

Supplementary Material

Application of Hydrological and Sediment Modeling with Limited Data in the Abay (Upper Blue Nile) Basin, Ethiopia

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Table S1. Suspended sediment concentration (SSC) data was used for the discharge-sediment rating curve development.

Sample Number	Date of Sampling	Time Taken, Sec	Flow, m ³ s ⁻¹	SSC, mg L ⁻¹
1	1-Aug-90	24	37.53	8717.81
2	1-Aug-90	25	37.53	4423.12
3	1-Aug-90	30	37.53	4024.37
1	30-Apr-93	55	1.42	368.21
2	30-Apr-93	52	1.42	347.07
3	30-Apr-93	49	1.42	380.55
1	23-Feb-05	40	1.33	257.06
2	23-Feb-05	34	1.33	254.00
3	23-Feb-05	35	1.33	252.81
1	6-Jun-05	50	0.93	207.75
2	6-Jun-05	75	0.93	234.55
3	6-Jun-05	42	0.93	187.71
1	12-Aug-07	11	40.96	11437.10
2	12-Aug-07	10	40.96	6447.20
3	12-Aug-07	9	40.96	6708.80
1	13-Aug-07	15	15.32	1279.40
2	13-Aug-07	12	15.32	1277.78
3	13-Aug-07	10	15.32	1164.18
1	12-Dec-07	17	3.64	264.53
2	12-Dec-07	16	3.64	277.78
3	12-Dec-07	24	3.64	276.32
1	9-Aug-10	25	63.15	7464.05
2	9-Aug-10	17	63.15	8834.47
3	9-Aug-10	18	63.15	6962.75
1	3-Oct-11	75	13.43	1876.80

Sample Number	Date of Sampling	Time Taken, Sec	Flow, m ³ s ⁻¹	SSC, mg L ⁻¹
2	3-Oct-11	57	13.43	1759.00
3	3-Oct-11	46	13.43	1877.63
1	4-Oct-11	30	7.91	1241.62
2	4-Oct-11	25	7.91	1338.16
3	4-Oct-11	55	7.91	1338.25
1	5-Oct-11	36	8.51	595.67
2	5-Oct-11	26	8.51	543.06
3	5-Oct-11	27	8.51	508.21
1	6-Oct-11	42	7.74	358.81
2	6-Oct-11	38	7.74	377.92
3	6-Oct-11	34	7.74	357.35
1	11-May-14	25	2.93	7682.25
2	11-May-14	22	2.93	7933.68
3	11-May-14	23	2.93	6581.20
1	16-Jun-14	13	3.53	689.88
2	16-Jun-14	15	3.53	680.71
3	16-Jun-14	15	3.53	709.50

Table S2. Initial streamflow parameters and their range that was used for sensitivity analysis. In the parameters list, r_ stands for the operation of the existing parameter value multiplied by (1+ given value); v_ is for the operation of the existing parameter value to be replaced by a given value, and a_ is for the operations of a given value added to the existing parameter value.

No	Parameters and Operation	Initial Range Values	
		Minimum	Maximum
1	v_ALPHA_BF.gw	0	1
2	v_BIOMIX.mgt	0	1
3	a_CANMX.hru	0	10
4	v_CH_K2.rte	0	15
5	v_CH_N2.rte	0	1
6	r_CN2.mgt	-0.2	0.2
7	a_EPCO.hru	0	1
8	v_ESCO.hru	0	1
9	a_GW_DELAY.gw	-30	60

No	Parameters and Operation	Initial Range Values	
		Minimum	Maximum
10	v_GW_REVAP.gw	-0.036	0.2
11	a_GWQMN.gw	-1000	1000
12	a_REVAPMN.gw	-750	750
13	r_SOL_ALB().sol	-0.25	0.25
14	r_SOL_AWC().sol	-0.2	0.2
15	r_SOL_K().sol	-0.2	0.2
16	r_SOL_Z().sol	-0.2	0.2
17	v_SURLAG.bsn	0	10
18	v_TLAPS.sub	0	50
19	v_CH_COV().rte	0	1
20	v_CH_EROD().rte	0	1
21	v_ALPHA_BF_D.gw	0	1
22	v_ALPHA_BNK.rte	0	1
23	v_RCHRG_DP.gw	0	1