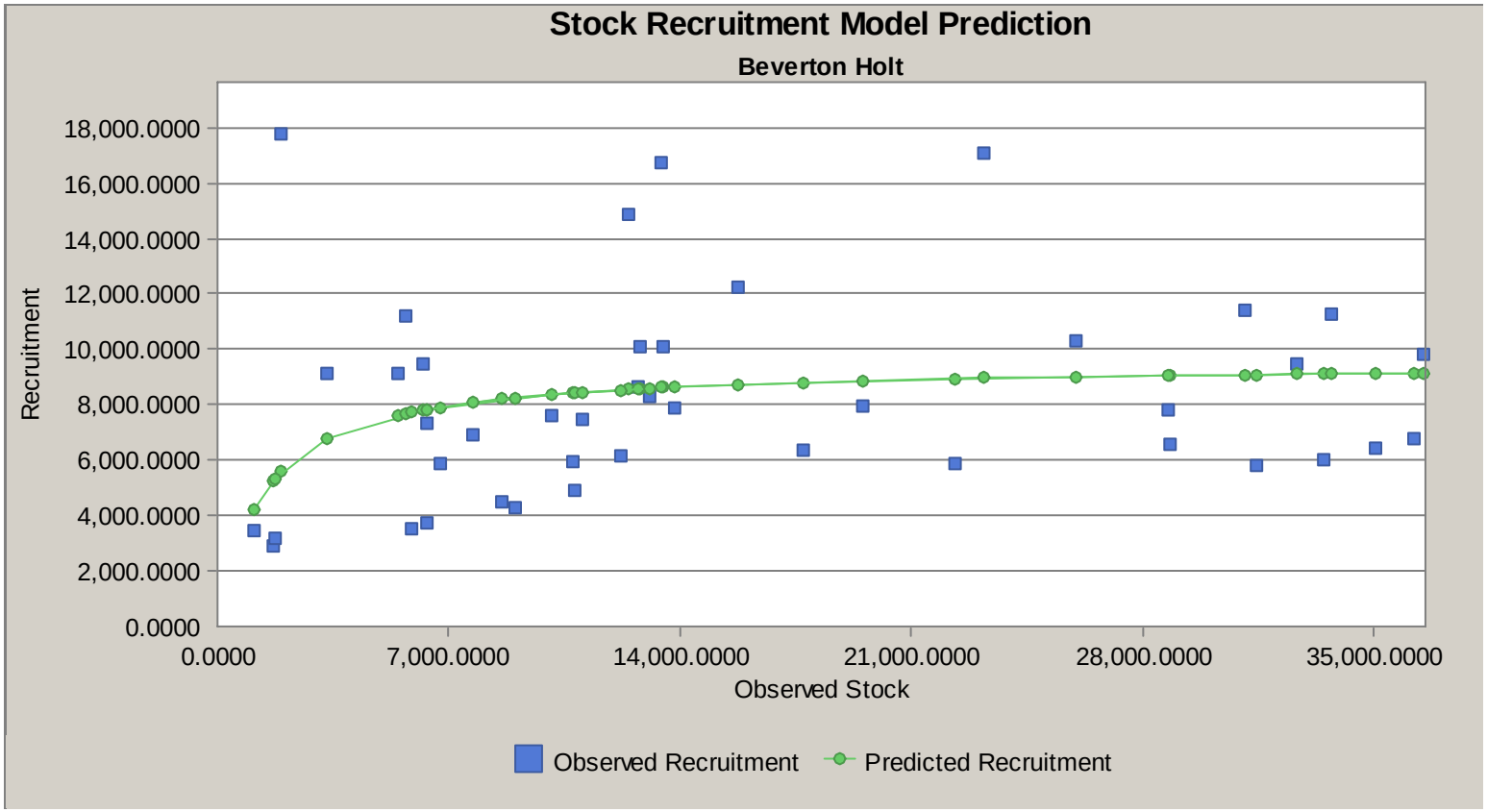



1893-1962
1963-1981
1982-2005
Recruitment (000s)
Spawning Stock Biomass (mt)
0
5000
10000
15000
20000
25000
30000
0
10000
20000
30000
40000
50000
60000
70000

Stock Recruitment curve from short time series ASAP model, internal fit



Stock Recruitment curve from short time series ASAP using values from 1963-2005



AIM Reference Points

Old Catch Data

Bmsy 7.7 kg/tow (>60 cm fish)
Fmsy 0.55
MSY 4,300 mt

New Catch Data

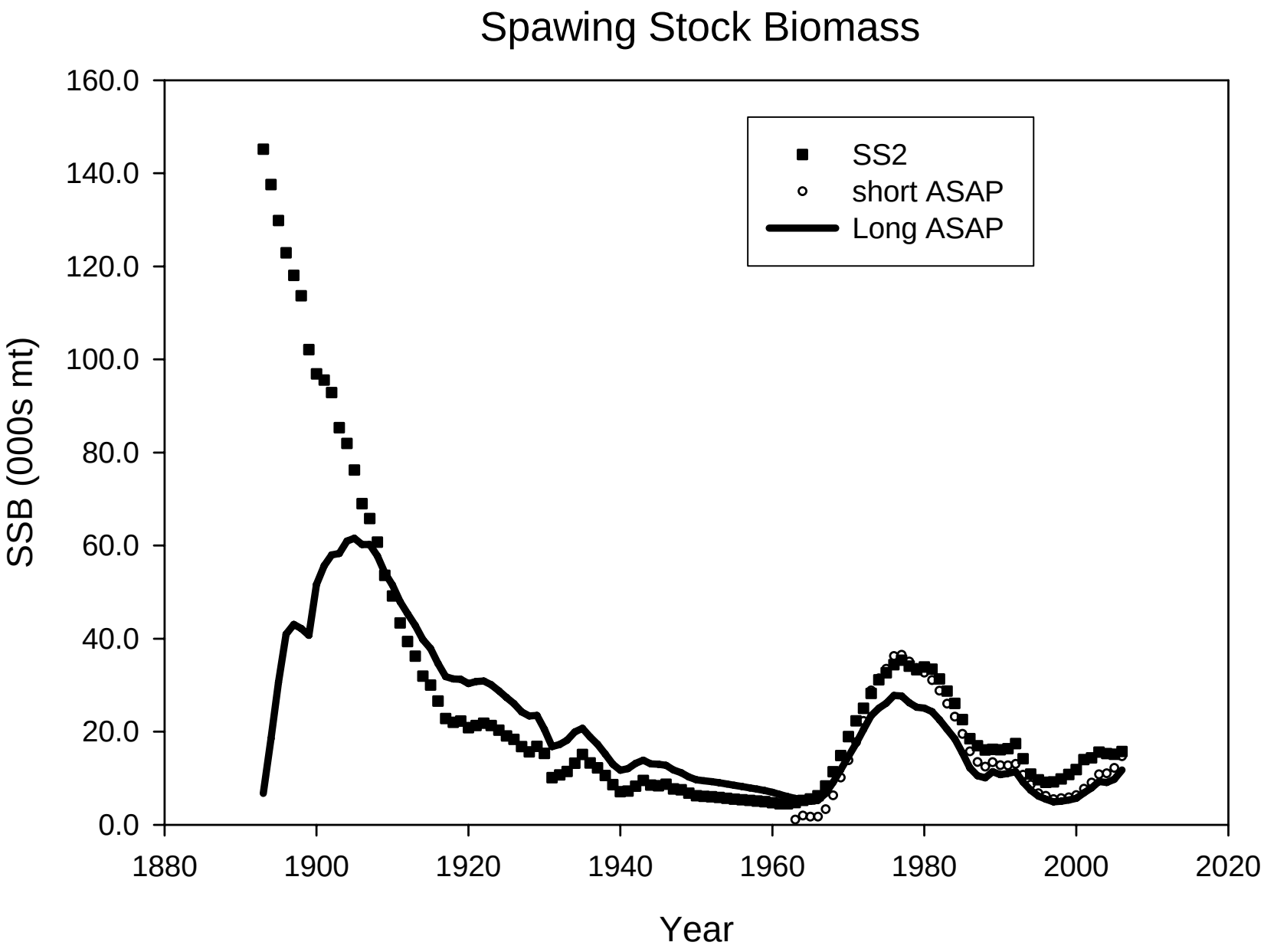
Bmsy 7.7 kg/tow (>60 cm fish)
Fmsy 0.616
MSY 4,743 mt

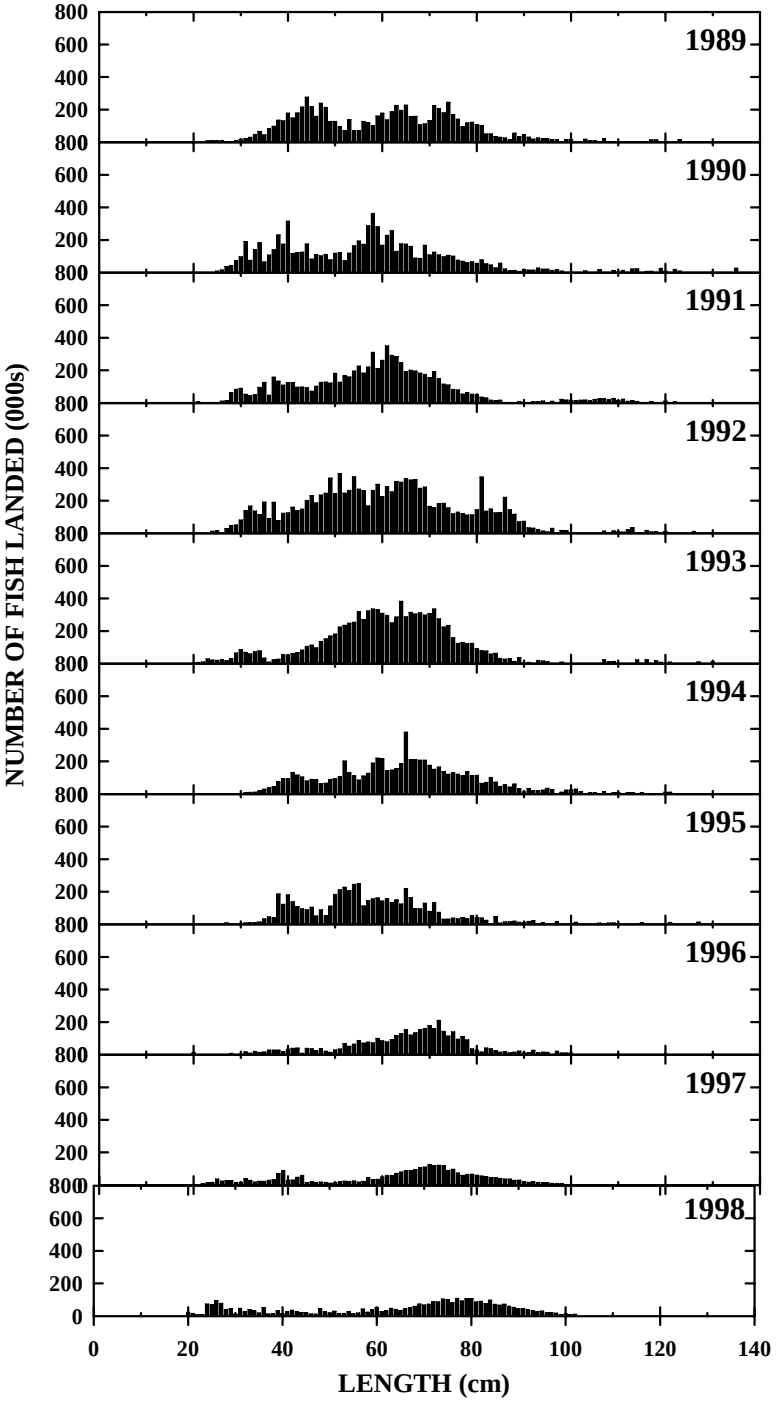
Parametric BRPs

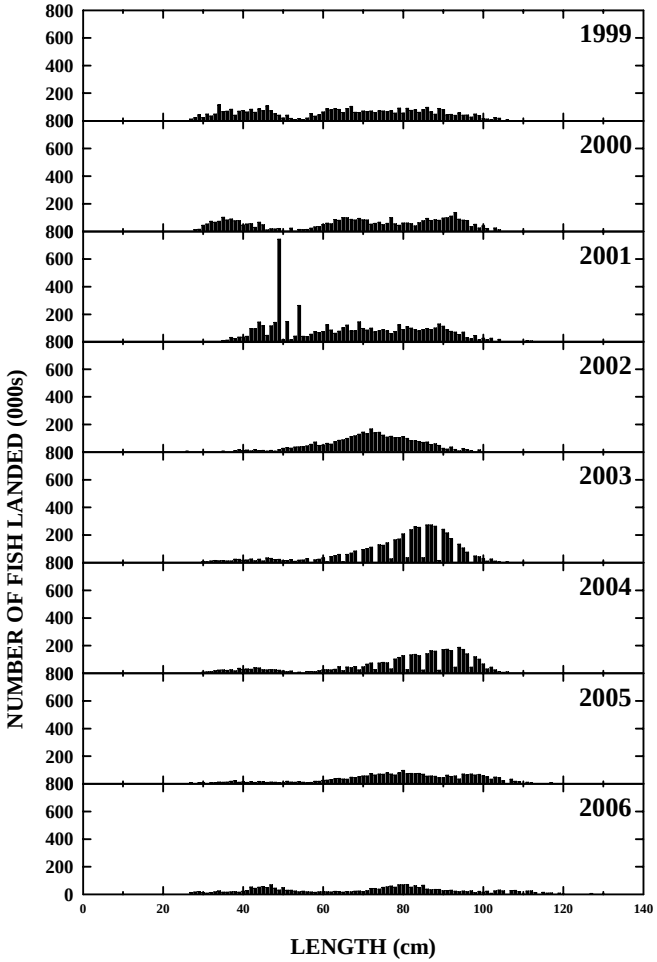
	Long (int)	Long (ext1893-2005)	Long (ext1963-2005)	Long (ext1982-2005)	Short (int)	Short (ext)
MSY	15000	14600	9200	15900	8000	8300
FMSY	0.19	0.21	0.24	0.22	0.25	0.35
SSBMSY	94200	77600	40700	77800	41100	33300
Alpha	18.13	18.08	10.06	18.37	9.50	9.48
Beta	18.31	16.70	4.10	11.59	2.26	1.39
Sigma		0.296	0.376	0.390		0.406
steepness	0.81	0.81	0.91	0.86	0.95	0.97
MSY(projected)		15300	9800	17100		8800
SSBMSY(proj)		81100	43600	83800		35900

Empirical BRPs

	Long First 100	Long Last 100	Long Last 43	Short
F40%	0.16	0.16	0.16	0.21
SSB/R	6.2462	6.2462	6.2462	6.4272
YPR	0.9244	0.9244	0.9244	0.8081
Average Recruitment	9456	8034	7260	8196
MSY	8700	7400	6700	6600
SSBMSY	59000	50200	45000	52700
MSY(projected)	8600	7500	7300	6500
SSBMSY(proj)	59900	51200	41300	52000


Spawing Stock Biomass
SS2
short ASAP
Long ASAP
SSB (000s mt)
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
1880
1900
1920
1940
1960
1980
2000
2020
Year


NUMBER OF FISH LANDED (000s)
LENGTH (cm)
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998


NUMBER OF FISH LANDED (000s)
LENGTH (cm)
1999
2000
2001
2002
2003
2004
2005
2006