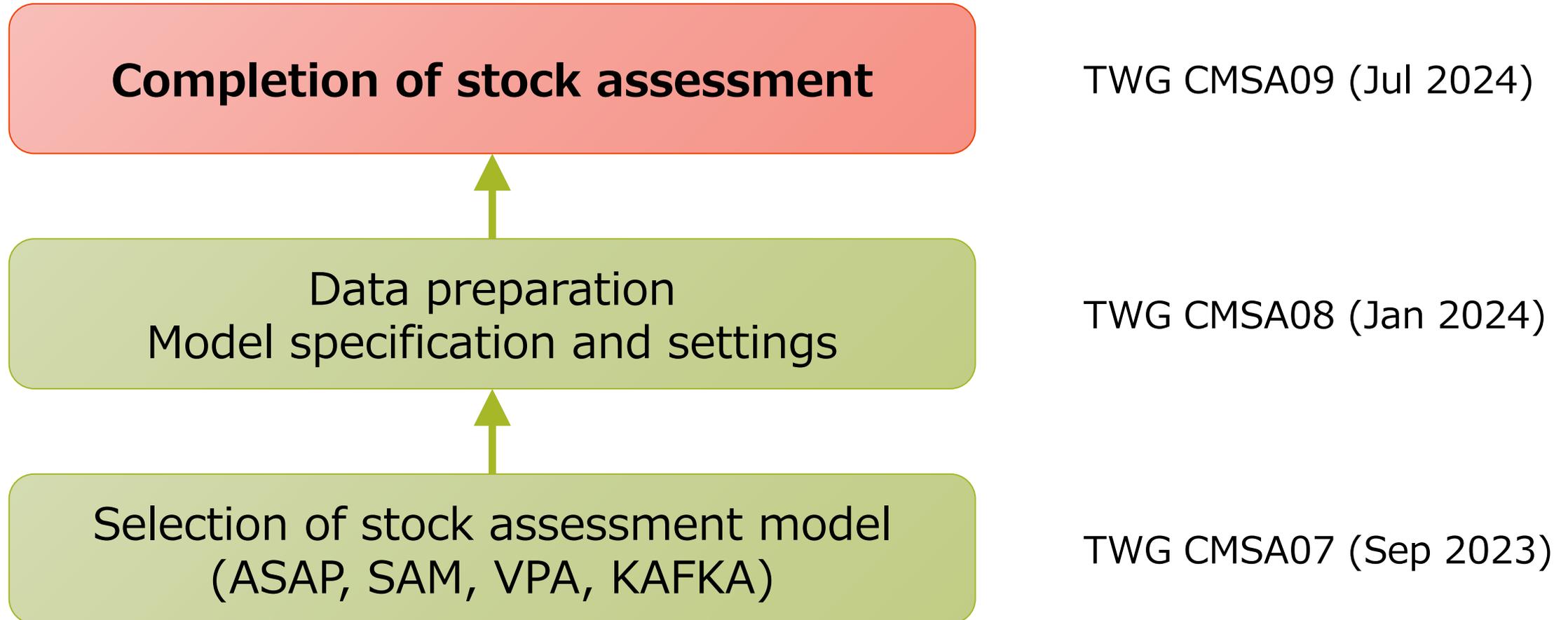




Agenda Item 4. Review of reports and recommendations from the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA) and the Small Scientific Committees (SSC BFME and SSC PS)

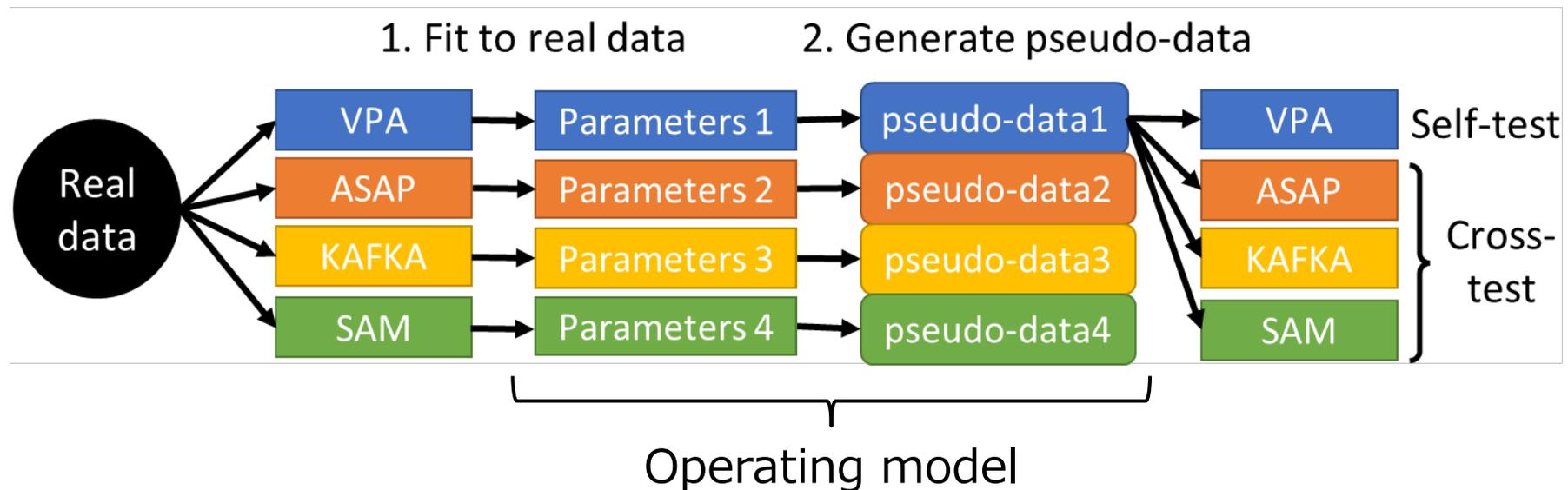
4.1 Technical Working Group on Chub Mackerel Stock Assessment

Current task of TWG CMSA



Selection of SA model

Discussion on SA model selection was started in March 2019.



- ❑ Self-/Cross test through performance measure
- ❑ Ranking SA models with summary metrics

Formal and informal meetings of TWG CMSA in 2023

Formal meeting

- TWC CMSA07 meeting in Vanuatu

Informal meetings (Online)

- 1st intersessional meeting
- 2nd intersessional meeting
- 3rd intersessional meeting

1st intersessional meeting

□ 17-19 May 2023

□ Via WebEx

□ Participants

- Canada 1
- China 2
- EU 1
- Japan 7
- Russia 4
- Invited expert 1
- Secretariat 5

□ Goal

- To rank the SA model candidates
- To select the SA model(s)

Agreements made at the 1st int. meeting

- Performance measures agreed

Category	Performance Measure (PM)
State	Total Biomass in years 2010 – 2019 (Tby2010 -TB2019)
State	Recruitment (Ry2010-Ry2019)
State	Fishing Mortality (AFy2010 - AFy2019)
State	Exploitation Rate (Ey2010 - Ey2019)
BRP	Bmsy_0.7_BH_1618
BRP	Fmsy_0.7_BH_1618
Depletion	Deple_SSB_median_2010
Depletion	Deple_B_median_2010
RFI	RF_Fmsy_0.7_BH_1618
RFI	RF_F40SPR_1618
RFI	RF_F0.1_1618

- Median relative bias (MedARB) as a summary metric
- A geometric mean will be used over the chosen PMs and data models to aggregate SMs.
- Agreed to give self-test a priority and to use weighted geometric mean with different weighting of self-test of 1 to 3 with 0.5 intervals (1, 1.5, 2, 2.5, 3).

2nd intersessional meeting

□ 29 Jun 2023

□ Via WebEx

□ Participants

- China 4
- Japan 6
- Russia 3
- Invited expert 1
- Secretariat 3

□ Goal

- To preliminary review the report from the invited expert on ranking of stock assessment model candidates
- To confirm the work plan and meeting documents towards the coming TWC CMSA07 meeting

TWG CMSA06 meeting

□ Dates: 4-7 September 2023

□ Place: Port Vila, Vanuatu

□ Participants

- Chair
- Canada 2
- China 4
- EU 1
- Japan 10
- Russia 2
- USA 1
- Vanuatu 6
- Invited expert 1
- Rapporteur 1
- Secretariat 4



Agenda

Agenda Item 1. Opening of the Meeting

Agenda Item 2. Adoption of Agenda

Agenda Item 3. Overview of the recommendations and outcomes of previous NPFC meetings relevant to chub mackerel

3.1 6th TWG CMSA

3.2 Intersessional meetings of TWG CMSA

3.3 COM07 meeting

3.3.1 NPFC Performance Review

3.3.2 Resolution on Climate Change

Agenda Item 4. Member's fisheries status and research activities

Agenda Item 5. Selection of stock assessment model(s) for chub mackerel

5.1 Project overview and methods development for the testing and evaluation of stock assessment models

5.2 Summary of performance and ranking of the stock assessment model candidates and their characteristics

5.2.1 Recommendations from the external expert

5.3 Final agreement on stock assessment model(s) and procedures in TWG CMSA

Agenda Item 6. Preparations for stock assessment of chub mackerel

6.1 Review of biological parameters

6.2 Intersessional works on fishery data (catch-at-age, weight-at-age, maturity-at-age, if possible)

6.2.1 Calendar to be applied to stock assessment on chub mackerel

6.3 Intersessional works on abundance indices

6.3.1 Review and update of the CPUE Standardization Protocol

6.4 Review of the Stock Assessment Protocol for Chub Mackerel

6.5 Possible settings and specification of stock assessment model

6.6 Recommendations on preparations for stock assessment

Agenda Item 7. Future projection of chub mackerel

7.1 Review of the table of options for the basic specifications of conducting future

projections for chub mackerel

Agenda Item 8. Biological reference points

8.1 Review of the table of candidate biological reference points for chub mackerel

Agenda Item 9. Review of the Work Plan of the TWG CMSA

Agenda Item 10. Other matters

10.1 Timeline and intersessional activities before TWG CMSA08

10.2 Observer Program

10.2.1 Review data or data description on fisheries bycatch in the chub mackerel fisheries

10.3 Species summary

10.4 Other issues

Agenda Item 11. Recommendations to the Scientific Committee

Agenda Item 12. Adoption of Report

Agenda Item 13. Close of the Meeting

Agenda Item 5. Selection of stock assessment model(s) for chub mackerel

SAM (State-space stock assessment model) was agreed to be used for stock assessment in TWG CMSA.

		Overall Summary Weighted Geometric Mean of Med ARB		
Rank	Estimation Model	Scenario A (Base Case 1)		Scenario B (Base Case 2)
1	SAM	0.396		0.325
2	VPA	0.443		0.345
3	KAFKA	0.587		0.533
4	ASAP	0.599		0.614

Agenda Item 6. Preparations for stock assessment of chub mackerel

Recommendation on preparation for stock assessment

Para 54. The TWG CMSA agreed to:

- a. submit input data such as quarterly catch-at-age, weight-at-age, and maturity-at-age (or annual data if quarterly data are not available) to be analyzed and aggregated through collaborative work among Members in a transparent manner with a written report, including methodology, with participants from China, Japan, and Russia as authors.
- b. share available quarterly or monthly catch-at-length data, length-weight relationship parameters, and length-frequency data in proportion in the intersessional period using the template on the NPFC Collaboration site to develop a common understanding on the difference of weight-at-age among Members.
- c. consider and compare the application of different definitions of year as follows:
 - i. **Application of fishing year (July-June)** will be used as a base case. For Chinese quarterly catch data which are not available from 2014 to 2017, a method to convert the annual catch for this period into the fishing year basis should be developed prior to the TWG CMSA08 meeting.
 - ii. A case where each fleet applies their own calendar will be a sensitivity case as a backup of the base case.
- d. finalize the template for presenting CPUE standardizations during the intersessional period.
- e. present updated CPUE standardizations at TWG CMSA08 using the CPUE standardization template and following **the updated CPUE Standardization Protocol**.
- f. follow **the updated Stock Assessment Protocol**.
- g. continue to discuss the settings and specification of SAM, conduct a preliminary run prior to TWG CMSA08 and present the results at TWG CMSA08, and finalize the settings and specification of SAM at TWG CMSA09.

Agenda Item 8. Biological reference points

Candidate biological reference points

a. F-based reference points

- i. F_{MSY}
- ii. $F_{\%SPR}$
- iii. $F_{0.1}$, F_{max}

b. Biomass-based reference points (including SSB, summary biomass, etc.)

- i. B_{MSY}
- ii. $\%B_0$
- iii. Certain historical level of B

Recommendation to the SC

The TWG CMSA agreed to:

- a. share relevant fisheries and research information on the impact of climate change, such as the impact of climate change on the distribution of chub mackerel, at future meetings.
- b. include consideration of the impact of density-dependent and density-independent factors on the biological parameters of chub mackerel in its agenda at future meetings.
- c. present and explain the methods used by Members to estimate catch-at-age data.
- d. present more detailed fleet descriptions, including gear specifications/configuration.
- e. share Members' methodologies for measuring/observing biological parameters, including for aging and determining maturity, and to identify and discuss differences among them, as a first step towards developing a protocol for common methodologies.
- f. use SAM as the model for stock assessment of chub mackerel.
- g. conduct sensitivity analyses to better understand the effect of catch uncertainty, given that chub mackerel catch is taken from mixed fisheries.
- h. continue to make preparations for the chub mackerel stock assessment as described in paragraph 54.
- i. continue to work intersessionally in accordance with the agreed timeline (**Annex J**).
- j. complete the first chub mackerel stock assessment in 2024.
- k. task the Secretariat, working with Members and the SC Chair, to set up an online private git repository to develop and share the TWG CMSA's code.

Timeline and activities for intersessional work

Month		Catch@Age	Weight@Age, Maturity@Age	Abundance Indices	SAM
Sep	Mid			Email communication on draft CPUE document template	Share specification table
	Late	Japan shares ALK			Email communication
Oct	Early				
	Mid			Determine CPUE document template	
	23 Oct	Share Catch@Age data	Share Weight@Age and Maturity@Age data		
	Late	China shares ALK	Share Catch@Length (Catch@Size) Exchange of age determination rule (timing of aging)		
Nov	Early				
	Mid	Intersessional meeting (one day in the week of 13-17 Nov)			
	Late				
Dec	Early				
	Mid				
	23 Dec	Submission of Catch@Age	Submission of Weight@Age and Maturity@Age	Submission of documents Share CPUE standardization code	
	Late				
Jan	Early				Trial run using tentative input data
	Mid				Share code and tentative input data
	22-25 Jan	TWG CMSA08			
	Late				
Feb	Early				
	Mid				
	25 Feb	Finalization of input data	Finalization of input data	Finalization of input data	

Recommendation to the SC

The TWG CMSA recommended that the SC:

- a. adopt the Work Plan of the TWG CMSA (NPFC-2023-TWG CMSA07-WP01 (Rev. 1)).
- b. endorse the TWG CMSA meeting schedule for 2023-2024 financial years: TWG CMSA08 on 22-25 January 2024 and TWG CMSA09 in autumn 2024.
- c. hire an invited expert to support the TWG CMSA in the future stock assessment project.
- d. develop general protocols and guidelines for using git repositories for joint data analysis projects.

3rd intersessional meeting

□ 15 Nov 2023

□ Via WebEx

□ Participants

- Canada 1
- China 3
- EU 1
- Japan 7
- USA 1
- Invited expert 1
- Secretariat 2

□ Goal

- To check the progress of data preparation
- to identify remaining works towards TWG CMSA08 meeting in Niigata

List documents planned to submit to TWG CMSA08

	China	Japan	Russia
Input data (CAA, WAA, MAA)	Joint document		
Abundance indices	Lighting PS CPUE	Summer survey (age 0 index)	Trawl CPUE
		Autumn survey (ages 0&1 indices)	CPUE from old Russian VMS submitted TWG CMSA01
		Egg survey (SSB indices)	
		Dipnet CPUE (SSB indices)	
Biological parameter (especially, M)	Growth parameters and M		
Preliminary run of SAM	Shota (Japan) will submit a paper (After data submission, Shota will try to conduct SAM)		

Progress of data sharing

Data	China	Japan	Russia
Catch@length	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Age-length key	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Apply JPN ALK
Catch@age	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Weight@age	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Maturity@age	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	