Supplement of Hydrol. Earth Syst. Sci., 22, 71–87, 2018
https://doi.org/10.5194/hess-22-71-2018-supplement

Hydrology and Earth System Sciences
Open Access
EGU

Supplement of

Shallow water table effects on water, sediment, and pesticide transport in vegetative filter strips – Part 2: model coupling, application, factor importance, and uncertainty

Claire Lauvernet and Rafael Muñoz-Carpena

Correspondence to: Claire Lauvernet (claire.lauvernet@irstea.fr)

Supplementary materials

S1. Program distribution.

Free open source code, executable program, documentation and sample applications can be downloaded from the VFSMOD main web page at http://abe.ufl.edu/carpena/vfsmod/

S2. Additional Supporting Tables

Table S2.1. Morris indices on Jaillière

Jaillière no WT						
	dQ	dQ	dE	dE	dP	dP
Morris Index	μ*	σ	μ*	σ	μ*	σ
FWIDTH	3.079	1.178	0.047	0.041	0.990	1.144
VL	2.913	0.792	0.039	0.026	1.088	0.956
RNA	0.023	0.017	0.007	0.010	0.009	0.012
SOA	0.032	0.029	0.066	0.073	0.029	0.036
VKS	45.663	2.906	0.389	0.193	21.468	6.439
SAV	2.406	1.399	0.009	0.010	0.789	1.076
OS	2.114	0.897	0.011	0.021	0.761	0.830
OI	1.558	0.492	0.004	0.006	0.506	0.547
SS	0.000	0.000	0.005	0.008	0.002	0.004
VN	0.000	0.000	0.025	0.043	0.010	0.022
VN2	0.000	0.000	0.000	0.000	0.000	0.000
SCHK	0.002	0.003	0.000	0.001	0.000	0.001
COARSE	0.000	0.000	0.023	0.029	0.011	0.016
DP	0.000	0.000	0.319	0.254	0.146	0.151
H	0.000	0.000	0.000	0.000	0.000	0.000
KOC	0.000	0.000	0.000	0.000	1.421	1.033
PCTOC	0.000	0.000	0.000	0.000	1.141	1.267
PCTC	0.000	0.000	0.000	0.000	3.551	2.451
Jaillière WT						
	dQ	dQ	dE	dE	dP	dP
Morris Index	μ*	σ	μ*	σ	μ*	σ
FWIDTH	0.572	0.439	3.714	0.206	2.241	0.274
VL	0.635	0.570	3.181	0.088	1.997	0.304
RNA	0.047	0.028	0.014	0.009	0.026	0.013

SOA	0.030	0.021	1.736	2.634	0.897	1.369
VKS	6.552	5.380	0.042	0.049	3.550	2.909
WTD	19.444	6.835	0.114	0.059	10.559	3.694
OS	1.115	1.318	0.002	0.003	0.603	0.712
OR	1.645	1.788	0.005	0.011	0.891	0.969
VGALPHA	0.652	0.724	0.001	0.002	0.353	0.392
VGN	0.522	0.491	0.002	0.004	0.283	0.268
SS	0.000	0.000	0.526	0.785	0.274	0.408
VN	0.000	0.000	1.890	2.500	0.983	1.300
VN2	0.000	0.000	0.000	0.000	0.000	0.000
SCHK	0.651	0.512	0.029	0.087	0.367	0.288
COARSE	0.000	0.000	0.584	1.121	0.304	0.583
DP	0.000	0.000	4.924	3.601	2.560	1.873
H	0.000	0.000	0.000	0.000	0.000	0.000
KOC	0.000	0.000	0.000	0.000	1.885	0.363
PCTOC	0.000	0.000	0.000	0.000	3.149	0.524
PCTC	0.000	0.000	0.000	0.000	5.073	0.001

Table S2.2. Morris indices on Morcille

Morcille no WT						
	dQ	dQ	dE	dE	dP	dP
Morris Index	μ*	σ	μ*	σ	μ*	σ
FWIDTH	2.914	0.741	0.358	0.062	1.559	0.674
VL	3.134	1.072	0.376	0.030	1.420	0.908
RNA	0.764	0.370	0.028	0.044	0.363	0.237
SOA	0.705	0.901	0.029	0.031	0.380	0.467
VKS	47.304	29.655	0.685	0.820	18.610	8.938
WTD	39.390	39.660	0.517	0.596	19.045	17.855
OS	4.321	10.657	0.009	0.019	2.295	5.775
OR	12.075	18.595	0.170	0.393	3.962	7.708
ALPHAVG	7.807	17.262	0.098	0.201	3.738	7.950
NVG	4.392	10.079	0.057	0.176	2.237	5.338
SS	0.000	0.000	0.004	0.002	0.002	0.001
VN	0.000	0.000	0.004	0.003	0.001	0.002
VN2	0.000	0.000	0.000	0.000	0.000	0.000
SCHK	4.657	6.574	0.116	0.278	1.503	2.625
COARSE	0.000	0.000	0.007	0.008	0.003	0.004
DP	0.000	0.000	0.165	0.071	0.086	0.037
H	0.000	0.000	0.000	0.000	0.000	0.000
KOC	0.000	0.000	0.000	0.000	1.566	0.995
PCTOC	0.000	0.000	0.000	0.000	1.239	0.743
PCTC	0.000	0.000	0.000	0.000	3.204	1.126
Morcille WT						
dQ	dQ	dE	dE	dP	dP	dP
Morris Index	μ*	σ	μ*	σ	μ*	σ
FWIDTH	3.336	0.607	0.352	0.083	1.355	0.858
VL	3.192	0.554	0.423	0.151	1.357	0.954
RNA	0.377	0.178	0.075	0.130	0.153	0.140
SOA	0.112	0.099	0.104	0.120	0.047	0.065
VKS	69.857	8.649	0.982	0.830	27.581	6.729
SAV	2.011	0.816	0.005	0.005	0.820	0.648
OS	2.166	0.683	0.009	0.016	0.792	0.707
OI	7.275	1.610	0.069	0.114	3.266	1.820

SS	0.000	0.000	0.003	0.002	0.002	0.001
VN	0.000	0.000	0.006	0.005	0.003	0.003
VN2	0.000	0.000	0.000	0.000	0.000	0.000
SCHK	0.000	0.001	0.000	0.000	0.000	0.000
COARSE	0.000	0.000	0.003	0.001	0.001	0.001
DP	0.000	0.000	0.146	0.084	0.059	0.056
H	0.000	0.000	0.000	0.000	0.000	0.000
KOC	0.000	0.000	0.000	0.000	1.327	1.177
PCTOC	0.000	0.000	0.000	0.000	0.997	0.865
PCTC	0.000	0.000	0.000	0.000	2.492	1.720

Table S2.3. eFAST indices on Jaillière

	S_i			S_{Ti}			$S_{Ti} - S_i$		
Inputs	dQ	dE	dP	dQ	dE	dP	dQ	dE	dP
Jaillière – no WT									
FWIDTH	0.004	0.010	0.003	0.012	0.126	0.014	0.007	0.116	0.011
VL	0.003	0.008	0.003	0.011	0.126	0.014	0.008	0.118	0.011
RNA	0.000	0.001	0.000	0.007	0.109	0.009	0.007	0.108	0.009
SOA	0.000	0.007	0.000	0.008	0.107	0.010	0.008	0.101	0.010
VKS	0.963	0.330	0.903	0.980	0.568	0.942	0.017	0.239	0.040
SAV	0.003	0.001	0.003	0.012	0.096	0.017	0.009	0.095	0.014
OS	0.003	0.002	0.003	0.012	0.114	0.016	0.009	0.112	0.014
OI	0.001	0.001	0.001	0.009	0.112	0.014	0.008	0.111	0.012
SS	0.000	0.000	0.000	0.008	0.101	0.012	0.008	0.101	0.012
VN	0.000	0.004	0.000	0.009	0.117	0.013	0.009	0.113	0.013
VN2	0.000	0.000	0.000	0.008	0.102	0.011	0.008	0.102	0.011
SCHK	0.000	0.000	0.000	0.008	0.101	0.012	0.008	0.100	0.012
COARSE	0.000	0.001	0.000	0.008	0.098	0.010	0.008	0.097	0.010
DP	0.000	0.363	0.000	0.008	0.632	0.012	0.008	0.269	0.012
H	0.000	0.000	0.000	0.009	0.160	0.014	0.009	0.160	0.014
KOC	0.000	0.000	0.005	0.008	0.154	0.020	0.008	0.154	0.015
PCTOC	0.000	0.000	0.008	0.009	0.152	0.024	0.009	0.151	0.016
PCTC	0.000	0.000	0.024	0.009	0.110	0.047	0.009	0.110	0.023
$\Sigma S_i =$	0.977	0.728	0.953						
Jaillière – WT									
FWIDTH	0.002	0.132	0.053	0.015	0.140	0.065	0.013	0.009	0.013
VL	0.001	0.064	0.044	0.013	0.072	0.060	0.012	0.008	0.017
RNA	0.000	0.000	0.000	0.012	0.008	0.007	0.012	0.008	0.007
SOA	0.000	0.037	0.014	0.011	0.137	0.061	0.011	0.100	0.046
VKS	0.057	0.000	0.022	0.203	0.008	0.080	0.145	0.008	0.058
L	0.764	0.000	0.417	0.907	0.008	0.496	0.143	0.008	0.080
OS	0.008	0.000	0.003	0.025	0.004	0.012	0.016	0.004	0.009
OR	0.005	0.000	0.002	0.024	0.006	0.013	0.019	0.006	0.011
VGALPHA	0.002	0.000	0.001	0.019	0.005	0.011	0.017	0.005	0.010
VGN	0.005	0.000	0.003	0.022	0.006	0.015	0.017	0.006	0.013
SS	0.000	0.002	0.001	0.013	0.010	0.010	0.013	0.008	0.009
VN	0.000	0.005	0.002	0.014	0.031	0.021	0.014	0.026	0.019
VN2	0.000	0.000	0.000	0.014	0.010	0.012	0.014	0.010	0.012

SCHK	0.002	0.000	0.001	0.015	0.006	0.011	0.013	0.006	0.010
COARSE	0.000	0.001	0.000	0.013	0.011	0.011	0.013	0.010	0.011
DP	0.000	0.569	0.123	0.014	0.824	0.185	0.014	0.255	0.062
H	0.000	0.000	0.000	0.014	0.020	0.010	0.014	0.020	0.010
KOC	0.000	0.000	0.028	0.014	0.031	0.045	0.013	0.030	0.017
PCTOC	0.000	0.000	0.036	0.012	0.025	0.045	0.011	0.024	0.009
PCTC	0.000	0.000	0.114	0.014	0.021	0.125	0.014	0.020	0.011
$\Sigma S_i =$	0.846	0.81	0.864						

Table S2.4. eFAST indices on Morcille

	S_i			S_{Ti}			$S_{Ti} - S_i$		
Inputs	dQ	dE	dP	dQ	dE	dP	dQ	dE	dP
Morcille – no WT									
FWIDTH	0.002	0.033	0.002	0.006	0.047	0.009	0.004	0.014	0.007
VL	0.003	0.038	0.003	0.007	0.053	0.010	0.005	0.014	0.007
RNA	0.000	0.000	0.000	0.004	0.012	0.006	0.004	0.012	0.005
SOA	0.000	0.000	0.000	0.004	0.012	0.006	0.004	0.012	0.006
VKS	0.974	0.880	0.946	0.981	0.921	0.969	0.007	0.041	0.023
SAV	0.001	0.000	0.001	0.005	0.015	0.008	0.005	0.015	0.008
OS	0.001	0.000	0.002	0.006	0.016	0.010	0.005	0.016	0.008
OI	0.009	0.001	0.011	0.014	0.015	0.023	0.006	0.014	0.012
SS	0.000	0.000	0.000	0.004	0.015	0.007	0.004	0.015	0.007
VN	0.000	0.000	0.000	0.005	0.013	0.008	0.005	0.013	0.008
VN2	0.000	0.000	0.000	0.004	0.015	0.007	0.004	0.015	0.007
SCHK	0.000	0.000	0.000	0.004	0.016	0.007	0.004	0.016	0.007
COARSE	0.000	0.000	0.000	0.004	0.014	0.006	0.004	0.014	0.006
DP	0.000	0.010	0.000	0.004	0.026	0.007	0.004	0.016	0.007
H	0.000	0.000	0.000	0.004	0.017	0.008	0.004	0.017	0.008
KOC	0.000	0.000	0.004	0.004	0.015	0.013	0.004	0.015	0.009
PCTOC	0.000	0.000	0.002	0.004	0.016	0.010	0.004	0.016	0.008
PCTC	0.000	0.000	0.007	0.004	0.015	0.018	0.004	0.015	0.011
$\Sigma S_i =$	0.99	0.962	0.976						
Morcille – WT									
FWIDTH	0.003	0.094	0.003	0.064	0.222	0.053	0.061	0.128	0.050
VL	0.003	0.124	0.002	0.057	0.251	0.045	0.054	0.127	0.042
RNA	0.001	0.001	0.001	0.059	0.195	0.044	0.059	0.193	0.043
SOA	0.000	0.003	0.001	0.051	0.111	0.046	0.050	0.108	0.045
VKS	0.248	0.080	0.258	0.556	0.491	0.534	0.308	0.411	0.275
L	0.412	0.205	0.475	0.708	0.519	0.758	0.296	0.314	0.283
OS	0.005	0.008	0.004	0.084	0.218	0.065	0.078	0.209	0.061
OR	0.005	0.009	0.004	0.077	0.185	0.054	0.072	0.176	0.050
VGALPHA	0.004	0.007	0.004	0.078	0.162	0.059	0.074	0.155	0.056
VGN	0.003	0.004	0.002	0.078	0.168	0.049	0.075	0.165	0.047
SS	0.000	0.002	0.000	0.068	0.099	0.053	0.067	0.097	0.053
VN	0.000	0.001	0.000	0.067	0.141	0.052	0.066	0.141	0.052
VN2	0.002	0.002	0.001	0.064	0.111	0.043	0.062	0.109	0.042

SCHK	0.004	0.006	0.002	0.064	0.128	0.052	0.061	0.122	0.050
COARSE	0.000	0.001	0.000	0.073	0.101	0.056	0.073	0.100	0.056
DP	0.001	0.088	0.001	0.052	0.195	0.042	0.051	0.107	0.041
H	0.000	0.002	0.000	0.053	0.084	0.043	0.052	0.082	0.043
KOC	0.001	0.003	0.005	0.069	0.178	0.060	0.068	0.175	0.055
PCTOC	0.000	0.002	0.004	0.080	0.126	0.076	0.080	0.124	0.073
PCTC	0.001	0.001	0.010	0.078	0.198	0.072	0.078	0.197	0.062
$\Sigma \mathbf{S_i} =$	0.693	0.643	0.777						

Table S2.5. Uncertainty analysis statistics for selected output probability distributions obtained from eFAST results.[a]

Output[b]	Site	Components	Range	Mean	Median	95% CI	SD	SE	Min.	Q1	Q3	Max.	Skew	Kurtosis
dQ	Jaillière	No WT	63.1	80.1	81	79.8-80.4	14.1	0.15	36.9	71	91.6	100	-0.44	2.45
		WT	29.1	7.9	7.4	7.8-8.1	5.1	0.051	-2.1	3.4	11.4	27	0.58	2.74
	Morcille	No WT	79.8	66.8	64.6	66.3 67.2	20.7	0.219	20.1	50.1	83.6	100	0.12	1.92
		WT	91.9	49.5	46.1	49.2 49.9	18.8	0.189	8.1	35.4	61.2	100	0.65	2.84
dE	Jaillière	No WT	1.95	99.8	99.9	99.8 99.8	0.19	0.002	98	99.8	99.9	100	-2.69	14.1
		WT	41	63.3	63.5	63.2 63.4	3.77	0.038	42.8	62.0	64.9	83.9	-0.87	8.28
	Morcille	No WT	2.2	98.7	98.5	98.7 98.7	0.52	0.005	97.8	98.3	98.7	100	1.48	4.28
		WT	2.5	98.4	98.4	98.4 98.4	0.31	0.003	97.5	98.2	98.5	100	1.65	9.11
dP-Iso.	Jaillière	No WT	29.9	94.4	96.5	94.3 94.6	6.28	0.066	70.1	90.6	100	100	-1.05	3.22
		WT	29.3	37.9	37.8	37.9 38.0	3.98	0.039	22.7	35.3	40.5	52	0.022	3.26
	Morcille	No WT	31.1	92.2	94	92.1 92.4	7.86	0.083	68.8	86	100	100	-0.604	2.13
		WT	38.3	85	83.9	84.9 85.2	9	0.09	61.7	77.9	92	100	0.191	2.047
dP-Dif.	Jaillière	No WT	24.5	96.5	99.9	96.4 96.6	5.06	0.053	75.4	94.2	100	100	-1.51	4.427
		WT	28.2	41.5	41.3	41.4 41.6	3.8	0.038	26.3	39.0	43.9	54.6	0.017	3.385
dP-Teb.	Morcille	No WT	28.1	94.2	97.1	94.1 94.4	6.71	0.071	71.9	89.1	100	100	-0.856	2.53
		WT	34.7	87.8	87.1	87.6 87.9	8.37	0.084	65.3	81.2	95.1	100	0.0019	1.94

[a] 95% CI = 95% confidence interval (i.e. range of output values between 2.5% and 97.5% cumulative distribution percentiles); SD = standard deviation; SE = standard error of the mean; Q1, Q3 = 1st and 3rd quartiles of the output probability distribution.

[b] dQ. dE. dP: VFS reductions of flow sediment and pesticide; Pesticides are Isoproturon (Iso). Diflufenican (Dif), Tebuconazole (Teb).

S3. Additional Supporting Figure

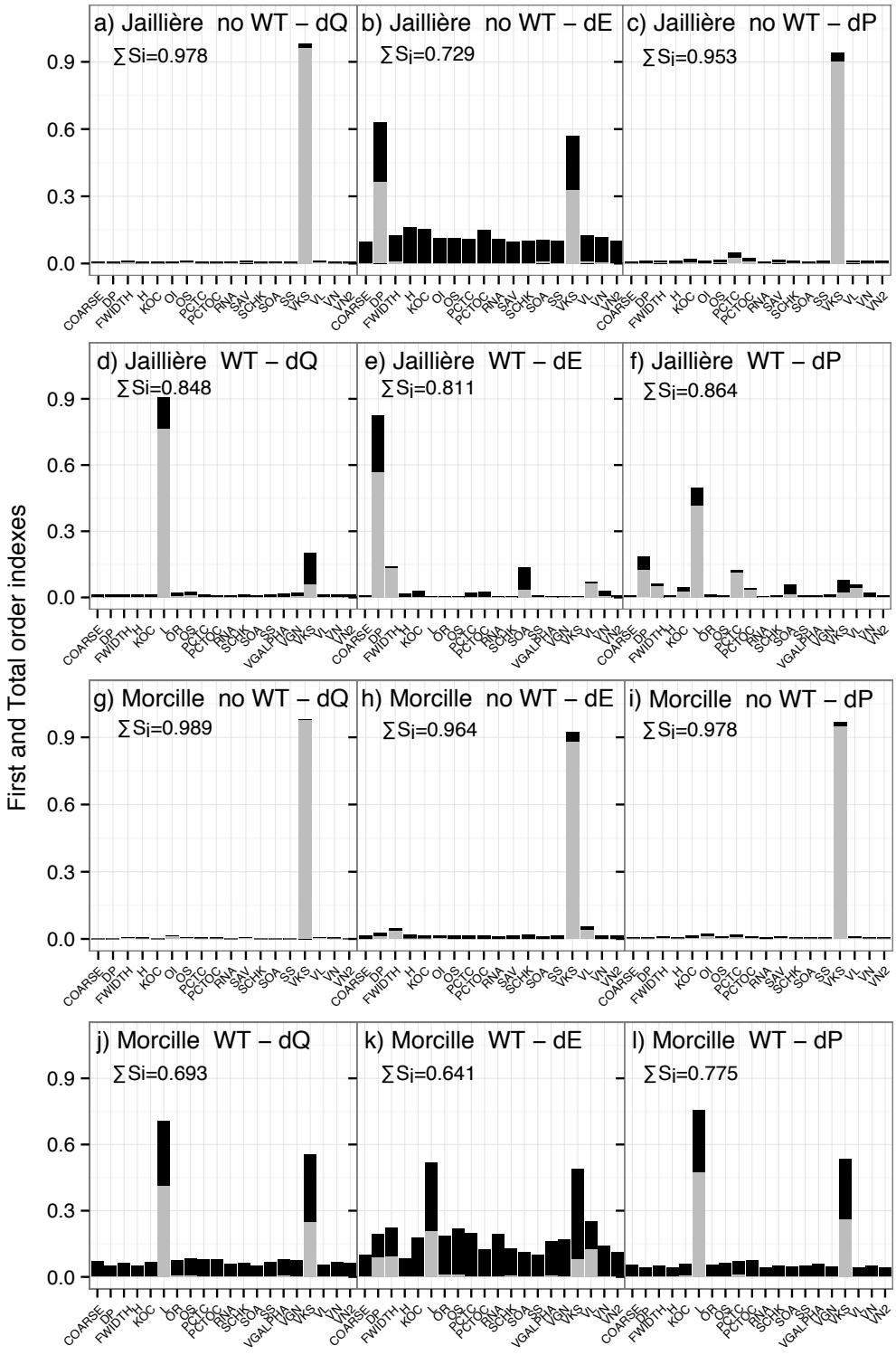

Figure S1: Global sensitivity analysis eFAST results for dQ (reduction of surface water), dE (reduction of sediment) and dP (reduction of pesticide Isoproturon) outputs on the Jaillière (a-f) and Morcille (g-l) sites, without water table (no WT) and with water table (WT). Grey and black bars represent indices for first order (S_i) and interactions (S_{Ti}- S_i).

S4. FitEval Evaluation Files

The FitEval framework and software is described in Ritter and Muñoz-Carpena (2013). For additional details of the files and options presented below please visit the software page at http://abe.ufl.edu/carpena/software/FITEVAL.shtml

A. Configuration options (file fitevalconfig.txt)

```
0.65 %Acceptable NSE threshold value
0.80 %Good NSE threshold value
0.90 %Very good NSE threshold value
5    %BiasValue
0    %Compute Legates and McCabe modified NSE (1=yes,0=no)
0    % Bootstrap method (1= Efrons' bootstrapping, 0= block boostrapping)
9   % FontSizeValue
1    % Do not display graphical output (1=accept)
1    % Take into account observations & model uncertainty (>0,1,2,3,4= yes)
bd   % Color and type of marker size
5    % Sizes of the series marker
```

B. Input file

predicted, P_i	Observed, O_i	lower 95CI P_i	upper 95CI P_i
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	1.30E-05	0.00E+00	0.00E+00
0.00E+00	1.50E-05	0.00E+00	0.00E+00
0.00E+00	1.30E-05	0.00E+00	0.00E+00
0.00E+00	1.20E-05	0.00E+00	0.00E+00
0.00E+00	1.20E-05	0.00E+00	0.00E+00
0.00E+00	1.20E-05	0.00E+00	0.00E+00
8.82E-06	5.00E-06	0.00E+00	2.50E-05
2.94E-05	1.20E-05	0.00E+00	8.33E-05
4.80E-05	7.00E-06	0.00E+00	1.36E-04
6.76E-05	1.30E-05	0.00E+00	1.92E-04
6.67E-05	1.10E-05	0.00E+00	2.04E-04
5.46E-05	7.00E-06	0.00E+00	1.92E-04
4.18E-05	4.00E-06	0.00E+00	1.79E-04
2.84E-05	1.00E-05	0.00E+00	1.66E-04
2.09E-05	1.00E-05	0.00E+00	1.34E-04
1.41E-05	1.00E-05	0.00E+00	9.66E-05
6.87E-06	6.00E-06	0.00E+00	5.71E-05
3.43E-07	6.00E-06	0.00E+00	2.13E-05
0.00E+00	9.00E-06	0.00E+00	1.46E-05
0.00E+00	2.00E-06	0.00E+00	9.28E-06
0.00E+00	1.00E-05	0.00E+00	4.46E-06
0.00E+00	2.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	1.00E-05	0.00E+00	0.00E+00
0.00E+00	3.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00

0.00E+00	4.00E-06	0.00E+00	0.00E+00
0.00E+00	8.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	1.10E-05	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	5.00E-06	0.00E+00	0.00E+00
0.00E+00	8.00E-06	0.00E+00	0.00E+00
0.00E+00	2.00E-06	0.00E+00	0.00E+00
0.00E+00	8.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	8.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	5.00E-06	0.00E+00	0.00E+00
0.00E+00	4.00E-06	0.00E+00	0.00E+00
0.00E+00	5.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	1.00E-06	0.00E+00	0.00E+00
0.00E+00	4.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	8.00E-06	0.00E+00	0.00E+00
0.00E+00	3.00E-06	0.00E+00	0.00E+00
0.00E+00	4.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	5.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	4.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	5.00E-06	0.00E+00	0.00E+00
0.00E+00	3.00E-06	0.00E+00	0.00E+00
0.00E+00	2.00E-06	0.00E+00	0.00E+00
0.00E+00	2.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	2.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	8.00E-06	0.00E+00	0.00E+00
0.00E+00	1.40E-05	0.00E+00	0.00E+00
0.00E+00	1.50E-05	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	1.20E-05	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	5.00E-06	0.00E+00	0.00E+00

0.00E+00	1.10E-05	0.00E+00	0.00E+00
9.02E-06	2.00E-06	0.00E+00	3.02E-05
2.41E-05	9.00E-06	0.00E+00	8.05E-05
3.98E-05	0.00E+00	0.00E+00	1.33E-04
5.41E-05	1.10E-05	0.00E+00	1.81E-04
1.11E-04	1.10E-05	2.22E-05	2.49E-04
1.81E-04	1.00E-05	5.14E-05	3.25E-04
2.45E-04	1.10E-05	7.78E-05	3.93E-04
3.12E-04	1.10E-05	1.06E-04	4.65E-04
2.96E-04	1.10E-05	9.43E-05	4.48E-04
2.78E-04	1.00E-05	8.22E-05	4.28E-04
2.59E-04	7.00E-06	6.94E-05	4.07E-04
2.38E-04	1.60E-05	5.58E-05	3.84E-04
2.16E-04	2.30E-05	4.17E-05	3.61E-04
1.92E-04	4.60E-05	2.70E-05	3.37E-04
1.68E-04	4.60E-05	1.15E-05	3.12E-04
1.45E-04	3.70E-05	1.73E-06	2.89E-04
1.23E-04	5.00E-05	1.25E-06	2.66E-04
9.92E-05	5.30E-05	7.32E-07	2.41E-04
7.78E-05	4.50E-05	2.69E-07	2.19E-04
5.82E-05	5.30E-05	0.00E+00	1.96E-04
4.14E-05	6.10E-05	0.00E+00	1.72E-04
2.62E-05	7.70E-05	0.00E+00	1.50E-04
1.02E-05	5.20E-05	0.00E+00	1.27E-04
3.17E-06	7.70E-05	0.00E+00	1.11E-04
2.21E-06	7.40E-05	0.00E+00	1.01E-04
1.21E-06	7.30E-05	0.00E+00	9.08E-05
1.51E-07	7.10E-05	0.00E+00	7.98E-05
1.49E-05	8.00E-05	0.00E+00	1.12E-04
3.35E-05	1.03E-04	0.00E+00	1.55E-04
5.30E-05	1.16E-04	0.00E+00	1.99E-04
7.07E-05	1.33E-04	0.00E+00	2.40E-04
1.08E-04	1.31E-04	4.62E-06	2.75E-04
1.48E-04	1.72E-04	9.72E-06	3.12E-04
1.84E-04	2.15E-04	1.43E-05	3.45E-04
2.17E-04	2.30E-04	1.90E-05	3.74E-04
2.04E-04	2.36E-04	2.16E-05	3.55E-04
1.93E-04	2.73E-04	2.39E-05	3.38E-04
1.80E-04	2.36E-04	2.64E-05	3.21E-04
1.58E-04	2.28E-04	2.56E-05	2.91E-04
1.19E-04	1.88E-04	1.86E-05	2.46E-04
7.87E-05	1.51E-04	1.13E-05	1.97E-04
3.62E-05	1.99E-04	3.65E-06	1.47E-04
1.41E-05	1.16E-04	0.00E+00	1.10E-04
9.99E-06	9.70E-05	0.00E+00	8.01E-05
5.62E-06	7.90E-05	0.00E+00	4.91E-05
1.66E-06	5.80E-05	0.00E+00	2.11E-05
0.00E+00	3.30E-05	0.00E+00	7.83E-06
0.00E+00	4.00E-06	0.00E+00	0.00E+00
0.00E+00	2.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	3.00E-06	0.00E+00	0.00E+00
0.00E+00	3.00E-06	0.00E+00	0.00E+00
0.00E+00	2.00E-06	0.00E+00	0.00E+00
0.00E+00	1.00E-06	0.00E+00	0.00E+00

0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	5.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	3.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	1.10E-05	0.00E+00	0.00E+00
0.00E+00	8.00E-06	0.00E+00	0.00E+00
0.00E+00	5.00E-06	0.00E+00	0.00E+00
0.00E+00	9.00E-06	0.00E+00	0.00E+00
0.00E+00	4.00E-06	0.00E+00	0.00E+00
0.00E+00	1.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	3.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00
0.00E+00	7.00E-06	0.00E+00	0.00E+00
0.00E+00	8.00E-06	0.00E+00	0.00E+00
0.00E+00	3.00E-06	0.00E+00	0.00E+00
0.00E+00	8.00E-06	0.00E+00	0.00E+00
0.00E+00	6.00E-06	0.00E+00	0.00E+00

C. Graphical Output File

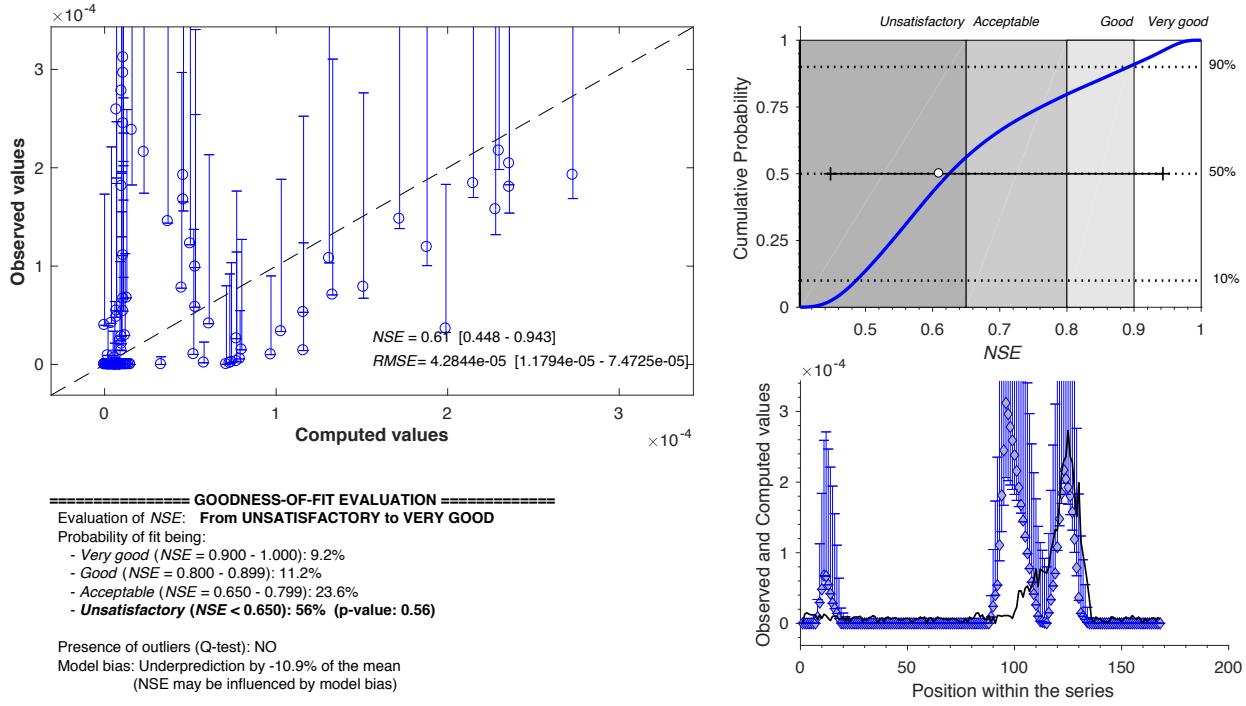

Figure S2: VFSMOD model goodness-of-fit evaluation for Morcille VFS outflow measurements (Fig. 4a in manuscript). Evaluation with observed data uncertainty based on simulations varying saturated hydraulic conductivity K_s within the field measured range. Data uncertainty handled based on Probable Error Range, PER (Harmel et al, 2007)

D. Text Output File

```
=============== GOODNESS-OF-FIT EVALUATION ================
 RMSE= 4.284e-05 [1.179e-05 - 7.472e-05]*
 NSE = 0.610 [0.448 - 0.943]*

Evaluation of NSE: From UNSATISFACTORY to VERY GOOD
Probability of fit being:
 - Very good (NSE = 0.900 - 1.000): 9.2%
 - Good (NSE = 0.800 - 0.899): 11.2%
 - Acceptable (NSE = 0.650 - 0.799): 23.6%
 - Unsatisfactory (NSE < 0.650): 56.0% (p-value: 0.560)

 Presence of outliers (Q-test): NO
 Model bias: Underprediction by -10.9% of the mean
            (NSE may be influenced by model bias)
_____________________________________________________________________
*: 95% Confidence interval obtained from Bca bootstrapping
   using Politis and Romano (1994) block bootstrap method
   for stationary dependent data.

   Uncertainty in observations included (Harmel et al. 2007):
   Lower and upper error specific to each observed value.
```