Pacific saury SS3 assessment: Preliminary comparison with surplus production model

NPFC SSC PS 15

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bluematter

Initial comparison of biomass and F estimates between surplus production and age-structured model

- Interesting to compare but importantly, the two models are not fully comparable due to different governing equations

- For example, shape of yield curve is determined by one parameter and fixed in SP model, but several biological parameters contribute to the shape of age-structured yield curve

North Pacific Fisheries Commission

Stock assessment report for Pacific saury

EXECUTIVE SUMMARY

Data used in the assessment modeling

Data are included from the NPFC Convention Area and Members' Exclusive Economic Zones (EEZs). Pacific saury (*Cololabis saira*) is widely distributed from the subarctic to the subtropical regions of the North Pacific Ocean. The fishing grounds are west of 180° E but differ among Members (China, Japan, Korea, Russia, Chinese Taipei, and Vanuatu). Figure 1 shows the historical catches of Pacific saury by Member. Figure 2 shows CPUE and Japanese survey biomass indices used in the stock assessment. Appendix 1 shows data used for the updated stock assessment.

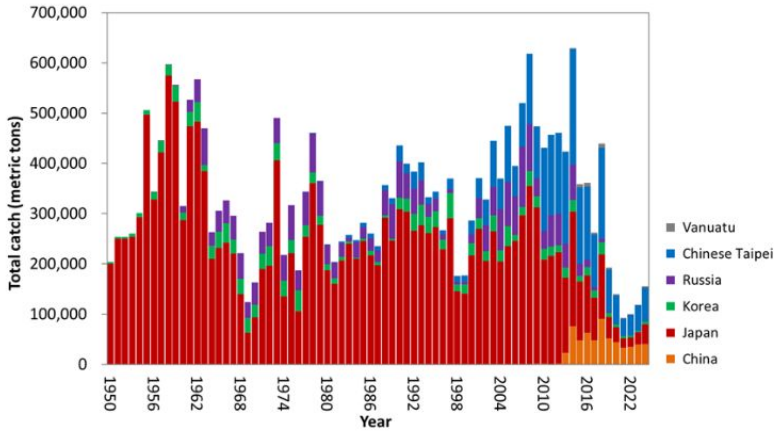
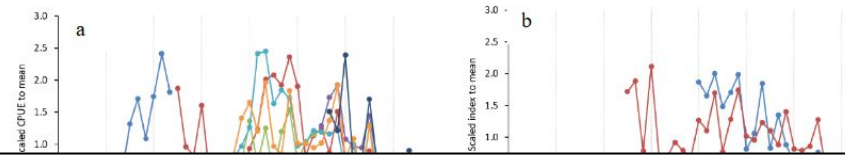
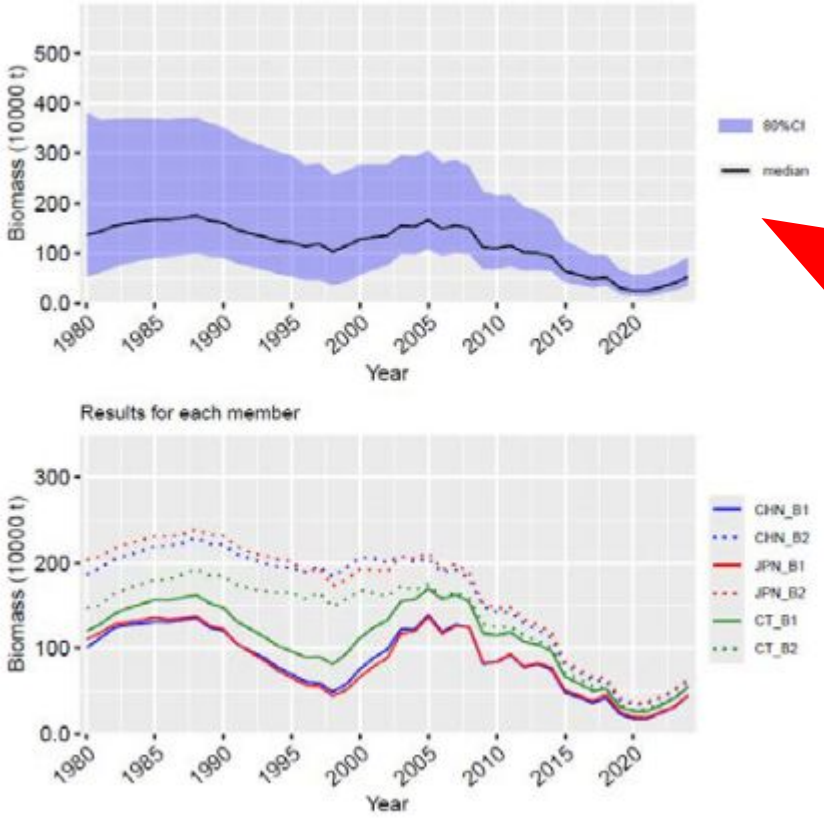


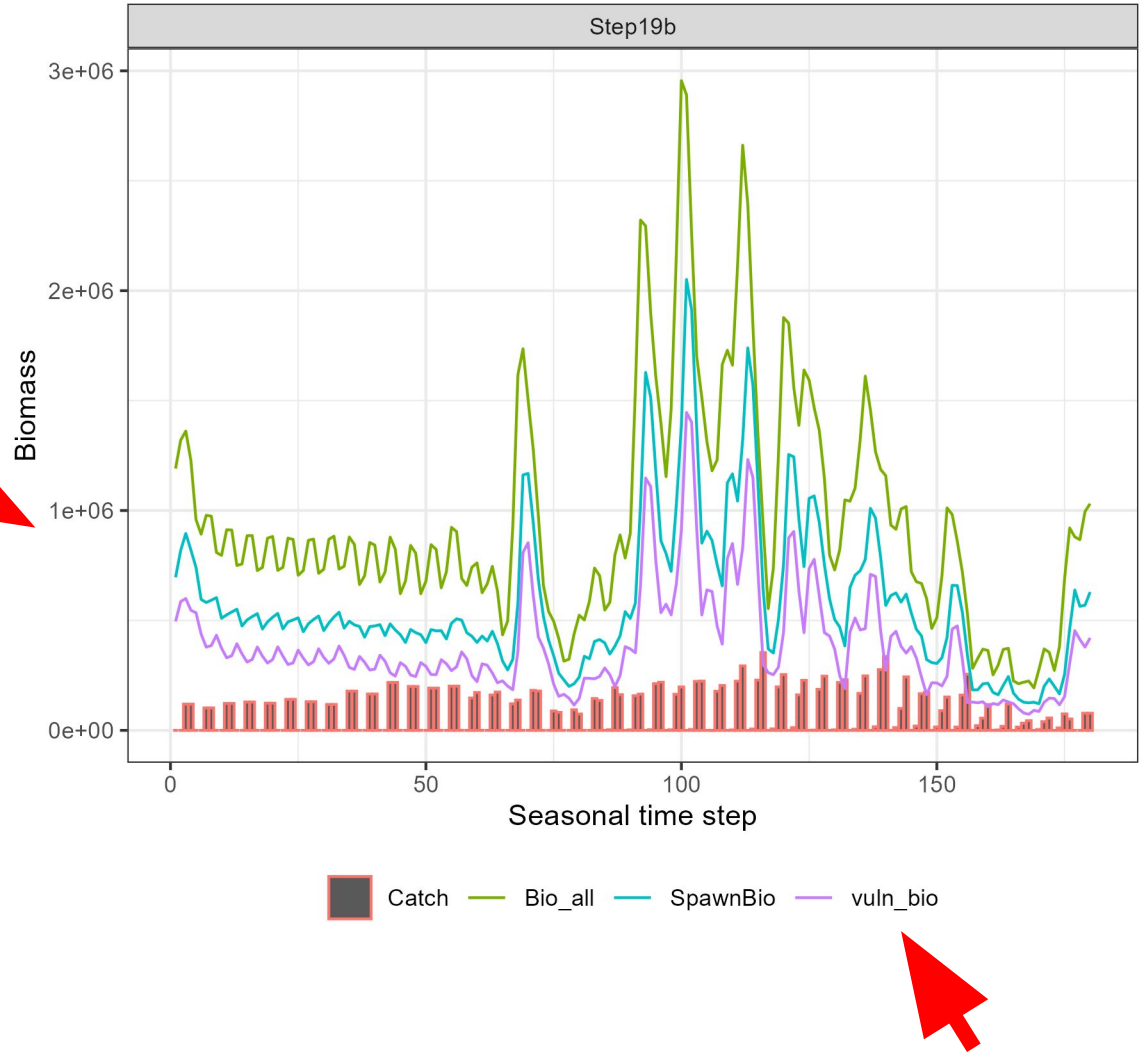
Figure 1. Time series of catch by Member during 1950-2024. The catch data for 1950-1979 are shown but not used in stock assessment modeling. Catch data in 2024 are preliminary (as of 29 November 2024) and not used in the assessment.



Biomass comparison

200 x 10 kt □ **2e6 t**

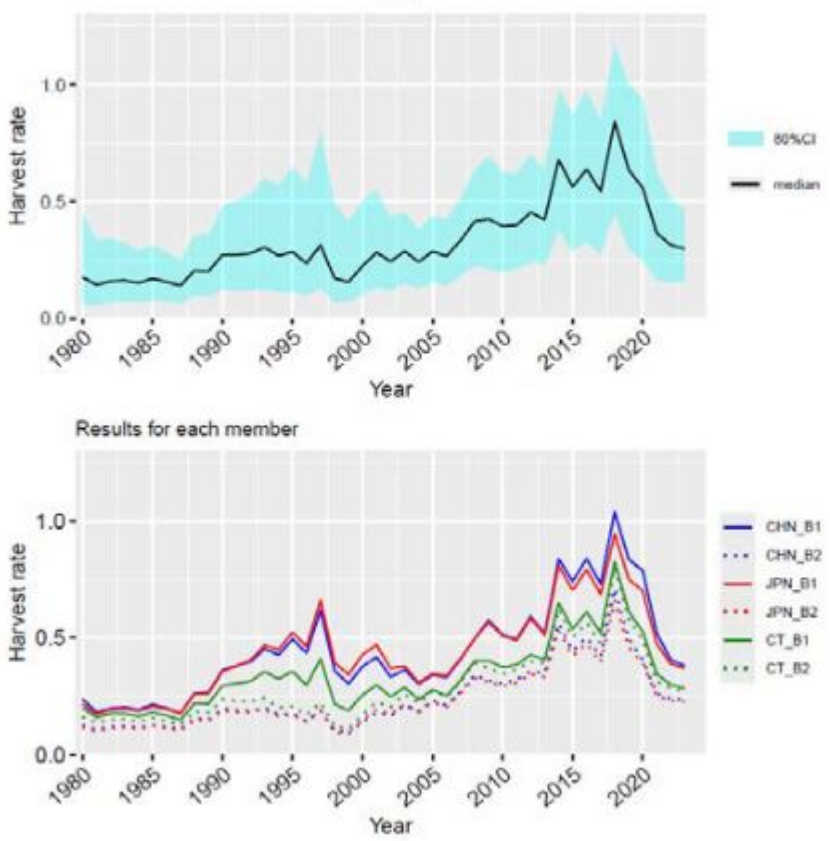


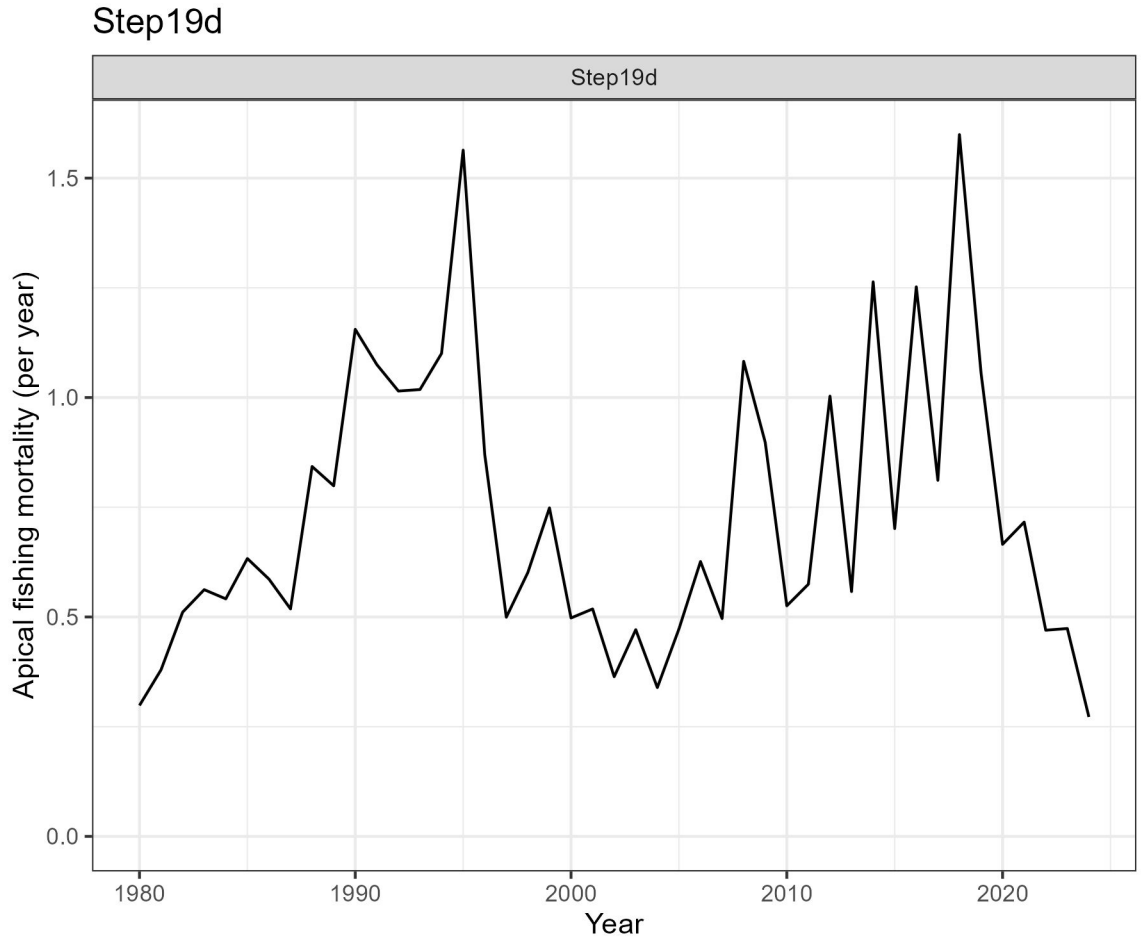


- The two models are in the same order of magnitude
- Biomass is much more variable in age-structured model due to short lifespan and seasonal time step

<u>Time steps:</u>
50 = 1992, season 2
100 = 2004, season 4
150 = 2017, season 2

F comparison

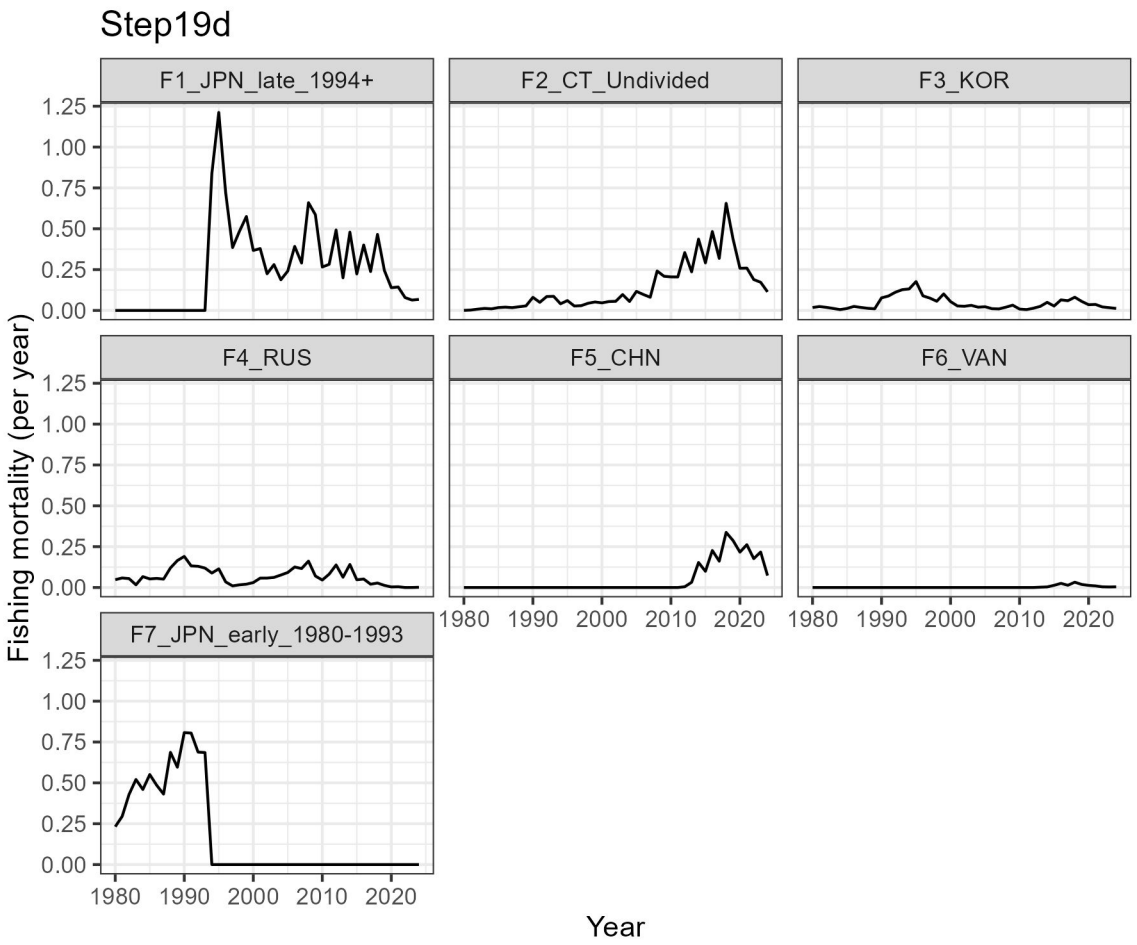


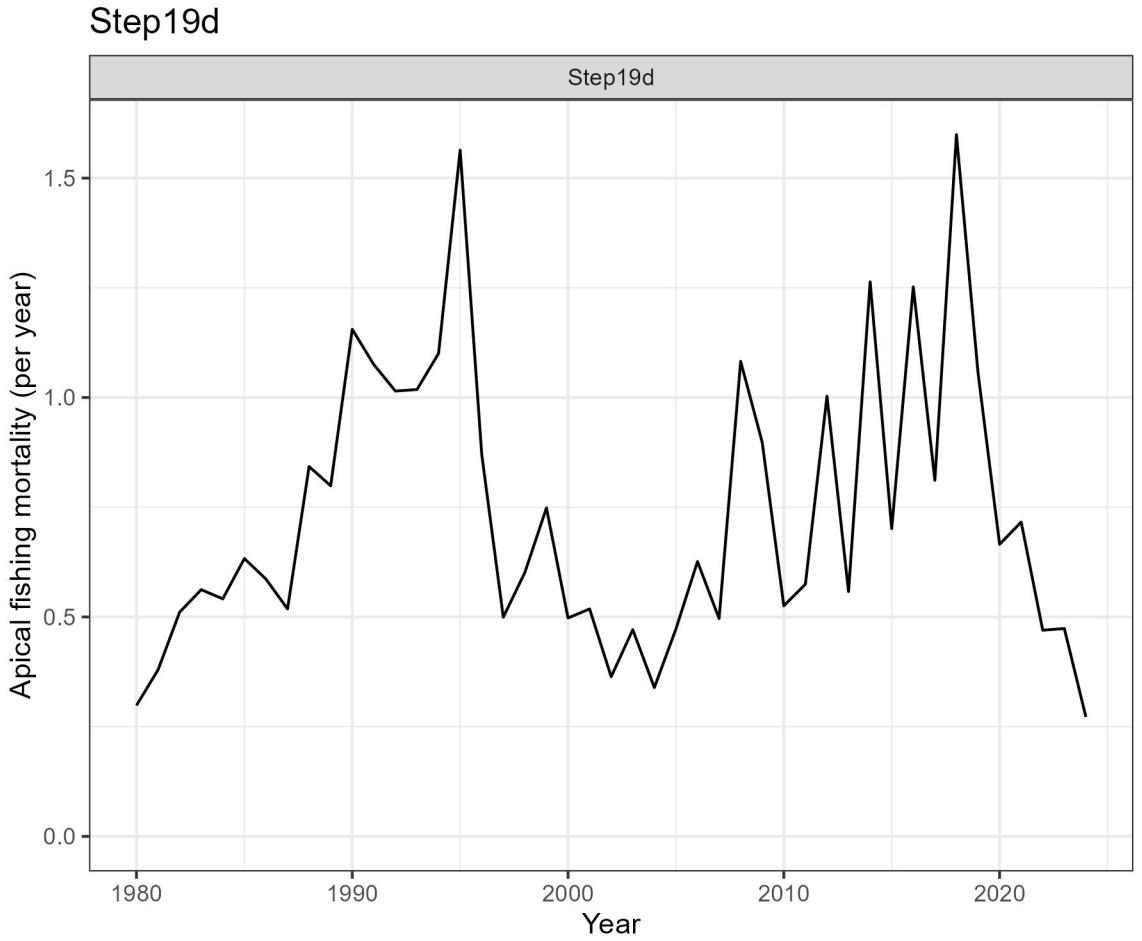


Apical F is the maximum value of F-at-age after summation across fleets & seasons

F comparison

There are multiple ways to describe exploitation rate in the seasonal age-structured model





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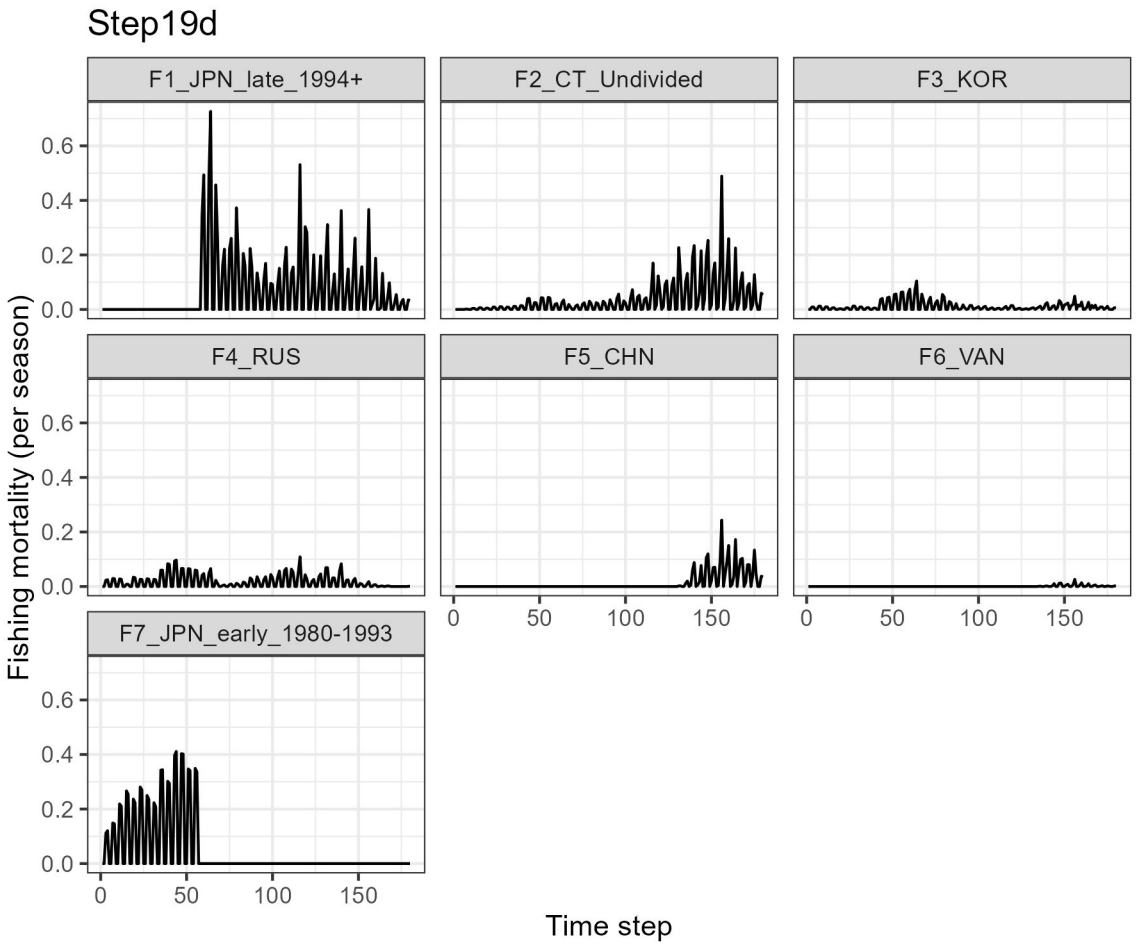
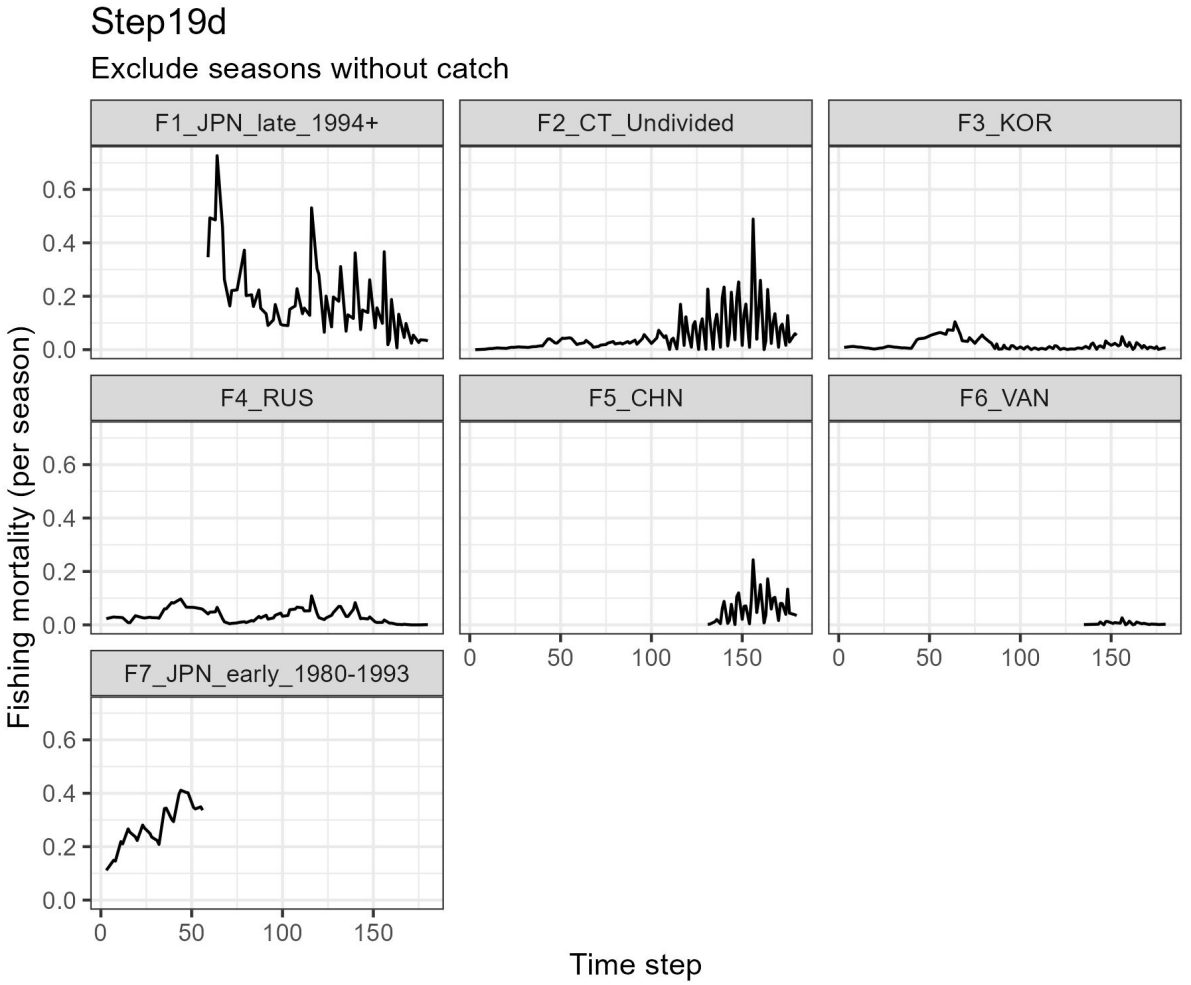
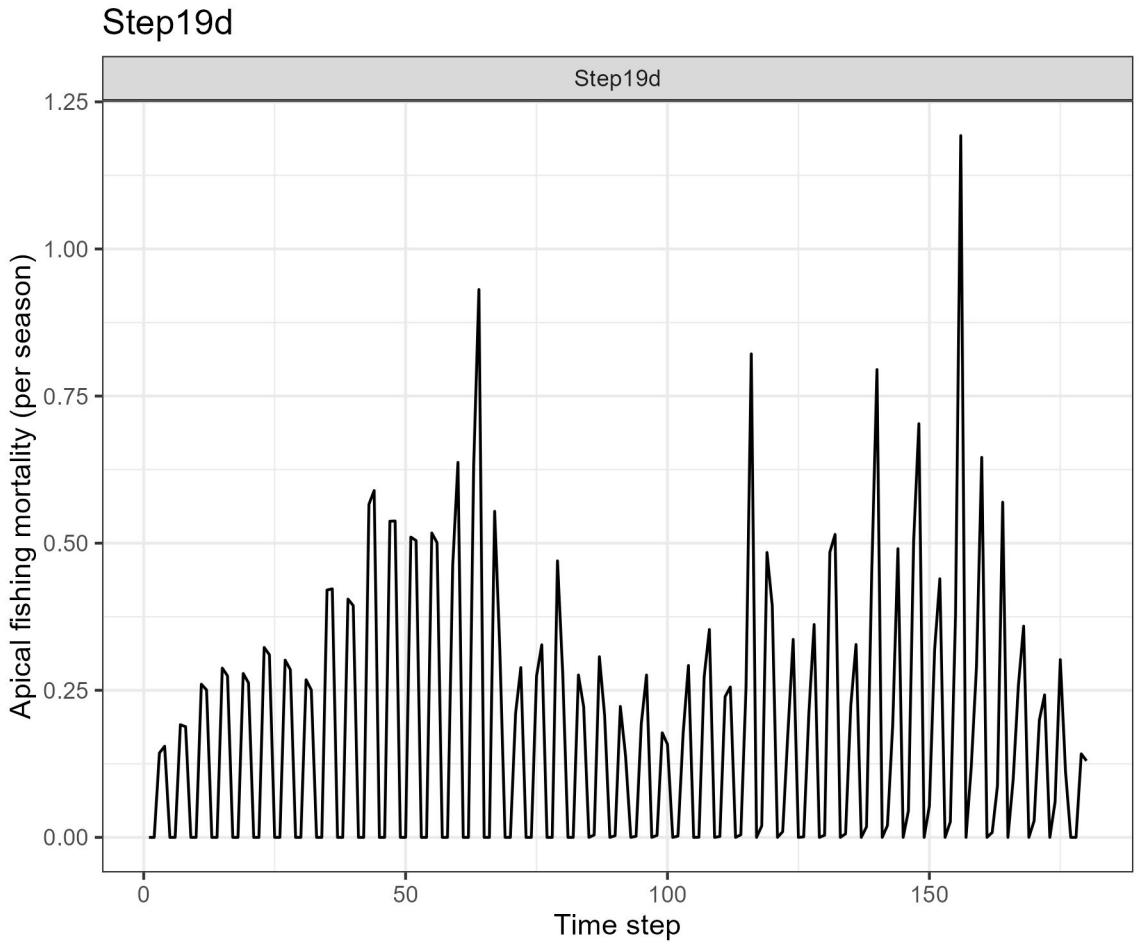
F comparison

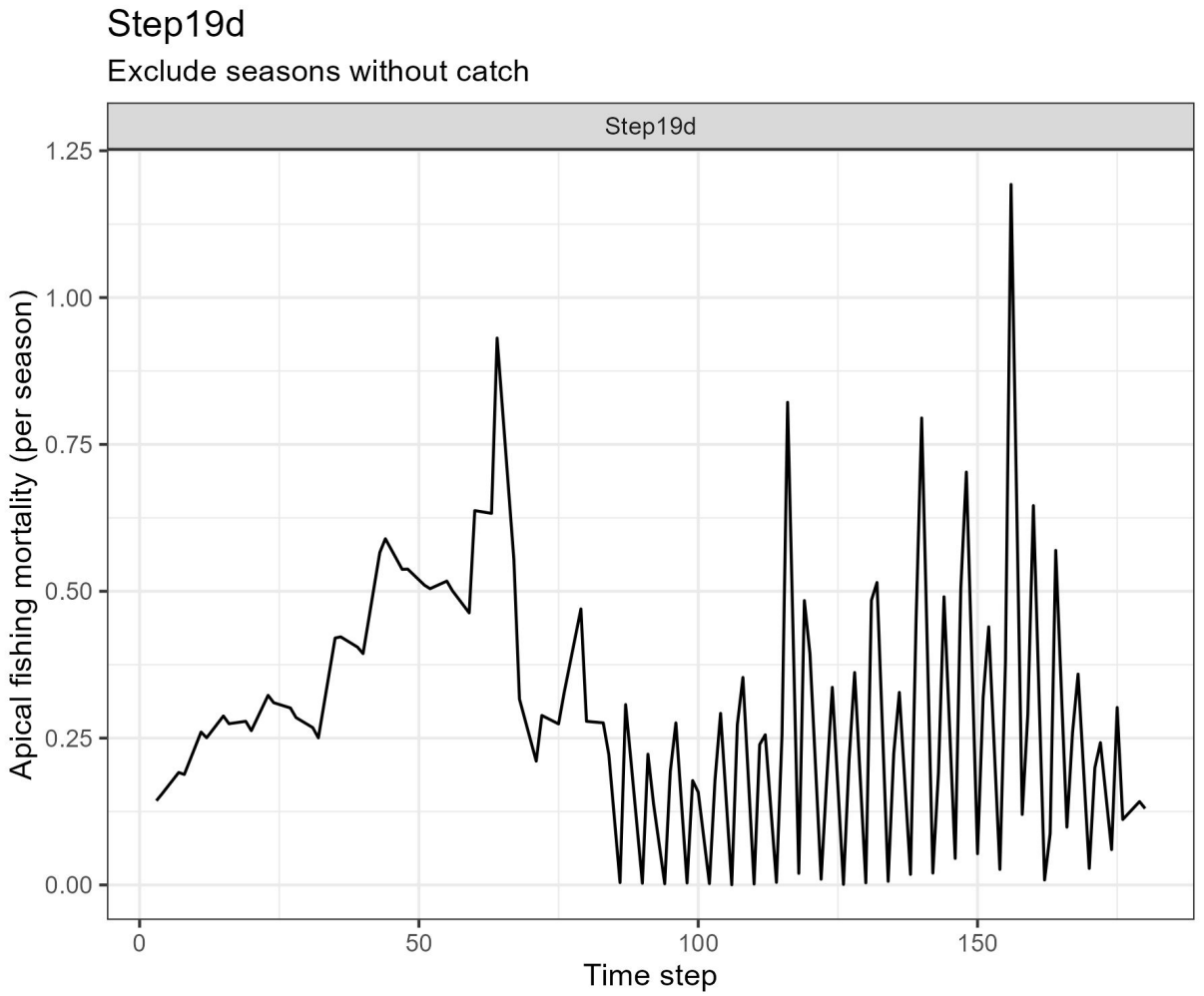




Apical F is the maximum value of F-at-age after summation across fleets

F comparison





Apical F is the maximum value of F-at-age after summation across fleets