DES MOINES RIVER BASIN

05486000 NORTH RIVER NEAR NORWALK, IOWA

LOCATION.--Lat 41°27'28.5", long 93°39'17.1" referenced to North American Datum of 1927, in SW 1/4 NW 1/4 SW 1/4 sec.20, T.77 N., R.24 W., Warren County, IA, Hydrologic Unit 07100008, on left bank 10 ft downstream from bridge on County Highway R57, 1.7 mi southeast of Norwalk, 5.2 mi upstream from Middle Creek, 6.2 mi downstream from Badger Creek, and 22.8 mi upstream from mouth.

DRAINAGE AREA.--349 mi².

PERIOD OF RECORD.--Discharge records from February 1940 to current year.

GAGE.--Water-stage recorder. Datum of gage is 788.45 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to June 12, 1946, non-recording gage at same site and datum; January 7 to October 11, 1960, non-recording gage at site 2.1 mi upstream at different datum.

A summary of all available data for this streamgage is provided through the USGS National Water Information System web interface (NWISWeb). The following link provides access to current/historical observations, daily data, daily statistics, monthly statistics, annual statistics, peak streamflow, field measurements, field/lab water-quality samples, and the latest water-year summaries. Data can be filtered by parameter and/or dates, and can be output in various tabular and graphical formats.

http://waterdata.usgs.gov/nwis/inventory/?site_no=05486000

The USGS WaterWatch Toolkit is available at:

http://waterwatch.usgs.gov/?id=ww_toolkit

Tools for summarizing streamflow information include the duration hydrograph builder, the cumulative streamflow hydrograph builder, the streamgage statistics retrieval tool, the rating curve builder, the flood tracking chart builder, the National Weather Service Advanced Hydrologic Prediction Service (AHPS) river forecast hydrograph builder, and the raster-hydrograph builder. Entering the above number for this streamgage into these toolkit webpages will provide streamflow information specific to this streamgage.

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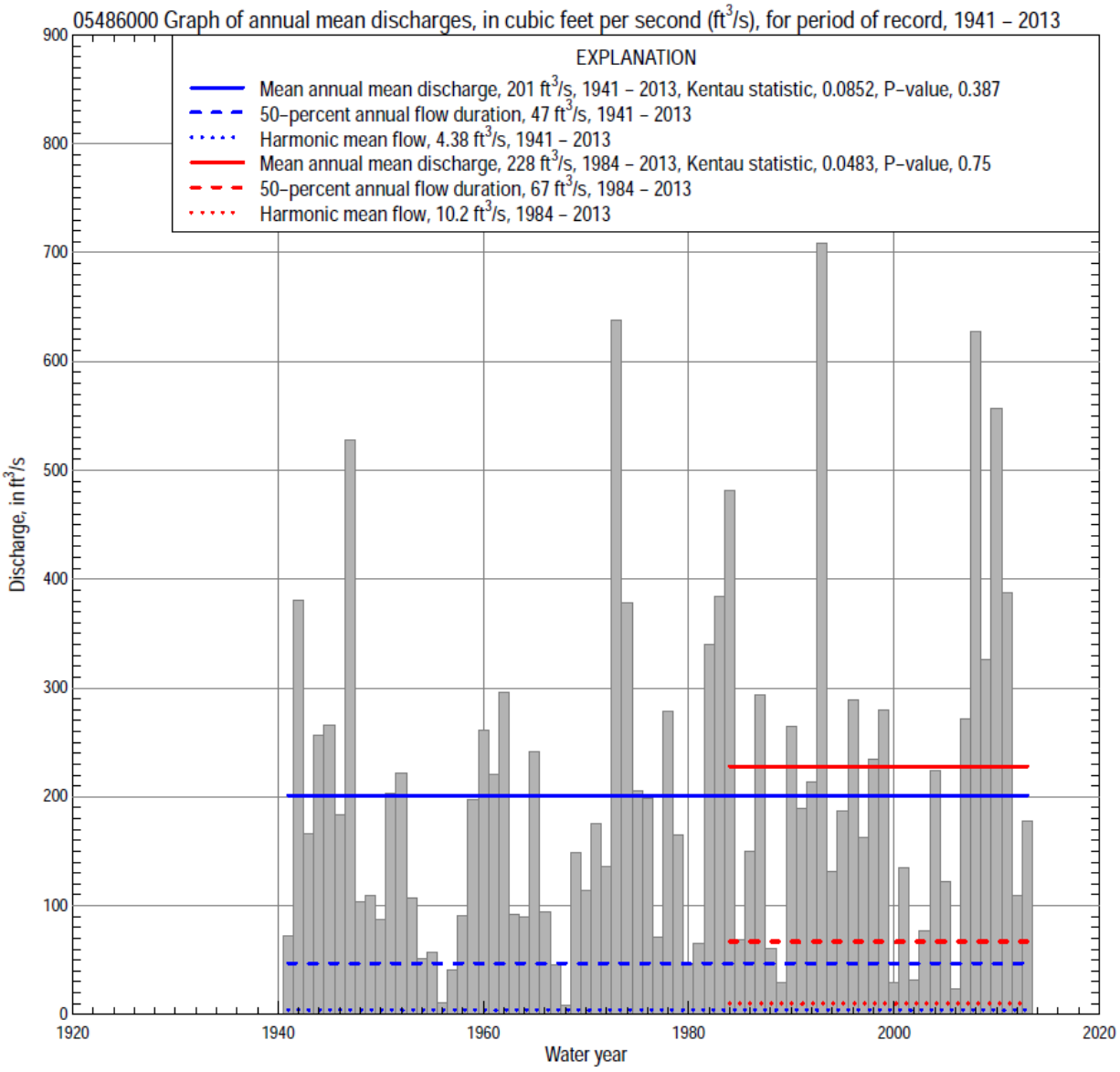
A description of the statistics presented for this streamgage is available in the main body of the report at:

http://dx.doi.org/10.3133/ofr20151214

A link to other streamgages included in this report, a map showing the location of the streamgages, information on the programs used to compute the statistical analyses, and references are included in the main body of the report.



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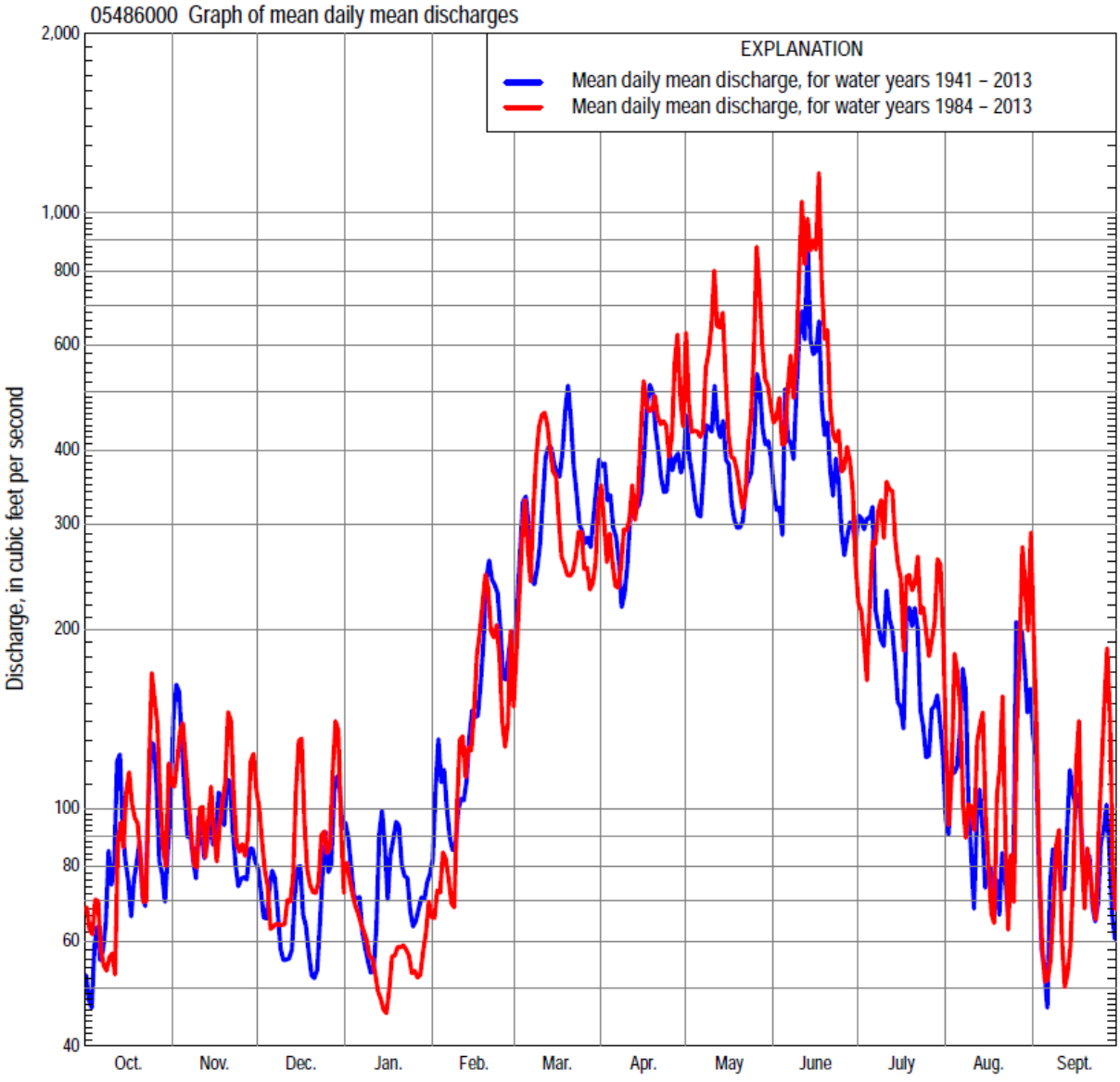

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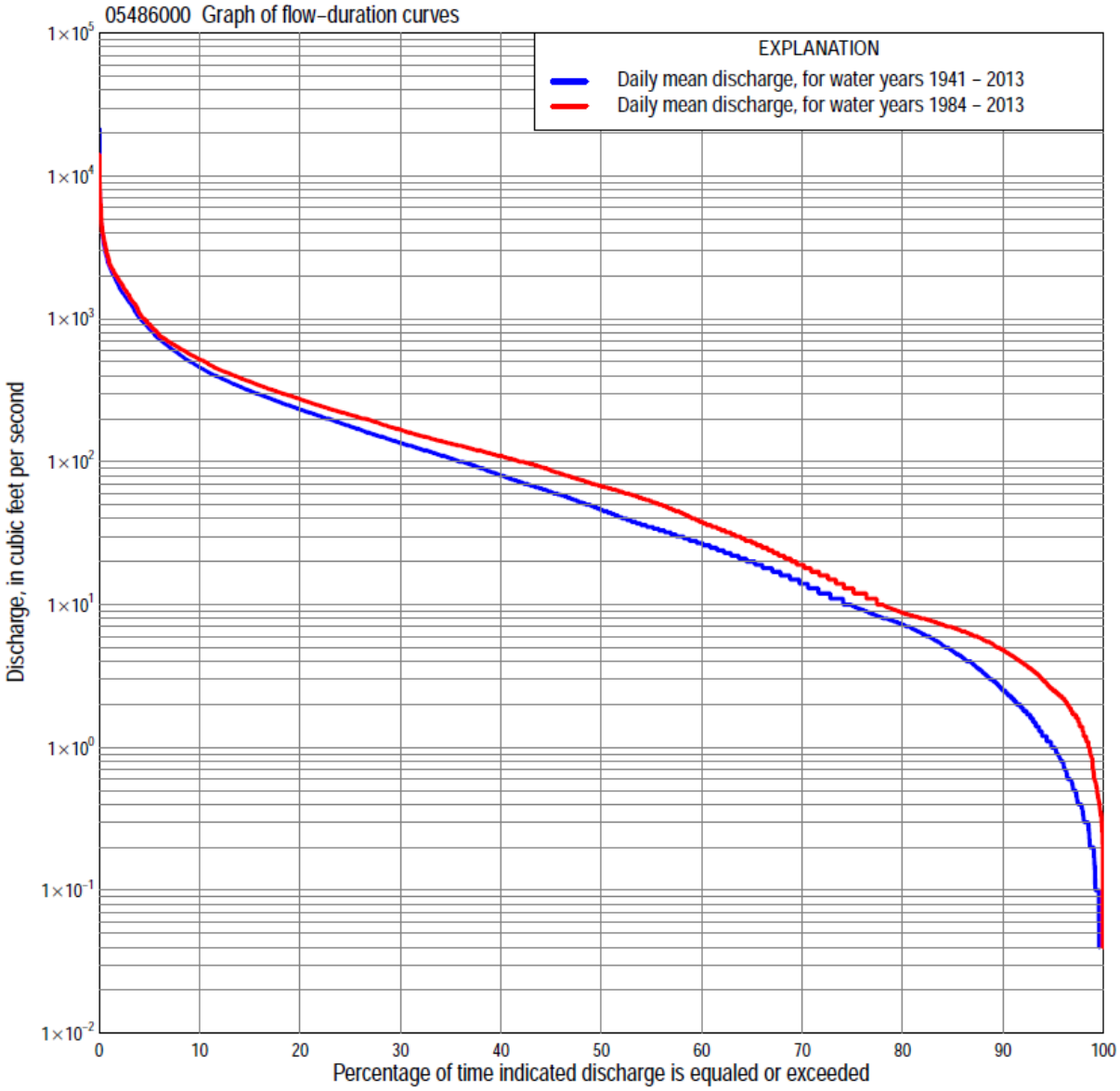

05486000 NORTH RIVER NEAR NORWALK, IOWA

Statistics Based on the Entire Streamflow Period of Record

05486000 Monthly and annual flow durations, based on 1941–2013 period of record (73 years)

Percentage of days discharge equaled or exceeded	Discharge (cubic feet per second)													Annual flow durations	
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Annual	Kentau statistic	P-value
99	0.00	0.20	0.40	0.30	1.0	3.0	1.5	1.2	0.80	0.11	0.00	0.00	0.20	0.120	0.120
98	0.10	0.40	0.50	0.40	1.1	4.0	4.2	2.7	1.5	0.30	0.15	0.10	0.33	0.138	0.078
95	0.20	0.80	1.2	1.1	2.1	7.2	7.4	5.2	4.4	1.6	0.47	0.33	1.0	0.138	0.081
90	0.40	1.6	2.0	1.8	4.0	11	17	9.7	12	5.6	1.6	0.66	2.6	0.134	0.094
85	0.92	2.4	2.8	3.3	6.6	19	26	24	22	8.0	3.4	1.2	4.8	0.124	0.121
80	1.5	5.1	4.1	4.8	9.2	32	36	39	36	11	4.7	2.0	7.4	0.114	0.154
75	3.0	7.4	6.0	6.6	14	45	48	64	53	17	6.0	3.3	10	0.111	0.165
70	4.9	10	8.0	8.0	21	61	62	88	66	23	7.8	4.5	14	0.099	0.217
65	6.3	13	10	10	26	75	80	112	83	28	9.9	6.1	20	0.100	0.214
60	8.0	17	13	13	31	96	102	136	103	37	12	7.7	27	0.092	0.251
55	11	21	16	17	39	115	129	165	126	45	16	9.2	35	0.109	0.173
50	15	25	20	21	50	139	162	203	149	58	20	11	47	0.110	0.169
45	21	30	26	27	60	173	204	242	175	74	24	16	62	0.121	0.132
40	28	35	35	34	78	214	232	280	211	89	32	22	81	0.111	0.167
35	33	45	45	43	100	250	269	321	255	110	42	30	107	0.113	0.157
30	42	69	65	60	123	295	312	373	311	137	53	39	136	0.122	0.127
25	56	110	81	75	150	350	371	431	389	169	66	51	179	0.126	0.115
20	74	150	108	100	190	436	455	517	486	212	86	72	234	0.121	0.130
15	117	191	135	126	230	574	604	652	711	286	117	103	316	0.123	0.124
10	197	260	171	160	350	763	822	902	1,030	415	188	169	460	0.096	0.232
5	348	408	256	250	650	1,410	1,450	1,580	1,740	868	394	362	860	0.051	0.526
2	713	680	438	500	1,100	2,140	2,380	2,430	3,140	1,900	1,200	812	1,690	0.033	0.682
1	1,230	1,020	700	870	1,500	3,000	3,400	3,130	4,900	2,360	1,780	1,400	2,370	0.064	0.424

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05486000 Annual exceedance probability of instantaneous peak discharges, in cubic feet per second (ft^3/s), based on the Weighted Independent Estimates method,

Annual exceed-ance probability	Recur-rence interval (years)	Discharge (ft^3/s)	95-percent lower confi-dence interval (ft^3/s)	95-percent upper confi-dence interval (ft^3/s)
0.500	2	3,610	2,960	4,400
0.200	5	7,300	5,990	8,900
0.100	10	10,500	8,500	12,900
0.040	25	15,200	12,000	19,200
0.020	50	18,600	14,300	24,300
0.010	100	22,100	16,300	29,800
0.005	200	27,100	19,300	38,100
0.002	500	30,900	20,800	45,700

and based on the expected moments algorithm/multiple Grubbs-Beck analysis computed using a historical period length of 74 years (1940–2013)

0.500	2	3,540	2,870	4,340
0.200	5	7,110	5,770	8,990
0.100	10	10,100	8,080	13,500
0.040	25	14,700	11,300	21,600
0.020	50	18,500	13,700	29,800
0.010	100	22,800	16,200	40,100
0.005	200	27,500	18,600	53,100
0.002	500	34,500	21,800	75,300

Kentau statistic	0.082
P-value	0.305
Begin year	1940
End year	2013
Number of peaks	74

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05486000 Annual exceedance probability of high discharges, based on 1941–2013 period of record (73 years)

Annual exceedance probability	Recurrence interval (years)	Maximum average discharge (ft^3/s) for indicated number of consecutive days				
		1	3	7	15	30
0.990	1.01	398	258	158	105	64
0.950	1.05	768	555	350	232	149
0.900	1.11	1,070	806	514	340	223
0.800	1.25	1,580	1,230	790	521	351
0.500	2	3,190	2,490	1,620	1,060	735
0.200	5	6,070	4,480	2,900	1,890	1,320
0.100	10	8,310	5,840	3,760	2,440	1,710
0.040	25	11,400	7,500	4,790	3,090	2,150
0.020	50	13,900	8,680	5,500	3,540	2,440
0.010	100	16,500	9,790	6,160	3,950	2,710
0.005	200	19,300	10,800	6,770	4,340	2,950
0.002	500	23,000	12,100	7,510	4,800	3,240
Kentau statistic		0.063	0.081	0.084	0.108	0.126
P-value		0.432	0.315	0.293	0.178	0.115

05486000 Annual nonexceedance probability of low discharges, based on April 1940 to March 2013 period of record (73 years)

Annual nonexceedance probability	Recurrence interval (years)	Minimum average discharge (ft^3/s) for indicated number of consecutive days								
		1	3	7	14	30	60	90	120	183
0.01	100	0.00	0.00	0.00	0.00	0.00	0.10	0.15	0.20	0.50
0.02	50	0.00	0.00	0.00	0.00	0.03	0.18	0.28	0.37	0.86
0.05	20	0.00	0.00	0.00	0.03	0.16	0.42	0.67	0.89	1.9
0.10	10	0.05	0.07	0.13	0.18	0.39	0.87	1.4	1.9	3.7
0.20	5	0.27	0.33	0.46	0.58	1.0	2.0	3.3	4.3	7.8
0.50	2	1.9	2.2	2.6	3.3	5.0	8.8	14	19	30
0.80	1.25	10	10	11	14	21	33	51	65	97
0.90	1.11	21	22	23	28	41	62	92	116	169
0.96	1.04	44	45	49	54	81	116	165	204	292
0.98	1.02	71	72	77	82	123	170	234	286	408
0.99	1.01	107	108	115	115	176	237	315	379	541
Kentau statistic		0.191	0.199	0.213	0.209	0.175	0.123	0.084	0.091	0.043
P-value		0.017	0.013	0.008	0.009	0.028	0.126	0.293	0.259	0.590

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05486000 Annual nonexceedance probability of seasonal low discharges, based on April 1940 to September 2013 period of record (73–74 years)

Annual nonexceed-ance probability	Recur-rence interval (years)	Minimum average discharge (cubic feet per second) for indicated number of consecutive days							
		1	7	14	30	1	7	14	30
		January-February-March				April-May-June			
0.01	100	0.16	0.18	0.22	0.32	0.08	0.26	0.43	1.1
0.02	50	0.26	0.31	0.37	0.57	0.20	0.53	0.85	2.0
0.05	20	0.56	0.68	0.80	1.3	0.71	1.5	2.3	4.9
0.10	10	1.1	1.3	1.6	2.6	2.0	3.4	5.0	10
0.20	5	2.3	2.8	3.4	5.7	5.9	8.6	12	23
0.50	2	8.9	11	13	23	33	39	54	93
0.80	1.25	32	39	47	75	113	131	179	291
0.90	1.11	59	73	86	132	183	220	303	482
0.96	1.04	110	134	159	230	272	353	492	772
0.98	1.02	163	197	231	321	334	460	650	1,010
0.99	1.01	230	273	321	426	389	569	814	1,270
Kentau statistic		0.109	0.093	0.104	0.055	0.191	0.195	0.196	0.176
P-value		0.173	0.247	0.195	0.496	0.016	0.014	0.014	0.027
		July-August-September				October-November-December			
0.01	100	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.07
0.02	50	0.00	0.00	0.01	0.17	0.00	0.00	0.02	0.14
0.05	20	0.00	0.00	0.10	0.39	0.02	0.07	0.15	0.36
0.10	10	0.13	0.21	0.29	0.81	0.16	0.28	0.43	0.83
0.20	5	0.48	0.70	0.86	1.9	0.64	0.93	1.3	2.2
0.50	2	3.0	3.8	5.0	8.9	4.8	6.1	7.9	12
0.80	1.25	14	16	22	37	24	30	38	52
0.90	1.11	28	33	41	74	51	63	79	107
0.96	1.04	57	67	77	151	105	131	163	217
0.98	1.02	88	99	111	236	161	204	253	336
0.99	1.01	128	138	149	346	232	298	369	487
Kentau statistic		0.167	0.156	0.137	0.068	0.094	0.095	0.101	0.106
P-value		0.036	0.049	0.085	0.393	0.243	0.236	0.207	0.187

05486000 NORTH RIVER NEAR NORWALK, IOWA

Statistics Based on the 1984–2013 Streamflow Period of Record

05486000 Monthly and annual flow durations, based on 1984–2013 period of record (30 years)

Percentage of days discharge equaled or exceeded	Discharge (cubic feet per second)													Annual flow durations	
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Annual	Kentau statistic	P-value
99	0.28	0.59	1.9	1.6	1.7	4.9	6.8	6.0	3.8	2.1	0.35	0.33	0.69	-0.044	0.745
98	0.54	1.1	2.1	2.1	2.1	7.4	7.2	6.9	4.5	2.9	0.44	0.43	1.3	-0.023	0.871
95	1.0	2.1	2.5	2.8	3.4	8.6	8.9	11	8.1	5.6	1.3	0.84	2.5	-0.062	0.641
90	1.7	3.8	3.7	4.3	7.6	15	23	29	19	7.7	3.1	1.4	4.8	-0.067	0.617
85	3.0	5.6	5.0	6.0	12	30	37	66	37	9.8	4.2	2.0	6.9	-0.039	0.775
80	4.0	7.2	6.9	7.9	17	45	51	102	60	16	5.1	3.2	8.8	-0.044	0.747
75	5.4	9.4	8.1	9.3	24	59	69	127	80	23	6.2	4.1	13	-0.039	0.775
70	6.0	12	9.3	12	31	75	94	152	100	31	7.4	5.7	19	-0.044	0.748
65	7.1	16	12	14	38	95	117	190	123	44	10	6.7	27	-0.048	0.721
60	8.7	18	14	18	48	116	141	219	148	61	14	7.8	38	-0.046	0.734
55	12	22	20	25	56	130	185	263	172	78	21	9.2	53	-0.030	0.830
50	16	27	37	33	64	156	220	299	211	92	29	11	67	-0.028	0.844
45	21	36	50	38	75	180	249	337	251	111	40	15	87	0.000	1.000
40	28	62	66	52	90	207	281	380	310	133	49	22	110	0.002	1.000
35	34	79	79	64	105	239	320	426	367	154	58	28	134	0.009	0.957
30	54	113	96	73	122	269	383	486	430	186	65	36	168	0.023	0.872
25	63	145	112	96	143	308	455	552	518	221	79	49	213	0.067	0.617
20	80	175	132	110	172	368	586	652	632	288	98	70	275	0.078	0.556
15	140	211	150	128	213	472	713	818	870	390	132	105	364	0.115	0.382
10	267	269	196	148	270	662	955	1,080	1,500	583	230	174	520	0.113	0.392
5	416	385	281	190	510	1,090	1,390	1,990	2,300	1,110	446	386	916	0.076	0.568
2	739	586	438	240	950	2,010	2,100	2,870	4,170	1,970	1,290	805	1,850	0.122	0.354
1	1,290	830	700	290	1,400	2,650	2,880	3,860	6,860	2,360	2,250	1,400	2,450	0.152	0.246

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05486000 Annual exceedance probability of high discharges, based on 1984–2013 period of record (30 years)

Annual exceedance probability	Recurrence interval (years)	Maximum average discharge (ft^3/s) for indicated number of consecutive days				
		1	3	7	15	30
0.990	1.01	259	199	136	101	70
0.950	1.05	591	469	308	222	155
0.900	1.11	892	714	463	328	231
0.800	1.25	1,430	1,140	735	512	362
0.500	2	3,270	2,550	1,630	1,110	784
0.200	5	6,800	4,980	3,270	2,170	1,520
0.100	10	9,610	6,730	4,510	2,970	2,070
0.040	25	13,500	8,970	6,180	4,040	2,780
0.020	50	16,600	10,600	7,460	4,850	3,310
0.010	100	19,800	12,200	8,750	5,670	3,830
0.005	200	23,100	13,700	10,000	6,490	4,350
0.002	500	27,600	15,600	11,700	7,560	5,020
Kentau statistic		0.122	0.108	0.122	0.131	0.149
P-value		0.354	0.412	0.354	0.318	0.254

05486000 Annual nonexceedance probability of low discharges, based on April 1983 to March 2013 period of record (30 years)

Annual nonexceedance probability	Recurrence interval (years)	Minimum average discharge (ft^3/s) for indicated number of consecutive days								
		1	3	7	14	30	60	90	120	183
0.01	100	0.00	0.00	0.07	0.13	0.22	0.31	0.56	0.84	0.94
0.02	50	0.00	0.00	0.12	0.20	0.35	0.49	0.87	1.3	1.5
0.05	20	0.07	0.10	0.27	0.42	0.69	1.0	1.7	2.4	2.9
0.10	10	0.26	0.34	0.54	0.77	1.2	1.8	2.9	4.1	5.2
0.20	5	0.76	0.91	1.2	1.6	2.4	3.6	5.5	7.7	10
0.50	2	3.8	4.2	4.8	5.9	8.5	13	18	24	34
0.80	1.25	15	16	18	20	28	41	56	73	105
0.90	1.11	28	30	33	36	49	72	99	127	183
0.96	1.04	53	57	61	68	90	129	175	223	323
0.98	1.02	78	84	90	100	132	186	251	318	460
0.99	1.01	108	117	125	140	184	255	345	434	626
Kentau statistic		0.078	0.069	0.053	0.057	-0.005	-0.034	-0.080	-0.067	-0.094
P-value		0.556	0.605	0.695	0.669	0.986	0.803	0.544	0.617	0.475

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05486000 Annual nonexceedance probability of seasonal low discharges, based on October 1983 to September 2013 period of record (30 years)

Annual nonexceed-ance probability	Recur-rence interval (years)	Minimum average discharge (cubic feet per second) for indicated number of consecutive days							
		1	7	14	30	1	7	14	30
		January-February-March				April-May-June			
0.01	100	0.46	0.60	0.89	1.1	0.75	1.0	1.4	2.8
0.02	50	0.71	0.92	1.3	1.7	1.4	1.8	2.5	4.8
0.05	20	1.3	1.7	2.3	3.2	3.1	4.1	5.6	10
0.10	10	2.3	2.9	3.8	5.5	6.2	7.9	11	20
0.20	5	4.2	5.3	6.7	10	14	17	24	41
0.50	2	13	16	19	29	50	60	85	141
0.80	1.25	35	44	51	73	145	174	249	400
0.90	1.11	56	71	82	112	233	282	401	640
0.96	1.04	91	118	135	170	365	446	630	1,000
0.98	1.02	122	161	183	218	473	584	820	1,310
0.99	1.01	158	211	239	269	585	730	1,020	1,620
Kentau statistic		-0.133	-0.099	-0.080	-0.117	0.186	0.166	0.177	0.163
P-value		0.309	0.454	0.544	0.372	0.154	0.205	0.175	0.212
		July-August-September				October-November-December			
0.01	100	0.12	0.23	0.28	0.36	0.00	0.09	0.19	0.41
0.02	50	0.18	0.32	0.39	0.52	0.00	0.17	0.31	0.64
0.05	20	0.34	0.54	0.66	0.92	0.13	0.39	0.67	1.2
0.10	10	0.60	0.88	1.1	1.5	0.47	0.81	1.3	2.2
0.20	5	1.2	1.6	2.0	3.0	1.4	1.9	2.8	4.3
0.50	2	4.8	5.8	6.9	11	6.8	8.4	11	16
0.80	1.25	20	23	27	47	27	32	39	55
0.90	1.11	42	48	57	104	51	62	73	104
0.96	1.04	94	112	132	252	96	120	138	205
0.98	1.02	161	197	232	453	142	179	205	317
0.99	1.01	261	332	389	779	197	253	289	467
Kentau statistic		0.021	0.011	0.021	-0.016	-0.014	-0.044	-0.053	-0.039
P-value		0.886	0.943	0.887	0.915	0.929	0.748	0.695	0.775