

# SardineMSE\_SupplInfo

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## Evaluating robustness of harvest control rules to climate-driven variability in Pacific sardine recruitment

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**Supplementary Information: Tables and Figures**

## Operating model behavior

### Stock Synthesis model parameterization

Fit of OM to historical acoustic-trawl index and comparison of age 1+ biomass timeseries by semester with Kuriyama et al. 2020 assessment.

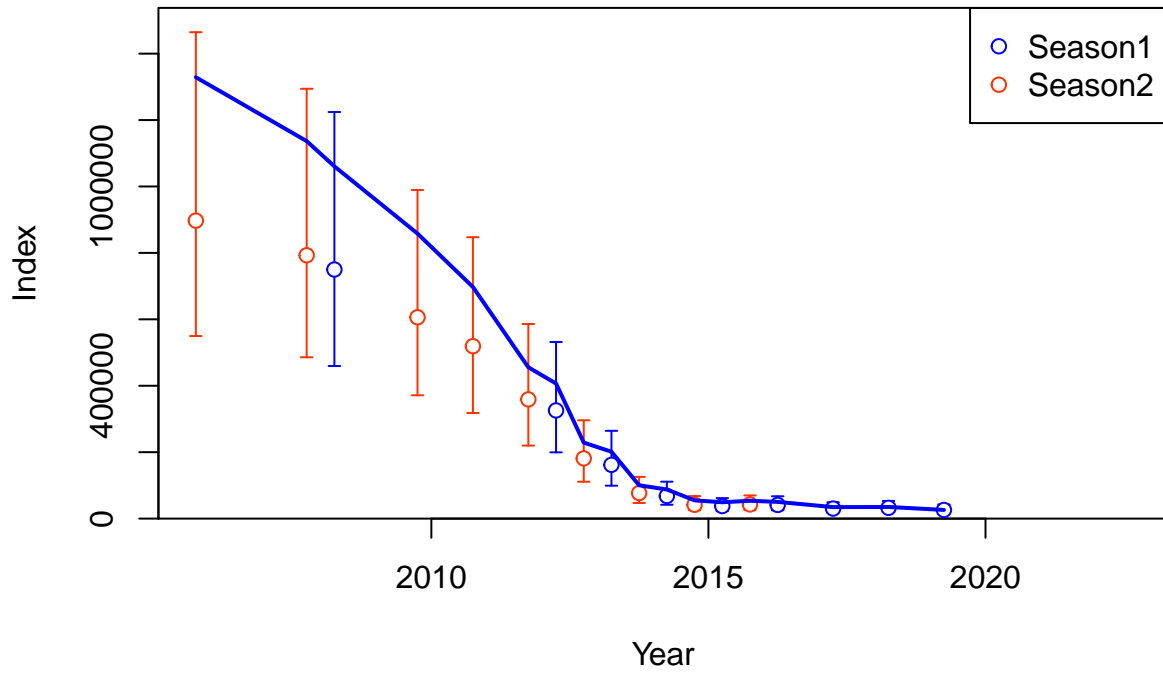


Figure S1: Fit of OM Stock Synthesis model (solid line) to acoustic-trawl survey data in calibration period.



Figure S2: Age 1+ biomass in the calibration period for the OM compared to estimated biomass from the Kuriyama et al. (2020) stock assessment for each semester (S1: left, S2: right).

Table S1: Model parameters defined for OM and EM Stock Synthesis models, including phase estimation settings for the EM.

Label	OM_Value	EM_Value	EM_Phase
NatM_uniform_Fem_GP_1	0.585	0.585	-2
L_at_Amin_Fem_GP_1	13.174	12.987	3
L_at_Amax_Fem_GP_1	25.153	24.427	3
VonBert_K_Fem_GP_1	0.273	0.307	3
CV_young_Fem_GP_1	0.119	0.110	3
CV_old_Fem_GP_1	0.026	0.039	3
Wtlen_1_Fem_GP_1	0.000	0.000	-3
Wtlen_2_Fem_GP_1	3.233	3.233	-3
Mat50%_Fem_GP_1	15.440	15.440	-3
Mat_slope_Fem_GP_1	-0.893	-0.893	-3
Eggs/kg_inter_Fem_GP_1	1.000	1.000	-3
Eggs/kg_slope_wt_Fem_GP_1	0.000	0.000	-3
CohortGrowDev	1.000	1.000	-1
FracFemale_GP_1	0.500	0.500	-99
SR_LN(R0)	14.933	14.322	1
SR_BH_steep	0.600	0.600	-5
SR_sigmaR	1.250	1.250	-3
SR_regime	0.000	0.000	-1
SR_autocorr	0.000	0.000	-3
SR_regime_BLK1repl_2000	0.654	NA	NA
Early_InitAge_7	-0.637	NA	NA
Early_InitAge_6	1.057	-2.470	2
Early_InitAge_5	1.112	-2.340	2
Early_InitAge_4	1.550	-1.454	2
Early_InitAge_3	1.041	-1.423	2
Early_InitAge_2	-0.719	0.903	2
Main_InitAge_1	-0.263	NA	NA
Main_RecrDev_2001	-0.701	NA	NA
Main_RecrDev_2002	2.860	NA	NA
Main_RecrDev_2003	2.119	NA	NA
Main_RecrDev_2004	2.713	NA	NA
Main_RecrDev_2005	1.594	2.166	1
Main_RecrDev_2006	1.946	2.490	1
Main_RecrDev_2007	0.896	1.296	1
Main_RecrDev_2008	1.965	2.604	1
Main_RecrDev_2009	1.014	1.812	1
Main_RecrDev_2010	-1.476	-0.760	1
Main_RecrDev_2011	-3.757	-2.796	1
Main_RecrDev_2012	-3.149	-2.414	1
Main_RecrDev_2013	-1.417	-0.935	1
Main_RecrDev_2014	-0.220	0.242	1
Main_RecrDev_2015	-1.569	-1.095	1
Main_RecrDev_2016	-0.077	0.240	1
Main_RecrDev_2017	-0.379	-0.342	1
Main_RecrDev_2018	-2.321	-2.655	1
Main_RecrDev_2019	0.221	0.148	1
ForeRecr_2020	0.000	0.000	5
LnQ_base_AT_Survey(4)	0.000	0.000	-2

LnQ_base_DEPM(5)	-1.830	-1.830	-2
LnQ_base_TEP_all(6)	-0.590	-0.590	-2
Size_inflection_MexCal_S1(1)	9.909	9.824	3
Size_95%width_MexCal_S1(1)	0.441	0.680	3
AgeSel_P1_MexCal_S1(1)	0.999	0.999	-3
AgeSel_P2_MexCal_S1(1)	2.687	2.687	-3
AgeSel_P3_MexCal_S1(1)	0.627	0.627	-3
AgeSel_P4_MexCal_S1(1)	-1.533	-1.533	-3
AgeSel_P5_MexCal_S1(1)	-0.485	-0.485	-3
AgeSel_P6_MexCal_S1(1)	-0.843	-0.843	-3
AgeSel_P7_MexCal_S1(1)	-0.494	-0.494	-3
AgeSel_P8_MexCal_S1(1)	-0.047	-0.047	-3
AgeSel_P9_MexCal_S1(1)	-0.713	-0.713	-3
AgeSel_P1_MexCal_S2(2)	2.000	2.000	-3
AgeSel_P2_MexCal_S2(2)	0.529	0.529	-3
AgeSel_P3_MexCal_S2(2)	-0.846	-0.846	-3
AgeSel_P4_MexCal_S2(2)	-0.704	-0.704	-3
AgeSel_P5_MexCal_S2(2)	-0.801	-0.801	-3
AgeSel_P6_MexCal_S2(2)	-0.500	-0.500	-3
AgeSel_P7_MexCal_S2(2)	-0.500	-0.500	-3
AgeSel_P8_MexCal_S2(2)	-0.500	-0.500	-3
AgeSel_P9_MexCal_S2(2)	-0.500	-0.500	-3
Age_inflection_PNW(3)	3.348	3.348	-4
Age_95%width_PNW(3)	1.344	1.344	-4
AgeSel_P1_AT_Survey(4)	0.000	0.000	-3
AgeSel_P2_AT_Survey(4)	0.000	0.000	-4
SR_regime_BLK1repl_2004	NA	2.398	4
Early_InitAge_1	NA	0.301	2

**Timeseries of derived quantities for each scenario**

Biomass

Recruitment

Catch

Unfished biomass (B0)

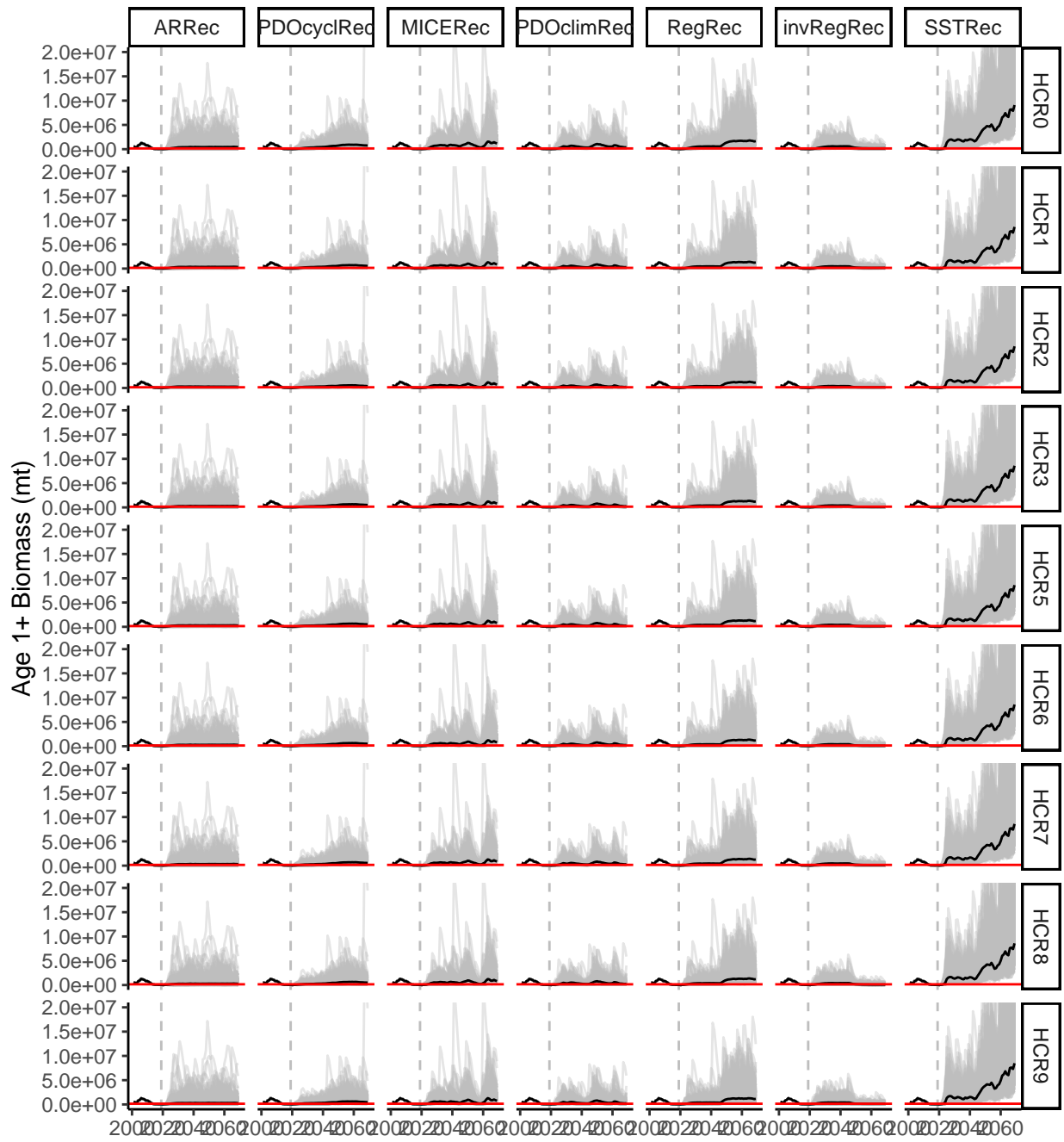


Figure S3: Median (solid line) and individual trajectories (grey lines) under a No Catch (HCR0) management rule for each recruitment scenario.

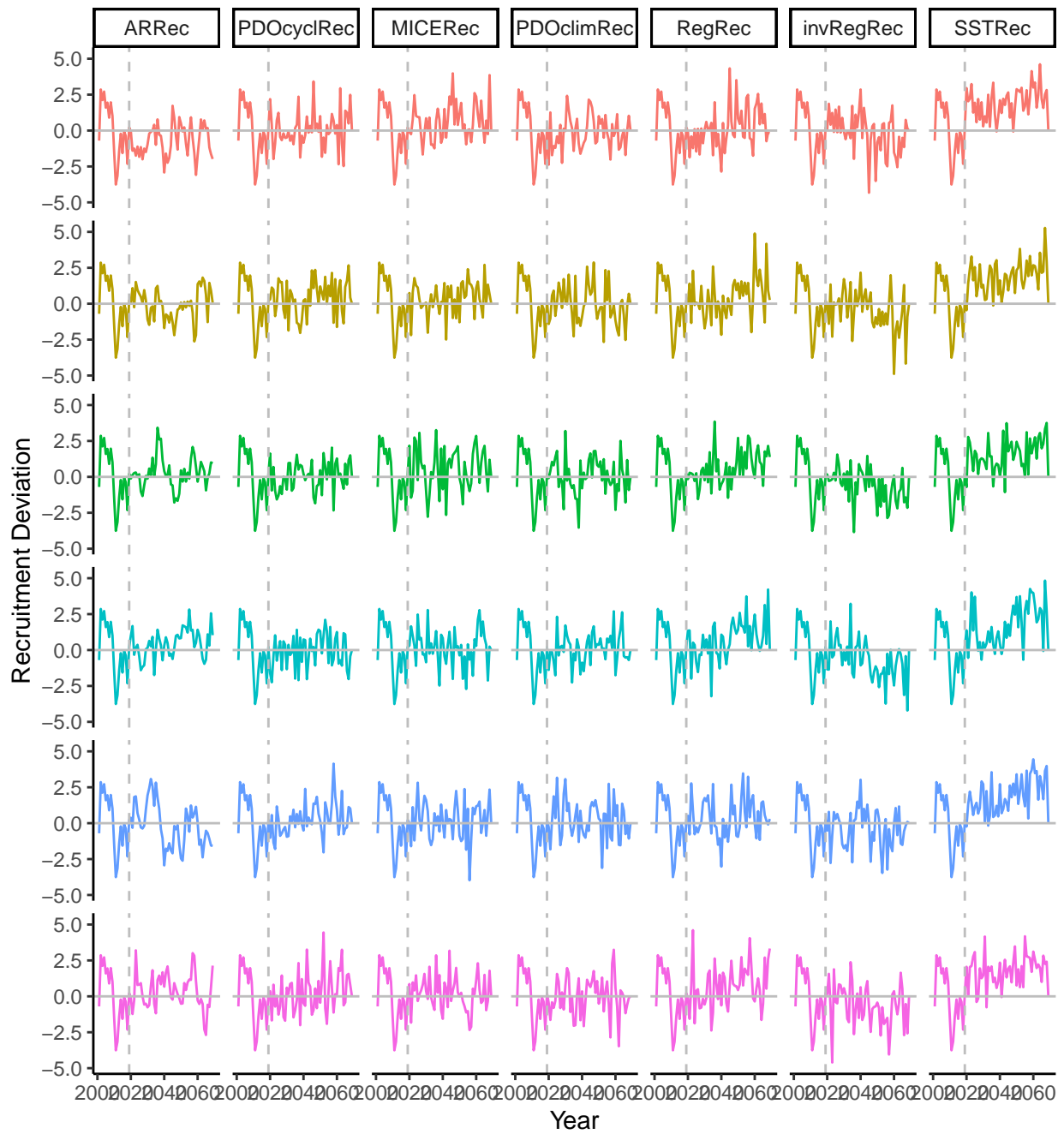


Figure S4: Six individual trajectories under a No Catch (HCR0) management rule for each recruitment scenario.



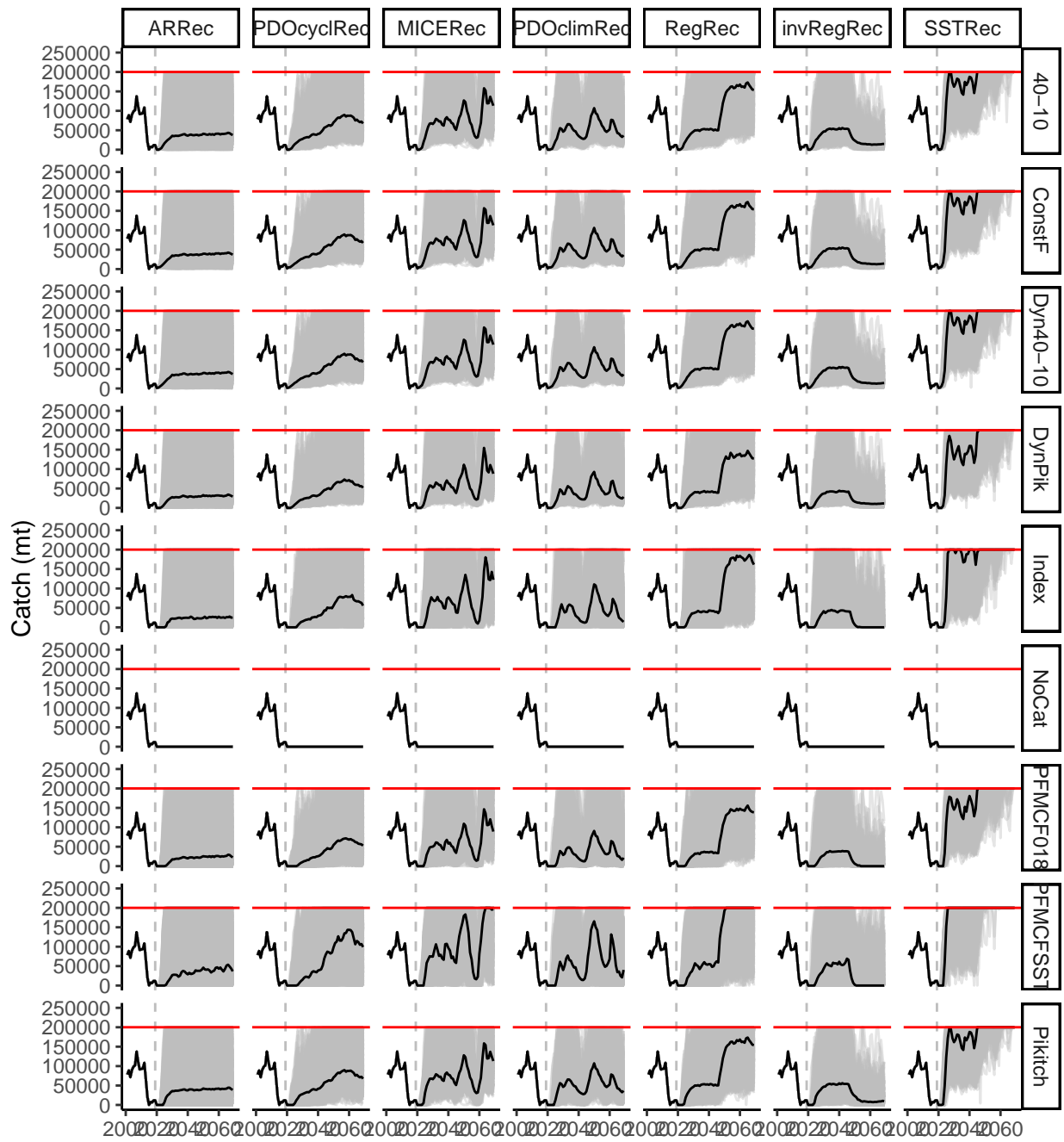


Figure S5: Median (solid line) and individual trajectories (grey lines) under each HCR for each recruitment scenario.

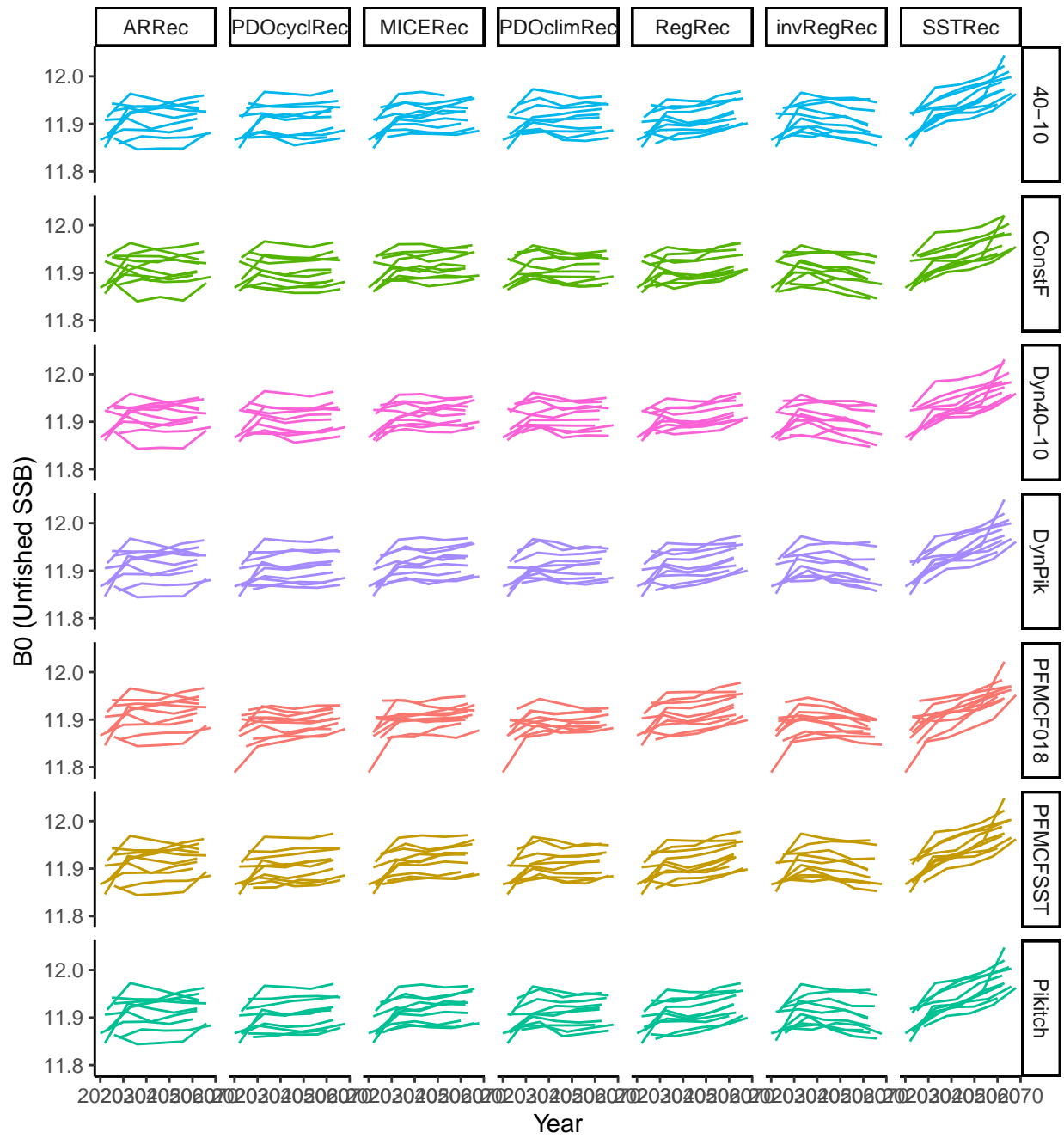


Figure S6: Sample of estimated unfished SSB ( $B_0$ ) in the assessment under each management rule (rows) and each recruitment scenario (columns).

## **Estimation model fit**

We provide diagnostics for the fit of the EM in three iterations for the autocorrelated recruitment scenario and SST-based HCR application.

Time series of OM and terminal EM estimate of age 1+ biomass with simulated data

Time series of OM and terminal EM estimate of recruitment and recruitment deviations

Histograms of length and age composition

Evolution of relative error in age 1+ biomass, including survey index, and recruitment deviations

Relative error of EM over all assessment years (similar to Fig 6)

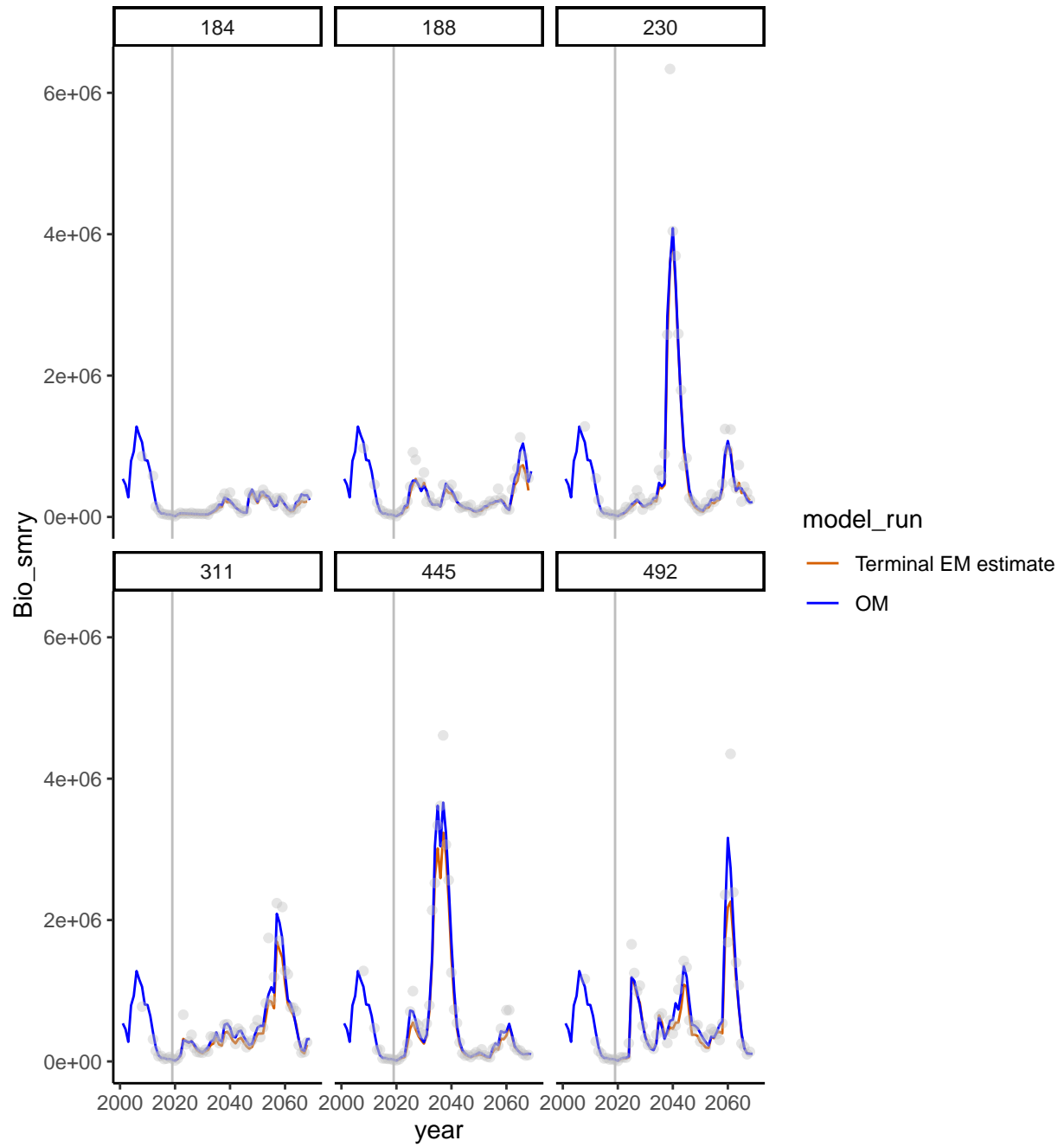


Figure S7: Age 1+ biomass in the OM (blue) and in terminal years of each EM assessment (orange) for a set of six iterations in the autocorrelated recruitment scenario and PFMCFSSST HCR. Grey points are simulated acoustic-trawl survey indices provided to the EM.

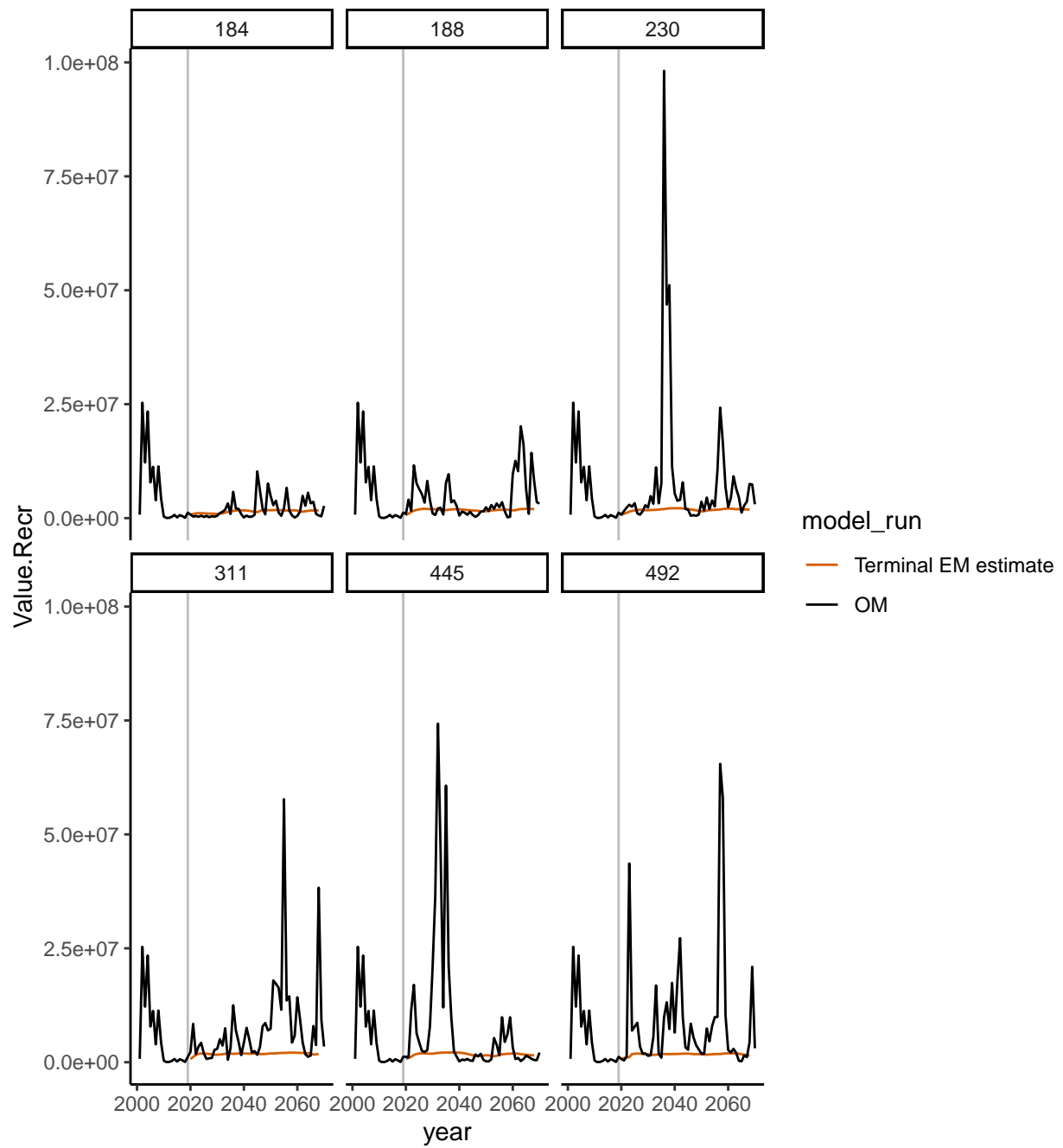


Figure S8: Recruit abundance in the OM (black) and in terminal years of each EM assessment (orange) for a set of six iterations in the autocorrelated recruitment scenario and PFMCFSSST HCR.

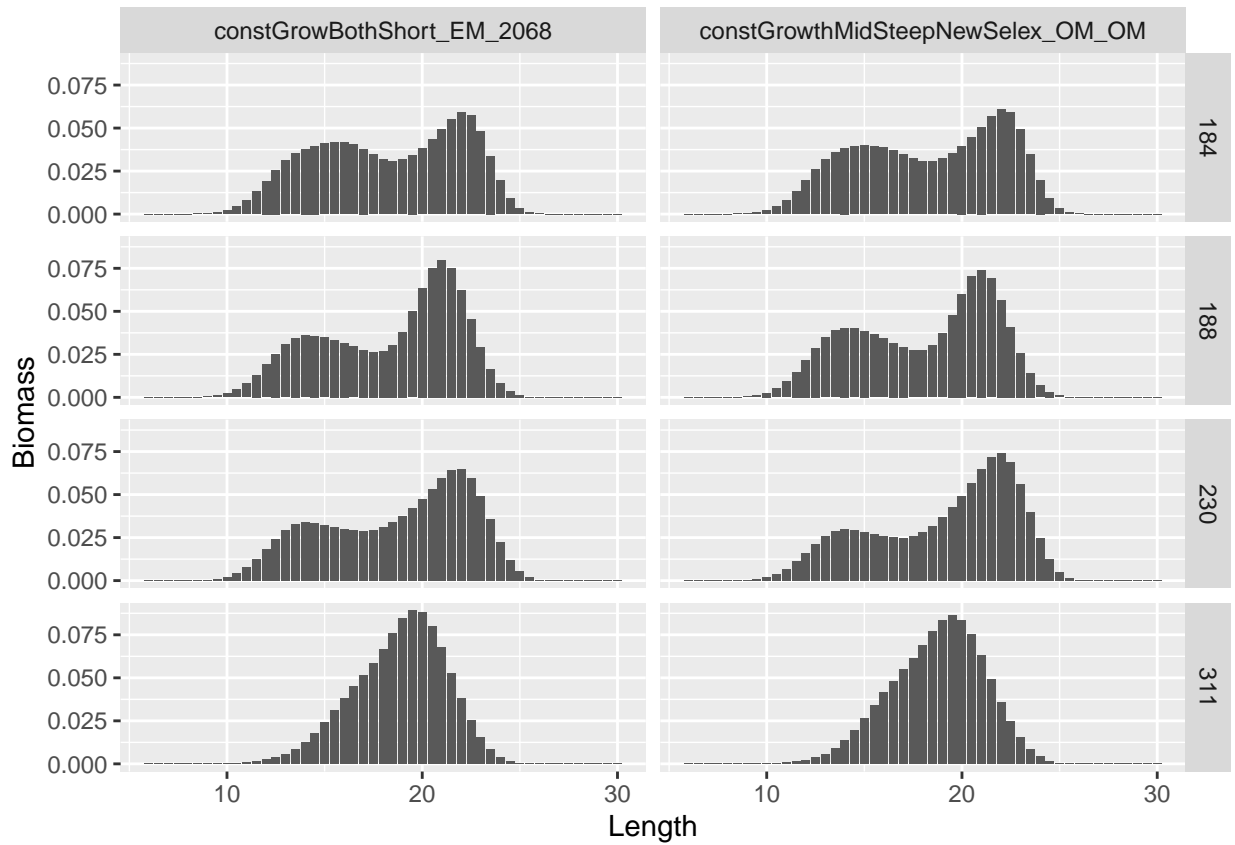


Figure S9: Length compositions as a proportion of biomass in the final simulation year of the EM (left) and OM (right). Compositions are from the Autocorrelated recruitment scenario applying the PFMCFSST HCR for a sample of iterations (rows).

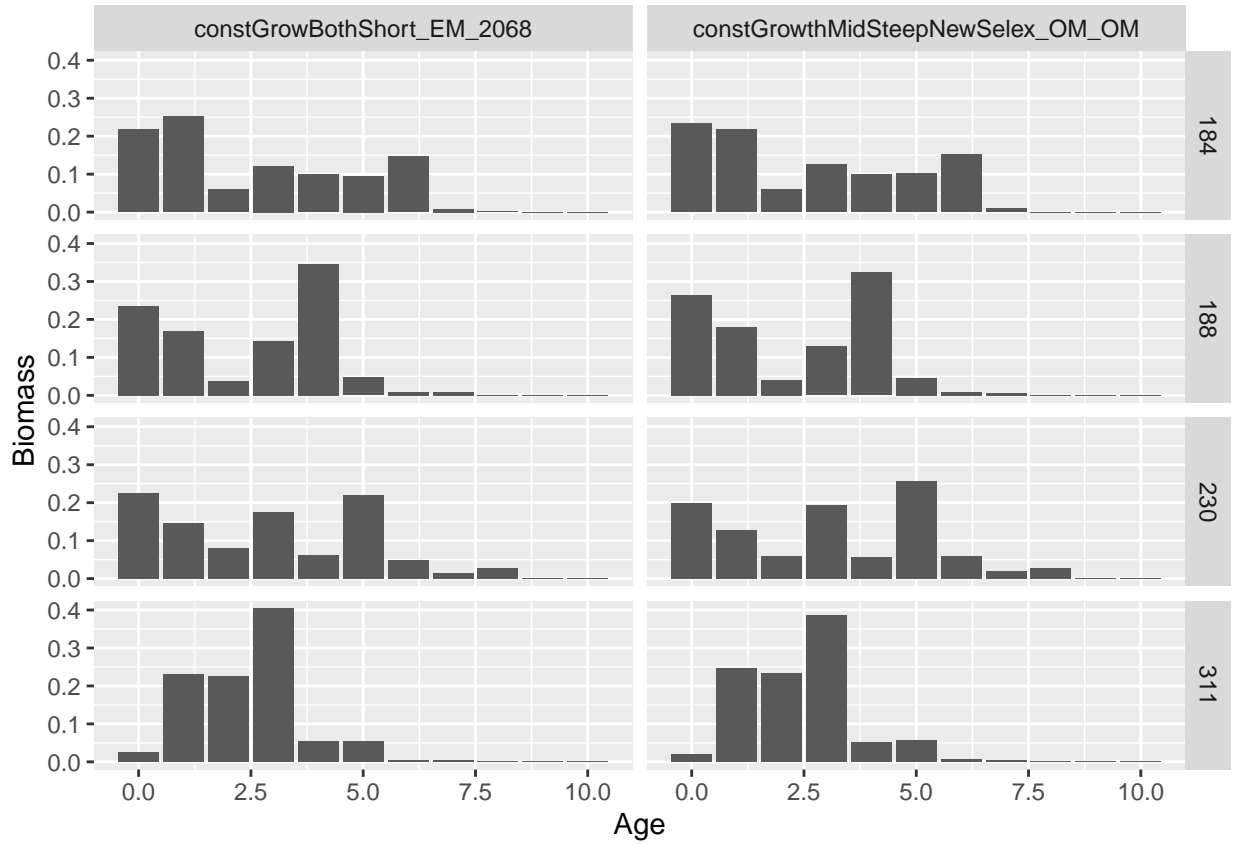


Figure S10: Age compositions as a proportion of biomass in the final simulation year of the EM (left) and OM (right). Compositions are from the Autocorrelated recruitment scenario applying the PFMCFSST HCR for a sample of iterations (rows).

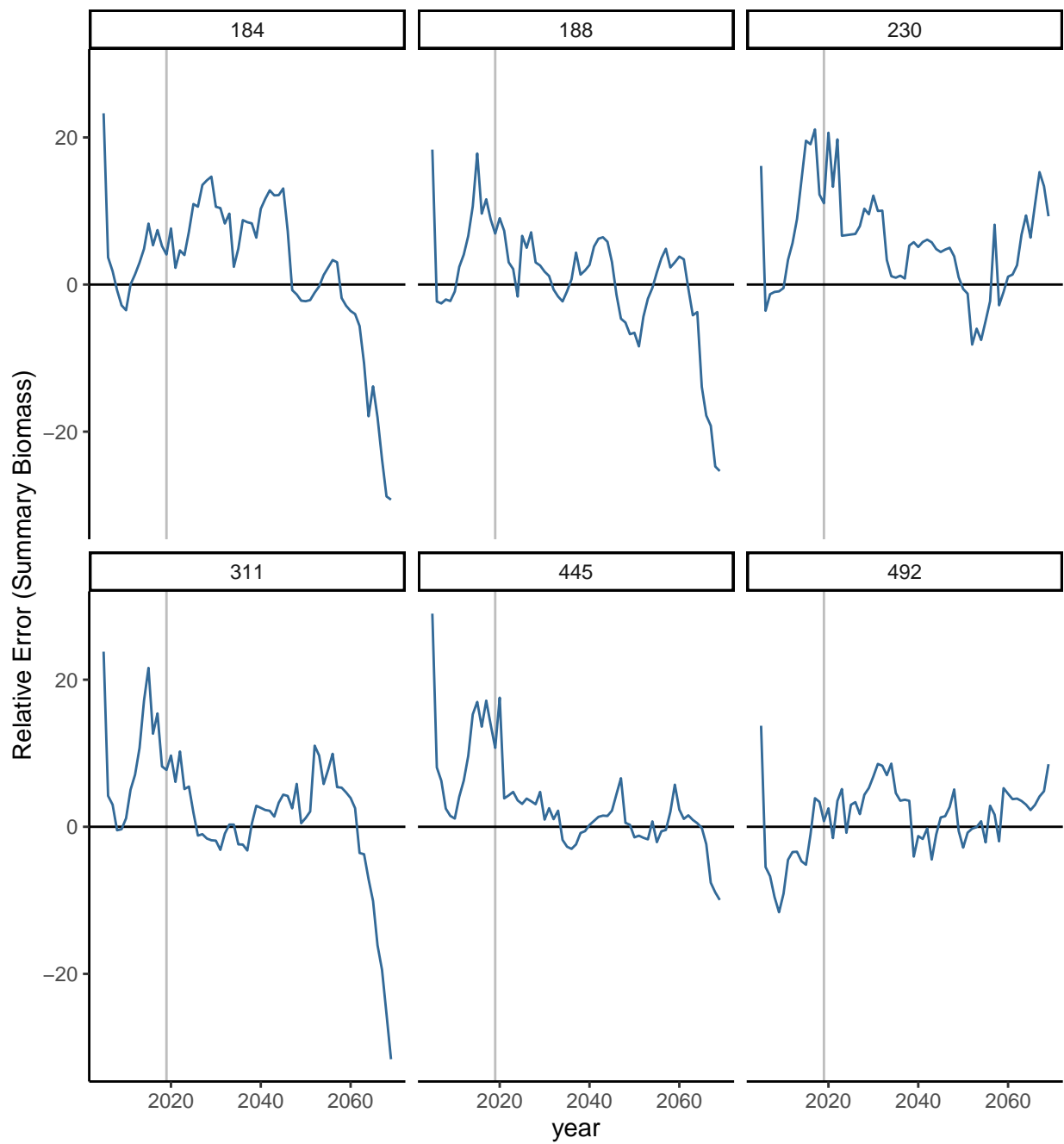


Figure S11: Relative error (%) between terminal year estimates of age 1+ biomass in the EM (blue) and the OM (black)



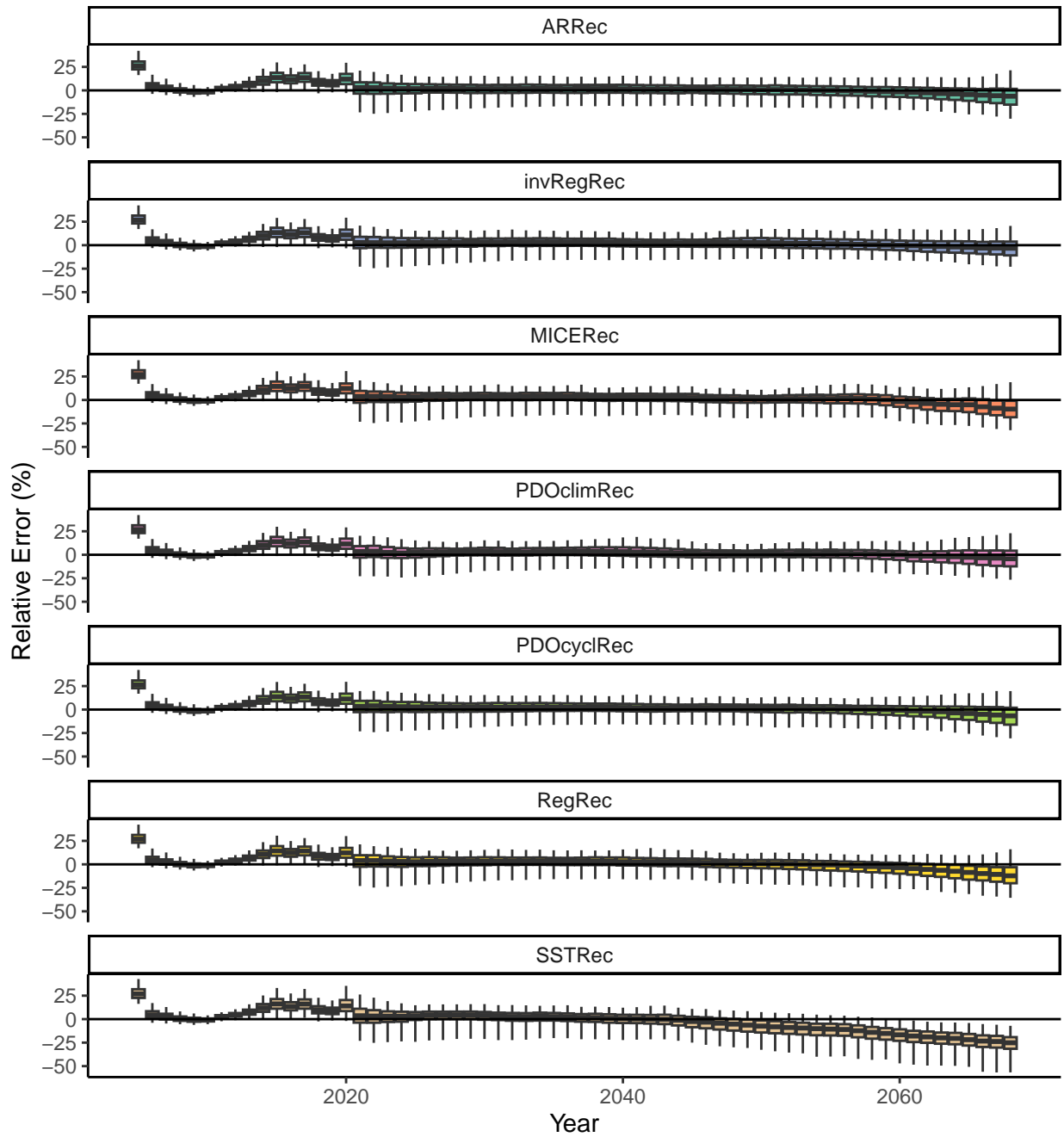


Figure S12: Relative assessment error in all years of the Stock Synthesis estimation model for each reference recruitment scenario under PFMCFSSST. Individual boxplots represent error between the assessment estimate of age 1+ biomass for that year and the operating model biomass across iterations. In each plot, the center horizontal bar is the median, hinges represent the 25% and 75% quartiles and whiskers are the upper and lower 95% confidence intervals.

Relative error of EM in forecast

EM convergence statistics

Table S2: Maximum and minimum frequency of non-converged EM fits for each HCR and recruitment scenario.

HCR	recScen	maxNonConvrg	minNonConvrg
HCR1	ARRec	0.04	0.02
HCR1	MICERec	0.04	0.02
HCR1	PDOclimRec	0.04	0.02
HCR1	PDOcyclRec	0.04	0.02
HCR1	RegRec	0.04	0.02
HCR1	SSTRec	0.02	0.02
HCR1	invRegRec	0.04	0.02
HCR2	ARRec	0.04	0.02
HCR2	MICERec	0.04	0.02
HCR2	PDOclimRec	0.04	0.02
HCR2	PDOcyclRec	0.04	0.02
HCR2	RegRec	0.06	0.02
HCR2	SSTRec	0.04	0.02
HCR2	invRegRec	0.04	0.02
HCR3	ARRec	0.04	0.02
HCR3	MICERec	0.04	0.02
HCR3	PDOclimRec	0.06	0.02
HCR3	PDOcyclRec	0.02	0.02
HCR3	RegRec	0.02	0.02
HCR3	SSTRec	0.04	0.02
HCR3	invRegRec	0.04	0.02
HCR5	ARRec	0.04	0.02
HCR5	MICERec	0.04	0.02
HCR5	PDOclimRec	0.04	0.02
HCR5	PDOcyclRec	0.06	0.02
HCR5	RegRec	0.04	0.02
HCR5	SSTRec	0.04	0.02
HCR5	invRegRec	0.04	0.02
HCR6	ARRec	0.04	0.02
HCR6	MICERec	0.06	0.02
HCR6	PDOclimRec	0.06	0.02
HCR6	PDOcyclRec	0.04	0.02
HCR6	RegRec	0.04	0.02
HCR6	SSTRec	0.04	0.02
HCR6	invRegRec	0.04	0.02
HCR7	ARRec	0.04	0.02
HCR7	MICERec	0.02	0.02
HCR7	PDOclimRec	0.06	0.02
HCR7	PDOcyclRec	0.04	0.02
HCR7	RegRec	0.04	0.02
HCR7	SSTRec	0.04	0.02
HCR7	invRegRec	0.02	0.02
HCR8	ARRec	0.02	0.02
HCR8	MICERec	0.04	0.02
HCR8	PDOclimRec	0.04	0.02

HCR8	PDOcyclRec	0.02	0.02
HCR8	RegRec	0.02	0.02
HCR8	SSTRec	0.04	0.02
HCR8	invRegRec	0.06	0.02

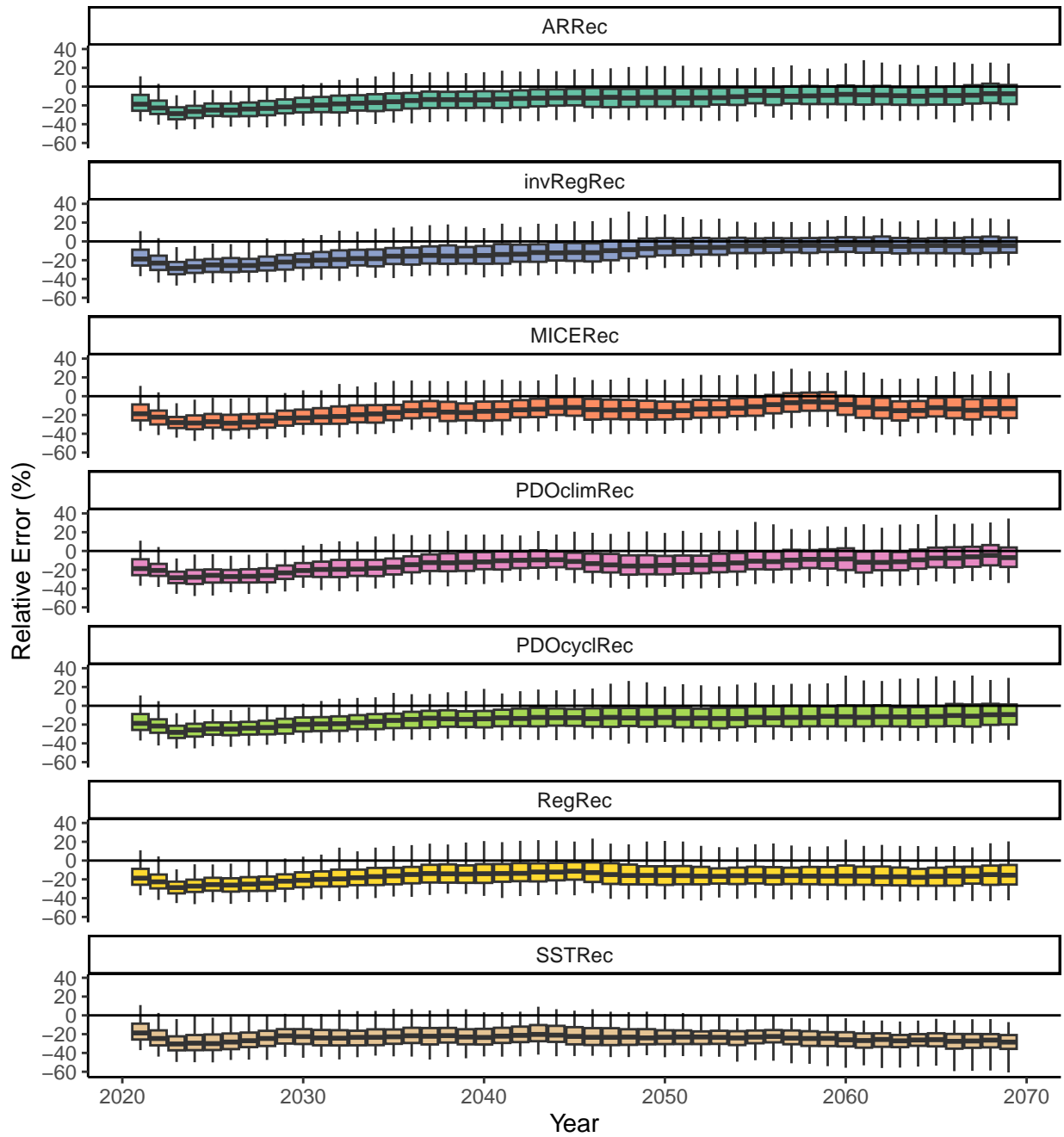


Figure S13: Relative assessment error in the forecast year (following the terminal assessment year) of the Stock Synthesis estimation model for each reference recruitment scenario under PFMCFSSST. Individual boxplots represent error between the assessment estimate of age 1+ biomass for that year and the operating model biomass across iterations. In each plot, the center horizontal bar is the median, hinges represent the 25% and 75% quartiles and whiskers are the upper and lower 95% confidence intervals.

## Performance metrics by scenario

Biomass and Catch metrics  
Tradeoff plot  
Other metrics

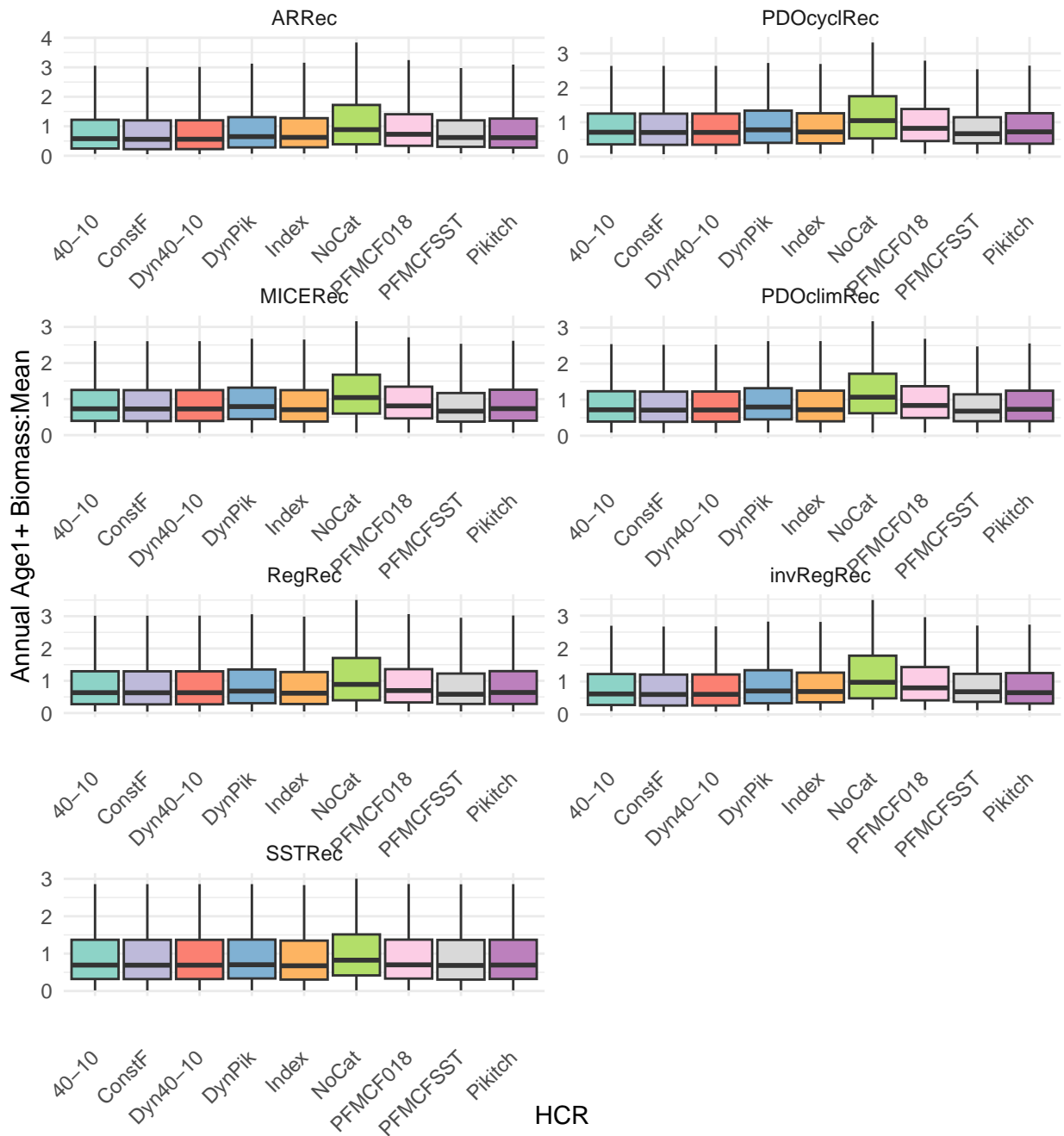


Figure S14: Annual age 1+ biomass relative to the mean within each recruitment scenario for each HCR. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.

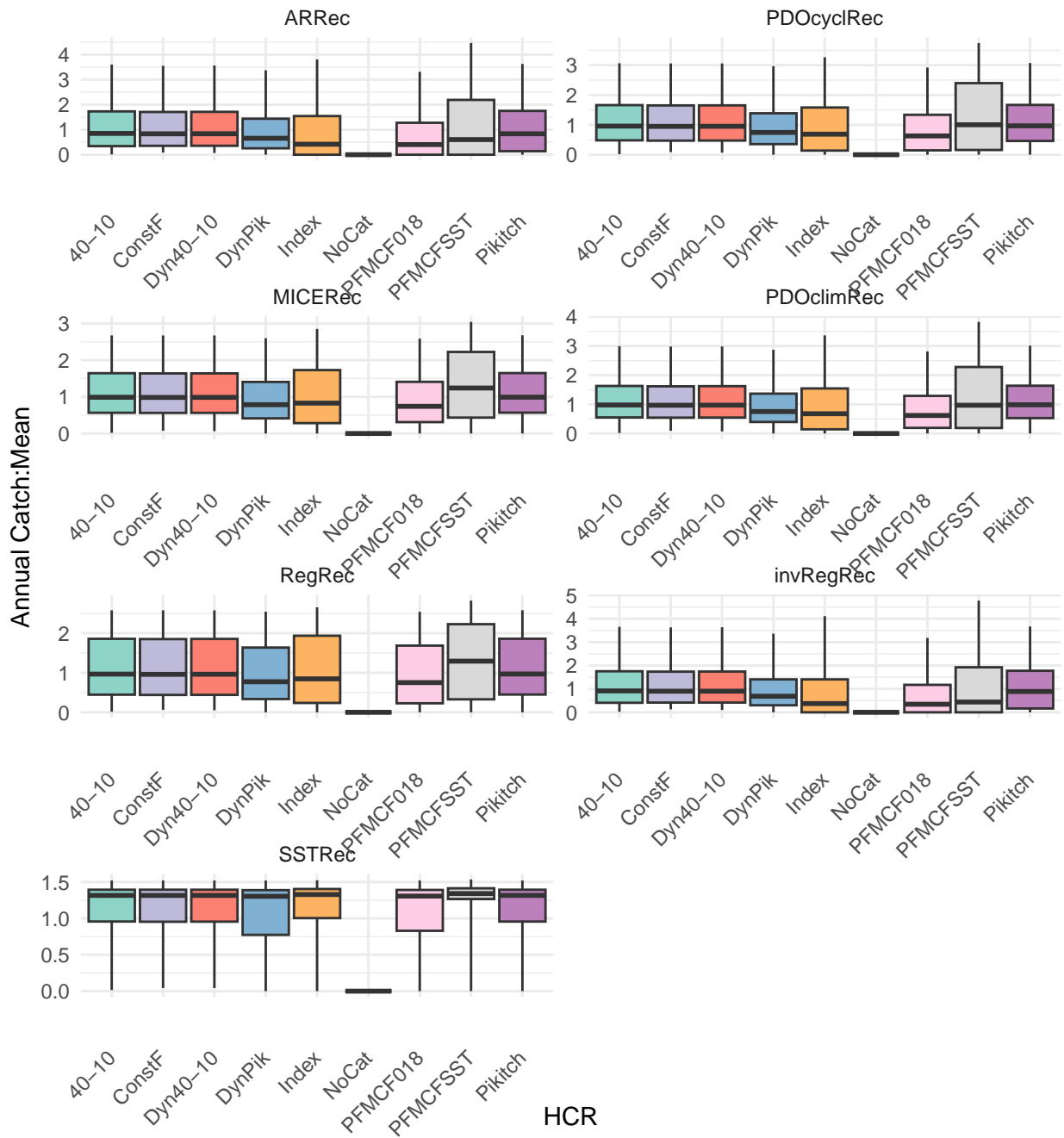


Figure S15: Annual catch relative to the mean within each recruitment scenario for each HCR. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.

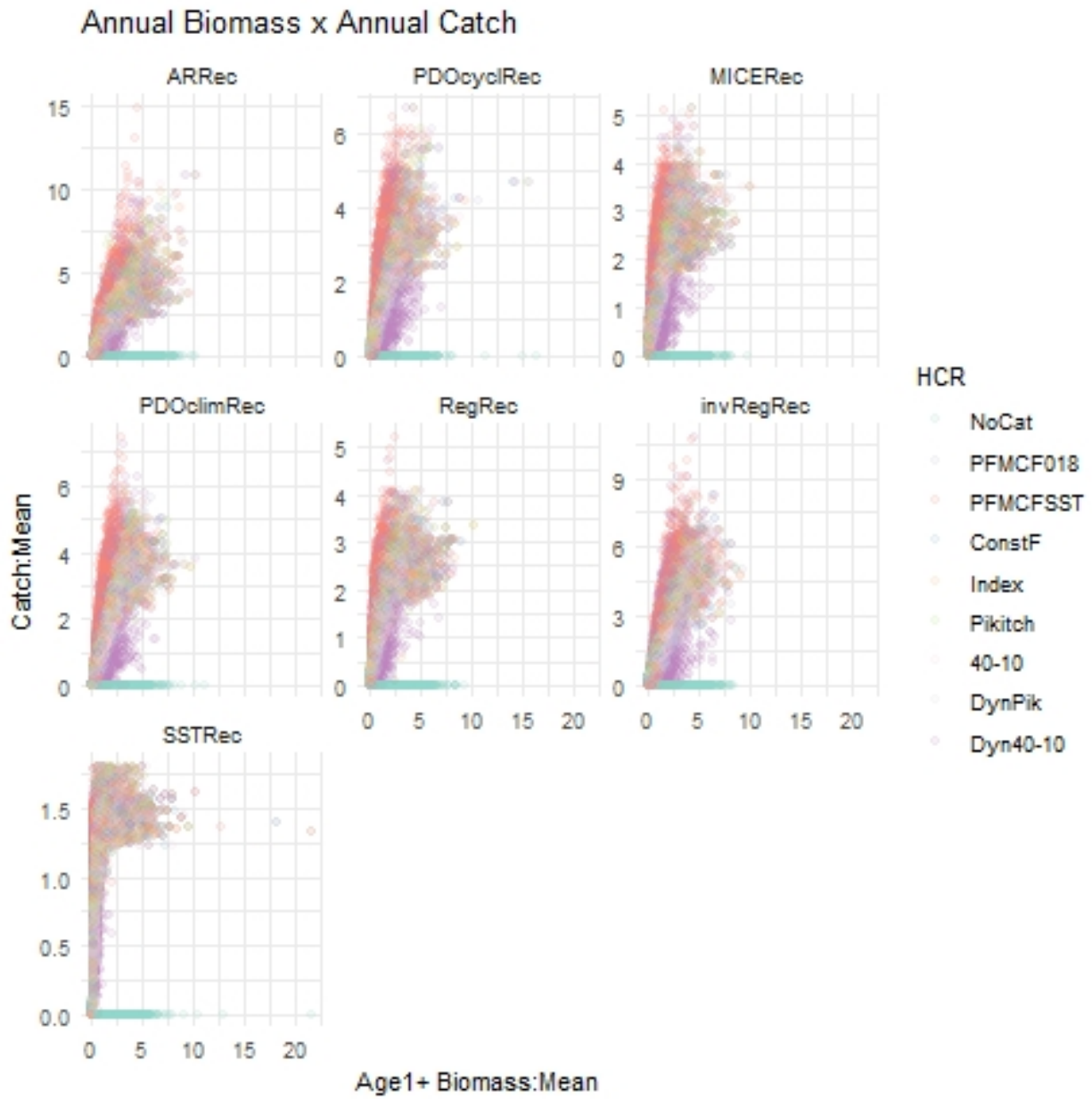


Figure S16: Interaction between annual catch and annual age 1+ biomass under each HCR (colored points) in each recruitment scenario.



Table S3: Number of iterations in which age 1+ biomass did not rebuild after 50 years.

HCR	recScen	nvrRebuiltN
HCR0	ARRec	1
HCR1	ARRec	1
HCR2	ARRec	1
HCR3	ARRec	1
HCR5	ARRec	1
HCR6	ARRec	1
HCR7	ARRec	1
HCR8	ARRec	1
HCR9	ARRec	1

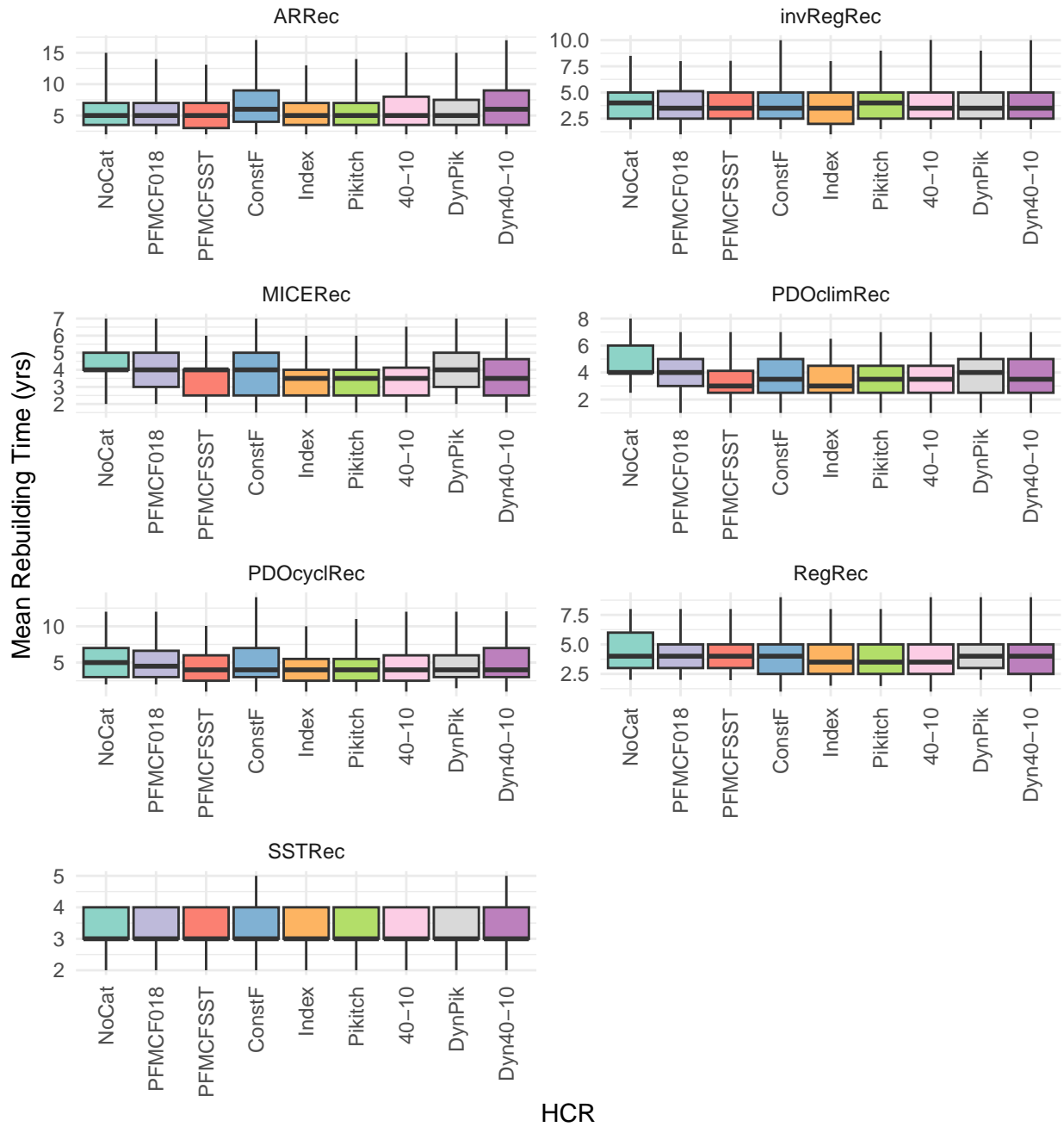


Figure S17: Mean number of years needed to rebuild biomass above the 150,000 mt cutoff threshold within each recruitment scenario for each HCR. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.

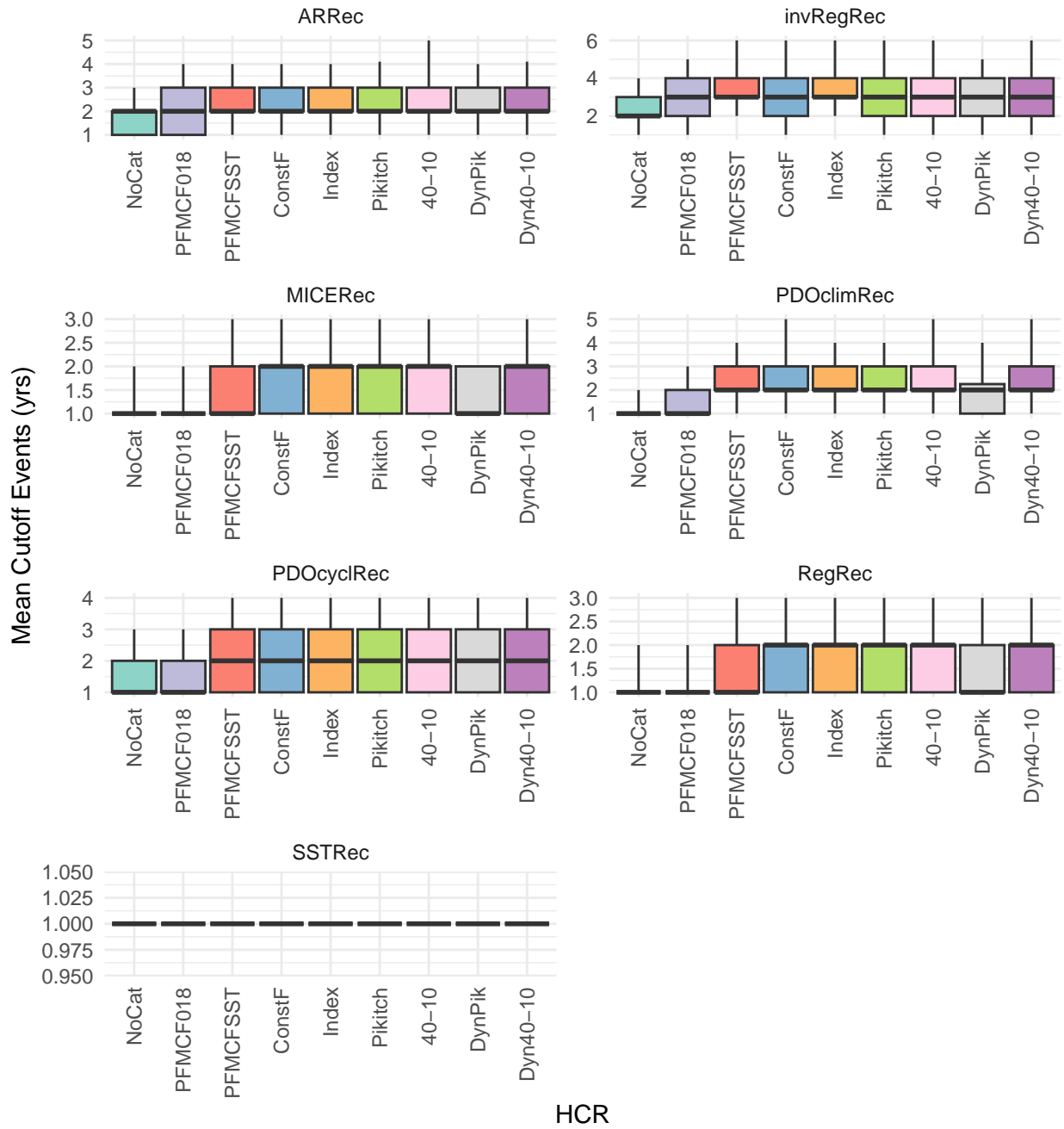


Figure S18: Mean number of cutoff events within each recruitment scenario for each HCR. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.

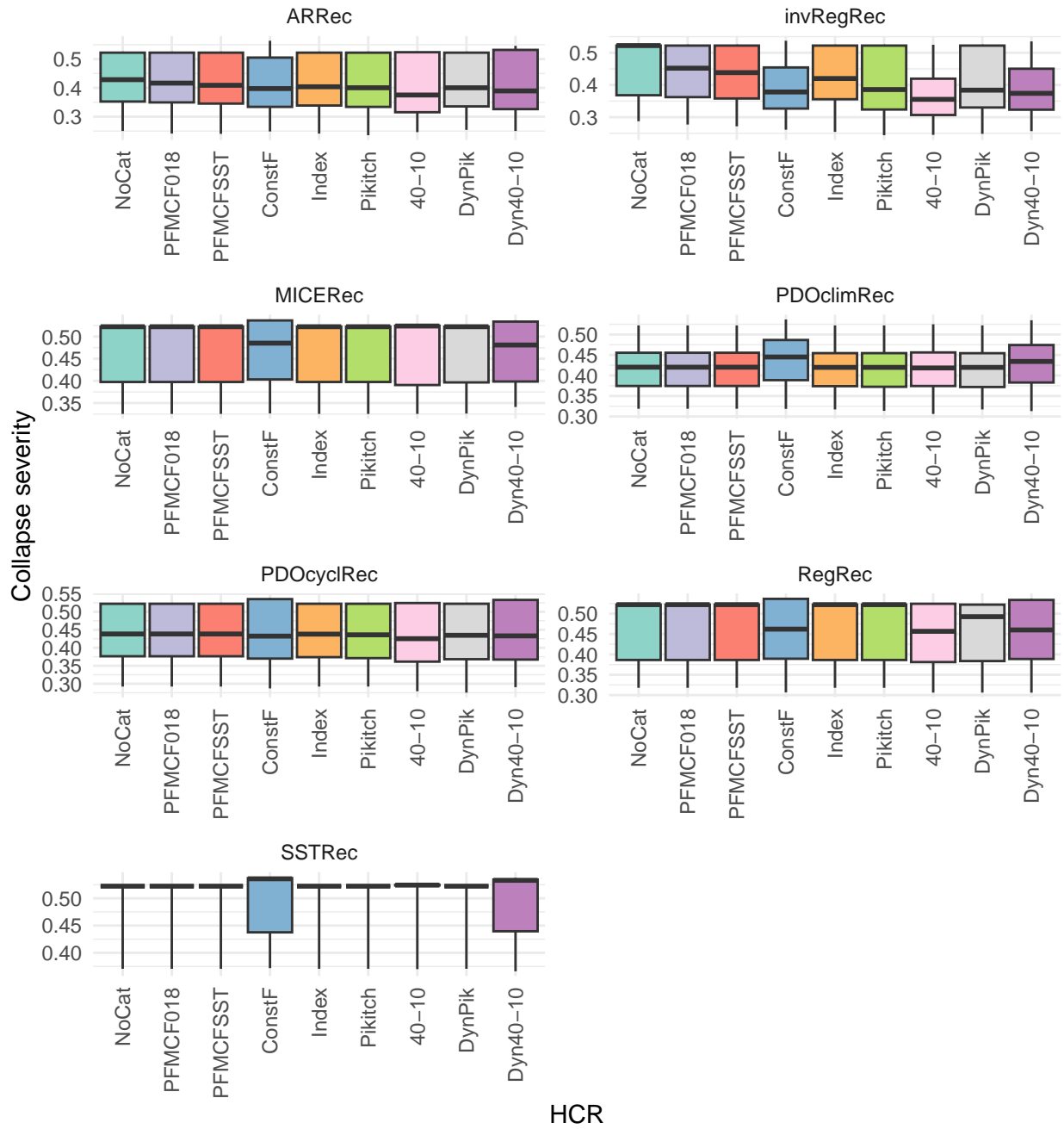


Figure S19: Mean collapse severity within each recruitment scenario for each HCR. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.

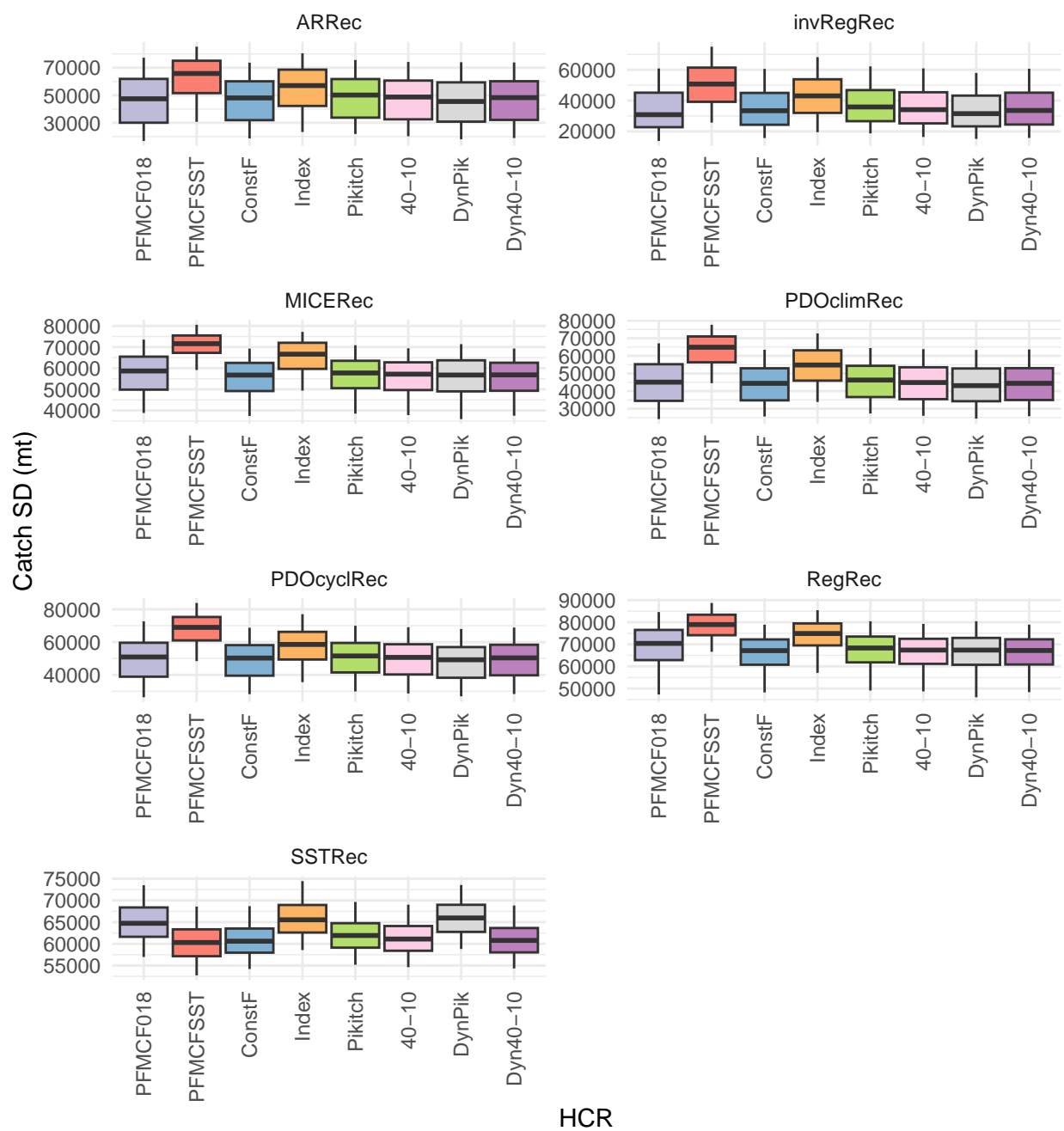


Figure S20: Catch variability within each recruitment scenario for each HCR. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.

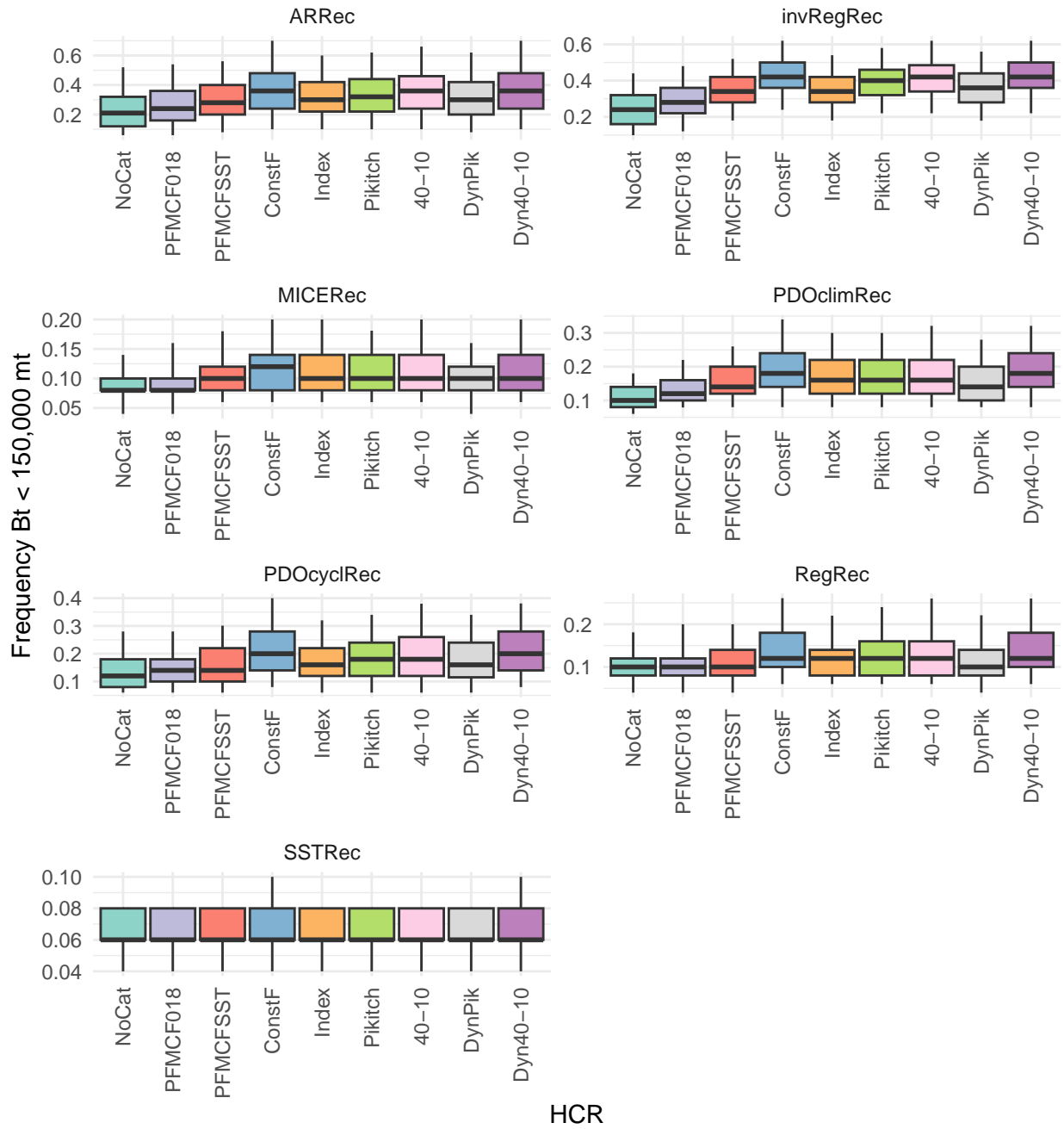


Figure S21: Cutoff frequency within each recruitment scenario for each HCR. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.

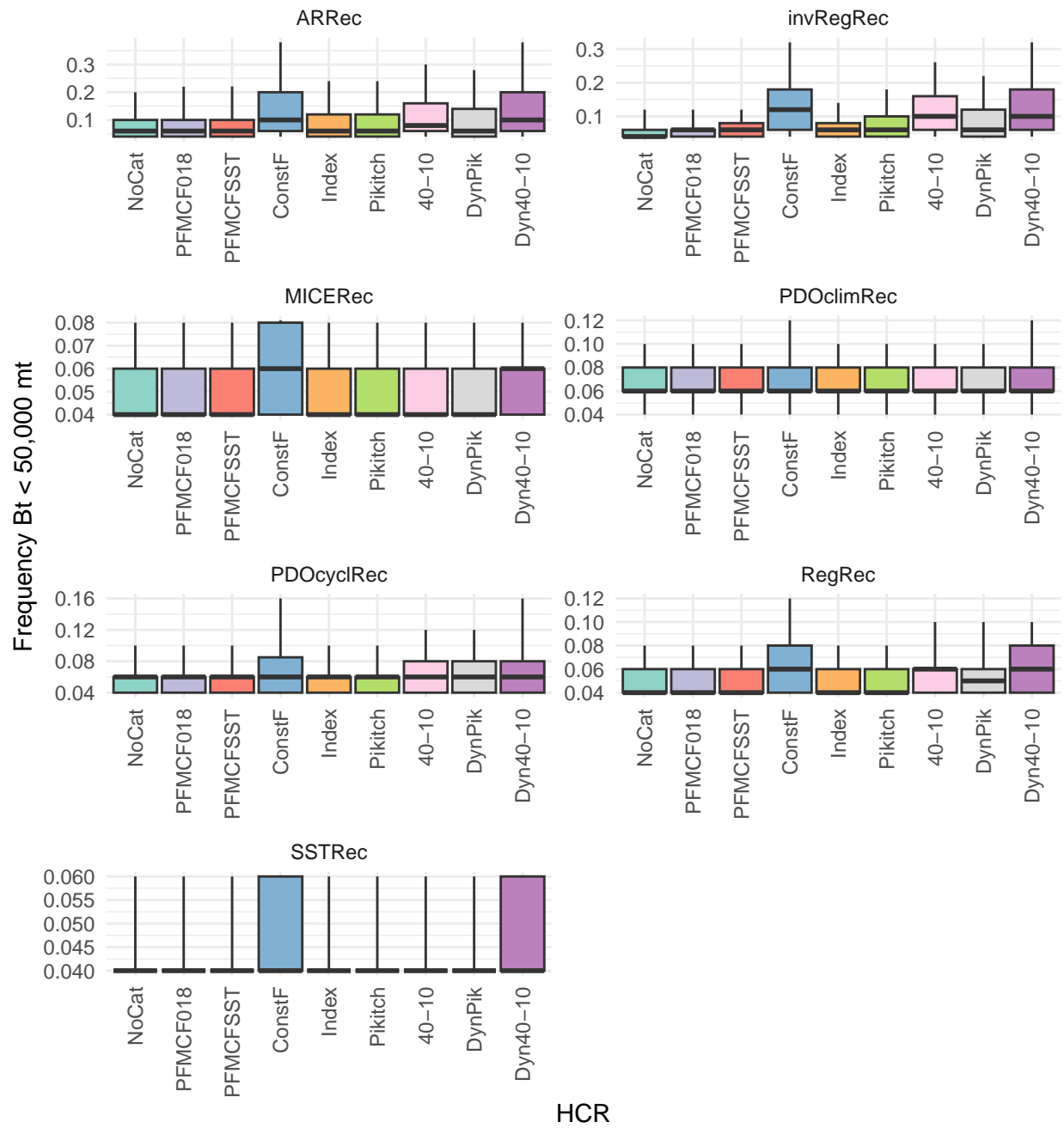


Figure S22: Collapse frequency within each recruitment scenario for each HCR. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.

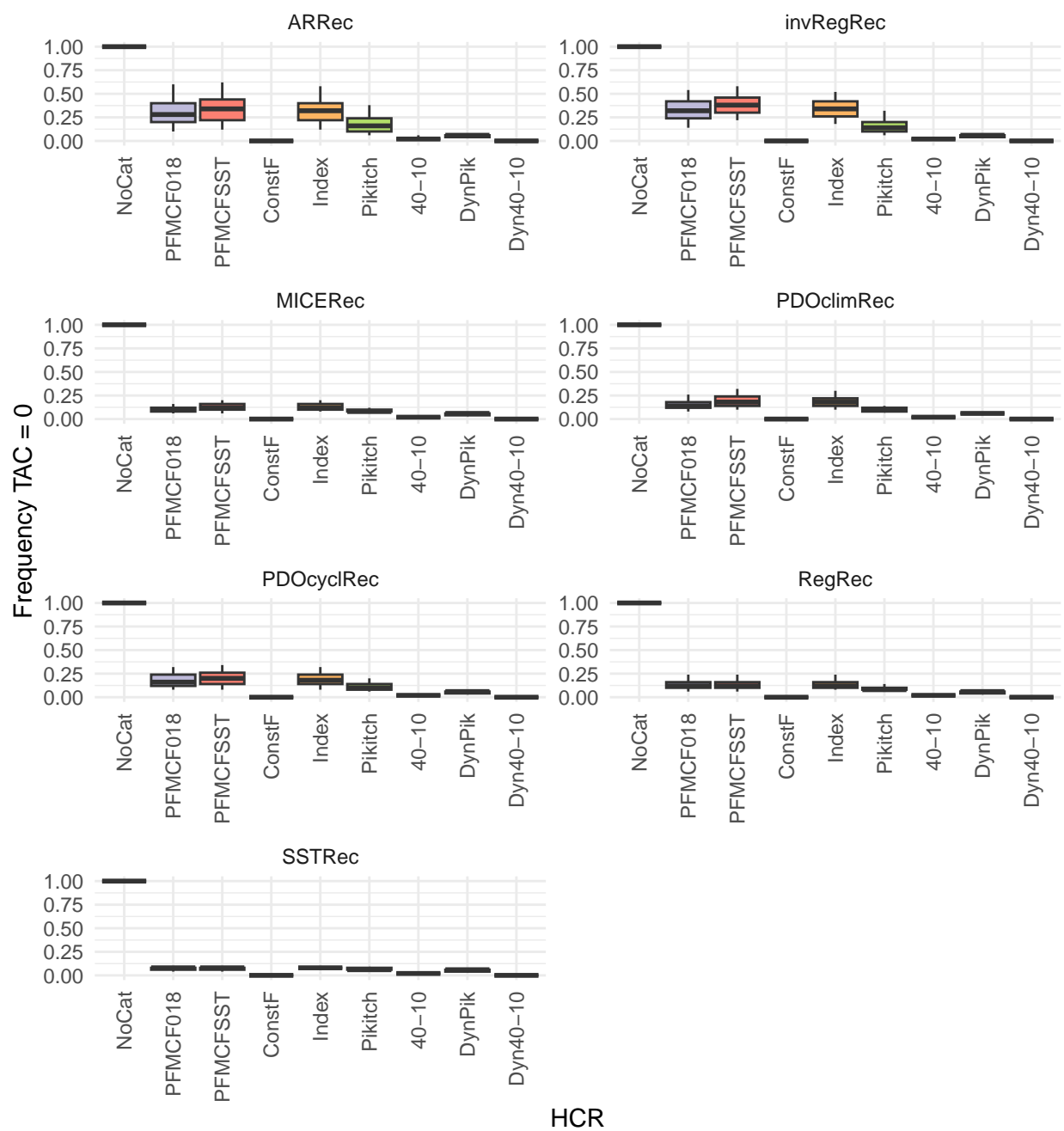


Figure S23: Closure frequency within each recruitment scenario for each HCR. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.



## Additional metrics from Hurtado-Ferro and Punt 2014

Table S4: Additional performance metrics reported in Hurtado-Ferro and Punt (2014) for each HCR and recruitment scenario.

Metric	nameHCR	recScen	mean	median	hi95	low05
lowCatFreq	40-10	ARRec	0.648	0.66	0.900	0.320
lowCatFreq	40-10	MICERec	0.357	0.34	0.560	0.200
lowCatFreq	40-10	PDOclimRec	0.538	0.54	0.740	0.320
lowCatFreq	40-10	PDOcyclRec	0.513	0.50	0.720	0.320
lowCatFreq	40-10	RegRec	0.359	0.36	0.540	0.180
lowCatFreq	40-10	SSTRec	0.094	0.10	0.120	0.060
lowCatFreq	40-10	invRegRec	0.745	0.74	0.921	0.560
lowCatFreq	ConstF	ARRec	0.653	0.66	0.901	0.320
lowCatFreq	ConstF	MICERec	0.360	0.34	0.560	0.200
lowCatFreq	ConstF	PDOclimRec	0.542	0.54	0.740	0.340
lowCatFreq	ConstF	PDOcyclRec	0.517	0.50	0.721	0.320
lowCatFreq	ConstF	RegRec	0.361	0.36	0.540	0.180
lowCatFreq	ConstF	SSTRec	0.094	0.10	0.120	0.060
lowCatFreq	ConstF	invRegRec	0.748	0.74	0.940	0.560
lowCatFreq	Dyn40-10	ARRec	0.652	0.66	0.901	0.320
lowCatFreq	Dyn40-10	MICERec	0.359	0.34	0.560	0.200
lowCatFreq	Dyn40-10	PDOclimRec	0.540	0.54	0.740	0.340
lowCatFreq	Dyn40-10	PDOcyclRec	0.516	0.50	0.721	0.320
lowCatFreq	Dyn40-10	RegRec	0.360	0.36	0.540	0.180
lowCatFreq	Dyn40-10	SSTRec	0.094	0.10	0.120	0.060
lowCatFreq	Dyn40-10	invRegRec	0.747	0.74	0.940	0.560
lowCatFreq	DynPik	ARRec	0.711	0.73	0.920	0.420
lowCatFreq	DynPik	MICERec	0.468	0.46	0.640	0.300
lowCatFreq	DynPik	PDOclimRec	0.642	0.64	0.820	0.460
lowCatFreq	DynPik	PDOcyclRec	0.612	0.62	0.801	0.440
lowCatFreq	DynPik	RegRec	0.436	0.44	0.600	0.280
lowCatFreq	DynPik	SSTRec	0.113	0.10	0.180	0.080
lowCatFreq	DynPik	invRegRec	0.810	0.82	0.960	0.640
lowCatFreq	Index	ARRec	0.699	0.70	0.920	0.420
lowCatFreq	Index	MICERec	0.460	0.46	0.640	0.300
lowCatFreq	Index	PDOclimRec	0.625	0.62	0.800	0.460
lowCatFreq	Index	PDOcyclRec	0.601	0.60	0.800	0.420
lowCatFreq	Index	RegRec	0.430	0.42	0.580	0.260
lowCatFreq	Index	SSTRec	0.117	0.10	0.180	0.080
lowCatFreq	Index	invRegRec	0.789	0.80	0.940	0.620
lowCatFreq	NoCat	ARRec	1.000	1.00	1.000	1.000
lowCatFreq	NoCat	MICERec	1.000	1.00	1.000	1.000
lowCatFreq	NoCat	PDOclimRec	1.000	1.00	1.000	1.000
lowCatFreq	NoCat	PDOcyclRec	1.000	1.00	1.000	1.000
lowCatFreq	NoCat	RegRec	1.000	1.00	1.000	1.000
lowCatFreq	NoCat	SSTRec	1.000	1.00	1.000	1.000
lowCatFreq	NoCat	invRegRec	1.000	1.00	1.000	1.000
lowCatFreq	PFMCF018	ARRec	0.732	0.74	0.960	0.440
lowCatFreq	PFMCF018	MICERec	0.495	0.50	0.700	0.300
lowCatFreq	PFMCF018	PDOclimRec	0.674	0.68	0.860	0.480
lowCatFreq	PFMCF018	PDOcyclRec	0.639	0.64	0.840	0.460

lowCatFreq	PFMCF018	RegRec	0.457	0.46	0.620	0.280
lowCatFreq	PFMCF018	SSTRec	0.109	0.10	0.180	0.080
lowCatFreq	PFMCF018	invRegRec	0.832	0.84	0.980	0.660
lowCatFreq	PFMCFSSST	ARRec	0.618	0.62	0.860	0.319
lowCatFreq	PFMCFSSST	MICERec	0.352	0.34	0.540	0.220
lowCatFreq	PFMCFSSST	PDOclimRec	0.518	0.52	0.700	0.340
lowCatFreq	PFMCFSSST	PDOcyclRec	0.493	0.48	0.680	0.320
lowCatFreq	PFMCFSSST	RegRec	0.350	0.34	0.520	0.200
lowCatFreq	PFMCFSSST	SSTRec	0.093	0.10	0.140	0.060
lowCatFreq	PFMCFSSST	invRegRec	0.721	0.72	0.900	0.540
lowCatFreq	Pikitch	ARRec	0.642	0.66	0.900	0.320
lowCatFreq	Pikitch	MICERec	0.356	0.34	0.560	0.200
lowCatFreq	Pikitch	PDOclimRec	0.534	0.54	0.740	0.320
lowCatFreq	Pikitch	PDOcyclRec	0.508	0.50	0.720	0.320
lowCatFreq	Pikitch	RegRec	0.356	0.36	0.540	0.180
lowCatFreq	Pikitch	SSTRec	0.093	0.10	0.120	0.060
lowCatFreq	Pikitch	invRegRec	0.740	0.74	0.920	0.560
lowCatLenMax	40-10	ARRec	19.714	18.00	37.050	7.000
lowCatLenMax	40-10	MICERec	8.368	8.00	14.050	5.000
lowCatLenMax	40-10	PDOclimRec	11.928	11.00	23.050	6.000
lowCatLenMax	40-10	PDOcyclRec	15.564	15.00	26.000	7.000
lowCatLenMax	40-10	RegRec	11.326	10.00	22.000	5.000
lowCatLenMax	40-10	SSTRec	4.548	5.00	6.000	3.000
lowCatLenMax	40-10	invRegRec	21.616	22.00	31.050	12.000
lowCatLenMax	ConstF	ARRec	20.004	18.00	38.000	7.000
lowCatLenMax	ConstF	MICERec	8.410	8.00	14.050	5.000
lowCatLenMax	ConstF	PDOclimRec	12.078	11.00	24.000	6.000
lowCatLenMax	ConstF	PDOcyclRec	15.844	15.00	26.050	7.000
lowCatLenMax	ConstF	RegRec	11.454	10.00	22.000	5.000
lowCatLenMax	ConstF	SSTRec	4.574	5.00	6.000	3.000
lowCatLenMax	ConstF	invRegRec	21.672	22.00	31.050	12.000
lowCatLenMax	Dyn40-10	ARRec	19.902	18.00	38.000	7.000
lowCatLenMax	Dyn40-10	MICERec	8.376	8.00	14.050	5.000
lowCatLenMax	Dyn40-10	PDOclimRec	12.016	11.00	24.000	6.000
lowCatLenMax	Dyn40-10	PDOcyclRec	15.764	15.00	26.050	7.000
lowCatLenMax	Dyn40-10	RegRec	11.398	10.00	22.000	5.000
lowCatLenMax	Dyn40-10	SSTRec	4.564	5.00	6.000	3.000
lowCatLenMax	Dyn40-10	invRegRec	21.664	22.00	31.050	12.000
lowCatLenMax	DynPik	ARRec	21.092	19.00	40.000	9.000
lowCatLenMax	DynPik	MICERec	9.706	9.00	16.050	6.000
lowCatLenMax	DynPik	PDOclimRec	13.370	12.00	25.050	7.000
lowCatLenMax	DynPik	PDOcyclRec	16.946	16.00	29.050	8.000
lowCatLenMax	DynPik	RegRec	12.512	11.00	25.050	6.000
lowCatLenMax	DynPik	SSTRec	4.870	5.00	7.000	4.000
lowCatLenMax	DynPik	invRegRec	23.184	23.00	34.050	13.000
lowCatLenMax	Index	ARRec	19.552	18.00	36.000	8.000
lowCatLenMax	Index	MICERec	9.048	8.00	15.000	6.000
lowCatLenMax	Index	PDOclimRec	11.956	11.00	21.000	7.000
lowCatLenMax	Index	PDOcyclRec	15.362	15.00	25.050	8.000
lowCatLenMax	Index	RegRec	11.480	11.00	21.000	6.000
lowCatLenMax	Index	SSTRec	5.168	5.00	7.000	4.000

lowCatLenMax	Index	invRegRec	21.342	22.00	31.000	12.000
lowCatLenMax	NoCat	ARRec	50.000	50.00	50.000	50.000
lowCatLenMax	NoCat	MICERec	50.000	50.00	50.000	50.000
lowCatLenMax	NoCat	PDOclimRec	50.000	50.00	50.000	50.000
lowCatLenMax	NoCat	PDOcyclRec	50.000	50.00	50.000	50.000
lowCatLenMax	NoCat	RegRec	50.000	50.00	50.000	50.000
lowCatLenMax	NoCat	SSTRec	50.000	50.00	50.000	50.000
lowCatLenMax	NoCat	invRegRec	50.000	50.00	50.000	50.000
lowCatLenMax	PFMCF018	ARRec	23.178	21.00	45.000	10.000
lowCatLenMax	PFMCF018	MICERec	11.160	10.00	20.000	6.000
lowCatLenMax	PFMCF018	PDOclimRec	15.512	14.00	29.000	8.000
lowCatLenMax	PFMCF018	PDOcyclRec	19.046	19.00	31.000	9.000
lowCatLenMax	PFMCF018	RegRec	14.332	13.00	27.000	6.000
lowCatLenMax	PFMCF018	SSTRec	4.878	5.00	7.000	4.000
lowCatLenMax	PFMCF018	invRegRec	25.098	24.00	42.300	14.000
lowCatLenMax	PFMCFSSST	ARRec	17.554	16.00	33.000	6.000
lowCatLenMax	PFMCFSSST	MICERec	7.742	7.00	14.000	5.000
lowCatLenMax	PFMCFSSST	PDOclimRec	10.514	10.00	18.000	5.950
lowCatLenMax	PFMCFSSST	PDOcyclRec	13.880	13.00	25.000	6.000
lowCatLenMax	PFMCFSSST	RegRec	10.244	9.00	19.000	5.000
lowCatLenMax	PFMCFSSST	SSTRec	4.392	4.00	6.000	3.000
lowCatLenMax	PFMCFSSST	invRegRec	18.142	18.00	27.000	9.950
lowCatLenMax	Pikitch	ARRec	19.310	18.00	36.050	7.000
lowCatLenMax	Pikitch	MICERec	8.314	8.00	14.050	5.000
lowCatLenMax	Pikitch	PDOclimRec	11.786	11.00	23.000	6.000
lowCatLenMax	Pikitch	PDOcyclRec	15.174	15.00	26.000	7.000
lowCatLenMax	Pikitch	RegRec	11.166	10.00	21.050	5.000
lowCatLenMax	Pikitch	SSTRec	4.518	5.00	6.000	3.000
lowCatLenMax	Pikitch	invRegRec	21.198	21.00	30.000	12.000
zeroCatFreq	40-10	ARRec	0.022	0.02	0.060	0.000
zeroCatFreq	40-10	MICERec	0.016	0.02	0.020	0.000
zeroCatFreq	40-10	PDOclimRec	0.016	0.02	0.020	0.000
zeroCatFreq	40-10	PDOcyclRec	0.016	0.02	0.020	0.000
zeroCatFreq	40-10	RegRec	0.016	0.02	0.020	0.000
zeroCatFreq	40-10	SSTRec	0.016	0.02	0.020	0.000
zeroCatFreq	40-10	invRegRec	0.017	0.02	0.020	0.000
zeroCatFreq	ConstF	ARRec	0.000	0.00	0.000	0.000
zeroCatFreq	ConstF	MICERec	0.000	0.00	0.000	0.000
zeroCatFreq	ConstF	PDOclimRec	0.000	0.00	0.000	0.000
zeroCatFreq	ConstF	PDOcyclRec	0.000	0.00	0.000	0.000
zeroCatFreq	ConstF	RegRec	0.000	0.00	0.000	0.000
zeroCatFreq	ConstF	SSTRec	0.000	0.00	0.000	0.000
zeroCatFreq	ConstF	invRegRec	0.000	0.00	0.000	0.000
zeroCatFreq	Dyn40-10	ARRec	0.000	0.00	0.000	0.000
zeroCatFreq	Dyn40-10	MICERec	0.000	0.00	0.000	0.000
zeroCatFreq	Dyn40-10	PDOclimRec	0.000	0.00	0.000	0.000
zeroCatFreq	Dyn40-10	PDOcyclRec	0.000	0.00	0.000	0.000
zeroCatFreq	Dyn40-10	RegRec	0.000	0.00	0.000	0.000
zeroCatFreq	Dyn40-10	SSTRec	0.000	0.00	0.000	0.000
zeroCatFreq	Dyn40-10	invRegRec	0.000	0.00	0.000	0.000
zeroCatFreq	DynPik	ARRec	0.054	0.06	0.060	0.040

zeroCatFreq	DynPik	MICERec	0.053	0.06	0.060	0.040
zeroCatFreq	DynPik	PDOclimRec	0.057	0.06	0.060	0.040
zeroCatFreq	DynPik	PDOcyclRec	0.054	0.06	0.060	0.040
zeroCatFreq	DynPik	RegRec	0.053	0.06	0.060	0.040
zeroCatFreq	DynPik	SSTRec	0.051	0.06	0.060	0.040
zeroCatFreq	DynPik	invRegRec	0.052	0.06	0.060	0.040
zeroCatFreq	Index	ARRec	0.324	0.32	0.580	0.120
zeroCatFreq	Index	MICERec	0.130	0.12	0.200	0.080
zeroCatFreq	Index	PDOclimRec	0.181	0.18	0.300	0.100
zeroCatFreq	Index	PDOcyclRec	0.187	0.18	0.320	0.080
zeroCatFreq	Index	RegRec	0.137	0.12	0.240	0.080
zeroCatFreq	Index	SSTRec	0.081	0.08	0.100	0.060
zeroCatFreq	Index	invRegRec	0.345	0.34	0.520	0.180
zeroCatFreq	NoCat	ARRec	1.000	1.00	1.000	1.000
zeroCatFreq	NoCat	MICERec	1.000	1.00	1.000	1.000
zeroCatFreq	NoCat	PDOclimRec	1.000	1.00	1.000	1.000
zeroCatFreq	NoCat	PDOcyclRec	1.000	1.00	1.000	1.000
zeroCatFreq	NoCat	RegRec	1.000	1.00	1.000	1.000
zeroCatFreq	NoCat	SSTRec	1.000	1.00	1.000	1.000
zeroCatFreq	NoCat	invRegRec	1.000	1.00	1.000	1.000
zeroCatFreq	PFMCF018	ARRec	0.307	0.28	0.600	0.100
zeroCatFreq	PFMCF018	MICERec	0.109	0.10	0.160	0.060
zeroCatFreq	PFMCF018	PDOclimRec	0.153	0.14	0.260	0.080
zeroCatFreq	PFMCF018	PDOcyclRec	0.182	0.16	0.320	0.080
zeroCatFreq	PFMCF018	RegRec	0.129	0.12	0.240	0.060
zeroCatFreq	PFMCF018	SSTRec	0.072	0.08	0.100	0.040
zeroCatFreq	PFMCF018	invRegRec	0.334	0.32	0.540	0.140
zeroCatFreq	PFMCFSSST	ARRec	0.344	0.34	0.621	0.120
zeroCatFreq	PFMCFSSST	MICERec	0.127	0.12	0.200	0.060
zeroCatFreq	PFMCFSSST	PDOclimRec	0.192	0.18	0.320	0.100
zeroCatFreq	PFMCFSSST	PDOcyclRec	0.202	0.20	0.341	0.080
zeroCatFreq	PFMCFSSST	RegRec	0.139	0.12	0.240	0.060
zeroCatFreq	PFMCFSSST	SSTRec	0.073	0.08	0.100	0.040
zeroCatFreq	PFMCFSSST	invRegRec	0.391	0.38	0.580	0.220
zeroCatFreq	Pikitch	ARRec	0.181	0.16	0.380	0.060
zeroCatFreq	Pikitch	MICERec	0.085	0.08	0.120	0.060
zeroCatFreq	Pikitch	PDOclimRec	0.100	0.10	0.140	0.080
zeroCatFreq	Pikitch	PDOcyclRec	0.110	0.10	0.200	0.060
zeroCatFreq	Pikitch	RegRec	0.091	0.08	0.140	0.060
zeroCatFreq	Pikitch	SSTRec	0.069	0.06	0.080	0.060
zeroCatFreq	Pikitch	invRegRec	0.159	0.14	0.320	0.060
zeroCatLenMax	40-10	ARRec	1.275	1.00	3.000	1.000
zeroCatLenMax	40-10	MICERec	1.000	1.00	1.000	1.000
zeroCatLenMax	40-10	PDOclimRec	1.000	1.00	1.000	1.000
zeroCatLenMax	40-10	PDOcyclRec	1.000	1.00	1.000	1.000
zeroCatLenMax	40-10	RegRec	1.000	1.00	1.000	1.000
zeroCatLenMax	40-10	SSTRec	1.000	1.00	1.000	1.000
zeroCatLenMax	40-10	invRegRec	1.027	1.00	1.000	1.000
zeroCatLenMax	ConstF	ARRec	NaN	NA	NA	NA
zeroCatLenMax	ConstF	MICERec	NaN	NA	NA	NA
zeroCatLenMax	ConstF	PDOclimRec	NaN	NA	NA	NA

zeroCatLenMax	ConstF	PDOcyclRec	NaN	NA	NA	NA
zeroCatLenMax	ConstF	RegRec	NaN	NA	NA	NA
zeroCatLenMax	ConstF	SSTRec	NaN	NA	NA	NA
zeroCatLenMax	ConstF	invRegRec	NaN	NA	NA	NA
zeroCatLenMax	Dyn40-10	ARRec	NaN	NA	NA	NA
zeroCatLenMax	Dyn40-10	MICERec	NaN	NA	NA	NA
zeroCatLenMax	Dyn40-10	PDOclimRec	NaN	NA	NA	NA
zeroCatLenMax	Dyn40-10	PDOcyclRec	NaN	NA	NA	NA
zeroCatLenMax	Dyn40-10	RegRec	NaN	NA	NA	NA
zeroCatLenMax	Dyn40-10	SSTRec	NaN	NA	NA	NA
zeroCatLenMax	Dyn40-10	invRegRec	NaN	NA	NA	NA
zeroCatLenMax	DynPik	ARRec	2.698	3.00	3.000	2.000
zeroCatLenMax	DynPik	MICERec	2.656	3.00	3.000	2.000
zeroCatLenMax	DynPik	PDOclimRec	2.820	3.00	3.000	2.000
zeroCatLenMax	DynPik	PDOcyclRec	2.708	3.00	3.000	2.000
zeroCatLenMax	DynPik	RegRec	2.668	3.00	3.000	2.000
zeroCatLenMax	DynPik	SSTRec	2.560	3.00	3.000	2.000
zeroCatLenMax	DynPik	invRegRec	2.596	3.00	3.000	2.000
zeroCatLenMax	Index	ARRec	9.054	8.00	19.000	4.000
zeroCatLenMax	Index	MICERec	5.078	5.00	7.000	3.000
zeroCatLenMax	Index	PDOclimRec	5.808	6.00	8.000	4.000
zeroCatLenMax	Index	PDOcyclRec	6.648	6.00	12.000	3.000
zeroCatLenMax	Index	RegRec	5.474	5.00	9.000	3.000
zeroCatLenMax	Index	SSTRec	4.066	4.00	5.000	3.000
zeroCatLenMax	Index	invRegRec	8.114	7.00	16.000	4.000
zeroCatLenMax	NoCat	ARRec	50.000	50.00	50.000	50.000
zeroCatLenMax	NoCat	MICERec	50.000	50.00	50.000	50.000
zeroCatLenMax	NoCat	PDOclimRec	50.000	50.00	50.000	50.000
zeroCatLenMax	NoCat	PDOcyclRec	50.000	50.00	50.000	50.000
zeroCatLenMax	NoCat	RegRec	50.000	50.00	50.000	50.000
zeroCatLenMax	NoCat	SSTRec	50.000	50.00	50.000	50.000
zeroCatLenMax	NoCat	invRegRec	50.000	50.00	50.000	50.000
zeroCatLenMax	PFMCF018	ARRec	9.978	9.00	20.000	3.950
zeroCatLenMax	PFMCF018	MICERec	4.920	5.00	8.000	3.000
zeroCatLenMax	PFMCF018	PDOclimRec	5.820	6.00	9.000	4.000
zeroCatLenMax	PFMCF018	PDOcyclRec	7.436	7.00	15.000	3.000
zeroCatLenMax	PFMCF018	RegRec	5.730	5.00	11.000	3.000
zeroCatLenMax	PFMCF018	SSTRec	3.596	4.00	5.000	2.000
zeroCatLenMax	PFMCF018	invRegRec	9.130	8.00	18.000	3.950
zeroCatLenMax	PFMCFSSST	ARRec	10.306	9.00	20.050	4.000
zeroCatLenMax	PFMCFSSST	MICERec	4.978	5.00	8.000	3.000
zeroCatLenMax	PFMCFSSST	PDOclimRec	6.012	6.00	9.000	4.000
zeroCatLenMax	PFMCFSSST	PDOcyclRec	7.498	7.00	14.000	3.000
zeroCatLenMax	PFMCFSSST	RegRec	5.746	5.00	11.000	3.000
zeroCatLenMax	PFMCFSSST	SSTRec	3.620	4.00	5.000	2.000
zeroCatLenMax	PFMCFSSST	invRegRec	9.874	9.00	19.000	4.000
zeroCatLenMax	Pikitch	ARRec	6.678	5.00	14.050	3.000
zeroCatLenMax	Pikitch	MICERec	4.230	4.00	6.000	3.000
zeroCatLenMax	Pikitch	PDOclimRec	4.886	5.00	7.000	3.950
zeroCatLenMax	Pikitch	PDOcyclRec	5.306	5.00	9.000	3.000
zeroCatLenMax	Pikitch	RegRec	4.482	4.00	7.000	3.000

zeroCatLenMax	Pikitch	SSTRec	3.450	3.00	4.000	3.000
zeroCatLenMax	Pikitch	invRegRec	5.350	5.00	10.000	3.000

Table S5: Summary statistics for all performance metrics by HCR and reference recruitment scenario set.

Metric	nameHCR	climGroup	mean	median	SD	hi95	low0
Bio_smry	40-10	clim	1632237.862	642286.000	2805565.653	6812415.000	43332.253
Bio_smry	40-10	invRegRec	307623.070	189340.500	377672.297	955861.150	35859.420
Bio_smry	40-10	noClim	663343.586	370238.500	964838.142	2255284.500	37385.500
Bio_smry	ConstF	clim	1627606.611	637056.500	2806291.669	6806639.500	37337.453
Bio_smry	ConstF	invRegRec	302259.849	185228.500	375993.929	947364.950	29151.730
Bio_smry	ConstF	noClim	658361.824	365362.000	965584.475	2252846.500	35786.100
Bio_smry	Dyn40-10	clim	1629023.175	638718.000	2806075.013	6811310.500	39603.570
Bio_smry	Dyn40-10	invRegRec	303359.164	186042.000	376666.070	950762.700	30073.780
Bio_smry	Dyn40-10	noClim	659378.024	366248.000	965402.891	2254103.000	36252.400
Bio_smry	DynPik	clim	1664330.303	686358.500	2800633.135	6819445.500	44306.780
Bio_smry	DynPik	invRegRec	333483.993	216777.500	387952.141	1001500.000	37592.400
Bio_smry	DynPik	noClim	694185.126	405020.500	972502.177	2294731.000	37592.400
Bio_smry	Index	clim	1610017.546	626923.000	2783692.484	6721421.000	44451.600
Bio_smry	Index	invRegRec	326163.379	209854.000	381201.639	984552.900	38238.580
Bio_smry	Index	noClim	665603.862	372385.500	957605.462	2239379.000	37592.400
Bio_smry	NoCat	clim	1896230.329	888486.000	2910961.594	7320183.000	44482.230
Bio_smry	NoCat	invRegRec	430711.405	297343.000	452649.694	1240932.500	42187.200
Bio_smry	NoCat	noClim	855132.830	537732.000	1076537.052	2699108.000	38503.280
Bio_smry	PFMCF018	clim	1673503.881	699903.000	2796414.124	6819401.000	44482.230
Bio_smry	PFMCF018	invRegRec	359149.841	244982.500	390866.642	1029131.500	41013.300
Bio_smry	PFMCF018	noClim	713272.209	428899.500	971023.046	2310615.000	38255.750
Bio_smry	PFMCFSSST	clim	1604615.451	586891.000	2808922.481	6795847.500	44482.230
Bio_smry	PFMCFSSST	invRegRec	318329.315	207744.000	369724.585	940530.550	39662.930
Bio_smry	PFMCFSSST	noClim	643557.026	350165.000	945144.551	2206403.000	37855.060
Bio_smry	Pikitch	clim	1636145.095	646612.000	2804730.484	6813016.000	44373.920
Bio_smry	Pikitch	invRegRec	318225.677	199231.500	378732.939	966375.150	37592.400
Bio_smry	Pikitch	noClim	670383.847	377562.000	963820.979	2261314.500	37592.400
Value.SSB	40-10	clim	1315645.923	508345.000	2242316.108	5558686.000	46760.030
Value.SSB	40-10	invRegRec	236829.619	150338.000	276707.316	717658.200	28713.300
Value.SSB	40-10	noClim	518786.019	295008.000	740370.679	1744889.500	31987.130
Value.SSB	ConstF	clim	1311882.246	505052.000	2243042.684	5558614.000	39770.320
Value.SSB	ConstF	invRegRec	232364.274	147057.000	275747.967	711411.150	22879.510
Value.SSB	ConstF	noClim	514744.546	291640.000	741185.127	1743100.500	26054.500
Value.SSB	Dyn40-10	clim	1313020.327	506042.000	2242827.100	5557854.000	41948.060
Value.SSB	Dyn40-10	invRegRec	233252.145	147750.000	276211.494	713605.150	23780.590
Value.SSB	Dyn40-10	noClim	515544.475	292308.000	740995.505	1743293.000	27579.370
Value.SSB	DynPik	clim	1346341.716	551877.500	2236337.433	5570902.000	48653.950
Value.SSB	DynPik	invRegRec	260989.748	175101.000	285603.887	759166.250	31341.260
Value.SSB	DynPik	noClim	548290.734	329279.500	746093.156	1777378.000	33563.450
Value.SSB	Index	clim	1335819.428	528342.500	2240238.707	5566177.500	49255.160
Value.SSB	Index	invRegRec	267102.556	178613.500	291813.946	773145.100	38417.630
Value.SSB	Index	noClim	547168.067	317910.000	751224.684	1805938.500	36197.610
Value.SSB	NoCat	clim	1581101.521	747970.500	2351438.205	6077414.000	49429.220
Value.SSB	NoCat	invRegRec	356332.696	251331.000	356302.546	1004816.500	42481.710
Value.SSB	NoCat	noClim	709723.222	457153.000	855973.213	2206242.000	37461.560

Value.SSB	PFMCF018	clim	1354789.291	562647.000	2232114.141	5572232.000	49429.222
Value.SSB	PFMCF018	invRegRec	285242.942	203490.000	286620.547	784177.350	41199.811
Value.SSB	PFMCF018	noClim	565854.601	351398.500	743381.691	1786101.500	37199.953
Value.SSB	PFMCFSSST	clim	1288527.618	449330.500	2246572.803	5547231.000	49429.222
Value.SSB	PFMCFSSST	invRegRec	245995.982	169524.500	265216.669	680651.900	39886.463
Value.SSB	PFMCFSSST	noClim	498607.195	277063.000	723193.761	1702688.500	36865.471
Value.SSB	Pikitch	clim	1319037.872	512198.000	2241423.408	5559197.500	49117.881
Value.SSB	Pikitch	invRegRec	246283.278	158654.500	276639.616	724747.650	36468.471
Value.SSB	Pikitch	noClim	524906.443	300310.500	739126.153	1747592.500	35727.781
belowBonanzaLenMax	40-10	clim	8.322	7.000	4.937	17.000	3.000
belowBonanzaLenMax	40-10	invRegRec	22.824	22.000	6.588	34.000	13.000
belowBonanzaLenMax	40-10	noClim	15.809	14.000	8.231	31.000	6.000
belowBonanzaLenMax	ConstF	clim	8.449	7.000	5.000	17.000	3.000
belowBonanzaLenMax	ConstF	invRegRec	22.902	23.000	6.546	34.000	13.000
belowBonanzaLenMax	ConstF	noClim	16.114	14.000	8.411	31.000	6.000
belowBonanzaLenMax	Dyn40-10	clim	8.423	7.000	5.001	17.000	3.000
belowBonanzaLenMax	Dyn40-10	invRegRec	22.898	23.000	6.545	34.000	13.000
belowBonanzaLenMax	Dyn40-10	noClim	16.049	14.000	8.368	31.000	6.000
belowBonanzaLenMax	DynPik	clim	7.853	7.000	4.594	16.000	3.000
belowBonanzaLenMax	DynPik	invRegRec	21.602	22.000	6.165	31.000	12.000
belowBonanzaLenMax	DynPik	noClim	14.952	13.000	8.015	30.000	5.000
belowBonanzaLenMax	Index	clim	8.001	7.000	4.399	15.050	3.000
belowBonanzaLenMax	Index	invRegRec	21.534	22.000	6.086	30.000	12.000
belowBonanzaLenMax	Index	noClim	14.573	13.000	7.438	29.000	6.000
belowBonanzaLenMax	NoCat	clim	6.775	6.000	3.391	13.000	3.000
belowBonanzaLenMax	NoCat	invRegRec	18.070	19.000	5.340	25.000	10.000
belowBonanzaLenMax	NoCat	noClim	12.939	11.000	7.073	26.050	5.000
belowBonanzaLenMax	PFMCF018	clim	7.439	6.000	3.967	14.000	3.000
belowBonanzaLenMax	PFMCF018	invRegRec	20.278	21.000	5.741	29.000	11.000
belowBonanzaLenMax	PFMCF018	noClim	13.893	12.000	7.387	28.000	5.000
belowBonanzaLenMax	PFMCFSSST	clim	8.221	7.000	4.613	16.000	3.000
belowBonanzaLenMax	PFMCFSSST	invRegRec	22.050	23.000	6.108	31.000	12.000
belowBonanzaLenMax	PFMCFSSST	noClim	14.809	13.000	7.669	29.000	6.000
belowBonanzaLenMax	Pikitch	clim	8.162	7.000	4.783	17.000	3.000
belowBonanzaLenMax	Pikitch	invRegRec	22.276	22.000	6.526	34.000	12.000
belowBonanzaLenMax	Pikitch	noClim	15.210	14.000	7.939	30.000	6.000
belowBonanzaLenMean	40-10	clim	3.784	3.179	1.845	6.947	2.000
belowBonanzaLenMean	40-10	invRegRec	9.481	9.042	3.344	14.475	5.291
belowBonanzaLenMean	40-10	noClim	6.941	5.963	3.926	14.625	2.741
belowBonanzaLenMean	ConstF	clim	3.835	3.214	1.875	7.106	2.000
belowBonanzaLenMean	ConstF	invRegRec	9.516	9.068	3.330	14.449	5.291
belowBonanzaLenMean	ConstF	noClim	7.098	6.095	4.043	15.000	2.771
belowBonanzaLenMean	Dyn40-10	clim	3.824	3.214	1.876	7.078	2.000
belowBonanzaLenMean	Dyn40-10	invRegRec	9.507	9.063	3.331	14.475	5.291
belowBonanzaLenMean	Dyn40-10	noClim	7.069	6.076	4.009	14.927	2.771
belowBonanzaLenMean	DynPik	clim	3.629	3.054	1.689	6.292	2.000
belowBonanzaLenMean	DynPik	invRegRec	8.931	8.802	3.000	13.702	4.861
belowBonanzaLenMean	DynPik	noClim	6.624	5.667	3.801	14.000	2.571
belowBonanzaLenMean	Index	clim	3.619	3.175	1.546	6.243	2.000
belowBonanzaLenMean	Index	invRegRec	8.781	8.720	2.890	13.072	4.741
belowBonanzaLenMean	Index	noClim	6.265	5.392	3.448	12.954	2.631

belowBonanzaLenMean	NoCat	clim	3.361	3.000	1.315	5.765	2.000
belowBonanzaLenMean	NoCat	invRegRec	7.575	7.739	2.413	11.004	4.141
belowBonanzaLenMean	NoCat	noClim	5.998	5.192	3.293	12.239	2.441
belowBonanzaLenMean	PFMCF018	clim	3.471	3.000	1.412	5.907	2.000
belowBonanzaLenMean	PFMCF018	invRegRec	8.289	8.362	2.674	12.521	4.461
belowBonanzaLenMean	PFMCF018	noClim	6.113	5.233	3.421	12.550	2.561
belowBonanzaLenMean	PFMCFSSST	clim	3.673	3.163	1.622	6.502	2.000
belowBonanzaLenMean	PFMCFSSST	invRegRec	8.945	8.890	2.931	13.449	4.841
belowBonanzaLenMean	PFMCFSSST	noClim	6.269	5.339	3.560	12.803	2.591
belowBonanzaLenMean	Pikitch	clim	3.717	3.108	1.750	6.552	2.000
belowBonanzaLenMean	Pikitch	invRegRec	9.185	8.861	3.255	14.420	4.911
belowBonanzaLenMean	Pikitch	noClim	6.655	5.683	3.747	13.971	2.661
bonanzaFreq	40-10	clim	0.654	0.640	0.222	0.940	0.300
bonanzaFreq	40-10	invRegRec	0.235	0.240	0.111	0.420	0.060
bonanzaFreq	40-10	noClim	0.472	0.480	0.184	0.760	0.160
bonanzaFreq	ConstF	clim	0.651	0.640	0.223	0.940	0.280
bonanzaFreq	ConstF	invRegRec	0.231	0.240	0.110	0.420	0.050
bonanzaFreq	ConstF	noClim	0.468	0.480	0.184	0.741	0.140
bonanzaFreq	Dyn40-10	clim	0.652	0.640	0.223	0.940	0.280
bonanzaFreq	Dyn40-10	invRegRec	0.231	0.240	0.110	0.420	0.050
bonanzaFreq	Dyn40-10	noClim	0.468	0.480	0.184	0.760	0.140
bonanzaFreq	DynPik	clim	0.685	0.700	0.206	0.940	0.320
bonanzaFreq	DynPik	invRegRec	0.265	0.280	0.117	0.460	0.080
bonanzaFreq	DynPik	noClim	0.505	0.520	0.186	0.780	0.180
bonanzaFreq	Index	clim	0.646	0.620	0.218	0.920	0.300
bonanzaFreq	Index	invRegRec	0.242	0.240	0.099	0.400	0.080
bonanzaFreq	Index	noClim	0.473	0.480	0.172	0.720	0.180
bonanzaFreq	NoCat	clim	0.773	0.800	0.147	0.940	0.480
bonanzaFreq	NoCat	invRegRec	0.375	0.380	0.123	0.580	0.160
bonanzaFreq	NoCat	noClim	0.609	0.640	0.181	0.860	0.260
bonanzaFreq	PFMCF018	clim	0.698	0.700	0.194	0.940	0.360
bonanzaFreq	PFMCF018	invRegRec	0.288	0.300	0.109	0.480	0.100
bonanzaFreq	PFMCF018	noClim	0.528	0.540	0.181	0.800	0.200
bonanzaFreq	PFMCFSSST	clim	0.625	0.600	0.234	0.921	0.260
bonanzaFreq	PFMCFSSST	invRegRec	0.229	0.240	0.099	0.400	0.060
bonanzaFreq	PFMCFSSST	noClim	0.446	0.440	0.176	0.720	0.160
bonanzaFreq	Pikitch	clim	0.657	0.660	0.219	0.940	0.300
bonanzaFreq	Pikitch	invRegRec	0.242	0.250	0.110	0.420	0.060
bonanzaFreq	Pikitch	noClim	0.478	0.500	0.182	0.760	0.160
closuresFreq	40-10	clim	0.122	0.100	0.071	0.260	0.040
closuresFreq	40-10	invRegRec	0.419	0.420	0.118	0.620	0.220
closuresFreq	40-10	noClim	0.232	0.180	0.151	0.540	0.060
closuresFreq	ConstF	clim	0.126	0.100	0.074	0.280	0.060
closuresFreq	ConstF	invRegRec	0.428	0.420	0.121	0.620	0.230
closuresFreq	ConstF	noClim	0.243	0.200	0.156	0.540	0.080
closuresFreq	Dyn40-10	clim	0.125	0.100	0.073	0.280	0.060
closuresFreq	Dyn40-10	invRegRec	0.427	0.420	0.121	0.620	0.220
closuresFreq	Dyn40-10	noClim	0.240	0.200	0.156	0.540	0.060
closuresFreq	DynPik	clim	0.106	0.080	0.056	0.220	0.040
closuresFreq	DynPik	invRegRec	0.367	0.360	0.119	0.560	0.170
closuresFreq	DynPik	noClim	0.205	0.160	0.141	0.500	0.060



closuresFreq	Index	clim	0.119	0.100	0.063	0.240	0.055
closuresFreq	Index	invRegRec	0.354	0.340	0.108	0.540	0.180
closuresFreq	Index	noClim	0.205	0.160	0.133	0.480	0.060
closuresFreq	NoCat	clim	0.089	0.080	0.035	0.160	0.040
closuresFreq	NoCat	invRegRec	0.248	0.240	0.110	0.440	0.090
closuresFreq	NoCat	noClim	0.160	0.120	0.112	0.380	0.060
closuresFreq	PFMCF018	clim	0.096	0.080	0.042	0.180	0.040
closuresFreq	PFMCF018	invRegRec	0.292	0.280	0.111	0.480	0.120
closuresFreq	PFMCF018	noClim	0.173	0.140	0.120	0.420	0.060
closuresFreq	PFMCFSSST	clim	0.111	0.100	0.058	0.220	0.040
closuresFreq	PFMCFSSST	invRegRec	0.346	0.340	0.106	0.520	0.180
closuresFreq	PFMCFSSST	noClim	0.191	0.160	0.129	0.460	0.060
closuresFreq	Pikitch	clim	0.117	0.100	0.066	0.260	0.040
closuresFreq	Pikitch	invRegRec	0.391	0.400	0.110	0.580	0.220
closuresFreq	Pikitch	noClim	0.216	0.180	0.140	0.500	0.060
collapseFreq	40-10	clim	0.054	0.040	0.018	0.080	0.040
collapseFreq	40-10	invRegRec	0.118	0.100	0.074	0.261	0.040
collapseFreq	40-10	noClim	0.081	0.060	0.065	0.220	0.040
collapseFreq	ConstF	clim	0.059	0.060	0.021	0.100	0.040
collapseFreq	ConstF	invRegRec	0.136	0.120	0.089	0.320	0.040
collapseFreq	ConstF	noClim	0.096	0.060	0.084	0.280	0.040
collapseFreq	Dyn40-10	clim	0.057	0.060	0.020	0.100	0.040
collapseFreq	Dyn40-10	invRegRec	0.134	0.100	0.088	0.320	0.040
collapseFreq	Dyn40-10	noClim	0.092	0.060	0.081	0.260	0.040
collapseFreq	DynPik	clim	0.054	0.040	0.017	0.080	0.040
collapseFreq	DynPik	invRegRec	0.093	0.060	0.066	0.220	0.040
collapseFreq	DynPik	noClim	0.074	0.060	0.060	0.200	0.040
collapseFreq	Index	clim	0.054	0.040	0.017	0.080	0.040
collapseFreq	Index	invRegRec	0.069	0.060	0.042	0.140	0.040
collapseFreq	Index	noClim	0.069	0.060	0.048	0.160	0.040
collapseFreq	NoCat	clim	0.054	0.040	0.017	0.080	0.040
collapseFreq	NoCat	invRegRec	0.060	0.040	0.032	0.120	0.040
collapseFreq	NoCat	noClim	0.065	0.060	0.042	0.140	0.040
collapseFreq	PFMCF018	clim	0.054	0.040	0.017	0.080	0.040
collapseFreq	PFMCF018	invRegRec	0.062	0.060	0.035	0.120	0.040
collapseFreq	PFMCF018	noClim	0.066	0.060	0.044	0.140	0.040
collapseFreq	PFMCFSSST	clim	0.054	0.040	0.017	0.080	0.040
collapseFreq	PFMCFSSST	invRegRec	0.065	0.060	0.037	0.120	0.040
collapseFreq	PFMCFSSST	noClim	0.067	0.060	0.045	0.160	0.040
collapseFreq	Pikitch	clim	0.054	0.040	0.017	0.080	0.040
collapseFreq	Pikitch	invRegRec	0.079	0.060	0.049	0.180	0.040
collapseFreq	Pikitch	noClim	0.070	0.060	0.050	0.180	0.040
lowCatFreq	40-10	clim	0.330	0.340	0.207	0.660	0.080
lowCatFreq	40-10	invRegRec	0.745	0.740	0.108	0.921	0.560
lowCatFreq	40-10	noClim	0.507	0.490	0.182	0.840	0.240
lowCatFreq	ConstF	clim	0.332	0.340	0.208	0.680	0.080
lowCatFreq	ConstF	invRegRec	0.748	0.740	0.108	0.940	0.560
lowCatFreq	ConstF	noClim	0.510	0.500	0.182	0.840	0.240
lowCatFreq	Dyn40-10	clim	0.331	0.340	0.207	0.680	0.080
lowCatFreq	Dyn40-10	invRegRec	0.747	0.740	0.108	0.940	0.560
lowCatFreq	Dyn40-10	noClim	0.509	0.500	0.182	0.840	0.240

lowCatFreq	DynPik	clim	0.408	0.460	0.238	0.760	0.080
lowCatFreq	DynPik	invRegRec	0.810	0.820	0.092	0.960	0.640
lowCatFreq	DynPik	noClim	0.586	0.580	0.169	0.880	0.320
lowCatFreq	Index	clim	0.401	0.440	0.229	0.740	0.100
lowCatFreq	Index	invRegRec	0.789	0.800	0.092	0.940	0.620
lowCatFreq	Index	noClim	0.577	0.560	0.165	0.860	0.320
lowCatFreq	NoCat	clim	1.000	1.000	0.000	1.000	1.000
lowCatFreq	NoCat	invRegRec	1.000	1.000	0.000	1.000	1.000
lowCatFreq	NoCat	noClim	1.000	1.000	0.000	1.000	1.000
lowCatFreq	PFMCF018	clim	0.426	0.480	0.255	0.800	0.080
lowCatFreq	PFMCF018	invRegRec	0.832	0.840	0.097	0.980	0.660
lowCatFreq	PFMCF018	noClim	0.609	0.600	0.172	0.900	0.340
lowCatFreq	PFMCFSSST	clim	0.321	0.330	0.196	0.640	0.080
lowCatFreq	PFMCFSSST	invRegRec	0.721	0.720	0.105	0.900	0.540
lowCatFreq	PFMCFSSST	noClim	0.487	0.460	0.167	0.780	0.240
lowCatFreq	Pikitch	clim	0.328	0.340	0.205	0.660	0.080
lowCatFreq	Pikitch	invRegRec	0.740	0.740	0.107	0.920	0.560
lowCatFreq	Pikitch	noClim	0.502	0.480	0.179	0.820	0.240
lowCatLenMax	40-10	clim	8.281	7.000	4.804	17.000	4.000
lowCatLenMax	40-10	invRegRec	21.616	22.000	6.383	31.050	12.000
lowCatLenMax	40-10	noClim	15.535	14.000	7.882	31.000	6.000
lowCatLenMax	ConstF	clim	8.354	7.000	4.837	17.000	4.000
lowCatLenMax	ConstF	invRegRec	21.672	22.000	6.388	31.050	12.000
lowCatLenMax	ConstF	noClim	15.767	14.000	8.023	31.000	6.000
lowCatLenMax	Dyn40-10	clim	8.319	7.000	4.805	17.000	4.000
lowCatLenMax	Dyn40-10	invRegRec	21.664	22.000	6.389	31.050	12.000
lowCatLenMax	Dyn40-10	noClim	15.688	14.000	7.995	31.000	6.000
lowCatLenMax	DynPik	clim	9.315	8.000	5.195	19.000	4.000
lowCatLenMax	DynPik	invRegRec	23.184	23.000	6.854	34.050	13.000
lowCatLenMax	DynPik	noClim	16.850	15.000	8.089	32.000	7.000
lowCatLenMax	Index	clim	8.724	8.000	4.195	16.000	4.000
lowCatLenMax	Index	invRegRec	21.342	22.000	5.511	31.000	12.000
lowCatLenMax	Index	noClim	15.465	14.000	7.391	29.000	6.000
lowCatLenMax	NoCat	clim	50.000	50.000	0.000	50.000	50.000
lowCatLenMax	NoCat	invRegRec	50.000	50.000	0.000	50.000	50.000
lowCatLenMax	NoCat	noClim	50.000	50.000	0.000	50.000	50.000
lowCatLenMax	PFMCF018	clim	10.517	9.000	6.531	25.000	4.000
lowCatLenMax	PFMCF018	invRegRec	25.098	24.000	8.152	42.300	14.000
lowCatLenMax	PFMCF018	noClim	18.852	17.000	8.786	35.000	8.000
lowCatLenMax	PFMCFSSST	clim	7.549	6.000	3.915	14.000	4.000
lowCatLenMax	PFMCFSSST	invRegRec	18.142	18.000	5.930	27.000	9.950
lowCatLenMax	PFMCFSSST	noClim	13.893	12.000	6.952	27.000	5.000
lowCatLenMax	Pikitch	clim	8.206	7.000	4.717	17.000	4.000
lowCatLenMax	Pikitch	invRegRec	21.198	21.000	6.266	30.000	12.000
lowCatLenMax	Pikitch	noClim	15.217	14.000	7.663	29.000	6.000
meanCollapseSever	40-10	clim	0.459	0.523	0.074	0.525	0.330
meanCollapseSever	40-10	invRegRec	0.371	0.355	0.087	0.525	0.240
meanCollapseSever	40-10	noClim	0.424	0.419	0.093	0.525	0.270
meanCollapseSever	ConstF	clim	0.466	0.477	0.073	0.539	0.330
meanCollapseSever	ConstF	invRegRec	0.391	0.378	0.089	0.537	0.260
meanCollapseSever	ConstF	noClim	0.433	0.430	0.092	0.539	0.280

meanCollapseSever	Dyn40-10	clim	0.463	0.470	0.074	0.537	0.333
meanCollapseSever	Dyn40-10	invRegRec	0.388	0.374	0.089	0.535	0.257
meanCollapseSever	Dyn40-10	noClim	0.432	0.428	0.094	0.537	0.273
meanCollapseSever	DynPik	clim	0.458	0.522	0.073	0.522	0.329
meanCollapseSever	DynPik	invRegRec	0.399	0.384	0.095	0.522	0.248
meanCollapseSever	DynPik	noClim	0.433	0.431	0.090	0.522	0.273
meanCollapseSever	Index	clim	0.458	0.522	0.073	0.522	0.329
meanCollapseSever	Index	invRegRec	0.423	0.420	0.096	0.522	0.257
meanCollapseSever	Index	noClim	0.435	0.436	0.090	0.522	0.273
meanCollapseSever	NoCat	clim	0.459	0.522	0.073	0.522	0.333
meanCollapseSever	NoCat	invRegRec	0.446	0.522	0.089	0.522	0.287
meanCollapseSever	NoCat	noClim	0.440	0.446	0.088	0.522	0.287
meanCollapseSever	PFMCF018	clim	0.459	0.522	0.073	0.522	0.333
meanCollapseSever	PFMCF018	invRegRec	0.439	0.452	0.091	0.522	0.273
meanCollapseSever	PFMCF018	noClim	0.439	0.443	0.089	0.522	0.273
meanCollapseSever	PFMCFSSST	clim	0.459	0.522	0.073	0.522	0.333
meanCollapseSever	PFMCFSSST	invRegRec	0.432	0.438	0.094	0.522	0.273
meanCollapseSever	PFMCFSSST	noClim	0.437	0.439	0.089	0.522	0.273
meanCollapseSever	Pikitch	clim	0.458	0.522	0.073	0.522	0.329
meanCollapseSever	Pikitch	invRegRec	0.401	0.386	0.099	0.522	0.248
meanCollapseSever	Pikitch	noClim	0.434	0.432	0.090	0.522	0.273
meanCollapseTime	40-10	clim	2.665	2.000	0.850	4.000	2.000
meanCollapseTime	40-10	invRegRec	2.703	2.000	1.270	5.000	1.500
meanCollapseTime	40-10	noClim	2.963	2.500	1.572	5.683	1.667
meanCollapseTime	ConstF	clim	2.880	3.000	1.026	5.000	2.000
meanCollapseTime	ConstF	invRegRec	2.916	2.500	1.441	6.000	1.500
meanCollapseTime	ConstF	noClim	3.439	3.000	2.217	7.000	2.000
meanCollapseTime	Dyn40-10	clim	2.790	3.000	0.965	5.000	2.000
meanCollapseTime	Dyn40-10	invRegRec	2.869	2.500	1.508	6.000	1.500
meanCollapseTime	Dyn40-10	noClim	3.332	3.000	2.292	7.000	2.000
meanCollapseTime	DynPik	clim	2.658	2.000	0.840	4.000	2.000
meanCollapseTime	DynPik	invRegRec	2.626	2.000	1.138	5.000	1.500
meanCollapseTime	DynPik	noClim	2.953	2.500	1.632	6.000	2.000
meanCollapseTime	Index	clim	2.661	2.000	0.836	4.000	2.000
meanCollapseTime	Index	invRegRec	2.512	2.000	0.972	4.000	1.500
meanCollapseTime	Index	noClim	2.901	2.500	1.444	5.000	2.000
meanCollapseTime	NoCat	clim	2.663	2.000	0.836	4.000	2.000
meanCollapseTime	NoCat	invRegRec	2.518	2.000	0.907	4.000	1.658
meanCollapseTime	NoCat	noClim	2.894	2.000	1.454	5.000	2.000
meanCollapseTime	PFMCF018	clim	2.663	2.000	0.836	4.000	2.000
meanCollapseTime	PFMCF018	invRegRec	2.516	2.000	0.920	4.000	1.500
meanCollapseTime	PFMCF018	noClim	2.900	2.333	1.457	5.000	2.000
meanCollapseTime	PFMCFSSST	clim	2.663	2.000	0.836	4.000	2.000
meanCollapseTime	PFMCFSSST	invRegRec	2.510	2.000	0.938	4.000	1.500
meanCollapseTime	PFMCFSSST	noClim	2.898	2.500	1.440	5.000	2.000
meanCollapseTime	Pikitch	clim	2.661	2.000	0.836	4.000	2.000
meanCollapseTime	Pikitch	invRegRec	2.495	2.000	1.024	4.342	1.500
meanCollapseTime	Pikitch	noClim	2.908	2.500	1.455	5.500	2.000
meanRebuildTime	40-10	clim	3.618	3.333	1.318	6.000	2.000
meanRebuildTime	40-10	invRegRec	4.700	4.000	2.397	9.683	2.000
meanRebuildTime	40-10	noClim	5.430	4.333	3.902	12.000	2.000

meanRebuildTime	ConstF	clim	3.779	3.500	1.450	7.000	2.000
meanRebuildTime	ConstF	invRegRec	4.746	4.000	2.367	9.342	2.150
meanRebuildTime	ConstF	noClim	5.859	4.667	4.211	14.000	2.000
meanRebuildTime	Dyn40-10	clim	3.732	3.500	1.441	6.500	2.000
meanRebuildTime	Dyn40-10	invRegRec	4.719	4.000	2.330	9.333	2.000
meanRebuildTime	Dyn40-10	noClim	5.759	4.500	4.159	13.000	2.000
meanRebuildTime	DynPik	clim	3.780	3.667	1.383	6.500	2.000
meanRebuildTime	DynPik	invRegRec	4.534	4.000	2.211	9.000	2.000
meanRebuildTime	DynPik	noClim	5.398	4.333	3.700	12.000	2.000
meanRebuildTime	Index	clim	3.500	3.000	1.178	6.000	2.000
meanRebuildTime	Index	invRegRec	4.401	4.000	2.006	8.017	2.000
meanRebuildTime	Index	noClim	4.955	4.000	3.207	11.000	2.000
meanRebuildTime	NoCat	clim	4.107	4.000	1.467	7.000	2.000
meanRebuildTime	NoCat	invRegRec	4.308	4.000	1.971	8.262	2.000
meanRebuildTime	NoCat	noClim	5.532	5.000	3.504	12.000	2.000
meanRebuildTime	PFMCF018	clim	3.876	4.000	1.395	7.000	2.000
meanRebuildTime	PFMCF018	invRegRec	4.337	4.000	1.997	8.000	2.000
meanRebuildTime	PFMCF018	noClim	5.378	4.500	3.388	11.500	2.000
meanRebuildTime	PFMCFSSST	clim	3.564	3.000	1.231	6.000	2.000
meanRebuildTime	PFMCFSSST	invRegRec	4.348	4.000	1.991	8.333	2.000
meanRebuildTime	PFMCFSSST	noClim	5.036	4.000	3.199	11.000	2.000
meanRebuildTime	Pikitch	clim	3.571	3.000	1.250	6.000	2.000
meanRebuildTime	Pikitch	invRegRec	4.716	4.225	2.106	8.667	2.250
meanRebuildTime	Pikitch	noClim	5.028	4.000	3.282	11.000	2.000
nClosures	40-10	clim	1.721	1.000	0.979	4.000	1.000
nClosures	40-10	invRegRec	3.100	3.000	1.382	6.000	1.000
nClosures	40-10	noClim	2.243	2.000	1.099	4.000	1.000
nClosures	ConstF	clim	1.716	1.000	0.986	4.000	1.000
nClosures	ConstF	invRegRec	3.046	3.000	1.368	6.000	1.000
nClosures	ConstF	noClim	2.192	2.000	1.063	4.000	1.000
nClosures	Dyn40-10	clim	1.720	1.000	0.987	4.000	1.000
nClosures	Dyn40-10	invRegRec	3.036	3.000	1.349	6.000	1.000
nClosures	Dyn40-10	noClim	2.203	2.000	1.069	4.000	1.000
nClosures	DynPik	clim	1.440	1.000	0.753	3.000	1.000
nClosures	DynPik	invRegRec	2.912	3.000	1.236	5.000	1.000
nClosures	DynPik	noClim	1.960	2.000	1.013	4.000	1.000
nClosures	Index	clim	1.743	1.000	0.939	4.000	1.000
nClosures	Index	invRegRec	3.442	3.000	1.237	6.000	2.000
nClosures	Index	noClim	2.141	2.000	1.009	4.000	1.000
nClosures	NoCat	clim	1.101	1.000	0.343	2.000	1.000
nClosures	NoCat	invRegRec	2.428	2.000	1.000	4.000	1.000
nClosures	NoCat	noClim	1.488	1.000	0.747	3.000	1.000
nClosures	PFMCF018	clim	1.283	1.000	0.582	2.000	1.000
nClosures	PFMCF018	invRegRec	2.872	3.000	1.103	5.000	1.000
nClosures	PFMCF018	noClim	1.638	1.000	0.822	3.000	1.000
nClosures	PFMCFSSST	clim	1.615	1.000	0.868	3.000	1.000
nClosures	PFMCFSSST	invRegRec	3.406	3.000	1.246	6.000	2.000
nClosures	PFMCFSSST	noClim	1.959	2.000	1.007	4.000	1.000
nClosures	Pikitch	clim	1.683	1.000	0.938	4.000	1.000
nClosures	Pikitch	invRegRec	3.320	3.000	1.298	6.000	1.000
nClosures	Pikitch	noClim	2.231	2.000	1.097	4.000	1.000

nCollapses	40-10	clim	1.029	1.000	0.171	1.000	1.000
nCollapses	40-10	invRegRec	1.978	2.000	0.882	3.050	1.000
nCollapses	40-10	noClim	1.310	1.000	0.617	3.000	1.000
nCollapses	ConstF	clim	1.039	1.000	0.200	1.000	1.000
nCollapses	ConstF	invRegRec	1.956	2.000	0.907	4.000	1.000
nCollapses	ConstF	noClim	1.340	1.000	0.650	3.000	1.000
nCollapses	Dyn40-10	clim	1.041	1.000	0.201	1.000	1.000
nCollapses	Dyn40-10	invRegRec	1.978	2.000	0.920	4.000	1.000
nCollapses	Dyn40-10	noClim	1.335	1.000	0.657	3.000	1.000
nCollapses	DynPik	clim	1.016	1.000	0.131	1.000	1.000
nCollapses	DynPik	invRegRec	1.604	1.000	0.777	3.000	1.000
nCollapses	DynPik	noClim	1.205	1.000	0.509	2.000	1.000
nCollapses	Index	clim	1.012	1.000	0.115	1.000	1.000
nCollapses	Index	invRegRec	1.365	1.000	0.607	3.000	1.000
nCollapses	Index	noClim	1.151	1.000	0.429	2.000	1.000
nCollapses	NoCat	clim	1.009	1.000	0.096	1.000	1.000
nCollapses	NoCat	invRegRec	1.174	1.000	0.442	2.000	1.000
nCollapses	NoCat	noClim	1.107	1.000	0.359	2.000	1.000
nCollapses	PFMCF018	clim	1.009	1.000	0.096	1.000	1.000
nCollapses	PFMCF018	invRegRec	1.222	1.000	0.491	2.000	1.000
nCollapses	PFMCF018	noClim	1.116	1.000	0.374	2.000	1.000
nCollapses	PFMCFSSST	clim	1.009	1.000	0.096	1.000	1.000
nCollapses	PFMCFSSST	invRegRec	1.284	1.000	0.551	2.000	1.000
nCollapses	PFMCFSSST	noClim	1.127	1.000	0.390	2.000	1.000
nCollapses	Pikitch	clim	1.013	1.000	0.118	1.000	1.000
nCollapses	Pikitch	invRegRec	1.562	1.000	0.752	3.000	1.000
nCollapses	Pikitch	noClim	1.169	1.000	0.464	2.000	1.000
nocatFreq	40-10	clim	0.016	0.020	0.008	0.020	0.000
nocatFreq	40-10	invRegRec	0.017	0.020	0.011	0.020	0.000
nocatFreq	40-10	noClim	0.018	0.020	0.017	0.020	0.000
nocatFreq	ConstF	clim	0.000	0.000	0.000	0.000	0.000
nocatFreq	ConstF	invRegRec	0.000	0.000	0.000	0.000	0.000
nocatFreq	ConstF	noClim	0.000	0.000	0.000	0.000	0.000
nocatFreq	Dyn40-10	clim	0.000	0.000	0.000	0.000	0.000
nocatFreq	Dyn40-10	invRegRec	0.000	0.000	0.000	0.000	0.000
nocatFreq	Dyn40-10	noClim	0.000	0.000	0.000	0.000	0.000
nocatFreq	DynPik	clim	0.054	0.060	0.009	0.060	0.040
nocatFreq	DynPik	invRegRec	0.052	0.060	0.010	0.060	0.040
nocatFreq	DynPik	noClim	0.054	0.060	0.009	0.060	0.040
nocatFreq	Index	clim	0.131	0.120	0.059	0.240	0.060
nocatFreq	Index	invRegRec	0.345	0.340	0.105	0.520	0.180
nocatFreq	Index	noClim	0.216	0.180	0.124	0.480	0.080
nocatFreq	NoCat	clim	1.000	1.000	0.000	1.000	1.000
nocatFreq	NoCat	invRegRec	1.000	1.000	0.000	1.000	1.000
nocatFreq	NoCat	noClim	1.000	1.000	0.000	1.000	1.000
nocatFreq	PFMCF018	clim	0.111	0.100	0.051	0.220	0.060
nocatFreq	PFMCF018	invRegRec	0.334	0.320	0.120	0.540	0.140
nocatFreq	PFMCF018	noClim	0.206	0.160	0.129	0.480	0.060
nocatFreq	PFMCFSSST	clim	0.131	0.100	0.068	0.260	0.060
nocatFreq	PFMCFSSST	invRegRec	0.391	0.380	0.112	0.580	0.220
nocatFreq	PFMCFSSST	noClim	0.228	0.190	0.138	0.520	0.080

nocatFreq	Pikitch	clim	0.085	0.080	0.024	0.140	0.066
nocatFreq	Pikitch	invRegRec	0.159	0.140	0.083	0.320	0.066
nocatFreq	Pikitch	noClim	0.127	0.100	0.080	0.300	0.066
relBio_smryMean	40-10	clim	0.964	0.716	0.892	2.681	0.066
relBio_smryMean	40-10	invRegRec	0.917	0.623	0.918	2.693	0.100
relBio_smryMean	40-10	noClim	0.950	0.643	0.988	2.892	0.066
relBio_smryMean	ConstF	clim	0.959	0.712	0.892	2.674	0.050
relBio_smryMean	ConstF	invRegRec	0.899	0.607	0.913	2.670	0.080
relBio_smryMean	ConstF	noClim	0.939	0.633	0.988	2.882	0.050
relBio_smryMean	Dyn40-10	clim	0.960	0.713	0.892	2.676	0.050
relBio_smryMean	Dyn40-10	invRegRec	0.902	0.611	0.915	2.674	0.080
relBio_smryMean	Dyn40-10	noClim	0.941	0.635	0.988	2.884	0.050
relBio_smryMean	DynPik	clim	1.006	0.769	0.900	2.726	0.066
relBio_smryMean	DynPik	invRegRec	0.998	0.712	0.946	2.820	0.110
relBio_smryMean	DynPik	noClim	1.003	0.707	1.003	2.963	0.066
relBio_smryMean	Index	clim	0.962	0.702	0.904	2.712	0.066
relBio_smryMean	Index	invRegRec	0.986	0.696	0.938	2.811	0.120
relBio_smryMean	Index	noClim	0.969	0.656	0.998	2.931	0.070
relBio_smryMean	NoCat	clim	1.219	0.988	1.000	3.105	0.066
relBio_smryMean	NoCat	invRegRec	1.296	0.977	1.121	3.476	0.140
relBio_smryMean	NoCat	noClim	1.259	0.945	1.159	3.532	0.070
relBio_smryMean	PFMCF018	clim	1.028	0.793	0.908	2.756	0.066
relBio_smryMean	PFMCF018	invRegRec	1.087	0.806	0.965	2.954	0.130
relBio_smryMean	PFMCF018	noClim	1.046	0.756	1.012	3.013	0.070
relBio_smryMean	PFMCFSSST	clim	0.933	0.676	0.881	2.649	0.066
relBio_smryMean	PFMCFSSST	invRegRec	0.962	0.689	0.897	2.699	0.130
relBio_smryMean	PFMCFSSST	noClim	0.928	0.627	0.957	2.819	0.070
relBio_smryMean	Pikitch	clim	0.970	0.723	0.894	2.688	0.066
relBio_smryMean	Pikitch	invRegRec	0.953	0.661	0.920	2.727	0.120
relBio_smryMean	Pikitch	noClim	0.966	0.660	0.989	2.910	0.070
reltotCatchMean	40-10	clim	1.157	1.171	0.738	2.576	0.010
reltotCatchMean	40-10	invRegRec	1.252	0.915	1.164	3.652	0.020
reltotCatchMean	40-10	noClim	1.179	0.928	0.996	3.036	0.010
reltotCatchMean	ConstF	clim	1.157	1.164	0.731	2.568	0.070
reltotCatchMean	ConstF	invRegRec	1.258	0.903	1.139	3.627	0.120
reltotCatchMean	ConstF	noClim	1.178	0.918	0.981	3.025	0.080
reltotCatchMean	Dyn40-10	clim	1.157	1.167	0.733	2.571	0.060
reltotCatchMean	Dyn40-10	invRegRec	1.258	0.904	1.144	3.634	0.100
reltotCatchMean	Dyn40-10	noClim	1.179	0.921	0.983	3.027	0.060
reltotCatchMean	DynPik	clim	1.025	0.951	0.735	2.462	0.000
reltotCatchMean	DynPik	invRegRec	1.045	0.687	1.089	3.358	0.000
reltotCatchMean	DynPik	noClim	1.020	0.727	0.960	2.883	0.000
reltotCatchMean	Index	clim	1.077	1.088	0.878	2.792	0.000
reltotCatchMean	Index	invRegRec	0.983	0.374	1.406	4.109	0.000
reltotCatchMean	Index	noClim	1.042	0.662	1.146	3.203	0.000
reltotCatchMean	NoCat	clim	0.000	0.000	0.000	0.000	0.000
reltotCatchMean	NoCat	invRegRec	0.000	0.000	0.000	0.000	0.000
reltotCatchMean	NoCat	noClim	0.000	0.000	0.000	0.000	0.000
reltotCatchMean	PFMCF018	clim	0.975	0.918	0.761	2.434	0.000
reltotCatchMean	PFMCF018	invRegRec	0.796	0.346	1.104	3.178	0.000
reltotCatchMean	PFMCF018	noClim	0.918	0.601	0.994	2.843	0.000

reltotCatchMean	PFMCFSSST	clim	1.303	1.318	0.995	3.204	0.000
reltotCatchMean	PFMCFSSST	invRegRec	1.215	0.440	1.644	4.771	0.000
reltotCatchMean	PFMCFSSST	noClim	1.326	0.975	1.334	3.683	0.000
reltotCatchMean	Pikitch	clim	1.149	1.175	0.752	2.582	0.000
reltotCatchMean	Pikitch	invRegRec	1.192	0.891	1.224	3.668	0.000
reltotCatchMean	Pikitch	noClim	1.159	0.931	1.025	3.045	0.000
sdCatch	40-10	clim	53905.598	57177.668	11532.602	68520.939	30732.320
sdCatch	40-10	invRegRec	35663.645	34091.962	13619.786	60862.708	16367.220
sdCatch	40-10	noClim	54372.602	56794.666	15986.992	76282.519	24790.250
sdCatch	ConstF	clim	53448.274	56776.482	11583.185	68073.507	30349.400
sdCatch	ConstF	invRegRec	35011.583	33392.711	13707.537	60528.974	15678.030
sdCatch	ConstF	noClim	53876.547	56349.093	16134.389	75820.080	23943.430
sdCatch	Dyn40-10	clim	53567.970	56867.052	11578.876	68178.072	30475.800
sdCatch	Dyn40-10	invRegRec	35151.638	33579.027	13703.002	60664.247	15765.050
sdCatch	Dyn40-10	noClim	53974.539	56404.659	16114.363	75882.110	24130.600
sdCatch	DynPik	clim	55093.723	58655.105	13386.478	71533.947	29035.890
sdCatch	DynPik	invRegRec	33565.581	31505.618	13530.184	57898.742	15145.730
sdCatch	DynPik	noClim	53205.773	55566.155	16726.406	76678.114	22900.620
sdCatch	Index	clim	61840.326	63960.197	10562.840	75733.397	40756.440
sdCatch	Index	invRegRec	43141.832	43028.438	14823.717	68163.263	19488.150
sdCatch	Index	noClim	61948.840	64631.316	15896.433	82729.597	31232.300
sdCatch	NoCat	clim	0.000	0.000	0.000	0.000	0.000
sdCatch	NoCat	invRegRec	0.000	0.000	0.000	0.000	0.000
sdCatch	NoCat	noClim	0.000	0.000	0.000	0.000	0.000
sdCatch	PFMCF018	clim	55746.595	59482.957	13367.192	72437.961	29074.780
sdCatch	PFMCF018	invRegRec	33986.003	30843.240	14897.936	60811.047	13805.280
sdCatch	PFMCF018	noClim	55154.527	58160.503	18056.140	80430.596	22457.720
sdCatch	PFMCFSSST	clim	64844.318	64865.781	8874.945	78143.267	50439.670
sdCatch	PFMCFSSST	invRegRec	50135.241	50722.150	15221.177	74962.501	25682.920
sdCatch	PFMCFSSST	noClim	69521.743	72449.352	14011.902	86660.029	40248.270
sdCatch	Pikitch	clim	54735.733	57907.510	11407.001	69304.486	31785.960
sdCatch	Pikitch	invRegRec	37326.908	35829.836	13420.216	62146.131	18699.060
sdCatch	Pikitch	noClim	55504.542	57801.356	15752.880	77468.679	26302.670
totCatch	40-10	clim	100826.985	82826.706	71527.804	200013.880	1157.250
totCatch	40-10	invRegRec	38234.238	26035.736	39398.070	121535.337	682.290
totCatch	40-10	noClim	68950.679	49096.364	61255.764	199978.680	715.950
totCatch	ConstF	clim	100796.761	82428.019	71230.016	200013.651	5075.340
totCatch	ConstF	invRegRec	38364.987	25658.690	38834.232	120300.312	3999.630
totCatch	ConstF	noClim	68866.506	48639.870	60851.095	199978.700	4251.480
totCatch	Dyn40-10	clim	100832.099	82541.649	71304.025	200013.661	4148.610
totCatch	Dyn40-10	invRegRec	38384.874	25701.510	38957.857	120867.239	2990.370
totCatch	Dyn40-10	noClim	68931.441	48807.057	60932.230	199978.672	3107.780
totCatch	DynPik	clim	91515.858	67287.132	73021.739	200013.210	0.000
totCatch	DynPik	invRegRec	32010.734	19560.874	37114.480	109198.883	0.000
totCatch	DynPik	noClim	60118.310	38614.042	59663.010	199975.730	0.000
totCatch	Index	clim	96494.718	76575.163	79193.083	200033.591	0.000
totCatch	Index	invRegRec	31032.880	11021.358	46682.941	141119.598	0.000
totCatch	Index	noClim	62742.079	36190.290	68311.328	199978.121	0.000
totCatch	NoCat	clim	0.000	0.000	0.000	0.000	0.000
totCatch	NoCat	invRegRec	0.000	0.000	0.000	0.000	0.000
totCatch	NoCat	noClim	0.000	0.000	0.000	0.000	0.000

totCatch	PFMCF018	clim	89537.559	66205.802	75653.279	200013.781	0.00
totCatch	PFMCF018	invRegRec	25514.344	9933.405	38369.665	106218.752	0.00
totCatch	PFMCF018	noClim	56099.079	32757.363	62547.041	199977.002	0.00
totCatch	PFMCFSSST	clim	111575.397	115344.740	79574.867	200014.131	0.00
totCatch	PFMCFSSST	invRegRec	38358.436	12967.886	53802.226	168825.666	0.00
totCatch	PFMCFSSST	noClim	78652.001	53184.802	76000.589	199985.640	0.00
totCatch	Pikitch	clim	100369.897	83047.551	72222.191	200013.920	0.00
totCatch	Pikitch	invRegRec	36696.545	26358.576	40896.886	121864.864	0.00
totCatch	Pikitch	noClim	68198.502	49711.611	62307.677	199979.130	0.00
zeroCatFreq	40-10	clim	0.016	0.020	0.008	0.020	0.00
zeroCatFreq	40-10	invRegRec	0.017	0.020	0.011	0.020	0.00
zeroCatFreq	40-10	noClim	0.018	0.020	0.017	0.020	0.00
zeroCatFreq	ConstF	clim	0.000	0.000	0.000	0.000	0.00
zeroCatFreq	ConstF	invRegRec	0.000	0.000	0.000	0.000	0.00
zeroCatFreq	ConstF	noClim	0.000	0.000	0.000	0.000	0.00
zeroCatFreq	Dyn40-10	clim	0.000	0.000	0.000	0.000	0.00
zeroCatFreq	Dyn40-10	invRegRec	0.000	0.000	0.000	0.000	0.00
zeroCatFreq	Dyn40-10	noClim	0.000	0.000	0.000	0.000	0.00
zeroCatFreq	DynPik	clim	0.054	0.060	0.009	0.060	0.04
zeroCatFreq	DynPik	invRegRec	0.052	0.060	0.010	0.060	0.04
zeroCatFreq	DynPik	noClim	0.054	0.060	0.009	0.060	0.04
zeroCatFreq	Index	clim	0.131	0.120	0.059	0.240	0.06
zeroCatFreq	Index	invRegRec	0.345	0.340	0.105	0.520	0.18
zeroCatFreq	Index	noClim	0.216	0.180	0.124	0.480	0.08
zeroCatFreq	NoCat	clim	1.000	1.000	0.000	1.000	1.00
zeroCatFreq	NoCat	invRegRec	1.000	1.000	0.000	1.000	1.00
zeroCatFreq	NoCat	noClim	1.000	1.000	0.000	1.000	1.00
zeroCatFreq	PFMCF018	clim	0.111	0.100	0.051	0.220	0.06
zeroCatFreq	PFMCF018	invRegRec	0.334	0.320	0.120	0.540	0.14
zeroCatFreq	PFMCF018	noClim	0.206	0.160	0.129	0.480	0.06
zeroCatFreq	PFMCFSSST	clim	0.131	0.100	0.068	0.260	0.06
zeroCatFreq	PFMCFSSST	invRegRec	0.391	0.380	0.112	0.580	0.22
zeroCatFreq	PFMCFSSST	noClim	0.228	0.190	0.138	0.520	0.08
zeroCatFreq	Pikitch	clim	0.085	0.080	0.024	0.140	0.06
zeroCatFreq	Pikitch	invRegRec	0.159	0.140	0.083	0.320	0.06
zeroCatFreq	Pikitch	noClim	0.127	0.100	0.080	0.300	0.06
zeroCatLenMax	40-10	clim	1.000	1.000	0.000	1.000	1.00
zeroCatLenMax	40-10	invRegRec	1.027	1.000	0.276	1.000	1.00
zeroCatLenMax	40-10	noClim	1.093	1.000	0.718	1.000	1.00
zeroCatLenMax	ConstF	clim	NaN	NA	NA	NA	NA
zeroCatLenMax	ConstF	invRegRec	NaN	NA	NA	NA	NA
zeroCatLenMax	ConstF	noClim	NaN	NA	NA	NA	NA
zeroCatLenMax	Dyn40-10	clim	NaN	NA	NA	NA	NA
zeroCatLenMax	Dyn40-10	invRegRec	NaN	NA	NA	NA	NA
zeroCatLenMax	Dyn40-10	noClim	NaN	NA	NA	NA	NA
zeroCatLenMax	DynPik	clim	2.679	3.000	0.468	3.000	2.00
zeroCatLenMax	DynPik	invRegRec	2.596	3.000	0.491	3.000	2.00
zeroCatLenMax	DynPik	noClim	2.691	3.000	0.465	3.000	2.00
zeroCatLenMax	Index	clim	4.984	5.000	1.403	8.000	3.00
zeroCatLenMax	Index	invRegRec	8.114	7.000	3.746	16.000	4.00
zeroCatLenMax	Index	noClim	7.059	6.000	3.732	14.000	3.00



zeroCatLenMax	NoCat	clim	50.000	50.000	0.000	50.000	50.000
zeroCatLenMax	NoCat	invRegRec	50.000	50.000	0.000	50.000	50.000
zeroCatLenMax	NoCat	noClim	50.000	50.000	0.000	50.000	50.000
zeroCatLenMax	PFMCF018	clim	4.779	4.000	1.663	8.000	3.000
zeroCatLenMax	PFMCF018	invRegRec	9.130	8.000	4.270	18.000	3.950
zeroCatLenMax	PFMCF018	noClim	7.715	7.000	4.583	16.000	3.000
zeroCatLenMax	PFMCFSSST	clim	4.870	4.000	1.771	8.000	3.000
zeroCatLenMax	PFMCFSSST	invRegRec	9.874	9.000	4.630	19.000	4.000
zeroCatLenMax	PFMCFSSST	noClim	7.850	7.000	4.598	16.000	3.000
zeroCatLenMax	Pikitch	clim	4.189	4.000	1.129	6.000	3.000
zeroCatLenMax	Pikitch	invRegRec	5.350	5.000	2.535	10.000	3.000
zeroCatLenMax	Pikitch	noClim	5.489	5.000	2.878	11.000	3.000

## Comparison of PFMC control rules by scenario

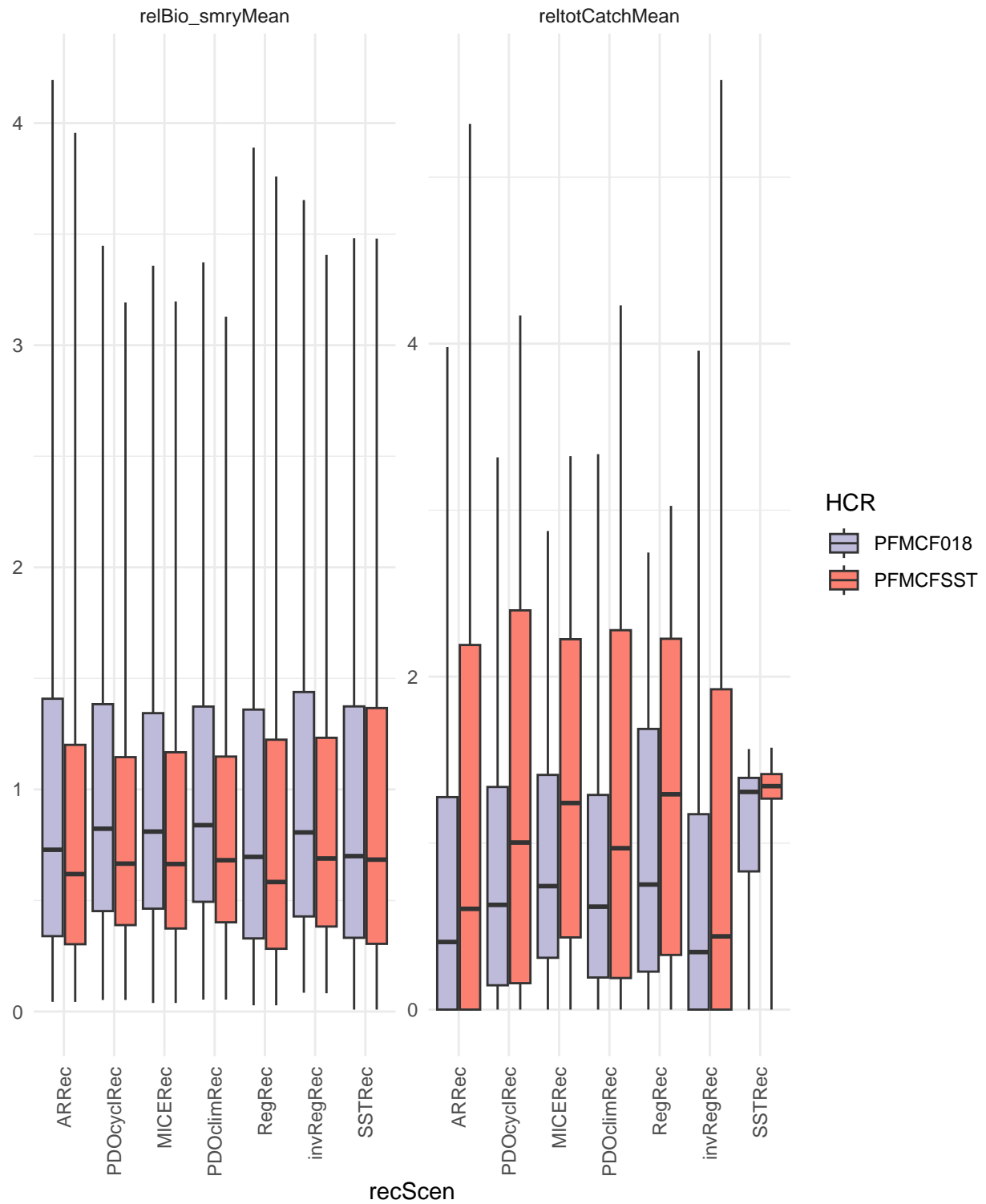


Figure S24: Annual age 1+ biomass (left) and catch (right) relative to the mean within each recruitment scenario for the two PFMC HCRs. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.

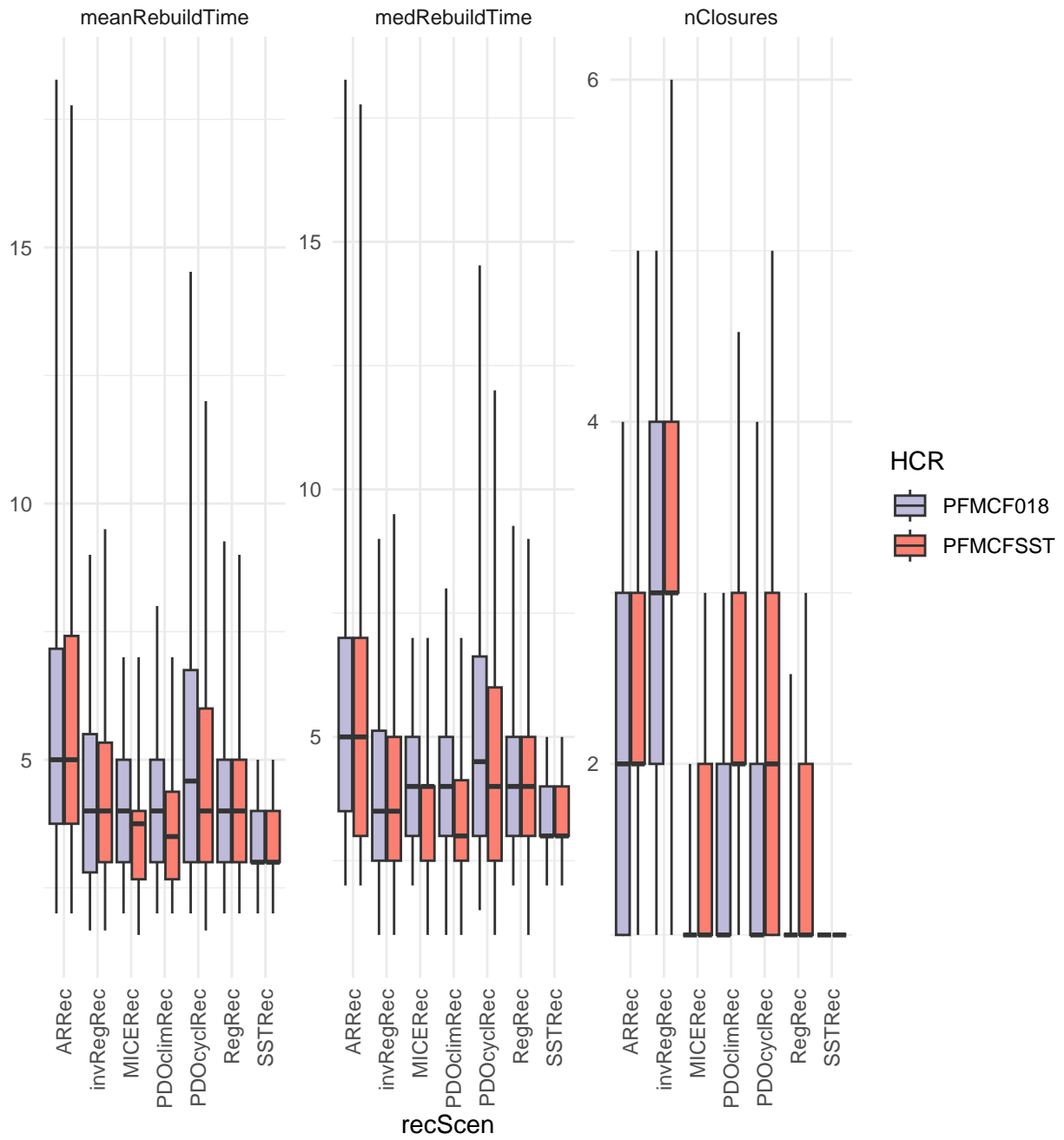


Figure S25: Mean (left) and median (center) years until age 1+ biomass was rebuilt above the cutoff threshold and number of cutoff (closure) events for each recruitment scenario for the two PFMCF HCRs. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.

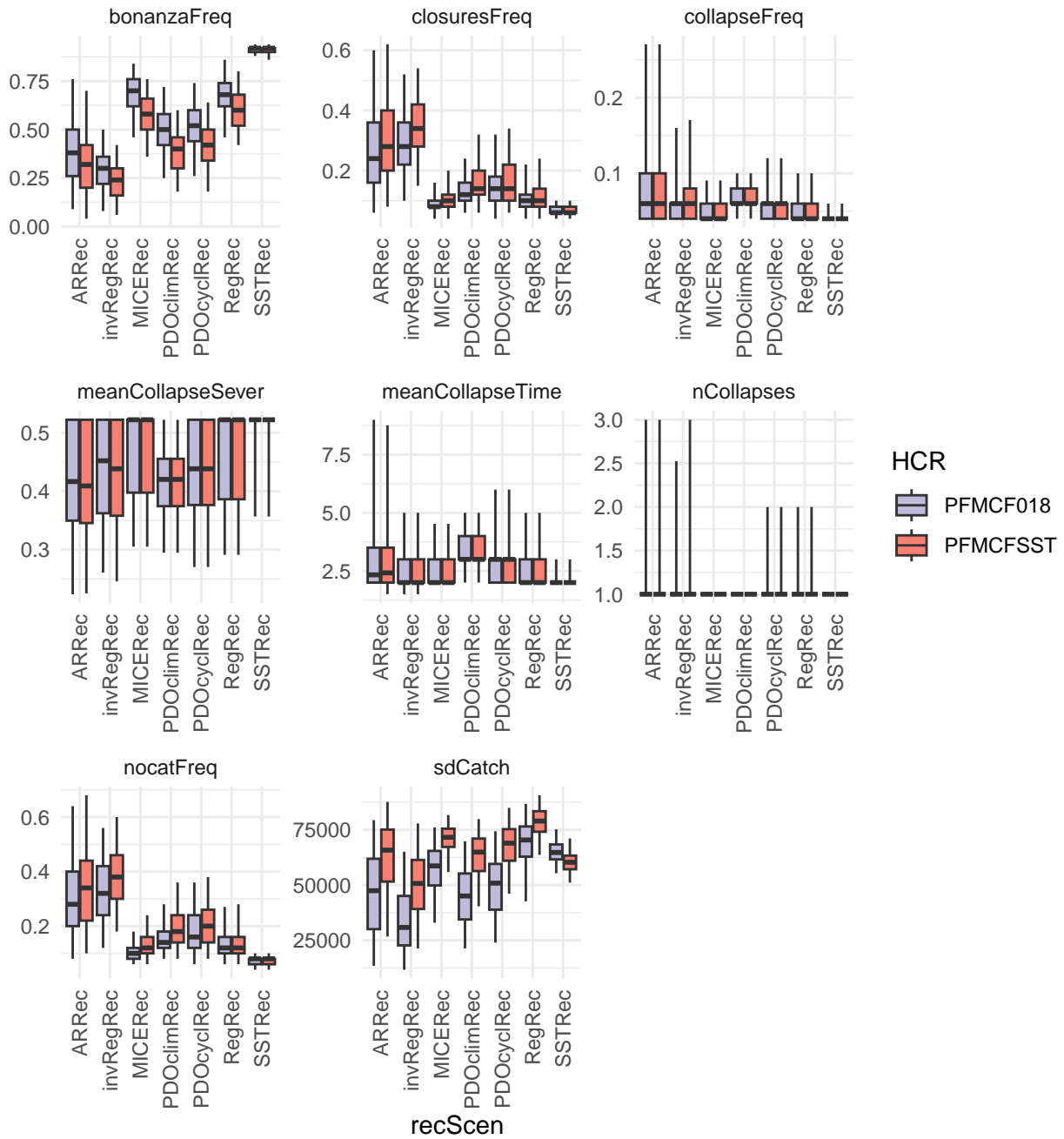


Figure S26: Additional fishery-related performance metrics for each recruitment scenario for the two PFMC HCRs. The horizontal bar indicates the median value and whiskers are the central 95th percentiles among samples for each metric.

## Confusion tables

Table S6: Confusion table values for discrimination at 150,000 mt, including the number of converged assessments and the number of identified cutoffs for each HCR and recruitment scenario.

nameHCR	recScen	nAssess	nClose	closeErrRate	closeFalsePosRate	closeFalseNegRate
PFMCF018	ARRec	24471	6537	0.042	0.054	0.010
PFMCFSSST	ARRec	24469	7343	0.053	0.067	0.020
ConstF	ARRec	24456	9166	0.038	0.052	0.016
Pikitch	ARRec	24469	8223	0.047	0.064	0.013
40-10	ARRec	24468	8830	0.041	0.056	0.015
DynPik	ARRec	24458	7851	0.040	0.054	0.010
Dyn40-10	ARRec	24466	9113	0.039	0.053	0.016
Index	ARRec	24500	7851	0.064	0.040	0.115
PFMCF018	MICERec	24471	2351	0.014	0.015	0.006
PFMCFSSST	MICERec	24464	2695	0.023	0.022	0.030
ConstF	MICERec	24464	2983	0.021	0.021	0.017
Pikitch	MICERec	24473	2774	0.023	0.024	0.017
40-10	MICERec	24461	2865	0.023	0.024	0.015
DynPik	MICERec	24474	2477	0.019	0.020	0.008
Dyn40-10	MICERec	24463	2949	0.021	0.022	0.017
Index	MICERec	24500	2926	0.030	0.013	0.153
PFMCF018	PDOclimRec	24474	3168	0.025	0.027	0.011
PFMCFSSST	PDOclimRec	24472	3919	0.041	0.042	0.038
ConstF	PDOclimRec	24468	4681	0.036	0.038	0.027
Pikitch	PDOclimRec	24467	4283	0.041	0.044	0.026
40-10	PDOclimRec	24468	4501	0.040	0.043	0.027
DynPik	PDOclimRec	24470	3744	0.032	0.035	0.018
Dyn40-10	PDOclimRec	24471	4621	0.038	0.040	0.028
Index	PDOclimRec	24500	4244	0.053	0.026	0.180
PFMCF018	PDOcyclRec	24480	3683	0.033	0.038	0.005
PFMCFSSST	PDOcyclRec	24476	4040	0.044	0.047	0.025
ConstF	PDOcyclRec	24471	5305	0.031	0.035	0.015
Pikitch	PDOcyclRec	24471	4636	0.040	0.046	0.012
40-10	PDOcyclRec	24474	5022	0.036	0.041	0.015
DynPik	PDOcyclRec	24480	4421	0.034	0.039	0.011
Dyn40-10	PDOcyclRec	24478	5230	0.032	0.036	0.015
Index	PDOcyclRec	24500	4351	0.047	0.024	0.153
PFMCF018	RegRec	24464	2626	0.022	0.025	0.002
PFMCFSSST	RegRec	24462	2797	0.025	0.028	0.009
ConstF	RegRec	24468	3556	0.021	0.023	0.012
Pikitch	RegRec	24475	3161	0.029	0.032	0.009
40-10	RegRec	24473	3378	0.025	0.028	0.012
DynPik	RegRec	24465	2980	0.025	0.028	0.007
Dyn40-10	RegRec	24473	3504	0.022	0.024	0.011
Index	RegRec	24500	3037	0.030	0.015	0.142
PFMCF018	SSTRec	24473	1642	0.006	0.006	0.000
PFMCFSSST	SSTRec	24447	1642	0.006	0.006	0.000
ConstF	SSTRec	24452	1693	0.005	0.005	0.001
Pikitch	SSTRec	24469	1642	0.006	0.006	0.000
40-10	SSTRec	24454	1654	0.005	0.006	0.000
DynPik	SSTRec	24457	1642	0.006	0.006	0.000

Dyn40-10	SSTRec	24453	1683	0.005	0.005	0.000
Index	SSTRec	24500	1643	0.007	0.001	0.082
PFMCF018	invRegRec	24470	7060	0.048	0.059	0.020
PFMCFSSST	invRegRec	24469	8362	0.060	0.075	0.031
ConstF	invRegRec	24471	10315	0.043	0.059	0.021
Pikitch	invRegRec	24472	9443	0.051	0.070	0.021
40-10	invRegRec	24484	10104	0.046	0.063	0.021
DynPik	invRegRec	24477	8847	0.046	0.062	0.019
Dyn40-10	invRegRec	24472	10274	0.043	0.060	0.021
Index	invRegRec	24500	8577	0.085	0.051	0.147

Table S7: Confusion table values for discrimination at 150,000 mt, including the number of converged assessments and the number of identified collapses for each HCR and recruitment scenario.

nameHCR	recScen	nAssess	nCollapse	collapseErrRate	collapseFalsePosRate	collapseFalseNegRate
PFMCF018	ARRec	24471	2061	0.020	0.020	0.011
PFMCFSSST	ARRec	24469	2120	0.020	0.020	0.013
ConstF	ARRec	24456	3670	0.020	0.019	0.022
Pikitch	ARRec	24469	2341	0.022	0.023	0.015
40-10	ARRec	24468	2991	0.027	0.028	0.025
DynPik	ARRec	24458	2593	0.024	0.025	0.019
Dyn40-10	ARRec	24466	3550	0.022	0.022	0.023
Index	ARRec	24500	2247	0.026	0.011	0.180
PFMCF018	MICERec	24471	1313	0.008	0.009	0.001
PFMCFSSST	MICERec	24464	1313	0.009	0.009	0.000
ConstF	MICERec	24464	1442	0.007	0.007	0.002
Pikitch	MICERec	24473	1313	0.009	0.009	0.000
40-10	MICERec	24461	1330	0.009	0.010	0.002
DynPik	MICERec	24474	1314	0.009	0.010	0.000
Dyn40-10	MICERec	24463	1394	0.008	0.008	0.001
Index	MICERec	24500	1313	0.013	0.002	0.196
PFMCF018	PDOclimRec	24474	1595	0.009	0.010	0.000
PFMCFSSST	PDOclimRec	24472	1595	0.011	0.011	0.001
ConstF	PDOclimRec	24468	1812	0.007	0.008	0.004
Pikitch	PDOclimRec	24467	1601	0.011	0.012	0.001
40-10	PDOclimRec	24468	1637	0.011	0.012	0.001
DynPik	PDOclimRec	24470	1606	0.011	0.012	0.002
Dyn40-10	PDOclimRec	24471	1754	0.009	0.009	0.003
Index	PDOclimRec	24500	1600	0.015	0.003	0.189
PFMCF018	PDOcyclRec	24480	1500	0.014	0.015	0.000
PFMCFSSST	PDOcyclRec	24476	1500	0.014	0.015	0.000
ConstF	PDOcyclRec	24471	1905	0.012	0.013	0.010
Pikitch	PDOcyclRec	24471	1506	0.014	0.015	0.003
40-10	PDOcyclRec	24474	1617	0.015	0.016	0.007
DynPik	PDOcyclRec	24480	1551	0.015	0.016	0.002
Dyn40-10	PDOcyclRec	24478	1824	0.014	0.015	0.010
Index	PDOcyclRec	24500	1502	0.015	0.003	0.196
PFMCF018	RegRec	24464	1370	0.010	0.011	0.000
PFMCFSSST	RegRec	24462	1370	0.010	0.011	0.000
ConstF	RegRec	24468	1578	0.007	0.008	0.006
Pikitch	RegRec	24475	1370	0.010	0.011	0.000

40-10	RegRec	24473	1407	0.011	0.011	0.001
DynPik	RegRec	24465	1382	0.010	0.011	0.000
Dyn40-10	RegRec	24473	1517	0.009	0.009	0.003
Index	RegRec	24500	1370	0.014	0.003	0.203
PFMCF018	SSTRec	24473	1112	0.006	0.007	0.000
PFMCFSSST	SSTRec	24447	1112	0.006	0.007	0.000
ConstF	SSTRec	24452	1183	0.005	0.005	0.000
Pikitch	SSTRec	24469	1112	0.006	0.007	0.000
40-10	SSTRec	24454	1116	0.006	0.006	0.000
DynPik	SSTRec	24457	1112	0.006	0.007	0.000
Dyn40-10	SSTRec	24453	1160	0.005	0.005	0.000
Index	SSTRec	24500	1112	0.009	0.001	0.192
PFMCF018	invRegRec	24470	1534	0.012	0.011	0.015
PFMCFSSST	invRegRec	24469	1605	0.014	0.013	0.026
ConstF	invRegRec	24471	3284	0.021	0.018	0.041
Pikitch	invRegRec	24472	1948	0.018	0.016	0.048
40-10	invRegRec	24484	2853	0.025	0.021	0.053
DynPik	invRegRec	24477	2254	0.020	0.017	0.048
Dyn40-10	invRegRec	24472	3239	0.022	0.019	0.043
Index	invRegRec	24500	1708	0.026	0.011	0.234