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 maximun 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 impurt are official landings from 1940-1991 but without CAA and abundance index.

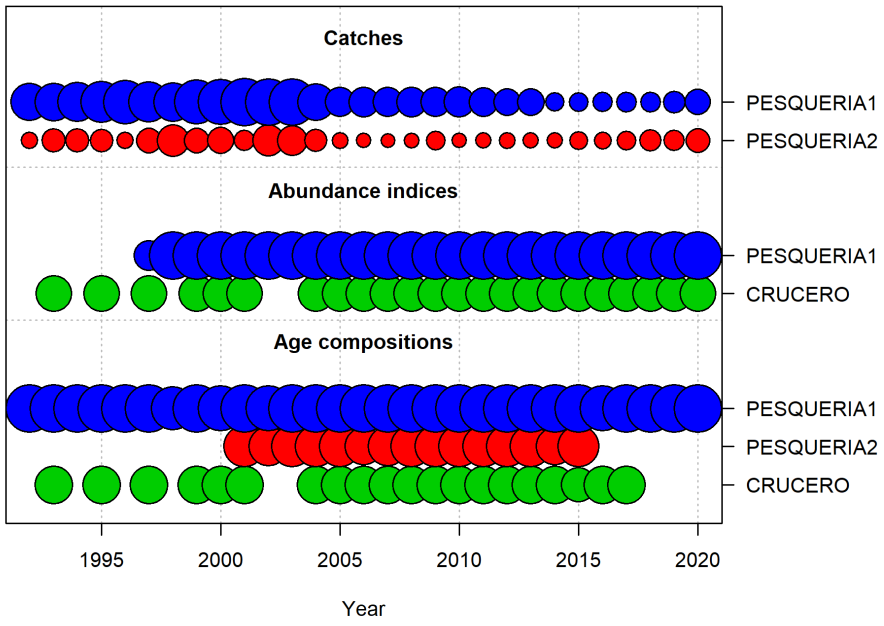


Figure 1: Chilean hake data (1992-2020)

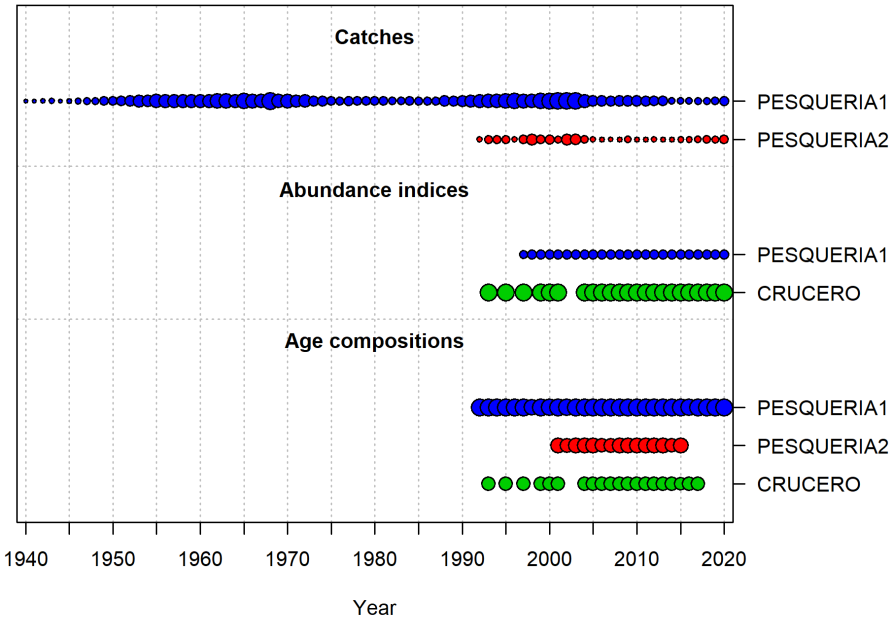


Figure 2: Chilean hake data (1940-2020)

Developed activities

a. Model costruction incorporating two fleets, catches, age-composition (fleets and survey) and biomass acoustic survey.
b. Structure data file to SS.
c. Structure control file-
d. Solve problems following examples, manual_SS, lectures and specially echoinput file.
e. Review different options to recruitment, include block to selectivity.
f. Generate output and summary to explore a first base model.
g. Review data weithing options.
h. Include bias correction SR.
i. 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).

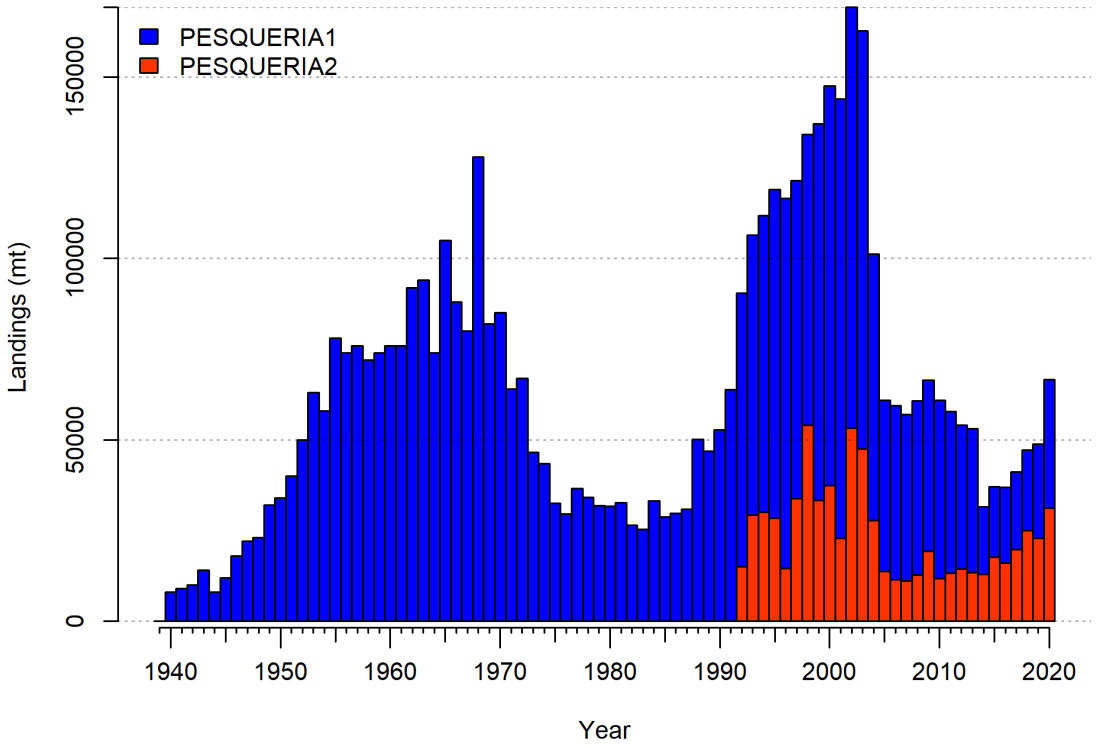
- You are using 3.30.16.0 which SHOULD work with this R code.
- CompReport file separated by this code as follows (rows = Ncomps*Nbins):

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

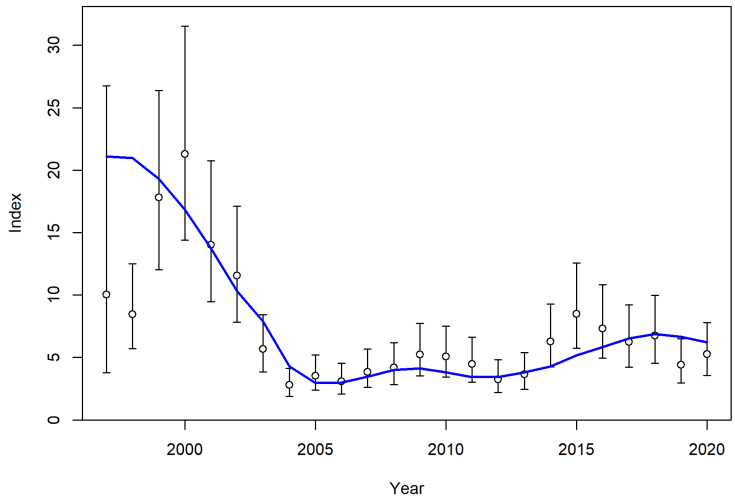
Catches

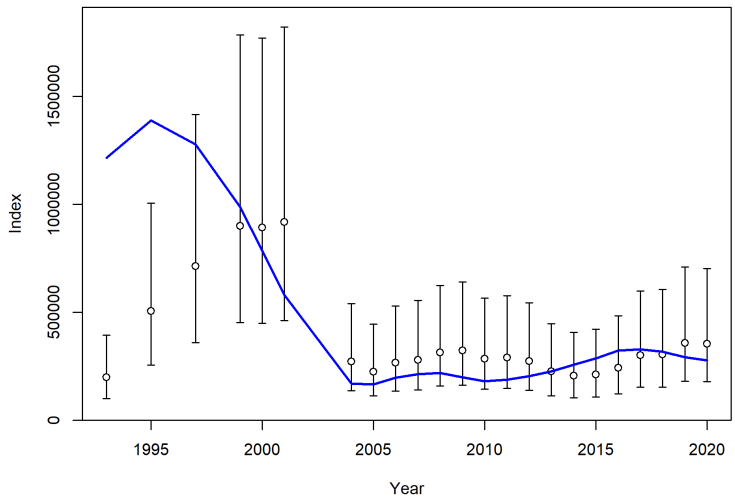
In Chile two Institutes develop assessment regulary in chilean hake. Furthermore, where each one has data bases different in some aspect i.e. monitoring program, spacial coverage by fleets, each reading.



Index fit

In the modelo we consider the index from acoustic survey and catch rate index. There are poor fit at the beggining of the series, this situation is similar with regular stock assessment from the institute.

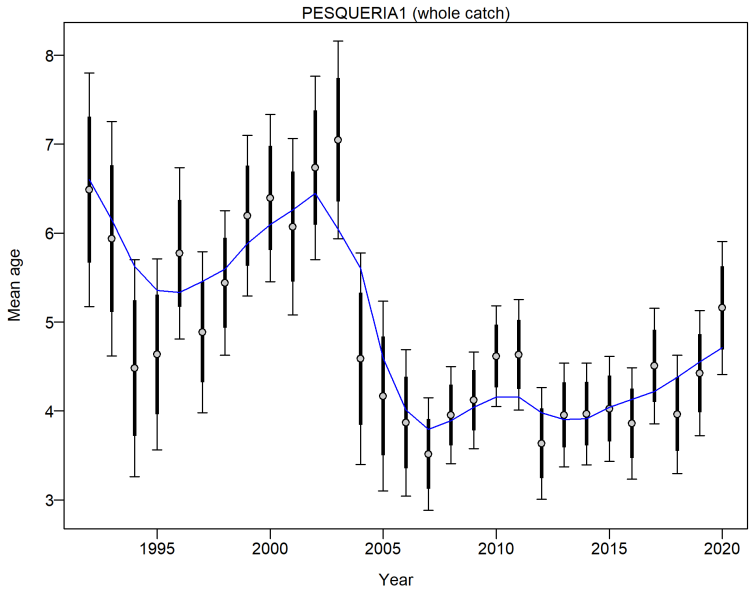




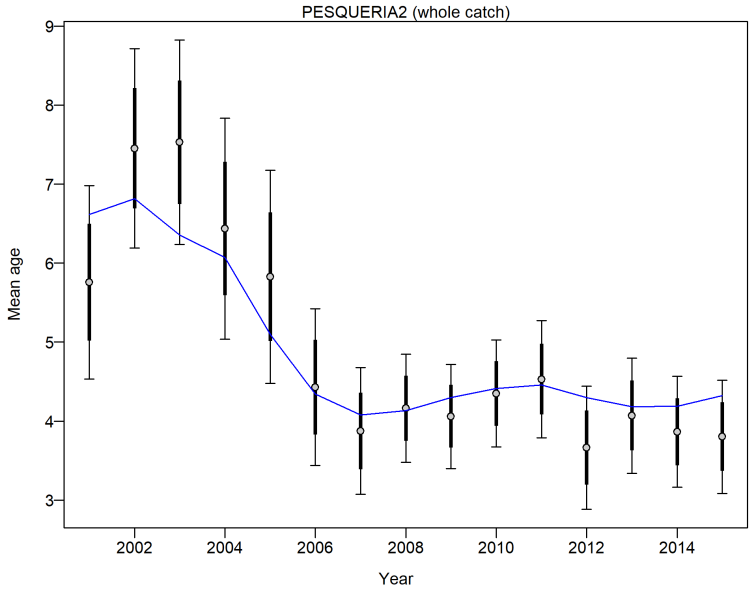
Age composition

The age composition fit to different fleets and sourvey show acceptable performance with the exception in period 2002-2004 when the composition of age in the population present changes with low presence of adults.

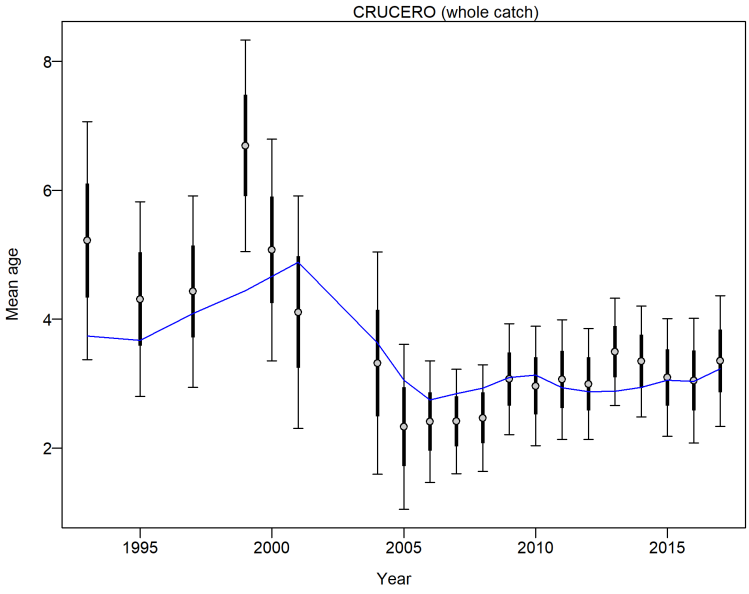
Fleet 1 (official)



Fleet 2 (not reported)

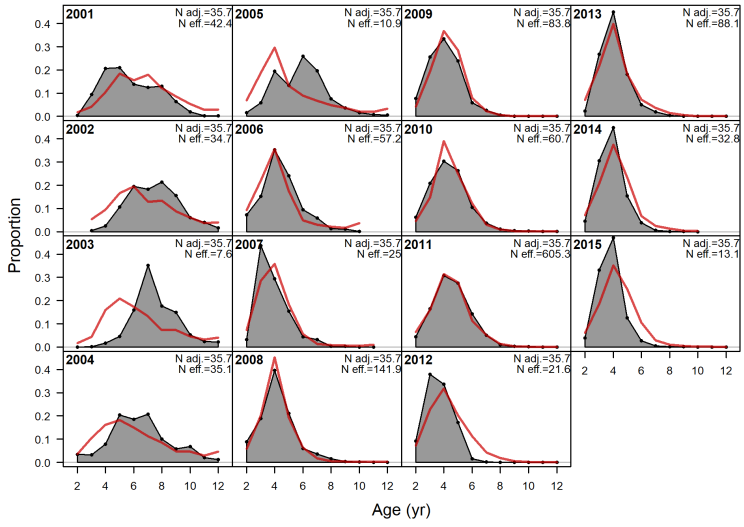


Survey

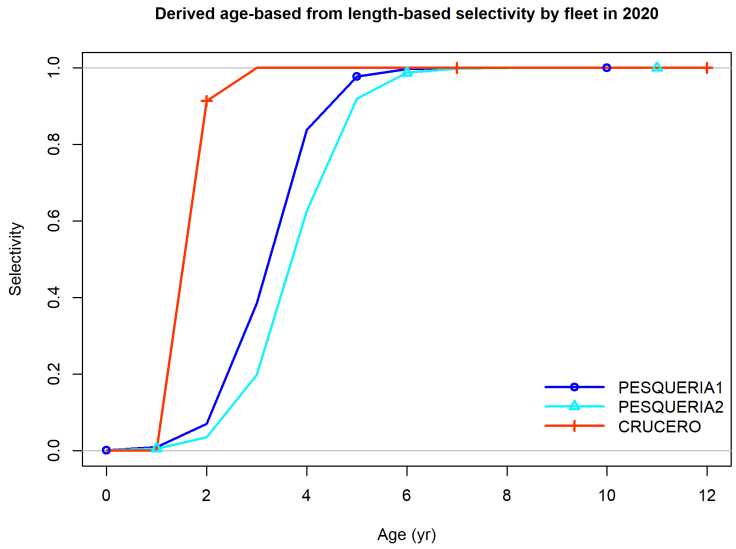


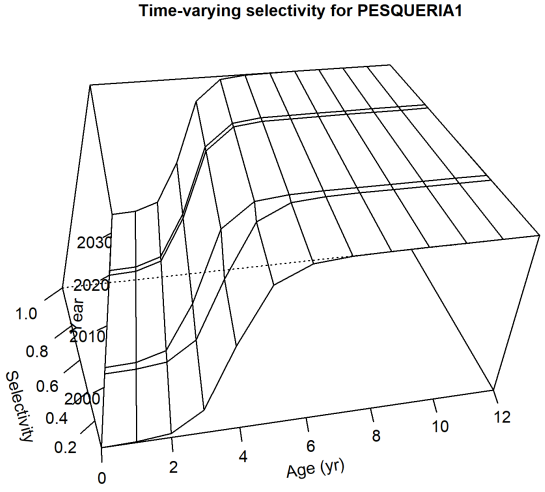
CAA

Survey fit

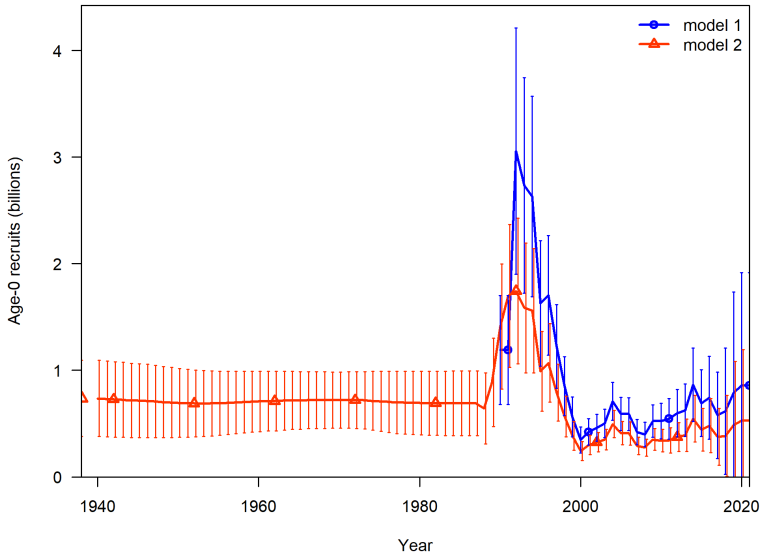


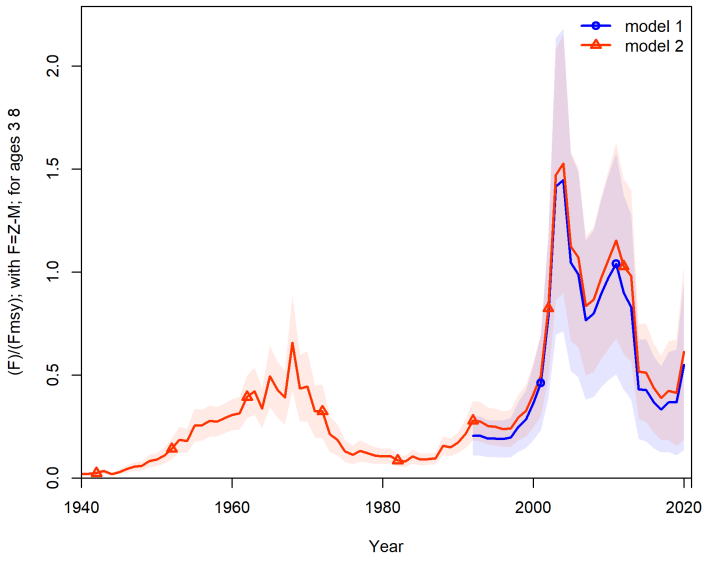
Selectivity by fleets and block



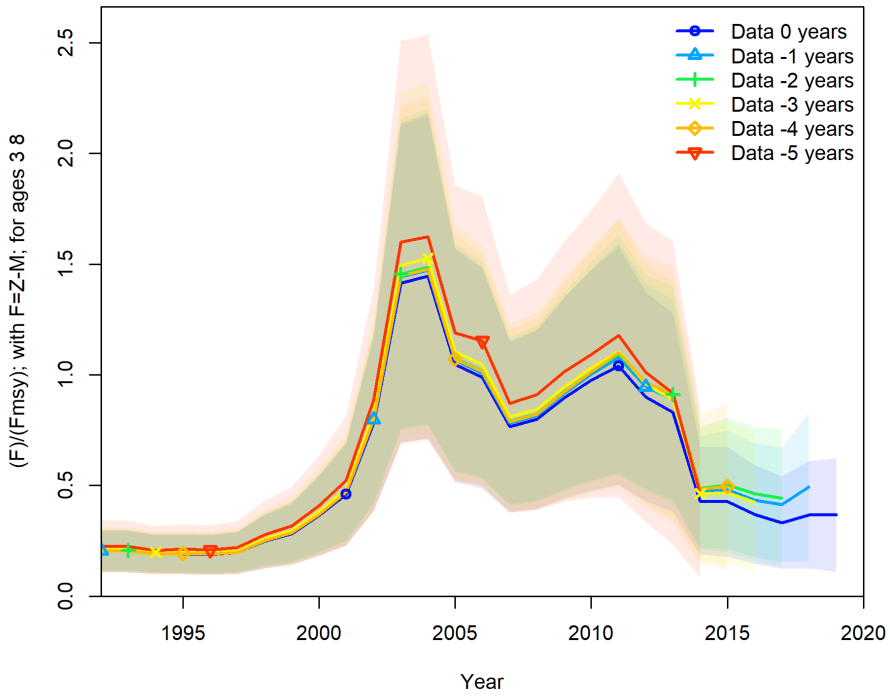


Time series comparisons mode 1 and 2





Retrospective analysis



Learned lesson

1. SS presents extensive capabilities to build different stock assessment.
2. Develop many neccesary analysis of diagnostic in a friendly environment.i.e. data weighting, retrospective.
3. Excellent tools to review output by plots and tables with use of r4ss.
4. Is neccesary the use of control version program i.e. github.
5. We need to continue learning about SS and methods incorporating. i.e. read Manual, view examples, training.