

TABLE 1. SEDIMENT YIELDS FOLLOWING VOLCANIC ERUPTIONS

Volcano	Basin	Drainage area (km ²)	Average annual sediment load (10 ³ Mg)*	Average annual normalized sediment yield (10 ³ Mg/km ²)	Source [†]
Japan					
Sakurajima	Nojiri	3	900	300	1
	Kurokami	6.9	750	110	1
	Harumadsu	2.1	60	28	1
	Mochiki	1.6	123	76	1
	Furusato No. 1	0.9	32	35	1
	Furusato No. 2	1.4	18	13	1
	Arimura	3.6	236	65	1
Yakedake	Kamikamihori	0.8	7.5	9	2
Unzen	Mizunashi	12	3150	260	3
Usu	Izumi	1.5	40	28	4
	Nishiyama	0.7	44	63	4
	Ko-Usu	1	51	48	4
	Sobetsu	0.5	45	96	4
	O-Usu	0.4	14	31	4
	Crater 4	0.2	45	195	4
Indonesia					
Merapi	Bebeng	5	300	60	5
Galunggung	S. Cikunir	90	25000	275	6
Kelud	various	N.A. [§]	16000	N.A.	7
Guatemala					
Fuego	Achiguate	1320	4000	3	8

TABLE 1. CONTINUED

	Pantaleon	1130	1700	1.5	8
Santa Maria	Samala	1500	300 000	200	9
Costa Rica					
Irazu	Rio Reventado	14.4	1000	100	10
Philippines					
Mayon	Mabinit	5	1200	230	11
Pinatubo [#]	various	540	3 000 000	5500	12

Notes: Average annual sediment yields are based on 2 to 10 years of documented measurements. These yields are based on total sediment accumulations, not just on measurements of suspended sediment.

*Sediment yields are sometimes reported as a volume ($\text{m}^3 \text{yr}^{-1}$). Conversion to mass shown here assumes a bulk density of 1500 kg/m^3 .

[†] 1. Shimokawa and Taniguchi (1983); Shimokawa et al. (1989). 2. Suwa et al. (1989); Suwa and Sumaryono (1996). 3. Suwa and Sumaryono (1996); Mizuyama and Kobashi (1996); Suwa and Yamakoshi (1997); Yamakoshi and Suwa (1998). 4. Kadomura et al. (1983); Chinen and Kadomura (1986). 5. Suwa and Sumaryono (1996); Shimokawa et al. (1996). 6. Hirao and Yoshida (1989); Hamidi (1989). 7. Smart (1981). 8. Davies et al. (1978). 9. Kuenzi et al. (1979). 10. Waldron (1967). 11. Rodolfo (1989). 12. Pierson et al. (1992); Janda et al. (1996); Umbal (1997); Hayes (1999).

[§]N.A. Data not specified. Data are reported as average percentage of eruptive deposits eroded. No specific basins areas are provided; therefore, data are insufficient to compute normalized sediment yield.

[#]Compilation of data from all basins. Area represents total area of affected basins, and yield represents average over all basins.

TABLE 2. DRAINAGE BASIN AND FLOW CHARACTERISTICS FOR STATIONS
AT MOUNT ST. HELENS

Station	Record period (water year)	Upstream drainage area (km ²)	Mean annual discharge (m ³ /s)	Mean annual flood (m ³ /s)
Toutle River (TOW)*	1981-1999	1230	60	674
North Fork Toutle (KID)	1982-1994	680	34	374
South Fork Toutle (SFT) [†]	1982-1999	300	18	275
Muddy River (MUD) [§]	1982-1999	350	25	283
Green River (GRE)	1982-1994	335	13.5	173

* Data collection at TOW began in March 1981. In our analysis, we use continuous data collected in water year 1981 at Highway 99 bridge, a temporary station located 9 kilometers farther downstream and having a drainage area of 1270 km².

[†]The gage station for SFT was moved 4 kilometers downstream following flood damage in 1996. The new gage station has a contributing area of 310 km². For consistency, we normalize all suspended-sediment loads by the pre-1996 drainage area.

[§]The gage station was moved from above to below Clear Creek in 1984. Measurements show that Clear Creek contributes negligible sediment; however, it drains an additional 134 km² area. Because relatively little channel change has occurred below, as compared to above, Clear Creek since 1983, we have normalized measured suspended-sediment loads by the basin area above Clear Creek (217 km²) to provide a consistent assessment of sediment yield.

TABLE 3. ANNUAL SUSPENDED-SEDIMENT LOADS AND FLOW CHARACTERISTICS FOR STATIONS AT MOUNT ST. HELENS

Water Year	Toutle River (TOW)		North Fork Toutle River (KID)			South Fork Toutle River (SFT)			
	Annual suspended load (10 ³ Mg)	Mean annual discharge (m ³ /s)	Annual runoff (10 ⁶ m ³)	Annual suspended load (10 ³ Mg)	Mean annual discharge (m ³ /s)	Annual runoff (10 ⁶ m ³)	Annual suspended load (10 ³ Mg)	Mean annual discharge (m ³ /s)	Annual runoff (10 ⁶ m ³)
1981	26900	52.7	1659	N.D.*	N.D.	N.D.	N.D.	N.D.	N.D.
1982	36800	71.3	2249	31200	41.9	1323	1300	20.0	631
1983	36000	69.8	2202	26500	40.8	1286	1450	22.3	702
1984	22400	66.4	2098	20000	44.8	1416	450	19.2	607
1985	8500	50.1	1579	8250	34.0	1072	50	12.9	407
1986	6900	51.6	1628	7200	34.6	1092	150	14.4	453
1987	7950	53.1	1676	6300	31.6	997	550	15.3	481
1988	2000	45.0	1422	900 (6200)	29.2	922	400	13.1	415
1989	700	47.9	1511	350 (3700)	30.2	952	200	13.2	417
1990	2150	58.9	1859	750 (7400)	37.6	1185	900	17.1	540
1991	2400	64.8	2044	950 (8900)	42.0	1323	850	19.7	621
1992	650	42.7	1352	250 (5800)	27.8	878	400	11.6	366
1993	400	47.1	1485	150 (2300)	29.2	921	500	14.2	449
1994	150	39.3	1239	100 (1900)	23.9	755	50	10.7	336
1995	1400	63.1	1988	(6500)	N.D.	N.D.	500	18.0	568
1996	5900	87.5	2766	(16800)	N.D.	N.D.	2500	26.2	828
1997	2750	88.3	2786	(11500)	N.D.	N.D.	1800	26.3	830
1998	1800	64.2	2026	(6100)	N.D.	N.D.	1250	20.6	650
1999	4550	82.5	2601	N.D.	N.D.	N.D.	1150	23.9	752

Notes: Tabulated sediment loads are measured at each gaging station. Values in parentheses are calculations based on the annual volume of sediment accumulated behind the sediment retention dam (SRS). See footnotes in Table 2 concerning gage station locations. Closure of SRS in late 1987 abruptly diminished sediment loads measured at TOW and KID.

*N.D. = no data.

TABLE 3. (CONTINUED)

Water Year	Muddy River (MUD)			Green River (GRE)		
	Annual suspended load (10 ³ Mg)	Mean annual discharge (m ³ /s)	Annual runoff (10 ⁶ m ³)	Annual suspended load (10 ³ Mg)	Mean annual discharge (m ³ /s)	Annual runoff (10 ⁶ m ³)
1981	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1982	3400	21.4	675	450	17.6	554
1983	2800	23.3	735	160	15.5	490
1984	1350	28.3	896	200	16.9	534
1985	300	19.9	627	30	12.3	388
1986	800	22.0	692	250	13.1	412
1987	1000	23.3	734	70	12.6	398
1988	900	20.5	648	70	11.5	364
1989	300	22.2	699	15	12.1	381
1990	650	22.8	720	80	14.9	469
1991	600	23.5	742	75	17.1	540
1992	450	18.0	570	15	10.3	326
1993	300	19.3	609	6	11.7	367
1994	50	17.8	562	6	9.4	297
1995	2100	29.6	933	N.D.	N.D.	N.D.
1996	2550	34.6	1096	N.D.	N.D.	N.D.
1997	1100	36.1	1137	N.D.	N.D.	N.D.
1998	N.D.	29.5	932	N.D.	N.D.	N.D.
1999	500	33.7	1063	N.D.	N.D.	N.D.

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