NOAA
FISHERIES
SERVICE

Summer flounder: a data rich stock assessment

Northeast **Fisheries Science Center**

Mark Terceiro
NEFSC Population Dynamics Branch
Mark.Terceiro@ noaa.gov

August 7, 2013

NOAA
FISHERIES
SERVICE

Summer flounder assessment

Last completed benchmark assessment: 2008 SAW 47

Most recently completed assessment: 2012 update with data through 2011

2013 SAW 57 benchmark assessment with data through 2012 is 'in publication'

NOAA
FISHERIES
SERVICE

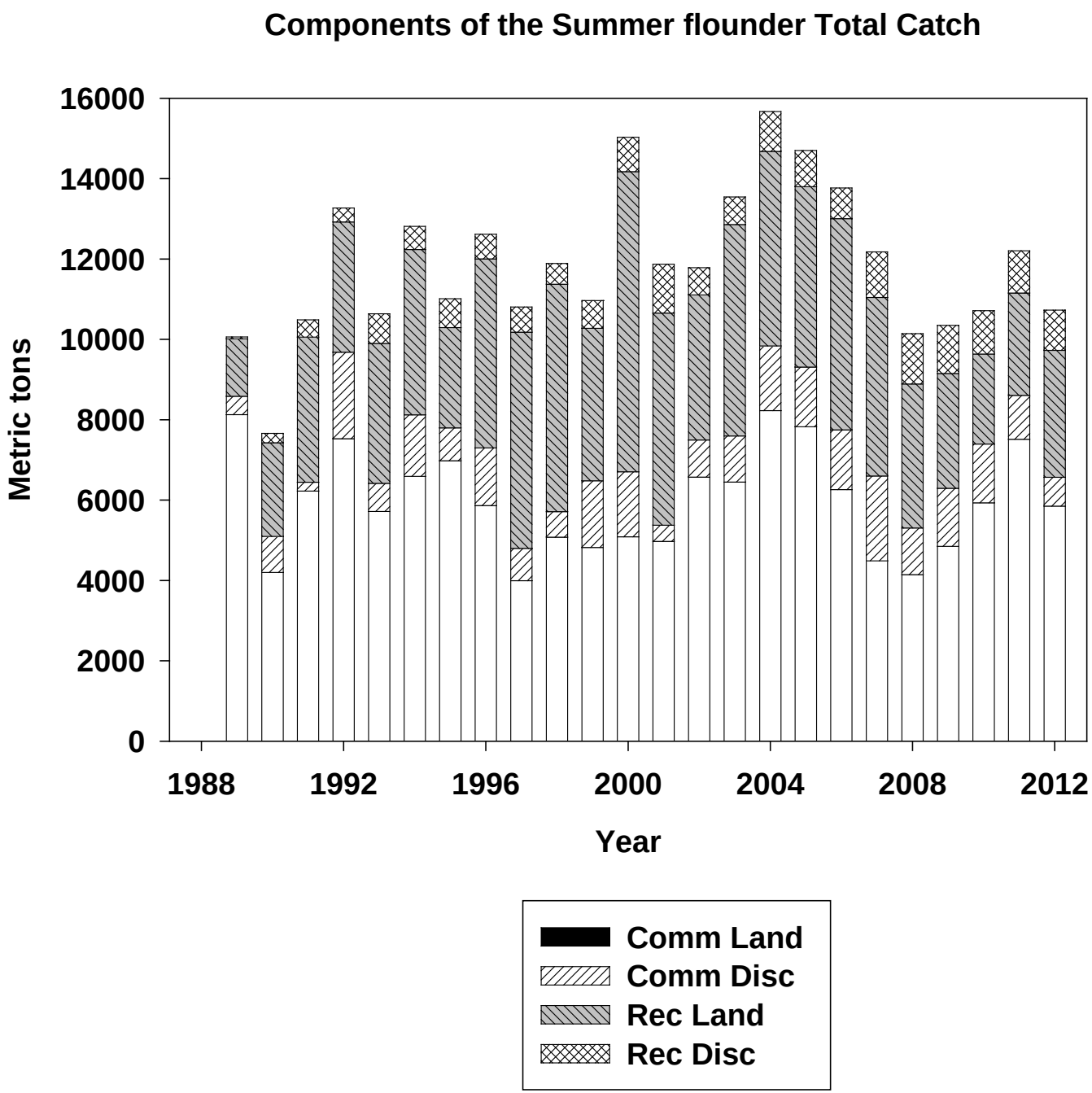
Summer flounder assessment

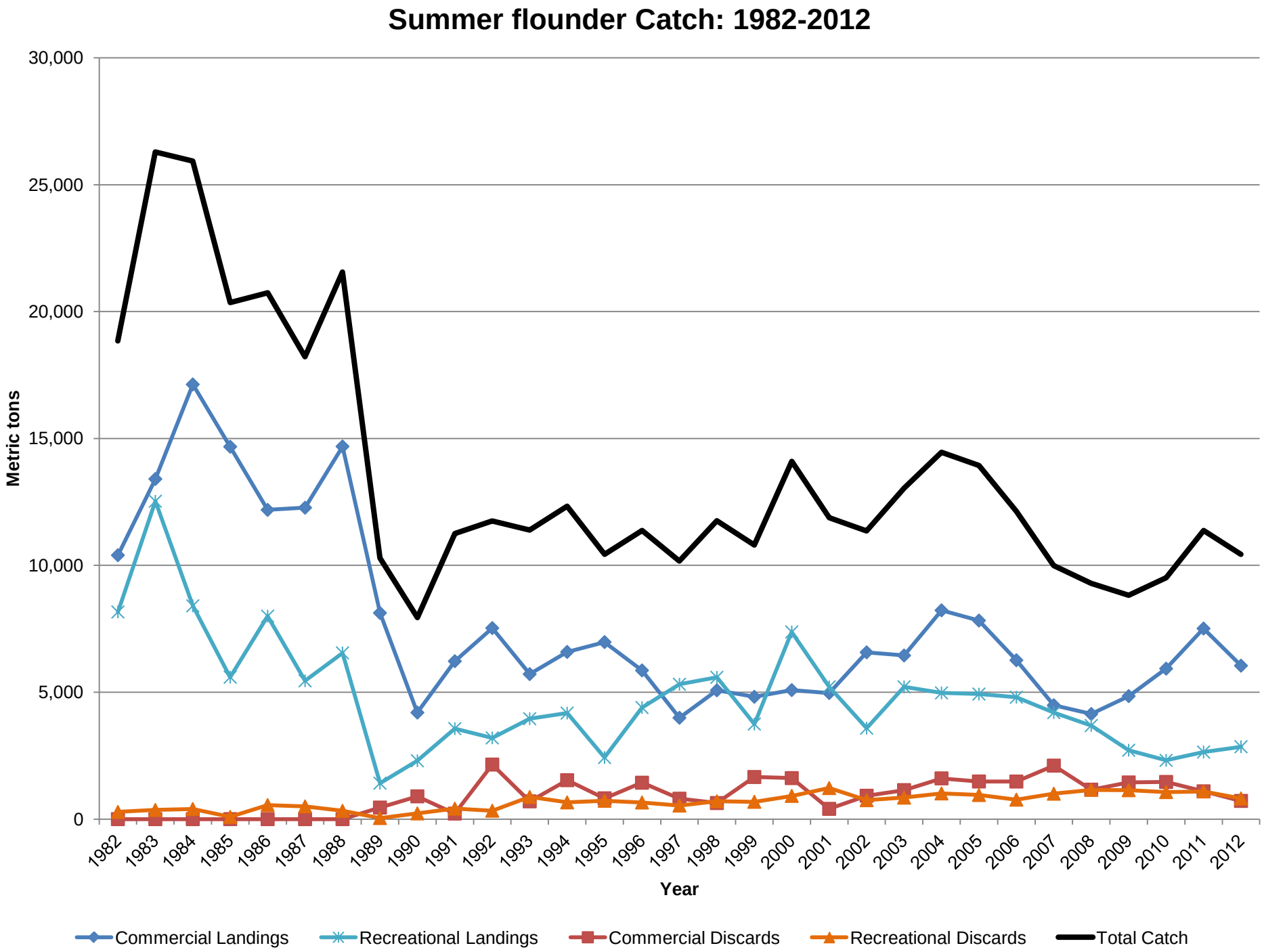
Managed as a unit stock from New England to North Carolina

Multiple assessment data components

Commercial trawl fishery landings and discards
Scallop dredge fishery landings and discards
Recreational rod and reel fishery landings and discards
Comm. landings ~50%; Comm. discards ~10%
Rec. landings ~35%; Rec. discards ~5%

NEFSC seasonal trawl surveys
NEFSC larval surveys
State agency trawl surveys
Academic institution trawl surveys


Components of the Summer flounder Total Catch
Metric tons
16000
14000
12000
10000
8000
6000
4000
2000
0
1988
1992
1996
2000
2004
2008
2012
Year
Comm Land
Comm Disc
Rec Land
Rec Disc


Summer flounder Catch: 1982-2012
30,000
25,000
20,000
15,000
10,000
5,000
0
Metric tons
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Year
Commercial Landings
Recreational Landings
Commercial Discards
Recreational Discards
Total Catch

NOAA
FISHERIES
SERVICE

Summer flounder assessment

Commercial Landings: mixed trawl fishery, minor dredge landings

- **NER Dealer Reports for Landings**
- **NER Vessel Trip Reports (VTRs) for area and effort**
- **NER Port Agent sampling for lengths and ages**
- **NCDMF biological data and estimates at age for NC landings**

Commercial Discards: fish trawl and scallop dredge

- **NEFOP: discard rates and biological samples**
- **SBRM: to estimate discards**
- **Cornell Marine Program studies: discard mortality rate (80%)**

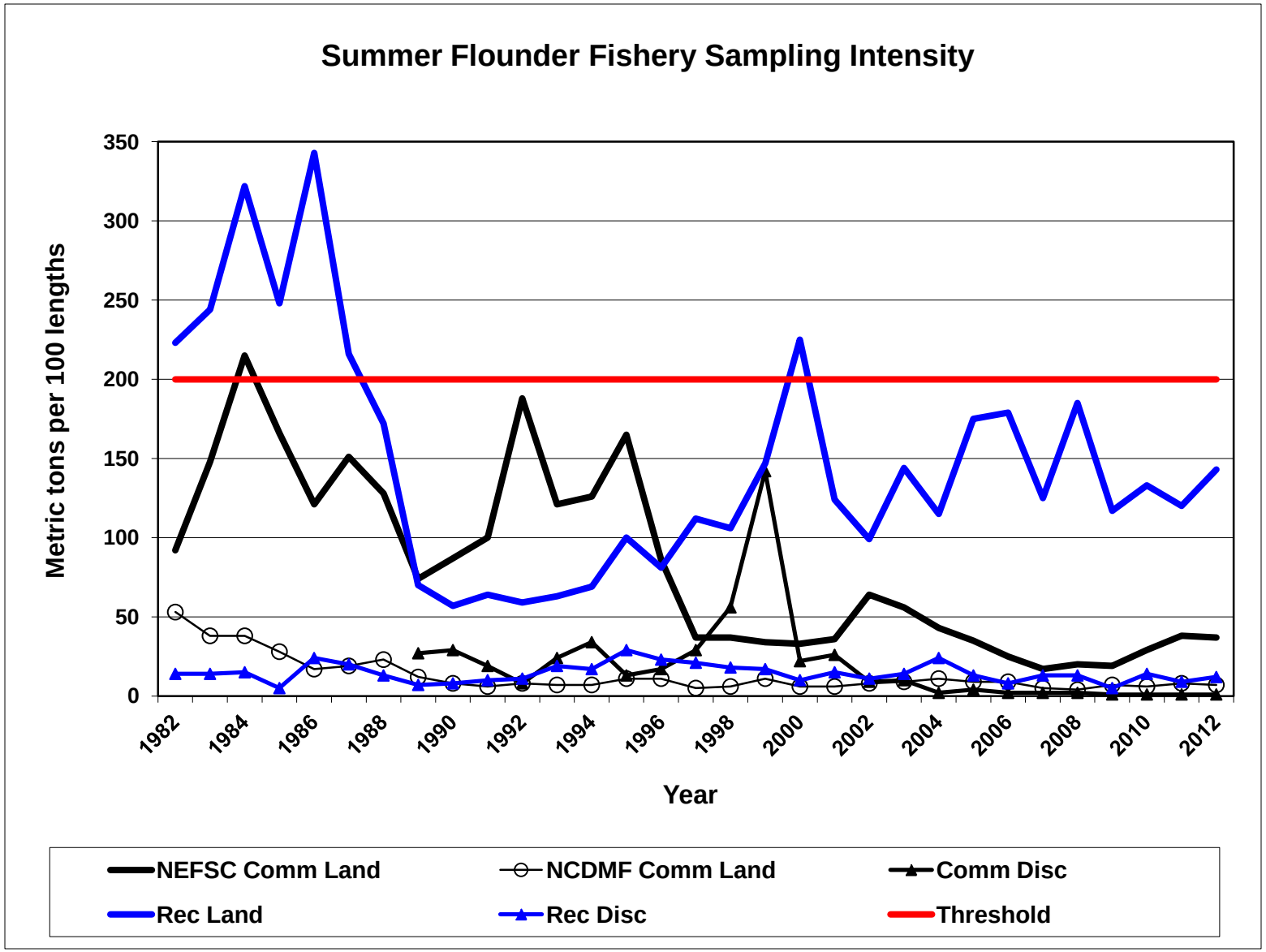
NOAA
FISHERIES
SERVICE

Summer flounder assessment

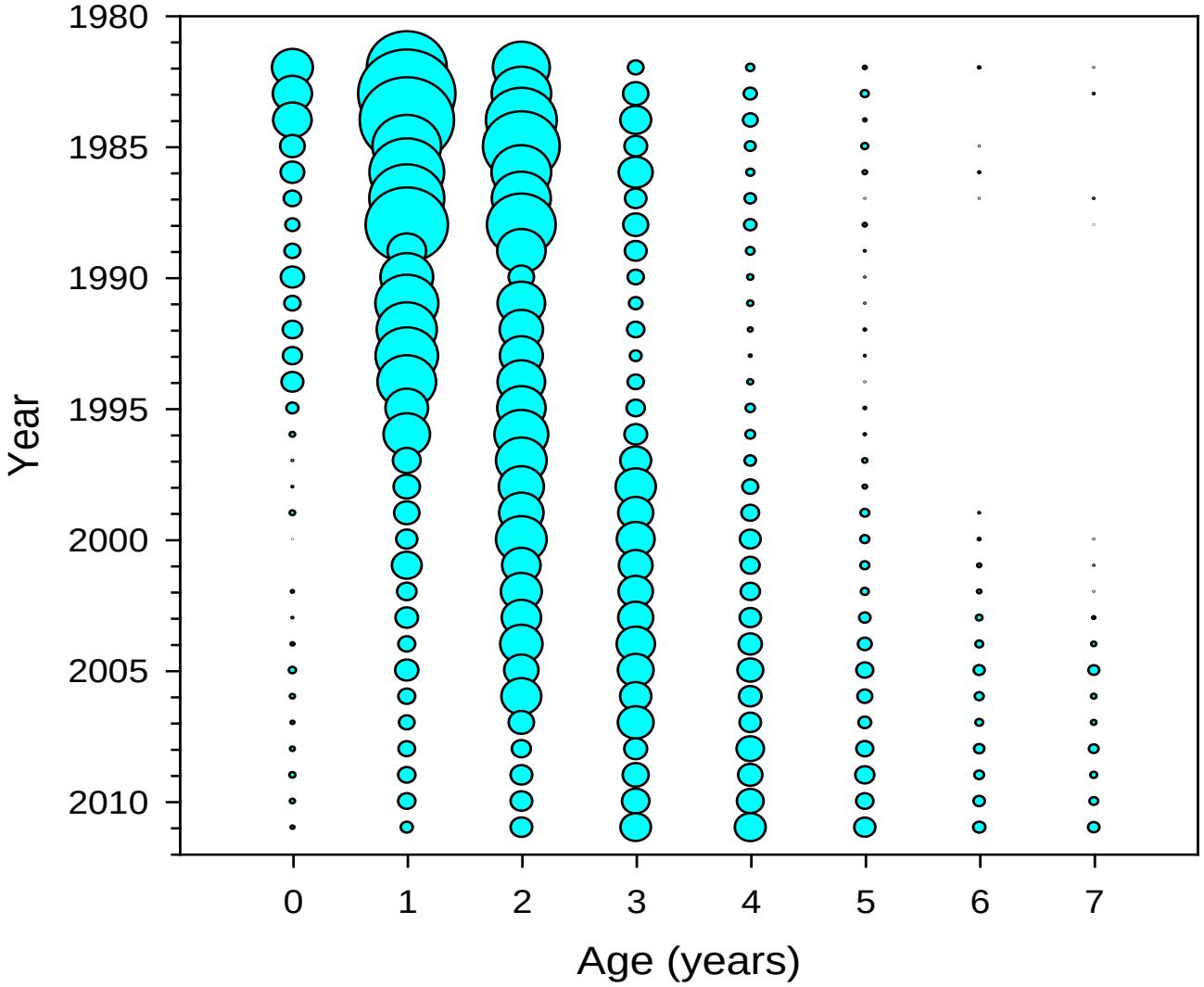
Recreational Landings and Discards

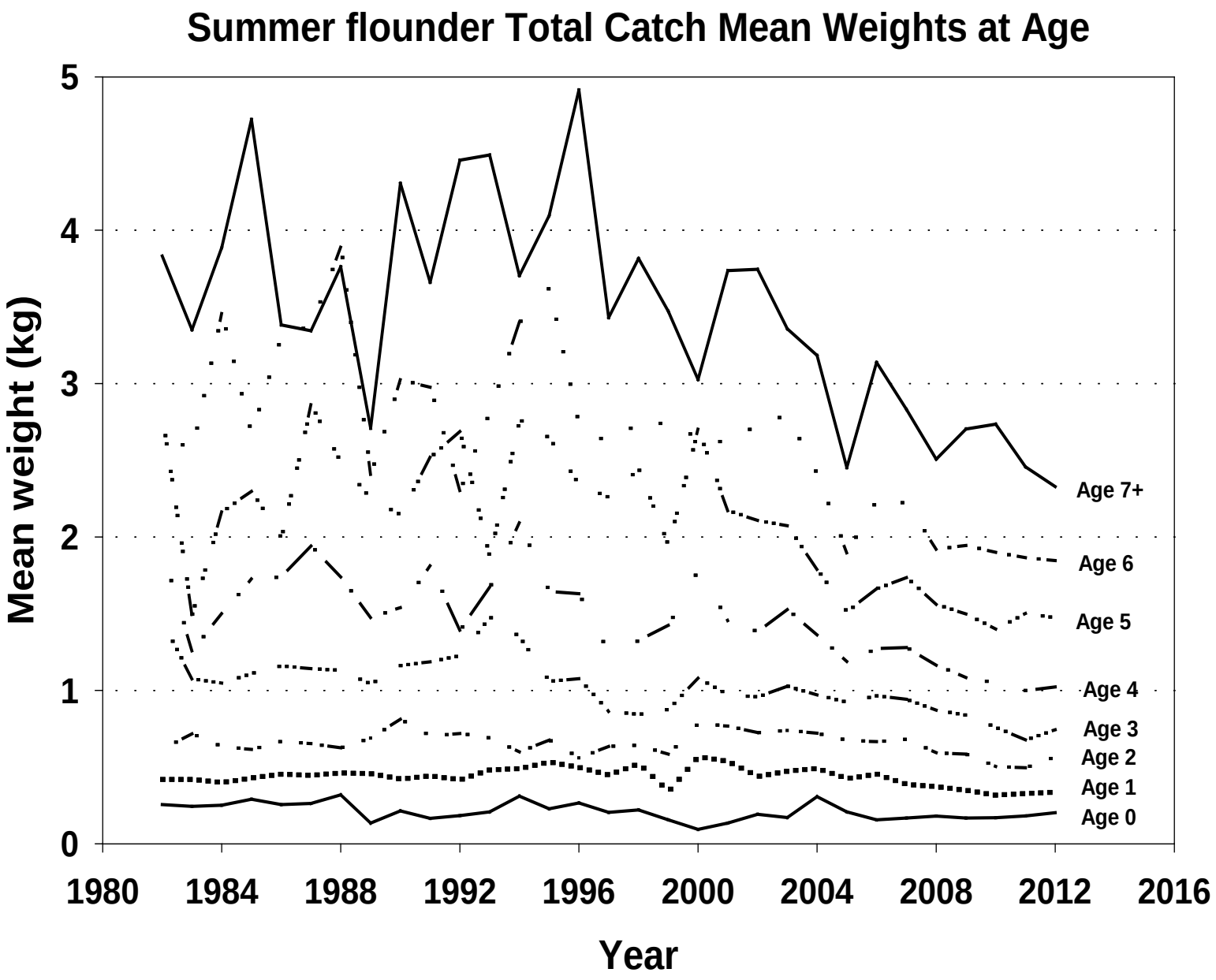
- **MRFSS/MRIP estimates for Landings and Discards**
- **MRFSS/MRIP intercepts, State agency Volunteer Angler Surveys and American Littoral Society angler reports for landed and discarded lengths (aged with NEFSC SV ALKs)**

Three 1999 studies: discard mortality rate (10%)


Summer Flounder Fishery Sampling Intensity
Metric tons per 100 lengths
350
300
250
200
150
100
50
0
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year
NEFSC Comm Land
NCDMF Comm Land
Comm Disc
Rec Land
Rec Disc
Threshold

Summer flounder Total Fishery Catch at Age




Summer flounder Total Catch Mean Weights at Age
Mean weight (kg)
0
1
2
3
4
5
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
Year
Age 7+
Age 6
Age 5
Age 4
Age 3
Age 2
Age 1
Age 0

NOAA
FISHERIES
SERVICE

Summer flounder assessment

Research survey data are used extensively in the summer flounder stock assessment population model

3 NEFSC seasonal trawl survey series with full age compositions

2 NEFSC larval survey series (MARMAP and ECOMON) providing aggregate stock indices

12 State/Academic trawl survey series with full age compositions

1 Academic trawl survey series providing an aggregate stock index

4 Stand-alone surveys of recruitment (age 0/YOY only)

NOAA
FISHERIES
SERVICE

Summer flounder assessment

With ages:

MADMF Spring and Fall 1978-2012

RIDFW Fall 1981-2012

RIDFW Monthly Fixed Station 1990-2012

CTDEP Spring and Fall 1984-2012

NJDFW Apr-Oct 1988-2012

DEDFW 30 ft Bay Mainstem 2003-2012

NYDEC Peconic Bay 1987-2012

VIMS ChesMMAP 2002-2012

VIMS NEAMAP Fall and Spring 2007/08-2012

Aggregate:

URI GSO Narragansett Bay-RI Sound, RI 1959-2012

NOAA
FISHERIES
SERVICE

Summer flounder assessment

Stand-alone recruitment indices (age 0, Young-of-the Year)

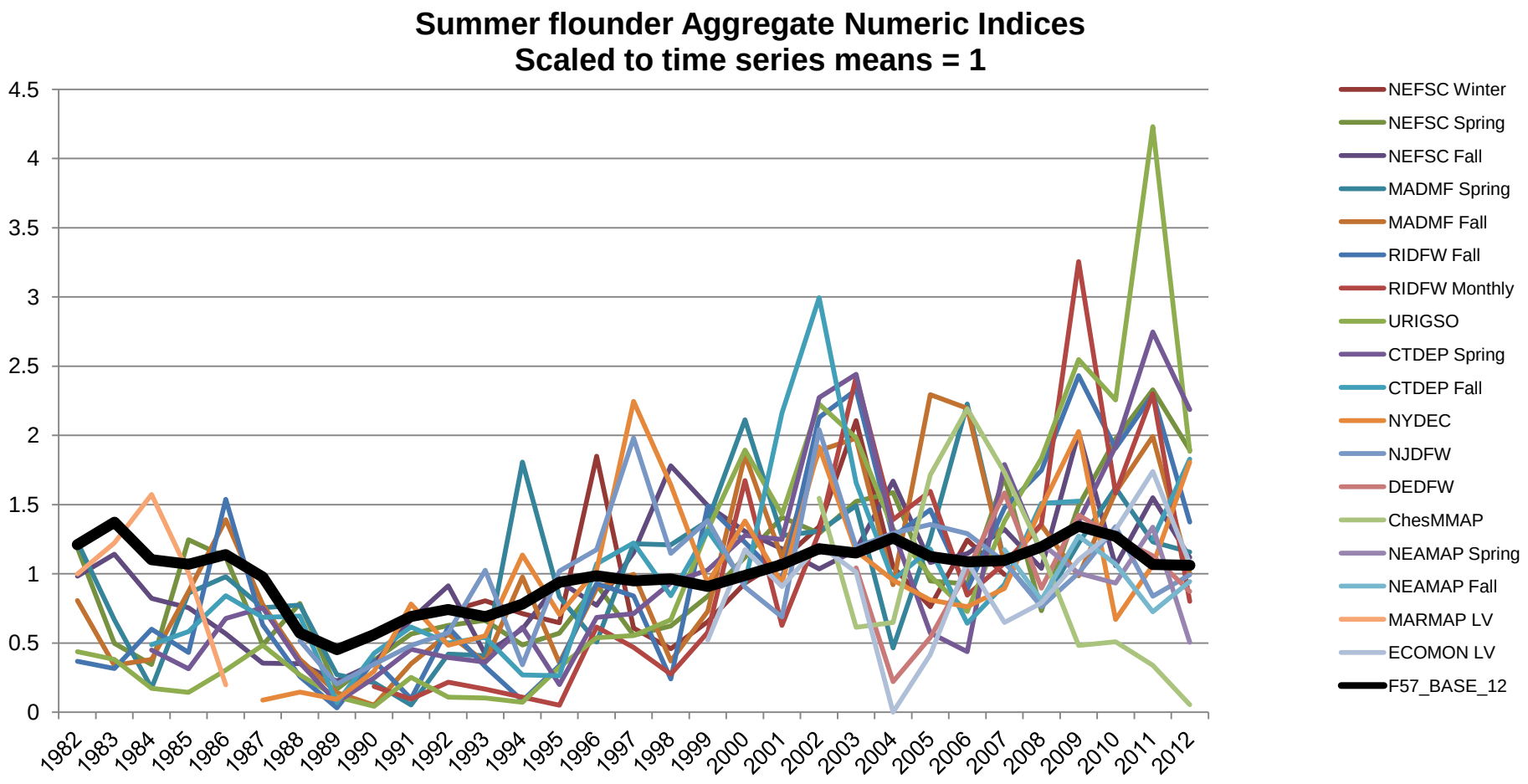
MADMF Seine 1982-2012

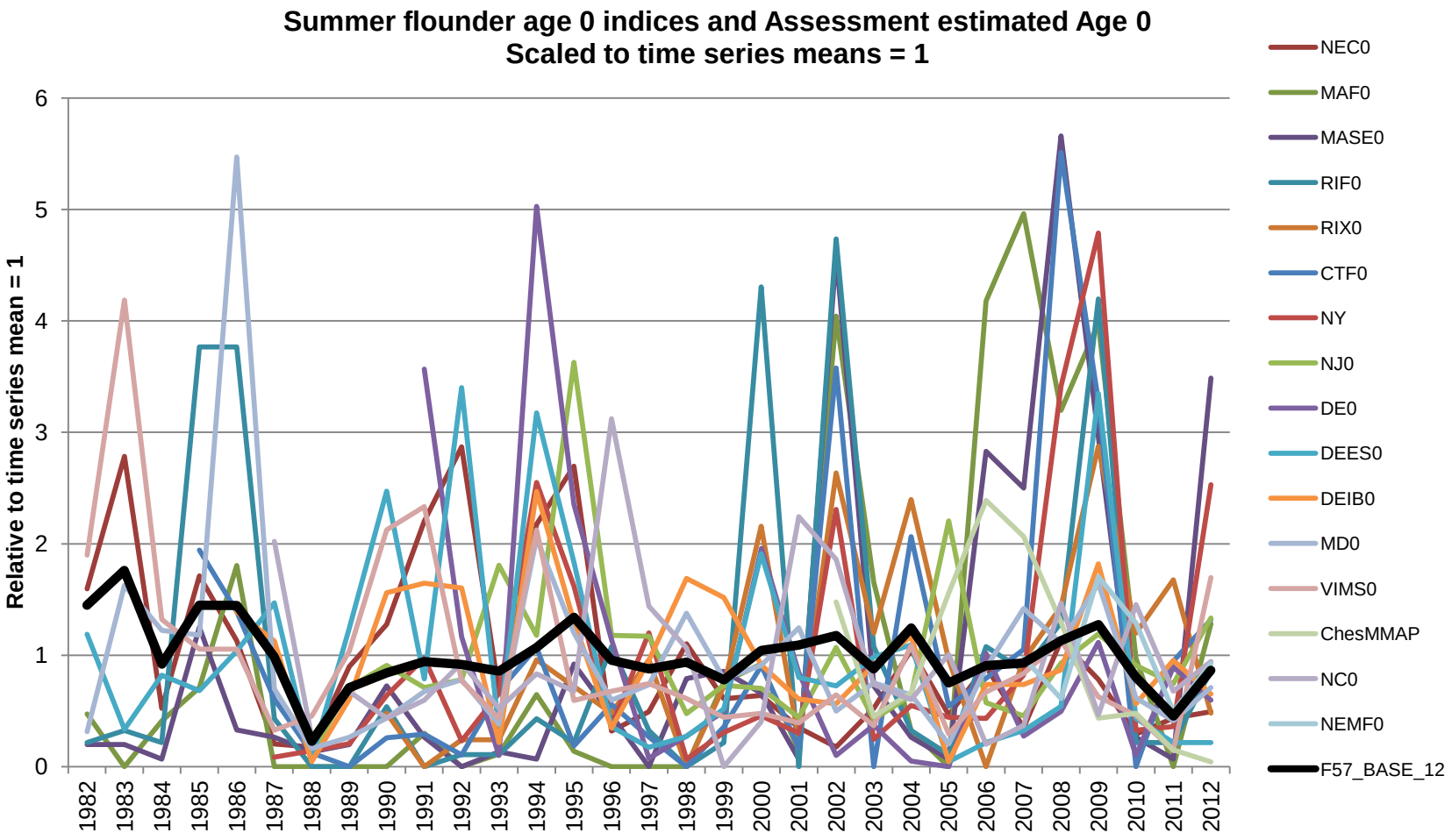
DEDFW 16 ft Estuary 1980-2012

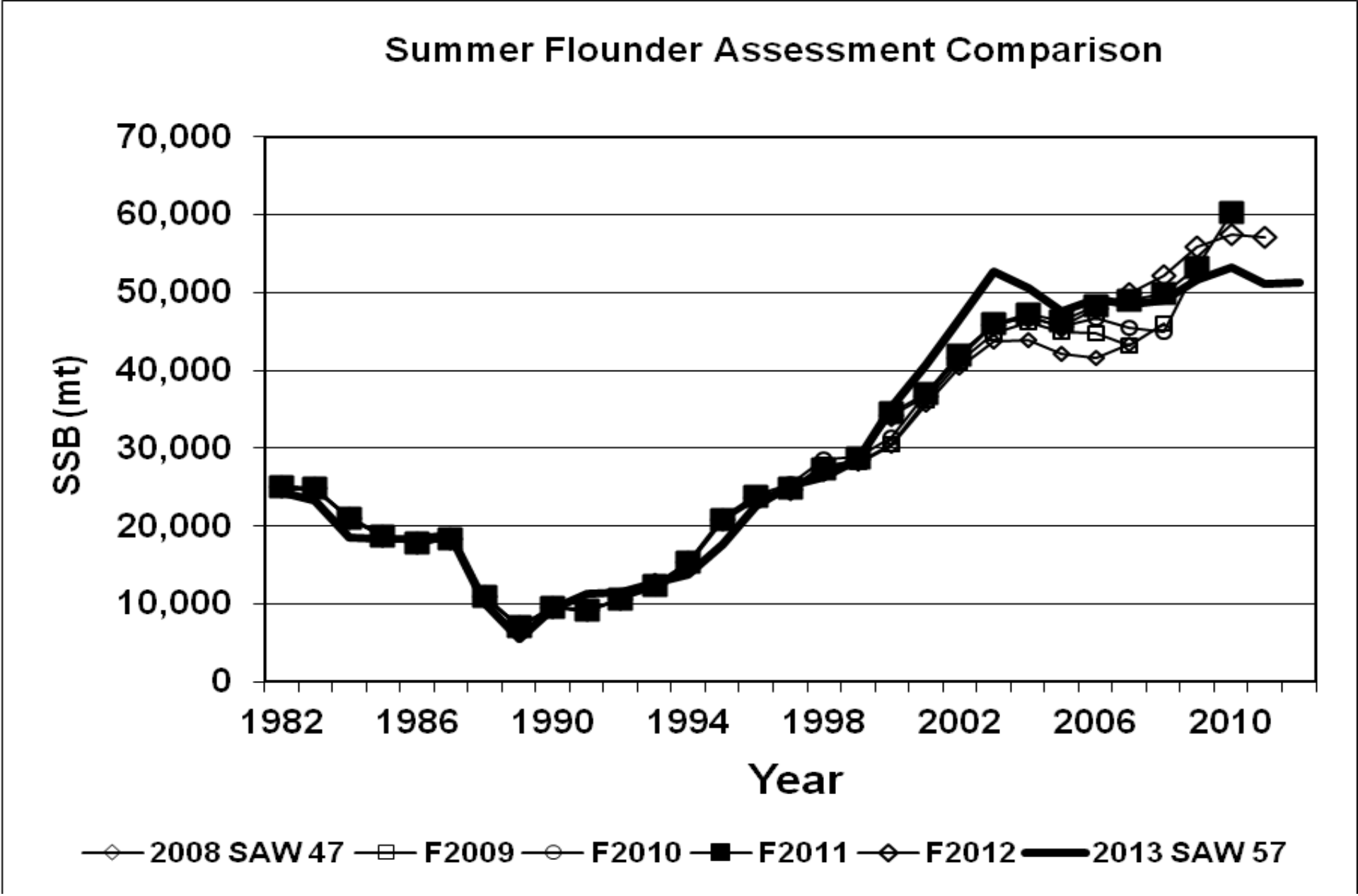
DEDFW 16 ft Inland Bays 1986-2012

MDDNR 1972-2012

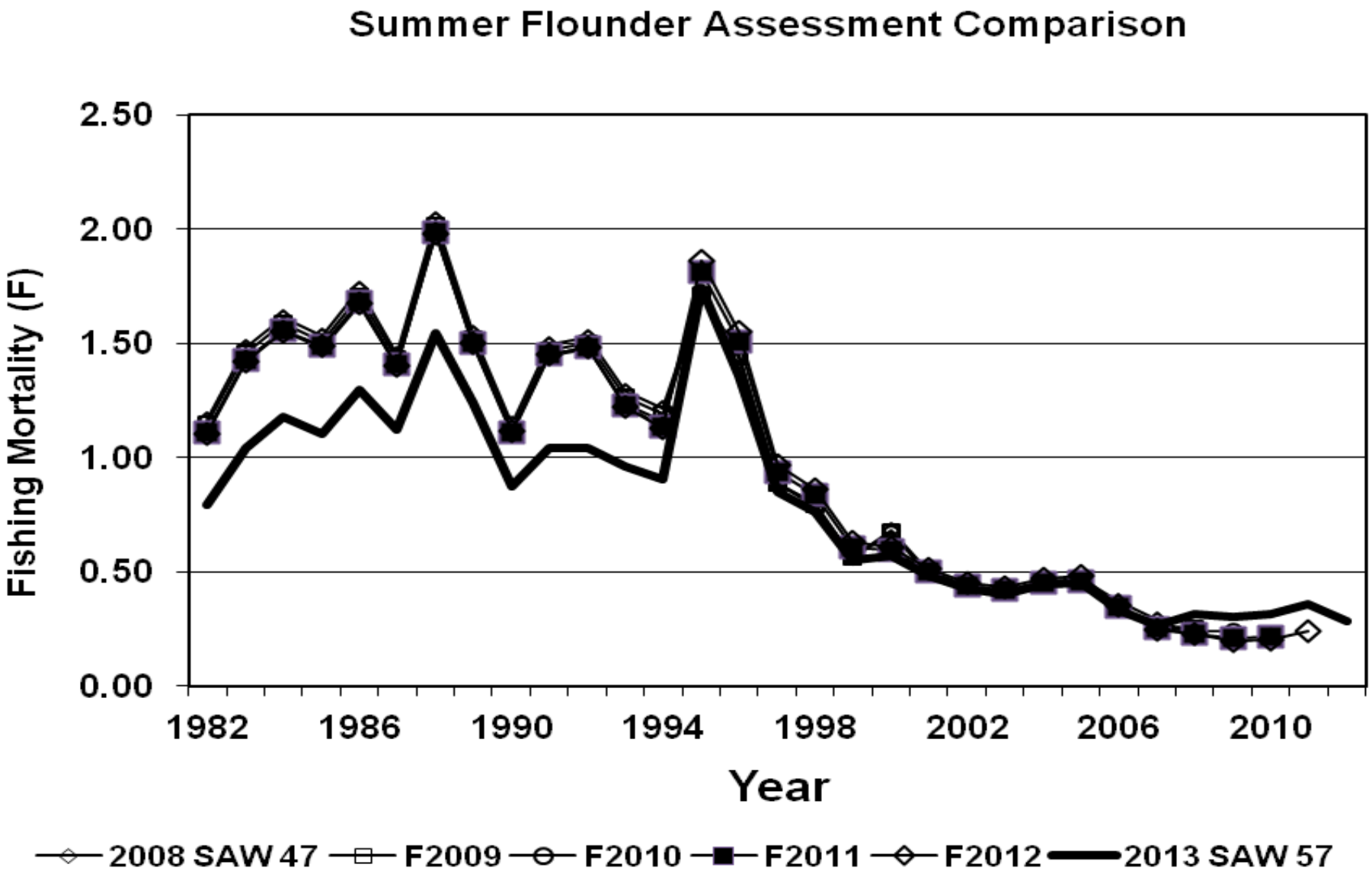
VIMS Juv. Trawl 1955-2012


Summer flounder Aggregate Numeric Indices
Scaled to time series means = 1
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
NEFSC Winter
NEFSC Spring
NEFSC Fall
MADMF Spring
MADMF Fall
RIDFW Fall
RIDFW Monthly
URIGSO
CTDEP Spring
CTDEP Fall
NYDEC
NJDFW
DEDFW
ChesMMAP
NEAMAP Spring
NEAMAP Fall
MARMAP LV
ECOMON LV
F57_BASE_12


Summer flounder age 0 indices and Assessment estimated Age 0
Scaled to time series means = 1
Relative to time series mean = 1
0
1
2
3
4
5
6
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
NEC0
MAF0
MASE0
RIF0
RIX0
CTF0
NY
NJ0
DE0
DEES0
DEIB0
MD0
VIMS0
ChesMMAP
NC0
NEMF0
F57_BASE_12



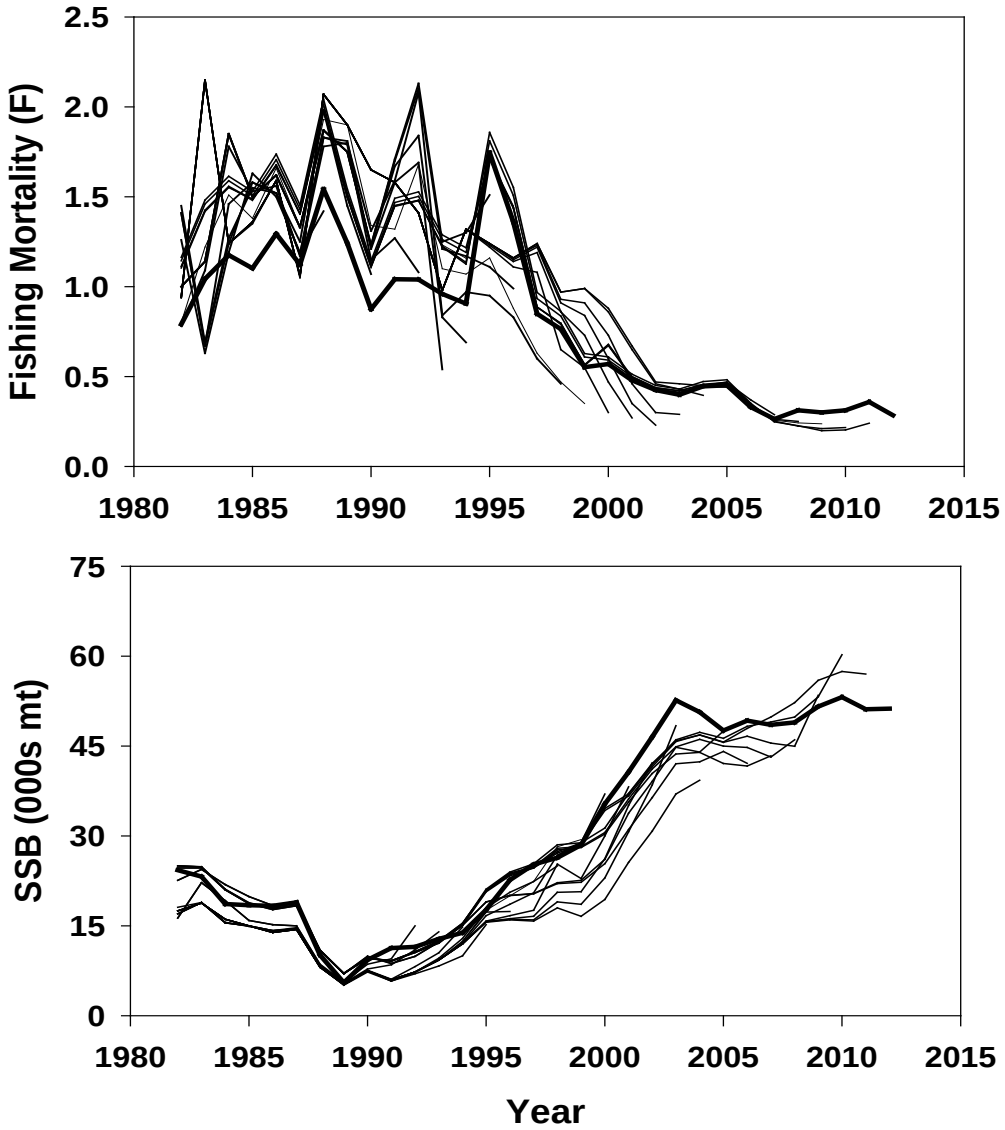
Major changes for 2013: revised comm. discards, new SVs



Major changes for 2013: revised comm. discards, new SVs

Note 2008-2012 for reported for ages 3+, 2013 for age 4

Summer Flounder Historical Retrospective
1990-2013 Stock Assessments



NOAA
FISHERIES
SERVICE

Summer flounder assessment

Strengths

NER Commercial and MRIP Recreational data and estimates for summer flounder are comprehensive and precise (CVs 10-20%)

NER commercial and MRIP recreational fishery sampling is sufficient to provide a stable assessment with precise estimates of fishing mortality and stock size (2012 F and SSB CVs ~15%)

The multiple 'signals' from research surveys are in general consistent and sufficient to provide an assessment robust to the variation in individual surveys

NOAA
FISHERIES
SERVICE

Summer flounder assessment

Challenges

Data from both NER commercial and MRIP recreational programs are not 'complete and available' for the previous year until May 1-15 annually

For summer flounder increased MRIP landings sampling is needed to bring sampling intensity in-line with other sources

For summer flounder, catch not routinely sampled by sex (ID'd by SAW 57 as the next potentially major modeling advance)

Use of many research surveys can sometimes cause estimation problems, with inconsistent signals requiring subjective judgments about inclusion and/or weighting

NOAA
FISHERIES
SERVICE

Summer flounder assessment

Potential Solutions

Fishery Catch: earlier availability through better data processing efficiency

Catch and Assessment: define post-July as 'Assessment Season'

Surveys: Modeling approaches to integrate and standardize

Expansion of NEAMAP approach / philosophy

Common gear, sampling protocols

Calibration across state agency vessels