

Appendix C3: Results Model 2

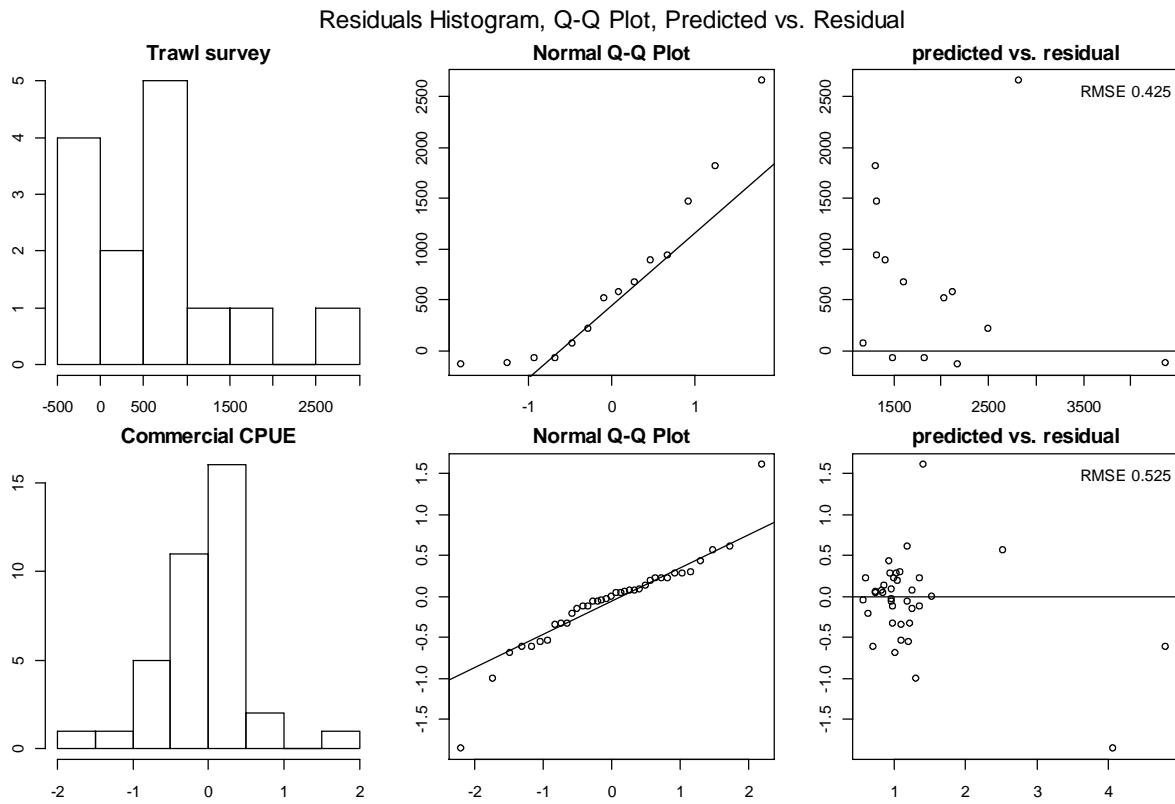


Figure C3-1. QQ plots of trawl survey abundance and commercial CPUE residuals.

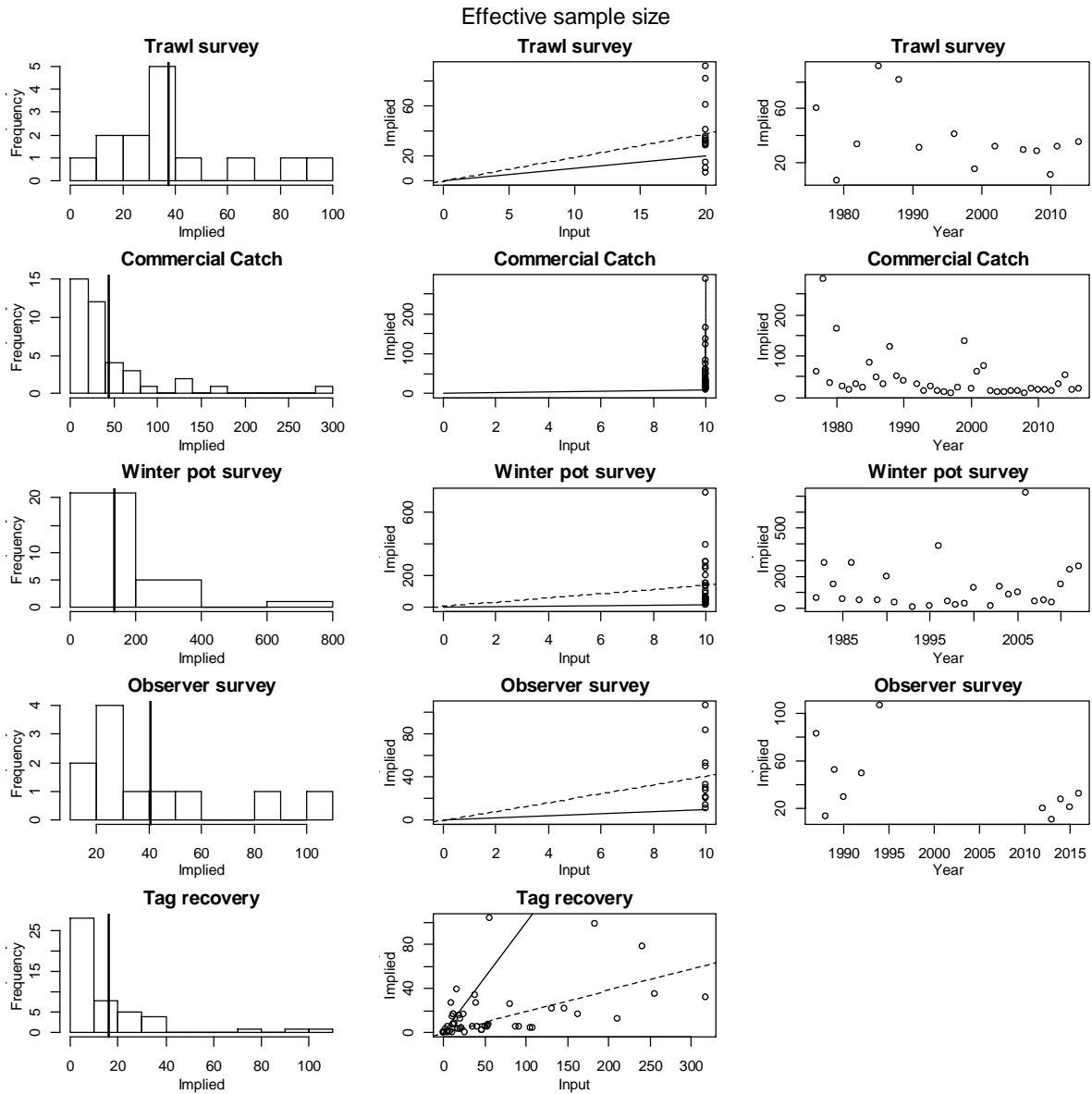


Figure C3-2: Implied effective sample sizes. Figures in the first column show implied effective sample size (x-axis) vs. frequency (y-axis). Vertical solid line is the mean implied effective sample size. The second column shows input sample sizes (x-axis) vs. implied effective sample sizes (y-axis). Dashed line indicates the linear regression slope, and solid line is 1:1 line. The third column shows years (x-axis) vs. implied effective sample sizes (y-axis).

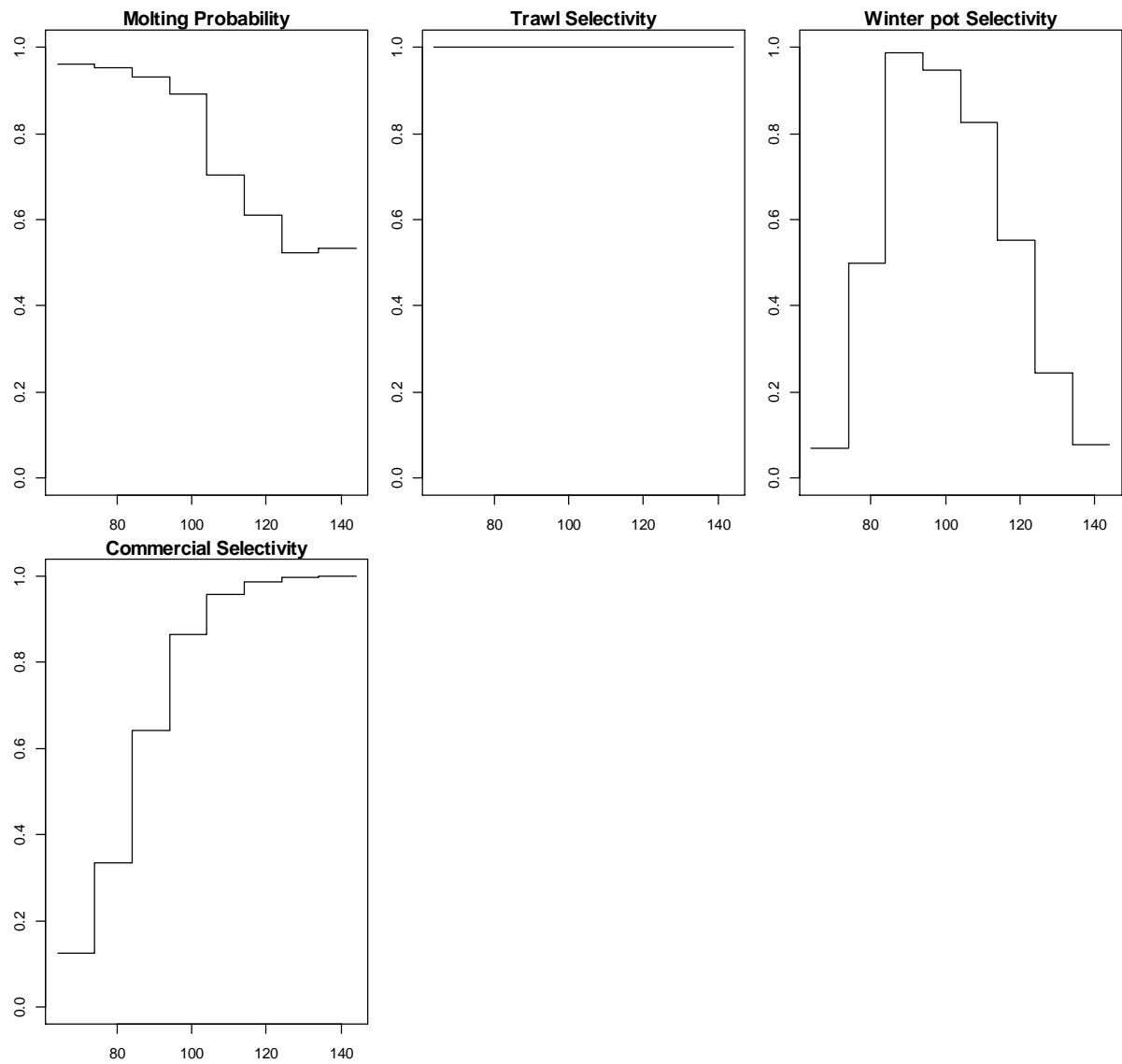


Figure C3-3. Model estimated annual molting probability, trawl survey selectivity, winter pot survey selectivity, and summer commercial fishery selectivity. X-axis is carapace length (mm).

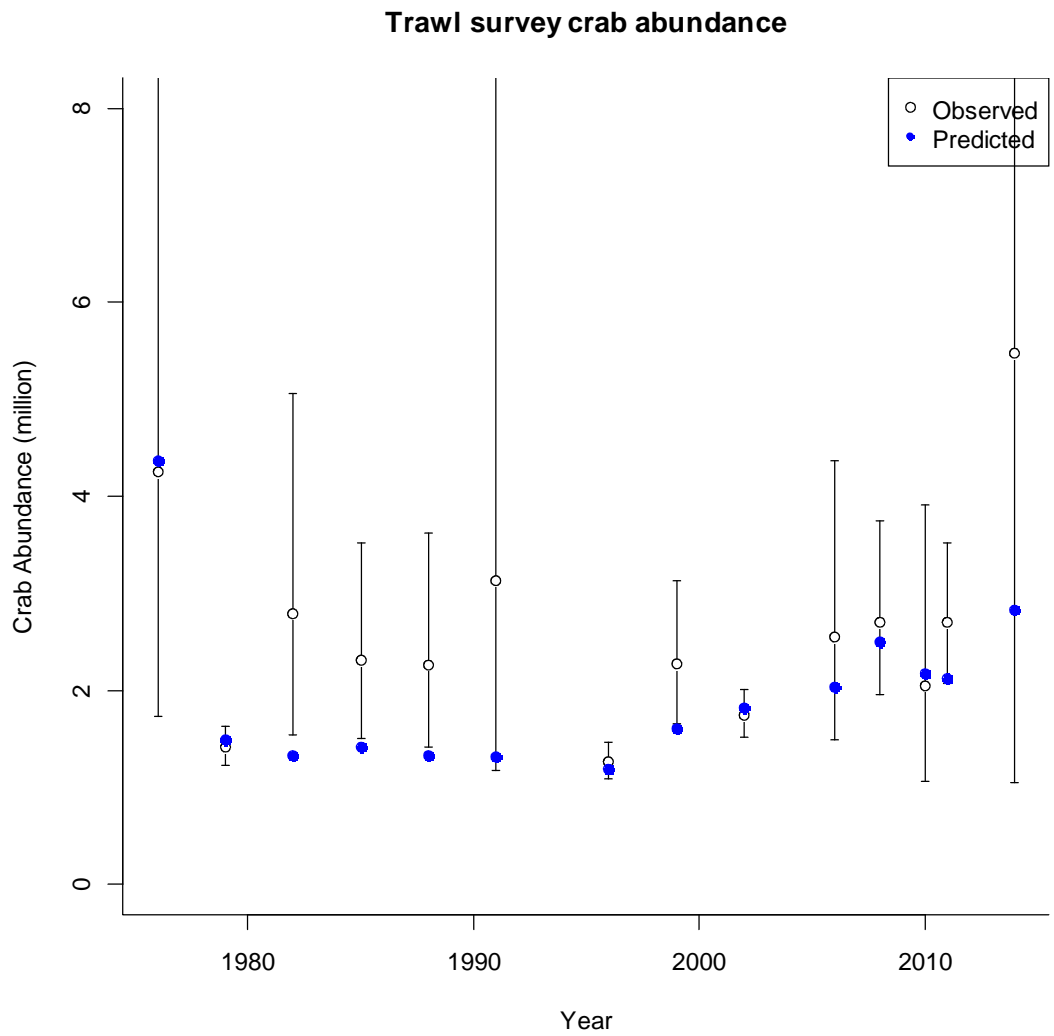


Figure C3-4. Observed and model estimated trawl survey male abundances over time with 95% confidence intervals (crab  $\geq$  74 mm CL).

**Modeled crab abundance Feb 01**

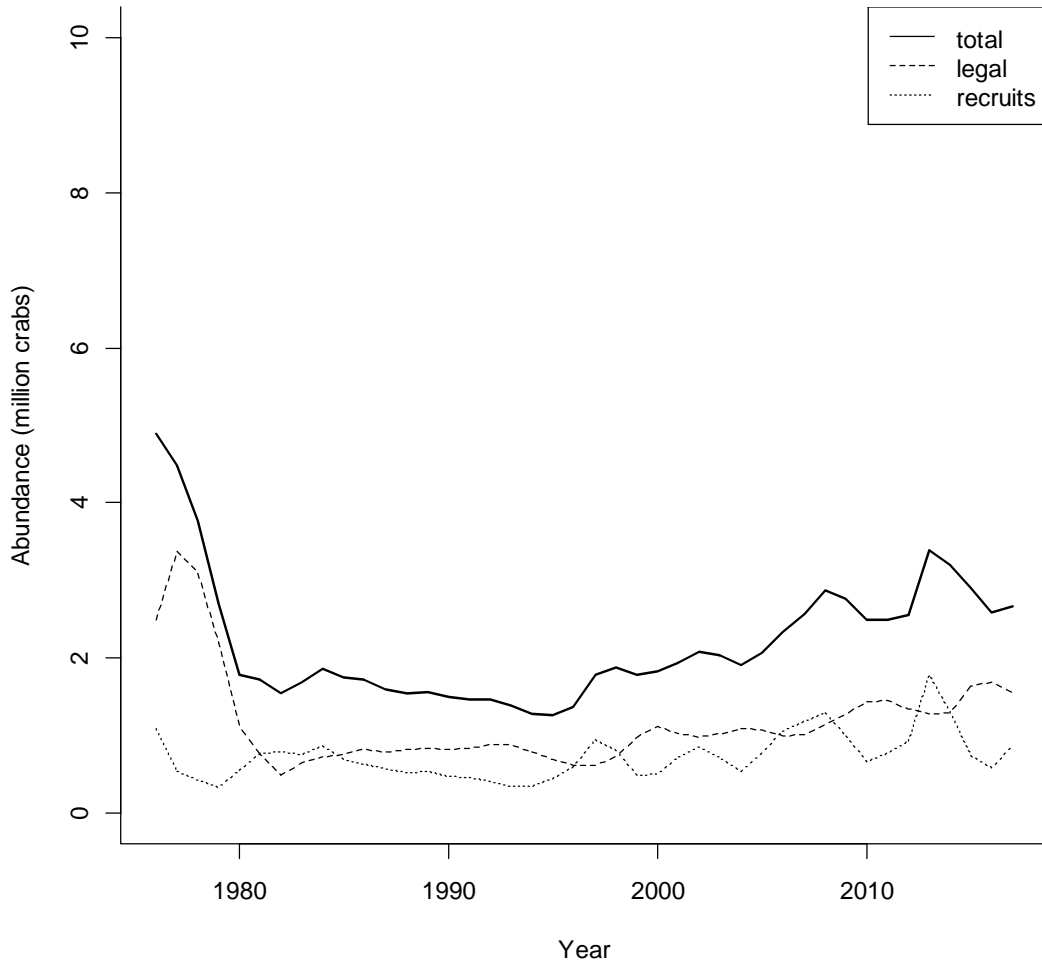


Figure C3-5. Estimated abundance of total, legal, and recruits males from 1976-2016.

### MMB Feb 01

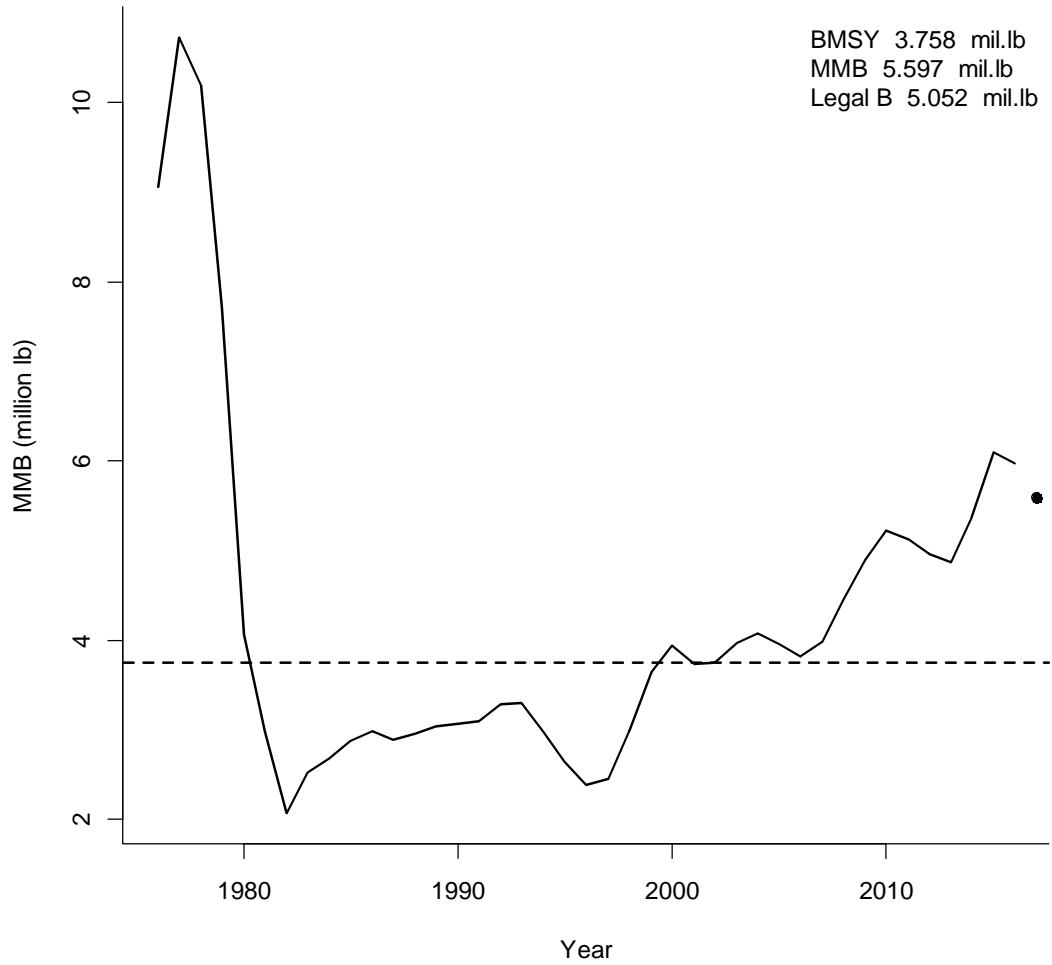


Figure C3-6. Estimated abundance of leg recruits from 1976-2016. Dash line shows  $B_{msy}$  (Average MMB of 1980-2016).

### Summer commercial standardized cpue

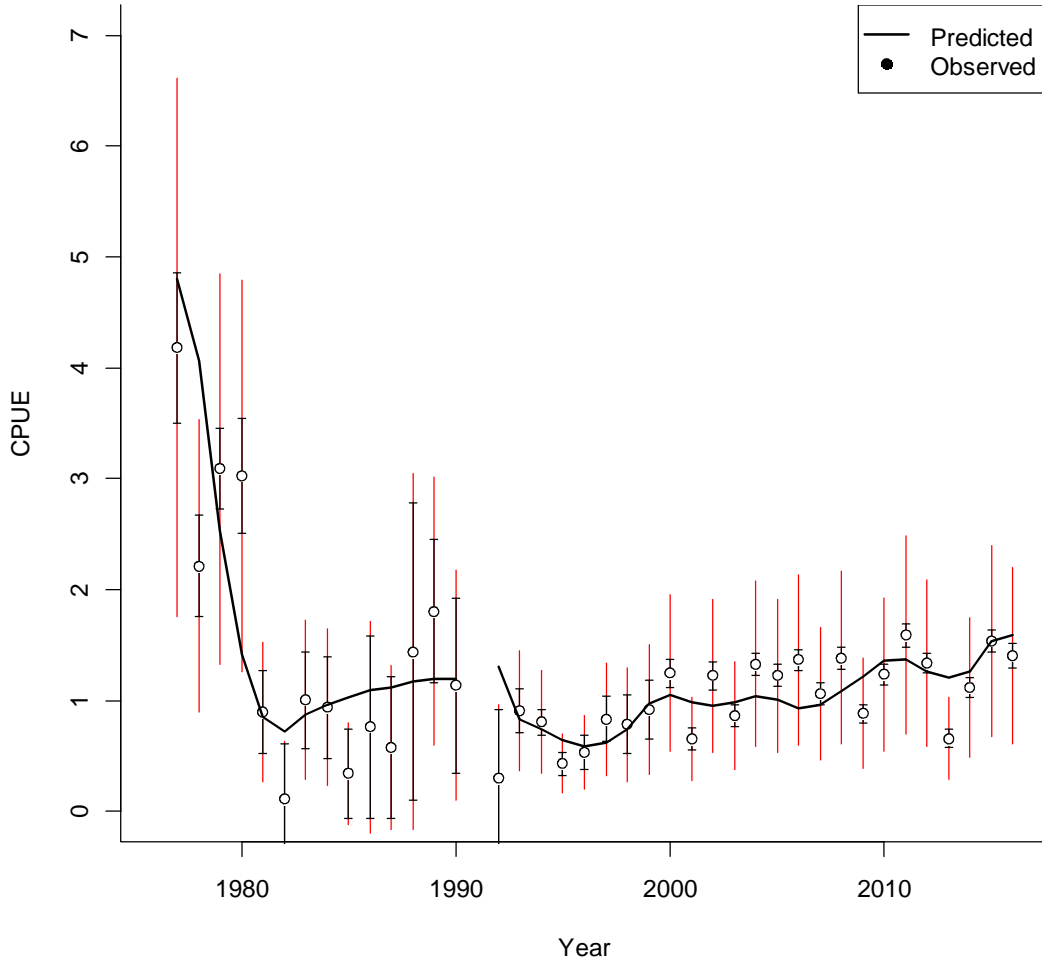


Figure C3-7. Summer commercial fishery standardized cpue during 1977-2016.

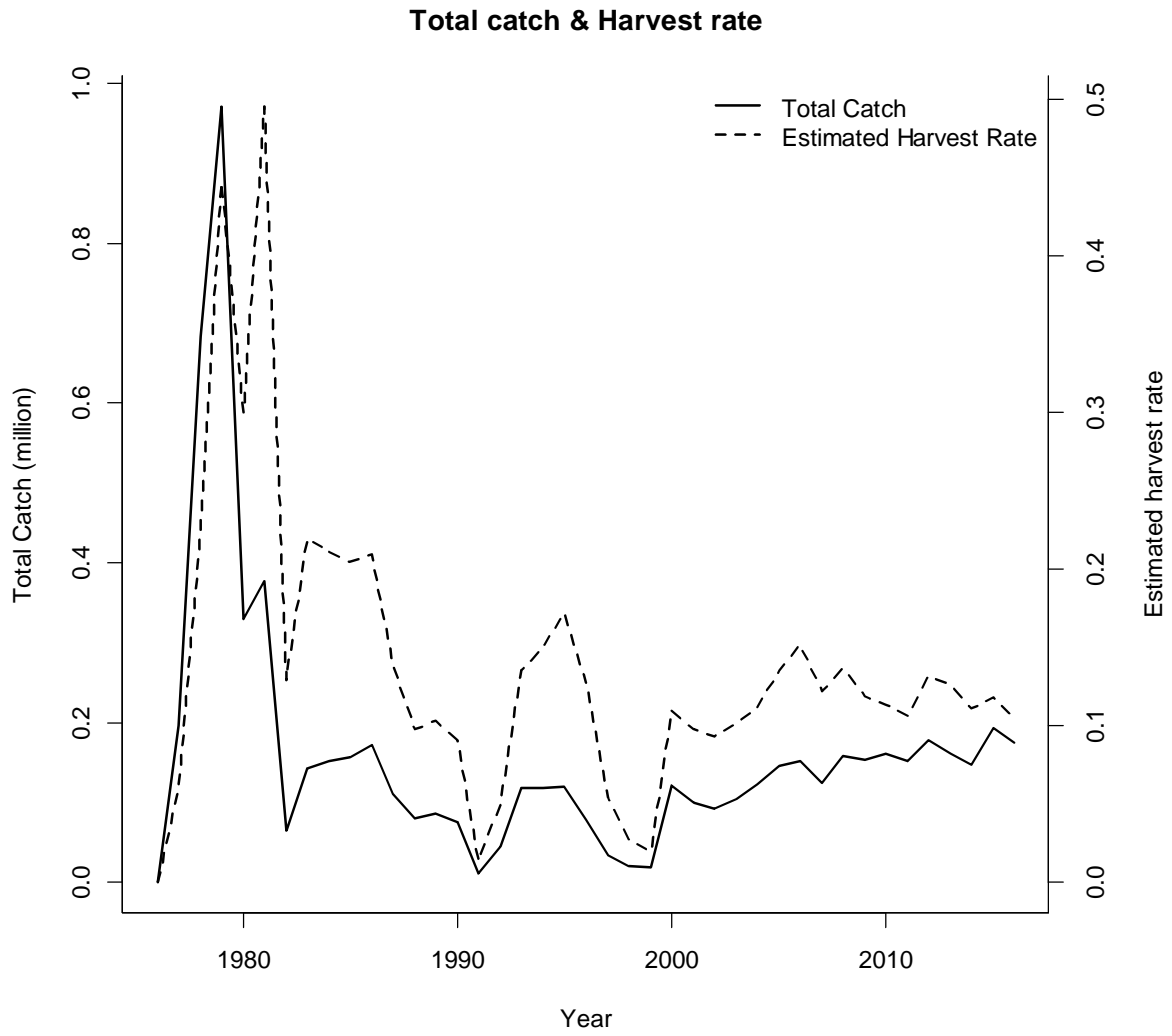


Figure C3-8. Total catch and estimated harvest rate 1976-2016.



commercial harvest length: observed vs predicted

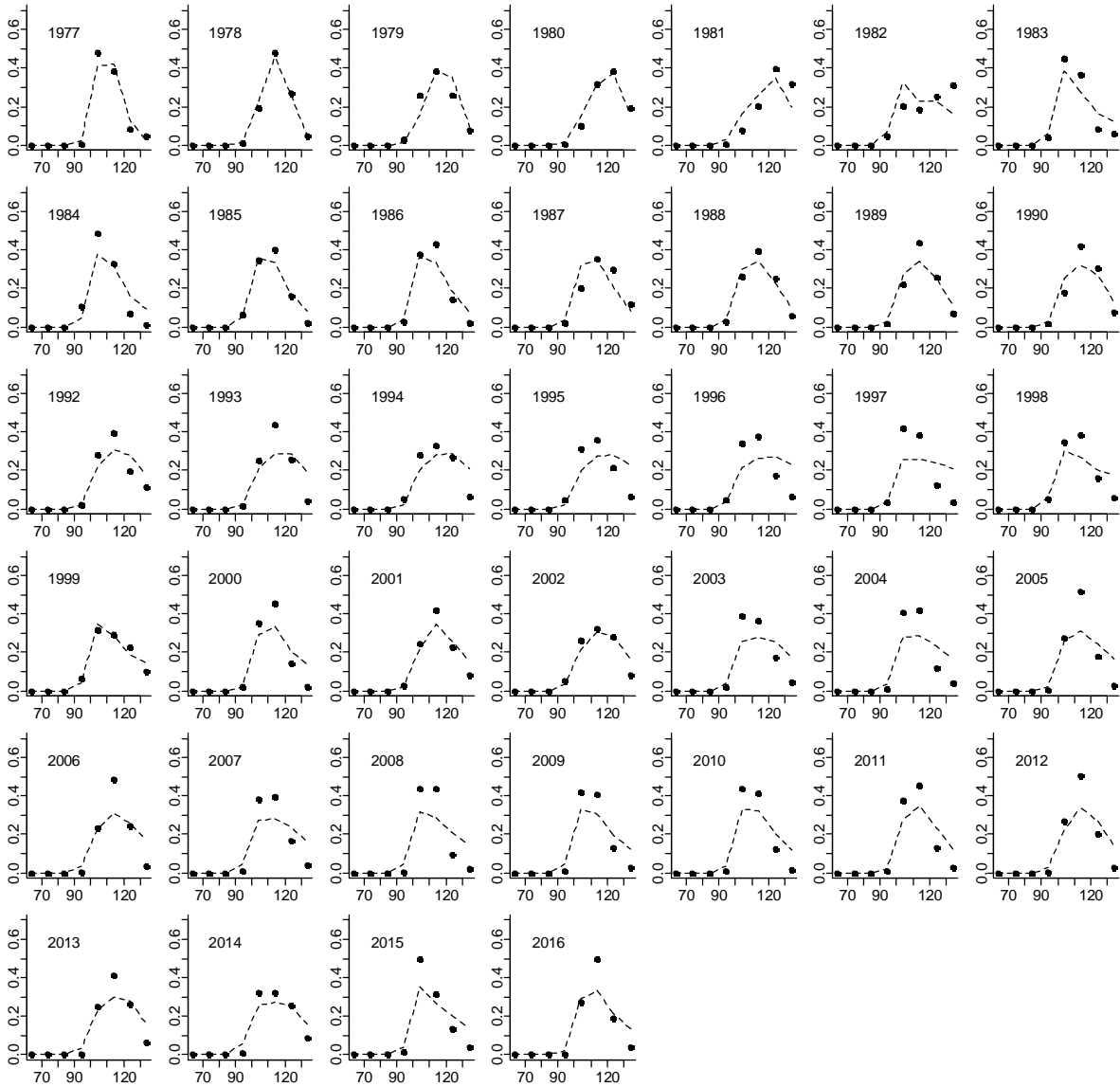


Figure C3-9. Predicted (dashed line) vs. observed (black dots) length class proportions for the summer commercial catch.

Winter pot length: observed vs predicted

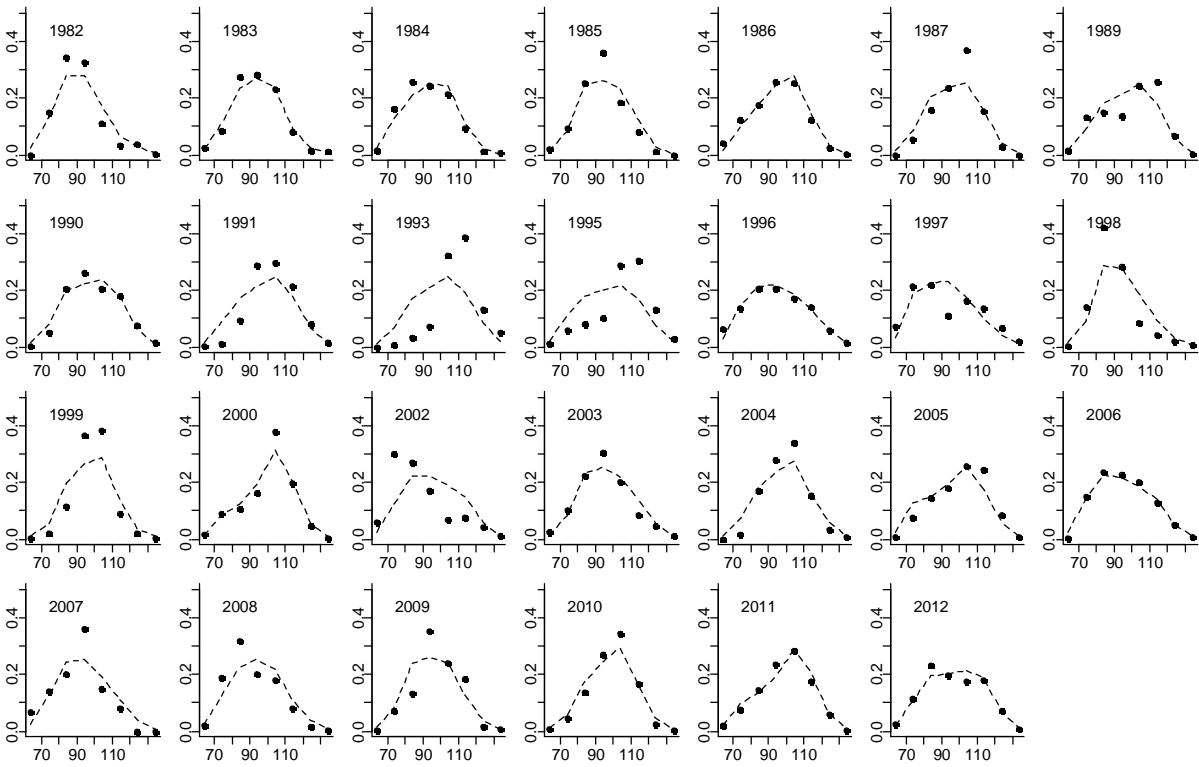


Figure C3-10. Predicted (dashed line) vs. observed (black dots) length class proportions for the winter pot survey.

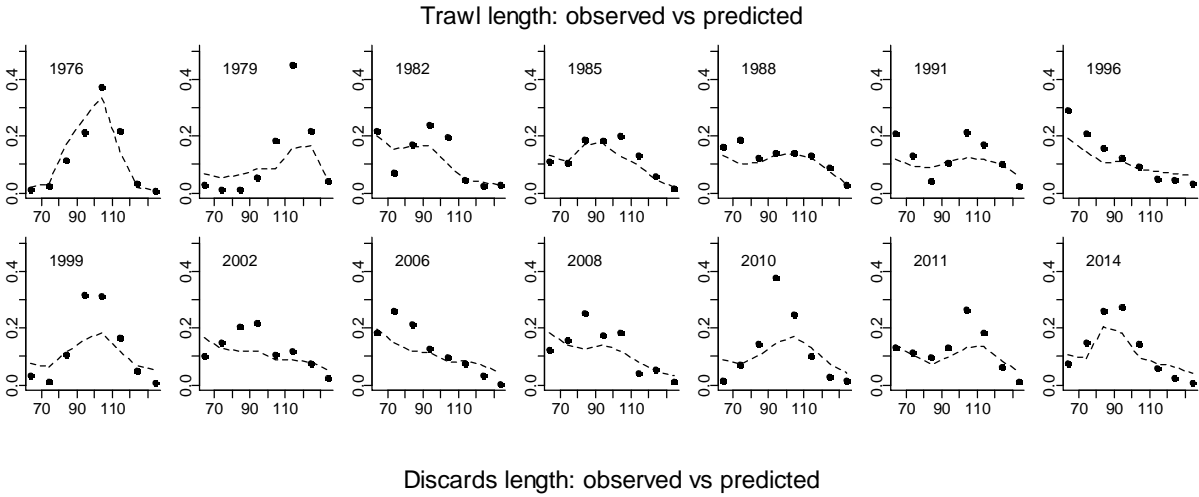


Figure C3-11. Predicted (dashed line) vs. observed (black dots) length class proportions for the trawl survey and observer survey.

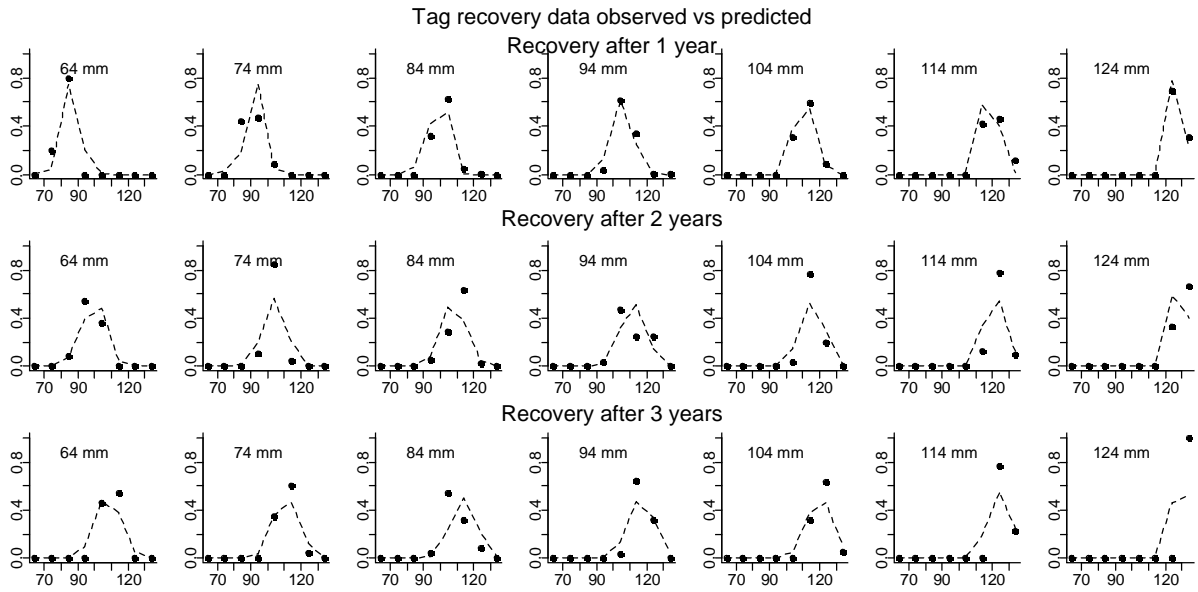


Figure C3-12. Predicted (dashed line) vs. observed (black dots) length class proportions for tag recovery data.

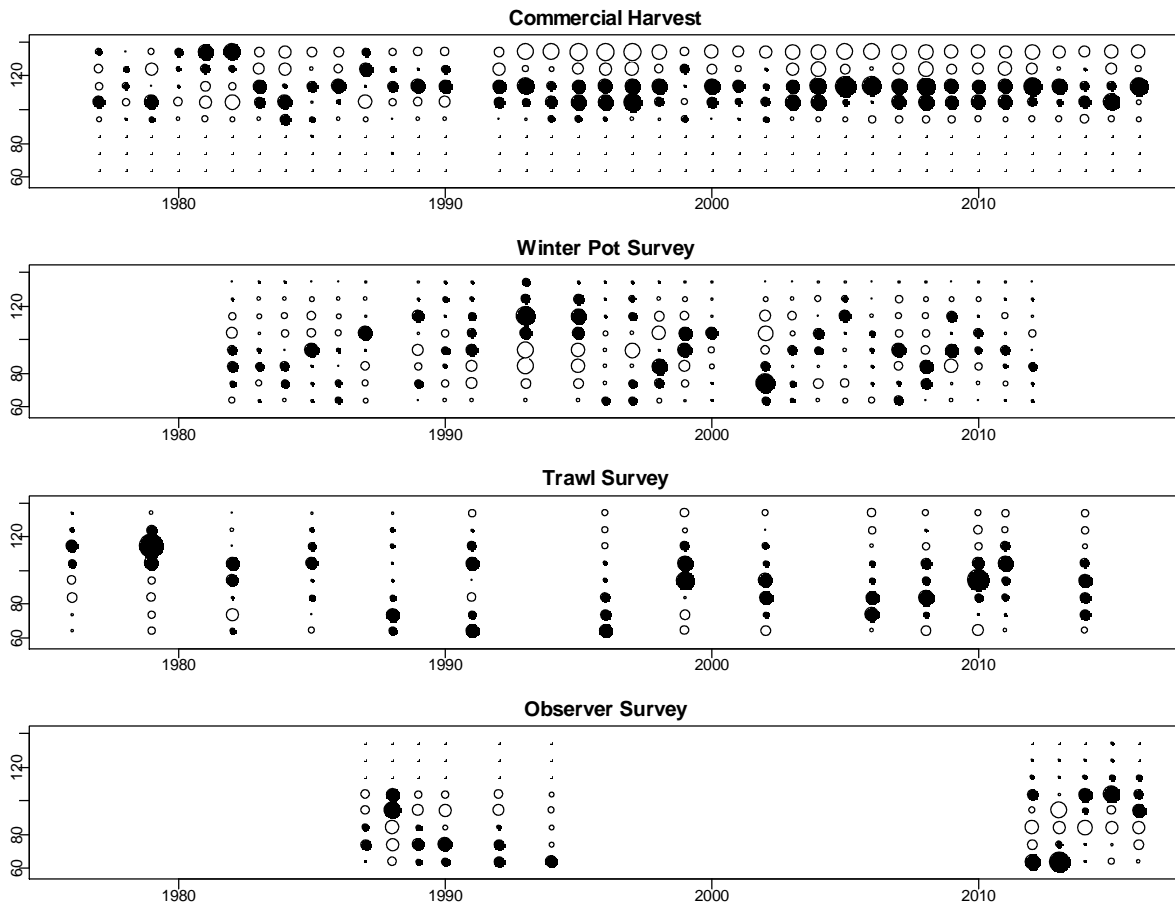


Figure C3-13. Bubble plots of predicted and observed length proportions. Black circle indicates model estimates lower than observed, white circle indicates model estimates higher than observed. Size of circle indicates degree of deviance (larger circle = larger deviance).

Table C3-1 . Summary of parameter estimates for a length-based stock synthesis population model of Norton Sound red king crab.

name	Estimate	std.dev
log_q1	-6.388	0.128
log_q2	-6.794	0.105
log_N76	8.496	0.051
R0	6.041	0.055
log_R76	-0.083	0.408
log_R77	-0.624	0.360
log_R78	-0.789	0.344
log_R79	0.059	0.307
log_R80	0.254	0.264
log_R81	0.180	0.248
log_R82	0.114	0.297
log_R83	0.352	0.245
log_R84	-0.149	0.276
log_R85	0.003	0.270
log_R86	-0.232	0.269
log_R87	-0.242	0.241
log_R88	-0.193	0.254
log_R89	-0.415	0.273
log_R90	-0.348	0.259
log_R91	-0.520	0.286
log_R92	-0.711	0.311
log_R93	-0.605	0.298
log_R94	-0.293	0.265
log_R95	0.029	0.229
log_R96	0.530	0.230
log_R97	0.005	0.298
log_R98	-0.589	0.324
log_R99	-0.135	0.320
log_R00	0.230	0.265
log_R01	0.301	0.236
log_R02	-0.084	0.320
log_R03	-0.297	0.337
log_R04	0.354	0.250
log_R05	0.568	0.224
log_R06	0.613	0.254

name	Estimate	std.dev
log_R07	0.716	0.234
log_R08	0.218	0.311
log_R09	-0.170	0.307
log_R10	0.300	0.253
log_R11	0.388	0.298
log_R12	1.226	0.238
log_R13	0.277	0.340
log_R14	-0.091	0.413
log_R15	-0.149	0.440
a1	0.964	3.424
a2	1.603	3.082
a3	3.208	2.761
a4	3.657	2.728
a5	3.892	2.716
a6	3.047	2.769
a7	1.152	3.314
r1	10.000	0.563
r2	9.651	0.596
mol.1	0.961	0.034
mol.2	0.952	0.024
mol.3	0.932	0.020
mol.4	0.892	0.018
mol.5	0.703	0.027
mol.6	0.610	0.035
mol.7	0.524	0.052
mol.8	0.533	0.114
log_φ <sub>st1</sub>	-14.935	251.610
log_φ <sub>w</sub>	-2.010	0.041
Sw <sub>7</sub>	0.070	0.034
Sw <sub>8</sub>	0.500	0.118
log_φ <sub>l</sub>	-2.068	0.053
w <sup>2</sup> <sub>t</sub>	0.074	0.022
q	1.000	0.000
ms		
σ	4.165	0.207

name	Estimate	std.dev
β <sub>1</sub>	13.533	0.708
β <sub>2</sub>	7.246	0.169