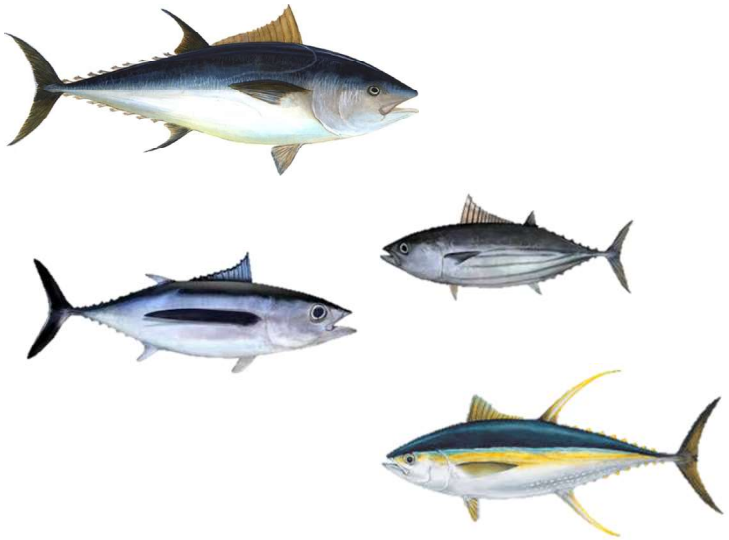
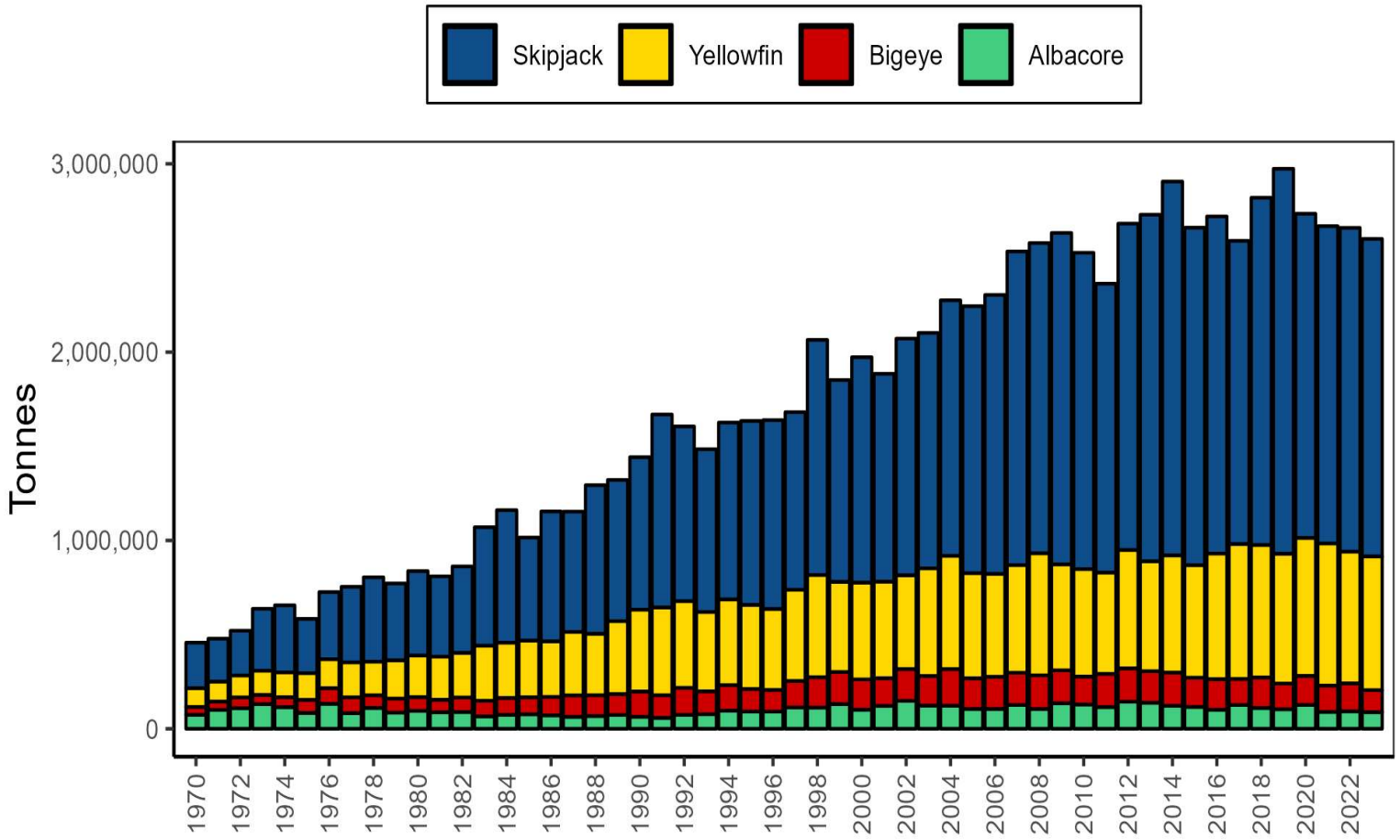


Pacific Community
Communauté du Pacifique

Status of the WCPFC Tuna Fisheries and Stocks

SPC-OFP
TCC 20
25 September – 1 October 2024
Pohnpei, Federated States of Micronesia

Fisheries Trends – WCPFC target tuna catch



2023 catch

2.6 mill mt

2.7% lower than 2022

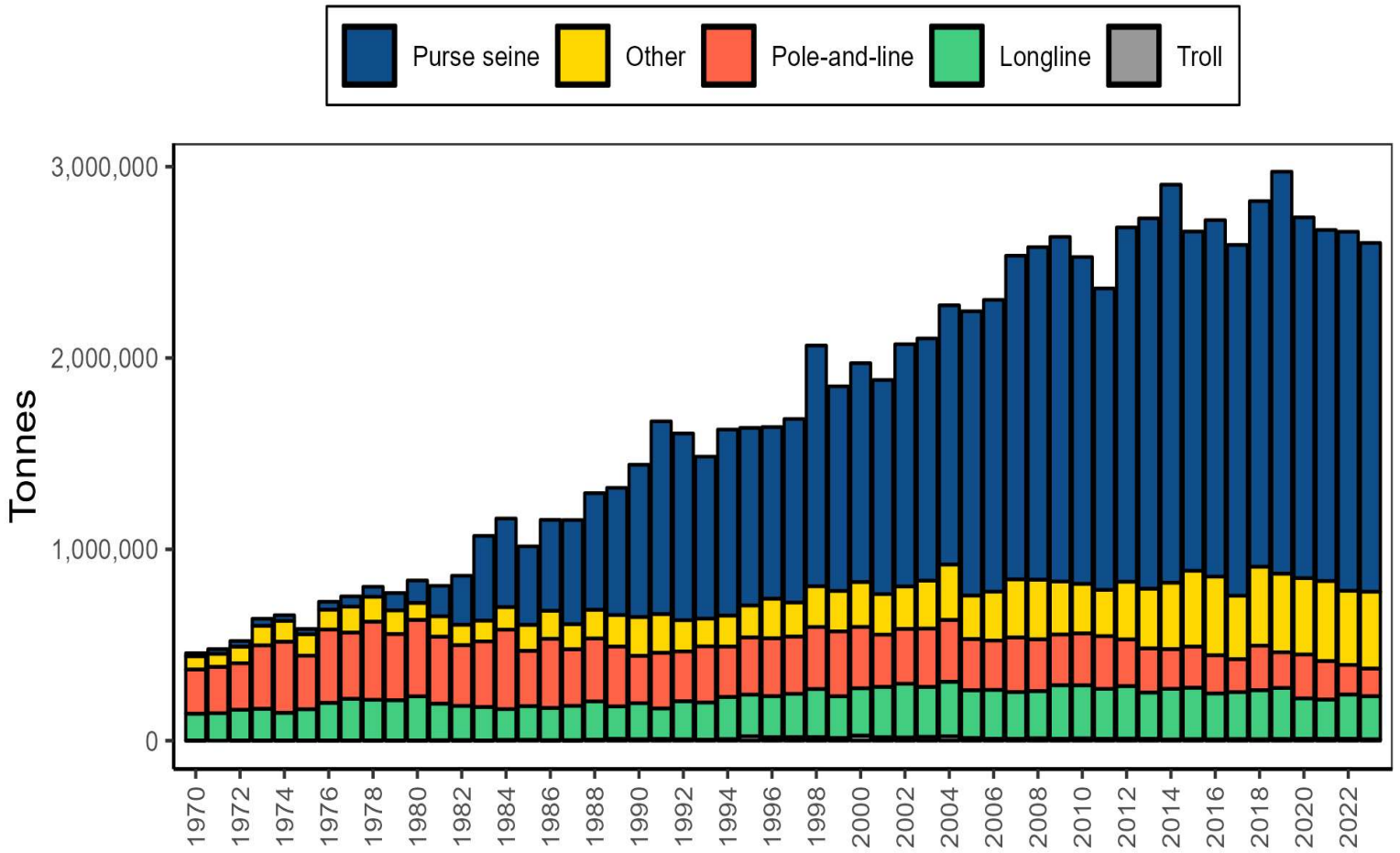
79% of the Pacific Ocean

52% of the global tuna catches

Provisional Estimates

- SKJ: 1.65 mill mt (63%)
- YFT: 747K mt (28%)
- BET: 140K mt (5%)
- ALB: 94K mt (4%)

Fisheries Trends – WCPFC target tuna catch, by gear



2023 Provisional Estimates

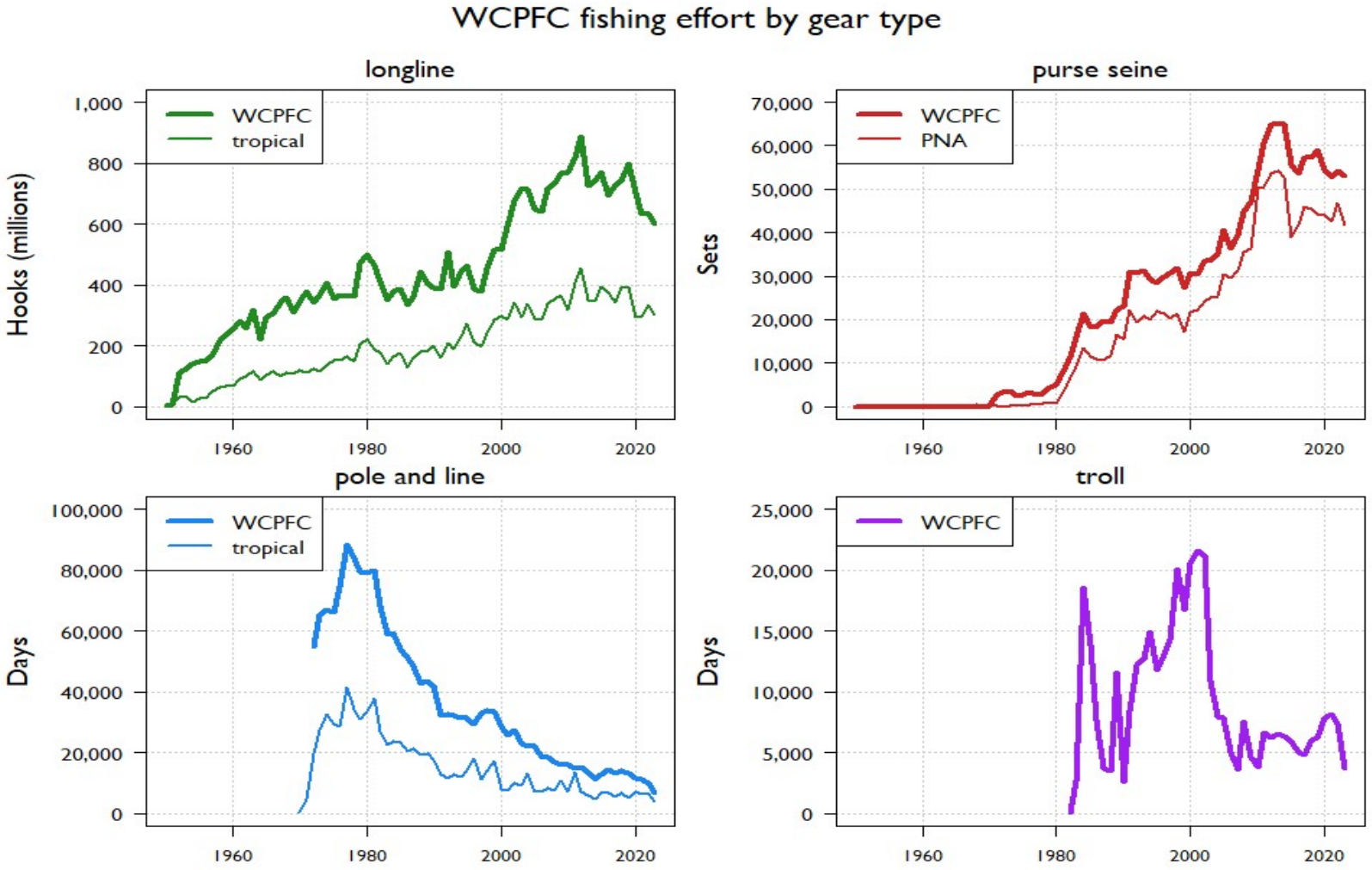
- Purse seine: 1.8 mill mt (70%)
- Longline: 234K mt (9%)
- Pole-and-line: 143K mt (5%)
- Other: mostly artisanal gears from Indonesia, Vietnam, and Philippines (15%)

Fisheries Trends

Species	Catch (1000 mt)	% of total tuna catch	Change from 2022	Notes
Albacore	94	4%	1%	7% below 5 yr avg
Bigeye	140	5%	-8%	4% below 5 yr avg
Skipjack	1650	63%	-5%	8% below 5 yr avg
Yellowfin	747	28%	7%	3% above 5 yr avg
Total	2631	100%	-1%	4% below 5 yr avg

Gear type	Catch (1000 mt)	% of total tuna catch	Change from 2022	Notes
Purse seine	1842	70%	-2%	3% below 5 yr avg
Longline	234	9%	<1%	similar to 5 yr avg
Pole-Line	143	5%	-8%	lowest since 1960s
Troll	7	<1%	-37%	24% below 5 yr avg
Other	404	15%	4%	1% below 5 yr avg
Total	2631	100	-1%	4% below 5 yr avg

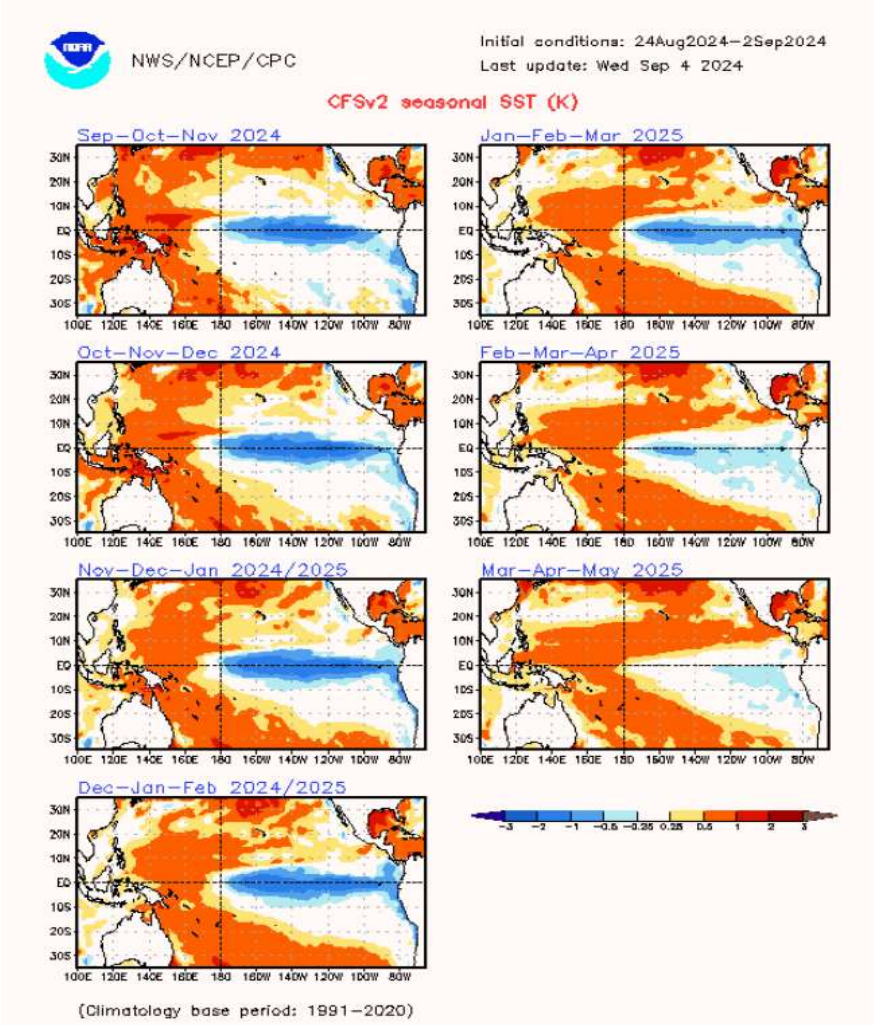
Fisheries Trends



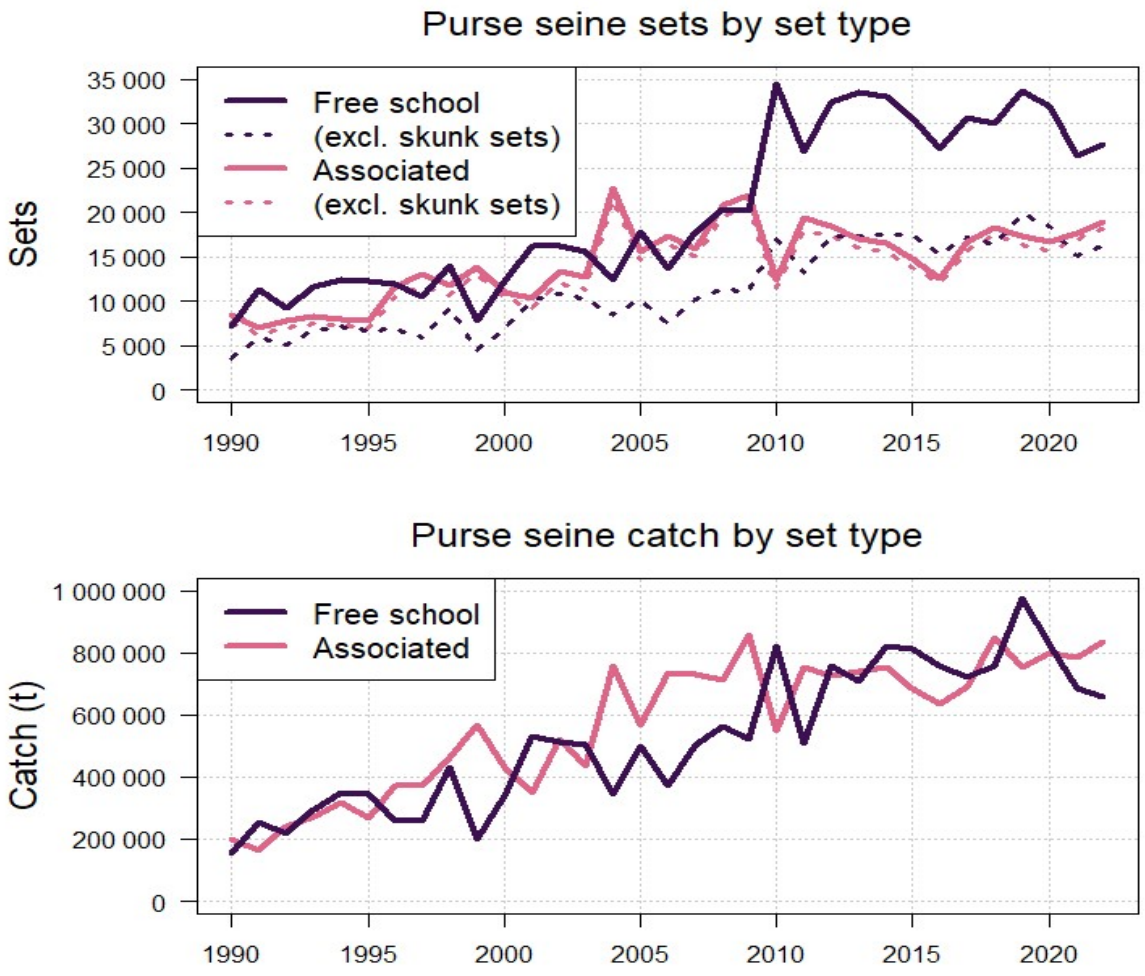
El Nino

ONI index:
Positive = warm conditions > 0.5 = El Nino
Negative = cold conditions < -0.5 = La Nina

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2012	-0.9	-0.7	-0.6	-0.5	-0.3	0.0	0.2	0.4	0.4	0.3	0.1	-0.2
2013	-0.4	-0.4	-0.3	-0.3	-0.4	-0.4	-0.4	-0.3	-0.3	-0.2	-0.2	-0.3
2014	-0.4	-0.5	-0.3	0.0	0.2	0.2	0.0	0.1	0.2	0.5	0.6	0.7
2015	0.5	0.5	0.5	0.7	0.9	1.2	1.5	1.9	2.2	2.4	2.6	2.6
2016	2.5	2.1	1.6	0.9	0.4	-0.1	-0.4	-0.5	-0.6	-0.7	-0.7	-0.6
2017	-0.3	-0.2	0.1	0.2	0.3	0.3	0.1	-0.1	-0.4	-0.7	-0.8	-1.0
2018	-0.9	-0.9	-0.7	-0.5	-0.2	0.0	0.1	0.2	0.5	0.8	0.9	0.8
2019	0.7	0.7	0.7	0.7	0.5	0.5	0.3	0.1	0.2	0.3	0.5	0.5
2020	0.5	0.5	0.4	0.2	-0.1	-0.3	-0.4	-0.6	-0.9	-1.2	-1.3	-1.2
2021	-1.0	-0.9	-0.8	-0.7	-0.5	-0.4	-0.4	-0.5	-0.7	-0.8	-1.0	-1.0
2022	-1.0	-0.9	-1.0	-1.1	-1.0	-0.9	-0.8	-0.9	-1.0	-1.0	-0.9	-0.8
2023	-0.7	-0.4	-0.1	0.2	0.5	0.8	1.1	1.3	1.6	1.8	1.9	2.0
2024	1.8	1.5	1.1	0.7	0.4	0.2						



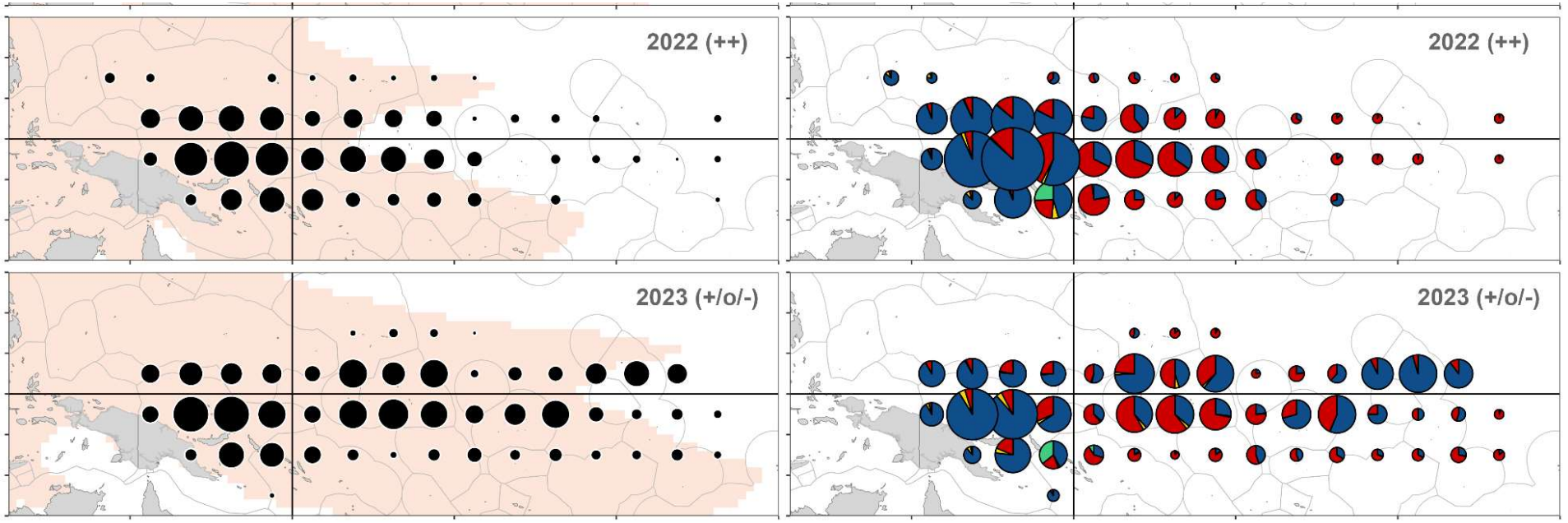
Purse seine catch and effort



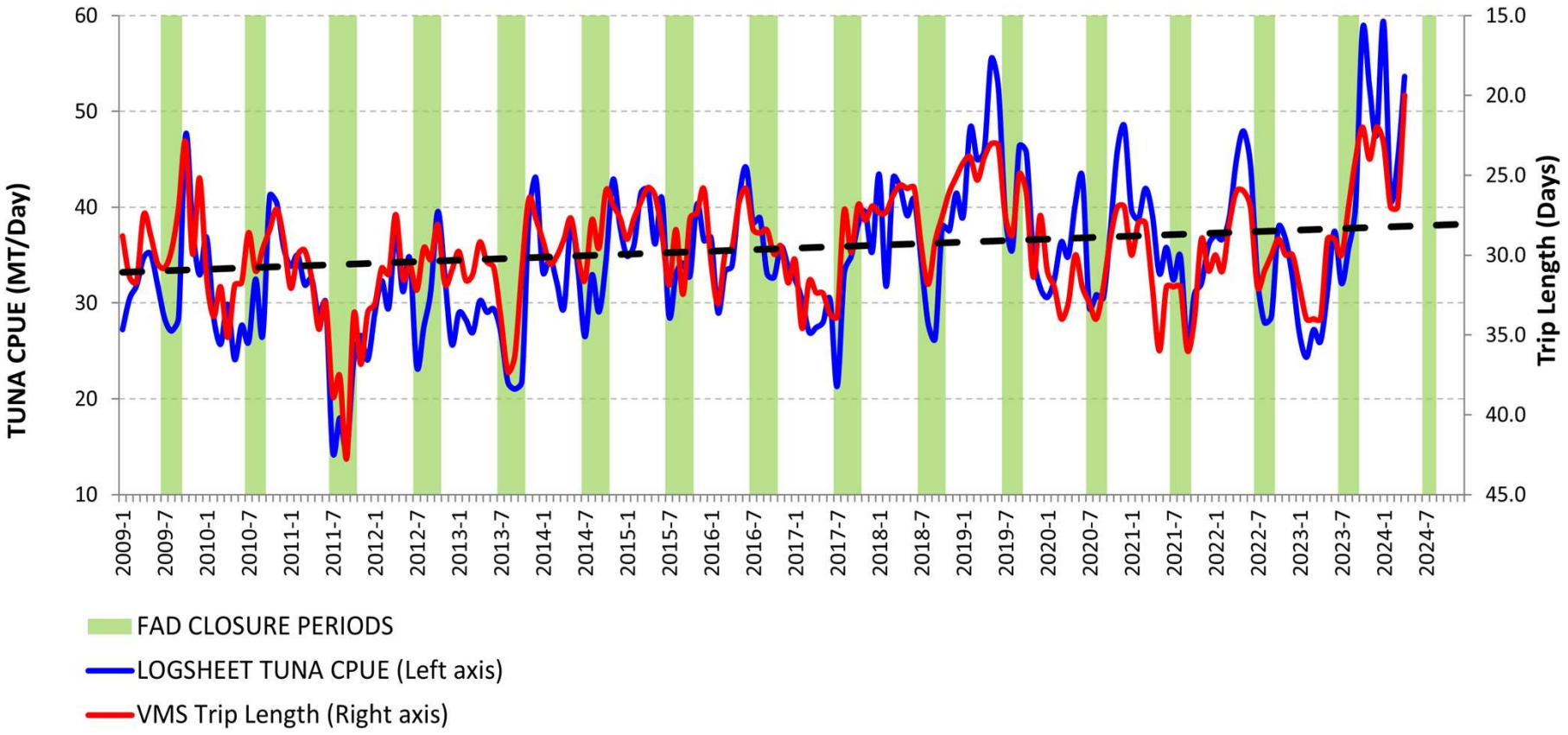
Purse seine effort distribution

Days

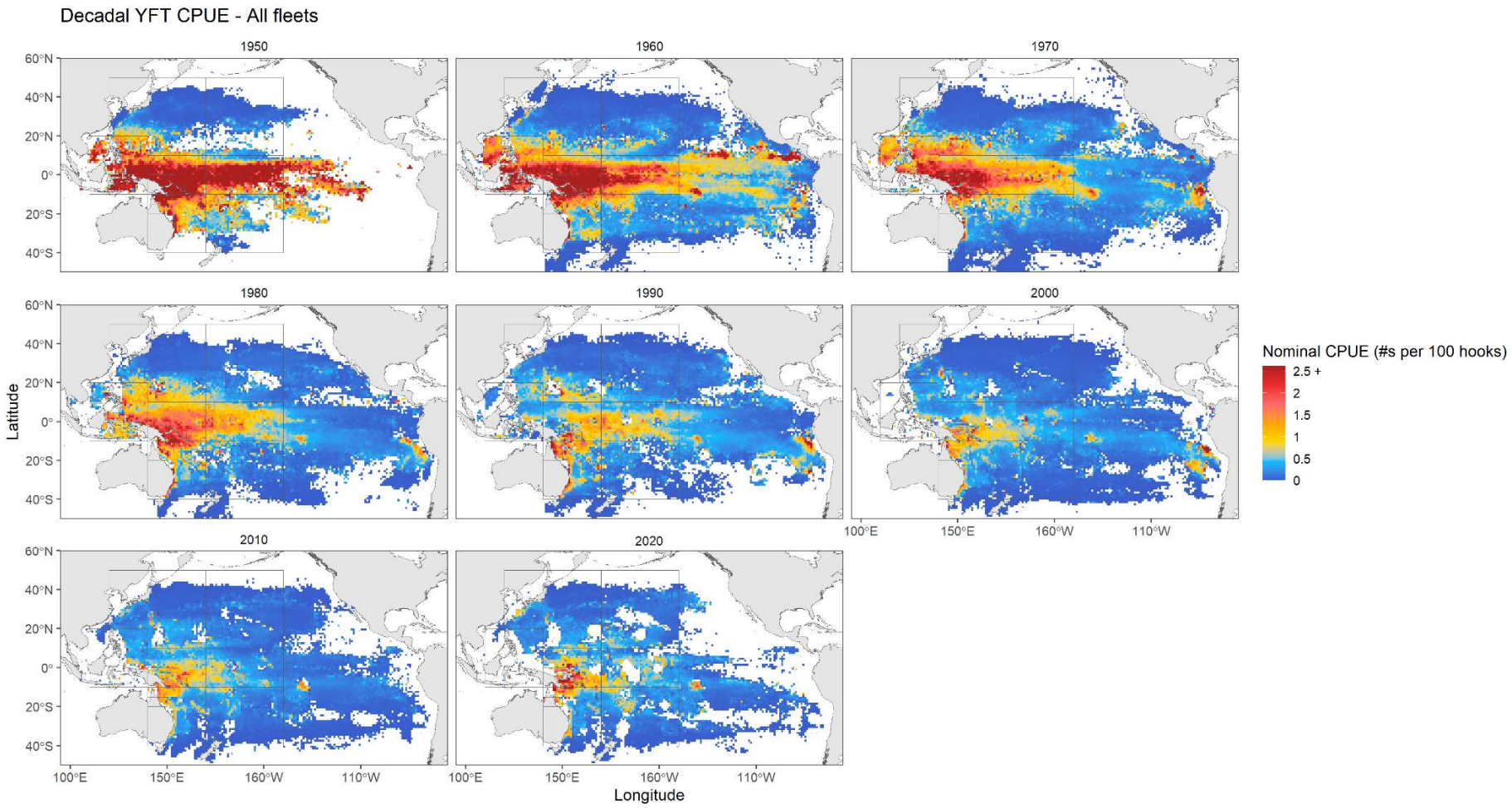
Sets



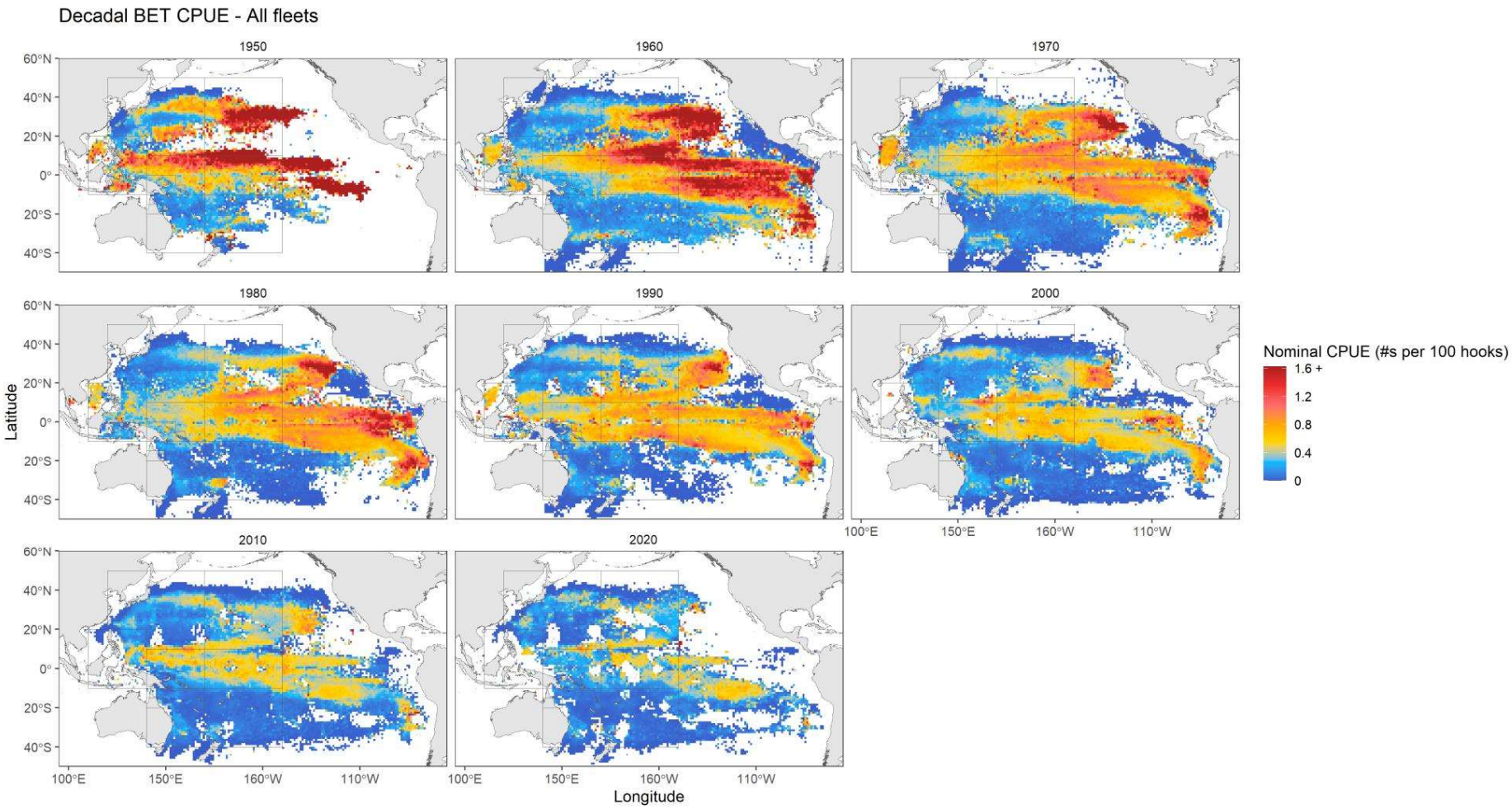
FAD closure, trip length, tuna CPUE history



Longline CPUE trends (YFT)

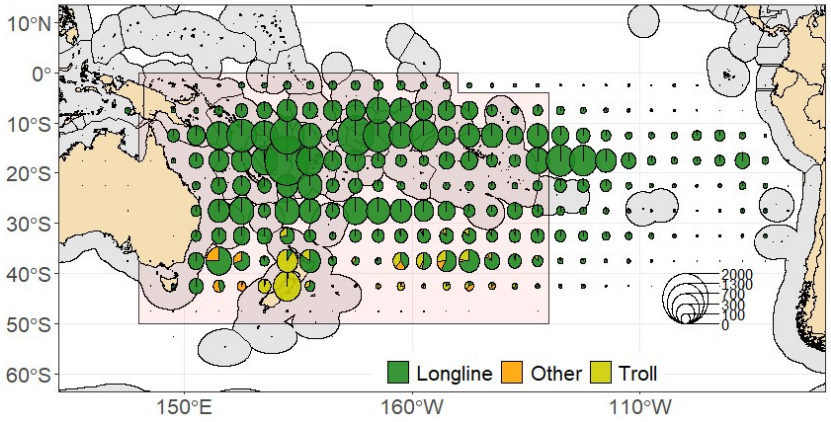


Longline CPUE trends (BET)

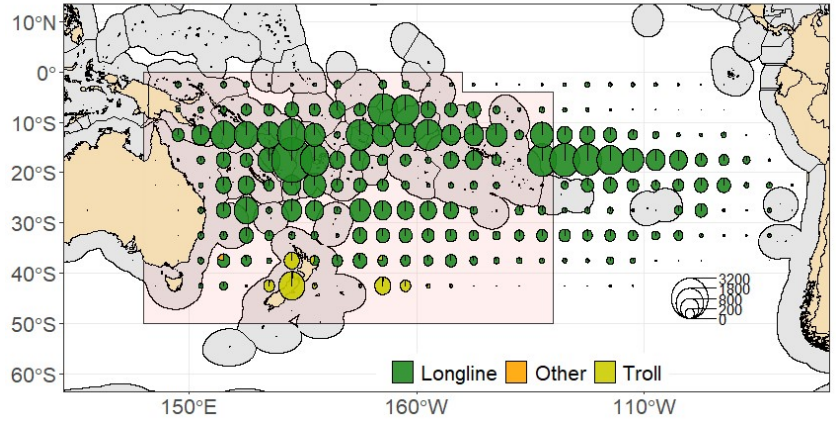


South Pacific Albacore catches

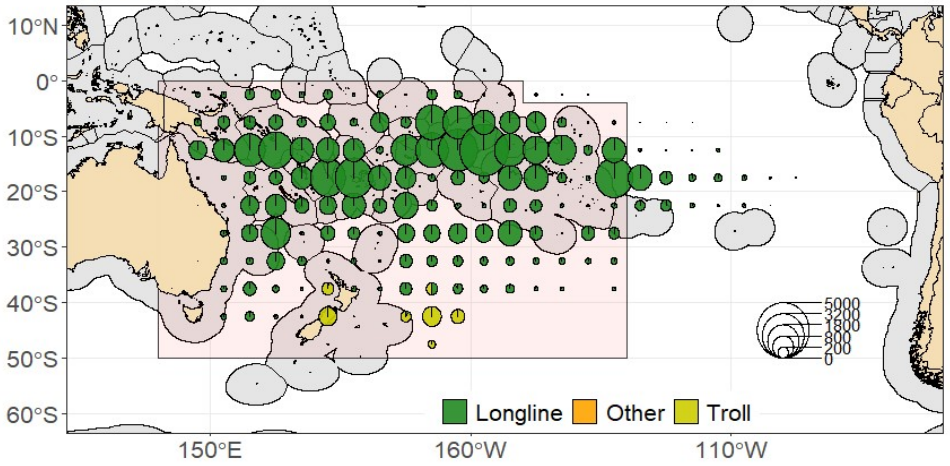
1950 - 2017



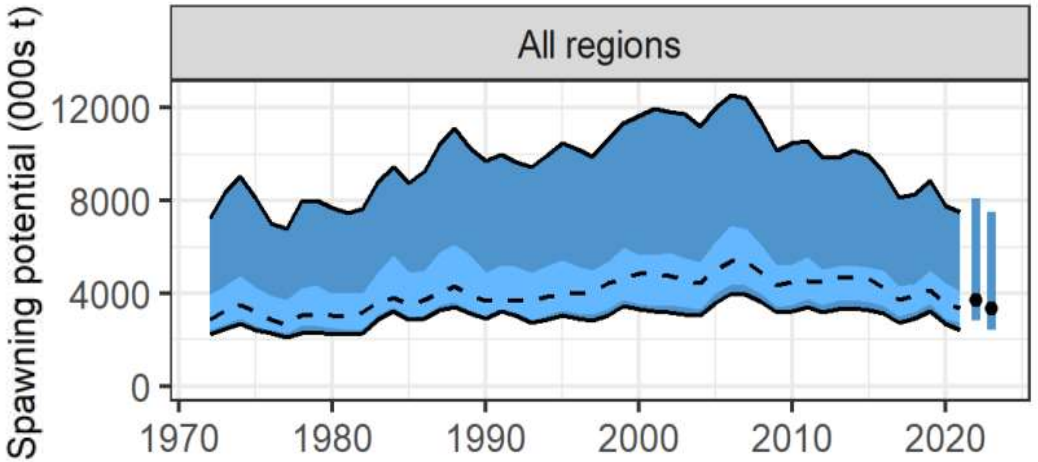
2018 - 2022

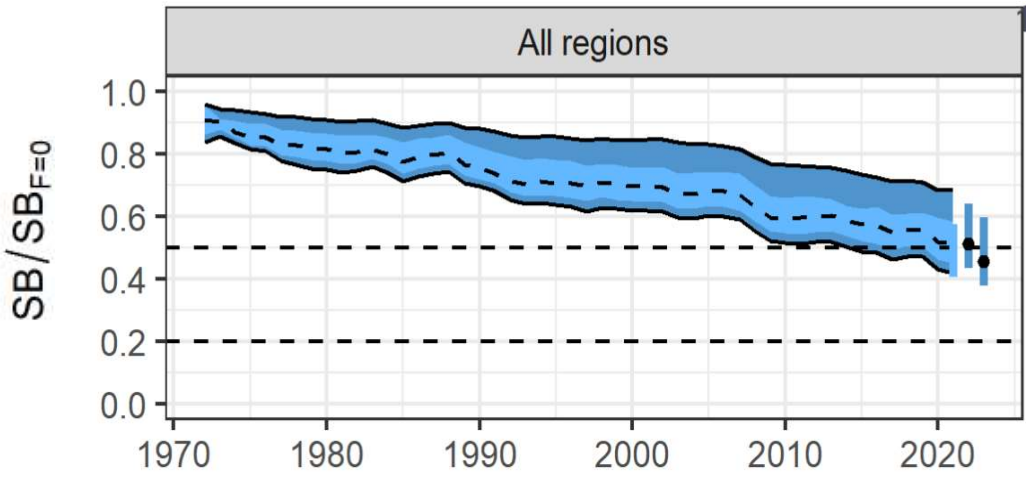


2023

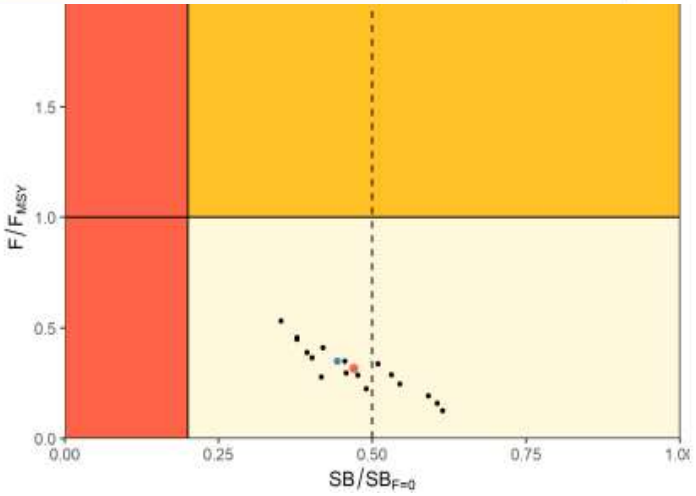


Skipjack (2022: not overfished; not undergoing overfishing)

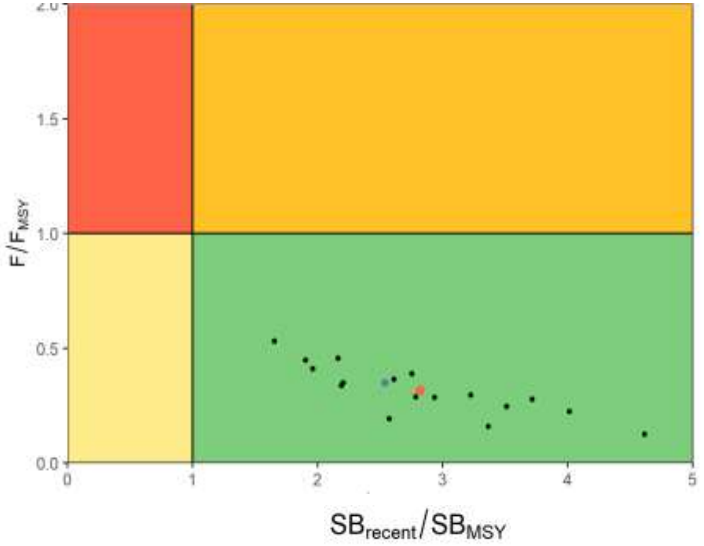




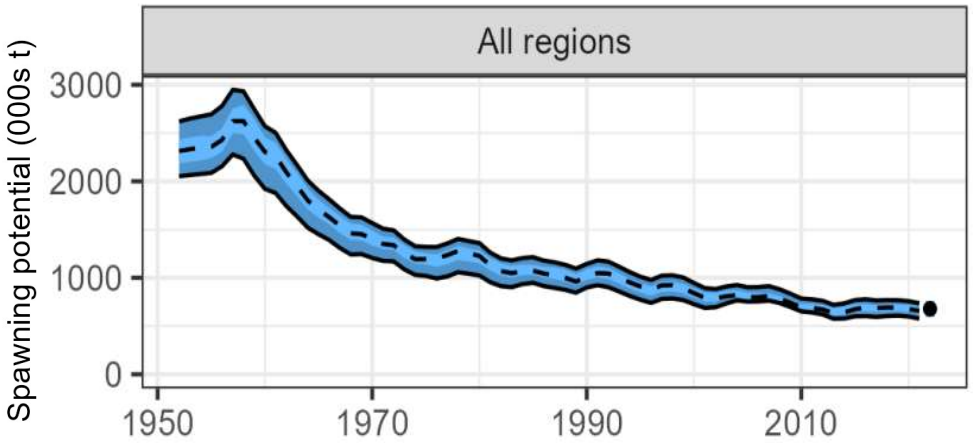
Majuro plot: Estimates from all models in the ensemble. Red is median; blue is diagnostic. iTRP of 0.5 shown with dashed line



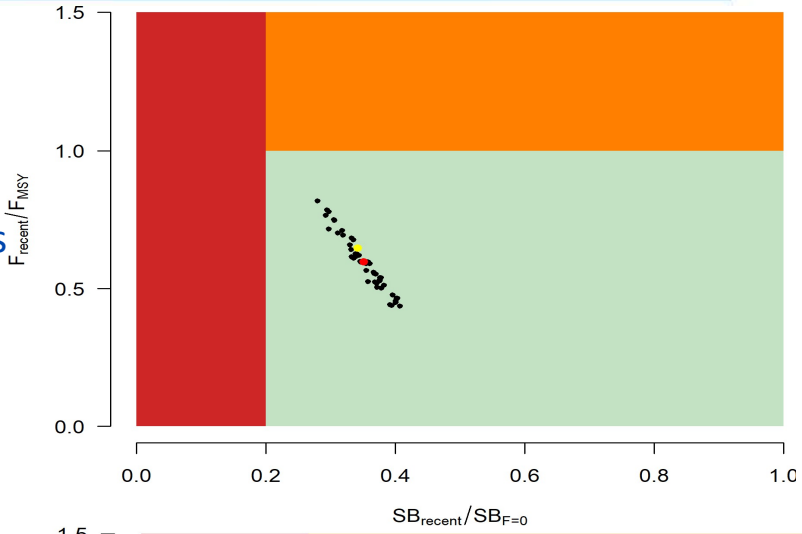
Kobe plot: Estimates from all models in the ensemble. Red is median; blue is diagnostic

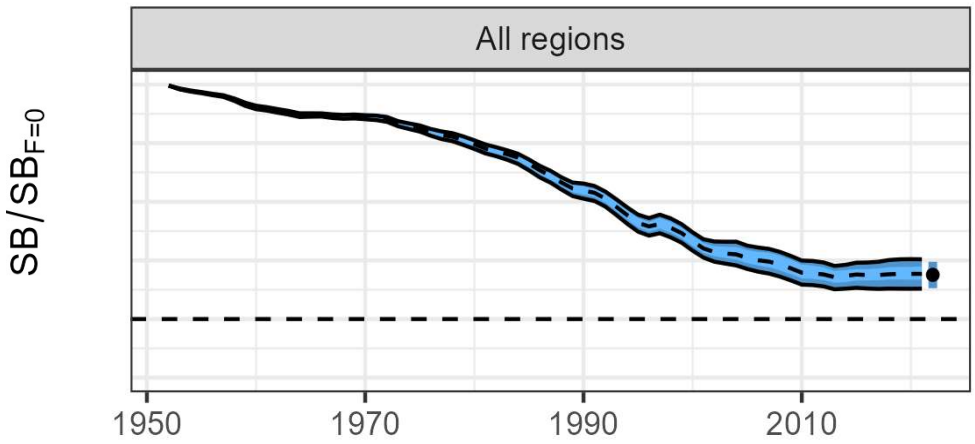


Bigeye (2023: not overfished; not undergoing overfishing)

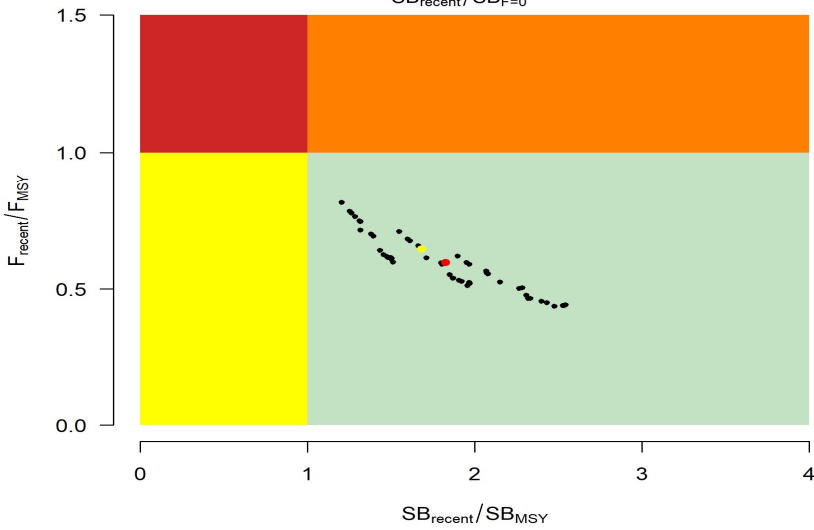


Majuro plot: Estimates from all models in the ensemble. Red is median; yellow is diagnostic.

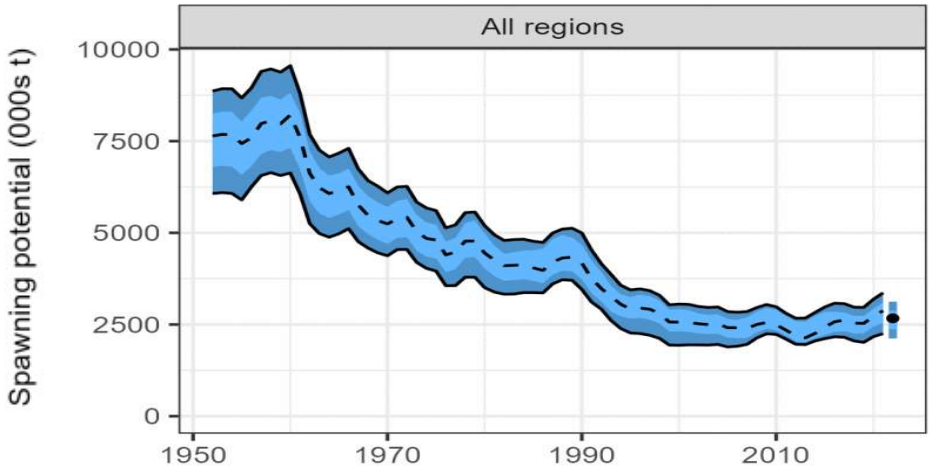


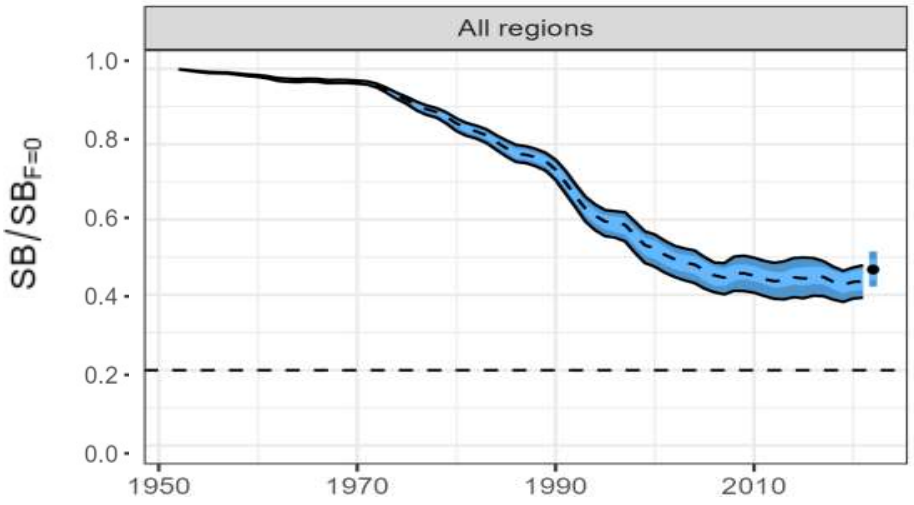


Kobe plot: Estimates from all models in the ensemble. Red is median; yellow is diagnostic.

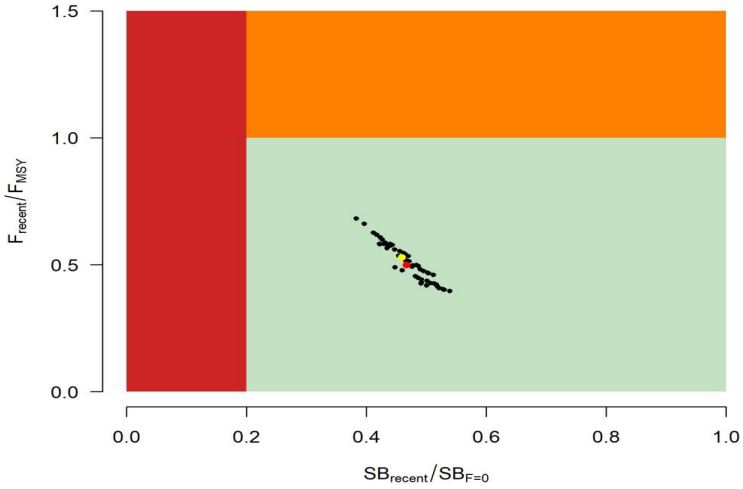


Yellowfin (2023: not overfished; not undergoing overfishing)

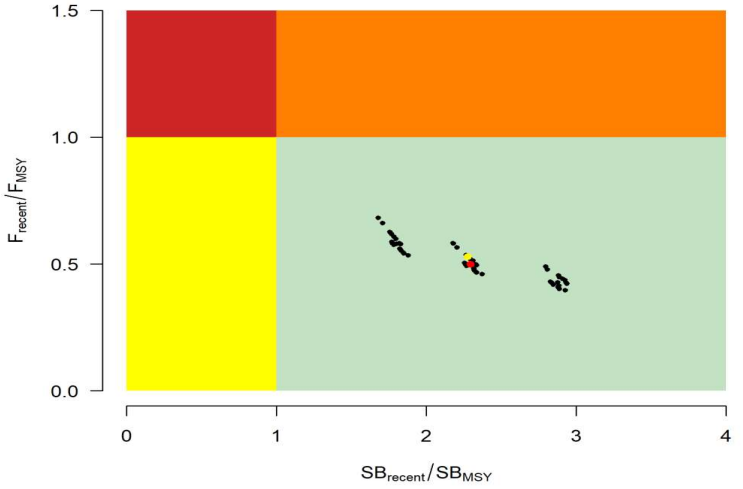




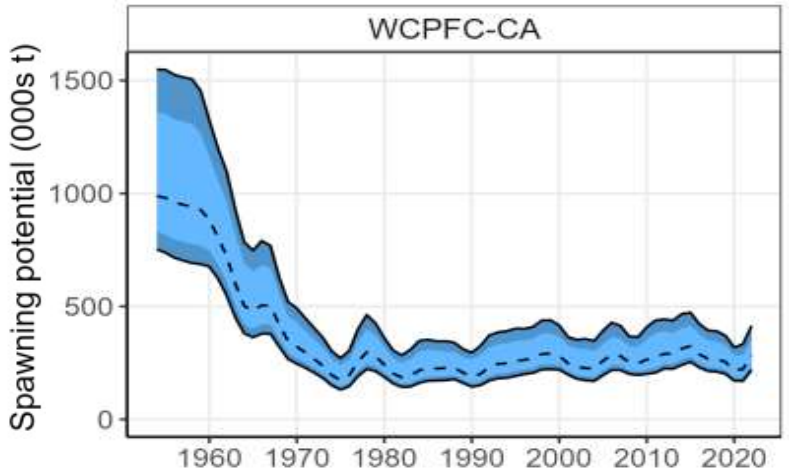
Majuro plot:
Estimates from all models in the ensemble. Red is median; yellow is diagnostic.

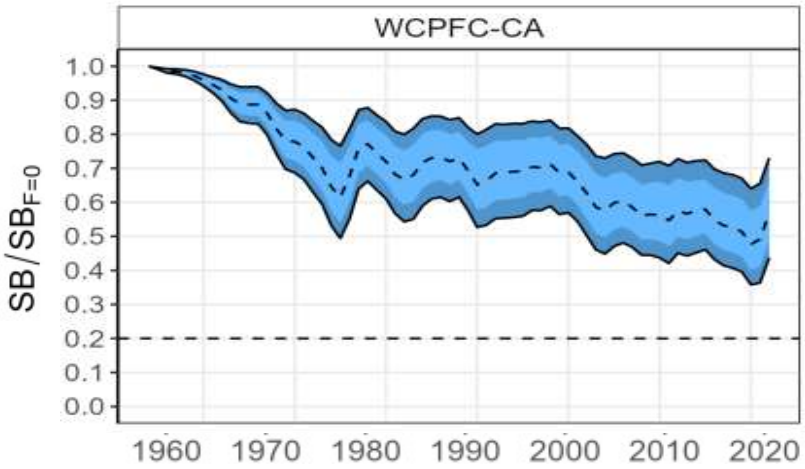


Kobe plot:
Estimates from all models in the ensemble. Red is median; yellow is diagnostic.

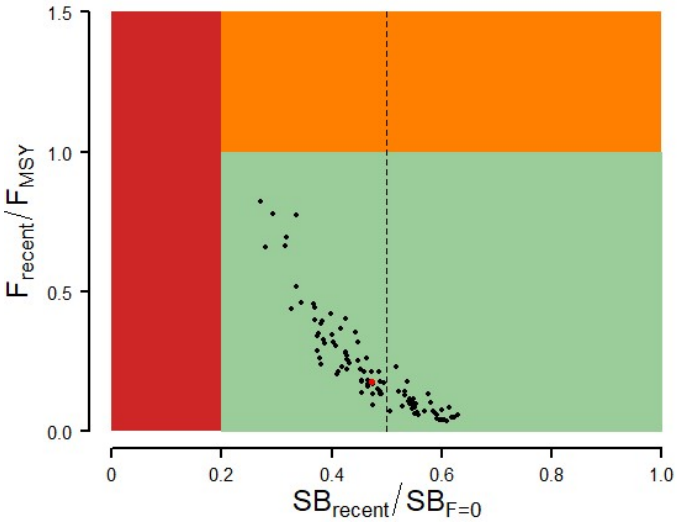


SP Albacore (2024: not overfished; not undergoing overfishing)

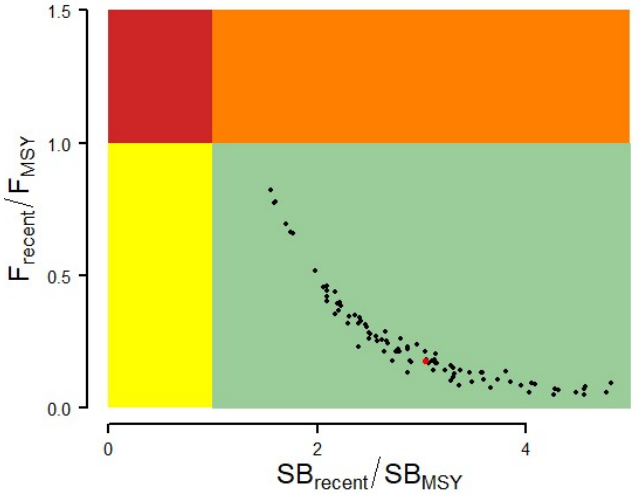




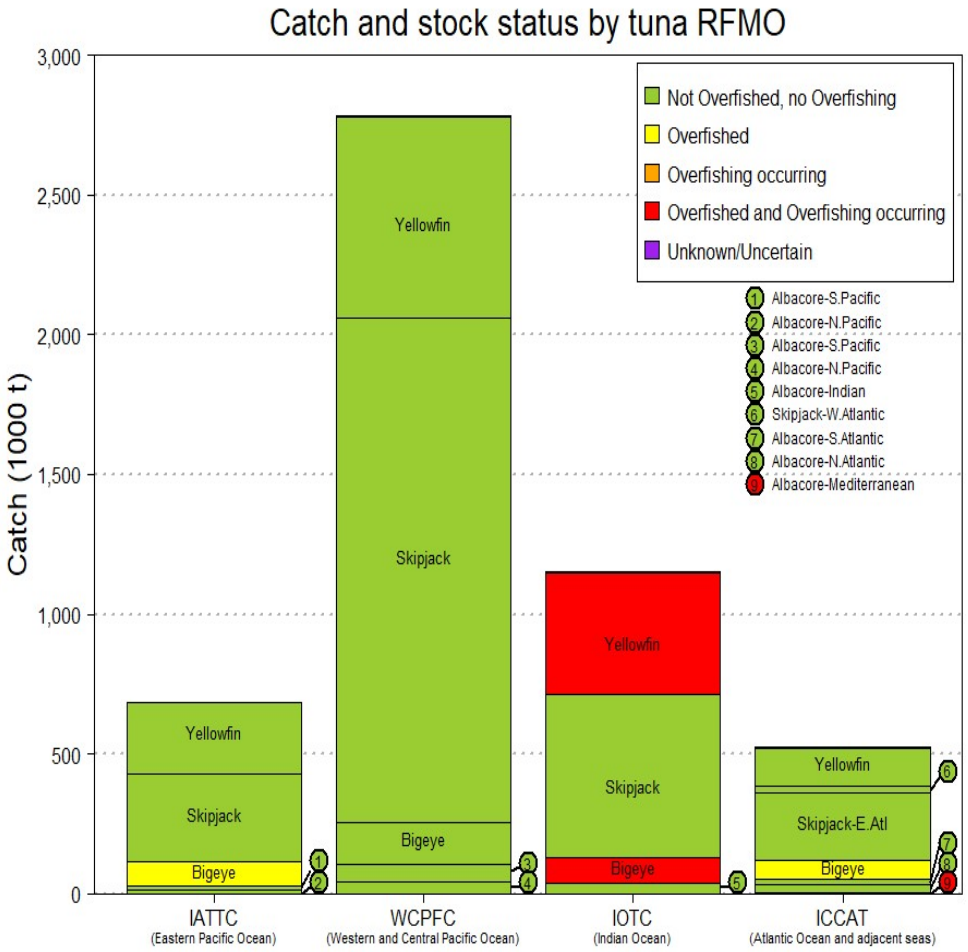
Majuro plot:
iTRP of 0.5 shown with dashed line



Kobe plot:
Estimates from all models in the ensemble

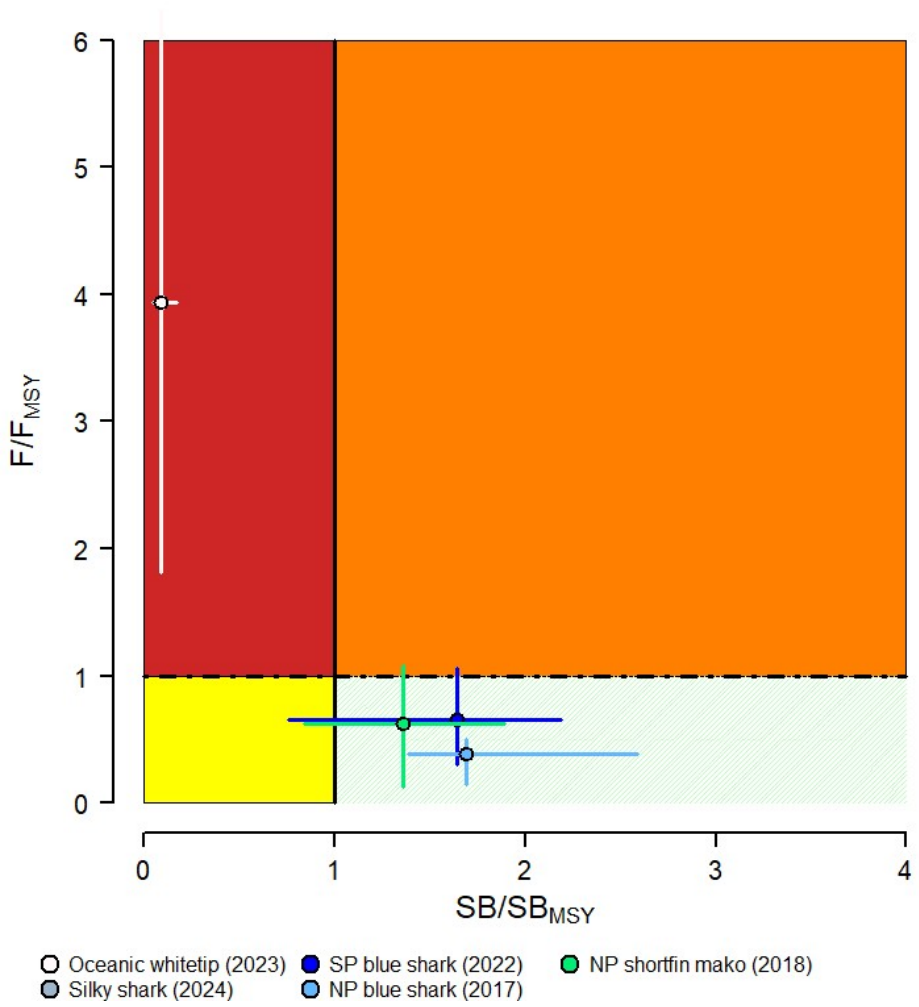


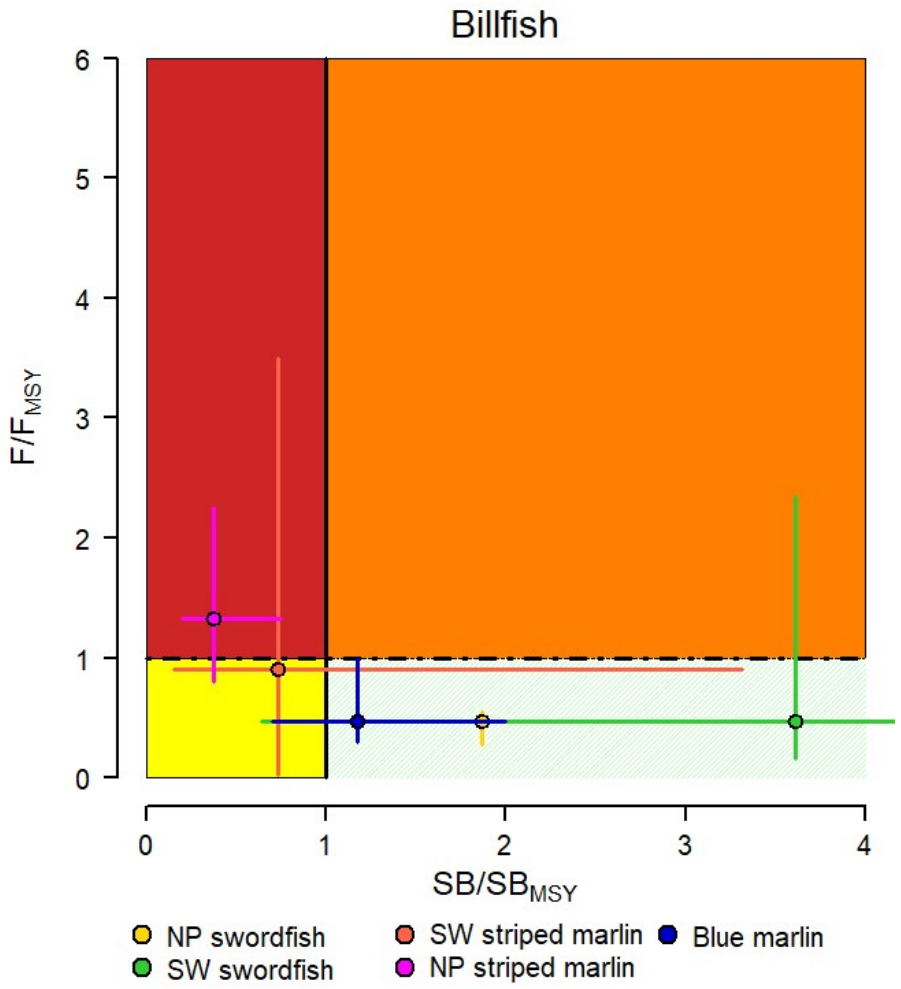
Global Stock Status' of Key Tunas



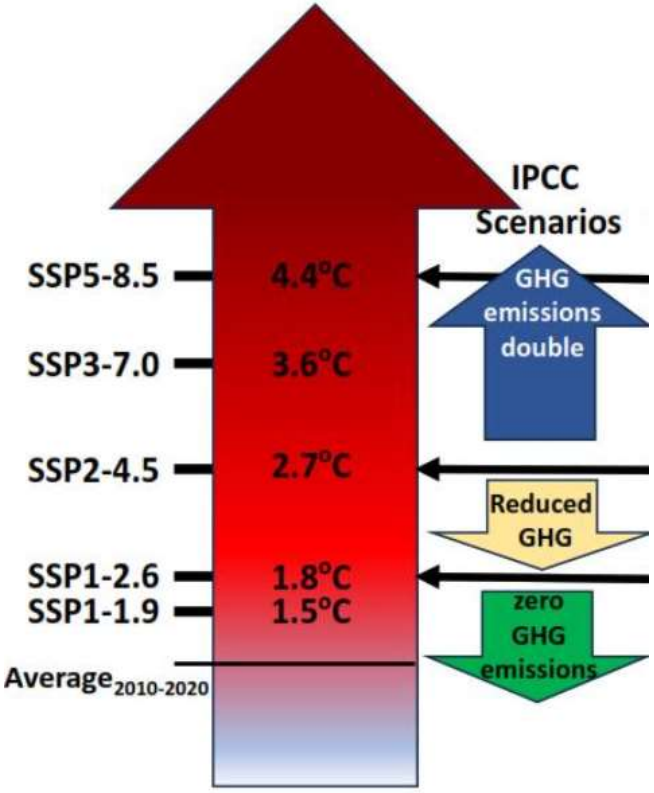
Species	$SB_{recent}/SB_{F=0}$ median	10-90 %iles	F_{recent}/F_{MSY} median	10-90 %iles	Prob breaching LRP
SP albacore	0.48	0.37-0.62	0.18	0.06-0.44	0.00
Bigeye	0.35	0.31-0.40	0.60	0.46-0.74	0.00
Skipjack	0.51	0.43-0.64	0.32	0.18-0.45	0.00
Yellowfin	0.47	0.42-0.52	0.50	0.42-0.61	0.00

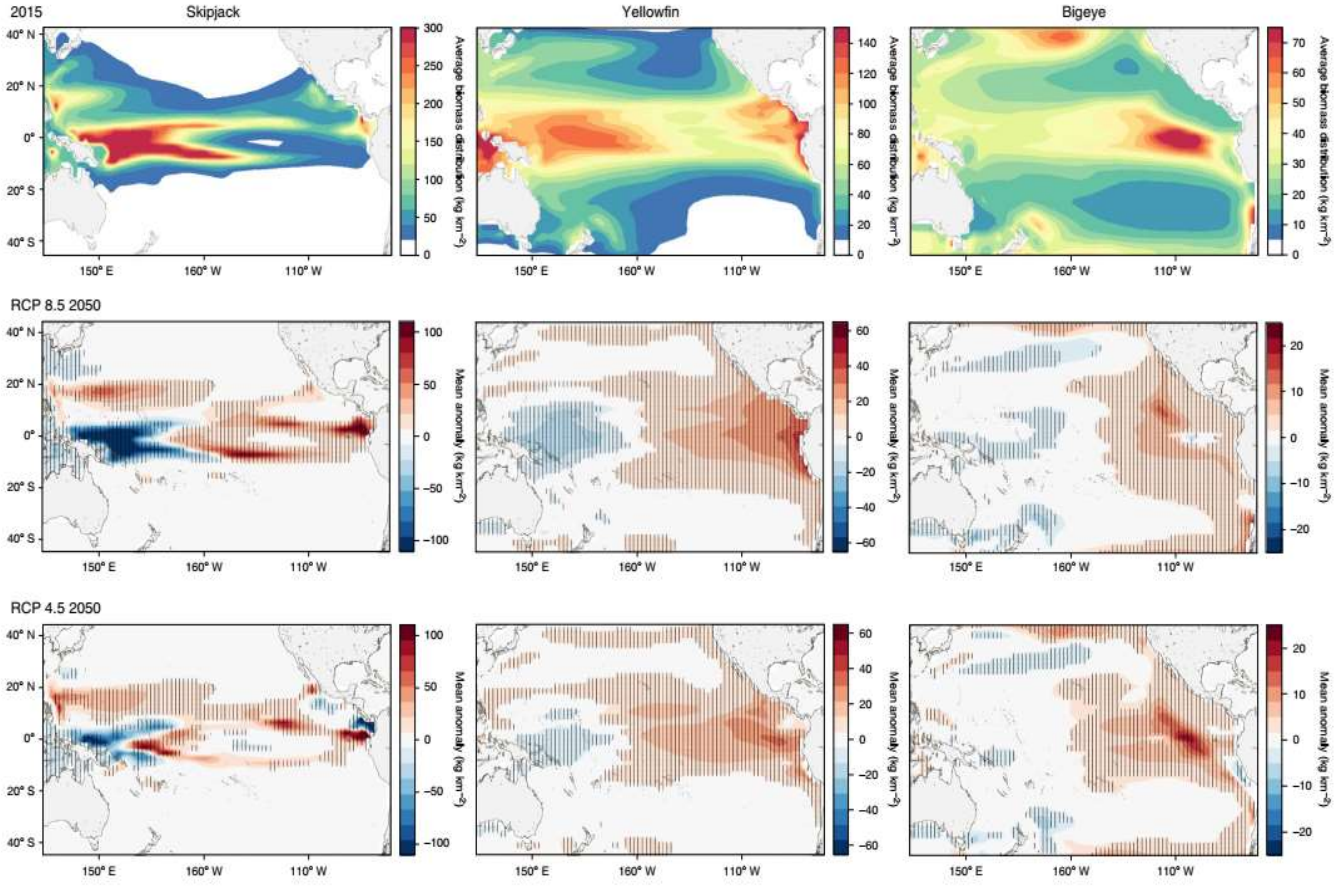
Sharks* and billfishes





Climate Scenarios





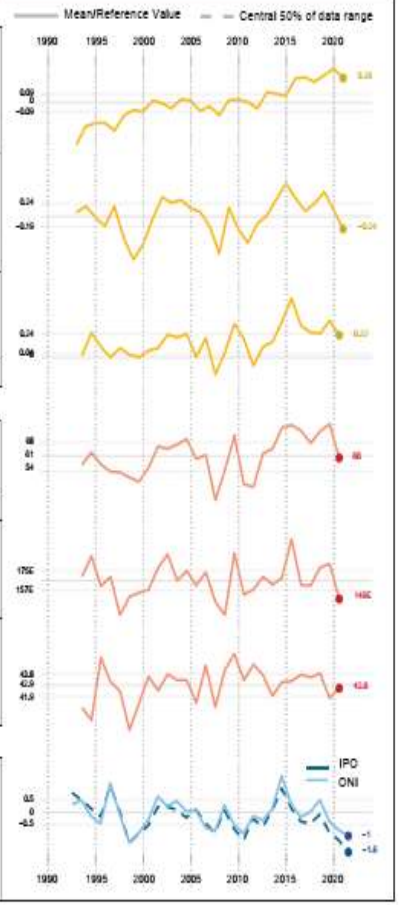
Bell et al., 2021

Report Cards

Pacific Community
Communauté du Pacifique

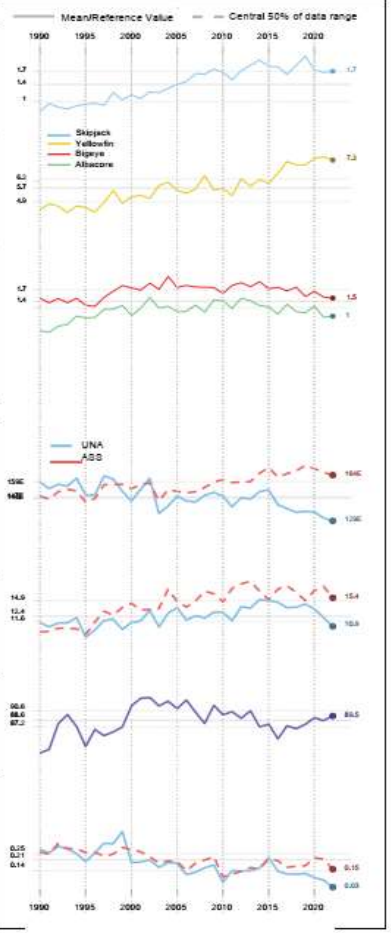
Report Card 1. Environment Indicators

Indicator	Description	Notes	Time-series
Sea Surface Temperature Anomalies (ANNEX 1 - A.1)			
Annual SST Anomaly	Mean annual SST anomaly (°C) across **WCPO area**	• Derived from ocean models • WCPO area western limit of 130°E • Anomaly from mean temperature 1993-2021	
	Mean annual SST anomaly (°C) across **WCPO equatorial zone**	• Derived from ocean models • Equatorial zone 5°S-5°N • Anomaly from mean temperature 1993-2021	
Nov-Apr Warm-pool SST Anomaly	Mean annual SST anomaly (°C) within warm-pool extent	• Derived from ocean models • Warm-pool defined by mean Nov-Apr temperature > 29°C	
Warm-pool Indices (ANNEX 1 - A.2)			
Mean Size of Warm-pool	Approximate size of warm-pool in millions of km²	• Derived from ocean models • Warm-pool defined by mean Nov-Apr temperature > 29°C	
Eastern Limit of Warm-pool Boundary	Longitude of strongest sea surface salinity boundary	• Derived from ocean models • Boundary defined as largest change over 10° distance	
Mean Warm-pool Mixed Layer Depth	Mean depth (m) of the mixed layer within warm-pool	• Derived from ocean models • Layer over which water temperature is homogenous	
Climate Indices (ANNEX 1 - A.3)			
Oceanic Niño (ONI) and Interdecadal Pacific Oscillation (IPO) Index	ONI indicates SST anomalies in the Niño 3.4 region during Nov-Jan each year IPO represents long-term oscillation between El Niño favourable and La Niña favourable phases	• ONI values > 0.5 indicative of El Niño events, values < -0.5 indicative of La Niña • IPO values > 0 indicative of more El Niño events, < 0 indicative of more La Niña events • Time series from 1993-2021	



Report Card 2. Annual Tuna Catch & Fishing Effort Indicators

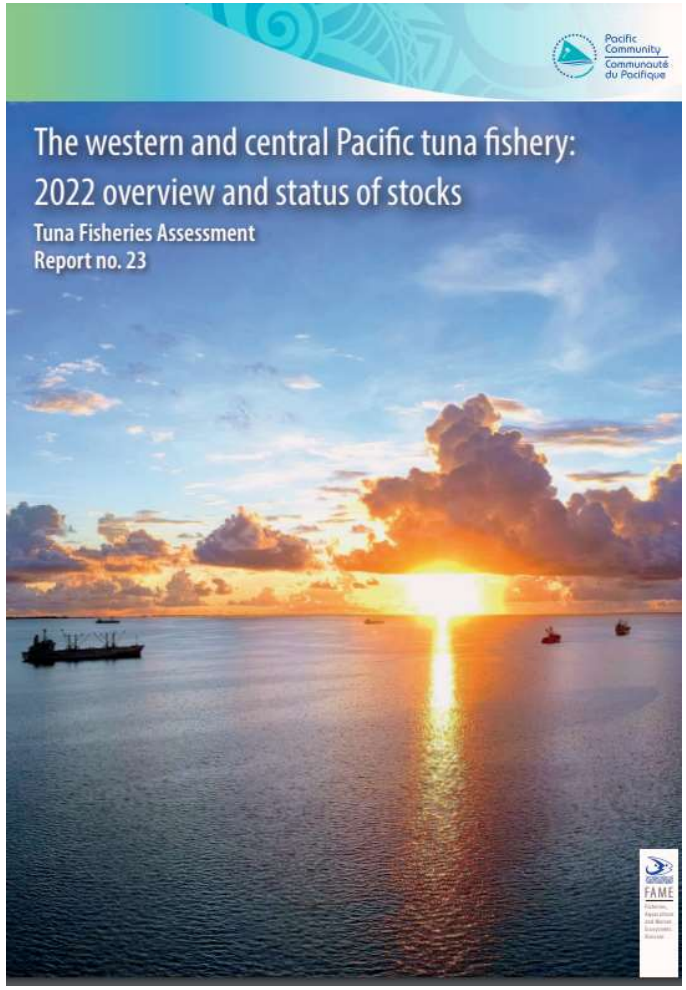
Indicator	Description	Notes	Time-series
Annual Tuna Catch (ANNEX 1 - A.4)			
Annual Tuna Catch	Total **Skipjack** catch for entire WCPFC-CA, in millions of tonnes	• Data from all fishing gears combined • See Hare et al. (2023) [SC19/SA-WP-06] for a compilation of all fishery indicators for skipjack	
	Total **Yellowfin** catch for entire WCPFC-CA, in 100,000 of tonnes	• Data from all fishing gears combined • See Hare et al. (2023) [SC19/SA-WP-06] for a compilation of all fishery indicators for yellowfin	
	Total **Bigeye** and **Albacore** catch for entire WCPFC-CA, in 100,000 of tonnes	• Data from all fishing gears combined • Data for albacore pertains to the South Pacific stock only • See Hare et al. (2023) [SC19/SA-WP-06] for a compilation of all fishery indicators for bigeye and South Pacific albacore	
Fishing Effort (ANNEX 1 - A.5)			
Annual, Longitudinal Centre of Purse Seine Effort	Mean longitudinal centre of gravity of purse seine effort	• Purse seine effort is disaggregated into unassociated (UNA) and associated (ASS) sets • Associated sets include those made on drifting FADs as well as drifting logs and debris	
Annual Area of Fishing Effort	Total area occupied by **Purse Seine** fleet annually, in millions of km²	• The sum of the area of 1° x 1° cells with at least one purse seine set, aggregated annually • Purse seine effort is disaggregated into unassociated and associated sets	
	Total area occupied by **Longline** fleet annually, in millions of km²	• The summed area of 5° x 5° cells with at least one longline set, aggregated annually	
Effort in High Seas Areas	Annual proportion of **Purse Seine** sets made in High Seas areas within the WCPFC-CA	• High Seas areas comprise the I1,I2,I3,I4,I5,I6,I7,I8,I9,H4,H5 regions • Proportions calculated relative to the total numbers of sets made, for unassociated and associated sets separately	



Incorporating climate into tuna assessments

- SEAPODYM
  - Spatial ecosystem and population dynamics model
- Existing stock assessments
  - Dynamic unfished biomass (B0) to account for directional productivity shifts
  - Use of spatial structures to capture climate impacts and distributional shifts
  - New information on model inputs: growth, mortality, movement (via tagging data) are all influenced by changes in the environment
- Management Strategy Evaluation/ Harvest Strategies
  - Assumptions in Operating Model(s) – recruitment, natural mortality, growth, steepness, etc.

Tuna Fisheries Assessment Report (TFAR)



Updated 2023 version to be released in November

https://fame.spc.int/resources/documents/tuna-fisheries-assessment-report

Shiny Climate Dashboard

https://ofp-sam.shinyapps.io/ofp-FEMA-climate-dashboard/

Thank you