NOAA FISHERIES

NEFSC

Gulf of Maine and Southern New England Winter Flounder

2015 Groundfish Operational Assessments Updates

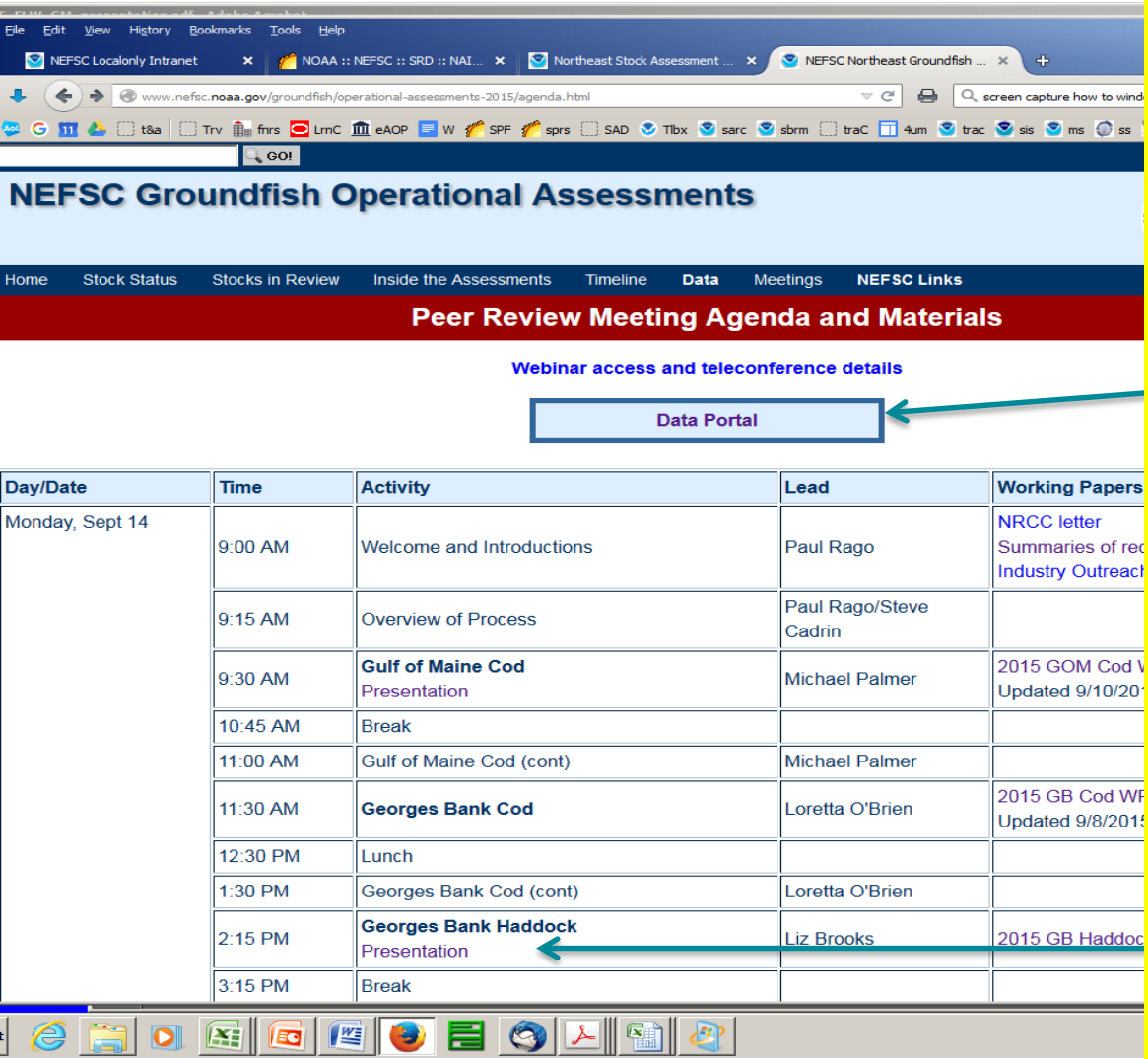
Paul Nitschke

November 3, 2015

20 Groundfish Stocks
Rules for Engagement

- Update model runs and BRP estimates with limited changes to model configuration (m, selectivity, weighting, etc).
- Exclusion of ASAP likelihood constants.
- TOGA for NEFSC survey tow evaluation.
- Apply a retrospective adjustment to the t+1 abundance if the Mohn's Rho (7 year peel) estimate are outside of the model's 90% CI.

http://www.nefsc.noaa.gov/groundfish/operational-as



Efficiency Initiative

Data Portal Output

Search Criteria

- Assessment Year
- Species
- Stock
- Information Type

OUTPUTS

- Zip File=Everything
- Assessment Report
- Figures
- Tables
- Model info: inputs, outputs, diagnostics
- Maps—Survey
- Maps –Commercial
- Background Reports

Gulf of Maine Winter Flounder

NOAA FISHERIES

NEFSC

Lead Scientist: Paul Nitschke

Last Assessed: 2014 Operational Assessments
2011 Benchmark SARC 52

30+ Survey Area-Swept

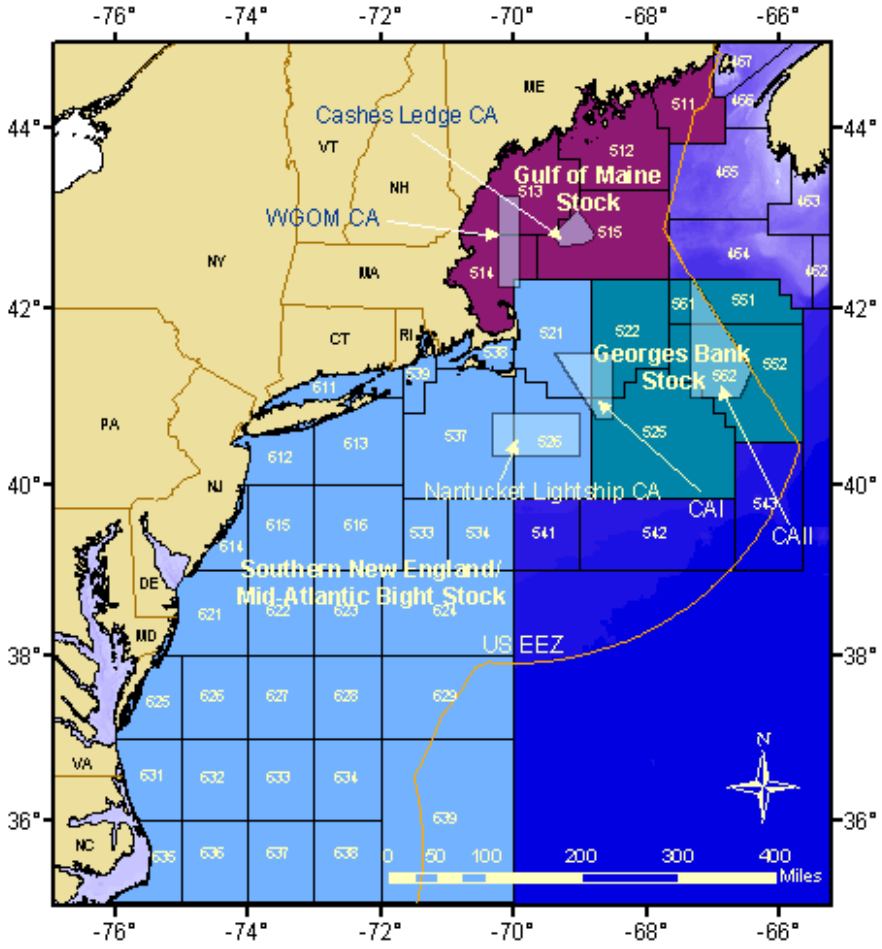
September 17, 2015

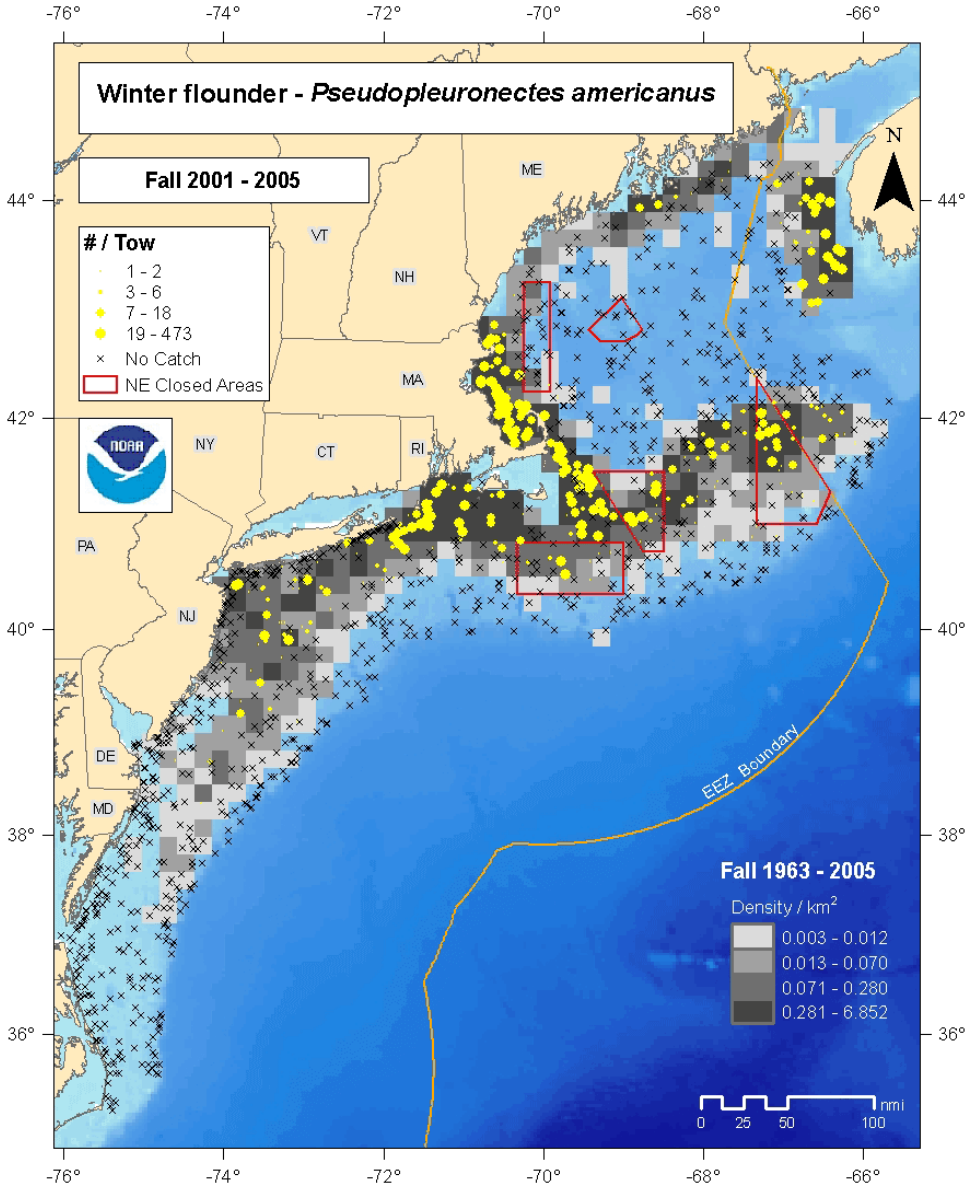
Assessment History

- Analytical model died at the SARC 52 Benchmark (2011) due to concerns with a large retrospective pattern. Models (VPA, SCALE, ASAP, SCAA) have difficulty with the apparent lack of a relationship between a large decrease in the catch with little change in the indices and age and/or size structure over time.
- Assessment is now based on 30+ cm area-swept biomass estimated directly from the surveys.

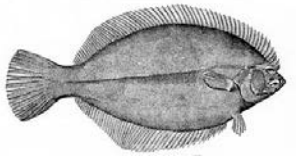
Current Status

- Overfished status is Unknown
- Overfishing not occurring

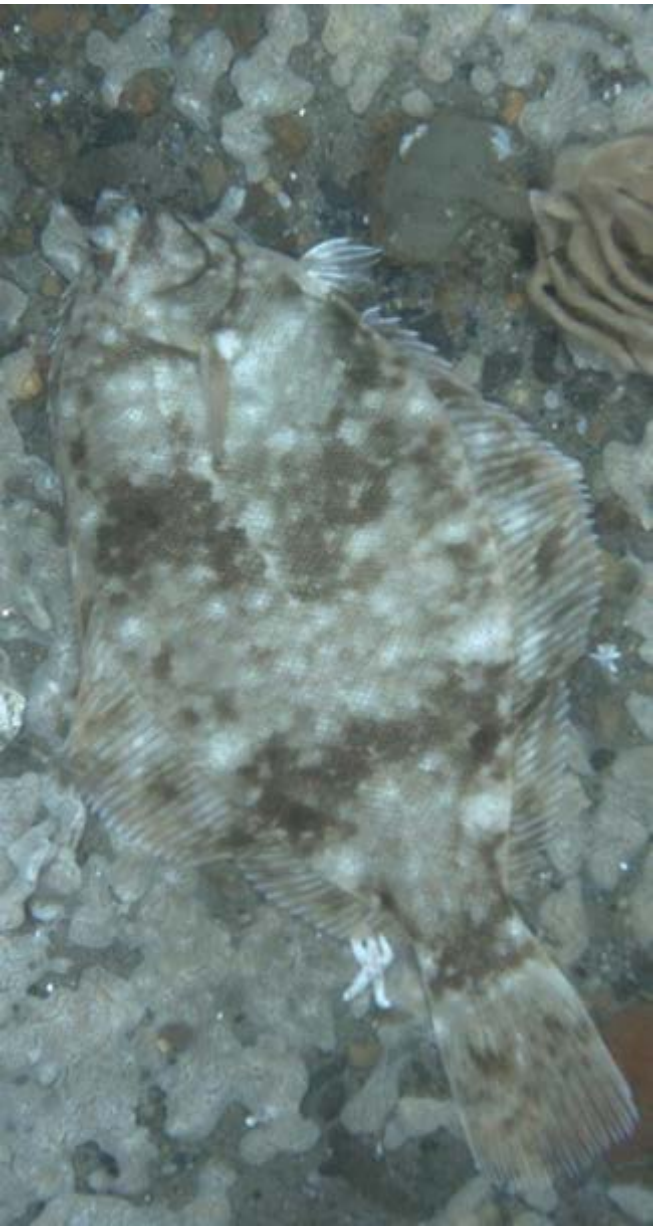


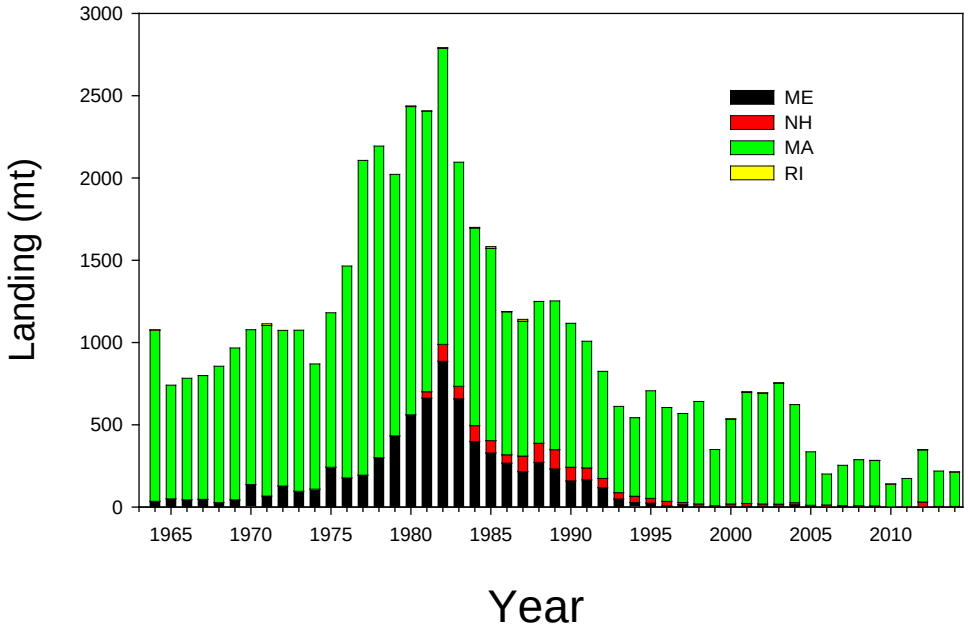


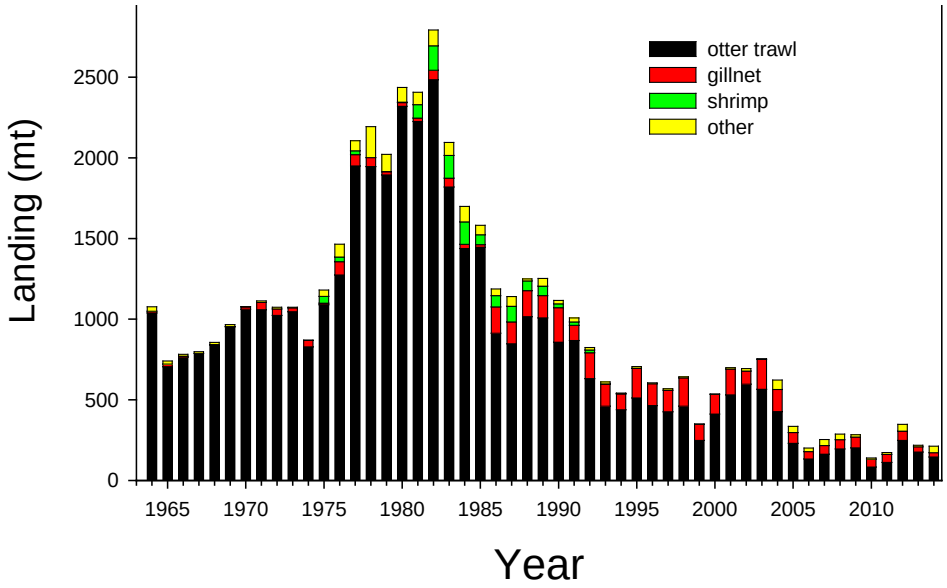
Assessment

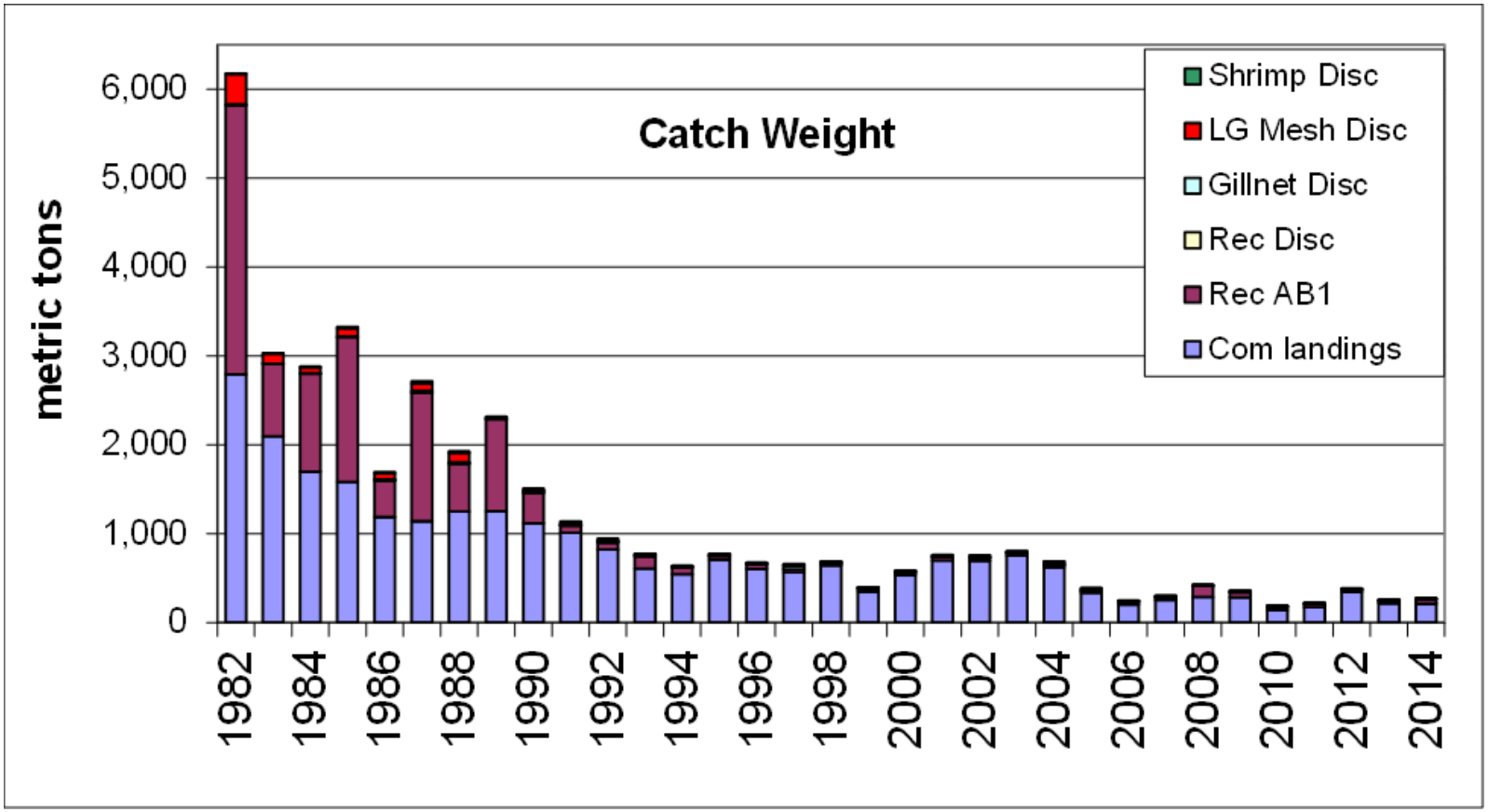


- Update trends in the NEFSC, MDMF, and MENH surveys.
- Estimate 2015 catch (commercial & recreational landing, recreational discards, large mesh trawl discards and gillnet discards).

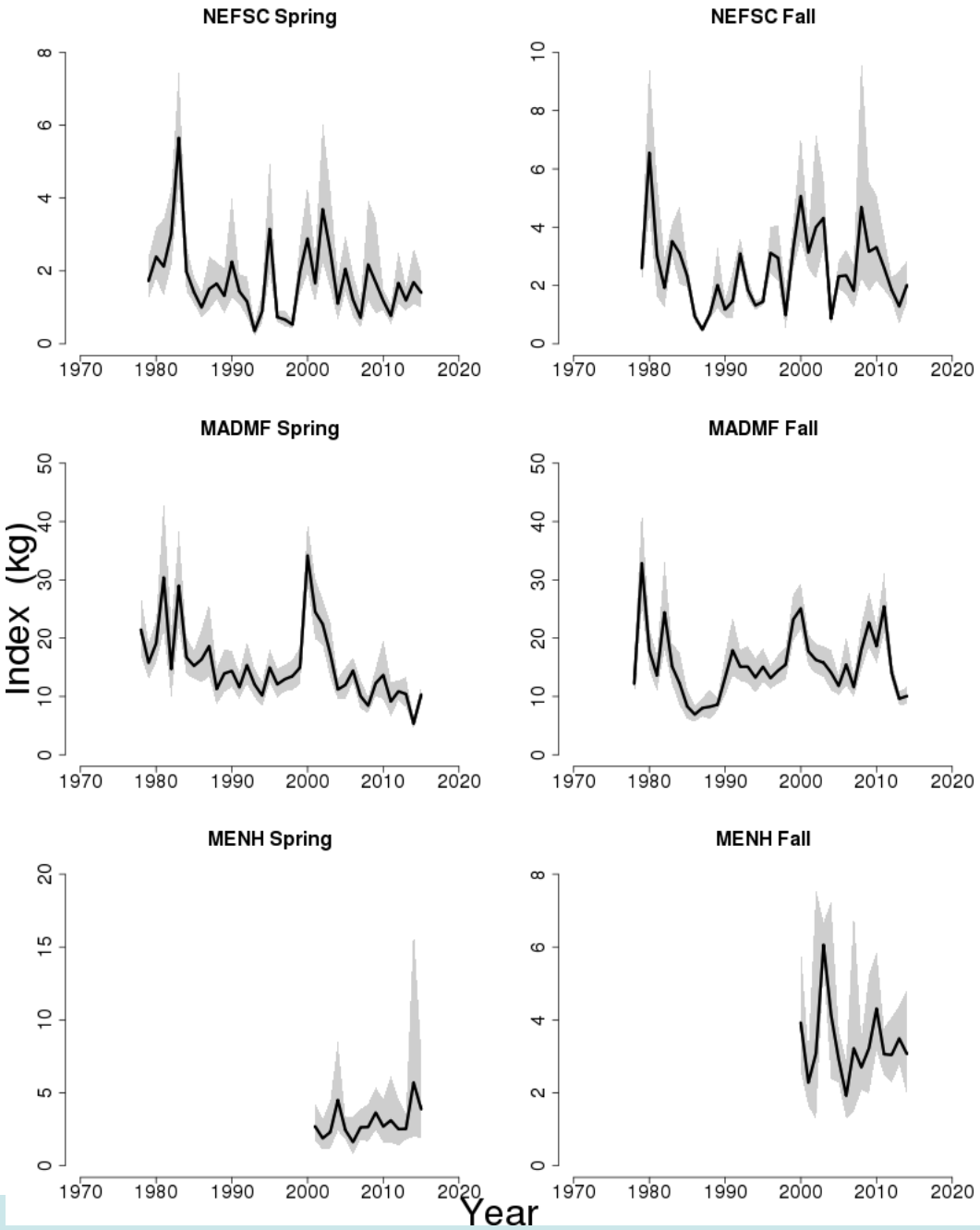



Landing (mt)
3000
2500
2000
1500
1000
500
0
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
Year
ME
NH
MA
RI


Landing (mt)
2500
2000
1500
1000
500
0
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
Year
otter trawl
gillnet
shrimp
other

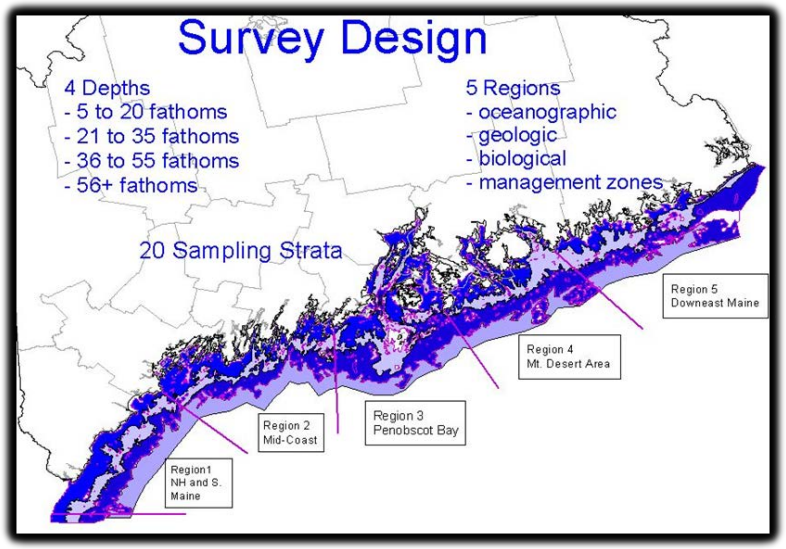


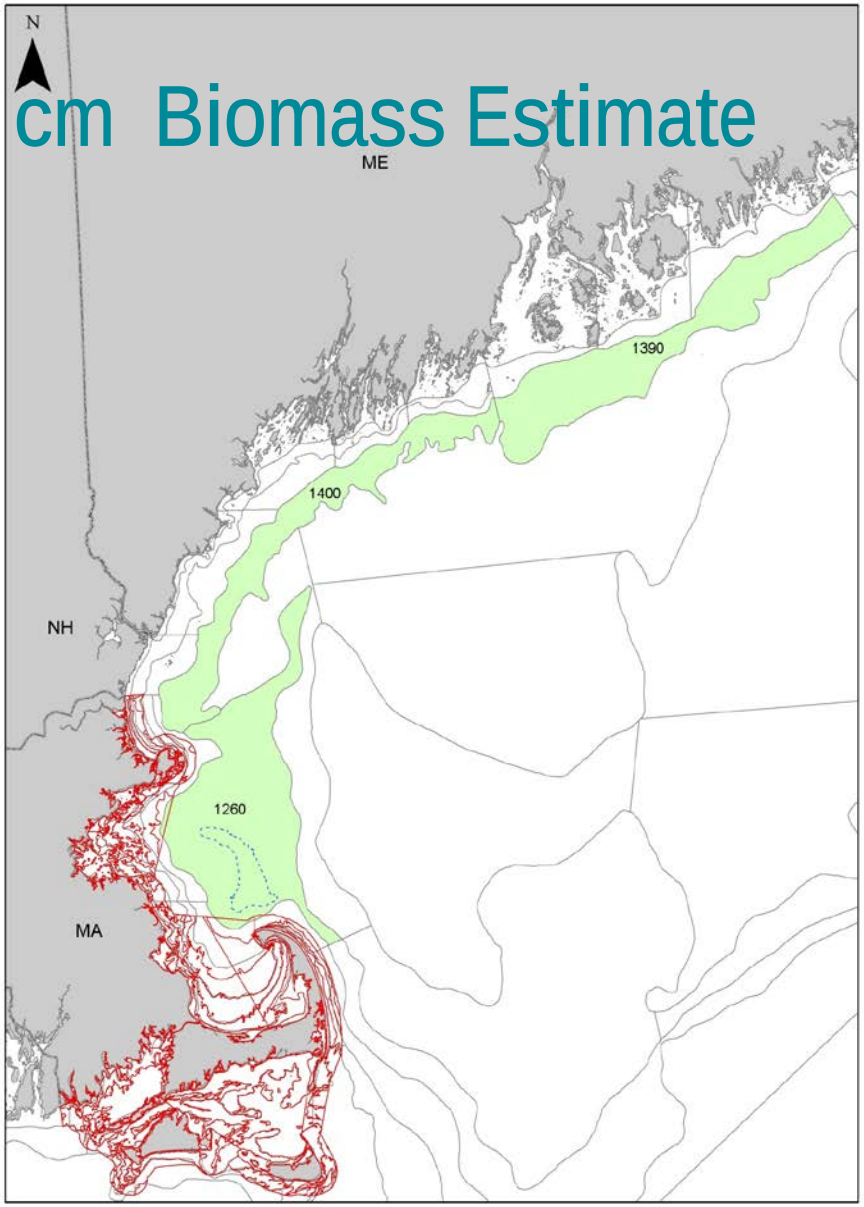
Commercial Discards assume a 50% mortality
Recreational Discards assume 15% mortality


NEFSC Spring
NEFSC Fall
MADMF Spring
MADMF Fall
MENH Spring
MENH Fall
Index (kg)
Year
1970
1980
1990
2000
2010
2020

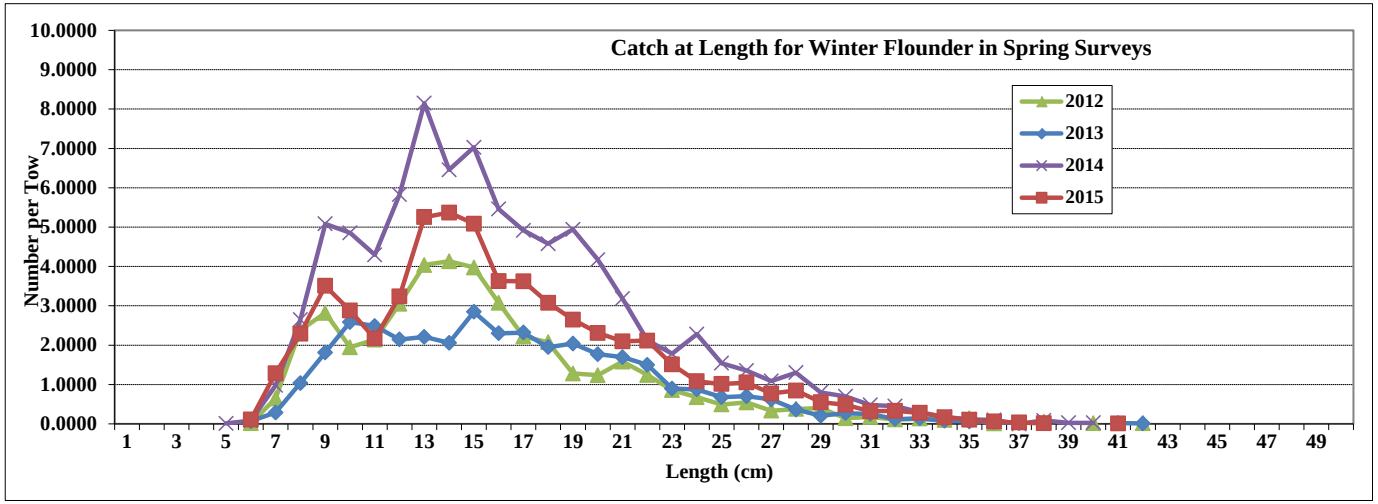
Combined Surveys 30+ cm Biomass Estimate

- Estimate Fall 2014 and Spring 2015 30+ cm biomass from the NEFSC, MDMF and MENH surveys.





MENH Survey Length Distribution



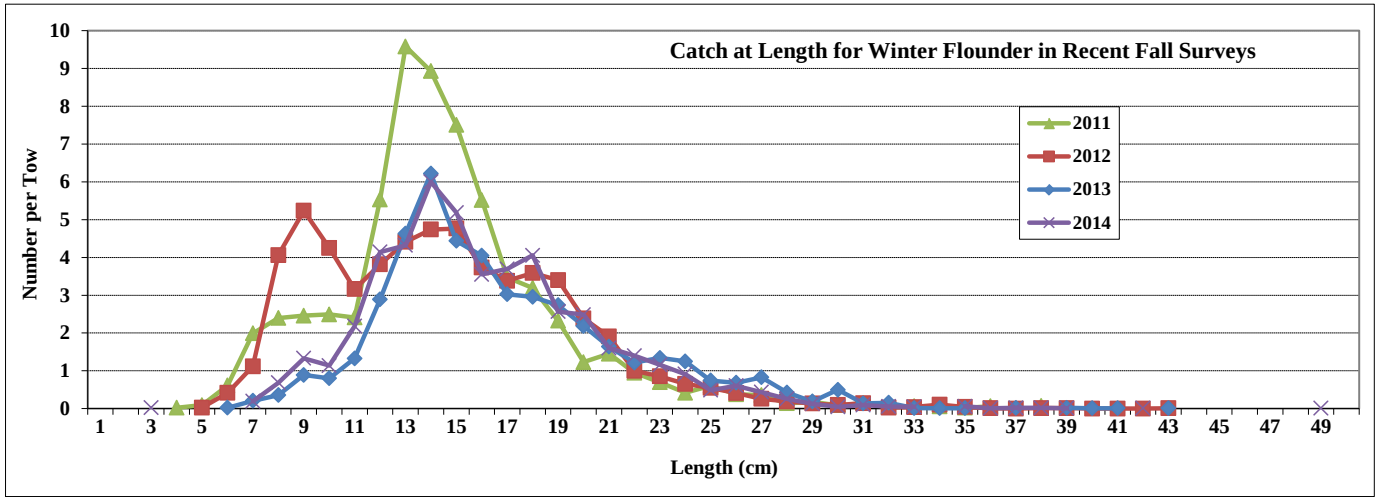


Table 7

	Combined Survey Estimate		
	NEFSC	MDMF	MENH
survey area (nm2)	2,990	309	3,475
Avg tow (wing area swept)	0.00700	0.00385	0.00462
Total area/tow footprint	427,143	80,343	752,154
Tow duration	20 min	20 min	20 min
Numbers per tow	34-65	80	35

Assessment

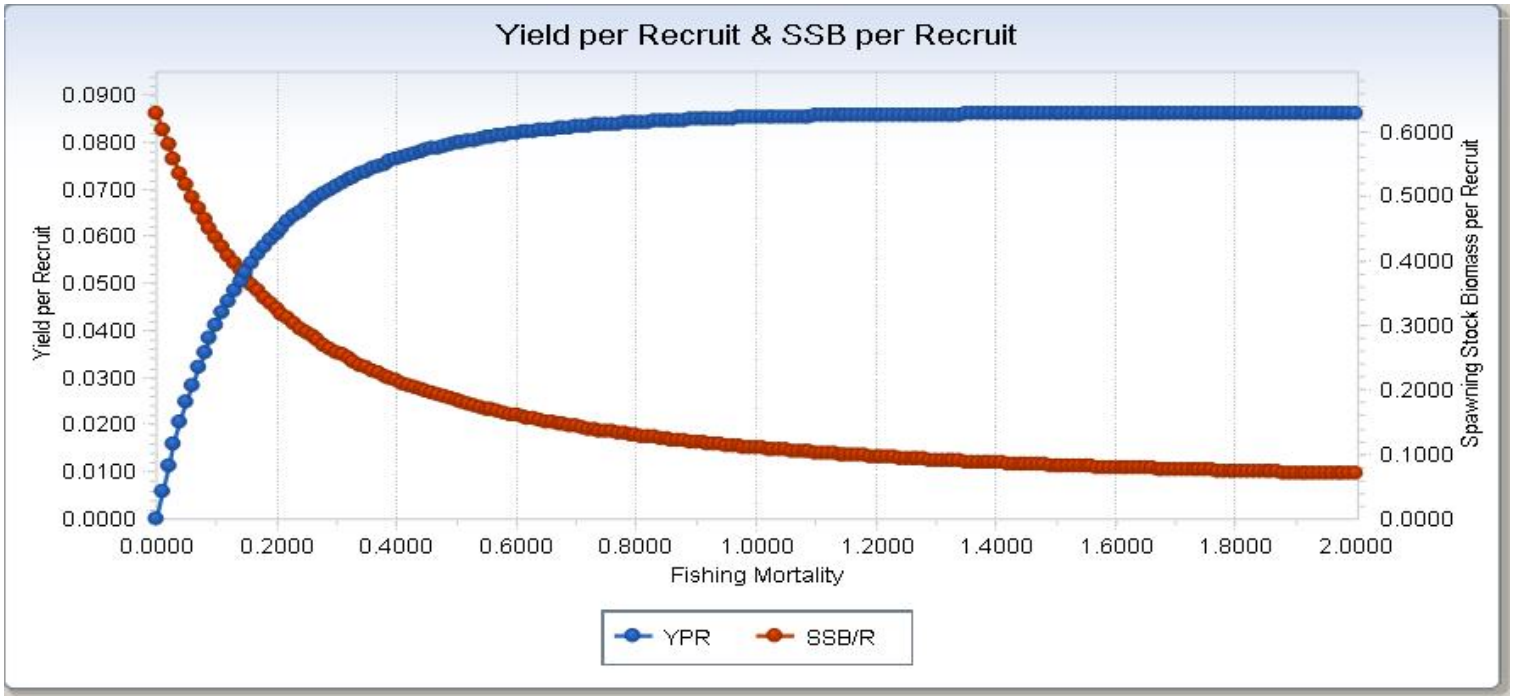
30+ cm Survey Area-Swept Biomass Estimate

Used in SARC 52 (2011) & 2014 Operational Update

- Exploitable Biomass = 30+ cm biomass index per tow x total survey area / tow footprint x q

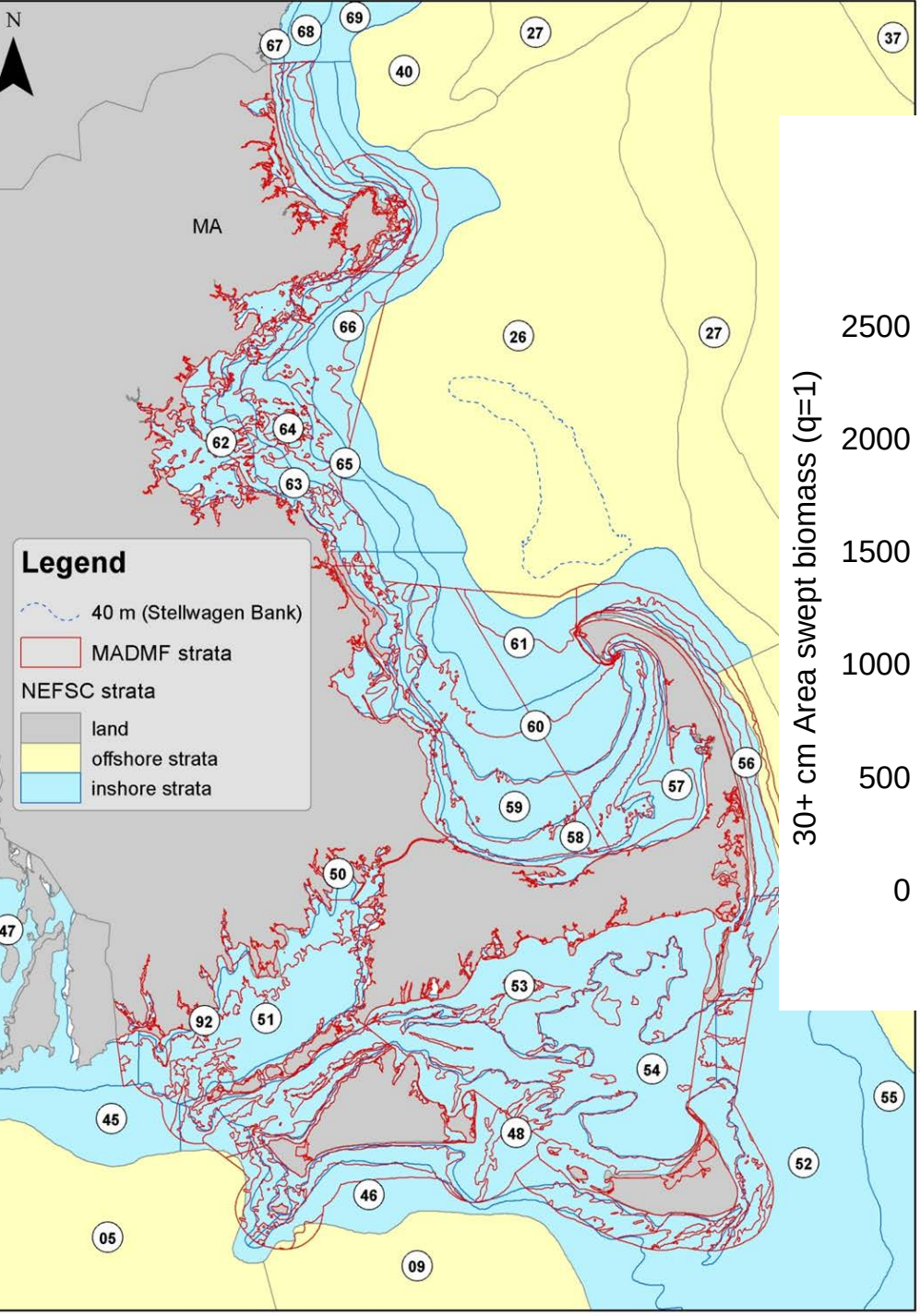
  Q = 0.6 Informed by GB winter flounder

- Exploitation rate = catch / 30+ cm biomass
- Overfishing BRPs based on F40% from Length based YPR (SARC 52, Not updated).

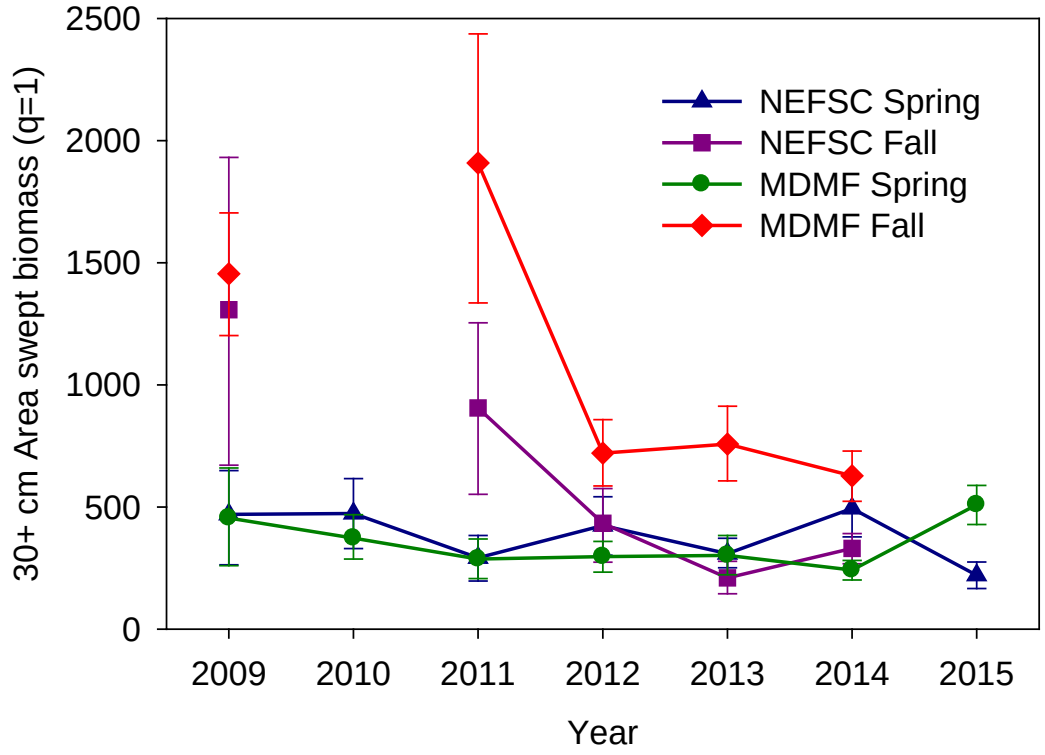


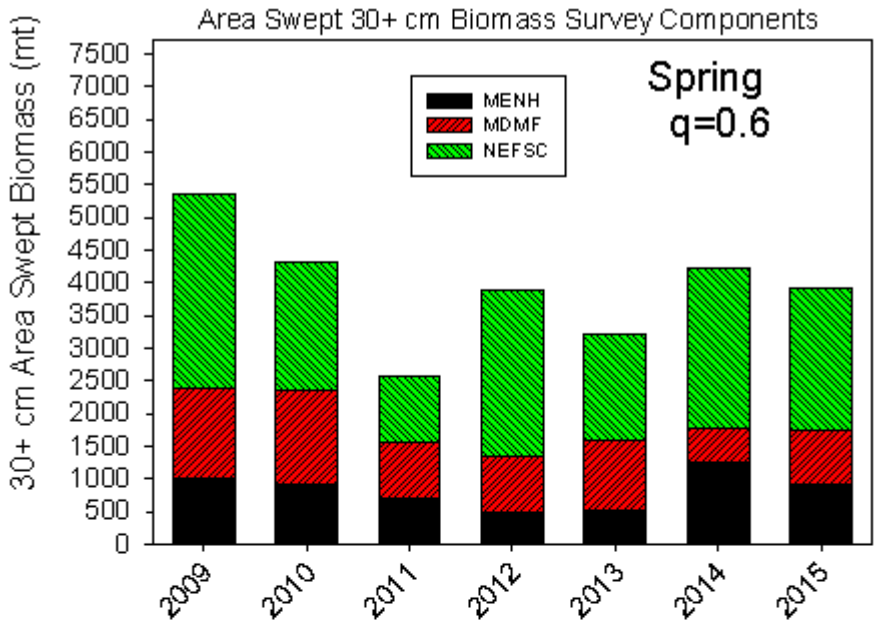
Length based YPR from SARC 52
m=0.3
FMSY = F40% = 0.31
Exploitation rate = 0.23
75%FMSY = 0.24
Exploitation rate = 0.17

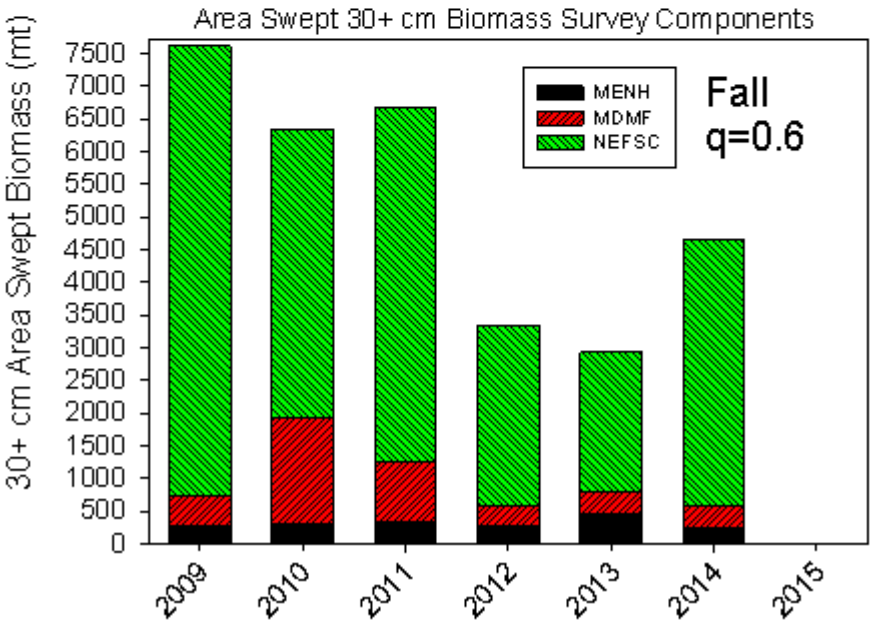
Knife edge selectivity at 30 cm

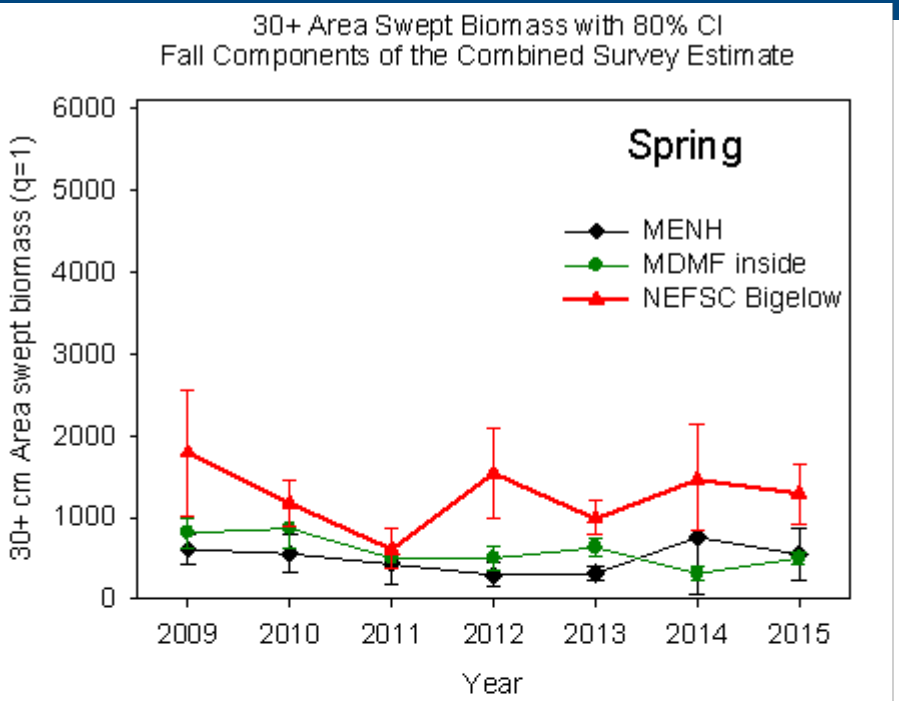


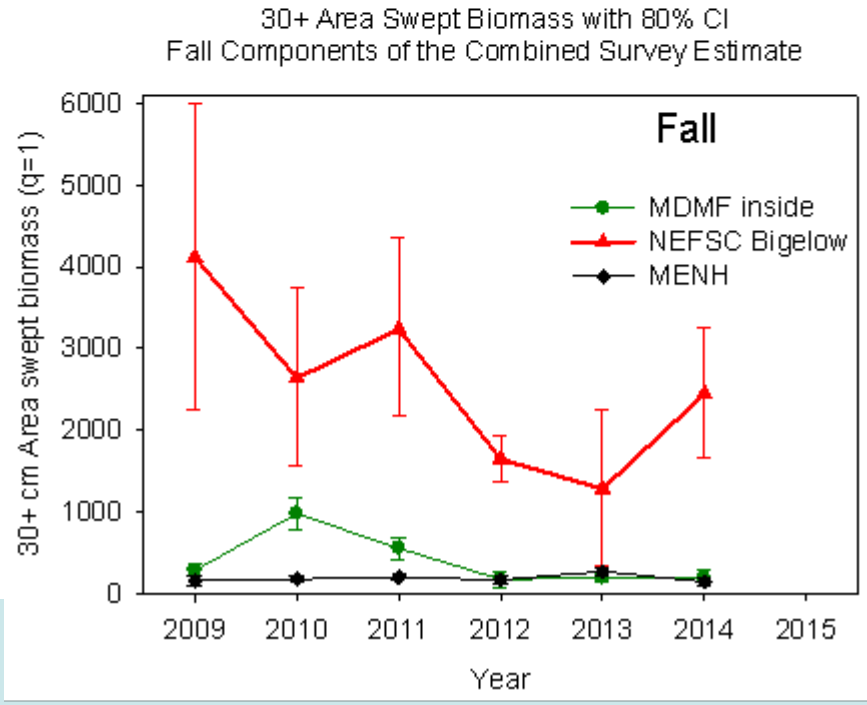
Inshore overlap area 30+ Area Swept Biomass with 80% CI
NEFSC biomass was adjusted to MDMF Area
DMF total area = 72% NMFS total area




Area Swept 30+ cm Biomass Survey Components
30+ cm Area Swept Biomass (mt)
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
MENH
MDMF
NEFSC
Spring
q=0.6
2009
2010
2011
2012
2013
2014
2015

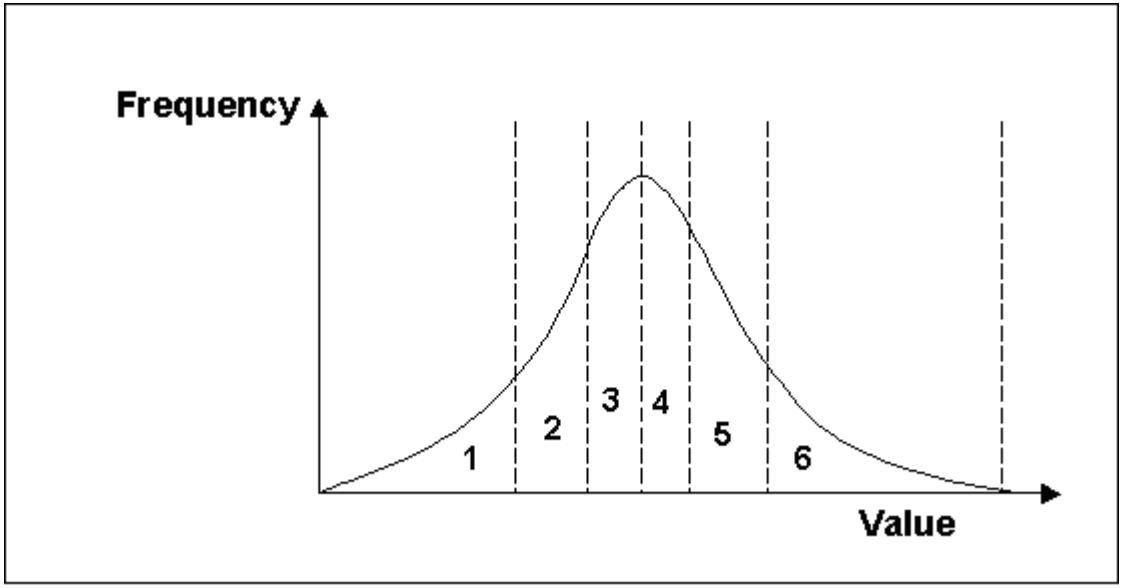

Area Swept 30+ cm Biomass Survey Components
30+ cm Area Swept Biomass (mt)
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
MENH
MDMF
NEFSC
Fall
q=0.6
2009
2010
2011
2012
2013
2014
2015


30+ Area Swept Biomass with 80% CI
Fall Components of the Combined Survey Estimate
Spring
MENH
MDMF inside
NEFSC Bigelow
30+ cm Area swept biomass (q=1)
6000
5000
4000
3000
2000
1000
0
2009
2010
2011
2012
2013
2014
2015
Year


30+ Area Swept Biomass with 80% CI
Fall Components of the Combined Survey Estimate
Fall
MDMF inside
NEFSC Bigelow
MENH
30+ cm Area swept biomass (q=1)
6000
5000
4000
3000
2000
1000
0
2009
2010
2011
2012
2013
2014
2015
Year

Uncertainty was estimated using the Latin Hypercube approach

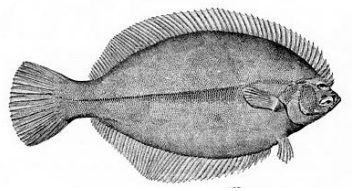
$$B_{Tot} = A_{NEFSC}\frac{I_{NEFSC}}{e\ a_{NEFSC}} + A_{MADMF}\frac{I_{MADMF}}{e\ a_{MADMF}} + A_{MENH}\frac{I_{MENH}}{e\ a_{MENH}}$$



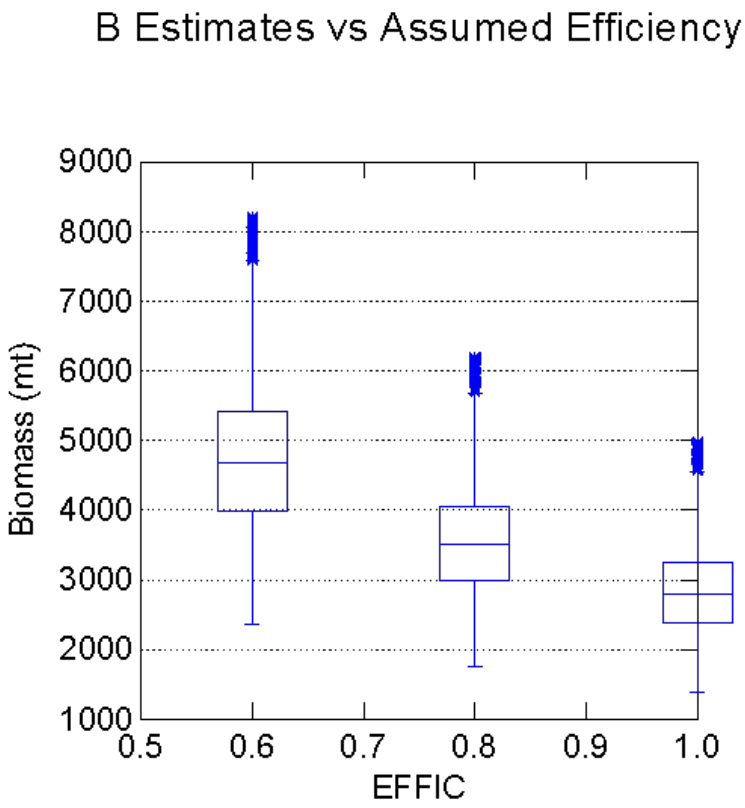
40 equal probability intervals

$$E[B_{Tot}] = \sum_{i=1}^{40}\sum_{j=1}^{40}\sum_{k=1}^{40}\sum_{l=1}^{40}\sum_{m=1}^{40}\sum_{n=1}^{40}\left[A_{NEFSC}\frac{I'_i}{e\ a'_j} + A_{MADMF}\frac{I'_k}{e\ a'_l} + A_{MENH}\frac{I'_m}{e\ a'_n}\right]\delta^6$$

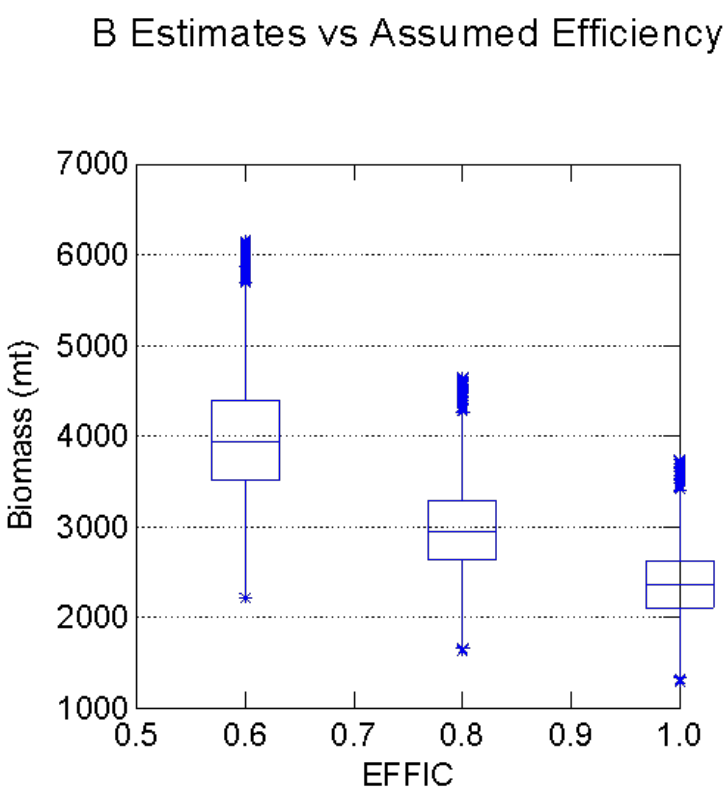
40^6 = 4,096,000,000 evaluations



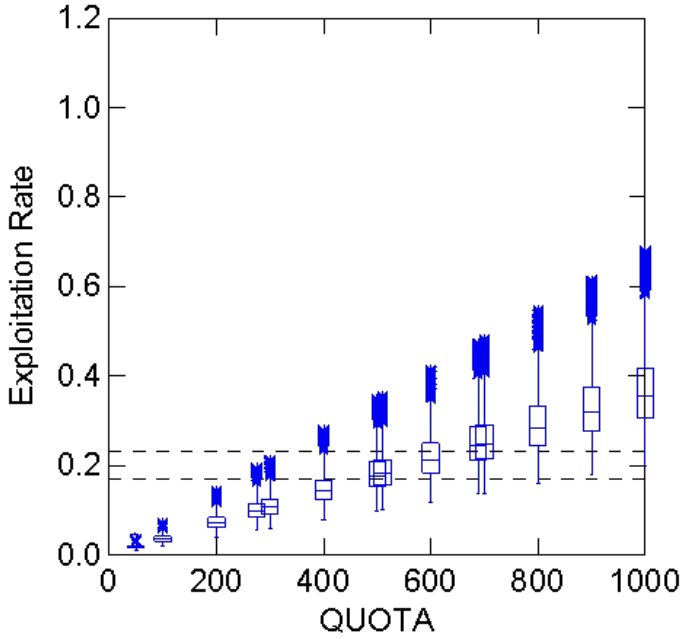
Fall 2014



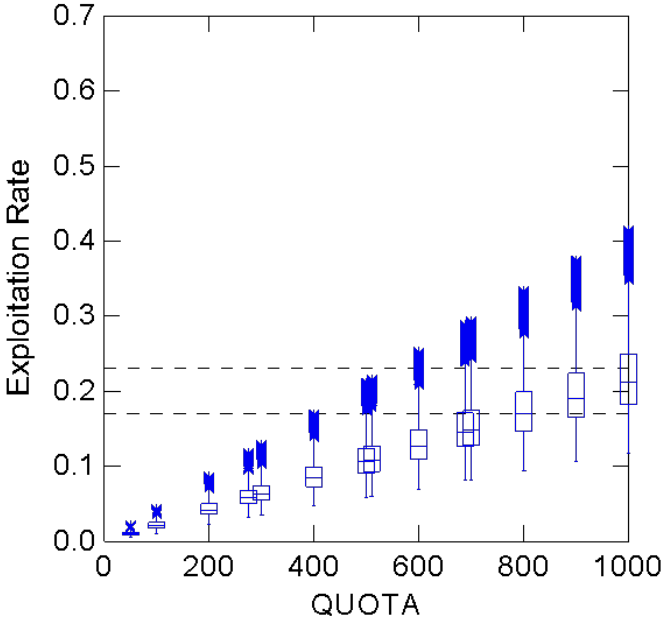
Spring 2015

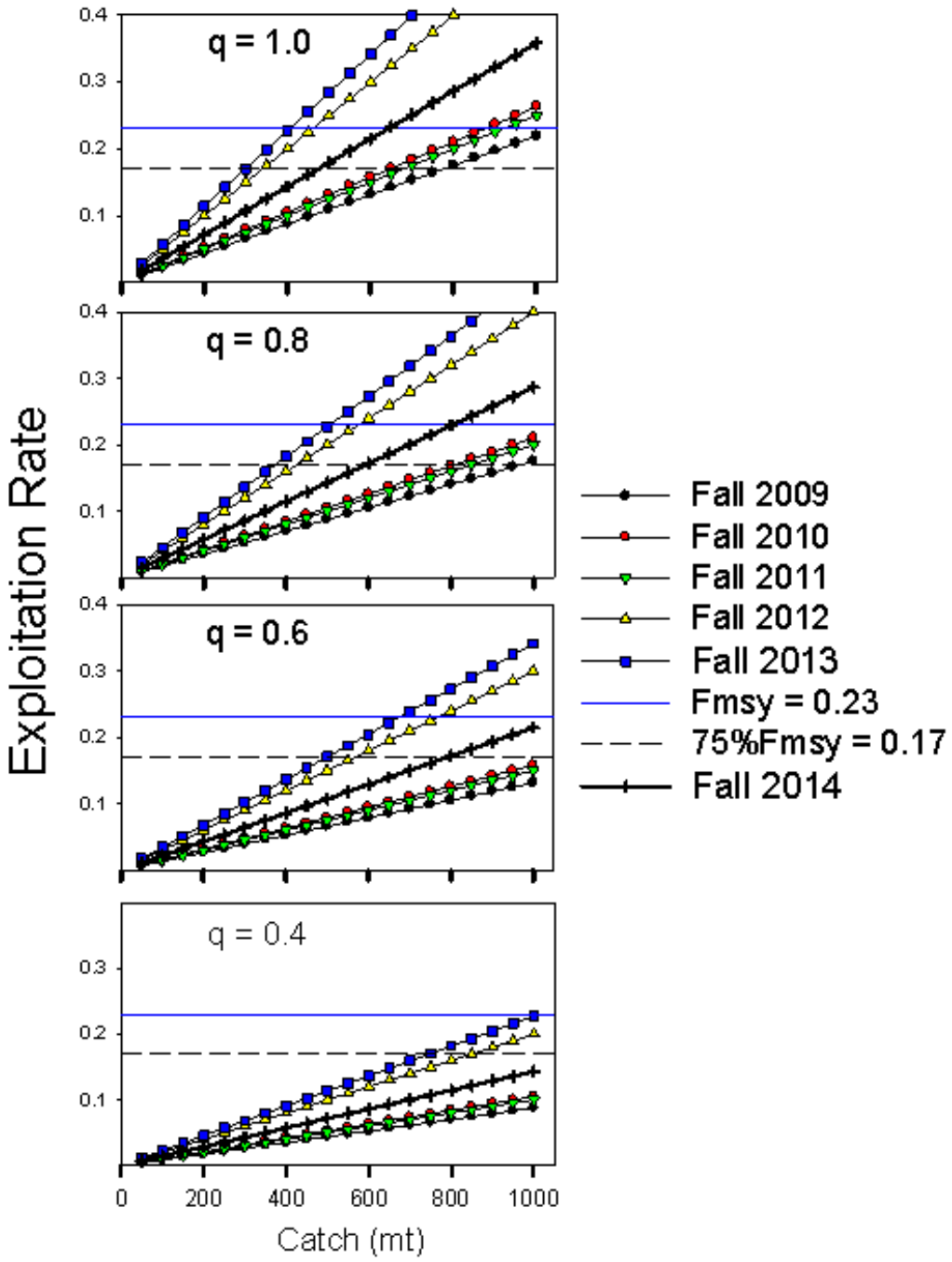


Exploitation Estimates: Fall 2014, Efficiency=1.0

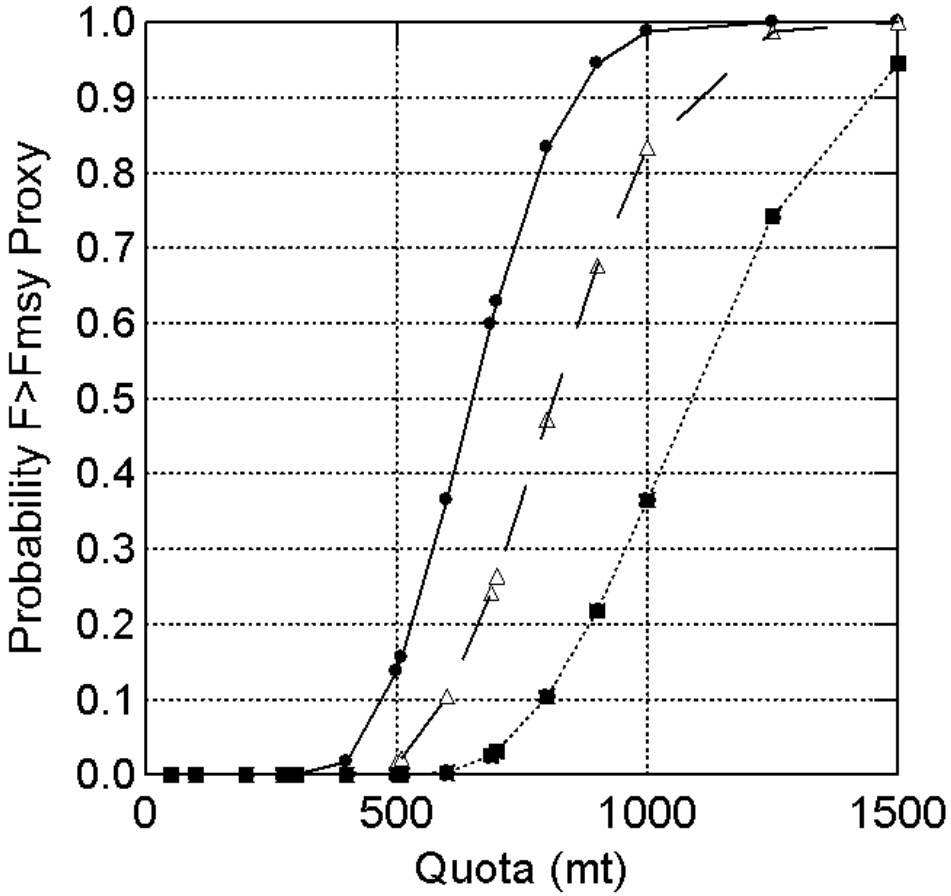


Exploitation Estimates: Fall 2014, Efficiency=0.6

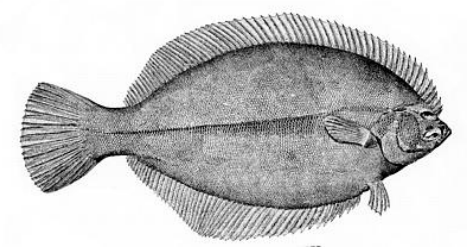



q = 1.0
q = 0.8
q = 0.6
q = 0.4
Exploitation Rate
0.4
0.3
0.2
0.1
0
200
400
600
800
1000
Catch (mt)
Fall 2009
Fall 2010
Fall 2011
Fall 2012
Fall 2013
Fmsy = 0.23
75%Fmsy = 0.17
Fall 2014

Probability of Exceeding Fmsy Proxy=0.23



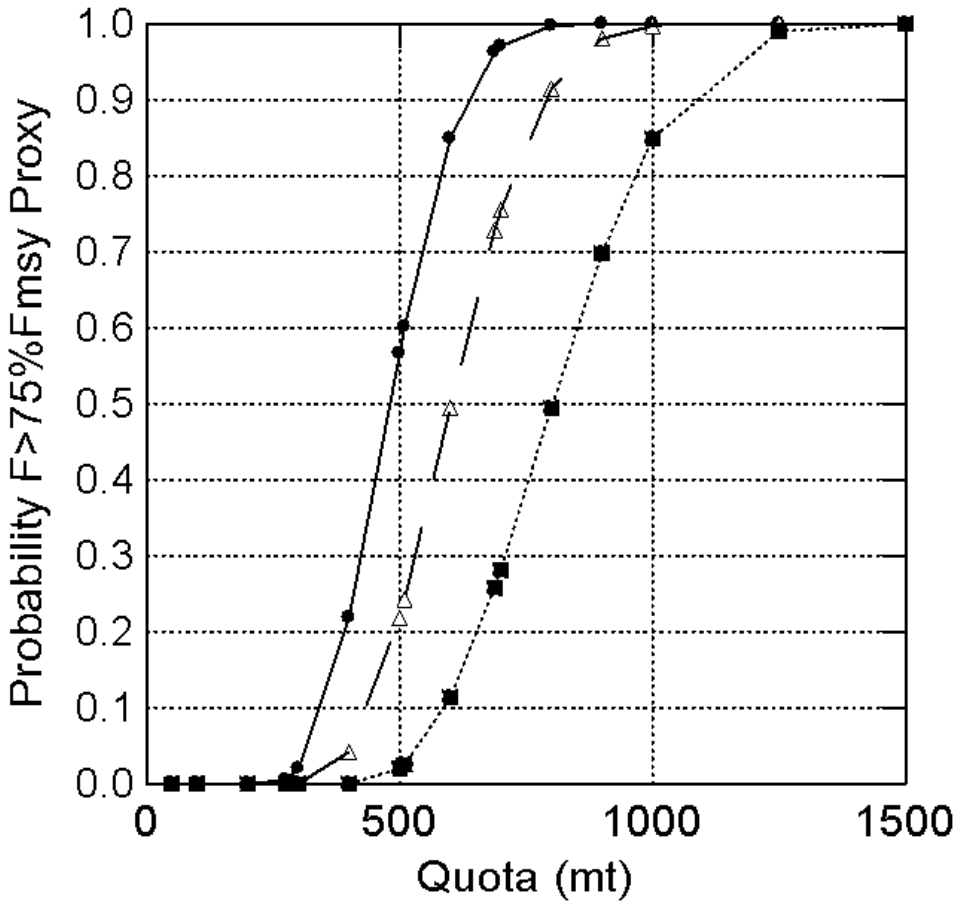
OFL = 1080 mt
Update 2015
Fall 2014



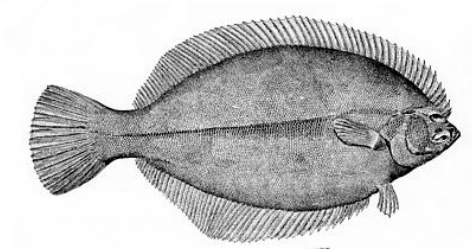
Efficiency

- 100%
- 80%
- 60%

Probability of Exceeding 75% Fmsy Proxy=0.17

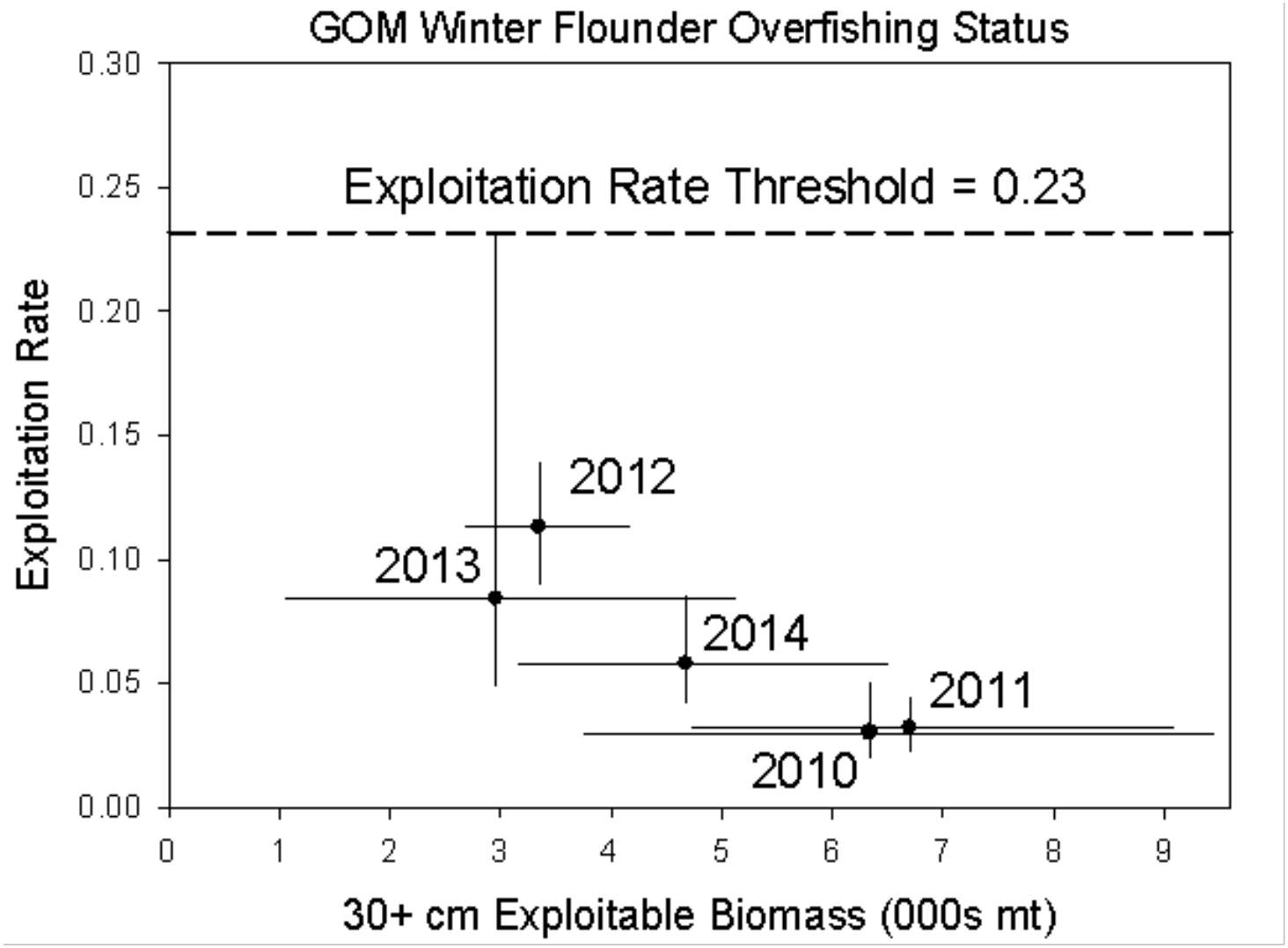


ABC = 810 mt
Update 2015
Fall 2014

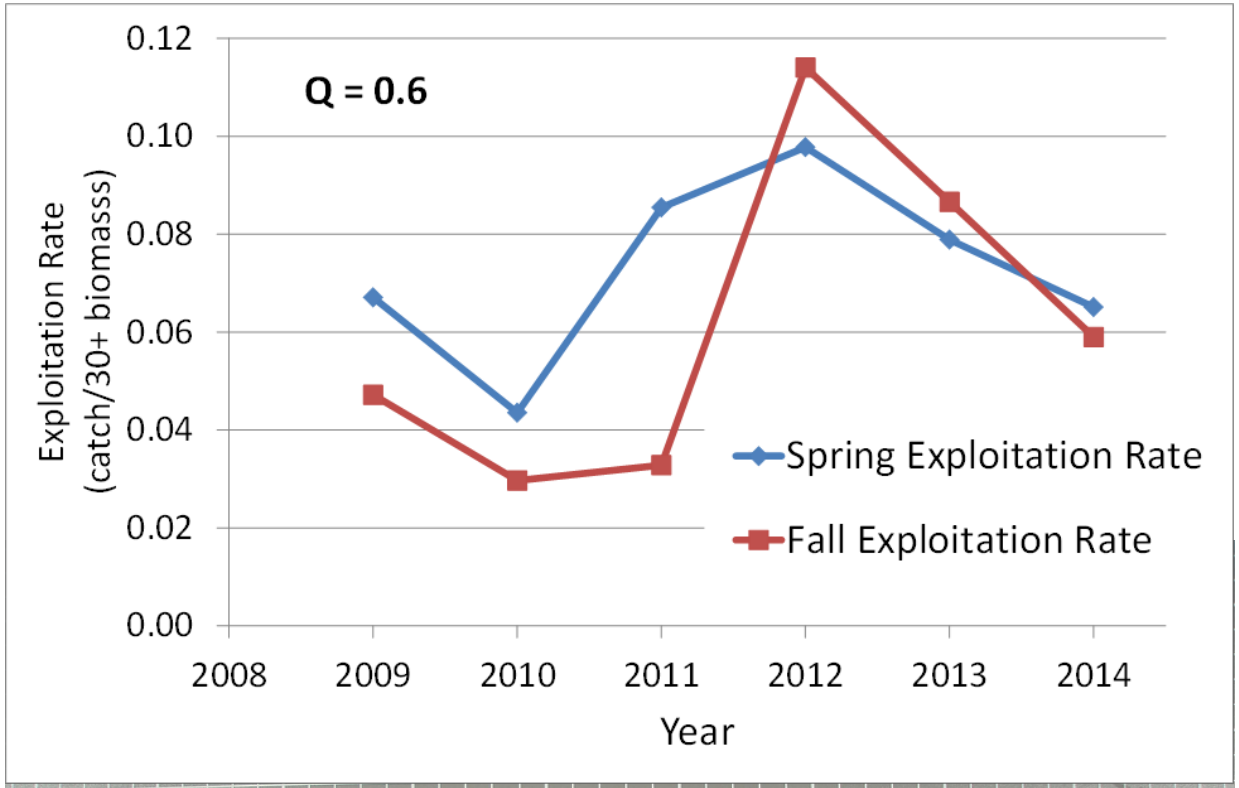


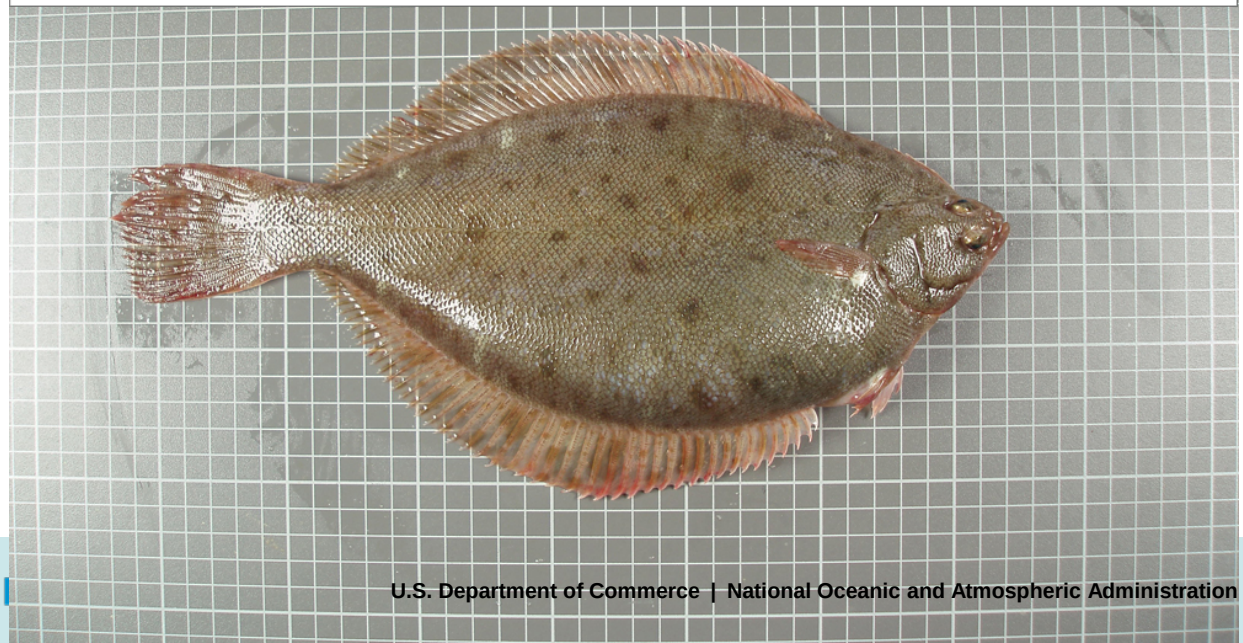
Efficiency

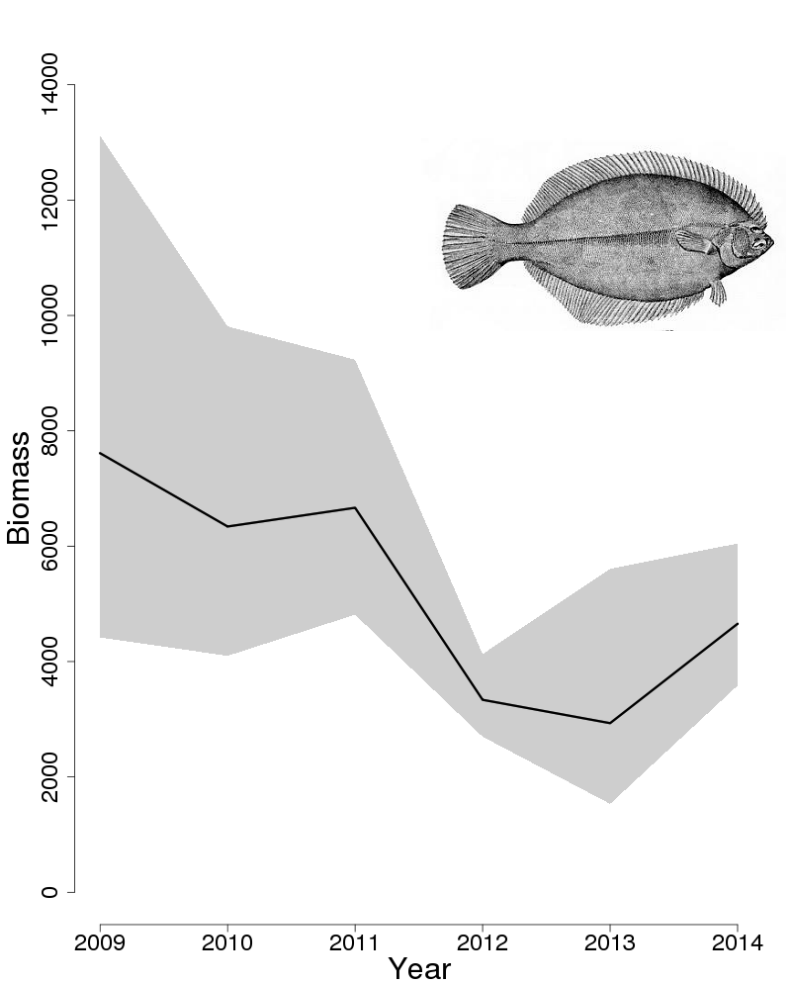
- ● 100%
- △ 80%
- ■ 60%

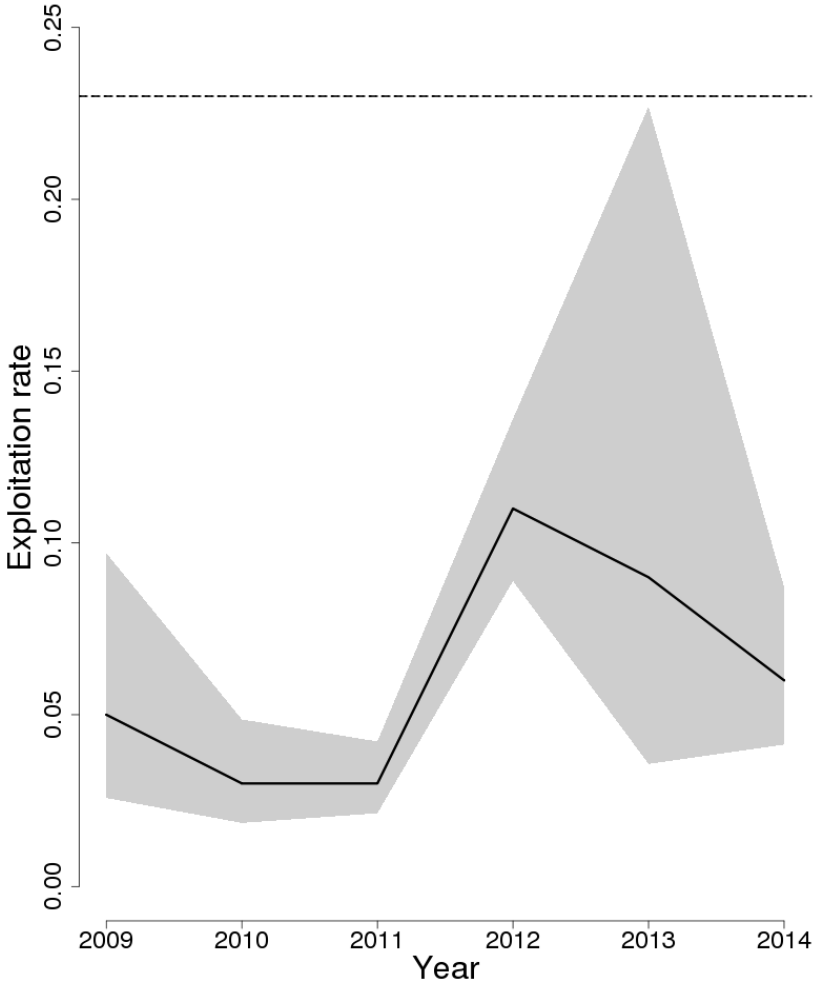


90% confidence intervals are shown for biomass and exploitation rate


Q = 0.6
Exploitation Rate
(catch/30+ biomasss)
0.12
0.10
0.08
0.06
0.04
0.02
0.00
2008
2009
2010
2011
2012
2013
2014
Year
Spring Exploitation Rate
Fall Exploitation Rate

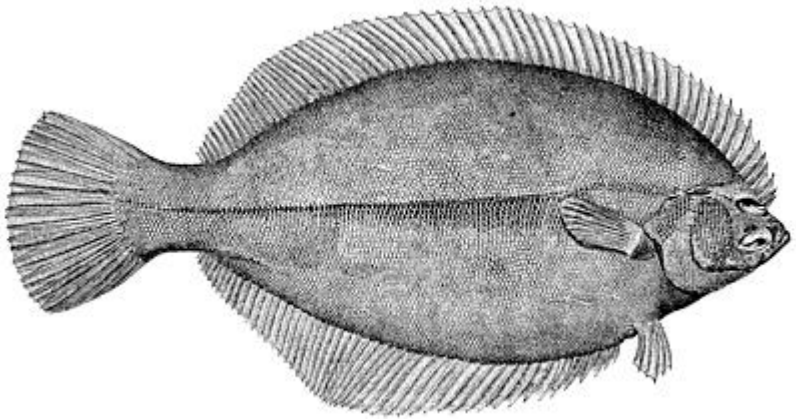



Biomass
0
2000
4000
6000
8000
10000
12000
14000
2009
2010
2011
2012
2013
2014
Year


Exploitation rate
0.00
0.05
0.10
0.15
0.20
0.25
2009
2010
2011
2012
2013
2014
Year

Gulf of Maine Winter Flounder

	2014	Current
E_{MSY} *proxy*	0.23	0.23
B_{MSY}	Unkown	Unkown
MSY (mt)	Unkown	Unkown
Overfishing	No	No
Overfished	Unknown	Unknown



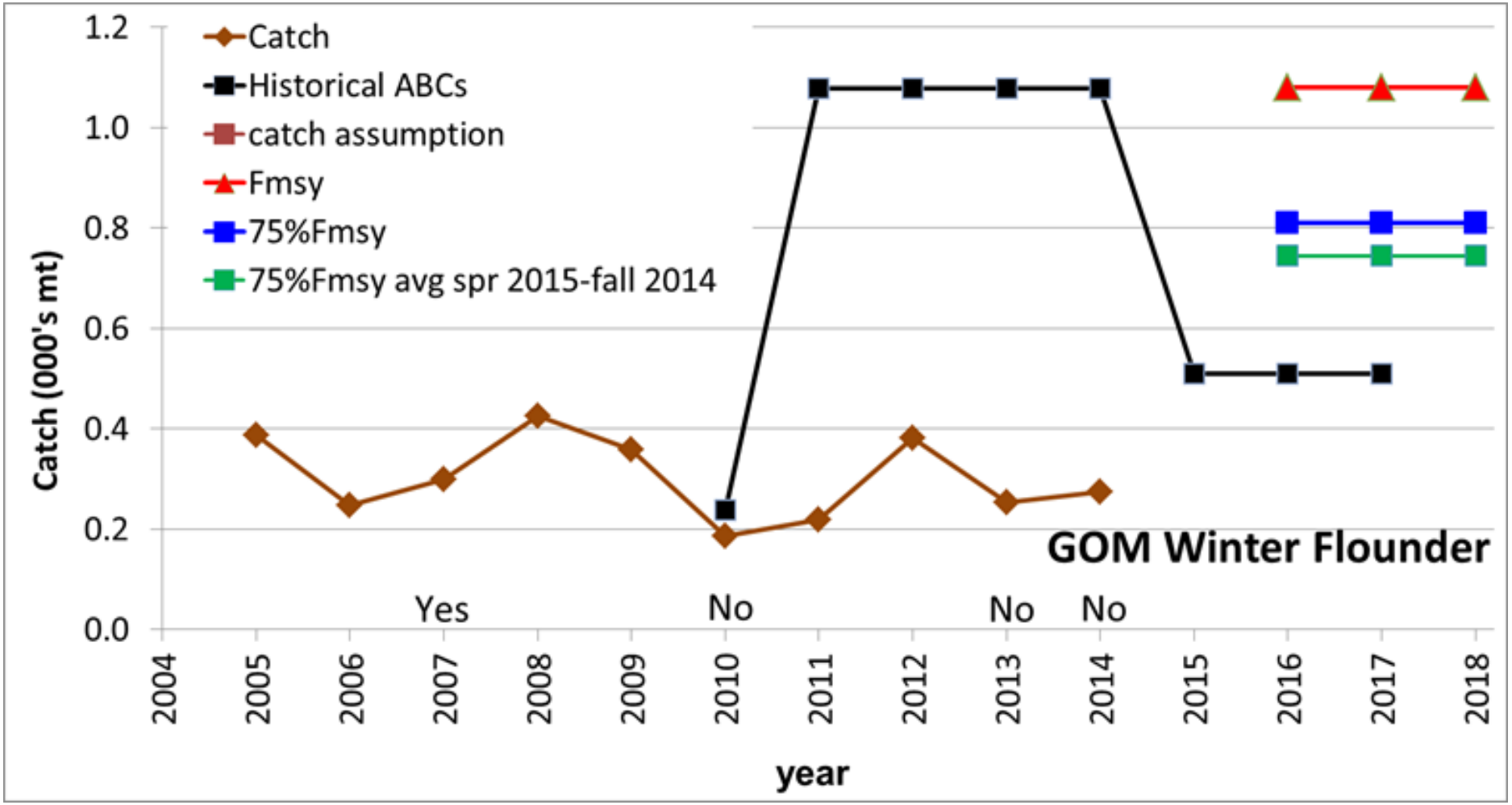
Sources of Uncertainty

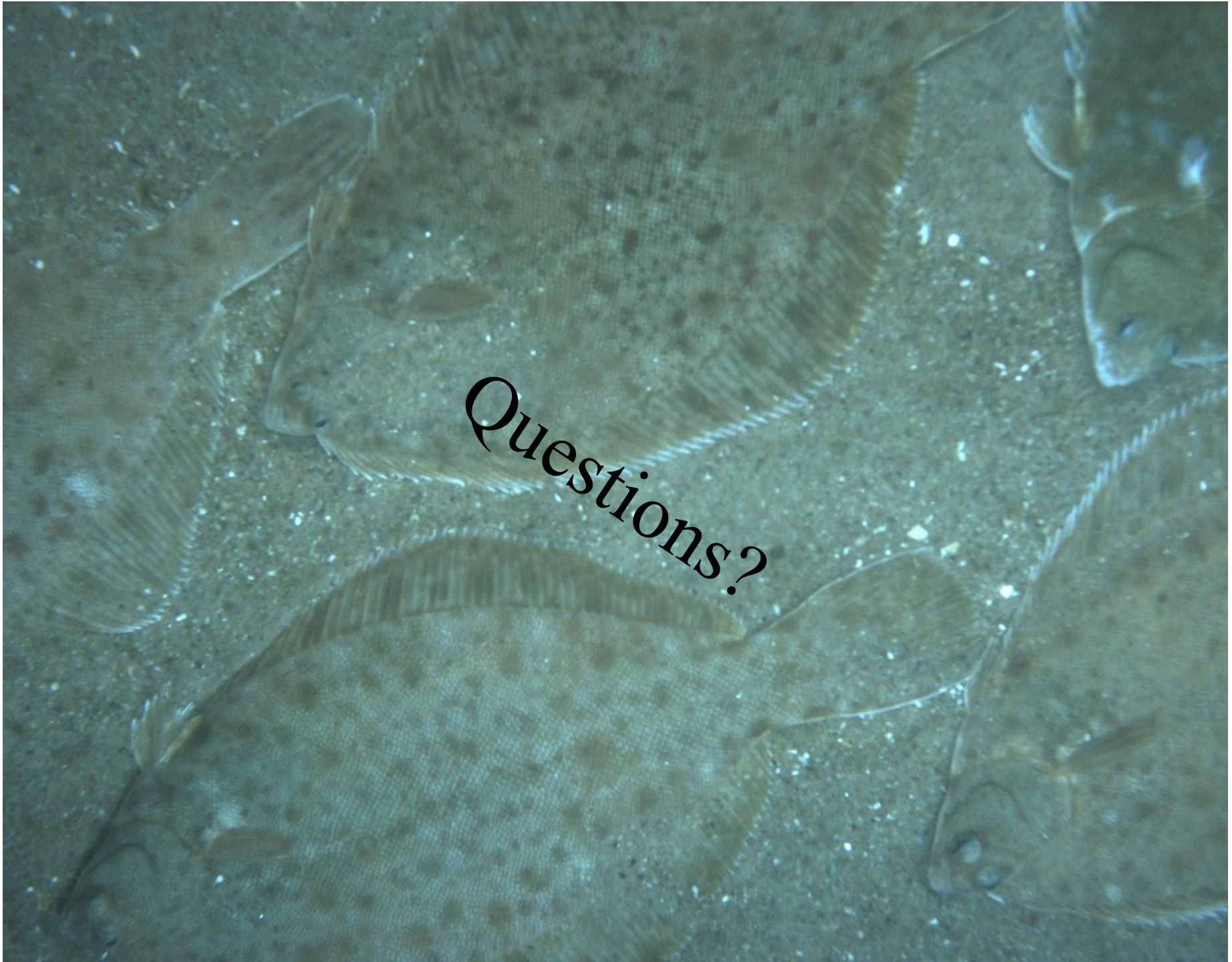
Limited information exists to inform the Q assumption. There are questions with herding from the ground cables and escapement below the footrope and above the headrope in the surveys. The GB yellowtail 2014 empirical benchmark used a Q estimated from the flatfish literature (0.37 on the doors). However catch advice from door spread estimates would still have resulted in higher catch limits than the removals that have occurred.

Concerns

The lack of a response in the survey 30+ cm biomass is a general source of concern with catches remaining far below the overfishing limit.

Gulf of Maine Winter Flounder




Questions?

Southern New England Winter Flounder

NOAA FISHERIES

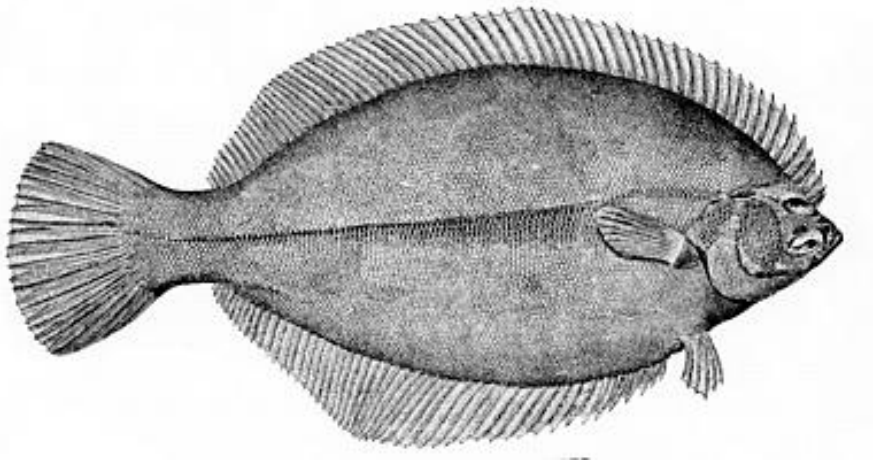
NEFSC

Lead Scientist: Anthony Wood

ASAP Model

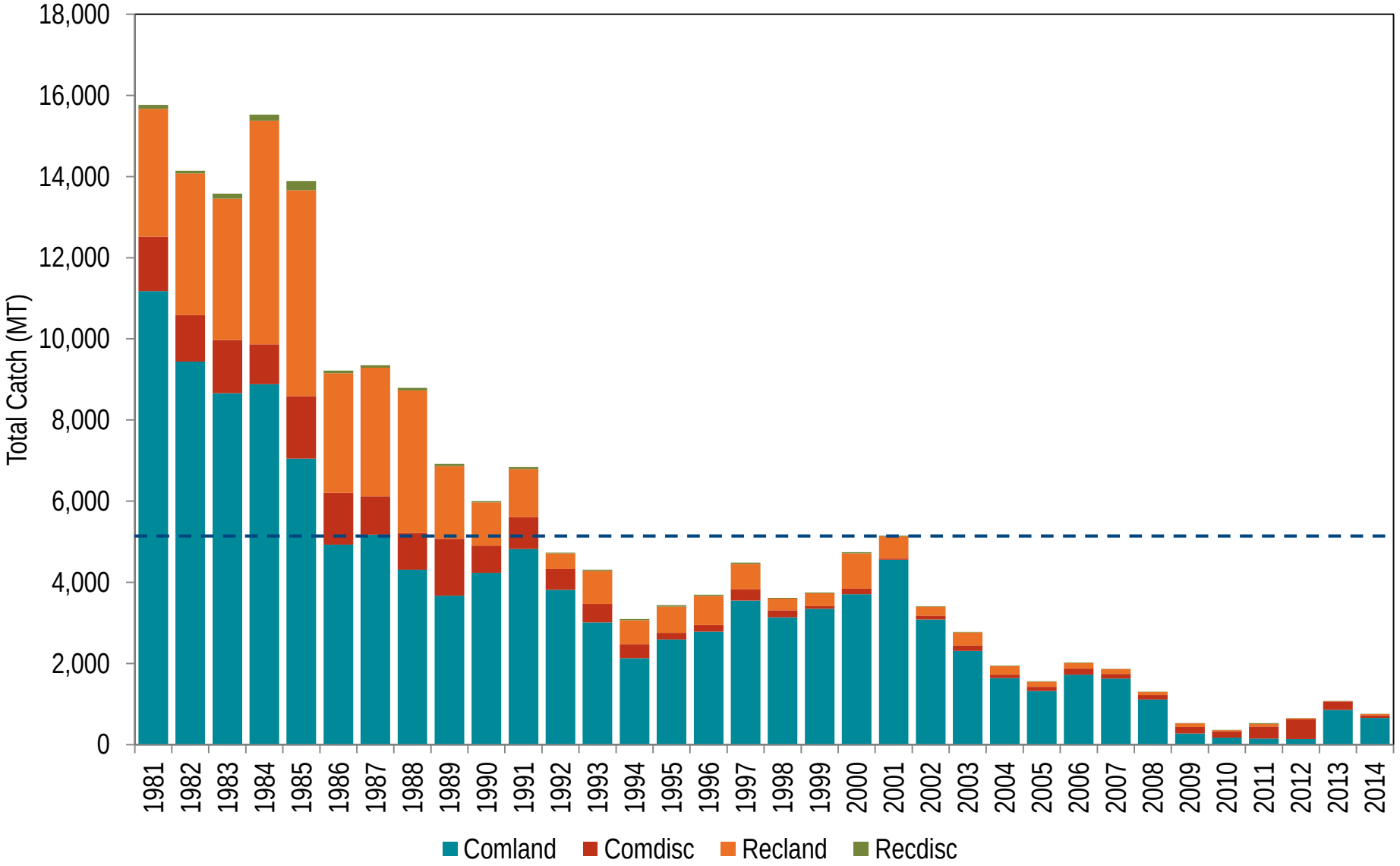
Last Assessed: 2011 Benchmark SARC 52 (T-yr 2010)

2008 Benchmark GARM III (T-yr 2007)

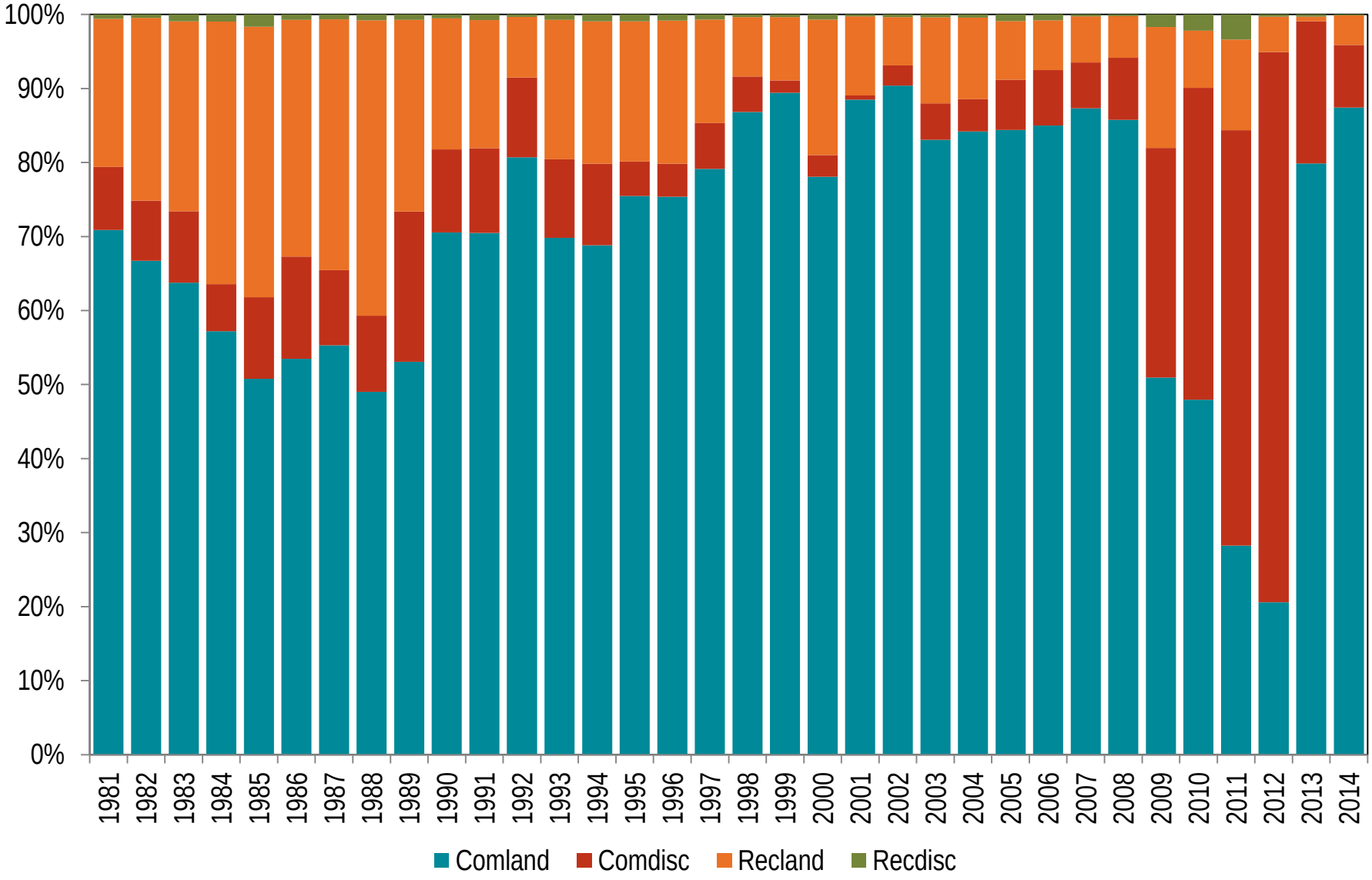


November 3, 2015

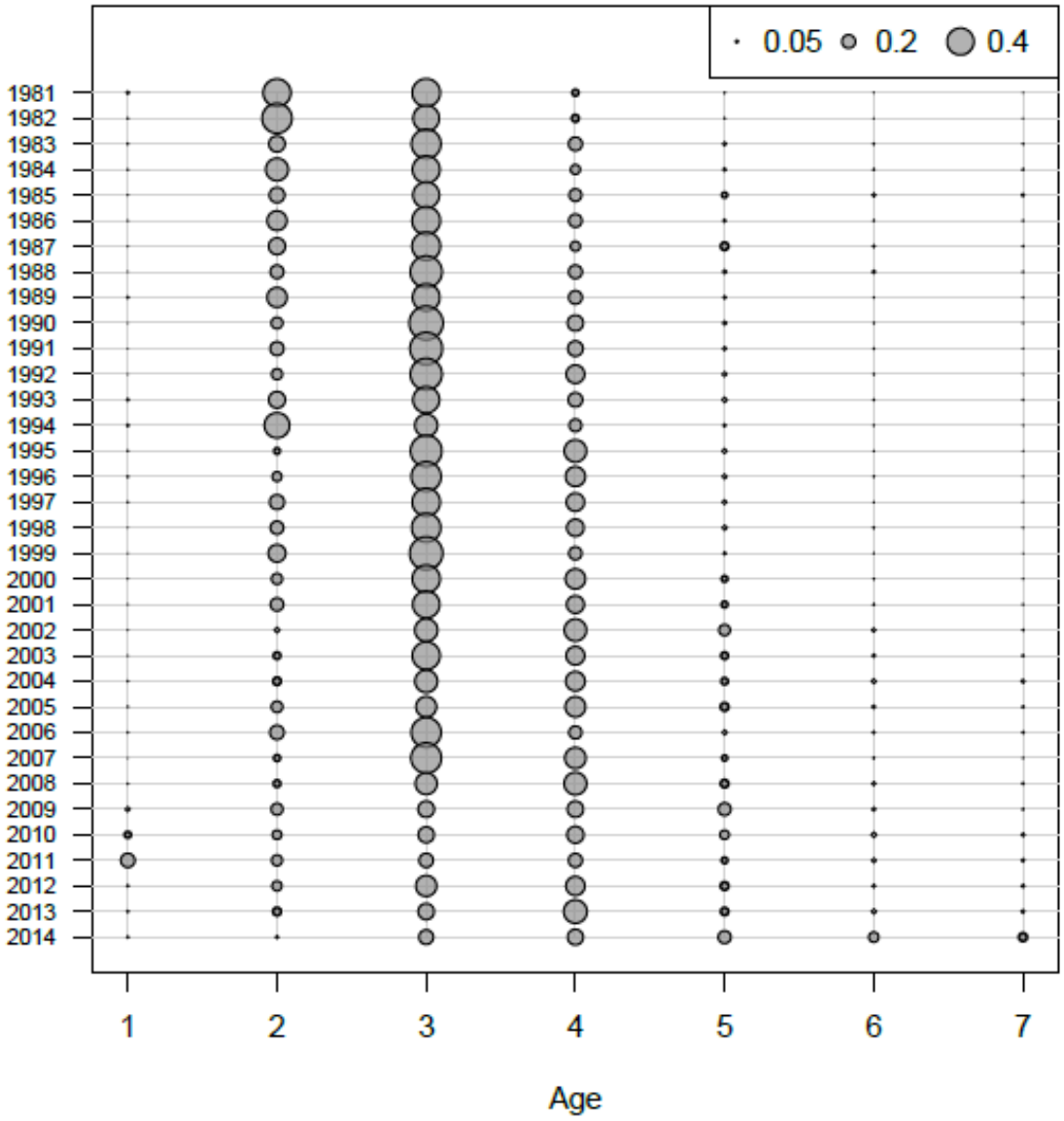
SNEMA WFL Total catch components 1981-2014



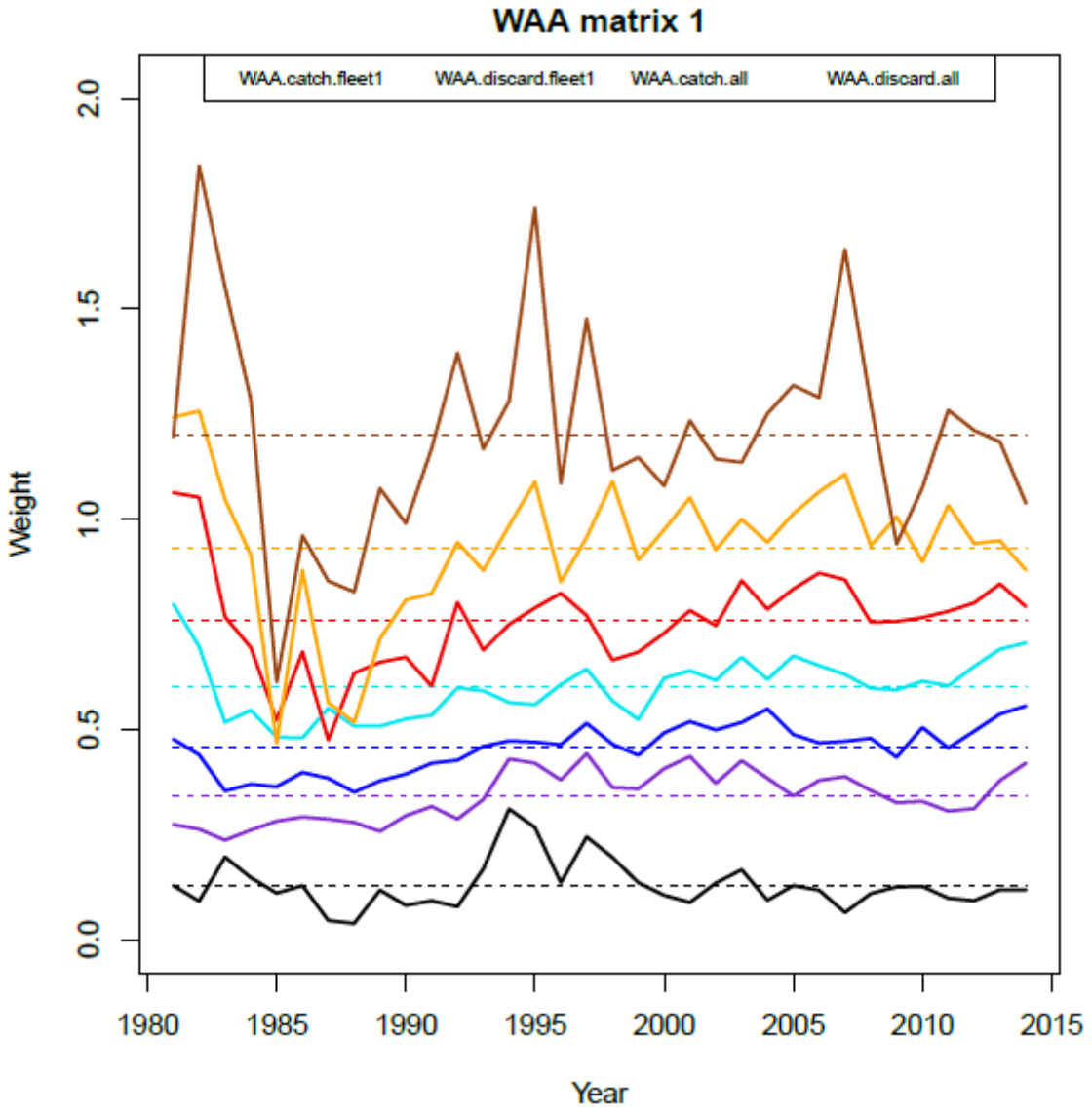
SNEMA WFL Total catch components 1981-2014



SNEMA WFL Total Catch at Age



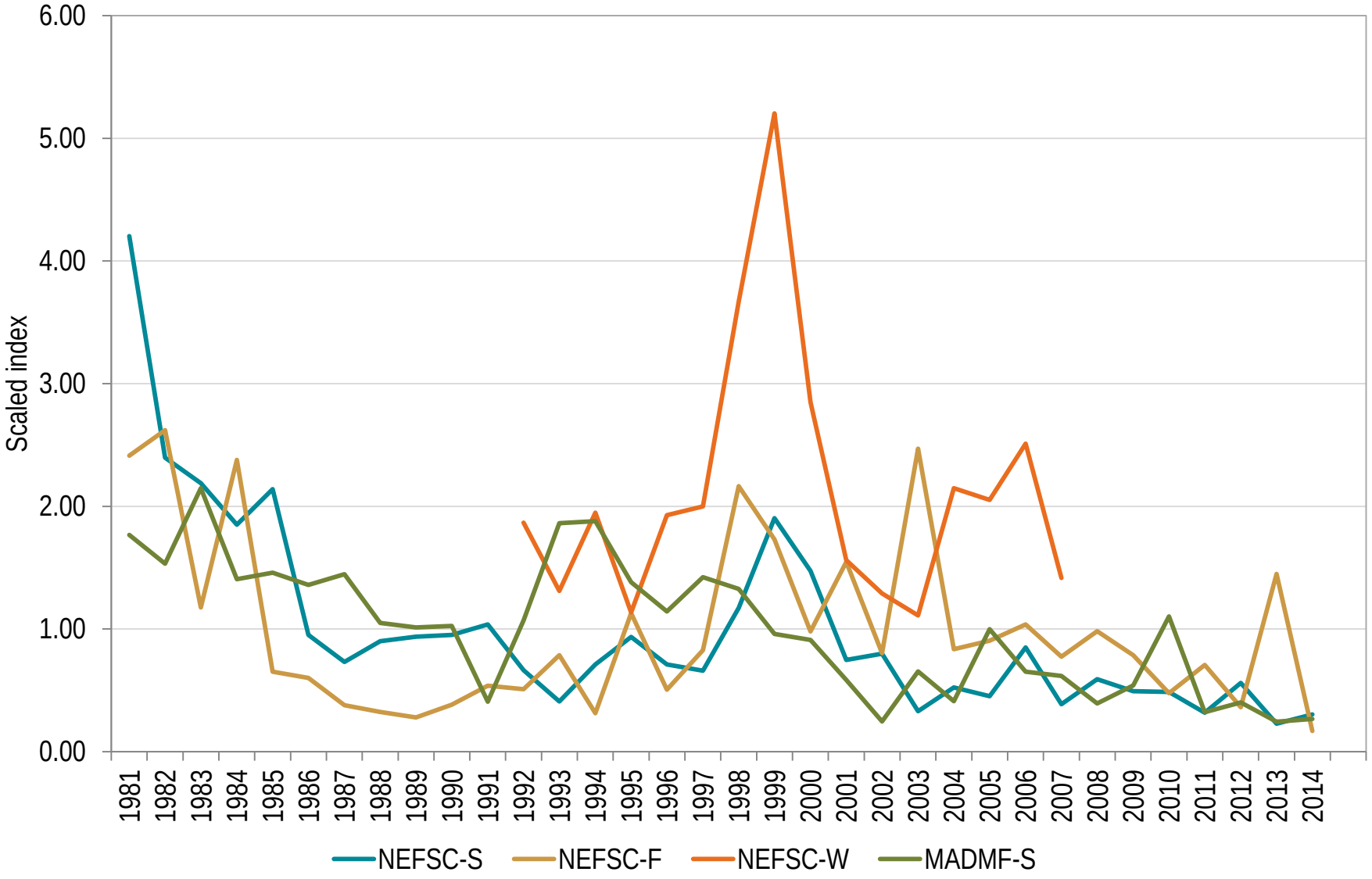
SNEMA WFL Average Weight at Age



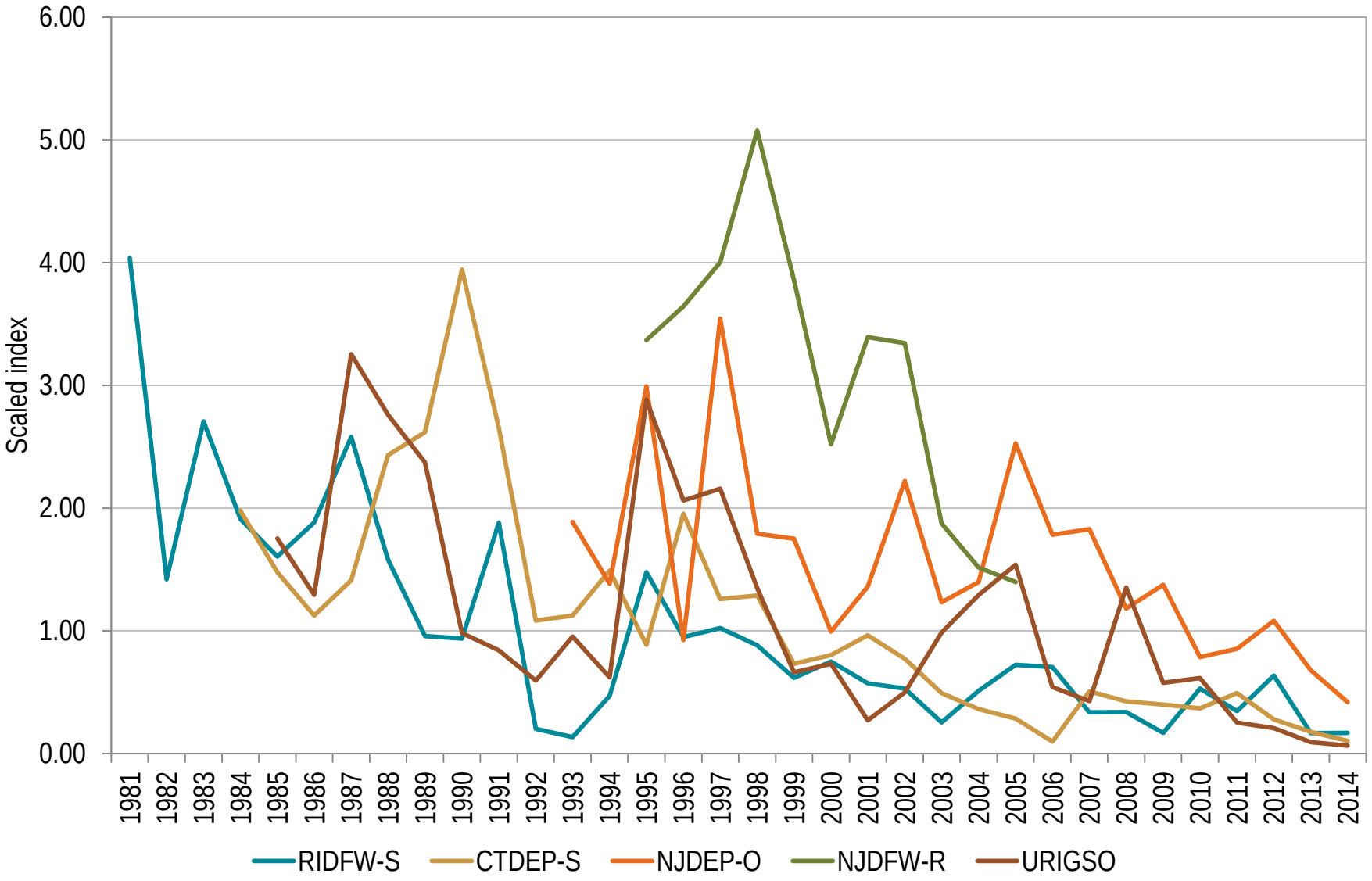
Fishery Independent: 1981-2014 ages 0-7+

- NEFSC winter, spring, and fall
- MADMF spring
- RIDMF spring
- CTDEP spring
- NJDFW ocean and river
- Recruits: MADMF, RIDFW, CTDEP, NYDEC, DEDFW
- NEW at SARC52: URIGSO, NEAMAP

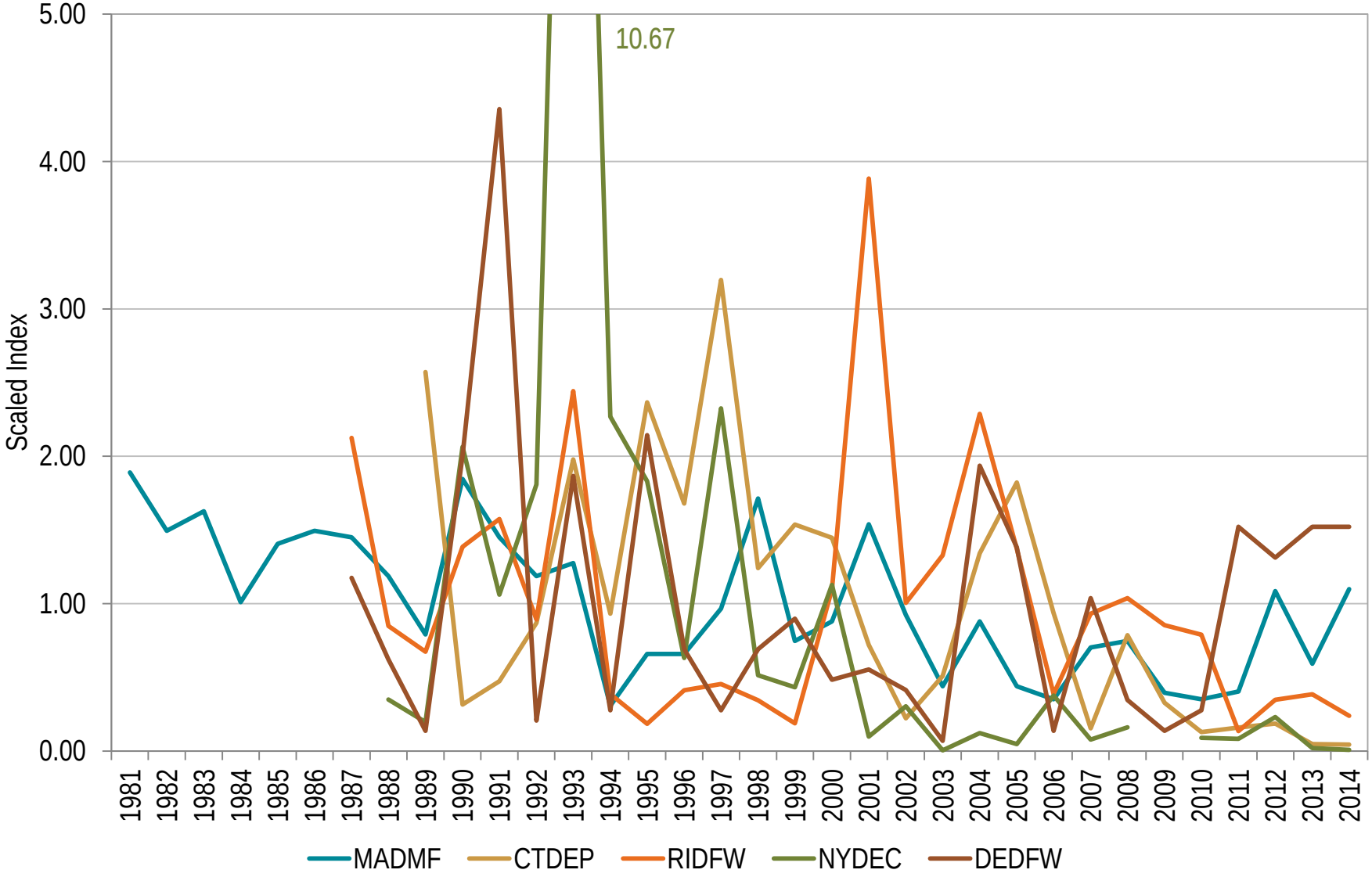
NEFSC BTS and MADMF Spring survey indices



State survey indices



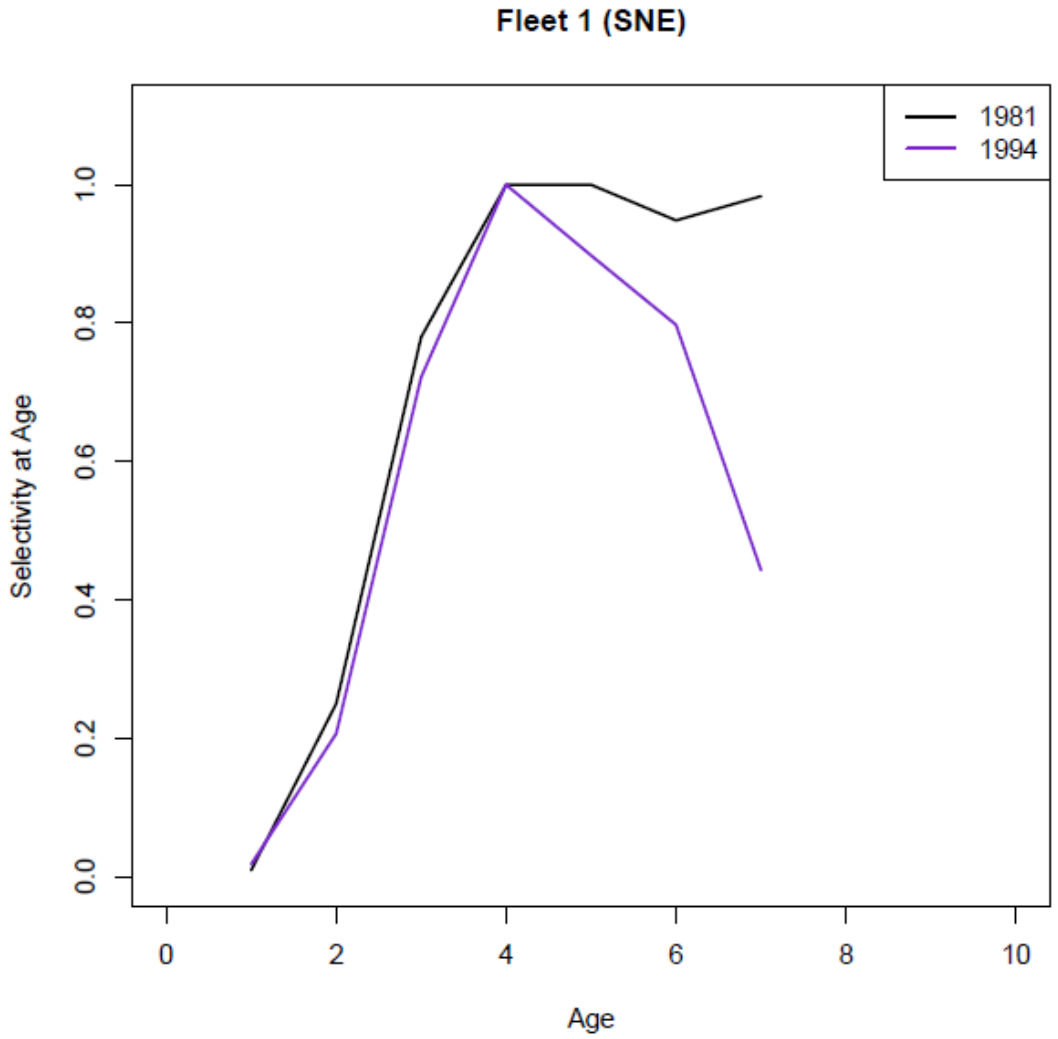
State Age 0 survey indices



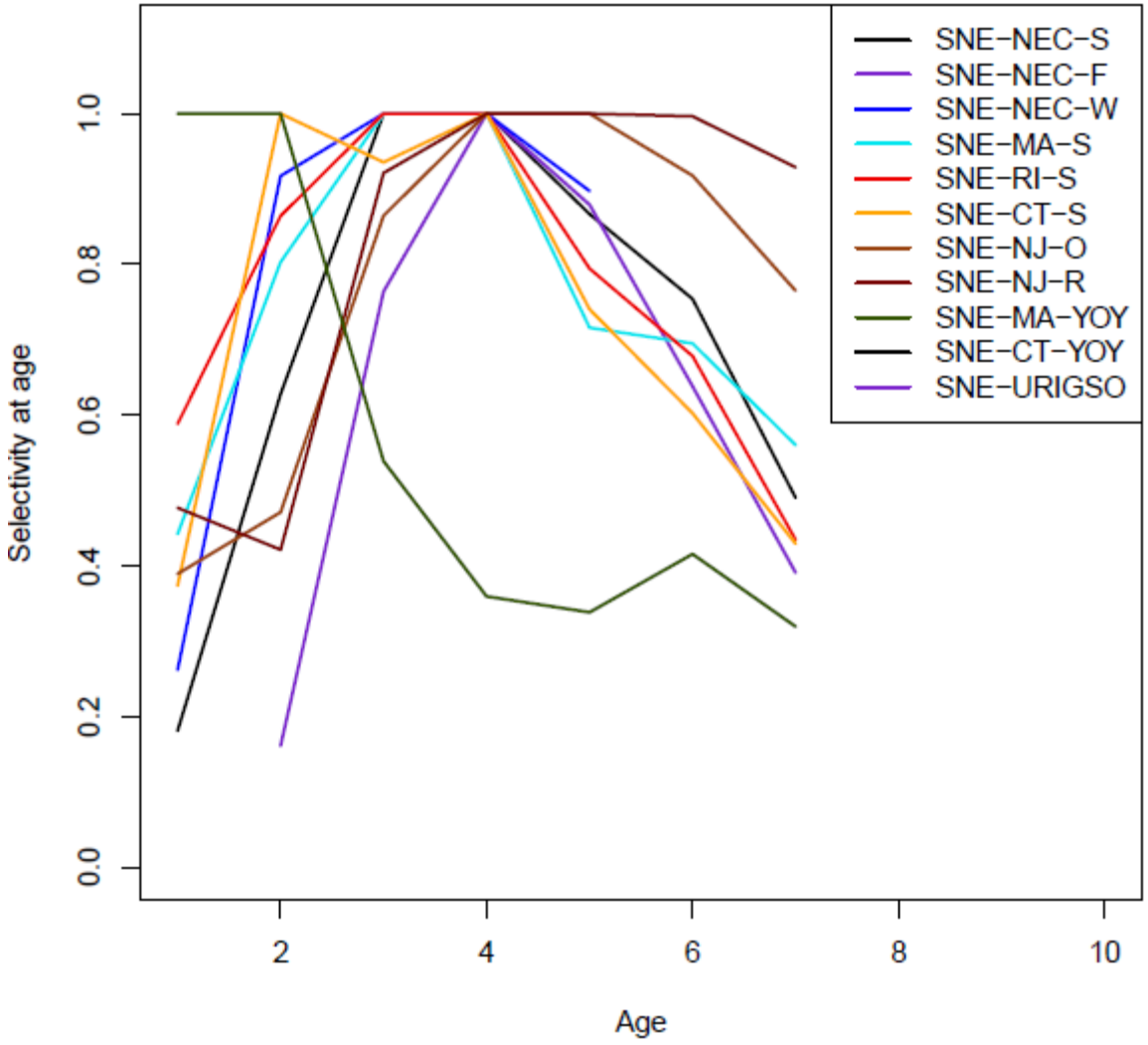
Final Model Configuration

- Single Fleet
- 14 survey indices (9 Age 1-7, 5 Age 0)
- M = 0.3
- Maturity: Age 1: 0%, Age 2: 8%, Age 3: 56%, Age 4: 95%
  Age 5+: 100%
- Two selectivity blocks: 1981-1993, 1994-2014, SAA
- No S-R fit in model

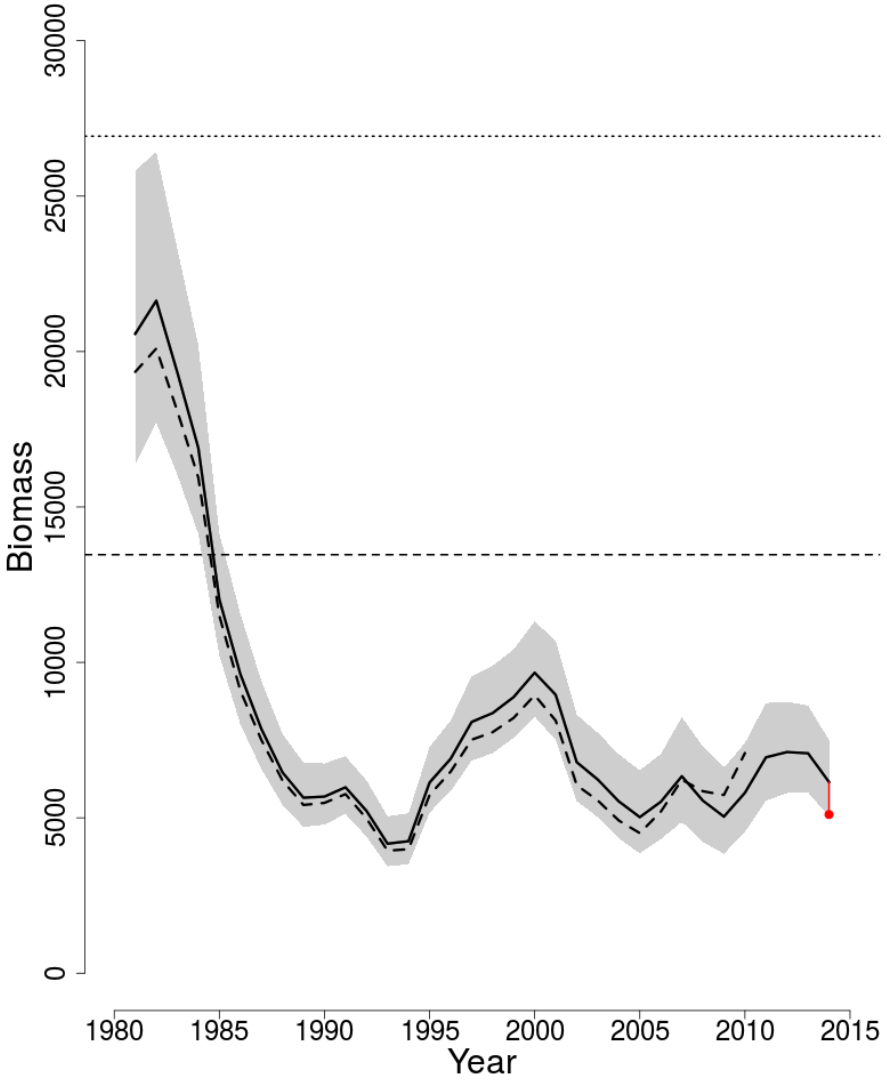
Results: Fleet Selectivities

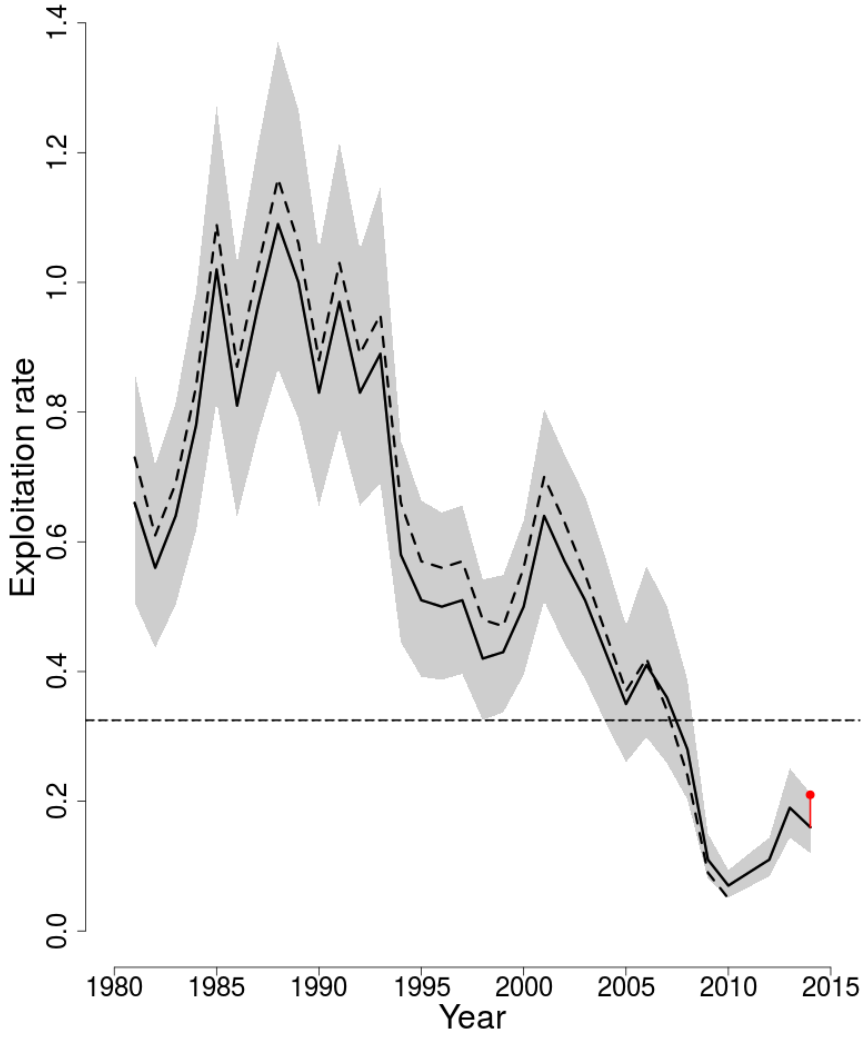


Results: Index Selectivities

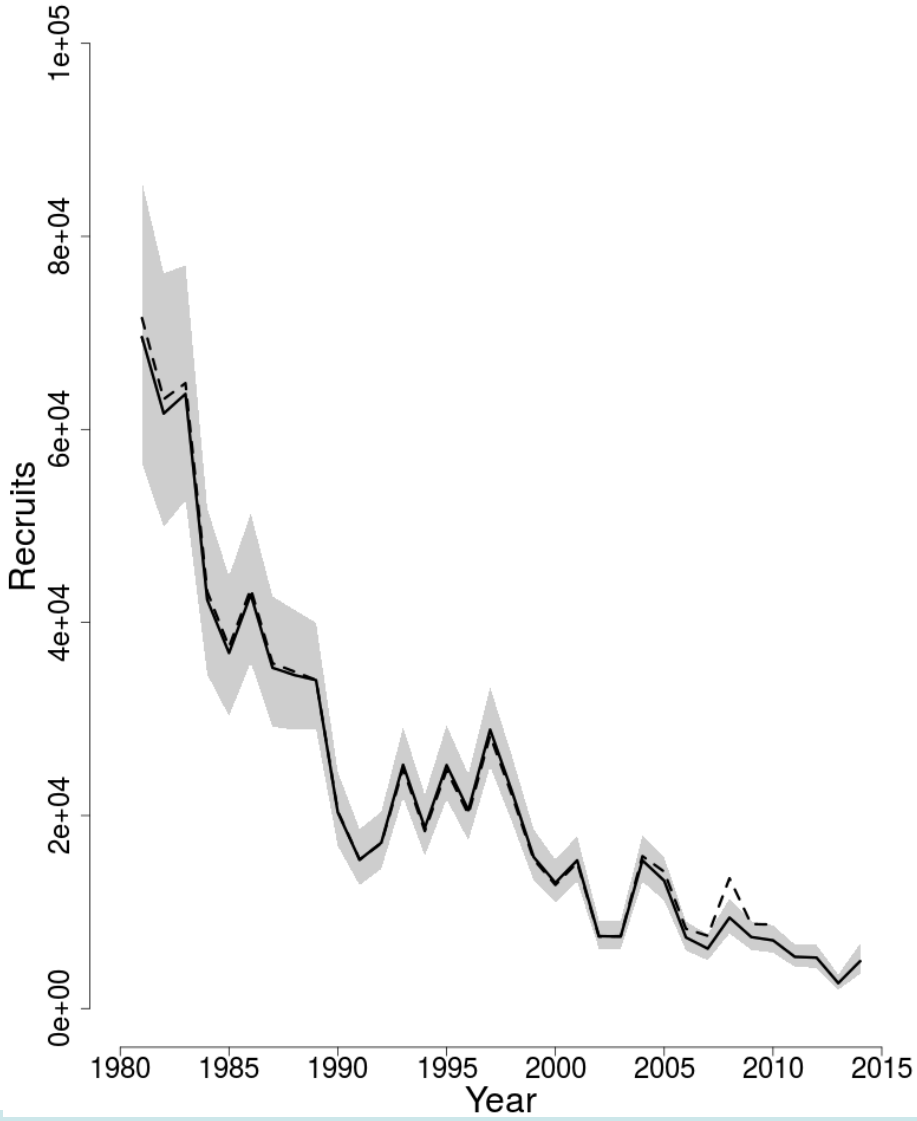


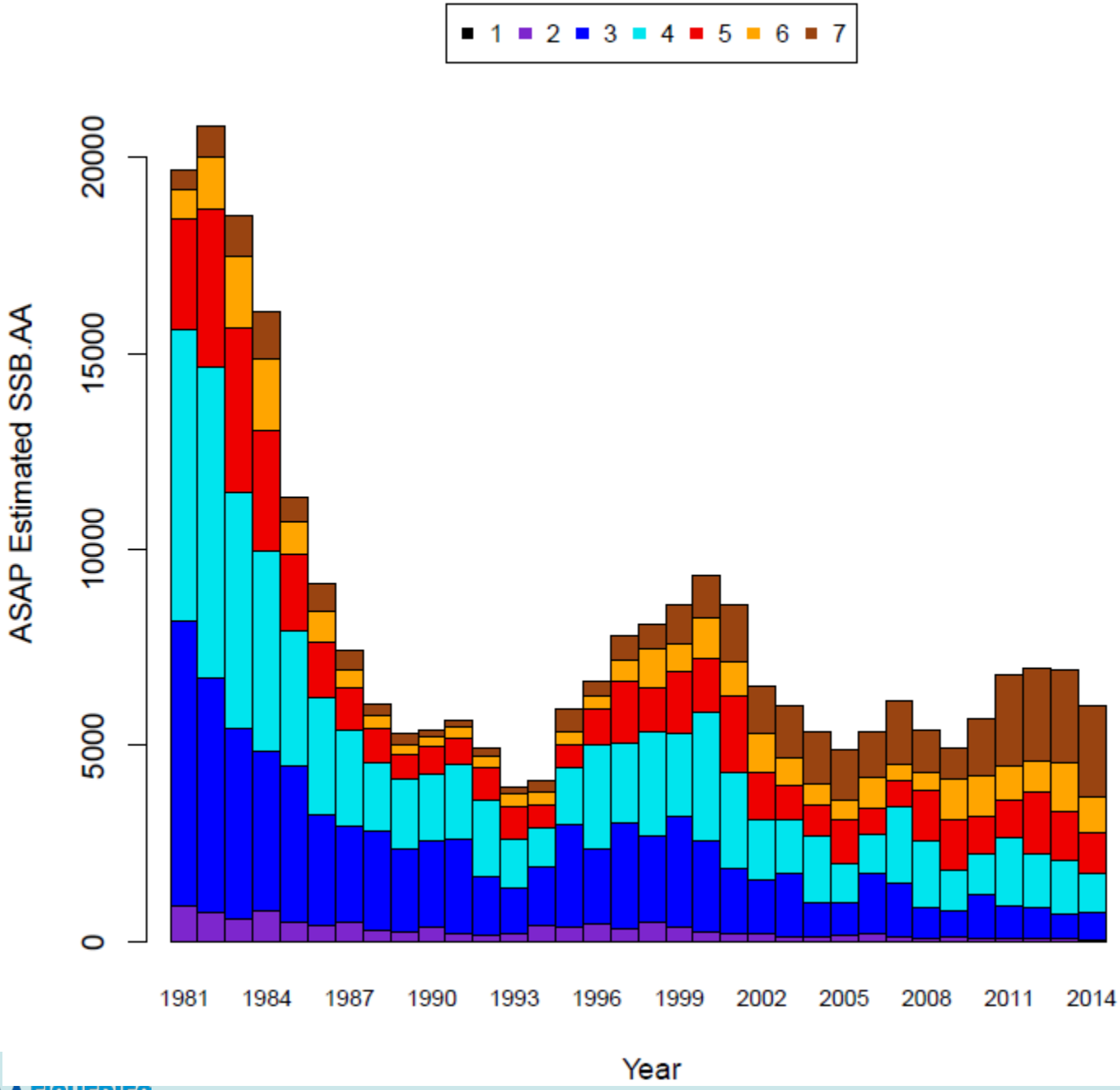
Southern New England/Mid-Atlantic Winter Flounder



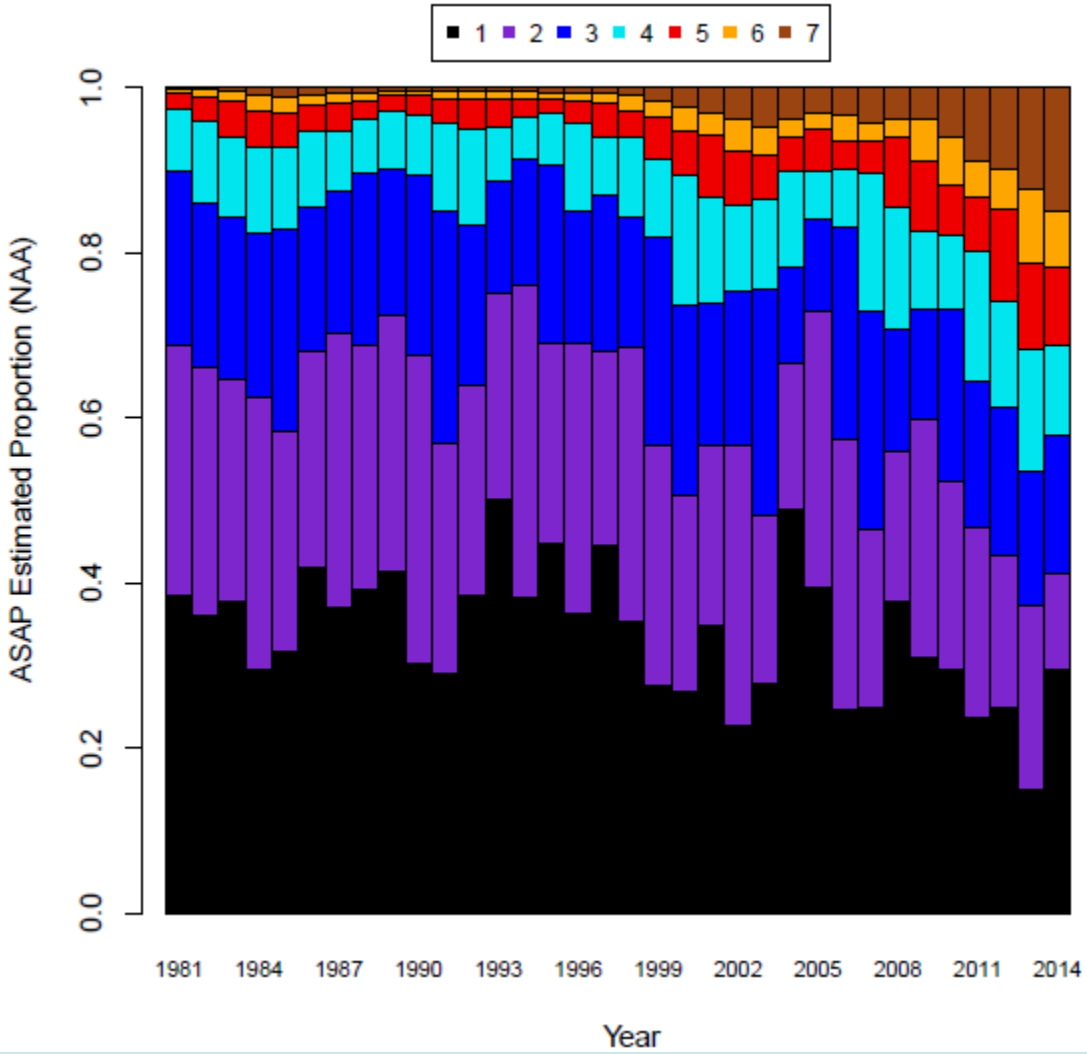


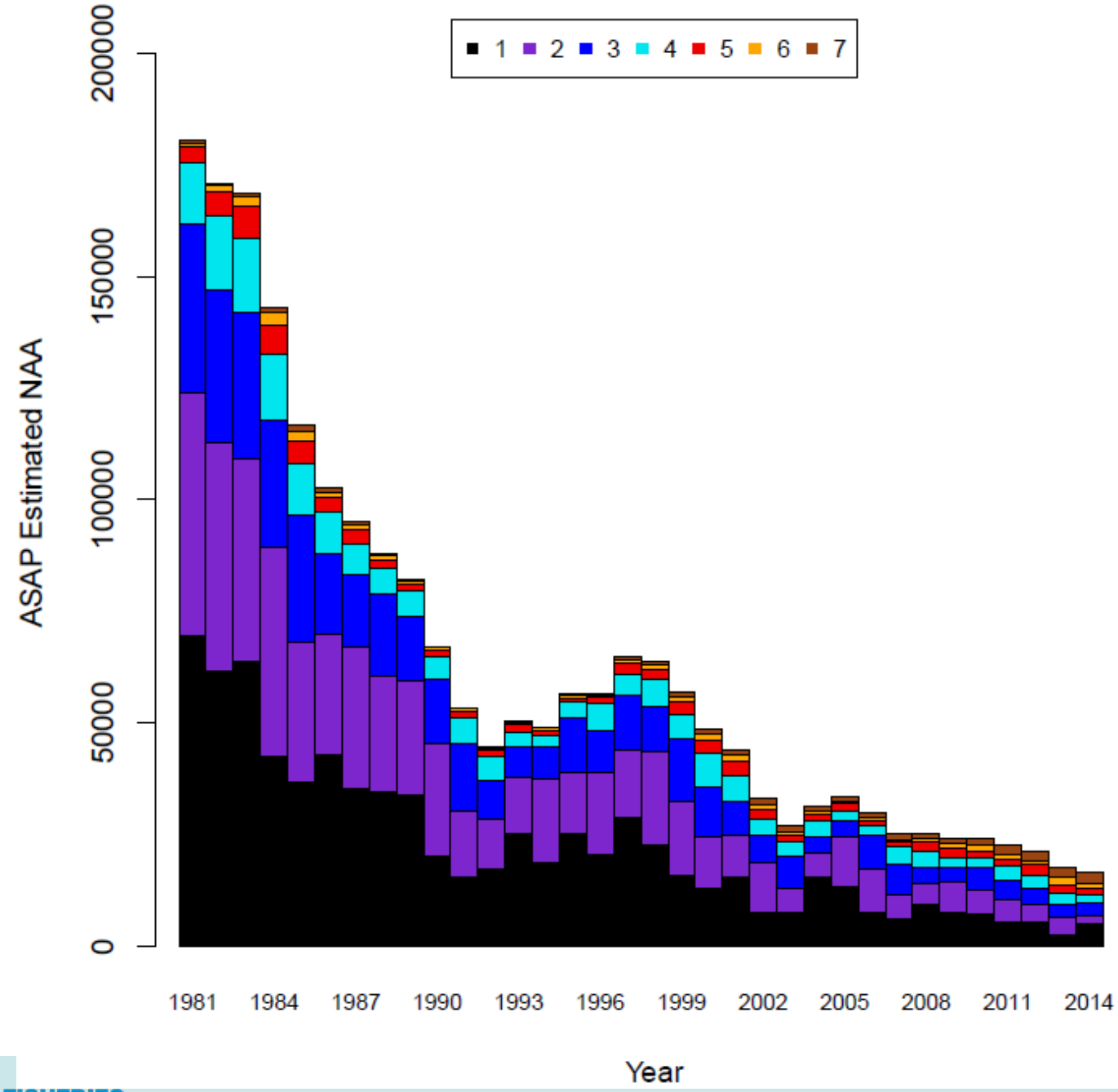
Southern New England/Mid-Atlantic Winter Flounder



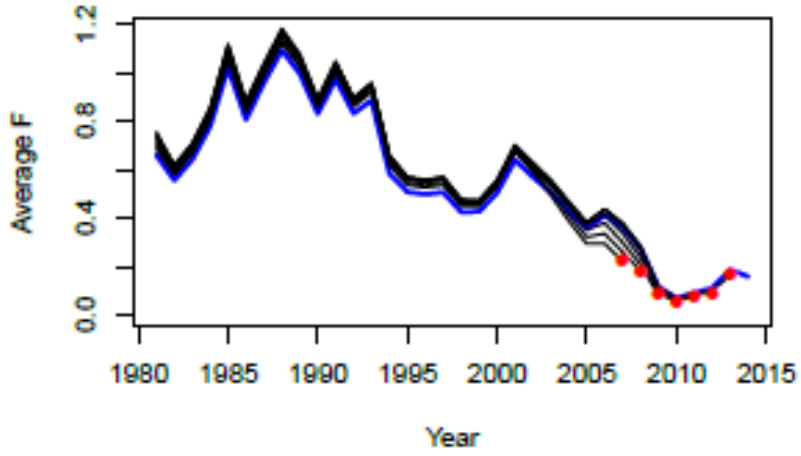

1 2 3 4 5 6 7
ASAP Estimated SSB.AA
0
5000
10000
15000
20000
1981
1984
1987
1990
1993
1996
1999
2002
2005
2008
2011
2014
Year

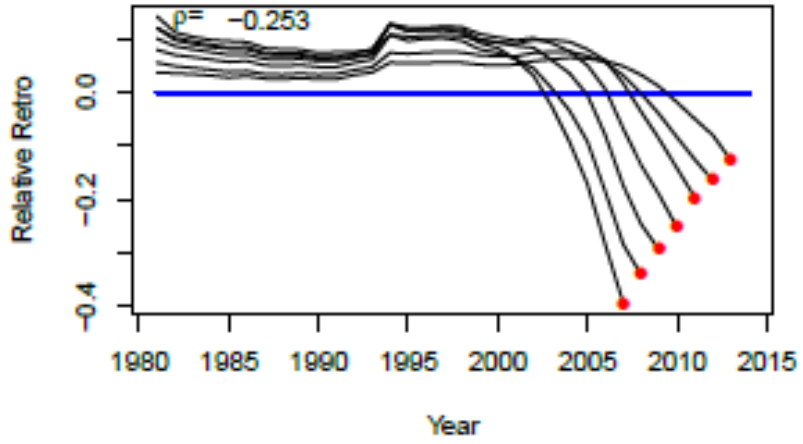
Results: Numbers at age

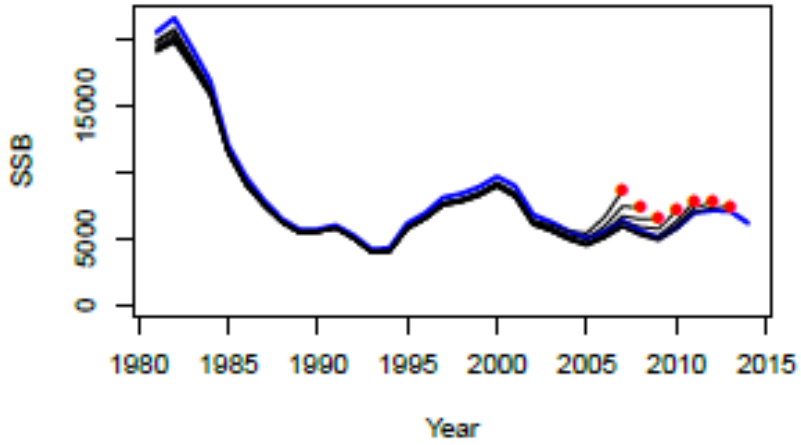


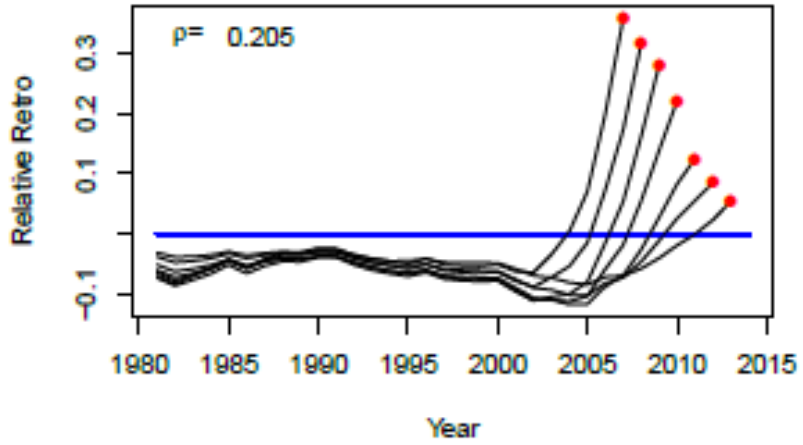

1 2 3 4 5 6 7
ASAP Estimated NAA
0
50000
100000
150000
200000
1981
1984
1987
1990
1993
1996
1999
2002
2005
2008
2011
2014
Year

Results: Retrospective bias





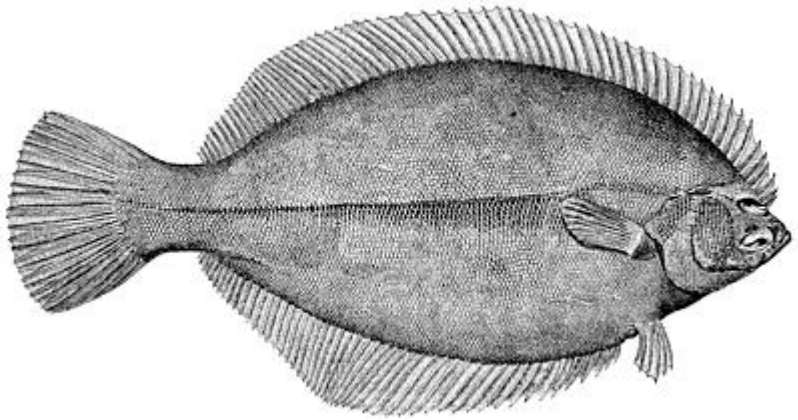




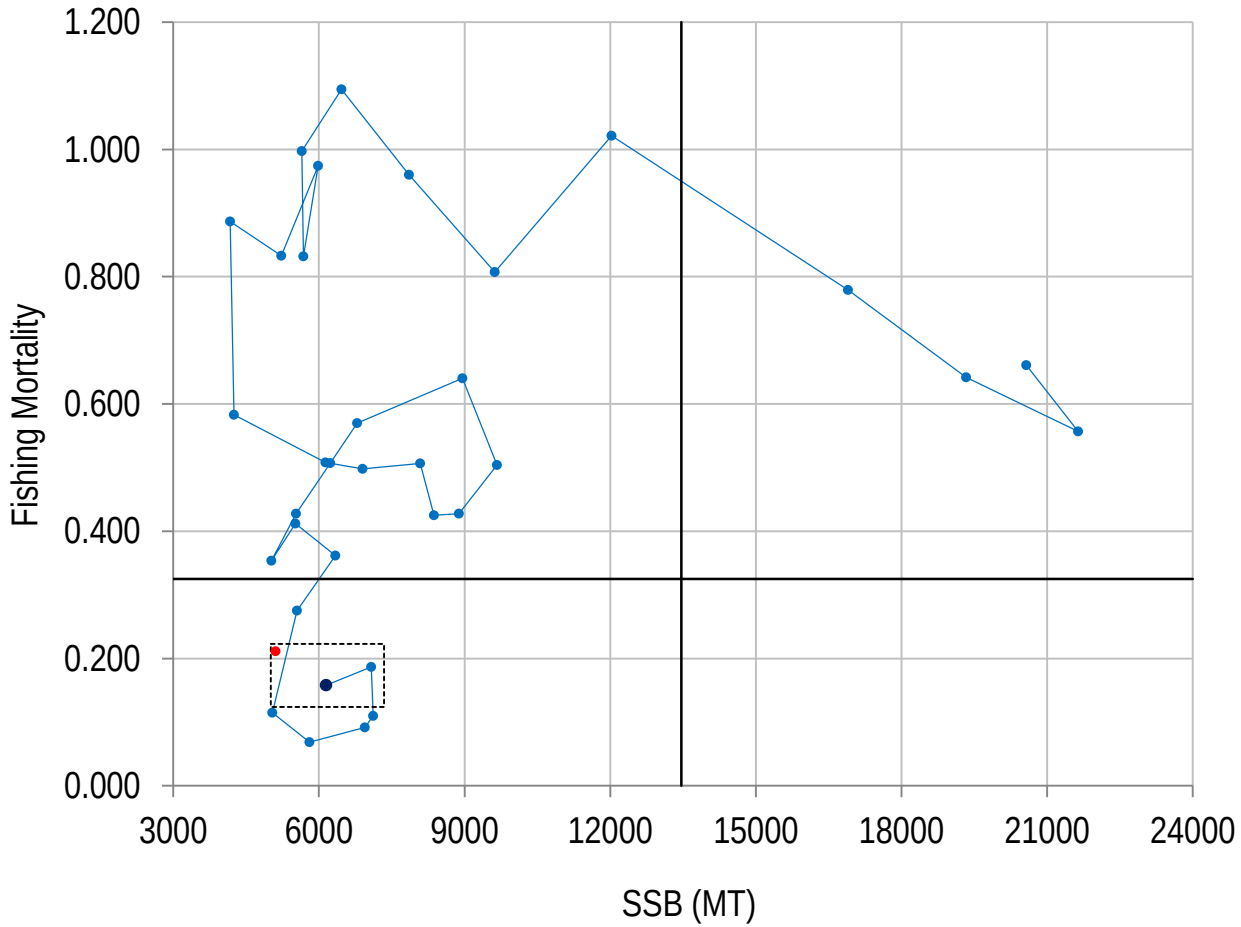
- Retrospective bias has decreased in both F and SSB

Southern New England/Mid-Atlantic Winter Flounder

	2011	Current
F_{MSY}	0.290	0.325
SSB_{MSY} (mt)	43,661	26,928 (18,488 - 39,847)
MSY (mt)	11,728	7,831 (5,237 - 11,930)
Median recruits (age 1) (000s)	19,256	16,448
Overfishing	No	No
Overfished	Yes	Yes



Current Stock Status

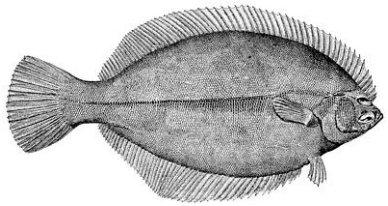


- Status unchanged: Overfished, overfishing not occurring
- Minor retrospective bias, no adjustment made

Sources of Uncertainty

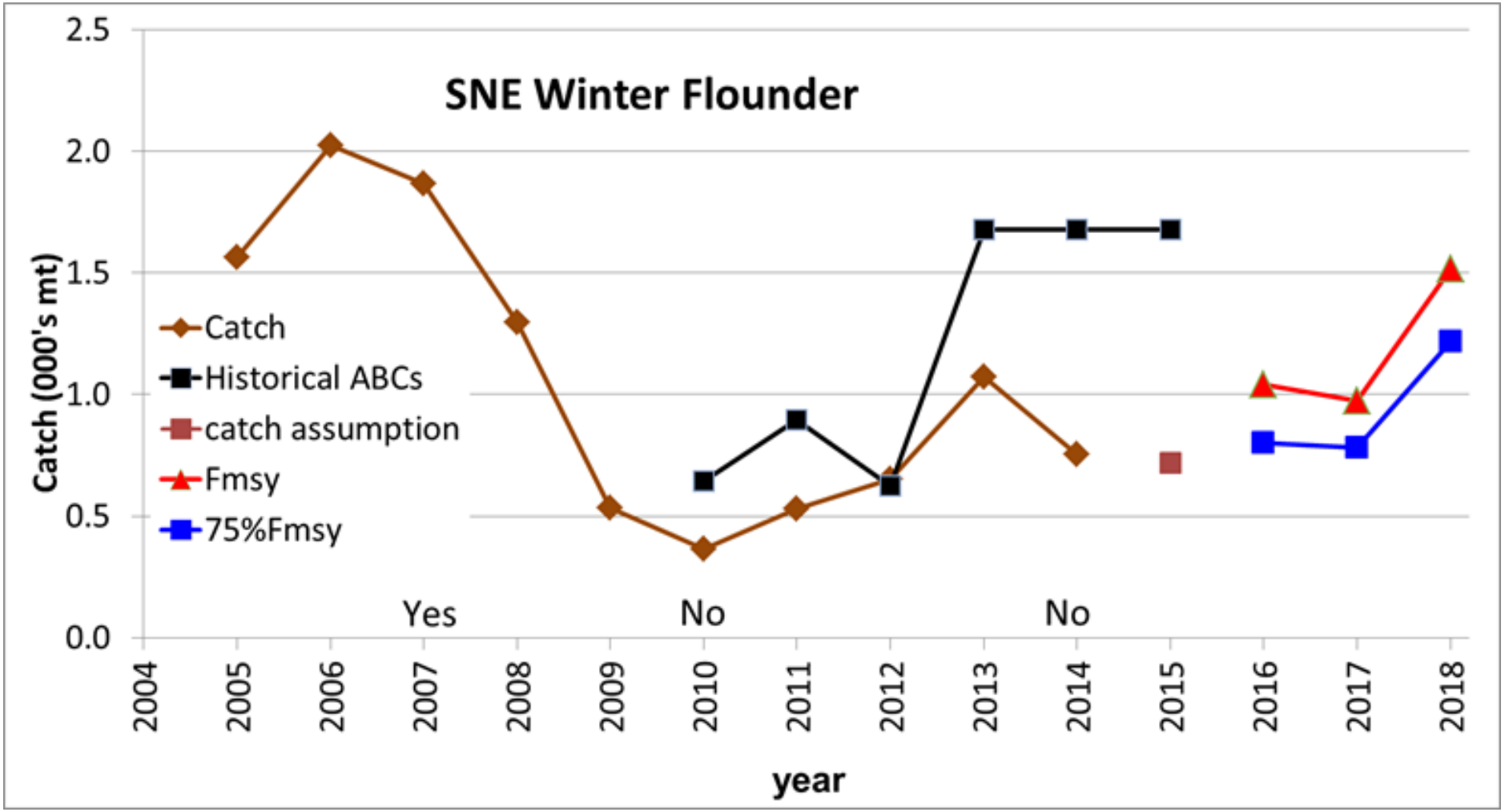
- Fixed natural mortality which is based on uncertain estimates of longevity (tmax)
- Length distribution of the recreational discards. Very few samples in recent years however very small component of total catch
- Retrospective bias (F and SSB) is minor, however close to being outside of confidence bounds and needing adjustment

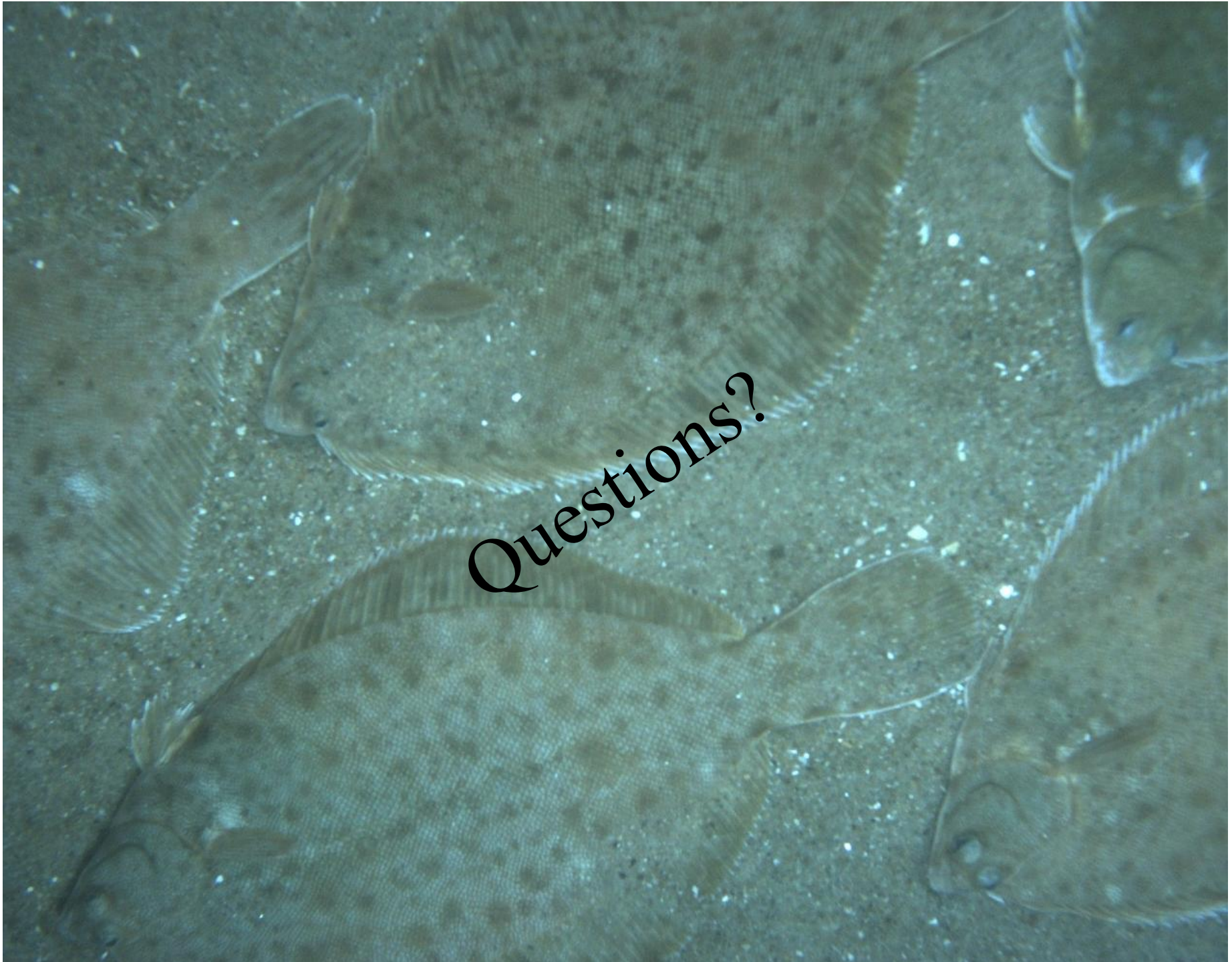
Southern New England/Mid-Atlantic Winter Flounder



MODEL	ASAP
STOCK STATUS	Overfished & Overfishing is not occurring
REBUILDING	2023 (Rebuilds at 40% probability with F=0)
RETROSPECTIVE ADJUSTMENT	No
UNCERTAINTIES	Recruitment continues to decline, natural mortality
REVIEWER COMMENTS	Change in productivity and poor fit to some survey data.

SNE Winter Flounder




Questions?

Gulf of Maine Winter Flounder

Fishing Year	U.S. ABC (mt)	State sub-Component		% of sub-Component Caught	State Waters Catch (mt)		
		% of ABC	Value (mt)		TOTAL	Commercial	Recreational
2010	238	25%	60	107%	**64.2**	**20.1**	**46.4**
2011	1,078	25%	163	70%	**113.3**	**22.4**	**90.8**
2012	1,078	25%	272	22%	**60.2**	**37.0**	**23.1**
2013	1,078	25%	272	25%	**67.4**	**37.1**	**30.3**
2014	1,078	25%	272	42%	**113.3**	**62.8**	**50.4**
2015	510	17%	87				

SNE/MA Winter Flounder

Fishing Year	U.S. ABC (mt)	State sub-Component		% of sub-Component Caught	State Waters Catch (mt)		
		% of ABC	Value (mt)		TOTAL	Commercial	Recreational
2010	644	8%	53	342%	**181.0**	**48.4**	**132.6**
2011	897	8%	72	56%	**40.0**	**24.9**	**15.1**
2012	626	28%	175	34%	**58.9**	**52.6**	**6.4**
2013	1,676	14%	235	24%	**55.7**	**48.0**	**7.7**
2014	1,676	14%	235	**30%**	**71.1**	**46.6**	**24.5**
2015	1,676	7%	117				