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Article:
Villamizar Velez, Martha Lucia, Stoate, Chris, Biggs, Jeremy et al. (2020) Comparison of technical and systems-based approaches to managing pesticide contamination in surface water catchments. Journal of Environmental Management. 110027. ISSN: 0301-4797

https://doi.org/10.1016/j.jenvman.2019.110027

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Comparison of technical and systems-based approaches to managing pesticide contamination in surface water catchments

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Table S1 Sensitivity analysis for hydrology parameters in the Stonton Brook catchment

SA Rank	Parameter name	Definition	t-stat	p-value	Fitted value	Min value	Max value
1	v_GWQMN.gw	Threshold depth of water in the shallow aquifer for return flow to occur (mm H_2O)	-26.91	0.00	1167	0	5000
2	v_RCHRG_DP.gw	Deep aquifer percolation fraction	19.20	0.00	0.1	0	1
3	v_GW_DELAY.gw	Groundwater delay (days)	-17.42	0.00	40.7	0	500
4	v_LAT_TTIME.hru	Lateral flow travel time (days)	-2.77	0.01	2.0	0	180
5	r_CN2.mgt_BARR	Initial SCS runoff curve number for moisture condition II for barren land	2.01	0.04	88	-0.1	0.1
6	v_REVAPMN.gw	Threshold depth of water in the shallow aquifer for "revap" to occur (mm)	-1.44	0.15	300	0	500
7	v_GW_REVAP.gw	Groundwater "revap" coefficient.	-1.35	0.18	0.02	0.02	0.2
8	r_CN2.mgt_PAST	Initial SCS runoff curve number for moisture condition II for pasture	1.29	0.20	78	-0.1	0.1
9	r_CN2.mgt_FRST	Initial SCS runoff curve number for moisture condition II for forest	1.28	0.20	66	-0.1	0.1
10	r_CN2.mgt_URBN	Initial SCS runoff curve number for moisture condition II for built areas	-1.24	0.22	90	-0.1	0.1
11	v_EPCO.bsn	Plant uptake compensation factor	-1.17	0.24	0.99	0.6	1
12	v_SURLAG.bsn	Surface runoff lag time	-0.66	0.51	0.2	0	24
13	v_ALPHA_BF.gw	Baseflow alpha factor (1/days)	-0.54	0.59	0.1	0	1
14	v_ESCO.bsn	Soil evaporation compensation factor	0.46	0.65	0.66	0.6	1
15	r_CN2.mgt_CANA,WWHT	Initial SCS runoff curve number for moisture condition II for oilseed rape and winter wheat (crop land)	-0.42	0.67	83	-0.1	0.1
16	v_SLSOIL.hru	Slope length for lateral subsurface flow (m)	0.27	0.79	65	0	150

Table S2 Goodness-of-fit results for calibration (2012-2013), validation (2013-2014) and post-measurement flow periods including Nash-Sutcliffe model efficiency (NSE), coefficient of determination (r2) and percentage bias (PBIAS) and total annual simulated flow as a percentage of the observed flow.

	NSE	r^2	PBIAS	Simulated flow (% of observed flow)
2012-2013	0.73	0.73	4.4	96
2013-2014	0.73	0.73	-6.6	107
2014-2015	0.61	0.65	-3.3	103
2015-2016	0.60	0.62	-7.6	108
2016-2017	0.74	0.76	-6.0	106
2014-2017	**0.64**	**0.67**	**-5.9**	106

Table S3 Mass balance for the transfer of propyzamide to the stream network.

	2013-2014	**2014-2015**	**2015-2016**	**2016-2017**
Annual pesticide exported (kg/crop year)	0.0360	0.2626	0.0398	0.2214
Application rate (kg/ha)	0.708	0.650	0.840	0.840
OSR area (ha)	33	209	26	57
Total propyzamide applied to OSR (kg)	23.4	136	21.8	47.9
Pesticide exported to surface water (% of applied)	0.154	0.193	0.182	0.462

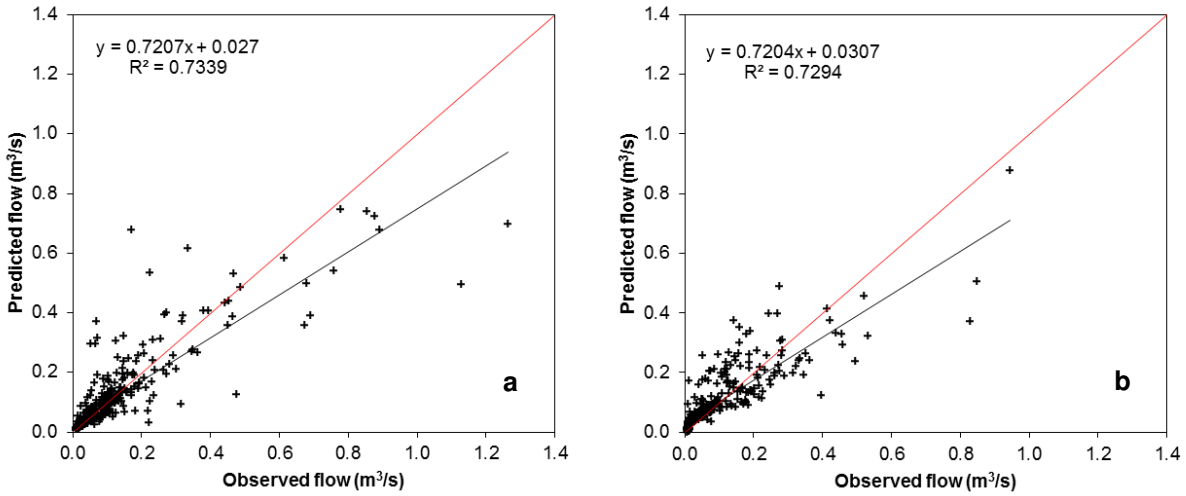

Figure S1 Observed vs. predicted plots and fitted line for the a) calibrated and b) validated flow in the Stonton Brook catchment together with the 1:1 line and model performance statistics.