

Water-Data Report 2011

06349000 HEART RIVER NEAR MANDAN, ND

Cannonball, Heart, and Knife Basin
Lower Heart Subbasin

LOCATION.--Lat 46°50'02", long 100°58'27" referenced to North American Datum of 1927, in NW ¼ NE ¼ sec.25, T.139 N., R.82 W., Morton County, ND, Hydrologic Unit 10130203, on left bank near downstream wingwall of bridge on county highway, 3 mi west of Mandan, and 4 mi downstream from Sweetbriar Creek.

DRAINAGE AREA.--3,310 mi², approximately.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--DAILY DISCHARGE--April to September 1924, April 1928 to June 1933, August 1937 to current year. Published as "at Sunny" 1924, 1928-33.

PERIOD OF RECORD.--DAILY GAGE HEIGHT--October 2000 to current year.

REVISED RECORDS.--WSP 926: 1938. WSP 1209: Drainage area. WSP 1239: 1924, 1928-29, 1948.

GAGE.--Water-stage recorder. Datum of gage is 1,638.70 ft above National Geodetic Vertical Datum of 1929 and 1,623.03 ft above Burlington Northern Railway datum. See WSP 1729 or 1917 for history of changes prior to June 30, 1958.

REMARKS.--Records fair except for estimated daily discharges, which are poor.

REGULATION.--Flow regulated by Lake Tschida (station 06346000), 105 mi upstream, since 1949. Some diversions above station.

06349000 HEART RIVER NEAR MANDAN, ND—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	77	90	e43	e37	e37	e31	1,910	1,400	2,070	758	542	214
2	72	90	e42	e37	e37	e31	5,480	1,330	2,770	690	570	210
3	69	89	e42	e37	e37	e31	9,130	1,260	2,710	e635	343	204
4	69	88	e42	e37	e37	e32	9,800	1,240	2,620	e580	303	204
5	85	86	e42	e37	e37	e32	8,870	1,250	2,250	e540	283	195
6	99	70	e41	e37	e37	e33	7,960	1,200	1,870	e530	297	196
7	99	61	e41	e36	e37	e35	8,050	1,160	e1,550	e521	314	e194
8	99	58	e40	e36	e36	e35	8,490	1,180	1,340	e630	580	e192
9	99	53	e39	e36	e36	e36	8,320	1,190	1,130	814	736	e188
10	98	50	e39	e36	e35	e38	7,410	1,190	974	1,250	640	184
11	96	50	e39	e36	e34	e41	6,270	1,210	898	1,420	563	180
12	96	49	e39	e36	e34	e43	5,510	1,190	844	2,570	558	173
13	94	49	e39	e36	e34	e50	5,010	1,160	1,390	1,340	535	e171
14	94	47	e39	e35	e33	e55	4,560	1,140	4,290	772	489	e170
15	94	47	e39	e35	e32	e68	4,170	1,130	e6,500	609	448	e169
16	92	47	e39	e35	e31	e93	3,770	1,110	4,470	503	476	168
17	92	47	e40	e35	e31	e174	3,000	1,070	2,990	448	490	169
18	94	47	e40	e35	e31	e447	2,340	1,020	2,320	408	685	170
19	94	e42	e40	e35	e31	e1,450	2,040	984	2,760	370	801	169
20	93	e41	e40	e35	e31	e2,410	1,850	983	2,190	340	835	187
21	92	e40	e40	e35	e31	e3,180	1,770	953	1,800	311	773	208
22	91	e41	e39	e35	e31	e3,910	2,000	3,380	2,420	298	719	211
23	85	e42	e39	e36	e31	e4,600	2,110	5,350	2,570	461	667	219
24	83	e42	e39	e36	e31	e3,820	2,580	4,120	2,010	458	635	218
25	86	e42	e39	e36	e31	e3,250	2,670	3,240	1,410	775	654	226
26	88	e43	e39	e36	e31	e2,680	2,250	3,410	1,150	629	613	229
27	88	e43	e39	e36	e31	e2,370	1,960	3,140	1,010	857	518	215
28	90	e43	e39	e36	e31	e2,110	1,780	2,860	938	631	281	204
29	82	e43	e38	e36	---	e1,940	1,630	2,450	908	464	234	193
30	93	e43	e38	e36	---	1,790	1,480	2,080	833	559	223	188
31	89	---	e38	e36	---	1,570	---	1,820	---	405	223	---
Total	2,772	1,623	1,232	1,113	936	36,385	134,170	56,200	62,985	21,576	16,028	5,818
Mean	89.4	54.1	39.7	35.9	33.4	1,174	4,472	1,813	2,100	696	517	194
Max	99	90	43	37	37	4,600	9,800	5,350	6,500	2,570	835	229
Min	69	40	38	35	31	31	1,480	953	833	298	223	168
Ac-ft	5,500	3,220	2,440	2,210	1,860	72,170	266,100	111,500	124,900	42,800	31,790	11,540

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 2011, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	55.9	43.1	25.7	17.6	98.2	948	943	334	344	233	102	65.9
Max	337	383	155	145	1,046	4,029	5,920	3,610	2,100	2,433	763	231
(WY)	(1995)	(1983)	(1983)	(1983)	(1930)	(1997)	(2009)	(1970)	(2011)	(1993)	(1998)	(1995)
Min	5.41	6.95	0.21	0.00	0.00	0.28	25.2	18.5	23.4	11.3	3.65	1.43
(WY)	(1940)	(1938)	(1938)	(1938)	(1940)	(1965)	(1990)	(1992)	(1961)	(1990)	(1932)	(1932)

06349000 HEART RIVER NEAR MANDAN, ND—Continued

SUMMARY STATISTICS

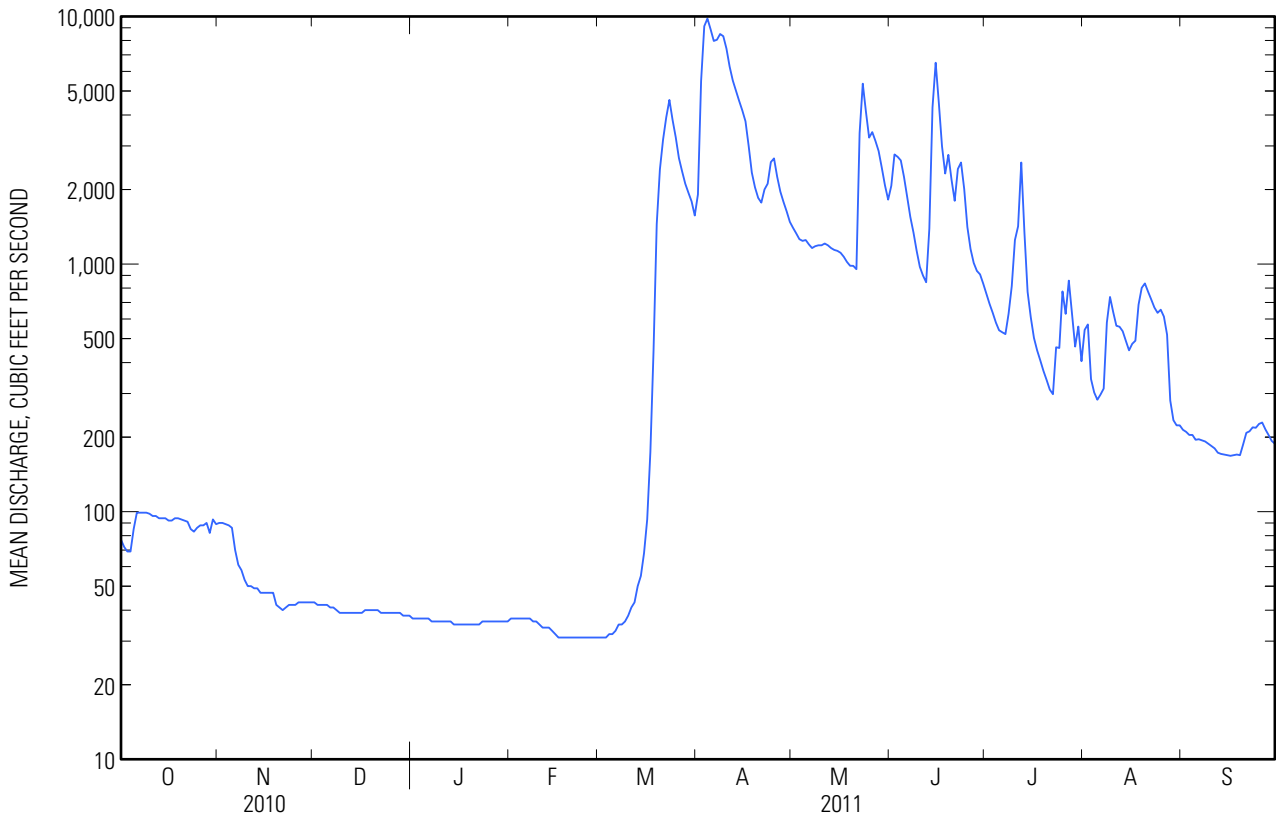
	Calendar Year 2010		Water Year 2011		Water Years 1924 - 2011	
Annual total	109,178		340,838			
Annual mean	299		934		269	
Highest annual mean					949	2009
Lowest annual mean					19.2	1990
Highest daily mean	5,040	Apr 1	9,800	Apr 4	28,400	Apr 18, 1950
Lowest daily mean	11	Jan 5	31	Feb 16	0.00	Aug 20, 1929
Annual seven-day minimum	11	Jan 5	31	Feb 16	0.00	Feb 1, 1930
Maximum peak flow			^a 10,100	Apr 4	^b 30,500	Apr 19, 1950
Maximum peak stage			^c 17.56	Mar 22	^d 25.75	Apr 4, 1952
Annual runoff (ac-ft)	216,600		676,100		195,200	
10 percent exceeds	618		2,670		428	
50 percent exceeds	94		193		49	
90 percent exceeds	12		36		6.5	

^a Gage height, 13.52 ft.

^b About; gage height, 23.64 ft.

^c Recorded, may have been higher during period of no record, March 22, backwater from ice.

^d Backwater from ice.

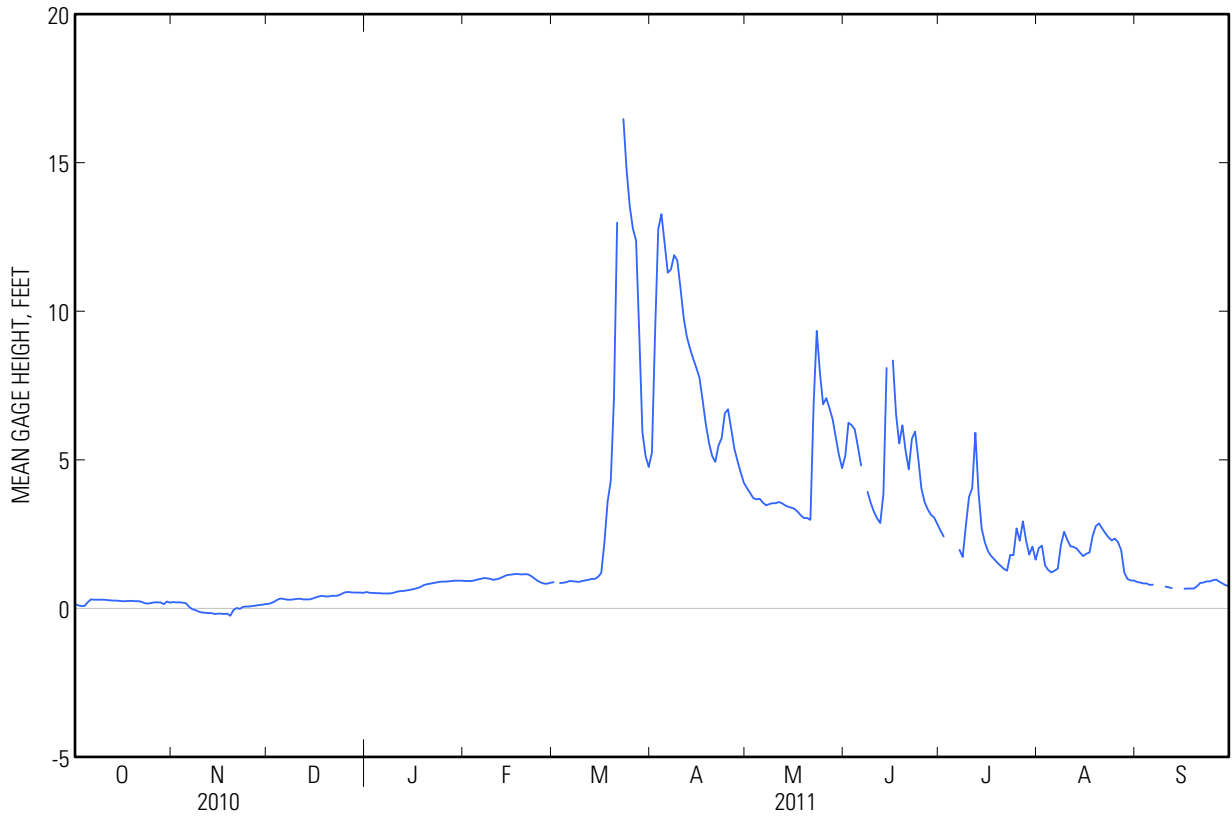


06349000 HEART RIVER NEAR MANDAN, ND—Continued

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0.14	0.21	0.15	0.55	0.92	0.88	5.25	4.05	5.14	2.62	2.03	0.89
2	0.10	0.20	0.18	0.52	0.92	---	9.30	3.88	6.25	2.42	2.11	0.87
3	0.08	0.20	0.23	0.52	0.92	0.85	12.77	3.71	6.17	---	1.44	0.84
4	0.08	0.19	0.30	0.51	0.94	0.86	13.27	3.67	6.02	---	1.29	0.84
5	0.20	0.17	0.33	0.51	0.97	0.88	12.30	3.69	5.43	---	1.21	0.79
6	0.30	0.05	0.31	0.50	0.99	0.92	11.30	3.56	4.81	---	1.27	0.80
7	0.29	-0.03	0.29	0.50	1.02	0.91	11.41	3.47	---	1.97	1.34	---
8	0.29	-0.06	0.29	0.50	1.01	0.90	11.89	3.51	3.92	1.73	2.14	---
9	0.29	-0.11	0.30	0.51	0.99	0.89	11.71	3.54	3.55	2.79	2.58	---
10	0.29	-0.14	0.32	0.54	0.96	0.92	10.79	3.54	3.25	3.75	2.31	0.73
11	0.28	-0.15	0.32	0.57	0.98	0.94	9.80	3.58	3.03	4.05	2.09	0.71
12	0.27	-0.16	0.30	0.58	1.01	0.96	9.15	3.54	2.87	5.91	2.07	0.68
13	0.26	-0.16	0.30	0.59	1.06	0.99	8.75	3.47	3.85	3.90	2.01	---
14	0.26	-0.19	0.30	0.61	1.11	0.99	8.41	3.42	8.09	2.68	1.88	---
15	0.25	-0.18	0.33	0.63	1.13	1.06	8.10	3.39	---	2.22	1.76	---
16	0.24	-0.18	0.37	0.65	1.14	1.19	7.76	3.35	8.34	1.92	1.84	0.66
17	0.24	-0.19	0.40	0.68	1.16	2.23	7.00	3.25	6.54	1.76	1.88	0.67
18	0.25	-0.18	0.42	0.72	1.15	3.59	6.20	3.13	5.55	1.65	2.44	0.67
19	0.25	-0.25	0.40	0.78	1.14	4.30	5.57	3.04	6.16	1.53	2.77	0.67
20	0.24	-0.06	0.40	0.81	1.15	7.07	5.13	3.04	5.31	1.43	2.86	0.75
21	0.24	0.01	0.42	0.83	1.14	12.98	4.93	2.98	4.68	1.33	2.69	0.86
22	0.22	-0.02	0.42	0.85	1.08	---	5.48	6.84	5.71	1.27	2.53	0.87
23	0.17	0.05	0.43	0.87	1.00	16.47	5.73	9.34	5.95	1.80	2.39	0.91
24	0.16	0.06	0.48	0.89	0.92	14.77	6.57	7.93	5.04	1.79	2.29	0.91
25	0.18	0.06	0.53	0.90	0.87	13.54	6.70	6.87	4.03	2.69	2.35	0.95
26	0.20	0.08	0.55	0.90	0.83	12.78	6.05	7.08	3.58	2.28	2.23	0.97
27	0.20	0.09	0.54	0.91	0.83	12.38	5.38	6.74	3.33	2.93	1.96	0.90
28	0.20	0.11	0.53	0.92	0.86	9.24	4.96	6.37	3.15	2.28	1.20	0.84
29	0.14	0.12	0.53	0.93	---	5.93	4.58	5.76	3.06	1.81	0.99	0.78
30	0.23	0.14	0.53	0.93	---	5.12	4.23	5.16	2.84	2.08	0.94	0.75
31	0.19	---	0.52	0.93	---	4.76	---	4.72	---	1.64	0.94	---
Mean	0.22	-0.01	0.38	0.70	1.01	---	8.02	4.50	---	---	1.93	---
Max	0.30	0.21	0.55	0.93	1.16	---	13.27	9.34	---	---	2.86	---
Min	0.08	-0.25	0.15	0.50	0.83	---	4.23	2.98	---	---	0.94	---

06349000 HEART RIVER NEAR MANDAN, ND—Continued



06349000 HEART RIVER NEAR MANDAN, ND—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946-50, 1971-76, 1978 to current year.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 1 of 5

[ANC, acid neutralizing capacity; CaCO₃, calcium carbonate; SiO₂, silicon dioxide; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Barometric pressure, mm Hg (00025)	Temperature, air, °C (00020)	Discharge, instantaneous, ft ³ /s (00061)	pH, water, unfiltered, field, standard units (00400)	pH, water, unfiltered, laboratory, standard units (00403)	Specific conductance, water, unfiltered, laboratory, µS/cm at 25 °C (90095)	Specific conductance, water, unfiltered, laboratory, µS/cm at 25 °C (00095)	Temperature, water, °C (00010)	Dissolved solids, water, filtered, sum of constituents, mg/L (70301)
07-28-2011	1120	722	21.5	617	8.0	8.3	1,550	1,590	23.1	961
09-01-2011	1446	--	20.3	214	8.3	8.5	1,640	1,660	22.9	1,020

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 2 of 5

[ANC, acid neutralizing capacity; CaCO₃, calcium carbonate; SiO₂, silicon dioxide; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Dissolved solids, water, tons per day (70302)	Hardness, water, mg/L as CaCO ₃ (00900)	Calcium, water, filtered, mg/L (00915)	Magnesium, water, filtered, mg/L (00925)	Potassium, water, filtered, mg/L (00935)	Sodium adsorption ratio, water, number (00931)	Sodium equivalent of major cations (00932)	Sodium, water, filtered, mg/L (00930)	ANC, water, unfiltered, fixed endpoint (pH 4.5) titration, laboratory, mg/L as CaCO ₃ (90410)
07-28-2011	1120	1,600	305	43.0	48.1	26.2	6.2	64	248	247
09-01-2011	1446	589	457	85.8	59.0	9.43	4.3	50	212	338

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 3 of 5

[ANC, acid neutralizing capacity; CaCO₃, calcium carbonate; SiO₂, silicon dioxide; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Chloride, water, filtered, mg/L (00940)	Fluoride, water, filtered, mg/L (00950)	Silica, water, filtered, mg/L as SiO ₂ (00955)	Sulfate, water, filtered, mg/L (00945)	Aluminum, water, filtered, µg/L (01106)	Barium, water, filtered, µg/L (01005)	Beryllium, water, filtered, µg/L (01010)	Cadmium, water, filtered, µg/L (01025)	Chromium, water, filtered, µg/L (01030)
07-28-2011	1120	< 15.0	.21	14.5	612	< 50	51	< 5.00	< 5.00	< 5.0
09-01-2011	1446	15.7	< .05	8.88	567	< 50	88	< 5.00	< 5.00	< 5.0

06349000 HEART RIVER NEAR MANDAN, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 4 of 5

[ANC, acid neutralizing capacity; CaCO₃, calcium carbonate; SiO₂, silicon dioxide; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Copper, water, filtered, µg/L (01040)	Iron, water, filtered, µg/L (01046)	Lead, water, filtered, µg/L (01049)	Manganese, water, filtered, µg/L (01056)	Nickel, water, filtered, µg/L (01065)	Silver, water, filtered, µg/L (01075)	Thallium, water, filtered, µg/L (01057)	Zinc, water, filtered, µg/L (01090)	Antimony, water, filtered, µg/L (01095)
07-28-2011	1120	< 5.0	< 50	< 5.00	52.0	< 5.0	< 5.00	< 5.00	< 5.0	< 5.00
09-01-2011	1446	< 5.0	< 50	< 5.00	< 10.0	6.6	< 5.00	< 5.00	< 5.0	< 5.00

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 5 of 5

[ANC, acid neutralizing capacity; CaCO₃, calcium carbonate; SiO₂, silicon dioxide; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Arsenic, water, filtered, µg/L (01000)	Boron, water, filtered, µg/L (01020)	Selenium, water, filtered, µg/L (01145)
07-28-2011	1120	10.7	804	< 5.0
09-01-2011	1446	< 5.0	442	< 5.0