

Additional results for the paper entitled:
*Modeling river flow for flood forecasting: a case study on the Ter
river*

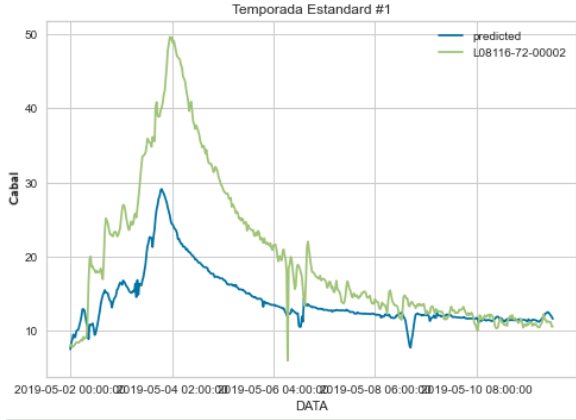
Fabián Serrano-López, Sergi Ger-Roca, Maria Salamó,
Jerónimo Hernández-González

Table 1: Results in the Upper course of the Ter river in terms of averaged RMSE (and standard deviation) using two validation strategies (TSS and CVS) plus 4 events using 4 different types of regressors. Results are shown with the complete dataset, and with the subsets of no-precipitation and precipitation-only data (normal and oversampled).

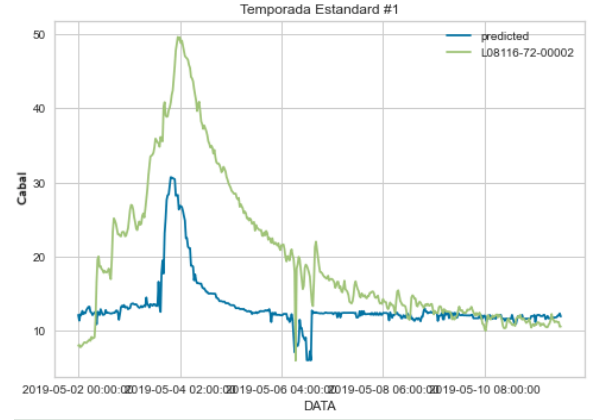
Model	TSS	CVS	E1	E2	Gloria	Leslie
KNN	13.21 \pm 3.94	19.43 \pm 1.82	10.18 \pm 0.29	28.58 \pm 1.77	233.93 \pm 22.91	143.32 \pm 10.28
LR	12.52 \pm 4.67	16.29 \pm 0.22	9.21 \pm 0.70	23.66 \pm 1.78	248.42 \pm 8.01	81.94 \pm 1.27
RF	13.23 \pm 5.28	19.26 \pm 2.77	9.13 \pm 0.32	25.71 \pm 0.89	245.35 \pm 39.25	153.83 \pm 25.16
XGB	14.62 \pm 5.07	19.21 \pm 3.54	10.65 \pm 0.33	30.47 \pm 1.82	216.85 \pm 42.57	151.10 \pm 30.42
COMPLETE DATASET						
KNN	7.40 \pm 1.68	7.35 \pm 0.92	10.06 \pm 0.30	26.91 \pm 0.51	364.06 \pm 13.82	204.28 \pm 5.23
LR	6.13 \pm 2.31	5.70 \pm 0.13	10.85 \pm 1.55	28.85 \pm 1.50	286.06 \pm 23.37	101.78 \pm 6.03
RF	6.16 \pm 1.39	7.56 \pm 0.92	8.74 \pm 0.70	20.16 \pm 3.93	406.61 \pm 3.72	221.77 \pm 0.81
XGB	6.64 \pm 2.51	8.03 \pm 3.46	11.32 \pm 0.66	27.27 \pm 4.08	357.91 \pm 16.55	203.38 \pm 7.91
NO-PRECIPITATION SUBSET						
KNN	37.86 \pm 10.94	53.75 \pm 4.68	9.32 \pm 0.18	27.90 \pm 1.25	227.45 \pm 13.23	146.32 \pm 21.47
LR	34.96 \pm 10.65	47.72 \pm 1.37	9.76 \pm 0.79	24.20 \pm 1.38	246.05 \pm 7.86	80.58 \pm 4.66
RF	37.83 \pm 15.58	57.76 \pm 6.19	8.90 \pm 0.49	27.20 \pm 1.74	249.05 \pm 33.44	158.31 \pm 17.01
XGB	44.04 \pm 13.55	54.66 \pm 5.01	9.42 \pm 0.55	29.75 \pm 1.96	210.84 \pm 26.56	154.70 \pm 30.32
PRECIPITATION-ONLY SUBSET						
KNN	60.40 \pm 54.93	48.72 \pm 32.06	8.44 \pm 2.80	13.80 \pm 2.28	230.63 \pm 174.72	130.71 \pm 86.84
LR	52.11 \pm 22.40	43.90 \pm 8.97	12.10 \pm 4.26	19.08 \pm 2.27	219.56 \pm 61.94	80.20 \pm 20.58
RF	57.84 \pm 58.85	46.94 \pm 38.95	9.35 \pm 4.34	11.53 \pm 0.84	221.40 \pm 203.10	121.43 \pm 112.77
XGB	57.88 \pm 56.37	46.20 \pm 36.64	8.42 \pm 2.75	11.61 \pm 1.69	215.55 \pm 196.31	121.55 \pm 105.09
PRECIPITATION-ONLY SUBSET (OVERSAMPLED)						

Table 2: Results in the Lower course of the Ter river in terms of averaged RMSE (and standard deviation) using two validation strategies (TSS and CVS) plus 4 events using 4 different types of regressors. Results are shown with the complete dataset, and with the subsets of no-precipitation and precipitation-only data (normal and oversampled).

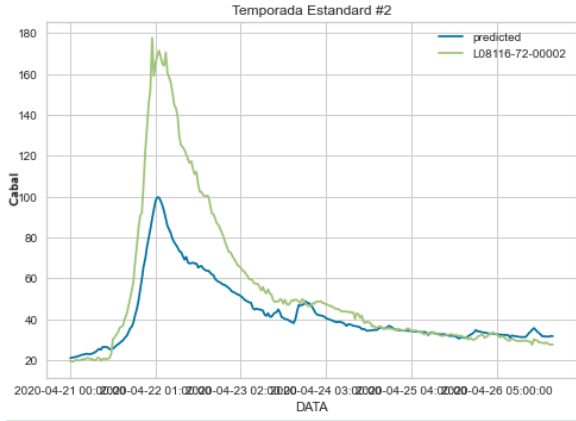
Model	TSS	CVS	E1	E2	Gloria	Leslie
KNN	20.95 ± 16.01	37.83 ± 0.82	5.19 ± 0.07	100.21 ± 14.54	206.88 ± 46.09	74.29 ± 1.25
LR	24.96 ± 22.21	51.16 ± 2.47	6.29 ± 0.68	78.99 ± 9.54	283.85 ± 15.94	49.68 ± 16.17
RF	18.24 ± 13.67	32.84 ± 1.85	3.02 ± 0.46	85.33 ± 3.43	214.28 ± 60.00	49.87 ± 5.53
XGB	20.09 ± 14.93	19.78 ± 15.39	3.12 ± 1.27	95.84 ± 0.59	244.26 ± 39.57	71.50 ± 9.34
COMPLETE DATASET						
KNN	13.40 ± 9.95	23.95 ± 0.21	5.10 ± 0.17	143.29 ± 9.82	320.37 ± 7.75	83.42 ± 0.51
LR	25.94 ± 30.98	66.53 ± 18.04	5.25 ± 0.50	178.88 ± 120.79	476.66 ± 191.80	66.77 ± 11.21
RF	10.05 ± 6.99	18.81 ± 1.26	3.23 ± 1.00	141.97 ± 19.27	343.13 ± 48.69	86.72 ± 24.75
XGB	10.86 ± 6.79	10.43 ± 7.16	3.39 ± 0.74	126.45 ± 9.18	287.90 ± 35.60	54.47 ± 3.14
NO-PRECIPITATION SUBSET						
KNN	66.48 ± 30.25	109.12 ± 3.92	5.39 ± 0.56	113.80 ± 18.95	241.16 ± 39.87	99.48 ± 0.83
LR	64.62 ± 33.64	118.89 ± 34.16	10.19 ± 2.12	131.30 ± 91.18	357.53 ± 148.46	42.26 ± 4.53
RF	63.85 ± 28.39	103.61 ± 8.17	2.18 ± 0.04	103.55 ± 13.39	257.01 ± 61.51	49.87 ± 6.25
XGB	72.22 ± 26.56	72.30 ± 23.35	2.14 ± 0.15	105.70 ± 16.69	254.54 ± 45.74	74.61 ± 11.68
PRECIPITATION-ONLY SUBSET						
KNN	123.90 ± 114.31	90.37 ± 31.67	18.91 ± 26.57	67.91 ± 70.97	198.69 ± 165.52	52.51 ± 31.62
LR	111.05 ± 82.07	74.06 ± 3.76	9.09 ± 6.68	74.67 ± 21.82	152.39 ± 5.05	44.79 ± 7.49
RF	113.01 ± 130.70	80.10 ± 33.70	31.56 ± 19.38	69.94 ± 77.45	196.87 ± 183.08	50.26 ± 60.13
XGB	136.84 ± 109.86	138.04 ± 109.12	23.41 ± 19.25	70.86 ± 78.13	203.95 ± 177.32	58.08 ± 56.73
PRECIPITATION-ONLY SUBSET (OVERSAMPLED)						



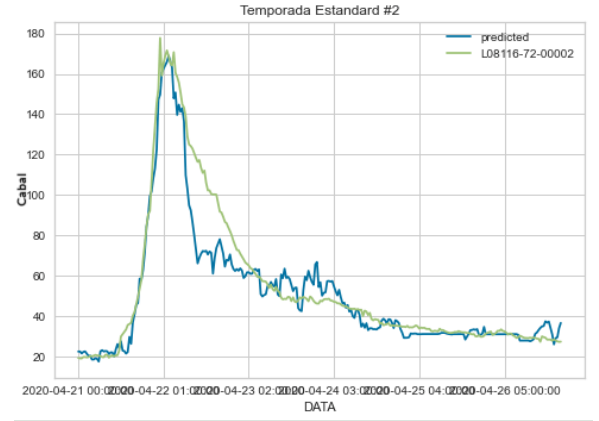
(a) *E1*, model learned with all the data



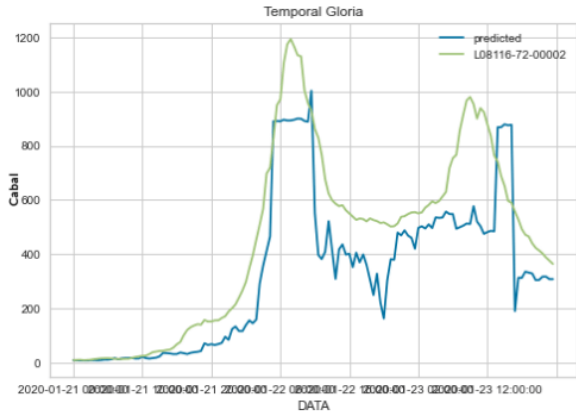
(b) *E1*, model learned with precipitation data (ov.)



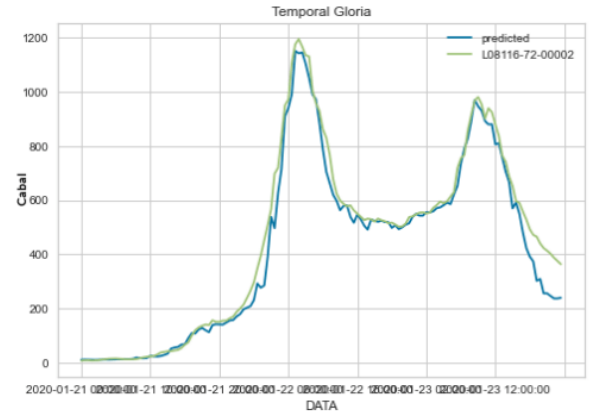
(c) *E2*, model learned with all the data



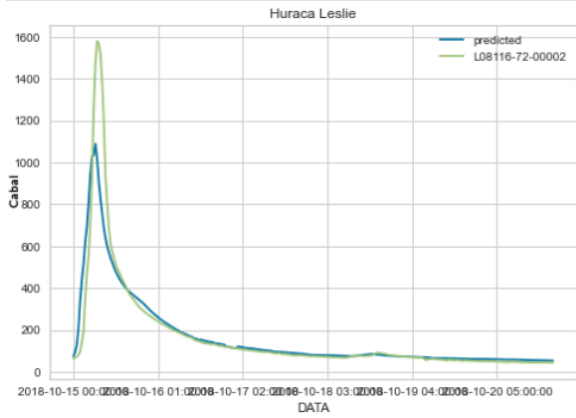
(d) *E2*, model learned with precipitation data (ov.)



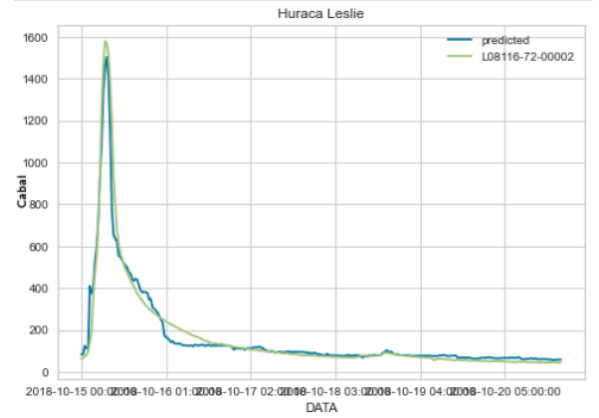
(e) *Gloria*, model learned with all the data



(f) *Gloria*, model learned with precipitation data (ov.)

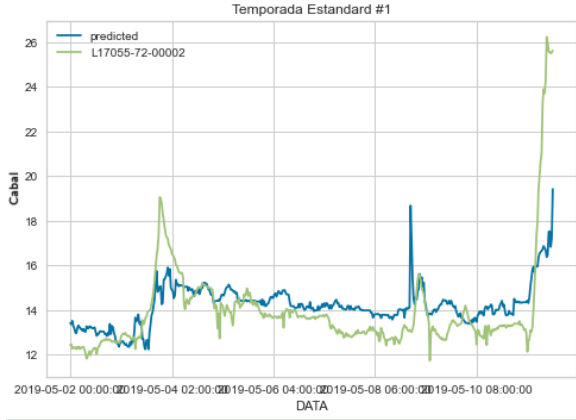


(g) *Leslie*, model learned with all the data

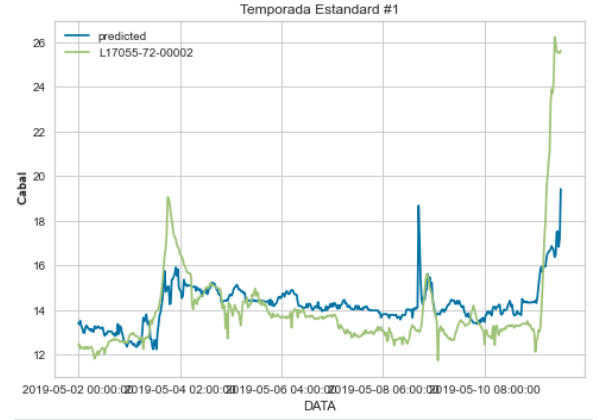


(h) *Leslie*, model learned with precipitation data (ov.)

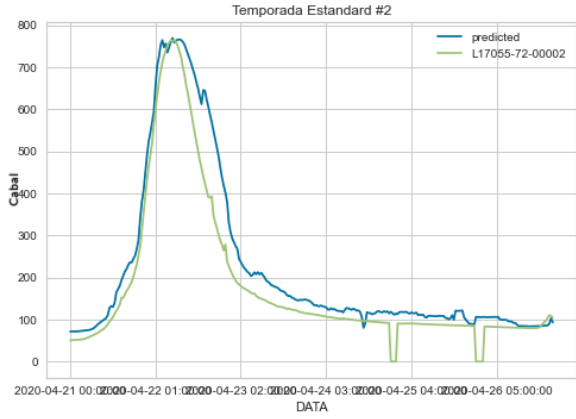
Figure 1: Results in the upper course of the Ter river



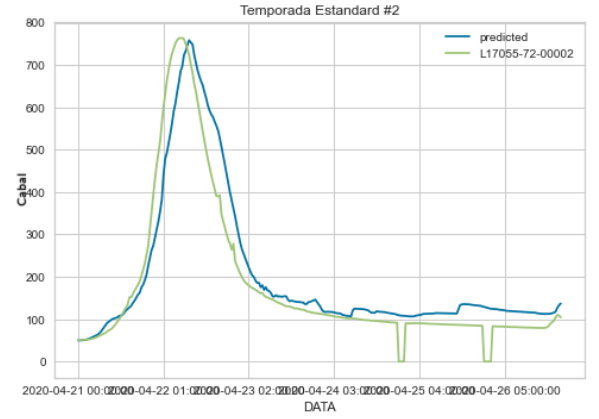
(a) *E1*, model learned with all the data



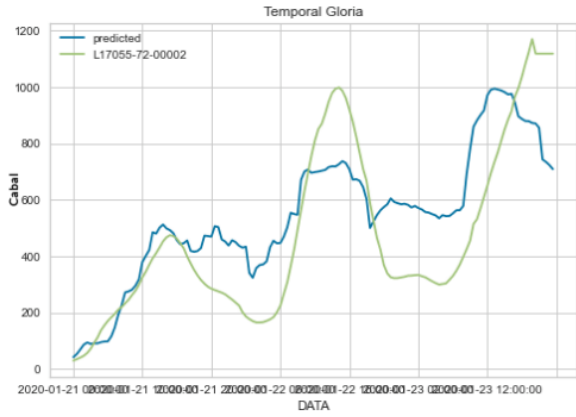
(b) *E1*, model learned with precipitation data (ov.)



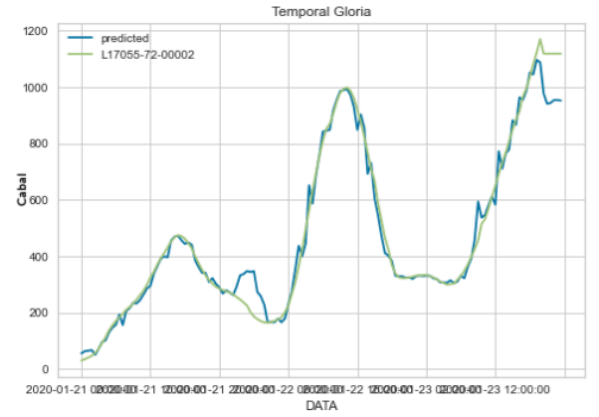
(c) *E2*, model learned with all the data



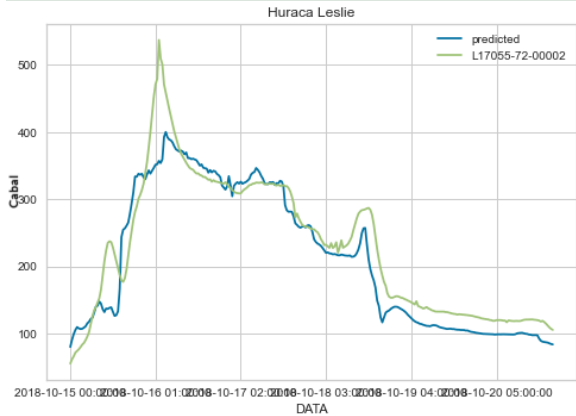
(d) *E2*, model learned with precipitation data (ov.)



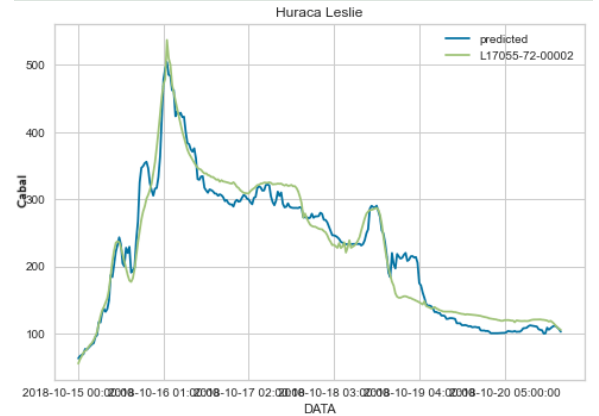
(e) *Gloria*, model learned with all the data



(f) *Gloria*, model learned with precipitation data (ov.)



(g) *Leslie*, model learned with all the data



(h) *Leslie*, model learned with precipitation data (ov.)

Figure 2: Results in the lower course of the Ter river