Comparing results of models fitted with 'hindcast' vs. 'reanalysis' variables

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0.1 Overall summary

0.1.1 Temporal data split

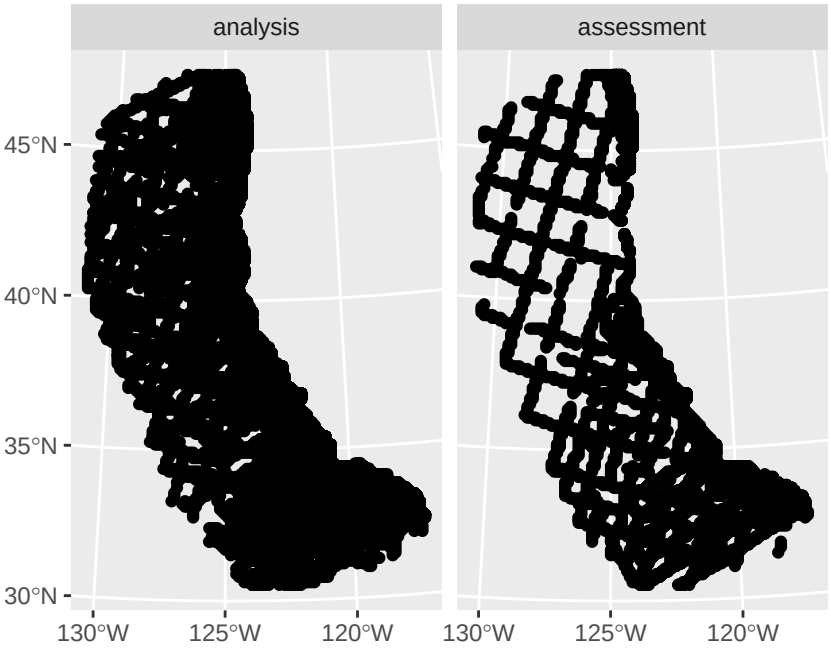


Table 1: Analysis set (first 85% of pre-2011 data)

year	n	percent
1980	3681	0.083
1981	4067	0.092
1982	4009	0.090
1983	380	0.009
1985	402	0.009
1986	56	0.001
1987	559	0.013
1988	815	0.018
1989	2608	0.059
1990	2404	0.054
1991	785	0.018
1992	976	0.022
1993	756	0.017
1994	612	0.014
1995	943	0.021
1996	2808	0.063
1997	1030	0.023

year	n	percent
1998	1285	0.029
1999	1688	0.038
2000	2421	0.055
2001	4166	0.094
2002	1655	0.037
2003	1741	0.039
2004	1573	0.035
2005	2912	0.066

Table 2: Assessment set (last 15% of pre-2011 data)

year	n	percent
2005	572	0.073
2006	1512	0.193
2007	933	0.119
2008	2654	0.339
2009	974	0.124
2010	1179	0.151

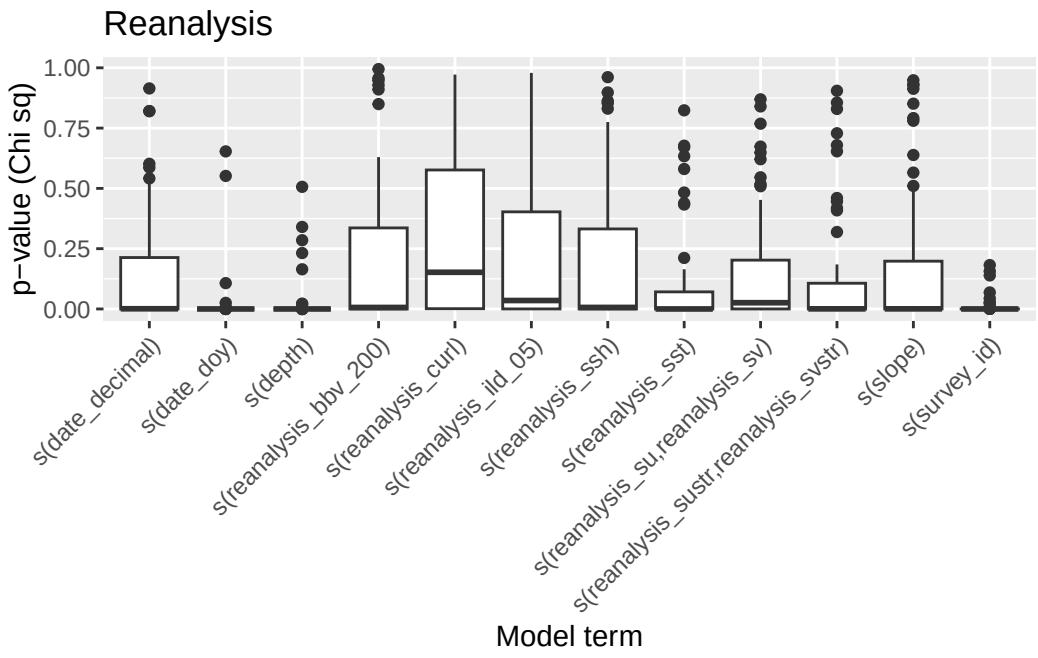
0.1.2 Summary of "best" models for each species

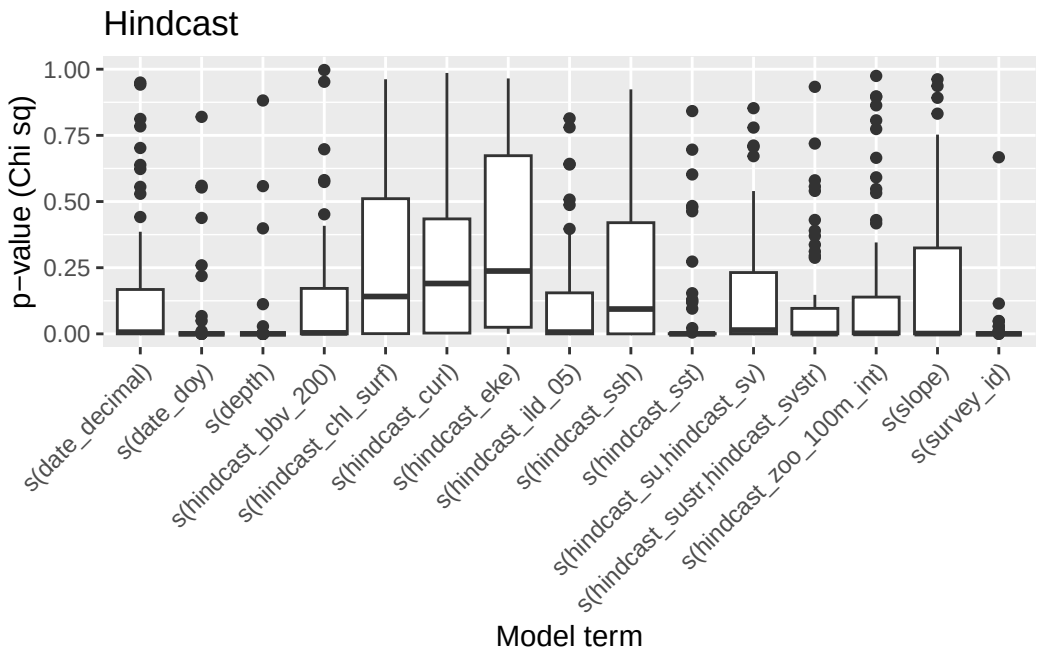
Table 3: Proportion of 'best' models (as chosen by each metric) that utilized the reanalysis covariates

Metric	Proportion (reanalysis)
ccc	0.52
huber_loss	0.60
huber_loss_pseudo	0.60
iic	0.53
mae	0.62
mase	0.62
msd	0.42
poisson_log_loss	0.53
rmse	0.62
rpd	0.62
rsq	0.52
rsq_trad	0.62
smape	0.52

Metric	Proportion (reanalysis)

0.1.3 Variable 'importance'





0.2 Species-specific summaries

0.2.1 Surf Scoter

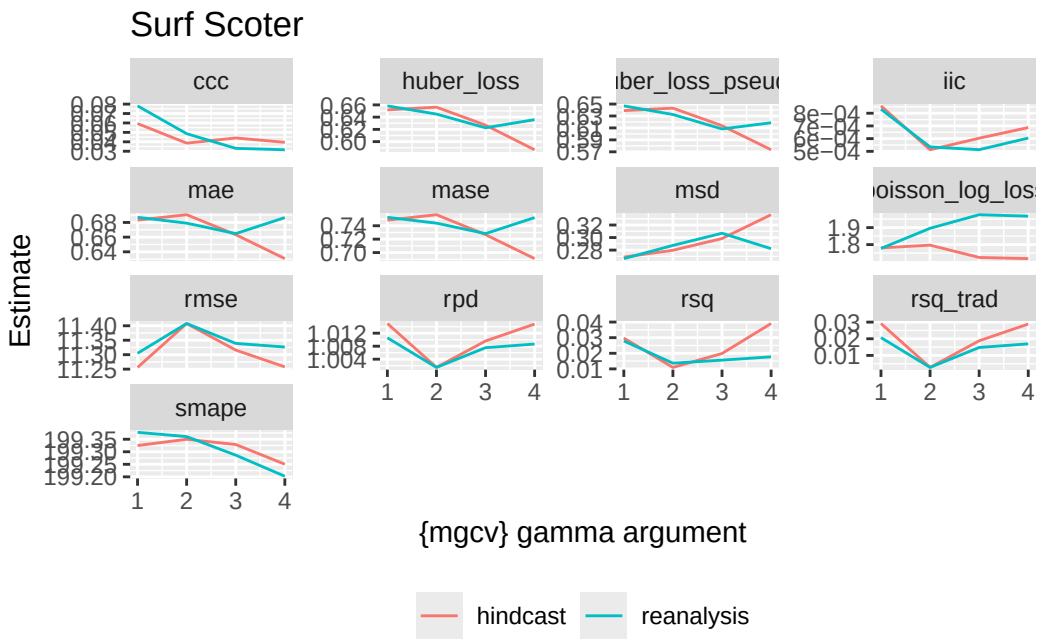


Table 4: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.4049794	10	37.8749566	-0.0000013
s(date_doy)	6.0286942	8	218.5631605	0.0000000
s(depth)	4.4529644	9	368.5308267	0.0000000
s(reanalysis_bbv_200)	4.1786486	9	60.8409155	0.0000000
s(reanalysis_su,reanalysis_sv)	13.1268322	29	59.6014440	0.0000000
s(reanalysis_curl)	2.7095958	9	19.8323438	0.0000229
s(reanalysis_ild_05)	1.9411704	9	9.6385587	0.0046521
s(reanalysis_ssh)	3.0263975	9	13.8732168	0.0073407
s(reanalysis_sustr,reanalysis_svstr)	2.6521157	29	5.5504074	0.0436947
s(reanalysis_sst)	0.0002466	9	0.0006752	0.0593430
s(date_decimal)	0.0002611	9	0.0001259	0.5865975
s(slope)	0.0001857	9	0.0000232	0.8512804

Table 5: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.0449542	10	59.9670387	0.0000000
s(date_doy)	6.0944102	8	132.5536706	0.0000000
s(depth)	4.1661541	9	295.7665628	0.0000000
s(hindcast_su,hindcast_sv)	11.1423890	29	32.5390377	0.0000578
s(hindcast_sst)	3.5126041	9	33.3193975	0.0001473
s(hindcast_bbv_200)	2.9393321	9	33.7434435	0.0001964
s(hindcast_sustr,hindcast_svstr)	5.5914288	29	15.1025984	0.0033691
s(hindcast_chl_surf)	0.8963746	9	7.6922293	0.0034795
s(hindcast_eke)	0.7323779	9	2.1471684	0.0243270
s(date_decimal)	1.3170771	9	11.8026717	0.0398510
s(hindcast_zoo_100m_int)	1.2340831	9	3.6409393	0.0416565
s(hindcast_ild_05)	0.7158854	9	2.1657195	0.0796646
s(hindcast_ssh)	0.0012602	9	0.0006661	0.5464517
s(hindcast_curl)	0.0001067	9	0.0000206	0.8004702
s(slope)	0.0005252	9	0.0000406	0.8920688

0.2.2 White-winged Scoter

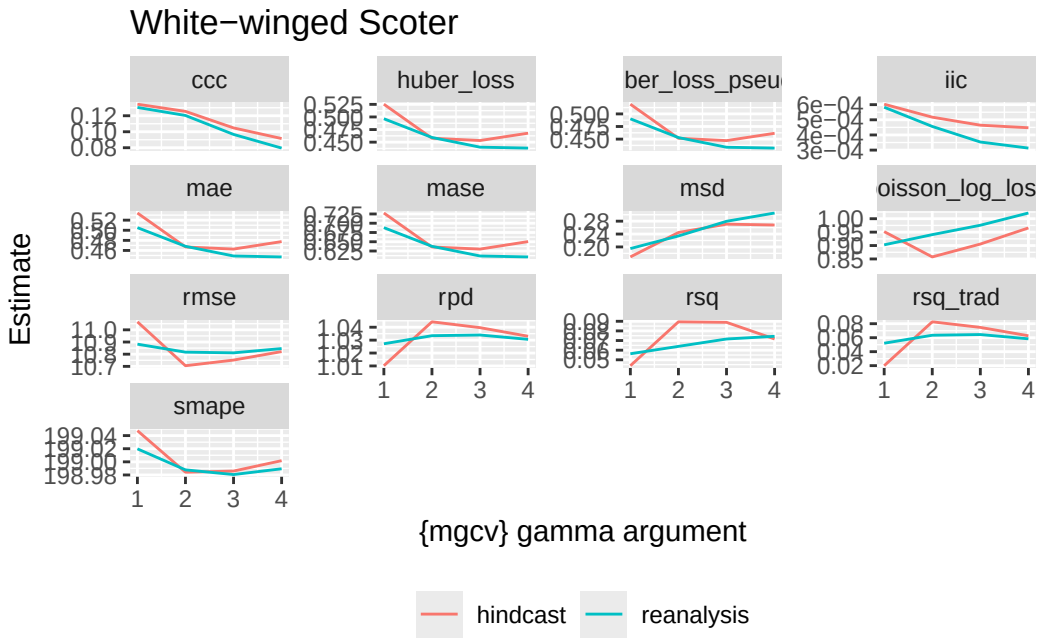


Table 6: Model summary for reanalysis model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(slope)	3.5317204	8	42.6576545	-0.0000008
s(survey_id)	6.2733322	10	113.6387783	0.0000000
s(date_doy)	2.4072852	8	41.9523763	0.0000000
s(depth)	3.6368887	9	165.8120494	0.0000000
s(reanalysis_sst)	1.6661631	9	41.1385642	0.0000000
s(reanalysis_bbv_200)	0.9286419	9	5.9156896	0.0058965
s(reanalysis_ssh)	0.0006586	9	0.0026569	0.0152719
s(reanalysis_sustr,reanalysis_svstr)	0.0001132	29	0.0002895	0.0379294
s(reanalysis_curl)	0.0000549	9	0.0001468	0.0919082
s(reanalysis_su,reanalysis_sv)	0.0000503	29	0.0000841	0.1335595
s(date_decimal)	0.0003915	9	0.0006517	0.1746652
s(reanalysis_ild_05)	0.0000311	9	0.0000203	0.4010872

Table 7: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.4807804	10	94.8266908	0.0000000
s(depth)	3.8310586	9	109.0073541	0.0000000
s(slope)	4.2252792	9	49.1308497	0.0000000
s(hindcast_sst)	0.9595386	9	69.2886328	0.0000000
s(date_doy)	2.4736346	8	25.1924562	0.0000002
s(hindcast_curl)	0.8490569	9	10.7333598	0.0003914
s(hindcast_bbv_200)	1.5923578	9	14.2277057	0.0011762
s(hindcast_ild_05)	0.5073731	9	2.0330764	0.0313880
s(hindcast_chl_surf)	0.0000271	9	0.0000348	0.2166181
s(hindcast_ssh)	0.0000239	9	0.0000231	0.3092308
s(hindcast_su,hindcast_sv)	0.0000171	29	0.0000173	0.3558019
s(hindcast_sustr,hindcast_svstr)	0.0000194	29	0.0000176	0.3898332
s(hindcast_zoo_100m_int)	0.0000158	9	0.0000067	0.5471950
s(date_decimal)	0.0000124	9	0.0000033	0.7024355
s(hindcast_eke)	0.0000179	9	0.0000021	0.8799148

0.2.3 Western Grebe

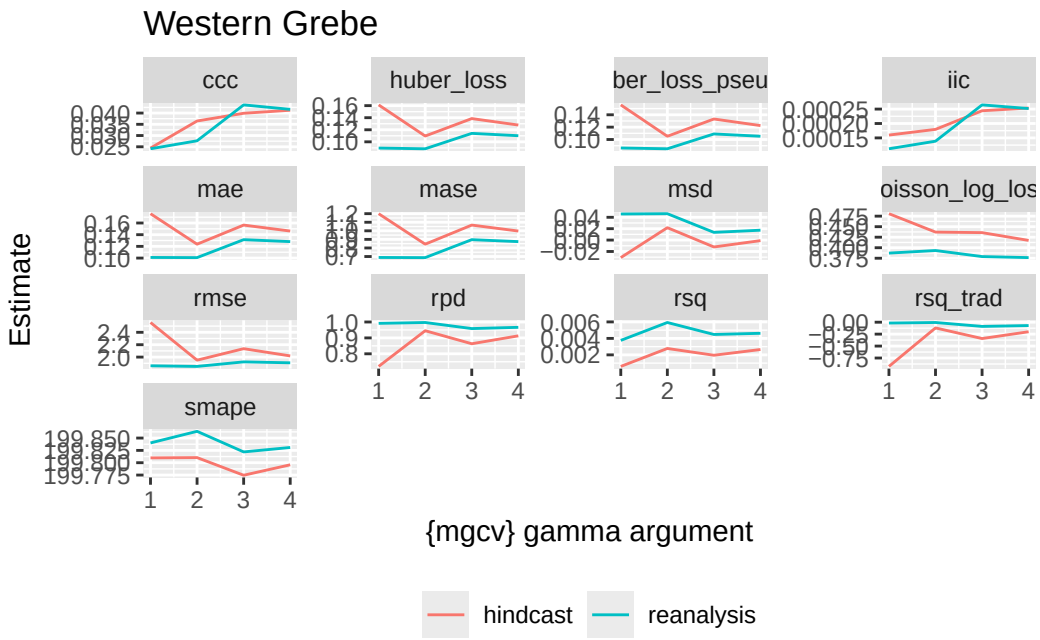


Table 8: Model summary for reanalysis model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.0383766	10	70.5962276	0.0000000
s(date_doy)	4.6739957	8	279.1650129	0.0000000
s(depth)	5.7799783	9	667.9207236	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	5.9429145	29	33.0747996	0.0000037
s(reanalysis_ssh)	0.8808172	9	17.4030511	0.0000352
s(reanalysis_ild_05)	0.8761418	9	14.2395753	0.0000683
s(reanalysis_curl)	1.6287329	9	9.9694488	0.0008653
s(slope)	1.7330702	9	11.6754052	0.0009855
s(date_decimal)	1.7723617	9	31.2515571	0.0351064
s(reanalysis_su,reanalysis_sv)	0.0012793	29	0.0016964	0.2047998
s(reanalysis_bbv_200)	0.0000472	9	0.0000596	0.2479504
s(reanalysis_sst)	0.0000343	9	0.0000130	0.6334232

Table 9: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.4712038	10	81.3849902	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	4.7696603	8	167.6782205	0.0000000
s(depth)	5.3814503	9	491.9332952	0.0000000
s(hindcast_ild_05)	1.3864217	9	33.7598704	0.0000000
s(hindcast_su,hindcast_sv)	6.4924693	29	40.4302127	0.0000000
s(hindcast_sst)	0.9315063	9	48.5493289	0.0000006
s(hindcast_sustr,hindcast_svstr)	5.5339909	29	30.2433057	0.0000026
s(slope)	2.1872933	9	12.2580801	0.0012640
s(hindcast_bbv_200)	2.5795461	9	22.3450020	0.0023216
s(hindcast_eke)	0.7143802	9	3.6707144	0.0025544
s(date_decimal)	1.6712942	9	32.6493577	0.0108434
s(hindcast_curl)	0.0007399	9	0.0012829	0.1354615
s(hindcast_chl_surf)	0.0001076	9	0.0001044	0.3162514
s(hindcast_ssh)	0.0001877	9	0.0001688	0.3378587
s(hindcast_zoo_100m_int)	0.0001052	9	0.0000062	0.8973603

0.2.4 Red-necked Phalarope

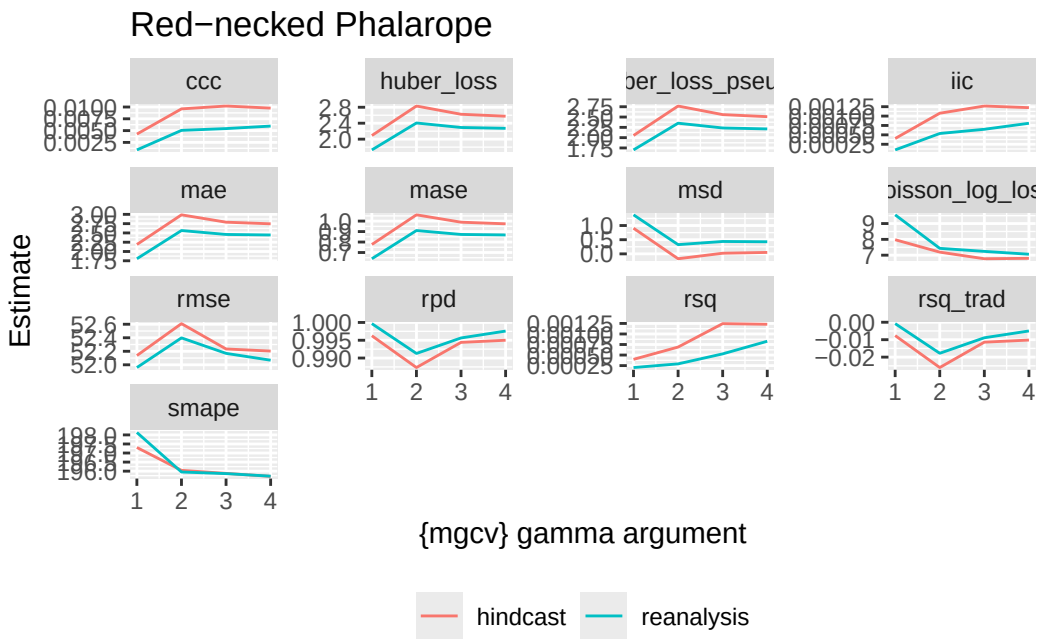


Table 10: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	9.0568777	10	169.3782025	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	7.9249676	8	630.4252469	0.0000000
s(depth)	4.8178520	9	199.4410853	0.0000000
s(slope)	5.1457348	9	46.2824250	0.0000000
s(reanalysis_ild_05)	3.8045235	9	37.3305057	0.0000000
s(reanalysis_ssh)	5.0302079	9	96.4604407	0.0000000
s(reanalysis_sst)	6.2496893	9	109.7398126	0.0000000
s(reanalysis_su,reanalysis_sv)	14.6219055	29	62.0453285	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	22.8765776	29	175.3018772	0.0000000
s(reanalysis_bbv_200)	4.2468929	9	40.1418294	0.0001878
s(date_decimal)	7.5086448	9	389.7400568	0.0028433
s(reanalysis_curl)	0.0020042	9	0.0007644	0.5763259

Table 11: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	9.1096784	10	187.136445	0.0000000
s(date_doy)	7.9458246	8	594.442327	0.0000000
s(depth)	7.2661911	9	171.704181	0.0000000
s(slope)	5.0687223	9	46.649145	0.0000000
s(hindcast_ild_05)	5.3074268	9	150.582677	0.0000000
s(hindcast_ssh)	6.2506121	9	50.570148	0.0000000
s(hindcast_sst)	4.0079171	9	110.642580	0.0000000
s(hindcast_zoo_100m_int)	5.9548422	9	40.839520	0.0000000
s(hindcast_su,hindcast_sv)	20.9404376	29	130.826630	0.0000000
s(hindcast_chl_surf)	5.4380072	9	27.884600	0.0000195
s(hindcast_sustr,hindcast_svstr)	13.7882875	29	39.082446	0.0000526
s(hindcast_bbv_200)	6.4934150	9	54.360118	0.0001672
s(hindcast_eke)	0.9168053	9	1.707662	0.0938921
s(hindcast_curl)	0.9950499	9	2.219632	0.1049681
s(date_decimal)	7.1396096	9	53.019804	0.1719591

0.2.5 Red Phalarope

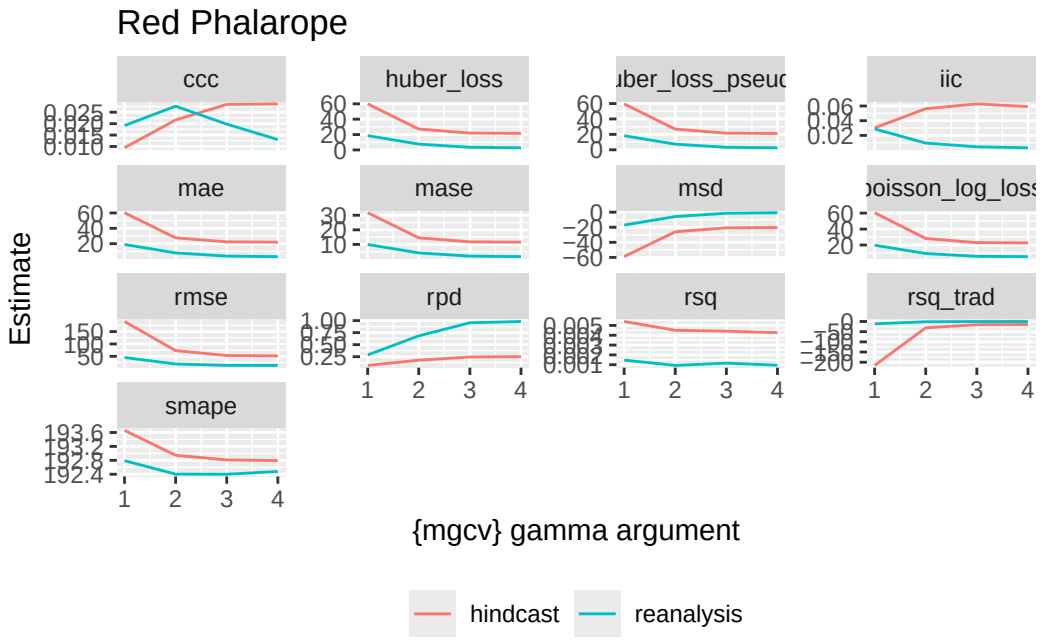


Table 12: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	5.9448300	10	82.9765838	0.0000000
s(date_doy)	7.0180319	8	394.7324037	0.0000000
s(date_decimal)	8.2658166	9	1214.1420100	0.0000000
s(reanalysis_bbv_200)	1.9098422	9	42.3564691	0.0000000
s(reanalysis_ild_05)	1.5733672	9	36.0656069	0.0000000
s(reanalysis_ssh)	3.2997299	9	104.2747325	0.0000000
s(reanalysis_sst)	4.4763193	9	163.1075297	0.0000000
s(reanalysis_su,reanalysis_sv)	1.6725282	29	9.0247093	0.0001422
s(reanalysis_sustr,reanalysis_svstr)	0.0021532	29	0.0048786	0.0549135
s(depth)	0.0018312	9	0.0032377	0.1645585
s(slope)	0.0002534	9	0.0001523	0.4549496
s(reanalysis_curl)	0.0004223	9	0.0001114	0.6634187

Table 13: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	3.7227052	10	26.6592409	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	7.0346235	8	324.1652212	0.0000000
s(date_decimal)	8.4809503	9	751.5659549	0.0000000
s(hindcast_bbv_200)	1.6994239	9	33.5956565	0.0000000
s(hindcast_ild_05)	2.5943743	9	63.0699473	0.0000000
s(hindcast_sst)	2.5046739	9	46.7676332	0.0000000
s(hindcast_zoo_100m_int)	1.6704378	9	38.6446820	0.0000000
s(hindcast_ssh)	2.2826597	9	23.4634993	0.0000014
s(hindcast_chl_surf)	0.8117439	9	16.8882015	0.0000026
s(hindcast_su,hindcast_sv)	0.0049934	29	0.0140995	0.0558204
s(hindcast_sustr,hindcast_svstr)	0.0005576	29	0.0013541	0.0582618
s(hindcast_curl)	0.0006998	9	0.0018382	0.0856548
s(hindcast_eke)	0.0000633	9	0.0000973	0.2063145
s(depth)	0.0001674	9	0.0001293	0.3986543
s(slope)	0.0001204	9	0.0000306	0.7171745

0.2.6 South Polar Skua

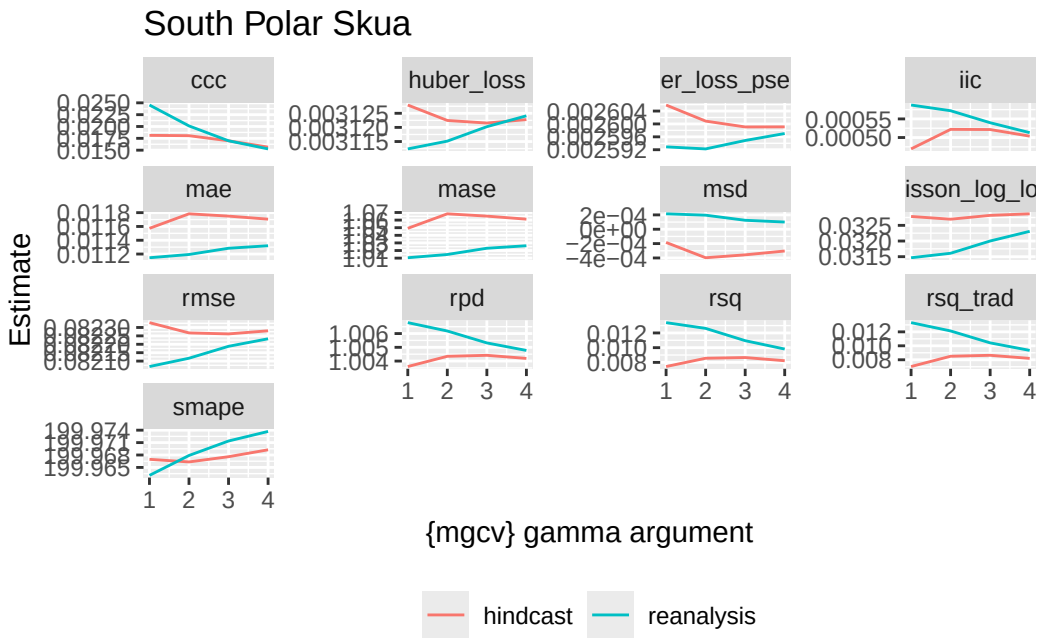


Table 14: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(date_doy)	4.5092671	8	80.9567811	0.0000479

term	edf	ref.df	statistic	p.value
s(reanalysis_ssh)	2.2946611	9	15.9149852	0.0003159
s(survey_id)	5.8807650	10	21.4128885	0.0003582
s(reanalysis_bbv_200)	3.6791704	9	22.4863764	0.0007253
s(depth)	1.8318701	9	11.0596837	0.0024219
s(reanalysis_ild_05)	0.8364106	9	2.9631072	0.0694426
s(reanalysis_su,reanalysis_sv)	1.1766270	29	2.7987143	0.0976880
s(slope)	0.3266471	9	0.4918727	0.2120139
s(reanalysis_curl)	0.0001144	9	0.0000841	0.3865137
s(reanalysis_sst)	0.0001302	9	0.0000610	0.5803973
s(date_decimal)	0.0000314	9	0.0000129	0.6019797
s(reanalysis_sustr,reanalysis_svstr)	0.0000733	29	0.0000366	0.6537539

Table 15: Model summary for hindcast model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(date_doy)	2.4722612	8	33.7128006	0.0000003
s(depth)	1.5598650	9	17.1456960	0.0000053
s(hindcast_zoo_100m_int)	0.8458722	9	14.9128601	0.0000200
s(survey_id)	2.0930990	10	11.3067800	0.0000503
s(hindcast_ild_05)	0.9875230	9	6.3922025	0.0013298
s(hindcast_bbv_200)	1.0067148	9	7.4135781	0.0017162
s(hindcast_curl)	0.2968045	9	1.4932879	0.0215223
s(hindcast_su,hindcast_sv)	0.0002856	29	0.0007743	0.0447350
s(hindcast_sustr,hindcast_svstr)	0.0000399	29	0.0000658	0.1459225
s(slope)	0.0000581	9	0.0000927	0.1841409
s(hindcast_ssh)	0.0000386	9	0.0000431	0.2708834
s(hindcast_sst)	0.0000436	9	0.0000245	0.4780408
s(hindcast_chl_surf)	0.0000222	9	0.0000075	0.5886844
s(date_decimal)	0.0000279	9	0.0000101	0.6384275
s(hindcast_eke)	0.0000339	9	0.0000052	0.7650973

0.2.7 Pomarine Jaeger

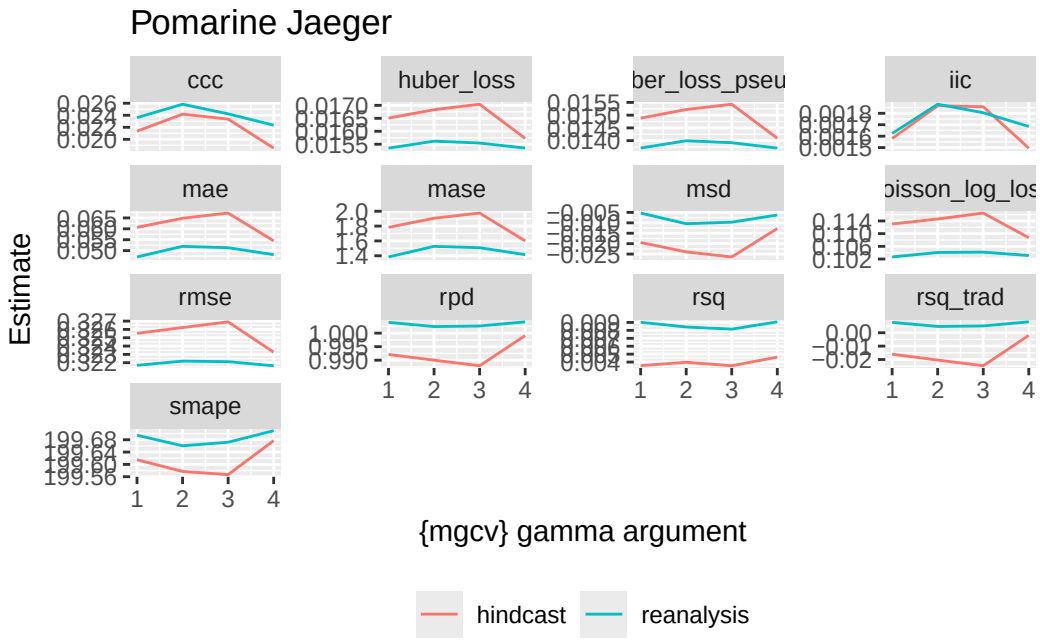


Table 16: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(date_doy)	6.0748649	8	390.5676639	0.0000000
s(date_decimal)	3.2276258	9	360.2843699	0.0000000
s(depth)	4.7056204	9	237.2977280	0.0000000
s(reanalysis_ssh)	1.4200806	9	46.0707754	0.0000000
s(reanalysis_sst)	2.3364346	9	34.6461139	0.0000000
s(reanalysis_curl)	1.0723012	9	14.5747261	0.0000088
s(reanalysis_ild_05)	0.7748997	9	12.9243533	0.0000293
s(slope)	1.1158306	9	9.8374297	0.0002588
s(reanalysis_sustr,reanalysis_svstr)	0.4355180	29	2.2564859	0.0051263
s(reanalysis_su,reanalysis_sv)	0.3138686	29	1.4914550	0.0072514
s(survey_id)	0.0001187	10	0.0003667	0.0105291
s(reanalysis_bbv_200)	0.0002453	9	0.0006834	0.0765873

Table 17: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(hindcast_sst)	1.2773885	9	22.0532793	-0.0000008

term	edf	ref.df	statistic	p.value
s(date_doy)	5.9641870	8	370.9065011	0.0000000
s(date_decimal)	3.7412798	9	364.6482358	0.0000000
s(depth)	4.9527753	9	374.2691271	0.0000000
s(hindcast_zoo_100m_int)	0.8831545	9	28.7525643	0.0000000
s(hindcast_ssh)	0.7632476	9	12.5789879	0.0000331
s(slope)	0.9859230	9	8.0164684	0.0005811
s(survey_id)	0.0003867	10	0.0013573	0.0047446
s(hindcast_sustr,hindcast_svstr)	0.0007895	29	0.0018678	0.0656293
s(hindcast_ild_05)	0.0005013	9	0.0011819	0.0950890
s(hindcast_curl)	0.0004094	9	0.0006764	0.1829589
s(hindcast_chl_surf)	0.0004025	9	0.0005968	0.2045992
s(hindcast_bbv_200)	0.0001194	9	0.0000832	0.4082947
s(hindcast_eke)	0.0004134	9	0.0002751	0.4278572
s(hindcast_su,hindcast_sv)	0.0005046	29	0.0003985	0.4988693

0.2.8 Parasitic Jaeger

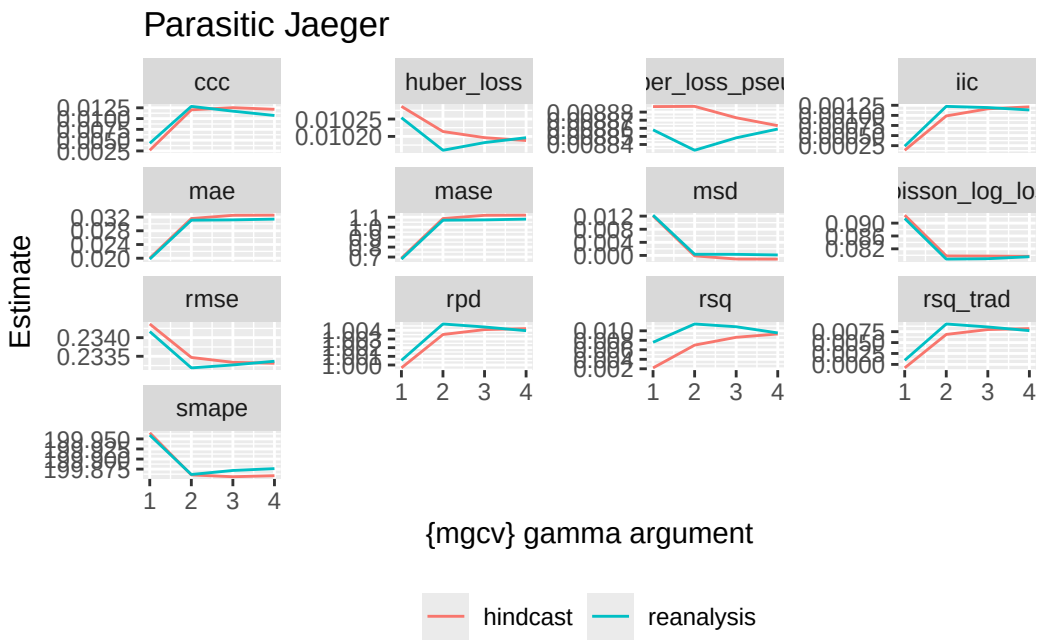


Table 18: Model summary for reanalysis model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(date_doy)	4.3149201	8	83.0522521	0.0000000

term	edf	ref.df	statistic	p.value
s(depth)	1.3965455	9	36.9544064	0.0000000
s(survey_id)	2.7397389	10	8.7503175	0.0036524
s(slope)	0.9829027	9	5.4718941	0.0051636
s(reanalysis_ild_05)	0.8831851	9	3.6557290	0.0209921
s(reanalysis_ssh)	0.5946588	9	1.9126376	0.0478171
s(reanalysis_sustr,reanalysis_svstr)	0.8647496	29	2.6222666	0.0495225
s(reanalysis_sst)	0.0446271	9	0.0947152	0.1002655
s(reanalysis_curl)	0.0001269	9	0.0002252	0.1639126
s(reanalysis_su,reanalysis_sv)	0.0001306	29	0.0001865	0.2017196
s(date_decimal)	0.0000692	9	0.0000777	0.2919744
s(reanalysis_bbv_200)	0.0000630	9	0.0000527	0.3516928

Table 19: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(date_doy)	3.0756027	8	66.9129950	0.0000000
s(depth)	1.7445446	9	64.0525942	0.0000000
s(hindcast_zoo_100m_int)	0.8314914	9	9.5396966	0.0002193
s(hindcast_eke)	0.6554916	9	6.3367054	0.0007515
s(hindcast_sustr,hindcast_svstr)	0.8804339	29	6.3232012	0.0013699
s(hindcast_su,hindcast_sv)	0.1606845	29	0.6720831	0.0135930
s(survey_id)	0.0000239	10	0.0000650	0.0288692
s(slope)	0.0000870	9	0.0002208	0.0853790
s(hindcast_ild_05)	0.0000493	9	0.0001025	0.0983987
s(hindcast_sst)	0.0000745	9	0.0001466	0.1294305
s(date_decimal)	0.0000505	9	0.0000414	0.3858684
s(hindcast_curl)	0.0000301	9	0.0000123	0.5416400
s(hindcast_chl_surf)	0.0000690	9	0.0000243	0.6040097
s(hindcast_ssh)	0.0000560	9	0.0000193	0.6293409
s(hindcast_bbv_200)	0.0000569	9	0.0000155	0.6975595

0.2.9 Long-tailed Jaeger

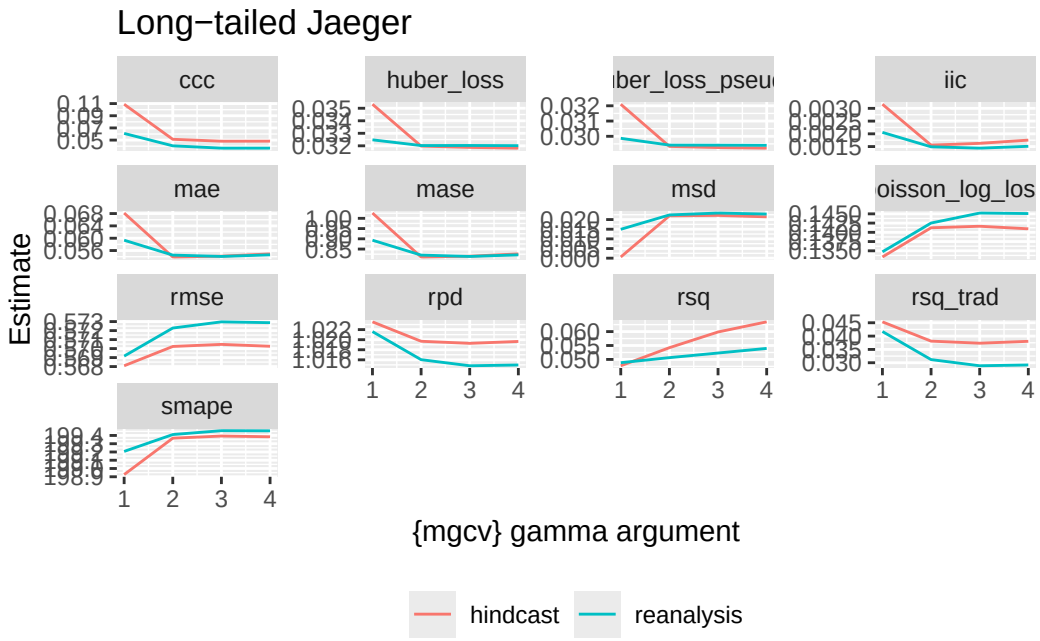


Table 20: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	5.3498015	10	36.1118652	0.0000000
s(date_doy)	6.4257032	8	246.8768296	0.0000000
s(depth)	3.1724194	9	63.9148257	0.0000000
s(reanalysis_ild_05)	0.9172924	9	10.5736410	0.0005481
s(reanalysis_bbv_200)	2.1285170	9	11.9885205	0.0009682
s(reanalysis_sst)	0.9036392	9	10.8896467	0.0010974
s(reanalysis_ssh)	1.8821819	9	8.3007030	0.0054167
s(reanalysis_su,reanalysis_sv)	3.0950929	29	7.4815972	0.0171236
s(date_decimal)	5.7346210	9	268.6435875	0.0457861
s(reanalysis_sustr,reanalysis_svstr)	3.7614228	29	7.3406514	0.0494625
s(reanalysis_curl)	0.5971597	9	1.3866400	0.1226736
s(slope)	0.0002292	9	0.0000963	0.5653511

Table 21: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	5.4004326	10	32.5561325	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	6.4464222	8	218.2359986	0.0000000
s(depth)	2.9555488	9	44.1592352	0.0000000
s(hindcast_sst)	0.9436766	9	27.9845438	0.0000139
s(hindcast_ssh)	3.3822334	9	15.8085510	0.0006143
s(hindcast_zoo_100m_int)	3.8652315	9	14.7618753	0.0017419
s(hindcast_sustr,hindcast_svstr)	2.9353994	29	7.0437145	0.0247359
s(hindcast_bbv_200)	2.1155153	9	4.7721260	0.0765697
s(hindcast_curl)	0.7411077	9	1.7009054	0.1113387
s(date_decimal)	5.3553419	9	250.3926862	0.1308977
s(hindcast_ild_05)	0.0007922	9	0.0006052	0.3843316
s(slope)	0.0007054	9	0.0002527	0.6017139
s(hindcast_su,hindcast_sv)	0.0007715	29	0.0003864	0.6714996
s(hindcast_eke)	0.0004585	9	0.0000991	0.6725458
s(hindcast_chl_surf)	0.0003812	9	0.0000701	0.7289173

0.2.10 Common Murre

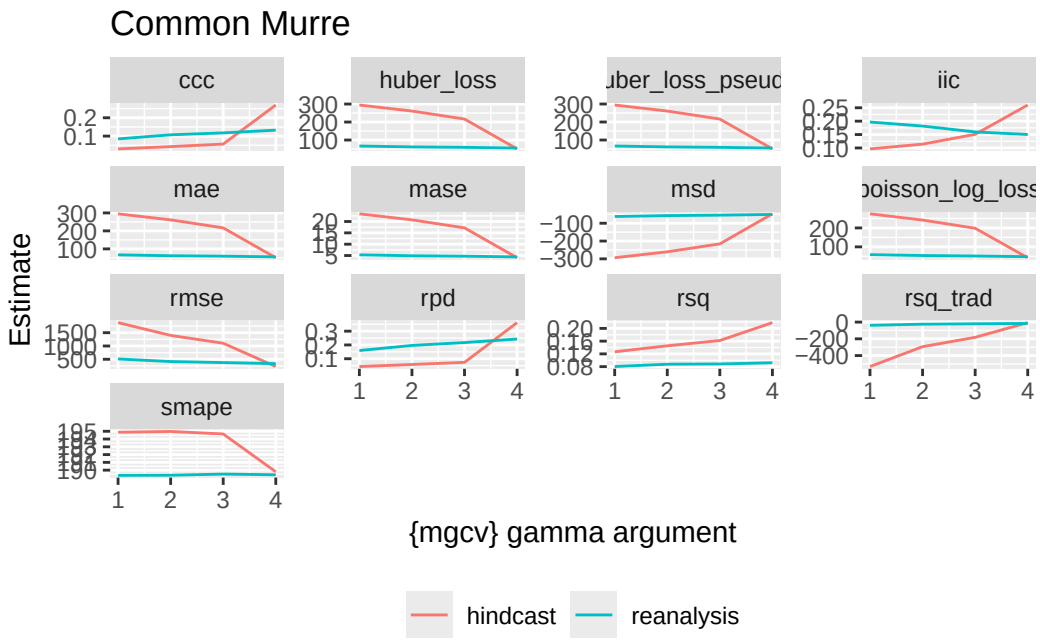


Table 22: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.1213090	10	895.8871362	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	4.8854898	8	140.9791372	0.0000000
s(date_decimal)	4.1358940	9	2589.0328957	0.0000000
s(depth)	6.7002578	9	6372.0122885	0.0000000
s(slope)	4.5133174	9	339.2202980	0.0000000
s(reanalysis_bbv_200)	0.9693474	9	193.1677523	0.0000000
s(reanalysis_ssh)	2.4295096	9	58.9522612	0.0000000
s(reanalysis_sst)	4.5386117	9	1529.3004130	0.0000000
s(reanalysis_su,reanalysis_sv)	7.3031570	29	96.8891531	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	17.1418030	29	444.2718287	0.0000000
s(reanalysis_curl)	0.0005915	9	0.0008290	0.2234510
s(reanalysis_ild_05)	0.0002206	9	0.0002683	0.2537847

Table 23: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.6541355	10	529.0422932	0.0000000
s(date_doy)	4.8478634	8	206.8922072	0.0000000
s(date_decimal)	5.1792193	9	2423.1992714	0.0000000
s(depth)	6.7707266	9	4920.3730320	0.0000000
s(slope)	4.8663855	9	328.4431964	0.0000000
s(hindcast_ild_05)	5.0779227	9	126.2233463	0.0000000
s(hindcast_ssh)	1.5325261	9	35.9776030	0.0000000
s(hindcast_sst)	5.1372840	9	1862.7324008	0.0000000
s(hindcast_zoo_100m_int)	1.7481651	9	43.4241318	0.0000000
s(hindcast_su,hindcast_sv)	9.3434253	29	135.1820403	0.0000000
s(hindcast_sustr,hindcast_svstr)	6.8583449	29	74.9834197	0.0000000
s(hindcast_bbv_200)	0.9234193	9	9.4849196	0.0002315
s(hindcast_chl_surf)	0.6715025	9	8.0386624	0.0005814
s(hindcast_curl)	0.0006498	9	0.0006196	0.3151908
s(hindcast_eke)	0.0006686	9	0.0002518	0.5374943

0.2.11 Pigeon Guillemot

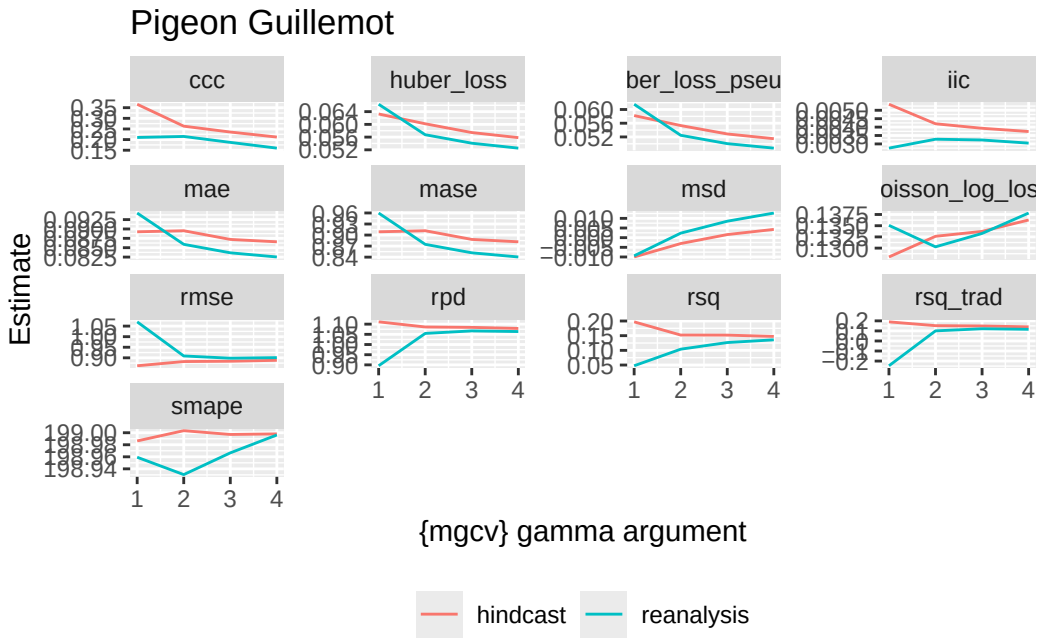


Table 24: Model summary for reanalysis model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(survey_id)	5.9045687	10	51.1388662	0.0000000
s(date_doy)	3.2516083	8	122.8149647	0.0000000
s(depth)	3.4749115	9	204.4381672	0.0000000
s(reanalysis_bbv_200)	1.3634826	9	25.5113942	0.0000528
s(slope)	0.7157719	9	7.8234019	0.0018141
s(reanalysis_sst)	0.3659191	9	2.0908115	0.0194458
s(reanalysis_curl)	0.0001031	9	0.0002084	0.1426633
s(reanalysis_sustr,reanalysis_svstr)	0.0000602	29	0.0000462	0.4459151
s(reanalysis_su,reanalysis_sv)	0.0000742	29	0.0000559	0.5089736
s(reanalysis_ild_05)	0.0000376	9	0.0000087	0.6902126
s(date_decimal)	0.0000675	9	0.0000133	0.8206881
s(reanalysis_ssh)	0.0000453	9	0.0000034	0.8978422

Table 25: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.7432166	10	73.7137003	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	4.3167151	8	83.3039090	0.0000000
s(depth)	4.5505995	9	135.6286814	0.0000000
s(slope)	1.7664964	9	21.7541088	0.0000365
s(hindcast_su,hindcast_sv)	10.5762053	29	30.6154598	0.0002007
s(hindcast_sustr,hindcast_svstr)	5.0143179	29	19.2131525	0.0003006
s(hindcast_zoo_100m_int)	2.9155682	9	19.7649399	0.0003544
s(hindcast_ild_05)	2.5976558	9	14.4122811	0.0005506
s(hindcast_sst)	1.3264831	9	21.8492557	0.0010461
s(hindcast_bbv_200)	2.3486239	9	31.4199126	0.0087630
s(hindcast_ssh)	0.7203922	9	3.6623696	0.0446102
s(hindcast_eke)	0.0064347	9	0.0065907	0.1731265
s(hindcast_curl)	0.0003684	9	0.0002463	0.4105821
s(hindcast_chl_surf)	0.0002221	9	0.0000593	0.7288628
s(date_decimal)	0.0000545	9	0.0000044	0.9417860

0.2.12 Marbled Murrelet

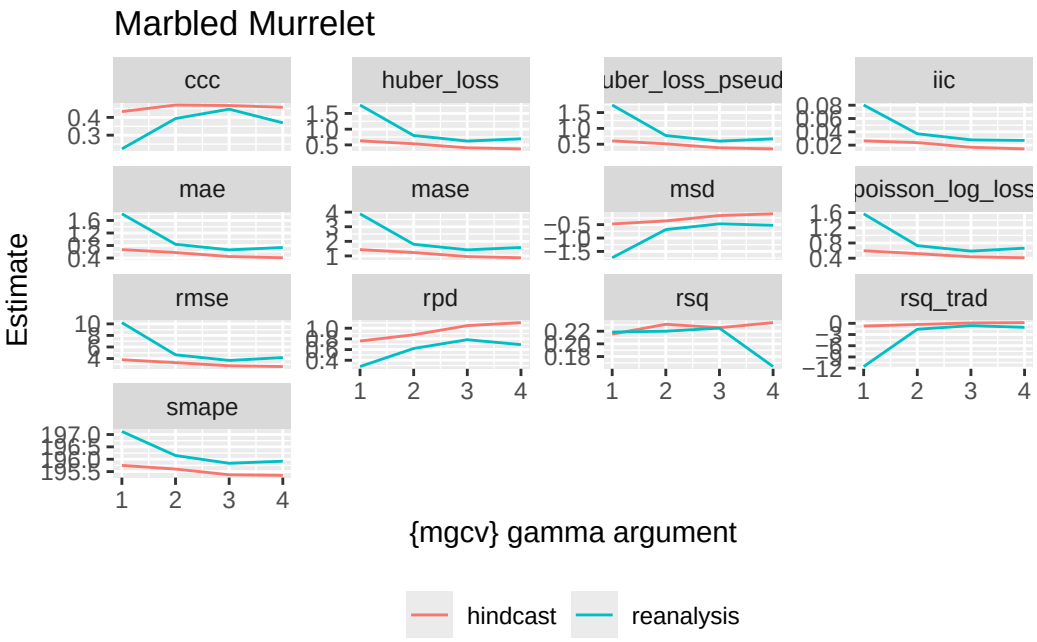


Table 26: Model summary for reanalysis model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(reanalysis_sst)	1.3184667	9	24.9206588	-0.0000002

term	edf	ref.df	statistic	p.value
s(survey_id)	8.7965532	11	420.8211649	0.0000000
s(date_doy)	2.8550989	8	55.6319942	0.0000000
s(depth)	1.9048783	9	42.2068566	0.0000000
s(slope)	5.0928252	9	157.5795912	0.0000008
s(reanalysis_ild_05)	0.8416595	9	16.2380719	0.0000137
s(date_decimal)	1.2984687	9	84.6339417	0.0002670
s(reanalysis_bbv_200)	0.9369519	9	5.6141318	0.0065126
s(reanalysis_sustr,reanalysis_svstr)	0.0001011	29	0.0001515	0.1846974
s(reanalysis_ssh)	0.0000117	9	0.0000056	0.5743272
s(reanalysis_curl)	0.0000362	9	0.0000065	0.7375080
s(reanalysis_su,reanalysis_sv)	0.0000258	29	0.0000080	0.8398812

Table 27: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.4760934	11	467.8919032	0.0000000
s(depth)	1.8745815	9	78.3679380	0.0000000
s(hindcast_sustr,hindcast_svstr)	1.3762190	29	17.2296565	0.0000203
s(slope)	4.8917038	9	342.9348106	0.0000645
s(hindcast_sst)	0.7071087	9	14.8095081	0.0001461
s(date_doy)	0.9571524	8	8.6996304	0.0003469
s(hindcast_ild_05)	0.1747398	9	0.8849489	0.0060374
s(date_decimal)	0.0001605	9	0.0004726	0.0455234
s(hindcast_chl_surf)	0.0000806	9	0.0001505	0.1435146
s(hindcast_bbv_200)	0.0000539	9	0.0000418	0.3562271
s(hindcast_curl)	0.0000408	9	0.0000208	0.4666625
s(hindcast_ssh)	0.0000648	9	0.0000259	0.5702763
s(hindcast_su,hindcast_sv)	0.0000327	29	0.0000099	0.8527129
s(hindcast_eke)	0.0000529	9	0.0000052	0.8600465
s(hindcast_zoo_100m_int)	0.0000321	9	0.0000026	0.8955110

0.2.13 Scripps's/Guadalupe Murrelet

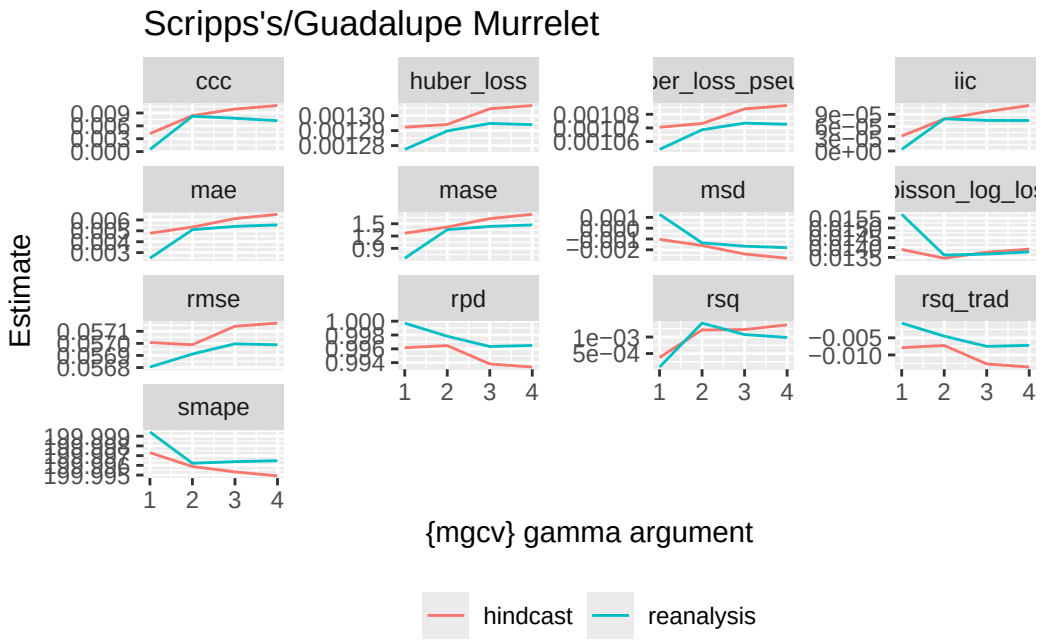


Table 28: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.4264344	10	39.3828143	0.0000000
s(date_doy)	4.1368112	8	45.4038477	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	9.5865816	29	20.8376017	0.0049522
s(reanalysis_curl)	1.5930058	9	7.8482878	0.0054431
s(reanalysis_sst)	2.6387791	9	9.3031584	0.0105572
s(reanalysis_su,reanalysis_sv)	1.4879646	29	5.7843549	0.0199430
s(date_decimal)	4.0051992	9	185.7701846	0.0866806
s(slope)	1.1977140	9	3.1154694	0.0922461
s(reanalysis_ild_05)	0.6814067	9	1.7457399	0.1062055
s(depth)	0.4577147	9	0.5833296	0.2850564
s(reanalysis_bbv_200)	0.1956514	9	0.1427081	0.4248005
s(reanalysis_ssh)	0.0000520	9	0.0000172	0.5962650

Table 29: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.2493979	10	72.4139115	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	2.4614318	8	36.4700020	0.0000092
s(hindcast_zoo_100m_int)	1.6229721	9	12.6404088	0.0003796
s(hindcast_sst)	1.6624850	9	6.8285475	0.0217526
s(hindcast_sustr,hindcast_svstr)	1.3031343	29	3.3089195	0.0332100
s(hindcast_ild_05)	0.4137497	9	1.5221285	0.0595533
s(slope)	0.4581535	9	1.8467308	0.0689738
s(date_decimal)	0.8998503	9	31.4042269	0.0773053
s(hindcast_bbv_200)	0.6749257	9	1.5513838	0.0914166
s(hindcast_curl)	0.0067579	9	0.0128814	0.1458382
s(hindcast_ssh)	0.0000976	9	0.0001629	0.1594074
s(hindcast_eke)	0.0018379	9	0.0021546	0.2737159
s(hindcast_chl_surf)	0.0000675	9	0.0000712	0.2790372
s(hindcast_su,hindcast_sv)	0.0001035	29	0.0000659	0.5396434
s(depth)	0.0000548	9	0.0000064	0.8818018

0.2.14 Ancient Murrelet

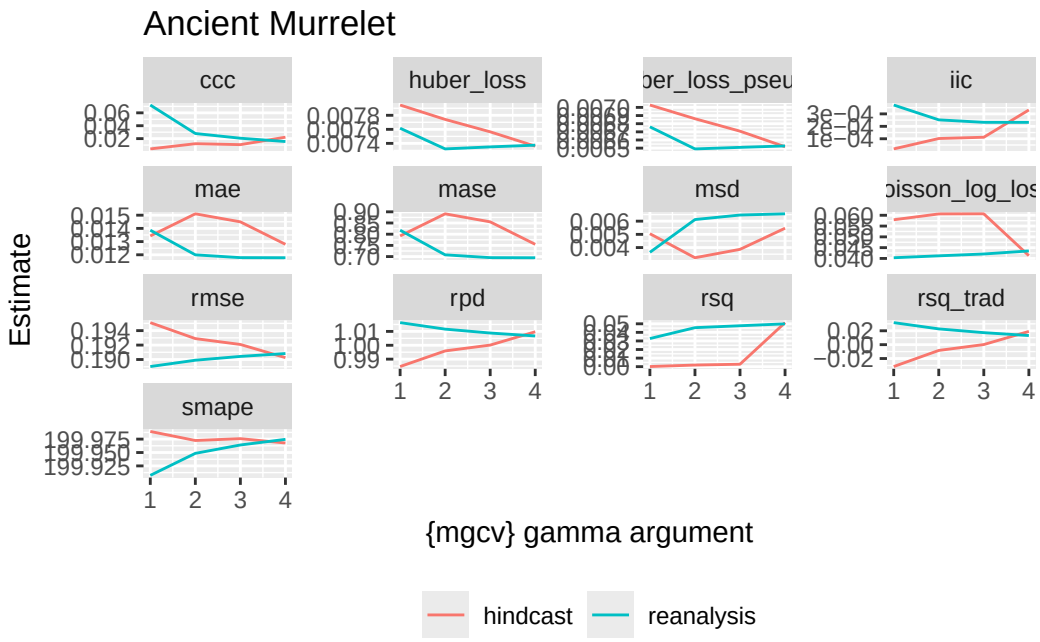


Table 30: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(reanalysis_sustr,reanalysis_svstr)	6.9174927	29	23.1605275	0.0003521

term	edf	ref.df	statistic	p.value
s(reanalysis_sst)	0.9078342	9	10.4536831	0.0027563
s(date_doy)	2.8076112	8	19.0939189	0.0049696
s(reanalysis_bbv_200)	0.8751967	9	7.6479114	0.0138294
s(reanalysis_ssh)	0.8399757	9	4.3202605	0.0204424
s(date_decimal)	0.9352718	9	4.9425948	0.0432963
s(survey_id)	4.4364600	10	8.3368520	0.0436958
s(depth)	0.3486427	9	0.5006180	0.2318637
s(reanalysis_ild_05)	0.3429885	9	0.3505824	0.3156923
s(reanalysis_su,reanalysis_sv)	0.0001707	29	0.0001018	0.6208673
s(reanalysis_curl)	0.0000387	9	0.0000065	0.7884328
s(slope)	0.0000250	9	0.0000009	0.9483659

Table 31: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(hindcast_sst)	0.8972894	9	26.0824367	0.0000000
s(date_decimal)	0.4919095	9	3.1082571	0.0119309
s(hindcast_sustr,hindcast_svstr)	0.0000179	29	0.0000604	0.0317931
s(date_doy)	0.0000048	8	0.0000122	0.0671707
s(hindcast_ild_05)	0.0000070	9	0.0000200	0.0836434
s(hindcast_bbv_200)	0.0000023	9	0.0000060	0.0916823
s(depth)	0.0000057	9	0.0000139	0.1121896
s(hindcast_curl)	0.0000122	9	0.0000230	0.1638737
s(hindcast_chl_surf)	0.0000125	9	0.0000209	0.1880196
s(hindcast_su,hindcast_sv)	0.0000071	29	0.0000109	0.1939374
s(hindcast_zoo_100m_int)	0.0000048	9	0.0000022	0.5322690
s(hindcast_ssh)	0.0000028	9	0.0000009	0.6110491
s(survey_id)	0.0000011	10	0.0000007	0.6673196
s(slope)	0.0000031	9	0.0000005	0.7528562
s(hindcast_eke)	0.0000034	9	0.0000001	0.9651229

0.2.15 Cassin's Auklet

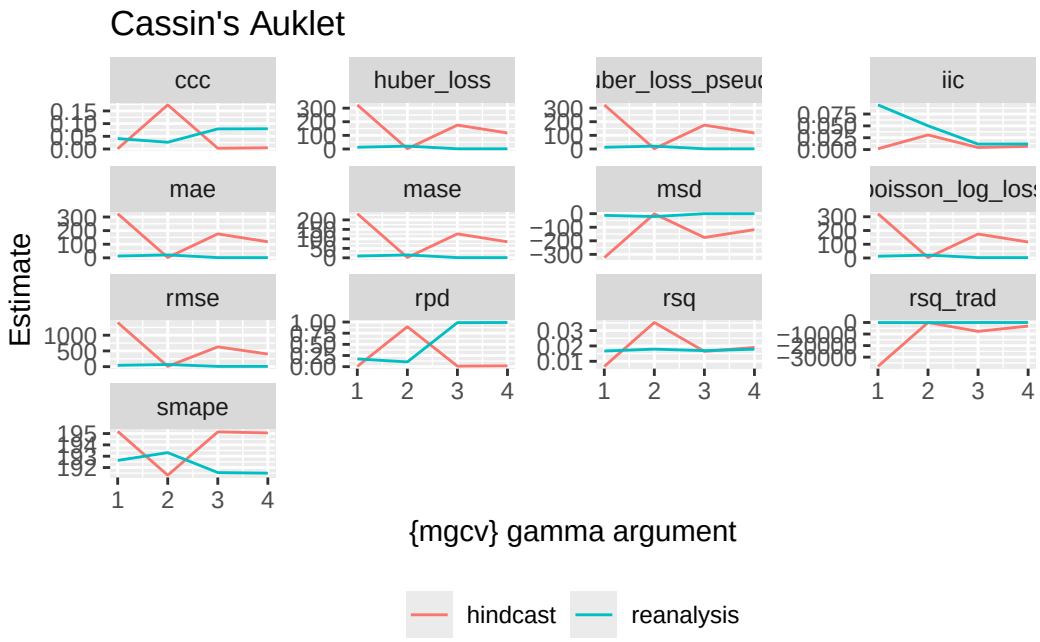


Table 32: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.4830500	10	206.0173210	0.0000000
s(date_doy)	6.1043431	8	1042.7830475	0.0000000
s(date_decimal)	7.5772259	9	1000.9082189	0.0000000
s(depth)	5.5732402	9	1144.7624192	0.0000000
s(slope)	0.9759301	9	157.7673653	0.0000000
s(reanalysis_bbv_200)	3.0540156	9	169.0665768	0.0000000
s(reanalysis_ild_05)	3.4745428	9	149.2923993	0.0000000
s(reanalysis_ssh)	2.4731383	9	54.2352911	0.0000000
s(reanalysis_sst)	3.9790413	9	766.0102007	0.0000000
s(reanalysis_curl)	0.4514552	9	2.3251489	0.0148955
s(reanalysis_sustr,reanalysis_svstr)	0.0016992	29	0.0042474	0.0371420
s(reanalysis_su,reanalysis_sv)	0.0002300	29	0.0002808	0.2732386

Table 33: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.4475808	10	205.4054676	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	6.7113425	8	475.6897757	0.0000000
s(date_decimal)	7.7427543	9	1201.4020220	0.0000000
s(depth)	6.6606174	9	930.8367696	0.0000000
s(slope)	2.9923301	9	189.1714564	0.0000000
s(hindcast_bbv_200)	5.1152767	9	359.1003869	0.0000000
s(hindcast_curl)	1.0022958	9	35.5858338	0.0000000
s(hindcast_ild_05)	4.9053152	9	121.8134775	0.0000000
s(hindcast_sst)	6.3752979	9	476.0759052	0.0000000
s(hindcast_zoo_100m_int)	6.0280829	9	98.5659736	0.0000000
s(hindcast_su,hindcast_sv)	12.4402735	29	71.0916827	0.0000000
s(hindcast_sustr,hindcast_svstr)	8.9441459	29	53.9865596	0.0000000
s(hindcast_ssh)	3.2331807	9	24.3123346	0.0000101
s(hindcast_eke)	0.0014180	9	0.0008322	0.4091020
s(hindcast_chl_surf)	0.0013292	9	0.0008151	0.4390889

0.2.16 Rhinoceros Auklet

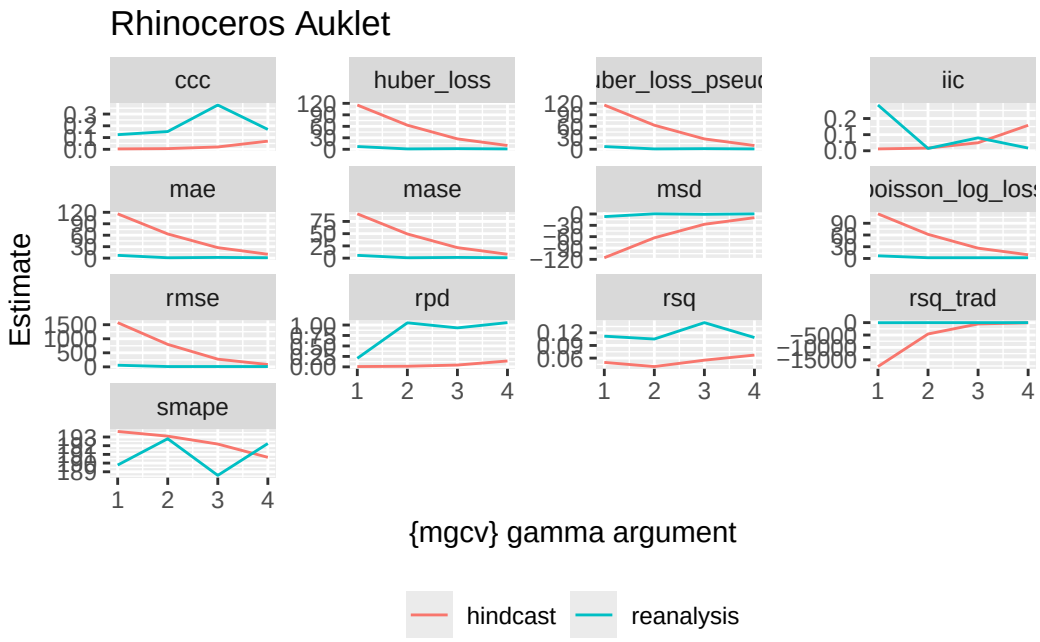


Table 34: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.4217324	10	602.1998242	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	5.4367942	8	1558.5630147	0.0000000
s(date_decimal)	5.6025977	9	932.3091879	0.0000000
s(depth)	6.1526444	9	744.8845284	0.0000000
s(slope)	2.1559307	9	83.3306047	0.0000000
s(reanalysis_curl)	1.5748606	9	27.3193237	0.0000000
s(reanalysis_sst)	3.8269167	9	662.9065151	0.0000000
s(reanalysis_su,reanalysis_sv)	4.8221768	29	33.4841328	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	11.5834602	29	329.2536487	0.0000000
s(reanalysis_bbv_200)	1.8088856	9	36.8417985	0.0000163
s(reanalysis_ild_05)	0.6167332	9	6.1085817	0.0013532
s(reanalysis_ssh)	0.0015016	9	0.0042177	0.0598781

Table 35: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.3825995	10	453.0316413	0.0000000
s(date_doy)	5.7715074	8	825.7142324	0.0000000
s(date_decimal)	7.3447895	9	1198.2921018	0.0000000
s(depth)	6.0014263	9	636.7071483	0.0000000
s(slope)	2.0473819	9	72.0502194	0.0000000
s(hindcast_ild_05)	2.4375270	9	139.0214454	0.0000000
s(hindcast_ssh)	2.8215919	9	90.9329385	0.0000000
s(hindcast_sst)	4.2988704	9	816.1141890	0.0000000
s(hindcast_zoo_100m_int)	2.5282130	9	147.9202759	0.0000000
s(hindcast_sustr,hindcast_svstr)	10.0677189	29	132.4912992	0.0000000
s(hindcast_su,hindcast_sv)	0.9945784	29	7.8423110	0.0003557
s(hindcast_chl_surf)	0.0017185	9	0.0053050	0.0665582
s(hindcast_bbv_200)	0.0035661	9	0.0047895	0.2285203
s(hindcast_curl)	0.0004804	9	0.0002873	0.4431493
s(hindcast_eke)	0.0004500	9	0.0001794	0.5780698

0.2.17 Tufted Puffin

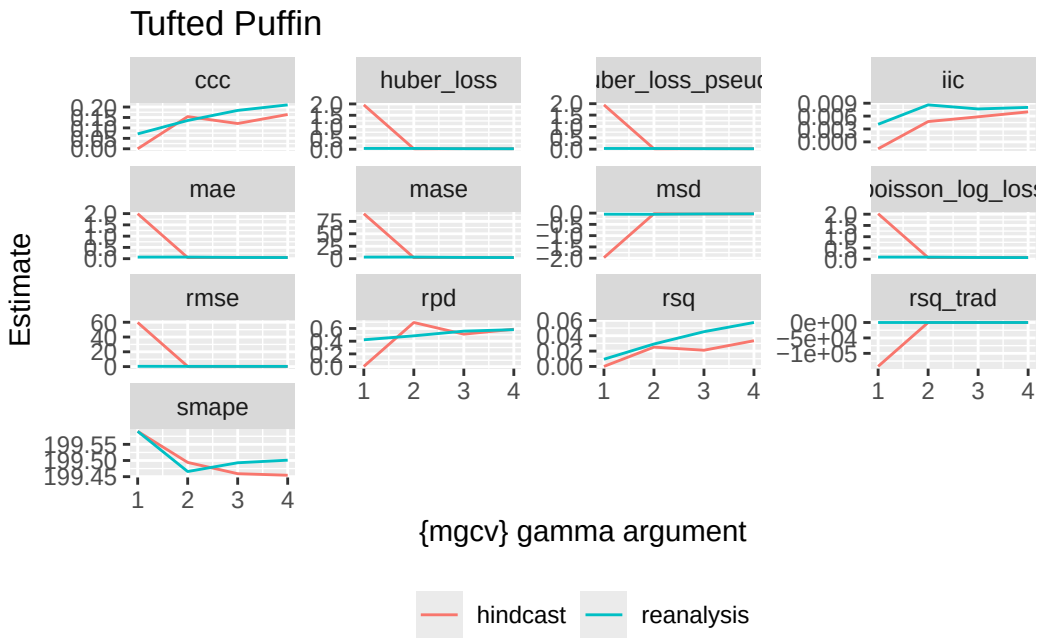


Table 36: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	4.3735014	11	51.3718091	0.0000000
s(depth)	0.8817314	9	31.7427664	0.0000000
s(reanalysis_bbv_200)	0.8950284	9	103.7454942	0.0000000
s(reanalysis_sst)	0.9298095	9	99.9248474	0.0000000
s(date_doy)	0.9685862	8	10.8691635	0.0022959
s(reanalysis_su,reanalysis_sv)	0.0000196	29	0.0000573	0.0303080
s(reanalysis_ssh)	0.0000205	9	0.0000615	0.0636296
s(date_decimal)	0.0000057	9	0.0000070	0.2653496
s(slope)	0.0000045	9	0.0000051	0.2832760
s(reanalysis_sustr,reanalysis_svstr)	0.0000066	29	0.0000069	0.3191165
s(reanalysis_ild_05)	0.0000039	9	0.0000020	0.4789009
s(reanalysis_curl)	0.0000066	9	0.0000021	0.6074736

Table 37: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(survey_id)	5.7078951	11	60.2433831	0.0000000

term	edf	ref.df	statistic	p.value
s(hindcast_sst)	2.3607983	9	55.6578207	0.0000000
s(depth)	1.7062955	9	21.3192382	0.0000044
s(hindcast_bbv_200)	1.5054448	9	50.4361831	0.0009332
s(hindcast_eke)	1.4424528	9	11.6868650	0.0009455
s(hindcast_zoo_100m_int)	1.3473757	9	5.2211716	0.0208360
s(date_doy)	3.8082358	8	42.8434744	0.0491990
s(hindcast_chl_surf)	0.0089549	9	0.0182335	0.1273827
s(date_decimal)	0.0015701	9	0.0031294	0.1281015
s(hindcast_ild_05)	0.0002316	9	0.0003573	0.1805895
s(hindcast_su,hindcast_sv)	0.0000812	29	0.0000818	0.3460221
s(hindcast_curl)	0.0001214	9	0.0000864	0.3877665
s(hindcast_ssh)	0.0000840	9	0.0000388	0.5543941
s(hindcast_sustr,hindcast_svstr)	0.0000534	29	0.0000201	0.7190836
s(slope)	0.0000647	9	0.0000020	0.9619105

0.2.18 Black-legged Kittiwake

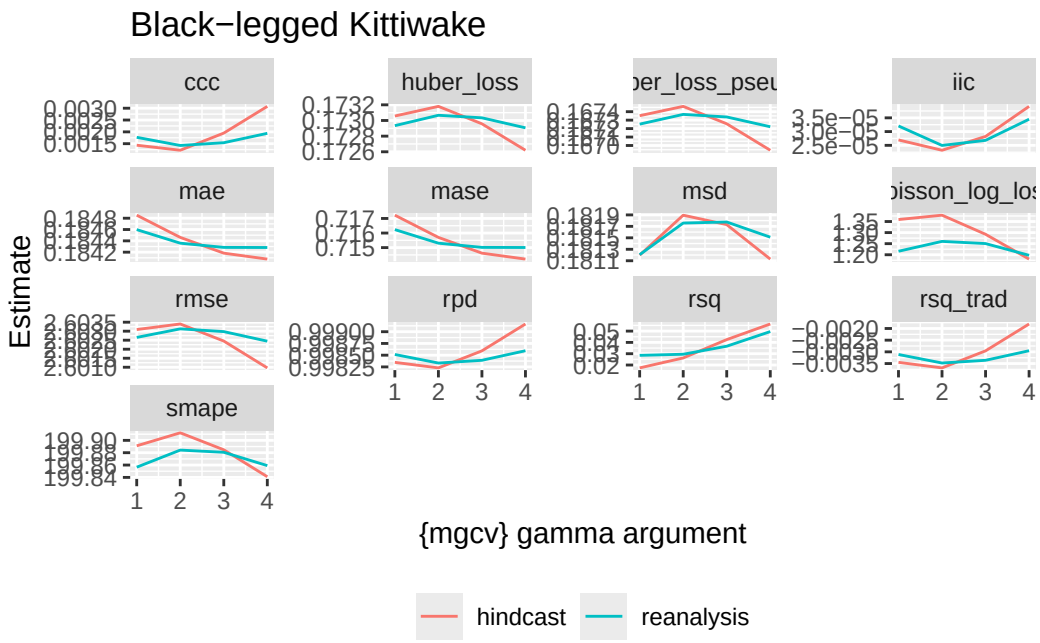


Table 38: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.0308986	10	99.9461767	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	6.3366371	8	1330.8473264	0.0000000
s(date_decimal)	6.9483113	9	475.3126132	0.0000000
s(depth)	0.8757287	9	28.1123591	0.0000000
s(slope)	2.8756804	9	175.7392976	0.0000000
s(reanalysis_sst)	5.2381560	9	754.0906451	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	5.1612764	29	49.1790216	0.0000000
s(reanalysis_ssh)	1.5553086	9	16.6224013	0.0000048
s(reanalysis_ild_05)	0.6253697	9	6.3930147	0.0009424
s(reanalysis_curl)	0.8895414	9	6.3924501	0.0018400
s(reanalysis_su,reanalysis_sv)	0.0004747	29	0.0012578	0.0289861
s(reanalysis_bbv_200)	0.0000697	9	0.0001444	0.1319804

Table 39: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	5.5953468	10	89.6179243	0.0000000
s(date_doy)	5.6296301	8	703.0009161	0.0000000
s(date_decimal)	7.1116725	9	394.6347399	0.0000000
s(depth)	0.9597800	9	92.0500872	0.0000000
s(slope)	2.6539997	9	118.0828199	0.0000000
s(hindcast_bbv_200)	1.8012122	9	39.2732093	0.0000000
s(hindcast_ild_05)	0.8912122	9	32.7132955	0.0000000
s(hindcast_ssh)	3.9267365	9	64.1546427	0.0000000
s(hindcast_sst)	6.0595136	9	624.8293551	0.0000000
s(hindcast_chl_surf)	0.7604813	9	11.5833941	0.0000854
s(hindcast_curl)	0.6939266	9	8.4718483	0.0003794
s(hindcast_zoo_100m_int)	0.8806413	9	6.0525588	0.0016881
s(hindcast_sustr,hindcast_svstr)	0.0003298	29	0.0008537	0.0478616
s(hindcast_eke)	0.0001273	9	0.0002290	0.1644774
s(hindcast_su,hindcast_sv)	0.0000699	29	0.0000696	0.3682353

0.2.19 Sabine's Gull

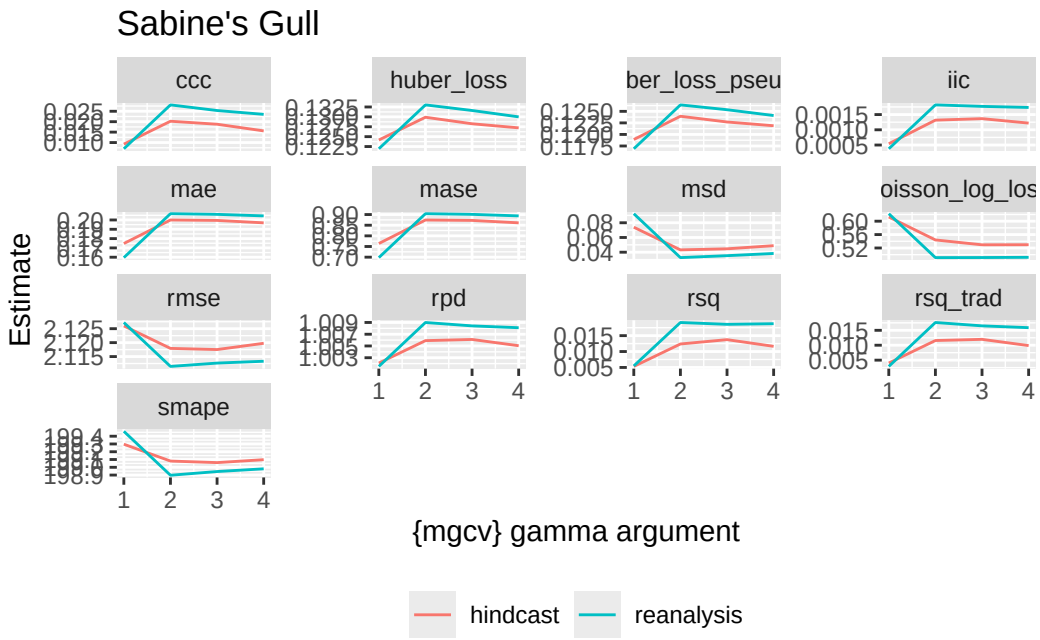


Table 40: Model summary for reanalysis model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(survey_id)	4.8857429	10	35.6423982	0.0000000
s(date_doy)	7.1064875	8	376.9809432	0.0000000
s(depth)	3.4600264	9	110.7022763	0.0000000
s(reanalysis_ssh)	3.4654102	9	63.9875440	0.0000000
s(reanalysis_ild_05)	1.3874766	9	13.0387253	0.0000934
s(slope)	1.8221729	9	13.9856129	0.0007842
s(reanalysis_su,reanalysis_sv)	2.1646886	29	6.9071815	0.0043266
s(reanalysis_sustr,reanalysis_svstr)	2.0516765	29	5.6522783	0.0147098
s(reanalysis_bbv_200)	0.0005958	9	0.0013274	0.1083866
s(reanalysis_sst)	0.0020743	9	0.0042852	0.1108244
s(date_decimal)	0.0003506	9	0.0003043	0.3756757
s(reanalysis_curl)	0.0016267	9	0.0007547	0.5333135

Table 41: Model summary for hindcast model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(survey_id)	3.6405169	10	27.0795939	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	6.7811608	8	334.6665110	0.0000000
s(depth)	2.7437822	9	114.1954023	0.0000000
s(hindcast_sustr,hindcast_svstr)	1.4748373	29	22.5473988	0.0000002
s(hindcast_sst)	2.3663165	9	26.5232818	0.0000824
s(slope)	1.5253103	9	12.6228983	0.0002682
s(hindcast_eke)	0.7763213	9	9.6452232	0.0004320
s(hindcast_ild_05)	1.7477563	9	10.8375066	0.0006291
s(hindcast_bbv_200)	0.9396001	9	7.1859338	0.0017338
s(hindcast_zoo_100m_int)	0.3884138	9	1.8962621	0.0255987
s(hindcast_su,hindcast_sv)	0.0002397	29	0.0005494	0.0699656
s(hindcast_chl_surf)	0.0025771	9	0.0067663	0.0803134
s(hindcast_ssh)	0.0001117	9	0.0001474	0.2306078
s(hindcast_curl)	0.0000418	9	0.0000070	0.7738961
s(date_decimal)	0.0000458	9	0.0000090	0.7840348

0.2.20 Bonaparte's Gull

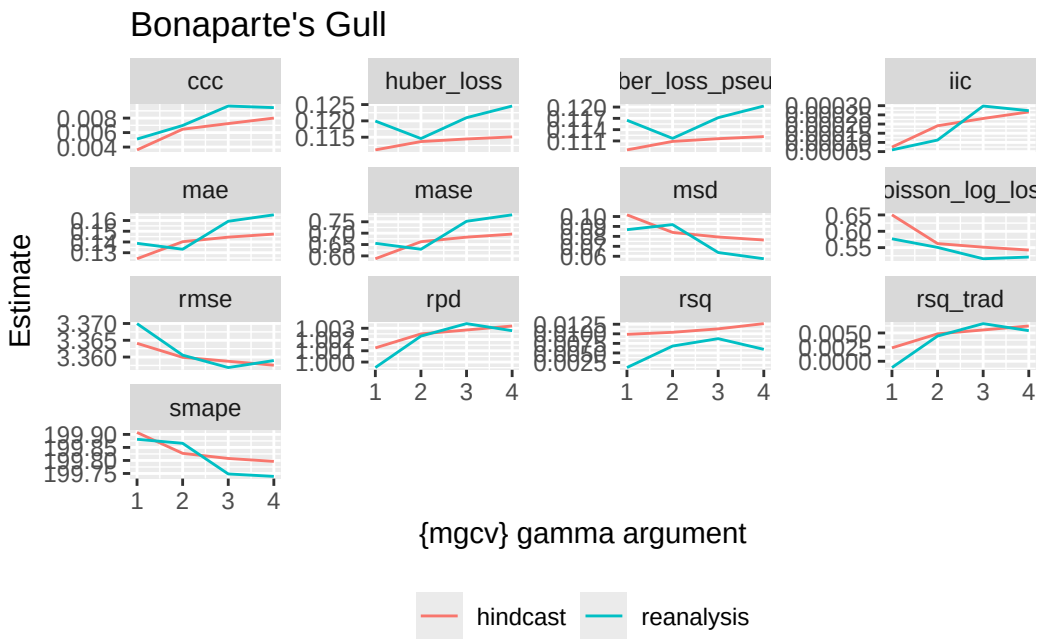


Table 42: Model summary for reanalysis model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(survey_id)	4.0972817	10	39.6687909	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	7.1965633	8	525.9861738	0.0000000
s(depth)	3.2049091	9	361.2240343	0.0000000
s(slope)	2.2039314	9	44.4985377	0.0000000
s(reanalysis_curl)	1.6268345	9	39.4060882	0.0000000
s(reanalysis_sst)	3.2115131	9	67.3854338	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	10.9064343	29	117.5020033	0.0000000
s(date_decimal)	2.0022824	9	100.6549511	0.0000014
s(reanalysis_ild_05)	0.8089200	9	11.0255213	0.0001927
s(reanalysis_su,reanalysis_sv)	1.0712662	29	7.1067478	0.0012225
s(reanalysis_bbv_200)	0.0006091	9	0.0010164	0.1769600
s(reanalysis_ssh)	0.0006676	9	0.0009637	0.2031236

Table 43: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	3.1809758	10	30.6983102	0.0000000
s(date_doy)	7.0105475	8	461.4267409	0.0000000
s(depth)	4.0292425	9	464.1197722	0.0000000
s(slope)	1.8360675	9	29.6213515	0.0000000
s(hindcast_sst)	2.8018855	9	71.1858799	0.0000000
s(hindcast_chl_surf)	1.5358952	9	32.4504460	0.0000000
s(hindcast_su,hindcast_sv)	5.8753761	29	37.3210468	0.0000000
s(hindcast_sustr,hindcast_svstr)	5.4671468	29	52.7508635	0.0000000
s(date_decimal)	1.7806507	9	72.2985533	0.0000000
s(hindcast_eke)	0.6624479	9	3.6040513	0.0002906
s(hindcast_curl)	0.0020024	9	0.0074076	0.0320511
s(hindcast_bbv_200)	0.0001361	9	0.0003116	0.1041090
s(hindcast_ssh)	0.0004132	9	0.0009027	0.1143156
s(hindcast_ild_05)	0.0001724	9	0.0001734	0.3214056
s(hindcast_zoo_100m_int)	0.0002129	9	0.0000448	0.7739926

0.2.21 Heermann's Gull

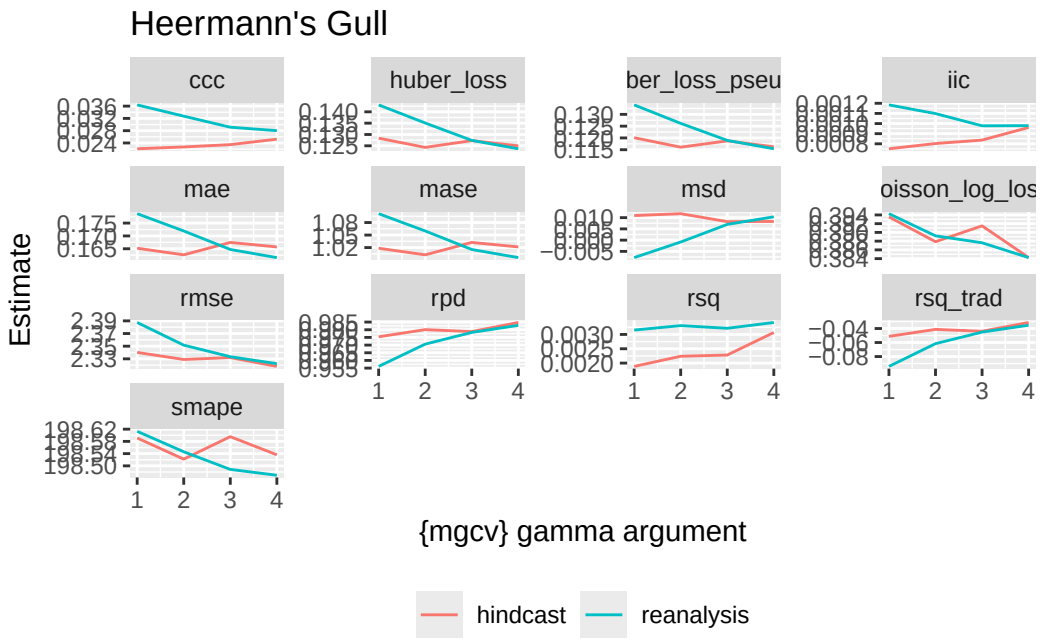


Table 44: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.2025019	10	855.9092805	0.0000000
s(date_doy)	6.2447034	8	971.2291904	0.0000000
s(depth)	4.8681655	9	2242.0942887	0.0000000
s(slope)	1.7033042	9	152.7340411	0.0000000
s(reanalysis_curl)	2.1641055	9	29.6498723	0.0000000
s(reanalysis_ssh)	2.9465354	9	108.3146546	0.0000000
s(reanalysis_su,reanalysis_sv)	2.1950240	29	15.0693149	0.0000082
s(reanalysis_sustr,reanalysis_svstr)	1.5808871	29	9.9499904	0.0000458
s(reanalysis_sst)	0.0003552	9	0.0007088	0.1319791
s(reanalysis_ild_05)	0.0000998	9	0.0000422	0.5282361
s(date_decimal)	0.0001081	9	0.0000205	0.8202237
s(reanalysis_bbv_200)	0.0000716	9	0.0000033	0.9474289

Table 45: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.2165365	10	861.5608042	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	6.1997972	8	1028.6368598	0.0000000
s(depth)	4.8278592	9	2228.8047418	0.0000000
s(slope)	1.3349367	9	133.6760256	0.0000000
s(hindcast_ssh)	2.8403526	9	70.7456106	0.0000000
s(hindcast_sst)	4.5363560	9	98.9913822	0.0000048
s(hindcast_sustr,hindcast_svstr)	1.5448696	29	9.3626639	0.0002015
s(hindcast_su,hindcast_sv)	0.8181666	29	5.4415499	0.0013552
s(hindcast_eke)	0.4820520	9	3.7139256	0.0084442
s(hindcast_ild_05)	0.3013540	9	1.5515816	0.0207583
s(hindcast_bbv_200)	0.1526352	9	0.8423680	0.0299925
s(hindcast_curl)	0.0000995	9	0.0000916	0.3092064
s(hindcast_zoo_100m_int)	0.0001170	9	0.0001046	0.3453890
s(hindcast_chl_surf)	0.0000553	9	0.0000471	0.3563236
s(date_decimal)	0.0000839	9	0.0000160	0.8121384

0.2.22 Mew Gull

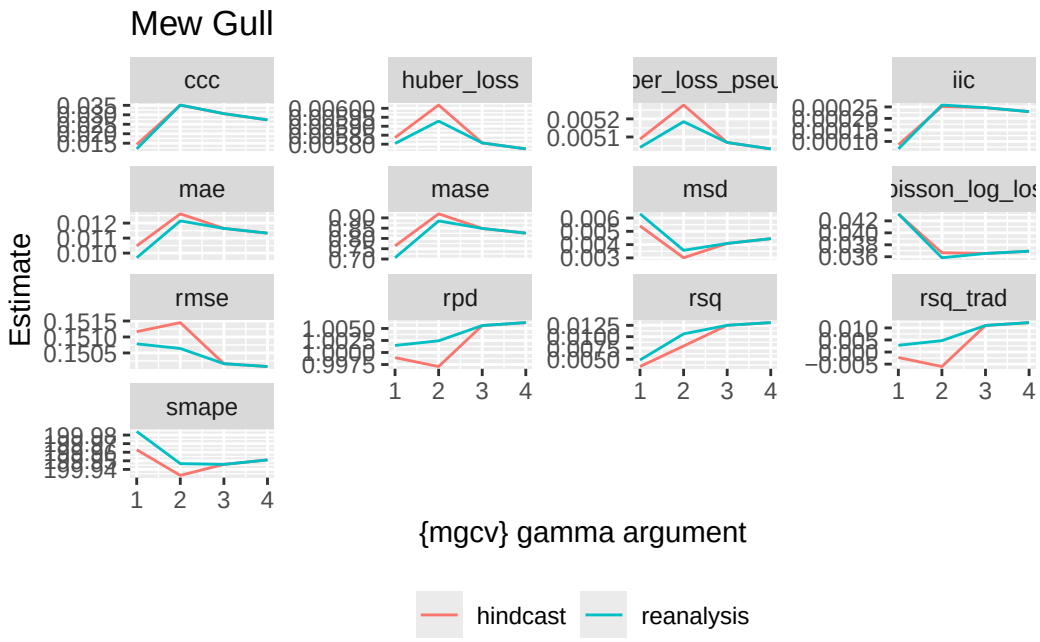


Table 46: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	2.8327637	10	24.6471557	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	2.9821883	8	90.8366022	0.0000000
s(depth)	1.0971436	9	40.1982309	0.0000000
s(date_decimal)	0.0001466	9	0.0003799	0.1019993
s(reanalysis_sustr,reanalysis_svstr)	0.0000081	29	0.0000156	0.1242830
s(reanalysis_curl)	0.0000107	9	0.0000158	0.2147364
s(reanalysis_ssh)	0.0000024	9	0.0000022	0.3316776
s(reanalysis_ild_05)	0.0000036	9	0.0000016	0.5190895
s(reanalysis_sst)	0.0000038	9	0.0000004	0.8237238
s(reanalysis_su,reanalysis_sv)	0.0000033	29	0.0000010	0.8692916
s(slope)	0.0000023	9	0.0000001	0.9304073
s(reanalysis_bbv_200)	0.0000018	9	0.0000000	0.9947351

Table 47: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	2.8327811	10	24.6484733	0.0000000
s(date_doy)	2.9821874	8	90.8372097	0.0000000
s(depth)	1.0971447	9	40.1983412	0.0000000
s(date_decimal)	0.0000713	9	0.0001853	0.1009270
s(hindcast_sst)	0.0000016	9	0.0000033	0.1242252
s(hindcast_chl_surf)	0.0000010	9	0.0000020	0.1352752
s(hindcast_bbv_200)	0.0000023	9	0.0000044	0.1467325
s(hindcast_ssh)	0.0000021	9	0.0000031	0.2104452
s(hindcast_eke)	0.0000046	9	0.0000056	0.2673437
s(hindcast_sustr,hindcast_svstr)	0.0000038	29	0.0000039	0.3369093
s(hindcast_ild_05)	0.0000014	9	0.0000013	0.3486099
s(hindcast_su,hindcast_sv)	0.0000012	29	0.0000006	0.7064759
s(hindcast_curl)	0.0000018	9	0.0000004	0.7171139
s(hindcast_zoo_100m_int)	0.0000007	9	0.0000001	0.8635021
s(slope)	0.0000010	9	0.0000000	0.9366429

0.2.23 Ring-billed Gull

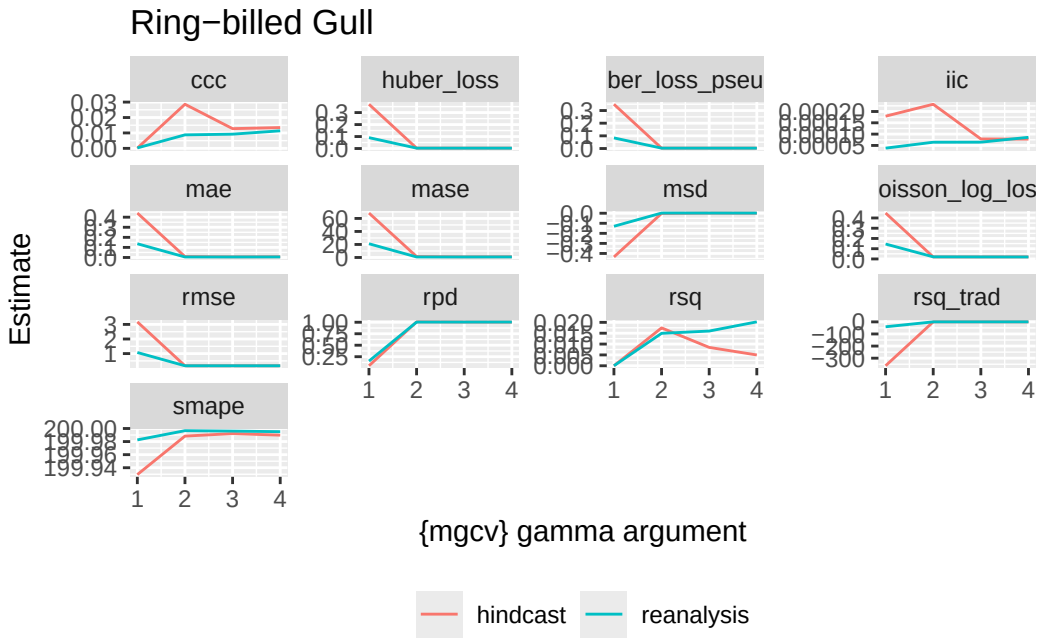


Table 48: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(date_doy)	3.2598449	8	111.2495827	0.0000000
s(date_decimal)	4.0047167	9	83.7590378	0.0000000
s(depth)	2.0433877	9	121.4911201	0.0000000
s(reanalysis_curl)	0.6127124	9	6.2463589	0.0012923
s(slope)	0.0000639	9	0.0002236	0.0462758
s(survey_id)	0.0000172	10	0.0000281	0.1390773
s(reanalysis_sst)	0.0000512	9	0.0000994	0.1413482
s(reanalysis_su,reanalysis_sv)	0.0000309	29	0.0000399	0.2483843
s(reanalysis_bbv_200)	0.0000503	9	0.0000584	0.2721126
s(reanalysis_ild_05)	0.0000251	9	0.0000253	0.3043093
s(reanalysis_ssh)	0.0000240	9	0.0000218	0.3323867
s(reanalysis_sustr,reanalysis_svstr)	0.0000230	29	0.0000098	0.6793261

Table 49: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(date_doy)	4.8917939	8	96.5799744	0.0000000

term	edf	ref.df	statistic	p.value
s(date_decimal)	6.1533269	9	108.9048437	0.0000000
s(depth)	2.2605240	9	91.3511171	0.0000000
s(hindcast_ssh)	4.0146474	9	28.4463273	0.0000021
s(hindcast_chl_surf)	2.4097300	9	18.9203723	0.0000853
s(hindcast_su,hindcast_sv)	2.0025303	29	6.4066194	0.0046589
s(survey_id)	1.7371563	10	5.7093044	0.0074968
s(hindcast_zoo_100m_int)	0.7511517	9	3.0648905	0.0179094
s(hindcast_curl)	0.4760896	9	1.4204801	0.0638257
s(slope)	0.3543872	9	0.9956267	0.0698711
s(hindcast_ild_05)	0.0327346	9	0.0638131	0.1497894
s(hindcast_eke)	0.0000800	9	0.0000964	0.2085544
s(hindcast_sustr,hindcast_svstr)	0.0000825	29	0.0000857	0.2875434
s(hindcast_sst)	0.0000492	9	0.0000311	0.4632643
s(hindcast_bbv_200)	0.0000490	9	0.0000225	0.5740242

0.2.24 Western Gull

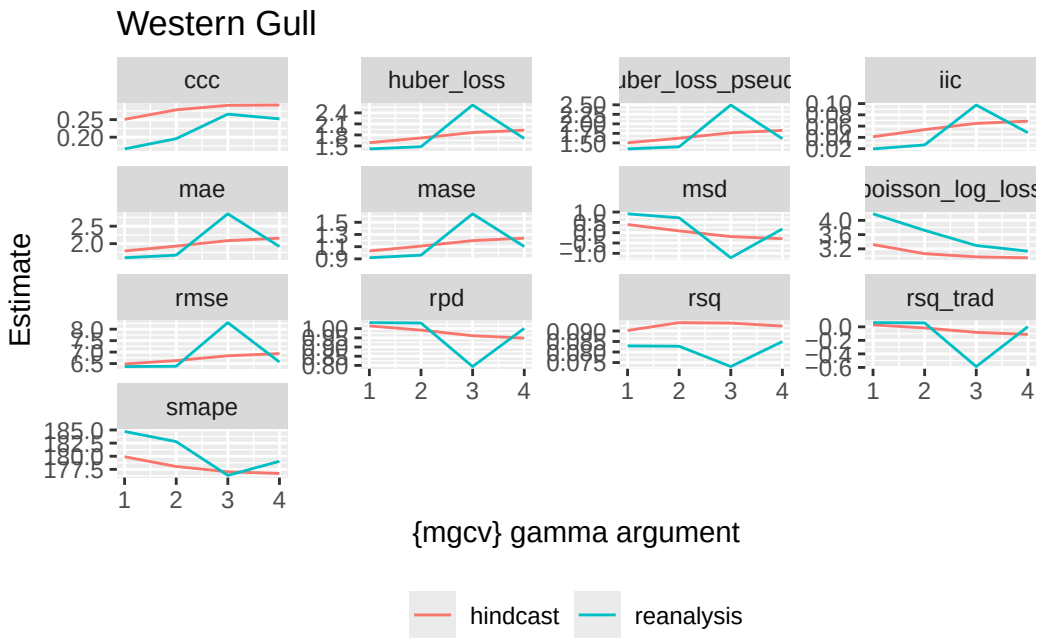


Table 50: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	9.742575	10	561.21604	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	6.395408	8	355.71934	0.0000000
s(date_decimal)	8.553699	9	2742.95941	0.0000000
s(depth)	7.775383	9	8113.67894	0.0000000
s(slope)	7.878014	9	349.33779	0.0000000
s(reanalysis_curl)	7.123066	9	109.79730	0.0000000
s(reanalysis_ild_05)	4.470776	9	51.19768	0.0000000
s(reanalysis_ssh)	4.343280	9	74.17737	0.0000000
s(reanalysis_sst)	7.102931	9	202.95946	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	23.153891	29	414.27820	0.0000000
s(reanalysis_bbv_200)	4.610636	9	35.70438	0.0000040
s(reanalysis_su,reanalysis_sv)	11.078817	29	30.72641	0.0001683

Table 51: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(hindcast_sst)	6.5011463	9	68.0447438	-0.0000002
s(survey_id)	9.7166865	10	334.5016490	0.0000000
s(date_doy)	6.8181576	8	519.7784575	0.0000000
s(date_decimal)	8.3031139	9	1015.9441712	0.0000000
s(depth)	7.7750607	9	6351.4083613	0.0000000
s(slope)	7.8407535	9	379.1960367	0.0000000
s(hindcast_bbv_200)	6.6999847	9	105.1411635	0.0000000
s(hindcast_curl)	5.2866112	9	82.1652174	0.0000000
s(hindcast_ild_05)	6.4721089	9	160.9596732	0.0000000
s(hindcast_ssh)	5.3822318	9	45.8556018	0.0000000
s(hindcast_zoo_100m_int)	6.1387432	9	45.8322725	0.0000000
s(hindcast_su,hindcast_sv)	16.1093313	29	69.6565076	0.0000000
s(hindcast_sustr,hindcast_svstr)	22.6136714	29	216.9612943	0.0000000
s(hindcast_chl_surf)	4.8014110	9	22.4716637	0.0001965
s(hindcast_eke)	0.4993346	9	0.6305012	0.1672765

0.2.25 California Gull

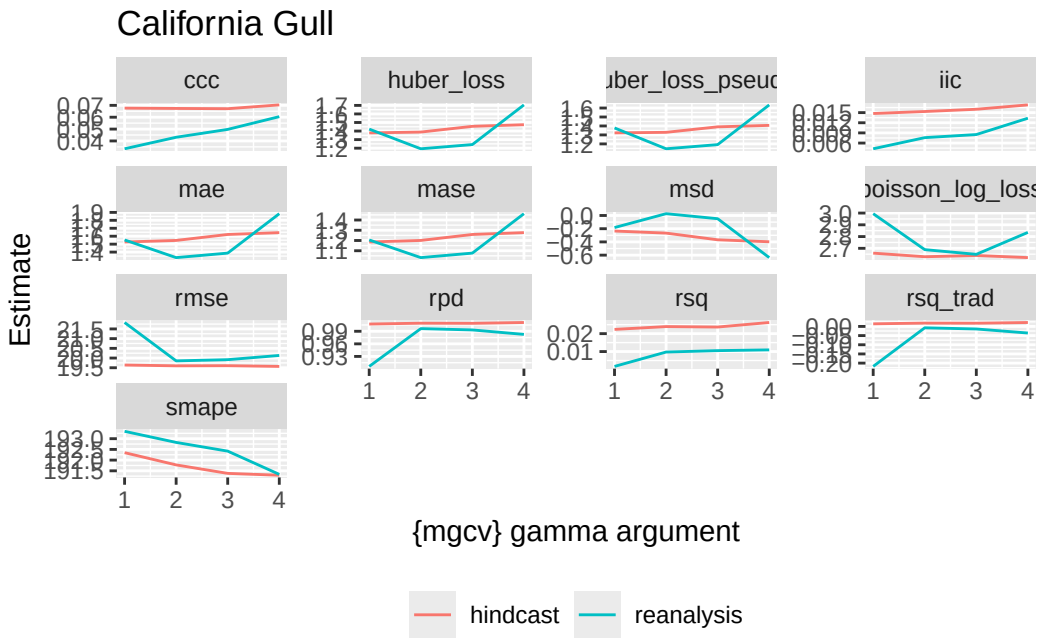


Table 52: Model summary for reanalysis model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.8741189	10	411.73033	0.0000000
s(date_doy)	7.6408488	8	2660.59274	0.0000000
s(date_decimal)	6.6969939	9	432.09290	0.0000000
s(depth)	6.4805147	9	4013.01752	0.0000000
s(slope)	6.0413906	9	301.93000	0.0000000
s(reanalysis_bbv_200)	3.1017506	9	64.73404	0.0000000
s(reanalysis_curl)	1.0696277	9	46.35223	0.0000000
s(reanalysis_ssh)	0.9877315	9	131.60751	0.0000000
s(reanalysis_sst)	5.4313828	9	119.02061	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	20.6665870	29	404.55169	0.0000000
s(reanalysis_su,reanalysis_sv)	8.5813632	29	36.11327	0.0000010
s(reanalysis_ild_05)	1.8299512	9	12.74080	0.0002969

Table 53: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.4044620	10	432.2532454	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	7.2845892	8	2173.4384247	0.0000000
s(date_decimal)	4.0466467	9	647.4739340	0.0000000
s(depth)	5.8147082	9	4148.2633041	0.0000000
s(slope)	4.8556016	9	342.4235353	0.0000000
s(hindcast_bbv_200)	1.6561336	9	47.0329867	0.0000000
s(hindcast_ild_05)	2.1387198	9	57.1991564	0.0000000
s(hindcast_sst)	2.9540464	9	267.8894036	0.0000000
s(hindcast_sustr,hindcast_svstr)	12.1205780	29	208.5872858	0.0000000
s(hindcast_chl_surf)	0.9578103	9	10.7465280	0.0000778
s(hindcast_su,hindcast_sv)	0.6237020	29	3.2751380	0.0048057
s(hindcast_eke)	0.0592856	9	0.2244208	0.0340857
s(hindcast_zoo_100m_int)	0.0103896	9	0.0322839	0.0553349
s(hindcast_ssh)	0.0023675	9	0.0060560	0.0809162
s(hindcast_curl)	0.0019362	9	0.0029189	0.1975591

0.2.26 Herring Gull

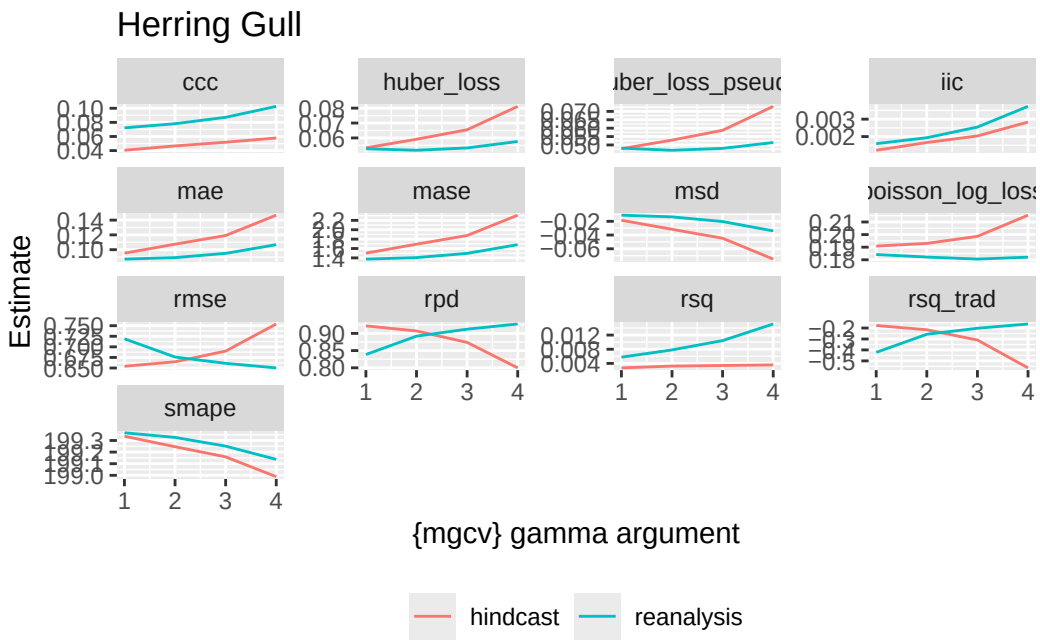


Table 54: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.8005429	10	298.3700253	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	7.0276962	8	1414.8896286	0.0000000
s(date_decimal)	3.5097456	9	249.2617697	0.0000000
s(depth)	4.8964768	9	1055.7546741	0.0000000
s(slope)	1.9228114	9	85.7101060	0.0000000
s(reanalysis_bbv_200)	2.0730698	9	95.5867732	0.0000000
s(reanalysis_ssh)	1.8599027	9	30.9439954	0.0000000
s(reanalysis_sst)	4.6302182	9	298.1962687	0.0000000
s(reanalysis_su,reanalysis_sv)	3.0923950	29	27.8032343	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	4.7907490	29	64.9197250	0.0000000
s(reanalysis_ild_05)	0.7031526	9	8.9768233	0.0002647
s(reanalysis_curl)	0.1095739	9	0.4616178	0.0337812

Table 55: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(hindcast_bbv_200)	5.4594680	9	37.4856619	-0.0000048
s(survey_id)	8.6966982	10	298.6581916	0.0000000
s(date_doy)	7.7018488	8	662.6585915	0.0000000
s(date_decimal)	6.6645612	9	356.1521389	0.0000000
s(depth)	6.0550988	9	603.2314388	0.0000000
s(slope)	6.6083530	9	80.8585275	0.0000000
s(hindcast_ild_05)	4.0054794	9	38.4693938	0.0000000
s(hindcast_ssh)	6.4344131	9	142.5604149	0.0000000
s(hindcast_sst)	7.1558583	9	386.0362491	0.0000000
s(hindcast_su,hindcast_sv)	9.2980933	29	44.7667802	0.0000000
s(hindcast_sustr,hindcast_svstr)	18.0735117	29	144.5878818	0.0000000
s(hindcast_zoo_100m_int)	3.8506802	9	18.5551028	0.0003193
s(hindcast_chl_surf)	2.6994624	9	14.4332493	0.0008842
s(hindcast_eke)	1.6536128	9	4.1538775	0.0172509
s(hindcast_curl)	0.0038722	9	0.0033046	0.3694265

0.2.27 Iceland Gull

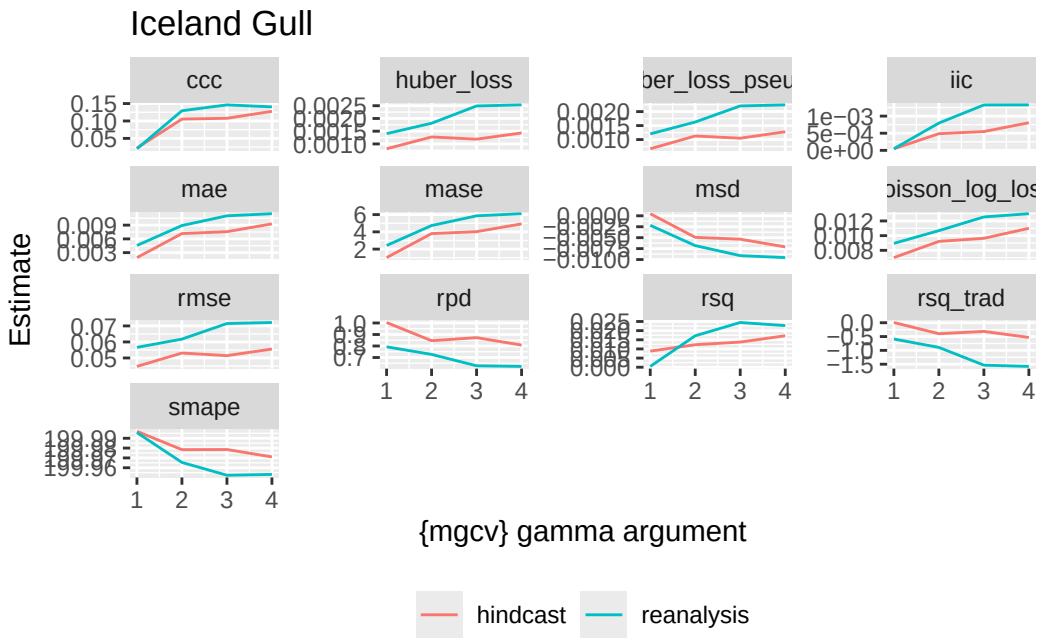


Table 56: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(reanalysis_sst)	0.9778209	9	80.4201008	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	5.3720371	29	21.6301005	0.0000953
s(depth)	0.9351373	9	13.5964467	0.0001022
s(date_doy)	3.5937279	8	157.0374576	0.0003768
s(date_decimal)	5.0104452	9	51.5888325	0.0009210
s(survey_id)	4.1276004	11	13.1294840	0.0015586
s(reanalysis_bbv_200)	1.7014623	9	6.7130640	0.0173748
s(reanalysis_su,reanalysis_sv)	3.8143963	29	8.5003789	0.0227731
s(reanalysis_ild_05)	0.8088377	9	3.8916811	0.0259842
s(slope)	0.0000040	9	0.0000019	0.5102923
s(reanalysis_ssh)	0.0000040	9	0.0000004	0.8535315
s(reanalysis_curl)	0.0000033	9	0.0000001	0.9122363

Table 57: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(hindcast_sst)	0.9752696	9	67.7497824	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	3.7847447	8	358.9326739	0.0000929
s(survey_id)	4.6724496	11	17.3258190	0.0002463
s(hindcast_zoo_100m_int)	0.9248137	9	13.0994190	0.0003495
s(date_decimal)	5.1849385	9	102.5375626	0.0021603
s(depth)	0.8939321	9	7.5433439	0.0034738
s(hindcast_sustr,hindcast_svstr)	1.6404436	29	7.6112342	0.0085747
s(hindcast_su,hindcast_sv)	0.9692202	29	1.9878483	0.1202172
s(hindcast_chl_surf)	0.7270018	9	1.7348691	0.1389677
s(slope)	0.1991702	9	0.2680821	0.2421947
s(hindcast_bbv_200)	0.0000203	9	0.0000075	0.5809319
s(hindcast_ild_05)	0.0000140	9	0.0000039	0.6399066
s(hindcast_eke)	0.0000071	9	0.0000015	0.6706438
s(hindcast_ssh)	0.0000074	9	0.0000006	0.9238642
s(hindcast_curl)	0.0000077	9	0.0000000	0.9858833

0.2.28 Glaucous-winged Gull

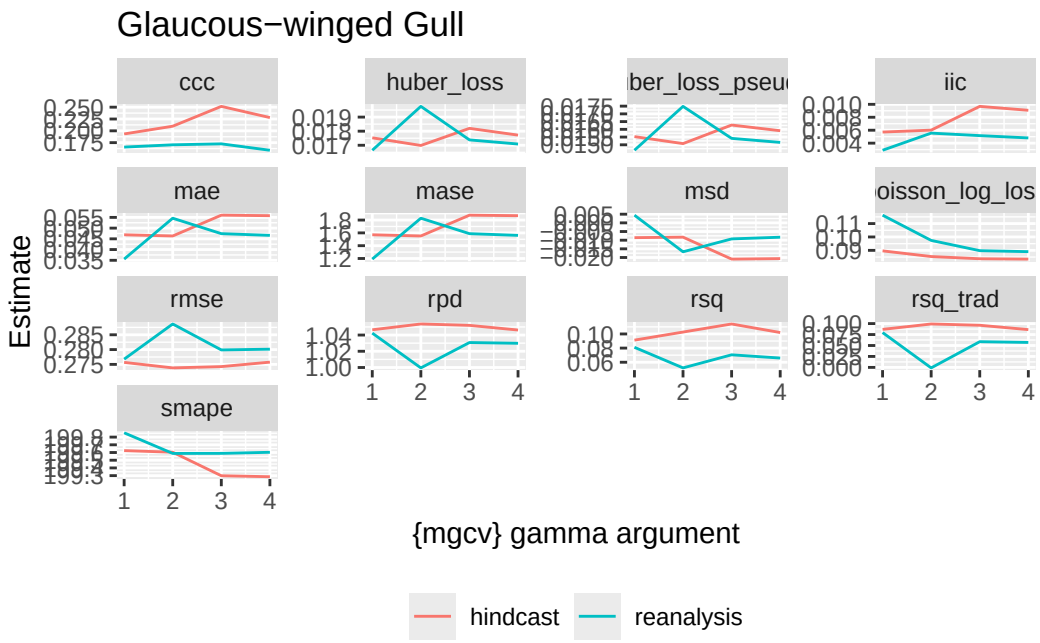


Table 58: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	9.1802462	10	241.6461652	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	5.8802435	8	318.7429823	0.0000000
s(depth)	4.1215551	9	296.5173886	0.0000000
s(reanalysis_bbv_200)	3.3289673	9	103.9075491	0.0000000
s(reanalysis_sst)	4.4198507	9	200.3895637	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	15.9263541	29	71.5601526	0.0000000
s(reanalysis_ild_05)	4.9112340	9	33.3016269	0.0000021
s(slope)	2.3538411	9	22.7251888	0.0000087
s(reanalysis_curl)	3.1668269	9	21.8195472	0.0000208
s(reanalysis_su,reanalysis_sv)	1.6167885	29	7.3020256	0.0106122
s(date_decimal)	7.4817326	9	216.0250004	0.0417928
s(reanalysis_ssh)	0.0003561	9	0.0000234	0.9611557

Table 59: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(slope)	1.4700204	9	25.0675363	-0.0000001
s(survey_id)	8.4347021	10	198.4778759	0.0000000
s(date_doy)	5.0103454	8	299.7251235	0.0000000
s(depth)	3.7453395	9	340.9593836	0.0000000
s(hindcast_bbv_200)	3.3554941	9	109.5100320	0.0000000
s(hindcast_sst)	3.7806723	9	325.9952421	0.0000000
s(hindcast_sustr,hindcast_svstr)	1.6237461	29	18.0680333	0.0000210
s(hindcast_zoo_100m_int)	0.7002763	9	4.9460676	0.0074304
s(hindcast_ssh)	0.6642420	9	4.0631798	0.0123856
s(hindcast_chl_surf)	1.2276701	9	5.0789207	0.0150618
s(date_decimal)	6.2307429	9	264.1187213	0.0226988
s(hindcast_su,hindcast_sv)	0.0006450	29	0.0012336	0.1238322
s(hindcast_ild_05)	0.0001508	9	0.0000834	0.5073185
s(hindcast_curl)	0.0001590	9	0.0000423	0.7104086
s(hindcast_eke)	0.0001886	9	0.0000444	0.7154361

0.2.29 Caspian Tern

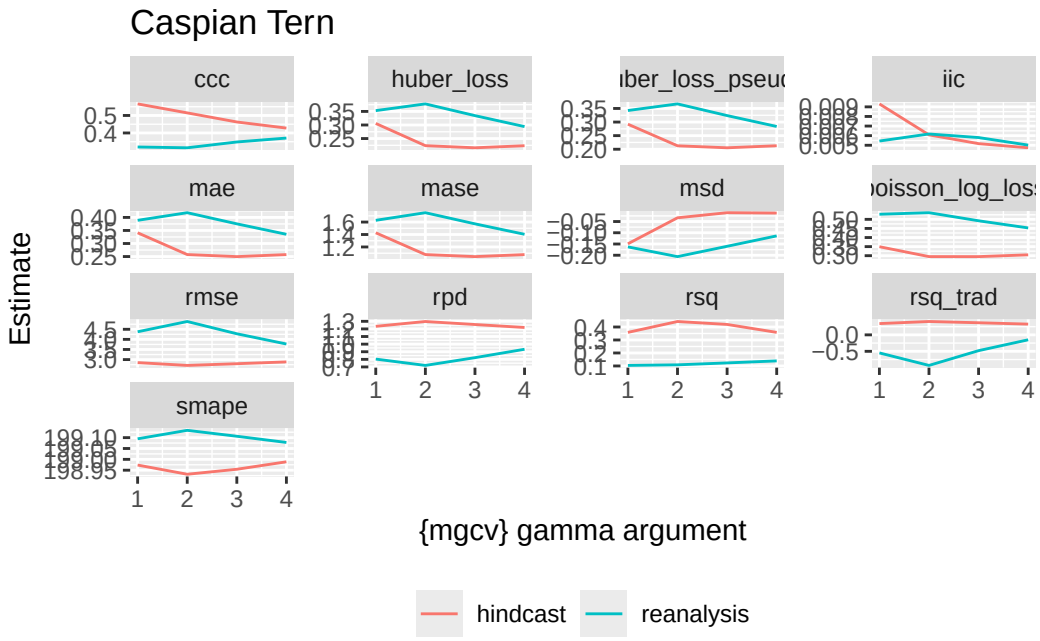


Table 60: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(date_doy)	2.9177379	8	86.7191627	0.0000000
s(date_decimal)	1.5040381	9	47.4860028	0.0000000
s(depth)	2.3924788	9	163.7566203	0.0000000
s(reanalysis_bbv_200)	1.9736158	9	51.4258398	0.0000000
s(reanalysis_sst)	1.2832345	9	36.5070482	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	1.3058115	29	8.1951881	0.0002233
s(survey_id)	0.0000873	10	0.0001175	0.1819540
s(reanalysis_su,reanalysis_sv)	0.0001623	29	0.0002255	0.1940546
s(reanalysis_ild_05)	0.0001400	9	0.0002008	0.2055884
s(reanalysis_ssh)	0.0000856	9	0.0000218	0.7011750
s(reanalysis_curl)	0.0001181	9	0.0000192	0.7457739
s(slope)	0.0001154	9	0.0000061	0.9295802

Table 61: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(hindcast_sst)	0.9269368	9	31.4830857	-0.0000001

term	edf	ref.df	statistic	p.value
s(date_doy)	3.6405931	8	71.6436461	0.0000000
s(date_decimal)	2.3447710	9	83.2475157	0.0000000
s(depth)	3.2843153	9	125.2114608	0.0000000
s(hindcast_bbv_200)	0.9806861	9	32.4378324	0.0000000
s(hindcast_su,hindcast_sv)	6.0706395	29	40.3316487	0.0000000
s(hindcast_sustr,hindcast_svstr)	5.5875392	29	41.1547591	0.0000000
s(hindcast_zoo_100m_int)	1.1231909	9	23.7728577	0.0000004
s(survey_id)	1.7709972	10	4.2659083	0.0131695
s(hindcast_ild_05)	0.0000939	9	0.0001833	0.1192326
s(hindcast_curl)	0.0000828	9	0.0001129	0.2208775
s(hindcast_ssh)	0.0001359	9	0.0000895	0.4200165
s(hindcast_chl_surf)	0.0000604	9	0.0000290	0.5095913
s(hindcast_eke)	0.0000759	9	0.0000121	0.6976511
s(slope)	0.0000845	9	0.0000092	0.8319879

0.2.30 Common Tern

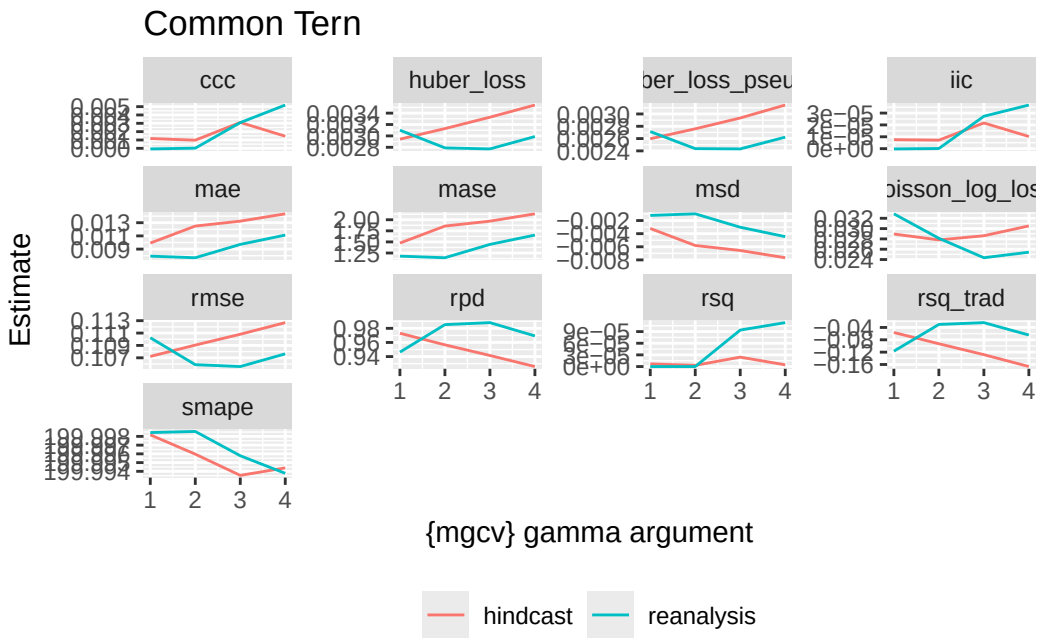


Table 62: Model summary for reanalysis model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(slope)	1.5685252	9	18.5621059	0.0000077

term	edf	ref.df	statistic	p.value
s(depth)	0.8881046	9	16.8394009	0.0000101
s(date_doy)	1.9695304	8	15.2567415	0.0000786
s(survey_id)	0.7397791	10	1.8427397	0.0280585
s(reanalysis_sustr,reanalysis_svstr)	0.0000078	29	0.0000143	0.1217520
s(reanalysis_su,reanalysis_sv)	0.0000068	29	0.0000106	0.1926812
s(reanalysis_ild_05)	0.0000009	9	0.0000013	0.2001222
s(date_decimal)	0.0000046	9	0.0000064	0.2291217
s(reanalysis_sst)	0.0000016	9	0.0000010	0.4387176
s(reanalysis_curl)	0.0000037	9	0.0000021	0.4718535
s(reanalysis_bbv_200)	0.0000018	9	0.0000005	0.6296902
s(reanalysis_ssh)	0.0000016	9	0.0000002	0.7751869

Table 63: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(hindcast_sustr,hindcast_svstr)	9.0211351	29	26.3053852	0.0004549
s(hindcast_ild_05)	2.0371705	9	13.2324469	0.0006902
s(hindcast_zoo_100m_int)	2.2399919	9	13.3345413	0.0007503
s(depth)	1.7256731	9	9.3649858	0.0024562
s(hindcast_sst)	2.3415491	9	14.0219400	0.0050108
s(hindcast_ssh)	2.3179207	9	6.9296768	0.0246140
s(survey_id)	4.2412361	10	8.0731260	0.0479695
s(hindcast_chl_surf)	0.0000620	9	0.0001042	0.1732451
s(slope)	0.8678126	9	1.4679661	0.1736514
s(date_doy)	0.7196463	8	1.1243966	0.2188237
s(hindcast_curl)	0.0089155	9	0.0068840	0.3882730
s(hindcast_su,hindcast_sv)	0.0000898	29	0.0000477	0.7117069
s(hindcast_eke)	0.0000802	9	0.0000057	0.8852256
s(date_decimal)	0.0001803	9	0.0000076	0.9495594
s(hindcast_bbv_200)	0.0000279	9	0.0000003	0.9969669

0.2.31 Arctic Tern

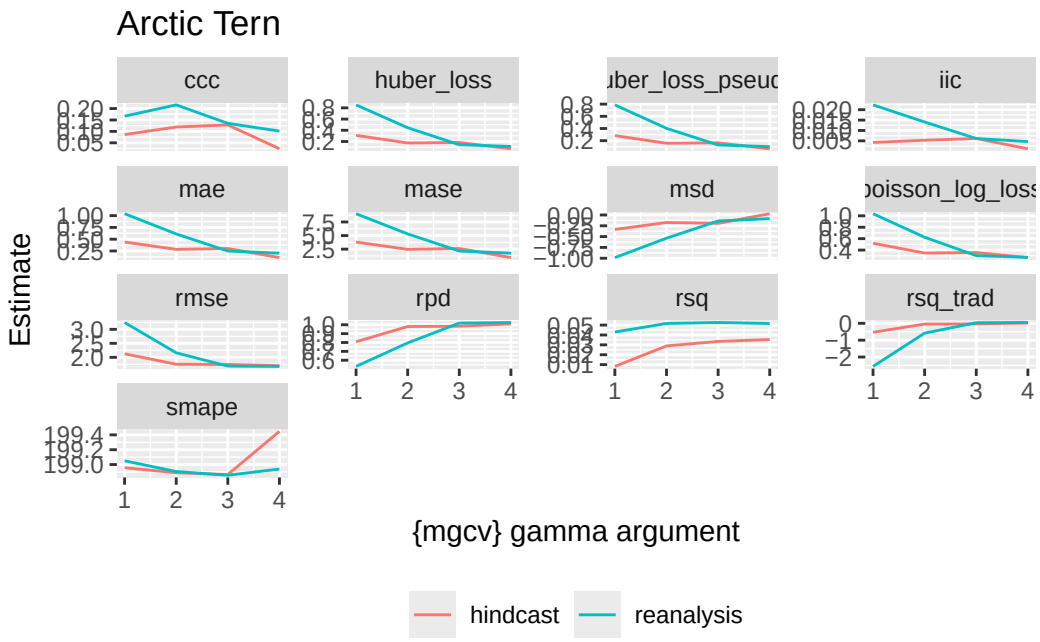


Table 64: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(date_doy)	5.2115578	8	267.6583724	0.0000000
s(depth)	2.2204254	9	51.1144881	0.0000000
s(reanalysis_ssh)	1.5223278	9	28.0146796	0.0000000
s(date_decimal)	3.5740362	9	83.5999607	0.0000003
s(survey_id)	1.7886256	10	13.2615638	0.0000036
s(reanalysis_su,reanalysis_sv)	0.0001660	29	0.0003211	0.0985792
s(reanalysis_bbv_200)	0.0000673	9	0.0000537	0.3737342
s(reanalysis_sst)	0.0000237	9	0.0000159	0.4330027
s(reanalysis_ild_05)	0.0000202	9	0.0000046	0.6727475
s(reanalysis_curl)	0.0000476	9	0.0000102	0.7045094
s(slope)	0.0000247	9	0.0000047	0.7803346
s(reanalysis_sustr,reanalysis_svstr)	0.0000411	29	0.0000143	0.8295183

Table 65: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(date_doy)	5.1941132	8	253.3326375	0.0000000

term	edf	ref.df	statistic	p.value
s(depth)	2.1700461	9	45.1908058	0.0000000
s(hindcast_ssh)	1.2687621	9	19.2837427	0.0000008
s(survey_id)	2.0134250	10	13.4385849	0.0000135
s(date_decimal)	1.7096986	9	27.3054526	0.0002266
s(hindcast_bbv_200)	1.8757753	9	13.5637938	0.0002921
s(hindcast_sst)	0.0000802	9	0.0001529	0.1189390
s(hindcast_zoo_100m_int)	0.0000803	9	0.0001591	0.1248940
s(hindcast_su,hindcast_sv)	0.0000676	29	0.0000996	0.1854225
s(hindcast_eke)	0.0000565	9	0.0000789	0.2315083
s(hindcast_curl)	0.0000212	9	0.0000206	0.3196464
s(hindcast_ild_05)	0.0000158	9	0.0000089	0.4872722
s(hindcast_chl_surf)	0.0000319	9	0.0000163	0.5144188
s(hindcast_sustr,hindcast_svstr)	0.0000654	29	0.0000442	0.5402124
s(slope)	0.0000300	9	0.0000103	0.6615671

0.2.32 Forster's Tern

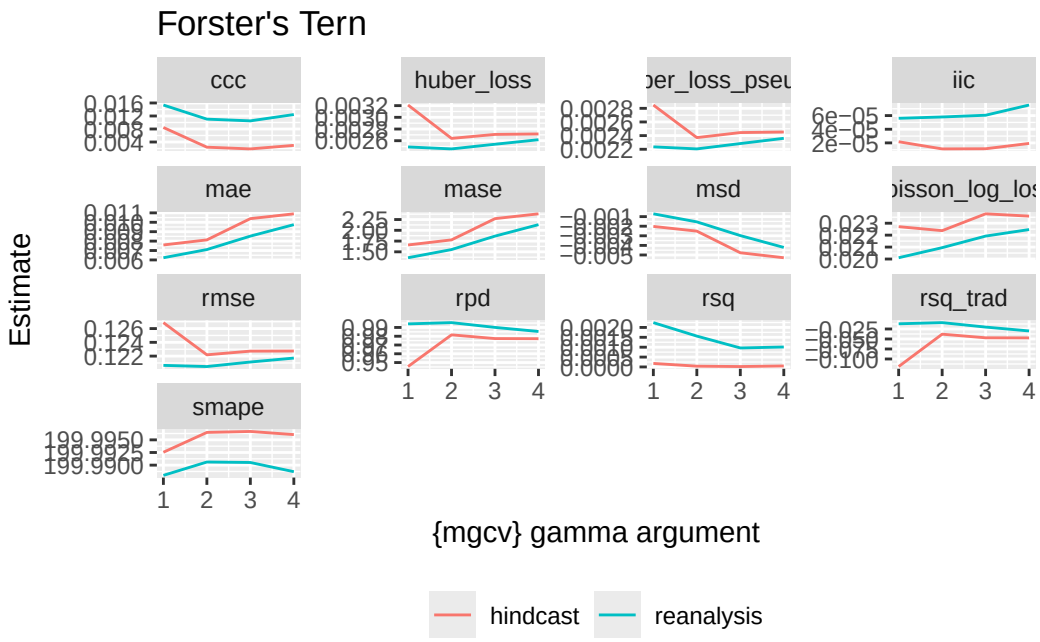


Table 66: Model summary for reanalysis model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(depth)	0.9971614	9	21.7347699	0.0000030

term	edf	ref.df	statistic	p.value
s(reanalysis_su,reanalysis_sv)	4.1067257	29	20.3859315	0.0000581
s(reanalysis_ild_05)	0.9106652	9	12.2388411	0.0001734
s(survey_id)	3.5521671	10	11.5980356	0.0025598
s(date_doy)	0.2038984	8	0.4332078	0.1070794
s(reanalysis_sst)	0.0412157	9	0.0879739	0.1185002
s(date_decimal)	0.0000783	9	0.0000747	0.3450118
s(reanalysis_ssh)	0.0000757	9	0.0000543	0.3940580
s(slope)	0.0000551	9	0.0000296	0.4913177
s(reanalysis_sustr,reanalysis_svstr)	0.0000682	29	0.0000186	0.8558382
s(reanalysis_bbv_200)	0.0000481	9	0.0000034	0.9103510
s(reanalysis_curl)	0.0000369	9	0.0000014	0.9380852

Table 67: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(depth)	0.9633697	9	18.3538576	0.0000095
s(hindcast_su,hindcast_sv)	2.7830683	29	13.8305250	0.0001583
s(survey_id)	3.2026453	10	9.2832760	0.0065443
s(hindcast_ild_05)	1.0143992	9	5.7891203	0.0072793
s(hindcast_chl_surf)	0.7490518	9	7.4515984	0.0076791
s(hindcast_eke)	0.6353068	9	2.2295342	0.0322189
s(date_doy)	0.0000084	8	0.0000102	0.2590194
s(date_decimal)	0.0000081	9	0.0000078	0.3527257
s(hindcast_ssh)	0.0000147	9	0.0000095	0.4203327
s(hindcast_sustr,hindcast_svstr)	0.0000070	29	0.0000050	0.4303615
s(hindcast_sst)	0.0000057	9	0.0000031	0.4831036
s(slope)	0.0000164	9	0.0000074	0.5253808
s(hindcast_zoo_100m_int)	0.0000093	9	0.0000033	0.5914343
s(hindcast_curl)	0.0000050	9	0.0000004	0.8755510
s(hindcast_bbv_200)	0.0000080	9	0.0000003	0.9525790

0.2.33 Royal Tern

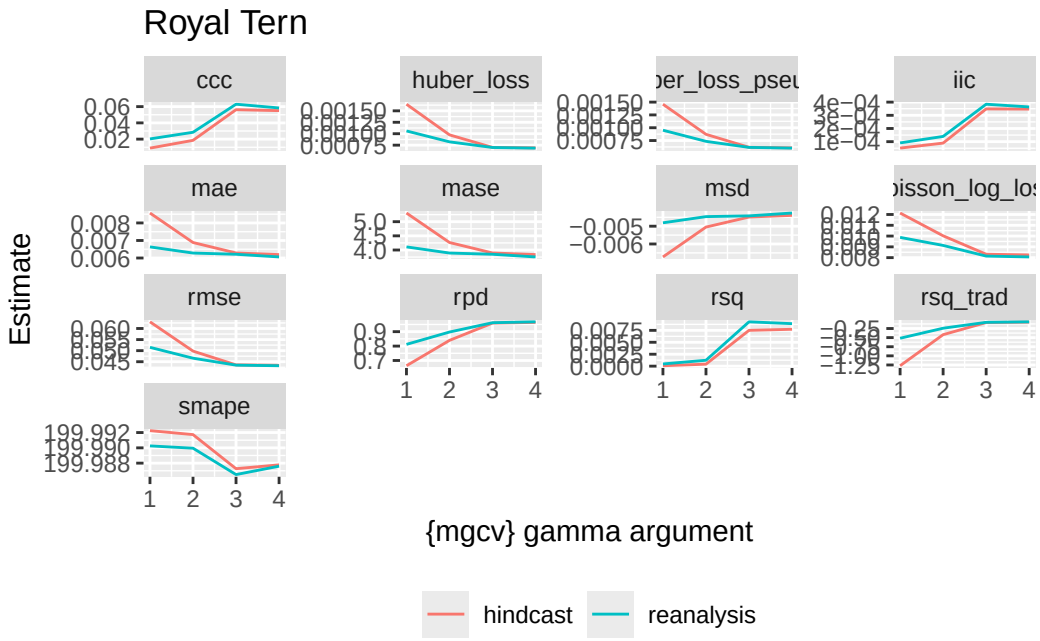


Table 68: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	4.3602332	10	54.2906424	0.0000000
s(depth)	0.9547931	9	74.8695129	0.0000000
s(date_decimal)	0.4686807	9	4.7985930	0.0069759
s(reanalysis_ild_05)	0.3406284	9	1.6926582	0.0194915
s(reanalysis_sst)	0.0000141	9	0.0000068	0.4828725
s(reanalysis_ssh)	0.0000047	9	0.0000022	0.5248476
s(date_doy)	0.0000032	8	0.0000019	0.5516330
s(slope)	0.0000064	9	0.0000022	0.6385291
s(reanalysis_su,reanalysis_sv)	0.0000081	29	0.0000031	0.7683379
s(reanalysis_bbv_200)	0.0000066	9	0.0000007	0.8495833
s(reanalysis_sustr,reanalysis_svstr)	0.0000075	29	0.0000015	0.9047548
s(reanalysis_curl)	0.0000065	9	0.0000002	0.9691001

Table 69: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	4.3478758	10	53.4466464	0.0000000

term	edf	ref.df	statistic	p.value
s(depth)	0.9582515	9	81.7705550	0.0000000
s(date_decimal)	0.3945168	9	3.3260947	0.0112243
s(hindcast_su,hindcast_sv)	0.0000089	29	0.0000306	0.0150829
s(hindcast_zoo_100m_int)	0.3035440	9	1.5997216	0.0229466
s(hindcast_ild_05)	0.0000073	9	0.0000199	0.0877186
s(hindcast_bbv_200)	0.0000032	9	0.0000062	0.1528526
s(hindcast_sst)	0.0000061	9	0.0000117	0.1535774
s(hindcast_ssh)	0.0000027	9	0.0000039	0.2197390
s(hindcast_curl)	0.0000021	9	0.0000019	0.3336171
s(date_doy)	0.0000012	8	0.0000008	0.5531215
s(hindcast_chl_surf)	0.0000014	9	0.0000004	0.6393331
s(hindcast_eke)	0.0000037	9	0.0000008	0.6925336
s(slope)	0.0000020	9	0.0000005	0.6941855
s(hindcast_sustr,hindcast_svstr)	0.0000020	29	0.0000003	0.9334204

0.2.34 Elegant Tern

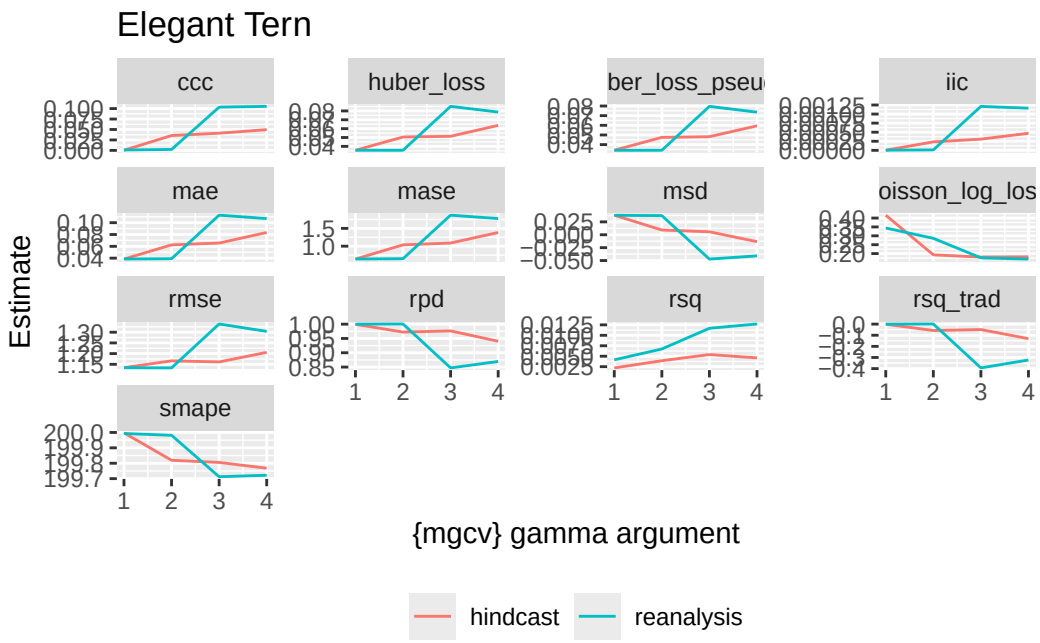


Table 70: Model summary for reanalysis model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(date_decimal)	6.4082925	9	127.4286779	-0.0000004

term	edf	ref.df	statistic	p.value
s(survey_id)	7.3061391	10	115.7581462	0.0000000
s(date_doy)	4.9887610	8	81.2202718	0.0000000
s(depth)	2.8481015	9	54.9628918	0.0000000
s(reanalysis_bbv_200)	0.9376826	9	38.6941411	0.0000000
s(reanalysis_sst)	2.4505820	9	95.3017765	0.0000000
s(reanalysis_ssh)	2.1381345	9	14.7228313	0.0004490
s(slope)	0.9723763	9	5.7589161	0.0079783
s(reanalysis_ild_05)	0.5908147	9	1.8912901	0.0599254
s(reanalysis_sustr,reanalysis_svstr)	0.0000405	29	0.0000284	0.4602637
s(reanalysis_curl)	0.0000546	9	0.0000317	0.4602808
s(reanalysis_su,reanalysis_sv)	0.0000710	29	0.0000377	0.6733727

Table 71: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(hindcast_sst)	5.3289627	9	59.7893455	-0.0000011
s(survey_id)	7.4390589	10	121.2875221	0.0000000
s(depth)	3.6316227	9	38.4510821	0.0000000
s(hindcast_ild_05)	2.2102014	9	28.0814169	0.0000014
s(hindcast_su,hindcast_sv)	7.5311558	29	36.1950189	0.0000049
s(hindcast_zoo_100m_int)	3.9344537	9	28.7090285	0.0000099
s(date_decimal)	7.3789329	9	160.0016171	0.0000148
s(hindcast_bbv_200)	4.2900406	9	19.2100667	0.0017243
s(hindcast_ssh)	3.1175928	9	11.4628246	0.0082875
s(slope)	1.4906699	9	3.9587920	0.0970200
s(date_doy)	0.0005568	8	0.0003227	0.5594801
s(hindcast_sustr,hindcast_svstr)	0.0014456	29	0.0008231	0.5803063
s(hindcast_chl_surf)	0.0001428	9	0.0000573	0.5982281
s(hindcast_eke)	0.0002270	9	0.0000398	0.6751010
s(hindcast_curl)	0.0005621	9	0.0000185	0.8877993

0.2.35 Red-billed Tropicbird

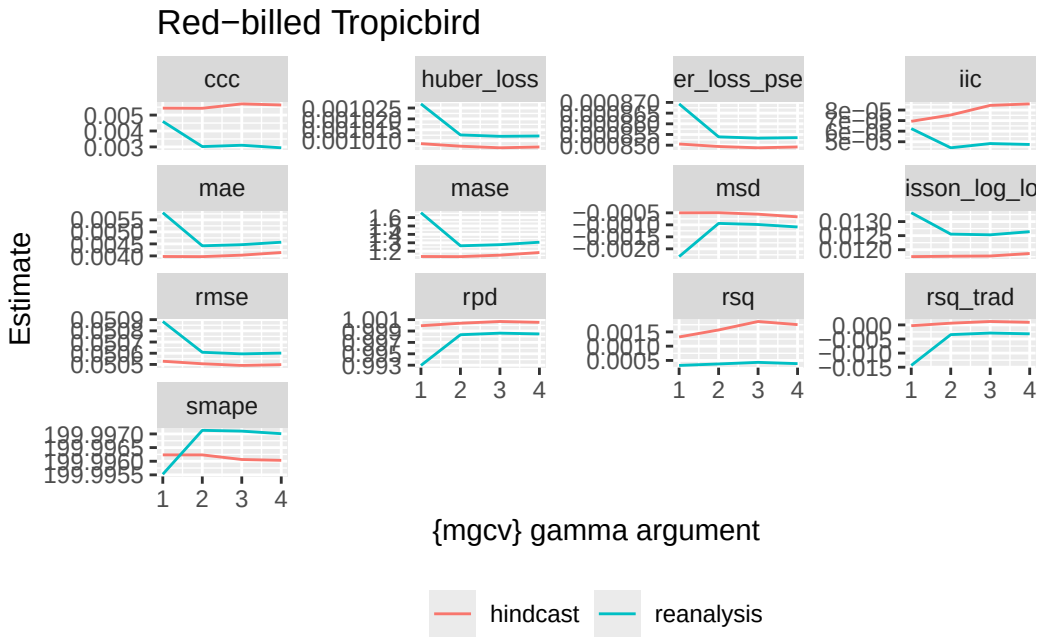


Table 72: Model summary for reanalysis model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(reanalysis_ssh)	0.9120501	9	27.6406204	0.0000000
s(reanalysis_sst)	2.2243773	9	60.5058822	0.0000000
s(date_decimal)	1.0725562	9	10.8834767	0.0003095
s(survey_id)	1.2744181	10	7.3283609	0.0007431
s(reanalysis_sustr,reanalysis_svstr)	0.4927840	29	1.8840972	0.0110926
s(reanalysis_su,reanalysis_sv)	0.0001309	29	0.0002380	0.1385047
s(depth)	0.0000869	9	0.0000399	0.5064586
s(reanalysis_bbv_200)	0.0000778	9	0.0000321	0.5431354
s(date_doy)	0.0000365	8	0.0000164	0.6533912
s(reanalysis_ild_05)	0.0000554	9	0.0000065	0.7859826
s(slope)	0.0000741	9	0.0000108	0.7914227
s(reanalysis_curl)	0.0000552	9	0.0000037	0.8311021

Table 73: Model summary for hindcast model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(hindcast_ssh)	0.9225234	9	32.9222548	0.0000000

term	edf	ref.df	statistic	p.value
s(hindcast_sst)	1.1272668	9	36.9701014	0.0000000
s(date_decimal)	1.0581848	9	10.6969820	0.0001556
s(hindcast_bbv_200)	0.6457046	9	4.7764845	0.0054182
s(hindcast_chl_surf)	0.6523160	9	3.8791437	0.0127545
s(survey_id)	0.0003759	10	0.0010589	0.0487370
s(hindcast_zoo_100m_int)	0.0000200	9	0.0000308	0.1811678
s(hindcast_su,hindcast_sv)	0.0000137	29	0.0000174	0.2655818
s(hindcast_sustr,hindcast_svstr)	0.0000089	29	0.0000082	0.3703631
s(hindcast_eke)	0.0000101	9	0.0000041	0.5275112
s(depth)	0.0000066	9	0.0000025	0.5581681
s(hindcast_curl)	0.0000101	9	0.0000027	0.6102079
s(slope)	0.0000081	9	0.0000030	0.6172476
s(hindcast_ild_05)	0.0000107	9	0.0000018	0.7803164
s(date_doy)	0.0000035	8	0.0000008	0.8199500

0.2.36 Red-tailed Tropicbird

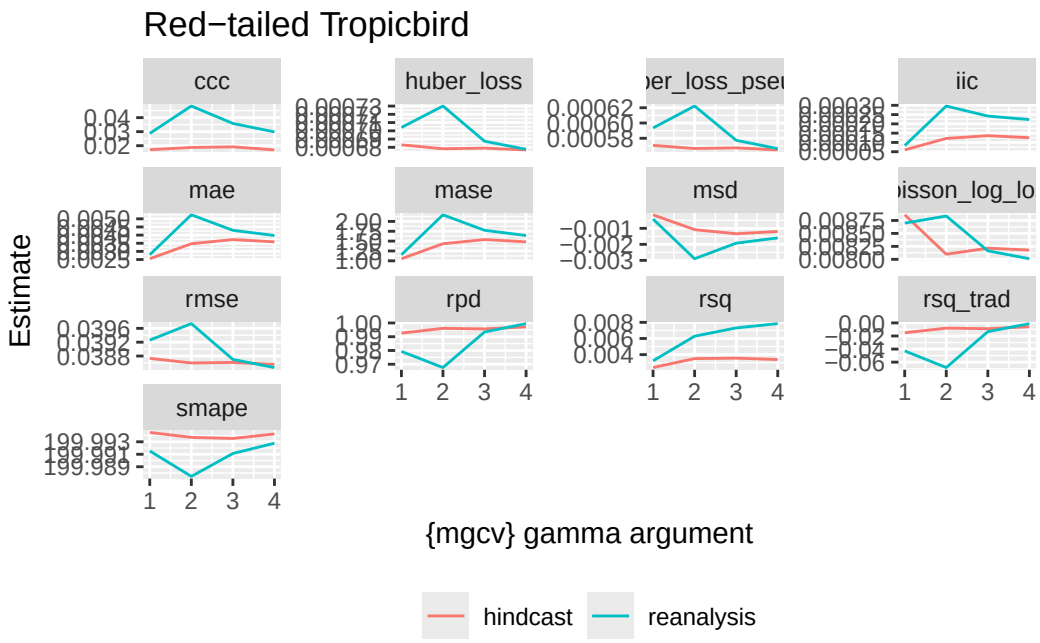


Table 74: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(depth)	0.9074373	9	28.9878998	0.0000000

term	edf	ref.df	statistic	p.value
s(reanalysis_sst)	1.5430088	9	19.1997013	0.0000015
s(date_doy)	0.9975415	8	7.4156372	0.0003369
s(reanalysis_sustr,reanalysis_svstr)	0.9996558	29	7.9499861	0.0003502
s(reanalysis_su,reanalysis_sv)	0.5727804	29	3.6159767	0.0019162
s(reanalysis_bbv_200)	0.4671062	9	3.0330494	0.0047990
s(survey_id)	0.0000027	8	0.0000069	0.0685736
s(reanalysis_curl)	0.0000258	9	0.0000778	0.0801727
s(date_decimal)	0.0000125	9	0.0000338	0.0882761
s(reanalysis_ssh)	0.0000060	9	0.0000102	0.1717006
s(slope)	0.0000035	9	0.0000021	0.4850386
s(reanalysis_ild_05)	0.0000033	9	0.0000005	0.7147564

Table 75: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(depth)	0.8636738	9	18.9142620	0.0000024
s(hindcast_zoo_100m_int)	1.5417921	9	19.2736565	0.0000037
s(hindcast_sst)	1.1150442	9	9.6691081	0.0000886
s(date_doy)	1.0711953	8	7.7111135	0.0003205
s(hindcast_bbv_200)	0.0000041	9	0.0000131	0.0305678
s(hindcast_sustr,hindcast_svstr)	0.0000198	29	0.0000521	0.0514439
s(date_decimal)	0.0001164	9	0.0003604	0.0607250
s(hindcast_ssh)	0.0000131	9	0.0000276	0.1068348
s(survey_id)	0.0000109	8	0.0000217	0.1146194
s(hindcast_ild_05)	0.0000022	9	0.0000014	0.3965439
s(slope)	0.0000105	9	0.0000071	0.4364044
s(hindcast_chl_surf)	0.0000007	9	0.0000003	0.5864057
s(hindcast_curl)	0.0000011	9	0.0000002	0.6443705
s(hindcast_eke)	0.0000080	9	0.0000010	0.7715248
s(hindcast_su,hindcast_sv)	0.0000124	29	0.0000059	0.7794539

0.2.37 Red-throated Loon

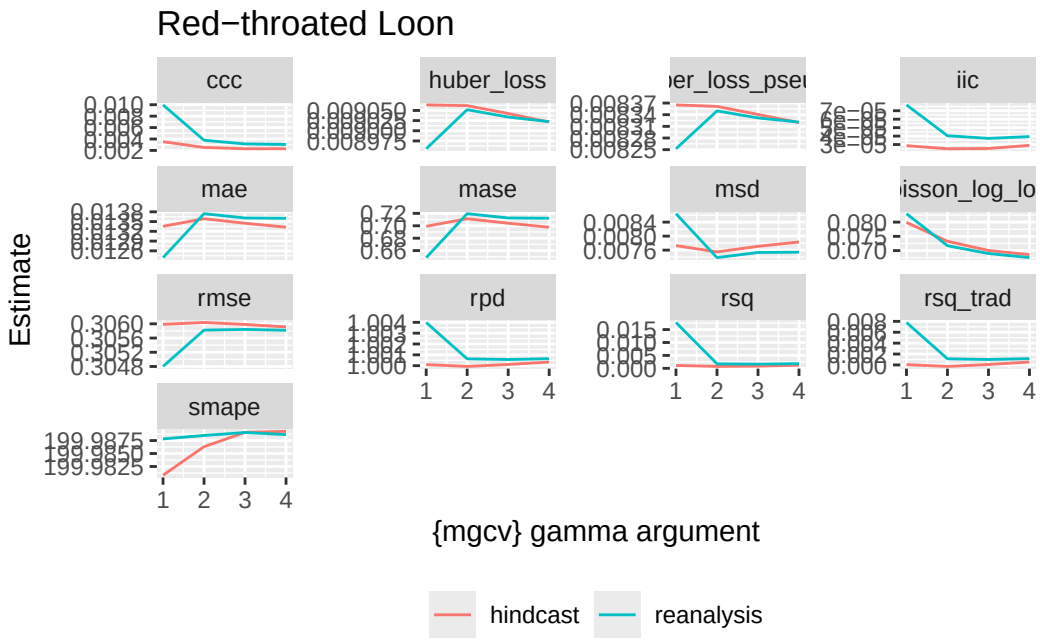


Table 76: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(date_doy)	4.7751566	8	64.9825963	0.0000000
s(depth)	4.8710140	9	164.0055804	0.0000000
s(survey_id)	6.9444131	10	29.0600364	0.0000075
s(slope)	4.4803987	9	24.5116243	0.0000428
s(reanalysis_sustr,reanalysis_svstr)	7.4206489	29	24.1199618	0.0001066
s(date_decimal)	5.6071551	9	160.7992009	0.0002856
s(reanalysis_ssh)	5.0235149	9	14.7698868	0.0042922
s(reanalysis_bbv_200)	2.7568740	9	9.2027631	0.0120880
s(reanalysis_ild_05)	0.7736999	9	3.0947656	0.0398332
s(reanalysis_su,reanalysis_sv)	2.5099486	29	3.9481967	0.1069068
s(reanalysis_sst)	0.7963477	9	1.4221668	0.1647002
s(reanalysis_curl)	0.0001719	9	0.0001082	0.4336648

Table 77: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	4.6760304	10	96.9321236	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	2.9865074	8	188.5322206	0.0000000
s(depth)	3.5006310	9	192.3148342	0.0000000
s(hindcast_zoo_100m_int)	0.6611461	9	5.7481900	0.0015754
s(hindcast_ild_05)	0.4997915	9	5.2466930	0.0042649
s(hindcast_sustr,hindcast_svstr)	0.0001315	29	0.0003815	0.0240812
s(hindcast_bbv_200)	0.0000522	9	0.0001622	0.0451118
s(slope)	0.0000167	9	0.0000396	0.1115535
s(date_decimal)	0.0000583	9	0.0000916	0.1993570
s(hindcast_eke)	0.0000133	9	0.0000195	0.2107310
s(hindcast_curl)	0.0000157	9	0.0000161	0.3003526
s(hindcast_su,hindcast_sv)	0.0000210	29	0.0000174	0.4875941
s(hindcast_sst)	0.0000282	9	0.0000127	0.6024378
s(hindcast_chl_surf)	0.0000133	9	0.0000020	0.8005913
s(hindcast_ssh)	0.0000088	9	0.0000011	0.8348730

0.2.38 Pacific Loon

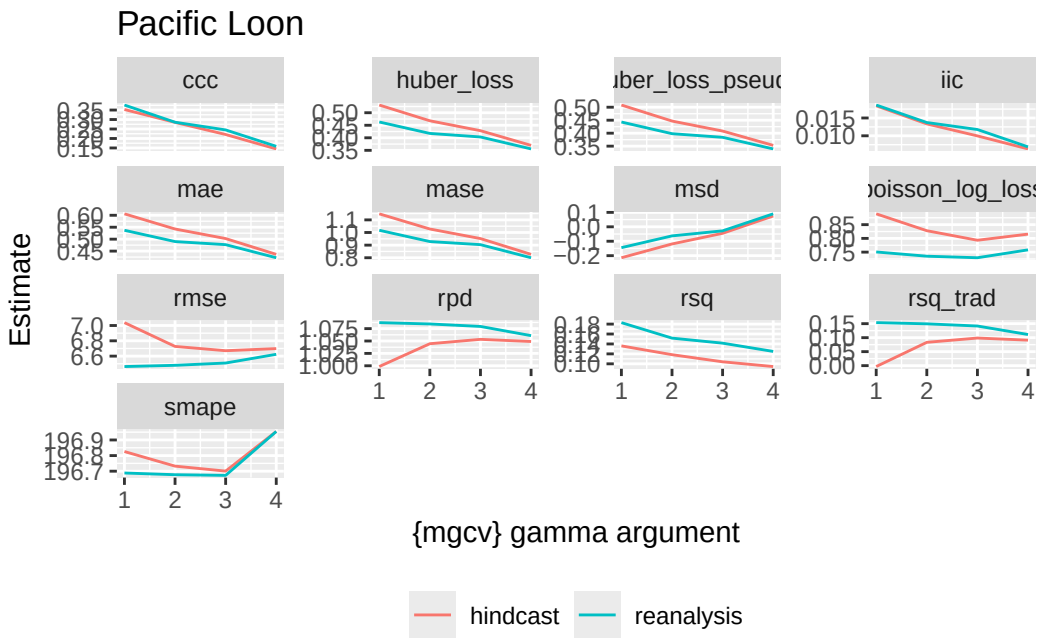


Table 78: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.4032920	10	163.1052302	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	7.5413789	8	1126.4808409	0.0000000
s(date_decimal)	6.7556741	9	540.9709280	0.0000000
s(depth)	6.6666665	9	762.2094164	0.0000000
s(slope)	4.8449279	9	62.3540285	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	15.6696244	29	72.6521629	0.0000000
s(reanalysis_ild_05)	2.0485142	9	25.2053699	0.0000016
s(reanalysis_su,reanalysis_sv)	12.1088889	29	33.8485842	0.0000880
s(reanalysis_curl)	1.8553249	9	12.2612430	0.0005281
s(reanalysis_bbv_200)	2.3999502	9	18.7504176	0.0036737
s(reanalysis_sst)	0.0004507	9	0.0005947	0.2116396
s(reanalysis_ssh)	0.4956224	9	0.6179647	0.2651930

Table 79: Model summary for hindcast model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.9165403	10	141.1386999	0.0000000
s(date_doy)	6.9926081	8	898.1701947	0.0000000
s(depth)	5.6107493	9	732.1559940	0.0000000
s(hindcast_ild_05)	0.9344858	9	42.7839034	0.0000000
s(slope)	2.2140384	9	30.6869846	0.0000009
s(date_decimal)	4.6210394	9	318.2236158	0.0000016
s(hindcast_sustr,hindcast_svstr)	4.8741287	29	28.5432318	0.0000028
s(hindcast_su,hindcast_sv)	1.4702866	29	15.9458345	0.0000132
s(hindcast_bbv_200)	2.6703889	9	34.9610489	0.0000524
s(hindcast_eke)	0.6232467	9	3.2102270	0.0088870
s(hindcast_ssh)	0.3673475	9	1.4597850	0.0435411
s(hindcast_sst)	0.0006920	9	0.0014754	0.0953815
s(hindcast_curl)	0.0009277	9	0.0005891	0.4314344
s(hindcast_chl_surf)	0.0005965	9	0.0000611	0.8483393
s(hindcast_zoo_100m_int)	0.0005497	9	0.0000199	0.9746793

0.2.39 Common Loon

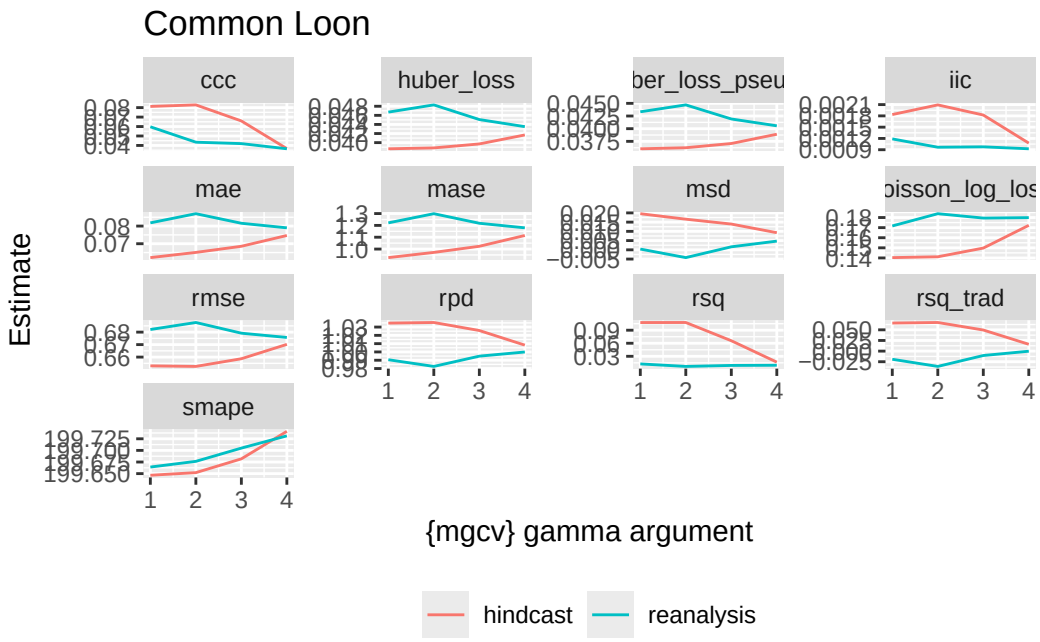


Table 80: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(date_doy)	4.9829133	8	153.9126670	0.0000000
s(depth)	1.2235046	9	141.4509488	0.0000000
s(reanalysis_ssh)	0.7854576	9	13.4108185	0.0000339
s(reanalysis_sustr,reanalysis_svstr)	0.0001477	29	0.0004857	0.0283196
s(reanalysis_sst)	0.0001142	9	0.0003633	0.0580424
s(survey_id)	0.0000241	10	0.0000372	0.1564549
s(reanalysis_curl)	0.0000471	9	0.0000396	0.3620535
s(reanalysis_su,reanalysis_sv)	0.0000535	29	0.0000382	0.5177116
s(reanalysis_bbv_200)	0.0000191	9	0.0000086	0.5279552
s(date_decimal)	0.0000459	9	0.0000242	0.5306021
s(reanalysis_ild_05)	0.0000412	9	0.0000113	0.6751842
s(slope)	0.0000402	9	0.0000025	0.9130798

Table 81: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(date_doy)	5.6679426	8	136.8231093	0.0000000

term	edf	ref.df	statistic	p.value
s(depth)	0.9811372	9	95.1978895	0.0000000
s(hindcast_sst)	1.9752240	9	22.3896155	0.0000595
s(hindcast_su,hindcast_sv)	3.5762488	29	14.7243561	0.0001651
s(survey_id)	2.9710232	10	12.8345732	0.0001761
s(hindcast_bbv_200)	2.0628372	9	14.1343904	0.0009029
s(hindcast_curl)	1.5406373	9	9.1643978	0.0012053
s(hindcast_zoo_100m_int)	0.7673493	9	6.4681849	0.0030416
s(hindcast_sustr,hindcast_svstr)	0.9127515	29	4.3393557	0.0079804
s(hindcast_ild_05)	0.6130681	9	2.6686064	0.0318105
s(date_decimal)	0.0021728	9	0.0040854	0.1662611
s(hindcast_ssh)	0.0000078	9	0.0000083	0.2914095
s(hindcast_eke)	0.0000126	9	0.0000063	0.4433083
s(hindcast_chl_surf)	0.0000100	9	0.0000051	0.4985616
s(slope)	0.0000087	9	0.0000030	0.6039624

0.2.40 Laysan Albatross

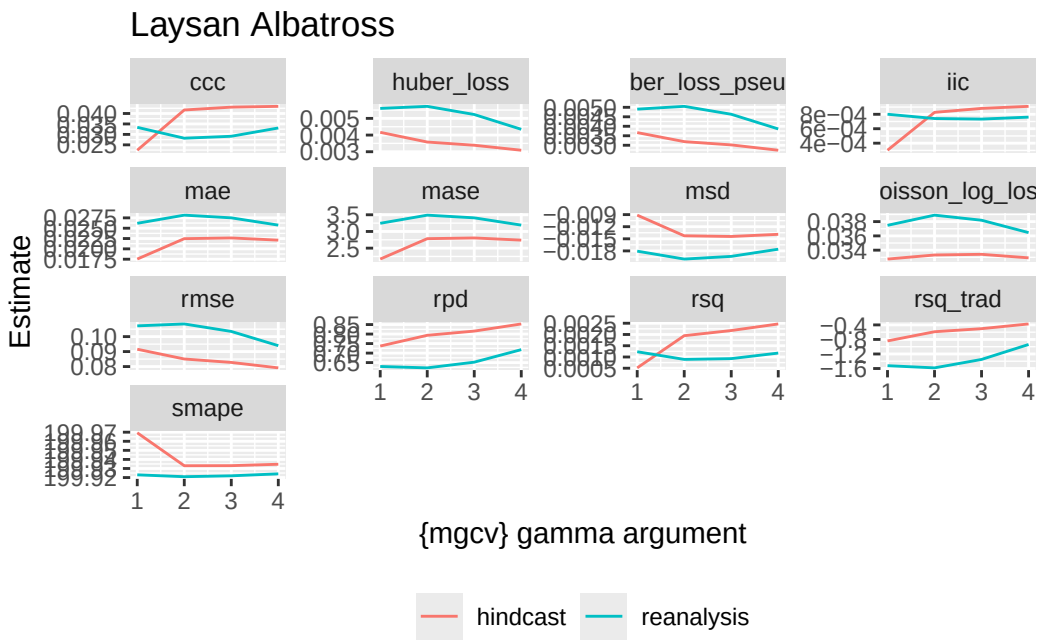


Table 82: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	4.1590079	10	49.1649214	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	4.3749200	8	327.9084028	0.0000000
s(depth)	0.9446882	9	66.0341064	0.0000000
s(reanalysis_sst)	2.3571811	9	96.8368601	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	5.4929709	29	132.7707821	0.0000000
s(slope)	0.0001796	9	0.0004935	0.0818215
s(reanalysis_ssh)	0.0001990	9	0.0004824	0.0911182
s(reanalysis_ild_05)	0.0000116	9	0.0000297	0.0997007
s(reanalysis_curl)	0.0001364	9	0.0002455	0.1615434
s(reanalysis_bbv_200)	0.0000064	9	0.0000058	0.3372860
s(reanalysis_su,reanalysis_sv)	0.0002156	29	0.0002097	0.3840297
s(date_decimal)	0.0000339	9	0.0000278	0.3872782

Table 83: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	4.0564357	10	45.0804151	0.0000000
s(date_doy)	4.0301719	8	163.7979408	0.0000000
s(depth)	0.9386587	9	57.9182568	0.0000000
s(hindcast_sst)	2.7300555	9	97.8326664	0.0000000
s(hindcast_sustr,hindcast_svstr)	6.1662508	29	93.8699052	0.0000000
s(hindcast_zoo_100m_int)	0.9094786	9	8.5150572	0.0002686
s(hindcast_curl)	0.3709779	9	2.4799655	0.0084878
s(hindcast_su,hindcast_sv)	0.0001683	29	0.0004434	0.0401595
s(hindcast_ild_05)	0.0538159	9	0.2148888	0.0402791
s(hindcast_bbv_200)	0.0003982	9	0.0012477	0.0544400
s(hindcast_chl_surf)	0.0000628	9	0.0001052	0.1805420
s(hindcast_eke)	0.0000635	9	0.0000718	0.2793939
s(slope)	0.0001356	9	0.0001323	0.3223293
s(date_decimal)	0.0000434	9	0.0000140	0.6229886
s(hindcast_ssh)	0.0000803	9	0.0000233	0.6637065

0.2.41 Black-footed Albatross

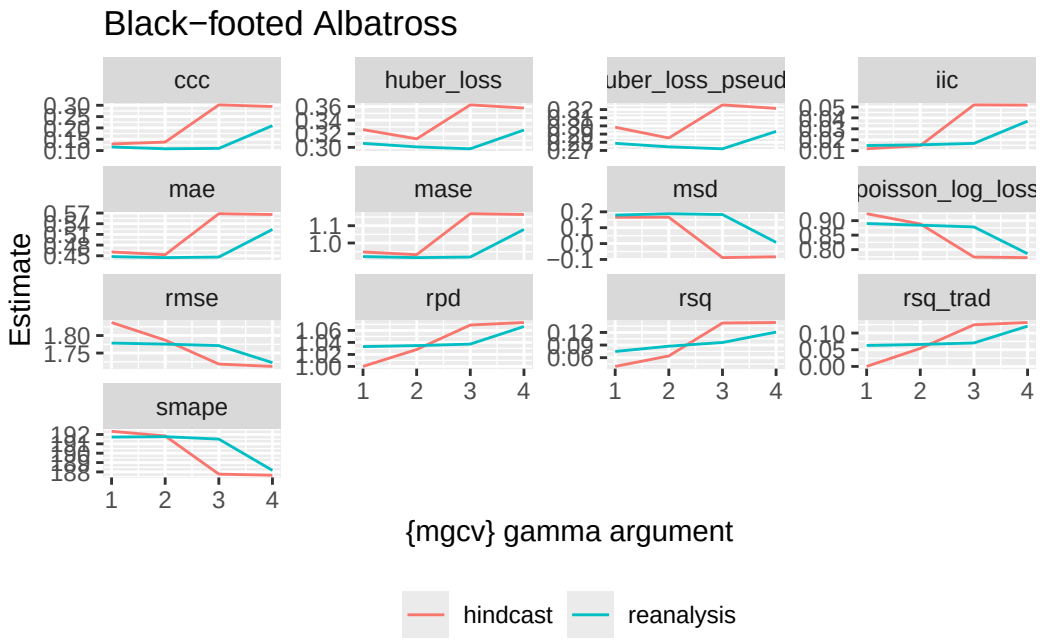


Table 84: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.1795360	10	456.3407834	0.0000000
s(date_doy)	6.4946126	8	995.3134633	0.0000000
s(depth)	6.8667709	9	537.0296076	0.0000000
s(slope)	1.9113614	9	86.4758426	0.0000000
s(reanalysis_bbv_200)	3.4746629	9	79.0532151	0.0000000
s(reanalysis_curl)	0.8835643	9	29.3760868	0.0000000
s(reanalysis_ssh)	2.4023230	9	37.1095052	0.0000000
s(reanalysis_sst)	3.3334534	9	278.4393672	0.0000000
s(reanalysis_su,reanalysis_sv)	5.9971382	29	66.6006037	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	9.0541668	29	137.1922431	0.0000000
s(date_decimal)	0.0004917	9	0.0004808	0.3338679
s(reanalysis_ild_05)	0.0004113	9	0.0001827	0.5367380

Table 85: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.8305178	10	399.2199353	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	6.3245113	8	1070.2644441	0.0000000
s(depth)	7.8036011	9	611.6347315	0.0000000
s(slope)	0.9413374	9	69.4681167	0.0000000
s(hindcast_bbv_200)	3.8642452	9	104.4687452	0.0000000
s(hindcast_sst)	3.9173518	9	960.3315413	0.0000000
s(hindcast_chl_surf)	2.0024342	9	56.9952841	0.0000000
s(hindcast_zoo_100m_int)	0.9248952	9	54.2524805	0.0000000
s(hindcast_sustr,hindcast_svstr)	0.0129898	29	0.0524539	0.0095979
s(hindcast_su,hindcast_sv)	0.0002499	29	0.0007490	0.0193856
s(date_decimal)	0.0004205	9	0.0012465	0.0618384
s(hindcast_ssh)	0.0003645	9	0.0011675	0.0637379
s(hindcast_curl)	0.0000585	9	0.0000273	0.5146221
s(hindcast_ild_05)	0.0000282	9	0.0000102	0.6422926
s(hindcast_eke)	0.0000603	9	0.0000080	0.7783025

0.2.42 Fork-tailed Storm-Petrel

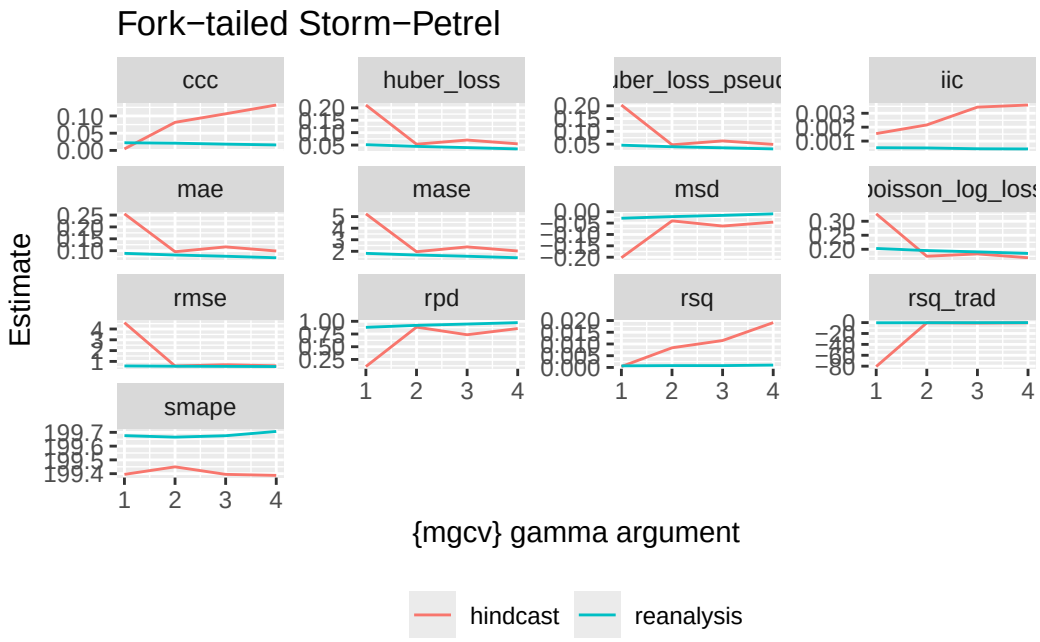


Table 86: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.7734842	10	862.2175833	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	3.3348648	8	128.9631789	0.0000000
s(slope)	2.3903668	9	67.9075000	0.0000000
s(reanalysis_bbv_200)	3.1765340	9	63.4746905	0.0000000
s(reanalysis_ild_05)	2.5667603	9	83.1606401	0.0000000
s(reanalysis_ssh)	3.7745580	9	95.9504848	0.0000000
s(reanalysis_sst)	3.4600295	9	195.5415555	0.0000000
s(reanalysis_su,reanalysis_sv)	7.0709328	29	75.0946929	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	0.7336542	29	3.2969605	0.0008420
s(depth)	0.3712037	9	1.6109405	0.0217975
s(reanalysis_curl)	0.0001606	9	0.0000439	0.6854003
s(date_decimal)	0.0004041	9	0.0000451	0.9145222

Table 87: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.1638810	10	443.5943757	0.0000000
s(date_doy)	4.4339988	8	185.2922103	0.0000000
s(depth)	6.1220313	9	96.2316608	0.0000000
s(slope)	3.0683156	9	41.3906583	0.0000000
s(hindcast_bbv_200)	4.4057845	9	121.8403782	0.0000000
s(hindcast_ild_05)	5.6123687	9	204.3084157	0.0000000
s(hindcast_sst)	4.0662693	9	402.2393485	0.0000000
s(hindcast_su,hindcast_sv)	11.5566489	29	52.7045042	0.0000000
s(hindcast_sustr,hindcast_svstr)	10.9060681	29	119.5445081	0.0000000
s(hindcast_chl_surf)	1.2632085	9	4.9508478	0.0250392
s(date_decimal)	0.4276036	9	7.7912755	0.0637799
s(hindcast_ssh)	0.0001882	9	0.0003384	0.1529825
s(hindcast_curl)	0.0029371	9	0.0041755	0.2147972
s(hindcast_eke)	0.0023045	9	0.0018244	0.2433368
s(hindcast_zoo_100m_int)	0.0003343	9	0.0000579	0.8067377

0.2.43 Leach's Storm-Petrel

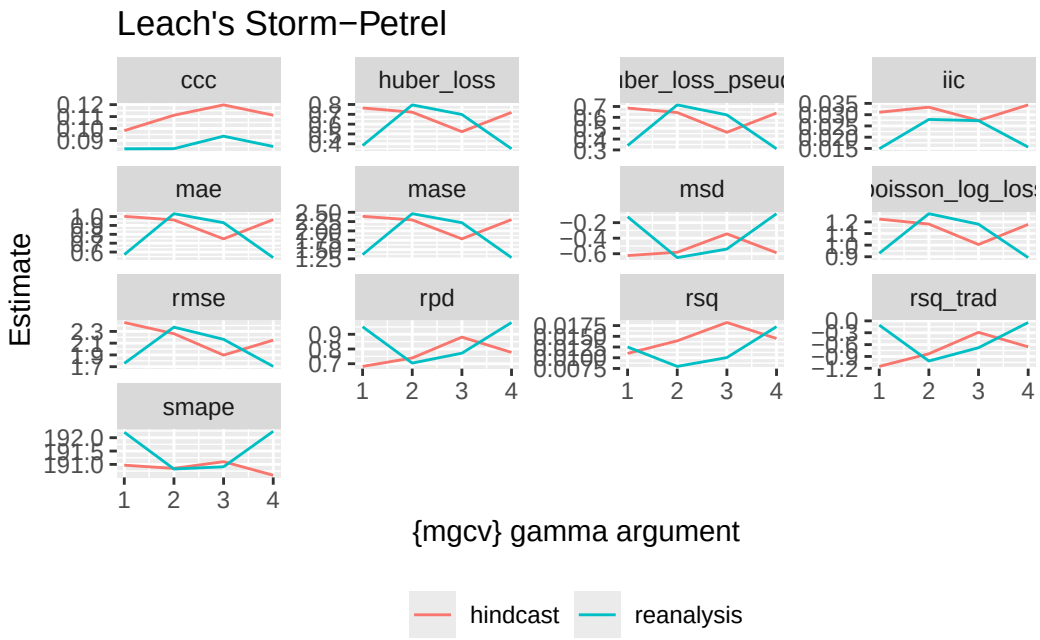


Table 88: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.9144793	10	288.5971457	0.0000000
s(date_doy)	5.5596932	8	1204.1886921	0.0000000
s(date_decimal)	7.6788998	9	3024.8855662	0.0000000
s(depth)	7.3164697	9	1772.4061043	0.0000000
s(slope)	1.8937049	9	40.2154992	0.0000000
s(reanalysis_bbv_200)	3.1893837	9	169.2473481	0.0000000
s(reanalysis_ssh)	0.8877408	9	30.7434200	0.0000000
s(reanalysis_sst)	1.8722371	9	35.1489224	0.0000000
s(reanalysis_su,reanalysis_sv)	10.2901972	29	127.7282077	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	12.8523745	29	373.9902399	0.0000000
s(reanalysis_ild_05)	1.0767040	9	13.1919514	0.0000186
s(reanalysis_curl)	0.0010256	9	0.0037222	0.0539503

Table 89: Model summary for hindcast model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.1620362	10	324.813380	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	6.0420321	8	602.726082	0.0000000
s(depth)	7.3556313	9	1250.926857	0.0000000
s(hindcast_bbv_200)	4.0493948	9	170.688749	0.0000000
s(hindcast_curl)	1.7940749	9	32.760517	0.0000000
s(hindcast_ild_05)	3.6119091	9	122.295466	0.0000000
s(hindcast_ssh)	3.1823993	9	39.966540	0.0000000
s(hindcast_sst)	5.6241081	9	188.943244	0.0000000
s(hindcast_chl_surf)	5.0878175	9	74.853352	0.0000000
s(hindcast_zoo_100m_int)	2.1748146	9	49.213380	0.0000000
s(hindcast_sustr,hindcast_svstr)	14.8842804	29	249.674361	0.0000000
s(date_decimal)	7.8747516	9	1086.959400	0.0000012
s(slope)	1.5838355	9	15.574709	0.0000485
s(hindcast_eke)	0.5895436	9	4.558498	0.0036987
s(hindcast_su,hindcast_sv)	0.7052003	29	2.441965	0.0074809

0.2.44 Ashy Storm-Petrel

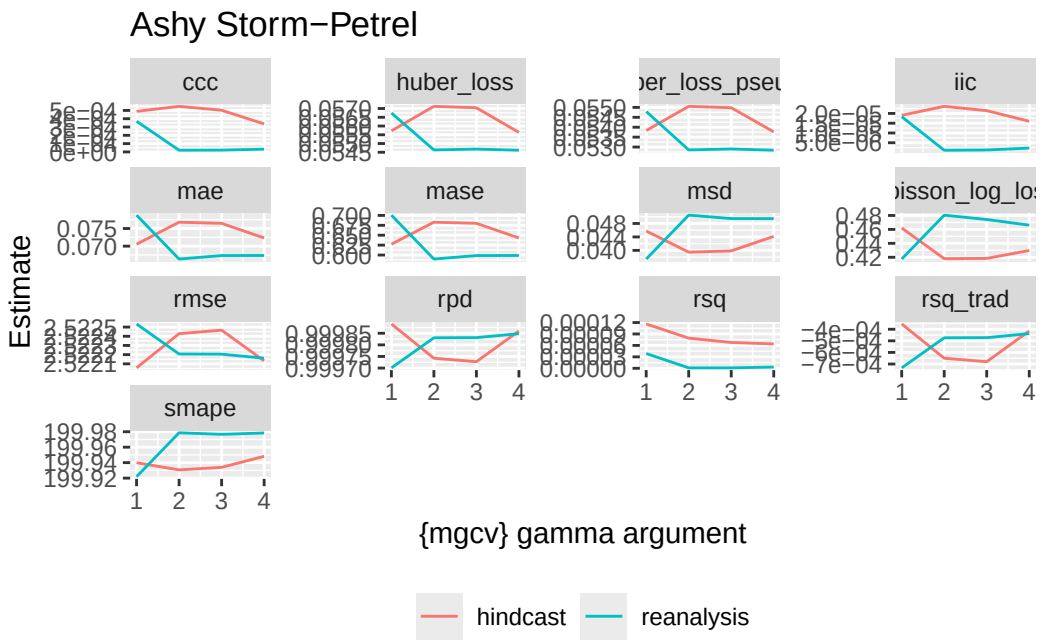


Table 90: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.2661327	10	160.2013574	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	3.2815085	8	208.4332242	0.0000000
s(date_decimal)	1.9236705	9	657.3703986	0.0000000
s(slope)	0.9440114	9	40.6901045	0.0000000
s(reanalysis_bbv_200)	1.7225358	9	75.5758002	0.0000000
s(reanalysis_sst)	3.0866127	9	232.6849129	0.0000000
s(reanalysis_ild_05)	1.9507969	9	23.2918522	0.0000020
s(reanalysis_sustr,reanalysis_svstr)	1.6852834	29	10.2292516	0.0000549
s(reanalysis_curl)	0.3180321	9	1.8859111	0.0126592
s(reanalysis_su,reanalysis_sv)	0.0001711	29	0.0001968	0.2845124
s(depth)	0.0002616	9	0.0002311	0.3402291
s(reanalysis_ssh)	0.0002183	9	0.0001196	0.4988273

Table 91: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(hindcast_chl_surf)	6.0594863	9	35.9655267	-0.0000042
s(survey_id)	7.9898162	10	93.6338265	0.0000000
s(date_doy)	4.8253593	8	71.8108836	0.0000000
s(depth)	6.4144917	9	53.4559663	0.0000000
s(slope)	2.2465100	9	47.0765235	0.0000000
s(hindcast_bbv_200)	4.8005442	9	44.6030049	0.0000000
s(hindcast_ild_05)	4.7285297	9	66.9960261	0.0000000
s(hindcast_sst)	4.1998945	9	86.1401987	0.0000000
s(hindcast_su,hindcast_sv)	13.7562078	29	60.7281148	0.0000000
s(date_decimal)	6.2643999	9	689.2315191	0.0000007
s(hindcast_sustr,hindcast_svstr)	3.8928879	29	16.5372106	0.0002882
s(hindcast_curl)	2.6656487	9	14.7280552	0.0004609
s(hindcast_zoo_100m_int)	2.8787491	9	14.5875816	0.0007627
s(hindcast_ssh)	0.0011128	9	0.0003932	0.6174415
s(hindcast_eke)	0.0007777	9	0.0001759	0.6956205

0.2.45 Black Storm-Petrel

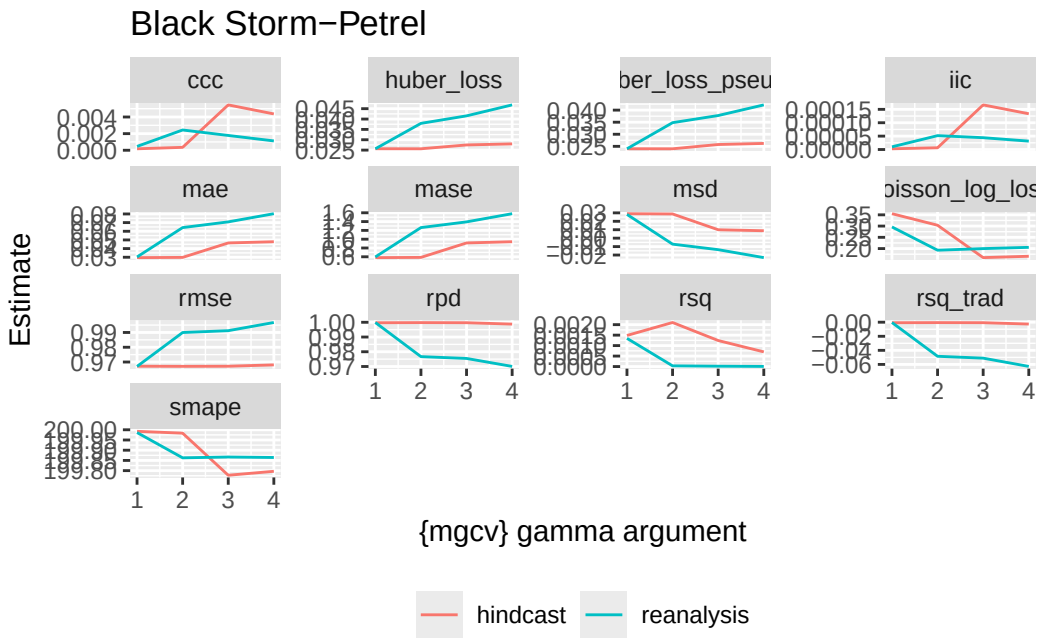


Table 92: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(slope)	5.8339340	9	35.3107176	-0.0000022
s(survey_id)	7.5308137	10	63.5849701	0.0000000
s(date_doy)	7.6129948	8	215.8938816	0.0000000
s(depth)	6.5220333	9	156.1848217	0.0000000
s(reanalysis_su,reanalysis_sv)	16.7416525	29	81.5366894	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	9.2011126	29	58.5256472	0.0000000
s(reanalysis_bbv_200)	2.9529838	9	24.1741868	0.0000123
s(date_decimal)	8.3639928	9	2109.4392038	0.0001840
s(reanalysis_ild_05)	0.8040531	9	3.5588769	0.0348229
s(reanalysis_sst)	2.1627197	9	6.7561716	0.0610651
s(reanalysis_curl)	0.0005991	9	0.0001385	0.6605464
s(reanalysis_ssh)	0.0006652	9	0.0000902	0.8627285

Table 93: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(hindcast_zoo_100m_int)	1.7854856	9	27.5713980	0.0000000

term	edf	ref.df	statistic	p.value
s(survey_id)	6.2687586	10	53.0632225	0.0000000
s(date_doy)	6.9245491	8	185.2817534	0.0000000
s(depth)	5.1047678	9	167.9700333	0.0000000
s(hindcast_curl)	2.5038958	9	79.5054770	0.0000000
s(hindcast_sst)	4.4984945	9	145.4655575	0.0000000
s(hindcast_sustr,hindcast_svstr)	8.4887583	29	105.1608879	0.0000000
s(hindcast_ild_05)	2.4087379	9	20.7730642	0.0000119
s(hindcast_su,hindcast_sv)	4.5212948	29	21.4816251	0.0000160
s(date_decimal)	7.9890920	9	616.1212023	0.0000294
s(hindcast_chl_surf)	0.4717437	9	1.7612433	0.0292719
s(hindcast_eke)	0.0004725	9	0.0005645	0.1787120
s(hindcast_bbv_200)	0.0010380	9	0.0010918	0.2968048
s(slope)	0.0009188	9	0.0008988	0.3319236
s(hindcast_ssh)	0.0004338	9	0.0002391	0.4785456

0.2.46 Least Storm-Petrel

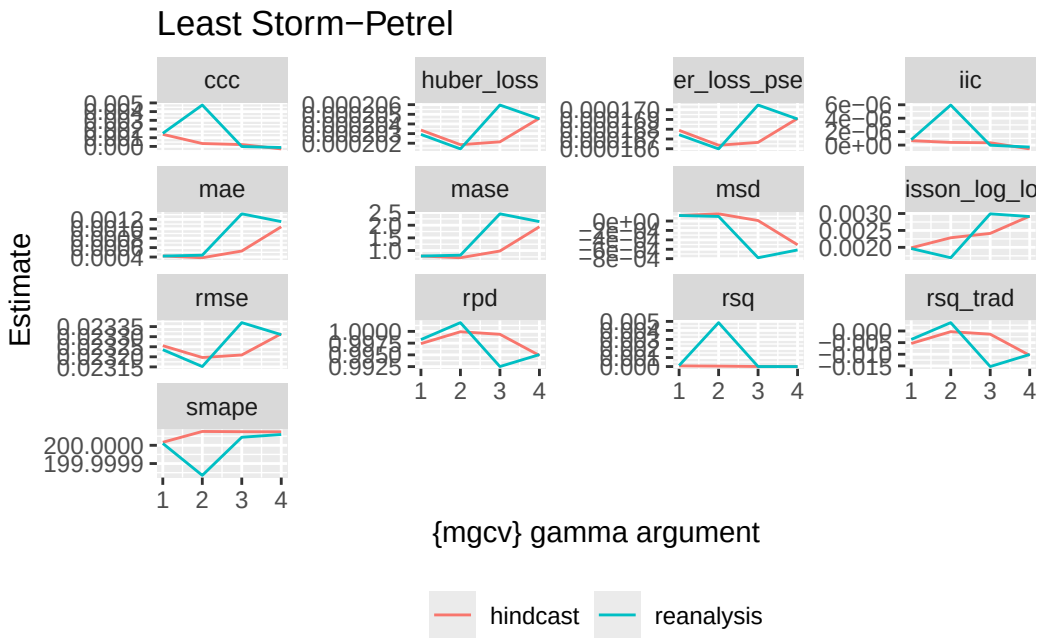


Table 94: Model summary for reanalysis model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(depth)	2.0886478	9	36.0167526	0.0000000

term	edf	ref.df	statistic	p.value
s(date_decimal)	5.6847570	9	193.2889557	0.0000005
s(date_doy)	4.4373433	8	35.2138759	0.0000036
s(survey_id)	3.4762416	10	14.7830639	0.0004987
s(slope)	1.2719064	9	6.9627111	0.0049614
s(reanalysis_sst)	1.9315510	9	12.0106712	0.0110770
s(reanalysis_ssh)	1.3828801	9	5.9344812	0.0116271
s(reanalysis_su,reanalysis_sv)	1.4904202	29	3.7668449	0.0299431
s(reanalysis_sustr,reanalysis_svstr)	0.0006799	29	0.0012543	0.1062597
s(reanalysis_curl)	0.0003591	9	0.0003887	0.2916589
s(reanalysis_ild_05)	0.0000321	9	0.0000282	0.3370693
s(reanalysis_bbv_200)	0.0000066	9	0.0000003	0.9571753

Table 95: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(date_decimal)	5.6855191	9	268.7055633	0.0000000
s(hindcast_sst)	2.9422689	9	77.9673318	0.0000000
s(depth)	1.6098125	9	21.8898757	0.0000010
s(survey_id)	3.3909341	10	17.3988269	0.0001183
s(hindcast_sustr,hindcast_svstr)	2.9079984	29	13.7868500	0.0002310
s(hindcast_su,hindcast_sv)	2.9181071	29	11.4444475	0.0007657
s(slope)	1.4609252	9	10.1892964	0.0008830
s(hindcast_ild_05)	0.0003895	9	0.0006873	0.1565263
s(hindcast_bbv_200)	0.0000805	9	0.0000555	0.3910872
s(hindcast_zoo_100m_int)	0.0000743	9	0.0000493	0.4176356
s(date_doy)	0.0000599	8	0.0000447	0.4380741
s(hindcast_chl_surf)	0.0001705	9	0.0000357	0.7079080
s(hindcast_eke)	0.0000902	9	0.0000092	0.7634217
s(hindcast_ssh)	0.0000474	9	0.0000067	0.8316006
s(hindcast_curl)	0.0000937	9	0.0000012	0.9394668

0.2.47 Northern Fulmar

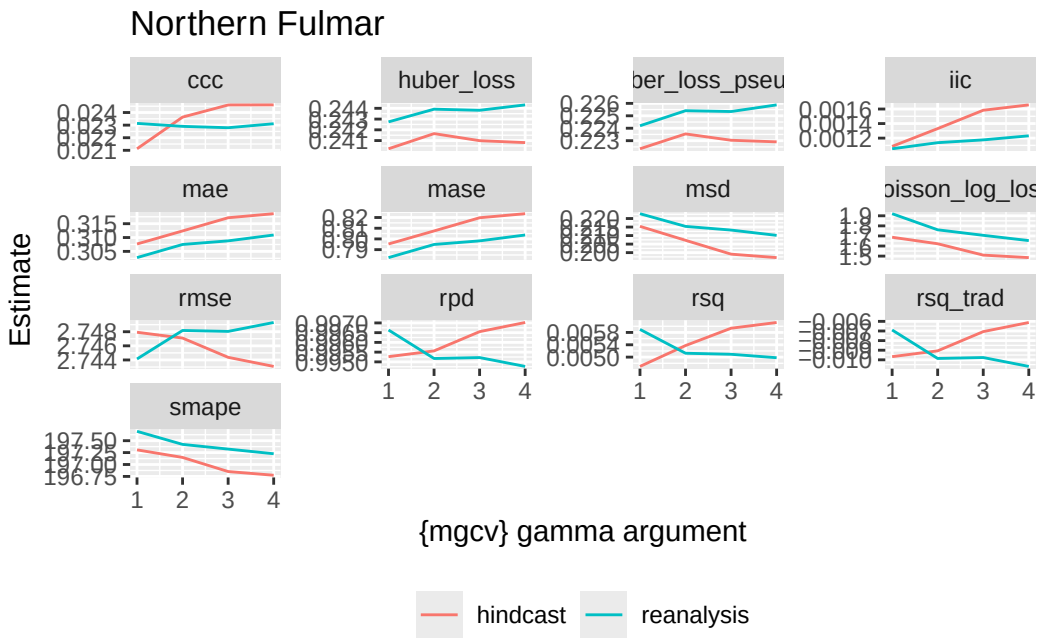


Table 96: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	9.0573435	10	349.038569	0.0000000
s(date_doy)	7.7864276	8	2354.488866	0.0000000
s(date_decimal)	8.4720835	9	1720.920789	0.0000000
s(depth)	7.5063939	9	488.924230	0.0000000
s(slope)	5.1929127	9	162.429199	0.0000000
s(reanalysis_ssh)	7.2786446	9	167.693909	0.0000000
s(reanalysis_sst)	5.8560511	9	563.421567	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	25.3118147	29	315.905850	0.0000000
s(reanalysis_ild_05)	2.7005009	9	15.720459	0.0002744
s(reanalysis_bbv_200)	1.9231812	9	12.902328	0.0014072
s(reanalysis_su,reanalysis_sv)	9.4365754	29	20.445666	0.0054579
s(reanalysis_curl)	0.8273342	9	4.143267	0.0247640

Table 97: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.4023354	10	397.1304512	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	7.0257537	8	1928.6151922	0.0000000
s(depth)	6.4127321	9	637.3318770	0.0000000
s(slope)	0.9728326	9	127.3221537	0.0000000
s(hindcast_ild_05)	4.3027881	9	158.9654197	0.0000000
s(hindcast_sst)	3.8501589	9	1075.1672910	0.0000000
s(hindcast_zoo_100m_int)	1.7050408	9	95.3284759	0.0000000
s(hindcast_su,hindcast_sv)	1.5935679	29	32.1650532	0.0000000
s(hindcast_sustr,hindcast_svstr)	1.7184028	29	48.1512061	0.0000000
s(date_decimal)	7.6402173	9	1029.2362649	0.0000010
s(hindcast_curl)	1.1799552	9	13.3363613	0.0000190
s(hindcast_bbv_200)	1.1913635	9	12.3712109	0.0001476
s(hindcast_eke)	0.0009288	9	0.0014455	0.1961443
s(hindcast_ssh)	0.0008629	9	0.0012672	0.2061778
s(hindcast_chl_surf)	0.0005186	9	0.0000742	0.7883636

0.2.48 Murphy's Petrel

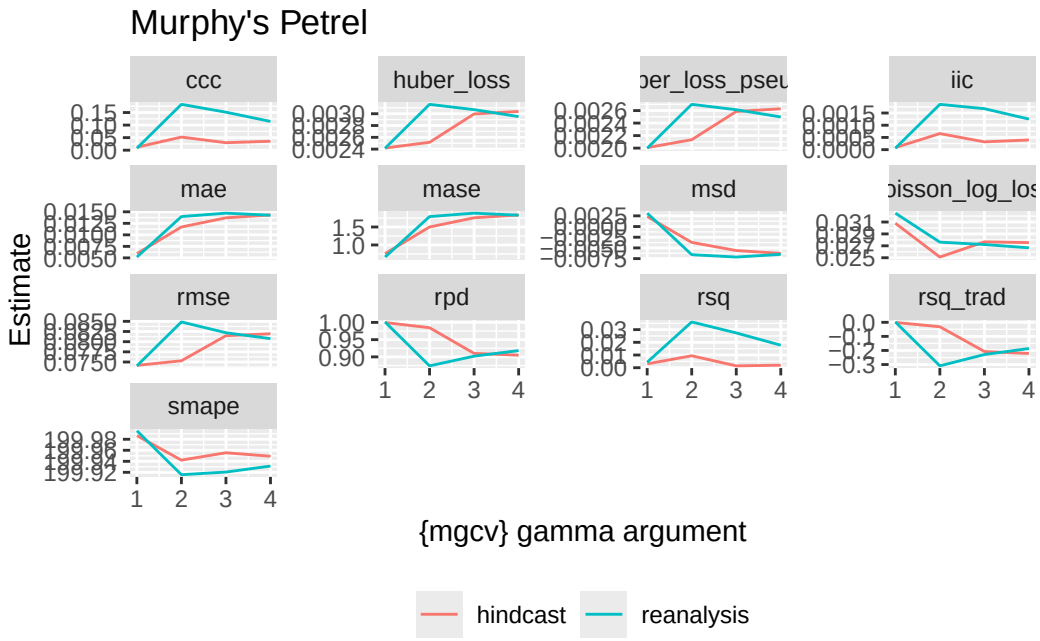


Table 98: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(date_doy)	4.1953881	8	65.8593637	0.0000000

term	edf	ref.df	statistic	p.value
s(reanalysis_sustr,reanalysis_svstr)	12.2336843	29	54.9708293	0.0000000
s(depth)	5.6388316	9	29.7442591	0.0000024
s(reanalysis_sst)	2.6951509	9	27.2860837	0.0000027
s(date_decimal)	5.7942793	9	39.0863554	0.0002327
s(reanalysis_curl)	2.5675017	9	9.1154333	0.0096619
s(survey_id)	2.8048871	11	6.6027350	0.0236190
s(slope)	1.2960923	9	3.5032220	0.0595528
s(reanalysis_bbv_200)	0.0013633	9	0.0011967	0.3356669
s(reanalysis_ild_05)	0.0001435	9	0.0001225	0.3537996
s(reanalysis_ssh)	0.0012387	9	0.0006498	0.5285355
s(reanalysis_su,reanalysis_sv)	0.0000681	29	0.0000493	0.5459703

Table 99: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(hindcast_sst)	4.4654176	9	63.6891531	0.0000000
s(date_doy)	3.6783134	8	37.5590602	0.0000132
s(depth)	6.2517315	9	23.5894764	0.0002573
s(hindcast_sustr,hindcast_svstr)	8.9731029	29	24.3300362	0.0005331
s(hindcast_bbv_200)	2.1015841	9	12.4148804	0.0006631
s(date_decimal)	5.4557762	9	23.0208487	0.0014146
s(hindcast_ssh)	1.5549395	9	8.2436468	0.0025886
s(hindcast_curl)	1.9709959	8	10.6338581	0.0031405
s(slope)	1.6585755	9	7.8304939	0.0064251
s(hindcast_zoo_100m_int)	2.7059728	9	9.4765466	0.0077615
s(hindcast_eke)	2.1109598	8	5.9170177	0.0250682
s(survey_id)	2.2031408	10	5.0298714	0.0277851
s(hindcast_su,hindcast_sv)	1.2537366	29	1.9369263	0.1500119
s(hindcast_ild_05)	0.3074066	9	0.3668797	0.2649312
s(hindcast_chl_surf)	0.0005751	9	0.0005414	0.3206106

0.2.49 Mottled Petrel

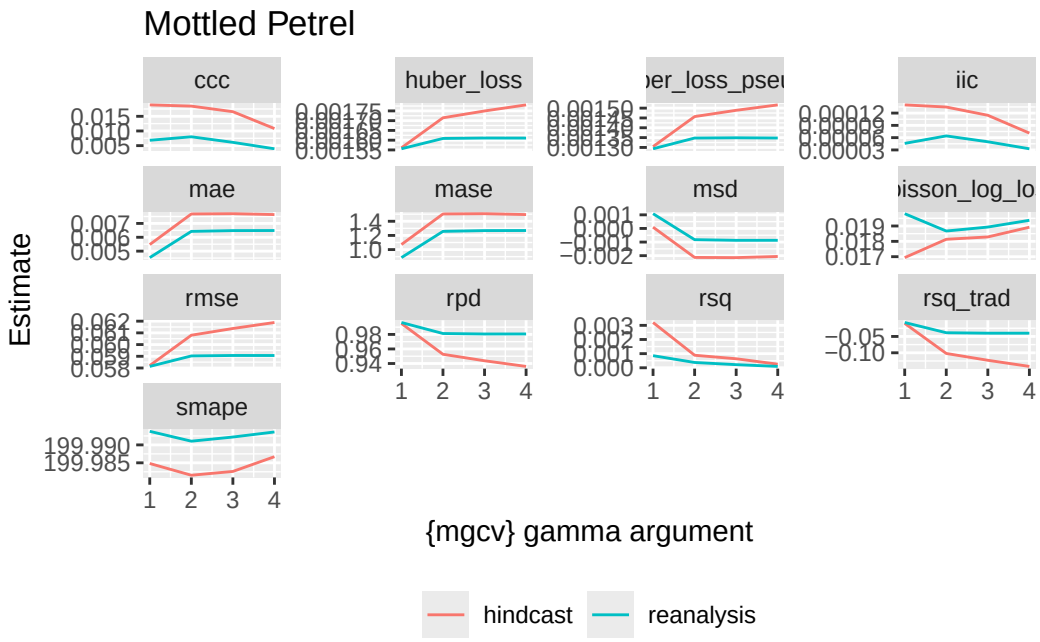


Table 100: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(depth)	2.4756135	9	28.2727679	0.0000004
s(survey_id)	4.6122943	10	30.2781642	0.0000013
s(reanalysis_ssh)	4.8211171	9	31.5844914	0.0000053
s(reanalysis_sst)	2.5814795	9	25.3369923	0.0000083
s(date_doy)	5.1357022	8	52.3576238	0.0010491
s(reanalysis_curl)	1.4346900	9	8.9738050	0.0026619
s(reanalysis_sustr,reanalysis_svstr)	5.9277716	29	16.0562706	0.0033770
s(slope)	0.7662013	9	2.7812600	0.0548838
s(date_decimal)	0.3229944	9	0.4895983	0.2810615
s(reanalysis_ild_05)	0.0000373	9	0.0000132	0.6418858
s(reanalysis_su,reanalysis_sv)	0.0000515	29	0.0000307	0.6486227
s(reanalysis_bbv_200)	0.0000030	9	0.0000002	0.9284731

Table 101: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(hindcast_sustr,hindcast_svstr)	13.7446062	29	61.9578579	-0.0000005

term	edf	ref.df	statistic	p.value
s(hindcast_sst)	1.9625546	9	53.8859242	0.0000000
s(depth)	2.2932808	9	18.6585270	0.0000531
s(survey_id)	4.5578331	10	21.7213533	0.0000562
s(date_doy)	4.8548814	8	58.5560007	0.0001140
s(hindcast_curl)	1.8536213	8	10.5250259	0.0025063
s(hindcast_chl_surf)	0.7668327	8	2.6008976	0.0509537
s(hindcast_ssh)	0.5461521	9	0.8746744	0.1904338
s(slope)	0.3351741	9	0.4228097	0.2506442
s(hindcast_su,hindcast_sv)	0.0919845	29	0.0957271	0.3424197
s(hindcast_bbv_200)	0.0001640	9	0.0000977	0.4518023
s(date_decimal)	0.0000415	9	0.0000220	0.5292530
s(hindcast_zoo_100m_int)	0.0000577	9	0.0000159	0.6651759
s(hindcast_eke)	0.0000324	9	0.0000085	0.6715014
s(hindcast_ild_05)	0.0000401	9	0.0000049	0.8141817

0.2.50 Cook's Petrel

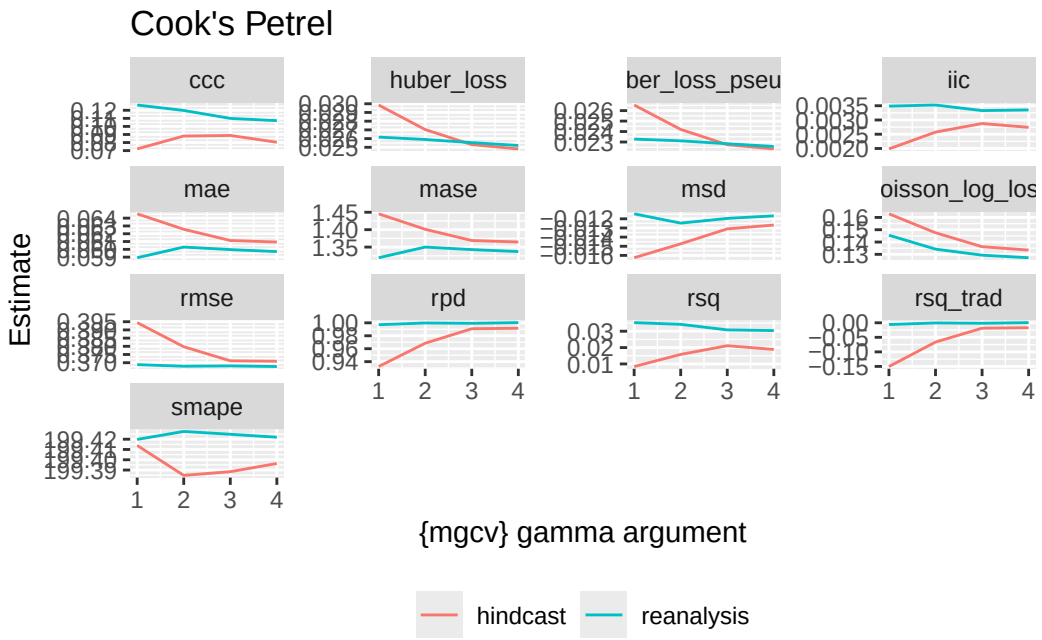


Table 102: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	2.2122864	8	27.9825760	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	4.4326939	8	423.3240996	0.0000000
s(depth)	4.4324236	9	229.5488660	0.0000000
s(reanalysis_ssh)	2.0738123	9	68.8311614	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	4.4907748	29	100.8935659	0.0000000
s(reanalysis_curl)	1.9207731	9	16.9163402	0.0000824
s(reanalysis_sst)	0.6052996	9	5.5288892	0.0023924
s(reanalysis_ild_05)	0.5185289	9	4.1466418	0.0042929
s(reanalysis_su,reanalysis_sv)	0.0004548	29	0.0011960	0.0399396
s(slope)	0.0007907	9	0.0026010	0.0486414
s(reanalysis_bbv_200)	0.0000959	9	0.0000511	0.4476910
s(date_decimal)	0.0001434	9	0.0000624	0.5414677

Table 103: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	2.1776537	8	28.9108135	0.0000000
s(date_doy)	4.3330047	8	424.2616825	0.0000000
s(depth)	4.5324309	9	219.3317778	0.0000000
s(hindcast_ild_05)	2.4488720	9	59.3733190	0.0000000
s(hindcast_bbv_200)	1.6073848	9	18.3199827	0.0000035
s(hindcast_sst)	0.7918114	9	14.7864385	0.0000309
s(hindcast_curl)	0.5625780	9	5.3555317	0.0016348
s(hindcast_sustr,hindcast_svstr)	0.6502795	29	3.2060335	0.0035682
s(hindcast_eke)	0.5208410	9	3.4304455	0.0078303
s(slope)	0.4411579	9	2.2115452	0.0094974
s(hindcast_zoo_100m_int)	0.0006042	9	0.0016815	0.0699017
s(hindcast_su,hindcast_sv)	0.0002072	29	0.0004408	0.0770696
s(hindcast_ssh)	0.0001234	9	0.0002694	0.1129365
s(hindcast_chl_surf)	0.0000929	9	0.0000421	0.5243846
s(date_decimal)	0.0001050	9	0.0000390	0.5554896

0.2.51 Buller's Shearwater

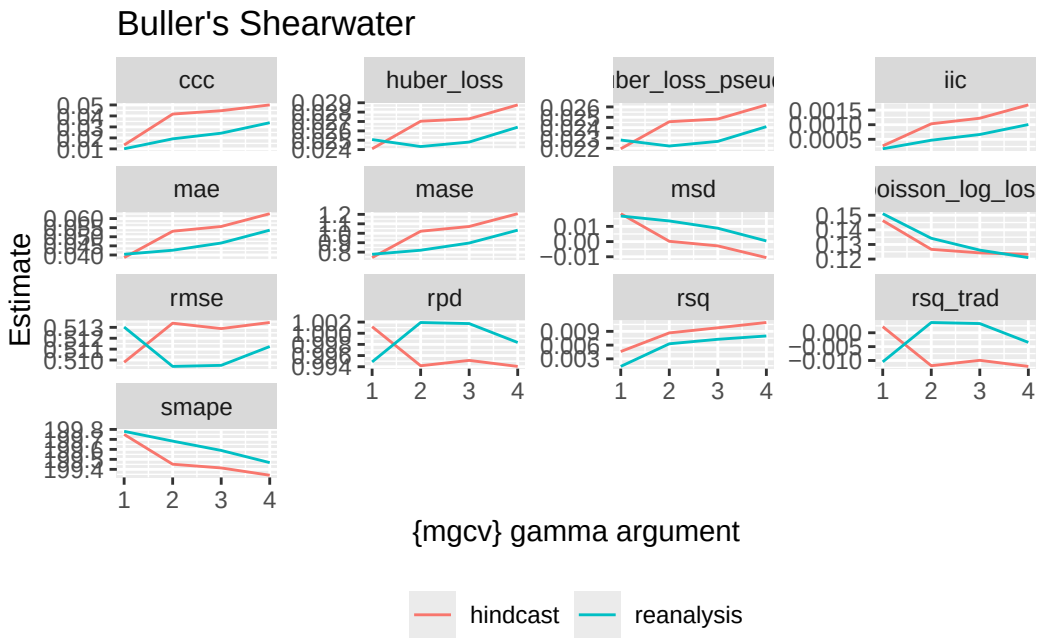


Table 104: Model summary for reanalysis model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.7955853	10	81.6240298	0.0000000
s(date_doy)	6.5707263	8	589.4956141	0.0000000
s(slope)	1.9833102	9	35.8112021	0.0000000
s(reanalysis_sst)	3.8604814	9	114.4192174	0.0000000
s(reanalysis_su,reanalysis_sv)	9.7434538	29	55.5329358	0.0000000
s(reanalysis_ssh)	1.6479701	9	14.6995671	0.0000674
s(date_decimal)	1.7529113	9	228.8199103	0.0000852
s(reanalysis_bbv_200)	1.4972611	9	13.8656633	0.0001826
s(reanalysis_curl)	1.5324720	9	12.6814038	0.0003029
s(reanalysis_ild_05)	0.9771663	9	7.0327381	0.0027240
s(depth)	0.8281982	9	3.4570655	0.0210365
s(reanalysis_sustr,reanalysis_svstr)	0.0000880	29	0.0000756	0.4088126

Table 105: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(hindcast_ssh)	6.0175029	9	34.640200	-0.0000045

term	edf	ref.df	statistic	p.value
s(survey_id)	7.0821861	10	50.347828	0.0000000
s(date_doy)	6.8690969	8	598.125824	0.0000000
s(hindcast_sst)	5.4498790	9	89.101777	0.0000000
s(hindcast_zoo_100m_int)	5.2221095	9	43.344438	0.0000000
s(slope)	2.4090535	9	28.343466	0.0000007
s(hindcast_sustr,hindcast_svstr)	14.5791042	29	43.144426	0.0000180
s(hindcast_su,hindcast_sv)	16.4968804	29	44.361291	0.0000200
s(date_decimal)	2.6375443	9	289.112576	0.0000338
s(hindcast_chl_surf)	5.2598776	9	24.710824	0.0000673
s(hindcast_curl)	1.7426218	9	10.888189	0.0010944
s(hindcast_ild_05)	0.8752784	9	6.322099	0.0059821
s(hindcast_eke)	2.0679538	9	6.428985	0.0062654
s(hindcast_bbv_200)	2.6821670	9	8.187351	0.0175819
s(depth)	2.0409089	9	6.112099	0.0286524

0.2.52 Short-tailed Shearwater

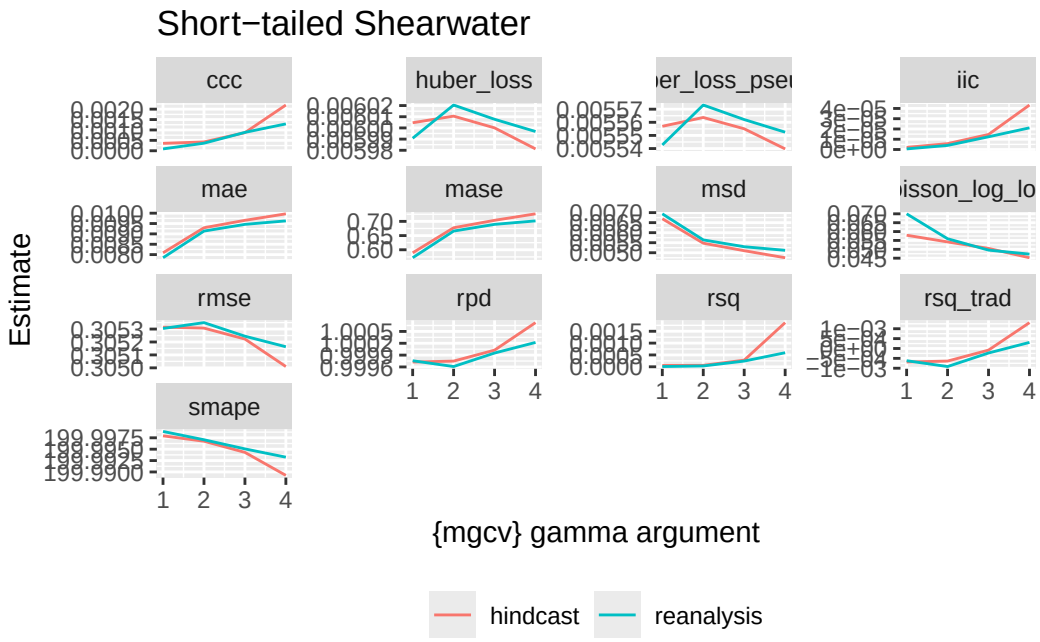


Table 106: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(depth)	1.6947373	9	34.4457639	-0.0000005

term	edf	ref.df	statistic	p.value
s(survey_id)	6.0705379	10	85.7777019	0.0000000
s(reanalysis_sst)	1.8341109	9	54.1806055	0.0000000
s(date_doy)	1.0268532	8	6.9915783	0.0056770
s(slope)	0.0001546	9	0.0004272	0.0814522
s(date_decimal)	0.0001695	9	0.0002952	0.1669622
s(reanalysis_su,reanalysis_sv)	0.0000051	29	0.0000042	0.4523787
s(reanalysis_curl)	0.0000048	9	0.0000022	0.5401354
s(reanalysis_bbv_200)	0.0000039	9	0.0000015	0.5836904
s(reanalysis_ild_05)	0.0000041	9	0.0000013	0.6228940
s(reanalysis_sustr,reanalysis_svstr)	0.0000025	29	0.0000011	0.7285910
s(reanalysis_ssh)	0.0000031	9	0.0000004	0.8307242

Table 107: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.0177020	10	80.1528049	0.0000000
s(depth)	1.8478528	9	46.8528938	0.0000000
s(hindcast_sst)	1.6881113	9	61.4384331	0.0000000
s(hindcast_chl_surf)	0.7579609	9	7.8350816	0.0039533
s(date_doy)	0.6246535	8	3.2670683	0.0103532
s(hindcast_curl)	0.1834087	9	0.8479110	0.0328871
s(hindcast_su,hindcast_sv)	0.0000021	29	0.0000050	0.0535497
s(slope)	0.0000026	9	0.0000058	0.1104195
s(hindcast_sustr,hindcast_svstr)	0.0000023	29	0.0000044	0.1152643
s(hindcast_eke)	0.0000041	9	0.0000081	0.1430085
s(date_decimal)	0.0000057	9	0.0000094	0.1835354
s(hindcast_bbv_200)	0.0000016	9	0.0000018	0.2689886
s(hindcast_ild_05)	0.0000016	9	0.0000015	0.3055497
s(hindcast_zoo_100m_int)	0.0000015	9	0.0000009	0.4300625
s(hindcast_ssh)	0.0000019	9	0.0000005	0.6669022

0.2.53 Sooty Shearwater

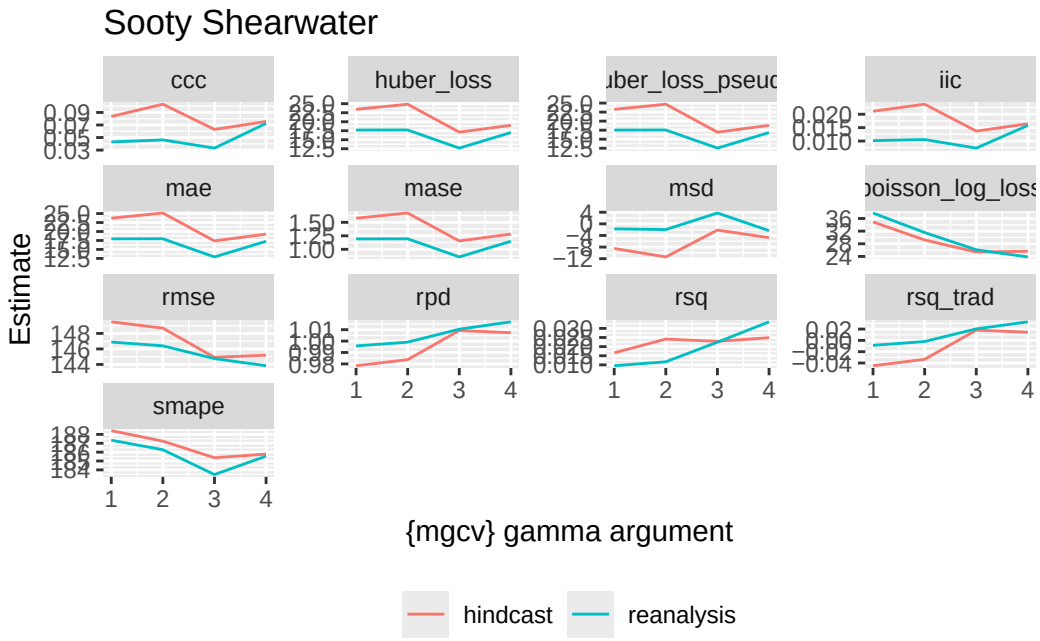


Table 108: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.0853854	10	115.9353444	0.0000000
s(date_doy)	7.3379986	8	3585.0338568	0.0000000
s(date_decimal)	1.4689534	9	829.5035377	0.0000000
s(depth)	6.8269837	9	2760.7776241	0.0000000
s(slope)	2.7448878	9	242.0927344	0.0000000
s(reanalysis_bbv_200)	3.8378639	9	48.0311913	0.0000000
s(reanalysis_ild_05)	3.5905418	9	72.8712207	0.0000000
s(reanalysis_ssh)	3.3688018	9	128.4075493	0.0000000
s(reanalysis_sst)	6.5951158	9	337.0396015	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	13.3438645	29	219.6566631	0.0000000
s(reanalysis_su,reanalysis_sv)	0.0017409	29	0.0029773	0.1392110
s(reanalysis_curl)	0.0012645	9	0.0004281	0.5767975

Table 109: Model summary for hindcast model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.5706173	10	147.8690217	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	7.4976935	8	2221.8716221	0.0000000
s(date_decimal)	6.4680784	9	792.3496184	0.0000000
s(depth)	7.0113734	9	1439.2694488	0.0000000
s(slope)	2.8974131	9	169.1622995	0.0000000
s(hindcast_curl)	5.3252602	9	152.8935007	0.0000000
s(hindcast_ild_05)	5.0270549	9	156.8177520	0.0000000
s(hindcast_ssh)	2.3006092	9	75.4212707	0.0000000
s(hindcast_sst)	4.8545624	9	183.9824058	0.0000000
s(hindcast_chl_surf)	2.4965110	9	42.2450921	0.0000000
s(hindcast_zoo_100m_int)	2.9428717	9	78.6442794	0.0000000
s(hindcast_su,hindcast_sv)	19.5776659	29	276.3477808	0.0000000
s(hindcast_sustr,hindcast_svstr)	15.7708337	29	270.5304119	0.0000000
s(hindcast_eke)	2.0776513	9	20.9965449	0.0000005
s(hindcast_bbv_200)	0.0012811	9	0.0009282	0.4064038

0.2.54 Pink-footed Shearwater

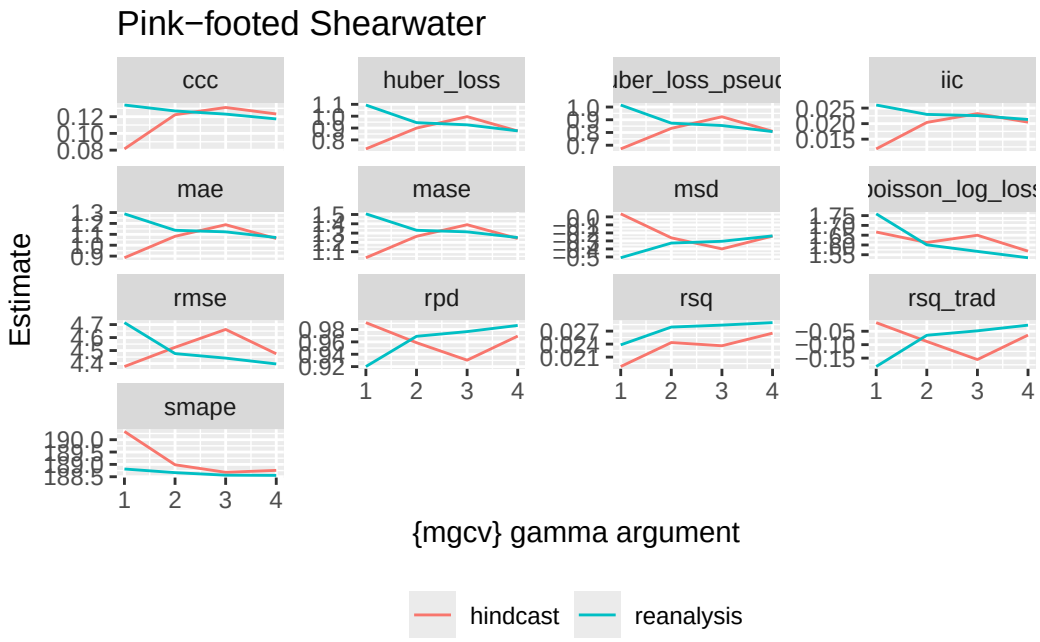


Table 110: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.4048308	10	127.5159059	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	5.7935205	8	1191.6866380	0.0000000
s(depth)	5.8754939	9	1548.0182294	0.0000000
s(slope)	2.2762447	9	83.7670021	0.0000000
s(reanalysis_bbv_200)	4.2294880	9	198.1081996	0.0000000
s(reanalysis_ssh)	2.2337852	9	54.9219334	0.0000000
s(reanalysis_sst)	4.0965100	9	209.6011931	0.0000000
s(reanalysis_su,reanalysis_sv)	2.4796589	29	17.1908913	0.0000067
s(date_decimal)	0.7088459	9	7.8053050	0.0304239
s(reanalysis_curl)	0.0002894	9	0.0003430	0.2637304
s(reanalysis_sustr,reanalysis_svstr)	0.0004591	29	0.0003729	0.4184629
s(reanalysis_ild_05)	0.0003006	9	0.0000055	0.9789865

Table 111: Model summary for hindcast model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.6470448	10	158.1408906	0.0000000
s(date_doy)	7.3209290	8	460.5130167	0.0000000
s(depth)	7.2764050	9	643.4497390	0.0000000
s(slope)	4.4841220	9	81.4784519	0.0000000
s(hindcast_bbv_200)	5.5236525	9	102.2711688	0.0000000
s(hindcast_curl)	2.9393759	9	59.8917970	0.0000000
s(hindcast_sst)	7.2730108	9	110.5481032	0.0000000
s(hindcast_zoo_100m_int)	4.1403014	9	164.8693179	0.0000000
s(hindcast_su,hindcast_sv)	17.5612028	29	117.9718054	0.0000000
s(hindcast_sustr,hindcast_svstr)	16.2011412	29	174.7589409	0.0000000
s(hindcast_ild_05)	4.1097232	9	32.3053250	0.0000012
s(hindcast_ssh)	2.3316165	9	24.5495413	0.0000021
s(date_decimal)	8.1741708	9	256.2000272	0.0004998
s(hindcast_chl_surf)	0.0754336	9	0.0567972	0.4247478
s(hindcast_eke)	0.0006195	9	0.0000698	0.8902072

0.2.55 Flesh-footed Shearwater

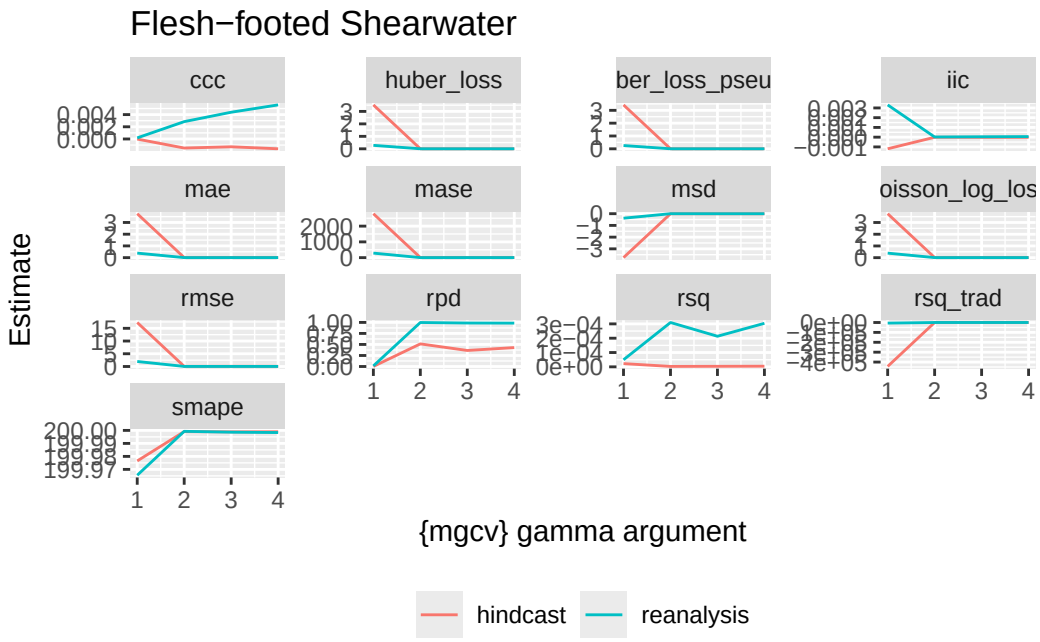


Table 112: Model summary for reanalysis model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(reanalysis_sst)	1.9851052	9	48.4184909	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	2.2049963	29	10.7682630	0.0005754
s(survey_id)	2.8428176	10	10.5101396	0.0009090
s(date_doy)	2.6209538	8	38.3426289	0.0012399
s(date_decimal)	2.2793946	9	15.8090601	0.0015116
s(depth)	0.7933111	9	7.4251749	0.0022932
s(reanalysis_su,reanalysis_sv)	0.0000507	29	0.0000827	0.1529065
s(slope)	0.0000143	9	0.0000228	0.1936226
s(reanalysis_bbv_200)	0.0000337	9	0.0000407	0.2561424
s(reanalysis_ssh)	0.0000157	9	0.0000091	0.4756111
s(reanalysis_curl)	0.0000057	9	0.0000001	0.9720029
s(reanalysis_ild_05)	0.0000058	9	0.0000001	0.9724645

Table 113: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(depth)	0.9097865	9	19.4992740	0.0000024

term	edf	ref.df	statistic	p.value
s(hindcast_zoo_100m_int)	0.8719473	9	12.2510915	0.0001246
s(date_doy)	2.1778824	8	19.4238715	0.0001253
s(hindcast_sst)	1.2456762	9	9.8347084	0.0007306
s(hindcast_su,hindcast_sv)	2.6845589	29	10.7227988	0.0007548
s(date_decimal)	1.8549845	9	11.1657549	0.0021370
s(hindcast_ild_05)	0.7575416	9	6.0578317	0.0025153
s(survey_id)	1.7445380	10	4.7234732	0.0112606
s(hindcast_sustr,hindcast_svstr)	0.0000220	29	0.0000353	0.1474842
s(hindcast_curl)	0.0000080	9	0.0000066	0.3567224
s(hindcast_bbv_200)	0.0000117	9	0.0000083	0.3889081
s(slope)	0.0000104	9	0.0000069	0.4297487
s(hindcast_ssh)	0.0000073	9	0.0000027	0.5837403
s(hindcast_chl_surf)	0.0000050	9	0.0000011	0.6951893
s(hindcast_eke)	0.0000053	9	0.0000006	0.8015298

0.2.56 Black-vented Shearwater

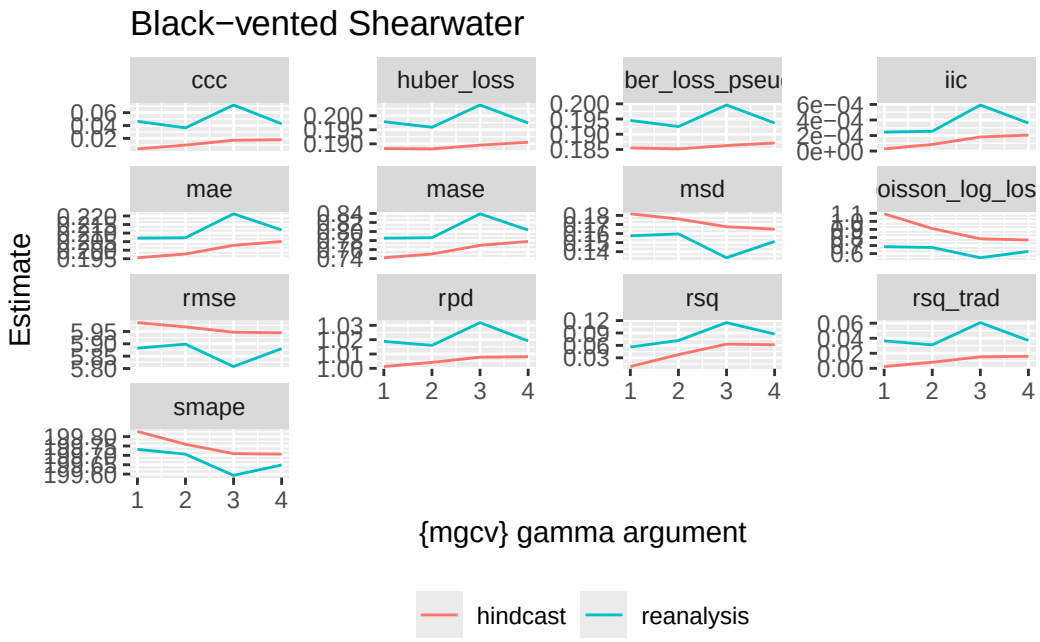


Table 114: Model summary for reanalysis model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.1349485	10	87.5874745	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	4.4304671	8	309.4738188	0.0000000
s(date_decimal)	4.4996399	9	135.8327614	0.0000000
s(depth)	3.0273520	9	521.0887356	0.0000000
s(reanalysis_bbv_200)	2.1870208	9	55.9934361	0.0000000
s(reanalysis_sst)	2.0520781	9	124.9525473	0.0000000
s(reanalysis_su,reanalysis_sv)	1.6869637	29	33.1417309	0.0000000
s(slope)	1.2101343	9	17.8909386	0.0000126
s(reanalysis_ild_05)	1.0090834	9	8.8494067	0.0006838
s(reanalysis_sustr,reanalysis_svstr)	0.0001010	29	0.0001977	0.1078049
s(reanalysis_ssh)	0.0000411	9	0.0000640	0.1724439
s(reanalysis_curl)	0.0000262	9	0.0000340	0.2423641

Table 115: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.6299750	10	122.0506637	0.0000000
s(date_doy)	3.7476395	8	186.3484621	0.0000000
s(date_decimal)	4.7292919	9	257.8542369	0.0000000
s(depth)	2.8981727	9	592.8105435	0.0000000
s(hindcast_ssh)	2.2679001	9	128.8772594	0.0000000
s(hindcast_chl_surf)	0.7414233	9	14.4488000	0.0002367
s(slope)	0.7589316	9	7.3603169	0.0009557
s(hindcast_zoo_100m_int)	0.5558733	9	4.2980440	0.0050538
s(hindcast_bbv_200)	0.4994418	9	3.8026420	0.0051610
s(hindcast_ild_05)	0.3966888	9	2.4135625	0.0085586
s(hindcast_eke)	0.5400824	9	3.7398756	0.0171192
s(hindcast_curl)	0.0005446	9	0.0008522	0.1964763
s(hindcast_sst)	0.0001538	9	0.0001605	0.2730501
s(hindcast_sustr,hindcast_svstr)	0.0001089	29	0.0001127	0.3112484
s(hindcast_su,hindcast_sv)	0.0000984	29	0.0000685	0.5312549

0.2.57 Brandt's Cormorant

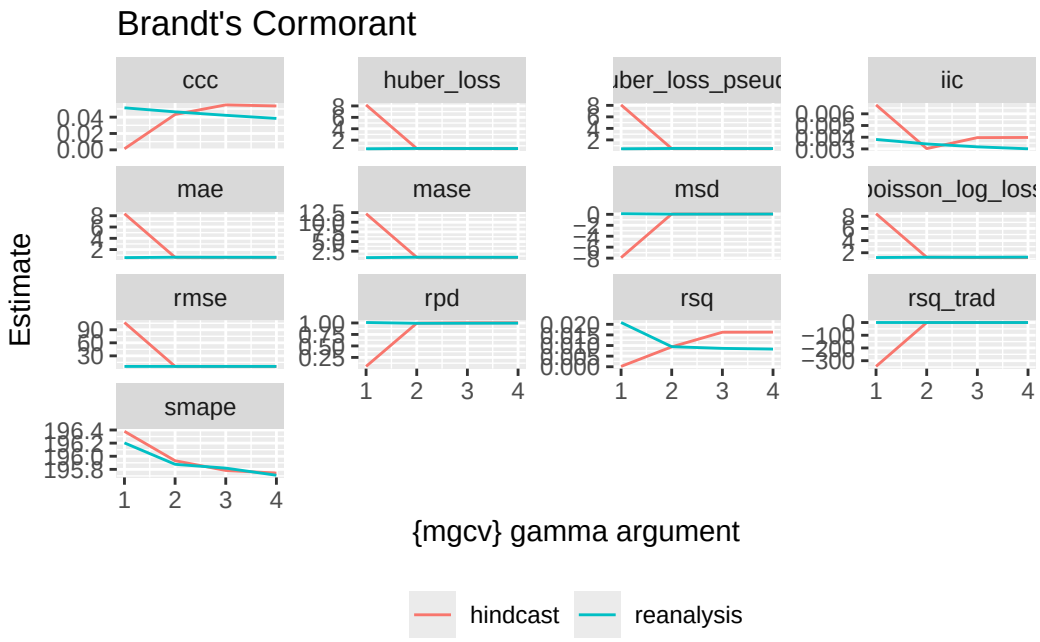


Table 116: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.6962858	10	136.237301	0.0000000
s(date_doy)	5.9482541	8	127.570571	0.0000000
s(depth)	6.0205351	9	1220.515398	0.0000000
s(slope)	7.5032466	9	311.965387	0.0000000
s(reanalysis_su,reanalysis_sv)	13.4313034	29	65.147656	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	18.9961958	29	92.839145	0.0000000
s(reanalysis_ssh)	3.9075815	9	20.918938	0.0002033
s(reanalysis_bbv_200)	3.0662992	9	25.139148	0.0005103
s(date_decimal)	7.4704937	9	185.624906	0.0007453
s(reanalysis_sst)	2.8254971	9	21.082038	0.0014028
s(reanalysis_ild_05)	0.7842043	9	3.431676	0.0353647
s(reanalysis_curl)	0.7877401	9	1.565586	0.1337206

Table 117: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(hindcast_ssh)	1.4088278	9	28.6252209	-0.0000004

term	edf	ref.df	statistic	p.value
s(survey_id)	4.5794278	10	66.3333216	0.0000000
s(date_doy)	3.1490727	8	111.2211418	0.0000000
s(depth)	4.4864407	9	1332.7273142	0.0000000
s(slope)	4.0485774	9	281.3983666	0.0000000
s(hindcast_sst)	4.2076309	9	289.1059328	0.0000000
s(hindcast_chl_surf)	2.3658398	9	83.0500828	0.0000000
s(hindcast_su,hindcast_sv)	5.1707352	29	39.8146482	0.0000000
s(hindcast_bbv_200)	1.4740029	9	23.9041732	0.0000002
s(hindcast_eke)	0.6017329	9	4.0433373	0.0004904
s(hindcast_zoo_100m_int)	0.7225057	9	4.9000751	0.0020859
s(hindcast_curl)	0.2523717	9	1.3938822	0.0179415
s(hindcast_sustr,hindcast_svstr)	0.0005123	29	0.0010463	0.0898733
s(date_decimal)	0.0027512	9	0.0060549	0.1161958
s(hindcast_ild_05)	0.0003260	9	0.0005277	0.1580974

0.2.58 Pelagic Cormorant

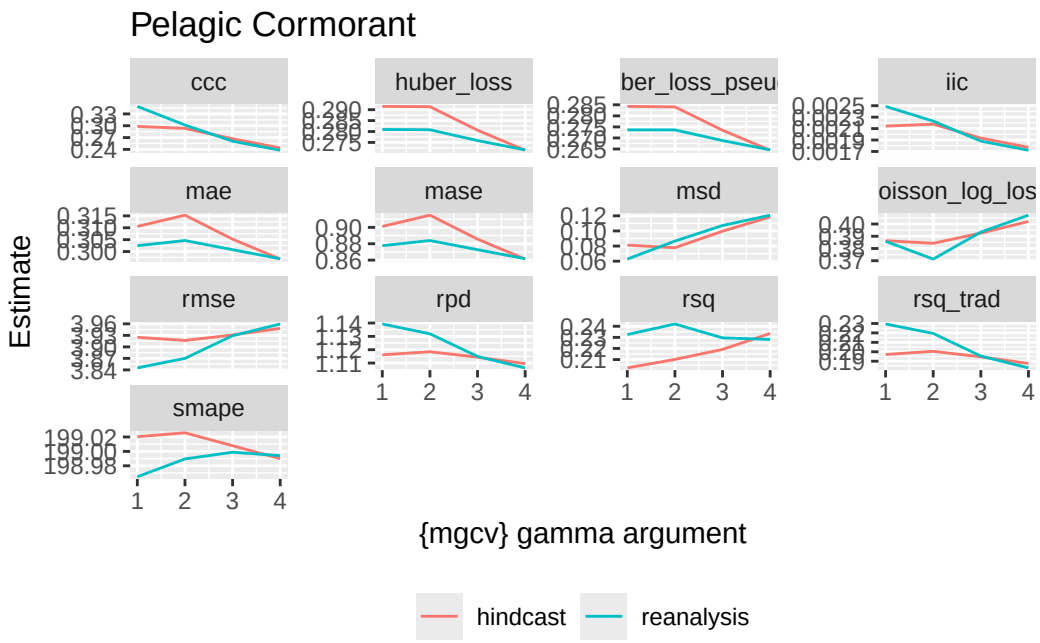


Table 118: Model summary for reanalysis model with lowest RMSE (gamma = 1)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.4802967	10	116.7323272	0.0000000

term	edf	ref.df	statistic	p.value
s(depth)	3.3281040	9	281.2616950	0.0000000
s(slope)	3.7181244	9	50.1311469	0.0000000
s(date_doy)	3.0821328	8	49.5066267	0.0000009
s(reanalysis_curl)	3.1715574	9	22.1658104	0.0000152
s(reanalysis_sustr,reanalysis_svstr)	9.5003401	29	31.7100950	0.0000543
s(reanalysis_su,reanalysis_sv)	9.3647351	29	28.1444673	0.0002654
s(reanalysis_bbv_200)	1.9929816	9	5.5132205	0.1817835
s(date_decimal)	1.1748959	9	6.0476883	0.2078690
s(reanalysis_ssh)	1.2377185	9	2.1163521	0.2088463
s(reanalysis_ild_05)	0.0025579	9	0.0017803	0.4079944
s(reanalysis_sst)	0.0001102	9	0.0000252	0.6705616

Table 119: Model summary for hindcast model with lowest RMSE (gamma = 2)

term	edf	ref.df	statistic	p.value
s(survey_id)	7.8881425	10	137.7164577	0.0000000
s(depth)	3.2635896	9	349.3998235	0.0000000
s(slope)	1.8416909	9	58.6645252	0.0000000
s(date_doy)	2.3682255	8	46.1914318	0.0000010
s(hindcast_zoo_100m_int)	1.0126469	9	7.4474163	0.0157184
s(hindcast_bbv_200)	0.6393172	9	7.9723186	0.0210715
s(hindcast_ild_05)	0.0006158	9	0.0009552	0.1544919
s(hindcast_su,hindcast_sv)	0.0002031	29	0.0002737	0.2203269
s(hindcast_eke)	0.0000807	9	0.0000995	0.2625717
s(hindcast_sustr,hindcast_svstr)	0.0000620	29	0.0000688	0.2951366
s(date_decimal)	0.0000746	9	0.0000540	0.4414953
s(hindcast_curl)	0.0000527	9	0.0000221	0.5492963
s(hindcast_ssh)	0.0001541	9	0.0000635	0.5983591
s(hindcast_sst)	0.0000170	9	0.0000031	0.8417928
s(hindcast_chl_surf)	0.0000275	9	0.0000010	0.9619913

0.2.59 Double-crested Cormorant

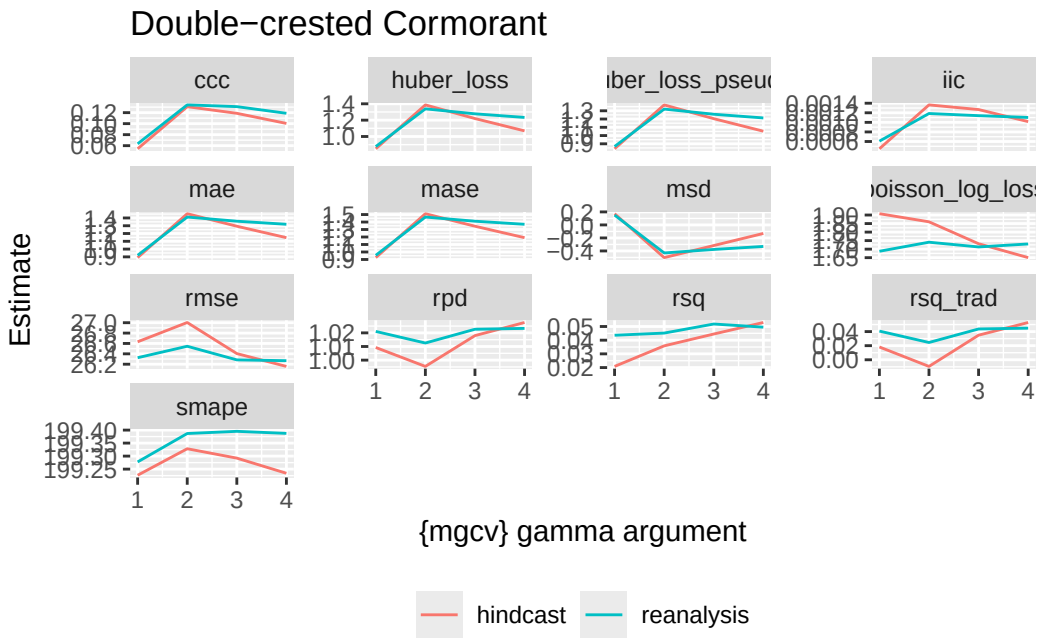


Table 120: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.6620824	10	181.7010122	0.0000000
s(date_decimal)	0.9579956	9	315.2771280	0.0000000
s(depth)	2.2362365	9	362.3527490	0.0000000
s(reanalysis_ssh)	1.5924272	9	95.2180999	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	0.8088706	29	11.9471945	0.0002316
s(date_doy)	0.0004033	8	0.0013701	0.0253094
s(reanalysis_su,reanalysis_sv)	0.0001012	29	0.0002049	0.0841144
s(slope)	0.0000801	9	0.0001998	0.0998711
s(reanalysis_bbv_200)	0.0001162	9	0.0002566	0.1283045
s(reanalysis_sst)	0.0000410	9	0.0000116	0.6769456
s(reanalysis_curl)	0.0000306	9	0.0000030	0.8252630
s(reanalysis_ild_05)	0.0000500	9	0.0000028	0.8771191

Table 121: Model summary for hindcast model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	6.4789228	10	168.4188166	0.0000000

term	edf	ref.df	statistic	p.value
s(date_decimal)	0.9566618	9	265.8530191	0.0000000
s(depth)	2.0731830	9	282.3043152	0.0000000
s(hindcast_ssh)	0.9072550	9	63.8571338	0.0000000
s(hindcast_ild_05)	0.7841324	9	15.7163120	0.0000025
s(date_doy)	1.3933796	8	11.0667548	0.0023942
s(hindcast_zoo_100m_int)	0.4351129	9	2.4902172	0.0102230
s(hindcast_chl_surf)	0.0004722	9	0.0023681	0.0161048
s(slope)	0.0000694	9	0.0001690	0.1047593
s(hindcast_curl)	0.0000581	9	0.0000963	0.1840825
s(hindcast_bbv_200)	0.0000659	9	0.0000814	0.2340899
s(hindcast_eke)	0.0000501	9	0.0000563	0.2867396
s(hindcast_su,hindcast_sv)	0.0000642	29	0.0000704	0.3238361
s(hindcast_sustr,hindcast_svstr)	0.0000269	29	0.0000138	0.5564242
s(hindcast_sst)	0.0000534	9	0.0000147	0.6960584

0.2.60 Brown Pelican

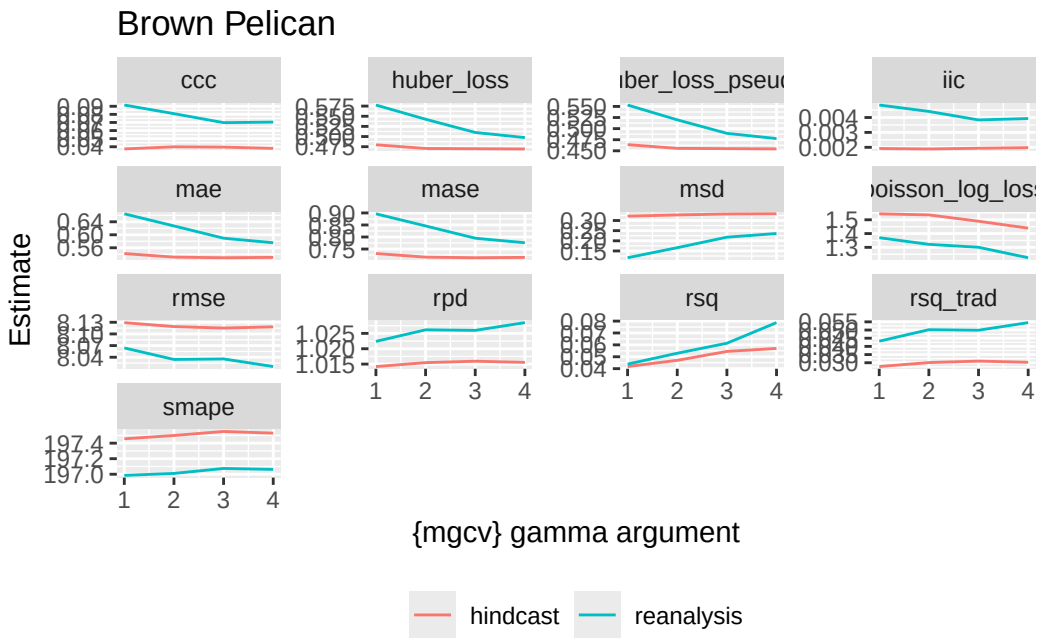


Table 122: Model summary for reanalysis model with lowest RMSE (gamma = 4)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.1118079	10	206.2284983	0.0000000

term	edf	ref.df	statistic	p.value
s(date_doy)	2.1386052	8	59.0666538	0.0000000
s(depth)	5.4647002	9	1825.9150857	0.0000000
s(slope)	1.6508824	9	55.7591553	0.0000000
s(reanalysis_curl)	1.9269067	9	91.9811266	0.0000000
s(reanalysis_sst)	3.6812047	9	269.5906335	0.0000000
s(reanalysis_su,reanalysis_sv)	4.6610831	29	34.4543189	0.0000000
s(reanalysis_sustr,reanalysis_svstr)	8.4061851	29	246.8110136	0.0000000
s(date_decimal)	4.6080898	9	551.9777490	0.0000005
s(reanalysis_bbv_200)	0.0020358	9	0.0064128	0.0533184
s(reanalysis_ssh)	0.0010637	9	0.0030476	0.0552957
s(reanalysis_ild_05)	0.0002628	9	0.0003538	0.2135773

Table 123: Model summary for hindcast model with lowest RMSE (gamma = 3)

term	edf	ref.df	statistic	p.value
s(survey_id)	8.0920026	10	169.8138002	0.0000000
s(date_doy)	3.5816990	8	121.2941036	0.0000000
s(date_decimal)	5.2959871	9	431.3185898	0.0000000
s(depth)	5.7338860	9	1080.0140249	0.0000000
s(slope)	1.8967455	9	43.7823820	0.0000000
s(hindcast_curl)	3.8918501	9	169.7281310	0.0000000
s(hindcast_ssh)	3.5517427	9	36.3212305	0.0000000
s(hindcast_sst)	3.8112222	9	240.3681719	0.0000000
s(hindcast_sustr,hindcast_svstr)	10.4097363	29	205.4697045	0.0000000
s(hindcast_ild_05)	1.5325461	9	10.6928702	0.0002685
s(hindcast_bbv_200)	2.5858468	9	22.9642901	0.0022473
s(hindcast_su,hindcast_sv)	0.0034357	29	0.0073504	0.0592812
s(hindcast_eke)	0.0015385	9	0.0025159	0.1912144
s(hindcast_zoo_100m_int)	0.0005944	9	0.0007057	0.2612429
s(hindcast_chl_surf)	0.0004985	9	0.0003112	0.4329113