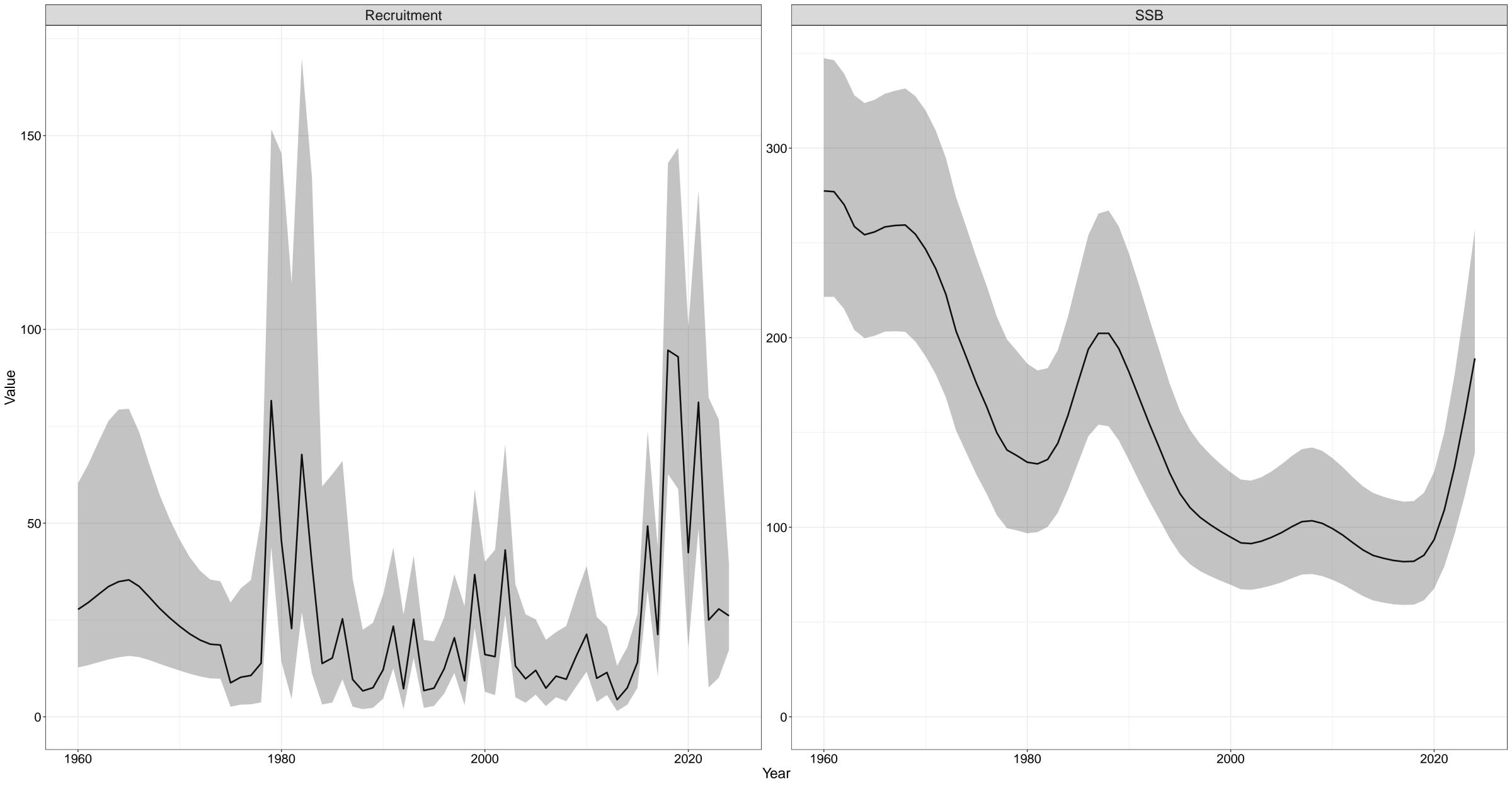
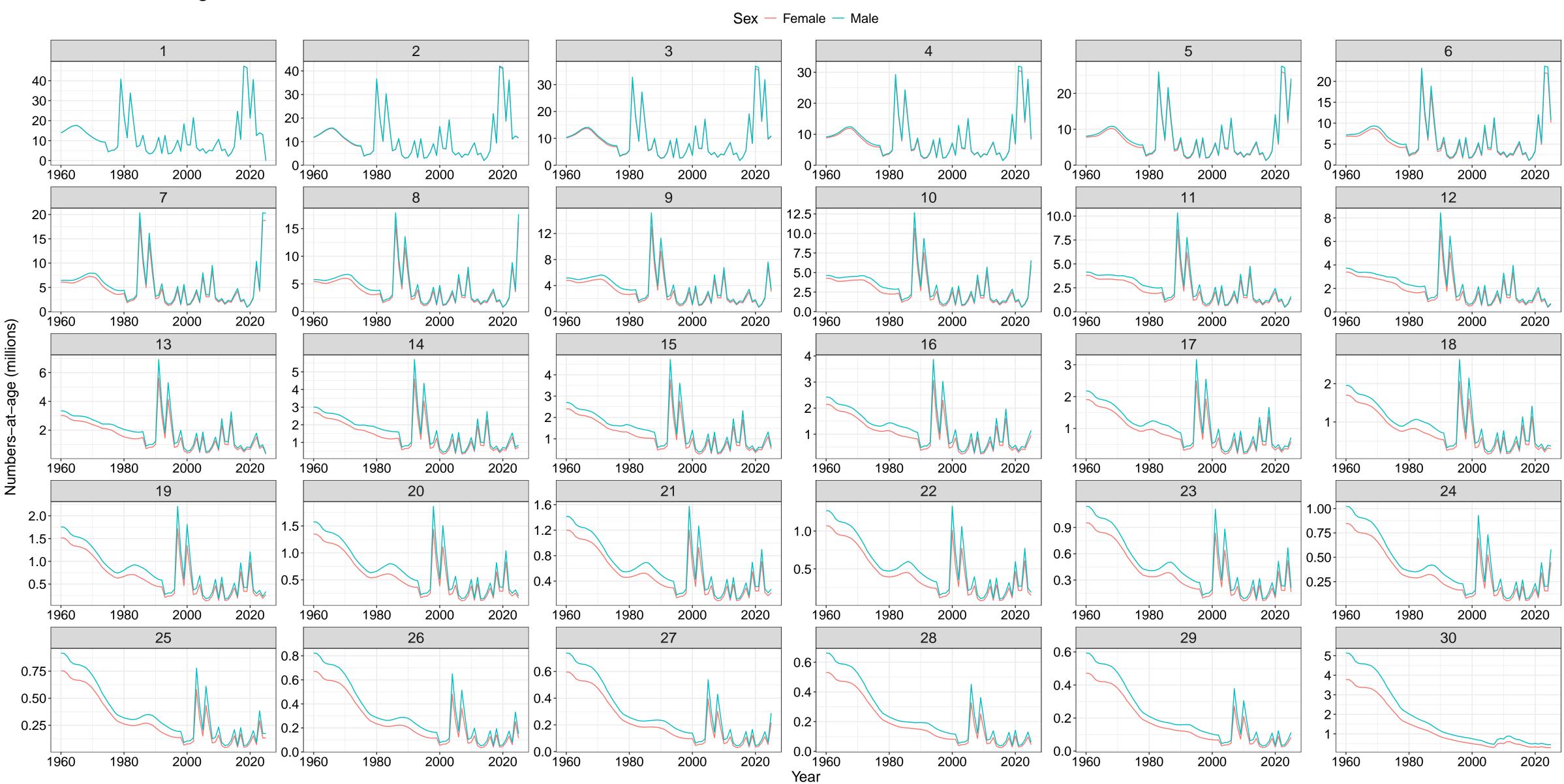
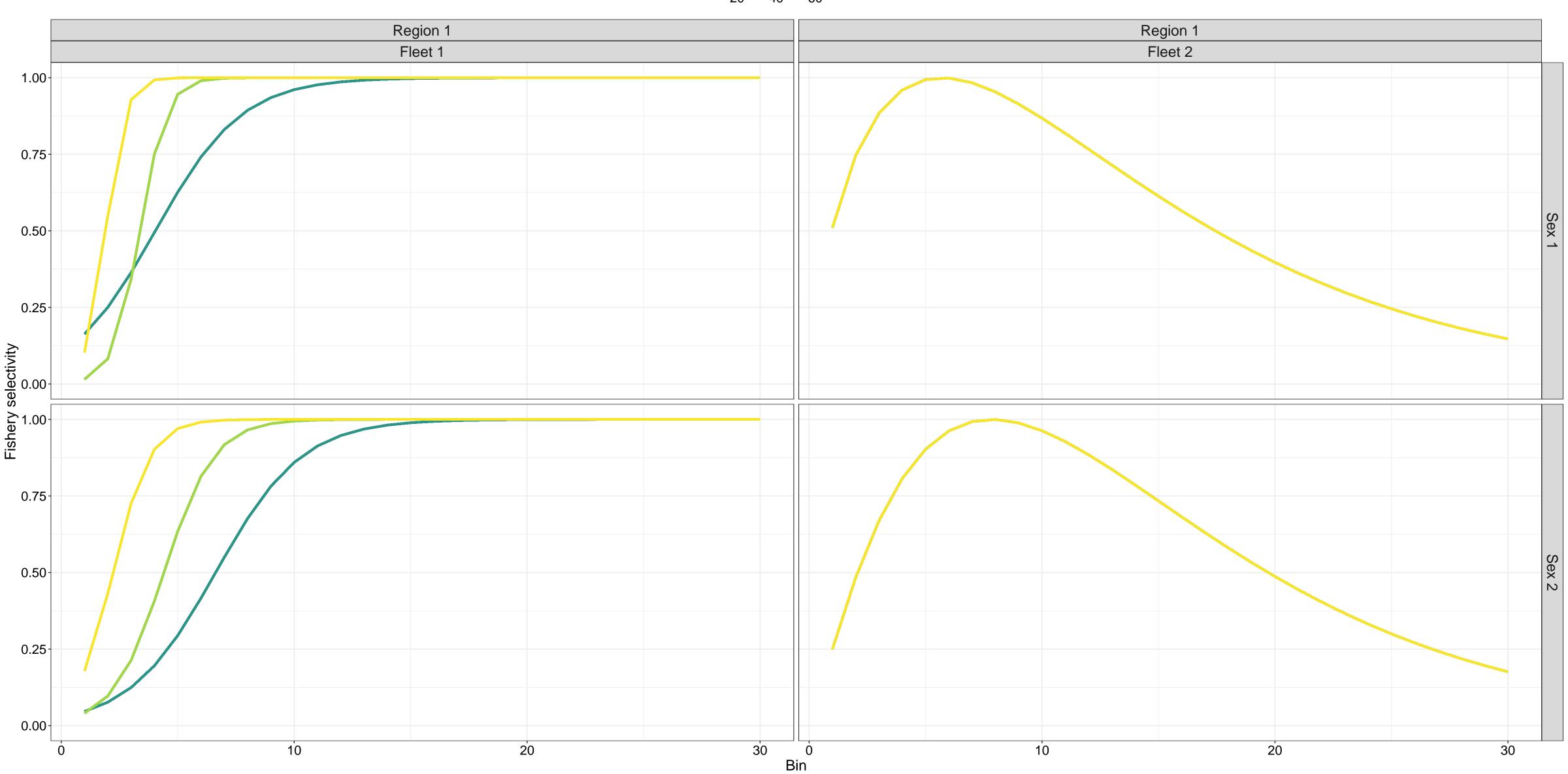
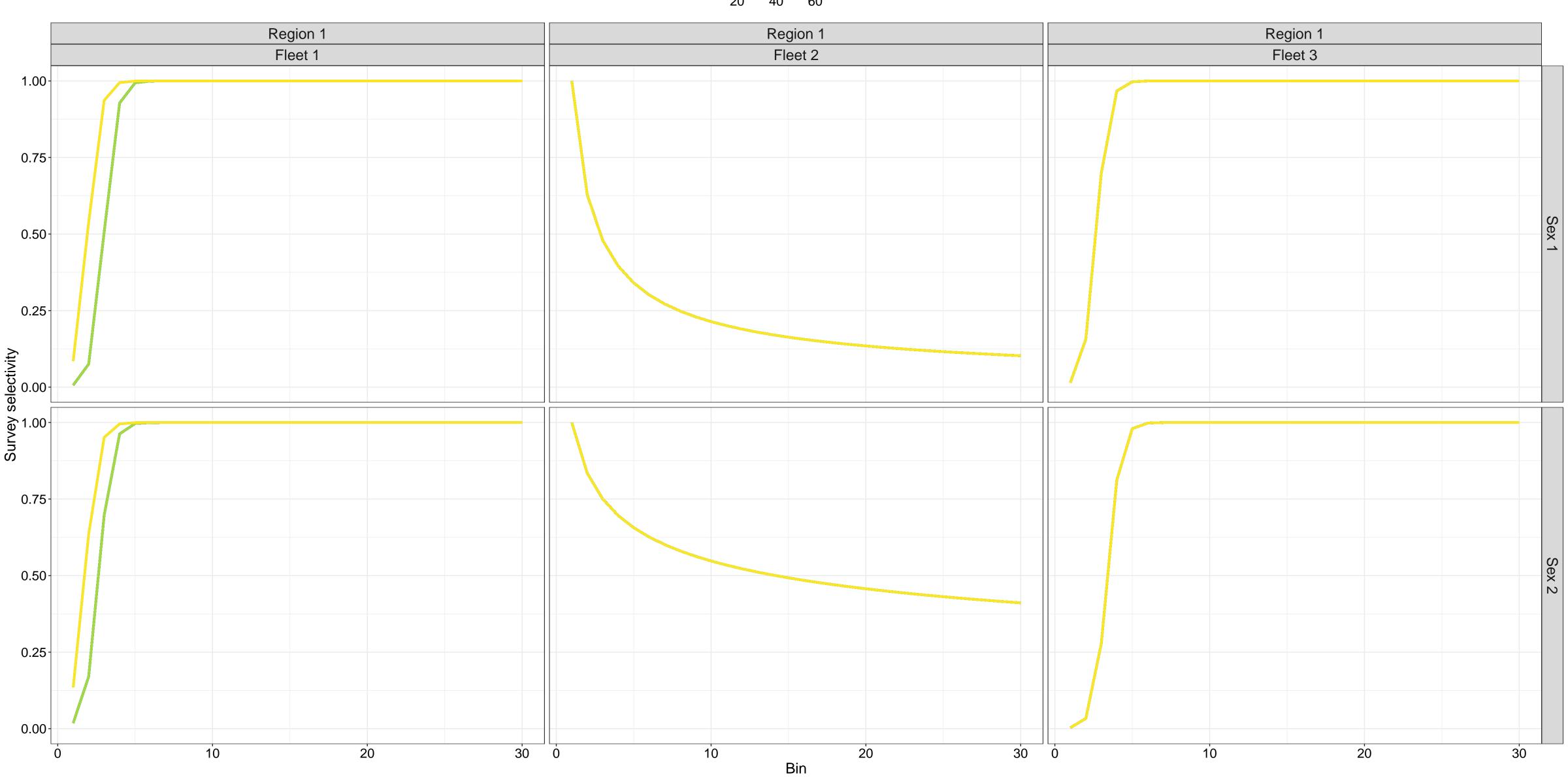
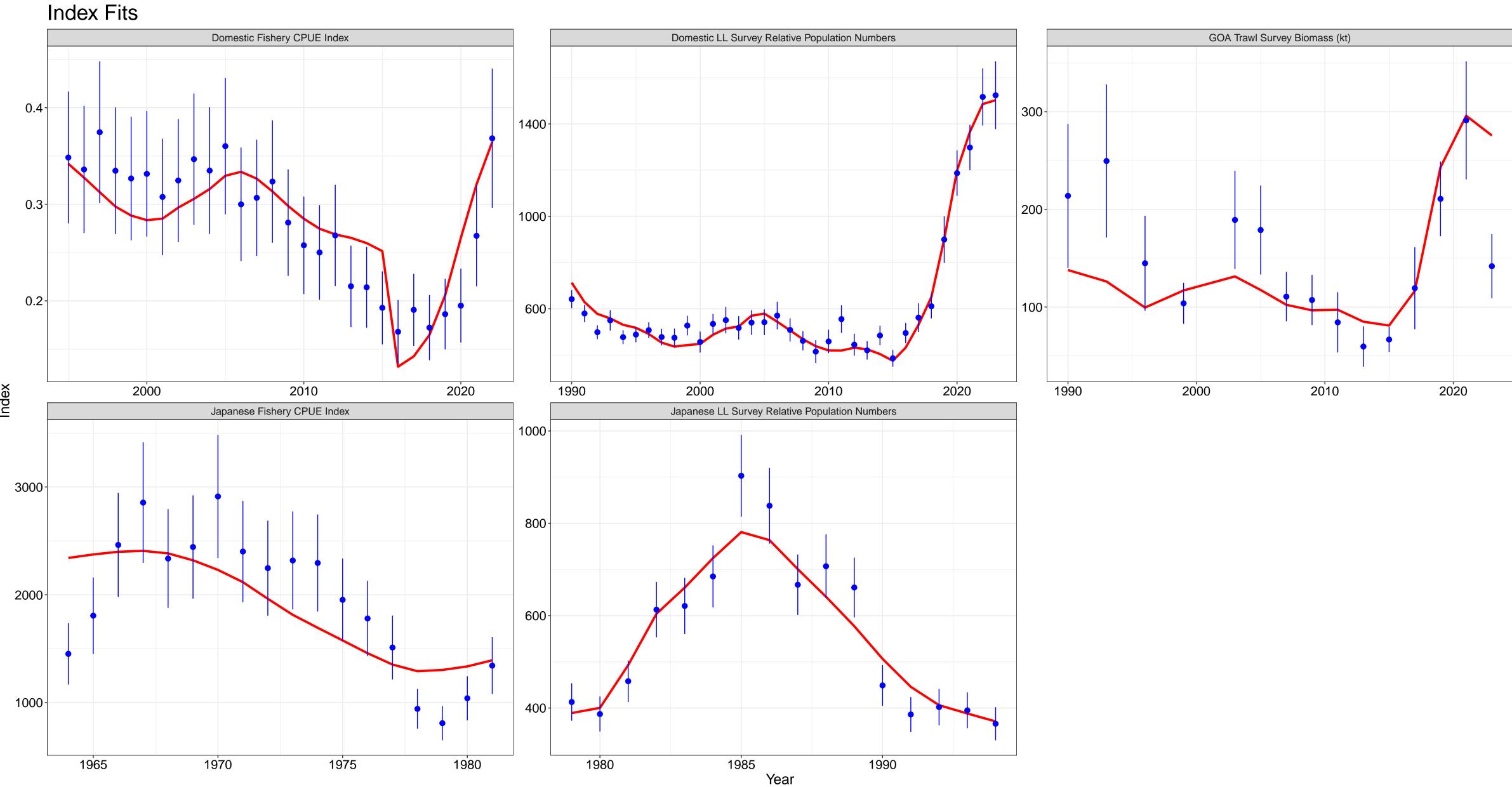
	Model	Region	Terminal_SSB	Terminal_F	Catch_Advice	B_Ref_Pt	F_Ref_Pt	B_over_B_Ref	F_over_F_Ref
1	1	1	189.0804	0.0403704402509903	49.68588	121.0229	0.08593	1.56235	0.46979



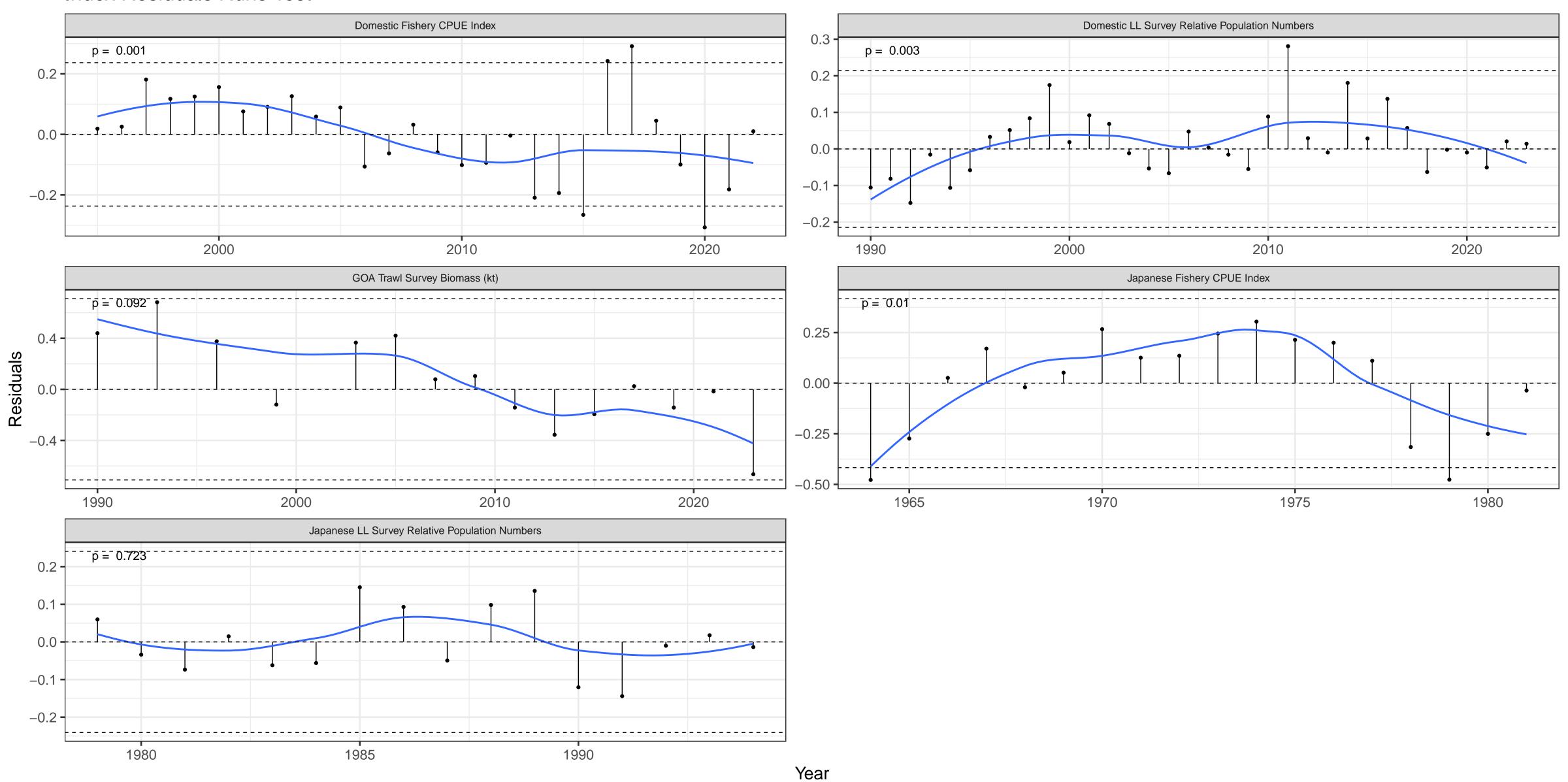


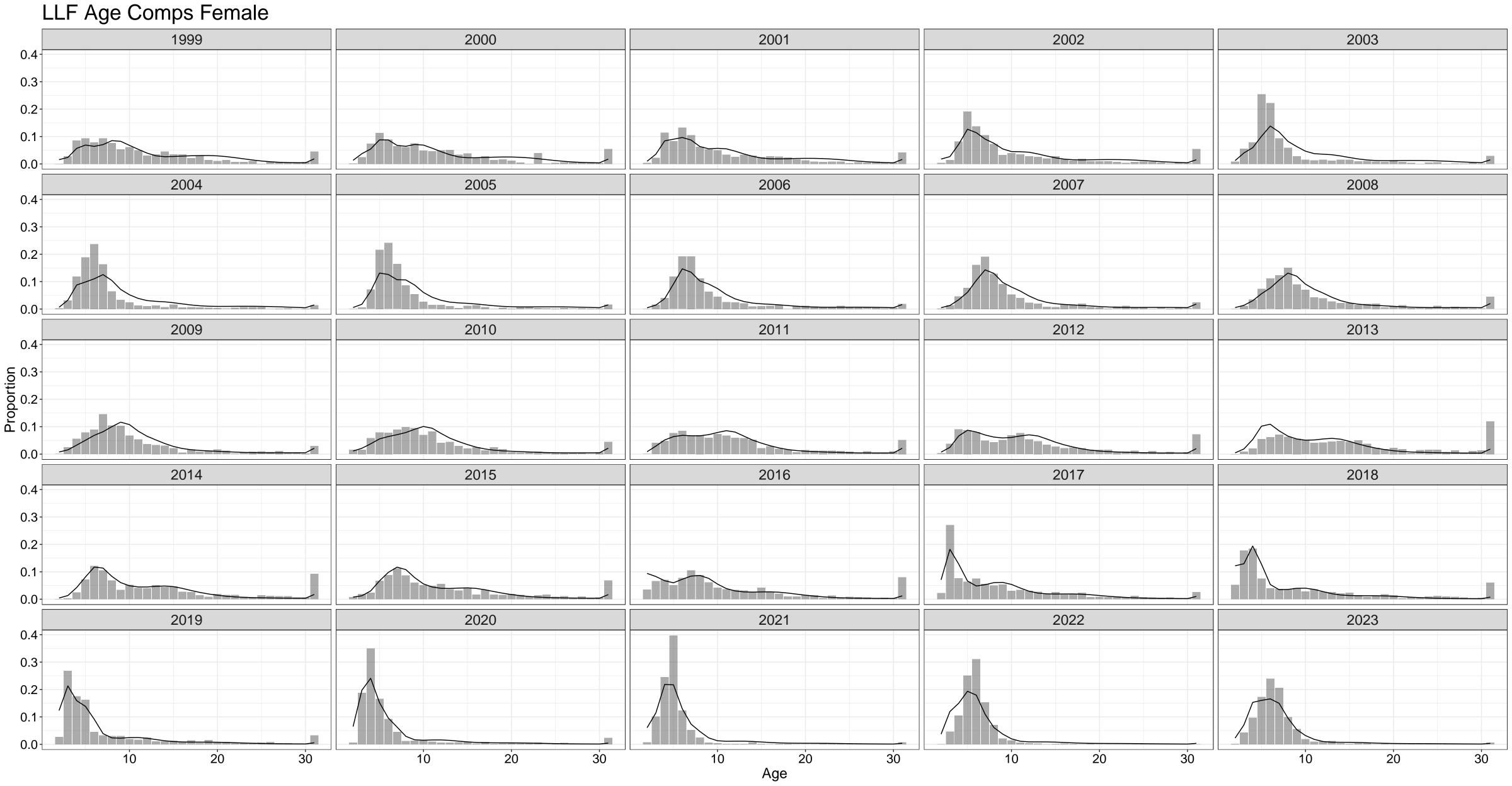






Index Residuals Runs Test





LLF Age Comps Cohort Fits Female 0.4 0.3 0.2 0.1 0.0 0.3 0.2 0.1 0.0 0.4 0.3 0.2 0.1 0.0 0.4 0.3 0.2 0.1 0.0 0.3 0.2 0.1 0.0 0.3 0.2 Age

LLF Length Comps Female 0.10-0.05 0.00 0.10 0.05 0.00 0.10-0.05 Proportion 0.10 0.05 0.00 0.10-0.05 0.00 100 40 0.10 0.05 0.00 100 40 Length 100 40 100 40

LLF Length Comps Male 0.15 0.10-0.05 0.00 0.15 0.10 0.05 0.00 0.15 0.10-0.05-0.00-0.015-0.10-0.05 0.00 0.15 0.10 0.05 0.00 100 40 0.15 0.10-0.05 0.00

100 40

100 40

TF Length Comps Female 1991 1999 2005 2006 1990 0.20 0.15 0.10 0.05 0.00 2007 2008 2009 2010 2011 0.20 0.15 0.10 0.05 0.00 2012 2014 2016 2013 2015 0.20 Proportion 0.10-0.00 2017 2021 2018 2019 2020 0.20 0.15 0.10-0.05 0.00 100 80 80 100 40 80 100 40 60 40 60 60 2022 2023 0.20-0.15 0.10 0.05 0.00 100 40 60 80 100 40 80 60 Length

TF Length Comps Male 1991 1999 2005 2006 1990 0.20 0.15 0.10 0.05-0.00 2009 2007 2008 2010 2011 0.20-0.15 0.10 0.05 0.00 2012 2013 2014 2015 2016 0.20-Proportion 0.10-0.00 2021 2017 2019 2018 2020 0.20-0.15 0.10-0.05 0.00 100 80 80 40 100 40 80 100 40 60 60 60 2022 2023 0.20 0.15 0.10 0.05 0.00 100 60 40 80 100 40 60 80 Length

LLS Age Comps Female 0.4 0.3 0.2 0.1 0.4 0.3-0.2 0.1 Droportion 0.2-0.0 0.3-0.2 0.1 0.0 0.3 0.2 0.1 Age

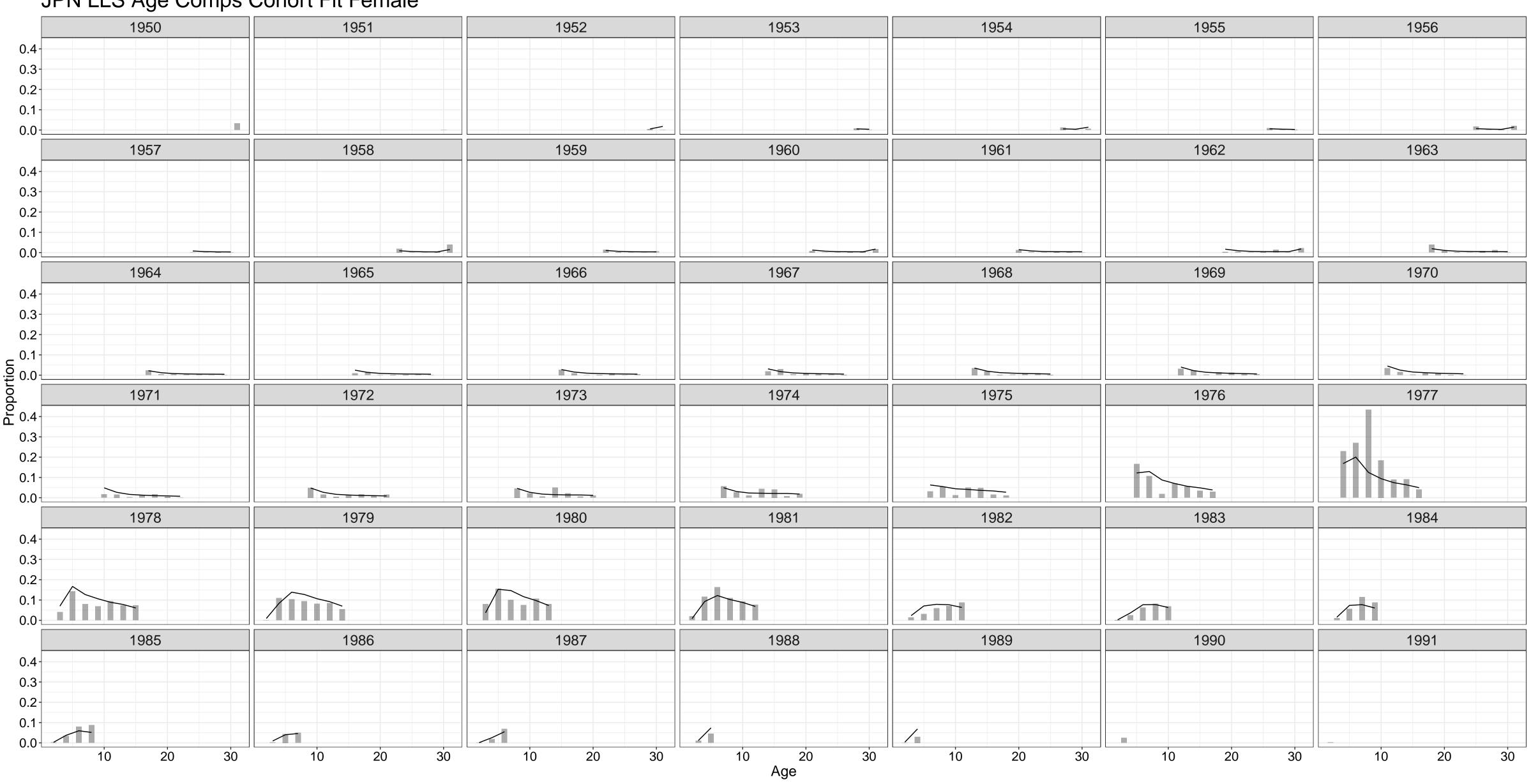
LLS Age Comps Cohort Fit Female 0.4 0.3-0.2-0.1-0.0 0.3 0.2 0.1 0.0 0.4 0.3-0.2-0.1 0.0 0.3-0.2-D.2 0.0 0.0 0.3 0.2 0.1 0.0 0.4 0.3-0.2-0.1-0.0-0.4 0.3-0.2-0.1-0.0-0.4 0.3-0.2-0.1-

0.0

JPN LLS Age Comps Female 1981 1983 1985 0.4 0.3-0.2 0.1 1991 1987 1989 0.4 Proportion 2.0 0.1 30 30 10 20 20 10 1993 0.4 0.3-0.2 0.1 20 30 10

Age

JPN LLS Age Comps Cohort Fit Female



LLS Length Comps Female 0.10-0.05 0.00 0.10 0.05 0.00 0.10-0.05 Proportion 0.10 0.05 0.00 0.10 0.05 0.00 100 40 0.10 0.05 0.00

100 40

100 40

LLS Length Comps Male 0.20 0.15 0.10 0.05 0.00 0.20-0.15 0.10 0.05-0.00 0.20 0.15 0.10 Droportion 0.00-0.10 0.05 0.00 0.20 0.15-0.10-0.05 0.00 100 40 0.20-0.15-0.10 0.05 0.00 100 40 Length 100 40 100 40

GOA TS Length Comps Female 1990 1993 1996 1999 0.15 0.10-0.05 2003 2005 2009 2007 0.15 0.10 0.05 Proportion -00.0 2011 2013 2015 2017 0.15 0.10-0.05 0.00 100 80 60 2019 2021 2023 0.15 0.10-0.05 0.00

60

80

100

60

80

60

80

100

GOA TS LEngth Comps Male 1993 1996 1999 1990 0.20 0.15 0.10 0.05 0.00 2003 2007 2005 2009 0.20 0.15 0.10 0.05 Proportion 0.20-2011 2013 2015 2017 0.15 0.10 0.05 0.00 100 60 80 2019 2021 2023 0.20 0.15 0.10 0.05

60

80

100

60

80

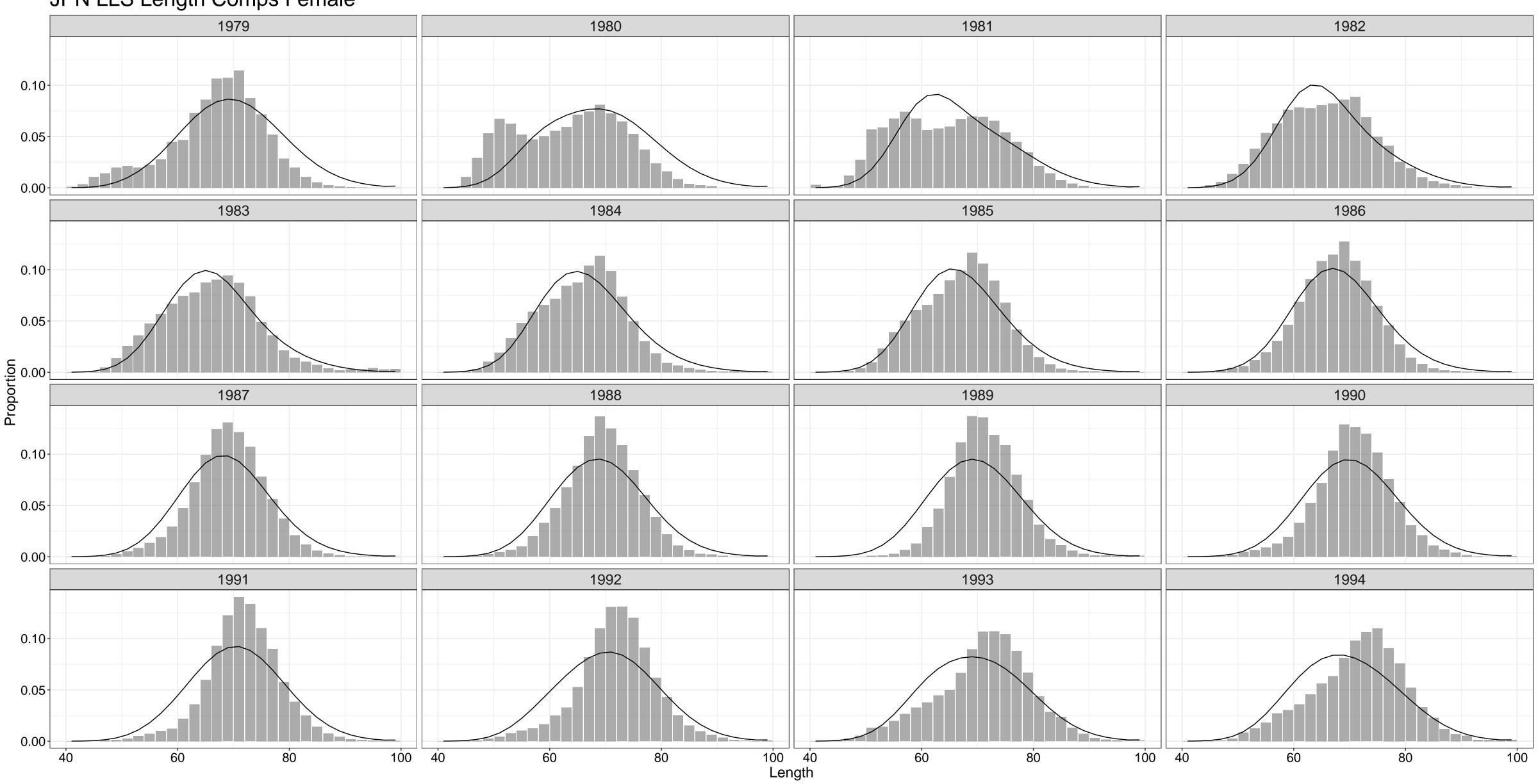
0.00

60

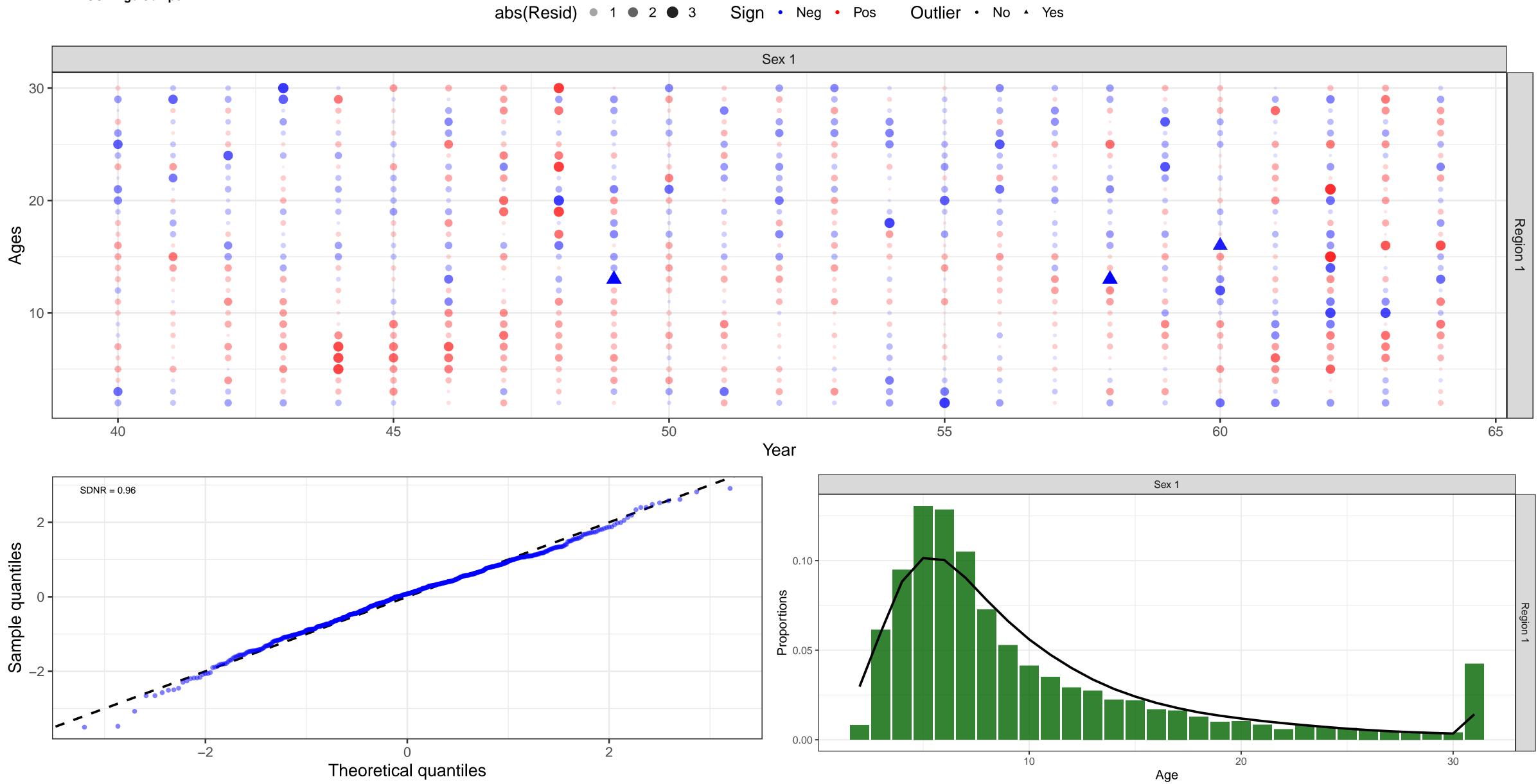
80

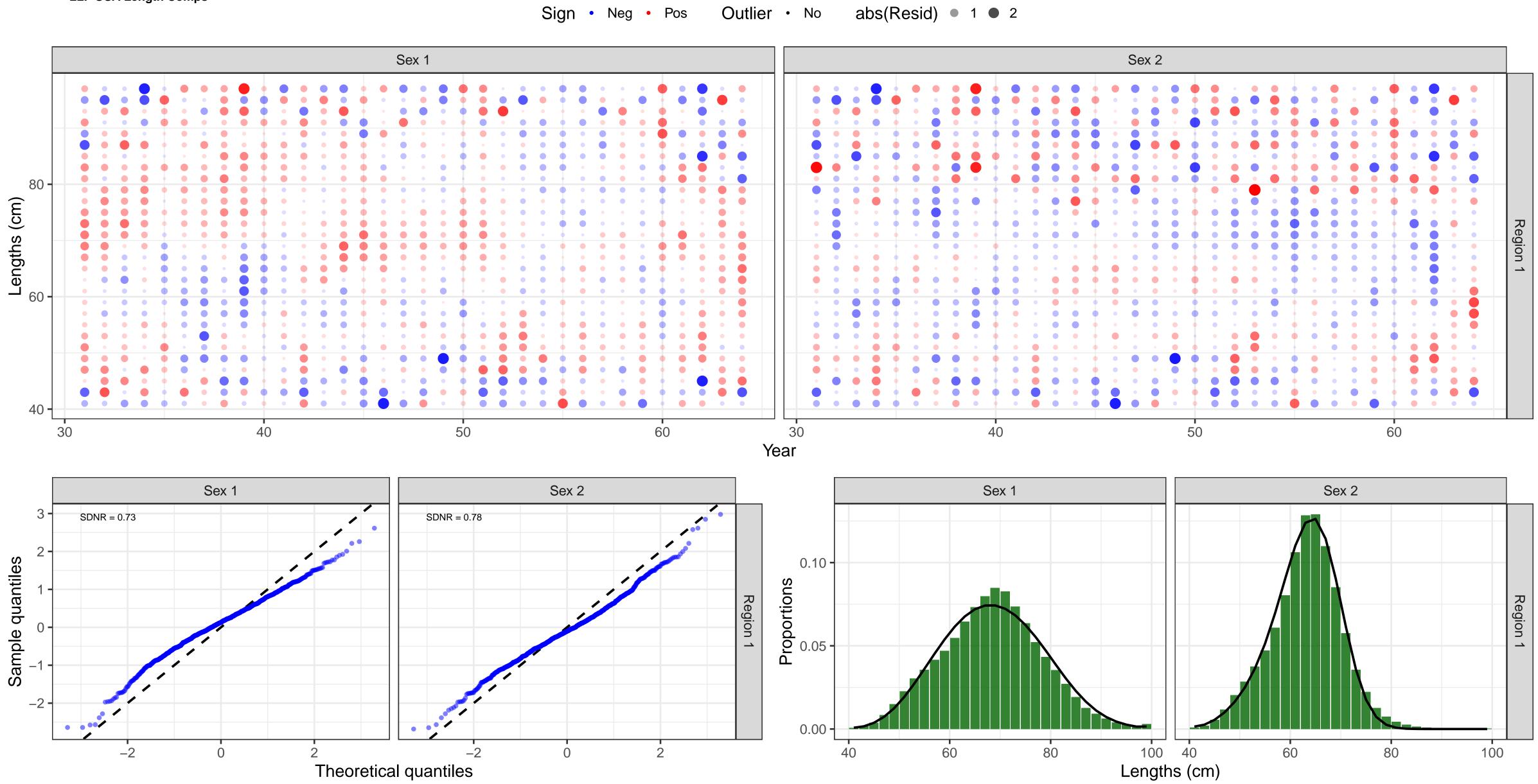
100

JPN LLS Length Comps Female

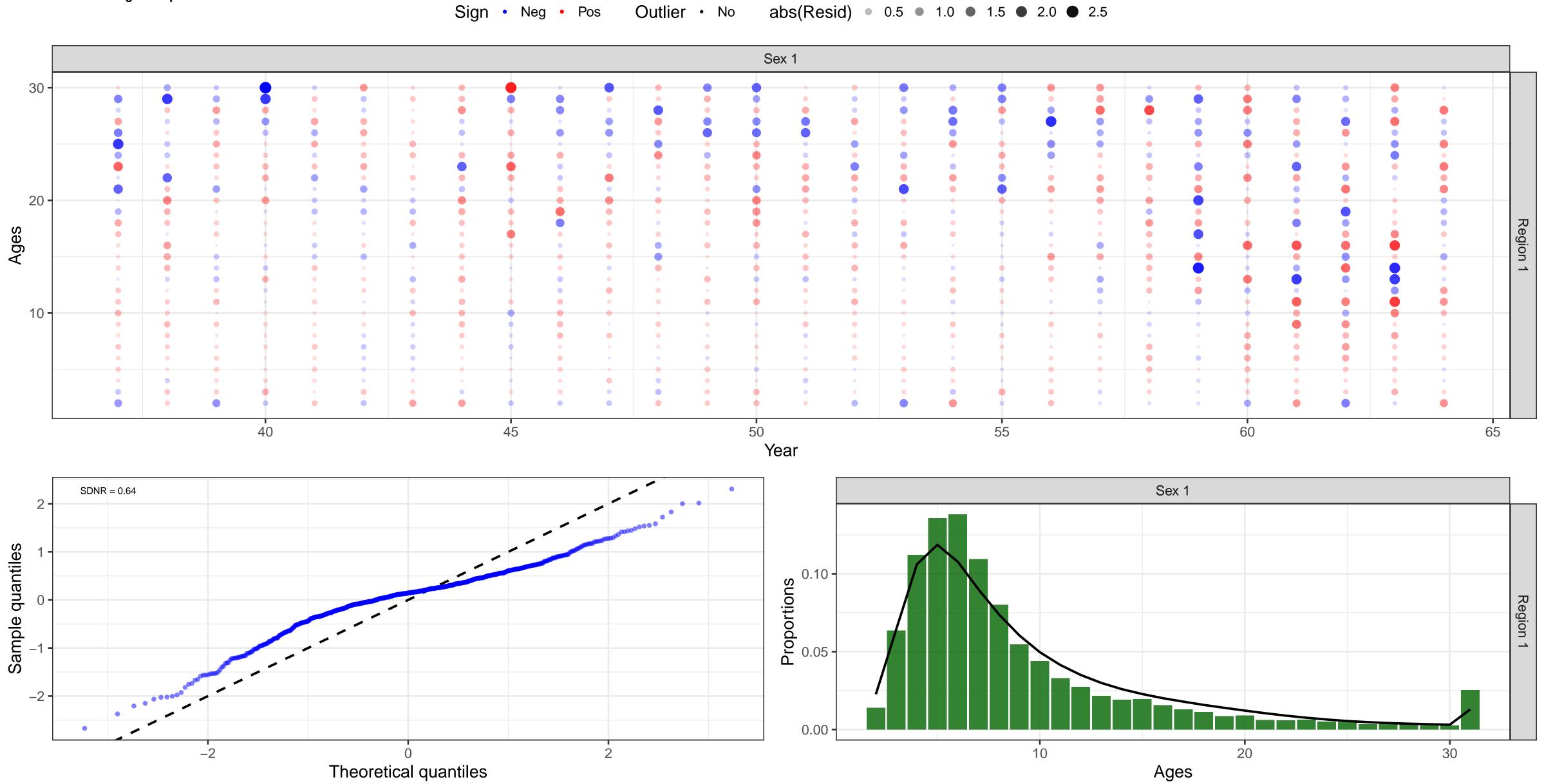


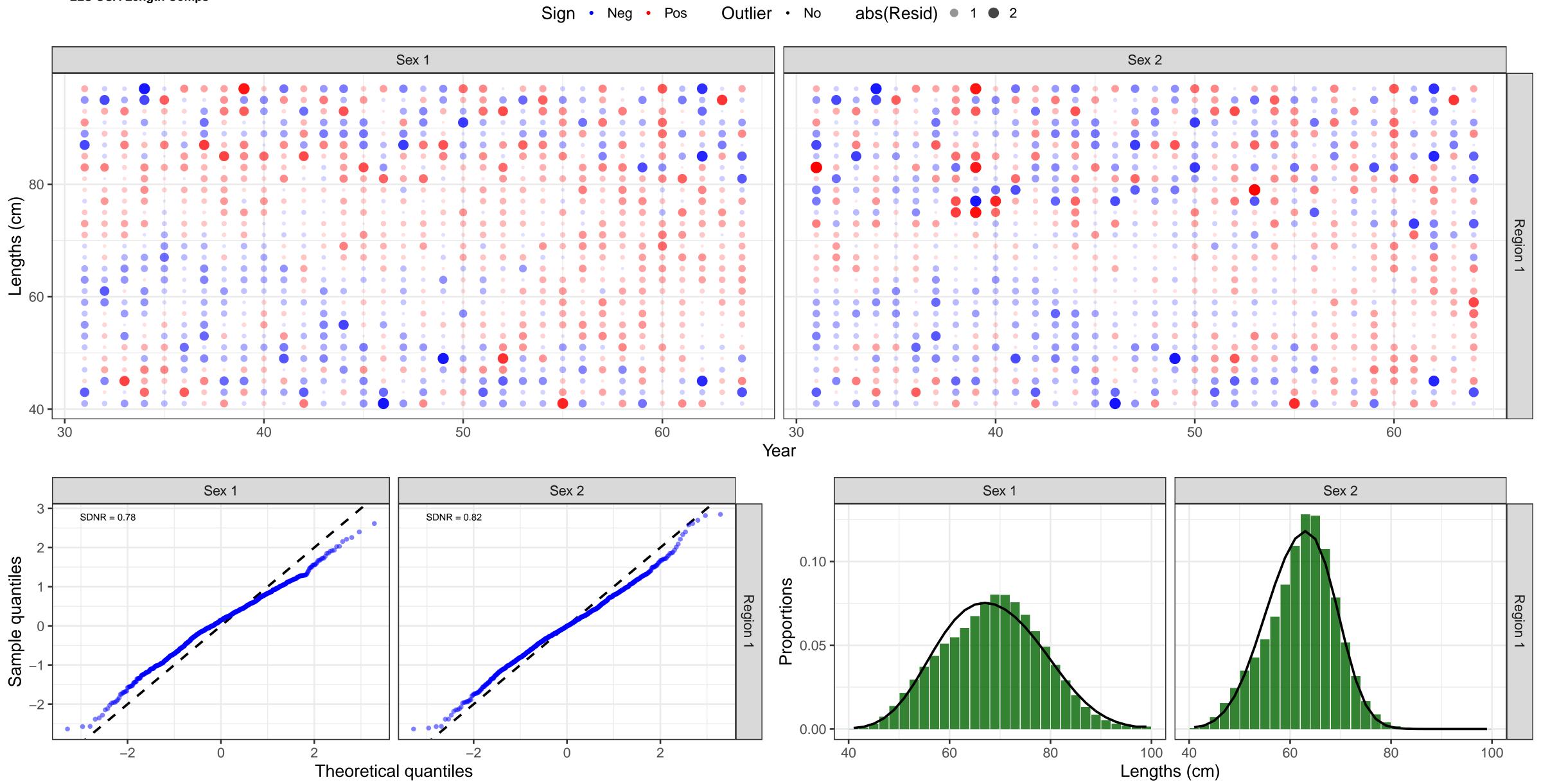
JPN LLS Length Comps Male 1979 1980 1981 1982 0.20 0.15 0.10 0.05 0.00 1983 1984 1985 1986 0.20 0.15 0.10 0.05 Proportion 0.20-1987 1988 1989 1990 0.15 0.10-0.05 0.00 1991 1993 1992 1994 0.20 0.15 0.10 0.05 0.00 100 60 60 80 100 40 80 100 40 Length 60 80 100 60 80

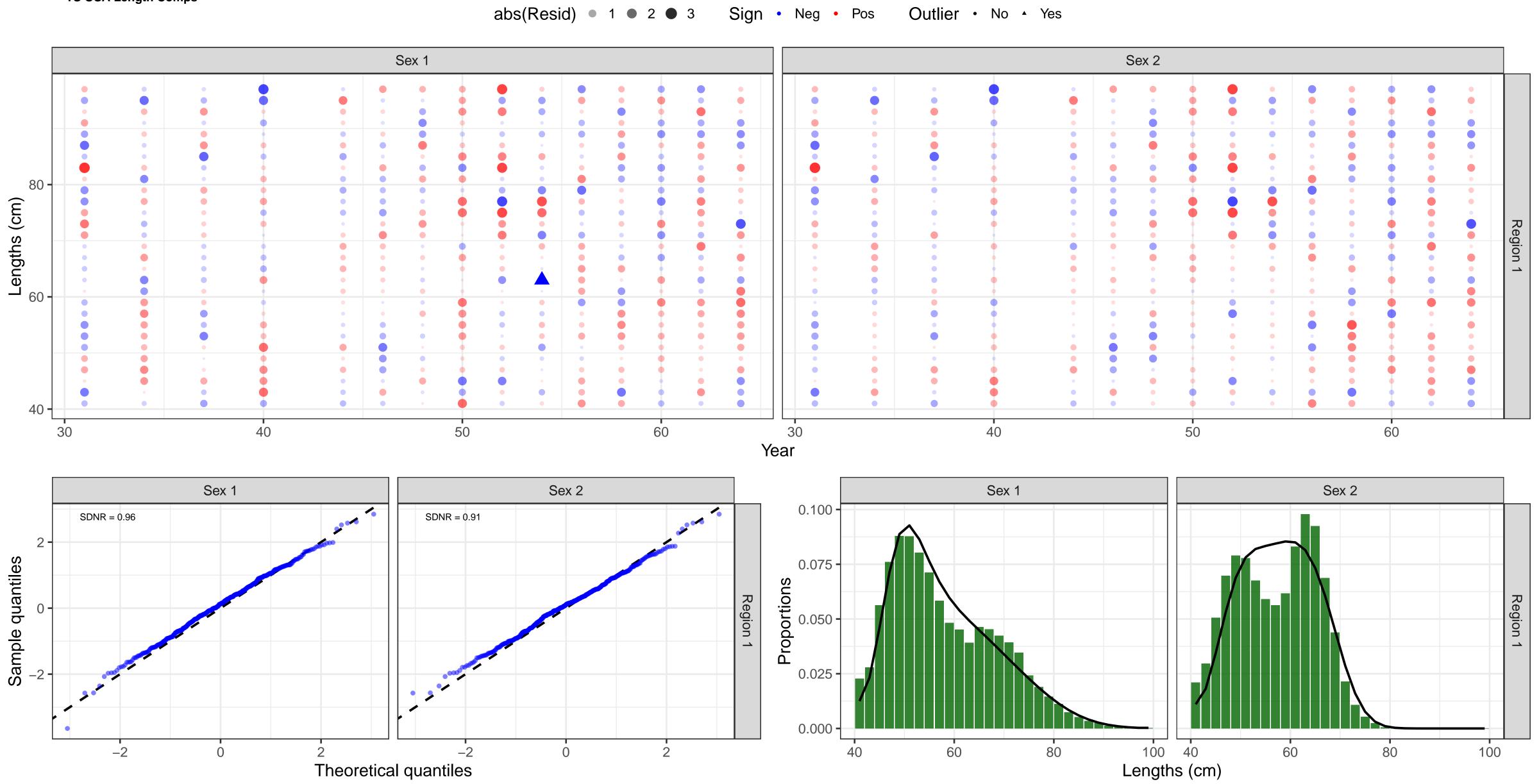


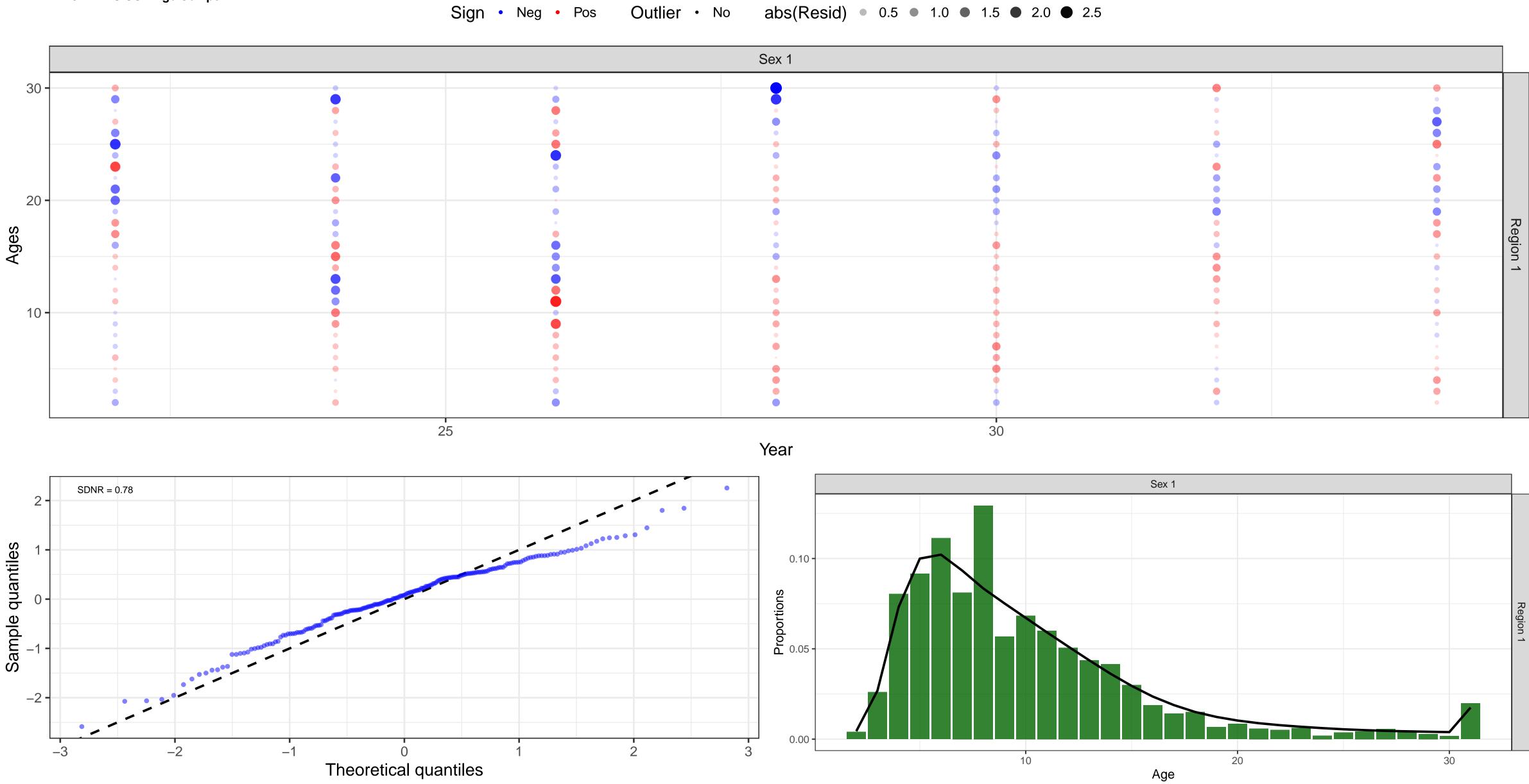


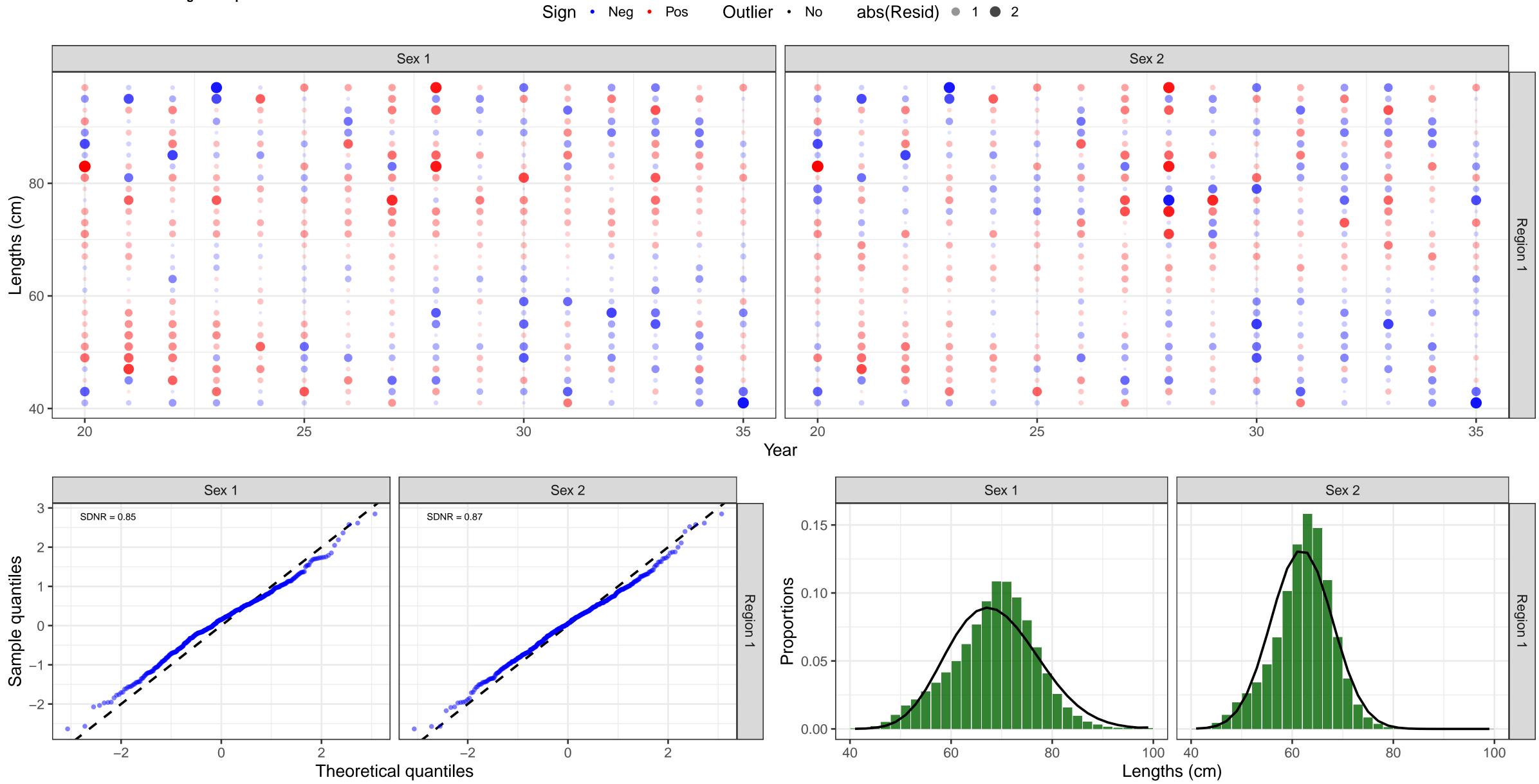
abs(Resid) ● 1 ● 2 ● 3 Sign • Neg • Pos Outlier • No • Yes Sex 1 Sex 2 80 Lengths (cm) Region 1 30 Year 50 40 50 30 40 60 60 Sex 2 Sex 1 Sex 2 Sex 1 0.125 -SDNR = 0.98 SDNR = 0.95 0.100 -Sample quantiles Proportions Region 1 Region 1 0.025 0.000 -100 40 Lengths (cm) 60 80 60 80 100 0 Theoretical quantiles

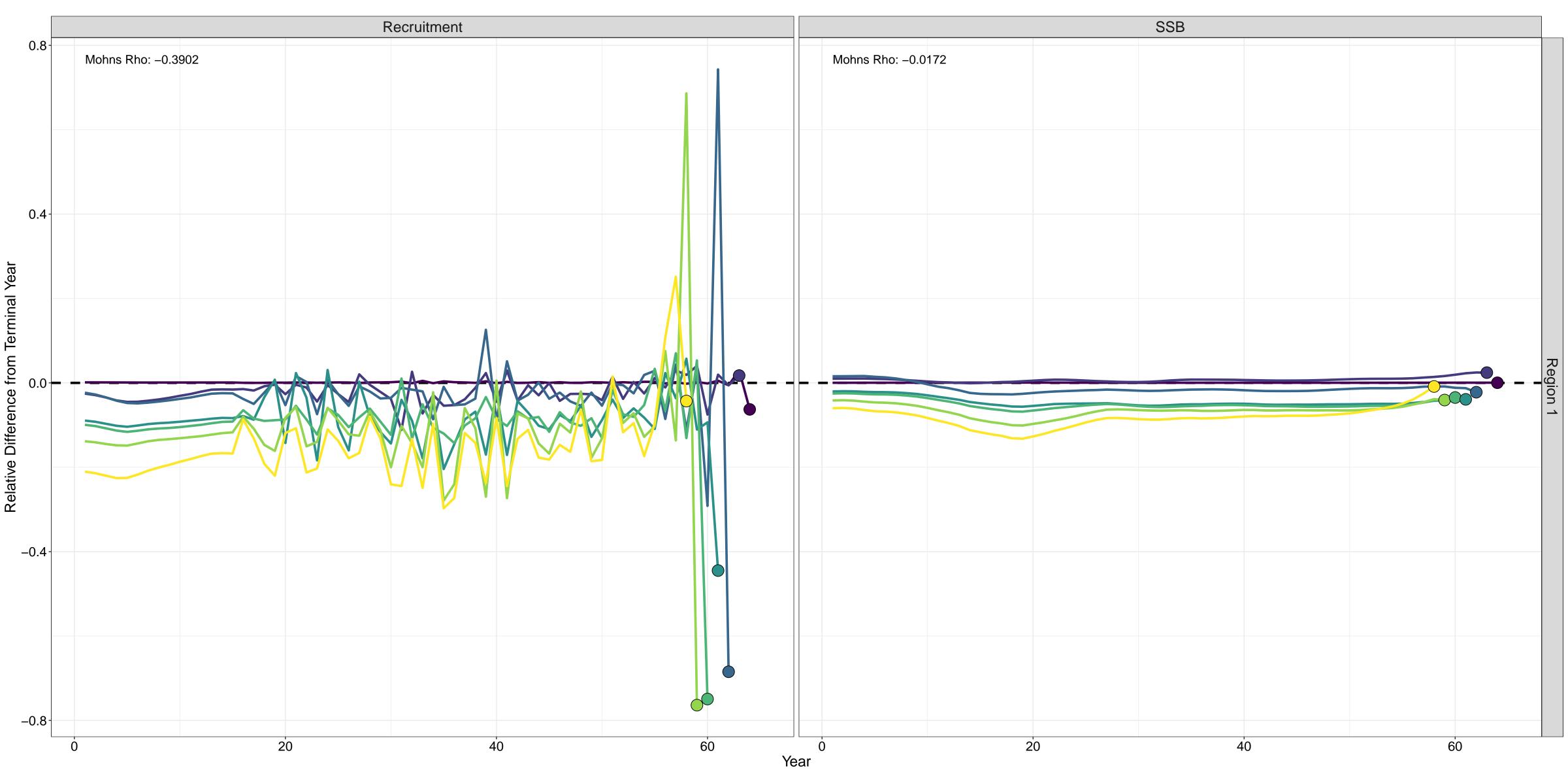


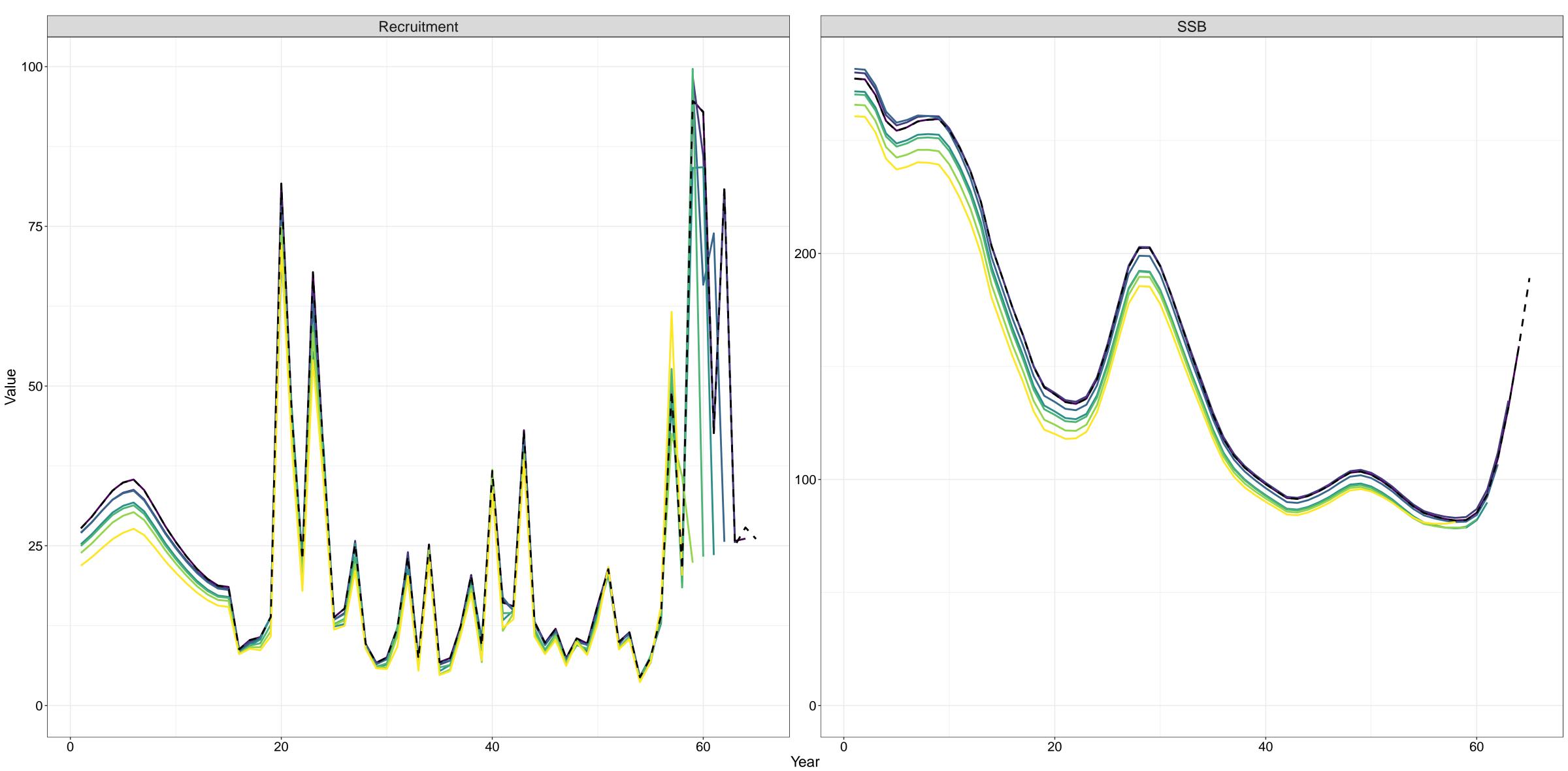


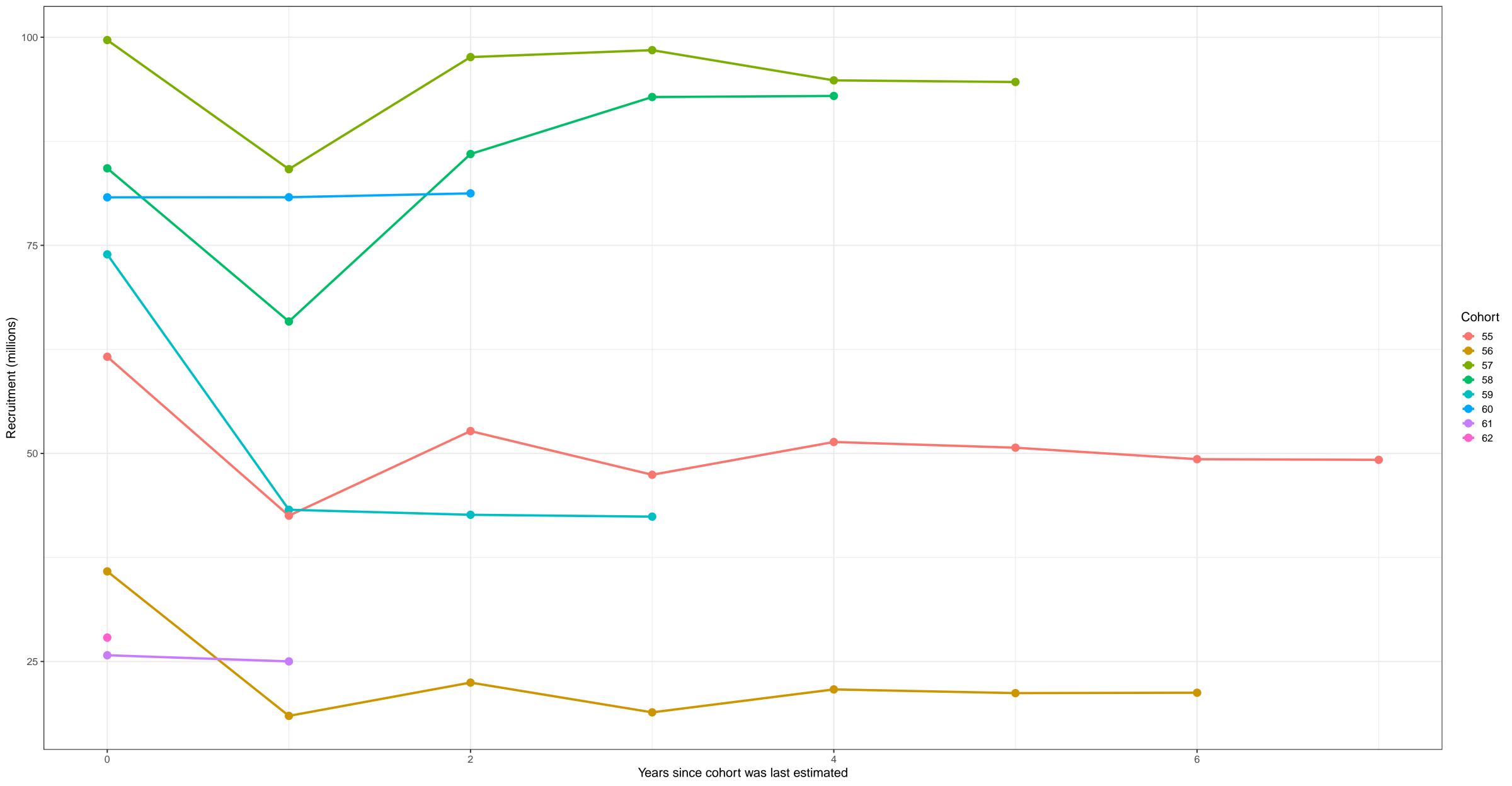




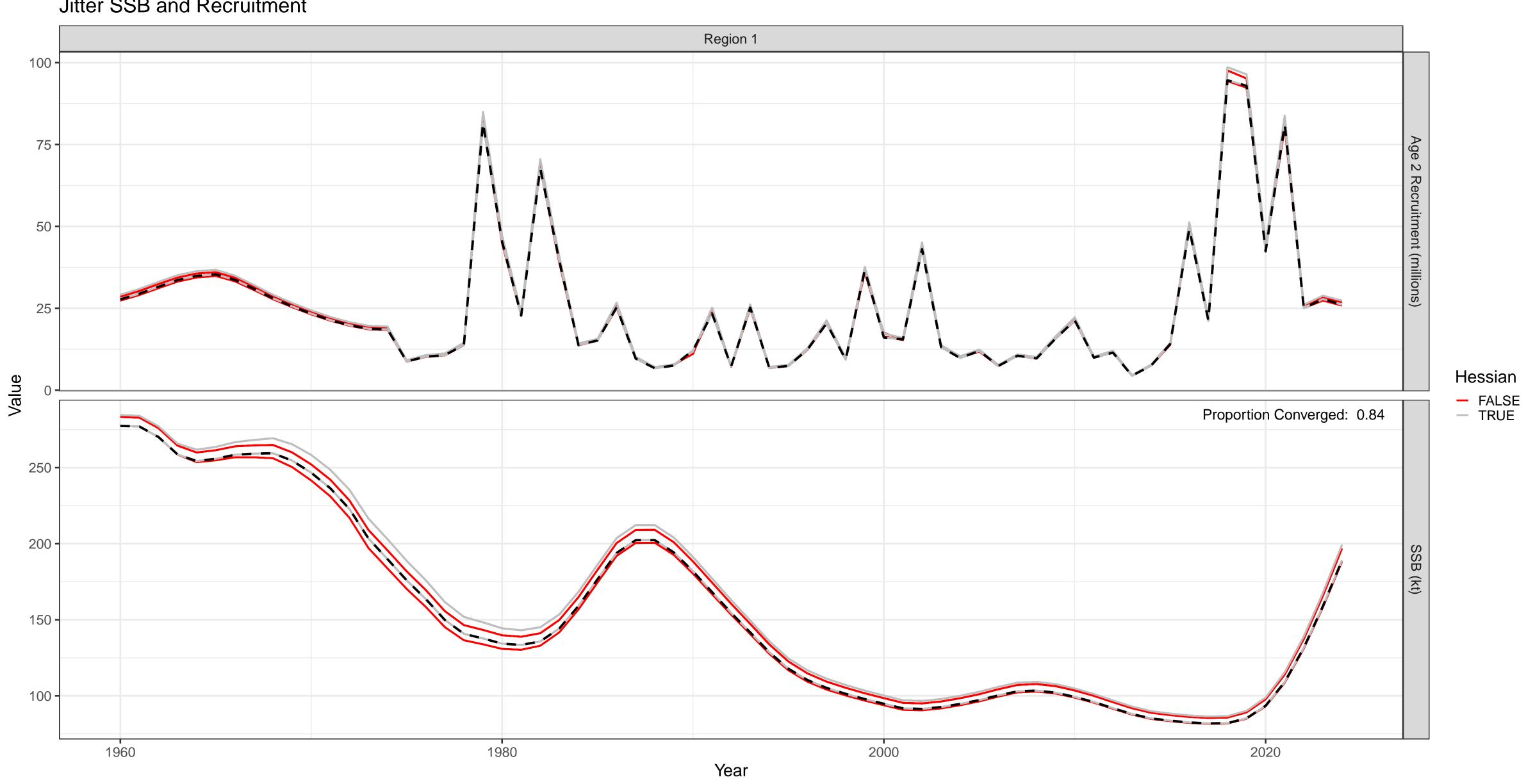




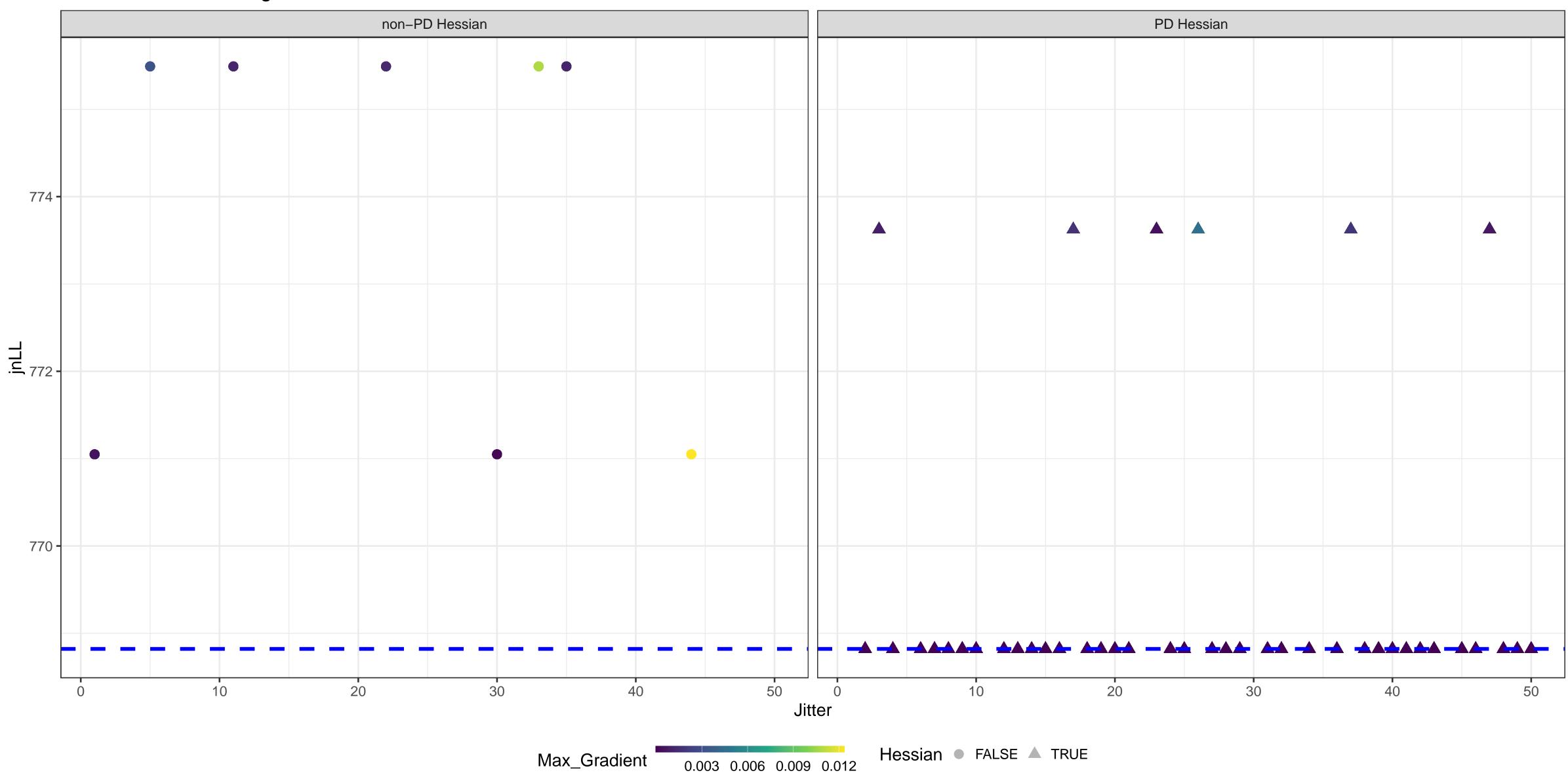


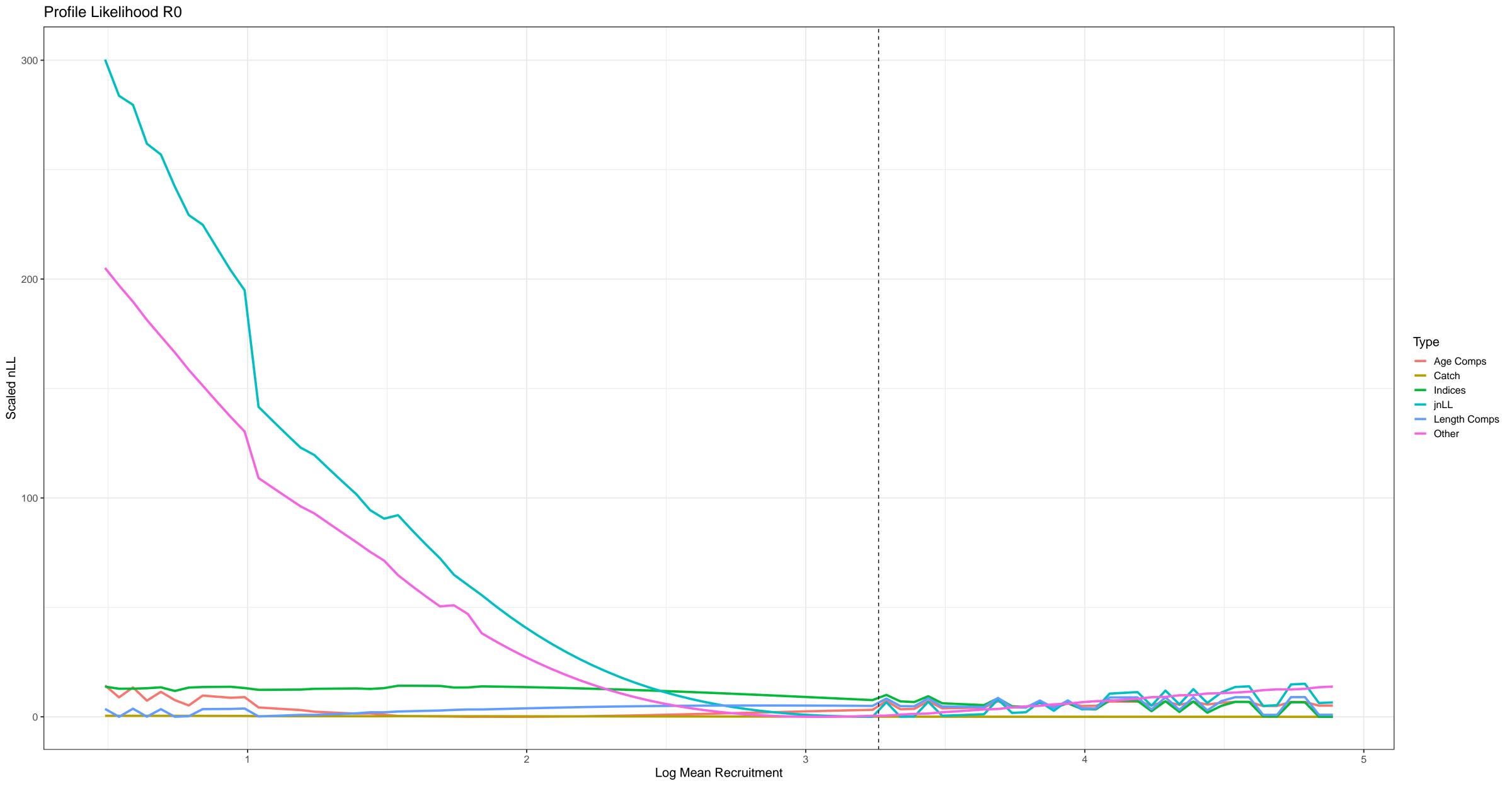


Jitter SSB and Recruitment



Jitter nLL and Convergence





Profile Likelihood R0 Catch Age Comps Indices 0.4 10 -0.3 0.1 Type 0.0 Scaled nLL Indices jnLL Other Length Comps Length Comps 200 -Other 7.5 150 -200 -5.0 100 -100 -50 **-**2 3 Log Mean Recruitment

