SELECTED DATA FOR STREAM SUBBASINS IN THE WATONWAN RIVER BASIN, SOUTH-CENTRAL MINNESOTA

By David L. Lorenz and Gregory A. Payne

ABSTRACT

This report presents selected data that describe the characteristics of stream basins upstream from selected points on streams in the Watonwan River basin. The points on the streams include outlets of subbasins of about five square miles, sewage treatment plant outlets, and U.S. Geological Survey streamflow-gaging stations in the basin.

INTRODUCTION

The Watonwan River upstream from its confluence with the Blue Earth River drains an area of 878 mi^2 (square miles). It is located in the counties of Blue Earth, Brown, Cottonwood, Martin, Jackson, and Watonwan in south-central Minnesota.

This report is one of several gazateers providing basin characteristics of streams in Minnesota. It provides selected data for subbasins larger than about 5 mi^2, sewage-treatment-plant outlets, and U.S. Geological Survey (USGS) streamflow-gaging stations located in the Watonwan River basin.

Methods

USGS 7-1/2 minute series topographic maps were used as base maps to obtain the data presented in this report. Data were compiled with a geographic information system (GIS) and were stored in an Albers equal-area projection. Data-base functions and other capabilities of the GIS were used to aggregate the data, determine drainage area of the subbasins, and determine stream-channel lengths. Elevation data for the streams were recorded at the point where topographic-contour lines intersected the stream traces. Points on the stream channel 10 percent and 85 percent of the stream-channel length from the basin outlet to the drainage divide were located by the GIS, and the elevations of these points were interpolated from the data recorded in the GIS. Stream slope was calculated from these data. Lake area and storage area data were calculated using the analytic capabilities of the GIS.

Acknowledgments

The Minnesota State Planning Information Center provided assistance with much of the digitizing and programing needed to produce this report. The Center's help is gratefully acknowledged.

DRAINAGE-AREA BOUNDARIES

The subbasins reported here were delineated on the basis of topographic features and human activities recorded on topographic maps. Data from field inspection and recent drainage-ditch maps were transferred to the topographic maps.

Drainage basins do not have fixed boundaries. Human activities along basin divides, such as the installation of storm sewers, the drainage of wetlands, and the diversions of streams can alter the stream's drainage area.

EXPLANATION OF BASIN CHARACTERISTICS

Table 1 is a list of the basin characteristics determined for each of the subbasins in the Watonwan River basin. The rank of the stream is shown by indentation and indicates the drainage pattern of the stream. The first-ranked river is the Watonwan River. Tributary streams are indented two spaces per rank.

The data for drainage area, main-channel length, and main-channel slope are reported using three significant figures or rounded to the nearest hundredth of a unit. The data for lake area and storage area are reported to two significant figures or to the nearest 0.1 percent.

Table 1.--*Selected characteristics of the Watonwan River drainage basin*

[Outlet location is quarter-quarter section, section, township, range]

Map number	Downstream order no.	Stream name	Outlet location	By subbasin			Cumulative to mouth of basin			Main channel length (miles)	Main channel slope (foot per mile)
				Drainage area (square miles)	Lake area (percent subbasin area)	Storage area (percent subbasin area)	Drainage area (square miles)	Lake area (percent total area)	Storage area (percent total area)		
5701	5318300	Watonwan River near Delft	NE¼SE¼ 11 106N 36W	13.5	0.6	2.0	13.5	0.6	2.0	8.32	14.6
5700		Watonwan River	NE¼NW¼ 28 106N 34W	33.4	1.4	3.5	46.9	1.2	3.1	29.5	7.69
5800		Tributary to Watonwan River	NE¼NW¼ 28 106N 34W	12.0	5.0	5.6	12.0	5.0	5.6	6.43	17.2
3401		Mountain Lake stp Outlet	NE¼NW¼ 28 106N 34W	.11	33	33	59.0	2.0	3.7	29.7	7.66
3400		Watonwan River	SE¼SW¼ 30 107N 33W	11.6	.0	.1	70.6	1.7	3.1	45.3	6.74
3500		Tributary to Watonwan River	SE¼SW¼ 30 107N 33W	12.2	.4	.6	12.2	.4	.6	9.00	15.8
3001	5318425	Watonwan River near Darfur	NE¼SE¼ 33 107N 33W	2.41	.0	.0	85.2	1.5	2.6	50.7	6.85
3330		Tributary to Watonwan River	NW¼SE¼ 34 107N 33W	7.83	.1	2.7	7.83	.1	2.7	5.08	36.3
3900		Tributary to Watonwan River	NW¼NE¼ 32 107N 32W	12.4	2.9	5.0	12.4	2.9	5.0	10.2	6.20
3000		Watonwan River	NW¼NE¼ 32 107N 32W	16.0	.0	.3	121	1.3	2.6	63.1	6.75
5400		North Fork Watonwan River	NW¼NW¼ 14 107N 32W	15.4	.0	.2	15.4	.0	.2	10.4	16.7
5600		Triburary to North Fork Watonwan River	NE¼NW¼ 01 106N 35W	4.19	.0	.5	4.19	.0	.5	5.92	19.8
5500		Tributary to North Fork Watonwan River	NW¼SE¼ 20 107N 34W	10.1	.1	.4	14.3	.1	.4	17.2	14.6
3601	5318530	North Fork Watonwan River near Darfur	NE¼NE¼ 18 107N 33W	13.5	.0	.2	43.2	.0	.3	30.7	9.55
3600		North Fork Watonwan River	NW¼NW¼ 07 107N 32W	9.75	.0	.9	53.0	.0	.4	41.2	7.80
3700		Wood Lake Outlet	NW¼NW¼ 07 107N 32W	14.4	6.9	11	14.4	6.9	11.0	10.0	6.37
3800		North Fork Watonwan River	NW¼NW¼ 14 107N 32W	10.3	.2	7.6	77.7	1.3	3.3	46.9	7.39
4001	5318700	Watonwan River at La Salle	NE¼NE¼ 19 107N 31W	7.03	.1	.2	206	1.3	2.8	68.9	6.65
4000		Watonwan River	NE¼NW¼ 22 107N 31W	4.42	.0	1.3	210	1.3	2.7	72.3	6.53
1501	5318706	St. James Creek near Odin	SE¼SE¼ 01 105N 32W	6.59	6.8	7.7	6.59	6.8	7.7	7.62	13.2
1500		St. James Creek	NE¼NW¼ 25 106N 32W	12.6	5.3	5.5	19.2	5.8	6.2	16.9	12.1

Table 1.--*Selected characteristics of the Watonwan River drainage basin*--Continued

Map number	Downstream order no.	Stream name	Outlet location	By subbasin			Cumulative to mouth of basin			Main channel length (miles)	Main channel slope (foot per mile)
				Drainage area (square miles)	Lake area (percent subbasin area)	Storage area (percent subbasin area)	Drainage area (square miles)	Lake area (percent total area)	Storage area (percent total area)		
1700		Tributary to St. James Creek	NE¼NW¼ 25 106N 32W	13.9	0.7	0.8	13.9	0.7	0.8	14.5	10.8
2003		St. James stp Outlet	NE¼NW¼ 18 106N 31W	12.4	3.1	3.5	45.6	3.5	3.8	19.8	10.9
2002	5318718	St. James Creek near St. James	NE¼NE¼ 07 106N 31W	1.60	.6	12	47.2	3.4	4.1	21.9	10.2
3200		Tributary to Butterfield Creek	SE¼NE¼ 19 106N 33W	7.87	.0	.2	7.87	.0	.2	3.97	17.3
1601		Butterfield stp Outlet	SE¼NW¼ 22 106N 33W	6.21	.0	.6	14.1	.0	.4	8.04	12.2
1600		Butterfield Creek	NE¼NE¼ 12 106N 33W	4.62	.0	.0	18.7	.0	.3	13.4	10.8
3100		Tributary to Butterfield Creek	NE¼NE¼ 12 106N 33W	6.85	2.0	4.8	6.85	2.0	4.8	5.58	14.2
1800		Butterfield Creek	SW¼SW¼ 31 107N 31W	17.4	.2	.9	42.9	.4	1.3	23.2	8.01
1900		County Ditch No. 4	SW¼NW¼ 31 107N 31W	8.63	.3	.6	8.63	.3	.6	9.89	9.57
2900		Butterfield Creek	NW¼NE¼ 28 107N 31W	6.80	.0	.2	58.4	.3	1.0	28.7	7.00
2001	5318800	St. James Creek near La Salle	NW¼NE¼ 28 107N 31W	15.9	.6	1.1	121	1.6	2.3	28.8	7.83
2000		St. James Creek	NE¼SW¼ 22 107N 31W	.57	.0	1.1	122	1.5	2.2	30.6	7.63
5300		County Ditch No. 33	NE¼NE¼ 16 108N 32W	8.44	.0	.3	8.44	.0	.3	6.29	7.62
4100		Judicial Ditch No. 5	SW¼NE¼ 24 108N 32W	15.6	.0	.1	15.6	.0	.1	7.63	5.77
4300		Tributary to Watonwan River	SW¼SW¼ 04 107N 31W	16.8	17	19	40.8	7.0	8.0	15.4	2.50
4200		Tributary to Watonwan River	SW¼SW¼ 04 107N 31W	7.00	.0	3.5	6.99	.0	3.5	3.93	5.62
4400		Tributary to Watonwan River	SW¼NW¼ 29 107N 30W	5.02	.0	.0	52.8	5.4	6.7	21.2	1.91
2800		Watonwan River	NE¼NW¼ 29 107N 30W	7.71	.4	2.3	393	1.9	3.1	80.2	6.17
5900		Judicial Ditch No. 1	NE¼SE¼ 23 105N 35W	13.2	3.6	3.6	13.2	3.6	3.6	8.60	12.4
6000		Tributary to Judicial Ditch No.	NE¼SE¼ 23 105N 35W	1 6.47	4.4	4.6	6.47	4.4	4.6	5.12	16.7
4700		Judicial Ditch No. 1	NW¼NW¼ 26 105N 33W	32.9	1.0	2.0	52.6	2.1	2.7	29.2	7.57

Table 1.--*Selected characteristics of the Watonwan River drainage basin*--Continued

Map number	Downstream order no.	Stream name	Outlet location	By subbasin			Cumulative to mouth of basin			Main channel length (miles)	Main channel slope (foot per mile)
				Drainage area (square miles)	Lake area (percent subbasin area)	Storage area (percent subbasin area)	Drainage area (square miles)	Lake area (percent total area)	Storage area (percent total area)		
902	5318897	South Fork Watonwan River near Ormsby	SE¼NW¼ 21 105N 32W	54.8	1.8	2.2	107	1.9	2.5	41.2	6.28
901	5318900	South Fork Watonwan River near Ormsby	NW¼SE¼ 21 105N 32W	.50	.0	.0	108	1.9	2.4	41.7	6.25
900		South Fork Watonwan River	NE¼NE¼ 19 105N 31W	9.50	.1	.1	117	1.8	2.3	50.8	5.99
800		Tributary to Willow Creek	SW¼NE¼ 13 104N 32W	6.50	.0	.0	6.50	.0	.0	6.66	8.92
600		Willow Creek	SE¼NE¼ 31 105N 31W	14.3	.3	.3	20.8	.2	.2	12.8	9.24
700		Judicial Ditch No. 2	SW¼NE¼ 31 105N 31W	6.09	.0	.0	6.09	.0	.0	5.73	15.0
4800		Willow River	NE¼NE¼ 19 105N 31W	6.30	.0	.2	33.2	.1	.2	16.7	9.60
1300		South Fork Watonwan River	SE¼SW¼ 27 106N 31W	19.4	.0	.1	170	1.2	1.6	61.5	5.40
1400		County Ditch No. 1	SE¼SW¼ 27 106N 31W	13.7	4.5	5.2	13.7	4.5	5.2	10.9	8.91
2101	5319100	South Fork Watonwan River near Madelia	NE¼SW¼ 29 107N 30W	15.6	.8	1.2	199	1.4	1.8	75.7	4.89
2200		Spring Brook	SE¼NW¼ 29 107N 30W	15.2	.7	1.4	15.2	.7	1.4	7.87	8.44
2100		South Fork Watonwan River Madelia	NE¼NW¼ 29 107N 30W	.19	.0	1.6	215	1.4	1.8	76.5	4.87
4500		Elm Creek	NW¼NE¼ 29 107N 30W	28.1	2.2	6.7	28.1	2.2	6.7	14.2	3.45
2701		Madelia stp Outlet	NW¼SW¼ 26 107N 30W	3.00	.0	1.1	639	1.7	2.8	85.3	5.86
4600		Judicial Ditch No. 7	NE¼SE¼ 26 107N 30W	15.0	2.2	4.6	15.0	2.2	4.6	6.42	6.54
2700		Watonwan River	SE¼NW¼ 14 106N 29W	25.9	.3	1.3	680	1.7	2.8	96.9	5.28
400		Mink Creek	SE¼NE¼ 06 104N 30W	16.9	.0	.2	16.9	.0	.2	12.7	9.82
300		Perch Creek	SE¼NE¼ 06 104N 30W	7.56	3.9	6.2	7.56	3.9	6.2	5.73	6.57
200		Tributary to Perch Creek	NE¼SE¼ 36 105N 31W	4.71	.0	.0	4.71	.0	.0	7.70	9.76
500		Tributary to Perch Creek	NE¼NE¼ 06 104N 30W	15.5	1.0	1.6	20.2	.8	1.3	12.3	8.90
101		Truman stp Outlet	NW¼SW¼ 11 104N 30W	7.32	.0	.2	7.32	.0	.2	5.63	8.70

Table 1.--*Selected characteristics of the Watonwan River drainage basin*--Continued

Map number	Downstream order no.	Stream name	Outlet location	By subbasin: Drainage area (square miles)	By subbasin: Lake area (percent subbasin area)	By subbasin: Storage area (percent subbasin area)	Cumulative to mouth of basin: Drainage area (square miles)	Cumulative to mouth of basin: Lake area (percent total area)	Cumulative to mouth of basin: Storage area (percent total area)	Main channel length (miles)	Main channel slope (foot per mile)
100		Tributary to Perch Creek	SW¼NE¼ 13 105N 30W	13.0	0.0	0.1	20.3	0.0	0.1	14.9	7.46
1100		Antrim Creek	NE¼NW¼ 05 105N 29W	16.0	.0	.4	16.0	.0	.4	10.8	7.26
1000		Perch Creek	NE¼NE¼ 30 106N 29W	18.3	.1	2.3	99.3	.5	1.3	35.3	5.15
1200		Spring Branch Creek	NW¼SW¼ 29 106N 30W	16.1	.7	1.8	16.1	.7	1.8	10.6	8.50
2300		Tributary to Spring Branch Creek	NW¼SW¼ 29 106N 30W	4.02	.0	.2	4.02	.0	.2	5.41	11.4
2401	5319400	Spring Branch Creek near Lewisville	SE¼NE¼ 21 106N 30W	3.13	1.7	1.7	23.2	.7	1.5	13.7	7.59
2500		Tributary to Spring Branch Creek	SE¼SE¼ 14 106N 30W	13.2	.0	.4	13.2	.0	.4	9.80	6.05
2400		Spring Branch Creek	NE¼NE¼ 30 106N 29W	6.65	.0	.6	43.0	.4	1.0	21.0	6.09
4900		Perch Creek	SE¼NE¼ 14 106N 29W	10.1	.0	.1	152	.4	1.1	47.6	4.55
5102	5319490	Watonwan River above Garden City	NE¼SE¼ 31 107N 28W	10.7	.0	.0	843	1.4	2.5	102	5.06
5101	5319500	Watonwan River near Garden City	SW¼NE¼ 28 107N 28W	8.20	.1	.1	851	1.4	2.4	107	4.85
5100		Watonwan River	SW¼NW¼ 26 107N 28W	4.57	.1	.1	856	1.4	2.4	110	4.80
5000		County Ditch No. 78	SW¼NW¼ 18 107N 28W	19.0	.0	.0	19.0	.0	.0	11.8	8.68
5200		Watonwan River	NW¼SW¼ 18 107N 28W	3.15	.3	.3	878	1.4	2.4	115	4.68

GLOSSARY

Downstream-Order Number.--Distinctive numbers assigned to each gaging station to provide geographical location and identification. The numbers are assigned based on the downstream order for each minor basin. The first digit designates the major river basin. The last six digits designate the downstream order of the location.

Drainage area.--That area measured on a horizontal plane, enclosed by a topographic divide, within which direct surface runoff from precipitation normally flows by gravity into a stream above a specified point. This may include closed basins and other areas which do not contribute directly to surface runoff.

Lake Area.--The percentage of the drainage area covered by open water.

Length.--The total length of the main channel from the basin outlet to the drainage divide. The main channel is that stream which drains the greatest area.

Map Number.--This is an arbitrary number used to identify the subbasin. The number is based on the Minnesota Common Stream Number System. The last five digits of the 7-digit number are used. The first 2 digits are 31 for all basins and were omitted to clarify the map.

Outlet Location.--The U.S. public lands system is used to describe subbasin outlet location down to quarter-quarter section. The description includes quarter-quarter section, section, Township, and Range.

Slope.--The average slope of the main channel between points 10 and 85 percent of the distance along the main channel from the basin outlet to the drainage divide.

Storage Area.--The percentage of the drainage area covered by lakes, ponds, and marshes as shown on topographic maps.

Stream Name.--The name of the stream shown on the map. U.S. Geological Survey streamflow-gaging stations are given the name of the stream on which they are located. Sewage-treatment plants are identified as STP outlets.

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