

Supplementary Materials: Evaluation of the Performance of Three Satellite Precipitation Products over Africa

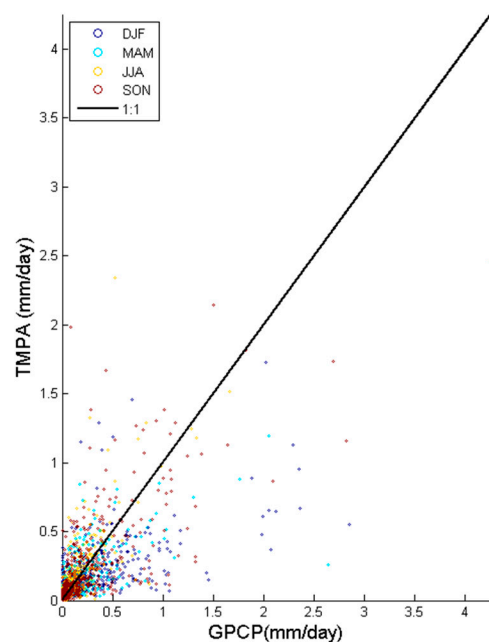
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For the interested reader, we include here scatterplots and the values of error statistics shown in Table 2 of the manuscript for each satellite precipitation product, each season and each latitudinal band, climatic and topographic zones.

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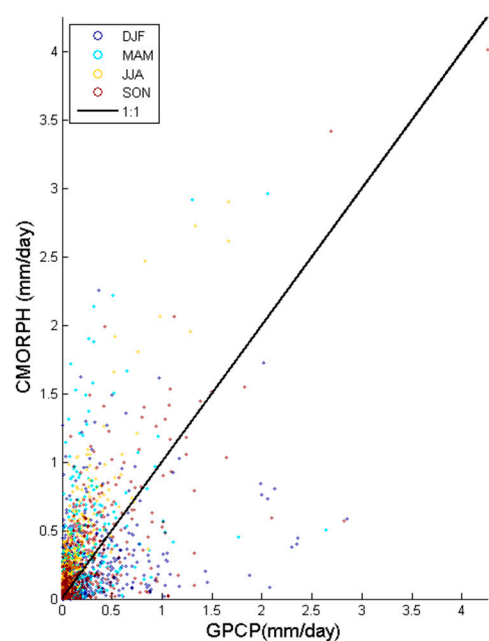
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A. Raw Estimates Error Analysis for Latitudinal Bands.



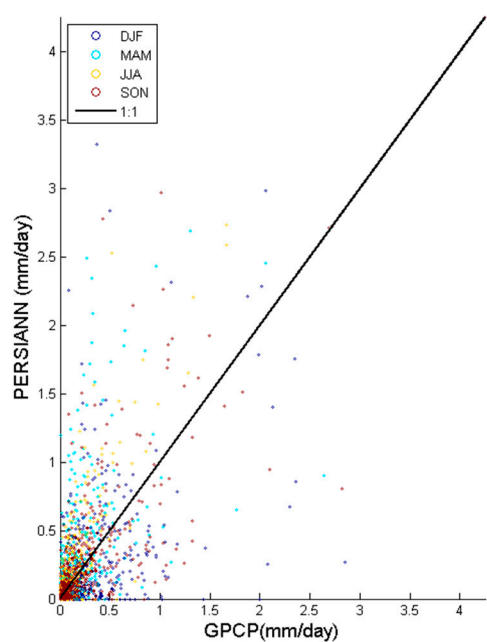
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.19	0.14	0.13	0.22	0.17
Mean GPCP (mm/day)	0.26	0.14	0.10	0.23	0.18
Std. dev. SPP (mm/d...	0.18	0.15	0.22	0.31	0.23
Std. dev. SPP (mm/d...	0.38	0.24	0.18	0.38	0.31
Bias (%)	-27.03	1.22	25.06	-6.49	-7.67
MSE from mean	0.00	0.00	0.00	0.00	0.00
MSE from variance	0.04	0.01	0.00	0.00	0.01
MSE from correlation	0.06	0.02	0.02	0.07	0.05
MSE	0.10	0.03	0.02	0.07	0.06
RMSE	0.32	0.18	0.14	0.27	0.24
Correlation coeff.	0.589	0.667	0.782	0.717	0.661
Nash-Sutcliffe Eff.	0.303	0.443	0.394	0.500	0.431
Max. SPP rainfall	1.73	1.19	2.34	2.46	2.46
Max. GPCP rainfall	2.85	2.64	1.67	4.25	4.25
Min. SPP rainfall	0.02	0.01	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure A-1. TMPA band A.



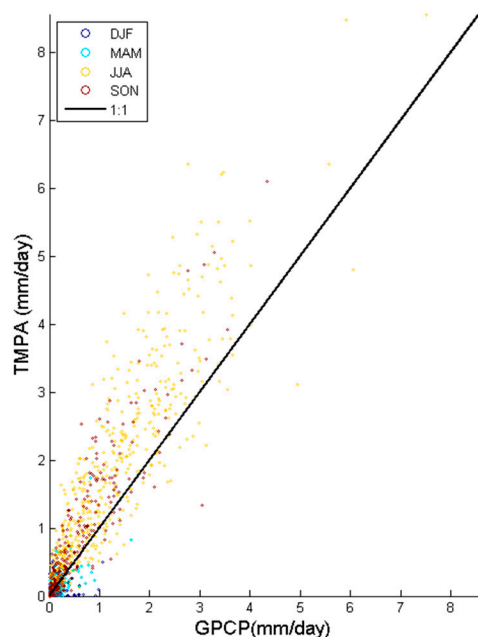
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.22	0.26	0.24	0.27	0.25
Mean GPCP (mm/day)	0.26	0.14	0.10	0.23	0.18
Std. dev. SPP (mm/d...	0.29	0.36	0.35	0.38	0.35
Std. dev. SPP (mm/d...	0.38	0.24	0.18	0.38	0.31
Bias (%)	-13.04	85.32	135.18	13.79	35.43
MSE from mean	0.00	0.01	0.02	0.00	0.00
MSE from variance	0.01	0.01	0.03	0.00	0.00
MSE from correlation	0.15	0.09	0.02	0.09	0.10
MSE	0.16	0.12	0.07	0.09	0.11
RMSE	0.40	0.34	0.26	0.29	0.33
Correlation coeff.	0.306	0.473	0.860	0.703	0.526
Nash-Sutcliffe Eff.	-0.110	-1.098	-1.103	0.388	-0.109
Max. SPP rainfall	2.26	2.96	2.90	4.01	4.01
Max. GPCP rainfall	2.85	2.64	1.67	4.25	4.25
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure A-2. CMORH band A.



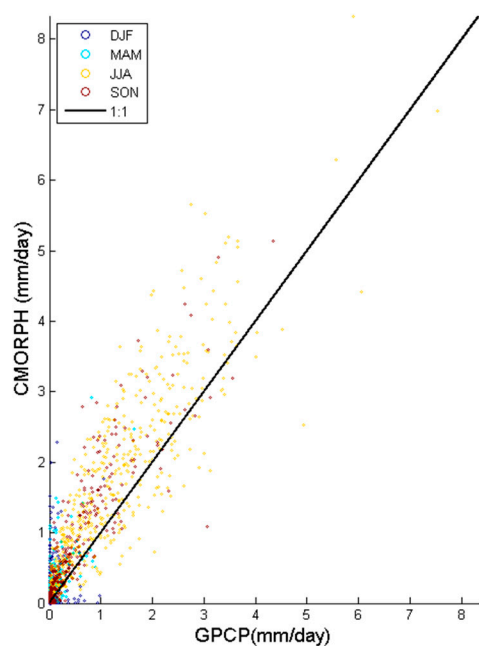
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.20	0.23	0.18	0.25	0.22
Mean GPCP (mm/day)	0.26	0.14	0.10	0.23	0.18
Std. dev. SPP (mm/d...	0.40	0.40	0.33	0.43	0.39
Std. dev. SPP (mm/d...	0.38	0.24	0.18	0.38	0.31
Bias (%)	-20.73	65.02	71.00	8.64	18.08
MSE from mean	0.00	0.01	0.01	0.00	0.00
MSE from variance	0.00	0.03	0.02	0.00	0.01
MSE from correlation	0.15	0.09	0.02	0.09	0.10
MSE	0.16	0.12	0.05	0.09	0.10
RMSE	0.39	0.35	0.21	0.30	0.32
Correlation coeff.	0.494	0.547	0.841	0.726	0.606
Nash-Sutcliffe Eff.	-0.070	-1.167	-0.433	0.353	-0.062
Max. SPP rainfall	3.32	2.69	2.73	4.25	4.25
Max. GPCP rainfall	2.85	2.64	1.67	4.25	4.25
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure A-3. PERSIANN band A.



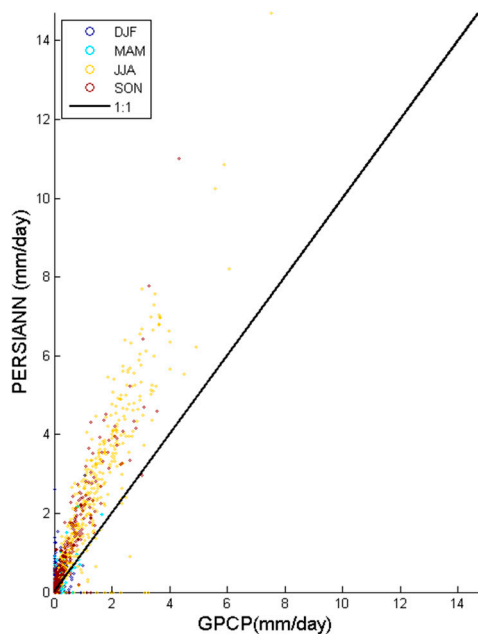
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.03	0.06	1.66	0.47	0.56
Mean GPCP (mm/day)	0.03	0.06	1.14	0.32	0.39
Std. dev. SPP (mm/d...	0.05	0.13	1.42	0.83	1.06
Std. dev. SPP (mm/d...	0.11	0.14	1.07	0.60	0.77
Bias (%)	-14.56	4.94	46.38	45.66	43.23
MSE from mean	0.00	0.00	0.28	0.02	0.03
MSE from variance	0.00	0.00	0.12	0.06	0.09
MSE from correlation	0.01	0.01	0.32	0.07	0.11
MSE	0.01	0.01	0.72	0.15	0.22
RMSE	0.10	0.10	0.85	0.38	0.47
Correlation coeff.	0.329	0.699	0.896	0.930	0.934
Nash-Sutcliffe Eff.	0.089	0.436	0.377	0.584	0.619
Max. SPP rainfall	0.51	1.74	8.55	6.11	8.55
Max. GPCP rainfall	1.06	1.64	7.52	4.34	7.52
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure A-4. TMPA Band B.



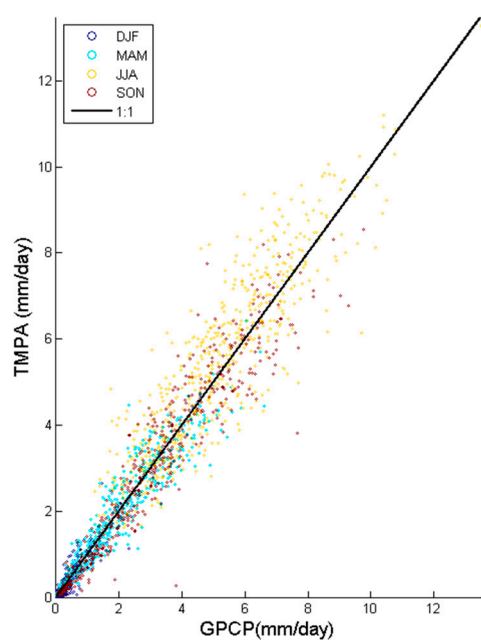
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.13	0.16	1.54	0.51	0.59
Mean GPCP (mm/day)	0.03	0.06	1.14	0.32	0.39
Std. dev. SPP (mm/d...	0.26	0.28	1.25	0.82	0.96
Std. dev. SPP (mm/d...	0.11	0.14	1.07	0.60	0.77
Bias (%)	275.75	153.20	35.77	57.19	50.15
MSE from mean	0.01	0.01	0.16	0.03	0.04
MSE from variance	0.02	0.02	0.03	0.05	0.04
MSE from correlation	0.05	0.02	0.33	0.09	0.13
MSE	0.08	0.05	0.53	0.17	0.21
RMSE	0.28	0.23	0.73	0.42	0.46
Correlation coeff.	0.191	0.686	0.876	0.907	0.910
Nash-Sutcliffe Eff.	-5.846	-1.697	0.540	0.511	0.643
Max. SPP rainfall	2.29	2.92	8.33	5.14	8.33
Max. GPCP rainfall	1.06	1.64	7.52	4.34	7.52
Min. SPP rainfall	0.00	0.00	0.01	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure A-5. CMORPH band B.



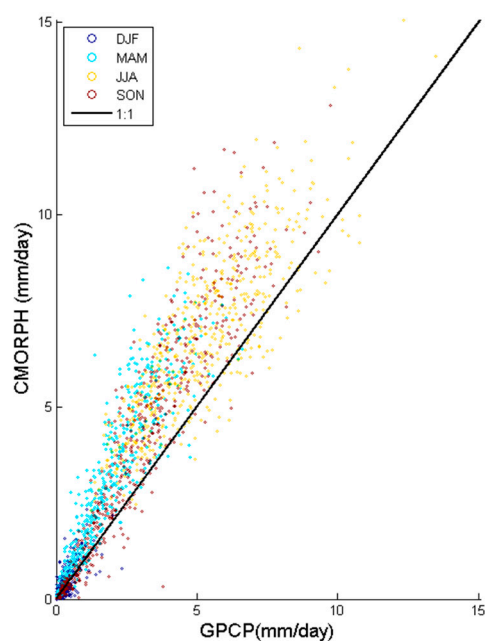
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.11	0.10	2.08	0.65	0.74
Mean GPCP (mm/day)	0.03	0.06	1.14	0.32	0.39
Std. dev. SPP (mm/d...	0.27	0.23	1.95	1.16	1.41
Std. dev. SPP (mm/d...	0.11	0.14	1.07	0.60	0.77
Bias (%)	220.00	68.23	83.18	102.77	89.62
MSE from mean	0.01	0.00	0.89	0.11	0.12
MSE from variance	0.03	0.01	0.78	0.32	0.41
MSE from correlation	0.04	0.02	0.37	0.08	0.13
MSE	0.07	0.03	2.04	0.51	0.66
RMSE	0.26	0.16	1.43	0.72	0.81
Correlation coeff.	0.376	0.741	0.912	0.939	0.940
Nash-Sutcliffe Eff.	-4.784	-0.405	-0.765	-0.437	-0.131
Max. SPP rainfall	2.96	2.18	14.71	11.01	14.71
Max. GPCP rainfall	1.06	1.64	7.52	4.34	7.52
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure A-6. PERSIANN band B.



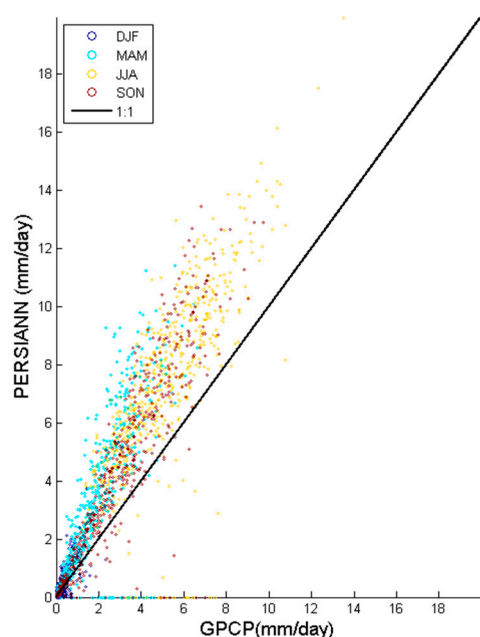
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.26	1.89	5.50	2.89	2.64
Mean GPCP (mm/day)	0.24	1.93	5.19	2.97	2.59
Std. dev. SPP (mm/d...	0.31	1.23	2.03	2.09	2.48
Std. dev. SPP (mm/d...	0.29	1.33	2.00	2.12	2.41
Bias (%)	4.67	-1.91	5.88	-2.74	1.93
MSE from mean	0.00	0.00	0.09	0.01	0.00
MSE from variance	0.00	0.01	0.00	0.00	0.01
MSE from correlation	0.02	0.18	0.93	0.38	0.40
MSE	0.02	0.19	1.02	0.38	0.41
RMSE	0.16	0.44	1.01	0.62	0.64
Correlation coeff.	0.869	0.944	0.886	0.957	0.967
Nash-Sutcliffe Eff.	0.715	0.891	0.743	0.914	0.930
Max. SPP rainfall	2.64	6.43	13.29	8.54	13.29
Max. GPCP rainfall	2.32	6.60	13.48	9.75	13.48
Min. SPP rainfall	0.02	0.04	1.61	0.04	0.02
Min. GPCP rainfall	0.00	0.00	1.22	0.03	0.00

Figure A-7. TMPA Band C.



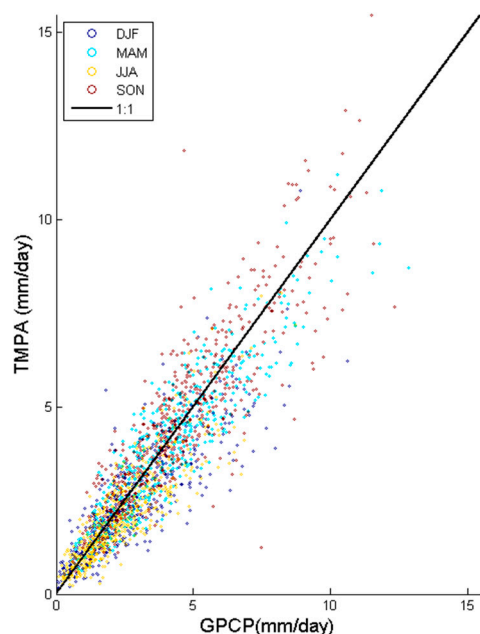
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.31	3.08	6.83	4.02	3.57
Mean GPCP (mm/day)	0.24	1.93	5.19	2.97	2.59
Std. dev. SPP (mm/d...	0.38	2.04	2.14	3.00	3.14
Std. dev. SPP (mm/d...	0.29	1.33	2.00	2.12	2.41
Bias (%)	27.98	59.77	31.46	35.29	37.77
MSE from mean	0.00	1.32	2.67	1.10	0.96
MSE from variance	0.01	0.50	0.02	0.78	0.54
MSE from correlation	0.05	0.53	1.55	0.79	0.84
MSE	0.06	2.36	4.23	2.66	2.34
RMSE	0.25	1.53	2.06	1.63	1.53
Correlation coeff.	0.771	0.901	0.819	0.938	0.944
Nash-Sutcliffe Eff.	0.261	-0.334	-0.064	0.404	0.597
Max. SPP rainfall	2.73	8.62	15.07	12.84	15.07
Max. GPCP rainfall	2.32	6.60	13.48	9.75	13.48
Min. SPP rainfall	0.00	0.07	2.31	0.03	0.00
Min. GPCP rainfall	0.00	0.00	1.22	0.03	0.00

Figure A-8. CMORPH band C.



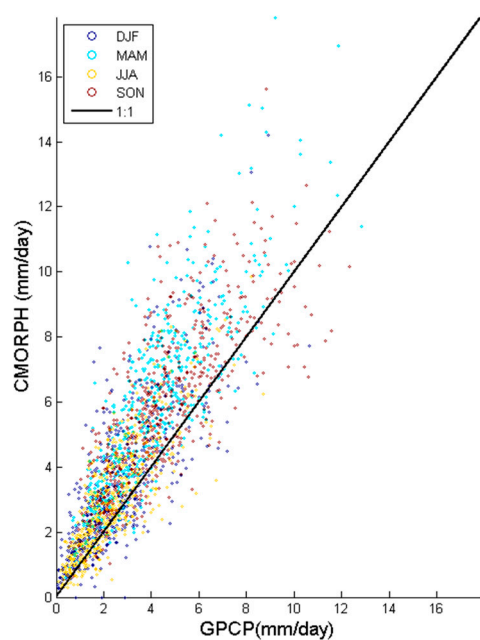
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.31	3.27	7.50	4.26	3.85
Mean GPCP (mm/day)	0.24	1.93	5.19	2.97	2.59
Std. dev. SPP (mm/d...	0.45	2.58	2.99	3.29	3.64
Std. dev. SPP (mm/d...	0.29	1.33	2.00	2.12	2.41
Bias (%)	29.09	69.63	44.39	43.51	48.50
MSE from mean	0.01	1.80	5.31	1.67	1.58
MSE from variance	0.02	1.56	0.98	1.37	1.51
MSE from correlation	0.06	1.46	2.91	1.32	1.54
MSE	0.09	4.82	9.20	4.36	4.64
RMSE	0.30	2.20	3.03	2.09	2.15
Correlation coeff.	0.768	0.787	0.756	0.905	0.912
Nash-Sutcliffe Eff.	-0.042	-1.729	-1.311	0.025	0.200
Max. SPP rainfall	3.74	11.40	19.93	13.42	19.93
Max. GPCP rainfall	2.32	6.60	13.48	9.75	13.48
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	1.22	0.03	0.00

Figure A-9. PERSIANN band C.



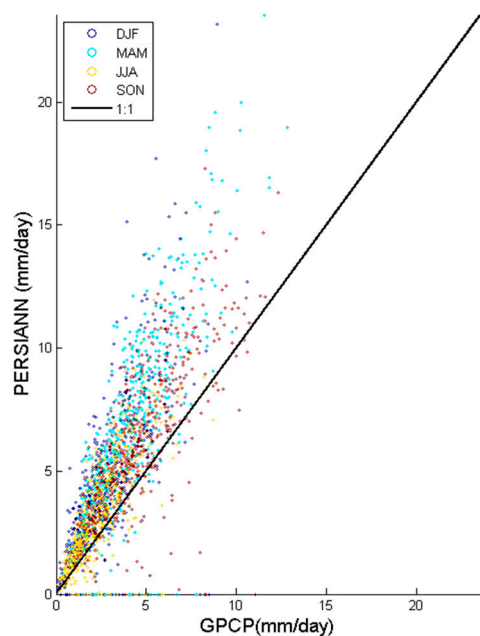
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	2.35	3.90	2.10	4.72	3.27
Mean GPCP (mm/day)	2.64	4.02	2.35	4.60	3.40
Std. dev. SPP (mm/d...	1.45	1.86	1.24	2.22	2.04
Std. dev. SPP (mm/d...	1.78	2.07	1.44	2.21	2.11
Bias (%)	-10.82	-3.02	-10.84	2.55	-4.00
MSE from mean	0.08	0.01	0.06	0.01	0.02
MSE from variance	0.11	0.04	0.04	0.00	0.00
MSE from correlation	0.74	0.69	0.47	1.30	0.86
MSE	0.93	0.75	0.57	1.31	0.89
RMSE	0.96	0.86	0.75	1.14	0.94
Correlation coeff.	0.857	0.911	0.869	0.868	0.900
Nash-Sutcliffe Eff.	0.707	0.826	0.723	0.730	0.801
Max. SPP rainfall	10.78	11.19	8.05	15.46	15.46
Max. GPCP rainfall	10.62	12.85	8.70	12.33	12.85
Min. SPP rainfall	0.15	0.50	0.22	0.59	0.15
Min. GPCP rainfall	0.06	0.39	0.10	0.59	0.06

Figure A-10. TMPA Band D.



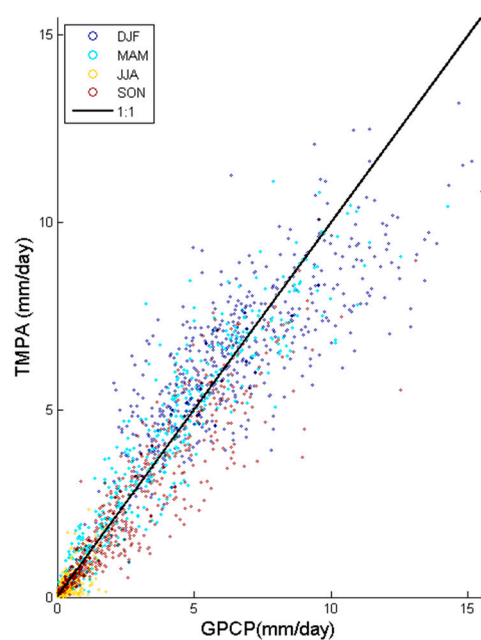
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	3.53	5.75	2.98	5.90	4.54
Mean GPCP (mm/day)	2.64	4.02	2.35	4.60	3.40
Std. dev. SPP (mm/d...	2.29	2.72	1.70	2.38	2.64
Std. dev. SPP (mm/d...	1.78	2.07	1.44	2.21	2.11
Bias (%)	33.63	43.13	26.95	28.28	33.49
MSE from mean	0.79	3.01	0.40	1.69	1.30
MSE from variance	0.25	0.42	0.07	0.03	0.28
MSE from correlation	1.68	1.73	0.87	2.38	1.75
MSE	2.72	5.16	1.34	4.10	3.33
RMSE	1.65	2.27	1.16	2.02	1.82
Correlation coeff.	0.794	0.847	0.822	0.773	0.843
Nash-Sutcliffe Eff.	0.144	-0.202	0.349	0.157	0.255
Max. SPP rainfall	14.20	17.83	9.86	15.63	17.83
Max. GPCP rainfall	10.62	12.85	8.70	12.33	12.85
Min. SPP rainfall	0.00	0.60	0.28	0.62	0.00
Min. GPCP rainfall	0.06	0.39	0.10	0.59	0.06

Figure A-11. CMORPH Band D.



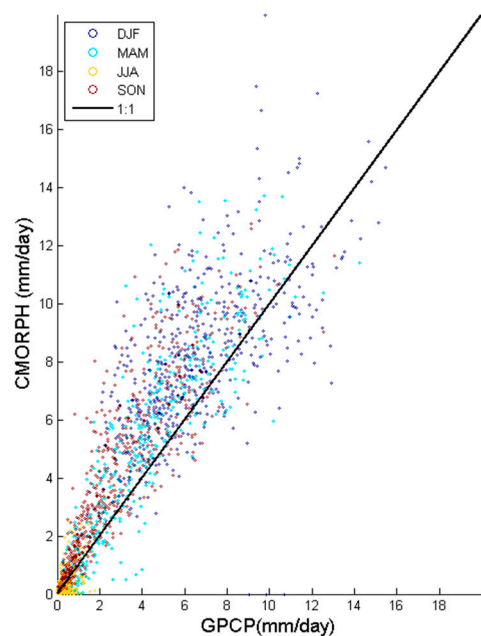
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	4.34	6.50	3.22	6.13	5.05
Mean GPCP (mm/day)	2.64	4.02	2.35	4.60	3.40
Std. dev. SPP (mm/d...	3.26	3.87	2.11	3.03	3.41
Std. dev. SPP (mm/d...	1.78	2.07	1.44	2.21	2.11
Bias (%)	64.45	61.75	37.08	33.25	48.38
MSE from mean	2.89	6.16	0.76	2.34	2.71
MSE from variance	2.19	3.25	0.46	0.67	1.67
MSE from correlation	2.39	3.50	1.31	3.36	2.94
MSE	7.48	12.92	2.53	6.37	7.32
RMSE	2.73	3.59	1.59	2.52	2.71
Correlation coeff.	0.795	0.782	0.784	0.748	0.796
Nash-Sutcliffe Eff.	-1.351	-2.010	-0.228	-0.309	-0.637
Max. SPP rainfall	23.16	23.55	11.98	17.28	23.55
Max. GPCP rainfall	10.62	12.85	8.70	12.33	12.85
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.06	0.39	0.10	0.59	0.06

Figure A-12. PERSIANN band D.



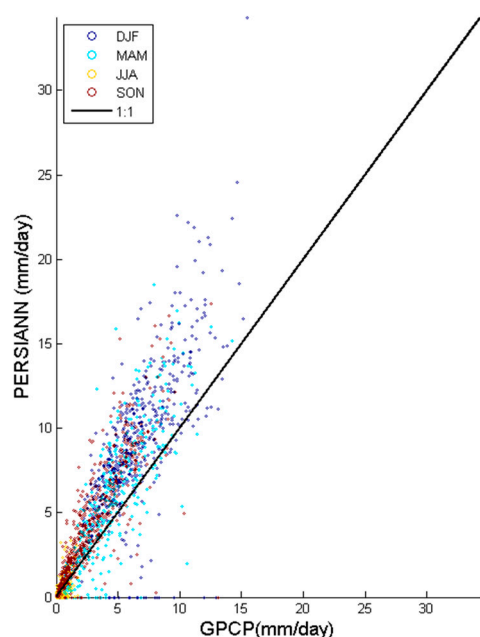
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	6.45	3.34	0.22	2.47	3.11
Mean GPCP (mm/day)	6.50	3.24	0.25	2.83	3.19
Std. dev. SPP (mm/d...	1.92	2.75	0.31	1.99	2.97
Std. dev. SPP (mm/d...	2.68	2.85	0.34	2.30	3.17
Bias (%)	-0.77	3.21	-12.05	-12.62	-2.59
MSE from mean	0.00	0.01	0.00	0.13	0.01
MSE from variance	0.57	0.01	0.00	0.10	0.04
MSE from correlation	2.13	0.75	0.06	0.80	1.08
MSE	2.70	0.77	0.06	1.03	1.13
RMSE	1.64	0.88	0.25	1.01	1.06
Correlation coeff.	0.793	0.952	0.710	0.912	0.942
Nash-Sutcliffe Eff.	0.623	0.905	0.454	0.805	0.888
Max. SPP rainfall	13.18	11.11	2.33	10.08	13.18
Max. GPCP rainfall	15.48	14.24	1.78	13.07	15.48
Min. SPP rainfall	1.78	0.03	0.00	0.07	0.00
Min. GPCP rainfall	1.00	0.00	0.00	0.02	0.00

Figure A-13. TMPA band E.



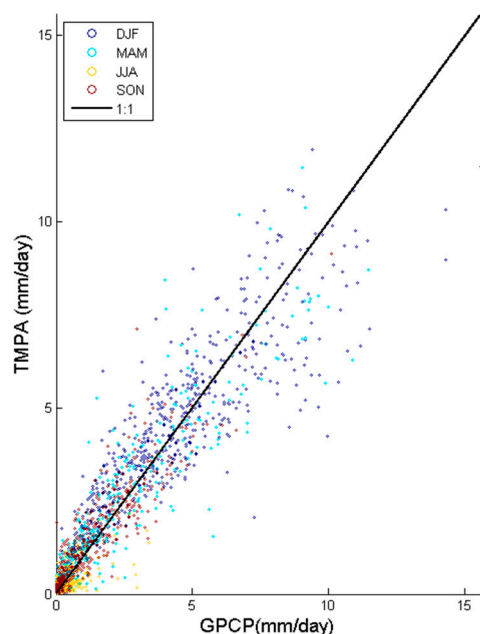
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	8.08	4.01	0.27	4.05	4.09
Mean GPCP (mm/day)	6.50	3.24	0.25	2.83	3.19
Std. dev. SPP (mm/d...	2.63	3.50	0.44	2.93	3.82
Std. dev. SPP (mm/d...	2.68	2.85	0.34	2.30	3.17
Bias (%)	24.33	24.00	10.54	43.04	28.12
MSE from mean	2.50	0.60	0.00	1.49	0.80
MSE from variance	0.00	0.43	0.01	0.40	0.42
MSE from correlation	5.38	1.73	0.10	1.77	2.36
MSE	7.88	2.76	0.11	3.66	3.58
RMSE	2.81	1.66	0.33	1.91	1.89
Correlation coeff.	0.619	0.913	0.676	0.868	0.903
Nash-Sutcliffe Eff.	-0.100	0.659	0.070	0.305	0.645
Max. SPP rainfall	19.97	13.72	2.95	12.78	19.97
Max. GPCP rainfall	15.48	14.24	1.78	13.07	15.48
Min. SPP rainfall	0.00	0.00	0.00	0.04	0.00
Min. GPCP rainfall	1.00	0.00	0.00	0.02	0.00

Figure A-14. CMORPH band E.



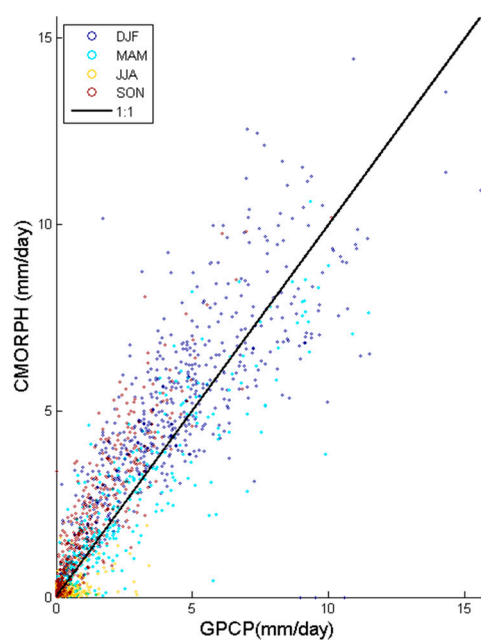
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	8.98	4.11	0.25	4.24	4.37
Mean GPCP (mm/day)	6.50	3.24	0.25	2.83	3.19
Std. dev. SPP (mm/d...	4.28	4.03	0.53	3.40	4.60
Std. dev. SPP (mm/d...	2.68	2.85	0.34	2.30	3.17
Bias (%)	38.11	27.00	0.26	49.75	37.11
MSE from mean	6.14	0.76	0.00	1.99	1.40
MSE from variance	2.58	1.39	0.04	1.22	2.02
MSE from correlation	6.81	2.50	0.12	2.45	3.03
MSE	15.53	4.66	0.15	5.66	6.45
RMSE	3.94	2.16	0.39	2.38	2.54
Correlation coeff.	0.703	0.891	0.675	0.843	0.896
Nash-Sutcliffe Eff.	-1.168	0.426	-0.332	-0.074	0.359
Max. SPP rainfall	34.33	18.50	3.35	17.40	34.33
Max. GPCP rainfall	15.48	14.24	1.78	13.07	15.48
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	1.00	0.00	0.00	0.02	0.00

Figure A-15. PERSIANN band E.



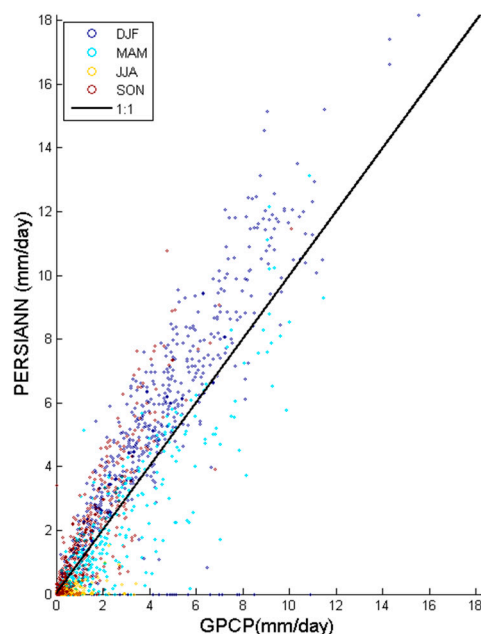
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	4.56	1.70	0.24	1.23	1.92
Mean GPCP (mm/day)	4.44	1.60	0.25	1.10	1.84
Std. dev. SPP (mm/d...	2.21	2.07	0.27	1.29	2.30
Std. dev. SPP (mm/d...	2.67	2.22	0.46	1.34	2.44
Bias (%)	2.51	5.70	-3.24	11.66	4.38
MSE from mean	0.01	0.01	0.00	0.02	0.01
MSE from variance	0.21	0.02	0.03	0.00	0.02
MSE from correlation	1.59	0.67	0.08	0.30	0.70
MSE	1.82	0.70	0.11	0.31	0.73
RMSE	1.35	0.83	0.34	0.56	0.85
Correlation coeff.	0.865	0.927	0.677	0.914	0.937
Nash-Sutcliffe Eff.	0.745	0.858	0.452	0.824	0.877
Max. SPP rainfall	11.94	11.44	2.18	9.14	11.94
Max. GPCP rainfall	15.56	11.44	3.42	10.09	15.56
Min. SPP rainfall	0.04	0.03	0.02	0.04	0.02
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure A-16. TMPA band F.



STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	5.11	1.56	0.16	1.69	2.12
Mean GPCP (mm/day)	4.44	1.60	0.25	1.10	1.84
Std. dev. SPP (mm/d...	2.46	1.99	0.20	1.84	2.58
Std. dev. SPP (mm/d...	2.67	2.22	0.46	1.34	2.44
Bias (%)	15.07	-2.64	-36.64	52.75	15.03
MSE from mean	0.45	0.00	0.01	0.34	0.08
MSE from variance	0.04	0.05	0.06	0.25	0.02
MSE from correlation	2.85	0.74	0.09	0.43	1.23
MSE	3.35	0.79	0.16	1.03	1.32
RMSE	1.83	0.89	0.40	1.01	1.15
Correlation coeff.	0.783	0.916	0.537	0.912	0.903
Nash-Sutcliffe Eff.	0.530	0.838	0.239	0.425	0.778
Max. SPP rainfall	14.44	10.61	1.94	10.19	14.44
Max. GPCP rainfall	15.56	11.44	3.42	10.09	15.56
Min. SPP rainfall	0.00	0.01	0.01	0.01	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure A-17. CMORPH band F.



STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	5.44	1.32	0.04	1.49	2.06
Mean GPCP (mm/day)	4.44	1.60	0.25	1.10	1.84
Std. dev. SPP (mm/d...	3.33	2.08	0.12	1.97	2.98
Std. dev. SPP (mm/d...	2.67	2.22	0.46	1.34	2.44
Bias (%)	22.48	-17.46	-84.20	34.90	11.89
MSE from mean	1.00	0.08	0.05	0.15	0.05
MSE from variance	0.43	0.02	0.11	0.40	0.29
MSE from correlation	2.79	0.81	0.05	0.51	1.25
MSE	4.22	0.90	0.21	1.07	1.59
RMSE	2.05	0.95	0.46	1.03	1.26
Correlation coeff.	0.843	0.913	0.547	0.903	0.914
Nash-Sutcliffe Eff.	0.406	0.816	-0.004	0.403	0.733
Max. SPP rainfall	18.18	13.12	1.53	11.47	18.18
Max. GPCP rainfall	15.56	11.44	3.42	10.09	15.56
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure A-18. PERSIANN band F.

B. Raw Estimates Error Analysis for Koppen Geiger Climatic Zones

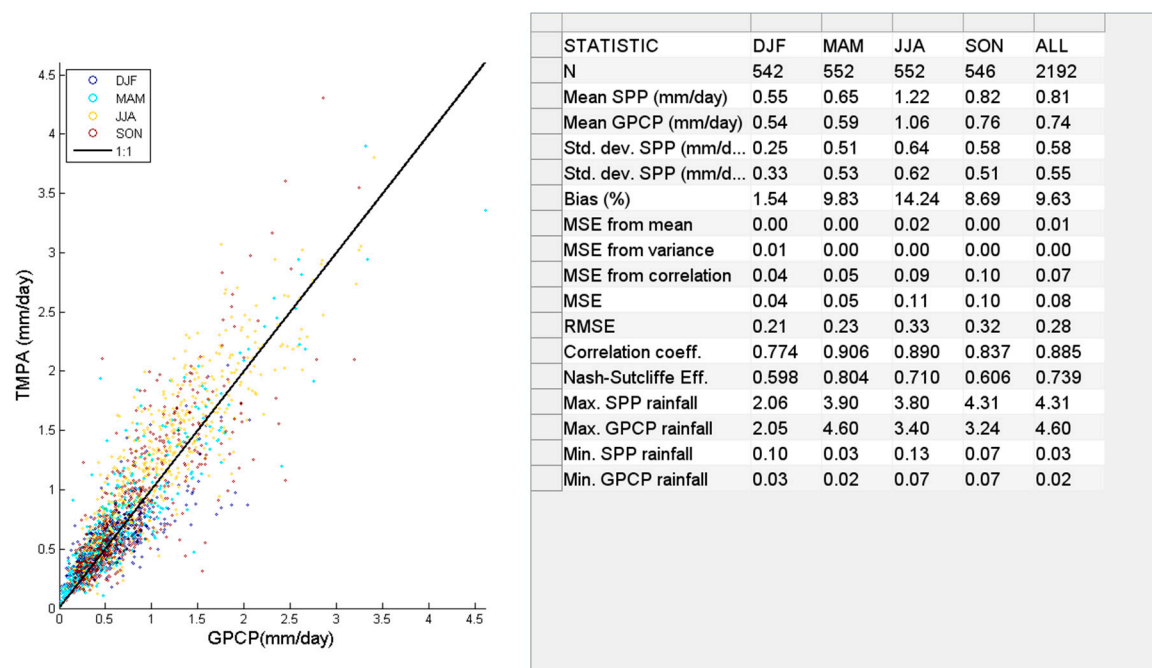


Figure B-1. Arid zones, TMPA.

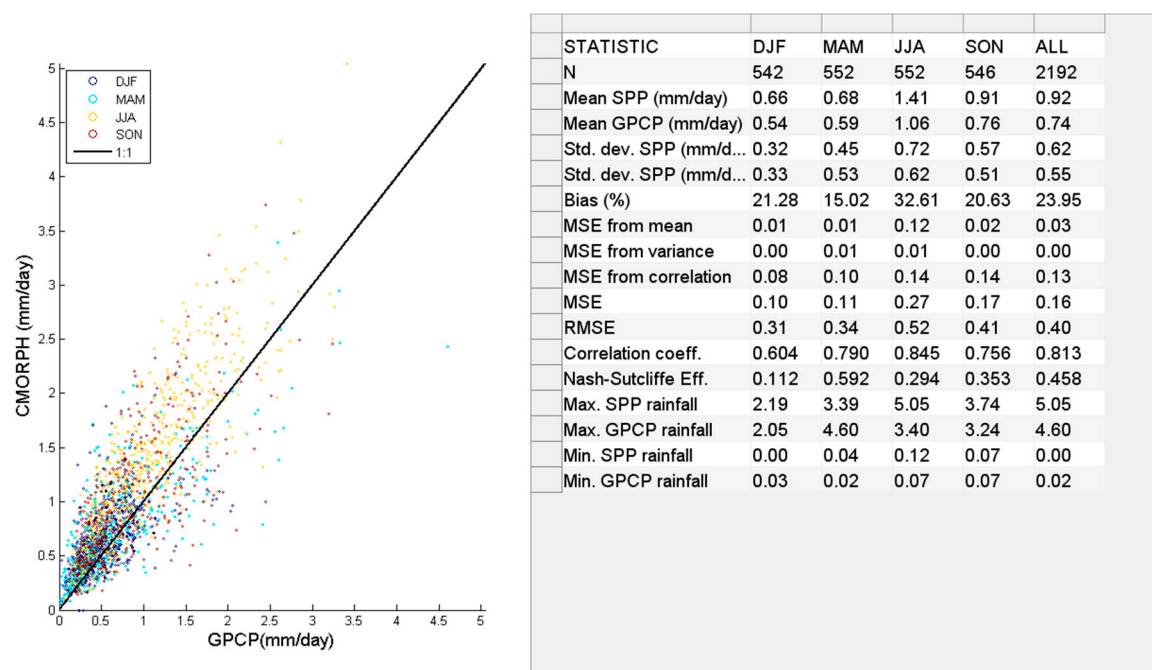
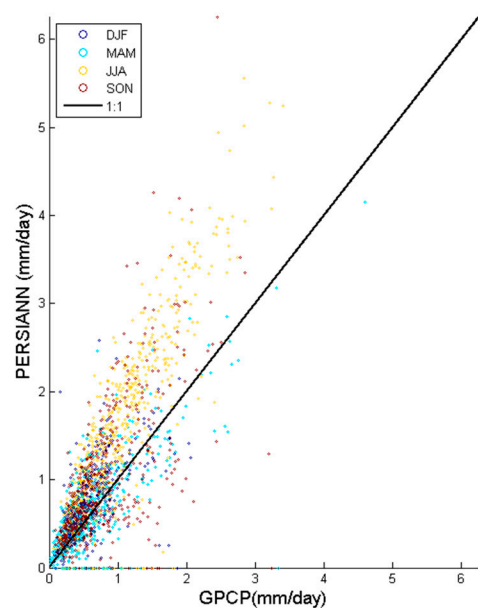
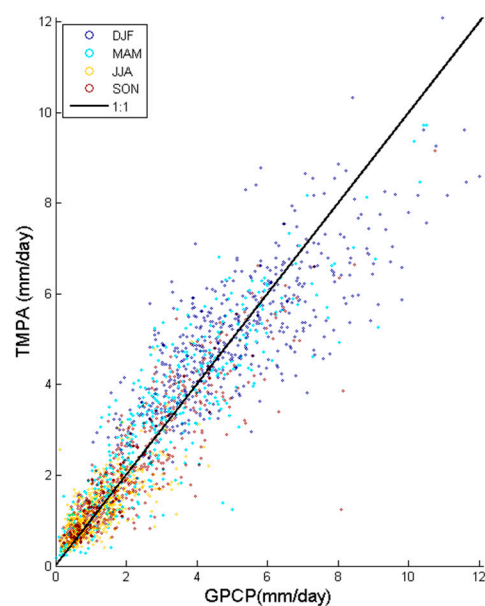


Figure B-2. Arid zones, CMORPH.



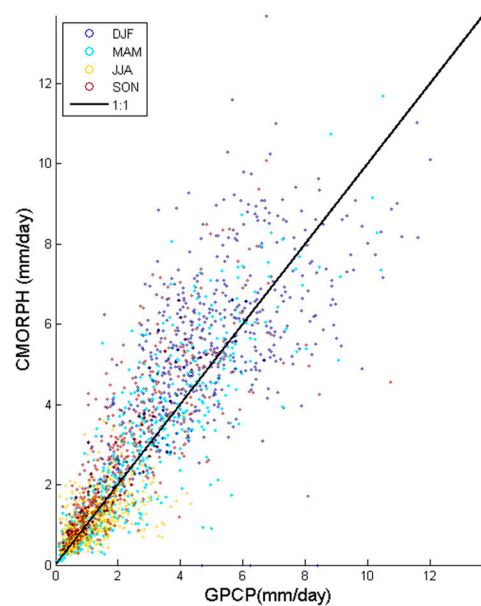
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.67	0.61	1.67	0.95	0.98
Mean GPCP (mm/day)	0.54	0.59	1.06	0.76	0.74
Std. dev. SPP (mm/d...	0.41	0.52	1.02	0.75	0.83
Std. dev. SPP (mm/d...	0.33	0.53	0.62	0.51	0.55
Bias (%)	23.93	3.48	56.49	25.50	31.99
MSE from mean	0.02	0.00	0.36	0.04	0.06
MSE from variance	0.01	0.00	0.16	0.06	0.08
MSE from correlation	0.10	0.13	0.18	0.26	0.19
MSE	0.12	0.13	0.70	0.36	0.33
RMSE	0.35	0.36	0.84	0.60	0.57
Correlation coeff.	0.642	0.771	0.859	0.663	0.791
Nash-Sutcliffe Eff.	-0.097	0.543	-0.839	-0.340	-0.086
Max. SPP rainfall	2.58	4.15	5.55	6.26	6.26
Max. GPCP rainfall	2.05	4.60	3.40	3.24	4.60
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.03	0.02	0.07	0.07	0.02

Figure B-3. Arid zones, PERSIANN.



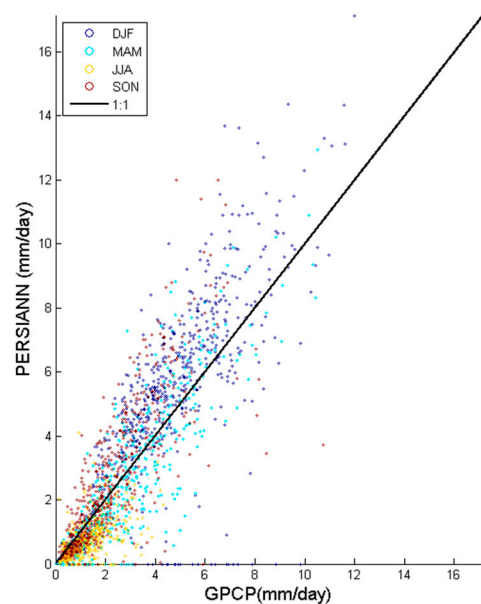
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	5.00	2.67	1.22	2.17	2.76
Mean GPCP (mm/day)	4.96	2.55	1.17	2.20	2.71
Std. dev. SPP (mm/d...	1.50	1.86	0.59	1.40	1.98
Std. dev. SPP (mm/d...	2.00	1.98	0.74	1.60	2.16
Bias (%)	0.77	4.73	4.02	-1.70	1.56
MSE from mean	0.00	0.01	0.00	0.00	0.00
MSE from variance	0.25	0.01	0.02	0.04	0.03
MSE from correlation	1.19	0.62	0.23	0.49	0.68
MSE	1.44	0.65	0.25	0.54	0.72
RMSE	1.20	0.81	0.50	0.73	0.85
Correlation coeff.	0.801	0.916	0.740	0.890	0.920
Nash-Sutcliffe Eff.	0.639	0.835	0.539	0.791	0.847
Max. SPP rainfall	12.10	9.73	4.95	9.15	12.10
Max. GPCP rainfall	12.01	10.50	4.33	10.74	12.01
Min. SPP rainfall	0.96	0.19	0.32	0.32	0.19
Min. GPCP rainfall	0.64	0.02	0.12	0.11	0.02

Figure B-4. Warm zones, TMPA.



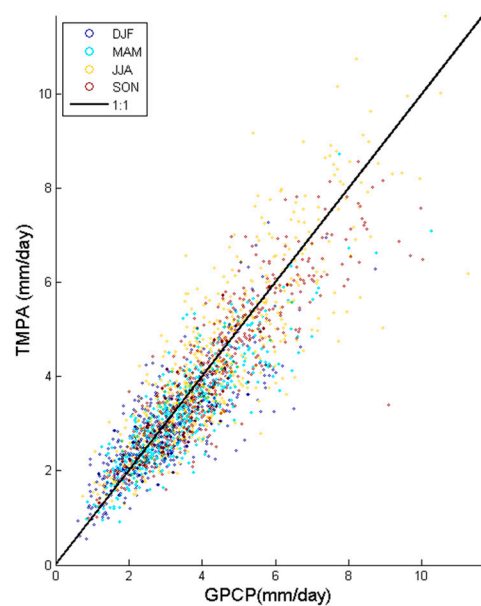
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	5.49	2.64	1.11	2.67	2.97
Mean GPCP (mm/day)	4.96	2.55	1.17	2.20	2.71
Std. dev. SPP (mm/d...	1.88	2.05	0.57	1.83	2.31
Std. dev. SPP (mm/d...	2.00	1.98	0.74	1.60	2.16
Bias (%)	10.72	3.44	-5.58	21.10	9.32
MSE from mean	0.28	0.01	0.00	0.22	0.06
MSE from variance	0.01	0.01	0.03	0.05	0.02
MSE from correlation	2.97	1.04	0.37	1.18	1.45
MSE	3.26	1.05	0.41	1.45	1.53
RMSE	1.81	1.02	0.64	1.20	1.24
Correlation coeff.	0.605	0.872	0.553	0.798	0.855
Nash-Sutcliffe Eff.	0.183	0.732	0.253	0.434	0.671
Max. SPP rainfall	13.69	11.69	3.74	10.07	13.69
Max. GPCP rainfall	12.01	10.50	4.33	10.74	12.01
Min. SPP rainfall	0.00	0.08	0.24	0.28	0.00
Min. GPCP rainfall	0.64	0.02	0.12	0.11	0.02

Figure B-5. Warm zones, CMORPH.



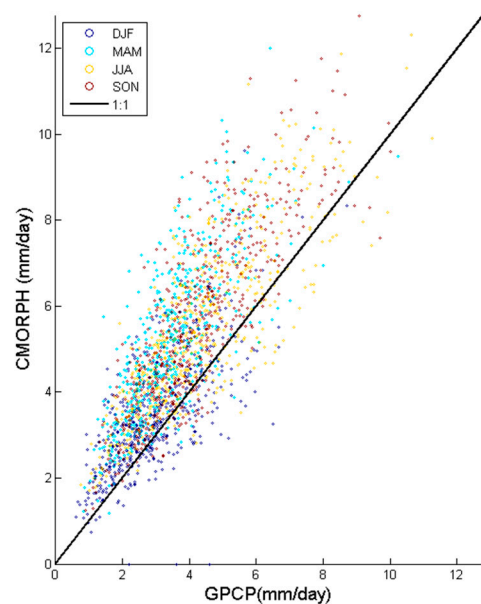
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	5.75	2.32	0.72	2.55	2.82
Mean GPCP (mm/day)	4.96	2.55	1.17	2.20	2.71
Std. dev. SPP (mm/d...	2.64	2.25	0.56	2.21	2.76
Std. dev. SPP (mm/d...	2.00	1.98	0.74	1.60	2.16
Bias (%)	15.95	-9.01	-38.81	15.63	4.01
MSE from mean	0.63	0.05	0.21	0.12	0.01
MSE from variance	0.42	0.07	0.03	0.37	0.36
MSE from correlation	3.50	1.03	0.33	1.39	1.65
MSE	4.54	1.15	0.57	1.88	2.02
RMSE	2.13	1.07	0.75	1.37	1.42
Correlation coeff.	0.669	0.884	0.603	0.804	0.861
Nash-Sutcliffe Eff.	-0.137	0.706	-0.039	0.265	0.566
Max. SPP rainfall	17.14	12.93	4.12	12.00	17.14
Max. GPCP rainfall	12.01	10.50	4.33	10.74	12.01
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.64	0.02	0.12	0.11	0.02

Figure B-6. Warm zones, PERSIANN.



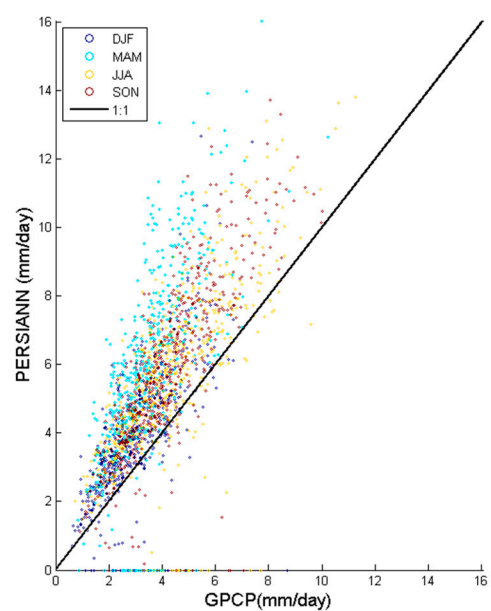
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	2.85	3.21	4.38	4.04	3.62
Mean GPCP (mm/day)	2.96	3.42	4.37	4.24	3.75
Std. dev. SPP (mm/d...	1.00	1.03	1.79	1.48	1.50
Std. dev. SPP (mm/d...	1.23	1.26	1.80	1.63	1.61
Bias (%)	-3.84	-5.93	0.05	-4.59	-3.39
MSE from mean	0.01	0.04	0.00	0.04	0.02
MSE from variance	0.05	0.05	0.00	0.02	0.01
MSE from correlation	0.47	0.36	0.94	0.53	0.60
MSE	0.54	0.46	0.94	0.59	0.63
RMSE	0.73	0.68	0.97	0.77	0.79
Correlation coeff.	0.809	0.862	0.854	0.891	0.875
Nash-Sutcliffe Eff.	0.645	0.715	0.710	0.780	0.757
Max. SPP rainfall	7.26	8.73	11.66	8.55	11.66
Max. GPCP rainfall	8.72	10.24	11.27	10.02	11.27
Min. SPP rainfall	0.56	0.93	1.25	1.00	0.56
Min. GPCP rainfall	0.62	0.84	0.74	0.89	0.62

Figure B-7. Tropical zones, TMPA.



STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	3.51	5.14	5.59	5.68	4.99
Mean GPCP (mm/day)	2.96	3.42	4.37	4.24	3.75
Std. dev. SPP (mm/d...	1.32	1.76	1.92	2.06	1.99
Std. dev. SPP (mm/d...	1.23	1.26	1.80	1.63	1.61
Bias (%)	18.54	50.52	27.83	33.92	32.93
MSE from mean	0.30	2.98	1.48	2.07	1.53
MSE from variance	0.01	0.24	0.01	0.18	0.14
MSE from correlation	0.97	1.10	1.28	1.18	1.29
MSE	1.28	4.33	2.78	3.43	2.96
RMSE	1.13	2.08	1.67	1.85	1.72
Correlation coeff.	0.700	0.752	0.814	0.826	0.798
Nash-Sutcliffe Eff.	0.153	-1.707	0.143	-0.286	-0.140
Max. SPP rainfall	9.62	12.00	12.32	12.77	12.77
Max. GPCP rainfall	8.72	10.24	11.27	10.02	11.27
Min. SPP rainfall	0.00	1.19	1.71	1.25	0.00
Min. GPCP rainfall	0.62	0.84	0.74	0.89	0.62

Figure B-8. Tropical zones, CMORPH.



STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	3.91	5.68	5.76	5.83	5.30
Mean GPCP (mm/day)	2.96	3.42	4.37	4.24	3.75
Std. dev. SPP (mm/d...	1.82	2.73	2.40	2.45	2.51
Std. dev. SPP (mm/d...	1.23	1.26	1.80	1.63	1.61
Bias (%)	31.80	66.13	31.66	37.53	41.25
MSE from mean	0.89	5.10	1.92	2.53	2.39
MSE from variance	0.35	2.16	0.36	0.67	0.80
MSE from correlation	1.40	2.25	2.42	1.71	2.25
MSE	2.63	9.51	4.69	4.92	5.45
RMSE	1.62	3.08	2.16	2.22	2.33
Correlation coeff.	0.689	0.675	0.721	0.786	0.721
Nash-Sutcliffe Eff.	-0.739	-4.950	-0.446	-0.844	-1.100
Max. SPP rainfall	12.67	16.05	13.81	13.72	16.05
Max. GPCP rainfall	8.72	10.24	11.27	10.02	11.27
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.62	0.84	0.74	0.89	0.62

Figure B-9. Tropical zones, PERSIANN.

C. Raw Estimates Error Analysis for Topographic Classification Zones.

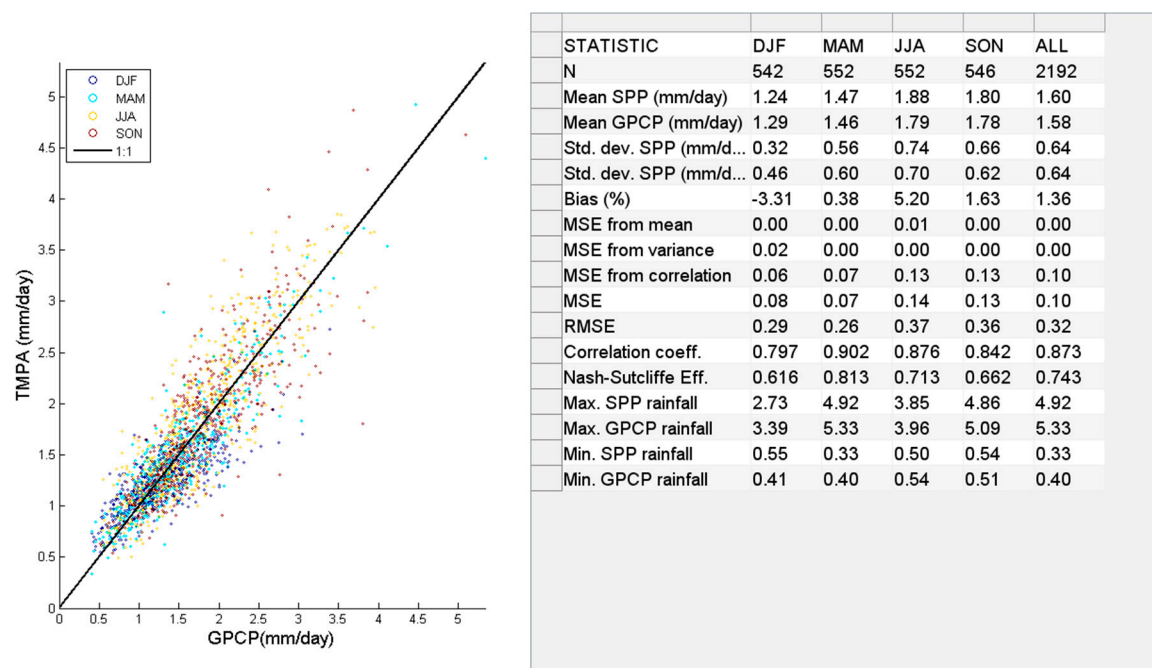


Figure C-1. Flat areas, TMPA.

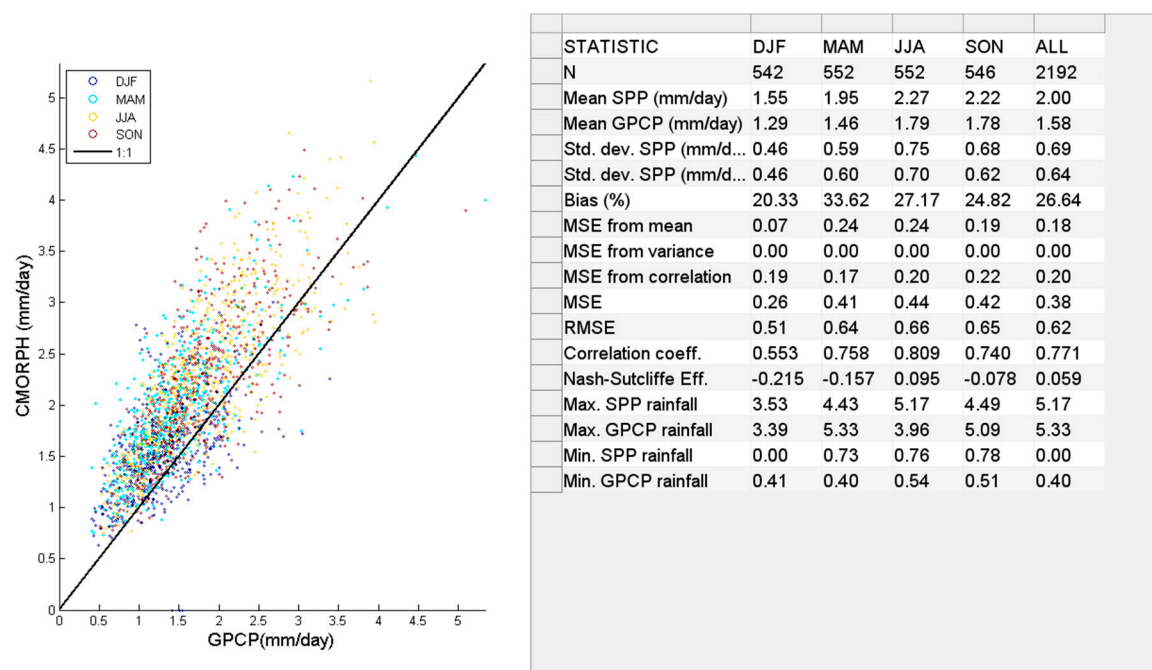
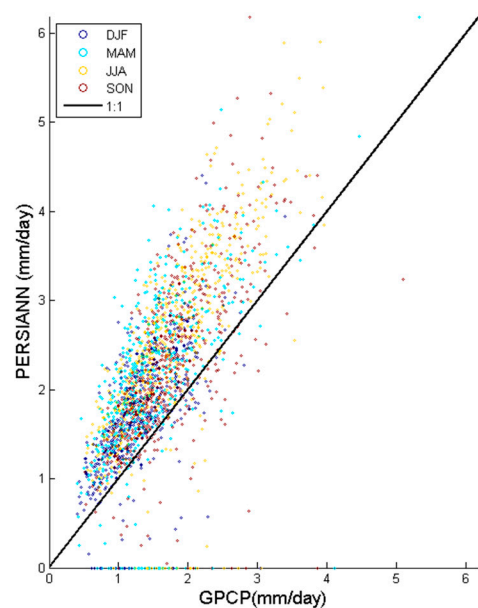
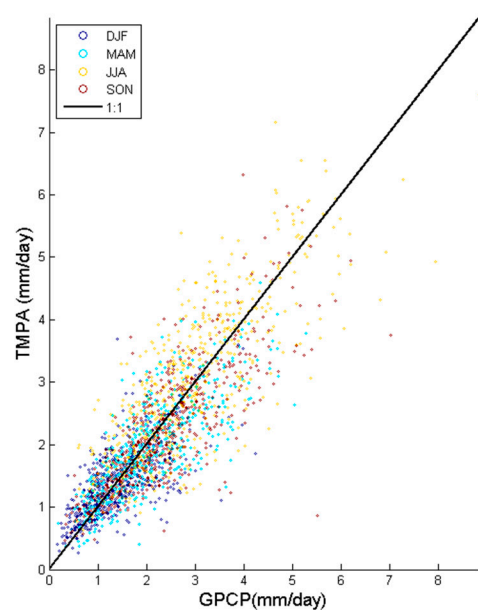


Figure C-2. Flat areas, CMORPH.



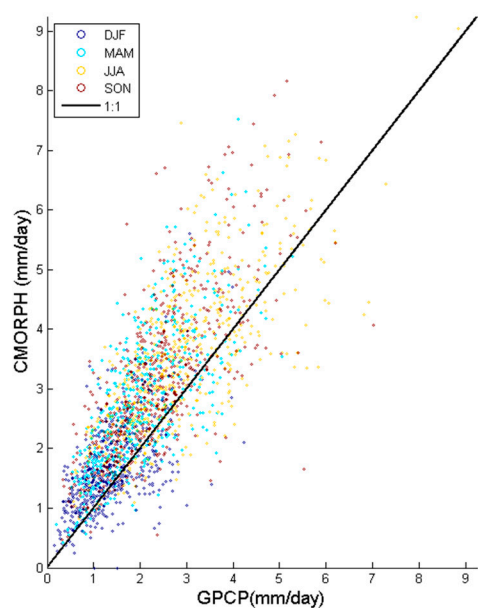
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	1.71	2.06	2.55	2.30	2.16
Mean GPCP (mm/day)	1.29	1.46	1.79	1.78	1.58
Std. dev. SPP (mm/d...	0.70	0.92	1.03	0.93	0.95
Std. dev. SPP (mm/d...	0.46	0.60	0.70	0.62	0.64
Bias (%)	33.37	41.18	42.29	29.26	36.59
MSE from mean	0.18	0.36	0.57	0.27	0.33
MSE from variance	0.06	0.10	0.11	0.09	0.10
MSE from correlation	0.28	0.43	0.38	0.42	0.38
MSE	0.52	0.89	1.06	0.78	0.81
RMSE	0.72	0.94	1.03	0.88	0.90
Correlation coeff.	0.570	0.609	0.735	0.639	0.685
Nash-Sutcliffe Eff.	-1.428	-1.498	-1.206	-1.002	-1.003
Max. SPP rainfall	4.41	6.18	5.91	6.18	6.18
Max. GPCP rainfall	3.39	5.33	3.96	5.09	5.33
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.41	0.40	0.54	0.51	0.40

Figure C-3. Flat areas, PERSIANN.



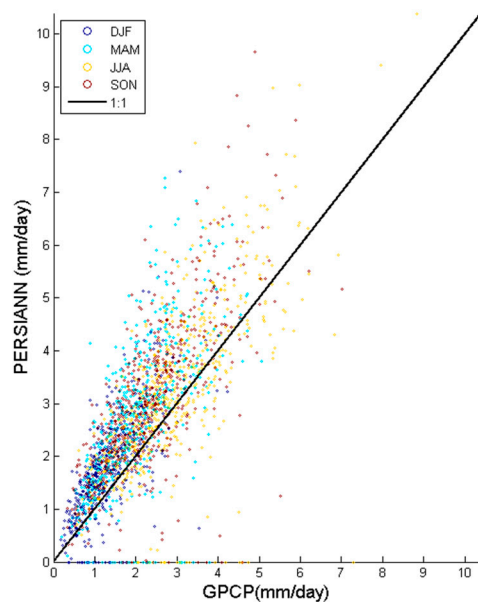
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	1.37	1.89	3.05	2.24	2.14
Mean GPCP (mm/day)	1.38	2.01	2.94	2.39	2.18
Std. dev. SPP (mm/d...	0.55	0.75	1.20	0.95	1.08
Std. dev. SPP (mm/d...	0.68	0.91	1.24	1.07	1.15
Bias (%)	-0.24	-6.13	3.78	-5.96	-1.80
MSE from mean	0.00	0.02	0.01	0.02	0.00
MSE from variance	0.02	0.02	0.00	0.01	0.00
MSE from correlation	0.23	0.28	0.62	0.41	0.41
MSE	0.25	0.32	0.64	0.44	0.41
RMSE	0.50	0.56	0.80	0.67	0.64
Correlation coeff.	0.691	0.795	0.792	0.800	0.837
Nash-Sutcliffe Eff.	0.465	0.613	0.589	0.615	0.688
Max. SPP rainfall	3.70	4.60	7.60	6.32	7.60
Max. GPCP rainfall	4.24	5.28	8.83	7.02	8.83
Min. SPP rainfall	0.27	0.38	0.64	0.47	0.27
Min. GPCP rainfall	0.16	0.19	0.57	0.33	0.16

Figure C-4. Mountainous areas, TMPA.



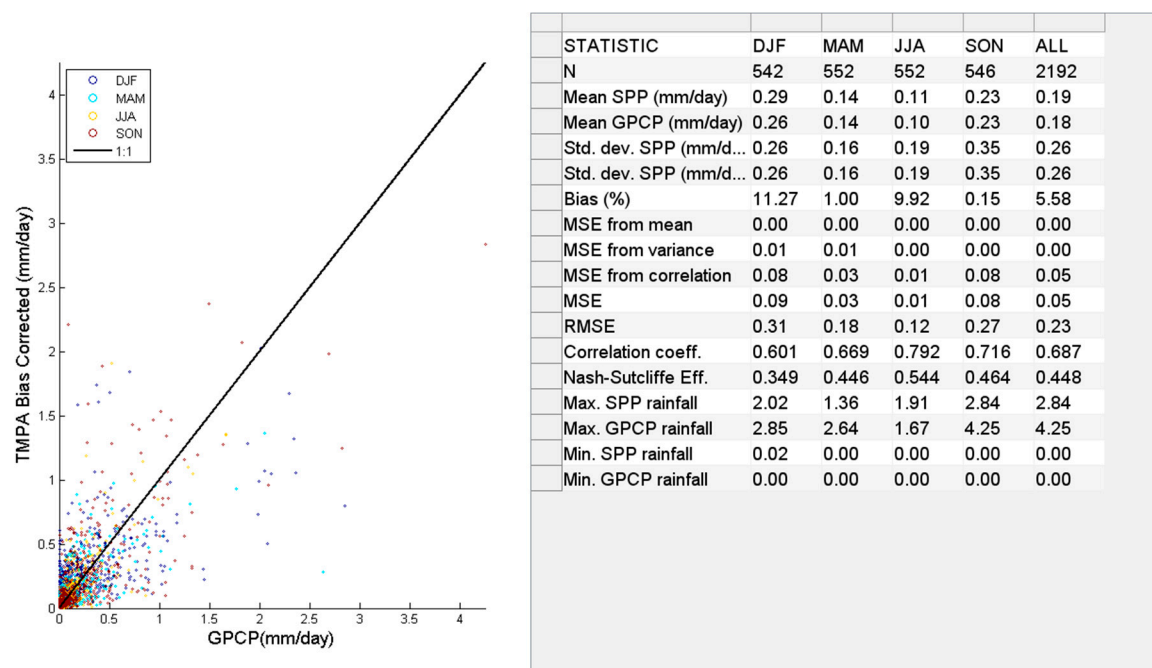
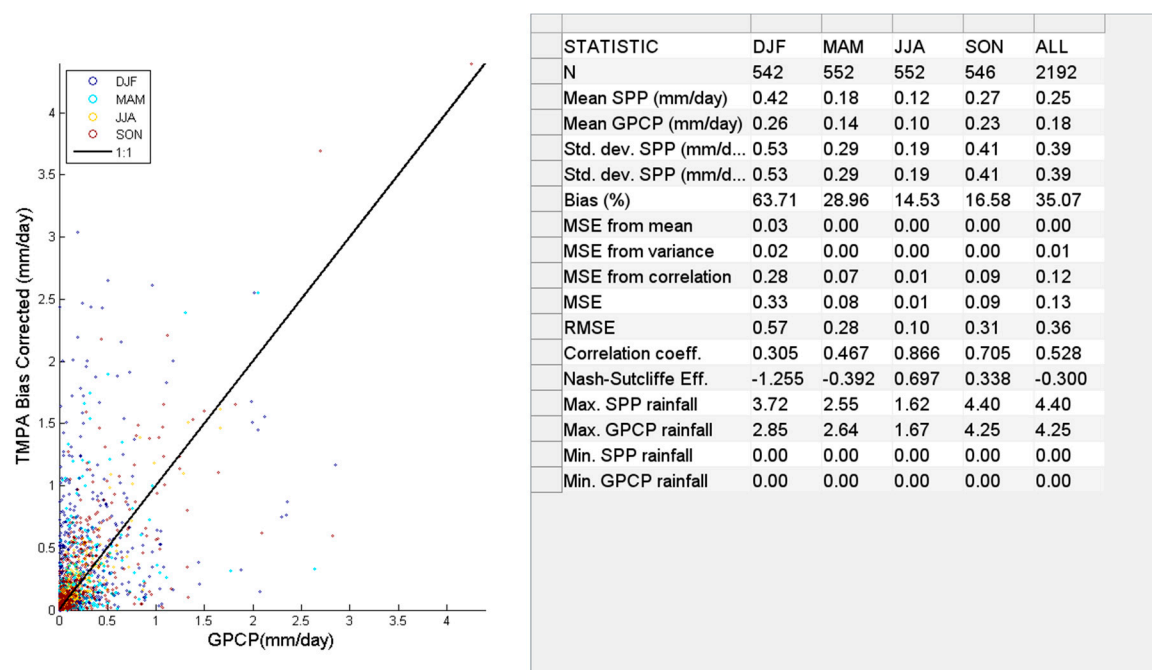
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	1.68	2.75	3.62	3.18	2.81
Mean GPCP (mm/day)	1.38	2.01	2.94	2.39	2.18
Std. dev. SPP (mm/d...	0.75	1.14	1.29	1.34	1.36
Std. dev. SPP (mm/d...	0.68	0.91	1.24	1.07	1.15
Bias (%)	22.02	36.84	23.22	33.16	28.90
MSE from mean	0.09	0.55	0.47	0.63	0.40
MSE from variance	0.00	0.06	0.00	0.07	0.04
MSE from correlation	0.41	0.56	0.90	0.78	0.69
MSE	0.51	1.17	1.37	1.48	1.13
RMSE	0.71	1.08	1.17	1.21	1.06
Correlation coeff.	0.601	0.728	0.719	0.728	0.779
Nash-Sutcliffe Eff.	-0.088	-0.426	0.112	-0.282	0.142
Max. SPP rainfall	5.60	7.52	9.24	8.16	9.24
Max. GPCP rainfall	4.24	5.28	8.83	7.02	8.83
Min. SPP rainfall	0.00	0.43	0.82	0.47	0.00
Min. GPCP rainfall	0.16	0.19	0.57	0.33	0.16

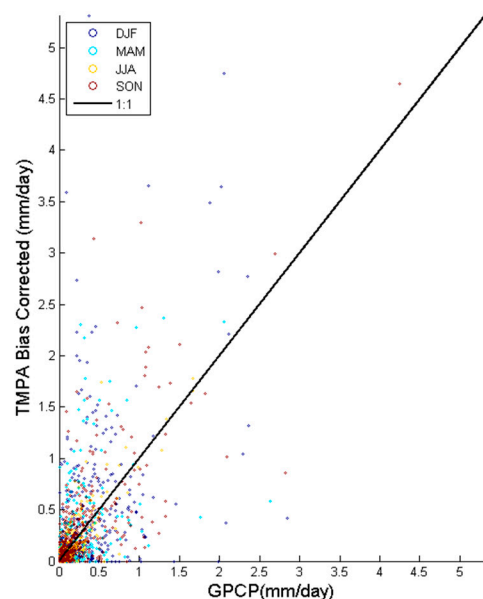
Figure C-5. Mountainous areas, TMPA.



STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	1.85	2.68	3.25	3.08	2.72
Mean GPCP (mm/day)	1.38	2.01	2.94	2.39	2.18
Std. dev. SPP (mm/d...	0.98	1.42	1.56	1.45	1.47
Std. dev. SPP (mm/d...	0.68	0.91	1.24	1.07	1.15
Bias (%)	33.96	33.23	10.62	29.19	24.57
MSE from mean	0.22	0.45	0.10	0.49	0.29
MSE from variance	0.09	0.27	0.10	0.14	0.11
MSE from correlation	0.37	0.94	1.21	0.93	0.93
MSE	0.67	1.65	1.40	1.56	1.32
RMSE	0.82	1.28	1.18	1.25	1.15
Correlation coeff.	0.726	0.635	0.689	0.700	0.725
Nash-Sutcliffe Eff.	-0.443	-1.019	0.092	-0.356	-0.004
Max. SPP rainfall	7.40	7.26	10.39	9.66	10.39
Max. GPCP rainfall	4.24	5.28	8.83	7.02	8.83
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.16	0.19	0.57	0.33	0.16

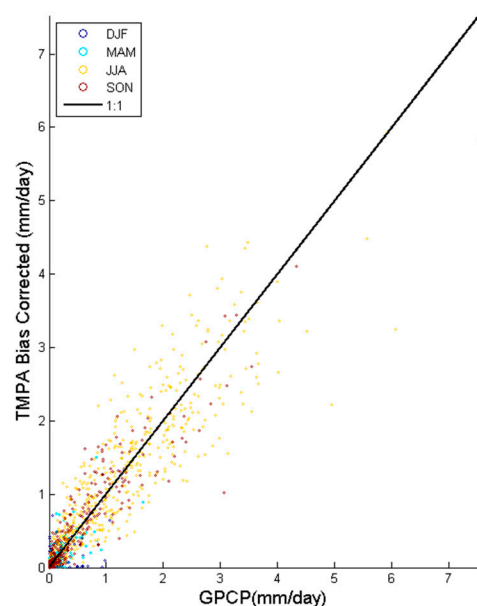
Figure C-6. Mountainous areas, PERSIANN.

D. Bias Corrected Estimates Error Analysis for Latitudinal Bands.**Figure D-1.** TMPA Band A, Bias corrected.**Figure D-2.** CMORPH band A, bias corrected.



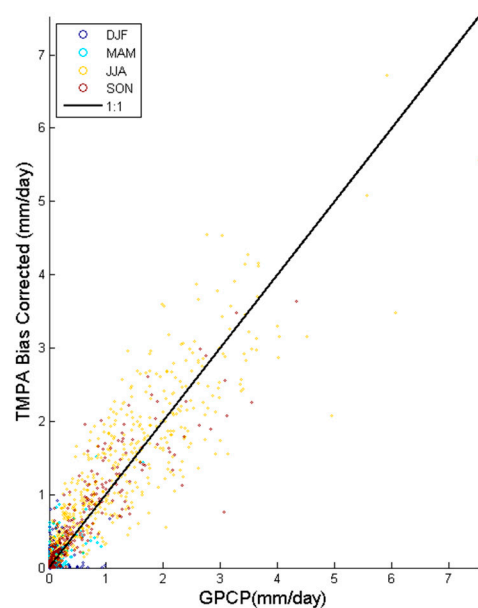
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.31	0.16	0.10	0.26	0.21
Mean GPCP (mm/day)	0.26	0.14	0.10	0.23	0.18
Std. dev. SPP (mm/d...	0.63	0.34	0.21	0.47	0.45
Std. dev. SPP (mm/d...	0.63	0.34	0.21	0.47	0.45
Bias (%)	22.02	14.79	-1.38	13.44	14.57
MSE from mean	0.00	0.00	0.00	0.00	0.00
MSE from variance	0.06	0.01	0.00	0.01	0.02
MSE from correlation	0.24	0.08	0.01	0.10	0.11
MSE	0.31	0.09	0.01	0.11	0.13
RMSE	0.55	0.29	0.11	0.33	0.36
Correlation coeff.	0.491	0.529	0.841	0.721	0.608
Nash-Sutcliffe Eff.	-1.106	-0.531	0.604	0.236	-0.309
Max. SPP rainfall	5.31	2.36	1.78	4.65	5.31
Max. GPCP rainfall	2.85	2.64	1.67	4.25	4.25
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure D-3. PERSIANN band A, bias corrected.



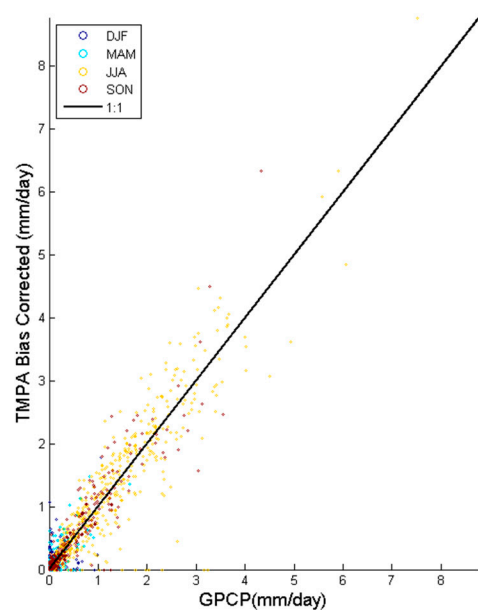
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.03	0.06	1.15	0.33	0.39
Mean GPCP (mm/day)	0.03	0.06	1.14	0.32	0.39
Std. dev. SPP (mm/d...	0.06	0.13	1.00	0.58	0.74
Std. dev. SPP (mm/d...	0.06	0.13	1.00	0.58	0.74
Bias (%)	-17.16	2.65	1.06	3.35	1.19
MSE from mean	0.00	0.00	0.00	0.00	0.00
MSE from variance	0.00	0.00	0.01	0.00	0.00
MSE from correlation	0.01	0.01	0.23	0.05	0.07
MSE	0.01	0.01	0.23	0.05	0.08
RMSE	0.11	0.10	0.48	0.22	0.27
Correlation coeff.	0.318	0.719	0.895	0.931	0.934
Nash-Sutcliffe Eff.	0.027	0.469	0.799	0.864	0.871
Max. SPP rainfall	0.71	1.50	5.93	4.11	5.93
Max. GPCP rainfall	1.06	1.64	7.52	4.34	7.52
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure D-4. TMPA band B, bias corrected.



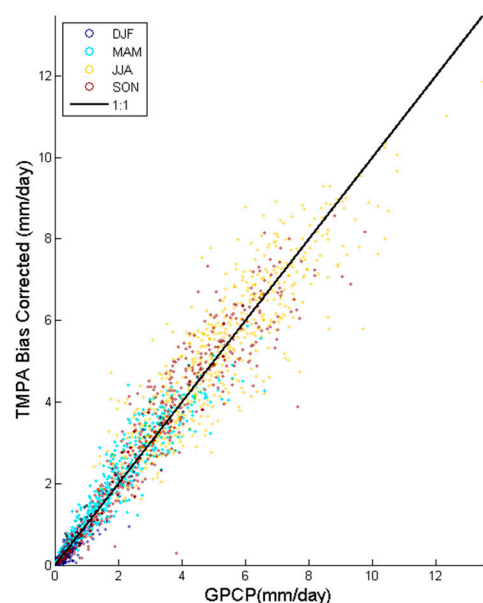
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.04	0.08	1.24	0.35	0.43
Mean GPCP (mm/day)	0.03	0.06	1.14	0.32	0.39
Std. dev. SPP (mm/d...	0.10	0.15	1.02	0.58	0.77
Std. dev. SPP (mm/d...	0.10	0.15	1.02	0.58	0.77
Bias (%)	22.60	30.68	9.43	9.50	10.58
MSE from mean	0.00	0.00	0.01	0.00	0.00
MSE from variance	0.00	0.00	0.00	0.00	0.00
MSE from correlation	0.02	0.01	0.28	0.06	0.09
MSE	0.02	0.01	0.29	0.07	0.10
RMSE	0.13	0.12	0.54	0.25	0.31
Correlation coeff.	0.195	0.698	0.875	0.908	0.920
Nash-Sutcliffe Eff.	-0.465	0.304	0.749	0.818	0.835
Max. SPP rainfall	0.92	1.52	6.73	3.63	6.73
Max. GPCP rainfall	1.06	1.64	7.52	4.34	7.52
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure D-5. CMORPH band B, bias corrected.



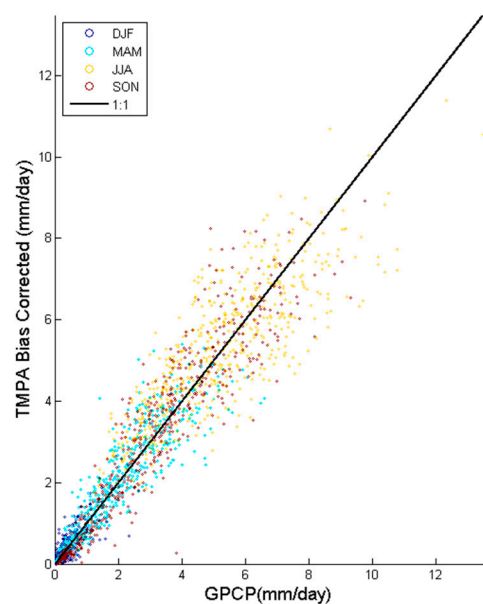
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.04	0.06	1.13	0.33	0.39
Mean GPCP (mm/day)	0.03	0.06	1.14	0.32	0.39
Std. dev. SPP (mm/d...	0.12	0.16	1.12	0.64	0.79
Std. dev. SPP (mm/d...	0.12	0.16	1.12	0.64	0.79
Bias (%)	13.44	3.86	-0.81	2.44	0.36
MSE from mean	0.00	0.00	0.00	0.00	0.00
MSE from variance	0.00	0.00	0.00	0.00	0.00
MSE from correlation	0.02	0.01	0.21	0.05	0.07
MSE	0.02	0.01	0.21	0.05	0.07
RMSE	0.13	0.11	0.46	0.22	0.27
Correlation coeff.	0.389	0.746	0.914	0.937	0.941
Nash-Sutcliffe Eff.	-0.439	0.417	0.817	0.859	0.876
Max. SPP rainfall	1.78	1.48	8.77	6.34	8.77
Max. GPCP rainfall	1.06	1.64	7.52	4.34	7.52
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure D-6. PERSIANN band B, bias corrected.



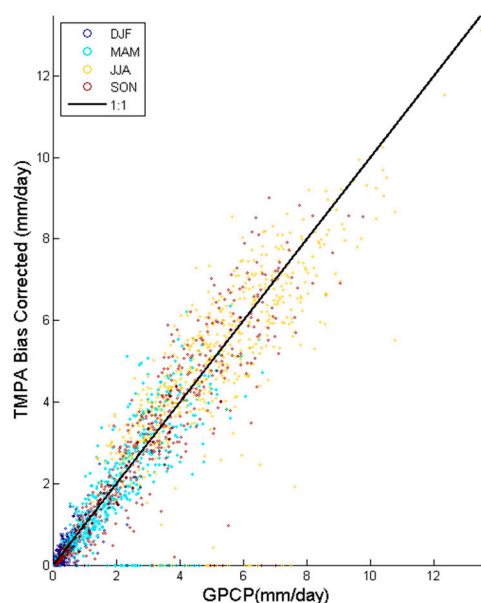
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.22	2.00	5.24	3.03	2.63
Mean GPCP (mm/day)	0.24	1.93	5.19	2.97	2.59
Std. dev. SPP (mm/d...	0.25	1.27	1.85	2.12	2.39
Std. dev. SPP (mm/d...	0.25	1.27	1.85	2.12	2.39
Bias (%)	-8.85	3.93	0.98	1.95	1.58
MSE from mean	0.00	0.01	0.00	0.00	0.00
MSE from variance	0.00	0.00	0.02	0.00	0.00
MSE from correlation	0.02	0.19	0.87	0.39	0.38
MSE	0.02	0.20	0.89	0.39	0.38
RMSE	0.14	0.45	0.94	0.63	0.61
Correlation coeff.	0.878	0.944	0.882	0.957	0.967
Nash-Sutcliffe Eff.	0.765	0.887	0.776	0.912	0.935
Max. SPP rainfall	1.85	5.87	11.86	8.56	11.86
Max. GPCP rainfall	2.32	6.60	13.48	9.75	13.48
Min. SPP rainfall	0.01	0.03	1.58	0.04	0.01
Min. GPCP rainfall	0.00	0.00	1.22	0.03	0.00

Figure D-7. TMPA band c, bias corrected.



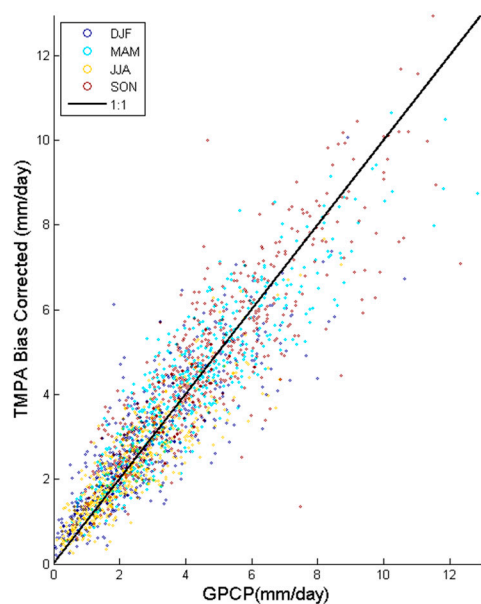
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.27	1.97	5.25	2.98	2.63
Mean GPCP (mm/day)	0.24	1.93	5.19	2.97	2.59
Std. dev. SPP (mm/d...	0.29	1.28	1.63	2.18	2.35
Std. dev. SPP (mm/d...	0.29	1.28	1.63	2.18	2.35
Bias (%)	12.43	2.14	1.09	0.37	1.34
MSE from mean	0.00	0.00	0.00	0.00	0.00
MSE from variance	0.00	0.00	0.13	0.00	0.00
MSE from correlation	0.04	0.33	1.17	0.57	0.56
MSE	0.04	0.34	1.31	0.57	0.57
RMSE	0.20	0.58	1.14	0.75	0.75
Correlation coeff.	0.779	0.903	0.820	0.939	0.950
Nash-Sutcliffe Eff.	0.545	0.810	0.671	0.873	0.903
Max. SPP rainfall	1.89	5.40	11.39	8.92	11.39
Max. GPCP rainfall	2.32	6.60	13.48	9.75	13.48
Min. SPP rainfall	0.00	0.04	1.76	0.02	0.00
Min. GPCP rainfall	0.00	0.00	1.22	0.03	0.00

Figure D-8. CMORPH band C, bias corrected.



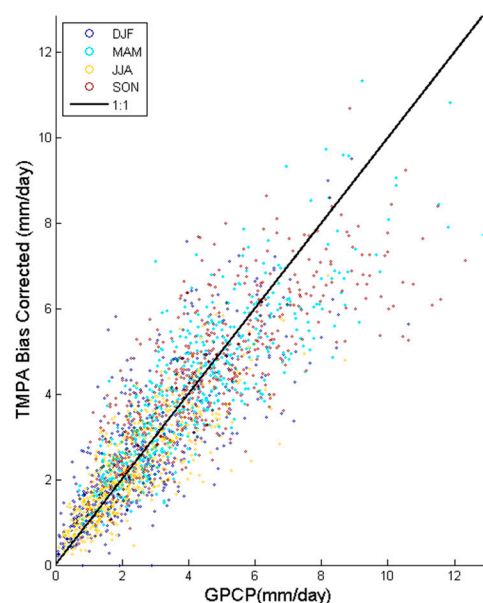
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.24	1.77	5.05	2.89	2.50
Mean GPCP (mm/day)	0.24	1.93	5.19	2.97	2.59
Std. dev. SPP (mm/d...	0.31	1.42	1.99	2.22	2.42
Std. dev. SPP (mm/d...	0.31	1.42	1.99	2.22	2.42
Bias (%)	-3.36	-8.05	-2.69	-2.55	-3.67
MSE from mean	0.00	0.02	0.02	0.01	0.01
MSE from variance	0.00	0.01	0.00	0.01	0.00
MSE from correlation	0.04	0.80	1.95	0.89	0.93
MSE	0.04	0.84	1.97	0.90	0.94
RMSE	0.20	0.91	1.40	0.95	0.97
Correlation coeff.	0.780	0.787	0.755	0.906	0.920
Nash-Sutcliffe Eff.	0.522	0.527	0.507	0.798	0.838
Max. SPP rainfall	2.48	6.36	13.12	9.02	13.12
Max. GPCP rainfall	2.32	6.60	13.48	9.75	13.48
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	1.22	0.03	0.00

Figure D-9. PERSIANN band C, bias corrected.



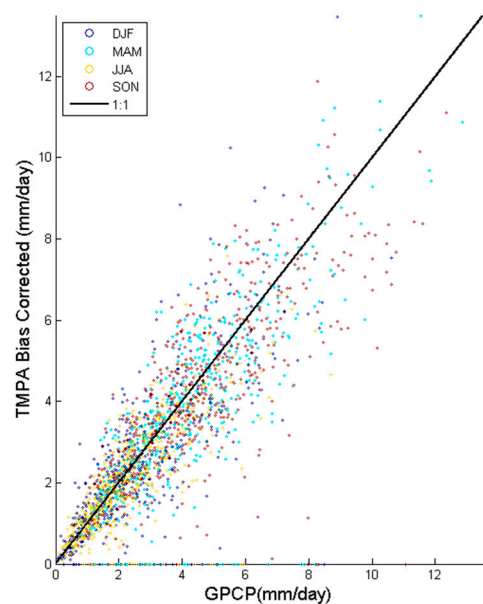
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	2.68	4.08	2.30	4.70	3.44
Mean GPCP (mm/day)	2.64	4.02	2.35	4.60	3.40
Std. dev. SPP (mm/d...	1.53	1.84	1.21	2.04	1.95
Std. dev. SPP (mm/d...	1.53	1.84	1.21	2.04	1.95
Bias (%)	1.60	1.39	-2.26	2.29	1.10
MSE from mean	0.00	0.00	0.00	0.01	0.00
MSE from variance	0.06	0.06	0.05	0.03	0.03
MSE from correlation	0.77	0.73	0.43	1.15	0.79
MSE	0.84	0.79	0.48	1.19	0.82
RMSE	0.91	0.89	0.69	1.09	0.91
Correlation coeff.	0.859	0.904	0.877	0.872	0.904
Nash-Sutcliffe Eff.	0.737	0.817	0.767	0.755	0.816
Max. SPP rainfall	10.06	10.64	7.67	12.95	12.95
Max. GPCP rainfall	10.62	12.85	8.70	12.33	12.85
Min. SPP rainfall	0.18	0.54	0.27	0.62	0.18
Min. GPCP rainfall	0.06	0.39	0.10	0.59	0.06

Figure D-10. TMPA band D, bias corrected.



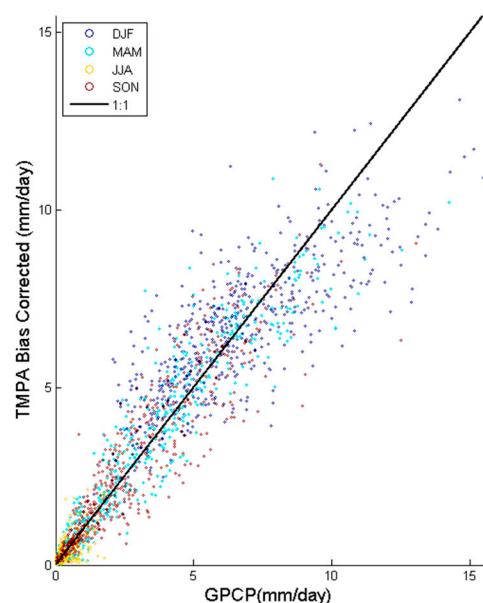
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	2.66	3.97	2.27	4.45	3.34
Mean GPCP (mm/day)	2.64	4.02	2.35	4.60	3.40
Std. dev. SPP (mm/d...	1.61	1.77	1.19	1.68	1.82
Std. dev. SPP (mm/d...	1.61	1.77	1.19	1.68	1.82
Bias (%)	0.85	-1.20	-3.20	-3.17	-1.82
MSE from mean	0.00	0.00	0.01	0.02	0.00
MSE from variance	0.03	0.09	0.06	0.28	0.09
MSE from correlation	1.19	1.09	0.60	1.62	1.15
MSE	1.22	1.19	0.66	1.92	1.24
RMSE	1.10	1.09	0.81	1.38	1.11
Correlation coeff.	0.794	0.850	0.826	0.782	0.850
Nash-Sutcliffe Eff.	0.618	0.723	0.679	0.606	0.722
Max. SPP rainfall	9.50	11.33	6.77	10.68	11.33
Max. GPCP rainfall	10.62	12.85	8.70	12.33	12.85
Min. SPP rainfall	0.00	0.44	0.24	0.50	0.00
Min. GPCP rainfall	0.06	0.39	0.10	0.59	0.06

Figure D-11. CMORPH band D, bias corrected.



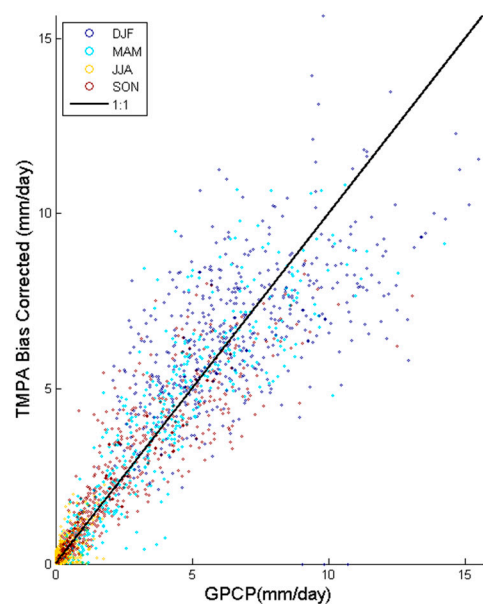
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	2.52	3.68	2.13	4.25	3.14
Mean GPCP (mm/day)	2.64	4.02	2.35	4.60	3.40
Std. dev. SPP (mm/d...	1.93	2.21	1.36	2.08	2.10
Std. dev. SPP (mm/d...	1.93	2.21	1.36	2.08	2.10
Bias (%)	-4.61	-8.47	-9.51	-7.50	-7.59
MSE from mean	0.01	0.12	0.05	0.12	0.07
MSE from variance	0.02	0.02	0.01	0.02	0.00
MSE from correlation	1.40	1.99	0.84	2.30	1.65
MSE	1.44	2.12	0.90	2.44	1.72
RMSE	1.20	1.45	0.95	1.56	1.31
Correlation coeff.	0.796	0.783	0.784	0.749	0.814
Nash-Sutcliffe Eff.	0.548	0.507	0.565	0.499	0.615
Max. SPP rainfall	13.46	13.50	7.57	11.88	13.50
Max. GPCP rainfall	10.62	12.85	8.70	12.33	12.85
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.06	0.39	0.10	0.59	0.06

Figure D-12. PERSIANN band D, bias corrected.



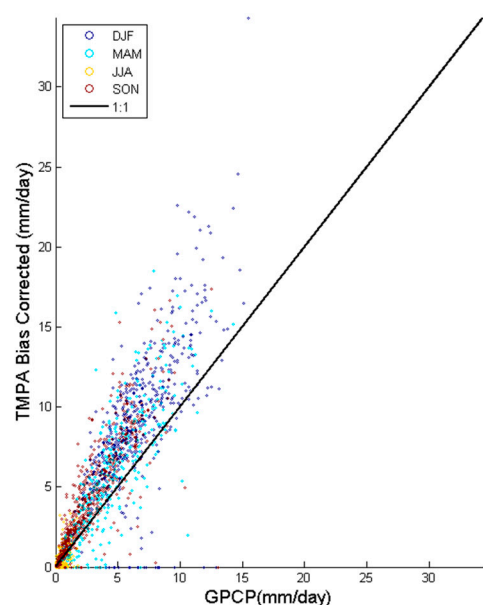
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	6.52	3.27	0.26	2.85	3.21
Mean GPCP (mm/day)	6.50	3.24	0.25	2.83	3.19
Std. dev. SPP (mm/d...	1.92	2.71	0.33	2.23	2.99
Std. dev. SPP (mm/d...	1.92	2.71	0.33	2.23	2.99
Bias (%)	0.33	0.91	5.99	0.70	0.67
MSE from mean	0.00	0.00	0.00	0.00	0.00
MSE from variance	0.57	0.02	0.00	0.00	0.03
MSE from correlation	2.14	0.75	0.06	0.90	1.07
MSE	2.71	0.77	0.06	0.90	1.10
RMSE	1.64	0.88	0.25	0.95	1.05
Correlation coeff.	0.792	0.952	0.723	0.913	0.944
Nash-Sutcliffe Eff.	0.622	0.905	0.463	0.829	0.891
Max. SPP rainfall	13.11	10.89	2.14	11.28	13.11
Max. GPCP rainfall	15.48	14.24	1.78	13.07	15.48
Min. SPP rainfall	1.77	0.02	0.00	0.08	0.00
Min. GPCP rainfall	1.00	0.00	0.00	0.02	0.00

Figure D-13. TMPA band E, bias corrected.



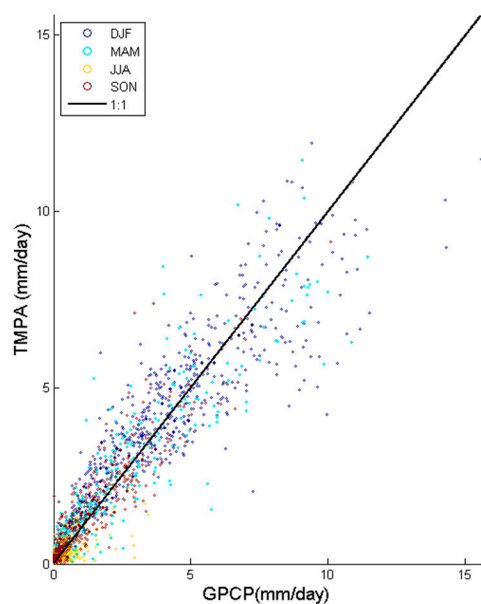
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	6.45	3.25	0.30	2.82	3.19
Mean GPCP (mm/day)	6.50	3.24	0.25	2.83	3.19
Std. dev. SPP (mm/d...	2.09	2.80	0.35	2.00	2.98
Std. dev. SPP (mm/d...	2.09	2.80	0.35	2.00	2.98
Bias (%)	-0.75	0.47	21.35	-0.46	0.06
MSE from mean	0.00	0.00	0.00	0.00	0.00
MSE from variance	0.34	0.00	0.00	0.09	0.04
MSE from correlation	4.30	1.36	0.08	1.19	1.79
MSE	4.65	1.36	0.08	1.27	1.83
RMSE	2.15	1.17	0.29	1.13	1.35
Correlation coeff.	0.616	0.915	0.670	0.871	0.905
Nash-Sutcliffe Eff.	0.352	0.832	0.288	0.759	0.819
Max. SPP rainfall	15.65	10.83	2.26	8.66	15.65
Max. GPCP rainfall	15.48	14.24	1.78	13.07	15.48
Min. SPP rainfall	0.00	0.00	0.00	0.03	0.00
Min. GPCP rainfall	1.00	0.00	0.00	0.02	0.00

Figure D-14. CMORPH band E, bias corrected.



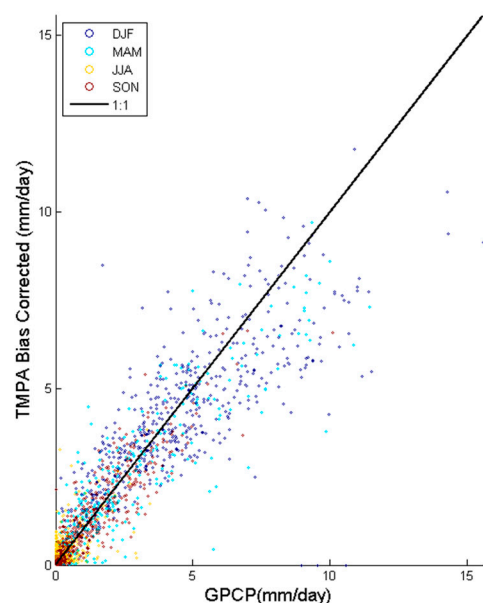
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	8.98	4.11	0.25	4.24	4.37
Mean GPCP (mm/day)	6.50	3.24	0.25	2.83	3.19
Std. dev. SPP (mm/d...	4.28	4.03	0.53	3.40	4.60
Std. dev. SPP (mm/d...	4.28	4.03	0.53	3.40	4.60
Bias (%)	38.11	27.00	0.26	49.75	37.11
MSE from mean	6.14	0.76	0.00	1.99	1.40
MSE from variance	2.58	1.39	0.04	1.22	2.02
MSE from correlation	6.81	2.50	0.12	2.45	3.03
MSE	15.53	4.66	0.15	5.66	6.45
RMSE	3.94	2.16	0.39	2.38	2.54
Correlation coeff.	0.703	0.891	0.675	0.843	0.896
Nash-Sutcliffe Eff.	-1.168	0.426	-0.332	-0.074	0.359
Max. SPP rainfall	34.33	18.50	3.35	17.40	34.33
Max. GPCP rainfall	15.48	14.24	1.78	13.07	15.48
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	1.00	0.00	0.00	0.02	0.00

Figure D-15. PERSIANN band E, bias corrected.



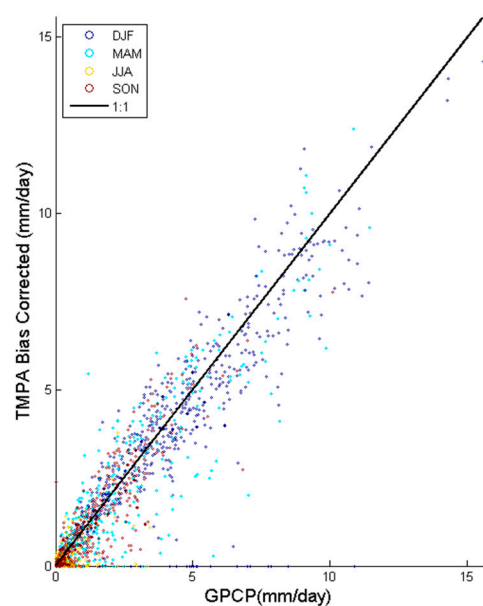
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	4.56	1.70	0.24	1.23	1.92
Mean GPCP (mm/day)	4.44	1.60	0.25	1.10	1.84
Std. dev. SPP (mm/d...	2.21	2.07	0.27	1.29	2.30
Std. dev. SPP (mm/d...	2.21	2.07	0.27	1.29	2.30
Bias (%)	2.51	5.70	-3.24	11.66	4.38
MSE from mean	0.01	0.01	0.00	0.02	0.01
MSE from variance	0.21	0.02	0.03	0.00	0.02
MSE from correlation	1.59	0.67	0.08	0.30	0.70
MSE	1.82	0.70	0.11	0.31	0.73
RMSE	1.35	0.83	0.34	0.56	0.85
Correlation coeff.	0.865	0.927	0.677	0.914	0.937
Nash-Sutcliffe Eff.	0.745	0.858	0.452	0.824	0.877
Max. SPP rainfall	11.94	11.44	2.18	9.14	11.94
Max. GPCP rainfall	15.56	11.44	3.42	10.09	15.56
Min. SPP rainfall	0.04	0.03	0.02	0.04	0.02
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure D-16. TMPA band F, bias corrected.



STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	4.18	1.51	0.37	1.08	1.78
Mean GPCP (mm/day)	4.44	1.60	0.25	1.10	1.84
Std. dev. SPP (mm/d...	2.07	1.89	0.41	1.22	2.11
Std. dev. SPP (mm/d...	2.07	1.89	0.41	1.22	2.11
Bias (%)	-5.92	-5.69	45.47	-2.29	-3.55
MSE from mean	0.07	0.01	0.01	0.00	0.00
MSE from variance	0.36	0.11	0.00	0.01	0.11
MSE from correlation	2.39	0.71	0.17	0.29	0.91
MSE	2.82	0.82	0.19	0.30	1.03
RMSE	1.68	0.91	0.44	0.55	1.01
Correlation coeff.	0.783	0.915	0.533	0.912	0.911
Nash-Sutcliffe Eff.	0.603	0.832	0.084	0.832	0.827
Max. SPP rainfall	11.78	9.71	3.85	6.64	11.78
Max. GPCP rainfall	15.56	11.44	3.42	10.09	15.56
Min. SPP rainfall	0.00	0.01	0.02	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure D-17. CMORPH band F, bias corrected.



STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	4.07	1.46	0.13	1.02	1.66
Mean GPCP (mm/day)	4.44	1.60	0.25	1.10	1.84
Std. dev. SPP (mm/d...	2.58	2.16	0.33	1.37	2.34
Std. dev. SPP (mm/d...	2.58	2.16	0.33	1.37	2.34
Bias (%)	-8.33	-9.19	-49.11	-7.42	-9.79
MSE from mean	0.14	0.02	0.02	0.01	0.03
MSE from variance	0.01	0.00	0.02	0.00	0.01
MSE from correlation	2.11	0.79	0.13	0.36	0.85
MSE	2.25	0.82	0.16	0.37	0.90
RMSE	1.50	0.90	0.40	0.61	0.95
Correlation coeff.	0.847	0.917	0.561	0.902	0.925
Nash-Sutcliffe Eff.	0.683	0.833	0.213	0.794	0.850
Max. SPP rainfall	14.31	12.40	3.77	7.75	14.31
Max. GPCP rainfall	15.56	11.44	3.42	10.09	15.56
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.00	0.00	0.00	0.00	0.00

Figure D-18. PERSIANN band F, bias corrected.

E. Bias Corrected Estimates Error Analysis for Koppen Geiger Climatic Classification Zones.

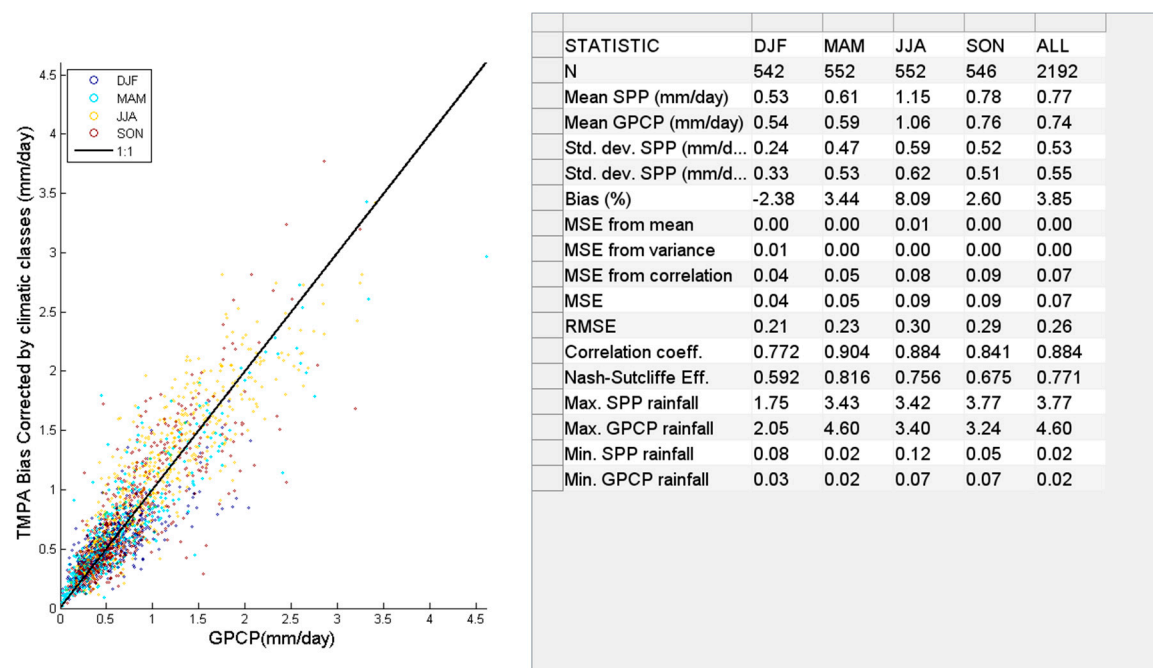


Figure E-1. TMPA Arid zone, bias corrected.

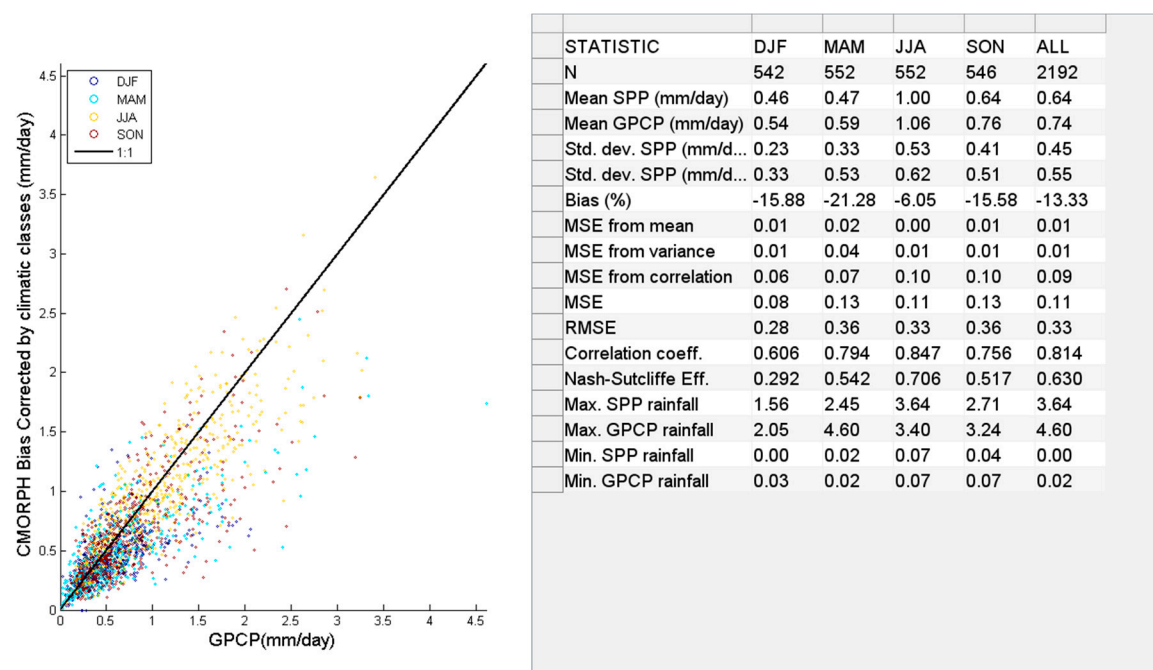
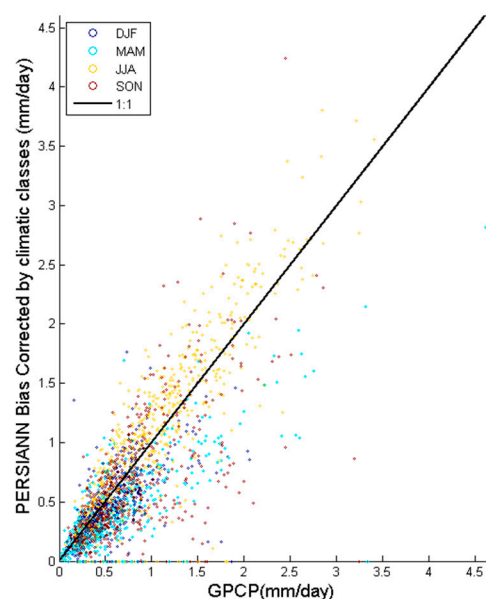
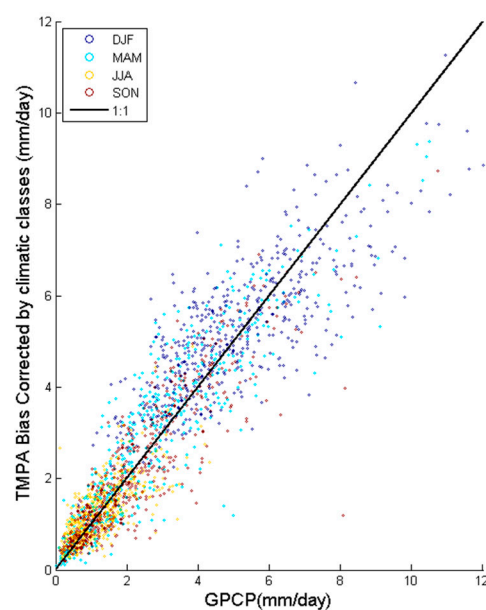


Figure E-2. CMORPH Arid zone, bias corrected.



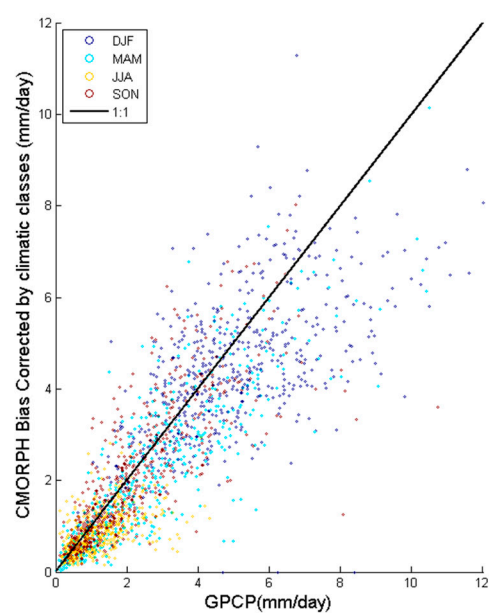
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	0.45	0.40	1.13	0.63	0.65
Mean GPCP (mm/day)	0.54	0.59	1.06	0.76	0.74
Std. dev. SPP (mm/d...	0.28	0.36	0.70	0.52	0.57
Std. dev. SPP (mm/d...	0.33	0.53	0.62	0.51	0.55
Bias (%)	-17.47	-31.85	5.88	-16.27	-11.61
MSE from mean	0.01	0.04	0.00	0.02	0.01
MSE from variance	0.00	0.03	0.01	0.00	0.00
MSE from correlation	0.07	0.08	0.12	0.18	0.13
MSE	0.08	0.15	0.13	0.19	0.14
RMSE	0.28	0.39	0.36	0.44	0.37
Correlation coeff.	0.643	0.775	0.860	0.664	0.791
Nash-Sutcliffe Eff.	0.290	0.462	0.656	0.271	0.541
Max. SPP rainfall	1.76	2.82	3.81	4.25	4.25
Max. GPCP rainfall	2.05	4.60	3.40	3.24	4.60
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.03	0.02	0.07	0.07	0.02

Figure E-3. PERSIANN arid zone, bias corrected.



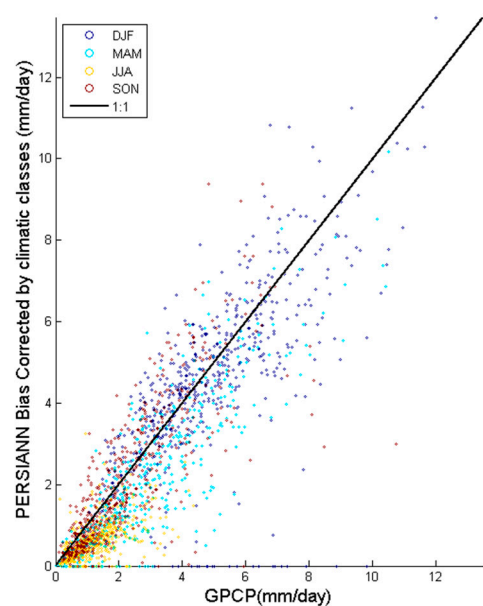
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	5.13	2.68	1.21	2.15	2.78
Mean GPCP (mm/day)	4.96	2.55	1.17	2.20	2.71
Std. dev. SPP (mm/d...	1.55	1.93	0.62	1.48	2.06
Std. dev. SPP (mm/d...	2.00	1.98	0.74	1.60	2.16
Bias (%)	3.53	5.19	3.21	-2.67	2.63
MSE from mean	0.03	0.02	0.00	0.00	0.01
MSE from variance	0.20	0.00	0.01	0.01	0.01
MSE from correlation	1.24	0.66	0.24	0.54	0.72
MSE	1.47	0.68	0.25	0.56	0.74
RMSE	1.21	0.83	0.50	0.74	0.86
Correlation coeff.	0.800	0.913	0.743	0.886	0.919
Nash-Sutcliffe Eff.	0.631	0.826	0.540	0.783	0.842
Max. SPP rainfall	11.27	9.39	4.89	8.74	11.27
Max. GPCP rainfall	12.01	10.50	4.33	10.74	12.01
Min. SPP rainfall	0.85	0.09	0.26	0.19	0.09
Min. GPCP rainfall	0.64	0.02	0.12	0.11	0.02

Figure E-4. TMPA warm zone, bias corrected.



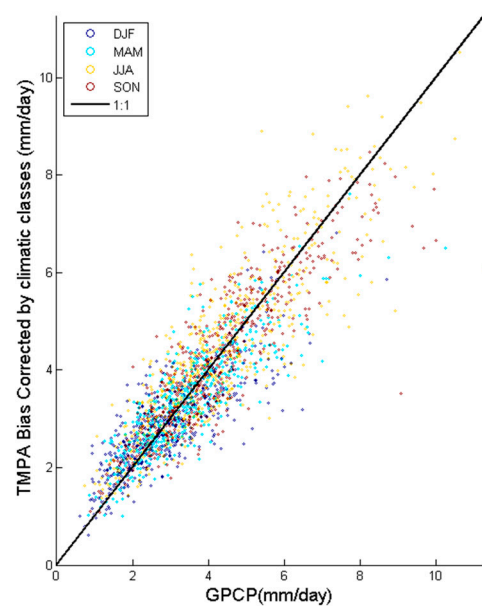
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	4.37	2.07	0.84	2.08	2.33
Mean GPCP (mm/day)	4.96	2.55	1.17	2.20	2.71
Std. dev. SPP (mm/d...	1.54	1.67	0.46	1.49	1.88
Std. dev. SPP (mm/d...	2.00	1.98	0.74	1.60	2.16
Bias (%)	-11.82	-18.93	-28.65	-5.52	-14.06
MSE from mean	0.34	0.23	0.11	0.01	0.15
MSE from variance	0.21	0.09	0.08	0.01	0.08
MSE from correlation	2.43	0.86	0.30	0.97	1.18
MSE	2.99	1.19	0.49	1.00	1.41
RMSE	1.73	1.09	0.70	1.00	1.19
Correlation coeff.	0.604	0.870	0.558	0.796	0.854
Nash-Sutcliffe Eff.	0.252	0.697	0.101	0.610	0.698
Max. SPP rainfall	11.29	10.14	2.94	8.03	11.29
Max. GPCP rainfall	12.01	10.50	4.33	10.74	12.01
Min. SPP rainfall	0.00	0.03	0.15	0.17	0.00
Min. GPCP rainfall	0.64	0.02	0.12	0.11	0.02

Figure E-5. CMORPH warm zone, bias corrected.



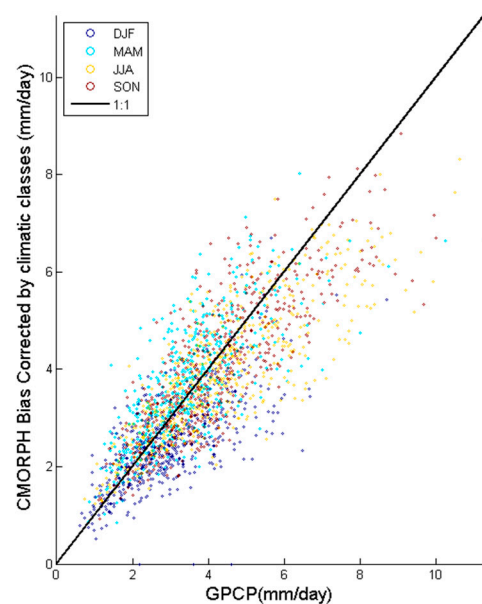
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	4.60	1.89	0.60	2.07	2.28
Mean GPCP (mm/day)	4.96	2.55	1.17	2.20	2.71
Std. dev. SPP (mm/d...	2.06	1.79	0.45	1.74	2.18
Std. dev. SPP (mm/d...	2.00	1.98	0.74	1.60	2.16
Bias (%)	-7.11	-25.87	-48.62	-6.00	-15.85
MSE from mean	0.12	0.44	0.32	0.02	0.18
MSE from variance	0.00	0.04	0.08	0.02	0.00
MSE from correlation	2.76	0.80	0.26	1.08	1.30
MSE	2.89	1.28	0.67	1.12	1.48
RMSE	1.70	1.13	0.82	1.06	1.22
Correlation coeff.	0.665	0.887	0.606	0.806	0.862
Nash-Sutcliffe Eff.	0.277	0.675	-0.228	0.562	0.682
Max. SPP rainfall	13.47	10.17	3.26	9.38	13.47
Max. GPCP rainfall	12.01	10.50	4.33	10.74	12.01
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.64	0.02	0.12	0.11	0.02

Figure E-6. PERSIANN warm zone, bias corrected.



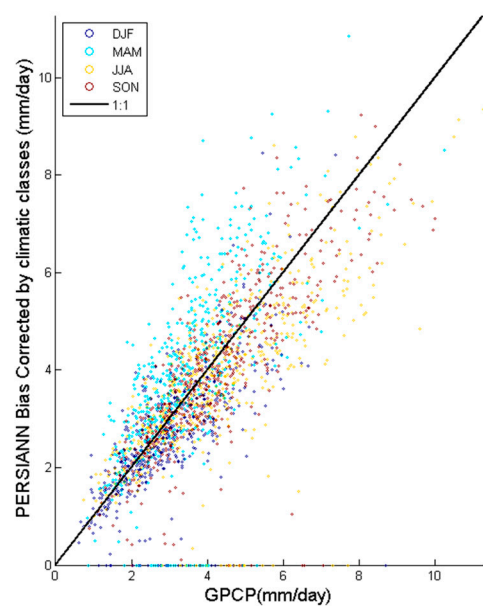
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	2.90	3.38	4.47	4.23	3.74
Mean GPCP (mm/day)	2.96	3.42	4.37	4.24	3.75
Std. dev. SPP (mm/d...	0.90	1.01	1.66	1.47	1.44
Std. dev. SPP (mm/d...	1.23	1.26	1.80	1.63	1.61
Bias (%)	-2.35	-1.15	2.09	-0.26	-0.18
MSE from mean	0.00	0.00	0.01	0.00	0.00
MSE from variance	0.11	0.07	0.02	0.03	0.03
MSE from correlation	0.43	0.39	0.86	0.54	0.59
MSE	0.55	0.45	0.88	0.57	0.61
RMSE	0.74	0.67	0.94	0.75	0.78
Correlation coeff.	0.805	0.848	0.857	0.887	0.874
Nash-Sutcliffe Eff.	0.640	0.716	0.728	0.786	0.764
Max. SPP rainfall	6.81	7.61	10.51	8.48	10.51
Max. GPCP rainfall	8.72	10.24	11.27	10.02	11.27
Min. SPP rainfall	0.60	1.00	1.38	1.08	0.60
Min. GPCP rainfall	0.62	0.84	0.74	0.89	0.62

Figure E-7. TMPA tropical zone, bias corrected.



STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	2.48	3.63	3.97	4.04	3.53
Mean GPCP (mm/day)	2.96	3.42	4.37	4.24	3.75
Std. dev. SPP (mm/d...	0.89	1.20	1.30	1.43	1.37
Std. dev. SPP (mm/d...	1.23	1.26	1.80	1.63	1.61
Bias (%)	-16.40	6.34	-9.22	-4.65	-5.77
MSE from mean	0.24	0.05	0.16	0.04	0.05
MSE from variance	0.11	0.00	0.25	0.04	0.06
MSE from correlation	0.69	0.77	0.86	0.82	0.90
MSE	1.04	0.82	1.27	0.90	1.01
RMSE	1.02	0.90	1.13	0.95	1.00
Correlation coeff.	0.688	0.746	0.816	0.825	0.796
Nash-Sutcliffe Eff.	0.315	0.488	0.608	0.664	0.612
Max. SPP rainfall	6.71	8.02	8.31	8.84	8.84
Max. GPCP rainfall	8.72	10.24	11.27	10.02	11.27
Min. SPP rainfall	0.00	0.85	1.23	0.91	0.00
Min. GPCP rainfall	0.62	0.84	0.74	0.89	0.62

Figure E-8. CMORPH tropical zone, bias corrected.



STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	2.64	3.84	3.90	3.96	3.59
Mean GPCP (mm/day)	2.96	3.42	4.37	4.24	3.75
Std. dev. SPP (mm/d...	1.22	1.84	1.62	1.66	1.69
Std. dev. SPP (mm/d...	1.23	1.26	1.80	1.63	1.61
Bias (%)	-10.80	12.30	-10.85	-6.61	-4.34
MSE from mean	0.10	0.18	0.23	0.08	0.03
MSE from variance	0.00	0.33	0.03	0.00	0.01
MSE from correlation	0.94	1.51	1.62	1.16	1.51
MSE	1.04	2.01	1.88	1.24	1.54
RMSE	1.02	1.42	1.37	1.11	1.24
Correlation coeff.	0.688	0.675	0.722	0.786	0.722
Nash-Sutcliffe Eff.	0.312	-0.258	0.420	0.536	0.405
Max. SPP rainfall	8.45	10.85	9.34	9.23	10.85
Max. GPCP rainfall	8.72	10.24	11.27	10.02	11.27
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.62	0.84	0.74	0.89	0.62

Figure E-9. PERSIANN tropical zone, bias corrected.

F. Bias Corrected Estimates Error Analysis for Topographic Classification Zones.

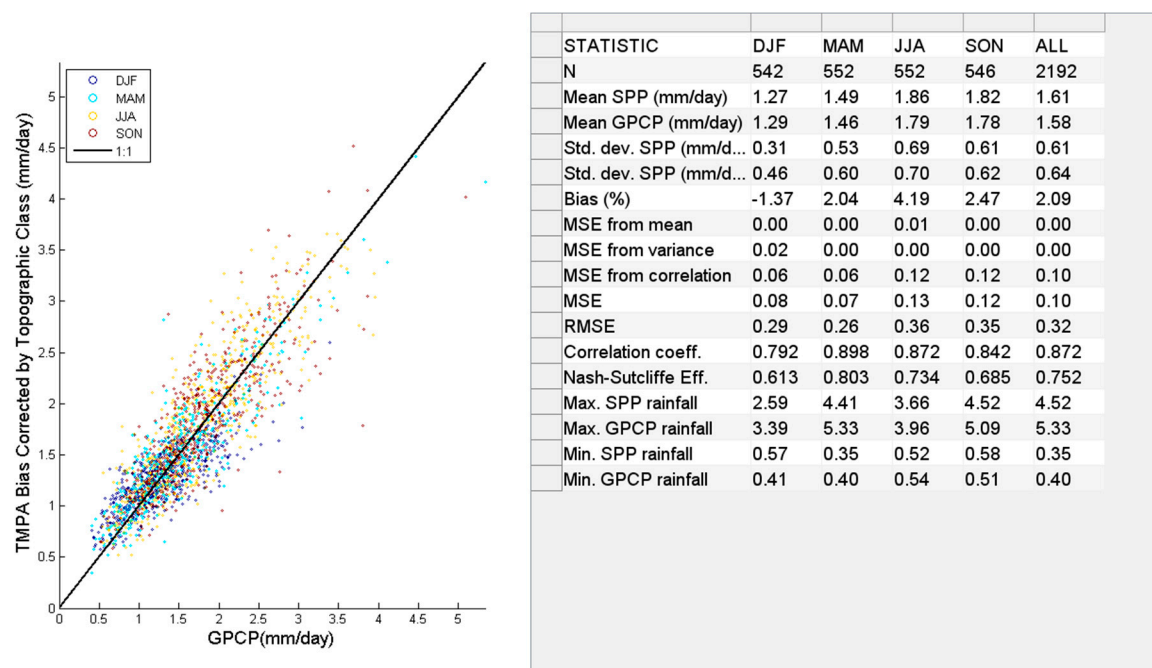


Figure F-1. TMPA plains, bias corrected.

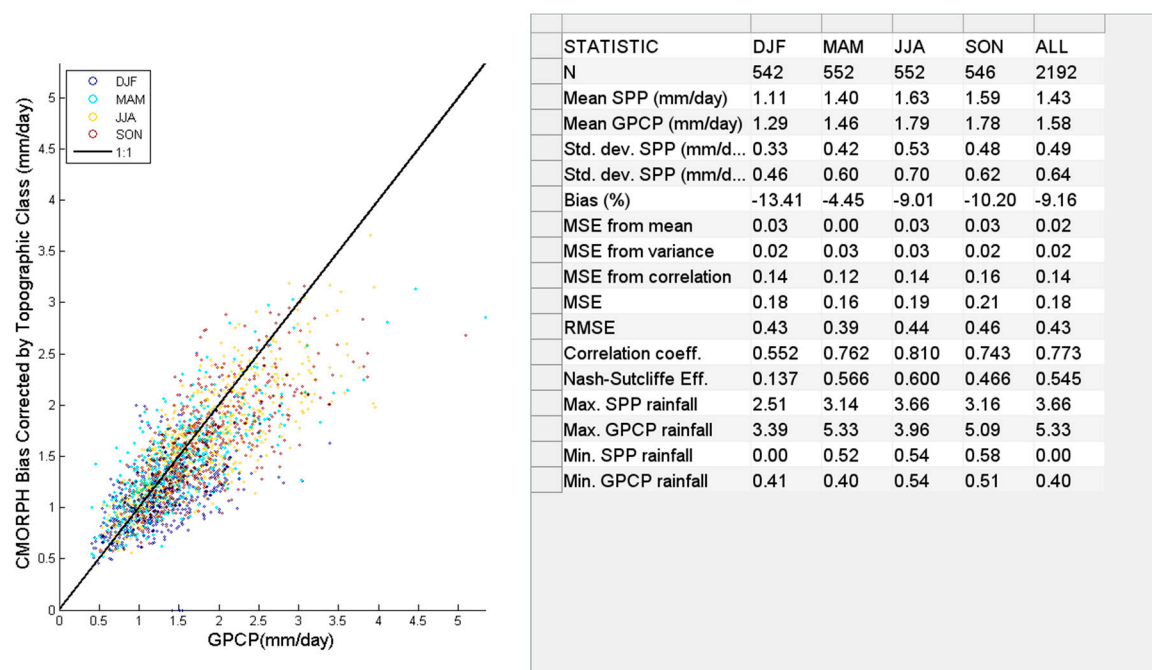
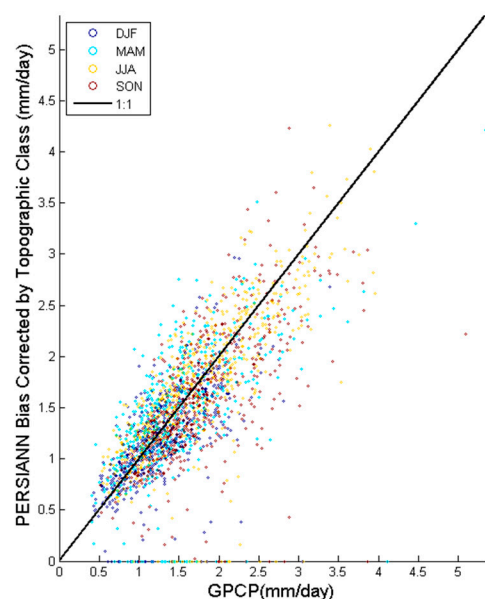
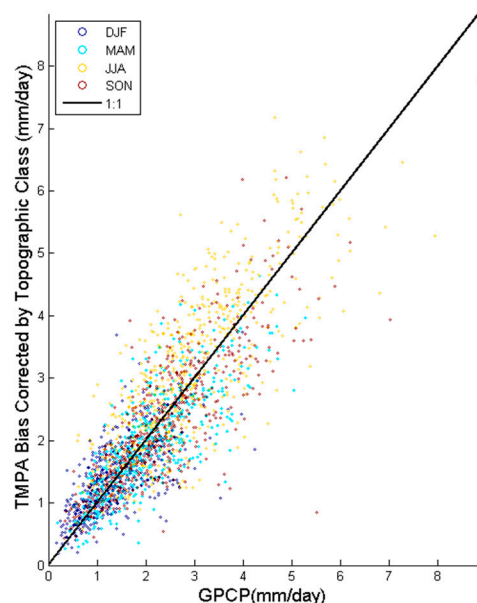


Figure F-2. CMORPH plains, bias corrected.



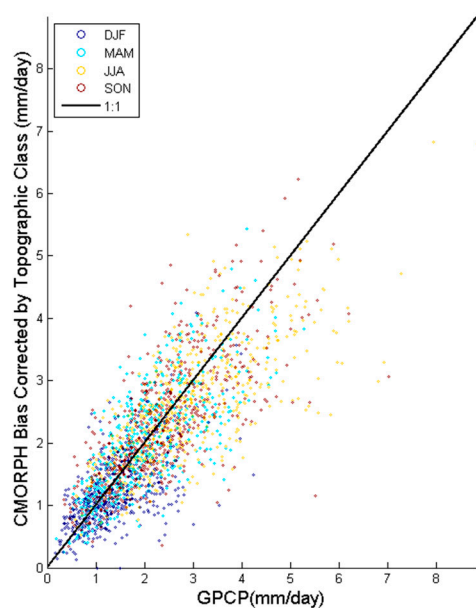
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	1.17	1.41	1.74	1.57	1.48
Mean GPCP (mm/day)	1.29	1.46	1.79	1.78	1.58
Std. dev. SPP (mm/d...	0.48	0.62	0.71	0.64	0.65
Std. dev. SPP (mm/d...	0.46	0.60	0.70	0.62	0.64
Bias (%)	-8.69	-3.57	-2.55	-11.44	-6.51
MSE from mean	0.01	0.00	0.00	0.04	0.01
MSE from variance	0.00	0.00	0.00	0.00	0.00
MSE from correlation	0.19	0.29	0.26	0.29	0.26
MSE	0.20	0.29	0.26	0.33	0.27
RMSE	0.45	0.54	0.51	0.57	0.52
Correlation coeff.	0.571	0.611	0.735	0.640	0.687
Nash-Sutcliffe Eff.	0.052	0.178	0.455	0.159	0.332
Max. SPP rainfall	2.96	4.21	4.25	4.23	4.25
Max. GPCP rainfall	3.39	5.33	3.96	5.09	5.33
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.41	0.40	0.54	0.51	0.40

Figure F-3. PERSIANN plains, bias corrected.



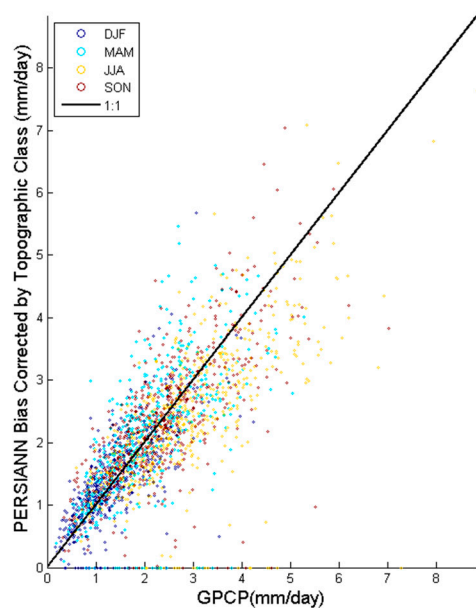
STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	1.39	1.92	3.17	2.31	2.20
Mean GPCP (mm/day)	1.38	2.01	2.94	2.39	2.18
Std. dev. SPP (mm/d...	0.58	0.81	1.27	1.01	1.15
Std. dev. SPP (mm/d...	0.68	0.91	1.24	1.07	1.15
Bias (%)	0.78	-4.57	7.80	-3.32	0.80
MSE from mean	0.00	0.01	0.05	0.01	0.00
MSE from variance	0.01	0.01	0.00	0.00	0.00
MSE from correlation	0.25	0.29	0.66	0.43	0.43
MSE	0.26	0.31	0.71	0.44	0.43
RMSE	0.50	0.56	0.84	0.66	0.66
Correlation coeff.	0.693	0.800	0.790	0.801	0.838
Nash-Sutcliffe Eff.	0.454	0.621	0.539	0.617	0.674
Max. SPP rainfall	3.73	4.64	7.74	6.21	7.74
Max. GPCP rainfall	4.24	5.28	8.83	7.02	8.83
Min. SPP rainfall	0.19	0.27	0.58	0.44	0.19
Min. GPCP rainfall	0.16	0.19	0.57	0.33	0.16

Figure F-4. TMPA mountains, bias corrected.



STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	1.21	2.00	2.65	2.32	2.05
Mean GPCP (mm/day)	1.38	2.01	2.94	2.39	2.18
Std. dev. SPP (mm/d...	0.56	0.85	0.95	0.99	1.01
Std. dev. SPP (mm/d...	0.68	0.91	1.24	1.07	1.15
Bias (%)	-12.26	-0.65	-9.85	-2.79	-6.17
MSE from mean	0.03	0.00	0.08	0.00	0.02
MSE from variance	0.02	0.00	0.09	0.01	0.02
MSE from correlation	0.31	0.42	0.65	0.57	0.51
MSE	0.35	0.42	0.82	0.58	0.54
RMSE	0.59	0.65	0.91	0.76	0.74
Correlation coeff.	0.599	0.729	0.725	0.730	0.781
Nash-Sutcliffe Eff.	0.250	0.488	0.469	0.493	0.588
Max. SPP rainfall	4.08	5.43	6.82	6.23	6.82
Max. GPCP rainfall	4.24	5.28	8.83	7.02	8.83
Min. SPP rainfall	0.00	0.25	0.52	0.32	0.00
Min. GPCP rainfall	0.16	0.19	0.57	0.33	0.16

Figure F-5. CMORPH mountains, bias corrected.



STATISTIC	DJF	MAM	JJA	SON	ALL
N	542	552	552	546	2192
Mean SPP (mm/day)	1.40	2.01	2.45	2.33	2.05
Mean GPCP (mm/day)	1.38	2.01	2.94	2.39	2.18
Std. dev. SPP (mm/d...	0.72	1.04	1.13	1.06	1.08
Std. dev. SPP (mm/d...	0.68	0.91	1.24	1.07	1.15
Bias (%)	1.37	0.27	-16.44	-2.59	-6.01
MSE from mean	0.00	0.00	0.23	0.00	0.02
MSE from variance	0.00	0.02	0.01	0.00	0.00
MSE from correlation	0.27	0.68	0.89	0.67	0.68
MSE	0.27	0.70	1.13	0.68	0.70
RMSE	0.52	0.84	1.06	0.82	0.84
Correlation coeff.	0.724	0.636	0.685	0.703	0.727
Nash-Sutcliffe Eff.	0.412	0.143	0.268	0.412	0.471
Max. SPP rainfall	5.69	5.47	7.63	7.03	7.63
Max. GPCP rainfall	4.24	5.28	8.83	7.02	8.83
Min. SPP rainfall	0.00	0.00	0.00	0.00	0.00
Min. GPCP rainfall	0.16	0.19	0.57	0.33	0.16

Figure F-6. PERSIANN mountains, bias corrected.

