

**NOAA
FISHERIES**

**Southeast
Fisheries
Science Center**

Gulf Menhaden Assessment Update

October 20, 2021
Dr. Amy M. Schueller

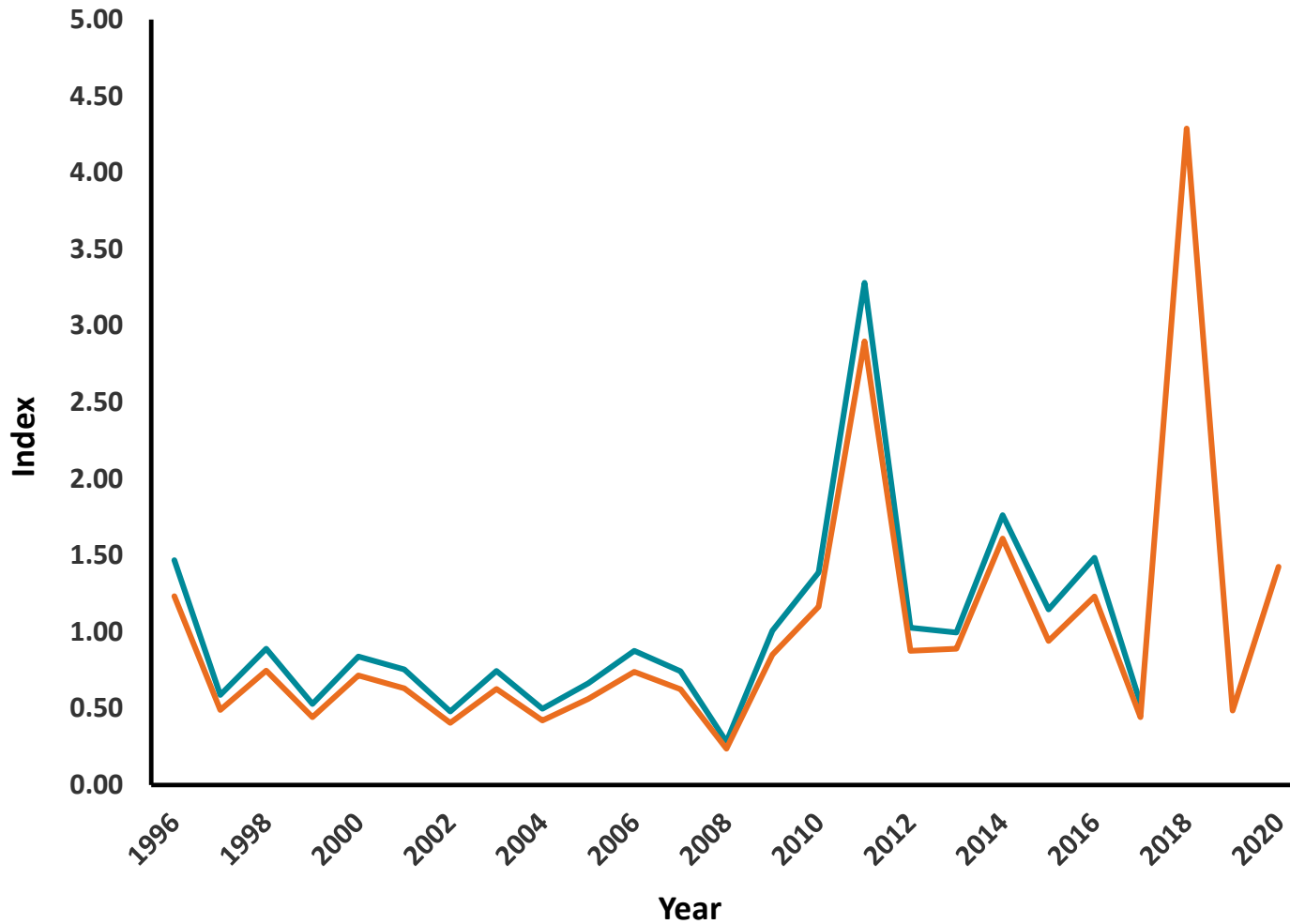
Outline

- Data used
- Base run results
 - Stock status
 - Phase plot
- Sensitivity analysis
 - EwE based natural mortality

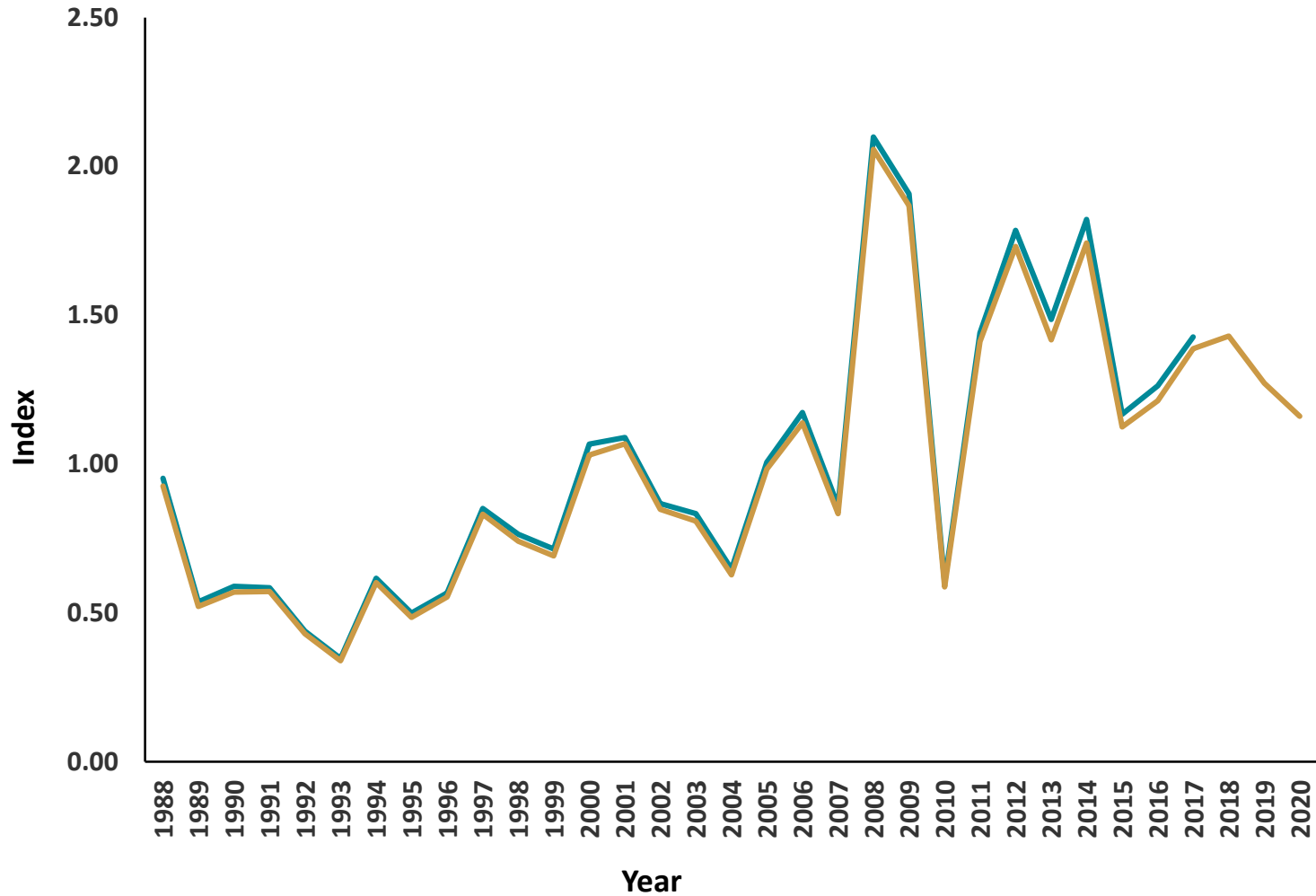
Data included in current model

- Commercial reduction landings [bait and MRIP]
- Commercial reduction age compositions
- 2 indices – LA gill net and seine
- LA gill net length compositions
- Life history information
 - Lorenzen M scaled to tagging data
 - Weights at age for population and fishery
 - Fecundity, maturity, sex ratio

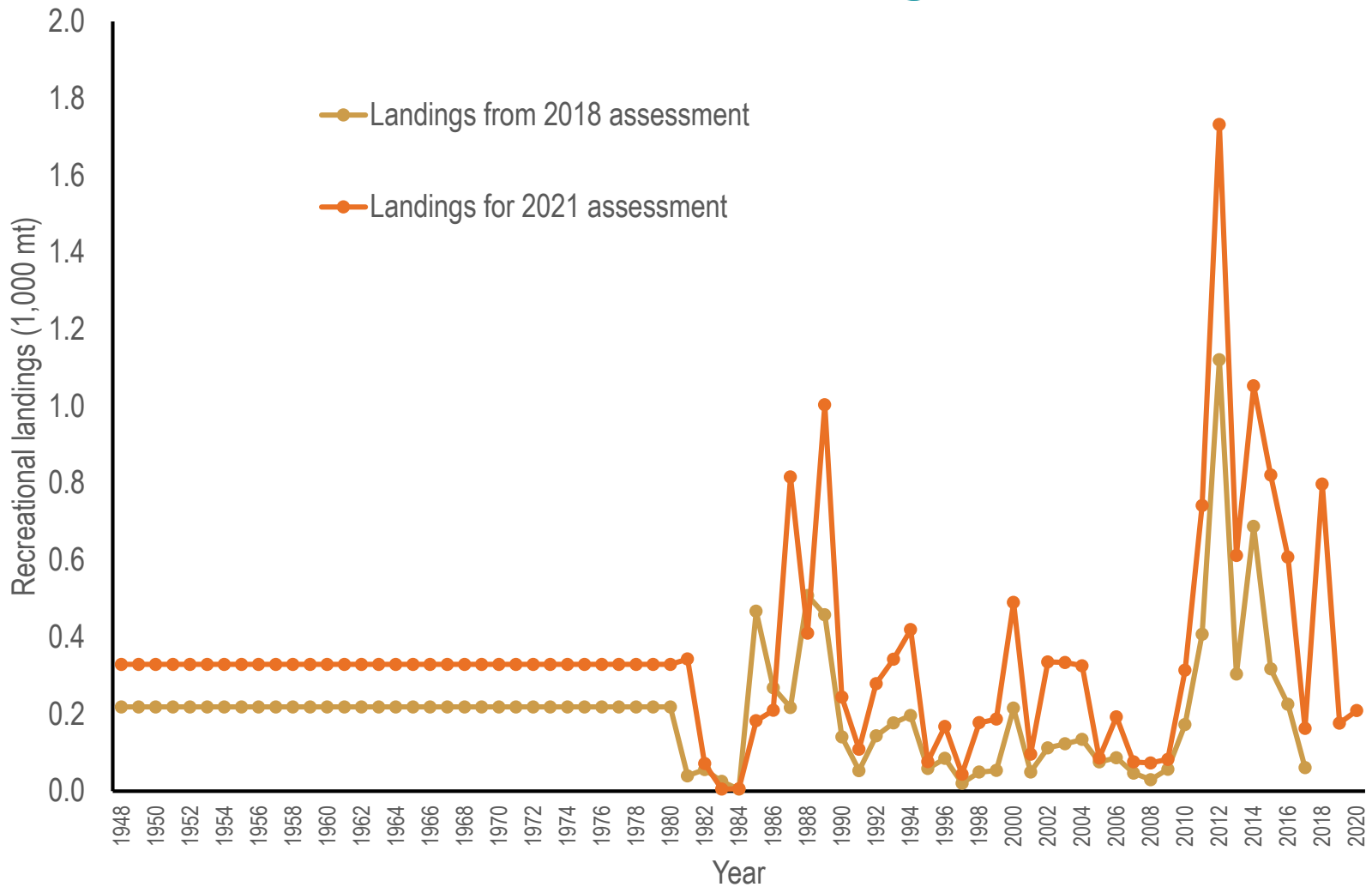
Updated seine index



Updated gill net index



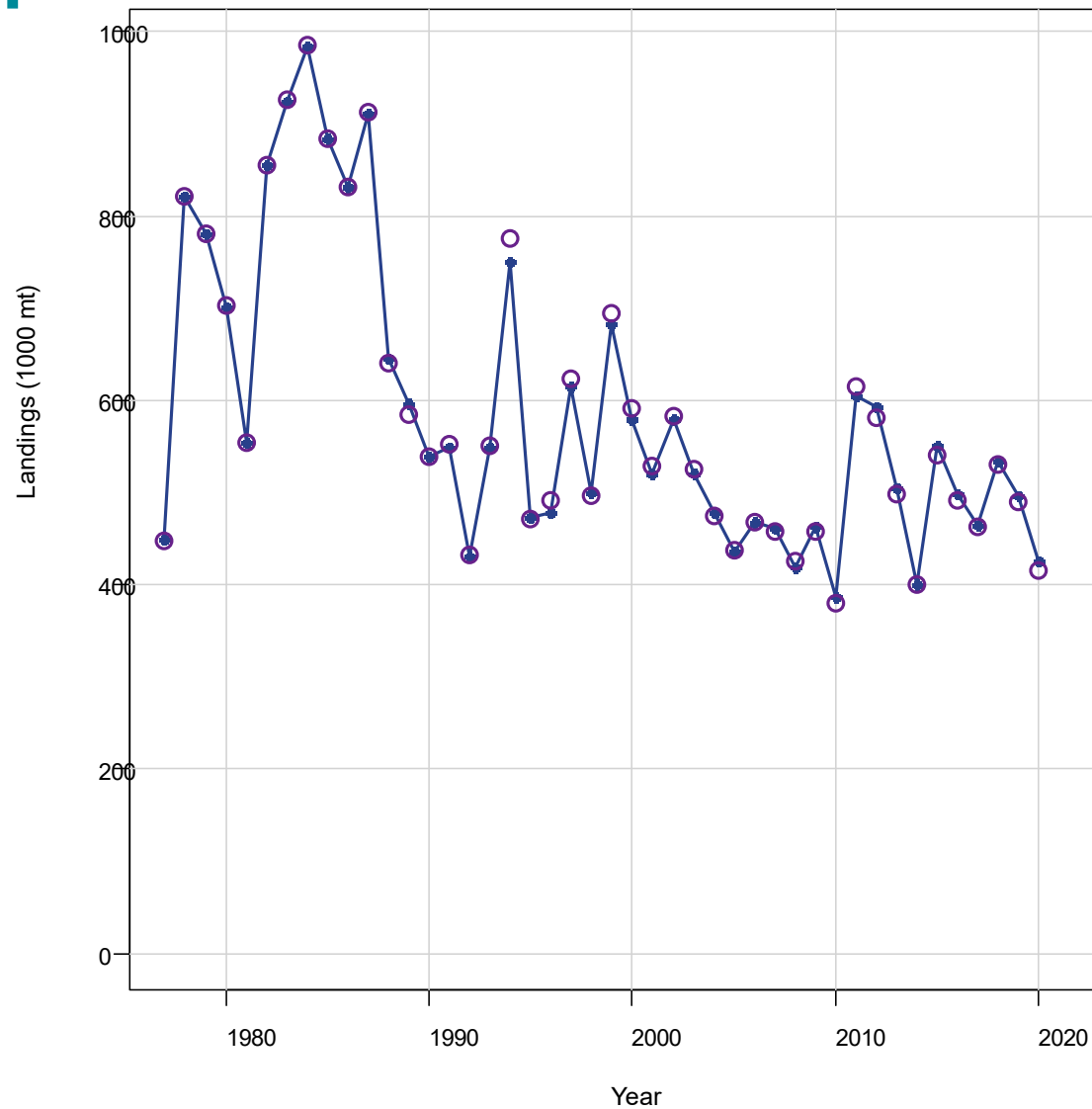
Updated recreational landings



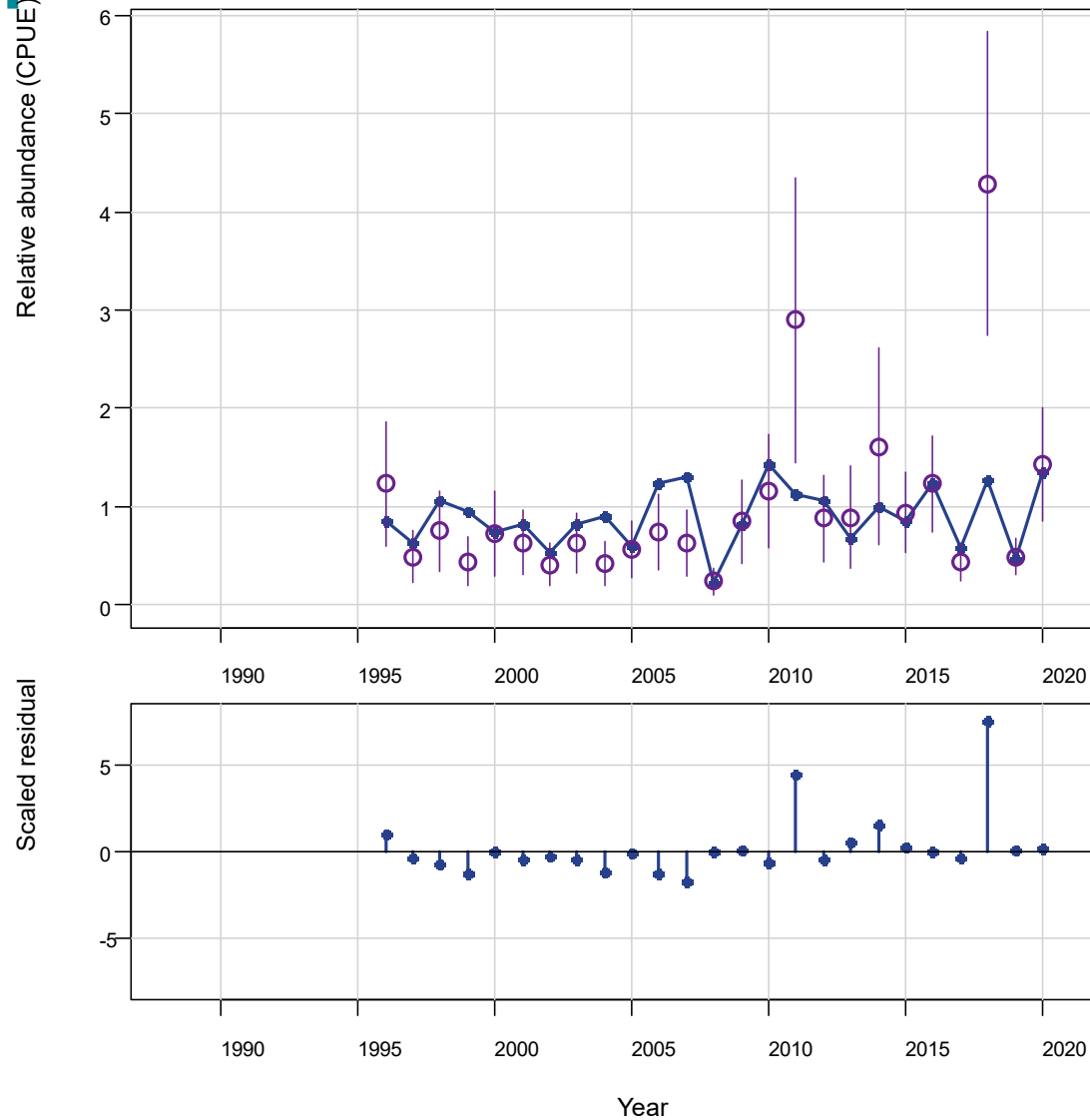
Model structure

- BAM [Beaufort Assessment Model] – SCAA model
- 1977-2020 (Jan 1 to Dec 31; annual time step)
- Ages 0 to 4+
- Landings data from 1977-2020
 - Age composition data 1977-2020
- LA gill net index 1988-2020 – July 1
 - Length composition data 1996-2020
- Seine (recruitment) index 1996-2020 – April 1

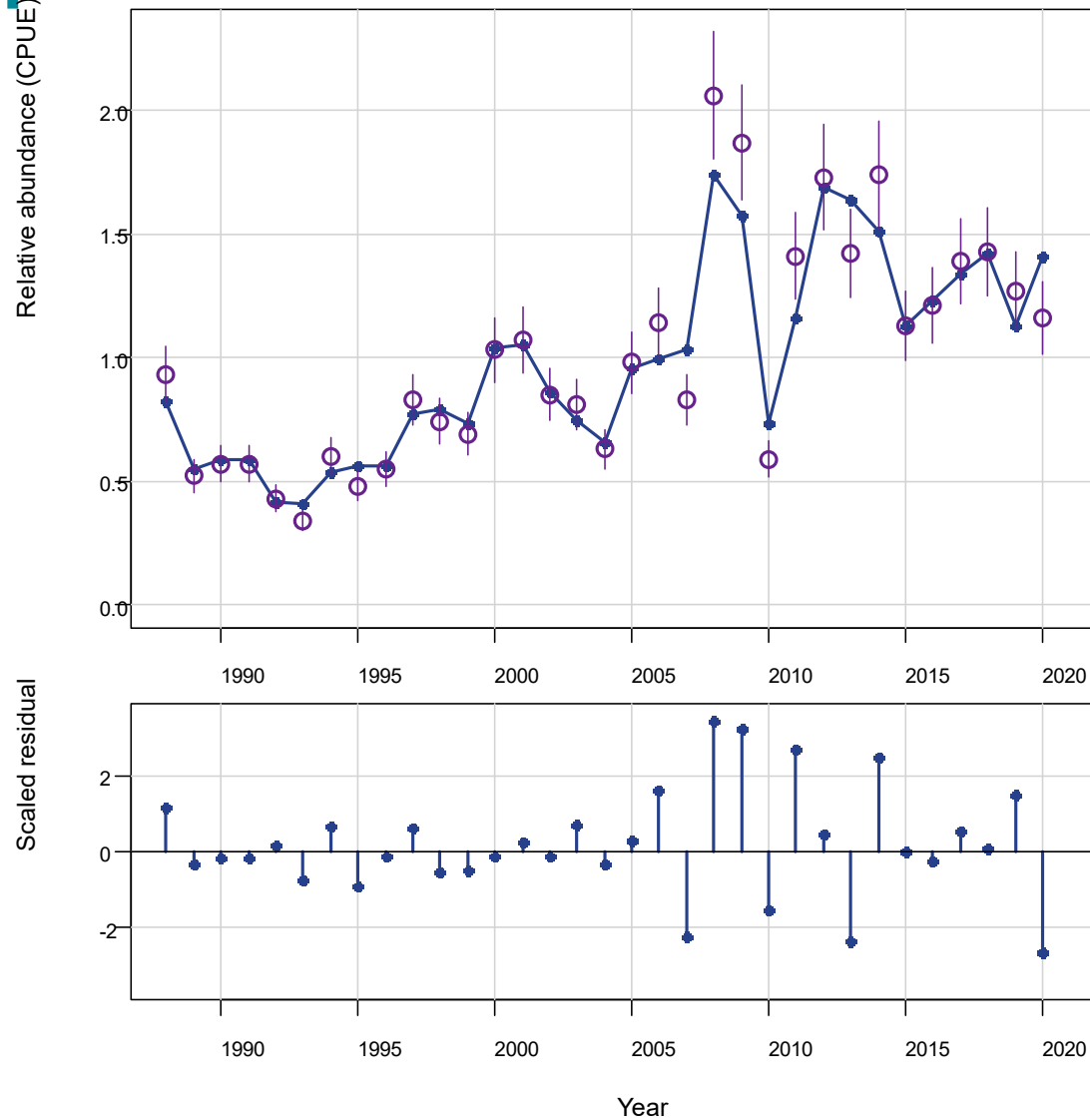
2021 Update assessment



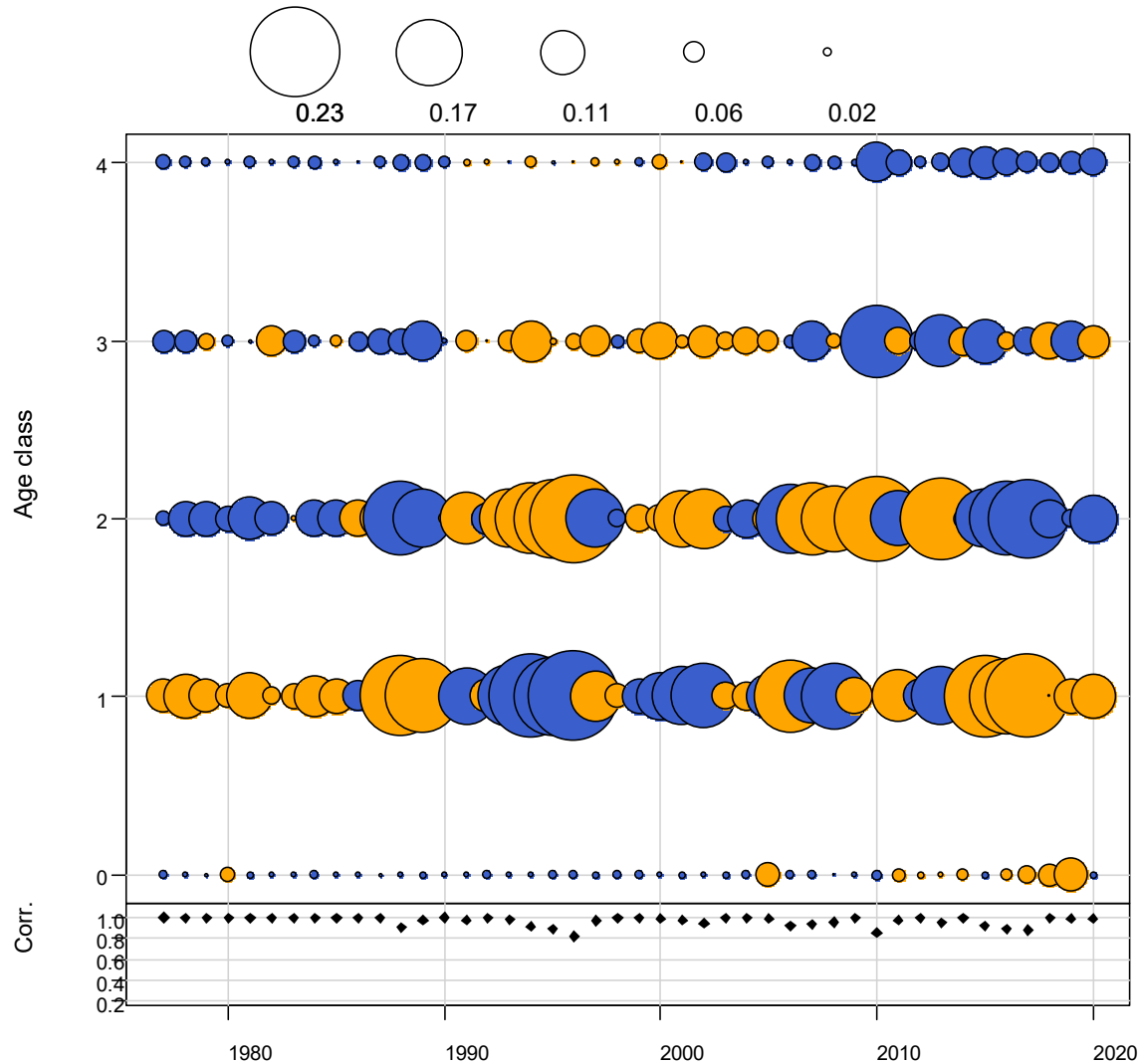
2021 Update assessment



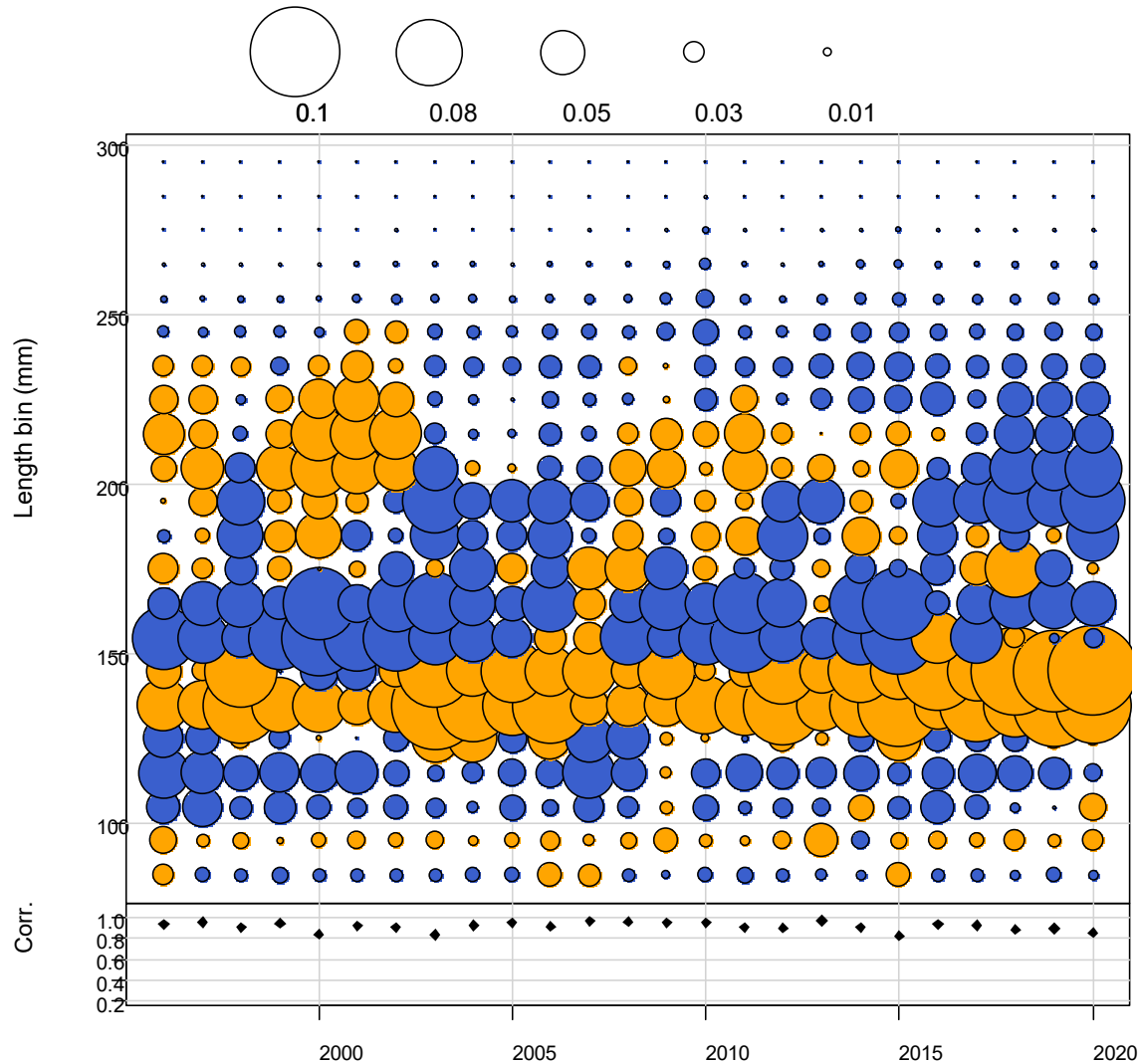
2021 Update assessment



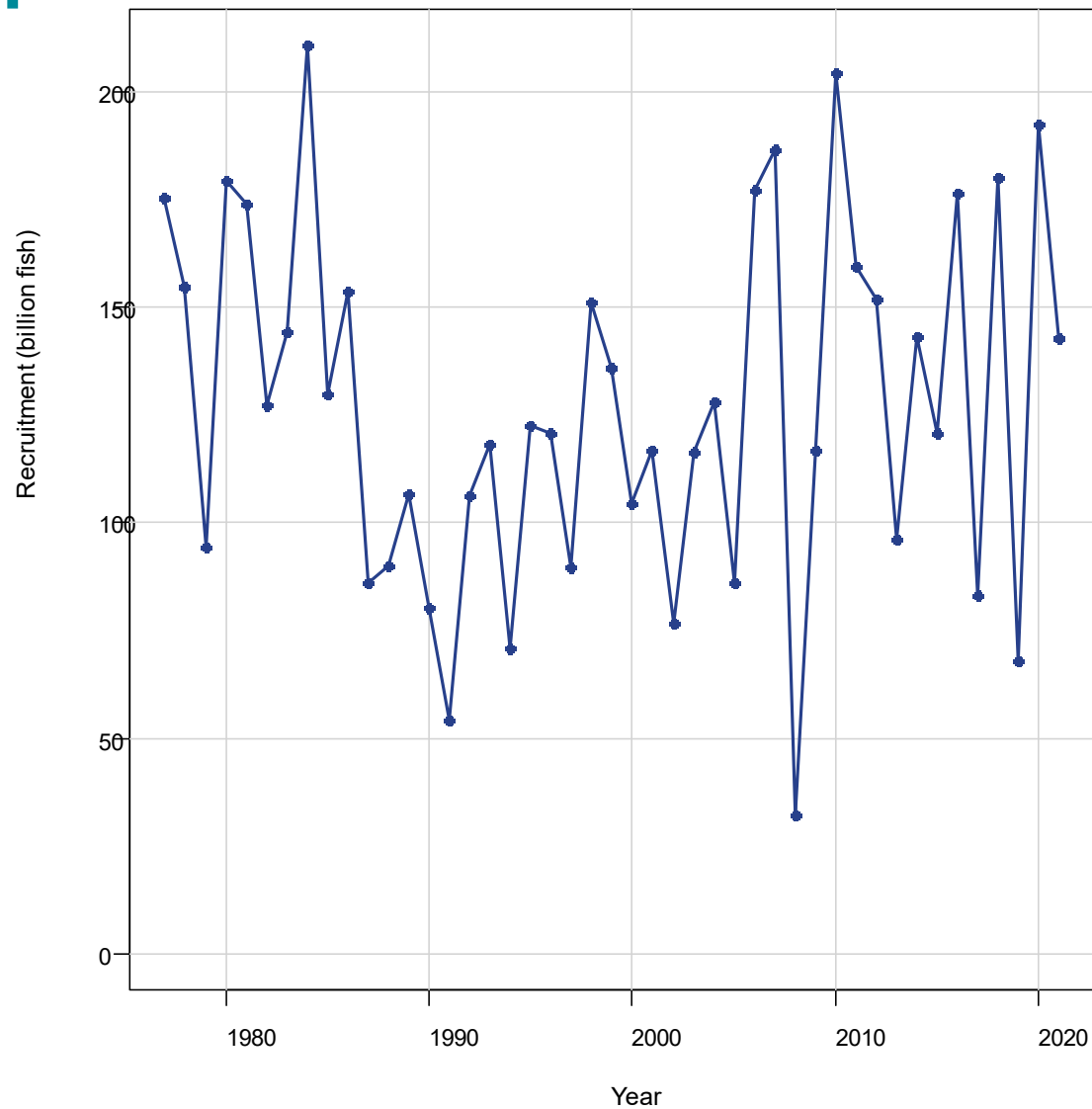
2021 Update assessment



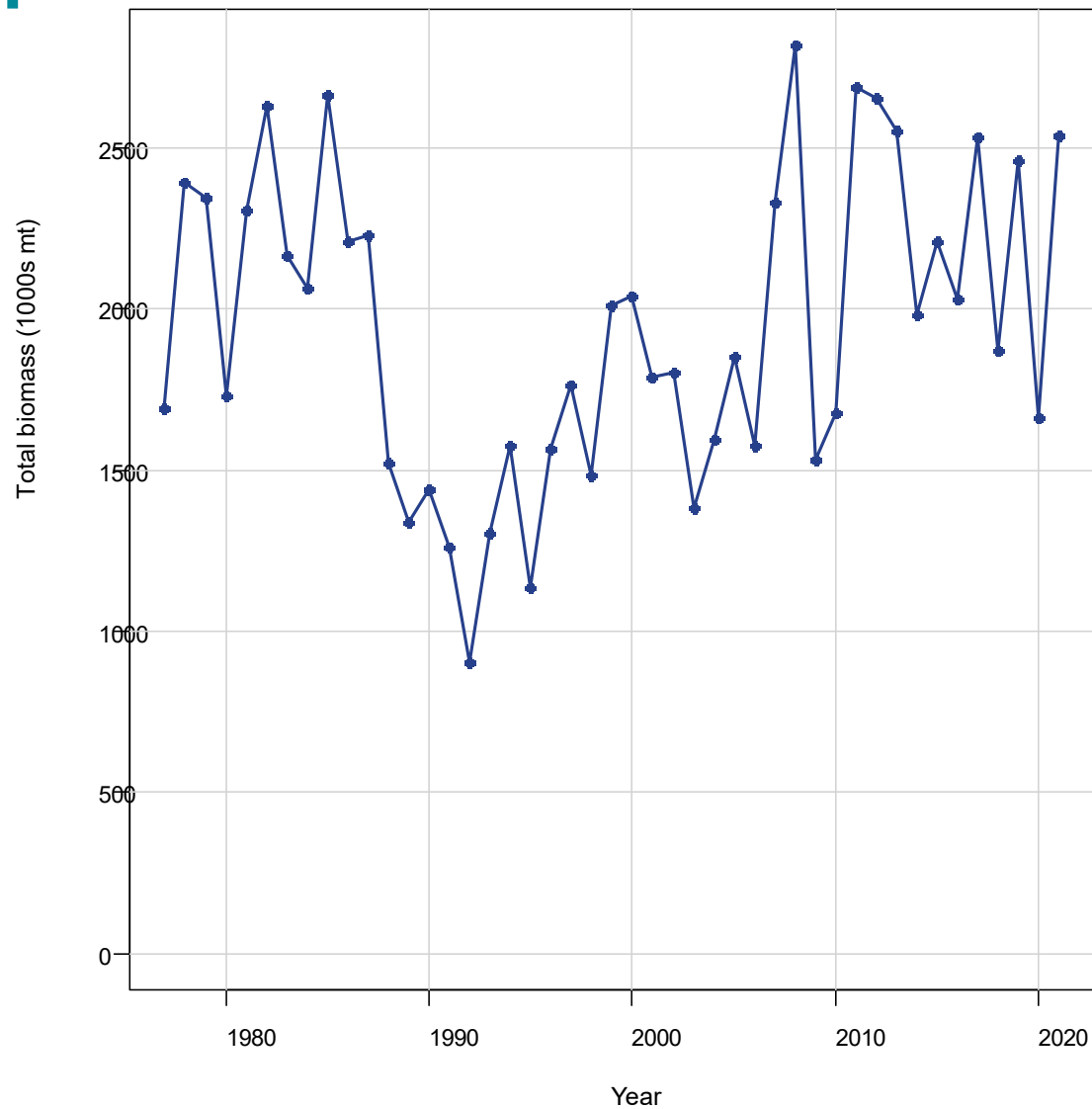
2021 Update assessment



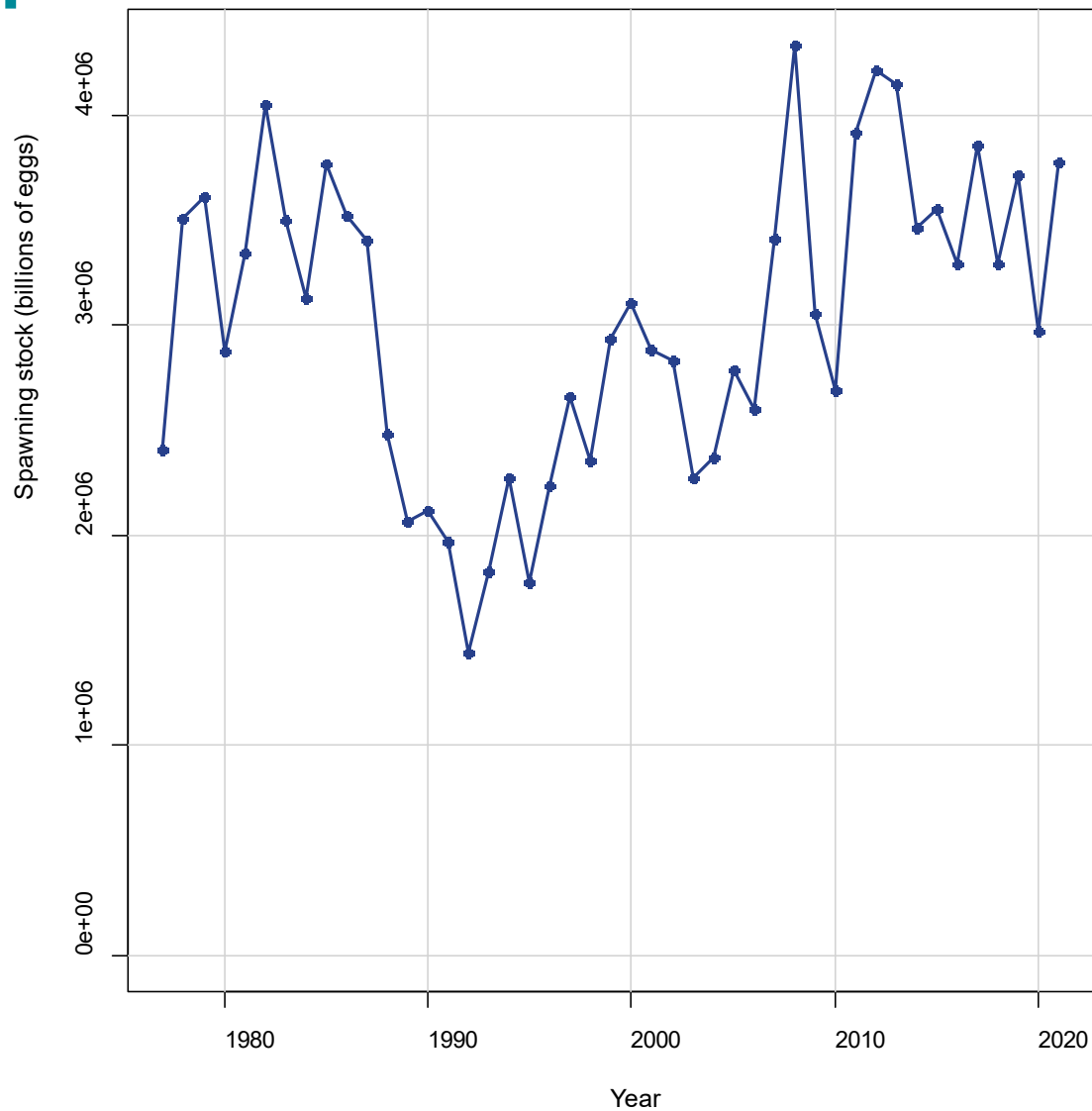
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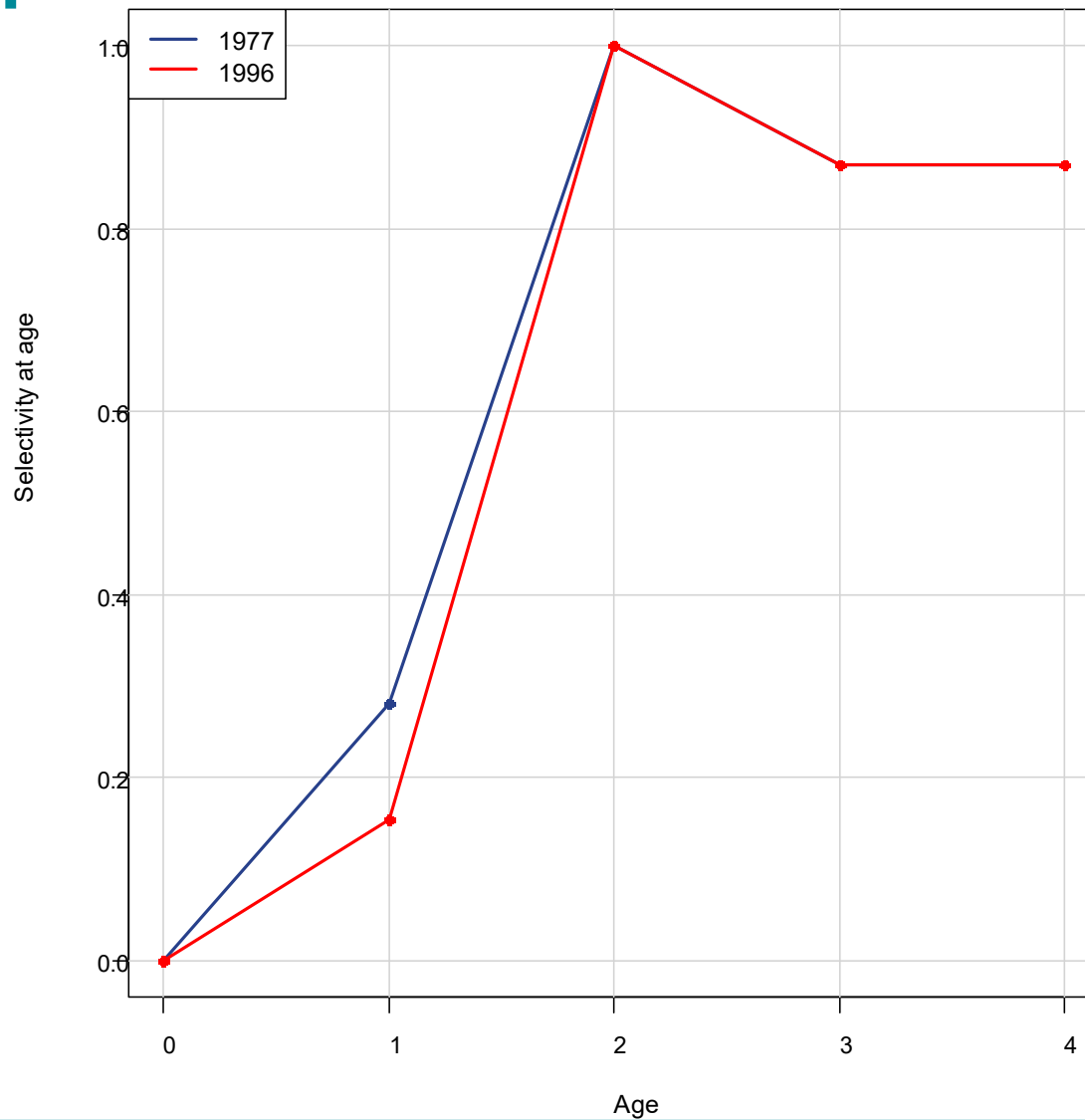
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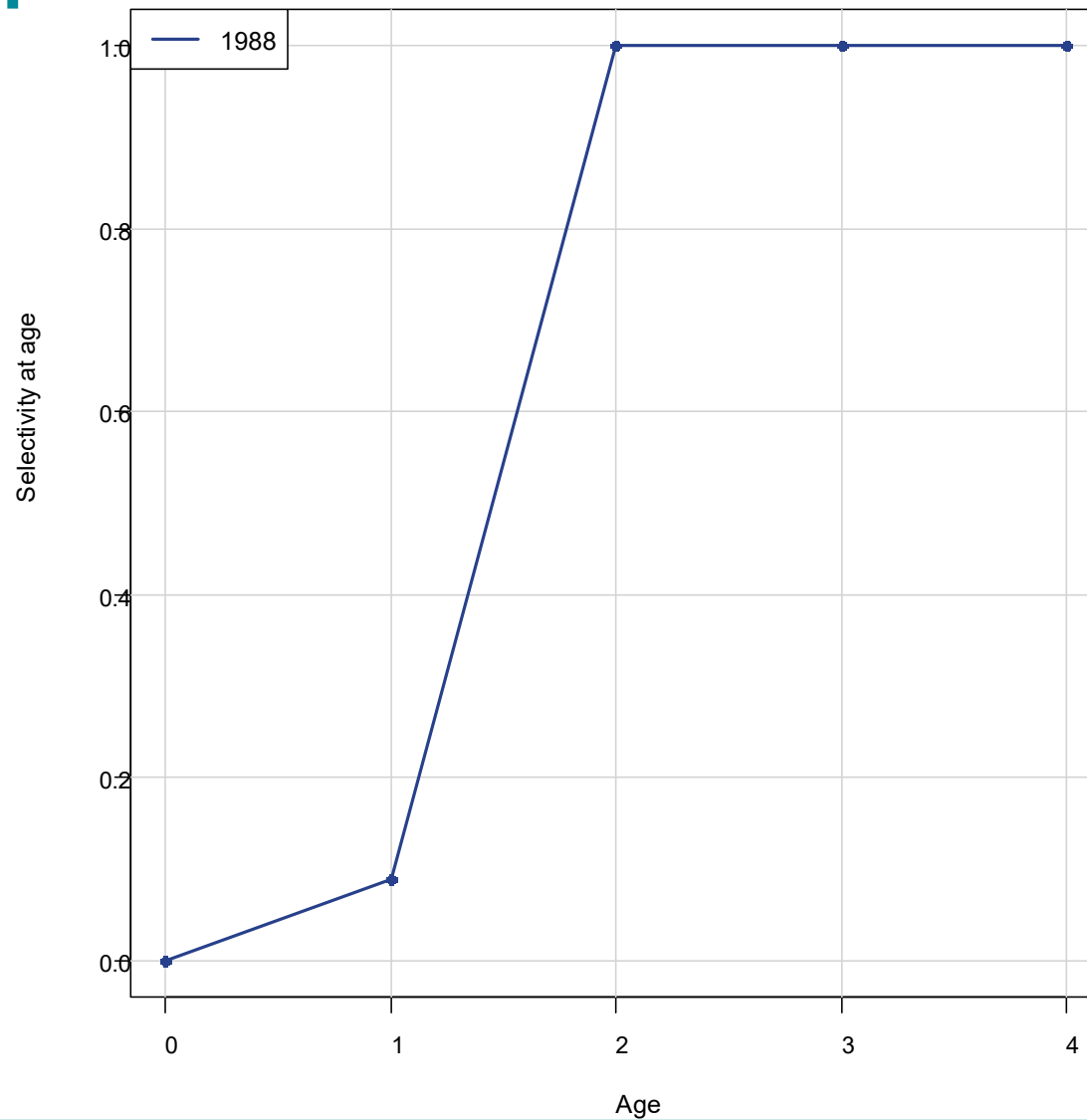
2021 Update assessment



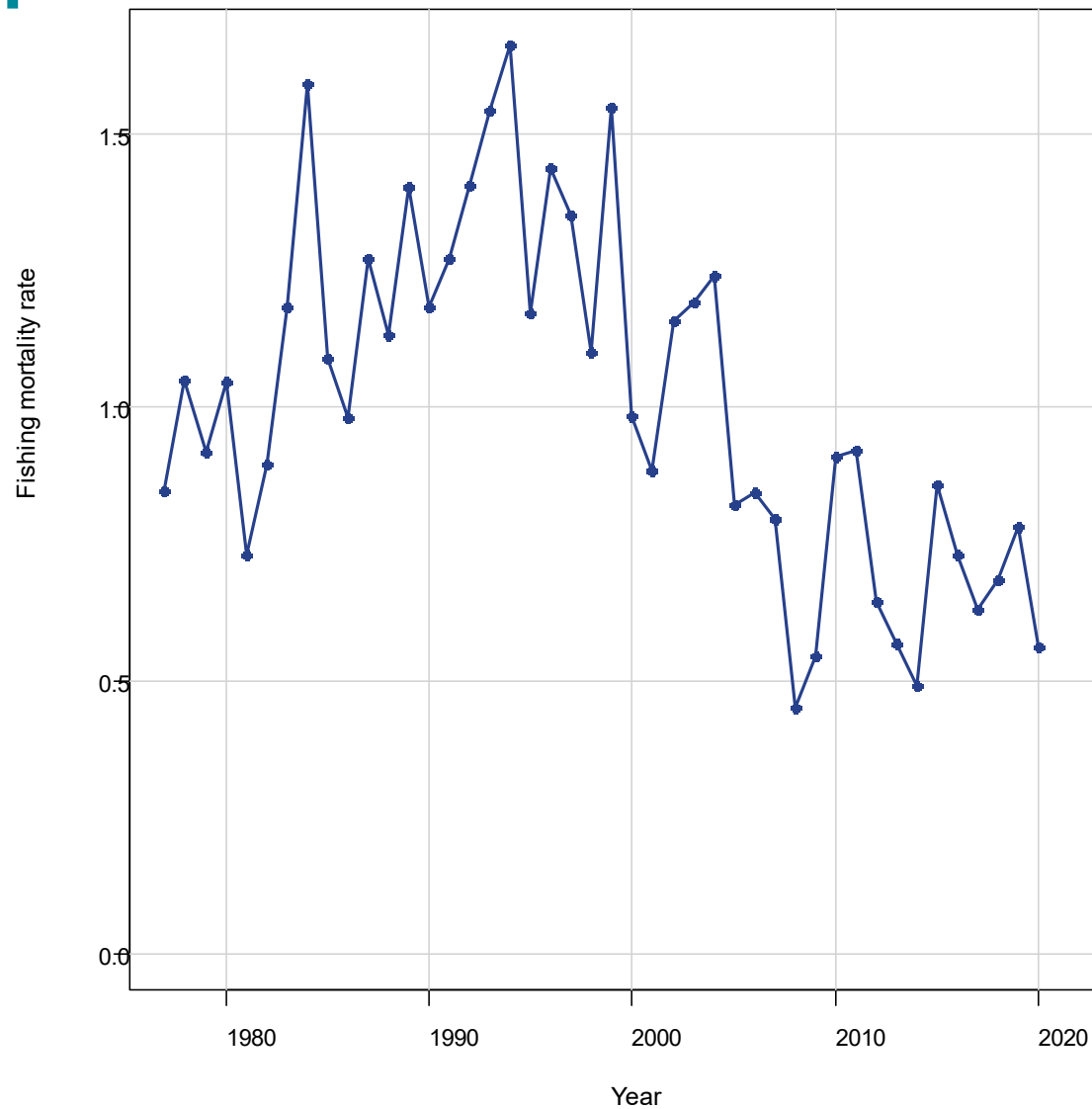
2021 Update assessment



2021 Update assessment



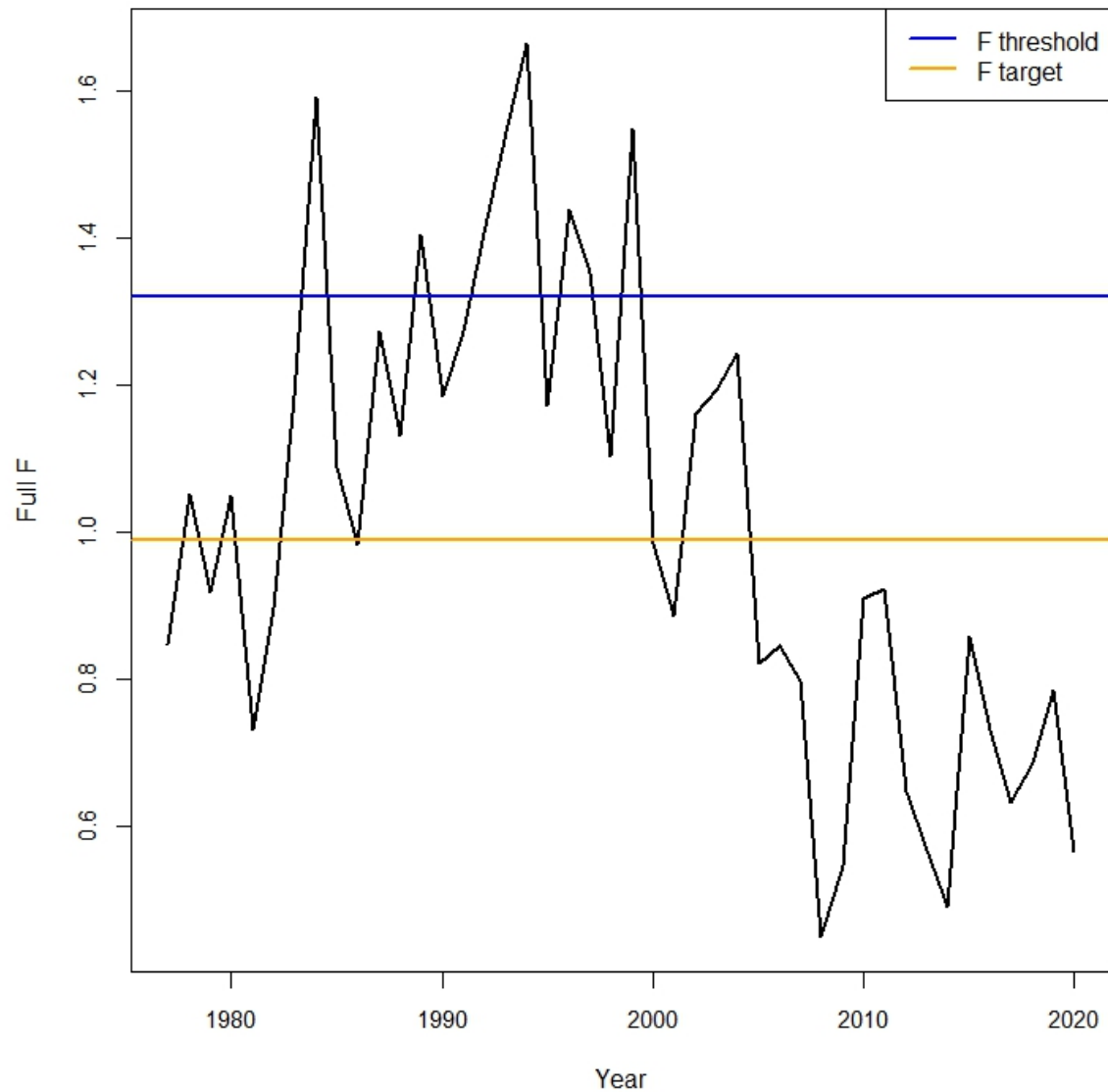
2021 Update assessment



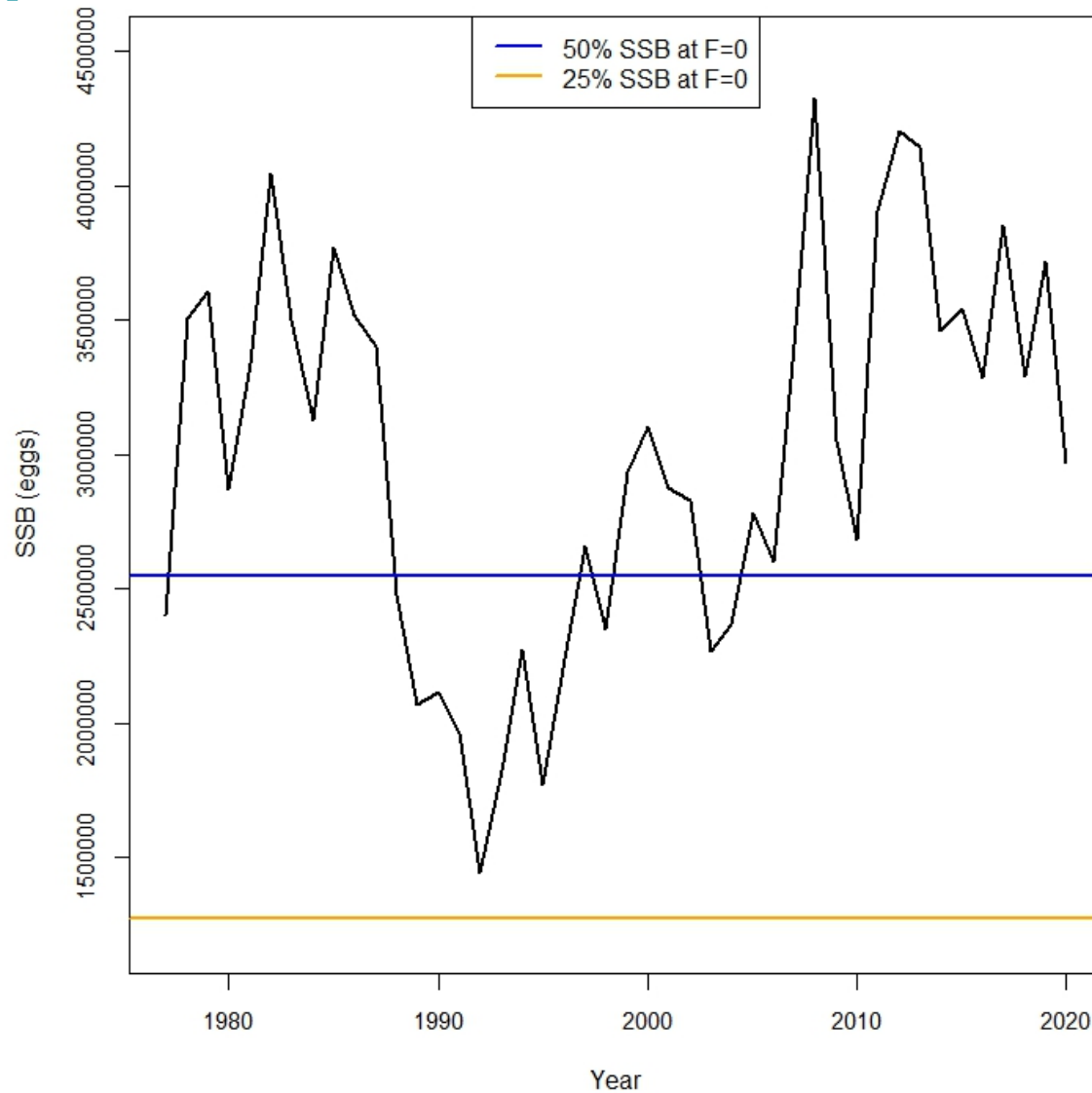
Benchmark or Reference Point definitions

- F based metrics
 - $F=M$ (threshold); $F=0.75M$ (target)
 - Geo mean of ages-0, -1 and -2
 - $F = 1.32$ (threshold) and $F = 0.75 \times 1.32 = 0.99$ (target)
- SSB based metrics
 - 25% (threshold) and 50% (target) of the equilibrium value of SSB when $F=0$

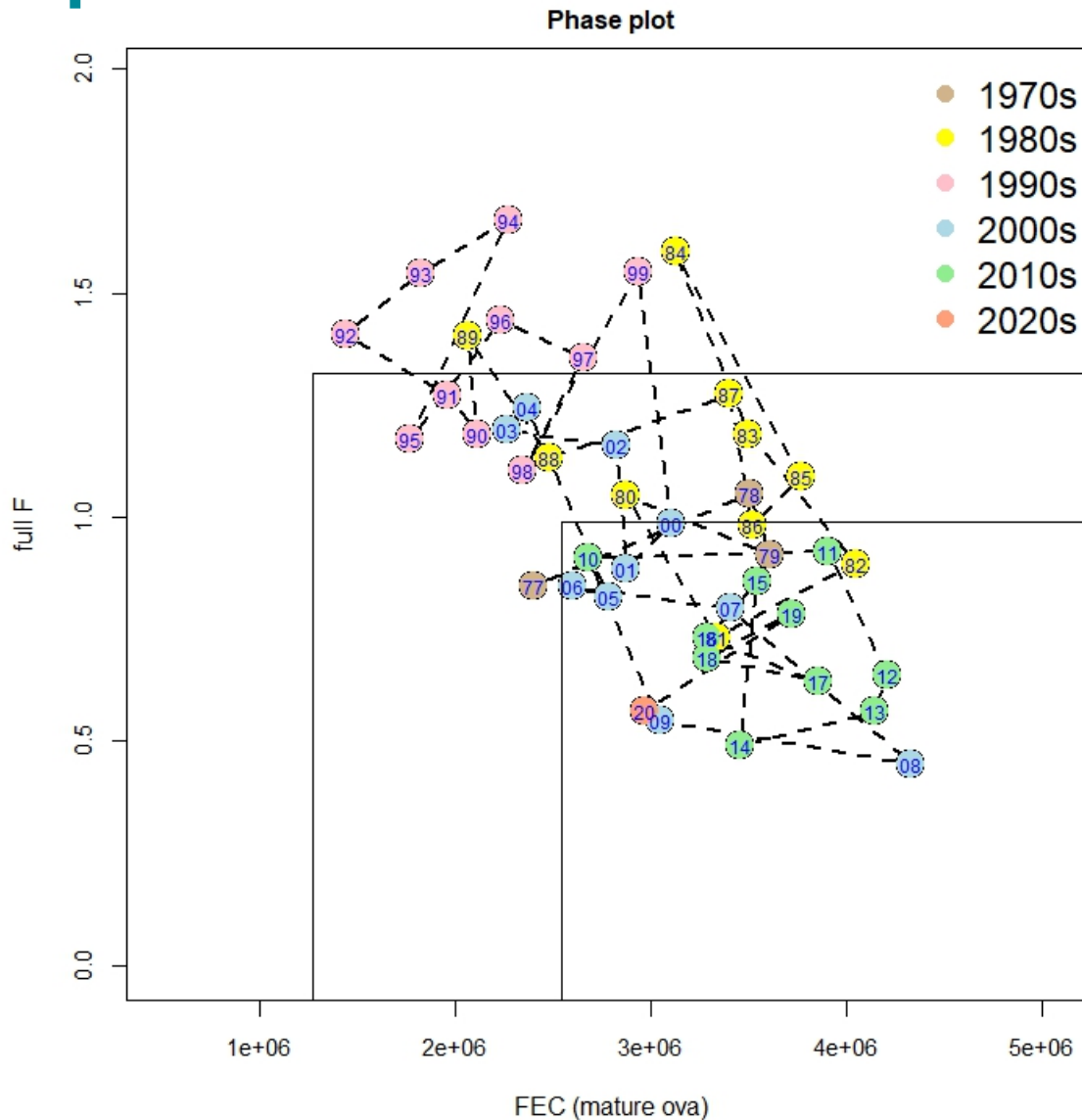
2021 Update assessment



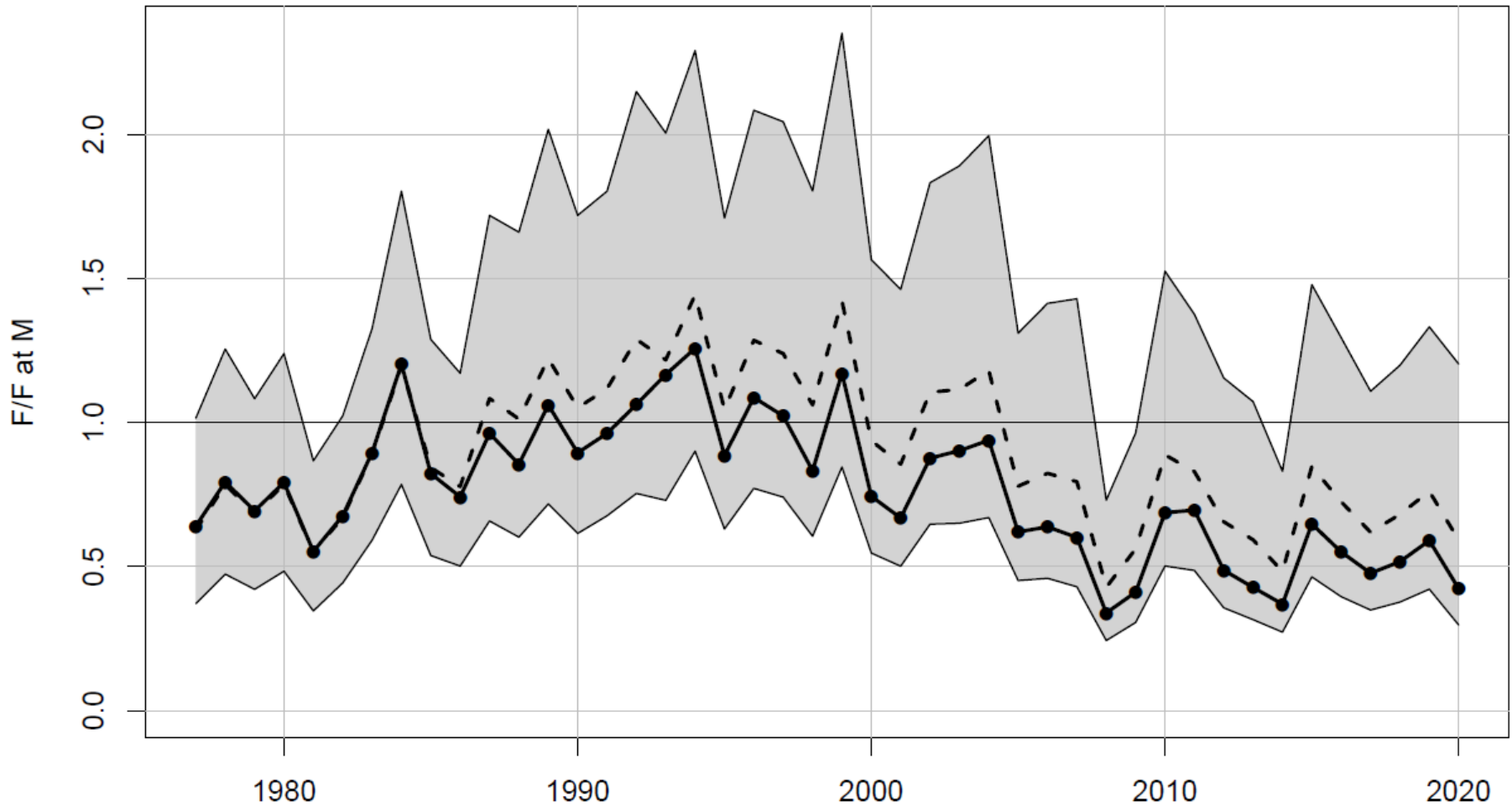
2021 Update assessment



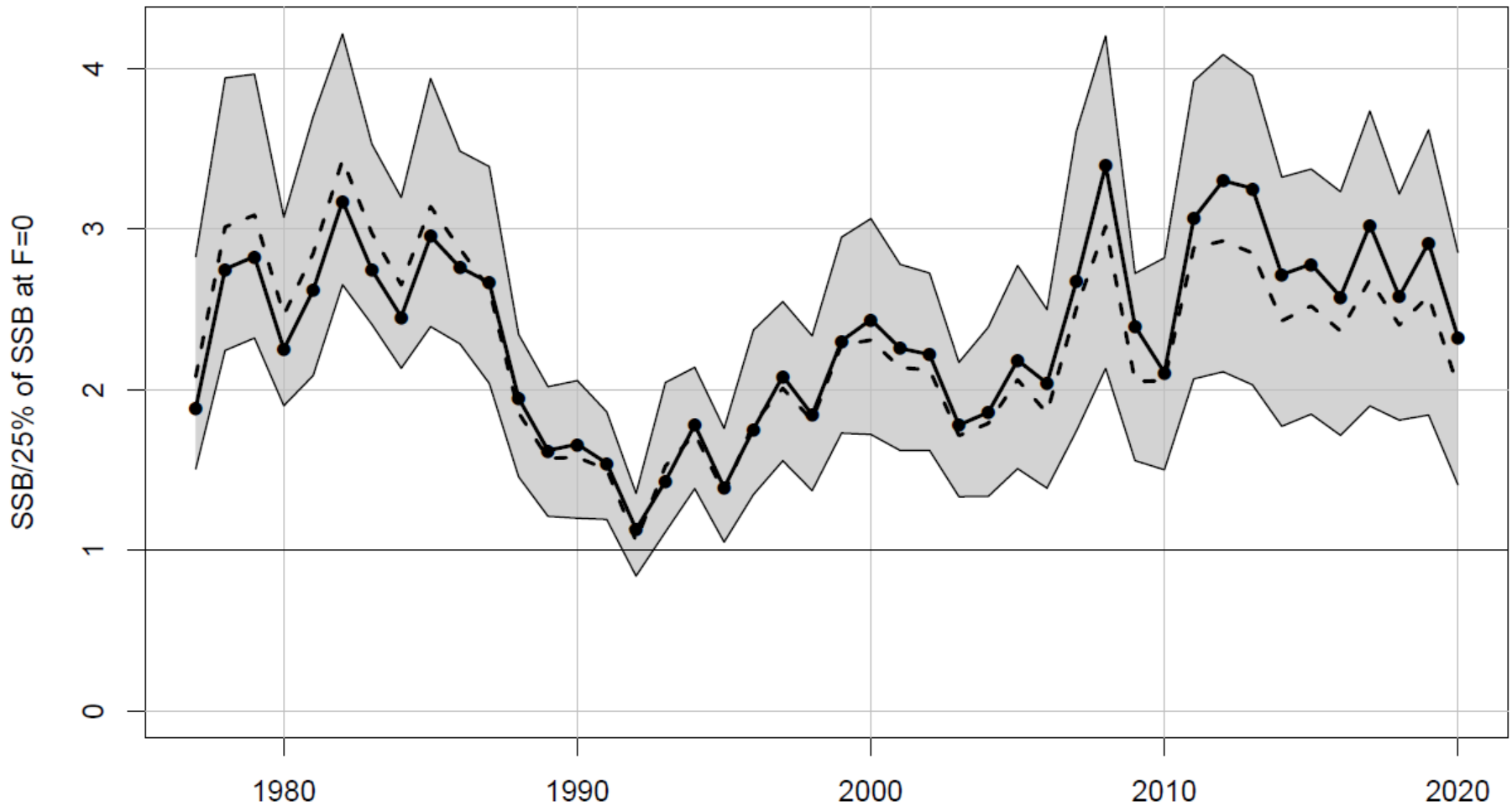
2021 Update assessment



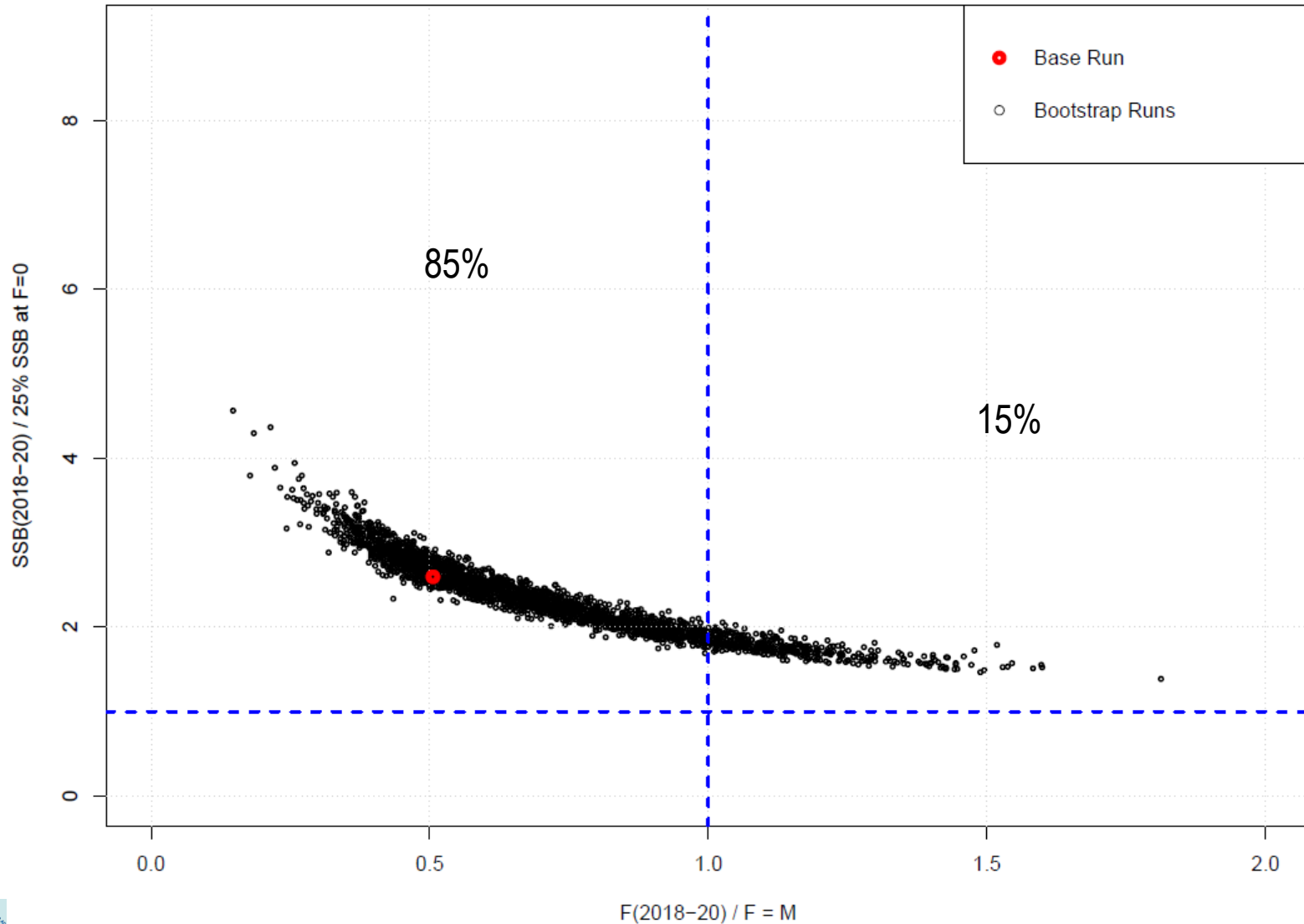
Monte Carlo Bootstrap Ensemble



Monte Carlo Bootstrap Ensemble



Monte Carlo Bootstrap Ensemble



Stock status determination

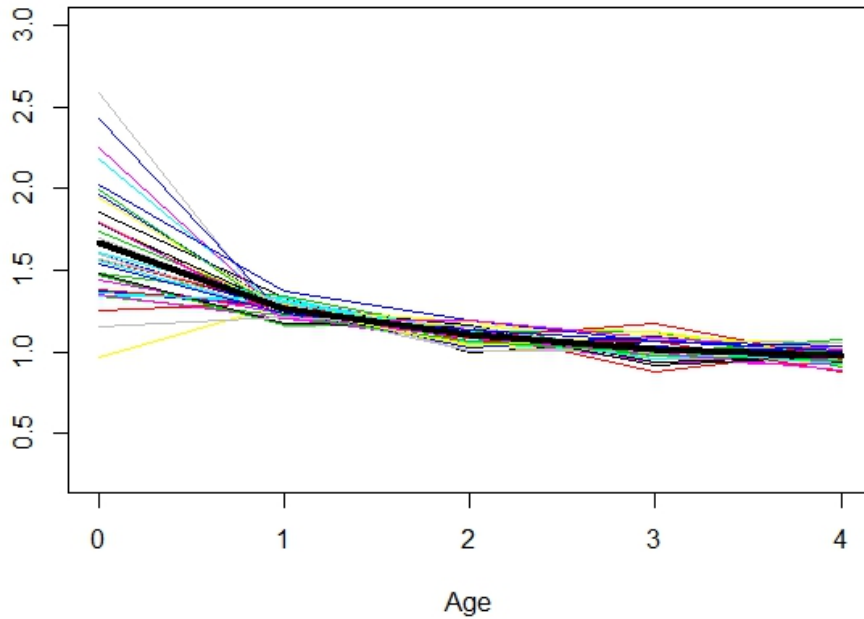
- Benchmarks
 - $F = 1.32$ (threshold); $F = 0.75 * 1.32 = 0.99$ (target)
 - SSB(FEC) based metrics – Threshold = 1,274,663 and Target = 2,549,325
- Stock status determination
 - G. mean (2018-20) of F – 0.67 – **overfishing is not occurring**
 - G. mean (2018-20) of SSB – 3310900 – **not overfished**
 - Sensitivity analyses agree with determination
 - MCBE runs generally agree, but some uncertainty in F Threshold

Sensitivity analyses

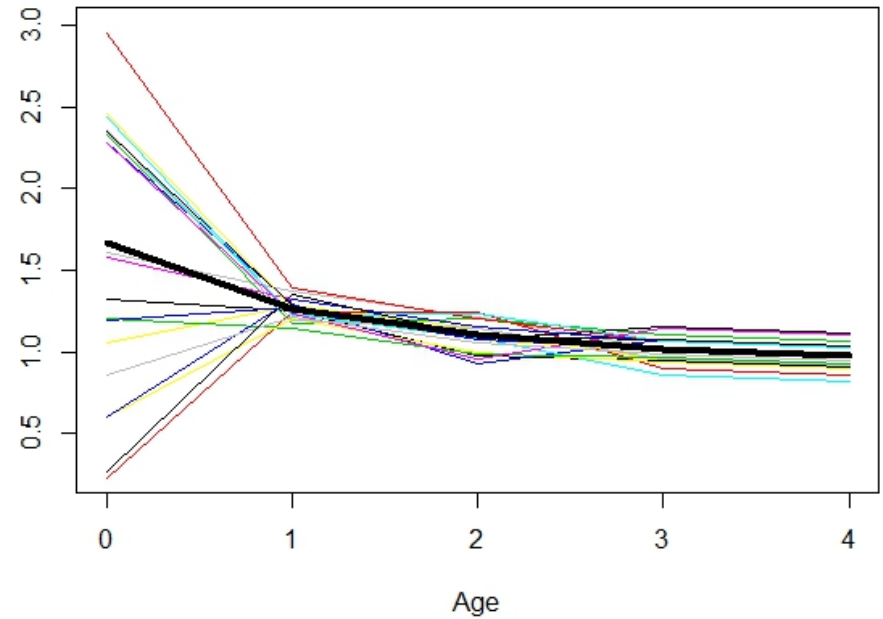
- M matrix from each EwE model
 - Gulf-wide: age (0-4) and year (1980-2016)
 - Used averages to fill missing years of data
 - Scaled to M vector from base [used deviations]
 - NGOMEX: age (0-3) and year (2000-2017)
 - Used averages to fill missing ages and years of data
 - Scaled to M vector from base [used deviations]

Sensitivity analyses – M comparison figures

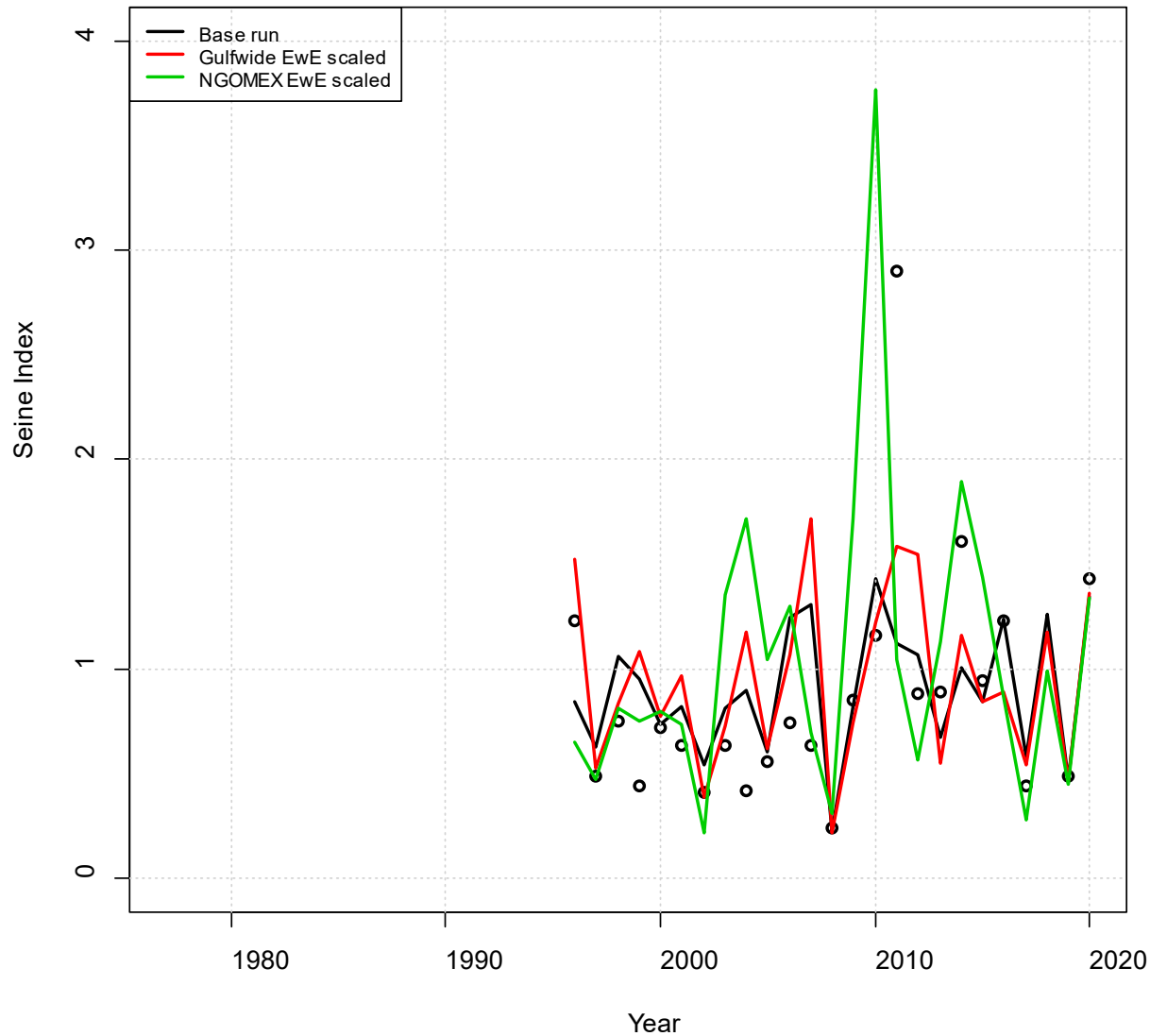
Gulfwide



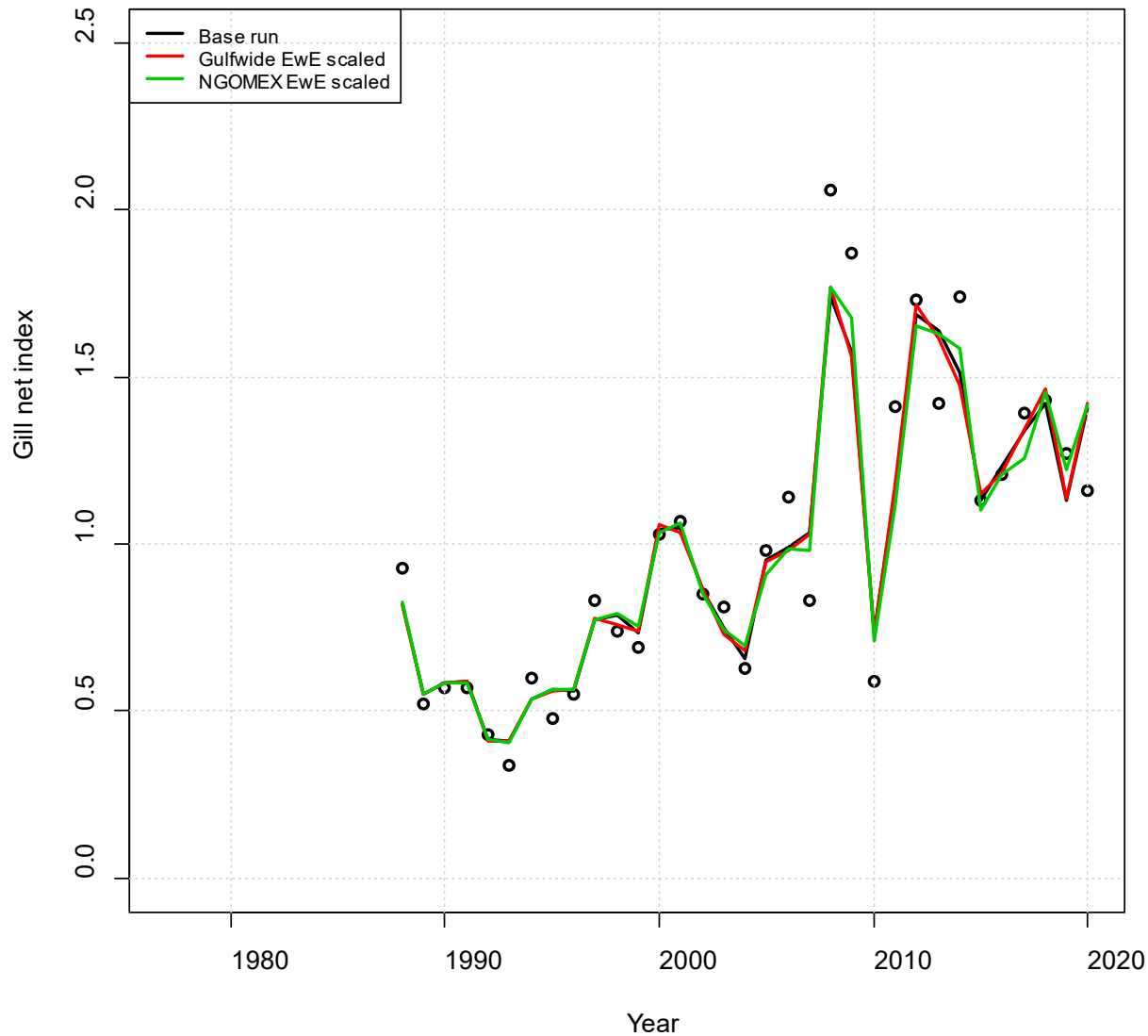
NGOMEX



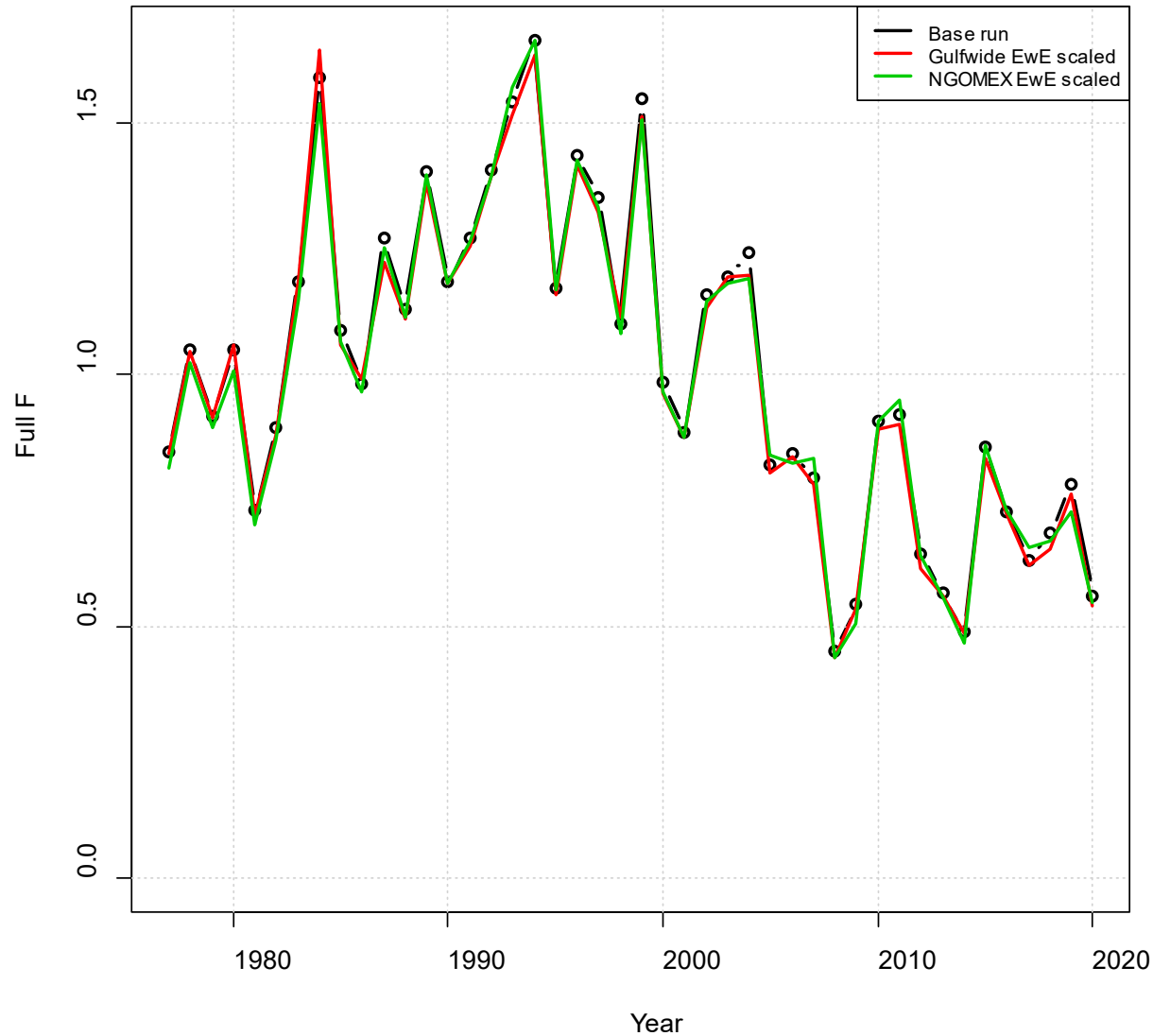
Sensitivity analyses



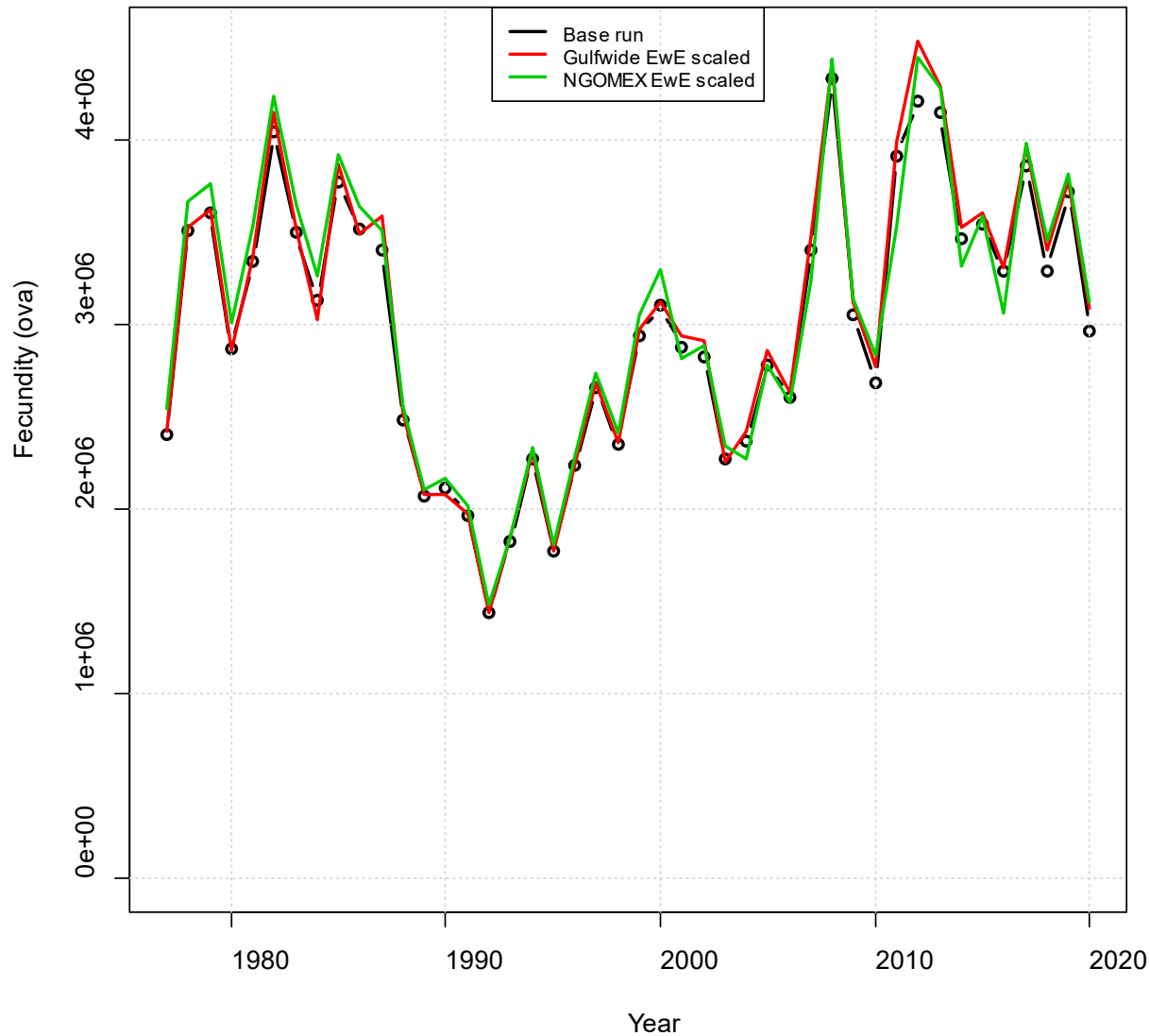
Sensitivity analyses



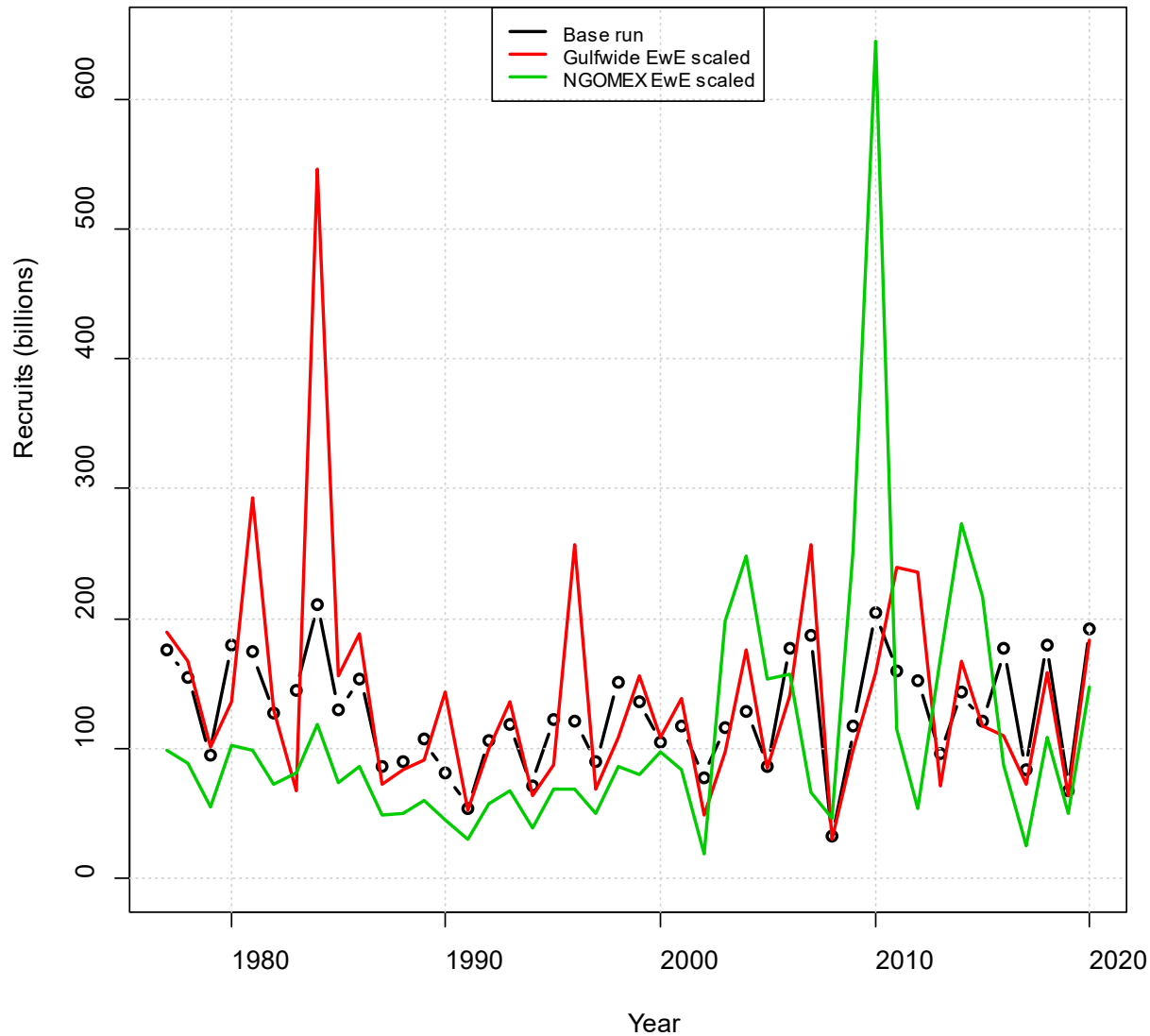
Sensitivity analyses



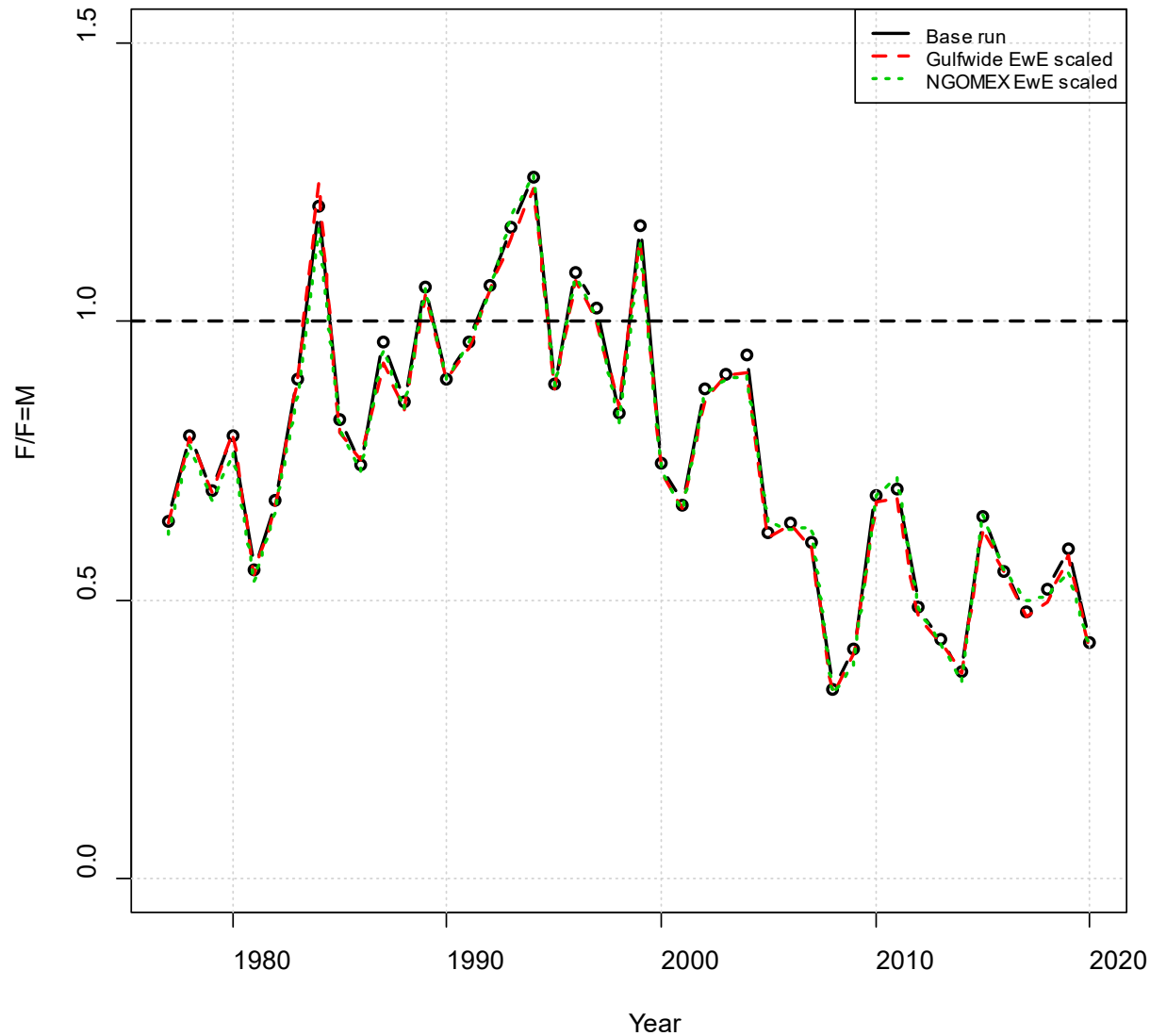
Sensitivity analyses



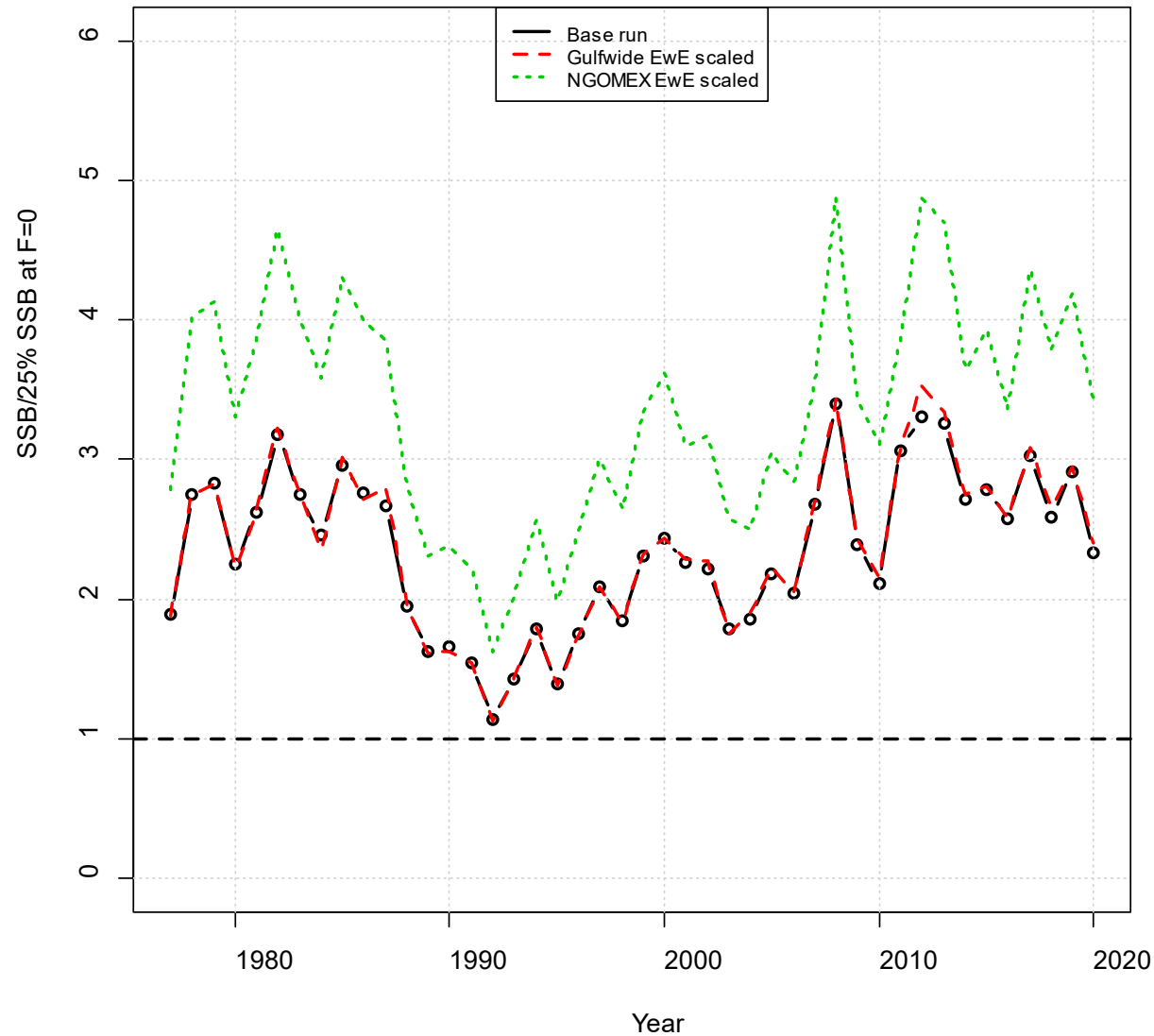
Sensitivity analyses



Sensitivity analyses



Sensitivity analyses



Questions?

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