

Supplementary Table 1: Minimum Temperature Results of the original and modified tests.

1

Country	Station	Original Z	Corrected Zc	old P.value	new P-value	N/N*	Tau	Sen's slope	old.variance	new.variance
Mozambique	Chimoio	5.92	5.92	0.00***	0.00***	1.00	0.51	0.02	29792.00	29792.00
	Monze	-1.56	-0.79	0.12	0.43	3.87	-0.13	0.00	31199.00	120636.84
	Pemba	-0.98	-0.38	0.33	0.71	6.81	-0.08	-0.01	31200.00	212361.38
	Quelimane	1.11	0.71	0.27	0.48	2.45	0.09	0.00	31197.00	76527.19
	Rotanda	-0.38	NaN	0.70 ^c	NaN ^c	-0.09	-0.03	0.00	23833.33	-2117.30
	Sussundenga	3.45	4.11	0.00***	0.00***	0.70	0.29	0.01	30503.00	21431.57
South Africa	Bethlehem	2.89	2.89	0.00***	0.00***	1.00	0.32	0.02	6832.67	6832.67
	Kimberley	-3.31	-3.31	0.00***	0.00***	1.00	-0.37	-0.03	6833.67	6833.67
	Levebu	0.47	0.47	0.64	0.64	1.00	0.05	0.00	6828.00	6828.00
	Nelspruit	2.32	2.32	0.02***	0.02***	1.00	0.26	0.01	6833.67	6833.67
	Pietermaritzburg	-0.21	-0.21	0.84	0.84	1.00	-0.02	0.00	6832.67	6832.67
	Polokwane	2.83	3.19	0.00***	0.00***	0.79	0.32	0.02	6833.67	5397.06
	Stellenbosch	3.15	1.84	0.00***	0.07	2.91	0.35	0.03	6833.67	19914.89
	Upington	-4.43	-2.61	0.00***	0.01***	2.87	-0.50	-0.08	6833.67	19634.50
	Vryburg	1.57	1.52	0.12	0.13	1.08	0.18	0.02	6833.67	7355.97
Zimbabwe	Harare	-0.42	-0.34	0.67	0.74	1.56	-0.04	0.00	15158.33	23645.12
	Marondera	1.23	0.95	0.22	0.34	1.68	0.12	0.01	15158.33	25448.87
	Masvingo	-0.39	-0.31	0.70	0.76	1.61	-0.04	0.00	15158.33	24426.28
	West Nicholson	3.14	2.16	0.00***	0.03***	2.10	0.30	0.02	15158.33	31829.28
Malawi	Chitala	0.70	0.60	0.49	0.55	1.32	0.07	0.00	16755.00	22195.65
	Chitedze	6.88	6.88	0.00***	0.00***	1.00	0.83	0.06	4550.33	4550.33
	Dedza	-1.84	-2.80	0.07	0.01***	0.43	-0.20	-0.01	8381.00	3608.19
	Golomoti	4.66	4.66	0.00***	0.00***	1.00	0.55	0.03	4958.33	4958.33
	Kandeu	6.08	3.45	0.00***	0.00***	3.11	0.66	0.04	7926.67	24617.64

Corrected Zc - Z statistic after variance Correction, new P.value - P-value after variance correction, N/N* - Effective sample size, Original Z - Original Mann-Kendall Z statistic, Old P-value - Original Mann-Kendall p-value, Tau - Mann-Kendall's Tau, Sen's Slope - Sen's slope, old.variance - Old variance before variance Correction, new.variance - Variance after correction.

2

3

4

5

6

7

Supplementary Table 2: Maximum Temperature results of the original and modified tests.

Country	Site	Original Z	Corrected Zc	Old P-value	New P-value	N/N*	Tau	Sen's slope	Old Variance	New Variance
Mozambique	Chimoio	2.46	1.59	0.01***	0.11	2.41	0.21	0.01	31200.00	75132.17
	Monze	0.36	0.21	0.72	0.83	2.96	0.03	0.00	31199.00	92195.74
	Pemba	-3.01	-1.40	0.00***	0.16	4.58	-0.26	-0.01	31200.00	142997.20
	Quelimane	2.38	2.13	0.02***	0.03***	1.25	0.20	0.01	31197.00	38998.46
	Rotanda	-0.11	-0.08	0.91	0.93	1.74	-0.01	0.00	23833.33	41584.53
	Sussundenga	-1.04	-0.65	0.30	0.51	2.52	-0.09	0.00	30502.00	77011.06
South Africa	Bethlehem	2.64	2.10	0.01***	0.04***	1.58	0.30	0.04	6833.67	10809.13
	Kimberley	3.70	3.70	0.00***	0.00***	1.00	0.41	0.04	6833.67	6833.67
	Levebu	0.93	1.59	0.35	0.11	0.34	0.11	0.00	6830.67	2335.90
	Nelspruit	3.56	3.56	0.00***	0.00***	1.00	0.40	0.04	6833.67	6833.67
	Pietermaritzburg	3.30	3.19	0.00***	0.00***	1.07	0.37	0.04	6832.67	7334.63
	Polokwane	3.87	2.22	0.00***	0.03***	3.05	0.43	0.09	6833.67	20861.76
	Stellenbosch	5.99	5.99	0.00***	0.00***	1.00	0.67	0.07	6832.67	6832.67
	Upington	4.84	2.84	0.00***	0.00***	2.89	0.54	0.06	6833.67	19773.30
	Vryburg	5.49	3.26	0.00***	0.00***	2.83	0.61	0.08	6833.67	19365.62
Zimbabwe	Harare	-0.18	-0.18	0.86	0.86	1.00	-0.02	0.00	15158.33	15158.33
	Marondera	2.29	2.15	0.02***	0.03***	1.14	0.22	0.02	15158.33	17283.94
	Masvingo	2.31	2.31	0.02***	0.02***	1.00	0.22	0.01	15158.33	15158.33
	West Nicholson	3.74	3.03	0.00***	0.00***	1.53	0.36	0.03	15157.33	23174.85
Malawi	Chitala	-0.93	-0.68	0.35	0.50	1.85	-0.09	0.00	16755.00	31049.67
	Chitedze	1.75	1.75	0.08	0.08	1.00	0.21	0.02	4550.33	4550.33
	Dedza	0.22	0.16	0.83	0.88	1.97	0.02	0.00	8381.00	16516.31
	Golomoti	2.76	2.76	0.01***	0.01***	1.00	0.33	0.03	4958.33	4958.33
	Kandeu	1.43	1.54	0.15	0.12	0.85	0.16	0.01	7926.67	6764.05

Values significant at the 5 % level are indicated by “***”,

Corrected Zc - Z statistic after variance Correction, new P.value - P-value after variance correction, N/N* - Effective sample size, Original Z - Original Mann-Kendall Z statistic, Old P-value - Original Mann-Kendall p-value, Tau - Mann-Kendall's Tau, Sen's Slope - Sen's slope, old.variance - Old variance before variance Correction, new.variance - Variance after correction.