

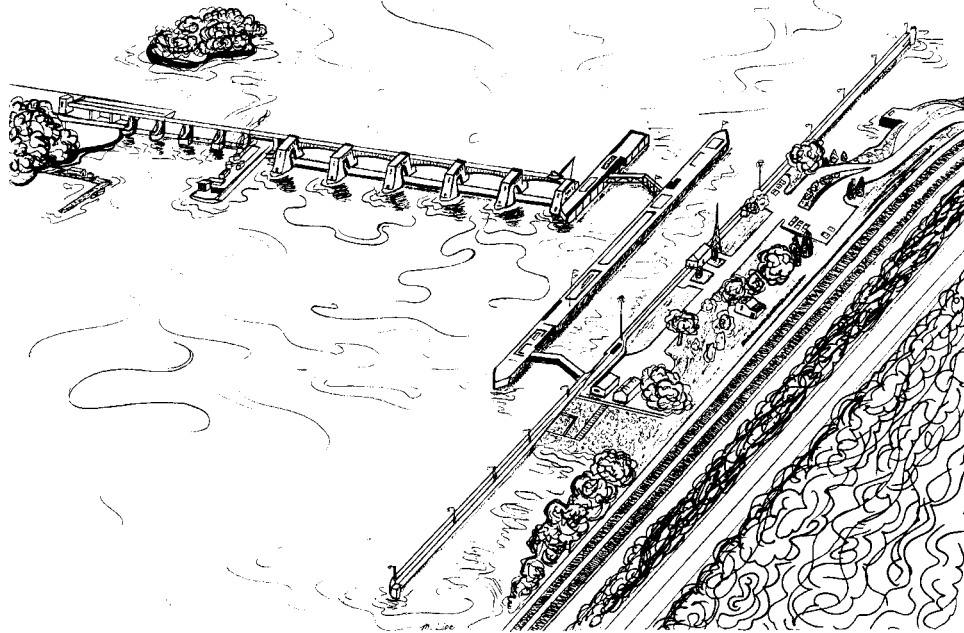
Long Term Resource Monitoring Program

# Technical Report

96-T001

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## Pool 25: Analysis of Water Levels and Discharge



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March 1996

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# Pool 25: Analysis of Water Levels and Discharge

by

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March 1996

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## Preface

The Long Term Resource Monitoring Program (LTRMP) was authorized under the Water Resources Development Act of 1986 (Public Law 99-662) as an element of the U.S. Army Corps of Engineers' Environmental Management Program. The LTRMP is being implemented by the Environmental Management Technical Center, an office of the National Biological Service, in cooperation with the five Upper Mississippi River System (UMRS) States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, with guidance and Program responsibility provided by the U.S. Army Corps of Engineers. The UMRS encompasses the commercially navigable reaches of the Upper Mississippi River, as well as the Illinois River and navigable portions of the Kaskaskia, Black, St. Croix, and Minnesota Rivers.

The mission of the LTRMP is to provide decision makers with information for maintaining the UMRS as a sustainable large river ecosystem given its multiple-use character. The long-term goals of the Program are to understand the system, determine resource trends and effects, develop management alternatives, manage information, and develop useful products.

This report was prepared under Strategy 1.2.3, *Determine Effects of Water Levels and Discharges on the Upper Mississippi River Ecosystem*, and Goal 3, *Develop Alternatives to Better Manage the Upper Mississippi River System*, as specified in the Operating Plan of the LTRMP for the Upper Mississippi River System (USFWS 1992). The purpose of the report is to provide requested information to the Pool 25 Natural Resources Management Committee concerning historical water level management practices.

This report was developed with funding provided by the Long Term Resource Monitoring Program.

Additional copies of this report may be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (1-800-553-6847 or 703-487-4650).

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# Pool 25: Analysis of Water Levels and Discharge

By Joseph H. Wlosinski

## Abstract

Analysis of water level elevations and discharges was performed for Pool 25 on the Upper Mississippi River as part of a study to increase ecological benefits of the operation of Lock and Dam 25. This dam was placed in operation in May 1939. Since that time, the operating plan for managing water levels has undergone several changes. Discharges for Pool 25 were estimated using data from the closest gaging stations, with corrections accounting for changes in watershed area. Discharge estimates since 1939 were used to compute exceedence frequencies on a weekly, monthly, and yearly basis. They were also used to calculate the percentage of time discharges were within specified ranges for the three time scales. Water level measurements at five in-pool stations were used to calculate the percentage of time water levels were above specific elevations for the same three time scales. Only data for the period between 1952 and 1993 were used for this part of the analysis because different water level management plans were in use before 1952. The results of this work, along with a companion study, show the expected frequencies when alternative water level plans may be utilized and the amount of habitat that would be affected by alternative plans.

## Introduction

Conservation agencies in Illinois and Missouri have requested assistance from the Environmental Management Technical Center (EMTC) in preparing an ecosystem management plan for Pool 25 on the Upper Mississippi River (UMR). The objective of the work to be performed by the EMTC is to evaluate management alternatives to minimize negative effects and increase ecological benefits of the operation of Lock and Dam 25 (Fig. 1). The purpose of this report is to provide requested information to the Pool 25 Natural Resources Management Committee concerning historical discharges and water level management practices. Results from historical analyses will be used to estimate the percentage of time that alternative plans could be utilized. The Committee requested that most analyses be conducted using three time scales: yearly, monthly, and weekly. A companion report (Wlosinski and Rogala 1996) includes information on water levels in Pool 25 and the types and amounts of habitat affected by various management alternatives. Related reports have been issued by the U.S. Army Corps of Engineers (1991), Wilcox and Willis (1993), Wlosinski and Hill (1995), and Wlosinski and Koljard (1996).

## Water Level Management

### *Legal Authorities*

Congress authorized a 9-ft channel for the Mississippi River by way of the River and Harbor Act of July 3, 1930, as modified by the act of August 30, 1935 (U.S. Army Corps of Engineers 1980a). These Acts provide for a channel depth of 9 ft at low water level with widths suitable for long-haul, common-carrier service. However, other laws, executive orders, and regulations also pertain to water level regulation. The information below was excerpted from reports by the U.S. Army Corps of Engineers (1991) and Wilcox and Willis (1993). The broad authority of the Secretary of the Army to prescribe regulations for the use, administration, and navigation of navigable waters of the United States (33 United States Code [U.S.C.] 1) could be exercised to impact water levels. Investigations and improvements of rivers must include a "due regard for wildlife conservation" (33 U.S.C. 540). According to para. 21, subpara. c of Engineering Manual 1110-2-3600, November 30, 1987, Management of Water Control Systems, even in single-purpose projects, operations "must be tuned to produce the benefits for environmental

and social goals such as flood control, instream quality, in-lake quality, recreation, power, or any other attainable goals a project can achieve without compromising the authorized project purpose." The Fish and Wildlife Coordination Act, 16 U.S.C. 661, et seq. provides that fish and wildlife receive equal consideration with other project purposes.

## Historical Plans

Water level management on Pool 25 has changed since construction of the lock and dam system on the UMR. Previous plans are included here to provide possible alternatives within the original laws and regulations. Historical plans were obtained from Appendix 25, Master Water Control Manual (U.S. Army Corps of Engineers 1980b). Lock and Dam 25 was placed in use on May 18, 1939, and reached full pool on July 11, 1939. The dam backs up water on the Mississippi River from river mile (measured from the confluence of the Mississippi and Ohio Rivers) 241.4 to river mile 273.4. The authorized project pool elevation is 434.0 ft above sea level (1929 National Geodetic Vertical Datum).

The water level management plan adopted when Lock and Dam 25 was constructed limited pool regulation to the navigation season of March 10 to December 1 of each year, with open river conditions during the remainder of the year. Open river conditions exist when all dam gates are out of the water, and water levels on the upriver and downriver side of the dam are nearly equal. Under this plan, water levels in Pool 25 were regulated as follows: Water stage would be allowed to recede as discharges fell from relatively high values, until elevation 435.75 ft was reached at the Mozier Landing gage (river mile 260.3; Fig. 1). It was thought this stage would be reached coincidental with a maximum drawdown at the dam of 427.0 ft. As flows continued to decrease, an elevation of 435.75 ft was maintained on the Mozier Landing gage by closing dam gates until an elevation of 434.0 ft was reached at the dam. This procedure was

reversed during increasing river flows. This scheme is known as the mid-pool control point method or the hinge point method.

The major benefit of this plan is that it required a minimum amount of land to be acquired by the Government. On navigable streams, the area between the plane of ordinary high water and the plane of highest backwater produced by regulation of a dam is a measure of damages for which the U.S. Government is liable. For Pool 25, the limiting land acquisition lines were drawn 2 ft higher than the maximum calculated backwater elevation at the dam site and at the towns of Sterling and Hamburg, and 2 ft above elevation 436.0 ft at the mouth of the Sny River (river mile 261.5). From elevation 438.0 ft at the mouth of the Sny River, a horizontal line was drawn to the intersection with ordinary high water, about river mile 264.4. The lands purchased totaled about 12,000 acres, with 7,000 acres in Calhoun County, Illinois, and 4,000 and 1,000 acres, respectively, in Lincoln and Pike Counties, Missouri.

Regulation of the pool on a year-round basis was commenced in the early 1940s, with the maximum drawdown elevation at the dam changed from 427.0 to 428.0 ft. Sterling Landing (river mile 250.8) was established as an auxiliary control point in 1945. Under that plan as discharge fell from relatively high values, an elevation of 428.0 ft was maintained at the dam by placing dam gates in the water. This elevation was held until an elevation of 431.0 ft was reached at Sterling Landing. An elevation of 431.0 ft was maintained at Sterling Landing by adjusting the dam gates until an elevation of 434.0 ft was reached at Mozier Landing. An elevation of 434.0 ft was maintained at Mozier Landing until an elevation of 434.0 ft was reached at the dam. This procedure was reversed during increasing river flows.

About 1950, use of the auxiliary control point at Sterling Landing was abandoned, and an elevation of 429.7 ft at the dam was established as the maximum drawdown elevation. A modified drawdown schedule was implemented in 1971 as an aid to waterfowl hunters. The new maximum

drawdown and waterfowl season changes are still in effect and are further described below.

When discharge, as estimated at Lock and Dam 25, is between 0 and 95,000 ft<sup>3</sup> per second (cfs), the target water level is maintained between 434.0 and 435.75 ft at Mozier Landing (mid-pool control point). To maintain the target water level at this location as the discharge increases up to 95,000 cfs, gates are raised at the dam, causing the water level to fall just upriver of Dam 25. However, the water level at the dam cannot be lowered past a maximum drawdown elevation without affecting the 9-ft navigation channel. At 95,000 cfs, the water level at Dam 25 is lowered to its maximum drawdown (429.7 ft), or 4.3 ft below the project pool elevation. Between 0 and 95,000 cfs, water levels rise in parts of the pool upriver of Mozier Landing and drop downriver of this location. Between 95,000 and 135,000 cfs, the target water level is maintained at 429.7 ft at Dam 25, and in all locations of the pool upriver of the dam the water surface rises with an increase in discharge. As discharge increases from 0 to 135,000 cfs, water levels rise in the tailwater of Dam 25. Above 135,000 cfs, water elevations on both sides of the dam will be nearly the same and all gates are raised above the water surface (known as open river conditions). Above 135,000 cfs, a 9-ft channel exists naturally, and the dam is not needed; the reverse operation occurs as discharge falls. The modified schedule begins October 1 of each year and is in effect only during the waterfowl season, when discharge is between 70,000 and 135,000 cfs. This modification was implemented so that hunters would not be stranded on mud flats. The present plan is shown in Figure 2. Navigation is officially possible during the entire year. However, from December into March, ice forms on the pool, which at times makes navigation nearly impossible. Ice may be passed from the pool by rapidly raising and lowering water levels (U.S. Army Corps of Engineers 1980b).

## Methods

Historical water level measurements were obtained from the U.S. Army Corps of Engineers, St. Louis District, at six stations: the tailwater at Lock and Dam 25 (river mile 241.2), the headwater of Lock and Dam 25 (river mile 241.5), Sterling Landing (river mile 250.8), Mozier Landing (river mile 260.3), Rip Rap Landing (river mile 265.0), and the tailwater at Lock and Dam 24 (river mile 273.2). Measurements were obtained as daily water level readings, usually taken between 6 and 8 a.m. Each water level observation includes a five-character station name, year, Julian day, the time the observation was made, and the water level, reported as feet above sea level using the 1929 National Geodetic Vertical Datum. Additional information concerning the water level and discharge databases maintained at the EMTC appear in the LTRMP Procedures Manual (Wlosinski et al. 1995).

Discharge estimates were also needed for the study because water levels are managed as a function of discharge. However, discharge estimates are not routinely measured at Lock and Dam 25. The closest U.S. Geological Survey (USGS) discharge station on the Mississippi River upriver of Dam 25 is at Keokuk, Iowa, and downriver at Grafton or Alton, Illinois. The USGS moved their monitoring station from Alton to Grafton in 1986. Dam 25 is 123 river miles from Keokuk, 23 river miles from Grafton, and 39 river miles from Alton. Grafton and Alton have a much larger watershed than Dam 25, but measured discharge at either Meredosia or Valley City on the Illinois River accounts for most of the difference. Because travel time is much shorter to Grafton and Alton, data from these stations were used to estimate discharge at Dam 25. Discharges for the tailwater of Lock and Dam 25 were estimated using the following equations:

### October 1939 to September 1986

$$Q_{25} = Q_a - Q_m - (0.0202 Q_a)$$

### October 1986 to September 1993

$$Q_{25} = Q_g - Q_{vc} - (0.0149 Q_g)$$

where:

$Q_{25}$  = Discharge estimate for Lock and Dam 25 tailwater

$Q_a$  = Discharge at Alton (from USGS)

$Q_g$  = Discharge at Grafton (from USGS)

$Q_m$  = Discharge at Meredosia (from USGS)

$Q_{vc}$  = Discharge at Valley City (from USGS)

The parameter 0.0202 represents the percentage of the watershed area at Alton not included in the Pool 25 watershed. Similarly, 0.0149 represents the percentage of the watershed area at Grafton not included in the Pool 25 watershed. Two equations were needed because gaging station locations were changed on both the Mississippi and the Illinois Rivers. If the calculated Pool 25 discharge from either equation was lower than the discharge at Keokuk, Iowa, three days before, the Keokuk discharge was used. Each discharge observation includes a five-character station name, year, Julian day, and discharge, reported in cubic feet per second as a daily average.

Linear trends for yearly minimum, mean, and maximum discharges were developed using autoregressive error correction procedures (SAS Institute, Inc. 1993). Significance for these procedures was set at  $P \leq 0.05$ .

Discharge estimates were used to compute exceedence frequencies on a weekly, monthly, and yearly basis. They were also used to calculate the percentage of time discharges were within specified ranges on a weekly, monthly, and yearly basis.

Water level measurements at the five in-pool stations were used to calculate the percentage of time water levels were above specific elevations on a weekly, monthly, and yearly basis. Only data for the period between 1952 and 1993 were used because different water level management plans were in use before 1952.

All analyses were conducted at the EMTC using the Statistical Analysis System (Version 6.09) on a Sun workstation and Fortran programs on a personal computer.

## Results and Discussion

Minimum, mean, and maximum yearly discharges for Pool 25 from 1940 to 1993, inclusive, are presented in Figure 3. A linear trend line is also presented for each relationship. Although all trends are increasing, only the trends for minimum and mean yearly discharges are statistically significant. The  $R^2$  values were 0.22, 0.12, and 0.03 for the minimum, mean, and maximum trends, respectively. Other statistics for the discharge database are presented in Table 1. The minimum, mean, and maximum estimated discharges for the period of record were 12,700, 91,200, and 524,000 cfs, respectively. The mean daily discharge for the period of record is presented in Figure 4.

A discharge exceedence curve for the tailwater of Pool 25, based on estimates from 1939 to 1993, is presented in Figure 5. Similar curves are presented for the months of January through December in Figures 6 through 17, respectively. Discharge exceedence values (1,000 cfs), by week, are listed in Table 2. Discharges are above the listed value for a specified percentage of time.

The percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Pool 25, based on estimates from 1939 to 1993, is presented in Figure 18. Similar curves are presented for the months of January through December in Figures 19 through 30, respectively. The percentage of time discharges were within certain ranges, calculated on a weekly basis, is presented in Table 3.

Yearly statistics for water surface elevations at the headwater of Lock and Dam 25, Sterling Landing, Mozier Landing, Rip Rap Landing, and the tailwater at Lock and Dam 24 are presented in Tables 4 through 8, respectively. The

percentages of time water levels are above specific elevations at the above five stations, calculated on a monthly and yearly basis, are presented in Tables 9 through 13. Similarly, the percentages of time water levels are above specific elevations at the above five stations, calculated weekly, are presented in Tables 14 through 18. The mean yearly water surface elevations at Sterling Landing are presented in Figure 31 (Sterling Landing is the station with the most data). Water level fluctuations are greatest in the upriver portions of the pool on the Upper Mississippi River because of the way the dams are managed. At Pool 25, water level fluctuations from 1952 to 1993 averaged 14.9 ft at the tailwater of Lock and Dam 24 to 7.9 ft at the headwater of Lock and Dam 25.

Discharge is an unpredictable variable that may allow or disallow any planned water level management alternative. However, some idea is needed as to how often discharge remains within predefined limits. Figures 18 through 30 and Table 3 provide information on discharge frequencies averaged over the historical record. For some purposes, it may be more useful to know the percentage of years when discharge remained at certain levels for a particular time period. For example, in August, discharge is between 35,000 and 55,000 cfs 30% of the time (Fig. 26), but during only 1 of 54 years of record it remained within that range for the entire month. A table or graph displaying this information cannot be developed because of the infinite number of possible alternatives. A program that calculates the percentage of years discharge would be expected to be between certain ranges for certain time periods has been developed, based on historical discharge estimates from October 1939 to October 1993. To run the program, the user must have access to the Sun computer system at the EMTC. After logging on to the Sun04 computer, enter the string:

```
sas /home/jhw0/getp25q
```

The program then queries the user for a discharge range and a time period and returns the percentage of years that discharge remained

within that range. For example, let us assume that discharge must be between 40,000 and 160,000 cfs to keep the water level lower than 433.0 ft at the headwater of Pool 25 in July. By running the program, we see that discharge is within the specified range for the entire month, for 33% of the years.

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**Table 1.** Yearly discharge estimates for the tailwater of Pool 25

Year	Number of values	Discharge (cfs)				Standard deviation
		Minimum	Maximum	Mean	Range	
1939	91	15,157	33,677	27,538	18,520	3,683
1940	366	13,090	113,814	45,709	100,724	21,567
1941	365	17,017	202,213	87,532	185,196	49,054
1942	365	25,585	239,071	95,200	213,486	45,027
1943	365	32,844	311,233	104,084	278,389	61,529
1944	366	30,289	302,855	97,320	272,566	73,942
1945	365	25,383	267,580	98,983	242,197	66,533
1946	365	27,846	265,727	93,904	237,881	53,988
1947	365	26,656	320,864	97,498	294,208	81,610
1948	366	14,875	287,187	63,153	272,312	58,160
1949	365	16,184	179,333	63,007	163,149	39,630
1950	365	18,683	209,321	79,462	190,638	55,915
1951	365	22,610	315,469	122,192	292,859	73,006
1952	366	27,727	302,022	98,380	274,295	64,805
1953	365	26,299	192,413	78,775	166,114	40,717
1954	365	26,061	215,866	75,453	189,805	42,917
1955	365	23,443	186,354	60,388	162,911	33,839
1956	366	16,422	156,485	49,869	140,063	29,878
1957	365	22,393	139,225	58,578	116,832	27,329
1958	365	18,445	155,399	48,385	136,954	27,260
1959	365	19,516	216,580	73,926	197,064	40,441
1960	366	28,738	344,505	99,390	315,767	72,875
1961	365	21,420	247,996	83,389	226,576	48,857
1962	365	28,421	267,273	95,177	238,852	59,050
1963	365	21,539	155,205	53,607	133,666	34,183
1964	366	13,984	166,379	45,561	152,395	26,938
1965	365	28,441	389,130	119,332	360,689	79,680
1966	365	22,491	197,778	82,087	175,287	50,081
1967	365	23,562	263,228	76,582	239,666	54,193
1968	366	24,990	170,289	74,816	145,299	34,413
1969	365	28,560	305,749	110,734	277,189	75,067
1970	365	25,638	288,851	89,925	263,213	49,202
1971	365	23,443	225,666	87,893	202,223	51,850
1972	366	32,477	228,480	108,314	196,003	47,279
1973	365	44,744	419,654	155,181	374,910	91,635
1974	365	29,988	309,400	112,258	279,412	70,528
1975	365	28,441	299,880	94,866	271,439	65,018
1976	366	12,733	263,098	61,671	250,365	56,411
1977	365	16,779	158,900	56,472	142,121	28,886
1978	365	33,766	241,322	98,420	207,556	55,177
1979	365	33,431	360,569	116,440	327,138	79,086
1980	366	28,441	167,790	81,339	139,349	36,219
1981	365	29,390	229,459	89,694	200,069	44,259
1982	365	38,556	349,541	136,807	310,985	65,437
1983	365	37,723	330,239	133,662	292,516	69,478
1984	366	33,437	252,340	125,383	218,903	60,989
1985	365	41,174	280,960	113,699	239,786	57,220
1986	364	61,404	351,816	149,972	290,412	69,007
1987	365	39,657	157,403	73,615	117,746	20,366

**Table 1.** Continued

<b>Year</b>	<b>Number of values</b>	<b>Discharge (cfs)</b>				<b>Standard deviation</b>
		<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Range</b>	
1988	366	14,399	133,937	51,042	119,538	28,788
1989	365	17,889	149,940	48,581	132,051	28,273
1990	365	21,617	312,970	91,979	291,353	60,099
1991	365	34,986	230,134	116,797	195,148	57,098
1992	366	38,819	217,770	107,639	178,951	45,918
1993	273	49,266	524,153	247,678	474,887	124,379

cfs = cubic feet per second



**Table 2.** Discharge (1,000 cubic feet per second [cfs]) exceedence values, by week, for Pool 25. Discharges (1,000 cfs) are above the listed values for a specified percentage of time.

Percent	Week of the year												
	1	2	3	4	5	6	7	8	9	10	11	12	13
0	236	243	266	196	205	193	168	269	274	281	264	283	321
1	171	189	210	184	190	182	146	191	261	250	235	259	302
2	157	159	169	164	156	176	124	175	222	240	227	251	290
3	151	144	146	160	145	154	121	167	198	209	207	245	284
4	145	126	116	129	140	124	115	164	183	190	201	240	272
5	129	121	109	117	115	121	113	160	174	185	195	231	267
6	125	114	100	110	104	113	106	158	171	182	185	218	260
7	118	104	96	101	98	102	101	150	167	179	183	212	252
8	110	94	94	98	93	102	97	142	159	174	179	207	248
9	108	92	88	97	90	96	95	137	149	169	176	205	243
10	107	91	83	96	87	95	92	135	138	168	175	203	239
11	103	90	80	91	83	87	90	130	131	165	173	197	234
12	102	87	79	89	81	84	89	123	127	159	170	194	232
13	98	83	78	88	80	82	88	116	126	155	167	189	224
14	96	81	76	86	79	81	88	107	125	153	166	188	223
15	94	78	76	85	79	79	85	105	121	145	164	182	211
16	89	75	73	81	78	78	84	102	118	143	162	179	208
17	84	73	73	75	77	78	82	96	115	138	157	177	203
18	84	72	71	70	75	77	81	91	111	136	156	175	200
19	82	71	71	69	75	76	80	89	109	134	155	173	196
20	80	69	70	68	74	75	78	88	106	132	153	171	196
21	78	67	69	66	73	75	78	85	103	130	151	170	192
22	76	66	68	64	72	74	78	85	101	125	150	169	189
23	75	66	66	63	71	73	77	84	100	124	148	169	187
24	74	65	65	62	68	72	76	83	98	123	147	167	184
25	73	64	64	61	67	71	75	81	97	122	142	164	179
26	73	62	62	60	65	69	74	80	96	120	139	163	175
27	72	62	61	59	64	68	73	79	94	117	137	161	171
28	71	61	61	59	63	67	72	78	94	115	134	161	169
29	71	60	60	59	62	64	71	77	93	114	130	157	168
30	69	59	58	58	60	61	69	76	92	111	127	155	167
31	68	58	58	57	59	60	67	75	91	109	125	154	165
32	68	57	57	57	59	59	66	74	90	107	124	154	164
33	66	57	56	57	58	58	66	74	87	106	121	152	162
34	65	55	54	56	58	57	65	72	86	103	118	151	161
35	65	54	53	55	58	56	64	71	85	101	117	150	159
36	64	54	52	55	57	55	64	71	82	100	116	147	156
37	62	53	52	53	57	54	63	70	81	99	115	146	155
38	61	52	51	53	57	54	63	69	80	98	114	142	152
39	60	50	51	52	56	53	61	68	79	97	112	139	150

**Table 2. Continued**

	Week of the year												
	Percent	14	15	16	17	18	19	20	21	22	23	24	25
0	324	361	352	416	420	369	317	313	303	298	287	313	331
1	321	332	315	365	389	337	310	303	284	263	285	267	312
2	311	309	309	322	364	328	299	288	264	249	262	248	306
3	291	306	306	300	356	318	290	279	257	239	258	239	292
4	273	302	292	293	342	312	285	275	252	231	235	238	277
5	268	300	284	290	338	309	284	269	249	228	228	234	270
6	265	295	272	285	315	302	283	262	245	216	217	232	253
7	253	289	268	277	308	300	268	253	239	210	213	226	238
8	249	275	262	272	301	289	251	249	235	206	207	220	236
9	240	267	261	264	299	276	244	242	220	200	204	218	224
10	238	263	256	261	298	266	240	240	217	199	202	214	218
11	236	253	253	255	293	261	235	235	213	192	199	210	210
12	227	244	245	253	285	255	230	228	205	190	196	208	206
13	221	234	242	251	263	249	225	220	199	186	191	207	205
14	213	226	240	250	259	241	223	217	194	184	189	204	195
15	211	222	233	244	253	237	222	214	191	183	182	194	192
16	207	217	228	242	250	230	220	211	185	182	173	190	188
17	205	214	224	240	248	227	214	203	184	181	171	183	186
18	201	212	217	238	242	224	211	199	183	179	169	181	179
19	199	210	215	235	230	223	207	198	182	177	168	179	171
20	198	208	213	232	225	217	201	194	179	174	165	176	167
21	198	206	212	230	220	214	198	193	175	171	164	172	163
22	195	204	210	227	217	213	193	192	173	168	163	167	161
23	194	203	208	224	215	208	188	189	171	167	162	166	157
24	192	202	207	222	211	206	186	187	170	166	159	163	155
25	189	201	202	219	209	199	185	186	166	162	157	159	151
26	188	199	200	216	205	193	183	181	160	160	155	152	149
27	188	197	199	215	203	190	182	179	157	159	153	151	147
28	185	196	196	215	200	189	180	178	155	156	152	148	146
29	183	193	194	213	198	188	178	175	151	154	150	147	144
30	182	190	193	211	196	186	176	171	148	151	148	145	141
31	179	188	192	209	196	184	174	167	145	148	144	142	141
32	178	188	191	207	194	182	173	165	145	146	143	138	137
33	176	186	190	205	192	179	172	163	143	144	139	135	135
34	175	185	189	204	191	178	170	161	141	138	137	133	133
35	173	182	187	202	190	176	168	158	139	134	133	131	129
36	172	180	185	201	188	172	165	156	138	130	131	130	128
37	171	178	184	199	188	170	165	155	134	129	129	129	124
38	169	177	183	196	186	167	164	154	131	127	128	127	123
39	166	175	182	192	184	164	163	152	130	126	127	125	120

**Table 2. Continued**

Percent	Week of the year												
	27	28	29	30	31	32	33	34	35	36	37	38	39
0	414	516	499	498	524	508	358	310	293	262	248	237	289
1	359	468	482	485	491	407	332	292	272	257	231	211	271
2	317	305	292	265	219	174	190	152	161	174	157	175	255
3	296	262	247	247	185	171	174	144	137	151	131	147	237
4	263	240	226	224	154	151	132	135	133	144	124	141	215
5	253	222	220	210	144	142	129	131	142	119	119	140	184
6	245	209	211	205	139	136	126	119	116	139	116	136	164
7	240	202	193	171	135	130	123	115	110	137	113	131	140
8	232	200	187	162	133	126	123	110	107	131	107	126	135
9	226	197	186	152	131	121	114	109	104	127	102	120	133
10	220	193	182	149	130	120	112	108	104	121	101	117	130
11	213	189	176	147	127	119	109	107	101	101	97	112	128
12	200	187	173	143	125	118	106	105	99	98	96	109	126
13	196	185	163	139	121	117	104	101	97	95	94	108	124
14	193	182	161	134	120	117	103	100	95	92	94	107	118
15	188	182	155	130	119	116	101	98	94	87	90	104	111
16	179	178	149	129	114	113	99	88	92	85	89	101	107
17	176	176	149	126	112	112	97	86	91	84	87	96	102
18	172	174	143	124	108	111	95	83	89	83	86	93	101
19	169	169	139	120	108	109	93	83	85	82	86	91	99
20	164	168	136	119	103	106	89	82	83	80	85	90	95
21	161	167	133	115	101	105	88	79	81	78	83	88	91
22	160	161	131	113	100	101	87	76	79	75	80	87	91
23	154	155	130	112	98	100	86	76	77	73	78	87	89
24	151	152	128	111	97	95	84	75	76	73	76	85	89
25	149	147	127	110	96	92	82	74	74	72	75	83	89
26	148	144	126	109	93	92	82	73	72	71	73	81	88
27	147	141	124	108	92	91	81	71	71	70	72	80	87
28	146	139	122	107	92	89	80	71	69	69	72	80	85
29	146	138	121	106	91	86	80	70	67	69	72	78	84
30	144	136	120	104	88	85	80	69	66	68	71	77	83
31	142	134	119	102	88	83	79	69	65	68	70	75	80
32	142	133	119	101	87	82	78	68	65	68	69	75	77
33	138	130	117	100	87	81	77	67	64	67	68	73	76
34	136	130	116	99	85	80	76	67	63	66	67	70	75
35	133	125	115	99	85	79	75	66	62	65	67	68	74
36	131	123	113	98	82	77	75	65	61	64	66	67	73
37	124	122	112	97	81	77	74	65	60	63	66	65	72
38	123	119	111	97	80	76	72	64	59	62	65	65	71
39	119	116	109	96	79	76	72	63	58	61	65	63	69

**Table 2. Continued**

	Week of the year												
	Percent	40	41	42	43	44	45	46	47	48	49	50	51
0	312	352	327	260	268	230	182	213	211	350	298	179	206
1	240	334	280	243	251	201	167	195	194	259	220	169	186
2	202	201	213	179	179	192	160	187	181	179	151	152	173
3	180	181	164	158	158	177	156	177	169	169	142	143	149
4	160	171	160	152	150	168	144	171	153	164	126	126	142
5	153	165	154	143	148	165	143	148	148	159	125	118	129
6	151	159	150	127	143	159	142	161	142	157	120	114	126
7	149	157	144	115	134	155	136	156	134	147	111	107	121
8	143	154	140	111	127	150	131	148	129	141	102	97	118
9	138	151	133	109	120	145	128	136	124	124	97	93	113
10	134	149	124	107	116	143	125	128	121	118	94	90	108
11	130	146	118	107	113	137	123	114	119	107	92	89	103
12	120	143	112	104	111	133	119	111	117	97	90	88	98
13	116	134	111	103	108	131	115	109	115	92	88	87	92
14	113	127	107	102	107	125	114	108	112	91	88	86	88
15	109	119	102	105	105	123	114	107	108	89	87	84	85
16	105	110	98	101	104	121	111	106	107	88	84	82	84
17	103	105	96	99	103	117	109	104	104	87	81	81	82
18	100	102	94	98	103	115	108	102	100	85	78	80	80
19	98	97	92	97	102	111	108	100	98	85	77	78	79
20	96	94	90	96	102	105	107	96	95	84	76	77	78
21	95	91	87	91	100	102	105	92	90	83	74	74	77
22	95	90	86	88	100	98	99	90	85	82	73	72	74
23	93	87	85	88	99	98	96	89	83	81	73	71	72
24	91	84	83	86	97	95	93	87	80	80	72	69	69
25	90	81	82	85	95	93	88	86	79	78	71	67	68
26	88	77	81	81	93	93	87	85	78	78	71	63	66
27	86	76	79	78	90	90	85	83	77	76	69	63	65
28	84	74	79	76	86	89	85	82	74	75	69	62	65
29	83	72	77	73	85	88	84	81	73	72	68	61	63
30	82	71	75	69	84	86	83	79	72	72	67	58	62
31	81	69	72	66	80	84	82	77	71	70	65	58	61
32	78	67	72	64	75	83	82	75	71	68	64	57	60
33	76	66	70	64	74	82	79	74	70	64	63	56	59
34	75	65	69	62	71	80	79	73	69	63	61	55	58
35	73	63	68	62	70	78	75	72	69	63	60	55	57
36	72	62	66	61	69	76	73	71	67	62	59	54	56
37	66	61	65	60	67	75	72	70	67	61	59	53	55
38	64	59	64	59	65	75	71	70	66	60	58	51	55
39	62	58	61	59	63	74	69	68	65	59	58	51	55

**Table 2. Continued**

Percent	Week of the year												
	1	2	3	4	5	6	7	8	9	10	11	12	13
40	59	50	50	51	55	53	60	67	79	96	110	137	148
41	57	49	48	51	55	51	59	67	78	95	108	136	146
42	57	49	48	49	54	50	58	66	77	93	107	135	144
43	56	48	47	48	54	50	56	65	76	92	105	134	141
44	56	48	46	47	53	50	55	65	74	92	101	132	140
45	55	47	46	47	53	49	53	64	73	90	98	129	136
46	54	47	46	46	52	47	52	63	72	89	95	127	135
47	53	47	45	46	51	47	50	63	72	88	94	124	134
48	52	46	45	45	51	47	49	62	70	86	93	122	132
49	51	45	45	45	50	46	48	62	69	86	91	120	130
50	51	45	44	44	49	46	47	60	68	85	91	119	129
51	50	44	44	43	47	45	47	60	67	83	91	118	128
52	49	43	43	43	46	45	47	59	66	82	89	116	126
53	49	43	42	42	45	44	46	57	64	81	88	114	125
54	47	42	41	41	45	43	45	56	64	80	85	113	124
55	46	42	41	40	44	43	44	56	64	79	84	112	122
56	46	41	41	40	44	42	43	54	63	78	83	110	121
57	45	41	40	39	43	42	42	54	62	77	81	110	120
58	45	40	40	39	42	41	42	53	61	77	80	107	118
59	44	40	39	39	41	40	41	52	60	74	79	105	118
60	43	39	39	39	41	40	41	51	60	73	78	101	117
61	42	39	38	38	40	40	40	49	59	71	77	99	116
62	42	39	38	37	40	39	40	48	57	69	75	99	114
63	40	38	37	37	39	39	40	47	56	68	74	97	112
64	40	38	37	37	39	39	40	46	55	67	72	95	110
65	40	38	36	36	39	38	40	46	53	66	71	94	107
66	39	37	36	36	38	38	40	45	52	64	70	93	105
67	39	37	36	36	38	37	39	43	51	62	69	92	102
68	38	36	35	35	37	36	39	43	50	61	68	89	99
69	37	36	35	35	36	35	39	42	49	59	67	87	97
70	37	35	34	34	36	34	39	41	49	58	66	86	95
71	37	35	34	34	35	33	38	41	48	56	63	84	94
72	36	35	34	33	35	33	38	40	47	54	62	82	93
73	36	35	34	33	34	32	38	40	46	51	62	77	91
74	36	34	33	33	34	32	37	40	45	50	60	74	89
75	36	33	33	33	33	32	37	40	43	48	59	72	84
76	35	33	33	32	33	32	36	39	43	48	58	71	82
77	35	33	32	32	32	31	36	39	42	46	56	70	79
78	35	32	32	32	32	31	35	39	42	46	55	68	78
79	34	32	31	32	32	31	35	38	42	45	54	67	77

**Table 2. Continued**

	Week of the year												
	Percent	14	15	16	17	18	19	20	21	22	23	24	25
40	165	173	180	188	184	160	162	150	129	126	125	124	119
41	162	172	177	187	183	158	161	148	128	124	124	123	118
42	162	168	175	186	182	155	158	145	127	122	122	122	115
43	160	167	173	184	181	153	155	143	124	119	121	121	114
44	159	164	170	183	181	150	153	138	121	117	121	120	113
45	157	164	167	181	178	149	150	136	119	115	120	119	112
46	157	162	165	181	177	148	148	133	118	114	119	118	111
47	155	160	163	180	174	145	146	132	116	113	117	117	110
48	153	159	160	178	172	143	145	127	115	110	116	115	106
49	150	156	155	176	168	142	143	126	113	109	114	114	102
50	148	155	153	174	165	140	143	124	111	109	112	113	101
51	145	154	150	168	161	139	141	122	110	107	110	113	100
52	142	154	144	165	156	136	140	121	109	105	109	111	99
53	141	152	142	161	147	134	137	118	107	104	107	109	97
54	139	150	140	157	144	131	135	116	106	102	105	108	95
55	139	149	139	156	143	130	133	114	105	102	103	106	94
56	137	148	139	153	139	127	126	113	104	99	102	106	94
57	135	146	137	151	137	125	124	112	103	97	101	104	92
58	133	145	137	148	130	122	118	111	100	96	100	101	92
59	132	144	136	145	129	120	115	107	99	95	100	100	91
60	131	143	135	143	129	119	115	105	99	95	99	98	89
61	128	139	133	140	126	115	112	104	97	94	98	96	88
62	126	138	133	136	121	114	110	100	97	92	96	95	87
63	123	136	132	134	117	112	108	97	94	92	94	92	87
64	121	134	131	134	115	110	107	96	92	90	93	91	86
65	121	133	128	130	113	108	105	93	91	89	93	90	85
66	120	131	127	126	112	106	104	92	89	88	90	88	83
67	119	130	127	124	110	104	101	91	87	87	89	87	83
68	117	128	126	121	108	103	100	90	84	84	88	85	80
69	117	128	125	119	108	103	98	90	83	83	87	83	78
70	116	127	122	114	105	101	98	89	80	82	85	81	77
71	115	124	121	111	103	98	97	88	79	81	83	80	75
72	114	121	119	108	101	97	94	87	77	80	81	78	72
73	113	118	118	107	100	97	94	86	76	79	79	76	72
74	108	116	113	106	98	95	91	85	75	78	78	73	70
75	106	112	111	103	95	90	90	84	74	77	76	72	69
76	105	110	109	101	92	88	88	81	72	74	74	70	69
77	103	107	108	99	91	86	85	78	71	73	72	69	67
78	100	103	107	97	90	86	84	77	69	72	70	68	66
79	96	99	105	97	89	83	78	76	68	70	67	64	65

**Table 2. Continued**

	Week of the year												
	Percent	27	28	29	30	31	32	33	34	35	36	37	38
40	117	113	107	94	79	76	70	63	58	60	63	62	67
41	115	111	107	93	77	75	70	62	57	59	62	61	66
42	112	108	104	92	76	74	68	61	56	59	62	60	66
43	110	107	103	91	75	74	68	61	55	58	61	60	64
44	109	105	102	89	74	72	67	61	54	57	61	59	63
45	108	103	101	87	73	70	65	60	53	56	60	59	62
46	107	100	100	85	72	69	65	60	53	56	60	59	62
47	104	98	98	84	71	68	64	59	53	55	59	58	60
48	102	97	97	84	70	67	63	58	52	55	58	58	59
49	100	95	96	83	68	66	61	56	51	55	58	57	58
50	98	94	94	81	68	65	60	55	50	54	58	56	57
51	98	92	92	78	67	63	59	54	50	54	57	55	57
52	97	90	91	75	66	61	58	54	49	53	56	54	56
53	96	89	89	74	65	60	57	53	49	52	56	53	55
54	94	87	86	72	64	58	56	52	48	52	55	53	54
55	93	85	84	72	63	58	55	51	48	51	53	52	53
56	91	83	83	71	62	57	54	51	48	51	53	52	51
57	90	79	81	70	62	56	54	50	47	51	52	51	51
58	89	77	80	69	60	55	53	49	47	50	52	51	49
59	84	76	79	69	58	54	52	48	46	49	52	50	48
60	84	76	79	69	58	54	51	47	46	48	51	49	48
61	82	75	77	66	57	53	51	46	45	48	50	48	47
62	81	74	76	65	56	51	49	46	44	48	50	48	46
63	80	73	76	64	55	51	48	45	44	47	49	47	45
64	79	73	75	63	54	50	48	45	44	47	49	46	45
65	78	72	73	62	53	49	48	44	42	47	48	45	44
66	76	72	72	62	52	49	46	44	42	46	47	45	43
67	76	71	69	61	51	48	45	43	42	45	47	44	42
68	74	70	67	60	51	47	45	43	41	44	46	43	41
69	74	69	67	59	50	47	45	42	41	44	46	43	40
70	72	68	65	58	49	47	44	41	40	43	45	42	40
71	71	66	63	58	48	46	42	39	39	42	44	41	40
72	70	65	62	56	48	46	41	38	38	42	44	40	39
73	70	64	60	55	47	46	41	38	37	41	43	40	39
74	68	63	59	53	45	45	40	38	37	40	42	39	38
75	67	61	58	52	45	44	40	37	36	39	41	38	37
76	66	60	56	51	43	44	39	37	35	39	41	37	36
77	65	58	52	51	42	44	39	36	34	38	40	36	35
78	64	57	50	50	42	43	38	36	33	37	39	36	35
79	64	56	48	49	41	42	38	36	32	36	38	35	34

**Table 2. Continued**

	Week of the year												
	Percent	40	41	42	43	44	45	46	47	48	49	50	51
40	60	57	59	59	60	74	67	67	64	58	56	48	54
41	59	57	58	58	59	72	67	66	63	57	56	48	53
42	58	56	57	57	57	71	66	66	63	56	55	47	53
43	58	55	55	55	57	70	64	65	61	55	54	47	52
44	57	54	52	54	55	68	64	63	60	54	52	46	52
45	56	54	52	54	54	67	62	61	58	53	51	46	52
46	55	53	51	54	53	66	61	60	58	52	51	45	51
47	54	52	50	54	53	66	60	60	57	51	50	44	50
48	53	52	49	52	52	63	59	59	56	50	48	44	50
49	52	51	48	51	52	62	58	58	55	50	48	44	49
50	51	50	47	50	51	61	56	57	55	50	48	44	49
51	50	49	47	49	50	58	55	56	54	49	47	43	48
52	49	48	46	48	49	56	54	56	53	48	47	43	48
53	48	48	45	47	49	53	53	54	52	48	46	42	47
54	46	47	45	46	47	51	52	53	51	47	45	42	46
55	46	46	44	45	46	49	51	52	50	46	44	41	45
56	46	45	43	44	45	47	50	52	50	46	44	41	44
57	44	44	42	43	45	47	49	51	50	45	43	40	44
58	43	43	41	43	44	46	48	50	49	44	42	40	44
59	42	42	40	42	42	45	47	50	48	44	42	40	43
60	41	41	40	41	42	45	46	48	48	44	41	40	42
61	40	41	39	40	42	44	45	48	47	43	41	39	42
62	40	40	38	39	39	43	44	48	47	43	40	39	41
63	40	40	38	38	39	42	43	47	46	42	40	38	40
64	39	39	37	37	38	41	43	46	46	42	39	38	40
65	39	39	36	36	36	40	43	45	45	41	39	38	39
66	38	38	36	35	35	40	42	45	45	40	39	37	39
67	37	37	36	34	35	39	41	45	43	40	38	37	38
68	37	36	36	34	34	38	40	44	43	40	38	36	38
69	37	36	35	33	34	37	40	44	43	39	38	36	37
70	36	35	33	33	33	37	39	43	42	38	38	36	37
71	35	35	33	33	33	35	37	43	42	38	37	35	36
72	35	35	33	32	32	34	36	42	41	37	37	34	36
73	34	35	32	32	32	34	36	42	40	37	36	33	36
74	33	34	32	32	32	33	34	42	39	37	36	33	35
75	32	34	32	31	32	32	34	41	39	36	35	33	35
76	32	34	32	31	31	32	33	39	39	35	34	33	34
77	31	33	31	30	31	31	32	38	39	35	34	33	34
78	30	33	31	30	30	31	32	37	38	34	34	33	33
79	30	33	30	30	30	31	32	36	37	33	33	32	33



**Table 2. Continued**

Percent	Week of the year												
	1	2	3	4	5	6	7	8	9	10	11	12	13
80	33	31	31	32	31	30	34	38	41	44	53	65	73
81	32	31	30	32	31	30	33	38	40	44	52	64	71
82	32	31	30	31	30	30	32	36	40	43	51	63	69
83	32	30	30	31	30	29	32	36	40	43	51	63	67
84	30	30	29	31	30	29	32	34	39	41	50	60	66
85	30	29	29	31	30	29	31	33	38	41	48	59	64
86	30	29	29	30	29	28	30	32	38	41	48	57	63
87	29	29	28	30	29	28	30	32	37	39	46	53	59
88	29	28	28	30	28	28	30	31	36	39	45	51	57
89	28	27	27	30	28	27	29	30	35	38	44	49	55
90	27	26	26	29	28	27	28	30	33	37	43	48	52
91	27	26	25	29	28	26	27	29	33	37	42	47	50
92	25	25	25	28	28	26	27	29	32	36	41	45	49
93	25	24	23	26	27	25	27	28	29	35	41	44	47
94	24	24	23	23	25	24	26	27	28	35	40	42	47
95	23	22	22	22	22	22	25	27	27	34	39	42	44
96	22	22	22	21	21	21	25	26	27	33	38	40	43
97	21	21	20	20	20	20	23	25	26	32	35	39	42
98	21	21	20	19	19	19	21	23	24	31	34	38	40
99	19	20	18	16	17	17	19	21	23	26	32	33	35

**Table 2. Continued**

	Week of the year												
	Percent	14	15	16	17	18	19	20	21	22	23	24	25
80	96	97	102	95	88	81	76	74	67	68	66	62	64
81	84	95	99	95	87	80	75	71	66	66	64	60	63
82	79	93	99	93	85	78	74	71	66	65	63	60	62
83	76	90	96	92	84	77	71	67	65	65	61	58	58
84	74	87	93	91	82	76	70	66	64	64	60	58	55
85	73	86	87	90	82	74	69	65	62	63	55	56	53
86	71	85	86	89	80	72	68	64	60	61	53	55	52
87	70	83	85	85	78	72	66	63	60	60	50	55	51
88	67	79	82	82	76	71	65	62	57	60	49	53	50
89	67	77	78	80	73	70	64	61	55	58	48	50	49
90	63	76	72	77	71	69	62	58	52	56	47	48	46
91	62	73	68	76	71	68	60	56	51	54	47	43	43
92	58	72	66	73	70	66	57	54	50	48	43	42	42
93	54	71	65	72	66	65	55	50	47	47	42	37	39
94	51	67	62	67	65	63	50	48	42	45	39	37	37
95	46	66	59	66	63	61	45	46	39	42	37	35	36
96	44	65	56	64	61	59	44	44	37	42	36	33	34
97	42	57	54	62	60	56	40	41	33	40	34	29	31
98	40	54	47	50	57	55	36	38	30	34	30	25	27
99	37	52	43	45	54	52	32	34	25	29	24	22	25

**Table 2.** Continued

	Week of the year												
	Percent	27	28	29	30	31	32	33	34	35	36	37	38
80	62	55	46	49	40	41	38	35	32	35	36	34	33
81	60	53	45	48	40	40	37	34	31	34	35	33	33
82	57	51	44	47	40	40	36	33	30	34	34	32	32
83	55	50	43	45	38	39	36	33	30	33	34	32	31
84	55	47	43	44	38	39	35	32	29	32	31	31	30
85	54	44	42	43	37	38	35	32	29	32	31	30	30
86	52	42	41	39	36	37	34	32	28	31	31	30	29
87	51	42	39	38	36	36	34	31	27	30	30	29	29
88	49	41	38	38	35	34	33	31	27	30	30	29	28
89	48	39	37	36	34	33	32	30	26	29	29	29	28
90	48	37	36	35	34	33	30	29	26	29	27	28	27
91	47	37	35	34	33	32	30	29	26	28	27	28	26
92	43	36	34	32	32	31	28	28	25	28	26	27	26
93	42	35	31	30	30	29	28	27	24	27	25	26	26
94	41	35	29	28	28	28	27	25	24	27	24	25	25
95	41	34	29	25	26	27	25	25	23	25	23	23	24
96	39	33	27	25	26	26	24	24	23	24	22	22	24
97	36	32	26	24	24	25	20	23	22	22	21	20	23
98	28	28	26	22	22	24	18	21	21	19	17	19	21
99	24	23	24	21	20	20	16	20	20	17	15	17	18

**Table 2. Continued**

	Week of the year												
	40	41	42	43	44	45	46	47	48	49	50	51	52
80	30	31	30	29	29	30	32	36	37	32	33	32	33
81	29	30	30	29	29	30	31	35	37	32	32	32	32
82	28	30	30	29	28	29	31	34	36	32	32	32	32
83	27	30	29	29	28	29	31	33	36	31	32	31	32
84	27	29	29	28	27	28	31	33	35	30	32	31	31
85	26	28	29	27	27	28	30	33	34	30	31	30	31
86	25	28	28	27	27	27	30	32	33	30	31	30	30
87	25	27	28	27	26	27	30	32	32	29	30	29	29
88	25	27	26	26	26	27	29	32	31	29	30	29	29
89	25	26	25	26	25	27	28	30	30	29	29	28	28
90	24	26	25	25	25	26	27	30	30	28	28	28	28
91	24	25	24	25	25	26	27	29	29	27	27	27	27
92	24	24	24	24	25	26	27	28	28	26	27	26	27
93	23	23	23	24	24	25	26	27	27	25	26	25	27
94	22	23	22	23	24	25	25	27	27	24	25	25	26
95	22	22	21	23	23	25	25	26	26	23	24	24	25
96	21	21	21	22	22	25	24	25	25	22	23	23	25
97	19	21	20	21	21	24	24	23	24	22	21	22	24
98	17	19	19	19	20	24	22	23	22	20	20	20	23
99	15	18	16	19	19	22	14	21	22	17	19	19	21

**Table 3.** Percentage of time discharges are within certain ranges during each week of the year. Percentages are based on estimated discharges between 1939 and 1993.

<b>Discharge (1,000 cfs)</b>										
<b>Week</b>	<b>0-35</b>	<b>35-55</b>	<b>55-75</b>	<b>75-95</b>	<b>95-115</b>	<b>115-135</b>	<b>135-155</b>	<b>155-175</b>	<b>175-195</b>	<b>&gt; 195</b>
1	22.8	31.8	21.9	8.3	7.7	3.1	1.9	1.5	0.3	0.6
2	28.3	36.8	19.0	7.7	2.1	2.4	1.3	0.3	1.1	1.1
3	32.0	34.4	18.3	7.9	2.9	0.5	1.3	0.5	0.5	1.6
4	31.2	33.1	18.5	6.9	4.8	1.3	0.3	2.6	1.1	0.3
5	28.8	30.4	22.0	10.8	2.9	0.5	1.9	1.3	0.5	0.8
6	30.7	32.5	15.6	11.6	3.7	1.9	0.8	0.8	2.4	0.0
7	21.4	34.7	18.3	16.4	5.0	2.4	1.3	0.5	0.0	0.0
8	16.1	27.8	24.9	13.5	4.0	4.0	3.2	4.2	1.3	1.1
9	1.8	25.1	20.6	16.4	9.5	6.6	1.9	4.0	1.6	3.4
10	6.1	22.2	13.0	18.3	11.9	9.8	5.3	5.6	4.2	3.7
11	2.9	18.8	15.9	16.1	9.0	9.3	8.7	8.7	5.8	4.8
12	1.1	12.2	13.0	9.3	11.6	10.6	12.2	11.6	6.3	12.2
13	0.5	10.3	9.5	9.3	8.7	15.6	9.0	10.8	5.8	20.4
14	0.3	6.9	9.5	2.9	9.3	13.2	10.8	13.2	11.1	22.8
15	0.0	2.1	7.4	9.5	6.3	10.8	13.2	10.8	10.6	29.1
16	0.0	3.4	7.1	5.3	10.8	13.2	10.8	7.1	13.2	28.8
17	0.0	2.1	6.6	10.3	10.8	7.1	7.7	5.6	11.1	38.6
18	0.0	0.8	10.3	13.8	11.1	6.3	5.0	5.8	15.1	31.7
19	0.0	1.9	13.2	10.8	12.4	9.0	10.6	6.3	9.8	25.9
20	1.3	5.3	12.4	9.0	12.4	5.3	10.8	12.7	8.5	22.2
21	0.8	7.7	11.6	15.3	9.8	9.0	9.3	7.7	8.7	20.1
22	3.2	7.4	14.8	11.6	14.6	11.6	9.0	6.3	7.7	13.8
23	2.1	7.1	14.8	16.4	14.0	10.3	6.1	9.5	8.7	10.8
24	3.7	10.6	9.8	13.2	14.0	14.3	8.5	9.8	3.4	12.7
25	5.0	8.7	13.0	11.4	13.5	15.1	7.1	5.8	5.3	15.1
26	4.2	11.4	13.2	16.9	11.4	9.3	9.8	5.0	4.2	14.6
27	2.6	13.8	16.1	13.5	12.4	6.9	11.6	5.6	3.7	13.8
28	5.8	14.3	19.0	11.6	9.5	9.3	7.4	5.0	8.5	9.5
29	8.5	15.1	12.7	13.8	14.8	14.6	5.0	4.0	4.8	6.9
30	10.1	16.9	20.9	12.2	18.3	7.7	5.3	1.6	0.3	6.9
31	11.4	25.1	20.1	17.7	9.5	9.0	2.9	0.8	0.5	2.9
32	12.2	29.9	16.1	17.7	8.7	9.0	2.1	2.1	0.3	1.9
33	15.1	29.1	19.3	18.0	9.5	5.0	0.3	0.5	1.3	1.9
34	19.8	29.6	26.2	8.7	8.2	2.9	2.4	0.3	0.0	1.9
35	23.8	33.3	18.3	10.6	7.7	2.6	1.3	0.5	0.0	1.9
36	20.4	31.0	26.2	9.3	2.1	3.7	4.5	0.8	0.3	1.9
37	18.8	27.5	28.8	12.2	6.1	4.0	0.3	0.3	0.3	1.9
38	20.6	28.0	19.6	14.0	6.9	4.5	3.2	0.8	0.5	1.9
39	22.0	24.9	19.0	13.8	5.6	6.1	2.4	0.8	0.8	4.8

**Table 3.** Continued

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<b>Week</b>	<b>Discharge (1,000 cfs)</b>									
	<b>0-35</b>	<b>35-55</b>	<b>55-75</b>	<b>75-95</b>	<b>95-115</b>	<b>115-135</b>	<b>135-155</b>	<b>155-175</b>	<b>175-195</b>	<b>&gt; 195</b>
40	28.2	25.8	11.7	12.5	8.5	3.2	5.1	1.3	1.3	2.4
41	28.3	28.3	15.6	7.9	4.5	2.1	5.3	3.7	1.9	2.4
42	30.7	25.9	13.0	12.7	6.3	2.4	4.0	2.4	0.0	2.6
43	33.1	24.1	14.3	7.9	13.5	1.6	1.6	1.6	0.5	1.9
44	33.3	22.2	12.2	7.4	14.3	3.7	3.2	1.3	0.3	2.1
45	29.1	18.3	14.8	13.5	6.1	6.9	4.2	3.4	2.1	1.6
46	26.7	22.5	15.9	11.4	10.1	6.1	4.0	2.9	0.5	0.0
47	18.3	28.8	20.9	11.6	9.3	1.6	2.1	3.7	2.9	0.8
48	15.6	34.4	22.0	7.9	6.6	6.3	2.9	1.3	1.9	1.1
49	23.0	33.9	15.1	15.3	2.1	1.9	2.4	3.4	1.3	1.6
50	24.6	33.6	20.9	11.1	2.6	3.2	2.1	0.0	0.3	1.6
51	28.6	36.2	14.3	12.2	2.6	2.1	2.1	1.1	0.8	0.0
52	25.4	37.0	15.8	9.0	4.0	4.0	1.8	1.2	1.2	0.6

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cfs = cubic feet per second

**Table 4.** Yearly statistics for water surface elevations at the headwater of Lock and Dam 25 (river mile 241.5)

Year	Number of values	Water surface elevation (ft)				Standard deviation
		Minimum	Maximum	Mean	Range	
1939	241	423.80	434.00	431.902	10.20	2.852
1940	366	429.95	434.00	433.208	4.05	1.078
1941	365	426.36	434.18	431.767	7.82	2.184
1942	365	425.95	435.78	431.477	9.83	2.233
1943	365	429.04	439.66	432.298	10.62	1.901
1944	366	421.16	438.84	432.824	17.68	2.501
1945	365	422.81	437.62	432.360	14.81	2.618
1946	365	423.15	436.91	432.474	13.76	2.065
1947	365	428.62	441.19	433.537	12.57	2.364
1948	366	427.67	439.39	432.746	11.72	2.186
1949	365	425.26	434.03	432.731	8.77	1.830
1950	365	420.11	435.24	430.858	15.13	4.212
1951	365	428.53	438.91	432.614	10.38	2.324
1952	366	429.61	439.84	432.746	10.23	2.000
1953	365	429.50	434.00	432.031	4.50	1.904
1954	365	420.44	439.35	431.913	18.91	2.768
1955	365	429.52	434.00	432.949	4.48	1.426
1956	366	429.63	434.06	433.503	4.43	1.048
1957	365	429.64	434.21	433.355	4.57	1.107
1958	365	429.56	434.02	433.539	4.46	0.956
1959	365	429.17	434.04	432.752	4.87	1.531
1960	366	423.45	439.93	433.417	16.48	1.833
1961	365	429.56	435.68	432.579	6.12	1.653
1962	365	429.55	437.78	432.827	8.23	1.799
1963	365	429.61	434.05	433.051	4.44	1.398
1964	366	429.66	434.07	433.389	4.41	1.105
1965	365	429.59	440.48	432.508	10.89	2.782
1966	365	429.48	436.96	432.187	7.48	1.768
1967	365	429.57	436.34	433.137	6.77	1.423
1968	366	429.52	434.03	432.497	4.51	1.676
1969	365	429.50	440.93	432.661	11.43	2.325
1970	365	429.45	437.83	432.345	8.38	1.800
1971	365	429.61	434.24	432.508	4.63	1.549
1972	366	429.61	433.99	432.007	4.38	1.729
1973	365	429.60	444.41	433.925	14.81	3.382
1974	364	429.62	439.95	433.019	10.33	2.054
1975	365	429.20	437.83	433.021	8.63	1.868
1976	366	429.62	438.50	433.312	8.88	1.552
1977	365	429.80	434.57	433.654	4.77	0.831
1978	365	429.59	434.87	432.737	5.28	1.592
1979	365	429.62	441.97	433.188	12.35	2.594
1980	366	429.56	434.08	432.580	4.52	1.788
1981	365	429.42	434.69	432.571	5.27	1.727
1982	365	426.88	440.25	432.757	13.37	2.152
1983	365	429.63	441.61	432.977	11.98	2.439
1984	363	429.68	436.45	433.138	6.77	1.431

**Table 4.** Continued

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<b>Year</b>	<b>Number of values</b>	<b>Water surface elevation (ft)</b>				<b>Standard deviation</b>
		<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Range</b>	
1985	365	429.62	439.70	432.847	10.08	1.822
1986	361	429.60	441.30	433.116	11.70	2.300
1987	365	429.61	434.13	433.344	4.52	1.030
1988	366	430.11	434.65	433.692	4.54	0.774
1989	365	429.71	434.21	433.687	4.50	0.801
1990	365	429.50	438.66	432.958	9.16	1.777
1991	365	429.53	435.86	433.086	6.33	1.192
1992	366	429.65	434.57	433.053	4.92	1.216
1993	365	429.75	447.44	436.485	17.69	4.319

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ft = feet



**Table 5.** Yearly statistics for water surface elevations at Sterling Landing (river mile 250.8)

Year	Number of values	Water surface elevation (ft)				Standard deviation
		Minimum	Maximum	Mean	Range	
1930	136	420.68	422.98	422.18	2.30	0.467
1931	355	420.68	433.38	424.45	12.70	2.860
1932	356	421.48	432.18	426.60	10.70	3.136
1933	365	418.18	437.78	425.17	19.60	4.526
1934	365	419.58	431.78	423.28	12.20	2.370
1935	365	422.68	437.68	427.95	15.00	3.843
1936	366	418.98	435.58	425.53	16.60	4.653
1937	365	418.98	438.48	425.96	19.50	4.620
1938	363	420.08	438.58	429.07	18.50	3.969
1939	365	422.88	439.58	431.60	16.70	3.506
1940	366	430.78	434.68	433.55	3.90	1.044
1941	365	430.28	436.48	433.49	6.20	1.139
1942	365	429.48	439.08	433.23	9.60	1.493
1943	365	430.58	440.66	434.03	10.08	1.671
1944	366	424.78	441.67	434.29	16.89	2.554
1945	365	427.18	440.48	434.04	13.30	2.392
1946	365	429.98	440.08	433.93	10.10	1.725
1947	365	431.08	443.88	434.88	12.80	2.572
1948	366	428.28	441.85	433.79	13.57	1.880
1949	365	426.08	435.78	433.61	9.70	1.200
1950	365	422.88	438.58	432.45	15.70	3.429
1951	365	431.08	442.08	434.53	11.00	2.446
1952	366	431.48	441.48	434.15	10.00	1.939
1953	365	431.38	437.48	433.30	6.10	0.967
1954	365	422.98	436.68	433.04	13.70	2.266
1955	365	431.08	435.68	433.65	4.60	0.850
1956	366	431.28	434.38	433.89	3.10	0.476
1957	365	431.28	434.48	433.74	3.20	0.723
1958	365	431.68	434.98	433.91	3.30	0.471
1959	365	431.18	436.78	433.71	5.60	0.979
1960	366	427.28	442.78	434.77	15.50	2.184
1961	365	431.18	439.08	433.81	7.90	1.183
1962	365	431.18	440.98	434.30	9.80	1.819
1963	357	431.28	434.28	433.65	3.00	0.621
1964	366	431.58	434.78	433.77	3.20	0.620
1965	365	429.98	443.68	434.47	13.70	3.057
1966	365	431.08	436.98	433.70	5.90	1.005
1967	365	431.18	439.98	434.27	8.80	1.164
1968	366	431.28	435.08	433.53	3.80	0.847
1969	365	431.28	443.98	434.70	12.70	2.514
1970	365	431.58	441.28	433.83	9.70	1.351
1971	365	431.38	438.18	433.99	6.80	1.099
1972	366	431.58	438.08	434.02	6.50	1.239
1973	365	431.68	447.08	436.29	15.40	3.546
1974	365	431.78	443.28	434.99	11.50	2.273
1975	365	431.88	441.38	434.53	9.50	1.723
1976	366	431.78	441.98	434.18	10.20	1.237
1977	365	431.48	437.28	434.03	5.80	0.583

**Table 5.** Continued

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<b>Year</b>	<b>Number of values</b>	<b>Water surface elevation (ft)</b>				<b>Standard deviation</b>
		<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Range</b>	
1978	365	431.28	438.48	434.38	7.20	1.260
1979	365	431.38	444.68	434.98	13.30	2.741
1980	366	431.18	436.08	433.76	4.90	0.812
1981	365	431.48	438.48	433.82	7.00	1.140
1982	365	431.58	442.98	435.12	11.40	2.151
1983	365	431.98	444.78	435.29	12.80	2.488
1984	366	431.78	440.18	435.60	8.40	1.681
1985	365	431.98	443.18	434.93	11.20	1.660
1986	365	432.18	444.58	435.82	12.40	2.696
1987	365	432.48	434.58	433.96	2.10	0.423
1988	366	432.48	436.38	434.09	3.90	0.513
1989	361	431.80	434.40	433.92	2.60	0.529
1990	357	431.79	442.25	434.50	10.46	1.571
1991	342	420.48	439.80	434.78	19.32	2.347
1992	366	433.28	438.68	434.68	5.40	1.053
1993	279	433.44	450.90	440.49	17.46	4.925

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ft = feet

**Table 6.** Yearly statistics for water surface elevations at Mozier Landing (river mile 260.3)

Year	Number of values	Water surface elevation (ft)				Standard deviation
		Minimum	Maximum	Mean	Range	
1939	162	433.20	435.70	433.987	2.50	0.369
1940	366	430.80	435.80	433.990	5.00	1.165
1941	353	432.90	440.80	435.613	7.90	1.820
1942	365	432.90	443.40	435.645	10.50	1.951
1943	365	433.00	444.82	436.439	11.82	2.674
1944	366	429.20	446.40	436.440	17.20	3.518
1945	364	431.90	448.10	436.421	16.20	3.439
1946	365	431.90	444.70	436.008	12.80	2.631
1947	365	433.50	448.50	436.822	15.00	3.858
1948	366	429.90	446.50	435.105	16.60	2.624
1949	365	429.30	440.70	434.899	11.40	1.527
1950	364	428.20	443.50	434.952	15.30	3.043
1951	365	433.80	446.60	437.323	12.80	3.396
1952	366	433.90	446.10	436.410	12.20	2.915
1953	365	433.00	442.20	435.301	9.20	1.411
1954	365	428.40	441.40	434.890	13.00	2.296
1955	365	432.60	440.50	434.734	7.90	1.124
1956	342	433.40	437.60	434.485	4.20	0.721
1957	365	432.80	436.30	434.492	3.50	0.612
1958	365	432.90	438.60	434.552	5.70	0.756
1959	365	430.50	441.60	435.196	11.10	1.625
1960	366	431.30	447.20	436.678	15.90	3.488
1961	365	432.80	443.70	435.639	10.90	2.140
1962	334	434.00	445.40	436.334	11.40	2.681
1963	364	433.70	438.70	434.683	5.00	0.950
1964	347	433.40	439.60	434.444	6.20	0.665
1965	365	431.20	448.30	437.236	17.10	4.040
1966	365	433.40	441.80	435.755	8.40	1.975
1967	365	433.50	444.60	435.750	11.10	2.419
1968	366	434.00	438.80	435.224	4.80	0.909
1969	365	432.80	447.90	437.260	15.10	3.543
1970	365	433.70	445.80	435.912	12.10	2.087
1971	365	434.00	443.00	435.967	9.00	2.156
1972	366	434.20	442.70	436.808	8.50	1.982
1973	365	432.90	451.40	439.381	18.50	4.486
1974	365	434.23	447.67	437.609	13.44	3.539
1975	365	433.99	445.93	436.513	11.94	2.979
1976	366	433.80	446.70	435.446	12.90	2.284
1977	365	433.80	442.10	434.922	8.30	1.028
1978	365	434.10	443.30	436.395	9.20	2.259
1979	365	434.30	448.89	437.609	14.59	3.702
1980	366	433.88	440.61	435.667	6.73	1.460
1981	365	433.92	443.07	435.918	9.15	1.756
1982	365	434.12	447.00	438.436	12.88	3.214
1983	344	434.34	449.27	438.350	14.93	3.498
1984	366	434.06	444.66	438.514	10.60	2.967
1985	356	433.51	447.71	437.549	14.20	2.649
1986	365	434.81	449.09	439.301	14.28	3.510

**Table 6.** Continued

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<b>Year</b>	<b>Number of values</b>	<b>Water surface elevation (ft)</b>				<b>Standard deviation</b>
		<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Range</b>	
1987	365	433.99	439.93	435.272	5.94	0.699
1988	366	433.30	438.41	434.805	5.11	0.998
1989	362	433.79	437.76	434.587	3.97	0.700
1990	363	431.46	446.74	436.400	15.28	2.854
1991	365	434.20	444.37	437.666	10.17	3.083
1992	357	434.41	444.12	437.146	9.71	2.382
1993	365	434.83	454.30	442.238	19.47	5.597

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ft = feet

**Table 7.** Yearly statistics for water surface elevations at Rip Rap Landing (river mile 265.0)

Year	Number of values	Water surface elevation (ft)				Standard deviation
		Minimum	Maximum	Mean	Range	
1930	148	428.03	430.83	429.850	2.8	0.539
1931	365	428.13	440.33	431.926	12.2	2.736
1932	366	426.43	439.43	433.816	13.0	3.253
1933	365	426.33	443.73	432.345	17.4	4.232
1934	365	426.53	438.33	430.341	11.8	2.410
1935	365	429.13	444.33	434.956	15.2	3.557
1936	366	426.13	443.53	433.036	17.4	4.231
1937	365	427.33	444.93	433.121	17.6	4.111
1938	365	427.53	444.93	435.778	17.4	3.709
1939	365	429.53	445.43	435.140	15.9	2.817
1940	366	430.93	437.23	434.546	6.3	1.272
1941	365	433.43	442.63	436.757	9.2	2.310
1942	365	434.23	445.23	436.898	11.0	2.307
1943	365	434.23	446.63	437.623	12.4	3.130
1944	366	430.83	448.53	437.489	17.7	4.010
1945	365	433.43	447.23	437.564	13.8	3.801
1946	365	432.93	446.53	437.101	13.6	3.032
1947	365	433.73	450.63	437.780	16.9	4.406
1948	366	430.83	448.53	435.813	17.7	3.054
1949	365	430.63	442.53	435.594	11.9	1.954
1950	365	429.03	445.43	435.947	16.4	3.375
1951	365	434.03	448.63	438.628	14.6	3.828
1952	366	434.03	448.13	437.498	14.1	3.422
1953	365	433.33	444.23	436.315	10.9	1.997
1954	365	429.73	443.43	435.909	13.7	2.568
1955	365	433.33	442.43	435.487	9.1	1.560
1956	366	433.53	439.43	434.963	5.9	1.154
1957	365	433.23	438.33	435.203	5.1	1.054
1958	365	433.63	440.23	435.045	6.6	1.183
1959	365	433.73	443.73	436.209	10.0	2.104
1960	366	433.13	449.43	437.760	16.3	4.093
1961	365	433.33	445.73	436.723	12.4	2.708
1962	365	434.13	447.73	437.644	13.6	3.380
1963	365	433.93	440.73	435.299	6.8	1.509
1964	366	433.53	441.63	434.910	8.1	1.146
1965	365	432.03	450.43	438.634	18.4	4.516
1966	365	434.13	443.73	436.712	9.6	2.650
1967	365	434.03	446.73	436.530	12.7	3.060
1968	366	434.23	441.23	436.185	7.0	1.504
1969	365	434.33	450.63	438.573	16.3	4.160
1970	365	434.43	448.03	437.080	13.6	2.509
1971	365	434.33	444.93	437.139	10.6	2.644
1972	366	430.63	444.73	438.234	14.1	2.432
1973	365	435.23	453.53	440.982	18.3	4.757
1974	365	434.43	449.73	438.847	15.3	4.015
1975	365	434.23	448.13	437.678	13.9	3.516
1976	366	433.83	448.93	436.217	15.1	2.915
1977	305	433.93	440.53	435.370	6.6	1.000

**Table 7.** Continued

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<b>Year</b>	<b>Number of values</b>	<b>Water surface elevation (ft)</b>				<b>Standard deviation</b>
		<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Range</b>	
1978	160	434.33	445.43	437.116	11.1	2.754
1979	293	434.03	444.03	437.241	10.0	1.914
1980	366	434.43	442.83	436.744	8.4	1.820
1981	309	434.73	442.83	436.621	8.1	1.589
1982	239	435.13	443.43	438.245	8.3	2.292
1983	256	434.83	442.53	437.931	7.7	2.044
1984	168	435.03	443.03	437.282	8.0	2.045
1985	160	434.63	442.33	437.069	7.7	1.958
1986	151	435.63	442.73	438.265	7.1	1.572
1987	364	434.33	439.33	436.138	5.0	0.972
1988	331	434.33	438.73	435.314	4.4	1.060
1989	360	434.23	439.53	435.310	5.3	0.963
1990	294	434.43	443.43	436.509	9.0	2.134
1991	250	434.43	442.63	437.100	8.2	1.730
1992	306	434.83	444.82	437.601	9.9	2.018
1993	365	435.42	454.93	443.031	19.5	5.460

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ft = feet

**Table 8.** Yearly statistics for water surface elevations at the tailwater of Lock and Dam 24 (river mile 273.2)

Year	Number of values	Water surface elevation (ft)				Standard deviation
		Minimum	Maximum	Mean	Range	
1939	136	434.10	441.25	435.282	7.15	0.960
1940	366	433.00	441.60	436.643	8.60	1.864
1941	365	434.67	446.66	439.725	11.99	3.299
1942	365	435.70	449.17	440.161	13.47	2.918
1943	365	435.50	450.48	440.535	14.98	3.915
1944	366	432.38	452.45	440.075	20.07	4.886
1945	365	434.52	451.29	440.319	16.77	4.552
1946	365	435.04	450.61	439.761	15.57	3.756
1947	365	434.39	454.53	440.048	20.14	5.408
1948	366	433.47	452.46	437.584	18.99	4.062
1949	365	433.61	446.45	437.430	12.84	2.929
1950	365	431.80	449.37	438.394	17.57	4.155
1951	365	434.67	452.53	441.632	17.86	4.515
1952	366	434.66	451.97	440.092	17.31	4.288
1953	365	434.53	448.12	438.627	13.59	3.071
1954	365	432.48	447.16	438.202	14.68	3.242
1955	365	434.58	446.15	437.272	11.57	2.468
1956	366	433.72	442.94	436.294	9.22	1.992
1957	365	434.08	441.71	436.893	7.63	1.867
1958	365	434.02	443.71	436.384	9.69	1.966
1959	365	434.36	447.28	438.276	12.92	2.947
1960	366	434.79	453.16	439.945	18.37	4.981
1961	365	434.33	449.52	438.736	15.19	3.430
1962	365	435.08	451.47	440.017	16.39	4.116
1963	365	434.30	444.16	436.844	9.86	2.391
1964	366	434.01	445.13	436.112	11.12	1.976
1965	365	432.56	454.16	441.279	21.60	5.220
1966	365	434.31	447.24	438.728	12.93	3.637
1967	365	434.45	450.35	438.269	15.90	4.010
1968	366	434.70	444.52	438.237	9.82	2.302
1969	365	434.97	454.53	440.939	19.56	5.000
1970	365	434.66	451.85	439.236	17.19	3.273
1971	365	434.55	448.41	439.125	13.86	3.555
1972	366	435.29	448.24	440.754	12.95	3.068
1973	365	436.29	458.18	443.924	21.89	5.465
1974	365	434.85	453.51	441.111	18.66	4.942
1975	365	434.65	451.83	439.656	17.18	4.484
1976	366	433.97	452.72	437.572	18.75	3.985
1977	365	434.16	447.69	436.926	13.53	2.169
1978	365	435.23	449.08	440.463	13.85	3.642
1979	365	435.37	454.44	441.563	19.07	4.809
1980	366	434.55	446.34	438.704	11.79	2.678
1981	365	434.90	448.65	439.236	13.75	2.969
1982	365	436.00	452.29	442.797	16.29	4.012
1983	365	435.47	455.14	442.478	19.67	4.310
1984	366	434.55	450.18	442.540	15.63	4.216

**Table 8.** Continued

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<b>Year</b>	<b>Number of values</b>	<b>Water surface elevation (ft)</b>				<b>Standard deviation</b>
		<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Range</b>	
1985	364	435.37	453.21	441.247	17.84	3.783
1986	365	436.21	454.91	443.562	18.70	4.381
1987	365	434.32	442.57	437.725	8.25	1.647
1988	366	433.34	441.75	436.230	8.41	2.143
1989	364	433.78	442.41	435.895	8.63	1.839
1990	365	434.19	452.35	439.308	18.16	4.318
1991	364	434.49	449.49	441.152	15.00	4.342
1992	366	434.46	448.59	440.363	14.13	3.302
1993	365	435.48	459.50	446.491	24.02	6.786

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ft = feet



**Table 9.** Percentage of time water levels are above specific elevations at the Corps of Engineers gage at river mile 241.5 (Dam 25 pool gage) on a monthly basis from 1952 through 1993 (15,333 observations). Data may be missing for some days.

<b>Elev.</b>	<b>Jan.</b>	<b>Feb.</b>	<b>Mar.</b>	<b>Apr.</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>Aug.</b>	<b>Sep.</b>	<b>Oct.</b>	<b>Nov.</b>	<b>Dec.</b>	<b>Year</b>
447	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0
446	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.3	0.0	0.0	0.0	0.0	0.1
445	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.5	0.0	0.0	0.0	0.0	0.2
444	0.0	0.0	0.0	0.1	0.0	0.0	1.8	0.5	0.0	0.0	0.0	0.0	0.2
443	0.0	0.0	0.0	0.5	0.0	0.0	2.0	0.8	0.0	0.0	0.0	0.0	0.3
442	0.0	0.0	0.0	0.6	0.2	0.0	2.2	1.1	0.0	0.0	0.0	0.0	0.3
441	0.0	0.0	0.2	1.9	0.6	0.0	2.3	1.8	0.0	0.2	0.0	0.0	0.6
440	0.0	0.0	0.3	3.2	2.4	0.1	2.6	2.0	0.0	0.5	0.0	0.1	0.9
439	0.1	0.0	0.5	4.8	3.8	0.5	2.8	2.4	0.0	0.8	0.2	0.3	1.4
438	0.1	0.0	1.0	7.7	5.4	1.0	3.0	2.4	0.9	0.9	0.2	0.5	1.9
437	0.1	0.0	2.2	10.1	7.8	1.7	3.2	2.4	1.7	1.3	0.2	0.6	2.6
436	0.1	0.3	3.8	13.7	10.8	3.5	3.7	2.4	2.7	1.9	0.3	0.7	3.7
435	0.1	0.4	5.3	17.3	15.4	5.2	4.8	2.4	3.1	2.6	0.6	1.0	4.9
434	3.1	3.5	7.5	22.4	20.2	9.4	6.9	3.3	4.8	4.1	2.8	3.8	7.7
433	74.9	69.8	46.9	44.8	47.5	44.4	51.1	70.2	83.3	81.3	81.0	85.5	65.1
432	86.4	79.6	58.4	56.6	58.6	53.9	60.9	79.0	87.8	85.7	86.9	92.6	73.9
431	90.3	85.7	67.9	67.9	68.0	64.8	67.7	84.4	90.9	89.6	91.4	94.9	80.3
430	94.2	89.3	77.6	79.1	76.3	74.5	76.5	89.1	93.4	92.5	94.6	97.4	86.2
429	98.8	98.7	100.0	100.0	100.0	99.9	100.0	100.0	100.0	99.9	100.0	100.0	99.8
428	98.9	98.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0	99.8
427	99.2	99.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0	99.9
426	99.4	99.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9
425	99.5	99.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9
424	99.6	99.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9
423	99.7	99.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9
422	99.8	99.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9
421	99.8	99.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9
420	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 10.** Percentage of time water levels are above specific elevations at the Corps of Engineers gage at river mile 250.8 (Sterling Landing gage) on a monthly basis from 1952 through 1993 (15,212 observations). Data may be missing for some days.

Elev.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year
450	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.2	0.0	0.0	0.0	0.0	0.1
449	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.4	0.0	0.0	0.0	0.0	0.1
448	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.5	0.0	0.0	0.0	0.0	0.2
447	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.5	0.0	0.0	0.0	0.0	0.2
446	0.0	0.0	0.0	0.3	0.0	0.0	2.1	0.9	0.0	0.0	0.0	0.0	0.3
445	0.0	0.0	0.0	0.7	0.0	0.0	2.3	1.4	0.0	0.0	0.0	0.0	0.4
444	0.0	0.0	0.2	2.1	0.2	0.0	2.3	2.0	0.0	0.3	0.0	0.0	0.6
443	0.0	0.0	0.4	3.3	2.2	0.3	2.7	2.2	0.0	0.5	0.0	0.0	1.0
442	0.0	0.0	0.6	4.8	3.5	0.7	2.8	2.4	0.6	0.8	0.0	0.3	1.4
441	0.0	0.0	1.0	8.0	5.9	1.1	3.0	2.4	1.4	1.1	0.0	0.4	2.1
440	0.0	0.1	2.6	11.5	9.2	2.7	3.4	2.4	2.0	1.6	0.0	0.6	3.0
439	0.0	0.3	4.1	16.1	13.4	4.4	4.8	2.4	3.0	2.4	0.1	0.6	4.3
438	0.0	0.4	6.6	21.4	18.7	7.5	6.2	2.4	3.5	2.8	0.6	0.8	6.0
437	0.6	0.8	9.8	27.8	24.7	11.6	7.8	2.4	4.0	2.9	1.9	1.7	8.1
436	2.5	1.6	13.7	36.4	32.2	14.8	10.2	2.4	4.2	3.2	2.9	2.9	10.7
435	7.2	5.7	19.2	46.6	36.5	20.2	12.5	3.1	4.9	4.2	4.5	5.4	14.2
434	46.8	45.6	40.7	60.4	54.0	41.3	36.2	28.5	44.4	46.6	54.6	52.0	45.8
433	89.4	84.1	78.4	80.9	76.0	73.0	77.5	84.4	91.2	92.5	95.7	96.9	84.9
432	96.5	91.4	93.5	96.3	92.3	92.8	91.8	94.6	97.4	97.3	98.8	99.1	95.2
431	98.4	96.7	99.8	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	99.6
430	98.6	98.4	99.9	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	99.7
429	98.8	98.7	99.9	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	99.8
428	99.1	99.0	99.9	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	99.8
427	99.4	99.3	99.9	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	99.9
426	99.5	99.4	99.9	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	99.9
425	99.6	99.5	99.9	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	99.9
424	99.8	99.6	99.9	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	99.9
423	100.0	99.8	99.9	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	100.0
422	100.0	100.0	99.9	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	100.0
421	100.0	100.0	99.9	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	100.0
420	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 11.** Percentage of time water levels are above specific elevations at the Corps of Engineers gage at river mile 260.3 (Mozier Landing gage) on a monthly basis from 1952 through 1993 (15,222 observations). Data may be missing for some days.

<b>Elev.</b>	<b>Jan.</b>	<b>Feb.</b>	<b>Mar.</b>	<b>Apr.</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>Aug.</b>	<b>Sep.</b>	<b>Oct.</b>	<b>Nov.</b>	<b>Dec.</b>	<b>Year</b>
454	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
453	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0
452	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.2	0.0	0.0	0.0	0.0	0.1
451	0.0	0.0	0.0	0.2	0.0	0.0	2.0	0.3	0.0	0.0	0.0	0.0	0.2
450	0.0	0.0	0.0	0.3	0.0	0.0	2.3	0.5	0.0	0.0	0.0	0.0	0.3
449	0.0	0.0	0.0	1.0	0.0	0.0	2.3	0.6	0.0	0.0	0.0	0.0	0.3
448	0.0	0.0	0.4	2.5	1.3	0.1	2.4	0.7	0.0	0.3	0.0	0.0	0.6
447	0.0	0.0	0.5	4.2	2.9	0.5	2.6	2.2	0.1	0.5	0.0	0.0	1.1
446	0.0	0.0	0.7	6.8	4.6	1.0	2.9	2.4	0.8	0.8	0.0	0.3	1.7
445	0.0	0.0	2.2	9.8	7.4	1.9	3.2	2.4	1.3	1.5	0.0	0.5	2.5
444	0.0	0.3	4.1	14.1	11.5	3.9	3.8	2.4	1.8	2.0	0.0	0.6	3.7
443	0.0	0.3	6.6	19.1	17.1	6.4	5.0	2.4	2.9	2.4	0.2	0.6	5.3
442	0.3	0.7	9.6	24.2	22.7	10.8	6.8	2.4	3.6	2.6	1.4	1.0	7.2
441	0.6	1.6	15.3	33.5	28.8	13.7	8.8	2.4	4.1	3.2	2.5	1.3	9.7
440	1.1	3.1	19.5	42.9	35.7	18.4	10.7	3.1	4.8	3.8	3.6	1.5	12.4
439	3.3	4.0	25.5	49.3	40.4	22.9	12.6	3.9	5.4	5.2	5.5	3.8	15.2
438	6.3	6.1	31.0	54.2	45.3	27.3	18.5	5.7	7.1	9.1	8.4	6.3	18.8
437	12.4	10.3	38.1	62.8	50.9	36.1	25.2	8.8	10.5	12.5	13.9	9.7	24.3
436	21.9	18.9	48.4	71.7	58.4	45.9	33.5	14.1	14.9	20.2	24.8	18.0	32.6
435	43.2	49.6	68.1	84.9	76.0	69.8	52.8	34.7	32.9	34.1	46.7	40.4	52.7
434	87.0	87.0	97.5	99.9	98.9	98.6	96.9	95.2	93.9	92.9	95.5	93.5	94.8
433	97.8	95.4	99.8	100.0	100.0	100.0	99.6	99.9	100.0	99.9	99.9	99.8	99.4
432	98.7	98.5	100.0	100.0	100.0	100.0	99.8	100.0	100.0	100.0	100.0	99.8	99.7
431	99.1	98.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.8
430	99.3	98.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8
429	99.6	99.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9
428	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 12.** Percentage of time water levels are above specific elevations at the Corps of Engineers gage at river mile 265.0 (Rip Rap Landing gage) on a monthly basis from 1952 through 1993 (13,809 observations). Data may be missing for some days.

<b>Elev.</b>	<b>Jan.</b>	<b>Feb.</b>	<b>Mar.</b>	<b>Apr.</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>Aug.</b>	<b>Sep.</b>	<b>Oct.</b>	<b>Nov.</b>	<b>Dec.</b>	<b>Year</b>
454	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
453	0.0	0.0	0.0	0.2	0.0	0.0	1.3	0.2	0.0	0.0	0.0	0.0	0.1
452	0.0	0.0	0.0	0.4	0.0	0.0	2.1	0.3	0.0	0.0	0.0	0.0	0.2
451	0.0	0.0	0.0	0.9	0.0	0.0	2.4	0.4	0.0	0.0	0.0	0.0	0.3
450	0.0	0.0	0.4	1.4	0.7	0.0	2.7	0.5	0.0	0.0	0.0	0.0	0.5
449	0.0	0.0	0.5	3.2	2.2	0.2	3.0	0.6	0.0	0.0	0.0	0.0	0.8
448	0.0	0.0	0.5	5.7	4.7	0.7	3.1	1.2	0.0	0.0	0.0	0.0	1.2
447	0.0	0.0	1.2	8.3	7.8	1.1	3.4	2.4	0.9	0.0	0.0	0.0	2.0
446	0.0	0.0	2.3	11.2	10.1	1.8	3.7	2.4	1.5	0.0	0.0	0.0	2.6
445	0.0	0.0	2.9	14.3	14.3	4.7	4.3	2.4	2.2	0.0	0.0	0.0	3.5
444	0.3	0.2	4.6	18.3	17.7	6.6	5.6	2.4	2.9	0.0	0.1	0.0	4.5
443	0.6	0.5	6.7	24.5	20.9	8.4	6.5	2.4	3.7	0.6	0.4	0.0	5.8
442	0.8	2.1	11.0	34.5	24.8	13.1	7.8	3.0	4.2	1.5	1.1	0.1	8.0
441	2.4	2.7	16.0	40.5	29.3	18.5	10.7	3.7	4.6	3.2	3.0	0.8	10.6
440	3.9	4.3	20.7	45.0	34.0	22.3	16.7	4.8	5.9	6.1	4.6	2.5	13.4
439	5.5	6.2	28.5	53.1	38.6	31.0	22.0	8.0	8.8	9.1	8.4	4.3	17.7
438	9.6	10.9	37.6	62.4	46.3	39.1	29.7	11.9	12.1	14.4	12.9	7.6	23.5
437	16.9	17.2	47.6	70.5	57.8	48.7	40.3	19.0	17.2	22.1	24.7	15.2	32.0
436	32.0	37.5	60.6	81.4	73.4	66.5	55.3	34.6	30.1	31.4	37.4	30.4	46.4
435	59.3	64.0	81.5	97.2	93.7	86.1	74.6	59.3	60.9	57.2	61.7	54.8	69.9
434	94.2	92.0	99.1	100.0	99.8	99.7	99.8	99.1	98.0	97.2	99.0	97.6	97.9
433	98.8	98.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	100.0	99.7
432	99.4	98.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	100.0	99.8
431	99.7	98.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	100.0	99.9
430	100.0	99.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
429	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 13.** Percentage of time water levels are above specific elevations at the Corps of Engineers gage at river mile 273.2 (Dam 24 tailwater gage) on a monthly basis from 1952 through 1993 (15,338 observations). Data may be missing for some days.

<b>Elev.</b>	<b>Jan.</b>	<b>Feb.</b>	<b>Mar.</b>	<b>Apr.</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>Aug.</b>	<b>Sep.</b>	<b>Oct.</b>	<b>Nov.</b>	<b>Dec.</b>	<b>Year</b>
459	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
458	0.0	0.0	0.0	0.1	0.0	0.0	1.5	0.1	0.0	0.0	0.0	0.0	0.1
457	0.0	0.0	0.0	0.2	0.0	0.0	1.9	0.2	0.0	0.0	0.0	0.0	0.2
456	0.0	0.0	0.0	0.3	0.0	0.0	2.2	0.4	0.0	0.0	0.0	0.0	0.2
455	0.0	0.0	0.0	0.7	0.0	0.0	2.3	0.5	0.0	0.0	0.0	0.0	0.3
454	0.0	0.0	0.2	1.4	0.4	0.0	2.5	0.6	0.0	0.3	0.0	0.0	0.5
453	0.0	0.0	0.5	3.2	2.4	0.3	2.7	0.7	0.0	0.5	0.0	0.0	0.9
452	0.0	0.0	0.7	5.5	4.1	0.7	2.8	2.4	0.2	0.6	0.0	0.2	1.4
451	0.0	0.0	1.3	8.4	6.0	1.4	3.1	2.4	1.0	1.1	0.0	0.4	2.1
450	0.0	0.0	2.8	11.7	8.9	2.4	3.4	2.4	1.7	1.5	0.0	0.5	2.9
449	0.0	0.3	4.6	16.7	13.5	4.8	4.3	2.4	2.3	2.2	0.0	0.5	4.3
448	0.1	0.6	6.8	21.7	18.6	7.9	6.1	2.4	3.4	2.5	0.3	0.7	5.9
447	0.5	0.9	9.8	28.7	24.0	11.7	8.1	2.4	3.9	2.8	1.8	0.9	8.0
446	0.7	1.8	13.8	38.6	31.3	15.4	10.5	2.4	4.4	3.3	2.8	1.2	10.5
445	1.1	3.2	18.4	47.1	36.9	20.0	12.7	3.1	4.6	3.8	3.7	1.5	13.0
444	2.4	4.0	24.2	50.6	40.7	25.2	16.2	3.8	5.5	5.8	5.8	3.1	15.6
443	3.4	5.8	29.7	55.6	45.3	29.8	22.1	4.7	6.6	8.5	8.2	4.2	18.7
442	5.6	7.0	36.0	63.2	51.0	37.5	27.0	7.5	9.0	10.4	11.4	6.3	22.7
441	7.8	9.6	43.8	70.3	57.7	45.4	35.9	13.1	11.4	14.9	15.4	10.0	28.0
440	14.2	13.3	50.4	76.1	65.8	53.2	44.8	18.4	16.3	21.0	21.5	12.8	34.1
439	22.2	23.3	58.6	81.7	74.7	64.8	52.0	28.0	21.0	27.8	29.8	20.3	42.1
438	33.3	40.2	68.0	87.9	81.8	74.3	60.6	37.7	32.5	33.5	41.1	32.6	52.0
437	49.8	57.6	78.3	95.0	90.9	83.0	70.4	50.7	47.0	43.9	51.7	43.6	63.5
436	64.1	69.8	87.9	98.7	95.5	89.0	80.3	65.7	63.9	57.0	66.0	60.6	74.9
435	87.2	88.4	97.6	99.8	98.4	96.0	91.2	85.6	82.8	77.5	86.7	85.5	89.7
434	99.4	98.2	100.0	100.0	100.0	100.0	99.7	99.4	99.1	99.3	99.8	99.2	99.5
433	99.9	99.2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9
432	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 14.** Percentage of time water levels are above specific elevations at the Corps of Engineers gage at river mile 241.5 (Dam 25 pool gage) on a weekly basis from 1952 through 1993 (15,333 observations). Data may be missing for some days.

Elev.	Week of the year												
	1	2	3	4	5	6	7	8	9	10	11	12	13
447	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
446	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
445	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
443	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
442	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
441	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
440	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
439	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	1.7
438	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	3.1
437	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.0	0.7	6.1
436	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0	3.7	8.2
435	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3	2.4	3.1	2.7	6.1	10.5
434	4.0	4.8	3.4	1.7	1.7	3.1	3.4	3.7	5.4	4.4	4.8	8.8	12.6
433	77.8	75.5	72.4	72.8	75.2	72.4	73.5	66.3	61.6	52.7	44.6	41.2	45.2
432	85.7	88.1	90.5	82.3	83.0	79.9	82.3	79.3	72.8	69.0	56.5	49.7	54.1
431	90.5	92.5	93.9	86.7	86.1	88.4	85.0	86.4	80.6	73.8	67.0	61.9	65.0
430	94.0	95.2	98.0	90.5	90.8	91.5	88.4	90.1	86.1	79.9	78.9	72.1	77.2
429	100.0	100.0	99.7	96.3	97.6	97.6	98.0	100.0	100.0	100.0	100.0	100.0	100.0
428	100.0	100.0	100.0	96.6	97.6	97.6	99.0	100.0	100.0	100.0	100.0	100.0	100.0
427	100.0	100.0	100.0	98.0	97.6	98.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0
426	100.0	100.0	100.0	98.6	97.6	98.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
425	100.0	100.0	100.0	99.0	97.6	98.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
424	100.0	100.0	100.0	99.7	97.6	99.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
423	100.0	100.0	100.0	100.0	97.6	99.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0
422	100.0	100.0	100.0	100.0	98.0	99.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0
421	100.0	100.0	100.0	100.0	98.0	99.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0
420	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 14. Continued**

Elev.	Week of the year												
	14	15	16	17	18	19	20	21	22	23	24	25	26
447	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
446	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
445	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
443	0.0	0.0	0.0	1.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
442	0.3	0.0	0.0	1.7	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
441	2.0	1.0	0.3	3.4	3.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
440	3.1	2.0	2.7	4.4	6.5	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.3
439	4.4	4.4	4.8	4.8	7.5	6.5	3.7	1.4	0.3	0.3	0.0	0.0	1.4
438	7.5	7.8	6.8	7.2	10.6	7.1	4.8	5.1	1.0	0.7	0.0	0.0	2.7
437	7.8	13.6	8.8	8.5	13.7	10.2	6.8	6.8	3.1	1.0	0.0	0.3	4.8
436	9.6	15.6	12.9	14.3	17.8	13.6	9.2	8.8	6.8	2.4	1.4	2.4	6.5
435	11.9	17.0	18.0	21.2	18.8	18.4	15.3	12.6	11.9	4.4	4.1	3.1	7.5
434	14.7	20.7	22.8	30.4	24.0	24.1	22.1	16.0	14.3	9.5	9.5	7.1	9.9
433	41.3	36.7	45.9	54.6	43.2	50.7	48.6	45.6	49.3	46.6	43.5	43.2	42.2
432	53.2	51.4	58.8	61.4	58.6	60.2	58.5	57.1	58.5	58.2	52.0	52.7	51.4
431	63.5	65.0	67.7	72.0	71.2	71.1	68.7	65.6	64.6	70.4	63.3	61.6	64.3
430	78.8	78.9	76.2	80.9	77.7	74.5	82.0	75.9	73.5	81.0	74.5	69.0	72.4
429	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	100.0
428	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
427	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
426	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
425	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
424	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
423	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
422	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
421	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
420	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 14. Continued**

Elev.	Week of the year												
	27	28	29	30	31	32	33	34	35	36	37	38	39
447	0.0	0.0	0.0	0.7	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
446	0.0	0.0	1.7	2.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
445	0.0	0.3	2.4	2.4	2.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	0.0	2.0	2.4	2.4	2.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
443	0.7	2.4	2.4	2.4	2.4	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
442	1.7	2.4	2.4	2.4	2.4	2.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0
441	2.0	2.4	2.4	2.4	2.4	2.4	2.4	1.7	0.3	0.0	0.0	0.0	0.0
440	2.4	3.4	2.4	2.4	2.4	2.4	2.4	2.4	0.3	0.0	0.0	0.0	0.0
439	2.4	4.1	2.7	2.4	2.4	2.4	2.4	2.4	2.1	0.0	0.0	0.0	0.0
438	2.4	4.4	3.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	1.0	0.0	0.0
437	3.1	4.8	3.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	0.7	1.7
436	5.1	4.8	3.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	1.7	4.4
435	8.5	5.1	3.7	3.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	5.4
434	11.2	7.1	5.8	4.8	3.4	3.4	3.1	4.1	3.1	2.7	4.1	3.7	9.2
433	53.4	51.0	45.6	52.7	58.2	61.2	65.0	78.6	81.7	82.3	85.0	81.3	86.1
432	62.2	58.5	55.4	65.0	66.3	71.8	82.7	84.0	84.8	87.1	88.4	87.8	89.1
431	65.3	68.0	63.3	72.4	72.8	80.3	88.4	86.4	89.0	88.1	90.1	91.5	93.9
430	76.5	73.1	73.8	82.3	79.9	85.7	92.2	89.8	93.1	90.8	93.2	93.9	95.2
429	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
428	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
427	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
426	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
425	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
424	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
423	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
422	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
421	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
420	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0



**Table 14. Continued**

Elev.	Week of the year												
	40	41	42	43	44	45	46	47	48	49	50	51	52
447	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
446	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
445	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
443	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
442	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
441	0.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
440	0.7	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
439	1.0	2.4	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.4	0.0	0.0	0.0
438	1.0	2.4	0.7	0.0	0.0	0.0	1.0	0.0	0.0	1.7	0.7	0.0	0.0
437	1.4	2.4	1.7	0.0	0.3	0.0	1.0	0.0	0.0	1.7	1.0	0.0	0.0
436	2.7	2.4	2.4	0.3	1.4	0.0	1.0	0.0	0.0	1.7	1.4	0.0	0.0
435	3.4	2.4	2.4	2.4	2.4	0.0	1.0	0.7	0.0	1.7	1.7	0.0	0.8
434	5.1	4.1	4.1	3.7	3.7	1.7	4.1	3.1	1.7	4.4	3.7	3.1	4.1
433	82.7	78.6	80.3	83.0	82.3	76.2	79.6	85.0	83.7	84.0	88.4	85.4	84.6
432	85.7	82.0	84.4	88.4	88.4	81.3	88.1	89.5	88.8	89.5	95.6	93.2	92.8
431	90.1	86.7	88.1	91.2	93.2	89.1	91.5	92.9	91.5	93.5	97.3	94.9	94.6
430	93.5	89.8	90.8	94.6	95.6	92.5	93.5	96.9	94.9	98.0	99.3	95.6	97.2
429	100.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
428	100.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
427	100.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
426	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
425	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
424	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
423	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
422	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
421	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
420	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 15.** Percentage of time water levels are above specific elevations at the Corps of Engineers gage at river mile 250.8 (Sterling Landing pool gage) on a weekly basis from 1952 through 1993 (15,212 observations). Data may be missing for some days.

Elev.	Week of the year												
	1	2	3	4	5	6	7	8	9	10	11	12	13
450	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
448	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
447	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
446	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
445	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
443	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	1.4
442	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.7
441	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	3.1
440	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.7	1.4	1.7	6.5
439	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.7	2.0	4.1	8.5
438	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.7	3.4	4.1	8.2	12.2
437	0.8	0.0	1.4	0.0	1.0	0.0	0.0	0.7	4.1	4.8	6.8	11.9	18.0
436	5.2	2.4	3.1	0.3	1.7	1.7	0.0	0.7	6.1	8.2	10.5	17.0	22.1
435	9.1	5.5	9.5	4.8	7.1	5.5	2.7	6.1	8.8	12.2	13.6	25.9	29.9
434	45.6	43.7	45.9	46.4	53.4	45.7	47.1	44.6	40.1	30.3	36.4	43.2	54.1
433	92.1	92.8	88.8	86.7	85.0	80.5	83.3	88.4	81.0	77.9	73.1	78.9	84.4
432	97.6	98.6	97.3	94.5	92.2	89.4	90.1	94.2	92.2	91.2	92.5	92.9	98.3
431	100.0	100.0	98.3	95.9	97.3	95.6	96.2	97.6	98.6	99.3	100.0	100.0	100.0
430	100.0	100.0	99.0	96.2	97.6	97.6	98.0	99.3	99.7	99.7	100.0	100.0	100.0
429	100.0	100.0	99.7	96.6	97.6	97.6	98.3	100.0	100.0	99.7	100.0	100.0	100.0
428	100.0	100.0	99.7	97.6	97.6	97.6	99.3	100.0	100.0	99.7	100.0	100.0	100.0
427	100.0	100.0	99.7	99.0	97.6	98.3	100.0	100.0	100.0	99.7	100.0	100.0	100.0
426	100.0	100.0	99.7	99.7	97.6	98.6	100.0	100.0	100.0	99.7	100.0	100.0	100.0
425	100.0	100.0	99.7	100.0	97.6	99.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0
424	100.0	100.0	99.7	100.0	98.3	99.3	100.0	100.0	100.0	99.7	100.0	100.0	100.0
423	100.0	100.0	100.0	100.0	99.3	100.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0
422	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0
421	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0
420	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 15. Continued**

Elev.	Week of the year												
	14	15	16	17	18	19	20	21	22	23	24	25	26
450	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
448	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
447	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
446	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
445	0.7	0.0	0.0	1.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	3.1	0.7	0.3	3.7	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
443	3.4	1.7	3.1	4.4	6.8	4.8	0.0	0.0	0.3	0.0	0.0	0.0	1.0
442	4.1	4.1	5.5	4.8	7.1	6.5	2.4	1.7	0.3	0.7	0.0	0.0	2.0
441	7.5	8.8	6.8	7.8	9.5	7.8	5.4	6.1	1.4	0.7	0.0	0.3	3.1
440	8.5	13.9	9.6	11.9	16.7	11.6	7.5	8.2	4.4	1.0	1.4	1.7	5.5
439	10.9	16.3	17.4	18.4	18.4	16.3	11.9	10.5	11.2	2.7	2.8	3.1	7.2
438	13.9	19.0	22.2	28.6	24.1	22.8	18.4	14.6	13.9	7.5	6.6	5.5	8.9
437	17.0	22.4	31.4	37.8	31.0	30.3	25.5	19.7	18.4	15.6	10.0	9.2	9.9
436	26.5	32.7	39.2	43.2	42.2	36.4	33.0	27.6	23.5	19.0	12.4	14.0	11.9
435	38.8	44.9	48.8	51.0	46.3	40.1	39.1	32.7	26.9	26.9	18.3	18.8	15.4
434	55.4	59.2	64.2	61.9	58.2	52.7	59.2	51.7	52.0	48.3	40.3	38.2	33.8
433	83.0	80.3	82.6	79.3	75.9	74.8	81.3	74.5	73.8	74.5	74.8	70.3	70.6
432	98.3	95.9	97.6	95.2	92.9	95.9	92.9	90.8	87.4	90.5	95.2	92.8	93.9
431	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
430	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
429	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
428	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
427	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
426	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
425	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
424	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
423	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
422	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
421	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
420	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 15. Continued**

Elev.	Week of the year												
	27	28	29	30	31	32	33	34	35	36	37	38	39
450	0.0	0.0	0.7	1.4	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	0.0	0.0	2.4	2.0	2.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
448	0.0	0.7	2.4	2.4	2.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
447	0.0	2.4	2.4	2.4	2.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
446	1.0	2.4	2.4	2.4	2.4	2.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
445	2.0	2.4	2.4	2.4	2.4	2.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0
444	2.0	2.4	2.4	2.4	2.4	2.4	2.4	2.4	0.3	0.0	0.0	0.0	0.0
443	2.4	3.8	2.4	2.4	2.4	2.4	2.4	2.4	1.0	0.0	0.0	0.0	0.0
442	2.4	4.1	2.7	2.4	2.4	2.4	2.4	2.4	2.4	2.4	0.0	0.0	0.0
441	2.4	4.4	3.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	1.7	0.3	1.4
440	3.4	4.8	3.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	1.0	2.4
439	8.5	5.1	3.7	3.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.0	5.5
438	10.9	6.5	5.8	3.8	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	6.8
437	11.9	8.9	7.1	5.8	2.7	2.4	2.4	2.4	2.4	2.4	2.4	3.1	7.8
436	15.0	11.9	10.5	6.5	3.1	2.4	2.4	2.4	2.4	2.4	2.4	3.4	8.5
435	18.0	16.0	11.9	7.5	3.4	3.4	4.1	2.4	3.1	3.1	2.7	4.1	9.6
434	44.6	39.2	36.7	27.0	25.9	29.9	20.7	30.3	37.1	39.5	41.6	44.2	52.2
433	83.7	77.1	68.7	78.5	79.6	78.9	85.4	87.8	90.1	91.8	88.1	89.5	95.9
432	96.3	95.2	86.1	90.8	90.1	96.3	94.9	93.5	96.3	99.3	92.8	97.6	99.7
431	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
430	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
429	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
428	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
427	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
426	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
425	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
424	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
423	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
422	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
421	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
420	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 15. Continued**

Elev.	Week of the year												
	40	41	42	43	44	45	46	47	48	49	50	51	52
450	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
448	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
447	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
446	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
445	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
443	0.7	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
442	1.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0
441	1.4	2.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.3	0.0	0.0
440	1.7	2.4	2.1	0.0	1.1	0.0	0.0	0.0	0.0	1.7	0.7	0.0	0.0
439	3.1	2.4	2.4	1.4	1.8	0.0	0.0	0.0	0.0	1.7	1.0	0.0	0.0
438	4.4	2.4	2.4	2.4	2.1	0.7	0.4	0.7	0.0	1.7	1.7	0.0	0.0
437	5.1	2.4	2.4	2.4	2.5	1.4	0.7	2.8	2.1	2.1	2.1	0.7	1.9
436	5.8	2.8	2.8	2.4	2.8	3.2	1.1	4.2	2.4	2.1	2.1	3.1	4.3
435	6.5	4.5	3.1	3.5	4.6	4.6	2.1	6.6	4.2	3.8	2.4	6.3	7.8
434	48.0	44.8	46.7	46.7	48.6	48.9	50.2	62.7	58.5	52.1	53.3	50.0	52.3
433	91.2	94.1	91.3	92.7	93.3	94.6	94.7	96.5	97.6	98.3	98.3	94.8	96.5
432	96.9	97.9	99.0	95.1	98.9	98.2	99.3	98.6	99.0	100.0	99.3	98.3	98.9
431	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
430	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
429	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
428	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
427	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
426	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
425	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
424	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
423	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
422	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
421	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
420	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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**Table 16. Continued**

Elev.	Week of the year												
	14	15	16	17	18	19	20	21	22	23	24	25	26
454	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
453	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
452	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
451	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
450	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	1.7	0.0	0.0	2.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
448	3.1	1.0	0.7	4.1	5.1	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.3
447	3.4	2.8	4.8	4.8	7.1	6.1	0.0	1.4	0.3	0.3	0.0	0.0	1.4
446	5.8	7.0	6.2	7.5	7.8	7.2	4.1	4.1	0.7	0.7	0.0	0.3	2.7
445	8.2	11.1	8.2	9.5	12.9	9.2	6.5	6.8	3.4	0.7	0.3	0.7	5.1
444	9.2	13.9	15.4	15.6	18.0	14.7	9.2	8.5	8.6	1.7	2.8	3.1	6.8
443	11.6	17.4	19.5	26.5	22.1	20.5	16.3	13.3	13.1	4.8	5.9	5.1	8.5
442	16.7	20.2	25.7	32.3	26.9	26.6	25.2	18.4	16.5	11.7	10.7	9.5	9.6
441	27.6	32.4	32.9	39.8	36.1	33.8	30.6	22.1	22.0	16.9	12.8	12.6	10.6
440	37.9	41.1	41.8	48.0	44.2	38.6	39.5	31.3	26.8	23.8	15.5	18.4	14.0
439	46.1	48.4	49.3	52.0	47.3	43.3	46.9	36.4	29.6	27.6	21.4	20.7	20.1
438	50.5	56.1	54.8	56.1	51.0	49.1	51.7	39.8	34.4	30.7	27.2	23.8	25.9
437	60.8	62.7	63.0	65.3	58.8	56.0	55.1	45.6	39.9	37.6	35.2	34.7	35.5
436	72.4	70.4	72.6	73.1	65.6	64.5	59.5	54.8	47.4	44.8	46.9	48.6	43.0
435	81.9	85.7	85.6	86.1	85.7	79.2	77.6	69.7	68.7	73.4	72.8	69.0	64.8
434	100.0	100.0	99.7	100.0	99.3	99.7	99.0	99.0	97.9	99.3	98.6	99.3	97.3
433	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
432	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
431	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
430	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
429	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
428	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 16. Continued**

Elev.	Week of the year												
	27	28	29	30	31	32	33	34	35	36	37	38	39
454	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
453	0.0	0.0	0.0	0.3	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
452	0.0	0.7	2.4	2.4	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
451	0.7	2.4	2.4	2.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
450	2.0	2.4	2.4	2.4	2.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	2.0	2.4	2.4	2.4	2.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
448	2.4	2.4	2.4	2.4	2.4	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
447	2.4	3.4	2.4	2.4	2.4	2.4	1.7	2.4	1.7	0.3	0.0	0.0	0.0
446	2.4	4.4	2.7	2.4	2.4	2.4	2.4	2.4	2.4	2.4	0.7	0.0	0.0
445	3.1	4.4	3.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.0	0.0	0.7
444	5.8	4.8	3.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	1.0	1.7
443	9.2	5.4	3.7	3.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.0	5.1
442	11.3	7.8	5.8	4.8	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.7	7.2
441	14.3	9.5	8.2	5.8	2.7	2.4	2.4	2.4	2.4	2.4	2.4	3.4	8.2
440	16.7	12.6	9.5	7.1	3.1	3.4	4.1	2.4	3.1	2.7	2.7	4.1	9.6
439	20.8	13.9	10.5	8.5	3.8	5.4	4.8	2.7	3.7	4.8	2.7	4.4	9.6
438	32.1	19.0	15.6	10.9	7.2	7.8	5.1	4.4	6.1	7.5	2.7	6.1	11.3
437	38.9	28.2	18.0	19.0	17.1	11.9	6.1	6.5	7.1	9.9	4.1	10.5	17.1
436	44.4	38.4	30.6	25.2	21.8	19.7	12.9	10.2	9.5	13.9	7.5	15.3	21.2
435	63.8	59.2	55.1	37.8	44.0	41.8	34.4	29.9	26.5	30.6	26.9	35.7	38.9
434	99.0	98.6	96.9	94.9	94.5	95.9	94.2	94.2	96.3	95.9	95.2	92.9	91.8
433	100.0	100.0	100.0	99.0	99.3	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
432	100.0	100.0	100.0	99.7	99.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
431	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
430	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
429	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
428	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0



**Table 16. Continued**

Week of the year													
Elev.	40	41	42	43	44	45	46	47	48	49	50	51	52
454	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
453	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
452	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
451	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
450	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
448	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
447	1.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
446	1.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0
445	1.7	2.4	1.4	0.0	1.0	0.0	0.0	0.0	0.0	1.7	0.4	0.0	0.0
444	1.7	2.4	2.4	1.0	1.4	0.0	0.0	0.0	0.0	1.7	0.7	0.0	0.0
443	2.4	2.4	2.4	2.4	1.7	0.3	0.0	0.3	0.0	1.7	1.1	0.0	0.0
442	3.4	2.4	2.4	2.4	2.4	1.4	0.7	1.4	1.7	2.1	1.8	0.4	0.0
441	5.8	3.1	2.4	2.4	3.1	2.0	1.0	3.7	2.0	2.1	2.2	1.5	0.0
440	5.8	5.1	2.4	3.1	3.1	3.7	1.7	5.4	2.7	2.1	2.2	2.2	0.3
439	7.1	7.5	3.7	4.1	3.7	5.4	2.7	9.2	4.1	7.7	2.5	2.5	2.7
438	11.9	13.7	8.8	5.8	5.1	9.2	7.1	10.5	6.8	9.8	3.2	5.1	6.5
437	13.6	16.4	12.6	9.2	10.9	16.0	11.2	13.3	15.7	12.5	7.9	7.3	10.0
436	20.1	19.9	19.4	20.7	25.2	27.9	21.4	24.8	23.5	19.5	14.3	18.2	18.9
435	33.0	30.8	36.1	32.3	43.2	51.4	46.6	45.2	43.3	43.6	38.7	37.5	41.0
434	93.2	91.1	90.8	94.9	94.9	94.9	96.6	96.3	94.5	93.7	93.9	94.5	91.9
433	100.0	100.0	99.7	100.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	99.2
432	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2
431	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2
430	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
429	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
428	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 17.** Percentage of time water levels are above specific elevations at the Corps of Engineers gage at river mile 265.0 (Rip Rap Landing gage) on a weekly basis from 1952 through 1993 (13,809 observations). Data may be missing for some days.

Elev.	Week of the year												
	1	2	3	4	5	6	7	8	9	10	11	12	13
454	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
453	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
452	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
451	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
450	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
449	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
448	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5
447	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	4.1
446	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.5	5.8
445	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	4.2	6.2
444	0.0	0.0	0.7	0.0	0.7	0.0	0.0	0.0	1.9	1.9	2.8	5.8	9.1
443	0.0	0.0	1.5	0.0	1.5	0.7	0.0	0.0	2.3	3.8	5.6	8.7	10.4
442	0.0	0.0	1.8	0.4	2.6	2.2	0.0	2.2	4.2	5.7	7.5	14.2	20.3
441	0.9	0.7	3.0	3.7	3.7	2.6	0.0	4.1	5.7	10.2	11.9	19.2	27.8
440	4.8	0.7	4.4	5.2	5.2	3.0	1.8	7.1	5.7	12.5	19.4	25.8	32.4
439	7.8	2.9	5.2	5.9	6.0	3.7	3.2	10.0	9.5	19.2	23.8	35.4	44.0
438	11.7	10.6	9.6	8.1	7.1	10.0	8.3	13.4	14.8	27.5	33.3	46.2	53.5
437	21.2	17.9	15.5	14.4	13.5	13.7	14.4	20.4	29.7	36.2	44.4	57.1	58.9
436	36.8	34.1	28.8	28.5	35.6	37.4	34.5	36.4	45.2	56.6	56.0	67.5	68.0
435	61.5	58.6	57.9	60.0	61.0	60.7	68.3	59.5	70.3	75.1	84.9	84.2	86.7
434	97.0	94.1	90.0	95.2	94.0	85.2	92.1	95.9	98.5	100.0	96.8	99.2	100.0
433	100.0	100.0	98.5	97.8	97.4	97.4	97.5	98.5	99.6	100.0	100.0	100.0	100.0
432	100.0	100.0	100.0	98.9	97.4	97.4	97.5	100.0	99.6	100.0	100.0	100.0	100.0
431	100.0	100.0	100.0	100.0	97.8	97.4	97.8	100.0	100.0	100.0	100.0	100.0	100.0
430	100.0	100.0	100.0	100.0	99.3	99.6	99.3	100.0	100.0	100.0	100.0	100.0	100.0
429	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 17. Continued**

Elev.	Week of the year												
	14	15	16	17	18	19	20	21	22	23	24	25	26
454	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
453	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
452	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
451	0.9	0.0	0.0	2.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
450	2.1	0.0	0.4	2.6	3.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	2.6	0.8	2.1	5.6	6.9	4.3	0.0	1.3	0.4	0.4	0.0	0.0	0.0
448	4.3	3.0	4.7	9.1	10.0	9.1	2.2	3.0	0.9	0.8	0.0	0.0	1.2
447	5.1	5.9	6.4	12.1	15.6	10.8	7.8	4.3	3.4	0.8	0.0	0.0	2.7
446	6.4	12.3	9.0	14.2	16.9	13.0	10.4	6.0	6.4	1.7	0.0	0.0	4.2
445	9.0	15.3	13.2	17.7	17.7	17.3	15.7	12.4	8.2	4.6	4.9	3.7	5.4
444	14.1	16.5	20.1	21.6	19.9	21.6	20.4	14.6	9.9	6.3	7.8	6.9	5.4
443	20.1	21.6	24.8	30.6	26.0	24.7	25.2	15.9	11.6	9.7	9.1	9.8	5.4
442	31.6	32.6	31.2	40.9	34.6	26.4	28.7	22.7	14.2	18.5	12.8	13.9	7.3
441	38.9	39.4	37.2	45.3	37.7	29.4	36.1	28.8	18.0	23.9	18.9	17.6	13.1
440	42.7	45.3	43.2	48.7	40.3	33.8	41.3	33.0	24.0	26.1	24.7	19.6	17.7
439	52.1	56.4	48.7	56.0	45.5	41.1	43.0	36.9	30.5	32.4	35.4	29.8	26.2
438	65.0	61.0	65.0	61.6	53.2	52.4	47.8	44.6	34.8	39.1	42.4	42.0	33.5
437	68.4	70.8	73.1	72.0	63.6	60.2	60.9	54.1	50.2	48.3	54.3	50.6	41.9
436	77.4	81.4	80.3	85.3	85.3	74.9	71.3	70.4	67.4	68.5	68.7	66.5	63.1
435	93.2	98.3	96.6	99.1	99.1	96.5	92.6	90.6	90.6	89.5	87.7	86.1	81.2
434	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	100.0	99.6	99.2	100.0	100.0
433	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
432	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
431	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
430	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
429	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 17. Continued**

Elev.	Week of the year												
	27	28	29	30	31	32	33	34	35	36	37	38	39
454	0.0	0.0	0.0	0.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
453	0.0	0.0	2.6	2.1	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
452	0.4	2.6	2.6	2.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
451	1.9	2.6	2.6	2.5	2.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
450	2.3	3.3	2.6	2.5	2.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	2.6	4.4	2.6	2.5	2.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
448	2.6	4.8	3.0	2.5	2.4	2.1	0.0	0.7	1.0	0.0	0.0	0.0	0.0
447	3.0	5.2	3.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	0.0	0.0	1.0
446	4.2	5.2	3.7	2.5	2.4	2.4	2.4	2.4	2.4	2.4	1.4	0.0	2.4
445	5.7	5.9	4.1	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	0.3	3.8
444	6.8	7.0	6.0	4.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.0	4.8
443	9.4	7.4	6.3	4.6	2.4	2.4	2.4	2.4	2.4	2.4	2.4	3.4	6.6
442	11.7	9.6	7.5	5.0	2.4	3.1	3.8	2.4	3.1	2.4	2.7	4.1	7.6
441	16.6	11.9	8.6	9.3	2.8	4.9	4.5	2.4	3.7	3.7	2.7	4.1	8.0
440	28.3	17.8	14.2	11.1	5.9	6.3	4.9	4.2	5.1	6.1	3.1	4.4	9.7
439	32.5	23.7	17.5	16.8	14.6	10.8	5.2	6.2	7.1	8.8	3.7	8.5	14.2
438	37.7	34.4	25.4	25.0	19.2	18.1	9.8	8.7	8.5	12.9	5.1	13.3	16.3
437	46.4	44.1	41.0	33.2	29.3	26.1	18.8	15.2	12.2	15.0	11.6	19.7	21.5
436	59.2	59.3	59.3	46.8	46.7	44.9	34.8	28.4	24.8	28.2	25.9	31.6	33.9
435	82.3	75.9	76.1	68.9	64.8	66.6	56.4	55.0	57.1	61.6	60.9	61.2	60.2
434	99.6	100.0	100.0	99.6	99.0	99.3	98.3	99.7	99.7	98.3	99.0	98.3	96.9
433	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
432	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
431	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
430	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
429	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 17. Continued**

Elev.	Week of the year												
	40	41	42	43	44	45	46	47	48	49	50	51	52
454	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
453	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
452	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
451	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
450	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
449	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
448	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
447	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
446	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
445	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
443	2.5	0.7	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
442	4.3	2.2	0.4	0.7	0.0	1.1	0.7	3.0	0.0	0.0	0.0	0.4	0.0
441	6.0	5.7	1.1	2.1	0.4	2.2	1.5	7.0	2.2	3.1	0.0	0.4	0.0
440	8.2	10.8	6.2	3.1	1.1	3.7	4.1	7.4	4.8	5.3	0.4	1.9	2.0
439	11.4	13.3	9.8	4.9	5.0	9.5	5.9	9.2	10.3	6.1	2.2	3.4	4.5
438	13.9	18.3	15.6	10.8	14.2	14.7	8.2	13.3	15.4	8.0	5.6	6.0	9.3
437	18.5	20.4	22.9	24.7	26.2	28.2	24.2	23.6	21.6	13.4	12.3	17.2	16.7
436	28.8	27.2	34.5	32.4	37.2	42.9	35.7	35.4	35.5	34.0	26.9	29.2	30.2
435	58.7	57.0	54.2	57.1	60.3	63.4	62.1	65.3	56.4	51.5	53.7	51.3	60.5
434	96.1	97.1	95.6	98.3	98.9	97.8	99.3	99.3	99.6	96.6	97.4	98.9	97.5
433	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	100.0	100.0	100.0	100.0	100.0
432	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	100.0	100.0	100.0	100.0	100.0
431	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	100.0	100.0	100.0	100.0	100.0
430	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
429	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 18.** Percentage of time water levels are above specific elevations at the Corps of Engineers gage at river mile 273.2 (Dam 24 tailwater gage) on a weekly basis from 1952 through 1993 (15,338 observations). Data may be missing for some days.

Elev.	Week of the year												
	1	2	3	4	5	6	7	8	9	10	11	12	13
459	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
458	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
457	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
456	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
455	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
454	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
453	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	1.7
452	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	2.0
451	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.3	4.4
450	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.4	2.0	7.1
449	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.7	2.0	6.5	8.5
448	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.3	3.1	3.7	3.4	9.5	11.9
447	0.0	0.0	1.0	0.0	1.4	0.3	0.3	0.3	4.4	5.1	6.8	12.2	17.0
446	0.0	0.0	1.7	0.0	1.7	1.0	0.3	1.4	6.8	8.2	11.2	17.0	21.8
445	0.4	0.0	2.0	0.7	2.7	2.0	0.3	3.7	8.8	10.9	12.9	23.8	30.6
444	2.0	0.7	2.4	3.4	4.1	2.4	0.7	5.8	9.5	15.0	18.0	31.3	38.4
443	3.6	1.4	3.1	4.8	4.8	2.7	2.0	10.2	10.2	17.0	25.2	37.8	46.6
442	7.9	4.8	4.4	5.1	5.8	2.7	3.7	11.6	12.9	22.8	28.6	46.3	55.1
441	10.3	6.1	7.1	7.8	6.8	4.1	5.1	15.3	18.0	28.9	38.4	56.5	61.6
440	17.9	13.6	14.3	13.3	10.5	8.5	6.5	17.3	28.9	36.4	46.3	61.9	64.6
439	26.2	22.1	19.4	21.4	22.4	19.7	16.7	24.5	40.5	46.6	54.1	68.4	70.7
438	36.9	35.4	31.0	29.3	38.1	37.8	36.4	40.1	51.4	61.6	65.3	73.1	77.2
437	53.2	51.7	46.6	46.3	55.8	56.8	57.1	55.1	64.3	72.4	78.2	83.0	83.7
436	63.5	63.9	63.9	65.3	64.3	65.0	72.4	69.4	77.6	81.0	89.1	93.2	92.9
435	86.1	86.1	87.8	87.8	88.1	86.1	90.8	87.8	91.8	94.9	97.3	99.7	99.7
434	100.0	100.0	99.7	99.0	97.6	97.3	97.6	99.3	99.7	100.0	100.0	100.0	100.0
433	100.0	100.0	100.0	100.0	99.0	99.7	98.0	100.0	99.7	100.0	100.0	100.0	100.0
432	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 18. Continued**

Elev.	Week of the year													
	14	15	16	17	18	19	20	21	22	23	24	25	26	
459	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
458	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
457	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
456	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
455	0.7	0.0	0.0	2.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
454	2.4	0.7	0.0	2.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
453	3.1	1.7	1.7	5.1	6.8	4.8	0.0	1.0	0.3	0.0	0.0	0.0	1.0	
452	5.1	4.8	5.1	5.8	7.8	6.8	2.4	3.1	1.4	0.3	0.0	0.3	1.7	
451	8.2	8.2	6.8	8.8	9.9	8.5	5.8	5.1	2.4	0.7	0.0	0.7	3.7	
450	9.2	14.3	9.2	12.2	16.0	11.2	7.8	7.1	4.8	0.7	1.0	1.0	5.4	
449	11.2	17.0	17.7	19.4	18.4	15.6	12.6	12.2	9.5	3.1	3.7	3.4	7.5	
448	15.3	20.4	22.1	28.2	23.5	22.1	20.1	13.9	13.3	6.5	7.1	7.5	8.8	
447	21.1	24.1	30.3	38.1	29.6	28.6	26.5	18.4	17.7	14.3	10.9	10.2	9.9	
446	31.6	35.0	38.4	46.3	41.2	35.7	32.7	24.8	23.8	19.7	13.6	15.0	11.9	
445	41.2	44.6	46.9	52.7	45.6	40.1	42.2	32.7	27.2	25.5	18.7	19.0	14.6	
444	45.6	49.3	50.7	54.8	48.3	42.5	46.9	36.7	32.0	29.9	24.5	22.8	21.4	
443	52.7	56.1	55.1	58.8	51.4	50.0	51.0	40.1	35.0	34.0	31.0	25.2	27.2	
442	59.9	62.6	62.6	67.7	60.2	56.5	54.1	44.9	41.5	39.8	40.1	35.0	33.3	
441	69.7	70.1	71.8	70.4	67.0	62.9	59.9	54.4	45.2	45.2	47.3	48.3	40.1	
440	74.1	77.6	76.9	77.2	70.7	68.0	69.4	62.2	58.5	52.7	55.1	55.4	48.6	
439	78.2	84.0	81.6	82.0	83.0	74.8	76.2	72.1	68.4	67.7	69.0	63.9	58.8	
438	83.0	88.8	87.8	90.8	88.1	83.7	80.3	80.6	78.2	75.5	77.2	73.5	70.4	
437	91.8	95.2	93.9	97.6	96.9	95.2	89.1	88.8	86.7	87.8	82.7	81.6	78.6	
436	96.6	100.0	98.0	99.0	100.0	98.3	93.9	94.6	91.5	91.2	90.1	88.4	86.1	
435	100.0	100.0	99.7	99.7	100.0	99.7	98.6	99.0	94.6	97.3	95.9	95.6	95.2	
434	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
433	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
432	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

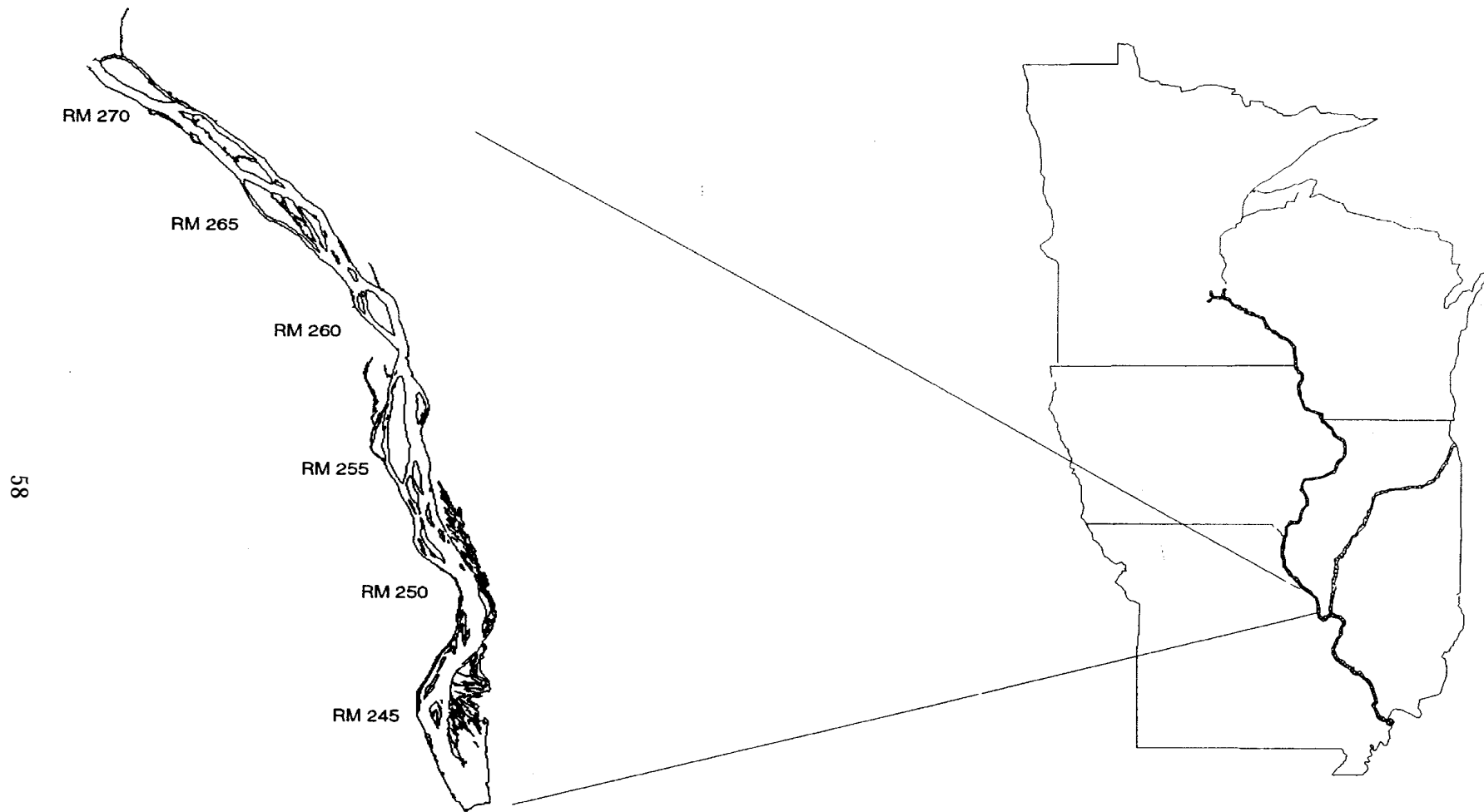
**Table 18.** Continued

Elev.	Week of the year												
	27	28	29	30	31	32	33	34	35	36	37	38	39
459	0.0	0.0	0.7	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
458	0.0	1.0	2.4	2.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
457	0.3	2.4	2.4	2.4	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
456	1.7	2.4	2.4	2.4	2.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
455	2.0	2.4	2.4	2.4	2.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
454	2.4	3.1	2.4	2.4	2.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
453	2.4	3.7	2.4	2.4	2.4	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
452	2.4	4.4	2.4	2.4	2.4	2.4	2.4	2.4	2.0	0.7	0.0	0.0	0.0
451	2.7	4.8	2.7	2.4	2.4	2.4	2.4	2.4	2.4	2.4	0.7	0.0	1.0
450	3.7	4.8	3.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	0.0	2.0
449	7.1	4.8	3.4	3.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	1.0	3.7
448	11.9	5.8	5.1	3.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	6.8
447	13.9	9.2	6.8	5.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.7	7.8
446	17.3	11.6	10.2	6.5	2.7	2.4	2.4	2.4	2.4	2.4	2.7	3.4	8.8
445	19.4	15.3	12.2	8.2	3.1	3.7	4.1	2.4	3.1	2.4	2.7	3.7	9.2
444	24.8	19.4	13.6	11.9	3.7	5.1	4.4	2.7	3.7	4.8	2.7	4.8	9.5
443	35.7	24.5	19.0	14.3	8.2	6.8	4.8	2.7	4.4	6.8	3.4	5.4	10.2
442	41.2	31.3	22.4	18.0	15.0	11.2	6.1	4.4	5.1	9.2	3.7	8.5	14.6
441	47.3	40.5	35.0	27.6	21.4	21.4	12.6	7.5	6.5	12.6	4.4	10.9	17.3
440	52.4	48.3	46.6	36.7	30.3	27.2	17.0	14.6	9.5	14.6	10.9	17.7	20.4
439	58.2	54.1	53.7	44.9	44.9	36.1	27.2	19.4	19.7	17.7	17.7	21.8	25.5
438	67.0	64.3	65.3	51.4	49.0	46.9	40.8	28.6	28.6	32.3	26.9	32.7	36.7
437	76.9	74.5	74.5	62.2	57.1	57.5	52.0	46.9	42.2	48.6	42.9	47.6	49.0
436	86.7	79.3	80.3	77.9	71.4	73.5	61.2	65.0	62.2	62.2	67.3	64.3	61.9
435	95.6	90.5	90.5	89.1	88.8	88.4	88.4	84.7	79.3	81.3	86.1	83.3	81.0
434	100.0	99.0	99.7	100.0	99.7	99.0	98.6	100.0	100.0	99.7	99.3	97.3	100.0
433	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
432	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0



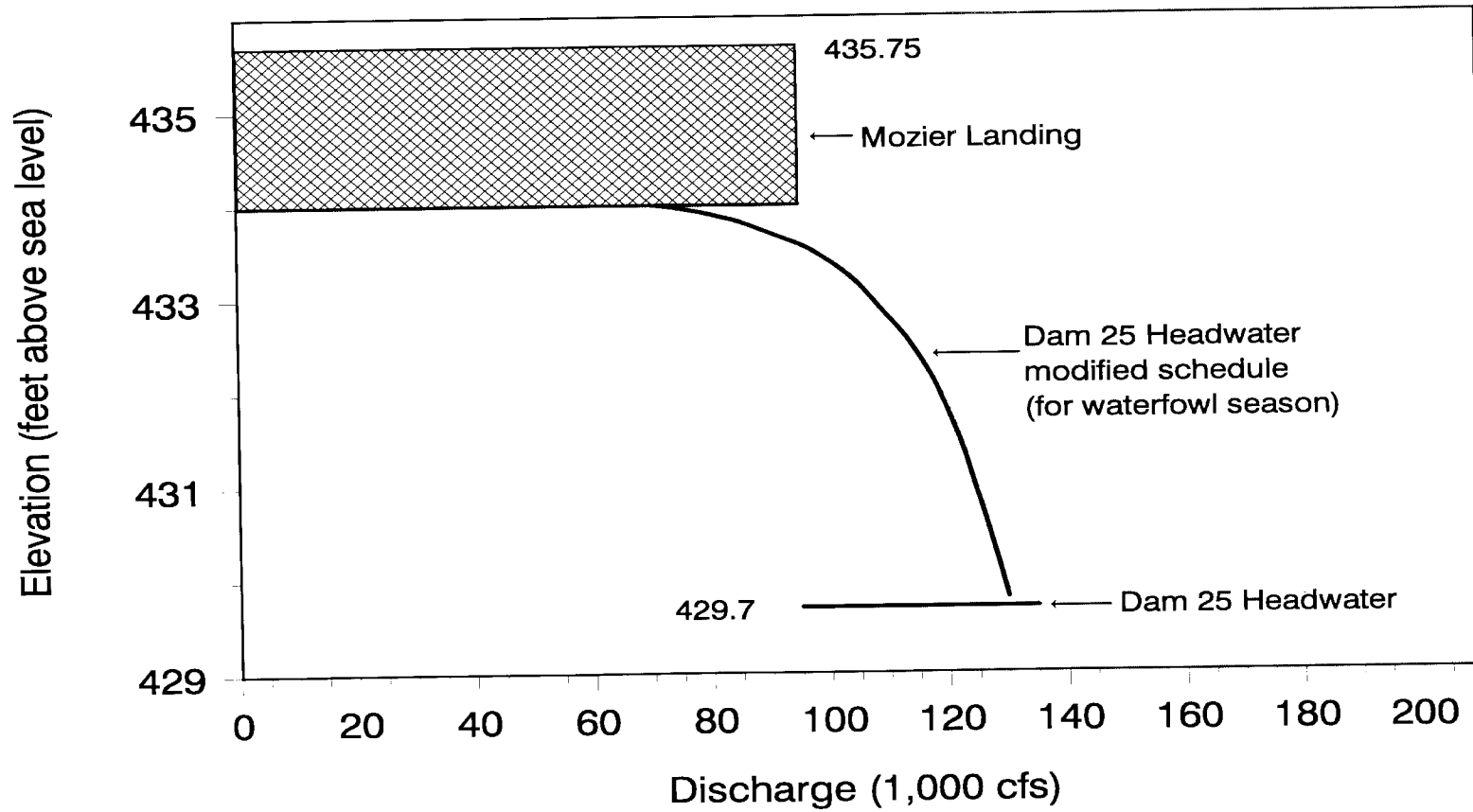
**Table 18.** Continued

Elev.	Week of the year												
	40	41	42	43	44	45	46	47	48	49	50	51	52
459	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
458	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
457	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
456	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
455	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
454	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
453	1.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
452	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0
451	1.4	2.4	0.3	0.0	0.7	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0
450	1.7	2.4	1.4	0.0	1.4	0.0	0.0	0.0	0.0	1.7	0.3	0.0	0.0
449	2.0	2.4	2.4	1.7	1.4	0.0	0.0	0.0	0.0	1.7	0.7	0.0	0.0
448	3.1	2.4	2.4	2.4	1.7	0.7	0.0	0.3	0.0	2.0	1.0	0.0	0.0
447	4.8	2.4	2.4	2.4	2.4	3.1	0.7	1.4	1.7	2.0	1.7	0.3	0.0
446	5.8	3.4	2.7	2.4	3.1	4.1	1.4	2.7	2.0	2.0	2.0	1.4	0.0
445	6.5	4.4	2.7	3.1	3.1	5.8	2.0	3.7	2.7	2.0	2.0	2.0	0.3
444	8.8	8.5	3.7	4.4	3.7	6.8	3.4	7.8	4.8	6.5	2.4	2.0	1.8
443	11.6	13.3	7.5	5.4	4.8	9.9	7.1	8.8	6.8	8.2	2.7	3.1	2.8
442	13.3	16.0	9.9	5.8	8.2	15.4	9.2	9.9	10.6	9.6	4.8	4.8	5.9
441	14.6	18.4	16.7	10.2	16.3	19.1	11.9	12.6	17.1	12.6	8.8	7.8	9.8
440	19.4	21.4	21.1	22.1	23.1	23.9	22.1	19.4	19.5	14.0	9.5	9.9	15.9
439	25.9	24.8	27.2	29.9	33.3	33.4	31.6	25.5	26.6	22.5	15.0	21.1	21.6
438	33.0	31.3	34.7	32.7	40.5	47.1	40.5	39.5	36.2	37.5	27.6	31.3	32.6
437	43.5	41.2	45.9	44.2	48.0	56.0	51.0	50.7	48.5	46.1	42.2	41.2	44.2
436	56.8	57.5	54.4	57.5	61.9	65.5	65.6	67.7	64.8	58.4	57.8	59.2	65.0
435	80.3	76.9	75.5	76.9	80.6	83.3	86.1	90.1	89.1	84.0	82.7	87.8	86.6
434	99.7	99.0	98.3	100.0	100.0	100.0	99.3	100.0	100.0	98.3	98.6	99.3	100.0
433	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
432	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

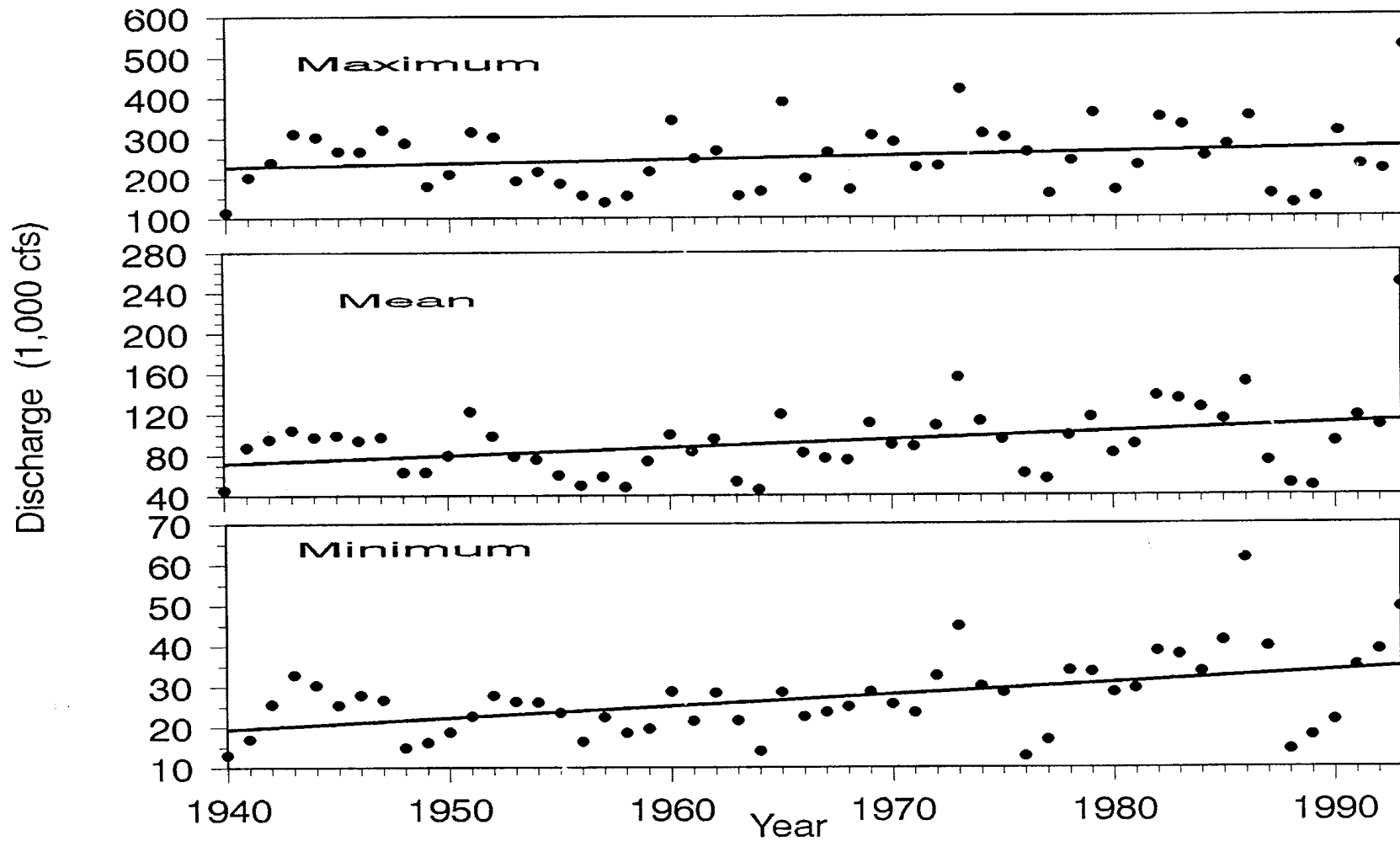


**Figure 1.** Pool 25 on the Mississippi River

RM = River Mile

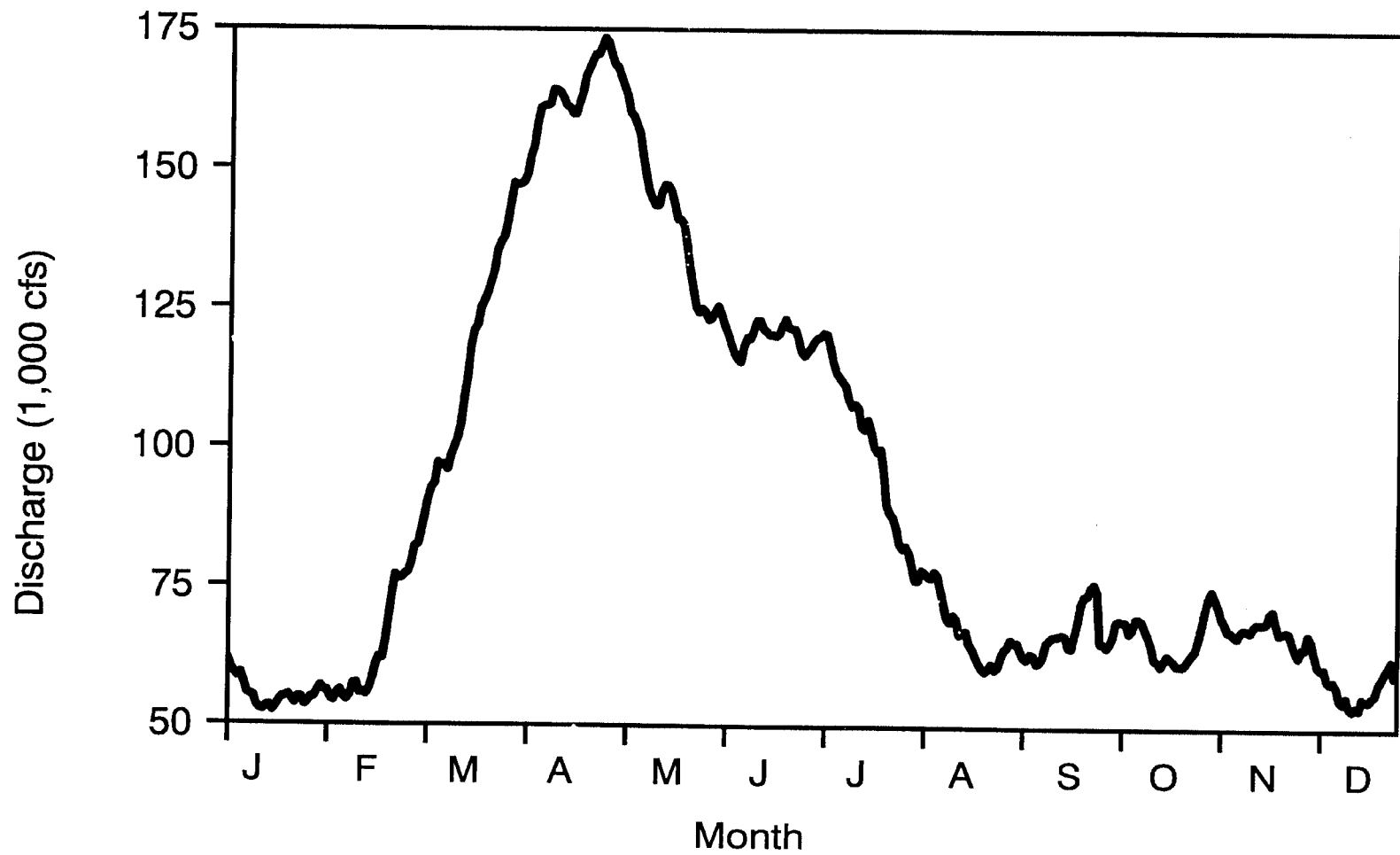


**Figure 2.** The present water level management plan for Upper Mississippi River System Pool 25. Water levels are kept within the hatched areas at Mozier Landing (river mile 260.3) when discharges are under 95,000 cubic feet per second (cfs).



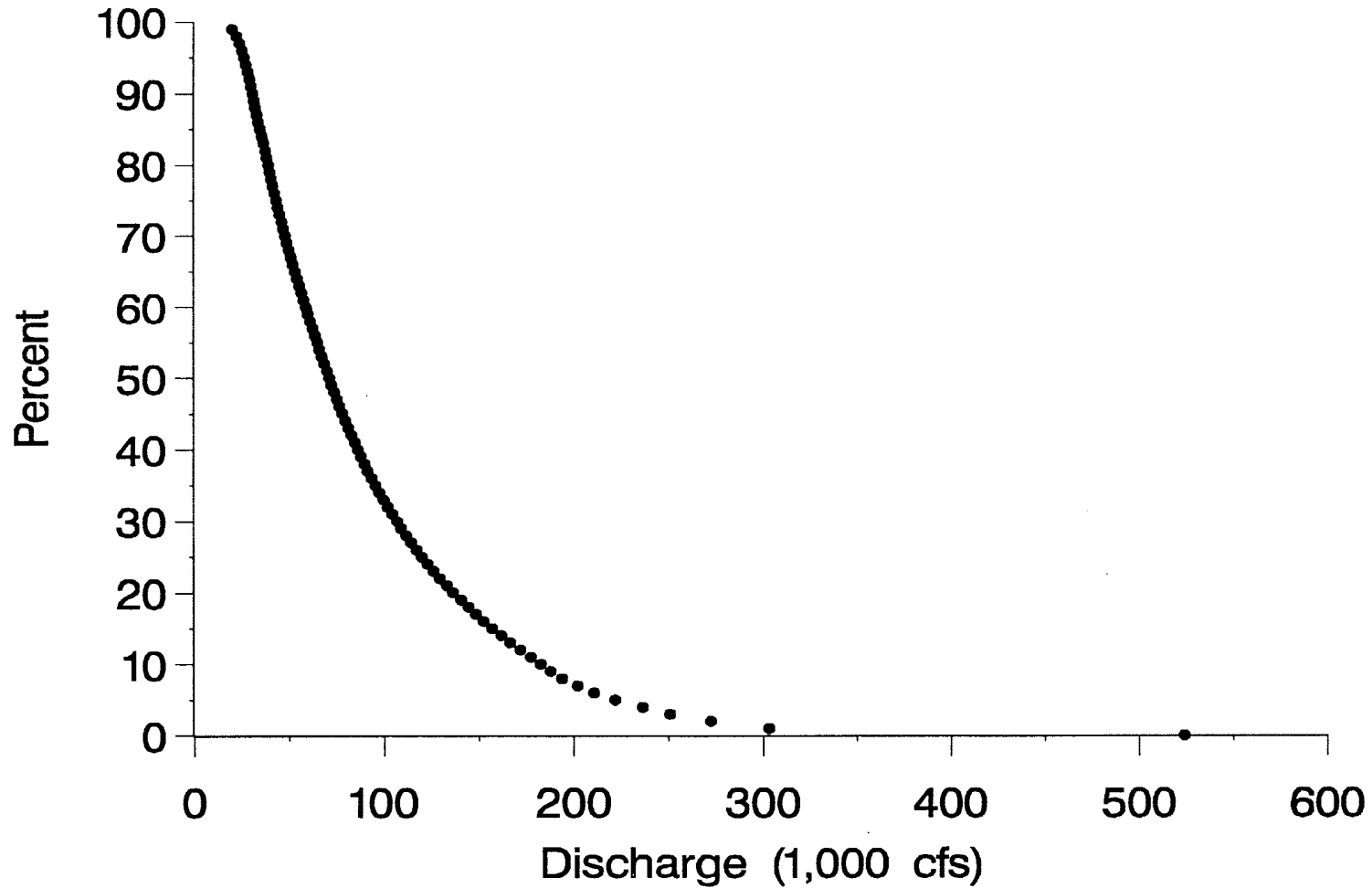
**Figure 3.** Minimum, mean, and maximum yearly discharges for Upper Mississippi River System Pool 25 from 1940 to 1993, inclusive

cfs = cubic feet per second

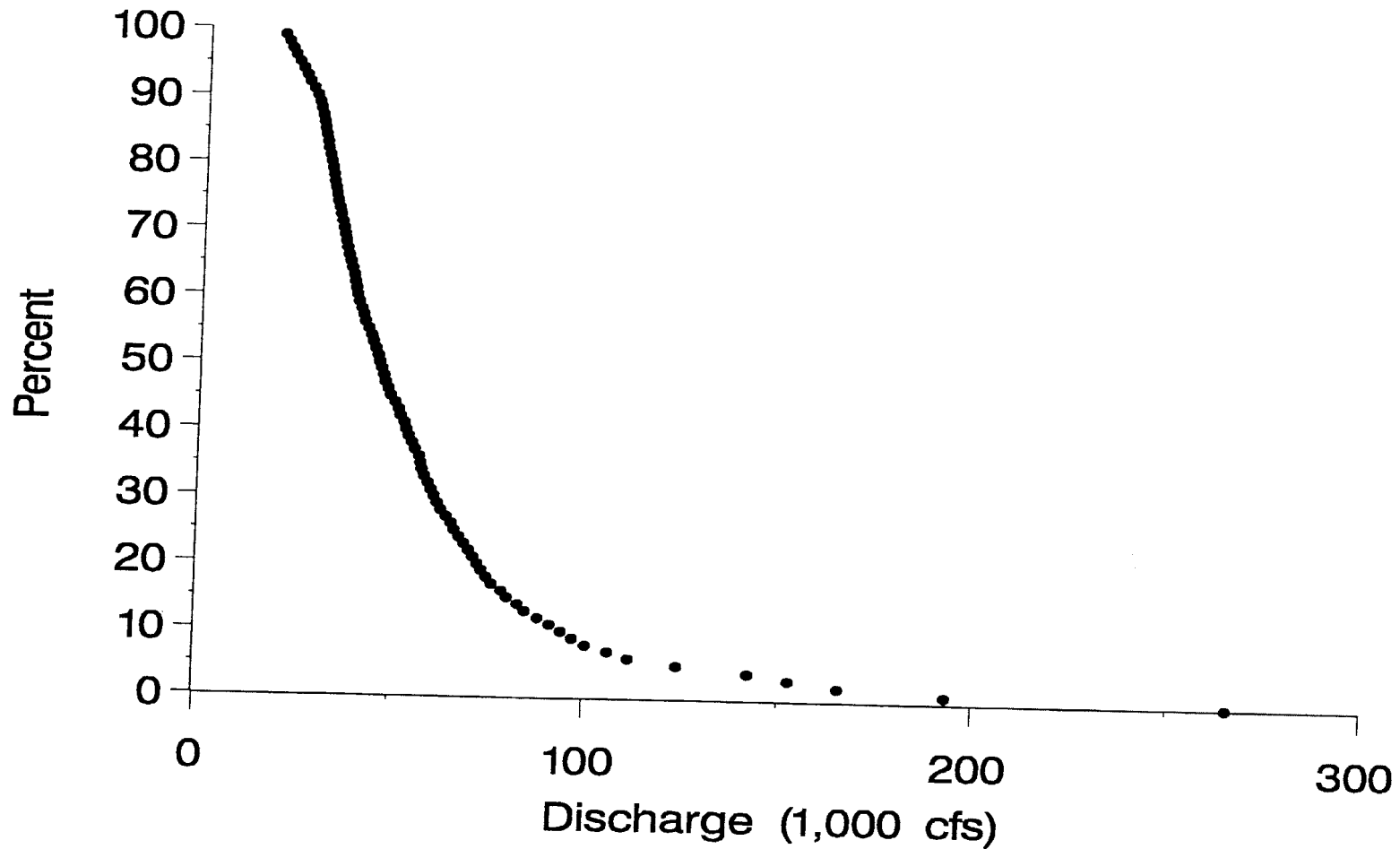


**Figure 4.** Mean daily discharge for Upper Mississippi River System Pool 25 from 1940 to 1993, inclusive

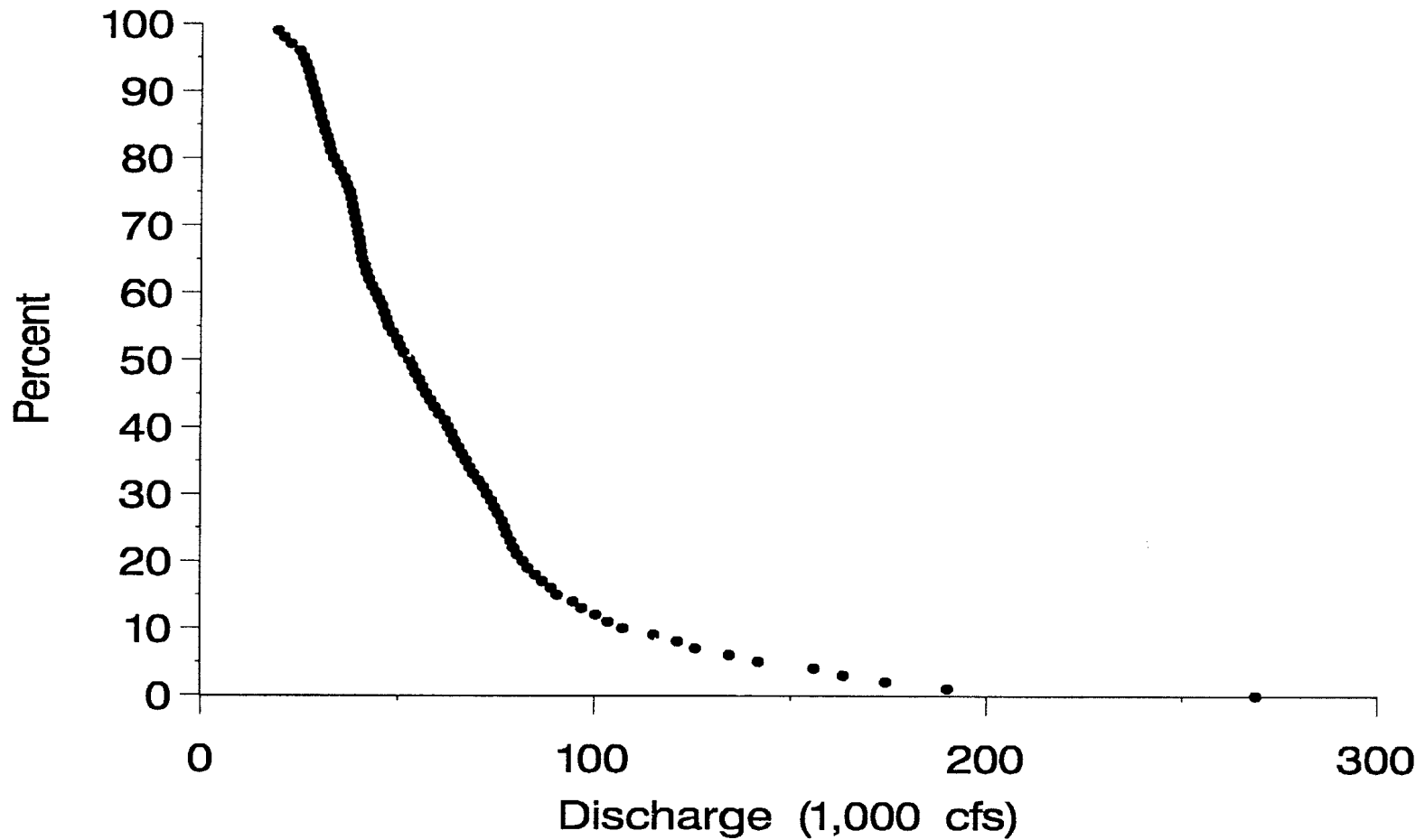
cfs = cubic feet per second



**Figure 5.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected from 1939 to 1993. The 50% exceedence value is 71,000 cubic feet per second (cfs).

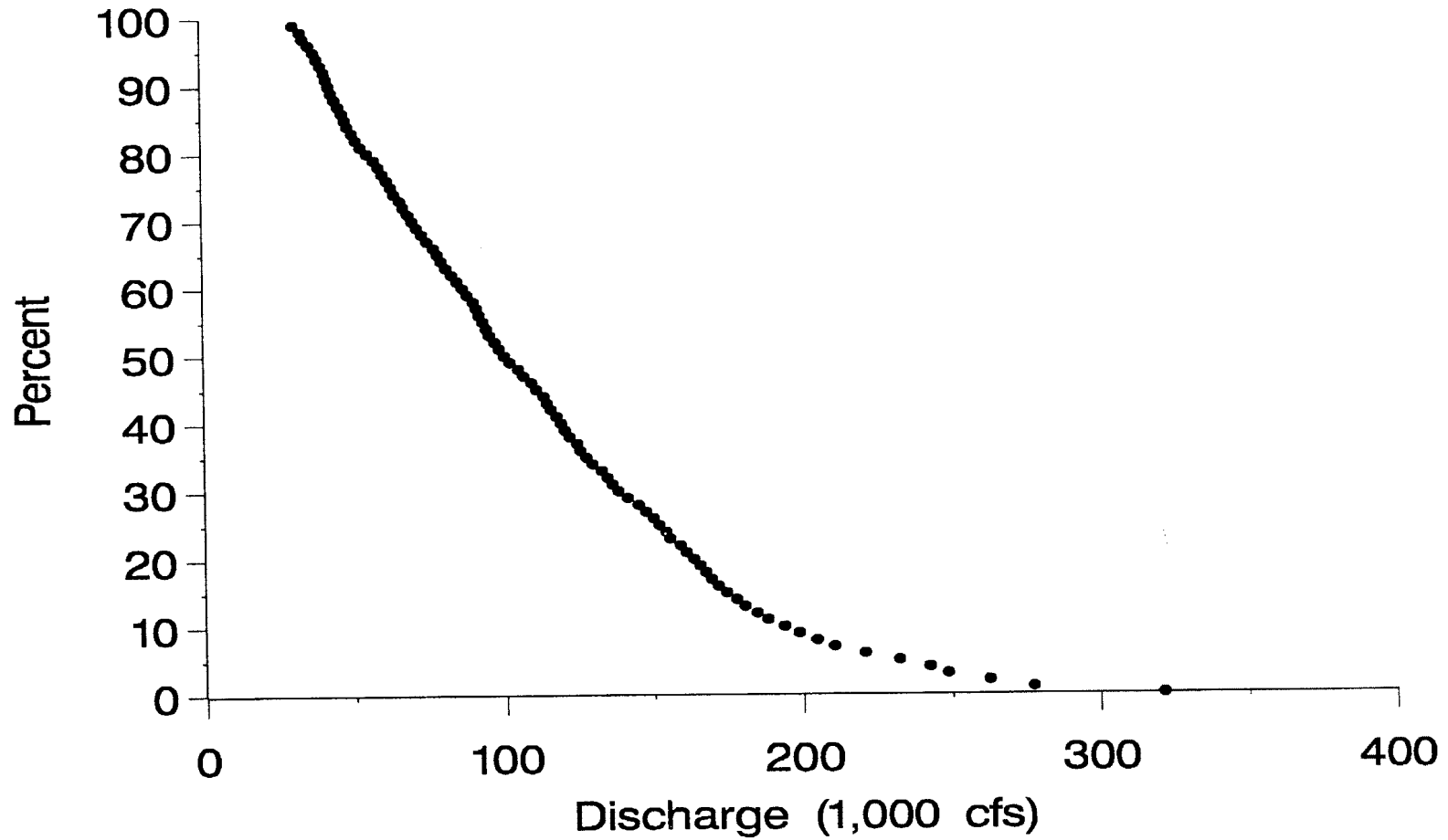


**Figure 6.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during January from 1939 to 1993. The 50% exceedence is 46,000 cubic feet per second (cfs).

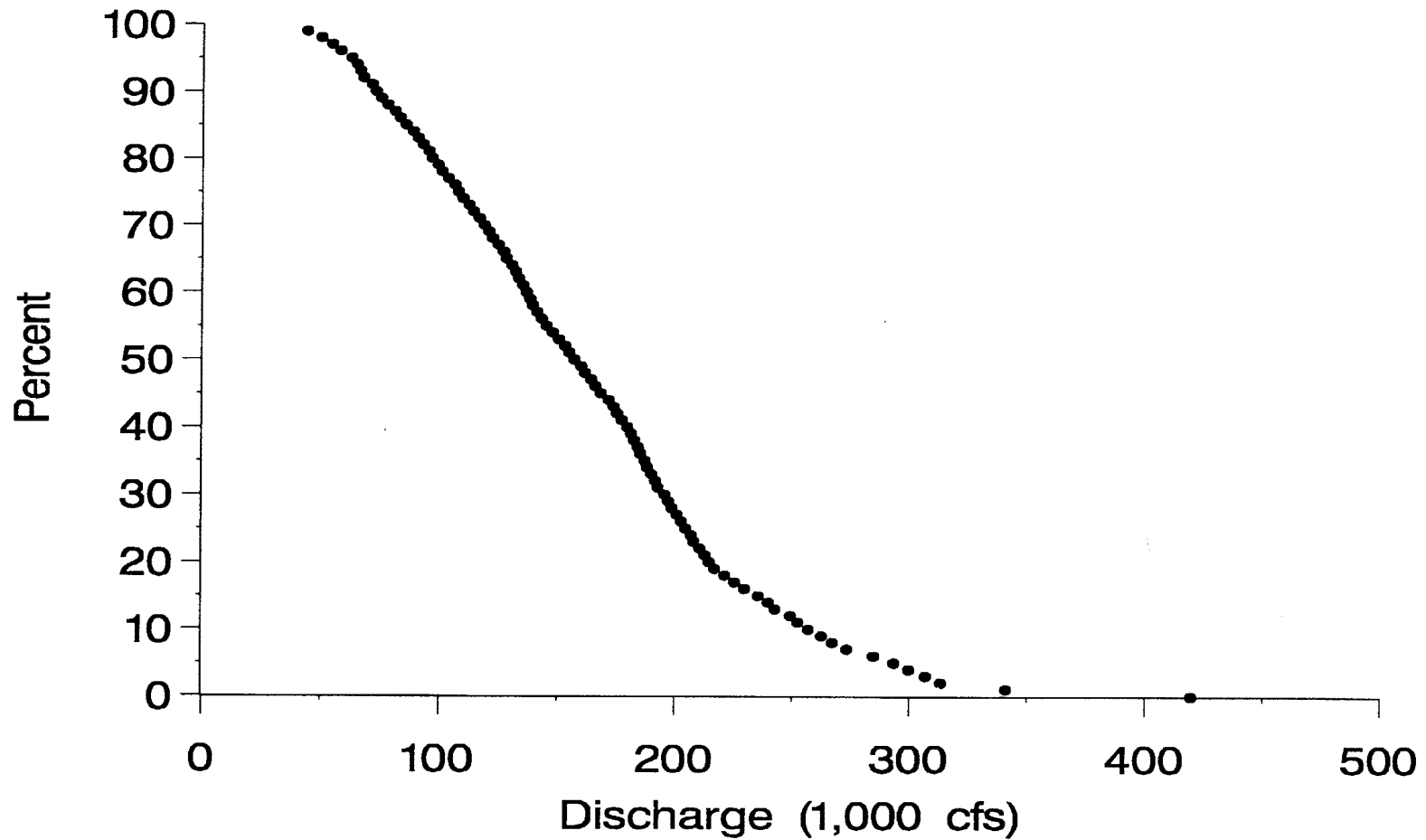


**Figure 7.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during February from 1939 to 1993. The 50% exceedence value is 53,000 cubic feet per second (cfs).

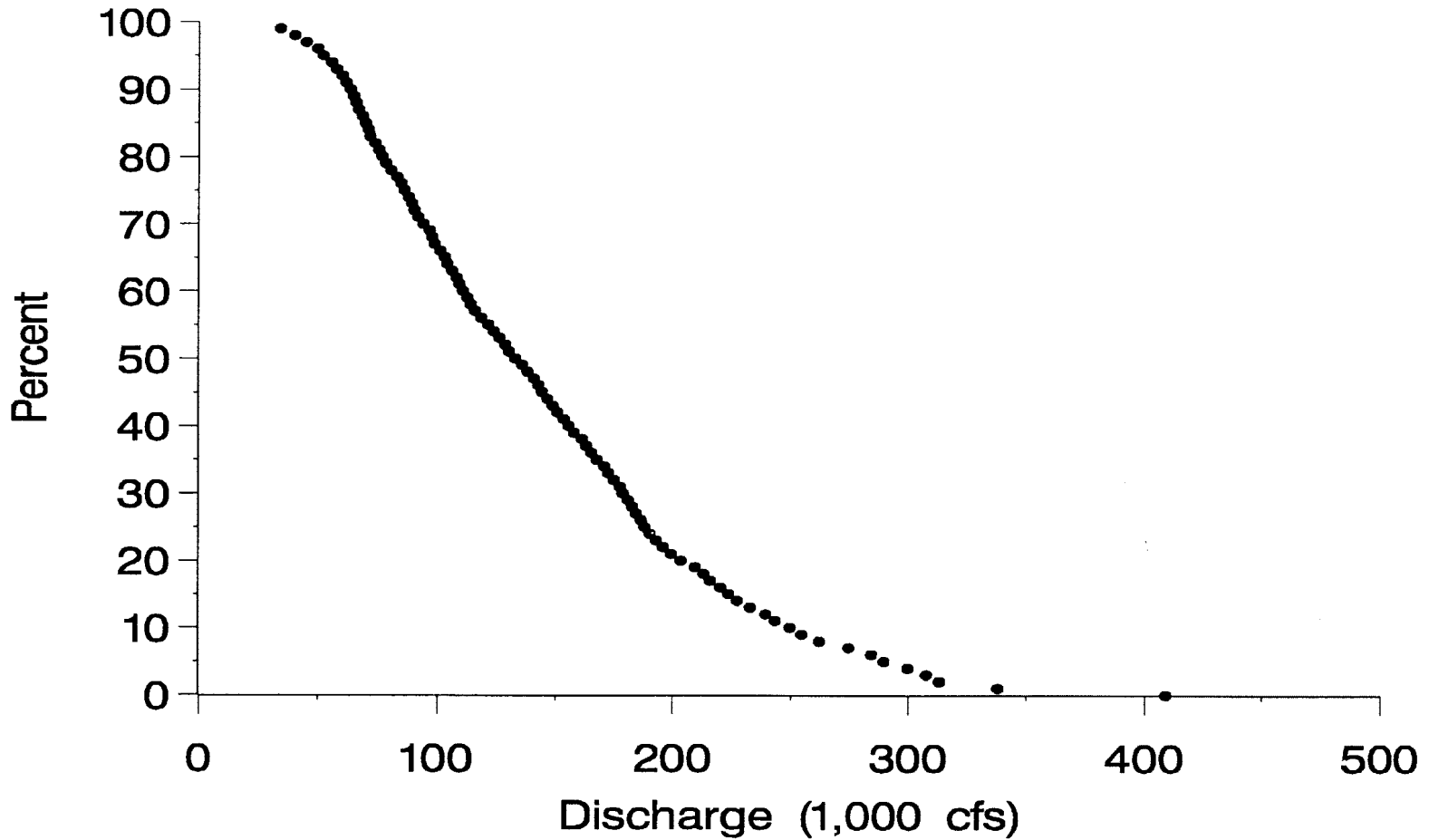




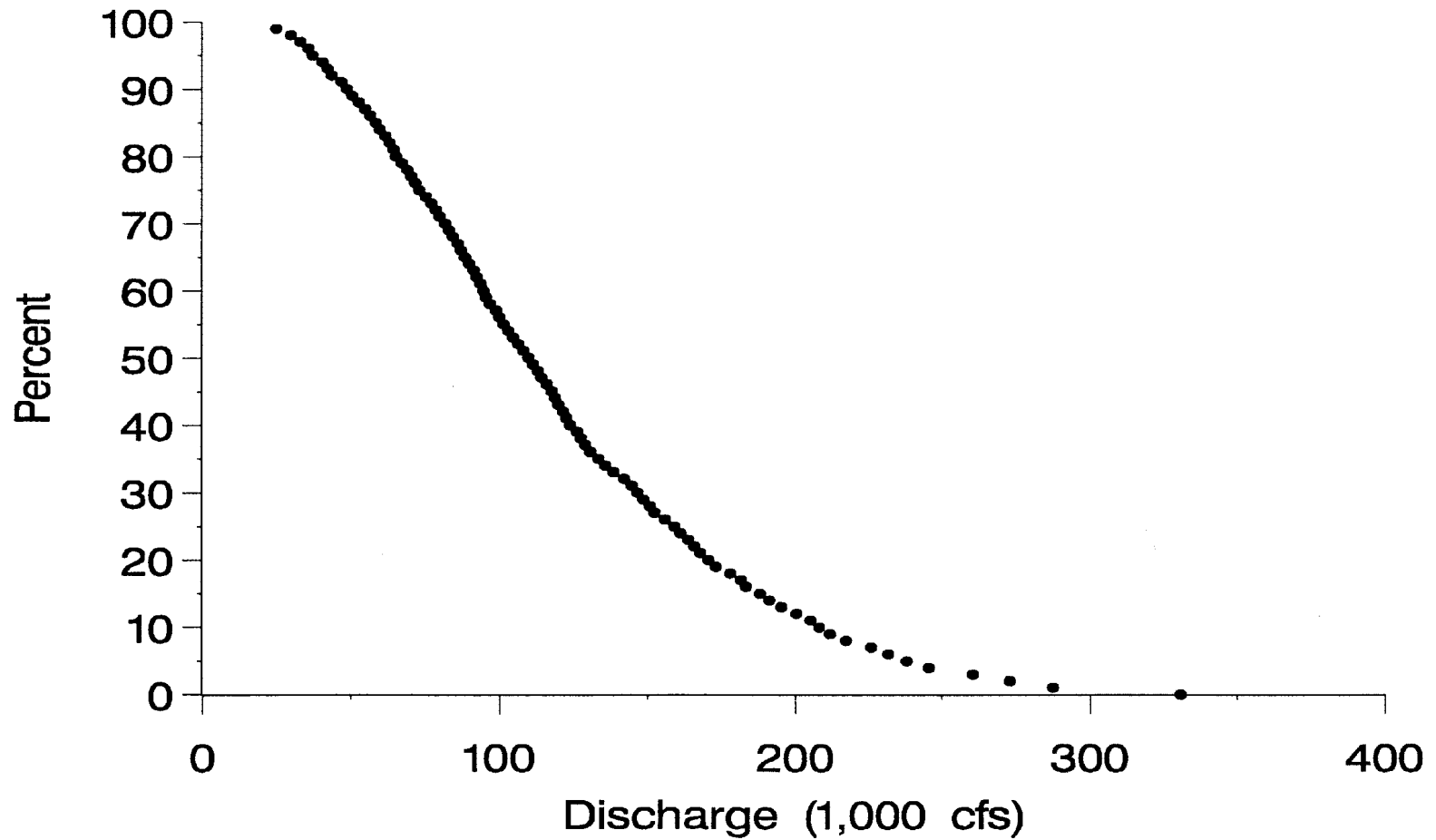
**Figure 8.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during March from 1939 to 1993. The 50% exceedence value is 100,000 cubic feet per second (cfs).



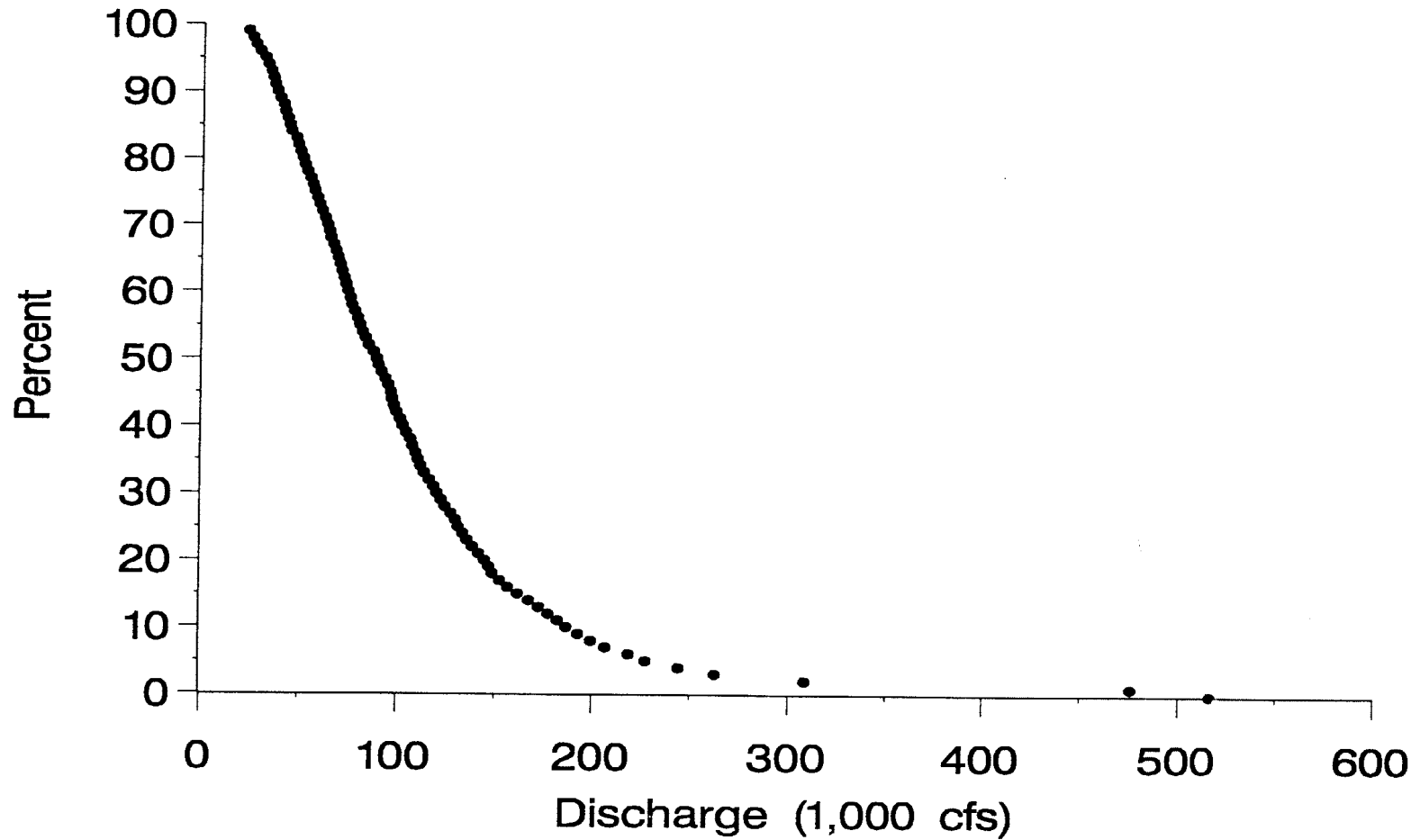
**Figure 9.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during April from 1939 to 1993. The 50% exceedence value is 157,000 cubic feet per second (cfs).



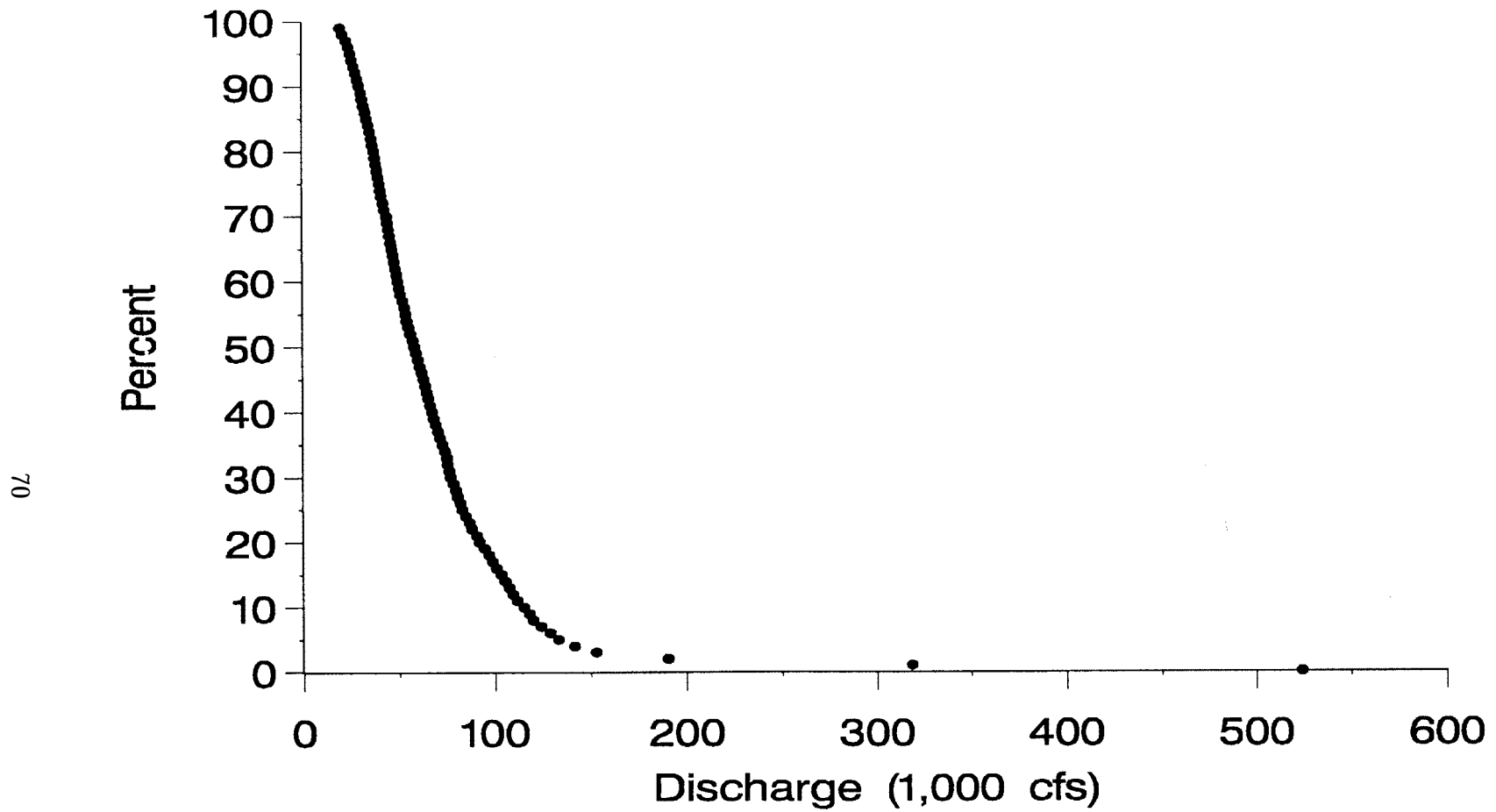
**Figure 10.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during May from 1939 to 1993. The 50% exceedence value is 133,000 cubic feet per second (cfs).



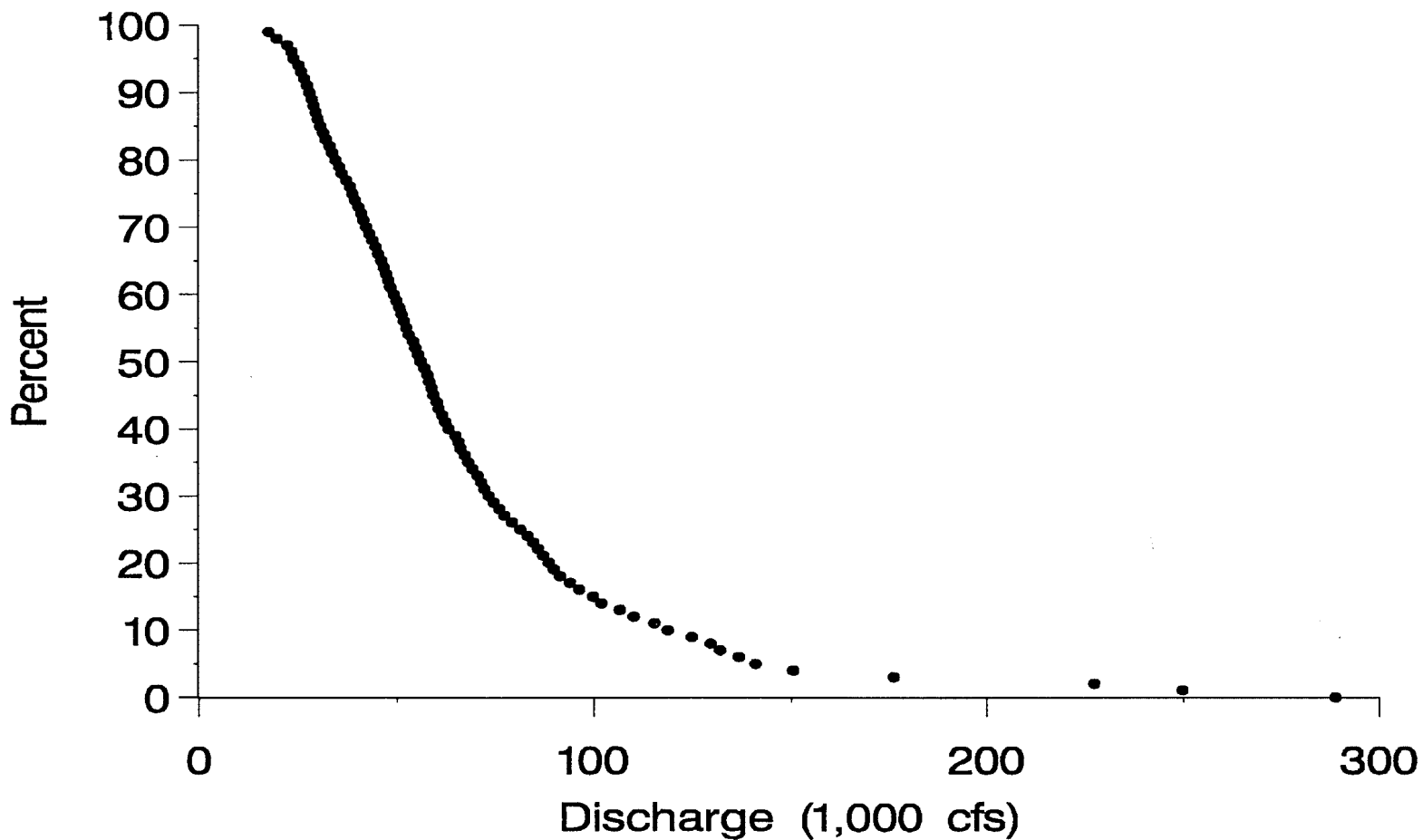
**Figure 11.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during June from 1939 to 1993. The 50% exceedence value is 109,000 cubic feet per second (cfs).



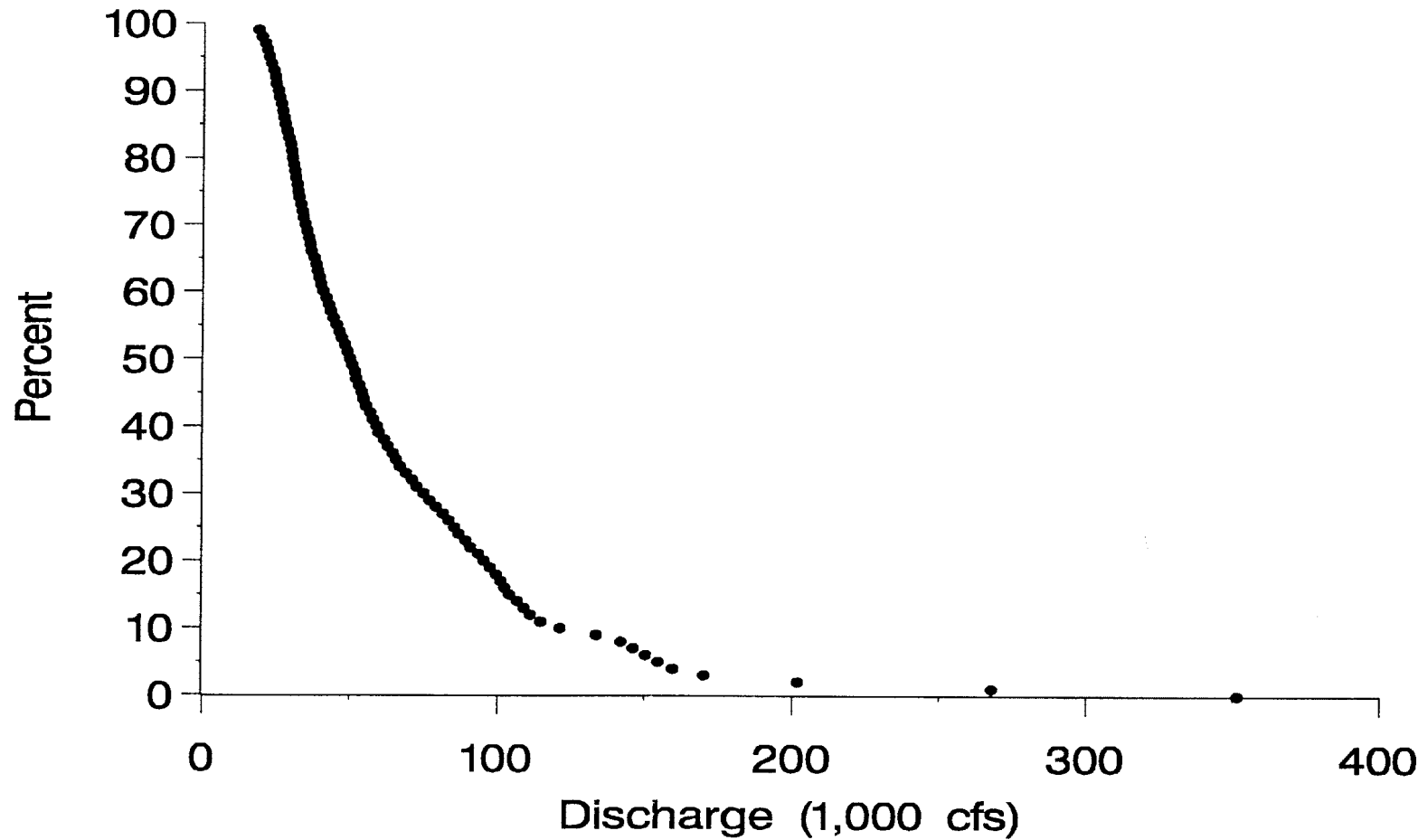
**Figure 12.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during July from 1939 to 1993. The 50% exceedence value is 89,000 cubic feet per second (cfs).



**Figure 13.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during August from 1939 to 1993. The 50% exceedence value is 58,000 cubic feet per second (cfs).

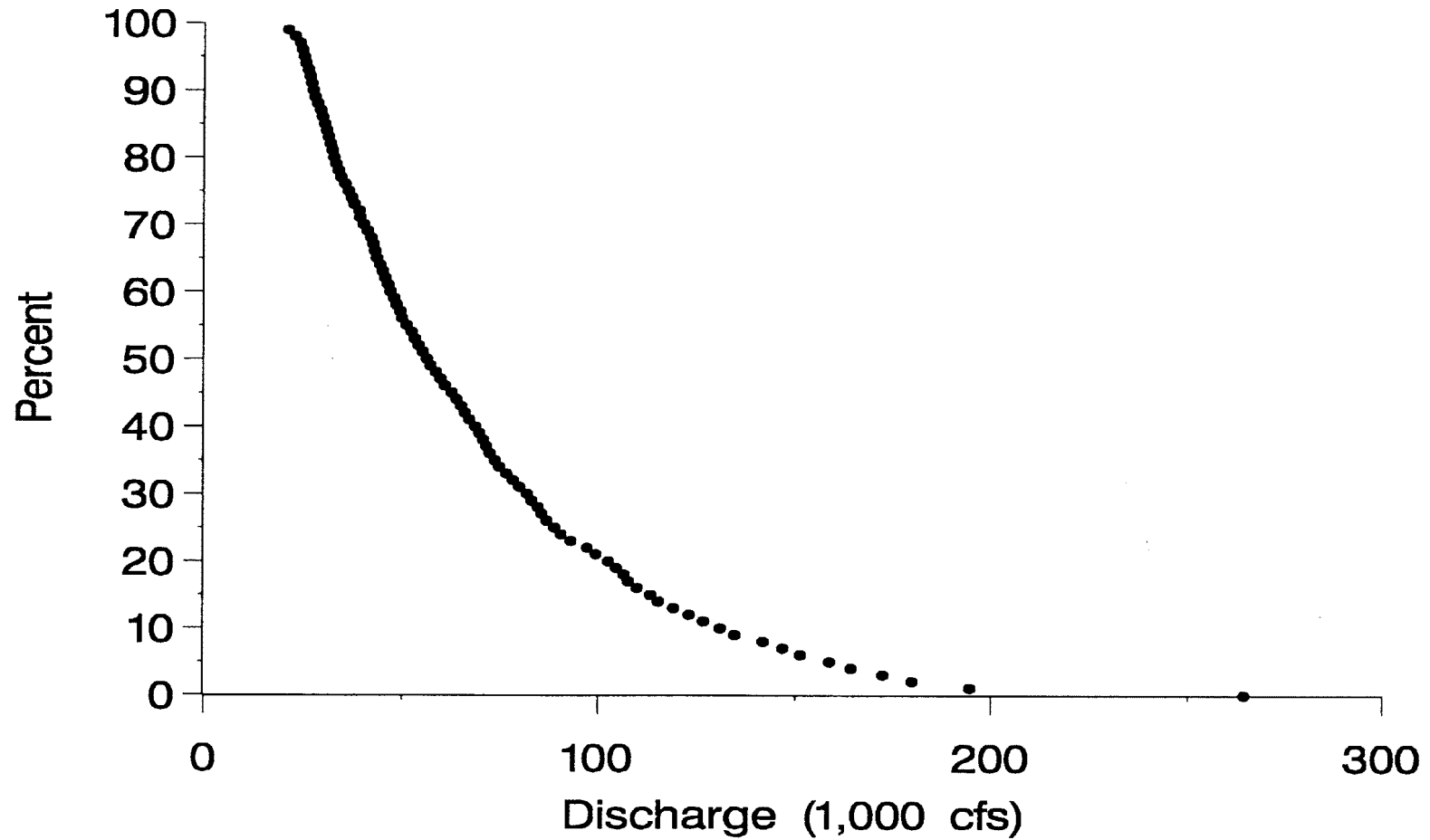


**Figure 14.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during September from 1939 to 1993. The 50% exceedence value is 56,000 cubic feet per second (cfs).

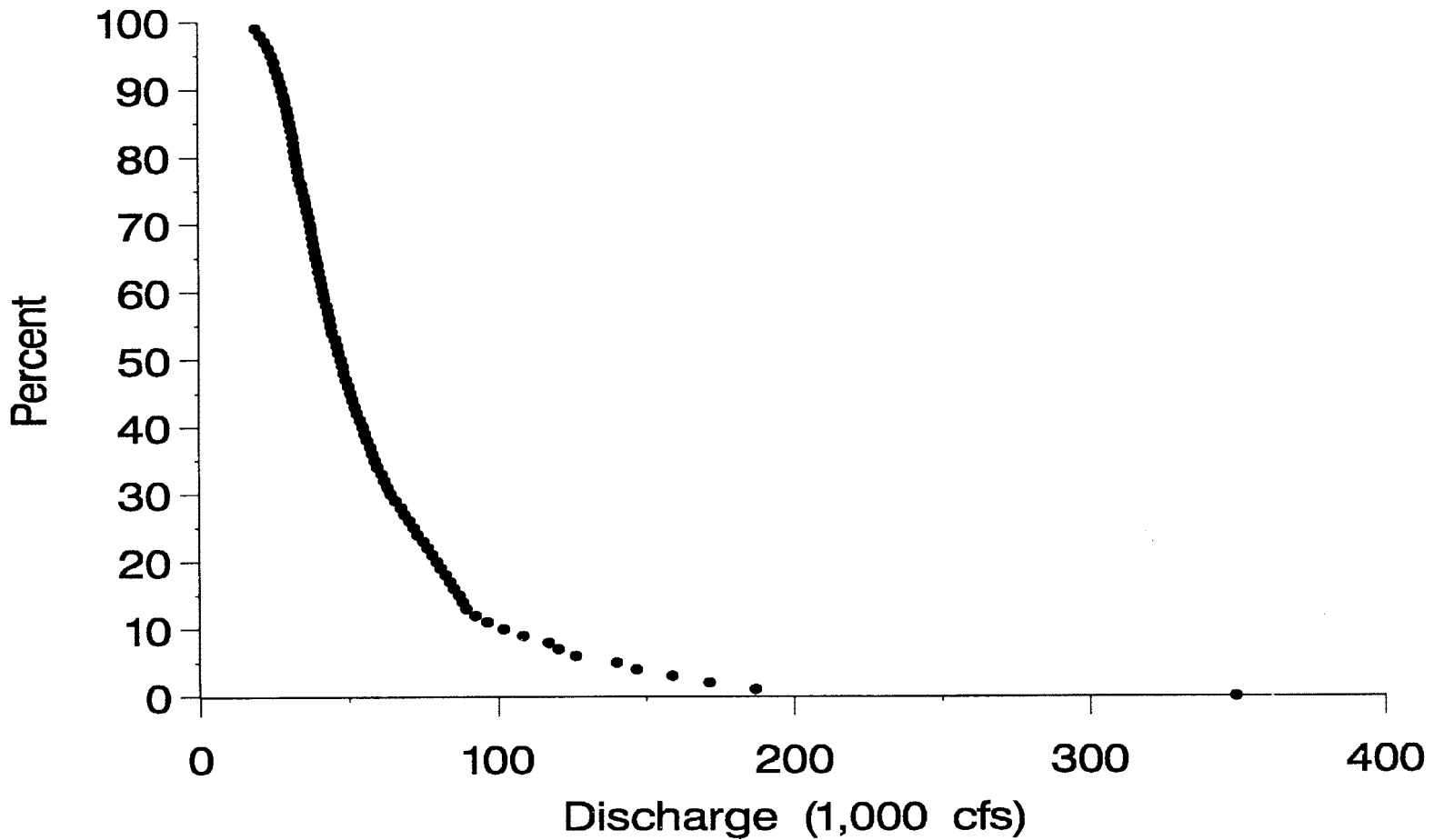


**Figure 15.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during October from 1939 to 1993. The 50% exceedence value is 49,000 cubic feet per second (cfs).

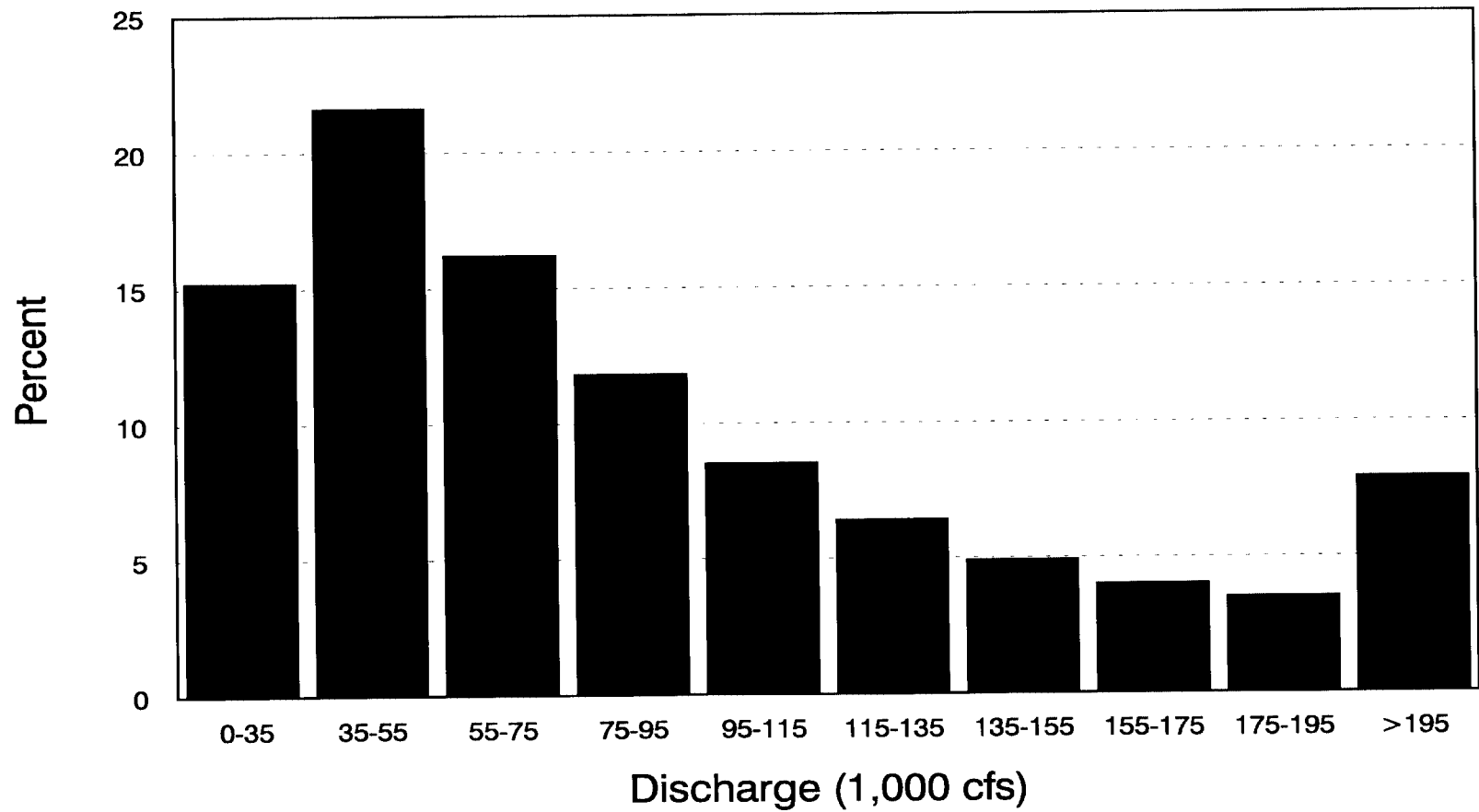




**Figure 16.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during November from 1939 to 1993. The 50% exceedence value is 56,000 cubic feet per second (cfs).

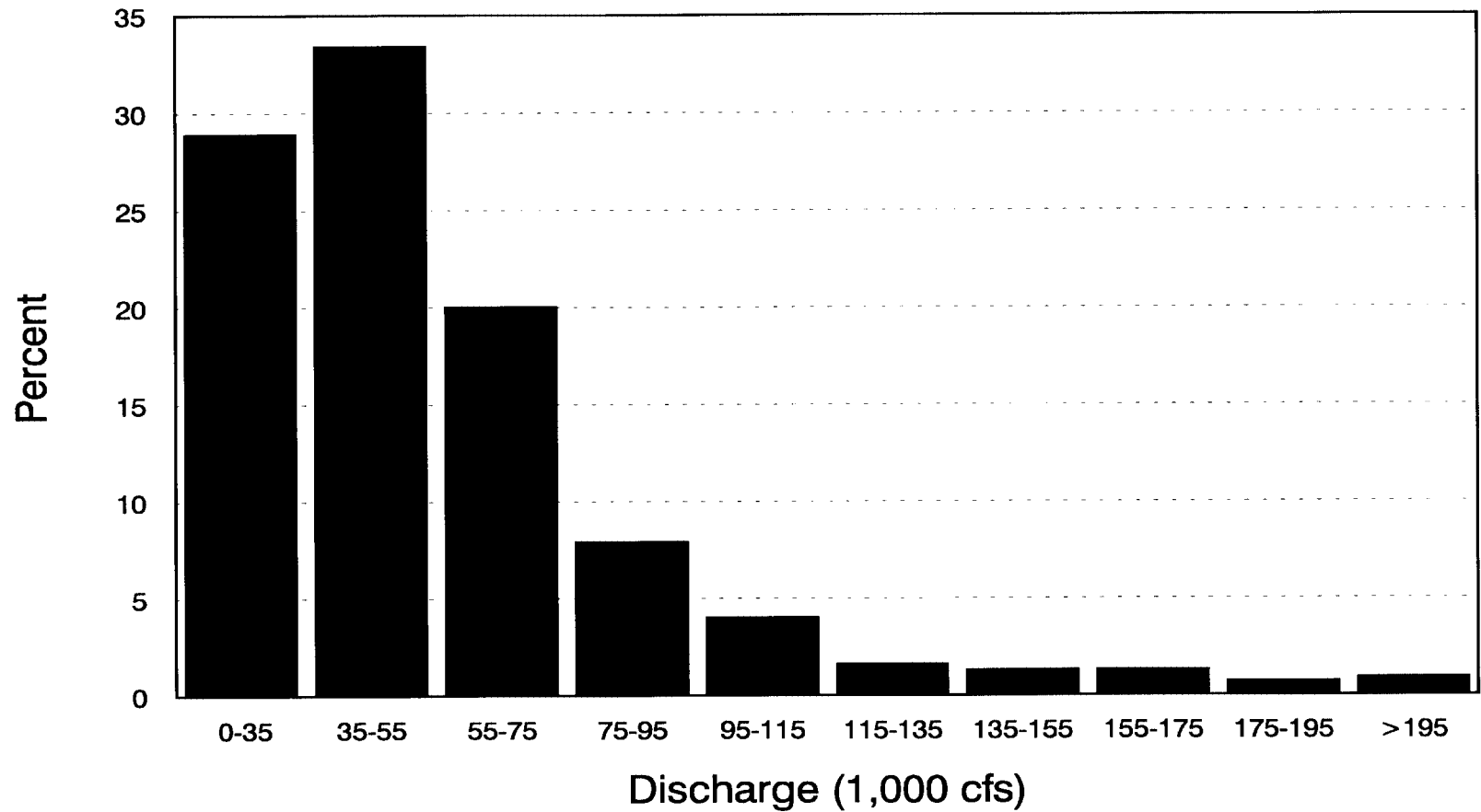


**Figure 17.** Discharge exceedence curve for the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during December from 1939 to 1993. The 50% exceedence value is 47,000 cubic feet per second (cfs).



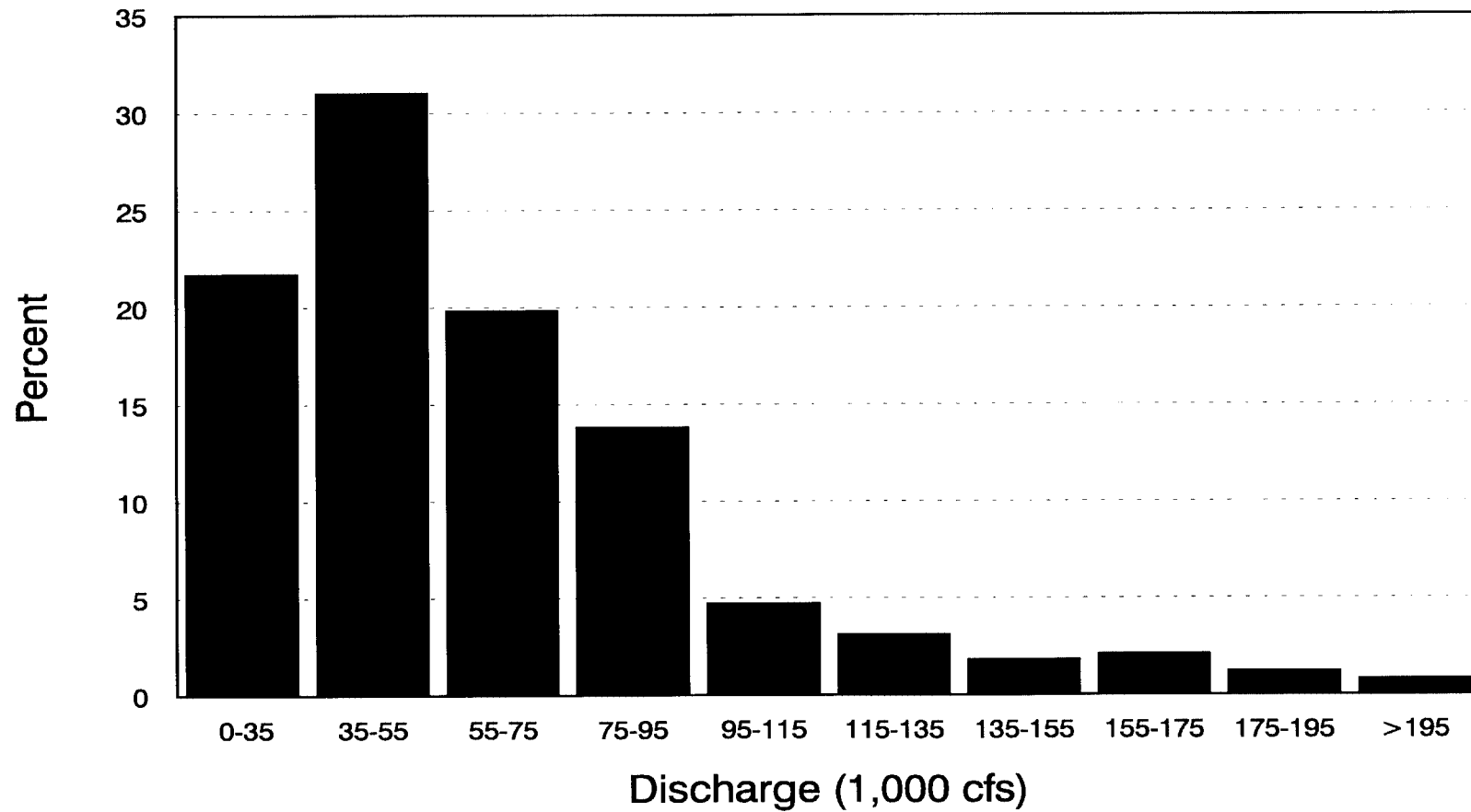
**Figure 18.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected from 1939 to 1993

cfs = cubic feet per second



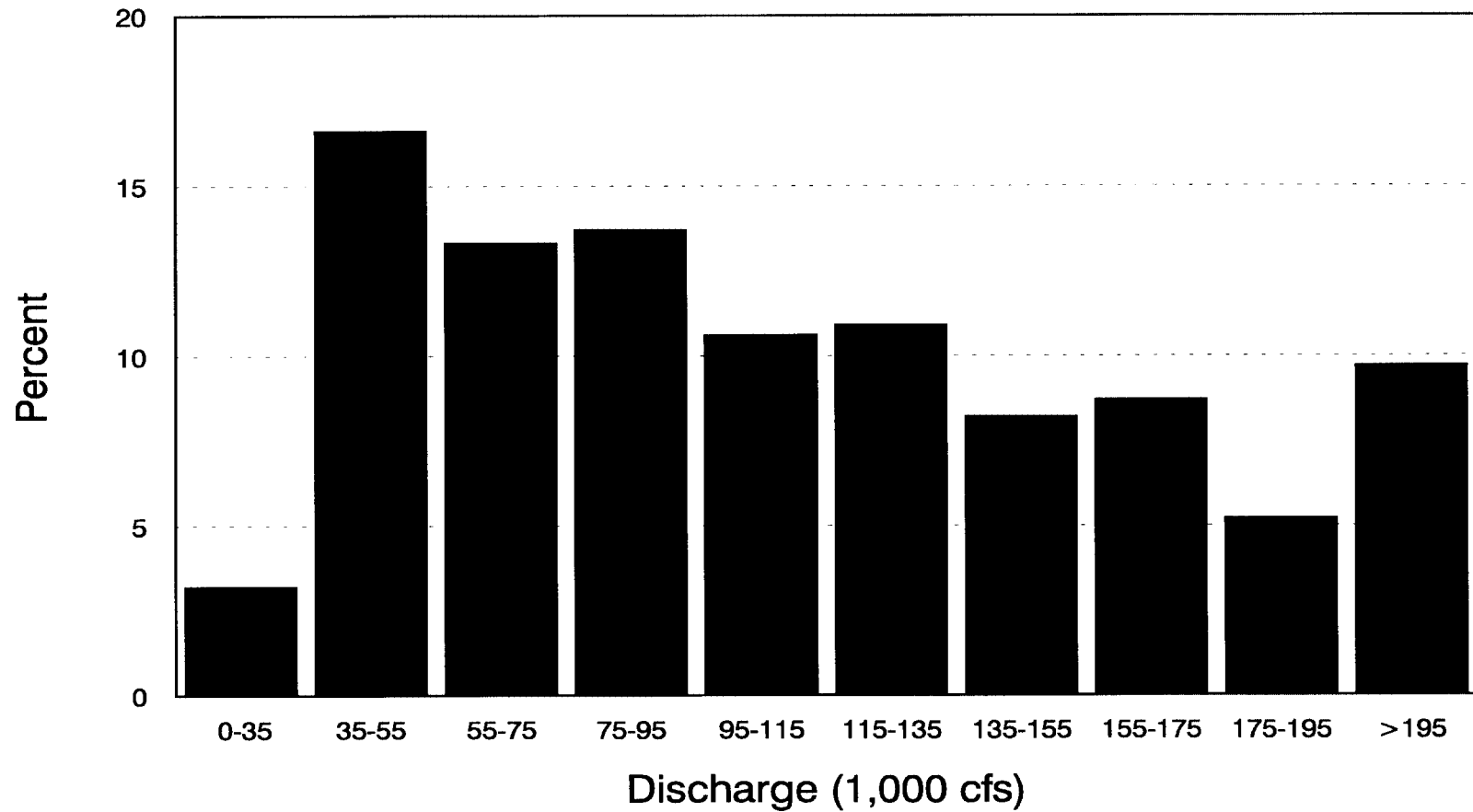
**Figure 19.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during January from 1939 to 1993

cfs = cubic feet per second



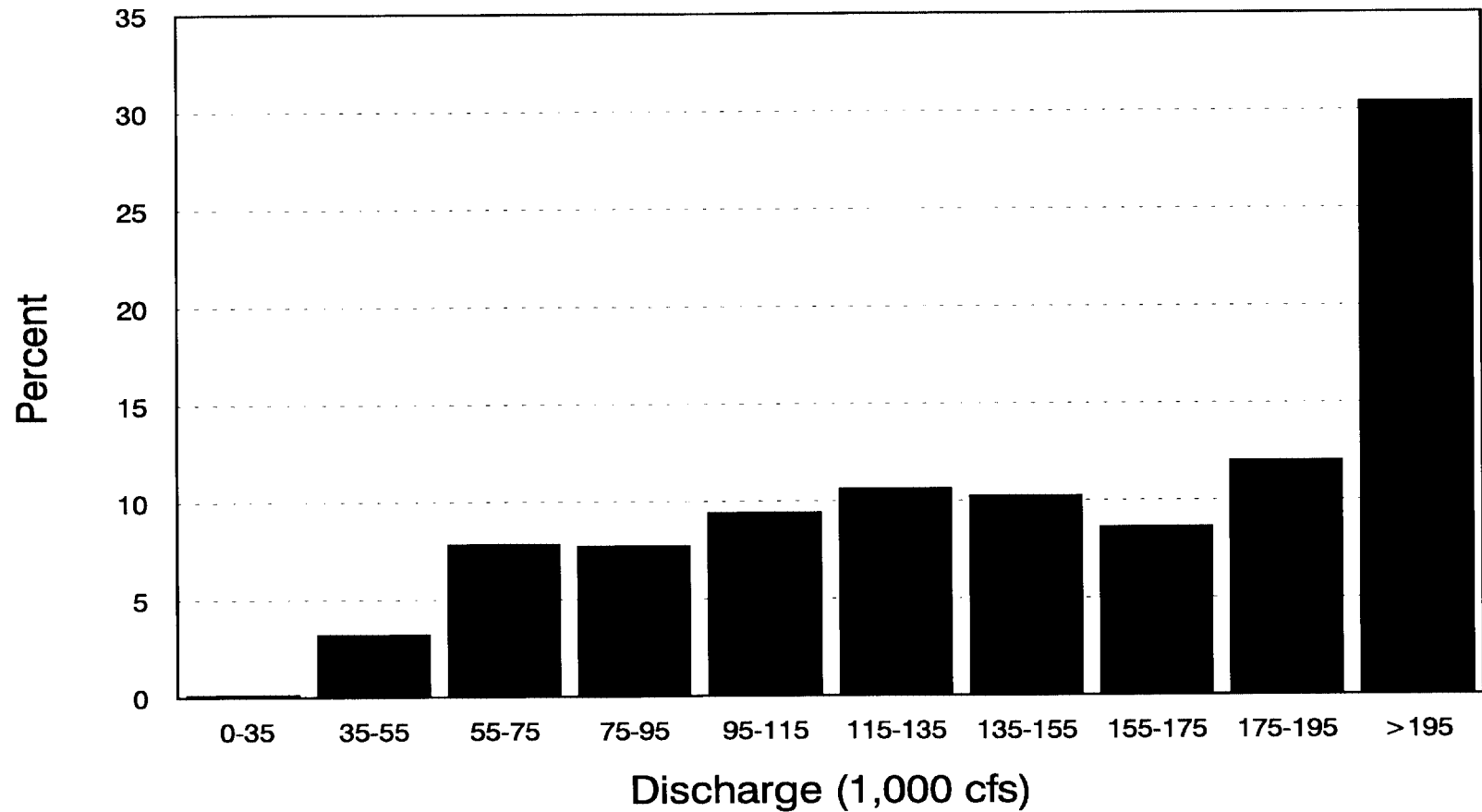
**Figure 20.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during February from 1939 to 1993

cfs = cubic feet per second



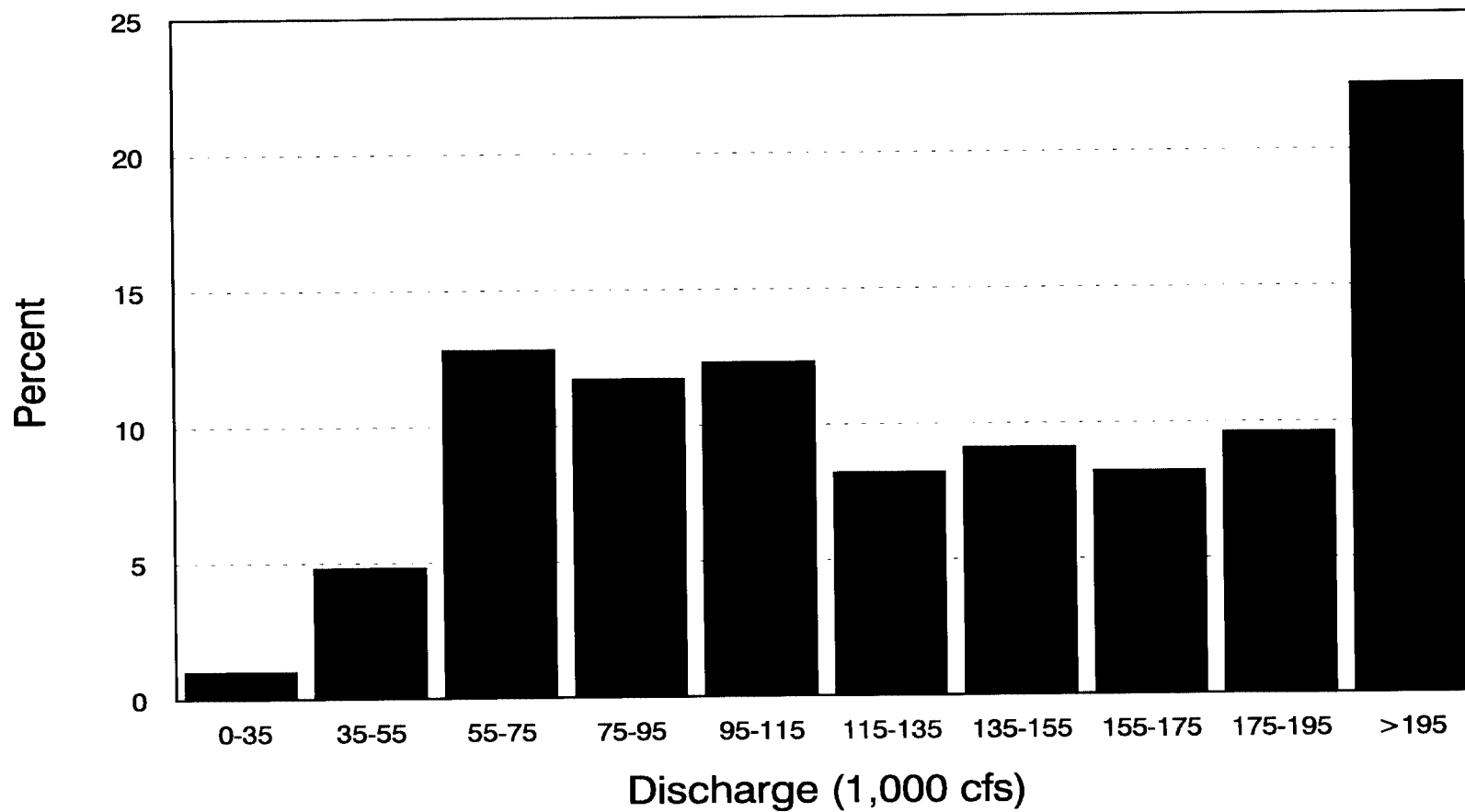
**Figure 21.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during March from 1939 to 1993

cfs = cubic feet per second



**Figure 22.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during April from 1939 to 1993

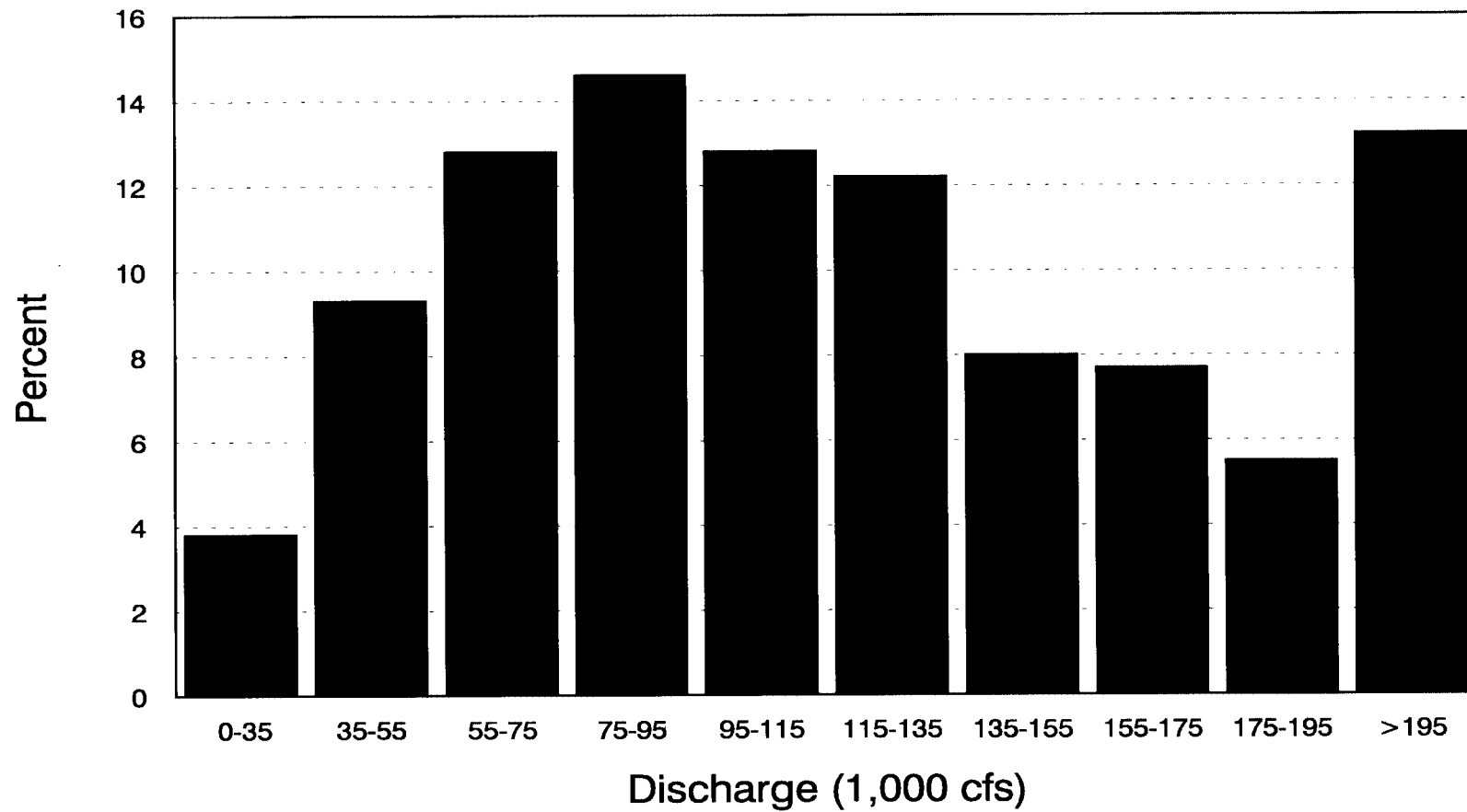
cfs = cubic feet per second



**Figure 23.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during May from 1939 to 1993

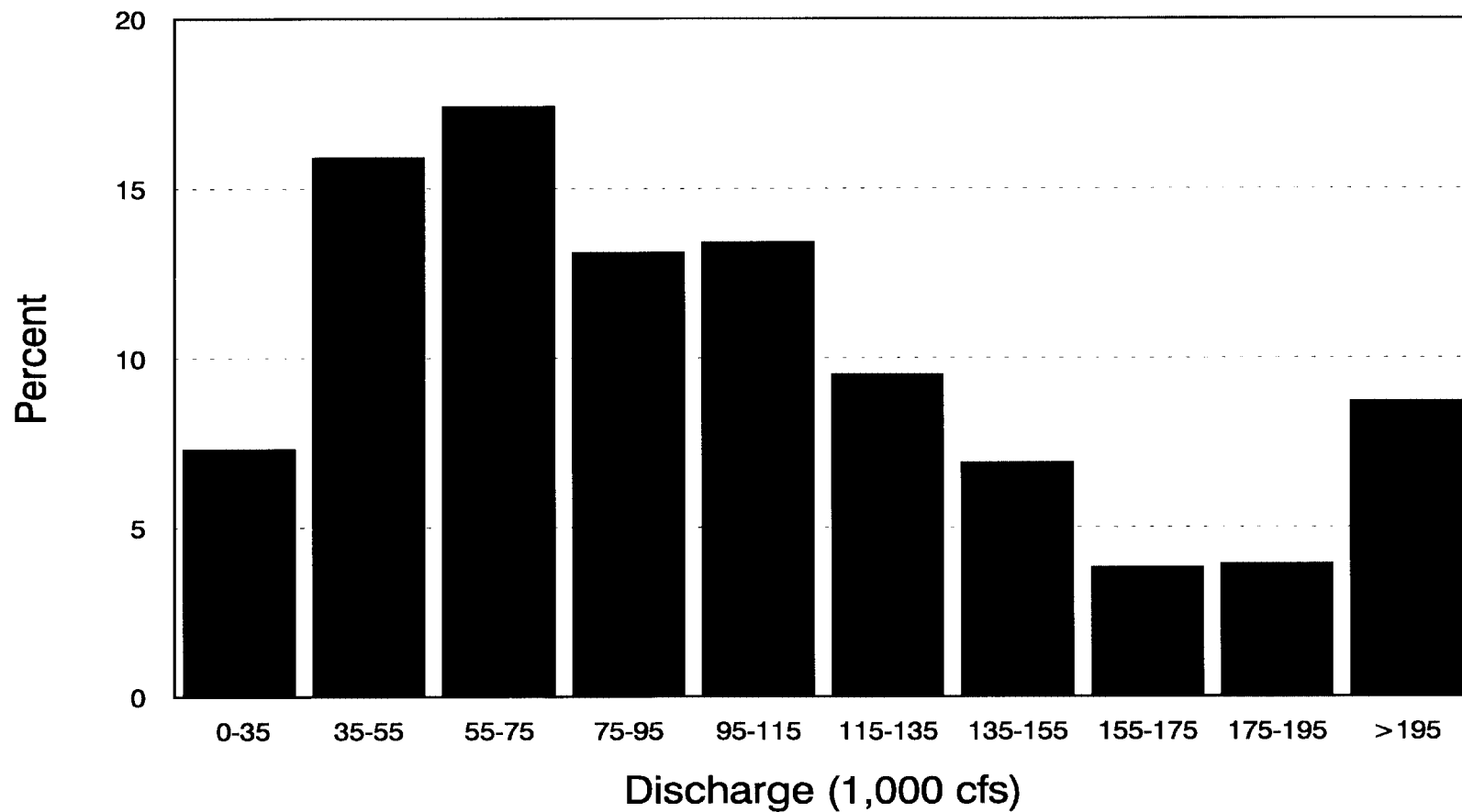
cfs = cubic feet per second





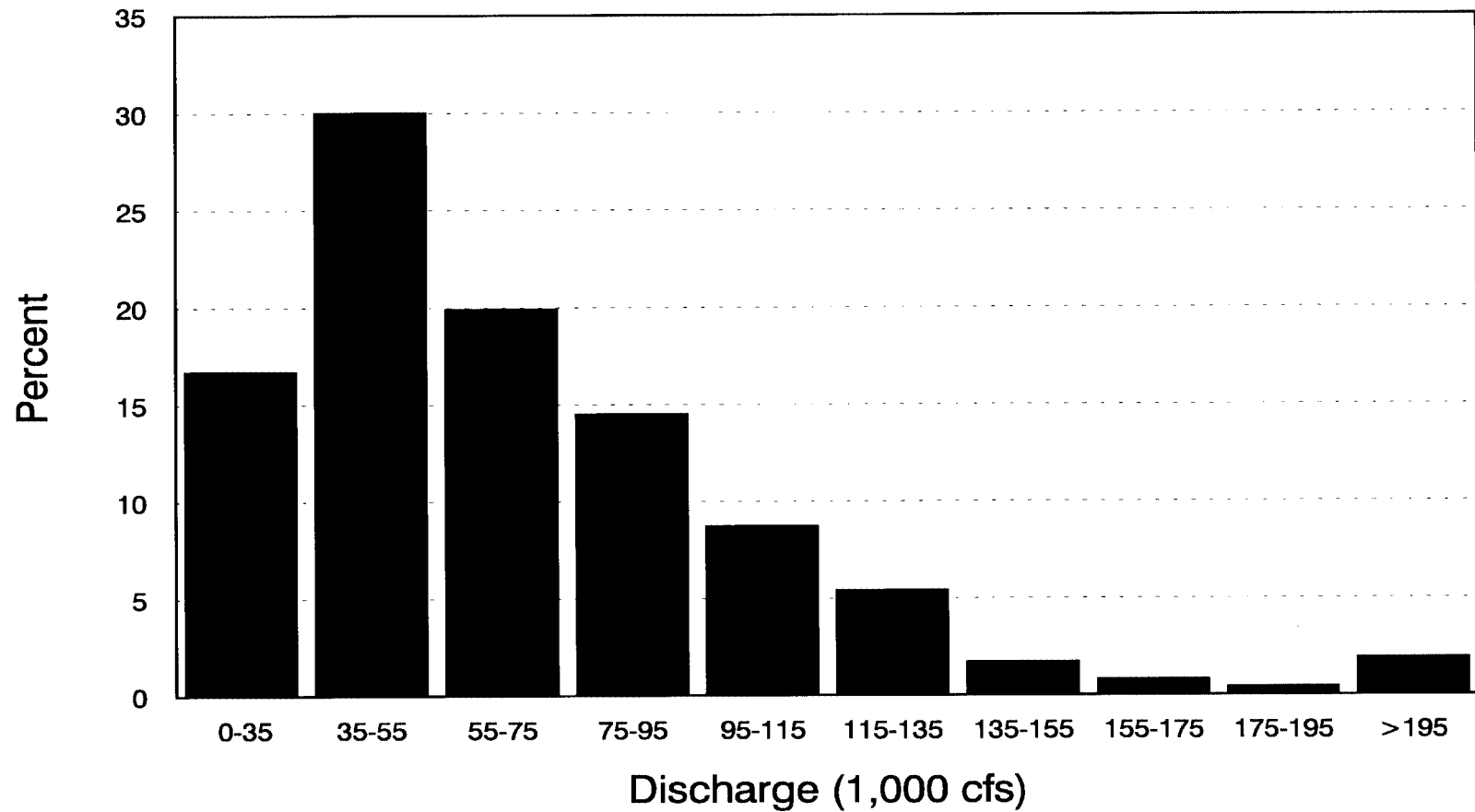
**Figure 24.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during June from 1939 to 1993

cfs = cubic feet per second



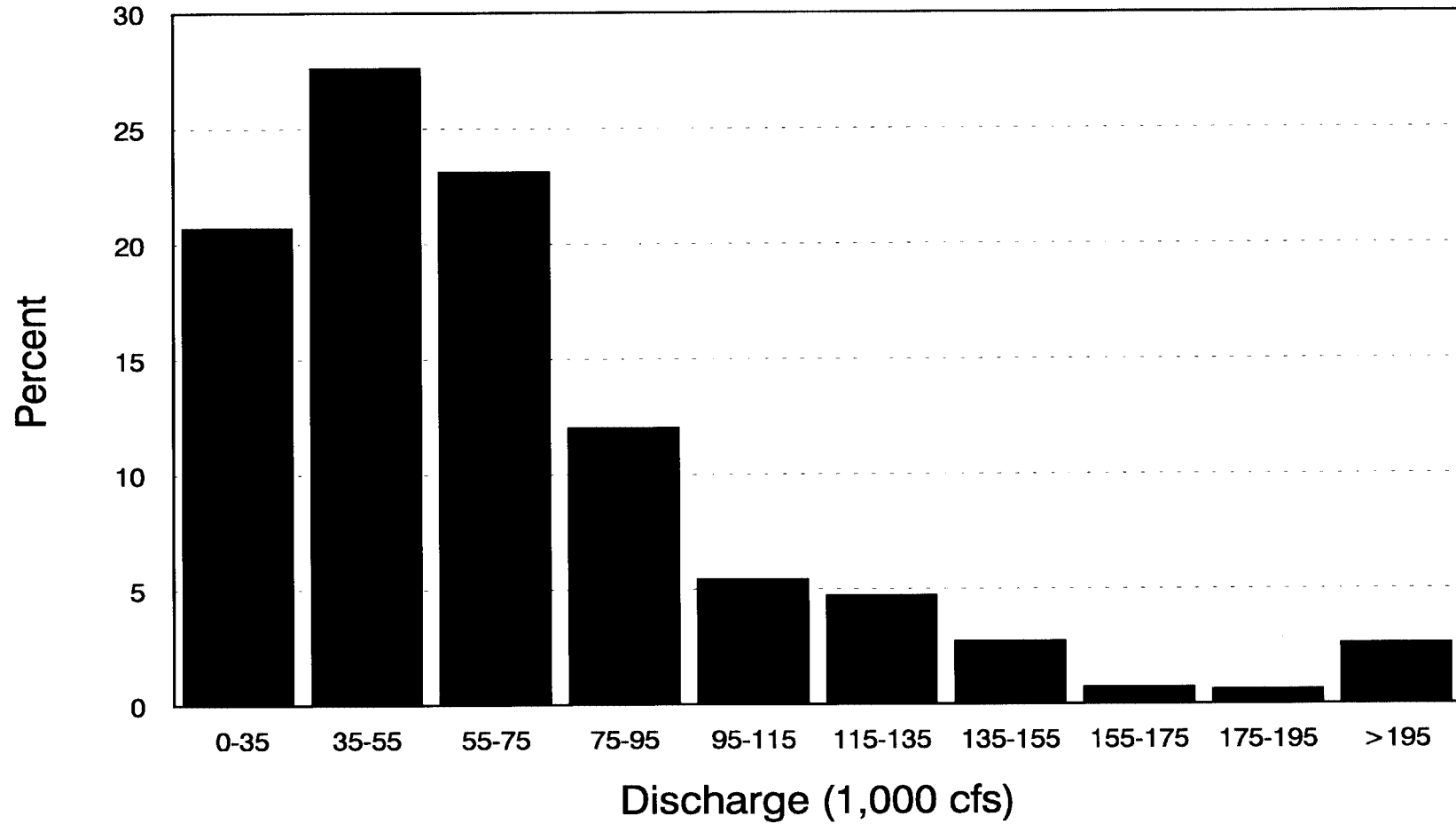
**Figure 25.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during July from 1939 to 1993

cfs = cubic feet per second



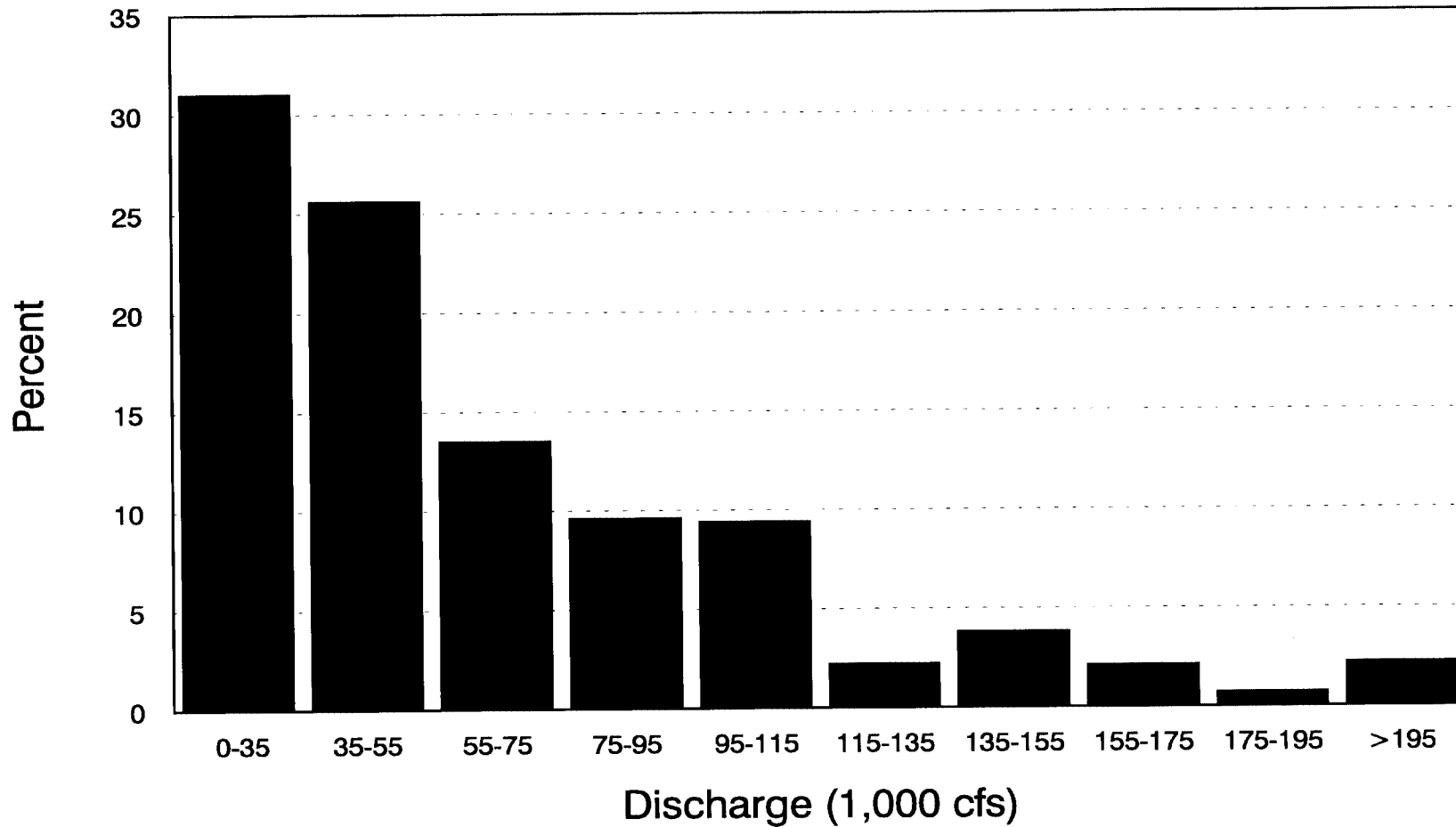
**Figure 26.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during August from 1939 to 1993

cfs = cubic feet per second



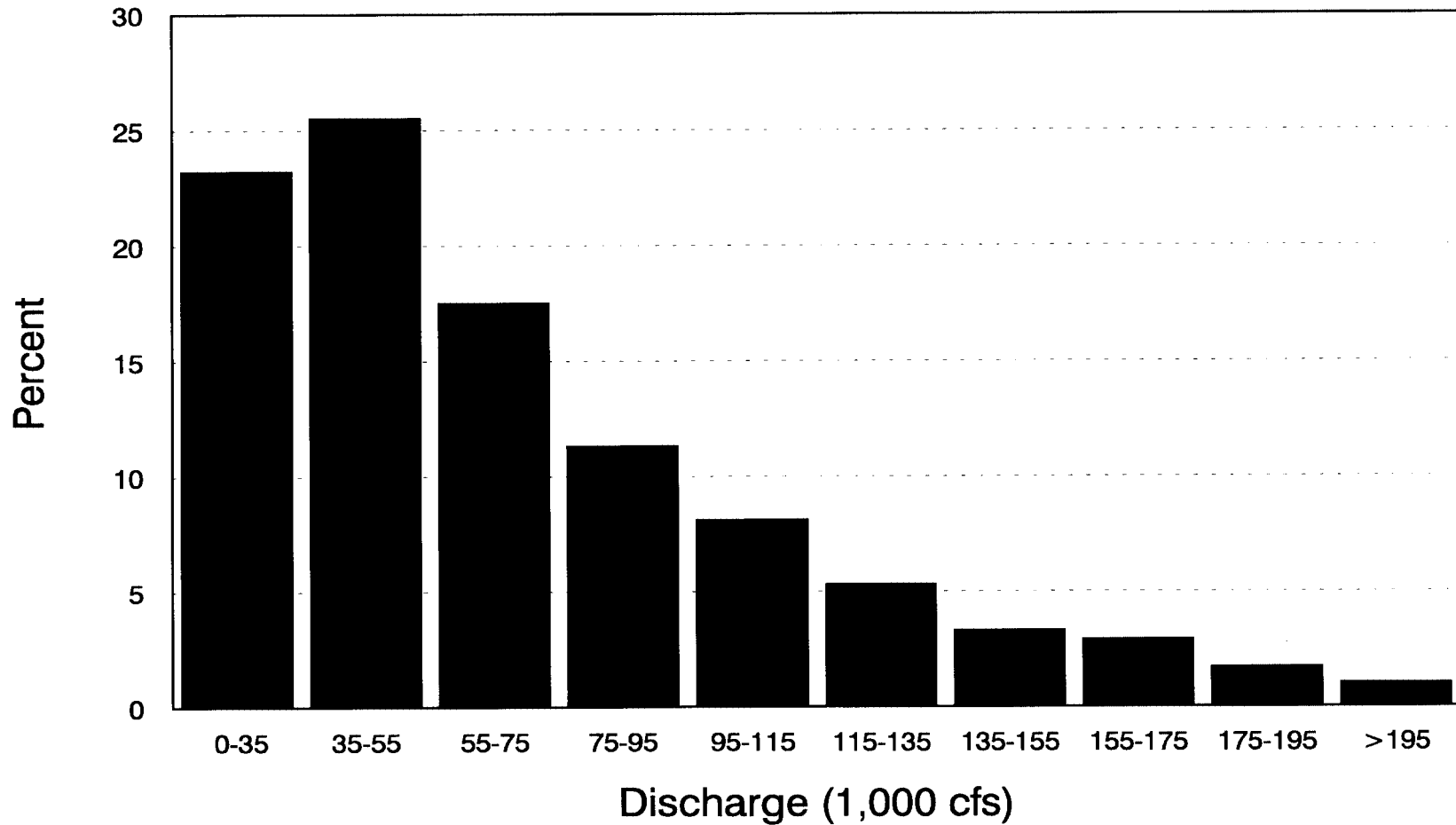
**Figure 27.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during September from 1939 to 1993

cfs = cubic feet per second



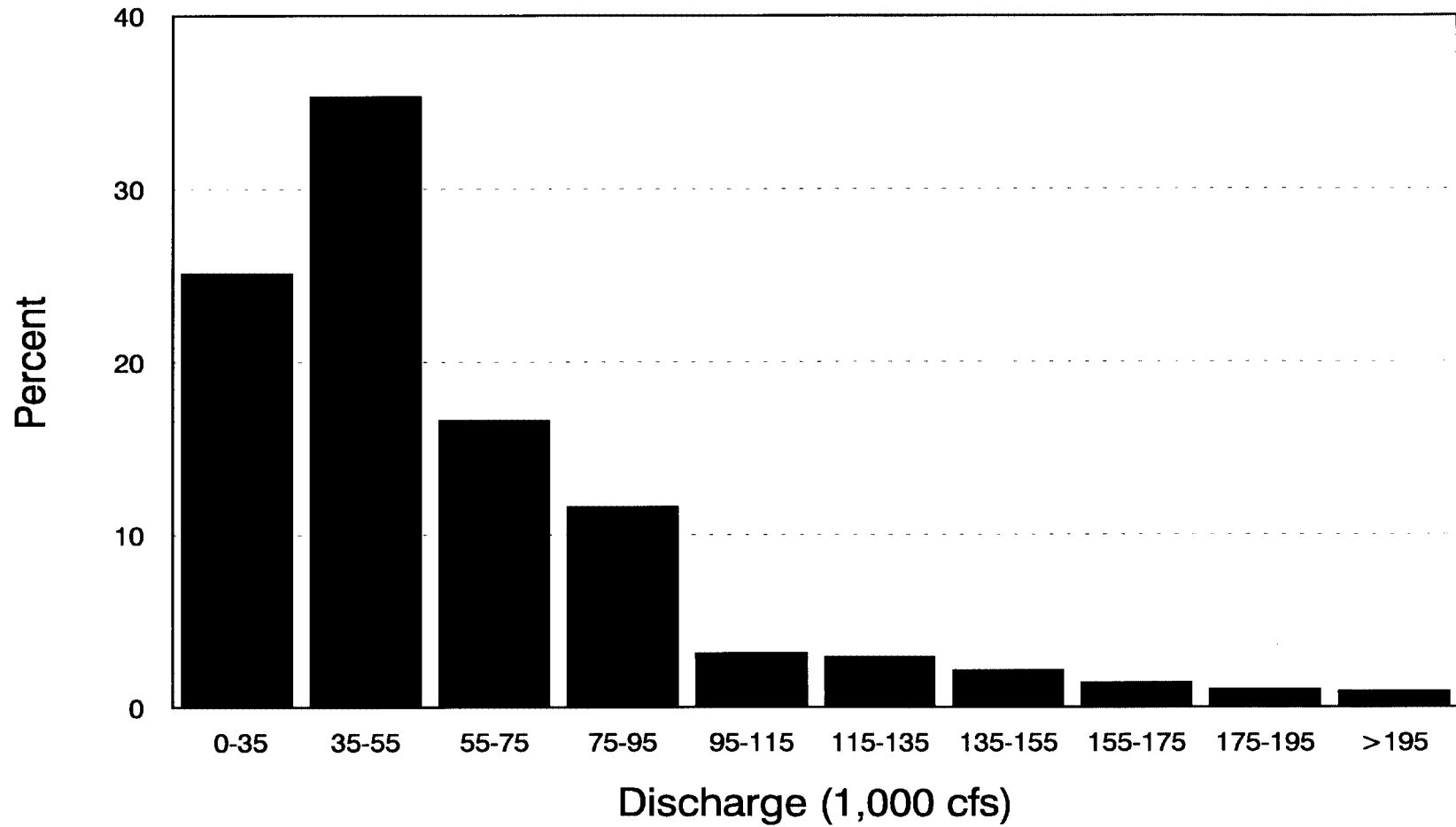
**Figure 28.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during October from 1939 to 1993

cfs = cubic feet per second



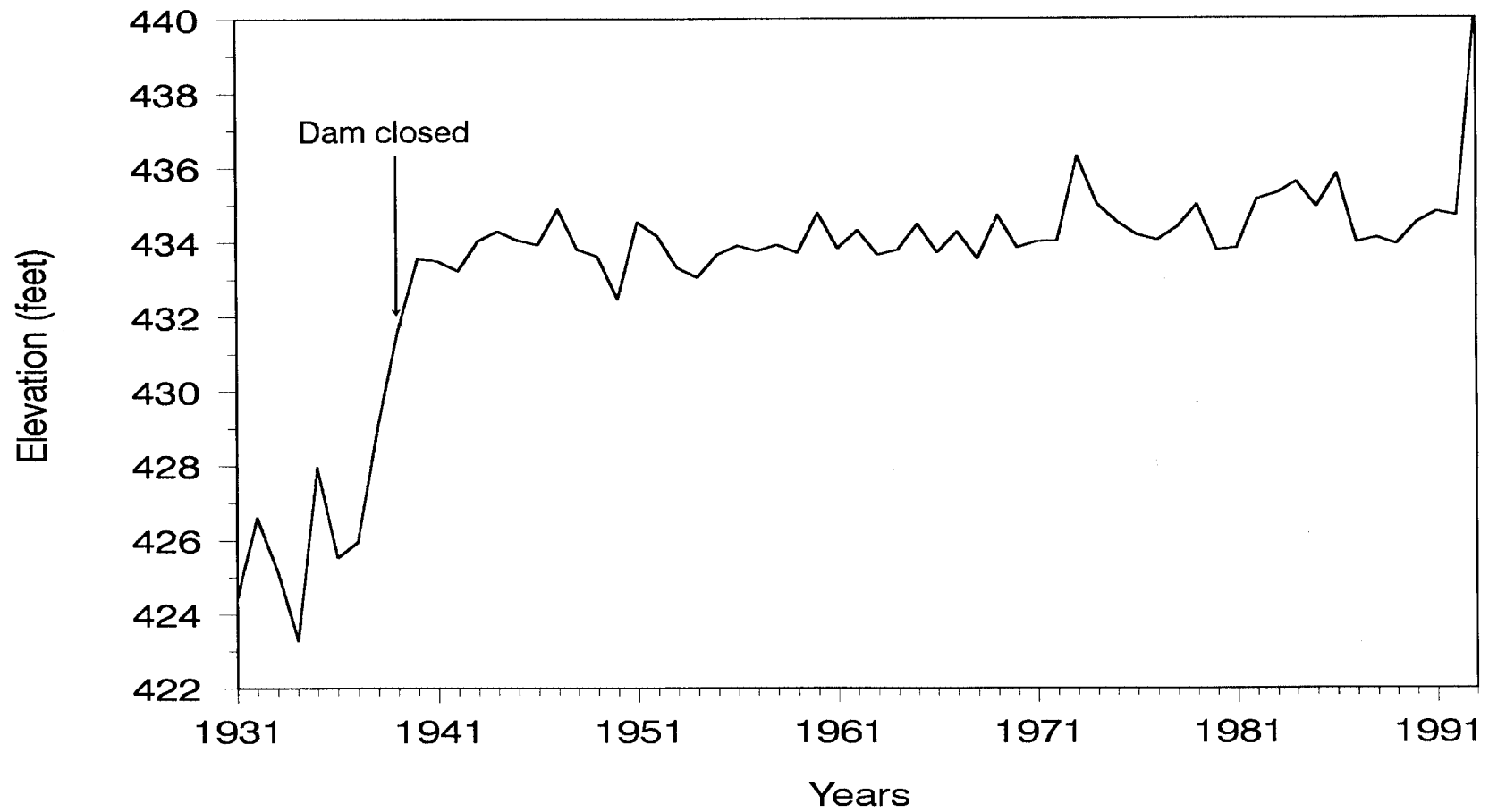
**Figure 29.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during November from 1939 to 1993

cfs = cubic feet per second



**Figure 30.** Percentage of time discharges were within certain ranges in the tailwater (river mile 241.2) of Upper Mississippi River System Pool 25 based on estimates of data collected during December from 1939 to 1993

cfs = cubic feet per second



**Figure 31.** Mean yearly water surface elevations at Sterling Landing (river mile 250.8), Upper Mississippi River System Pool 25



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13. ABSTRACT (Maximum 200 words)  Analysis of water level elevations and discharges was performed for Pool 25 on the Upper Mississippi River as part of a study to increase ecological benefits of the operation of Lock and Dam 25. This dam was placed in operation in May 1939. Since that time, the operating plan for managing water levels has undergone several changes. Discharges for Pool 25 were estimated using data from the closest gaging stations, with corrections accounting for changes in watershed area. Discharge estimates since 1939 were used to compute exceedence frequencies on a weekly, monthly, and yearly basis. They were also used to calculate the percentage of time discharges were within specified ranges for the three time scales. Water level measurements at five in-pool stations were used to calculate the percentage of time water levels were above specific elevations for the same three time scales. Only data for the period between 1952 and 1993 were used for this part of the analysis because different water level management plans were in use before 1952. The results of this work, along with a companion study, show the expected frequencies when alternative water level plans may be utilized and the amount of habitat that would be affected by alternative plans.			
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The Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System was authorized under the Water Resources Development Act of 1986 as an element of the Environmental Management Program. The mission of the LTRMP is to provide river managers with information for maintaining the Upper Mississippi River System as a sustainable large river ecosystem given its multiple-use character. The LTRMP is a cooperative effort by the National Biological Service, the U.S. Army Corps of Engineers, and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin.

