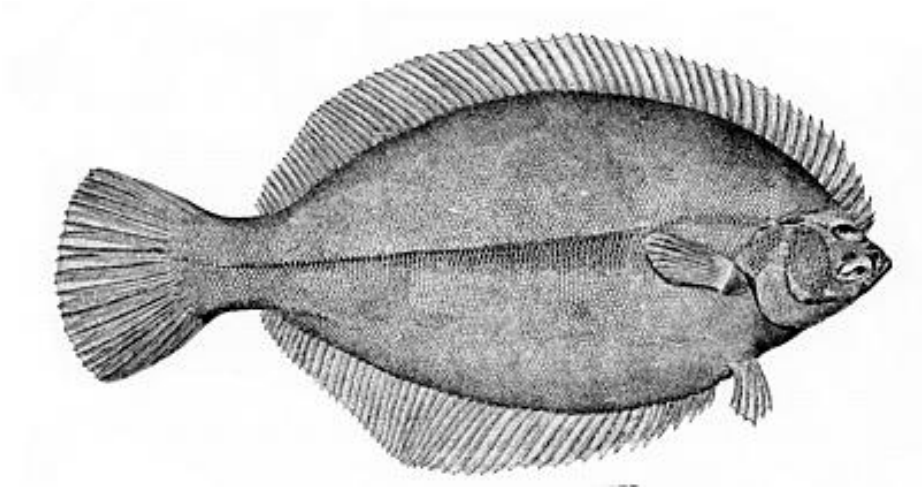
Multispecies Groundfish Updates Assessment Review Meeting

NOAA FISHERIES

NEFSC

Southern New England Winter Flounder

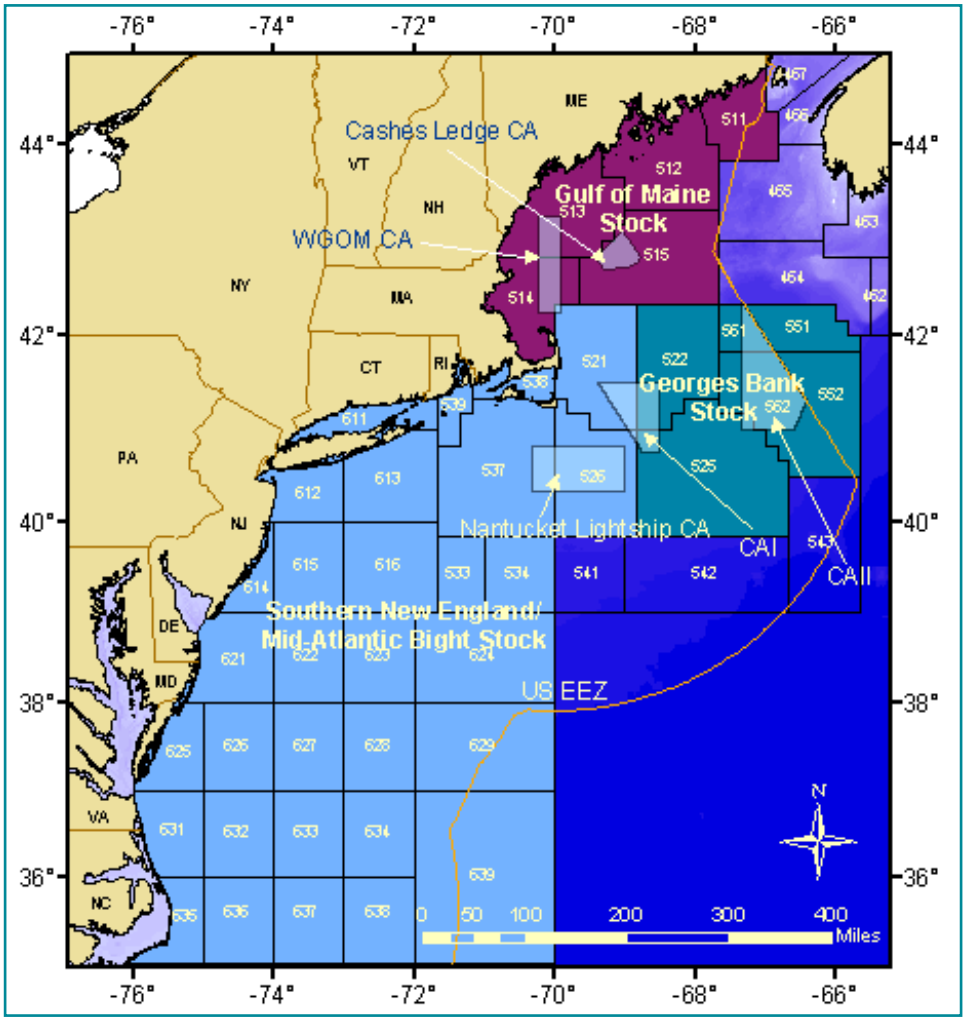
Pseudopleuronectes americanus



September 15th 2015

Southern New England Winter Flounder

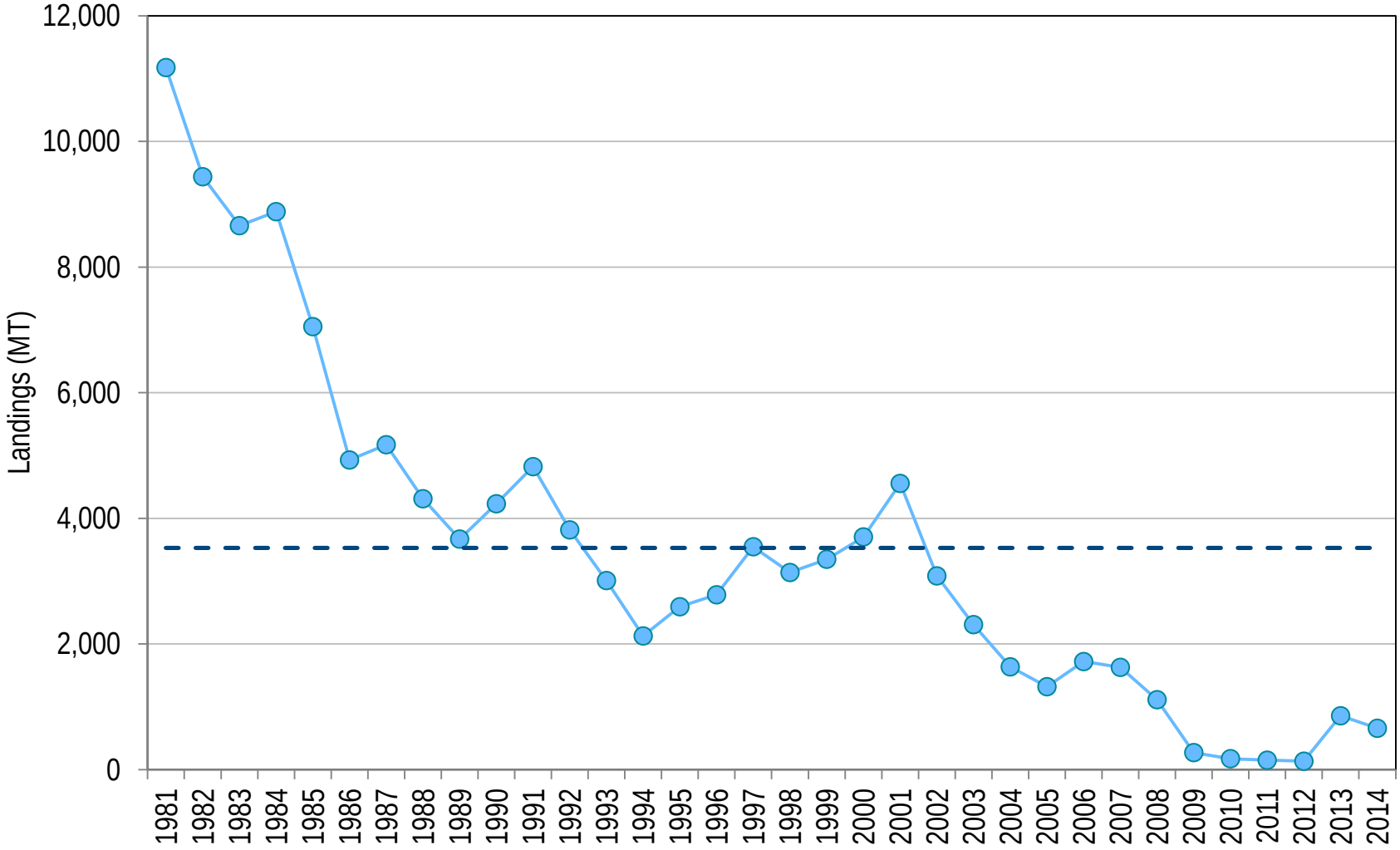
- Last assessment: SARC52 in 2011 (Lead: Mark Terceiro)
- Statistical catch-at-age model: ASAP ages 1-7+, years 1981-2014
- Stock status from SARC52: overfished, overfishing not occurring



Fishery Dependent: 1981-2014 ages 1-7+

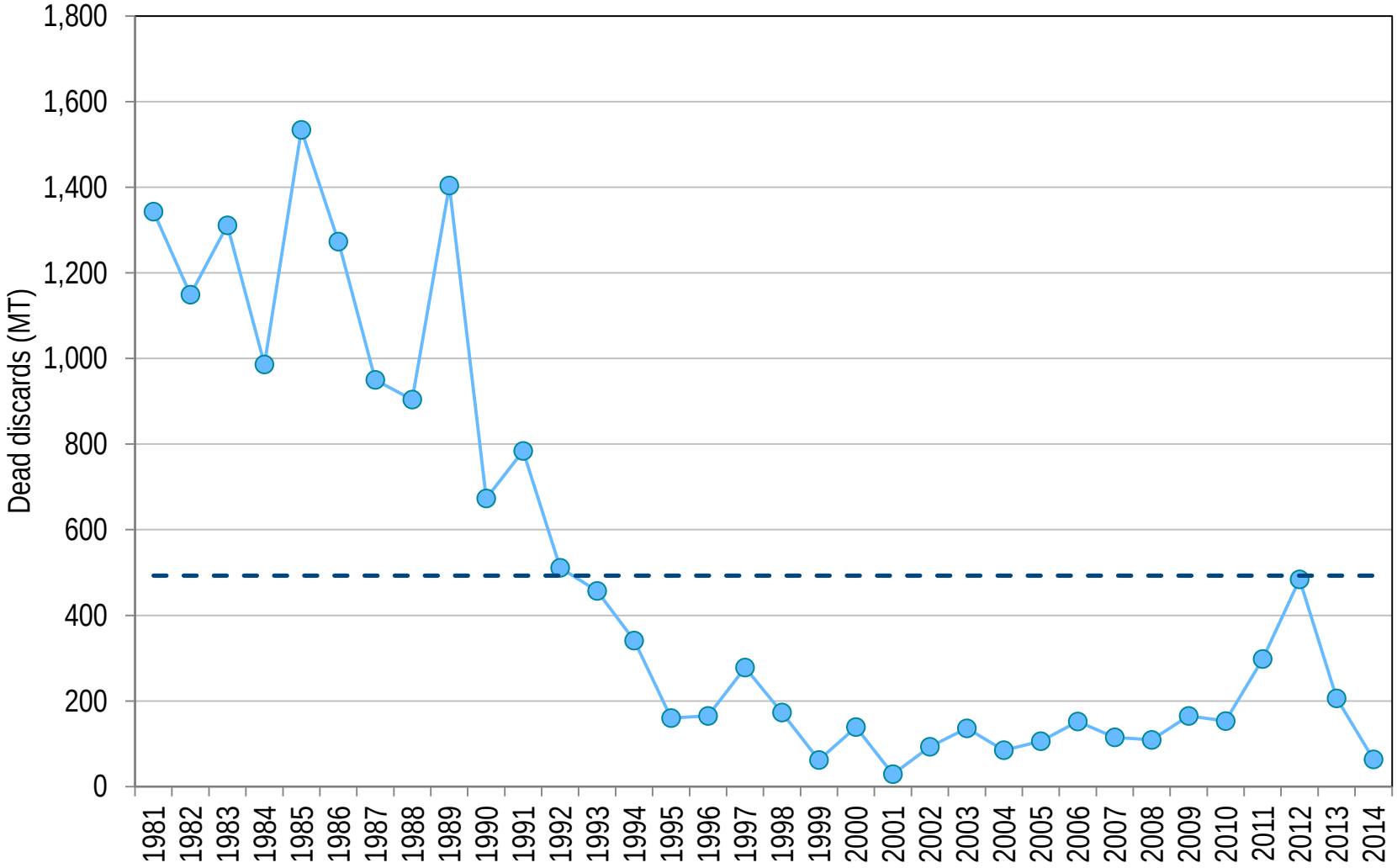
- Commercial Landings: AA Tables, market category by quarter or half year
- Commercial Discards: SBRM
- Recreational Landings: MRIP (A+B1)
- Recreational Discards: MRIP (B2)

SNEMA WFL Commercial Landings 1981-2014



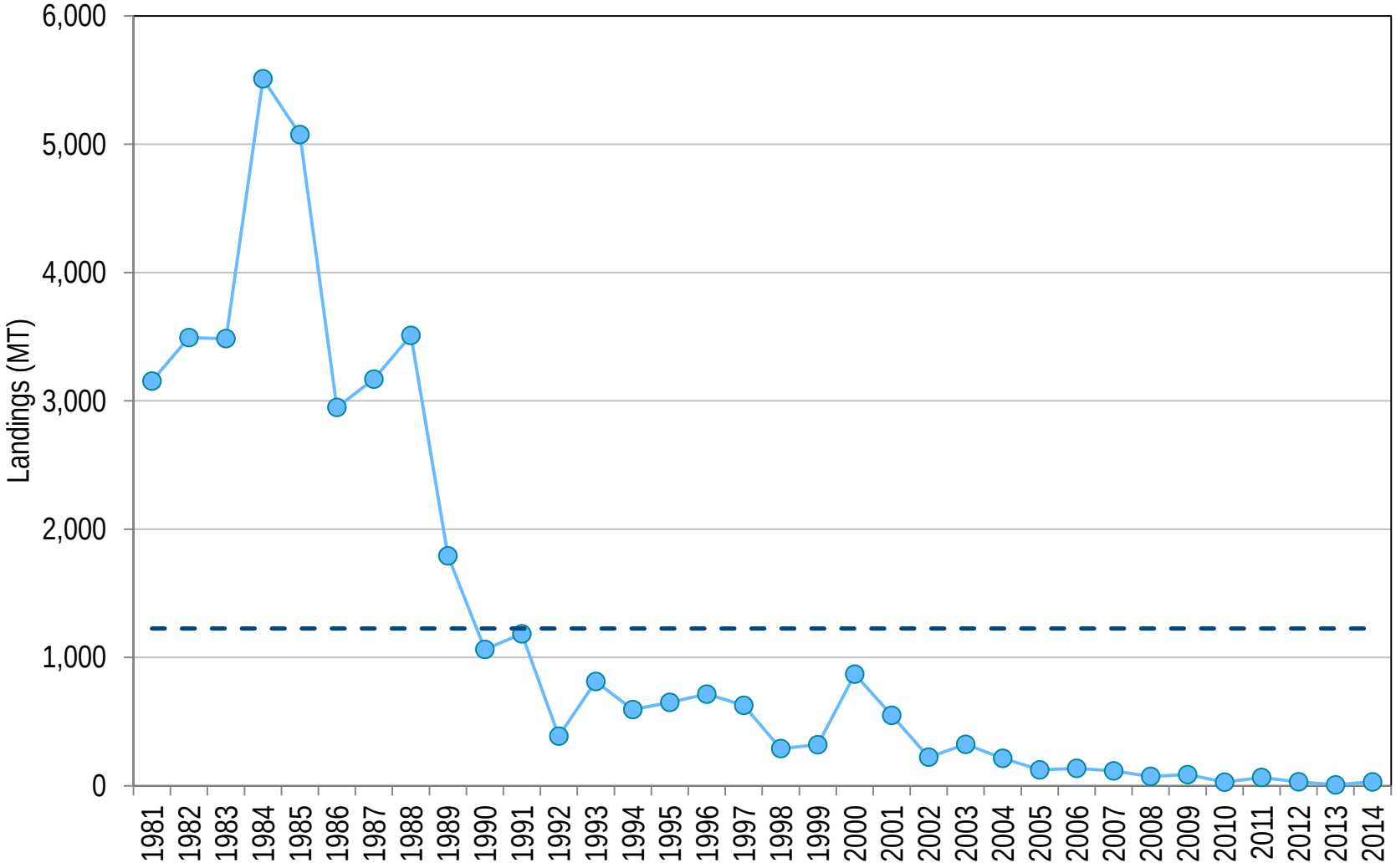
- 2014 landings were 658 MT, time-series average = 3,530 MT

SNEMA WFL Commercial Discards (50% mortality) 1981-2014



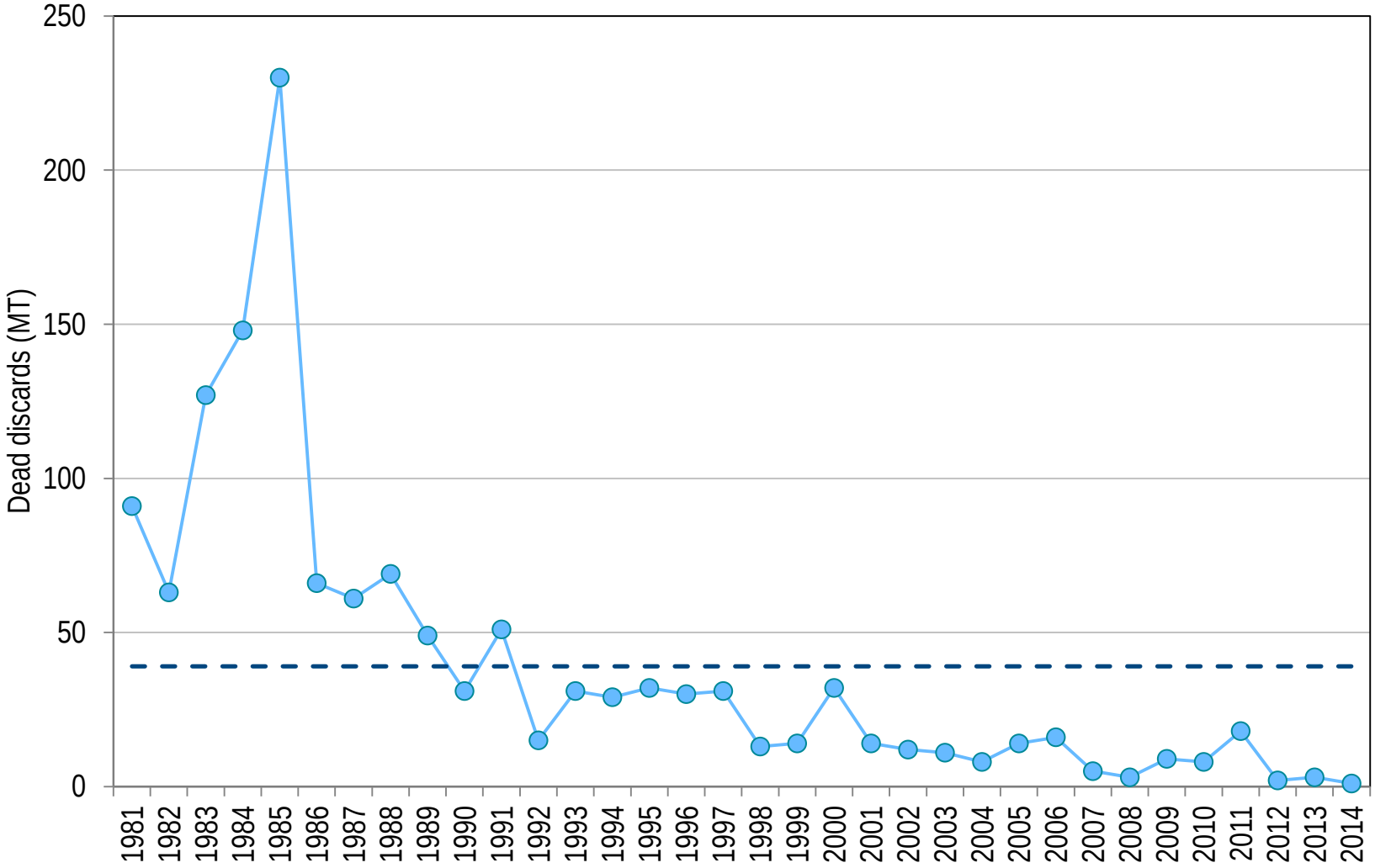
- 2014 discard loss was 64 MT, time-series average = 493 MT

SNEMA WFL Recreational Landings 1981-2014



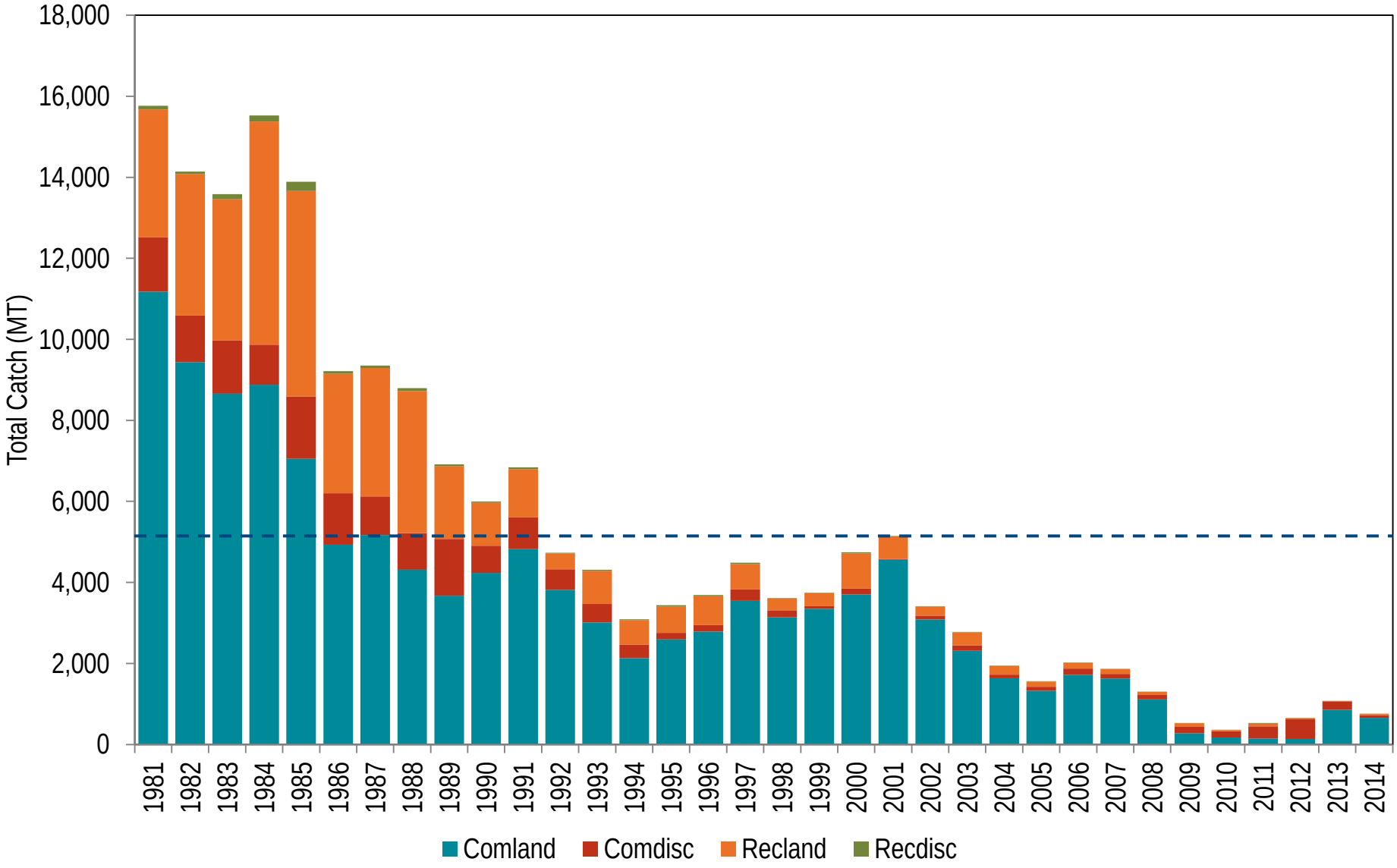
- 2014 recreational landings were 38 MT, time-series average = 2,785 MT

SNEMA WFL Recreational Discards (15% mortality) 1981-2014

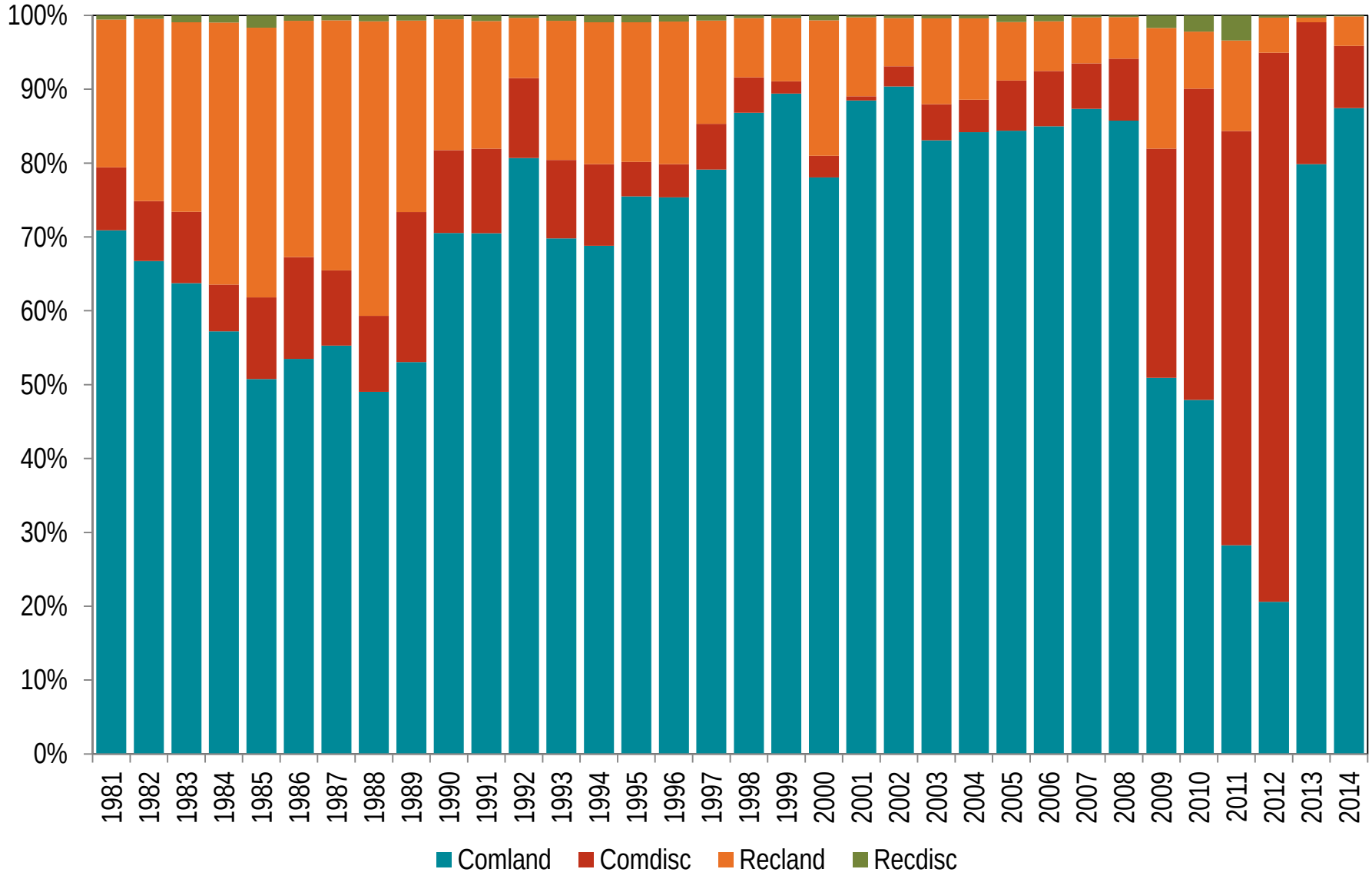


- 2014 recreational discard loss was 3 MT, time-series average = 171 MT

SNEMA WFL Total catch components 1981-2014



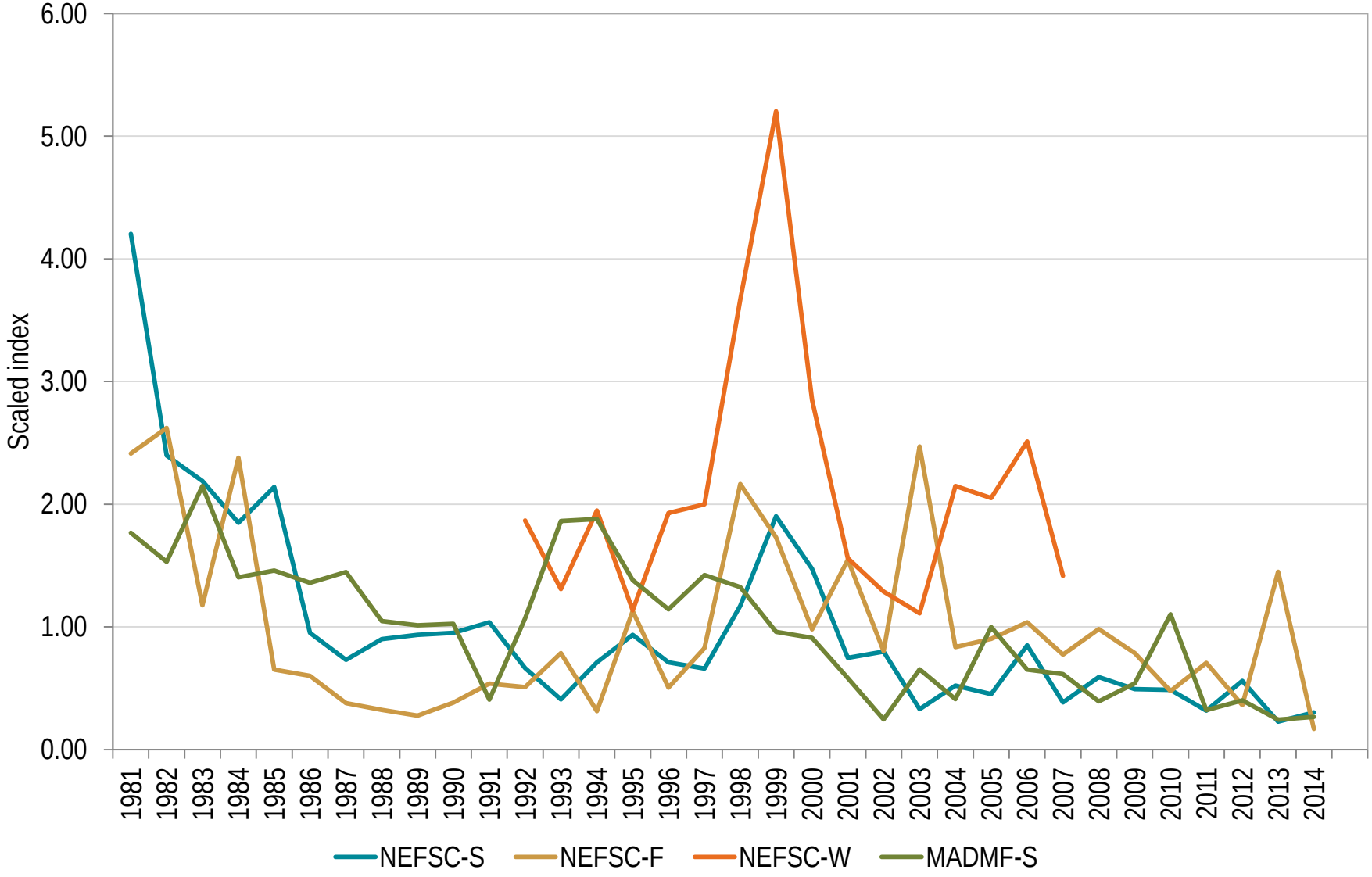
SNEMA WFL Total catch components 1981-2014



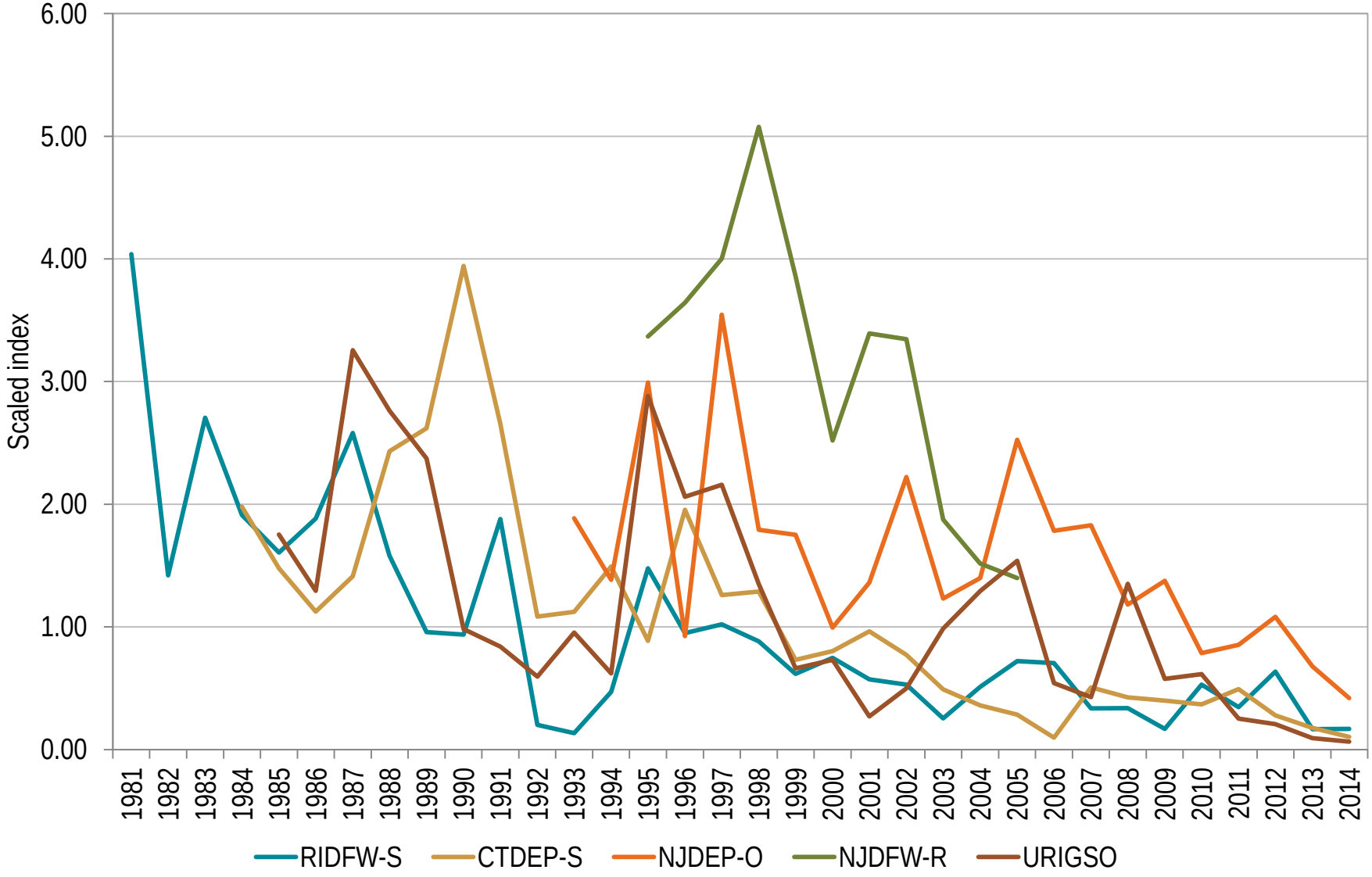
Fishery Independent: 1981-2014 ages 0-7+

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

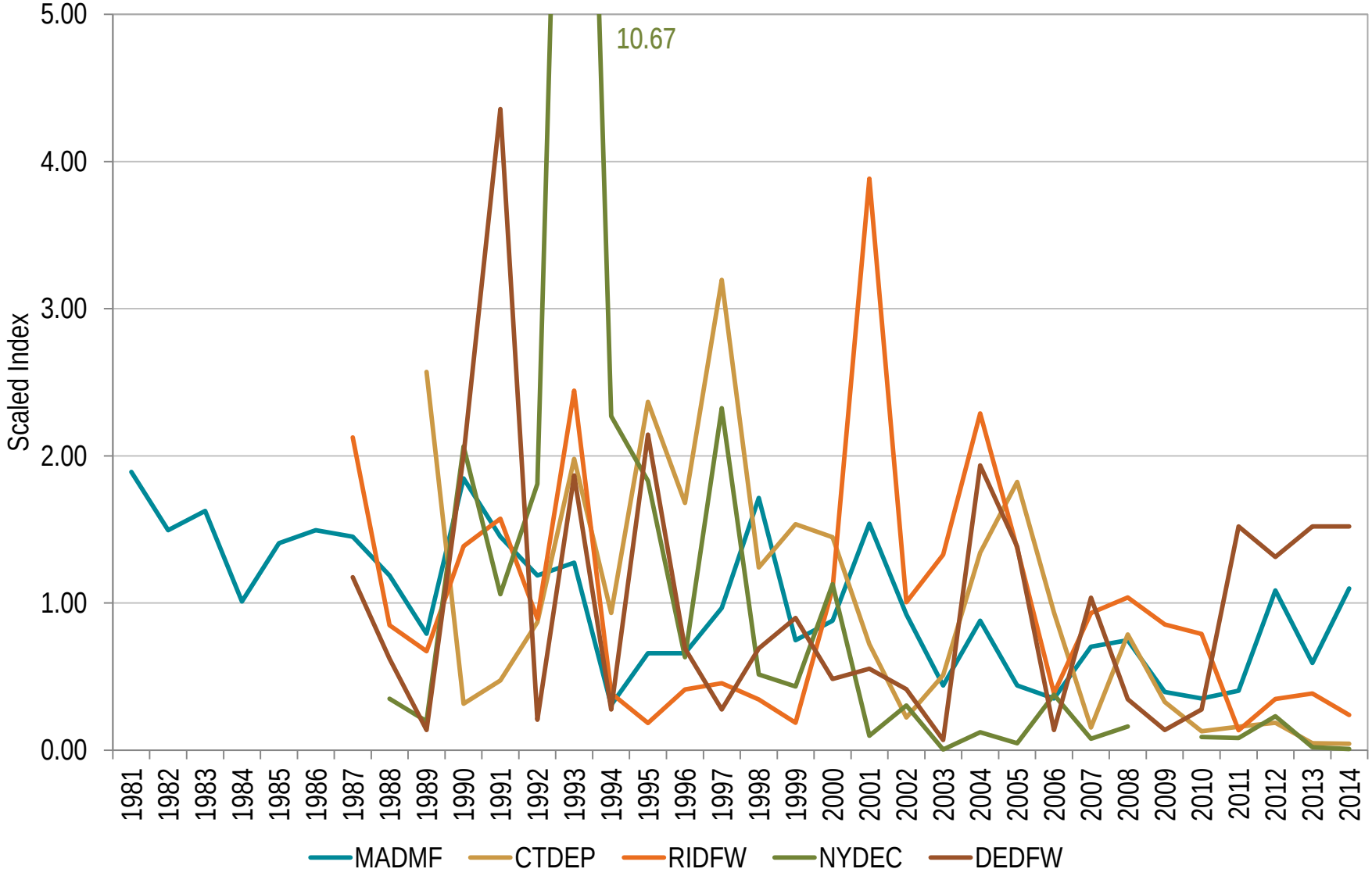
NEFSC BTS and MADMF Spring survey indices



State survey indices



State Age 0 survey indices



Biology

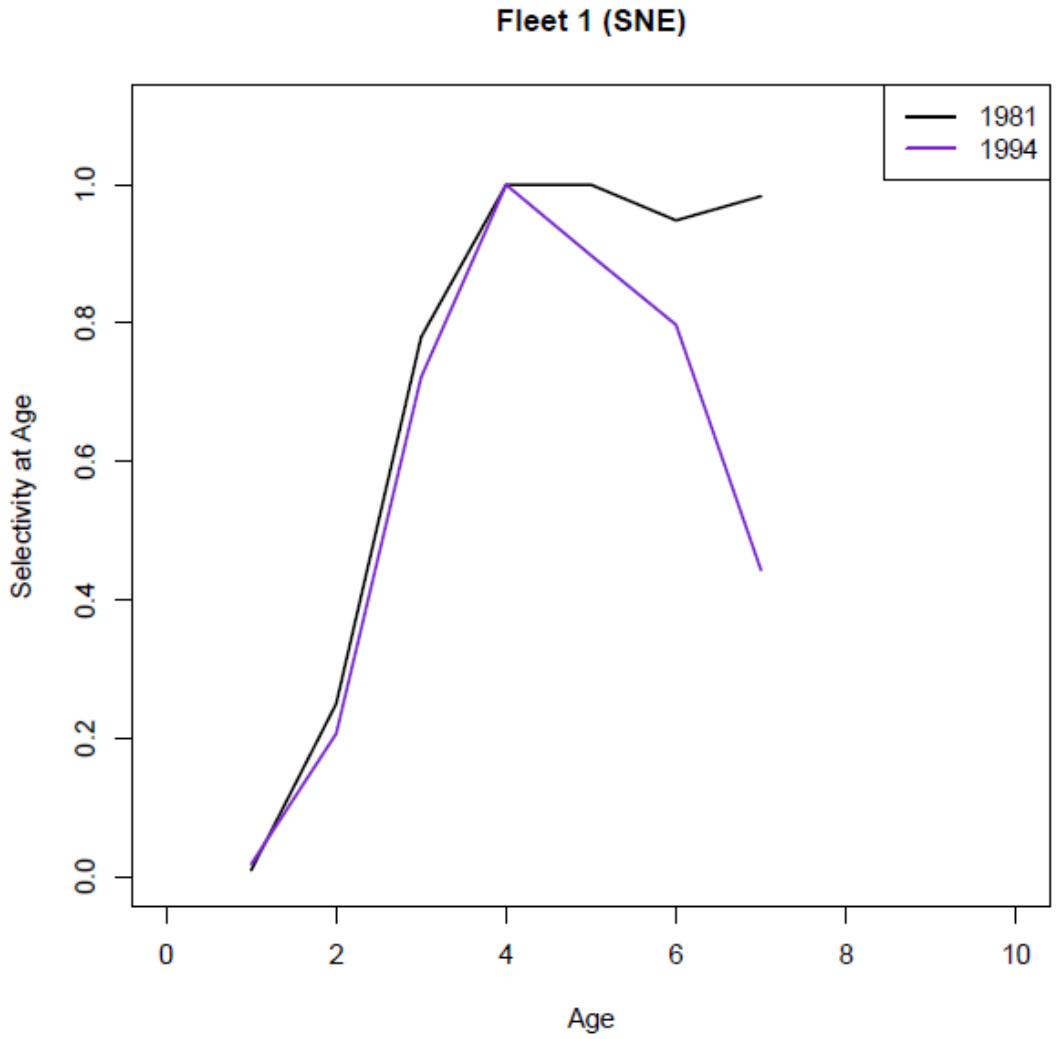
- M = 0.3
- Maturity: MADMF Spring survey data provide maturity information
  - Data from 1982-2008 used in SAW52
  - Age 1: 0%, Age 2: 8%, Age 3: 56%, Age 4: 95%

  Age 5+: 100%
- These input values were retained for the 2015 operational assessment

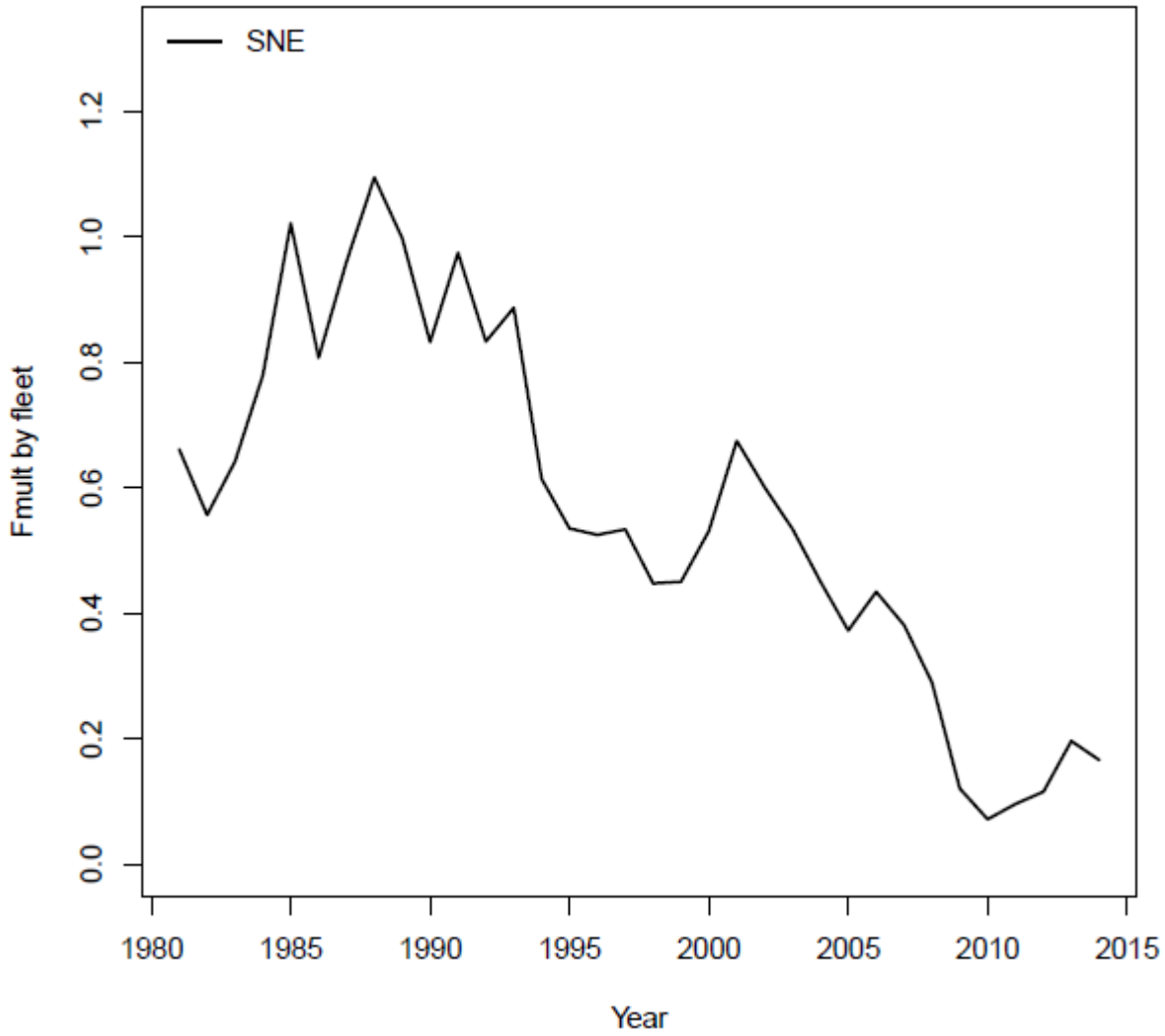
Final Model Configuration

- 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
- No S-R fit in model
- Penalties on Fmult in Year1, Fmult Devs, q devs, Nyear1

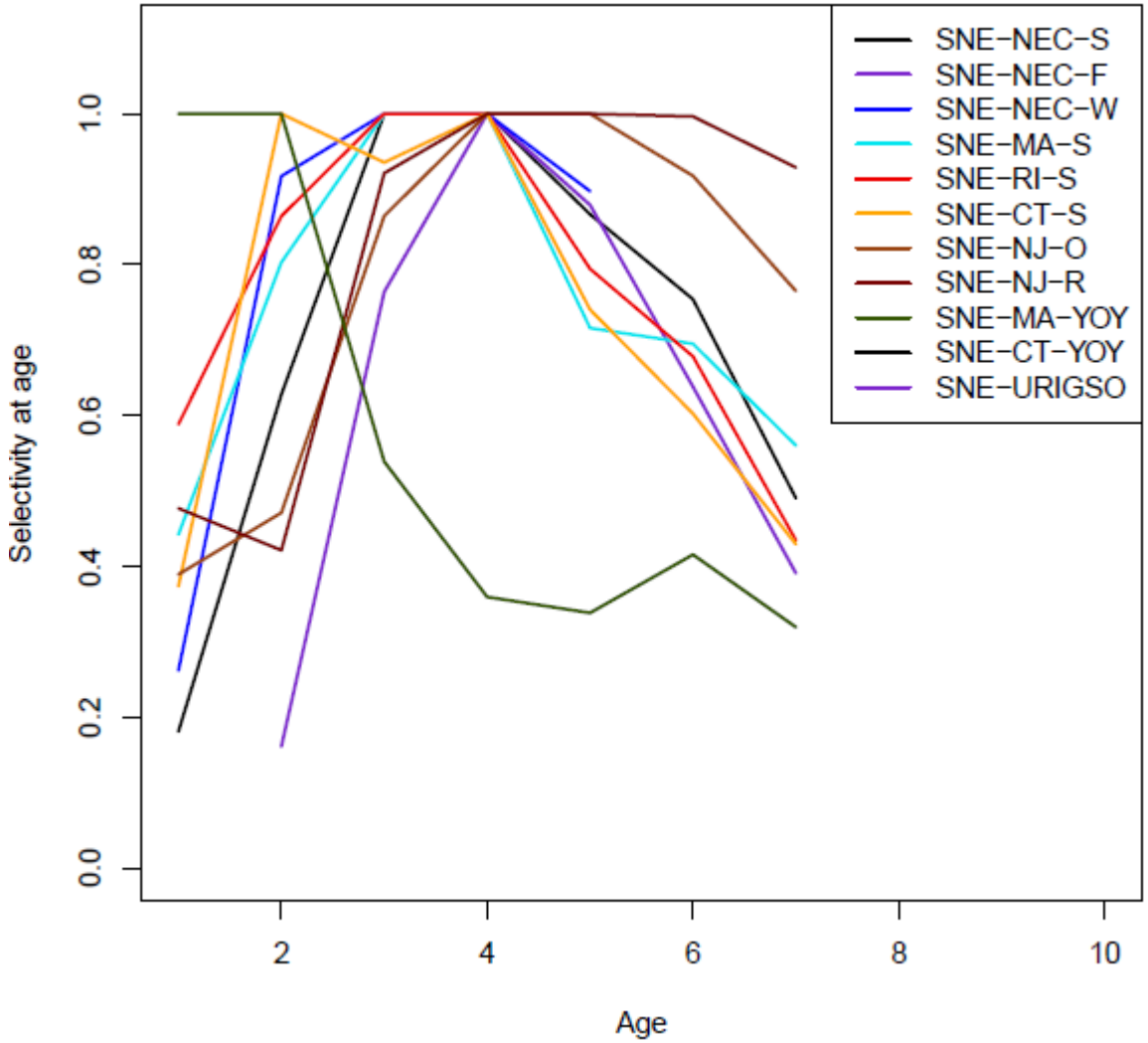
Results: Fleet Selectivities



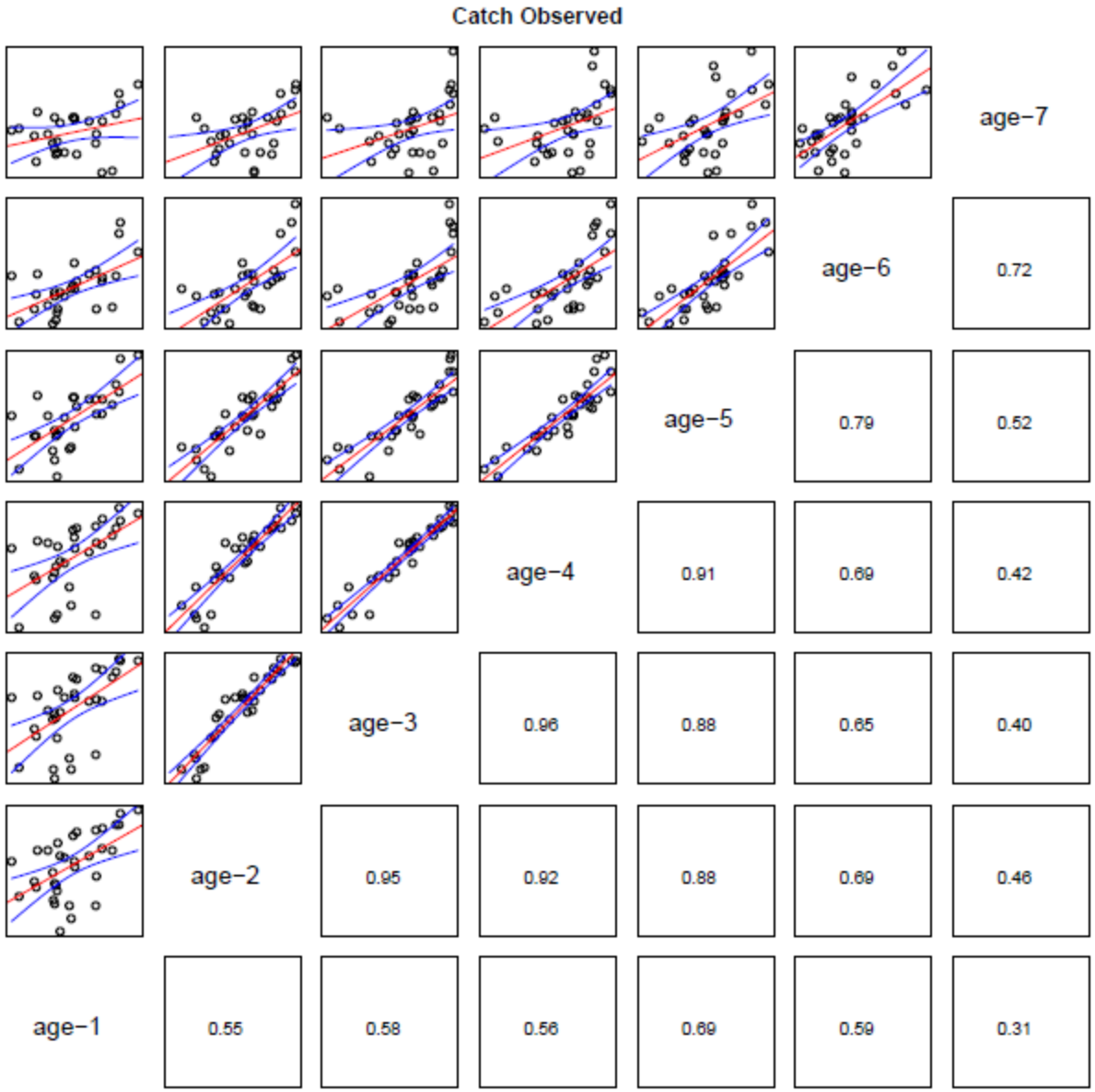
Results: Fmult



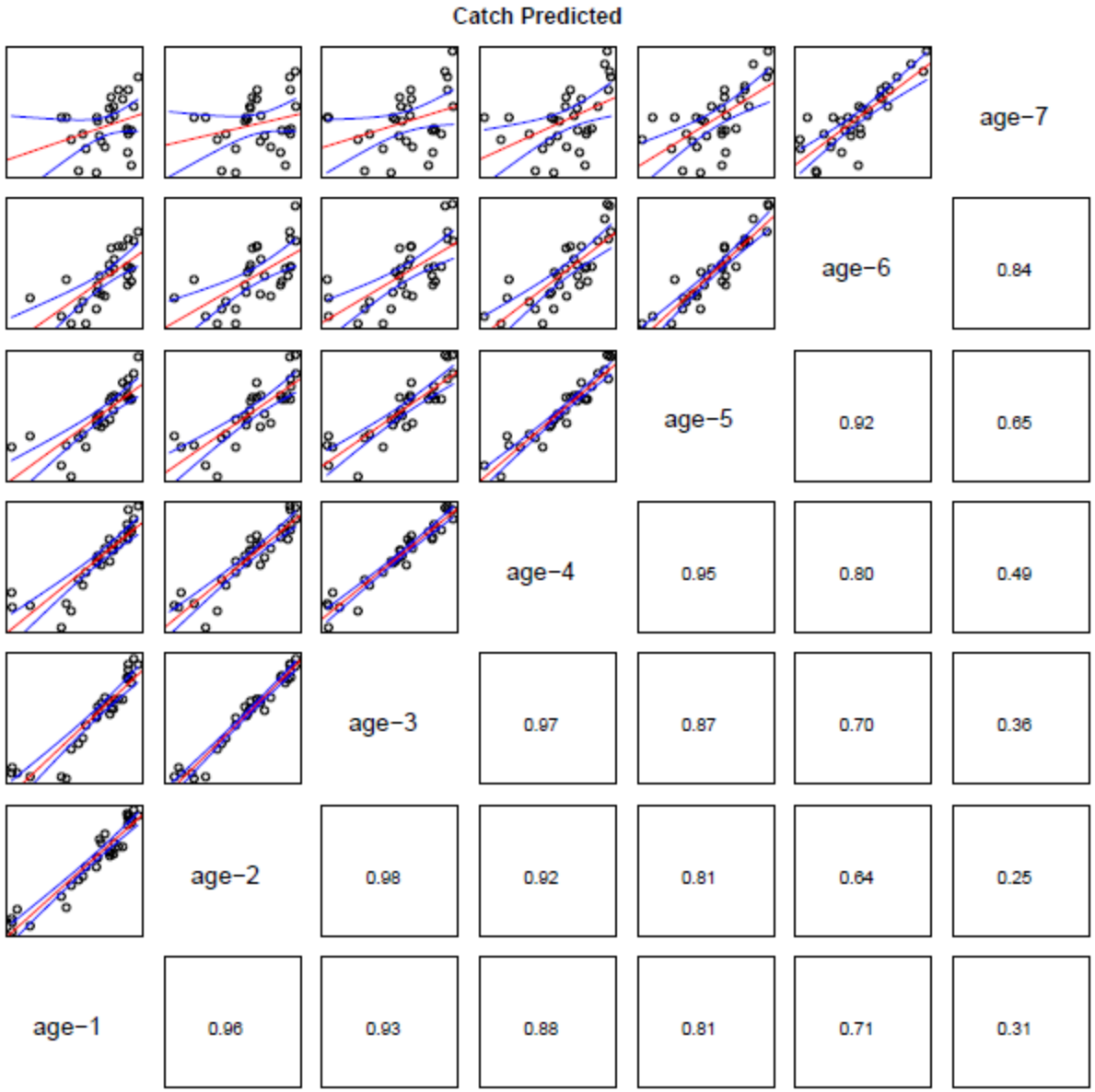
Results: Index Selectivities



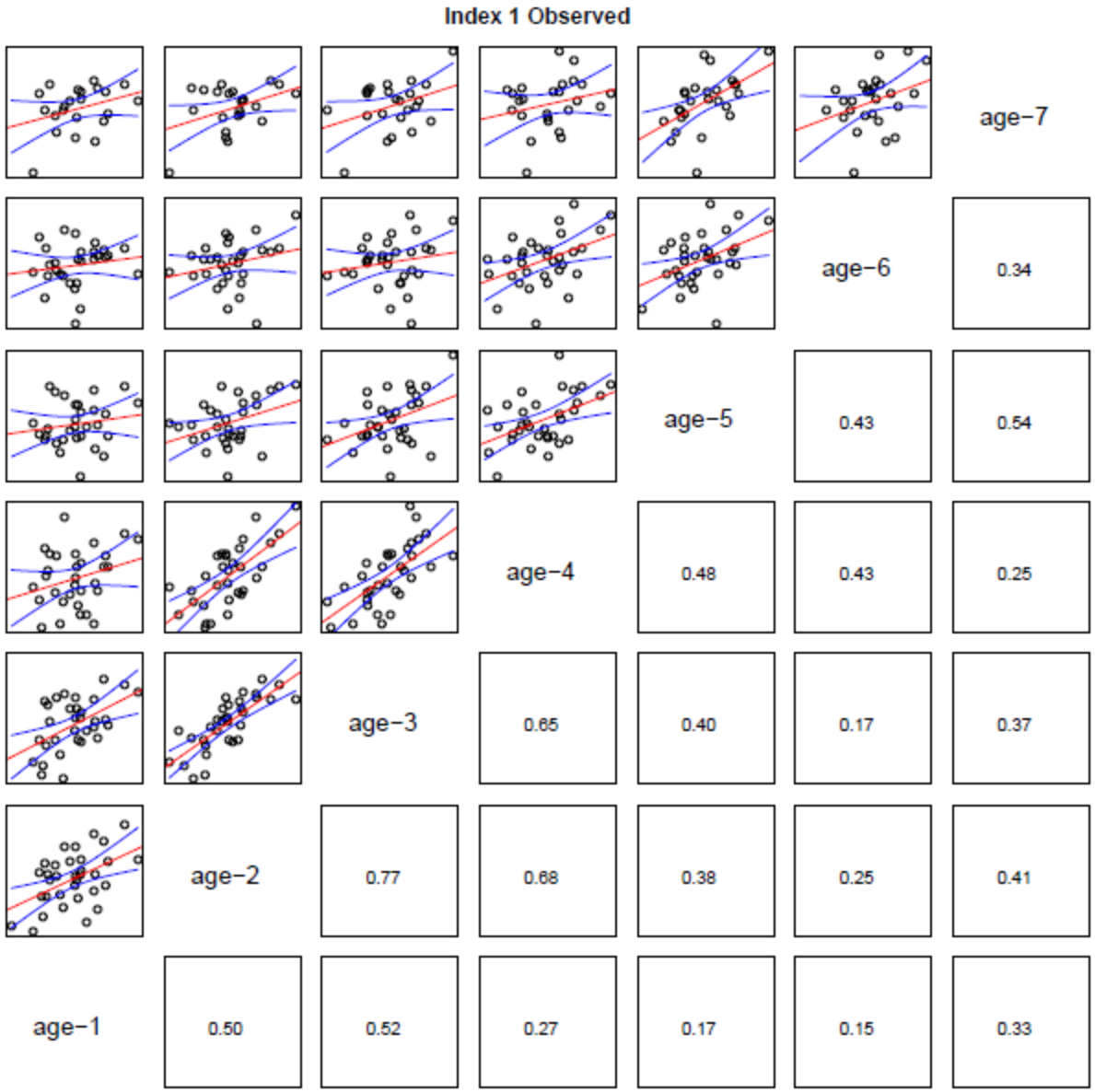
Results: Catch



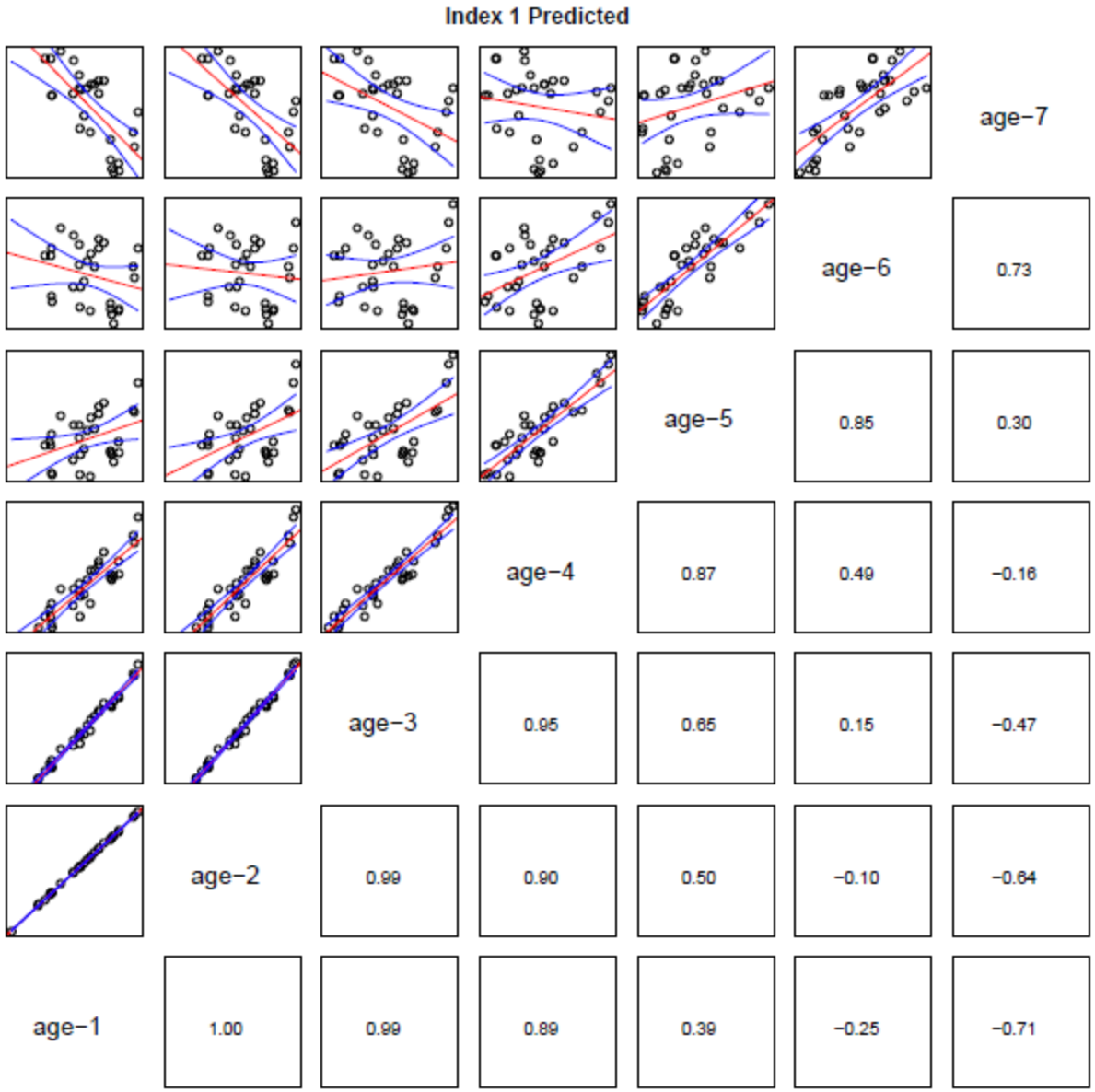
Results: Catch



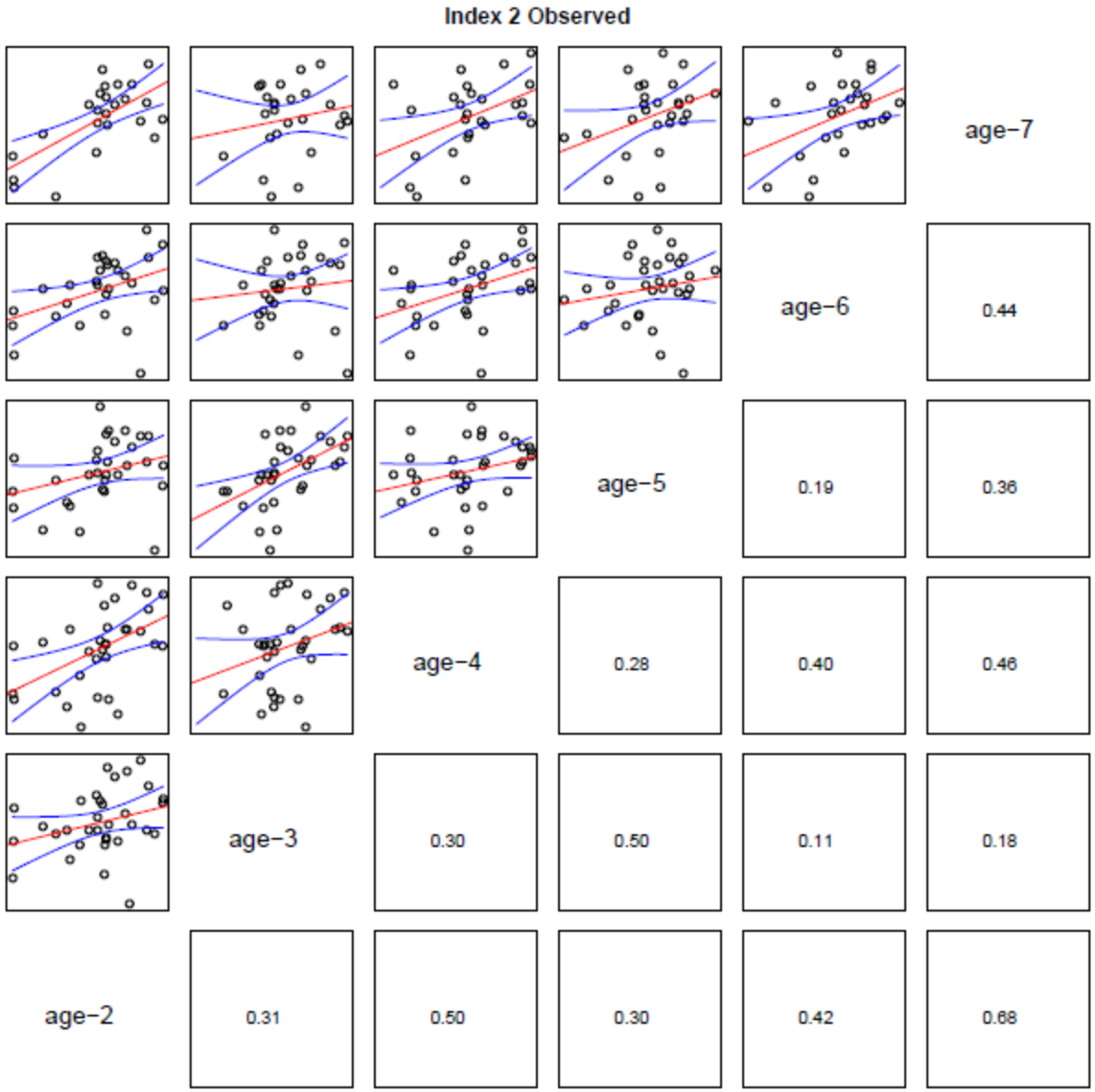
Results: NEFSC S



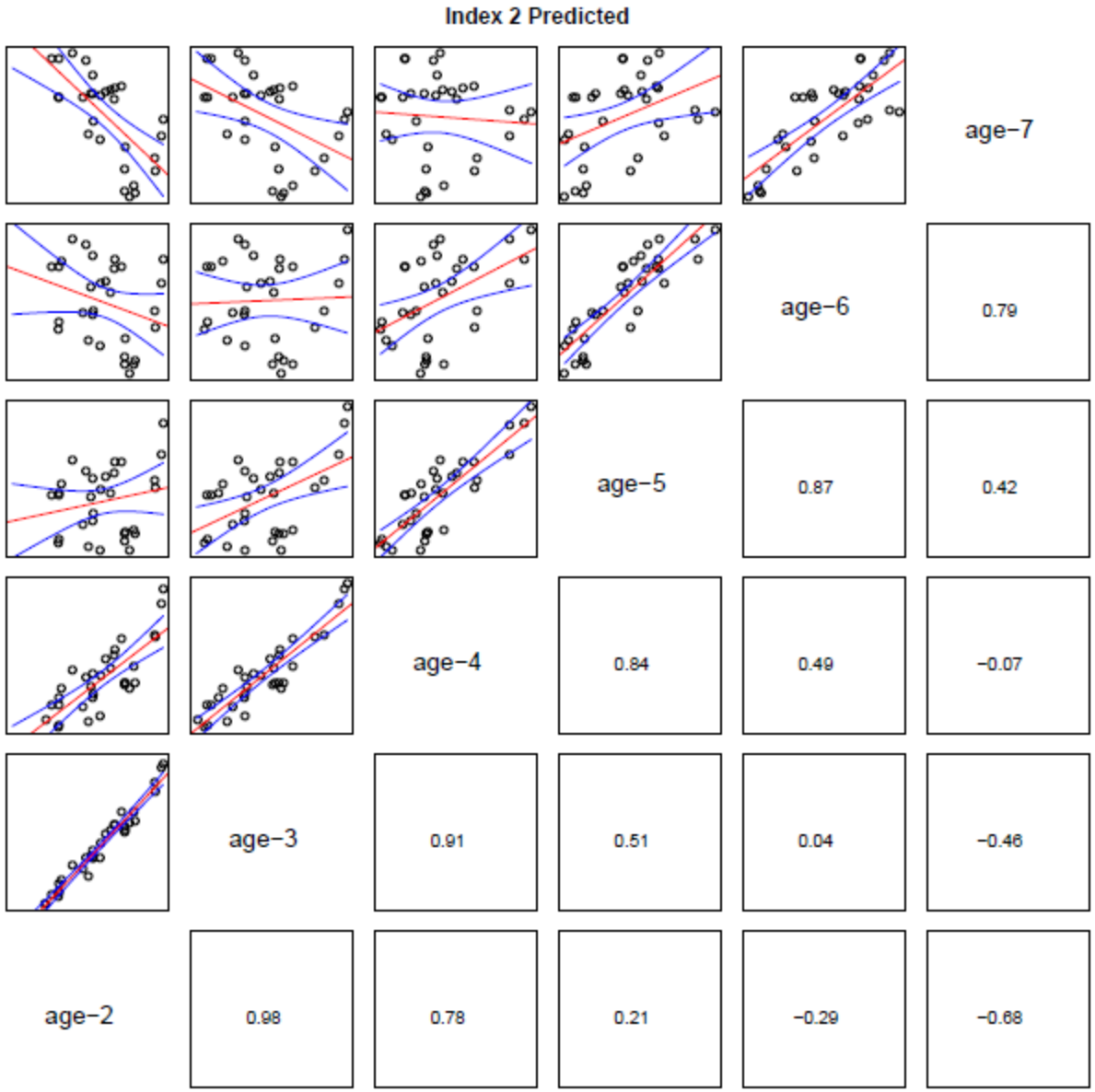
Results: NEFSC S



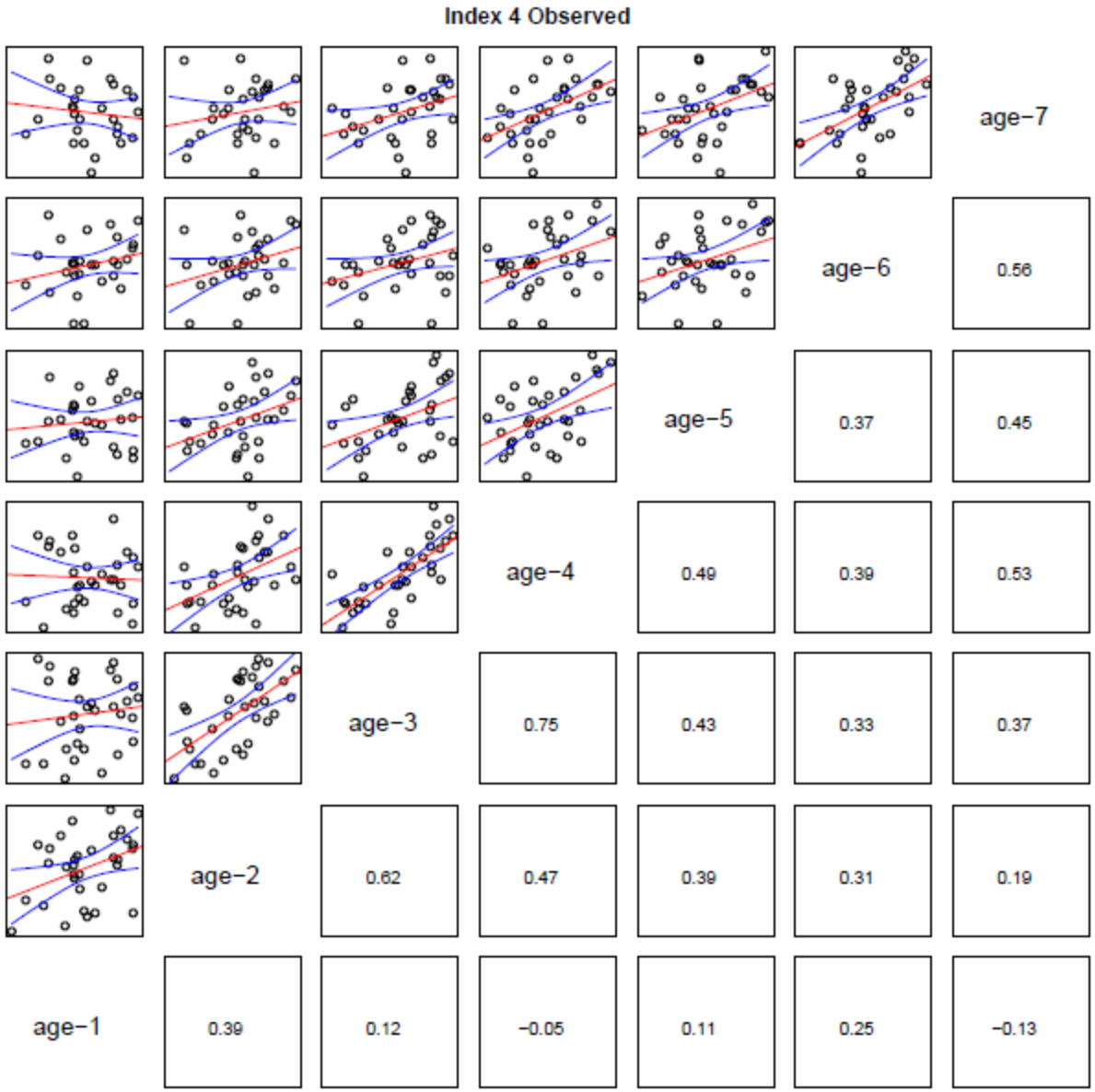
Results: NEFSC F



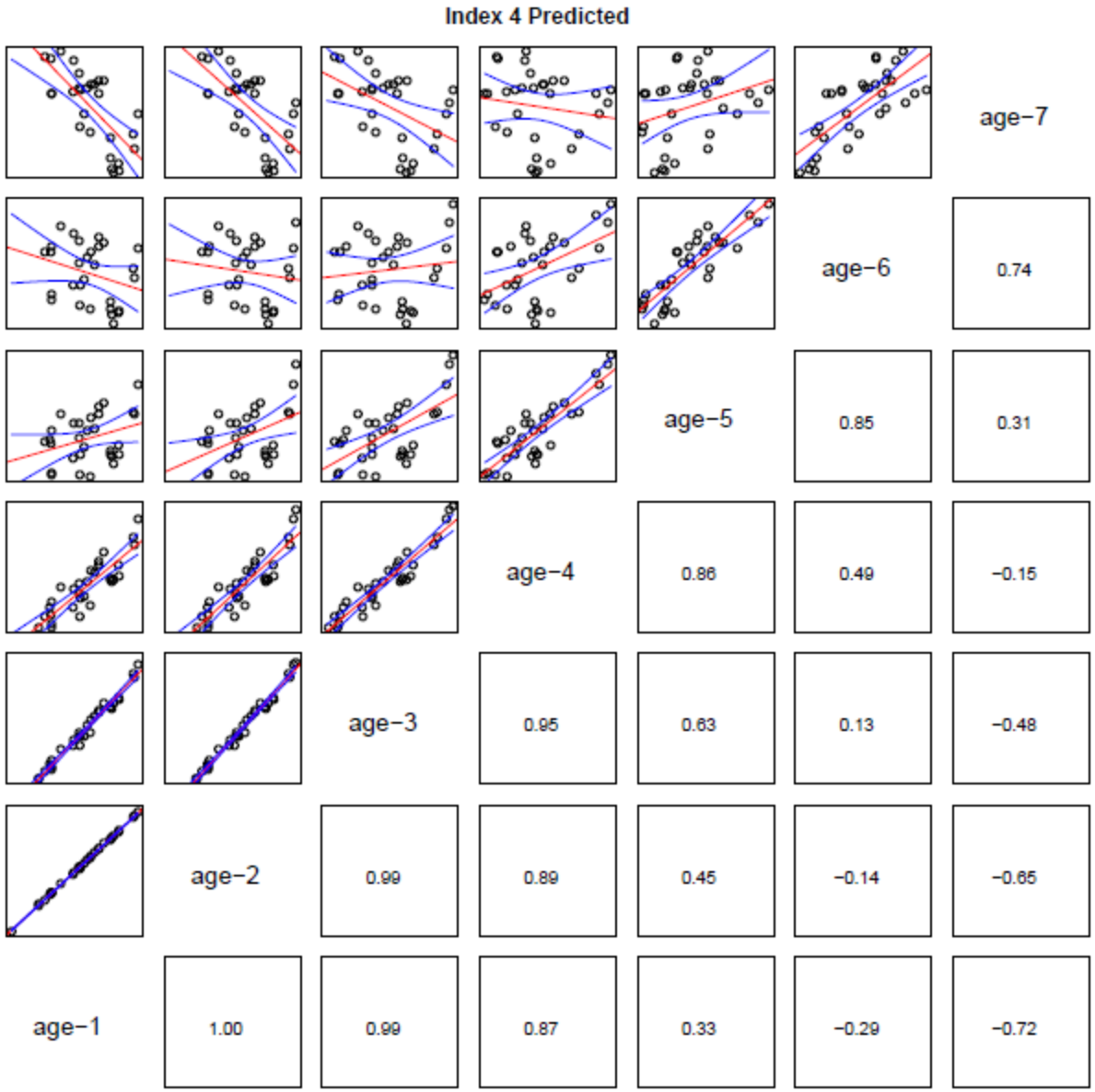
Results: NEFSC F



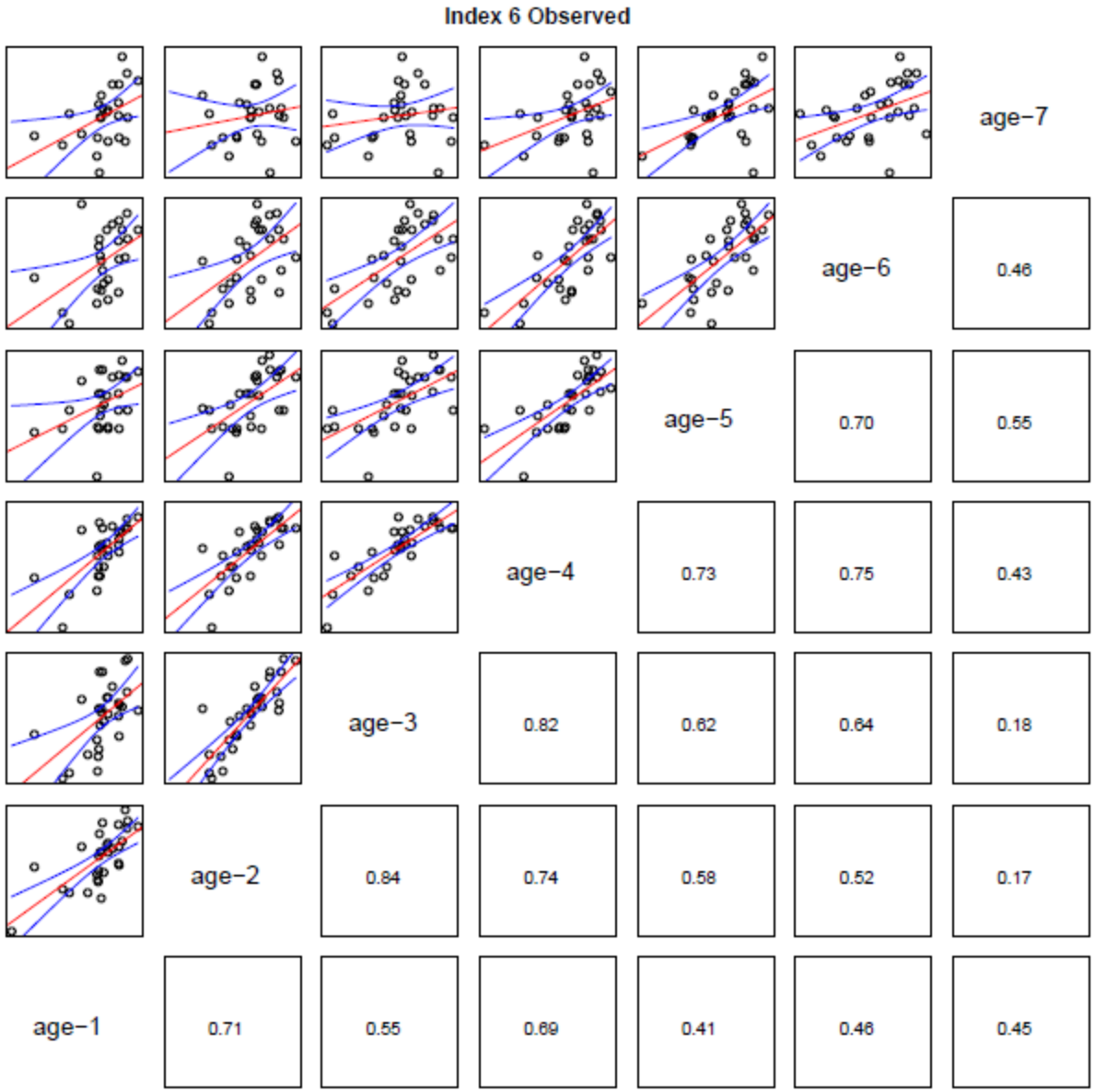
Results: MADMF S



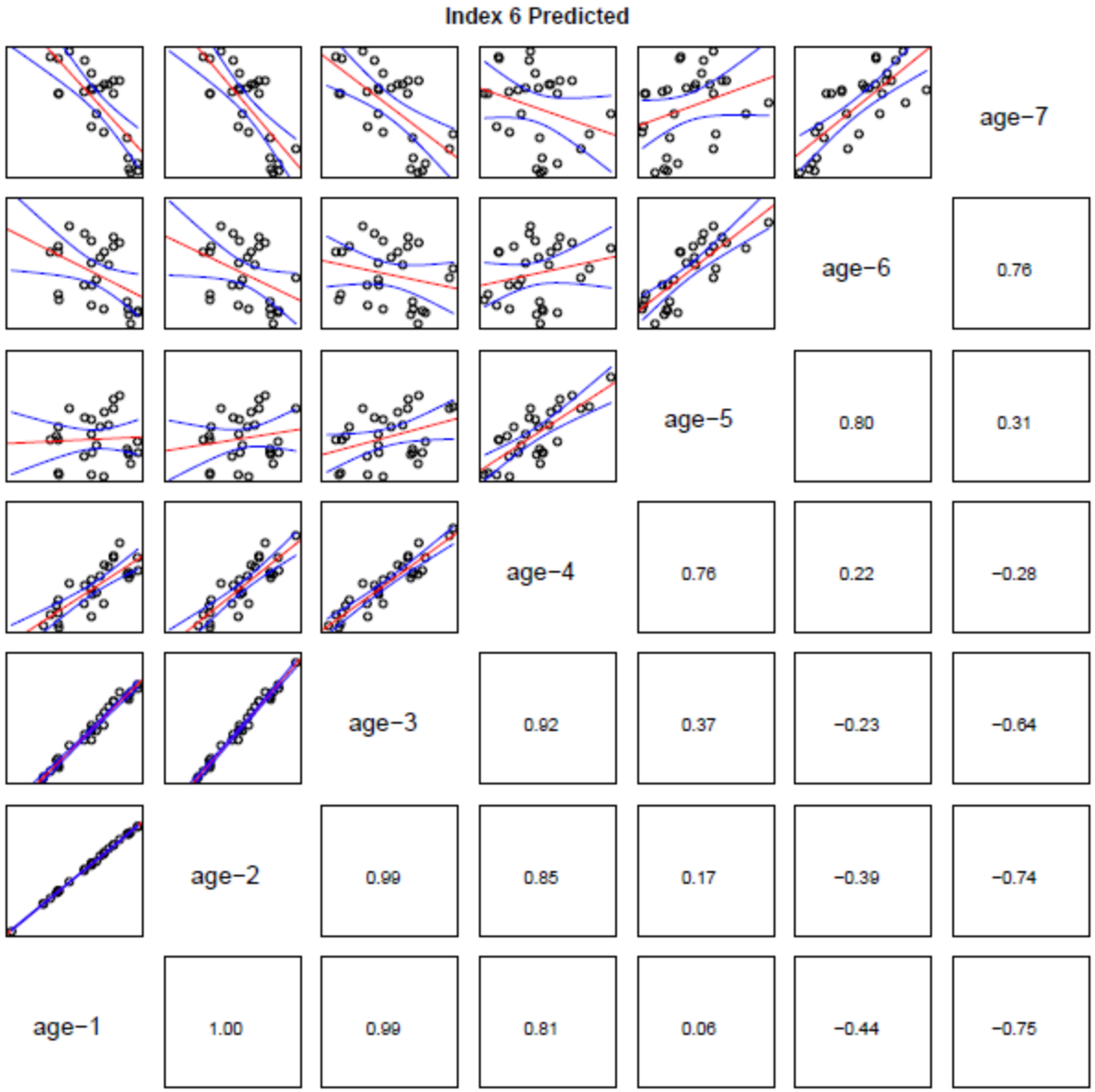
Results: MADMF S



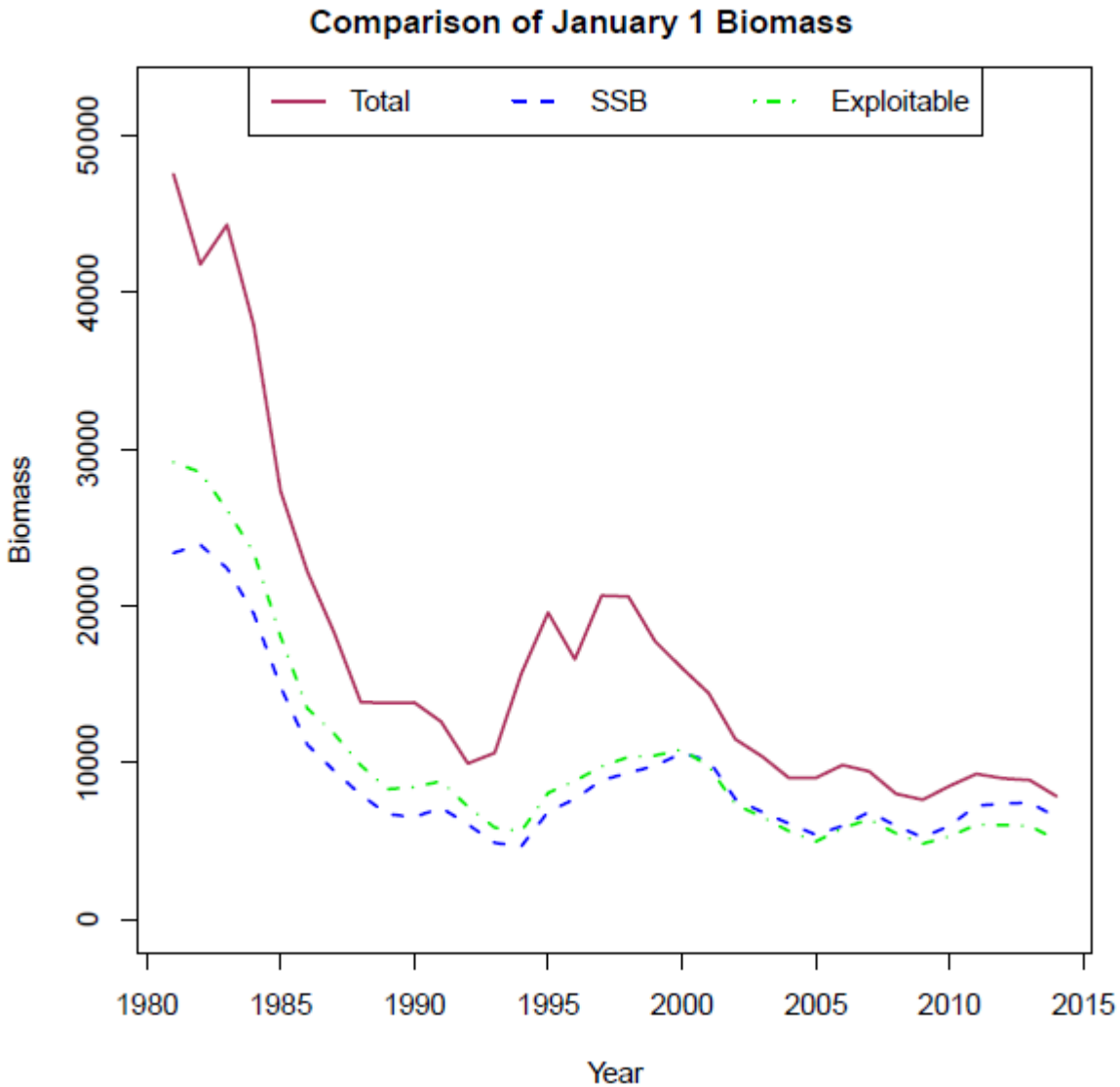
Results: CTDEP



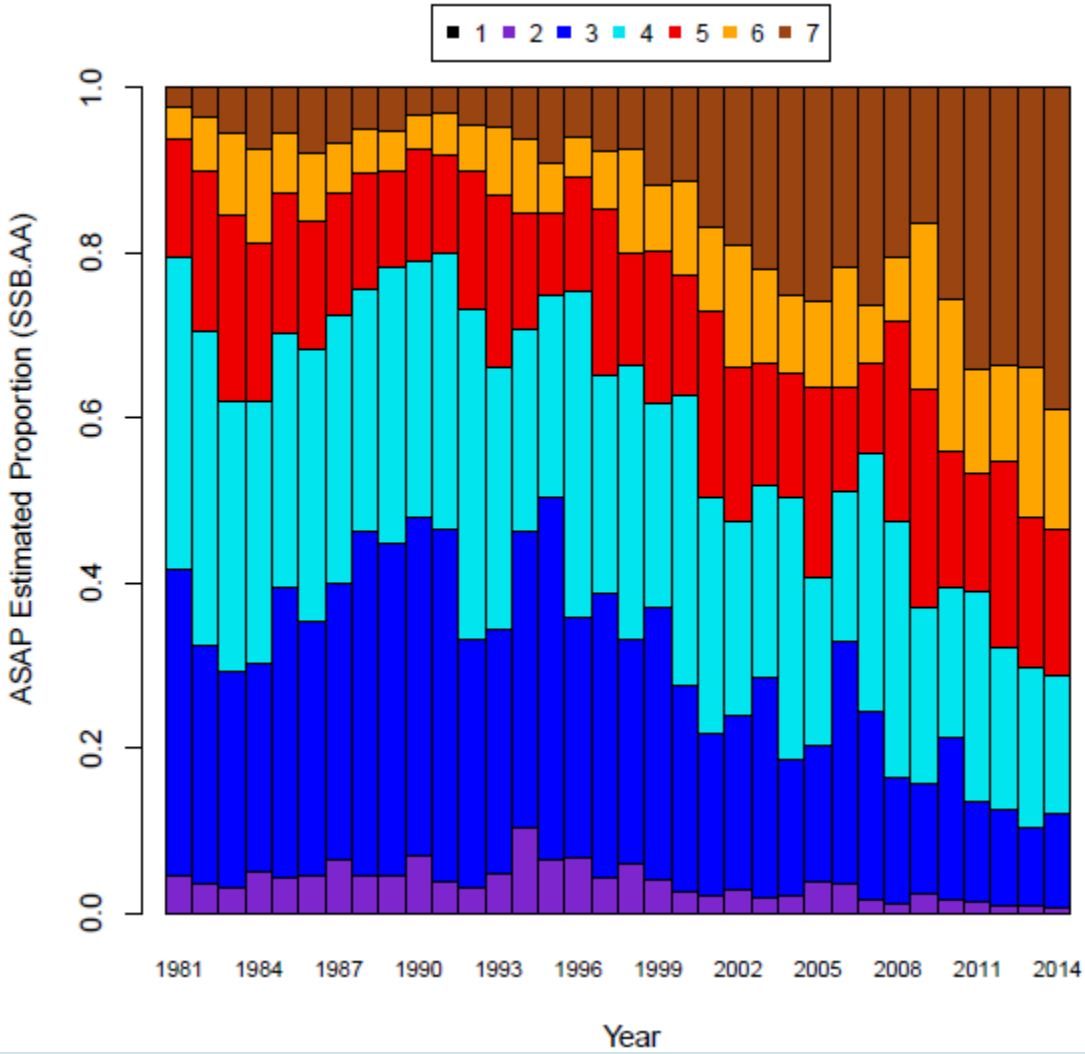
Results: CTDEP



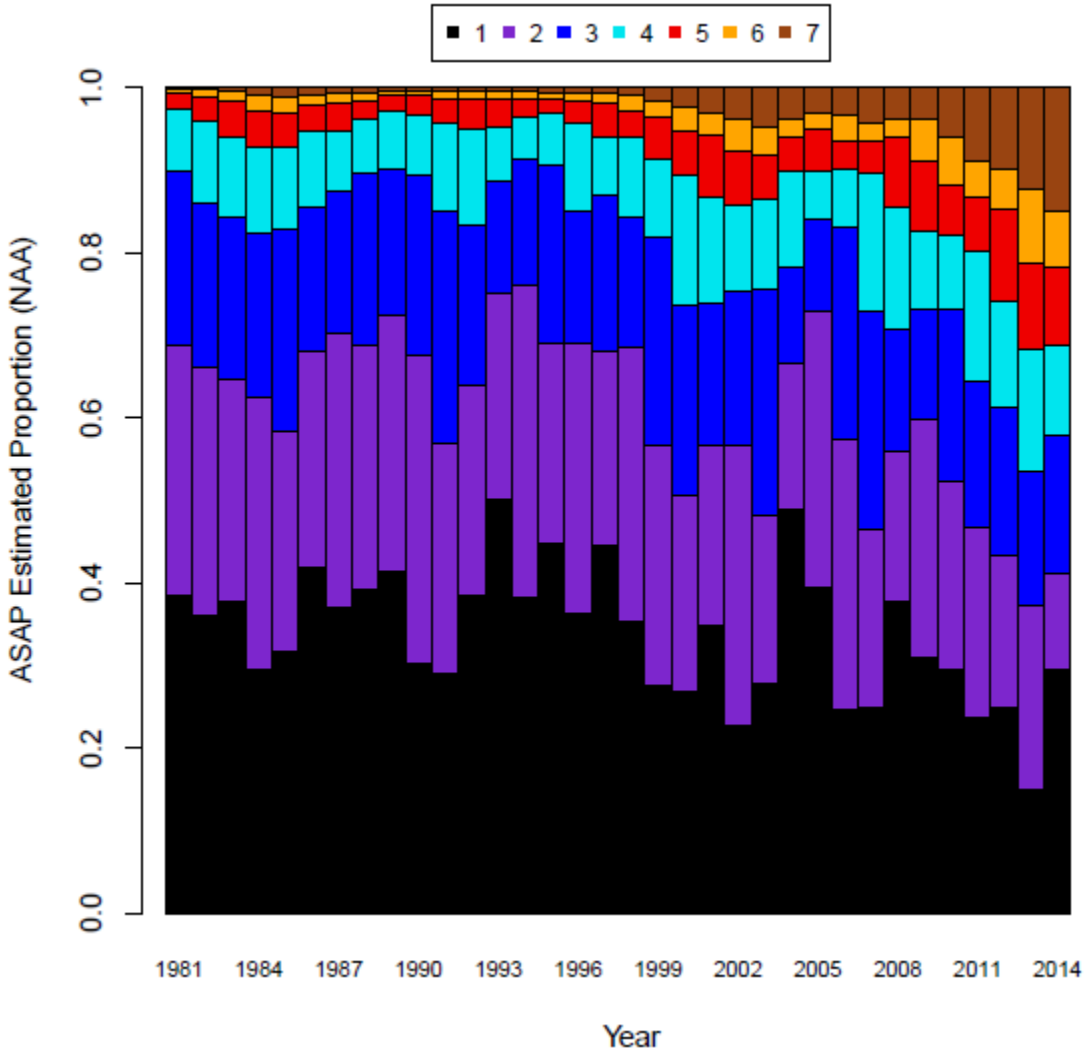
Results: Biomass



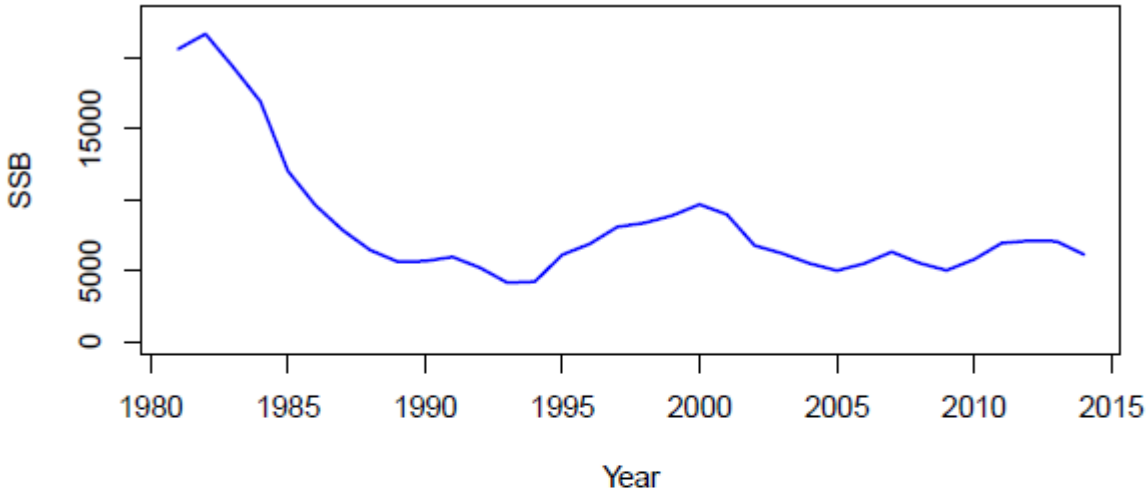
Results: SSB at age

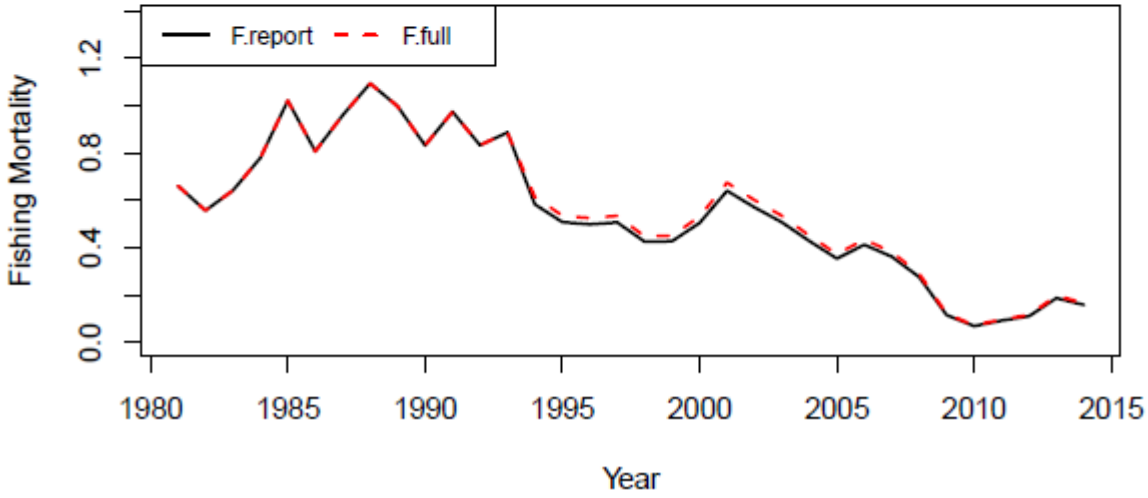


Results: Numbers at age

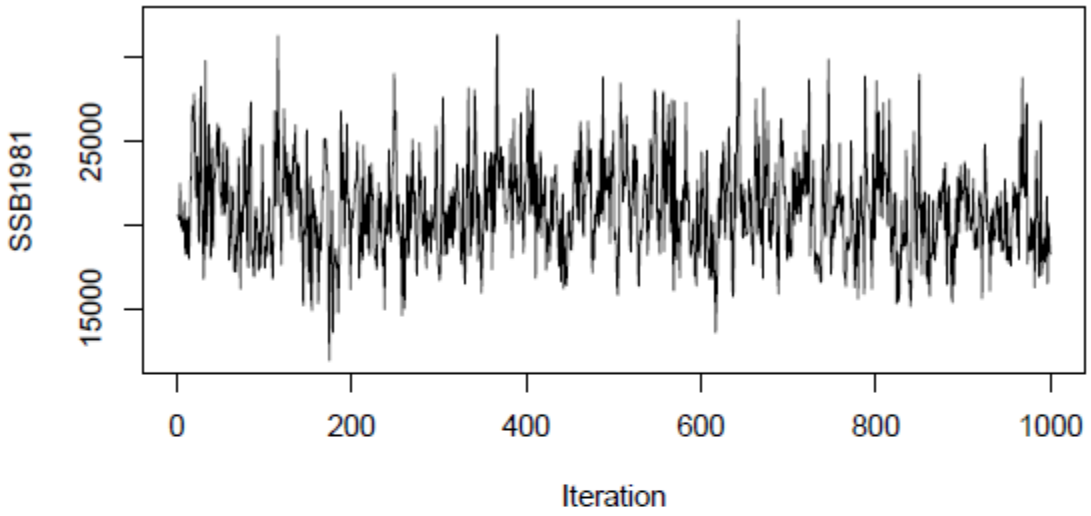


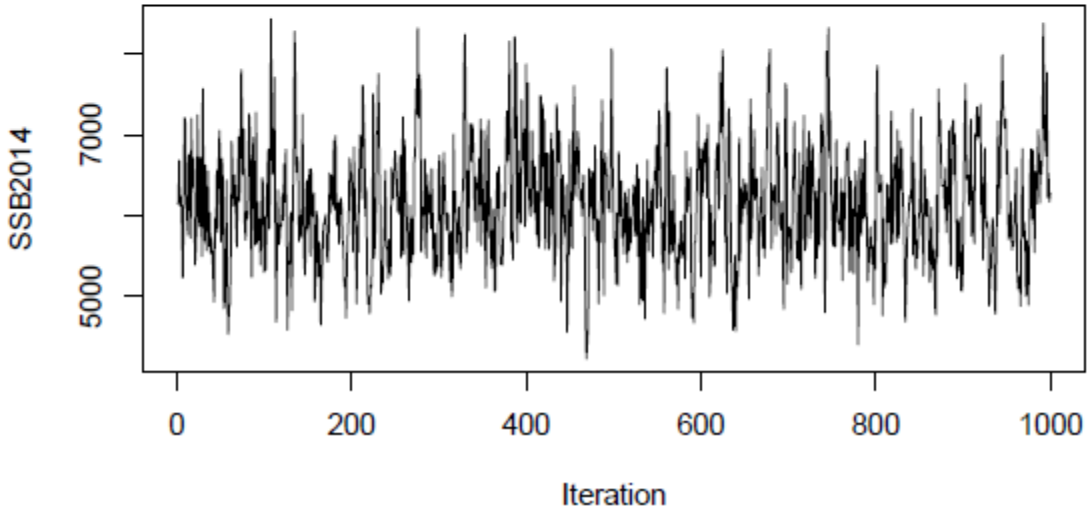
Results: SSB and F



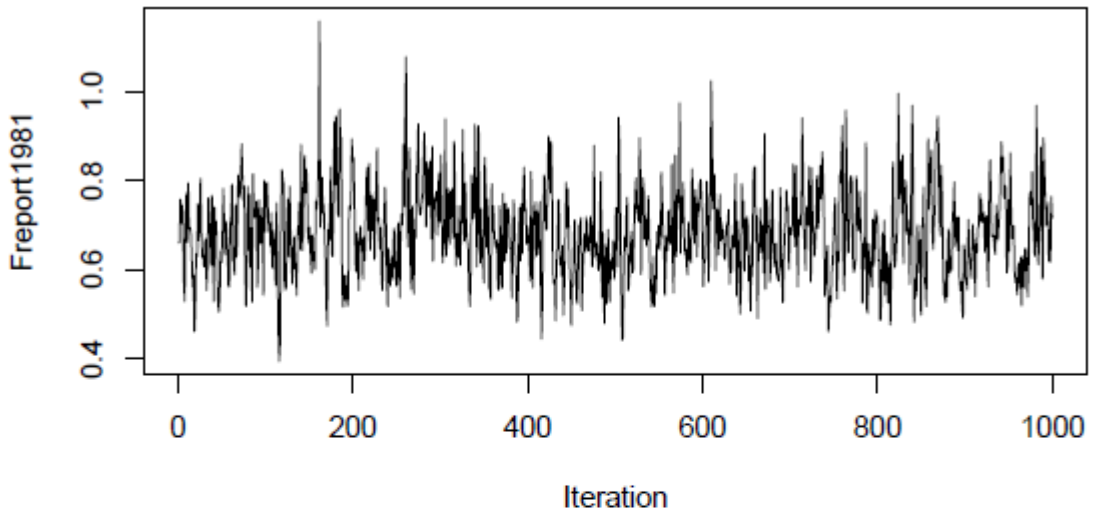


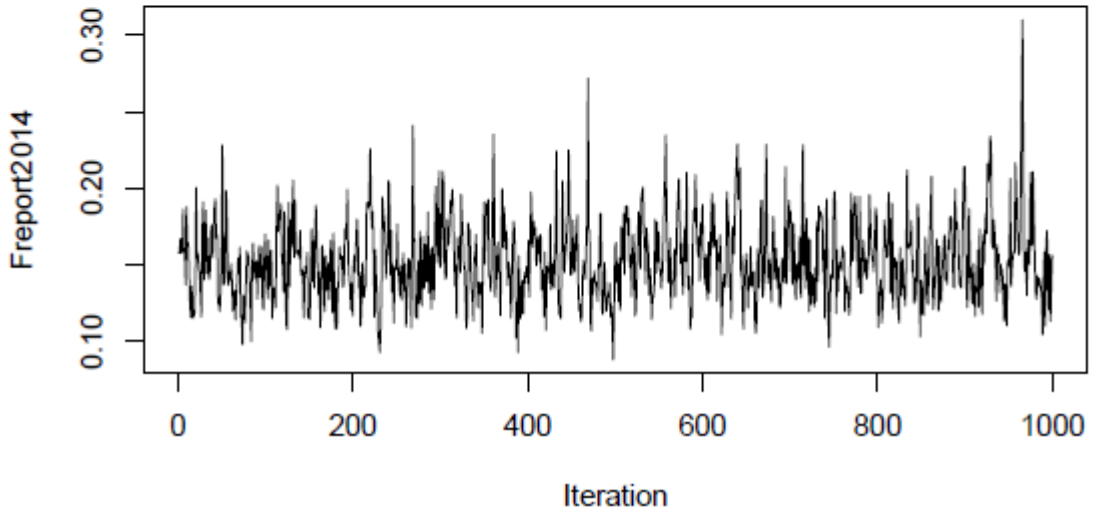
MCMC Results: SSB and F



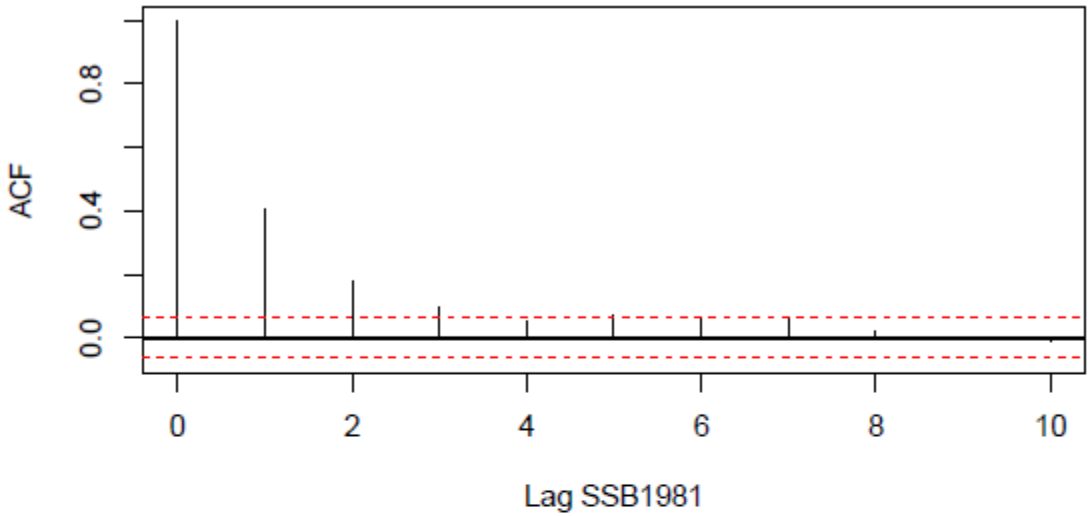


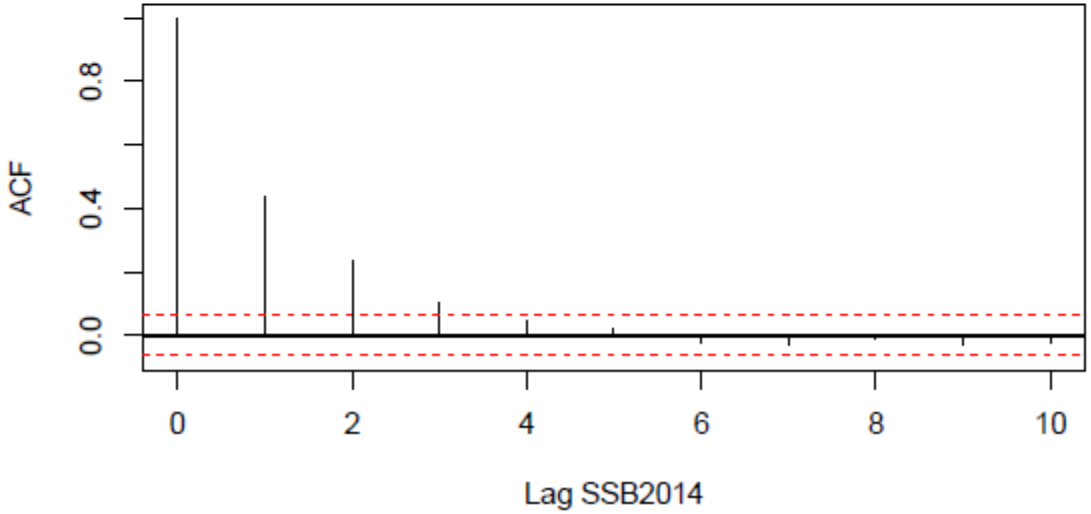
MCMC Results: SSB and F



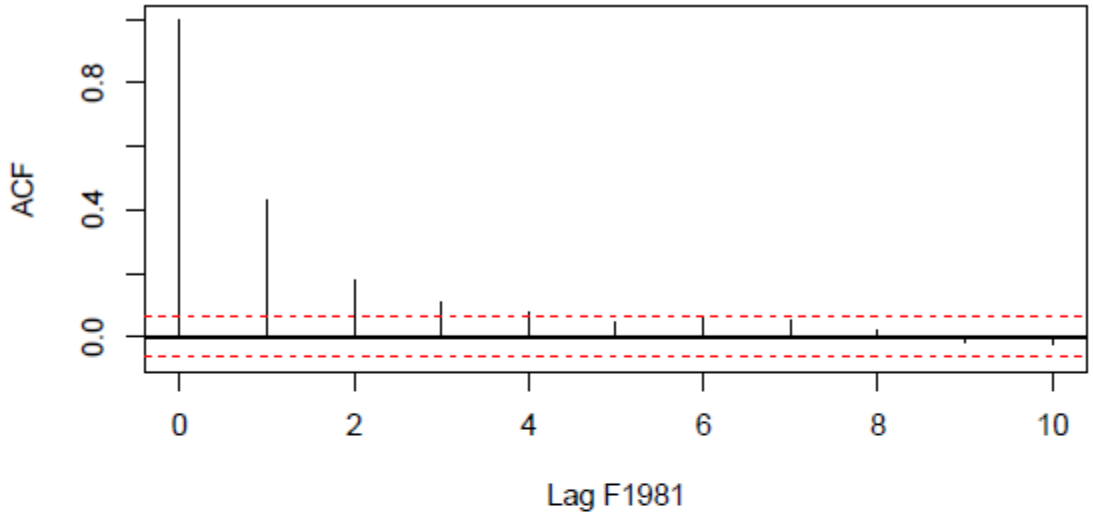


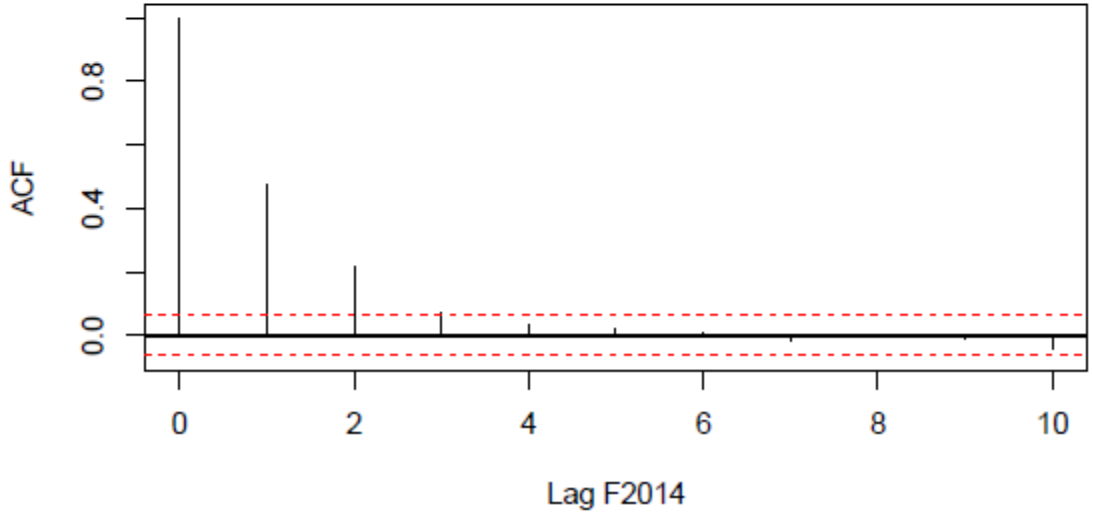
MCMC Results: SSB and F



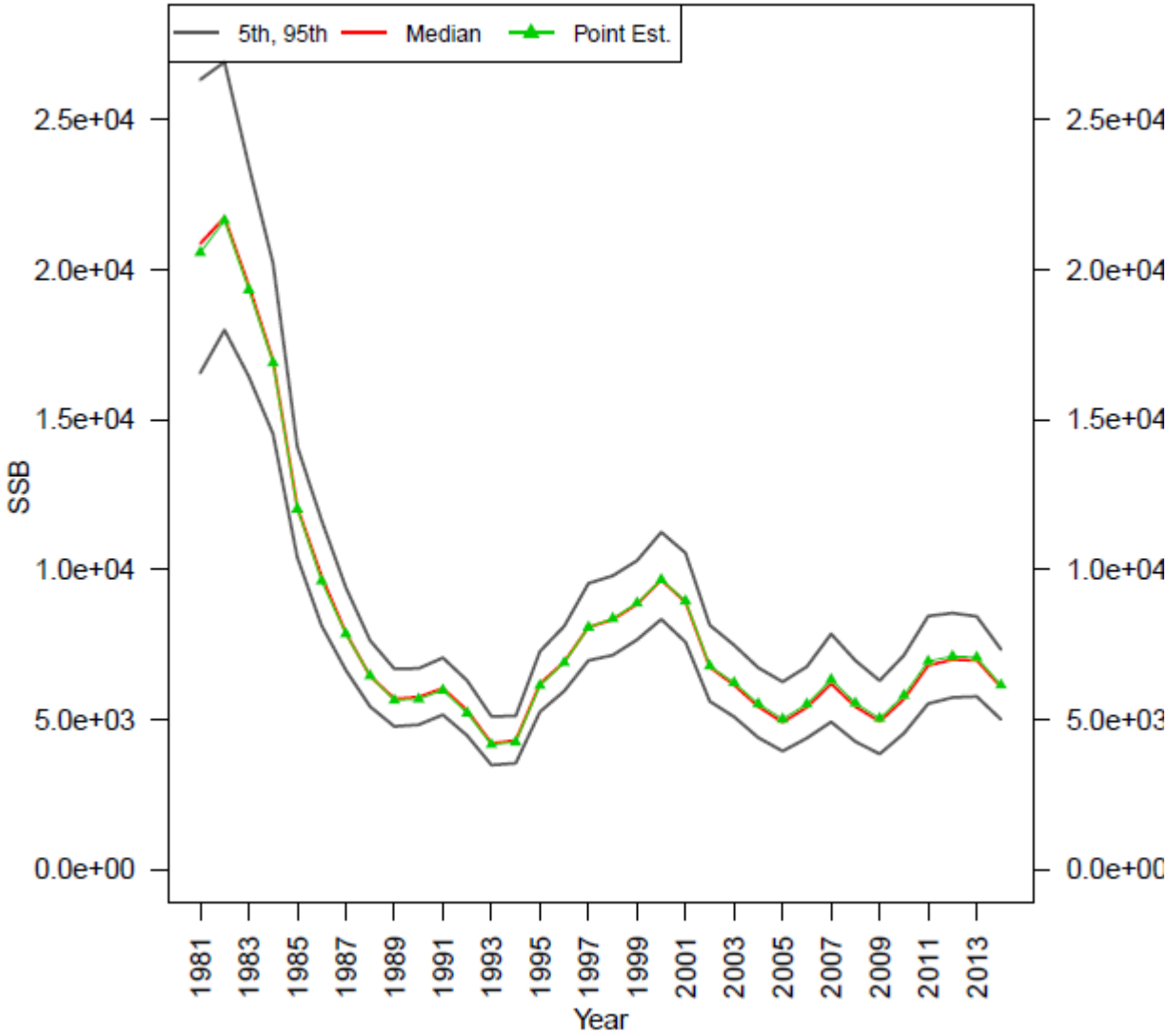


MCMC Results: SSB and F

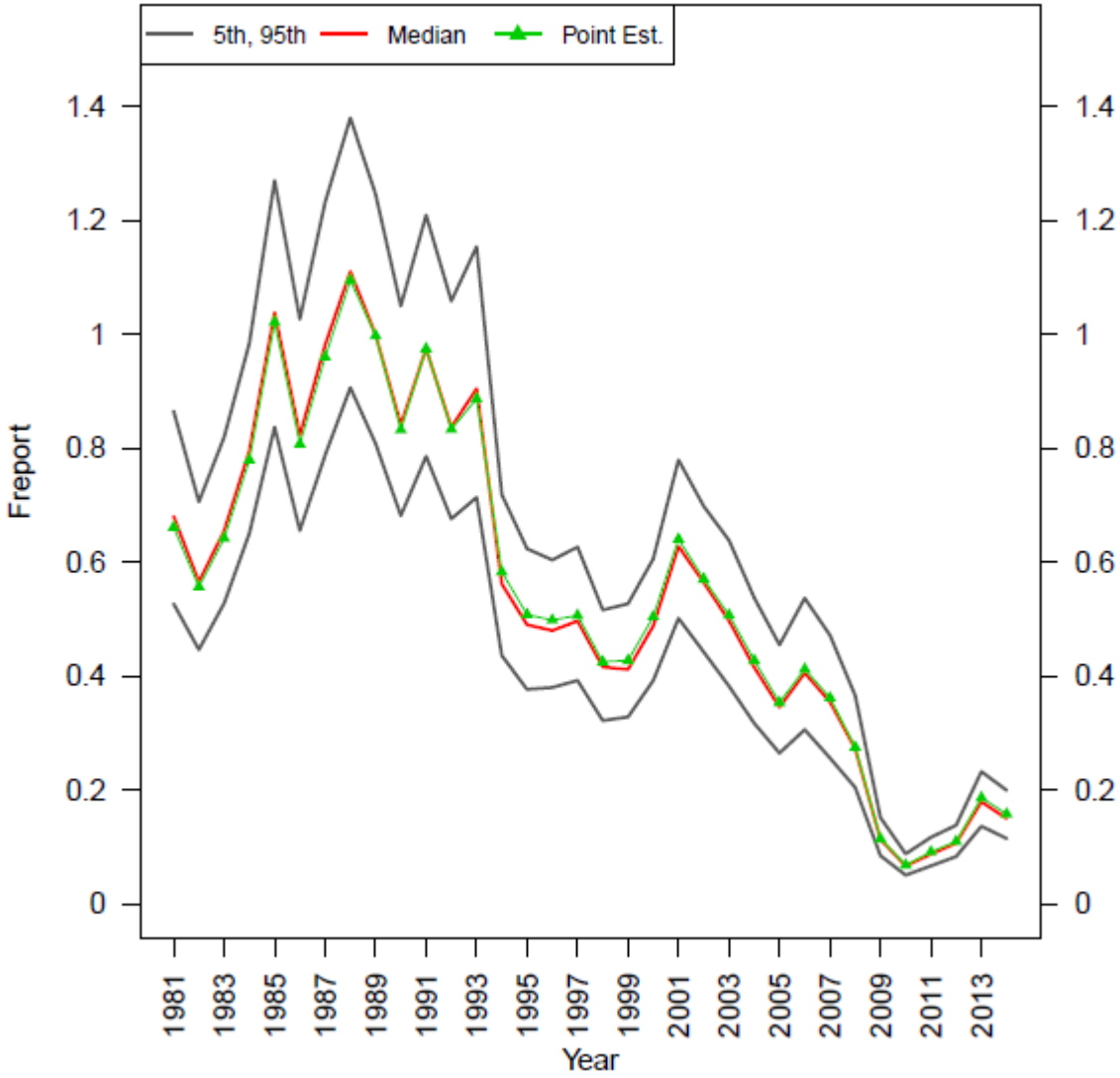




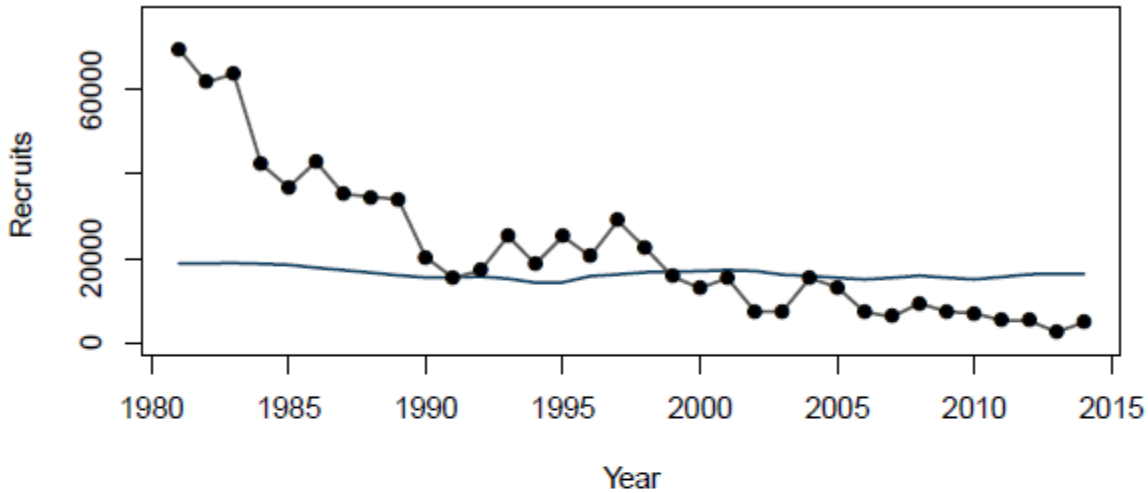
MCMC Results: SSB and F

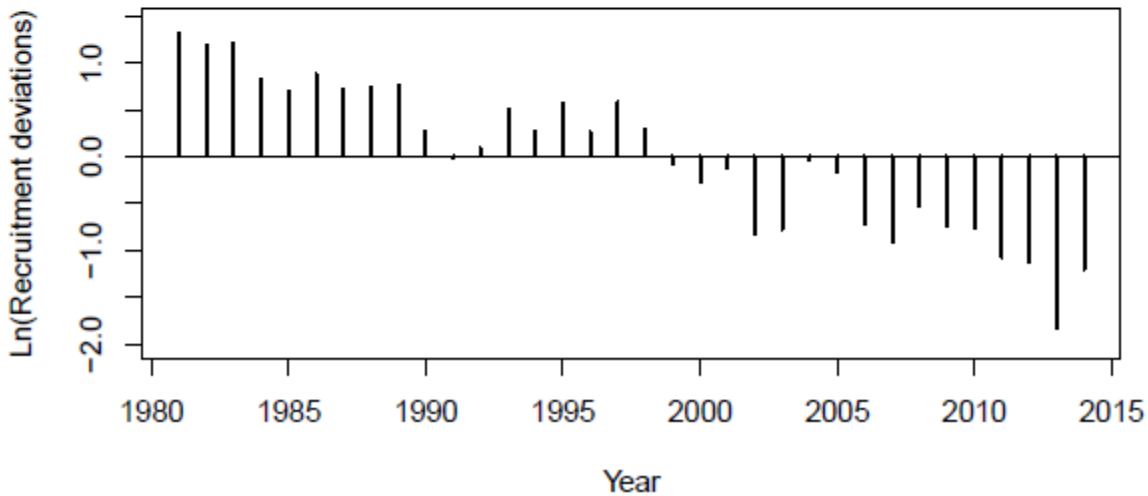


MCMC Results: SSB and F

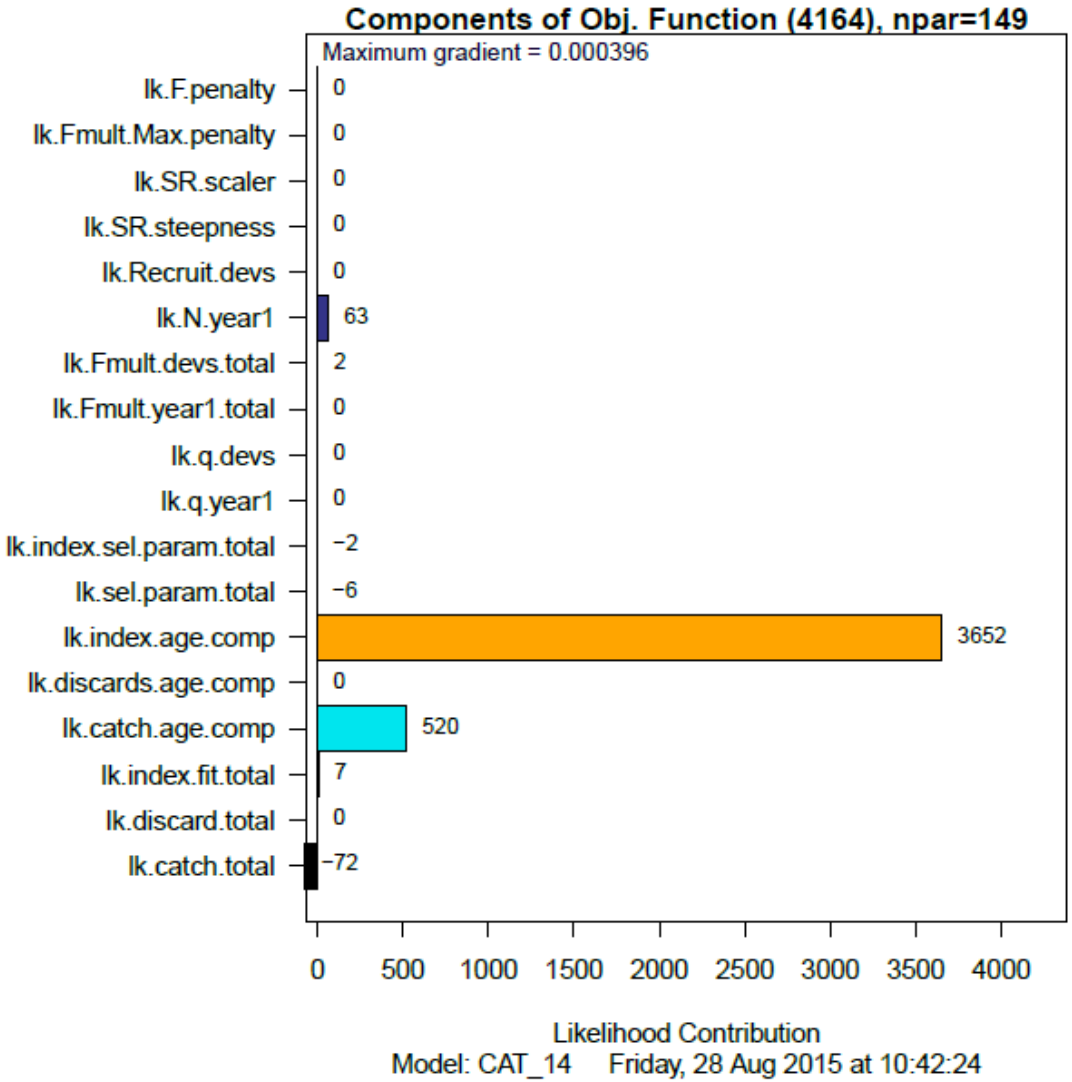


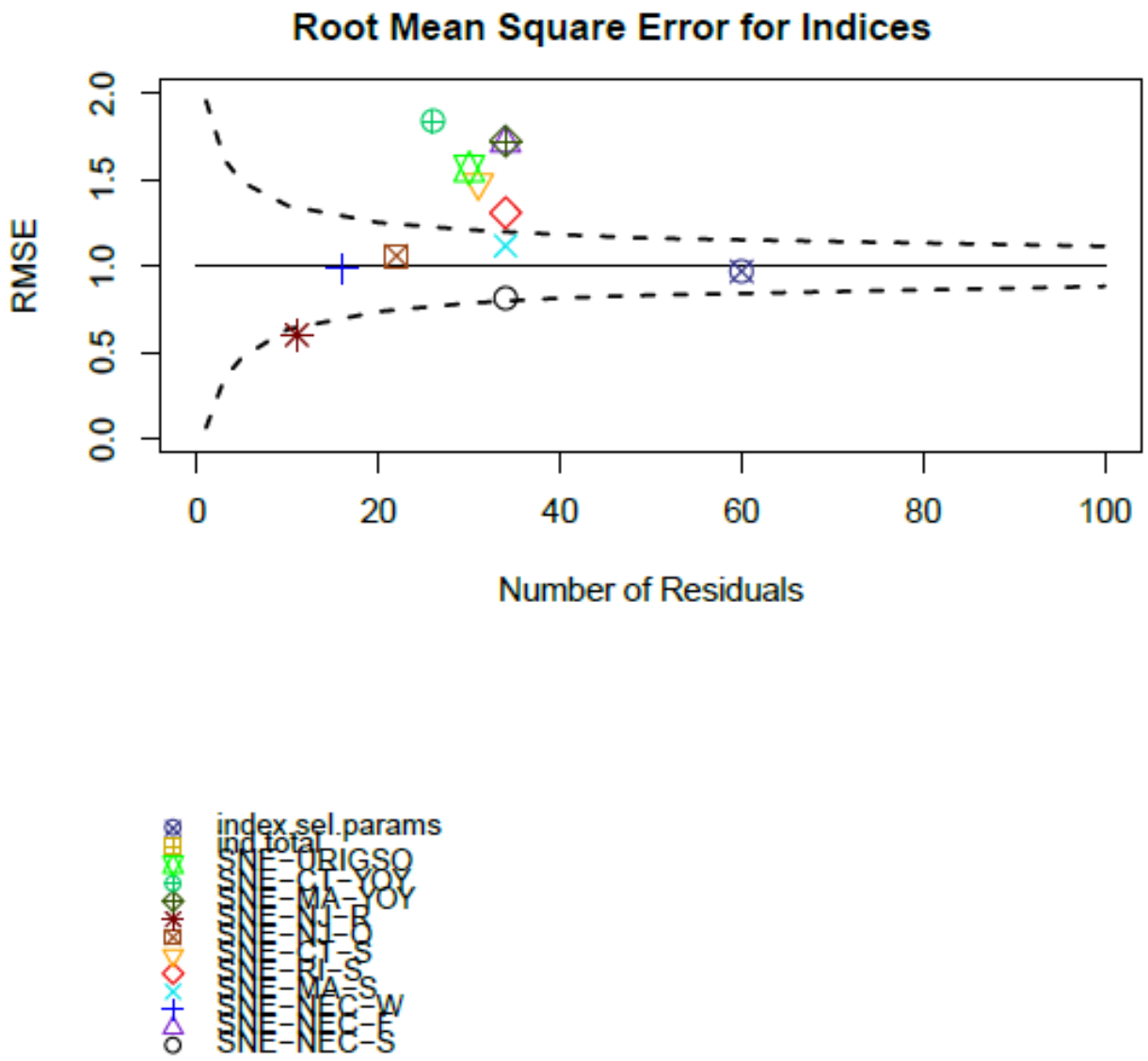
Results: Recruitment

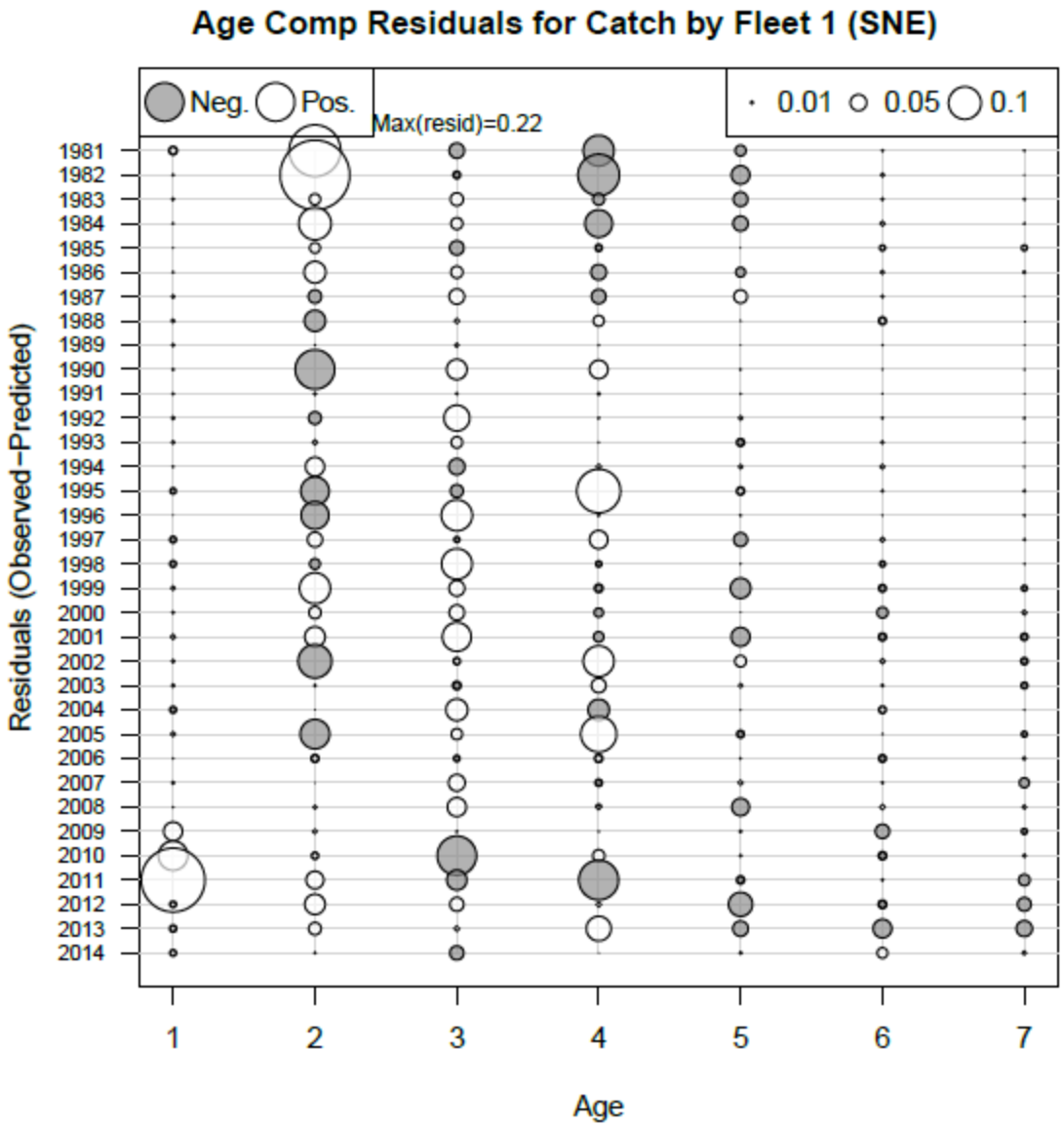


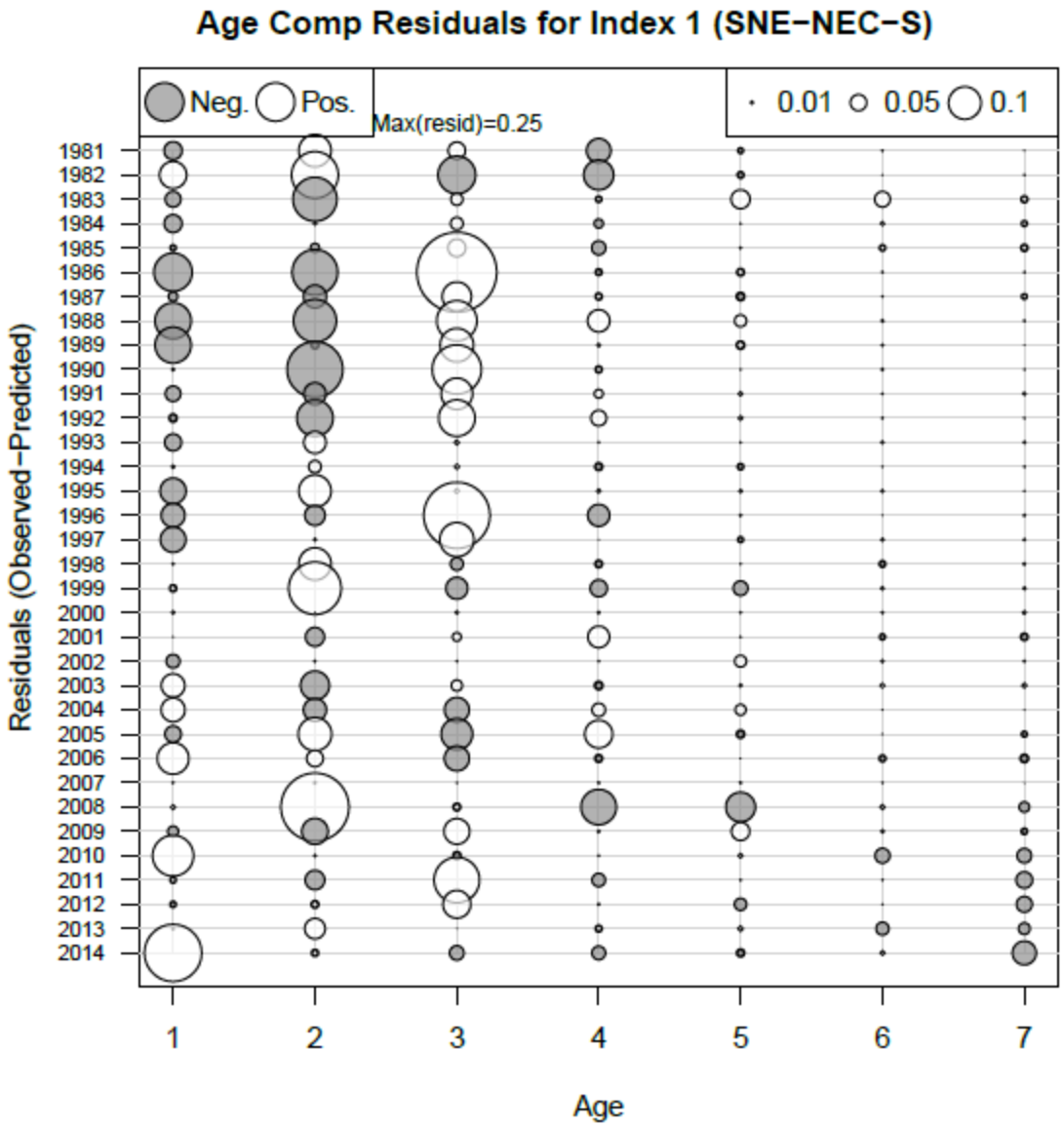


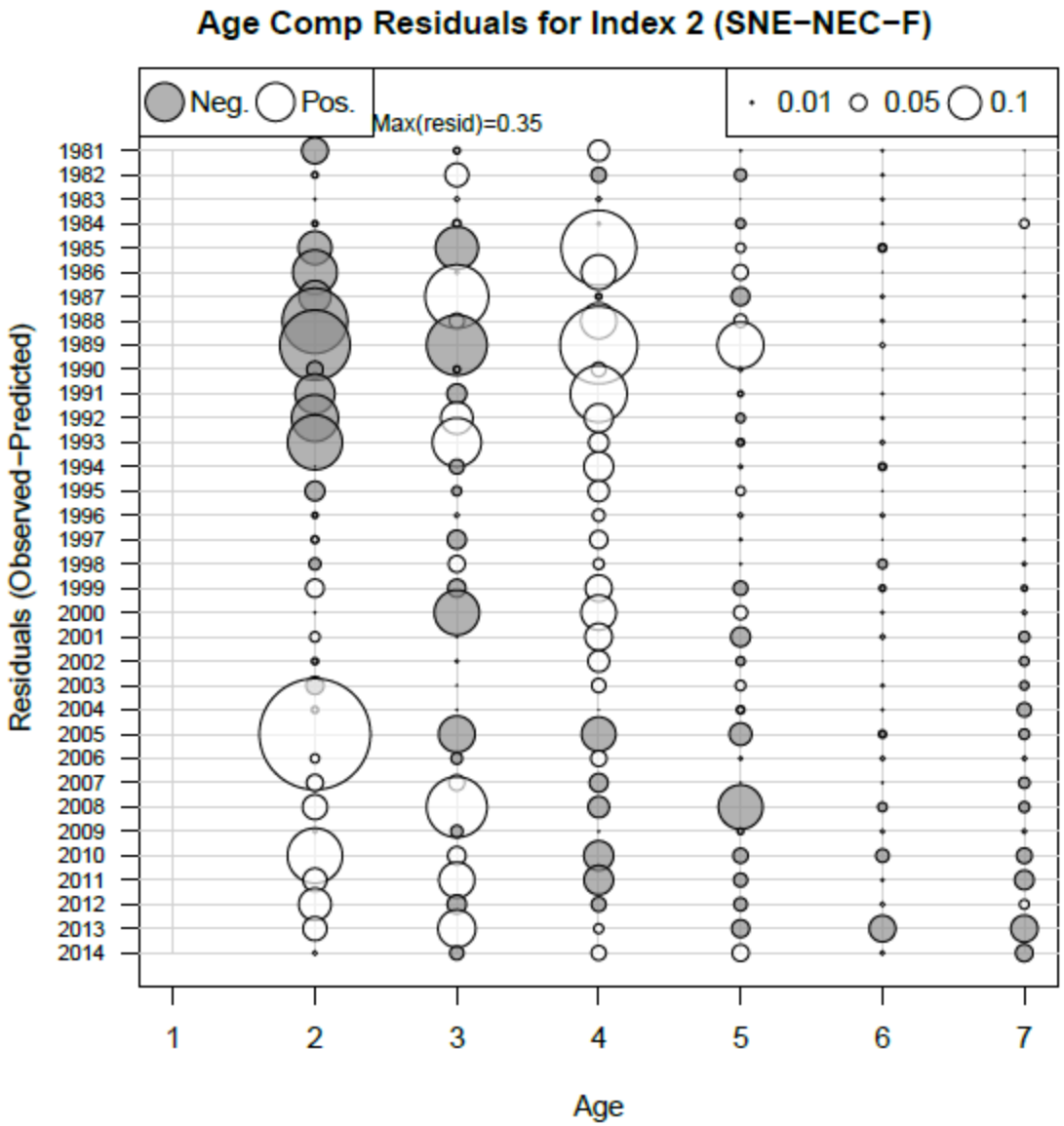
Results: Diagnostics




Root Mean Square Error for Indices
RMSE
0.0
0.5
1.0
1.5
2.0
0
20
40
60
80
100
Number of Residuals
index.sel.params
ind.total
SNE-ORIGSO
SNE-CT-YOY
SNE-MA-YOY
SNE-NJ-R
SNE-NJ-O
SNE-CT-S
SNE-RI-S
SNE-MA-S
SNE-NEC-W
SNE-NEC-F
SNE-NEC-S


Age Comp Residuals for Catch by Fleet 1 (SNE)
Neg.
Pos.
Max(resid)=0.22
0.01
0.05
0.1
Residuals (Observed−Predicted)
1981
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
2013
2014
1
2
3
4
5
6
7
Age


Age Comp Residuals for Index 1 (SNE−NEC−S)
Neg.
Pos.
Max(resid)=0.25
0.01
0.05
0.1
Residuals (Observed−Predicted)
1981
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
2013
2014
1
2
3
4
5
6
7
Age


Age Comp Residuals for Index 2 (SNE−NEC−F)
Neg.
Pos.
Max(resid)=0.35
0.01
0.05
0.1
Residuals (Observed−Predicted)
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
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2008
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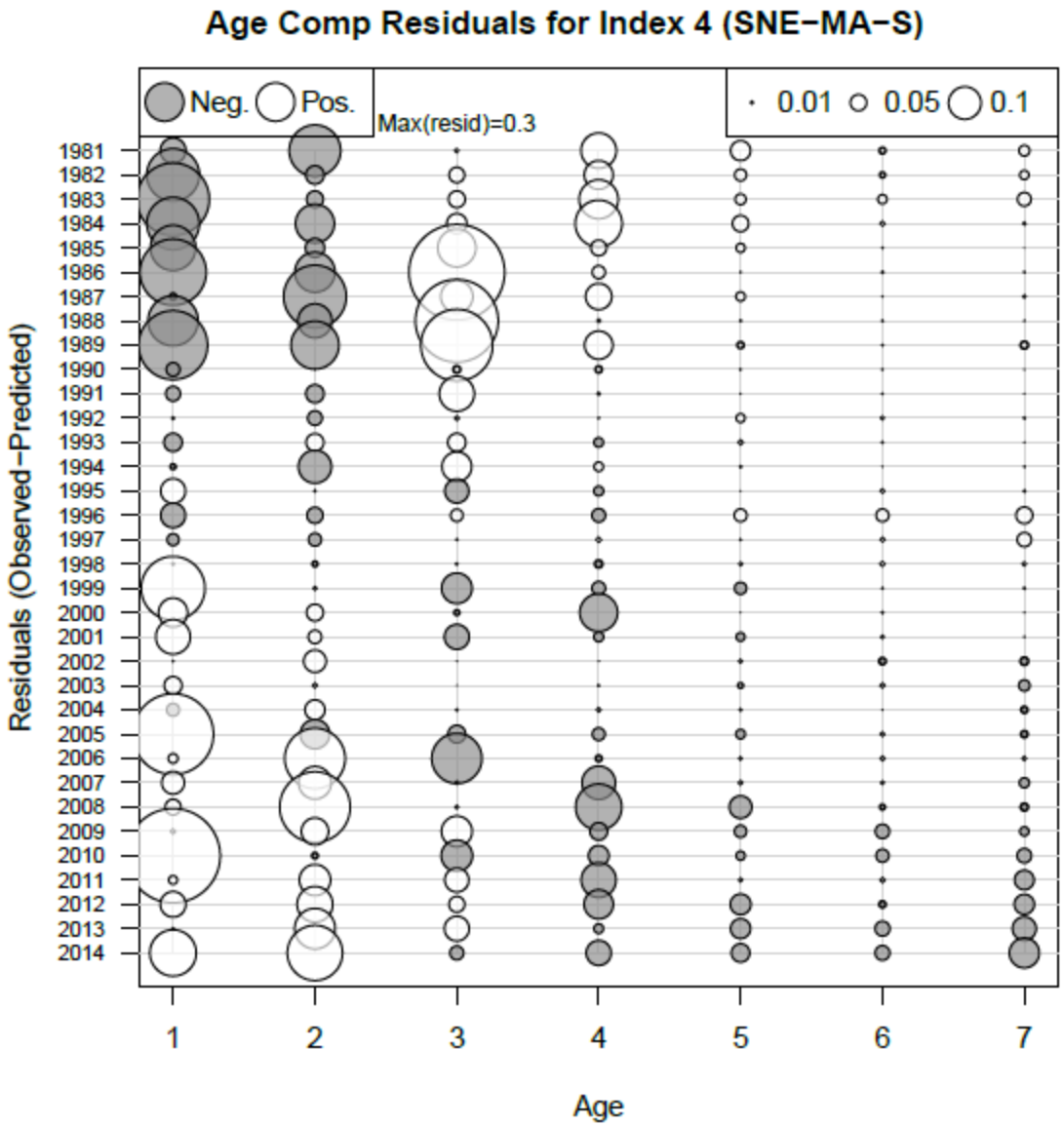
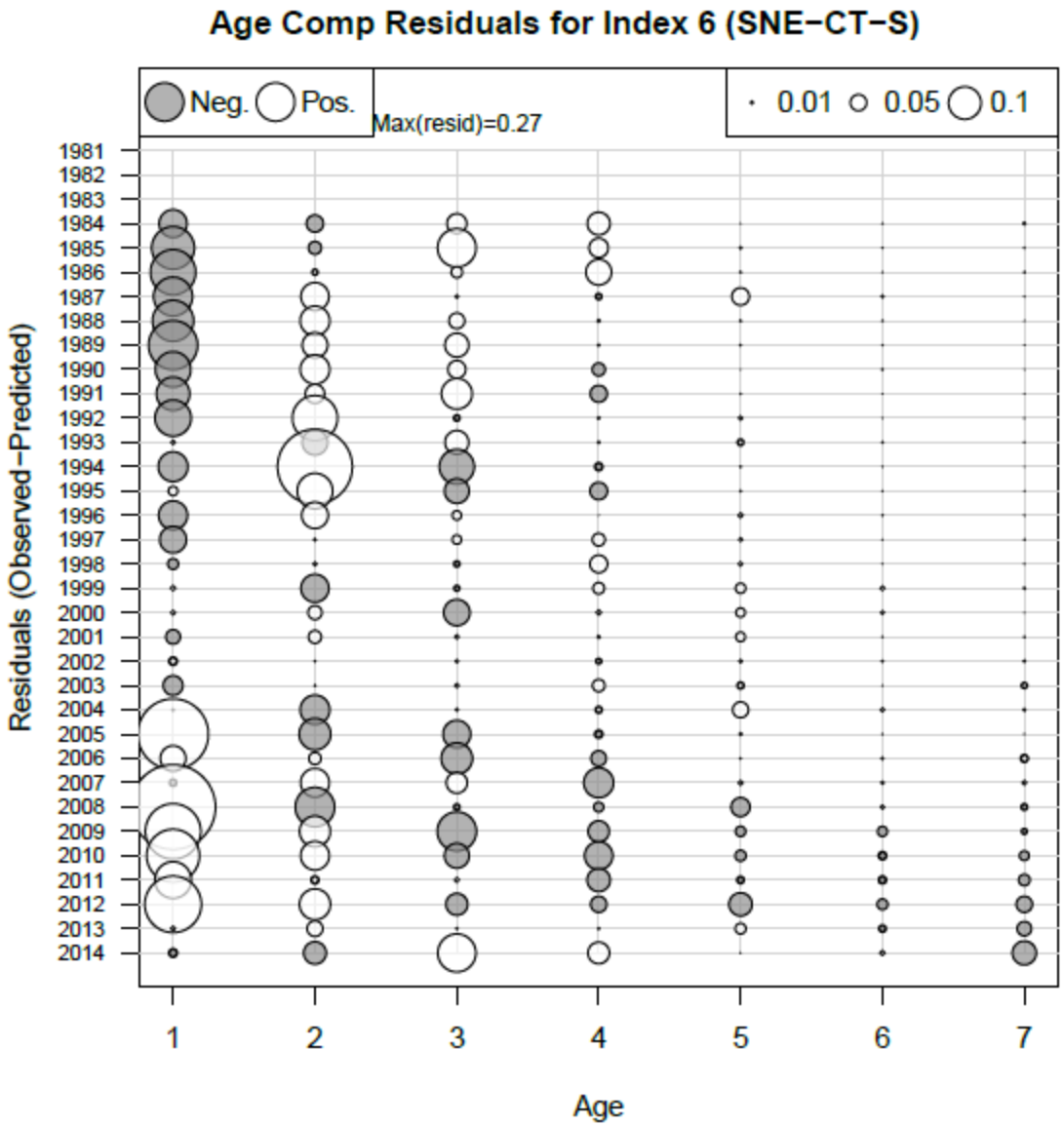
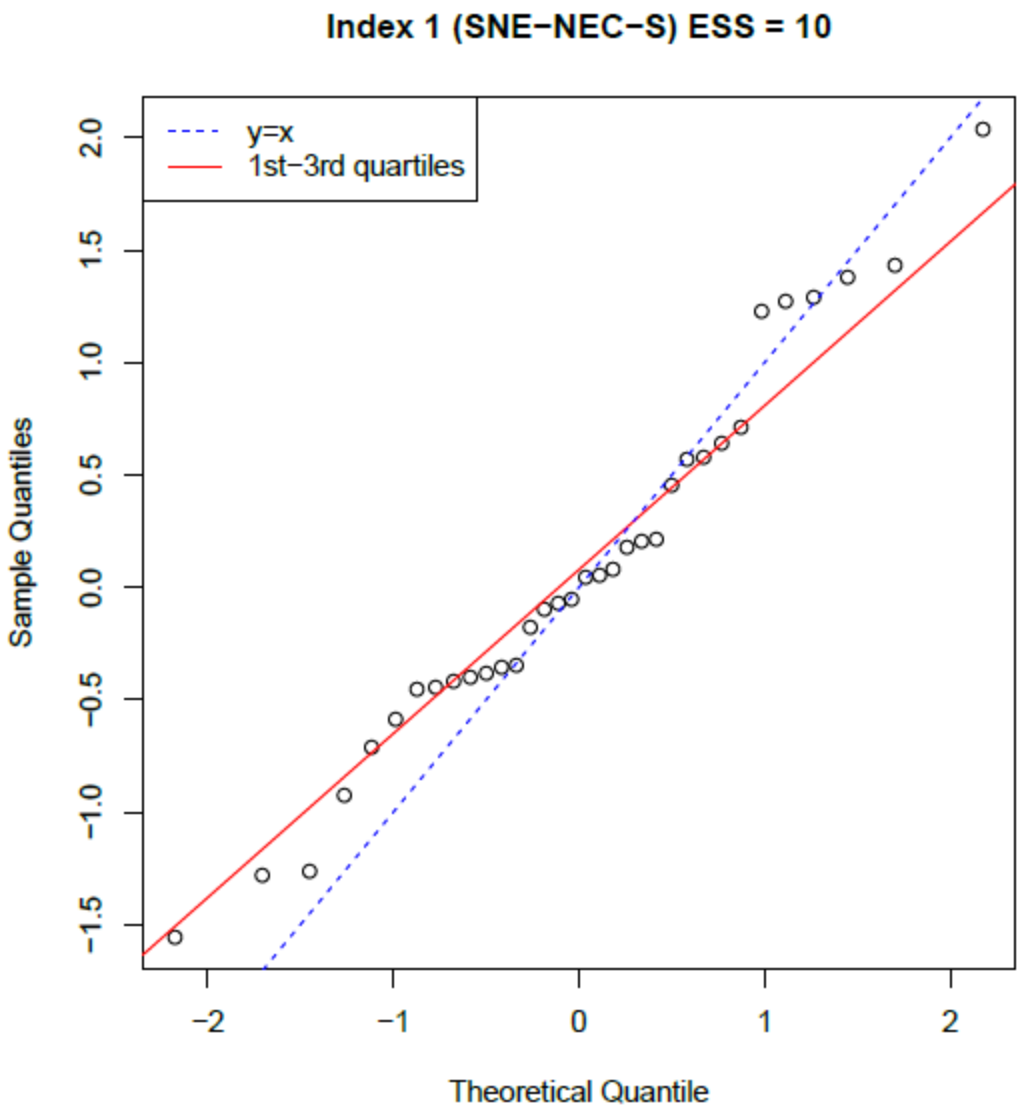
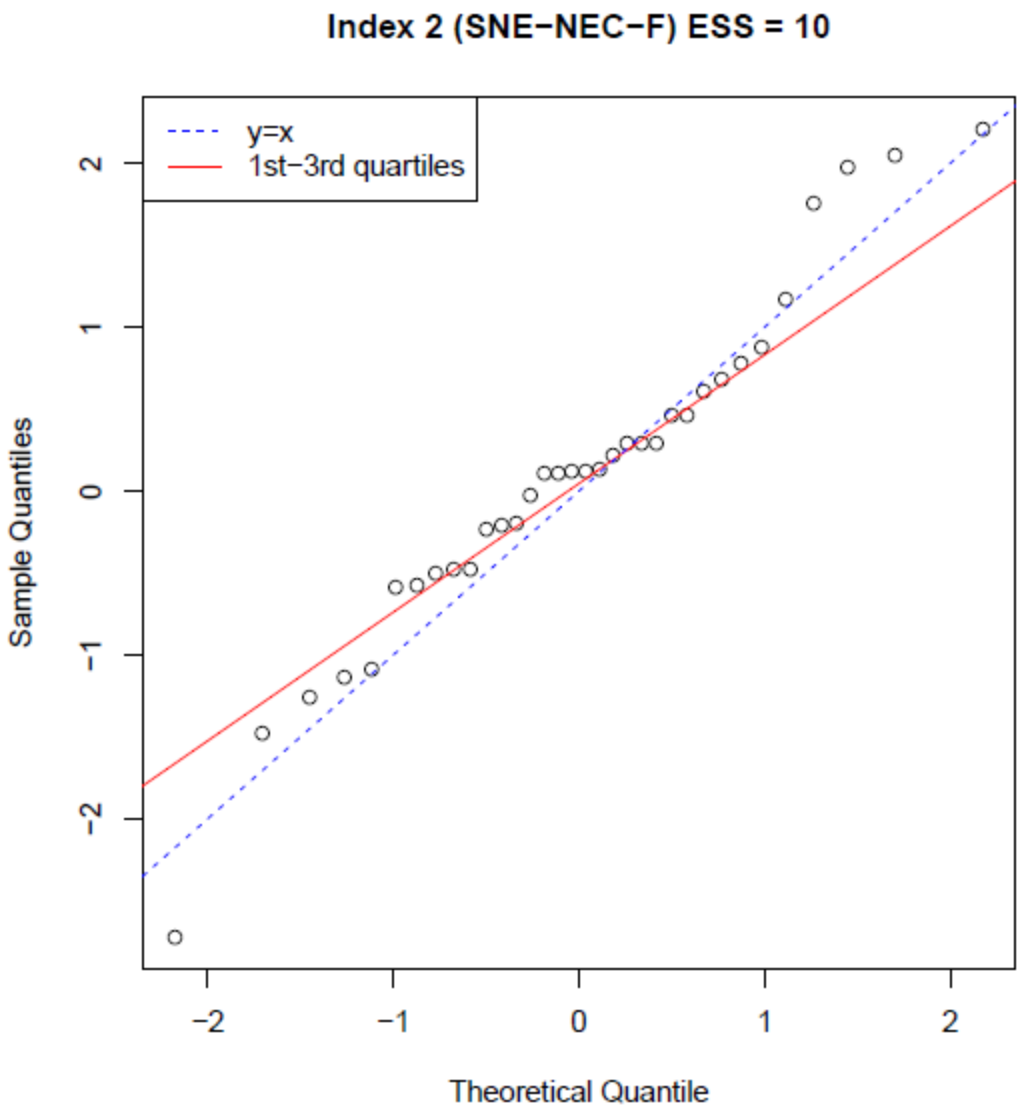
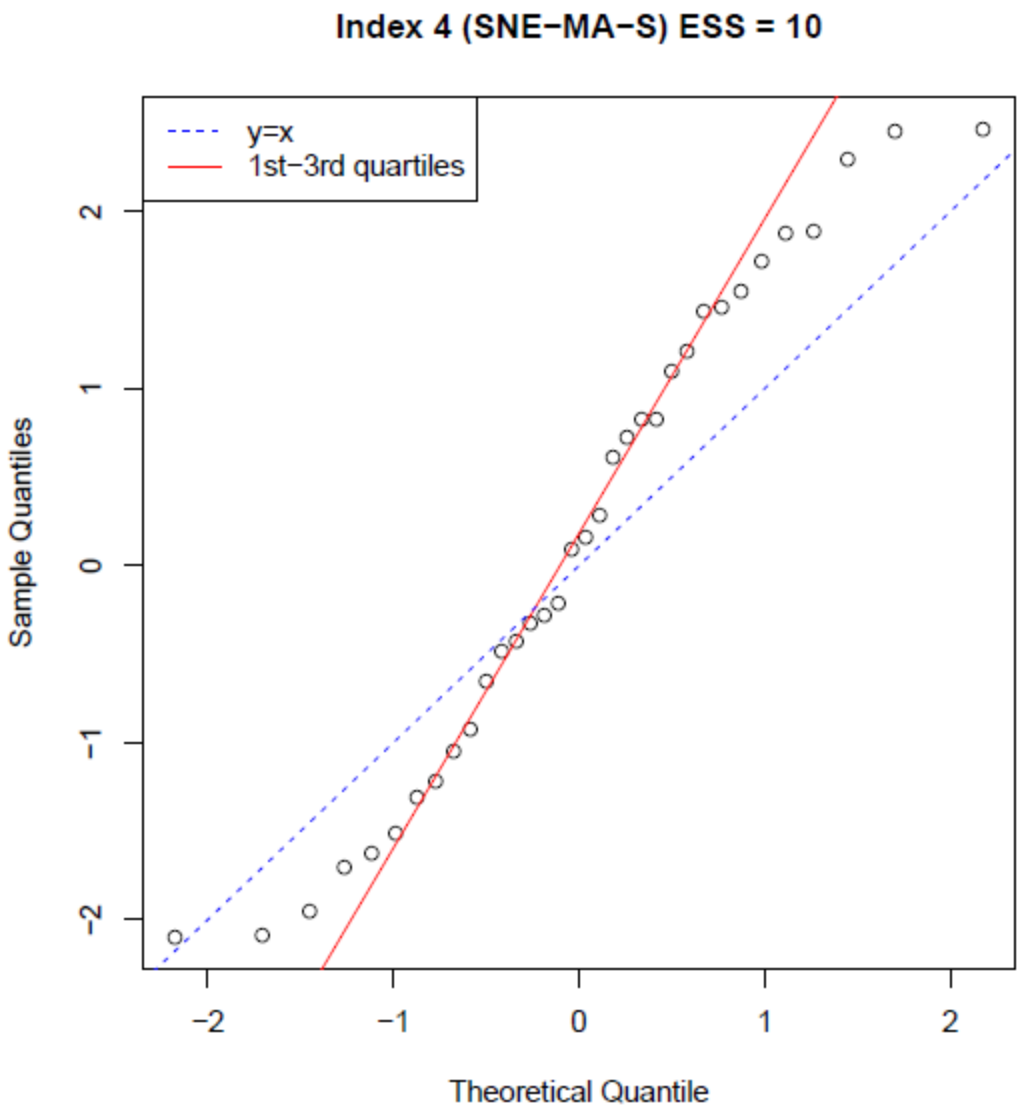
2012
2013
2014
1
2
3
4
5
6
7
Age

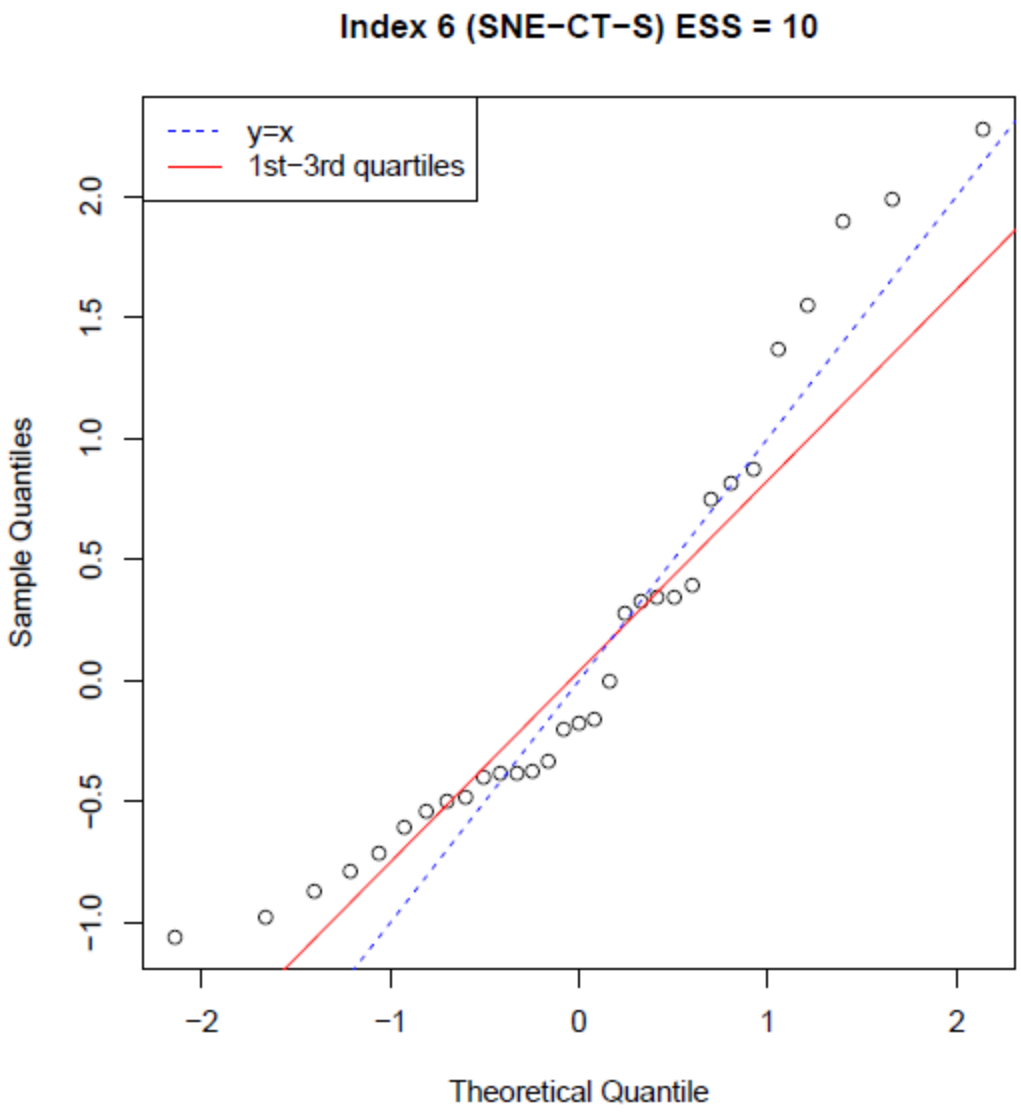

Age Comp Residuals for Index 4 (SNE−MA−S)
Neg.
Pos.
Max(resid)=0.3
0.01
0.05
0.1
Residuals (Observed−Predicted)
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
1
2
3
4
5
6
7
Age


Age Comp Residuals for Index 6 (SNE−CT−S)
Neg.
Pos.
Max(resid)=0.27
0.01
0.05
0.1
Residuals (Observed−Predicted)
1981
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
2013
2014
1
2
3
4
5
6
7
Age

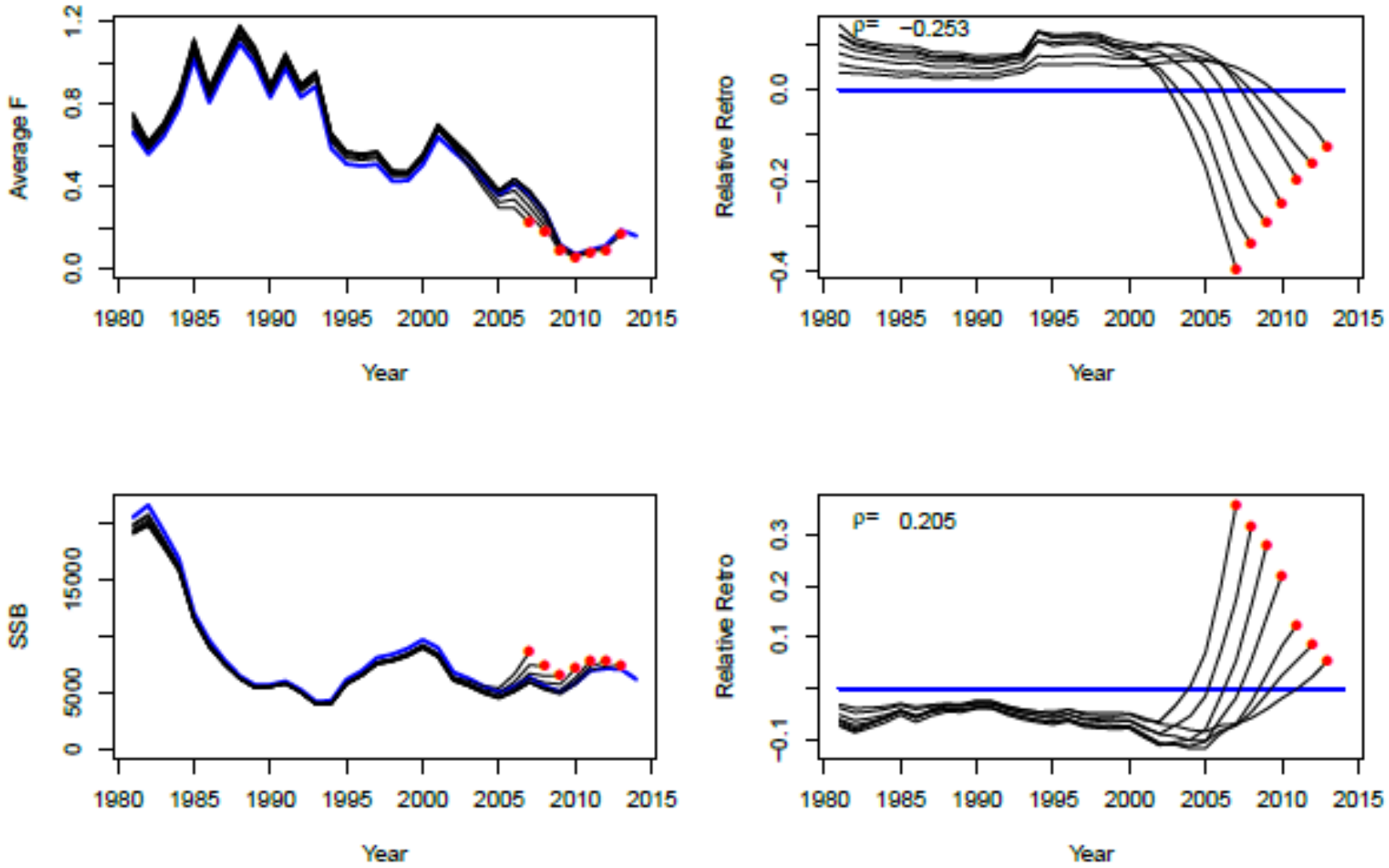

Index 1 (SNE−NEC−S) ESS = 10
y=x
1st−3rd quartiles
Sample Quantiles
Theoretical Quantile
−1.5
−1.0
−0.5
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2


Index 2 (SNE−NEC−F) ESS = 10
y=x
1st−3rd quartiles
Sample Quantiles
Theoretical Quantile
−2
−1
0
1
2


Index 4 (SNE−MA−S) ESS = 10
y=x
1st−3rd quartiles
Sample Quantiles
Theoretical Quantile
−2
−1
0
1
2


Index 6 (SNE−CT−S) ESS = 10
y=x
1st−3rd quartiles
Sample Quantiles
Theoretical Quantile
−1.0
−0.5
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2

Results: Retrospective bias



- Retrospective bias has decreased in both F and SSB

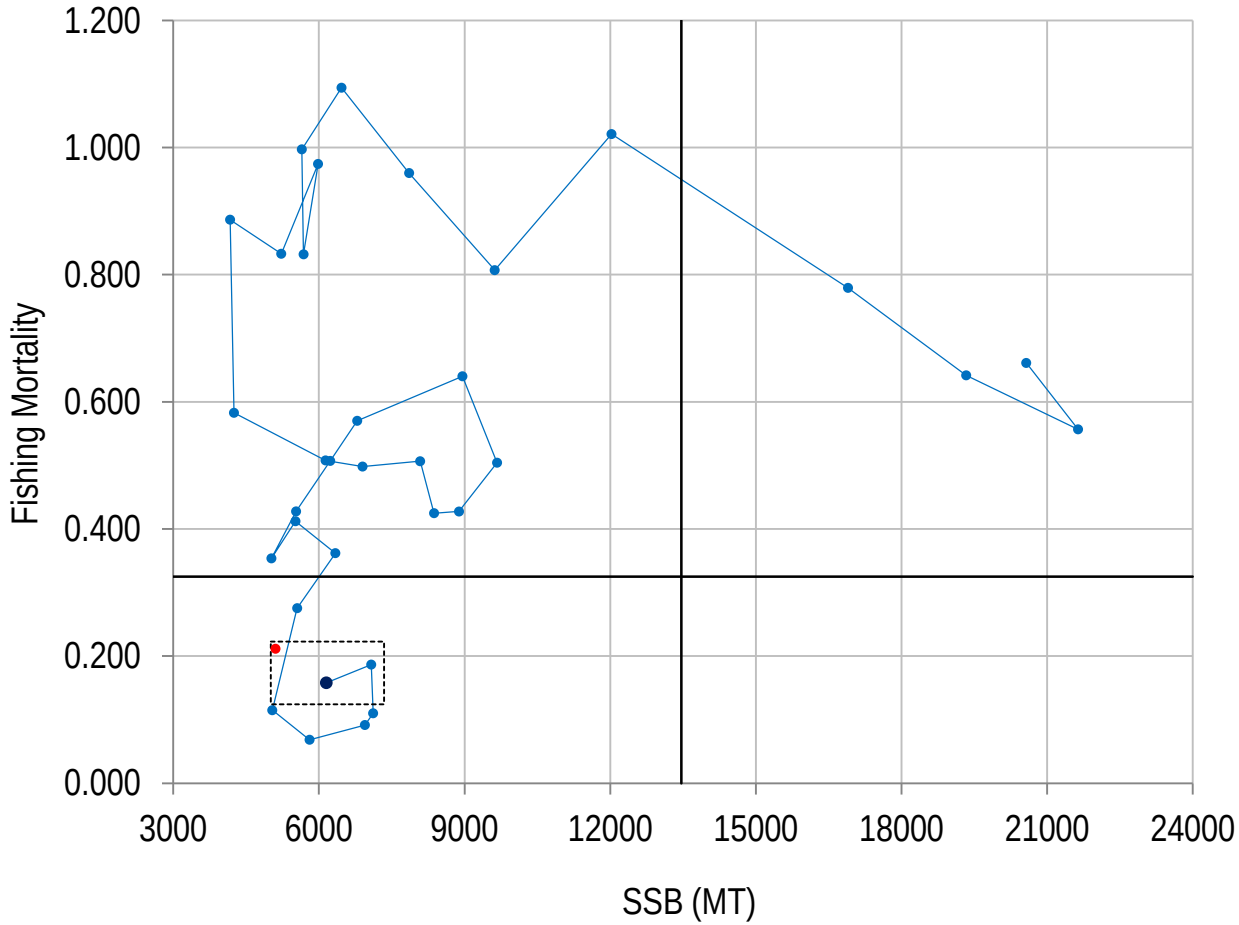
SARC52 Reference Points: Beverton-Holt SR

- SARC52 Status Evaluation: Overfished, not overfishing
- F2010 = 0.051, SSB2010 = 7,076 mt
- FMSY = 0.290 (Fthreshold)
- SSBMSY = 43,661 mt (Btarget)
- ½ SSBMSY = 21,831 mt (Bthreshold)
- MSY = 11,728 mt
- F2010/Fthreshold = 18%, SSB2010/Btarget = 16%
- SSB2010/Bthreshold = 32%

2015 update Reference Points: Beverton-Holt SR

- F2014 = 0.16, SSB2014 = 6,151 mt
- FMSY = 0.325 (Fthreshold)
- SSBMSY = 26,928 mt (Btarget)
- ½ SSBMSY = 13,464 mt (Bthreshold)
- MSY = 11,728 mt
- F2014/Fthreshold = 49%, SSB2014/SSBtarget = 46%
- SSB2014/SSBthreshold = 23%

Current Stock Status



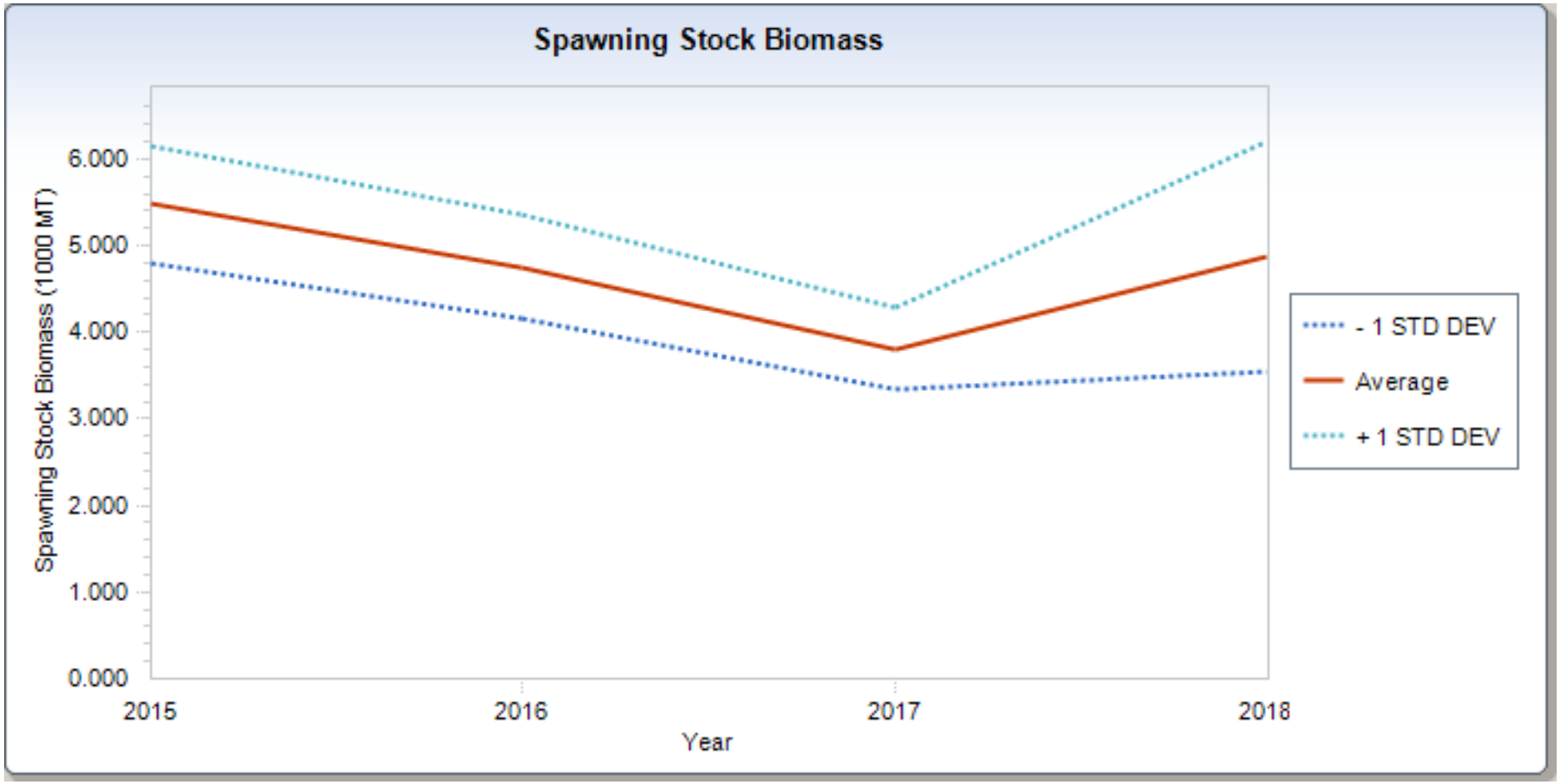
- Status unchanged: Overfished, overfishing not occurring
- Minor retrospective bias, no adjustment made

Projection at FMSY (0.325), 2015 catch = 717 MT

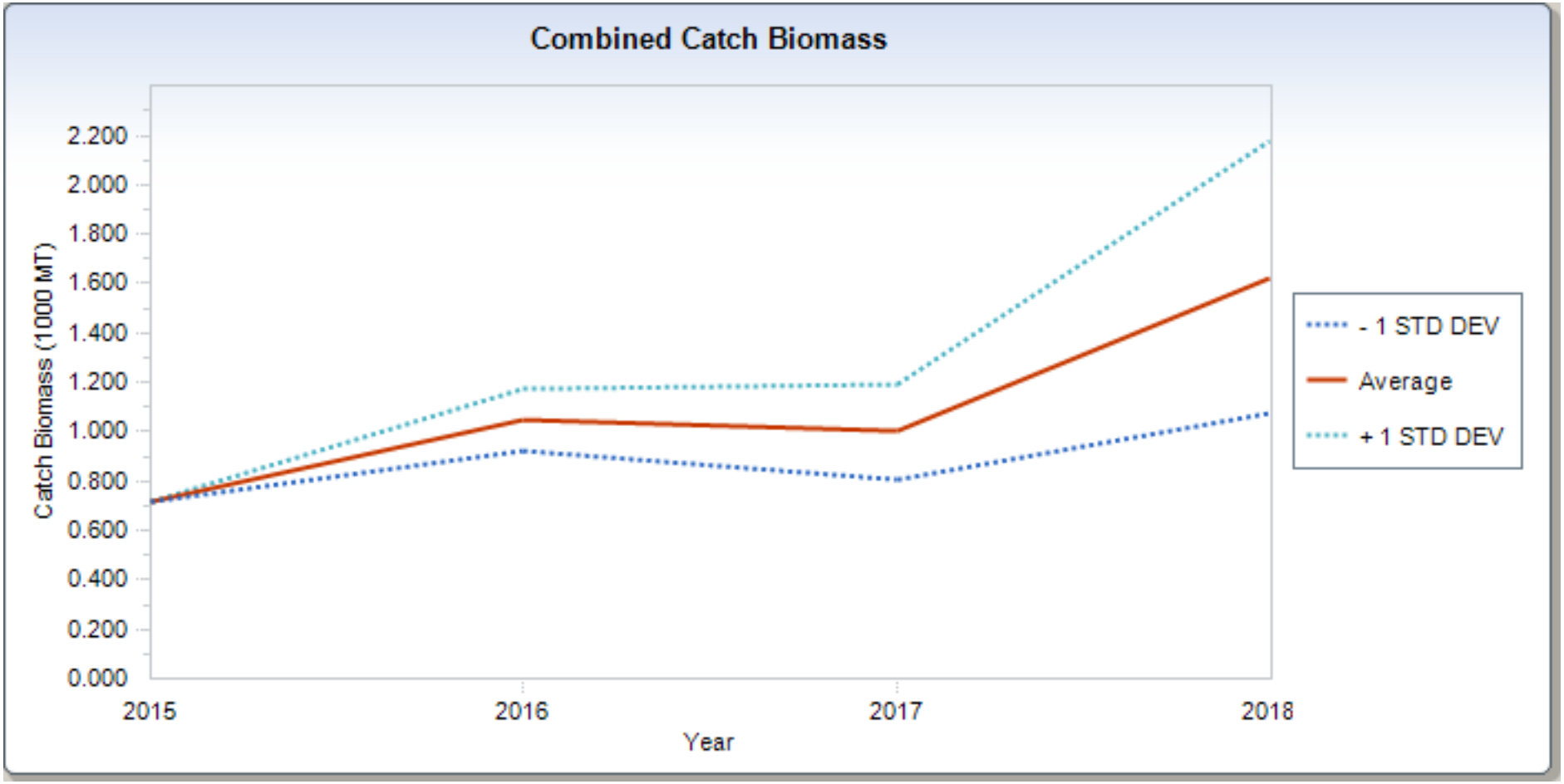
Table 3: Short term projections of total fishery catch and spawning stock biomass for Southern New England Mid-Atlantic Winter Flounder based on a harvest scenario of fishing at F_{MSY} between 2016 and 2018. Catch in 2015 was assumed to be 717 (mt), a value provided by GARFO (Dan Caless pers. comm.). 90% CI are shown next to SSB estimates.

Year	Catch (mt)	SSB (mt)	F_{Full}
2015	717	5,439 (4,423 - 6,607)	0.183
2016	1,041	4,732 (3,827 - 5,774)	0.325
2017	973	3,782 (3,057 - 4,645)	0.325
2018	1,515	4,612 (3,267 - 7,339)	0.325

Projection at FMSY (0.325), 2015 catch = 717 MT



Projection at FMSY (0.325), 2015 catch = 717 MT



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

Research Needs

- Additional studies on maximum age
- Additional sources for maturity information
- Investigation into localized stock structure and genetics
- Incorporate environmental influence on S-R recruitment relationship and survey catchability (ASAP4)