WIN:	25105.00	**Project Name:**	WILTON BRIDGES BR #2102
Town:	Wilton	**Stream Name:**	Wilson Stream
Route No.	ME 156 (Pond Rd)	**Bridge Name:**	Bridges
Asset ID:	2102	**Analysis by:**	csh
Lat:	44.61554 **Long:** -70.26312	**Date:**	11/8/2021

Peak Flow Calculations by USGS Regression Equations (Lombard/Hodgkins, 2021; Hodgkins, 1999 & Lombard/Hodgkins, 2015)

Enter data in blue cells only!

ver. 2021 Jan 01

	km²	mi²	ac	*Enter data in [mi²]*
A	55.27	21.34	13657.6	Watershed Area *DRNAREA*
W	1.58	0.6	389.2	Wetlands area (by NWI)

P_c	396102	4944409	watershed centroid (E, N; UTM 19N; meters)
County	Franklin		*choose county from drop-down menu*

Worksheet prepared by:
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Maine Dept. Transportation
Augusta, ME 04333-0016
207-557-1052
Charles.Hebson@maine.gov

Watershed Characteristics from StreamStats

STORNWI	2.85	NWI Wetlands %
STORAGE	2.13	% storage (lakes, ponds, reservoirs, wetlands)
SANDGRAVF	0.03	sand & gravel aquifer as decimal fraction of watershed A
ELEV	1205	mean basin elevation (ft)
BSLDEM10M	18.2	mean basin slope (%)
COASTDIST	94.00	distance from the coast (mi)
ELEVMAX	2564	maximum basin elevation (ft)
LC06WATER	0.16	percent of drainage basin land cover as open water
PRECIP	52.3	mean annual precipitation
STATSGOA	3.45	mean basin percentage of hydrological soil group A

References:

Hodgkins, G.A., 1999.
Estimating the magnitude of peak flows for streams in Maine for Selected Recurrence Intervals
WRIR 99-4008, USGS Augusta, ME

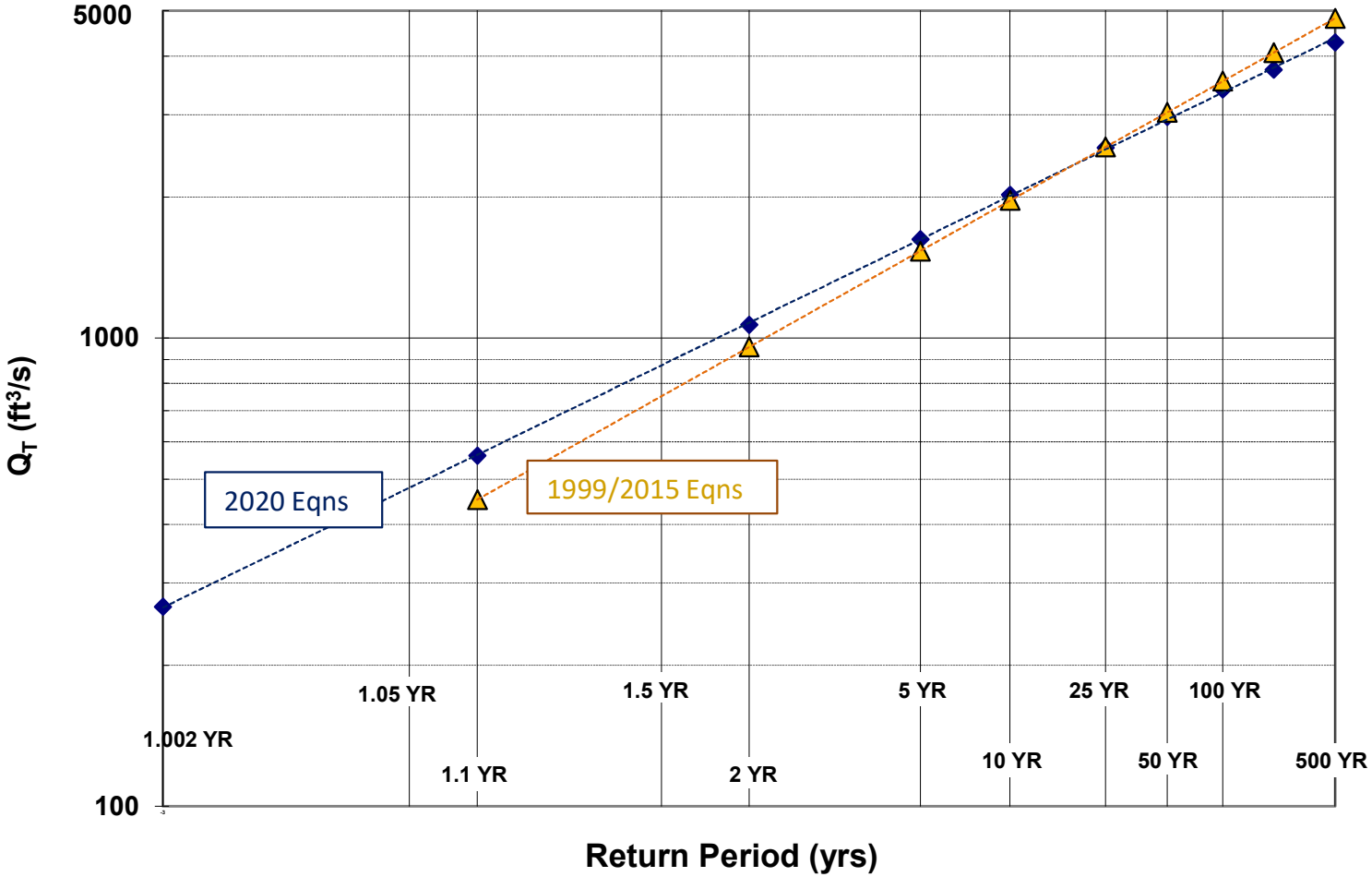
Lombard, P.J. & G.A. Hodgkins, 2015.
Peak flow regression equations for small, ungaged streams: in Maine: Comparing Map-Based to Field-Based Variables
SIR 2015-4059, USGS, Augusta, ME

Lombard, P.J. & G.A. Hodgkins, 2020.
Estimating Flood Magnitude and Frequency on Gaged and Ungaged Streams in Maine
SIR 2020-5092, USGS, Augusta, ME.

Ret Pd T (yr)	I24	Q_T (ft³/s) *1999 / 2015*	Q_T (ft³/s) *2020*	Q_T (ft³/s) ***Design***
1.1		452	561	***560***
2	3.08	957	1068	***1070***
5	3.81	1531	1624	***1625***
10	4.41	1967	2023	***2025***
25	5.24	2560	2551	***2550***
50	5.86	3033	2969	***2970***
100	6.51	3537	3395	***3395***
200	7.20	4067	3744	***3745***
500	8.20	4817	4280	***4280***

Instructions:
Enter values in blue cells only, watershed data from StreamStats
Generate "I24" DDF table from NOAA Atlas 14
Copy CSV file into "I24" page
Use results under "Design"
Check against gage data and FEMA studies if available
Questions? Check with ENV / Hydrology Section

Log-Normal Probability Plot



WIN:	25105.00	**Project Name:**	WILTON BRIDGES BR #2102
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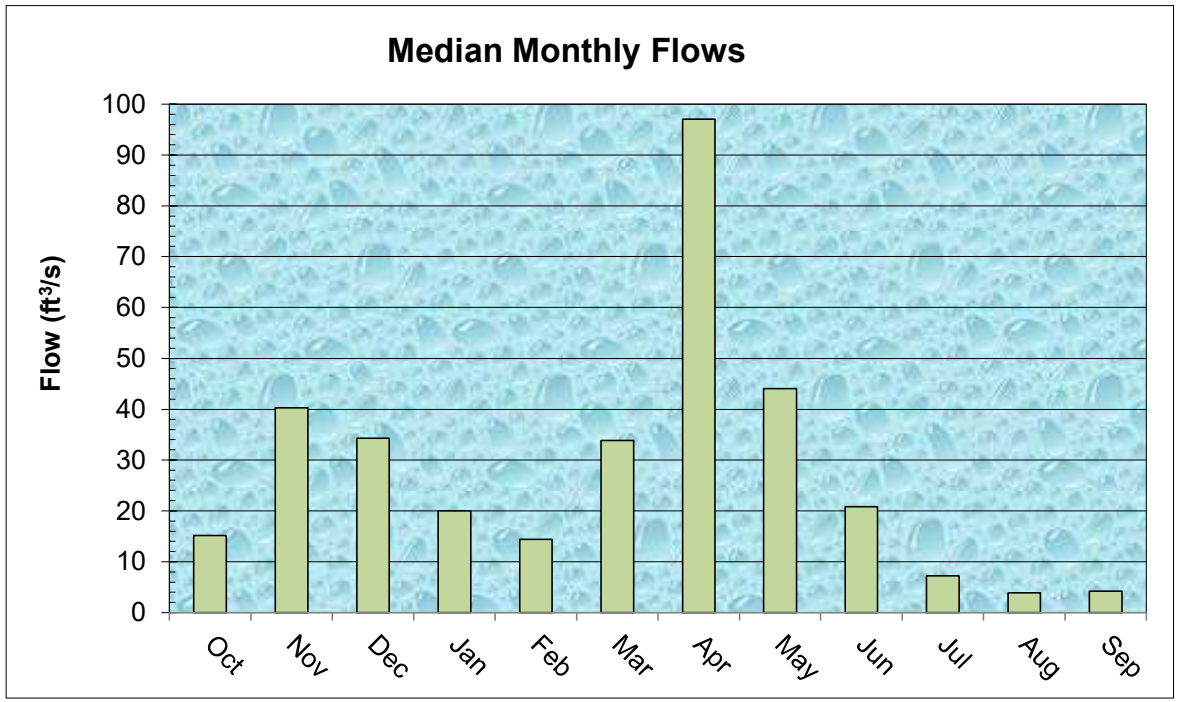
Asset ID:	2102	**Analysis by:**	csh
Lat:	44.61554 **Long:** -70.26312	**Date:**	11/8/2021

DO NOT ENTER ANY DATA ON THIS PAGE; EVERYTHING IS CALCULATED

MAINE MONTHLY MEDIAN FLOWS and HYDRAULIC GEOMETRY BY USGS REGRESSION EQUATIONS (2004, 2013, 2015)

	Value	Variable	Explanation
	21.34	*A*	Area (mi^2)
396102	4944409	P_c	Watershed centroid (E,N; UTM; Zone 19; meters)
	93.47	*DIST*	Distance from Coastal reference line (mi)
	52.3	*pptA*	Mean Annual Precipitation (inches)
	0.00	*SG*	Sand & Gravel Aquifer (decimal fraction of watershed area)

Month	Q_{median} (ft3/s)	(m^3/s)
Jan	**19.98**	0.5663
Feb	**14.39**	0.4078
Mar	**33.84**	0.9590
Apr	**97.06**	2.7505
May	**44.05**	1.2484
Jun	**20.80**	0.5895
Jul	**7.20**	0.2040
Aug	**3.85**	0.1091
Sep	**4.18**	0.1183
Oct	**15.12**	0.4286
Nov	**40.23**	1.1400
Dec	**34.25**	0.9706



Q_{bf}	**129.1**	
ann avg	**50.9**	
ann med	**22.7**	
$Q_{1.002}$	**266.5**	
$Q_{1.01}$	**347.7**	
$Q_{1.05}$	**477.6**	
Q_{bf}	**265.3**	assume v = 4ft/s

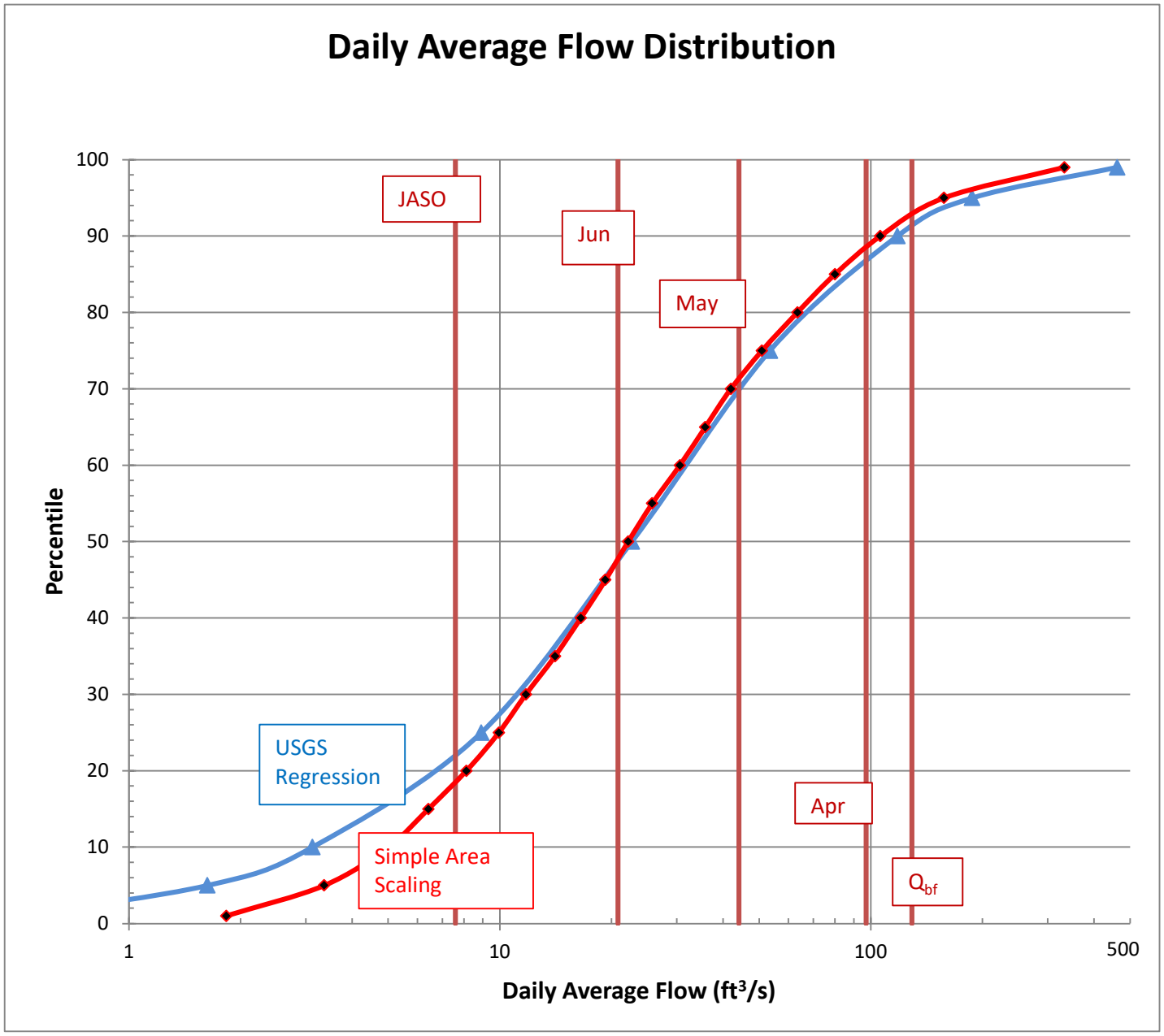
W_{bf}	**39.4**	estimated bankfull width (ft)
d_{bf}	**1.7**	estimated bankfull depth (ft)
A_{bf}	**63.3**	estimated bankfull flow area (ft^2)

References

Dudley, 2013. FY2013 Progress Report - Phase 1 …, USFWS QRP Project

Dudley, 2004. Estimating Monthly Streamflows … , SIR 2004-5026

Dudley, 2015. Regression Equations for Monthly & Annual Mean..., USGS SIR 2015-5151



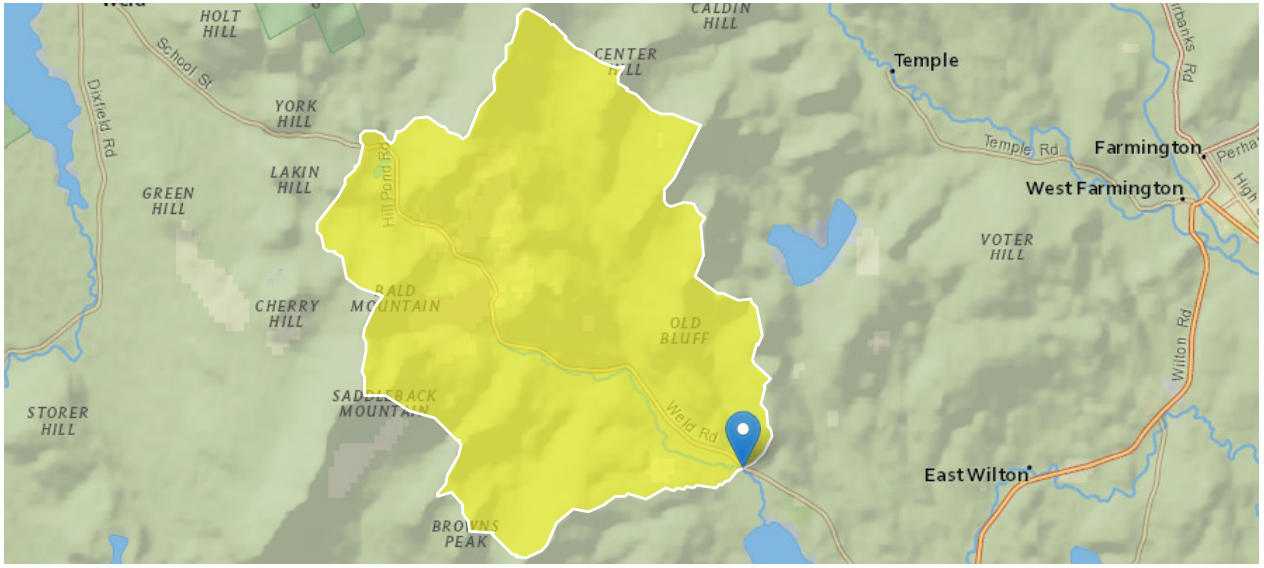
Daily Avg Flow Dist	
A_{ws} = (mi^2)	21.3

Pctl	Q (ft^3/s) Median	84th pctl
1	1.83	3.24
5	3.36	5.41
10	4.99	7.50
15	6.41	9.37
20	8.12	11.36
25	9.94	13.32
30	11.76	15.17
35	14.09	17.33
40	16.52	19.93
45	19.25	22.54
50	22.17	26.61
55	25.74	30.97
60	30.57	36.36
65	35.77	42.35
70	41.95	49.42
75	50.86	59.42
80	63.43	70.95
85	80.03	90.92
90	106.01	122.09
95	157.33	189.85
99	332.71	438.02

Q_{bf}	129.1
$Q_{1.002}$	266.5
$Q_{1.1}$	560.9
Q_2	1067.9

Wilton 25105 Bridges Br #2102 ME-156 @ Wilson Stream

Region ID: ME
Workspace ID: ME20211109190142534000
Clicked Point (Latitude, Longitude): 44.61557, -70.26315
Time: 2021-11-09 14:02:06 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	21.34	square miles
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precipitation intensity index	3.08	inches
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	2.131	percent
I24H5Y	Maximum 24-hour precipitation that occurs on average once in 5 years	3.81	inches
I24H10Y	Maximum 24-hour precipitation that occurs on average once in 10 years	4.41	inches
I24H25Y	Maximum 24-hour precipitation that occurs on average once in 25 years	5.24	inches
I24H50Y	Maximum 24-hour precipitation that occurs on average once in 50 years	5.86	inches
I24H100Y	Maximum 24-hour precipitation that occurs on average once in 100 years	6.51	inches
I24H200Y	Maximum 24-hour precipitation that occurs on average once in 200 years	7.2	inches
I24H500Y	Maximum 24-hour precipitation that occurs on average once in 500 years	8.2	inches

Parameter Code	Parameter Description	Value	Unit
SANDGRAVAF	Fraction of land surface underlain by sand and gravel aquifers	0.033	dimensionless
ELEV	Mean Basin Elevation	1205.3	feet
BSLDEM10M	Mean basin slope computed from 10 m DEM	18.2	percent
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	396101.67	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	4944409.15	meters
COASTDIST	Shortest distance from the coastline to the basin centroid	94	miles
ELEVMAX	Maximum basin elevation	2563.8	feet
LC06WATER	Percent of open water, class 11, from NLCD 2006	0.16	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	2.12	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.29	percent
PRDECFEB90	Basin average mean precipitation for December to February from PRISM 1961-1990	12.1	inches
PRECIP	Mean Annual Precipitation	52.3	inches
SANDGRAVAP	Percentage of land surface underlain by sand and gravel aquifers	3.32	percent
STATSGOA	Percentage of area of Hydrologic Soil Type A from STATSGO	3.45	percent
STORNWI	Percentage of strorage (combined water bodies and wetlands) from the Nationa Wetlands Inventory	2.85	percent

Peak-Flow Statistics Parameters [Statewide multiparameter peakflows SIR 2020 5092]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.34	square miles	0.26	5680
I24H2Y	24 Hour 2 Year Precipitation	3.08	inches	1.92	4.17
STORAGE	Percent Storage	2.131	percent	0	29.4
I24H5Y	24 Hour 5 Year Precipitation	3.81	inches	2.48	5.38
I24H10Y	24 Hour 10 Year Precipitation	4.41	inches	2.84	6.38
I24H25Y	24 Hour 25 Year Precipitation	5.24	inches	3.3	7.75
I24H50Y	24 Hour 50 Year Precipitation	5.86	inches	3.65	8.79
I24H100Y	24 Hour 100 Year Precipitation	6.51	inches	3.99	9.88
I24H200Y	24 Hour 200 YearPrecipitation	7.2	inches	5.26	11.1
I24H500Y	24 Hour 500 Year Precipitation	8.2	inches	5.95	13.1

Peak-Flow Statistics Flow Report [Statewide multiparameter peakflows SIR 2020 5092]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	ASEp

Statistic	Value	Unit	PII	PIu	ASEp
50-percent AEP flood	1070	ft^3/s	574	1990	39.1
20-percent AEP flood	1620	ft^3/s	883	2970	38.1
10-percent AEP flood	2020	ft^3/s	1090	3750	38.9
4-percent AEP flood	2550	ft^3/s	1350	4800	39.9
2-percent AEP flood	2970	ft^3/s	1550	5680	39.7
1-percent AEP flood	3390	ft^3/s	1780	6440	40.7
0.5-percent AEP flood	3740	ft^3/s	1900	7350	42.8
0.2-percent AEP flood	4280	ft^3/s	2150	8520	43.8

Peak-Flow Statistics Citations

Lombard, P.J., and Hodgkins, G.A.,2020, Estimating flood magnitude and frequency on gaged and ungaged streams in Maine: U.S. Geological Survey Scientific Investigations Report 2020–5092, 56 p. (https://doi.org/10.3133/sir20205092)

Flow-Duration Statistics Parameters [Statewide Annual SIR 2015 5151]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.34	square miles	14.9	1419
SANDGRAVAF	Fraction of Sand and Gravel Aquifers	0.033	dimensionless	0	0.212
ELEV	Mean Basin Elevation	1205.3	feet	239	2120

Flow-Duration Statistics Flow Report [Statewide Annual SIR 2015 5151]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	ASEp
1 Percent Duration	0.502	ft^3/s	144
5 Percent Duration	1.63	ft^3/s	62
10 Percent Duration	3.12	ft^3/s	41
25 Percent Duration	8.91	ft^3/s	22
50 Percent Duration	22.7	ft^3/s	20
75 Percent Duration	53.5	ft^3/s	17
90 Percent Duration	118	ft^3/s	17
95 Percent Duration	187	ft^3/s	18
99 Percent Duration	462	ft^3/s	29

Flow-Duration Statistics Citations

Dudley, R.W.,2015, Regression equations for monthly and annual mean and selected percentile streamflows for ungaged rivers in Maine: U.S. Geological Survey Scientific Investigations Report 2015–5151, 35 p. (http://dx.doi.org/10.3133/sir20155151)

Annual Flow Statistics Parameters [Statewide Annual SIR 2015 5151]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.34	square miles	14.9	1419
SANDGRAVAF	Fraction of Sand and Gravel Aquifers	0.033	dimensionless	0	0.212
ELEV	Mean Basin Elevation	1205.3	feet	239	2120

Annual Flow Statistics Flow Report [Statewide Annual SIR 2015 5151]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	ASEp
Mean Annual Flow	50.9	ft^3/s	16

Annual Flow Statistics Citations

Dudley, R.W.,2015, Regression equations for monthly and annual mean and selected percentile streamflows for ungaged rivers in Maine: U.S. Geological Survey Scientific Investigations Report 2015–5151, 35 p. (http://dx.doi.org/10.3133/sir20155151)

Bankfull Statistics Parameters [Central and Coastal Bankfull 2004 5042]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.34	square miles	2.92	298

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.34	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.34	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.34	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Central and Coastal Bankfull 2004 5042]

Statistic	Value	Unit
Bankfull Streamflow	129	ft^3/s
Bankfull Width	37.7	ft
Bankfull Depth	1.68	ft
Bankfull Area	63.3	ft^2

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	54.1	ft
Bieger_D_channel_depth	2.7	ft
Bieger_D_channel_cross_sectional_area	149	ft^2

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	59.5	ft
Bieger_P_channel_depth	2.7	ft
Bieger_P_channel_cross_sectional_area	165	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	36.4	ft
Bieger_USA_channel_depth	2.31	ft
Bieger_USA_channel_cross_sectional_area	89.2	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bankfull Streamflow	129	ft^3/s
Bankfull Width	37.7	ft
Bankfull Depth	1.68	ft
Bankfull Area	63.3	ft^2
Bieger_D_channel_width	54.1	ft
Bieger_D_channel_depth	2.7	ft
Bieger_D_channel_cross_sectional_area	149	ft^2
Bieger_P_channel_width	59.5	ft
Bieger_P_channel_depth	2.7	ft

Statistic	Value	Unit
Bieger_P_channel_cross_sectional_area	165	ft^2
Bieger_USA_channel_width	36.4	ft
Bieger_USA_channel_depth	2.31	ft
Bieger_USA_channel_cross_sectional_area	89.2	ft^2

Bankfull Statistics Citations

Dudley, R.W.,2004, Hydraulic-Geometry Relations for Rivers in Coastal and Central Maine: U.S. Geological Survey Scientific Investigations Report 2004-5042, 30 p (http://pubs.usgs.gov/sir/2004/5042/pdf/sir2004-5042.pdf)

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)

Application Version: 4.6.2
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2