Gmacs update
&
Saint Matthew Island Blue King Crab Assessment
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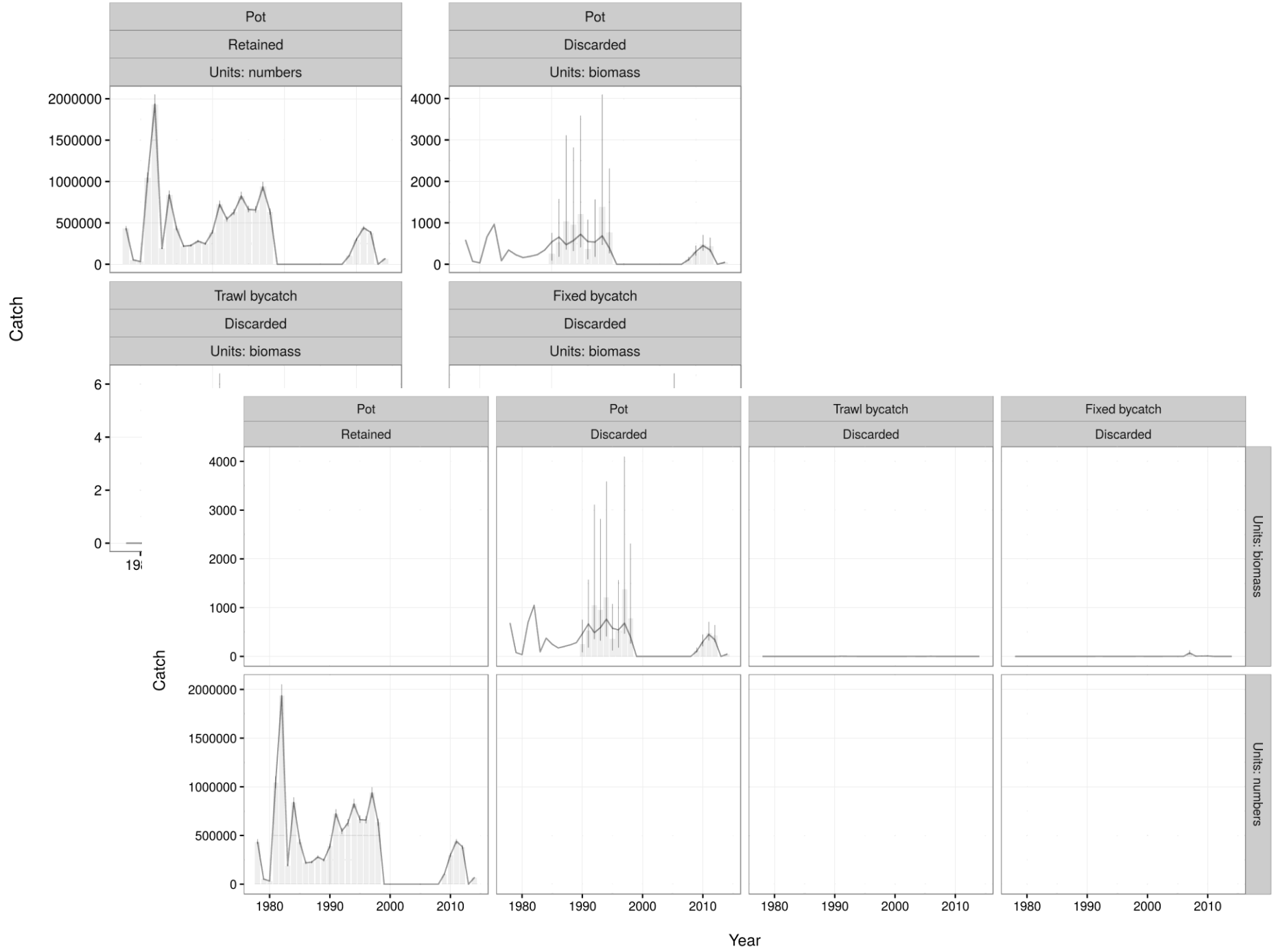
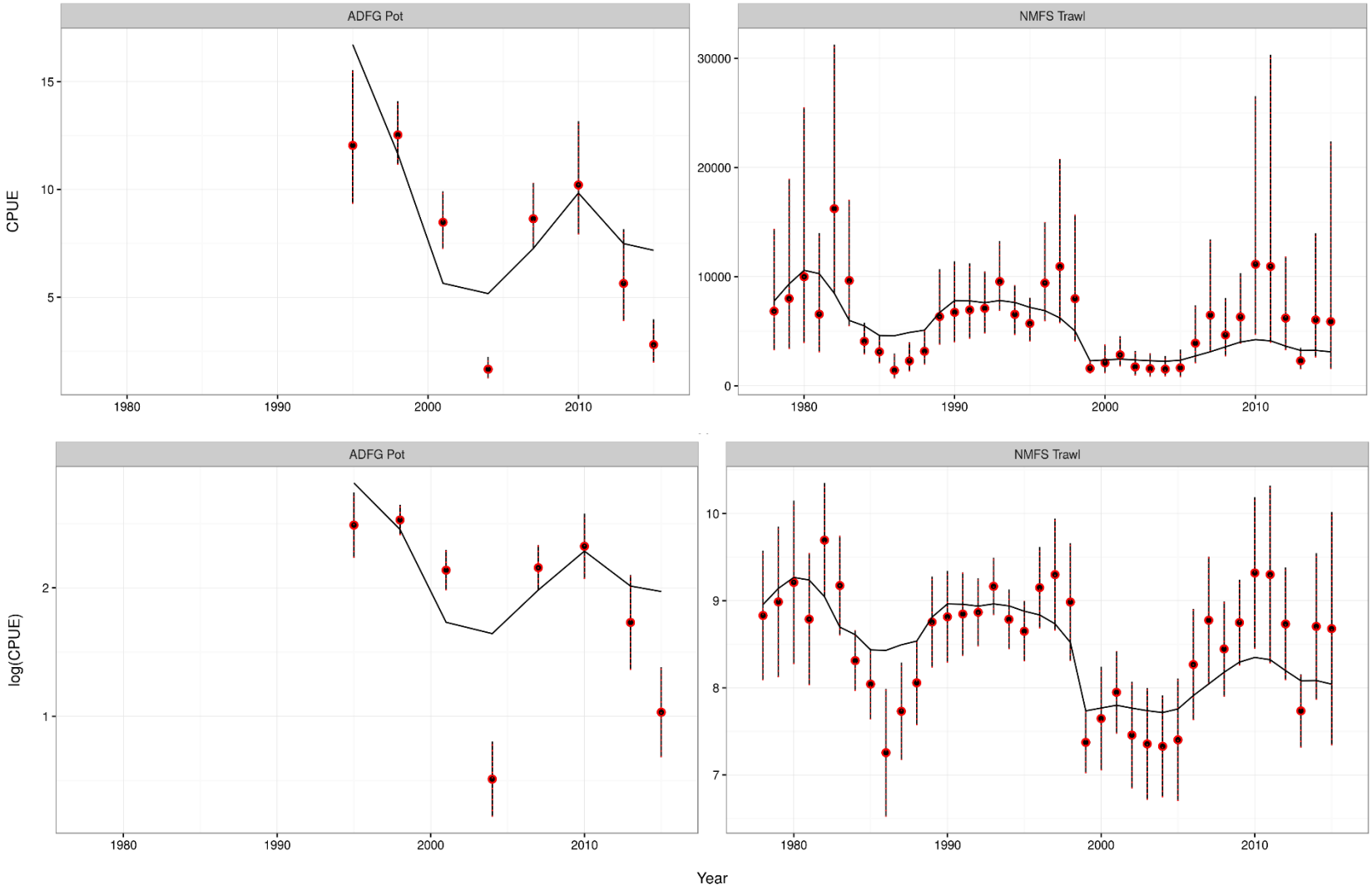
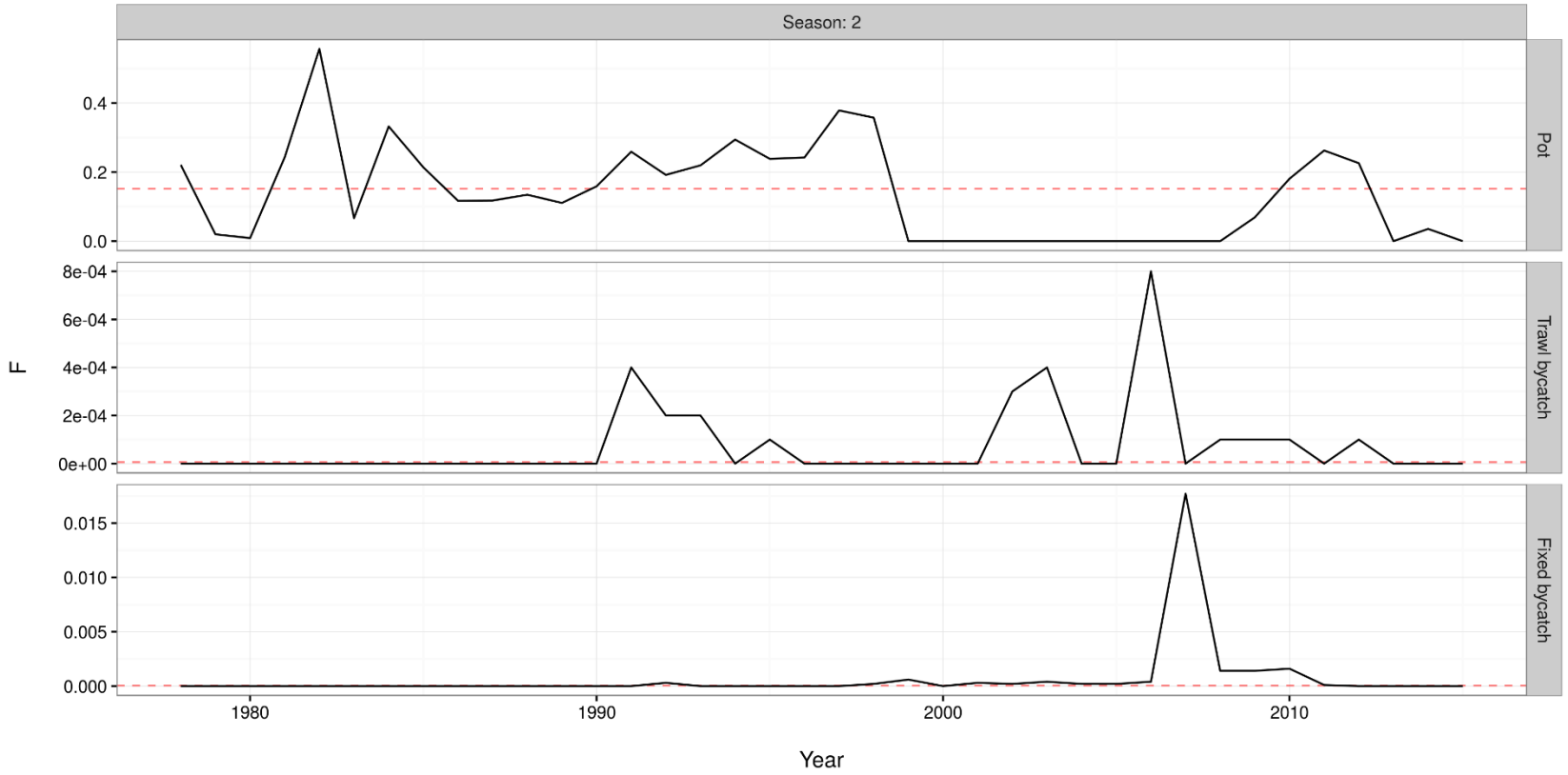
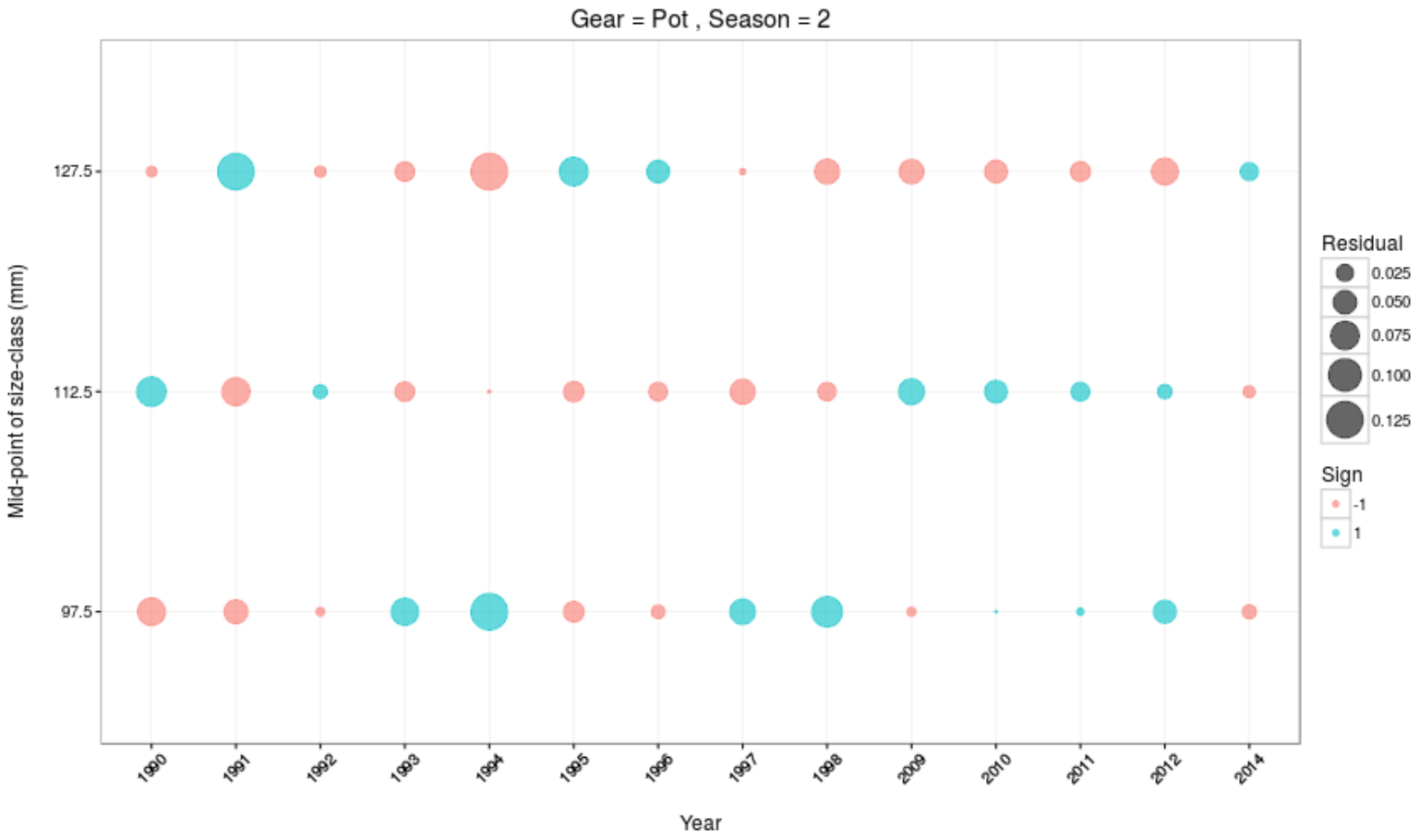
Gmacs progress

- Added seasons to Gmacs dynamics
  - Retained continuous *M*/*F* (within each season)
  - Number of seasons
  - Proportion of *M* each season
  - Season molting and growth occur
  - Season recruitment occurs
  - Season SSB is to be calculated
  - All data sets have a time stamp (season/year)
- Added option to initialize numbers as free parameters
- New plotting functions in gmr
- Draft SMBKC document


Pot
Retained
Units: numbers
Pot
Discarded
Units: biomass
Trawl bycatch
Discarded
Units: biomass
Fixed bycatch
Discarded
Units: biomass
Pot
Retained
Pot
Discarded
Trawl bycatch
Discarded
Fixed bycatch
Discarded
Units: biomass
Units: numbers
Catch
Year
1980
1990
2000
2010


ADFG Pot
NMFS Trawl
CPUE
log(CPUE)
Year
15
10
5
30000
20000
10000
0
2
1
9
8
7
1980
1990
2000
2010


Season: 2
Pot
Trawl bycatch
Fixed bycatch
F
Year
0.0
0.2
0.4
0e+00
2e-04
4e-04
6e-04
8e-04
0.000
0.005
0.010
0.015
1980
1990
2000
2010


Gear = Pot , Season = 2
Mid-point of size-class (mm)
127.5
112.5
97.5
1990
1991
1992
1993
1994
1995
1996
1997
1998
2009
2010
2011
2012
2014
Year
Residual
0.025
0.050
0.075
0.100
0.125
Sign
-1
1

Gmacs in progress

- Equilibrium numbers at length
  - Broke when seasonal changes added, can't use the elegant solutions anymore
  - Not required for SMBKC as we estimate initial numbers as free parameters
  - The new function is complete but yet to be put in the right places
- SPR calculations
  - As above/requires equilibrium numbers
  - Probably only a day or two of work but I fell asleep yesterday
- BBRKC model
  - Runs but as above/requires equilibrium numbers

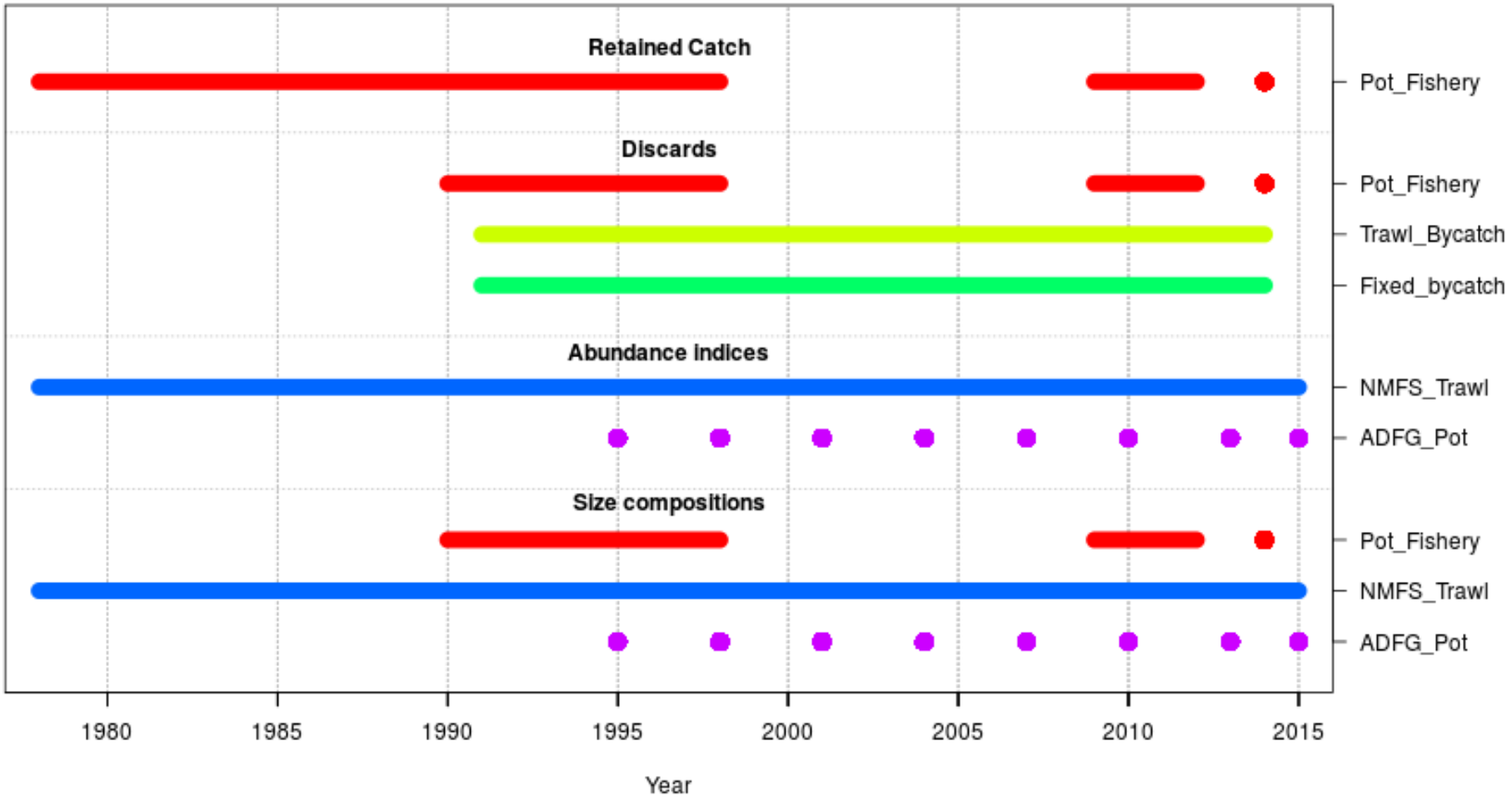
SMBKC in Gmacs

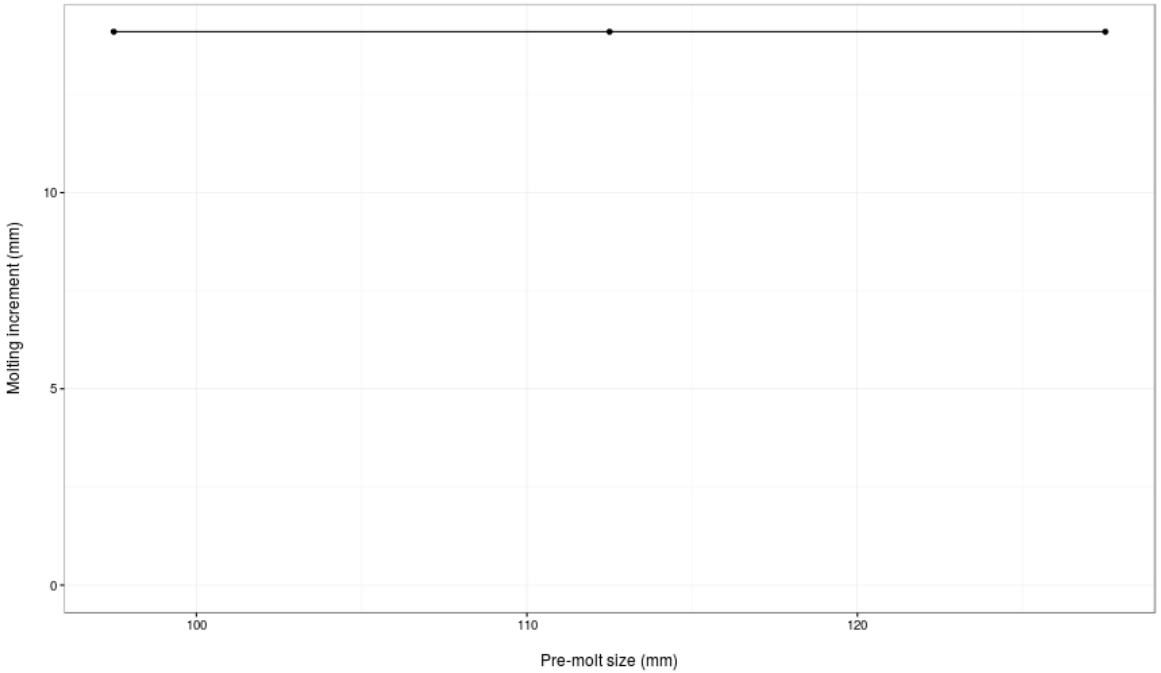
- 1978-2015
- 4 seasons (M = 0, 0.44, 0.185, 0.375)
- 3 stages (90-104, 105-119, 120+)
- 1 sex, 1 shell type, 1 maturity class
- 3 fleets (pot, trawl bycatch, fixed bycatch)
- 2 surveys (NMFS trawl and ADF&G pot CPUE) both in season 1
- 4 catch types (directed pot, pot discards, trawl bycatch, fixed bycatch) all during season 2
- 3 size compositions (pot in season 2, NMFS trawl in season 1, ADF&G pot in season 1)

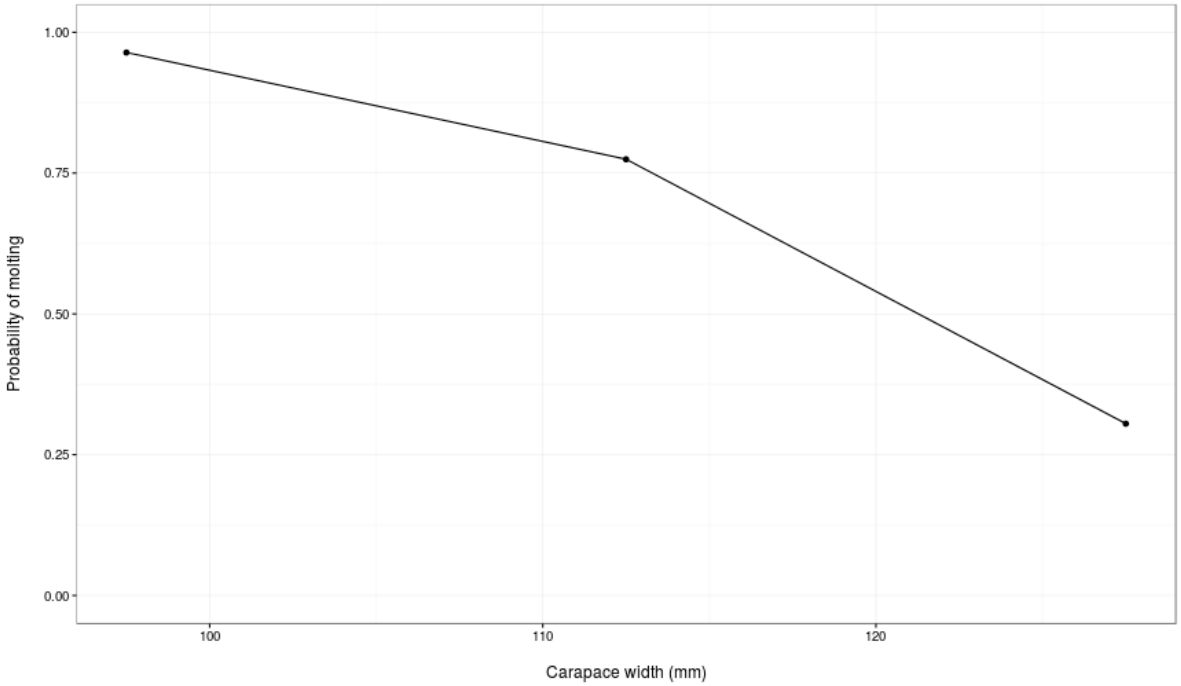
SMBKC dynamics

- Season 1
  - 1 July, start of fishing year
  - Surveys
- Season 2
  - M=0.44 & catch (note that this differs from 2015 model)
- Season 3
  - M=0.185
  - Calculate MMB
- Season 4
  - M=0.375
  - Growth and molting
  - Recruitment (all to stage-1)

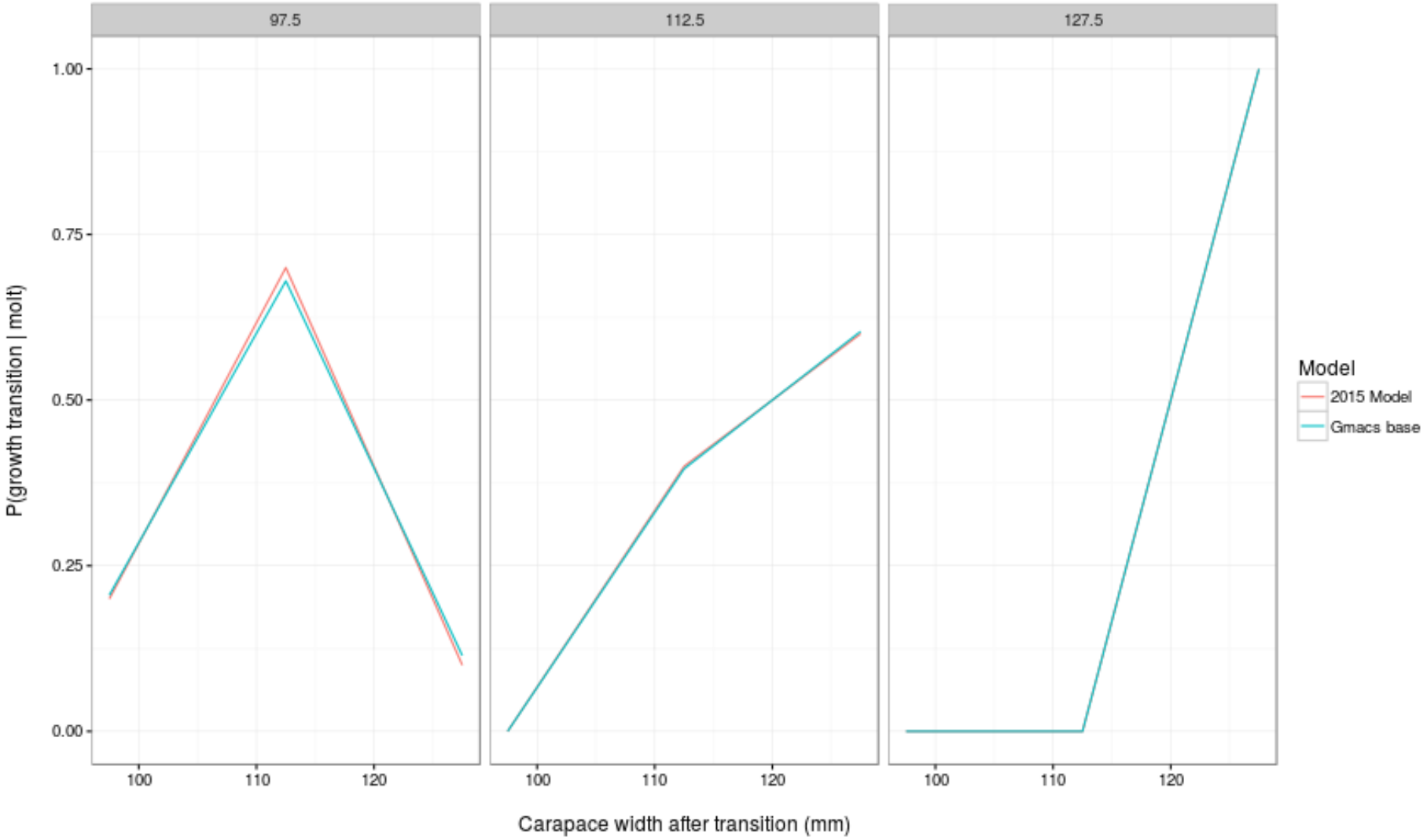
Data

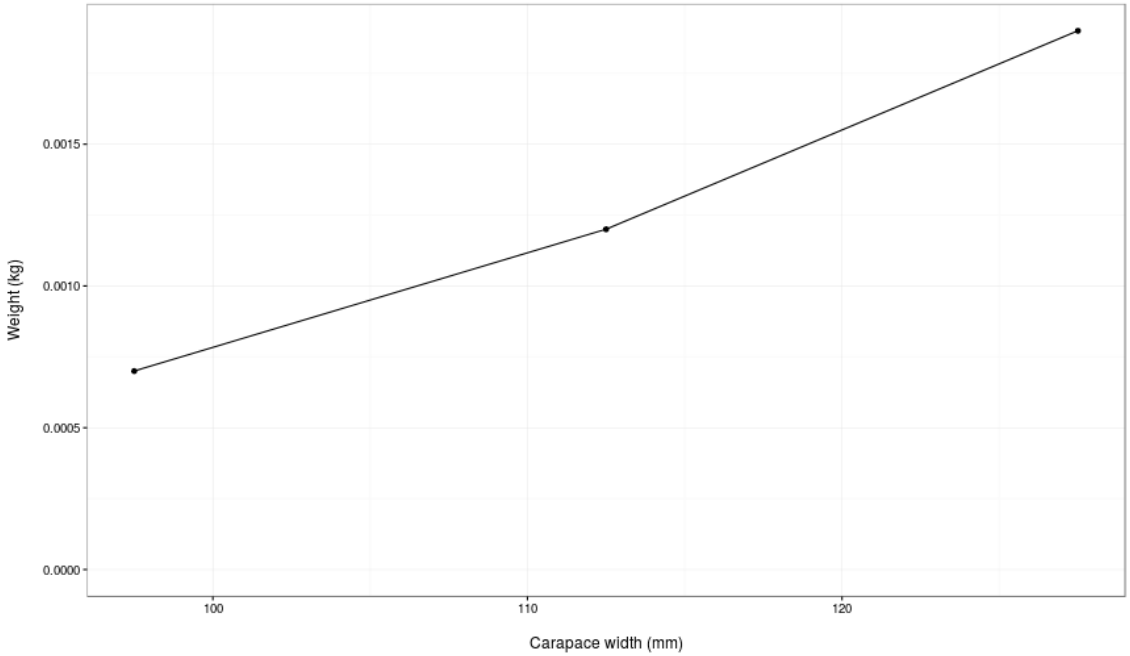

Retained Catch
Pot_Fishery
Discards
Pot_Fishery
Trawl_Bycatch
Fixed_bycatch
Abundance Indices
NMFS_Trawl
ADFG_Pot
Size compositions
Pot_Fishery
NMFS_Trawl
ADFG_Pot
1980
1985
1990
1995
2000
2005
2010
2015
Year

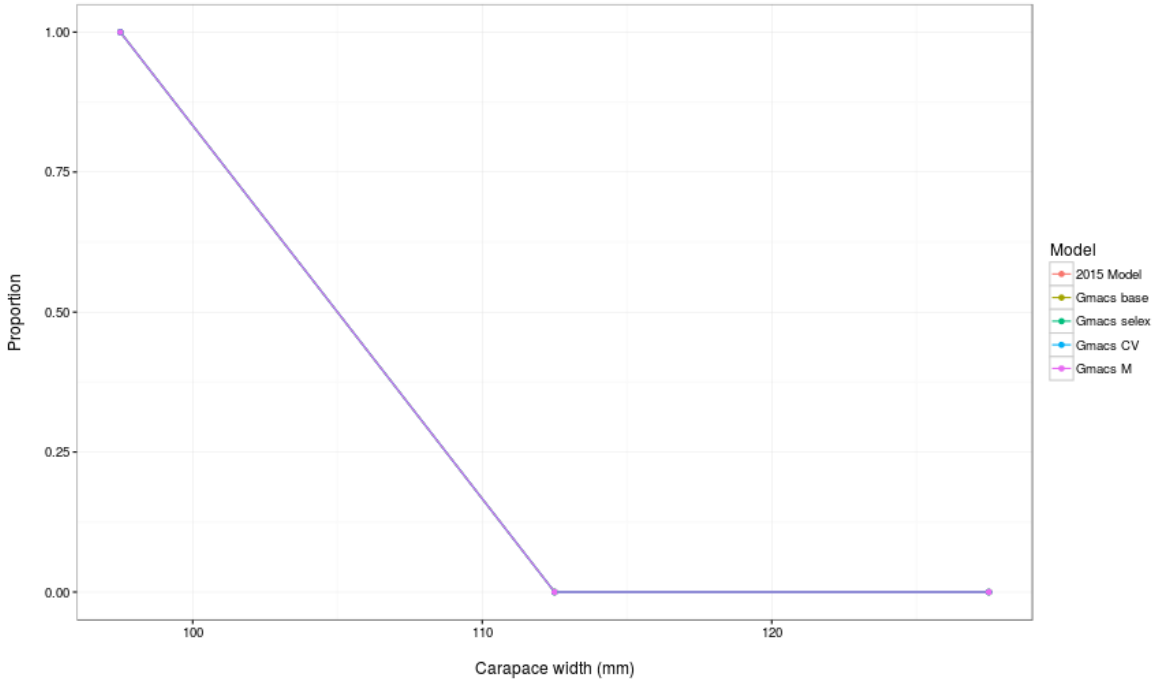

Moulting increment (mm)
10
5
0
100
110
120
Pre-molt size (mm)


Probability of moulting
1.00
0.75
0.50
0.25
0.00
100
110
120
Carapace width (mm)

Size transition matrix




Weight (kg)
0.0015
0.0010
0.0005
0.0000
100
110
120
Carapace width (mm)


Proportion
1.00
0.75
0.50
0.25
0.00
100
110
120
Carapace width (mm)
Model
2015 Model
Gmacs base
Gmacs selex
Gmacs CV
Gmacs M

SMBKC

Jump to document.

Start with table of model runs.

What else would people like to see?

- Model runs:
  - Estimate M_{1998} but with smaller SD constraining deviation?
  - Fix stage-2 selectivity at 1.0 (rather than stage-1) if estimated stage-2 selectivity > 1.0
- Plots…