It is believed that the combination of upland mass-wasting processes in the undeveloped, upstream part of the basin (Entrix, 2001), combined with erosion from cut slopes and streambanks in the downstream developed areas has resulted in the high long-term suspended-sediment yield. In comparison, the adjacent, developed Incline Creek watershed maintains considerably lower suspended-sediment yields (median = 12.0 $T/y/km^2$) even though the two basins have similar road densities (a measure of urbanization). The lower yields from Incline Creek are in part due to the fact that the basin does not cut through major unconsolidated debris flow and landslide deposits in its upper reaches, as does Third Creek.

Similar spatial variations between watersheds are seen when expressing annual suspended-sediment loads per unit of runoff. Annual loads (in tonnes) are divided by annual runoff (in m^3) for each year of record to express annual yields or concentrations, in g/m^3 (Table 3-8). Within basin comparisons using annual concentration data can show variations in sediment production and sources within basins. This approach can be better than using loads per unit area because of the tendency for yield values expressed in T/km^2 to decrease with distance downstream because of greater opportunities for sediment storage.

A revealing result of the analysis of suspended-sediment loads per unit runoff is that production and delivery of sediment from the northern quadrant streams, on average, is about the same as the wetter, western streams if we neglect the data from Third Creek. This is most certainly due to higher unit-runoff rates from the developed areas in the northern quadrant, resulting in higher yields of sediment. However, subsequent analysis of the temporal trends of suspended-sediment transport will show that because of the natural attenuation of sediment loads following disturbance, as well as installation of erosion-control measures, that annual loads are decreasing faster here than in any other quadrant of the Lake Tahoe Basin.

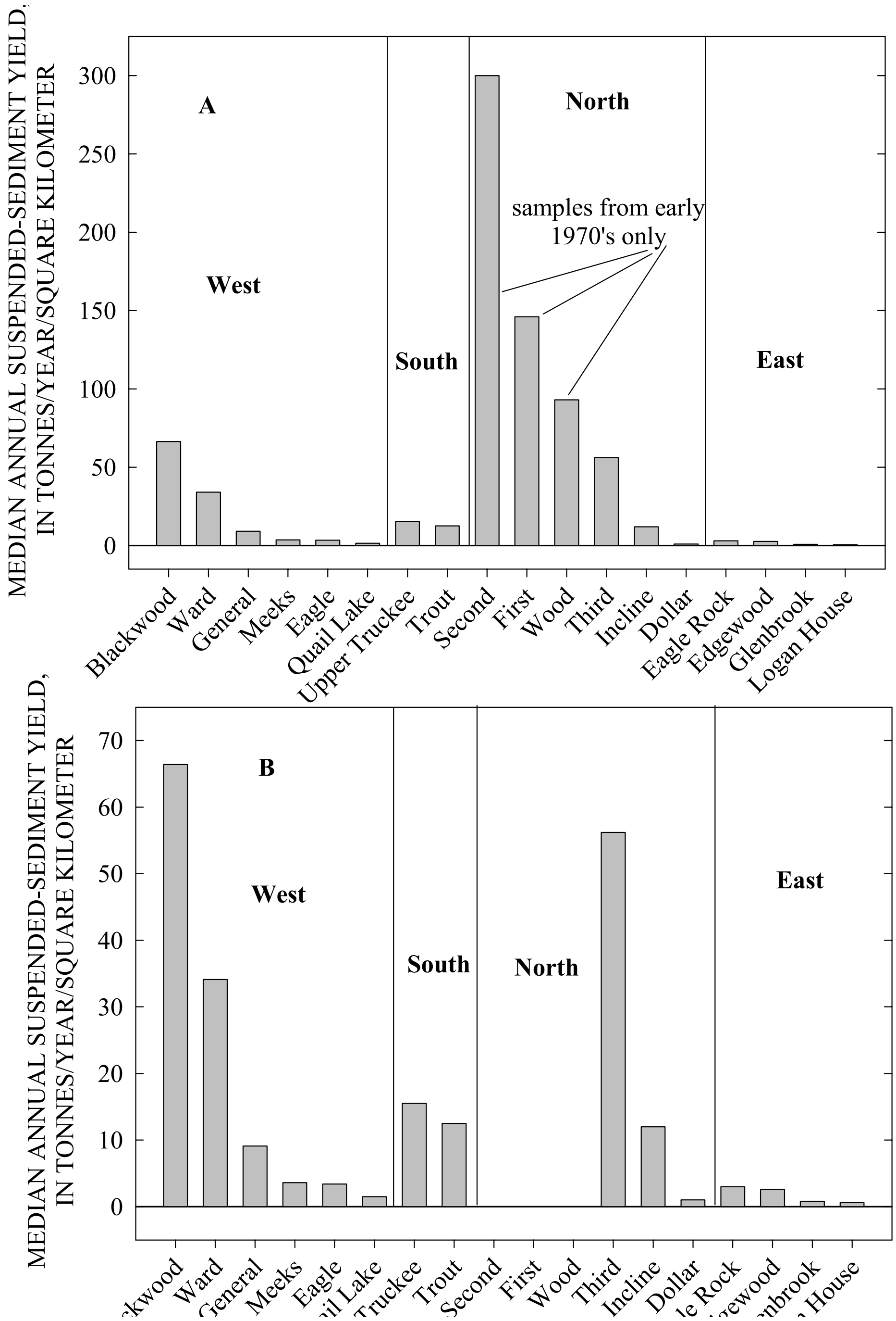

Figure 3-8. Median annual suspended-sediment yields for the 18 index stations (A), and without those northern streams sampled only in the early 1970's (B).

Table 3-8. Annual suspended-sediment loads per unit runoff (annual sediment concentrations). Rows shaded in gray have short periods of record and are not included in calculations of the median values for their respective quadrant.

Stream	Station	Quadrant	Annual sediment concentrations		Percent difference from median
			Median (g/m^3)	Average (g/m^3)	(g/m^3)
Eagle Rock	103367592	E	6.50	7.18	-6.3
Edgewood	10336760	E	6.94	6.98	0.0
Edgewood	10336765	E	7.14	7.14	2.9
Edgewood	103367585	E	12.6	14.6	81.6
Edgewood Trib	10336756	E	3.98	3.98	-42.7
Glenbrook	10336730	E	6.94	7.44	0.0
Logan House	10336740	E	6.16	7.36	-11.2
Median			**6.94**	**7.36**	
First	10336688	N	397	418	1424
Second	10336691	N	964	964	3601
Wood	10336692	N	261	241	902
Incline	10336700	N	29.4	64.4	12.9
Incline	103366993	N	16.7	14.2	-35.9
Incline	103366995	N	22.7	26.4	-12.9
Third	10336698	N	153	181	487
Median			**26.1**	**45.4**	
Grass	10336593	S	14	14	-6.7
Trout	10336770	S	7.8	11.4	-48.0
Trout	10336775	S	10.7	12.1	-28.7
Trout	10336780	S	41.2	41.7	175
Trout	10336790	S	15.0	14.3	0.0
UTR	10336580	S	7.76	8.44	-48.3
UTR	10336610	S	27.1	28.5	80.7
UTR	103366092	S	15.4	14.2	2.7
Median			**15.0**	**14.2**	
Blackwood	10336660	W	54.6	74.2	225
General	10336645	W	11.3	15.0	-32.7
Ward	10336670	W	83.4	81.5	396
Ward	10336674	W	16.8	17.55	0.0
Ward	10336675	W	15.5	18.2	-7.7
Ward	10336676	W	30.7	56	82.7
Median			**16.8**	**18.2**	

3.6 Fine-Grained Suspended-Sediment Loads and Yields

In terms of lake clarity, the delivery of sands and gravels to Lake Tahoe is not a critical issue. Material finer than 0.062 mm, defined as silts and clays, have the ability to remain in suspension for longer periods of time and have a direct effect on lake clarity. Using calculated suspended-sediment loads in combination with relations derived herein between discharge and percent silt plus clay, fine-sediment loads and yields are calculated by multiplying the load for a given day by the percent of material finer than 0.062 mm. Examples of these relations are shown in Figure 3-9.

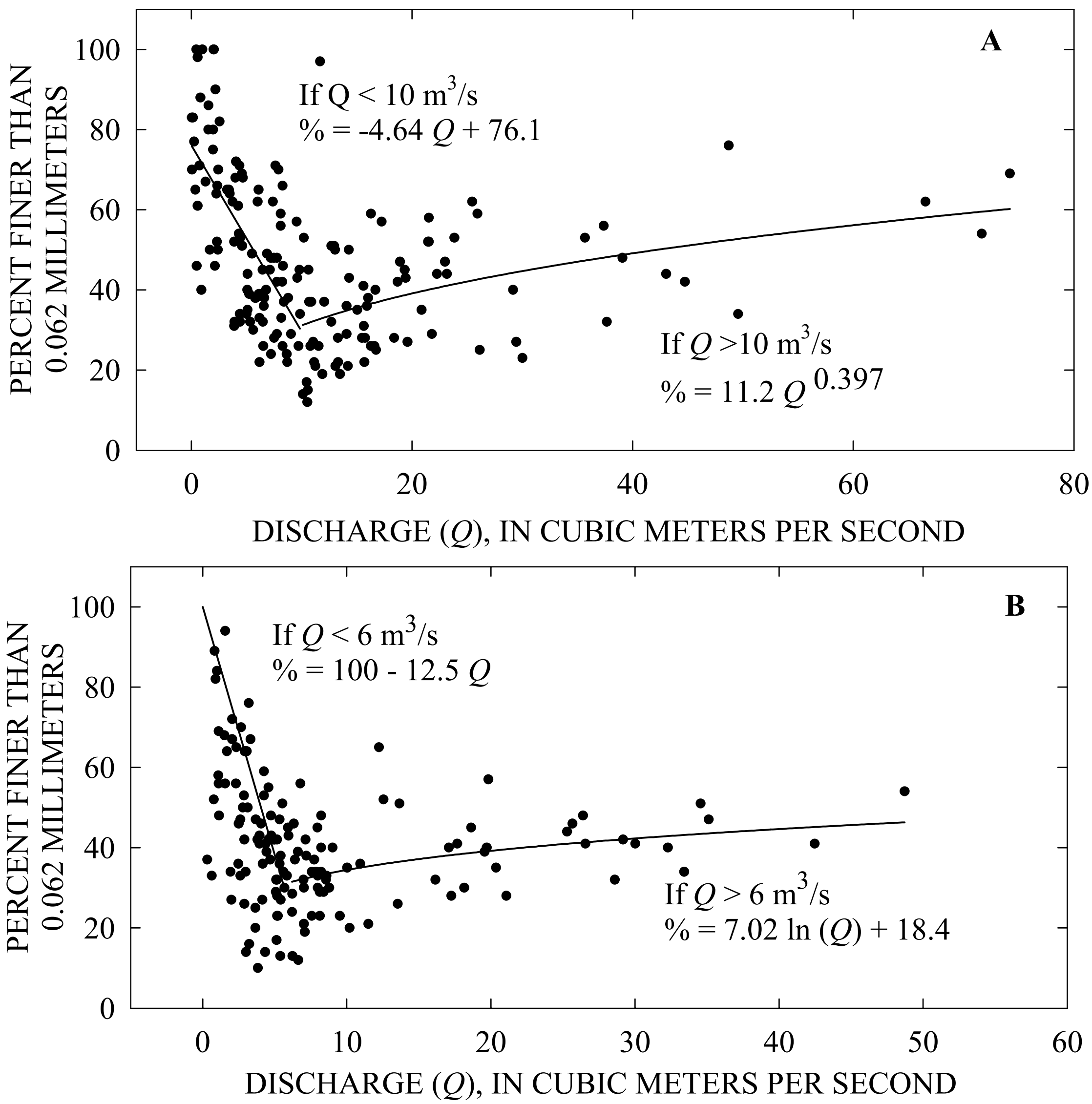

Figure 3-9. Example relations between discharge and percent of suspended load finer than 0.062 millimeters for index stations on the Upper Truckee River, 10336610 (A), and Blackwood Creek, 10336660 (B).

The largest contributors of fine sediment to Lake Tahoe on an annual basis are the Upper Truckee River and Blackwood Creek with median annual values of 1010 T/y and 846 T/y, respectively (Table 3-9). These values are about twice that of the next largest annual contributors Trout (462 T/y) and Ward Creeks (412 T/y). In comparison General Creek, delivers about 53 T/y. The greatest contributor from the eastern side of the lake is the index station on Edgewood Creek (11.4 T/y). Table 3-9 also provides an estimate of the relative contributions of fine load

Table 3-9. Summary of annual fine-grained suspended-sediment loads to Lake Tahoe calculated from measured data. Stations highlighted in green are index stations.

Stream	Station number	Annual Fine Load		Median relative contribution (percent)	Years of data	Drainage Area (km^2)
		Average (tonnes)	Median (tonnes)			
UTR	10336610	1261	1010	44	24	142
Blackwood	10336660	1347	846	45	40	29.0
Trout	10336780	624	462	38	40	95.1
Ward	10336676	658	412	47	28	25.1
Third	10336698	462	318	31	26	15.7
Ward	10336670	194	193	30	3	5.2
Trout	10336790	134	141	40	5	105
Incline	10336700	320	129	67	17	18.1
Incline	103366995	74.4	66.7	47	11	11.6
General	10336645	69.2	53.3	29	20	19.3
Grass	10336593	40.4	40.4	31	2	16.6
Incline	103366993	24.4	27.7	36	10	7.2
Eagle[1]	10336630		21.8		3	20.4
Meeks[1]	10336640		19.1		3	22.2
Edgewood	103367585	12.9	11.4	59	11	8.1
Edgewood	10336765	8.5	8.5	89	2	16.2
Glenbrook	10336730	8.8	7.0	80	16	10.5
Quail Lake[1]	10336650		3.2		3	4.2
Dollar [1]	10336684		2.6		3	4.7
Logan House	10336740	3.5	2.3	75	17	5.4

[1] = Data from Kroll (1976).

to total suspended-sediment load on an annual basis. Eastern streams such as Glenbrook, Logan House, and Edgewood Creeks display high percentages of fine loads as does Incline Creek on the north side of the basin, however, these values should be considered as estimates only because of the large degree of scatter in the discharge vs. percent finer relations. The spatial distribution of fine-grained loads is displayed in Figure 3-10.

Table 3-10. Summary of annual fine-grained suspended-sediment yields from Lake Tahoe watersheds. Stations highlighted in green are index stations.

Stream	Station number	Annual Fine Yield		Years of data	Drainage area (km^2)
		Average (tonnes/km^2)	Median (tonnes/km^2)		
Ward	10336670	37.4	37.1	3	5.2
Blackwood	10336660	45.4	21.5	40	29.0
Third	10336698	29.4	20.2	26	15.7
Ward	10336676	26.2	16.4	28	25.1
UTR	10336610	8.9	7.1	24	142
Incline	10336700	17.7	7.1	17	18.1
Incline	103366995	6.4	5.7	11	11.6
Trout	10336780	6.6	4.9	40	95.1
Incline	103366993	3.4	3.8	10	7.2
General	10336645	3.6	2.8	20	19.3
Grass	10336593	2.4	2.4	2	16.6
Trout	10336790	1.3	1.4	5	105
Edgewood	103367585	1.6	1.4	11	8.1
Eagle[1]	10336630		1.1		20.4
Meeks[1]	10336640		0.9		22.2
Quail Lake[1]	10336650		0.8		4.2
Glenbrook	10336730	0.8	0.7	16	10.5
Dollar [1]	10336684		0.6		4.7
Edgewood	10336765	0.5	0.5	2	16.2
Logan House	10336740	0.6	0.4	17	5.4

[1] = Original data from Kroll,