

Supplemental material of the paper titled: Resolving the water budget of a complex carbonate basin in Central Italy with parsimonious modelling solutions.

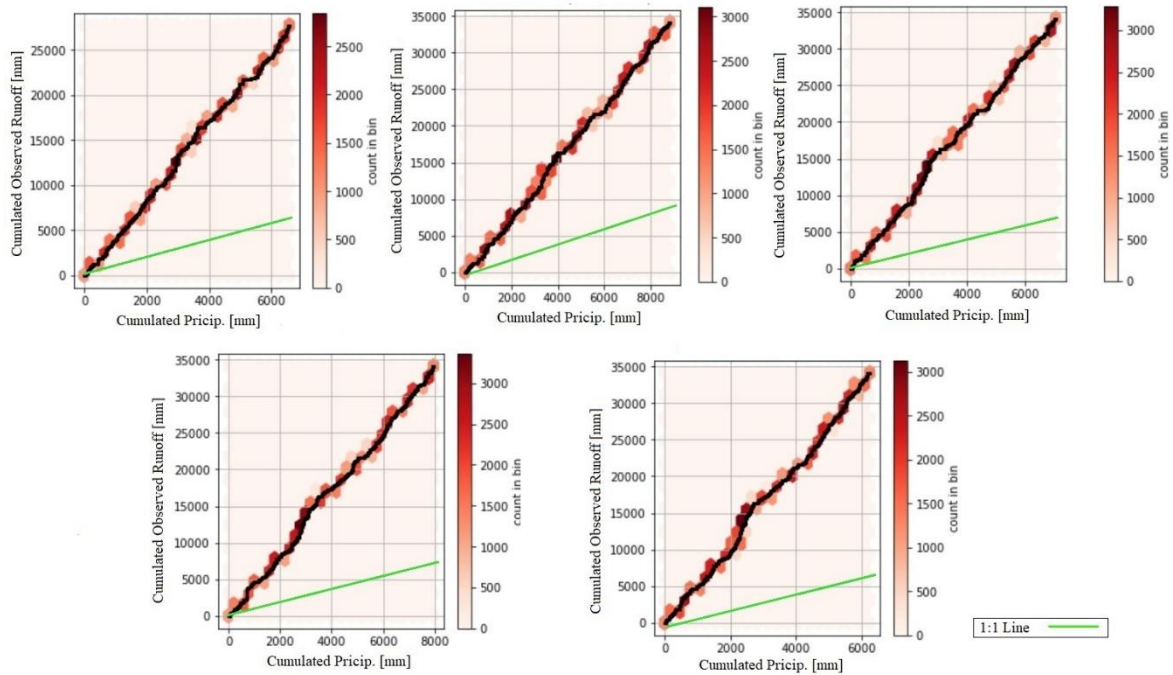


Figure S1. Cumulative CSA observed discharge against cumulative precipitation recorded at different stations located inside and outside of CSA.

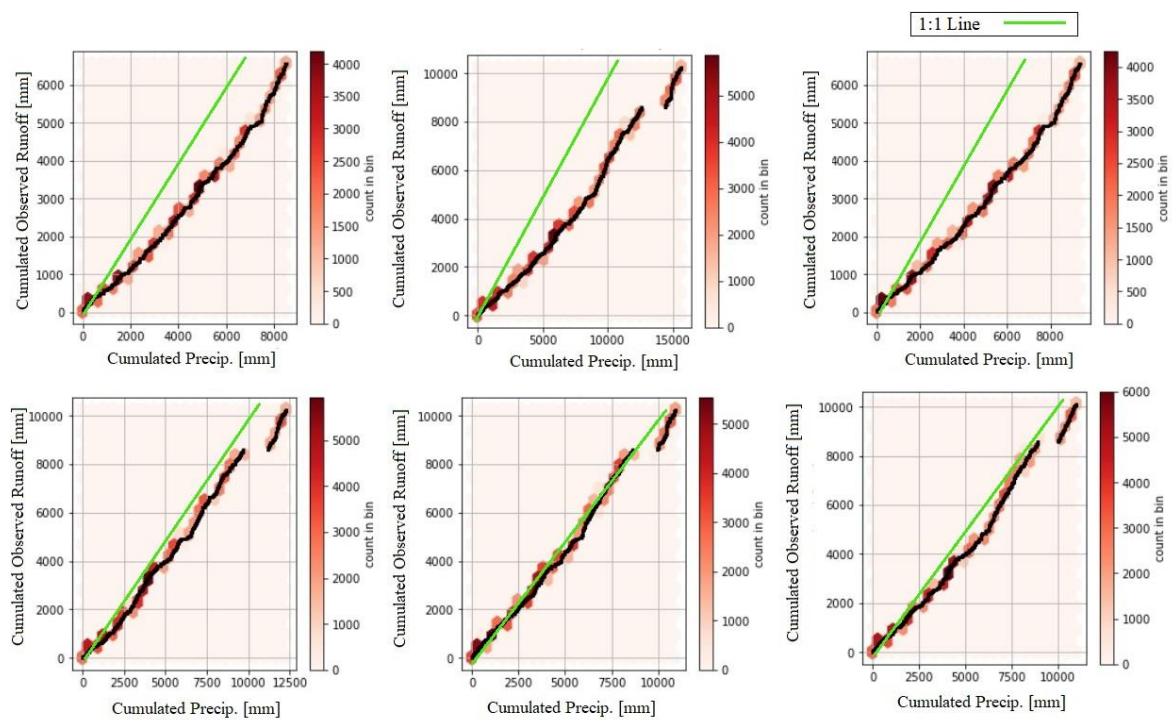


Figure S2. Cumulative Visso observed discharge against cumulative precipitation recorded at different stations located inside and outside of the basin.

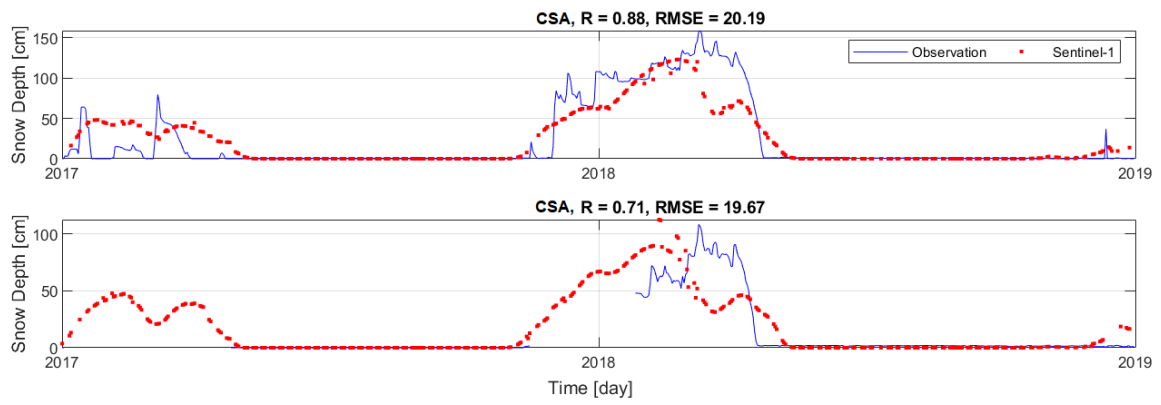


Figure S3. A comparison between Sentinel-1 and in-situ snow depth related to different stations located at CSA. The performance of Sentinel-1 is relatively good.

Table S1. Calibrated model parameters for CSA, Ussita, and Visso

Parameters	Description	CSA	Ussita	Visso
α_r	Partitioning coefficient of precipitation	1.1435	1.5530	0.8596
α_s	Partitioning coefficient of snow	0.7220	0.2166	0.1877
Melting Temperature	-	1.4873	-0.5251	-1.9366
Combined Melting Factor	Melting Factor	0.4221	0.4150	0.4764
Freezing Factor	refreezing rate of the liquid water in the snow pack	0.2759	0.2065	0.3826
α_t	Melting Factor	0.7362	0.1931	0.1978
Maximum Root Zone Storage	-	2880.875	523.665	472.301
a	Linear reservoir coefficient	10.4466	1.4023	0.9210
b	Nonlinear reservoir coefficient	2.4037	2.3958	1.3811
pB_{soil}	-	0.9759	6.8207	7.7801
c	Nonlinear reservoir exponent	10.2251	3.0933	4.3279
d	Linear reservoir coefficient	0.2818	5.0553	5.0553
$s_{RunoffMax}$	-	1.4691	3.4409	2.3258
e	Linear reservoir coefficient	1.0463	1.2591	2.3652
f	Dimensional ET coefficient	9.8212	6.70964	6.9816
Maximum Ground Water Storage	-	3417.712	802.550	757.825
x	Muskingum parameter	0.2402	0.3582	0.3699
uc	Muskingum X parameter	0.2771	0.5289	0.6323