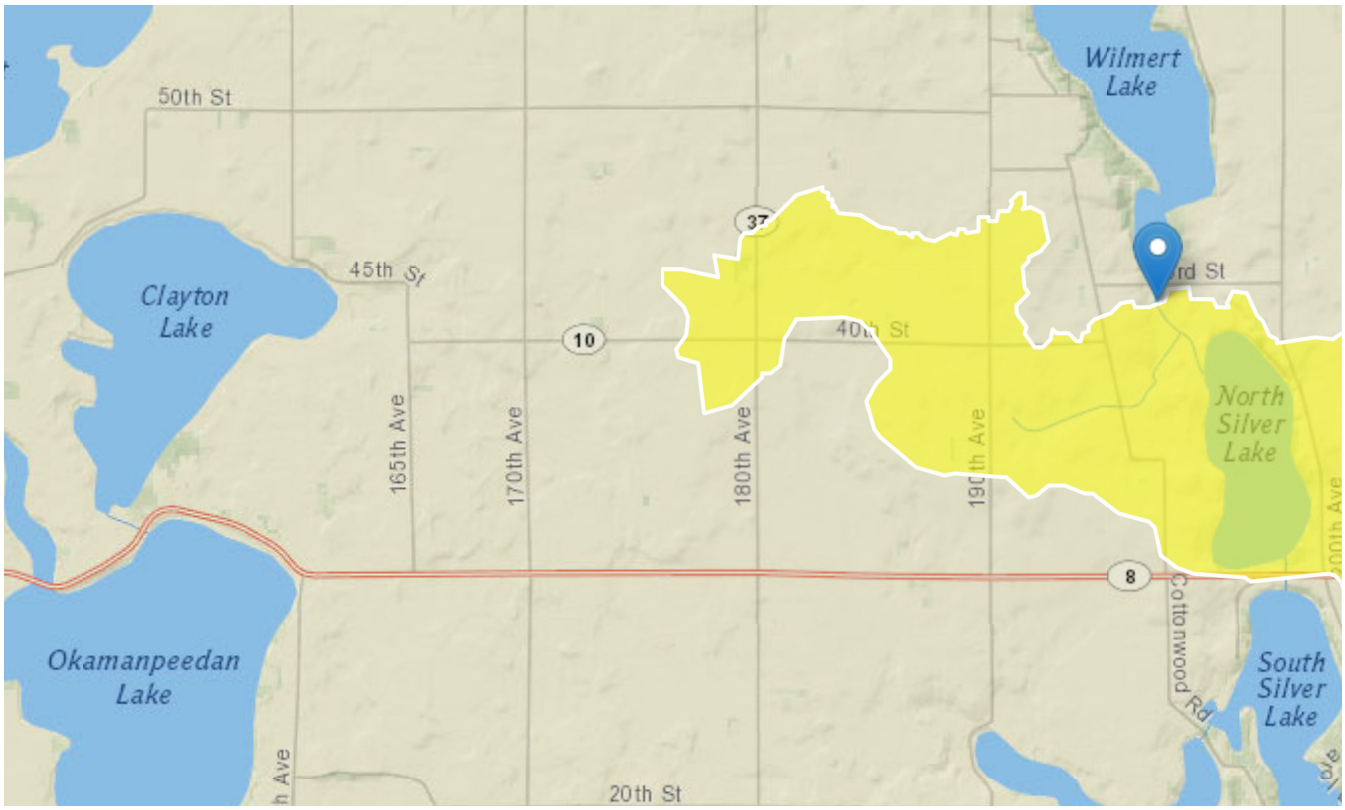
StreamStats Report

Region ID: MN
Workspace ID: MN20220204191444207000
Clicked Point (Latitude, Longitude): 43.54623, -94.47817
Time: 2022-02-04 13:15:06 -0600



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	2.95	square miles
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	13.2	feet per mi
LAKEAREA	Percentage of Lakes and Ponds	10.5	percent
GENRO	Generalized mean annual runoff in Minnesota 1951-85	6.07	inches
BSLDEM10M	Mean basin slope computed from 10 m DEM	2.31	percent

Parameter Code	Parameter Description	Value	Unit
LC06CROP	Percentage of area of cultivated crops from NLCD 2006 class 82	78.7	percent
LC06FOREST	Percentage of forest from NLCD 2006 classes 41-43	0.13	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	0.0521	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.34	percent
LOGDA	Logarithm base 10 of drainage area	0.47	Log base 10
PFLATLOW	Flat lands lower than median elevation from Wolock 2003 unpublished data	11.6	percent
PMPE	Precipitation minus potential evaporation from Wolock 2003 unpublished data	96.2	millimeters
SOILA	Percentage of area of Hydrologic Soil Type A	0	percent
SSURGOC	Percentage of area of Hydrologic Soil Type C from SSURGO	15.7	percent
SSURGOM	Percentage of organic matter in soils from SSURGO	0.73	percent
STORNWI	Percentage of strorage (combined water bodies and wetlands) from the Nationa Wetlands Inventory	13.5	percent

Peak-Flow Statistics Parameters [Region D]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.95	square miles	0.15	2640
CSL10_85	Stream Slope 10 and 85 Method	13.2	feet per mi	1.49	77.2
LAKEAREA	Percent Lakes and Ponds	10.5	percent	0	14
GENRO	Generalized Runoff	6.07	inches	2.15	7.8

Peak-Flow Statistics Flow Report [Region D]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of

Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu	SE	ASEp	Equiv. Yrs.
66.7-percent AEP flood	23.8	ft^3/s	7.95	54.2	63.5	63.5	3.1
50-percent AEP flood	31.6	ft^3/s	11.9	67.1	56.2	56.2	3.5
20-percent AEP flood	55.1	ft^3/s	23.8	108	49.7	49.7	6.3
10-percent AEP flood	74	ft^3/s	32.2	145	50.8	50.8	8.8
4-percent AEP flood	102	ft^3/s	42.8	205	55.2	55.2	11.4
2-percent AEP flood	125	ft^3/s	50.1	258	59.7	59.7	12.8
1-percent AEP flood	152	ft^3/s	57.6	325	64.8	64.8	13.8
0.2-percent AEP flood	222	ft^3/s	72.2	520	78	78	14.8

Peak-Flow Statistics Citations

Lorenz, D.L., Sanocki, C.A., and Kocian, M.J.,2009, Techniques for Estimating the Magnitude and Frequency of Peak Flows on Small Streams in Minnesota Based on Data through Water Year 2005: U.S. Geological Survey Scientific Investigations Report 2009-5250, 54 p. (http://pubs.usgs.gov/sir/2009/5250/pdf/sir2009-5250.pdf)

Application Version: 4.6.2

StreamStats Services Version: 1.2.22

NSS Services Version: 2.1.2

NOAA Atlas 14, Volume 8, Version 2
Location name: Fairmont, Minnesota, USA*
Latitude: 43.5453°, Longitude: -94.4783°
Elevation: 1206.53 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.393 (0.314-0.501)	0.464 (0.370-0.591)	0.578 (0.460-0.738)	0.672 (0.532-0.859)	0.799 (0.611-1.03)	0.896 (0.672-1.17)	0.991 (0.721-1.31)	1.09 (0.761-1.45)	1.21 (0.819-1.64)	1.31 (0.862-1.79)
10-min	0.576 (0.460-0.734)	0.679 (0.542-0.866)	0.847 (0.674-1.08)	0.984 (0.779-1.26)	1.17 (0.895-1.52)	1.31 (0.984-1.71)	1.45 (1.06-1.92)	1.59 (1.11-2.13)	1.77 (1.20-2.41)	1.91 (1.26-2.62)
15-min	0.702 (0.561-0.895)	0.828 (0.661-1.06)	1.03 (0.821-1.32)	1.20 (0.950-1.54)	1.43 (1.09-1.85)	1.60 (1.20-2.09)	1.77 (1.29-2.34)	1.94 (1.36-2.60)	2.16 (1.46-2.94)	2.33 (1.54-3.19)
30-min	0.982 (0.784-1.25)	1.17 (0.930-1.49)	1.46 (1.16-1.86)	1.70 (1.35-2.17)	2.02 (1.54-2.61)	2.26 (1.69-2.95)	2.50 (1.81-3.29)	2.73 (1.91-3.65)	3.03 (2.05-4.11)	3.25 (2.15-4.45)
60-min	1.26 (1.01-1.61)	1.49 (1.19-1.91)	1.88 (1.50-2.40)	2.22 (1.76-2.84)	2.69 (2.07-3.51)	3.06 (2.30-4.01)	3.44 (2.51-4.57)	3.84 (2.70-5.16)	4.38 (2.97-5.96)	4.80 (3.17-6.57)
2-hr	1.54 (1.24-1.94)	1.82 (1.47-2.30)	2.31 (1.86-2.91)	2.73 (2.19-3.46)	3.36 (2.62-4.35)	3.86 (2.94-5.03)	4.39 (3.24-5.79)	4.95 (3.51-6.62)	5.73 (3.91-7.77)	6.34 (4.22-8.63)
3-hr	1.70 (1.39-2.13)	2.01 (1.63-2.51)	2.55 (2.06-3.19)	3.04 (2.45-3.82)	3.79 (2.99-4.92)	4.42 (3.39-5.75)	5.09 (3.78-6.71)	5.82 (4.16-7.78)	6.85 (4.71-9.29)	7.69 (5.13-10.4)
6-hr	1.98 (1.63-2.45)	2.32 (1.90-2.86)	2.95 (2.41-3.64)	3.54 (2.89-4.39)	4.48 (3.59-5.79)	5.29 (4.12-6.85)	6.18 (4.65-8.11)	7.16 (5.17-9.53)	8.58 (5.96-11.6)	9.75 (6.55-13.1)
12-hr	2.26 (1.88-2.76)	2.63 (2.18-3.21)	3.32 (2.75-4.06)	3.99 (3.29-4.89)	5.05 (4.10-6.48)	5.98 (4.71-7.68)	7.01 (5.32-9.12)	8.15 (5.93-10.8)	9.80 (6.86-13.2)	11.2 (7.56-15.0)
24-hr	2.57 (2.17-3.10)	2.96 (2.49-3.56)	3.69 (3.09-4.45)	4.40 (3.67-5.33)	5.54 (4.54-7.03)	6.54 (5.20-8.31)	7.64 (5.86-9.86)	8.87 (6.52-11.6)	10.7 (7.52-14.2)	12.2 (8.28-16.2)
2-day	2.95 (2.51-3.51)	3.34 (2.84-3.97)	4.09 (3.47-4.88)	4.83 (4.07-5.77)	6.01 (4.98-7.54)	7.06 (5.67-8.87)	8.21 (6.36-10.5)	9.51 (7.04-12.4)	11.4 (8.09-15.1)	13.0 (8.88-17.1)
3-day	3.23 (2.77-3.81)	3.63 (3.11-4.28)	4.40 (3.76-5.21)	5.16 (4.38-6.12)	6.35 (5.29-7.90)	7.41 (5.98-9.24)	8.57 (6.67-10.9)	9.87 (7.34-12.8)	11.8 (8.38-15.5)	13.3 (9.17-17.5)
4-day	3.46 (2.99-4.06)	3.88 (3.34-4.55)	4.67 (4.01-5.50)	5.44 (4.64-6.42)	6.64 (5.55-8.20)	7.70 (6.24-9.55)	8.86 (6.91-11.2)	10.2 (7.57-13.1)	12.0 (8.59-15.8)	13.6 (9.37-17.8)
7-day	4.06 (3.53-4.71)	4.52 (3.93-5.25)	5.36 (4.65-6.24)	6.15 (5.30-7.19)	7.38 (6.19-8.97)	8.42 (6.87-10.3)	9.56 (7.50-11.9)	10.8 (8.10-13.8)	12.6 (9.05-16.4)	14.1 (9.77-18.4)
10-day	4.61 (4.04-5.31)	5.10 (4.47-5.89)	5.99 (5.22-6.93)	6.80 (5.89-7.89)	8.02 (6.75-9.64)	9.04 (7.40-11.0)	10.1 (7.98-12.5)	11.3 (8.51-14.3)	13.0 (9.37-16.8)	14.4 (10.0-18.7)
20-day	6.25 (5.55-7.12)	6.87 (6.09-7.82)	7.90 (6.97-9.01)	8.77 (7.69-10.0)	9.98 (8.44-11.7)	10.9 (9.01-13.0)	11.9 (9.44-14.5)	12.9 (9.76-16.1)	14.3 (10.3-18.2)	15.3 (10.7-19.8)
30-day	7.65 (6.84-8.64)	8.42 (7.51-9.51)	9.64 (8.57-10.9)	10.6 (9.38-12.1)	11.9 (10.1-13.9)	12.9 (10.7-15.2)	13.9 (11.0-16.7)	14.8 (11.2-18.3)	16.0 (11.6-20.2)	16.9 (11.9-21.7)
45-day	9.43 (8.49-10.6)	10.4 (9.38-11.7)	12.0 (10.7-13.5)	13.2 (11.8-14.9)	14.8 (12.6-17.0)	15.9 (13.2-18.5)	16.9 (13.5-20.2)	17.9 (13.6-21.9)	19.1 (13.9-24.0)	19.9 (14.1-25.5)
60-day	11.0 (9.91-12.2)	12.2 (11.0-13.6)	14.1 (12.7-15.8)	15.6 (13.9-17.5)	17.5 (14.9-19.9)	18.8 (15.7-21.7)	20.0 (16.0-23.7)	21.1 (16.1-25.6)	22.4 (16.3-27.9)	23.2 (16.4-29.6)

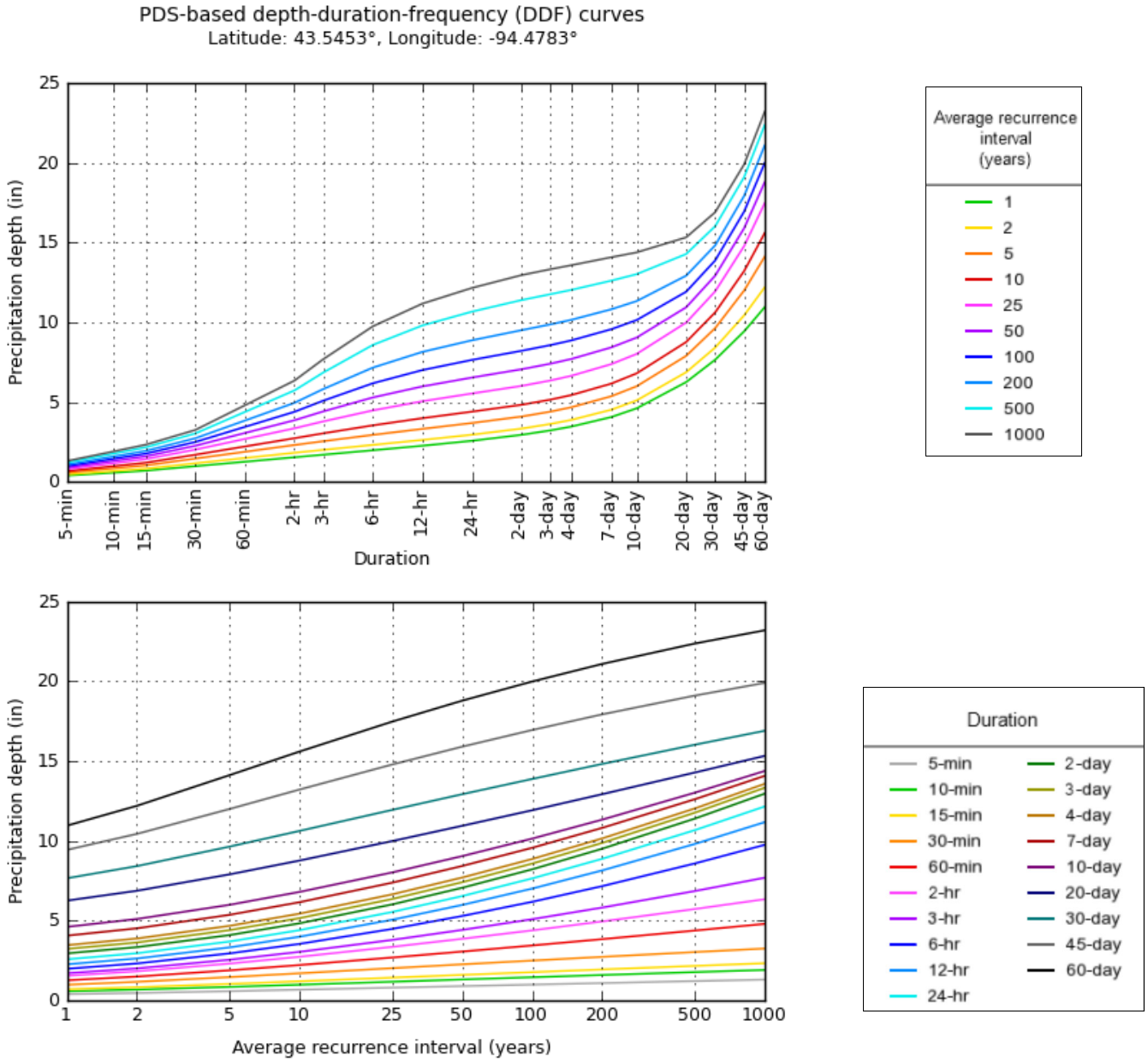
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



NOAA Atlas 14, Volume 8, Version 2

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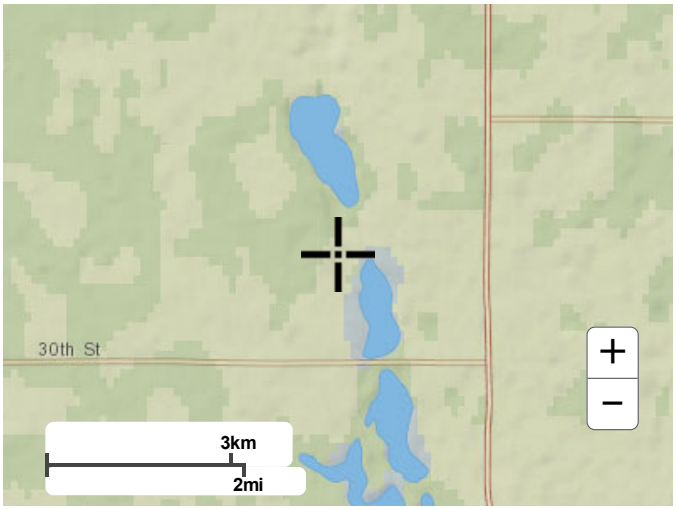
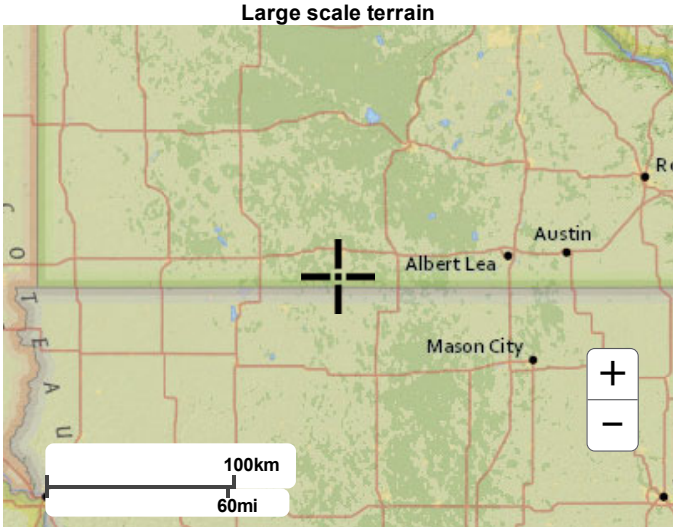
Back to Top

Maps & aerials

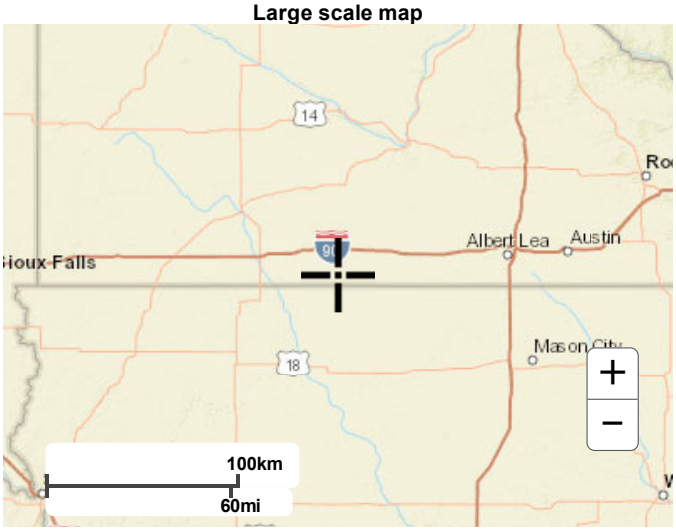
Small scale terrain



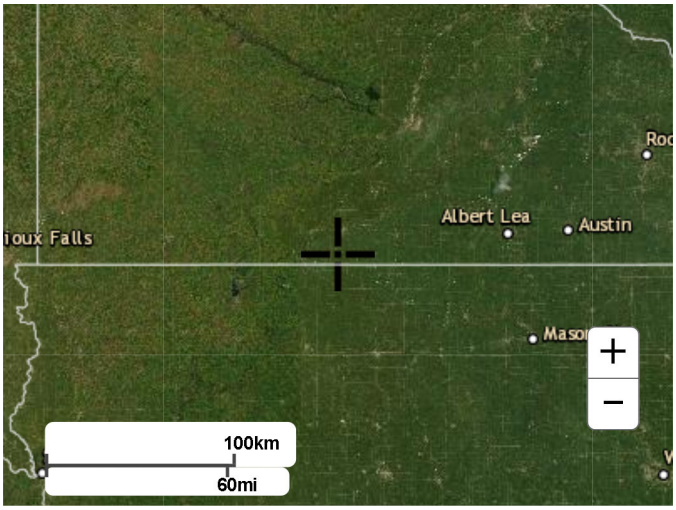
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Flood Frequency Estimation Worksheet

!!!Populate Blue Cells!!!

Date:	Project Name:	Lat/Long:	Initials:
2/4/2022	**Martin Co Cons L**	**43.54620/-94.4782**	**SR**

Drainage Area of Wetland Restoration ***Acres***	*Drainage Area of Wetland Restoration* ***Square Miles***	GENRO (generalized runoff) in inches	*Drainage Area of Wetland Restoration* ***(sq. mi.)***	*Drainage Area of Nearest Streamstats Stream Cell* ***(sq. mi.)***	*Watershed Ratio*
1888	2.95	**6.07**	2.95	**2.95**	1.000

Streamstats Application: https://streamstats.usgs.gov/ss/

Techniques for Estimating the Magnitude and Frequency of Peak Flows on Small Streams in Minnesota Based on Data through Water Year 2005: https://pubs.usgs.gov/sir/2009/5250/pdf/sir2009-5250.pdf

Flood Frequency	Streamstats Estimated Flood Frequency (cfs)	Wetland Restoration (cfs)
1.5 Year Peak Flood	**23.8**	23.80
2 Year Peak Flood	**31.6**	31.60
5 Year Peak Flood	**55.1**	55.10
10 Year Peak Flood	**74**	74.00
25 Year Peak Flood	**102**	102.00
50 Year Peak Flood	**125**	125.00
100 Year Peak Flood	**152**	152.00
500 Year Peak Flood	**222**	222.00

Broad Crested Weir Flow (Rock Weir)				
Variable	Definition	Value		
Q	discharge over weir, cfs (cms)	**226.1029**	CFS	**Output**
C	broad crested weir coefficient	2.6	From Table -->	Input
L	weir crest length perpedicular to flow	16	ft	Input
H	head above weir crest	2.5	ft	Input
Z	side slope (Z horizontal to 1 vertical) of the weir crest	3	:1	Input
Formula				
Q1=	C*L*H^1.5	For rectangular weir		
Q2=	((2/5*C*Z*H^2.5)*2)	Angled part of trapezoidal Weir		
Total Q =	Q1 + Q2	Total for trapezoidal Weir		
Calculations				
Q=	**164.4384383**	cfs	**Output**	
Q2=	**61.66441437**	cfs	**Output**	
Total Q	**226.1028527**	cfs	**Output**	