MONTHLY MEAN DISCHARGE AT AND BETWEEN SELECTED STREAMFLOW-GAGING STATIONS ALONG THE MISSISSIPPI, MINNESOTA, AND ST. CROIX RIVERS, 1932-87

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CONVERSION FACTORS

Multiply Inch-Pound Unit	By	To Obtain Metric Unit
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)

MONTHLY MEAN DISCHARGE AT AND BETWEEN SELECTED STREAMFLOW-GAGING STATIONS ALONG THE MISSISSIPPI, MINNESOTA, AND ST. CROIX RIVERS, 1932-87

By Michael E. Schoenberg and Gregory B. Mitton

ABSTRACT

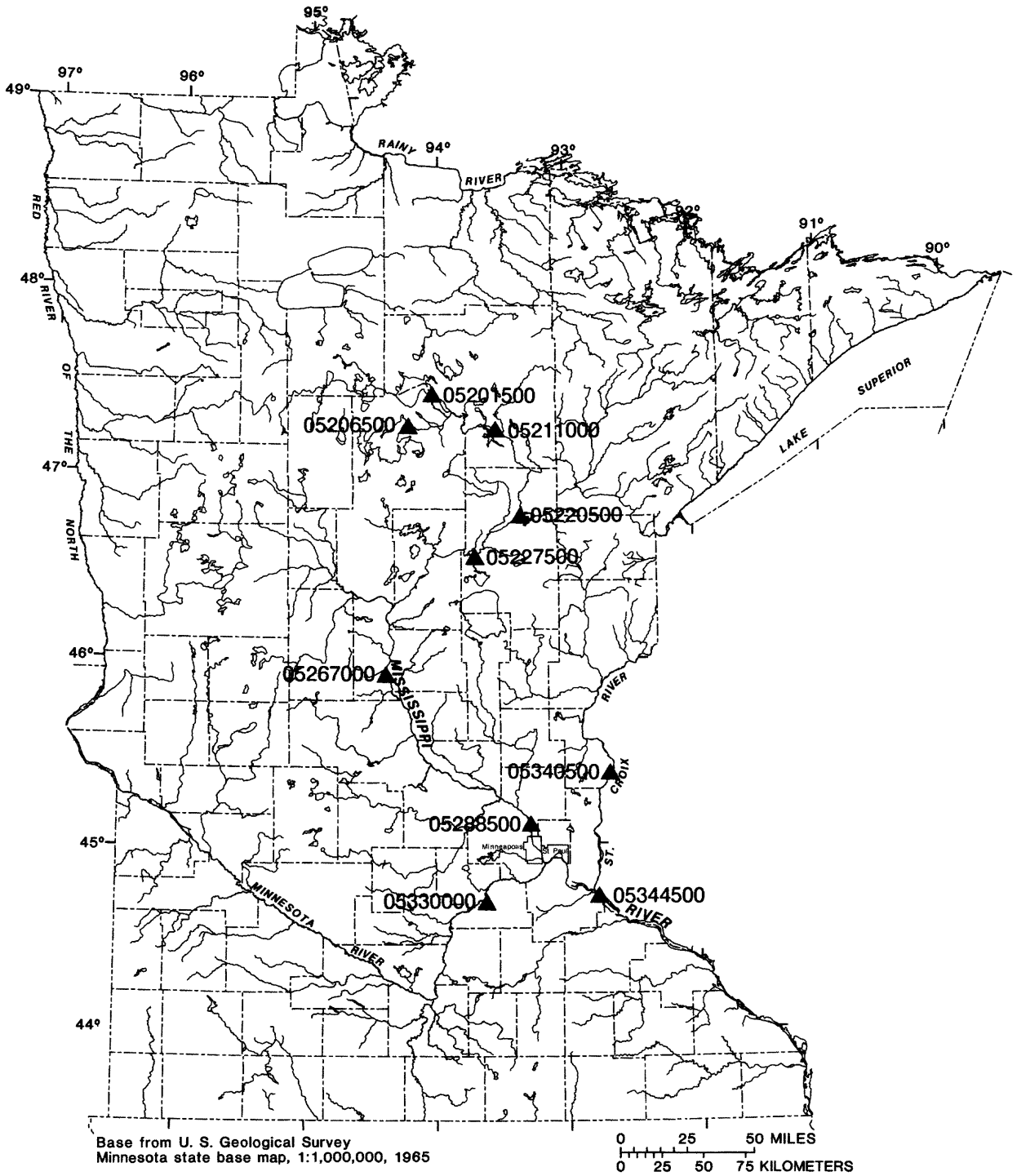
Monthly mean discharges for the period of record are given for the streamflow-gaging stations along the upper Mississippi River from its headwaters to Prescott, Wisconsin, as well as for the first upstream streamflow-gaging station on the major tributaries of the Mississippi River, the Minnesota and St. Croix Rivers. Differences in the monthly mean discharge between selected upstream and downstream streamflow-gaging stations are given. The differences were calculated by subtracting the monthly mean discharge from the upstream streamflow-gaging station or stations from the downstream station. The difference is reported at the downstream streamflow-gaging station.

INTRODUCTION

The longest streamflow records from streamflow-gaging stations along the upper Mississippi River from its headwaters downstream to Prescott, Wisconsin, (fig.1 and table 1) start in the middle of the 1920's. Most streamflow records for these stations start in the early 1930's; the shortest record starts in 1945 for station 05227500. The two major tributaries for the Mississippi River above Prescott are the St. Croix River and the Minnesota River. Streamflow records for the first upstream streamflow-gaging stations on these rivers start in 1903 (station 05340500 on the St. Croix River and in 1935 (station 05320000 on the Minnesota River). These records are kept in WATSTORE, a database maintained by the U.S. Geological Survey.

These data were compiled in cooperation with the U.S. Army Corps of Engineers (COE). In response to drought conditions during 1987, the COE recognized the need for historical data that show the effects of previous droughts on discharge in the upper Mississippi River.

This report provides tables of the monthly mean discharge at each of 10 streamflow-gaging stations for the period of record. The differences between the monthly mean discharge between selected upstream and downstream streamflow-gaging stations are tabulated for available data. The tables of monthly mean discharge are provided for the convenience of the reader and can be used in conjunction with the tables of differences between monthly mean discharge between selected streamflow-gaging stations.



EXPLANATION

▲05344500 Streamflow-gaging station location and number

Figure 1.--Locations of streamflow-gaging stations discussed in report and described in table 1

TABLE 1.--Description of streamflow-gaging stations

Station number	Station name	Location	Drainage area (square miles)	Period of record
05201500	Mississippi River at Winnibigoshish Dam near Deer River, Minn.	Latitude 47°25'42", longitude 94°03'00", in SW¼ sec.25, T.146 N., R.27 W., Itasca County, Hydrologic Unit 07010101, on Leech Lake Indian Reservation, at dam 1 miles northwest of Little Winnibigoshish Lake, 14 miles northwest of city of Deer River, and at mile 1,248 upstream from Ohio River.	1,442	May 1884 to current year (1989) Monthly discharge only for some periods, published in Water-Supply Paper 1308.
05206500	Leech Lake River at Federal Dam, Minn.	Latitude 47°14'45", longitude 94°13'12", in sec.34, T.144 N., R.28 W., Cass County, Hydrologic Unit 07010102, on Leech Lake Reservation, on right bank at dam on Leech Lake River at city of Federal Dam, 2 miles downstream from natural outlet of Leech Lake.	1,163	May 1884 to current year (1989). Monthly discharge only for some periods, published in Water-Supply Paper 1308.
05211000	Mississippi River at Grand Rapids, Minn.	Latitude 47°13'56", longitude 93°31'48", in SW¼NW¼ sec.21, T.55 N., R.25 W., Itasca County, Hydrologic Unit 07010103, on left bank, in super-calendar room of Blandin Paper Mill in Grand Rapids, 400 feet downstream from Blandin Dam, 400 feet upstream from bridge on U.S. Highway 169, 2.5 miles upstream from Prairie River, and at mile 1,182 upstream from Ohio River.	3,370 approximately	October 1883 to current year (1989). Monthly discharge only for some periods, published in Water-Supply Paper 1308. Published as "at Pokegama Dam near Grand Rapids" 1942-44.
05220500	Mississippi River below Sandy River, near Libby, Minn.	Latitude 46°47'23", longitude 93°19'43", in SE¼NE¼ sec.25, T.50 N., R.24 W., Aitkin County, Hydrologic Unit 07010103, on right bank 600 feet downstream from Sandy River, 0.8 miles northwest of Libby, and at mile 1,106 upstream from Ohio River.	5,060 approximately	April 1930 to current year (1989). Monthly discharge only for some periods, published in Water-Supply Paper 1308.
05227500	Mississippi River at Aitkin, Minn.	Latitude 46°32'26", longitude 93°42'26", in SW¼NW¼ sec.24, T.47 N., R.27 W., Aitkin County, Hydrologic Unit 07010104, on right bank upstream side of highway bridge at north edge of Aitkin, 1 mile downstream from Ripple River and at mile 1,055.9 upstream from Ohio River.	6,140 approximately	March 1945 to current year (1989). Monthly discharge only for some periods, published in Water-Supply Paper 1308.

MONTHLY MEAN DISCHARGE AT SELECTED STREAMFLOW-GAGING STATIONS ALONG THE MISSISSIPPI, MINNESOTA, AND ST. CROIX RIVERS, 1903-87

Monthly mean discharges for the upper Mississippi River basin for the period of record are given for the following streamflow-gaging stations:

(1) station 05201500, for 1932-87 (table 2);
(2) station 05206500, for 1932-87 (table 3);
(3) station 05211000, for 1932-87 (table 4);
(4) station 05220500, for 1930-87 (table 5);
(5) station 05227500, for 1945-87 (table 6);
(6) station 05267000, for 1924-87 (table 7);
(7) station 05288500, for 1931-87 (table 8);
(8) station 05344500, for 1928-88 (table 9).

Monthly mean discharges for the Minnesota River for the period of record (1935-87) are given for station 05330000 (table 10). Monthly mean discharges for the St. Croix River for the period of record (1903-87) are given for station 05340500 (table 11).

DIFFERENCES IN MONTHLY MEAN DISCHARGE BETWEEN SELECTED UPSTREAM AND DOWNSTREAM STREAMFLOW-GAGING STATIONS ALONG THE MISSISSIPPI, MINNESOTA, AND ST. CROIX RIVERS, 1932-87

The difference in monthly mean discharge between streamflow-gaging stations was calculated by subtracting the monthly mean discharge for the upstream streamflow-gaging station or stations from the downstream station. Factors such as length of river between stations, time of year, and lag of flow between stations were not considered. The difference is reported at the downstream streamflow-gaging station. Where the downstream station had a significantly longer period of record than the closest upstream station, the next closest upstream station was used to supplement the missing record.

Tables 12-17 give the differences in monthly mean discharge between selected downstream and upstream streamflow-gaging stations on the Mississippi River:

(1) 05211000, and the stations 05201500 and 05206500, for 1932-87 (table 12);
(2) 05220500 and 50211000, for 1932-87 (table 13);
(3) 05227500 and 05220500, for 1945-87 (table 14);
(4) 05267000 and 05220500, for 1932-45 (table 15);
(5) 05267000 and 05227500, for 1945-87 (table 16);
(6) 05288500 and 05267000, for 1932-87 (table 17).

Two major rivers, the Minnesota and St. Croix, join the Mississippi River below Anoka, Minnesota. Table 18 gives the differences between monthly mean discharges at streamflow-gaging station 05344500 on the Mississippi River, and the combined monthly mean discharge of stations 05288500 on the Mississippi River, 05330000 on the Minnesota River, and 05340500 on the St. Croix River, for 1935-87.

TABLE 1.--Description of streamflow-gaging stations--Continued

Station number	Station name	Location	Drainage area (square miles)	Period of record
05267000	Mississippi River near Royalton, Minn.	Latitude 45°51'41", longitude 94°21'33", in lot 2, sec.20, T.39 N., R.32 W., Morrison County, Hydrologic Unit 07010104, at plant of Minnesota Power Co., 4 miles northwest of Royalton, 4.5 miles downstream from Swan River, and at mile 956 upstream from Ohio River.	11,600 approximately	March 1924 to current year (1989). Monthly discharge only for some periods, published in Water-Supply Paper 1308.
05288500	Mississippi River near Anoka, Minn.	Latitude 45°07'36", longitude 93°17'48", in SW¼ sec.12, T.119 N., R.21 W., Hennepin County, Hydrologic Unit 07010206, on right bank 0.4 mile downstream from Coon Creek, 1.3 miles downstream from Coon Rapids dam at Coon Rapids, 6.5 miles downstream from Anoka, and at mile 864.8 upstream from Ohio River.	19,100 approximately	June 1931 to current year (1989). Monthly discharge only for some periods, published in Water-Supply Paper 1308. Prior to October 1931 published as "at Coon Rapids, near Anoka."
05330000	Minnesota River near Jordan, Minn.	Latitude 44°41'35", longitude 93°38'30", in NW¼SW¼ sec.7, T.114 N., R.23 W., Carver County, Hydrologic Unit 07020012, on pier at center downstream side of bridge, 1.5 miles northwest of Jordan, and at mile 39.4 upstream from Mississippi River.	16,200 approximately	September 1934 to current year (1989). Monthly discharge only for some periods, published in Water-Supply Paper 1308. Prior to Oct. 1, 1966, published as "near Carver, Minn".
05340500	St. Croix River at St. Croix Falls, Wis.	Latitude 45°24'25", longitude 92°38'49", in SW¼NW¼ sec.30, T.34 N., R.18 W., Polk County, Hydrologic Unit 07030005, St. Croix National Scenic Riverway, on left bank, 1,500 feet downstream from powerplant of Northern States Power Co., in St. Croix Falls, and at mile 52.2.	6,240	January 1902 to current year (1989). Prior to January 1910, monthly discharge only, published in Water-Supply Paper 1308. Prior to October 1939, published as "near St. Croix Falls."
05344500	Mississippi River at Prescott, Wis.	Latitude 44°44'45", longitude 92°48'00", in sec.9, T.26 N., R.20 W., Pierce County, Hydrologic Unit 07040001, on left bank at Prescott, 200 feet downstream from St. Croix River, 300 feet south of Chicago, Burlington & Quincy Railroad bridge, 800 feet south of bridge on U.S. Highway 10, and at mile 811.4 upstream from Ohio River.	44,800 approximately	June 1928 to current year (1989). Monthly discharge only for some periods, published in Water-Supply Paper 1308.

Table 2.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station at Winnibigoshish Dam, Minnesota, (05201500) 1932-87

[All values in cubic feet per second]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1932	150	141	131	139	143	138	145	148	146	148	144	144
1933	138	139	144	142	145	146	144	138	145	135	142	139
1934	144	137	136	137	137	138	140	82	66	132	132	21
1935	80	120	120	120	118	116	106	63	20	18	76	121
1936	129	134	134	144	142	112	23	7	15	191	188	154
1937	116	122	120	98	25	10	10	7	6	15	52	191
1938	340	158	160	153	144	150	44	29	118	827	778	494
1939	277	533	599	723	781	570	29	31	27	225	374	283
1940	633	194	155	101	54	55	45	38	23	164	290	386
1941	919	436	249	183	89	50	39	23	42	309	595	742
1942	73.4	406	630	904	904	487	22.3	20.7	22	166	793	700
1943	493	560	851	929	912	310	25.6	26.9	34.6	363	752	839
1944	1089	1008	1027	1102	980	165	35.4	25.9	25.4	27.5	345	1112
1945	1193	1178	1098	1269	1586	995	513	1180	1118	1204	1206	949
1946	509	367	310	420	568	446	211	758	540	310	499	504
1947	419	316	353	614	599	500	159	136	405	758	1196	898
1948	714	717	701	699	704	704	95	165	307	310	624	414
1949	386	705	614	423	567	195	29.8	19.5	22.5	238	1225	1061
1950	818	758	722	1122	1149	1061	98.9	135	1309	2492	2437	1494
1951	1203	1344	1237	1177	1229	904	47.2	198	1611	1083	806	733
1952	652	924	986	1221	1303	865	49.2	89.2	668	744	443	632
1953	483	945	1115	735	744	248	55	50.8	210	598	462	811
1954	995	1436	1206	1187	1022	164	60.6	195	981	1056	513	357
1955	422	722	640	549	492	323	53.3	56.3	85.2	266	223	391
1956	392	427	414	264	211	206	54.6	254	304	332	335	283
1957	402	402	398	506	600	13.8	58.1	95.4	199	1780	1452	995
1958	1137	868	861	780	566	292	109	50.8	44	43	134	348
1959	300	213	208	192	194	196	64.4	50.3	48.7	76.3	89.1	446
1960	496	453	427	435	576	673	98.5	55.5	60.1	60.3	376	497
1961	286	273	282	282	274	270	110	55.2	51.1	52.5	50.9	56.3
1962	53.5	377	412	393	397	398	306	427	1982	1910	1782	763
1963	973	916	874	793	502	421	123	112	148	200	611	133
1964	251	285	301	318	311	240	226	116	680	729	316	315
1965	710	688	650	592	530	80.5	71.4	114	120	561	817	662
1966	763	828	823	813	944	956	447	631	928	903	898	900
1967	894	815	766	780	798	702	177	507	622	884	786	543
1968	487	493	493	505	516	297	101	105	384	988	412	304
1969	431	1157	1099	1008	1058	1058	332	315	811	876	753	285
1970	586	819	910	980	1047	1032	413	668	1243	622	170	115
1971	115	544	819	998	1011	1172	424	107	109	169	136	219
1972	532	990	1004	983	971	774	99.1	409	528	371	293	605
1973	541	547	679	743	766	295	152	153	150	150	150	151
1974	487	1077	981	983	980	491	394	515	1061	1211	409	210
1975	294	841	845	998	998	918	274	573	1030	1064	1448	1296
1976	889	897	893	888	884	617	199	106	106	107	106	106

Table 2.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station at Winnibigoshish Dam, Minnesota, (05201500) 1932-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1977	105	105	105	105	105	105	106	106	106	106	106	116
1978	517	948	1103	1100	1097	442	101	164	857	884	764	876
1979	1020	1008	831	813	807	424	105	803	1104	1110	1096	592
1980	482	850	723	845	873	387	100	101	101	100	100	100
1981	218	350	356	185	100	100	101	101	118	890	907	452
1982	703	1000	996	988	955	517	105	482	1125	586	360	304
1983	606	964	998	991	834	118	106	106	424	1160	874	479
1984	479	672	829	826	825	545	187	102	663	638	102	102
1985	646	972	968	938	628	162	101	514	1287	1284	1280	1277
1986	1231	1109	1100	930	540	115	151	754	1006	1072	1070	1061
1987	986	628	711	708	393	201	125	224	786	254	771	709

Table 3.--Monthly mean discharge for the Mississippi River at streamflow-gaging station near Leech Lake River at Federal Dam, Minnesota, (05206500) 1932-87

[All values in cubic feet per second]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1932	197	103	100	101	99	100	98	26	3	37	57	68
1933	97	101	100	100	100	100	97	100	96	97	97	95
1934	59	97	99	31	5	5	98	99	102	99	99	97
1935	97	97	96	97	30	50	78	60	25	26	26	25
1936	25	26	26	26	25	22	14	14	26	82	69	54
1937	25	24	25	26	25	24	21	23	21	29	33	55
1938	69	69	72	69	69	71	35	33	30	49	189	276
1939	398	442	495	544	591	531	37	30	30	388	463	156
1940	245	147	107	56	44	43	41	43	40	230	388	457
1941	645	113	70	62	66	58	56	64	187	343	328	210
1942	193	371	792	674	503	429	62.5	77.6	85.3	171	413	492
1943	587	635	755	709	700	341	85	53	199	546	545	570
1944	537	497	541	692	563	112	101	65.1	71.9	91.4	496	881
1945	1064	1073	1146	1149	1099	870	547	209	209	162	126	509
1946	527	510	495	431	570	570	201	397	345	312	307	457
1947	429	438	528	833	582	440	325	265	341	471	367	404
1948	386	346	345	355	514	503	82.9	159	544	447	395	303
1949	233	457	455	367	440	178	77	69.4	78.9	90.7	174	443
1950	503	504	485	508	499	454	114	125	640	1193	1172	882
1951	808	738	824	934	784	287	42	210	524	496	447	459
1952	510	742	822	954	822	511	55	600	621	415	408	527
1953	706	937	884	826	484	194	36	85.8	578	698	452	820
1954	1230	1005	955	894	870	129	65	179	567	584	560	541
1955	442	518	480	514	469	334	55.5	209	401	423	591	63.5
1956	121	211	207	154	101	105	56.1	205	163	139	124	131
1957	201	265	326	195	112	425	54	50.4	1565	2	119	309
1958	456	475	581	733	690	495	108	47.9	47.4	41.7	50	47.6
1959	84.6	75	47	51.5	50.3	41.8	38.9	41.0	43.8	53.6	98	422
1960	391	349	342	369	397	395	74.7	54.7	105	93	341	401
1961	396	370	331	345	364	370	147	141	99.6	62.7	48.5	52.3
1962	50.8	361	392	384	392	394	296	233	622	687	698	704
1963	938	973	988	903	792	601	112	100	99.2	100	86.6	109
1964	197	243	254	280	277	328	236	112	165	193	194	208
1965	502	497	506	534	568	745	338	77.1	480	805	812	735
1966	818	755	758	726	843	541	169	634	888	862	817	733
1967	695	659	721	748	797	691	183	509	153	117	97.5	117
1968	297	282	288	313	327	194	114	112	363	687	124	101
1969	317	850	835	871	907	858	286	306	87	544	378	241
1970	471	689	870	769	658	665	273	265	510	186	82.7	82.4
1971	95.1	356	520	544	584	574	239	104	105	105	104	213
1972	531	936	833	728	740	664	102	606	509	106	244	745
1973	834	819	771	734	679	236	112	113	113	113	114	114
1974	467	940	874	798	804	789	674	935	695	636	103	89.4
1975	108	520	670	705	780	684	237	519	972	777	954	885
1976	769	762	729	690	697	410	109	109	106	107	101	94.5

Table 3.--Monthly mean discharge for the Mississippi River at streamflow-gaging station near Leech Lake River at Federal Dam, Minnesota, (05206500) 1932-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1977	91	88.9	88.1	88.9	90.3	93.4	98.3	101	103	101	96.1	100
1978	178	484	719	708	676	240	110	119	312	593	625	874
1979	1190	1099	963	863	689	689	139	663	876	664	380	249
1980	362	830	802	910	1001	504	138	110	110	106	102	102
1981	248	350	351	177	100	103	108	110	108	149	410	306
1982	683	905	905	723	732	518	151	840	878	211	127	310
1983	705	1100	1042	986	901	209	115	118	375	913	286	188
1984	441	794	720	674	757	726	237	112	278	386	102	93.9
1985	633	925	846	799	714	235	143	510	1000	920	836	841
1986	696	626	835	816	835	533	172	629	827	666	593	527
1987	555	941	958	924	649	402	210	173	240	163	140	237

Table 4.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station near Grand Rapids, Minnesota, (05211000) 1932-87

[All values in cubic feet per second]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1932	244	265	242	222	225	240	351	388	382	319	132	155
1933	126	248	259	254	250	253	382	392	395	376	156	275
1934	115	177	171	169	155	156	336	385	269	194	88.2	89.2
1935	111	193	178	195	241	287	257	195	199	197	324	367
1936	231	214	272	228	155	184	200	193	186	511	161	141
1937	104	122	150	165	303	130	106	278	320	447	232	224
1938	250	320	384	312	377	329	452	683	938	641	838	606
1939	649	978	1056	1174	1212	1460	530	518	389	395	539	580
1940	1025	395	321	206	194	190	212	455	563	390	402	611
1941	1595	670	391	390	396	460	417	764	507	655	1336	751
1942	1175	696	914	1329	1603	1549	434	404	409	598	1015	1325
1943	1206	1391	1536	1653	1760	1618	681	1276	766	1306	1352	1359
1944	1600	1598	1566	1634	1616	787	590	393	499	1182	1549	1471
1945	2234	2301	1828	2075	2729	2762	3442	2330	1766	1530	1520	1545
1946	1551	1290	1118	1005	1046	1307	1977	1517	1565	1179	941	1300
1947	1252	1285	1043	1652	1589	1447	1323	1848	1292	1280	1356	1582
1948	1505	1370	1372	1355	1331	1401	843	2173	857	882	972	356
1949	1005	1325	1057	826	1271	1015	524	32.5	422	1139	1662	1769
1950	1430	1778	1513	1452	1679	1894	1506	2849	2548	3231	3711	3542
1951	2580	2191	1837	2110	2185	2185	1436	1851	2047	1806	1783	1728
1952	1826	1923	2144	2410	2478	2503	1146	1488	1268	1342	2121	1649
1953	1213	1736	1715	1924	1571	1248	682	760	1767	2517	1688	2527
1954	2325	2496	2375	2316	2101	1809	1098	1900	1880	1839	1498	1432
1955	1201	1404	1450	1430	1246	1100	893	957	960	1024	985	698
1956	622	889	1094	516	279	675	794	856	666	524	525	505
1957	565	941	1049	839	852	724	794	875	1867	2552	2112	1705
1958	2051	1794	1695	1825	1705	1846	468	182	353	248	243	420
1959	360	324	304	298	286	304	247	393	453	867	257	1174
1960	1158	964	870	871	934	1096	1223	886	758	442	484	926
1961	766	703	583	586	653	733	556	765	251	125	98.3	196
1962	193	746	836	825	827	980	1080	1486	3271	3363	2862	2254
1963	1772	2094	1798	1693	1410	1288	1098	727	1011	528	958	510
1964	462	579	681	743	807	732	1030	1623	1084	1640	760	1002
1965	1241	1335	1278	1278	1270	1199	1244	1833	1558	1294	1785	1820
1966	2595	2196	1916	1899	1997	2130	2533	2667	2431	1976	2254	2010
1967	2043	1878	1647	1751	2081	1813	2155	1573	1199	1121	954	821
1968	940	929	802	788	862	567	686	570	1095	1740	996	716
1969	1149	2053	1778	1892	2037	2339	2810	2068	1687	1570	1625	917
1970	1403	1863	1907	1894	1868	2055	1957	1889	2461	1266	359	277
1971	278	924	1336	1573	1753	1986	2346	885	686	506	250	303
1972	1369	2385	2103	1992	1969	2060	1179	2321	1525	634	750	1481
1973	1736	1834	1624	1623	1635	1160	598	554	386	336	434	336
1974	1693	2382	2108	2026	1995	1937	1930	2460	2832	2058	1303	646
1975	631	1735	1691	1824	2056	2093	1772	2782	2553	2877	2645	2790
1976	2378	2183	1821	1785	1863	2015	1298	360	226	280	197	195

Table 4.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station near Grand Rapids, Minnesota, (05211000) 1932-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1977	188	174	186	168	177	198	343	256	307	293	219	827
1978	1328	1774	1827	1997	2027	1628	1478	676	1403	2416	2148	2844
1979	2730	2326	1981	1857	1785	1765	1248	3026	2810	2520	1769	1519
1980	935	2050	1761	1695	1716	1583	897	288	347	230	219	345
1981	585	896	790	444	297	405	527	514	540	1061	1931	1242
1982	1918	2410	2041	1927	1961	1715	1596	2434	2482	1661	921	854
1983	1800	2162	2177	2070	2023	1063	625	420	1000	2125	2145	1035
1984	1260	1616	1596	1571	1618	1849	1419	891	1484	1318	387	297
1985	1369	2030	1804	1832	1584	1011	970	2119	2230	2725	2489	2782
1986	2865	2049	1829	2161	1952	1364	1694	1987	2182	2149	2056	2307
1987	2280	1845	1782	1797	1610	992	601	719	1315	884	1201	1142

Table 5.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station below Sandy River near Libby, Minnesota, (05220500) 1930-87

[All values in cubic fet per second; *, no value]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1930	*	*	*	*	*	*	*	1941	1284	1520	2217	2036
1931	1518	852	680	733	659	788	739	732	1547	741	430	339
1932	460	532	621	581	922	739	1599	1976	1117	762	600	411
1933	344	914	525	411	444	538	1302	2152	1613	530	291	432
1934	480	492	363	318	314	306	1303	1145	558	381	200	199
1935	249	295	265	264	322	618	1638	1942	786	748	1199	856
1936	383	451	572	532	398	585	1820	3588	1109	908	266	280
1937	321	167	245	279	365	419	1517	2596	1549	612	467	710
1938	492	552	589	610	698	823	1495	5875	2665	881	1247	908
1939	906	1430	1381	1590	1629	1997	3301	1815	1043	927	879	913
1940	1346	637	560	409	383	305	1189	2252	1455	578	578	774
1941	2095	1336	764	786	827	819	4143	2394	1849	1116	1653	3004
1942	3124	1602	1617	1774	2107	2055	1509	3039	2024	1175	1281	2145
1943	1748	2211	2394	2219	2200	2048	2865	3566	4984	2743	2815	2112
1944	2300	2314	2290	2184	2159	1158	1282	3323	5433	4567	3365	2396
1945	3280	3325	3252	2774	3214	4182	6661	4352	3165	2195	2061	2148
1946	2475	1838	1455	1150	1214	2430	4506	2897	3548	2365	1094	1427
1947	2448	2443	1523	2003	1700	1503	3293	4721	3204	1543	1452	1970
1948	1929	1922	1719	1542	1683	1826	5115	5255	1180	1012	1139	809
1949	1025	1422	1371	984	1443	1300	1291	924	1276	2604	2395	2071
1950	2609	2538	2342	2016	1989	1974	3257	11680	5954	3917	3903	3842
1951	3229	2634	2580	2618	2524	2592	4051	4815	3236	2250	2075	3643
1952	3559	3641	2961	2895	2824	2990	4438	2955	1642	3214	4299	2601
1953	1715	2151	1941	2133	2061	2138	3081	2845	4510	5296	5202	4195
1954	3018	3276	3138	2825	2646	2377	4450	5901	3660	2302	1782	1546
1955	1395	1678	1708	1574	1378	1442	2814	1941	2071	2170	2446	1151
1956	1153	1250	1654	844	603	1041	3742	2738	1182	677	865	696
1957	794	1377	1197	978	924	934	3295	2911	2739	4529	2757	1913
1958	2298	2152	1954	1936	1878	2025	980	484	1195	1291	566	1189
1959	676	728	480	567	659	690	822	2043	2416	2002	565	1952
1960	1874	1555	1294	1225	1242	1379	3010	3920	2460	1054	747	1205
1961	1011	1020	853	869	929	1087	1476	2815	830	314	258	478
1962	500	1067	996	1067	1127	1559	1905	3687	5050	3942	3426	2935
1963	2122	2501	2072	1936	1739	2011	2921	2068	2691	1009	1438	951
1964	764	851	931	1000	1049	1048	2479	4468	2041	2185	989	2681
1965	2004	1849	1778	1635	1552	1834	4494	5601	4551	1744	1850	2351
1966	4865	3170	2959	2818	2594	3185	7337	6748	3630	2489	3455	2545
1967	2427	2308	2080	1939	2276	2212	5243	3477	2391	1451	1053	846
1968	1041	1099	992	956	986	1035	1963	2261	3248	2667	1381	1360
1969	2566	2911	2365	2073	2216	2708	6220	5152	2426	1915	1712	1142
1970	1698	2228	2133	1911	1995	2334	3878	4630	3310	1632	532	400
1971	572	1773	2102	1998	1965	2099	5584	3810	2369	1361	626	513
1972	1969	4850	2924	2437	2224	2108	3524	5553	2247	1708	2945	2484
1973	2557	2929	1844	1863	1735	2384	1796	2341	1418	849	1552	980
1974	3817	3506	2855	2280	2064	2066	4290	6135	5997	2749	2017	967

Table 5.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station below Sandy River near Libby, Minnesota, (05220500) 1930-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1975	1066	2723	2254	2201	2254	2472	4268	7551	3999	4697	2874	2893
1976	2633	2529	2013	1992	2092	2655	3774	1038	599	749	399	318
1977	307	307	296	322	385	520	777	559	935	838	446	2551
1978	3038	3274	2955	2271	2182	2150	3805	2225	3475	4029	3913	4295
1979	3355	2892	2203	1889	1729	2238	4290	7192	4027	3851	2088	1805
1980	1295	3033	2187	1988	1924	1991	2319	1007	691	479	592	1140
1981	1139	1352	1053	731	533	700	1962	2336	1659	1913	2621	1789
1982	3588	3472	2575	2276	2217	2062	4614	6492	3839	2486	1474	1356
1983	3951	3625	3018	2474	2287	2238	2542	1577	2067	3018	2721	1592
1984	2334	2695	2533	2132	2137	2533	2939	2898	4012	2307	691	486
1985	2246	3232	2353	2214	1996	1776	2563	5574	4385	4722	3197	3481
1986	4540	3015	2584	2537	2296	2095	4936	6238	3824	3149	2699	4313
1987	3814	2856	2429	2205	1957	2177	1450	1948	2309	1619	1913	1549

Table 6.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station near Aitkin, Minnesota (05227500) 1945-87

[All values in cubic feet per second; *, no value]

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
1945	*	*	*	*	*	5415	8641	5226	3914	2493	2363	2693
1946	3102	2167	1829	1439	1429	3190	5820	3762	5401	3783	1276	1550
1947	3394	3135	2032	2087	1932	1952	5395	6214	4695	1870	1582	2063
1948	2055	1982	1868	1597	1769	2010	7659	7298	1421	1128	1221	957
1949	1015	1498	1481	1050	1546	1426	2056	1660	1866	3369	2920	2249
1950	3281	2908	2613	2142	2186	2052	5151	15510	7566	4323	4007	3944
1951	3404	2710	2664	2693	2667	2717	6240	6893	4216	2830	2295	4869
1952	4749	5194	3629	3517	3046	3060	7515	4484	2007	6146	6549	3528
1953	2014	2345	2239	2207	2159	2559	4769	4998	7168	6849	8270	5145
1954	3415	3595	3390	3110	2904	2715	6619	7897	4872	3265	2114	1748
1955	1641	1880	1921	1715	1502	1564	4473	2478	2790	3682	4116	1582
1956	1620	1592	1805	992	716	1112	7063	3994	1748	814	999	788
1957	787	1420	1317	1049	972	1057	4616	4168	3569	5392	3411	2111
1958	2455	2337	2070	1908	1870	2019	1284	669	1687	1834	768	1428
1959	869	994	677	662	689	780	1081	2708	3692	2368	731	1941
1960	1946	1741	1522	1292	1344	1580	4363	5690	3378	1381	831	1270
1961	1058	1091	895	917	1000	1294	1830	3732	1086	346	273	518
1962	621	1076	1109	1160	1064	1903	2969	5168	6380	4358	3615	3145
1963	2250	2600	2227	2039	1804	2117	4055	3039	3875	1326	1702	1235
1964	976	1044	1078	1098	1159	1123	3726	6395	2435	2538	1328	4373
1965	2672	2110	1858	1724	1647	1893	8038	8437	8072	2151	2000	2563
1966	6534	3751	3647	3525	3196	3948	10830	9522	4500	3126	4217	2921
1967	2756	2490	2206	2105	2291	2419	8051	4635	3471	1870	1197	944
1968	1109	1199	1068	1005	1045	1230	2657	3262	4471	3388	1511	1529
1969	3518	3495	2655	2431	2546	3829	10100	7287	2890	2162	2000	1370
1970	1937	2386	2356	1962	2217	2554	5559	6526	3970	1843	575	415
1971	644	2146	2436	2147	1989	2325	8353	5666	3200	1755	807	645
1972	2167	6756	3762	2605	2341	2695	6443	8165	3021	2315	5397	3542
1973	2988	3913	2279	2161	2003	3365	2555	3145	1987	1357	2899	1436
1974	5851	4219	3216	2590	2218	2205	6814	9014	8036	3195	2636	1141

Table 6.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station near Aitkin, Minnesota (05227500) 1945-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
1975	1138	3156	2434	2301	2339	2552	6651	11010	5034	7134	2957	2949
1976	2805	2712	2332	2256	2301	2723	5328	1310	703	902	438	321
1977	313	328	324	345	398	638	1074	738	1154	1009	473	2793
1978	3840	4235	3574	2626	2223	2121	5914	3076	4801	5170	4916	5450
1979	3615	2971	2323	1839	1678	2108	7037	10270	4961	4440	2243	1912
1980	1319	3464	2246	2010	1989	1990	3281	1341	854	565	621	1607
1981	1258	1405	1114	860	611	861	2452	3432	2770	2544	2758	1900
1982	4299	4042	2615	2287	2165	2039	7927	9227	4539	2588	1542	1444
1983	5295	4168	3431	2632	2418	3055	3782	2291	2587	3702	2801	1625
1984	2406	2744	2691	2310	2372	2795	4326	4149	6095	2443	796	512
1985	2715	3709	2696	2262	1991	2216	3721	7266	5642	6327	3806	4128
1986	5563	3678	2974	2732	2491	2296	7739	9208	5051	3896	3314	6689
1987	5252	3397	2795	2465	2222	2556	1926	2462	2707	1768	2258	1612

Table 7.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station near Royalton, Minnesota, (05267000) 1924-87

[All values in cubic feet per second; *, no value]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1924	*	*	*	*	*	*	2288	2606	2030	2186	3975	3212
1925	3646	2258	1294	890	849	1523	2647	2733	3779	2714	2383	3203
1926	2740	1838	1434	905	975	2359	3110	1904	1721	1687	1413	3162
1927	4232	2517	1785	1478	1409	4604	9725	6155	3978	2727	3398	4003
1928	3887	2400	1453	1436	1544	2853	5583	4152	3544	3992	4164	5838
1929	6800	4168	3075	2475	2404	4742	5302	3664	2933	2841	3329	3351
1930	3478	2246	1169	1100	1313	2218	2880	5823	2790	2337	3051	2972
1931	2324	1504	1192	1056	1117	1325	1924	1750	4378	2233	1394	962
1932	1106	1372	1651	1559	1507	1627	3299	3980	2447	1266	1285	837
1933	716	1259	903	752	762	1101	2537	4548	4994	1469	738	957
1934	1169	1161	992	958	810	1266	2969	2202	1309	733	449	535
1935	719	813	627	534	763	2072	3263	4365	2776	2027	2033	1755
1936	1203	1301	1392	1313	1091	1591	4186	6836	2105	1407	526	577
1937	632	618	712	684	758	1039	4500	6075	3890	2065	2033	1842
1938	1289	1294	1262	1193	1231	2379	3701	14680	7345	2082	2106	2665
1939	1825	2409	2421	2504	2519	4093	9591	4429	3308	2468	1793	1672
1940	2075	1321	1086	657	760	968	4796	5275	3001	1232	1283	1254
1941	3120	2498	1961	1776	1817	1768	12300	6134	6530	2853	2521	6578
1942	6266	3599	2984	2848	3193	3775	3985	9853	6782	3052	3235	5541
1943	4223	4183	3729	3528	3443	3752	11050	8296	17290	8771	4730	3371
1944	3561	3764	3498	3792	3517	2576	4792	9373	14960	10190	8465	5416
1945	5253	5237	3956	4145	4627	9347	12770	7597	5627	3609	3772	5155
1946	4806	3401	3118	2535	2427	6403	8825	5504	8376	9923	2755	3064
1947	6973	5076	3639	3762	3245	3309	11210	10990	7932	3568	2390	2883
1948	2955	2795	2970	2536	2714	3505	13200	11060	3220	2399	2647	1980
1949	1935	2350	2224	1978	2457	2660	4816	3815	3365	4960	4224	2949
1950	4261	3794	3376	2973	2923	3051	11820	24600	12110	5808	4734	4503
1951	4221	3250	3621	3668	3670	3829	10400	9625	6694	4490	3345	7934
1952	7364	7983	6456	4610	3818	4226	18020	7725	3400	11390	11360	5688
1953	3152	3378	3194	3253	3512	4814	10200	9374	15150	10070	15230	7496
1954	5145	4957	4367	4288	3856	5048	12040	14540	8932	5360	3175	3010
1955	2912	3019	2925	2769	2397	2568	8270	4101	4542	5761	7023	2818
1956	2751	2439	2762	2084	1844	2156	12920	7843	4709	1734	2510	1598
1957	1623	2824	2018	1755	1659	2902	8920	7425	8857	9308	5123	4704
1958	4360	3971	3317	3000	2783	3359	3254	1945	2942	3267	1565	2542
1959	1789	2166	1571	1231	1150	1496	2331	5565	7696	4682	1718	3162
1960	2892	2448	2328	2335	2168	2209	7587	10010	5769	2553	1506	2074
1961	1686	1735	1504	1412	1445	2129	3072	5893	2225	1112	804	1123
1962	1296	1738	1581	1521	1487	2547	6267	10810	10940	7568	5809	4665
1963	3454	3726	2862	2647	2314	3251	7194	5634	7762	2591	3816	2529
1964	1948	1950	1828	1991	1986	2033	8440	10830	4298	3813	2214	7760
1965	4478	3184	2802	2673	2490	2601	19760	16810	18160	4575	3404	5230
1966	12930	6762	6028	5713	4978	12290	22200	18500	7330	5472	7245	4867
1967	4265	3948	3283	3298	3453	4420	16180	8913	7354	3715	1905	1551
1968	1756	1786	1785	1695	1764	2722	5985	6331	10610	6802	2738	2842

Table 7.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station near Royalton, Minnesota, (05267000) 1924-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1969	6627	5824	3679	3882	3978	4749	21410	13480	4768	3675	2854	2038
1970	3384	3687	3386	3325	3218	3406	10600	12140	7011	2933	1182	975
1971	1547	3629	3289	2905	2783	3697	15310	9776	5500	3613	1837	1760
1972	4861	14640	6179	4397	3643	7660	15460	16120	6865	10060	12880	7215
1973	5834	7649	3828	3417	3121	8822	6069	6996	4522	2880	5202	3370
1974	12860	8601	4622	3445	3152	3688	12870	16570	13510	4996	4585	2300
1975	2569	5363	3565	3752	4010	4149	14630	20750	9229	12420	4341	4090
1976	3908	4056	3461	3149	3381	4585	9262	2575	1457	1424	814	653
1977	738	762	737	770	850	1793	2610	1663	2062	1945	1016	3994
1978	6805	7568	6206	3767	2796	4024	14640	6266	8394	9334	7290	8743
1979	5222	3902	3380	2975	2923	3855	17750	20690	10950	10520	3979	3071
1980	2415	7125	3543	3302	3217	3189	9192	2850	2746	1496	1439	3015
1981	2582	2835	2019	1550	1425	2023	4335	6143	6081	4515	4864	3318
1982	7614	7105	3612	3495	3361	3236	21020	19770	9106	5447	2684	2735
1983	9635	6652	5534	4456	4082	7315	7174	4839	6942	8263	4255	2744
1984	3863	4234	4783	4621	5048	5411	8380	8143	11520	4404	1730	1325
1985	6582	6829	4135	3376	2792	5788	8210	14970	12190	11630	8219	7730
1986	8877	5565	5207	4295	3650	5025	18940	18270	10110	7398	6633	12940
1987	9972	6378	5412	3963	3452	5069	4692	4725	4599	2422	2989	2341

Table 8.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station near Anoka, Minnesota, (05288500) 1931-81

[All values in cubic feet per second; *, no value]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1931	*	*	*	*	*	*	*	*	5577	2907	1826	1300
1932	1577	2009	2161	1983	1952	2611	5909	5832	3519	1926	1696	1206
1933	1160	1747	1249	1084	1079	1978	3686	6308	6658	1841	1089	1213
1934	1474	1495	1211	1265	1122	1677	3930	2796	1646	1022	715	888
1935	1225	1306	1006	935	1174	4149	4859	6605	4054	2873	3034	3085
1936	2027	2020	1900	1874	1505	4573	10810	11990	3302	1796	989	1125
1937	1128	1152	1147	1123	1189	1892	8732	10700	6305	2847	3187	2887
1938	2044	1893	1740	1662	1726	4880	6343	24740	12010	4911	3518	4807
1939	3027	3566	3242	3394	3352	8534	18130	7956	5813	4369	2804	2717
1940	2908	2197	1791	1173	1293	1602	10280	8450	4465	1882	2014	1939
1941	3897	3457	2907	2644	2651	2961	25210	11190	15020	6173	3966	10230
1942	10150	6401	4521	3943	4380	6139	6939	16180	13010	5435	5755	9586
1943	7219	6012	4719	4906	4562	5276	24740	13910	29910	14000	7073	5201
1944	5221	5532	4961	5250	5398	5192	11110	22330	29610	20550	12940	8004
1945	7140	7131	5115	5277	5857	17540	20080	11750	10820	6655	6598	7501
1946	7289	5119	4572	4006	3750	12530	14720	8637	12600	15220	4416	4666
1947	10200	8645	5526	5665	4821	5226	20630	19730	15450	6854	4120	4361
1948	4416	4190	4061	3503	3600	8371	24070	16110	4945	3735	4009	2975
1949	2880	3414	2910	2771	3193	5248	10730	6379	4942	6082	5365	3918
1950	5334	4851	3715	3548	3536	5152	24720	38490	16890	7686	5895	5559
1951	5673	3964	4429	4561	4614	5190	26130	17630	11060	11090	6588	12780
1952	10870	12270	10160	7856	6661	6595	41410	15480	9015	21120	16750	9615
1953	5054	4965	4561	4608	4993	8868	16580	16340	23290	17020	21880	9905
1954	6789	6802	5678	5769	5750	7701	15560	22850	15120	11880	5297	5598
1955	5545	4978	4141	3711	3358	4421	14320	5863	5831	8196	8951	5352
1956	4281	3536	3862	3219	2838	3265	20450	10500	7533	3894	8941	3784
1957	2822	4641	3286	2650	2464	5929	12920	11240	19430	19060	10780	12200
1958	8060	7426	5155	4521	4052	5624	8272	4427	5050	4591	2615	4319
1959	2904	3427	2407	1873	1651	2293	3575	7823	10050	5752	2550	4313
1960	4036	3478	3259	3115	2767	3168	14690	14530	8142	3965	2265	3428
1961	2482	2572	2113	1951	1998	3145	4825	9097	3937	2224	1540	1851
1962	2368	2767	2245	2195	2136	3371	15140	16510	16760	11990	8508	6856
1963	5597	5424	4077	3652	3185	5551	10620	10120	15250	4223	5459	4006
1964	2891	2843	2489	2621	2610	3238	11440	15890	5500	4746	2747	8585
1965	5423	4044	3424	3334	3111	3216	41500	27470	27440	8834	5711	7399
1966	18180	9740	8777	7074	9947	23410	28210	23200	11150	8196	8940	6604
1967	5826	5518	4410	4664	4904	6751	26340	11950	12900	7281	3353	2649
1968	2753	2753	2601	2360	2416	4746	8711	9271	14110	10530	4296	4342
1969	12980	10440	5758	5755	5818	8416	42970	22380	8199	6143	4203	2821
1970	4451	4815	4321	4589	4295	4848	15580	16210	10770	5011	2238	1820
1971	3038	7345	5568	4165	4087	6650	26230	15510	10110	8223	3556	3281
1972	6931	22800	10800	8252	6941	16370	25520	23010	12580	16360	22490	11860
1973	9445	12500	6755	6597	5431	18610	12440	12160	9030	4609	7303	5536
1974	16170	11650	7504	5848	5500	7729	18930	20820	18640	6942	6143	3386
1975	3444	6687	4772	4718	5332	5625	23700	34510	15730	18190	6405	6040

Table 8.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station near Anoka, Minnesota, (05288500) 1931-81--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1976	5437	6199	6023	5284	5804	10660	17760	5279	2987	2498	1356	1054
1977	1153	1395	1254	1269	1463	3942	4781	3044	3364	3151	1800	5650
1978	8504	9894	8902	5675	4246	6512	22820	11370	12460	17390	9616	12310
1979	7600	5773	4632	4155	4096	6411	31330	29160	16370	14550	7214	5804
1980	4400	10380	5722	4882	4871	6320	14230	5442	6640	2996	3079	5958
1981	4509	4420	3165	2635	2559	3520	6999	8353	9937	7963	6674	5451
1982	10150	9157	5338	4631	4699	6297	33340	24830	12490	7905	4090	4992
1983	13650	11030	10370	8109	6804	19260	17280	9946	12150	16600	7018	5980
1984	8185	8855	8435	7315	9217	13070	19090	17630	26780	11410	4735	3788
1985	13730	12570	7871	6375	5186	14800	17990	23340	17490	16680	11290	16610
1986	18080	10320	9125	8304	7319	10250	38180	39760	17910	15250	14470	23570
1987	21250	11400	9249	7268	6894	8892	8563	7040	7441	4067	5112	3637

Table 9.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station at Prescott, Wisconsin, (05344500) 1928-88

[All values in cubic feet per second; *, no value]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1928	*	*	*	*	*	*	*	*	9791	12620	11370	16560
1929	17820	13840	9334	8925	8666	25440	32790	15970	9909	8502	7075	7226
1930	8121	7564	4851	3909	6084	11220	9180	20040	12120	7142	5875	5944
1931	6482	6063	5117	4455	4765	5839	7215	6304	12540	7629	3988	3461
1932	4216	6600	6049	4887	4751	8379	19170	14850	8832	4994	3865	3551
1933	3526	4627	3637	3533	3692	6762	13690	12860	11540	4172	2995	3345
1934	3778	3890	3379	3487	3519	4369	10830	6372	4185	3197	2366	3096
1935	4855	4819	3968	3153	3857	14460	14340	14000	9694	9115	7163	6561
1936	4998	5975	5000	4385	3682	14680	38360	26770	7723	3881	2726	3747
1937	3958	4041	3753	3815	3643	6585	20980	23740	17420	8096	6273	6040
1938	5516	5044	3867	3781	4083	14120	17550	46060	26590	14330	8248	15420
1939	9566	9868	7935	8032	6821	17820	39610	18980	15540	10050	6982	6512
1940	5877	5643	4605	3717	4286	5043	21510	17870	11280	4672	5200	4720
1941	7137	7981	7097	6945	6157	10520	51420	22250	27750	12750	7079	25080
1942	20130	15940	10160	7640	8093	12350	17270	31760	30390	15420	13140	21960
1943	16310	12130	8706	9360	8670	13310	50620	26530	61840	31790	18860	14310
1944	10510	11650	11080	8963	9851	13050	28060	61910	69720	39880	20040	14030
1945	12200	12580	9385	9329	10060	40690	44260	24780	37340	19350	15850	15890
1946	14320	10780	9182	7848	8191	34950	35060	17560	33340	31280	9140	10370
1947	18630	19710	12990	10750	9240	11950	46600	46450	30140	22510	8769	8428
1948	7680	8647	8265	7031	7069	22200	52540	28530	9301	7768	8690	5863
1949	6191	6803	5865	5576	5954	15950	37920	17640	9611	11170	9515	6902
1950	10970	8561	6937	6184	6641	11340	53440	68240	26720	12800	9641	9039
1951	9362	6798	7926	7893	7941	10690	70650	43590	25720	34330	16050	32010
1952	22490	24780	18310	13690	12820	15540	100100	39270	20190	48970	30020	17680
1953	9585	9346	8520	8265	8930	20900	38150	39990	49640	39210	43840	17280
1954	11420	12200	10830	10010	10860	16630	29900	47790	34960	28190	10830	12200
1955	13750	11130	8671	7726	7464	12560	31380	12890	12180	17310	18900	11510
1956	9625	9017	8548	7231	6768	7925	42940	19750	18870	11710	17560	7897
1957	6720	10200	7421	5977	5534	11900	26250	19640	34570	48220	21860	23100
1958	15910	16300	10970	8600	7909	12540	21280	12490	12560	15540	6735	9989
1959	6514	7797	5121	4482	4295	6196	7962	15460	18140	10310	6323	9677
1960	10140	8184	7600	8128	6193	6973	40030	35650	24640	11370	6667	10570
1961	7374	7337	5939	4855	4772	10980	20210	26700	12110	6608	6149	5651
1962	6083	8188	6186	5278	5338	8324	50670	38890	37070	27410	18810	16310
1963	12790	10680	7640	6424	5997	11550	21340	21280	29190	13230	14150	8913
1964	7894	6698	5587	5155	5224	6816	23840	39300	12140	8828	6801	17240
1965	11180	8558	6252	6181	5850	7500	117600	62320	52900	22580	12130	14890
1966	33440	19520	18880	13830	21390	44950	53600	39530	22360	14660	14970	10660
1967	10970	9655	7736	8213	8161	15740	58560	23780	35830	20960	7838	6637
1968	6235	5983	5426	4910	5190	9665	17430	20540	29800	27360	17930	15510
1969	44050	28610	13290	11530	11640	18020	113400	52060	19950	18840	8565	6166
1970	8181	8707	7995	8100	7852	9556	32280	33290	22730	9998	5262	4703
1971	10350	23030	14670	9600	8900	22610	59970	30180	26580	19320	7599	7457
1972	13430	40360	18820	12160	10440	27790	51700	46820	32850	33190	41000	22020

Table 9.--Monthly mean discharge for the Mississippi River at the streamflow-gaging station at Prescott, Wisconsin, (05344500) 1928-88 --Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1973	17110	25170	11270	11630	10540	45360	34070	32660	23210	8808	11820	9762
1974	27990	21460	14300	9508	9164	17070	38720	37340	41990	12810	11020	6281
1975	6511	11680	8058	7995	8691	9944	45860	65220	36200	38010	11790	10950
1976	10070	12570	11320	9066	9987	21190	43070	11030	6883	5323	3636	3002
1977	3635	3874	3635	3571	4034	12330	12800	8175	10460	8206	5351	15850
1978	20080	17150	16750	10590	7799	12790	50970	25700	26370	35920	17210	21510
1979	12990	9807	8216	7400	7582	13640	73570	61280	32850	29900	24490	23250
1980	10890	23390	13260	10280	9259	13900	30950	11900	19780	8041	7551	13320
1981	9676	9157	6499	5622	5992	9174	18980	19990	24330	21740	17030	14460
1982	19810	15840	10390	8594	8440	17610	67530	47190	25660	17800	9088	11220
1983	25570	24650	21460	16060	14440	55010	58900	35390	26210	40750	15370	14160
1984	17620	18460	18180	14150	18990	28470	60010	51500	63550	38200	13250	9798
1985	25530	25910	16830	12400	9656	34560	46140	45220	30010	26420	18400	29070
1986	38190	21200	16930	14720	12750	26480	89830	90100	39760	34890	30570	45950
1987	49740	25510	19430	14650	12880	18090	21240	13820	15250	10420	10100	7339
1988	7616	8279	8139	6375	6333	13480	21400	13510	5469	3322	4984	5909

Table 10.--Monthly mean discharge for the Minnesota River at the streamflow-gaging station near Jordan, Minnesota, (05330000) 1935-87

[All values in cubic feet per second]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1935	167	178	175	142	328	2679	1035	1213	1355	782	449	201
1936	192	213	178	158	153	6345	5350	2326	801	279	178	259
1937	172	182	168	162	176	2109	4315	4799	5840	2127	466	505
1938	394	266	202	184	194	4554	2383	4818	3676	4134	1689	3612
1939	1465	851	530	447	293	3601	3882	1843	1028	673	403	232
1940	209	211	202	111	130	322	2839	1145	1347	498	506	770
1941	302	660	705	828	561	4252	9630	3748	5012	2413	675	695
1942	1162	2254	1233	747	921	1940	3250	4991	6289	3826	3090	4831
1943	4007	1503	960	702	770	4123	11500	5411	15040	7561	6413	5109
1944	1490	1690	2003	911	2150	4255	8259	20630	17260	5491	1684	1386
1945	841	763	529	359	575	8428	6940	4739	12400	4337	3204	1186
1946	879	623	384	314	759	10310	9019	3738	5655	3830	1453	1741
1947	2718	3192	2316	982	788	2569	12990	12680	7560	11500	2002	1040
1948	593	889	947	503	798	9794	11210	5191	1708	1386	2394	963
1949	469	565	488	484	441	7623	16990	2991	1161	874	727	382
1950	332	329	266	208	224	2056	7711	6130	2819	1264	617	356
1951	337	271	221	227	206	1571	30390	13780	5688	9172	3558	4609
1952	2545	1790	2886	1392	1759	3934	36860	11480	4882	9146	3493	1369
1953	684	558	337	309	500	4448	6710	10590	13080	10490	10980	2579
1954	763	750	753	437	889	4156	4483	4973	5479	2871	1062	958
1955	1068	924	604	486	367	3067	3055	1654	1131	3598	1010	589
1956	373	326	246	245	241	698	3852	1656	5141	3037	2754	880
1957	405	576	520	298	262	1420	2968	2359	10780	12270	4994	3776
1958	2795	3053	2151	1125	733	2400	5700	3035	2214	1265	560	364
1959	288	289	215	206	197	582	926	923	2064	1058	676	942
1960	1032	1136	1068	1399	588	1037	16930	13010	6622	3815	920	1474
1961	1241	798	642	446	459	4127	6431	4942	3060	1703	2344	818
1962	861	1219	662	485	410	1088	24760	10330	7903	12230	5979	4350
1963	2431	1508	779	543	507	2533	3608	3849	5545	5929	5184	1783
1964	1573	1170	713	451	502	813	4037	8455	2400	1309	656	3131
1965	1718	873	585	440	394	680	44860	15630	12610	5514	1626	1606
1966	5292	2449	2550	1195	3462	8280	10560	5989	3767	2525	1089	799
1967	1092	795	573	497	499	5291	11730	4355	8858	6364	1080	637
1968	427	438	381	194	212	591	1234	1222	2416	4929	8457	4253
1969	16030	7643	2991	1228	1388	5625	48210	15230	6526	8260	1983	662
1970	530	607	592	653	666	1308	7025	6302	5262	2349	913	684
1971	2638	7072	4131	1591	1148	11300	13100	4571	8747	6352	1329	659
1972	767	3600	2219	1106	713	6439	9481	11070	11920	5809	3887	2006
1973	1756	3853	1674	2028	2285	12920	9874	9407	5773	1696	791	572
1974	2175	2428	2142	1105	1149	3700	6502	5012	8603	1754	747	390
1975	314	401	449	296	416	717	9752	11970	10070	4710	805	495
1976	404	516	564	425	682	3118	3669	1231	633	348	245	183
1977	197	204	158	149	184	3235	2120	1163	2443	892	424	368
1978	1078	1716	1593	955	605	4335	13110	7575	6763	4572	2008	1050
1979	707	443	393	296	457	3327	24830	14240	7540	8264	13910	11020

Table 10.--Monthly mean discharge for the Minnesota River at the streamflow-gaging station near Jordan, Minnesota, (05330000) 1935-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1980	2956	7029	3714	2006	1333	4384	7076	2692	8952	2108	1271	1286
1981	958	874	626	440	638	1069	1459	2389	4435	6760	5082	3465
1982	2199	2201	1609	777	641	8222	13730	8643	6856	3960	1441	1663
1983	4236	6781	5216	3118	3992	21170	25160	16030	8766	12740	1997	1704
1984	1576	2421	2393	1390	3730	9435	27560	17810	22690	15250	3517	1317
1985	3710	6070	3505	1875	1256	14490	15090	10790	6046	3577	1498	5381
1986	9228	4131	2548	1878	1590	12760	29070	23030	14910	10960	7022	10560
1987	13740	6707	4407	2281	1993	4310	6520	3050	3188	2492	1476	734

Table 11.--Monthly mean discharge for the St. Croix River at the streamflow-gaging station at St. Croix Falls, Wisconsin, (05340500) 1903-87

[All values in cubic feet per second; *, no value]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1903	2061	4023	2247	1906	1892	5563	11920	12740	5182	6190	4816	*
1904	*	4275	2753	2615	2238	2859	10750	8175	8867	3177	2335	3536
1905	10320	4843	2441	2502	2082	3415	5629	9330	9624	*	*	*
1910	*	*	*	3047	3077	5969	3934	2764	1867	1359	1344	1416
1911	1515	1342	1287	1157	1417	2297	3427	4024	3167	1769	1773	2153
1912	3829	2028	1986	1489	1447	1538	6847	9781	3591	1797	1743	2057
1913	1846	1552	1491	1328	1257	1718	6433	4894	2889	3509	2709	2511
1914	4145	3315	2376	1790	1530	2153	5311	7469	7000	5533	2741	4150
1915	2843	2197	1861	1742	1750	2385	6295	8847	7488	3595	2090	1800
1916	3077	5483	2556	1800	1979	2161	22180	13810	6773	6969	2827	3036
1917	2974	2362	1872	1678	1668	2106	9727	4718	3536	3584	2529	2227
1918	2846	2935	1589	1554	1675	2832	2650	5076	4761	1722	1710	1638
1919	1658	2585	2214	2016	1869	4871	9573	4753	4247	2859	3534	1866
1920	2181	3500	2477	1868	1865	9415	9983	6666	8325	5757	2084	2297
1921	3041	3143	2404	1936	1968	2813	6427	3915	3708	1825	1721	2128
1922	1835	1582	1741	1513	1551	3952	12790	5851	2887	2305	1645	1750
1923	1632	1983	1748	1713	1603	1902	4569	4892	2558	3522	1767	1644
1924	1651	1674	1819	1443	1433	1712	3326	5551	2591	1857	4093	3145
1925	3708	2403	1648	1331	1501	2688	3915	2728	2377	2199	1356	1481
1926	1539	1459	1350	1168	1307	2318	3660	2545	2351	1699	2054	3901
1927	4916	3491	2392	1965	1826	10180	12510	6236	5436	3776	2010	2062
1928	2161	2115	2136	1861	1864	6299	10650	5965	3146	4478	2708	5513
1929	5796	3830	2605	2014	2010	8400	11410	3867	2461	2400	1556	2022
1930	2538	2411	1846	1691	2248	3059	3246	7719	3951	1898	1233	1325
1931	1903	2063	1816	1562	1717	2212	2624	2560	6573	2535	1519	1384
1932	1694	3011	2339	1761	1538	1879	7027	5522	2281	1307	1165	1344
1933	1380	1969	1395	1341	1311	1840	3808	4511	2704	1222	944	1152
1934	1540	1554	1544	1554	1389	1844	4482	2430	1481	1014	839	1401
1935	2441	2166	1858	1583	1743	7773	5213	4547	3395	3918	3316	2161
1936	2032	2573	1927	1754	1455	3306	14990	10880	2268	1303	1274	1928
1937	1690	1779	1663	1784	1654	2114	8915	8160	4351	1738	1649	2063
1938	2022	1971	1551	1457	1568	4677	8873	16140	7315	3349	2467	4963
1939	2355	3195	2190	2275	1971	6016	14100	6431	5861	2914	2357	1878
1940	1870	1884	1671	1433	1567	1787	6545	6920	2979	1592	1855	1598
1941	1658	3203	2245	2203	1895	1959	17220	4463	6432	2480	1822	14590
1942	7841	5535	3357	2272	2162	3928	5660	10330	7680	4030	2608	4495
1943	3361	3032	2194	2064	2119	2666	12620	7160	16240	4921	3646	2673
1944	2644	3128	2173	1878	2147	2487	8872	16400	19510	7944	3987	3544
1945	3286	3115	2253	2113	2033	14420	13350	4876	11530	5875	4209	6369
1946	4185	3447	2670	2674	2469	9395	7094	4181	14490	6932	2238	2674
1947	4472	6590	3279	2649	2185	2648	12500	8371	5405	2005	1904	2030
1948	1959	2310	2134	1818	1704	4878	14160	4086	2107	1795	1613	1409
1949	1452	1978	1787	1639	1695	3500	7010	6948	2213	3449	2193	1854
1950	3645	2210	1849	1634	1847	2605	20040	21840	3519	2640	1778	1666
1951	2895	2289	2175	2041	2006	2592	18000	6235	7876	8924	3594	11250

Table 11.--Monthly mean discharge for the St. Croix River at the streamflow-gaging station at St. Croix Falls, Wisconsin, (05340500) 1903-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1952	6924	8495	4553	3048	2812	2866	22320	4869	5132	17260	5557	4026
1953	2547	2418	2479	2298	2324	6848	11820	13300	13100	6472	9775	2775
1954	2466	3008	3133	2505	2616	3084	10650	16940	13450	10250	3741	5098
1955	5784	3936	2836	2454	2416	3059	13840	3601	3872	4218	9777	4153
1956	3736	3925	3057	2722	2571	2729	17400	6003	4688	3540	4171	2487
1957	2500	3329	2529	2071	2013	3982	9003	4882	9339	7290	2732	5570
1958	3106	4038	2647	2152	2168	2964	6159	3130	3908	8946	2347	3943
1959	2465	3056	1905	1701	1650	2097	2902	5505	5035	2709	2068	3388
1960	3571	2611	2153	2292	1874	2155	9652	8291	4886	2356	2215	3795
1961	2405	2641	2348	1710	1647	2867	7065	11430	3091	2038	1561	1904
1962	2095	2982	2031	1786	1817	2412	10490	12870	5481	2859	2349	3360
1963	2539	2242	1882	1715	1533	2707	5222	6237	5030	1612	1875	1767
1964	1830	1816	1701	1563	1514	1884	6617	12640	2791	1963	1773	3652
1965	2241	2129	1758	1736	1680	1957	22160	11620	7460	3231	2382	3216
1966	7502	3503	5551	3413	4161	12670	12580	6548	4292	2654	4112	2387
1967	2807	2398	2071	2132	2187	3242	14700	4140	13330	3575	2262	2100
1968	2112	2041	1867	1701	1586	2914	6188	7172	10340	8579	2838	4928
1969	14270	4707	3582	3484	3398	3784	21500	7831	2851	2665	2011	2002
1970	2412	2621	2239	2112	1960	2462	11240	7572	4249	1942	1495	1554
1971	3490	6536	3322	2378	2303	3394	16770	7662	4365	2504	2239	2173
1972	5561	11910	3676	2796	2550	5187	14550	8821	4437	12010	9672	5386
1973	4647	6326	2724	2861	2590	12210	6995	7892	5237	2563	3966	3736
1974	8830	5324	3747	2692	2571	3263	11100	8700	10210	2582	3318	2475
1975	2383	3812	2464	2448	2380	2688	15900	11010	6860	9915	2230	2596
1976	2467	3841	3694	2718	3129	7602	16050	3135	2908	1961	1475	1292
1977	1624	1569	1492	1488	1456	3252	3803	2600	2686	2585	2049	7784
1978	8330	4889	5048	2704	1829	2855	13490	4719	4856	10810	4873	5574
1979	3127	2737	2323	2122	2293	4064	18830	12730	6344	4372	2497	2607
1980	2725	3902	2345	2172	2015	2543	6901	2447	2734	1783	2366	4884
1981	3233	2362	1895	1679	2095	2975	9208	6896	8428	4594	4078	3015
1982	6813	3658	2378	2201	2335	2977	17200	10780	2949	4287	2305	3545
1983	8764	6974	4908	3388	3100	11230	14080	5942	4201	6731	4384	4921
1984	7025	5887	5821	4279	6021	5477	11410	11620	14620	4655	3126	3859
1985	9339	5668	3891	2864	2611	7283	13380	8480	6883	5155	3891	8005
1986	9381	4609	3848	3235	2518	4973	20380	19790	6723	6641	8035	12420
1987	7503	4784	3490	3079	2935	4367	3670	3258	2598		2082	2119

Table 12.--Difference in monthly mean discharge of the Mississippi River between the streamflow-gaging station at Grand Rapids, Minnesota (05211000) and the combined monthly discharge of the stations at Winnibigoshish Dam, Minnesota (05201500) and near Leech Lake River at Federal Dam, Minnesota (05206500) 1932-87

[All values in cubic feet per second]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1932	-103	21	11	-18	-17	2	108	214	233	134	-69	-57
1933	-109	8	15	12	5	7	141	154	154	144	-83	41
1934	-88	-57	-64	1	13	13	98	204	101	-37	-143	-28.8
1935	-66	-24	-38	-22	93	121	73	72	154	153	222	221
1936	77	54	112	58	-12	50	163	172	145	238	-96	-67
1937	-37	-24	5	41	253	96	75	248	293	403	147	-22
1938	-159	93	152	90	164	108	373	621	790	-235	-129	-164
1939	-26	3	-38	-93	-160	359	464	457	332	-218	-298	141
1940	147	54	59	49	96	92	126	374	500	-4	-276	-232
1941	31	121	72	145	241	352	322	677	278	3	413	-201
1942	909	-81	-508	-249	196	633	349	306	302	260	-191	132
1943	126	196	-70	15.4	148	968	571	1196	533	397	55.4	-50
1944	-26	93	-2	-160	73.5	510	454	302	401	1063	708	-522
1945	-23	50	-416	-343	44	897	2382	941	439	164	188	86.6
1946	515	413	312	154	-91.9	292	1565	362	680	557	135	339
1947	404	531	162	204	408	507	839	1447	546	51.3	-207	280
1948	405	307	326	301	113	194	665	1849	5.9	125	-47	-360
1949	386	163	-11.8	36.5	264	642	417	-56.4	321	810	263	265
1950	109	516	306	-178	31	379	1293	2589	599	-454	102	1166
1951	569	109	-224	-1	172	994	1347	1442	-88	227	530	536
1952	664	256	336	235	353	1127	1042	799	-20.6	182	1270	490
1953	24.3	-146	-284	363	343	806	591	624	979	1221	774	896
1954	100	55	214	235	209	1516	972	1526	332	199	425	534
1955	337	164	330	367	285	443	784	691	474	335	171	244
1956	109	250	473	97.7	-33.3	364	683	396	199	53.6	66.8	90.8
1957	-37.5	274	326	138	140	285	682	730	103	770	541	401
1958	458	452	253	312	449	1059	252	83.5	262	164	59.1	24.8
1959	-24	36	48.5	54.5	41.3	66.4	144	302	360	737	69.5	306
1960	270	162	101	67.7	-40	27.6	1050	776	593	288	-232.3	27.7
1961	84.1	60	-30.3	-40	15.3	93.1	300	569	100	9.5	-1.1	86.9
1962	88.3	7.4	33.2	48.3	38.5	188	479	826	667	766	382	787
1963	-139	205	-64.6	-2.8	116	266	863	514	764	228	260	267
1964	13.5	50.5	126	145	218	164	568	1394	239	717	250	479
1965	28.3	150	123	152	172	374	835	1642	958	-71.9	156	423
1966	1014	613	335	360	210	633	1917	1402	615	211	539	376

Table 12.--Difference in monthly mean discharge of the Mississippi River between the streamflow-gaging station at Grand Rapids, Minnesota (05211000) and the combined monthly discharge of the stations at Winnibigoshish Dam, Minnesota (05201500) and near Leech Lake River at Federal Dam, Minnesota (05206500) 1932-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1967	454	404	160	223	486	420	1795	557	424	120	71	160
1968	156	154	21.4	-30.1	18.8	76.4	471	353	348	65	460	311
1969	401	46.1	-156	13	72	422	2193	1446	69	151	493	390
1970	346	355	128	145	162	358	1271	955	708	458	106	79.6
1971	67.6	24.6	-3.4	31.6	158	240	1683	675	472	232	11.2	-129
1972	305	459	266	282	258	623	978	1306	488	156	214	131
1973	360	468	175	146	190	629	334	288	122	73.3	170	70.8
1974	739	365	253	245	211	657	862	1010	1076	211	791	347
1975	229	374	176	121	278	491	1262	1690	551	1036	243	609
1976	720	524	199	207	282	989	990	146	13.3	66.3	-10.6	-5.1
1977	-8.7	-20	-6.6	-27.3	-18.7	0.1	139	49.9	97.7	86.5	17.2	611
1978	634	342	5	189	254	946	1267	393	234	939	760	1094
1979	520	219	187	181	288	652	1003	1560	830	746	293	678
1980	91	370	236	-59.3	-158	692	659	76.7	136	23.4	17.4	142
1981	118	195	83.9	81.6	96.5	202	318	303	314	22	614	484
1982	532	505	140	216	275	680	1341	1112	479	864	433	240
1983	489	98.3	137	92.9	288	736	404	197	202	51.6	985	368
1984	339	149	46.4	72	36.2	578	995	678	543	293	184	101
1985	90.2	133	-9.5	94.3	242	614	726	1095	-56.8	520	373	664
1986	938	314	-106	415	577	716	1371	604	349	411	393	719
1987	739	276	113	165	568	389	267	322	289	466	291	196

Table 13.--Difference in monthly mean discharge of the Mississippi River between streamflow-gaging stations below the Sandy River near Libby, Minnesota, (05220500) and at Grand Rapids, Minnesota (05211000), 1932-87

[All values in cubic feet per second]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1932	216	267	379	359	697	499	1248	1588	735	443	468	256
1933	218	666	266	157	194	285	920	1760	1218	154	135	157
1934	366	316	192	149	159	150	967	760	289	187	112	110
1935	138	102	87.1	68.6	81.2	332	1381	1747	587	551	875	489
1936	152	237	300	304	243	401	1620	3395	923	397	105	139
1937	217	44.9	94.6	114	61.7	289	1411	2318	1229	165	235	486
1938	242	232	205	298	321	494	1043	5192	1727	240	409	302
1939	258	452	325	416	417	537	2771	1297	654	532	340	333
1940	321	242	239	203	189	115	977	1797	892	188	176	163
1941	500	666	374	396	431	359	3726	1630	1342	461	317	2253
1942	1949	906	703	445	504	506	1075	2635	1615	577	266	820
1943	542	820	858	566	440	430	2184	2290	4218	1437	1463	753
1944	700	716	724	550	543	371	692	2930	4934	3385	1816	925
1945	1046	1024	1424	699	485	1420	3219	2022	1399	665	541	603
1946	924	548	337	145	168	1123	2529	1380	1983	1186	153	127
1947	1196	1158	480	351	111	56	1970	2873	1912	263	96	388
1948	424	552	347	187	352	425	4272	3082	323	130	167	453
1949	20	97	314	158	172	285	767	892	854	1465	733	302
1950	1179	760	829	564	310	80	1751	8831	3406	686	192	300
1951	649	443	743	508	339	407	2615	2964	1189	444	292	1915
1952	1733	1718	817	485	346	487	3292	1467	374	1872	2178	952
1953	502	415	226	209	490	890	2399	2085	2743	2779	3514	1668
1954	693	780	763	509	545	568	3352	4001	1780	463	284	114
1955	194	274	258	144	132	342	1921	984	1111	1146	1461	453
1956	531	361	560	328	324	366	2948	1882	516	153	340	192
1957	229	436	148	139	72	210	2500	2036	872	1977	645	208
1958	247	358	259	111	173	179	512	302	842	1042	323	769
1959	316	404	176	269	373	385	575	1650	1963	1135	308	778
1960	716	590	424	354	308	283	1787	3034	1702	612	263	279
1961	245	317	270	283	277	354	920	2050	580	189	160	283
1962	308	321	160	242	300	579	825	2201	1779	579	564	681
1963	350	407	274	243	329	723	1823	1342	1680	480	480	442
1964	302	272	250	257	242	316	1449	2845	957	545	230	1679
1965	763	514	500	357	282	635	3250	3768	2993	450	65	531
1966	2270	974	1043	919	597	1055	4804	4081	1199	513	1201	535
1967	384	430	433	188	195	399	3088	1904	1192	330	98.7	25
1968	101	170	190	169	124	468	1278	1691	2153	927	385	644
1969	1417	858	587	181	179	369	3410	3084	739	345	87	225
1970	295	365	226	17	127	279	1921	2741	849	366	173	123
1971	295	848	766	425	212	113	3238	2925	1683	854	375	211
1972	600	2465	821	445	255	48	2345	3232	722	1074	2194	1003
1973	821	1095	220	240	100	1224	1198	1788	1032	513	1118	644
1974	2124	1124	747	254	69	129	2360	3675	3165	691	714	320
1975	435	988	563	377	198	379	2496	4769	1446	1820	229	103
1976	255	346	192	207	229	640	2476	678	373	469	202	122

Table 13.--Difference in monthly mean discharge of the Mississippi River between streamflow-gaging stations below the Sandy River near Libby, Minnesota, (05220500) and at Grand Rapids, Minnesota (05211000), 1932-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1977	119	133	110	154	209	322	434	302	629	545	227	1724
1978	1710	1500	1128	274	155	522	2327	1549	2072	1613	1765	1451
1979	625	566	222	32	-56	473	3042	4166	1217	1331	319	286
1980	360	983	426	293	208	408	1422	719	344	249	372	795
1981	554	456	263	287	236	295	1435	1822	1118	852	690	547
1982	1670	1062	534	349	256	347	3018	4058	1357	825	553	502
1983	2151	1463	841	404	264	1175	1917	1156	1067	893	576	557
1984	1074	1079	937	561	519	684	1520	2007	2528	989	304	189
1985	877	1202	549	382	412	765	1593	3455	2155	1997	708	699
1986	1675	966	755	376	344	731	3242	4251	1642	1000	643	2006
1987	1534	1011	647	408	347	1184	849	1229	994	735	712	407

Table 14.--Difference in monthly mean discharge of the Mississippi River between streamflow-gaging stations at Aitkin, Minnesota, (05227500) and below Sandy River near Libby, Minnesota, (05220500) 1945-87

[All values in cubic feet per second; *, no value]

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
1945	*	*	*	*	*	1233	1980	874	749	298	302	545
1946	627	329	374	289	215	760	1314	865	1853	1418	182	123
1947	946	692	509	84	232	449	2102	1493	1491	327	130	93
1948	126	60	149	55	86	184	2544	2043	241	116	82	148
1949	-10	76	110	65.8	103	126	765	736	590	765	525	178
1950	672	370	271	126	197	78	1894	3830	1612	406	104	102
1951	175	76	84	75	143	125	2189	2078	980	580	220	1226
1952	1190	1553	668	622	222	70	3077	1529	365	2932	2250	927
1953	299	194	298	74	98	421	1688	2153	2658	1553	3068	950
1954	397	319	252	285	258	338	2169	1996	1212	963	332	202
1955	246	202	213	141	124	122	1659	537	719	1512	1670	431
1956	467	342	151	148	113	71	3321	1256	566	136	134	91.4
1957	-7.1	43	120	70.8	48	123	1321	1257	830	863	654	198
1958	157	185	116	-28	-8	-6	304	185	492	543	202	239
1959	193	266	197	94.9	30	89.6	259	665	1276	366	166	-11
1960	72	186	228	67	102	201	1353	1770	918	327	84.1	65
1961	47	71	41.8	48.1	70.3	207	354	917	256	31.8	14.7	39.6
1962	121	9	113	93	-63	344	1064	1481	1330	416	189	210
1963	128	99	155	103	65	106	1134	971	1184	317	264	284
1964	212	193	147	98	110	75	1247	1927	394	353	339	1692
1965	668	261	80	89	95	59	3544	2836	3521	407	150	212
1966	1669	581	688	707	602	763	3493	2774	870	637	762	376
1967	329	182	126	166	15	207	2808	1158	1080	419	144	98.4
1968	68	100	76.4	48.5	58.9	195	694	1001	1223	721	130	169
1969	952	584	290	358	330	1121	3880	2135	464	247	288	228
1970	239	158	223	51	222	220	1681	1896	660	211	43.3	14.3
1971	71.4	373	334	149	24	226	2769	1856	831	394	181	131
1972	198	1906	838	168	117	587	2919	2612	774	607	2452	1058
1973	431	984	435	298	268	981	759	804	569	508	1347	456
1974	2034	713	361	310	154	139	2524	2879	2039	446	619	174
1975	72	433	180	100	85	80	2383	3459	1035	2437	83	56
1976	172	183	319	264	209	68	1554	272	104	153	39.7	3.4
1977	6.1	21	27.8	23	12.8	117	297	179	219	171	26.7	242
1978	802	961	619	355	41	-29	2109	851	1326	1141	1003	1155
1979	260	79	120	-50	-51	-130	2747	3078	934	589	155	107
1980	24	431	59	22.3	65	-1	962	334	163	86.3	29.6	467
1981	119	53	61	129	78	161	490	1096	1111	631	137	111
1982	711	570	40	11	-52	-23	3313	2735	700	102	68	88
1983	1344	543	413	158	131	817	1240	714	520	684	80	33
1984	72	49	158	178	235	262	1387	1251	2083	136	105	26.2
1985	469	477	343	48	-5	440	1158	1692	1257	1605	609	647
1986	1023	663	390	195	195	201	2803	2970	1227	747	615	2376
1987	1438	541	366	260	265	379	476	514	398	149	345	63

Table 15.--Difference in monthly mean discharge of the Mississippi River between streamflow-gaging stations at Royalton, Minnesota, (05267000) and below Sandy River near Libby, Minnesota, (05220500) 1932-1945

[All values in cubic feet per second]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1932	647	840	1030	978	585	888	1700	2004	1330	504	685	426
1933	372	345	378	341	317	563	1235	2396	3381	939	447	525
1934	689	669	630	640	496	960	1666	1057	751	352	249	336
1935	470	517	362	271	441	1454	1625	2423	1990	1279	834	899
1936	820	850	820	781	693	1006	2366	3248	996	499	261	297
1937	311	451	468	406	393	620	2983	3479	2341	1453	1566	1132
1938	797	742	673	583	533	1556	2206	8805	4680	1201	859	1757
1939	919	979	1040	914	890	2096	6290	2614	2265	1541	914	759
1940	729	684	526	247	377	663	3607	3023	1546	655	705	480
1941	1025	1162	1197	991	990	949	8157	3740	4681	1737	868	3574
1942	3142	1997	1367	1074	1086	1720	2476	6814	4758	1877	1954	3396
1943	2475	1972	1335	1309	1243	1704	8185	4730	12306	6028	1915	1259
1944	1261	1450	1208	1608	1358	1418	3510	6050	9527	5623	5100	3020
1945	1973	1912	704	1371	1413	5165	6109	3245	2462	1414	1711	3007

Table 16.--Difference in monthly mean discharge of the Mississippi River between streamflow-gaging stations at Royalton, Minnesota, (05267000) and at Aitkin, Minnesota (05227500) 1945-87

[All values in cubic feet per second; *, no value]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1945	*	*	*	*	*	3932	4129	2371	1713	1116	1409	2462
1946	1704	1234	1289	1096	998	3213	3005	1742	2975	6140	1479	1514
1947	3579	1941	1607	1675	1313	1357	5815	4776	3237	1698	808	820
1948	900	813	1102	939	945	1495	5541	3762	1799	1271	1426	1023
1949	920	852	743	928	911	1234	2760	2155	1499	1591	1304	700
1950	980	886	763	831	737	999	6669	9090	4544	1485	727	559
1951	817	540	957	975	1003	1112	4160	2732	2478	1660	1050	3065
1952	2615	2789	2827	1093	772	1166	10505	3241	1393	5244	4811	2160
1953	1138	1033	955	1046	1353	2255	5431	4376	7982	3221	6960	2351
1954	1730	1362	977	1178	952	2333	5421	6643	4060	2095	1061	1262
1955	1271	1139	1004	1054	895	1004	3797	1623	1752	2079	2907	1236
1956	1131	847	957	1092	1128	1044	5857	3849	2961	920	1511	810
1957	836	1404	701	706	687	1845	4304	3257	5288	3916	1712	2593
1958	1905	1634	1247	1092	913	1340	1970	1276	1255	1433	798	1114
1959	920	1172	894	569	461	717	1250	2857	4004	2314	987	1221
1960	946	707	806	1043	824	629	3224	4320	2391	1172	675	804
1961	628	644	609	495	445	835	1242	2161	1139	766	531	605
1962	675	662	472	361	423	644	3298	5642	4560	3210	2194	1520
1963	1204	1126	635	608	510	1134	3139	2595	3887	1265	2114	1294
1964	972	906	750	893	827	910	4714	4435	1863	1275	886	3387
1965	1806	1074	944	949	843	708	11722	8373	10088	2424	1404	2667
1966	6396	3011	2381	2188	1782	8342	11370	8978	2830	2346	3028	1946
1967	1509	1458	1077	1193	1162	2001	8129	4278	3883	1845	708	607
1968	647	587	717	690	719	1492	3328	3069	6139	3414	1227	1313
1969	3109	2329	1024	1451	1432	920	11310	6193	1878	1513	854	668
1970	1447	1301	1030	1363	1001	852	5041	5614	3041	1090	607	561
1971	903	1483	853	758	794	1372	6957	4110	2300	1858	1030	1115
1972	2694	7884	2417	1792	1302	4965	9017	7955	3844	7745	7483	3673
1973	2846	3736	1549	1256	1118	5457	3514	3851	2535	1523	2303	1934
1974	7009	4382	1406	855	934	1483	6056	7556	5474	1801	1949	1159
1975	1431	2207	1131	1451	1671	1597	7979	9740	4195	5286	1384	1141
1976	1103	1344	1129	893	1080	1862	3934	1265	754	522	376	332
1977	426	434	413	425	452	1155	1536	925	908	936	543	1201
1978	2965	3333	2632	1141	573	1903	8726	3190	3593	4164	2374	3293
1979	1607	931	1057	1136	1245	1747	10713	10420	5989	6080	1736	1159
1980	1096	3661	1297	1292	1228	1199	5911	1509	1893	931	818	1408
1981	1324	1430	905	690	814	1162	1883	2711	3311	1971	2106	1418
1982	3315	3063	997	1208	1196	1197	13093	10543	4567	2859	1142	1291
1983	4340	2484	2103	1824	1664	4260	3392	2548	4355	4561	1454	1119
1984	1457	1490	2092	2311	2676	2616	4054	3994	5425	1961	934	813
1985	3867	3120	1439	1114	801	3572	4489	7704	6548	5303	4413	3602
1986	3314	1887	2233	1563	1159	2729	11201	9062	5059	3502	3319	6251
1987	4720	2981	2617	1498	1230	2513	2766	2263	1892	654	731	729

Table 17.--Difference in monthly mean discharge of the Mississippi River between streamflow-gaging stations at Anoka, Minnesota, (05288500) and at Royalton, Minnesota, (05267000) 1932-87

[All values in cubic feet; *, no value]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1932	471	637	510	424	445	984	2610	1852	1072	660	411	369
1933	444	488	346	332	317	877	1149	1760	1664	372	351	256
1934	305	334	219	307	312	411	961	594	337	289	265	353
1935	506	493	379	401	411	2077	1596	2240	1278	846	1001	1330
1936	824	719	508	561	414	2982	6624	5154	1197	389	463	548
1937	496	534	435	439	431	853	4232	4625	2415	782	1154	1045
1938	755	599	478	469	495	2501	2642	10060	4665	2829	1412	2142
1939	1202	1157	821	890	833	4441	8539	3527	2505	1901	1011	1045
1940	833	876	705	516	533	634	5484	3175	1464	650	731	685
1941	777	959	946	868	834	1193	12910	5056	8490	3320	1445	3652
1942	3884	2802	1537	1095	1187	2364	2954	6327	6228	2383	2520	4045
1943	2996	1829	990	1378	1119	1524	13690	5614	12620	5229	2343	1830
1944	1660	1768	1463	1458	1881	2616	6318	12957	14650	10360	4475	2588
1945	1887	1894	1159	1132	1230	8193	7310	4153	5193	3046	2826	2346
1946	2483	1718	1454	1471	1323	6127	5895	3133	4224	5297	1661	1602
1947	3227	3569	1887	1903	1576	1917	9420	8740	7518	3286	1730	1478
1948	1461	1395	1091	967	886	4866	10870	5050	1725	1336	1362	995
1949	945	1064	686	793	736	2588	5914	2564	1577	1122	1141	969
1950	1073	1057	339	575	613	2101	12900	13890	4780	1878	1161	1056
1951	1452	714	808	893	944	1361	15730	8005	4366	6600	3243	4846
1952	3506	4287	3704	3246	2843	2369	23390	7755	5615	9730	5390	3927
1953	1902	1587	1367	1355	1481	4054	6380	6966	8140	6950	6650	2409
1954	1644	1845	1311	1481	1894	2653	3520	8310	6188	6520	2122	2588
1955	2633	1959	1216	942	961	1853	6050	1762	1289	2435	1928	2534
1956	1530	1097	1100	1135	994	1109	7530	2657	2824	2160	6431	2186
1957	1199	1817	1268	895	805	3027	4000	3815	10573	9752	5657	7496
1958	3700	3455	1838	1521	1269	2265	5018	2482	2108	1324	1050	1777
1959	1115	1261	836	642	501	797	1244	2258	2354	1070	832	1151
1960	1144	1030	931	780	599	959	7103	4520	2373	1412	759	1354
1961	796	837	609	539	553	1016	1753	3204	1712	1112	736	728
1962	1072	1029	664	674	649	824	8873	5700	5820	4422	2699	2191
1963	2143	1698	1215	1005	871	2300	3426	4486	7488	1632	1643	1477
1964	943	893	661	630	624	1205	3000	5060	1202	933	533	825
1965	945	860	622	661	621	615	21740	10660	9280	4259	2307	2169
1966	5250	2978	2749	1361	4969	11120	6010	4700	3820	2724	1695	1737
1967	1561	1570	1127	1366	1451	2331	10160	3037	5546	3566	1448	1098
1968	997	967	816	665	652	2024	2726	2940	3500	3728	1558	1500
1969	6353	4616	2079	1873	1840	3667	21560	8900	3431	2468	1349	783
1970	1067	1128	935	1264	1077	1442	4980	4070	3759	2078	1056	845
1971	1491	3716	2279	1260	1304	2953	10920	5734	4610	4610	1719	1521
1972	2070	8160	4621	3855	3298	8710	10060	6890	5715	6300	9610	4645
1973	3611	4851	2927	3180	2310	9788	6371	5164	4508	1729	2101	2166
1974	3310	3049	2882	2403	2348	4041	6060	4250	5130	1946	1558	1086
1975	875	1324	1207	966	1322	1476	9070	13760	6501	5770	2064	1950
1976	1529	2143	2562	2135	2423	6075	8498	2704	1530	1074	542	401

Table 17.--Difference in monthly mean discharge of the Mississippi River between streamflow-gaging stations at Anoka, Minnesota, (05288500) and at Royalton, Minnesota, (05267000) 1932-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1977	415	633	517	499	613	2149	2171	1381	1302	1206	784	1656
1978	1699	2326	2696	1908	1450	2488	8180	5104	4066	8056	2326	3567
1979	2378	1871	1252	1180	1173	2556	13580	8470	5420	4030	3235	2733
1980	1985	3255	2179	1580	1654	3131	5038	2592	3894	1500	1640	2943
1981	1927	1585	1146	1085	1134	1497	2664	2210	3856	3448	1810	2133
1982	2536	2052	1726	1136	1338	3061	12320	5060	3384	2458	1406	2257
1983	4015	4378	4836	3653	2722	11945	10106	5107	5208	8337	2763	3236
1984	4322	4621	3652	2694	4169	7659	10710	9487	15260	7006	3005	2463
1985	7148	5741	3736	2999	2394	9012	9780	8370	5300	5050	3071	8880
1986	9203	4755	3918	4009	3669	5225	19240	21490	7800	7852	7837	10630
1987	11278	5022	3837	3305	3442	3823	3871	2315	2842	1645	2123	1296

Table 18.--Difference in monthly mean discharge at the streamflow-gaging station at Prescott, Wisconsin (05344500) and the combined monthly mean discharge of stations at Anoka, Minnesota, (05288500) near Jordan, Minnesota, (05330000) and at St. Croix Falls, Wisconsin, (05340500) 1935-87

[All values in cubic feet per second]

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1935	1022	1169	929	493	612	-141	3233	1635	890	1543	364	1114
1936	748	1169	995	599	569	456	7210	1574	1352	503	285	435
1937	968	928	775	746	624	470	-982	81	924	1384	971	585
1938	1056	914	375	478	595	9	-49	362	3589	1936	574	2038
1939	2719	2256	1973	1916	1205	-331	3498	2750	2838	2094	1418	1685
1940	890	1351	941	1000	1296	1332	1846	1355	2489	700	825	413
1941	1280	661	1240	1270	1050	1348	-640	2849	1286	1684	616	-435
1942	977	1750	1049	678	630	343	1421	259	3411	2129	1687	3048
1943	1723	1583	833	1688	1219	1245	1760	49	650	5308	1728	1327
1944	1155	1300	1943	924	156	1116	-181	2550	3340	5895	1429	1096
1945	933	1571	1488	1580	1595	302	3890	3415	2590	2483	1839	834
1946	1967	1591	1556	855	1213	2715	4227	1004	595	5298	1033	1289
1947	1240	1283	1869	1454	1447	1507	480	5669	1725	2151	743	997
1948	712	1258	1123	1207	967	-843	3100	3143	541	852	674	516
1949	1390	846	680	683	625	-421	3190	1322	1295	765	1230	748
1950	1659	1171	1108	794	1034	1527	969	1780	3492	1210	1351	1458
1951	457	274	1101	1064	1115	1337	-3870	5945	1096	5144	2310	3371
1952	2151	2225	711	1394	1588	2145	-490	7441	1161	1444	4220	2670
1953	1300	1406	1143	1050	1113	736	3040	-240	170	5228	1205	2021
1954	1402	1640	1266	1299	1605	1689	-793	3027	911	3189	730	546
1955	1353	1292	1090	1075	1323	2013	165	1772	1346	1298	-838	1416
1956	1235	1230	1384	1045	1118	1233	1238	1591	1508	1239	1694	746
1957	993	1654	1086	958	795	569	1359	1159	-4979	9600	3354	1554
1958	1949	1783	1017	802	956	1552	1149	1898	1388	738	1213	1363
1959	858	1025	594	702	797	1224	559	1209	991	791	1029	1034
1960	1501	959	1120	1322	964	613	-1242	-181	4990	1234	1267	1873
1961	1246	1326	836	749	668	841	1889	1231	2022	643	704	1078
1962	759	1220	1248	812	975	1453	280	-820	6926	331	1974	1744
1963	2223	1506	902	514	772	759	1890	1074	3365	1466	1632	1357
1964	1600	869	684	520	598	881	1746	2315	1449	810	1625	1872
1965	1798	1512	486	671	665	1647	9080	7600	5390	5001	2411	2669
1966	2466	3828	2002	2148	3820	590	2250	3793	3151	1285	829	870
1967	1245	944	682	920	571	456	5790	3335	742	3740	1143	1251
1968	943	751	577	655	976	1414	1297	2875	2934	3322	2339	1987
1969	770	5820	959	1063	1036	195	720	6619	2374	1772	368	682
1970	788	664	843	746	931	938	-1565	3206	2449	696	616	645
1971	1184	2077	1649	1466	1362	1266	3870	2437	3358	2241	475	1344
1972	171	2050	2125	6	236	-206	2149	3919	3913	-989	4951	2768
1973	1262	2491	117	144	234	1620	4761	3201	3170	-60	-240	-81.6
1974	815	2058	907	-137	-56	2378	2188	2808	4537	1532	812	29.7

Table 18.--Difference in monthly mean discharge at the streamflow-gaging station at Prescott, Wisconsin (05344500) and the combined monthly mean discharge of stations at Anoka, Minnesota, (05288500) near Jordan, Minnesota, (05330000) and at St. Croix Falls, Wisconsin, (05340500) 1935-87--Continued

Year	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
1975	370	780	373	497	563	914	-3492	7730	3540	5195	2350	1819
1976	1762	2014	1039	639	372	-190	5591	1385	355	516	560	473
1977	661	706	731	665	931	1901	2096	1368	1967	1578	1078	2048
1978	2168	651	1207	1256	1119	-912	1550	2036	2291	3148	713	2576
1979	1556	854	868	827	736	-162	-1420	5150	2596	2714	869	3819
1980	809	2079	1479	1220	1040	653	2743	1319	1454	1154	835	1192
1981	976	1502	813	868	700	1610	1314	2352	1530	2423	1196	2529
1982	648	824	1065	985	765	114	3260	2937	3365	1648	1252	1020
1983	-1080	-135	966	1445	544	3350	2380	3472	1093	4679	1971	1555
1984	834	1297	1531	1166	22	488	1950	4440	-540	6885	1872	834
1985	-1249	1602	1563	1286	603	-2013	-320	2610	-409	1008	1721	-926
1986	1501	2140	1409	1303	1323	-1503	2200	7520	217	2039	1043	-600
1987	7247	2619	2284	2022	1058	521	2487	472	2023	1819	1430	850

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