Long Island Sound
Regional Assessment Results

Tautog Management Board

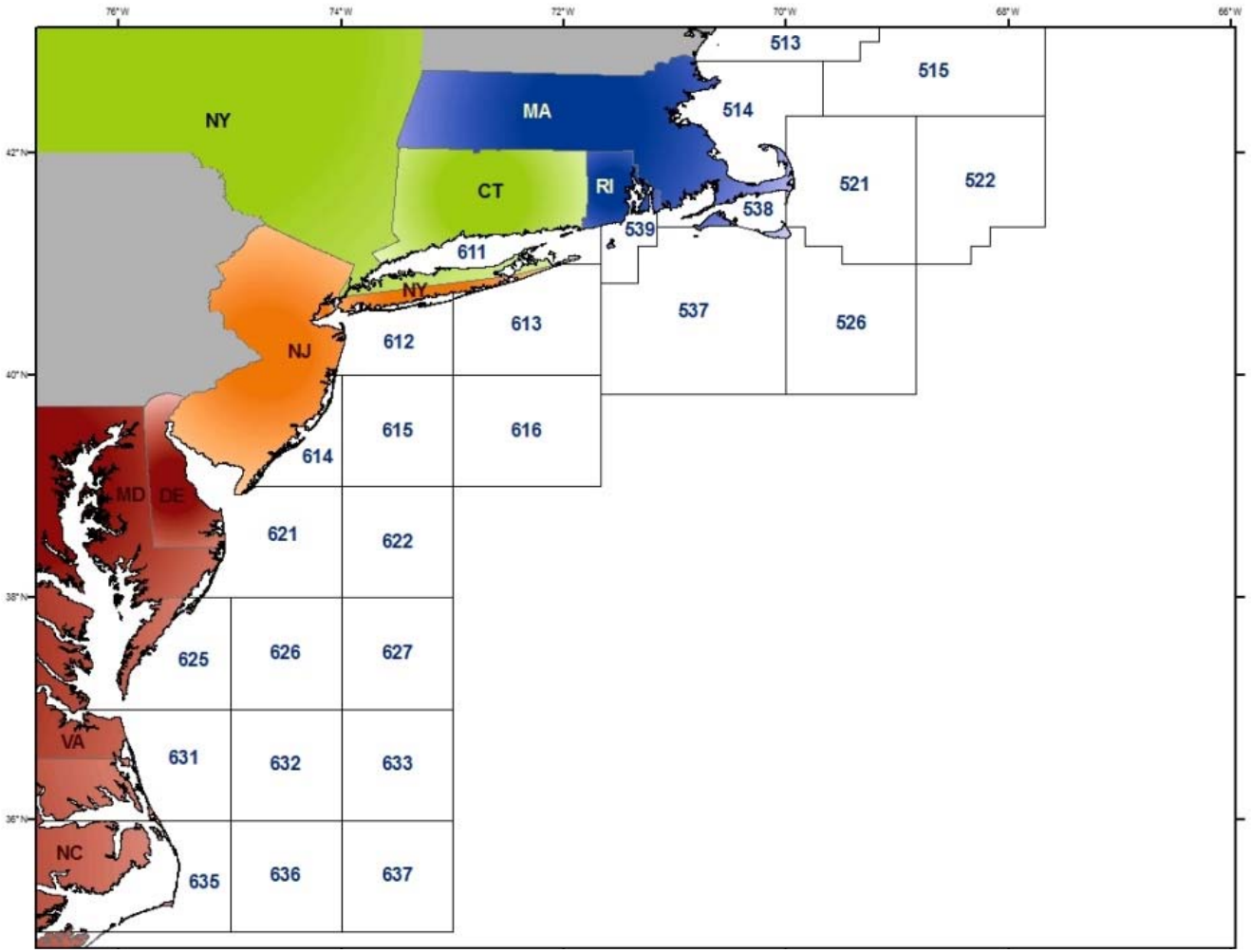
August 2016

Tautog stock assessment contributors

- Jacob Kasper – UConn
- Dr. Eric Schultz – UConn
- Jeffrey Brust - NJ DFW
- Jason McNamee - RI DEM, Technical Committee chair
- Greg Wojcik – CT DEEP
- Sandy Dumais – NYS DEC
- Dr. Katie Drew - ASMFC
- Ashton Harp - ASMFC species coordinator
- Significant input from ASMFC Tautog Technical Committee and Stock Assessment Subcommittee

Revised regional structure

- LIS assessment covers the green region
- NJ-NYB assessment covers the orange region



Why consider a 4-region stock assessment?

- Previously assessed by single stock unit
- Coast-wide single stock unit assumption flaws:
  - Regional differences in the fishery
  - Site fidelity
  - Localized spawning
  - Variations in life history
- The following approached keeps LIS as a contiguous region
- New data were accessed and included in current assessment

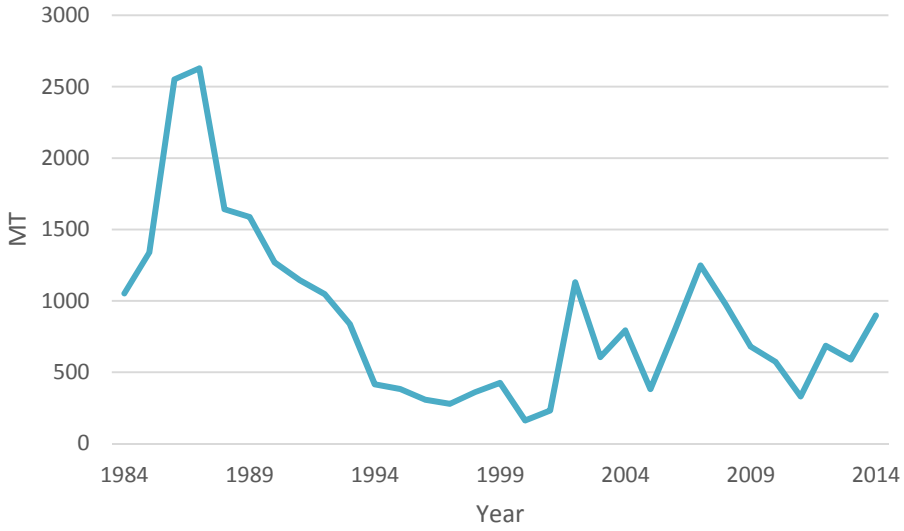
Data types

- Recreational harvest 1984-2014
- Recreational discards 1984-2014
  - 2.5% mortality
- Commercial harvest 1984-2014
- Commercial discards not included
- Fishery independent survey data
- Fishery dependent index data
- FI and FD biological samples

Data treatment

- CT data used “as is”
- NY data split by area (LIS vs south shore)
- Recreational
  - 1988-2014: LIS specific AREA code
  - 1984-1987: Multiyear average harvest
- Commercial
  - 1986-2014: VTR statistical area (611=LIS; 612, 613, 168, 149 = south)
  - 1984-1985: Multiyear average harvest

Harvest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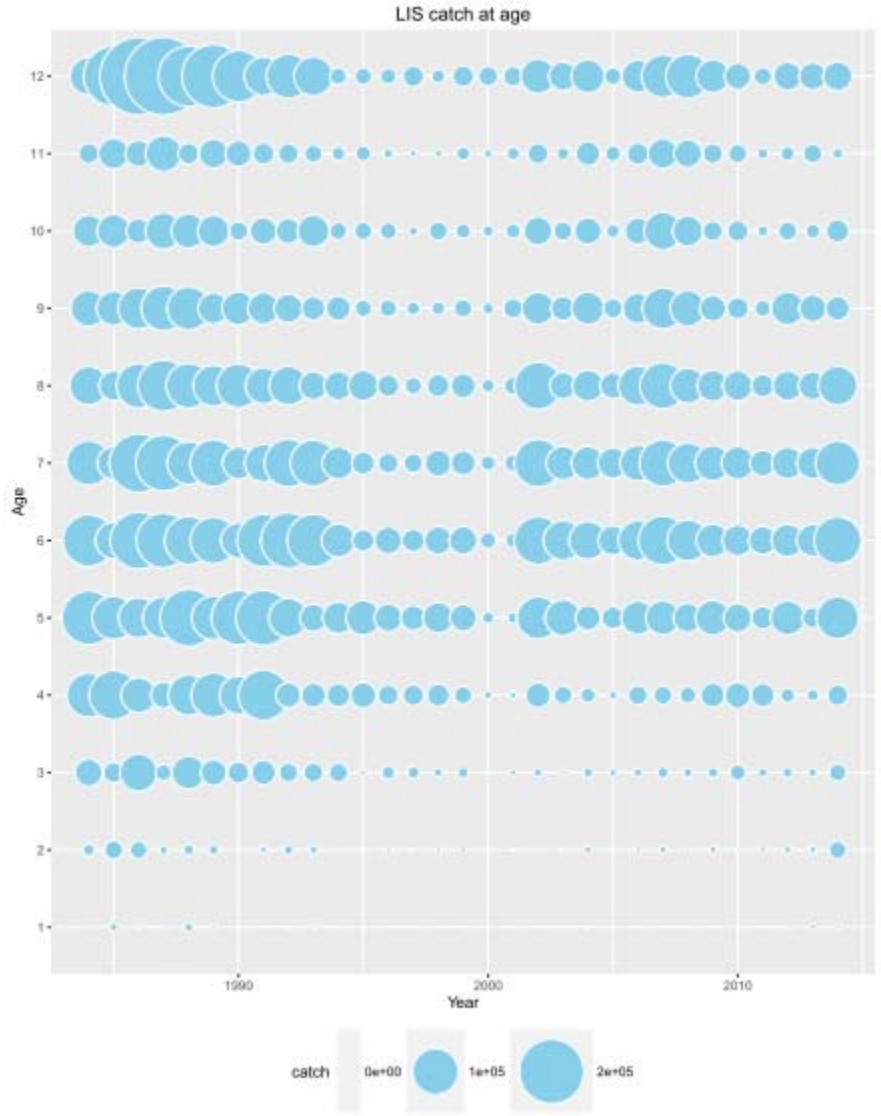
2014
Year


LIS catch at age
Age
12
11
10
9
8
7
6
5
4
3
2
1
1990
2000
2010
Year
catch
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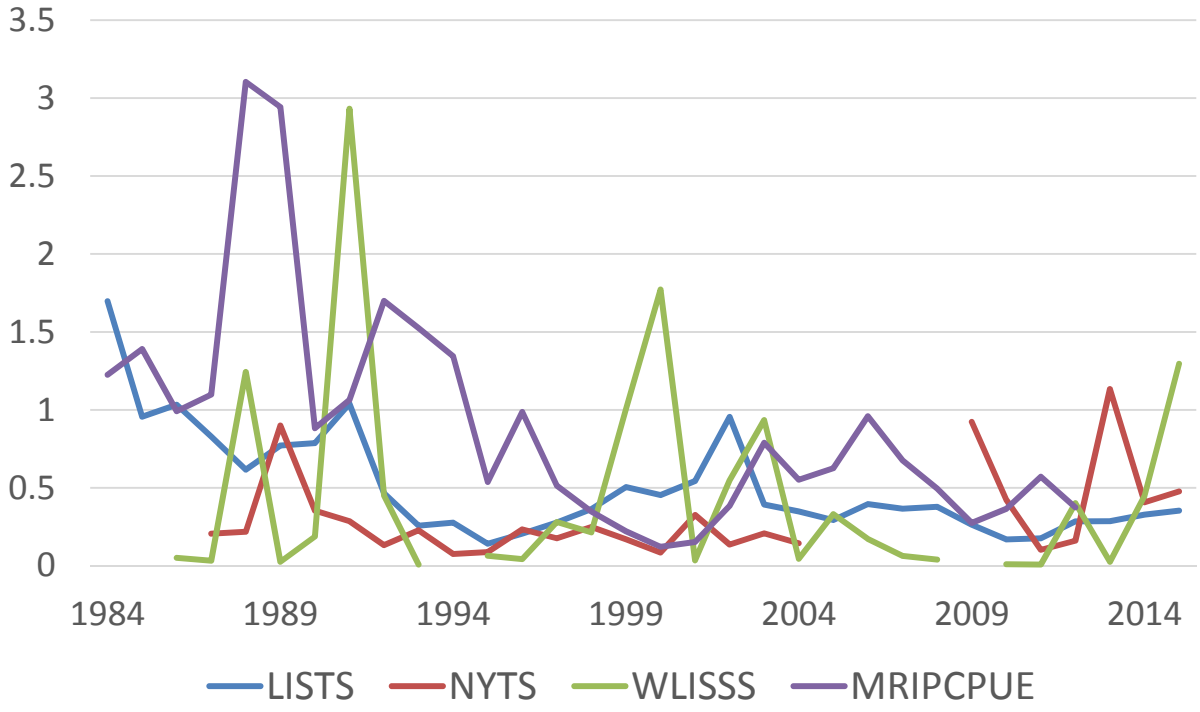
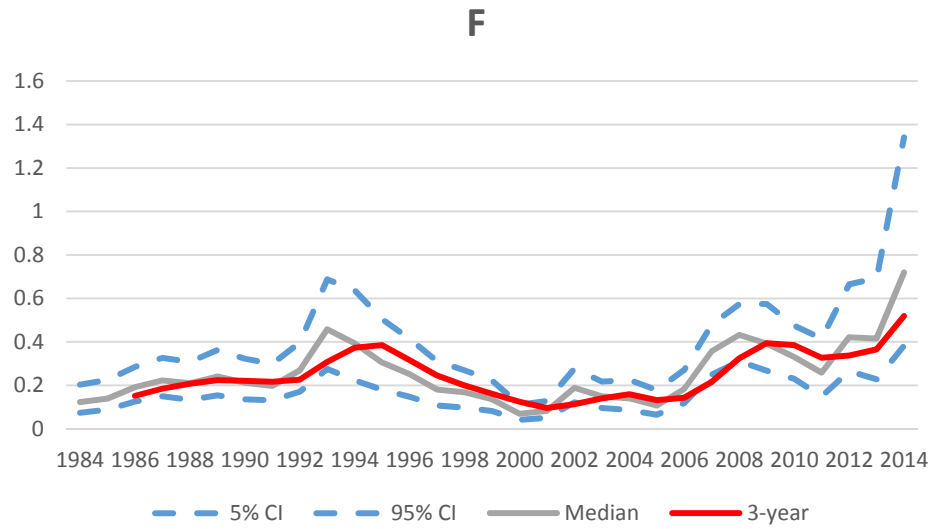
1e+05
2e+05

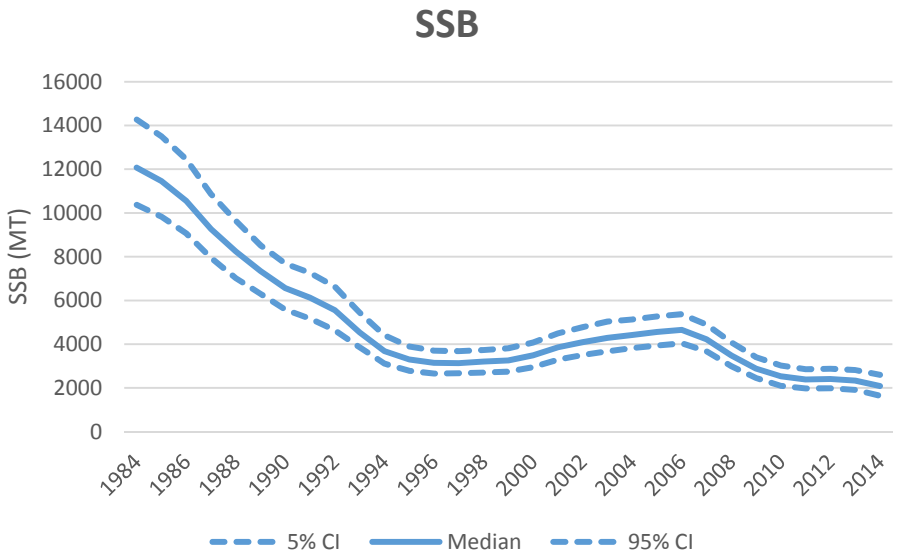
Indices

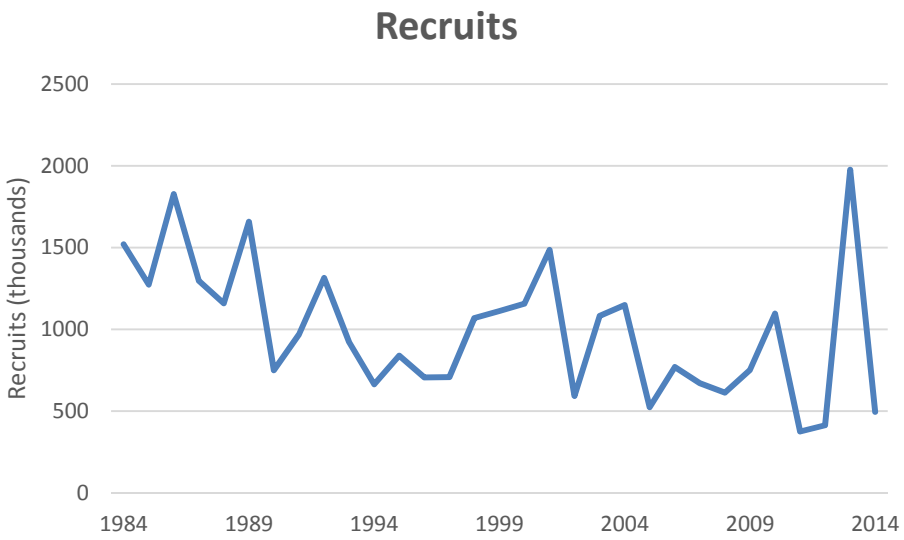
- CT LISTS (adult)
- MRFSS CPUE (adult)
- NYTS (age 1)
- Part of Western Long Island Seine Survey (YOY)
  - Little Neck Bay
  - Manhasset Bay



Model results





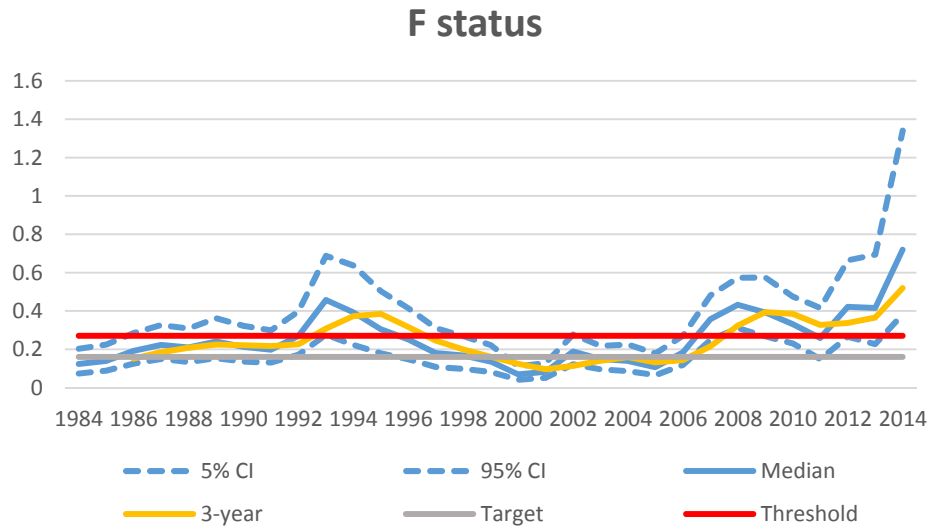


Biological reference points

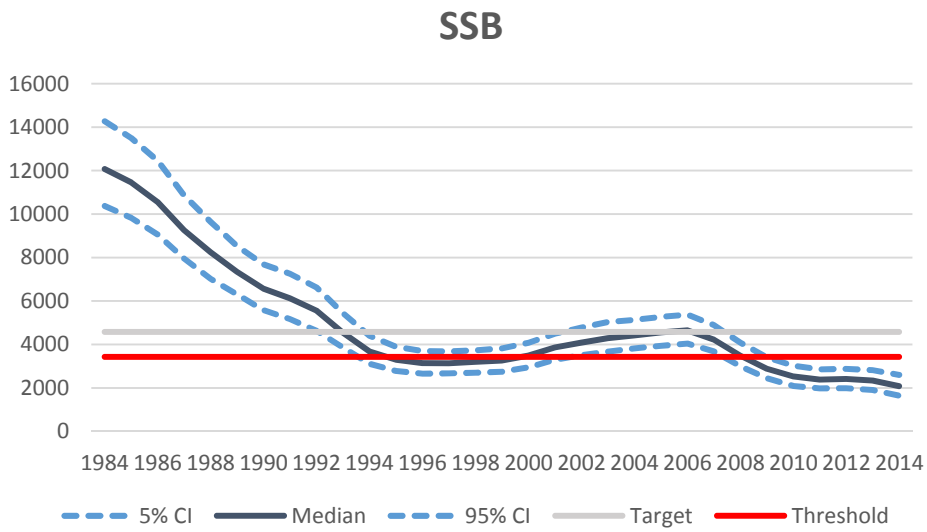
- MSY-TC preferred
  - Strong fit to SR relationship
- Included SPR based reference points
- MSY
  - Target =F_{MSY}
  - Threshold=$F_{75\%MSY}$
- SPR
  - Target = 40% SPR
  - Threshold = 30% SPR

	LIS (MSY)	LIS (SPR)
F_{target}	0.16	0.27
$F_{threshold}$	0.32	0.47
3-year Avg.	0.53	0.53
SSB_{target}	4,576	3,757
$SSB_{threshold}$	3,432	2,820
SSB 2014	1,956	1,956
Stock Status	Overfishing, Overfished	Overfishing, Overfished

Stock status



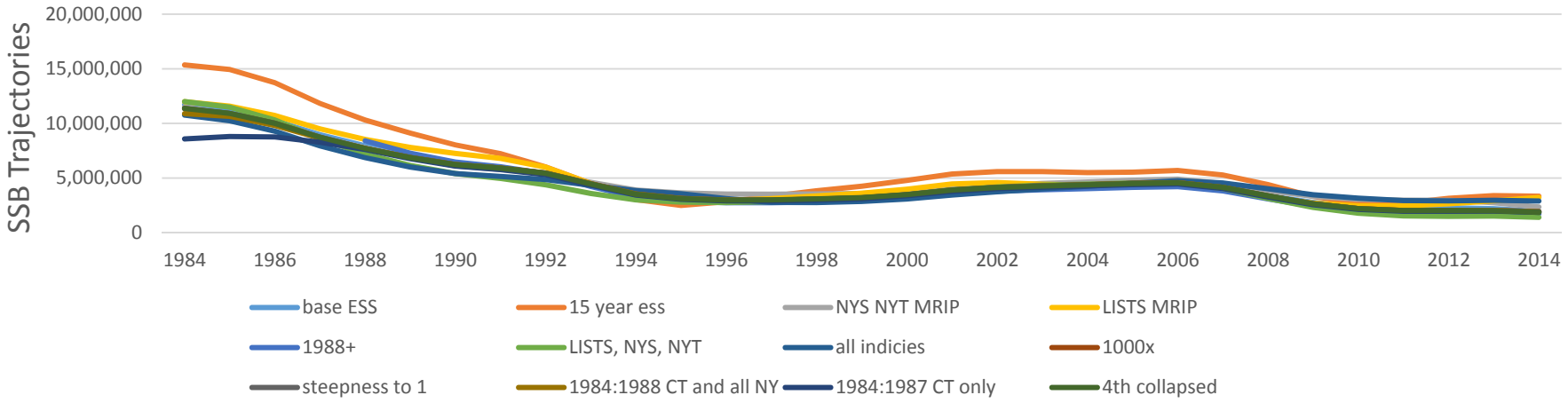
LIS is overfished and overfishing is occurring

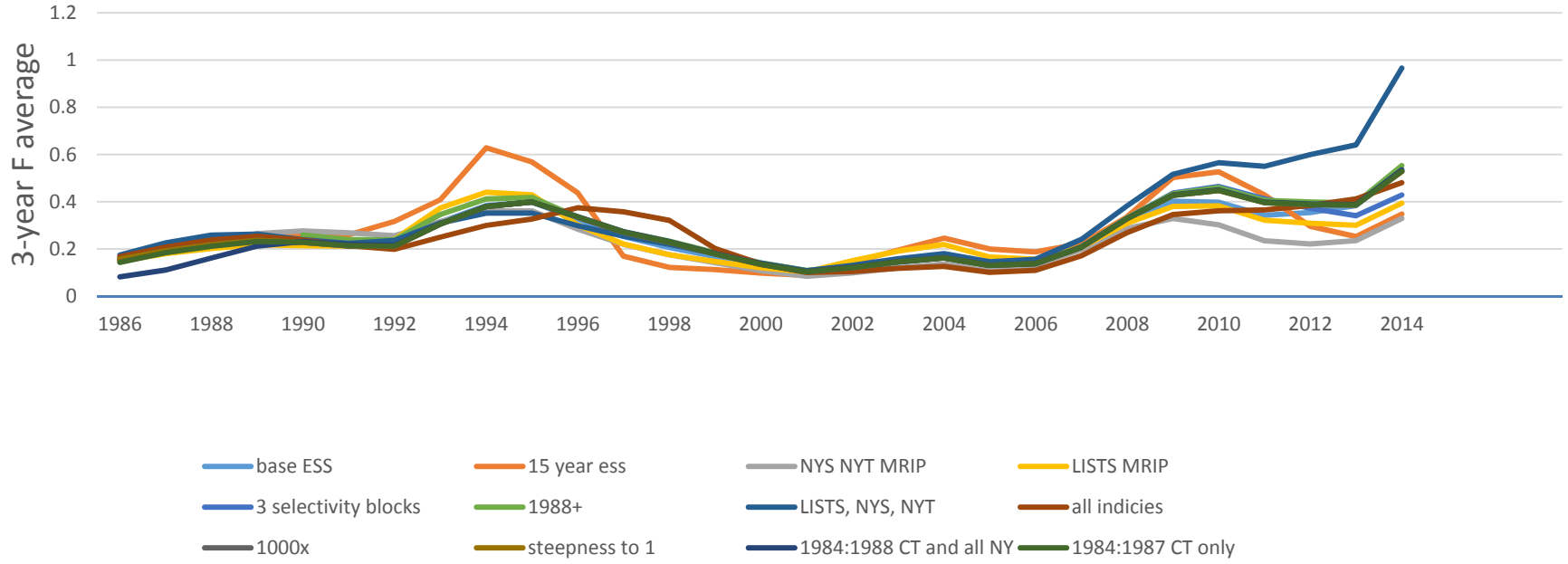


Model uncertainty

- Sensitivity to input data
  - Drop individual surveys
  - Add Millstone survey data
  - Start in 1988 (no landing estimations)
  - 15-year plus group
  - Excluding all of the New York recreational (1984-1987) and commercial (1984-1985) harvest
  - Including all of New York recreational (1984-1987) and commercial harvest from 1984-1985
- Sensitivity to model structure
  - Three selectivity blocks (merged blocks 3 and 4)
- Retrospective analysis
  - Six year peel (2007-2014)
  - Crosses selectivity block
  - Nothing outstanding (see extra slide if interested)

Sensitivity results





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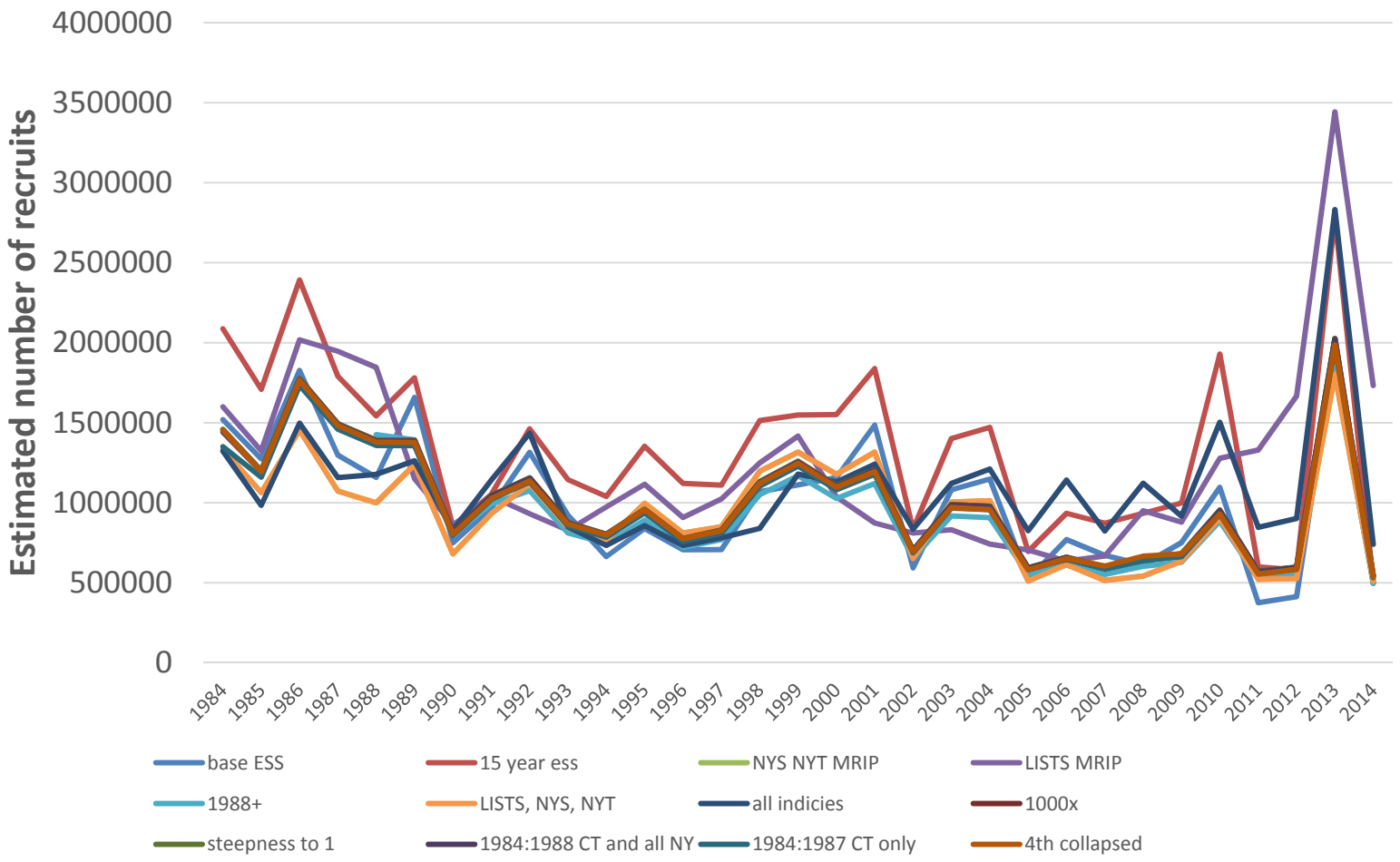
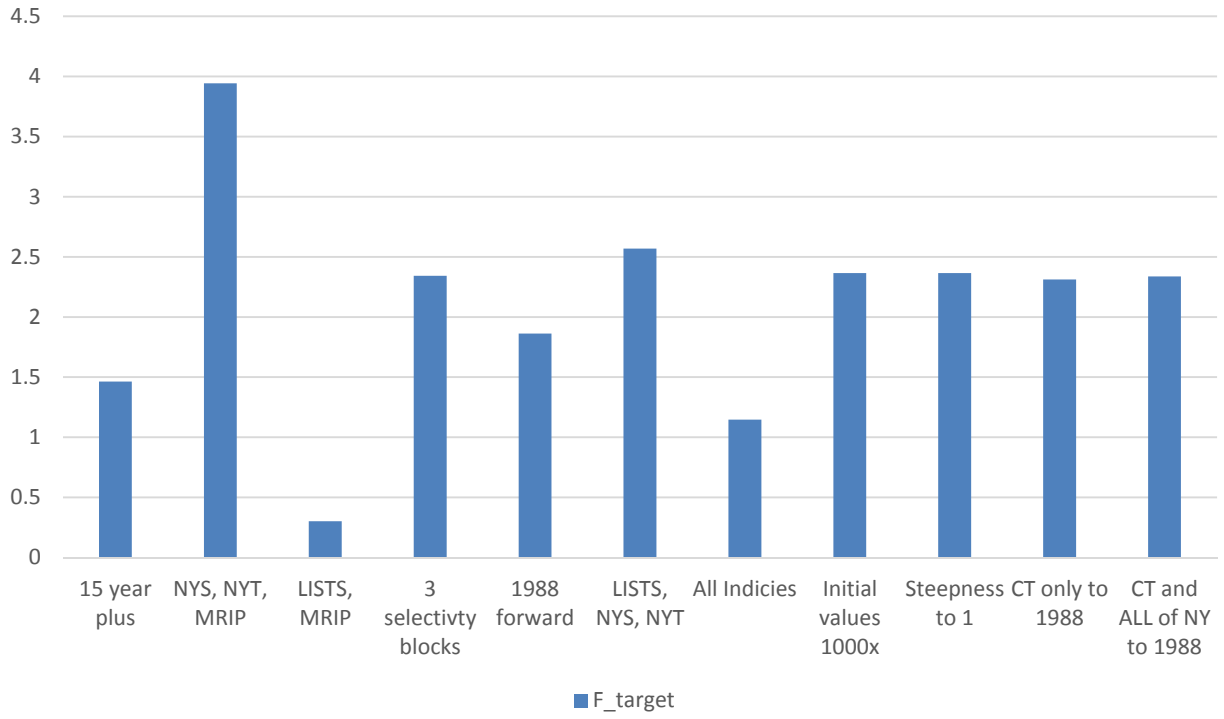


Stock status sensitivity



Terminal F is larger than F_{MSY} (target, not threshold) in all but one sensitivity run

Regional Assessment Results

- Models robust to input data and model configuration
- Stock is overfished and overfishing is occurring
- Status reasonably consistent with alternate regional configurations from benchmark

	LIS (MSY)	LIS (SPR)	MA-CT (MSY)
F_{target}	0.16	0.27	0.15
$F_{threshold}$	0.32	0.47	0.20
3-year Avg.	0.53	0.53	0.48
SSB_{target}	4,576	3,757	3,883
$SSB_{threshold}$	3,432	2,820	2,912
SSB 2014	1,956	1,956	1,839 (2013)
Stock Status	Overfishing, Overfished	Overfishing, Overfished	Overfishing, Overfished

QUESTIONS?

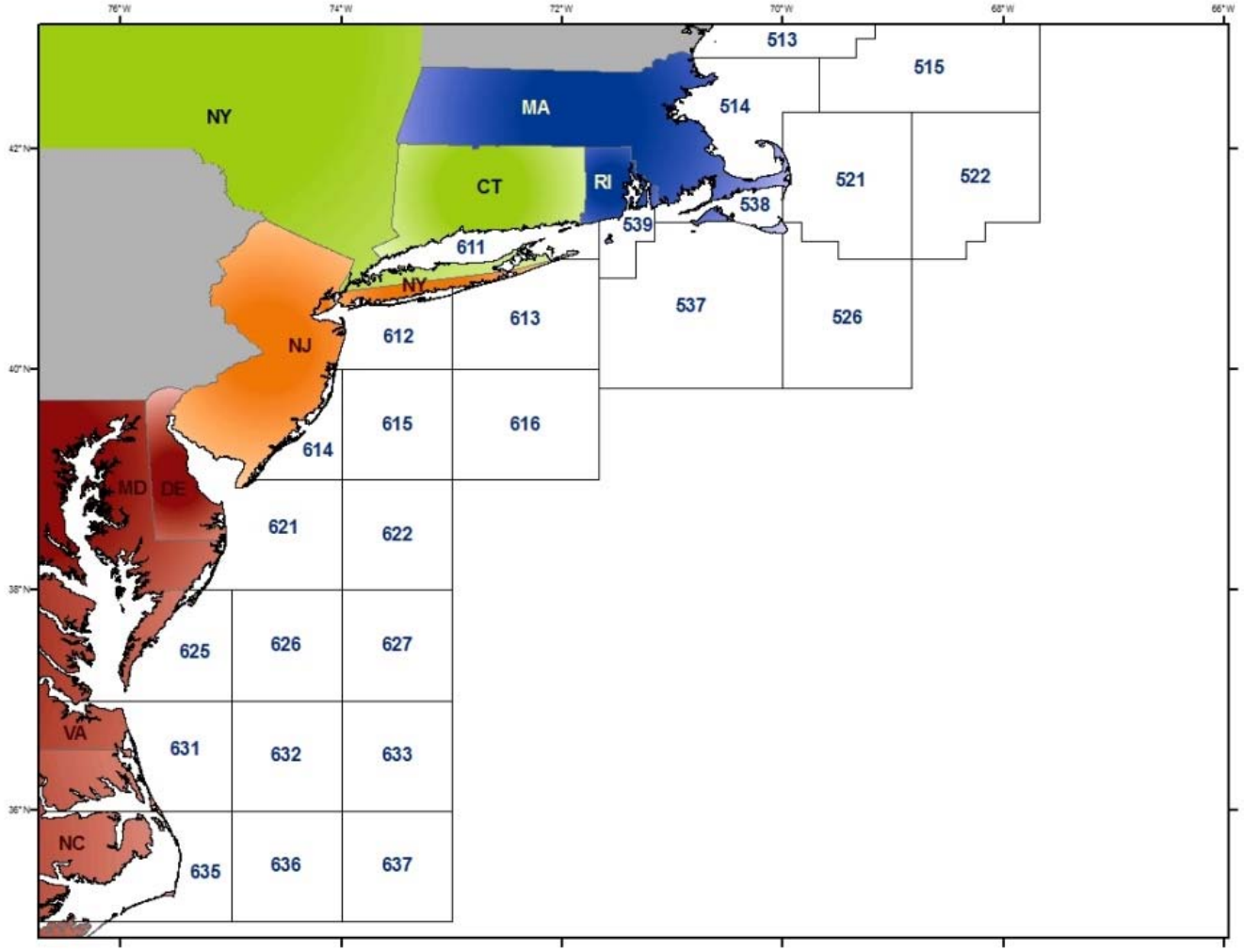
New Jersey + New York Bight (NJ-NYB) Regional Assessment Results

Tautog Management Board

August 2016

Revised regional structure

- This assessment covers the orange region



Data types

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- Commercial discards not included
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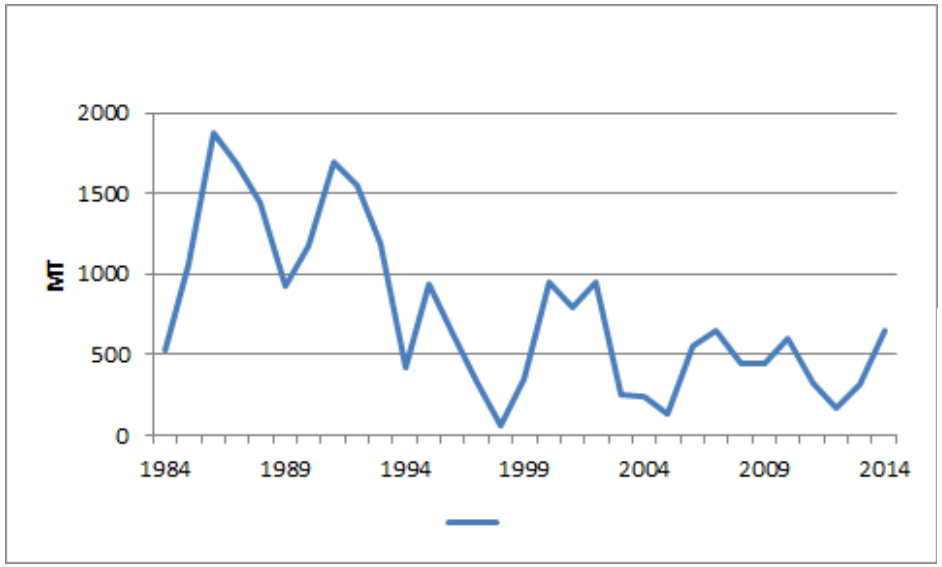
Data treatment

- NJ data used “as is”
- NY data split by area (LIS vs south shore)
- Recreational
  - 1988-2014: LIS specific AREA code
  - 1984-1987: Multiyear average harvest
  - South shore = All NY minus LIS
- Commercial
  - 1988-2014: VTR statistical area (611=LIS; 612, 613, 168, 149 = south)
  - 1984-1987: Multiyear average harvest

Harvest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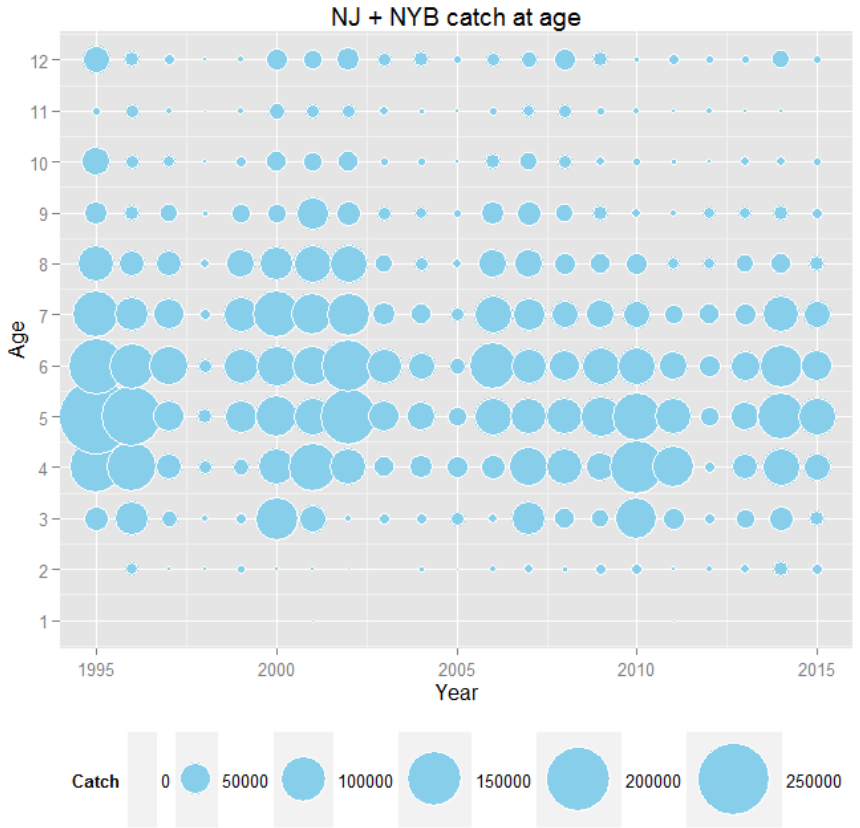
NJ + NYB catch at age
Age
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6
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2010
2015
Year
Catch
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50000
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150000
200000
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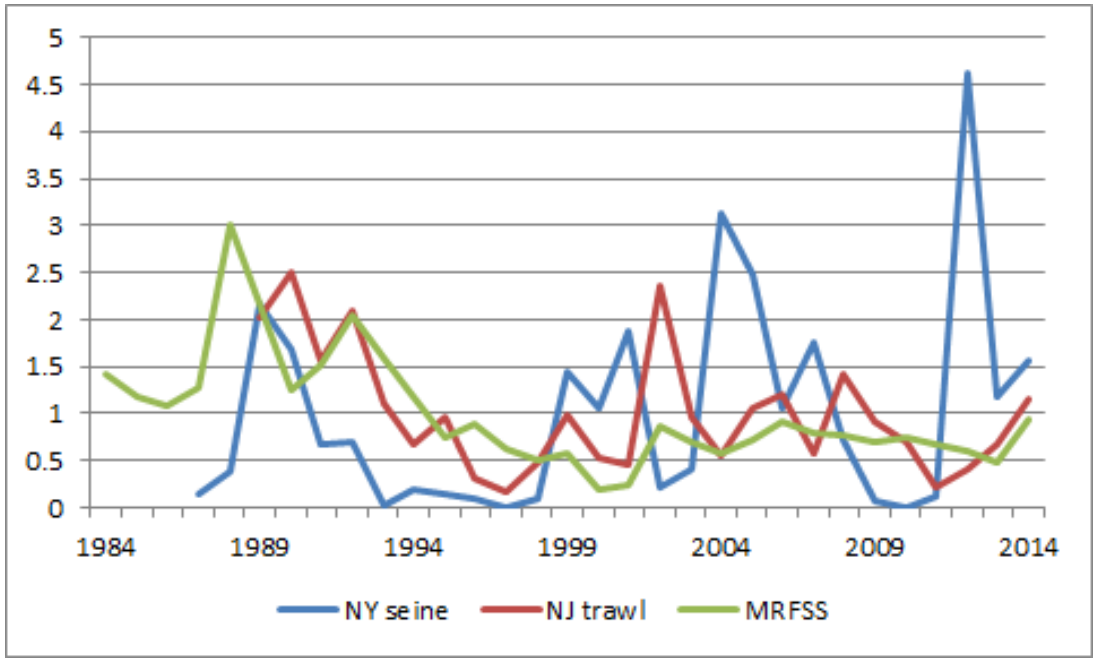
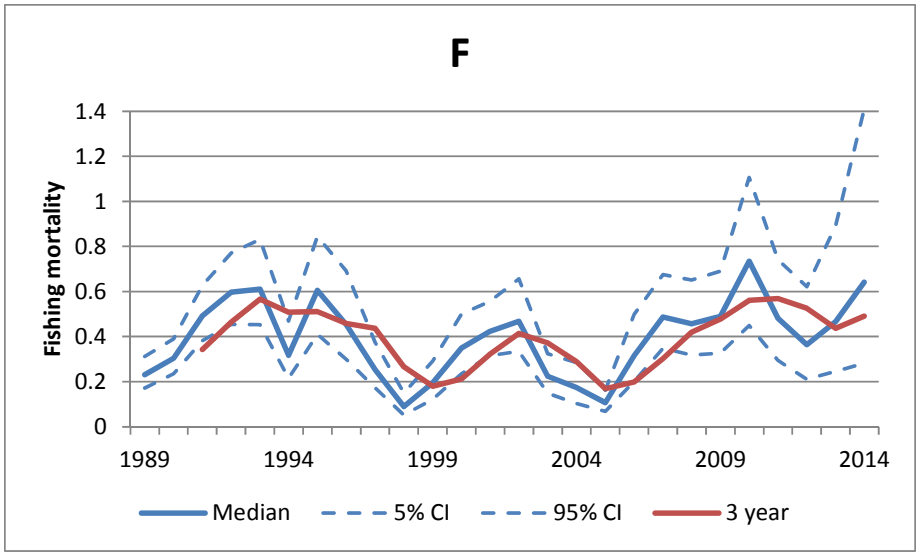
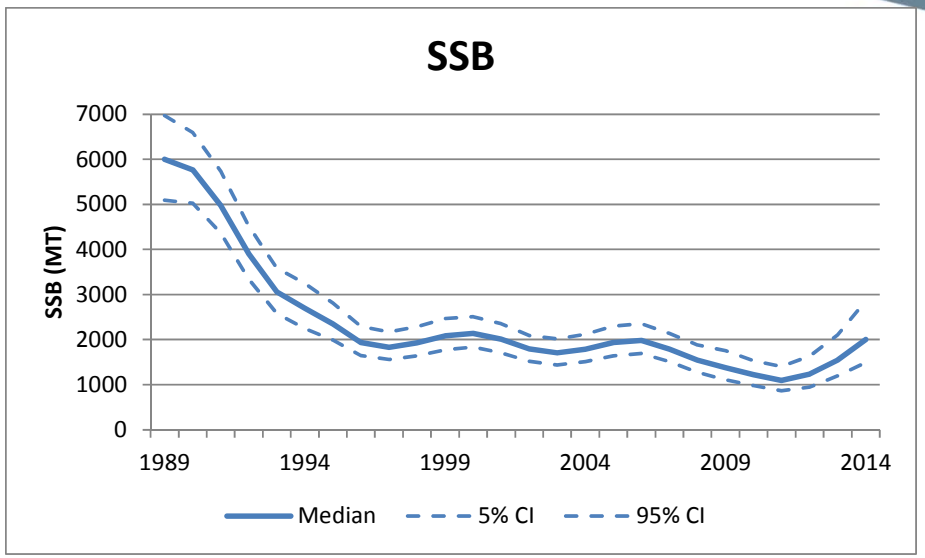
Indices

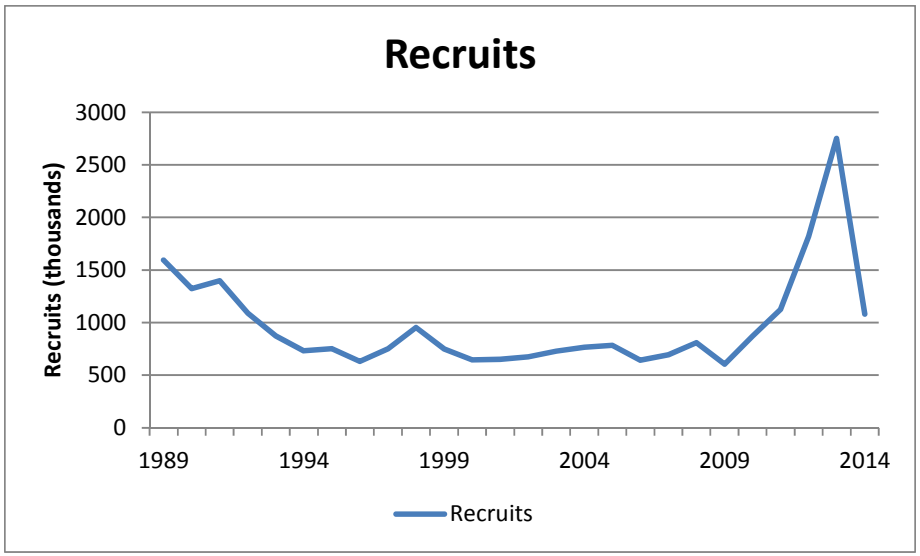
- NJ ocean trawl (adult)
- MRFSS CPUE (adult)
- Jamaica Bay Seine Survey (YOY)
  - Part of Western Long Island Seine Survey



Model results





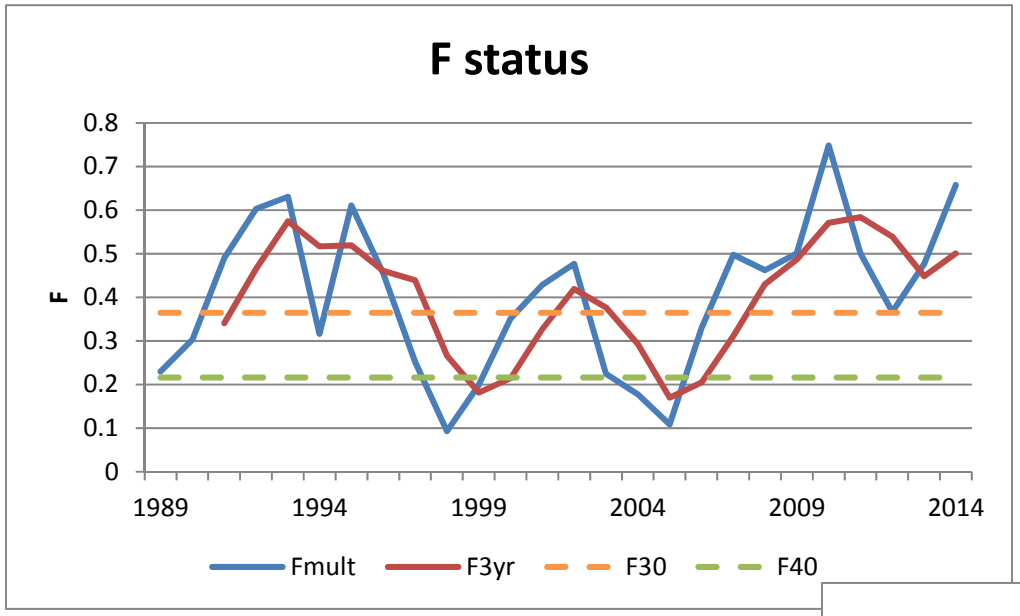


Biological reference points

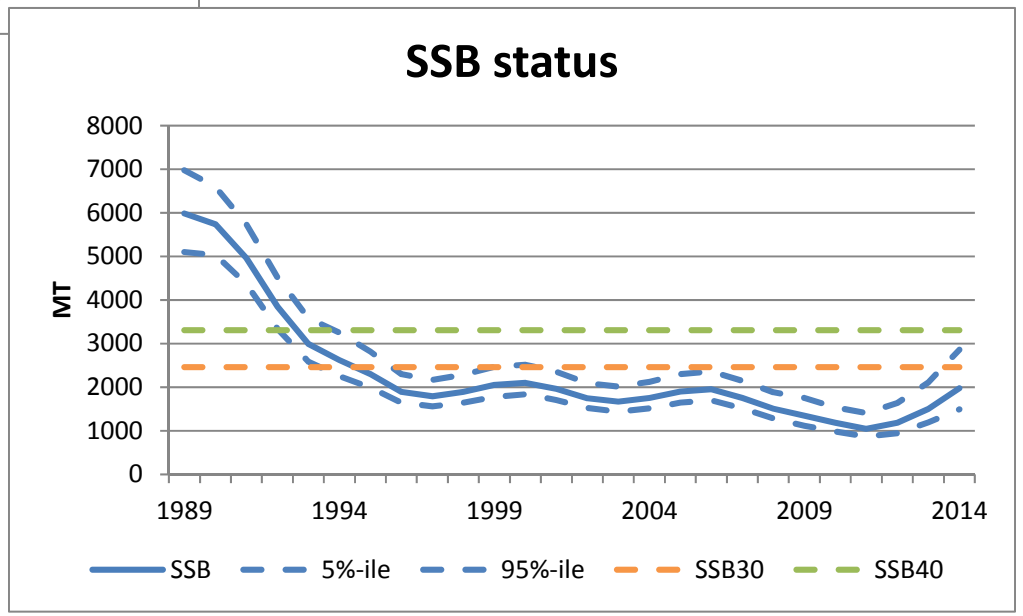
- MSY-based reference points unreliable
  - Poor fit to SR relationship
- Default to SPR based reference points
- Target = 40% SPR
- Threshold = 30% SPR
- Consistent with benchmark

	F	SSB
30% SPR	0.364	2,457.39
40% SPR	0.216	3,304.76

Stock status



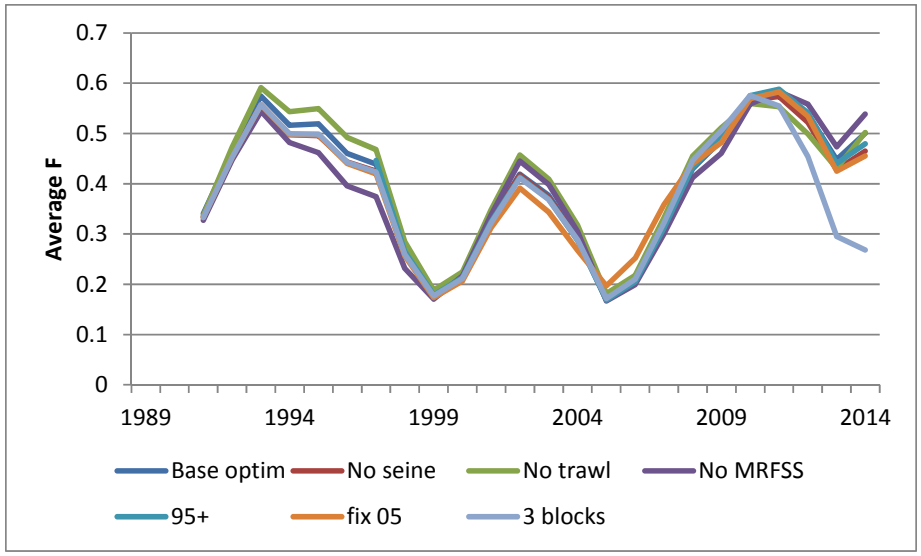
NJ+NYB is overfished and overfishing is occurring

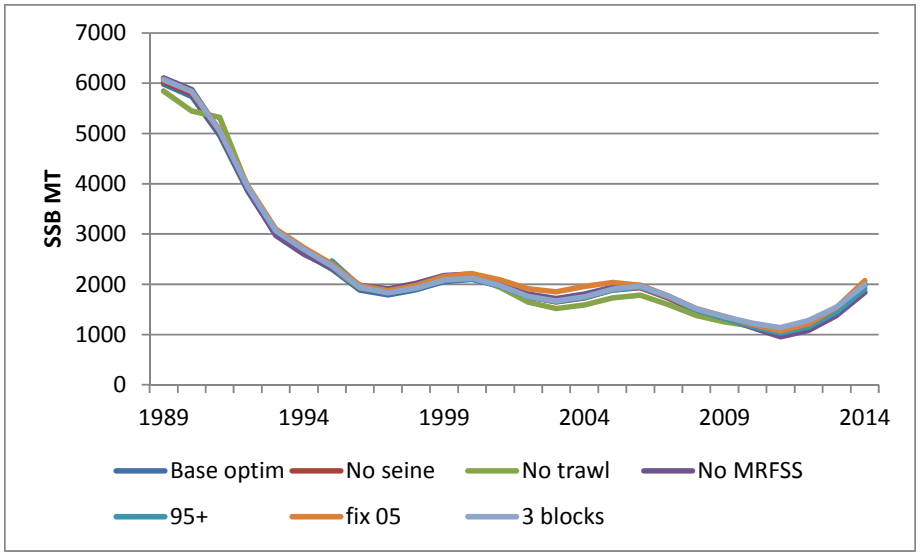


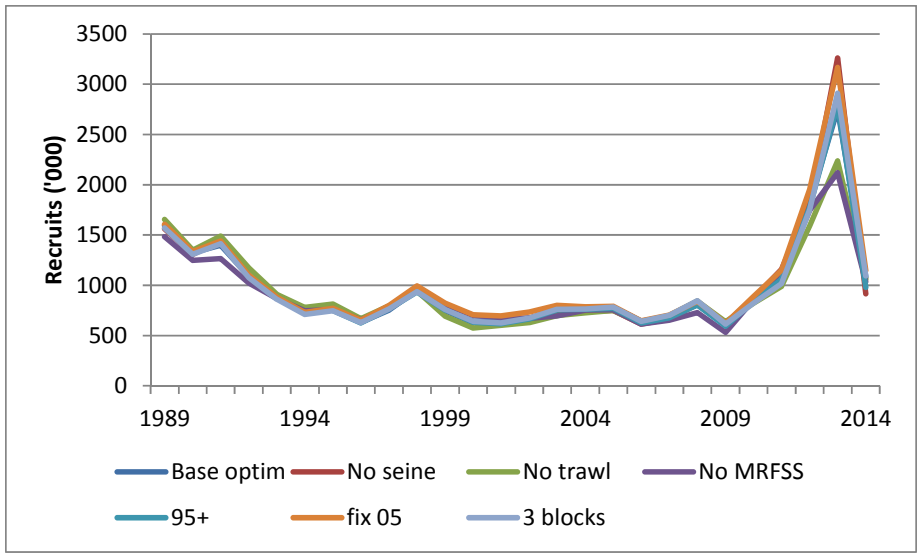
Model uncertainty

- Sensitivity to input data
  - Drop individual surveys
  - Start in 1995 (age data)
  - Fix 1995 severe underestimation in NJ recreational harvest
- Sensitivity to model structure
  - Three selectivity blocks
  - 1996-1997, 1998-2003, 2004-2014
- Retrospective analysis
  - Six year peel (2007-2014)
  - Crosses selectivity block
  - Nothing outstanding (see extra slide if interested)

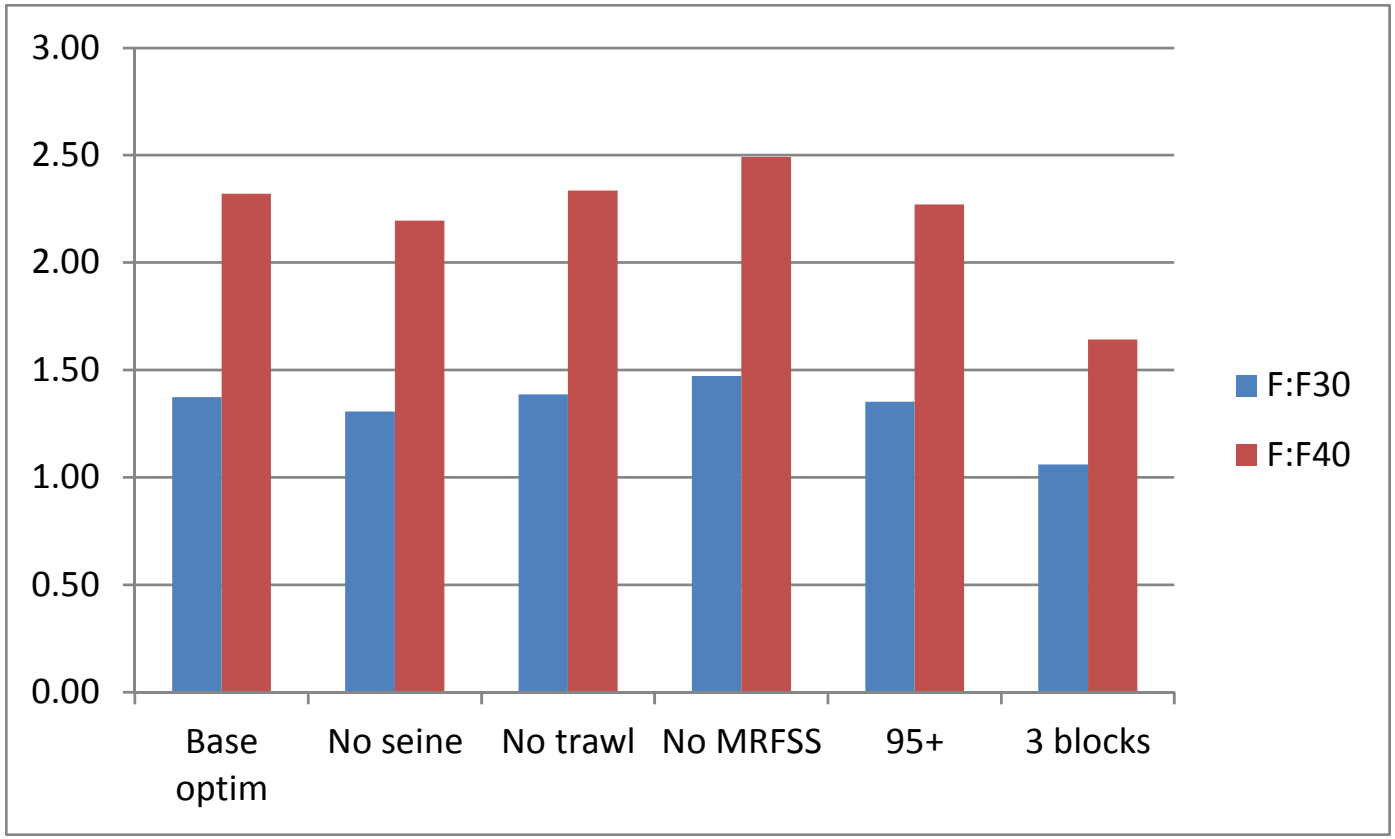
Sensitivity results







Stock status sensitivity



Overfishing is occurring in all sensitivity runs

Conclusions

- Smaller regional scale not as problematic as anticipated
- Models robust to input data and model configuration
- Status consistent with alternate regional configuration from benchmark

	LIS (MSY)	NJ+NYB (SPR)	LIS (SPR)
SSB target	4,576	3,305	3,757
SSB threshold	3,432	2,547	2,820
SSB current	1,956	1,972	1,956
SSB status	**Overfished**	**Overfished**	**Overfished**
F target	0.16	0.22	0.27
F threshold	0.32	0.36	0.47
F current	0.53	0.5	0.53
F status	**Overfishing**	**Overfishing**	**Overfishing**

Future assessments

- The TC recommends conducting a benchmark assessment in 2021

- All regions will undergo an update in 2016

- TC will consider future updates at that time

Questions

Tautog Regional Stock Assessment Desk Review Report

Tautog Management Board

August 2, 2016

Stock Assessment Desk Review Process

- Tautog Regional Stock Assessment Working Group
  - Developed new regional assessments for Long Island Sound and NJ-NY Bight

Scientific Peer Review Panel

- 2 Technical Reviewers, with expertise in population dynamics, stock assessment modeling, statistics, and tautog biology
- Scientific review focusing on data inputs, assessment quality

Products

- Stock Assessment Report and Desk Review Report (for Board and TC)

Tautog Stock Assessment Desk Review

June 27 – July 21, 2016

Review Panel:

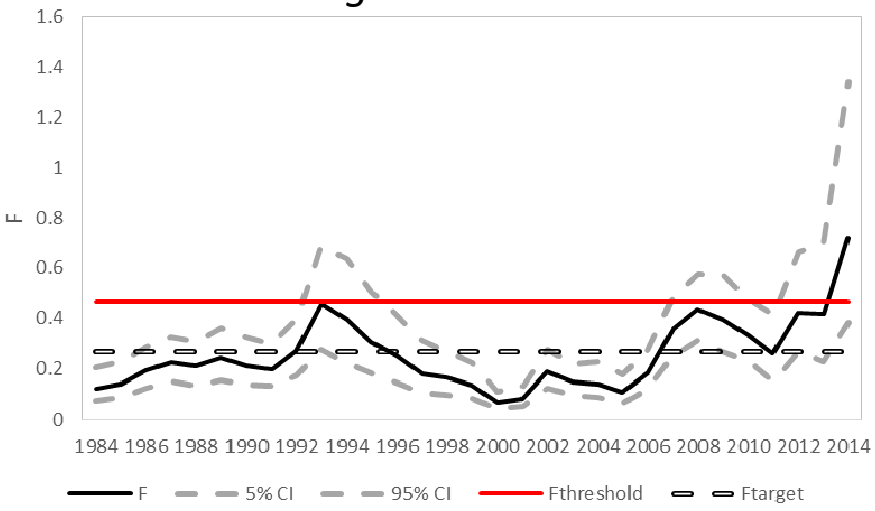
Dr. Cynthia Jones, Old Dominion University,
Center for Quantitative Fisheries Ecology

Mr. Joe O'Hop, Florida Fish & Wildlife
Conservation Commission, FWRI

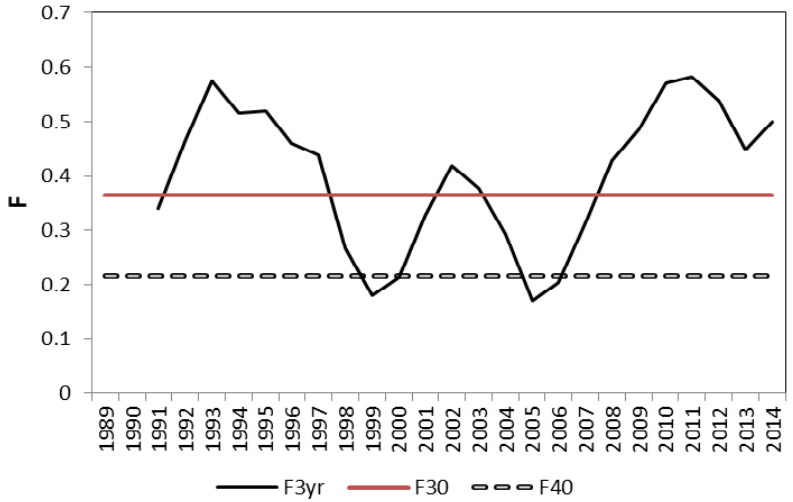
Review Panel Overall Findings

- Regional stock assessments passed desk review
  - Long Island regional stock: overfished, overfishing in 2014
  - New Jersey-New York Bight: overfished, overfishing in 2014
- Panel finds stock assessment acceptable for management use

Long Island Sound



NJ / NY Bight

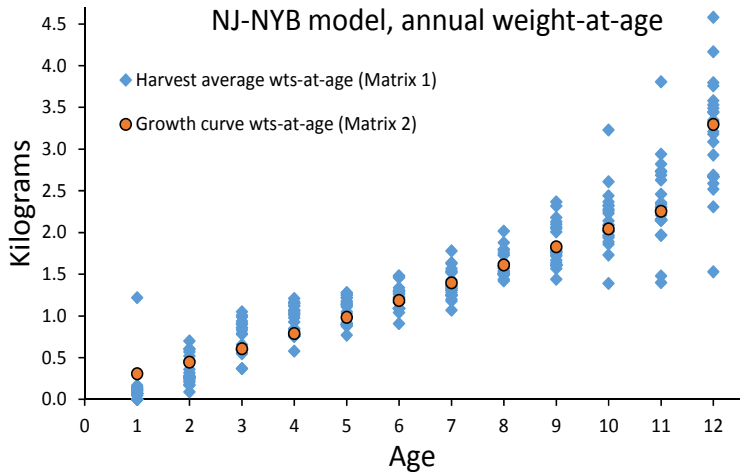


Review Terms of Reference

ToR 1: *Evaluate how assessment data were selected and used.*

Panel Conclusions

- All potential fishery-dependent and fishery-independent data sources thoroughly reviewed and selected appropriately
- Review agreed MRIP recreational survey estimates were sufficient for stock assessment, despite low sample sizes; in future assessments, implement new calibrations
- Explore correction to growth curve parameterization where fishery-dependent data used



Review Terms of Reference

ToR 2: *Evaluate stock structure and geographical scale of the regional assessments*

Panel Conclusions:

- Growth rates similar from CT – NJ
- Genetic studies inconclusive relative to LIS and NJ-NYBight regions

→ New regions reasonable and acceptable, but not necessarily better than benchmark regions

Review Terms of Reference

ToR 3: *Evaluate the methods and models used to estimate population parameters*

Panel Conclusions:

- Age-Structured Assessment Program (ASAP) model is appropriate for use of selected input data, and justified for use in making management decisions
- Explore alternative approaches to weight-at-age and growth curve analyses

Review Terms of Reference

ToR 4: *Evaluate the methods used to characterize uncertainty in assessment results*

Panel Conclusions:

- Sensitivity to a range of data inputs and model structures well addressed and understood; outcomes were robust
- **Long Island Sound model:** retrospective patterns small and not cause for concern relative to management action
- **NJ-NYB model:** larger retrospective bias; “worrisome” and indicates F and SSB estimates more uncertain

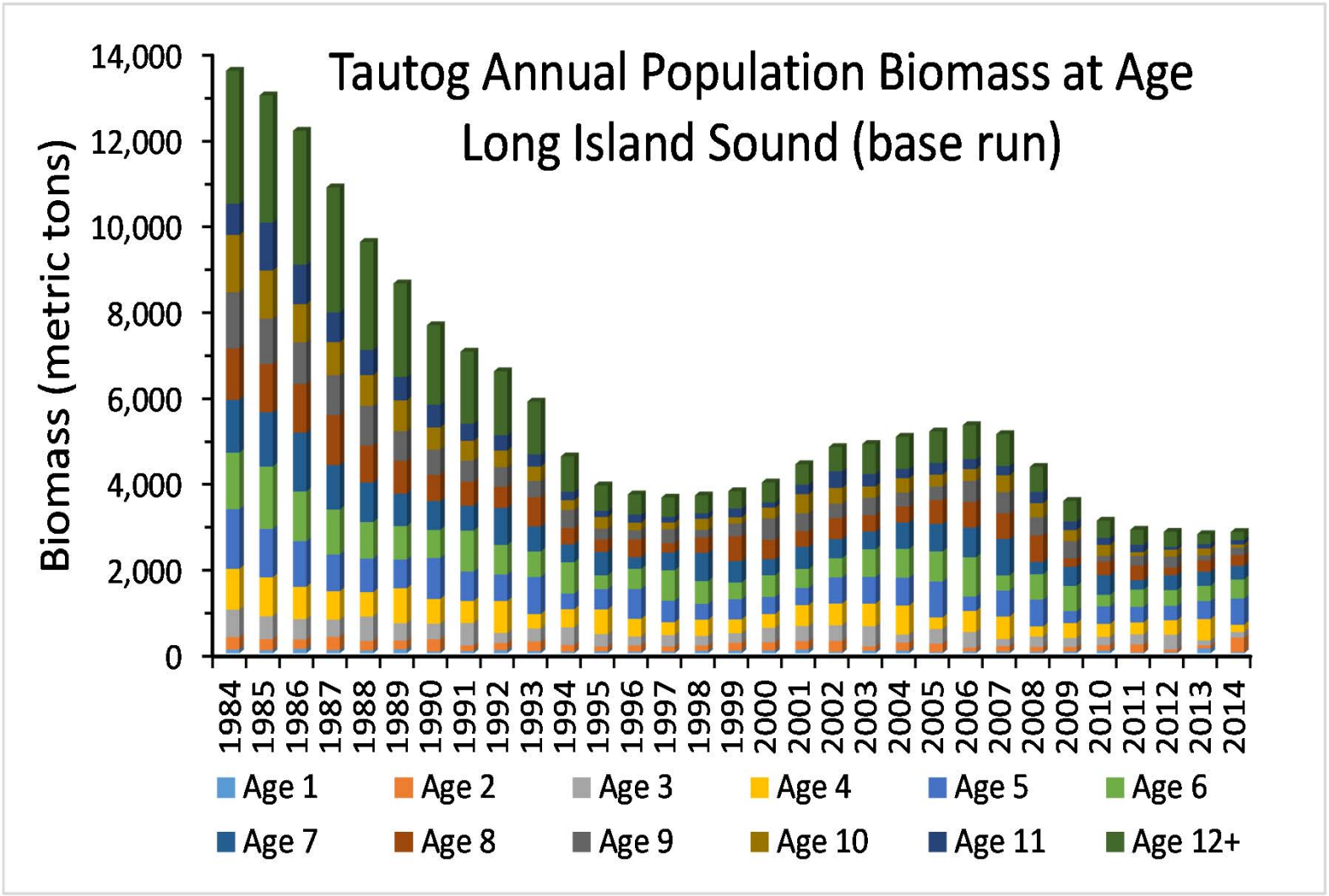
Review Terms of Reference

ToR 5: *Evaluate estimates of stock biomass, abundance, and exploitation from the assessment*

<u>Panel Conclusions:</u>

- The ASAP model and associated reference points provide the best estimates for determining stock biomass, abundance, and exploitation rates
- **Long Island Sound:** re-examine plus group (12+ vs. 15+); otherwise model estimates are robust
- **NJ-NYB:** greater uncertainty (poor S-R relationship, larger retrospective patterns); re-examine weights-at-age, growth

Erosion of older age classes in both regions



Review Terms of Reference

ToR 6: *Evaluate reference points and methods used to estimate them. Recommend stock status determination.*

Panel Conclusions:

- Long Island Sound: Spawner-per-recruit (SPR) and MSY reference points acceptable
- NJ-NYB: SPR acceptable; MSY ref pts not appropriate, given poor Stock-Recruitment relationship
- Possible misspecification of selectivity in NJ-NYB model
- Long Island Sound: overfished, overfishing in 2014
- New Jersey-New York Bight: overfished, overfishing in 2014
- Panel finds stock assessment acceptable for management use

Commercial Harvest Tagging Program – Tank Trial Update

Presented to the ASMFC Tautog Board
August 2, 2016

Law Enforcement Sub-Committee

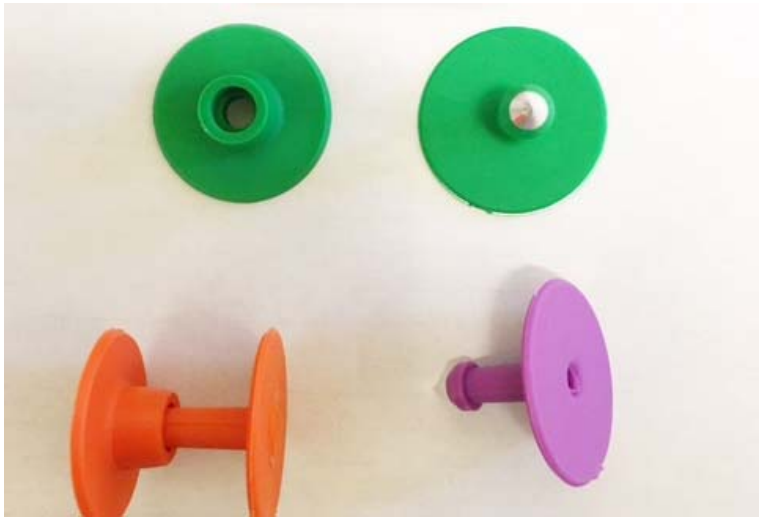
- ✓ Program objectives
- ✓ Procured tags
- ✓ Commercial harvester interviews
- ❑ Tank trial - *underway*

Commercial Harvest Tagging Program

Objectives (paraphrased)

1. Implement a tagging program to reduce illegal, unreported and unregulated fishing
2. Standardized tags across states
3. Single-use tags
4. Accommodate the live market fishery

Tags selected by the LE Sub-Committee to use in a tank trial



Harvester Feedback

- Linked to the black sea bass (BSB) fishery. Targeted when BSB closes. Incidental catch when targeting BSB.
- Generally fish out to 10 miles, but will go further if targeting BSB
- Tautog are not as resilient in warm water or during spawning. Tags could increase mortality during this time.
- Supply chain is de-centralized with lots of small-scale buyers and wholesalers
- Live tautog are held by buyers/dealers for weeks
- *A full list of harvester comments is provided in the May Law Enforcement Sub-Committee meeting summary*

Tank Trial

- Led by New York Division of Marine Resources & Stony Brook University
- Fish traps are currently collecting tautog
- 80 tautog will be collected and transferred to a wet lab
- Each tag will be applied to 20 fish (60 fish in total); 20 fish will serve as the control group
- Each fish will be tagged and monitored for 4 weeks
- Trial expected to begin in August 2016

Looking Ahead

- The following will be presented at the annual meeting:
  - Results of the tagging tank trial
  - Law Enforcement Sub-Committee recommendations (based on the results of the tagging tank trial)

At the annual meeting the Board can opt to task the PDT with developing Draft Amendment 1 options for a commercial harvest tagging program

Questions