Water-Data Report 2010

05485500 Des Moines River below Raccoon River at Des Moines, IA

Des Moines Basin
Lake Red Rock Subbasin

LOCATION.--Lat 41°34′40″, long 93°36′19″ referenced to North American Datum of 1927, in SW ¼ SW ¼ NE ¼ sec.10, T.78 N., R.24 W., Polk County, IA, Hydrologic Unit 07100008, on left bank 40 ft downstream from bridge on Southeast 6th Street in Des Moines, 0.4 mi downstream from Raccoon River and Scott Street Dam, and 201.0 mi upstream from mouth.

DRAINAGE AREA.--9,879 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--April 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1943 (P). WDR-US-2007: Location.

GAGE.--Water-stage recorder. Datum of gage is 762.52 ft above National Geodetic Vertical Datum of 1929. Prior to October 1, 1951, water-stage recorder upstream from Scott Street Dam (0.4 mi upstream from current site) at datum 11.16 ft higher; October 1, 1951, to September 30, 1953, water-stage recorder at Southeast 14th Street (0.5 mi downstream from current site) at current datum; October 1, 1953, to September 30, 1959, water-stage recorder upstream from Scott Street Dam at datum 11.16 ft higher; October 1, 1959, to September 30, 1961, nonrecording gage at current site and datum; October 1, 1961, to April 24, 1997, water-stage recorder at Southeast 14th Street at current datum.

COOPERATION.--Average monthly pumpage from galleries provided by Des Moines Water Works.

REMARKS.--Records good except for estimated daily discharges, which are poor. Des Moines municipal water supply is taken from infiltration galleries on Raccoon River, 3.5 mi upstream from station. At times, water is pumped from Raccoon River into recharge basins or into Waterworks Reservoir, capacity 4,800 acre-ft. Effluent from sewage treatment plant enters the river 2.3 mi downstream from station. Net effect of diversions not known. Flow regulated by Saylorville Lake (station 05481630), 12.7 mi upstream, since April 12, 1977. U.S. Army Corps of Engineers rain gage, U.S. Geological Survey data collection platform with satellite telemetry, and U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharges, 116,000 ft^3/s, July 11, 1993, gage height 34.29 ft, at Southeast 14th Street site at current datum; 104,000 ft^3/s, June 13, 2008, gage height 35.55 ft, at current site and datum; minimum daily discharge, 26 ft^3/s, January 16-29, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 31, 1903, reached a stage of 20.9 ft, from flood profile, at Scott Street site and datum, from the office of the Des Moines City Engineer.

05485500 Des Moines River below Raccoon River at Des Moines, IA—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	753	18,100	7,110	e2,750	e3,340	2,670	26,400	13,200	10,500	47,200	29,200	11,600
2	958	18,600	6,940	e2,650	e3,100	2,660	25,900	15,000	14,600	56,400	29,300	12,400
3	1,560	16,900	6,530	e2,650	e3,050	2,650	23,800	14,400	12,900	53,800	31,400	12,500
4	1,700	15,900	5,960	e2,610	e2,970	2,630	20,700	13,700	9,720	47,600	35,000	11,400
5	1,820	15,500	5,450	e2,650	e2,990	2,650	21,500	13,200	9,710	43,200	36,200	10,300
6	2,010	15,000	5,010	e2,650	e3,090	2,730	22,100	12,800	10,300	39,300	31,400	9,780
7	1,870	13,900	e4,700	e2,650	e3,120	3,330	24,600	12,300	10,600	34,300	25,700	9,370
8	1,780	12,300	e4,730	e2,590	e3,580	4,350	22,900	11,100	11,200	33,300	22,000	8,890
9	1,500	10,300	e3,700	e2,500	e3,050	7,280	21,600	10,800	13,100	32,700	33,100	8,240
10	1,410	8,470	e2,760	e2,530	e2,150	e14,600	20,600	10,600	14,100	30,400	38,100	7,450
11	1,360	8,050	e2,150	e2,520	e2,660	23,900	19,800	10,900	17,700	29,000	41,100	6,390
12	1,300	7,390	e1,800	e2,550	e2,930	31,000	19,000	11,100	24,200	27,900	37,600	5,860
13	1,280	6,910	e2,170	e2,650	e2,860	36,000	18,200	14,800	29,100	27,100	38,700	5,980
14	1,300	7,070	e2,610	e2,790	e2,830	40,600	17,400	15,400	30,300	26,800	41,000	5,930
15	1,510	6,880	e2,880	e2,550	e2,840	44,200	17,500	15,800	28,100	23,300	40,400	5,530
16	1,640	6,550	e3,120	e2,520	3,050	47,500	18,300	16,900	25,800	21,800	36,800	4,980
17	1,630	6,520	e3,400	e2,580	3,110	49,000	19,200	17,800	27,700	21,000	31,300	4,650
18	1,630	5,880	e3,500	e2,600	2,970	49,900	18,900	18,600	29,200	24,900	26,500	4,490
19	1,620	4,140	e3,490	e2,500	2,860	50,100	17,700	18,600	30,700	33,000	23,100	5,580
20	1,610	5,970	e3,390	e2,560	2,760	49,900	15,200	17,100	30,200	32,100	21,000	6,230
21	1,620	5,580	e3,380	e2,670	2,750	47,800	13,300	14,300	31,300	29,200	19,500	7,860
22	3,030	5,080	e3,320	e2,660	2,850	44,600	12,500	12,700	33,100	26,700	17,800	11,000
23	5,260	3,340	e3,200	e3,230	2,960	41,600	12,200	11,800	35,400	25,500	16,300	11,200
24	8,210	5,830	e3,160	e3,890	e2,910	38,400	11,800	11,000	33,500	30,700	15,200	10,700
25	13,200	6,420	e3,160	e4,350	e2,840	35,900	11,200	10,300	29,700	31,900	14,300	10,600
26	14,100	7,080	e3,180	e3,990	e2,770	33,700	9,140	10,300	32,700	33,700	13,500	12,300
27	13,100	7,420	e3,100	e3,450	2,690	31,500	8,580	10,300	39,400	35,500	13,000	15,700
28	12,100	8,060	e3,000	e3,590	2,680	29,800	9,280	9,170	50,200	36,700	12,600	16,400
29	12,500	8,510	e2,850	e3,290	---	28,600	10,300	8,810	50,600	36,300	12,000	15,600
30	17,000	7,860	e3,090	e3,190	---	27,700	10,700	8,620	46,200	34,000	11,400	15,100
31	18,300	---	e2,900	e3,240	---	26,900	---	9,310	---	28,600	11,000	---
Total	148,661	275,510	115,740	89,600	81,760	854,150	520,300	400,710	771,830	1,033,900	805,500	284,010
Mean	4,796	9,184	3,734	2,890	2,920	27,550	17,340	12,930	25,730	33,350	25,980	9,467
Max	18,300	18,600	7,110	4,350	3,580	50,100	26,400	18,600	50,600	56,400	41,100	16,400
Min	753	3,340	1,800	2,500	2,150	2,630	8,580	8,620	9,710	21,000	11,000	4,490
Ac-ft	294,900	546,500	229,600	177,700	162,200	1,694,000	1,032,000	794,800	1,531,000	2,051,000	1,598,000	563,300
Cfsm	0.49	0.93	0.38	0.29	0.30	2.79	1.76	1.31	2.60	3.38	2.63	0.96
In.	0.56	1.04	0.44	0.34	0.31	3.22	1.96	1.51	2.91	3.89	3.03	1.07

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 2010, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	3,321	3,413	2,727	1,801	3,018	8,384	11,630	12,450	13,910	10,970	5,321	3,445
Max	15,880	10,610	9,045	6,439	12,400	27,550	27,620	28,190	45,140	55,960	26,050	21,430
(WY)	(2008)	(1993)	(1983)	(1983)	(1984)	(2010)	(1993)	(1993)	(2008)	(1993)	(1993)	(1993)
Min	293	363	342	310	343	560	627	1,159	1,716	739	441	388
(WY)	(2001)	(1990)	(1990)	(1981)	(1978)	(1981)	(2000)	(2000)	(1988)	(1988)	(1988)	(2003)

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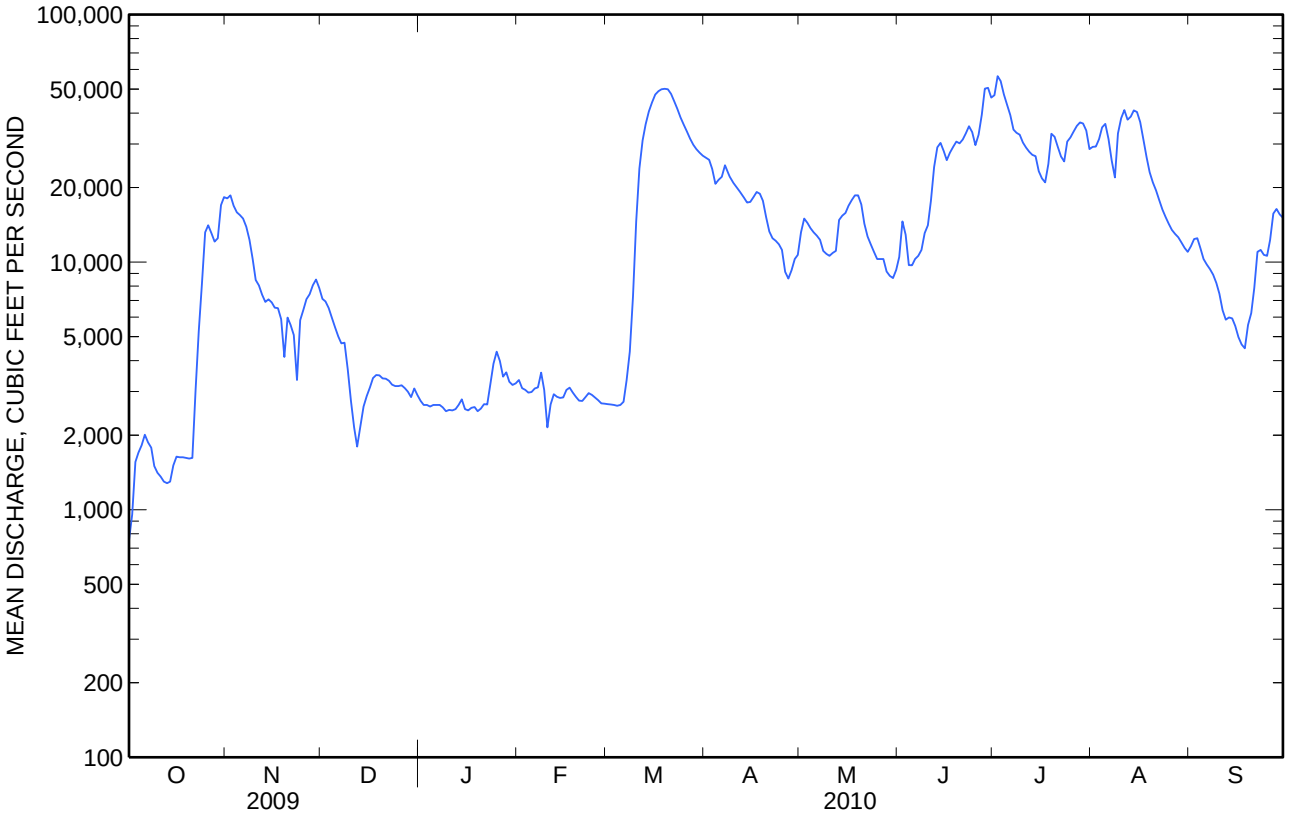
SUMMARY STATISTICS

	Calendar Year 2009		Water Year 2010		Water Years 1978 - 2010[a]	
Annual total	2,261,842		5,381,671			
Annual mean	6,197		14,740		6,711	
Highest annual mean					19,180	1993
Lowest annual mean					1,036	1989
Highest daily mean	22,000	Apr 28	56,400	Jul 2	113,000	Jul 11, 1993
Lowest daily mean	606	Sep 20	753	Oct 1	146	Oct 24, 2003
Annual seven-day minimum	639	Sep 18	1,380	Oct 9	236	Mar 7, 1978
Maximum peak flow			57,700	Jul 2	[b]116,000	Jul 11, 1993
Maximum peak stage			29.83	Jul 2	35.55	Jun 13, 2008
Annual runoff (ac-ft)	4,486,000		10,670,000		4,862,000	
Annual runoff (cfsm)	0.627		1.49		0.679	
Annual runoff (inches)	8.52		20.27		9.23	
10 percent exceeds	12,900		34,600		18,300	
50 percent exceeds	5,450		10,800		3,290	
90 percent exceeds	1,190		2,610		576	

[a] Post regulation.

[b] At site 0.5 mi downstream at current datum.



05485500 Des Moines River below Raccoon River at Des Moines, IA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1944 to September 1947, June 2008, May 2009 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1944 to September 1945.
SUSPENDED-SEDIMENT DISCHARGE: October 1944 to September 1947.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010

Part 1 of 3

[CaCO3, calcium carbonate; N, nitrogen; P, phosphorus; SiO2, silicon dioxide; ft, feet; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; E, estimated]

Date	Sample start time	Barometric pressure, mm Hg (00025)	Temperature, air, °C (00020)	Discharge, instantaneous, ft³/s (00061)	Dissolved oxygen, water, unfiltered, mg/L (00300)	pH, water, unfiltered, field, standard units (00400)	Specific conductance, water, unfiltered, µS/cm at 25 °C (00095)	Temperature, water, °C (00010)	Gage height, ft (00065)	Stream width, ft (00004)
11-17-2009	1030	745	5.0	6,600	11.9	8.0	732	7.7	14.03	490
01-13-2010	1030	743	--	E 2,650	13.9	--	837	-.1	12.44	487
03-24-2010	0945	739	--	38,700	11.4	8.1	476	5.8	26.80	740
06-09-2010	1100	740	--	12,800	8.6	8.1	640	21.5	17.48	495
08-03-2010	1000	738	--	32,200	8.1	7.9	540	25.1	25.01	528

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010

Part 2 of 3

[CaCO3, calcium carbonate; N, nitrogen; P, phosphorus; SiO2, silicon dioxide; ft, feet; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; E, estimated]

Date	Number of sampling points, count (00063)	Alkalinity, water, filtered, inflection-point, incremental titration method, field, mg/L as CaCO3 (39086)	Bicarbonate, water, filtered, inflection-point, incremental titration method, field, mg/L (00453)	Carbonate, water, filtered, inflection-point incremental titration method, field, mg/L (00452)	Chloride, water, filtered, mg/L (00940)	Silica, water, filtered, mg/L as SiO2 (00955)	Sulfate, water, filtered, mg/L (00945)	Ammonia, water, filtered, mg/L as N (00608)	Nitrate plus nitrite, water, filtered, mg/L as N (00631)
11-17-2009	10	285	343	2.3	23.1	23.8	41.3	.021	8.44
01-13-2010	11	286	347	.9	27.2	23.0	52.7	.037	7.70
03-24-2010	10	160	194	.3	14.8	16.5	17.6	.223	6.41
06-09-2010	10	214	258	1.3	19.9	18.1	35.6	.102	7.95
08-03-2010	10	213	257	1.5	14.0	22.3	23.9	.026	5.67

05485500 Des Moines River below Raccoon River at Des Moines, IA—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010

Part 3 of 3

[$CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; SiO_2, silicon dioxide; ft, feet; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; E, estimated]

Date	Nitrite, water, filtered, mg/L as N (00613)	Orthophos-phate, water, filtered, mg/L as P (00671)	Phos-phorus, water, filtered, mg/L as P (00666)	Phosphorus, water, unfiltered, mg/L as P (00665)	Total nitrogen, water, filtered, analytically determined, mg/L (62854)	Total nitrogen, water, unfiltered, analytically determined, mg/L (62855)	Organic carbon, water, filtered, mg/L (00681)	Suspended sediment concen-tration, mg/L (80154)
11-17-2009	.018	.107	.108	.167	8.87	8.85	3.1	174
01-13-2010	.016	.084	.092	.102	8.08	7.92	2.7	101
03-24-2010	.067	.334	.326	.544	6.98	7.32	4.4	259
06-09-2010	.055	.088	.084	.287	8.10	8.67	2.9	312
08-03-2010	.065	.164	.165	.357	6.08	6.40	3.9	461