

UPPER MISSISSIPPI RIVER MAIN STEM

05275000 ELK RIVER NEAR BIG LAKE, MN

LOCATION.--Lat 4520'02", long 9340'00", in NE 1 / 4 SW 1 / 4 sec. 23, T.22 N., R.27 W., Sherburne County, Hydrologic Unit 07010203, on right bank at upstream side of highway bridge, 4 mi east of Big Lake and 4 mi downstream from St. Francis River.

DRAINAGE AREA.--559 mi² (revised).

PERIOD OF RECORD.--April 1911 to September 1917, April to September 1931, April to November 1932, March to November 1933, March 1934 to September 1987, October 1990 to current year.

REVISED RECORDS.--WSP 895: 1939. WSP 1308: 1912(M), 1915-17(M).

GAGE.--Water-stage recorder. Datum of gage is 899.60 ft above mean sea level. April 1911 to Sept. 30, 1917, April 1, 1931 to July 26, 1934, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods of estimated daily discharge, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|-----|-----|-----|------|------|------|------|------|------|-----|-----|-----|-----|
| 1 | 162 | 173 | 174 | e110 | e160 | 503 | 582 | 284 | 193 | 185 | 95 | 79 |
| 2 | 157 | 183 | 170 | e110 | e160 | 492 | 676 | 266 | 186 | 175 | 90 | 77 |
| 3 | 154 | 190 | 172 | e110 | e160 | e450 | 760 | 255 | 178 | 175 | 93 | 74 |
| 4 | 150 | 193 | 171 | e115 | e160 | e420 | 805 | 243 | 179 | 169 | 96 | 71 |
| 5 | 146 | 188 | 166 | e115 | e160 | e370 | 901 | 236 | 173 | 155 | 93 | 69 |
| | | | | | | | | | | | | |
| 6 | 144 | 186 | e170 | e115 | e160 | e330 | 1070 | e220 | 168 | 164 | 95 | 66 |
| 7 | 145 | 187 | e165 | e118 | e160 | e310 | 1200 | 208 | 160 | 163 | 103 | 62 |
| 8 | 145 | 183 | e162 | e120 | e160 | e290 | 1250 | 255 | 155 | 154 | 112 | 60 |
| 9 | 142 | 183 | e160 | e125 | e160 | e280 | 1190 | 272 | 151 | 153 | 106 | 59 |
| 10 | 142 | 183 | e155 | e120 | e160 | 269 | 1100 | 256 | 151 | 146 | 99 | 57 |
| | | | | | | | | | | | | |
| 11 | 145 | 182 | e150 | e107 | e162 | e255 | 1050 | 247 | 152 | 137 | 93 | 55 |

| | | | | | | | | | | | | |
|-------|------|-------|------|------|-------|-------|-------|-------|-------|------|------|------|
| 12 | 150 | 170 | 145 | e98 | e165 | e248 | 1020 | 246 | 158 | 129 | 89 | 54 |
| 13 | 174 | e175 | 141 | e96 | e170 | e240 | 969 | 242 | 165 | 122 | 85 | 56 |
| 14 | 184 | 176 | e150 | e96 | e178 | e233 | 878 | 243 | 167 | 120 | 83 | 59 |
| 15 | 188 | 187 | e155 | e104 | e185 | e225 | 788 | 243 | 173 | 194 | 79 | 60 |
| | | | | | | | | | | | | |
| 16 | 183 | e200 | e150 | e110 | e192 | e220 | 717 | 266 | 180 | 202 | 85 | 57 |
| 17 | 182 | e215 | 150 | e115 | e205 | e215 | 664 | 259 | 179 | 180 | 80 | 57 |
| 18 | 179 | e220 | 154 | e125 | e215 | 211 | e620 | 248 | 180 | 178 | 82 | 57 |
| 19 | 173 | e215 | 145 | e135 | e230 | 200 | e580 | 243 | 194 | 191 | 81 | 59 |
| 20 | 170 | 209 | 153 | e140 | e240 | 195 | e530 | 230 | 200 | 197 | 90 | 64 |
| | | | | | | | | | | | | |
| 21 | 169 | 203 | e150 | e145 | e255 | 190 | e500 | 217 | 192 | 196 | 94 | 62 |
| 22 | 166 | 189 | e142 | e150 | 273 | 183 | e465 | 207 | 185 | 189 | 106 | 62 |
| 23 | 163 | 176 | e137 | e155 | 324 | 183 | e430 | 196 | 179 | 178 | 124 | 60 |
| 24 | 162 | 158 | e130 | e158 | 357 | 183 | e400 | 190 | 175 | 165 | 118 | 62 |
| 25 | 159 | 185 | e125 | e158 | 385 | 184 | e380 | 188 | 182 | 147 | 113 | 65 |
| | | | | | | | | | | | | |
| 26 | 158 | 200 | e118 | e158 | 409 | 196 | e360 | 181 | 183 | 137 | 107 | 68 |
| 27 | 157 | 186 | e113 | e160 | 447 | 228 | e335 | 173 | 230 | 127 | 103 | 73 |
| 28 | 157 | 183 | e110 | e160 | 499 | 300 | 309 | 167 | 235 | 118 | 101 | 72 |
| 29 | 157 | 177 | e110 | e160 | --- | 355 | 297 | 161 | 202 | 108 | 94 | 69 |
| 30 | 157 | 173 | e110 | e160 | --- | 431 | 288 | 172 | 187 | 103 | 87 | 71 |
| 31 | 160 | --- | e110 | e160 | --- | 492 | --- | 195 | --- | 100 | 82 | --- |
| | | | | | | | | | | | | |
| TOTAL | 4980 | 5628 | 4513 | 4008 | 6491 | 8881 | 21114 | 7009 | 5392 | 4857 | 2958 | 1916 |
| MEAN | 161 | 188 | 146 | 129 | 232 | 286 | 704 | 226 | 180 | 157 | 95.4 | 63.9 |
| MAX | 188 | 220 | 174 | 160 | 499 | 503 | 1250 | 284 | 235 | 202 | 124 | 79 |
| MIN | 142 | 158 | 110 | 96 | 160 | 183 | 288 | 161 | 151 | 100 | 79 | 54 |
| AC-FT | 9880 | 11160 | 8950 | 7950 | 12870 | 17620 | 41880 | 13900 | 10700 | 9630 | 5870 | 3800 |
| CFSM | .29 | .34 | .26 | .23 | .41 | .51 | 1.26 | .40 | .32 | .28 | .17 | .11 |
| IN. | .33 | .37 | .30 | .27 | .43 | .59 | 1.41 | .47 | .36 | .32 | .20 | .13 |

e Estimated

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1998, BY WATER YEAR (WY)

| | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| MEAN | 211 | 214 | 151 | 112 | 119 | 308 | 662 | 440 | 338 | 267 | 181 | 201 |
| MAX | 778 | 794 | 410 | 290 | 392 | 1125 | 1823 | 1620 | 1647 | 1026 | 926 | 1050 |
| (WY) | 1985 | 1972 | 1966 | 1979 | 1984 | 1966 | 1969 | 1986 | 1984 | 1978 | 1972 | 1986 |
| MIN | 32.7 | 56.3 | 44.1 | 38.4 | 29.8 | 58.8 | 75.5 | 37.5 | 20.5 | 8.94 | 8.74 | 23.4 |
| (WY) | 1934 | 1935 | 1935 | 1935 | 1936 | 1934 | 1934 | 1934 | 1934 | 1934 | 1934 | 1932 |

| SUMMARY STATISTICS | FOR 1997 CALENDAR YEAR | FOR 1998 WATER YEAR | FOR 1998 WATER YEAR | FOR 1998 WATER YEAR | FOR 1998 WATER YEAR | FOR 1998 WATER YEAR | FOR 1998 WATER YEAR |
|--------------------------|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| ANNUAL TOTAL | 120148 | | 77747 | | | | |
| ANNUAL MEAN | 329 | | 213 | | 277 | | |
| HIGHEST ANNUAL MEAN | | | | | 669a | | 1986 |
| LOWEST ANNUAL MEAN | | | | | 88.0 | | 1935 |
| HIGHEST DAILY MEAN | 4020 | Apr 7 | 1250 | Apr 8 | 7170 | Apr 16 | 1965 |
| LOWEST DAILY MEAN | 86 | Jan 29 | 54 | Sep 12 | 4.0 | Aug 1 | 1934 |
| ANNUAL SEVEN-DAY MINIMUM | 90 | Jan 25 | 57 | Sep 10 | 4.5 | Jul 27 | 1934 |
| INSTANTANEOUS PEAK FLOW | | | 1260 | Apr 8 | 7360 | Apr 16 | 1965 |
| INSTANTANEOUS PEAK STAGE | | | 4.09 | Apr 8 | 10.86 | Apr 16 | 1965 |
| INSTANTANEOUS LOW FLOW | | | 53 | Sep 11 | 3.6 | Jul 31 | 1934 |
| ANNUAL RUNOFF (AC-FT) | 238300 | | 154200 | | 201000 | | |
| ANNUAL RUNOFF (CFSM) | .59 | | .38 | | .50 | | |
| ANNUAL RUNOFF (INCHES) | 8.00 | | 5.17 | | 6.74 | | |
| 10 PERCENT EXCEEDS | 611 | | 364 | | 560 | | |

| | | | | | | | |
|--------------------|-----|--|-----|--|-----|--|--|
| 50 PERCENT EXCEEDS | 183 | | 169 | | 167 | | |
| 90 PERCENT EXCEEDS | 112 | | 84 | | 68 | | |

a Median of annual mean discharges is 260 ft³/s.

