

Supplementary Material

Table S1. Landscape and landcover variables of the selected catchments.

ID	HID	H (m)	L (m)	G (-)	L/G (m ²)	A (km ²)	DD (km/km ²)	S_m (%)	HI (-)	ELO (-)	C_W (%)	C_F (%)	C_A (%)
W1	1140H085	91	256.1	0.38	699.3	110	0.994	1.0	0.768	0.329	1.0	90.7	4.8
W2	1140H086	124	260.0	0.48	549.2	79	0.933	1.4	0.416	0.766	0.6	68.5	1.5
W3	1300H013	169	291.2	0.57	526.7	147	0.875	6.2	0.312	0.588	1.0	89.9	4.3
W4	1340H008	74	247.4	0.38	712.3	298	1.037	4.0	0.795	1.552	1.4	80.9	9.9
W5	1350H001	127	260.8	0.51	557.7	244	1.073	3.7	0.375	1.403	0.8	83.3	10.4
W6	1350H012	77	241.7	0.37	764.5	471	1.030	2.3	0.507	1.044	1.4	74.6	13.5
W7	1420H034	208	286.4	0.72	404.8	105	0.856	7.6	0.375	1.068	0.9	92.1	3.3
W8	1430H028	36	201.0	0.22	1109.3	265	1.191	0.9	0.716	0.730	2.4	41.1	29.4
W9	1430H030	131	269.1	0.55	561.0	1043	0.962	1.8	0.173	1.960	1.1	69.0	20.6
W10	1510H063	204	277.8	0.74	383.6	2089	0.924	2.0	0.703	2.617	0.5	84.8	4.3
W11	1540H014	7	200.0	0.05	3200.0	83	1.285	1.6	0.626	0.260	0.0	25.0	7.7
W12	1540H029	4	180.0	0.03	3600.0	220	1.539	0.7	0.628	0.466	3.0	18.8	53.2
W13	1580H001	148	282.8	0.52	545.3	81	1.157	5.5	0.463	0.181	1.9	11.8	70.9
W14	1660H010	23	208.8	0.12	1951.2	140	1.350	0.2	0.634	1.184	3.0	56.2	22.4
W15	1730H031	211	280.7	0.75	375.9	812	0.915	2.8	0.309	2.243	0.7	85.5	3.1
W16	2200H011	167	268.3	0.65	457.1	1573	0.919	2.3	0.515	1.270	2.6	59.2	19.4
W17	2370H017	157	260.8	0.65	475.8	1527	0.945	2.7	0.213	0.866	1.9	79.7	9.5
W18	2420H043	148	260.0	0.64	518.7	563	1.015	4.2	0.668	1.700	1.0	75.5	12.1
W19	2560H001	188	269.1	0.69	424.9	450	0.934	3.6	0.474	1.346	1.9	88.8	2.3

Here, H is the average height above the drainage networks [L], L is the total length of the drainage networks [L], G is the average gradient of the drainage networks [-], A is the catchment area [L²], DD is the drainage density [L/L²] defined as the stream length within a unit of drainage area, S_m is the slope of the main stream, HI is the hypsometric integral [-], ELO is the elongation [-], C_W , C_F , C_A is the land cover of water, forest, and agriculture [-].

Table S2. Descriptions of the selected catchments and events

ID	HID	N	$AP_{7\text{day}}$ (mm)	P (mm)	I_{avg} (mm)	Q_{ini} (mm h ⁻¹)	Q_{tot} (mm)	Q_{p} (mm h ⁻¹)	Q_{tot}/P (-)
W1	1140H085	12	70 (3/282)	246 (131/904)	7.3 (3.7/11.7)	0.32 (0.02/2.35)	205 (100/697)	8.7 (4.9/27.2)	0.76 (0.49/1.05)
W2	1140H086	9	60 (1/294)	272 (98/854)	7.1 (3.1/17.5)	0.24 (0.02/1.91)	190 (99/650)	8.8 (4.6/27.1)	0.80 (0.52/1.04)
W3	1300H013	17	56 (3/248)	239 (25/1012)	10.0 (5.6/23.6)	0.34 (0.07/2.16)	111 (26/537)	8.6 (0.9/37.5)	0.52 (0.26/1.02)
W4	1340H008	19	51 (0/498)	206 (58/865)	7.4 (3.9/21.6)	0.13 (0.01/1.06)	122 (16/670)	12.6 (1.6/31.8)	0.71 (0.23/1)
W5	1350H001	16	53 (0/272)	352 (127/1247)	5.4 (1.3/13.4)	0.19 (0.05/0.89)	191 (51/749)	10.5 (2.4/52.2)	0.61 (0.2/0.94)
W6	1350H012	21	45 (9/489)	336 (155/596)	5.9 (3.5/11.3)	0.14 (0.01/0.86)	221 (55/424)	8.0 (2.1/32.9)	0.54 (0.24/1.06)
W7	1420H034	15	38 (4/186)	558 (189/651)	10.3 (5.4/12.1)	0.34 (0.08/1.03)	302 (104/691)	11.9 (4.9/22.8)	0.63 (0.32/1.08)
W8	1430H028	11	81 (4/355)	343 (89/934)	6.5 (3.6/13.8)	0.23 (0.12/0.46)	138 (38/458)	13.6 (4/65.4)	0.41 (0.21/0.7)
W9	1430H030	18	84 (3/923)	415 (87/674)	4.7 (1.9/8.7)	0.40 (0.11/0.76)	150 (43/446)	3.6 (1.5/14)	0.34 (0.23/1.03)
W10	1510H063	18	31 (8/102)	471 (105/1276)	6.2 (2.6/10.4)	0.11 (0.05/0.7)	237 (46/964)	5.8 (1.6/19.1)	0.51 (0.21/0.91)
W11	1540H014	22	80 (17/187)	164 (85/364)	7.1 (3/10.3)	0.25 (0.03/0.63)	137 (30/304)	13.0 (3.2/22.2)	0.73 (0.36/1.1)
W12	1540H029	12	69 (13/237)	158 (28/581)	6.2 (4/11.9)	0.33 (0.19/0.7)	112 (16/591)	8.4 (1.6/28.1)	0.75 (0.27/1.02)
W13	1580H001	16	65 (2/396)	712 (61/2558)	9.7 (4.2/20.3)	0.44 (0.04/1.27)	368 (37/1736)	24.9 (1.6/84.5)	0.56 (0.25/1.08)
W14	1660H010	9	80 (11/707)	201 (24/982)	6.6 (3.2/13.6)	0.16 (0.02/3.22)	137 (14/946)	11.7 (1.7/27.4)	0.72 (0.31/1.1)
W15	1730H031	11	106 (26/317)	507 (186/820)	7.6 (4.8/17)	0.28 (0.11/0.66)	254 (101/628)	9.8 (2.2/28.8)	0.67 (0.38/1)
W16	2200H011	3	66 (21/175)	236 (65/716)	4.9 (2.4/9.4)	0.20 (0.03/0.92)	156 (27/583)	5.2 (1/18.8)	0.67 (0.25/0.99)
W17	2370H017	10	28 (4/124)	456 (225/840)	5.2 (4.4/10.8)	0.10 (0.05/0.68)	369 (59/512)	10.9 (2.6/21.3)	0.76 (0.22/1.11)
W18	2420H043	14	49 (0/358)	333 (102/813)	4.9 (2.7/13.8)	0.30 (0.01/0.85)	187 (34/602)	10.1 (1.5/47.6)	0.58 (0.28/0.98)
W19	2560H001	7	58 (48/59)	255 (196/484)	5.0 (4.1/9.5)	0.12 (0.03/0.46)	109 (82/277)	4.9 (2/11.5)	0.43 (0.42/0.57)
Ave.		62	340	6.7	0.24	194	10.1	0.61	

* ID is the identifier of catchments in this study, HID is the identifier of catchments named by the Taiwan Water Resource Agency, N is the number of events. Values in each column present the median and range of the events in the corresponding catchments. Numbers in parentheses indicate the lower and upper limit among the events in the specific catchment.

Table S3. Median and range of recession rate and nonlinearity for individual catchment.

ID	HID	a	b	$1/a$
W1	1140H085	0.030 (0.016/0.064)	1.72 (1.2/2.21)	33.6 (15.6/62.9)
W2	1140H086	0.031 (0.015/0.049)	1.65 (1.23/2.29)	31.9 (20.6/67.6)
W3	1300H013	0.027 (0.009/0.124)	1.81 (0.97/2.85)	37.6 (8.1/109.9)
W4	1340H008	0.060 (0.029/0.136)	1.48 (0.6/2.11)	16.8 (7.3/34.8)
W5	1350H001	0.030 (0.016/0.126)	1.79 (0.94/2.59)	32.9 (7.9/62.1)
W6	1350H012	0.041 (0.011/0.112)	1.52 (0.59/2.06)	24.5 (8.9/92.6)
W7	1420H034	0.014 (0.007/0.042)	1.96 (1.37/2.33)	72.2 (24/138.9)
W8	1430H028	0.096 (0.051/0.207)	1.60 (1.15/2.15)	10.4 (4.8/19.6)
W9	1430H030	0.022 (0.012/0.107)	1.67 (1.15/2.87)	44.8 (9.4/85.5)
W10	1510H063	0.032 (0.017/0.063)	1.16 (0.66/1.74)	31.0 (15.8/57.5)
W11	1540H014	0.106 (0.045/0.152)	1.38 (1.02/1.7)	9.4 (6.6/22.3)
W12	1540H029	0.110 (0.047/0.228)	1.45 (0.98/2.99)	9.2 (4.4/21.4)
W13	1580H001	0.033 (0.002/0.108)	1.52 (0.93/4.8)	30.4 (9.3/416.7)
W14	1660H010	0.121 (0.04/0.301)	1.32 (1.14/1.67)	8.3 (3.3/25.2)
W15	1730H031	0.016 (0.006/0.034)	1.79 (1.22/2.43)	63.3 (29.9/181.8)
W16	2200H011	0.028 (0.017/0.066)	1.40 (0.63/1.95)	36.0 (15.1/59.5)
W17	2370H017	0.024 (0.009/0.08)	1.69 (0.95/2.03)	41.7 (12.4/107.5)
W18	2420H043	0.044 (0.018/0.142)	1.37 (0.92/2.13)	22.7 (7.1/55.2)
W19	2560H001	0.047 (0.025/0.063)	0.88 (0.72/1.6)	21.3 (16/39.5)