SEDIMENT DISCHARGE DATA FOR THE LOWER REACH OF CAMPBELL CREEK, ANCHORAGE, ALASKA: MAY TO SEPTEMBER 1987

by Stephen W. Lipscomb

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CONVERSION TABLE

For readers who may prefer to use International System of Units (SI) rather than inch-pound units, the conversion factors for the terms used in this report are listed below:

Multiply inch-pound units	by	To obtain SI units
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
square mile (mi^2)	2.590	square kilometer (km^2)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
ton per day (ton/d)	0.0972	megagram per day (Mg/d)
degree Fahrenheit (°F)	°C = 5/9 x (°F-32)	degree Celsius (°C)

Other abbreviation in this report is:

mg/L, milligram per liter

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INTRODUCTION

In May 1986, the U.S. Geological Survey, in cooperation with the Alaska Department of Transportation and Public Facilities (ADOT&PF), began a study of suspended-sediment transport and streamflow characteristics in the lower reach of Campbell Creek near Anchorage, Alaska (fig. 1). The ADOT&PF is in the process of constructing a new bridge at the Dimond Boulevard crossing of the creek within this reach. Sediment and streamflow data collection from the creek in the vicinity of the proposed bridge construction site began in 1986 and continued during the open-water period of 1987. A summary of the data collected during the 1986 water year is published in an earlier report (Lipscomb, 1987).

In early spring 1987, the ADOT&PF requested that the Geological Survey expand the study to include a site about 2 mi upstream from Dimond Boulevard. The new site is in the vicinity of the C Street crossing of Campbell Creek. Because construction activities similar to those at Dimond Boulevard are planned in the near future at this site, the ADOT&PF was interested in obtaining baseline sediment data prior to the beginning of construction. This report summarizes the data collected between May and September 1987.

DESCRIPTION OF STUDY REACH

The Campbell Creek drainage basin, which encompasses an area of 74 mi^2, has its headwaters in the Chugach Mountains east of Anchorage (fig. 1). The creek empties into Turnagain Arm south of the city. The lower part of the basin includes Campbell Lake, a shallow, man-made impoundment. The property adjacent to Campbell Lake is almost fully developed and the lake itself is used extensively for recreation and as a float-plane base. The study reach is located just upstream from the inlet to Campbell Lake and includes the proposed sites of new bridges at Dimond Boulevard and at C Street.

DATA COLLECTION METHODS

Streamflow

The Geological Survey has operated a continuous recording stream-gaging station on Campbell Creek at Dimond Boulevard since 1966 (U.S. Geological Survey, 1967-86). Prior to the spring of 1986 the gage consisted of a stilling well and a digital recorder attached to the wingwall on the upstream right-bank side of the bridge. In 1986, the gage was relocated to a site about 500 ft upstream of the existing bridge, where a mercury manometer was installed. Gage height is now recorded on both a continuous analog chart as well as digitally using a Campbell Scientific

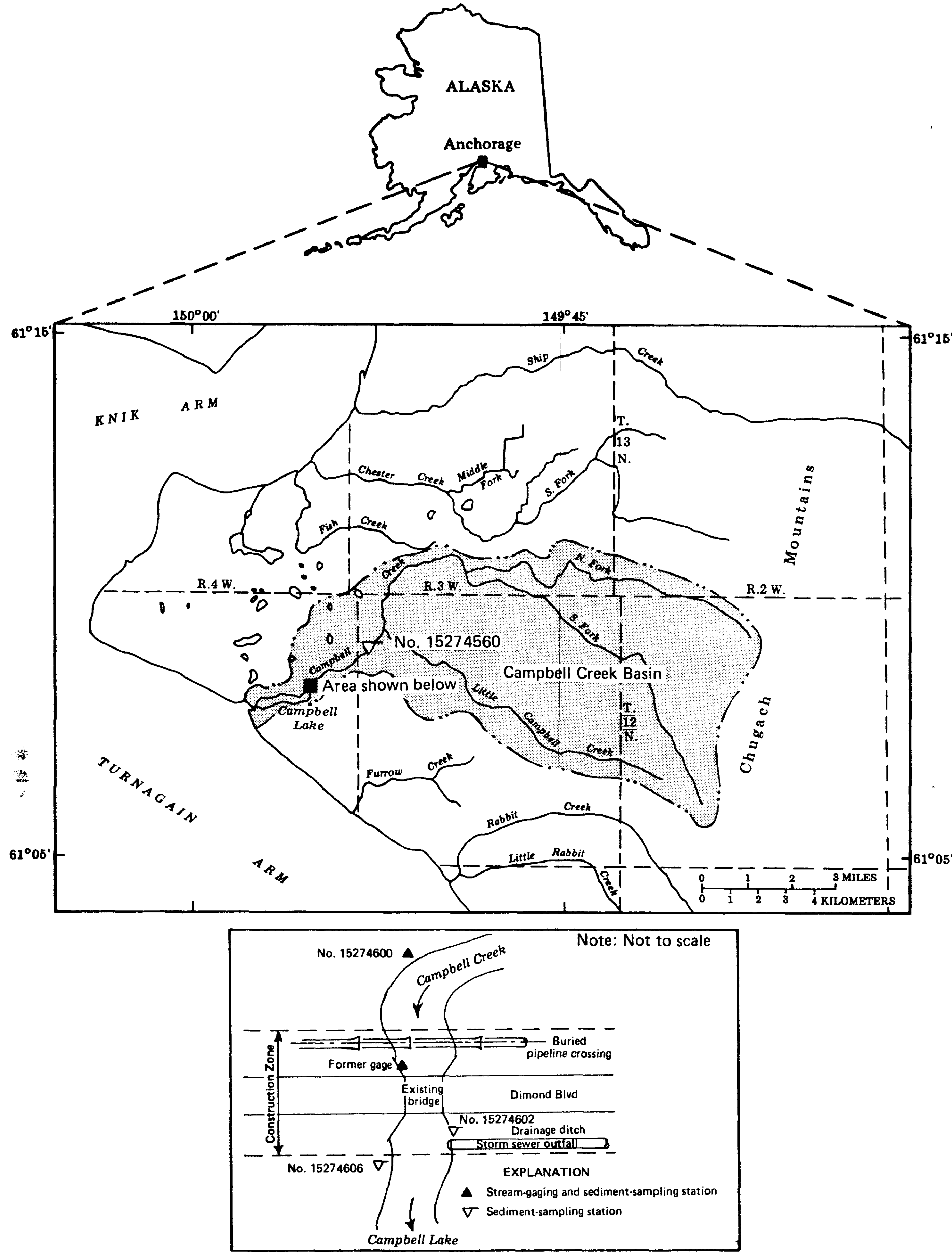

Figure 1.--Locations of the Campbell Creek basin, the study reach, and the stream-gaging and sediment-sampling sites.

CR-21 micrologger.[1] Frequent discharge measurements have been made over a wide range in stage to develop a stage-discharge relation at the new site.

Mean daily stream discharge was computed for the gaging station (No. 15274600). These data were used to compute daily suspended-sediment loads at both sediment stations in the vicinity of Dimond Boulevard (Nos. 15274600 and 15274606). Several discharge measurements were made at the C Street sediment station (No. 15274560), and, using regression analysis, were correlated to the discharge at the gaging station site. The resulting regression equation was used to calculate stream discharge at the C Street site for the purpose of suspended-sediment load computations.

Suspended Sediment

During the open-water period (May to September), suspended-sediment samples were collected on a regular basis at the three sites using automatic pumping samplers (designated PS-69). The pumping samplers were controlled by the CR-21 microloggers, which activated the samplers at 6-hour intervals. The micrologger located at the stream-gaging station site (No. 15274600) was also programmed to activate that sampler at a greater frequency during storm events.

The intakes for the pumping samplers were secured within the channel at points determined to produce samples most closely representing the average suspended-sediment concentration of the entire cross section. Integrated cross-section samples were obtained periodically in order to determine how closely the pumped samples represented the actual suspended-sediment concentration in the stream. This comparison was then used to make any necessary adjustment to the pumped samples.

Cross-section samples were collected using a standard U.S. Geological Survey DH-75 depth integrating suspended-sediment sampler. The samples were obtained by the equal-width increment (EWI) method as described by Guy and Norman (1970).

Comparison of cross-section samples to pumped samples showed good correlation at station Nos. 15274560 and 15274606. However, a much poorer correlation was commonly obtained at station 15274600. This was likely due to the difference in proximity to the stream and the vertical distances between the sampler intakes and pumps at the three sites; these distances were much less at station Nos. 15274560 and 15274606 than at No. 15274600. Because of the discrepancy between concentrations of suspended sediment in pumped samples versus manually collected EWI samples at station No. 15274600, daily values for sediment concentration and load for this site are not included here.

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[1] Use of the brand name Campbell Scientific CR-21 micrologger in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

Bedload

Bedload samples were collected three times at both Dimond Boulevard sites. The samples were taken using a hand-held Helley-Smith bedload sampler (Helley and Smith, 1971) which is designed to sample coarse material (0.062 - 76.2 mm) within 0.3 ft of the streambed. The sampler was held on the bed for 60-second intervals at 15 to 20 equally spaced points across the channel. Each sample included two complete passes with the results averaged to reduce errors resulting from temporal variations of transport rates.

SEDIMENT DISCHARGE DATA

Table 1 shows the results of the laboratory analyses of suspended sediment in EWI cross-section samples collected at the two stations on Campbell Creek near Dimond Boulevard (Nos. 15274600 and 15274606) and the station near C Street (No. 15274560) from May to September 1987.

The mean daily water discharge and the suspended-sediment concentration and load values for each day during the open-water period are given for station No. 15274560 (table 2) and station No. 15274606 (table 3). These data are presented graphically in figure 2. Daily suspended-sediment loads were computed from the mean daily discharge and mean daily suspended-sediment concentration using the method described by Porterfield (1972).

The sediment load at the downstream sites is typically from 20 to 25 percent greater than the load at C Street (fig. 3). This is due primarily to sediment derived from the intervening drainage area. Although daily values of sediment concentration and load for station No. 15274600 have not been included here (as explained above), with few exceptions the data gathered at the two stations near Dimond Boulevard indicate that under natural hydrologic conditions the sediment load is virtually the same at both sites. This equivalence is reflected in the 1986 data for these sites (Lipscomb, 1987). Notable exceptions are during the latter part of June and early July 1987 when construction activities in and near the stream at Dimond Boulevard caused a temporary increase in sediment transport rates at station No. 15274606 (table 3). Bedload samples taken during this same period (table 4) indicate a slightly lower bedload rate at the downstream site (station No. 15274606). Due to the intermittent nature of bedload transport, however, this difference is probably insignificant.

The summary of bedload data (table 4) includes the computed instantaneous bedload as well as the associated particle-size analyses of each sample.

Table 1.--Suspended-sediment and streamflow data for three sites on lower Campbell Creek, May to September 1987

[Data include the percent sand and silt-clay fractions of each suspended-sediment sample. Sand-size particles range in size from 0.062 mm to 2.0 mm; silt-clay size particles range in size from 0.5 microns to 0.062 mm (U.S. Geological Survey, 1977). mg/L, milligram per liter; ft, foot; ft^3/s, cubic foot per second, °C, degree Celsius; --, no data]

Station name and number (fig. 1)	Date	Time	Sediment conc. (mg/L)	Percent sand	Percent silt	Gage height (ft)	Water discharge (ft^3/s)	Water temp. (°C)
Campbell Creek	5/19	1315	7	28	72	--	27.7	--
near C Street	6/ 5	1750	15	53	47	--	45.0	10.8
(15274560)	6/23	1455	45	53	47	--	124.0	8.5
	6/29	1515	91	55	45	--	152.0	--
	7/22	1545	90	23	77	--	67.0	--
	9/ 4	1055	266	53	47	--	130.0	--
Campbell Creek	2/ 5	1230	8	--	--	--	28.4	--
near Spenard	5/19	1440	7	27	73	17.80	47.8	--
(15274600)	6/ 5	1620	17	42	58	18.26	83.2	10.5
	6/23	1630	48	40	60	18.77	126.0	9.0
	6/29	0730	146	39	61	19.16	156.0	8.1
	6/29	0815	116	50	50	19.12	153.0	--
	6/29	1310	108	48	52	19.18	158.0	8.1
	7/ 1	0850	38	53	47	18.96	138.0	--
	7/ 1	1515	31	49	51	18.92	134.0	--
	7/ 2	0745	26	55	45	18.78	122.0	8.5
	7/ 2	1530	20	--	--	18.76	120.0	--
	7/ 6	1615	13	--	--	18.60	107.0	--
	7/ 7	1000	11	--	--	18.61	108.0	--
	7/22	1455	66	25	75	18.85	128.0	10.7
	7/31	0020	78	33	67	18.97	139.0	--
	8/15	0840	267	29	71	18.86	129.0	--
	8/15	945	180	30	70	19.04	145.0	--
	9/ 4	1215	231	--	--	19.04	145.0	--
	9/ 8	1010	275	--	--	19.86	225.0	--
Campbell Creek	5/19	1450	6	23	77	--	47.8	--
below outfall	6/ 5	1645	16	39	61	--	83.2	10.6
(15274606)	6/23	1655	50	46	54	--	127.0	9.8
	6/29	0800	164	51	49	--	153.0	8.1
	6/29	1255	118	53	47	--	158.0	--
	6/30	0835	136	56	44	--	171.0	--
	7/ 1	0815	64	57	43	--	134.0	--
	7/ 1	0915	55	63	37	--	137.0	--
	7/ 1	1100	59	52	48	--	138.0	--
	7/ 1	1300	63	30	70	--	134.0	--
	7/ 1	1500	47	39	61	--	134.0	--
	7/ 1	1640	47	33	67	--	131.0	--
	7/ 1	1910	28	50	50	--	130.0	--
	7/ 2	0725	50	49	51	--	122.0	--
	7/ 2	0905	69	53	47	--	122.0	--
	7/ 2	1130	40	0	0	--	122.0	--
	7/ 2	1315	113	0	0	--	121.0	--
	7/ 2	1515	29	0	0	--	120.0	--
	7/ 6	1520	26	0	0	--	105.0	--
	7/ 7	0705	14	0	0	--	102.0	--
	7/ 7	0900	92	0	0	--	102.0	--
	7/ 7	1100	76	0	0	--	108.0	--
	7/ 7	1305	54	0	0	--	110.0	--
	7/ 7	1500	46	0	0	--	110.0	--
	7/13	0910	56	18	82	--	114.0	--
	7/15	0805	140	0	0	--	92.0	--
	7/15	0905	41	0	0	--	91.0	--
	7/15	1105	466	0	0	--	90.0	--
	7/22	1435	71	30	70	--	128.0	--
	7/30	2350	73	42	58	--	139.0	--
	8/15	0905	301	39	61	--	143.0	--
	9/ 4	1240	284	0	0	--	144.0	--
	9/ 8	1205	237	0	0	--	226.0	--

Table 2.--Water discharge and suspended-sediment concentrations and loads, May to September 1987, for station No. 15274560, Campbell Creek near C Street

[ft^3/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day]

	May			June			July			August			September		
		Suspended sediment			Suspended sediment			Suspended sediment			Suspended sediment			Suspended sediment	
Day	Water discharge (ft^3/s)	Mean concen-tration (mg/L)	Load (ton/d)	Water discharge (ft^3/s)	Mean concen-tration (mg/L)	Load (ton/d)	Water discharge (ft^3/s)	Mean concen-tration (mg/L)	Load (ton/d)	Water discharge (ft^3/s)	Mean concen-tration (mg/L)	Load (ton/d)	Water discharge (ft^3/s)	Mean concen-tration (mg/L)	Load (ton/d)
1	24	8	0.5	88	S	12.0	128	25	8.6	102	23	6.3	52	6	0.8
2	25	8	.5	94	44	4.5	115	17	5.3	93	28	7.0	52	6	.8
3	27	9	.7	87	43	4.0	105	9	2.6	84	16	3.6	58	11	1.7
4	29	10	.8	78	63	5.3	100	8	2.2	78	13	2.7	125	S	63.0
5	30	10	.8	80	55	4.8	101	9	2.4	95	30	7.7	120	56	18.0
6	35	12	1.1	92	72	7.2	101	13	3.6	88	16	3.8	102	30	8.3
7	37	11	1.1	95	77	7.9	102	11	3.0	88	18	4.3	126	68	23.0
8	37	12	1.2	100	105	11.0	99	10	2.7	85	20	4.6	193	S	177.0
9	33	9	.8	96	39	4.0	92	9	2.2	80	16	3.5	154	91	38.0
10	37	11	1.1	86	34	3.2	89	8	1.9	78	14	3.0	136	69	25.0
11	35	12	1.1	79	45	3.8	87	7	1.6	73	14	2.8	115	49	15.0
12	36	20	1.9	79	32	2.7	100	S	5.4	73	14	2.8	116	52	16.0
13	38	11	1.1	83	25	2.2	109	14	14.0	83	21	4.7	101	28	7.6
14	38	10	1.0	93	80	8.0	99	11	2.9	84	22	5.0	91	19	4.7
15	48	24	3.1	99	38	4.1	89	10	2.4	96	S	15.0	88	16	3.8
16	50	21	2.8	99	31	3.3	89	14	3.4	84	24	5.4	86	12	2.8
17	49	17	2.2	93	20	2.0	96	16	4.2	77	17	3.5	88	12	2.8
18	52	14	2.0	86	18	1.7	109	24	7.1	73	19	3.7	82	9	2.0
19	45	8	1.0	83	12	2.7	106	22	6.3	69	13	2.4	77	8	1.7
20	47	9	1.1	86	11	2.6	100	19	5.1	66	12	2.1	75	7	1.4
21	57	23	3.5	108	30	8.7	102	21	5.8	64	11	1.9	72	7	1.4
22	54	12	1.8	141	102	39.0	106	S	13.0	59	11	1.8	72	7	1.4
23	49	10	1.3	130	94	33.0	107	24	6.9	58	10	1.6	116	S	58.0
24	66	S	9.1	113	24	7.3	96	18	4.7	57	9	1.4	140	S	62.0
25	57	10	1.5	103	14	3.9	102	24	6.6	55	9	1.3	107	35	10.0
26	53	7	1.0	96	9	2.3	93	17	4.3	55	6	.9	101	17	4.6
27	50	8	1.1	97	19	5.0	91	19	4.7	54	6	.9	96	10	2.6
28	58	14	2.2	98	11	2.9	89	21	5.0	54	6	.9	88	8	1.9
29	53	8	1.1	143	S	39.0	88	16	3.8	56	6	.9	86	8	1.9
30	51	10	1.4	153	71	29.0	104	S	14.0	54	6	.9	83	6	1.3
31	58	12	1.9	--	--	--	117	53	17.0	52	6	.8	--	--	--
Total			52			267			163			107			558

S, Indicates the daily sediment load was computed using the subdivided-day method (time-discharge weighted average) because of rapidly changing flow or sediment concentration

Table 3.--Water discharge and suspended-sediment concentrations and loads, May to September 1987, for station No. 15274606, Campbell Creek below outfall

[ft³/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day]

Day	May Water discharge (ft³/s)	May Suspended sediment Mean concentration (mg/L)	May Suspended sediment Load (ton/d)	June Water discharge (ft³/s)	June Suspended sediment Mean concentration (mg/L)	June Suspended sediment Load (ton/d)	July Water discharge (ft³/s)	July Suspended sediment Mean concentration (mg/L)	July Suspended sediment Load (ton/d)	August Water discharge (ft³/s)	August Suspended sediment Mean concentration (mg/L)	August Suspended sediment Load (ton/d)	September Water discharge (ft³/s)	September Suspended sediment Mean concentration (mg/L)	September Suspended sediment Load (ton/d)
1	24	12	0.8	93	S	12.0	135	45	16.0	107	33	9.5	54	4	0.6
2	25	12	.8	99	72	19.0	121	54	18.0	98	27	7.1	54	6	.9
3	27	12	.9	92	32	7.9	111	24	7.2	88	26	6.2	60	7	1.1
4	29	13	1.0	82	20	4.4	105	24	6.8	82	26	5.8	132	S	60.0
5	31	14	1.2	84	16	3.6	106	17	4.9	100	44	12.0	127	63	22.0
6	36	16	1.6	97	30	7.9	106	25	7.2	93	18	4.5	108	30	8.8
7	38	16	1.6	100	28	7.6	107	S	12.0	93	16	4.0	133	59	21.0
8	38	17	1.7	105	31	8.8	104	38	11.0	89	16	3.8	205	S	171.0
9	34	14	1.3	101	29	7.9	97	20	5.2	84	16	3.6	163	72	32.0
10	38	16	1.6	91	20	4.9	94	17	4.3	82	11	2.4	144	40	16.0
11	36	11	1.1	83	18	4.0	92	20	5.0	77	8	1.7	121	24	7.8
12	37	11	1.1	83	16	3.6	105	S	11.0	77	19	4.0	122	35	12.0
13	39	10	1.0	87	20	4.7	115	19	5.9	87	12	2.8	106	19	5.4
14	39	9	1.0	98	100	26.0	104	18	5.0	88	13	3.1	96	18	4.7
15	50	19	2.6	104	31	8.7	94	S	17.0	101	S	24.0	93	22	5.5
16	52	19	2.7	104	25	7.0	94	16	4.1	88	11	2.6	90	14	3.4
17	51	17	2.3	98	16	4.2	101	14	3.8	81	10	2.2	93	14	3.5
18	54	16	2.3	91	14	3.4	115	23	7.1	77	12	2.5	86	8	1.9
19	47	8	1.0	87	12	2.8	112	13	3.9	72	8	1.6	81	7	1.5
20	49	10	1.3	90	11	2.7	105	13	3.7	69	7	1.3	79	7	1.5
21	59	14	2.2	114	30	9.2	108	18	5.2	67	6	1.1	76	7	1.4
22	56	13	2.0	149	105	42.0	112	S	11.0	62	4	.7	76	7	1.4
23	51	8	1.1	137	92	34.0	113	25	7.6	61	9	1.5	123	S	62.0
24	69	S	27.0	119	32	10.0	101	19	5.2	59	8	1.3	148	S	67.0
25	59	34	5.4	109	21	6.2	108	27	7.9	57	6	.9	113	38	12.0
26	55	12	1.8	101	18	4.9	98	18	4.8	57	6	.9	106	18	5.2
27	52	12	1.7	105	26	7.4	96	25	6.5	56	7	1.1	101	10	2.7
28	61	14	2.3	103	25	7.0	94	23	5.8	56	6	.9	93	7	1.8
29	55	12	1.8	151	S	53.0	93	27	6.8	58	4	.6	90	6	1.5
30	53	9	1.3	162	97	42.0	110	S	17.0	56	5	.8	87	5	1.2
31	61	11	1.8	--	--	--	124	72	24.0	54	4	.6	--	--	--
Total			77			367			261			115			537

S, Indicates the daily sediment load was computed using the subdivided-day method (time-discharge weighted average) because of rapidly changing flow or sediment concentration

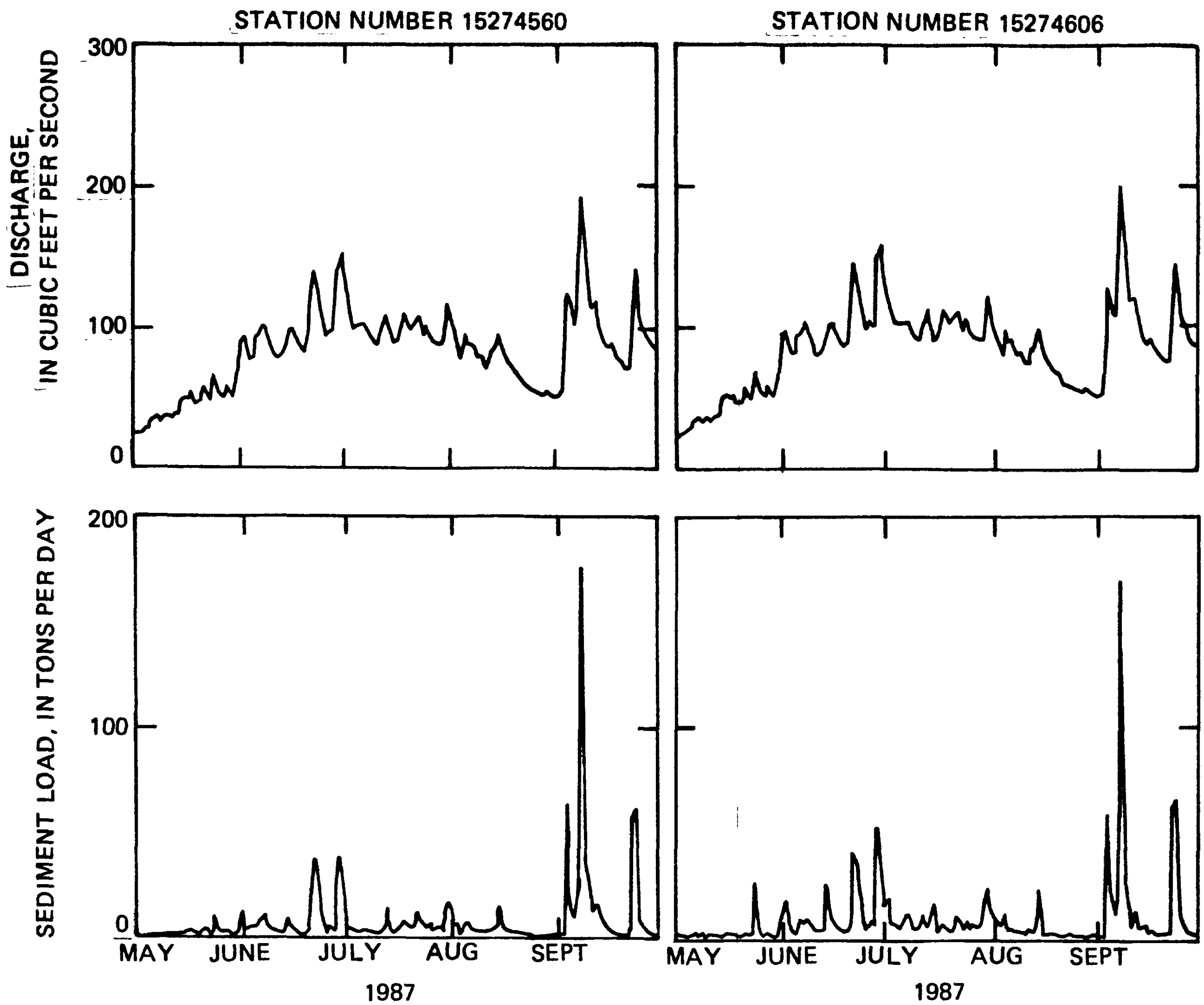

Figure 2.--Mean daily discharge and daily sediment load, May to September 1987, at two sites on lower Campbell Creek.

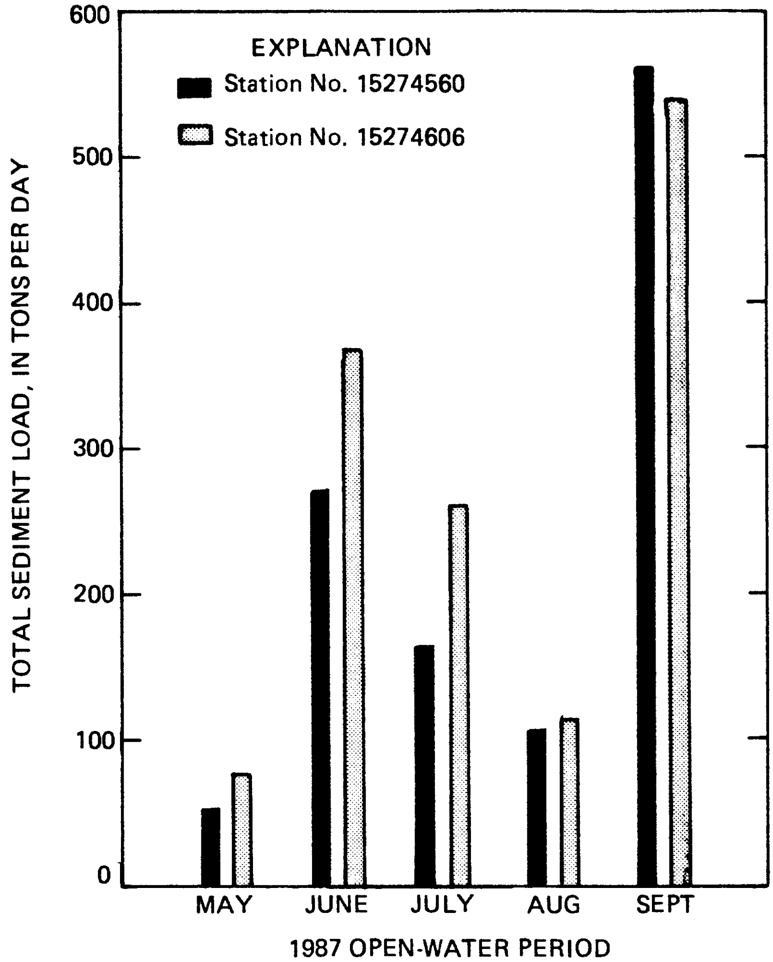

Figure 3.--Total monthly sediment load, May to September 1987, for two sites on lower Campbell Creek.

Table 4 --Bedload discharge and particle-size distribution of samples from lower Campbell Creek, July 1987

[ft^3/s, cubic foot per second; ton/d, ton per day]

Station name and number	Date	Time	Water discharge (ft^3/s)	Bedload discharge (ton/d)	Particle-size distribution Percentage by weight finer than size (mm) indicated									
					0.062	0.125	0.25	0.50	1.0	2.0	4.0	8.0	16.0	32.0
Campbell Creek near Spenard (15274600)	7/6	1600	106	13	0	0	1	17	34	44	55	65	78	100
	7/7	1015	107	10	0	0	2	22	36	48	62	78	96	100
Campbell Creek below outfall (15274606)	7/6	1430	106	6	0	0	2	43	61	75	84	92	100	--
	7/7	0920	107	3	0	3	19	61	75	86	93	96	100	--
	7/15	0830	91	4	0	1	6	57	69	77	85	95	100	--

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APPENDIX

The following table which was originally published in Lipscomb (1987) contained errors. The correct version of the table is reproduced here.

From: SEDIMENT-DISCHARGE DATA FOR THE LOWER REACH OF CAMPBELL CREEK, ANCHORAGE, ALASKA: MAY TO OCTOBER 1986

U.S. Geological Survey Open-File Report 87-101

Table 2.--Water discharge and suspended-sediment loads for station No. 15274600, Campbell Creek near Spenard, May to October 1986

	May		June		July		August		September		October	
Day	Water discharge (ft^3/s)	Sediment load (ton/d)	Water discharge (ft^3/s)	Sediment load (ton/d)	Water discharge (ft^3/s)	Sediment load (ton/d)	Water discharge (ft^3/s)	Sediment load (ton/d)	Water discharge (ft^3/s)	Sediment load (ton/d)	Water discharge (ft^3/s)	Sediment load (ton/d)
1	60.0	6.0	80.0	5.4	82.0	2.8	75.0	0.7	110.0	12.0	119.0	2.9
2	55.0	5.0	74.0	4.0	86.0	3.3	70.0	0.7	110.0	17.0	121.0	4.1
3	45.0	4.0	65.0	2.5	87.0	3.4	67.0	1.0	93.0	4.1	157.0	114.0
4	40.0	3.0	65.0	2.5	80.0	2.3	68.0	1.0	87.0	2.5	170.0	69.0
5	40.0	2.5	62.0	1.8	78.0	1.9	69.0	1.3	82.0	2.0	138.0	20.0
6	38.0	2.5	68.0	3.0	77.0	1.9	70.0	2.0	80.0	1.6	123.0	8.4
7	38.0	2.5	82.0	4.8	76.0	2.6	64.0	1.0	100.0	11.0	125.0	12.0
8	34.0	2.0	100.0	9.7	68.0	5.3	65.0	1.9	109.0	8.6	121.0	5.9
9	32.0	1.9	81.0	2.4	65.0	1.6	59.0	1.4	99.0	6.7	114.0	3.3
10	32.0	1.9	76.0	2.2	61.0	1.5	73.0	2.8	86.0	2.5	198.0	118.0
11	34.0	1.8	74.0	2.2	60.0	1.4	73.0	2.1	82.0	2.0	352.0	328.0
12	39.0	2.3	73.0	2.8	65.0	2.5	101.0	18.0	77.0	1.9	302.0	108.0
13	45.0	2.6	76.0	3.3	82.0	5.6	189.0	130.0	76.0	1.5	253.0	49.0
14	39.0	1.9	87.0	5.9	75.0	2.9	132.0	19.0	73.0	1.4	245.0	40.0
15	35.0	1.9	98.0	9.0	65.0	1.6	123.0	23.0	72.0	1.0	206.0	19.0
16	42.0	2.4	119.0	32.0	71.0	2.1	113.0	12.0	92.0	6.3	192.0	14.0
17	39.0	1.9	129.0	41.0	64.0	1.6	99.0	5.8	99.0	5.8	172.0	10.0
18	37.0	1.8	129.0	24.0	58.0	1.1	96.0	7.5	87.0	3.0	164.0	7.2
19	39.0	1.9	115.0	9.5	57.0	1.1	96.0	4.2	84.0	2.8	165.0	8.8
20	41.0	2.4	109.0	7.9	75.0	24.0	85.0	2.5	181.0	103.0	172.0	9.2
21	44.0	3.2	101.0	4.9	106.0	19.0	81.0	0.8	248.0	68.0	156.0	5.3
22	49.0	3.8	92.0	3.1	82.0	5.2	82.0	1.6	208.0	34.0	145.0	4.9
23	58.0	5.9	86.0	3.3	168.0	151.0	84.0	0.4	207.0	72.0	138.0	4.0
24	59.0	5.7	81.0	2.8	151.0	38.0	127.0	9.2	151.0	15.0	131.0	3.2
25	69.0	10.0	76.0	1.8	113.0	13.0	161.0	13.0	134.0	11.0	120.0	2.3
26	81.0	19.0	70.0	1.4	162.0	29.0	145.0	12.0	123.0	15.0	115.0	2.2
27	69.0	5.0	71.0	1.4	139.0	6.8	124.0	7.4	121.0	6.5	120.0	1.2
28	67.0	4.6	77.0	1.5	108.0	3.5	118.0	5.7	118.0	4.6	119.0	1.2
29	77.0	8.2	79.0	1.9	91.0	2.6	109.0	4.7	113.0	2.2	112.0	1.1
30	91.0	17.0	79.0	2.3	82.0	1.6	100.0	2.9	120.0	5.8	105.0	1.0
31	92.0	15.0	--	--	77.0	1.1	101.0	2.9	--	--	102.0	1.0
Total	1560	150	2574	200	2711	341	3019	298	3414	431	4972	978