

## Update future projection program for stock synthesis 3

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## Abstract

I upgrade future projection program that was used ISC albacore working group. The main upgrade point is to respond to Stock Synthesis 3 version 3.30 and MCMC result.

## Introduction

ISC albacore working group estimated the future stock status North Pacific albacore tuna using future projection program. The feature of this future projection model is 1) developed by C++ language, 2) calculates fishing mortality at age using the output of the SS3, and 3) consider two gender population dynamics. However, this program could not consider initial population uncertainty and needed to respond to the latest version of Stock Synthesis 3 (version 3.30). Here, I upgrade future program.

## Upgrade point

- ✓ Calculate future population dynamics with the fishing mortality base reference point ( $F_{msy}$  or  $F_{\%SPR}$ ).
- ✓ Available the SS3 result of MCMC and recruitment uncertainty (Figure 1).
- ✓ Respond to Stock Synthesis 3 version 3.30.
- ✓ Apply for quarterly time step population dynamics.

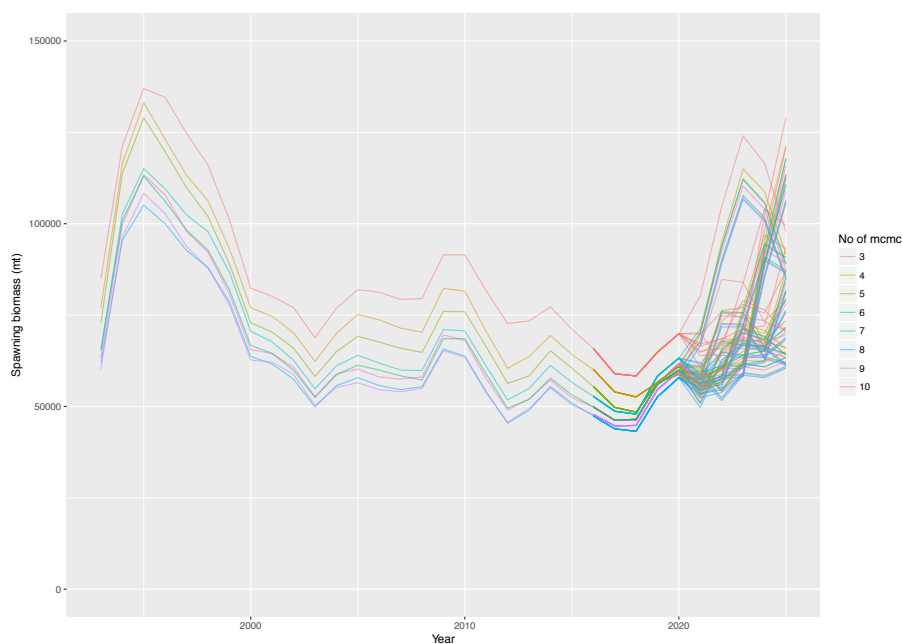


Figure 1. Simple stochastic simulation using stock assessment result of North Pacific albacore using constant  $F_{2015}$ . This simulation was calculated by MCMC result that iterations are 1,000 (burn in 200) with the 100 thinning intervals.