

Table 1: Return period of rainfall

Return period (years)	Daily rainfall (mm)		Hourly rainfall (mm)	
	(a)	(b)	(a)	(b)
200	235	227	106	109
100	216	212	97	100
75	208	205	94	96
50	197	196	89	90
30	182	184	82	84
20	171	175	77	78
10	151	157	68	69
7	141	148	63	64
5	131	138	58	59
3	115	122	50	51
2	100	107	44	44

The records used for the analysis are the extreme statistics of hourly rainfall for 72 years (1931 – 2002) and daily rainfall for 112 years (1891 – 2002) at the JMA meteorological observatory ‘Utsunomiya’. The data (a) were analyzed with the Chow’s method and (b) with the Iwai’s method.

Table 2: Topographic characteristics of channel heads

No.	$\theta_h(^{\circ})$	$S_h$	$\theta_c(^{\circ})$	$S_c$	$A$ (m <sup>2</sup> )	$H_r$ (m)	landslide
C1H	28	0.53	26	0.50	4700	83	---
C3H	51	1.22	38	0.78	810	51	LS
O11H	30	0.58	20	0.36	6630	70	---
O12H	37	0.75	28	0.53	1400	77	---
O14H	35	0.70	32	0.63	680	39	LS
O15H	29	0.55	28	0.53	3140	65	---
O16H	23	0.42	20	0.36	7200	98	---
O17H	27	0.51	24	0.45	6910	95	---
O19H	37	0.75	36	0.71	3690	70	---
O21H	35	0.70	33	0.65	5250	83	---
O23H*	43	0.93	NA	NA	1340	47	---
O24H	47	1.07	41	0.86	1490	45	---
O25H	47	1.07	44	0.98	710	41	LS
O27H	35	0.70	34	0.67	6240	95	---
O30H*	43	0.93	NA	NA	880	41	---
O31H	40	0.84	34	0.67	2060	54	---
O32H**	50	1.19	NA	NA	< 500	NA	---
O33H*	37	0.75	NA	NA	1470	29	---
O34H**	41	0.87	NA	NA	< 500	NA	---
O35H	40	0.84	41	0.86	530	14	---

$S_h$ ,  $S_c$ ,  $A$  and  $H_r$  are head slope, channel gradient, source area, and relative height, respectively (Figure 8). NA: Data not available. LS: a shallow-landslide scar is found in the channel head  
\*: Data not used in Figure 10. \*\*: Data not used in Figures 9 and 10.

Table 2: continued

No.	$\theta_h(^{\circ})$	$S_h$	$\theta_c(^{\circ})$	$S_c$	$A$ (m <sup>2</sup> )	$H_r$ (m)	landslide
O36H	50	1.19	39	0.82	580	23	---
O37H**	NA	NA	NA	NA	< 500	NA	---
O38H**	NA	NA	> 40	> 0.84	< 500	NA	---
O51H	27	0.50	26	0.49	9900	134	---
O52H	34	0.67	39	0.81	2650	74	---
O53H	29	0.55	22	0.40	4210	81	---
O54H	43	0.93	35	0.70	990	68	LS
O55H	26	0.49	25	0.47	16900	155	---
O56H**	NA	NA	> 45	> 1.00	< 2160	> 82	---
O57H**	NA	NA	NA	NA	< 5630	> 86	---
O58H**	NA	NA	NA	NA	< 8700	> 79	---
O60H	39	0.81	35	0.70	2250	57	---
O61H	44	0.97	38	0.78	1020	45	LS
O62H	38	0.78	37	0.75	1740	96	---

Table 3: Drainage area and altitude of 19 observation sites

(a): stream site

Site	Area (m <sup>2</sup> )	Altitude (m)
C3L	5100	195
O31L	10330	215
O30L	8060	222
O25L	4300	265
O19L	11150	265
O33L	4230	295
O23L	9570	325

(b): spring site

Site	Loc. 1	Loc. 1	Loc. 2	Loc. 2	Loc. 3	Loc. 3
	Area (m <sup>2</sup> )	Altitude (m)	Area (m <sup>2</sup> )	Altitude (m)	Area (m <sup>2</sup> )	Altitude (m)
C1S	7200	185	---	---	---	---
C3S	3800	210	1300	245	---	---
O31S	4870	250	3220	270	2060	280
O37S	580	218	---	---	---	---
O34S	620	220	---	---	---	---
O27S	8630	235	6240	250	---	---
O25S	940	295	---	---	---	---
O24S	1720	295	---	---	---	---
O19S	9420	285	4920	305	---	---
O35S	1020	278	---	---	---	---
O36S	1030	285	---	---	---	---
O21S	5250	340	---	---	---	---

Each location was mapped in Figure 12.

Table 4: Hydro-geomorphic properties of the investigated headwater basins

Watershed		C1	C3	
Site		C1L	C3L	C3U
Drainage area	(m <sup>2</sup> )	7200	5100	1700
Local channel gradient		0.384	0.394	0.758
Elevation	(m)	185-280	195-305	240-305
Basin relief ratio		0.72	0.81	1.03
Ratio of bedrock outcrop	(%)	5	20	19
Average depth of regolith*	(m)	1.3	-	-
Median grain size of regolith	(mm)	2.0	41	-
Grain-size composition of regolith**				
Gravel	(%)	50	80	-
Sand	(%)	36	17	-
Silt and Clay	(%)	14	3	-

\*: Number of sounding test for regolith depth in C1 watershed was 6 points.

\*\* : Regolith sample for grain size measurement was obtained at CTR1(C1) and G(C3).

Table 5: Antecedent precipitation and runoff condition on the day of observation

Date	Runoff condition	$API_{30}$ (mm)*
19 January 2002	Base flow (dry)	1.8
28 April 2002	Base flow (dry)	9.0
21 May 2002	Base flow (rain)	23.5
29 June 2002	Base flow (rain)	18.4
11 July 2002	Storm flow	169.6
31 July 2002	Base flow (rain)	18.9
20 August 2002	Base flow (rain)	44.7
26 September 2002	Base flow (rain)	12.9
2 October 2002	Storm flow	130.2

\*: Antecedent precipitation index,  $API_{30}$ , was calculated with Equation (3).

Table 6: Stream discharge at 19 observation sites

site	19 Jan.	Loc.	$Q$ (mL/s)	28 Apr.	Loc.	$Q$ (mL/s)	21 May	Loc.	$Q$ (mL/s)
C1S	7:43	1	4	8:25	1	35	8:09	1	109
C3L	7:55	---	7	8:44	---	27	8:23	---	102
C3S	8:10	1	1	9:05	1	3	8:35	2	4
O31L	8:55	---	10	9:20	---	26	9:00	---	189
O31S	8:30	1	0	9:32	1	6	9:11	2	58
O37S	---	1	0	---	1	0	---	1	0
O34S	---	1	0	---	1	0	---	1	0
O30L	9:20	---	13	9:50	---	35	9:31	---	133
O27S	9:36	1	0	10:00	1	12	9:40	1	124
O25L	10:30	---	0	10:30	---	0	---	---	0
O25S	10:35	1	0	10:35	1	0	10:00	1	4
O24S	10:35	1	0	10:35	1	0	---	1	0
O19L	9:50	---	35	10:30	---	25	10:16	---	26
O19S	9:58	1	7	10:45	1	1	10:28	2	1
O35S	10:23	1	0	---	1	0	10:38	1	1
O36S	10:20	1	0	---	1	0	10:54	1	4
O33L	10:16	---	0	11:04	---	1	11:02	---	10
O23L	11:15	---	0	11:25	---	0	---	---	0
O21S	11:05	1	7	11:36	1	9	11:20	1	30

Drainage area and altitude of each site were listed in Table 3. Number in the ‘Loc.’ column corresponds to the number of ‘Loc.’ in Table 3, which varies depending on the spring position.

Table 6: continued

site	29 Jun.	Loc.	$Q$ (mL/s)	11 Jul.	Loc.	$Q$ (mL/s)	31 Jul.	Loc.	$Q$ (mL/s)
C1S	8:20	1	200	7:42	1	6350	6:56	1	21
C3L	8:37	---	166	8:09	---	4330	7:05	---	29
C3S	8:48	2	7	8:18	2	400	7:23	1	22
O31L	9:04	---	215	8:30	---	8500	7:35	---	73
O31S	9:16	2	37	8:40	3	2200	7:51	2	11
O37S	---	1	0	8:50	1	750	---	1	0
O34S	---	1	0	8:56	1	920	---	1	0
O30L	9:30	---	130	9:04	---	5850	8:07	---	83
O27S	9:35	1	167	9:26	2	4600	8:16	1	22
O25L	---	---	0	9:32	---	1120	---	---	0
O25S	9:51	1	4	9:40	1	940	---	1	0
O24S	---	1	0	9:46	1	180	---	1	0
O19L	10:04	---	85	9:57	---	3975	8:45	---	91
O19S	10:16	2	4	10:03	2	2317	8:55	2	3
O35S	10:27	1	5	10:16	1	393	---	1	0
O36S	10:35	1	8	10:30	1	240	9:13	1	0
O33L	10:41	---	21	10:35	---	870	9:21	---	7
O23L	---	---	0	10:44	---	3125	---	---	0
O21S	10:57	1	48	10:52	1	1933	9:40	1	63



Table 6: continued

site	20 Aug.	Loc.	$Q$ (mL/s)	26 Sep.	Loc.	$Q$ (mL/s)	2 Oct.	Loc.	$Q$ (mL/s)
C1S	7:46	1	510	7:43	1	35	5:50	1	3083
C3L	7:58	---	360	7:57	---	38	6:10	---	1983
C3S	8:14	2	7	8:06	1	21	6:22	2	167
O31L	8:33	---	380	8:17	---	73	6:39	---	5900
O31S	8:47	2	80	8:30	2	6	6:50	3	843
O37S	9:00	1	19	---	1	0	7:02	1	500
O34S	9:16	1	32	---	1	0	7:11	1	520
O30L	9:22	---	440	8:46	---	80	7:19	---	2113
O27S	9:30	1	215	8:52	1	38	7:42	2	2117
O25L	---	---	0	---	---	0	7:51	---	287
O25S	9:40	1	8	9:08	1	0	8:03	1	100
O24S	9:40	1	0	---	1	0	8:14	1	267
O19L	10:14	---	193	9:15	---	77	8:24	---	1420
O19S	10:23	2	7	9:27	1	20	8:37	2	675
O35S	10:36	1	12	---	1	0	8:52	1	163
O36S	10:46	1	16	---	1	0	8:58	1	133
O33L	10:53	---	37	9:42	---	2	9:07	---	333
O23L	11:00	---	0	9:53	---	0	9:21	---	1130
O21S	11:14	1	148	9:58	1	55	9:30	1	1100

Table 7: Observation periods for stream discharge, bedload yield and rockfall in the investigated headwater basins

Year	Stream discharge	Tensiometer	Bedload	Rockfall
2000	11 Jun. – 3 Nov. <sup>*1</sup>	–	11 Jun. – 31 Dec.	29 Jan. – 31 Dec.
2001	9 Jun. – 4 Nov. <sup>*2,3</sup>	24 Jun. – 4 Nov.	1 Jan. – 31 Dec.	1 Jan. – 31 Dec.
2002	3 May – 3 Nov.	3 May – 3 Nov.	1 Jan. – 31 Dec.	1 Jan. – 31 Dec.
2003	–	–	1 Jan. – 4 May	1 Jan. – 4 May

\*1: Observation at C3U in 2000 was started on 14 July.

\*2: Observation at C3L in 2001 was started on 28 June.

\*3: From 10 August to 1 September in 2001, data at C3U were affected by the debris trapped in the flume, and data are not available at C3L.

Table 8: Comparison of bedload yield among three observation sites

Watershed		C1			C3		
Site	Unit	C1L	C3U	C3L			
$A$	(m <sup>2</sup> )	7200	1700	5100			
$S_c$		0.384	0.758	0.394			
$Y_t$	(kg)	14.21	> 298.50	> 647.10			
$Y_a$	(kg y <sup>-1</sup> )	4.73	> 99.50	> 215.70			
$Y_a / A$	(kg m <sup>-2</sup> y <sup>-1</sup> )	0.0007	> 0.0585	> 0.0423			
$Y_w$ (2000-2001)	(kg)	1.02	23.16	3.34			
$Y_w$ (2001-2002)	(kg)	0.65	0.35	1.53			
$Y_w$ (2002-2003)	(kg)	0.16	53.35	5.41			
$Y_w$ (all)	(kg)	1.85	76.86	10.29			
$Y_w / Y_t$	(%)	13	< 26	< 2			

$A$ : drainage area of observation sites

$S_c$ : local channel gradient of observation sites

$Y_t$ : total bedload yield for three years (2000 – 2002)

$Y_a$ : annual bedload yield

$Y_a/A$ : annual bedload yield per unit area

$Y_w$ : bedload yield in winter

$Y_w/Y_t$ : ratio of yield in winter to total yield

Table 9: Coefficient of the regression lines of spring discharge on source area

Date	$\alpha_s (10^{-6} \text{ m s}^{-1})$	$\beta_s (\text{m}^2)$	$R^2 *$	$P **$
19 Jan. 2002	0.001	699	0.395	< 0.05
28 Apr. 2002	0.002	610	0.321	> 0.05
21 May 2002	0.014	1039	0.753	< 0.001
29 Jun. 2002	0.021	1164	0.749	< 0.001
11 Jul. 2002	0.703	223	0.792	< 0.001
31 Jul. 2002	0.004	383	0.372	< 0.05
20 Aug. 2002	0.040	855	0.573	< 0.01
26 Sep. 2002	0.005	375	0.584	< 0.01
2 Oct. 2002	0.330	295	0.764	< 0.001

\*: coefficient of determination.

\*\*: significance level of correlation.

Table 10a: Rainfall and peak discharge of storm events at three observation sites: data from 11 June to 3 November in 2000

Date (2000)	Rainfall data				C1L		C3U		C3L	
	$R_1$	$R_4$	$R_{24}$	$R_{total}$	$Q_p$	$Q_p/A$	$Q_p$	$Q_p/A$	$Q_p$	$Q_p/A$
13 Jun.	5.0	15.2	34.2	35.0	1.70	0.24	NA	NA	2.89	0.57
23 Jun.	4.4	8.8	19.4	33.2	0.23	0.03	NA	NA	0.56	0.11
2 Jul.	27.8	32.0	33.8	32.2	4.81	0.67	NA	NA	5.86	1.15
4 Jul.	10.6	11.8	16.6	14.6	0.50	0.07	NA	NA	1.05	0.21
8 Jul.	11.0	31.8	61.8	61.8	10.02	1.39	NA	NA	13.13	2.57
17 Jul.	8.6	10.0	10.0	10.0	0.12	0.02	0.08	0.05	0.71	0.14
18 Jul.	25.0	25.8	25.8	25.8	1.97	0.27	0.90	0.53	3.33	0.65
25 Jul.	13.0	22.0	36.4	36.6	0.60	0.08	0.69	0.40	2.23	0.44
2 Aug.	48.6	48.8	48.8	48.8	5.73	0.80	6.02	3.54	12.54	2.46
3 Aug.	22.8	25.6	25.6	25.6	2.64	0.37	3.58	2.11	6.65	1.30
5 Aug.	12.6	20.0	23.4	23.4	1.16	0.16	0.52	0.30	2.00	0.39
14 Aug.	11.2	11.4	11.4	11.4	0.38	0.05	0.19	0.11	1.50	0.29
15 Aug.	22.4	26.4	26.8	26.8	1.57	0.22	1.06	0.62	3.61	0.71
16 Aug.	8.4	12.4	38.0	13.0	0.50	0.07	0.13	0.08	1.43	0.28
11 Sep.	11.2	32.0	90.8	92.4	7.86	1.09	2.68	1.57	9.37	1.84
17 Sep.	6.6	15.4	31.8	31.0	2.36	0.33	0.93	0.55	3.61	0.71
23 Sep.	8.6	13.8	34.0	34.0	0.51	0.07	0.38	0.22	1.64	0.32
2 Oct.	4.2	11.4	20.0	20.0	0.24	0.03	0.02	0.01	0.51	0.10
20 Oct.	6.8	20.4	34.4	34.4	0.21	0.03	0.19	0.11	1.18	0.23

The unit of peak discharge,  $Q_p$ , is L/s, specific peak discharge,  $Q_p/A$ , is  $10^{-6}$  m/s.  $R_1$ ,  $R_4$ ,  $R_{24}$ , and  $R_{total}$  indicate maximum 1-hour, 4-hour, 24-hour rainfalls and total rainfall, respectively. The unit of rainfall is mm. Rainfall data were obtained at R site (see Figure 13).  
NR: no runoff response. NA: data not available.

Table 10b: Rainfall and peak discharge of storm events at three observation sites: data from 9 June to 4 November in 2001

Date (2001)	Rainfall data				C1L	C1L	C3U	C3U	C3L	C3L
	$R_1$	$R_4$	$R_{24}$	$R_{total}$	$Q_p$	$Q_p/A$	$Q_p$	$Q_p/A$	$Q_p$	$Q_p/A$
14 Jun.	4.4	10.8	31.8	52.0	2.11	0.29	NR	NR	NA	NA
29 Jun.	25.0	29.6	53.2	53.0	3.33	0.46	1.71	1.01	1.81	0.35
17 Jul.	12.4	24.4	25.8	25.8	0.54	0.08	0.03	0.02	1.08	0.21
18 Jul.	18.2	20.4	30.4	27.2	1.45	0.20	0.75	0.44	4.08	0.80
24 Jul.	12.8	28.2	29.8	29.8	0.97	0.14	0.49	0.29	3.19	0.63
31 Jul.	14.6	14.6	14.8	14.8	0.44	0.06	0.01	0.01	1.52	0.30
10 Aug.	58.6	88.6	91.0	91.0	34.90	4.85	<b>8.26</b>	<b>4.86</b>	<b>37.16</b>	<b>7.29</b>
11 Aug.	5.8	12.0	34.0	19.0	1.00	0.14	NR	NR	NA	NA
21 Aug.	23.0	48.8	130.2	131.2	30.62	4.25	<b>5.84</b>	<b>3.44</b>	NA	NA
26 Aug.	72.0	89.4	99.8	99.8	36.52	5.07	<b>10.09</b>	<b>5.93</b>	NA	NA
27 Aug.	19.6	35.2	41.6	39.2	11.34	1.57	<b>0.05</b>	<b>0.03</b>	NA	NA
3 Sep.	<i>4.6</i>	<i>8.8</i>	<i>15.4</i>	<i>15.4</i>	0.25	0.03	NR	NR	0.30	0.06
9 Sep.	<i>24.4</i>	<i>44.2</i>	<i>152.8</i>	<i>234.0</i>	15.80	2.19	3.27	1.92	16.46	3.23
21 Sep.	<i>7.2</i>	<i>21.2</i>	<i>32.0</i>	<i>32.2</i>	0.22	0.03	0.05	0.03	0.45	0.09
30 Sep.	<i>5.8</i>	<i>17.4</i>	<i>49.0</i>	<i>49.2</i>	0.28	0.04	0.05	0.03	1.12	0.22
10 Oct.	12.2	38.4	124.8	125.0	18.97	2.63	2.19	1.29	20.74	4.07
17 Oct.	2.0	4.8	17.4	19.2	0.20	0.03	0.05	0.03	0.26	0.05
22 Oct.	6.2	15.0	20.8	20.8	0.29	0.04	0.05	0.03	1.27	0.25
28 Oct.	3.4	10.4	13.8	13.8	0.18	0.02	0.05	0.03	0.34	0.07
3 Nov.	2.6	8.0	19.2	19.2	0.20	0.03	NR	NR	0.42	0.08

The unit of peak discharge,  $Q_p$ , is L/s, specific peak discharge,  $Q_p/A$ , is  $10^{-6}$  m/s.  $R_1$ ,  $R_4$ ,  $R_{24}$ , and  $R_{total}$  indicate maximum 1-hour, 4-hour, 24-hour rainfalls and total rainfall, respectively. The unit of rainfall is mm. Italic figures indicate rainfall at R' site, and the other rainfall data were obtained at R site (see Figure 13). Bold figures indicate that the data may not be precise by trapped debris.

NR: no runoff response. NA: data not available.

Table 10c: Rainfall and peak discharge of storm events at three observation sites: data from 3 May to 3 November in 2002

Date (2002)	Rainfall data				C1L	C1L	C3U	C3U	C3L	C3L
	$R_1$	$R_4$	$R_{24}$	$R_{total}$	$Q_p$	$Q_p/A$	$Q_p$	$Q_p/A$	$Q_p$	$Q_p/A$
7 May	3.8	10.0	18.2	18.2	0.15	0.02	NR	NR	0.21	0.04
11 May	7.0	15.0	33.8	33.8	1.61	0.22	NR	NR	5.87	1.15
17 May	3.6	7.6	23.8	23.8	0.24	0.03	NR	NR	1.32	0.26
18 Jun.	6.8	16.0	26.6	26.6	0.23	0.03	0.05	0.03	1.47	0.29
20 Jun.	9.0	27.0	42.0	42.0	0.33	0.05	NR	NR	4.03	0.79
24 Jun.	2.2	6.4	16.0	32.2	0.16	0.02	NR	NR	0.43	0.08
9 Jul.	31.0	98.8	202.8	250.2	41.01	5.70	16.09	9.46	57.43	11.26
16 Jul.	12.2	22.4	32.2	32.2	1.32	0.18	0.15	0.09	3.28	0.64
4 Aug.	9.8	18.8	24.4	20.6	0.25	0.04	NR	NR	0.99	0.19
12 Aug.	12.0	16.2	16.2	16.2	0.12	0.02	NR	NR	0.48	0.09
15 Aug.	14.8	22.0	22.2	22.2	0.22	0.03	NR	NR	0.72	0.14
18 Aug.	12.2	25.6	31.4	31.4	0.34	0.05	0.19	0.11	5.16	1.01
23 Aug.	2.8	7.2	14.4	14.4	0.08	0.01	NR	NR	0.28	0.05
4 Sep.	13.8	16.0	16.0	16.0	0.07	0.01	NR	NR	0.55	0.11
6 Sep.	7.8	13.0	32.6	58.2	0.65	0.09	NR	NR	2.77	0.54
8 Sep.	5.2	10.2	24.4	10.2	0.37	0.05	NR	NR	0.80	0.16
13 Sep.	13.8	25.8	31.4	31.4	0.28	0.04	NR	NR	0.64	0.12
28 Sep.	11.4	25.2	36.6	36.6	0.13	0.02	0.03	0.02	0.95	0.19
1 Oct.	44.0	99.2	150.6	151.6	29.36	4.08	9.24	5.44	40.90	8.02
7 Oct.	7.2	11.6	15.0	15.0	0.18	0.02	0.08	0.05	0.30	0.06
21 Oct.	3.8	9.8	24.0	24.0	0.24	0.03	0.05	0.03	1.22	0.24

The unit of peak discharge,  $Q_p$ , is L/s, specific peak discharge,  $Q_p/A$ , is  $10^{-6}$  m/s.  $R_1$ ,  $R_4$ ,  $R_{24}$ , and  $R_{total}$  indicate maximum 1-hour, 4-hour, 24-hour rainfalls and total rainfall, respectively. The unit of rainfall is mm. Rainfall data were obtained at R site (see Figure 13). NR: no runoff response. NA: data not available.

Table 11a: Peak discharge and bedload yield at three observation sites:  
data from 11 July 2000 to 4 February 2001

	Period (2000-2001)	C1L $Q_p$	C1L Bedload	C3U $Q_p$	C3U Bedload	C3L $Q_p$	C3L Bedload
A	11 Jun. – 30 Jun.	1.70	0.00	NA	0.22	2.89	0.36
B	30 Jun. – 7 Jul.	4.81	0.08	NA	0.04	5.86	0.51
C	7 Jul. – 10 Jul.	10.03	0.08	NA	2.34	13.13	6.76
D	10 Jul. – 17 Jul.	NE	0.00	NE	0.00	NE	0.00
E	17 Jul. – 22 Jul.	1.97	0.06	0.90	0.01	3.33	0.01
F	22 Jul. – 28 Jul.	0.60	0.04	0.69	0.00	2.23	0.00
G	28 Jul. – 10 Aug.	5.73	0.25	6.02	0.00	12.54	0.13
H	10 Aug. – 28 Aug.	1.57	0.15	1.06	0.03	3.61	3.90
I	28 Aug. – 7 Sep.	NE	0.00	NE	0.00	NE	0.00
J	7 Sep. – 19 Sep.	7.86	0.17	2.68	0.14	9.37	0.03
K	19 Sep. – 1 Oct.	0.51	0.00	0.38	0.00	1.64	0.00
L	1 Oct. – 15 Oct.	0.24	0.02	0.02	0.00	0.51	0.01
M	15 Oct. – 3 Nov.	0.20	0.00	0.19	0.00	1.18	0.00
N	3 Nov. – 26 Nov.	NA	0.00	NA	0.00	NA	0.00
O	26 Nov. – 4 Feb.	NA	0.00	NA	9.91	NA	0.60

The unit of peak discharge,  $Q_p$ , is L/s. The unit of bedload yield is kg.  
NE: no runoff event. NA: data not available.



Table 11b: Peak discharge and bedload yield at three observation sites:  
data from 4 February 2001 to 6 January 2002

	Period (2001-2002)	C1L $Q_p$	C1L Bedload	C3U $Q_p$	C3U Bedload	C3L $Q_p$	C3L Bedload
A	4 Feb. – 5 Apr.	NA	0.12	NA	5.40	NA	0.98
B	5 Apr. – 19 May	NA	0.18	NA	0.23	NA	0.82
C	19 May – 9 Jun.	NA	0.72	NA	7.62	NA	0.93
D	9 Jun. – 16 Jun.	2.11	0.15	NE	0.00	NA	0.19
E	16 Jun. – 24 Jun.	NE	0.01	NE	0.00	NE	0.00
F	24 Jun. – 15 Jul.	3.33	0.20	1.71	0.33	1.81	0.93
G	15 Jul. – 22 Jul.	1.45	0.19	0.75	0.00	4.08	0.00
H	22 Jul. – 5 Aug.	0.97	0.17	0.01	0.19	3.19	0.00
I	5 Aug. – 1 Sep.	36.10	1.07	> 10.10	>208.70	> 37.16	>537.35
J	1 Sep. – 22 Sep.	15.80	0.25	3.27	0.22	16.46	4.20
K	22 Sep. – 6 Oct.	0.28	0.03	0.05	0.00	1.12	0.03
L	6 Oct. – 13 Oct.	18.97	0.15	2.19	0.15	20.74	0.66
M	13 Oct. – 4 Nov.	0.29	0.04	0.05	0.00	1.27	0.00
N	4 Nov. – 2 Dec.	NA	0.02	NA	0.06	NA	0.02
O	2 Dec. – 6 Jan.	NA	0.07	NA	0.00	NA	0.00

The unit of peak discharge,  $Q_p$ , is L/s. The unit of bedload yield is kg.  
NE: no runoff event. NA: data not available.

Table 11c: Peak discharge and bedload yield at three observation sites:  
data from 6 January 2002 to 8 February 2003

	Period (2002-2003)	C1L	C1L	C3U	C3U	C3L	C3L
		$Q_p$	Bedload	$Q_p$	Bedload	$Q_p$	Bedload
A	6 Jan. – 2 Feb.	NA	0.46	NA	0.10	NA	0.13
B	2 Feb. – 3 Mar.	NA	0.02	NA	0.00	NA	0.95
C	3 Mar. – 6 Apr.	NA	0.07	NA	0.19	NA	0.08
D	6 Apr. – 3 May	NA	0.00	NA	0.00	NA	0.35
E	3 May – 19 May	1.61	0.08	NE	0.00	5.87	0.03
F	19 May – 8 Jun.	NE	0.01	NE	0.07	NE	0.01
G	8 Jun. – 6 Jul.	0.33	0.03	0.05	0.15	4.03	0.02
H	6 Jul. – 13 Jul.	41.01	7.85	16.09	6.80	57.43	71.40
I	13 Jul. – 4 Aug.	1.32	0.58	0.15	0.42	3.28	0.38
J	4 Aug. – 8 Sep.	0.65	0.28	0.19	0.00	5.16	0.22
K	8 Sep. – 5 Oct.	29.36	0.43	9.24	1.82	40.90	9.70
L	5 Oct. – 3 Nov.	0.24	0.01	0.08	0.00	1.22	0.00
M	3 Nov. – 21 Dec.	NA	0.00	NA	0.00	NA	0.46
N	21 Dec. – 8 Feb.	NA	0.00	NA	1.40	NA	1.80

The unit of peak discharge,  $Q_p$ , is L/s. The unit of bedload yield is kg.  
NE: no runoff event. NA: data not available.