A. Tables to summarise algorithm performance

The numbers in the following tables for non-biased stations/ stations with zero RMSE don't necessarily match with the numbers of homogeneous stations in table two from chapter five. This is because the numbers in chapter five were the number of stations with no identifiable inhomogeneities, whereas the numbers here are the numbers of stations with no inhomogeneities at all.

Table A.1. A summary of algorithm performance using bias, which is defined as the difference in means between the clean and released or clean and returned series and is therefore measured in °C. Absolute bias refers to the value obtained by taking the modulus of the bias thereby forcing it to be positive. When percentage recovery is referred to the letters indicate the following: I = Improved; a PR less than 75 indicating the improvement is not large enough and in brackets between 125 and 200, which indicates a bias better than before, but that has overshot the true value. GI = Greatly improved; a PR between 75 and 125. MW = Made worse; a PR of less than 0 or greater than 200 indicating that homogenisation increased the station bias, potentially by 'correcting' it too far. U = Unchanged; PR of 0, values in brackets in this column indicate that the bias is unchanged because the station was already unbiased. For the best and worst stations the groupings are simply Improved: PR between 0 and 200, Unchanged: PR = 0 and Made worse: PR is less than 0 or greater than 200. Values in brackets in the column referring to non-biased stations indicate the quantity of stations that have an absolute bias less than 0.05°C, which therefore effectively have a bias of zero when rounded to point one degree precision.

Scenario	Algorithm	Region bias	No. positively biased (mean bias)	No. negatively biased (mean bias)	No. non-biased (to measurement precision)	Sum absolute biases	Percentage recovery				PR best stats			PR worst stats			Best stats mean bias	Worst stats mean bias
							GI	I	U	MW	I	U	MW	I	U	MW		
WYW1	Released	0.053	37 (0.44)	36 (-0.34)	2 (18)	28.52	-	-	-	-	-	-	-	-	-	-	0.01	0.27
	MACD	-0.016	38 (0.11)	35 (-0.35)	2 (27)	9.42	25	10 (7)	19 (2)	12	0	9	1	10	0	0	0.01	-0.16
	Climatol-D	-0.035	27 (0.11)	46 (-0.12)	2 (29)	8.49	32	5 (2)	27 (2)	7	0	10	0	9	1	0	0.01	-0.11
	Climatol-M	0.047	36 (0.41)	37 (-0.30)	2 (18)	25.93	1	51 (0)	15 (2)	6	2	8	0	10	0	0	0.01	0.25
	MASH	-0.012	32 (0.13)	43 (-0.12)	0 (30)	9.03	38	16 (4)	0 (0)	17	5	0	5	8	0	2	-0.003	0.06
	ACMANT2	-0.037	24 (0.08)	50 (-0.09)	1 (33)	6.43	35	13 (10)	2 (1)	14	4	2	4	10	0	0	0.02	-0.10
	DAP1	0.067	41 (0.35)	33 (-0.28)	1 (16)	23.64	2	25 (4)	36 (1)	7	0	9	1	6	3	1	0.02	0.28
	HOM1	0.062	39 (0.37)	35 (-0.28)	1 (16)	24.25	3	21 (1)	42 (1)	7	0	9	1	5	4	1	0.02	0.30
	SPLIDHOM1	0.064	39 (0.37)	35 (-0.28)	1 (16)	24.34	2	22 (2)	42 (1)	6	0	9	1	5	4	1	0.02	0.31

Table A.2. A summary of algorithm performance using RMSE, which is the root mean squared error between clean and returned series or clean and released series (see chapter 6 section 3.2), reported in °C. Percentage recovery here cannot be greater than 100 as it is not possible to overshoot perfection because RMSE is constrained to be positive. The categories of PR are: I = Improved; PR between 0 and 75; GI = Greatly improved; a PR of between 75 and 100. MW = Made worse; a PR of less than 0, and U = Unchanged; a PR of 0 (values in brackets indicate no improvement possible because of perfection).

Scenario	Algorithm	Region RMSE	No. perfect RMSEs (to measurement precision)	Range of RMSEs in best stats	Range of RMSEs in worst stats	Percentage recovery				PR best stats			PR worst stats			PR value for region
						GI	I	MW	U	I	U	MW	I	U	MW	
WYW1	Released	0.726	2 (4)	(0, 0.11)	(1.17, 1.95)	-	-	-	-	-	-	-	-	-	-	-
	MACD	0.304	2 (5)	(0, 0.26)	(0.10, 1.50)	17	30	7	19 (2)	0	9	1	10	0	0	58.10
	Climatol-D	0.272	2 (6)	(0, 0.11)	(0.11, 1.20)	21	25	0	27 (2)	0	10	0	9	1	0	62.54
	Climatol-M	0.659	2 (4)	(0, 0.11)	(1.04, 1.78)	0	56	2	15 (2)	1	7	2	10	0	0	9.22
	MASH	0.333	0 (0)	(0.09, 0.23)	(0.17, 1.70)	12	46	17	0 (0)	1	0	9	8	0	2	54.15
	ACMANT2	0.242	1 (1)	(0, 0.26)	(0.11, 0.80)	14	49	9	2 (1)	2	2	6	10	0	0	66.60
	DAP1	0.649	1 (3)	(0, 0.23)	(0.45, 1.79)	0	26	12	36 (1)	0	9	1	6	1	3	10.62
	HOM1	0.662	1 (3)	(0, 0.23)	(0.44, 1.95)	0	24	8	42 (1)	0	9	1	5	4	1	8.75
	SPLIDHOM1	0.661	1 (3)	(0, 0.23)	(0.44, 1.95)	0	24	8	42 (1)	0	9	1	5	4	1	8.93

Table A.3. A summary of algorithm performance on linear trend recovery. Note that 'significant trends preserved' (the value in brackets in the 'significant trends' column) refers to where a trend that is significant in the clean data is also significant in the released or returned data. This value is red only when the trend's significance is preserved and when its value is also preserved (with a 0.05°C buffer to allow for slight changes). All trends are in the units of °C/decade. The range of percentage recovery values are the same as for bias and therefore table 1 should be seen for PR classifications used here.

Scenario	Algorithm	Decadal trends (°C)		Positive trends		Negative trends		No. of signif. trends (pre-served)	Percentage recovery				PR best stats			PR worst stats			Regional average trend	PR for regional average trend
		Min	Max	No.	Mean	No.	Mean		GI	I	MW	U	I	MW	U	I	MW	U		
WYW1	Clean	-0.027	0.279	71	0.103	4	-0.022	1	-	-	-	-	-	-	-	-	-	-	0.105	-
	Released	-0.874	0.669	50	0.216	25	-0.238	31 (1)	-	-	-	-	-	-	-	-	-	-	0.065	-
	MACD	-0.125	0.328	64	0.123	11	-0.045	6 (1)	32	10 (5)	7	19 (2)	0	1	9	10	0	0	0.096	76.99
	Climatol-D	-0.112	0.287	69	0.123	6	-0.043	4 (1)	39	2 (4)	1	27 (2)	0	0	10	9	0	1	0.110	110.66
	Climatol-M	-0.787	0.627	50	0.206	25	-0.206	30 (1)	0	52 (0)	6	15 (2)	1	1	8	10	0	0	0.068	9.03
	MASH	-0.203	0.236	68	0.119	7	-0.069	0 (0)	45	11 (5)	14	0 (0)	3	7	0	10	0	0	0.101	89.15
	ACMANT2	-0.008	0.291	73	0.123	2	-0.005	2 (0)	44	12 (6)	9	2 (2)	5	3	2	10	0	0	0.119	134.77
	DAP1	-0.671	0.491	52	0.159	23	-0.192	21 (1)	3	24 (3)	8	36 (1)	0	1	9	7	0	3	0.057	-19.17
	HOM1	-0.874	0.571	52	0.180	23	-0.212	25 (1)	4	20 (2)	6	42 (1)	0	9	1	6	0	4	0.059	-14.35
	SPLIDHOM1	-0.874	0.567	52	0.180	23	-0.214	25 (1)	3	20 (3)	6	42 (1)	0	1	9	6	0	4	0.058	-17.53

Table A.4. A summary of algorithm performance when considering similarity in inter-annual and inter-decadal variability using correlations of loess smooths. Loess smooths were compared between clean and released and clean and returned data using Spearman rank correlations and it is these correlations that were used in the calculation of percentage recovery. PR values cannot be greater than 100 and therefore are constrained to be the same as for RMSE. Colour coding of table rows to represent algorithms is the same as for other tables.

Scenario	PR for inter-decadal smooths				PR for inter-decadal best			PR for inter-decadal worst			PR for inter-annual smooths				PR for inter-annual best			PR for inter-annual worst			Biggest correlation decrease (station ID)		Overall correlation for region	
	GI	I	MW	U	I	U	MW	I	U	MW	GI	I	MW	U	I	U	MW	I	U	MW	D	Y	D	Y
WYW1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.623	0.888
	27	17	10	19 (2)	0	9	1	9	0	1	34	14	6	19 (2)	0	9	1	9	0	1	0.15 (47)	0.018 (23)	0.910	0.982
	31	13	2	27 (2)	0	10	0	9	1	0	39	7	0	27 (2)	0	10	0	9	1	0	0.05 (20)	NA	0.918	0.983
	0	52	6	15 (2)	1	7	2	9	1	0	0	56	2	15 (2)	1	7	2	10	0	0	0.001 (35)	0.0001 (23)	0.655	0.904
	39	21	15	0 (0)	4	0	6	9	0	1	48	17	10	0 (0)	4	0	6	10	0	0	0.062 (47)	0.009 (45)	0.961	0.989
	43	13	16	2 (1)	2	2	6	9	0	1	52	8	12	2 (1)	1	2	7	9	0	1	0.56 (47)	0.58 (47)	0.957	0.987
	4	24	10	36 (1)	0	9	1	7	3	0	1	30	8	36 (1)	0	9	1	7	0	3	1.16 (33)	0.11 (33)	0.694	0.918
	4	18	10	42 (1)	0	9	1	6	4	0	5	20	7	42 (1)	0	9	1	6	4	0	33 (1.21)	0.13 (33)	0.678	0.911
	4	19	9	42 (1)	0	9	1	6	4	0	4	22	6	42 (1)	0	9	1	6	4	0	1.17 (33)	0.12 (33)	0.676	0.910

Table A.5. A summary of algorithm performance on variability recovery. Variability between stations was compared using ratios of standard deviations relative to the clean series. The variability increases and decreases columns are relative to the released series; that is if returned stations were made more (less) variable than the released series what was the percentage recovery of this change? The groupings are the same as for bias, but without the 'unchanged' option as this is moot when these columns pertain specifically to variabilities that have been changed. The sums of the numbers in these columns do not equal the values in columns three and four as those pertain to the variability relative to the clean series.

Scenario	Algorithm	No. stats more variable than clean	No. stats less variable than clean	Variability increases			Variability decreases			Variability unchanged (because of perfection)	PR best stats			PR worst stats		
				GI	I	MW	GI	I	MW		I	U	MW	I	U	MW
WYW1	Released	56	17	-	-	-	-	-	-	-	-	-	-	-	-	-
	MACD	43	30	5	0	7	10	25	6	21 (2)	0	9	1	9	0	1
	Climatol-D	42	31	0	3	6	13	18	6	29 (2)	0	10	0	9	1	0
	Climatol-M	53	20	1	2	12	2	29	12	17 (2)	0	7	3	6	0	4
	MASH	40	35	0	2	28	10	16	19	0 (0)	3	0	7	5	0	5
	ACMANT2	43	31	2	4	12	9	31	14	3 (1)	3	2	5	8	0	2
	DAP1	51	23	0	0	21	3	6	8	37 (1)	0	9	1	2	3	5
	HOM1	50	24	0	0	18	1	6	7	43 (1)	0	9	1	1	4	5
	SPLIDHOM1	50	24	0	0	19	2	5	6	43 (1)	0	9	1	1	4	5

Table A.6. A summary of algorithm performance on recovery and preservation of extremes. Extremes were here compared on like for like days. That is, if an algorithm did not preserve the day of the extreme it was not credited with preserving it at all. Measurement error is important here as single days are being focussed on, whereas for all other statistics aggregation of some kind has occurred and therefore random measurement error would be expected to have cancelled out. The measurement error here was calculated as 0.14°C from Brohan et al. [2006] and the number of values exact to measurement precision is indicated in brackets. Where extremes are referred to as being 'too warm' or 'too cool' here the implication is that they are more than 0.14°C away from the observed value.

Scenario	Algorithm	Warm extremes							Cold extremes						
		Exact (± 0.14)	Too warm in returned			Too cool in returned			Exact (± 0.14)	Too warm in returned			Too cool in returned		
			I	U	MW	I	U	MW		I	U	MW	I	U	MW
WYW1	Released	46 (56)	-	-	-	-	-	-	13 (26)	-	-	-	-	-	-
	MACD	48 (59)	2	3	1	3	7	0	22 (42)	9	3	2	5	10	4
	Climatol-D	48 (62)	2	4	0	5	6	0	20 (44)	6	5	3	3	11	3
	Climatol-M	46 (56)	4	4	0	5	6	0	14 (26)	19	7	0	15	8	0
	MASH	43 (56)	3	0	3	2	3	8	16 (38)	9	1	9	13	1	4
	ACMANT2	49 (62)	0	4	1	4	3	1	23 (48)	4	3	3	8	5	4
	DAP1	47 (57)	0	7	1	1	9	0	12 (25)	3	22	2	4	18	1
	HOM1	45 (55)	1	7	1	2	9	0	13 (26)	2	23	1	3	18	2
	SPLIDHOM1	46 (56)	1	7	1	1	9	0	12 (24)	2	24	1	3	18	3

Table A.7. A table to summarise algorithm detection ability when a window of thirty days either side of a change point was used. Colour coding is the same as for other tables, apart from that blue now represents DAP1, HOM1 and SPLIDHOM1 as all three of these algorithms had the same change point detection method applied and therefore yielded the same results. Values in brackets for hits, false alarms and CSI indicate the values that are obtained if you count multiple hits and multiple false alarms within a single window. The value not in brackets for CSI is when only multiple false alarms in windows are counted, but not multiple hits as the justification for the latter is more complicated. All values for hit rate (HR) and false alarm rate (FAR) are calculated from non-bracketed quantities. Abbreviations used in this table are as follows: CO = constant offset; EV = explanatory variables; SC = shelter changes; SR = station relocations.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
WYW1	57 (58)	40 (63)	193	279	0.228	0.125	0.467	0.182 (0.185)	51.3%	9.88%	76.7%	26.0%	2.06%	20.7%	26.3%	20.5%
	55 (55)	12 (12)	195	307	0.220	0.038	0.261	0.210 (0.210)	51.3%	8.72%	83.3%	24.4%	0%	19.8%	26.3%	18.2%
	88 (88)	56 (58)	162	263	0.352	0.176	0.568	0.286 (0.286)	62.8%	22.7%	96.7%	46.3%	2.06%	35.1%	40.0%	25.0%
	58 (58)	95 (103)	192	224	0.232	0.298	0.626	0.164 (0.164)	29.5%	20.3%	40.0%	35.0%	3.09%	19.80%	24.2%	29.5%
	4 (4)	40 (42)	246	279	0.016	0.125	0.179	0.014 (0.014)	1.28%	1.74%	3.33%	1.63%	1.03%	1.80%	0%	4.55%

Table A.8. A table to summarise algorithm detection ability when a window of ninety days either side of a change point was used. See comments for table 7.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
WYW1	73 (77)	24 (45)	177	284	0.292	0.078	0.467	0.247 (0.258)	60.3%	15.1%	93.3%	35.0%	2.06%	27.0%	33.7%	25.0%
	64 (64)	6 (6)	186	302	0.256	0.019	0.261	0.250 (0.250)	53.8%	12.8%	83.3%	29.3%	3.09%	23.4%	30.5%	20.5%
	109 (109)	39 (41)	141	269	0.436	0.127	0.568	0.375 (0.375)	71.7%	30.8%	96.7%	60.2%	6.18%	44.1%	46.3%	36.4%
	109 (109)	49 (55)	141	259	0.436	0.159	0.626	0.357 (0.357)	64.1%	34.3%	70.0%	64.2%	9.28%	44.1%	45.3%	38.6%
	19 (19)	26 (27)	231	282	0.076	0.084	0.179	0.069 (0.069)	14.1%	4.65%	20.0%	9.76%	1.03%	6.31%	6.32%	13.6%

Table A.9. As in table 1, but for Wyoming scenarios 2 and 3.

Scenario	Algorithm	Region bias	No. positively biased (mean bias)	No. negatively biased (mean bias)	No. non-biased (to measurement precision)	Sum absolute biases	Percentage recovery				PR best stats			PR worst stats			Best stats mean bias	Worst stats mean bias
							GI	I	U	MW	I	U	MW	I	U	MW		
WYW2	Released	-0.066	63 (0.34)	84 (-0.38)	11 (36)	53.49	-	-	-	-	-	-	-	-	-	-	0	0.35
	MACD	-0.050	52 (0.09)	99 (-0.13)	7 (66)	17.63	55	26 (10)	41 (7)	19	0	6	4	10	0	0	-0.01	-0.09
	Climatol-D	-0.052	51 (0.09)	96 (-0.13)	11 (70)	17.36	55	13 (10)	58 (11)	11	0	10	0	10	0	0	0	-0.11
	Climatol-M	-0.063	66 (0.29)	82 (-0.36)	11 (36)	48.79	0	106 (1)	36 (10)	5	0	9	1	10	0	0	0	-0.34
	MASH	-0.044	45 (0.06)	113 (-0.09)	0 (74)	12.27	78	30 (12)	0 (0)	38	0	0	10	10	0	0	-0.01	0.01
	ACMANT2	-0.044	38 (0.06)	116 (-0.06)	4 (75)	11.14	77	23 (19)	10 (4)	25	0	4	6	10	0	0	-0.03	-0.10
	DAP1	-0.063	65 (0.23)	85 (-0.30)	8 (40)	40.41	16	46 (4)	73 (8)	11	0	8	2	9	1	0	-0.01	-0.31
	HOM1	-0.063	67 (0.23)	83 (-0.30)	8 (41)	40.59	12	46 (6)	76 (8)	10	0	8	2	9	1	0	-0.01	-0.32
	SPLIDHOM1	-0.061	68 (0.23)	82 (-0.31)	8 (40)	40.69	12	49 (4)	75 (8)	10	0	8	2	9	1	0	-0.01	-0.32
WYW3	Released	-0.076	61 (0.34)	88 (-0.37)	9 (30)	53.87	-	-	-	-	-	-	-	-	-	-	0	-0.53
	MACD	-0.050	46 (0.09)	106 (-0.11)	63 (6)	15.68	54	28 (14)	36 (6)	20	0	7	3	10	0	0	-0.01	-0.09
	Climatol-D	-0.060	39 (0.07)	111 (-0.11)	8 (68)	14.84	52	13 (16)	62 (8)	7	0	9	1	10	0	0	0	-0.09
	Climatol-M	-0.024	46 (0.10)	105 (-0.08)	7 (74)	12.70	68	20 (22)	27 (7)	14	0	8	2	9	0	1	-0.02	0.12
	MASH	-0.013	50 (0.10)	108 (-0.06)	0 (95)	11.65	82	29 (21)	0 (0)	26	1	0	9	10	0	0	0	0.14
	ACMANT2	-0.024	41 (0.09)	113 (-0.07)	4 (84)	10.99	81	22 (21)	8 (4)	22	0	4	6	9	0	1	-0.03	0.13
	DAP1	-0.067	61 (0.26)	88 (-0.30)	9 (36)	42.58	13	45 (7)	73 (9)	11	0	10	0	8	1	1	0	-0.40
	HOM1	-0.061	64 (0.27)	85 (-0.32)	9 (34)	44.22	12	41 (7)	79 (9)	10	0	10	0	8	1	1	0	-0.42
	SPLIDHOM1	-0.060	64 (0.27)	85 (-0.31)	9 (35)	43.71	11	42 (7)	78 (9)	11	0	10	0	8	1	1	0	-0.42

Table A.10. As in table 2, but for Wyoming scenarios 2 and 3.

Scenario	Algorithm	Region RMSE	No. perfect RMSEs (to measurement precision)	Range of RMSEs in best stats	Range of RMSEs in worst stats	Percentage recovery				PR best stats			PR worst stats			PR value for region
						GI	I	MW	U	I	U	MW	I	U	MW	
WYW2	Released	0.654	11 (15)	(0, 0)	(1.25, 2.53)	-	-	-	-	-	-	-	-	-	-	-
	MACD	0.264	7 (13)	(0, 0.29)	(0.10, 0.89)	36	54	20	41 (7)	0	6	4	10	0	0	59.90
	Climatol-D	0.249	18 (11)	(0, 0)	(0.06, 0.55)	44	41	4	58 (11)	0	10	0	10	0	0	62.23
	Climatol-M	0.600	14 (11)	(0, 0.07)	(1.12, 2.28)	0	108	4	36 (10)	0	9	1	10	0	0	8.81
	MASH	0.217	0 (2)	(0, 0.11)	(0.12, 0.72)	31	94	33	0 (0)	0	0	10	10	0	0	67.07
	ACMANT2	0.192	9 (4)	(0, 0.16)	(0.09, 0.59)	40	88	16	10 (4)	0	4	6	10	0	0	70.87
	DAP1	0.536	8 (12)	(0, 0.24)	(0.43, 1.42)	6	58	13	73 (8)	0	8	2	9	0	1	18.55
	HOM1	0.538	8 (12)	(0, 0.23)	(0.47, 1.42)	6	56	12	76 (8)	0	8	2	9	0	1	18.25
	SPLIDHOM1	0.536	8 (11)	(0, 0.23)	(0.42, 1.42)	6	56	13	75 (8)	0	8	2	9	0	1	18.55
WYW3	Released	0.696	9 (13)	(0, 0.02)	(1.34, 2.73)	-	-	-	-	-	-	-	-	-	-	-
	MACD	0.252	6 (13)	(0, 0.20)	(0.10, 0.58)	32	62	22	36 (6)	0	7	3	10	0	0	63.84
	Climatol-D	0.237	8 (14)	(0, 0.05)	(0.10, 0.58)	42	43	3	62 (8)	0	9	1	10	0	0	65.88
	Climatol-M	0.246	7 (13)	(0, 0.13)	(0.10, 1.88)	41	75	8	27 (7)	0	8	2	9	0	1	64.67
	MASH	0.258	0 (4)	(0.02, 0.12)	(0.16, 1.84)	37	97	24	0 (0)	1	0	9	10	0	0	62.93
	ACMANT2	0.238	4 (8)	(0, 0.14)	(0.11, 1.84)	43	89	14	8 (4)	0	4	6	10	0	0	65.79
	DAP1	0.615	9 (13)	(0, 0.02)	(1.34, 2.39)	4	62	10	73 (9)	0	10	0	8	1	1	11.65
	HOM1	0.627	9 (14)	(0, 0.02)	(1.34, 2.50)	3	58	9	79 (9)	0	10	0	8	1	1	9.94
	SPLIDHOM1	0.622	9 (14)	(0, 0.02)	(1.34, 2.39)	3	59	9	78 (9)	0	10	0	8	1	1	10.73

Table A.11. As in table 3, but for Wyoming scenarios 2 and 3.

Scenario	Algorithm	Decadal trends (°C)		Positive trends		Negative trends		No. of signif. trends (pre-served)	Percentage recovery				PR best stats			PR worst stats			Regional average trend	PR for regional average trend
		Min	Max	No.	Mean	No.	Mean		GI	I	MW	U	I	MW	U	I	MW	U		
WYW2	Clean	-0.044	0.253	152	0.108	6	-0.027	1	-	-	-	-	-	-	-	-	-	-	0.102	-
	Released	-0.510	0.756	118	0.234	40	-0.205	65 (0)	-	-	-	-	-	-	-	-	-	-	0.122	-
	MACD	-0.158	0.378	146	0.136	12	-0.052	17 (1)	61	24 (10)	15	41 (7)	0	4	6	10	0	0	0.121	4.74
	Climatol-D	-0.158	0.476	146	0.139	12	-0.060	15 (1)	69	12 (4)	4	58 (11)	0	0	10	10	0	0	0.123	-6.54
	Climatol-M	-0.441	0.725	120	0.220	38	-0.185	61 (0)	0	107 (0)	5	36 (10)	0	1	9	10	0	0	0.122	0.78
	MASH	-0.058	0.585	152	0.131	6	-0.036	3 (0)	88	29 (18)	23	0 (0)	0	0	10	10	0	0	0.124	-8.88
	ACMANT2	-0.027	0.378	152	0.108	6	-0.027	4 (1)	87	21 (22)	4	14 (10)	0	6	4	10	0	0	0.120	13.09
	DAP1	-0.373	0.675	127	0.196	31	-0.155	50 (0)	15	49 (5)	8	73 (8)	0	2	8	8	1	1	0.127	-20.72
	HOM1	-0.373	0.674	127	0.196	31	-0.153	51 (0)	13	48 (5)	8	76 (8)	0	2	8	7	2	1	0.127	-23.84
	SPLIDHOM1	-0.373	0.673	126	0.197	32	-0.150	50 (0)	13	50 (5)	7	75 (8)	0	2	8	8	1	1	0.127	-19.74
WYW3	Clean	-0.065	0.342	153	0.109	5	-0.039	1	-	-	-	-	-	-	-	-	-	-	0.104	-
	Released	-0.788	1.102	123	0.249	35	-0.205	60 (0)	-	-	-	-	-	-	-	-	-	-	0.149	-
	MACD	-0.114	0.459	149	0.146	9	-0.072	12 (0)	69	22 (11)	14	36 (6)	0	3	7	10	0	0	0.133	34.23
	Climatol-D	-0.086	0.459	153	0.145	5	-0.049	14 (0)	63	10 (11)	4	62 (8)	0	1	9	10	0	0	0.138	24.88
	Climatol-M	-0.117	0.352	153	0.131	5	-0.065	4 (1)	84	16 (11)	13	27 (7)	0	2	8	9	1	0	0.124	55.25
	MASH	-0.172	0.371	152	0.121	6	-0.043	4 (1)	99	25 (10)	24	0 (0)	1	0	9	9	0	1	0.115	73.85
	ACMANT2	-0.089	0.297	156	0.129	2	-0.053	4 (1)	84	26 (17)	19	8 (4)	0	6	4	9	0	1	0.126	50.42
	DAP1	-0.707	1.011	127	0.222	31	-0.171	48 (0)	15	45 (6)	10	73 (9)	0	0	10	8	1	1	0.142	14.91
	HOM1	-0.709	1.015	127	0.220	31	-0.174	49 (0)	15	42 (4)	9	79 (9)	0	0	10	8	1	1	0.143	11.53
	SPLIDHOM1	-0.707	1.013	127	0.218	31	-0.171	47 (0)	15	43 (4)	9	78 (9)	0	0	10	8	1	1	0.143	12.66

Table A.12. As in table 4, but for Wyoming scenarios 2 and 3.

Scen.	PR for inter-decadal smooths				PR for inter-decadal best			PR for inter-decadal worst			PR for inter-annual smooths				PR for inter-annual best			PR for inter-annual worst			Biggest correlation decrease (station ID)		Overall correlation for region	
	GI	I	MW	U	I	U	MW	I	U	MW	GI	I	MW	U	I	U	MW	I	U	MW	D	Y	D	Y
WYW2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.677	0.905
	54	32	24	41 (7)	0	6	4	9	0	1	68	27	15	41 (7)	0	6	4	10	0	0	0.30 (23)	0.02 (67)	0.923	0.984
	54	25	10	58 (11)	0	10	0	10	0	0	78	9	2	58 (11)	0	10	0	10	0	0	0.183 (12)	0.004 (118)	0.929	0.985
	0	106	5	36 (10)	0	9	1	10	0	0	0	111	1	36 (10)	0	9	1	10	0	0	0.232 (87)	0.057 (85)	0.707	0.919
	92	48	18	0 (0)	0	0	10	10	0	0	99	38	21	0 (0)	0	0	10	10	0	0	0.480 (31)	0.012 (41)	0.968	0.991
	92	39	13	10 (4)	0	4	6	9	0	1	102	30	12	10 (4)	0	4	6	10	0	0	0.418 (31)	0.007 (26)	0.974	0.992
	18	50	9	73 (8)	0	8	2	9	1	0	18	53	6	73 (8)	0	8	2	9	1	0	43 (0.161)	145 (0.057)	0.760	0.938
	18	49	7	76 (8)	0	8	2	9	1	0	19	50	5	76 (8)	0	8	2	9	0	1	43 (0.187)	145 (0.059)	0.762	0.938
	17	52	6	75 (8)	0	8	2	9	1	0	19	51	5	75 (8)	0	8	2	9	1	0	43 (0.158)	5 (0.066)	0.761	0.938
WYW3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.694	0.897
	54	43	19	36 (6)	0	7	3	9	0	1	66	37	13	36 (6)	0	7	3	10	0	0	0.240 (138)	0.019 (51)	0.932	0.985
	65	16	7	62 (8)	0	9	1	9	0	1	79	7	2	62 (8)	0	9	1	10	0	0	0.240 (138)	0.012 (83)	0.938	0.985
	74	36	12	27 (7)	0	8	2	9	0	1	91	25	8	27 (7)	0	8	2	10	0	0	0.145 (73)	0.025 (6)	0.962	0.989
	103	39	16	0 (0)	1	0	9	8	0	2	102	40	16	0 (0)	1	0	9	10	0	0	0.167 (47)	0.011 (6)	0.974	0.991
	88	40	18	8 (4)	0	4	6	9	0	1	99	32	15	8 (4)	0	4	6	10	0	0	0.226 (47)	0.020 (75)	0.973	0.991
	13	51	12	73 (9)	0	10	0	9	1	0	20	50	6	73 (9)	0	10	0	9	1	0	119 (0.238)	17 (0.064)	0.765	0.926
	11	49	10	79 (9)	0	10	0	9	1	0	20	46	4	79 (9)	0	10	0	9	1	0	119 (0.217)	17 (0.062)	0.757	0.923
	12	48	11	78 (9)	0	10	0	9	1	0	19	47	5	78 (9)	0	10	0	9	1	0	119 (0.241)	17 (0.067)	0.759	0.924

Table A.13. As in table 5, but for Wyoming scenarios 2 and 3.

Scenario	Algorithm	No. stats more variable than clean	No. stats less variable than clean	Variability increases			Variability decreases			Variability unchanged (because of perfection)	PR best stats			PR worst stats		
				GI	I	MW	GI	I	MW		I	U	MW	I	U	MW
WYW2	Released	110	37	-	-	-	-	-	-	-	-	-	-	-	-	-
	MACD	93	58	3	9	16	23	45	14	48 (7)	0	6	4	6	0	4
	Climatol-D	95	52	2	8	8	30	31	10	69 (11)	0	10	0	8	0	2
	Climatol-M	104	44	0	6	16	4	66	20	46 (10)	0	9	1	7	0	3
	MASH	97	61	3	6	62	10	34	43	0 (0)	0	0	10	2	0	8
	ACMANT2	92	62	1	14	23	33	48	25	14 (4)	0	4	6	7	0	3
	DAP1	94	56	0	0	30	8	18	21	81 (8)	0	8	2	3	1	7
	HOM1	90	60	0	0	29	8	15	22	84 (8)	0	8	2	2	1	7
	SPLIDHOM1	94	56	0	0	27	10	19	19	83 (8)	0	8	2	3	1	6
WYW3	Released	130	19	-	-	-	-	-	-	-	-	-	-	-	-	-
	MACD	108	44	0	2	22	31	46	15	42 (6)	0	7	3	10	0	0
	Climatol-D	119	31	1	3	14	30	36	4	70 (8)	0	9	1	10	0	0
	Climatol-M	90	61	1	1	28	20	41	33	34 (7)	0	8	2	8	0	2
	MASH	103	55	2	3	55	19	48	31	0 (0)	1	0	9	7	0	3
	ACMANT2	113	41	2	3	36	31	59	15	12 (4)	0	4	6	10	0	0
	DAP1	113	36	0	1	35	6	20	14	82 (9)	0	10	0	3	1	6
	HOM	109	40	0	0	28	6	23	13	88 (9)	0	10	0	4	1	5
	SPLIDHOM1	109	40	0	0	33	12	9	17	87 (9)	0	10	0	4	1	5

Table A.14. As in table 6, but for Wyoming scenarios 2 and 3.

Scenario	Algorithm	Warm extremes							Cold extremes						
		Exact (± 0.14)	Too warm in returned			Too cool in returned			Exact (± 0.14)	Too warm in returned			Too cool in returned		
			I	U	MW	I	U	MW		I	U	MW	I	U	MW
WYW2	Released	101 (113)	-	-	-	-	-	-	38 (69)	-	-	-	-	-	-
	MACD	102 (126)	2	11	1	7	11	0	40 (91)	8	12	4	18	18	7
	Climatol-D	104 (127)	1	13	0	3	12	2	48 (101)	4	9	1	16	23	4
	Climatol-M	101 (113)	14	8	0	11	12	0	40 (69)	24	14	0	30	21	0
	MASH	102 (129)	7	3	4	7	3	5	38 (87)	14	3	7	24	4	19
	ACMANT2	106 (140)	4	2	1	6	4	1	46 (121)	2	2	4	15	4	10
	DAP1	101 (113)	1	20	2	3	19	0	38 (70)	4	27	7	7	39	4
	HOM1	101 (113)	1	20	2	3	19	0	40 (73)	5	28	3	3	40	6
	SPLIDHOM1	101 (113)	1	20	2	3	19	0	38 (72)	6	28	3	5	40	4
WYW3	Released	114 (125)	-	-	-	-	-	-	51 (68)	-	-	-	-	-	-
	MACD	117 (131)	6	6	1	4	9	1	56 (89)	5	10	2	25	18	9
	Climatol-D	116 (132)	6	5	0	1	14	0	62 (100)	4	6	1	19	23	5
	Climatol-M	115 (138)	1	4	2	7	6	0	58 (99)	9	5	5	20	9	11
	MASH	101 (124)	3	4	5	9	4	9	49 (101)	11	3	8	24	0	11
	ACMANT2	121 (139)	6	3	0	2	5	3	58 (121)	4	4	2	13	3	11
	DAP1	114 (126)	2	11	0	17	2	0	51 (72)	10	25	1	7	39	4
	HOM1	114 (125)	2	12	0	1	18	0	52 (74)	8	26	3	4	39	4
	SPLIDHOM1	114 (126)	2	12	0	1	17	0	53 (73)	8	27	2	4	39	5

Table A.15. As in table 7, but for Wyoming scenarios 2 and 3.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
WYW2	87 (87)	71 (138)	376	547	0.188	0.115	0.470	0.145 (0.145)	39.7%	9.15%	86.0%	22.5%	0%	17.8%	23.1%	11.6%
	87 (87)	31 (31)	376	587	0.188	0.050	0.246	0.176 (0.176)	40.4%	8.83%	88.4%	20.7%	1.51%	22.0%	19.4%	10.5%
	148 (148)	100 (105)	315	518	0.320	0.162	0.528	0.261 (0.261)	54.1%	21.8%	90.7%	43.7%	6.06%	30.9%	37.1%	23.3%
	94 (94)	193 (214)	369	425	0.203	0.312	0.641	0.139 (0.139)	26.0%	17.7%	39.5%	29.3%	6.06%	22.5%	19.4%	17.4%
	16 (16)	92 (95)	447	526	0.035	0.149	0.230	0.029 (0.029)	6.16%	2.21%	9.30%	4.95%	0.51%	4.71%	2.69%	2.33%
WYW3	107 (109)	84 (146)	338	513	0.240	0.141	0.566	0.181 (0.184)	57.7%	9.09%	88.5%	22.8%	1.82%	19.3%	29.5%	NA
	106 (106)	18 (18)	339	579	0.238	0.030	0.274	0.229 (0.229)	60.6%	7.47%	88.5%	22.8%	1.21%	19.7%	28.5%	NA
	102 (102)	96 (101)	343	501	0.229	0.161	0.454	0.187 (0.187)	49.6%	11.0%	65.6%	25.6%	3.64%	18.5%	28.0%	NA
	105 (105)	202 (231)	340	394	0.236	0.339	0.752	0.155 (0.155)	36.5%	17.9%	36.1%	28.8%	12.1%	22.3%	25.1%	NA
	7 (7)	87 (93)	438	510	0.016	0.146	0.225	0.013 (0.013)	2.92%	0.97%	1.64%	2.74%	0%	2.10%	0.97%	NA

Table A.16. As in table 8, but for Wyoming scenarios 2 and 3.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
WYW2	114 (115)	52 (114)	349	555	0.246	0.086	0.470	0.198 (0.199)	47.9%	13.9%	90.7%	32.9%	1.01%	24.1%	28.5%	17.4%
	102 (102)	18 (18)	361	589	0.220	0.030	0.246	0.212 (0.212)	45.2%	11.4%	88.4%	27.0%	2.02%	24.6%	22.6%	15.1%
	201 (201)	51 (54)	262	556	0.434	0.084	0.528	0.389 (0.389)	65.1%	33.4%	97.7%	62.2%	10.6%	44.5%	47.8%	31.4%
	182 (182)	118 (129)	281	489	0.393	0.194	0.641	0.307 (0.307)	51.4%	33.8%	88.4%	54.5%	11.6%	40.3%	41.4%	32.6%
	48 (48)	60 (63)	415	547	0.104	0.099	0.230	0.091 (0.091)	19.9%	5.99%	39.5%	12.2%	2.02%	11.0%	11.83%	5.81%
WYW3	138 (140)	56 (117)	307	529	0.310	0.096	0.567	0.246 (0.248)	69.3%	14.0%	98.4%	34.2%	1.82%	26.5%	36.2%	NA
	118 (118)	9 (9)	327	576	0.265	0.014	0.274	0.260 (0.260)	65.0%	9.42%	91.8%	25.6%	3.64%	22.7%	30.9%	NA
	137 (137)	66 (68)	308	519	0.308	0.113	0.454	0.267 (0.267)	60.6%	17.5%	75.4%	37.4%	5.45%	26.1%	36.2%	NA
	202 (203)	116 (136)	243	468	0.454	0.199	0.753	0.347 (0.348)	70.8%	34.1%	80.3%	54.3%	20.6%	42.9%	48.3%	NA
	48 (48)	51 (54)	397	534	0.108	0.087	0.225	0.096 (0.096)	27.7%	3.25%	29.5%	13.2%	0.61%	9.66%	12.1%	NA

Table A.17. As in table 1, but for Wyoming scenario 4 and the South East scenario 1.

Scenario	Algorithm	Region bias	No. positively biased (mean bias)	No. negatively biased (mean bias)	No. non-biased (to measurement precision)	Sum absolute biases	Percentage recovery				PR best stats			PR worst stats			Best stats mean bias	Worst stats mean bias
							GI	I	U	MW	I	U	MW	I	U	MW		
WYW4	Released	0.041	34 (0.48)	39 (-0.34)	2 (12)	29.62	-	-	-	-	-	-	-	-	-	-	0.01	0.20
	MACD	0.043	50 (0.14)	25 (-0.15)	0 (15)	10.90	26	14 (6)	4 (0)	25	2	1	7	10	0	0	0.01	0.02
	Climatol-D	0	37 (0.14)	38 (-0.13)	0 (18)	10.33	23	10 (6)	21 (0)	15	1	4	5	10	0	0	0.01	0.05
	Climatol-M	0.021	37 (0.22)	38 (-0.18)	0 (22)	14.90	24	17 (7)	0 (0)	27	3	0	7	8	0	2	0.01	0.27
	MASH	0.022	38 (0.18)	37 (-0.14)	0 (26)	11.97	29	22 (4)	0 (0)	20	3	0	7	7	0	3	0.03	0.20
	ACMANT2	-0.044	28 (0.10)	47 (-0.13)	0 (24)	8.75	31	6 (9)	6 (0)	23	1	1	8	9	0	1	-0.06	-0.15
	DAP1	0.023	34 (0.43)	39 (-0.33)	2 (12)	27.74	0	18 (0)	53 (2)	2	0	10	0	4	6	0	0.01	0.12
	HOM1	0.025	34 (0.44)	39 (-0.34)	2 (12)	29.20	0	17 (0)	54 (2)	2	0	10	0	3	7	0	0.01	0.13
	SPLIDHOM1	0.026	34 (0.44)	39 (-0.33)	12 (2)	28.04	0	17 (0)	54 (2)	2	0	10	0	3	7	0	0.01	0.13
SEW1	Released	-0.078	64 (0.34)	86 (-0.39)	3 (44)	55.82	-	-	-	-	-	-	-	-	-	-	0	0.04
	Climatol-D	-0.040	47 (0.03)	103 (-0.08)	3 (105)	9.31	72	10 (9)	52 (3)	7	0	10	0	10	0	0	0	-0.04
	Climatol-M	-0.054	31 (0.12)	120 (-0.10)	2 (80)	15.77	64	19 (17)	23 (2)	28	0	5	5	10	0	0	-0.03	0.09
	MASH	-0.005	74 (0.09)	79 (-0.09)	0 (91)	13.49	77	28 (15)	0 (0)	33	3	0	7	10	0	0	0	0.16
	ACMANT2	-0.040	45 (0.06)	106 (-0.08)	2 (96)	11.37	75	20 (15)	13 (2)	28	0	4	6	10	0	0	-0.02	-0.02
	DAP1	-0.084	55 (0.20)	95 (-0.25)	3 (59)	34.60	25	45 (2)	65 (3)	13	0	10	0	10	0	0	0	0
	HOM1	-0.091	56 (0.23)	94 (-0.28)	3 (56)	39.32	21	43 (2)	69 (3)	15	0	10	0	8	1	1	0	-0.06
	SPLIDHOM1	-0.085	56 (0.19)	94 (-0.25)	3 (58)	34.73	25	45 (2)	65 (3)	13	0	10	0	10	0	0	0	-0.01

Table A.18. As in table 2, but for Wyoming scenario 4 and the South East scenario 1.

Scenario	Algorithm	Region RMSE	No. perfect RMSEs (to measurement precision)	Range of RMSEs in best stats	Range of RMSEs in worst stats	Percentage recovery				PR best stats			PR worst stats			PR value for region
						GI	I	MW	U	I	U	MW	I	U	MW	
WYW4	Released	0.785	2 (4)	(0, 0.14)	(1.20, 2.38)	-	-	-	-	-	-	-	-	-	-	-
	MACD	0.347	0 (2)	(0.03, 0.44)	(0.21, 0.64)	10	28	33	4 (0)	0	1	9	10	0	0	55.78
	Climatol-D	0.292	0 (1)	(0.09, 0.21)	(0.16, 0.29)	15	22	17	21 (0)	0	4	6	10	0	0	62.80
	Climatol-M	0.478	0 (0)	(0.12, 0.29)	(0.29, 1.76)	6	31	38	0 (0)	0	0	10	8	0	2	39.07
	MASH	0.415	0 (0)	(0.14, 0.40)	(0.27, 1.67)	4	40	31	0	0	0	10	8	0	2	47.18
	ACMANT2	0.301	0 (0)	(0.12, 0.37)	(0.17, 1.13)	16	35	18	6 (0)	0	1	9	10	0	0	61.67
	DAP1	0.762	2 (4)	(0, 0.14)	(1.20, 2.38)	0	16	4	53 (2)	0	10	0	4	6	0	2.96
	HOM1	0.767	2 (4)	(0, 0.14)	(1.20, 2.38)	0	13	6	54 (2)	0	10	0	3	7	0	2.28
	SPLIDHOM1	0.767	2 (4)	(0, 0.14)	(1.20, 2.38)	0	14	5	54 (2)	0	10	0	3	7	0	2.36
SEW1	Released	0.730	3 (18)	(0, 0.03)	(1.36, 3.06)	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	0.177	3 (27)	(0, 0.03)	(0.04, 0.23)	36	39	3	52 (3)	0	10	0	10	0	0	75.75
	Climatol-M	0.478	2 (14)	(0, 0.17)	(0.08, 1.52)	43	60	25	23 (2)	0	5	5	10	0	0	39.07
	MASH	0.256	0 (9)	(0.01, 0.12)	(0.10, 1.51)	48	64	41	0 (0)	0	0	10	10	0	0	64.95
	ACMANT2	0.215	2 (12)	(0, 0.09)	(0.11, 0.63)	43	74	21	13 (2)	0	4	6	10	0	0	70.47
	DAP1	0.525	3 (18)	(0, 0.03)	(0.57, 1.64)	9	65	11	65 (3)	0	10	0	10	0	0	28.11
	HOM1	0.699	3 (18)	(0, 0.03)	(0.57, 3.97)	8	59	14	69 (3)	0	10	0	8	1	1	4.21
	SPLIDHOM1	0.526	18 (3)	(0, 0.03)	(0.57, 1.65)	9	64	12	65 (3)	0	10	0	10	0	0	27.93

Table A.19. As in table 3, but for Wyoming scenario 4 and the South East scenario 1.

Scenario	Algorithm	Decadal trends (°C)		Positive trends		Negative trends		No. of signif. trends (pre-served)	Percentage recovery				PR best stats			PR worst stats			Regional average trend	PR for regional average trend
		Min	Max	No.	Mean	No.	Mean		GI	I	MW	U	I	MW	U	I	MW	U		
WYW4	Clean	-0.038	0.242	72	0.117	3	-0.025	2	-	-	-	-	-	-	-	-	-	-	0.110	-
	Released	-1.000	1.045	52	0.222	23	-0.238	28 (0)	-	-	-	-	-	-	-	-	-	-	0.079	-
	MAC	-0.096	0.305	69	0.110	6	-0.042	3 (0)	31	16 (6)	18	4 (0)	3	6	1	10	0	0	0.096	54.19
	Climatol-D	-0.092	0.303	69	0.121	6	-0.036	6 (0)	29	10 (8)	7	21 (0)	4	2	4	10	0	0	0.105	86.67
	Climatol-M	-0.081	0.303	69	0.116	6	-0.032	4 (0)	30	21 (7)	17	0 (0)	6	4	0	10	0	0	0.101	72.30
	MASH	-0.147	0.246	65	0.117	7	-0.069	2 (0)	28	23 (10)	14	0 (0)	4	0	6	10	0	0	0.093	47.33
	ACMANT2	-0.036	0.244	72	0.126	3	-0.025	1 (0)	41	16 (3)	15	0 (0)	4	6	0	10	0	0	0.118	127.96
	DAP1	-0.996	1.045	53	0.216	22	-0.230	25 (1)	0	17 (1)	2	53 (2)	0	10	0	4	6	0	0.088	31.02
	HOM1	-0.996	1.045	53	0.217	22	-0.218	25 (1)	0	17 (0)	2	54 (2)	0	10	0	3	7	0	0.087	26.86
	SPLIDHOM1	-0.996	1.045	52	0.219	23	-0.203	25 (1)	1	16 (0)	2	54 (2)	0	10	0	3	7	0	0.087	27.07
SEW1	Clean	-0.056	0.188	141	0.060	12	-0.032	4	-	-	-	-	-	-	-	-	-	-	0.052	-
	Released	-0.820	0.866	110	0.188	43	-0.166	68 (2)	-	-	-	-	-	-	-	-	-	-	0.087	-
	Climatol-D	-0.089	0.197	143	0.069	10	-0.025	9 (3)	70	12 (14)	2	52 (3)	0	0	10	10	0	0	0.062	70.79
	Climatol-M	-0.038	0.237	152	0.083	1	-0.038	18 (1)	65	18 (23)	22	23 (2)	0	5	5	10	0	0	0.081	18.29
	MASH	-0.040	0.217	137	0.063	16	-0.017	6 (3)	91	22 (12)	28	0 (0)	3	0	7	10	0	0	0.05	95.96
	ACMANT2	-0.062	0.273	152	0.070	1	-0.062	9 (1)	84	13 (21)	20	13 (2)	0	6	4	10	0	0	0.067	55.56
	DAP1	-0.369	0.838	123	0.121	30	-0.089	48 (2)	24	48 (3)	10	65 (3)	0	10	0	10	0	0	0.079	24.37
	HOM1	-0.372	0.825	124	0.129	24	-0.101	53 (2)	21	46 (2)	12	69 (3)	0	10	0	8	1	1	0.084	8.43
	SPLIDHOM1	-0.380	0.824	124	0.120	29	-0.092	49 (2)	24	47 (4)	10	65 (3)	0	10	0	10	0	0	0.078	24.94

Table A.20. As in table 4, but for Wyoming scenario 4 and the South East scenario 1.

Scenario	PR for inter-decadal smooths				PR for inter-decadal best			PR for inter-decadal worst			PR for inter-annual smooths				PR for inter-annual best			PR for inter-annual worst			Biggest correlation decrease (station ID)		Overall correlation for region	
	GI	I	MW	U	I	U	MW	I	U	MW	GI	I	MW	U	I	U	MW	I	U	MW	D	Y	D	Y
WYW4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.624	0.882
	22	21	28	4 (0)	2	1	7	7	0	3	22	30	19	4 (0)	1	1	8	10	0	0	0.310 (33)	0.052 (45)	0.888	0.973
	26	15	13	21 (0)	1	4	5	8	0	2	31	16	7	21 (0)	1	4	5	10	0	0	0.195 (29)	0 (23)	0.912	0.981
	26	24	25	0 (0)	4	0	6	7	0	3	29	30	16	0 (0)	4	0	6	10	0	0	0.423 (47)	0 (66)	0.904	0.973
	33	19	23	0 (0)	1	0	9	7	0	3	36	25	14	0 (0)	0	0	10	10	0	0	0.148 (28)	0.019 (45)	0.933	0.982
	37	15	23	0 (0)	3	0	7	6	0	4	39	18	18	0 (0)	1	0	9	9	0	1	0.558 (47)	0.063 (47)	0.932	0.980
	0	13	7	53 (2)	0	10	0	4	6	0	0	17	3	53 (2)	0	10	0	4	6	0	0.021 (30)	0.007 (30)	0.658	0.894
	0	11	8	54 (2)	0	10	0	2	7	1	0	16	3	54 (2)	0	10	0	3	7	0	0.020 (30)	0.007 (30)	0.651	0.891
	0	12	7	54 (2)	0	10	0	2	7	1	0	16	3	54 (2)	0	10	0	3	7	0	0.020 (30)	0.006 (30)	0.656	0.893
SEW1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.557	0.829
	78	18	2	52 (3)	0	10	0	10	0	0	87	9	2	52 (3)	0	10	0	10	0	0	0.001 (150)	0.017 (92)	0.943	0.989
	70	39	18	23 (2)	0	5	5	10	0	0	85	22	21	23 (2)	0	5	5	10	0	0	0.255 (140)	0.057 (129)	0.921	0.984
	76	46	31	0 (0)	2	0	8	10	0	0	97	23	33	0 (0)	0	0	10	10	0	0	0.190 (88)	0.068 (49)	0.958	0.991
	78	34	26	13 (2)	0	4	6	9	0	1	85	33	20	13 (2)	0	4	6	10	0	0	0.253 (88)	0.047 (88)	0.942	0.986
	19	55	11	65 (3)	0	10	0	9	0	1	30	48	7	65 (3)	0	10	0	10	0	0	0.192 (88)	0.143 (34)	0.729	0.921
	19	55	7	69 (3)	0	10	0	9	1	0	25	47	9	69 (3)	0	10	0	8	1	1	0.309 (86)	0.149 (88)	0.717	0.913
	20	56	9	65 (3)	0	10	0	10	0	0	31	47	7	65 (3)	0	10	0	10	0	0	1.412 (29)	0.524 (56)	0.728	0.921

Table A.21. As in table 5, but for Wyoming scenario 4 and the South East scenario 1.

Scenario	Algorithm	No. stats more variable than clean	No. stats less variable than clean	Variability increases			Variability decreases			Variability unchanged from released (because of perfection)	PR best stats			PR worst stats		
				GI	I	MW	GI	I	MW		I	U	MW	I	U	MW
WYW4	Released	55	18	-	-	-	-	-	-	-	-	-	-	-	-	-
	MACD	32	43	3	5	8	9	24	22	4 (0)	1	1	8	9	0	1
	Climatol-D	44	31	2	5	3	9	26	9	21 (0)	3	4	3	10	0	0
	Climatol-M	45	30	2	5	18	4	29	17	0 (0)	4	0	6	7	0	3
	MASH	36	39	0	1	25	6	19	24	0 (0)	1	0	9	8	0	2
	ACMANT2	45	30	0	7	9	8	29	16	6 (0)	1	1	8	10	0	0
	DAP1	51	22	0	0	11	2	3	4	55 (2)	0	10	0	0	6	4
	HOM	53	20	0	0	11	3	4	1	56 (2)	0	10	0	1	7	2
	SPLIDHOM1	54	19	0	0	11	3	3	2	56 (2)	0	10	0	1	7	2
SEW1	Released	114	36	-	-	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	97	53	2	5	11	33	38	9	55 (3)	0	10	0	10	0	0
	Climatol-M	101	50	6	6	40	14	42	20	25 (2)	1	5	4	8	0	2
	MASH	86	67	3	7	35	36	34	38	0 (0)	4	0	6	9	0	1
	ACMANT2	90	61	2	14	19	32	51	20	15 (2)	4	4	2	10	0	0
	DAP1	90	60	0	3	31	5	26	20	68 (3)	0	10	0	4	0	6
	HOM	87	63	1	1	30	6	22	21	72 (3)	0	10	0	4	1	5
	SPLIDHOM1	92	58	1	1	34	7	22	20	68 (3)	0	10	0	4	0	6

Table A.22. As in table 6, but for Wyoming scenario 4 and the South East scenario 1.

Scenario	Algorithm	Warm extremes							Cold extremes						
		Exact (± 0.14)	Too warm in returned			Too cool in returned			Exact (± 0.14)	Too warm in returned			Too cool in returned		
			I	U	MW	I	U	MW		I	U	MW	I	U	MW
WYW4	Released	56 (63)	-	-	-	-	-	-	11 (22)	-	-	-	-	-	-
	MACD	42 (55)	2	1	6	1	2	8	15 (31)	16	3	11	8	3	3
	Climatol-D	52 (59)	0	2	4	0	3	7	16 (36)	10	11	0	7	10	1
	Climatol-M	42 (48)	0	3	1	0	4	19	15 (33)	14	12	0	5	9	2
	MASH	14 (15)	0	1	2	2	0	55	16 (29)	21	3	6	6	1	9
	ACMANT2	46 (56)	0	3	0	1	4	11	10 (16)	8	7	2	7	7	3
	DAP1	56 (63)	0	6	0	0	6	0	11 (22)	2	25	2	1	21	2
	HOM1	56 (63)	0	6	0	0	6	0	11 (23)	1	25	1	0	22	3
	SPLIDHOM1	56 (63)	0	6	0	0	6	0	11 (24)	0	25	1	1	21	3
SEW1	Released	84 (101)	-	-	-	-	-	-	47 (67)	-	-	-	-	-	-
	Climatol-D	100 (134)	0	6	0	4	9	0	72 (107)	6	9	1	11	15	4
	Climatol-M	79 (126)	0	7	0	9	10	1	59 (95)	9	8	3	14	11	13
	MASH	84 (124)	8	3	1	9	3	5	48 (98)	11	5	4	11	7	17
	ACMANT2	97 (134)	4	3	0	6	5	1	60 (104)	8	5	5	11	5	15
	DAP1	87 (106)	2	15	0	5	22	3	50 (77)	12	14	2	17	26	5
	HOM1	86 (106)	2	17	0	2	23	3	52 (79)	12	15	1	14	26	6
	SPLIDHOM1	87 (108)	2	15	0	3	22	3	50 (74)	14	13	2	19	25	6

Table A.23. As in table 7, but for Wyoming scenario 4 and the South East scenario 1.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
WYW4	44 (46)	132 (293)	208	189	0.175	0.411	1.309	0.081 (0.084)	38.5%	8.05%	75.0%	15.9%	0%	11.7%	27.4%	10.9%
	40 (40)	22 (23)	212	299	0.159	0.070	0.243	0.145 (0.145)	38.5%	5.75%	65.6%	14.3%	1.06%	14.4%	18.9%	13.0%
	36 (36)	31 (31)	216	290	0.143	0.097	0.259	0.127 (0.127)	32.1%	6.32%	40.6%	17.5%	1.06%	12.6%	20.0%	6.52%
	39 (39)	79 (89)	213	241	0.155	0.247	0.498	0.114 (0.114)	29.5%	9.20%	50.0%	17.5%	1.06%	12.6%	18.9%	15.2%
	0 (0)	27 (27)	252	294	0	0.084	0.104	0 (0)	0%	0%	0%	0%	0%	0%	0%	0%
SEW1	101 (101)	40 (42)	262	470	0.278	0.078	0.379	0.249 (0.249)	63.5%	3.26%	95.6%	58.0%	3.04%	24.1%	47.1%	7.32%
	85 (85)	108 (117)	278	402	0.234	0.212	0.516	0.177 (0.177)	47.3%	6.98%	73.3%	43.2%	6.09%	19.1%	37.8%	11.0%
	72 (73)	198 (246)	291	311	0.198	0.389	0.849	0.118 (0.120)	29.7%	13.0%	40.0%	26.1%	13.5%	21.0%	20.2%	17.1%
	14 (14)	90 (92)	349	420	0.039	0.176	0.281	0.031 (0.031)	8.78%	0.47%	15.6%	5.68%	0.87%	4.32%	5.04%	1.22%

Table A.24. As in table 8, but for Wyoming scenario 4 and the South East scenario 1.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
WYW4	57 (64)	120 (155)	195	189	0.226	0.388	1.309	0.108 (0.120)	50.0%	10.3%	87.5%	23.0%	0%	17.1%	32.6%	15.2%
	51 (51)	11 (12)	201	298	0.202	0.032	0.243	0.194 (0.194)	51.3%	6.32%	84.4%	18.3%	1.06%	19.8%	23.2%	15.2%
	45 (45)	23 (23)	207	286	0.179	0.074	0.259	0.164 (0.164)	39.7%	8.05%	50.0%	21.4%	2.13%	16.2%	24.2%	8.70%
	68 (68)	56 (60)	184	252	0.270	0.182	0.498	0.221 (0.221)	52.6%	15.5%	71.9%	34.1%	2.13%	22.5%	34.7%	21.7%
	12 (12)	15 (15)	240	294	0.048	0.049	0.104	0.045 (0.045)	11.5%	1.74%	18.8%	4.76%	0%	4.50%	4.21%	6.52%
SEW1	120 (120)	26 (27)	143	471	0.331	0.052	0.379	0.321 (0.321)	68.2%	8.84%	100%	65.9%	7.39%	30.9%	50.4%	12.2%
	124 (124)	79 (82)	239	418	0.342	0.159	0.536	0.279 (0.279)	56.8%	18.6%	86.7%	59.1%	14.3%	33.3%	43.7%	22.0%
	155 (158)	136 (164)	208	359	0.427	0.275	0.849	0.294 (0.298)	64.9%	27.4%	82.2%	68.2%	25.2%	43.2%	49.6%	31.7%
	55 (55)	52 (53)	308	445	0.152	0.105	0.281	0.132 (0.132)	29.1%	5.58%	44.4%	29.5%	3.91%	13.6%	20.2%	11.0%

Table A.25. As in table 1, but for the South East scenarios 2 and 3.

Scen.	Algorithm	Region bias	No. positively biased (mean bias)	No. negatively biased (mean bias)	No. non-biased (to measurement precision)	Sum absolute biases	Percentage recovery				PR best stats			PR worst stats			Best stats mean bias	Worst stats mean bias
							GI	I	U	MW	I	U	MW	I	U	MW		
SEW2	Released	-0.024	88 (0.28)	111 (-0.27)	11 (67)	54.08	-	-	-	-	-	-	-	-	-	-	0	0.33
	Climatol-D	-0.025	55 (0.03)	141 (-0.05)	14 (156)	8.61	96	13 (13)	72 (11)	5	0	10	0	10	0	0	0	-0.04
	Climatol-M	-0.033	54 (0.05)	149 (-0.06)	7 (151)	12.20	97	18 (20)	47 (7)	21	0	7	3	9	0	1	-0.01	-0.18
	MASH	-0.028	77 (0.04)	133 (-0.07)	0 (155)	12.01	103	38 (18)	0 (0)	51	0	0	10	9	0	1	0	-0.14
	ACMANT2	-0.024	67 (0.03)	134 (-0.05)	9 (148)	8.91	109	26 (22)	22 (9)	22	0	8	2	10	0	0	-0.01	-0.03
	DAP1	-0.018	82 (0.15)	117 (-0.14)	11 (89)	27.96	34	62 (7)	80 (11)	16	0	10	0	9	1	0	0	0.13
	HOM1	-0.019	82 (0.15)	117 (-0.14)	11 (89)	28.46	35	61 (6)	81 (11)	16	0	10	0	9	1	0	0	0.15
	SPLIDHOM1	-0.017	84 (0.145)	115 (-0.137)	89 (11)	27.93	36	62 (5)	80 (11)	16	0	10	0	9	1	0	0	0.14
SEW3	Released	0.013	104 (0.34)	98 (-0.33)	8 (80)	68.33	-	-	-	-	-	-	-	-	-	-	0	0.25
	Climatol-D	0.006	98 (0.03)	100 (-0.02)	12 (180)	5.62	113	7 (6)	71 (8)	5	0	10	0	10	0	0	0	0.01
	Climatol-M	0.012	101 (0.07)	104 (-0.05)	5 (174)	12.14	114	14 (8)	45 (5)	24	1	5	4	8	0	2	-0.01	0.38
	MASH	0.012	117 (0.06)	93 (-0.05)	0 (161)	12.51	115	24 (13)	0 (0)	58	0	0	10	9	0	1	0	0.14
	ACMANT2	0.005	101 (0.04)	104 (-0.03)	5 (160)	7.64	118	15 (11)	31 (5)	30	0	6	4	10	0	0	-0.02	0.07
	DAP1	-0.005	102 (0.15)	102 (-0.16)	6 (103)	30.78	48	64 (9)	69 (6)	14	0	9	1	10	0	0	0	0.08
	HOM1	-0.007	102 (0.16)	102 (-0.17)	6 (106)	34.08	47	55 (5)	80 (6)	17	0	9	1	10	0	0	0	0.07
	SPLIDHOM1	-0.005	103 (0.14)	101 (-0.16)	6 (103)	30.84	48	62 (9)	69 (6)	16	0	9	1	10	0	0	0	0.17

Table A.26. As in table 2, but for the South East scenarios 2 and 3.

Scenario	Algorithm	Region RMSE	No. perfect RMSEs (to measurement precision)	Range of RMSEs in best stats	Range of RMSEs in worst stats	Percentage recovery				PR best stats			PR worst stats			PR value for region
						GI	I	MW	U	I	U	MW	I	U	MW	
SEW2	Released	0.552	11 (37)	(0, 0)	(1.28, 2.21)	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	0.118	14 (58)	(0, 0)	(0.02, 0.24)	70	55	2	72 (11)	0	10	0	10	0	0	78.55
	Climatol-M	0.185	7 (45)	(0, 0.07)	(0.04, 1.51)	62	77	17	47 (7)	0	7	3	10	0	0	66.57
	MASH	0.181	0 (28)	(0, 0.07)	(0.04, 1.42)	54	97	59	0 (0)	0	0	10	9	0	1	67.17
	ACMANT2	0.138	9 (40)	(0, 0.08)	(0.05, 0.37)	59	98	22	22 (9)	0	8	2	10	0	0	74.99
	DAP1	0.352	11 (37)	(0, 0)	(0.16, 1.42)	9	97	13	80 (11)	0	10	0	9	1	0	36.31
	HOM1	0.364	11 (37)	(0, 0)	(0.17, 1.42)	8	97	13	81 (11)	0	10	0	9	1	0	34.21
	SPLIDHOM1	0.351	11 (37)	(0, 0)	(0.16, 1.42)	9	98	12	80 (11)	0	10	0	9	1	0	36.49
SEW3	Released	0.643	8 (37)	(0, 0.02)	(1.25, 2.37)	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	0.121	12 (67)	(0, 0.02)	(0.05, 0.20)	95	32	4	71 (8)	0	10	0	10	0	0	81.14
	Climatol-M	0.271	5 (49)	(0, 0.08)	(0.05, 2.87)	87	51	22	45 (5)	0	5	5	8	0	2	57.78
	MASH	0.221	0 (18)	(0.02, 0.13)	(0.12, 1.73)	77	64	69	0 (0)	0	0	10	9	0	1	65.64
	ACMANT2	0.156	5 (48)	(0, 0.16)	(0.12, 0.77)	75	70	29	31 (5)	0	6	4	10	0	0	75.71
	DAP1	0.411	6 (38)	(0, 0.02)	(0.24, 1.63)	17	104	14	69 (6)	0	9	1	10	0	0	35.97
	HOM1	0.459	6 (37)	(0, 0.02)	(0.19, 2.13)	13	95	16	80 (6)	0	9	1	9	0	1	28.36
	SPLIDHOM1	0.410	6 (38)	(0, 0.02)	(0.23, 1.63)	18	104	13	69 (6)	0	9	1	10	0	0	36.20

Table A.27. As in table 3, but for the South East scenarios 2 and 3.

Scenario	Algorithm	Decadal trends (°C)		Positive trends		Negative trends		No. of signif. trends (pre-served)	Percentage recovery				PR best stats			PR worst stats			Regional average trend	PR for regional average trend
		Min	Max	No.	Mean	No.	Mean		GI	I	MW	U	I	MW	U	I	MW	U		
SEW2	Clean	-0.060	0.201	196	0.056	14	-0.017	4	-	-	-	-	-	-	-	-	-	-	0.051	-
	Released	-0.975	0.722	142	0.157	68	-0.163	91 (1)	-	-	-	-	-	-	-	-	-	-	0.051	-
	Climatol-D	-0.056	0.174	197	0.065	13	-0.017	9 (3)	105	7 (10)	5	72 (11)	0	0	10	10	0	0	0.060	6623.36
	Climatol-M	-0.041	0.206	204	0.068	6	-0.022	9 (3)	105	12 (15)	24	47 (7)	0	3	7	10	0	0	0.065	10618.51
	MASH	-0.031	0.264	203	0.062	7	-0.011	10 (3)	121	33 (17)	39	0 (0)	0	10	0	10	0	0	0.059	5792.2
	ACMANT2	-0.038	0.281	201	0.064	9	-0.013	6 (3)	119	20 (17)	23	22 (9)	0	2	8	10	0	0	0.061	7227.60
	DAP1	-0.435	0.547	155	0.096	55	-0.076	55 (2)	38	63 (5)	14	79 (11)	0	0	10	9	0	1	0.049	-851.33
	HOM1	-0.446	0.547	157	0.094	53	-0.080	56 (2)	38	63 (5)	13	80 (11)	0	0	10	9	0	1	0.049	-884.09
	SPLIDHOM1	-0.433	0.547	155	0.095	55	-0.078	56 (2)	38	63 (5)	14	79 (11)	0	0	10	9	0	1	0.049	-1148.76
SEW3	Clean	-0.067	0.198	189	0.060	21	-0.016	3	-	-	-	-	-	-	-	-	-	-	0.052	-
	Released	-0.676	0.729	127	0.170	83	-0.184	91 (1)	-	-	-	-	-	-	-	-	-	-	0.031	-
	Climatol-D	-0.103	0.200	184	0.058	26	-0.025	4 (3)	112	5 (6)	7	71 (8)	0	0	10	10	0	0	0.048	80.72
	Climatol-M	-0.628	0.313	201	0.058	9	-0.024	5 (3)	116	10 (10)	24	45 (5)	0	5	5	10	0	0	0.054	108.80
	MASH	-0.259	0.178	187	0.055	23	-0.029	5 (3)	120	18 (11)	61	0 (0)	0	10	0	10	0	0	0.047	74.74
	ACMANT2	-0.151	0.216	198	0.055	12	-0.025	2 (2)	122	13 (7)	32	31 (5)	0	4	6	10	0	0	0.051	96.41
	DAP1	-0.558	0.454	149	0.101	61	-0.087	51 (2)	47	65 (5)	18	69 (6)	0	1	9	10	0	0	0.047	74.99
	HOM	-0.581	0.481	148	0.106	62	-0.097	53 (2)	42	60 (8)	14	80 (6)	0	1	9	10	0	0	0.048	78.34
	SPLIDHOM1	-0.520	0.454	148	0.102	62	-0.085	50 (2)	45	64 (6)	20	69 (6)	0	1	9	10	0	0	0.047	75.97

Table A.28. As in table 4, but for the South East scenarios 2 and 3.

Scenario	PR for inter-decadal smooths				PR for inter-decadal best			PR for inter-decadal worst			PR for inter-annual smooths				PR for inter-annual best			PR for inter-annual worst			Biggest correlation decrease (station ID)		Overall correlation for region	
	GI	I	MW	U	I	U	MW	I	U	MW	GI	I	MW	U	I	U	MW	I	U	MW	D	Y	D	Y
SEW2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.568	0.849
	97	23	7	72 (11)	0	10	0	9	0	1	115	11	1	72 (11)	0	10	0	10	0	0	0.087 (170)	0 (207)	0.962	0.994
	100	34	18	47 (7)	0	7	3	10	0	0	121	21	14	47 (7)	0	7	3	10	0	0	0.056 (138)	0.013 (126)	0.962	0.993
	121	44	45	0 (0)	0	0	10	9	0	1	132	36	42	0 (0)	0	0	10	10	0	0	0.242 (149)	0.029 (149)	0.971	0.993
	106	43	30	22 (9)	0	8	2	9	0	1	122	35	22	22 (9)	0	8	2	10	0	0	0.178 (88)	0.036 (149)	0.957	0.990
	32	73	15	79 (11)	0	10	0	9	1	0	39	73	8	79 (11)	0	10	0	9	1	0	191 (0.195)	104 (0.100)	0.773	0.948
	33	71	15	80 (11)	0	10	0	9	1	0	38	73	8	80 (11)	0	10	0	9	1	0	170 (0.290)	104 (0.054)	0.765	0.945
	34	71	15	79 (11)	0	10	0	9	1	0	40	72	8	79 (11)	0	10	0	9	1	0	170 (0.218)	104 (0.058)	0.772	0.948
SEW3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.439	0.811
	105	23	3	71 (8)	0	10	0	10	0	0	122	6	3	71 (8)	0	10	0	10	0	0	0.010 (82)	0.002 (54)	0.963	0.993
	117	25	15	45 (5)	0	5	5	9	0	1	126	19	15	45 (5)	0	5	5	10	0	0	0.179 (60)	0.022 (153)	0.965	0.992
	119	50	41	0 (0)	0	0	10	9	0	1	127	35	48	0 (0)	0	0	10	10	0	0	0.239 (149)	0.025 (149)	0.961	0.992
	114	29	31	31 (5)	0	6	4	6	0	4	121	30	23	31 (5)	0	6	4	10	0	0	0.374 (76)	0.022 (170)	0.955	0.988
	45	77	13	69 (6)	0	9	1	9	1	0	55	72	8	69 (6)	0	1	9	10	0	0	176 (0.385)	42 (0.053)	0.719	0.932
	42	69	13	80 (6)	0	9	1	8	0	2	47	64	10	80 (6)	0	9	1	10	0	0	176 (0.408)	135 (0.050)	0.686	0.920
	45	76	14	69 (6)	0	9	1	9	0	1	54	71	10	69 (6)	0	9	1	10	0	0	176 (0.376)	135 (0.051)	0.718	0.932

Table A.29. As in table 5, but for the South East scenarios 2 and 3.

Scenario	Algorithm	No. stats more variable than clean	No. stats less variable than clean	Variability increases			Variability decreases			Variability unchanged from released (because of perfection)	PR best stats			PR worst stats		
				GI	I	MW	GI	I	MW		I	U	MW	I	U	MW
SEW2	Released	160	39	-	-	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	135	61	3	7	15	46	45	11	83 (11)	0	10	0	10	0	0
	Climatol-M	141	62	2	9	43	35	49	18	54 (7)	0	7	3	7	0	3
	MASH	125	85	1	11	65	24	61	48	0 (0)	0	0	10	8	0	2
	ACMANT2	133	68	1	9	37	38	67	27	31 (9)	0	8	2	9	0	1
	DAP1	133	66	1	1	54	7	23	33	91 (11)	0	10	0	2	1	7
	HOM	135	64	1	4	53	5	25	30	92 (11)	0	10	0	1	1	8
	SPLIDHOM1	130	69	1	2	53	4	26	33	91 (11)	0	10	0	2	1	7
SEW3	Released	157	45	-	-	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	116	82	2	4	8	53	50	14	79 (8)	0	10	0	10	0	0
	Climatol-M	114	91	1	6	21	33	67	32	50 (5)	1	5	4	7	0	3
	MASH	127	83	2	9	59	33	61	46	0 (0)	0	0	10	7	0	3
	ACMANT2	121	84	1	9	24	40	70	30	36 (5)	1	6	3	9	0	1
	DAP1	126	78	1	0	56	8	33	37	75 (6)	0	3	7	5	0	5
	HOM	129	75	0	2	60	8	20	34	86 (6)	0	9	1	1	0	9
	SPLIDHOM1	126	78	1	1	56	9	32	36	75 (6)	0	3	7	4	0	6

Table A.30. As in table 6, but for the South East scenarios 2 and 3.

Scenario	Algorithm	Warm extremes							Cold extremes						
		Exact (± 0.14)	Too warm in returned			Too cool in returned			Exact (± 0.14)	Too warm in returned			Too cool in returned		
			I	U	MW	I	U	MW		I	U	MW	I	U	MW
SEW2	Released	132 (150)	-	-	-	-	-	-	70 (95)	-	-	-	-	-	-
	Climatol-D	146 (184)	1	8	0	3	13	1	92 (145)	5	15	3	17	19	6
	Climatol-M	146 (183)	3	6	1	4	8	5	83 (145)	7	14	3	20	14	7
	MASH	142 (183)	3	6	3	5	4	6	76 (127)	9	13	10	30	6	15
	ACMANT2	153 (186)	5	2	2	7	3	5	89 (139)	7	9	8	27	7	13
	DAP1	137 (165)	4	17	1	2	21	0	84 (118)	15	15	4	24	30	4
	HOM1	137 (162)	6	16	1	3	22	0	74 (113)	14	18	5	24	31	5
	SPLIDHOM1	139 (165)	3	16	2	3	21	0	80 (119)	15	15	5	22	28	6
SEW3	Released	141 (154)	-	-	-	-	-	-	88 (106)	-	-	-	-	-	-
	Climatol-D	167 (197)	2	5	1	1	4	0	114 (163)	8	10	1	15	13	0
	Climatol-M	163 (191)	1	6	2	2	4	4	101 (149)	14	10	4	19	12	2
	MASH	137 (187)	3	2	3	8	1	6	86 (136)	21	4	8	22	9	10
	ACMANT2	159 (199)	2	2	3	1	1	2	100 (155)	8	9	8	17	7	6
	DAP1	155 (173)	7	13	1	3	13	0	93 (130)	22	15	3	15	20	5
	HOM1	147 (169)	5	17	0	3	16	0	93 (127)	19	17	3	18	19	7
	SPLIDHOM1	149 (172)	7	13	1	5	12	0	91 (126)	24	13	3	15	19	10

Table A.31. As in table 7, but for the South East scenarios 2 and 3.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
SEW2	135 (135)	37 (442)	310	611	0.303	0.057	0.376	0.277 (0.277)	62.5%	7.66%	97.9%	64.7%	4.30%	31.3%	44.2%	12.2%
	111 (111)	126 (136)	334	533	0.249	0.194	0.528	0.191 (0.191)	49.5%	7.66%	76.6%	47.9%	6.45%	24.5%	34.1%	14.8%
	97 (97)	240 (292)	348	408	0.218	0.370	0.835	0.132 (0.132)	33.7%	21.7%	40.4%	43.7%	9.32%	18.8%	26.8%	20.9%
	31 (31)	117 (123)	414	531	0.070	0.181	0.328	0.055 (0.055)	12.5%	3.07%	10.6%	20.2%	0.72%	4.17%	12.3%	5.22%
SEW3	155 (155)	29 (33)	288	620	0.350	0.045	0.424	0.326 (0.326)	77.2%	1.22%	98.2%	71.3%	1.59%	29.6%	43.4%	NA
	116 (116)	115 (120)	327	534	0.262	0.177	0.533	0.206 (0.206)	53.3%	4.47%	67.3%	48.5%	5.16%	24.1%	29.5%	NA
	95 (96)	238 (277)	348	410	0.214	0.367	0.844	0.132 (0.133)	36.5%	9.35%	30.9%	34.6%	12.3%	18.9%	25.4%	NA
	36 (36)	127 (133)	407	520	0.081	0.196	0.386	0.063 (0.063)	16.8%	1.22%	16.4%	16.9%	1.59%	6.67%	6.59%	NA

Table A.32. As in table 8, but for the South East scenarios 2 and 3.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
SEW2	151 (151)	25 (30)	294	614	0.339	0.039	0.376	0.331 (0.331)	66.8%	10.7%	100%	72.3%	6.45%	33.3%	47.1%	19.1%
	153 (153)	91 (98)	292	547	0.344	0.143	0.528	0.282 (0.282)	59.8%	16.5%	89.4%	63.0%	12.9%	34.9%	41.3%	25.2%
	186 (188)	168 (207)	259	471	0.418	0.263	0.835	0.285 (0.287)	63.6%	26.4%	85.1%	76.5%	19.7%	41.1%	47.8%	35.7%
	80 (80)	74 (77)	365	565	0.180	0.116	0.328	0.153 (0.153)	32.6%	7.66%	42.6%	40.3%	4.30%	17.7%	23.9%	11.3%
SEW3	169 (169)	16 (20)	274	624	0.381	0.025	0.424	0.372 (0.372)	82.7%	2.44%	98.2%	78.7%	3.17%	33.0%	46.2%	NA
	166 (166)	70 (71)	277	570	0.375	0.109	0.533	0.323 (0.323)	73.1%	8.94%	89.1%	67.6%	9.92%	33.3%	43.9%	NA
	207 (210)	143 (166)	236	496	0.467	0.224	0.844	0.340 (0.343)	79.7%	20.3%	78.2%	75.7%	24.2%	40.7%	56.1%	NA
	88 (87)	77 (81)	355	560	0.199	0.122	0.386	0.168 (0.168)	41.1%	2.85%	45.6%	38.2%	4.37%	16.3%	25.4%	NA

Table A.33. As in table 1, but for the North East scenarios 1 and 2.

Scenario	Algorithm	Region bias	No. positively biased (mean bias)	No. negatively biased (mean bias)	No. non-biased (to measurement precision)	Sum absolute biases	Percentage recovery				PR best stats			PR worst stats			Best stats mean bias	Worst stats mean bias
							GI	I	U	MW	I	U	MW	I	U	MW		
NEW1	Released	-0.097	58 (0.33)	85 (-0.40)	3 (25)	53.47	-	-	-	-	-	-	-	-	-	-	0	0.27
	Climatol-D	-0.042	51 (0.05)	90 (-0.10)	5 (88)	11.37	73	7 (7)	50 (3)	6	0	10	0	10	0	0	0	0
	Climatol-M	-0.032	57 (0.05)	86 (-0.09)	3 (87)	10.65	83	11 (7)	30 (3)	12	1	9	0	10	0	0	0	0.03
	MASH	-0.055	56 (0.04)	100 (-0.10)	0 (69)	11.52	81	28 (11)	0 (0)	26	2	0	8	10	0	0	0	-0.03
	ACMANT2	-0.051	36 (0.04)	108 (-0.08)	2 (77)	10.15	77	24 (8)	19 (2)	16	1	7	2	10	0	0	0	-0.02
	DAP1	-0.070	58 (0.23)	86 (-0.27)	2 (35)	36.89	13	62 (0)	54 (2)	15	0	8	2	10	0	0	-0.01	0.12
	HOM1	-0.097	58 (0.23)	86 (-0.27)	2 (35)	36.96	15	61 (0)	55 (2)	13	0	8	2	10	0	0	0	0.10
	SPLIDHOM1	-0.097	58 (0.23)	86 (-0.27)	2 (36)	36.96	14	61 (0)	55 (2)	14	0	8	2	10	0	0	-0.01	0.13
NEW2	Released	-0.075	83 (0.29)	118 (-0.34)	6 (39)	64.68	-	-	-	-	-	-	-	-	-	-	0	-0.20
	Climatol-D	-0.025	79 (0.06)	122 (-0.08)	6 (112)	14.51	91	14 (6)	73 (6)	17	0	10	0	10	0	0	0	-0.10
	Climatol-M	-0.026	69 (0.03)	132 (-0.06)	6 (148)	10.00	117	17 (12)	34 (6)	21	0	9	1	10	0	0	0	-0.02
	MASH	-0.040	78 (0.03)	129 (-0.08)	0 (128)	13.34	101	50 (17)	0 (0)	39	1	0	9	10	0	0	0	-0.06
	ACMANT2	-0.037	46 (0.04)	160 (0.06)	1 (124)	11.46	102	36 (20)	18 (1)	30	0	2	8	10	0	0	-0.03	0.02

Table A.34. As in table 2, but for the North East scenarios 1 and 2.

Scenario	Algorithm	Region RMSE	No. perfect RMSEs (to measurement precision)	Range of RMSEs in best stats	Range of RMSEs in worst stats	Percentage recovery				PR best stats			PR worst stats			PR value for region
						GI	I	MW	U	I	U	MW	I	U	MW	
NEW1	Released	0.694	3 (9)	(0,0.06)	(1.42, 1.80)	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	0.191	5 (18)	(0, 0.06)	(0.06, 0.39)	51	38	2	50 (5)	0	10	0	10	0	0	72.37
	Climatol-M	0.184	3 (16)	(0, 0.06)	(0.09, 0.33)	61	49	3	30 (3)	1	9	0	10	0	0	73.50
	MASH	0.187	0 (3)	(0.03, 0.18)	(0.09, 0.31)	51	71	24	0 (0)	1	0	9	10	0	0	73.11
	ACMANT2	0.174	2 (13)	(0, 0.16)	(0.08, 0.42)	56	61	8	19 (2)	1	7	2	10	0	0	75.99
	DAP1	0.535	2 (9)	(0, 0.08)	(0.18, 1.50)	7	69	14	54 (2)	0	8	2	10	0	0	23.03
	HOM1	0.536	2 (9)	(0, 0.08)	(0.17, 1.49)	7	69	13	55 (2)	0	8	2	10	0	0	22.76
	SPLIDHOM1	0.536	2 (9)	(0, 0.08)	(0.17, 1.50)	7	68	14	55 (2)	0	8	2	10	0	0	22.90
NEW2	Released	0.631	6 (13)	(0, 0.03)	(1.32, 2.40)	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	0.179	6 (20)	(0, 0.03)	(0.03, 0.52)	67	57	4	73 (6)	0	10	0	10	0	0	71.64
	Climatol-M	0.155	6 (16)	(0, 0.13)	(0.04, 0.18)	71	89	7	34 (6)	0	9	1	10	0	0	75.36
	MASH	0.215	0 (5)	(0, 0.13)	(0.08, 0.57)	53	121	33	0 (0)	0	0	10	10	0	0	65.88
	ACMANT2	0.164	1 (13)	(0, 0.10)	(0.09, 0.31)	66	103	19	18 (1)	0	2	8	10	0	0	74.02

Table A.35. As in table 3, but for the North East scenarios 1 and 2.

Scenario	Algorithm	Decadal trends (°C)		Positive trends		Negative trends		No. of signif. trends (pre-served)	Percentage recovery				PR best stats			PR worst stats			Regional average trend	PR for regional average trend
		Min	Max	No.	Mean	No.	Mean		GI	I	MW	U	I	MW	U	I	MW	U		
NEW1	Clean	-0.088	0.366	145	0.245	1	-0.088	142	-	-	-	-	-	-	-	-	-	-	0.245	-
	Released	-0.655	-0.927	128	0.334	18	-0.239	120 (38)	-	-	-	-	-	-	-	-	-	-	0.264	-
	Climatol-D	-0.037	-0.421	145	0.246	1	-0.037	141 (114)	79	6 (7)	1	50 (3)	0	0	10	10	0	0	0.255	47.67
	Climatol-M	-0.037	0.446	145	0.246	1	-0.037	140 (128)	97	4 (9)	3	30 (3)	1	0	9	10	0	0	0.246	95.46
	MASH	-0.043	0.401	145	0.260	1	-0.043	142 (121)	89	27 (11)	19	0 (0)	3	7	0	10	0	0	0.260	22.55
	ACMANT2	-0.162	0.387	146	0.245	0	-	144 (130)	96	10 (12)	7	19 (2)	1	2	7	10	0	0	0.259	31.09
	DAP1	-0.405	0.690	135	0.289	11	-0.133	119 (56)	18	57 (3)	12	54 (2)	0	2	8	10	0	0	0.257	40.71
	HOM1	-0.405	0.708	135	0.288	11	-0.137	119 (57)	19	57 (3)	10	55 (2)	0	2	8	10	0	0	0.257	37.95
	SPLIDHOM1	-0.405	0.747	135	0.287	11	-0.137	119 (55)	19	54 (3)	13	55 (2)	0	2	8	10	0	0	0.256	41.85
NEW2	Clean	0.086	0.371	207	0.238	0	-	202	-	-	-	-	-	-	-	-	-	-	0.239	-
	Released	-0.466	1.268	188	0.317	19	-0.180	166 (74)	-	-	-	-	-	-	-	-	-	-	0.272	-
	Climatol-D	0.048	0.388	207	0.245	0	-	201 (167)	99	10 (12)	7	73 (6)	0	0	10	10	0	0	0.245	80.38
	Climatol-M	0.032	0.394	207	0.245	0	-	203 (197)	127	8 (18)	14	34 (6)	0	1	9	10	0	0	0.246	79.07
	MASH	0.079	0.412	207	0.248	0	-	205 (191)	124	37 (16)	30	0 (0)	1	9	0	10	0	0	0.249	70.47
	ACMANT2	0.138	0.385	207	0.255	0	-	206 (191)	119	27 (15)	27	18 (1)	0	8	2	10	0	0	0.255	52.69

Table A.36. As in table 4, but for the North East scenarios 1 and 2.

Scenario	PR for inter-decadal smooths				PR for inter-decadal best			PR for inter-decadal worst			PR for inter-annual smooths				PR for inter-annual best			PR for inter-annual worst			Biggest correlation decrease (station ID)		Overall correlation for region	
	GI	I	MW	U	I	U	MW	I	U	MW	GI	I	MW	U	I	U	MW	I	U	MW	D	Y	D	Y
NEW1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.706	0.876
	54	31	6	50 (5)	0	10	0	10	0	0	79	14	0	50 (3)	0	10	0	10	0	0	0.063 (111)	NA	0.978	0.991
	80	24	9	30 (3)	1	9	0	9	0	1	91	21	1	30 (3)	1	9	0	10	0	0	0.066 (139)	0.001 (126)	0.987	0.993
	84	25	16	19 (2)	1	7	2	9	0	1	94	25	6	19 (2)	1	7	2	10	0	0	0.115 (56)	0.013 (110)	0.990	0.995
	79	44	23	0 (0)	2	0	8	10	0	0	96	36	14	0 (0)	2	0	8	10	0	0	0.032 (106)	0.013 (41)	0.989	0.994
	14	64	12	54 (2)	0	8	2	10	0	0	18	64	8	54 (2)	0	8	2	10	0	0	1.265 (101)	0.322 (101)	0.823	0.926
	13	64	12	55 (2)	0	8	2	10	0	0	19	62	8	55 (2)	0	8	2	10	0	0	1.268 (101)	0.333 (101)	0.821	0.935
	14	64	11	55 (2)	0	8	2	10	0	0	18	62	9	55 (2)	0	8	2	10	0	0	1.266 (101)	0.326 (101)	0.821	0.935
NEW2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.764	0.899
	85	30	13	73 (6)	0	10	0	8	0	2	106	21	1	73 (6)	0	10	0	10	0	0	0.401 (109)	0 (91)	0.977	0.992
	118	36	13	34 (6)	0	9	1	9	0	1	136	27	4	34 (6)	0	9	1	10	0	0	0.038 (175)	0.004 (111)	0.990	0.995
	123	53	31	0 (0)	0	0	10	9	0	1	144	37	26	0 (0)	0	0	10	10	0	0	0.098 (199)	0.012 (56)	0.991	0.995
	133	30	25	18 (1)	1	2	7	9	0	1	133	35	20	18 (1)	0	2	8	10	0	0	0.070 (126)	0.024 (145)	0.990	0.995

Table A.37. As in table 5, but for the North East scenarios 1 and 2.

Scenario	Algorithm	No. stats more variable than clean	No. stats less variable than clean	Variability increases			Variability decreases			Variability unchanged (because of perfection)	PR best stats			PR worst stats		
				GI	I	MW	GI	I	MW		I	U	MW	I	U	MW
NEW1	Released	91	52	-	-	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	69	72	2	14	8	24	27	18	53 (3)	0	10	0	7	0	3
	Climatol-M	67	76	5	19	16	23	24	26	33 (3)	0	9	1	7	0	3
	MASH	95	51	5	20	51	19	28	23	0 (0)	0	0	10	7	0	3
	ACMANT2	76	68	2	18	19	29	30	27	21 (2)	0	7	3	7	0	3
	DAP1	80	64	0	14	33	5	9	29	56 (2)	0	8	2	3	0	7
	HOM1	84	60	2	11	30	3	15	28	57	0	8	2	3	0	7
	SPLIDHOM1	81	63	1	13	32	2	13	28	57	0	8	2	4	0	6
NEW2	Released	116	85	-	-	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	95	106	3	24	16	28	32	25	79 (6)	0	10	0	9	0	1
	Climatol-M	84	117	12	23	19	30	35	48	40 (6)	1	9	0	6	0	4
	MASH	110	97	17	27	50	34	44	35	0 (0)	1	0	9	7	0	3
	ACMANT2	100	106	3	26	38	21	44	56	19	0	1	9	7	0	3

Table A.38. As in table 6, but for the North East scenarios 1 and 2.

Scenario	Algorithm	Warm extremes							Cold extremes						
		Exact (± 0.14)	Too warm in returned			Too cool in returned			Exact (± 0.14)	Too warm in returned			Too cool in returned		
			I	U	MW	I	U	MW		I	U	MW	I	U	MW
NEW1	Released	68 (80)	-	-	-	-	-	-	38 (56)	-	-	-	-	-	-
	Climatol-D	77 (101)	5	7	1	10	20	2	63 (104)	3	6	1	13	18	1
	Climatol-M	84 (113)	4	7	2	10	8	2	64 (116)	4	4	1	10	10	1
	MASH	75 (114)	6	1	2	16	4	3	52 (100)	3	1	3	23	9	7
	ACMANT2	77 (116)	6	2	0	12	7	3	58 (117)	3	1	1	12	8	4
	DAP1	75 (96)	4	13	2	7	23	1	44 (70)	13	12	7	12	28	4
	HOM1	77 (96)	6	13	1	6	24	0	45 (73)	10	12	5	13	27	6
	SPLIDHOM1	76 (93)	6	13	1	10	23	0	43 (70)	11	11	7	13	28	6
NEW2	Released	106 (123)	-	-	-	-	-	-	59 (98)	-	-	-	-	-	-
	Climatol-D	122 (159)	1	8	3	10	26	0	77 (149)	2	12	2	17	22	3
	Climatol-M	122 (172)	5	3	2	10	14	1	90 (160)	7	6	2	16	10	6
	MASH	100 (168)	6	2	5	15	4	7	64 (138)	11	6	4	22	6	20
	ACMANT2	119 (174)	6	1	2	14	8	2	74 (156)	0	4	3	20	6	18

Table A.39. As in table 7, but for the North East scenarios 1 and 2.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
NEW1	94 (94)	28 (29)	357	564	0.208	0.047	0.383	0.196 (0.196)	43.7%	10.4%	83.7%	39.4%	1.09%	18.8%	26.2%	15.2%
	94 (94)	88 (93)	357	504	0.208	0.149	0.402	0.173 (0.173)	35.9%	13.9%	69.4%	42.5%	2.18%	17.3%	26.2%	18.5%
	75 (76)	188 (215)	376	404	0.166	0.318	0.624	0.113 (0.114)	24.6%	12.9%	38.8%	33.1%	5.09%	13.6%	12.3%	17.4%
	1 (2)	94 (113)	450	498	0.002	0.159	0.248	0.002 (0.004)	0%	0.32%	0%	0.79%	0%	0%	0.60%	0%
NEW2	153 (153)	40 (42)	431	743	0.262	0.051	0.324	0.244 (0.244)	55.4%	12.8%	90.6%	52.1%	2.04%	18.2%	41.0%	17.2%
	139 (139)	143 (152)	445	640	0.238	0.183	0.487	0.189 (0.189)	44.0%	14.5%	71.7%	42.6%	6.12%	19.4%	33.3%	16.4%
	143 (147)	244 (274)	441	539	0.245	0.312	0.703	0.167 (0.171)	37.0%	18.8%	45.3%	43.1%	11.1%	22.5%	31.4%	16.4%

Table A.40. As in table 8, but for the North East scenarios 1 and 2.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
NEW1	106 (106)	19 (20)	345	560	0.235	0.033	0.266	0.225 (0.225)	47.2%	12.6%	91.8%	42.5%	2.55%	20.9%	29.2%	18.5%
	129 (129)	58 (62)	322	521	0.286	0.100	0.402	0.251 (0.251)	48.6%	19.4%	89.8%	55.1%	5.45%	23.6%	35.7%	26.1%
	152 (153)	126 (141)	299	453	0.337	0.218	0.624	0.257 (0.258)	46.5%	27.8%	75.6%	65.4%	10.9%	24.6%	42.9%	11.3%
	5 (7)	90 (108)	446	489	0.011	0.155	0.248	0.009 (0.012)	1.41%	0.97%	2.04%	1.57%	0.73%	1.05%	1.19%	1.09%
NEW2	176 (176)	19 (21)	408	748	0.301	0.025	0.324	0.291 (0.291)	60.9%	16.0%	96.2%	58.5%	4.37%	21.3%	46.2%	20.7%
	199 (200)	87 (93)	385	680	0.341	0.113	0.487	0.294 (0.295)	57.6%	23.3%	81.1%	62.8%	11.1%	27.9%	46.2%	25.9%
	250 (254)	151 (170)	334	616	0.428	0.197	0.703	0.332 (0.335)	59.2%	35.3%	83.0%	93.1%	22.2%	38.0%	52.9%	35.3%

Table A.41. As in table 1, but for the North East scenario 3 and South West scenario 1.

Scenario	Algorithm	Region bias	No. positively biased (mean bias)	No. negatively biased (mean bias)	No. non-biased (to measurement precision)	Sum absolute biases	Percentage recovery				PR best stats			PR worst stats			Best stats mean bias	Worst stats mean bias
							GI	I	U	MW	I	U	MW	I	U	MW		
NEW3	Released	-0.024	96 (0.38)	99 (-0.42)	12 (54)	78.13	-	-	-	-	-	-	-	-	-	-	0	-0.11
	Climatol-D	-0.001	87 (0.03)	107 (-0.03)	13 (134)	12.15	104	12 (8)	64 (12)	7	0	10	0	10	0	0	0	-0.01
	Climatol-M	-0.007	109 (0.04)	87 (-0.06)	11 (157)	9.53	127	12 (8)	34 (11)	15	0	9	1	10	0	0	-0.01	0.01
	MASH	0.001	118 (0.05)	89 (-0.06)	0 (140)	11.35	124	28 (16)	1 (0)	38	0	0	10	10	0	0	0.02	-0.05
	ACMANT2	-0.004	91 (0.04)	106 (-0.04)	10 (162)	7.98	128	22 (13)	11 (10)	23	0	8	2	10	0	0	-0.01	0
SWW1	Released	0.015	71 (0.31)	70 (-0.28)	10 (53)	41.64	-	-	-	-	-	-	-	-	-	-	0	0.25
	Climatol-D	-0.018	64 (0.05)	77 (-0.08)	10 (98)	9.27	69	6 (3)	55 (10)	8	0	10	0	10	0	0	0	-0.01
	Climatol-M	0.004	68 (0.14)	76 (-0.12)	7 (72)	18.34	58	11 (12)	33 (7)	30	0	7	3	8	0	2	0.04	-0.04
	MASH	-0.017	65 (0.08)	86 (-0.09)	0 (87)	13.33	70	20 (14)	1 (0)	46	0	0	10	8	0	2	-0.02	-0.07
	ACMANT2	-0.050	38 (0.06)	110 (-0.09)	3 (69)	11.70	62	16 (13)	17 (3)	40	0	4	6	10	0	0	-0.02	-0.07
	DAP1	0.011	70 (0.24)	71 (-0.21)	10 (60)	32.62	10	37 (3)	78 (10)	13	0	10	0	6	3	1	0	.29
	HOM1	0.008	69 (0.24)	72 (-0.22)	10 (60)	32.55	9	38 (2)	78 (10)	14	0	10	0	6	3	1	0	0.28
	SPLIDHOM1	0.010	71 (0.24)	70 (-0.22)	10 (60)	32.59	10	36 (3)	78 (10)	14	0	10	0	6	3	1	0	0.29

Table A.42. As in table 2, but for the North East scenario 3 and South West scenario 1.

Scenario	Algorithm	Region RMSE	No. perfect RMSEs (to measurement precision)	Range of RMSEs in best stats	Range of RMSEs in worst stats	Percentage recovery				PR best stats			PR worst stats			PR value for region
						GI	I	MW	U	I	U	MW	I	U	MW	
NEW3	Released	0.733	12 (20)	(0, 0)	(1.61, 2.17)	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	0.169	13 (41)	(0, 0)	(0.06, 0.34)	88	42	1	64 (12)	0	10	0	10	0	0	77.01
	Climatol-M	0.190	11 (31)	(0, 0.09)	(0.09, 0.34)	91	62	9	34 (11)	0	9	1	10	0	0	74.10
	MASH	0.168	0 (8)	(0.01, 0.17)	(0.11, 0.68)	75	94	37	1 (0)	0	0	10	10	0	0	77.03
	ACMANT2	0.165	23 (10)	(0, 0.09)	(0.07, 0.71)	86	82	18	11 (10)	0	8	2	10	0	0	77.50
SWW1	Released	0.576	10 (18)	(0, 0.02)	(1.13, 1.92)	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	0.196	10 (20)	(0, 0.02)	(0.07, 0.28)	39	42	5	55 (10)	0	10	0	10	0	0	66.04
	Climatol-M	0.310	7 (13)	(0, 0.25)	(0.09, 1.66)	29	56	26	33 (7)	0	7	3	8	0	2	46.09
	MASH	0.276	0 (8)	(0.04, 0.15)	(0.08, 1.73)	38	72	40	1 (0)	0	0	10	8	0	2	52.06
	ACMANT2	0.195	3 (8)	(0, 0.24)	(0.07, 0.81)	36	60	35	17 (3)	0	4	6	10	0	0	66.21
	DAP1	0.491	10 (16)	(0, 0.02)	(0.44, 1.92)	1	45	17	78 (10)	0	10	0	6	3	1	14.79
	HOM1	0.492	10 (16)	(0, 0.02)	(0.46, 1.92)	1	45	17	78 (10)	0	10	0	6	3	1	14.57
	SPLIDHOM1	0.491	10 (16)	(0, 0.02)	(0.44, 1.92)	1	45	17	78 (10)	0	10	0	6	3	1	14.80

Table A.43. As in table 3, but for the North East scenario 3 and South West scenario 1.

Scen.	Algorithm	Decadal trends (°C)		Positive trends		Negative trends		No. of signif. trends (pre-served)	Percentage recovery				PR best stats			PR worst stats			Regional average trend	PR for regional average trend
		Min	Max	No.	Mean	No.	Mean		GI	I	MW	U	I	MW	U	I	MW	U		
NEW3	Clean	0.141	0.340	207	0.236	0	-	203	-	-	-	-	-	-	-	-	-	-	0.236	-
	Rel	-0.738	1.145	174	0.314	33	-0.207	163 (73)	-	-	-	-	-	-	-	-	-	-	0.231	-
	CD	0.020	0.345	207	0.239	0	-	201 (188)	113	4 (9)	5	64 (12)	0	0	10	10	0	0	0.239	152.20
	CM	0.131	0.340	207	0.235	0	-	201 (199)	131	6 (13)	12	34 (11)	0	1	9	10	0	0	0.235	78.56
	MASH	0.131	0.404	207	0.237	0	-	203 (196)	136	24 (15)	31	1 (0)	0	10	0	10	0	0	0.236	103.14
	A2	0.164	0.419	207	0.242	0	-	204 (198)	134	16 (14)	22	11 (10)	0	2	8	10	0	0	0.241	183.79
SWW1	Clean	-0.107	0.272	123	0.135	28	-0.051	68	-	-	-	-	-	-	-	-	-	-	0.098	-
	Rel	-0.759	0.800	101	0.221	50	-0.191	94 (27)	-	-	-	-	-	-	-	-	-	-	0.083	-
	CD	-0.156	0.405	124	0.141	27	-0.047	73 (59)	69	4 (7)	6	55 (10)	0	0	10	10	0	0	0.105	144.11
	CM	-0.118	0.405	136	0.121	15	-0.037	66 (48)	65	6 (20)	20	33 (7)	0	3	7	9	1	0	0.103	128.70
	MASH	-0.103	0.290	122	0.139	29	-0.043	68 (61)	83	23 (8)	36	1 (0)	0	10	0	10	0	0	0.103	129.04
	A2	-0.064	0.297	131	0.143	20	-0.022	81 (56)	73	14 (17)	27	17 (3)	0	6	4	10	0	0	0.119	234.56
	D1	-0.678	0.655	109	0.185	42	-0.154	87 (30)	12	41 (1)	9	78 (10)	0	0	10	7	0	3	0.091	49.32
	H1	-0.678	0.655	109	0.187	42	-0.157	88 (30)	13	41 (1)	8	78 (10)	0	0	10	7	0	3	0.093	61.83
	S1	-0.678	0.655	109	0.187	43	-0.150	88 (30)	12	41 (1)	9	78 (10)	039.94	0	10	7	0	3	0.091	49.94

Table A.44. As in table 4, but for the North East scenario 3 and South West scenario 1.

Scenario	PR for inter-decadal smooths				PR for inter-decadal best			PR for inter-decadal worst			PR for inter-annual smooths				PR for inter-annual best			PR for inter-annual worst			Biggest correlation decrease (station ID)		Overall correlation for region	
	GI	I	MW	U	I	U	MW	I	U	MW	GI	I	MW	U	I	U	MW	I	U	MW	D	Y	D	Y
NEW3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.664	0.867
	110	17	3	64 (13)	0	10	0	10	0	0	126	5	0	64 (12)	0	10	0	10	0	0	0.026 (140)	-	0.983	0.994
	123	28	11	34 (11)	0	9	1	10	0	0	139	18	5	34 (11)	0	9	1	10	0	0	0.029 (140)	0.031 (192)	0.992	0.996
	137	47	22	1 (0)	0	0	10	10	0	0	146	38	22	1 (0)	0	0	10	10	0	0	0.072 (191)	0.005 (21)	0.991	0.995
	139	22	25	11 (10)	0	8	2	9	0	1	139	30	17	11 (10)	0	8	2	10	0	0	0.299 (30)	0.005 (21)	0.990	0.993
SWW1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.698	0.858
	53	21	12	55 (10)	0	10	0	9	0	1	69	11	6	55 (10)	0	10	0	10	0	0	0.101 (61)	0.131 (32)	0.967	0.834
	48	29	34	33 (7)	0	7	3	7	0	3	63	26	22	33 (7)	0	7	3	9	0	1	0.695 (99)	0.075 (94)	0.947	0.976
	80	31	39	1 (0)	0	0	10	10	0	0	90	26	34	1 (0)	0	0	10	10	0	0	0.844 (128)	0.043 (128)	0.979	0.991
	66	30	35	17 (3)	0	4	6	9	0	1	80	20	31	17 (3)	0	4	6	10	0	0	0.686 (99)	0.049 (60)	0.969	0.986
	13	38	12	78 (10)	0	10	0	7	0	3	15	41	7	78 (10)	0	10	0	6	3	1	1.070 (148)	0.194 (148)	0.794	0.908
	13	38	12	78 (10)	0	10	0	7	3	0	15	40	8	78 (10)	0	10	0	6	3	1	1.093 (148)	0.203 (148)	0.795	0.908
	13	38	12	78 (10)	0	10	0	7	3	0	15	40	8	78 (10)	0	10	0	6	3	1	1.049 (148)	0.185 (148)	0.794	0.908

Table A.45. As in table 5, but for the North East scenario 3 and South West scenario 1.

Scenario	Algorithm	No. stats more variable than clean	No. stats less variable than clean	Variability increases			Variability decreases			Variability unchanged (because of perfection)	PR best stats			PR worst stats		
				GI	I	MW	GI	I	MW		I	U	MW	I	U	MW
NEW3	Released	117	78	-	-	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	97	97	4	18	17	37	30	24	76 (12)	0	10	0	9	0	1
	Climatol-M	91	105	8	22	23	32	33	44	45 (11)	0	9	1	8	0	2
	MASH	110	97	15	29	48	24	49	41	1 (0)	0	0	10	8	0	2
	ACMANT2	103	94	2	31	38	32	44	39	21 (10)	0	8	2	8	0	2
SWW1	Released	83	58	-	-	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	61	80	0	10	3	16	32	25	65 (10)	0	10	0	9	0	1
	Climatol-M	55	89	1	13	14	15	32	36	40 (7)	0	7	3	9	0	1
	MASH	62	89	5	25	24	21	30	45	1 (0)	0	0	10	9	0	1
	ACMANT2	69	79	0	17	20	18	42	34	20 (3)	0	4	6	7	0	3
	DAP1	74	67	1	6	21	4	12	19	88 (10)	0	10	0	4	3	3
	HOM	78	63	1	7	23	5	11	16	88 (10)	0	10	0	4	3	3
	SPLIDHOM1	75	66	2	6	22	5	10	18	88 (10)	0	10	0	5	3	2

Table A.46. As in table 6, but for the North East scenario 3 and South West scenario 1.

Scenario	Algorithm	Warm extremes							Cold extremes						
		Exact (± 0.14)	Too warm in returned			Too cool in returned			Exact (± 0.14)	Too warm in returned			Too cool in returned		
			I	U	MW	I	U	MW		I	U	MW	I	U	MW
NEW3	Released	101 (119)	-	-	-	-	-	-	70 (95)	-	-	-	-	-	-
	Climatol-D	122 (151)	8	15	3	10	19	1	106 (167)	8	9	2	7	11	3
	Climatol-M	122 (167)	7	9	4	9	8	2	94 (168)	14	5	1	10	4	5
	MASH	105 (168)	12	5	6	9	5	2	72 (147)	24	2	5	22	3	4
	ACMANT2	125 (169)	9	6	4	12	5	2	94 (175)	8	3	3	10	4	4
SWW1	Released	103 (127)	-	-	-	-	-	-	70 (94)	-	-	-	-	-	-
	Climatol-D	105 (134)	0	4	4	2	7	0	81 (116)	6	5	5	5	11	3
	Climatol-M	105 (131)	1	6	2	2	7	2	72 (109)	5	5	15	5	8	4
	MASH	97 (119)	1	5	1	9	4	12	68 (120)	6	2	6	7	3	7
	ACMANT2	96 (123)	1	2	5	6	4	10	68 (108)	6	1	3	17	3	13
	DAP1	104 (128)	0	10	1	1	11	0	72 (99)	3	19	0	3	25	2
	HOM1	103 (128)	0	10	1	0	11	1	74 (100)	1	19	0	4	25	2
	SPLIDHOM1	103 (128)	0	10	1	0	11	1	72 (99)	1	19	0	4	26	2

Table A.47. As in table 7, but for the North East scenario 3 and South West scenario 1.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
NEW3	188 (188)	20 (20)	353	723	0.348	0.027	0.383	0.335 (0.335)	74.2%	12.7%	93.4%	59.6%	2.84%	27.2%	42.7%	NA
	155 (155)	119 (120)	386	624	0.287	0.160	0.506	0.234 (0.234)	54.1%	14.4%	69.7%	49.9%	6.38%	21.9%	35.9%	NA
	131 (132)	214 (242)	410	528	0.242	0.288	0.693	0.167 (0.168)	43.8%	13.3%	40.8%	39.9%	9.57%	20.4%	28.2%	NA
SWW1	78 (78)	50 (89)	287	461	0.214	0.098	0.448	0.172 (0.172)	40.4%	10.0%	75.6%	37.0%	0%	22.5%	26.8%	9.64%
	62 (62)	102 (108)	303	408	0.170	0.200	0.555	0.131 (0.131)	31.6%	8.30%	56.1%	27.6%	2.03%	17.8%	20.9%	8.43%
	77 (77)	170 (200)	288	336	0.211	0.336	0.757	0.136 (0.136)	28.7%	16.6%	46.3%	36.2%	6.09%	24.0%	22.9%	13.3%
	18 (18)	63 (67)	347	449	0.049	0.123	0.224	0.042 (0.042)	8.08%	3.06%	19.5%	7.09%	0.51%	4.65%	4.58%	6.02%

Table A.48. As in table 8, but for the North East scenario 3 and South West scenario 1.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
NEW3	198 (198)	10 (10)	343	718	0.366	0.014	0.383	0.359 (0.359)	75.8%	14.7%	93.4%	63.4%	3.90%	28.7%	45.0%	NA
	211 (211)	64 (64)	330	664	0.390	0.088	0.506	0.349 (0.349)	72.2%	20.5%	85.5%	61.7%	11.7%	32.6%	45.8%	NA
	256 (258)	107 (118)	285	620	0.473	0.147	0.693	0.388 (0.390)	79.4%	29.4%	82.9%	71.0%	22.3%	43.7%	51.1%	NA
SWW1	100 (100)	31 (68)	265	465	0.274	0.063	0.448	0.231 (0.231)	50.7%	13.5%	90.2%	47.2%	1.52%	29.5%	32.7%	14.5%
	95 (95)	69 (77)	270	425	0.260	0.140	0.456	0.215 (0.215)	45.6%	14.4%	63.4%	48.0%	4.06%	25.6%	32.7%	14.5%
	145 (145)	110 (133)	220	379	0.397	0.225	0.757	0.291 (0.291)	60.3%	27.5%	85.4%	71.7%	9.64%	38.0%	49.0%	25.3%
	39 (39)	42 (45)	326	455	0.107	0.085	0.224	0.095 (0.095)	19.9%	5.24%	36.6%	15.7%	2.03%	10.1%	11.8%	9.64%

Table A.49. As in table 1, but for the South West scenarios 2 and 3.

Scen.	Algorithm	Region bias	No. positively biased (mean bias)	No. negatively biased (mean bias)	No. non-biased (to measurement precision)	Sum absolute biases	Percentage recovery				PR best stats			PR worst stats			Best stats mean bias	Worst stats mean bias
							GI	I	U	MW	I	U	MW	I	U	MW		
SWW2	Released	-0.061	86 (0.33)	121 (-0.35)	15 (65)	71.03	-	-	-	-	-	-	-	-	-	-	0	-0.05
	Climatol-D	-0.027	86 (0.04)	120 (-0.08)	16 (149)	12.32	104	14 (11)	71 (15)	7	0	10	0	10	0	0	0	-0.05
	Climatol-M	-0.057	70 (0.10)	146 (-0.13)	6 (99)	26.13	80	23 (22)	45 (6)	46	0	4	6	9	0	1	0.01	-0.30
	MASH	-0.053	86 (0.05)	136 (-0.12)	0 (133)	19.81	97	33 (21)	0 (0)	71	0	0	10	9	0	1	-0.01	-0.20
	ACMANT2	-0.061	39 (0.07)	175 (-0.09)	8 (98)	19.14	101	28 (14)	17 (8)	54	0	6	4	10	0	0	-0.04	-0.06
	DAP1	-0.058	92 (0.19)	117 (-0.26)	13 (82)	47.36	29	59 (5)	98 (13)	18	0	8	2	9	1	0	0.01	-0.22
	HOM1	-0.063	89 (0.19)	120 (-0.26)	13 (82)	48.23	27	60 (6)	98 (13)	18	0	8	2	9	1	0	0.01	-0.23
	SPLIDHOM1	-0.057	92 (0.18)	117 (-0.26)	13 (82)	47.49	29	60 (5)	98 (13)	17	0	8	2	9	1	0	0.01	-0.22
SWW3	Released	-0.003	111 (0.39)	102 (-0.43)	9 (65)	87.72	-	-	-	-	-	-	-	-	-	-	0	0.22
	Climatol-D	0.027	145 (0.06)	66 (-0.05)	11 (155)	12.66	116	10 (11)	69 (9)	7	0	10	0	10	0	0	0	0.01
	Climatol-M	-0.007	121 (0.09)	94 (-0.14)	7 (112)	24.44	100	21 (16)	41 (7)	37	0	9	1	10	0	0	-0.01	-0.03
	MASH	0.016	123 (0.07)	98 (-0.05)	1 (140)	14.40	119	36 (19)	0 (1)	47	0	1	9	10	0	0	-0.01	0.04
	ACMANT2	-0.020	104 (0.07)	116 (-0.10)	2 (102)	19.03	110	24 (14)	17 (2)	55	0	2	8	10	0	0	-0.05	-0.03
	DAP1	0.012	114 (0.28)	99 (-0.30)	9 (77)	61.87	27	59 (5)	105 (9)	17	0	10	0	8	1	1	0	0.57
	HOM1	0.007	112 (0.29)	101 (-0.30)	9 (78)	62.71	25	61 (4)	106 (9)	17	0	10	0	8	1	1	0	0.49
	SPLIDHOM1	0.012	114 (0.28)	99 (-0.30)	9 (78)	61.97	26	61 (4)	105 (9)	17	0	0.56	0	10	0	8	1	1

Table A.50. As in table 2, but for the South West scenarios 2 and 3.

Scenario	Algorithm	Region RMSE	No. perfect RMSEs (to measurement precision)	Range of RMSEs in best stats	Range of RMSEs in worst stats	Percentage recovery				PR best stats			PR worst stats			PR value for region
						GI	I	MW	U	I	U	MW	I	U	MW	
SWW2	Released	0.658	20 (13)	(0, 0)	(1.36, 3.62)	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	0.164	28 (16)	(0, 0)	(0.05, 0.31)	80	58	0	71 (13)	0	10	0	10	0	0	75.15
	Climatol-M	0.289	6 (12)	(0, 0.22)	(0.11, 1.77)	60	73	38	45 (6)	0	4	6	9	0	1	56.56
	MASH	0.254	0 (6)	(0.03, 0.12)	(0.08, 1.47)	66	108	48	0 (0)	0	0	10	10	0	0	61.43
	ACMANT2	0.207	8 (11)	(0, 0.25)	(0.11, 0.64)	65	90	42	17 (8)	0	6	4	10	0	0	68.49
	DAP1	0.526	13 (18)	(0, 0.21)	(0.16, 3.02)	5	86	20	98 (13)	0	8	2	9	1	0	20.07
	HOM1	0.529	13 (18)	(0, 0.16)	(0.17, 2.95)	4	87	20	98 (13)	0	8	2	9	1	0	19.61
	SPLIDHOM1	0.525	13 (18)	(0, 0.19)	(0.16, 3.01)	5	86	20	98 (13)	0	8	2	9	1	0	20.14
SWW3	Released	0.796	9 (22)	(0, 0.01)	(1.57, 3.88)	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	0.182	11 (37)	(0, 0.01)	(0.07, 0.38)	95	47	2	69 (9)	0	10	0	10	0	0	77.16
	Climatol-M	0.259	7 (28)	(0, 0.09)	(0.09, 0.65)	76	73	25	41 (7)	0	9	1	10	0	0	67.47
	MASH	0.204	0 (7)	(0, 0.17)	(0.10, 0.29)	85	84	53	0 (0)	0	0	10	10	0	0	74.42
	ACMANT2	0.251	2 (13)	(0, 0.33)	(0.14, 0.39)	82	74	47	17 (2)	0	2	8	10	0	0	68.47
	DAP1	0.610	9 (20)	(0, 0.01)	(0.69, 3.12)	9	84	15	105 (9)	0	10	0	8	1	1	23.35
	HOM1	0.629	9 (20)	(0, 0.01)	(0.77, 3.12)	6	84	17	106 (9)	0	10	0	8	1	1	20.99
	SPLIDHOM1	0.610	9 (20)	(0, 0.01)	(0.73, 3.13)	9	85	14	105 (9)	0	10	0	8	1	1	23.32

Table A.51. As in table 3, but for the South West scenarios 2 and 3.

Scenario	Algorithm	Decadal trends (°C)		Positive trends		Negative trends		No. of signif. trends (pre-served)	Percentage recovery				PR best stats			PR worst stats			Regional average trend	PR for regional average trend
		Min	Max	No.	Mean	No.	Mean		GI	I	MW	U	I	MW	U	I	MW	U		
SWW2	Clean	-0.137	0.291	180	0.136	42	-0.047	102	-	-	-	-	-	-	-	-	-	-	0.099	-
	Released	-0.790	1.107	160	0.251	62	-0.184	153 (35)	-	-	-	-	-	-	-	-	-	-	0.126	-
	Climatol-D	-0.196	0.319	182	0.142	40	-0.048	117 (92)	118	7 (10)	3	71 (13)	0	0	10	10	0	0	0.106	75.30
	Climatol-M	-0.075	0.678	215	0.131	7	-0.030	117 (87)	100	16 (20)	35	45 (6)	0	6	4	10	0	0	0.123	12.89
	MASH	-0.097	0.300	180	0.145	42	-0.038	115 (95)	119	33 (20)	50	0 (0)	0	10	0	10	0	0	0.108	67.89
	ACMANT2	-0.248	0.424	204	0.140	18	-0.031	130 (87)	112	18 (20)	47	17 (8)	0	4	6	10	0	0	0.125	5.79
	DAP1	-0.435	1.107	170	0.202	52	-0.121	135 (44)	28	57 (7)	19	98 (13)	0	2	8	8	1	1	0.124	10.32
	HOM1	-0.438	1.107	171	0.205	51	-0.122	136 (43)	25	61 (7)	18	98 (13)	0	2	8	8	1	1	0.127	-1.89
	SPLIDHOM1	-0.442	1.107	169	0.204	53	-0.120	135 (44)	27	60 (7)	17	98 (13)	0	2	8	8	1	1	0.124	9.54
SWW3	Clean	-0.128	0.283	179	0.135	43	-0.047	104	-	-	-	-	-	-	-	-	-	-	0.098	-
	Released	-1.271	0.967	143	0.265	79	-0.223	146 (45)	-	-	-	-	-	-	-	-	-	-	0.090	-
	Climatol-D	-0.251	0.314	175	0.127	47	-0.053	93 (98)	122	8 (6)	6	69 (11)	0	10	0	10	0	0	0.087	-30.00
	Climatol-M	-0.097	0.380	199	0.114	23	-0.034	88 (76)	112	15 (20)	27	41 (7)	0	9	1	10	0	0	0.096	77.72
	MASH	-0.095	0.321	175	0.129	47	-0.039	90 (90)	137	30 (11)	44	0 (0)	0	0	10	10	0	0	0.092	25.95
	ACMANT2	-0.055	0.552	184	0.131	38	-0.018	92 (85)	116	22 (13)	52	17 (2)	0	2	8	10	0	0	0.104	168.02
	DAP1	-1.046	0.828	149	0.203	73	-0.141	121 (43)	32	58 (7)	11	105 (9)	0	10	0	9	1	0	0.088	-17.37
	HOM1	-1.045	0.835	149	0.208	73	-0.144	123 (41)	31	58 (7)	11	106 (9)	0	10	0	9	1	0	0.090	9.20
	SPLIDHOM1	-1.048	0.827	149	0.204	26	-0.142	122 (42)	29	62 (6)	11	105 (9)	0	10	0	9	1	0	0.088	-17.96

Table A.52. As in table 4, but for the South West scenarios 2 and 3.

Scenario	PR for inter-decadal smooths				PR for inter-decadal best			PR for inter-decadal worst			PR for inter-annual smooths				PR for inter-annual best			PR for inter-annual worst			Biggest correlation decrease (station ID)		Overall correlation for region	
	GI	I	MW	U	I	U	MW	I	U	MW	GI	I	MW	U	I	U	MW	I	U	MW	D	Y	D	Y
SWW2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.694	0.842
	88	36	11	71 (16)	0	10	0	7	0	3	123	13	0	71 (15)	0	10	0	10	0	0	0.037 (169)	-	0.975	0.989
	81	50	40	45 (6)	0	4	6	6	0	4	108	36	27	45 (6)	0	4	6	10	0	0	0.932 (153)	0.064 (153)	0.958	0.981
	126	47	49	0 (0)	0	0	10	9	0	1	148	28	47	0 (0)	0	0	10	10	0	0	0.301 (153)	0.015 (222)	0.984	0.992
	102	47	48	17 (8)	0	6	4	9	0	1	124	35	38	17 (8)	0	6	4	10	0	0	0.704 (153)	0.074 (222)	0.967	0.985
	27	64	20	98 (13)	0	8	2	5	1	4	33	65	13	98 (13)	0	8	2	8	1	1	0.470 (16)	0.024 (21)	0.820	0.912
	26	67	18	98 (13)	0	8	2	5	1	4	30	69	12	98 (13)	0	8	2	8	1	1	0.488 (16)	0.017 (14)	0.818	0.910
	27	65	19	98 (13)	0	8	2	5	1	4	33	65	13	98 (13)	0	8	2	8	1	1	0.486 (16)	0.021 (21)	0.820	0.912
SWW3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.607	0.795
	103	24	15	69 (11)	0	10	0	8	0	2	131	11	2	69 (9)	0	10	0	10	0	0	0.271 (222)	0.007 (197)	0.981	0.990
	95	26	53	41 (7)	0	9	1	7	0	3	118	27	29	41 (7)	0	9	1	9	0	1	0.897 (111)	0.065 (152)	0.957	0.981
	127	42	53	0 (0)	0	0	10	10	0	0	144	39	39	0 (0)	0	0	10	10	0	0	0.340 (95)	0.029 (95)	0.983	0.991
	108	32	63	17 (2)	0	2	8	8	0	2	123	33	47	17 (2)	0	2	8	10	0	0	0.679 (111)	0.060 (173)	0.970	0.984
	14	70	24	105 (9)	0	10	0	6	1	3	29	70	9	105 (9)	0	10	0	9	1	0	1.130 (39)	0.369 (193)	0.751	0.883
	14	70	23	106 (9)	0	10	0	8	1	1	27	72	8	106 (9)	0	10	0	9	1	0	1.135 (39)	0.430 (193)	0.744	0.879
	14	72	22	105 (9)	0	10	0	6	1	3	29	71	8	105 (9)	0	10	0	9	1	0	1.138 (39)	0.317 (193)	0.750	0.882

Table A.53. As in table 5, but for the South West scenarios 2 and 3.

Scenario	Algorithm	No. stats more variable than clean	No. stats less variable than clean	Variability increases			Variability decreases			Variability unchanged (because of perfection)	PR best stats			PR worst stats		
				GI	I	MW	GI	I	MW		I	U	MW	I	U	MW
SWW2	Released	132	75	-	-	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	97	109	1	10	7	25	52	41	86 (15)	0	10	0	9	0	1
	Climatol-M	101	115	12	13	28	22	44	52	51 (6)	0	4	6	7	0	3
	MASH	99	123	4	29	29	26	66	68	0 (0)	0	0	10	8	0	2
	ACMANT2	103	111	0	24	28	26	62	57	25 (8)	0	6	4	9	0	1
	DAP1	123	86	2	4	44	10	18	33	111 (13)	0	8	2	3	1	6
	HOM1	125	84	1	8	43	7	22	30	111 (13)	0	8	2	5	1	4
	SPLIDHOM1	124	85	3	5	43	9	20	31	111 (13)	0	8	2	5	1	4
SWW3	Released	151	62	-	-	-	-	-	-	-	-	-	-	-	-	-
	Climatol-D	104	107	3	5	7	44	52	33	78 (9)	0	10	0	9	0	1
	Climatol-M	102	113	3	22	24	33	41	48	48 (7)	0	9	1	7	0	3
	MASH	130	92	9	21	59	27	61	45	0 (0)	0	0	10	8	0	2
	ACMANT2	103	117	1	16	24	33	63	49	19 (2)	1	2	7	9	0	1
	DAP1	137	76	0	5	43	9	33	18	114 (9)	0	10	0	4	1	5
	HOM	137	76	0	5	41	8	30	23	115 (9)	0	10	0	3	1	6
	SPLIDHOM1	138	75	0	5	45	8	33	17	114 (9)	0	10	0	2	1	7

Table A.54. As in table 6, but for the South West scenarios 2 and 3.

Scenario	Algorithm	Warm extremes							Cold extremes						
		Exact (± 0.14)	Too warm in returned			Too cool in returned			Exact (± 0.14)	Too warm in returned			Too cool in returned		
			I	U	MW	I	U	MW		I	U	MW	I	U	MW
SWW2	Released	166 (187)	-	-	-	-	-	-	95 (120)	-	-	-	-	-	-
	Climatol-D	170 (196)	1	9	1	4	10	1	122 (176)	6	11	0	11	18	0
	Climatol-M	157 (181)	0	8	2	9	11	11	95 (144)	14	10	8	14	14	18
	MASH	145 (181)	2	3	4	8	10	14	111 (171)	12	5	3	1	10	6
	ACMANT2	156 (184)	1	5	4	9	5	14	105 (164)	6	5	0	21	9	17
	DAP1	169 (192)	0	12	0	4	13	1	95 (128)	9	30	1	5	48	1
	HOM1	166 (191)	0	12	0	5	13	1	93 (127)	8	31	2	5	48	1
	SPLIDHOM1	168 (194)	0	12	0	2	13	1	94 (127)	10	30	1	5	48	1
SWW3	Released	146 (160)	-	-	-	-	-	-	94 (117)	-	-	-	-	-	-
	Climatol-D	156 (180)	5	16	3	5	13	0	130 (181)	16	11	1	5	8	0
	Climatol-M	152 (171)	8	15	2	7	16	3	111 (162)	20	9	6	7	15	3
	MASH	132 (170)	12	8	7	6	7	12	102 (170)	14	4	8	13	9	4
	ACMANT2	147 (179)	4	9	5	7	9	9	111 (172)	10	3	6	7	12	5
	DAP1	146 (162)	5	27	1	1	26	0	98 (128)	6	35	2	7	43	1
	HOM1	147 (163)	3	27	1	1	27	0	98 (129)	6	34	2	6	45	0
	SPLIDHOM1	146 (160)	6	27	1	2	26	0	98 (124)	10	34	2	7	44	1

Table A.55. As in table 7, but for the South West scenarios 2 and 3.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
SWW2	143 (143)	54 (58)	388	689	0.269	0.073	0.366	0.243 (0.243)	45.7%	16.8%	85.5%	46.9%	0.70%	20.4%	38.3%	16.4%
	107 (107)	176 (195)	424	566	0.202	0.237	0.555	0.147 (0.147)	37.6%	10.7%	56.5%	37.7%	0.70%	20.4%	23.4%	14.1%
	108 (108)	263 (313)	423	476	0.203	0.356	0.778	0.128 (0.128)	29.6%	15.4%	42.0%	38.3%	4.18%	16.6%	24.3%	18.8%
	32 (32)	113 (116)	499	630	0.060	0.152	0.272	0.049 (0.049)	11.3%	3.19%	18.8%	8.57%	1.39%	5.52%	7.66%	3.91%
SWW3	176 (176)	44 (56)	342	692	0.340	0.060	0.449	0.307 (0.307)	62.1%	15.9%	89.1%	50.6%	1.61%	28.8%	38.1%	NA
	141 (141)	144 (149)	377	592	0.272	0.196	0.560	0.211 (0.211)	51.2%	11.7%	66.3%	41.0%	2.82%	23.6%	30.1%	NA
	102 (102)	283 (327)	416	450	0.197	0.386	0.834	0.121 (0.121)	35.0%	9.84%	30.4%	32.0%	6.85%	18.3%	20.8%	NA
	25 (25)	124 (131)	493	612	0.048	0.168	0.301	0.039 (0.039)	8.37%	2.54%	17.4%	5.06%	0%	3.06%	6.23%	NA

Table A.56. As in table 8, but for the South West scenarios 2 and 3.

Scenario	Hits	FAs	Misses	CRs	HR	FAR	Freq. bias	Critical Success Index	Prop. CO IHs found	Prop. EV IHs found	Prop. large IHs found	Prop. medium IHs found	Prop. small IHs found	Prop. SCs found	Prop. SRs found	Prop. urbani-sation IHs found
SWW2	168 (168)	33 (36)	363	695	0.316	0.045	0.366	0.296 (0.296)	51.1%	21.2%	94.2%	54.9%	2.44%	24.3%	43.2%	21.9%
	150 (150)	138 (154)	381	588	0.282	0.190	0.555	0.219 (0.219)	46.2%	18.6%	69.6%	52.6%	3.48%	24.3%	33.8%	24.2%
	215 (215)	171 (204)	316	547	0.405	0.238	0.778	0.293 (0.293)	58.6%	30.7%	84.1%	71.4%	11.1%	33.7%	48.6%	35.9%
	72 (72)	76 (77)	459	652	0.136	0.104	0.272	0.118 (0.118)	24.2%	7.83%	42.0%	21.7%	1.74%	11.0%	18.5%	8.59%
SWW3	198 (198)	22 (33)	320	708	0.382	0.030	0.448	0.359 (0.359)	70.4%	17.5%	94.6%	59.6%	2.02%	34.1%	41.5%	NA
	196 (196)	90 (94)	322	640	0.378	0.123	0.560	0.320 (0.320)	69.0%	17.8%	78.3%	60.1%	6.85%	34.5%	44.7%	NA
	236 (236)	165 (192)	282	561	0.456	0.227	0.834	0.332 (0.332)	76.8%	25.4%	78.3%	73.0%	13.7%	39.3%	50.5%	NA
	71 (71)	83 (85)	447	648	0.137	0.114	0.301	0.118 (0.118)	25.1%	6.35%	41.3%	18.0%	0.40%	10.5%	16.3%	NA