2025 Yellowtail Rockfish North of 40° 10’ N. STAR presentation 3: Response to STAR requests from Day 1

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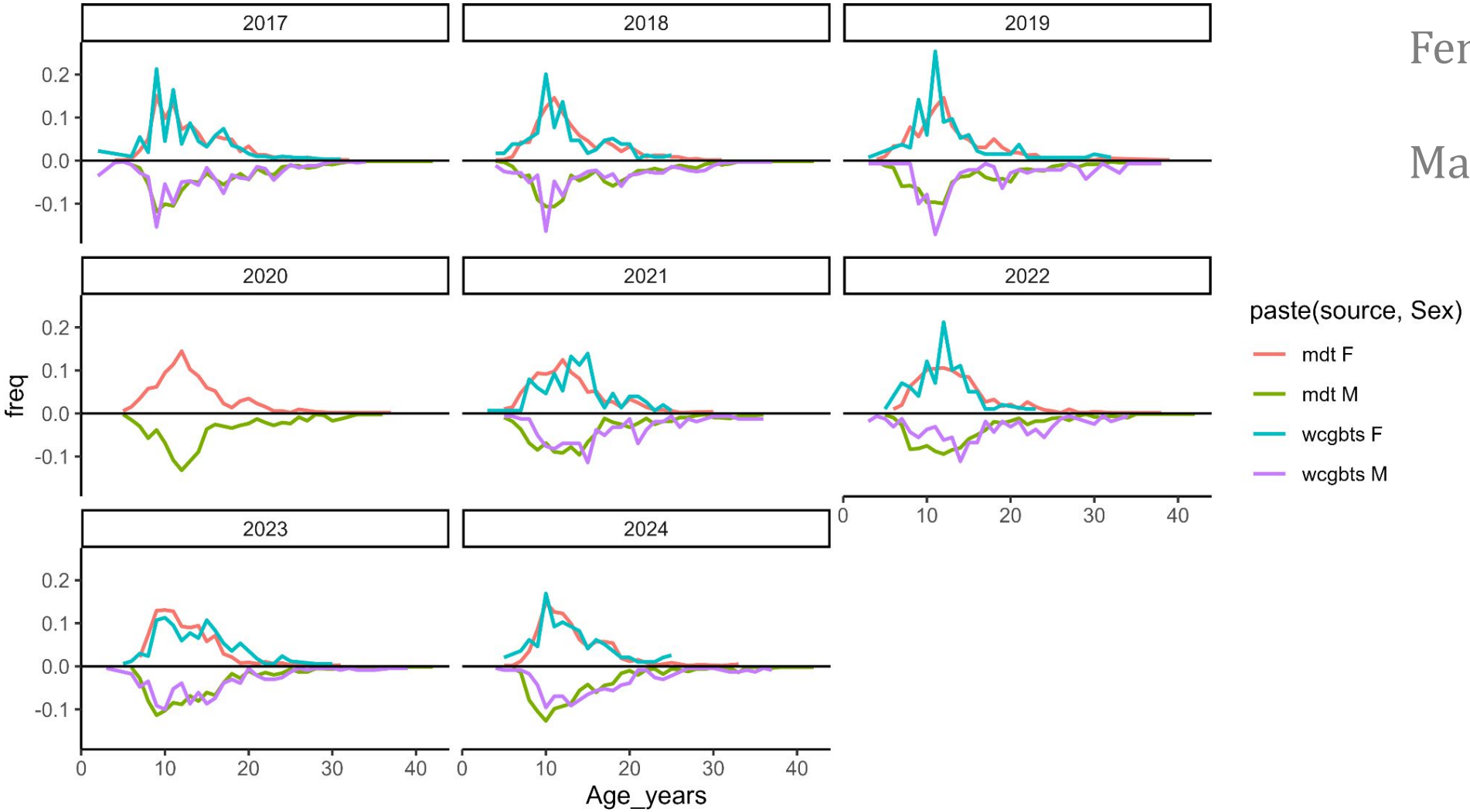
Request 1

Compare length and age composition by sex between the midwater trawl fishery since resumed access to deeper depths since 2017 (for 2017 and onward) and the West Coast Groundfish Bottom Trawl Survey (WCGBTS) composition as in Figure 42 and Figure 20.

Rationale: Determine whether the fish presumably encountered over rocky reef between data sources are of comparable size and age to the fish sampled by the WCBTS. This will help resolve whether there might be some hidden biomass over rocky reef observed in the midwater fishery, that the WCBTS cannot access with bottom trawl gear.

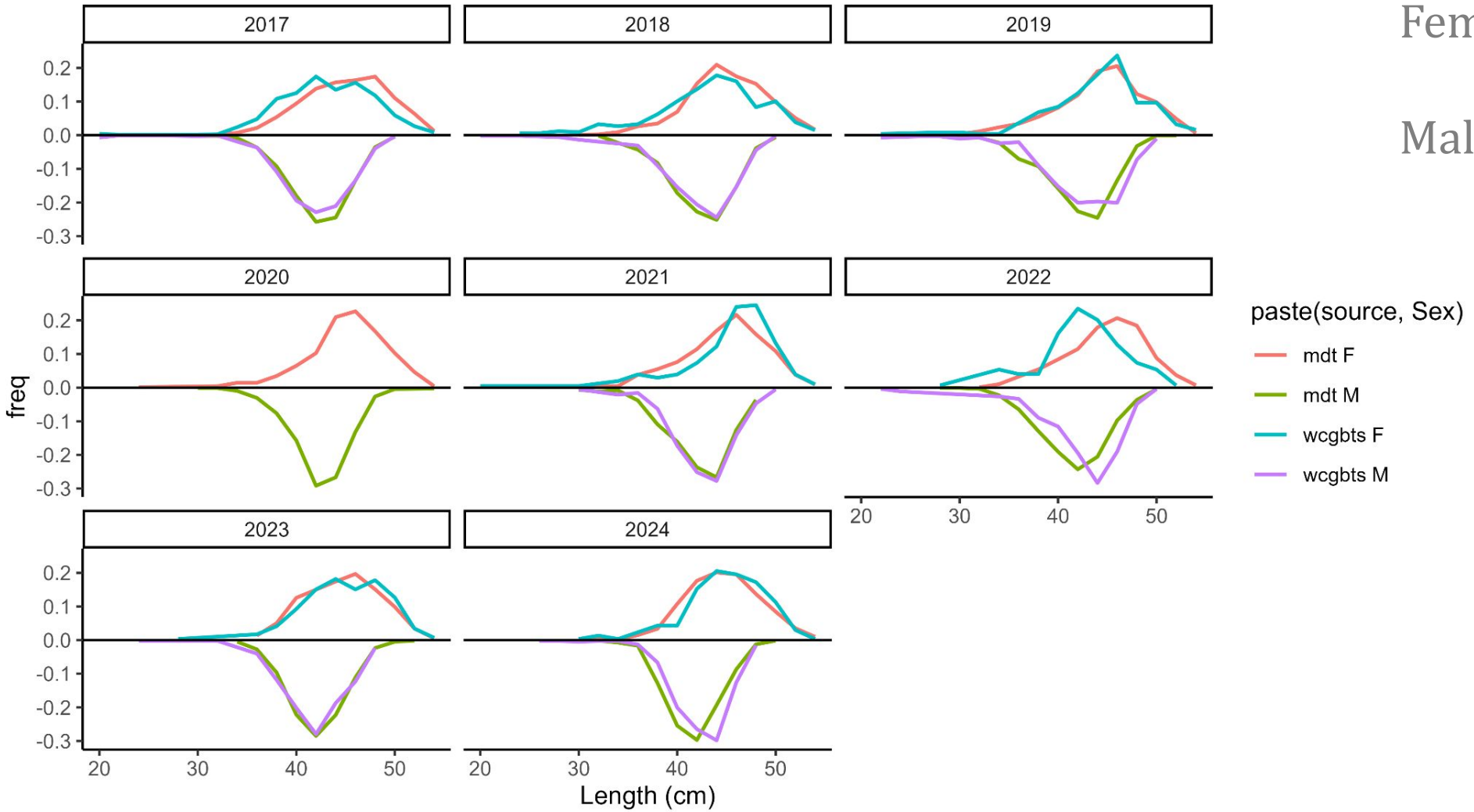
MDT vs. WCGBTS ages



Females on top

Males on bottom

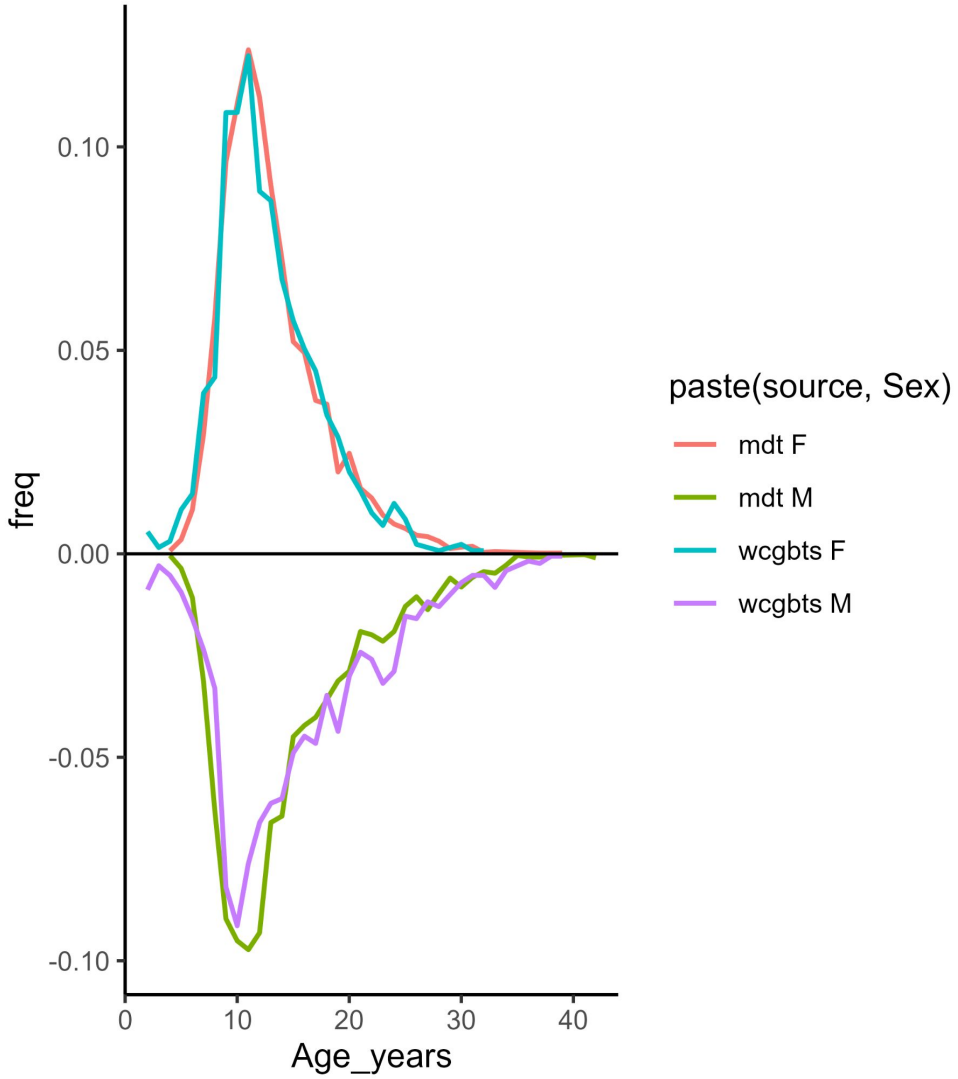
MDT vs. WCGBTS lengths

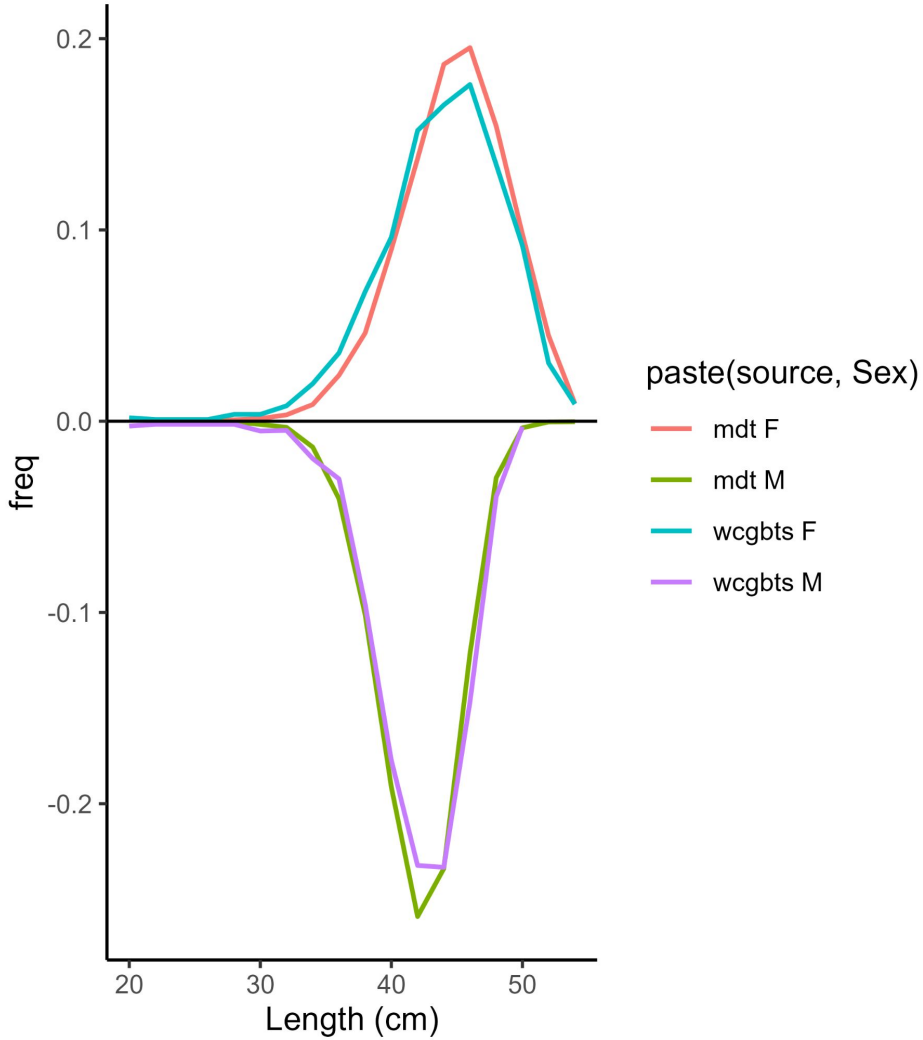


Females on top

Males on bottom

MDT vs WCGBTS aggregated





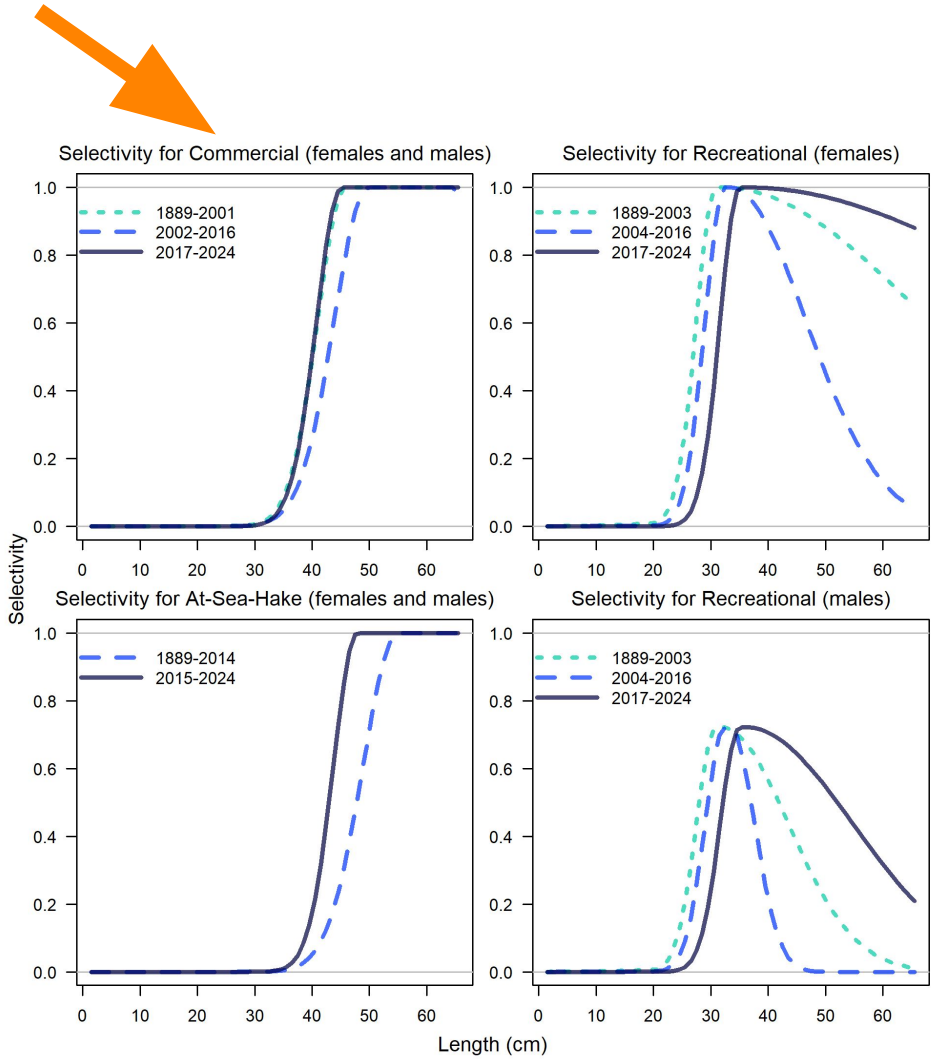
Request 2

Implement an alternative time blocking on selectivity for the commercial fleet with three time blocks prior to 2000 or 2003 (depending on shifts in composition observed) with asymptotic selectivity, 2000 or 2003-2016 (with domed and asymptotic selectivity) and 2017 to present with asymptotic selectivity.

Rationale: The time blocking may improve the fit to the length and age composition data source over time. In 2000, vessels using bottom trawl footrope >8 inches were prohibited from retaining shelf rockfish species (which included yellowtail rockfish). In 2002, the trawl Rockfish Conservation Areas (RCAs) were established off all three states (Washington, Oregon, and California). However, there were some allowances for midwater trawl vessels to fish within the “no trawl” Darkblotched Conservation Area (DBCA) for midwater rockfish such as yellowtail and widow. In 2017, the trawl gear Experimental Fishing Permit (EFP) went into effect to monitor and minimize salmon bycatch when vessels target rockfish in the Individual Fishing Quota (IFQ) fishery. This was expanded in 2018 to include year-round midwater trawl targeting midwater stocks. Additionally, the canary rockfish (a co-occurring species) ACL increased in 2017 following the 2015 canary rockfish stock assessment.

Request 2

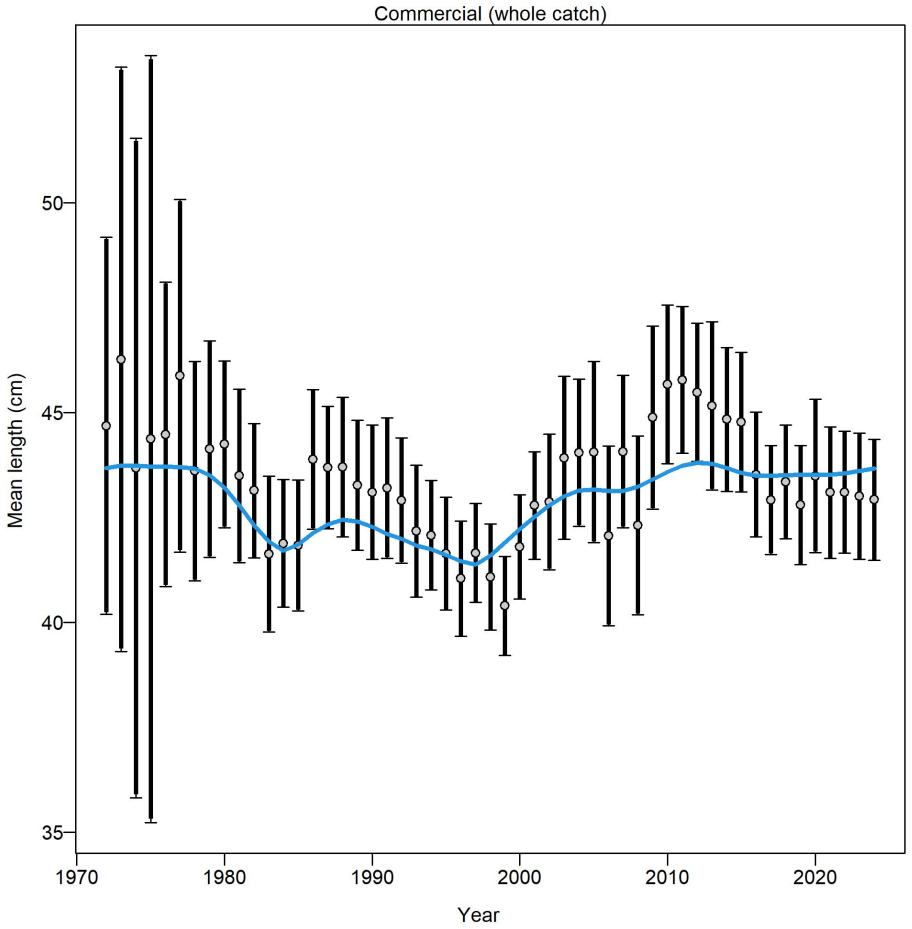
- Estimated selectivity is shifted to larger fish during 2002-2016
- early and late periods very similar
- middle period allowed to be domed, but estimated as asymptotic



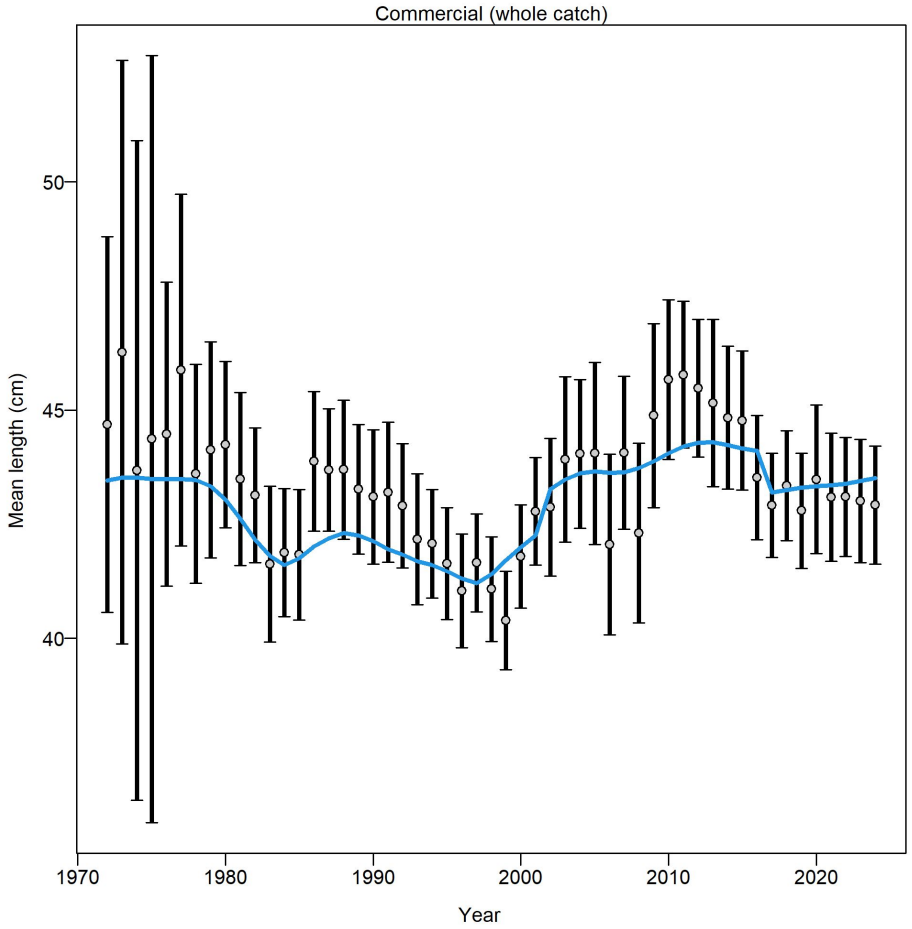
Request 2

mean length

base model



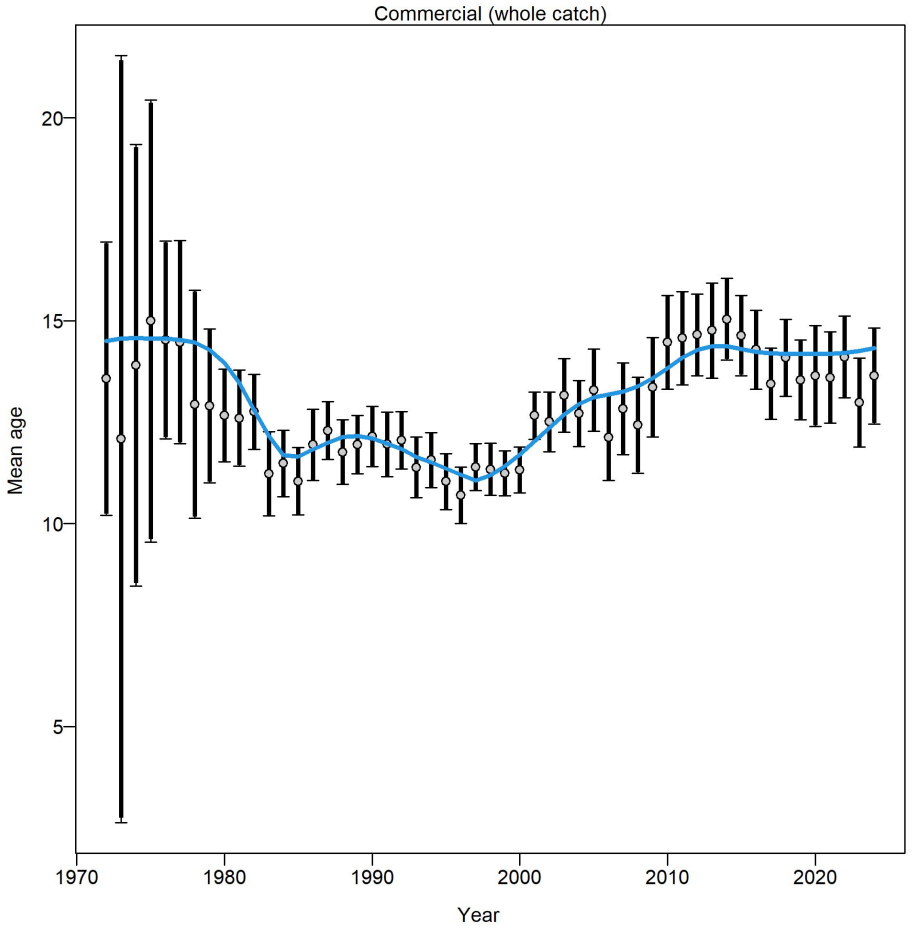
with blocks



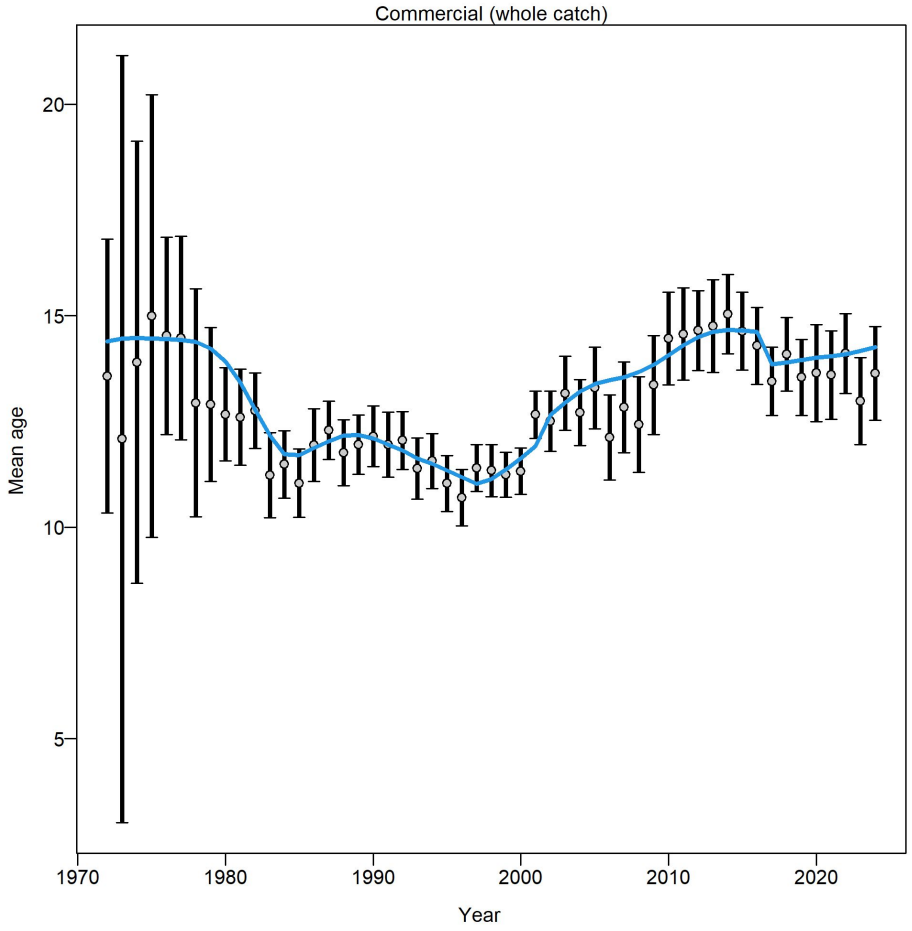
Request 2

mean age

base model

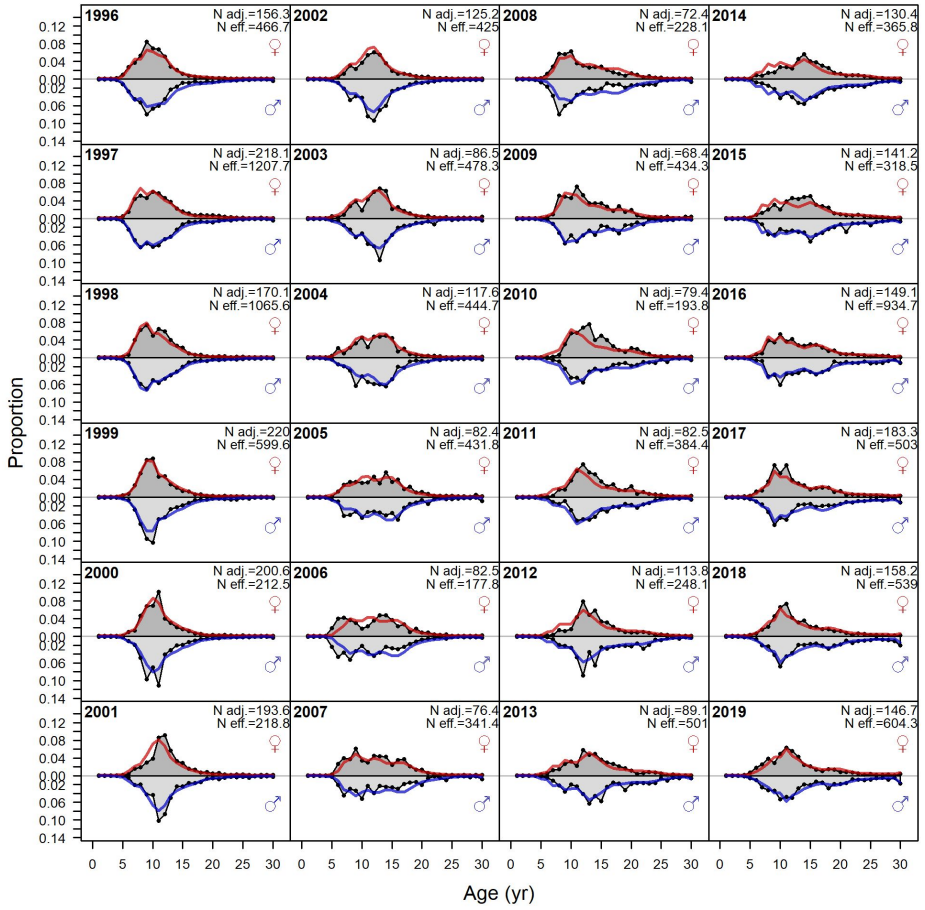


with blocks

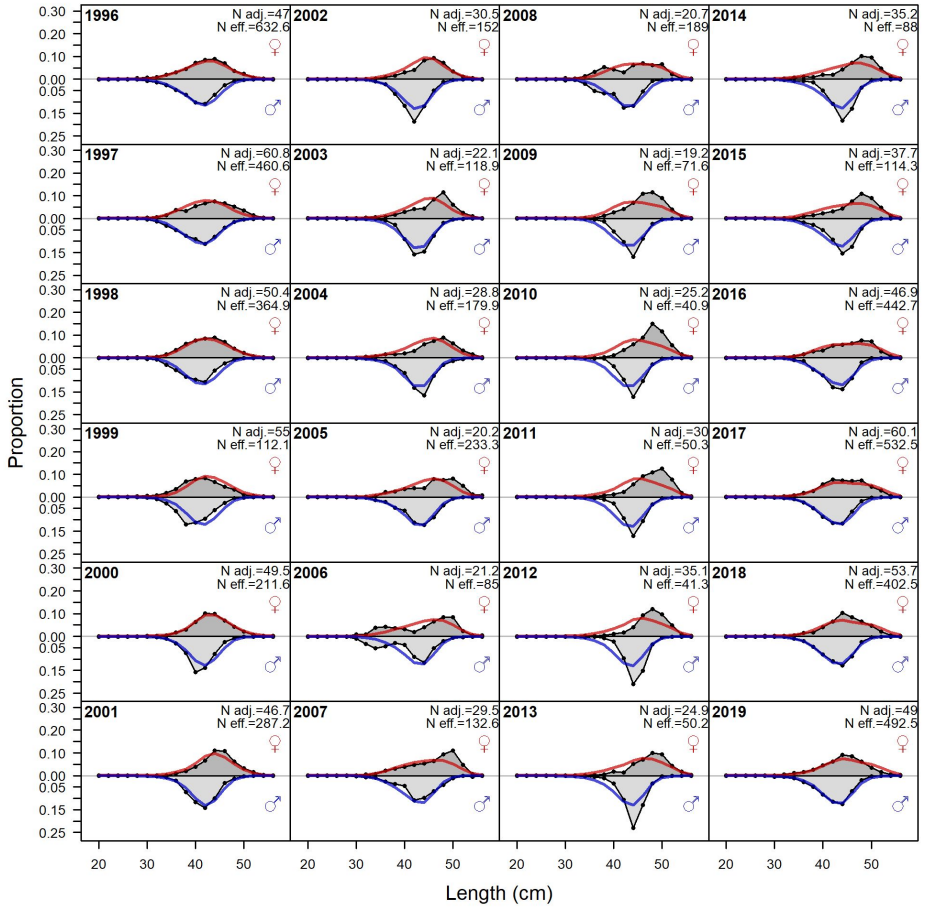


Request 2

base model ages

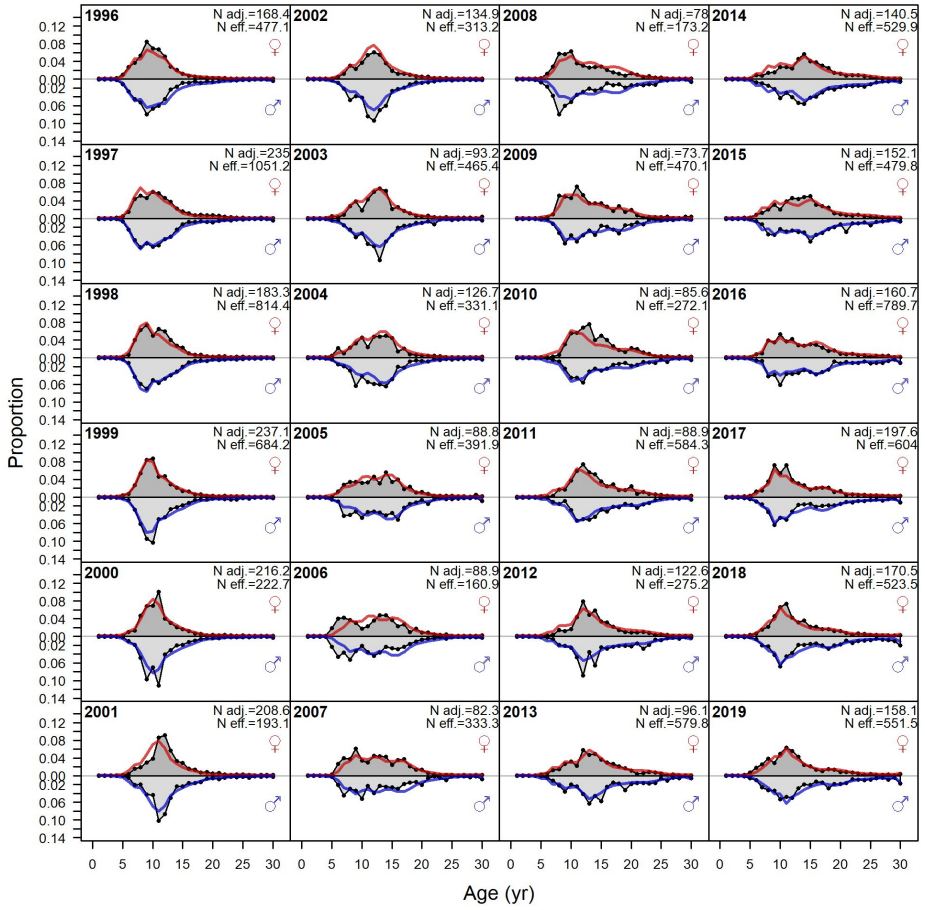


base model lengths

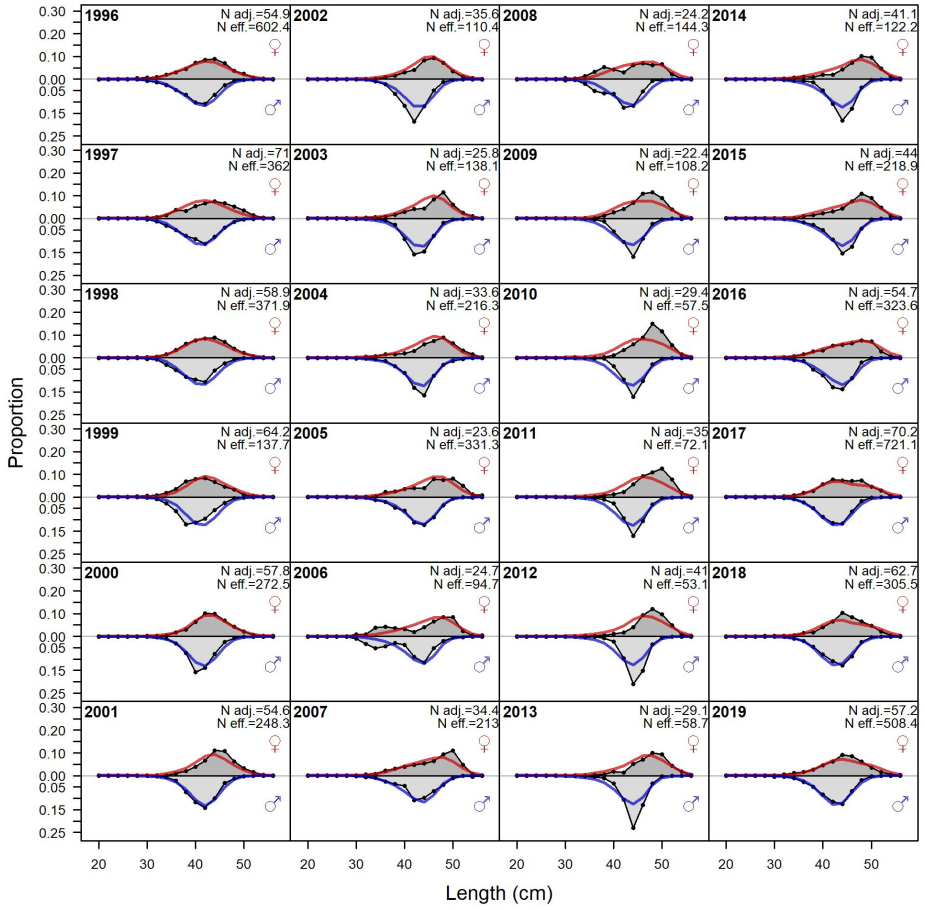


Request 2

with blocks ages



with blocks lengths



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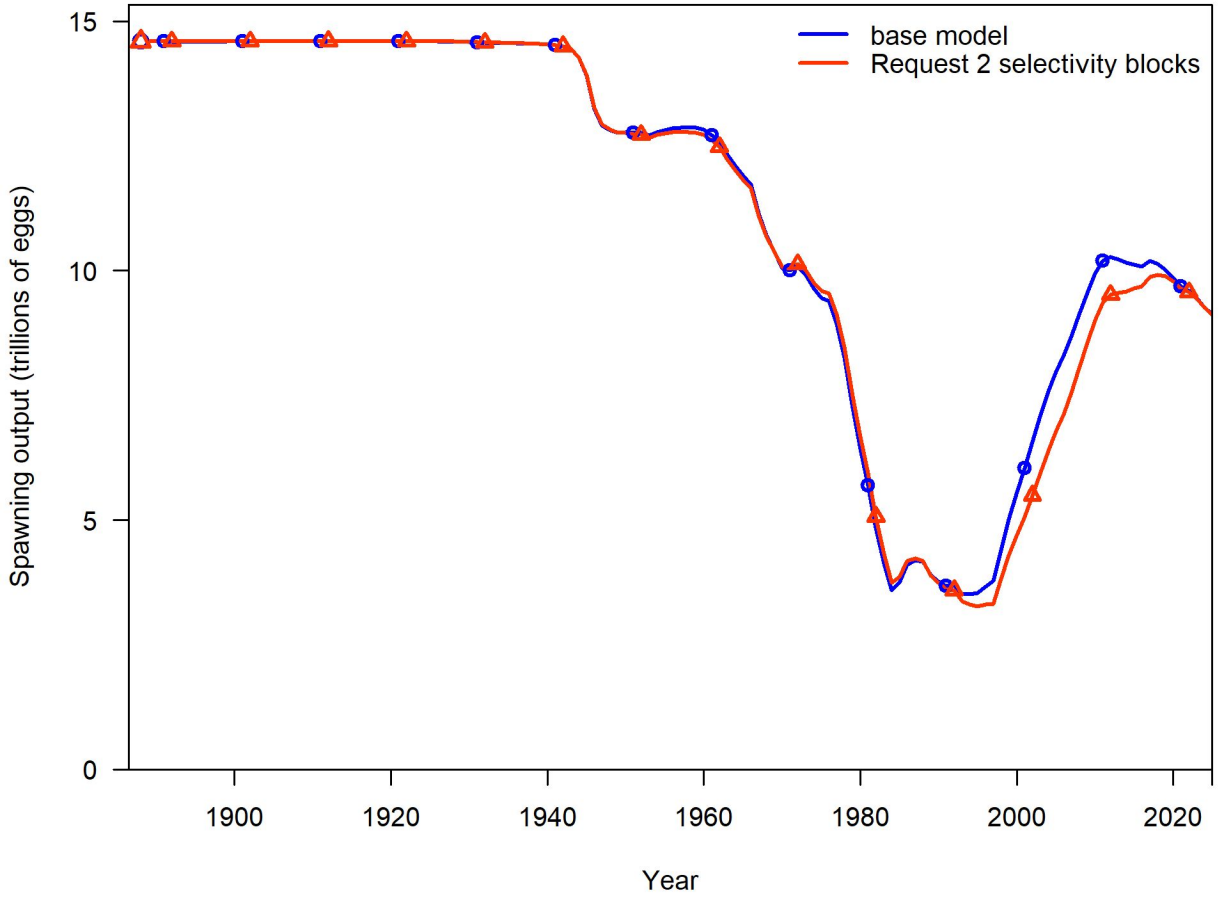
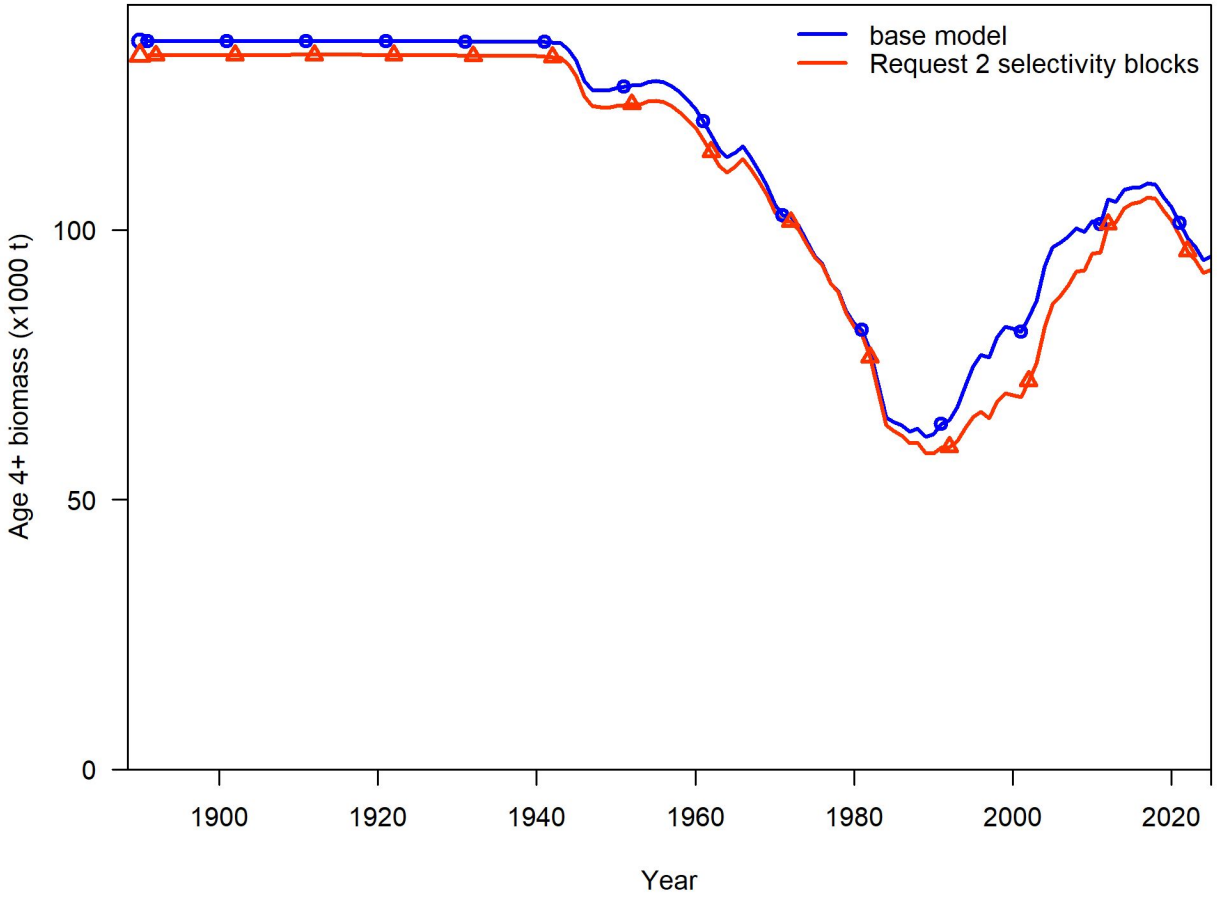
Request 2


base model
Request 2 selectivity blocks
Spawning output (trillions of eggs)
0
5
10
15
1900
1920
1940
1960
1980
2000
2020
Year


base model
Request 2 selectivity blocks
Age 4+ biomass (x1000 t)
0
50
100
1900
1920
1940
1960
1980
2000
2020
Year

Request 3

For the base model, the model with fishery length data removed, and the model with survey indices removed provide a table of input sample size, data weight, and adjusted input sample size. Also provide time series of spawning output and relative spawning depletion. Can we have more detail presented on the adjusted input sample sizes for the composition data, as a way to check on whether the composition data are appropriately weighted. This should also include any details on model runs that have dropped length composition data and/or age composition data and how this affected fits and outcomes.

Rationale: The assessment shows a substantial increase in abundance after about 2000 over a period when none of the abundance indices show material increases. This implies that the model is drawing abundance information from elsewhere, possibly from the composition data, which would not necessarily be appropriate.

Base model weights

Type	Fleet	Francis	Obs.	Mean N input	Mean N adj.	Sum N adj.
Length	Commercial	0.056	53	575.5	32.5	1720.4
Length	At-Sea-Hake	0.166	40	292.0	48.6	1943.0
Length	Recreational	0.020	41	1576.5	31.6	1293.6
Length	H&L_survey	0.052	14	112.0	5.8	81.3
Length	Triennial	0.076	9	114.0	8.6	77.7
Length	WCGBTS	0.096	21	103.3	9.9	207.5
Age	Commercial	0.239	53	480.0	114.6	6073.1
Age	At-Sea-Hake	0.130	2	255.5	33.2	66.4
Age	Recreational	0.018	15	613.5	11.2	167.8
Age	Triennial	0.137	9	66.8	9.1	82.1
CAAL	WCGBTS	0.140	520	15.0	2.1	1089.6

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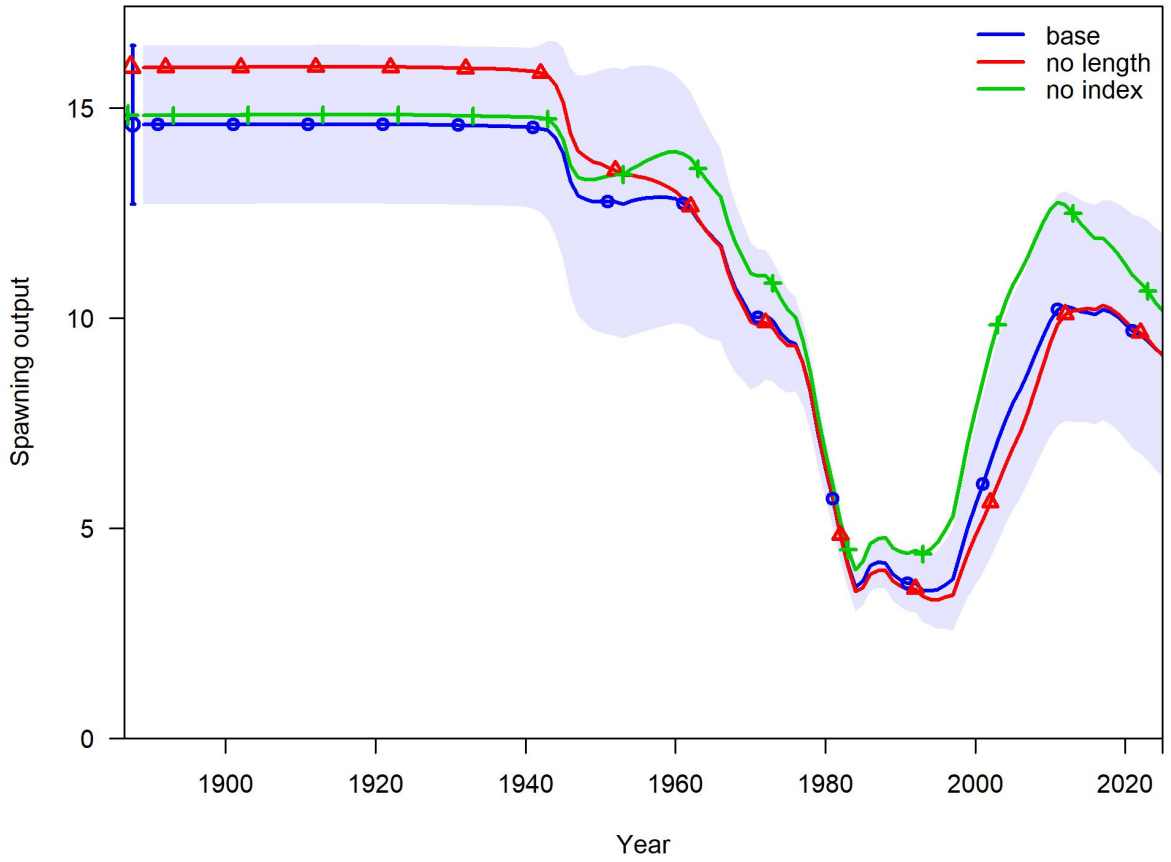
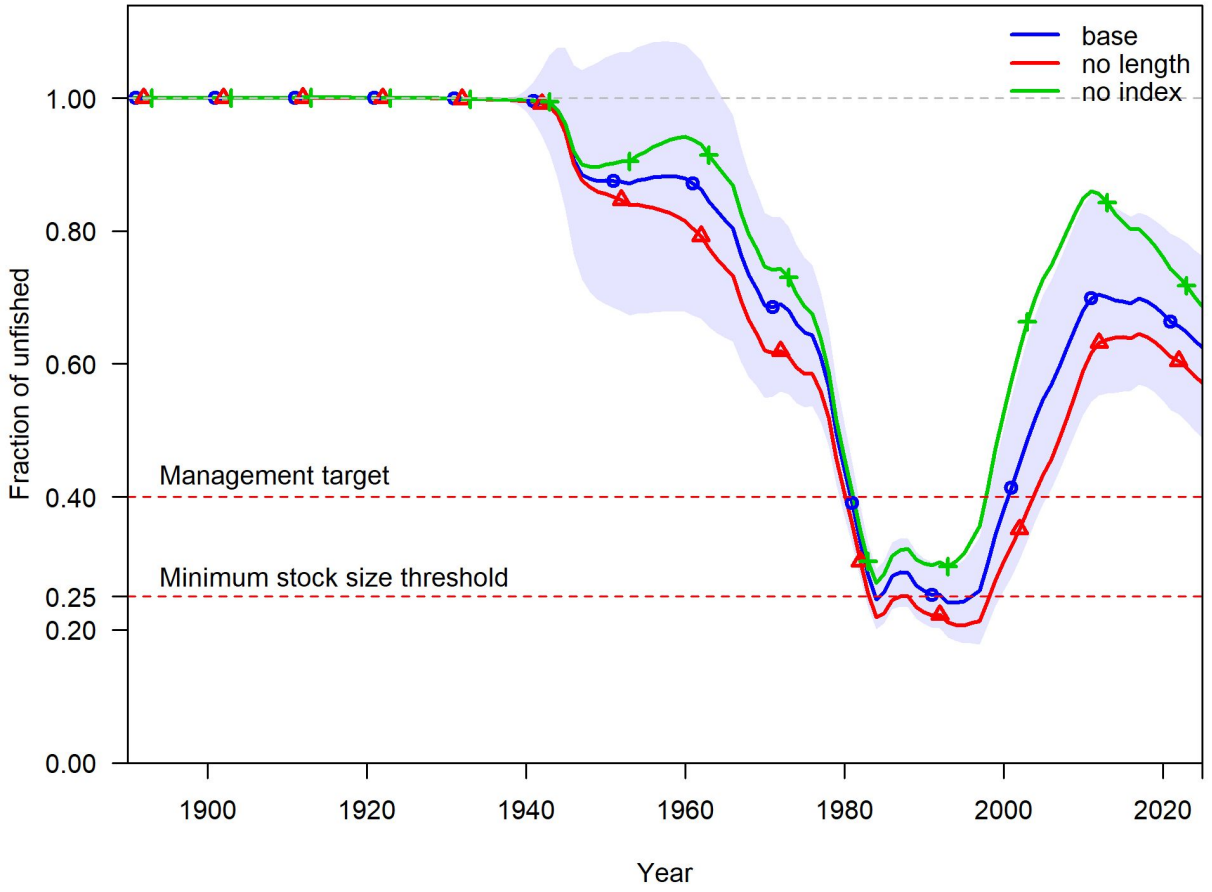
No indices model data weights

Type	Fleet	Francis	Obs.	Mean N input	Mean N adj.	Sum N adj.
Length	Commercial	0.055	53	575.5	31.7	1681.8
Length	At-Sea-Hake	0.161	40	292	46.9	1877.6
Length	Recreational	0.02	41	1576.5	30.9	1266.4
Length	H&L_survey	0.054	14	112	6	84.4
Length	Triennial	0.074	9	114	8.4	75.6
Length	WCGBTS	0.094	21	103.3	9.7	203.9
Age	Commercial	0.246	53	480	118	6255.9
Age	At-Sea-Hake	0.134	2	255.5	34.3	68.6
Age	Recreational	0.018	15	613.5	11.3	170.1
Age	Triennial	0.144	9	66.8	9.6	86.7
CAAL	WCGBTS	0.143	520	15	2.1	1110.6

No fishery lengths model data weights

Type	Fleet	Francis	Obs.	Mean N input	Mean N adj.	Sum N adj.
Age	Commercial	0.215	53	480	103.4	5480.2
Age	At-Sea-Hake	0.118	2	255.5	30.1	60.2
Age	Recreational	0.059	15	613.5	35.9	539
Age	Triennial	0.164	9	66.8	10.9	98.4
CAAL	WCGBTS	0.173	520	15	2.6	1346.8


base
no length
no index
Spawning output
0
5
10
15
1900
1920
1940
1960
1980
2000
2020
Year

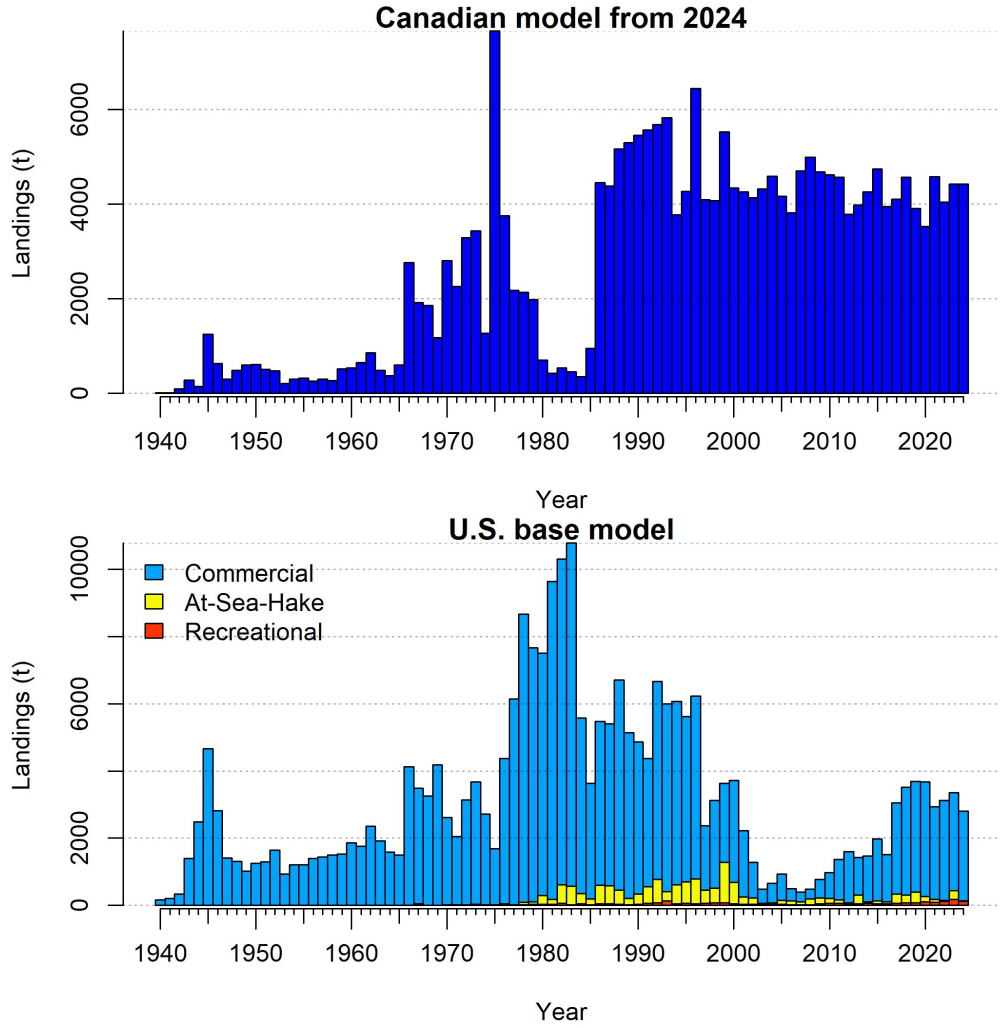

base
no length
no index
Fraction of unfished
0.00
0.20
0.25
0.40
0.60
0.80
1.00
Management target
Minimum stock size threshold
1900
1920
1940
1960
1980
2000
2020
Year

Request 4

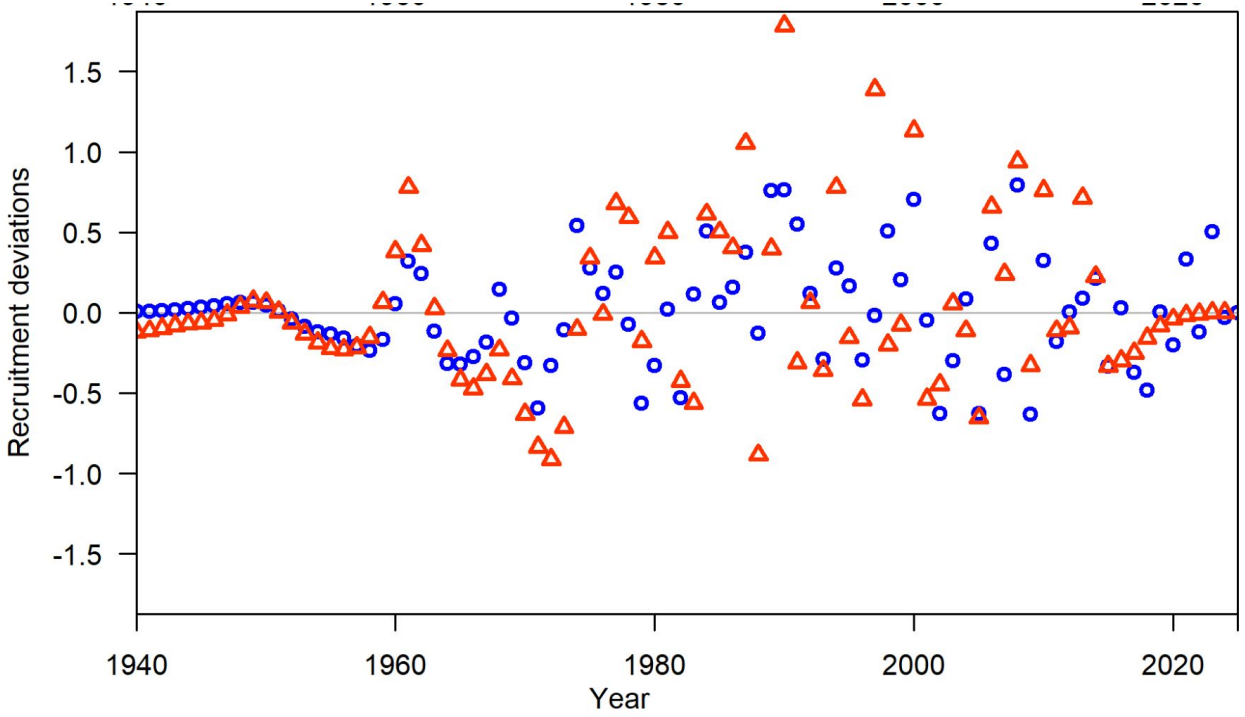
Present a comparison of the Canadian recruitment and trawl survey index for discussion.

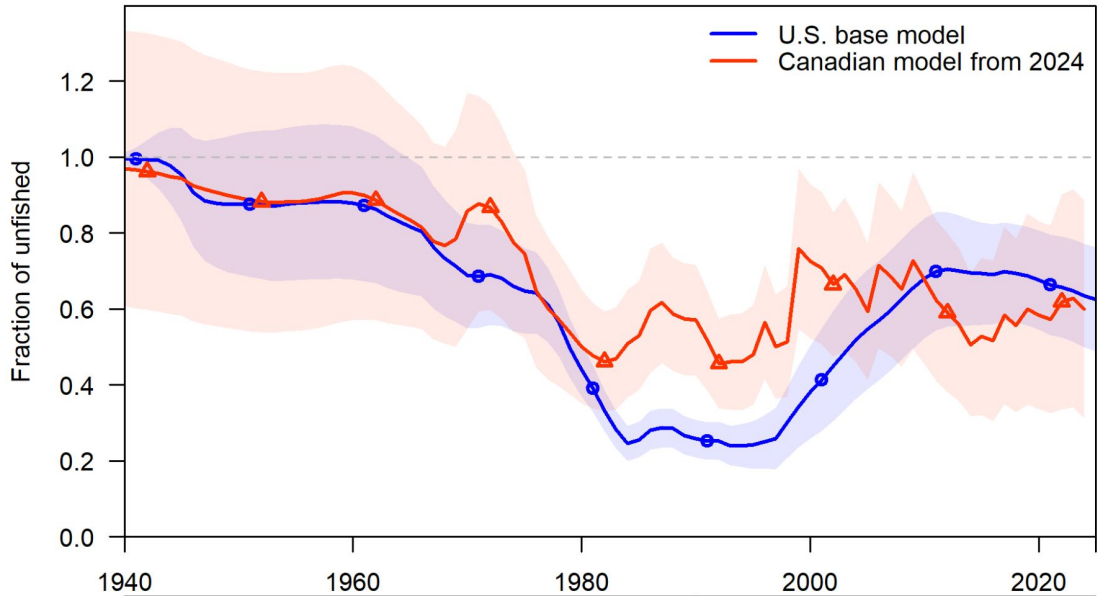
Rationale: This was not discussed during the presentation today and it would be good to see how well they compare.

Request 4: catch comparison

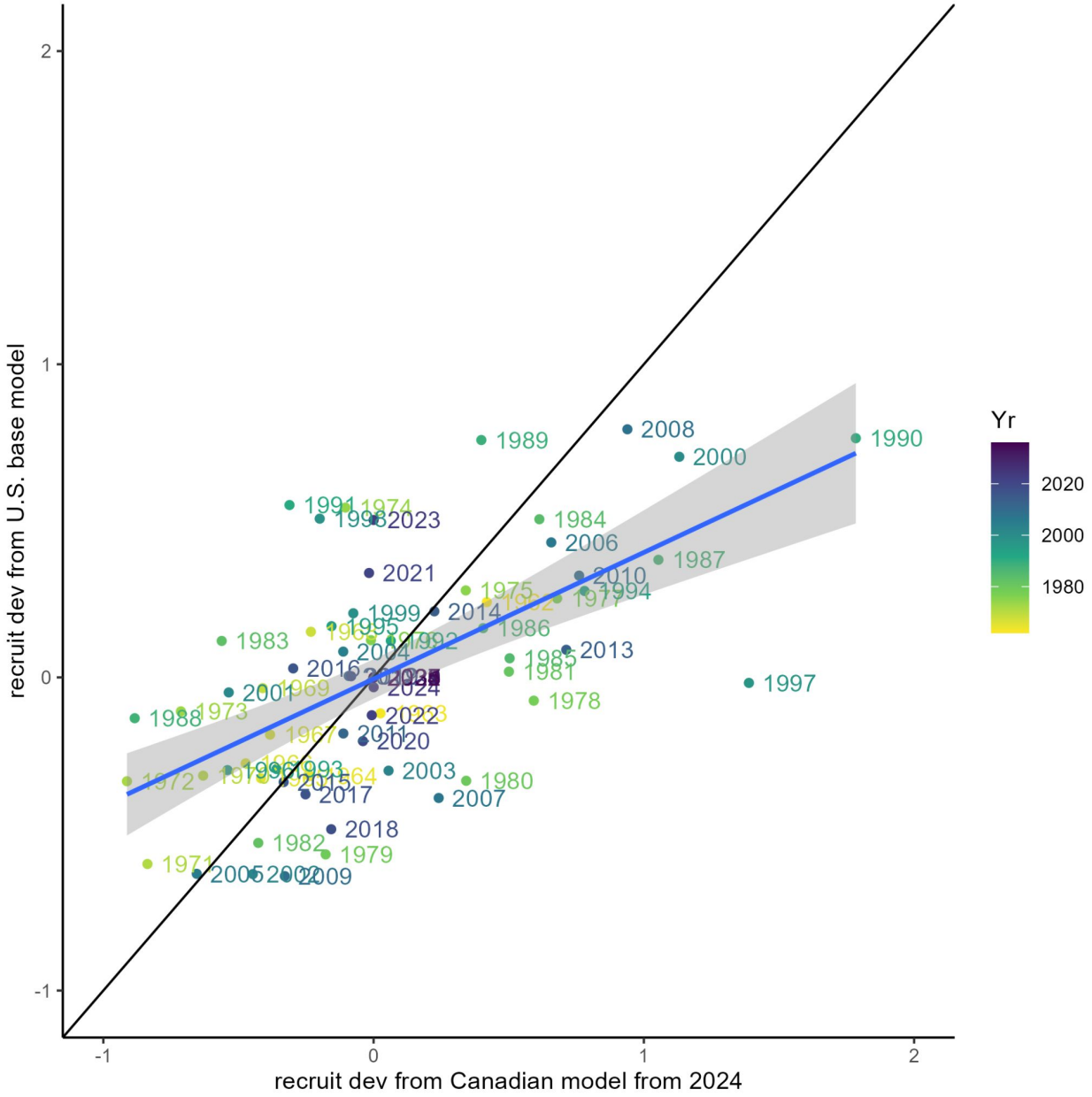


Request 4: time series comparison

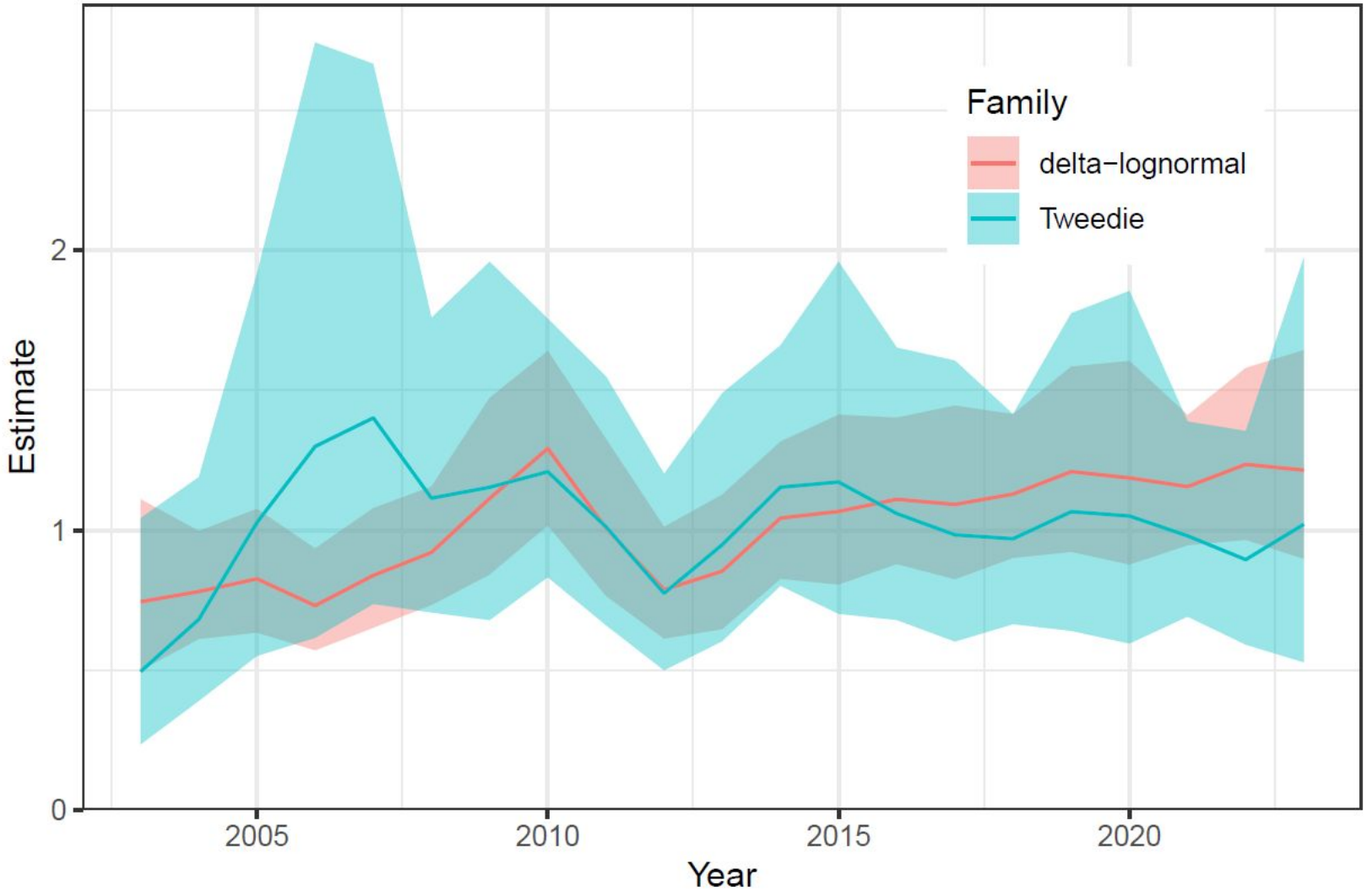




Comparing recruitment deviations



Canadian trawl survey index



Delta-lognormal strongly preferred

Request 5

What evidence exists pertaining to stock structure, including for yellowtail rockfish in Canadian waters and the Gulf of Alaska?

Rationale: The current assessment makes a strong assumption of the spatial extent of the stock. This is supported by evidence from the southern boundary but not for the northern boundary. This is key to understanding aspects of the uncertainty of the assessment, particularly if the assessment is of a partial biological population, etc.

Request 5

Stock structure assumptions are based on Hess et al. (2011): single stock north of 40°10’

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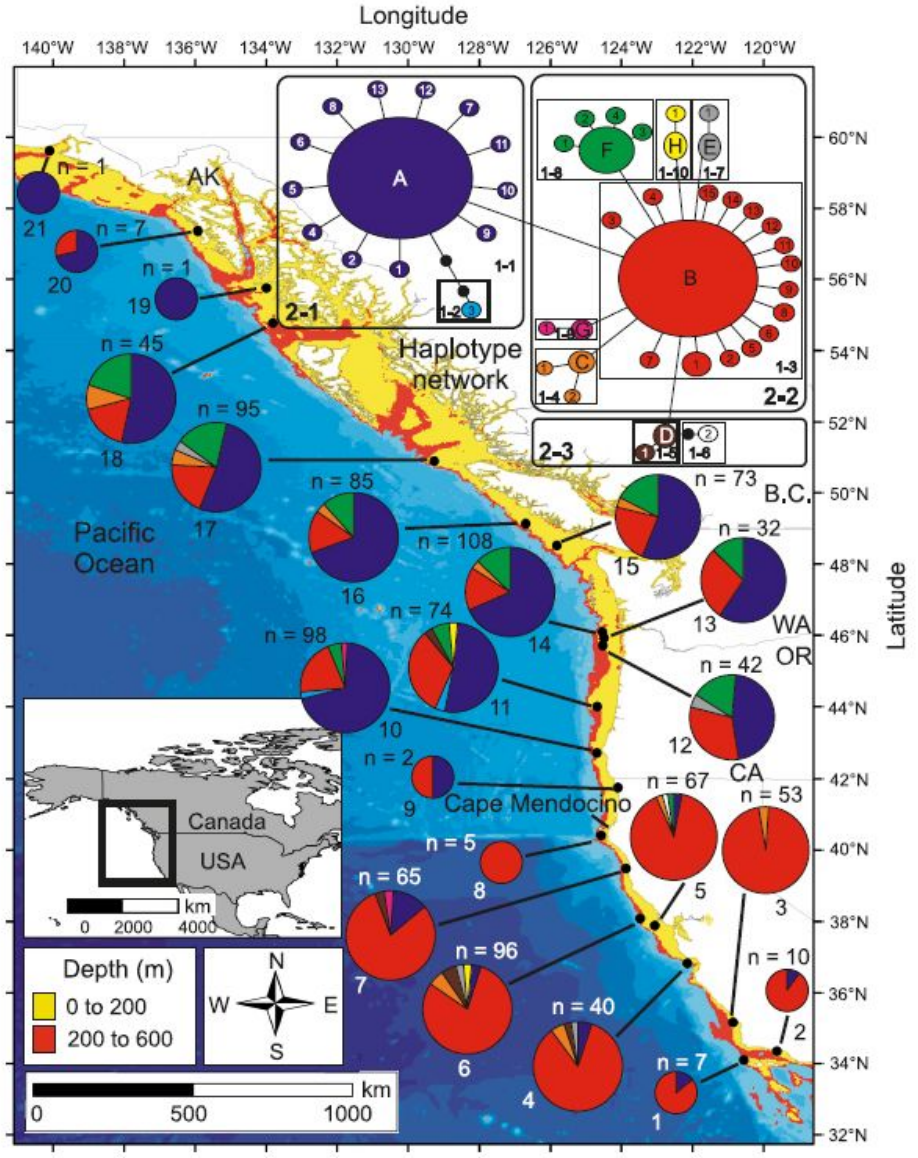
A steep genetic cline in yellowtail rockfish, *Sebastes flavidus*, suggests regional isolation across the Cape Mendocino faunal break

Jon E. Hess, Russell D. Vetter, and Paul Moran

Can. J. Fish. Aquat. Sci. Vol. 68, 2011

Fig. 1. Map of yellowtail rockfish collections, mtDNA 1-step clade frequencies, nested haplotype network, and sample sizes. The inset map in grey scale shows North America with a box around the region of interest. The colors in the pie-charts correspond to the haplotypes at top of figure. Collection sample sizes are shown above each chart and numbers below charts refer to collection names. The depth range highlighted in yellow, is the maximum depth where yellowtail are most abundant and red marks the deepest depth range yellowtail have been recorded. The nested clade showed significant patterns at the two-step level within clade 2-2 (range expansion) and at the total cladogram level (range expansion).



Request 5

Fig. 2. Principal component analysis using genotypic data from six microsatellite loci. A genetic break is apparent between collections located north and south of Cape Mendocino. This analysis includes only populations with $n \geq 10$.

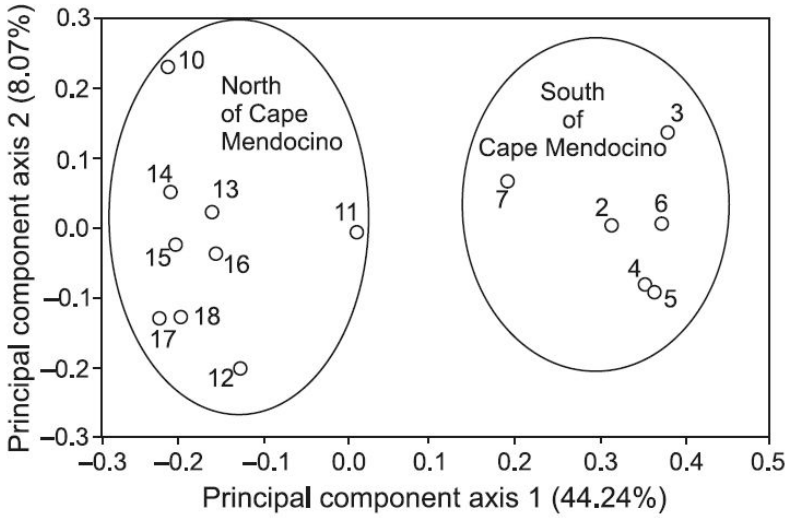
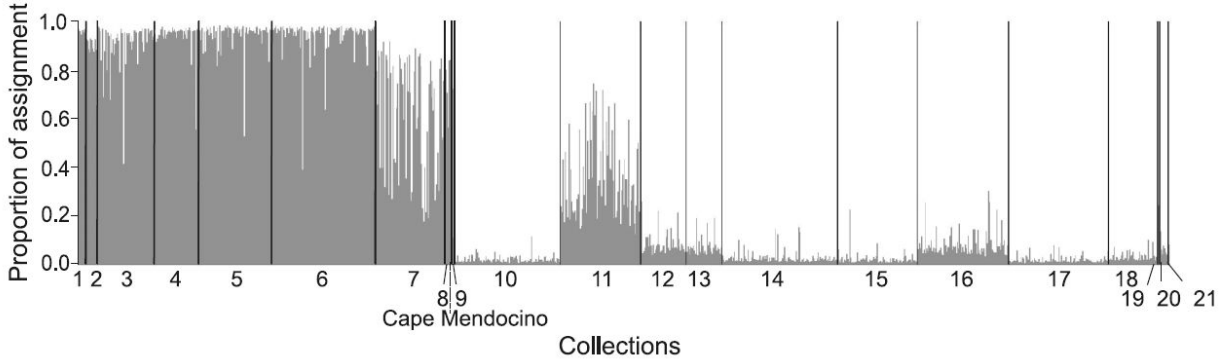


Fig. 3. Individual assignment values from the Structure analysis using microsatellite data and a cluster setting of $K = 2$. The collections are depicted on the x axis and posterior probabilities along the y axis. The location of Cape Mendocino is indicated between collections 8 and 9.



Thank you!

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