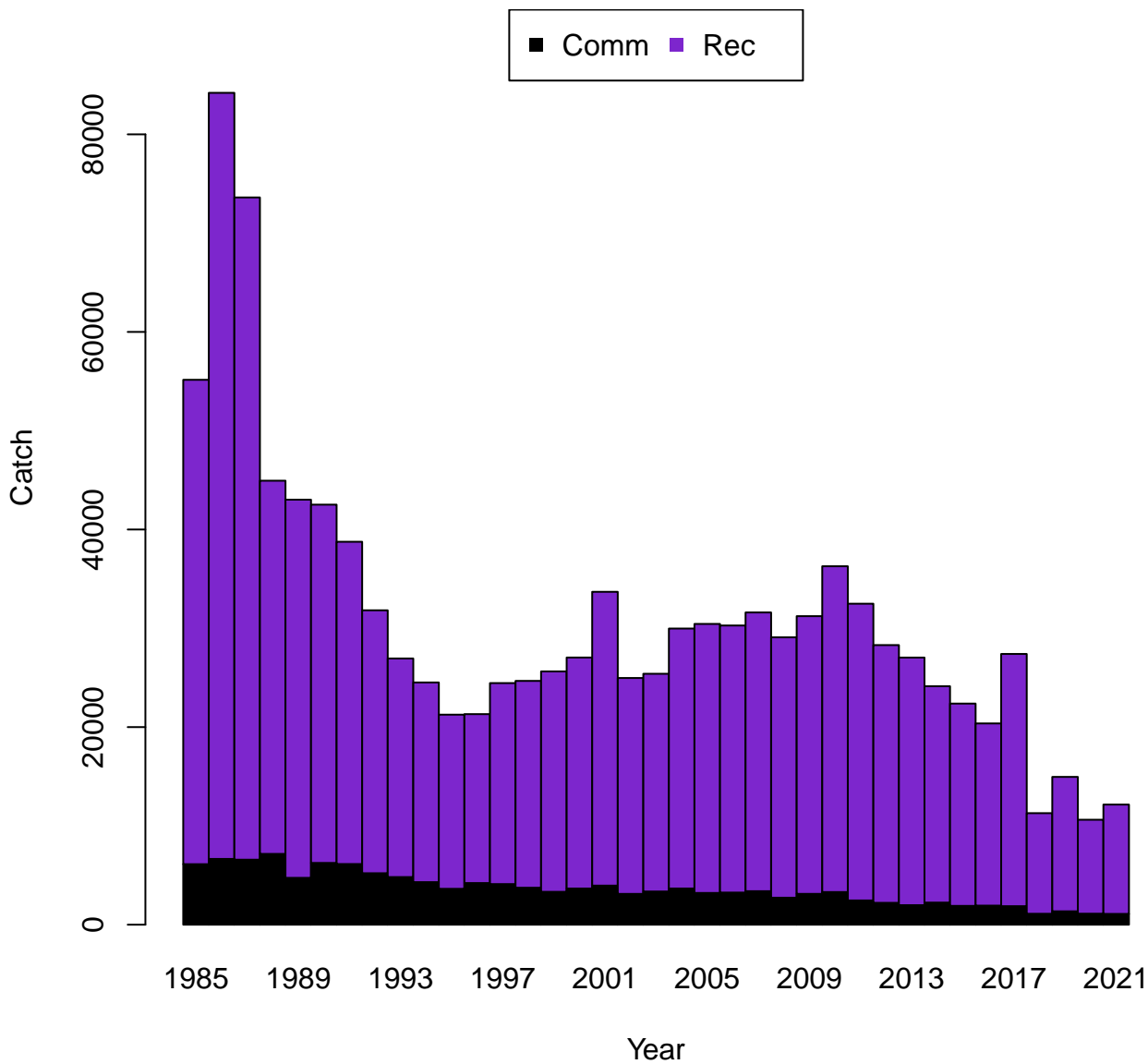
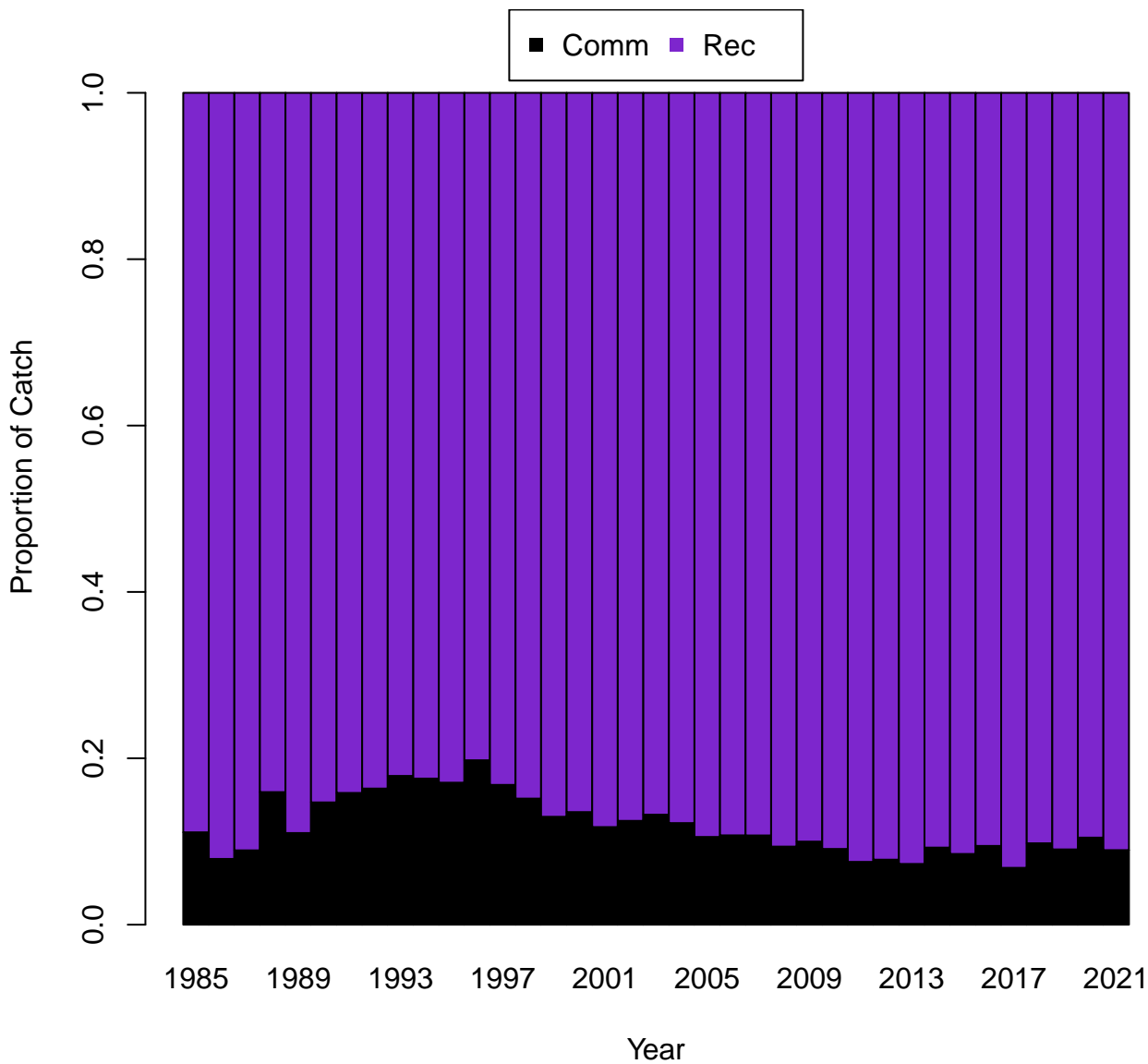


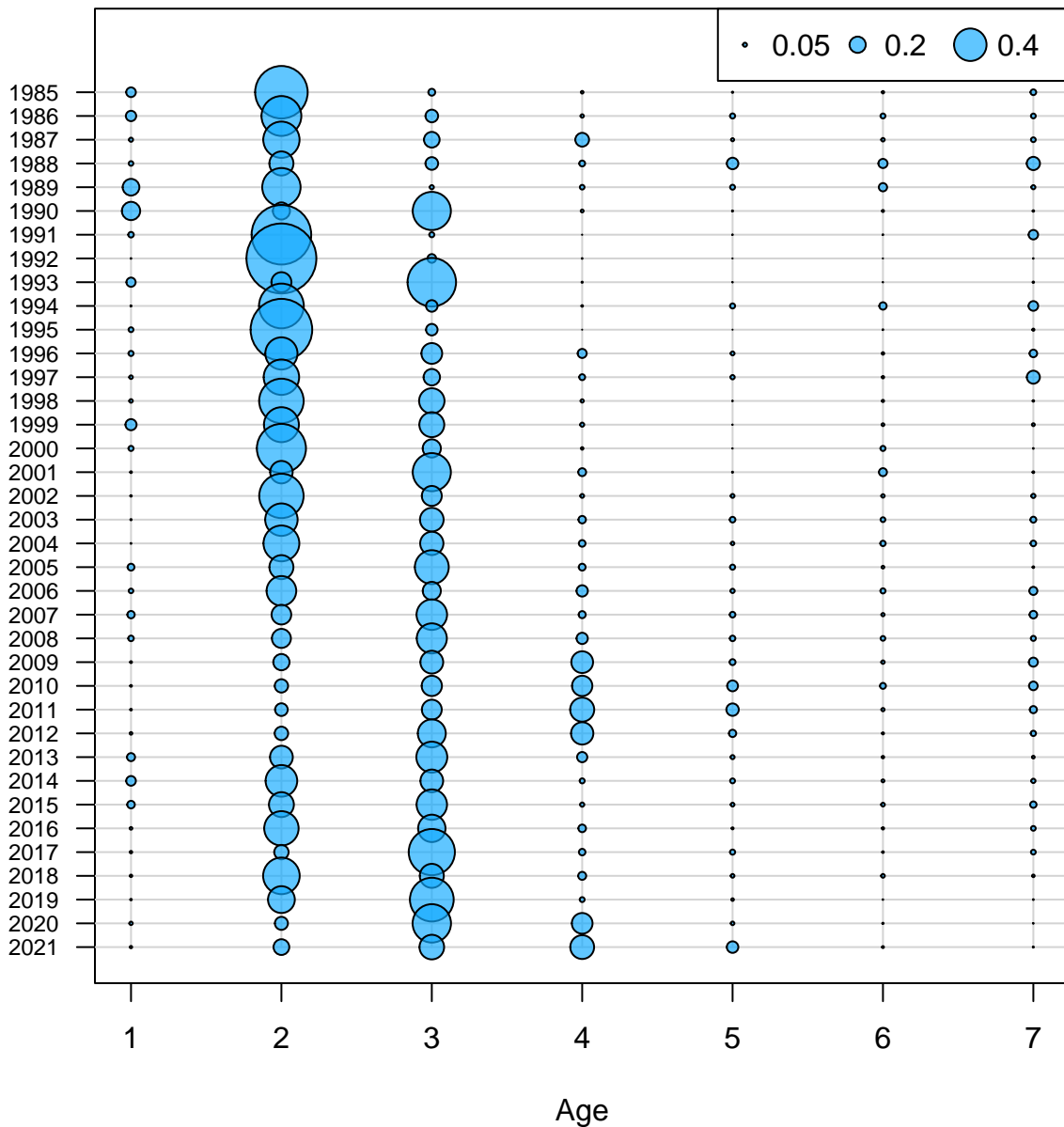
BF01: Continuity Run

DATA PLOTS

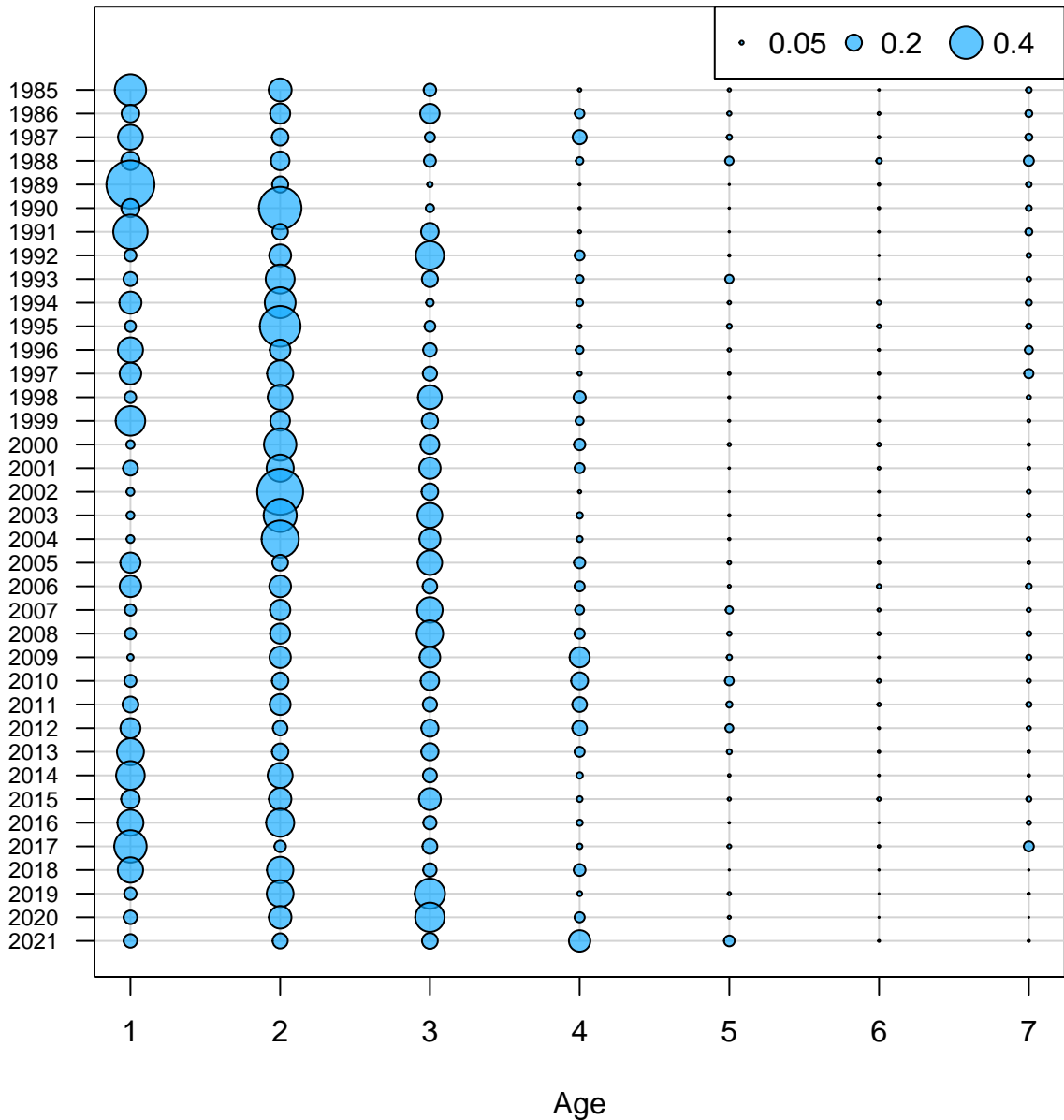


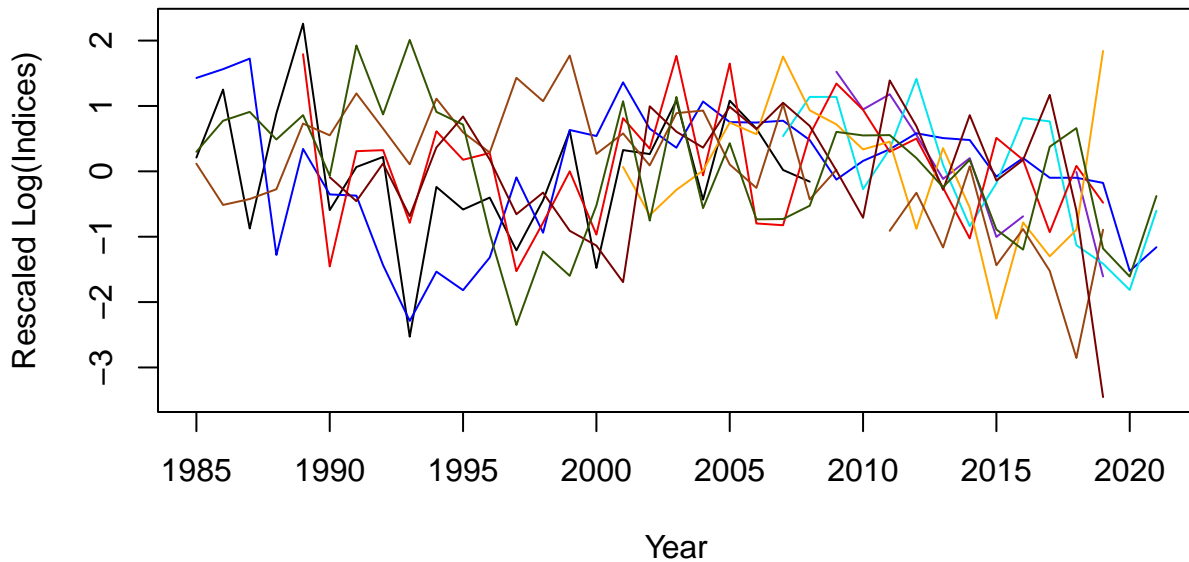
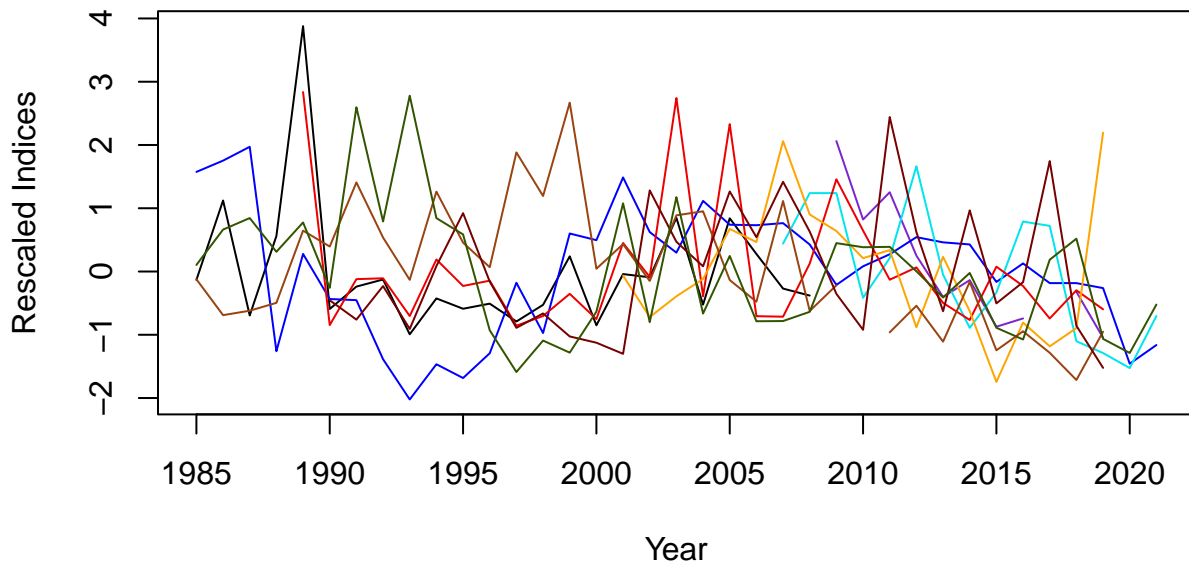


Age Comps for Catch by Fleet 1 (Comm)

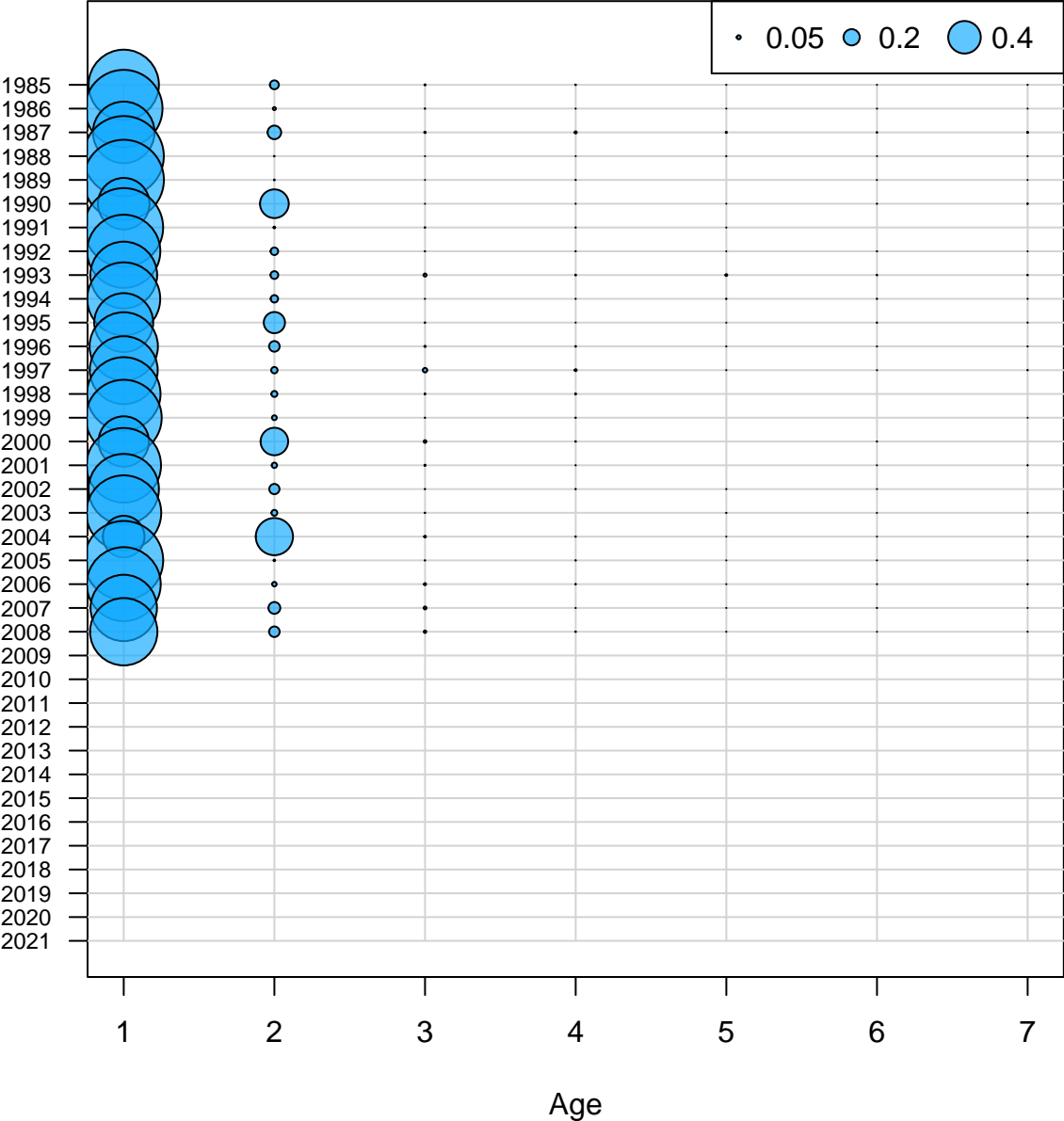


Age Comps for Catch by Fleet 2 (Rec)

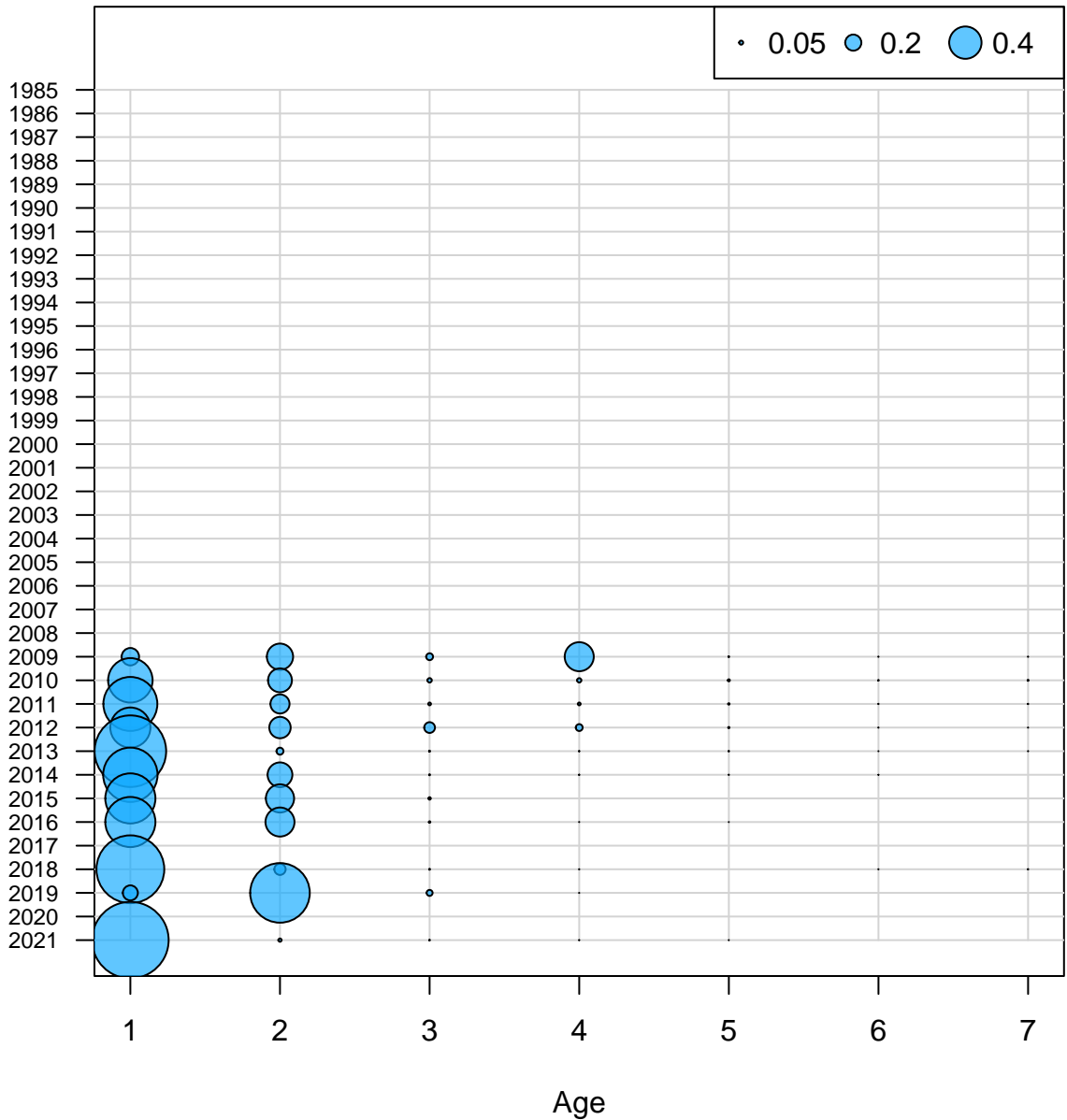




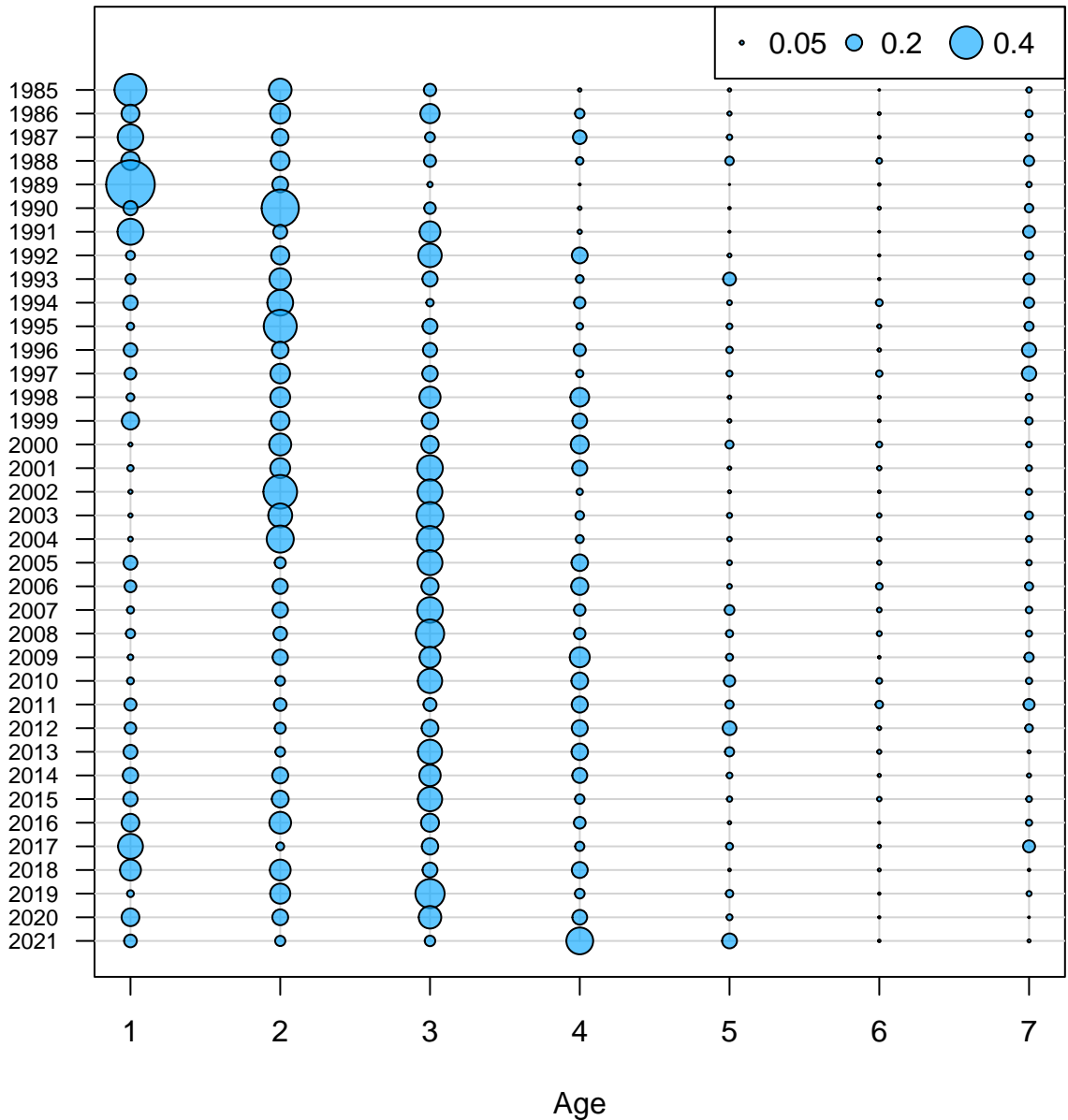
Age Comps for Index 1 (NEFSC Inshore)



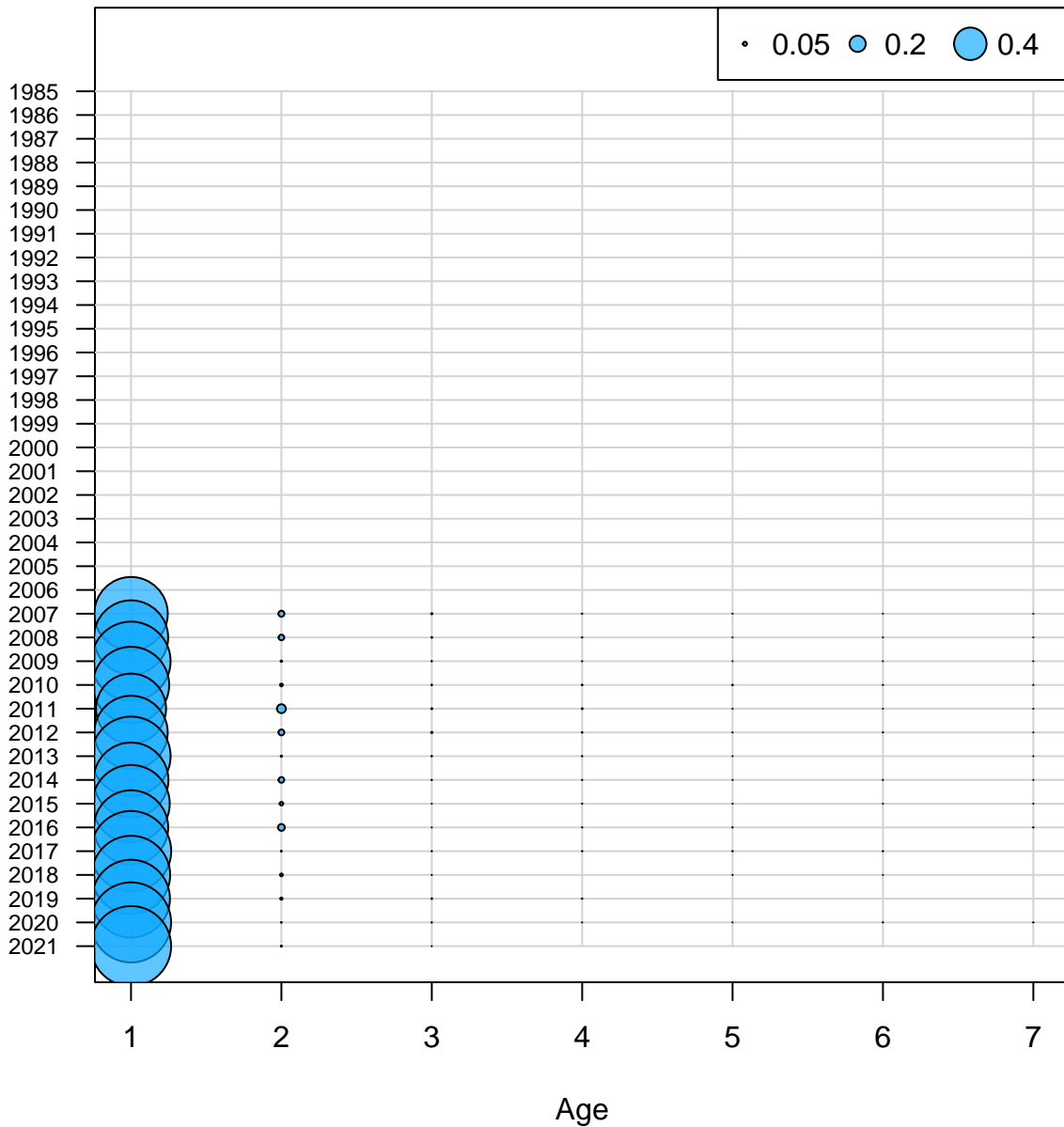
Age Comps for Index 2 (Bigelow)



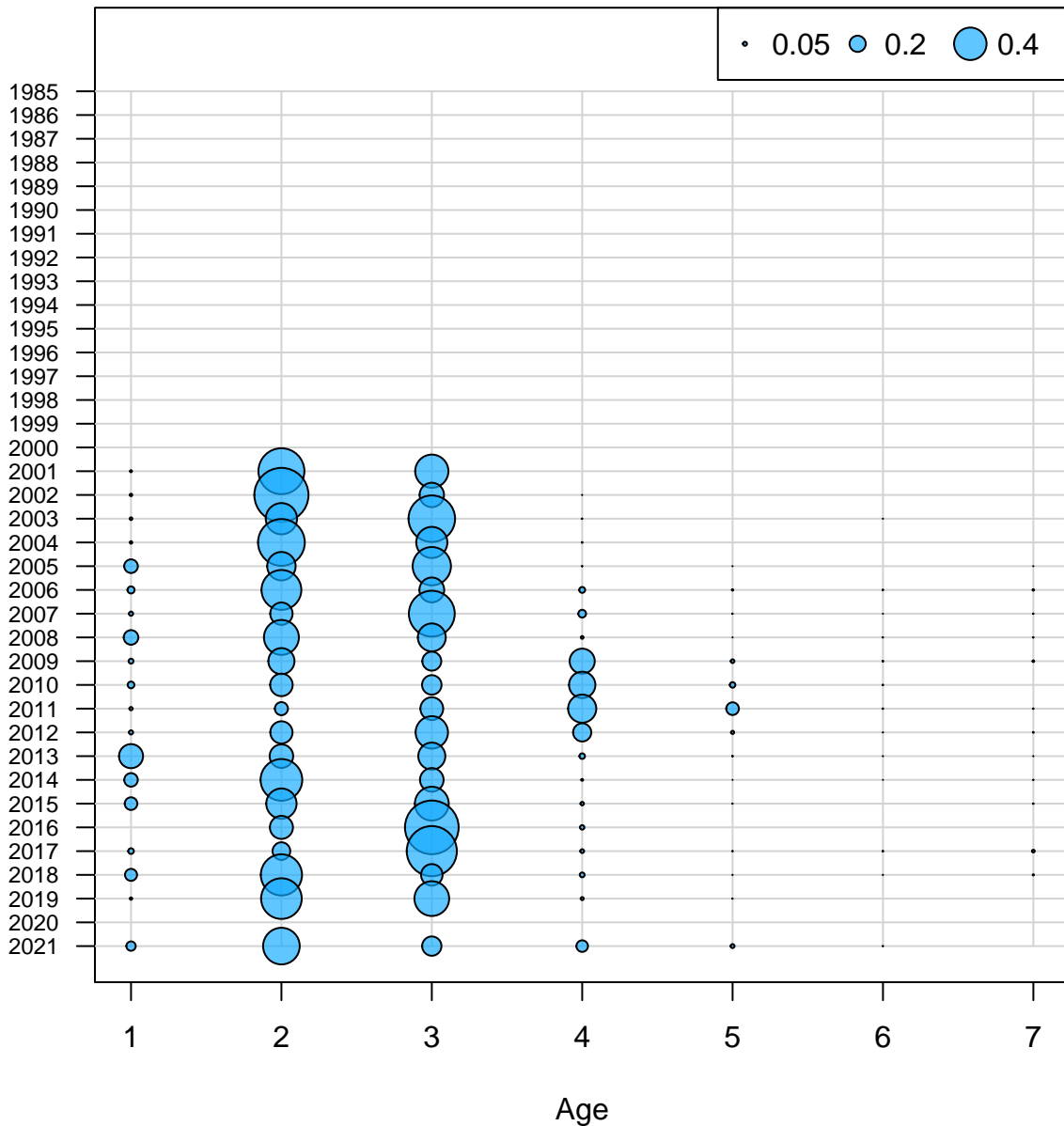
Age Comps for Index 3 (MRIP)



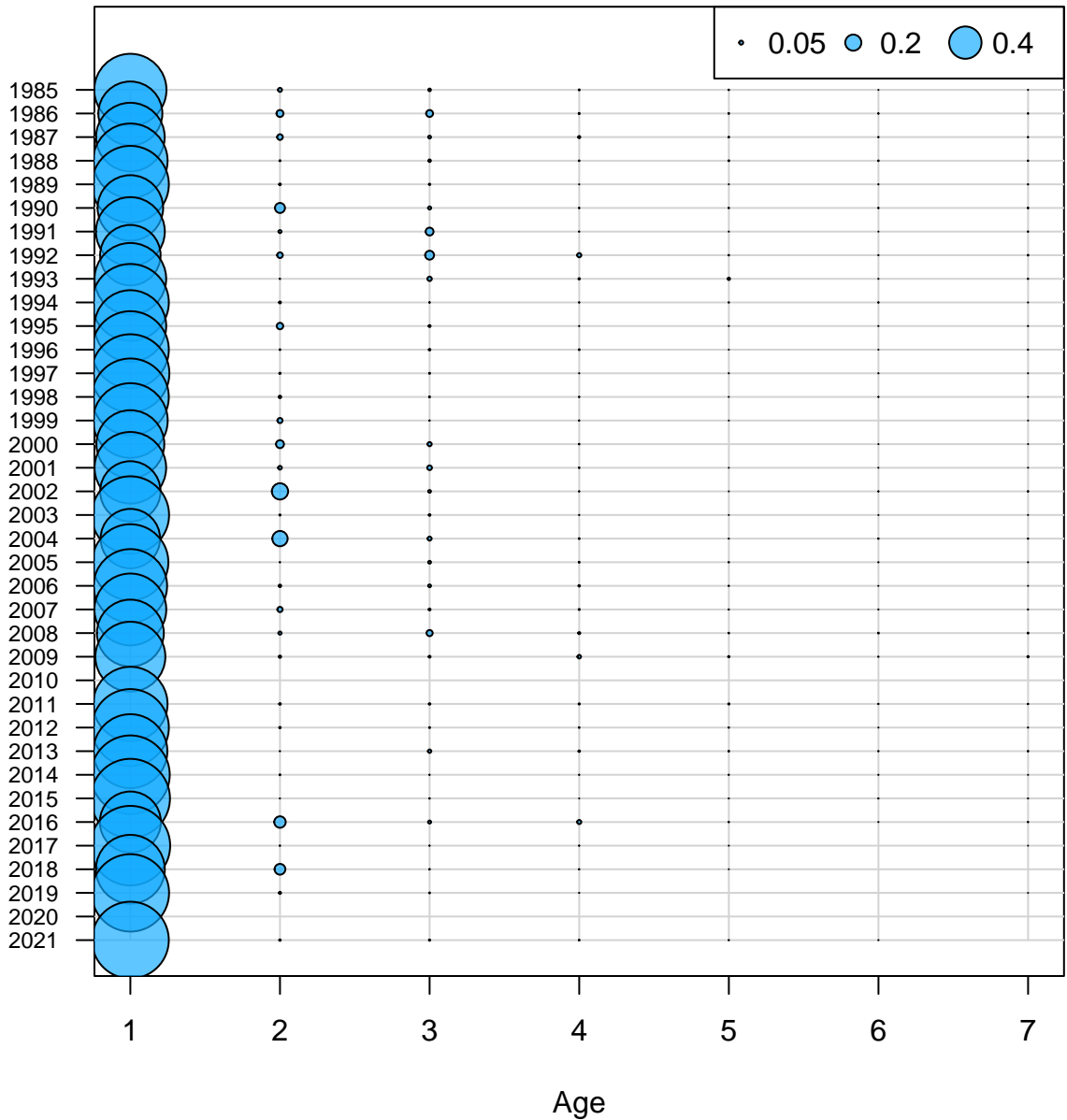
Age Comps for Index 4 (NEAMAP)



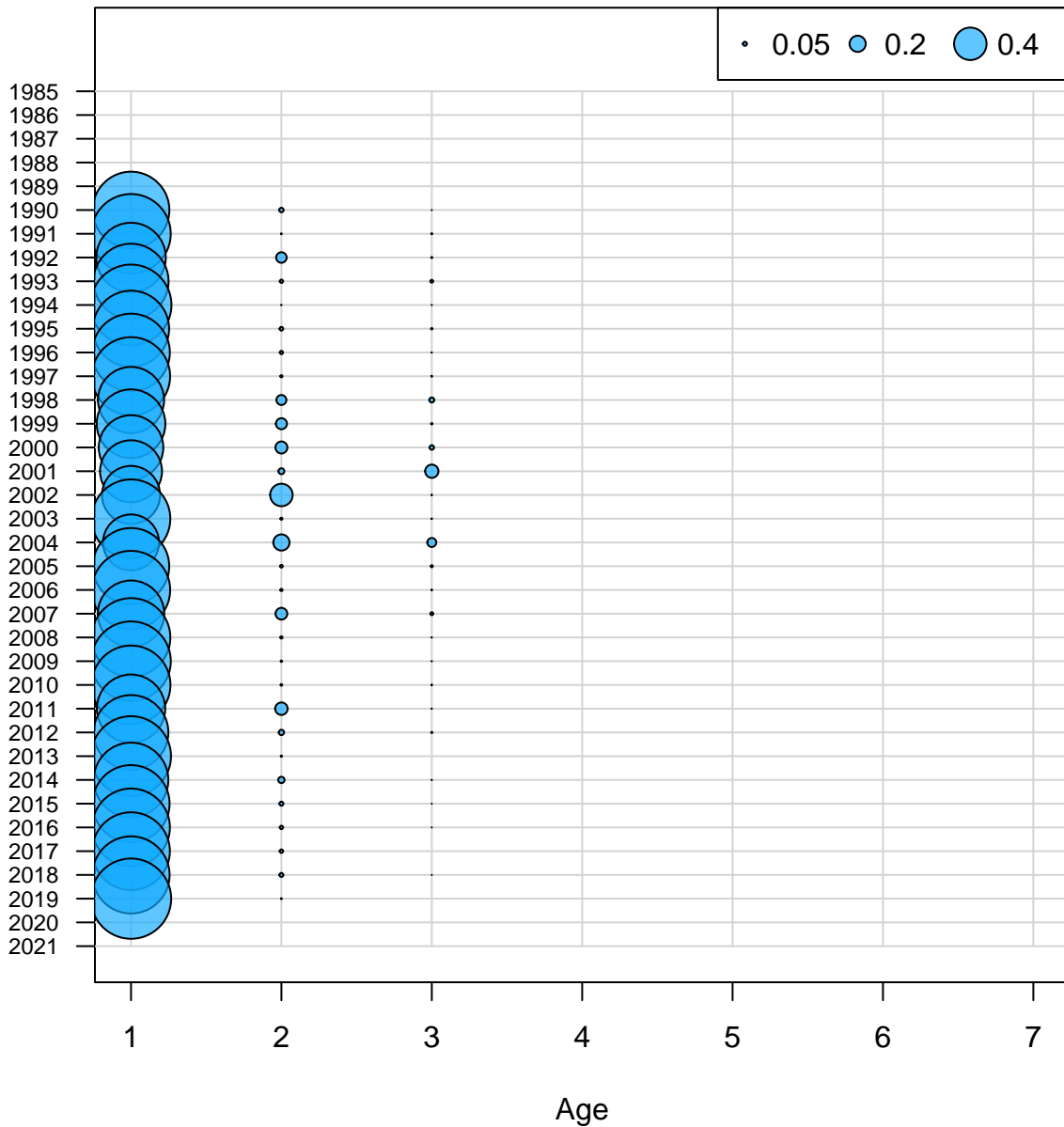
Age Comps for Index 6 (PSIGN)



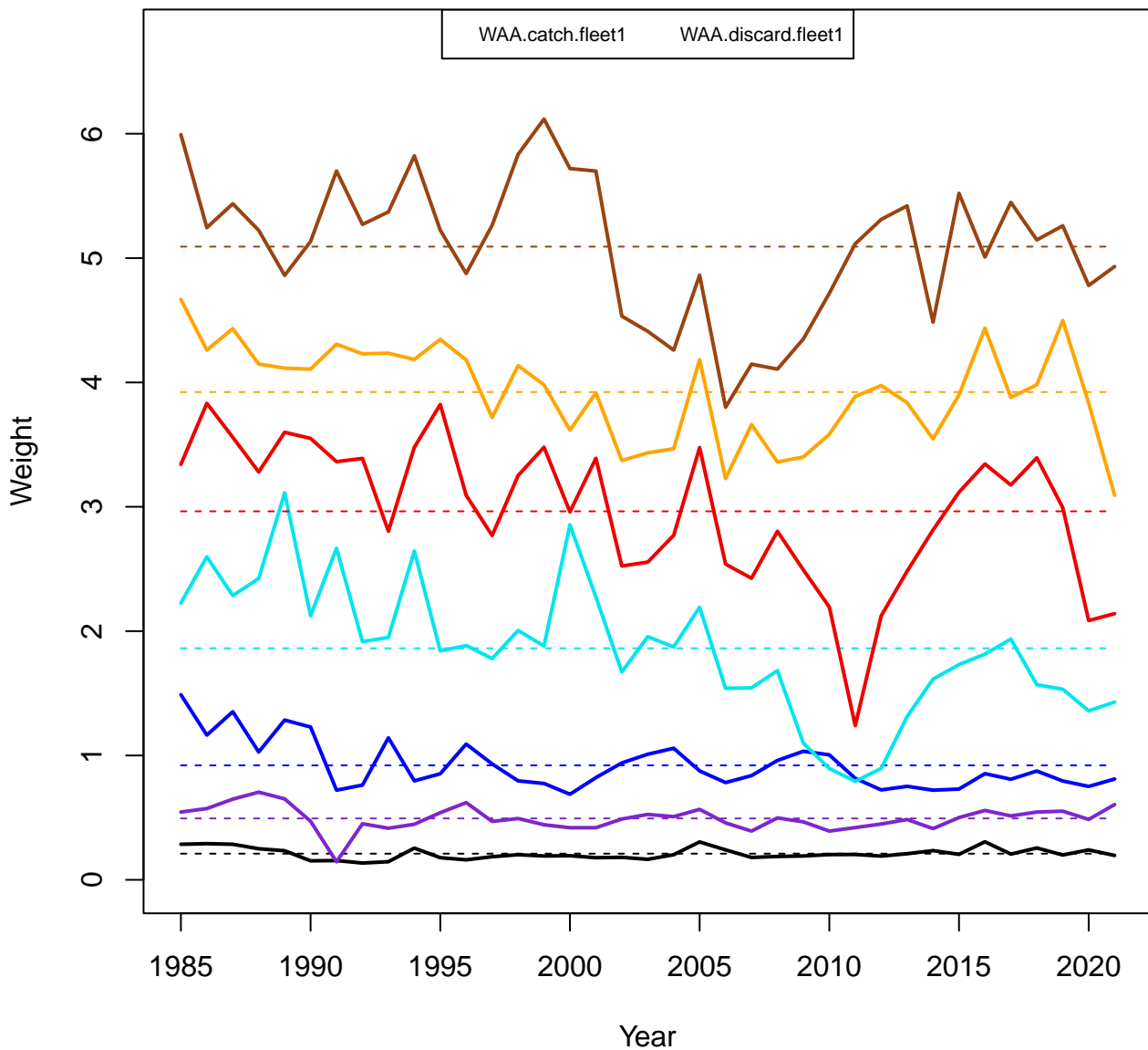
Age Comps for Index 7 (CT Trawl)



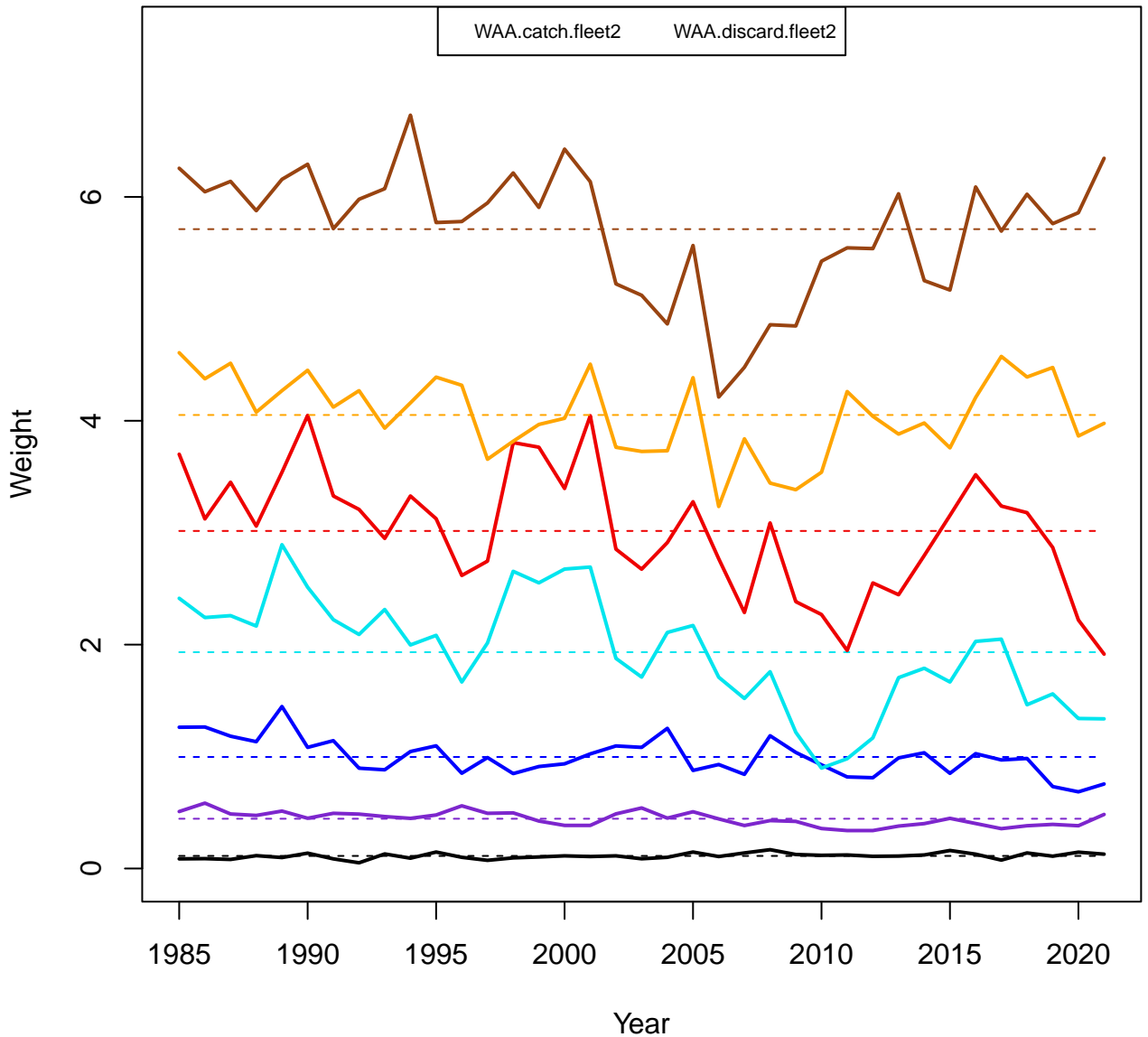
Age Comps for Index 8 (NJ Trawl)



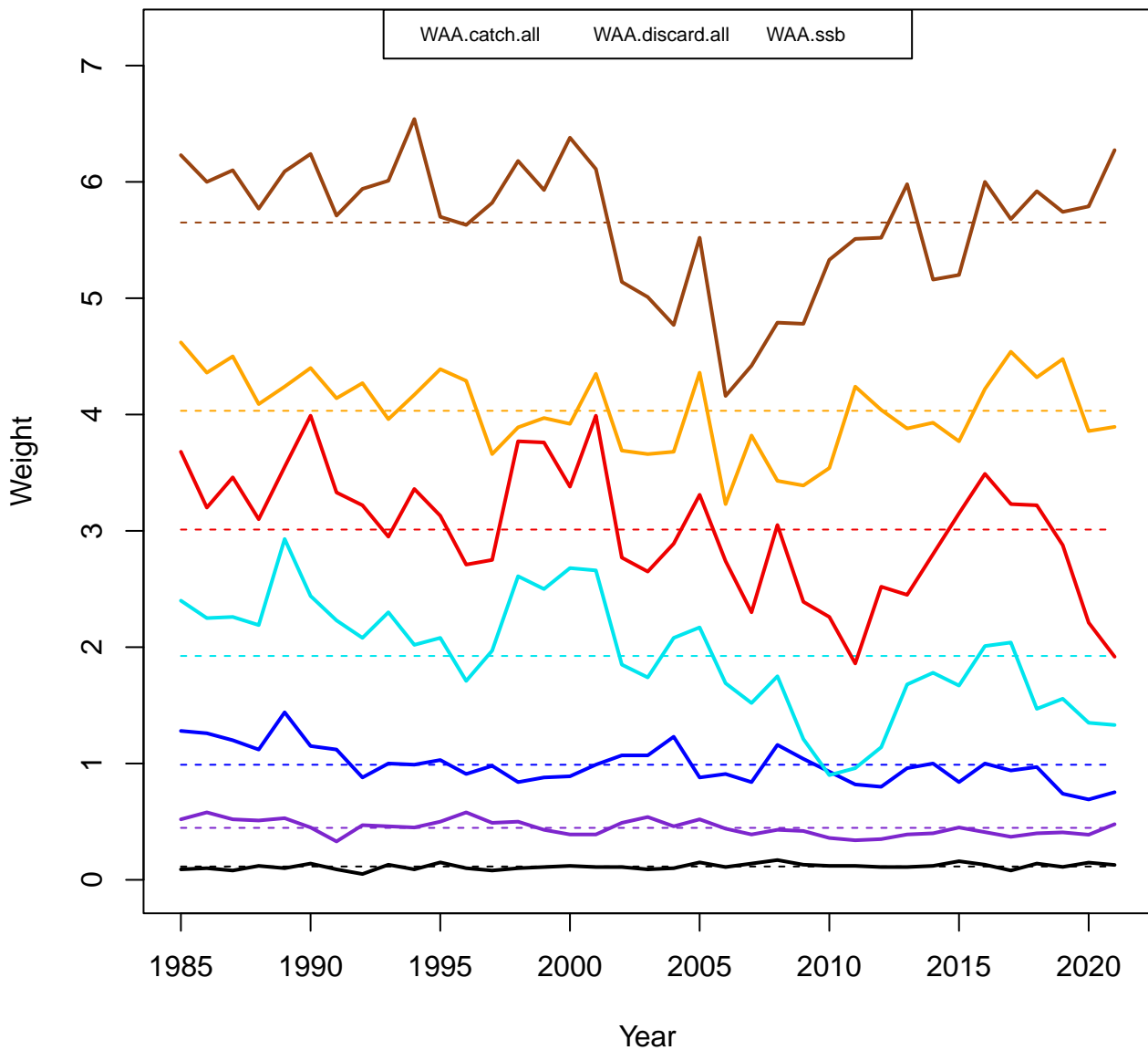
WAA matrix 1



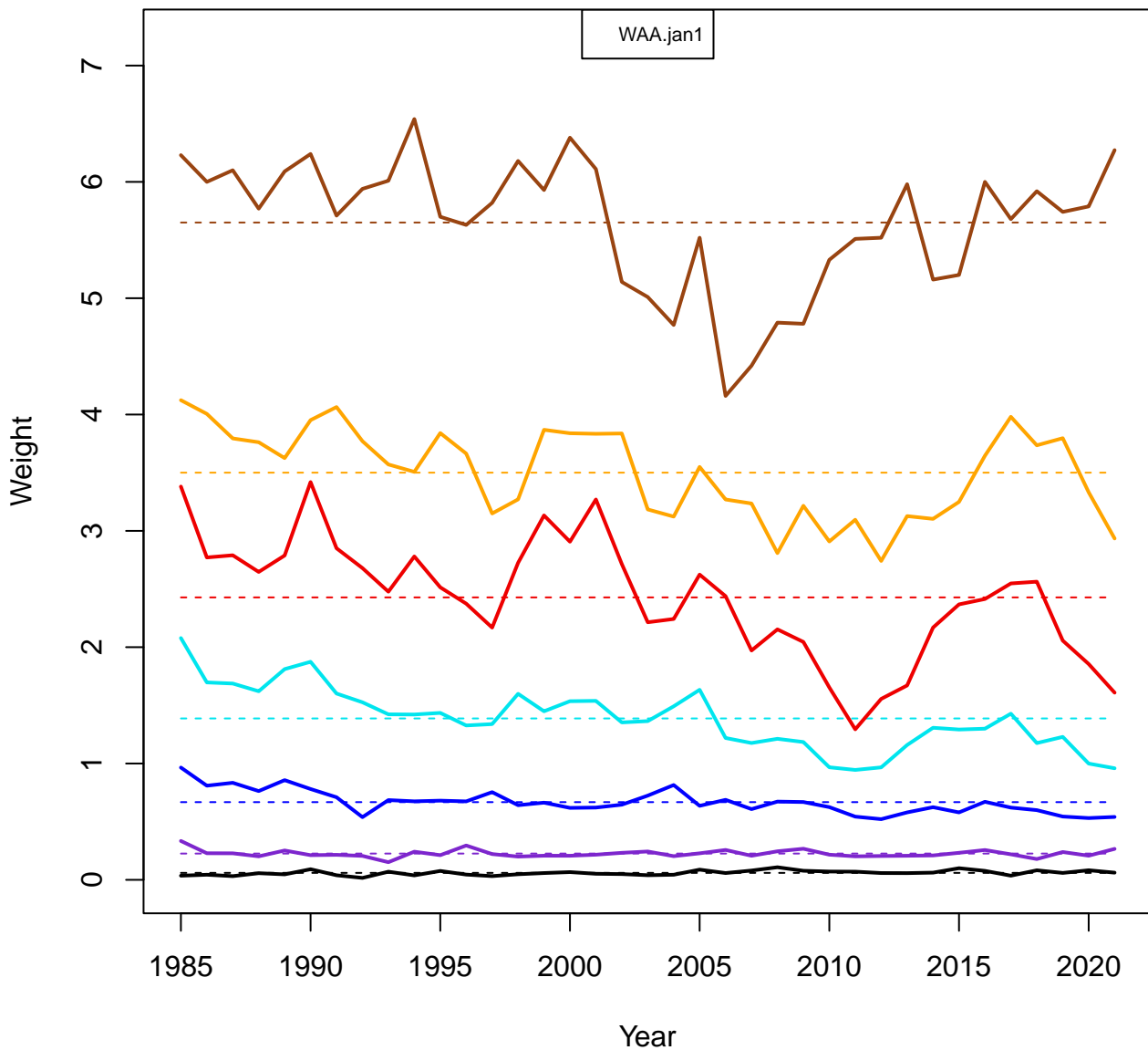
WAA matrix 2



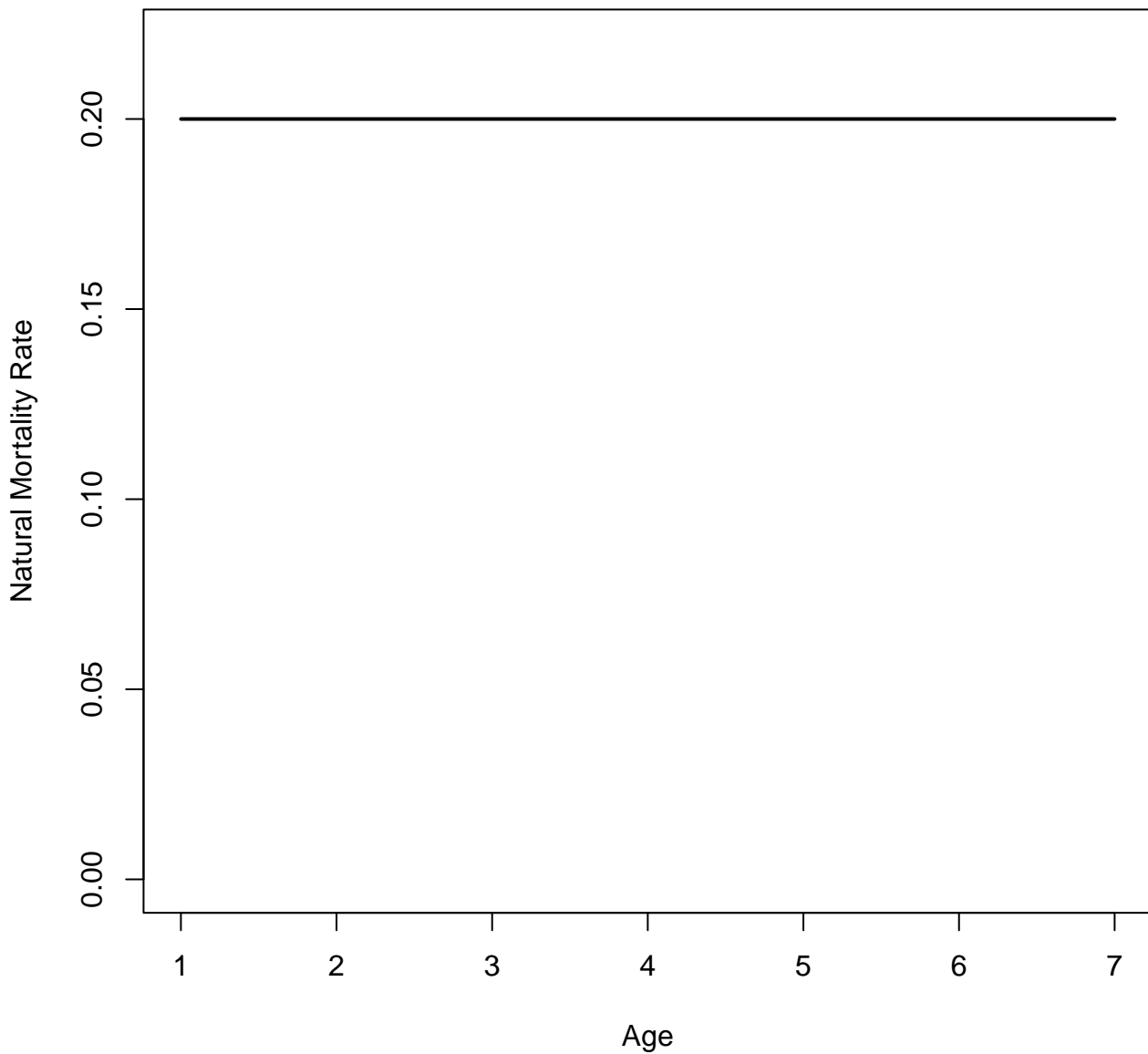
WAA matrix 3



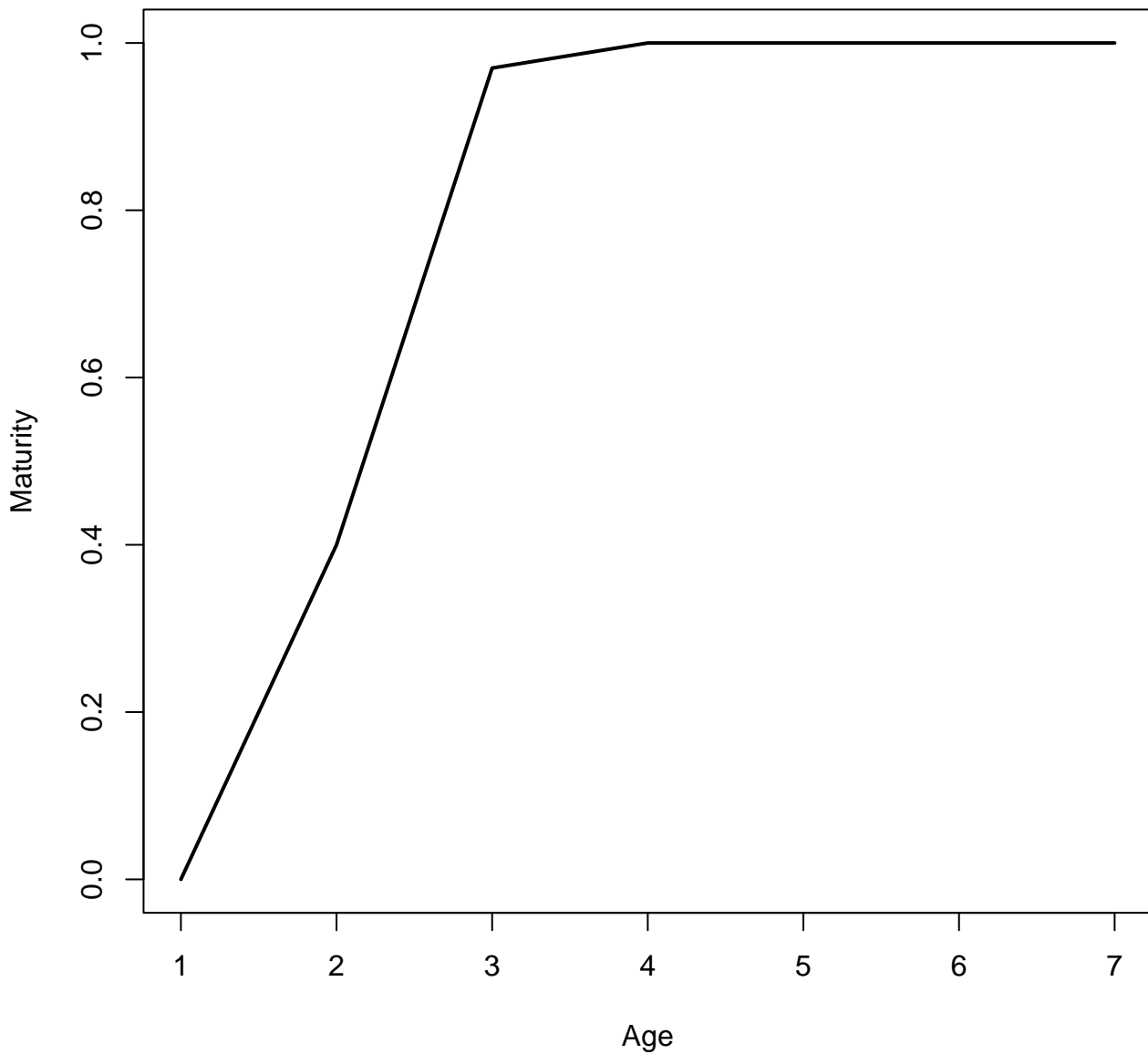
WAA matrix 4



M



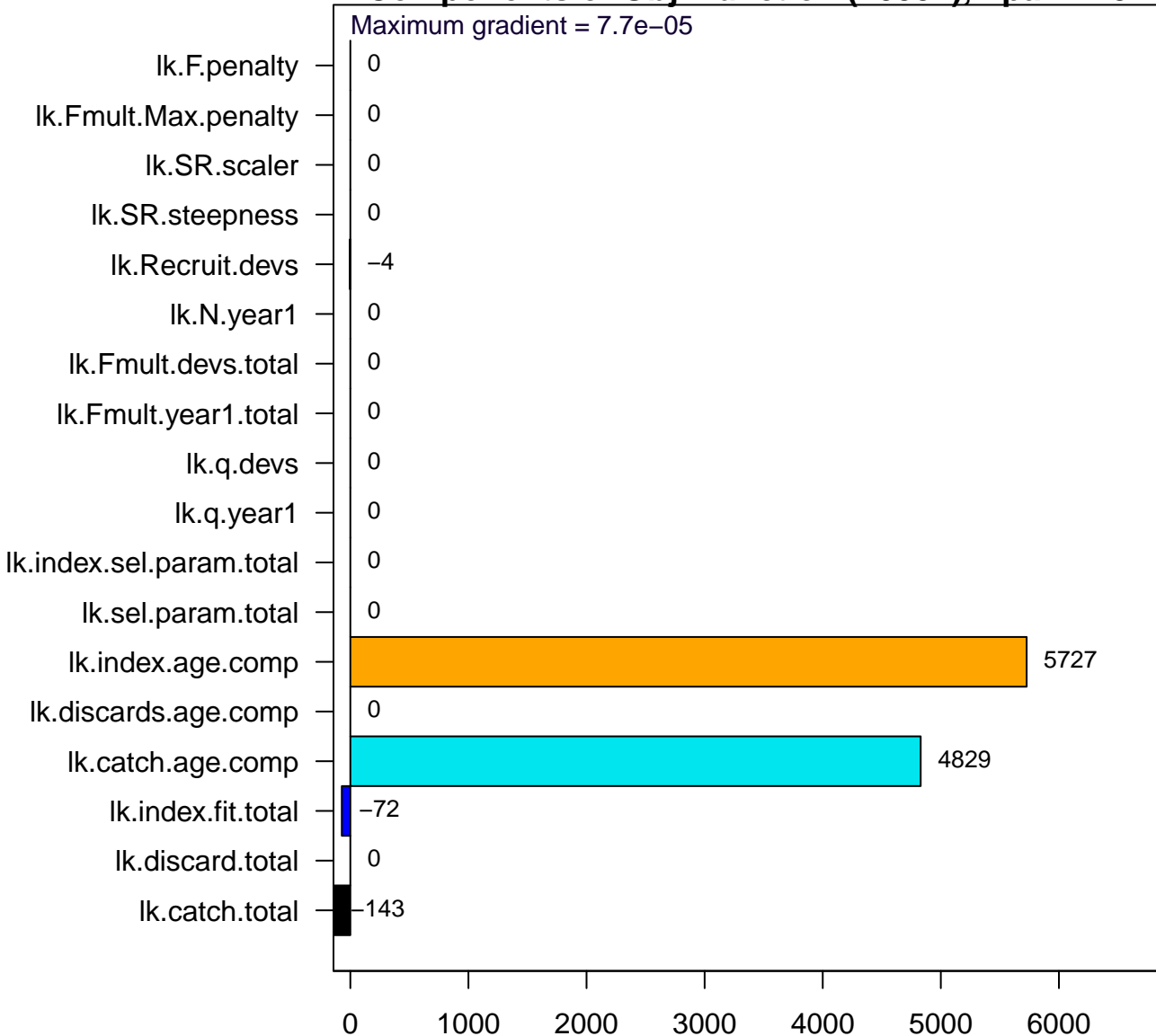
Maturity



BF01: Continuity Run

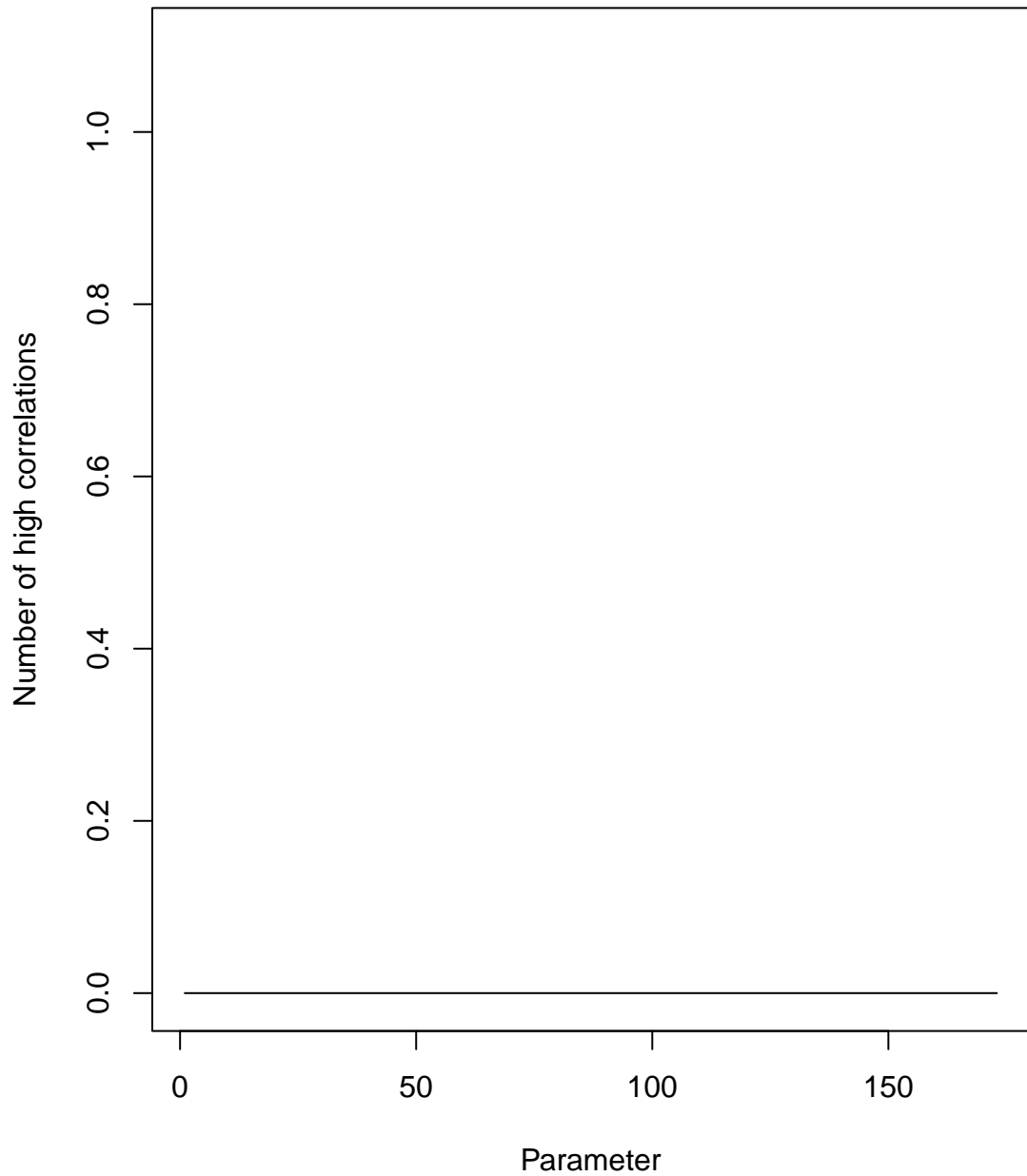
DIAGNOSTIC PLOTS

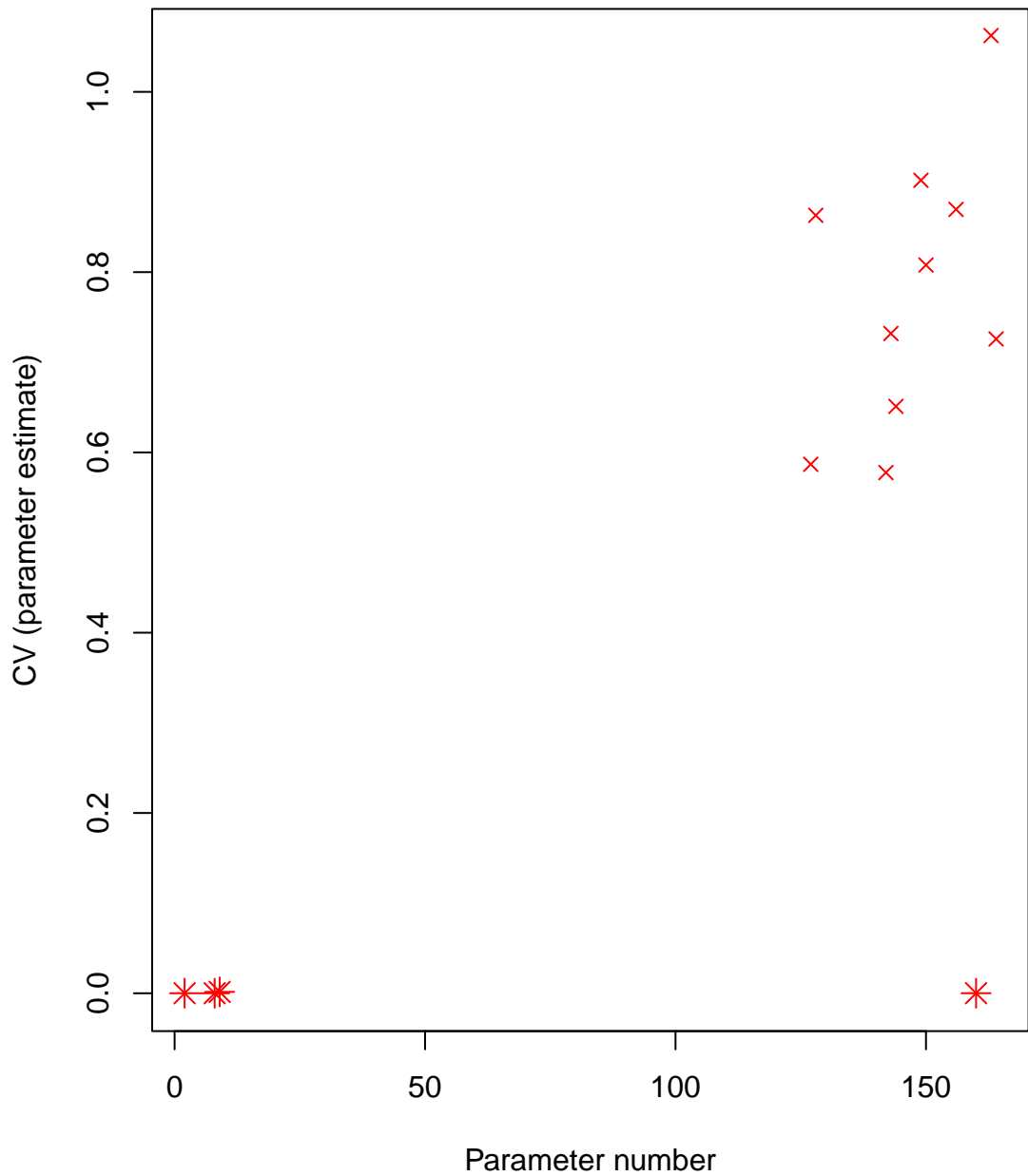
Components of Obj. Function (10337), npar=173



Likelihood Contribution

Model: BF01 Friday, 23 Sep 2022 at 12:07:26

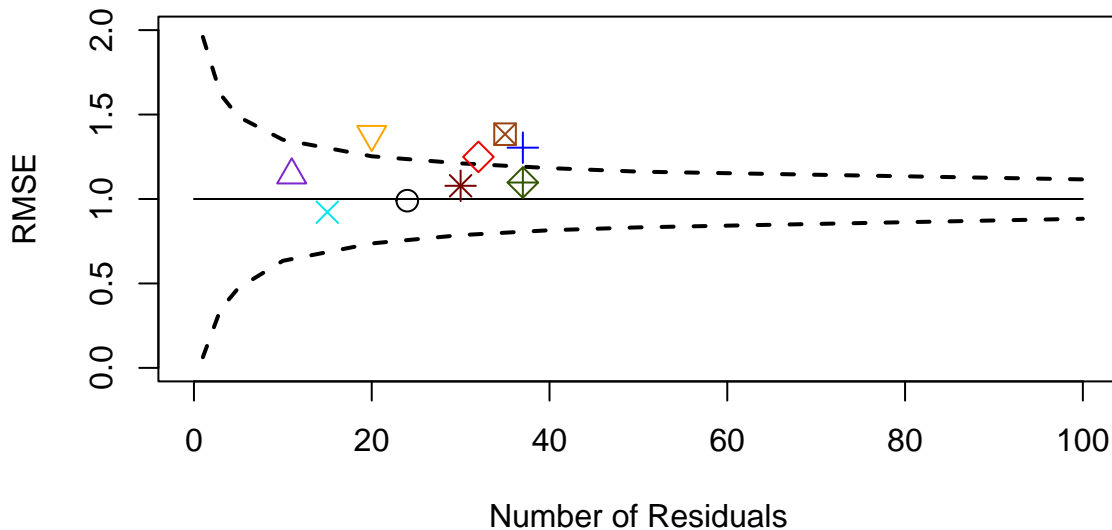




Root Mean Square Error computed from Standardized Residuals

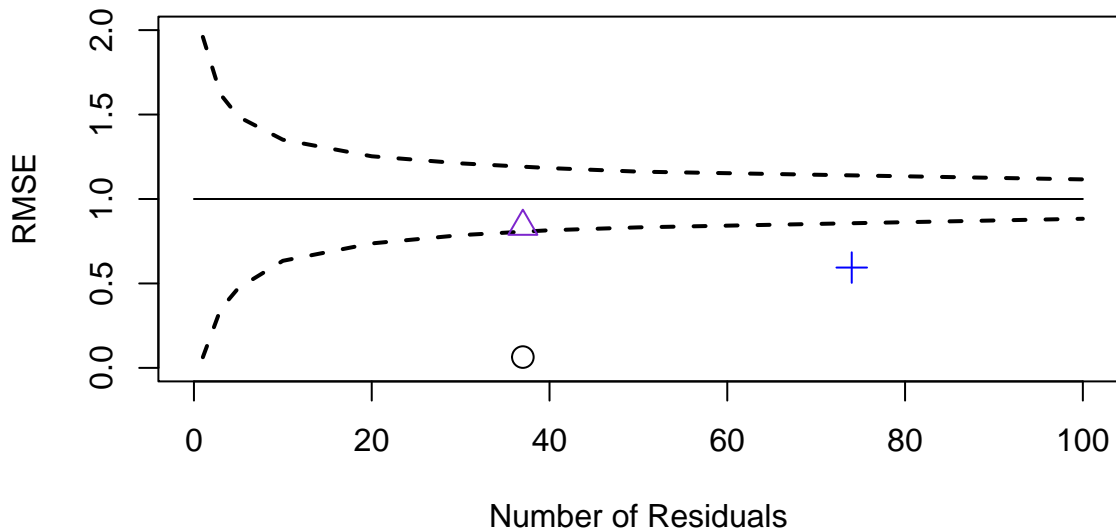
Component	# resids	RMSE
catch.fleet1	37	0.064
catch.fleet2	37	0.838
catch.tot	74	0.594
discard.fleet1	0	0
discard.fleet2	0	0
discard.tot	0	0
ind01	24	0.99
ind02	11	1.14
ind03	37	1.3
ind04	15	0.922
ind05	32	1.25
ind06	20	1.38
ind07	35	1.38
ind08	30	1.08
ind09	37	1.1
ind.total	241	1.2
N.year1	0	0
Fmult.year1	0	0
Fmult.devs.fleet1	0	0
Fmult.devs.fleet2	0	0
Fmult.devs.total	0	0
recruit.devs	37	0.356
fleet.sel.params	0	0
index.sel.params	0	0
q.year1	0	0
q.devs	0	0
SR.steepness	0	0
SR.scaler	0	0

Root Mean Square Error for Indices



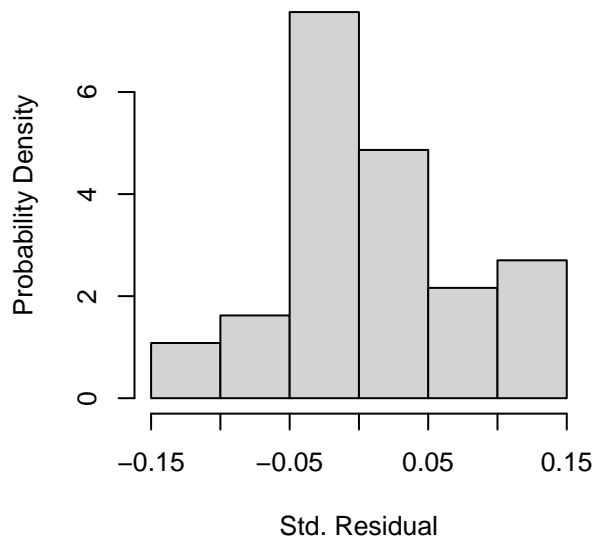
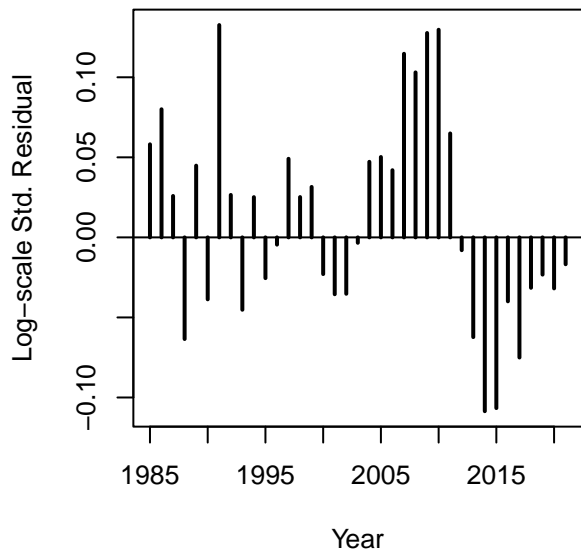
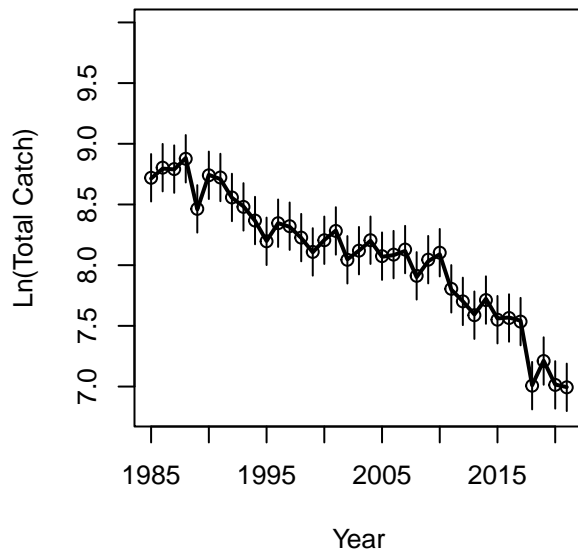
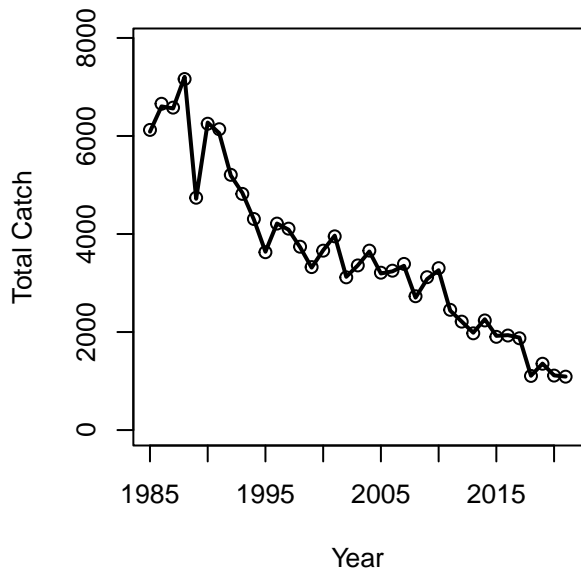
- ind.total
- Compound YOY
- NI Trawl
- CT Trawl
- SSIGN
- SEAMAP
- NEAMAP
- MRIP
- Bigelow
- NEF SC Inshore

Root Mean Square Error for Catch

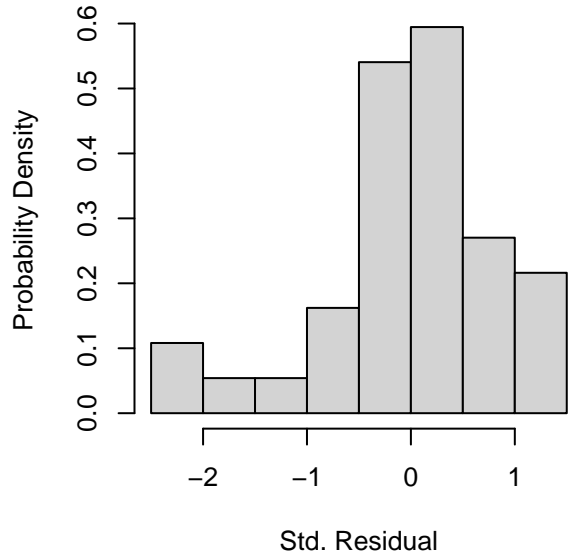
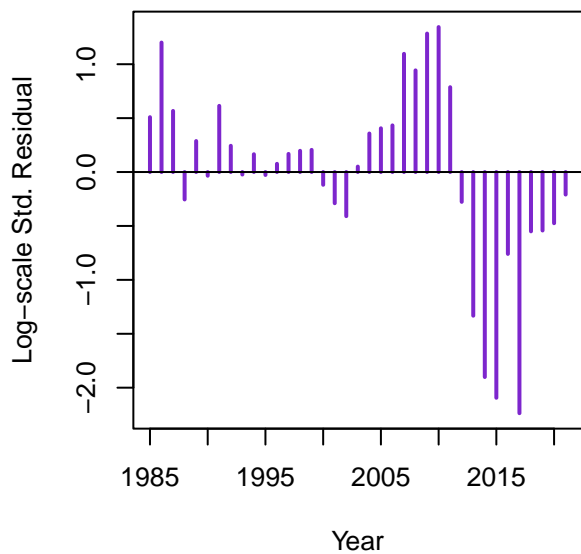
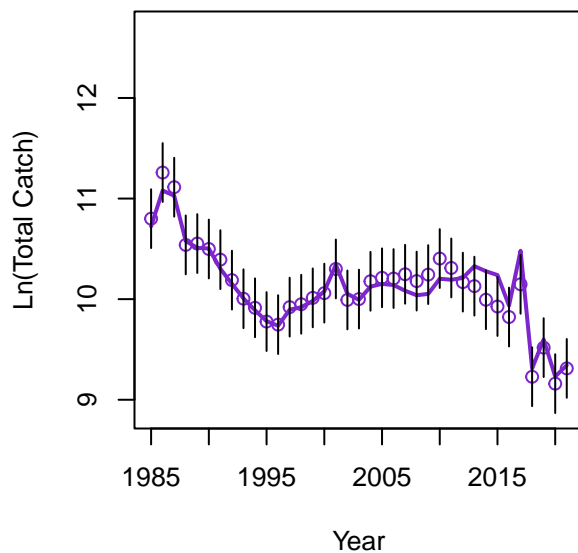
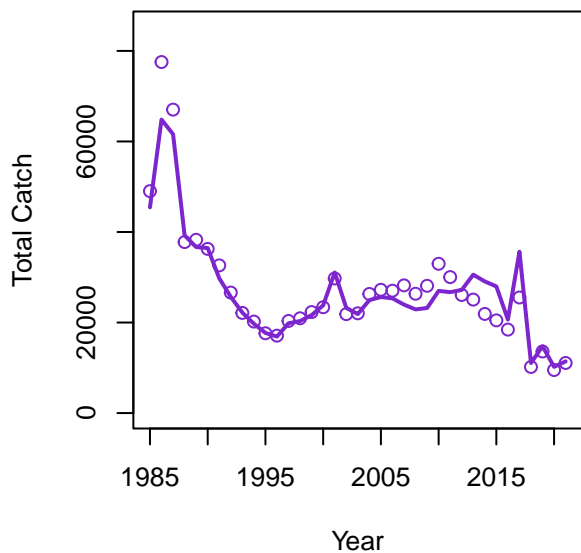


+ `catch.tot`
△ `catch.fleet2`
○ `catch.fleet1`

Fleet 1 Catch (Comm)

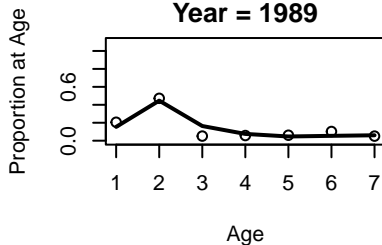


Fleet 2 Catch (Rec)

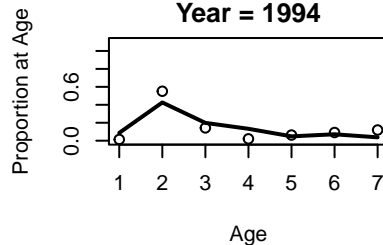


Catch

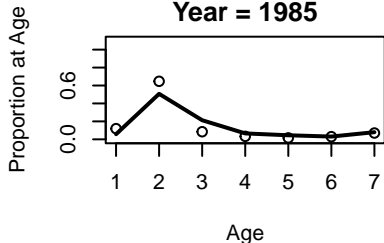
Year = 1989



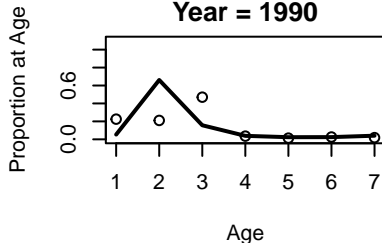
Year = 1994



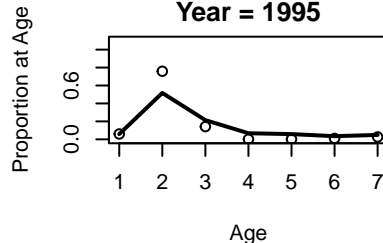
Year = 1985



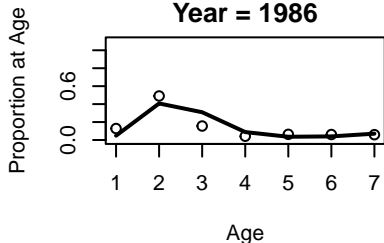
Year = 1990



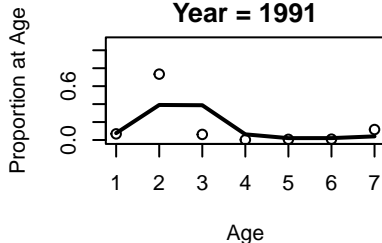
Year = 1995



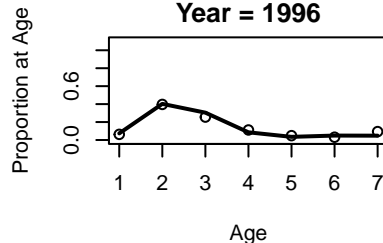
Year = 1986



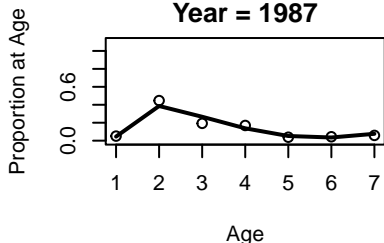
Year = 1991



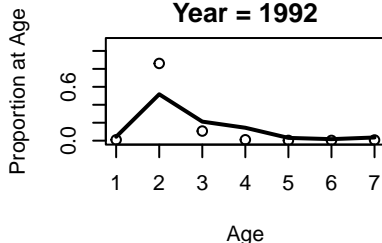
Year = 1996



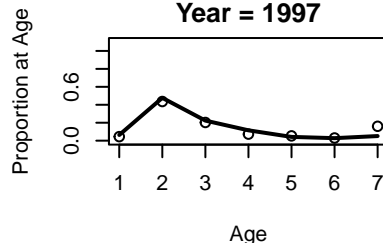
Year = 1987



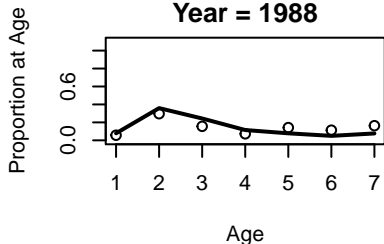
Year = 1992



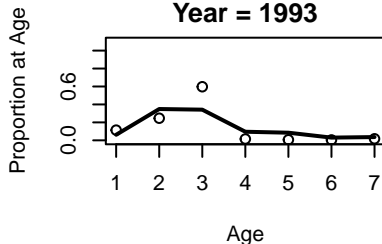
Year = 1997



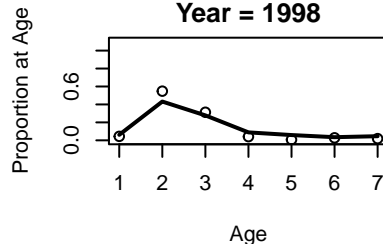
Year = 1988



Year = 1993

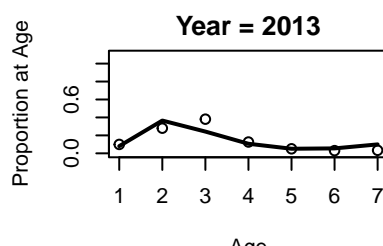
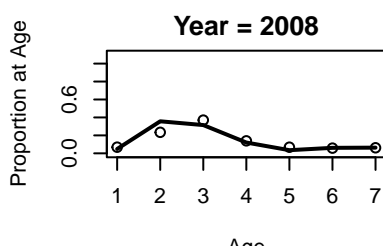
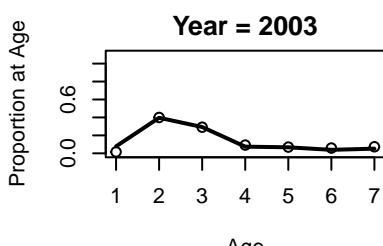
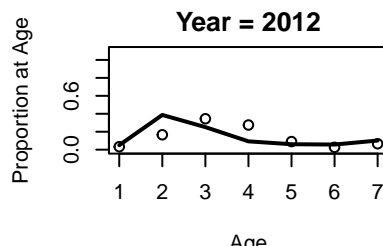
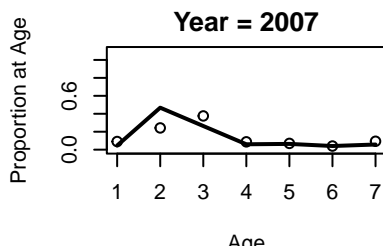
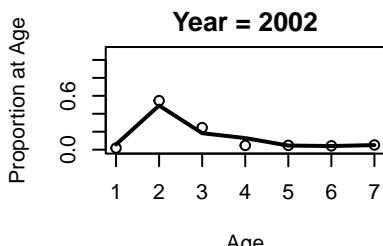
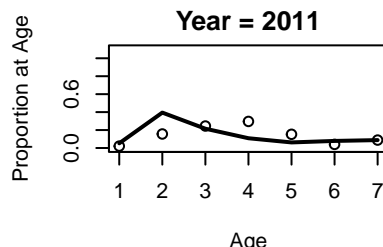
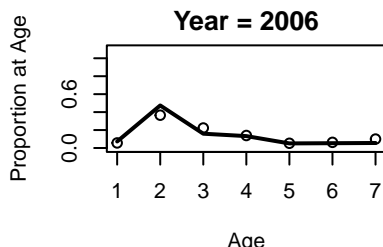
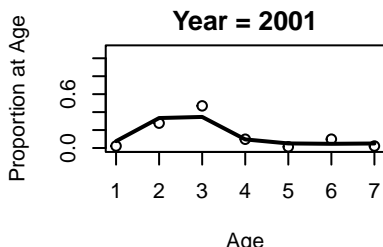
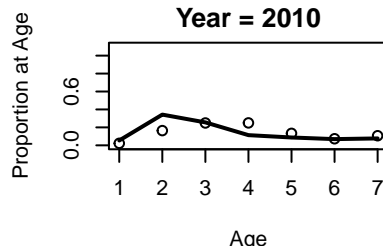
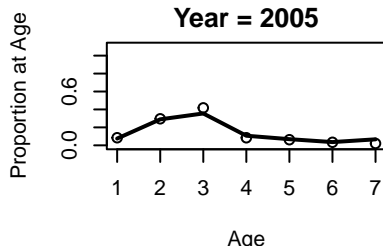
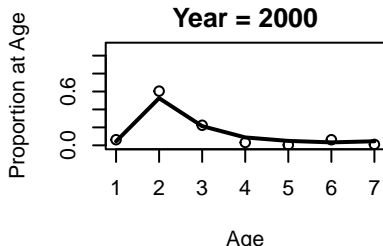
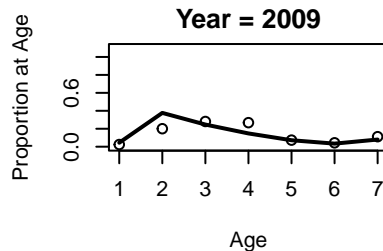
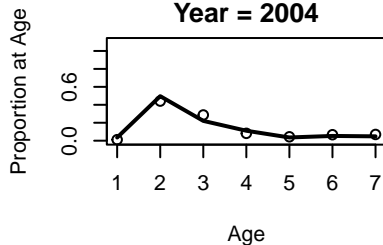
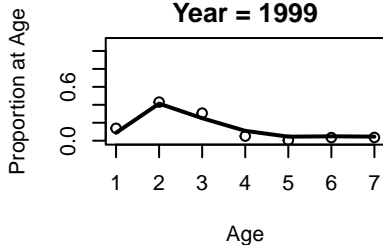
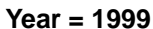


Year = 1998



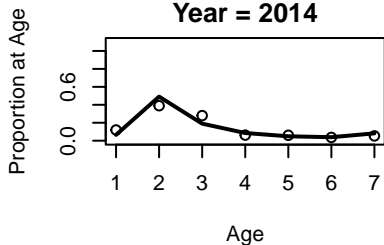
Fleet 1
Comm
↓

Year = 2004

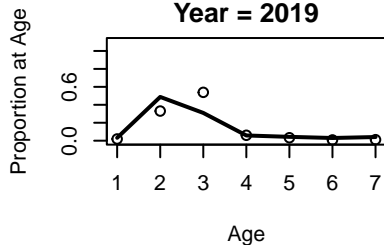


Catch

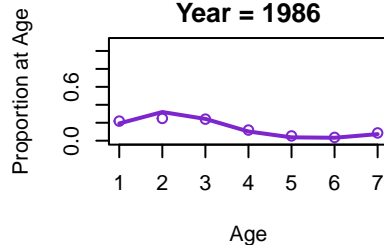
Year = 2014



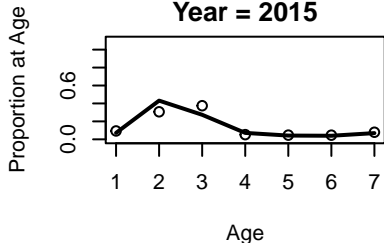
Year = 2019



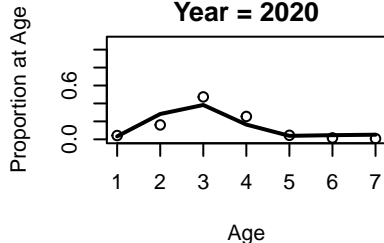
Year = 1986



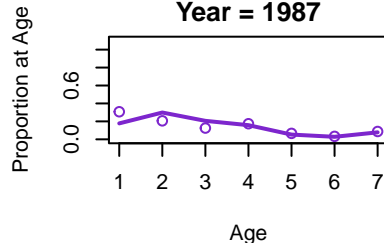
Year = 2015



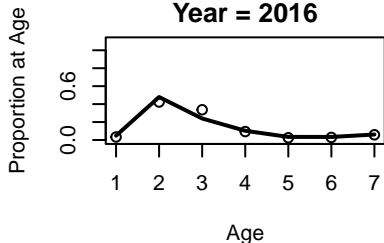
Year = 2020



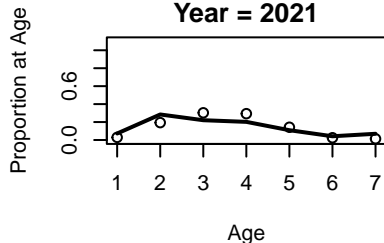
Year = 1987



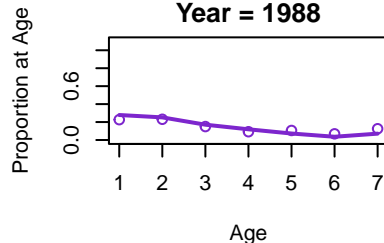
Year = 2016



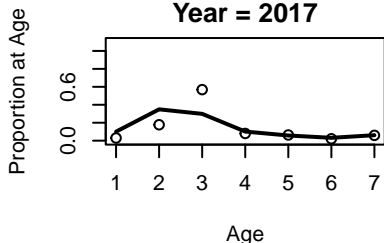
Year = 2021



Year = 1988

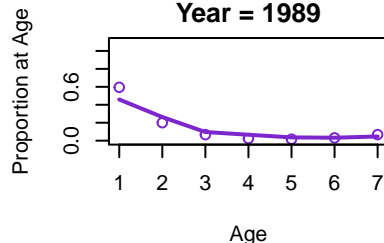


Year = 2017

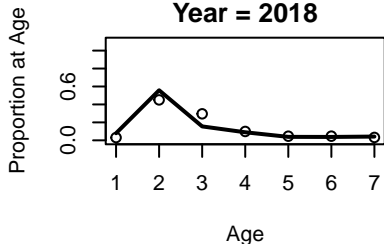


Fleet 2
Rec
↓

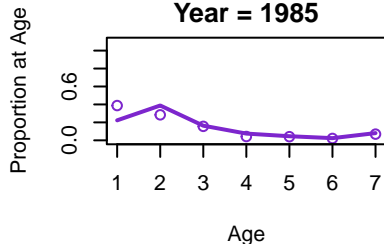
Year = 1989



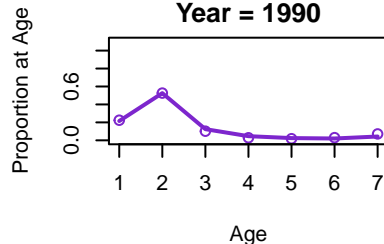
Year = 2018



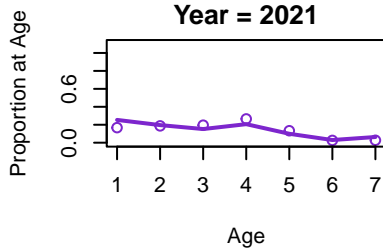
Year = 1985



Year = 1990

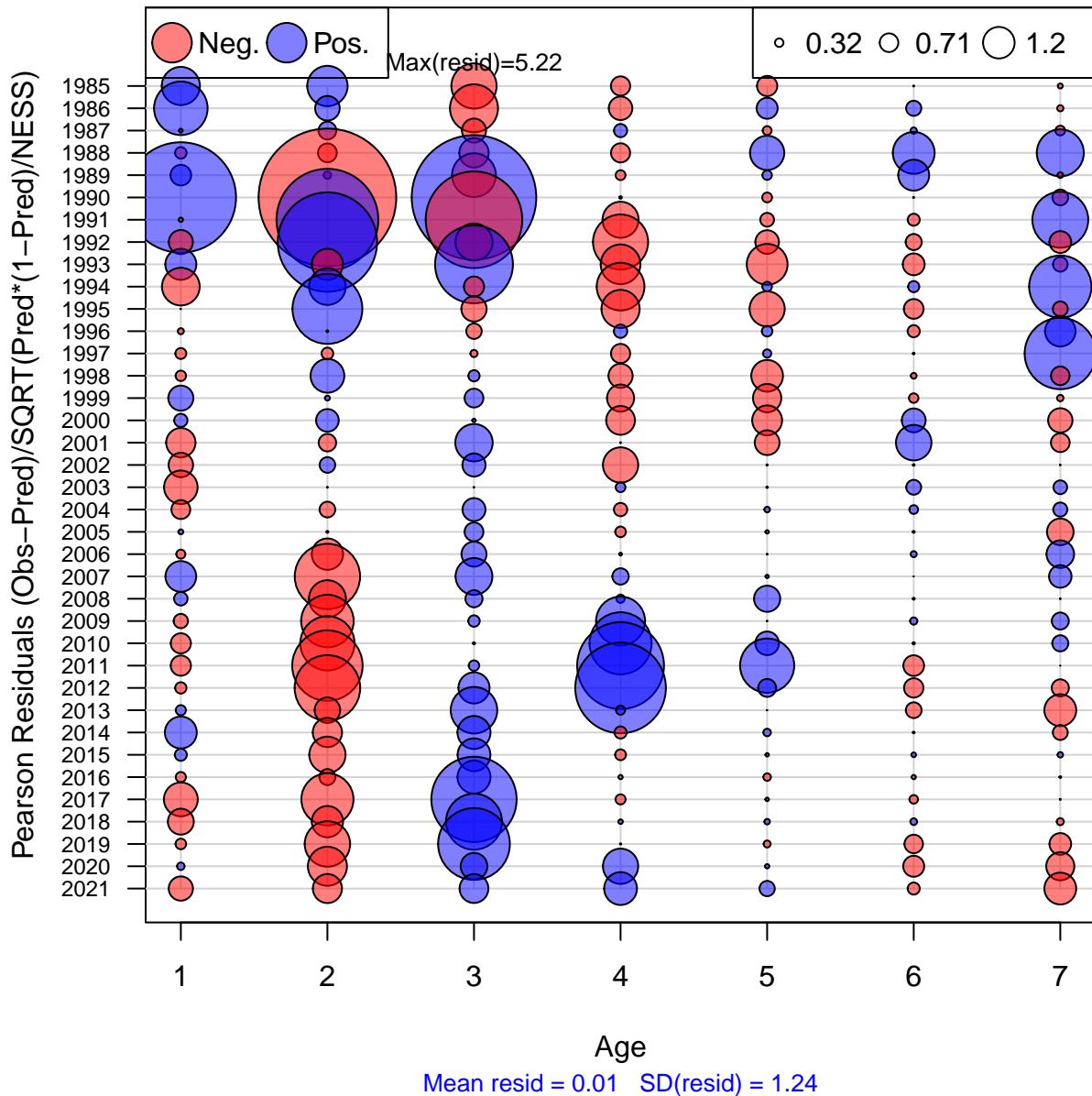


Year = 2021

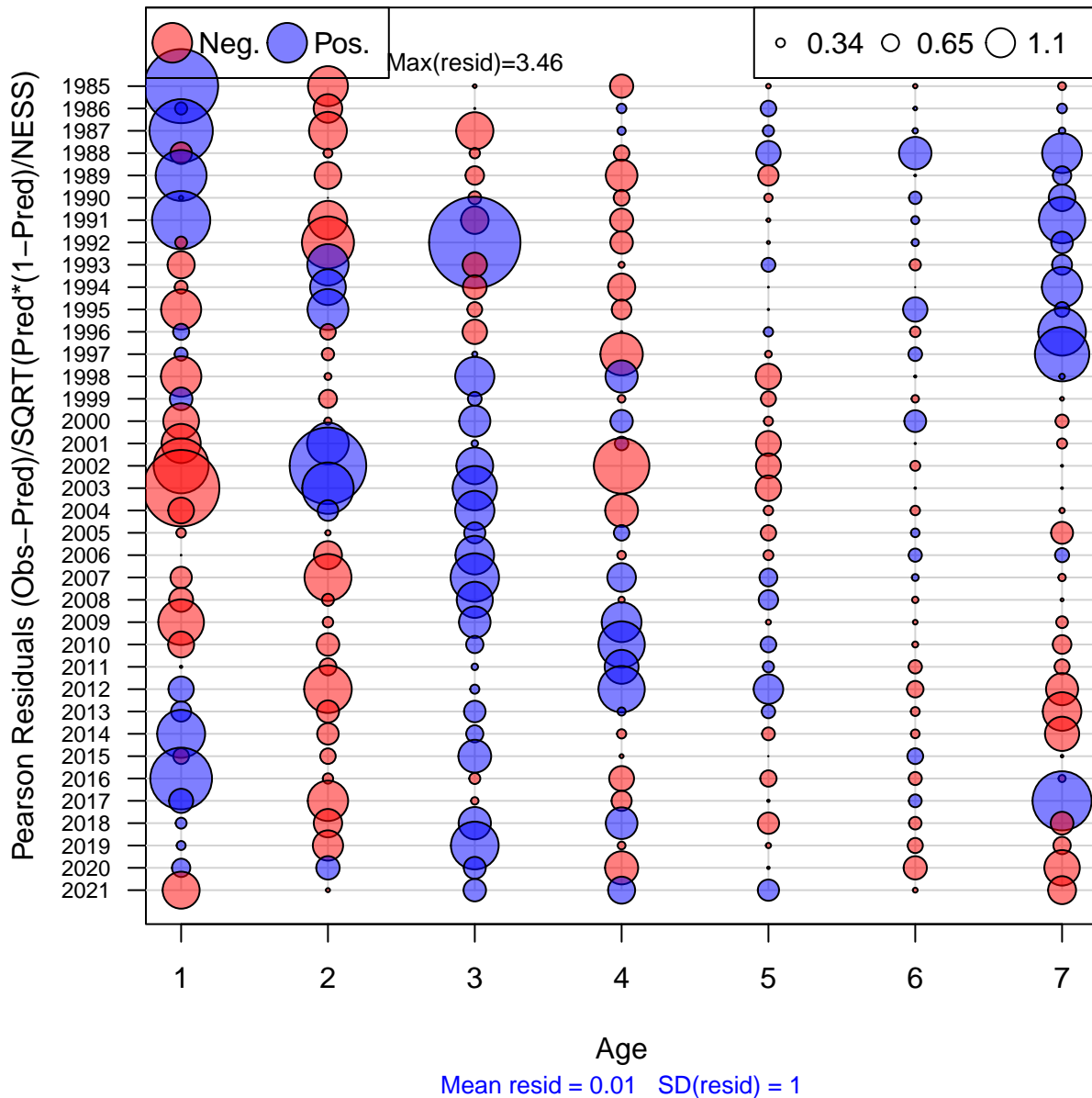


Catch

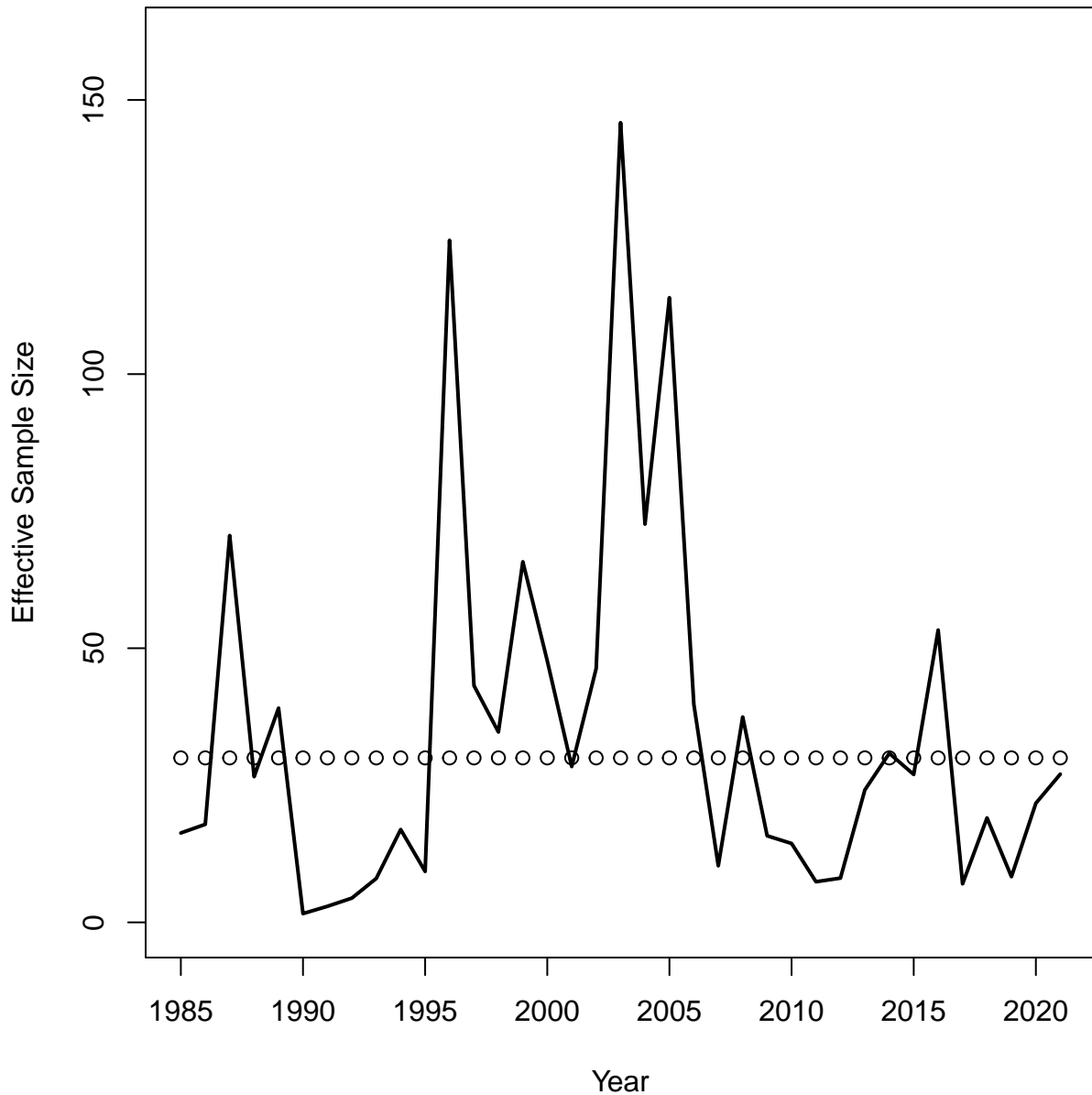
Age Comp Residuals for Catch by Fleet 1 (Comm)



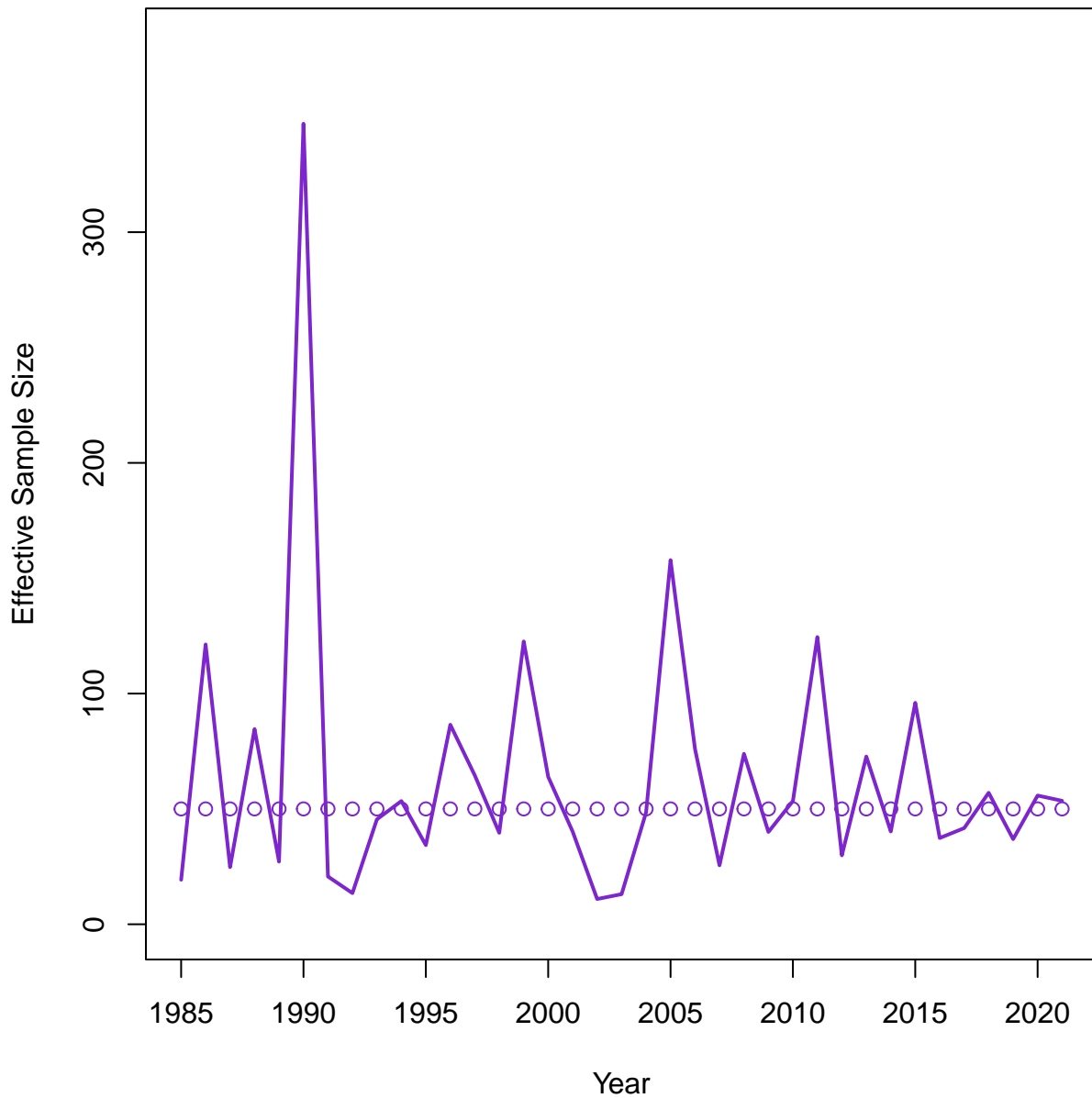
Age Comp Residuals for Catch by Fleet 2 (Rec)



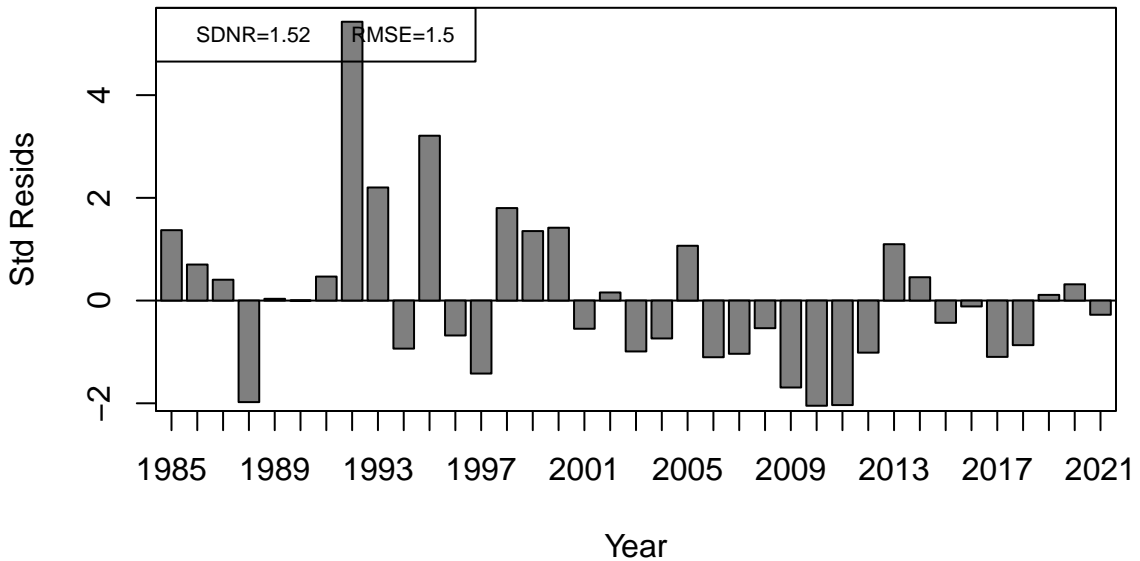
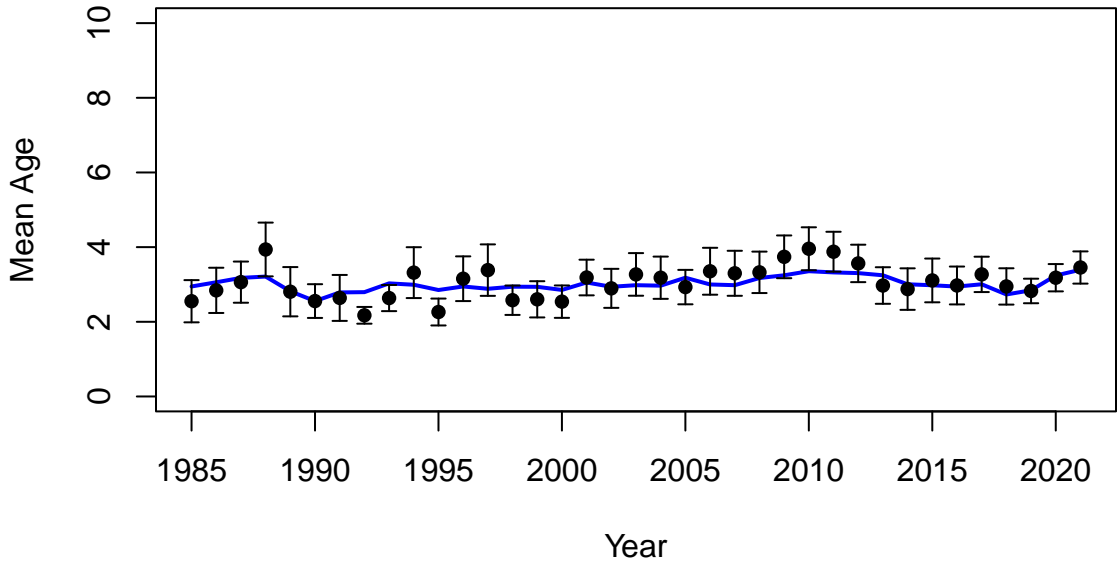
Catch Neff Fleet 1 (Comm)



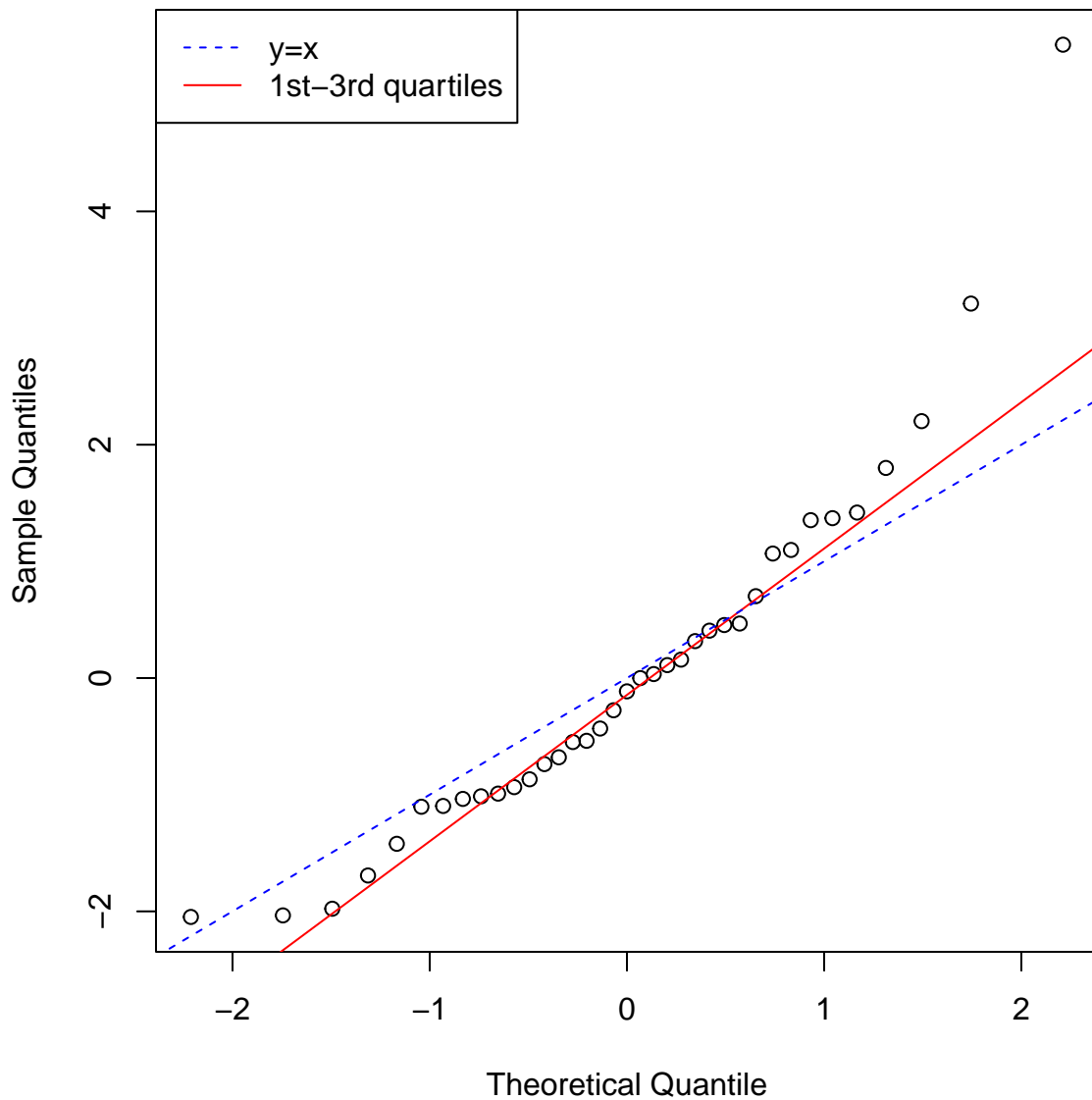
Catch Neff Fleet 2 (Rec)



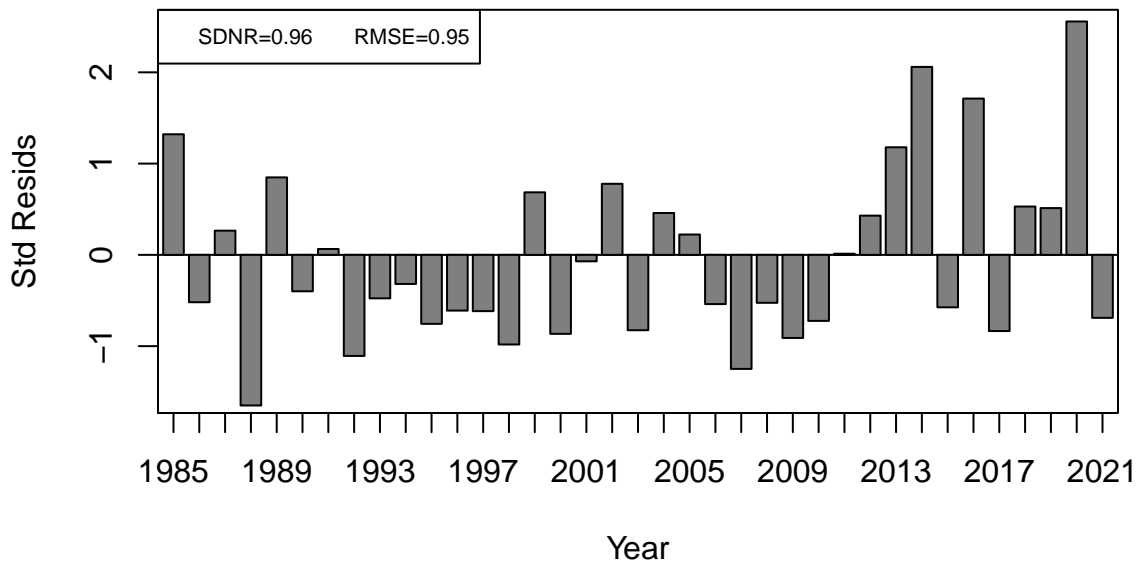
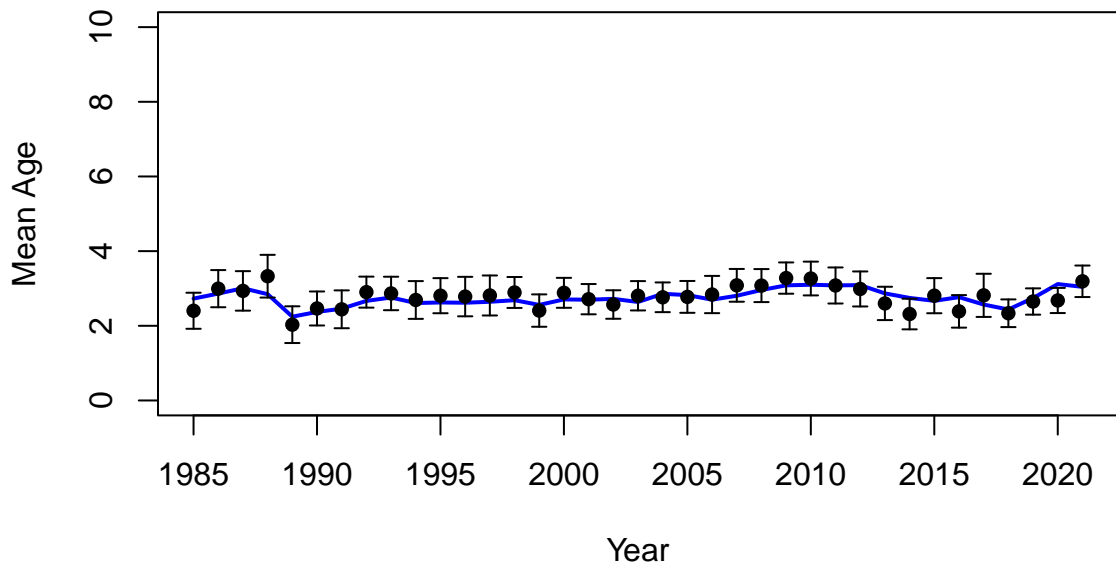
Catch Fleet 1 (Comm) ESS = 30



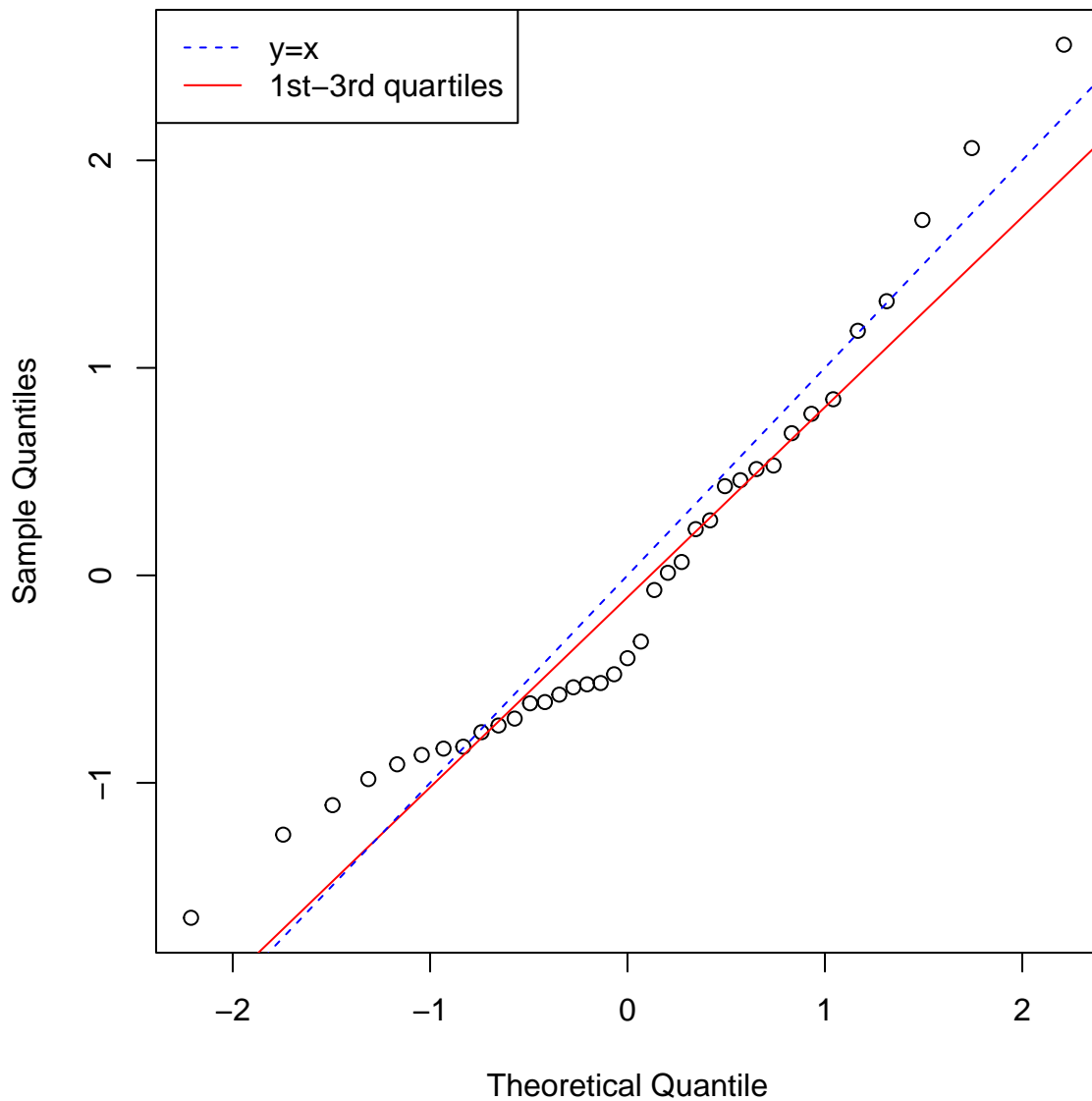
Catch Fleet 1 (Comm) ESS = 30



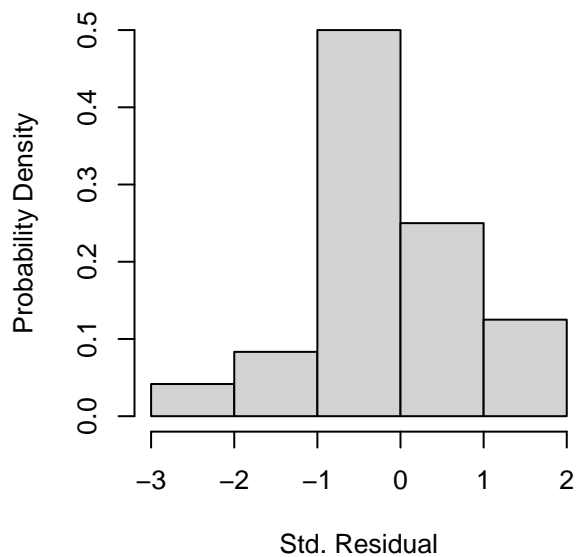
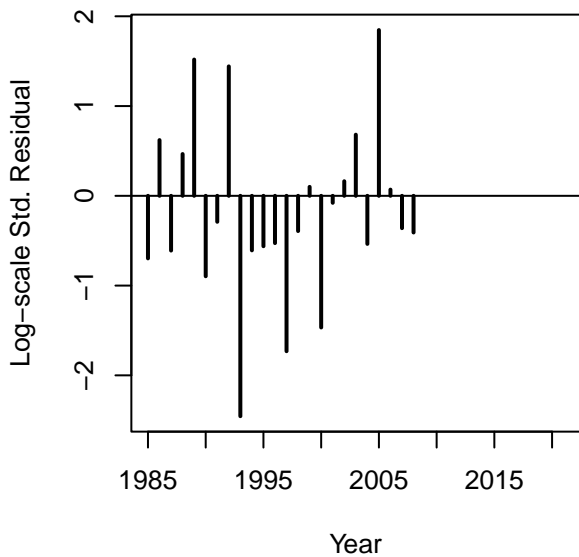
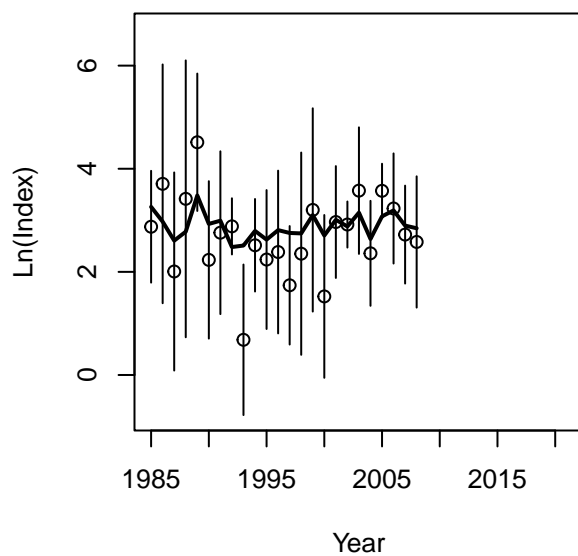
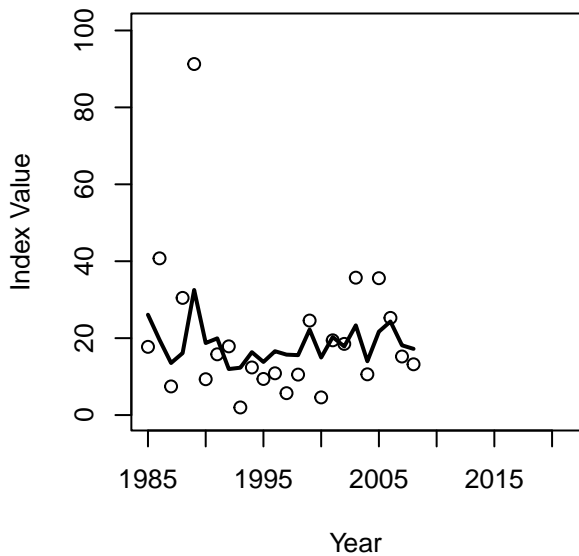
Catch Fleet 2 (Rec) ESS = 50



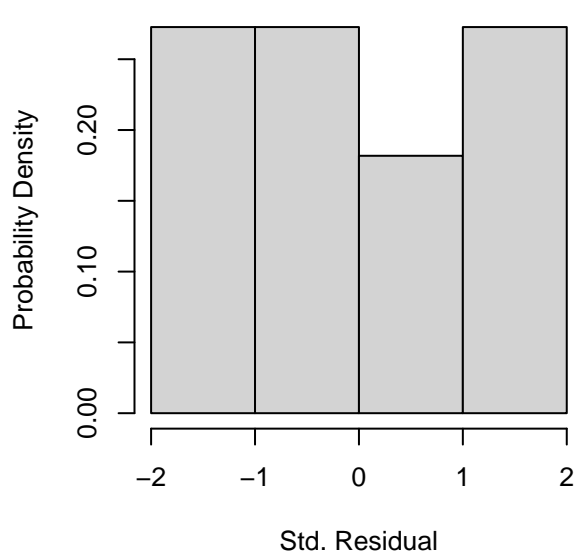
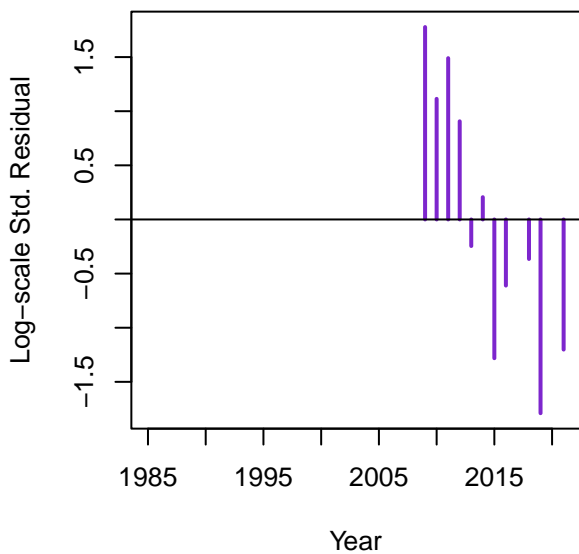
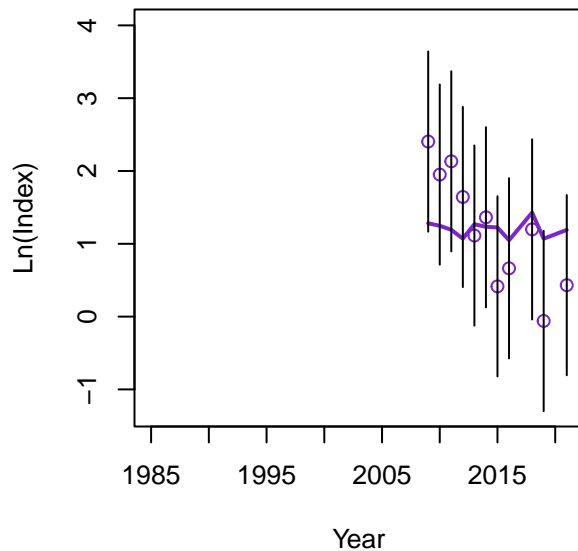
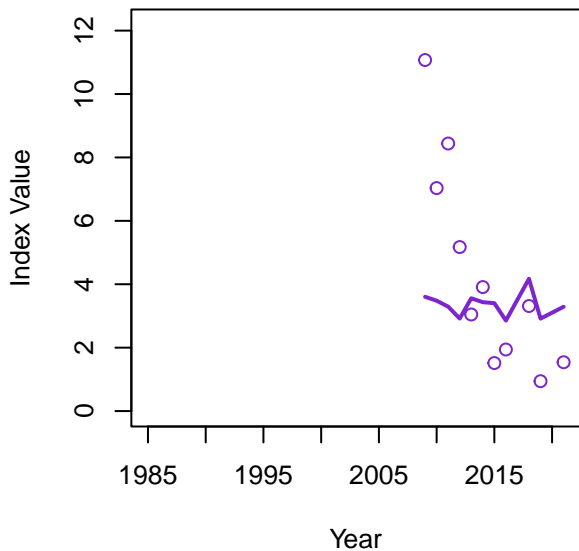
Catch Fleet 2 (Rec) ESS = 50



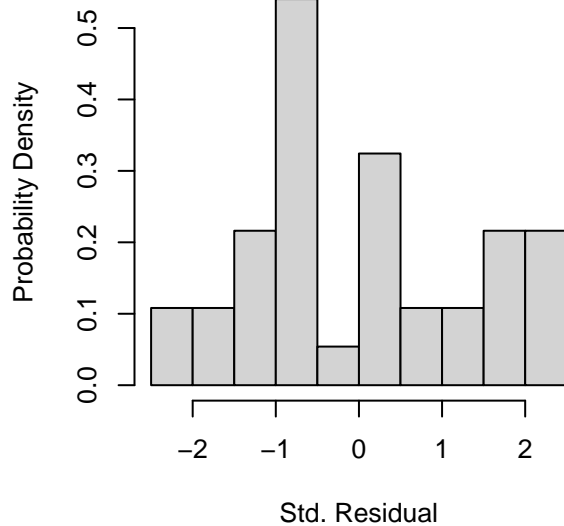
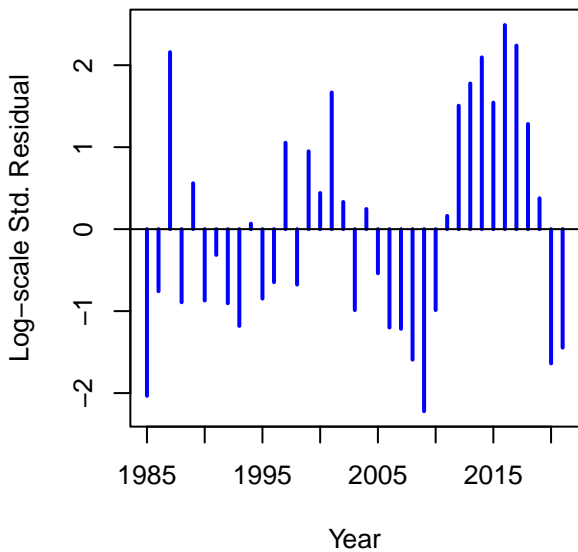
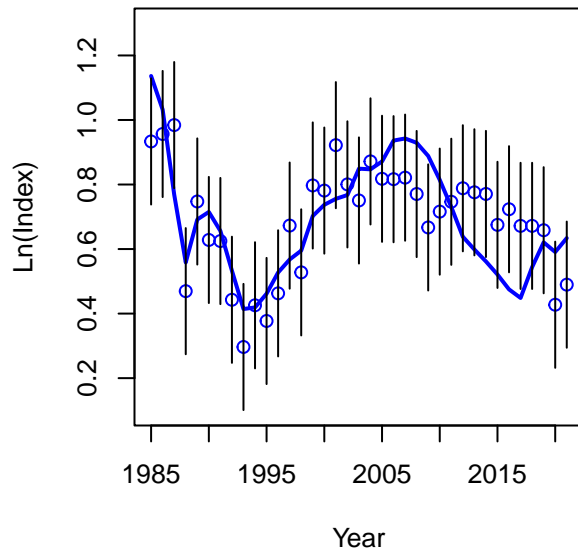
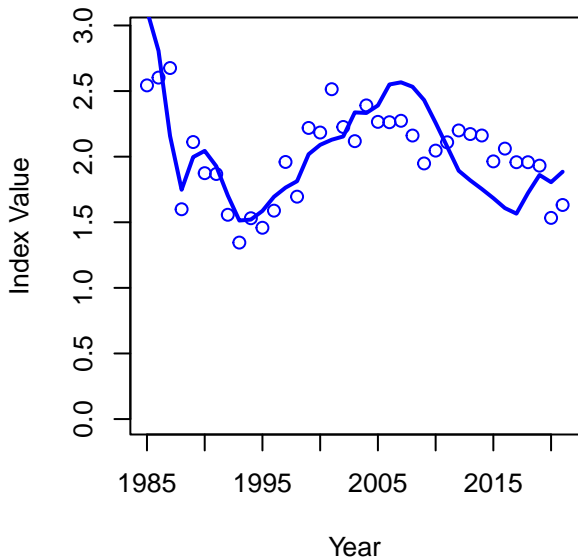
Index 1 (NEFSC Inshore)



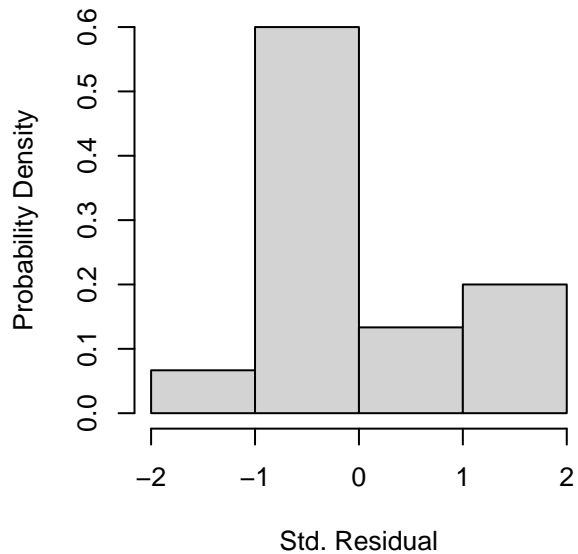
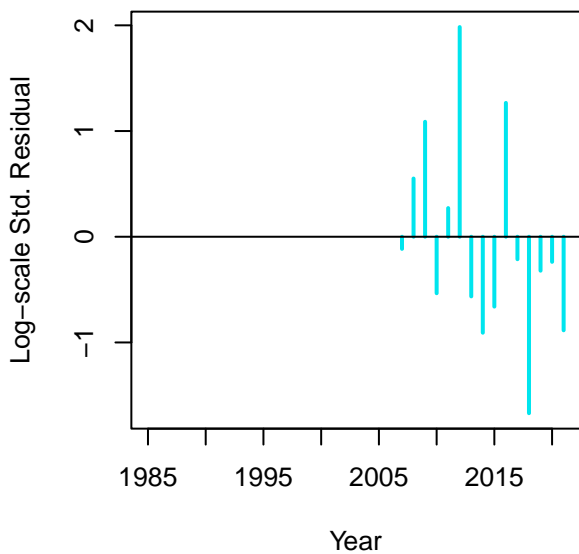
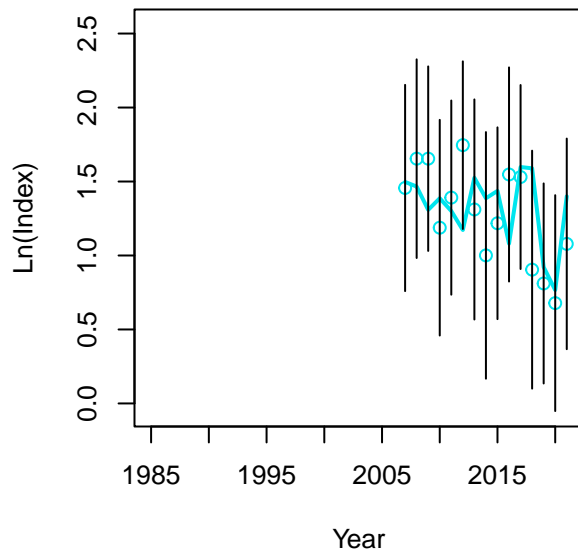
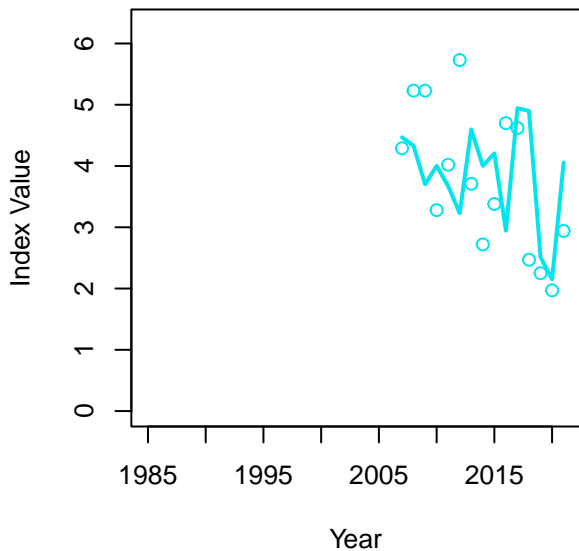
Index 2 (Bigelow)



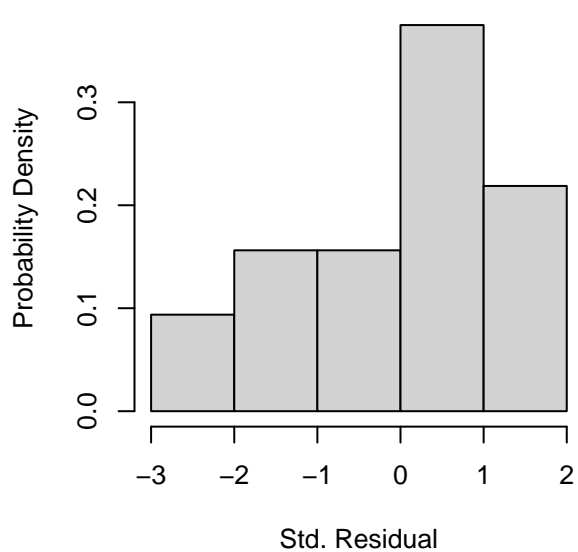
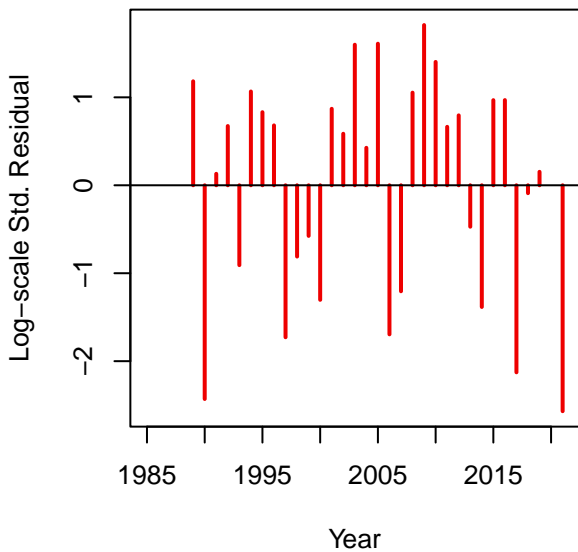
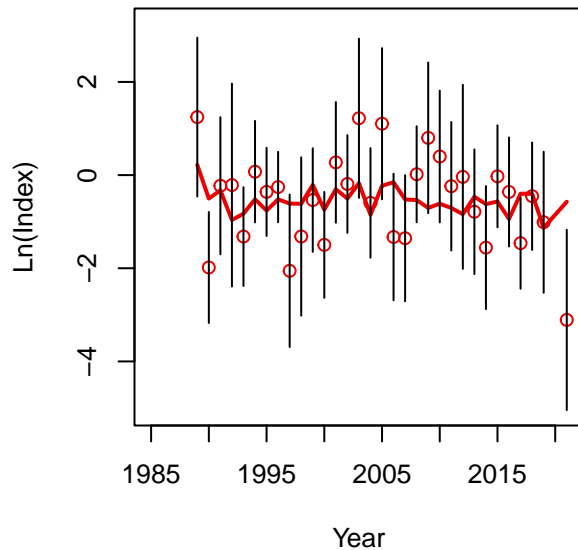
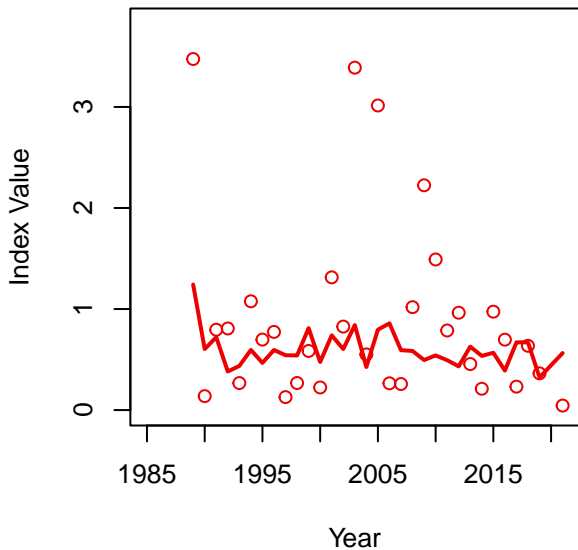
Index 3 (MRIP)



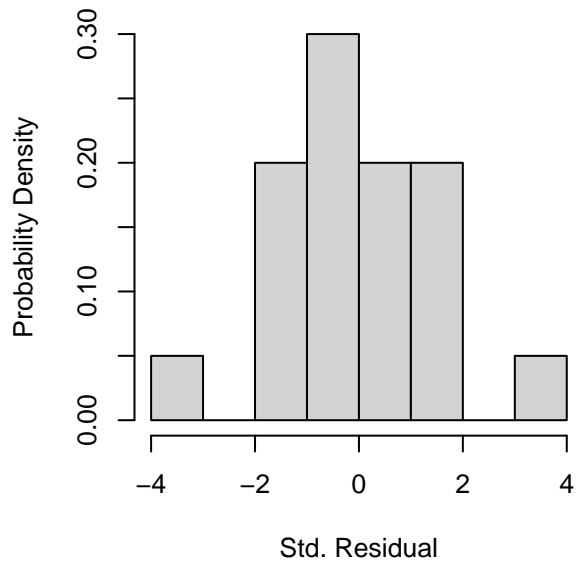
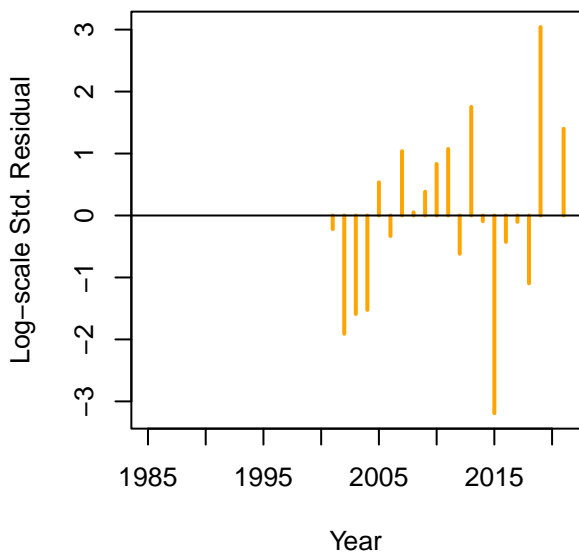
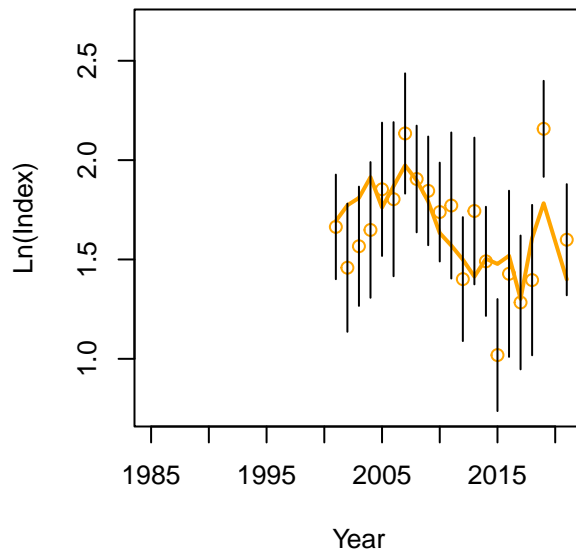
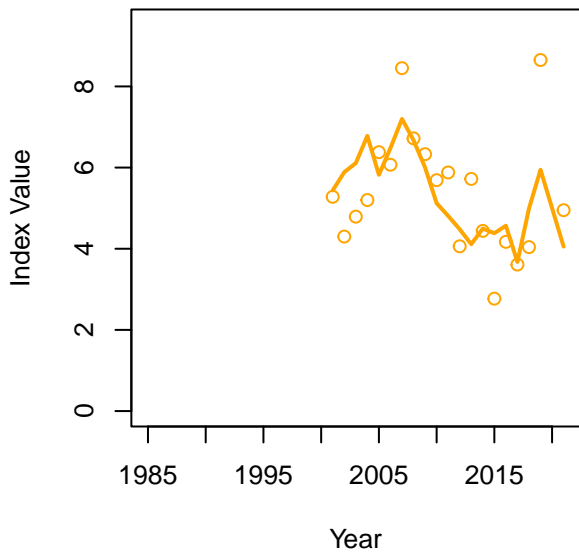
Index 4 (NEAMAP)



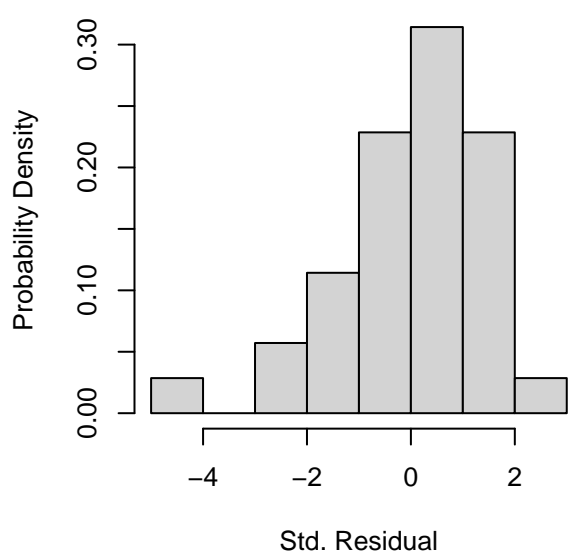
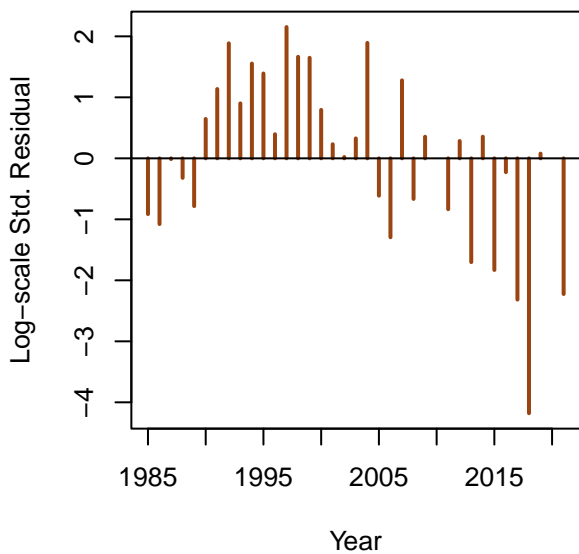
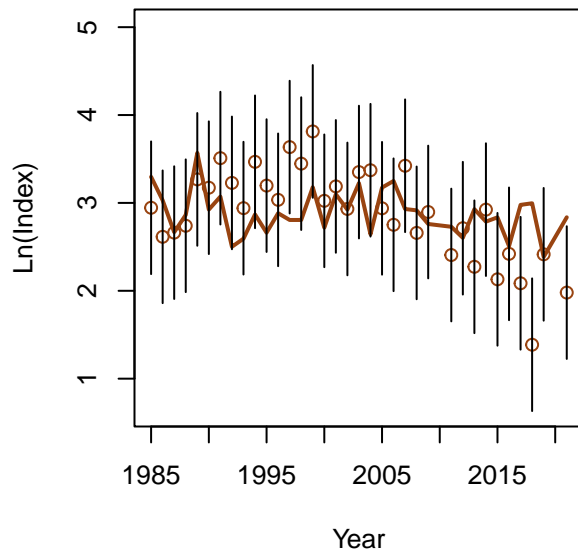
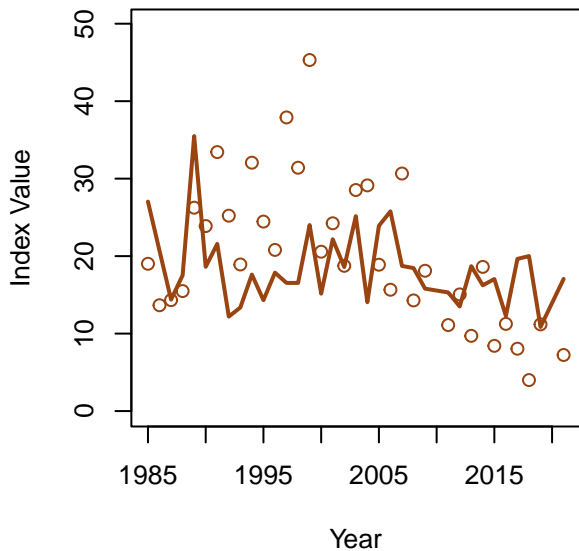
Index 5 (SEAMAP)



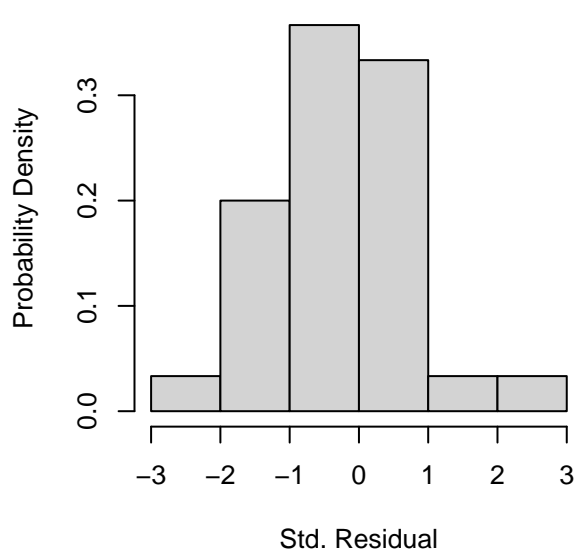
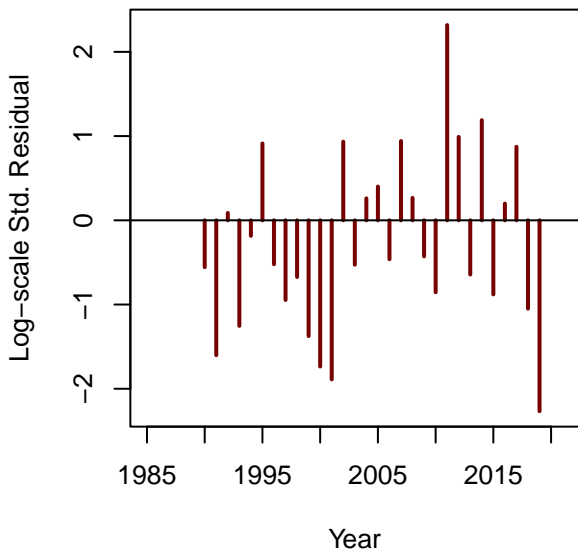
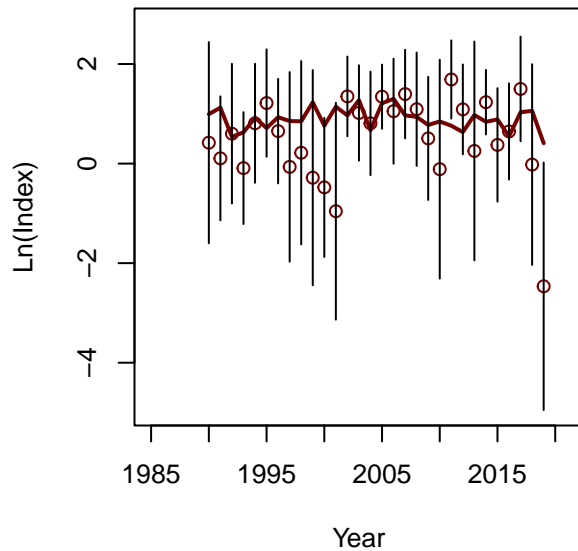
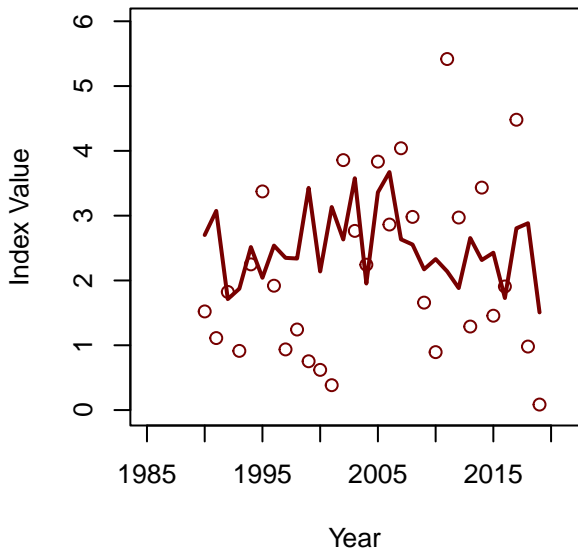
Index 6 (PSIGN)



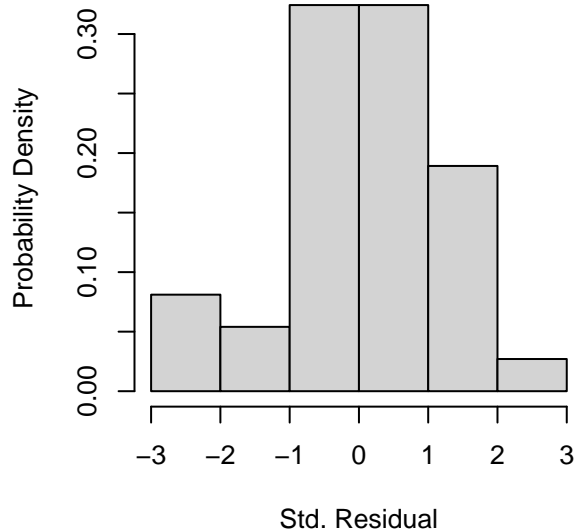
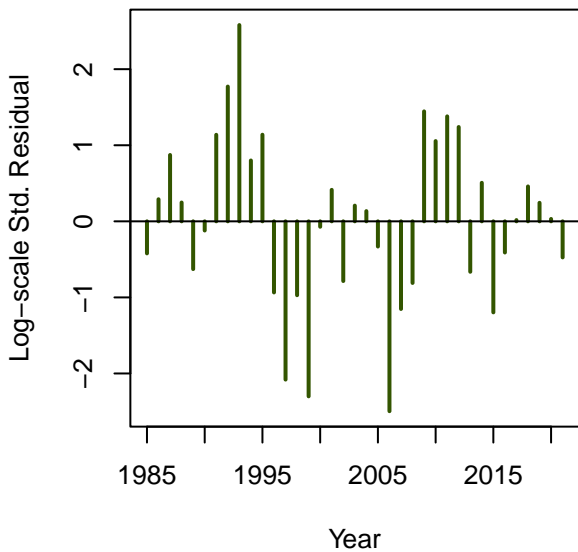
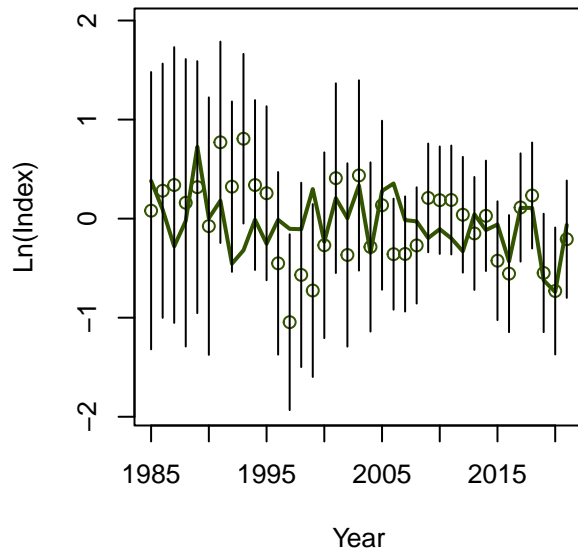
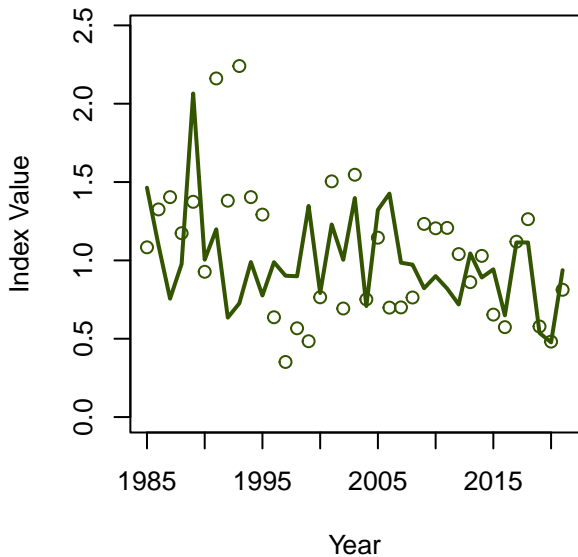
Index 7 (CT Trawl)



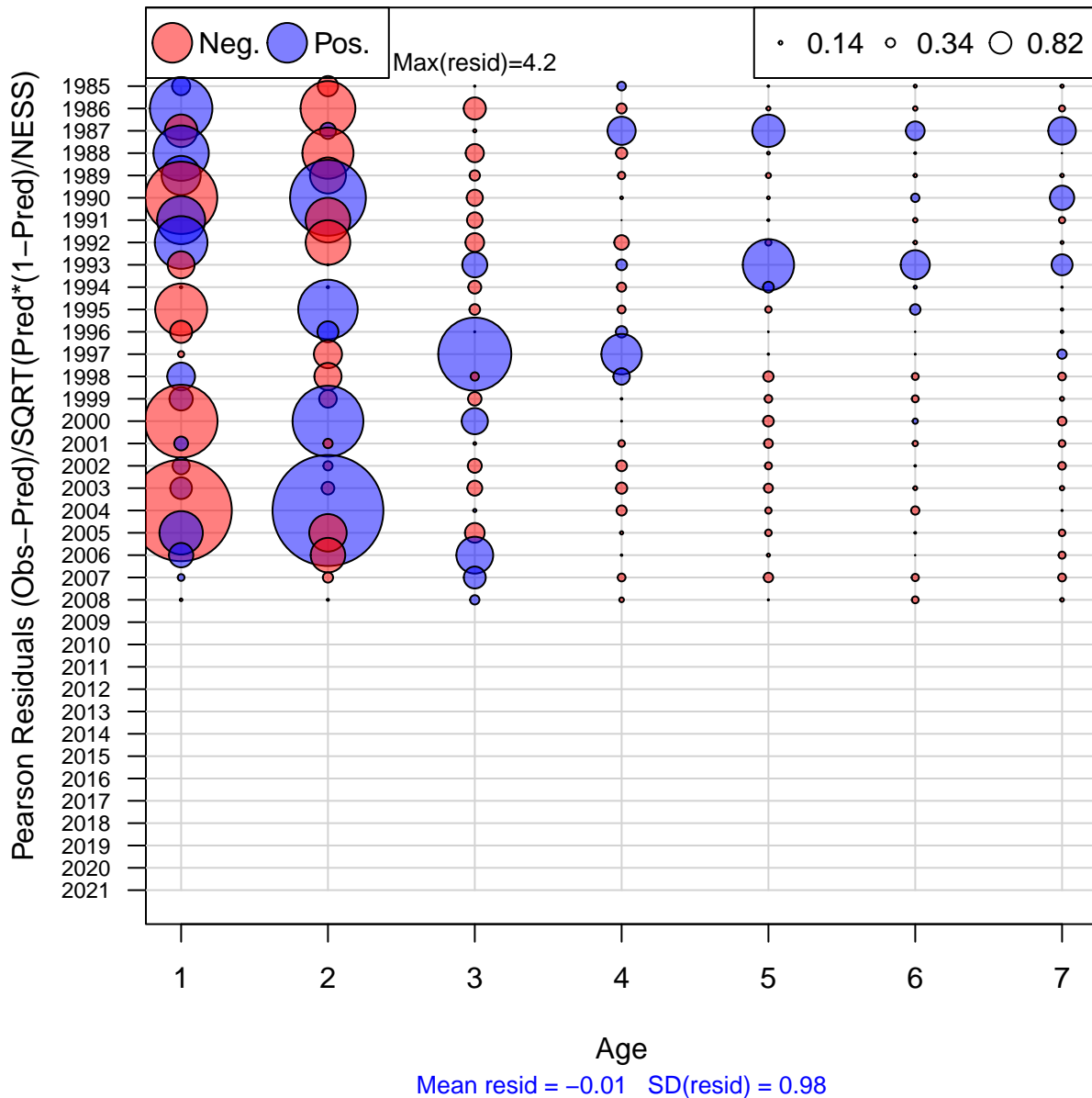
Index 8 (NJ Trawl)



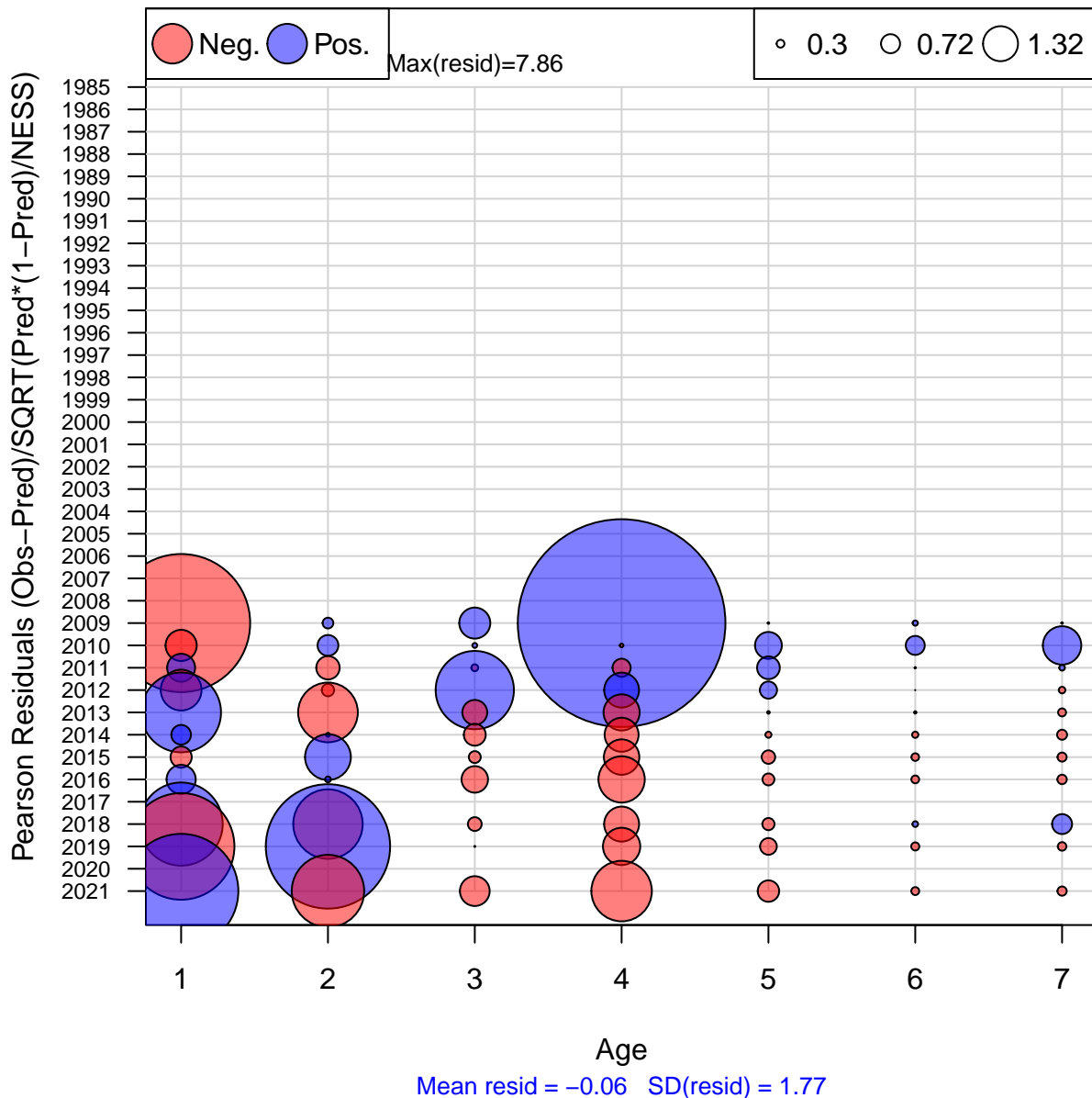
Index 9 (Compound YOY)



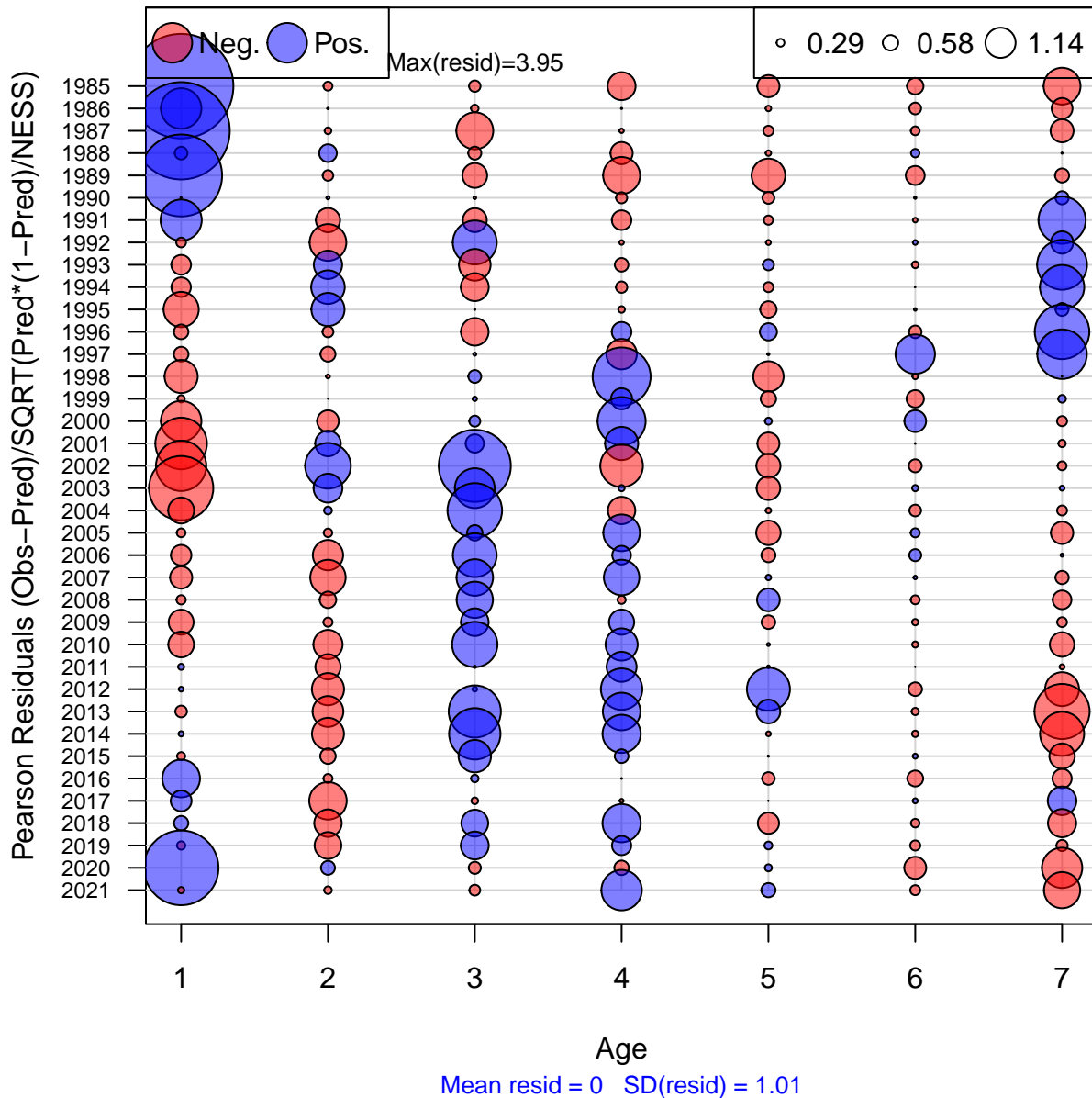
Age Comp Residuals for Index 1 (NEFSC Inshore)



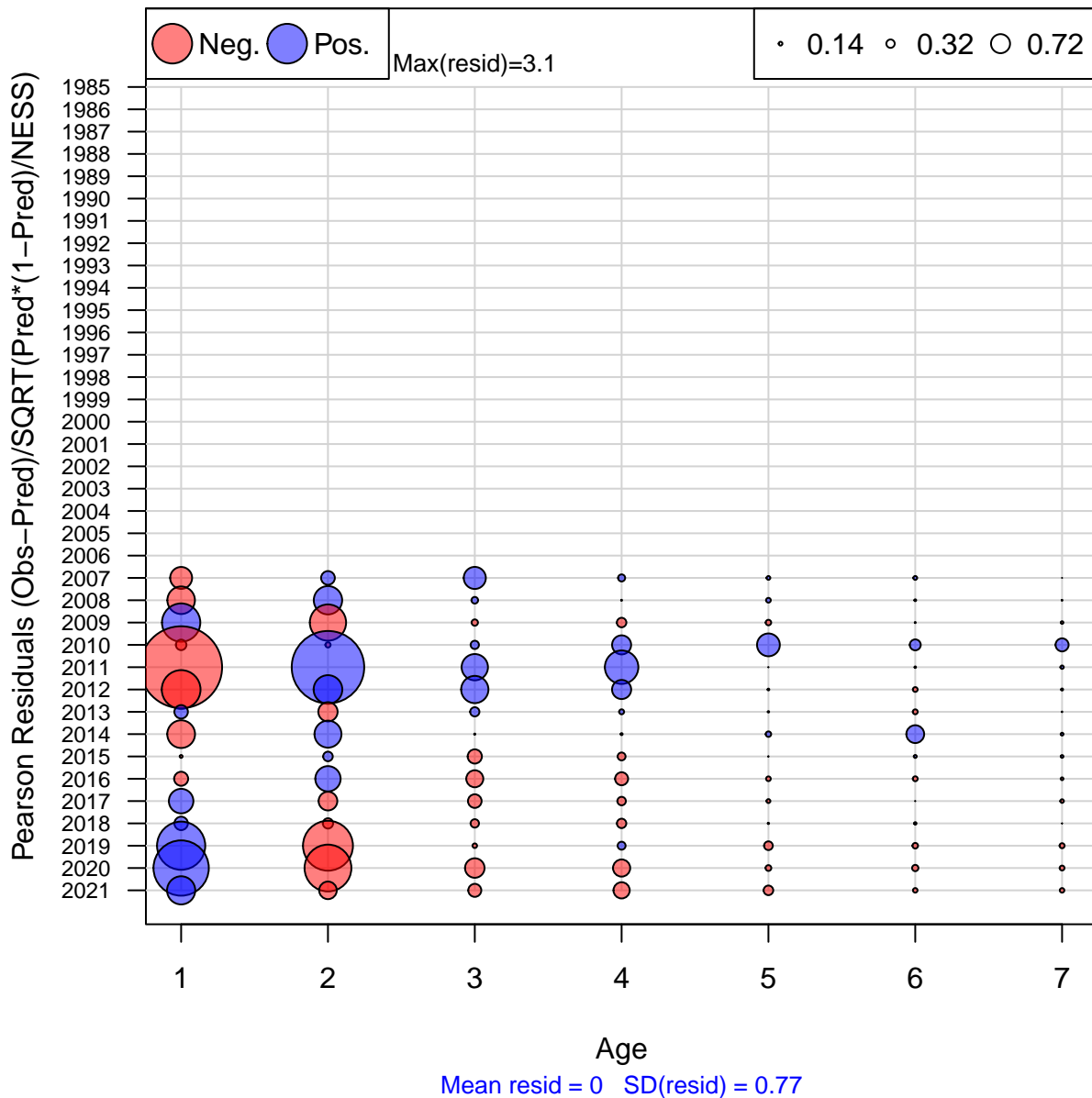
Age Comp Residuals for Index 2 (Bigelow)



Age Comp Residuals for Index 3 (MRIP)



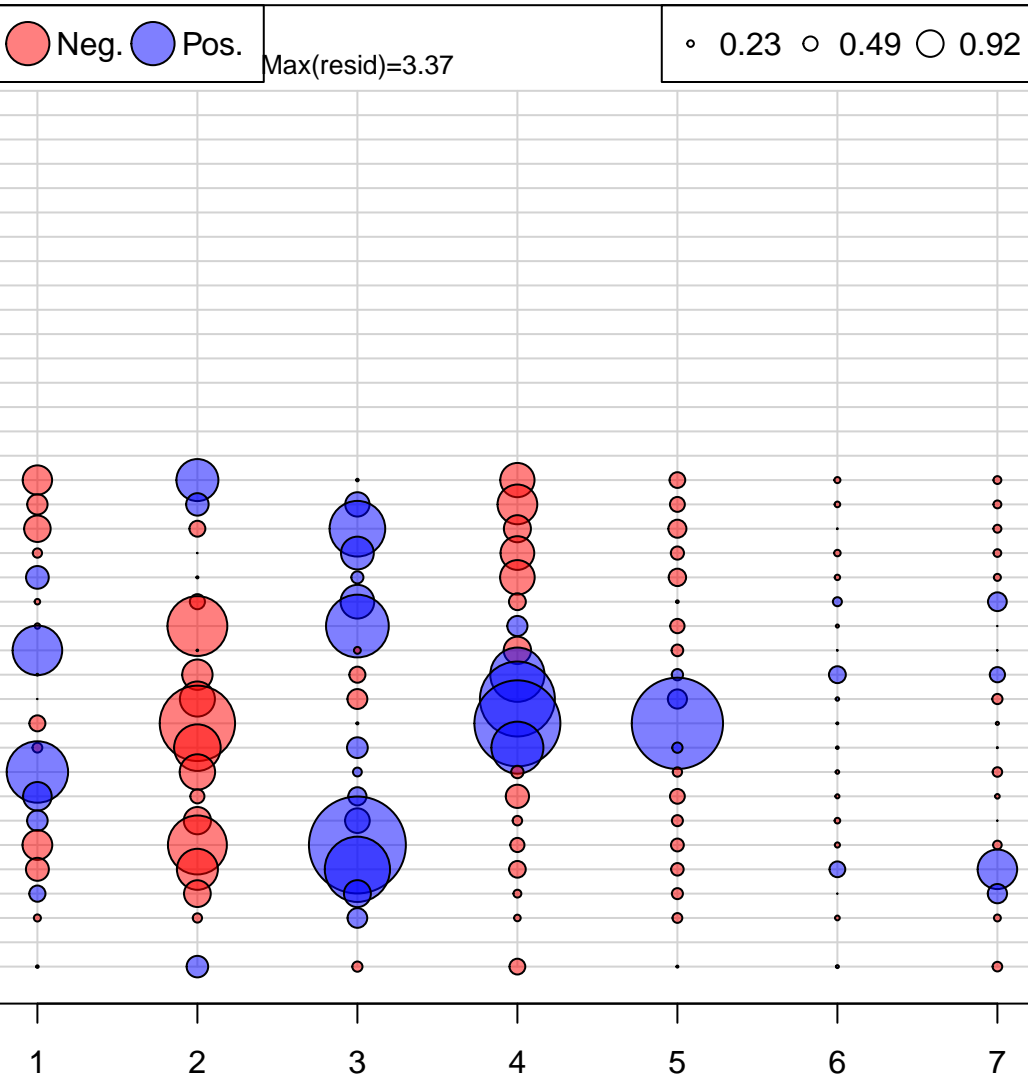
Age Comp Residuals for Index 4 (NEAMAP)



Age Comp Residuals for Index 6 (PSIGN)

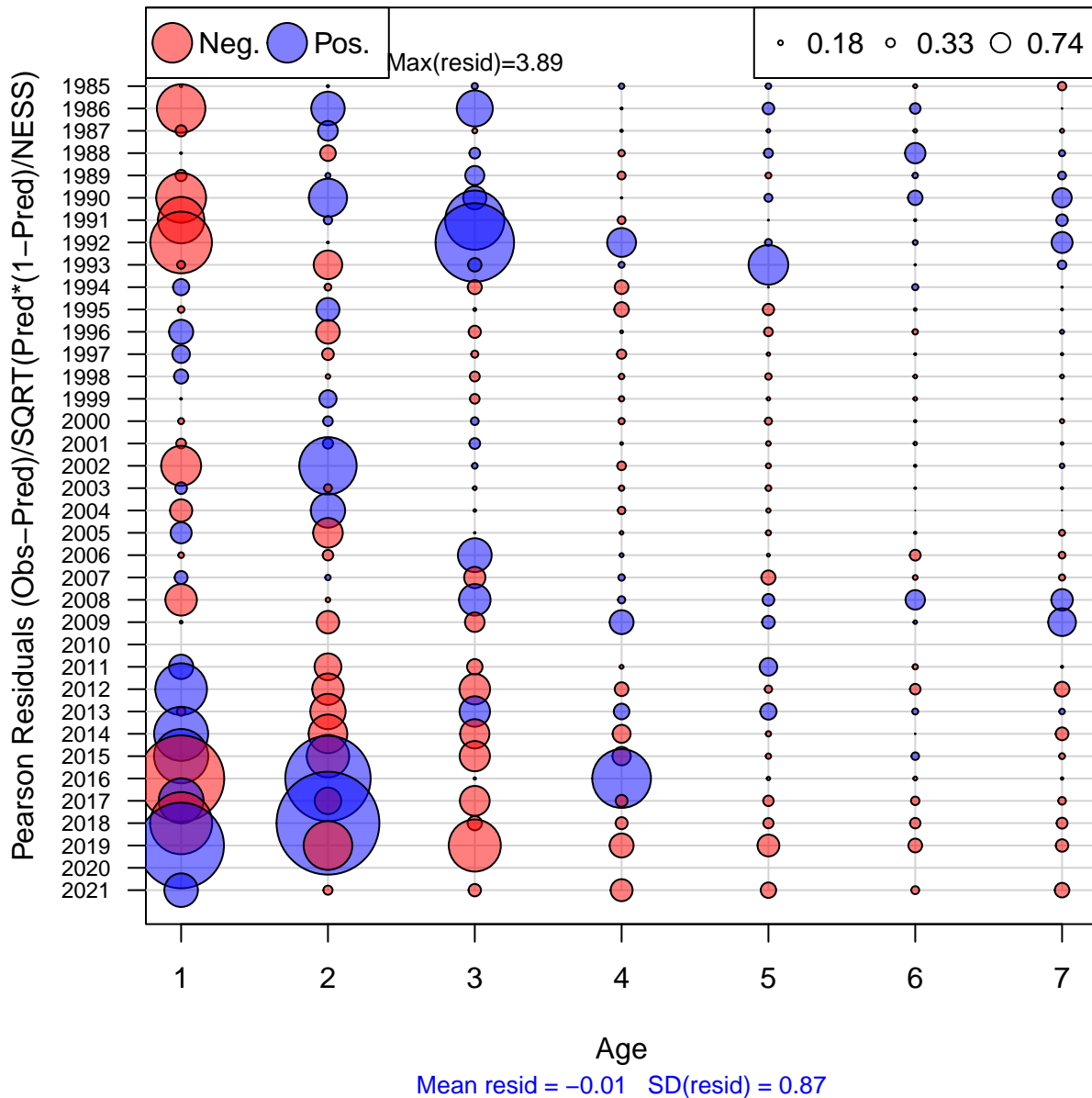
Pearson Residuals (Obs-Pred)/SQRT(Pred*(1-Pred))/NESS

1985
1986
1987
1988
1989
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1996
1997
1998
1999
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2020
2021

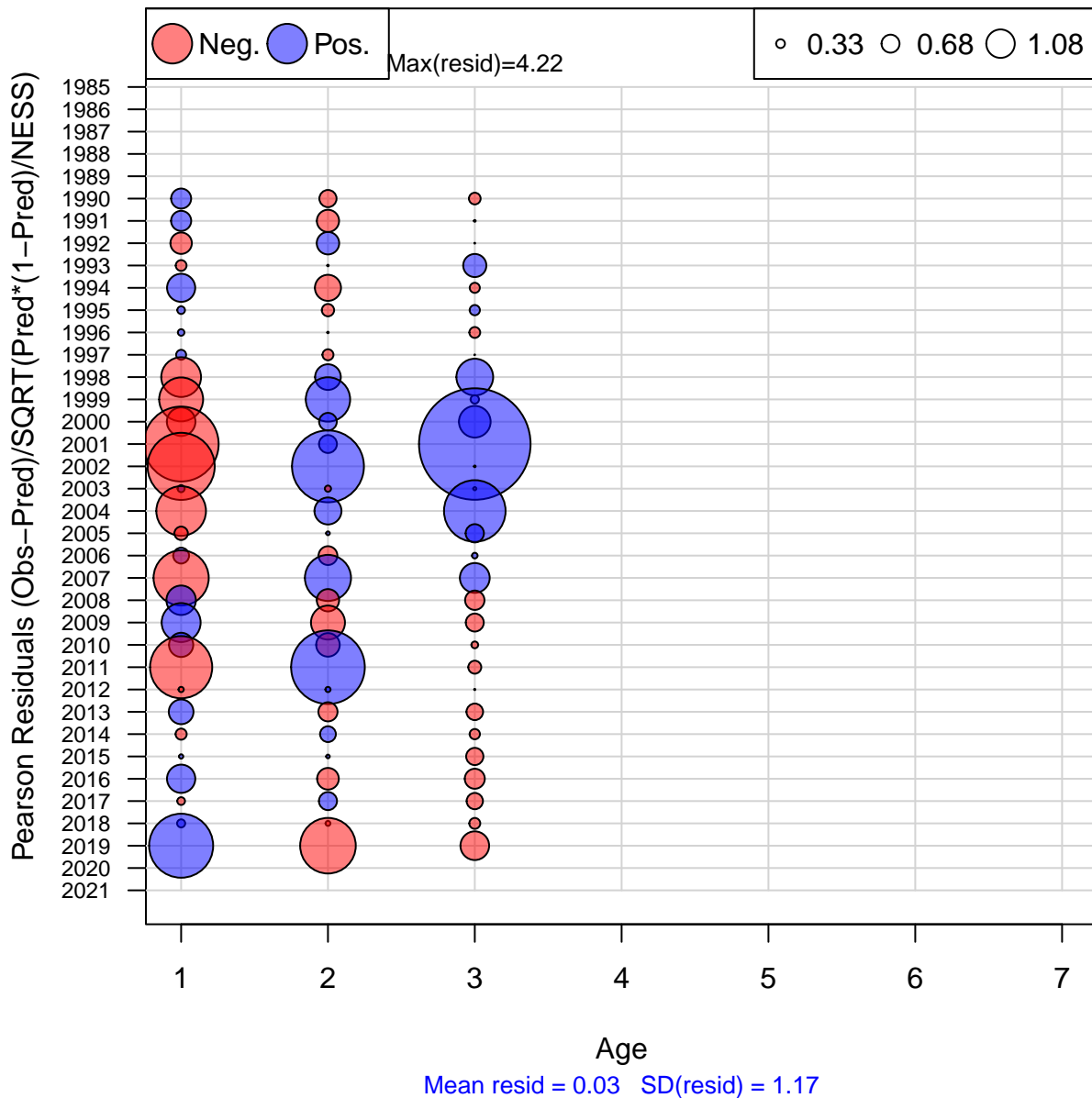


Mean resid = 0 SD(resid) = 0.96

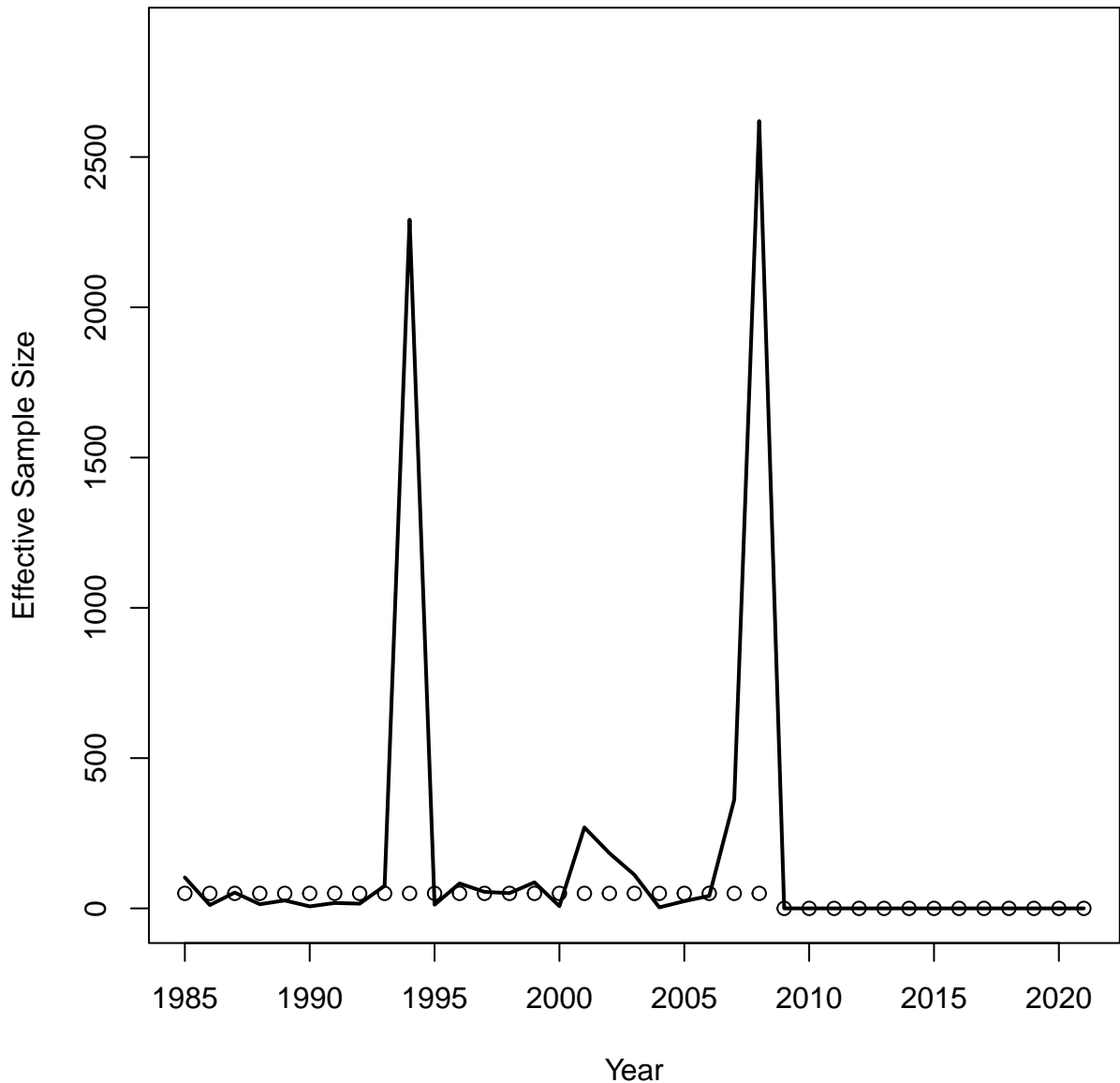
Age Comp Residuals for Index 7 (CT Trawl)



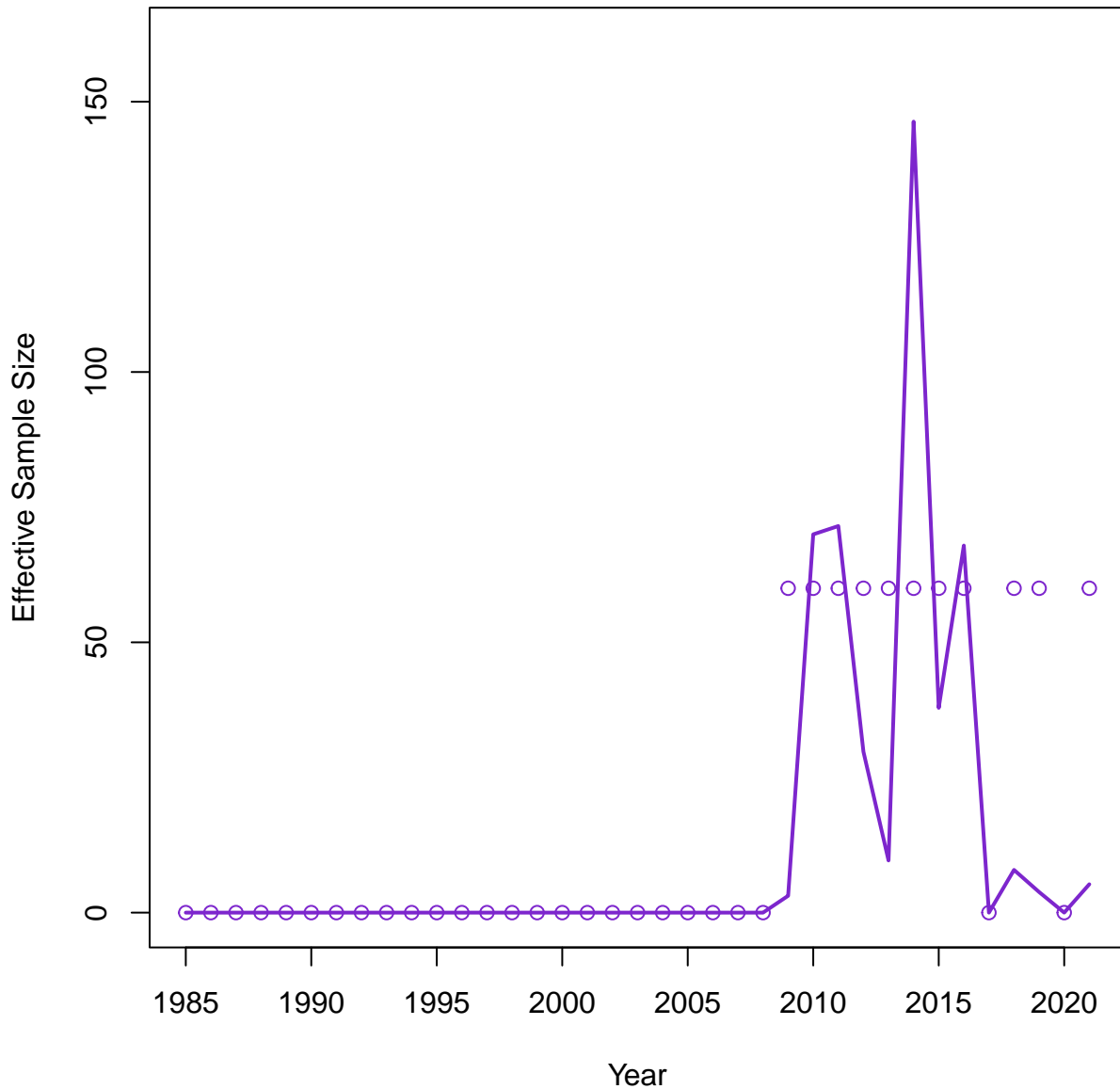
Age Comp Residuals for Index 8 (NJ Trawl)



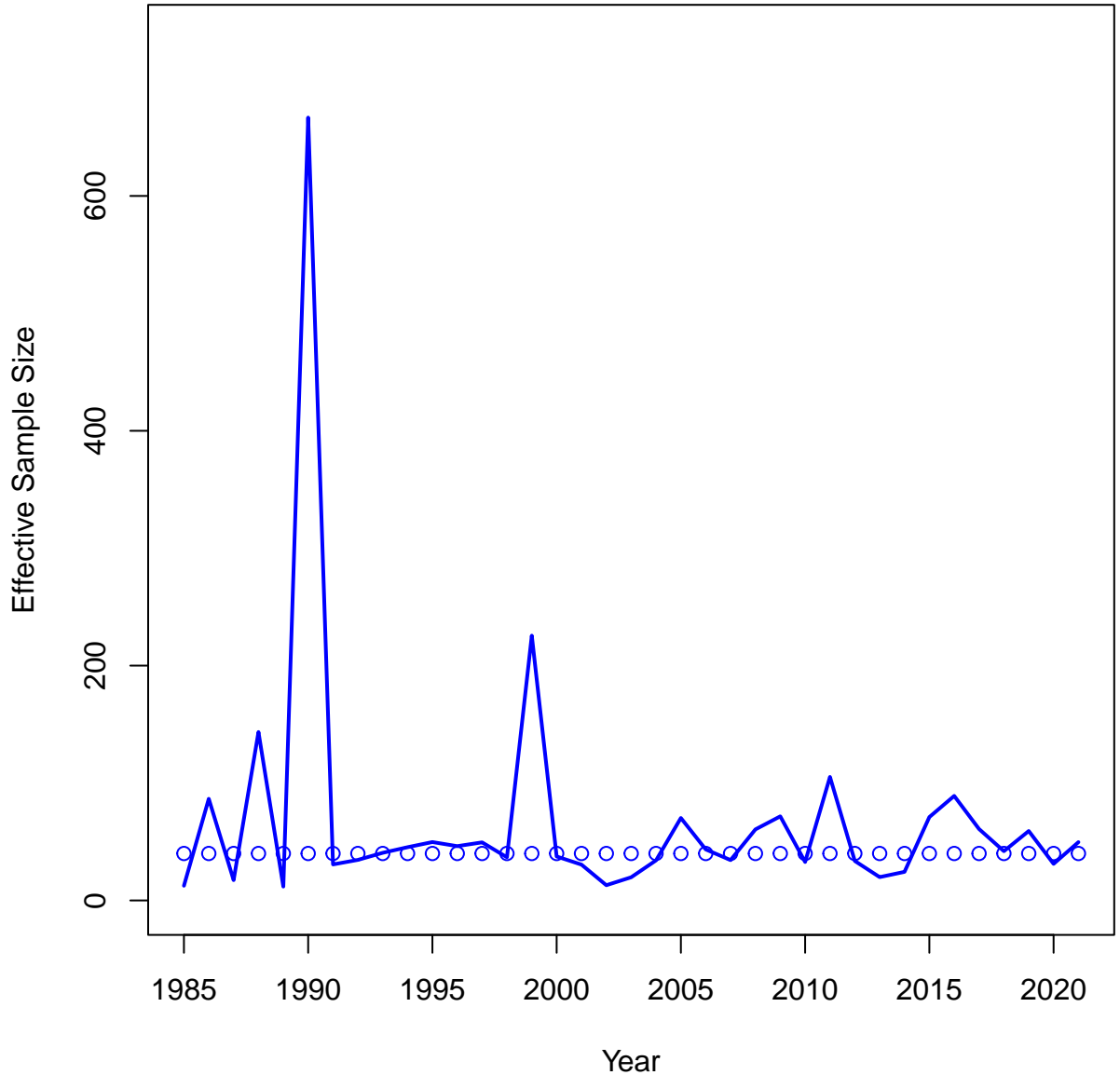
Index Neff 1 (NEFSC Inshore)



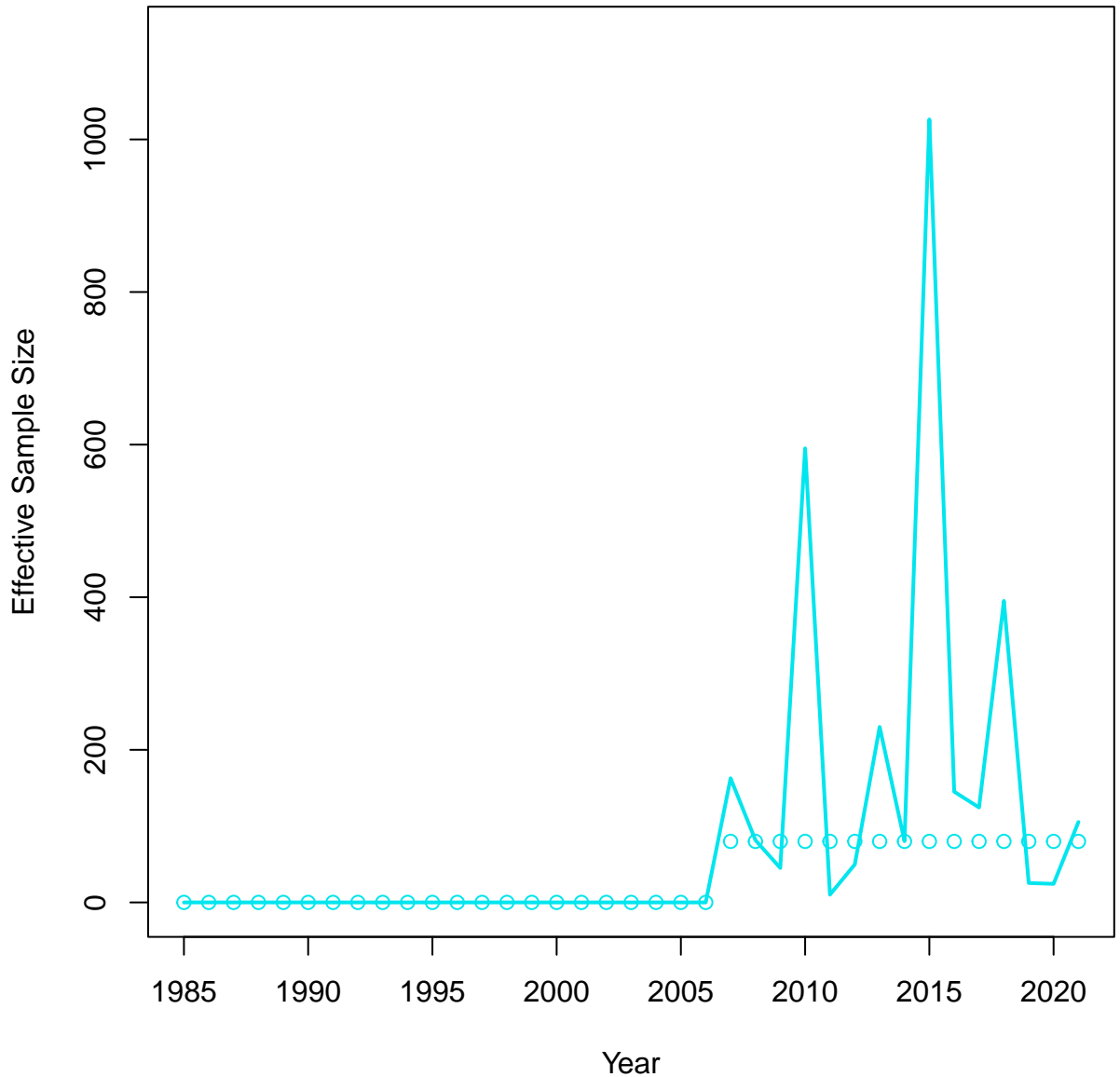
Index Neff 2 (Bigelow)



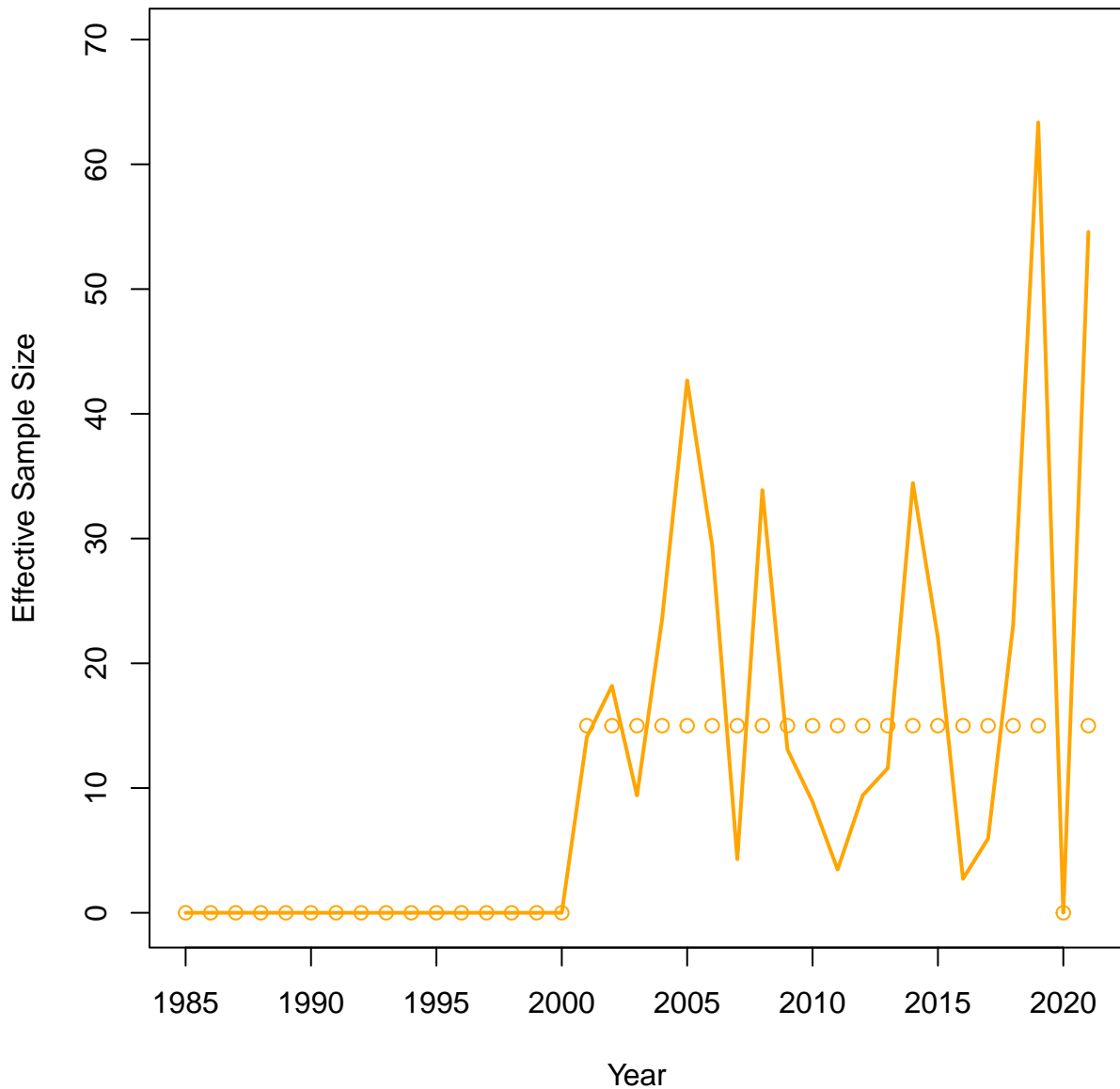
Index Neff 3 (MRIP)



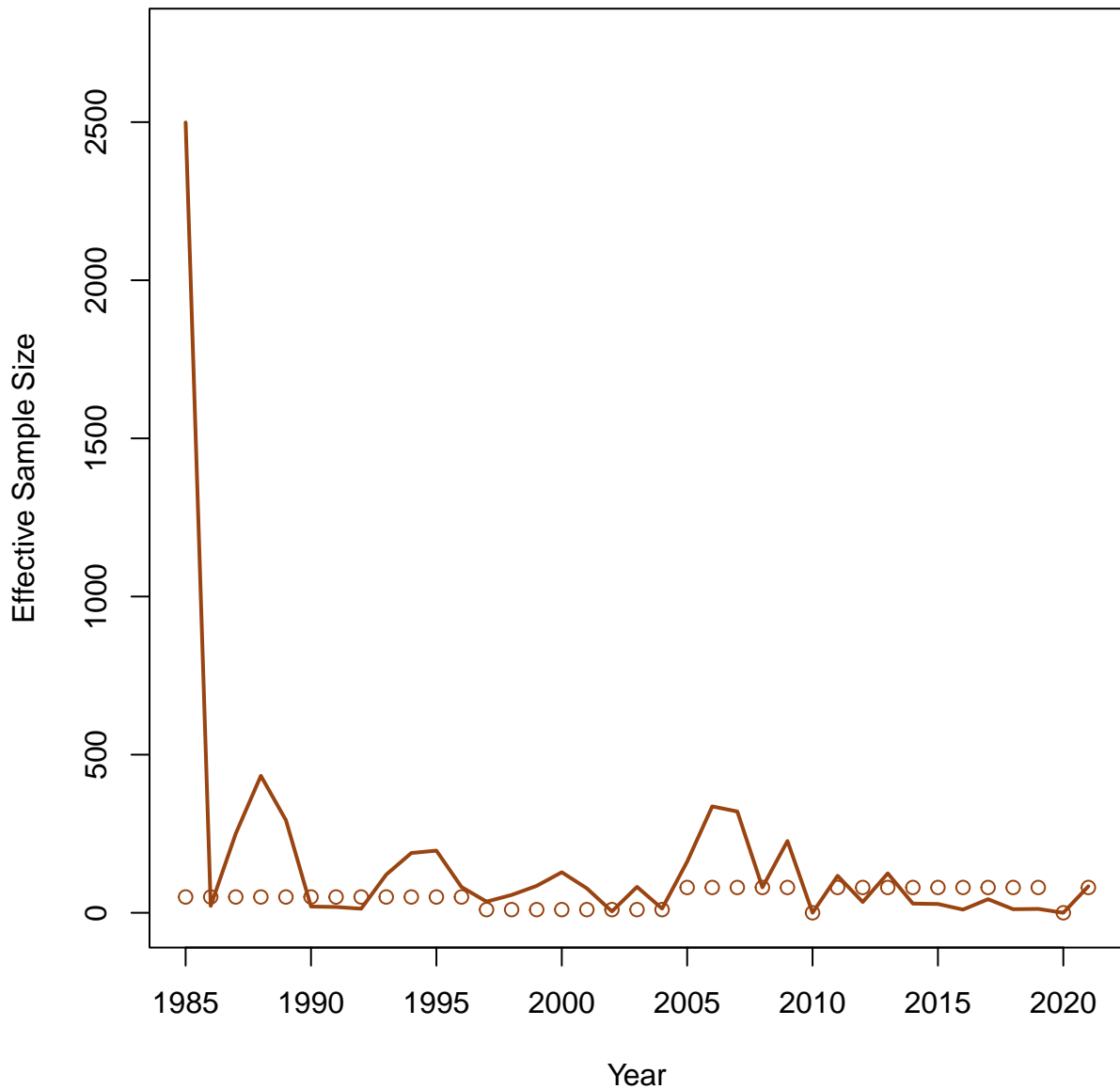
Index Neff 4 (NEAMAP)



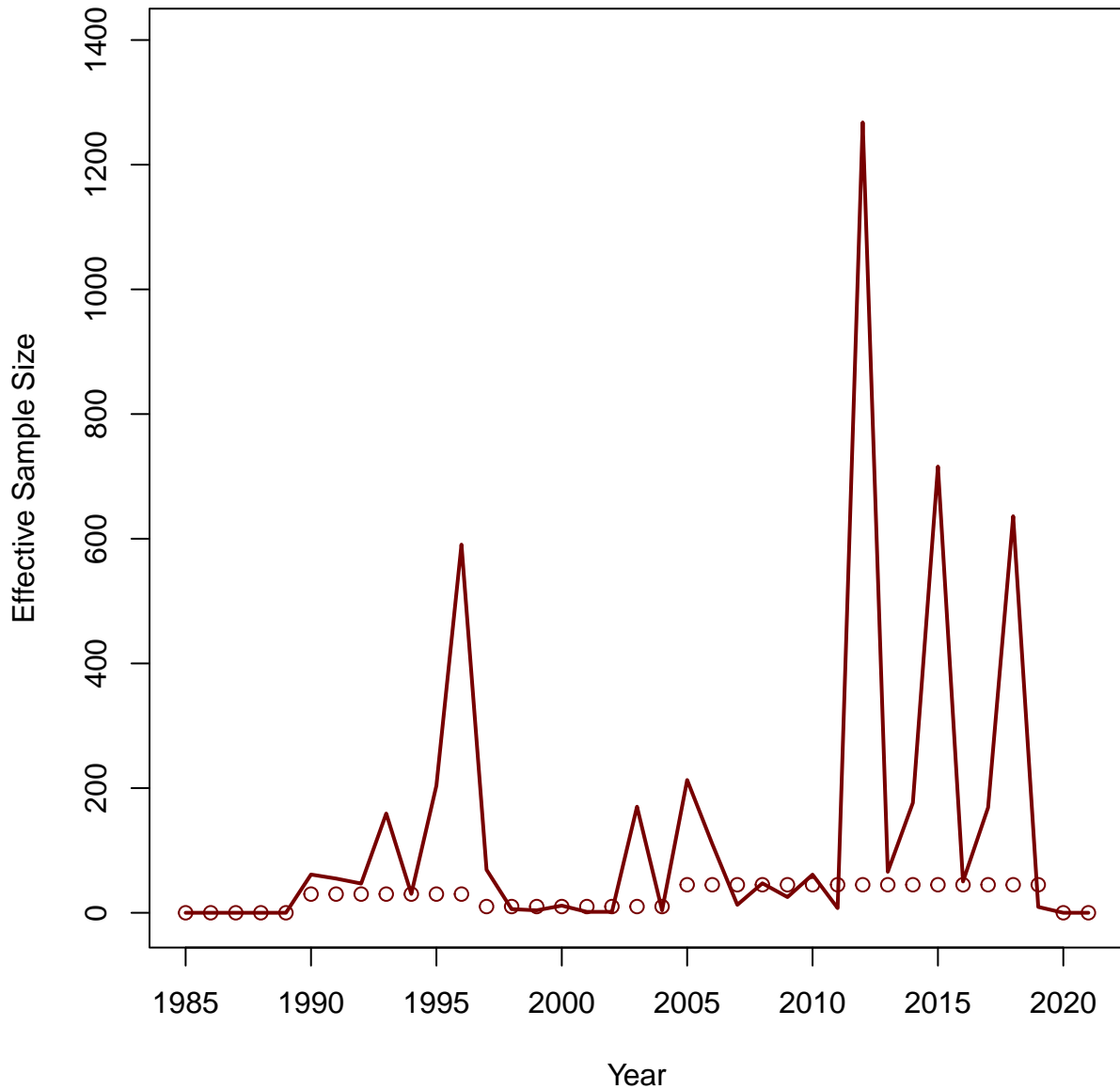
Index Neff 6 (PSIGN)



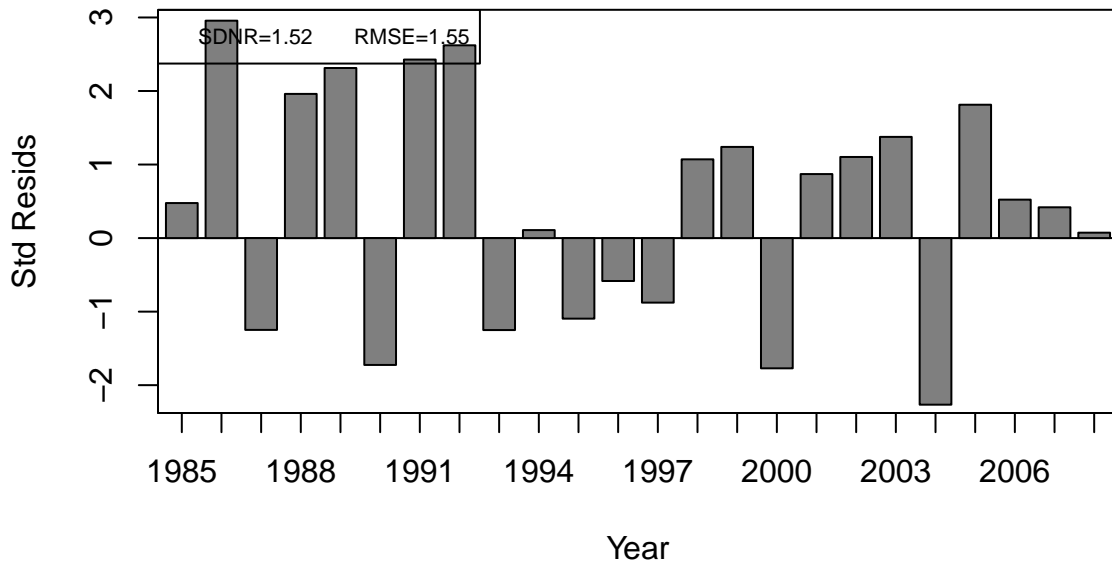
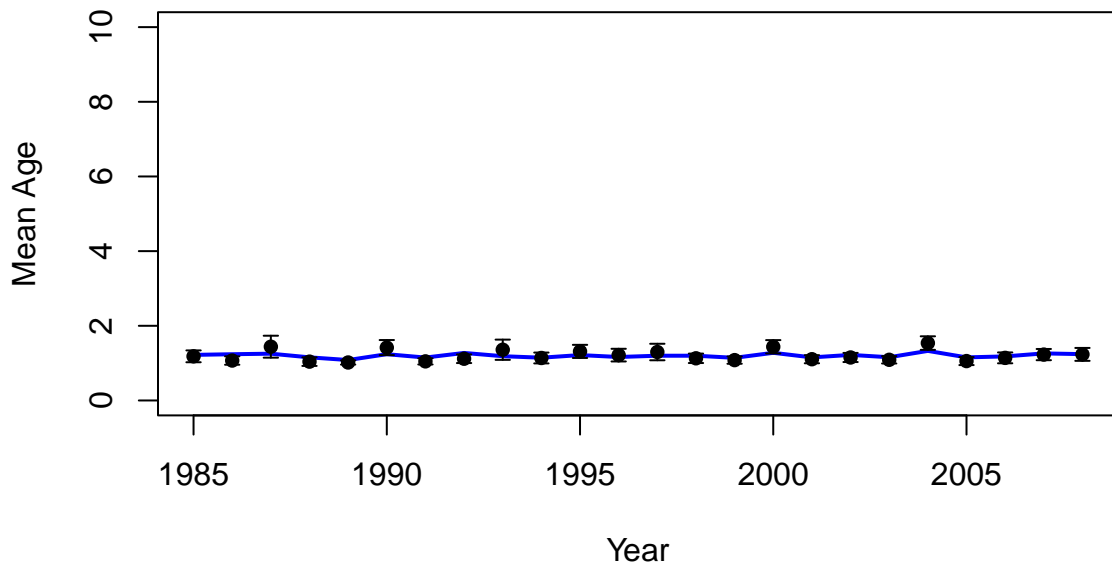
Index Neff 7 (CT Trawl)



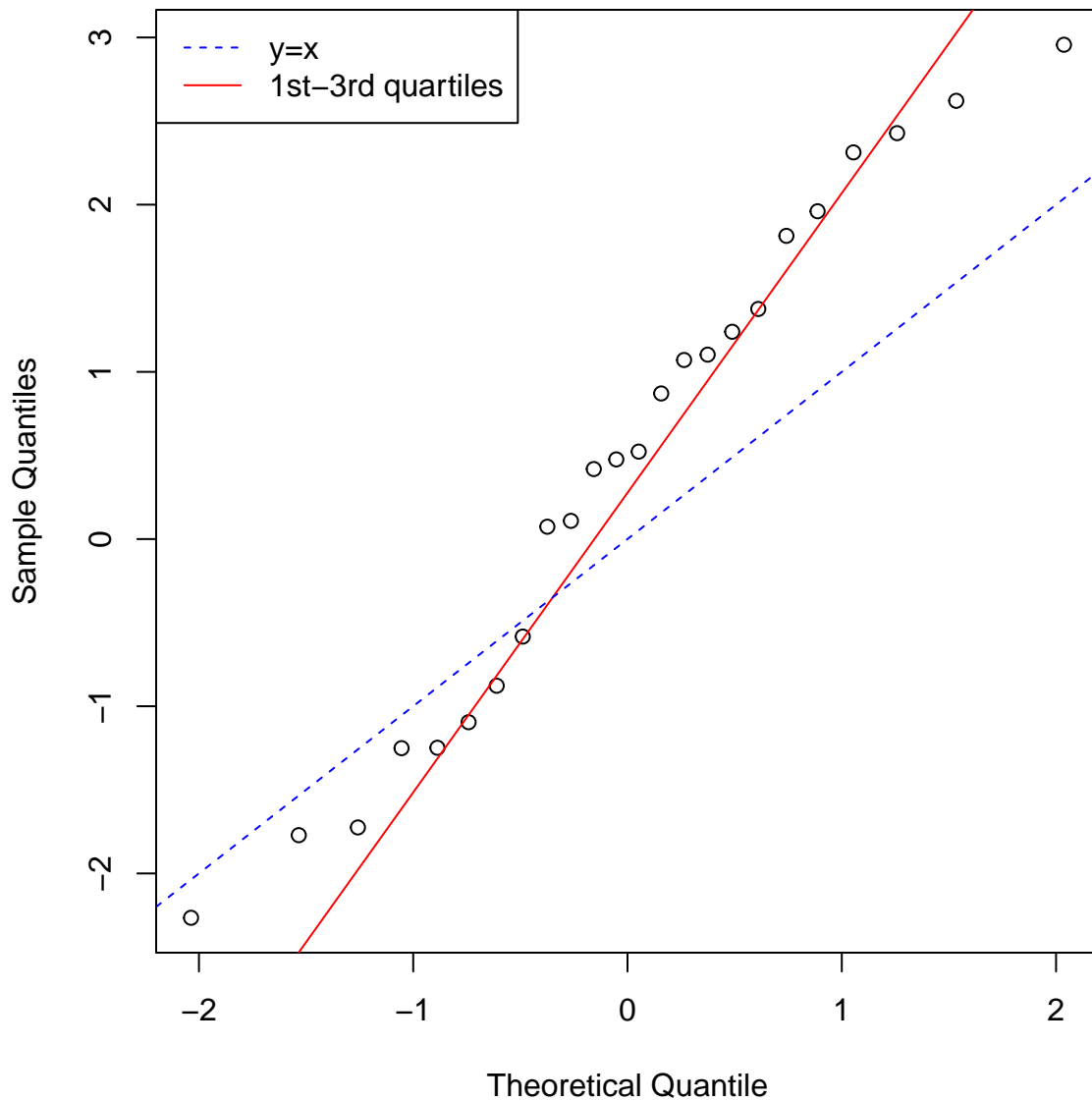
Index Neff 8 (NJ Trawl)



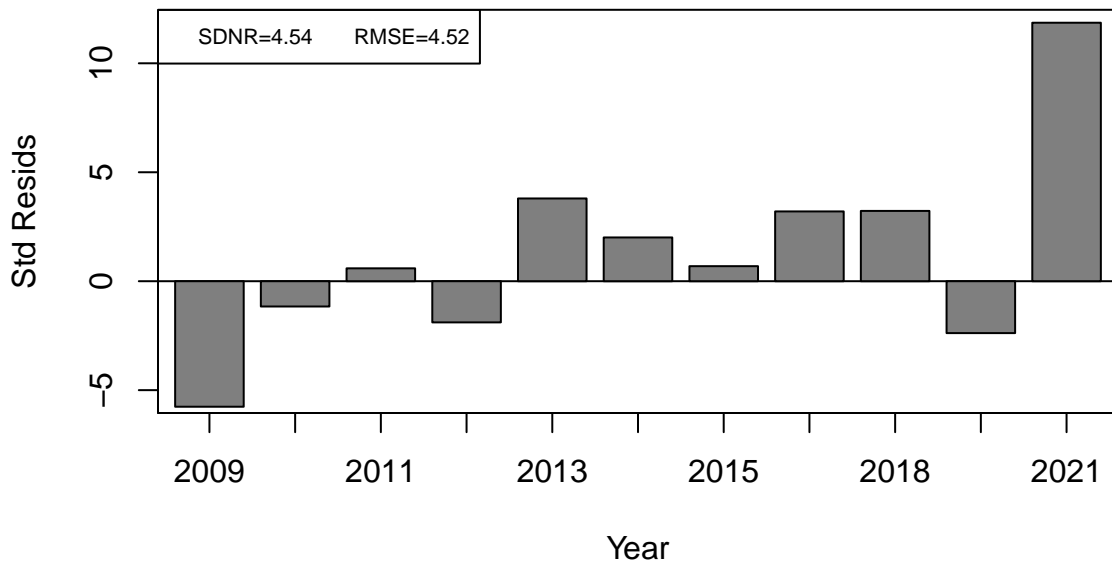
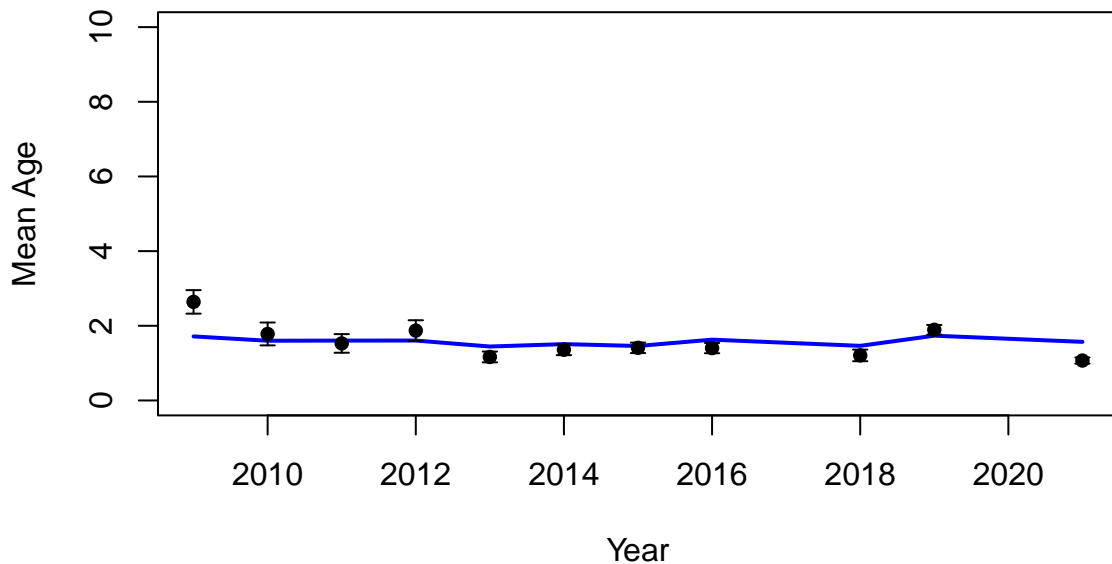
Index 1 (NEFSC Inshore) ESS = 50



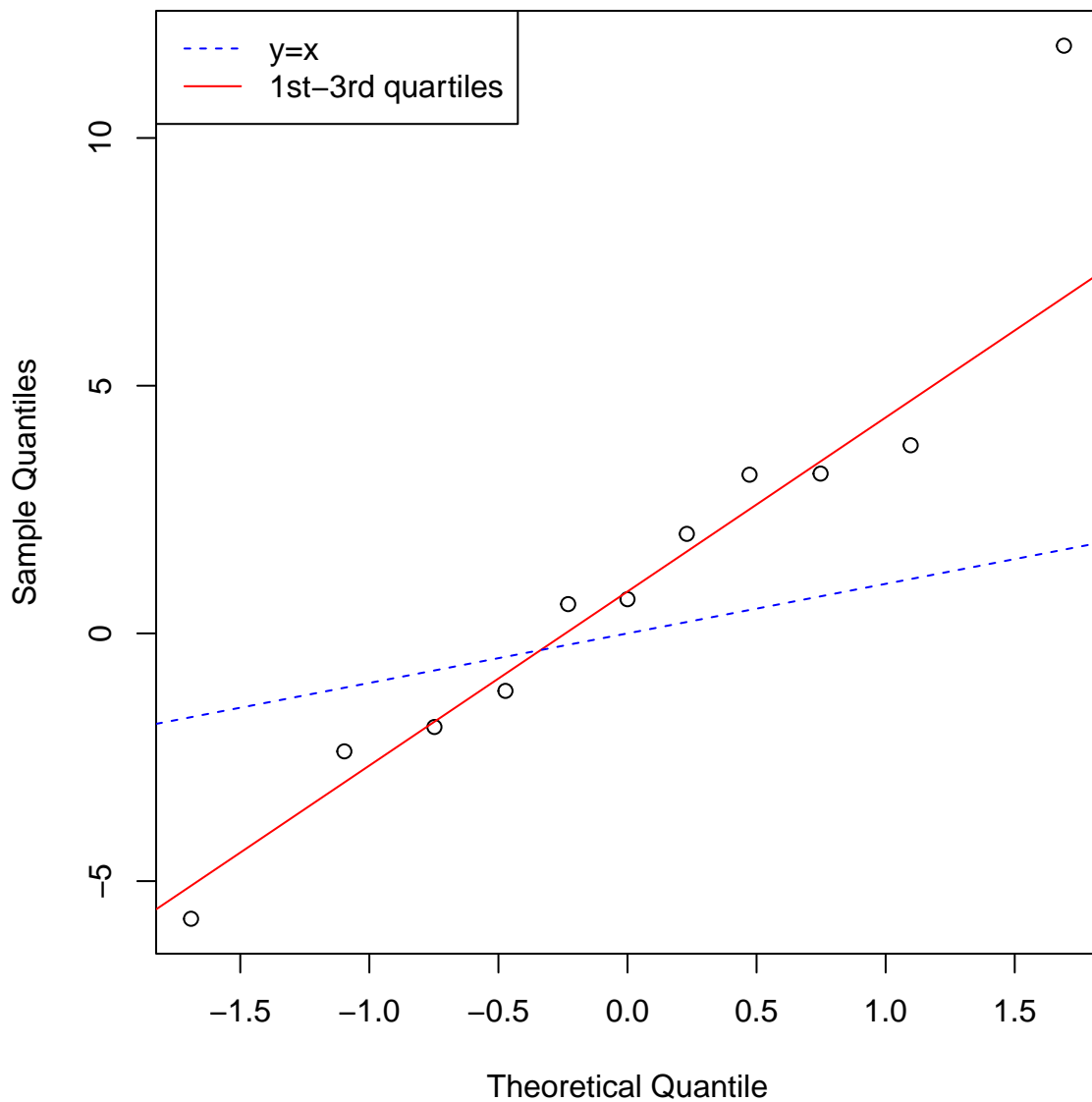
Index 1 (NEFSC Inshore) ESS = 50



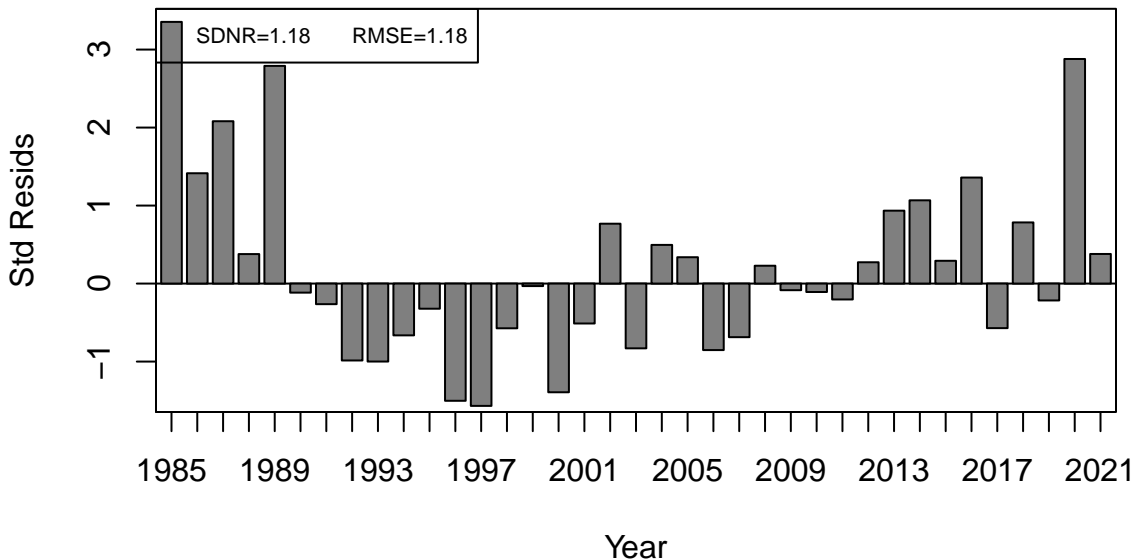
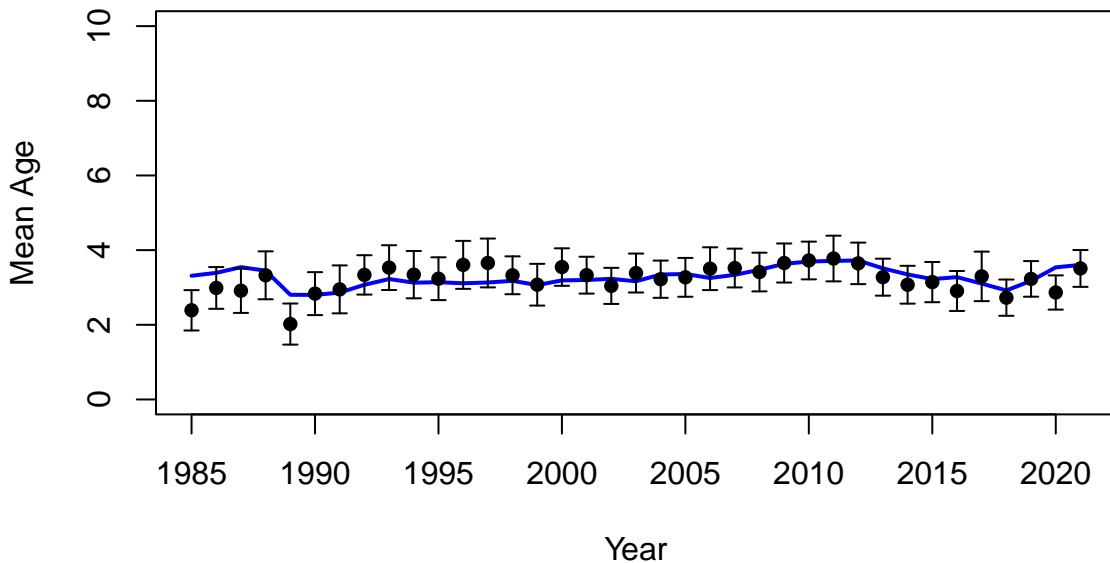
Index 2 (Bigelow) ESS = 60



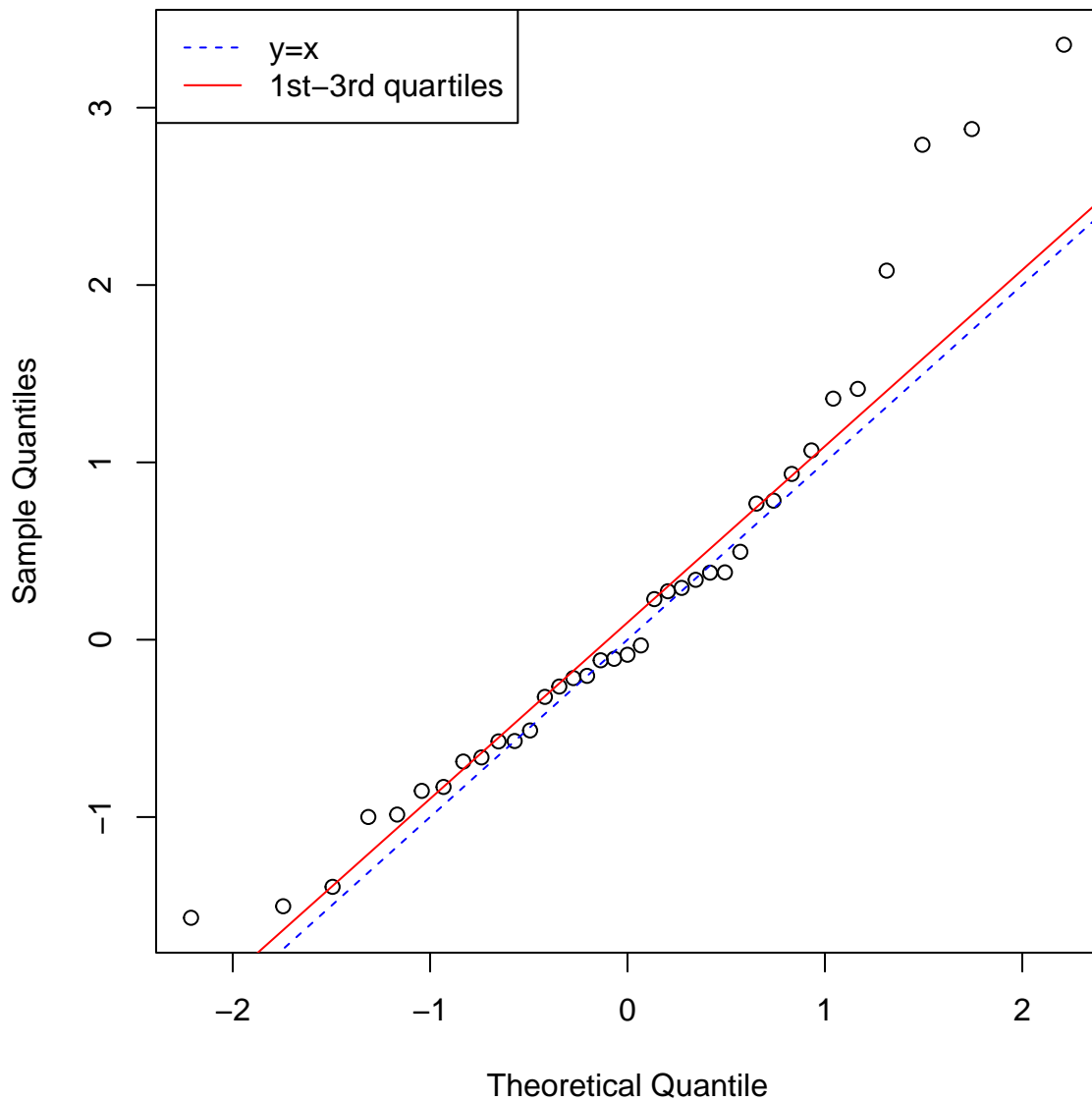
Index 2 (Bigelow) ESS = 60



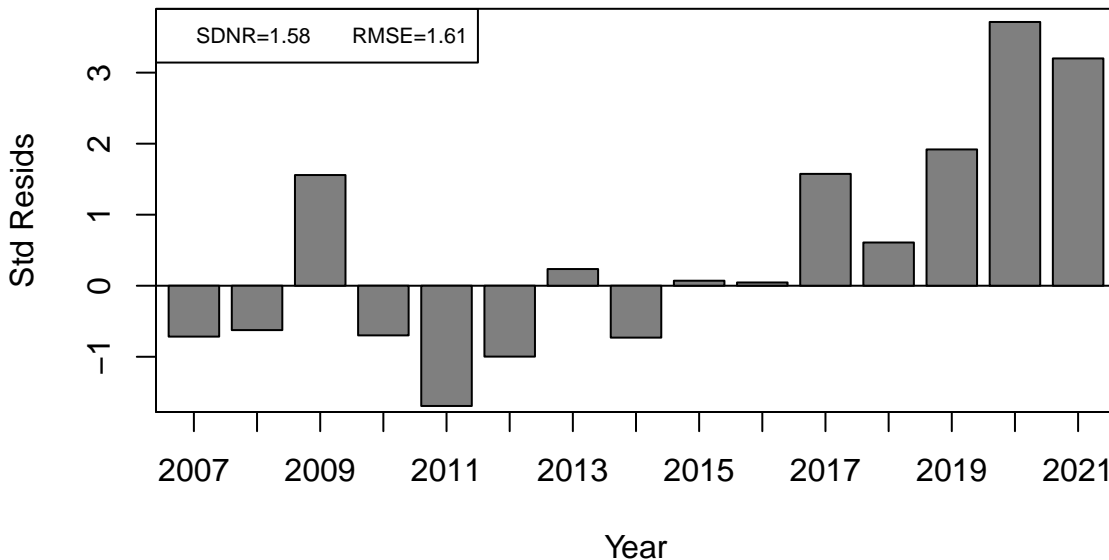
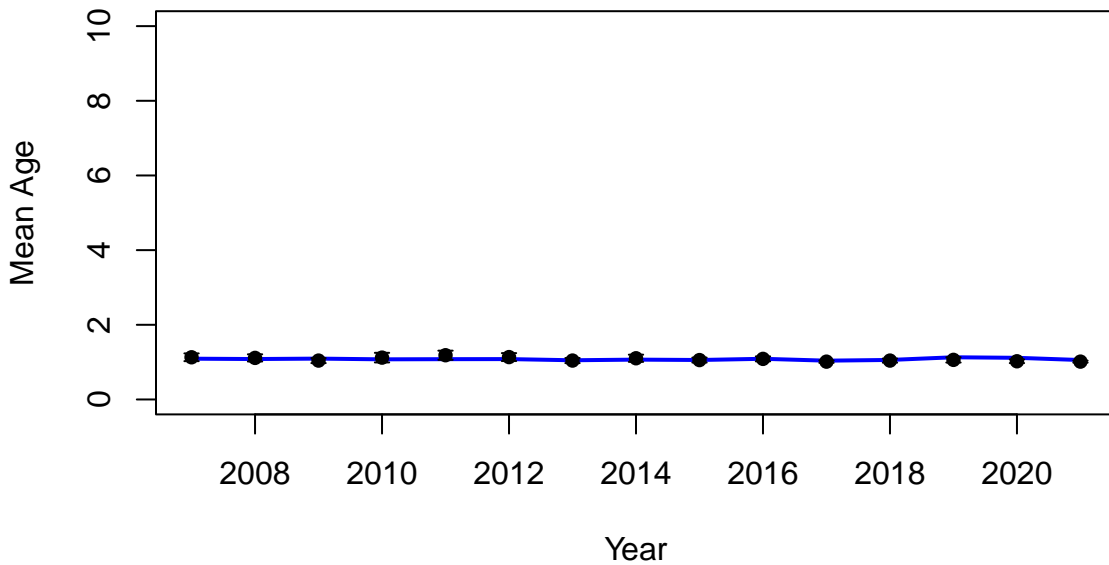
Index 3 (MRIP) ESS = 40



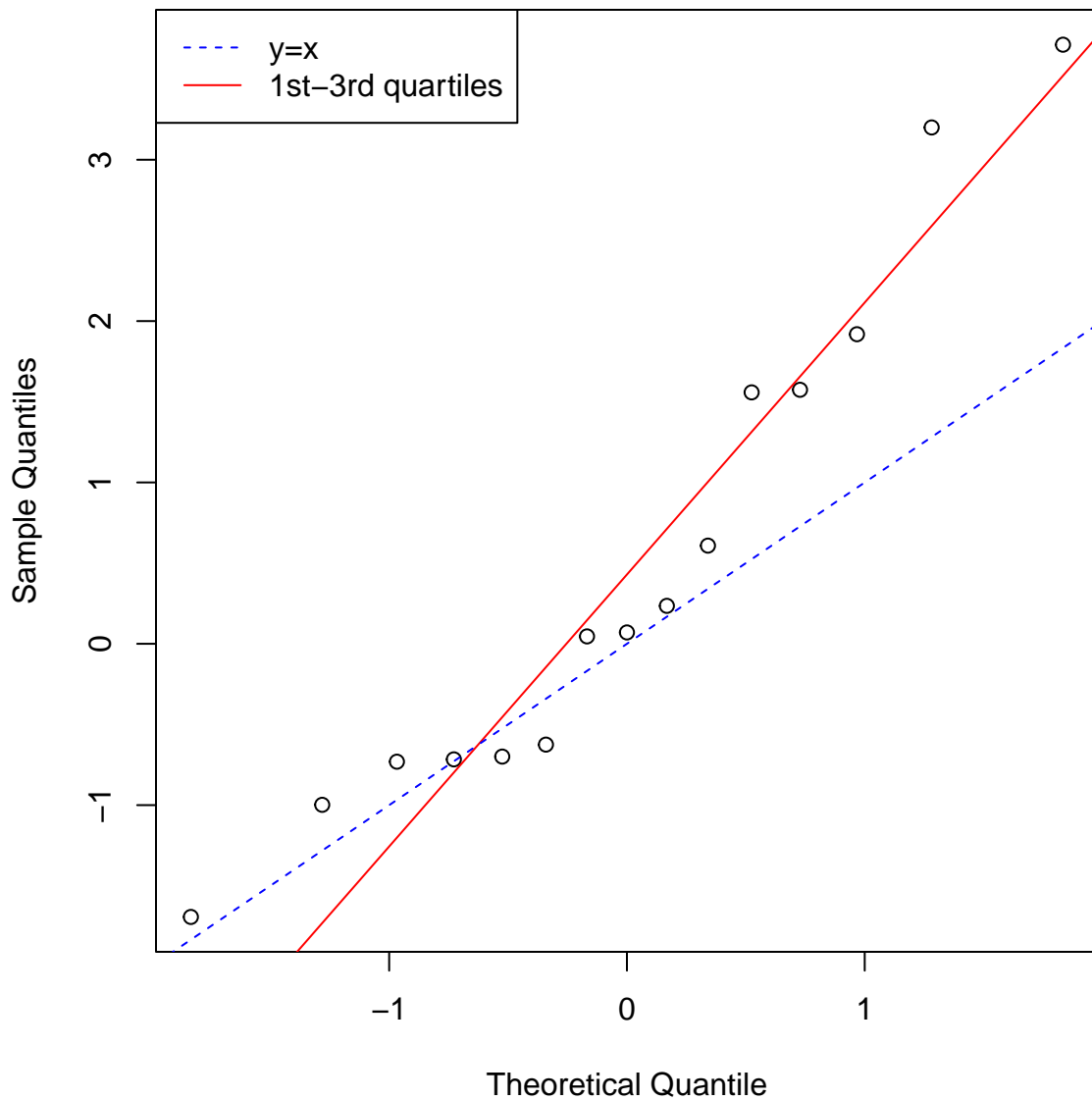
Index 3 (MRIP) ESS = 40



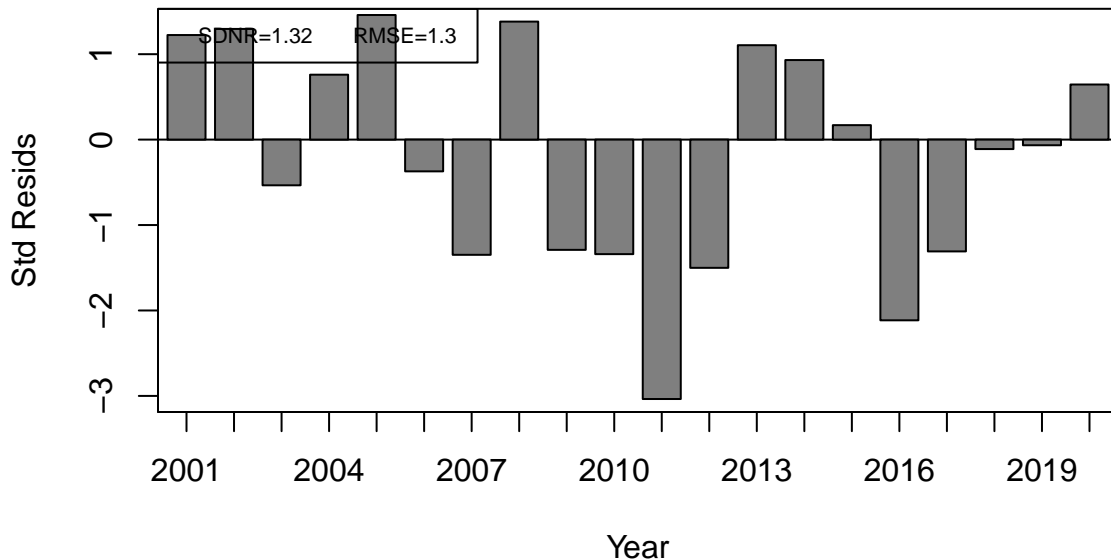
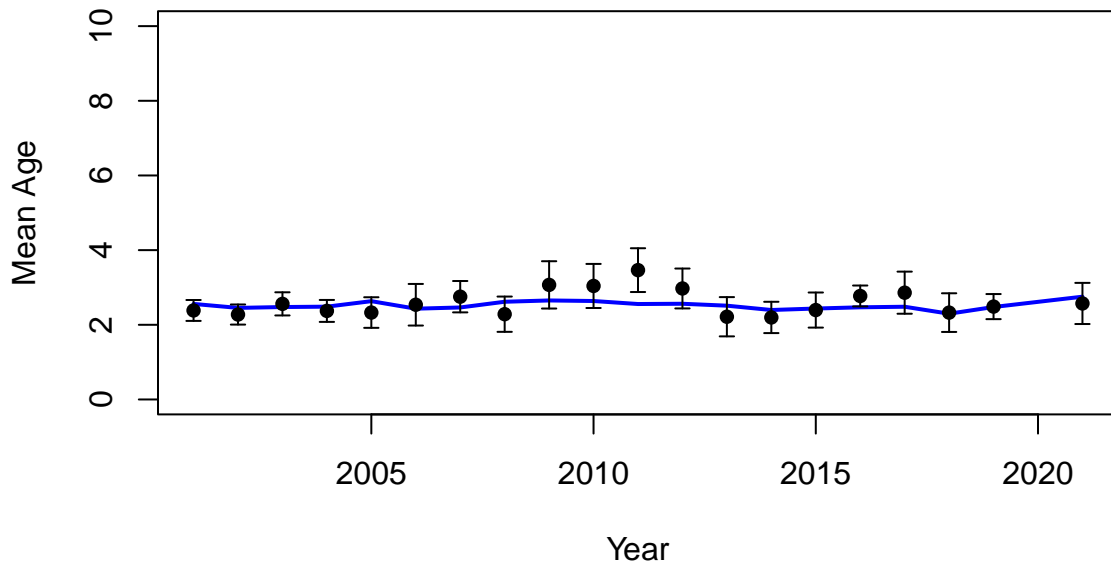
Index 4 (NEAMAP) ESS = 80



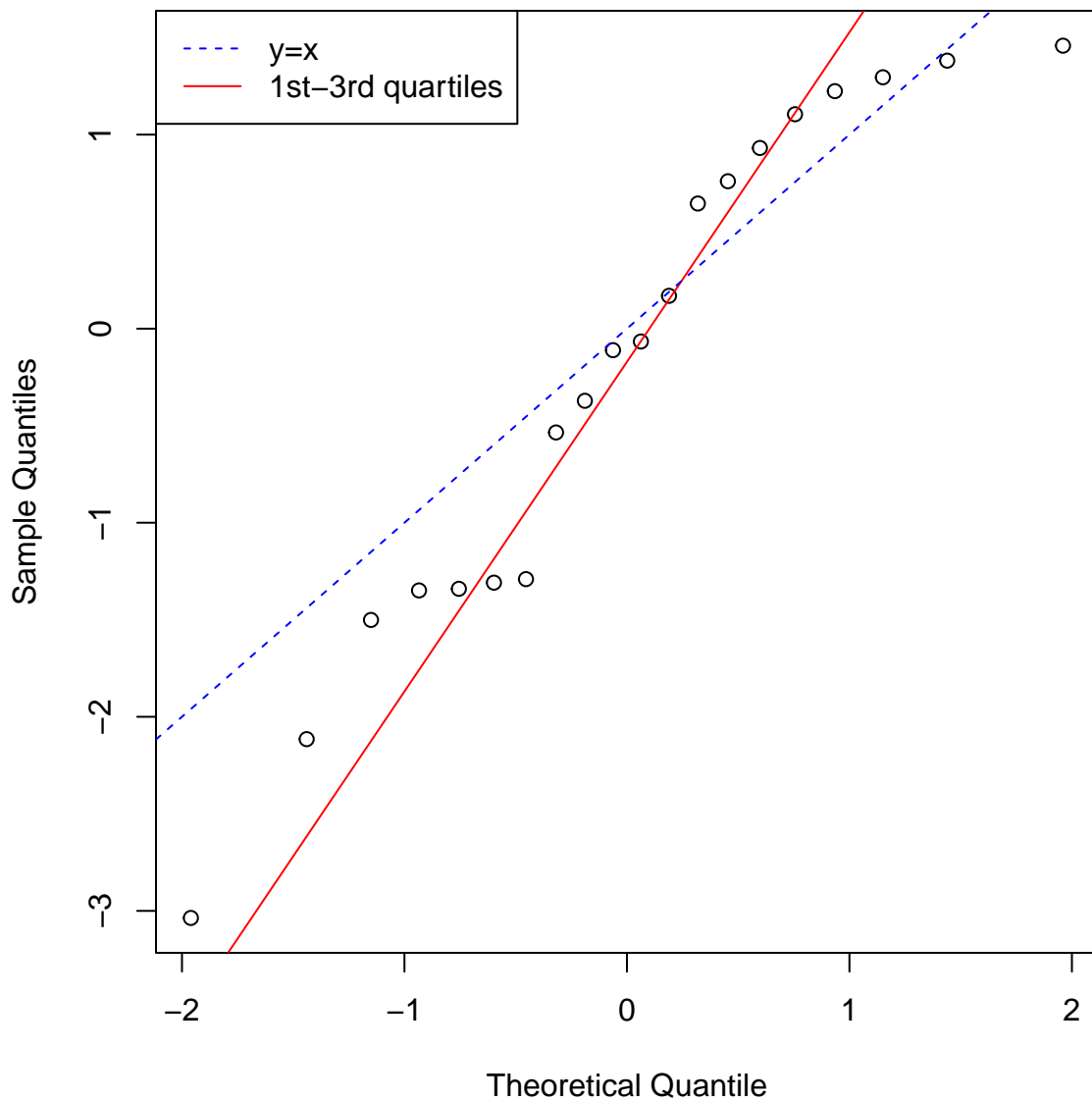
Index 4 (NEAMAP) ESS = 80



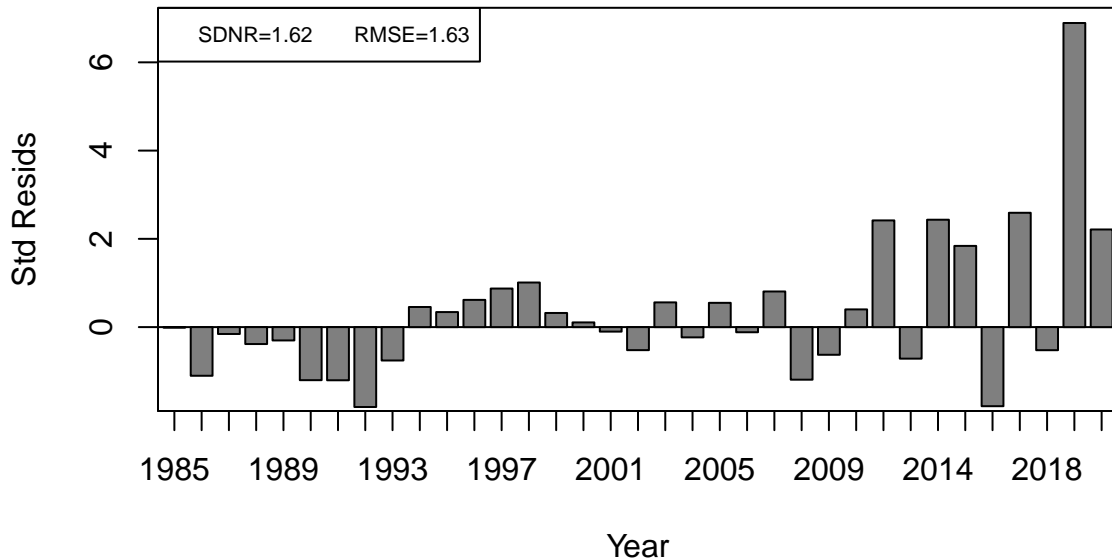
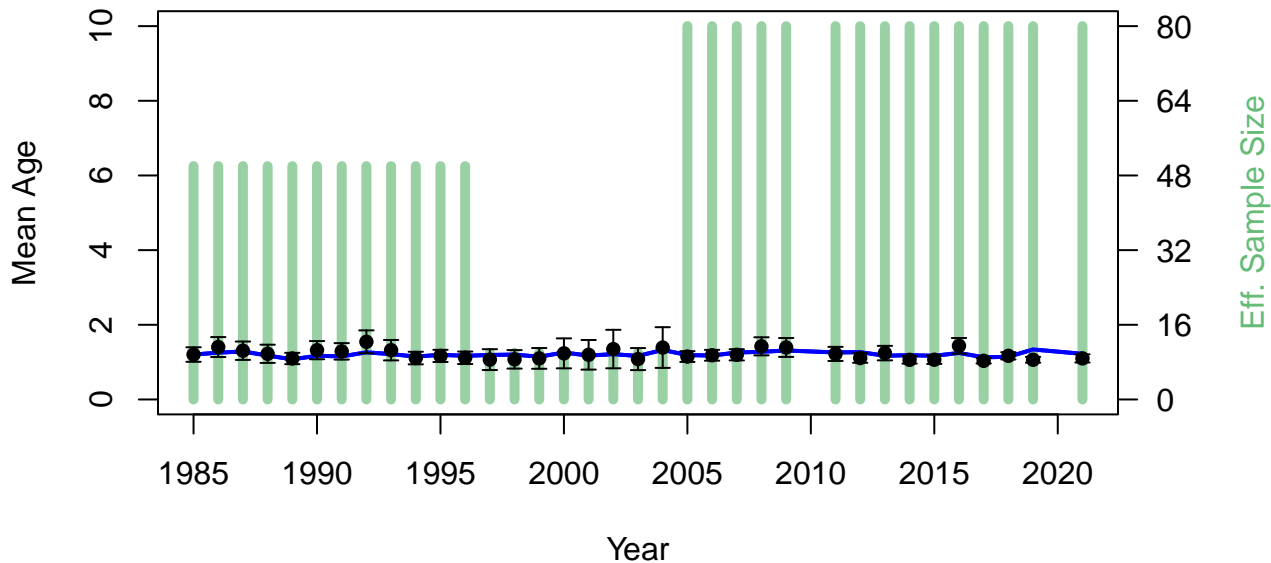
Index 6 (PSIGN) ESS = 15



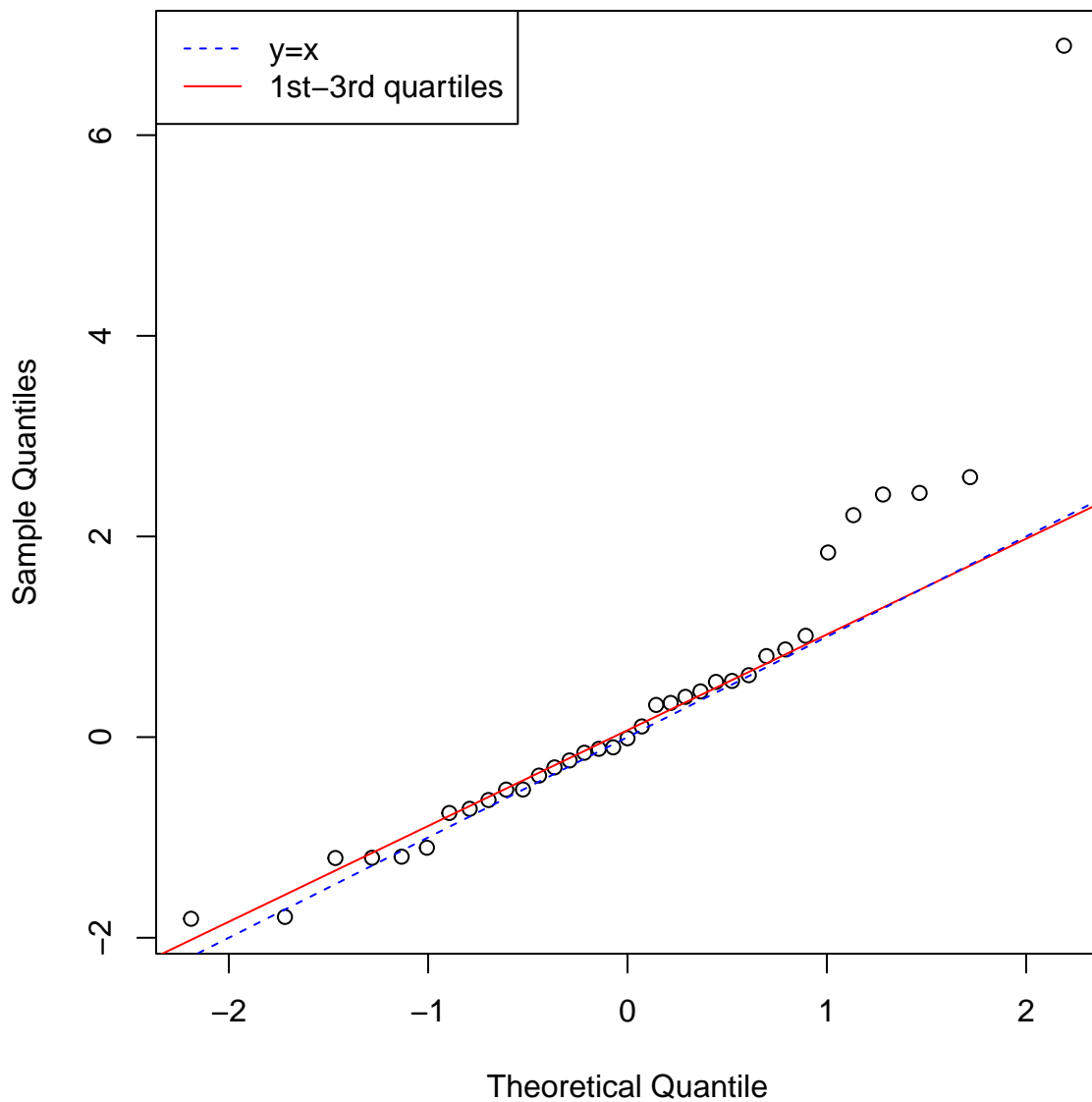
Index 6 (PSIGN) ESS = 15



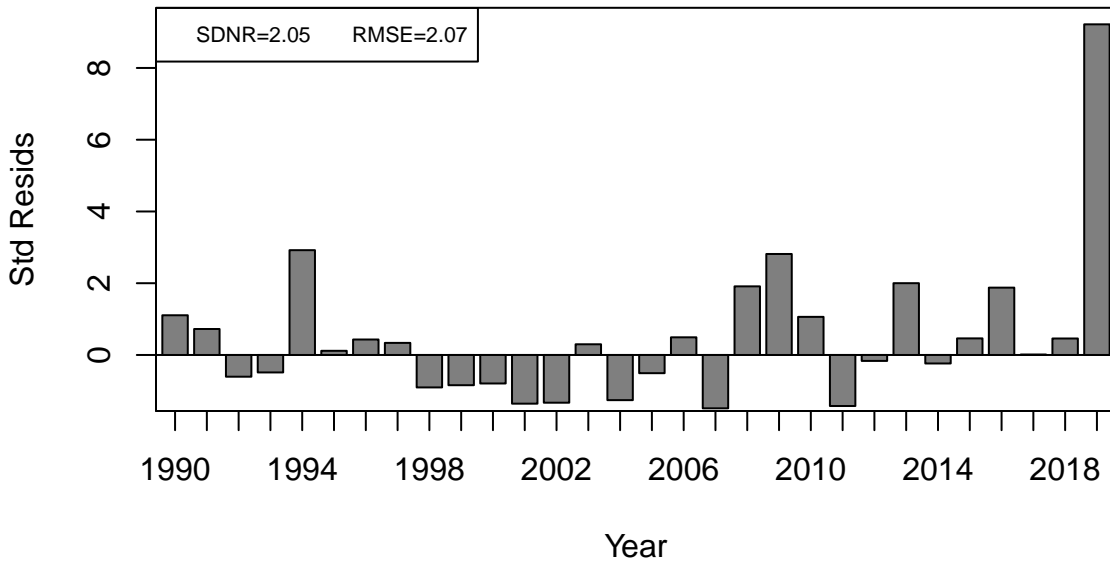
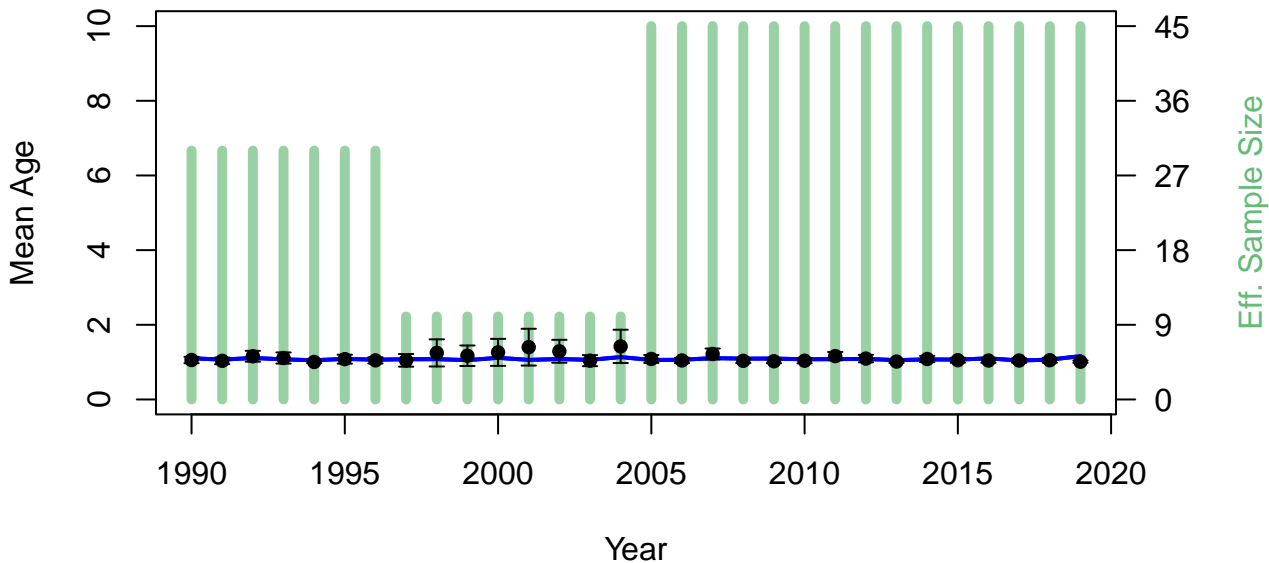
Index 7 (CT Trawl)



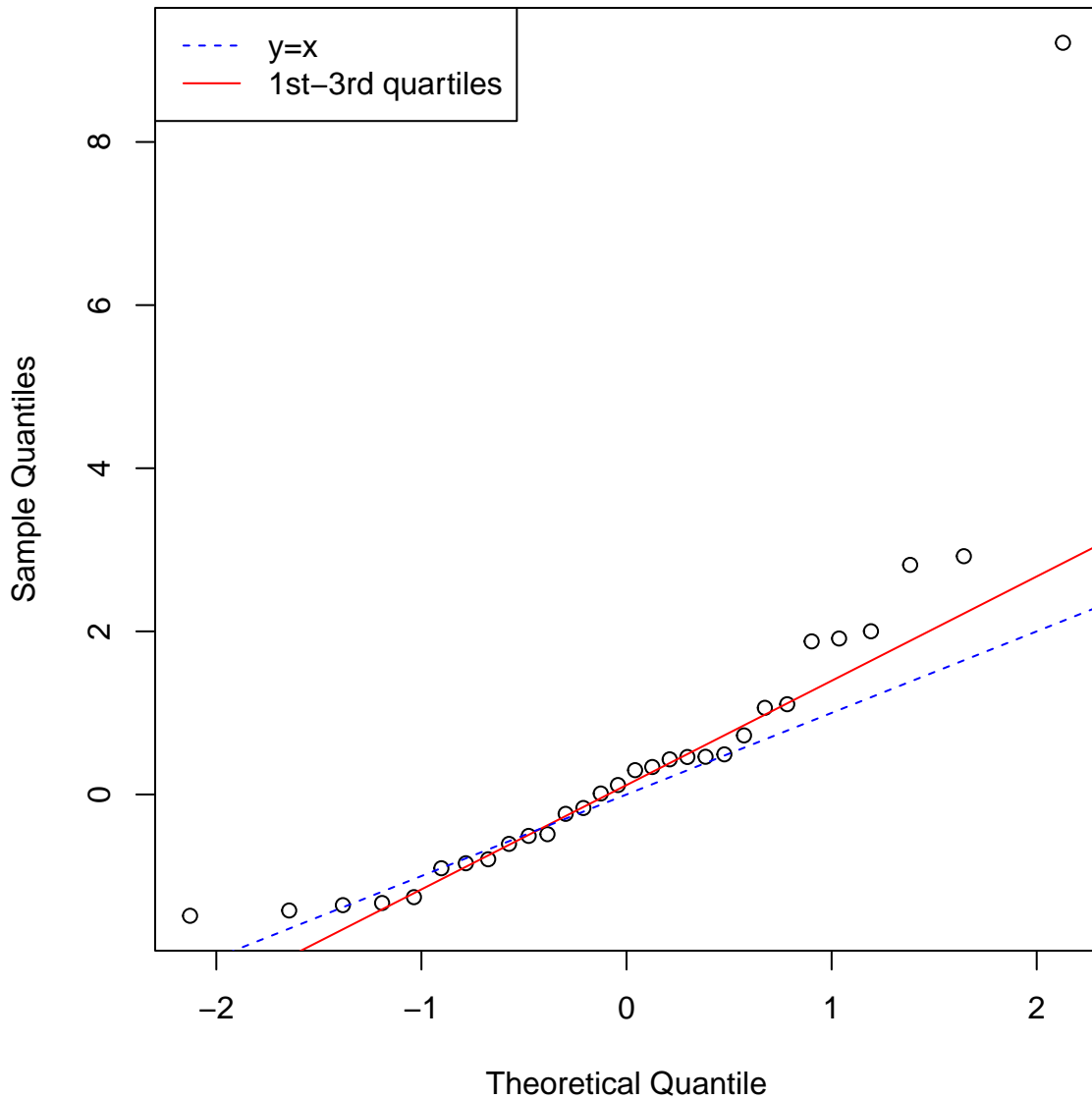
Index 7 (CT Trawl)



Index 8 (NJ Trawl)



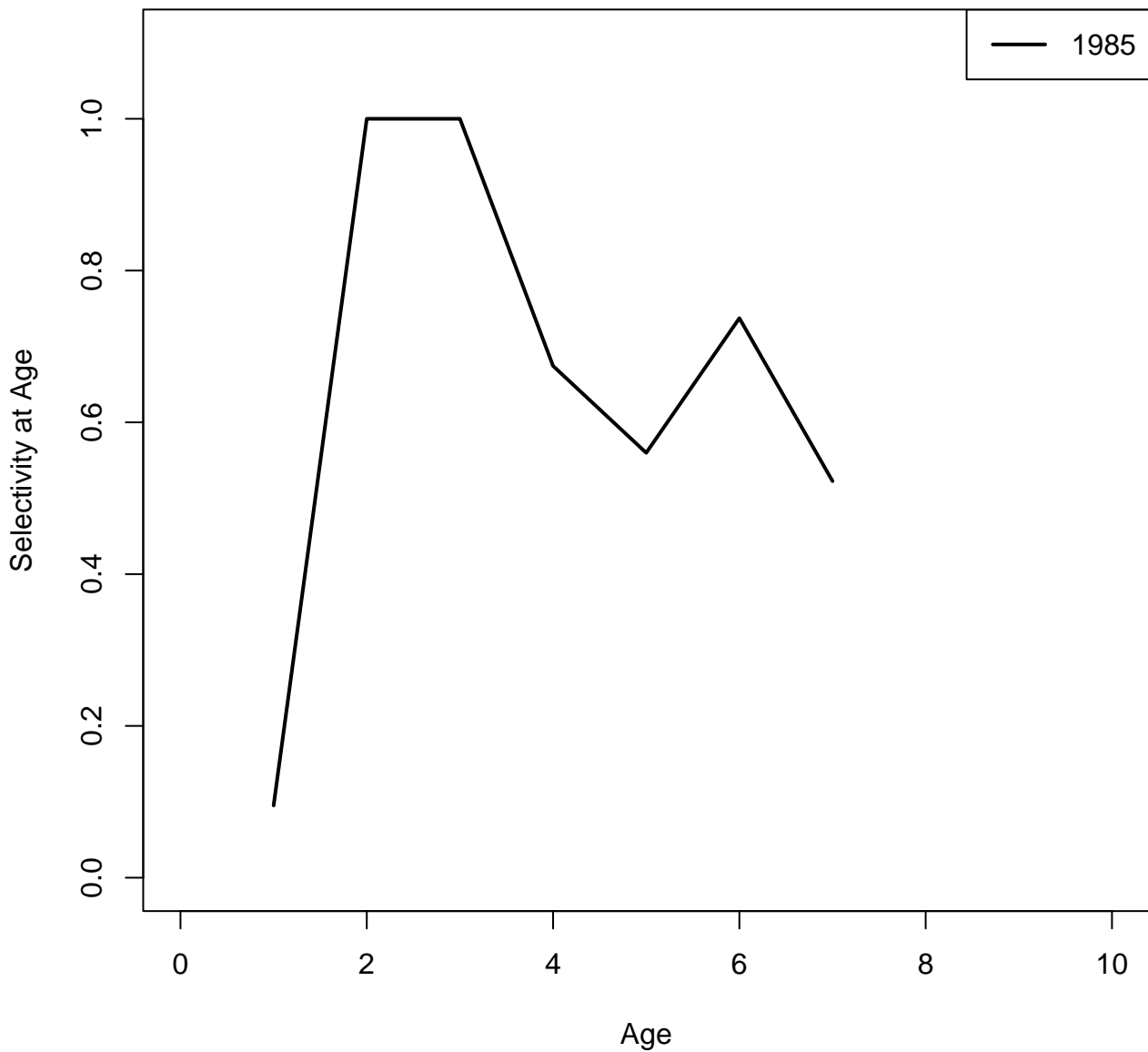
Index 8 (NJ Trawl)



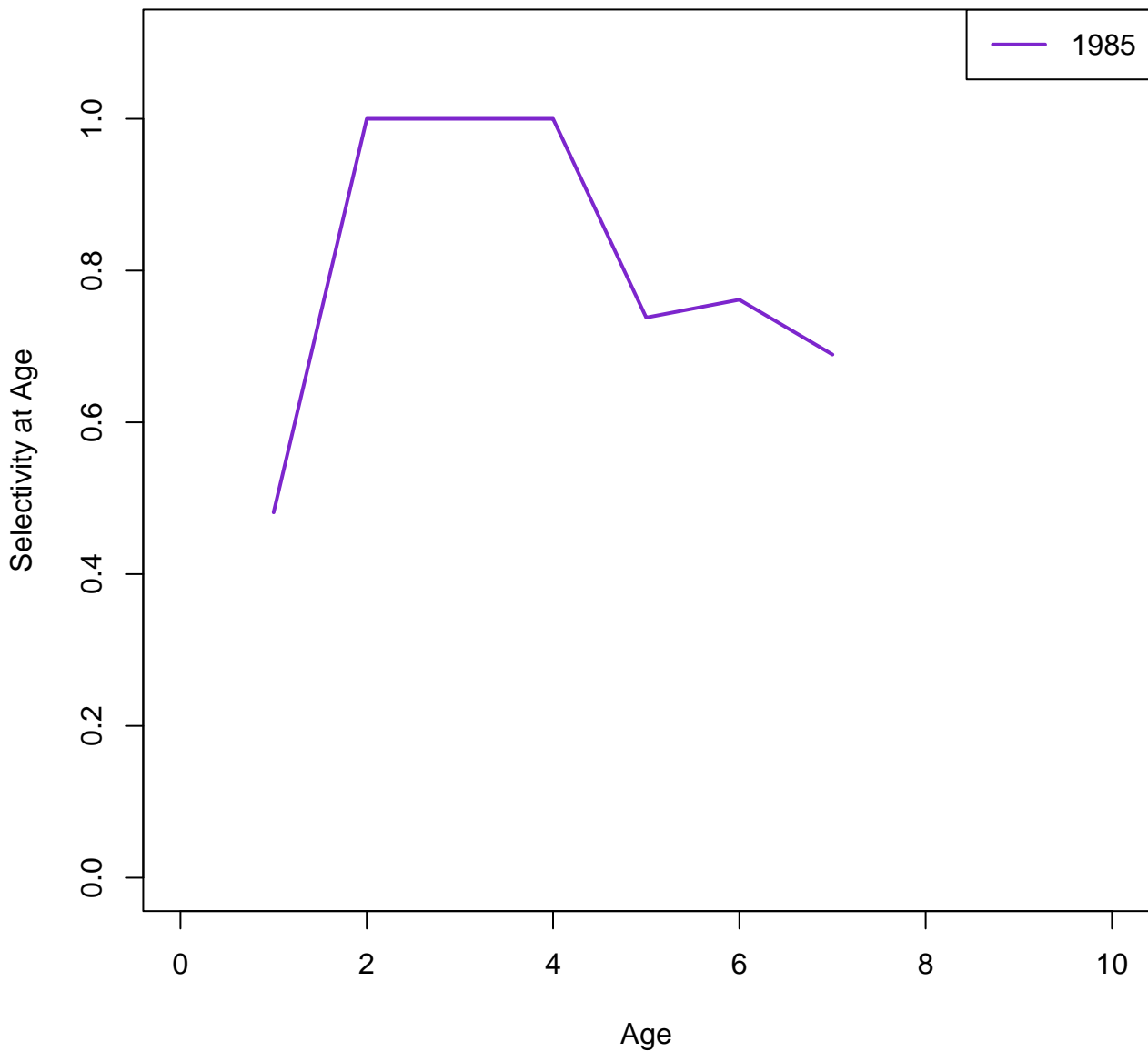
BF01: Continuity Run

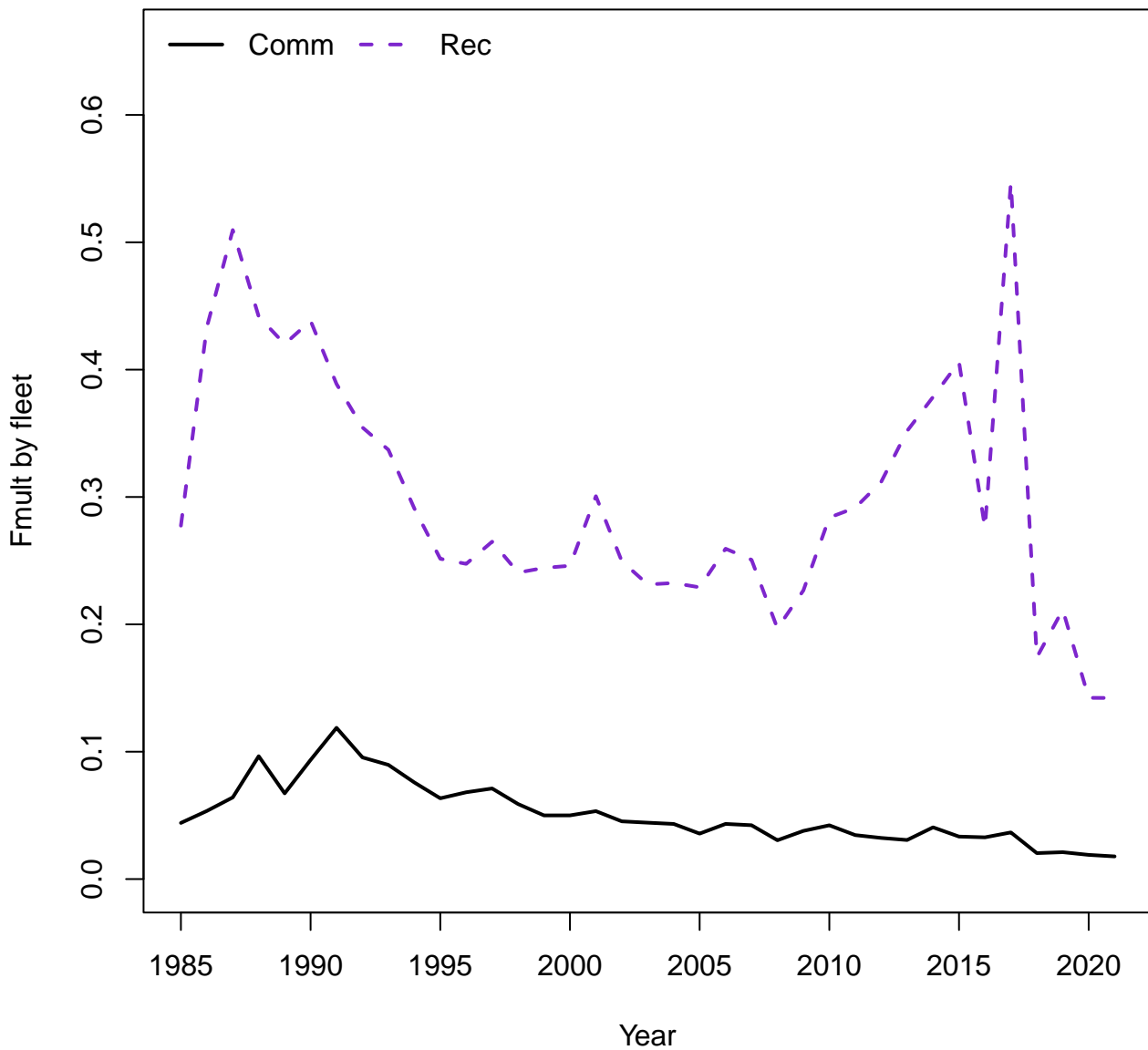
RESULTS PLOTS

Fleet 1 (Comm)

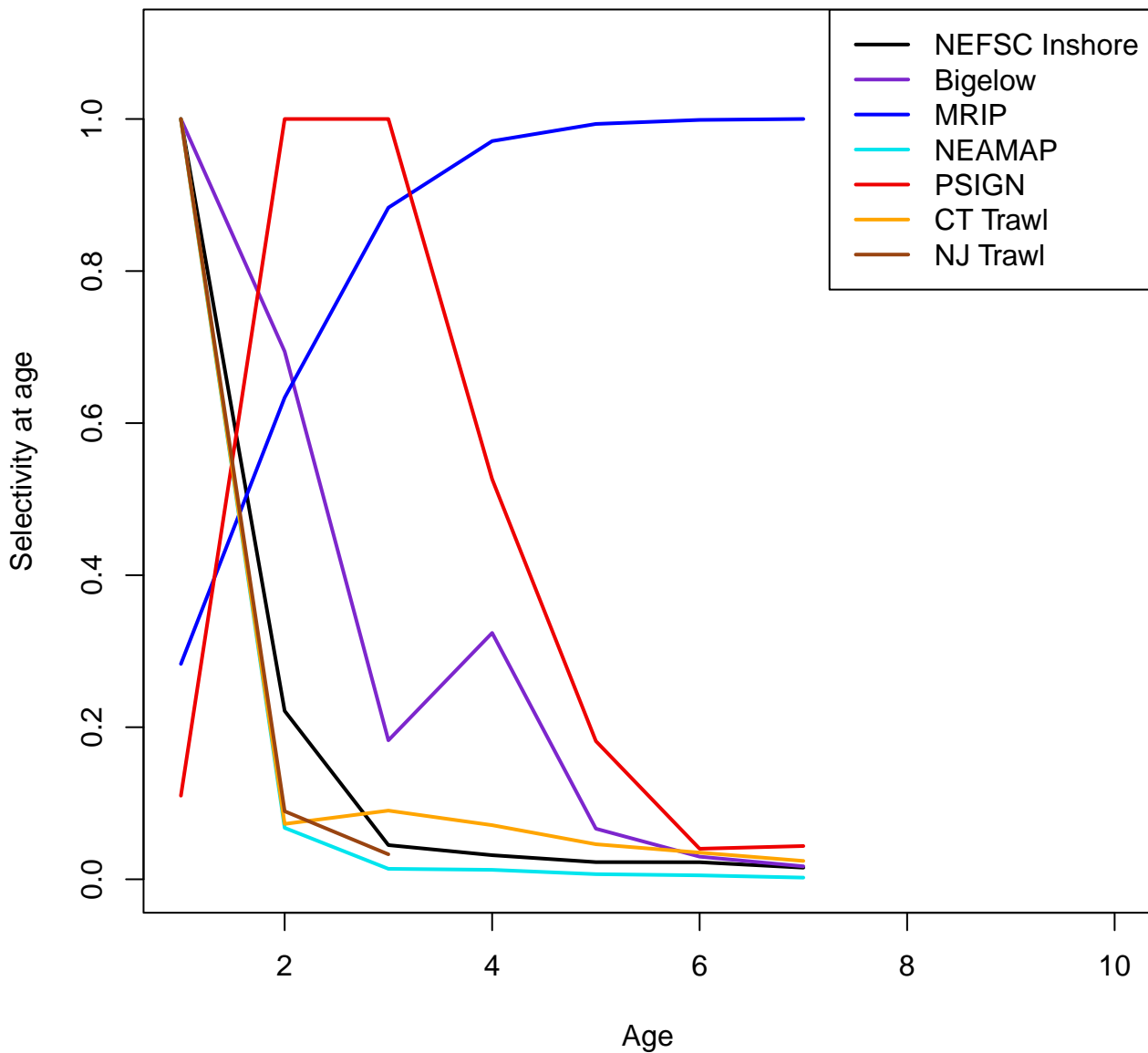


Fleet 2 (Rec)

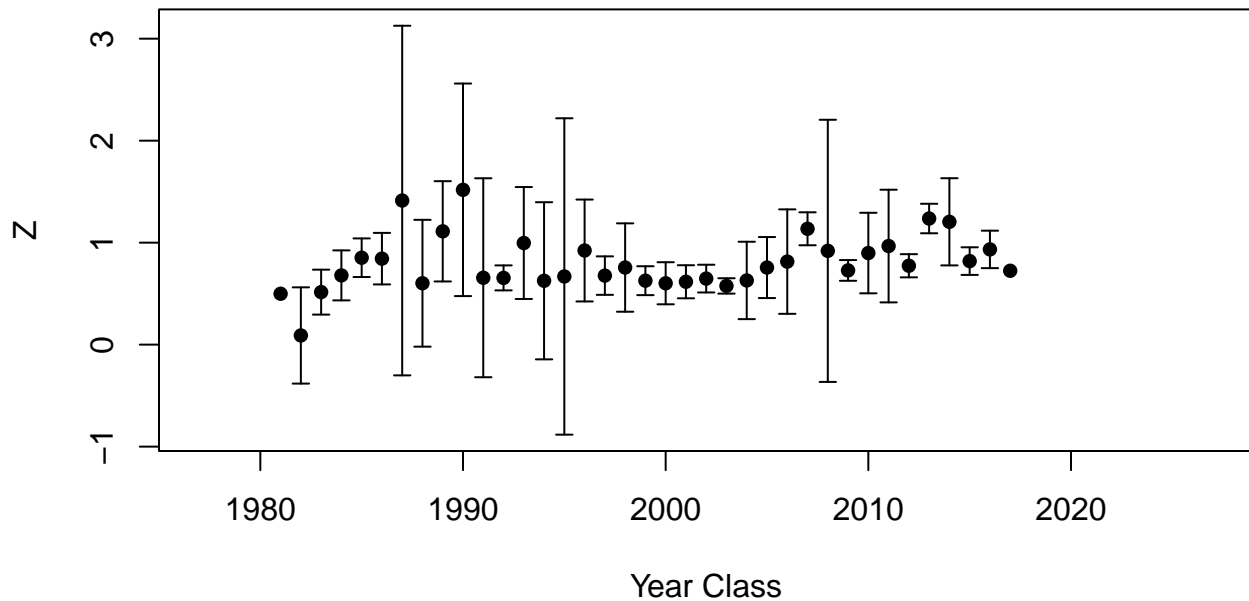
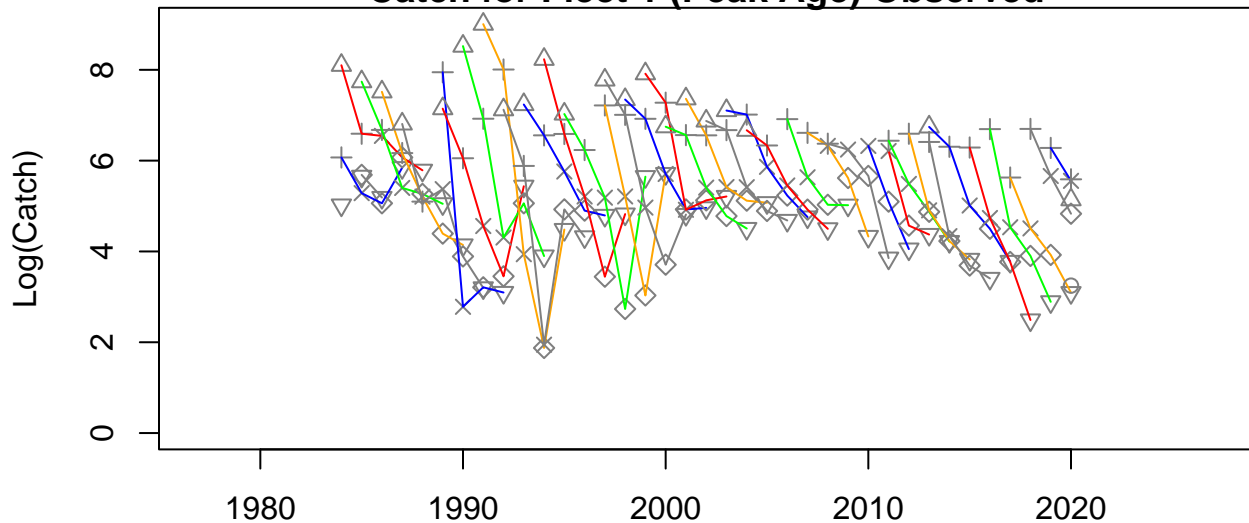




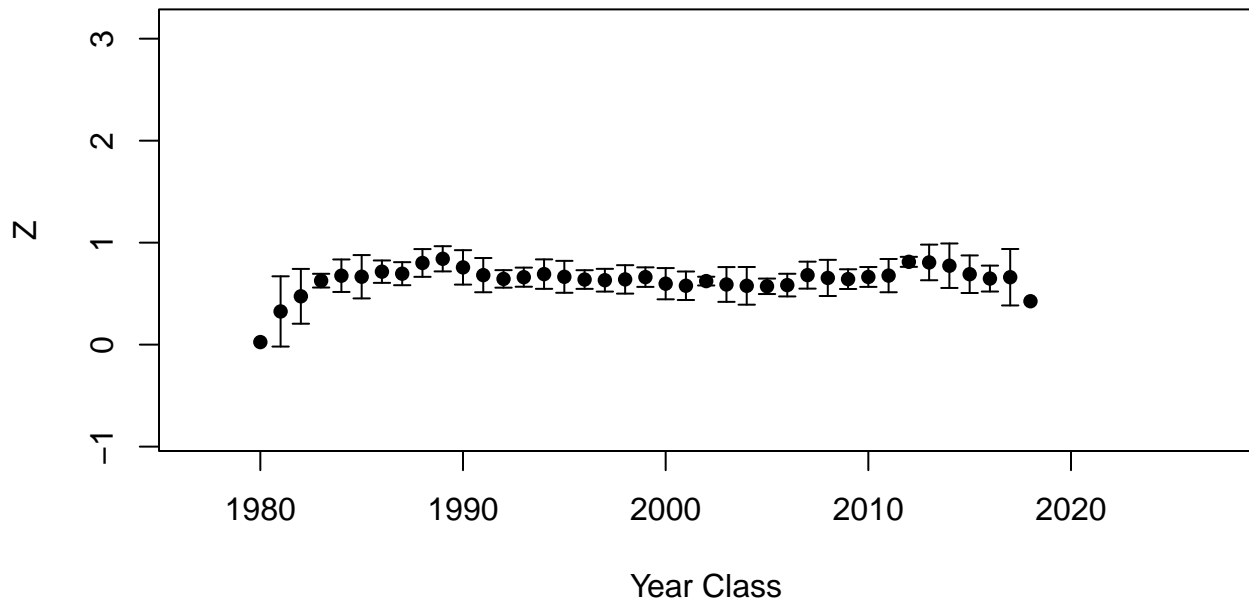
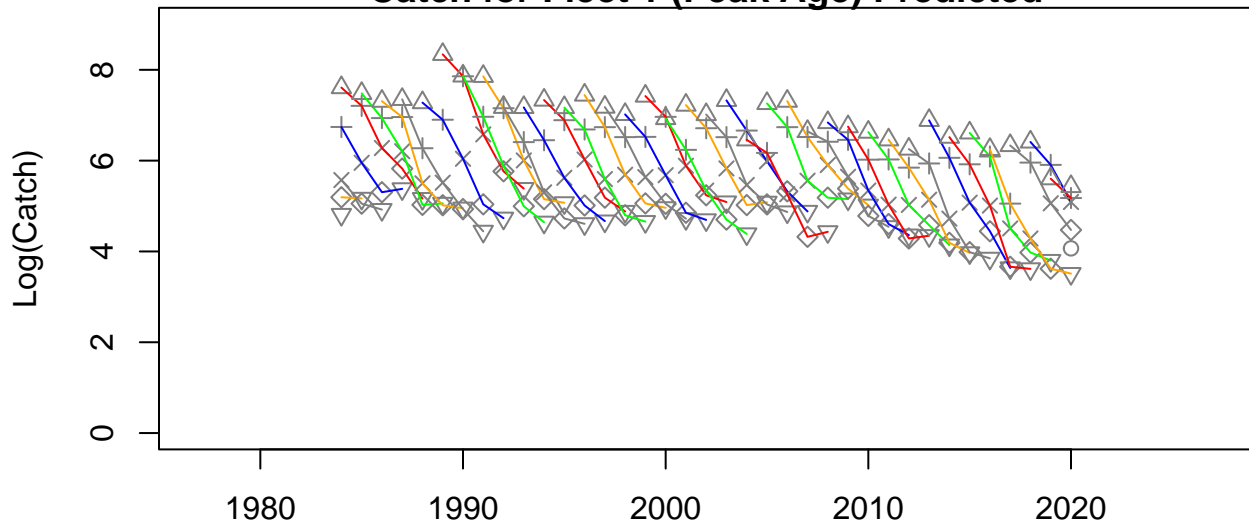
Indices



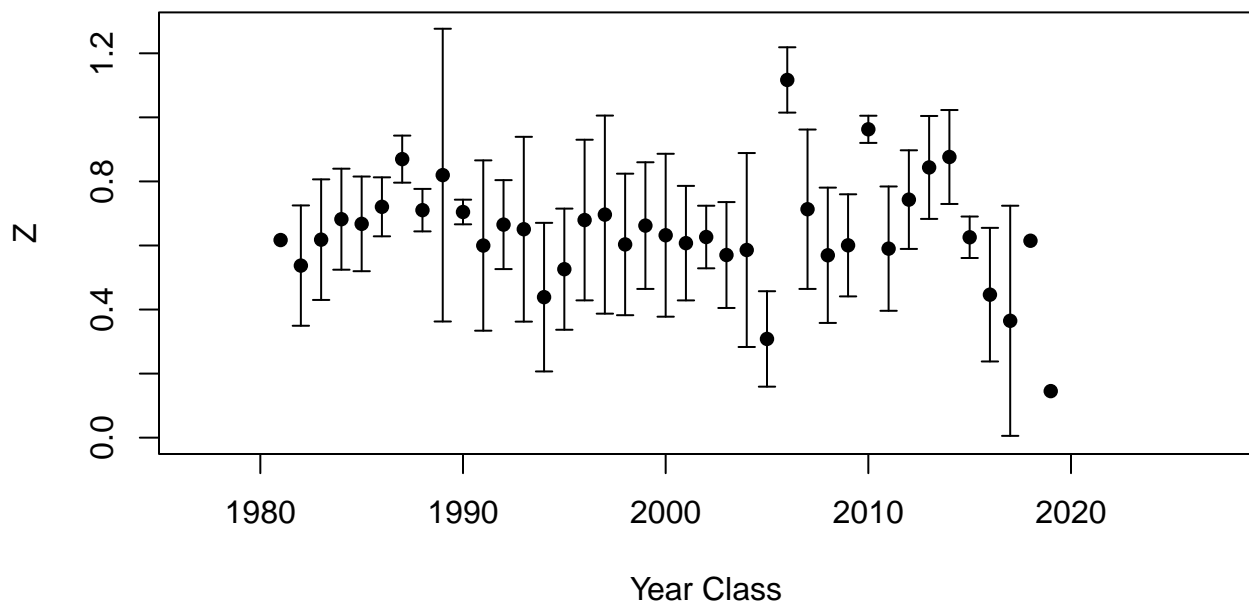
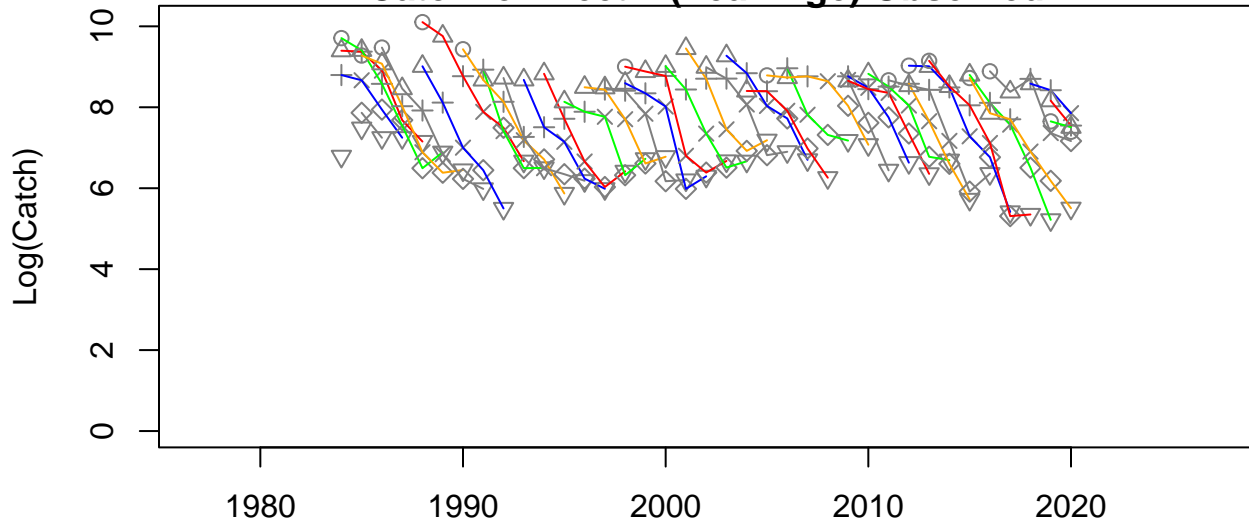
Catch for Fleet 1 (Peak Age) Observed



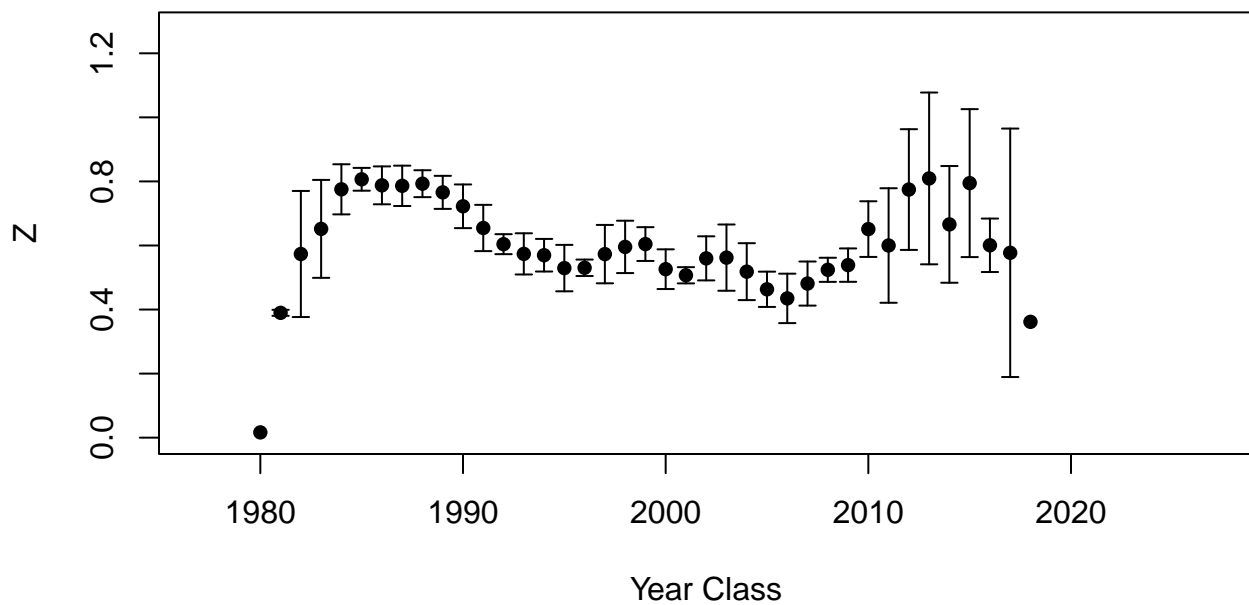
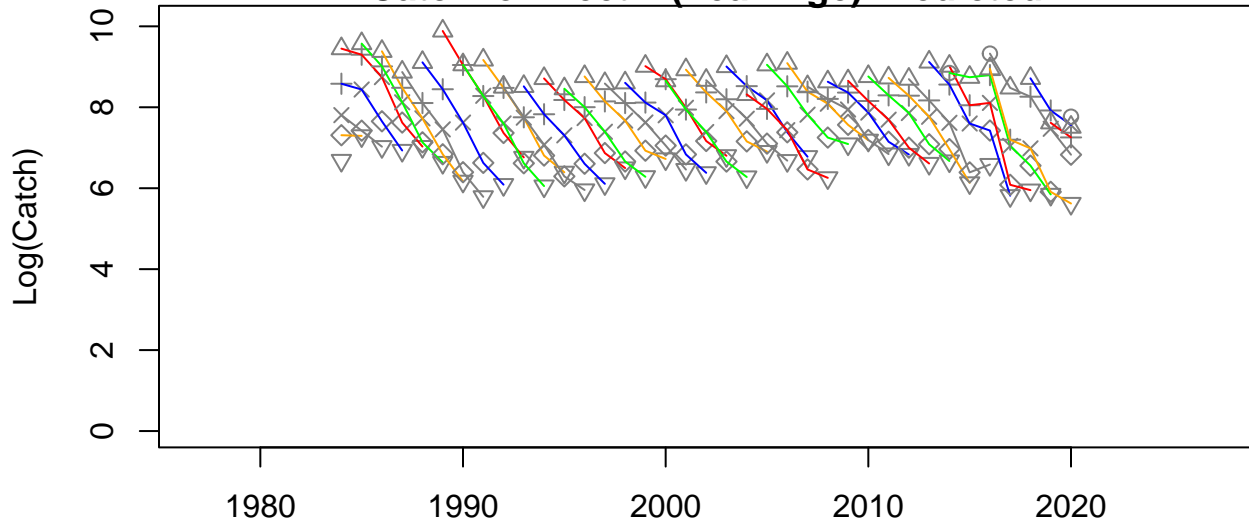
Catch for Fleet 1 (Peak Age) Predicted



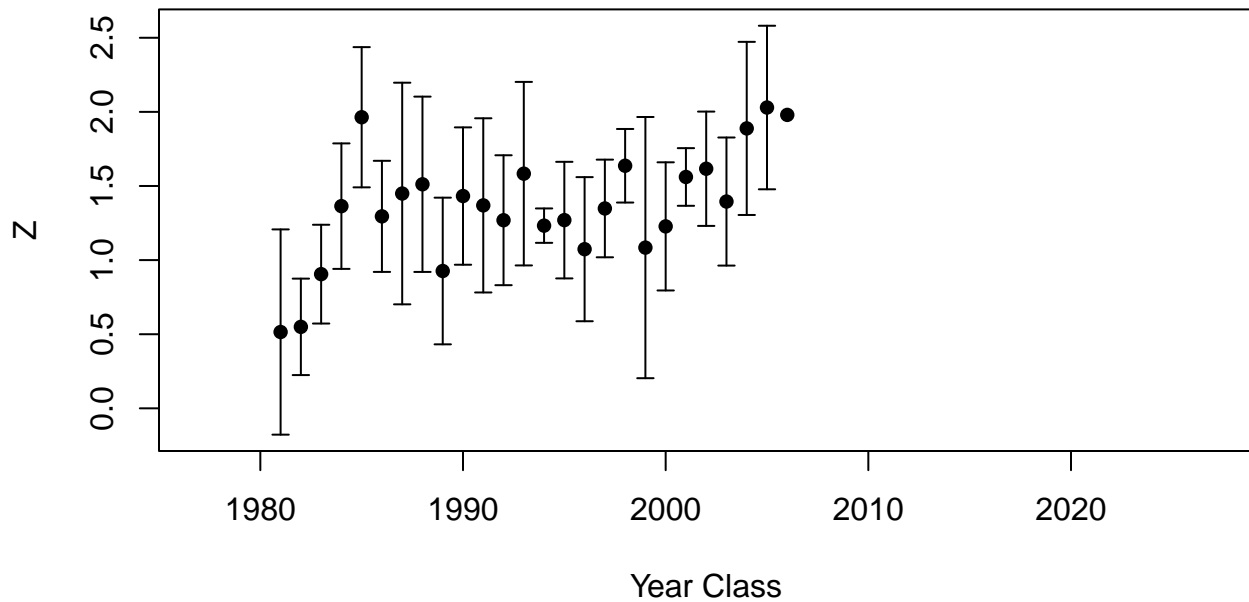
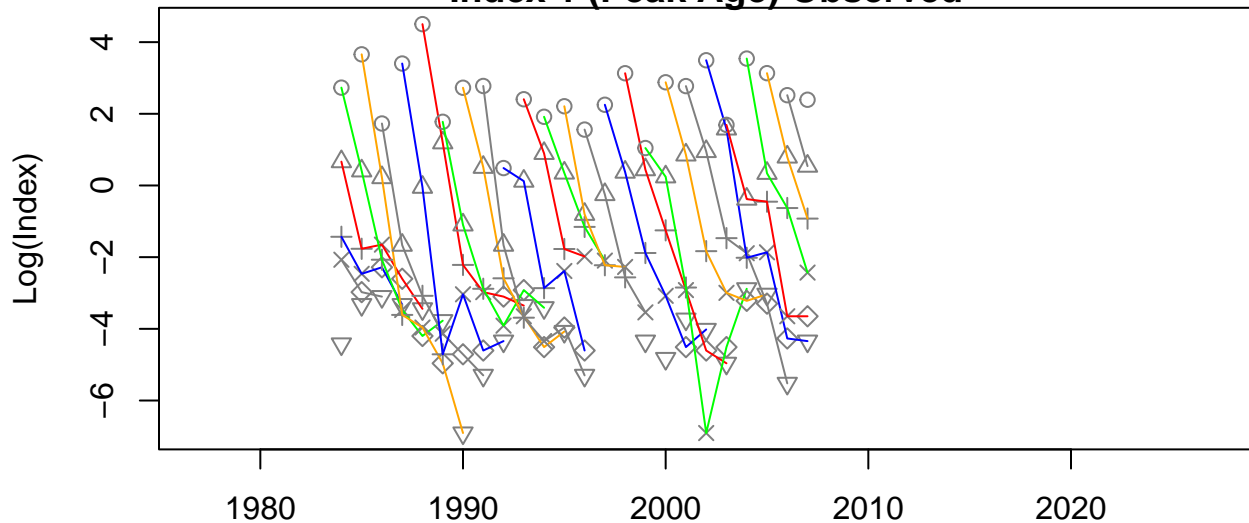
Catch for Fleet 2 (Peak Age) Observed



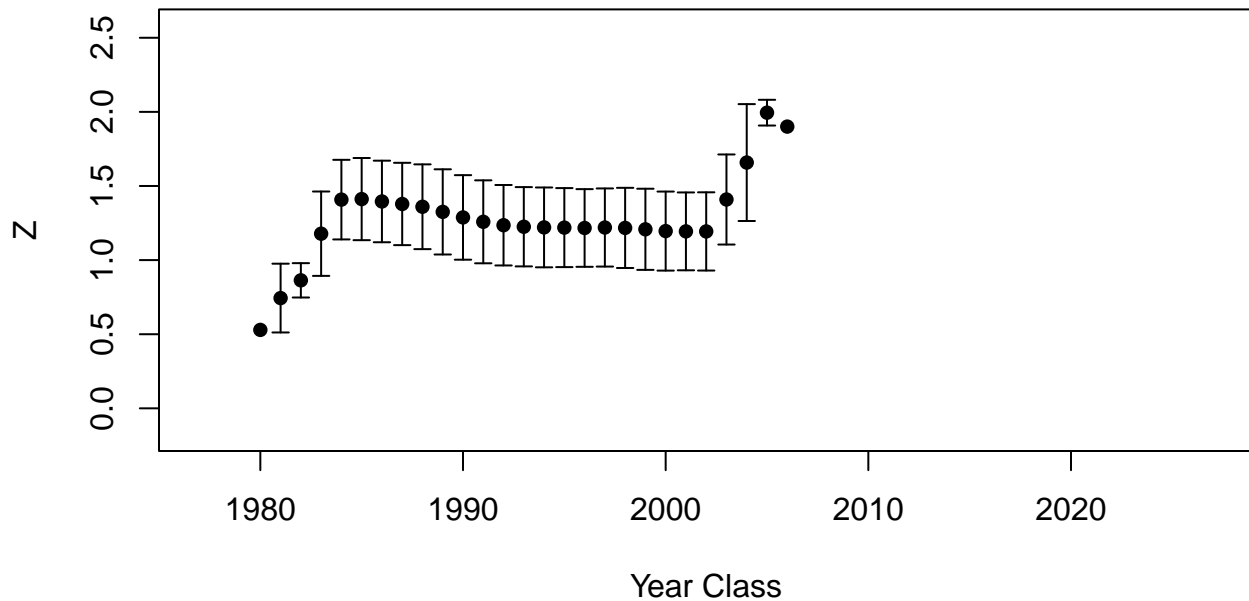
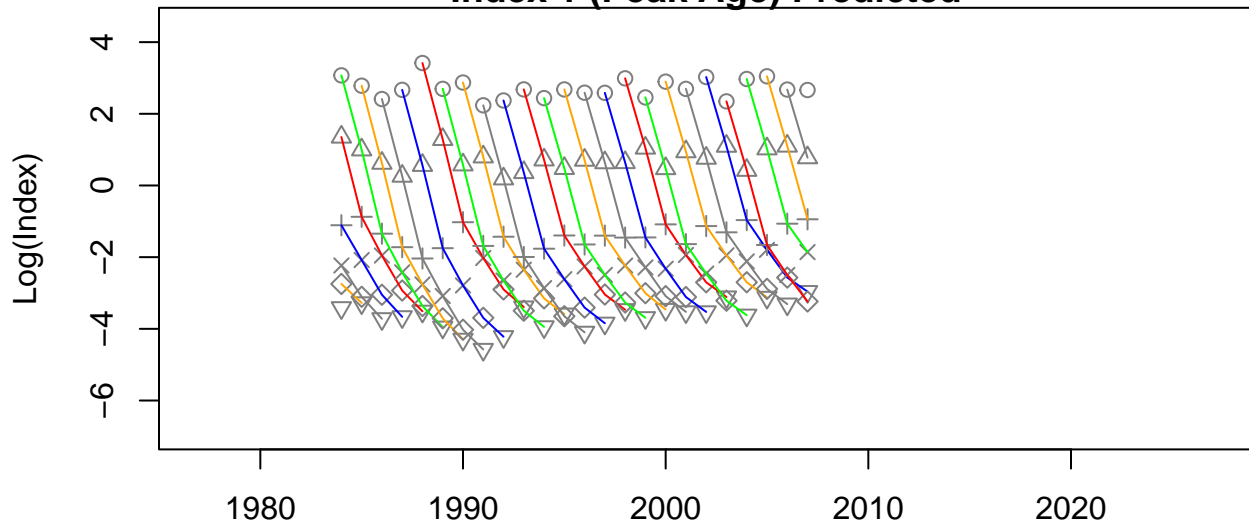
Catch for Fleet 2 (Peak Age) Predicted

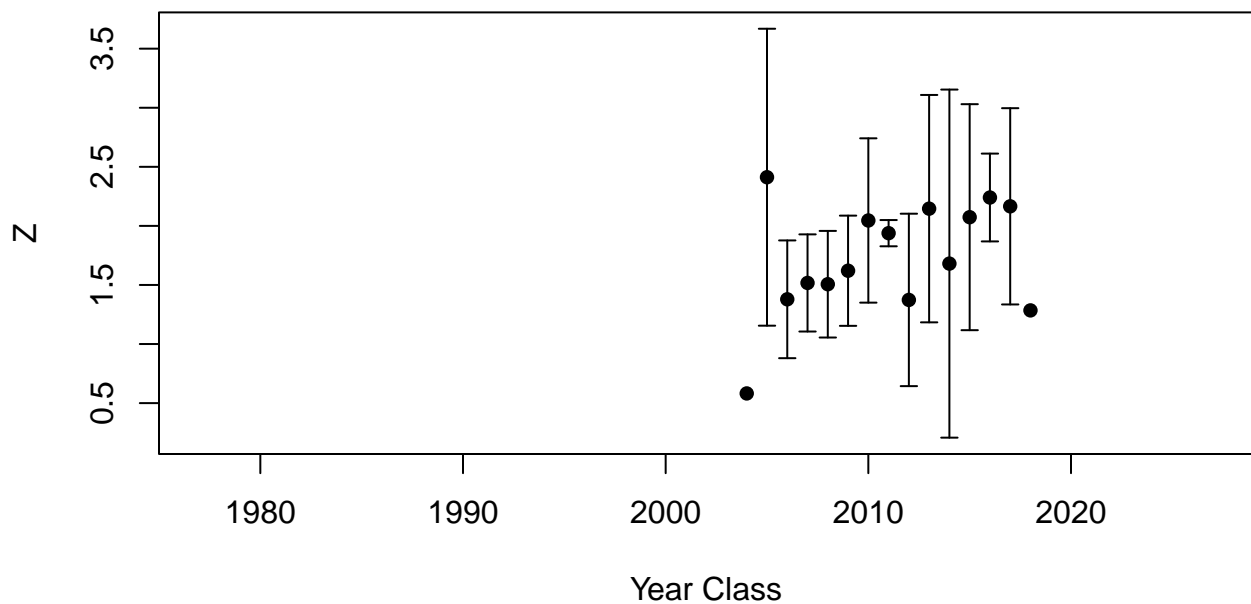
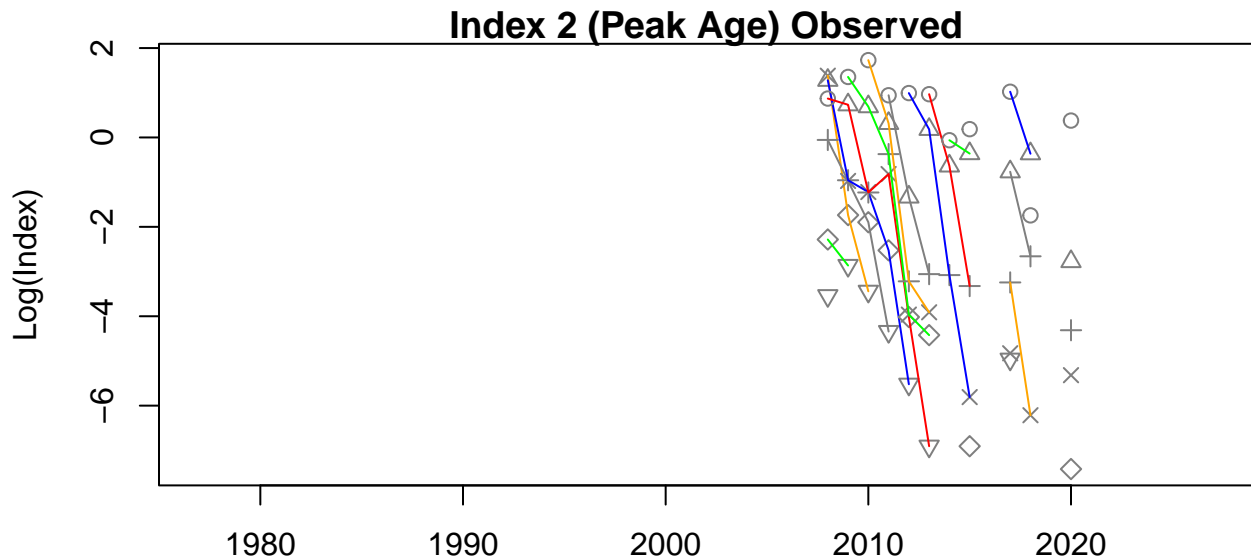


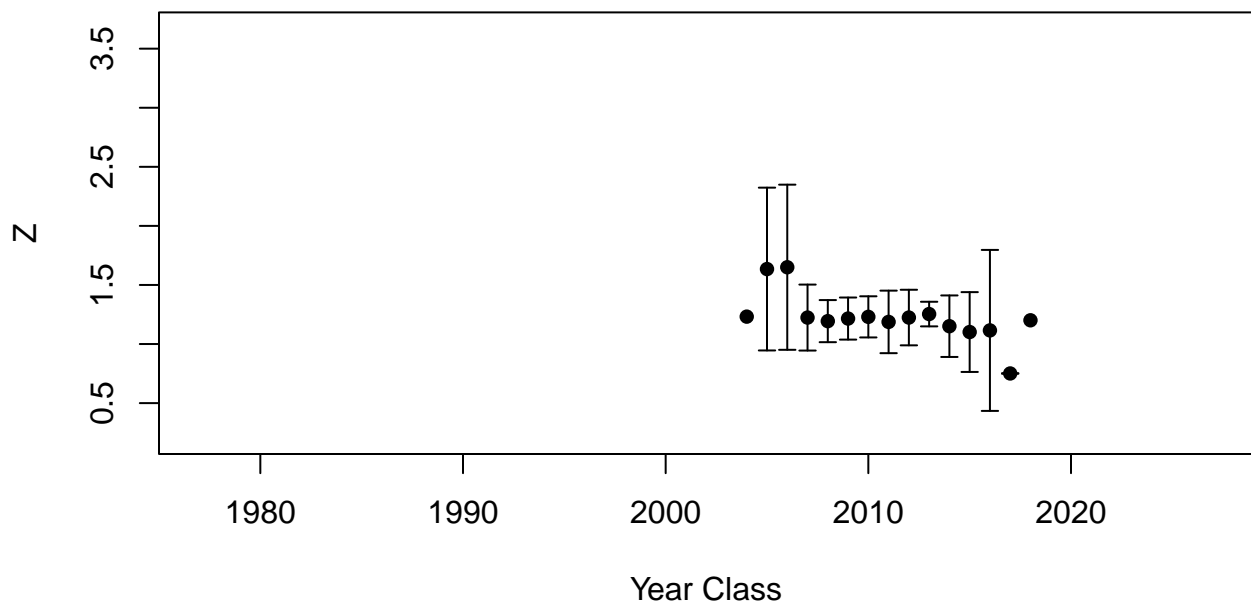
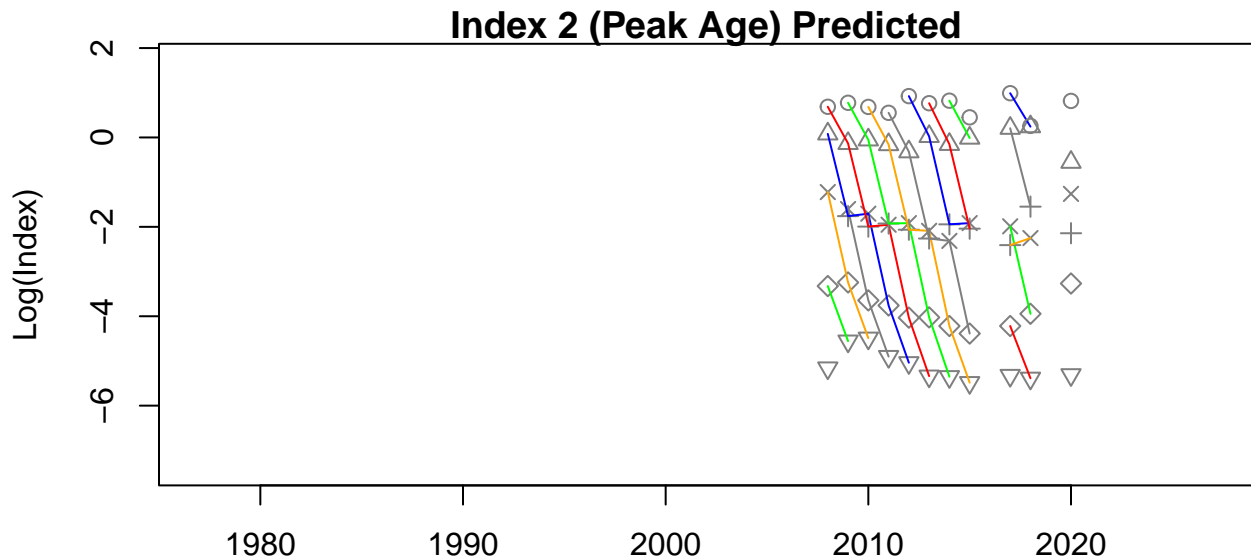
Index 1 (Peak Age) Observed



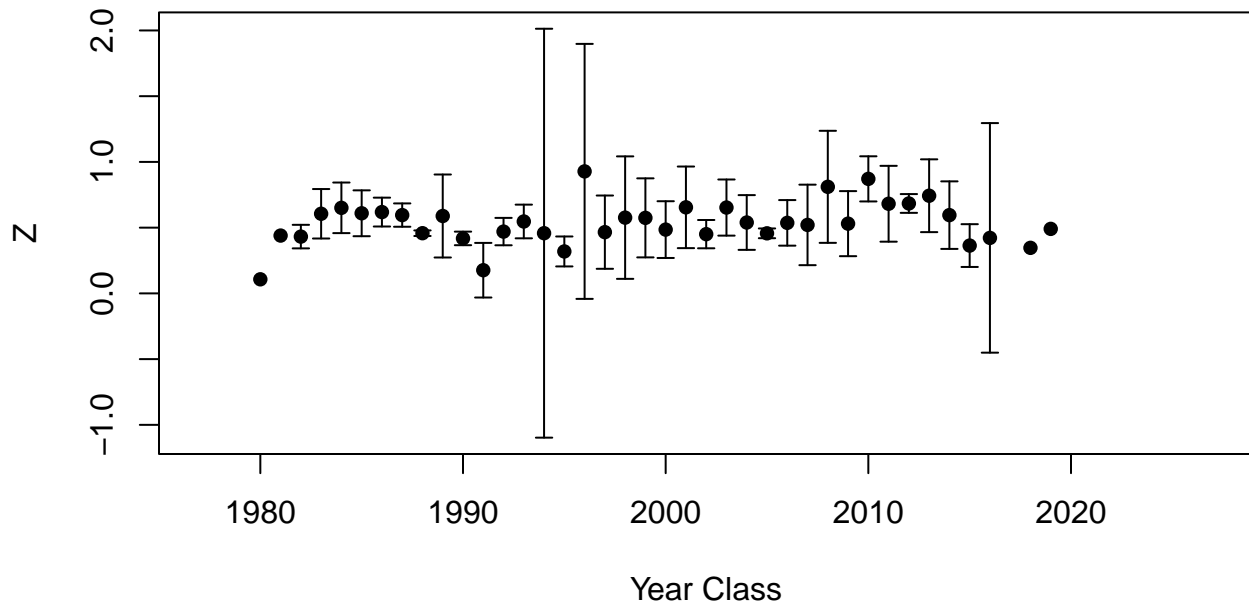
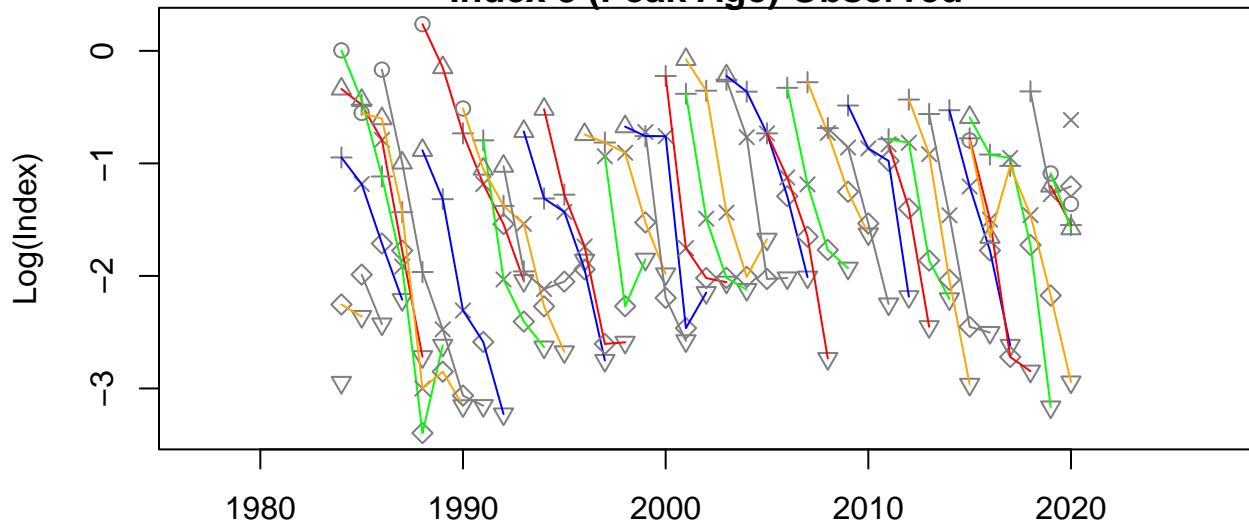
Index 1 (Peak Age) Predicted



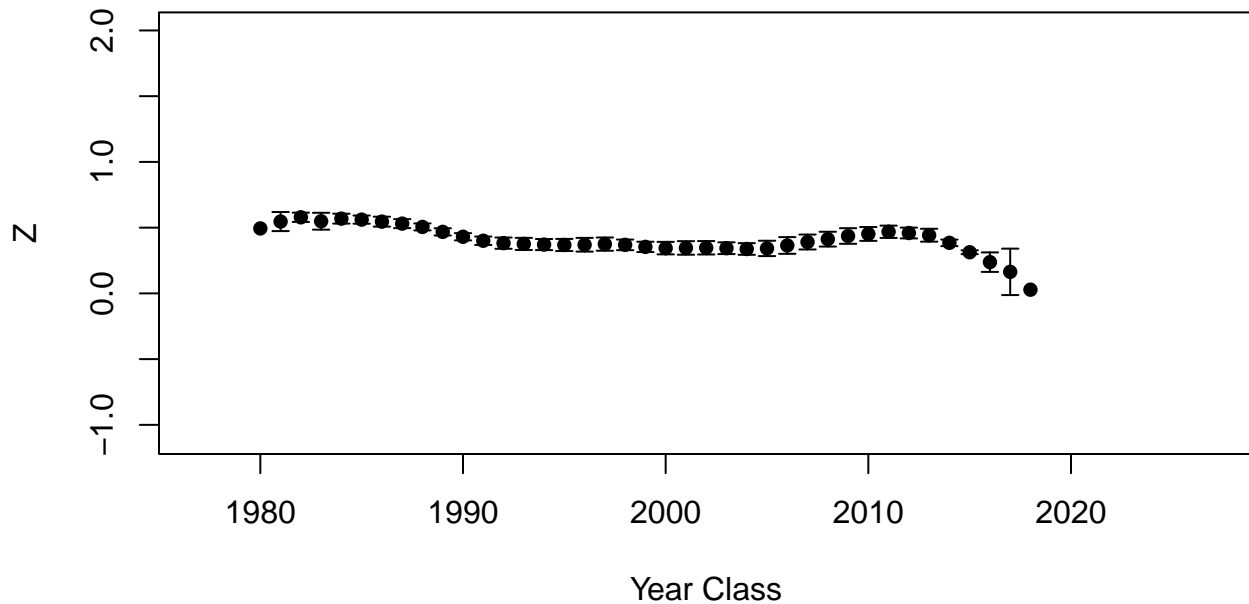
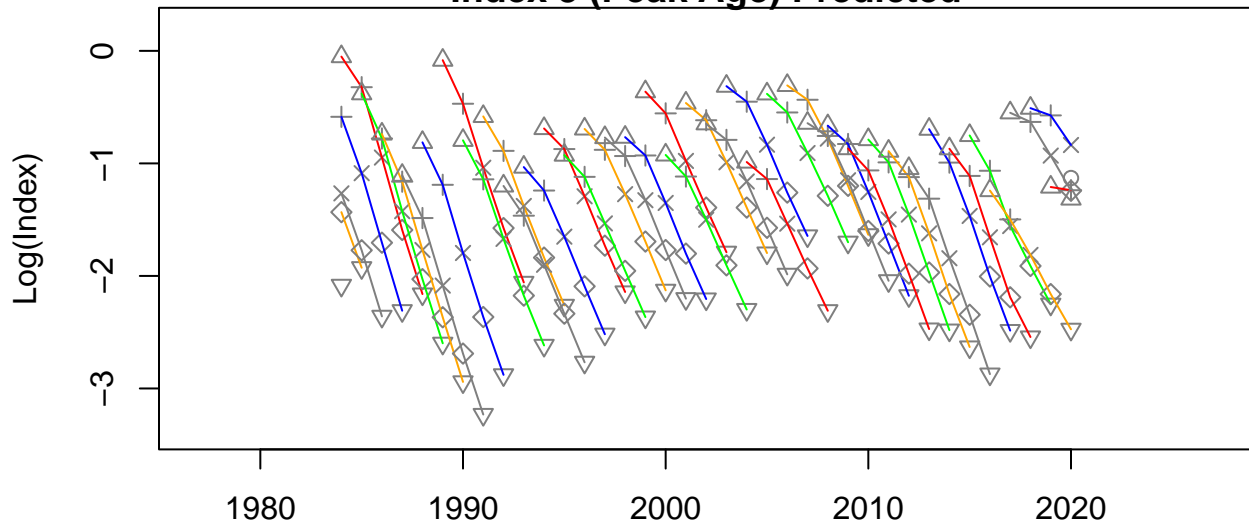


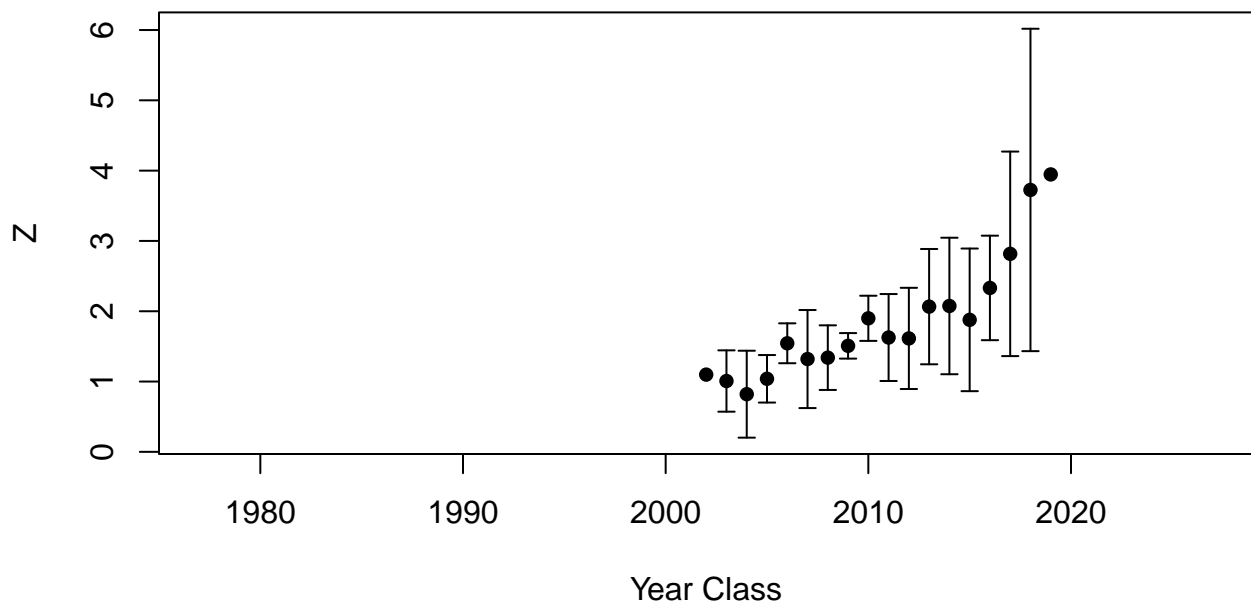
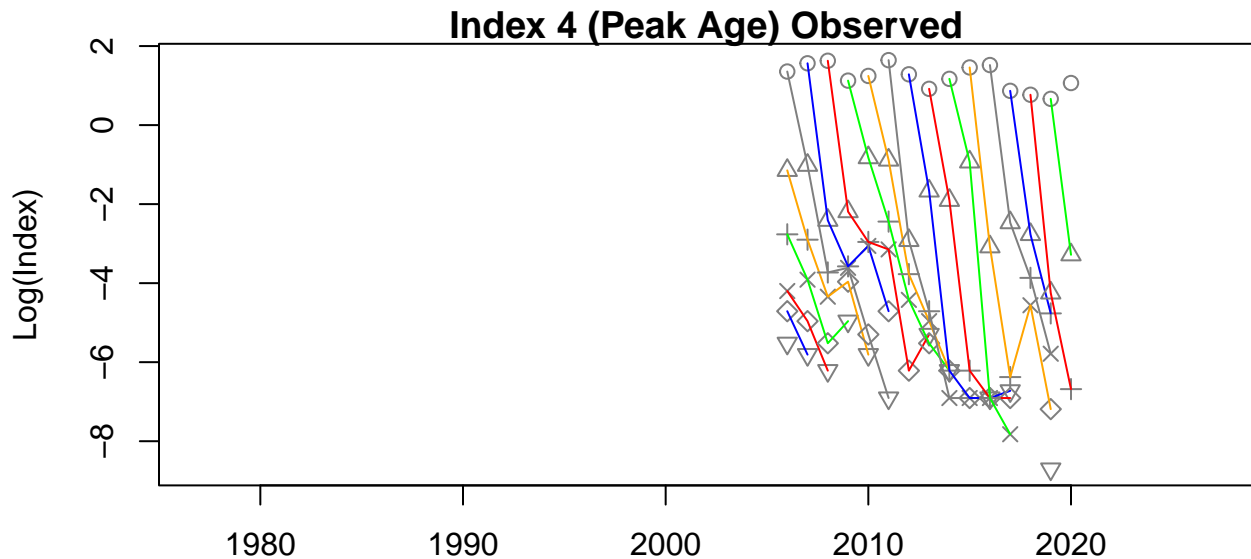


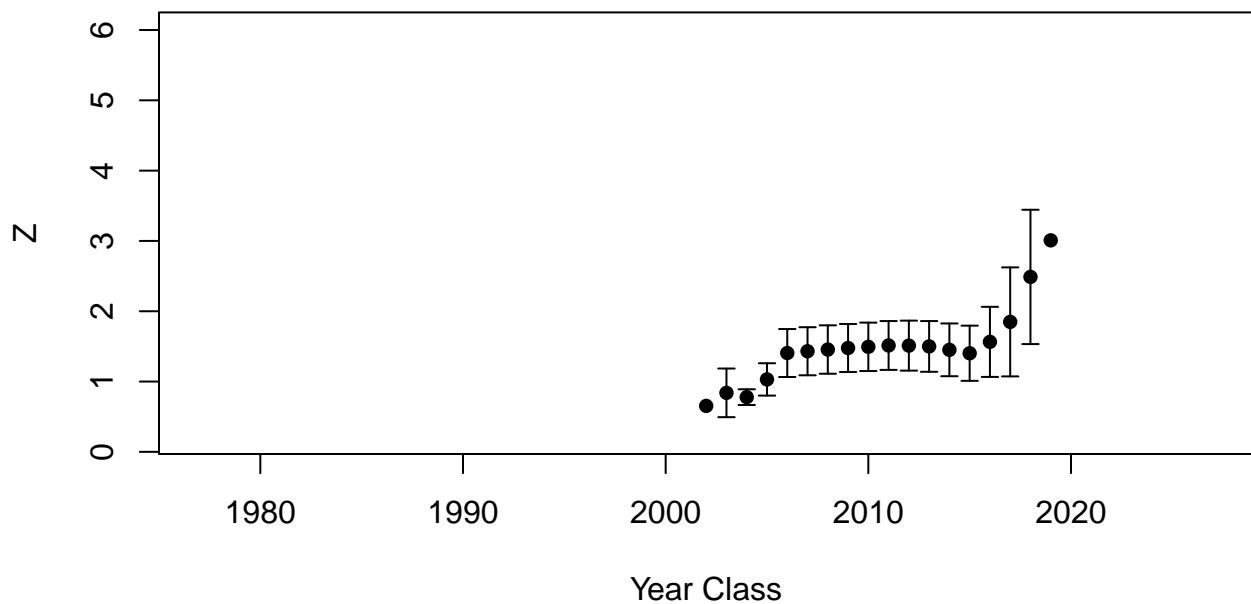
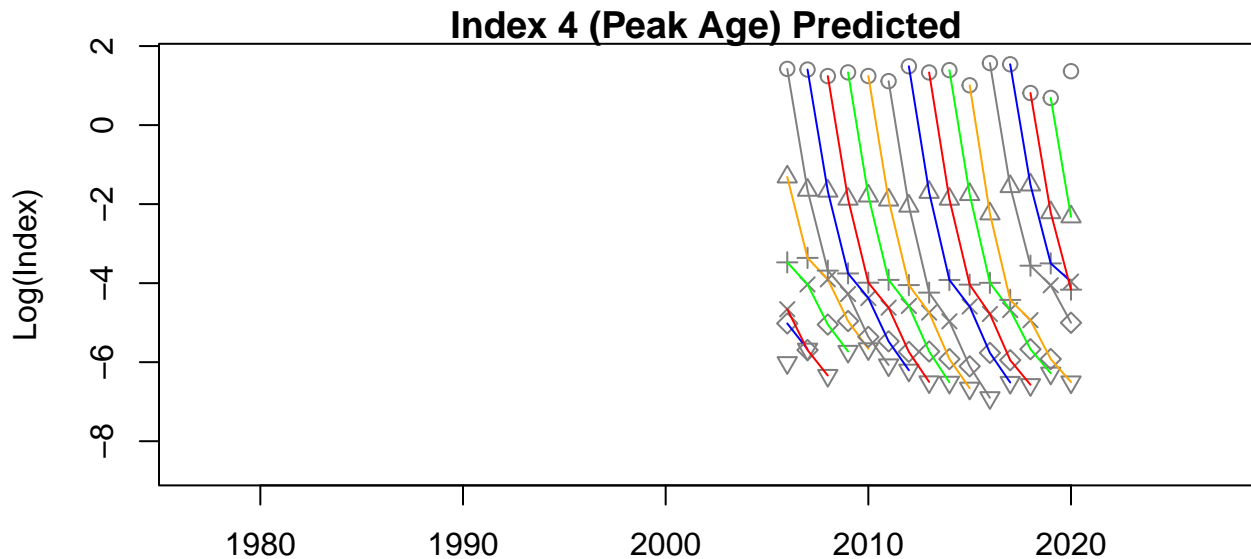
Index 3 (Peak Age) Observed



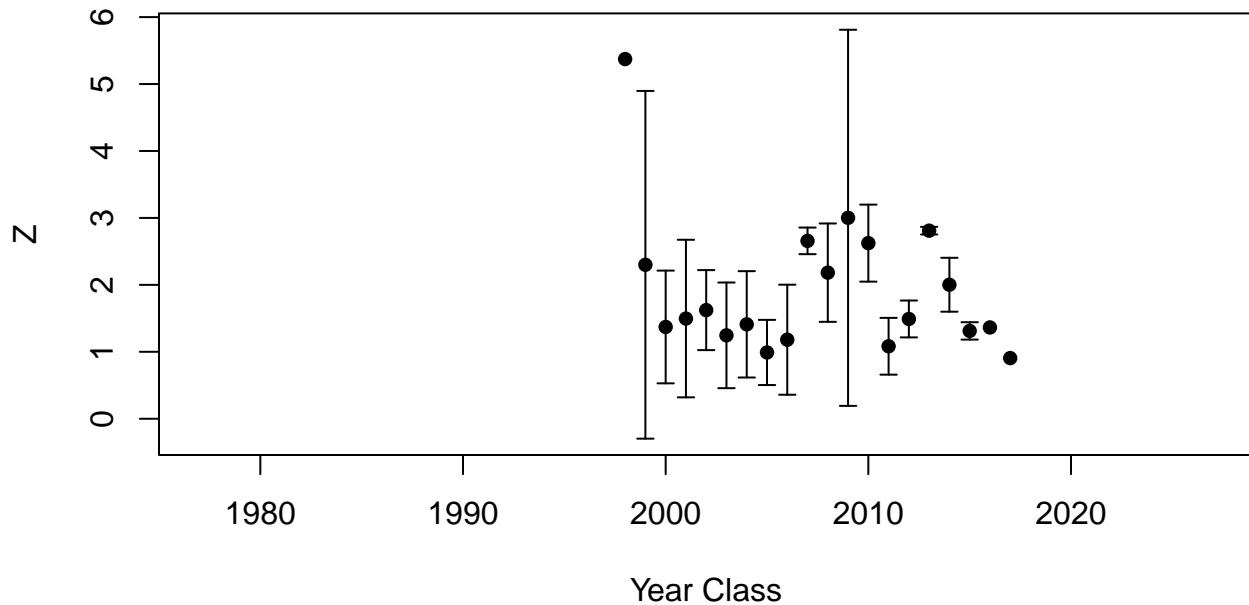
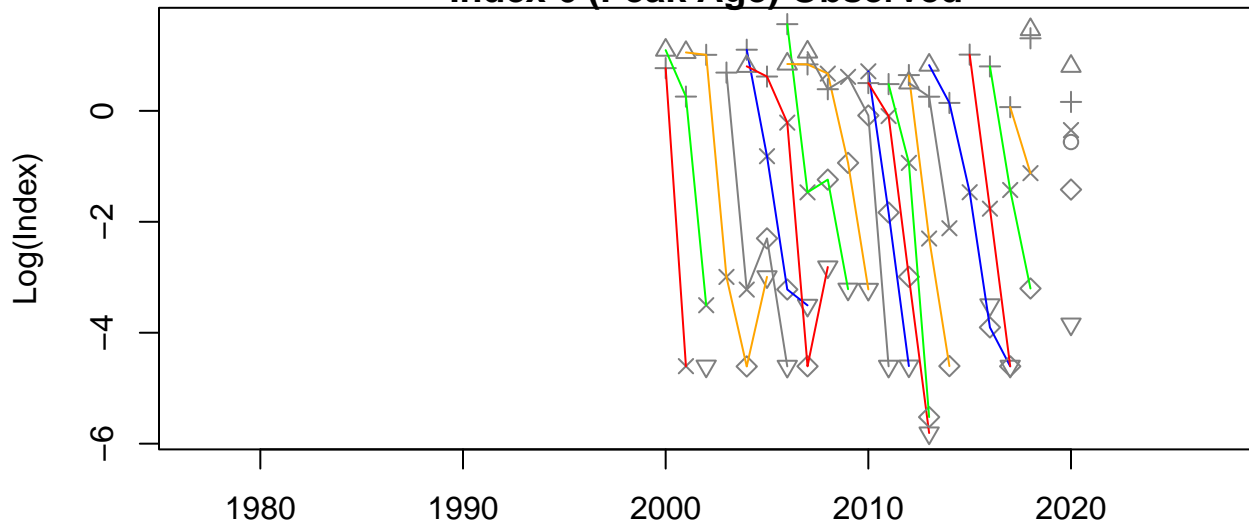
Index 3 (Peak Age) Predicted



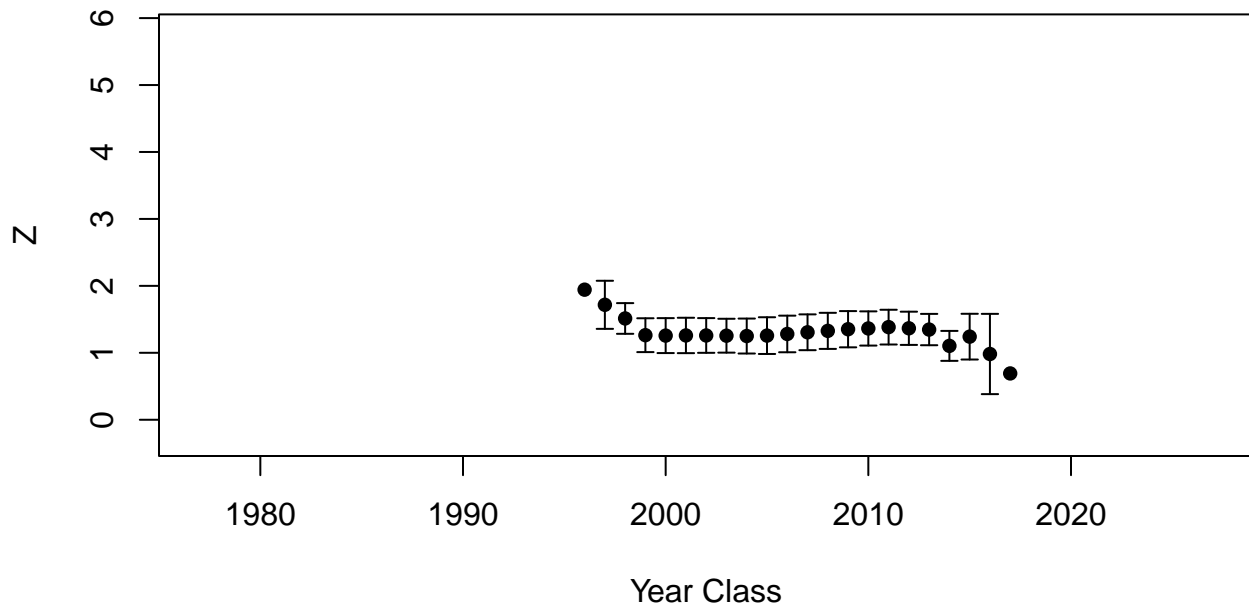
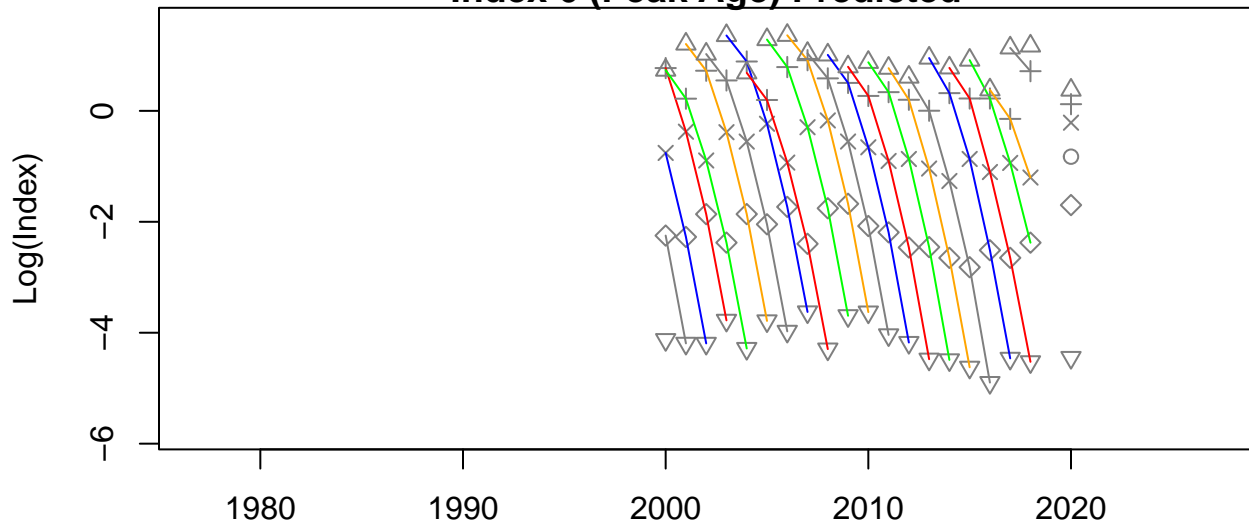




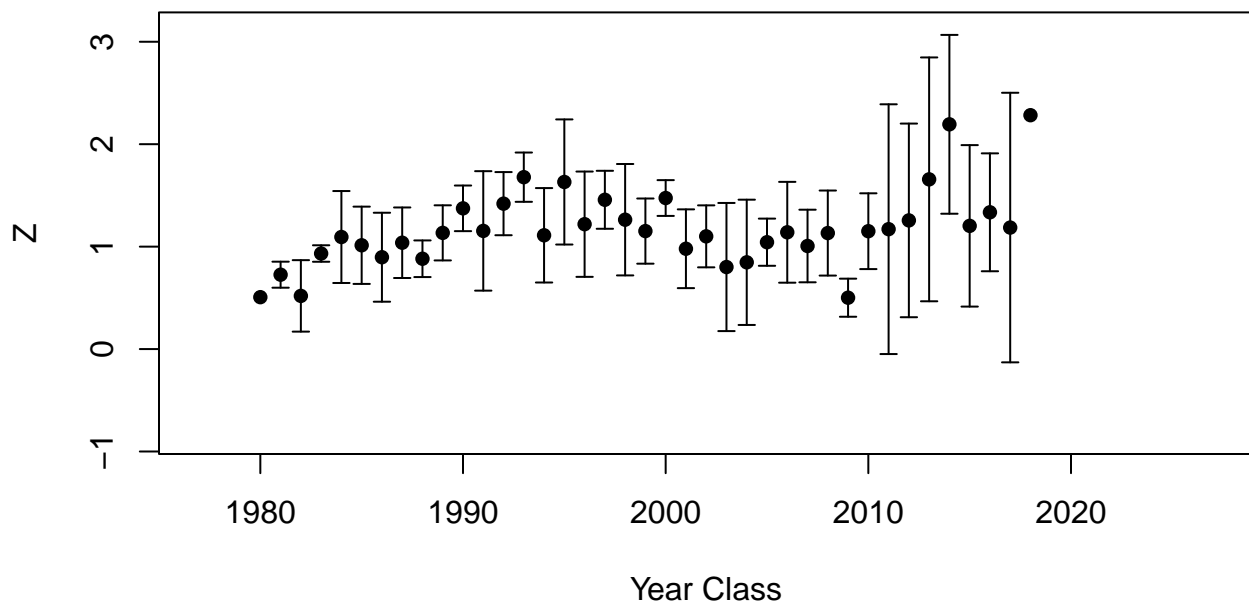
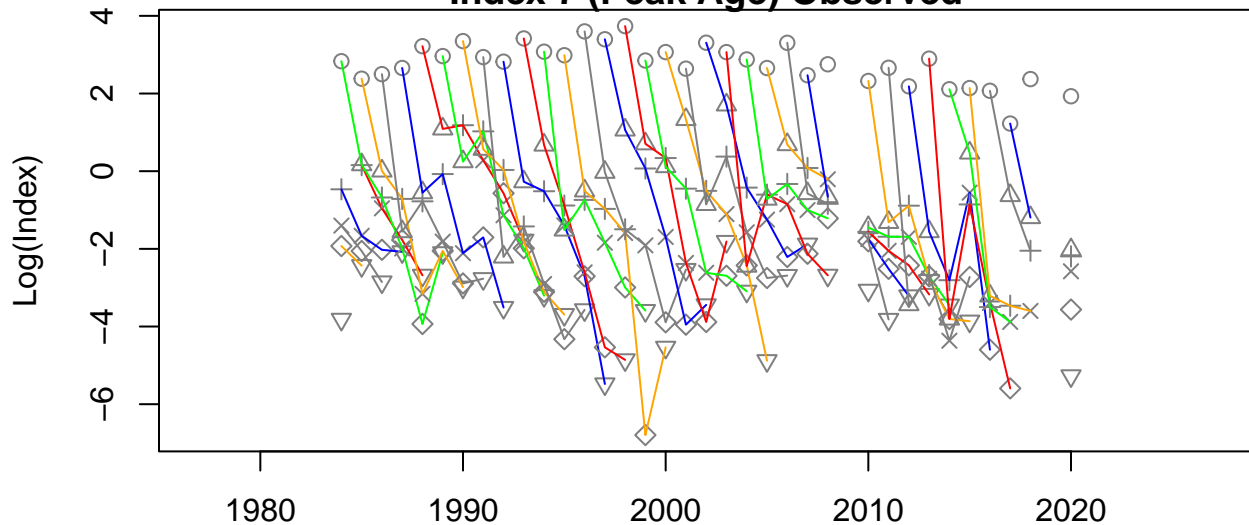
Index 6 (Peak Age) Observed

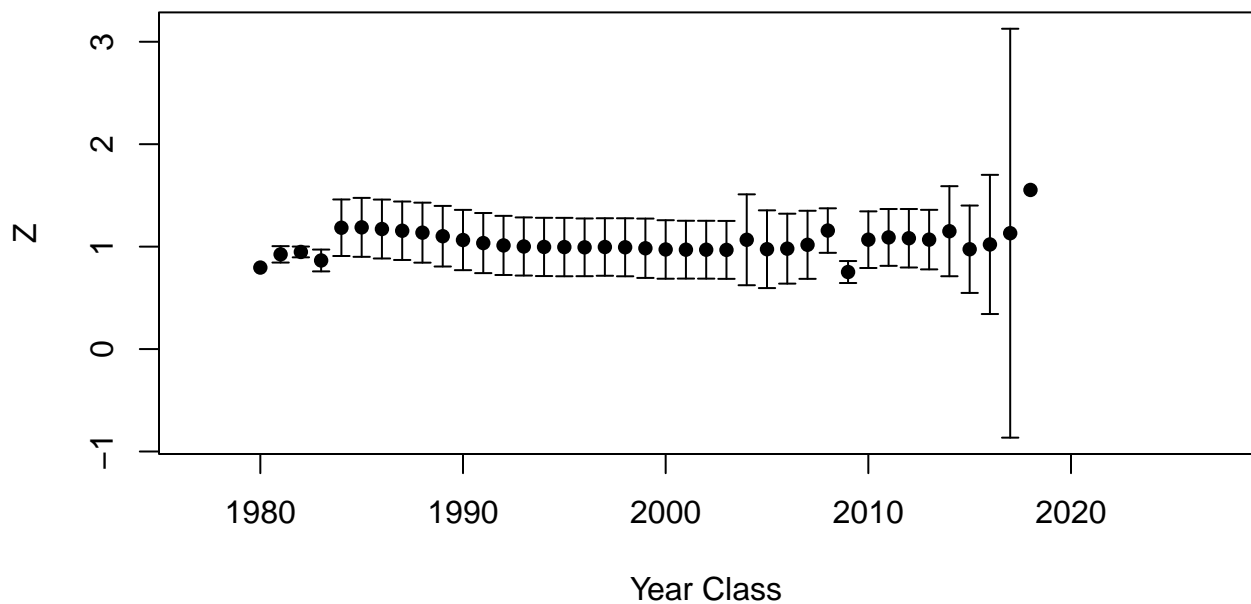
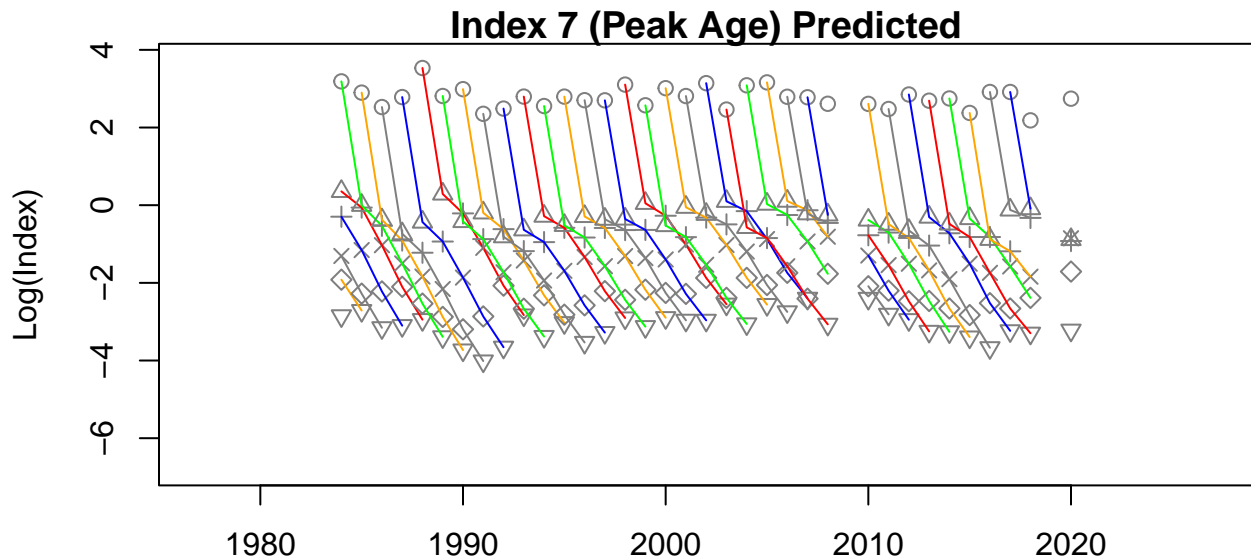


Index 6 (Peak Age) Predicted

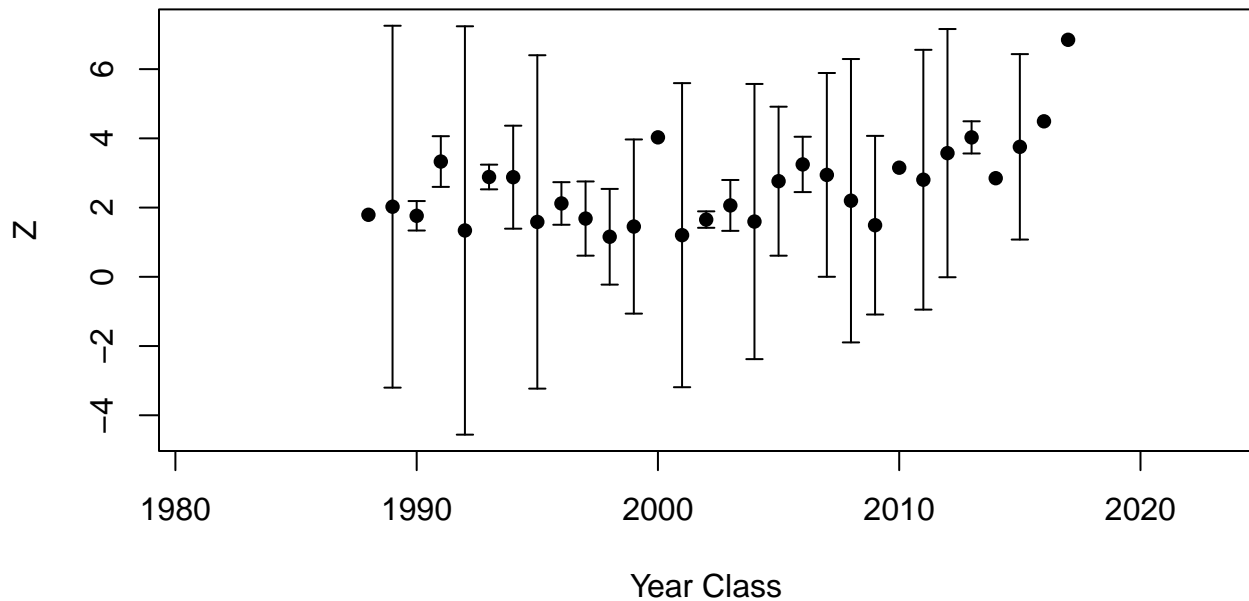
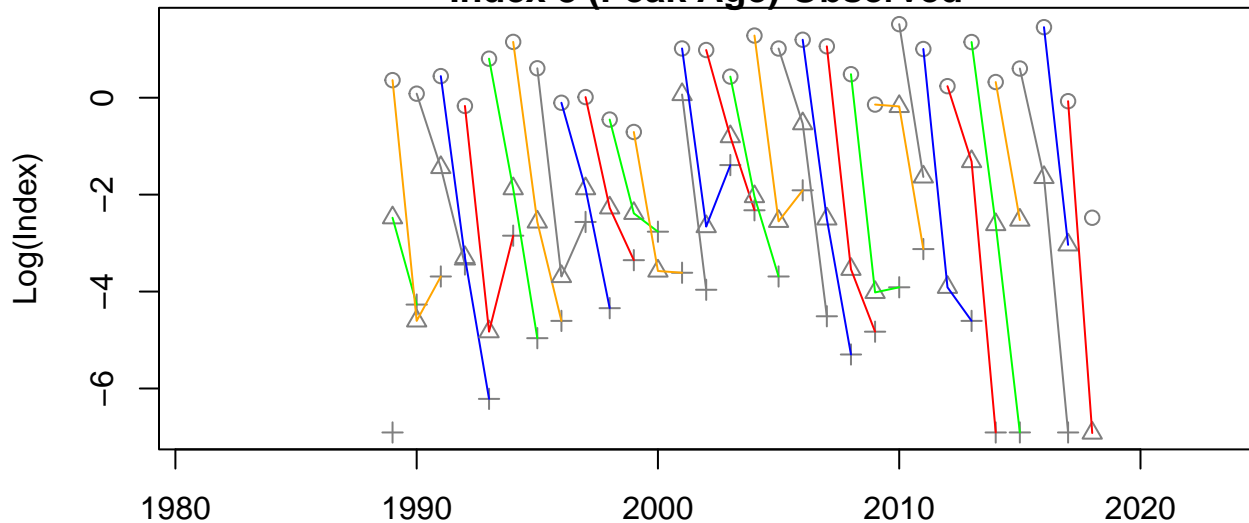


Index 7 (Peak Age) Observed

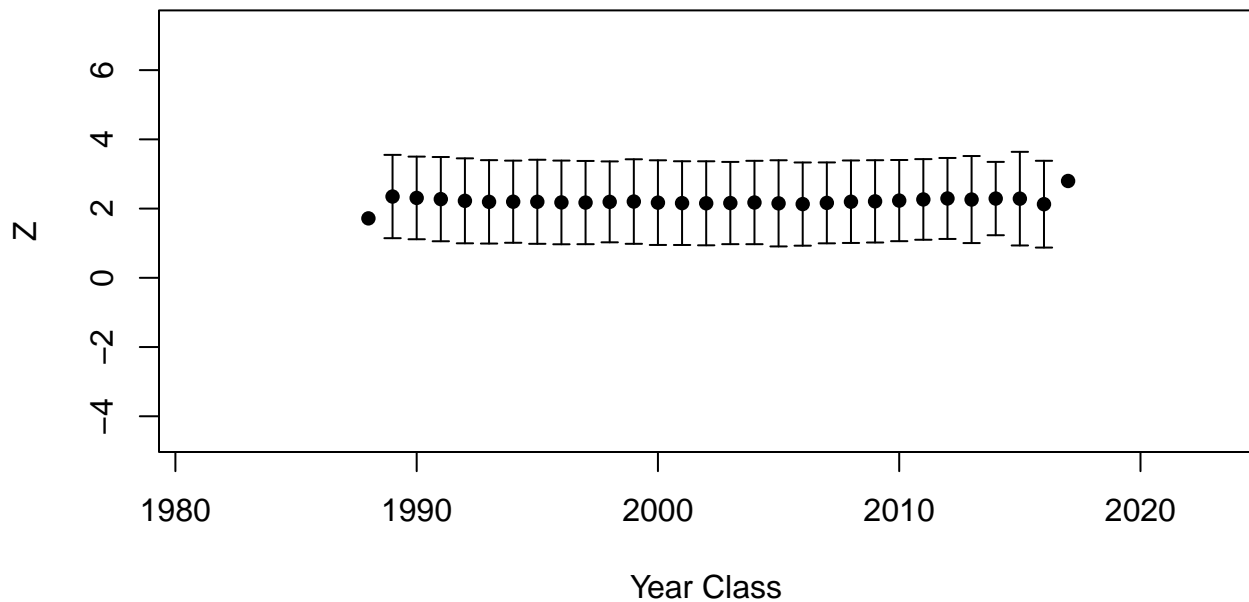
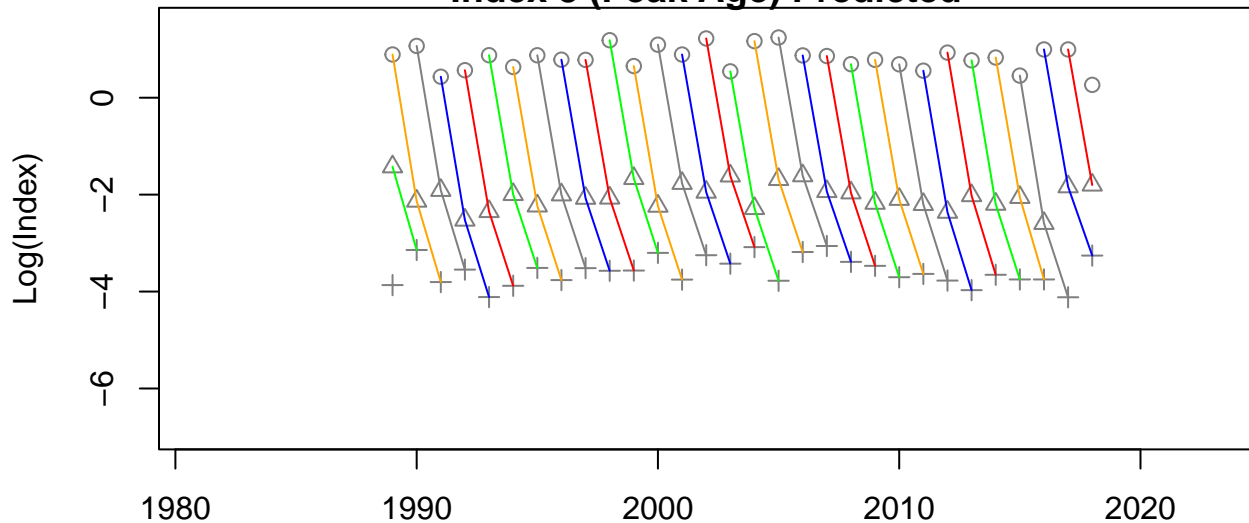




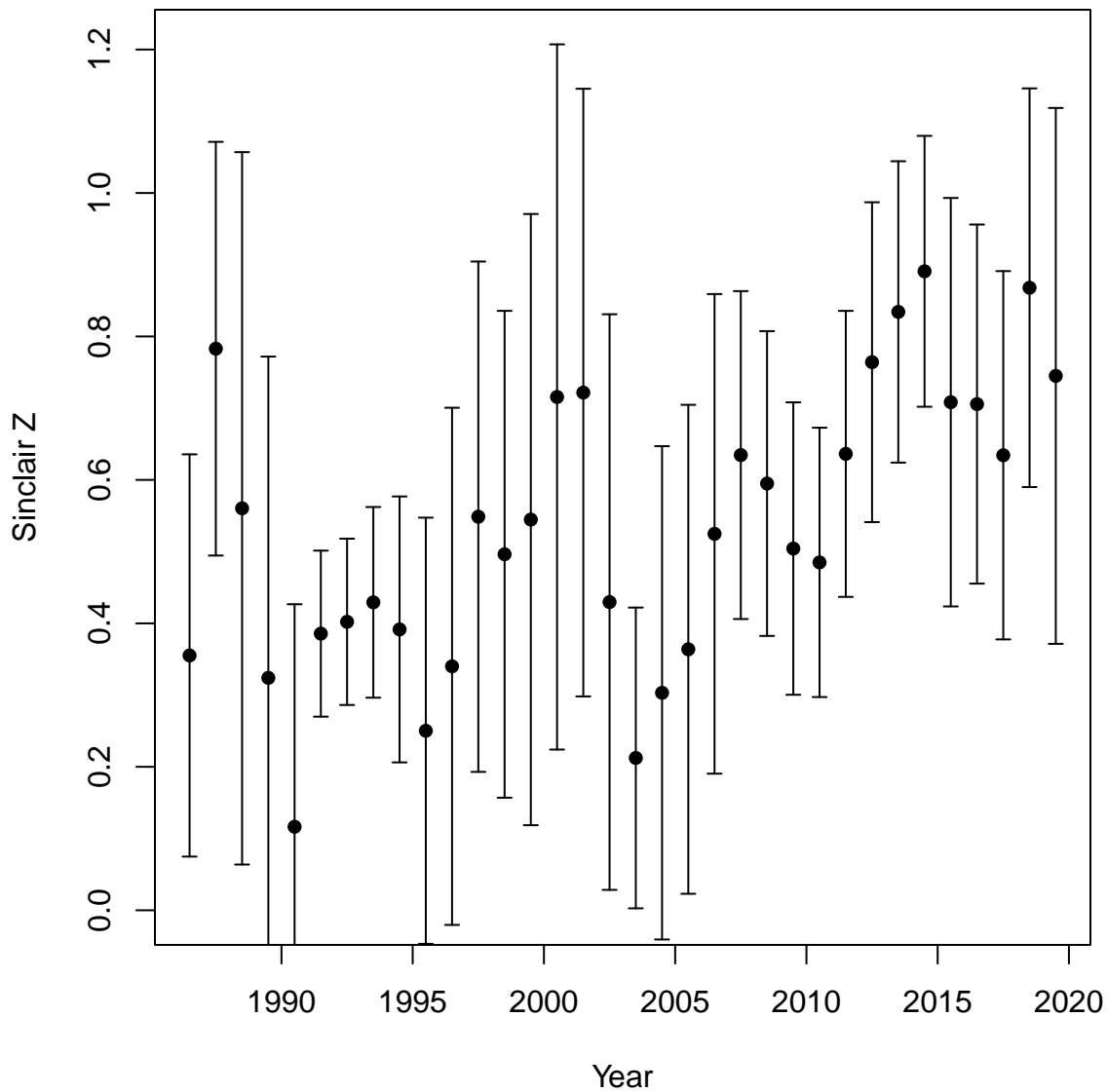
Index 8 (Peak Age) Observed



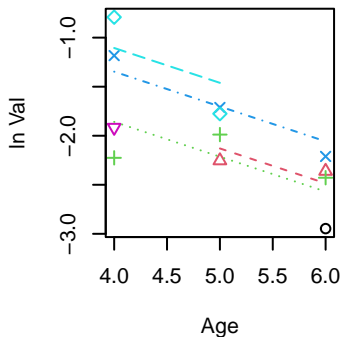
Index 8 (Peak Age) Predicted



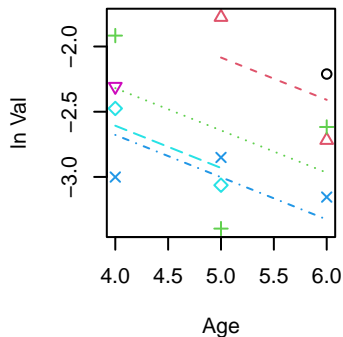
MRIP



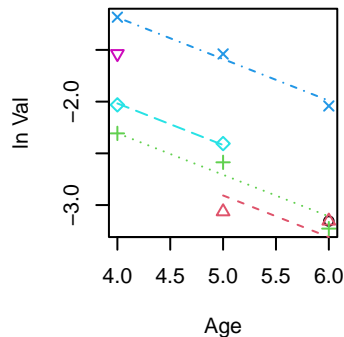
Years 1985 to 1988
Z = 0.355



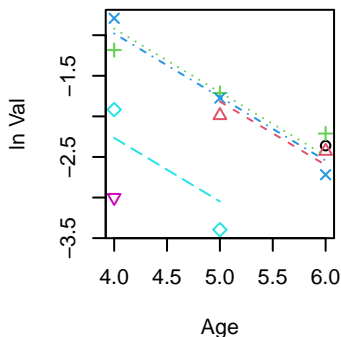
Years 1988 to 1991
Z = 0.324



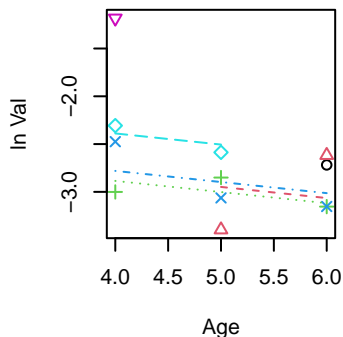
Years 1991 to 1994
Z = 0.402



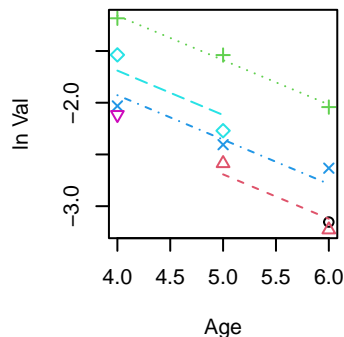
Years 1986 to 1989
Z = 0.783



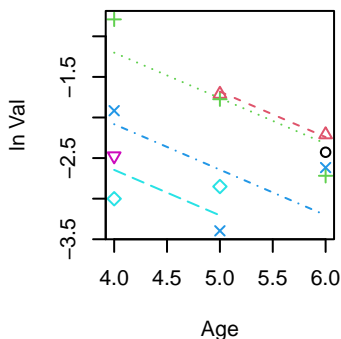
Years 1989 to 1992
Z = 0.116



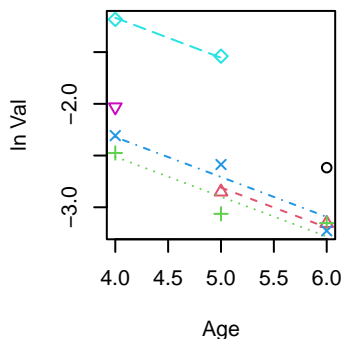
Years 1992 to 1995
Z = 0.429



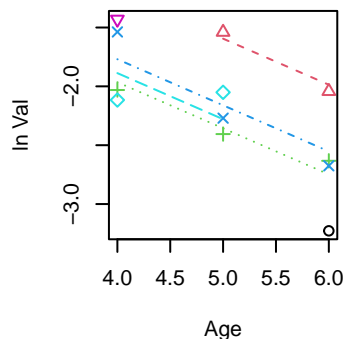
Years 1987 to 1990
Z = 0.56



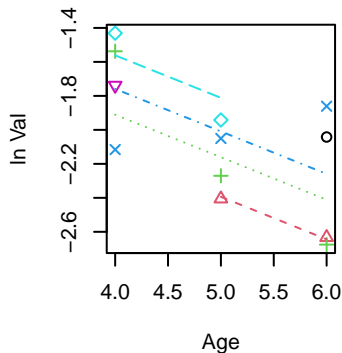
Years 1990 to 1993
Z = 0.386



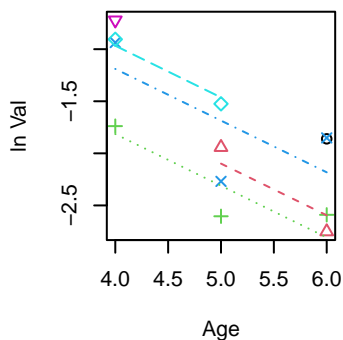
Years 1993 to 1996
Z = 0.392



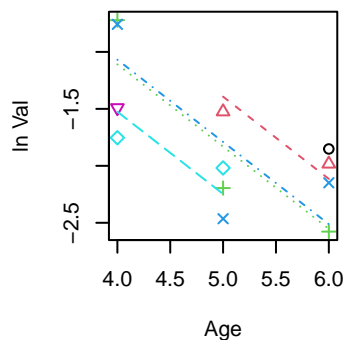
Years 1994 to 1997
Z = 0.25



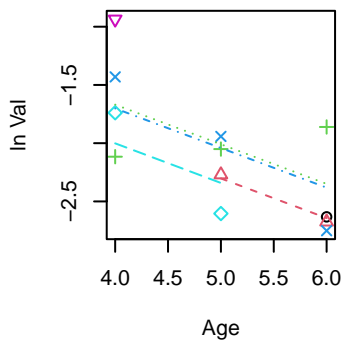
Years 1997 to 2000
Z = 0.496



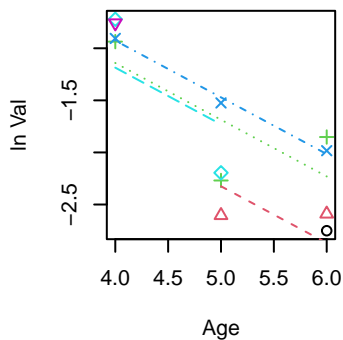
Years 2000 to 2003
Z = 0.722



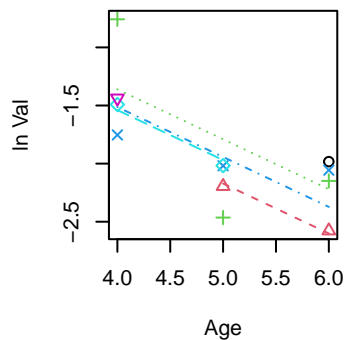
Years 1995 to 1998
Z = 0.34



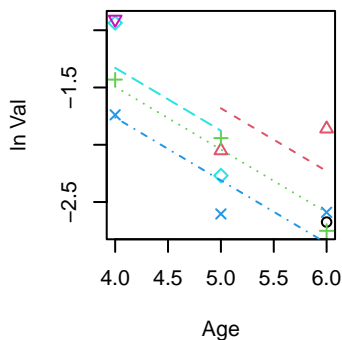
Years 1998 to 2001
Z = 0.545



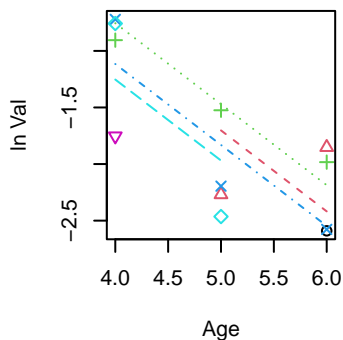
Years 2001 to 2004
Z = 0.43



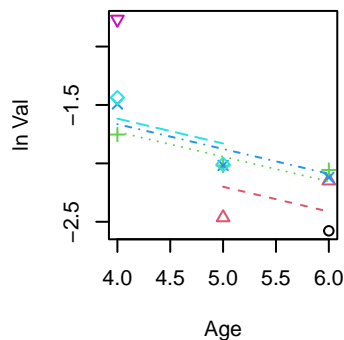
Years 1996 to 1999
Z = 0.549



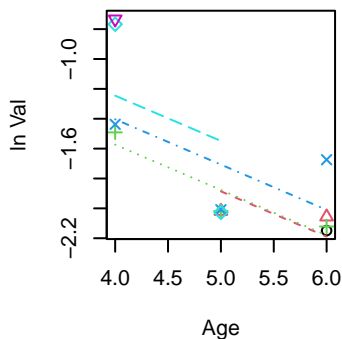
Years 1999 to 2002
Z = 0.716



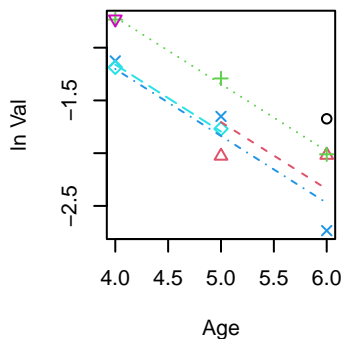
Years 2002 to 2005
Z = 0.212



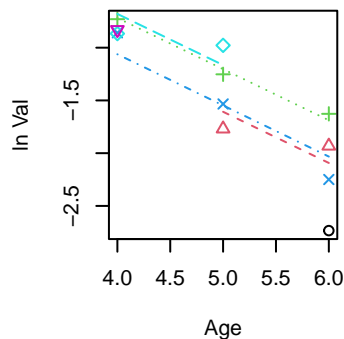
Years 2003 to 2006
Z = 0.303



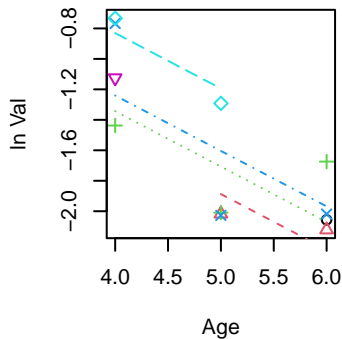
Years 2006 to 2009
Z = 0.635



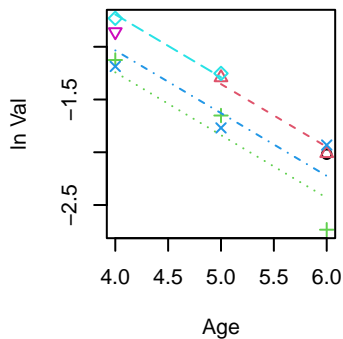
Years 2009 to 2012
Z = 0.485



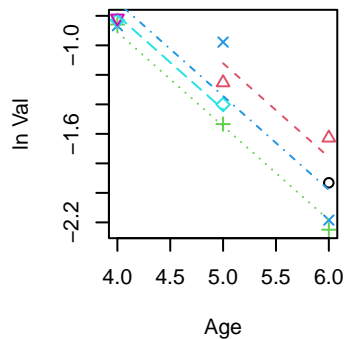
Years 2004 to 2007
Z = 0.364



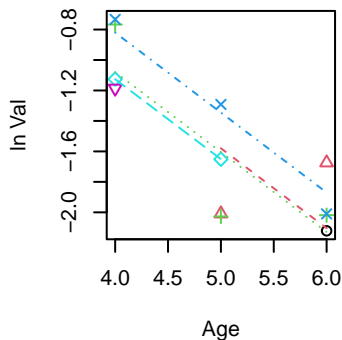
Years 2007 to 2010
Z = 0.595



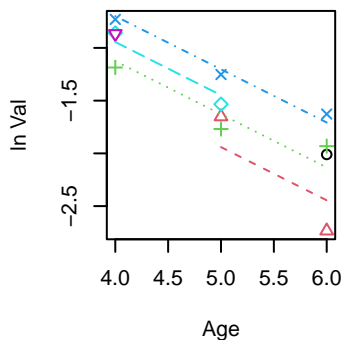
Years 2010 to 2013
Z = 0.636



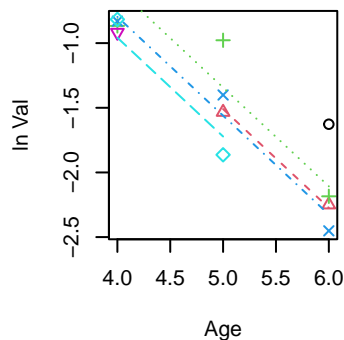
Years 2005 to 2008
Z = 0.525



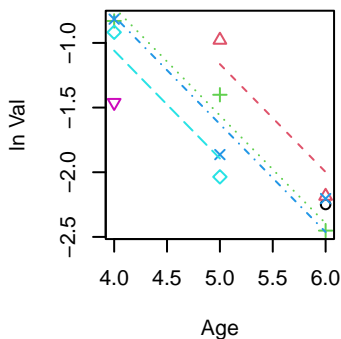
Years 2008 to 2011
Z = 0.504



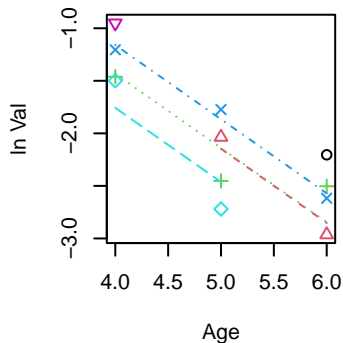
Years 2011 to 2014
Z = 0.764



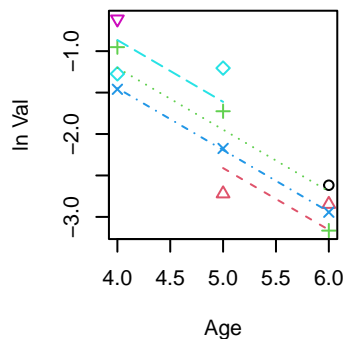
Years 2012 to 2015
Z = 0.834



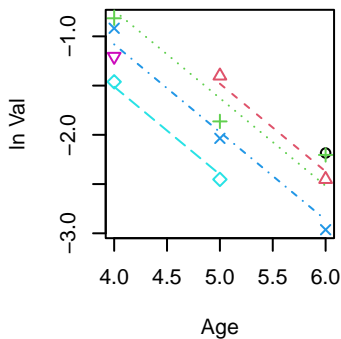
Years 2015 to 2018
Z = 0.706



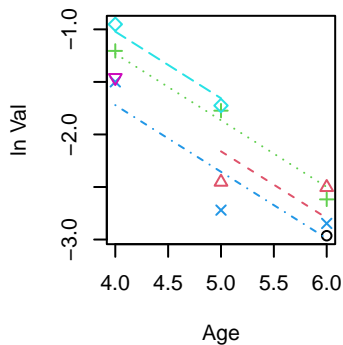
Years 2018 to 2021
Z = 0.745



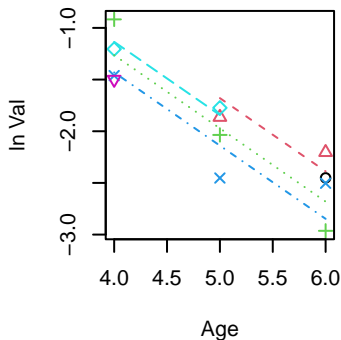
Years 2013 to 2016
Z = 0.891



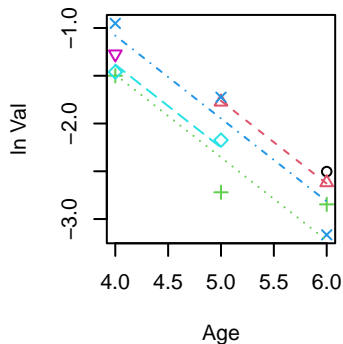
Years 2016 to 2019
Z = 0.634



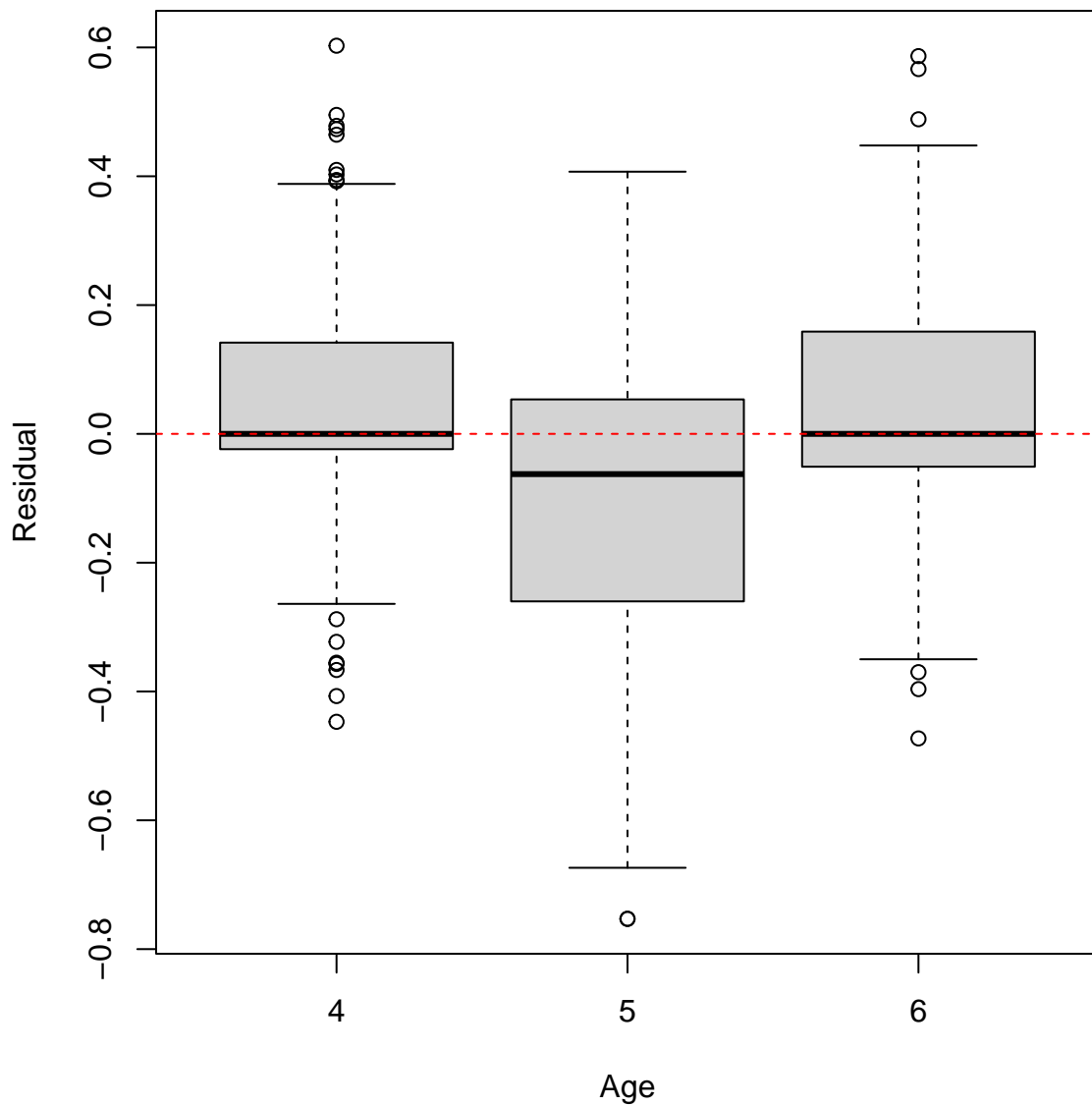
Years 2014 to 2017
Z = 0.708



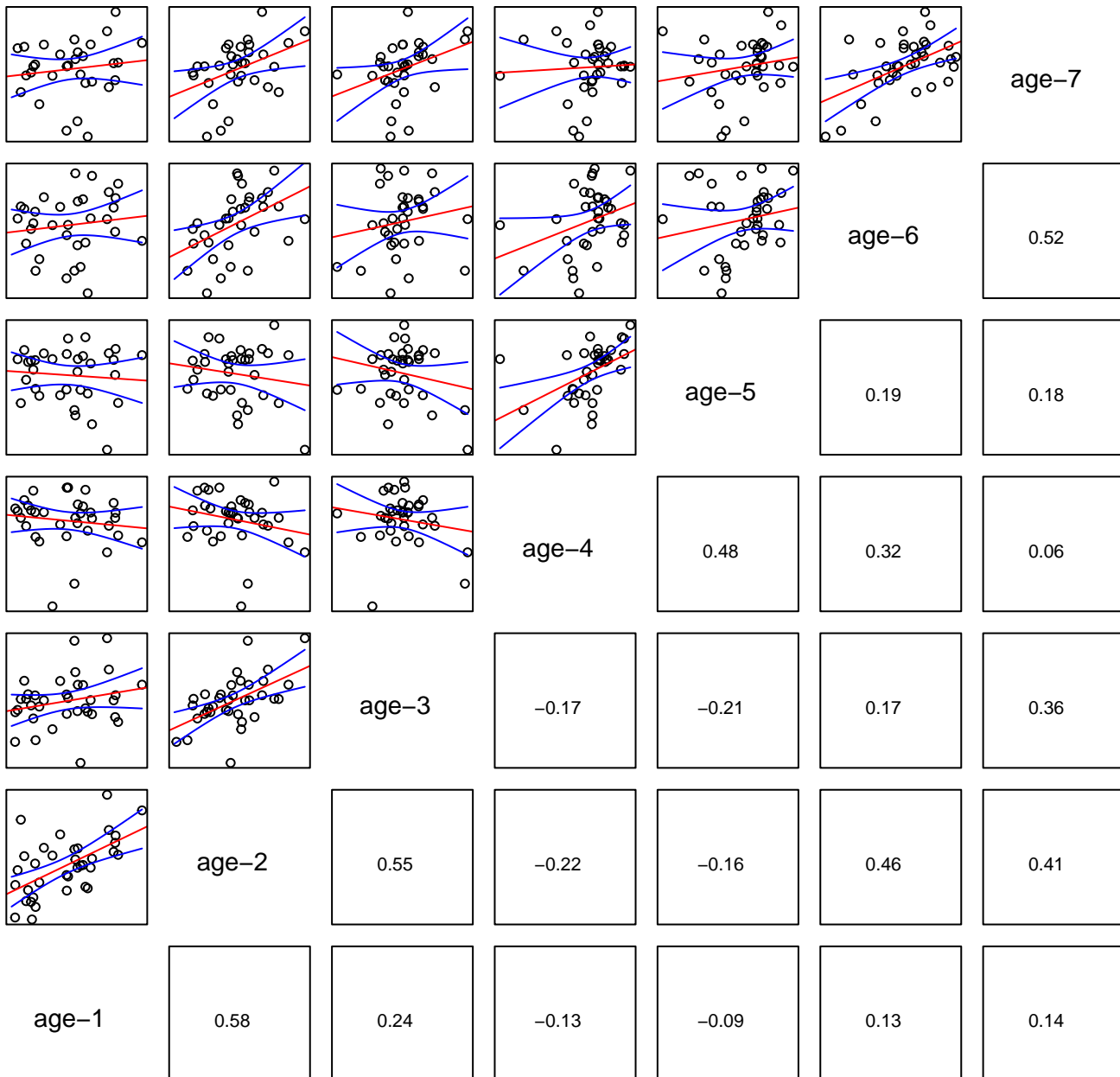
Years 2017 to 2020
Z = 0.868



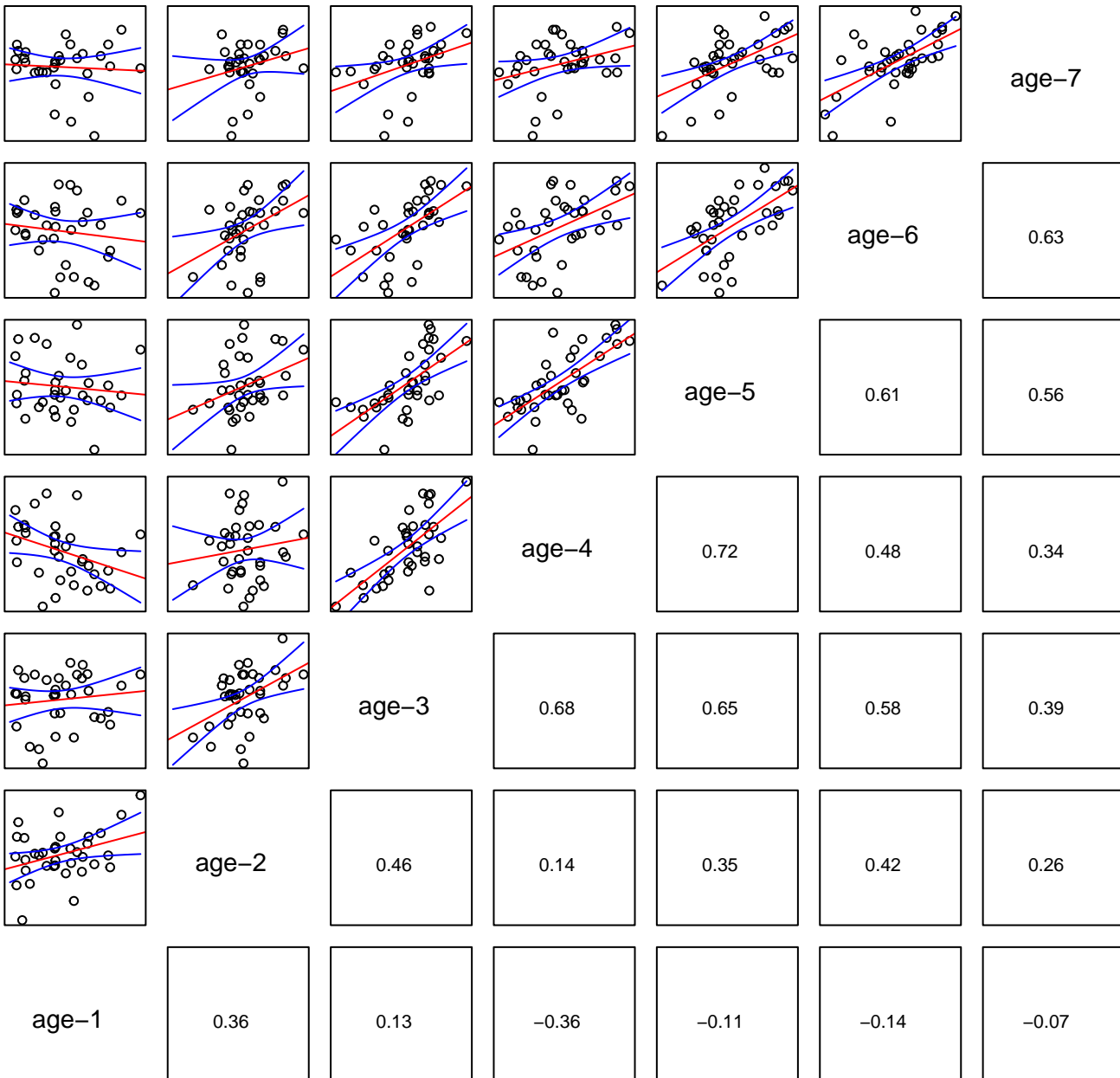
MRIP



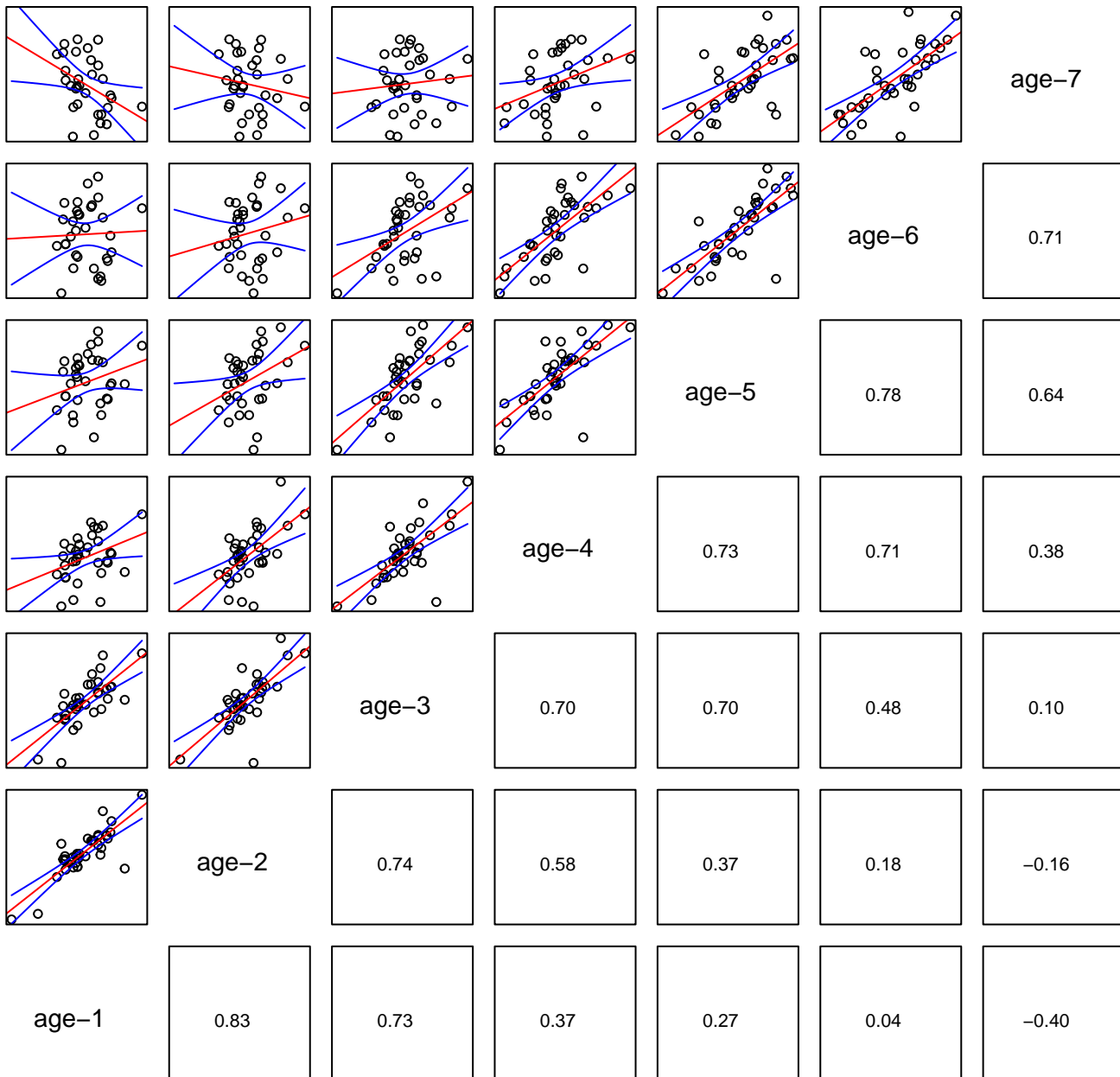
Catch for Fleet 1 (Comm) Observed



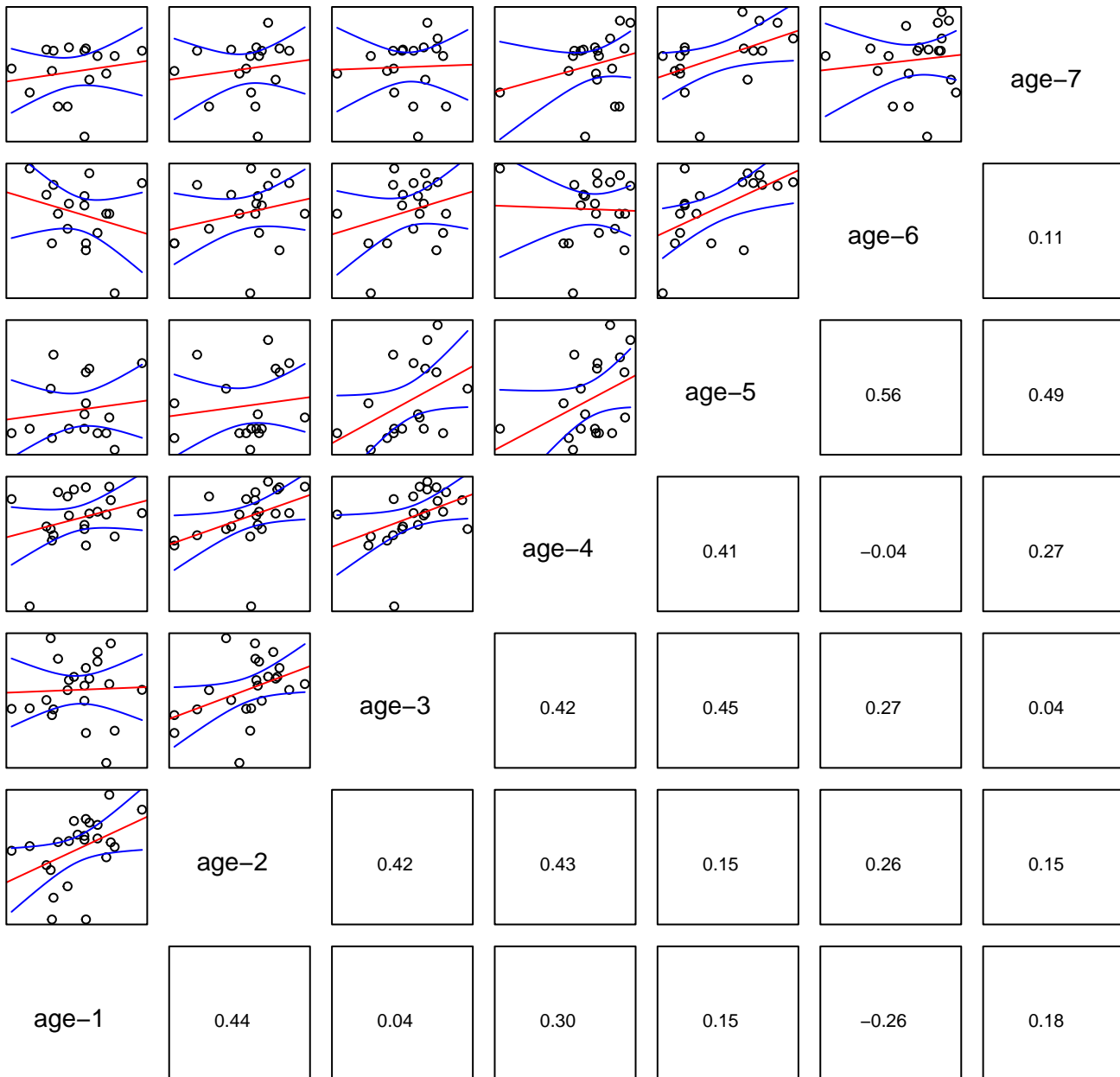
Catch for Fleet 2 (Rec) Observed



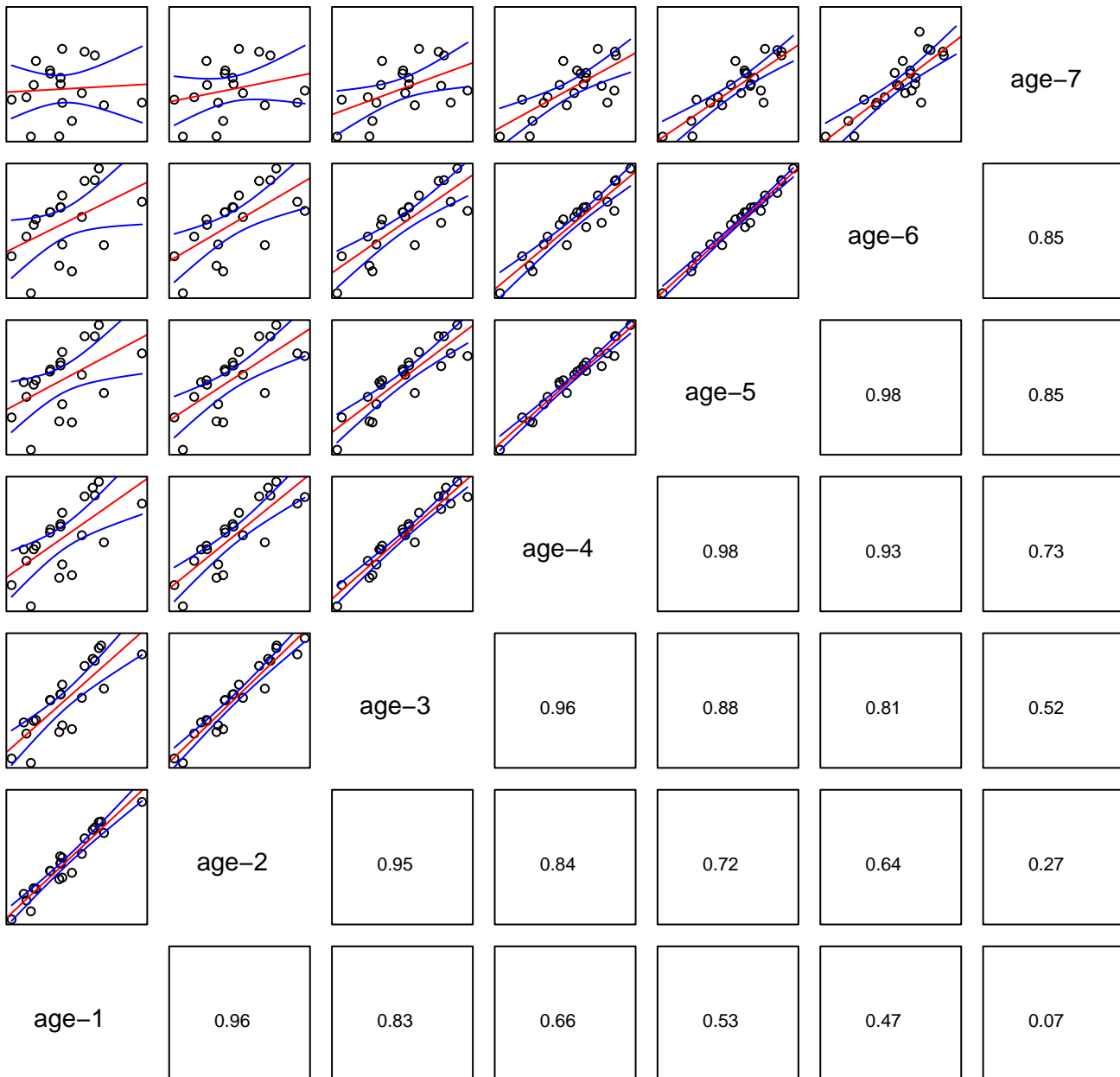
Catch for Fleet 2 (Rec) Predicted



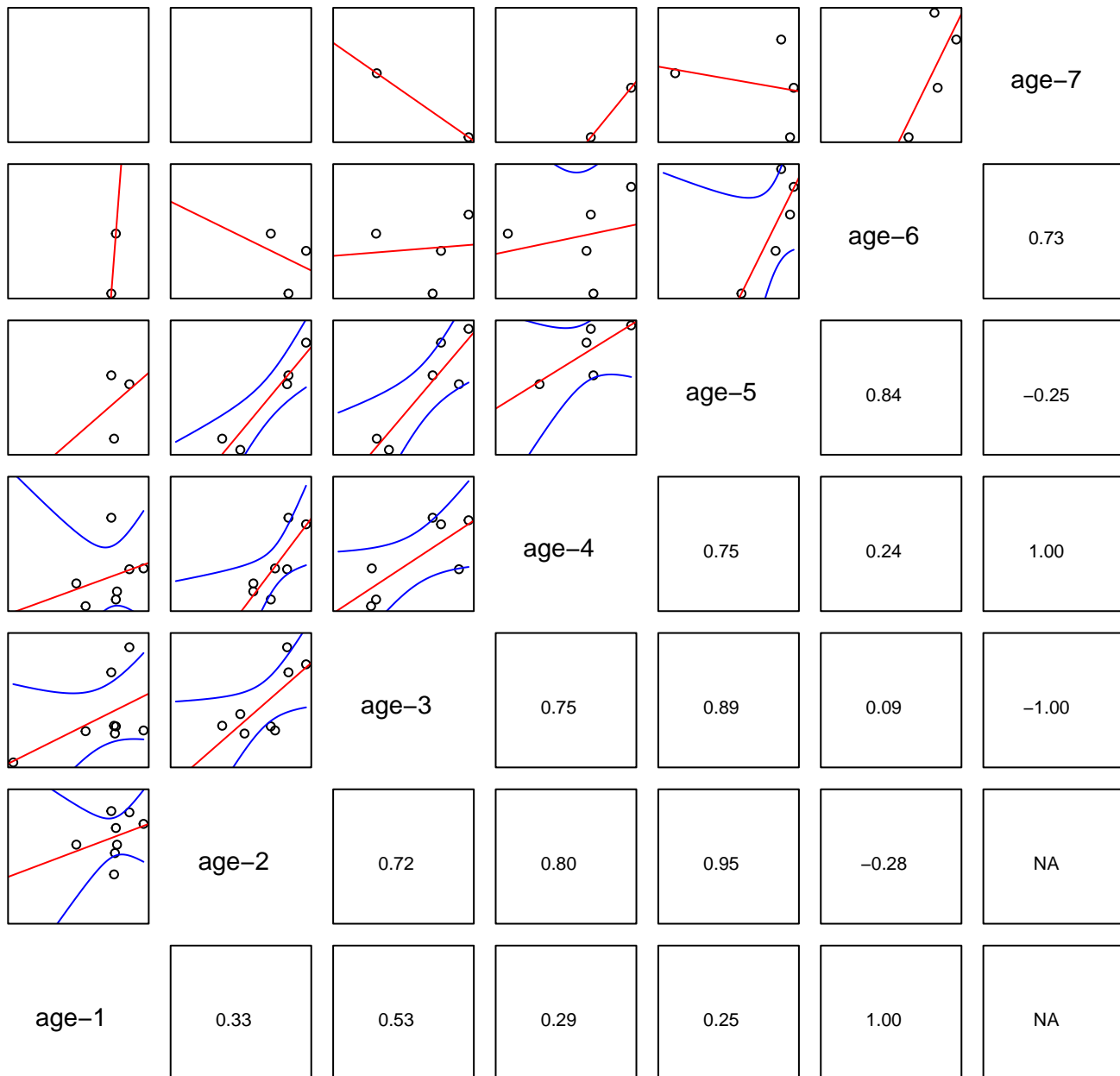
Index 1 (NEFSC Inshore) Observed



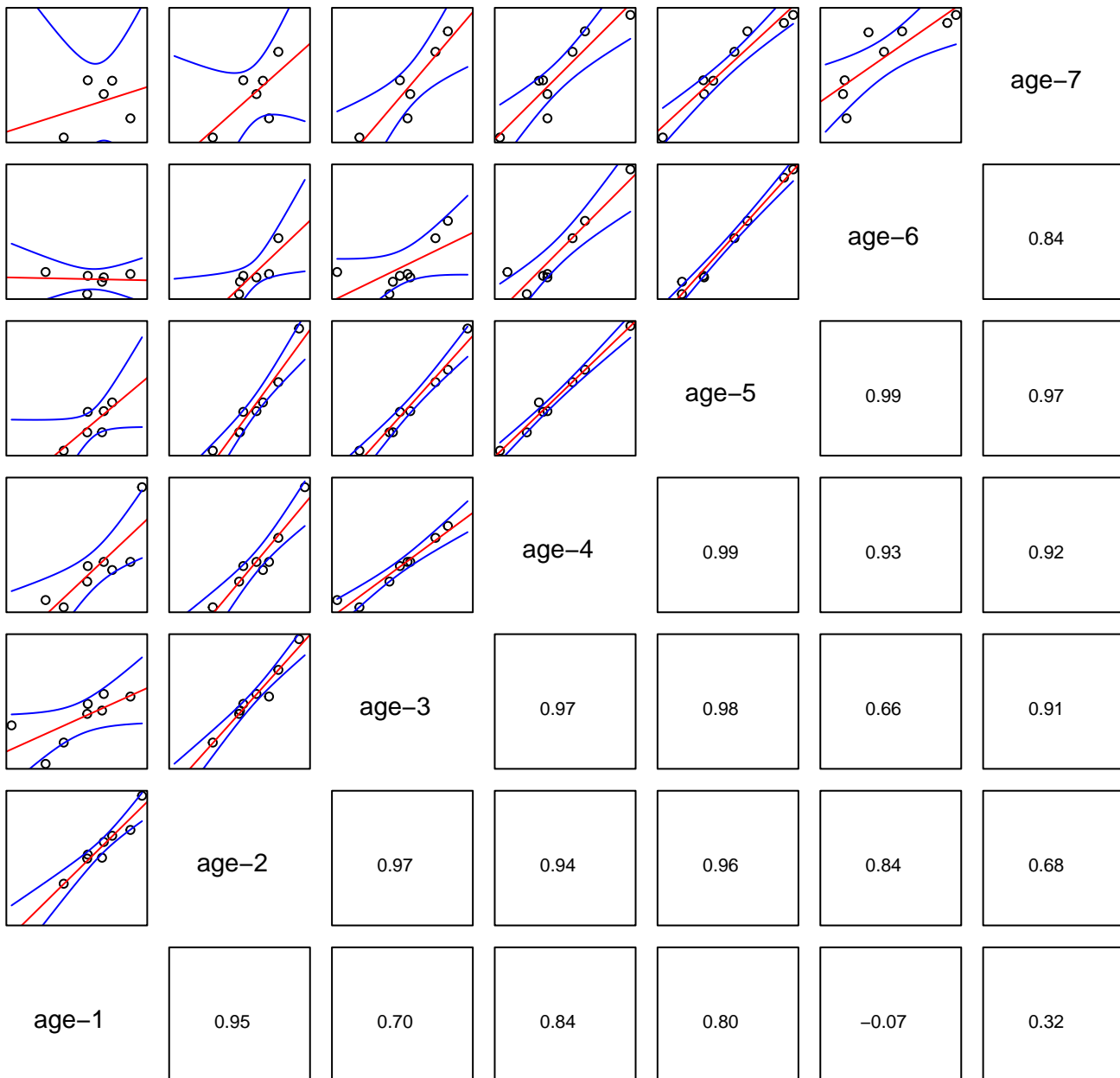
Index 1 (NEFSC Inshore) Predicted



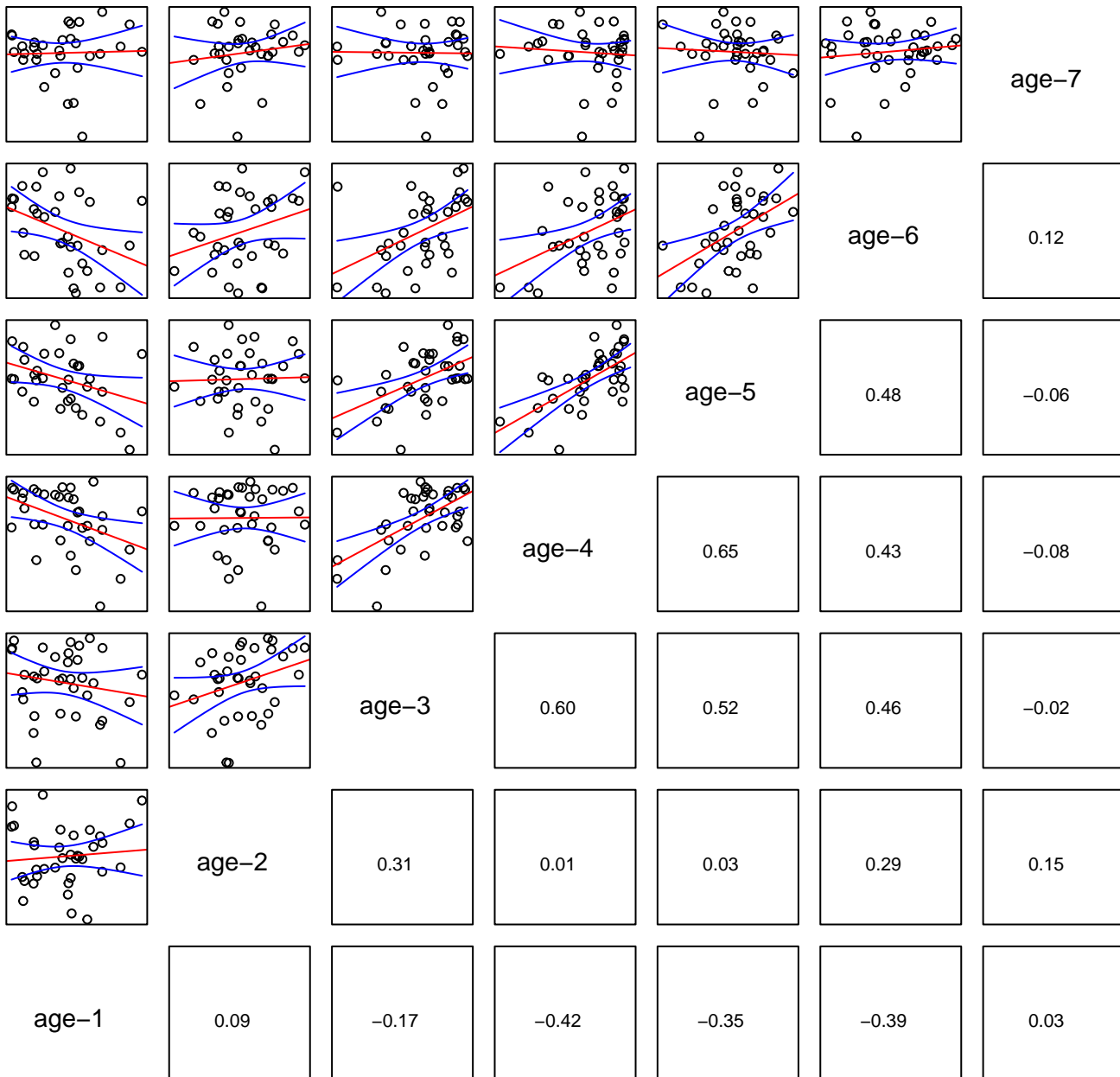
Index 2 (Bigelow) Observed



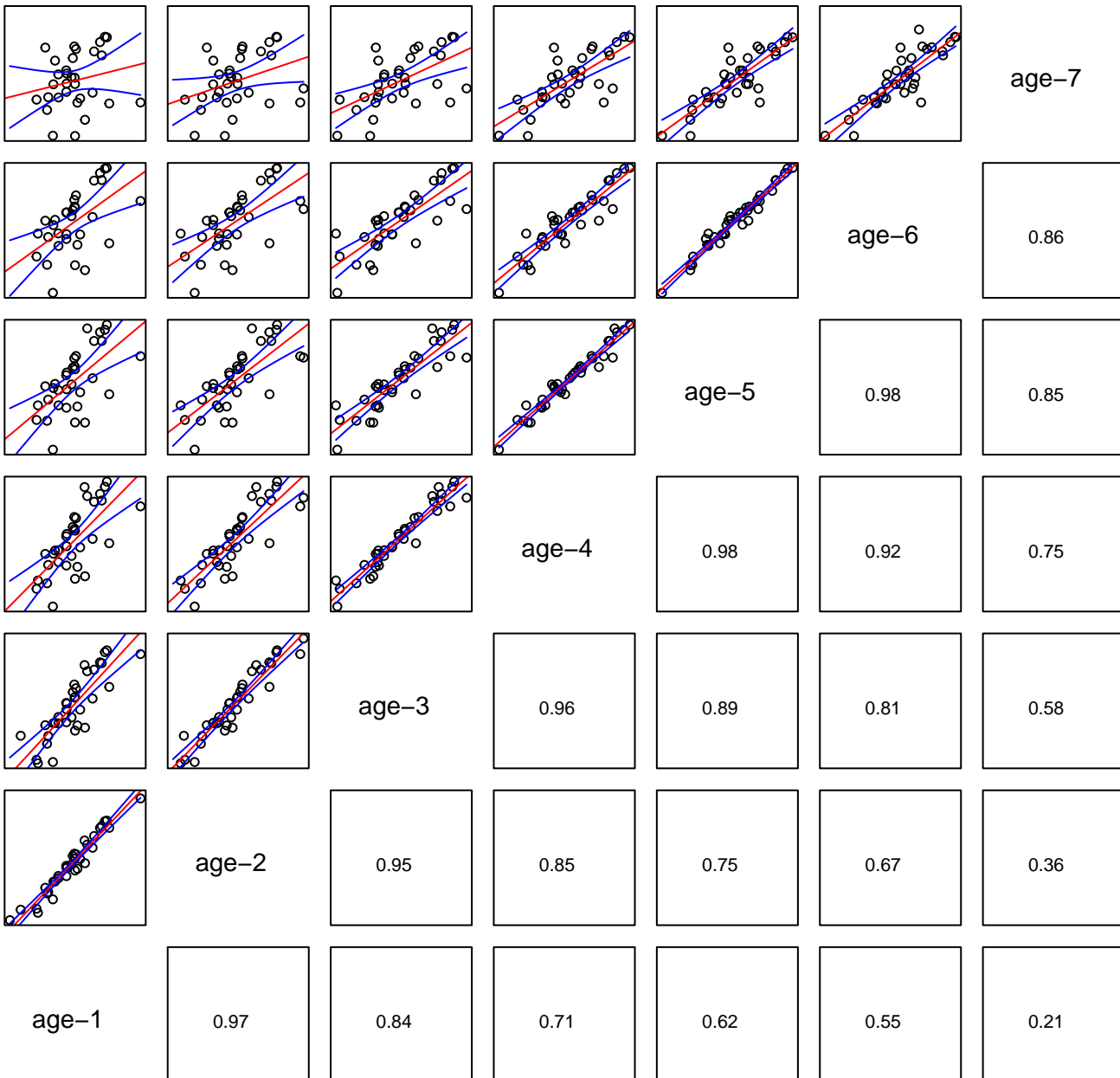
Index 2 (Bigelow) Predicted



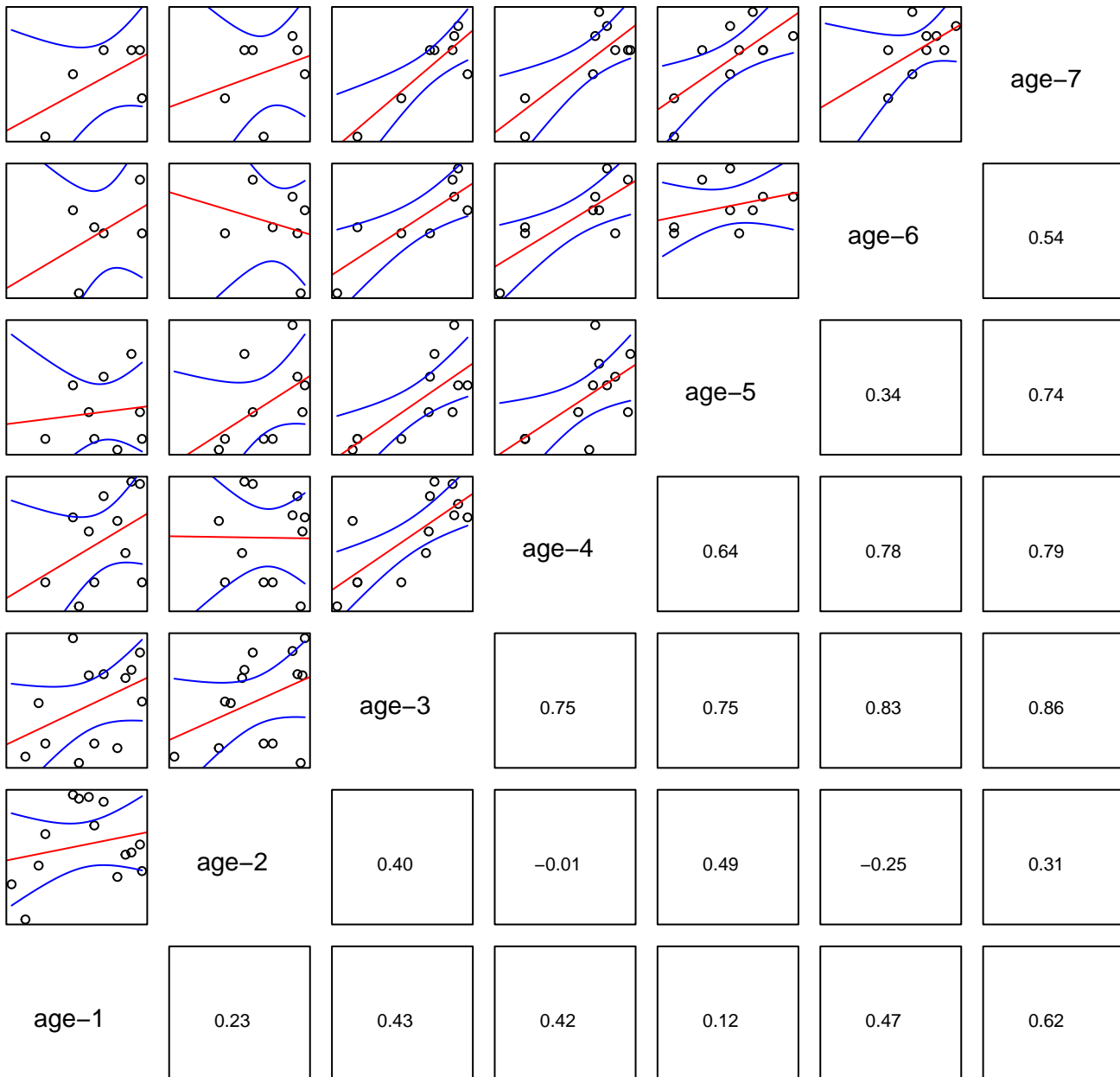
Index 3 (MRIP) Observed



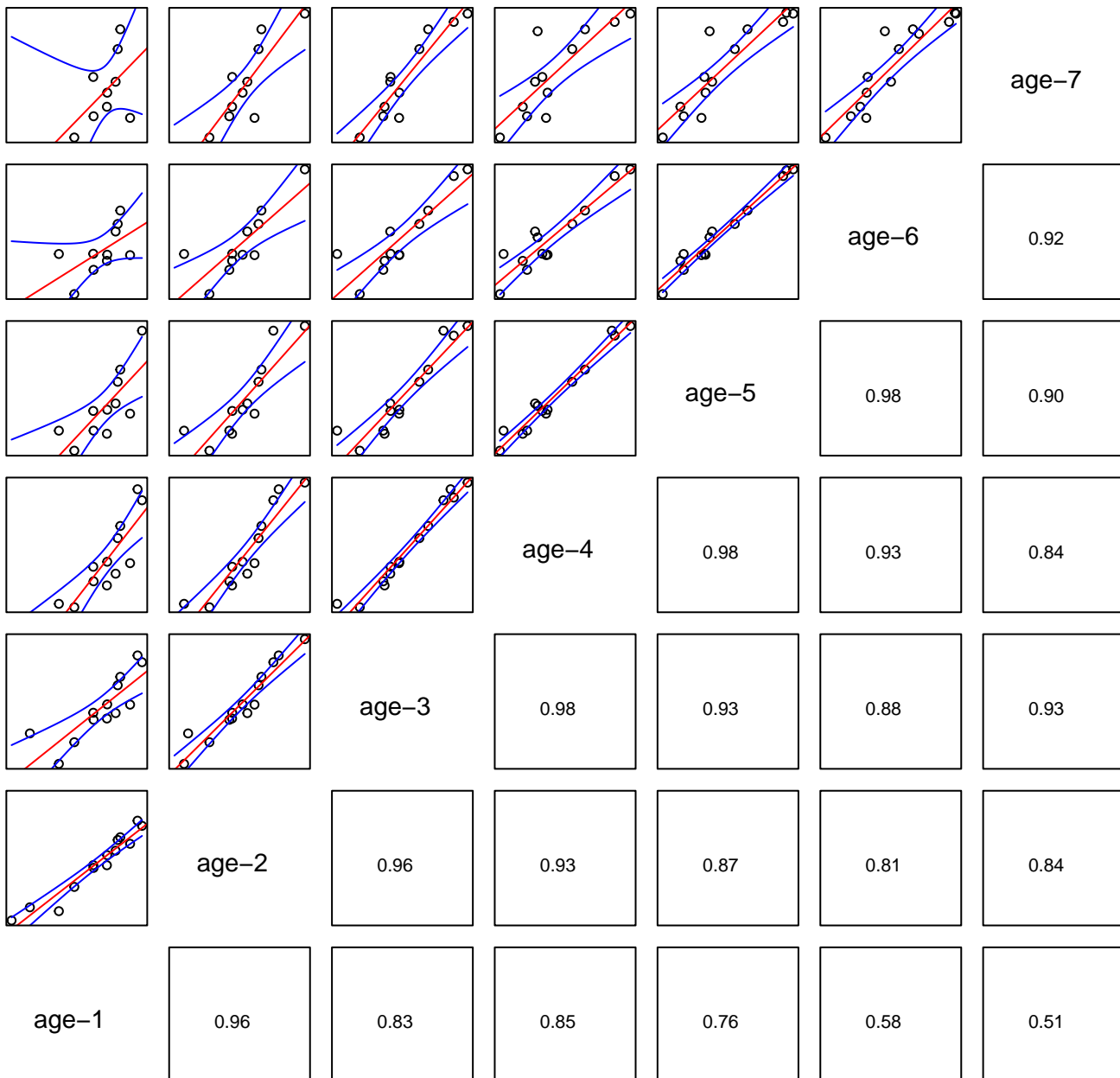
Index 3 (MRIP) Predicted



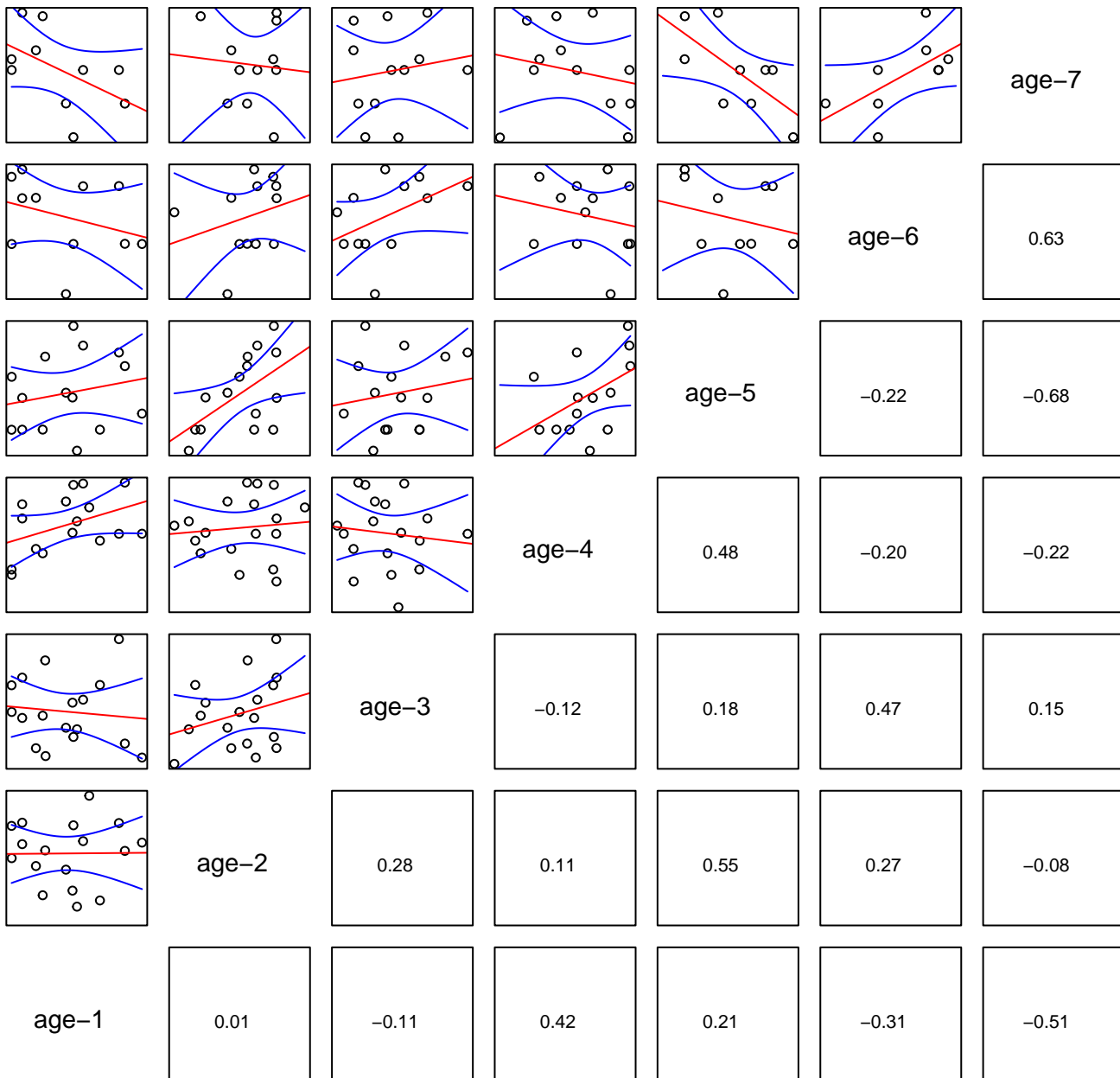
Index 4 (NEAMAP) Observed



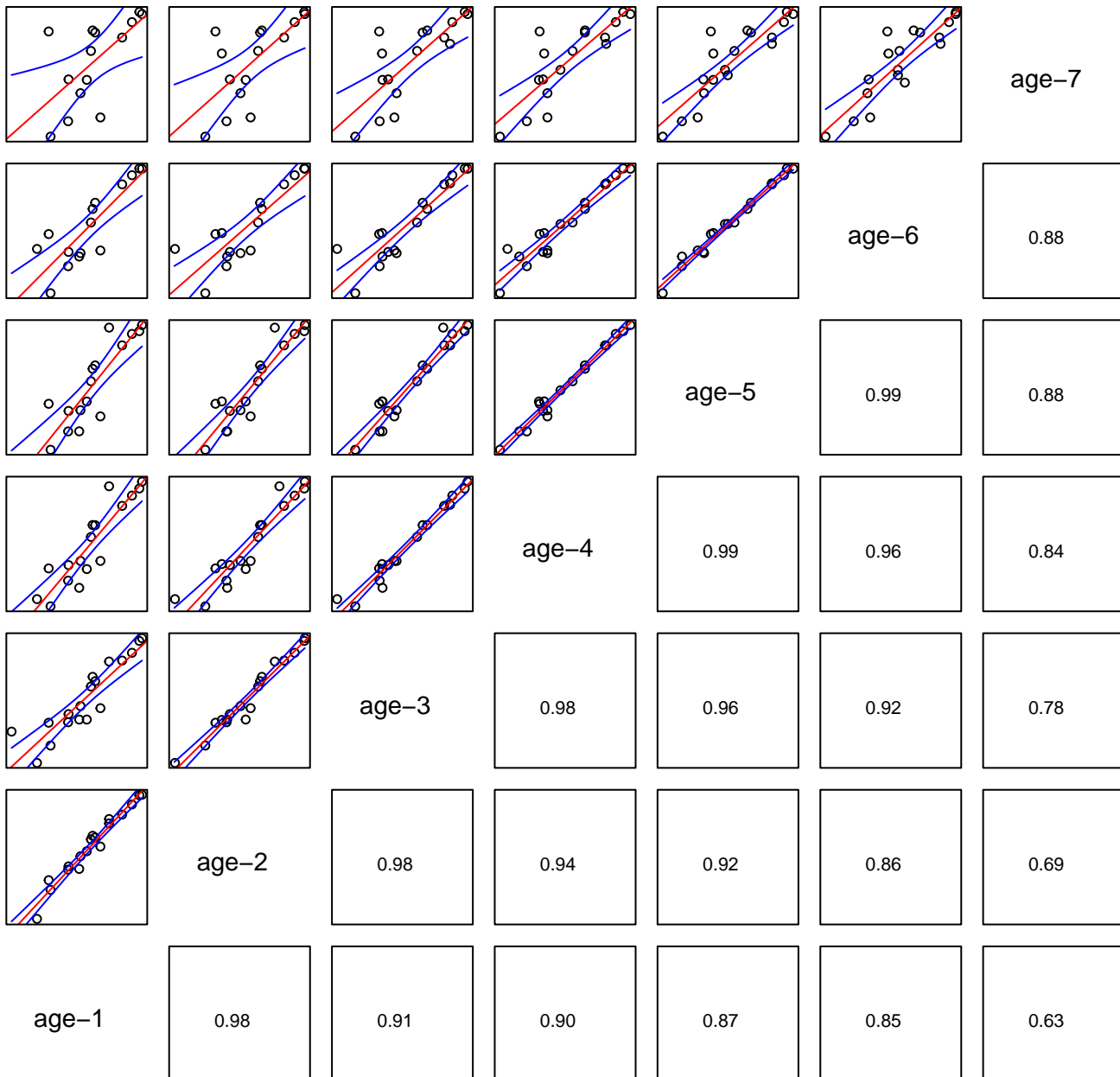
Index 4 (NEAMAP) Predicted



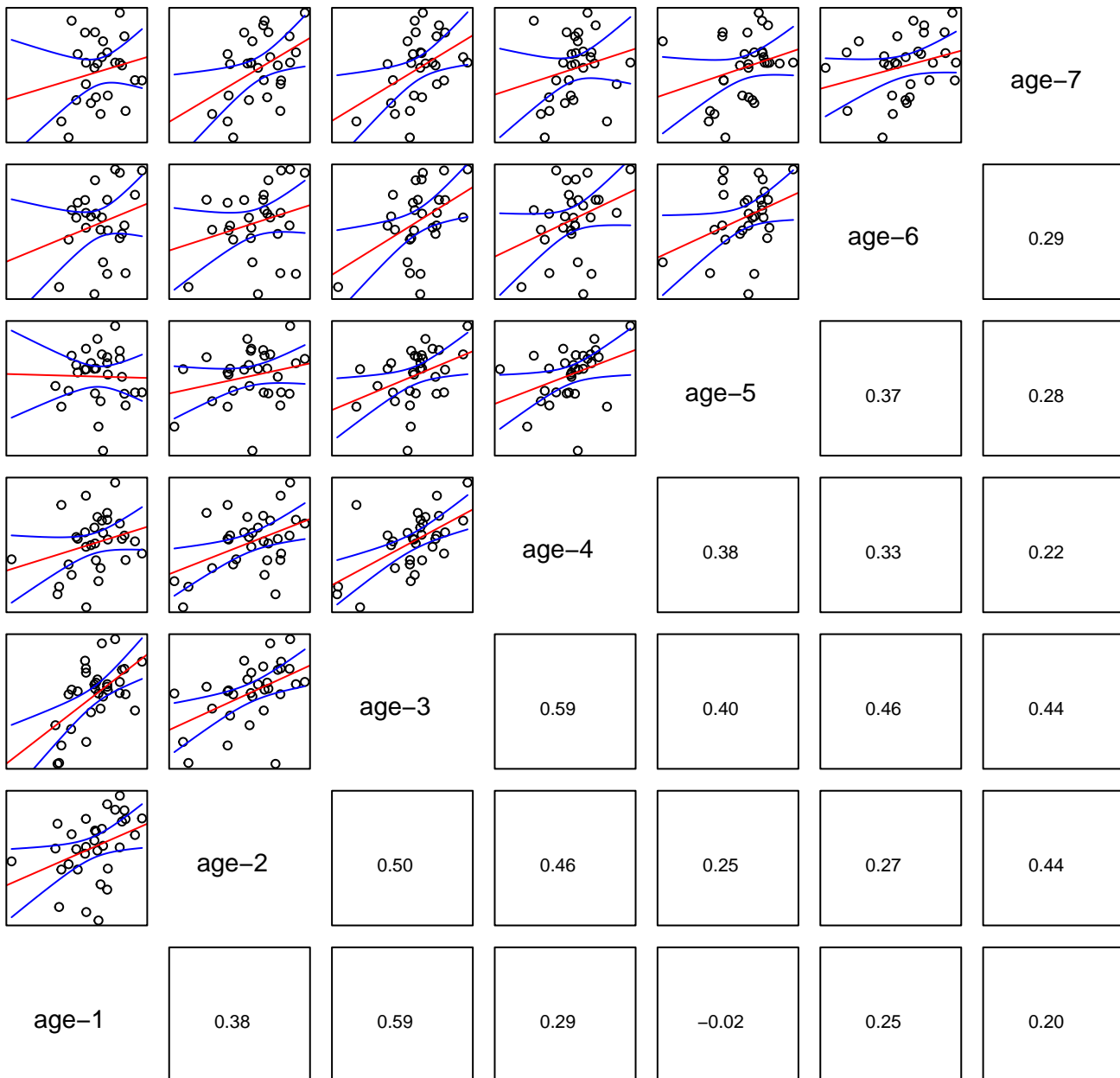
Index 6 (PSIGN) Observed



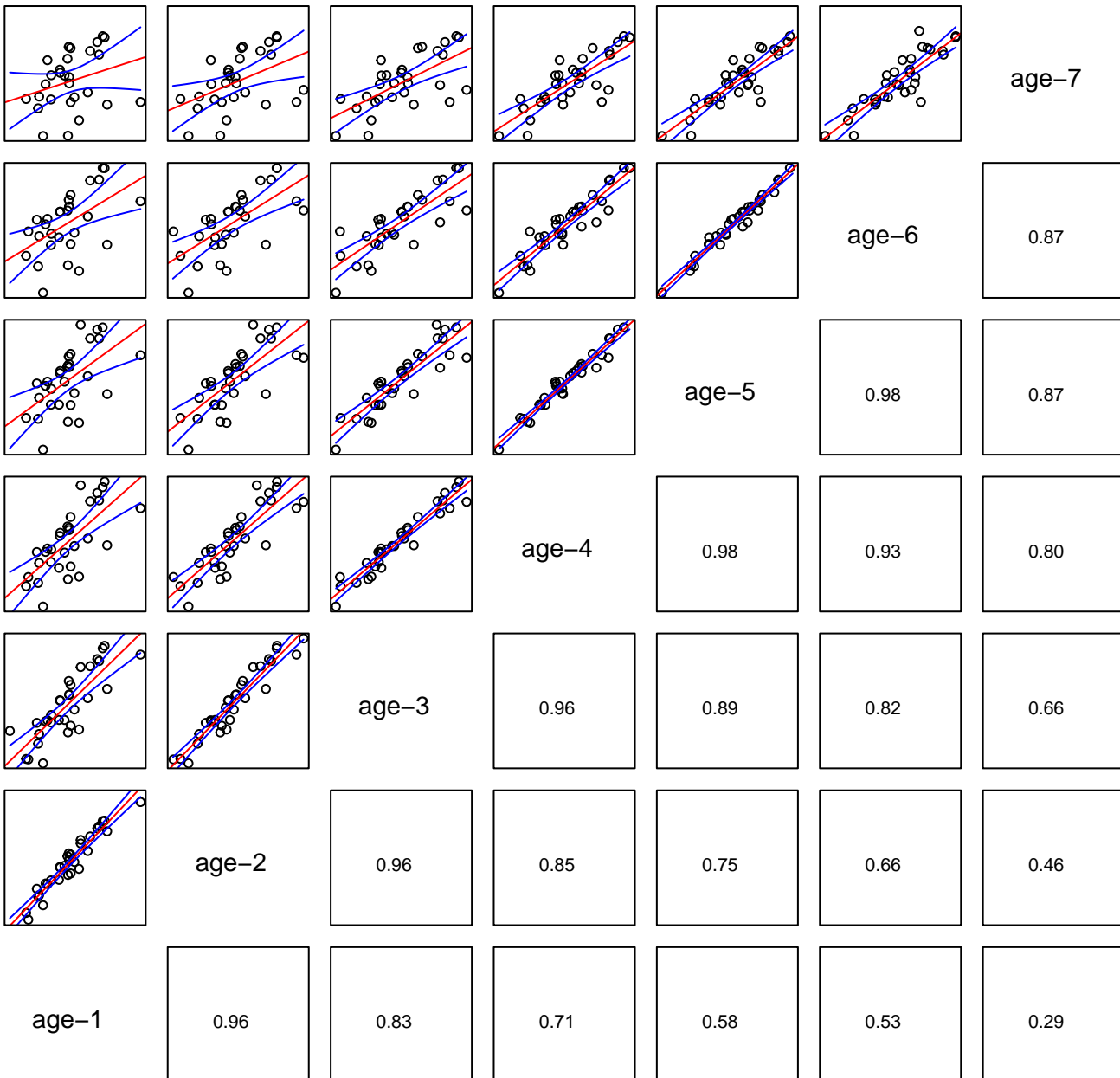
Index 6 (PSIGN) Predicted



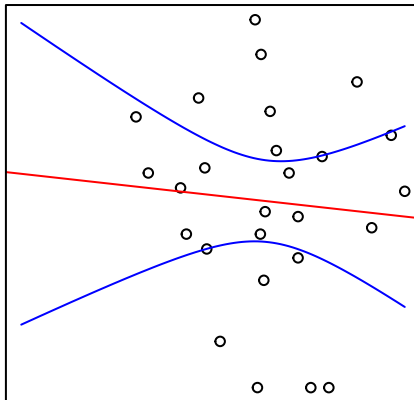
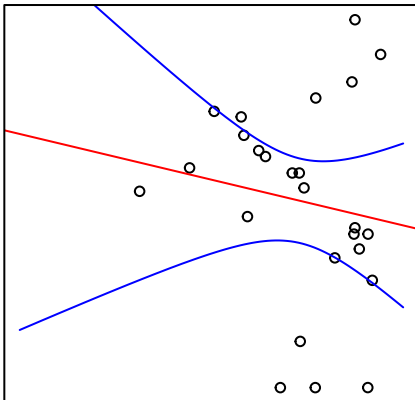
Index 7 (CT Trawl) Observed



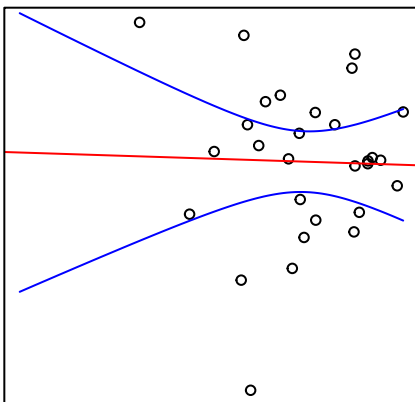
Index 7 (CT Trawl) Predicted



Index 8 (NJ Trawl) Observed



age-3



age-2

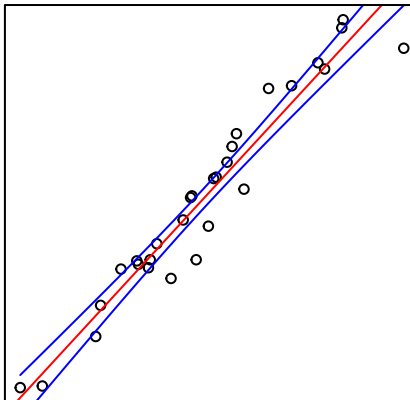
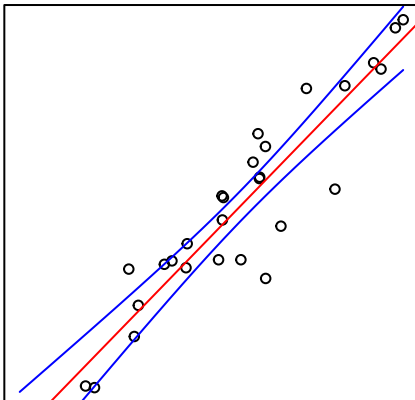
-0.08

age-1

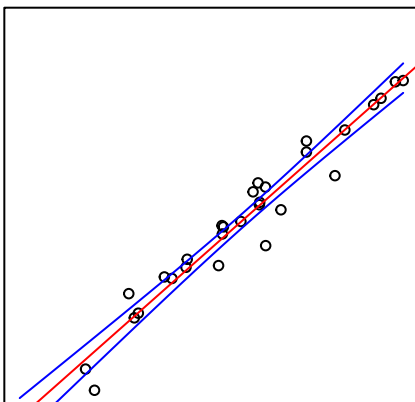
-0.03

-0.15

Index 8 (NJ Trawl) Predicted



age-3



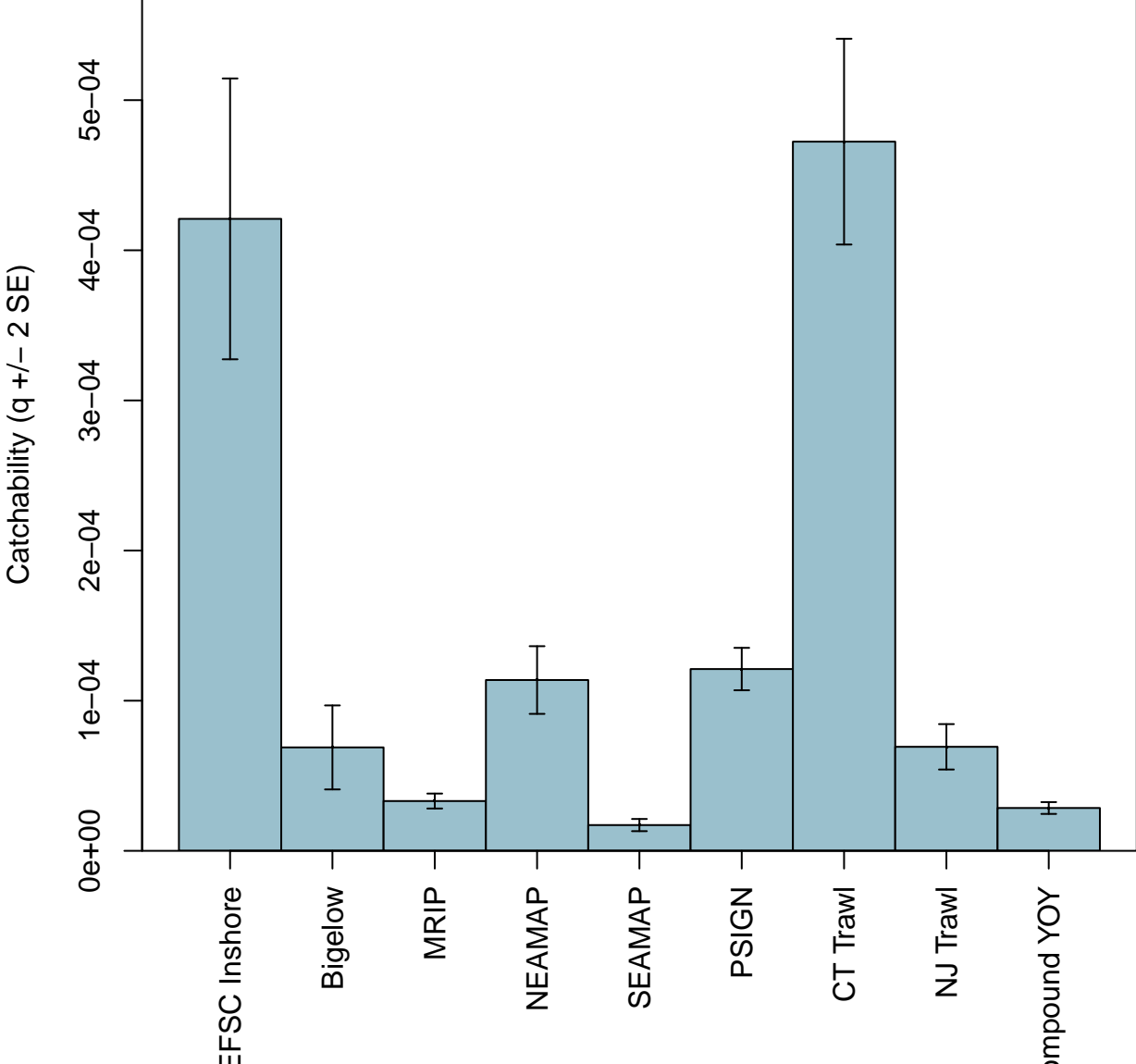
age-2

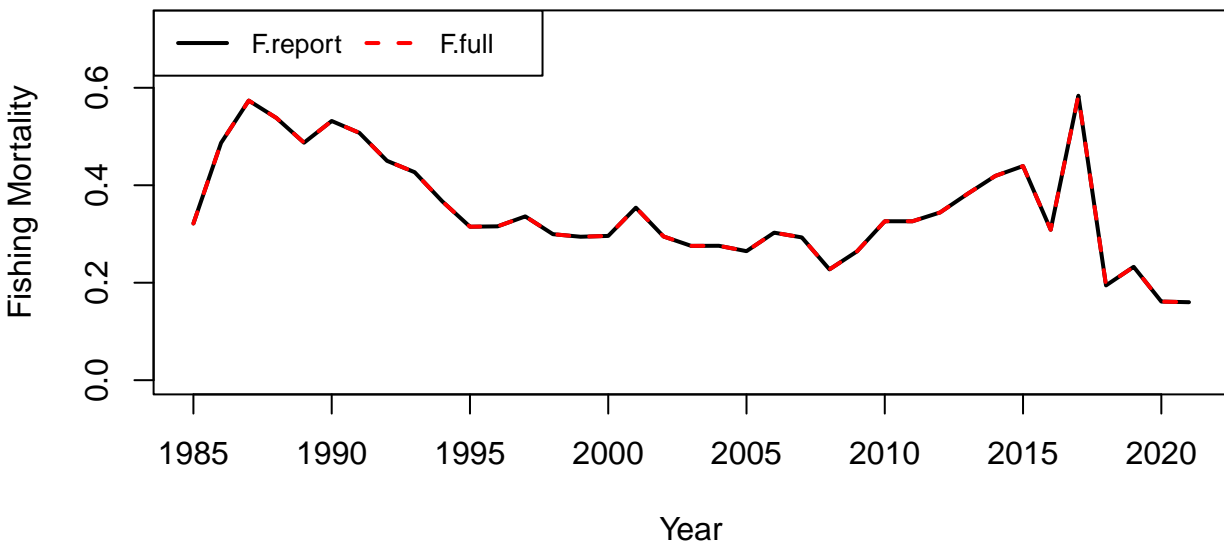
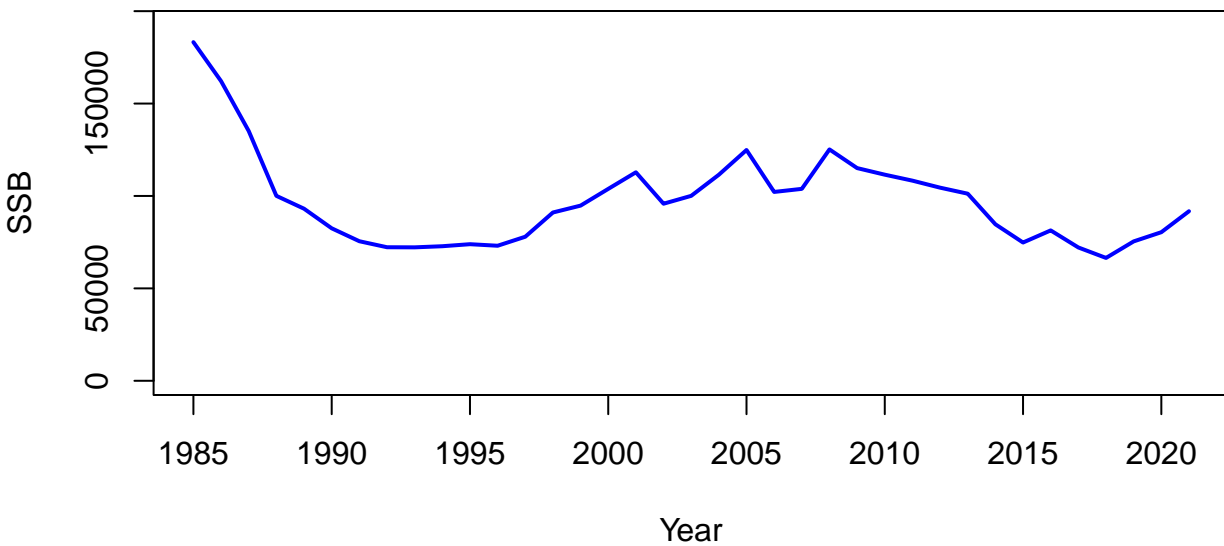
0.97

age-1

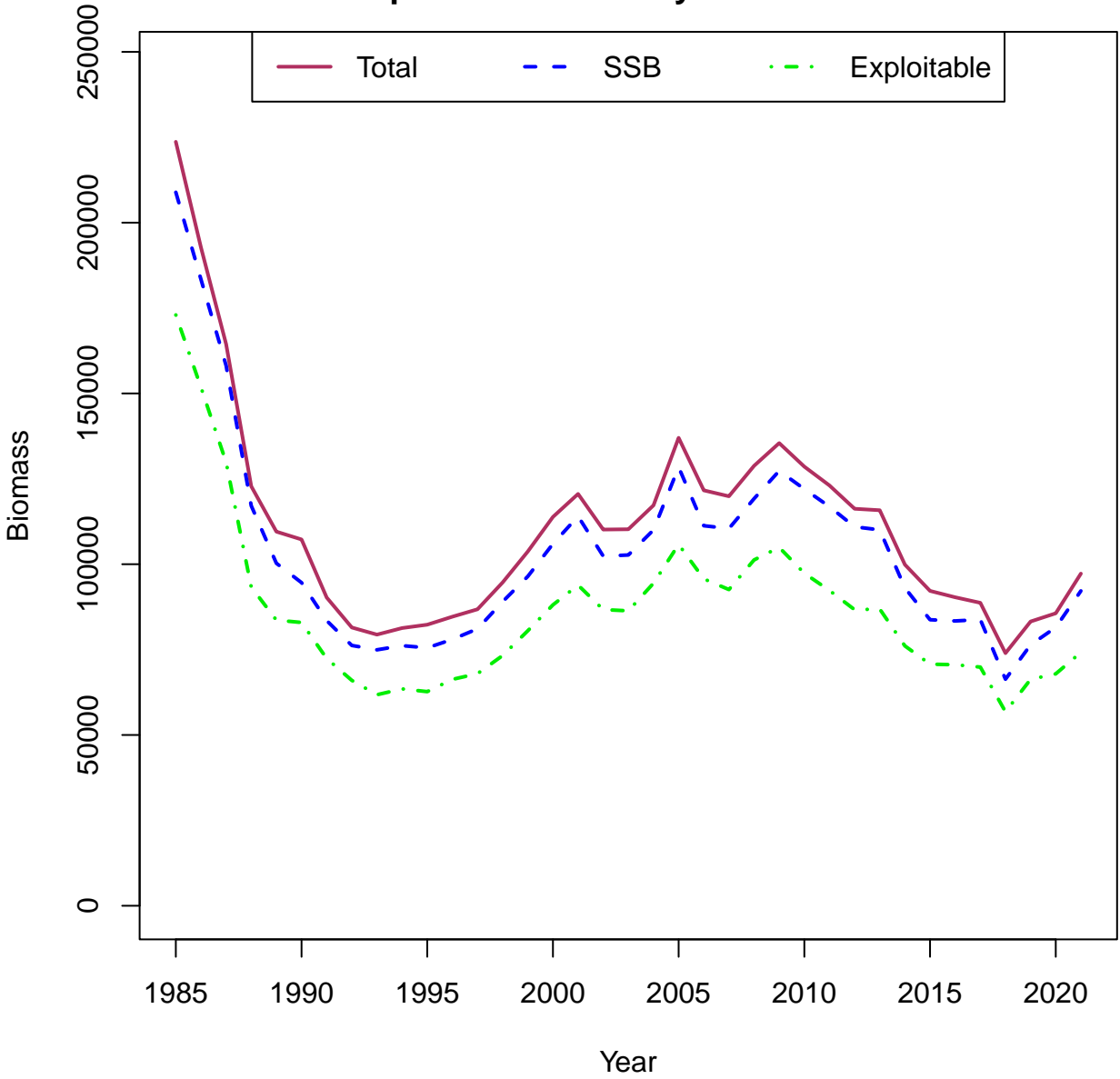
0.97

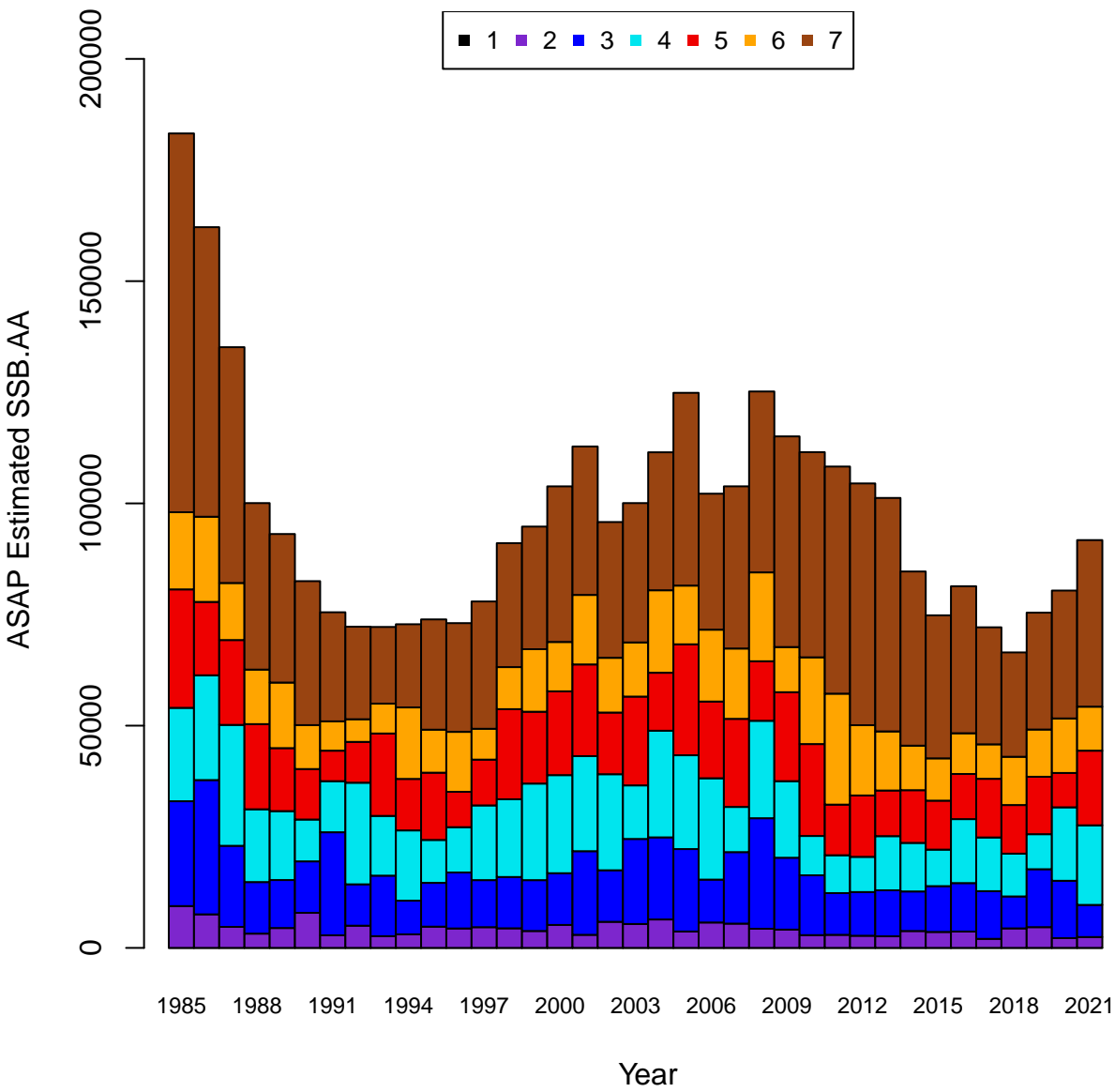
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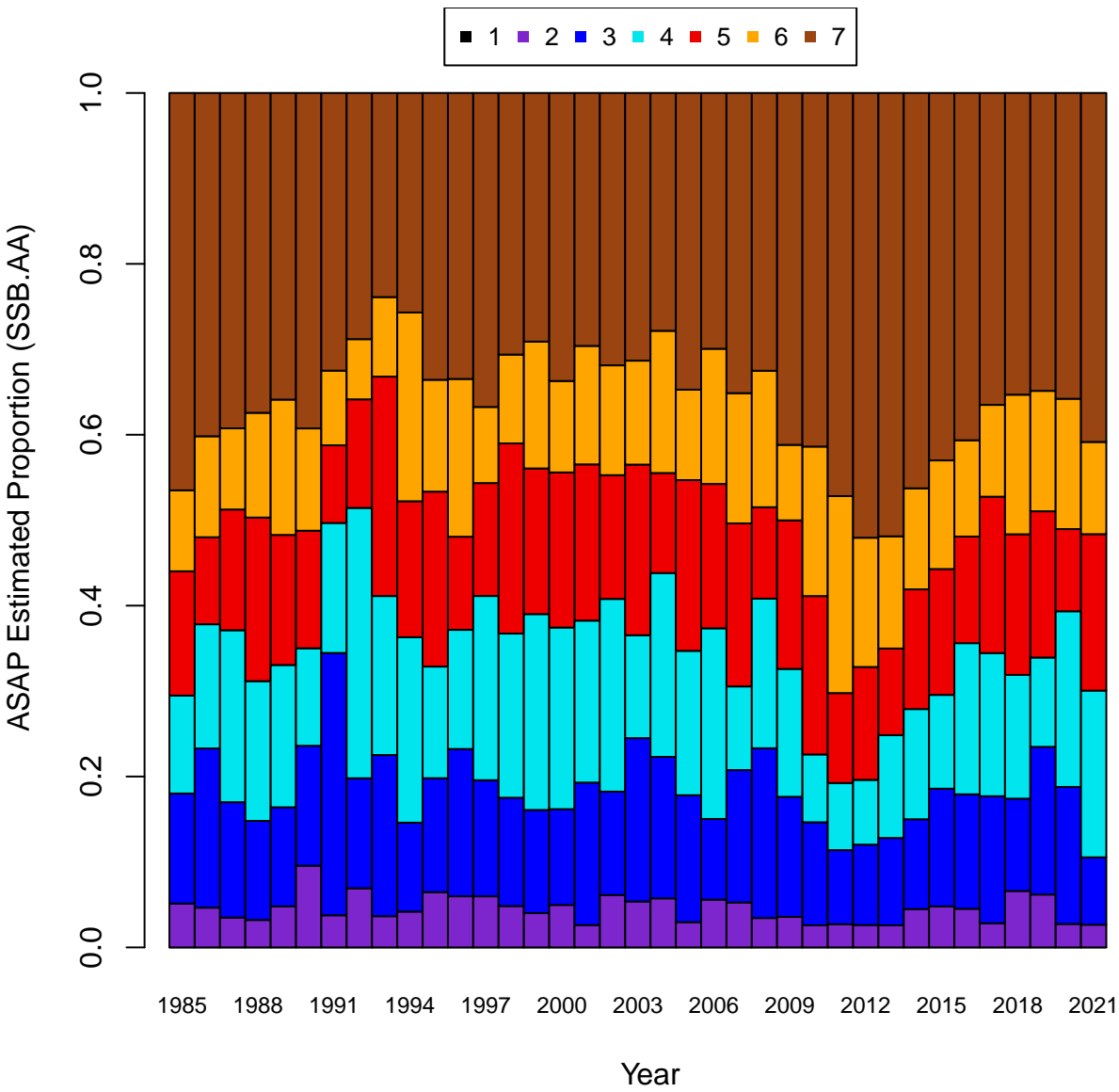


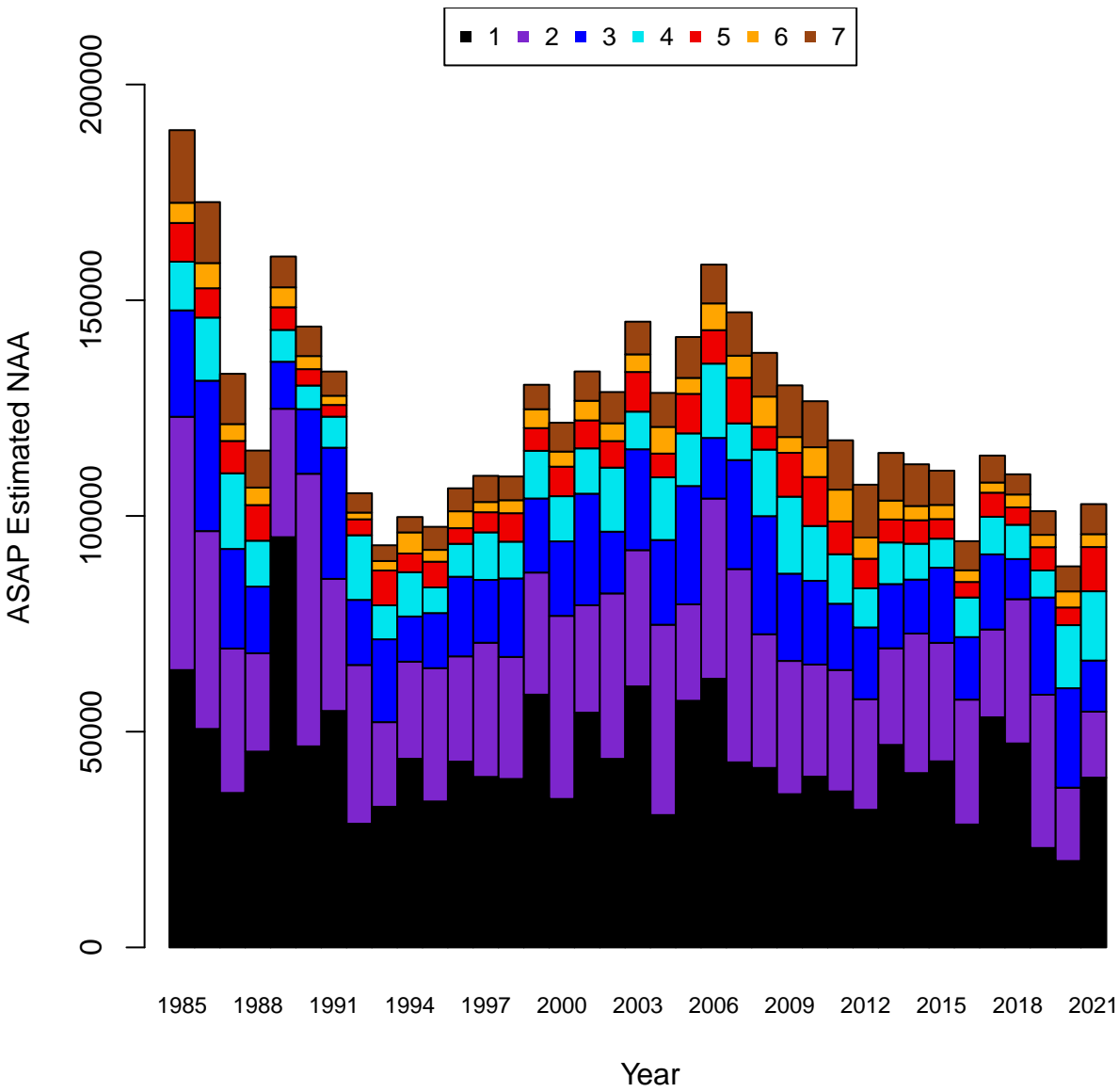


Comparison of January 1 Biomass

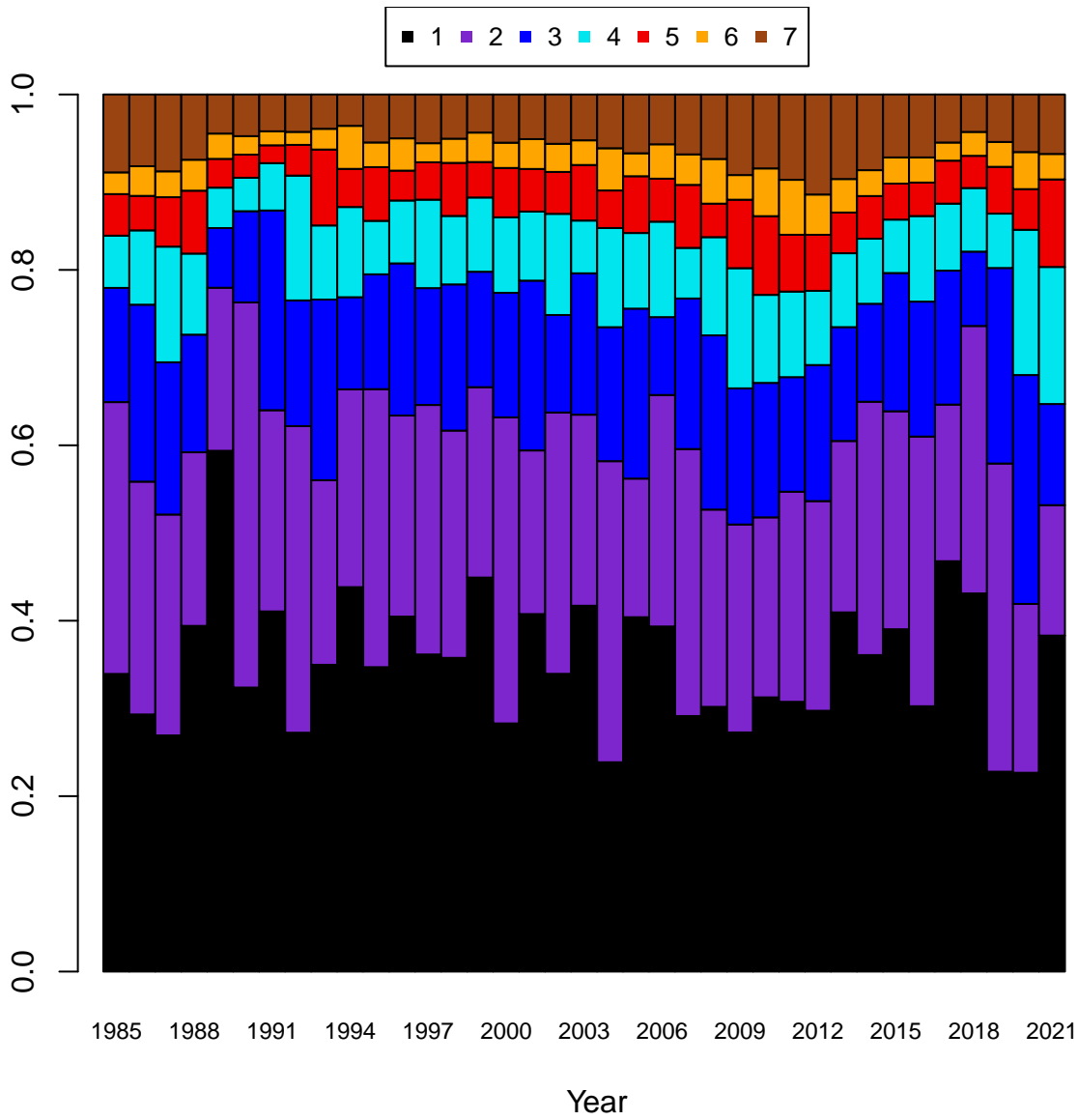


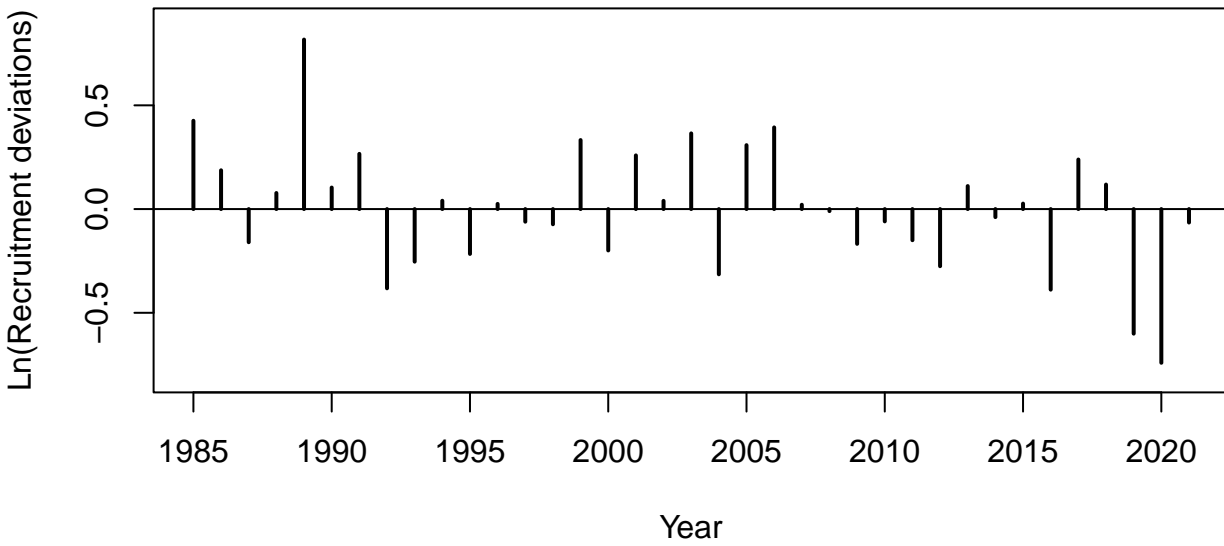
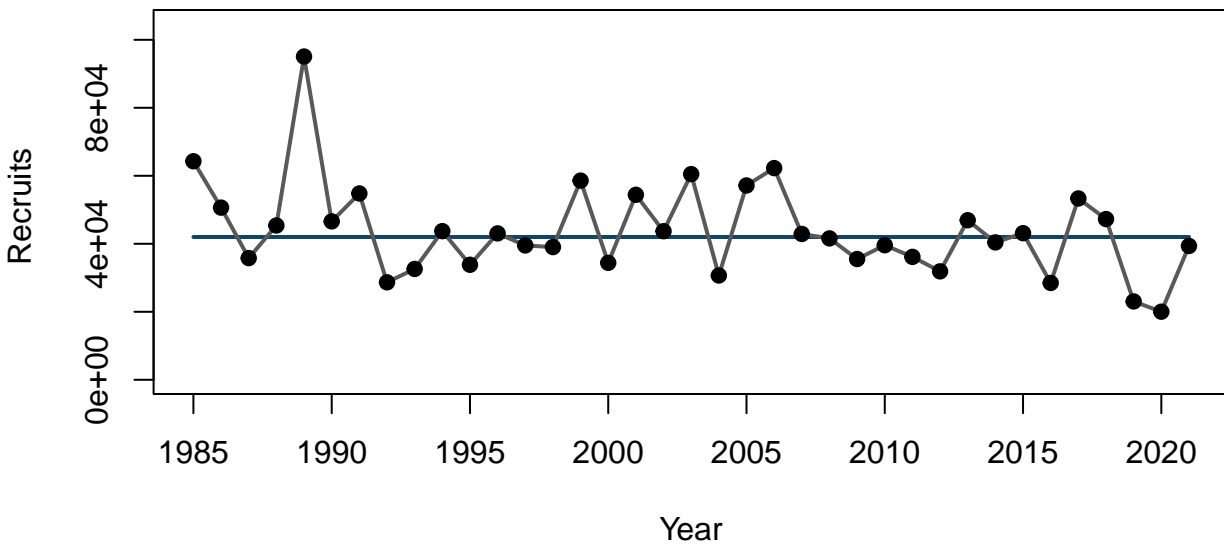


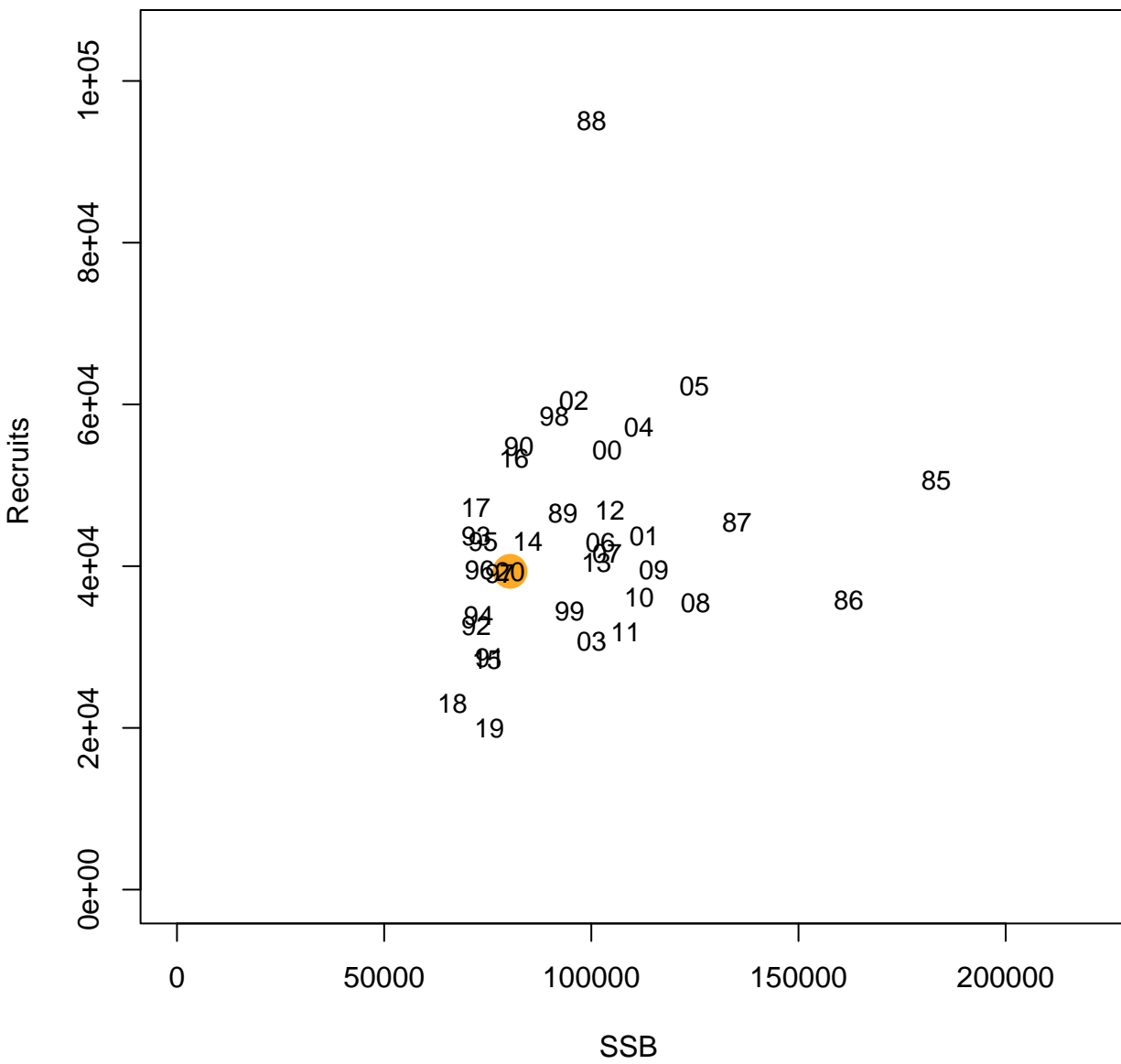


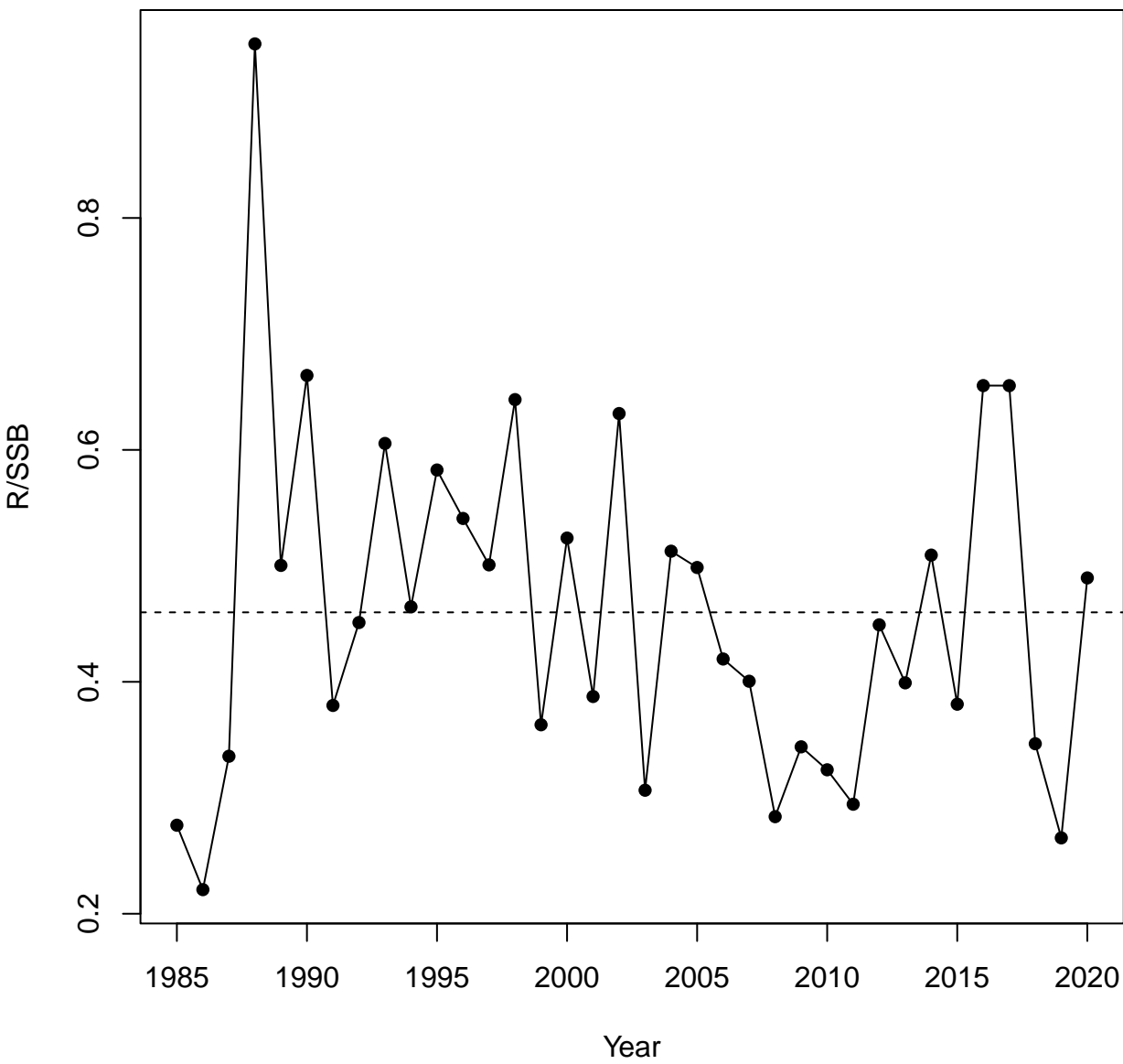


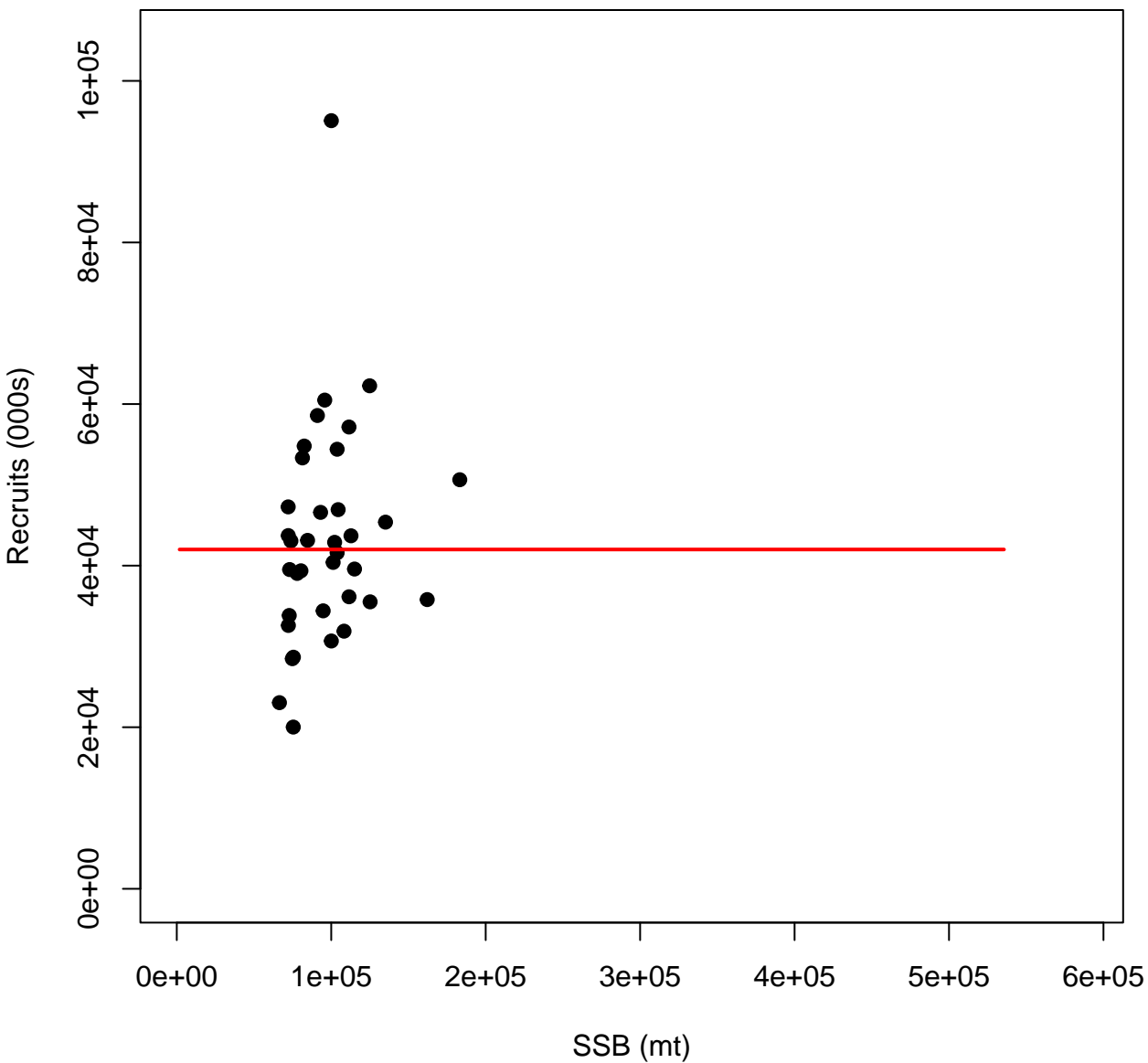
ASAP Estimated Proportion (NAA)





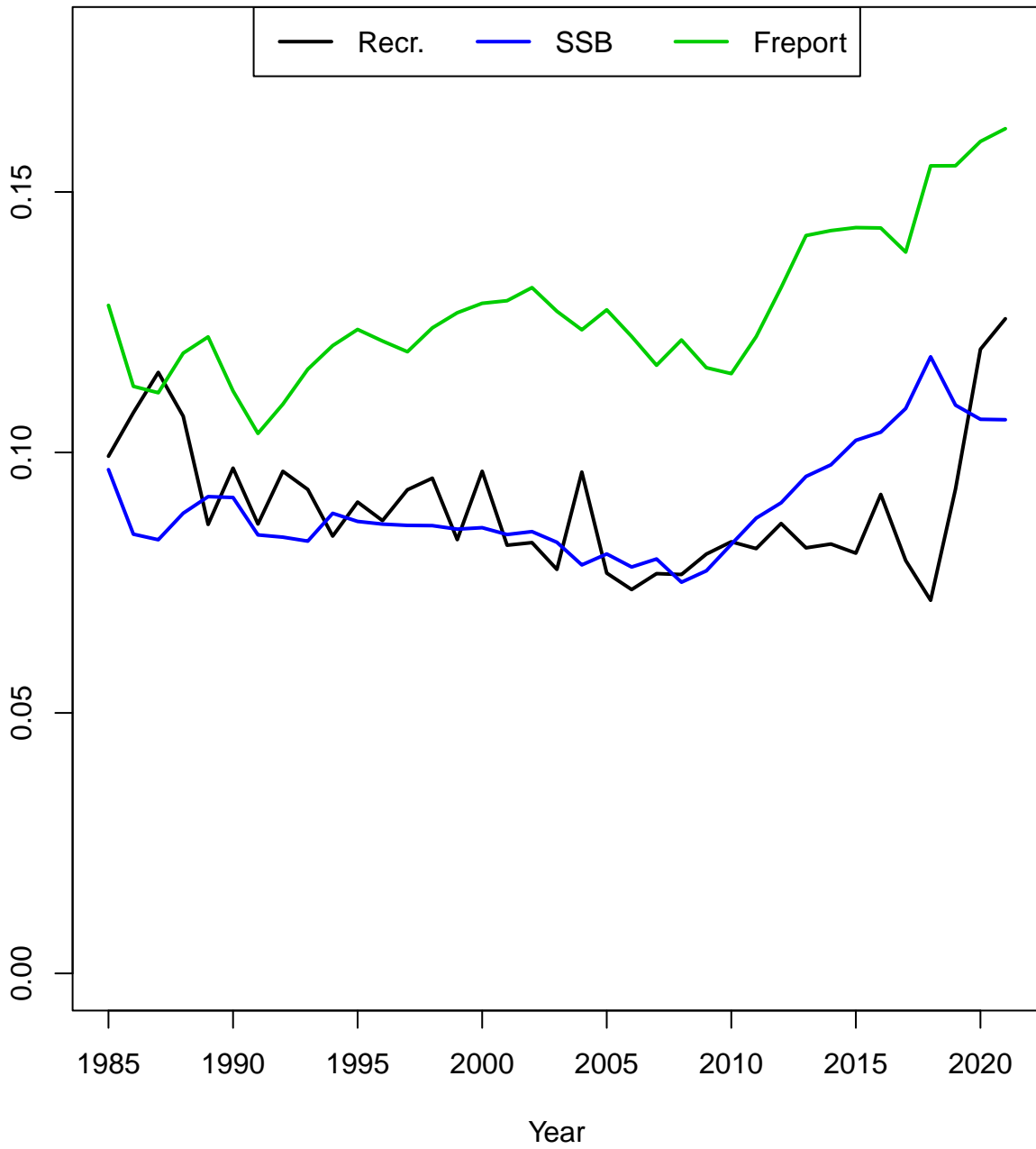




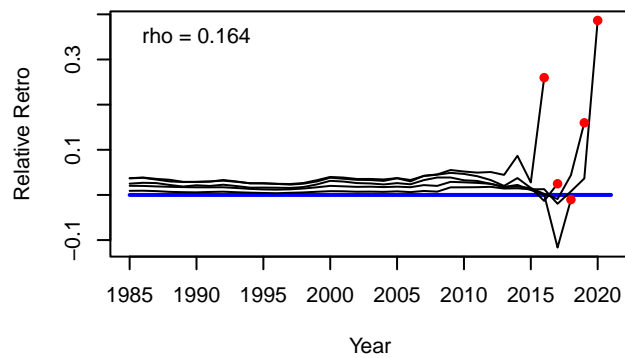
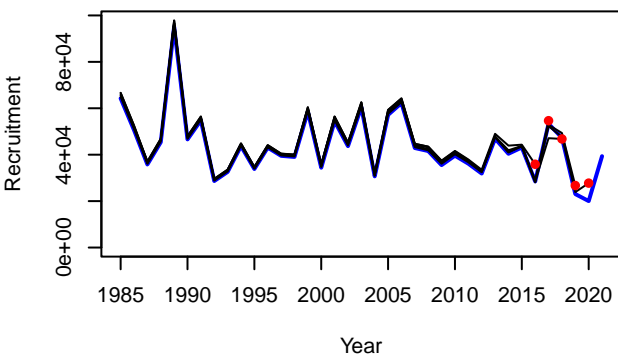
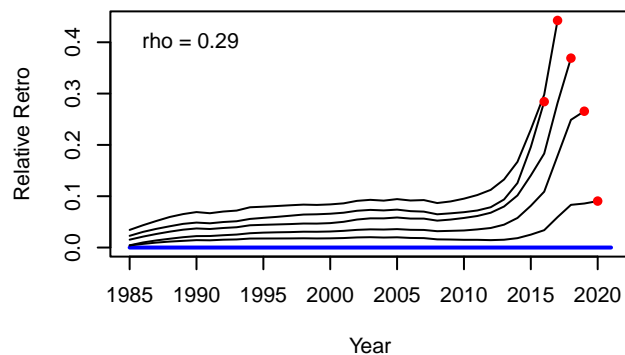
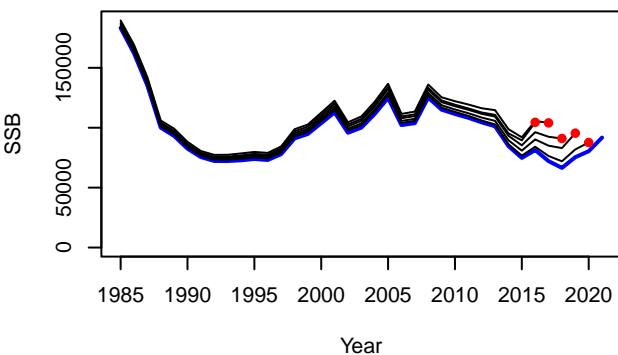
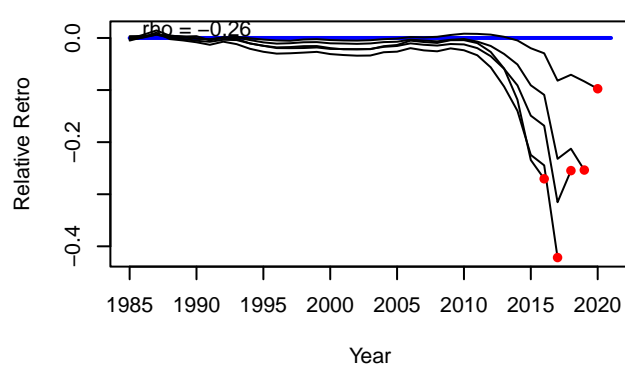
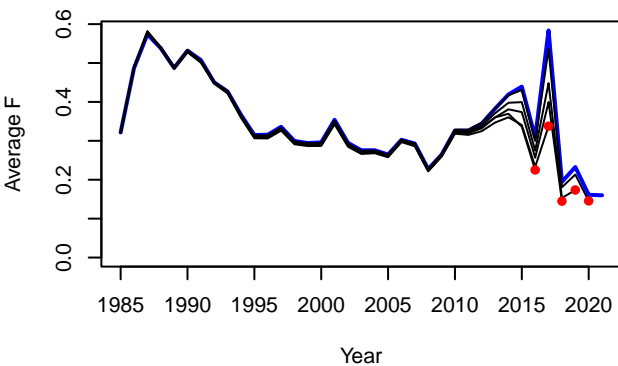




CV

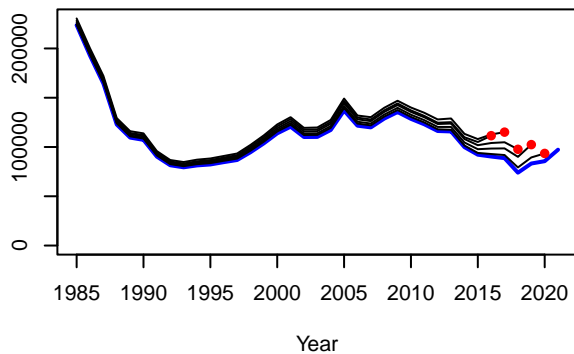


F, SSB, R

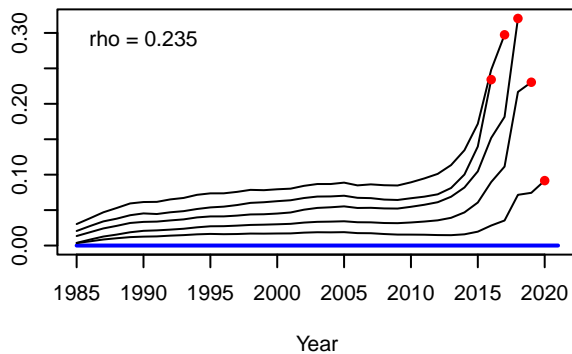


Jan-1 B, Exploitable B, Total Stock N

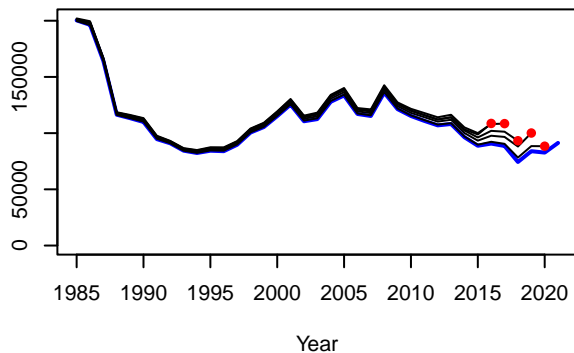
Jan-1 B



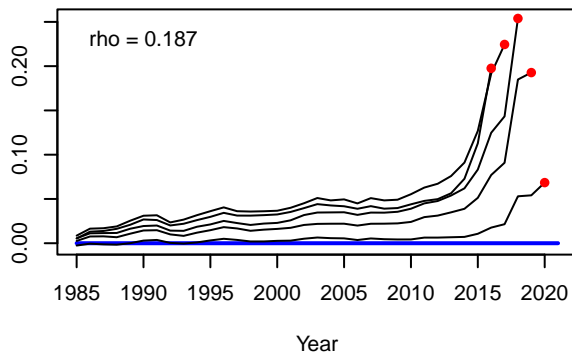
Relative Retro



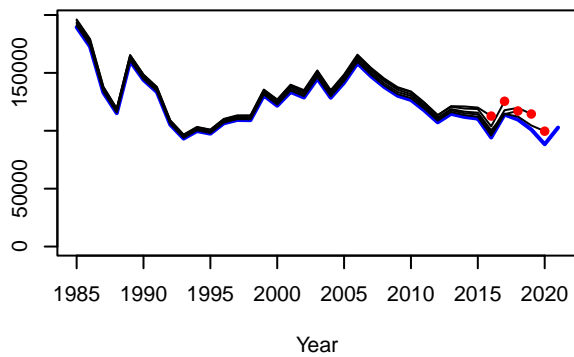
Exploitable B



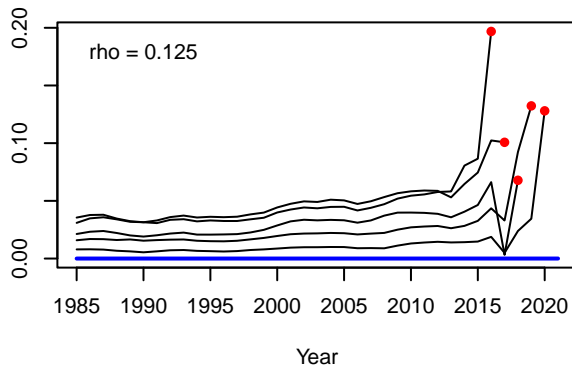
Relative Retro



Total Stock N

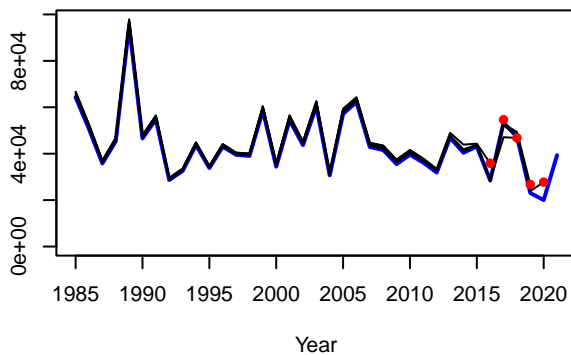


Relative Retro

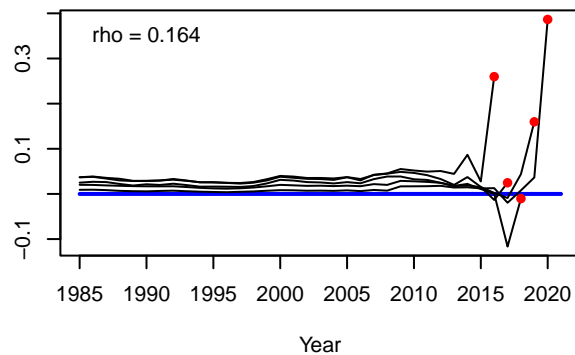


Stock Numbers at Age

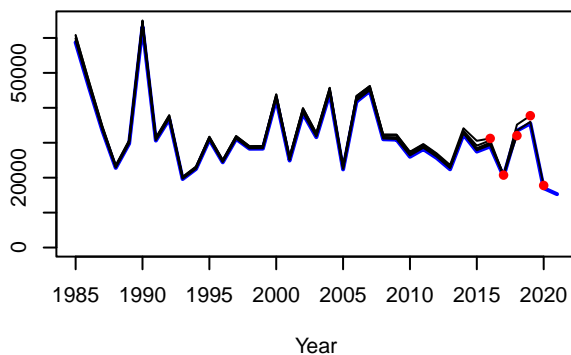
N at Age 1



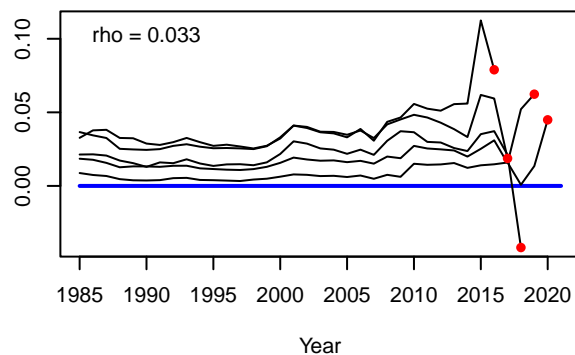
Relative Retro



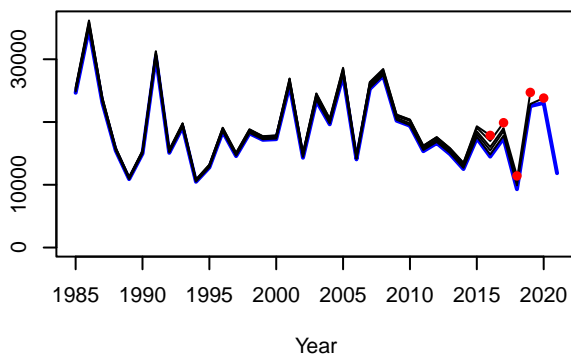
N at Age 2



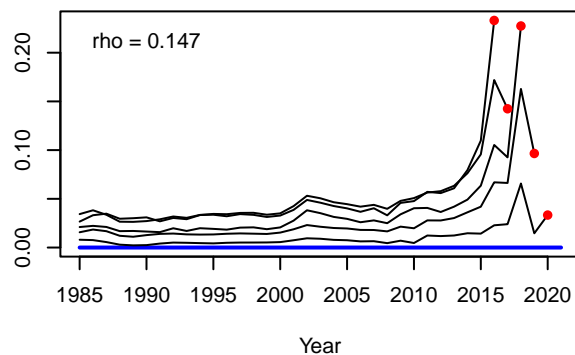
Relative Retro



N at Age 3

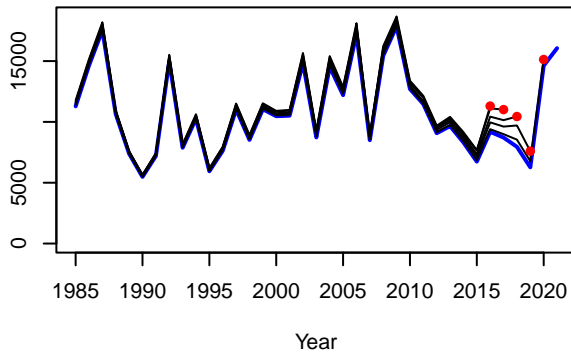


Relative Retro

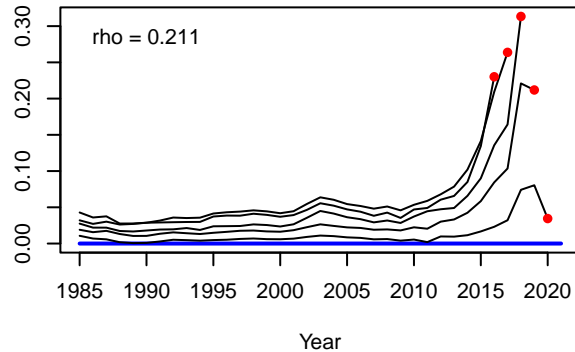


Stock Numbers at Age

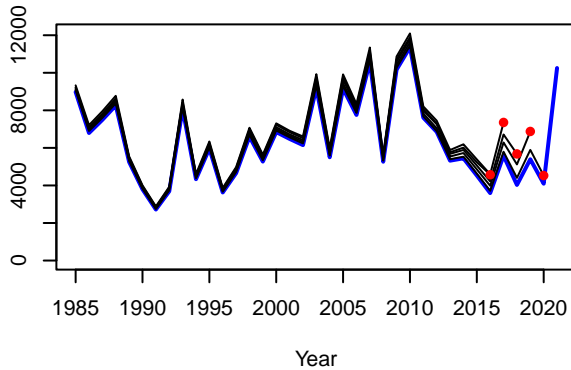
N at Age 4



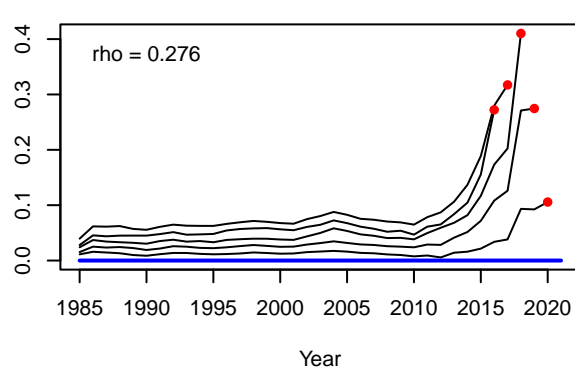
Relative Retro



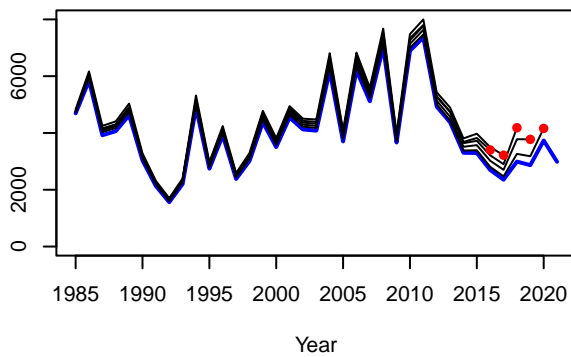
N at Age 5



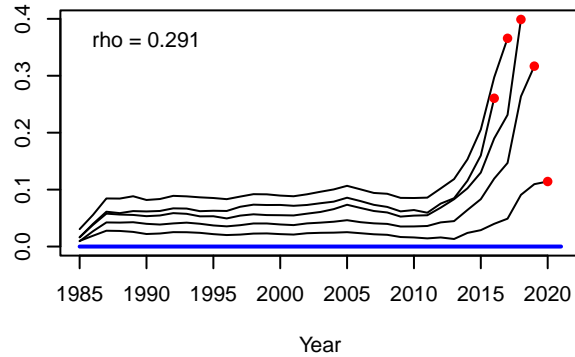
Relative Retro



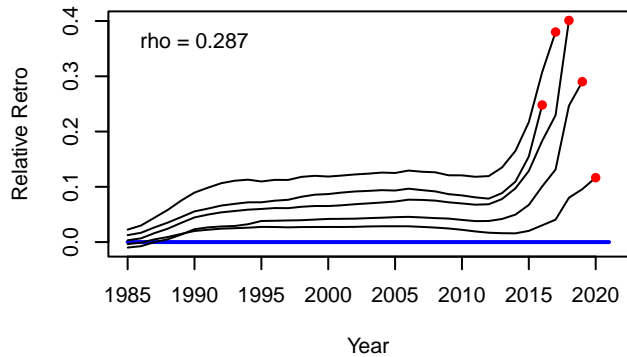
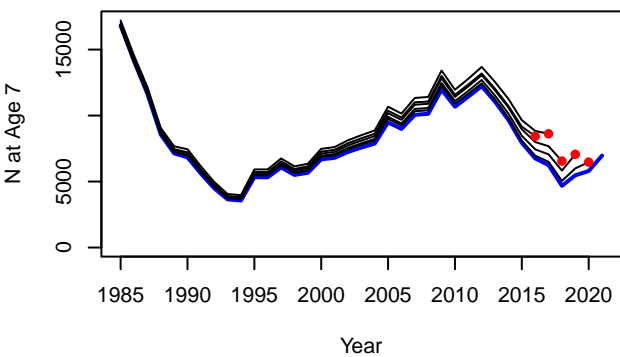
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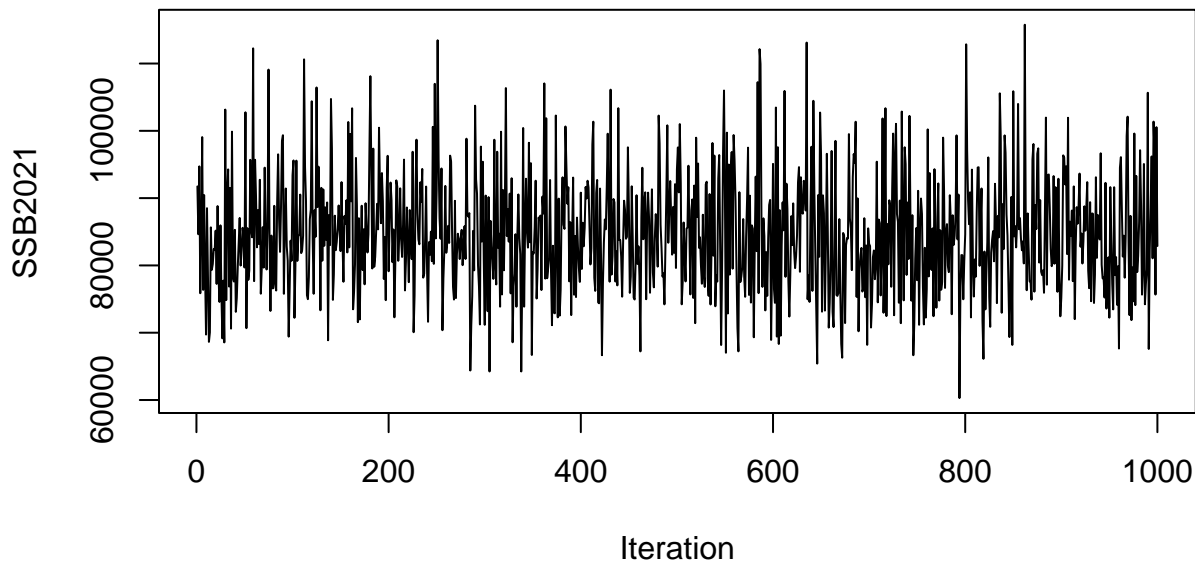
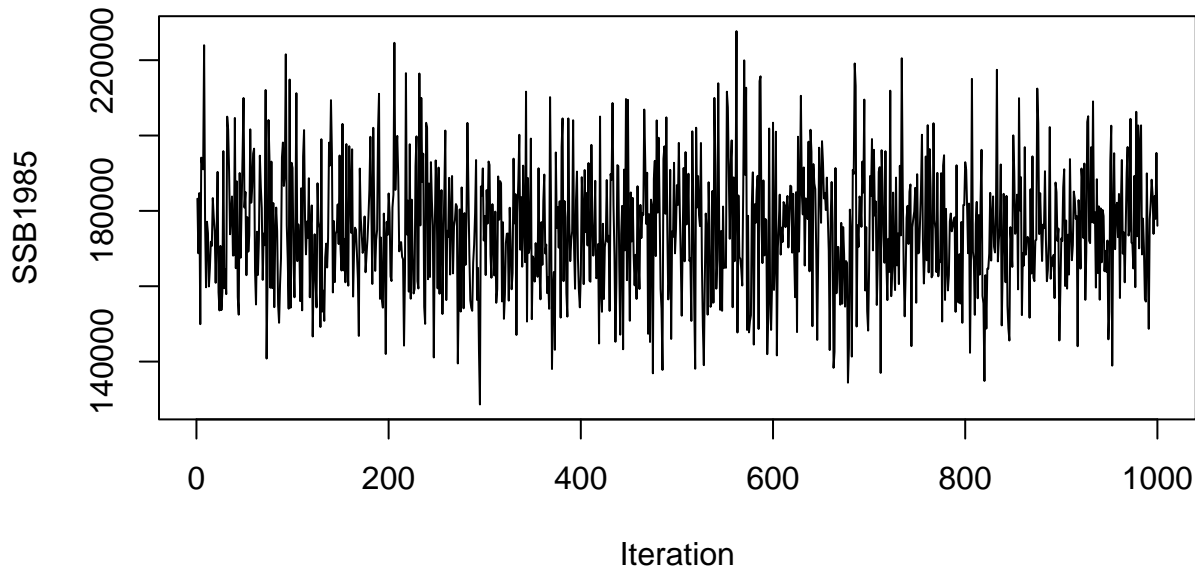


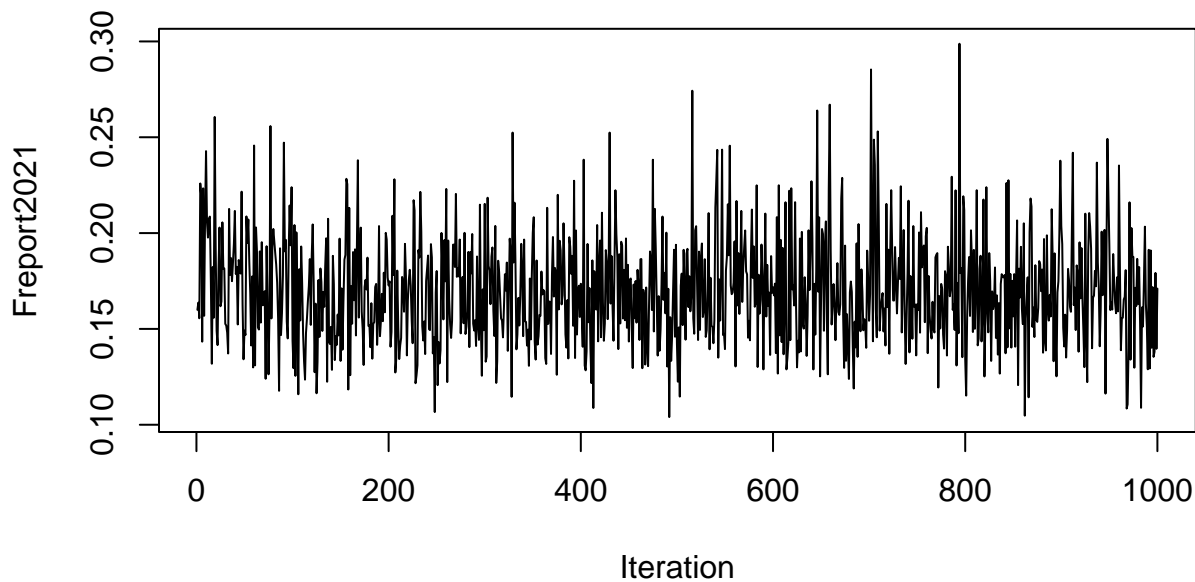
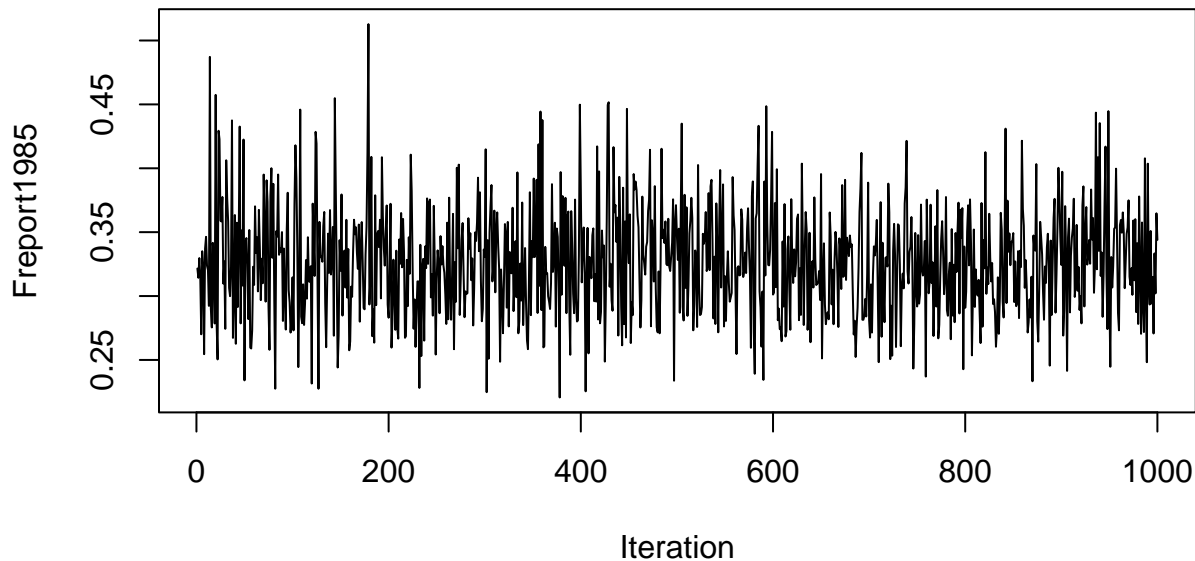
Relative Retro

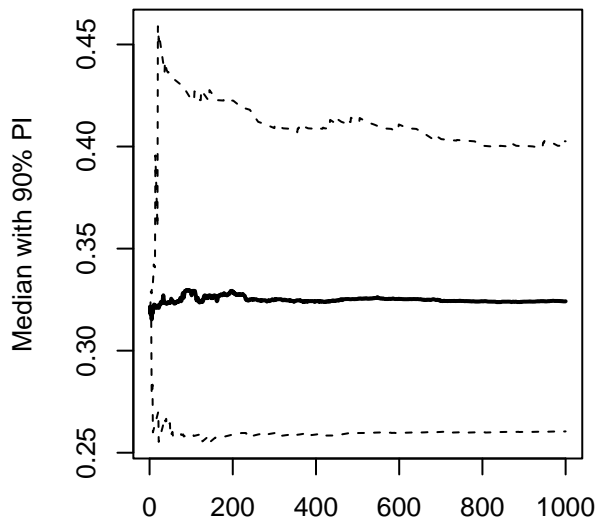
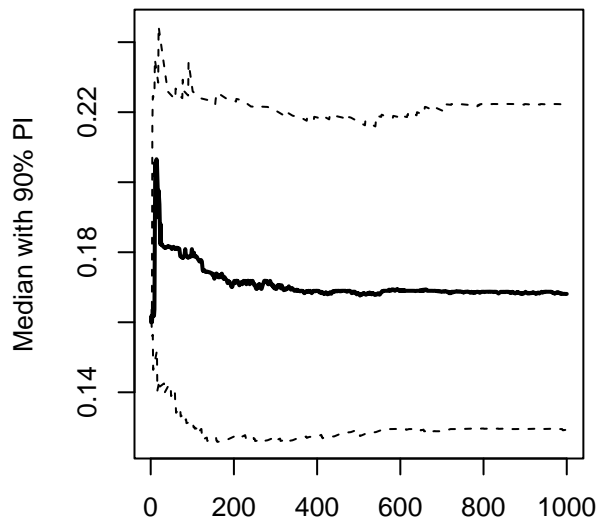
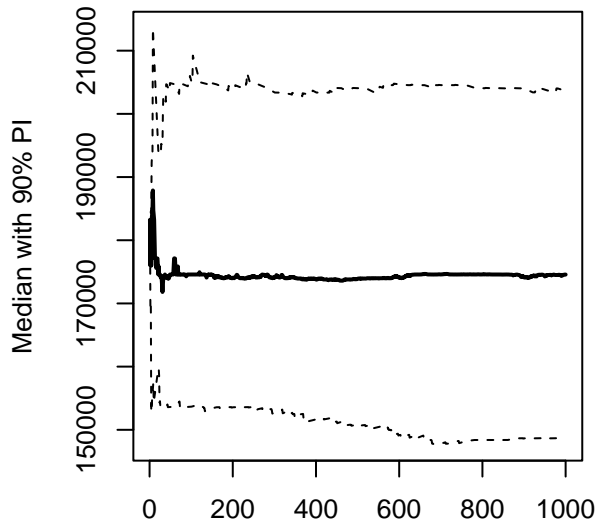
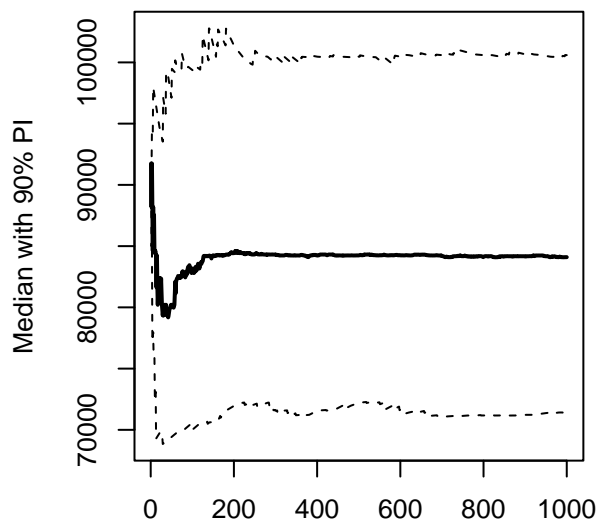


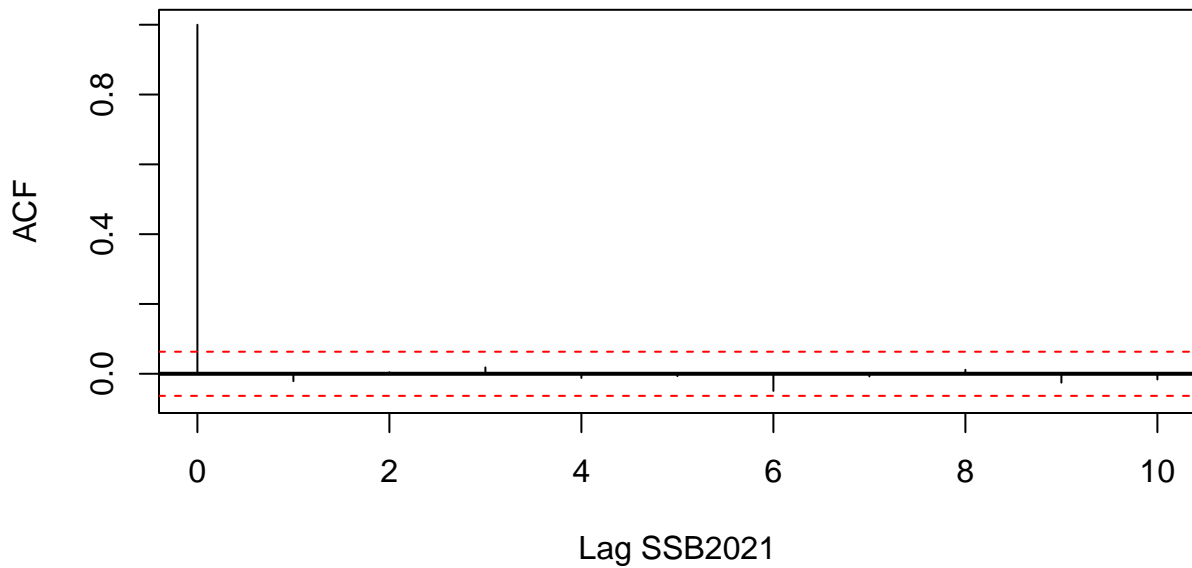
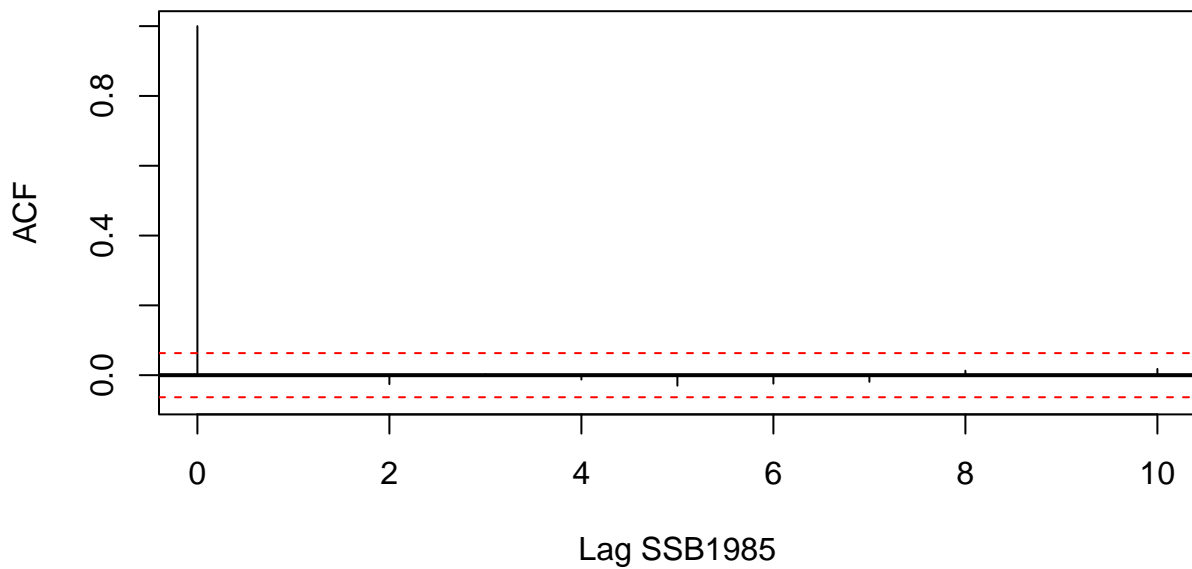
Stock Numbers at Age

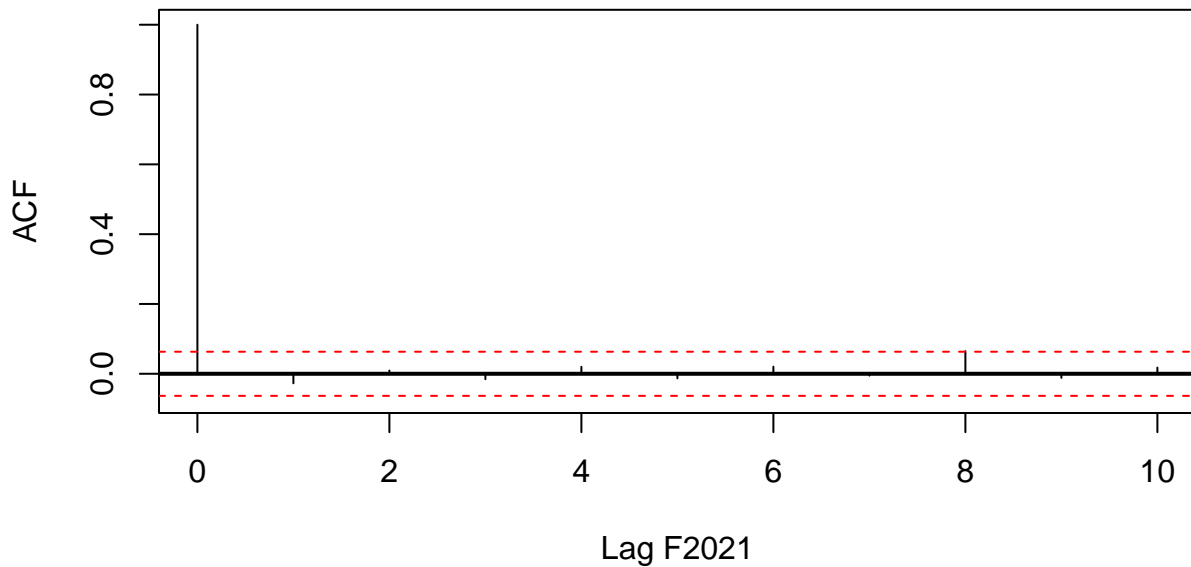
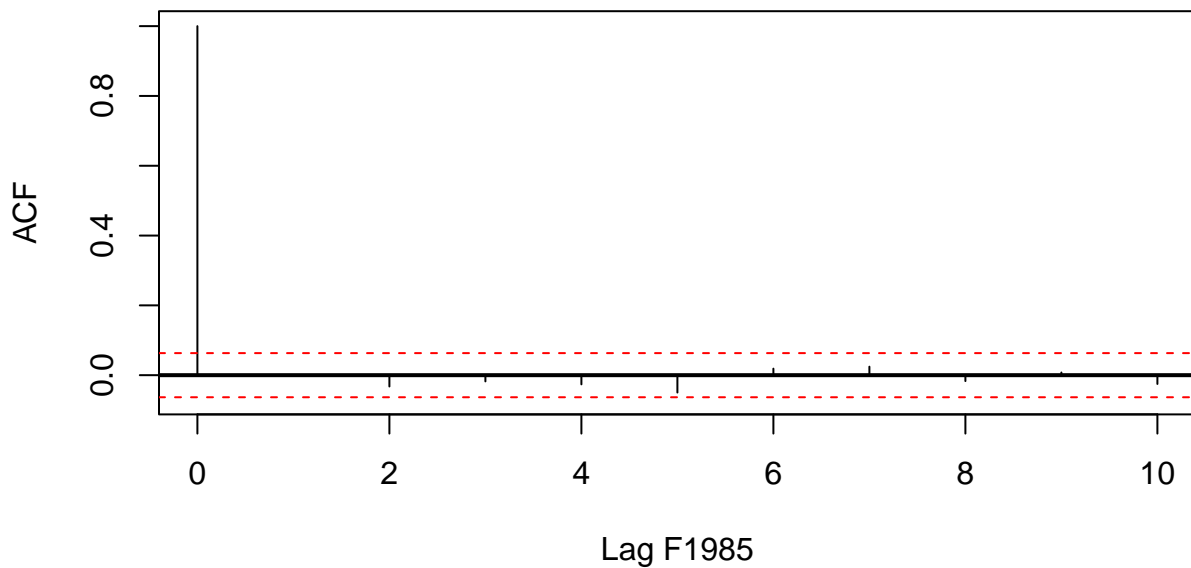


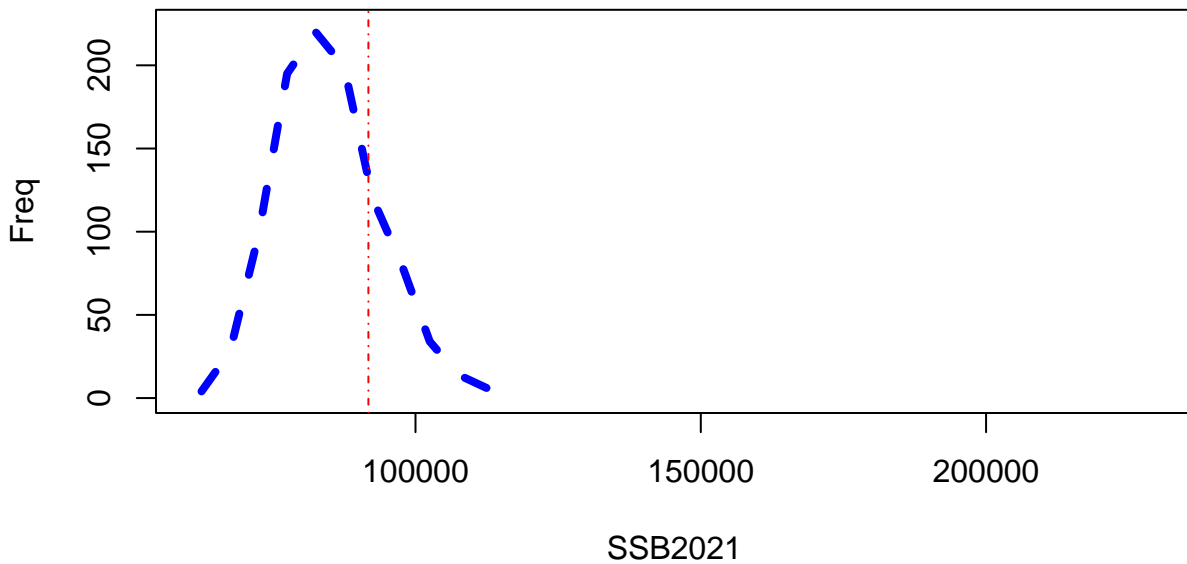
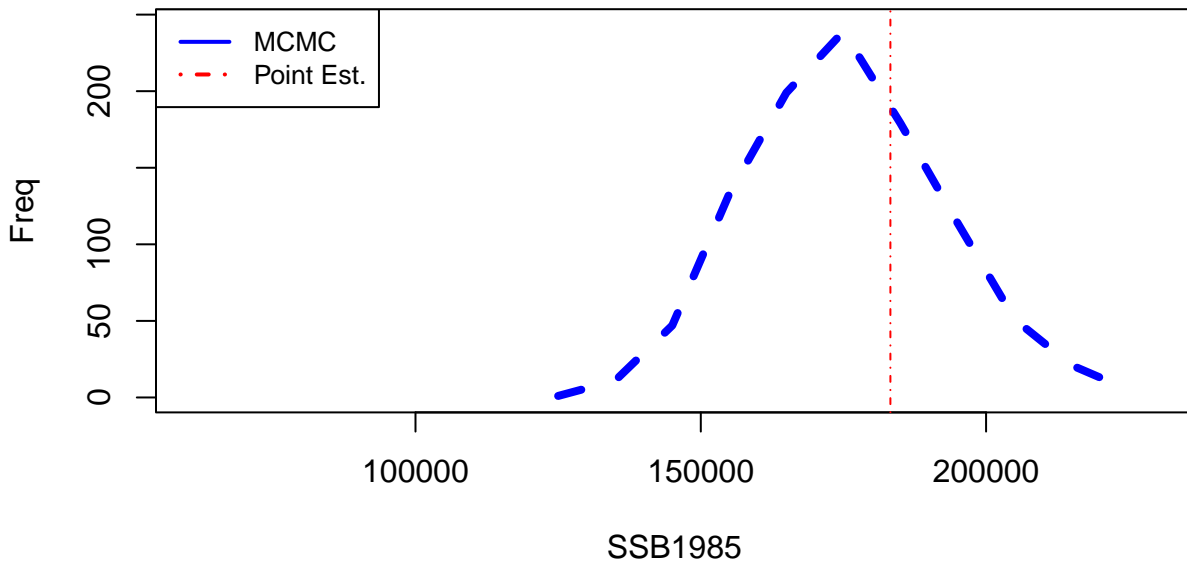


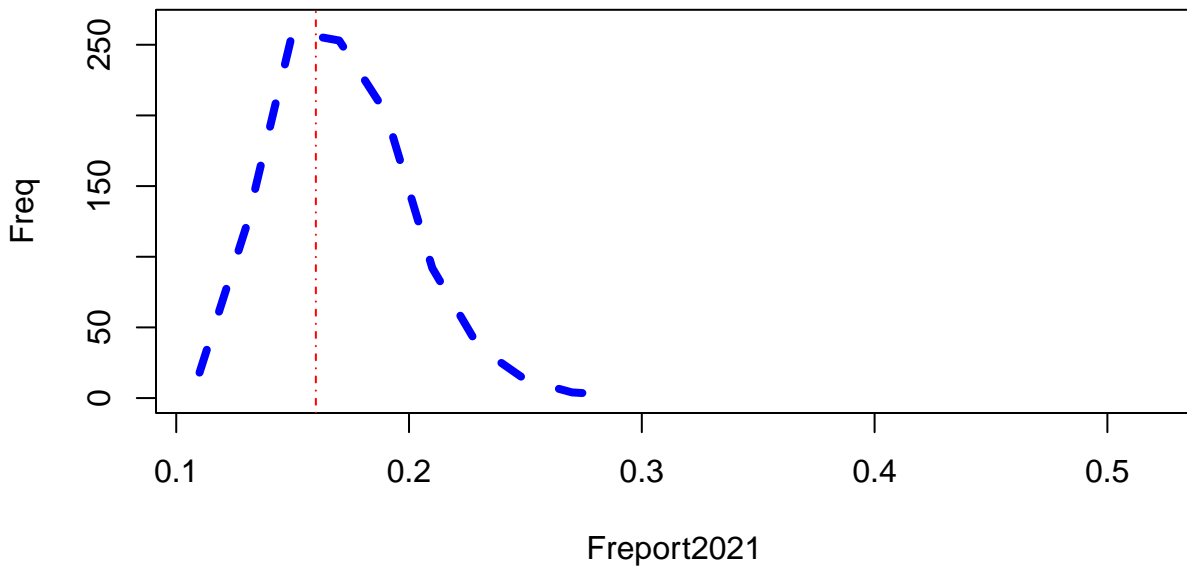
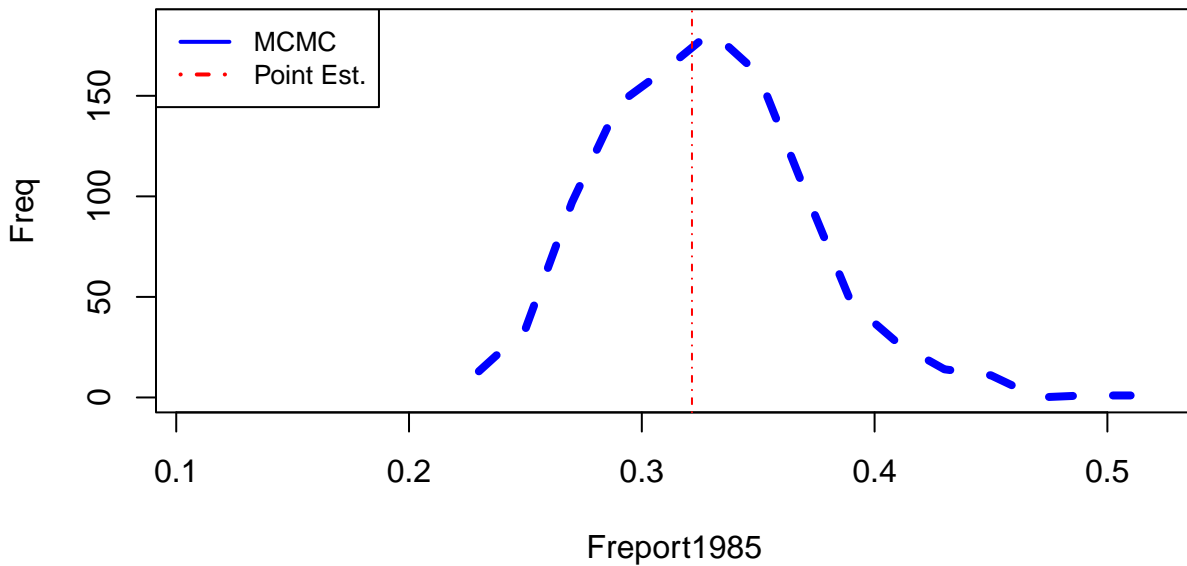


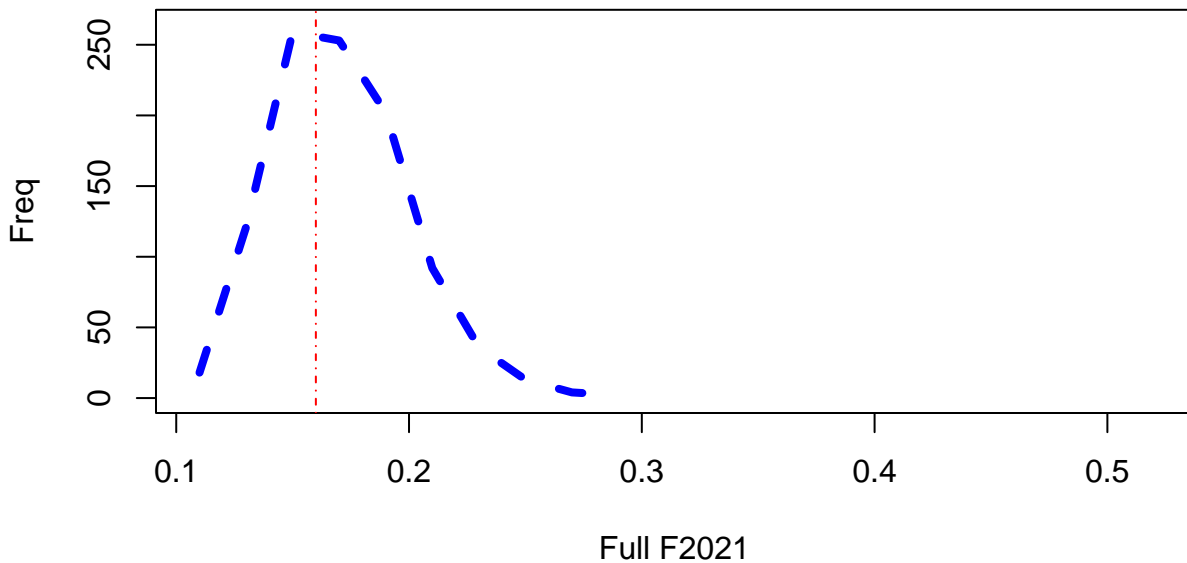
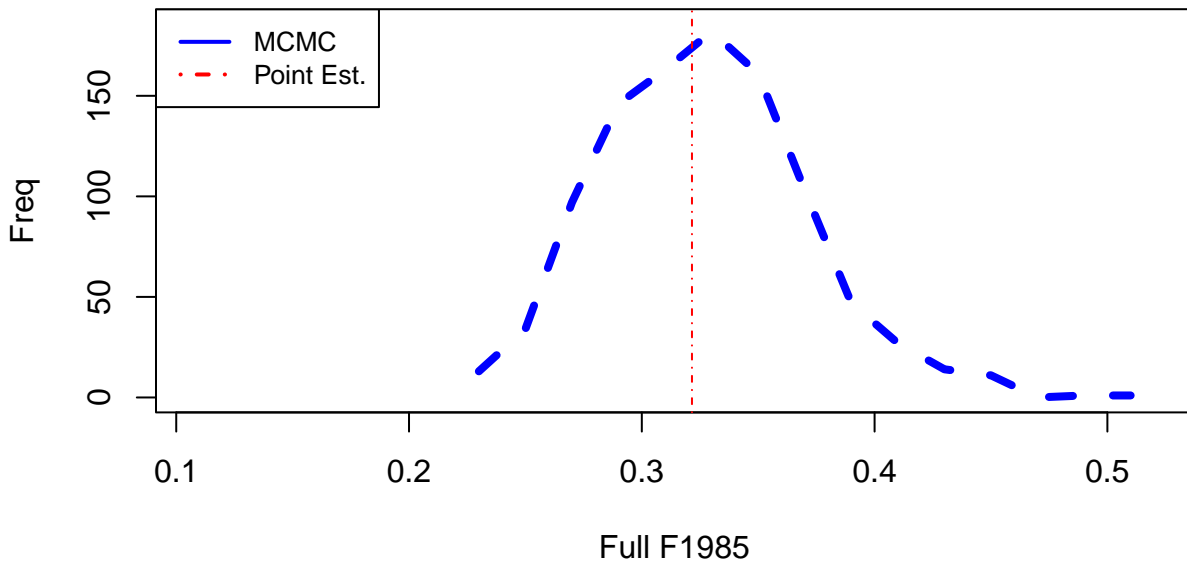
F1985**F2021****SSB1985****SSB2021**

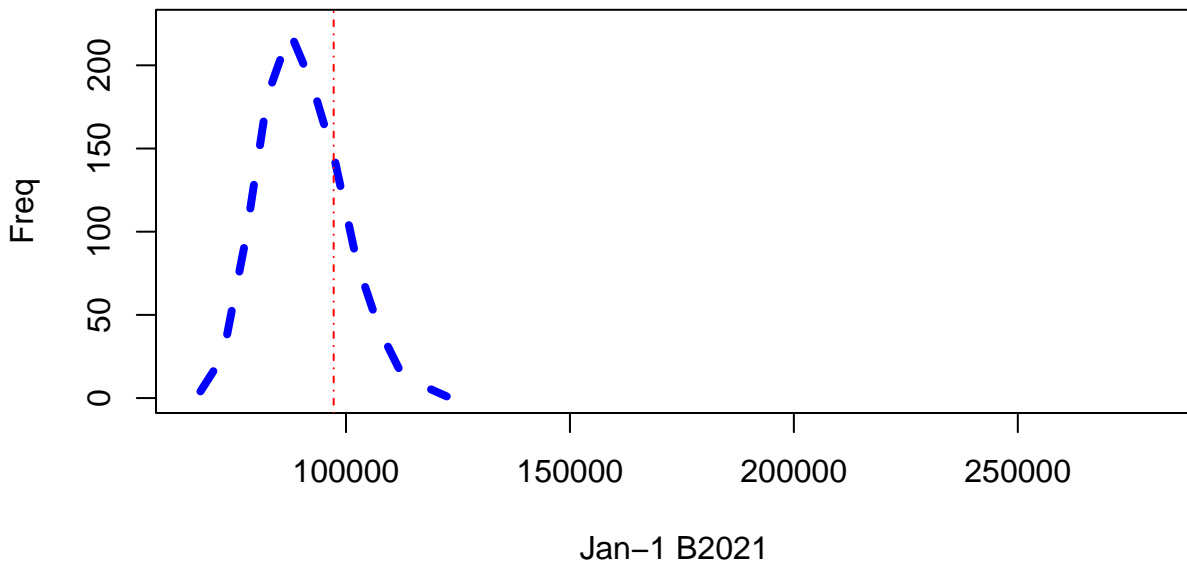
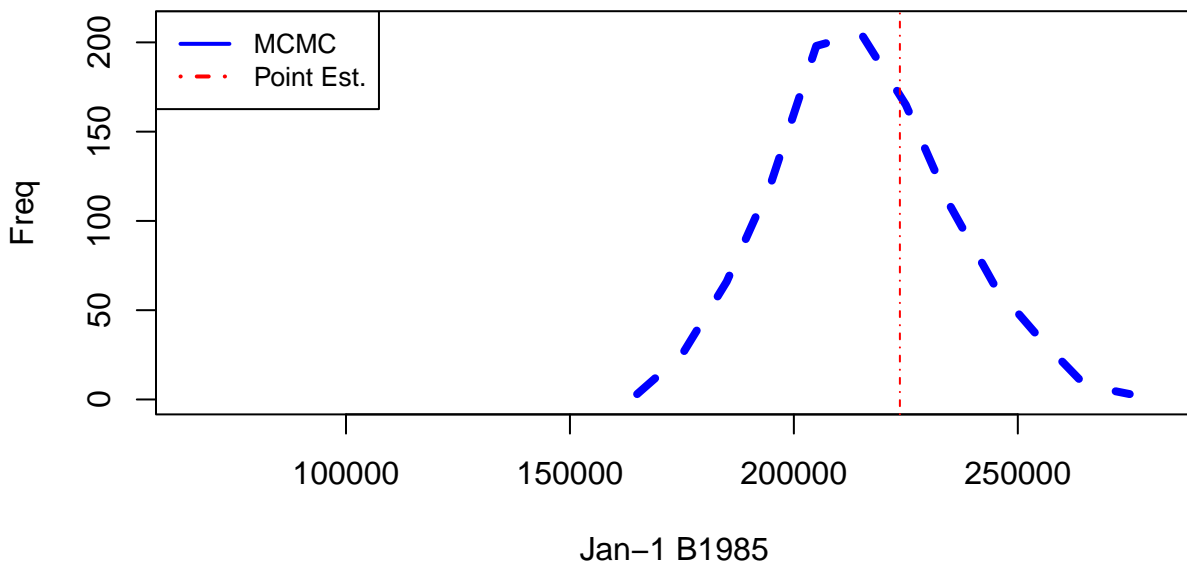


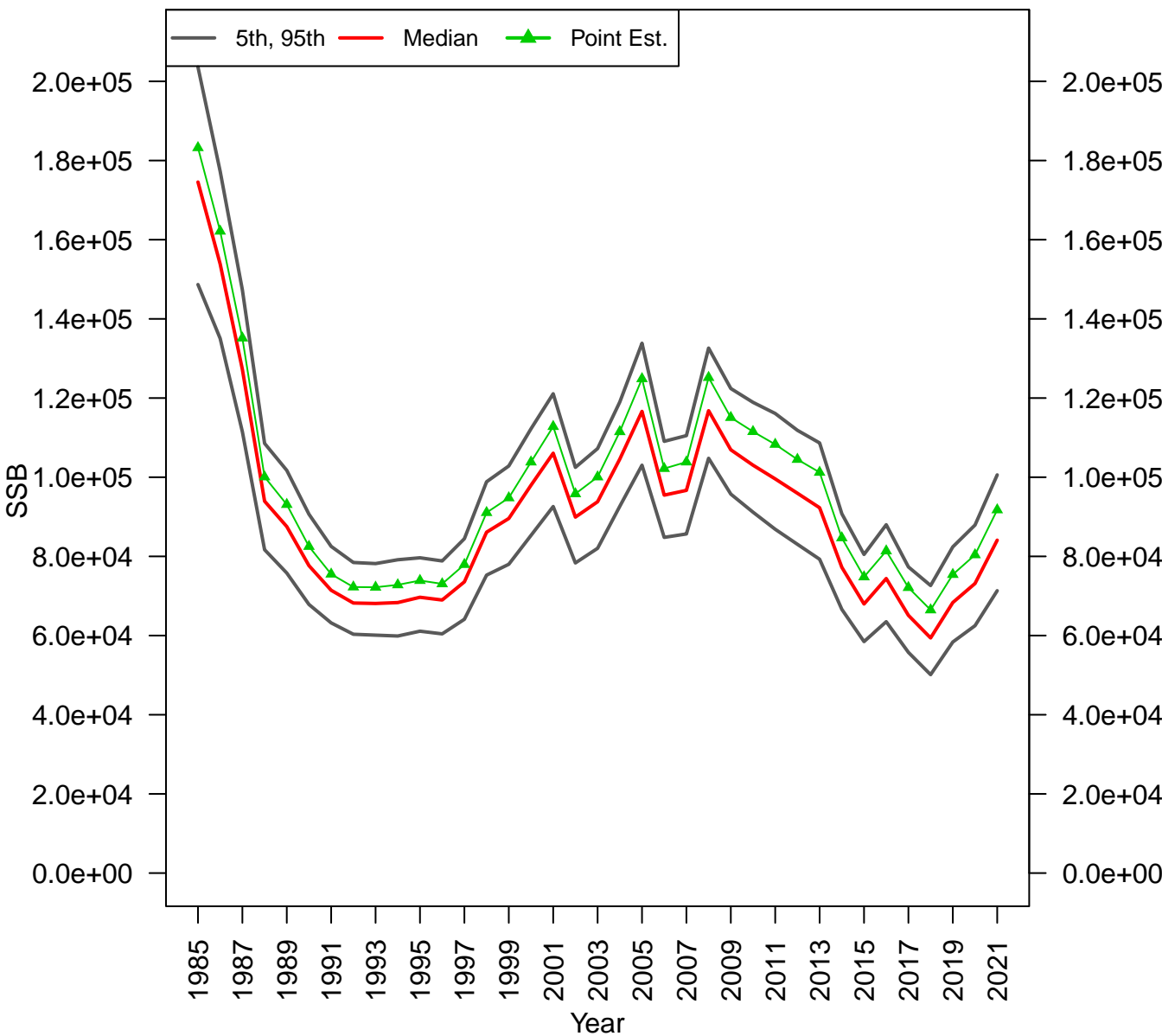


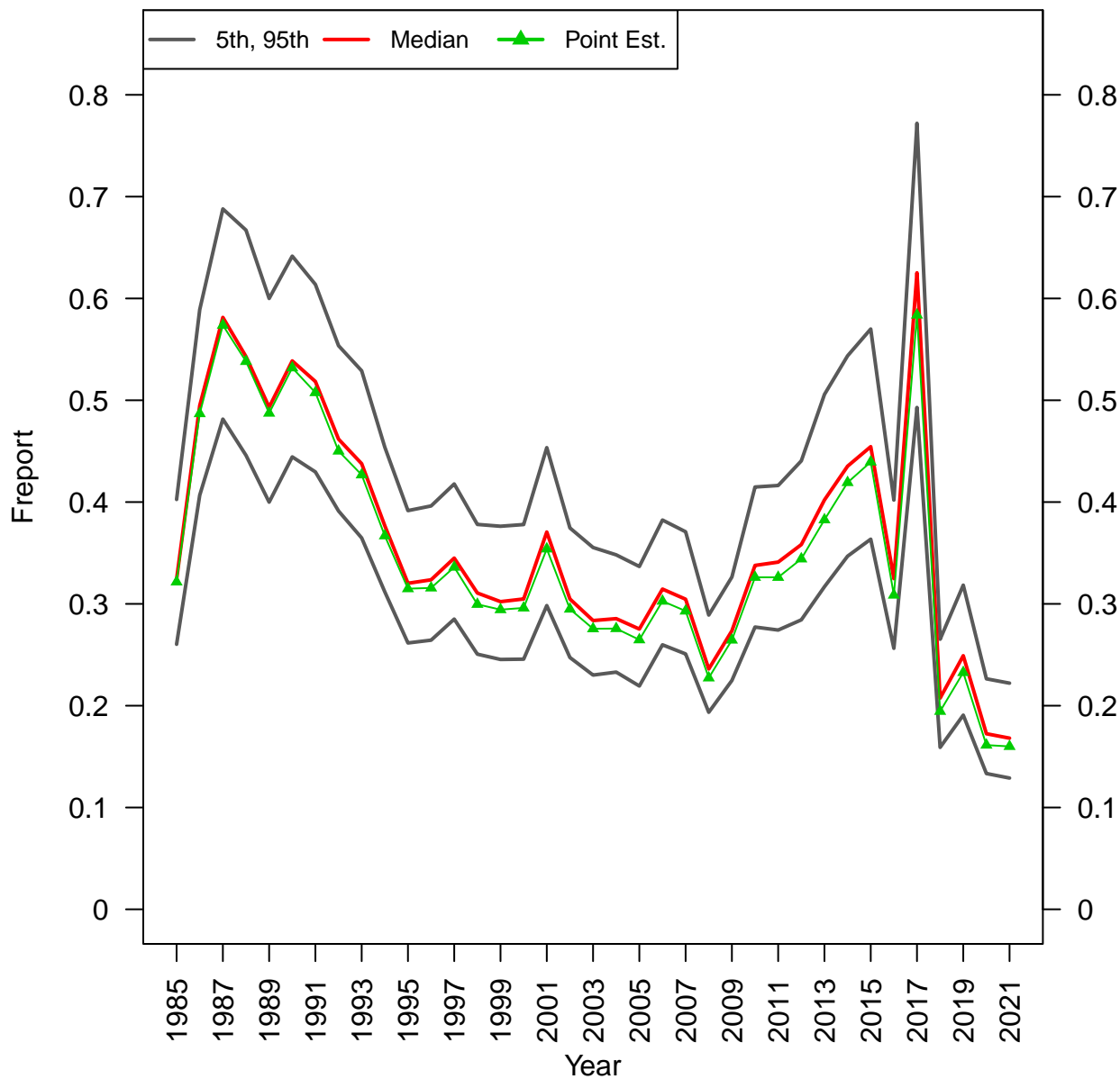


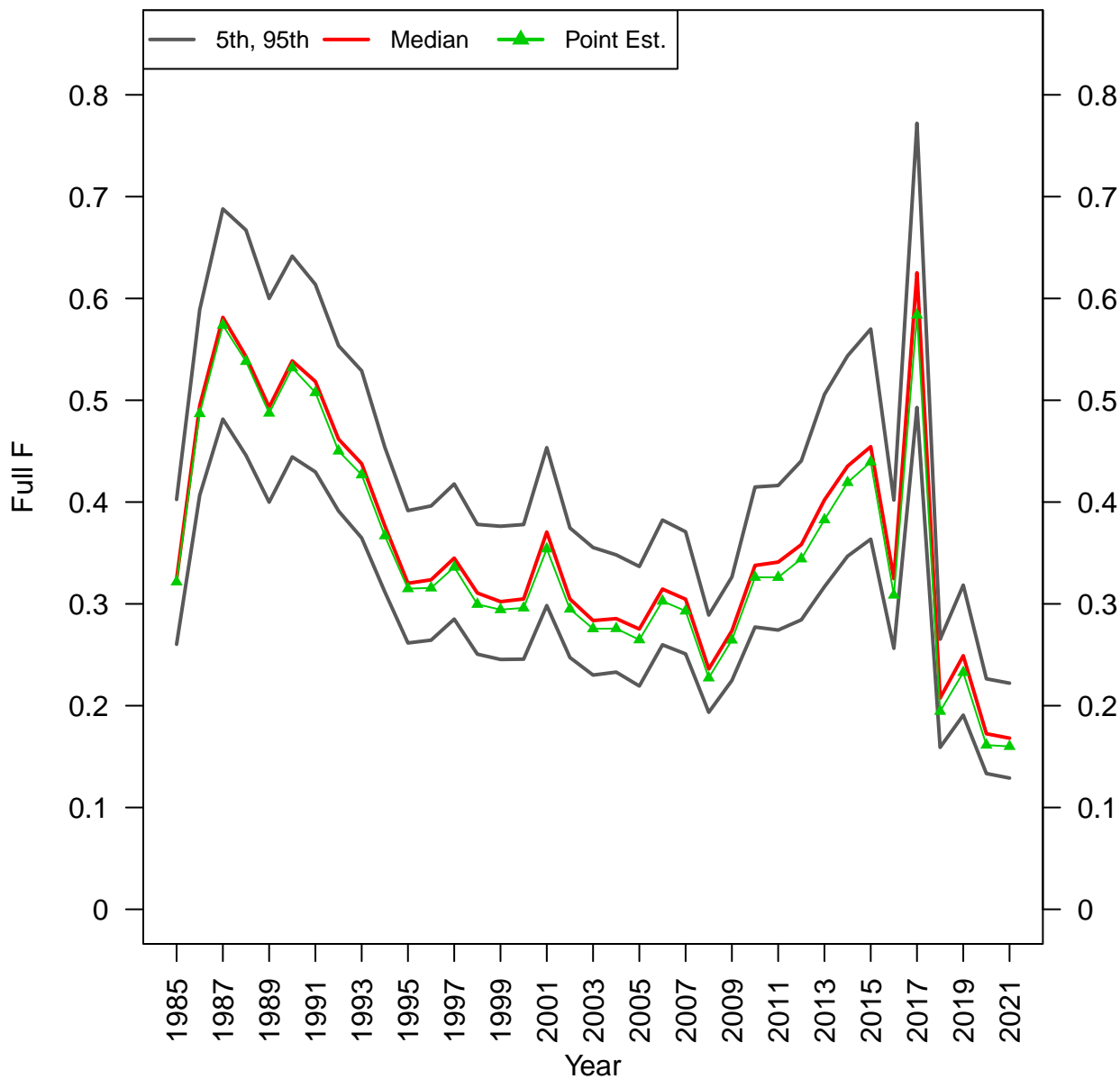


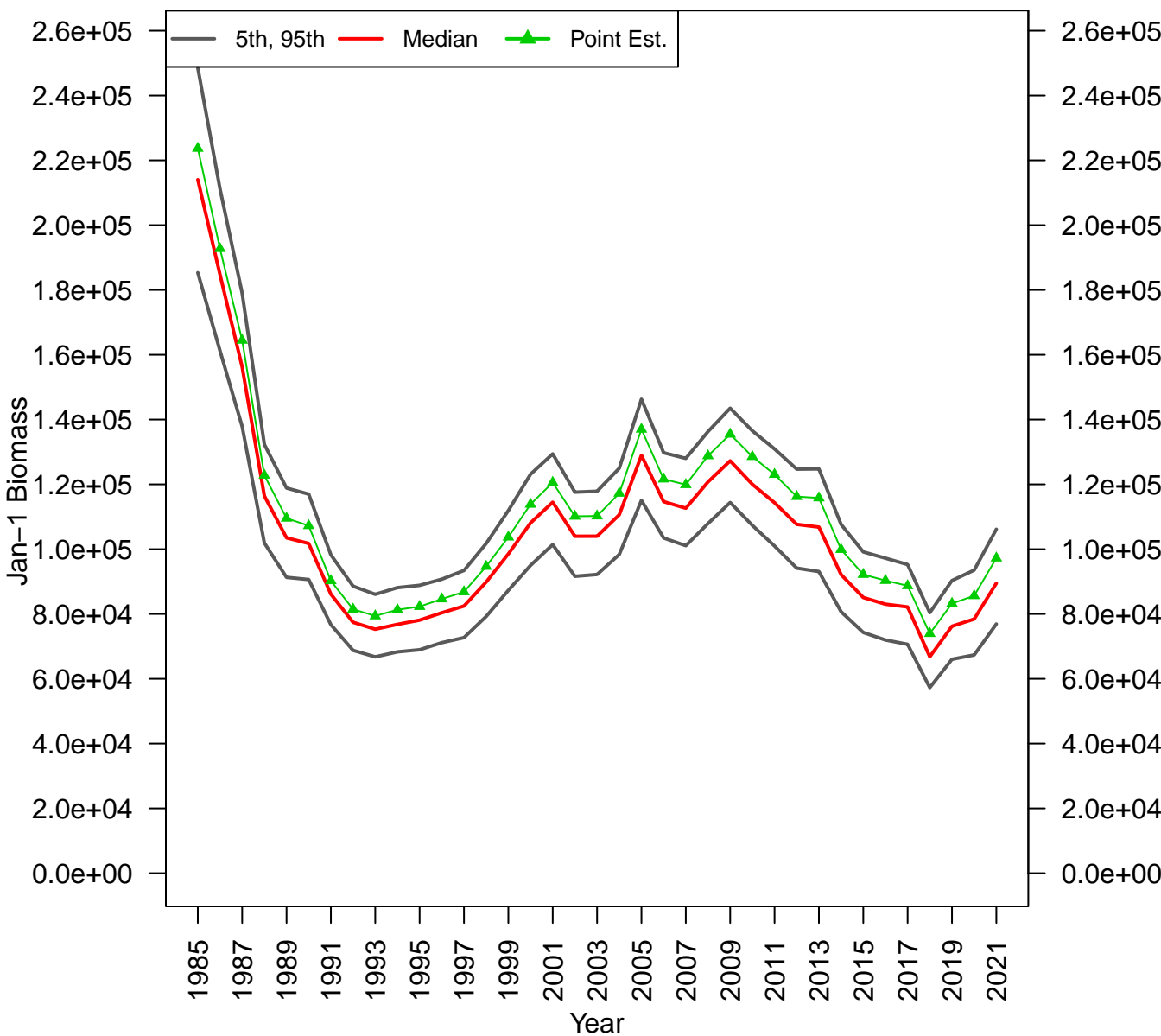








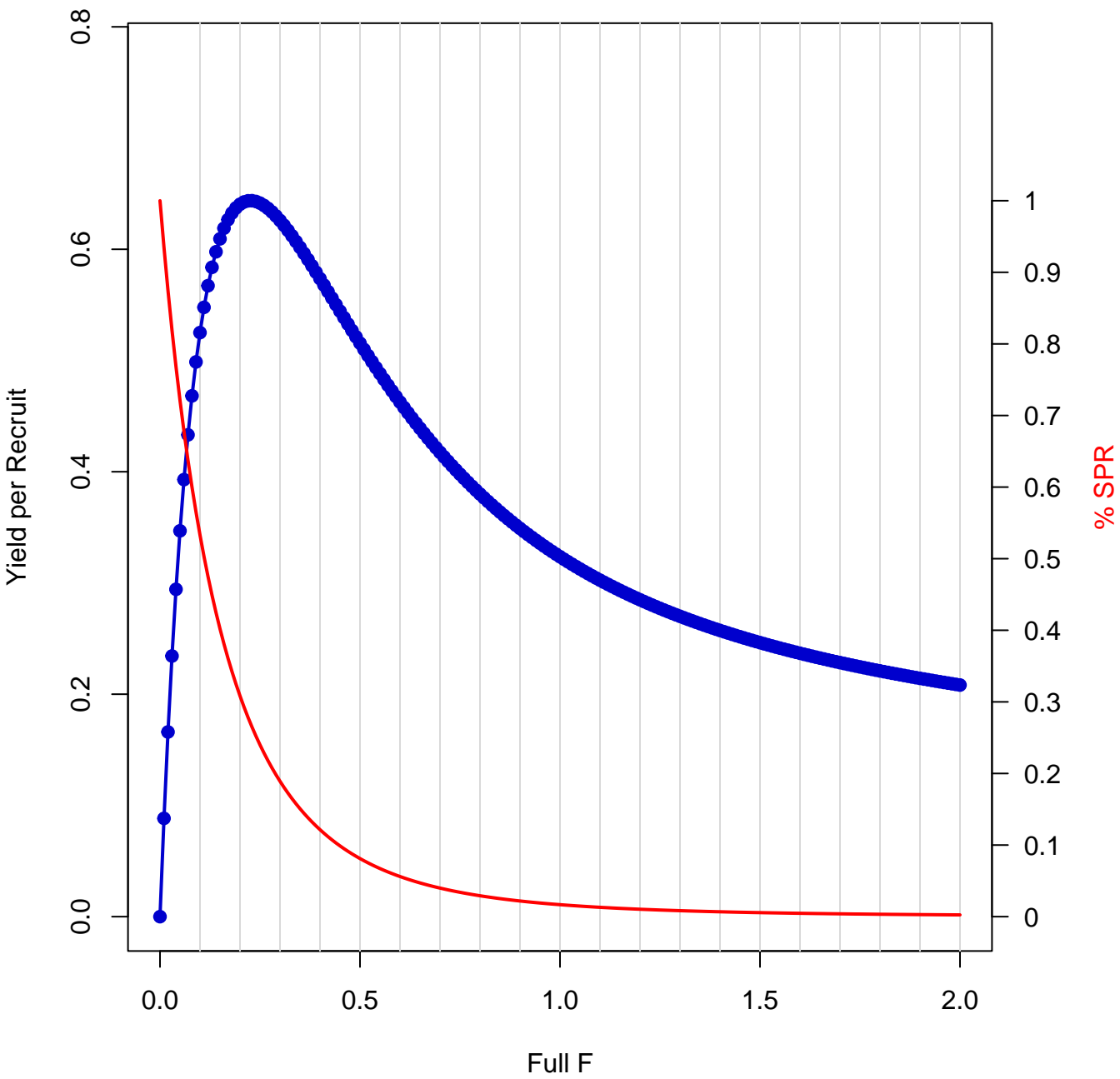




BF01: Continuity Run

REFERENCE POINT PLOTS

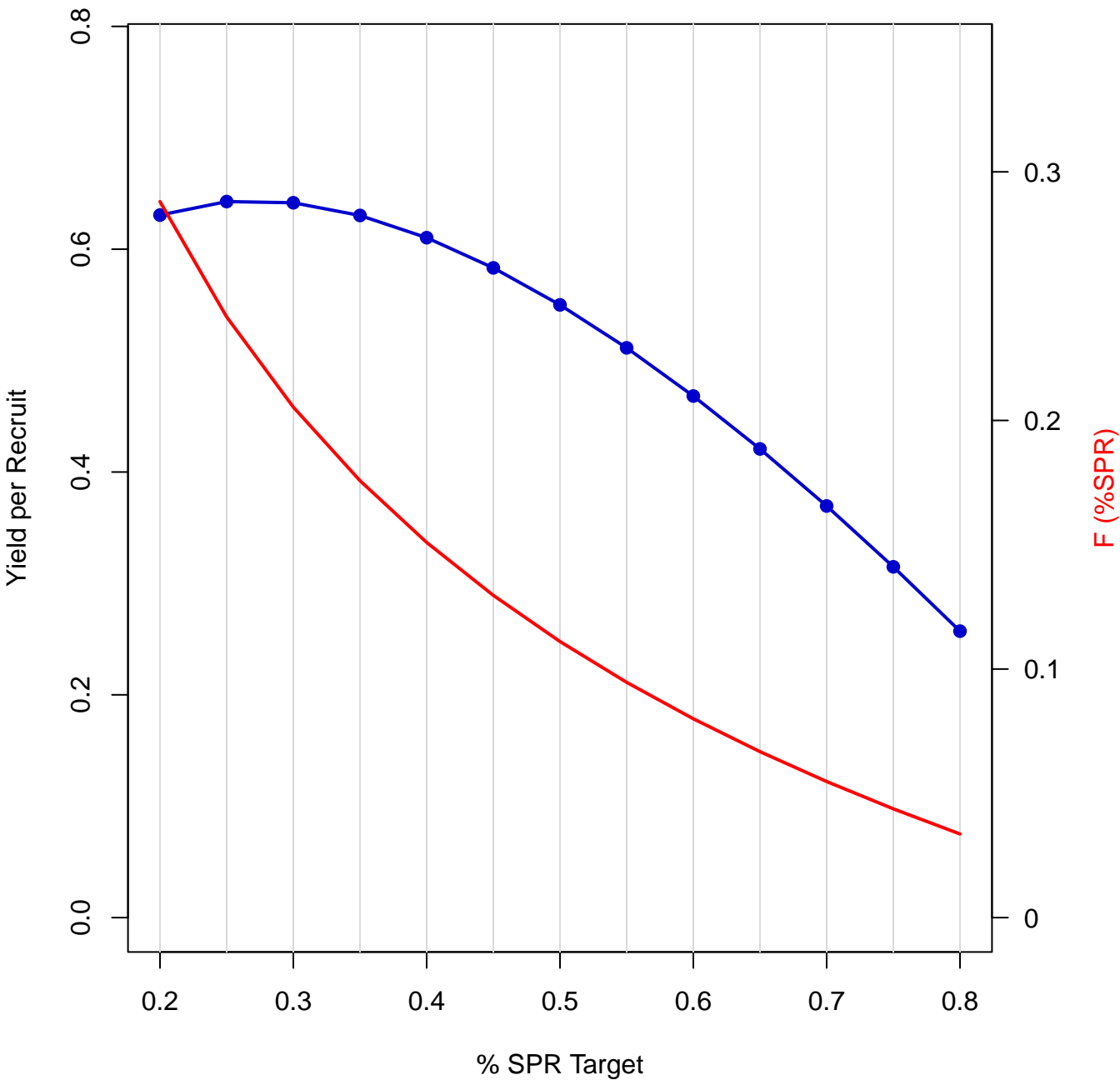
YPR-SPR Reference Points (Years Avg = 5)



YPR–SPR Reference Points (Years Avg = 5)

F	YPR	SPR	F	YPR	SPR	F	YPR	SPR
0	0	1	0.35	0.6017	0.1508	0.7	0.4174	0.0399
0.01	0.0884	0.9345	0.36	0.5963	0.1443	0.71	0.4134	0.0386
0.02	0.166	0.8744	0.37	0.5908	0.1381	0.72	0.4094	0.0374
0.03	0.2343	0.8191	0.38	0.5851	0.1323	0.73	0.4054	0.0362
0.04	0.2943	0.7681	0.39	0.5794	0.1268	0.74	0.4016	0.0351
0.05	0.3469	0.7211	0.4	0.5736	0.1215	0.75	0.3978	0.034
0.06	0.3929	0.6776	0.41	0.5678	0.1165	0.76	0.3941	0.033
0.07	0.4332	0.6373	0.42	0.5619	0.1117	0.77	0.3904	0.032
0.08	0.4682	0.5999	0.43	0.5561	0.1072	0.78	0.3869	0.031
0.09	0.4987	0.5653	0.44	0.5502	0.1029	0.79	0.3834	0.0301
0.1	0.5251	0.5331	0.45	0.5444	0.0988	0.8	0.3799	0.0292
0.11	0.5478	0.5031	0.46	0.5385	0.095	0.81	0.3766	0.0283
0.12	0.5673	0.4751	0.47	0.5327	0.0912	0.82	0.3733	0.0275
0.13	0.5838	0.4491	0.48	0.527	0.0877	0.83	0.37	0.0267
0.14	0.5977	0.4248	0.49	0.5213	0.0844	0.84	0.3668	0.0259
0.15	0.6094	0.402	0.5	0.5156	0.0811	0.85	0.3637	0.0252
0.16	0.6189	0.3808	0.51	0.51	0.0781	0.86	0.3607	0.0245
0.17	0.6266	0.3609	0.52	0.5045	0.0752	0.87	0.3577	0.0238
0.18	0.6326	0.3423	0.53	0.499	0.0724	0.88	0.3547	0.0231
0.19	0.6372	0.3248	0.54	0.4936	0.0697	0.89	0.3519	0.0225
0.2	0.6405	0.3084	0.55	0.4882	0.0672	0.9	0.349	0.0219
0.21	0.6425	0.293	0.56	0.4829	0.0648	0.91	0.3463	0.0213
0.22	0.6436	0.2785	0.57	0.4777	0.0624	0.92	0.3436	0.0207
0.23	0.6437	0.2649	0.58	0.4726	0.0602	0.93	0.3409	0.0201
0.24	0.6429	0.252	0.59	0.4676	0.0581	0.94	0.3383	0.0196
0.25	0.6415	0.24	0.6	0.4626	0.0561	0.95	0.3357	0.0191
0.26	0.6394	0.2286	0.61	0.4578	0.0541	0.96	0.3332	0.0186
0.27	0.6367	0.2179	0.62	0.453	0.0523	0.97	0.3307	0.0181
0.28	0.6335	0.2077	0.63	0.4482	0.0505	0.98	0.3283	0.0176
0.29	0.6299	0.1982	0.64	0.4436	0.0488	0.99	0.3259	0.0172
0.3	0.6259	0.1891	0.65	0.439	0.0471	1	0.3236	0.0167
0.31	0.6216	0.1806	0.66	0.4346	0.0456	1.01	0.3213	0.0163
0.32	0.617	0.1725	0.67	0.4302	0.0441	1.02	0.3191	0.0159
0.33	0.6121	0.1649	0.68	0.4258	0.0426	1.03	0.3169	0.0155
0.34	0.607	0.1577	0.69	0.4216	0.0412	1.04	0.3147	0.0151

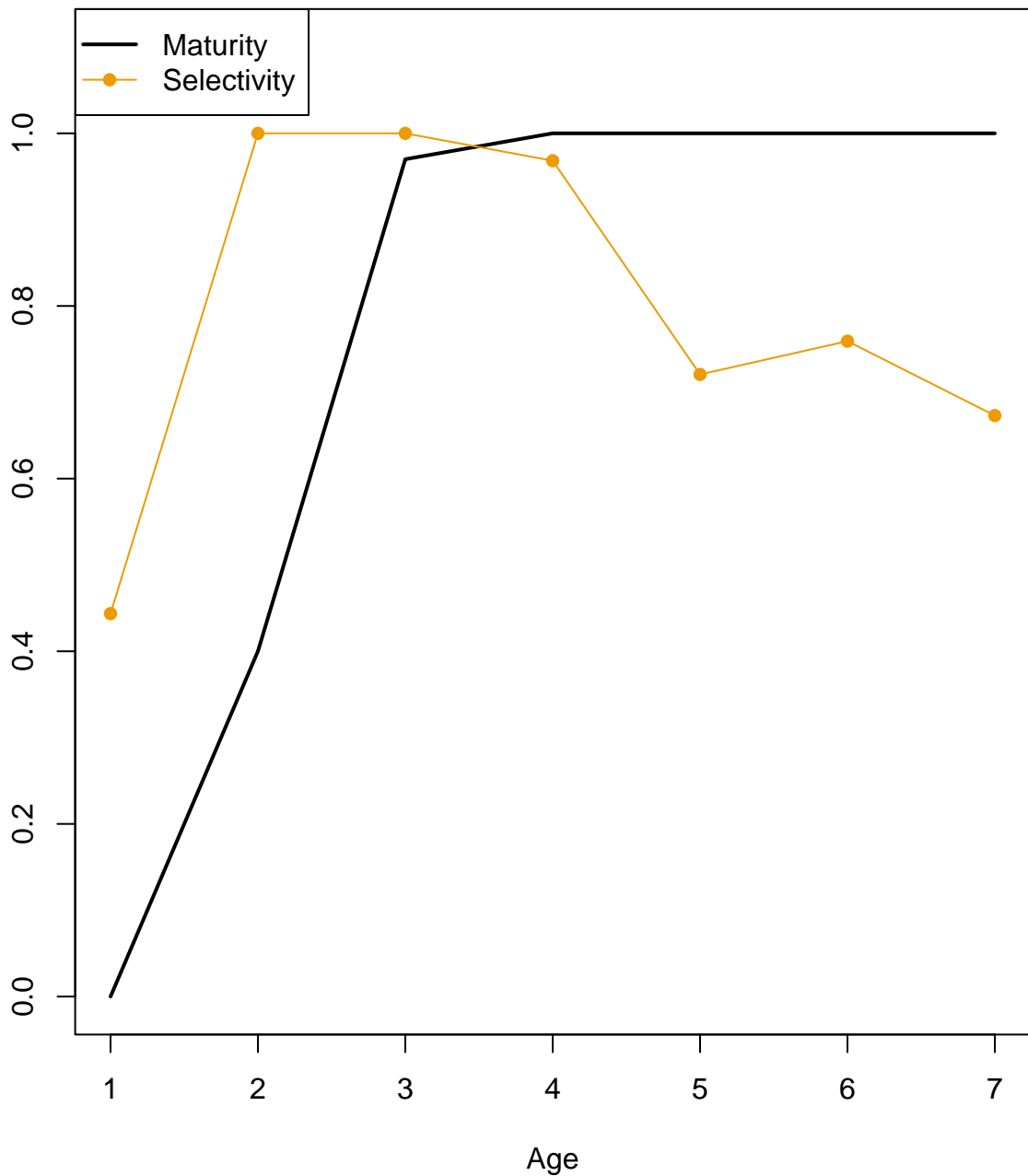
SPR Target Reference Points (Years Avg = 5)



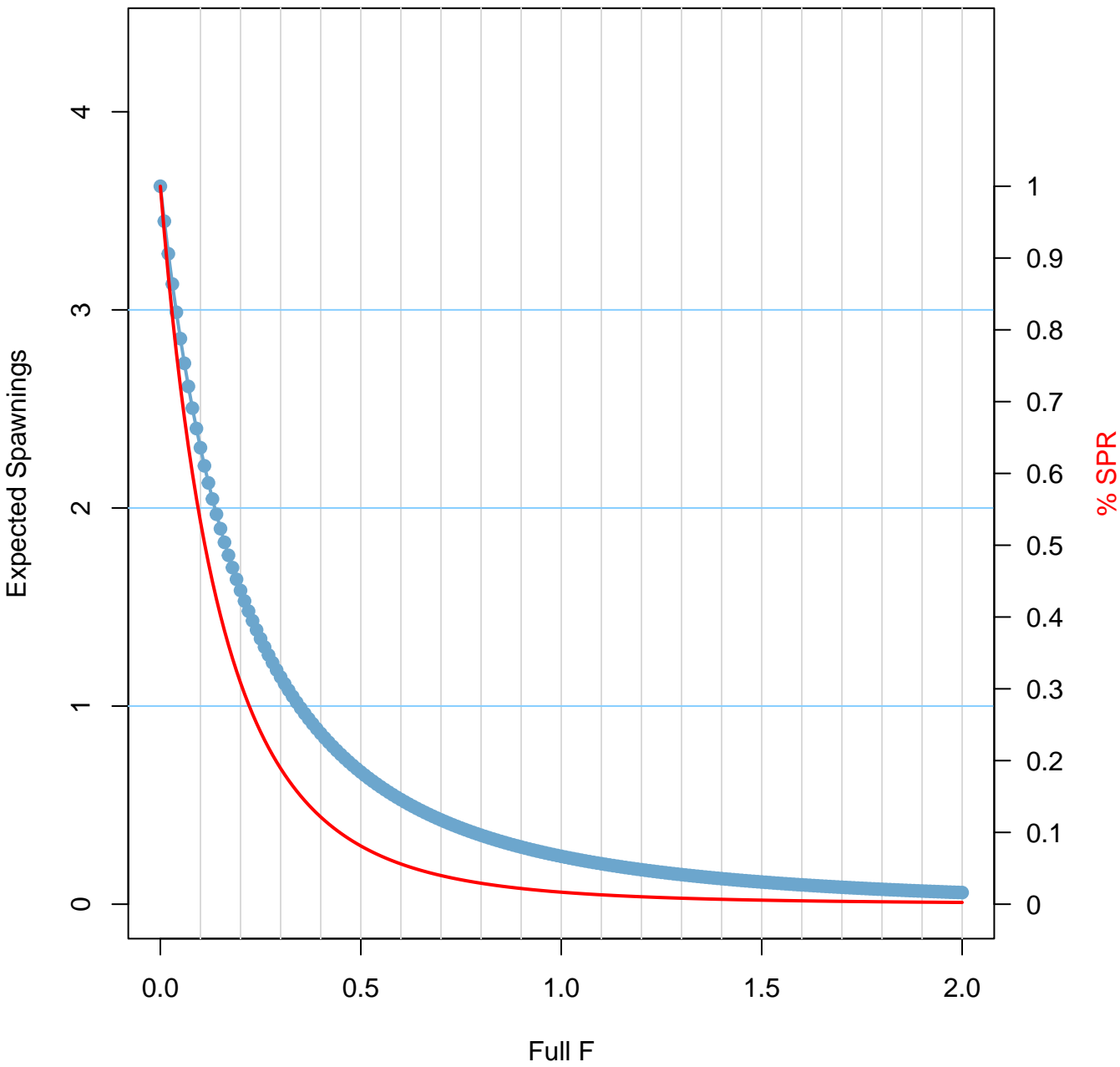
SPR Target Reference Points (Years Avg = 5)

% SPR	F(%SPR)	YPR
0.2	0.288	0.6307
0.25	0.2416	0.6427
0.3	0.2054	0.6417
0.35	0.1758	0.6303
0.4	0.1509	0.6103
0.45	0.1296	0.5832
0.5	0.1111	0.55
0.55	0.0947	0.5115
0.6	0.08	0.4682
0.65	0.0668	0.4207
0.7	0.0547	0.3695
0.75	0.0438	0.3149
0.8	0.0337	0.2571

Selectivity or Maturity at age



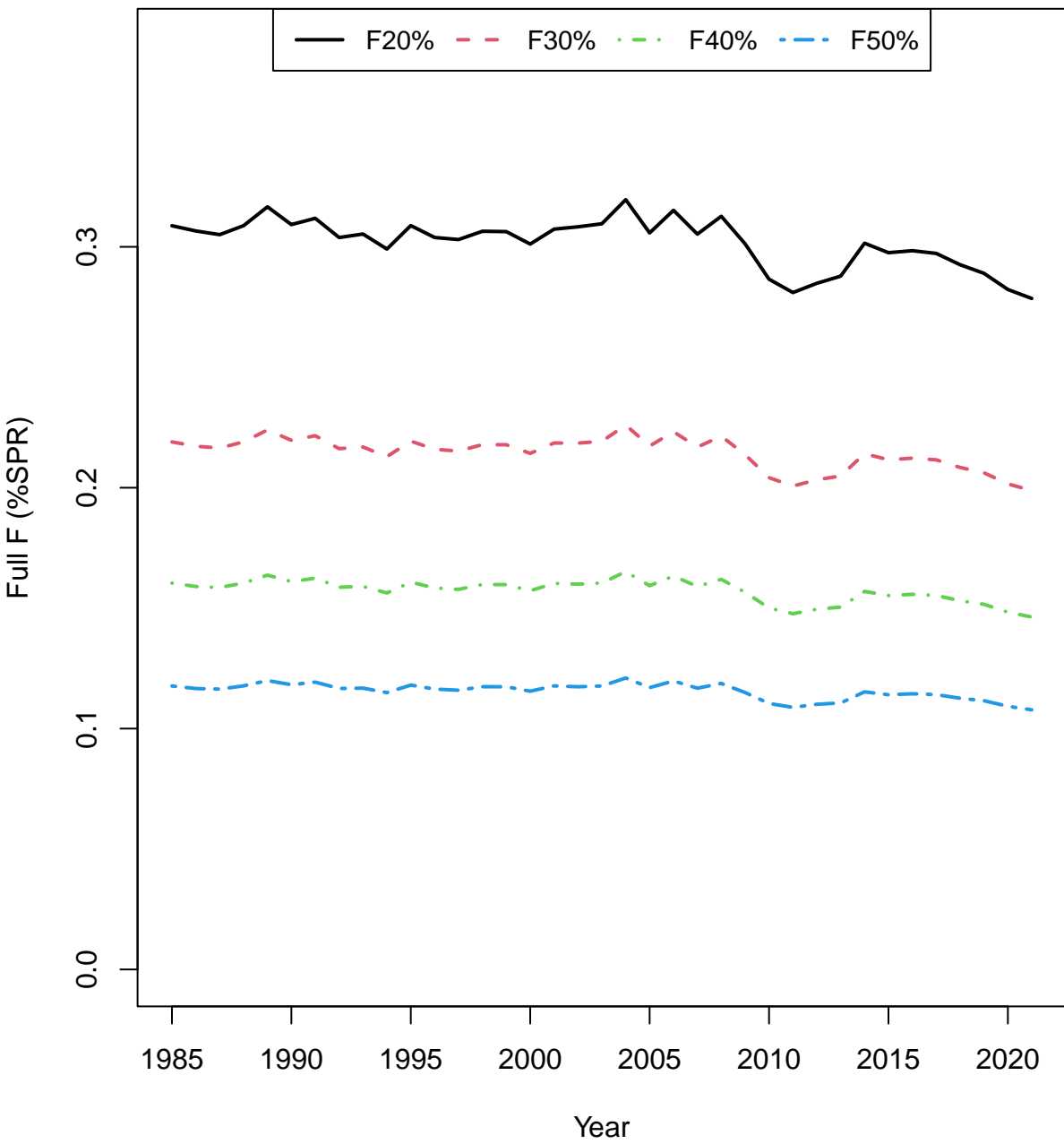
Expected Spawns and SPR Reference Points (Years Avg = 5)



Expected Spawnings & SPR Reference Points (Years Avg = 5)

F	E[Sp]	SPR	F	E[Sp]	SPR	F	E[Sp]	SPR
0	3.6242	1	0.35	0.9902	0.1508	0.7	0.4254	0.0399
0.01	3.4474	0.9345	0.36	0.9625	0.1443	0.71	0.4167	0.0386
0.02	3.2833	0.8744	0.37	0.9359	0.1381	0.72	0.4083	0.0374
0.03	3.1305	0.8191	0.38	0.9104	0.1323	0.73	0.4	0.0362
0.04	2.988	0.7681	0.39	0.8857	0.1268	0.74	0.392	0.0351
0.05	2.8549	0.7211	0.4	0.8621	0.1215	0.75	0.3842	0.034
0.06	2.7303	0.6776	0.41	0.8392	0.1165	0.76	0.3766	0.033
0.07	2.6136	0.6373	0.42	0.8172	0.1117	0.77	0.3692	0.032
0.08	2.5041	0.5999	0.43	0.796	0.1072	0.78	0.362	0.031
0.09	2.4011	0.5653	0.44	0.7756	0.1029	0.79	0.355	0.0301
0.1	2.3042	0.5331	0.45	0.7559	0.0988	0.8	0.3481	0.0292
0.11	2.2129	0.5031	0.46	0.7368	0.095	0.81	0.3415	0.0283
0.12	2.1267	0.4751	0.47	0.7184	0.0912	0.82	0.335	0.0275
0.13	2.0454	0.4491	0.48	0.7007	0.0877	0.83	0.3286	0.0267
0.14	1.9684	0.4248	0.49	0.6835	0.0844	0.84	0.3225	0.0259
0.15	1.8956	0.402	0.5	0.667	0.0811	0.85	0.3165	0.0252
0.16	1.8265	0.3808	0.51	0.6509	0.0781	0.86	0.3106	0.0245
0.17	1.7611	0.3609	0.52	0.6354	0.0752	0.87	0.3049	0.0238
0.18	1.6989	0.3423	0.53	0.6204	0.0724	0.88	0.2993	0.0231
0.19	1.6399	0.3248	0.54	0.6059	0.0697	0.89	0.2938	0.0225
0.2	1.5837	0.3084	0.55	0.5918	0.0672	0.9	0.2885	0.0219
0.21	1.5302	0.293	0.56	0.5782	0.0648	0.91	0.2833	0.0213
0.22	1.4793	0.2785	0.57	0.565	0.0624	0.92	0.2782	0.0207
0.23	1.4308	0.2649	0.58	0.5522	0.0602	0.93	0.2733	0.0201
0.24	1.3845	0.252	0.59	0.5398	0.0581	0.94	0.2684	0.0196
0.25	1.3403	0.24	0.6	0.5278	0.0561	0.95	0.2637	0.0191
0.26	1.298	0.2286	0.61	0.5162	0.0541	0.96	0.2591	0.0186
0.27	1.2576	0.2179	0.62	0.5049	0.0523	0.97	0.2546	0.0181
0.28	1.219	0.2077	0.63	0.4939	0.0505	0.98	0.2502	0.0176
0.29	1.182	0.1982	0.64	0.4832	0.0488	0.99	0.2459	0.0172
0.3	1.1466	0.1891	0.65	0.4729	0.0471	1	0.2417	0.0167
0.31	1.1127	0.1806	0.66	0.4629	0.0456	1.01	0.2375	0.0163
0.32	1.0802	0.1725	0.67	0.4531	0.0441	1.02	0.2335	0.0159
0.33	1.0489	0.1649	0.68	0.4436	0.0426	1.03	0.2296	0.0155
0.34	1.019	0.1577	0.69	0.4344	0.0412	1.04	0.2257	0.0151

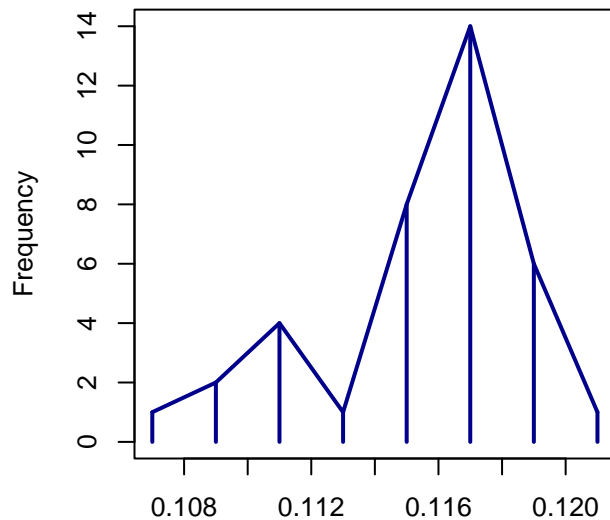
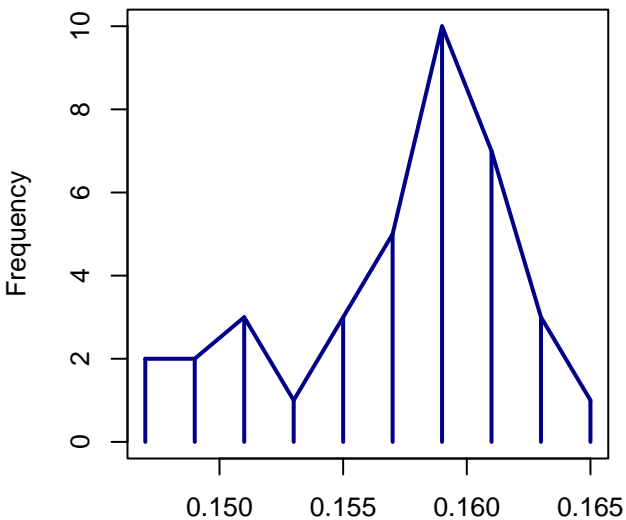
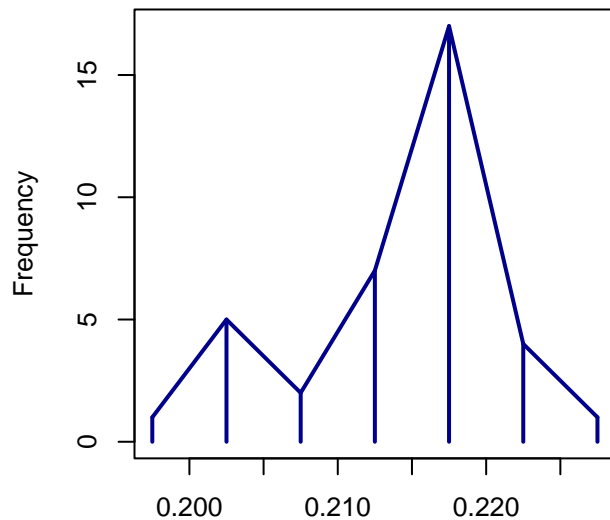
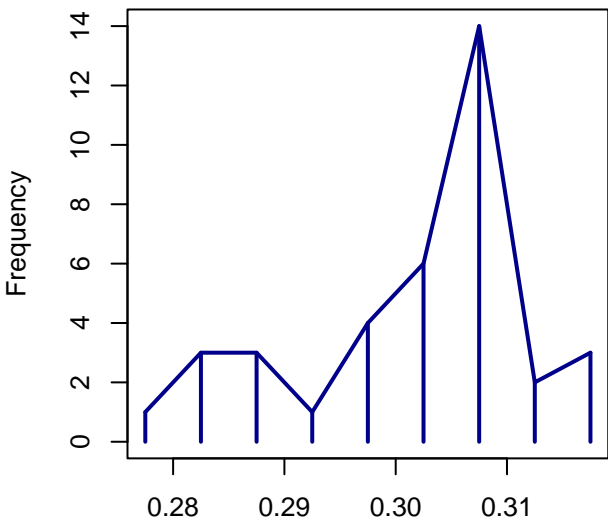
Annual F(%SPR) Reference Points



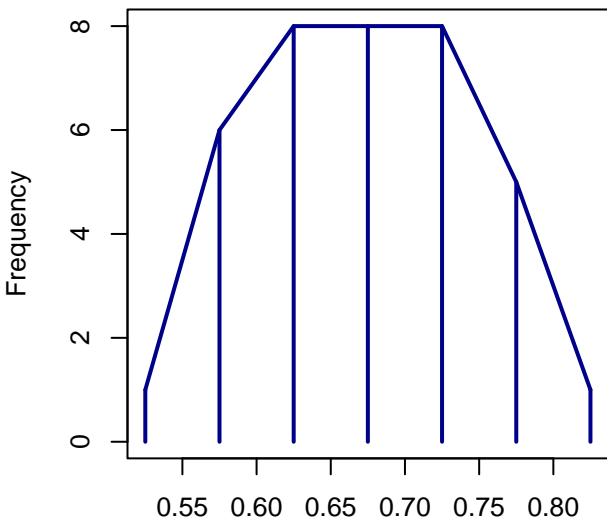
Annual YPR(%SPR) Reference Points



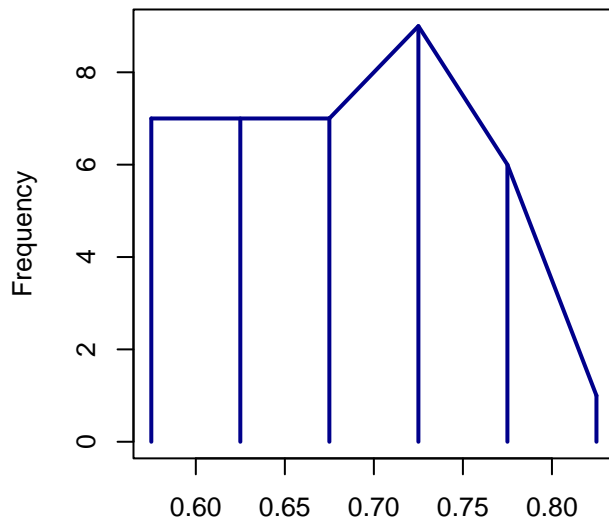
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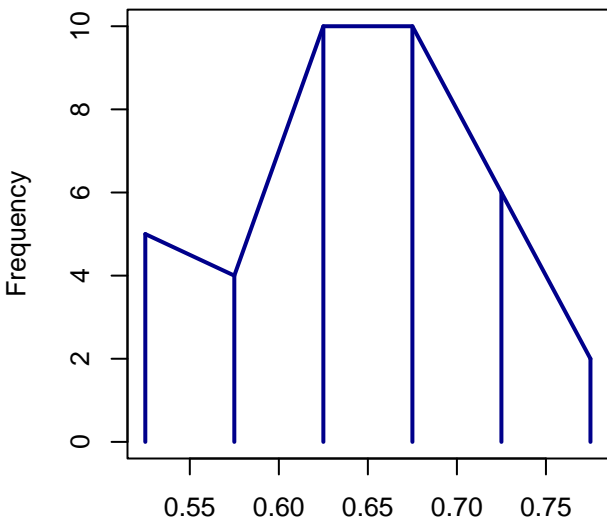
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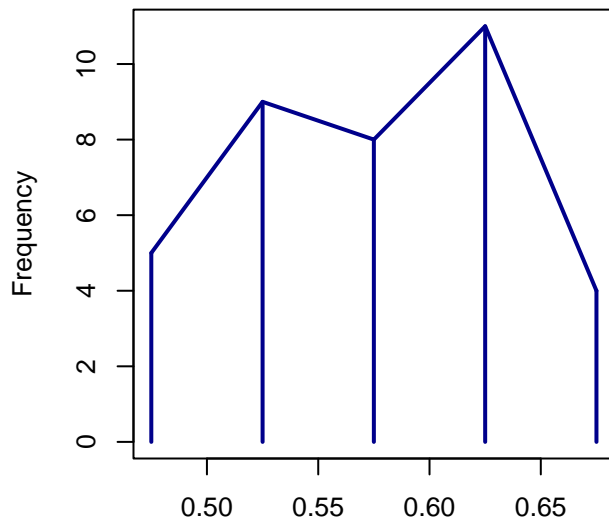
YPR(20%)



YPR(30%)



YPR(40%)



YPR(50%)