



Table S1. Significance of the models determined.

Stations	BIC GEV0	BIC Best Model	Gap	Significance
Ahlan	422.38	407.96	14.42	Very strong
Atchakpa	515.72	499.67	16.05	Very strong
Beterou	521.92	510.71	11.21	Very strong
Say	412.40	397.42	14.98	Very strong
Garbey Kourou	393.25	381.3	11.95	Very strong
Jiderebodo	466.06	458.06	8	Strong
Kaboua	349.83	344.05	5.78	Positive
Kakassi	288.69	278.33	10.36	Strong
WED- MILLSTONE	560.07	560.07	0	-
Koulikoro	577.55	577.55	0	-
Mopti	473.69	472.47	1.22	Weak
Nawuni	467.46	467.46	0	-
Patience Oti	476.77	472.66	4.11	Positive

Table S2. Summary of selected parameters by station for non-stationarity.

Stations	Parameters						Covariates			Criterion (BIC)
	Position		Log(Scale)				Shape	Position	Scale	
	Mu0	Mu1	Mu2	Phi0	Phi1	Phi2				
Ahlan	744.27	−106.61	5.7	4.96			−0.42	MEI-AS, time		407.96
Atchakpa	426.12	451.50	10.48	5.37	0.52		−0.07	TSAI-M5 ,time	TSAI-M5	499.67
Beterou	276.35	228.41		4.84			−0.12	TSAI-M5		510.71
Say	1431.13	153.54	17.49	5.68	−0.03		−0.34	TNAI-M9, time	time	397.42
Sheaf Kourou	122.55	−33.59	5.22	4.21			0.14	MEI-JJ, time		381.3
Jidere Bode	1815.63	241.11	21.63	6.66	2.2	−0.03	−0.08	DMIW-M7, time	DMIW-M7 , time	458.06
Kaboua	168.01	166.47	2.73	4.58			−0.19	DMIW-M1 ,time		344.05
Kakassi	66.66	1.75		3.46	2.64		0.36	time	DMIW-M1	278.33
Wed Millstone	3493.03			6.78			−0.47			560.07
Koulikoro	3937.88			6.9			−0.25			577.55
Mopti	2228.79			6.18			−0.48			473.69
Nawuni	1305.42			6.98			−1.09			467.46
Patience Oti	1387.14	30.06		6.7			−0.13	time		472.66