

Table S1: Recapitulation of yearly highest discharge values both for simulated WRF-H and station dataset, followed by KGE during the rainy season.

		Catchment	
		Savè	Bétérou
2008	High value observed	1250 m <sup>3</sup> /s	500 m <sup>3</sup> /s
	High value simulated	1935 m <sup>3</sup> /s	1320 m <sup>3</sup> /s
	KGE	0.22	0.16
2009	High value observed	1127 m <sup>3</sup> /s	572 m <sup>3</sup> /s
	High value simulated	1453 m <sup>3</sup> /s	854 m <sup>3</sup> /s
	KGE	0.62	0.69
2010	High value observed	2200 m <sup>3</sup> /s	930 m <sup>3</sup> /s
	High value simulated	2090 m <sup>3</sup> /s	950 m <sup>3</sup> /s
	KGE	0.80	0.84

Table S2 : Comparison of KGE between the deterministic model WRF-H, and WRF-Hydro-SKEBS for Savè (resp. Bétérou).

	2008	2009	2010
WRF-H	0.22 (resp. 0.18)	0.62 (resp. 0.69)	0.80 (resp. 0.73)
WRF-Hydro-SKEBS	0.10-0.41 (resp. 0.12-0.46)	0.30-0.64 (resp. 0.42-0.75)	0.14-0.79 (resp. 0.14-0.70)

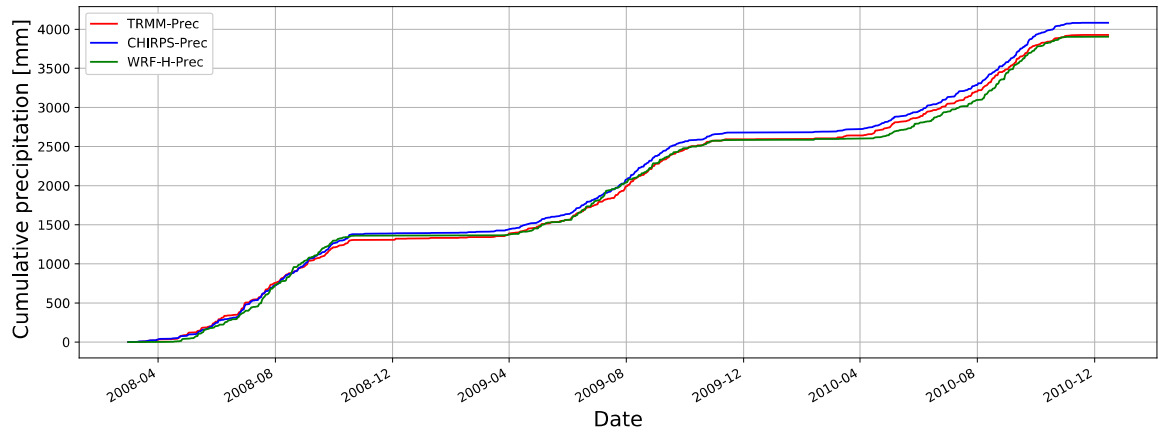


Figure S1: cumulative total precipitation derived from TRMM, CHIRPS and simulated in WRF-H over Savè during the period 2008 to 2010.

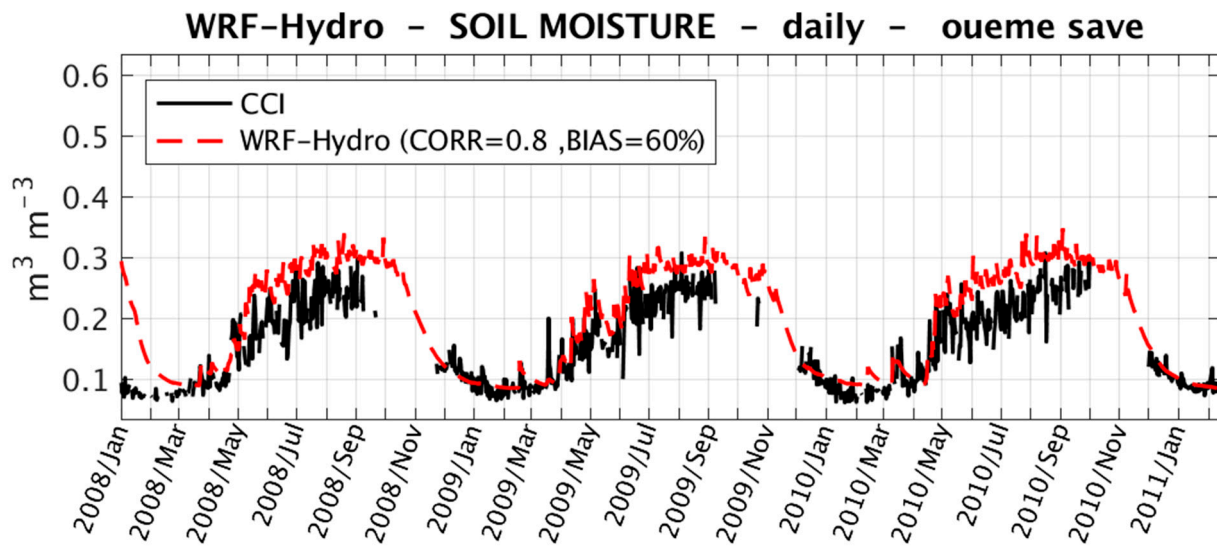


Figure S2: Evaluation of the soil moisture between the simulated with WRF-H of the first Noah LSM soil layer (from 0 to 10 cm) and the daily average from CCI (from 0.5 to 2 cm) over Savè catchment.

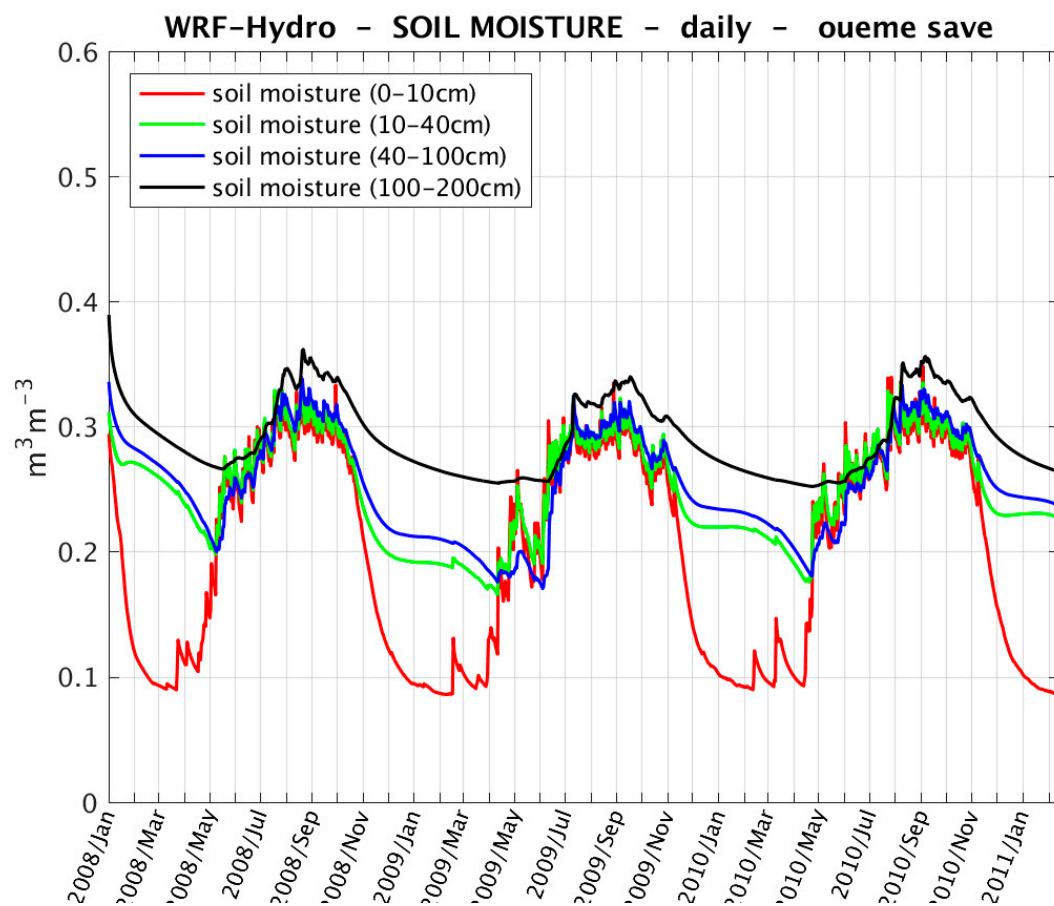


Figure S3: Daily average time series of soil water content (SWC) of the four Noah LSM soil layers of the WRF-H simulation at Savè.