



NPFC-2023-SSC PS12-IP08

Updated saury's SS3 model for SSC PS 12

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Biological parameters

Parameter	Value	Comments	Reference
Reference age (a1)	0	Fixed parameter	Suyama et al. (2015)
Maximum age (a2)	2	Fixed parameter	Suyama et al. (2015)
Length at a1 (L1)	0.669	Fixed parameter	Refit Suyama et al. (2015)
Length at a1 (L2)	31.488	Fixed parameter	Refit Suyama et al. (2015)
Growth rate (K)	1.97	Fixed parameter	Refit Suyama et al. (2015)
CV of L1	0.1	Fixed parameter	
CV of L2	0.1	Fixed parameter	
Wtlen_1_Fem	2.44e-06	Fixed parameter	Fuji et al. (2019)
Wtlen_2_Fem	3.34694	Fixed parameter	Fuji et al. (2019)
Size-at-50% Maturity	25.8	Fixed parameter	Suyama (2006)
Slope of maturity ogive	-0.66	Fixed parameter	Suyama (2006)
Natural mortality (M)	2.18	Fixed parameter	
Fecundity	Proportional to spawning biomass	Fixed parameter	Fuji et al. (2019)
Spawning season	February	Model structure	Fuji et al. (2020)
Spawner-recruit relationship	Beverton-Holt	Model structure	
R_0	-	Estimated	
Steepness (h)	0.82	Fixed parameter	
Recruitment variability (σ_R)	0.6	Fixed parameter	

Growth

All fish become integer age 1
(for age determination) on their first January 1st

Report file

Season	Month	Event	Real age (year)			Length (cm)		
			Y year	Y+1 year	Y+2 year	Y year	Y+1 year	Y+2 year
1	Jan		Y year	Y+1 year	Y+2 year	Y year	Y+1 year	Y+2 year
	Feb	Spawning	0	0.5 (1)	1.5 (2)	0.66	20.03	30.79
	Mar							
2	Apr		0	0.75	1.75	0.66	24.51	30.94
	May							
	Jun							
3	Jul	Recruitment	0	1	2	0.66	27.23	31.16
	Aug							
	Sep							
4	Oct		0.25	1.25	2.25	12.70	28.89	31.29
	Nov							
	Dec							

6 months =
0.5 year

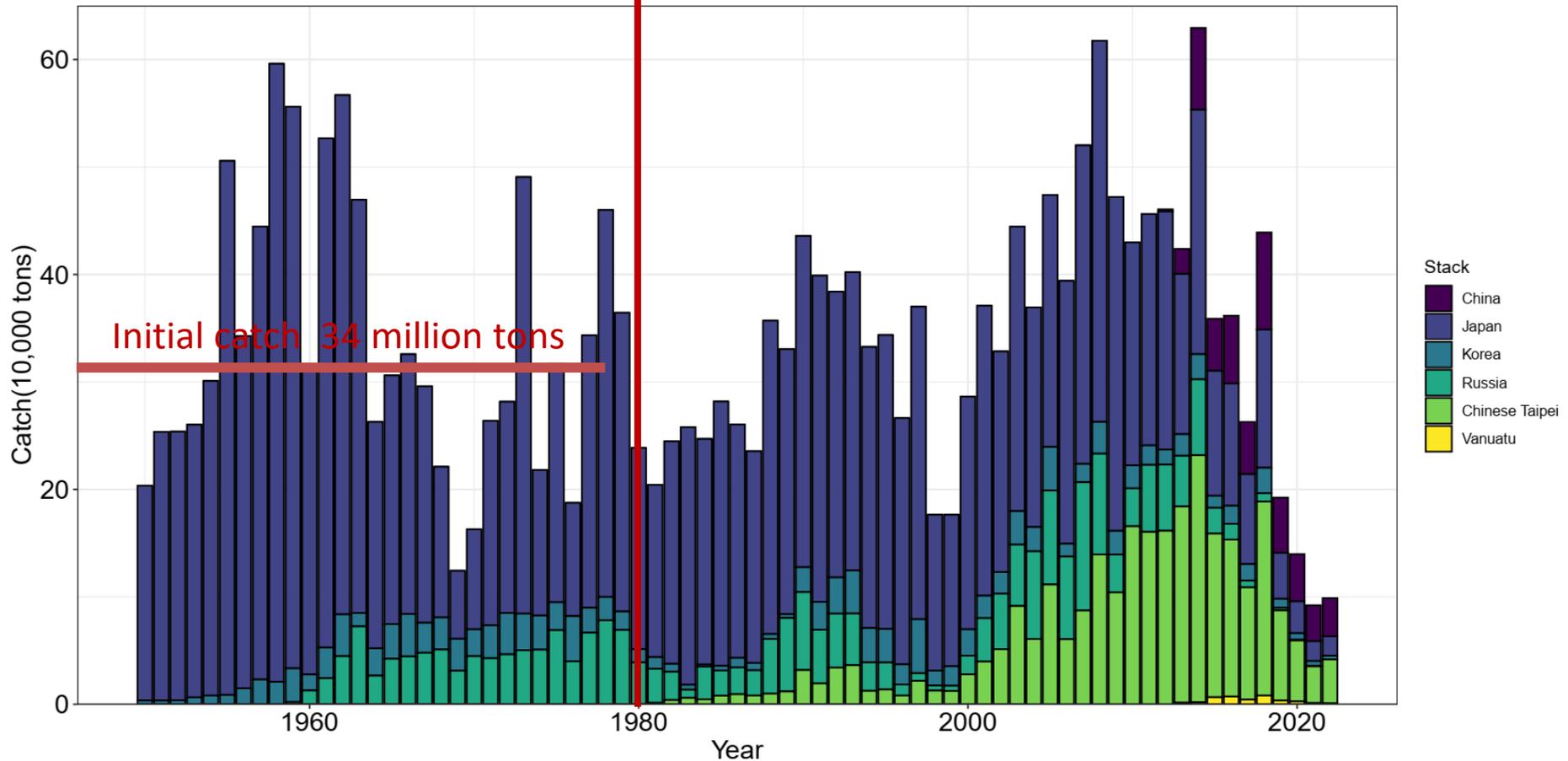
r4ss

Length data

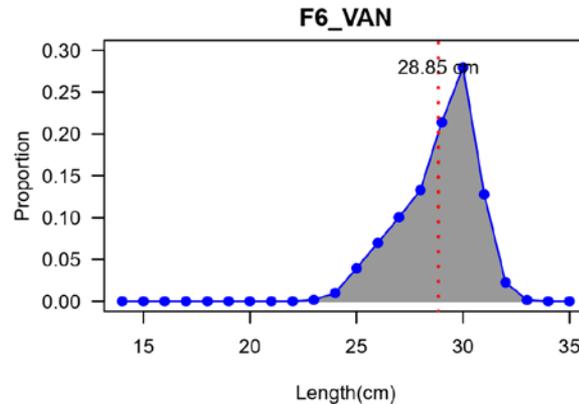
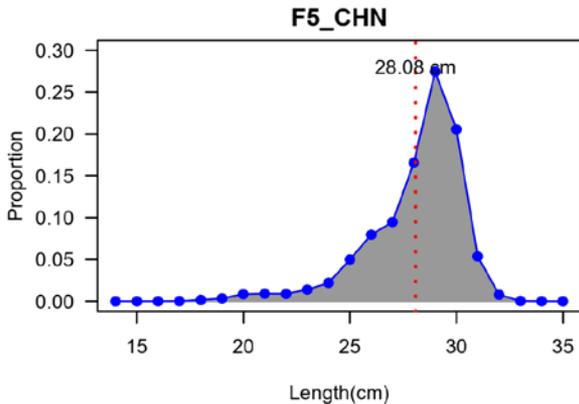
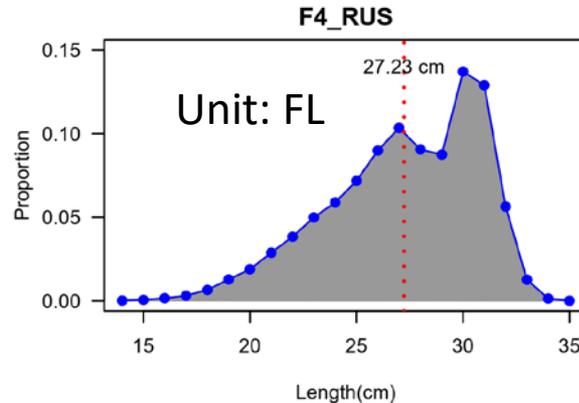
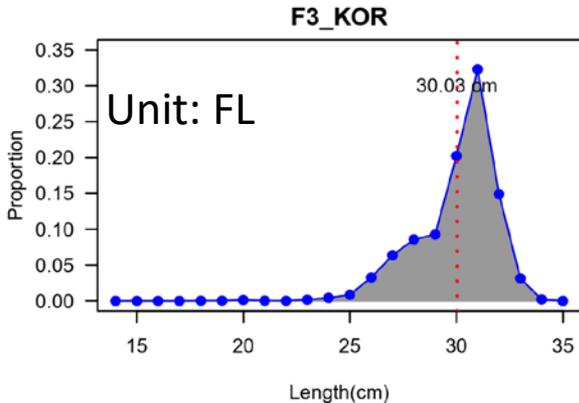
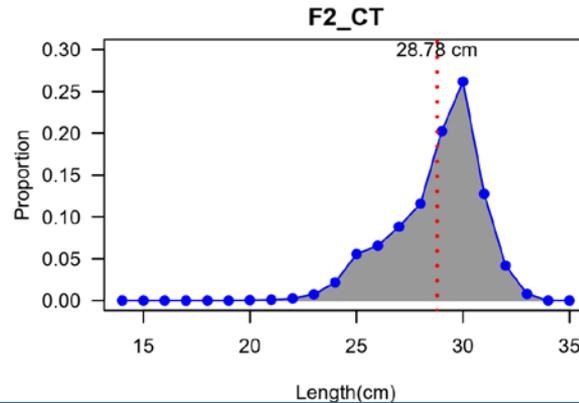
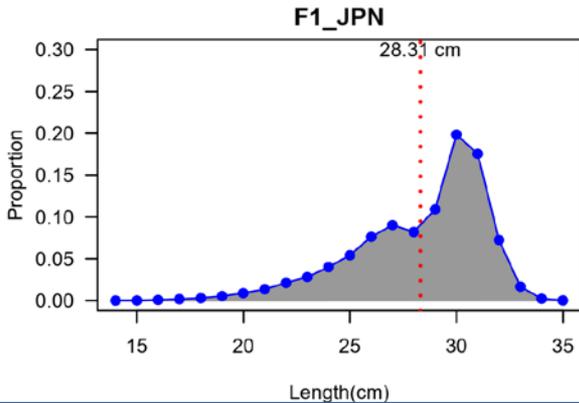
Length data

Historical catch data by fleets

Starting year of model: 1980

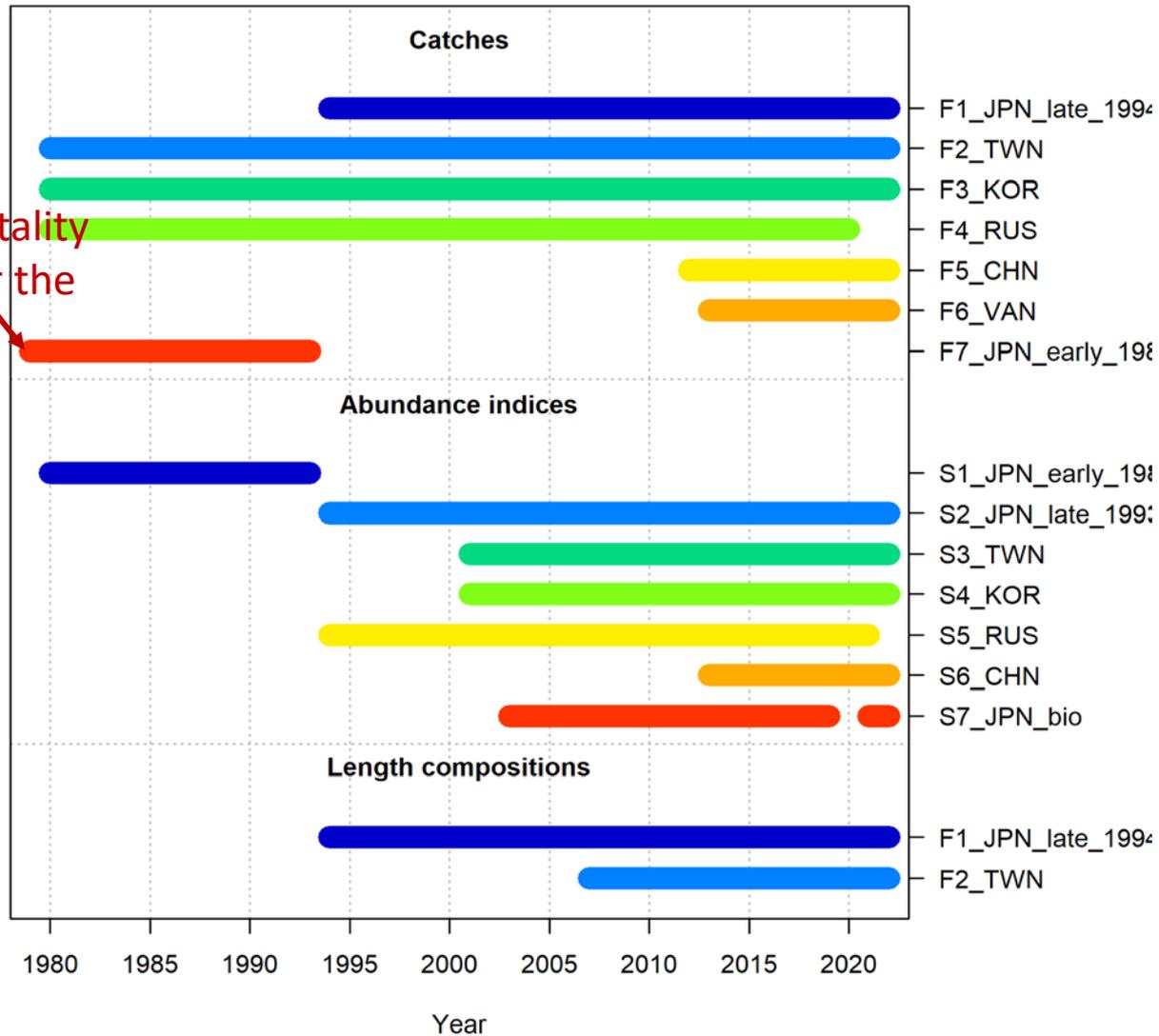


Aggregated length comp data by fleets



I did not include these size data

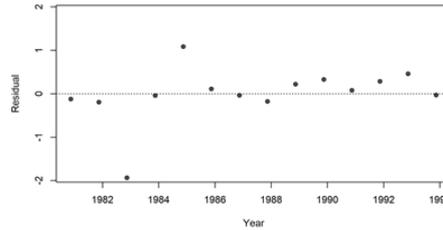
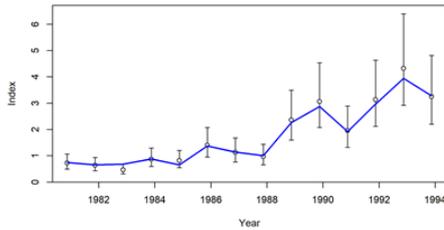
Data available for saury assessment by fleets



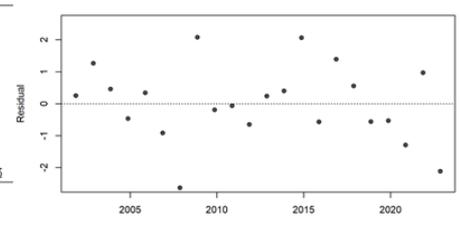
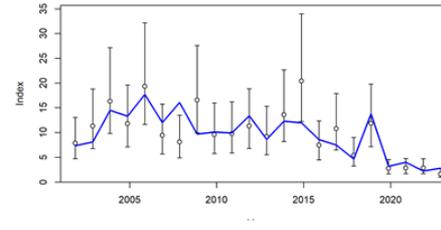
Initial fishing mortality was estimated for the fleet of Japan;

Fits to standardized CPUE by fleets

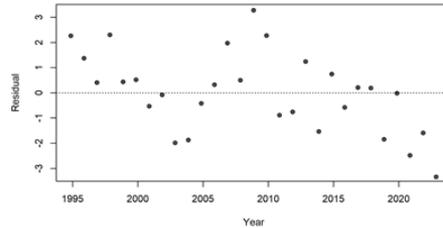
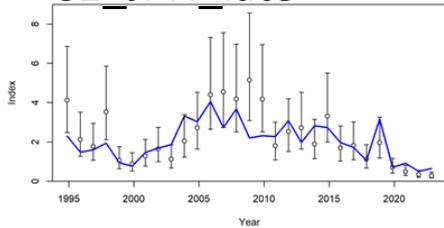
S1_JPN_early



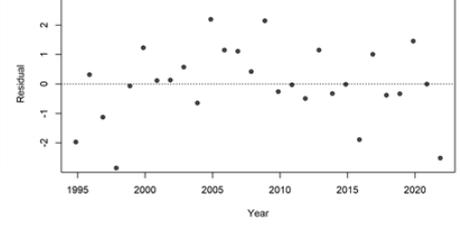
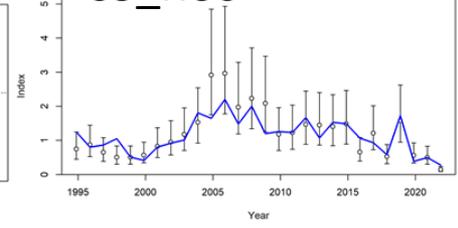
S4_KOR



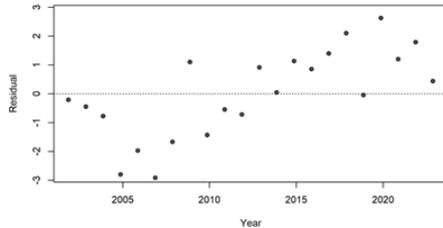
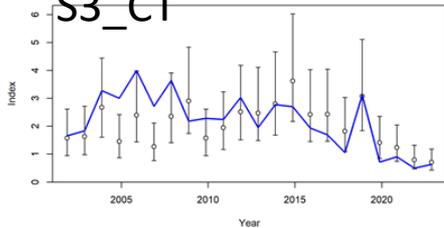
S2_JPN_late



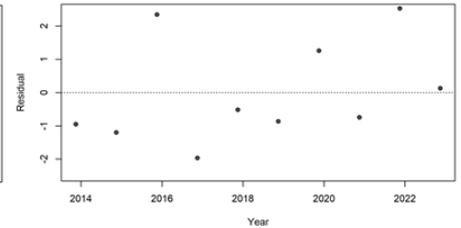
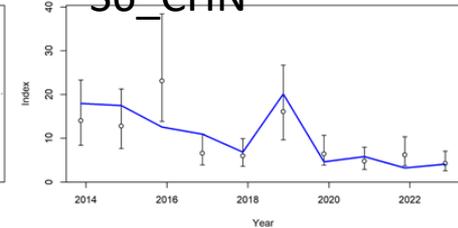
S5_RUS



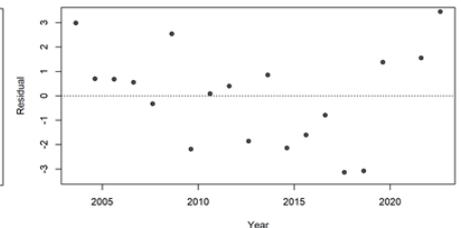
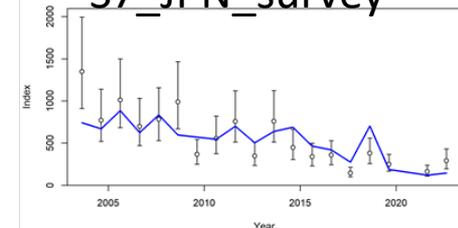
S3_CT



S6_CHN

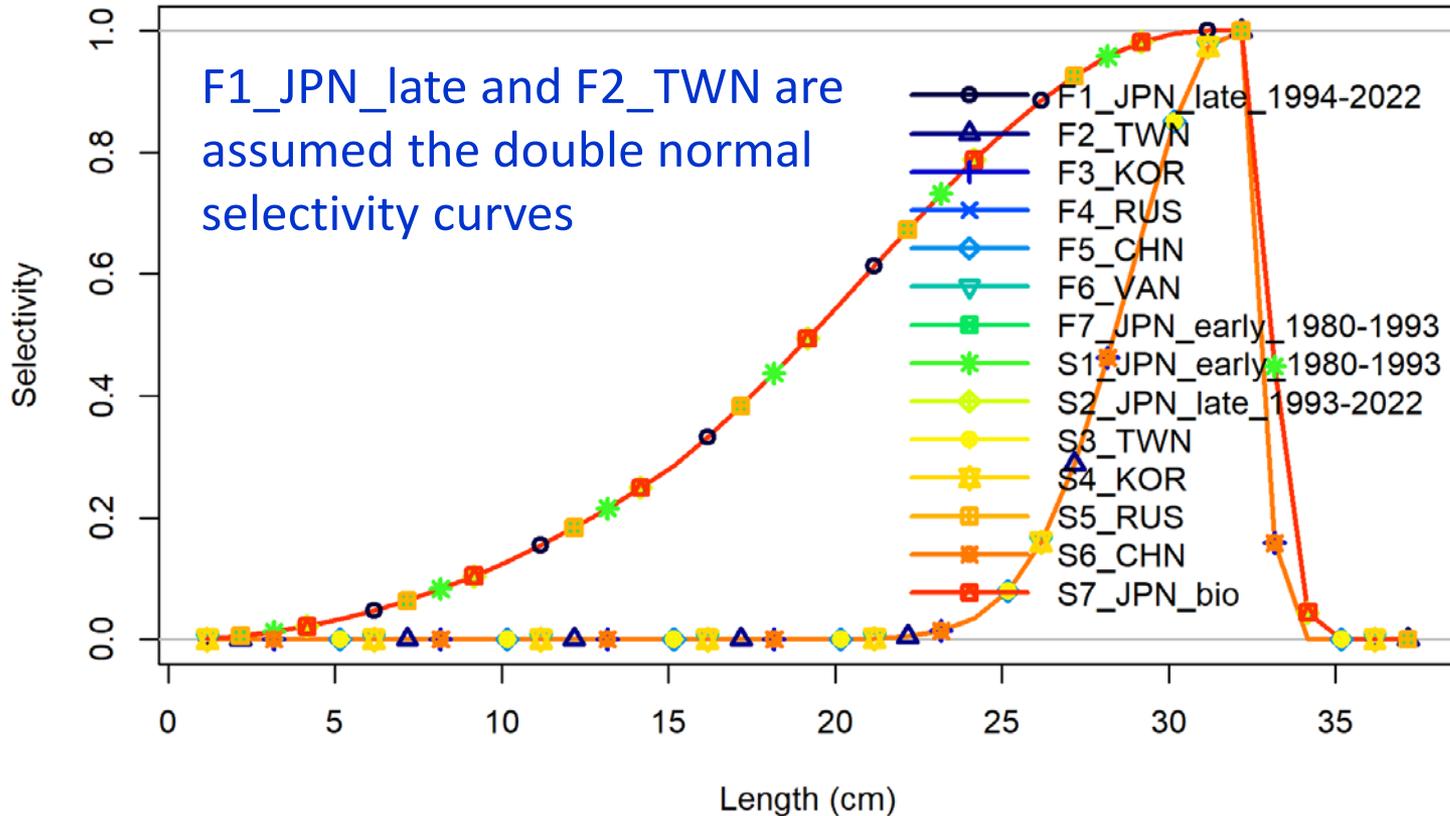


S7_JPN_survey



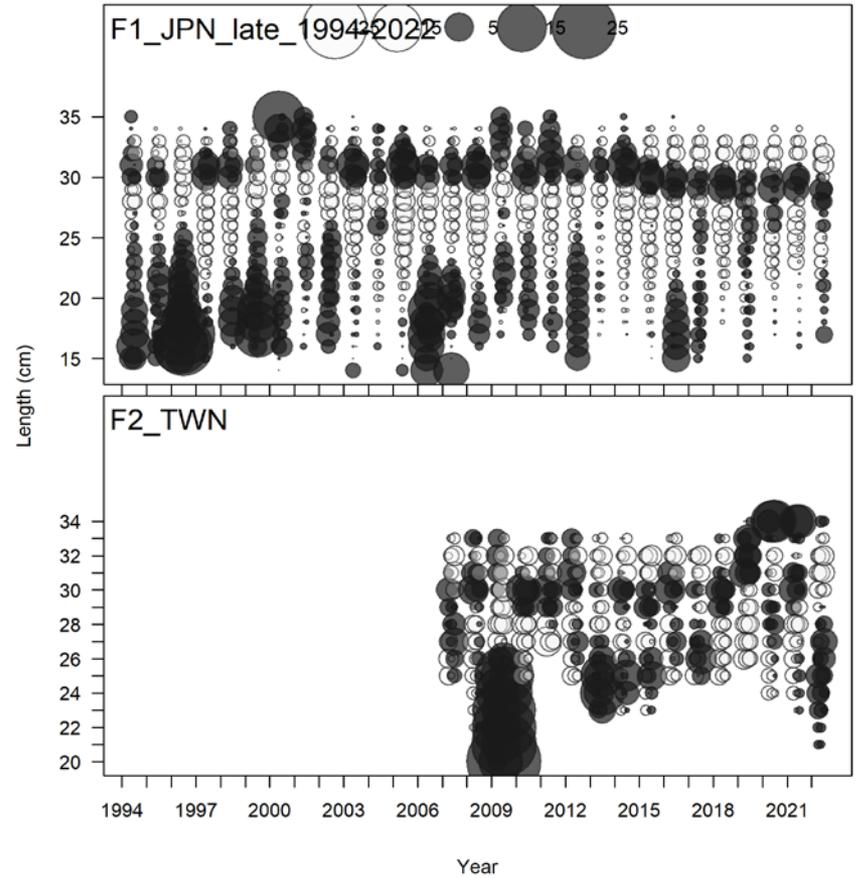
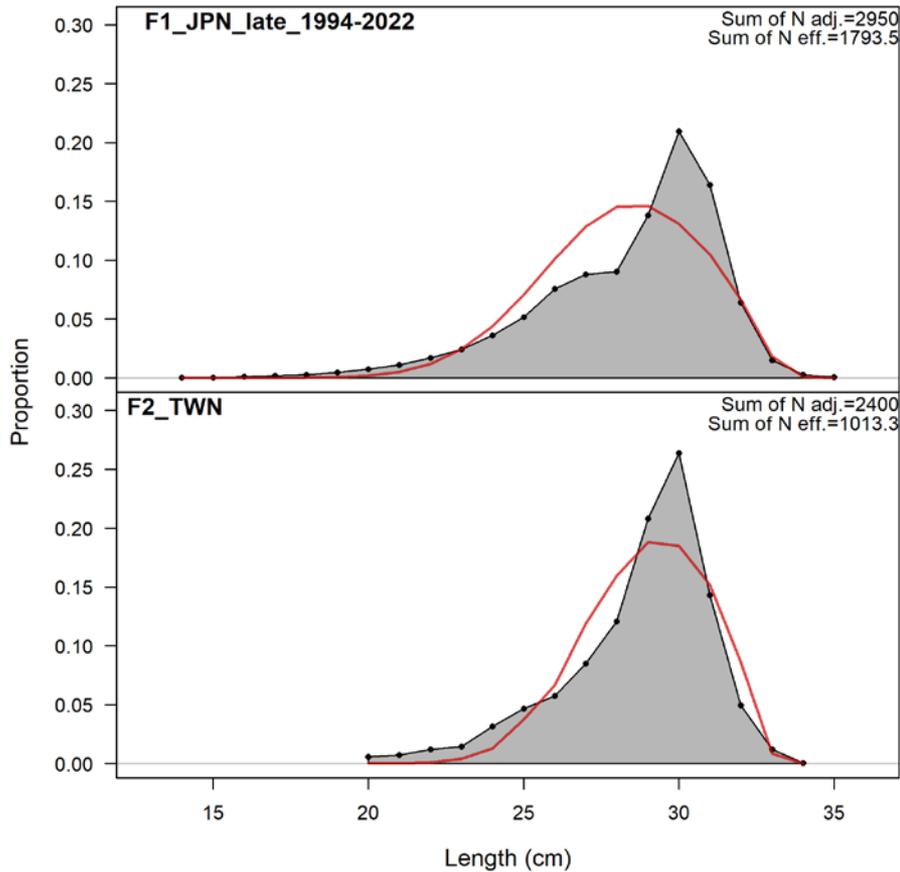
- Fits to CPUE data were generally good;
- No substantial divergences between the expected and estimated values;

Estimated selectivity by fleets



- RUS was mirrored to JPN;
- KOR, CHN and VAN were mirrored to CT;

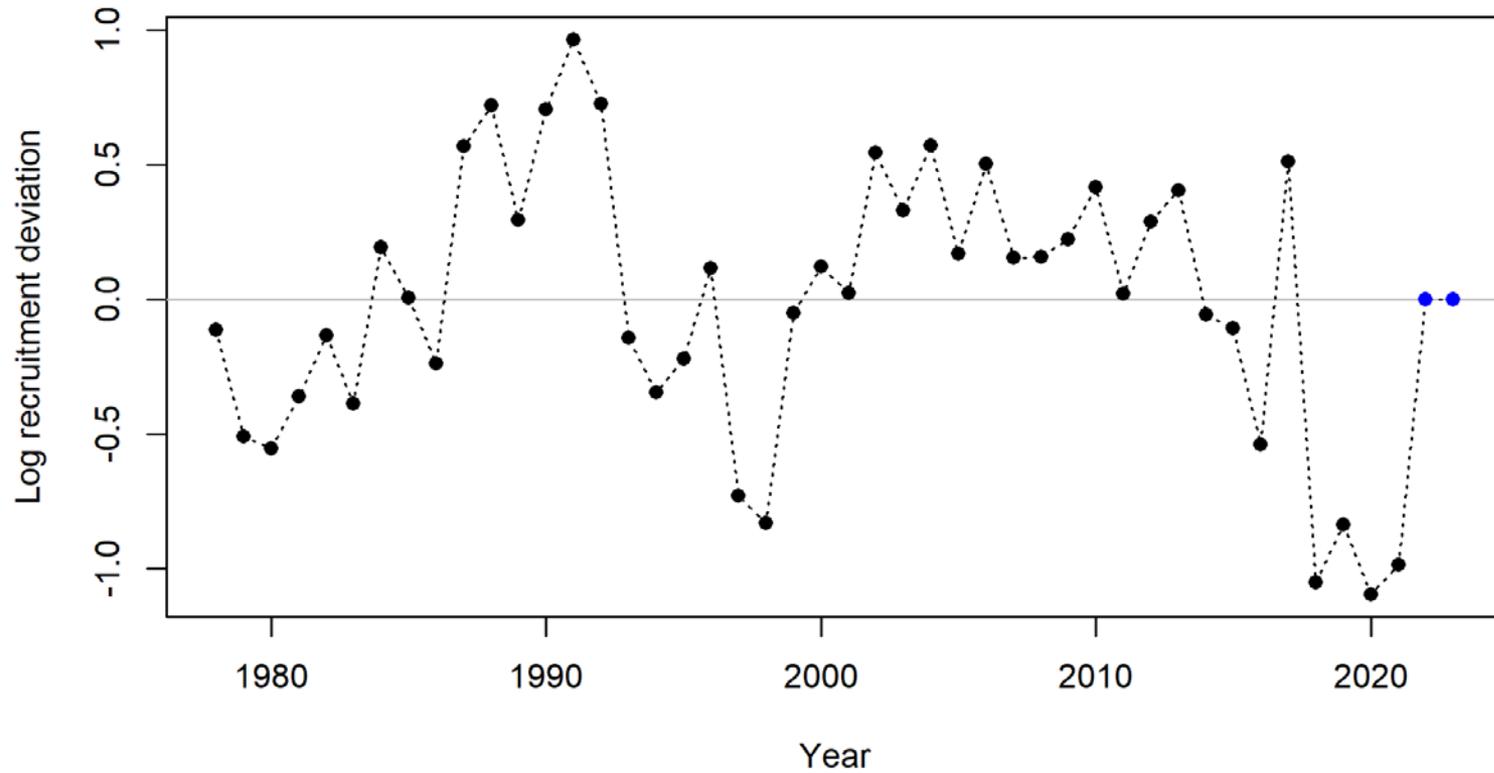
Fits to length composition data by fleets



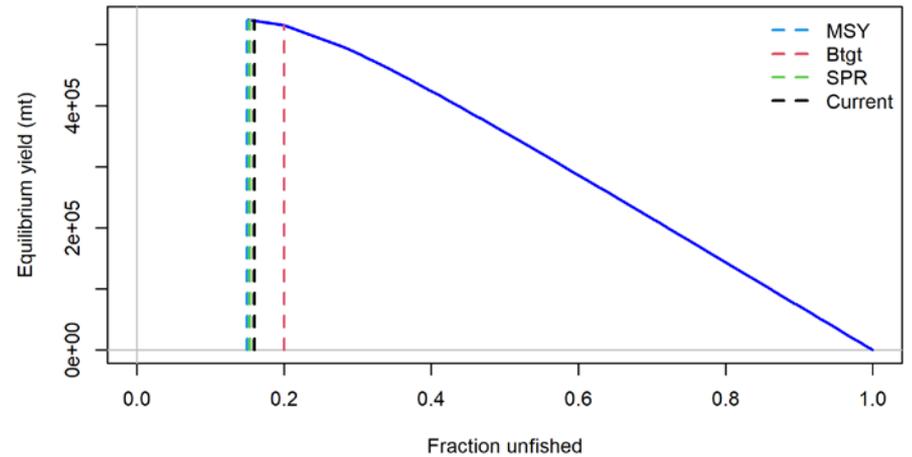
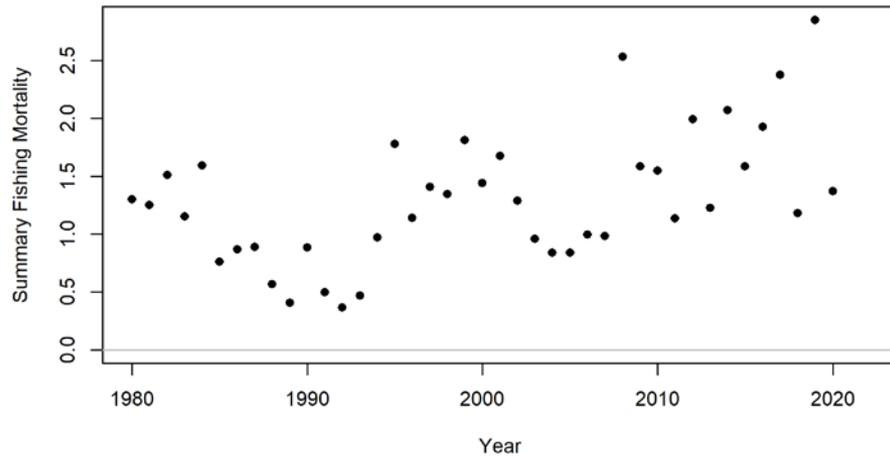
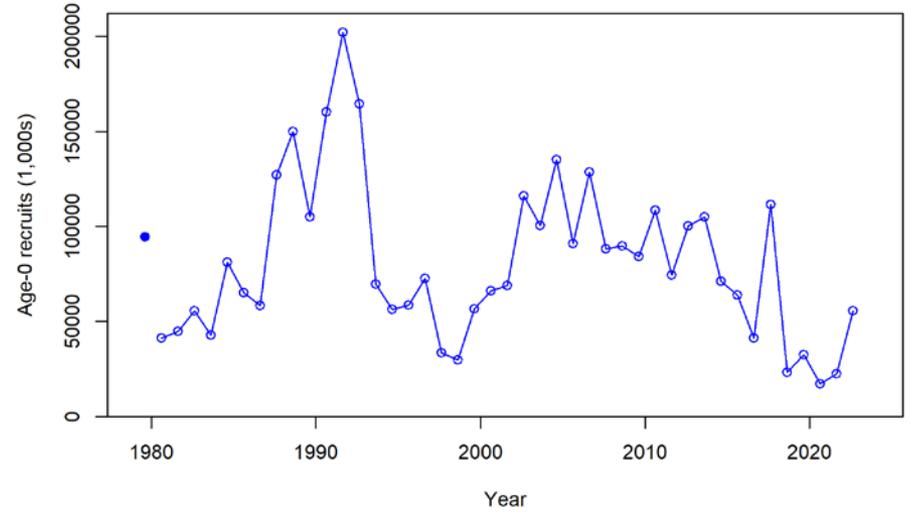
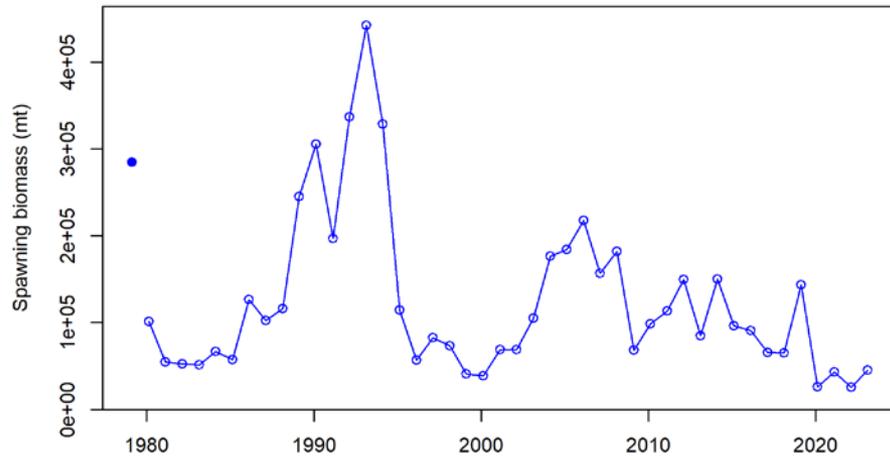
Fits to the length modes in composition data aggregated by fleets generally well;

The model predicted size compositions did not match the observations in some years;

Time-series of recruitment deviations



Preliminary model outputs



Summary

- We presented the methodology for a preliminary age-structured assessment with SS3 framework, which contains the information on input data, model structure, and parameterization;
- However, there is still uncertainty in life history parameters and input length composition data;
 - e.g., maturation, growth, and natural mortality;
- We shared the current SS3 model with the SSC PS group;
- *We recommended the SSC PS:*
 1. continuing model development work, reducing data conflicts and modelling uncertainties;
 2. examining and improving input assessment data;