Science, Service, Stewardship

SEDAR 31 Red Snapper Review Workshop

Diagnostics and Sensitivity on Base Model Configuration

May 3, 2013

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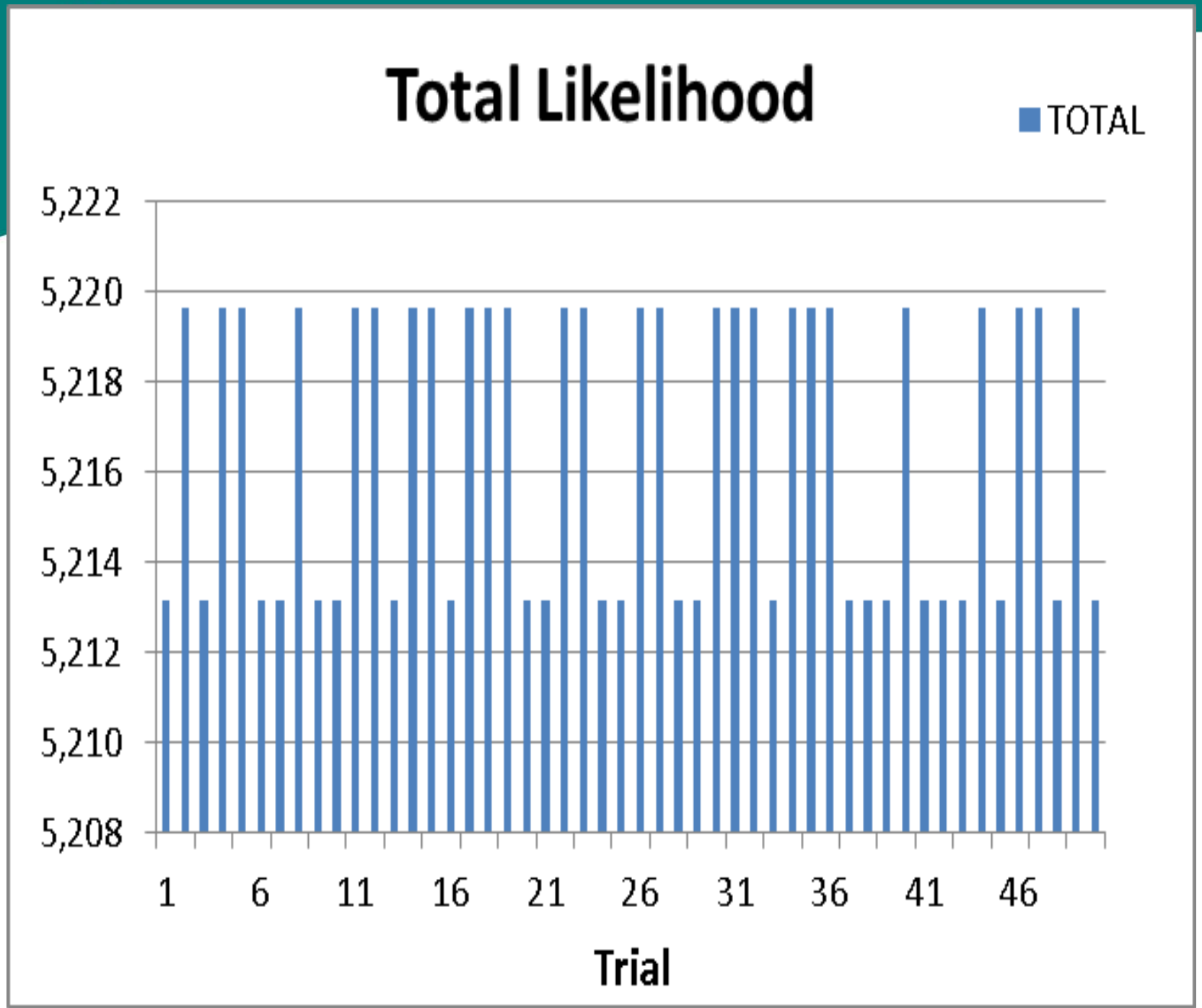
Material to be covered

Model Diagnostic work

- Model Convergence (Jitter)
- Key Parameter Profiling (steepness, R0)

Model sensitivity Work

- Natural Mortality levels (Base, High, Low)


Total Likelihood
TOTAL
5,222
5,220
5,218
5,216
5,214
5,212
5,210
5,208
1
6
11
16
21
26
31
36
41
46
Trial

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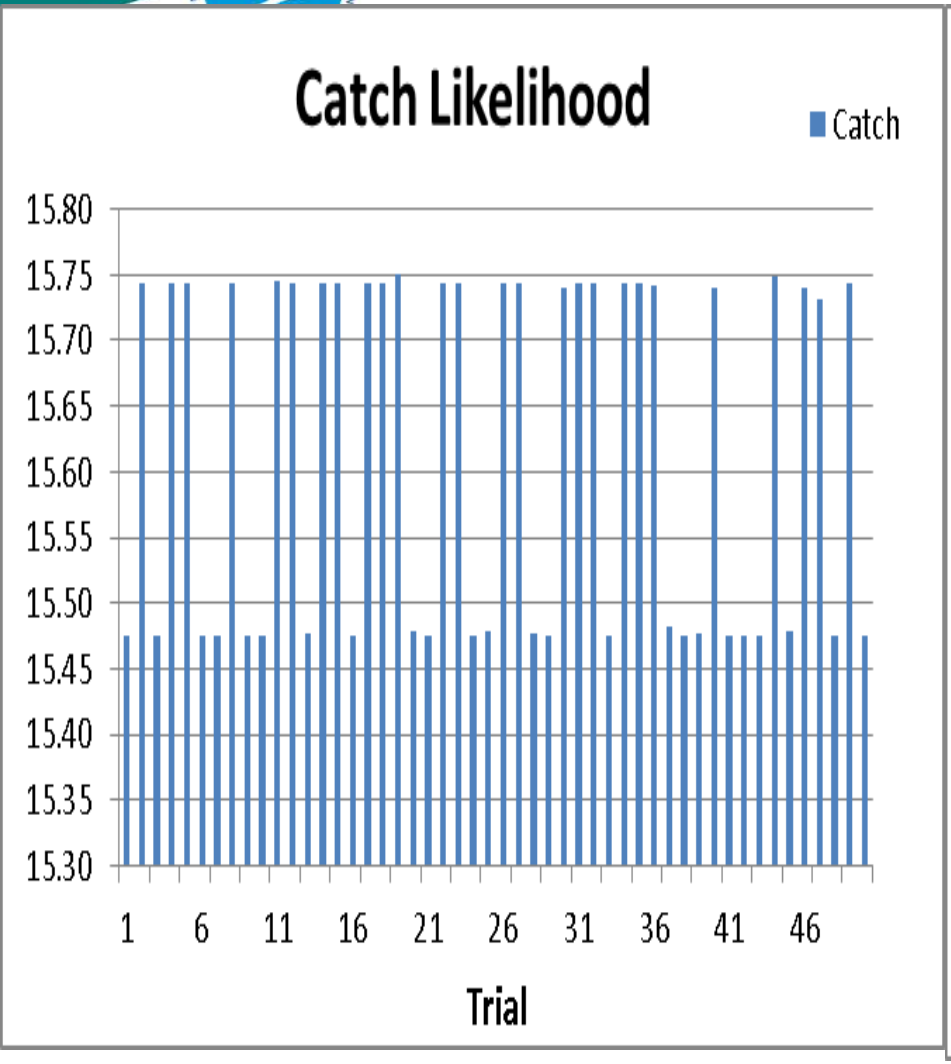
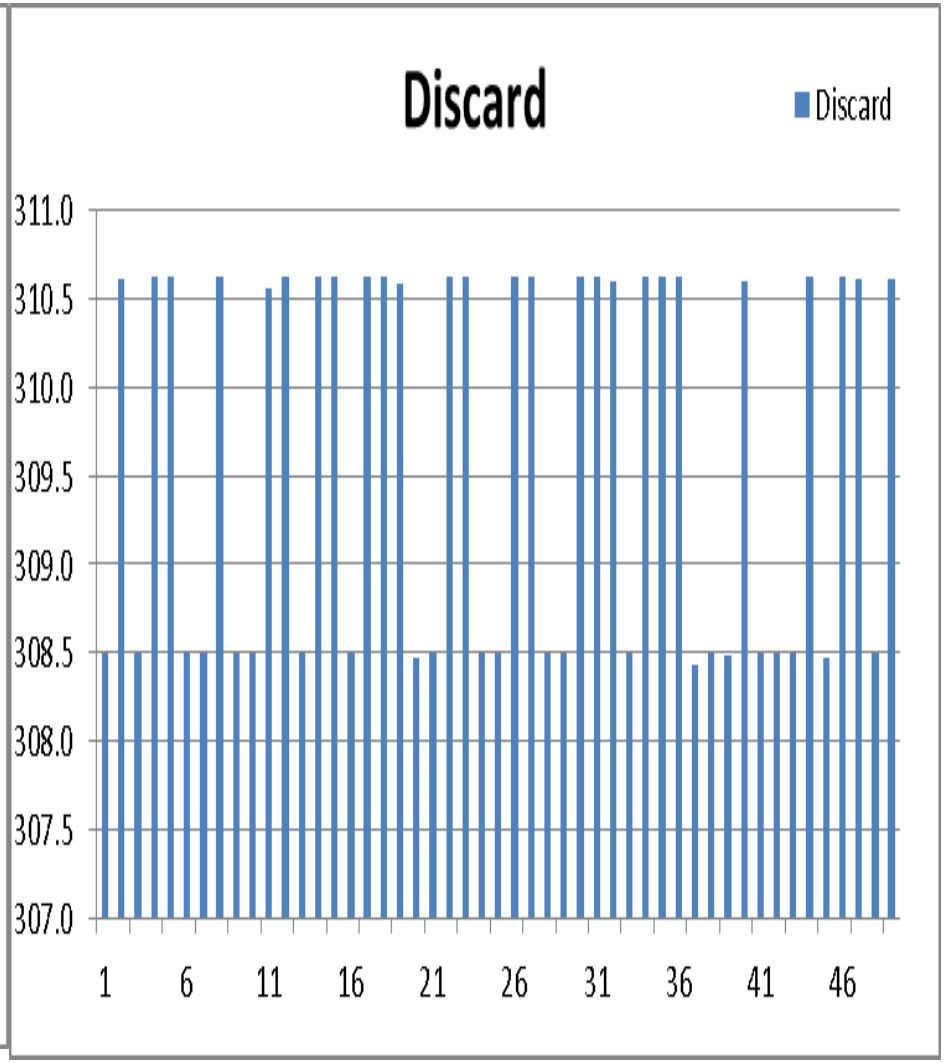
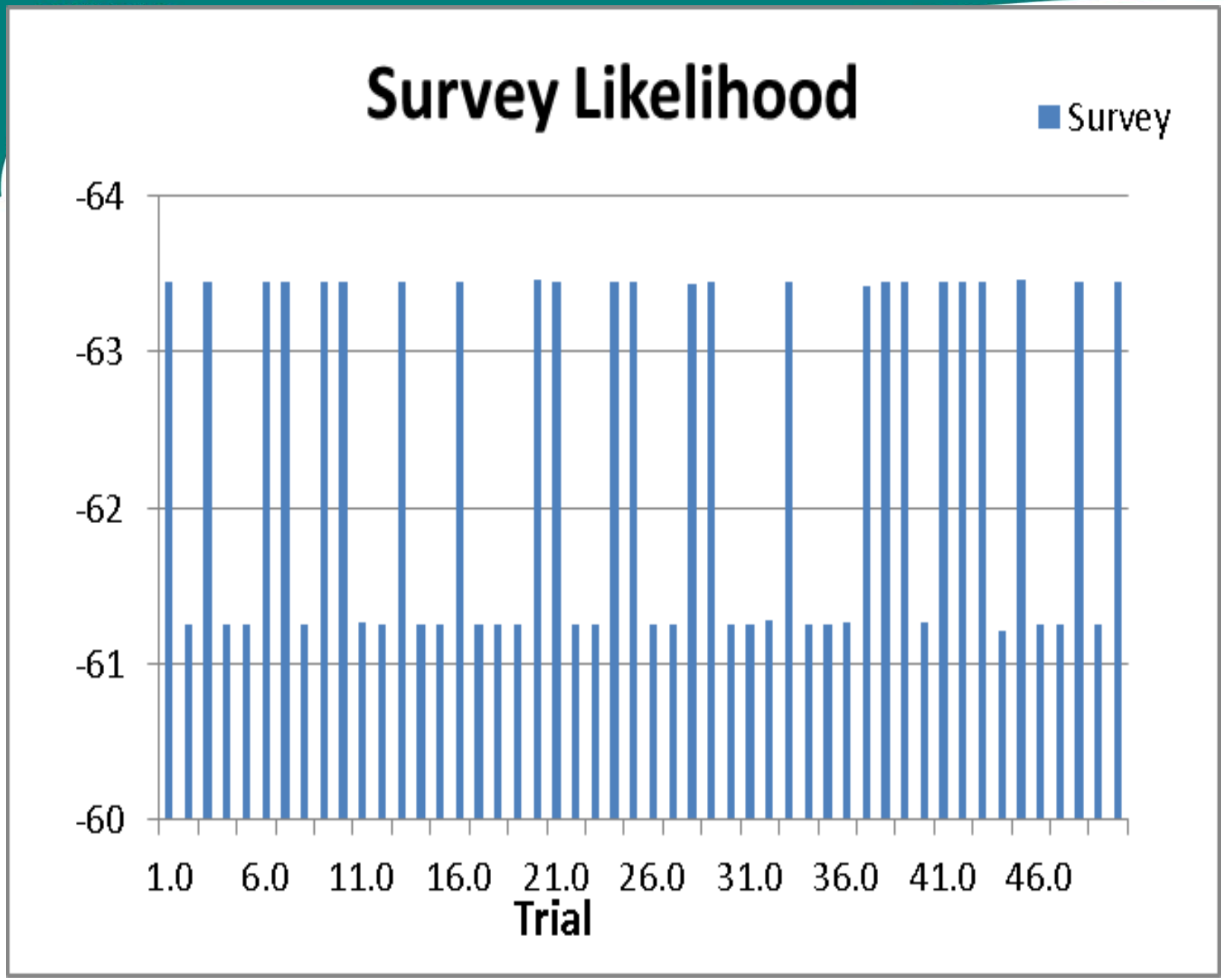
Catch and Discard Likelihoods






Survey Likelihood
Survey
-64
-63
-62
-61
-60
1.0
6.0
11.0
16.0
21.0
26.0
31.0
36.0
41.0
46.0
Trial

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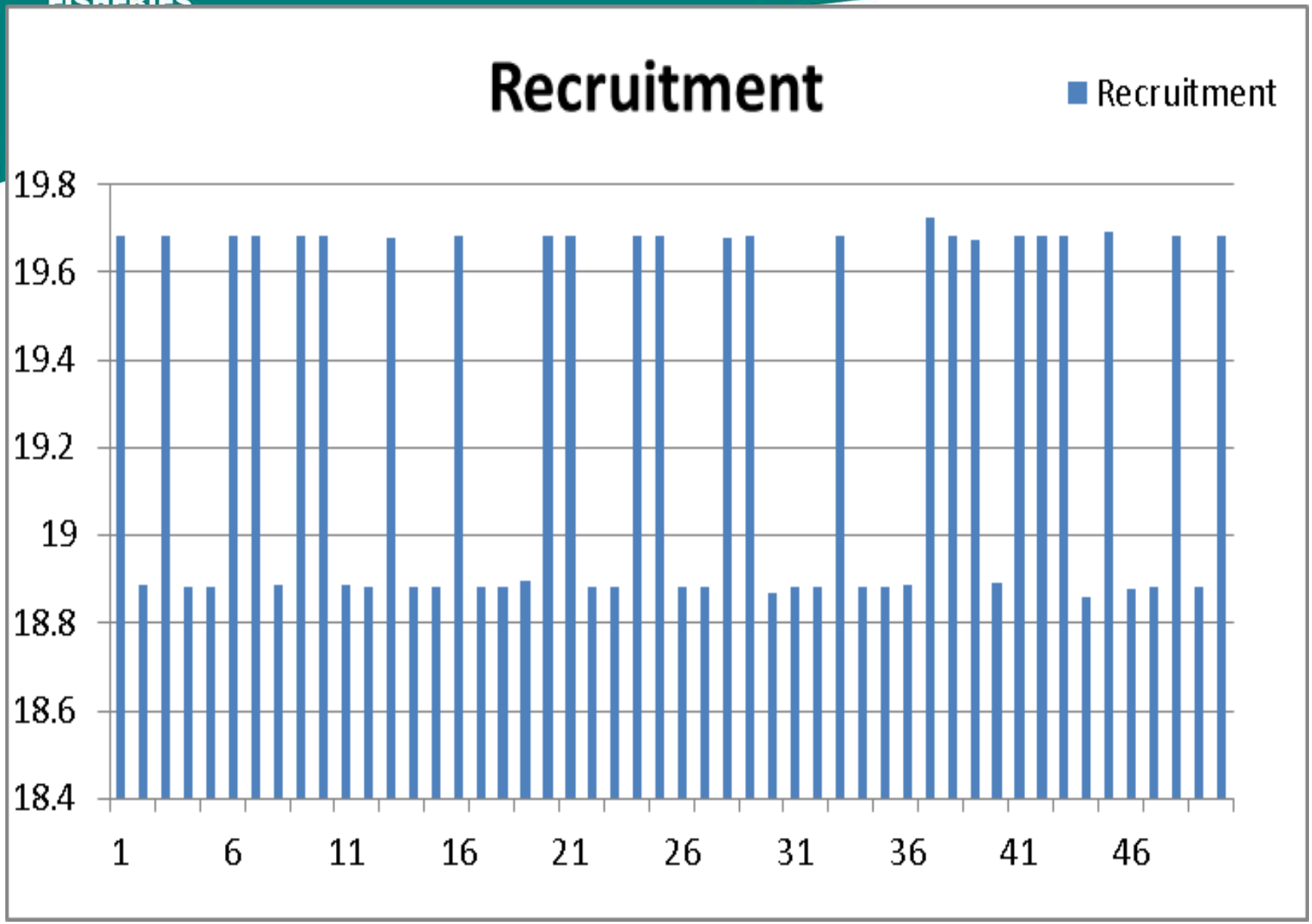

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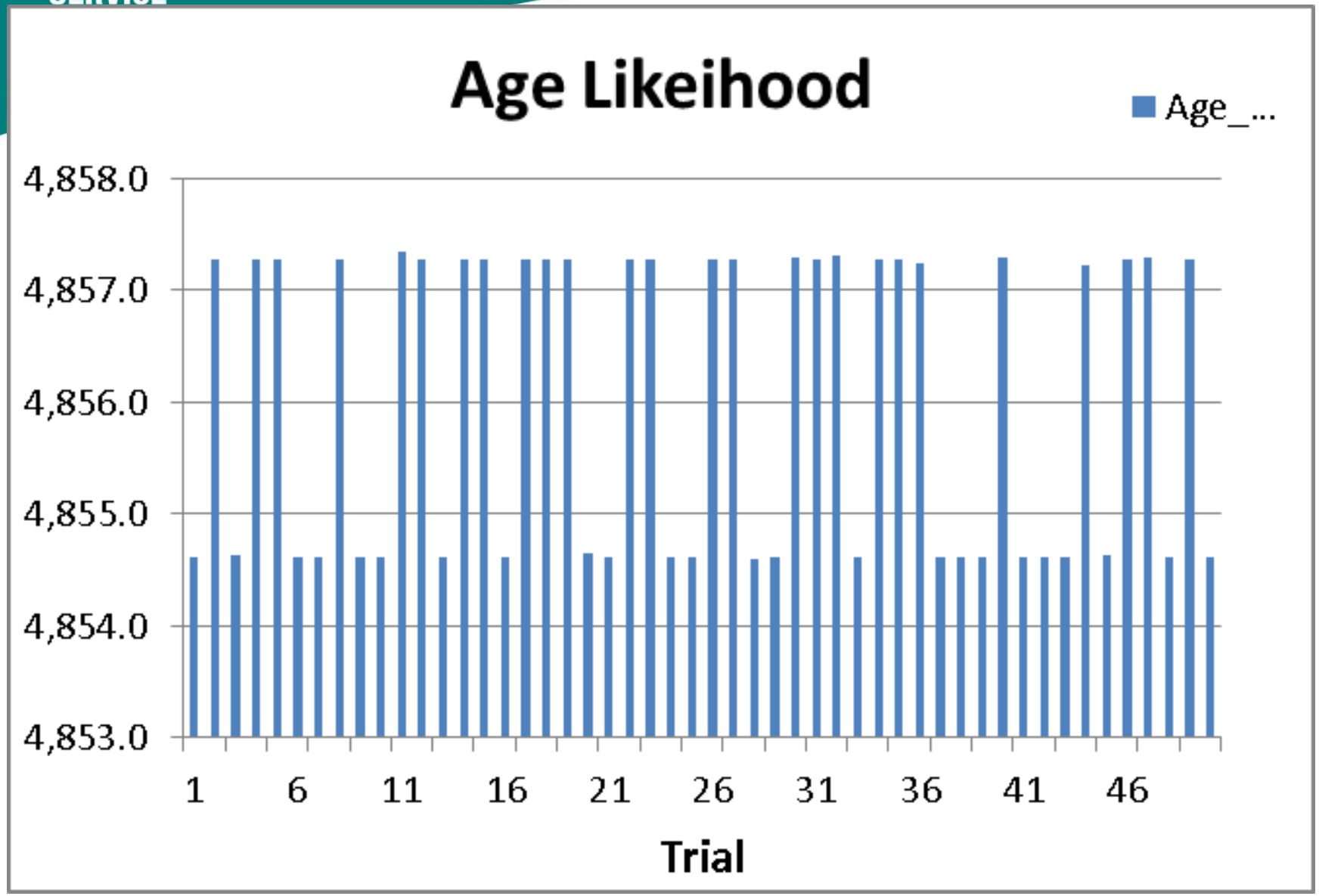

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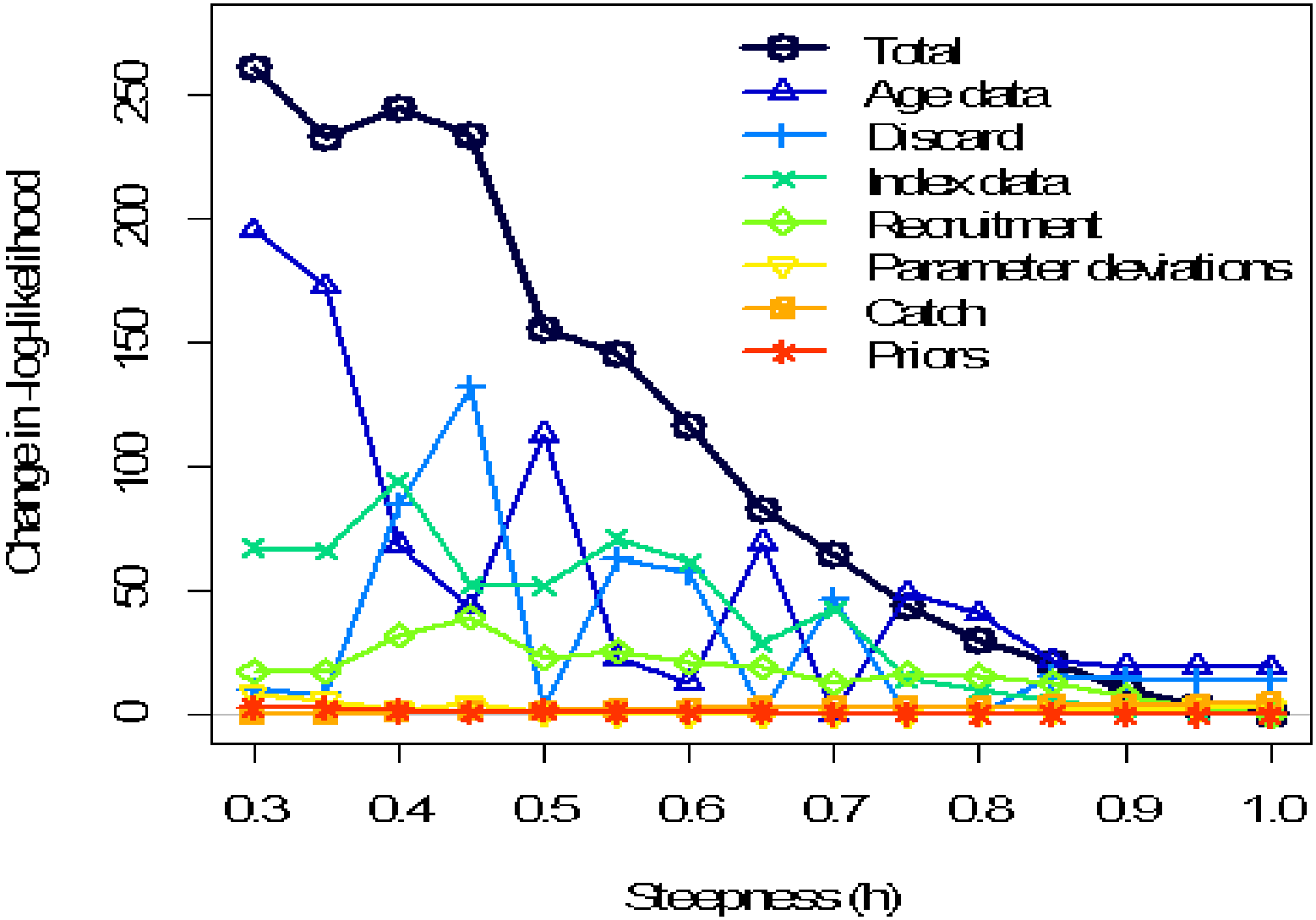
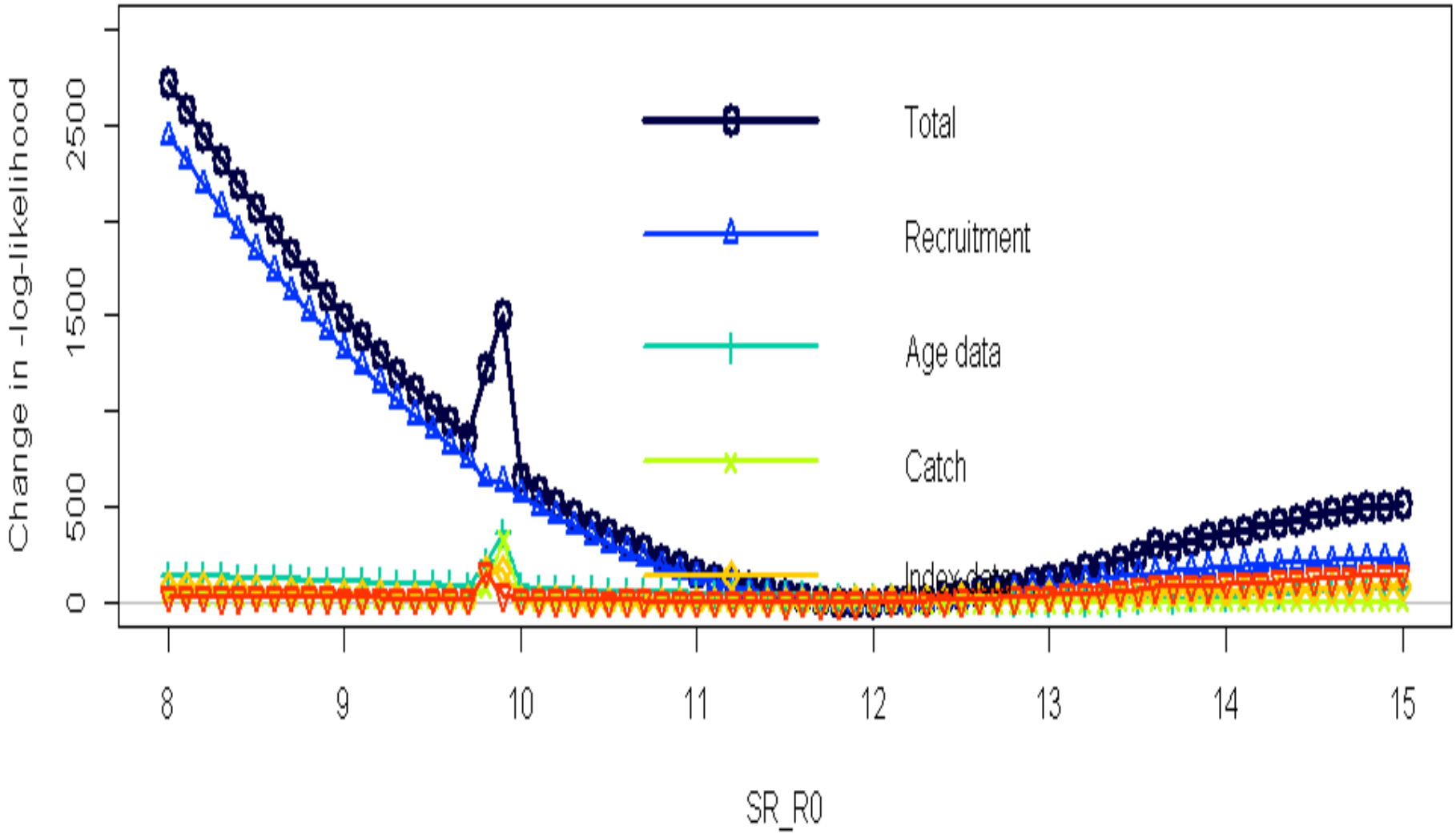
SS Model Parameter Profiling

Profiles developed for two key SS model parameters for the Stock-recruitment relationship

- Steepness (h)
- R_0-unexploited equilibrium recruitment (early Period)


Total
Age data
Discard
Index data
Recruitment
Parameter deviations
Catch
Priors
Change in -log-likelihood
0
50
100
150
200
250
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Steepness (h)


Change in -log-likelihood
0
500
1500
2500
8
9
10
11
12
13
14
15
SR_R0
Total
Recruitment
Age data
Catch
Index data

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Sensitivities: Data Inputs

Primary:

- M High
- M Low
- Estimate Steepness: bounded High, no Hessian

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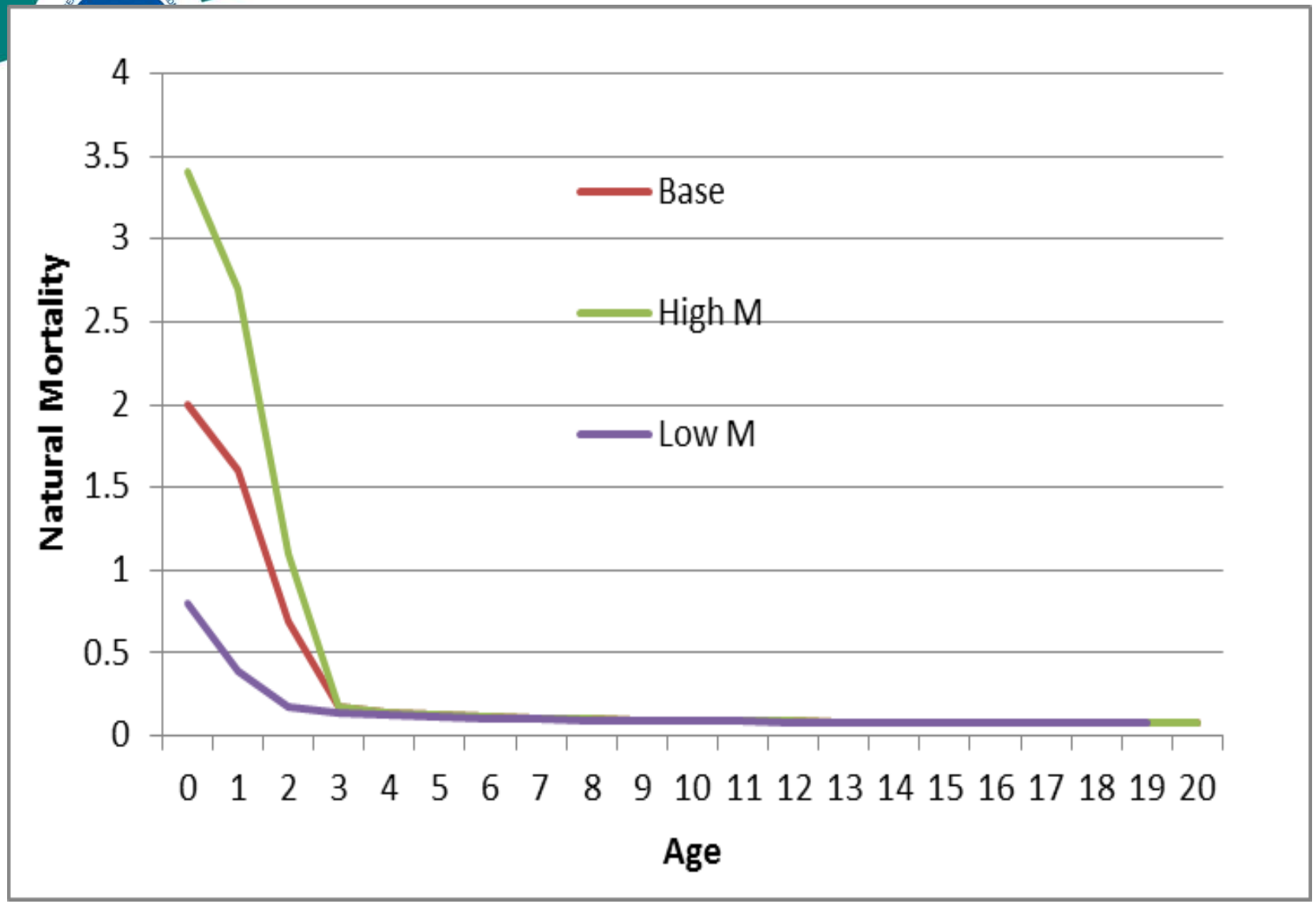
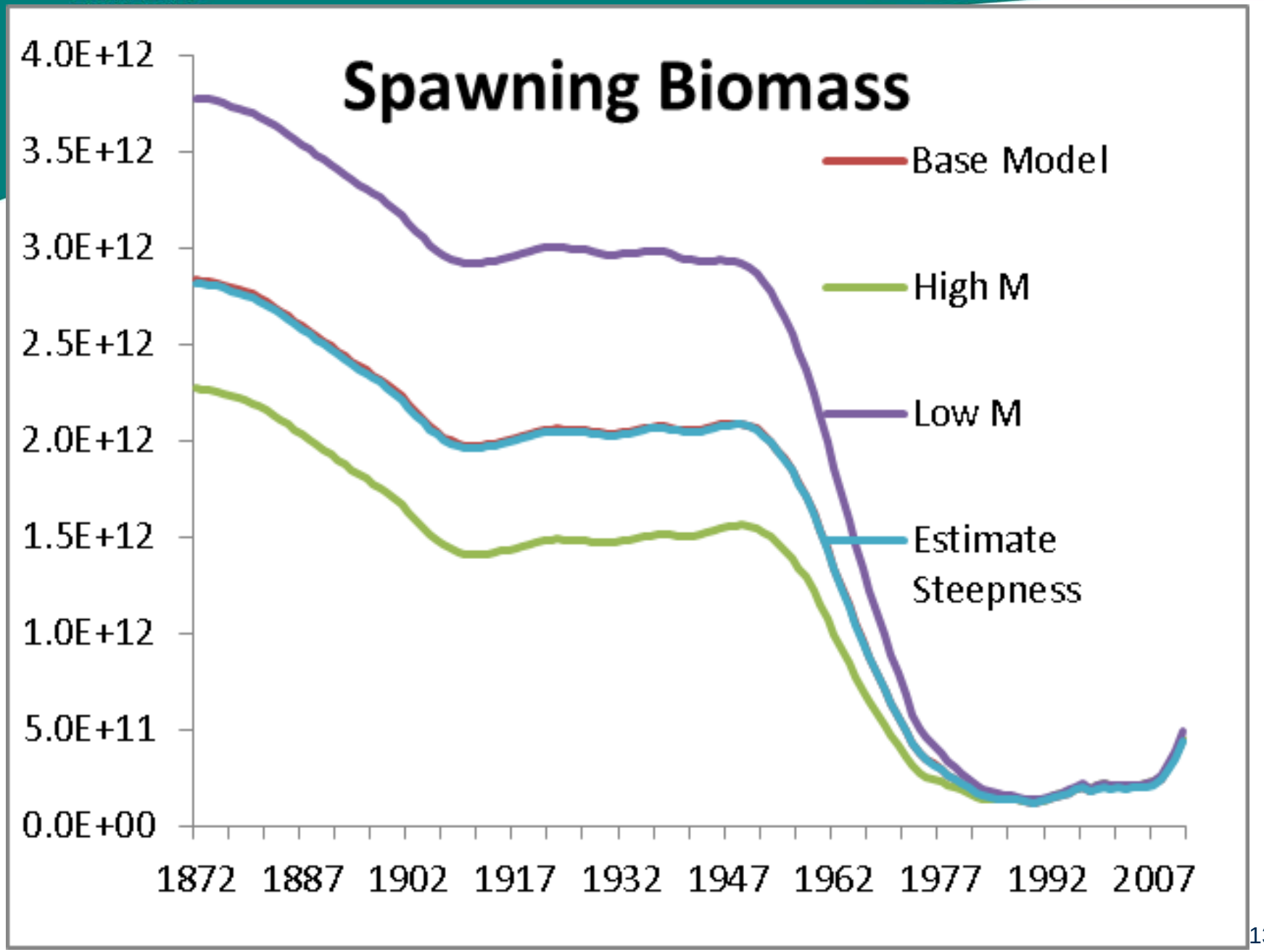
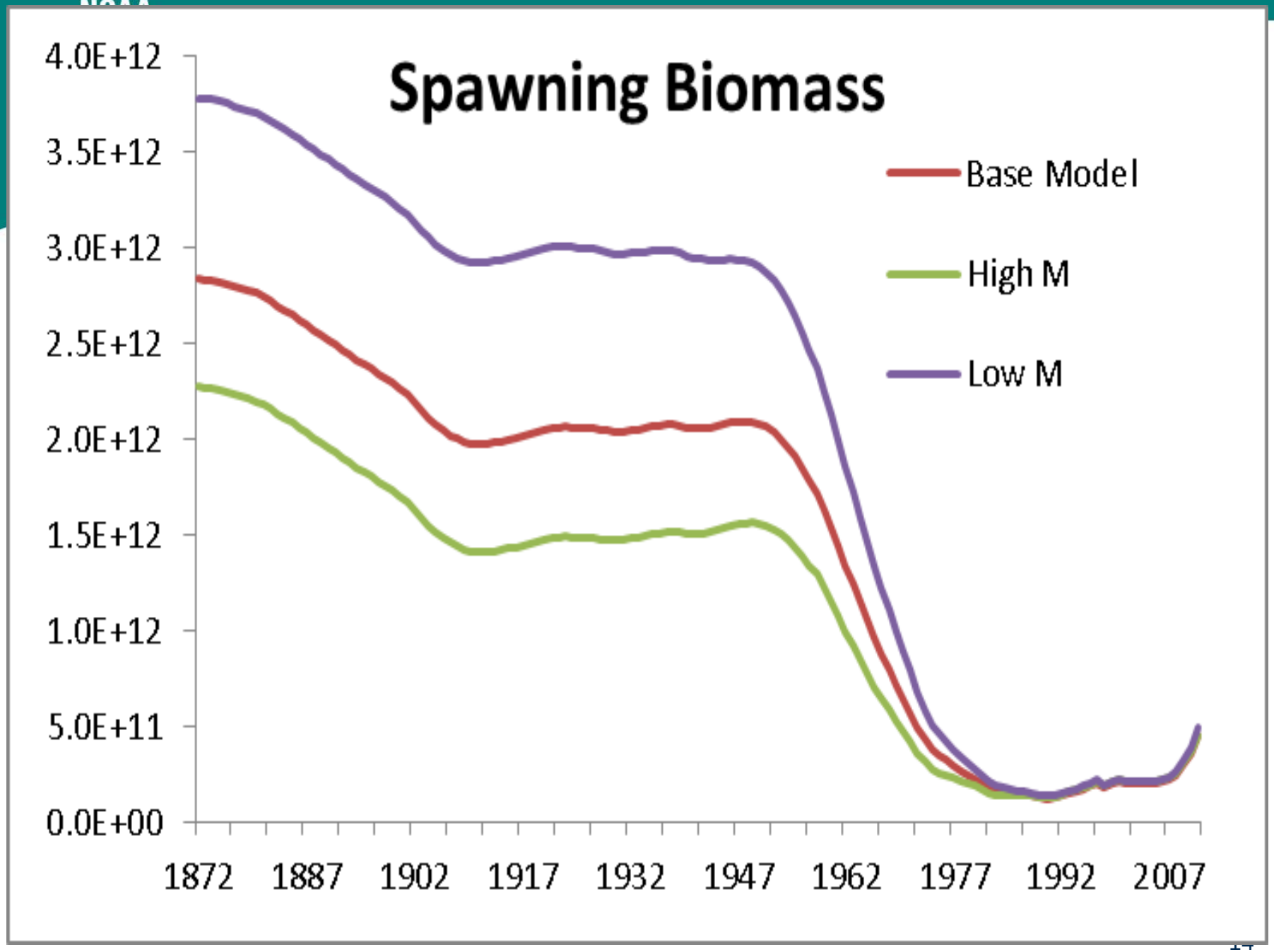
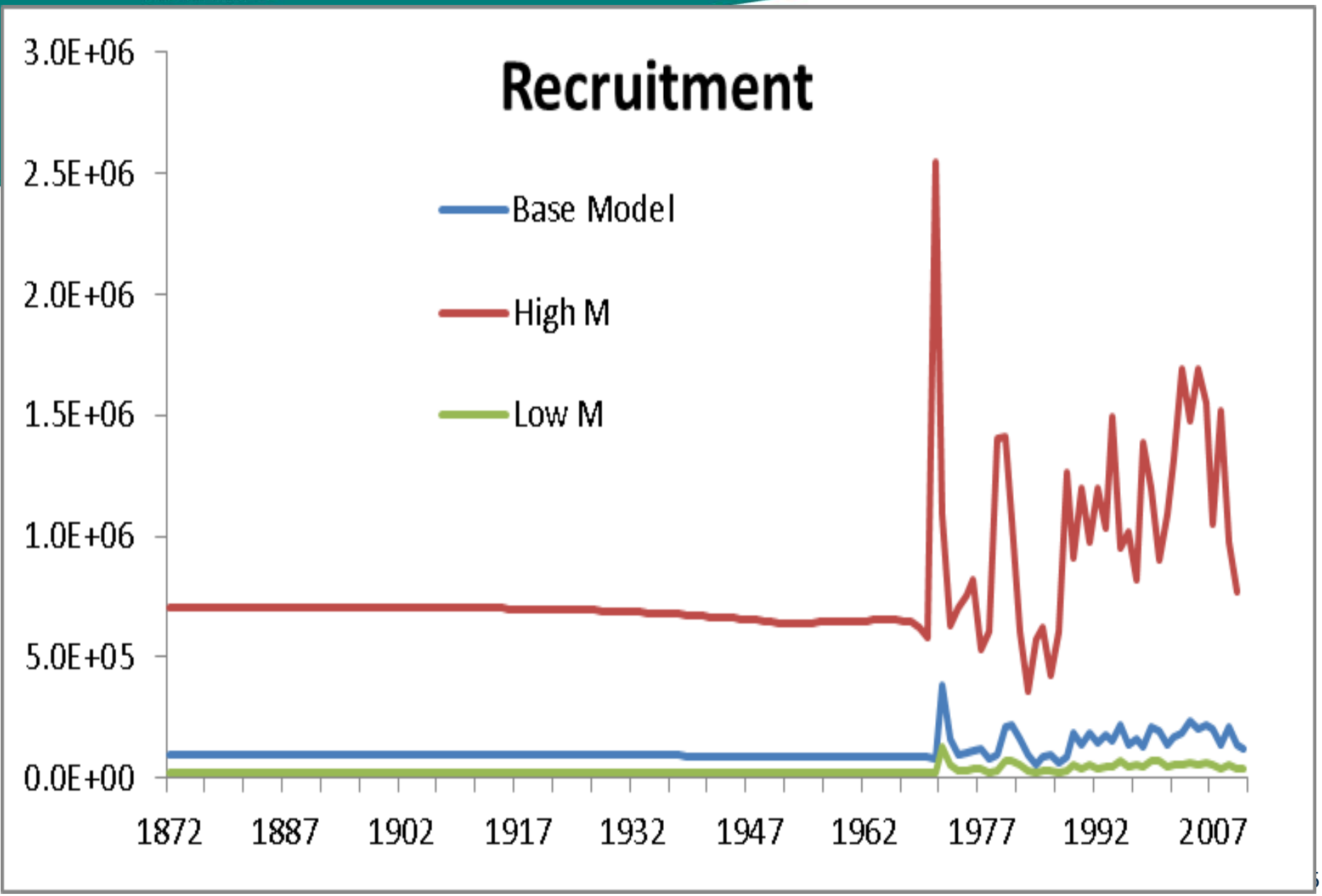
Natural Mortality




Spawning Biomass
4.0E+12
3.5E+12
3.0E+12
2.5E+12
2.0E+12
1.5E+12
1.0E+12
5.0E+11
0.0E+00
1872
1887
1902
1917
1932
1947
1962
1977
1992
2007
Base Model
High M
Low M
Estimate Steepness


Spawning Biomass
4.0E+12
3.5E+12
3.0E+12
2.5E+12
2.0E+12
1.5E+12
1.0E+12
5.0E+11
0.0E+00
1872
1887
1902
1917
1932
1947
1962
1977
1992
2007
Base Model
High M
Low M


Recruitment
Base Model
High M
Low M
3.0E+06
2.5E+06
2.0E+06
1.5E+06
1.0E+06
5.0E+05
0.0E+00
1872
1887
1902
1917
1932
1947
1962
1977
1992
2007

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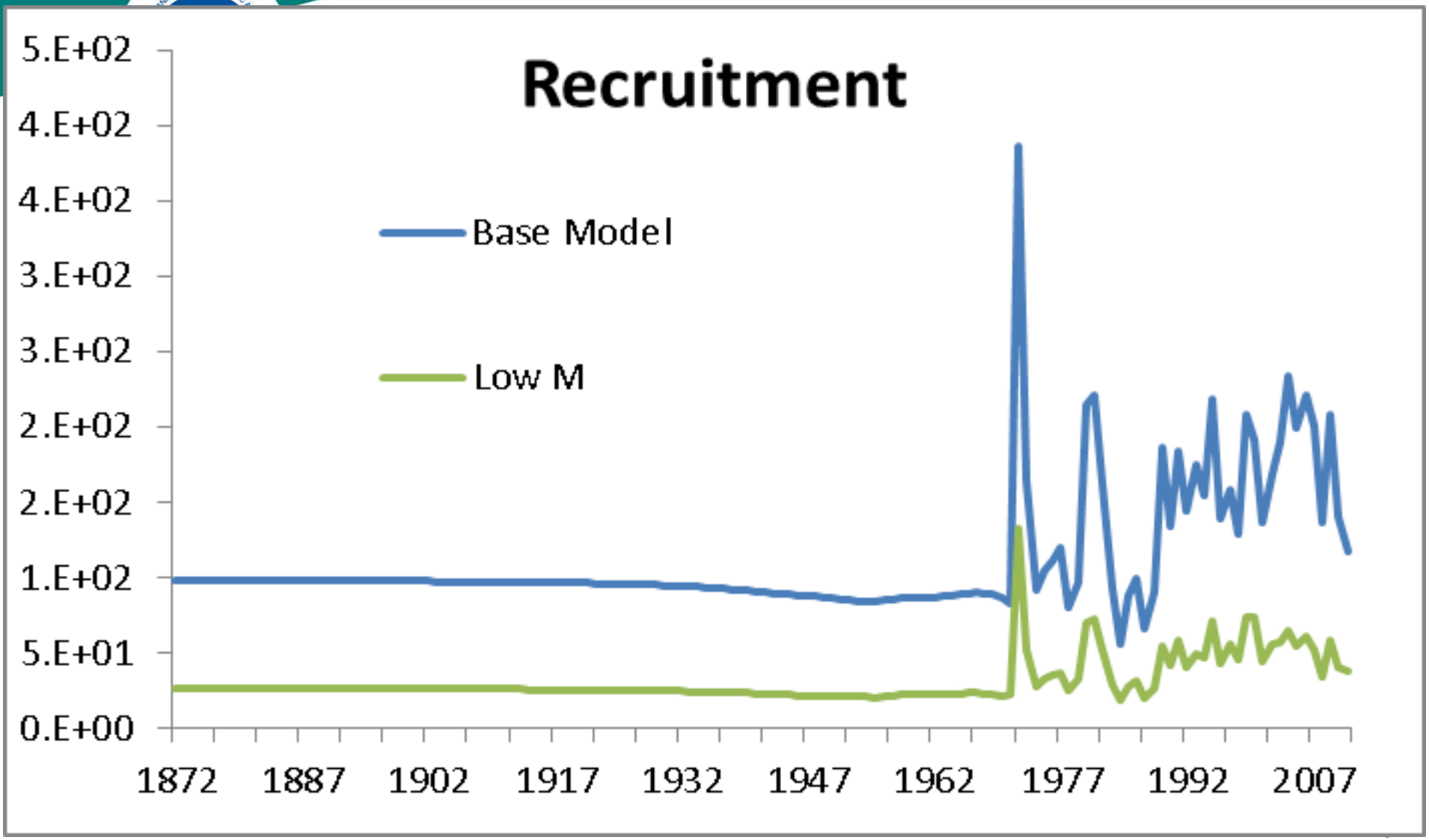
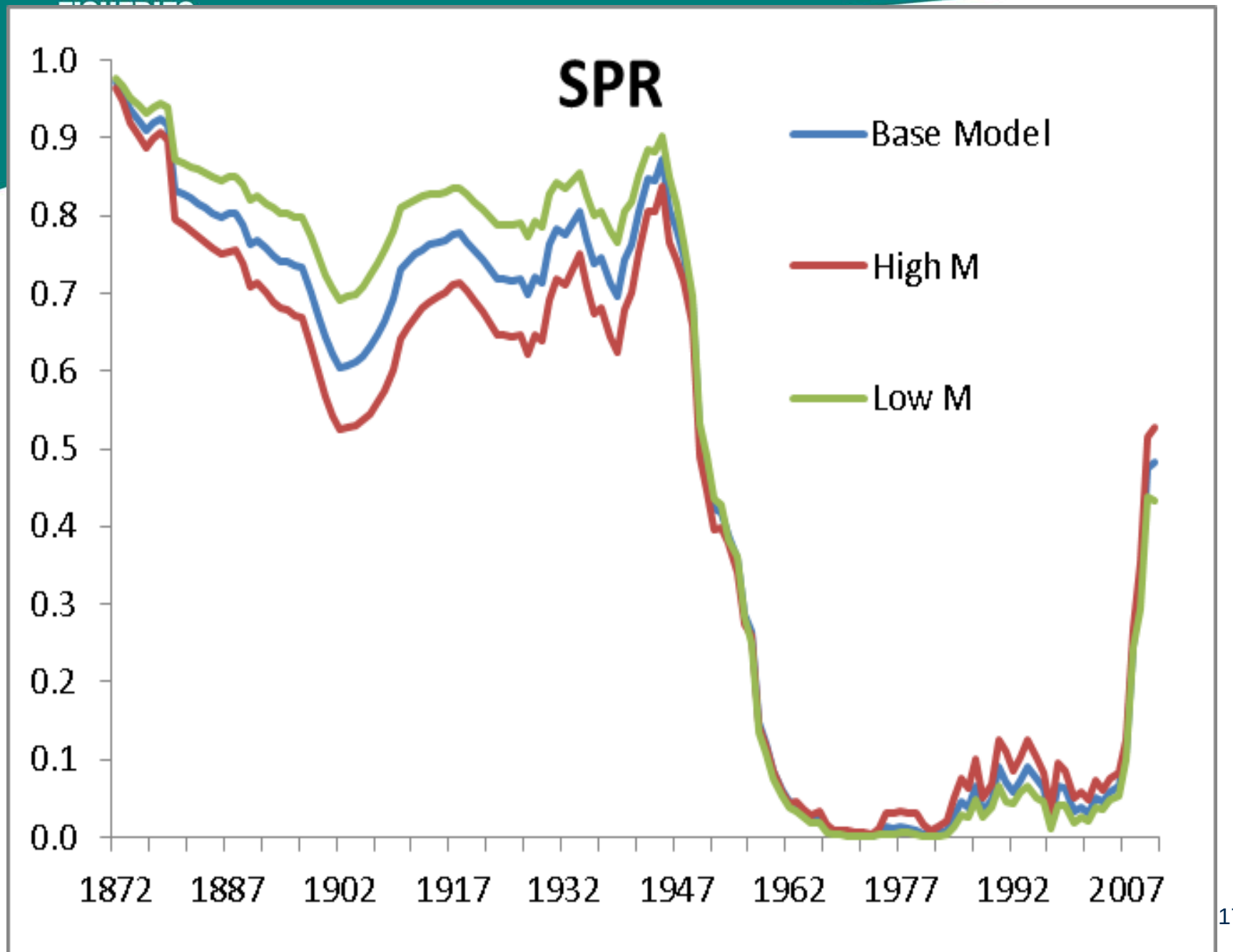
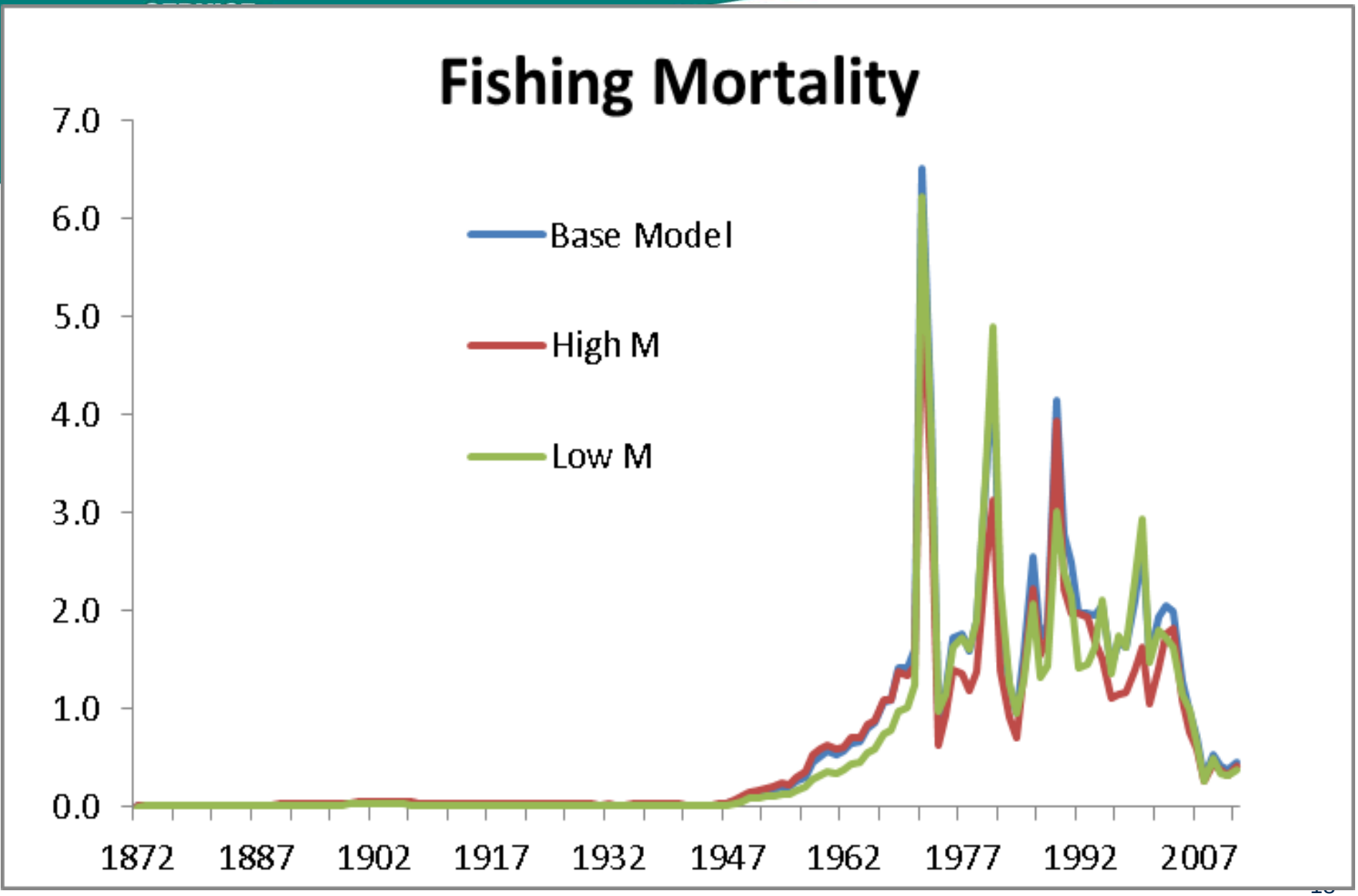



SPR
Base Model
High M
Low M
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1872
1887
1902
1917
1932
1947
1962
1977
1992
2007


Fishing Mortality
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Base Model
High M
Low M
1872
1887
1902
1917
1932
1947
1962
1977
1992
2007

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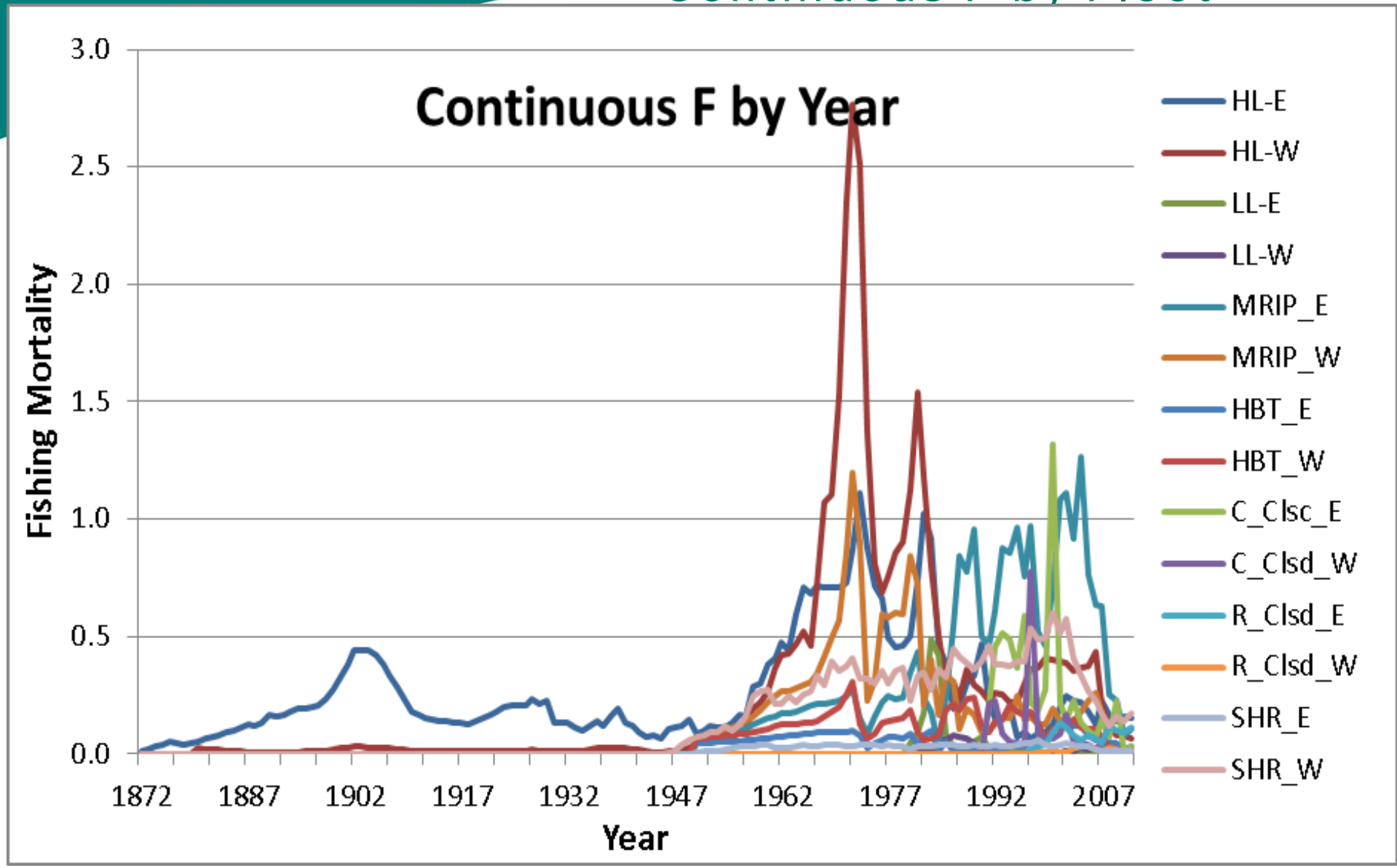
Continuous F by Fleet



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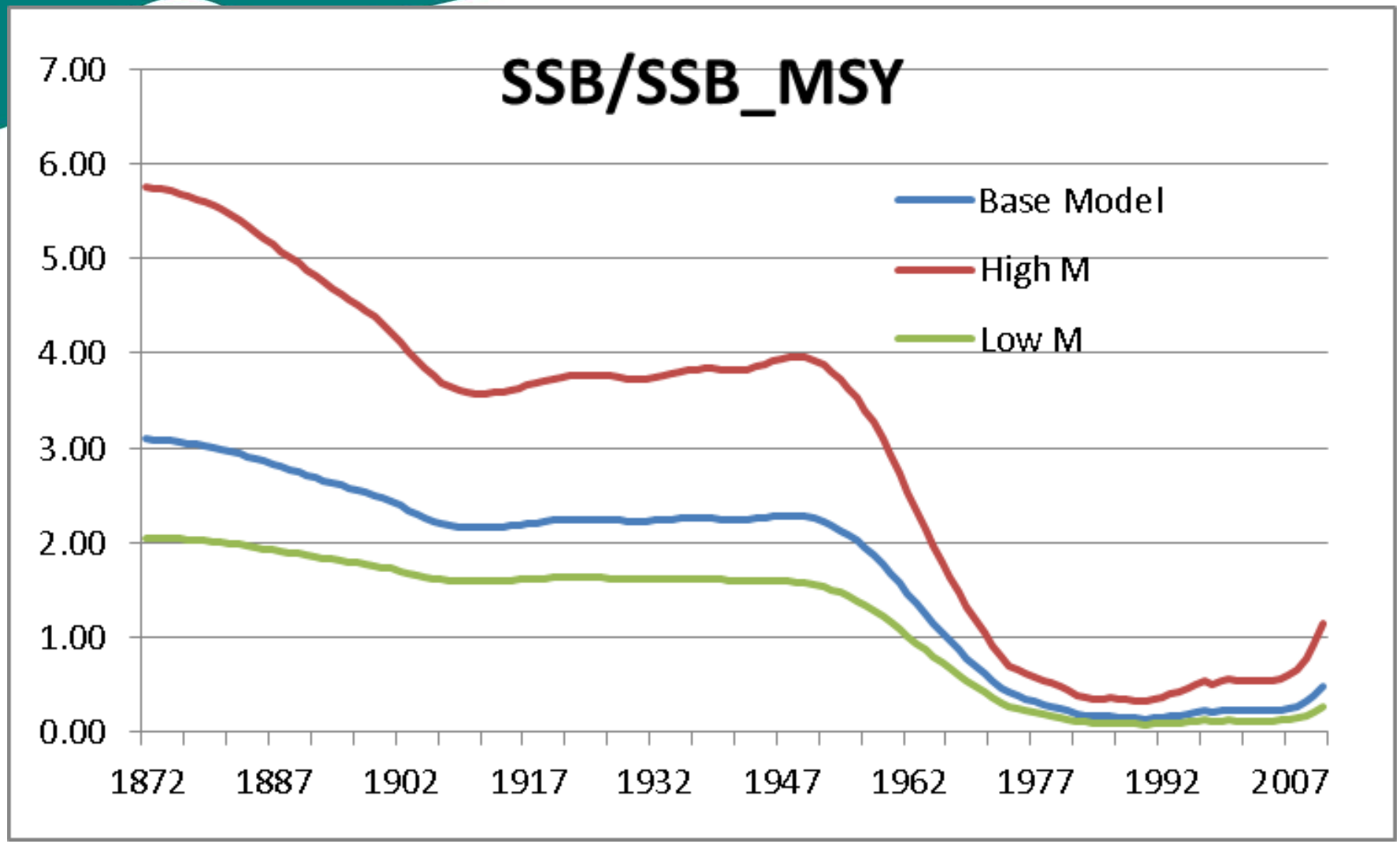
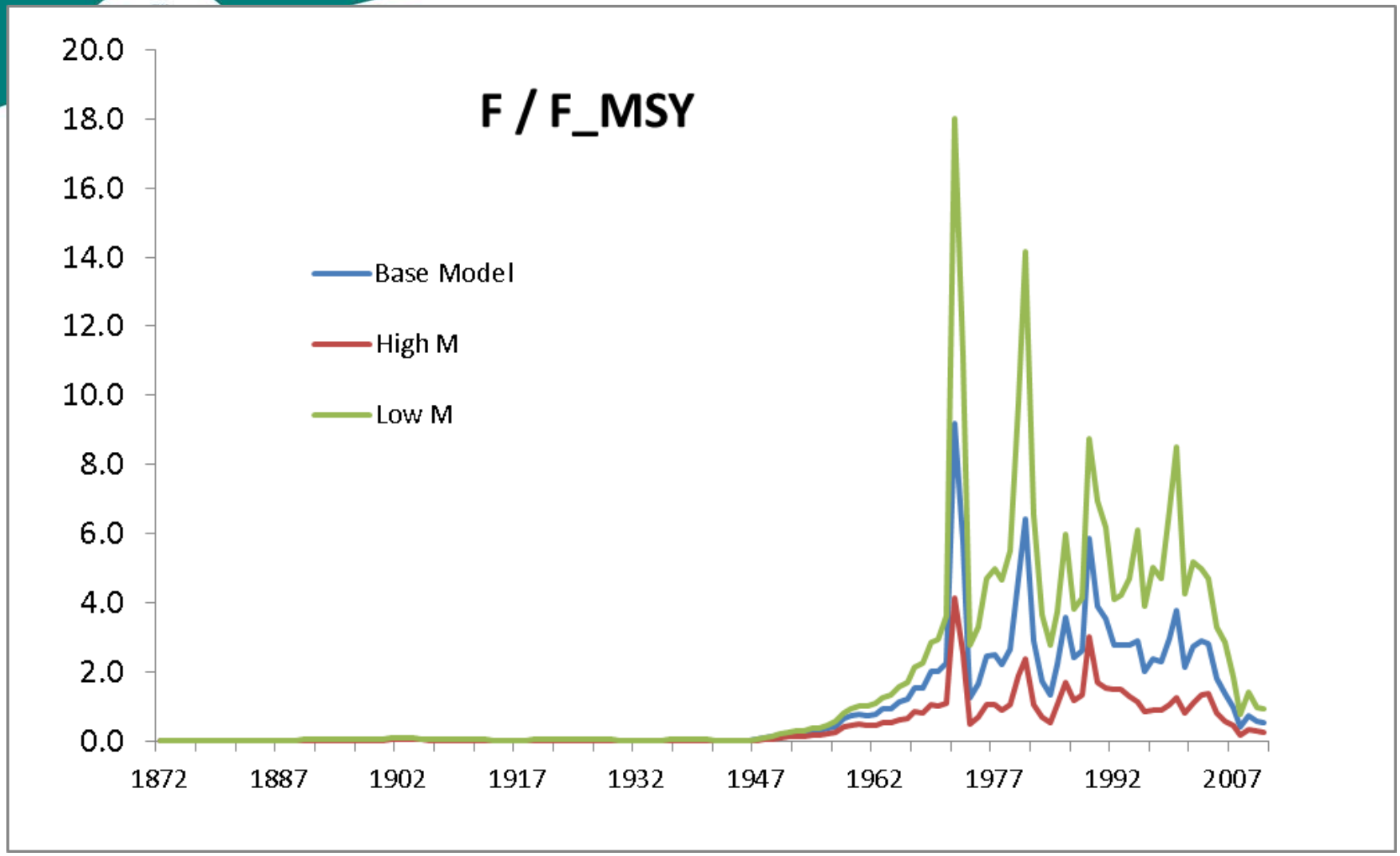
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