SEDIMENT-DATA SOURCES AND ESTIMATED ANNUAL SUSPENDED-SEDIMENT LOADS OF RIVERS AND STREAMS IN COLORADO

By John G. Elliott and Kenneth L. DeFeyter

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 86-4344

Prepared in cooperation with the
COLORADO RIVER WATER CONSERVATION DISTRICT and the
U.S. BUREAU OF RECLAMATION

Denver, Colorado
1986

DEPARTMENT OF THE INTERIOR

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[In pocket]

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CONVERSION FACTORS

The inch-pound units used in this report may be converted to International System of Units (SI) by using the following conversion factors:

Multiply inch-pound unit	*By*	*To obtain metric unit*
acre-foot (acre-ft)	0.001233	cubic hectometer
acre-foot per year (acre-ft/yr)	0.001233	cubic hectometer per year
square mile (mi^2)	2.590	square kilometer
ton (short)	0.9072	metric ton or megagram
ton per year (ton/yr)	0.9072	metric ton or megagram per year

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ABSTRACT

Sources of sediment data collected by several government agencies through water year 1984 are summarized for Colorado. The U.S. Geological Survey has collected suspended-sediment data at 243 sites; these data are stored in the U.S. Geological Survey's water data storage and retrieval system. The U.S. Forest Service has collected suspended-sediment and bedload data at an additional 225 sites, and most of these data are stored in the U.S. Environmental Protection Agency's water-quality-control information system. Additional unpublished sediment data are in the possession of the collecting entities.

Annual suspended-sediment loads were calculated for 133 U.S. Geological Survey surface-water sites using the daily mean water-discharge, sediment-transport curve method. Sediment-transport curves were derived for each site by one of three techniques: (1) Least-squares linear regression of all pairs of suspended-sediment and corresponding water-discharge data, (2) least-squares linear regression of data sets subdivided on the basis of hydrograph season, and (3) graphically fitted to a logarithmic plot of data. The curve-fitting technique used for each site depended on site-specific characteristics. Sediment-data sources and estimates of annual loads of suspended, bed, and total sediment from several other reports also are summarized.

INTRODUCTION

Interaction between the water and sediment of the fluvial system largely controls alluvial-channel hydraulics, bed and bank stability, and stream pattern. The physical properties and volume of sediment transported and deposited by a stream or river affect the ecology of aquatic and riparian habitats, the ability of a channel to transport flood waters, the operation of impoundment and diversion structures, and the quality of water for municipal, agricultural, industrial, and recreational uses. Interpretation of sediment-transport data can be useful when estimating average basin erosion rates, identifying sources of sediment, and characterizing the nature of sediment movement through the fluvial system.

Sediment data have been collected from sites in Colorado by many government agencies and by other organizations. Many of these data are presented in published hydrologic-data reports or in interpretive reports; however, some data are not published by the collecting entities, or they are stored in the entities' computer files. In recent years, there has been no coordinated effort to compile and analyze all these data. As demand for Colorado's water resources continues to increase, more accurate and complete assessments of this valuable resource may be made if all available sediment-data sources are compiled into a single summary.

The objectives of this study were to:

1. Collate available sediment-data sources in Colorado and summarize site location, type of data, and location of data storage; and
2. Assess reliability of sediment data and estimate annual suspended-sediment loads when data are of sufficient quality and abundance.

Purpose and Scope

The purpose of this report is to describe and summarize available sediment-data sources and to provide estimates of annual suspended-sediment loads for selected rivers and streams in Colorado. Sediment data are available for 243 sites monitored by the U.S. Geological Survey, 225 sites monitored by the U.S. Forest Service, and several sites monitored by other Federal agencies. Annual suspended-sediment loads were calculated using daily mean discharge values and sediment-transport curves. These suspended-sediment-load estimates are provided for 133 sediment-data-collection sites. The length of record for annual suspended-sediment-load estimates ranges between 1 and 37 years.

Approach

Sources of sediment data were identified by several means. Summaries of site location, type of data, number of measurements, and name of collecting agency were compiled from retrievals of data from the Master Water Data Index (MWDI), maintained by the National Water Data Exchange (NAWDEX); from the U.S. Geological Survey's Water Data Storage and Retrieval System (WATSTORE); and from the U.S. Environmental Protection Agency's Water-Quality-Control Information System (STORET). Additional information was collected from a review of literature and personal communication with representatives of various government agencies and private organizations.

Annual suspended-sediment loads were estimated for sites at many rivers and streams in Colorado when the instantaneous or daily sediment data were considered reliable and representative of conditions at the site, and when daily mean water discharges were recorded for 1 or more complete years. Sediment data were considered for analysis of annual suspended-sediment load if samples were collected and processed in a manner consistent with standard U.S. Geological Survey procedures. These procedures are discussed in detail in Guy (1970), Guy and Norman (1970), and Porterfield (1972). To be considered representative of conditions at a site, sediment data needs to be available for a full range of streamflow conditions, especially during high flows.

The method for estimating annual suspended-sediment loads used 1 or more years of daily water-discharge measurements and a site-specific sediment-transport curve. A sediment-transport curve expresses the relation between instantaneous sediment discharge and corresponding instantaneous water discharge, or between daily sediment discharge and corresponding daily mean water discharge. Once this relation has been established, it can be applied to other water-discharge values to estimate sediment discharges, as long as conditions that affect the sediment versus water-discharge relation remain unchanged. Daily suspended-sediment discharges at a site were estimated with

the historical daily mean water-discharge record and the sediment-transport curve. Daily suspended-sediment discharges were summed to determine estimates of annual suspended-sediment loads. Annual suspended-sediment loads were averaged to provide estimates of mean annual suspended-sediment loads.

Acknowledgments

The authors wish to thank Michael R. Karlinger and Brent M. Troutman for their discussions on methods of sediment-transport-curve estimation, and William F. Curtis who corresponded with, and compiled data from, many of the Federal agencies cited in this report. Computer graphics software used to map the location of sediment-data sites were developed by Timothy D. Liebermann and William C. Blattner.

SEDIMENT-DATA SOURCES

Sediment data have been collected by several Federal and State agencies at numerous surface-water sites in Colorado. Each agency publishes or maintains a unique data base or filing system. Thus, a comprehensive summary of available sediment data necessitated a review of several sources.

U.S. Geological Survey Sediment Data

Sediment characteristics have been monitored at 243 sediment-data-collection sites in Colorado by the U.S. Geological Survey. Instantaneous sediment data collected periodically at 239 sites are stored in the WATSTORE Quality of Water (QW) file (U.S. Geological Survey, 1983). These data include suspended-sediment concentration, suspended-sediment discharge, water discharge, and occasionally suspended-sediment- or bed-material-size distributions. Daily mean suspended-sediment concentrations and suspended-sediment discharges from 73 sites are stored in the WATSTORE Daily Values (DV) file. Daily mean water-discharge data also are stored in the DV file. Both files contain data from active and discontinued sites, and their contents are updated periodically. All data stored in WATSTORE are available to the public from the U.S. Geological Survey.

U.S. Geological Survey sediment-data-collection sites are listed in table 1, which lists the site number, station identification number and name, latitude and longitude, number of measurements of variables stored in the QW or DV files, and period of record for sediment-data collection. Size distributions of suspended sediment and bed material are available for many U.S. Geological Survey sites, although these variables are not summarized in table 1. When collected, bedload data commonly are published in U.S. Geological Survey reports.

Other Sources of Sediment Data

Suspended-sediment concentration, suspended-sediment discharge, bedload, and streamflow data also have been collected periodically by other government agencies and organizations, including the U.S. Forest Service, the U.S. Bureau of Reclamation, the National Park Service, the U.S. Soil Conservation Service,

Table 1.--*U.S. Geological Survey sediment-data-collection sites*

[Latitude and longitude in degrees, minutes, seconds; number of measurements in the WATSTORE Water Quality (QW) and Daily Values (DV) files through water year 1984; C_{ss}, suspended-sediment concentration; Q_{ss}, suspended-sediment discharge; WY, water years; dashes, no available data]

Site number	Station identification number	Station name	Latitude	Longitude	QW File		DV File		Period of sediment record (WY)
					C_{ss}	Q_{ss}	C_{ss}	Q_{ss}	
		NORTH PLATTE RIVER BASIN							
1	06611100	Grizzly Creek near Spicer	402936	1062657	20	20	--	--	1977-80
2	06611200	Buffalo Creek near Hebron	403123	1062207	23	23	--	--	1977-80
3	06611300	Grizzly Creek near Hebron	403327	1062322	23	22	--	--	1977-80
4	06611800	Little Grizzly Creek above Coalmont	403424	1063034	22	22	--	--	1977-80
5	06611900	Little Grizzly Creek above Hebron	403757	1062658	23	23	--	--	1977-80
6	06619400	Canadian River near Lindland	404143	1060356	75	75	1,013	1,504	1978-83
7	06619420	Williams Draw near Walden	404417	1060649	3	3	--	--	1979-80
8	06619450	Canadian River near Brownlee	402829	1061409	93	93	1,076	1,565	1978-83
9	06620000	North Platte River near Northgate	405610	1062021	34	34	--	--	1972-75
10	402918106125600	Willow Creek below Rand	402918	1061256	2	2	--	--	1976
11	402953105581000	Michigan River below Seven Utes Mountain near Gould	402953	1055810	1	1	--	--	1976
12	403425106311500	Little Grizzly Creek above Chedsey Creek	403425	1063115	2	2	--	--	1976
13	403647106050400	Michigan River below Gould	403647	1060504	2	2	--	--	1976
14	403657106165000	Illinois River near Rand	403657	1061650	2	2	--	--	1976
15	403832106250600	North Platte River below Grizzly Creek near Hebron	403832	1062506	1	1	--	--	1976
16	404143106035700	Canadian River above Muddy Creek	404143	1060357	2	2	--	--	1976
17	404335106172300	Illinois River near Walden	404335	1061723	2	2	--	--	1976
18	405447106172600	Pinkham Creek near Northgate	405447	1061726	2	2	--	--	1976
19	405750106340600	South Fork Big Creek near Pearl	405750	1063406	2	2	--	--	1976
		SOUTH PLATTE RIVER BASIN							
20	06696000	South Platte River near Lake George	385419	1052822	1	1	--	--	1983
21	06698500	Tarryall Creek near Jefferson	391742	1054305	16	16	--	--	1978-80
22	06707000	North Fork South Platte River at South Platte	392432	1051031	69	69	--	--	1964-67
23	06707500	South Platte River at South Platte	392433	1051010	42	42	--	--	1961-65
24	06710000	South Platte River at Littleton	393708	1050107	41	40	--	--	1979-84

Table 1.--*U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	QW File C_{ss}	QW File Q_{ss}	DV File C_{ss}	DV File Q_{ss}	Period of sediment record (WY)
		SOUTH PLATTE RIVER BASIN--Continued							
25	06711635	North Avenue Storm Drain at Denver Federal Center	394321	1050747	12	--	--	--	1977
26	06714100	36th Street Storm Sewer at Denver	394623	1045846	25	20	--	--	1976
27	06719505	Clear Creek at Golden	394511	1051405	4	4	177	177	1981
28	06719725	Ralston Creek near Plainview	395104	1051753	218	179	--	--	1983-84
29	06719730	Schwartzwalder Mine Effluent near Plainview	395048	1051653	214	159	--	--	1983-84
30	06719735	Ralston Creek below Schwartzwalder Mine near Plainview	395037	1051633	224	209	--	--	1983-84
31	06719740	Ralston Creek above Ralston Reservoir, near Plainview	394917	1051540	219	192	--	--	1983-84
32	06720330	Grange Hall Creek at Grant Park, at Northglenn	395317	1045855	27	20	--	--	1978-79
33	06720415	Grange Hall Creek at Northglenn	395321	1045740	35	35	--	--	1978-79
34	06724000	Saint Vrain Creek at Lyons	401305	1051534	81	80	--	--	1966-79
35	06724500	Left Hand Creek near Boulder	400732	1051812	8	8	--	--	1979
36	06725000	Left Hand Creek at mouth, at Longmont	400850	1050605	29	29	--	--	1977-79
37	06725450	Saint Vrain Creek below Longmont	400929	1050053	34	33	--	--	1977-79
38	06733000	Big Thompson River at Estes Park	402242	1053048	27	27	--	--	1953
39	06752000	Cache La Poudre River at mouth of Canyon near Fort Collins	403952	1051326	32	32	--	--	1962-65
40	06754000	South Platte River near Kersey	402444	1043346	87	87	--	--	1962-67
41	06758000	Kiowa Creek at Elbert	391235	1043200	11	11	398	978	1957-65
42	06758100	West Kiowa Creek at Elbert	391238	1043216	11	11	86	975	1963-65
43	06758200	Kiowa Creek at Kiowa	392014	1042830	24	24	379	3,009	1956-65
44	06758500	South Platte River near Weldona	401919	1035517	151	151	1,118	1,364	1952-84
45	06764000	South Platte River at Julesburg	405846	1021515	94	86	--	--	1974-84
46	06822000	North Fork Republican River near Wray	400424	1021706	6	6	347	365	1963-64

Table 1.--*U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	QW File C_{ss}	QW File Q_{ss}	DV File C_{ss}	DV File Q_{ss}	Period of sediment record (WY)
		ARKANSAS RIVER BASIN							
47	07083000	Halfmoon Creek near Malta	391020	1062319	94	94	--	--	1968-84
48	07093740	Badger Creek, Upper Station, near Howard	383925	1054845	34	34	296	607	1981-84
49	07093775	Badger Creek, Lower Station, near Howard	385759	1055106	39	39	340	482	1981-84
50	07094500	Arkansas River at Parkdale	382914	1052223	38	38	--	--	1968-69
51	07096000	Arkansas River at Canon City	382602	1051524	128	114	--	--	1971-77
52	07097000	Arkansas River at Portland	382318	1050056	109	108	--	--	1976-84
53	07099200	Arkansas River near Portland	382014	1045618	311	281	--	--	1965-79
54	07099400	Arkansas River above Pueblo	381617	1044306	96	96	--	--	1966-69
55	07099500	Arkansas River near Pueblo	381602	1043926	23	23	--	--	1965
56	07118500	Apishapa River at Aguilar	372401	1043829	13	13	119	443	1979-81
57	07124000	Arkansas River at Las Animas	380451	1031309	6	6	--	--	1976
58	07124050	Middle Fork Purgatoire River at Stonewall	370910	1050045	25	25	81	325	1979-81
59	07124100	Molino Canyon near Weston	370756	1044824	8	8	78	122	1979-81
60	07124120	Sarcillo Canyon near Segundo	370726	1044549	14	14	8	366	1979-81
61	07124200	Purgatoire River at Madrid	370746	1043820	33	33	609	1,094	1978-81
62	07124210	Mulligan Canyon near Boncarbo	371237	1043937	1	1	17	188	1979-81
63	07124220	Reilly Canyon at Cokedale	370843	1043707	14	14	53	335	1979-81
64	07124350	Carpios Canyon near Jansen	370913	1043411	5	5	31	234	1979-81
65	07124410	Purgatoire River below Trinidad Lake	370837	1043249	33	32	1,842	2,350	1977-84
66	07126300	Purgatoire River near Thatcher	372130	1035344	32	32	--	--	1983-84
67	07126485	Purgatoire River at Rock Crossing near Timpas	373703	1033547	24	22	--	--	1983-84
68	07128500	Purgatoire River near Las Animas	380202	1031200	1	1	--	--	1976
69	07130500	Arkansas River below John Martin Reservoir	380502	1025510	13	13	--	--	1976
		RIO GRANDE BASIN							
70	08224110	San Luis Creek near Poncha Pass	382422	1060349	21	21	323	393	1981-83
71	08224113	San Luis Creek above Villa Grove	382404	1060351	18	17	277	428	1981-83
72	08251500	Rio Grande near Lobatos	370442	1054522	86	85	--	--	1975-84

Table 1.--*U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	QW File C_{ss}	QW File Q_{ss}	DV File C_{ss}	DV File Q_{ss}	Period of sediment record (WY)
		UPPER COLORADO RIVER BASIN							
73	09019500	Colorado River near Granby	400715	1055400	2	2	--	--	1976
74	09024000	Fraser River near Winter Park	395400	1054634	2	2	--	--	1976
75	09040000	East Fork Troublesome Creek near Troublesome	400927	1061658	2	2	--	--	1976
76	09041200	Red Dirt Creek near Kremmling	400941	1063332	1	1	--	--	1976
77	09047500	Snake River near Montezuma	393620	1055633	2	2	--	--	1976
78	09049200	West Tenmile Creek at Copper Mountain	393001	1060956	1	-	1,583	2,191	1974-79
79	09057500	Blue River below Green Mountain Reservoir	395249	1062000	1	1	--	--	1976
80	09058000	Colorado River near Kremmling	400212	1062622	1	1	--	--	1976
81	09060500	Rock Creek near Toponas	400228	1063919	1	1	--	--	1976
82	09066050	Black Gore Creek near Vail	393724	1061647	--	--	--	2,191	1974-79
83	09066250	Gore Creek at Vail	393835	1062044	--	--	--	2,191	1974-79
84	09069000	Eagle River at Gypsum	393900	1065706	--	--	--	6	1959
85	09070000	Eagle River below Gypsum	393858	1065711	40	40	--	--	1960-65
86	09070500	Colorado River near Dotsero	393840	1070440	36	36	6	6	1959-65
87	09072500	Colorado River at Glenwood Springs	393300	1071913	39	39	8	8	1959-65
88	09081600	Crystal River above Avalanche Creek near Redstone	391356	1071336	1	1	--	--	1976
89	09082800	North Thompson Creek near Carbondale	391947	1071958	1	1	--	--	1976
90	09085000	Roaring Fork River at Glenwood Springs	393237	1071944	39	39	8	8	1959-65
91	09092830	Northwater Creek near Anvil Points	393713	1080044	8	6	--	--	1978-80
92	09092850	East Middle Fork Parachute Creek near Rio Blanco	393715	1080146	6	6	492	1,665	1977-82
93	09092970	East Fork Parachute Creek near Rulison	393403	1080114	40	40	295	600	1978-83
94	09093000	Parachute Creek near Parachute	393401	1080637	57	54	365	183	1975-81
95	09093500	Parachute Creek at Parachute	392711	1080333	32	14	2,325	2,560	1975-82
96	09093700	Colorado River near De Beque	392145	1080907	54	54	731	731	1974-82
97	09095000	Roan Creek near De Beque	392712	1081859	9	9	1,588	2,165	1975-81
98	09095400	Dry Fork near De Beque	392208	1081541	20	20	--	--	1980-82
99	09095500	Colorado River near Cameo	391420	1081600	90	90	--	--	1983-84

Table 1.--*U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	QW File C_{ss}	QW File Q_{ss}	DV File C_{ss}	DV File Q_{ss}	Period of sediment record (WY)
		GUNNISON RIVER BASIN							
100	09129800	Clear Fork near Ragged Mountain	390836	1072550	10	10	--	--	1982-83
101	09131100	Cow Creek near Paonia	390615	1073502	11	11	--	--	1982-83
102	09132050	Anthracite Creek near Somerset	385714	1071623	39	39	--	--	1978-81
103	09132500	North Fork Gunnison River near Somerset	385545	1072653	38	38	--	--	1979-82
104	09147000	Dallas Creek near Ridgway	381040	1074528	1	--	--	--	1980
105	09149400	Spring Creek near Beaver Hill	383126	1075814	22	22	--	--	1978-81
106	09149420	Spring Creek near Montrose	383126	1075815	40	40	--	--	1978-81
107	09149500	Uncompahgre River at Delta	384431	1080449	40	40	8	8	1959-65
108	09152500	Gunnison River near Grand Junction	385900	1082700	141	134	14	14	1959-84
109	385033107190300	Upper Coal Creek near Somerset	385033	1071903	6	6	--	--	1982-83
110	385037107190300	Cliff Creek near Somerset	385037	1071903	7	6	--	--	1982-83
111	385146107094700	Ruby Anthracite Creek near Kebler Pass	385146	1070947	9	9	--	--	1982-83
112	385308107345100	North Fork Gunnison River above Paonia	385308	1073451	13	12	--	--	1982-83
113	385414107334000	Terror Creek near Paonia	385414	1073340	11	10	--	--	1982-83
114	385506107161400	Grouse Spring Creek near Marcellina	385506	1071614	11	9	--	--	1982-83
115	385532107310400	Lower Hubbard Creek near Bowie	385532	1073104	12	11	--	--	1982-83
116	385534107201900	Lower Coal Creek near Somerset	385534	1072019	9	8	--	--	1982-83
117	385538107202400	Lower Anthracite Creek near Somerset	385538	1072024	12	12	--	--	1982-83
118	385626107212000	Muddy Creek below Paonia Reservoir	385626	1072120	9	9	--	--	1982-83
119	385712107162600	Upper Anthracite Creek near Somerset	385712	1071626	8	8	--	--	1982-83
120	385741107315100	Upper Hubbard Creek near Bowie	385741	1073151	11	11	--	--	1982-83
121	385903107210800	Muddy Creek above Paonia Reservoir	385903	1072108	10	10	--	--	1982-83
122	390000107212700	Lower West Muddy Creek near Paonia Reservoir	390000	1072127	11	11	--	--	1982-83
123	390620107241900	East Muddy Creek near Ragged Mountain	390620	1072419	11	11	--	--	1982-83
124	390658107312500	West Muddy Creek near West Muddy Creek Ranger Station	390658	1073125	13	13	--	--	1982-83

Table 1.--*U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	QW File C_{ss}	QW File Q_{ss}	DV File C_{ss}	DV File Q_{ss}	Period of sediment record (WY)
		COLORADO RIVER BASIN BELOW GUNNISON RIVER							
125	09153330	West Salt Creek near Carbonera	392347	1085851	20	20	--	--	1981
126	09153400	West Salt Creek near Mack	391831	1085859	2	2	--	--	1981
127	09160500	Badger Wash Observation Reservoir 12 near Mack	391924	1085548	39	39	--	--	1981-82
128	09163500	Colorado River near Colorado-Utah State line	390745	1090136	78	75	--	--	1976-84
129	09168800	Big Gypsum Creek near Slick Rock	380649	1085129	1	1	--	--	1981
130	09173000	Beaver Creek near Norwood	375812	1081142	41	41	--	--	1978-81
131	09175000	West Naturita Creek near Norwood	375833	1081938	38	38	--	--	1978-81
132	09175500	San Miguel River at Naturita	381304	1083357	40	40	--	--	1978-81
133	09179200	Salt Creek near Gateway	383159	1085813	15	15	--	--	1982-84
		YAMPA AND GREEN RIVER BASINS							
134	09235450	Vermillion Creek at Ink Springs Ranch	404543	1084333	27	25	--	--	1978-81
135	09238000	Oak Creek near Oak Creek	401438	1070053	1	1	--	--	1976
136	09238500	Walton Creek near Steamboat Springs	402429	1064711	8	8	--	--	1983-84
137	09238900	Fish Creek at Upper Station near Steamboat	402830	1064711	9	9	--	--	1983-84
138	09239000	Fish Creek near Steamboat Springs	402755	1064915	4	3	--	--	1976
139	09239500	Yampa River at Steamboat Springs	402901	1064954	10	10	--	--	1975-76
140	09241000	Elk River at Clark	404303	1065455	8	8	--	--	1975-77
141	09242000	Mad Creek near Steamboat Springs	403356	1065319	4	4	--	--	1976
142	09242500	Elk River near Trull	403053	1065712	5	5	--	--	1975-76
143	09243500	Trout Creek at Pinnacle	401545	1070400	16	16	--	--	1910-11
144	09243700	Middle Creek near Oak Creek	402308	1065933	62	61	--	--	1976-84
145	09243800	Foidel Creek near Oak Creek	402045	1070504	48	48	--	--	1976-83
146	09243900	Foidel Creek at mouth, near Oak Creek	402325	1065939	101	102	355	1,016	1976-84
147	09244100	Fish Creek near Milner	402003	1070819	3	3	--	--	1982
148	09244300	Grassy Creek near Mount Harris	402649	1070842	10	3	--	--	1976-82

Table 1.--*U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	QW File C_{ss}	QW File Q_{ss}	DV File C_{ss}	DV File Q_{ss}	Period of sediment record (WY)
		YAMPA AND GREEN RIVER BASINS--Continued							
149	09244410	Yampa River below Diversion, near Hayden	402918	1070933	87	85	--	--	1975-82
150	09244415	Sage Creek above Sage Creek Reservoir, near Hayden	402301	1071134	29	29	--	--	1981-83
151	09244460	Watering Trough Gulch near Hayden	402257	1071649	23	22	--	--	1978-81
152	09244464	Hubberson Gulch near Hayden	402328	1071615	34	30	--	--	1979-82
153	09244470	Stokes Gulch near Hayden	402806	1071447	47	47	173	320	1978-82
154	09245000	Elkhead Creek near Elkhead	404011	1071704	6	6	--	--	1975-77
155	09245500	North Fork Elkhead Creek near Elkhead	404050	1071712	3	2	--	--	1976
156	09246500	Elkhead Creek near Craig	403152	1072608	4	4	--	--	1976
157	09246550	Yampa River below Elkhead Creek near Craig	402950	1073034	6	4	--	--	1975-78
158	09247500	Yampa River at Craig	402945	1073310	5	2	--	--	1975-761
159	09247600	Yampa River below Craig	402851	1073649	37	32	--	--	1975-80
160	09249200	South Fork of Williams Fork near Pagoda	401244	1072632	4	4	--	--	1976-77
161	09249750	Williams Fork at mouth, near Hamilton	402614	1073850	46	40	--	--	1975-80
162	09250000	Milk Creek near Thornburgh	401137	1074357	4	4	--	--	1981-82
163	09250400	Good Spring Creek at Axial	401725	1074722	80	80	--	--	1976-78
164	09250507	Wilson Creek above Taylor Creek, near Axial	401853	1074758	9	8	361	365	1981-82
165	09250510	Taylor Creek at mouth, near Axial	401848	1074757	52	52	--	--	1975-81
166	09250600	Wilson Creek near Axial	401856	1074750	307	306	1,434	1,679	1975-81
167	09250610	Jubb Creek near Axial	401845	1074918	67	66	--	--	1976-81
168	09250700	Morgan Gulch near Axial	402009	1075306	11	10	--	--	1981-82
169	09251000	Yampa River near Maybell	403010	1080145	191	176	4,394	5,295	1951-84
170	09253000	Little Snake River near Slater	405958	1070834	6	6	--	--	1975-78
171	09255000	Slater Fork near Slater	405857	1072256	7	7	--	--	1975-78
172	09258000	Willow Creek near Dixon	405456	1073116	5	5	--	--	1975-76
173	09260000	Little Snake River near Lily	403250	1082525	535	528	1,051	1,560	1958-84
174	09260050	Yampa River at Deerlodge Park	402702	1083120	59	59	--	--	1982-83
175	09260150	Yampa River below Box Elder Park near Dinosaur	403108	1085738	19	19	--	--	1982

Table 1.--*U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	QW File C_{ss}	QW File Q_{ss}	DV File C_{ss}	DV File Q_{ss}	Period of sediment record (WY)
		WHITE RIVER BASIN							
176	09302450	Lost Creek near Buford	400301	1072806	2	2	--	--	1975-84
177	09302500	Marvine Creek near Buford	400218	1072915	2	2	--	--	1975-84
178	09303000	North Fork White River at Buford	395915	1073650	37	37	--	--	1975-84
179	09303300	South Fork White River at Budges Resort	395036	1072003	2	2	--	--	1983-84
180	09303500	South Fork White River near Buford	395518	1073304	6	6	--	--	1975-84
181	09304000	South Fork White River at Buford	395828	1073729	33	33	--	--	1975-81
182	09304200	White River above Coal Creek, near Meeker	400018	1074929	35	35	--	--	1975-82
183	09304500	White River near Meeker	400201	1075142	2	2	--	--	1975
184	09304800	White River below Meeker	400048	1080533	115	115	--	--	1975-84
185	09306007	Piceance Creek below Rio Blanco	394934	1081057	357	357	2,657	4,176	1974-84
186	09306015	Middle Fork Stewart Gulch near Rio Blanco	394720	1081023	5	9	3	7	1976
187	09306022	Stewart Gulch above West Fork near Rio Blanco	394909	1081108	33	32	1,991	2,915	1975-84
188	09306025	West Fork Stewart Gulch near Rio Blanco	394701	1081121	45	45	224	577	1974-76
189	09306028	West Fork Stewart Gulch at mouth, near Rio Blanco	394845	1081100	24	37	14	77	1975-81
190	09306033	Sorghum Gulch near Rio Blanco	394707	1081233	23	31	16	24	1975-80
191	09306036	Sorghum Gulch at mouth, near Rio Blanco	394930	1081155	6	6	8	236	1975-83
192	09306039	Cottonwood Gulch near Rio Blanco	394936	1081225	12	17	65	101	1975-84
193	09306042	Piceance Creek Tributary near Rio Blanco	395001	1081312	112	109	333	747	1976-84
194	09306045	Piceance Creek below Gardenhire Gulch near Rio Blanco	395008	1081314	4	4	--	--	1981
195	09306050	Scandard Gulch near Rio Blanco	394738	1081340	10	15	3	10	1975-76
196	09306052	Scandard Gulch at mouth, near Rio Blanco	394851	1081435	26	32	19	39	1975-83
197	09306058	Willow Creek near Rio Blanco	395014	1081437	329	329	1,895	2,921	1974-84
198	09306061	Piceance Creek above Hunter Creek, near Rio Blanco	395102	1081531	429	425	2,395	3,676	1974-84
199	09306175	Black Sulphur Creek near Rio Blanco	395216	1081718	260	260	1,557	2,192	1975-83
200	09306200	Piceance Creek below Ryan Gulch, near Rio Blanco	395516	1081749	334	334	2,926	4,017	1973-84

Table 1.--*U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	QW File C_{ss}	QW File Q_{ss}	DV File C_{ss}	DV File Q_{ss}	Period of sediment record (WY)
		WHITE RIVER BASIN--Continued							
201	09306202	Horse Draw near Rangely	395559	1081859	1	1	1	2	1980
202	09306203	Horse Draw at mouth, near Rangely	395612	1081753	2	2	3	13	1980-82
203	09306222	Piceance Creek at White River	400516	1081435	275	271	2,490	3,382	1972-84
204	09306224	White River above Crooked Wash near White River City	400932	1082034	8	8	--	--	1983-84
205	09306230	Stake Springs Draw near Rangely	395537	1082514	3	14	2	13	1976-77
206	09306235	Corral Gulch, below Water Gulch near Rangely	395422	1083156	231	231	882	2454	1974-84
207	09306237	Dry Fork near Rangely	395520	1083155	6	6	11	48	1975-82
208	09306240	Box Elder Gulch near Rangely	395318	1083140	95	95	316	961	1974-84
209	09306241	Box Elder Gulch Tributary near Rangely	395450	1082905	25	23	10	45	1975-82
210	09306242	Corral Gulch near Rangely	395513	1082820	415	415	2,572	3,653	1974-84
211	09306244	Corral Gulch at 84 Ranch	395602	1082535	75	75	270	628	1975-77
212	09306246	Yellow Creek Tributary near 84 Ranch	395802	1082315	8	16	3	11	1976
213	09306248	Duck Creek at Upper Station near 84 Ranch	395855	1082710	5	11	3	9	1976
214	09306250	Duck Creek near 84 Ranch	395849	1082427	3	3	--	--	1975-76
215	09306255	Yellow Creek near White River	401007	1082402	423	423	2,196	3,059	1974-82
216	09306290	White River below Boise Creek, near Rangely	401047	1083353	75	75	--	--	1983-84
217	09306300	White River above Rangely	400626	1084244	265	262	--	--	1972-83
218	09306395	White River near Colorado-Utah State line	400050	1090448	68	68	--	--	1977-82
		SAN JUAN RIVER BASIN							
219	09341200	Wolf Creek near Pagosa Springs	372647	1065300	42	42	--	--	1971-75
220	09343000	Rio Blanco near Pagosa Springs	371246	1064738	48	43	14	14	1963-75
221	09343300	Rio Blanco below Diversion Dam, near Pagosa Springs	371211	1064845	67	58	--	--	1972-75
222	09343400	Rio Blanco at U.S. Highway 84, near Pagosa Springs	370830	1065024	37	32	--	--	1972-75
223	09343600	Rio Blanco at mouth, near Trujillo	370724	1070235	5	--	--	--	1972
224	09344000	Navajo River at Banded Peak Ranch, near Chromo	370507	1064120	1	1	--	--	1974
225	09344300	Navajo River above Chromo	370155	1064356	39	35	14	14	1962-75
226	09344400	Navajo River below Oso Diversion Dam, near Chromo	370148	1064416	33	27	--	--	1972-75
227	09345250	Little Navajo River below Little Oso Diversion	370426	1064904	7	7	--	--	1974-75
228	09345500	Little Navajo River at Chromo	370244	1065033	1	1	--	--	1974

Table 1.--*U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	QW File C_{ss}	QW File Q_{ss}	DV File C_{ss}	DV File Q_{ss}	Period of sediment record (WY)
		SAN JUAN RIVER BASIN--Continued							
229	09346000	Navajo River at Edith	370010	1065425	40	40	--	--	1971-75
230	09346300	Navajo River at mouth, near Juanita	370126	1070756	5	-	--	--	1972
231	09346400	San Juan River near Carracas	370049	1071842	16	17	--	--	1973
232	09347200	Middle Fork Piedra River near Pagosa Springs	372912	1070946	40	40	--	--	1971-75
233	09349800	Piedra River near Arboles	370518	1072350	14	14	--	--	1971-73
234	09352900	Vallecito Creek near Bayfield	372839	1073235	179	177	--	--	1964-83
235	09354500	Los Pinos River at La Boca	370034	1073556	17	17	--	--	1971-73
236	09357500	Animas River at Howardsville	374959	1073556	36	36	--	--	1972-75
237	09358900	Mineral Creek above Silverton	375104	1074331	41	41	--	--	1971-75
238	09363500	Animas River near Cedar Hill	370217	1075225	17	17	--	--	1971-73
239	09366500	La Plata River at Colorado-New Mexico State line	365959	1081117	41	41	--	--	1978-81
240	09371000	Mancos River near Towaoc	370139	1084427	--	--	--	151	1951-84
241	09371010	San Juan River at 4 Corners	370020	1090200	67	67	--	--	1978-81
242	09372000	McElmo Creek near Colorado-Utah State line	371927	1090054	40	40	--	--	1978-81
243	374126106490410	Little Navajo River below Little Oso Diversion Dam	370426	1064904	3	3	--	--	1973

the U.S. Army Corps of Engineers, and the Office of Surface Mining. Most of the U.S. Forest Service data are stored in STORET (table 2), however, data from several recent years have not been entered into the STORET system, and the data remain in the possession of various local U.S. Forest Service offices. Office of Surface Mining data are contained in unpublished, individual mine plan proposals, currently filed at their Denver Technical Center office. Most U.S. Bureau of Reclamation and U.S. Army Corps of Engineers data also are unpublished. U.S. Bureau of Reclamation data may be acquired from their Denver (Platte River basin) and Grand Junction (Colorado River basin) offices. U.S. Army Corps of Engineers data may be acquired from their Omaha (Platte River basin) and Albuquerque (Arkansas River basin) District offices. State agencies, organizations, and municipalities that have collected sediment data include: the University of Colorado, the Colorado River Water Conservation District, the city of Longmont, and the city of Louisville. Many of these data are unpublished, are not stored in a machine-readable format, and must be obtained directly from the collecting agency or organization (Hren, and others, 1985). The location of sediment-data-collection sites where sediment data are readily accessible are shown on plate 1.

ESTIMATION OF ANNUAL SUSPENDED-SEDIMENT LOADS

Annual total-sediment load is the quantity of all sediment, expressed in tons per year, transported through a reach of river or stream. Annual total-sediment load is composed of bedload, the material moving along or just above the bed surface, and suspended load, the material suspended in water by turbulent forces. The percentage of total-sediment load transported in suspension varies from stream to stream, and varies temporally and spatially within a stream. Uncertainty exists concerning the percentage of total-sediment load transported in suspension because the computation of bedload discharge generally is inexact.

Annual suspended-sediment load is the yearly sum of daily suspended-sediment discharges. Daily suspended-sediment discharge is computed by multiplying suspended-sediment concentration by water discharge, and by a conversion factor (Porterfield, 1972). Estimates of bedload discharge can be made from empirical formulas (Vanoni, 1977, p. 190-214), or from extrapolation of the quantity of material collected in a bedload trap, such as the Helley-Smith bedload sampler (Hubbell, 1964; Emmett, 1980). Detailed data necessary to compute bedload discharge have been collected at relatively few sites in Colorado, and, therefore, only annual suspended-sediment-load estimates were made by the authors. Estimates of suspended-sediment load, bedload, and total-sediment load made by other authors are included in a later section of this report.

The simplest way of determining annual suspended-sediment load is by summing measured daily sediment discharges for a given year. However, very few sediment-data-collection sites in Colorado have 1 or more complete years of daily sediment-discharge data. For many sediment-data-collection sites that have some measured sediment-discharge data and a long period of daily mean water-discharge data, mean annual suspended-sediment loads may be estimated using one of two techniques. Both techniques involve use of a sediment-transport curve, which expresses the relation between sediment discharge and water discharge.

Table 2.--*Sediment-data-collection sites operated by other Federal agencies*

[Latitude and longitude in degrees, minutes, seconds; number of measurements in the STORET data files for the following parameters: Q_b, bedload discharge; C_{ss}, suspended-sediment concentration; and Q_{ss}, suspended-sediment discharge. WY, water years; FS, U.S. Forest Service; BR, U.S. Bureau of Reclamation; NPS, National Park Service; s, STORET; h, hard copy with agency; dashes, no available data; ***, no station identification number]

Site number	Station identification number	Station name	Latitude	Longitude	Q_b	C_{ss}	Q_{ss}	Agency code	Storage code	Period of sediment record (WY)
			ARCHULETA COUNTY							
244	FS0213050800001	Rio Blanco near Trujillo	370738	1070212	--	15	6	FS	s	1978-81
245	FS0213070800007	San Juan River at Pagosa Springs	371558	1070037	--	13	4	FS	s	1978-80
246	FS0213090800008	East Fork San Juan River near Pagosa Springs	372210	1065330	--	15	4	FS	s	1978-80
247	FS0213150600010	Piedra River near Arboles	370517	1072352	--	16	6	FS	s	1978-81
			CHAFFEE COUNTY							
248	127103	Middle Cottonwood Creek	384700	1061500	7	11	2	FS	s	1976-80
249	FS0212071000004	North Cottonwood Creek	385200	1061400	6	11	2	FS	s	1976-80
			CLEAR CREEK COUNTY							
250	***	Mad Creek #1	394720	1054244	10	20	20	FS	h	1983-84
251	***	Mad Creek #2	394636	1054229	13	7	7	FS	h	1983-84
252	***	Mad Creek #3	394640	1054256	17	18	18	FS	h	1983-84
253	***	Mad Creek #4	394553	1054200	18	19	19	FS	h	1983-84
254	FS0210037020101	Chicago Creek above Treatment Plant I-1	394300	1053430	10	--	10	FS	s	1979
255	FS0210037020201	South Fork Chicago Creek I-5	393940	1053810	5	--	13	FS	s	1979
256	FS0210037020202	Chicago Creek below Reservoir I-2	393840	1053650	--	--	12	FS	s	1979
257	FS0210037020203	Chicago Creek above Reservoir I-3	393820	1053700	6	--	11	FS	s	1979-80
258	FS0210037020204	Chicago Creek above Burn I-4	393730	1053740	--	--	12	FS	s	1979-80
259	FS0210037020701	Lower Hoop Creek H-1	394630	1054700	7	--	7	FS	s	1979
260	FS0210037020702	Upper Hoop Creek H-2	394730	1054650	5	--	7	FS	s	1979

Table 2.--*Sediment-data-collection sites operated by other Federal agencies*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	Q_b	C_{ss}	Q_{ss}	Agency code	Storage code	Period of sediment record (WY)
			CUSTER COUNTY							
261	128501	North Taylor Creek	380800	1053500	3	3	2	FS	s	1979-80
262	128901	St Charles River above Lake Isabel	375900	1050400	7	8	3	FS	s	1976-80
263	FS0212085000002	Middle Taylor Creek	380630	1053603	4	6	2	FS	s	1978-80
264	FS0212085000003	Music Pass Creek	375700	1052900	4	6	2	FS	s	1976-80
			DOLORES COUNTY							
265	FS0213430000056	Dolores River below Cayton Campground	374608	1075910	--	15	5	FS	s	1978-81
266	FS0213440000050	West Fork Dolores River at Burro Bridge	374744	1080356	--	15	4	FS	s	1978-81
267	FS0213490000044	West Fork Dolores River at Emerson Picnicground	373804	1082008	--	16	5	FS	s	1978-81
			DOUGLAS COUNTY							
268	FS0212015000001	Jackson Creek at Shamballah Ashrama	391921	1050127	4	7	3	FS	s	1978-80
269	FS0212015000002	Bear Creek at Perry Park	391502	1045904	5	8	3	FS	s	1978-80
			EAGLE COUNTY							
270	41-001	Fryingpan River at Meredith	392145	1064358	--	1	--	FS	s	1978
271	FS021523H010001	Cottonwood Creek upstream from Forest Boundary	395348	1063154	--	12	--	FS	s	1978-82
272	FS021523H020001	Sheephorn Creek below Slate Creek	395219	1062820	--	8	--	FS	s	1978-80
273	FS021523H050001	Piney River at USGS Gage below Piney Lake	394229	1062534	--	13	--	FS	s	1978-82
274	FS021523H060003	Dickson Creek at USGS Gaging Station	394214	1062925	--	13	--	FS	s	1978-82
275	FS021523H060004	Freeman Creek at USGS Gaging Station	394155	1062641	--	13	--	FS	s	1978-82
276	FS021529H020001	Lower Turkey Creek at USGS Gage near Redcliff	393122	1062008	--	14	--	FS	s	1978-82
277	FS021529H020002	Upper Turkey Creek above Hanks Gulch Road	393326	1061558	--	9	--	FS	s	1979-82
278	FS021529H040001	Lower East Eagle River under Bridge	392513	1061724	--	12	--	FS	s	1978-82
279	FS021529H040002	Upper East Fork Eagle River above Ford	392508	1061619	--	5	--	FS	s	1979-80

Table 2.--*Sediment-data-collection sites operated by other Federal agencies*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	Q_b	C_{ss}	Q_{ss}	Agency code	Storage code	Period of sediment record (WY)
			EAGLE COUNTY--Continued							
280	FS021529H040003	Cataract Creek 20 feet above Road Crossing	392516	1061654	--	4	--	FS	s	1979
281	FS021529H070001	Lower Homestake Creek at USGS Gage	392824	1062202	--	2	--	FS	s	1980
282	FS021529H080001	Upper Homestake Creek at Gold Park at USGS Gage	392420	1062558	--	14	--	FS	s	1978-82
283	FS021529H100001	Cross Creek 1 mile above Trailhead at 1st Bridge	393228	1062559	--	7	--	FS	s	1978-80
284	FS021531H010001	Lower Red Sandstone Creek above 1st Switchback	393755	1062345	--	15	--	FS	s	1978-82
285	FS021531H010002	Upper Red Sandstone Creek at USGS Gage	394058	1062403	--	15	--	FS	s	1978-82
286	FS021535E010001	Lower Brush Creek Si 14 71.5	393330	1064600	--	19	--	FS	s	1978-82
287	FS021535E010002	West Brush Creek above Sylvan Si 13 109	393340	1064620	--	8	--	FS	s	1980-82
288	FS021535E020001	West Brush Creek below Sylvan Si 13 94.9	392830	1064330	--	9	--	FS	s	1978-80
289	FS021535E030001	East Brush Creek Si 14 70.5	393000	1064030	--	15	--	FS	s	1978-82
290	FS021537E010001	Lower Gypsum Creek Si 11 97	393200	1065530	--	13	--	FS	s	1978-82
291	FS021537E010002	Upper Gypsum Creek Si 11 88	392800	1064630	--	6	--	FS	s	1978-79
292	FS021537E010003	Red Creek Si 11 82	392730	1065100	--	6	--	FS	s	1978-79
293	FS021543S010001	Lower Cattle Creek Si 12 99	392800	1070300	--	6	--	FS	s	1978-80
294	FS021543S010002	Upper Cattle Creek Si 12 100	392730	1070000	--	6	--	FS	s	1978-80
295	FS021543S020001	Lower Taylor Creek Si 7 99	392400	1065630	--	16	--	FS	s	1978-82
296	FS021543S020002	Upper Taylor Creek Si 7 80.5	392530	1065600	--	5	--	FS	s	1978-79
297	FS021543S020003	Upper Toner Creek Si 7 80	392400	1065830	--	6	--	FS	s	1978-79
298	FS021543S030001	Reudi Creek Si 7 83	392200	1064830	--	9	--	FS	s	1978-80
			FREMONT COUNTY							
299	128301	Hayden Creek	382000	1054800	4	6	3	FS	s	1976-80

Table 2.--*Sediment-data-collection sites operated by other Federal agencies*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	Q_b	C_{ss}	Q_{ss}	Agency code	Storage code	Period of sediment record (WY)
		GARFIELD COUNTY								
87	09072500	Colorado River at Glenwood Springs	393300	1071913	--	13	13	BR	h	1951
90	09085000	Roaring Fork River at Glenwood Springs	393237	1071944	--	13	13	BR	h	1951
300	11057701	Bear River #1	400200	1070700	--	3	--	FS	s	1975
301	11057702	Bear River #2, 13 Miles Southwest of Yampa	400300	1070400	--	2	--	FS	s	1975
302	11057703	Bear River #3, 10 Miles Southwest of Yampa	400400	1070200	--	22	--	FS	s	1975-79
303	FS021527E020001	Lower Sweetwater Creek Si 02	394830	1071030	--	9	--	FS	s	1978-80
304	FS021527E020002	Upper Sweetwater Creek Si 02 76	394830	1071030	--	17	--	FS	s	1978-82
305	FS021527E020003	Turret Creek Si 02 80	394900	1071100	--	16	--	FS	s	1978-82
306	FS021539E020001	Lower Grizzly Creek Si 01 87.5	393330	1071500	--	15	--	FS	s	1978-82
307	FS021539E020002	Upper Grizzly Creek Si 01 71	394230	1071700	--	9	--	FS	s	1978-80
308	FS021539E020003	Broken Rib Creek Si 01 66	394100	1071400	--	7	--	FS	s	1978-80
309	FS021559R020001	Main Elk Creek Si 6 72.5	394130	1073500	--	16	--	FS	s	1978-82
310	FS021563R010001	Three Forks Creek Si 4 94	394600	1074200	--	15	--	FS	s	1978-82
311	FS021563R010002	East Rifle Creek Si 4 95.5	394630	1074030	--	15	--	FS	s	1978-82
312	FS021563R010003	Stump Gulch Si 4 81.5	394630	1074200	--	7	--	FS	s	1978-79
313	FS021567B030001	Ripple Creek Si 12 85.5	400400	1071830	--	11	--	FS	s	1978-82
314	FS021567B050001	Upper North Fork White River Si 03	400000	1071400	--	7	--	FS	s	1978-80
		GRAND COUNTY								
315	11060901	East Fork Troublesome Creek	400927	1061658	--	42	--	FS	s	1975-80
316	11062101	Williams Fork at Leal	394953	1060315	--	44	--	FS	s	1976-80
317	11062102	South Fork Williams Fork	394744	1060149	--	43	--	FS	s	1976-80
318	11062103	Williams Fork above Darling Creek	394722	1060118	--	47	--	FS	s	1976-80
319	FS0210017060202	Cabin Creek at mouth C-1 and #21	401320	1060310	19	--	31	FS	s	1976-78
320	FS0210017060203	Upper Cabin Creek C-2	401140	1060430	11	--	21	FS	s	1978
321	FS0210017060204	Lower North Fork of Cabin Creek C-3	401140	1060500	12	--	22	FS	s	1978
322	FS0210017060205	Upper North Fork of Cabin Creek C-4	401200	1060530	10	--	18	FS	s	1978
323	FS0210017060206	Lower Left Fork of North Fork Cabin Creek C-5	401200	1060540	12	--	20	FS	s	1978
324	FS0210017060207	Upper Left Fork of North Fork Cabin Creek C-6	401160	1060560	12	--	22	FS	s	1978

Table 2.--*Sediment-data-collection sites operated by other Federal agencies*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	Q_b	C_{ss}	Q_{ss}	Agency code	Storage code	Period of sediment record (WY)
		GRAND COUNTY--Continued								
325	FS0210017060302	Lower Elk Creek E-1	401840	1060250	11	--	11	FS	s	1979
326	FS0210017060303	Upper Elk Creek E-2	401710	1060120	18	--	24	FS	s	1978-79
327	FS0210017060304	Trout Creek T-1 and #24	401910	1060230	6	--	31	FS	s	1976-79
328	FS0210011060201	Hurd Creek at mouth #27	400000	1054750	--	--	6	FS	s	1976
329	FS0210011060202	Hamilton Creek at mouth #28	395950	1054740	--	--	7	FS	s	1978
330	FS0210011060301	Main Ranch Creek #29	395630	1054420	--	--	7	FS	s	1978
331	FS0210011060302	Middle Fork Ranch Creek #31	395640	1054540	--	--	7	FS	s	1976
332	FS0210011060303	South Fork Ranch #30	395610	1054550	--	--	7	FS	s	1978
333	FS0210011060401	Fraser River at USGS Station #48	395310	1054840	12	--	37	FS	s	1977-78
334	FS0210011060402	Fraser River at Berthoud Pass #47	394950	1054520	19	--	18	FS	s	1977
335	FS0210011060502	Upper Vasquez #45	394900	1055010	18	--	28	FS	s	1977-78
336	FS0210011060701	Main St. Louis Creek #41	395430	1055240	--	--	16	FS	s	1977
337	FS0210011060702	Dead Horse Creek #43	395400	1055440	8	321	51	FS	s	1977-79
338	FS0210011060703	Lexen Creek #55	395330	1055520	3	261	47	FS	s	1977-79
339	FS0210011060704	Fool Creek #40	395350	1055210	--	--	19	FS	s	1977
340	FS0210011060705	East St. Louis Creek #42	395050	1055430	--	--	17	FS	s	1977
341	FS0210011060706	Upper St. Louis Creek #44	395340	1055240	8	--	12	FS	s	1977
342	FS0210011060801	Crooked Creek #54	395620	1055610	6	--	14	FS	s	1977
343	FS0210015060101	Stillwater Creek #25	401340	1055440	--	--	9	FS	s	1976
344	FS0210015060102	South Supply Creek #26	401540	1055330	--	--	9	FS	s	1976
345	FS0210017060201	Willow Creek #20	401840	1060350	--	--	11	FS	s	1976
346	FS0210017060301	Upper Willow Creek #23	401840	1060300	--	--	10	FS	s	1976
347	FS0210019060201	Upper Beaver Creek #50	400100	1060300	12	--	18	FS	s	1977
348	FS0210019060301	Lower Beaver Creek #52	400150	1060600	9	--	17	FS	s	1977
349	FS0210019060302	Spring Creek #51	400150	1060550	--	--	4	FS	s	1977
350	FS0210019060501	Lower Muddy Creek #53	400040	1060610	2	--	16	FS	s	1977

Table 2.--*Sediment-data-collection sites operated by other Federal agencies*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	Q_b	C_{ss}	Q_{ss}	Agency code	Storage code	Period of sediment record (WY)
		GUNNISON COUNTY								
351	09110000	Taylor River at Almont	383952	1065041	--	4	4	BR	h	1971
352	09112500	East River at Almont	383952	1065051	--	4	4	BR	h	1971
		HINSDALE COUNTY								
353	FS0213110800017	Middle Fork Piedra River near Pagosa Springs	372716	1071037	--	16	6	FS	s	1978-81
		HUERFANO COUNTY								
354	129307	Cucharas River below Campground	372000	1050600	6	7	2	FS	s	1976-80
355	FS0212091000002	Upper Apache Creek	375130	1050030	--	1	1	FS	s	1980
356	FS0212091000003	Lower Apache Creek	375100	1045730	--	1	1	FS	s	1980
		JACKSON COUNTY								
357	119501	Damfino Creek Stream Gage	405950	1064450	--	24	--	FS	s	1973-78
358	119502	Damfino Creek at Headwaters	405940	1064100	--	3	--	FS	s	1975-76
359	119503	Tributary to Damfino Creek at Upper Station	405930	1064320	--	4	--	FS	s	1975-76
360	119504	Tributary to Damfino Creek at Lower Station	405950	1064340	--	3	--	FS	s	1975-76
361	119505	Ryan Creek at Headwaters	405930	1064600	--	3	--	FS	s	1975-76
362	119506	At Hog Park Guard Station	410000	1064850	--	23	--	FS	s	1973-78
363	119507	West Fork Encamp at Jeep Trail	405920	1064830	--	15	--	FS	s	1975-79
364	068704	Colorado Bridge	405610	1061930	--	15	--	FS	s	1976-78
365	11040302	Illinois River at Road 750	402400	1060400	--	18	--	FS	s	1975-79
366	11049901	Lone Pine Creek near Forest Boundry	404400	1063400	--	3	--	FS	s	1975
367	11040301	Michigan River 0.5 Miles South of Gould	403100	1060200	--	19	--	FS	s	1975-79
		JEFFERSON COUNTY								
368	FS0212004000002	Goose Creek at Bridge on F.R.211	391000	1052200	4	5	1	FS	s	1976-80

Table 2.--*Sediment-data-collection sites operated by other Federal agencies*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	Q_b	C_{ss}	Q_{ss}	Agency code	Storage code	Period of sediment record (WY)
			LAKE COUNTY							
369	126501	Main Lake Creek Gage	390400	1062400	4	10	--	FS	s	1978
370	126502	South Fork Lake Creek Gage	390300	1063200	9	14	--	FS	s	1977-79
371	126503	Sayers Gulch Gage	390300	1063200	10	14	--	FS	s	1978-79
372	126504	North Fork Lake Creek Gage	390500	1063300	10	14	--	FS	s	1978-79
373	126505	Mountain Boy Gage	390500	1063300	6	10	--	FS	s	1978-79
374	126301	Union Creek	390900	1061600	11	13	1	FS	s	1976-80
			LA PLATA COUNTY							
375	FS0213190600021	Los Pinos River above Vallecito Reservoir	372517	1073039	-	16	6	FS	s	1978-81
376	FS0213230600024	Florida River above Lemon Reservoir	372607	1074042	-	6	6	FS	s	1980-81
377	FS0213350400027	Hermosa Creek near Hermosa	372519	1075040	-	19	6	FS	s	1978-81
378	FS0213390200035	La Plata River at Hesperus	371720	1080205	-	15	4	FS	s	1978-81
			LARIMER COUNTY							
379	***	Fall River below Roaring River	402421	1053755	--	21	--	NPS	h	1983
380	FS0210061040301	Poudre River below Fish Hatchery #1	404150	1054120	1	--	11	FS	s	1976
381	FS0210061540101	South Fork of Poudre at mouth #5	404200	1051500	--	--	11	FS	s	1976
382	FS021005705030J	Middle Reservoir Station at USGS Station #72	403300	1055230	--	--	1	FS	s	1977
383	FS021005705030K	Lower Montgomery Creek #80	403240	1055230	--	--	1	FS	s	1977
384	FS021005705030L	Upper Montgomery Creek #79	403240	1055260	2	--	4	FS	s	1977
385	FS021005705030M	Above Reservoir below ZL Stations #81	403230	1055250	3	--	3	FS	s	1977
386	FS021005705030N	Joe Wright above Culvert #1	402220	1055250	14	--	49	FS	s	1979
387	FS021005705030O	Upper Zimmerman Lake Station #77	403210	1055240	2	--	5	FS	s	1977
388	FS021005705030P	Lower Zimmerman Lake Station #78	403220	1055310	--	--	5	FS	s	1977
389	FS021005705030Q	Upper Joe Wright Creek at Cameron Pass #11 & #76	403720	1055320	--	--	9	FS	s	1977
390	FS0210057050301	Joe Wright Creek above Chambers Lake #6	403550	1055110	--	--	29	FS	s	1976
391	FS0210057050302	Trap Creek #7	403540	1055050	--	--	10	FS	s	1976
392	FS0210057050303	Joe Wright Creek #68	403440	1055130	9	--	--	FS	s	1977
393	FS0210057050304	Joe Wright at Bridge #4	403440	1055120	19	--	81	FS	s	1979

Table 2.--*Sediment-data-collection sites operated by other Federal agencies*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	Q_b	C_{ss}	Q_{ss}	Agency code	Storage code	Period of sediment record (WY)
		LARIMER COUNTY--Continued								
394	FS0210057050305	North Fork Joe Wright Creek Lower Station #71 & #3	403430	1055130	19	--	83	FS	s	1977
395	FS0210057050306	North Fork of Joe Wright Creek Upper Station #70	403420	1055200	--	--	5	FS	s	1977
396	FS0210057050307	Joe Wright below Sediment ponds #75	403400	1055140	2	--	5	FS	s	1977
397	FS0210057050308	Joe Wright above Sediment ponds #74	403340	1055210	1	--	5	FS	s	1977
398	FS0210057050309	Tributary #1 Joe Wright Reservoir #73	403320	1055200	--	--	4	FS	s	1977
399	FS0210057450401	Big South Fork of South Poudre #3	403800	1054830	--	--	8	FS	s	1976
400	FS0210057450402	Joe Wright Creek at mouth #8	403740	1054840	--	3	81	FS	s	1976
401	FS0210057540201	Corral Creek #9	403110	1054610	--	--	9	FS	s	1976
402	FS0210059040201	Little South Fork at Bennett Creek Campground #2	403430	1053500	--	--	8	FS	s	1976
403	FS0210059040401	Little Beaver Creek #4	403730	1053140	6	--	14	FS	s	1976-79
404	FS0210067060101	Stub Creek #67	404740	1055410	--	--	11	FS	s	1977
405	FS0210067060102	Stub Creek #67a	404710	1055410	4	--	9	FS	s	1977
406	FS0210067060103	Rawah Creek #66	404510	1055310	--	--	9	FS	s	1977
407	FS0210067060104	West Branch #62	404000	1055300	2	--	6	FS	s	1977
408	FS0210069050101	McIntyre Creek #63	404810	1055620	10	--	11	FS	s	1977
409	FS0210069050202	Struck Creek #61	405650	1060250	4	--	10	FS	s	1977
410	FS0210069050301	Jimmy Creek #64	405220	1055210	4	--	12	FS	s	1977
411	FS0210069050302	Main Laramie #65	404810	1055250	--	--	6	FS	s	1977
412	FS0210053040201	Upper Lion Gulch L-2	401820	1052640	3	--	4	FS	s	1979
413	FS0210053040202	Lower Lion Gulch L-1	401850	1052440	3	--	5	FS	s	1979
414	FS0210059040402	Beaver Creek below Comanche Reservoir B-2	403500	1053830	6	--	6	FS	s	1979
415	FS021005705030R	Joe Wright Creek Stn 2Dam	403250	1055220	--	32	--	FS	s	1979
416	FS021005705030S	North Fork Joe Wright Creek Lower Station #71, #3	404300	1055130	--	39	1	FS	s	1979-80

Table 2.--*Sediment-data-collection sites operated by other Federal agencies*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	Q_b	C_{ss}	Q_{ss}	Agency code	Storage code	Period of sediment record (WY)
		LAS ANIMAS COUNTY								
417	129701	North Fork Purgatoire	371400	1050500	3	7	2	FS	s	1976-79
		MESA COUNTY								
99	09095500	Colorado River near Cameo	391420	1081600	--	13	13	BR	h	1951-53
418	FS021557R020001	West Divide Creek Si 15 94	391630	1072800	--	7	--	FS	s	1978-80
419	FS021557R020002	Upper West Divide Creek Si 15 100	391600	1072600	--	6	--	FS	s	1978-80
420	FS021557R020003	Tributary of West Divide Creek Si 15 106	391630	1072530	--	7	--	FS	s	1978-80
		MONTEZUMA COUNTY								
421	FS0213410200037	Mancos River near Mancos	372113	1081541	--	12	--	FS	s	1978-79
422	FS0213450000043	Dolores River at Dolores	372816	1083015	--	16	6	FS	s	1978-81
		OURAY COUNTY								
423	09146200	Uncompaghre River near Ridgway	381105	1074440	--	37	37	BR	h	1958-63
		PARK COUNTY								
424	FS0212001000001	Jefferson Creek above Jefferson Boundary PG	392500	1055000	4	6	2	FS	s	1976-80
425	FS0212001000002	Deadman Creek near Jefferson Creek	392600	1053000	3	5	1	FS	s	1976-80
426	FS0212004000003	South Fork of Lost Creek	391700	1053030	2	2	2	FS	s	1980
427	FS0212004000004	North Fork of Lost Creek	391715	1053020	2	2	2	FS	s	1980
428	FS0212004000005	Indian Creek	391645	1053100	1	1	1	FS	s	1980
429	FS0212004000006	No Name Creek	391715	1053245	1	1	1	FS	s	1980
430	FS0212004000007	Monkey Creek	391730	1053330	1	1	1	FS	s	1980
431	FS0212007000002	Hoosier Creek	392600	1054630	4	4	4	FS	s	1980

Table 2.--*Sediment-data-collection sites operated by other Federal agencies*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	Q_b	C_{ss}	Q_{ss}	Agency code	Storage code	Period of sediment record (WY)
			PITKIN COUNTY							
432	FS021541S040001	Upper Fryingpan River Si 8 62	391430	1063200	--	15	--	FS	s	1978-82
433	FS021541S040002	Marten Creek Si 8	391430	1063200	--	11	--	FS	s	1978-82
434	FS021543S050001	Rocky Fork Creek Si 7 72	392130	1064900	--	12	--	FS	s	1978-80
435	FS021545A030001	Lower Lincoln Creek Si 8 76	390700	1064130	--	15	--	FS	s	1978-82
436	FS021545A030002	Upper Lincoln Creek Si 8 64	390330	1063700	--	14	--	FS	s	1978-82
437	FS021545A030003	Grizzly Creek on Lincoln Si 8 74	390430	1063700	--	13	--	FS	s	1978-82
438	FS021547A020001	Lower Castle Creek Si 9 80	390500	1064830	--	17	--	FS	s	1978-82
439	FS021547A020002	Upper Castle Creek Si 9 65	390100	1064900	--	12	--	FS	s	1978-82
440	FS021547A020003	Waterfall Creek Si 9 71.5	390300	1064730	--	7	--	FS	s	1978-79
441	FS021549A020001	Sawmill Creek Si 7 74	391430	1064700	--	7	--	FS	s	1978-80
442	FS021549A030001	Upper Woody Creek Si 8 68	391430	1064430	--	7	--	FS	s	1978-80
443	FS021551A020001	Capital Creek Si 10 97.5	391330	1070500	--	15	--	FS	s	1978-82
444	FS021551A020002	Lower Tributary of Capital Creek Si 10 114	391300	1070430	--	8	--	FS	s	1978-80
445	FS021555S020001	Upper North Thompson Creek Si 12 93.5	392000	1072500	--	14	--	FS	s	1978-82
446	FS021555S020002	Park Creek on North Thompson Si 12 91	392030	1072430	--	13	--	FS	s	1978-82
447	FS021551A020003	Upper Tributary of Capitol Creek Si 10 86	391300	1070500	--	1	--	FS	s	1980
			RIO BLANCO COUNTY							
448	FS021565B010001	Lower South Fork of White River Si 5	395200	1073200	--	9	--	FS	s	1978-82
449	FS021565B020001	Middle South Fork of White River Si 5 69	395100	1072530	--	10	--	FS	s	1978-82
450	FS021565B020002	Lost Solar Creek Si 5 82.5	395200	1072730	--	9	--	FS	s	1978-82
451	FS021565B020003	Park Creek Si 5 90	395100	1072530	--	8	--	FS	s	1978-82
452	FS021567B010001	Lost Creek at USGS Station Si 16	400300	1072800	--	10	--	FS	s	1978-82
453	FS021567B010002	Upper Lost Creek Si 16 98	400330	1072800	--	6	--	FS	s	1978-80
454	FS021567B010003	Long Park Creek Si 16 101	400330	1072800	--	4	--	FS	s	1978-80
455	FS021567B070001	Marvine Creek Si 03 84	400000	1072530	--	9	--	FS	s	1978-82
456	FS021567B070002	East Marvine Creek Si 03 81	400030	1072530	--	10	--	FS	s	1978-82

Table 2.--*Sediment-data-collection sites operated by other Federal agencies*--Continued

Site number	Station identification number	Station name	Latitude	Longitude	Q_b	C_{ss}	Q_{ss}	Agency code	Storage code	Period of sediment record (WY)
		ROUTT COUNTY								
457	11038501	Floyd Creek above Forest Boundry	404700	1070100	--	16	--	FS	s	1975-78
458	11039102	Whiskey Creek 9 miles north of Columbine	405800	1065500	--	24	--	FS	s	1973-79
459	11039103	Middle Fork Little Snake River near Columbine	405600	1065500	--	22	--	FS	s	1973-79
81	09060500	Rock Creek near Toponas	400228	1063919	--	57	--	FS	h	1976-84
		SAN JUAN COUNTY								
460	FS0213350400028	Hermosa Creek above Hermosa Park	373849	1075541	--	16	5	FS	s	1978-81
		SUMMIT COUNTY								
461	FS021527D030003	North Fork Swan River above Mainstem	393052	1055540	--	9	--	FS	s	1978-80
462	FS021527D050001	Lower Indiana Creek on Private Land above Tarn	392701	1062629	--	4	--	FS	s	1979-80
463	FS021527D050002	Upper Indiana Creek upstream from Private Land	392556	1060013	--	9	--	FS	s	1978-80
464	FS021531D020003	Porcuipine Gulch 200 feet above U.S. Highway 6	393741	1055456	--	10	--	FS	s	1978-80
465	FS021535D020002	Acorn Creek 200 feet east of Boundary Fence	394545	1060629	--	11	--	FS	s	1978-82
466	FS021535D050001	Straight Creek 400 yards above Laskey Gulch	393901	1060054	--	14	--	FS	s	1978-82
467	FS021535D070001	Rock Creek at gaging station	394323	1060741	--	12	--	FS	s	1978-82
468	FS021535D110003	South Fork Deep Creek below Lower Diversion Ditch	395210	1062305	--	7	--	FS	s	1978-79
469	FS021535D110004	Martin Creek at Spring Creek Road	395100	1062253	--	9	--	FS	s	1978-81
470	FS021535D110005	North Fork Deep Creek at Spring Creek Road	395241	1062440	--	8	--	FS	s	1978-80
471	FS021535D110006	Tributary to North Fork at Spring Creek Road	395223	1062435	--	5	--	FS	s	1978-79
		TELLER COUNTY								
472	FS0212006000003	Phantom Creek	390340	1051100	1	1	--	FS	s	1980

The streamflow-duration, sediment-transport-curve method (Miller, 1951) estimates mean annual suspended-sediment load and is applicable when the streamflow-gaging station record is sufficient to define the frequency of water-discharge occurrence (flow duration), and when sufficient sediment data are available to construct a relation between sediment discharge and corresponding water discharge (sediment-transport curve). Mean annual suspended-sediment load transported by increments of water discharge is estimated by combining the sediment-transport curve with the midpoint of incremental water discharge and weighing by the average frequency of water-discharge occurrence. The resulting increments of sediment load are summed to derive the mean annual suspended-sediment load for the period of record defined by the flow-duration curve.

The use of daily mean water-discharge and a sediment-transport-curve to estimate daily sediment discharge is applicable when 1 or more complete years of daily mean water-discharge data are available, and when a sediment-transport curve has been defined. Daily sediment discharges are estimated from daily mean water discharges and the sediment-rating curve. Annual suspended-sediment loads are computed as the yearly sum of the estimated daily sediment discharges. In this study, the daily mean water-discharge, sediment-transport-curve method was used because it provides estimates of annual sediment loads in addition to the mean annual sediment load. The streamflow-duration, sediment-transport-curve method, based on average streamflow conditions over a period of years, cannot provide estimates of annual suspended-sediment loads, only the mean annual sediment load.

Sediment-Transport Curves and Linear Regression

Sediment-transport curves may be derived using either instantaneous sediment discharge and instantaneous water discharge, or daily sediment discharge and daily mean water discharge. The latter type of relation is preferable when a sediment-transport curve is to be used with daily mean water discharge to predict daily sediment discharge. Instantaneous sediment-transport curves may be used with daily mean water discharge if water discharge is relatively constant throughout a 24-hour period. Otherwise, sediment discharge may be underestimated by as much as 50 percent (Walling, 1977). Sediment-transport curves are derived by fitting a line to the sediment-discharge and water-discharge data so that the deviation of all points from the line is minimized. These curves may be straight, curvilinear, or segmented, and may be fitted to the data mathematically or graphically.

Sediment-transport curves commonly are approximated by a least-squares linear regression of logarithmic-transformed data (Walling, 1977), and, as used in this analysis, are expressed in the form of a power equation:

$$Q_s = aQ^b; \quad (1)$$

where Q_s = sediment discharge, in tons per day;
a = regression constant, or intercept;
Q = water discharge, in cubic feet per second; and
b = regression exponent, or slope.

Linear regression may not always be appropriate because it assumes that the linear relation is continuous from low streamflows to high streamflows

(D.W. Hubbell, U.S. Geological Survey, oral commun., 1984). Other types of curve-fitting techniques are described by Troutman and Williams (1987), but they indicate that ordinary least-squares regression is an appropriate technique when prediction of the dependent variable is the objective, and when the assumption of linearity can be met. When the transport curve is used as a predictive tool, it usually is used to estimate the mean response of the dependent variable (estimated sediment discharge) given a value of the independent variable (measured water discharge).

Logarithmic transformation of data can result in bias when these data are used in regression analysis. Because the mean of the log values of sediment discharges can be different than the log of the mean of nonlog values, nonlog values of sediment discharge estimated from the regression of log-transformed data may be biased to varying degrees. Transformation bias occurs when regression estimates (expressed in log values) are detransformed (to nonlog values). This transformation bias usually results in underestimation of the mean response of the dependent variable (estimated sediment discharge). Transformation bias is greater when the sediment and water-discharge data are characterized by a relatively large number of measurements at low water discharges, and when the scatter of data (variance) is great (Jansson, 1985).

Miller (1984) discusses transformation bias in fitting curves to natural logarithm-transformed data, and shows that for estimates of the dependent variable, transformation bias is multiplicative, and increases exponentially with the variance. It is possible, however, to eliminate the major part of this transformation bias by multiplying estimated sediment discharges by a correction factor:

$$C_b = e^{0.5s^2} \quad ; \qquad (2)$$

where C_b = transformation bias correction factor;
e = base of the natural logarithm; and
s^2 = variance of the natural logarithms.

Methods of Derivation of Sediment-Transport Curves

The suspended-sediment loads of many rivers and streams virtually are noncapacity loads; they are conditional on sediment supply and availability and, therefore, the relation between sediment discharge and water discharge may have considerable variability. Some of this variability also may exist because of the inaccuracy of field and laboratory procedures, seasonal variability of the relation between sediment concentration and water discharge, or adjustments through time of basin response to climate, land use, or geomorphic changes. The effects of some of this variability may be offset by subdividing the data set, for example, on the basis of seasonal trends in the streamflow hydrograph, or water-discharge range. Individual sediment-transport curves then may be derived for each data subset and sediment discharge estimated for the respective season or range of water discharges. Walling (1977) discusses some of the advantages and limitations of sediment-rating-curve estimates based on subdivided data sets.

Three techniques of deriving sediment-transport curves were tested with data from a group of 19 Colorado streams where daily suspended-sediment discharge and daily water-discharge measurements have been made for 1 or more entire years. Sediment-transport curves were derived for each site by: (1) Least-squares linear regression of all measurements; (2) least-squares linear regressions of data sets subdivided on the basis of hydrograph periods; and (3) graphically fitting a curve to a log plot of suspended-sediment discharge and water discharge. Daily suspended-sediment discharges and annual suspended-sediment loads were estimated for each technique using the daily mean water-discharge, sediment-transport-curve method described in the "Sediment-Transport Curves and Linear Regression" section. Estimated daily suspended-sediment discharges and annual suspended-sediment loads were compared with measured daily suspended-sediment discharges and annual suspended-sediment loads from the group of 19 Colorado streams to assess the accuracy of each sediment-transport-curve derivation technique. An analysis of the residuals of differences between measured daily suspended-sediment discharge and daily suspended-sediment discharges estimated with the three sediment-transport-curve fitting techniques were inconclusive, and no one technique was better than the others. However, an analysis of estimated annual suspended-sediment loads indicated various techniques could be more appropriate than others under certain conditions.

The first sediment-transport-curve derivation technique included all available suspended-sediment-discharge and water-discharge measurements in the regression analysis. All pairs of measurements were weighed equally in the analysis. Evaluation of annual suspended-sediment-load estimates indicated that this technique worked well when the sample size was small (less than 20 to 30 paired measurements), or when the distribution of the log of daily sediment discharge versus the log of daily water discharge defined a linear relation with a small standard error of estimate. A drawback of this technique was that measurements made during high-flow discharges were given no greater weight in determining transport-curve plotting position than were measurements made during low-flow discharges. When there was a proportionately large number of low-flow measurements, variance in distribution of these points greatly affected the plotting position of the regression line through the high-flow measurements. High-flow discharges transport a large percentage of annual suspended-sediment load (Andrews, 1980; Elliott and others, 1984), and high-flow measurements need to be given a greater weight in determining sediment-transport-curve plotting position.

The second technique considered seasonal trends indicated by the streamflow hydrograph. After examination of the mean annual hydrograph at each site, the data set was subdivided into rising-stage, falling-stage, and low-flow periods. Individual sediment-transport curves were derived by linear regression of data for the rising-stage and falling-stage periods, and daily suspended-sediment discharges were estimated using daily mean water discharges from the appropriate period. Daily suspended-sediment discharges for the low-flow period were estimated using the mean suspended-sediment concentration of the low-flow period and daily mean water discharges from the low-flow period. Annual suspended-sediment-load estimates were the yearly sums of daily sediment discharges. This technique generally produced accurate estimates of annual suspended-sediment loads for streams that have substantial snowmelt runoff. This technique also decreased the problem of plotting

position bias due to variance in the distribution of low-flow measurements because intermediate- and high-flow measurements, made during rising-stage and falling-stage periods, were considered separately from low-flow measurements. Furthermore, this technique accounted for the possible hysteretic effects of greater daily suspended-sediment concentrations during the rising stage of the hydrograph than during the falling stage. One drawback of this technique was that the sample size of each subgroup used to define the regression equation was much smaller (about 30 to 50 percent) than the sample size if all measurements had been analyzed together. This limited the use of the hydrograph periods technique to sites that had numerous suspended-sediment-discharge measurements distributed throughout the year.

The third technique used a hand-drawn rating curve graphically fitted to a log plot of suspended-sediment discharge versus water-discharge data. These rating curves were single straight lines, or connected, segmented straight lines that were described as power equations. As with the hydrograph periods technique, an advantage of the graphically fitted technique was that curves could be fitted to intermediate- and high-flow measurements without being affected by inconsequential low-flow measurements. In addition, outliers could be discounted if their plotting position was dubious, and a rating curve of connected straight line segments could be drawn if there were inflections in the plot of data. This analysis indicated that the graphically fitted technique usually resulted in more accurate estimates of annual suspended-sediment loads than the other techniques when the standard error of estimate of the regression equation derived from all pairs of measurements was greater than about 135 percent. Limitations of the graphically fitted technique were its subjectivity and potential lack of reproducibility.

Annual Suspended-Sediment Loads

Annual suspended-sediment loads were estimated for rivers and streams in Colorado where a minimum of 1 complete year of daily mean water discharge was recorded, and where an adequate data base existed to construct a suspended-sediment-discharge versus water-discharge curve. The daily mean water-discharge, sediment-transport-curve method was used to compute daily suspended-sediment discharges and, hence, annual suspended-sediment loads. Annual suspended-sediment loads were estimated for most years having daily water-discharge measurements. This commonly involved extrapolation for years during which no sediment data were collected.

Sediment-transport curves were derived by one of the three techniques discussed in the "Methods of Derivation of Sediment-Transport Curves" section. Transport curves derived by regression of all pairs of measurements and by regression on the basis of hydrograph periods had a minimum of 10 measurements per regression equation and a minimum coefficient of determination (R^2) of 0.60. Daily suspended-sediment-discharge estimates from the technique using all pairs of measurements and the technique based on hydrograph period were corrected for transformation bias by application of equation 2. Graphically fitted rating curves usually were used at sites where there was a minimum of 10 measurements, and where the standard error of estimate (SE) of the regression using all measurements exceeded about 135 percent. Annual suspended-sediment-load estimates for 133 U.S. Geological Survey sediment-data-

collection sites are presented in tables 6 through 138 in the "Supplemental Data" section at the back of the report. Many other sediment-data-collection sites in Colorado have both sediment- and water-discharge data; however, annual suspended-sediment loads were not computed because of small sample size, inadequate correlation between sediment discharge and water discharge, incomplete years of daily water-discharge data, or unverified quality control of the sediment data.

Estimated mean annual suspended-sediment loads for 94 U.S. Geological Survey sediment-data-collection sites are presented in table 3. Mean annual suspended-sediment loads for 19 sites are based entirely on annual sums of measured daily suspended-sediment discharges. Fifteen other sites have 1 or more years of annual suspended-sediment loads based on measured daily sediment discharges and additional years of estimated loads. These are noted in the tables in the "Supplemental Data" section at the back of this report. Mean annual suspended-sediment loads for the remaining sites are based entirely on estimated daily sediment discharges.

The period of record used to estimate mean annual suspended-sediment loads in this report was a minimum of 5 years and extended from the 1940's or 1950's through water year 1984, even though daily water-discharge records existed for earlier decades at some sites. When daily water-discharge records were available for several decades, no more than about 35 years were selected for computation of mean annual suspended-sediment loads because averages from recent decades represent contemporary fluvial conditions more accurately than do averages based on extremely long periods of record. Several rivers and streams were regulated by impoundments or diversions. When the period of discharge record included completion of a major impoundment or diversion structure, mean annual suspended-sediment loads of the more severely regulated rivers were estimated for periods prior to and following completion of the structure. The location of 94 sediment-data-collection sites where mean annual suspended-sediment loads have been estimated are shown on plate 2.

Mean annual suspended- and total-sediment loads have been estimated for numerous sites in Colorado by other authors (table 4). Mean annual suspended-sediment loads for some sites in table 4 may be different than mean annual suspended-sediment loads in table 3 because of differences in the period of record used to estimate loads, use of different sediment-transport curves, or use of different suspended-sediment-load computation techniques. No attempt has been made to verify the published data summarized in table 4. Also, some additional sediment studies are summarized in table 5. Included in these reports are some of the following types of information: daily or monthly suspended-sediment discharges, bedload discharges, sediment-rating curves, sediment-size distributions, applications of empirical bedload and total load formulas, and estimates of reservoir sedimentation rates.

Table 3.--*Estimated mean annual suspended-sediment loads at U.S. Geological Survey sediment-data-collection sites*

[mi^2, square miles; acre-ft, acre-feet; ton, tons; WY, water years; latitude and longitude in degrees, minutes, seconds; (m), mean annual suspended-sediment load computed from annual totals of measured daily suspended-sediment loads]

Site number	Station identification number	Drainage area (mi^2)	Mean annual streamflow (acre-ft)	Mean annual suspended-sediment load (ton)	Period for mean load computation (WY)	Number of years for mean computation: Load	Flow	Latitude	Longitude
6	06619400	44.0	17,930	863	1979-83	5	5	404143	1060356
8	06619450	158.0	30,290	3,970	1979-83	5	5	404829	1061409
9	06620000	1,431.0	318,800	22,100	1950-84	35	69	405610	1062021
22	06707000	479.0	110,800	10,600	1950-82	33	70	392432	1051031
24	06710000	3,069.0	193,400	20,500	1976-84	9	9	393708	1050107
27	06719505	400.0	142,000	16,000	1975-84	10	10	394511	1051405
34	06724000	212.0	93,460	1,960	1950-84	35	93	401305	1051534
37	06725450	424.0	84,770	51,500	1977-82	6	6	400929	1050053
38	06733000	137.0	92,010	2,950	1948-84	37	37	402242	1053048
39	06752000	1,056.0	239,300	11,400	1950-84	35	35	403952	1051326
40	06754000	9,598.0	1,035,000	2,275,000	1951-84	9	9	402444	1043346
41	06758000	28.6	644	32,100	1956-65	10	10	391235	1043200
43	06758200	111.0	2,750	61,900	1956-65	10	10	392014	1042830
44	06758500	13,245.0	753,500	554,000	1976-84	9	9	401919	1035517
45	06764000	23,138.0	385,400	638,000	1951-84	34	82	405846	1021515
47	07083000	23.6	21,010	331	1948-84	37	38	391020	1062319
50	07094500	2,548.0	579,600	277,000	1946-84	16	30	382914	1052223
51	07096000	3,117.0	518,000	123,000	1950-81	32	93	382602	1051524
52	07097000	4,024.0	557,900	394,000	1940-84	23	23	382318	1050056
53	07099200	4,280.0	565,800	567,000	1965-74	10	10	382014	1045618

Table 3.--*Estimated mean annual suspended-sediment loads at U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Drainage area (mi^2)	Mean annual streamflow (acre-ft)	Mean annual suspended-sediment load (ton)	Period for mean load computation (WY)	Number of years for mean computation: Load	Flow	Latitude	Longitude
54	07099400	4,670.0	500,000	1,310,000	1966-84	8	8	381617	1044306
55	07099500	4,686.0	513,700	810,000	1950-73	24	80	381602	1043926
61	07124200	550.0	49,120	270,000	1973-84	12	12	370746	1043820
66	07126300	1,791.0	64,340	1,760,000	1977-84	8	8	372130	1035344
69	07130500	18,915.0	169,500	333,000	1949-84	36	36	380502	1025510
70	08224110	6.6	732	204	1980-84	5	5	382422	1060349
71	08224113	11.2	747	197	1980-84	5	5	382404	1060351
72	08251500	7,700.0	304,300	74,600	1952-84	33	54	370442	1054522
78	09049200	21.0	21,230	2,810(m)	1974-79	6	6	393001	1060956
82	09066050	19.6	20,720	1,600(m)	1974-79	6	6	393724	1061647
83	09066250	55.0	69,260	2,660(m)	1974-79	6	6	393835	1062044
85	09070000	944.0	419,500	81,200	1948-84	37	38	393858	1065711
86	09070500	4,394.0	1,548,000	1,120,000	1950-84	35	44	393840	1070440
90	09085000	1,451.0	896,200	157,000	1972-84	13	13	393237	1071944
92	09092850	22.1	6,990	10,500	1977-83	7	7	393715	1080146
93	09092970	20.4	7,010	4,980	1978-83	6	6	393403	1080114
94	09093000	141.0	19,630	39,200	1965-84	15	21	393401	1080637
95	09093500	198.0	22,390	56,000	1949-82	14	20	392711	1080333
96	09093700	7,370.0	2,795,000	2,490,000	1967-84	18	18	392145	1080907
97	09095000	321.0	30,650	74,400	1963-81	17	22	392712	1081859
98	09095400	109.0	3,460	16,700	1975-82	8	8	392208	1081541
99	09095500	8,050.0	2,826,000	3,130,000	1950-84	35	51	391420	1081600
100	09129800	38.5	26,660	6,880	1966-73	8	8	390836	1072550
101	09131100	12.0	5,720	240	1969-82	14	14	390615	1073502
103	09132500	526.0	326,000	69,500	1962-84	23	51	385545	1072653

Table 3.--*Estimated mean annual suspended-sediment loads at U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Drainage area (mi^2)	Mean annual streamflow (acre-ft)	Mean annual suspended-sediment load (ton)	Period for mean load computation (WY)	Number of years for mean computation: Load	Flow	Latitude	Longitude
107	09149500	1,129.0	210,800	294,000	1950-84	35	48	384431	1080449
108	09152500	7,928.0	1,926,000	1,570,000	1950-84	16	16	385900	1082700
127	09160500	0.1	1	32	1977-81	5	5	391924	1085548
128	09163500	17,843.0	4,882,000	8,180,000	1952-84	16	16	390745	1090136
130	09173000	40.6	10,870	275	1950-81	23	31	375812	1081142
131	09175000	53.0	6,420	173	1941-81	18	18	375833	1081938
132	09175500	1,069.0	238,400	27,700	1950-81	32	53	381304	1083357
144	09243700	23.5	3,210	3,180	1976-84	8	8	402308	1065933
145	09243800	8.6	572	227	1976-83	7	7	402045	1070504
146	09243900	17.5	1,960	1,760	1976-84	8	8	402325	1065939
149	09244410	1,430.0	802,200	105,000	1966-84	19	20	402918	1070933
153	09244470	13.6	1,200	761	1977-81	5	5	402806	1071447
165	09250510	7.2	355	1,200	1976-84	9	9	401848	1074757
166	09250600	27.4	1,590	19,100	1975-80	6	6	401856	1074750
169	09251000	3,410.0	1,140,000	516,000	1950-84	35	68	403010	1080145
173	09260000	3,730.0	427,500	1,270,000	1950-84	35	63	403250	1082525
178	09303000	260.0	228,200	16,800	1952-84	33	39	395915	1073650
181	09304000	177.0	186,600	31,900	1952-84	33	34	395828	1073729
182	09304200	648.0	412,200	52,600	1962-84	23	23	400018	1074929
184	09304800	1,024.0	469,500	111,000	1962-84	23	23	400048	1080533
185	09306007	177.0	14,200	49,400(m)	1975-84	10	10	394934	1081057
187	09306022	44.0	1,350	156(m)	1975-84	8	10	394909	1081108
189	09306028	15.7	3.5	2.85	1975-81	7	7	394845	1081100
196	09306052	8.0	8.5	58	1975-84	8	8	394851	1081435
197	09306058	48.4	1,890	500(m)	1975-84	8	10	395014	1081437

Table 3.--*Estimated mean annual suspended-sediment loads at U.S. Geological Survey sediment-data-collection sites*--Continued

Site number	Station identification number	Drainage area (mi^2)	Mean annual streamflow (acre-ft)	Mean annual suspended-sediment load (ton)	Period for mean load computation (WY)	Number of years for mean computation: Load	Flow	Latitude	Longitude
198	09306061	309.0	18,980	61,800	1975-84	10	10	395102	1081531
199	09306175	103.0	5,850	3,780(m)	1976-83	6	8	395217	1081713
200	09306200	506.0	18,910	43,400	1973-84	10	20	395516	1081749
203	09306222	652.0	24,270	76,000	1975-84	9	16	400516	1081435
206	09306235	8.6	645	449(m)	1975-84	6	10	395422	1083156
209	09306241	2.4	4.2	10	1975-82	8	8	395450	1082905
210	09306242	31.6	1,850	26,100(m)	1975-84	10	10	395513	1082820
215	09306255	262.0	1,380	39,900(m)	1973-82	8	10	401007	1082402
217	09306300	2,773.0	458,600	402,000	1973-81	9	9	400626	1084244
218	09306395	3,680.0	568,000	1,550,000	1977-84	8	8	400050	1090448
219	09341200	14.0	22,530	897	1969-75	7	7	372647	1065300
220	09343000	58.0	61,000	33,700	1952-71	20	36	371246	1064738
225	09344300	96.4	84,040	13,600	1957-70	14	14	370155	1064356
229	09346000	172.0	52,790	41,400	1972-84	13	13	370010	1065425
232	09347200	32.2	31,660	1,030	1970-75	6	6	372912	1070946
233	09349800	629.0	277,500	209,000	1963-84	22	22	370518	1072350
234	09352900	72.1	104,300	832	1963-84	22	22	372839	1073235
235	09354500	510.0	160,100	35,300	1952-84	33	34	370034	1073556
236	09357500	55.9	73,900	4,420	1950-82	33	47	374959	1073556
237	09358900	11.0	15,870	667	1969-75	7	7	375104	1074331
238	09363500	1,090.0	656,400	272,000	1964-84	20	51	370217	1075225
239	09366500	331.0	25,570	42,500	1950-84	35	64	365959	1081117
241	09371010	14,600.0	1,711,000	5,410,000	1978-83	6	6	370020	1090200
242	09372000	346.0	33,980	221,000	1952-84	33	33	371927	1090054

Table 4.--*Estimates of mean annual sediment loads from additional sources at selected sediment-data-collection sites*

[mi^2, square miles; acre-ft, acre-feet; SCS, U.S. Soil Conservation Service; ACE, U.S. Army Corps of Engineers unpublished internal memorandum; dashes, no available data; *, no site number assigned because of lack of location information, and the site is not included on plate 1 or plate 2; ***, no station identification number]

Site number	Station identification number	Station name	Drainage area (mi^2)	Mean annual streamflow (acre-ft)	Mean annual sediment loads			Period of record for load computation (water year)	Publication source
					Suspended-sediment load (tons)	Bedload (tons)	Total sediment load (tons)		
				SOUTH PLATTE RIVER BASIN					
24	06710000	South Platte River at Littleton	3,069	2,091,400	384,000	--	--	1942-48	SCS, 1975
473	06712000	Cherry Creek near Franktown	169	12,000	39,000	--	--	1942-45, 1947-48	SCS, 1975
474	06712500	Cherry Creek near Melvin	360	18,000	260,000	--	--	1942-48	SCS, 1975
475	06718000	Clear Creek below Idaho Springs	259	106,000	33,000	--	--	1953-55	SCS, 1975
476	06718500	North Clear Creek near Blackhawk	52.2	4,700	2,300	--	--	1953-55	SCS, 1975
477	06720500	South Platte River near Henderson	4,710	296,000	1,129,000	--	--	1942-44, 1946-48	SCS, 1975
478	06757000	South Platte River at Sublette	12,100	370,000	729,000	--	--	1944-48	SCS, 1975
41	06758000	Kiowa Creek at Elbert	28.6	720	35,600	--	--	1957-65	SCS, 1975
42	06758100	West Kiowa Creek at Elbert	35.9	830	32,700	--	--	1963-65	SCS, 1975
43	06758200	Kiowa Creek at Kiowa	111	2,700	40,700	--	--	1957-65	SCS, 1975
479	06759000	Bijou Creek near Wiggins	1,310	6,700	953,000	--	--	1951-55	SCS, 1975
480	06759500	South Platte River at Fort Morgan	14,800	361,000	1,827,000	--	--	1944-48	SCS, 1975
				ARKANSAS RIVER BASIN					
55	07099500	Arkansas River near Pueblo	4,686	533,700	820,000	--	--	1941-52	ACE, 1955 (unpublished)
481	07106500	Fountain Creek at Pueblo	926	43,650	661,000	--	--	1942-52	ACE, 1955 (unpublished)
482	07108500	St. Charles River near Pueblo	467	20,000	519,000	--	--	1943-53	SCS, 1975
482	07108500	St. Charles River near Pueblo	467	21,090	558,000	--	--	1943-52	ACE, 1955 (unpublished)
483	07116000	Huerfano River below Dam near Undercliffe	1,670	35,000	996,000	--	--	1940-53	SCS, 1975

Table 4.--*Estimates of mean annual sediment loads from additional sources at selected sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Drainage area (mi^2)	Mean annual streamflow (acre-ft)	Mean annual sediment loads: Suspended-sediment load (tons)	Mean annual sediment loads: Bedload (tons)	Mean annual sediment loads: Total sediment load (tons)	Period of record for load computation (water year)	Publication source
				ARKANSAS RIVER BASIN--Continued					
483	07116000	Huerfano River below Dam near Undercliffe	1,670	37,505	1,041,000	--	--	1940-52	ACE, 1955 (unpublished)
*	***	Other Inflow, Pueblo to Nepesta	--	144,800	2,425,000	--	--	1941-52	ACE, 1955 (unpublished)
484	07117000	Arkansas River near Nepesta	9,340	540,500	4,654,000	--	--	1941-52	ACE, 1955 (unpublished)
485	07119500	Apishapa River near Fowler	1,120	28,100	2,213,000	--	--	1940-52	ACE, 1955 (unpublished)
486	07121000	Timpas Creek near La Junta (Rocky Ford)	451	29,000	460,000	--	--	1942-53	SCS, 1975
486	07121000	Timpas Creek near La Junta (Rocky Ford)	451	30,980	487,000	--	--	1942-52	ACE, 1955 (unpublished)
*	***	Other Inflow, Nepesta to Rocky Ford	--	128,800	1,929,000	--	--	1945-52	ACE, 1955 (unpublished)
487	07123000	Arkansas River at La Junta	12,200	225,000	3,268,000	--	--	1940-52	ACE, 1955 (unpublished)
*	***	Other Inflow, La Junta to Las Animas	--	23,830	236,000	--	--	1944-52	ACE, 1955 (unpublished)
57	07124000	Arkansas River at Las Animas	14,400	219,600	3,030,000	--	--	1940-52	ACE, 1955 (unpublished)
68	07128500	Purgatoire River near Las Animas	3,500	93,440	3,900,000	--	--	1940-52	ACE, 1955 (unpublished)
*	***	Other Inflow, Las Animas to Caddoa	--	21,970	311,000	--	--	1944-52	ACE, 1955 (unpublished)
[1]69	07130500	Arkansas River at Caddoa	18,132	312,000	2,218,000	--	--	1940-53	SCS, 1975
[1]69	07130500	Arkansas River below John Martin Reservoir	18,915	324,300	2,281,000	--	--	1940-52	ACE, 1955 (unpublished)
				UPPER COLORADO RIVER BASIN					
80	09058000	Colorado River near Kremmling	2,380	--	150,000	--	--	1914-57	SCS, 1975
87	09072500	Colorado River at Glenwood Springs	4,550	1,738,000	485,800	--	--	1914-57	Iorns, and others, 1965
90	09085000	Roaring Fork River at Glenwood Springs	1,450	980,000	287,100	--	--	1914-57	Iorns, and others, 1965
488	09092000	Rifle Creek near	137	17,800	43,500	--	--	1940-46, 1953-57	Iorns, and others, 1965
91	09092830	Northwater Creek near Anvil Points	12.6	--	350	17,000	17,000	1975-81	Steele and Kunkel, 1983

Table 4.--*Estimates of mean annual sediment loads from additional sources at selected sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Drainage area (mi^2)	Mean annual streamflow (acre-ft)	Mean annual sediment loads: Suspended-sediment load (tons)	Mean annual sediment loads: Bedload (tons)	Mean annual sediment loads: Total sediment load (tons)	Period of record for load computation (water year)	Publication source
				UPPER COLORADO RIVER BASIN--Continued					
92	09092850	East Middle Fork Parachute Creek near Rio Blanco	22.1	--	5,200	9,300	14,500	1975-81	Steele and Kunkel, 1983
93	09092970	East Fork Parachute Creek near Rulison	20.4	--	3,800	45,700	49,500	1975-81	Steele and Kunkel, 1983
94	09093000	Parachute Creek near Parachute	141	--	42,900	9,800	52,700	1975-81	Steele and Kunkel, 1983
95	09093500	Parachute Creek at Parachute	198	--	85,500	8,400	93,900	1975-81	Steele and Kunkel, 1983
97	09095000	Roan Creek near DeBeque	321	--	173,000	11,600	184,600	1975-81	Steele and Kunkel, 1983
98	09095400	Dry Fork near DeBeque	109	--	18,500	900	19,400	1975-81	Steele and Kunkel, 1983
99	09095500	Colorado River near Cameo	8,050	2,997,000	9,248,000	--	--	1917-57	Iorns, and others, 1965
489	09096500	Plateau Creek near Collbran	80.4	75,300	19,000	--	--	1917-57	Iorns, and others, 1965
490	09127998	Gunnison River above Gunnison Tunnel	42.2	1,280,000	183,000	--	--	1917-57	Iorns, and others, 1965
491	09128500	Smith Fork near Crawford	42.8	39,500	12,000	--	--	1914-57	Iorns, and others, 1965
492	09129500	Iron Creek near Crawford	71.5	12,200	16,400	--	--	1948-52	Iorns, and others, 1965
493	09143500	Surface Creek at Cedaredge	39	19,600	3,000	--	--	1918-57	Iorns, and others, 1965
108	09152500	Gunnison River near Grand Junction	7,928	1,884,000	2,067,000	--	--	1914-57	Iorns, and others, 1965
494	09166500	Dolores River at Dolores	504	356,000	119,100	--	--	1914-57	Iorns, and others, 1965
				YAMPA RIVER BASIN					
139	09239500	Yampa River at Steamboat Springs	604	339,000	11,000	3,700	15,000	1905-06 1910-77	Andrews, 1978
140	09241000	Elk River at Clark	206	243,000	5,200	11,000	16,000	1911-22 1931-77	Andrews, 1978
142	09242500	Elk River near Trull	415	430,000	7,600	18,000	26,000	1905-06 1910-27	Andrews, 1978
148	09244300	Grassy Creek near Mount Harris	25.8	1,010	2,380	320	2,700	1959-66	Andrews, 1978
149	09244410	Yampa River below diversion, near Hayden	1,430	797,000	70,000	38,000	110,000	1966-77	Andrews, 1978

Table 4.--*Estimates of mean annual sediment loads from additional sources at selected sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Drainage area (mi^2)	Mean annual streamflow (acre-ft)	Mean annual sediment loads: Suspended-sediment load (tons)	Mean annual sediment loads: Bedload (tons)	Mean annual sediment loads: Total sediment load (tons)	Period of record for load computation (water year)	Publication source
				YAMPA RIVER BASIN--Continued					
154	09245000	Elkhead Creek near Elkhead	64.2	38,400	11,000	5,900	17,000	1954-77	Andrews, 1978
155	09245500	North Fork of Elkhead Creek near Elkhead	21	12,300	1,300	490	1,800	1959-73	Andrews, 1978
160	09249200	South Fork of Williams Fork near Pagoda	46.7	31,700	22,000	700	23,000	1966-77	Andrews, 1978
161	09249750	Williams Fork at mouth near Hamilton	419	157,000	160,000	49,000	210,000	1905-06 1910-27	Andrews, 1978
163	09250400	Good Springs Creek near Axial	40	1,450	540	12	550	1975-77	Andrews, 1978
166	09250600	Wilson Creek near Axial	27.4	1,300	450	420	870	1975-77	Andrews, 1978
169	09251000	Yampa River near Maybell	3,410	1,120,000	420,000	120,000	540,000	1917-77	Andrews, 1978
169	09251000	Yampa River near Maybell	3,410	1,057,000	366,000	--	--	1951-57	SCS, 1975
169	09251000	Yampa River near Maybell	3,410	1,152,000	308,000	--	--	1914-57	Iorns, and others, 1965
170	09253000	Little Snake River near Slater	285	164,000	19,000	3,600	23,000	1943-47, 1951-77	Andrews, 1978
171	09255000	Slater Fork near Slater	161	53,600	12,000	10,000	22,000	1932-77	Andrews, 1978
171	09255000	Slater Fork near Slater	161	60,800	17,500	--	--	1914-57	Iorns, and others, 1965
173	09260000	Little Snake River near Lily	3,730	416,000	1,300,000	70,000	1,400,000	1922-77	Andrews, 1978
173	09260000	Little Snake River near Lily	3,730	295,000	1,297,000	--	--	1959-64	SCS, 1975
173	09260000	Little Snake River near Lily	3,730	450,000	1,099,000	--	--	1914-57	Iorns, and others, 1965
174	09260050	Yampa River at Deerlodge Park	7,660	1,500,000	1,940,000	100,000	2,040,000	1941-83	Elliott, and others, 1984
				WHITE RIVER BASIN					
178	09303000	North Fork White River at Buford	260	240,000	33,240	--	--	1914-57	Iorns, and others, 1965
185	09306007	Piceance Creek below Rio Blanco	177	--	14,900	--	--	1974-80	Kircher and Von Guerard, 1982
185	09306007	Piceance Creek below Rio Blanco	177	--	14,900	3,100	18,000	1975-81	Steele and Kunkel, 1983
187	09306022	Stewart Gulch above West Fork near Rio Blanco	44	--	180	500	680	1975-81	Steele and Kunkel, 1983
197	09306058	Willow Creek near Rio Blanco	48.4	--	550	3,500	4,050	1975-81	Steele and Kunkel, 1983

Table 4.--*Estimates of mean annual sediment loads from additional sources at selected sediment-data-collection sites*--Continued

Site number	Station identification number	Station name	Drainage area (mi^2)	Mean annual streamflow (acre-ft)	Mean annual sediment loads: Suspended-sediment load (tons)	Mean annual sediment loads: Bedload (tons)	Mean annual sediment loads: Total sediment load (tons)	Period of record for load computation (water year)	Publication source
				WHITE RIVER BASIN--Continued					
198	09306061	Piceance Creek above Hunter Creek near Rio Blanco	309	--	16,800	1,400	18,200	1975-81	Steele and Kunkel, 1983
199	09306175	Black Sulphur Creek near Rio Blanco	103	--	3,700	800	4,500	1975-81	Steele and Kunkel, 1983
200	09306200	Piceance Creek below Ryan Gulch near Rio Blanco	506	--	17,200	--	--	1974-79	Kircher and Von Guerard, 1982
200	09306200	Piceance Creek below Ryan Gulch near Rio Blanco	506	--	16,500	50	16,550	1975-81	Steele and Kunkel, 1983
203	09306222	Piceance Creek at White River	652	--	28,980	--	--	1974-80	Kircher and Von Guerard, 1982
203	09306222	Piceance Creek at White River	652	--	29,000	300	29,300	1975-81	Steele and Kunkel, 1983
206	09306235	Corral Gulch below Water Gulch near Rangely	8.6	--	232	--	--	1975-80	Kircher and Von Guerard, 1982
210	09306242	Corral Gulch near Rangely	31.6	--	2,620	--	--	1975-80	Kircher and Von Guerard, 1982
210	09306242	Corral Gulch near Rangely	31.6	--	2,600	1,400	4,000	1975-81	Steele and Kunkel, 1983
215	09306255	Yellow Creek near White River	262	--	44,300	--	--	1974-80	Kircher and Von Guerard, 1982
215	09306255	Yellow Creek near White River	262	--	44,300	300	44,600	1975-81	Steele and Kunkel, 1983
				SAN JUAN RIVER BASIN					
495	09353500	Los Pinos River near Bayfield	270	288,000	1,800	--	--	1914-57	Iorns, and others, 1965
496	09355000	Spring Creek at La Boca	58	25,600	32,000	--	--	1914-57	Iorns, and others, 1965
239	09366500	La Plata River at Colorado-New Mexico State line	331	27,900	28,000	--	--	1914-57	Iorns, and others, 1965
497	09371500	McElmo Creek near Cortez	230	38,600	141,000	--	--	1914-57	Iorns, and others, 1965

[1]0710305500 Arkansas River at Caddoa relocated and renamed Arkansas River below John Martin Reservoir 1947. Streamflow records considered equivalent by U.S. Geological Survey. SCS published contributing drainage area; ACE published contributing plus noncontributing drainage area.

Table 5.--*Summary of additional sediment studies and type of data*

Location of study sites	Type of data	Publication source
South Platte River, Arkansas River, and Upper Colorado River basins	Reservoir sedimentation data for 53 sites collected by several Federal agencies, updated intermittently.	U.S. Department of Agriculture, 1965, 1969, 1973, 1978
Arapaho, Bent, Douglas, Eagle, Elbert, El Paso, Huerfano, Jefferson, Larimer, Las Animas, Mesa, Montrose, Otero, Pueblo, Sedgwick, Weld, and Yuma Counties	Reservoir sedimentation rates in many small, ephemeral watersheds, resurveyed intermittently.	U.S. Soil Conservation Service, unpublished data, 1983
Fall River below Roaring River near Estes Park	Bed-material-size distributions from five sites.	Biedenharn, 1983
Fall River below Roaring River near Estes Park	Bedload transport and hydraulic geometry data.	Pitlick, 1984
Station 06758000 Kiowa Creek at Elbert Station 06758200 Kiowa Creek at Kiowa, and several sites near K-79 Reservoir	Suspended-sediment rating curves, total-sediment discharge, bed-material-size distributions, and reservoir-sedimentation rates.	Mundorff, 1964 and 1968
Station 06758500 South Platte River near Weldona, and 12 sites on nearby irrigation cannals	Suspended-sediment rating curves, daily and monthly sediment discharges, sediment-size distributions.	Ruddy, 1984
Station 06754000 South Platte River near Kersey Station 06758500 South Platte River near Weldona Station 06760000 South Platte River at Balzac Station 06764000 South Platte River at Julesburg	Total sediment-rating curves; suspended-sediment, bedload, and bed-material-size distributions; total sediment discharge; modified Einstein estimates of total-sediment discharge.	Kircher, 1983

Table 5.--*Summary of additional sediment studies and type of data*--Continued

Location of study sites	Type of data	Publication source
Las Animas and Otero Counties	Reservoir-sedimentation rates and sediment-yield estimates from 28 ponds.	Paul Von Guerard, U.S. Geological Survey, unpublished data, 1983
Station 09093700 Colorado River near De Beque	Suspended-sediment concentration and suspended-sediment discharge-rating curves, bedload-rating curve, bedload and suspended-sediment-size distributions, total-sediment discharge.	Butler, 1986
Yampa River and Little Snake River basins	Total-sediment loads, sediment-discharge-duration curves, sediment yields for 18 sites.	Andrews, 1978
Station 09260050 Yampa River at Deerlodge Park	Sediment-rating curves, total load, suspended load, bedload, sediment-size distributions, modified Einstein estimates of total-sediment load, cumulative load versus discharge curve.	Elliott and others, 1984

SUMMARY AND CONCLUSIONS

This report presents a collation of available sediment-data sources and estimates of annual suspended-sediment loads from selected rivers and streams in Colorado. Sediment data have been collected and analyzed by several government agencies at numerous sediment-data-collection sites in Colorado, but sources of these data have not been compiled previously in a single reference.

Sediment data from 243 sites have been collected by the U.S. Geological Survey and are located in the WATSTORE data storage and retrieval system. The data include: site number, station identification and name, suspended-sediment concentration, suspended-sediment discharge, water discharge, and occasionally suspended-sediment- or bed-material-size distributions. Sediment data also are routinely collected by the U.S. Forest Service, and many of these data are located in the STORET water-quality-control information system. Several other Federal and State agencies collect and analyze sediment data, but do not publish them. These data are in the possession of the collecting agency and are not included in this report.

Annual suspended-sediment loads were estimated for 133 U.S. Geological Survey sediment-data-collection sites using the daily mean water-discharge, sediment-transport-curve method. This method computed estimates of daily suspended-sediment discharges that were summed to produce estimates of annual suspended-sediment loads. Estimates of annual suspended-sediment loads were limited to U.S. Geological Survey sites because quality control of data collection and analysis at other agencies' sites was not verified. Sediment-transport curves were derived for each site by one of the following techniques: (1) Least-squares linear regression of all pairs of suspended-sediment discharge and water-discharge data; (2) least-squares linear regression of data sets subdivided on the basis of hydrograph periods; and (3) graphically fitted to a log plot of suspended-sediment discharge and water discharge. Data in each regression were log-normal transformed.

The accuracy of the three sediment-transport-curve derivation techniques was assessed by comparing annual suspended-sediment loads estimated by each technique with measured annual suspended-sediment loads from 19 control sites where daily suspended-sediment discharge measurements were available. No single rating-curve estimation technique consistently produced the best estimates; however, there was some indication that each technique was suitable under different conditions. The first sediment-transport-curve estimation technique, using all measurements, produced good estimates of annual suspended-sediment loads when the sample size was small (less than about 20 or 30), or when the distribution of the logarithm of sediment discharge and the logarithm of water discharge was linear and had a small standard error of estimate. The second technique, based on hydrograph periods, produced good estimates of annual suspended-sediment loads when streamflow was characterized by a pronounced snowmelt hydrograph, or when daily suspended-sediment discharge had seasonal hysteretic effects. The third technique, using a graphically fitted line, generally produced better estimates of annual suspended-sediment loads when there was an inflection in the sediment-discharge versus water-discharge plot, or if there was large variance in the data (standard error of estimate greater than about 135 percent). Annual suspended-sediment loads were estimated for each sediment-data-collection site using one of the three transport curves when at least 1 entire year of daily water-discharge data was available.

Estimated mean-annual suspended-sediment loads for 94 U.S. Geological Survey sediment-data-collection sites that have a minimum of 5 years of water-discharge record are presented in table 3 and on plate 2. Mean annual suspended-sediment loads from 19 of these sites are based entirely on measured daily suspended-sediment discharges. Some sediment-data-collection sites in the analysis had several decades of daily water-discharge record, but no more than about 35 years of record were used to compute the mean annual suspended-sediment load. The streamflows of several rivers with extensive discharge records were interrupted by construction of dams and diversions. When the effect of these structures was determined to be significant, mean annual suspended-sediment loads were computed for periods prior to and following completion of the structure.

Additional estimates of mean annual suspended-sediment loads for selected sediment-data-collection sites in Colorado have been cited in previous studies; suspended-sediment load estimates for the same site may vary because of use of different periods of record, use of different sediment-transport curves, or use of different suspended-sediment-load computation techniques.

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SUPPLEMENTAL DATA

(The site numbers in the following tables correspond to site numbers shown on plates 1, 2, or both.)

Table 6.--*Annual streamflows and estimated annual suspended-sediment loads for station 06611100 Grizzly Creek near Spicer (site 1)*

Latitude: 40°29'36" Longitude: 106°26'57"
Drainage area: 118.0 square miles
Published mean annual streamflow: (none) acre-feet, 3 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1977	12,360	569
1978	58,030	7,200
1979	62,410	8,510
Total	132,800	16,279
Mean	44,270	5,430

Table 7.--*Annual streamflows and estimated annual suspended-sediment loads for station 06611200 Buffalo Creek near Hebron (site 2)*

Latitude: 40°31'23" Longitude: 106°22'07"
Drainage area: 56.3 square miles
Published mean annual streamflow: (none) acre-feet, 4 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1977	953	39
1978	1,980	82
1979	6,370	269
1980	5,100	216
Total	14,403	606
Mean	3,600	152

Table 8.--*Annual streamflows and estimated annual suspended-sediment loads for station 06611300 Grizzly Creek near Hebron (site 3)*

Latitude: 40°33'27" Longitude: 106°23'22"
Drainage area: 223.0 square miles
Published mean annual streamflow: (none) acre-feet, 4 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1977	5,930	183
1978	45,630	2,780
1979	66,760	4,800
1980	45,560	3,080
Total	163,880	10,840
Mean	40,970	2,710

Table 9.--*Annual streamflows and estimated annual suspended-sediment loads for station 06611800 Little Grizzly Creek above Coalmont (site 4)*

Latitude: 40°34'24" Longitude: 106°30'34"
Drainage area: 35.4 square miles
Published mean annual streamflow: (none) acre-feet, 3 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1977	4,400	174
1978	31,050	2,700
1979	27,400	2,610
Total	62,850	5,484
Mean	20,950	1,830

Table 10.--*Annual streamflows and estimated annual suspended-sediment loads for station 06611900 Little Grizzly Creek above Hebron (site 5)*

Latitude: 40°37'57" Longitude: 106°26'58"
Drainage area: 52.2 square miles
Published mean annual streamflow: (none) acre-feet, 4 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1977	6,660	321
1978	37,760	3,340
1979	32,410	2,920
1980	29,460	2,560
Total	106,290	9,141
Mean	26,570	2,280

Table 11.--*Annual streamflows and estimated annual suspended-sediment loads for station 06619400 Canadian River near Lindland (site 6)*

Latitude: 40°41'43" Longitude: 106°03'56"
Drainage area: 44.0 square miles
Published mean annual streamflow: (none) acre-feet, 5 years
Annual suspended-sediment-load estimation technique: Measured daily and hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1979	12,660	[1]533
1980	13,060	[1]522
1981	10,750	[1]311
1982	15,690	508
1983	37,480	2,440
Total	89,640	4,314
Mean	17,930	863

[1]Computed from measured daily suspended-sediment discharges.

Table 12.--*Annual streamflows and estimated annual suspended-sediment loads for station 06619450 Canadian River near Brownlee (site 8)*

Latitude: 40°48'29" Longitude: 106°14'09"
Drainage area: 158.0 square miles
Published mean annual streamflow: (none) acre-feet, 5 years
Annual suspended-sediment-load estimation technique: Measured daily and hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1979	20,560	[1]2,090
1980	24,540	[1]2,890
1981	12,480	[1]528
1982	23,480	1,540
1983	70,410	12,800
Total	151,470	19,848
Mean	30,290	3,970

[1]Computed from measured daily suspended-sediment discharges.

Table 13.--*Annual streamflows and estimated annual suspended-sediment loads for station 06620000 North Platte River near Northgate (site 9)*

Latitude: 40°56'10" Longitude: 106°20'21"
Drainage area: 1,431.0 square miles
Published mean annual streamflow: 318,800 acre-feet, 69 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	242,200	11,500	1968	288,900	15,800
1951	327,000	19,700	1969	287,100	15,300
1952	493,700	48,400	1970	386,000	26,400
1953	197,400	8,910	1971	400,500	27,100
1954	104,900	2,160	1972	237,300	12,200
1955	161,200	5,570	1973	405,800	32,000
1956	271,500	16,000	1974	417,000	36,000
1957	563,200	63,100	1975	304,600	19,400
1958	273,800	16,400	1976	196,600	7,310
1959	219,400	10,000	1977	84,990	1,710
1960	273,700	14,600	1978	362,900	26,600
1961	233,600	10,600	1979	407,100	33,100
1962	522,500	46,300	1980	373,600	31,700
1963	182,900	6,730	1981	114,400	2,940
1964	174,000	6,890	1982	351,100	20,500
1965	411,100	32,000	1983	567,800	57,300
1966	162,400	4,150	1984	614,500	68,600
1967	274,300	14,900			
			Total	10,888,990	771,870
			Mean	311,100	22,100

Table 14.--*Annual streamflows and estimated annual suspended-sediment loads for station 06698500 Tarryall Creek near Jefferson (site 21)*

Latitude: 39°17'42" Longitude: 105°43'05"
Drainage area: 183.0 square miles
Published mean annual streamflow: 30,650 acre-feet, 9 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1978	21,000	851
1979	29,990	1,570
1980	32,560	1,540
1981	6,170	69
Total	89,720	4,030
Mean	22,430	1,010

Table 15.--*Annual streamflows and estimated annual suspended-sediment loads for station 06707000 North Fork South Platte River at South Platte (site 22)*

Latitude: 39°24'32" Longitude: 105°10'31"
Drainage area: 479.0 square miles
Published mean annual streamflow: 110,800 acre-feet, 70 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	62,750	1,460	1968	129,600	4,510
1951	94,110	6,260	1969	195,800	28,000
1952	110,500	13,500	1970	209,300	35,100
1953	74,390	2,940	1971	129,900	5,700
1954	42,290	353	1972	124,800	8,160
1955	63,800	1,100	1973	174,900	37,000
1956	76,710	3,180	1974	124,600	5,900
1957	162,900	24,400	1975	158,100	13,600
1958	99,150	8,000	1976	144,300	11,900
1959	70,900	2,080	1977	145,600	5,570
1960	90,420	3,640	1978	190,100	13,400
1961	95,480	3,140	1979	192,800	19,900
1962	106,900	4,560	1980	217,100	38,800
1963	40,650	279	1981	159,400	6,280
1964	81,500	1,870	1982	158,400	9,740
1965	181,200	22,700			
1966	86,210	1,780			
1967	122,100	3,780			
			Total	4,116,660	348,582
			Mean	124,700	10,600

Table 16.--*Annual streamflows and estimated annual suspended-sediment loads for station 06710000 South Platte River at Littleton (site 24)*

Latitude: 39°37'08" Longitude: 105°01'07"
Drainage area: 3,069.0 square miles
Published mean annual streamflow: 193,400 acre-feet, 9 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	94,210	4,090
1977	80,180	2,970
1978	63,770	2,270
1979	135,600	10,200
1980	356,900	47,700
1981	56,560	1,510
1982	92,190	4,350
1983	456,600	61,400
1984	405,800	50,000
Total	1,741,810	184,490
Mean	193,500	20,500

Table 17.--*Annual streamflows and estimated annual suspended-sediment loads for station 06719505 Clear Creek at Golden (site 27)*

Latitude: 39°45'11" Longitude: 105°14'05"
Drainage area: 400.0 square miles
Published mean annual streamflow: 142,000 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	142,000	17,100
1976	96,650	6,800
1977	78,730	4,980
1978	123,000	12,000
1979	144,400	15,700
1980	188,300	21,600
1981	79,440	5,140
1982	119,400	11,700
1983	228,500	37,000
1984	223,400	28,300
Total	1,423,820	160,320
Mean	142,400	16,000

Table 18.--*Annual streamflows and estimated annual suspended-sediment loads for station 06719725 Ralston Creek near Plainview (site 28)*

Latitude: 39°51'04" Longitude: 105°17'53"
Drainage area: 36.9 square miles
Published mean annual streamflow: (none) acre-feet, 1 year
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1984	8,150	509

Table 19.--*Annual streamflows and estimated annual suspended-sediment loads for station 06719735 Ralston Creek below Schwartzwalder Mine near Plainview (site 30)*

Latitude: 39°50'37" Longitude: 105°16'33"
Drainage area: 38.9 square miles
Published mean annual streamflow: (none) acre-feet, 1 year
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1984	9,880	811

Table 20.--*Annual streamflows and estimated annual suspended-sediment loads for station 06719740 Ralston Creek above Ralston Reservoir near Plainview (site 31)*

Latitude: 39°49'17" Longitude: 105°15'40"
Drainage area: 42.7 square miles
Published mean annual streamflow: (none) acre-feet, 1 year
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1984	7,240	506

Table 21.--*Annual streamflows and estimated annual suspended-sediment loads for station 06720330 Grange Hall Creek at Grant Park, at Northglenn (site 32)*

Latitude: 39°53'17" Longitude: 104°58'55"
Drainage area: 0.54 square miles
Published mean annual streamflow: (none) acre-feet, 1 year
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-ft)	Estimated annual suspended-sediment load (tons)
1979	295	133

Table 22.--*Annual streamflows and estimated annual suspended-sediment loads for station 06720415 Grange Hall Creek at Northglenn (site 33)*

Latitude: 39°53'21" Longitude: 104°57'40"
Drainage area: 3.08 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1979	1,510	3,260
1980	1,290	1,710
Total	2,800	4,970
Mean	1,400	2,480

Table 23.--*Annual streamflows and estimated annual suspended-sediment loads for station 06724000 Saint Vrain Creek at Lyons (site 34)*

Latitude: 40°13'05" Longitude: 105°15'34"
Drainage area: 212.0 square miles
Published mean annual streamflow: 93,460 acre-feet, 93 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	63,530	1,280	1968	67,290	1,270
1951	113,600	2,760	1969	131,200	3,930
1952	127,400	3,210	1970	98,480	2,130
1953	66,360	1,310	1971	103,400	2,320
1954	33,500	483	1972	65,240	1,240
1955	48,930	848	1973	103,900	2,440
1956	63,680	1,300	1974	69,180	1,330
1957	159,000	4,570	1975	90,840	2,010
1958	88,930	2,120	1976	54,700	952
1959	75,040	1,600	1977	40,110	609
1960	74,750	1,460	1978	101,400	2,430
1961	96,920	2,280	1979	119,300	2,890
1962	77,260	1,460	1980	145,200	3,850
1963	57,820	1,050	1981	42,590	623
1964	49,510	872	1982	86,720	1,880
1965	113,000	3,030	1983	144,900	3,770
1966	38,550	567	1984	125,200	2,910
1967	78,090	1,750			
			Total	3,015,520	68,534
			Mean	86,160	1,960

Table 24.--*Annual streamflows and estimated annual suspended-sediment loads for station 06725450 Saint Vrain Creek below Longmont (site 37)*

Latitude: 40°09'29" Longitude: 105°00'53"
Drainage area: 424.0 square miles
Published mean annual streamflow: 84,770 acre-feet, 6 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1977	39,680	4,800
1978	79,400	41,400
1979	111,600	77,000
1980	171,000	161,000
1981	44,610	5,930
1982	61,920	18,800
Total	508,210	308,930
Mean	84,700	51,500

Table 25.--*Annual streamflows and estimated annual suspended-sediment loads for station 06733000 Big Thompson River at Estes Park (site 38)*

Latitude: 40°22'42" Longitude: 105°30'48"
Drainage area: 137.0 square miles
Published mean annual streamflow: 92,010 acre-feet, 38 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1948	91,400	2,440	1967	80,710	2,140
1949	137,100	5,890	1968	80,730	2,150
1950	95,600	3,350	1969	103,500	3,430
1951	116,000	4,160	1970	106,500	3,480
1952	118,000	4,310	1971	104,800	3,500
1953	84,050	2,580	1972	77,250	1,940
1954	45,830	622	1973	100,300	3,280
1955	63,660	1,190	1974	79,560	2,000
1956	84,940	2,520	1975	93,950	2,860
1957	135,500	6,080	1976	65,140	1,350
1958	90,000	2,980	1977	46,790	714
1959	79,930	2,240	1978	113,100	4,550
1960	88,160	2,340	1979	112,400	4,100
1961	93,040	2,800	1980	119,300	4,850
1962	102,700	2,690	1981	55,740	1,100
1963	72,700	1,530	1982	89,690	2,410
1964	67,630	1,490	1983	133,800	6,020
1965	126,400	5,330	1984	114,500	3,740
1966	59,560	924			
			Total	3,429,960	109,080
			Mean	92,700	2,950

Table 26.--*Annual streamflows and estimated annual suspended-sediment loads for station 06752000 Cache La Poudre River at mouth of Canyon near Fort Collins (site 39)*

Latitude: 40°39'52" Longitude: 105°13'26"
Drainage area: 1,056.0 square miles
Published mean annual streamflow: (none) acre-feet, 25 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	212,700	8,170	1968	217,100	8,940
1951	297,100	15,400	1969	191,400	7,200
1952	273,500	12,100	1970	262,800	12,600
1953	162,800	5,720	1971	311,100	15,400
1954	100,100	2,220	1972	177,600	6,250
1955	144,300	4,640	1973	321,500	17,200
1956	216,000	8,800	1974	268,200	11,100
1957	322,500	20,700	1975	221,400	12,200
1958	240,700	10,300	1976	156,000	5,630
1959	213,500	7,980	1977	93,410	2,410
1960	205,500	7,790	1978	270,100	14,100
1961	270,300	11,900	1979	291,600	15,300
1962	273,400	10,800	1980	425,100	22,200
1963	110,900	2,600	1981	138,100	4,030
1964	160,700	5,800	1982	250,900	14,200
1965	281,100	16,300	1983	644,800	51,400
1966	98,290	2,160	1984	386,100	18,700
1967	166,200	6,730			
			Total	8,376,800	398,970
			Mean	239,300	11,400

Table 27.--*Annual streamflows and estimated annual suspended-sediment loads for station 06754000 South Platte River near Kersey (site 40)*

Latitude: 40°24'44" Longitude: 104°33'46"
Drainage area: 9,598.0 square miles
Published mean annual streamflow: 1,035,300 acre-feet, 9 years since completion of Chatfield dam
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1951	352,400	232,000			
1952	560,200	417,000			
1953	264,000	57,800			
1954	181,400	32,900			
1955	159,000	25,100			
1956	188,000	38,900			
1957	846,200	1,350,000			
1958	922,900	1,790,000			
1959	402,500	148,000			
1960	489,400	242,000			
1961	767,800	1,110,000			
1962	840,600	567,000			
1963	294,000	115,000			
1964	247,000	65,800			
1965	812,000	1,780,000			
1966	354,900	135,000			
1967	510,100	428,000	1976	428,900	157,000
1968	324,400	85,700	1977	330,000	104,000
1969	896,200	2,100,000	1978	460,300	247,000
1970	1,229,000	1,710,000	1979	1,054,000	2,220,000
1971	944,000	922,000	1980	1,830,000	5,570,000
1972	465,500	226,000	1981	423,100	163,000
1973	1,599,000	5,220,000	1982	476,900	324,000
1974	684,700	397,000	1983	2,629,000	9,010,000
1975	611,400	391,000	1984	1,686,000	2,680,000
Total	14,946,600	19,586,200	Total	9,318,200	20,475,000
Mean (Prior to completion of dam)	597,900	783,000	Mean (Since completion of dam)	1,035,000	2,275,000

Table 28.--*Annual streamflows and estimated annual suspended-sediment loads for station 06758000 Kiowa Creek at Elbert (site 41)*

Latitude: 39°12'35" Longitude: 104°32'00"
Drainage area: 28.6 square miles
Published mean annual streamflow: 644 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Graphical fit and measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1956	0	0
1957	129	864
1958	19	34
1959	0	0
1960	857	6,550
1961	7	4
1962	11	1
1963	0	0
1964	0	0
1965	5,420	[1]314,000
Total	6,443	321,453
Mean	644	32,100

[1]Computed from measured daily suspended-sediment discharges.

Table 29.--*Annual streamflows and estimated annual suspended-sediment loads for station 06758100 West Kiowa Creek at Elbert (site 42)*

Latitude: 39°12'38" Longitude: 104°32'16"
Drainage area: 35.9 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1963	172	[1]1,530
1965	2,220	[1]96,400
Total	2,392	97,930
Mean	1,200	49,000

[1]Computed from measured daily suspended-sediment discharges.

Table 30.--*Annual streamflows and estimated annual suspended-sediment loads for station 06758200 Kiowa Creek at Kiowa (site 43)*

Latitude: 39°20'14" Longitude: 104°28'30"
Drainage area: 111.0 square miles
Published mean annual streamflow: 2,750 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Graphical fit and measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1956	1,050	17,800
1957	5,230	[1]100,000
1958	1,570	[1]3,280
1959	886	1,170
1960	5,870	125,000
1961	1,930	[1]3,870
1962	1,930	[1]903
1963	1,060	12,300
1964	873	1,370
1965	7,190	[1]353,000
Total	27,589	618,693
Mean	2,760	61,900

[1]Computed from measured daily suspended-sediment discharges.

Table 31.--*Annual streamflows and estimated annual suspended-sediment loads for station 06758500 South Platte River near Weldona (site 44)*

Latitude: 40°19'19" Longitude: 103°55'17"
Drainage area: 13,245.0 square miles
Published mean annual streamflow: 753,500 acre-feet, 9 years
Annual suspended-sediment-load estimation technique: Hydrograph periods and measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	251,500	54,600
1977	167,400	30,500
1978	218,800	[1]42,600
1979	680,900	435,000
1980	1,399,000	1,120,000
1981	269,200	59,500
1982	252,100	88,500
1983	2,168,000	2,290,000
1984	1,370,000	864,000
Total	6,776,900	4,984,700
Mean	753,000	554,000

[1]Computed from measured daily suspended-sediment discharges.

Table 32.--*Annual streamflows and estimated annual suspended-sediment loads for station 06764000 South Platte River at Julesburg (site 45)*

Latitude: 40°58'46" Longitude: 102°15'15"
Drainage area: 23,138.0 square miles
Published mean annual streamflow: 385,400 acre-feet, 82 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1951	193,600	78,000	1968	201,800	171,000
1952	337,700	234,000	1969	475,700	780,000
1953	148,100	51,600	1970	816,600	1,060,000
1954	101,000	29,400	1971	588,100	580,000
1955	73,100	17,300	1972	200,400	86,100
1956	55,390	10,300	1973	1,101,000	2,420,000
1957	379,800	557,000	1974	487,200	382,000
1958	657,600	888,000	1975	255,400	154,000
1959	249,200	142,000	1976	162,000	69,000
1960	202,600	96,900	1977	110,300	35,300
1961	327,200	407,000	1978	72,520	16,700
1962	614,600	517,000	1979	474,800	679,000
1963	183,100	82,600	1980	1,370,000	3,060,000
1964	102,500	28,000	1981	233,000	120,000
1965	438,200	1,250,000	1982	138,700	52,900
1966	374,900	253,000	1983	2,087,000	5,270,000
1967	259,200	218,000	1984	1,287,000	1,900,000
			Total	14,759,310	21,696,100
			Mean	434,100	638,000

Table 33.--*Annual streamflows and estimated annual suspended-sediment loads for station 06822000 North Fork Republican River near Wray (site 46)*

Latitude: 40°04'24" Longitude: 102°17'06"
Drainage area: 1,019.0 square miles
Published mean annual streamflow: 16,000 acre-feet, 17 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1952	17,080	(2)
1953	16,300	(2)
1954	15,840	(2)
1955	16,180	(2)
1956	16,110	(2)
1957	17,100	(2)
1963	16,340	[1]3,230
1964	16,100	(2)
Total	131,050	(2)
Mean	16,380	(2)

[1]Computed from measured daily suspended-sediment discharges.
[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 34.--*Annual streamflows and estimated annual suspended-sediment loads for station 07083000 Halfmoon Creek near Malta (site 47)*

Latitude: 39°10'20" Longitude: 106°23'19"
Drainage area: 23.6 square miles
Published mean annual streamflow: 21,010 acre-feet, 38 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1948	19,820	326	1967	16,340	231
1949	22,090	378	1968	19,800	306
1950	15,600	224	1969	18,370	250
1951	23,430	376	1970	26,810	487
1952	25,370	425	1971	21,380	346
1953	19,670	311	1972	19,950	342
1954	14,040	178	1973	19,670	310
1955	15,240	199	1974	15,450	235
1956	17,310	295	1975	20,000	289
1957	33,530	593	1976	15,560	220
1958	21,090	377	1977	10,370	121
1959	20,260	352	1978	22,950	409
1960	21,690	350	1979	24,020	425
1961	18,120	255	1980	24,330	484
1962	25,570	400	1981	14,680	190
1963	14,640	188	1982	22,300	322
1964	16,200	208	1983	27,740	456
1965	29,660	478	1984	35,560	669
1966	18,460	242			
			Total	767,070	12,247
			Mean	20,730	331

Table 35.--*Annual streamflows and estimated annual suspended-sediment loads for station 07093740 Badger Creek, Upper Station, near Howard (site 48)*

Latitude: 38°39'25" Longitude: 105°48'45"
Drainage area: 106.0 square miles
Published mean annual streamflow: (none) acre-feet, 3 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1982	3,370	3,500
1983	4,210	30,800
1984	3,580	4,440
Total	11,160	38,740
Mean	3,720	12,900

Table 36.--*Annual streamflows and estimated annual suspended-sediment loads for station 07093775 Badger Creek, Lower Station, near Howard (site 49)*

Latitude: 38°57'59" Longitude: 105°51'06"
Drainage area: 211.0 square miles
Published mean annual streamflow: (none) acre-feet, 3 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load. (tons)
1982	3,840	550
1983	7,740	50,600
1984	6,520	67,600
Total	18,100	118,750
Mean	6,030	39,600

Table 37.--*Annual streamflows and estimated annual suspended-sediment loads for station 07094500 Arkansas River at Parkdale (site 50)*

Latitude: 38°29'14" Longitude: 105°22'23"
Drainage area: 2,548.0 square miles
Published mean annual streamflow: 579,600 acre-feet, 30 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
			1969	572,300	158,000
			1970	711,400	324,000
1946	485,100	116,000	1971	603,800	151,000
1947	655,700	352,000	1972	530,000	132,000
1948	682,300	376,000	1973	590,600	226,000
1949	702,100	409,000	1974	510,400	86,300
1950	475,200	96,800	1975	601,100	245,000
1951	552,300	171,000	1976	464,800	66,500
1952	744,300	504,000	1977	288,600	11,400
1953	556,500	247,000	1978	479,100	179,000
1954	351,400	29,600	1979	658,500	412,000
1955	385,800	45,400	1980	755,300	600,000
1965	747,700	438,000	1981	375,200	30,800
1966	516,500	57,500	1982	607,300	170,000
1967	432,300	62,700	1983	885,700	872,000
1968	554,900	163,000	1984	921,000	763,000
Total	7,842,100	3,068,000	Total	9,555,100	4,427,000
Mean	560,200	219,000	Mean	597,200	277,000
(Prior to completion of dam)			(Since completion of dam)		

Table 38.--*Annual streamflows and estimated annual suspended-sediment loads for station 07096000 Arkansas River at Canon City (site 51)*

Latitude: 38°26'02" Longitude: 105°15'24"
Drainage area: 3,117.0 square miles
Published mean annual streamflow: 518,000 acre-feet, 93 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	403,100	62,400	1966	474,700	64,700
1951	456,200	85,400	1967	390,500	62,000
1952	625,400	171,000	1968	538,100	128,000
1953	468,800	107,000	1969	516,700	117,000
1954	284,800	25,300	1970	747,700	235,000
1955	329,900	37,900	1971	555,800	111,000
1956	415,000	84,400	1972	456,700	87,700
1957	909,500	552,000	1973	580,500	166,000
1958	600,100	147,000	1974	449,400	73,000
1959	393,900	61,600	1975	573,200	158,000
1960	518,400	110,000	1976	414,800	61,600
1961	449,400	73,600	1977	238,100	15,700
1962	691,400	167,000	1978	433,700	105,000
1963	327,000	33,600	1979	596,200	201,000
1964	378,600	64,400	1980	703,800	261,000
1965	771,900	294,000	1981	310,700	26,900
			Total	16,004,000	3,950,200
			Mean	500,100	123,000

Table 39.--*Annual streamflows and estimated annual suspended-sediment loads for station 07097000 Arkansas River at Portland (site 52)*

Latitude: 38°23'18" Longitude: 105°00'56"
Drainage area: 4,024.0 square miles
Published mean annual streamflow: 557,900 acre-feet, 23 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1940	262,300	29,800
1941	553,300	349,000
1942	880,100	914,000
1943	601,700	242,000
1944	515,700	262,000
1945	445,400	152,000
1946	433,500	130,000
1947	663,200	591,000
1948	683,300	511,000
1949	680,800	643,000
1950	401,700	116,000
1951	428,800	160,000
1952	612,300	422,000
1975	563,100	371,000
1976	414,900	120,000
1977	228,100	17,300
1978	404,000	216,000
1979	573,800	467,000
1980	750,000	858,000
1981	304,900	33,900
1982	569,300	236,000
1983	906,600	1,120,000
1984	954,500	1,100,000
Total	12,831,300	9,061,000
Mean	557,900	394,000

Table 40.--*Annual streamflows and estimated annual suspended-sediment loads for station 07099200 Arkansas River near Portland (site 53)*

Latitude: 38°20'14" Longitude: 104°56'18"
Drainage area: 4,280.0 square miles
Published mean annual streamflow: 565,800 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1965	749,700	1,320,000
1966	550,700	293,000
1967	411,200	237,000
1968	543,700	535,000
1969	556,200	518,000
1970	757,400	968,000
1971	569,800	414,000
1972	457,800	325,000
1973	623,700	827,000
1974	439,400	230,000
Total	5,659,600	5,667,000
Mean	566,000	567,000

Table 41.--*Annual streamflows and estimated annual suspended-sediment loads for station 07099400 Arkansas River above Pueblo (site 54)*

Latitude: 38°16'17" Longitude: 104°43'06"
Drainage area: 4,670.0 square miles
Published mean annual streamflow: 499,900 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
			1975	497,200	1,240,000
			1976	359,300	433,000
1966	412,200	340,000	1977	191,900	86,500
1967	334,300	346,000	1978	349,100	598,000
1968	454,700	771,000	1979	511,900	1,300,000
1969	437,700	689,000	1980	718,800	2,160,000
1970	677,500	1,360,000	1981	269,800	223,000
1971	477,900	530,000	1982	522,500	1,120,000
1972	398,300	466,000	1983	688,400	2,660,000
1973	532,400	1,140,000	1984	890,600	3,310,000
Total	3,725,000	5,642,000	Total	4,999,500	13,130,500
Mean (Prior to completion of dam)	465,600	705,000	Mean (Since completion of dam)	500,000	1,310,000

Table 42.--*Annual streamflows and estimated annual suspended-sediment loads for station 07099500 Arkansas River near Pueblo (site 55)*

Latitude: 38°16'02" Longitude: 104°39'26"
Drainage area: 4,686.0 square miles
Published mean annual streamflow: 513,700 acre-feet, 80 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	342,900	300,000
1951	346,100	362,000
1952	557,400	1,050,000
1953	386,200	554,000
1954	224,600	117,000
1955	266,300	335,000
1956	336,300	479,000
1957	980,100	5,530,000
1958	497,000	720,000
1959	337,100	257,000
1960	467,600	482,000
1961	423,400	404,000
1962	633,900	821,000
1963	283,300	141,000
1964	319,700	295,000
1965	743,000	2,400,000
1966	438,800	329,000
1967	338,300	289,000
1968	491,100	711,000
1969	455,900	545,000
1970	691,500	1,280,000
1971	507,100	505,000
1972	407,700	444,000
1973	570,000	1,080,000
Total	11,045,300	19,430,000
Mean	460,200	810,000

Table 43.--*Annual streamflows and estimated annual suspended-sediment loads for station 07118500 Apishapa River at Aguilar (site 56)*

Latitude: 37°24'01" Longitude: 104°38'29"
Drainage area: 149.0 square miles
Published mean annual streamflow: (none) acre-feet, 4 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1939	2,510	10,500
1979	2,370	23,600
1980	10,030	141,000
1981	3,850	33,800
Total	18,760	208,900
Mean	4,690	52,200

Table 44.--*Annual streamflows and estimated annual suspended-sediment loads for station 07124050 Middle Fork Purgatoire River at Stonewall (site 58)*

Latitude: 37°09'10" Longitude: 105°00'45"
Drainage area: 52.1 square miles
Published mean annual streamflow: (none) acre-feet, 3 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1979	13,110	1,220
1980	17,780	2,040
1981	9,920	750
Total	40,810	4,010
Mean	13,600	1,340

Table 45.--*Annual streamflows and estimated annual suspended-sediment loads for station 07124120 Sarcillo Canyon near Segundo (site 60)*

Latitude: 37°07'26" Longitude: 104°45'49"
Drainage area: 35.3 square miles
Published mean annual streamflow: (none) acre-feet, 1 year
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1979	1,570	102,000

Table 46.--*Annual streamflows and estimated annual suspended-sediment loads for station 07124200 Purgatoire River at Madrid (site 61)*

Latitude: 37°07'46" Longitude: 104°38'20"
Drainage area: 550.0 square miles
Published mean annual streamflow: 49,120 acre-feet, 12 years
Annual suspended-sediment-load estimation technique: Graphical fit and measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1973	45,900	66,200
1974	15,640	1,180
1975	34,850	32,900
1976	23,320	30,500
1977	19,080	5,680
1978	35,280	58,900
1979	57,520	[1]696,000
1980	75,550	[1]122,000
1981	53,300	[1]1,450,000
1982	65,750	134,000
1983	105,000	553,000
1984	58,530	92,000
Total	589,720	3,242,360
Mean	49,140	270,000

[1]Computed from measured daily suspended-sediment discharges.

Table 47.--*Annual streamflows and estimated annual suspended-sediment loads for station 07124220 Reilly Canyon at Cokedale (site 63)*

Latitude: 37°08'43" Longitude: 104°37'07"
Drainage area: 35.1 square miles
Published mean annual streamflow: (none) acre-feet, 1 year
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1979	1,110	59,300

Table 48.--*Annual streamflows and estimated annual suspended-sediment loads for station 07124410 Purgatoire River below Trinidad Lake (site 65)*

Latitude: 37°08'37" Longitude: 104°32'49"
Drainage area: 672.0 square miles
Published mean annual streamflow: 59,920 acre-feet, 7 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1978	30,970	[1]23,800
1979	35,650	[1]34,400
1980	53,530	([2])
1981	55,940	([2])
1982	62,320	([2])
1983	106,100	[1]2,810
1984	75,610	[1]2,640
Total	420,120	63,650
Mean	60,020	15,900

[1]Computed from measured daily suspended-sediment discharges.
[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 49.--*Annual streamflows and estimated annual suspended-sediment loads for station 07126300 Purgatoire River near Thatcher (site 66)*

Latitude: 37°21'30" Longitude: 103°53'44"
Drainage area: 1,791.0 square miles
Published mean annual streamflow: 64,340 acre-feet, 8 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1967	61,560	1,020,000	1977	29,440	375,000
1968	37,110	165,000	1978	24,700	222,000
1969	46,230	2,130,000	1979	45,150	744,000
1970	26,580	16,500	1980	54,620	498,000
1971	18,250	6,000	1981	131,000	10,600,000
1972	14,920	52,400	1982	50,330	278,000
1973	41,760	231,000	1983	127,400	1,270,000
1974	10,770	1,230	1984	52,020	60,000
1975	8,460	4,810			
1976	8,910	26,800			
Total	274,550	3,653,740	Total	514,660	14,047,000
Mean (Prior to completion of dam)	27,460	365,000	Mean (Since completion of dam)	64,330	1,760,000

Table 50.--*Annual streamflows and estimated annual suspended-sediment loads for station 07130500 Arkansas River below John Martin Reservoir (site 69)*

Latitude: 38°05'02" Longitude: 102°55'10"
Drainage area: 18,915.0 square miles
Published mean annual streamflow: 169,500 acre-feet, 36 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1949	212,200	373,000	1967	267,800	537,000
1950	214,300	358,000	1968	172,900	281,000
1951	182,500	307,000	1969	140,200	217,000
1952	176,900	268,000	1970	187,900	323,000
1953	158,600	284,000	1971	143,700	205,000
1954	116,400	211,000	1972	120,700	181,000
1955	248,500	573,000	1973	147,000	266,000
1956	160,900	275,000	1974	98,460	144,000
1957	203,200	435,000	1975	91,820	133,000
1958	191,500	347,000	1976	73,050	100,000
1959	297,600	614,000	1977	99,930	161,000
1960	117,600	201,000	1978	100,300	181,000
1961	130,400	186,000	1979	134,900	208,000
1962	168,500	270,000	1980	247,800	614,000
1963	89,670	131,000	1981	173,500	268,000
1964	59,880	86,200	1982	205,300	364,000
1965	280,100	919,000	1983	283,600	646,000
1966	348,300	641,000	1984	303,800	664,000
			Total	6,349,710	11,972,200
			Mean	176,400	333,000

Table 51.--*Annual streamflows and estimated annual suspended-sediment loads for station 08224110 San Luis Creek near Poncha Pass (site 70)*

Latitude: 38°24'22" Longitude: 106°03'49"
Drainage area: 6.57 square miles
Published mean annual streamflow: 732 acre-feet, 5 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1980	968	441
1981	642	114
1982	614	110
1983	614	126
1984	820	231
Total	3,658	1,022
Mean	732	204

Table 52.--*Annual streamflows and estimated annual suspended-sediment loads for station 08224113 San Luis Creek above Villa Grove (site 71)*

Latitude: 38°24'04" Longitude: 106°03'51"
Drainage area: 11.2 square miles
Published mean annual streamflow: (none) acre-feet, 5 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1980	995	401
1981	654	107
1982	609	97
1983	649	128
1984	829	251
Total	3,736	984
Mean	747	197

Table 53.--*Annual streamflows and estimated annual suspended-sediment loads for station 08251500 Rio Grande near Lobatos (site 72)*

Latitude: 37°04'42" Longitude: 105°45'22"
Drainage area: 7,700.0 square miles
Published mean annual streamflow: 304,300 acre-feet, 54 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1952	447,900	239,000	1969	325,100	37,408
1953	134,600	4,530	1970	365,300	32,100
1954	71,570	1,940	1971	230,600	13,200
1955	62,140	1,510	1972	172,500	6,670
1956	76,670	2,240	1973	513,100	197,000
1957	382,800	171,000	1974	167,600	6,550
1958	409,400	242,000	1975	399,600	87,800
1959	77,620	2,150	1976	313,400	23,000
1960	210,500	18,400	1977	71,810	1,890
1961	143,600	6,810	1978	145,800	5,640
1962	326,600	56,600	1979	646,000	544,000
1963	101,700	3,420	1980	444,600	207,000
1964	51,470	1,220	1981	107,200	3,140
1965	418,600	171,000	1982	412,700	57,300
1966	294,100	16,700	1983	438,300	112,000
1967	176,200	7,940	1984	382,900	126,000
1968	329,000	55,900			
			Total	8,850,980	2,463,058
			Mean	268,200	74,600

Table 54.--*Annual streamflows and estimated annual suspended-sediment loads for station 09049200 West Tenmile Creek at Copper Mountain (site 78)*

Latitude: 30°30'01" Longitude: 106°09'56"
Drainage area: 21.0 square miles
Published mean annual streamflow: 21,230 acre-feet, 6 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1974	21,600	[1]12,900
1975	20,830	[1]1,220
1976	18,620	[1]644
1977	13,980	[1]382
1978	28,850	[1]1,090
1979	23,390	[1]642
Total	127,270	16,878
Mean	21,210	2,810

[1]Computed from measured daily suspended-sediment discharges.

Table 55.--*Annual streamflows and estimated annual suspended-sediment loads for station 09066050 Black Gore Creek near Vail (site 82)*

Latitude: 39°37'26" Longitude: 106°16'47"
Drainage area: 19.6 square miles
Published mean annual streamflow: 20,720 acre-feet, 6 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1974	24,620	[1]4,690
1975	19,420	[1]1,710
1976	16,270	[1]664
1977	10,690	[1]351
1978	27,540	[1]1,430
1979	26,010	[1]729
Total	124,550	9,574
Mean	20,760	1,600

[1]Computed from measured daily suspended-sediment discharges.

Table 56.--*Annual streamflows and estimated annual suspended-sediment loads for station 09066250 Gore Creek at Vail (site 83)*

Latitude: 39°38'35" Longitude: 106°20'44"
Drainage area: 55.0 square miles
Published mean annual streamflow: 69,260 acre-feet, 6 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1974	76,870	[1]3,600
1975	72,290	[1]2,670
1976	54,160	[1]1,150
1977	36,300	[1]989
1978	87,980	[1]4,720
1979	87,390	[1]2,850
Total	414,990	15,979
Mean	69,160	2,660

[1]Computed from measured daily suspended-sediment discharges.

Table 57.--*Annual streamflows and estimated annual suspended-sediment loads for station 09070000 Eagle River below Gypsum (site 85)*

Latitude: 39°38'58" Longitude: 106°57'11"
Drainage area: 944.0 square miles
Published mean annual streamflow: 419,500 acre-feet, 38 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1948	475,700	100,000	1967	315,900	44,700
1949	460,200	91,900	1968	368,900	61,800
1950	396,300	70,300	1969	361,500	52,200
1951	464,200	92,700	1970	477,000	96,300
1952	580,700	143,000	1971	456,100	81,800
1953	402,900	80,600	1972	364,200	60,500
1954	221,100	20,700	1973	454,400	91,600
1955	292,300	35,500	1974	441,100	83,300
1956	391,700	76,800	1975	427,800	83,000
1957	622,900	173,000	1976	341,800	48,200
1958	430,300	96,000	1977	191,100	16,500
1959	366,100	68,400	1978	457,900	98,900
1960	407,000	72,300	1979	506,300	114,000
1961	295,700	38,500	1980	395,200	70,800
1962	563,800	118,000	1981	248,700	28,400
1963	258,100	25,900	1982	456,500	86,200
1964	310,100	46,400	1983	602,300	160,000
1965	522,900	115,000	1984	785,500	229,000
1966	285,100	32,200			
			Total	15,399,300	3,004,400
			Mean	416,200	81,200

Table 58.--*Annual streamflows and estimated annual suspended-sediment loads for station 09070500 Colorado River near Dotsero (site 86)*

Latitude: 39°38'40" Longitude: 107°04'40"
Drainage area: 4,394.0 square miles
Published mean annual streamflow: 1,548,000 acre-feet, 44 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	1,343,000	598,000	1968	1,260,000	428,000
1951	1,715,000	1,350,000	1969	1,337,000	399,000
1952	2,218,000	3,230,000	1970	1,910,000	1,860,000
1953	1,475,000	965,000	1971	1,901,000	1,260,000
1954	830,000	77,400	1972	1,391,000	507,000
1955	969,900	182,000	1973	1,759,000	1,130,000
1956	1,424,000	966,000	1974	1,824,000	1,280,000
1957	2,293,000	3,800,000	1975	1,576,000	746,000
1958	1,604,000	1,570,000	1976	1,251,000	287,000
1959	1,212,000	434,000	1977	808,600	64,500
1960	1,418,000	573,000	1978	1,436,000	898,000
1961	1,052,000	218,000	1979	1,680,000	1,310,000
1962	2,317,000	2,130,000	1980	1,583,000	960,000
1963	1,005,000	127,000	1981	954,000	211,000
1964	959,200	228,000	1982	1,369,000	543,000
1965	1,584,000	915,000	1983	2,358,000	3,590,000
1966	1,076,000	136,000	1984	3,030,000	6,070,000
1967	1,074,000	243,000			
			Total	49,966,700	39,285,900
			Mean	1,428,000	1,120,000

Table 59.--*Annual streamflows and estimated annual suspended-sediment loads for station 09085000 Roaring Fork River at Glenwood Springs (site 90)*

Latitude: 39°32'37" Longitude: 107°19'44"
Drainage area: 1,451.0 square miles
Published mean annual streamflow: 896,200 acre-feet, 13 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1960	772,000	108,000	1972	798,500	95,500
1961	630,200	69,400	1973	1,015,000	176,000
1962	1,136,000	230,000	1974	814,900	90,700
1963	554,100	35,400	1975	890,900	134,000
1964	709,100	98,300	1976	699,100	57,200
1965	1,169,000	285,000	1977	351,500	10,600
1966	676,900	54,300	1978	840,700	143,000
1967	749,900	102,000	1979	1,077,000	224,000
1968	815,100	136,000	1980	979,200	174,000
1969	823,500	104,000	1981	539,200	34,700
1970	1,041,000	182,000	1982	931,700	120,000
1971	981,600	143,000	1983	1,198,000	306,000
			1984	1,519,000	474,000
Total	10,058,800	1,547,400	Total	11,654,700	2,039,700
Mean (Prior to diversion)	838,200	129,000	Mean (Since diversion)	896,500	157,000

Table 60.--*Annual streamflows and estimated annual suspended-sediment loads for station 09092850 East Middle Fork Parachute Creek near Rio Blanco (site 92)*

Latitude: 39°37'15" Longitude: 108°01'46"
Drainage area: 22.1 square miles
Published mean annual streamflow: 6,990 acre-feet, 7 years
Annual suspended-sediment-load estimation technique: Hydrograph periods and measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1977	489	29
1978	5,200	[1]3,110
1979	8,410	[1]15,600
1980	7,690	[1]2,760
1981	1,020	[1]54
1982	4,160	1,690
1983	21,910	50,600
Total	48,879	73,843
Mean	6,980	10,500

[1]Computed from measured daily suspended-sediment discharges.

Table 61.--*Annual streamflows and estimated annual suspended-sediment loads for station 09092970 East Fork Parachute Creek near Rulison (site 93)*

Latitude: 39°34'03" Longitude: 108°01'14"
Drainage area: 20.4 square miles
Published mean annual streamflow: 7,010 acre-feet, 6 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1978	5,270	1,640
1979	9,090	7,110
1980	8,790	6,220
1981	634	16
1982	4,340	1,200
1983	13,960	13,700
Total	42,084	29,886
Mean	7,010	4,980

Table 62.--*Annual streamflows and estimated annual suspended-sediment loads for station 09093000 Parachute Creek near Parachute (site 94)*

Latitude: 39°34'01" Longitude: 108°06'37"
Drainage area: 141.0 square miles
Published mean annual streamflow: 19,630 acre-feet, 21 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1965	14,300	13,600
1966	6,590	2,620
1967	3,950	1,030
1968	14,310	13,200
1969	22,030	31,600
1970	14,000	12,700
1976	10,690	6,650
1977	1,560	336
1978	17,010	17,700
1979	38,240	81,700
1980	31,360	48,700
1981	5,060	1,080
1982	13,280	8,540
1983	65,380	167,000
1984	65,180	182,000
Total	322,940	588,456
Mean	21,530	39,200

Table 63.--*Annual streamflows and estimated annual suspended-sediment loads for station 09093500 Parachute Creek at Parachute (site 95)*

Latitude: 39°27'11" Longitude: 108°03'33"
Drainage area: 198.0 square miles
Published mean annual streamflow: 22,390 acre-feet, 20 years
Annual suspended-sediment-load estimation technique: Graphical fit and measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1949	24,920	41,100
1950	15,150	9,420
1951	6,200	1,090
1952	42,630	194,000
1953	8,720	3,520
1954	6,460	1,620
1975	27,280	[1]42,400
1976	14,200	[1]88,400
1977	4,080	[1]30,300
1978	21,470	[1]60,500
1979	40,300	[1]164,000
1980	46,830	[1]127,000
1981	9,160	1,620
1982	20,660	19,600
Total	288,060	784,570
Mean	20,600	56,000

[1]Computed from measured daily suspended-sediment discharges.

Table 64.--*Annual streamflows and estimated annual suspended-sediment loads for station 09093700 Colorado River near De Beque (site 96)*

Latitude: 39°21'45" Longitude: 108°09'07"
Drainage area: 7,370.0 square miles
Published mean annual streamflow: 2,795,000 acre-feet, 18 years
Annual suspended-sediment-load estimation technique: Hydrograph periods and measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1967	2,067,000	1,240,000
1968	2,346,000	1,450,000
1969	2,478,000	1,690,000
1970	3,326,000	4,150,000
1971	3,276,000	2,560,000
1972	2,407,000	1,430,000
1973	3,166,000	2,840,000
1974	2,814,000	2,470,000
1975	2,806,000	[1]967,000
1976	2,169,000	[1]332,000
1977	1,292,000	249,000
1978	2,508,000	1,930,000
1979	3,048,000	3,170,000
1980	2,865,000	2,440,000
1981	1,584,000	517,000
1982	2,645,000	1,730,000
1983	4,219,000	5,000,000
1984	5,307,000	10,700,000
Total	50,323,000	44,865,000
Mean	2,796,000	2,490,000

[1]Computed from measured daily suspended-sediment discharges.

Table 65.--*Annual streamflows and estimated annual suspended-sediment loads for station 09095000 Roan Creek near De Beque (site 97)*

Latitude: 39°27'12" Longitude: 108°18'59"
Drainage area: 321.0 square miles
Published mean annual streamflow: 30,650 acre-feet, 22 years
Annual suspended-sediment-load estimation technique: Hydrograph periods and measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1963	11,580	3,030
1964	7,600	2,050
1965	26,280	55,500
1966	16,230	8,440
1967	10,840	3,330
1968	25,970	46,200
1969	46,080	162,000
1970	18,540	10,100
1971	11,410	3,560
1972	10,290	3,070
1975	37,450	83,800
1976	22,160	[1]18,500
1977	8,540	[1]19,700
1978	35,750	[1]121,000
1979	56,610	[1]221,000
1980	94,860	[1]498,000
1981	17,410	5,120
Total	457,600	1,264,400
Mean	26,920	74,400

[1]Computed from measured daily suspended-sediment discharges.

Table 66.--*Annual streamflows and estimated annual suspended-sediment loads for station 09095400 Dry Fork near De Beque (site 98)*

Latitude: 39°22'08" Longitude: 108°15'41"
Drainage area: 109.0 square miles
Published mean annual streamflow: 3,460 acre-feet, 8 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	534	361
1976	1,040	570
1977	430	369
1978	3,310	8,320
1979	6,350	20,700
1980	12,140	102,000
1981	2,280	530
1982	1,650	1,070
Total	27,734	133,920
Mean	3,470	16,700

Table 67.--*Annual streamflows and estimated annual suspended-sediment loads for station 09095500 Colorado River near Cameo (site 99)*

Latitude: 39°14'20" Longitude: 108°16'00"
Drainage area: 8,050 square miles
Published mean annual streamflow: 2,826,000 acre-feet, 51 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	2,557,000	1,940,000	1968	2,413,000	1,370,000
1951	2,911,000	2,950,000	1969	2,576,000	2,520,000
1952	4,130,000	7,870,000	1970	3,276,000	6,010,000
1953	2,573,000	1,940,000	1971	3,362,000	2,870,000
1954	1,552,000	747,000	1972	2,558,000	1,680,000
1955	1,976,000	1,200,000	1973	3,246,000	3,420,000
1956	2,416,000	3,690,000	1974	2,927,000	3,670,000
1957	4,213,000	4,290,000	1975	2,892,000	1,930,000
1958	2,902,000	6,040,000	1976	2,273,000	1,410,000
1959	2,188,000	1,480,000	1977	1,402,000	383,000
1960	2,462,000	1,950,000	1978	2,570,000	2,050,000
1961	1,887,000	1,230,000	1979	3,085,000	3,970,000
1962	4,001,000	8,050,000	1980	3,040,000	3,350,000
1963	1,749,000	864,000	1981	1,551,000	559,000
1964	1,903,000	1,710,000	1982	2,608,000	1,760,000
1965	3,152,000	2,600,000	1983	4,399,000	4,740,000
1966	1,956,000	1,070,000	1984	5,521,000	16,800,000
1967	2,112,000	1,460,000			
			Total	96,339,000	109,573,000
			Mean	2,753,000	3,130,000

Table 68.--*Annual streamflows and estimated annual suspended-sediment loads for station 09129800 Clear Fork near Ragged Mountain (site 100)*

Latitude: 39°08'36" Longitude: 107°25'50"
Drainage area: 38.5 square miles
Published mean annual streamflow: 26,660 acre-feet, 8 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1966	19,000	2,770
1967	16,710	2,160
1968	31,360	10,100
1969	27,230	6,660
1970	33,680	11,000
1971	29,540	5,400
1972	17,140	1,780
1973	38,450	15,180
Total	213,110	55,050
Mean	26,640	6,880

Table 69.--*Annual streamflows and estimated annual suspended-sediment loads for station 09131100 Cow Creek near Paonia (site 101)*

Latitude: 39°06'15" Longitude: 107°35'02"
Drainage area: 12.0 square miles
Published mean annual streamflow: 5,720 acre-feet, 14 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1969	7,240	297
1970	6,530	243
1971	5,880	210
1972	3,420	107
1973	10,150	477
1974	2,530	82
1975	7,260	333
1976	3,890	153
1977	437	10
1978	5,730	256
1979	7,920	369
1980	8,290	390
1981	1,450	40
1982	9,340	393
Total	80,067	3,360
Mean	5,720	240

Table 70.--*Annual streamflows and estimated annual suspended-sediment loads for station 09132050 Anthracite Creek near Somerset (site 102)*

Latitude: 38°57'14" Longitude: 107°16'23"
Drainage area: 94.6 square miles
Published mean annual streamflow: (none) acre-feet, 4 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1978	149,200	14,800
1979	171,800	22,100
1980	151,000	16,000
1981	72,710	4,110
Total	544,710	57,010
Mean	136,200	14,300

Table 71.--*Annual streamflows and estimated annual suspended-sediment loads for station 09132500 North Fork Gunnison River near Somerset (site 103)*

Latitude: 38°55'45" Longitude: 107°26'53"
Drainage area: 526.0 square miles
Published mean annual streamflow: 326,000 acre-feet, 51 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1962	451,300	98,000
1963	176,500	16,500
1964	266,000	51,400
1965	425,700	89,600
1966	250,000	27,000
1967	245,000	30,700
1968	342,200	64,300
1969	356,600	61,600
1970	344,600	62,100
1971	328,100	45,600
1972	220,200	23,800
1973	427,200	102,000
1974	321,400	60,800
1975	361,200	75,300
1976	234,800	29,100
1977	82,270	3,490
1978	348,000	66,400
1979	447,100	113,000
1980	489,800	126,000
1981	172,500	16,100
1982	396,300	70,600
1983	565,100	159,000
1984	601,800	205,000
Total	7,853,670	1,597,390
Mean	341,500	69,500

Table 72.--*Annual streamflows and estimated annual suspended-sediment loads for station 09149400 Spring Creek near Beaver Hill (site 105)*

Latitude: 38°31'26" Longitude: 107°58'14"
Drainage area: 41.6 square miles
Published mean annual streamflow: (none) acre-feet, 4 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1978	8,500	853
1979	12,670	1,450
1980	11,980	1,390
1981	2,170	112
Total	35,320	3,805
Mean	8,830	951

Table 73.--*Annual streamflows and estimated annual suspended-sediment loads for station 09149500 Uncompahgre River at Delta (site 107)*

Latitude: 38°44'31" Longitude: 108°04'49"
Drainage area: 1,129.0 square miles
Published mean annual streamflow: 210,800 acre-feet, 48 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	142,700	76,200	1968	213,100	260,000
1951	111,900	47,800	1969	216,900	233,000
1952	217,300	249,000	1970	273,500	413,000
1953	165,800	134,000	1971	212,500	209,000
1954	135,700	80,000	1972	164,500	124,000
1955	153,700	96,500	1973	280,500	428,000
1956	122,000	57,700	1974	211,700	197,000
1957	287,200	527,000	1975	229,200	291,000
1958	247,400	367,000	1976	175,900	130,000
1959	154,800	105,000	1977	120,900	67,400
1960	181,200	157,000	1978	172,800	168,000
1961	217,200	285,000	1979	228,800	316,000
1962	189,300	194,000	1980	206,300	219,000
1963	143,700	89,100	1981	147,600	89,900
1964	205,700	217,000	1982	269,800	331,000
1965	269,100	392,000	1983	368,300	1,090,000
1966	177,000	130,000	1984	499,300	2,410,000
1967	154,600	124,000			
			Total	7,267,900	10,304,600
			Mean	207,700	294,000

Table 74.--*Annual streamflows and estimated annual suspended-sediment loads for station 09152500 Gunnison River near Grand Junction (site 108)*

Latitude: 38°59'00" Longitude: 108°27'00"
Drainage area: 7,928.0 square miles
Published mean annual streamflow: 1,868,000 acre-feet, 76 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	1,387,000	1,020,000			
1951	1,127,000	777,000			
1952	2,625,000	4,270,000			
1953	1,331,000	1,100,000	1969	1,875,000	1,250,000
1954	663,500	278,000	1970	2,253,000	1,690,000
1955	1,032,000	615,000	1971	2,224,000	1,230,000
1956	1,113,000	817,000	1972	1,199,000	533,000
1957	3,209,000	6,380,000	1973	2,083,000	1,690,000
1958	2,383,000	3,590,000	1974	1,699,000	912,000
1959	950,900	522,000	1975	1,816,000	1,340,000
1960	1,390,000	1,050,000	1976	1,314,000	640,000
1961	1,015,000	622,000	1977	772,800	322,000
1962	2,194,000	2,580,000	1978	1,317,000	878,000
1963	913,800	441,000	1979	2,343,000	2,020,000
1964	1,347,000	1,190,000	1980	2,249,000	2,010,000
1965	2,611,000	3,290,000	1981	1,061,000	459,000
1966	1,046,000	550,000	1982	1,704,000	1,020,000
1967	886,500	407,000	1983	3,147,000	3,840,000
1968	1,444,000	848,000	1984	3,766,000	5,320,000
Total	28,668,700	30,347,000	Total	30,822,800	25,154,000
Mean	1,509,000	1,600,000	Mean	1,926,000	1,570,000
(Prior to completion of dam)			(Since completion of dam)		

Table 75.--*Annual streamflows and estimated annual suspended-sediment loads for station 09153330 West Salt Creek near Carbonera (site 125)*

Latitude: 39°23'47" Longitude: 108°58'51"
Drainage area: 95.6 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1980	317	93,600
1981	303	84,000
Total	620	177,600
Mean	310	88,800

Table 76.--*Annual streamflows and estimated annual suspended-sediment loads for station 09160500 Badger Wash Observation Reservoir 12 near Mack (site 127)*

Latitude: 39°19'24" Longitude: 108°55'48"
Drainage area: 0.09 square miles
Published mean annual streamflow: 0.7 acre-feet, 5 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1977	0.9	37
1978	1.6	51
1979	0.2	10
1980	0.0	0
1981	1.7	60
Total	4.4	158
Mean	0.9	32

Table 77.--*Annual streamflows and estimated annual suspended-sediment loads for station 09163500 Colorado River near Colorado-Utah State line (site 128)*

Latitude: 39°07'45" Longitude: 109°01'36"
Drainage area: 17,843.0 square miles
Published mean annual streamflow: 4,443,000 acre-feet, 33 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1952	6,847,000	18,500,000	1969	4,328,000	5,870,000
1953	3,773,000	5,180,000	1970	5,488,000	9,690,000
1954	2,086,000	1,970,000	1971	5,375,000	6,880,000
1955	2,903,000	3,320,000	1972	3,455,000	3,670,000
1956	3,345,000	5,520,000	1973	5,394,000	8,800,000
1957	7,525,000	14,400,000	1974	4,347,000	6,070,000
1958	5,424,000	14,700,000	1975	4,743,000	6,560,000
1959	2,976,000	3,390,000	1976	3,335,000	3,550,000
1960	3,749,000	5,210,000	1977	1,852,000	1,610,000
1961	2,760,000	3,260,000	1978	3,865,000	5,200,000
1962	6,196,000	14,300,000	1979	5,659,000	10,000,000
1963	2,586,000	2,620,000	1980	5,237,000	9,280,000
1964	3,112,000	4,860,000	1981	2,695,000	2,500,000
1965	5,714,000	9,420,000	1982	4,524,000	5,700,000
1966	2,959,000	3,170,000	1983	8,033,000	14,700,000
1967	2,861,000	3,150,000	1984	9,780,000	30,800,000
1968	3,723,000	4,280,000			
Total	68,539,000	117,250,000	Total	78,110,000	130,880,000
Mean (Prior to completion of dam)	4,032,000	6,900,000	Mean (Since completion of dam)	4,882,000	8,180,000

Table 78.--*Annual streamflows and estimated annual suspended-sediment loads for station 09173000 Beaver Creek near Norwood (site 130)*

Latitude: 37°58'12" Longitude: 108°11'42"
Drainage area: 40.6 square miles
Published mean annual streamflow: 10,870 acre-feet, 31 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	6,190	88
1951	2,200	16
1952	25,690	1,210
1953	5,150	73
1954	2,280	17
1955	4,590	75
1956	3,850	47
1957	23,920	1,350
1958	25,910	1,210
1959	3,080	35
1960	7,070	175
1961	6,130	129
1963	3,070	38
1964	4,840	93
1965	9,610	279
1966	7,200	138
1967	2,550	22
1976	5,270	94
1977	1,640	16
1978	7,640	215
1979	14,580	572
1980	11,900	412
1981	2,250	20
Total	186,610	6,324
Mean	8,110	275

Table 79.--*Annual streamflows and estimated annual suspended-sediment loads for station 09175000 West Naturita Creek near Norwood (site 131)*

Latitude: 37°58'33" Longitude: 108°19'38"
Drainage area: 53.0 square miles
Published mean annual streamflow: 6,420 acre-feet, 18 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1941	19,640	590
1942	19,880	581
1943	4,660	112
1944	12,600	366
1945	7,250	188
1946	2,360	50
1947	2,760	57
1948	9,360	256
1949	4,240	101
1950	1,960	39
1951	752	14
1952	6,370	166
1976	3,440	76
1977	919	17
1978	2,310	51
1979	8,640	231
1980	7,530	197
1981	864	14
Total	115,535	3,106
Mean	6,420	173

Table 80.--*Annual streamflows and estimated annual suspended-sediment loads for station 09175500 San Miguel River at Naturita (site 132)*

Latitude: 38°13'04" Longitude: 108°33'57"
Drainage area: 1,069.0 square miles
Published mean annual streamflow: 238,400 acre-feet, 53 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	143,500	10,400	1966	169,400	13,600
1951	89,610	4,640	1967	105,100	5,960
1952	298,500	51,200	1968	181,900	19,900
1953	153,100	13,600	1969	176,300	16,100
1954	90,830	3,790	1970	262,000	38,700
1955	154,000	13,100	1971	212,300	20,400
1956	120,100	9,590	1972	112,100	6,420
1957	384,300	80,500	1973	394,600	88,300
1958	401,600	102,000	1974	173,400	19,000
1959	110,000	6,350	1975	277,100	46,400
1960	207,500	25,700	1976	128,400	8,920
1961	195,300	23,100	1977	48,820	1,340
1962	219,000	26,200	1978	225,000	31,200
1963	120,500	7,500	1979	335,100	69,700
1964	161,000	17,500	1980	278,300	48,300
1965	303,900	52,200	1981	101,400	5,910
			Total	6,333,960	887,520
			Mean	197,900	27,700

Table 81.--*Annual streamflows and estimated annual suspended-sediment loads for station 09179200 Salt Creek near Gateway (site 133)*

Latitude: 38°31'59" Longitude: 108°58'13"
Drainage area: 31.2 square miles
Published mean annual streamflow: 1,360 acre-feet, 5 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1980	363	14,800
1981	5,050	3,820,000
1982	298	20,500
1983	776	75,700
1984	315	7,800
Total	6,802	3,938,800
Mean	1,360	788,000

Table 82.--*Annual streamflows and estimated annual suspended-sediment loads for station 09243700 Middle Creek near Oak Creek (site 144)*

Latitude: 40°23'08" Longitude: 106°59'33"
Drainage area: 23.5 square miles
Published mean annual streamflow: 3,210 acre-feet, 8 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	1,550	592
1977	360	53
1978	2,540	1,860
1979	3,010	2,080
1980	5,240	6,140
1981	474	61
1983	2,930	1,540
1984	9,610	13,100
Total	25,714	25,426
Mean	3,210	3,180

Table 83.--*Annual streamflows and estimated annual suspended-sediment loads for station 09243800 Foidel Creek near Oak Creek (site 145)*

Latitude: 40°20'45" Longitude: 107°05'04"
Drainage area: 8.61 square miles
Published mean annual streamflow: 572 acre-feet, 7 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	130	22
1977	16	2
1978	573	234
1979	922	366
1980	1,450	714
1981	158	29
1983	744	223
Total	3,993	1,590
Mean	570	227

Table 84.--*Annual streamflows and estimated annual suspended-sediment loads for station 09243900 Foidel Creek at mouth, near Oak Creek (site 146)*

Latitude: 40°23'25" Longitude: 106°59'39"
Drainage area: 17.5 square miles
Published mean annual streamflow: 1,960 acre-feet, 8 years
Annual suspended-sediment-load estimation technique: Graphical fit and measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	962	186
1977	51	6
1978	1,650	597
1979	1,960	729
1980	3,150	[1]4,010
1981	311	41
1983	2,290	500
1984	5,340	8,000
Total	15,714	14,069
Mean	1,960	1,760

[1]Computed from measured daily suspended-sediment discharges.

Table 85.--*Annual streamflows and estimated annual suspended-sediment loads for station 09244410 Yampa River below Diversion, near Hayden (site 149)*

Latitude: 40°29'18" Longitude: 107°09'33"
Drainage area: 1,430.0 square miles
Published mean annual streamflow: 802,200 acre-feet, 20 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1966	475,100	52,500
1967	652,900	66,400
1968	789,900	88,100
1969	715,600	96,700
1970	954,600	136,000
1971	978,400	129,000
1972	622,800	68,800
1973	829,300	108,000
1974	966,600	178,000
1975	819,000	92,000
1976	583,800	66,900
1977	237,000	19,300
1978	1,033,000	138,000
1979	904,900	134,000
1980	773,900	111,000
1981	415,800	39,100
1982	824,300	93,200
1983	998,200	113,000
1984	1,403,000	257,000
Total	14,978,100	1,987,000
Mean	788,300	105,000

Table 86.--*Annual streamflows and estimated annual suspended-sediment loads for station 09244415 Sage Creek above Sage Creek Reservoir, near Hayden (site 150)*

Latitude: 40°23'01" Longitude: 107°11'34"
Drainage area: 4.17 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1982	490	190
1983	859	375
Total	1,349	565
Mean	674	282

Table 87.--*Annual streamflows and estimated annual suspended-sediment loads for station 09244460 Watering Trough Gulch near Hayden (site 151)*

Latitude: 40°22'57" Longitude: 107°16'49"
Drainage area: 2.65 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1980	108	9
1981	22	2
Total	130	11
Mean	65	6

Table 88.--*Annual streamflows and estimated annual suspended-sediment loads for station 09244464 Hubberson Gulch near Hayden (site 152)*

Latitude: 40°23'28" Longitude: 107°16'15"
Drainage area: 8.08 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1980	802	2,350
1981	71	10
Total	873	2,360
Mean	436	1,180

Table 89.--*Annual streamflows and estimated annual suspended-sediment loads for station 09244470 Stokes Gulch near Hayden (site 153)*

Latitude: 40°28'06" Longitude: 107°14'47"
Drainage area: 13.6 square miles
Published mean annual streamflow: 1,200 acre-feet, 5 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1977	0	0
1978	1,360	788
1979	1,890	1,170
1980	2,700	1,840
1981	60	8
Total	6,010	3,806
Mean	1,200	761

Table 90.--*Annual streamflows and estimated annual suspended-sediment loads for station 09250400 Good Spring Creek at Axial (site 163)*

Latitude: 40°17'25" Longitude: 107°47'22"
Drainage area: 40.0 square miles
Published mean annual streamflow: (none) acre-feet, 3 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	1,730	554
1976	1,130	302
1977	206	34
Total	3,066	890
Mean	1,020	297

Table 91.--*Annual streamflows and estimated annual suspended-sediment loads for station 09250507 Wilson Creek above Taylor Creek, near Axial (site 164)*

Latitude: 40°18'53" Longitude: 107°47'58"
Drainage area: 20.0 square miles
Published mean annual streamflow: (none) acre-feet, 4 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1981	656	[1]1,240
1982	1,540	([2])
1983	5,470	([2])
1984	10,780	([2])
Total	18,446	([2])
Mean	4,610	([2])

[1]Computed from measured daily suspended-sediment discharges.
[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 92.--*Annual streamflows and estimated annual suspended-sediment loads for station 09250510 Taylor Creek at mouth, near Axial (site 165)*

Latitude: 40°18'48" Longitude: 107°47'57"
Drainage area: 7.22 square miles
Published mean annual streamflow: 355 acre-feet, 9 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	23	14.0
1977	1	0.1
1978	0	0.0
1979	74	58.0
1980	439	832.6
1981	40	13.9
1982	33	8.3
1983	389	615.8
1984	2,170	9,290.0
Total	3,169	10,832.7
Mean	352	1,200.0

Table 93.--*Annual streamflows and estimated annual suspended-sediment loads for station 09250600 Wilson Creek near Axial (site 166)*

Latitude: 40°18'56" Longitude: 107°47'50"
Drainage area: 27.4 square miles
Published mean annual streamflow: 1,590 acre-feet, 6 years
Annual suspended-sediment-load estimation technique: Measured daily and graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	1,630	8,340
1976	957	861
1977	316	[1]23
1978	784	[1]759
1979	2,780	[1]28,100
1980	3,080	[1]76,500
Total	9,547	114,583
Mean	1,590	19,100

[1]Computed from measured daily suspended-sediment discharges.

Table 94.--*Annual streamflows and estimated annual suspended-sediment loads for station 09250610 Jubb Creek near Axial (site 167)*

Latitude: 40°18'45" Longitude: 107°49'18"
Drainage area: 7.53 square miles
Published mean annual streamflow: (none) acre-feet, 6 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	59	4.80
1977	10	0.75
1978	3	0.05
1979	19	0.97
1980	290	93.70
1981	84	6.40
Total	465	106.67
Mean	78	17.78

Table 95.--*Annual streamflows and estimated annual suspended-sediment loads for station 09251000 Yampa River near Maybell (site 169)*

Latitude: 40°30'10" Longitude: 108°01'45"
Drainage area: 3,410.0 square miles
Published mean annual streamflow: 1,140,000 acre-feet, 68 years
Annual suspended-sediment-load estimation technique: Graphical fit and measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	952,000	381,000	1968	1,144,000	566,000
1951	1,016,000	418,000	1969	1,104,000	467,000
1952	1,447,000	[1]546,000	1970	1,350,000	751,000
1953	829,200	[1]248,000	1971	1,470,000	750,000
1954	522,200	[1]125,000	1972	908,800	333,000
1955	772,600	[1]402,000	1973	1,232,000	618,000
1956	1,033,000	[1]398,000	1974	1,418,000	853,000
1957	1,781,000	[1]602,000	1975	1,207,000	609,000
1958	1,268,000	703,000	1976	826,300	[1]265,000
1959	814,000	298,000	1977	345,100	66,000
1960	1,010,000	406,000	1978	1,451,000	[1]500,000
1961	629,300	200,000	1979	1,310,000	[1]506,000
1962	1,492,000	779,000	1980	1,280,000	[1]651,000
1963	630,300	186,000	1981	554,200	[1]187,000
1964	865,200	389,000	1982	1,373,000	[1]619,000
1965	1,314,000	665,000	1983	1,575,000	[1]1,240,000
1966	702,800	196,000	1984	2,196,000	1,780,000
1967	907,000	349,000			
			Total	38,730,000	18,052,000
			Mean	1,107,000	516,000

[1]Computed from measured daily suspended-sediment discharges.

Table 96.--*Annual streamflows and estimated annual suspended-sediment loads for station 09260000 Little Snake River near Lily (site 173)*

Latitude: 40°32'50" Longitude: 108°25'25"
Drainage area: 3,730.0 square miles
Published mean annual streamflow: 427,500 acre-feet, 63 years
Annual suspended-sediment-load estimation technique: Graphical fit and measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	442,000	1,250,000	1968	480,000	1,470,000
1951	294,600	694,000	1969	404,500	1,060,000
1952	728,500	2,790,000	1970	519,800	1,650,000
1953	268,700	646,000	1971	642,600	2,060,000
1954	178,300	328,000	1972	361,000	825,000
1955	233,200	487,000	1973	519,300	1,600,000
1956	410,900	1,160,000	1974	538,600	1,780,000
1957	507,900	1,586,000	1975	432,500	1,280,000
1958	424,900	1,310,000	1976	382,400	925,000
1959	216,000	413,000	1977	103,300	114,000
1960	300,300	[1]932,000	1978	507,000	1,490,000
1961	162,800	[1]573,000	1979	417,500	1,220,000
1962	569,100	1,750,000	1980	557,400	1,790,000
1963	203,600	[1]958,000	1981	248,300	546,000
1964	318,000	[1]1,220,000	1982	570,100	1,690,000
1965	479,700	1,370,000	1983	671,200	2,280,000
1966	306,100	691,000	1984	908,800	3,620,000
1967	346,900	876,000			
			Total	14,655,800	44,434,000
			Mean	418,700	1,270,000

[1]Computed from measured daily suspended-sediment discharges.

Table 97.--*Annual streamflows and estimated annual suspended-sediment loads for station 09260050 Yampa River at Deerlodge Park (site 174)*

Latitude: 40°27'02" Longitude: 108°31'20"
Drainage area: 7,660.0 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1983	2,446,000	3,780,000
1984	3,112,000	6,850,000
Total	5,558,000	10,630,000
Mean	2,779,000	5,320,000

Table 98.--*Annual streamflows and estimated annual suspended-sediment loads for station 09303000 North Fork White River at Buford (site 178)*

Latitude: 39°59'15" Longitude: 107°36'50"
Drainage area: 260.0 square miles
Published mean annual streamflow: 228,200 acre-feet, 39 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1952	274,800	23,300	1969	210,000	14,800
1953	208,600	11,900	1970	246,200	25,000
1954	160,000	5,250	1971	253,900	15,200
1955	174,700	9,180	1972	226,600	11,700
1956	211,600	15,800	1973	236,600	19,000
1957	316,800	23,000	1974	241,400	22,300
1958	263,300	28,700	1975	248,300	15,800
1959	204,400	9,760	1976	177,600	7,720
1960	200,800	9,930	1977	113,400	2,170
1961	171,500	6,810	1978	251,700	21,000
1962	260,400	25,200	1979	239,500	21,000
1963	168,300	7,480	1980	224,600	14,700
1964	202,900	15,700	1981	158,000	5,280
1965	260,000	19,200	1982	247,700	15,500
1966	161,400	5,490	1983	317,700	29,900
1967	179,700	9,140	1984	379,800	76,500
1968	210,300	12,300			
			Total	7,609,400	555,710
			Mean	230,600	16,800

Table 99.--*Annual streamflows and estimated annual suspended-sediment loads for station 09304000 South Fork White River at Buford (site 181)*

Latitude: 39°58'28" Longitude: 107°37'29"
Drainage area: 177.0 square miles
Published mean annual streamflow: 186,600 acre-feet, 34 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1952	259,100	68,300	1969	183,600	25,400
1953	188,500	36,600	1970	198,700	34,300
1954	130,400	10,100	1971	201,200	30,800
1955	153,800	19,900	1972	175,700	25,900
1956	166,200	27,500	1973	208,600	35,700
1957	242,300	63,100	1974	175,700	25,700
1958	204,700	39,900	1975	204,700	34,800
1959	176,500	23,500	1976	164,700	20,800
1960	170,500	23,000	1977	93,180	3,040
1961	144,100	15,400	1978	236,700	68,900
1962	240,800	42,800	1979	206,600	42,200
1963	147,300	15,400	1980	187,600	33,000
1964	174,200	29,500	1981	120,500	8,640
1965	205,300	36,900	1982	204,000	27,600
1966	136,300	10,300	1983	253,600	68,100
1967	147,500	18,400	1984	252,200	53,100
1968	178,400	34,000			
			Total	6,133,180	1,052,580
			Mean	185,900	31,900

Table 100.--*Annual streamflows and estimated annual suspended-sediment loads for station 09304200 White River above Coal Creek, near Meeker (site 182)*

Latitude: 40°00'18" Longitude: 107°49'29"
Drainage area: 648.0 square miles
Published mean annual streamflow: 412,200 acre-feet, 23 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1962	538,100	77,600
1963	294,200	19,600
1964	354,000	39,600
1965	492,200	61,900
1966	277,500	15,300
1967	327,800	30,200
1968	389,500	43,300
1969	389,400	40,400
1970	479,700	74,500
1971	452,000	44,900
1972	373,000	32,800
1973	461,400	63,100
1974	436,100	63,500
1975	463,100	54,000
1976	341,600	30,900
1977	150,400	4,060
1978	442,800	64,700
1979	457,500	75,300
1980	395,800	44,500
1981	248,200	11,100
1982	459,900	50,700
1983	566,200	97,800
1984	701,400	171,000
Total	9,491,800	1,210,760
Mean	412,700	52,600

Table 101.--*Annual streamflows and estimated annual suspended-sediment loads for station 09304800 White River below Meeker (site 184)*

Latitude: 40°00'48" Longitude: 108°05'33"
Drainage area: 1,024.0 square miles
Published mean annual streamflow: 469,500 acre-feet, 23 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1962	572,700	162,000
1963	342,800	57,000
1964	395,300	90,200
1965	537,200	117,000
1966	328,700	48,800
1967	377,100	72,000
1968	434,500	84,000
1969	453,300	115,000
1970	524,900	152,000
1971	504,200	97,600
1972	434,400	76,200
1973	529,800	144,000
1974	481,100	137,000
1975	524,500	102,000
1976	380,500	73,900
1977	210,100	16,200
1978	525,800	127,000
1979	522,700	142,000
1980	462,100	99,000
1981	308,000	39,900
1982	493,600	102,000
1983	684,200	169,000
1984	775,800	322,000
Total	10,803,300	2,545,800
Mean	469,700	111,000

Table 102.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306007 Piceance Creek below Rio Blanco (site 185)*

Latitude: 39°49'34" Longitude: 108°10'57"
Drainage area: 177.0 square miles
Published mean annual streamflow: 14,200 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	9,650	[1]19,400
1976	7,250	[1]3,170
1977	3,630	[1]5,670
1978	7,010	[1]12,500
1979	15,070	[1]28,200
1980	14,540	[1]26,000
1981	5,200	[1]646
1982	5,820	[1]2,530
1983	33,740	[1]158,000
1984	39,900	[1]238,000
Total	141,810	494,116
Mean	14,180	49,400

[1]Computed from measured daily suspended-sediment discharges.

Table 103.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306022 Stewart Gulch above West Fork near Rio Blanco (site 187)*

Latitude: 39°49'09" Longitude: 108°11'08"
Drainage area: 44.0 square miles
Published mean annual streamflow: 1,350 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	1,410	[1]380
1976	1,340	[1]346
1977	998	[1]43
1978	897	[1]94
1979	885	[1]92
1980	1,350	[1]79
1981	1,220	[1]181
1982	969	[1] 33
1983	1,720	([2])
1984	2,670	([2])
Total	13,459	1,248
Mean	1,350	156

[1]Computed from measured daily suspended-sediment discharges.
[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 104.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306025 West Fork Stewart Gulch near Rio Blanco (site 188)*

Latitude: 39°47'01" Longitude: 108°11'21"
Drainage area: 14.2 square miles
Published mean annual streamflow: (none) acre-feet, 3 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	17	[1]1.1
1976	22	([2])
1980	4	([2])
Total	43	([2])
Mean	14	([2])

[1]Computed from measured daily suspended-sediment discharges.
[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 105.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306028 West Fork Stewart Gulch at mouth, near Rio Blanco (site 189)*

Latitude: 39°48'45" Longitude: 108°11'00"
Drainage area: 15.7 square miles
Published mean annual streamflow: (none) acre-feet, 7 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	7.1	8.40
1976	3.3	0.84
1977	1.0	0.83
1978	4.7	3.05
1979	0.0	0.00
1980	8.4	6.80
1981	0.3	0.04
Total	24.8	19.96
Mean	3.5	2.85

Table 106.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306042 Piceance Creek Tributary near Rio Blanco (site 193)*

Latitude: 39°50'01" Longitude: 108°13'12"
Drainage area: 1.06 square miles
Published mean annual streamflow: (none) acre-feet, 7 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1977	26	(2)
1978	0	(2)
1979	3	(2)
1980	303	(2)
1981	1,240	[1]357
1982	151	(2)
1983	462	(2)
Total	2,185	(2)
Mean	312	(2)

[1]Computed from measured daily suspended-sediment discharges.
[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 107.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306052 Scandard Gulch at mouth, near Rio Blanco (site 196)*

Latitude: 39°48'51" Longitude: 108°14'35"
Drainage area: 7.97 square miles
Published mean annual streamflow: (none) acre-feet, 8 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	0.8	1.5
1976	1.4	5.3
1979	2.5	12.4
1980	8.7	68.1
1981	11.0	69.9
1982	11.0	67.8
1983	27.0	203.3
1984	5.6	36.8
Total	68.0	465.1
Mean	8.5	58.1

Table 108.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306058 Willow Creek near Rio Blanco (site 197)*

Latitude: 39°50'14" Longitude: 108°14'37"
Drainage area: 48.4 square miles
Published mean annual streamflow: 1,890 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	1,440	[1]684
1976	1,720	[1]941
1977	1,010	[1]505
1978	709	[1]122
1979	956	[1]485
1980	2,870	[1]821
1981	1,640	[1]287
1982	1,050	[1]156
1983	2,890	([2])
1984	4,670	([2])
Total	18,955	4,001
Mean	1,900	500

[1]Computed from measured daily suspended-sediment discharges.
[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 109.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306061 Piceance Creek above Hunter Creek, near Rio Blanco (site 198)*

Latitude: 39°51'02" Longitude: 108°15'31"
Drainage area: 309.0 square miles
Published mean annual streamflow: 18,980 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Measured daily and graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	13,140	[1]12,700
1976	12,040	[1]6,480
1977	7,150	[1]30,000
1978	7,900	[1]8,300
1979	17,810	[1]30,100
1980	18,570	[1]26,600
1981	9,340	[1]2,400
1982	8,240	[1]4,180
1983	43,660	279,000
1984	52,340	[1]218,000
Total	190,190	617,760
Mean	19,020	61,800

[1]Computed from measured daily suspended-sediment discharges.

Table 110.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306175 Black Sulphur Creek near Rio Blanco (site 199)*

Latitude: 39°52'17" Longitude: 108°17'13"
Drainage area: 103.0 square miles
Published mean annual streamflow: 5,850 acre-feet, 8 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	5,920	[1]4,550
1977	3,660	[1]1,020
1978	1,890	[1]1,340
1979	6,380	[1]4,400
1980	7,040	[1]8,710
1981	3,060	[1]2,640
1982	3,680	([2])
1983	15,160	([2])
Total	46,790	22,660
Mean	5,850	3,780

[1]Computed from measured daily suspended-sediment discharges.
[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 111.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306200 Piceance Creek below Ryan Gulch, near Rio Blanco (site 200)*

Latitude: 39°55'16" Longitude: 108°17'49"
Drainage area: 506.0 square miles
Published mean annual streamflow: 18,910 acre-feet, 20 years
Annual suspended-sediment-load estimation technique: Measured daily and graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1973	21,100	[1]25,400
1974	19,800	[1]9,370
1975	21,270	[1]15,400
1976	18,360	[1]12,900
1977	9,220	[1]8,350
1978	11,560	[1]13,600
1979	20,790	[1]38,900
1980	25,710	[1]39,900
1981	12,550	[1]4,700
1983	51,460	[1]138,000
1984	67,140	171,000
Total	278,960	477,520
Mean	25,360	43,400

[1]Computed from measured daily suspended-sediment discharges.

Table 112.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306222 Piceance Creek at White River (site 203)*

Latitude: 40°05'16" Longitude: 108°14'35"
Drainage area: 652.0 square miles
Published mean annual streamflow: 24,270 acre-feet, 16 years
Annual suspended-sediment-load estimation technique: Measured daily and graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	24,570	[1]22,100
1976	19,570	[1]28,100
1977	10,540	[1]4,120
1978	12,710	[1]22,700
1979	27,920	[1]60,200
1980	29,860	[1]56,100
1981	15,820	[1]10,500
1983	65,170	[1]231,000
1984	71,040	249,000
Total	277,200	683,820
Mean	30,800	76,000

[1]Computed from measured daily suspended-sediment discharges.

Table 113.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306230 Stake Springs Draw near Rangely (site 205)*

Latitude: 39°55'37" Longitude: 108°25'14"
Drainage area: 26.1 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	16	72
1977	24	1,050
Total	40	1,122
Mean	20	561

Table 114.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306235 Corral Gulch below Water Gulch, near Rangely (site 206)*

Latitude: 39°54'22" Longitude: 108°31'56"
Drainage area: 8.61 square miles
Published mean annual streamflow: 645 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	109	[1]47
1976	99	([2])
1977	41	([2])
1978	109	[1]102
1979	228	[1]739
1980	403	[1]408
1981	130	[1]1,120
1982	177	[1]279
1983	2,380	([2])
1984	2,790	([2])
Total	6,466	2,695
Mean	647	449

[1]Computed from measured daily suspended-sediment discharges.
[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 115.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306240 Box Elder Gulch near Rangely (site 208)*

Latitude: 39°53'18" Longitude: 108°31'40"
Drainage area: 9.21 square miles
Published mean annual streamflow: 652 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	183	[1]260
1976	36	([2])
1977	5	([2])
1978	228	([2])
1979	258	([2])
1980	465	([2])
1981	26	([2])
1982	62	([2])
1983	2,320	([2])
1984	2,910	([2])
Total	6,493	([2])
Mean	649	([2])

[1]Computed from measured daily suspended-sediment discharges.
[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 116.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306241 Box Elder Gulch Tributary near Rangely (site 209)*

Latitude: 39°54'50" Longitude: 108°29'05"
Drainage area: 2.39 square miles
Published mean annual streamflow: (none) acre-feet, 8 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	0.6	1.10
1976	2.4	4.80
1977	0.8	1.90
1978	0.2	0.45
1979	0.0	0.00
1980	7.3	18.50
1981	14.0	35.20
1982	8.3	19.40
Total	33.6	81.35
Mean	4.2	10.20

Table 117.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306242 Corral Gulch near Rangely (site 210)*

Latitude: 39°55'13" Longitude: 108°28'20"
Drainage area: 31.6 square miles
Published mean annual streamflow: 1,850 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1975	632	[1]987
1976	418	[1]1,040
1977	263	[1]1,720
1978	1,410	[1]5,020
1979	2,410	[1]3,750
1980	1,470	[1]3,030
1981	679	[1]7,300
1982	563	[1]2,450
1983	5,020	[1]102,000
1984	5,630	[1]134,000
Total	18,495	261,297
Mean	1,850	26,100

[1]Computed from measured daily suspended-sediment discharges.

Table 118.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306244 Corral Gulch at 84 Ranch (site 211)*

Latitude: 39°56'02" Longitude: 108°25'35"
Drainage area: 37.8 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	89	[1]71
1977	65	[1]2,800
Total	154	2,871
Mean	77	1,440

[1]Computed from measured daily suspended-sediment discharges.

Table 119.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306246 Yellow Creek Tributary near 84 Ranch (site 212)*

Latitude: 39°58'02" Longitude: 108°23'15"
Drainage area: 5.53 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	44.0	1,200.0
1977	0.3	37.8
Total	44.3	1,237.8
Mean	22.2	618.9

Table 120.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306248 Duck Creek at Upper Station near 84 Ranch (site 213)*

Latitude: 39°58'55" Longitude: 108°27'10"
Drainage area: 39.1 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1976	7.3	1.00
1977	6.0	0.94
Total	13.3	1.94
Mean	6.6	0.97

Table 121.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306255 Yellow Creek near White River (site 215)*

Latitude: 40°10'07" Longitude: 108°24'02"
Drainage area: 262.0 square miles
Published mean annual streamflow: 1,380 acre-feet, 10 years
Annual suspended-sediment-load estimation technique: Measured daily

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1973	1,130	[2]
1974	1,740	[2]
1975	1,140	[1]1,380
1976	1,060	[1]2,420
1977	925	[1]990
1978	1,640	[1]291,000
1979	1,030	[1]1,480
1980	2,070	[1]12,500
1981	1,390	[1]544
1982	1,630	[1]8,550
Total	13,755	318,864
Mean	1,380	39,900

[1]Computed from measured daily suspended-sediment discharges.
[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 122.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306290 White River below Boise Creek, near Rangely (site 216)*

Latitude: 40°10'47" Longitude: 108°33'53"
Drainage area: 2,530.0 square miles
Published mean annual streamflow: (none) acre-feet, 2 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1983	775,100	1,290,000
1984	976,700	2,230,000
Total	1,751,800	3,520,000
Mean	875,900	1,760,000

Table 123.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306300 White River above Rangely (site 217)*

Latitude: 40°06'26" Longitude: 108°42'44"
Drainage area: 2,773.0 square miles
Published mean annual streamflow: 458,600 acre-feet, 9 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1973	554,200	605,000
1974	492,900	421,000
1975	549,100	611,000
1976	414,600	197,000
1977	226,000	33,300
1978	520,100	637,000
1979	545,700	567,000
1980	498,400	435,000
1981	325,300	113,000
Total	4,126,300	3,619,300
Mean	458,500	402,000

Table 124.--*Annual streamflows and estimated annual suspended-sediment loads for station 09306395 White River near Colorado-Utah State line (site 218)*

Latitude: 40°00'50" Longitude: 109°04'48"
Drainage area: 3,680.0 square miles
Published mean annual streamflow: 568,000 acre-feet, 8 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1977	233,900	193,000
1978	529,400	1,340,000
1979	553,900	1,390,000
1980	526,500	1,150,000
1981	337,200	417,000
1982	573,200	1,190,000
1983	815,100	2,830,000
1984	976,700	3,860,000
Total	4,545,900	12,370,000
Mean	568,200	1,550,000

Table 125.--*Annual streamflows and estimated annual suspended-sediment loads for station 09341200 Wolf Creek near Pagosa Springs (site 219)*

Latitude: 37°26'47" Longitude: 106°53'00"
Drainage area: 14.0 square miles
Published mean annual streamflow: 22,530 acre-feet, 7 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1969	26,260	1,030
1970	21,100	707
1971	14,770	318
1972	15,100	338
1973	35,090	1,820
1974	12,530	313
1975	32,860	1,750
Total	157,710	6,276
Mean	22,530	897

Table 126.--*Annual streamflows and estimated annual suspended-sediment loads for station 09343000 Rio Blanco near Pagosa Springs (site 220)*

Latitude: 37°12'46" Longitude: 106°47'38"
Drainage area: 58.0 square miles
Published mean annual streamflow: 61,000 acre-feet, 36 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1952	89,120	73,000
1953	44,380	3,120
1954	40,000	697
1955	37,740	1,020
1956	45,130	4,450
1957	116,900	402,000
1958	81,880	49,800
1959	32,540	602
1960	68,090	5,930
1961	44,130	1,320
1962	61,330	8,820
1963	40,260	1,340
1964	43,720	5,820
1965	91,990	54,000
1966	61,560	7,300
1967	51,060	2,310
1968	58,690	4,730
1969	65,360	4,690
1970	59,310	41,600
1971	45,290	793
Total	1,178,480	673,342
Mean	58,920	33,700

Table 127.--*Annual streamflows and estimated annual suspended-sediment loads for station 09344300 Navajo River above Chromo (site 225)*

Latitude: 37°01'55" Longitude: 106°43'56"
Drainage area: 96.4 square miles
Published mean annual streamflow: 84,040 acre-feet, 14 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1957	133,500	38,600
1958	113,200	27,000
1959	49,620	3,470
1960	88,210	13,400
1961	67,780	7,530
1962	88,670	13,200
1963	56,950	4,840
1964	55,210	6,290
1965	112,700	24,000
1966	84,810	10,400
1967	68,190	6,120
1968	80,120	11,100
1969	96,060	14,400
1970	80,600	10,200
Total	1,175,620	190,550
Mean	83,970	13,600

Table 128.--*Annual streamflows and estimated annual suspended-sediment loads for station 09346000 Navajo River at Edith (site 229)*

Latitude: 37°00'10" Longitude: 106°54'25"
Drainage area: 172.0 square miles
Published mean annual streamflow: 52,790 acre-feet, 13 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1972	33,980	3,090
1973	84,610	197,000
1974	37,530	7,650
1975	52,350	28,500
1976	38,240	4,900
1977	28,520	3,250
1978	35,620	6,290
1979	59,880	50,500
1980	60,730	47,900
1981	37,570	4,760
1982	75,120	59,900
1983	67,840	51,800
1984	74,330	72,800
Total	686,320	538,340
Mean	52,790	41,400

Table 129.--*Annual streamflows and estimated annual suspended-sediment loads for station 09347200 Middle Fork Piedra River near Pagosa Springs (site 232)*

Latitude: 37°29'12" Longitude: 107°09'46"
Drainage area: 32.2 square miles
Published mean annual streamflow: 31,660 acre-feet, 6 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1970	35,380	1,220
1971	19,930	351
1972	24,960	559
1973	49,430	1,890
1974	14,750	226
1975	45,450	1,910
Total	189,900	6,156
Mean	31,650	1,030

Table 130.--*Annual streamflows and estimated annual suspended-sediment loads for station 09349800 Piedra River near Arboles (site 233)*

Latitude: 37°05'18" Longitude: 107°23'50"
Drainage area: 629.0 square miles
Published mean annual streamflow: 277,500 acre-feet, 22 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1963	151,900	61,100
1964	132,500	55,800
1965	396,800	348,000
1966	275,900	167,000
1967	157,300	57,100
1968	253,400	160,000
1969	290,100	187,000
1970	245,600	151,000
1971	164,800	57,800
1972	166,100	59,000
1973	560,200	580,000
1974	118,700	37,400
1975	441,200	447,000
1976	226,700	126,000
1977	68,040	11,600
1978	231,900	148,000
1979	595,300	724,000
1980	421,100	423,000
1981	142,700	51,400
1982	347,800	227,000
1983	397,800	303,000
1984	324,600	220,000
Total	6,110,440	4,602,200
Mean	277,700	209,000

Table 131.--*Annual streamflows and estimated annual suspended-sediment loads for station 09352900 Vallecito Creek near Bayfield (site 234)*

Latitude: 37°28'39" Longitude: 107°32'35"
Drainage area: 72.1 square miles
Published mean annual streamflow: 104,300 acre-feet, 22 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1963	78,190	575
1964	69,600	521
1965	141,400	1,180
1966	105,400	814
1967	79,010	588
1968	113,500	941
1969	122,000	994
1970	120,000	978
1971	80,380	592
1972	83,730	615
1973	163,600	1,390
1974	61,320	441
1975	131,300	1,110
1976	90,960	710
1977	45,840	309
1978	87,070	686
1979	144,300	1,240
1980	122,800	1,040
1981	80,070	603
1982	123,200	967
1983	117,600	950
1984	130,100	1,050
Total	2,291,370	18,294
Mean	104,200	832

Table 132.--*Annual streamflows and estimated annual suspended-sediment loads for station 09354500 Los Pinos River at La Boca (site 235)*

Latitude: 37°00'34" Longitude: 107°35'56"
Drainage area: 510.0 square miles
Published mean annual streamflow: 160,100 acre-feet, 34 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1952	282,200	81,000
1953	62,170	4,930
1954	64,060	5,510
1955	80,400	7,910
1956	70,020	5,620
1957	323,300	111,000
1958	327,300	96,400
1959	56,020	4,120
1960	141,400	25,000
1961	105,300	12,700
1962	152,400	29,400
1963	82,060	7,730
1964	58,580	4,930
1965	241,100	60,400
1966	166,100	27,400
1967	78,830	7,720
1968	107,100	16,300
1969	179,600	35,000
1970	162,500	30,000
1971	104,100	11,900
1972	85,740	8,160
1973	421,600	138,000
1974	77,290	7,120
1975	279,600	75,200
1976	120,000	16,200
1977	56,640	4,900
1978	85,880	10,000
1979	401,100	135,000
1980	292,100	83,200
1981	84,810	8,140
1982	164,800	28,500
1983	275,700	55,100
1984	223,900	45,300
Total	5,413,700	1,199,790
Mean	164,100	35,300

Table 133.--*Annual streamflows and estimated annual suspended-sediment loads for station 09357500 Animas River at Howardsville (site 236)*

Latitude: 37°49'59" Longitude: 107°35'56"
Drainage area: 55.9 square miles
Published mean annual streamflow: 73,900 acre-feet, 47 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	54,920	879	1967	51,540	1,180
1951	56,110	1,790	1968	73,990	6,310
1952	105,100	18,000	1969	72,790	1,940
1953	55,700	3,990	1970	81,970	3,040
1954	49,940	404	1971	66,570	1,950
1955	53,360	1,460	1972	56,200	1,260
1956	58,600	2,420	1973	93,740	9,890
1957	108,400	19,900	1974	48,350	814
1958	85,740	7,490	1975	88,310	10,800
1959	56,170	2,030	1976	58,420	1,590
1960	75,260	4,360	1977	33,220	187
1961	64,520	2,970	1978	76,470	6,300
1962	83,930	3,300	1979	83,990	7,100
1963	54,040	781	1980	77,540	6,920
1964	52,900	1,970	1981	48,640	1,250
1965	99,200	7,060	1982	95,190	5,170
1966	70,180	1,480			
			Total	2,291,000	145,985
			Mean	69,420	4,420

Table 134.--*Annual streamflows and estimated annual suspended-sediment loads for station 09358900 Mineral Creek above Silverton (site 237)*

Latitude: 37°51'04" Longitude: 107°43'31"
Drainage area: 11.0 square miles
Published mean annual streamflow: 15,870 acre-feet, 7 years
Annual suspended-sediment-load estimation technique: Hydrograph periods

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1969	16,560	722
1970	17,570	734
1971	16,140	655
1972	12,250	504
1973	19,810	888
1974	10,950	425
1975	17,570	742
Total	110,850	4,670
Mean	15,840	667

Table 135.--*Annual streamflows and estimated annual suspended-sediment loads for station 09363500 Animas River near Cedar Hill (site 238)*

Latitude: 37°02'17" Longitude: 107°52'25"
Drainage area: 1090.0 square miles
Published mean annual streamflow: 656,400 acre-feet, 51 years
Annual suspended-sediment-load estimation technique: All measurements

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1964	384,300	84,000	1975	908,200	510,000
1965	909,900	431,000	1976	500,300	117,000
1966	607,500	141,000	1977	246,000	16,600
1967	388,200	61,700	1978	614,500	214,000
1968	629,600	254,000	1979	1,042,000	688,000
1969	685,700	212,000	1980	889,700	499,000
1970	669,900	219,000	1981	421,500	83,800
1971	516,700	95,100	1982	755,800	230,000
1972	441,400	68,100	1983	876,800	407,000
1973	1,181,000	728,000	1984	816,200	379,000
1974	361,400	([2])			
			Total	13,846,600	5,438,300
			Mean	659,400	272,000

[2]Insufficient measured or estimated daily suspended-sediment discharges.

Table 136.--*Annual streamflows and estimated annual suspended-sediment loads for station 09366500 La Plata River at Colorado-New Mexico State line (site 239)*

Latitude: 36°59'59" Longitude: 108°11'17"
Drainage area: 331.0 square miles
Published mean annual streamflow: 25,570 acre-feet, 64 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1950	12,960	4,940	1968	15,640	6,170
1951	7,970	3,000	1969	29,660	33,000
1952	45,280	121,000	1970	15,990	9,670
1953	11,390	4,200	1971	14,570	2,770
1954	6,730	2,050	1972	9,120	1,070
1955	9,340	4,640	1973	79,120	255,000
1956	8,380	3,270	1974	8,530	1,150
1957	41,840	105,000	1975	44,850	83,100
1958	48,010	124,000	1976	10,730	2,530
1959	7,810	2,180	1977	3,210	1,730
1960	23,200	29,500	1978	17,810	10,700
1961	14,930	5,930	1979	60,810	210,000
1962	18,850	10,500	1980	68,890	266,000
1963	10,770	3,260	1981	13,000	9,330
1964	10,900	3,520	1982	24,010	11,300
1965	28,360	29,600	1983	50,850	91,800
1966	24,340	11,900	1984	30,130	20,100
1967	10,320	2,080			
			Total	838,300	1,485,990
			Mean	23,950	42,500

Table 137.--*Annual streamflows and estimated annual suspended-sediment loads for station 09371010 San Juan River at 4 Corners (site 241)*

Latitude: 37°00'20" Longitude: 109°02'00"
Drainage area: 14,600.0 square miles
Published mean annual streamflow: 1,711,000 acre-feet, 6 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1978	977,200	1,170,000
1979	2,908,000	18,000,000
1980	1,954,000	5,470,000
1981	967,100	753,000
1982	1,478,000	2,420,000
1983	1,978,000	4,640,000
Total	10,262,300	32,453,000
Mean	1,710,000	5,410,000

Table 138.--*Annual streamflows and estimated annual suspended-sediment loads for station 09372000 McElmo Creek near Colorado-Utah State line (site 242)*

Latitude: 37°19'27" Longitude: 109°00'54"
Drainage area: 346.0 square miles
Published mean annual streamflow: 33,980 acre-feet, 33 years
Annual suspended-sediment-load estimation technique: Graphical fit

Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)	Water year	Annual streamflow (acre-feet)	Estimated annual suspended-sediment load (tons)
1952	24,860	52,900	1969	44,840	95,400
1953	20,000	19,700	1970	41,380	954,000
1954	20,790	36,800	1971	38,440	188,000
1955	26,460	58,300	1972	29,280	131,000
1956	20,200	19,900	1973	68,520	858,000
1957	45,330	1,210,000	1974	25,070	52,800
1958	48,800	187,000	1975	36,500	61,700
1959	16,710	18,200	1976	32,220	54,700
1960	26,620	77,400	1977	11,730	3,350
1961	23,030	18,500	1978	17,950	21,800
1962	30,080	45,300	1979	52,920	502,000
1963	24,630	64,600	1980	48,910	274,000
1964	21,020	37,300	1981	26,820	93,900
1965	49,780	123,000	1982	33,410	156,000
1966	46,450	226,000	1983	58,390	181,000
1967	35,030	1,300,000	1984	38,560	80,100
1968	37,420	100,000			
			Total	1,122,150	7,302,650
			Mean	34,000	221,000

*U.S. GOVERNMENT PRINTING OFFICE: 1987-0-573-477/85012