

# Summary chilean Hake model in SS (1992-2020)

## group members

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## General characteristics

Chilean hake (*Merluccius gayi gayi*) sustains an important fishery composed of two fleets, that is, the bottom-trawl industrial fleet (large vessels) and the artisanal fleet (smaller vessels and boats). The hake present intermediate growth and mean longevity with a maximum age 17 years in females and 11 years in males.

## Information available

There are official catch data and estimates of illegal catches between 1992-2020. Furthermore, abundance and biomass from survey in august (spawning period). Additional input are official landings from 1940-1991 but without CAA and abundance index.

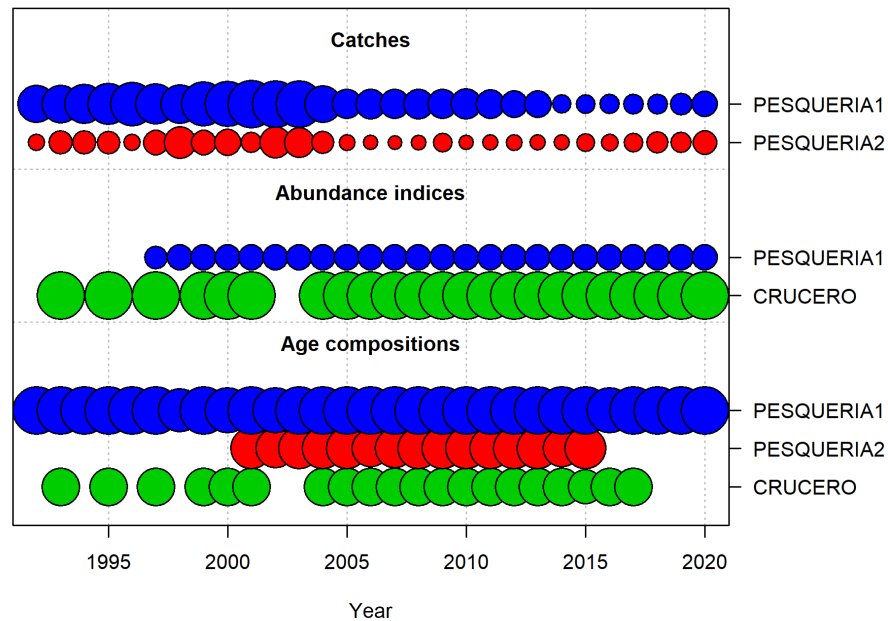


Figure 1: Chilean hake data (1992-2020)

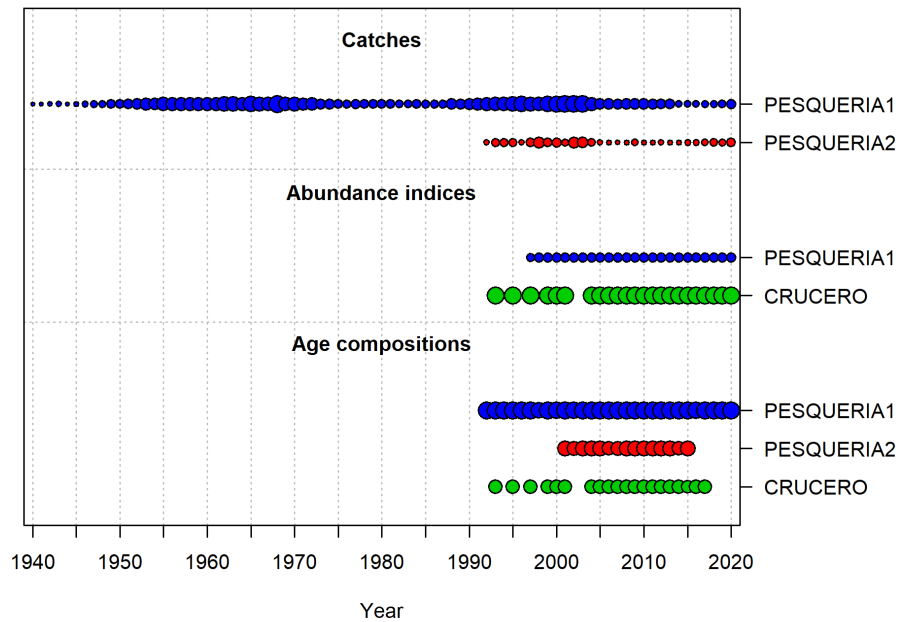


Figure 2: Chilean hake data (1940-2020)

## Developed activities

- Model construction incorporating two fleets, catches, age-composition (fleets and survey) and biomass acoustic survey.
- Structure data file to SS.
- Structure control file-
- Solve problems following examples, manual\_SS, lectures and specially echoinput file.
- Review different options to recruitment, include block to selectivity.
- Generate output and summary to explore a first base model.
- Review data weithing options.
- Include bias correction SR.
- Explore diagnostic options (i.e. retrospective analysis).

## Model and package problem

1. Package ‘r4ss’ was built under R version 3.6.3
2. SS ADMB safe libraries compiled with Microsoft Visual C++ 2015 14.0(64bit) Copyright (c) 2008-2015 ADMB Foundation and Regents of the University of California Build date: Jun 13 2017.
3. SS ADMB-12.2 safe libraries compiled with GNU C++ 8.3.0 (64bit) Copyright (c) 2008-2020 ADMB Foundation and Regents of the University of California Build date: Jul 31 2020

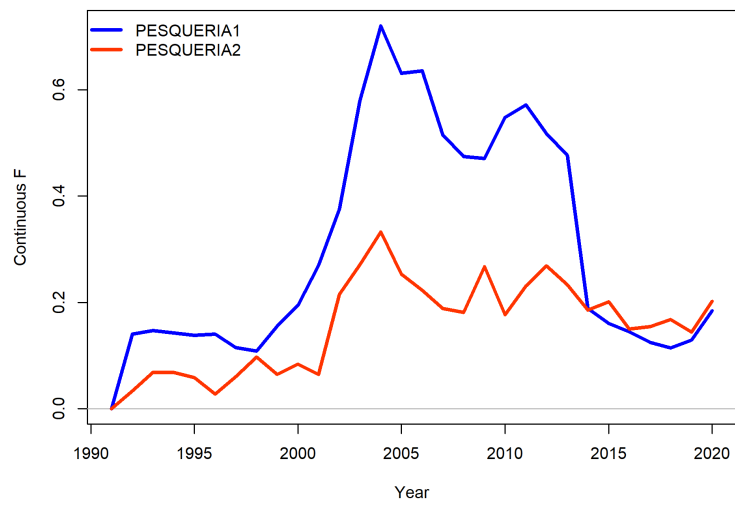
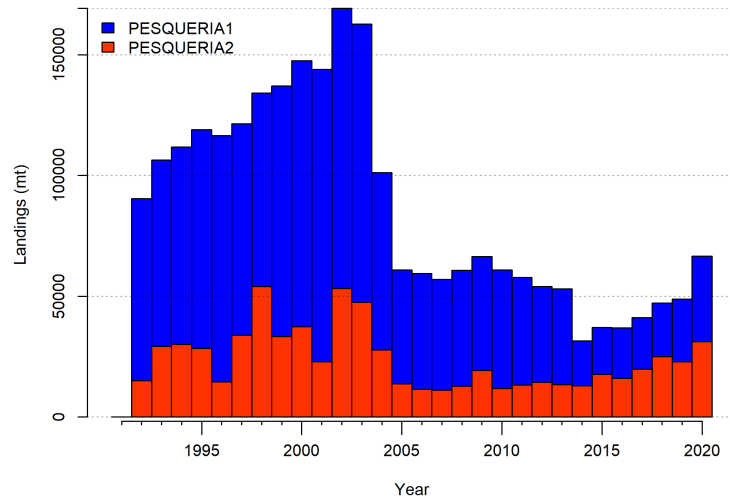
Interaction problem between r4ss and version SS (jul 2020).

- You are using 3.30.16.0 which SHOULD work with this R code.
- CompReport file separated by this code as follows (rows = Ncomps\*Nbins):

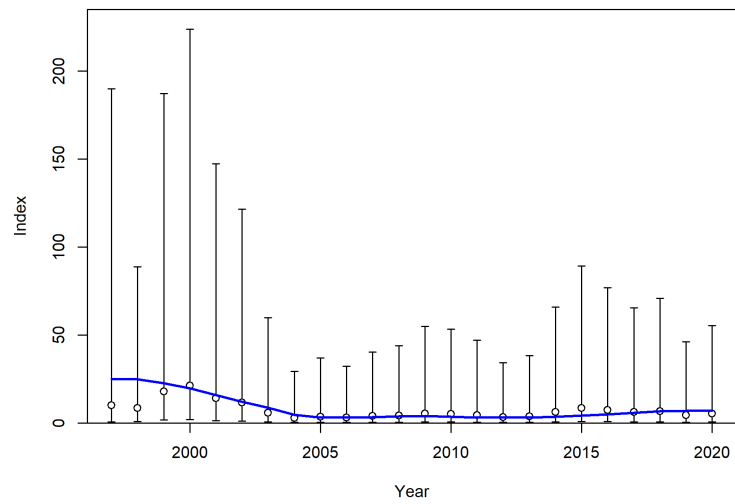
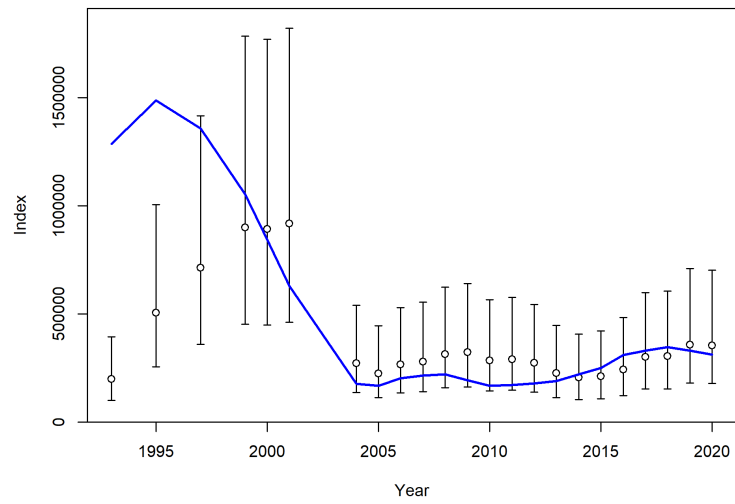
```
Error in 1:ncol(morph_indexing) : argument of length 0 > SS_plots(repfile) Error in SS_plots(repfile) :
objeto ‘repfile’ no encontrado > > SS_tune_comps(repfile, fleets = “all”, option = “Francis”,+ digits =
6, write = TRUE) Error in SS_tune_comps(repfile, fleets = “all”, option = “Francis”, digits = 6, : objeto
‘repfile’ no encontrado
```

## Results

### Catches and F

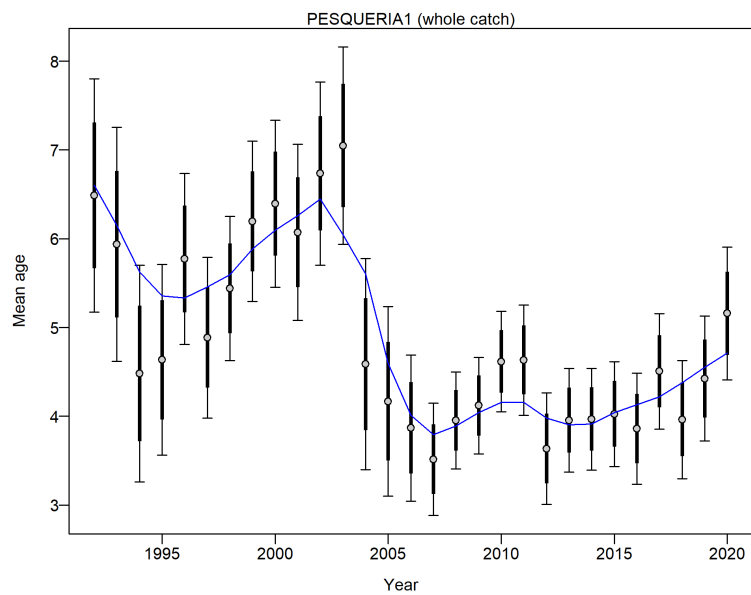


## Index fit

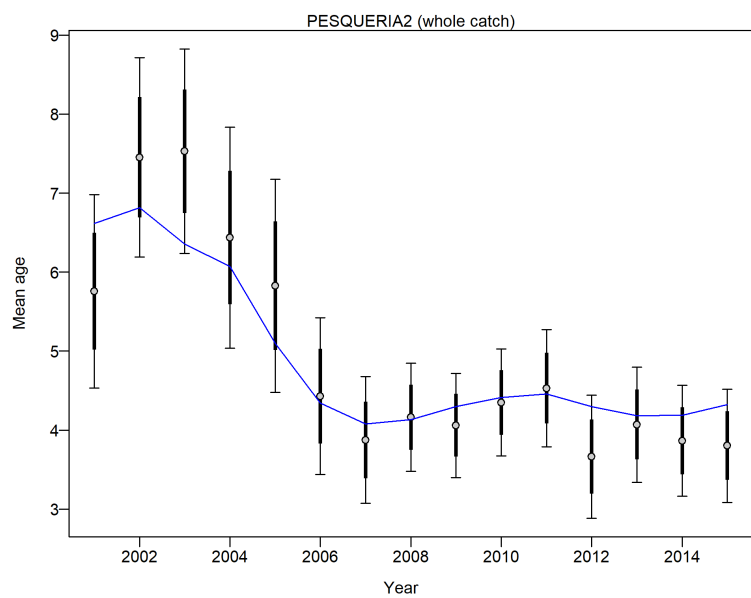


## Age composition

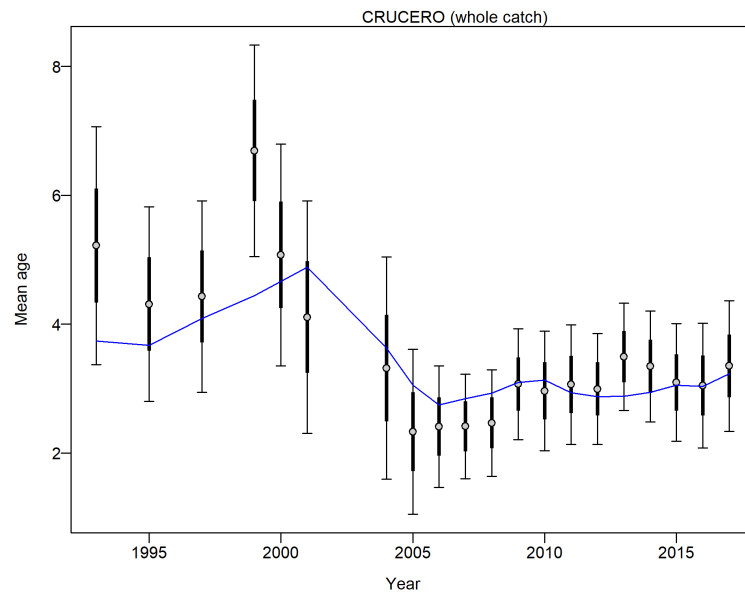
Fleet 1 (official)



Fleet 2 (not reported)

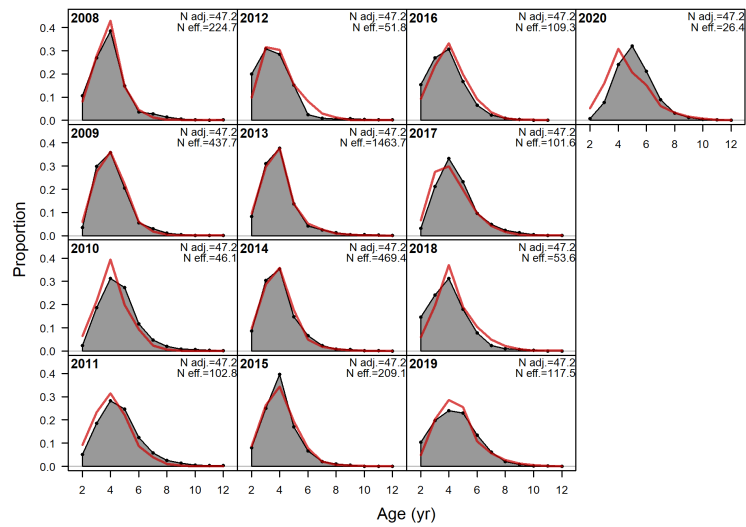


Survey

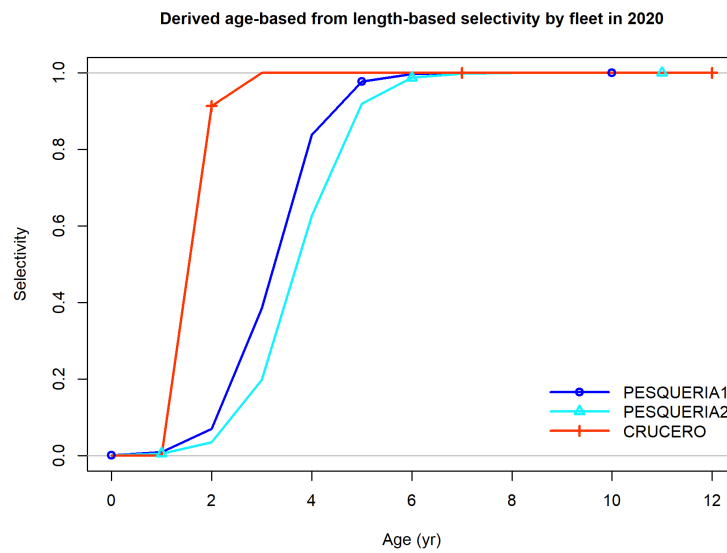
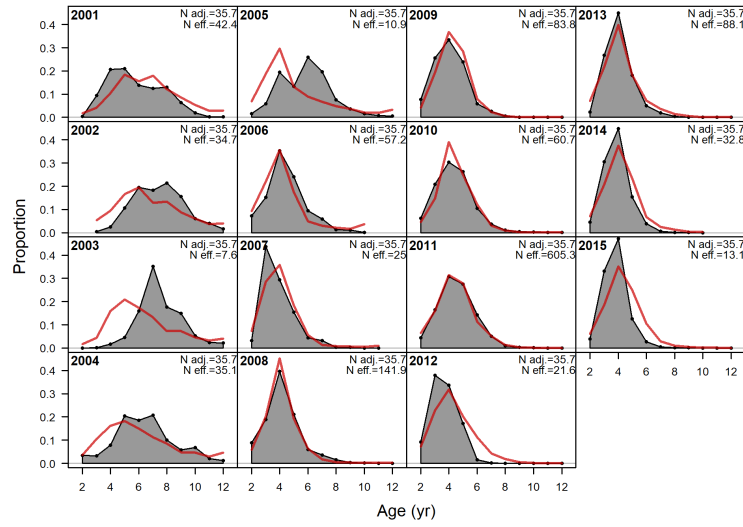


CAA

Survey

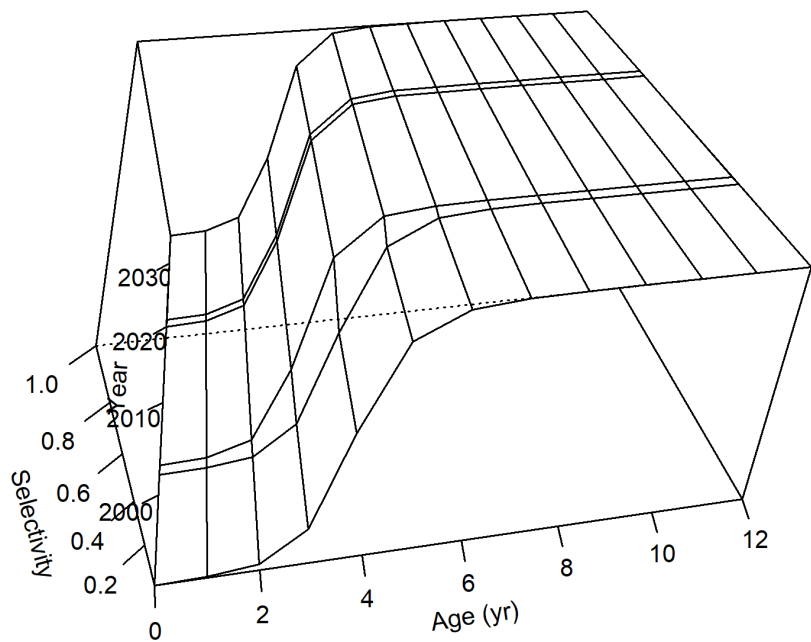


Selectivity by fleets and block





Time-varying selectivity for PESQUERIA1



## Time series

