NOAA FISHERIES SERVICE

SAW/SARC-57 Summary

(NEFSC CRD#13-14)

Public Presentation: Sept./Oct. 2013

SAW/SARC Process

1. SAW Working Groups

2. External Peer Review Panel: Center of Independent Experts (CIE) + SSC.

- Emphasis on reviewing just the science/assessment.

3. Products: (Reviewer's Reports) + (2 Science Reports)
http://www.nefsc.noaa.gov/nefsc/saw/ (see SAW57)
http://www.nefsc.noaa.gov/publications/ (see Ref. Docs.)

4. Management advice:

- **SAW/SARC reports support SSC in making ABC recommendation.**
- **Primarily developed by Tech. Committees, PDTs, SSC.**

The 57th Northeast Regional Stock Assessment Review Committee (57th SARC)

Stephen H. Clark Conference Room – Northeast Fisheries Science Center
Woods Hole, Massachusetts
July 23-26, 2013

SARC Chairman:
Dr. Cynthia Jones
(Old Dominion Univ.; MAFMC SSC)

SARC Panelists:
Dr. Robin Cook
(Glasgow, UK; CIE)

Dr. John Simmonds
(Aberdeenshire, UK; CIE)

Dr. Henrik Sparholt
(Copenhagen, DK; CIE)

A. Summer flounder
B. Striped bass

(A.) Summer flounder

Summer flounder

Assessment TORs (1)

1. Estimate catch from all sources including landings and discards. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize the uncertainty in these sources of data.

2. Present the survey data available for use in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.), and explore standardization of fishery-independent indices*. Investigate the utility of commercial or recreational LPUE as a measure of relative abundance. Characterize the uncertainty and any bias in these sources of data. Describe the spatial distribution of the stock over time.

3. Review recent information on sex-specific growth and on sex ratios at age. If possible, determine if fish sex, size and age should be used in the assessment*.

4. Estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series (integrating results from TOR-3), and estimate their uncertainty. Explore inclusion of multiple fleets in the model. Include both internal and historical retrospective analyses to allow a comparison with previous assessment results and previous projections.

5. State the existing stock status definitions for "overfished" and "overfishing". Then update or redefine biological reference points (BRPs; point estimates or proxies for B_{MSY}, $B_{THRESHOLD}$, F_{MSY} and MSY) and provide estimates of their uncertainty. If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the "new" (i.e., updated, redefined, or alternative) BRPs.

Summer flounder Assessment TORs (2)

6. Evaluate stock status with respect to the existing model (from previous peer reviewed accepted assessment) and with respect to a new model developed for this peer review.

   a. When working with the existing model, update it with new data and evaluate stock statu (overfished and overfishing) with respect to the existing BRP estimates.

   b. Then use the newly proposed model and evaluate stock status with respect to "new" BRPs and their estimates (from TOR-5).

7. Develop approaches and apply them to conduct stock projections and to compute the statistical distribution (e.g., probability density function) of the OFL (overfishing level) and candidate ABCs (Acceptable Biological Catch; see Appendix to the SAW TORs).

   a. Provide annual projections (3 years). For given catches, each projection should estimate and report annual probabilities of exceeding threshold BRPs for F, and probabilities of falling below threshold BRPs for biomass. Use a sensitivity analysis approach in which a range of assumptions about the most important uncertainties in the assessment are considered (e.g., terminal year abundance, variability in recruitment).
   b. Comment on which projections seem most realistic. Consider the major uncertainties in the assessment as well as sensitivity of the projections to various assumptions.
   c. Describe this stock's vulnerability (see "Appendix to the SAW TORs") to becoming overfished, and how this could affect the choice of ABC.

8. Review, evaluate and report on the status of the SARC and Working Group research recommendations listed in most recent SARC reviewed assessment and review panel reports, a well as MAFMC SSC model recommendations from 2012. Identify new research recommendations.

Summer Flounder | SARC57 Panel Findings (1)

- **Stock assessment <u>was accepted</u>. Stock is <u>not</u> overfished. Overfishing is <u>not</u> occurring in 2012.**

- **Accepted model is not sex-disaggregated. Retrospective pattern not strong (i.e., model has reasonable statistical fit).**

- **Significant research progress from NMFS and "Partnership for mid-Atlantic Fisheries Science" (PMAFS) (e.g., otoliths, sexually dimorphic growth, reporting accuracy in recreational fishery, sex ratios in landings, otolith chemistry/spatial structure).**

- **Implementing a sex-specific model will require sex-specific data <u>not</u> currently available for recreational catch. NEFSC survey data cannot be used as a proxy for making critical inferences about sex-based recreational landings.**

- **Uncertainty about dimorphic growth and survival could impact stock projections.**

Summer Flounder | SARC57 Panel Findings (2)

- **Current F_{MSY} proxy is $F_{35\%MSP}$. A less conservative proxy was considered but not recommended. No consensus that $F_{30\%}$ should be preferred over $F_{35\%}$.**

- **Stock does not appear vulnerable to overfishing at this time.**

- **Mean length and weight-at-age in all seasons and for sexes combined has declined. Partly due to 1.)recent inclusion of more, older males that are smaller than females and 2.)higher survival of fish resulting from lower F.**

- **Center of distribution is more northerly than in the past. Larger fish are generally found further north. Possible cause 1.)expansion of age structure and 2.)increase in abundance. Environmental factors have not been fully quantified.**

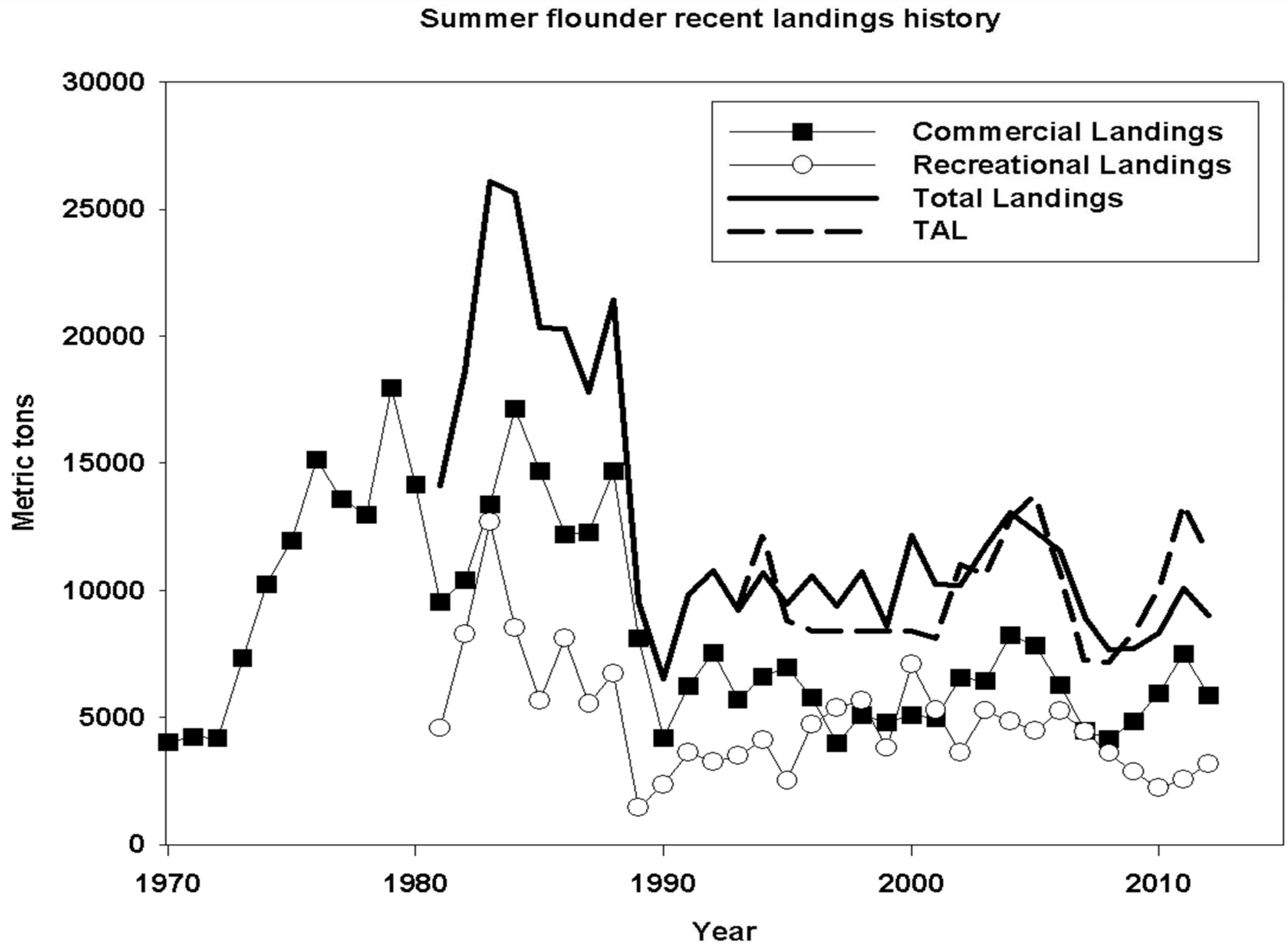
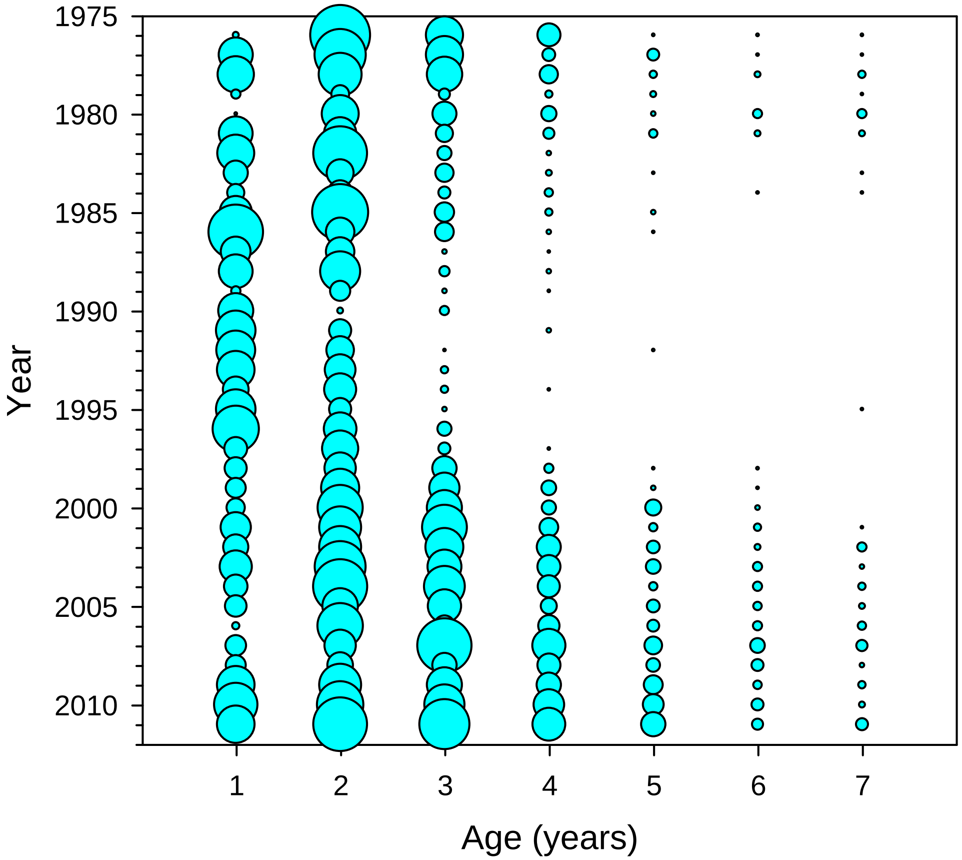


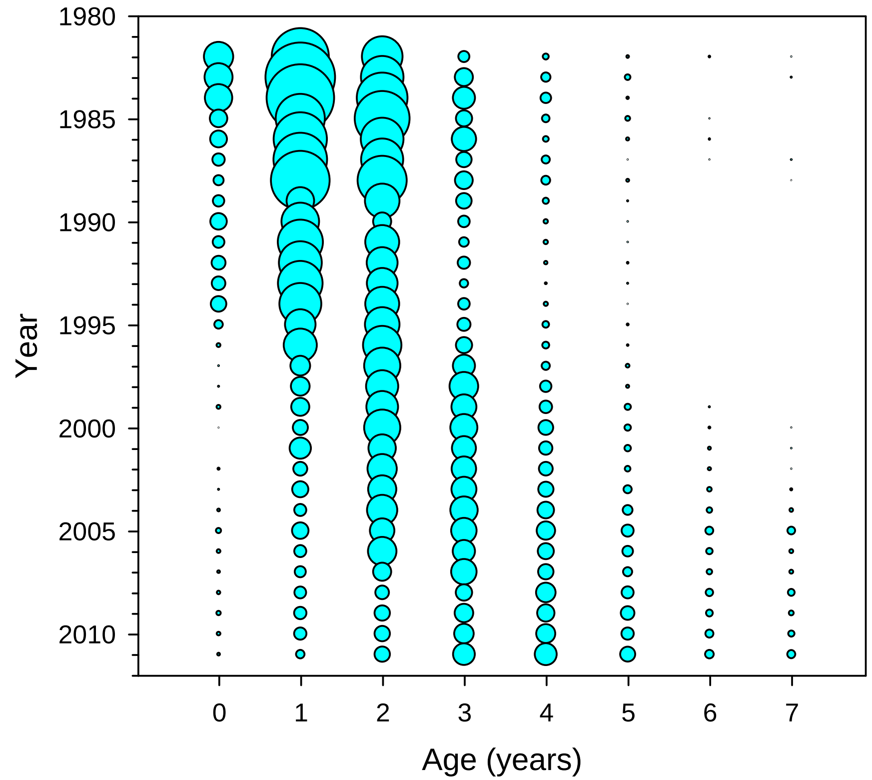
Figure A52. Summer flounder recent commercial (1970-2012), recreational (1981-2012), total fishery (1981-2012) landings, and the corresponding fishery Total Allowable Landings (TAL).

Summer flounder: Age structure through time

(NEFSC Survey)



Fishery Catch



Evidence of stock rebuilding.

Summer Flounder	Life history

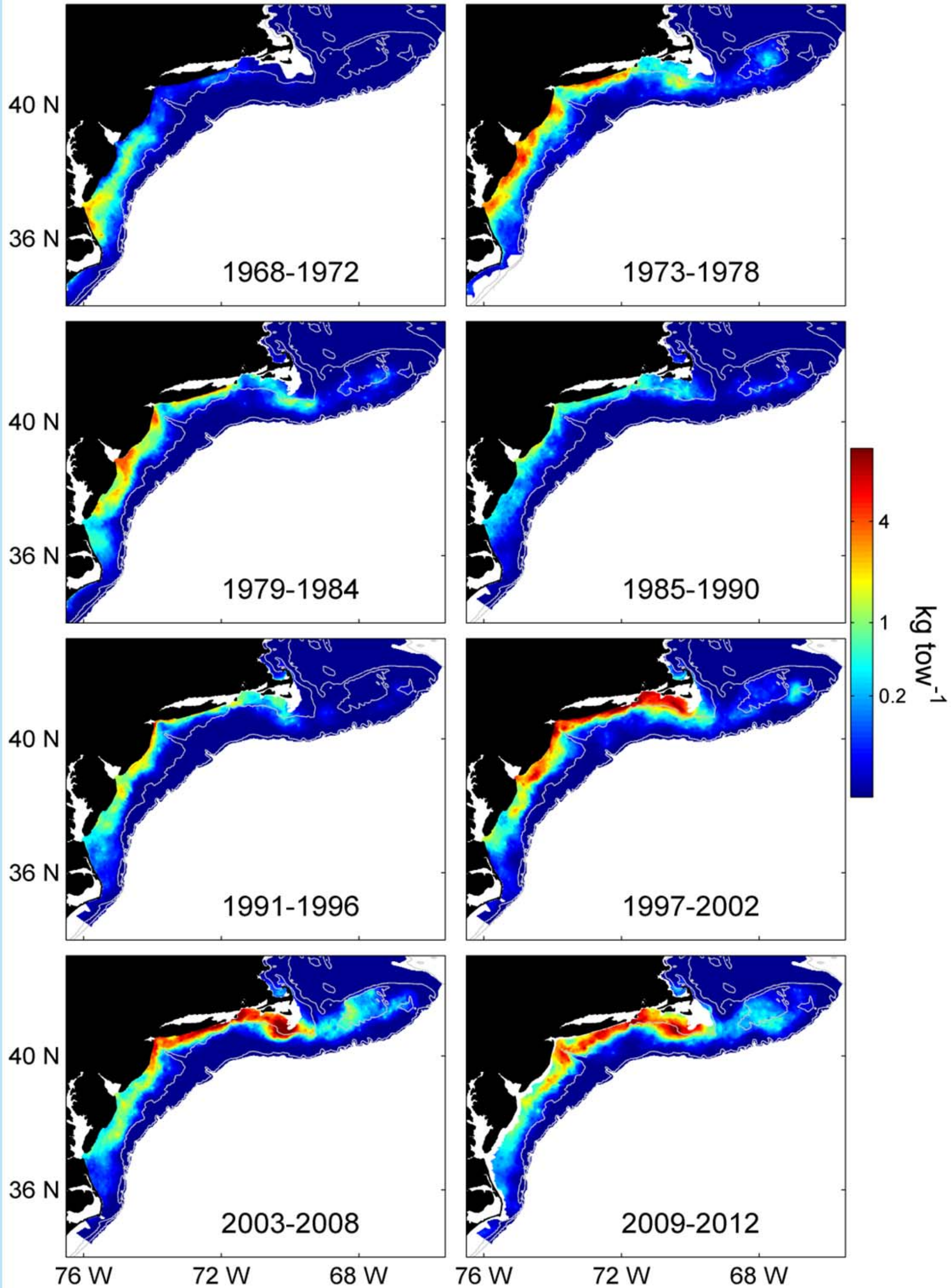
Females are larger than males, by age

Mean size of both males and females, as a function of age, has changed over time and space

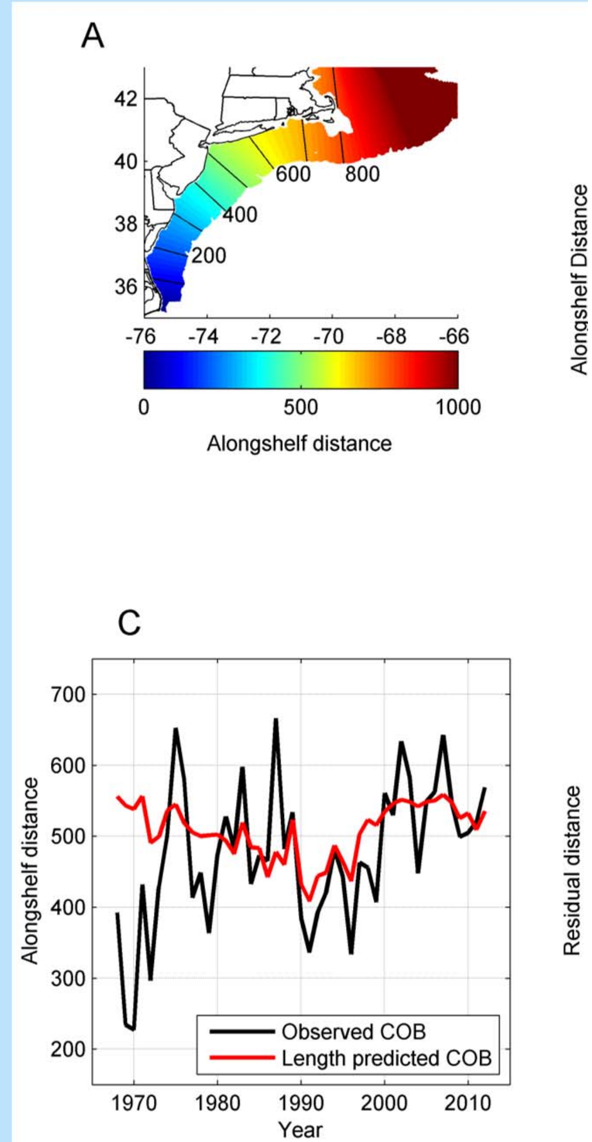
Was not possible to develop sex-disaggregated model

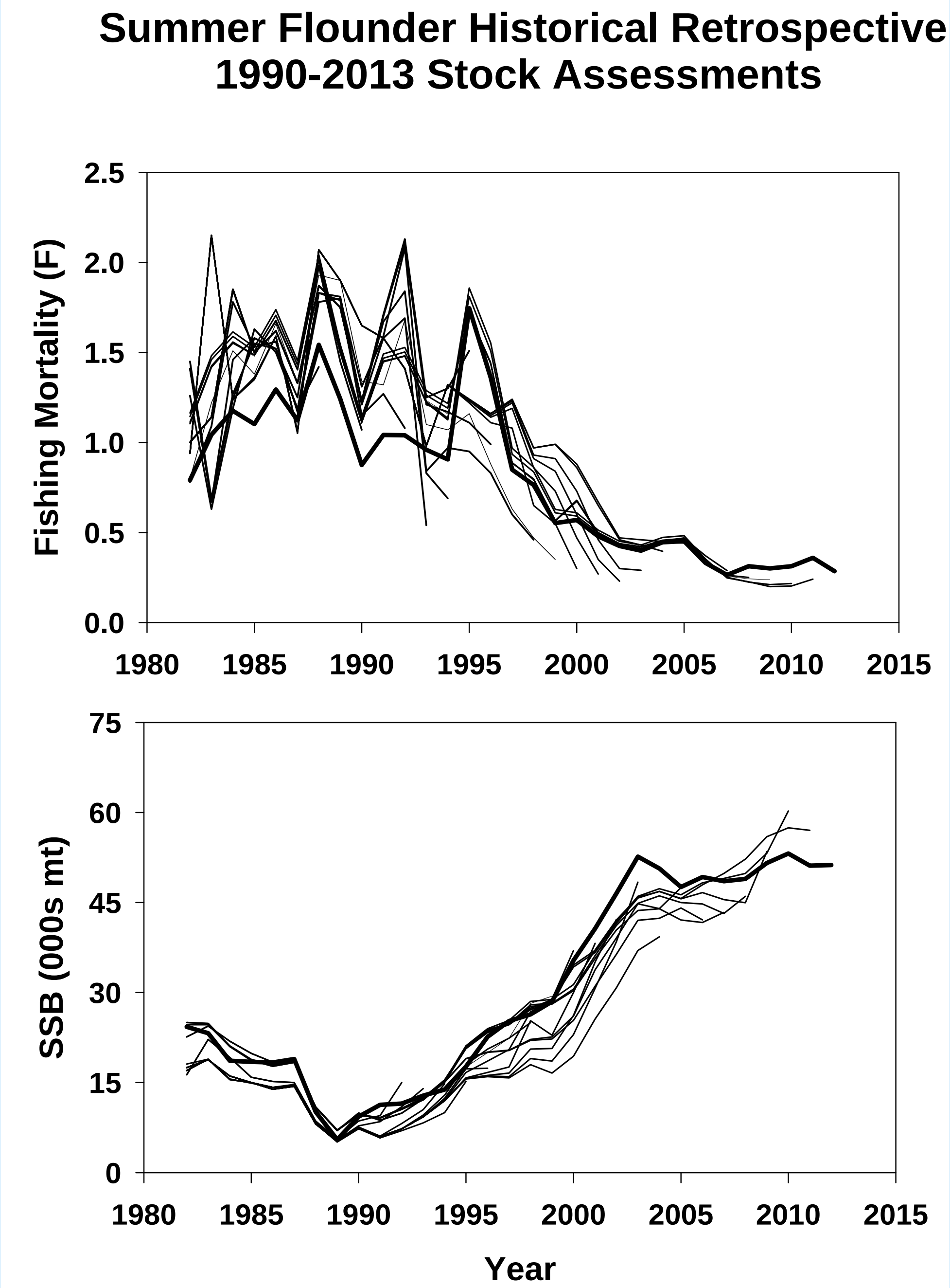
This would require an extensive, continuous, future sampling program

Distrib. through time (Fall survey)



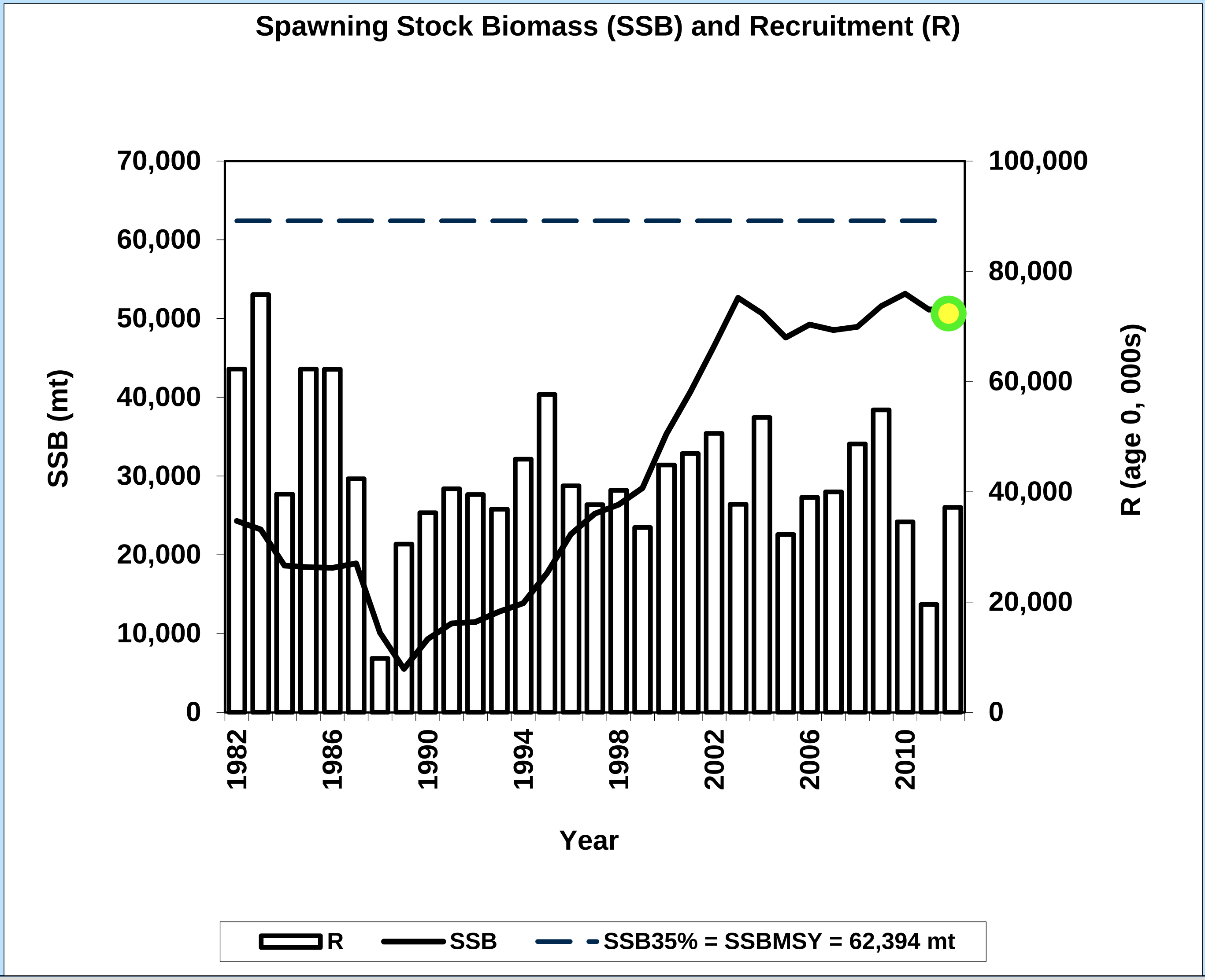
Center of biomass





Assessment results have been consistent through time.

Summer flounder: 1982-2012



SSB_{Target} ~ 62 kmt

SSB_{12} ~ 51 kmt

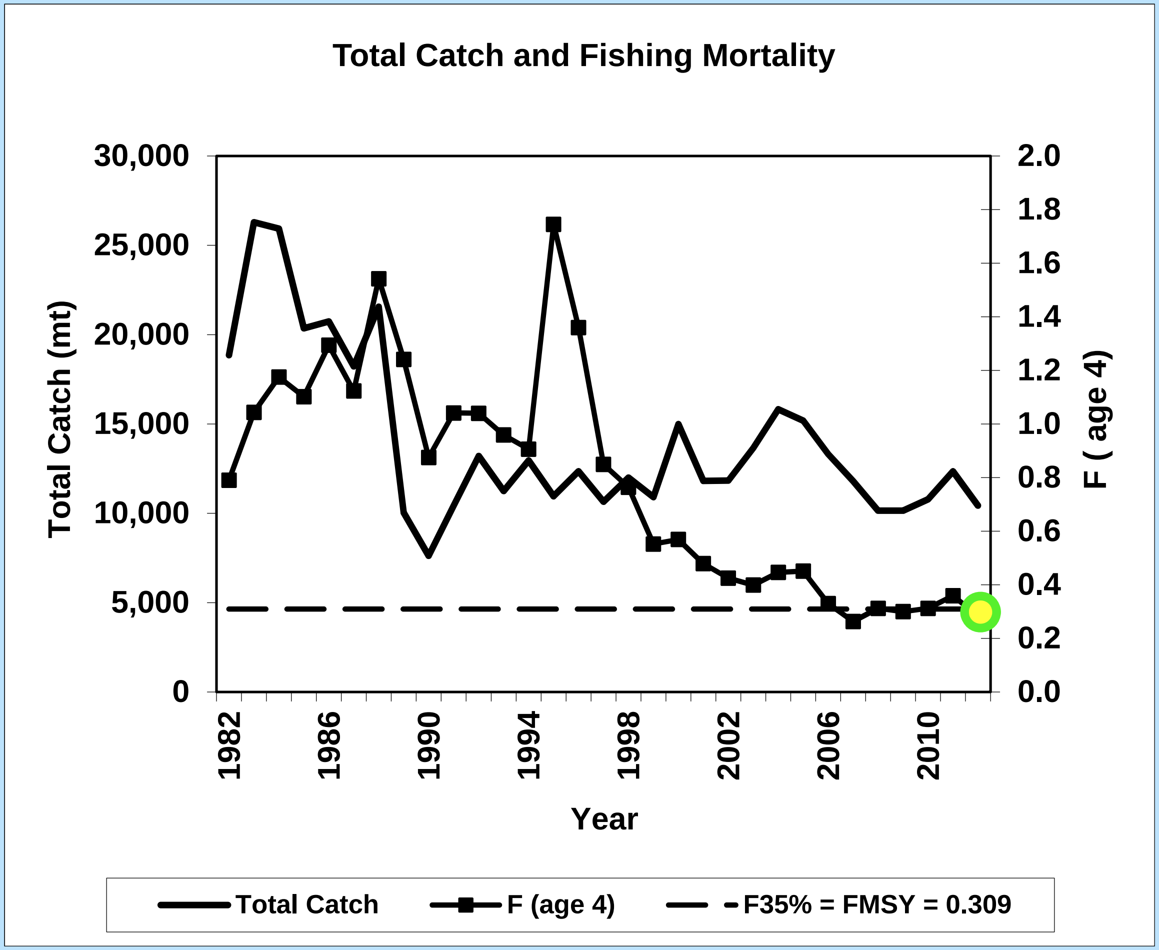
$SSB_{Threshold}$ ~ 31 kmt

Not Overfished in 2012.

R was below average in 2011; ~average in 2012.

Summer flounder

Not Overfishing in 2012

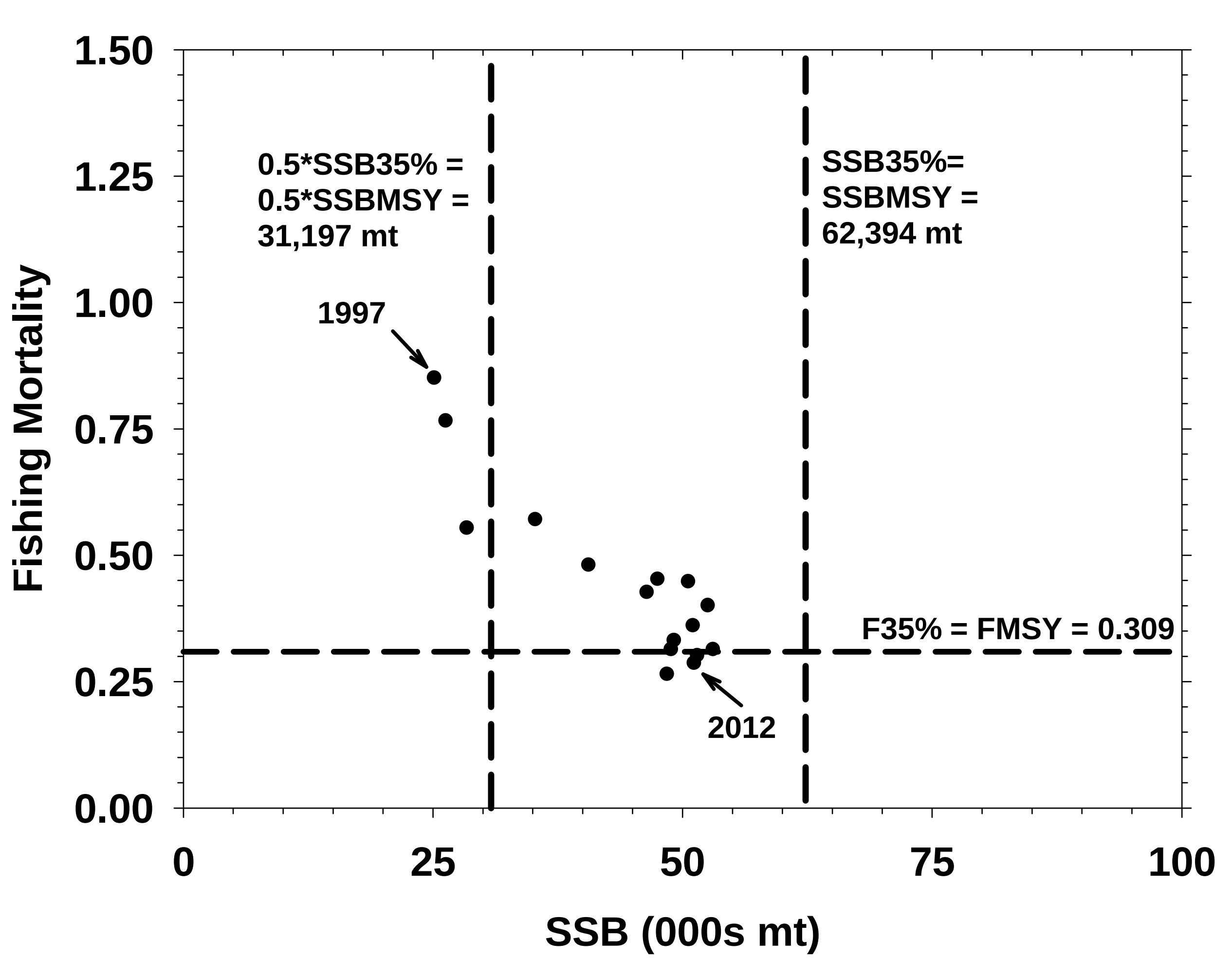


Fthreshold =0.309

F'12 ~ 0.285

Catch and Fishing mortality over time, and associated overfishing level, $F_{Threshold}$.

Summer flounder : F, SSB, BRPs



Stock size increased over time as F decreased.

Summer flounder : Projection

F35% =0.309

Year	Total Catch	Landings	Discard	F	SSB
2014	12,138	9,961	2,177	0.309	57,140
2015	11,785	9,497	2,288	0.309	58,231
2016	11,914	9,527	2,387	0.309	59,268

Summer flounder	SARC57 Recommendations

- **Further development of a sex-based assessment model (need recreational fishery data).**
- **SAW WG sees as a priority sex-specific sampling of surveys and landings to provide improved model input, sampling of discards and changing the model to include sex-specific parameterization.**
- **Modeling commercial and recreational fleets would be a more natural way of partitioning the catch and more meaning to fleet selectivity.**
- **Standardize state surveys to better address temporal and spatial availability of stock and to provide a meaningful combined stock index.**

(B.) Striped bass

Striped bass

Assessment TORs (1)

1. Investigate all fisheries independent and dependent data sets, including life history, indices of abundance, and tagging data. Discuss strengths and weaknesses of the data sources. Evaluate evidence for changes in natural mortality in recent years.

2. Estimate commercial and recreational landings and discards. Characterize the uncertainty in the data and spatial distribution of the fisheries.

3. Use the statistical catch-at-age model to estimate annual fishing mortality, recruitment, total abundance and stock biomass (total and spawning stock) for the time series and estimate their uncertainty. Provide retrospective analysis of the model results and historical retrospective. Provide estimates of exploitation by stock component, where possible, and for total stock complex.

4. Use the Instantaneous Rates Tag Return Model Incorporating Catch-Release Data (IRCR) and associated model components applied to the Atlantic striped bass tagging data to estimate F and abundance from coast wide and producer area tag programs along with the uncertainty of those estimates. Provide suggestions for further development of this model.

Striped bass

Assessment TORs (2)

5. Update or redefine biological reference points (BRPs; point estimates or proxies for B_{MSY}, SSB_{MSY}, F_{MSY}, MSY). Define stock status based on BRPs.

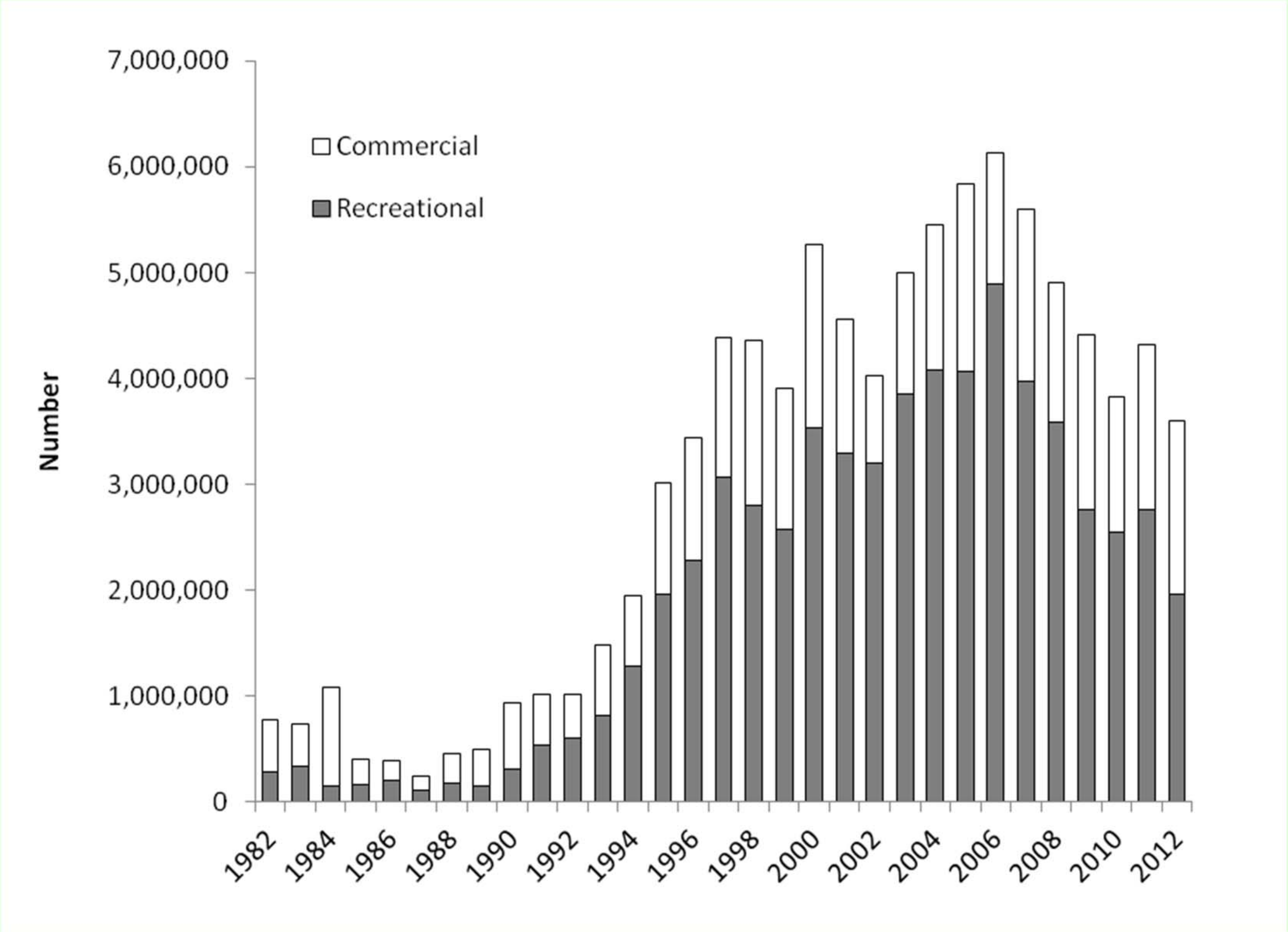
6. Provide annual projections of catch and biomass under alternative harvest scenarios. Projections should estimate and report annual probabilities of exceeding threshold BRPs for F and probabilities of falling below threshold BRPs for biomass. Use a sensitivity analysis approach covering a range of assumptions about the most important sources of uncertainty, including potential changes in natural mortality.

7. Review and evaluate the status of the Technical Committee research recommendations listed in the most recent SARC report. Indentify new research recommendations. Recommend timing and frequency of future assessment updates and benchmark assessments.

Striped bass	SARC57 Panel Findings (1)

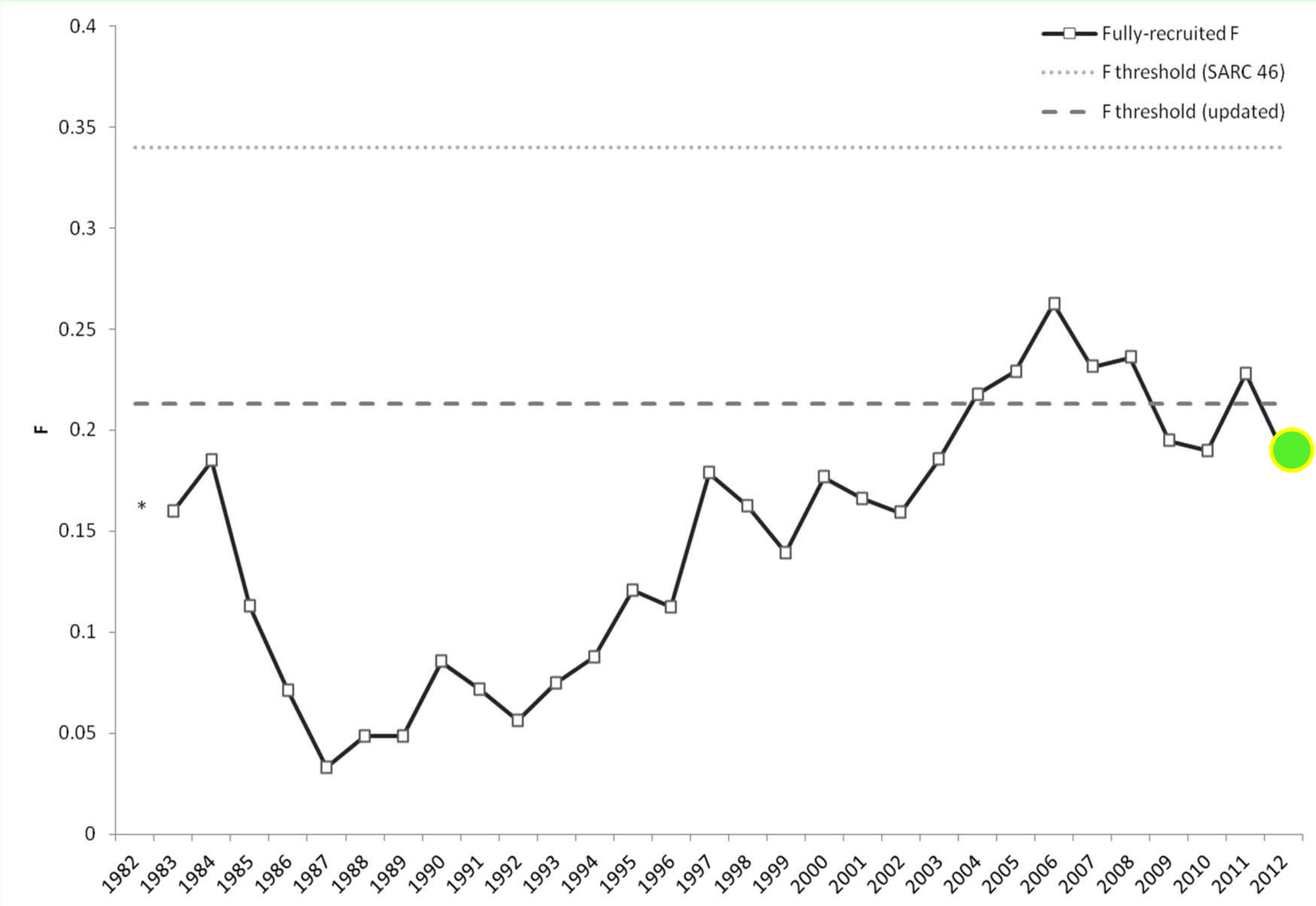
- **Stock assessment was accepted. Stock is not overfished and overfishing is not occurring in 2012 .**
- **Aggregating commercial and recreational catches make results less clear.**
- **Management of striped bass has a history with ad hoc reference points, such as SSB_{1995}, written into regulations. Internally consistent F and SSB thresholds and targets were computed that are consistent with estimated SSB_{1995}.**
- **Available data were assembled well and suitable for the assessment. Assessment was robust to different formulations. Modeling approach is stable.**
- **SARC reviewers agreed with WG that natural mortality (M) used in the assessment should be higher at younger ages.**
- **The estimate of both recreational and commercial dead discards is sensitive to assumed values of post-release mortality.**

Striped bass: Catches



**Catches increased from 1990 to 2006. Declining since 2006.
Large recreational component.**

Striped bass: F and BRP



Fmsy proxy = 0.213

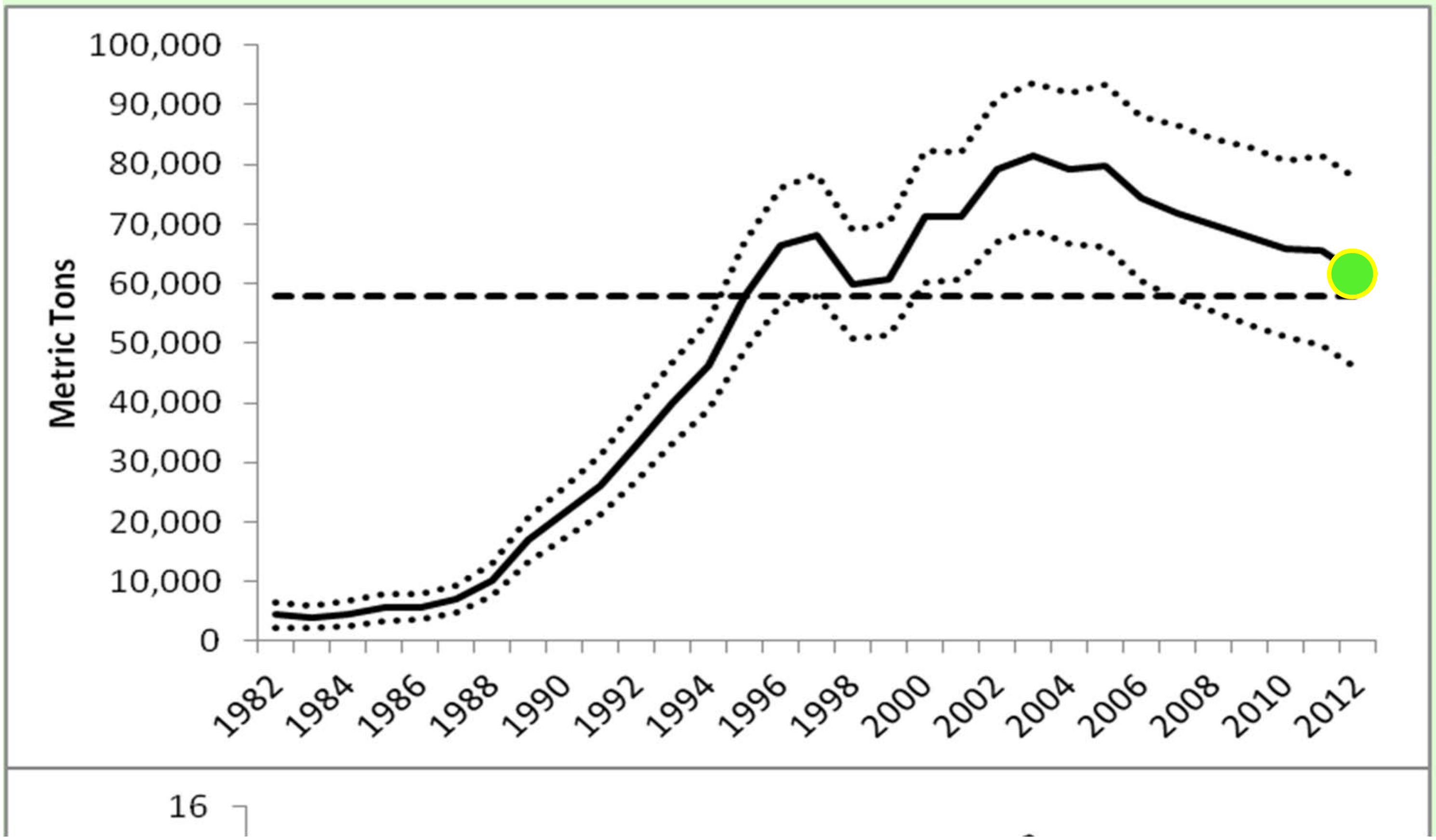
F'12 = 0.188

F increased from 1987 to 2006, with some years overfishing.
F has been declining since 2006. In 2012: Not overfishing.

Striped bass:

Female SSB and BRP

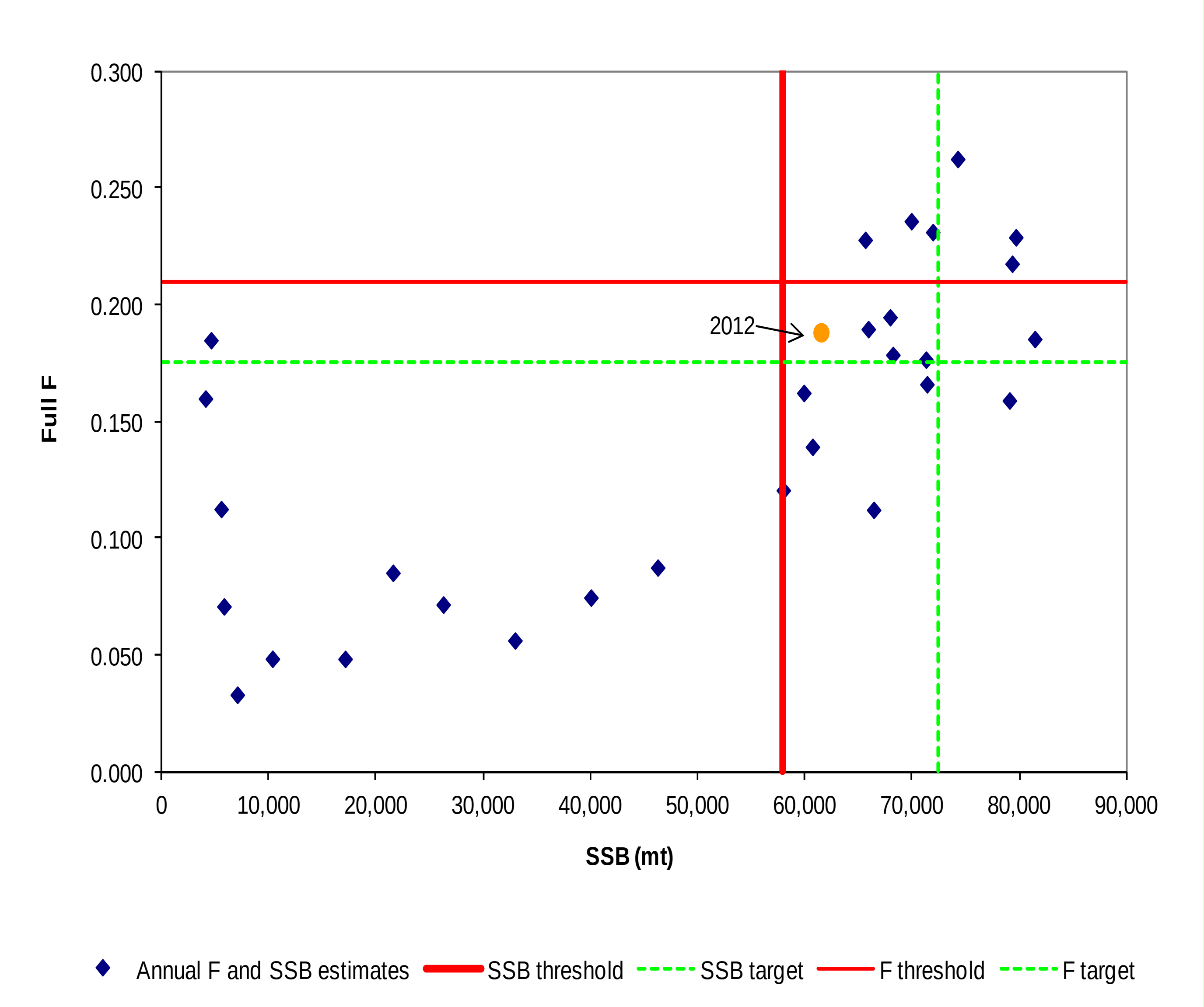
Biomass increased in the 1990s.
In 2012: Not overfished



Female SSB'12 = 61.5 kmt

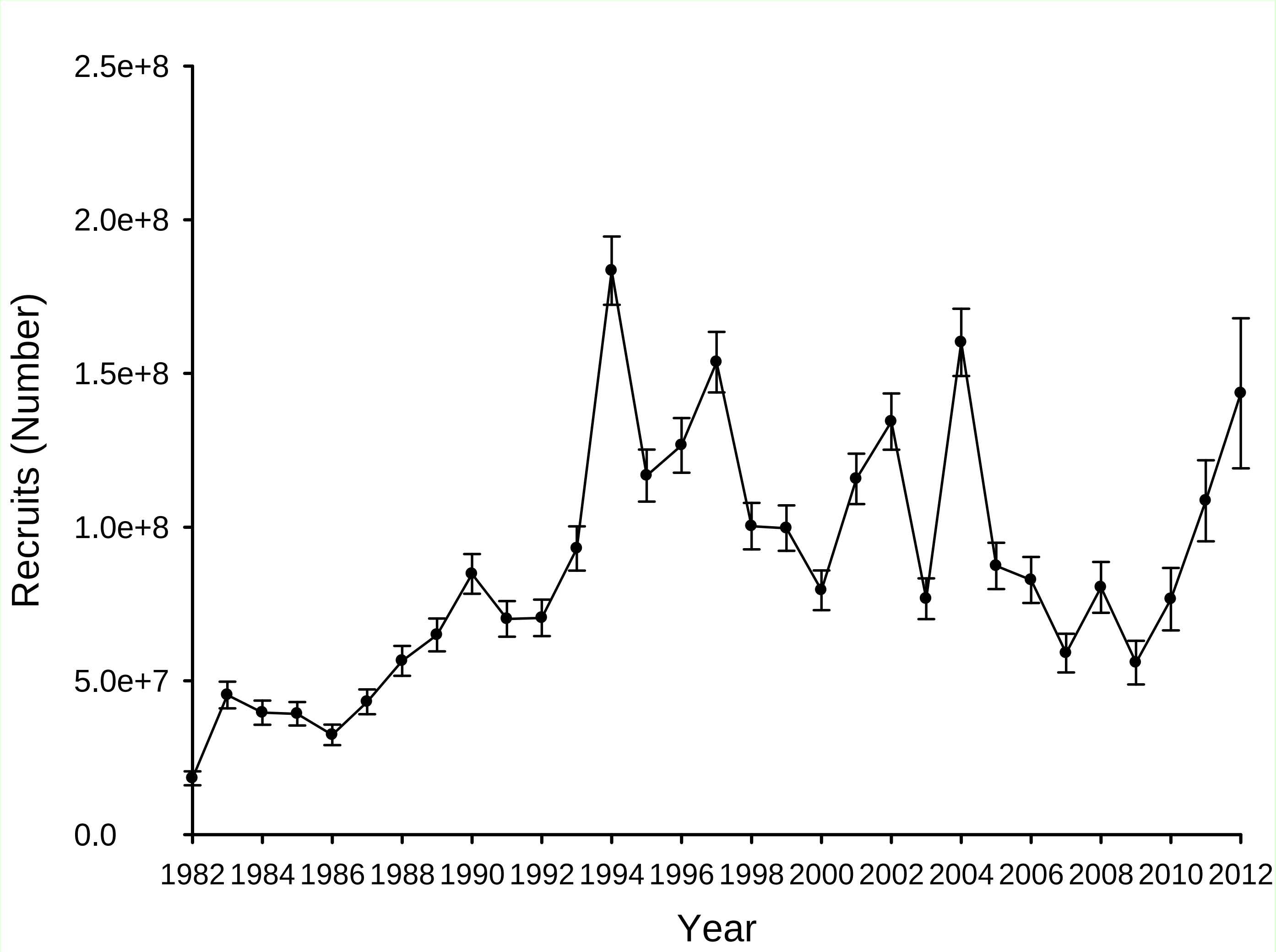
SSB threshold (SSB_{1995}) ~57.9kmt

Striped bass: BRPs and Stock Status



In 2012, stock is above $SSB_{threshold}$. F_{2012} is below $F_{threshold}$.

Striped bass: Recruitment

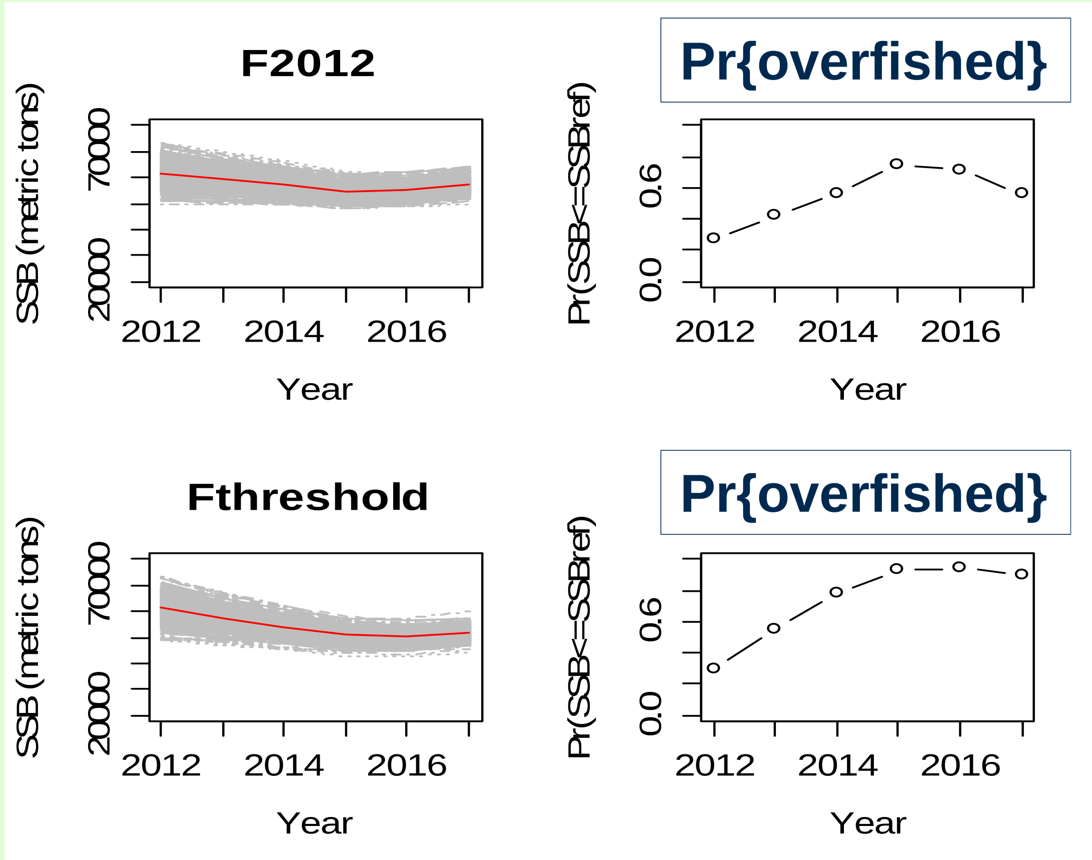


Recruitment has increased since the 1980s.
Well above average in 2011 and 2012.

Striped bass: Sample Projections to 2017

F_{2012} = 0.188

F_{thresh} = 0.213



SARC Recommendations (1)

- **Better coordination of fishery-independent surveys to better match the temporal and spatial use of habitats.**
- **Explore developing a sex-disaggregated model.**
- **Given the non-uniform spatial distribution of the stock by age, to obtain a better model of selection for this index or perhaps truncate the age range.**
- **The assessment was particularly sensitive to two surveys (MDSSN and MRFSS). Evaluate these data sources further.**
- **Further exploration of aging method should be considered. Scales vs otoliths.**

Striped bass

SARC Recommendations (2)

- **Examine if tag estimated mortality can be used in estimating discard survival rates.**
- **Examine whether there is modeling inconsistency between projections and BRPs.**
- **Reformulating the model into recreational and commercial fleets including dead discard components might allow fleetwise catch options.**
- **Standardize state/coastal surveys to better address temporal and spatial availability of stock and to provide meaningful combined stock index.**
- **Management targets based on female SSB may need to be reconsidered if exploitation of males is significant.**