

Calculating an informative prior distribution for anchovy survey bias and an update of the anchovy assessment using this prior

SWG-PEL Meeting
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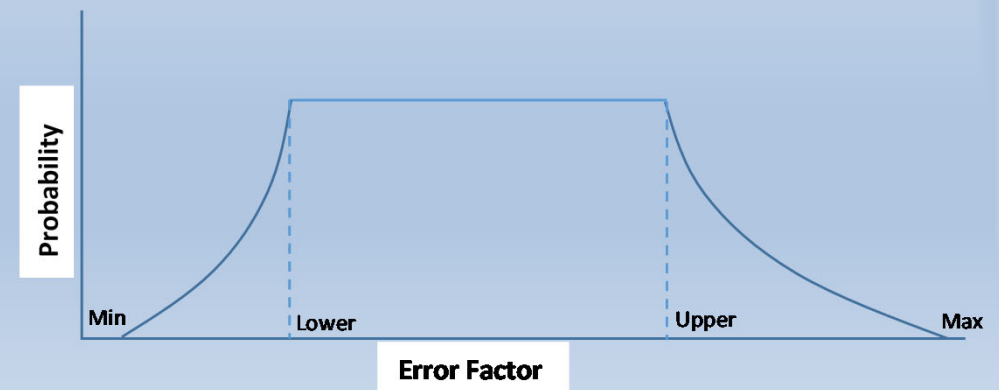
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University of Cape Town

Anchovy Assessment

[illegible]

2000 Workshop

Error	Minimum	Likely (lower)	Likely (midpoint)	Likely (upper)	Maximum	Nature
Target Strength	0.80	1.15	1.40	1.65	2.00	Constant
Calibration (On-axis sensitivity)	0.90	0.95	1.00	1.05	1.10	Variable
(Beam factor)	0.75	0.90	1.00	1.10	1.25	Constant
Target Identification	0.50	0.90	1.00	1.10	1.50	Variable
Weather Effects	1.01	1.05	1.15	1.25	2.00	Variable



Updates to Errors

Error	Minimum	Likely (lower)	Likely (midpoint)	Likely (upper)	Maximum	Nature
Target Strength	0.84	0.94	1.00	1.06	1.19	Constant
Calibration						
(On-axis sensitivity)	0.90	0.95	1.00	1.05	1.10	Variable
(Beam factor)	0.75	0.90	1.00	1.10	1.25	Constant
Target Identification	0.50	0.90	1.00	1.10	1.50	Variable
Weather Effects	1.01	1.02	1.15	1.28	1.50	Variable

- Target strength – updated from ‘trapezium type’ distribution to normal distribution, using anchovy TS from Barange *et al.* (1996)

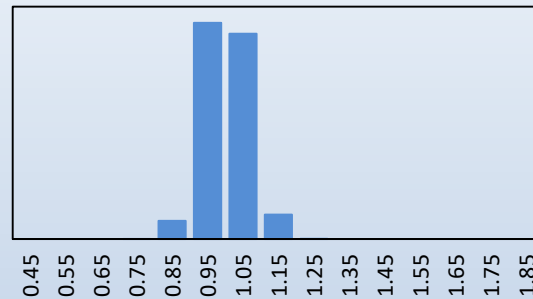
Updates to Errors

Error	Minimum	Likely (lower)	Likely (midpoint)	Likely (upper)	Maximum	Nature
Target Strength	0.84	0.94	1.00	1.06	1.19	Constant
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Weather Effects	1.01	1.02	1.15	1.28	1.50	Variable

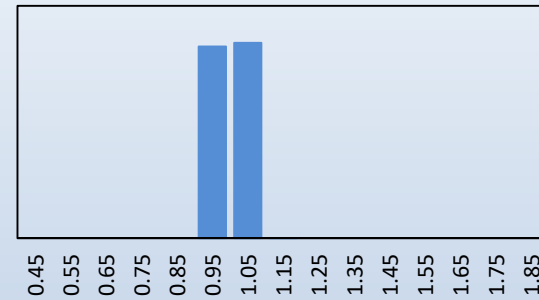
- Calibration – no further work, no basis to modify
- Target ID – no further work, no basis to modify
- Weather effects – error associated with bad weather and increased aeration and transducer pitch and roll < 1.5 and minimum >1.0 as surveys never conducted entirely in good conditions

Individual Errors

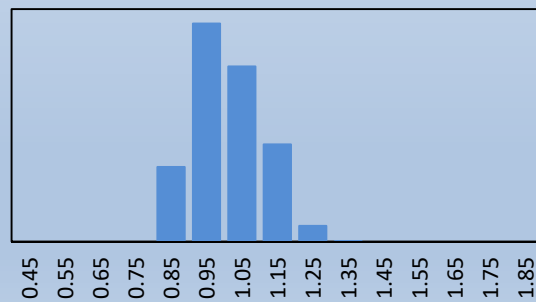
Target Strength



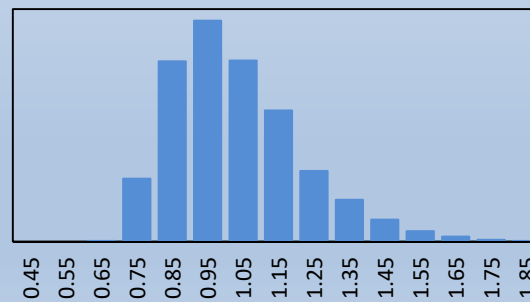
On-axis Calibration



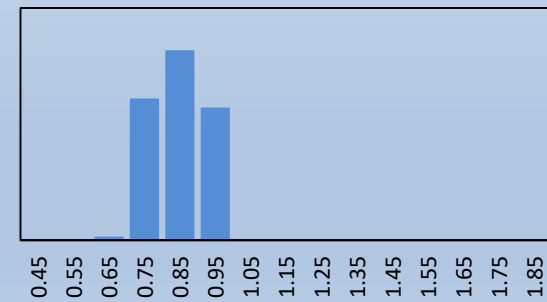
Beam Calibration



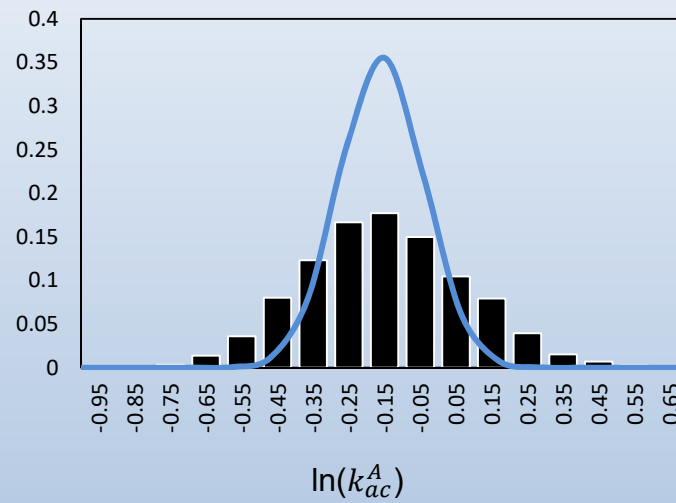
Target Identification



Weather Effects



Informative Prior



Anchovy Assessment

			Obj fn	-log likelihood						-lnprior				Survey bias		
	$\ln(k_N^A)$	DEPM survey bias		$-\ln L$	$-\ln L^{Nov}$	$-\ln L^{Egg}$	$-\ln L^{rec}$	$-\ln L^{sur\ pre}$	$-\ln L^{com\ pre}$	ε_y^A	Growth	δ_1 and δ_3	$N_{1983,a}^A$	k_N^A	k_r^A	k_g^A
A ₀	$U(-100,0.7)$	1	-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
	$N(-0.158,0.112^2)$	1	-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
	$N(-0.158,0.112^2)$	$U(-100,0.7)$	-720.0	-759.4	-0.6	7.5	20.0	-483.4	-302.9	33.7	-1.8	-2.0	10.8	0.84	0.69	1.31
A ₁	$U(-100,0.7)$	1	-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
	$N(-0.158,0.112^2)$	1	-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
	$N(-0.158,0.112^2)$	$U(-100,0.7)$	-722.2	-761.7	-0.2	6.0	20.0	-485.0	-302.5	33.5	-1.6	-2.0	10.8	0.84	0.70	0.85

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Thank you!