The South African anchovy assessment with annual maturity ogives

SWG-PEL Meeting

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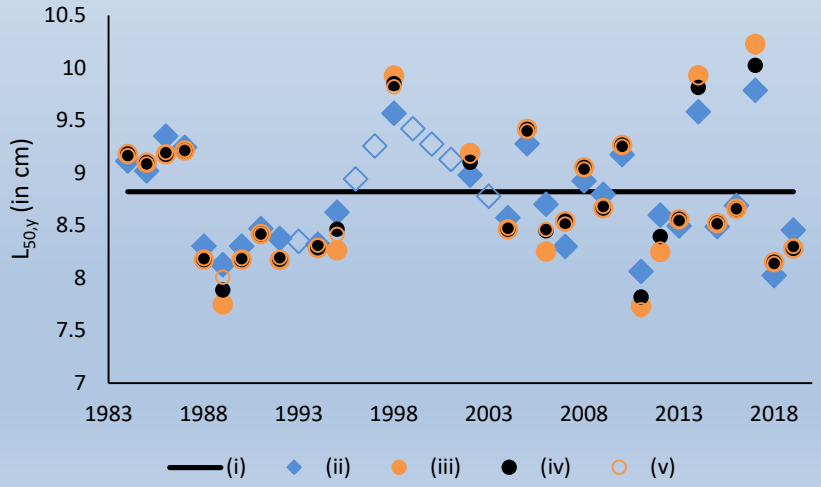
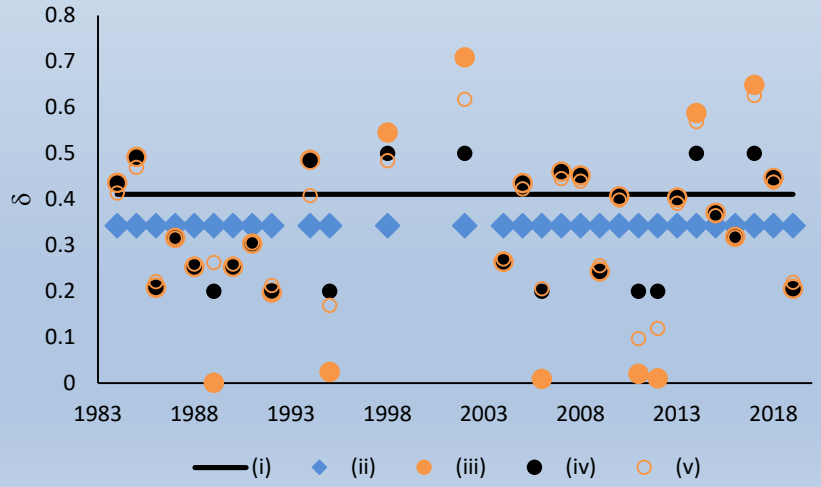
Updated Assessment

Key changes:

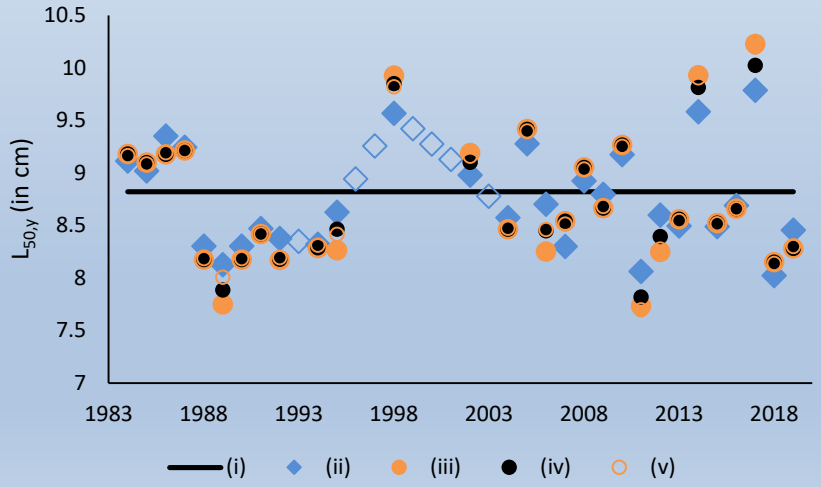
- Informative prior on hydro-acoustic survey bias (Doc #40)
- Inclusion of additional hydro-acoustic survey variance (Doc #40)
- DEPM indices are assumed to be absolute estimates of abundance (Doc #48)
- Maturity ogives with $L_{50,y}$ and $\delta_y = \delta$ (Appendix)

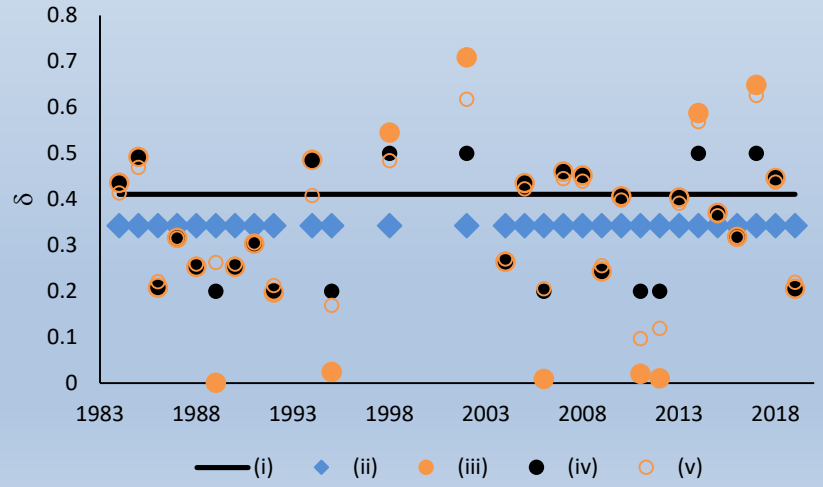




Maturity Ogives Used

Alternative models	Objective function
i) Time-invariant maturity ogives: $L_{50,y} = L_{50}$ and $\delta_y = \delta$	7.732
ii) Time-invariant steepness in the maturity ogives: $L_{50,y}$ and $\delta_y = \delta$	4.000
iii) Annually varying maturity ogives: $L_{50,y}$ and δ_y — Unrealistically small δ_y's	3.081
iv) Annually varying maturity ogives with prior on steepness: $L_{50,y}$ and $\delta_y \sim U(0.2,0.5)$	3.308
v) Annually varying maturity ogives with prior on steepness: $L_{50,y}$ and $\delta_y \sim N(\delta, 5^2)$	3.288





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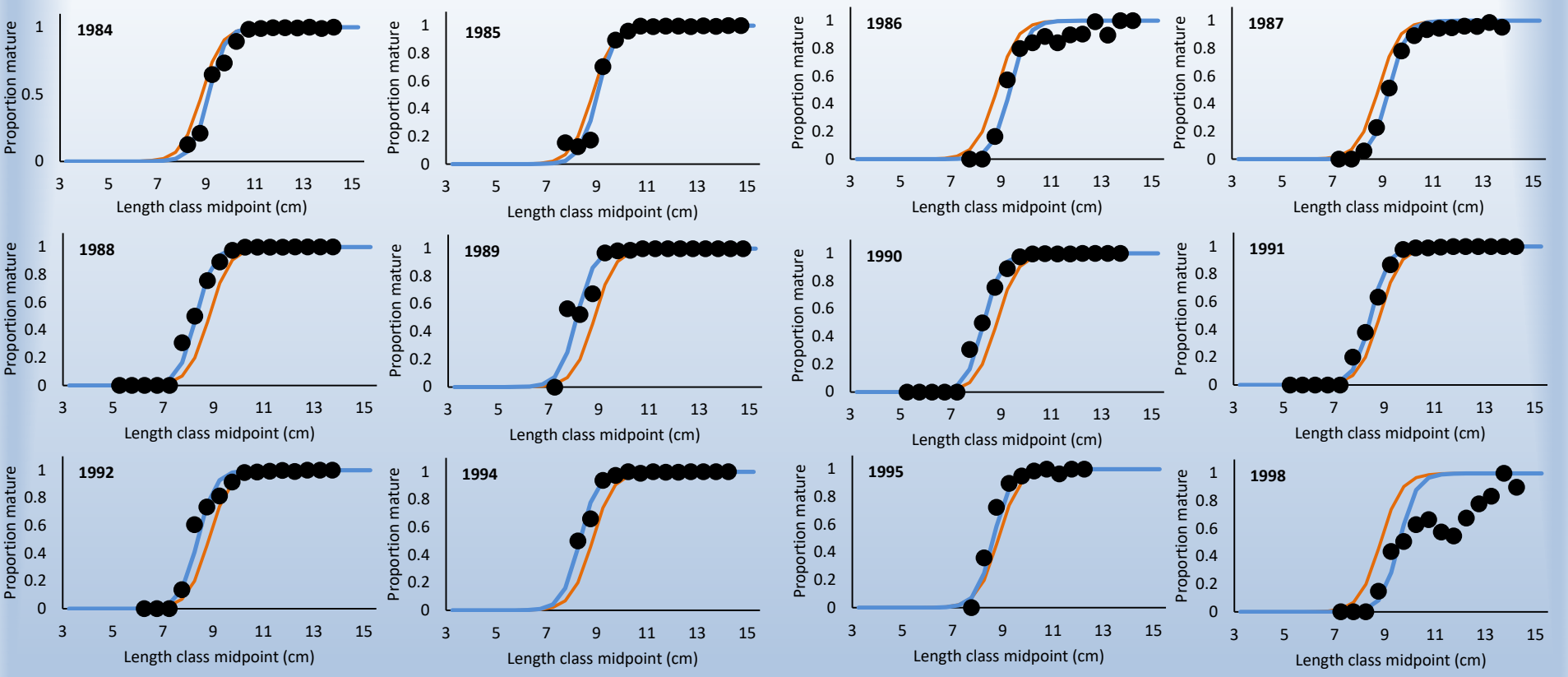

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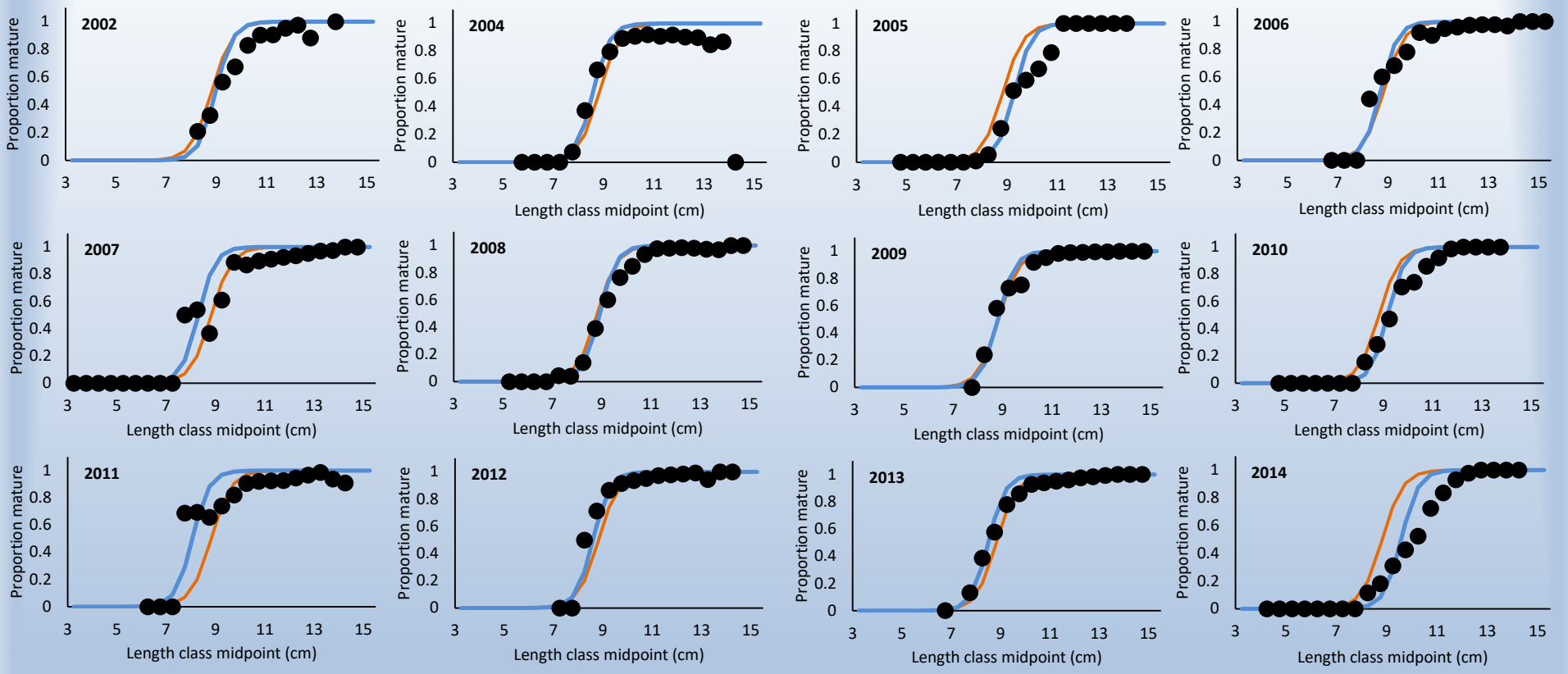

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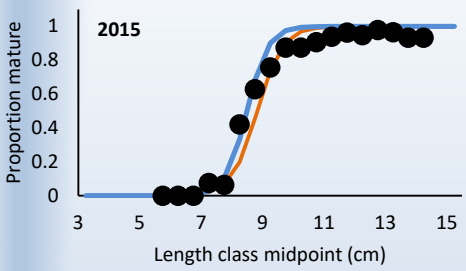
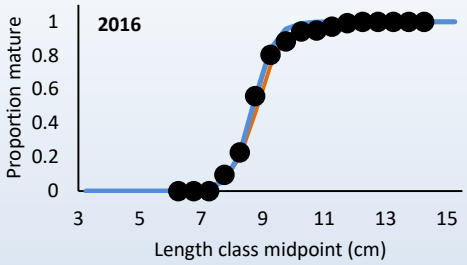
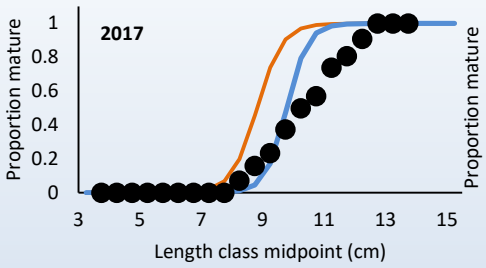
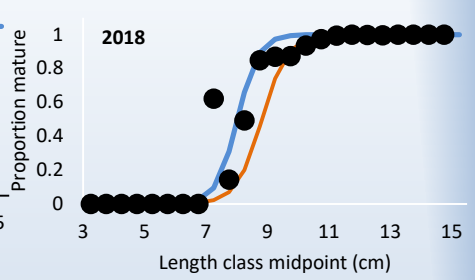
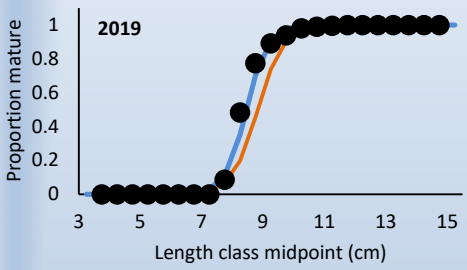








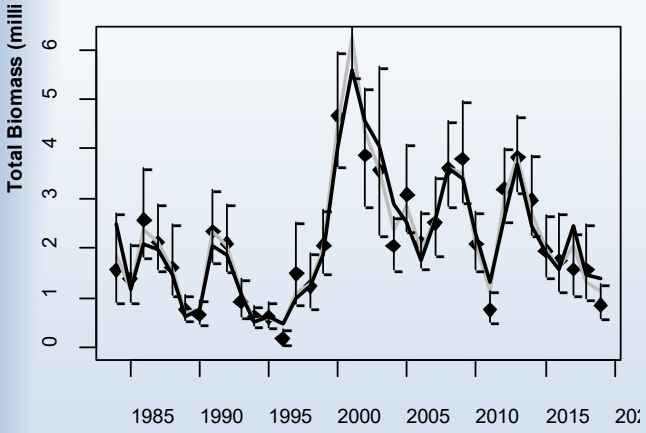


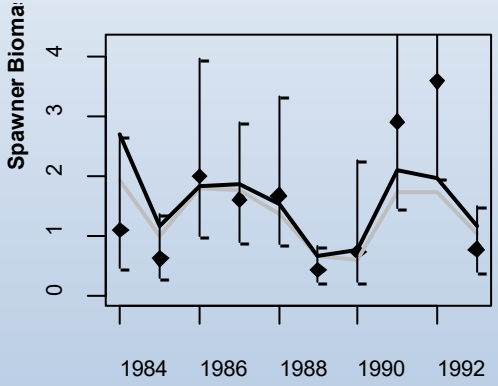
Indices of Anchovy Abundance

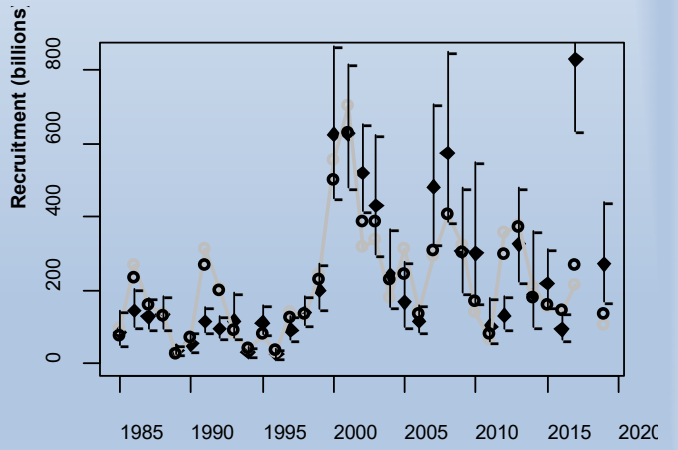
			Obj fn	-log likelihood						-lnprior				Survey bias		
		$ln(k_{ac}^{A})$		$-lnL$	$-lnL^{Nov}$	$-lnL^{Egg}$	$-lnL^{rec}$	$lnL^{sur\ pro}$	$lnL^{com\ pro}$	ε_y^A	All growth parameters	δ_1 and δ_3	$N_{1983,a}^{A}$	k_N^A	k_r^A	k_g^A
From de Moor (2020c)	A_0	$U(-100,0.7)$	-725.7	-767.9	-17.9	6.1	25.9	-479.0	-303.1	35.5	-2.0	-2.0	10.8	0.68	0.58	1
		$N(-0.158,0.112^2)$	-718.6	**-758.9**	-1.1	7.4	20.9	-483.3	-302.8	34.1	-1.8	-2.0	10.8	0.76	0.64	1
	A_1	$U(-100,0.7)$	-727.1	-769.0	-16.4	6.3	25.7	-481.8	-302.9	35.0	-1.9	-2.0	10.8	0.98	0.80	1
		$N(-0.158,0.112^2)$	-721.7	**-761.1**	0.5	6.8	19.3	-485.2	-302.5	33.3	-1.5	-2.0	10.8	0.89	0.73	1
New	$L_{50,y}$	$N(-0.158,0.112^2)$	-721.8	**-761.5**	0.4	6.6	19.4	-485.2	-302.6	33.6	-1.5	-2.0	10.8	0.89	0.74	1
	L_{50}	$N(-0.158,0.112^2)$	-721.5	-760.9	0.5	7.0	19.3	-485.2	-302.5	33.3	-1.5	-2.0	10.8	0.89	0.73	1

- "Guesstimated" values aren't influential
- Model fits to survey data

Indices of Anchovy Abundance







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	L_{50}	$N(-0.158,0.112^2)$	-721.5	-760.9	0.5	7.0	19.3	-485.2	-302.5	33.3	-1.5	-2.0	10.8	0.89	0.73	1

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- Nov 2019 biomass ~1.5 million tons (~A_1, lower than A_0)

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Thank you!