Remote sensing-aided large-scale rainfall-runoff modelling in the humid tropics

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Figure S2. Statistics of CHIRPS and corrected CHIRPS (CHIRPSc) performance with respect to ground precipitation. a) computed MAE at daily scale, b) computed MAE at monthly scale, c) computed MAE at annual scale and d) confusion matrix of days with rain and days without rain, e) False alarm ratio between ground precipitation and CHIRPS, f) Probability of detection, g) Threat Score.

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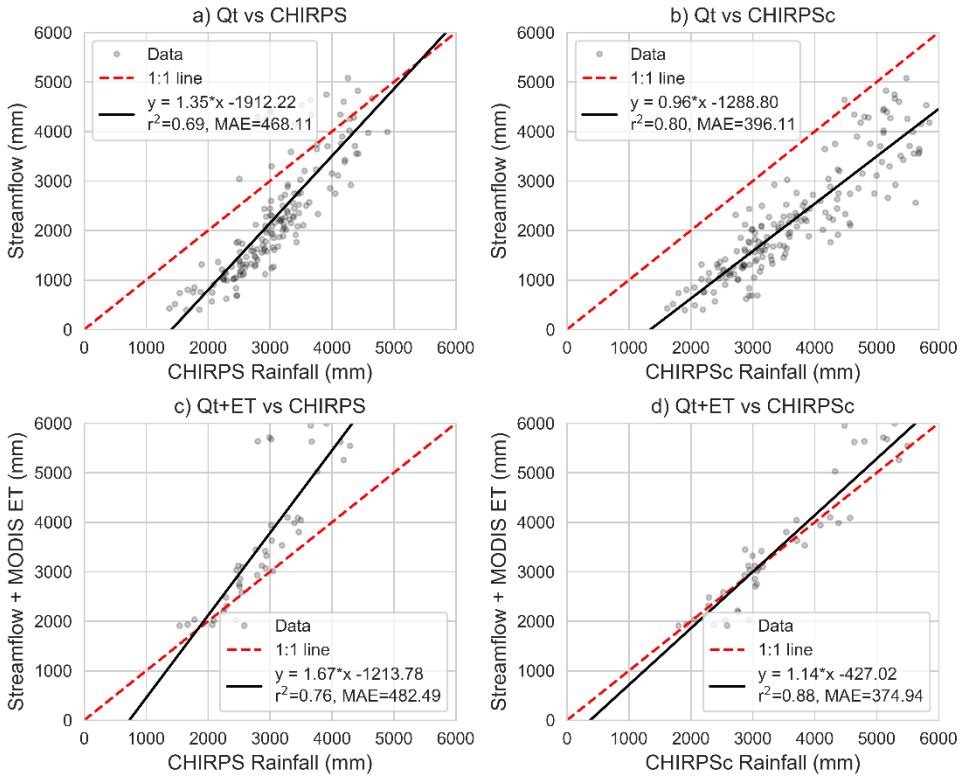
Introduction

This supplementary material contains additional results for the precipitation bias correction. Figures S1 and S2 show the errors obtained by the bias correction technique at different time scales and the comparison of annual streamflow and precipitation.

Tables show detailed model performance results and simulated hydrological signatures for the monitored catchments.



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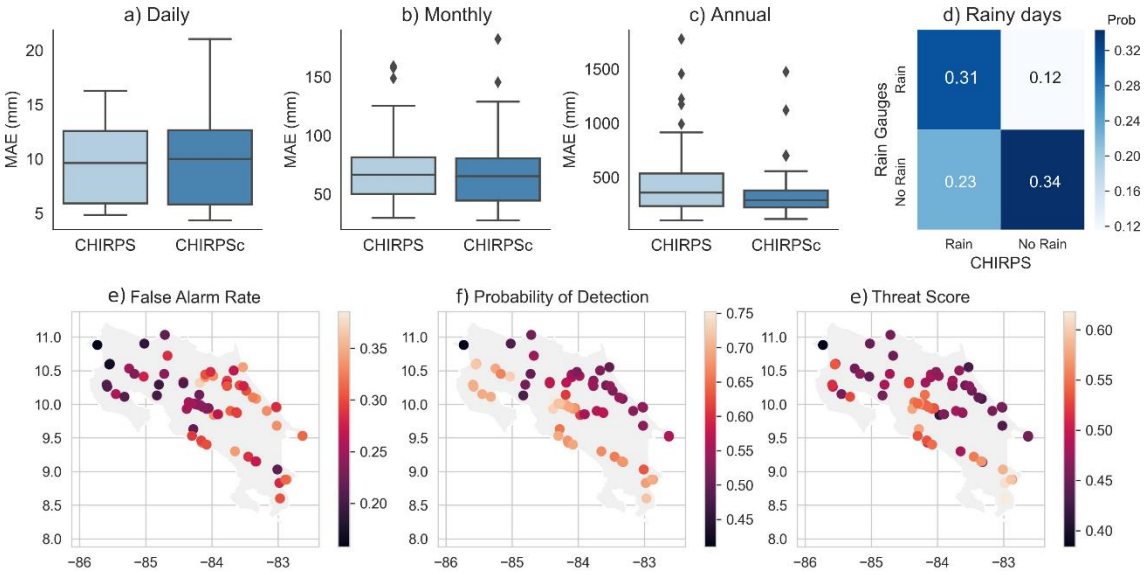

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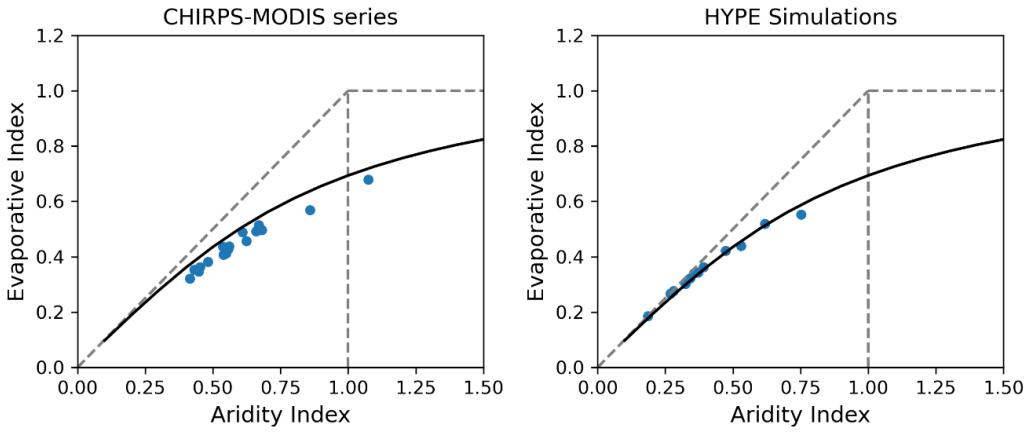

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		Calibration				Validation			
Model	**Variable**	**KGE**	**CC**	**MAE**	**NSE**	**KGE**	**CC**	**MAE**	**NSE**
M1	Qtd	0.54±0.09	0.64±0.12	23.87±29.57	0.24±0.24	0.42±0.50	0.65±0.18	25.76±31.33	0.21±0.44
	Qtm	0.60±0.18	0.83±0.08	16.99±20.51	0.66±0.12	0.42±0.72	0.84±0.09	17.52±20.20	0.59±0.22
	ETm	0.29±0.29	0.38±0.30	20.72±9.89	-1.63±2.60	0.28±0.34	0.37±0.33	19.43±9.05	-1.58±2.82
	PETm	0.64±0.09	0.74±0.04	27.54±10.66	-0.71±2.15	0.64±0.11	0.75±0.04	27.06±10.91	-0.72±2.34
M2	Qtd	0.53±0.08	0.63±0.12	21.19±25.97	0.11±0.32	0.45±0.25	0.63±0.16	23.74±29.08	0.03±0.47
	Qtm	0.67±0.11	0.82±0.07	15.09±18.2	0.61±0.14	0.54±0.50	0.83±0.08	16.95±20.25	0.49±0.25
	ETm	0.04±0.33	0.43±0.22	31.88±18.54	-1.64±2.12	0.06±0.31	0.44±0.24	28.86±16.06	-1.50±2.12
	PETm	0.43±0.28	0.74±0.04	37.70±15.77	-0.53±2.17	0.37±0.32	0.75±0.04	36.53±14.62	-0.51±2.38
M3	Qtd	0.45±0.2	0.62±0.12	24.67±29.81	0.23±0.2	0.39±0.36	0.63±0.16	25.45±29.36	0.25±0.35
	Qtm	0.59±0.21	0.82±0.08	16.89±20.84	0.62±0.14	0.45±0.52	0.83±0.09	15.45±16.65	0.58±0.21
	ETm	0.49±0.17	0.59±0.17	17.51±6.04	-0.96±2.44	0.48±0.19	0.59±0.18	17.58±6.46	-1.15±2.62
	PETm	0.61±0.10	0.74±0.04	35.145±11.18	-2.15±3.12	0.62±0.09	0.75±0.04	35.42±12.03	-2.35±3.50
M4	Qtd	0.47±0.17	0.62±0.12	24.84±30.78	0.21±0.21	0.40±0.35	0.63±0.17	25.41±29.86	0.21±0.43
	Qtm	0.59±0.21	0.82±0.08	17.26±21.62	0.62±0.14	0.44±0.53	0.83±0.09	15.19±16.09	0.59±0.21
	ETm	0.49±0.17	0.59±0.17	17.36±5.95	-0.88±2.36	0.47±0.20	0.59±0.19	17.41±6.37	-1.05±2.53
	PETm	0.61±0.10	0.74±0.04	35.15±11.18	-2.15±3.12	0.62±0.09	0.75±0.04	35.42±12.03	-2.34±3.50

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Statistic	Model	Cariblanco	Oriente	Dos Montanas	Terron Colorado	Guatuso
Mean.Qtd ($m^3 s^{-1}$)	Obs	8.51	28.75	53.65	137.58	26.7
	M1	8.09	29.3	53.69	135.87	28.1
	M2	7.73	28.65	48.98	125.69	25.37
	M3	9.32	33.65	63.29	139.28	29.09
	M4	9.32	33.64	63.25	139.07	29.11
Median.Qtd ($m^3 s^{-1}$)	Obs	7.44	26.1	47.2	127	21
	M1	7.74	29.01	51.86	120.42	19.06
	M2	6.16	27.73	43.23	95.95	15.68
	M3	8.4	31.53	56.67	116.81	20.08
	M4	8.79	32.34	59.75	121.63	21.16
Slope.Qtd ($m^3 s^{-1}$)	Obs	10.05	44.43	78.18	213.41	43.33
	M1	18.99	73	128.03	500.44	97.06
	M2	15.24	69.23	93.46	363.09	68.96
	M3	24.62	76.73	131.15	417.68	75.91
	M4	23.2	76.04	126.09	443.05	80.24
CV.Qtd (-)	Obs	0.74	0.62	0.71	0.64	0.99
	M1	0.83	0.74	0.73	0.9	1.04
	M2	0.99	0.73	0.69	0.88	1.11
	M3	0.99	0.74	0.74	0.83	0.99
	M4	0.87	0.71	0.7	0.82	0.95
SC (-)	Obs	0.66	0.71	0.61	0.54	0.67
	M1	0.62	0.72	0.61	0.53	0.70
	M2	0.59	0.70	0.55	0.49	0.63
	M3	0.72	0.82	0.72	0.54	0.72
	M4	0.72	0.82	0.72	0.54	0.72
AI (-)	Obs	0.3	0.31	0.38	0.44	0.34
	M1	0.4	0.31	0.4	0.41	0.38
	M2	0.44	0.33	0.46	0.49	0.48
	M3	0.28	0.19	0.27	0.37	0.34
	M4	0.28	0.19	0.27	0.37	0.34
EI (-)	Obs	0.25	0.24	0.31	0.35	0.26
	M1	0.38	0.3	0.38	0.36	0.35
	M2	0.41	0.32	0.44	0.41	0.42
	M3	0.28	0.19	0.27	0.35	0.32
	M4	0.28	0.19	0.27	0.35	0.32

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Statistic	Model	Providencia	Tacares	Guapinol	Caracucho	El Rey	Rancho Rey	Guardia	Palmar
Mean.Qtd ($m^3 s^{-1}$)	Obs	6.8	11.16	10.52	72.31	34.92	9.52	24.51	301.65
	M1	8.35	10.98	9.39	60.38	29.98	12.07	25.32	312.64
	M2	8.27	10.87	9.34	57.66	29.18	11.25	23.64	306.44
	M3	10.3	13.66	10.38	75.75	36.34	12.66	30.34	353.03
	M4	10.3	13.61	10.33	75.59	36.15	12.62	30.25	352.19
Median.Qtd ($m^3 s^{-1}$)	Obs	4.44	8.35	6.35	50	17.6	6.72	12.6	216
	M1	6.14	6.94	3.82	43.13	16.88	5.54	9.11	264.58
	M2	5.39	6.99	5.07	38.36	18.49	7.47	13.11	236.48
	M3	7.39	9.26	6.09	58.96	20.59	8.74	12.49	299.49
	M4	8.07	9.14	4.82	60.19	19.03	7.47	10.83	301.87
Slope.Qtd ($m^3 s^{-1}$)	Obs	12.27	18.11	20.15	133.19	63.02	10.09	20.76	687.88
	M1	22.58	34.91	25.92	166.87	78.79	28.85	51.15	972.81
	M2	13.92	22.84	22.58	90.28	60.29	24.86	30.71	699.81
	M3	33.63	40.65	25.42	187.28	88.75	26.42	46.49	959.84
	M4	31.56	44.28	25.86	201.09	96.28	26.92	42.32	1018.52
CV.Qtd (-)	Obs	0.96	0.68	1.39	1.01	1.39	1.12	2.08	1.04
	M1	0.98	1	1.21	0.95	1.15	1.2	1.68	0.92
	M2	0.93	1.02	1.11	0.89	1.1	0.95	1.39	0.9
	M3	1.03	1.01	1.06	0.83	1.08	0.89	1.42	0.85
	M4	0.95	1.01	1.08	0.82	1.09	0.91	1.42	0.85
RC (-)	Obs	0.48	0.53	0.59	0.62	0.58	0.38	0.36	0.58
	M1	0.60	0.52	0.53	0.53	0.50	0.48	0.38	0.60
	M2	0.59	0.52	0.52	0.50	0.49	0.44	0.35	0.59
	M3	0.74	0.65	0.58	0.66	0.61	0.50	0.46	0.68
	M4	0.74	0.65	0.58	0.66	0.61	0.50	0.46	0.68
AI (-)	Obs	0.54	0.52	0.73	0.54	0.66	0.8	0.94	0.51
	M1	0.56	0.63	0.67	0.54	0.69	0.68	0.87	0.47
	M2	0.56	0.66	0.7	0.58	0.74	0.76	0.97	0.49
	M3	0.33	0.39	0.53	0.36	0.47	0.63	0.72	0.35
	M4	0.33	0.39	0.53	0.36	0.47	0.63	0.72	0.35
EI (-)	Obs	0.39	0.42	0.54	0.41	0.51	0.53	0.6	0.39
	M1	0.45	0.5	0.5	0.47	0.53	0.56	0.63	0.4
	M2	0.46	0.5	0.5	0.5	0.54	0.6	0.65	0.42
	M3	0.31	0.36	0.44	0.34	0.42	0.53	0.54	0.33
	M4	0.31	0.37	0.44	0.34	0.42	0.54	0.54	0.33