

WIN:	24271.00
Town:	China
Route No.	ME9/US202
Asset ID:	266578
Lat:	44.41286
Long:	-69.5575

Project Name:	China LC Rehab
Stream Name:	n/n/ trib to China Lake
Bridge Name:	n/a
Analysis by:	csh
Date:	3/11/2019

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

*Enter data in blue cells only!*

*ver. 2020 Feb 07*

	km <sup>2</sup>	mi <sup>2</sup>	ac
A	11.91	4.60	2944.0
W	2.66	1.0	656.5
P <sub>c</sub>	457749	4918264	
County	Kennebec		
pptA			
A (km <sup>2</sup> )	11.91		
W (%)	22.30		

*Enter data in [mi<sup>2</sup>]*

Watershed Area *DRNAREA*  
Wetlands area (by NWI)

watershed centroid (E, N; UTM 19N; meters)  
*choose county from drop-down menu*  
mean annual precipitation (inches; by look-up)

Conf Lvl

NWI Wetlands % *STORNWI*

**Worksheet prepared by:**

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**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

#### Watershed Characteristics for Monthly & Daily Flows

EAVG	318
SLOPE	4.65
EMAX	479
WATER	0.06
PRECIP	42.6
SG	0.00
HGA	0
DIST	61.00

mean basin elevation (ft)  
mean basin slope (%)  
maximum basin elevation (ft)  
percent of drainage basin land cover classified as open water  
mean annual precipitation  
sand & gravel aquifer as decimal fraction of watershed A  
mean basin percentage of hydrological soil group A  
distance from the coast (mi)

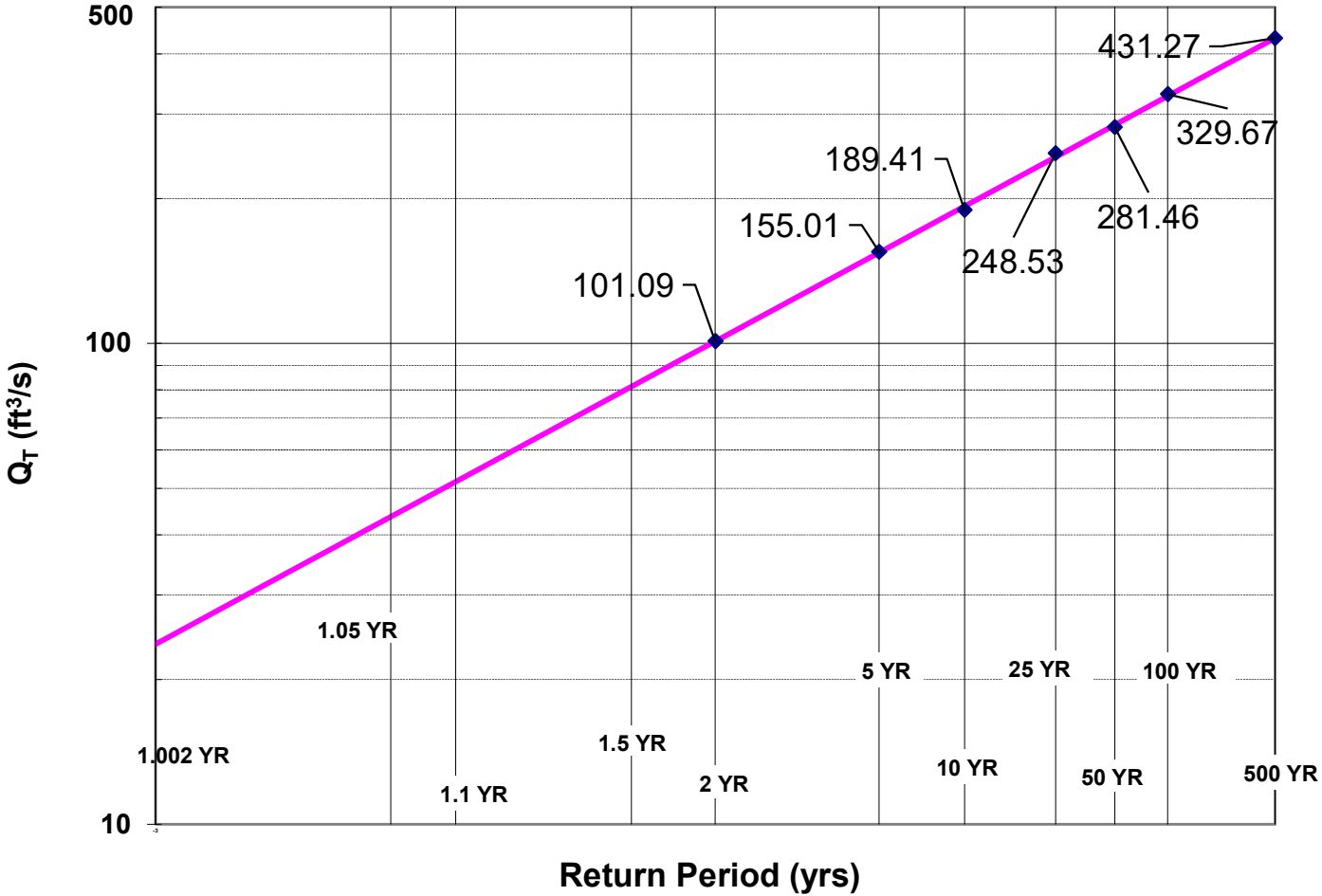
Ret Pd	Peak Flow Estimate		
T (yr)	Lower	Q <sub>T</sub> (m <sup>3</sup> /s)	Upper
1.1		1.46	
2		2.86	
5		4.39	
10		5.37	
25		7.04	
50		7.98	
100		9.34	
500		12.22	

Q <sub>T</sub> (ft <sup>3</sup> /s)
51.6
101.2
155.1
189.5
248.7
281.6
329.9
431.5

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

$$Q_T = b \times A^a \times 10^{-WW}$$

# Log-Normal Probability Plot



WIN:	24271.00
Town:	China
Route No.:	ME9/US202
Asset ID:	266578
Lat:	44.41286
Long:	-69.55749

Project Name:	China LC Rehab
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Bridge Name:	n/a
Analysis by:	csh
Date:	3/11/2019

**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)**

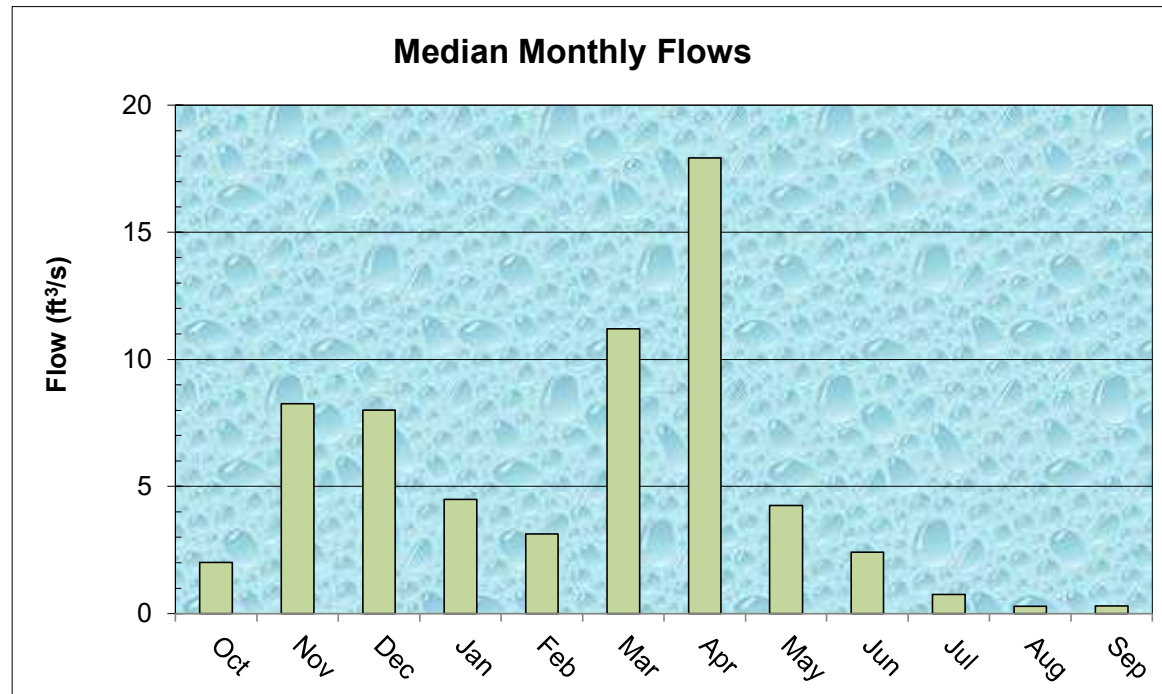
Value	Variable	Explanation
4.60	A	Area (mi <sup>2</sup> )
457749	P <sub>c</sub>	Watershed centroid (E,N; UTM; Zone 19; meters)
60.46	DIST	Distance from Coastal reference line (mi)
42.6	pptA	Mean Annual Precipitation (inches)
0.00	SG	Sand & Gravel Aquifer (decimal fraction of watershed area)

Month	Q <sub>median</sub> (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)
Jan	4.49	0.1272
Feb	3.13	0.0888
Mar	11.20	0.3173
Apr	17.93	0.5081
May	4.25	0.1206
Jun	2.42	0.0685
Jul	0.75	0.0212
Aug	0.28	0.0080
Sep	0.30	0.0085
Oct	2.01	0.0570
Nov	8.25	0.2339
Dec	8.01	0.2270

Q <sub>bf</sub>	25.8
ann avg	10.0
ann med	4.1
Q <sub>1.002</sub>	23.7
Q <sub>1.01</sub>	31.2
Q <sub>1.05</sub>	43.6
Q <sub>bf</sub>	81.4

assume v = 4ft/s

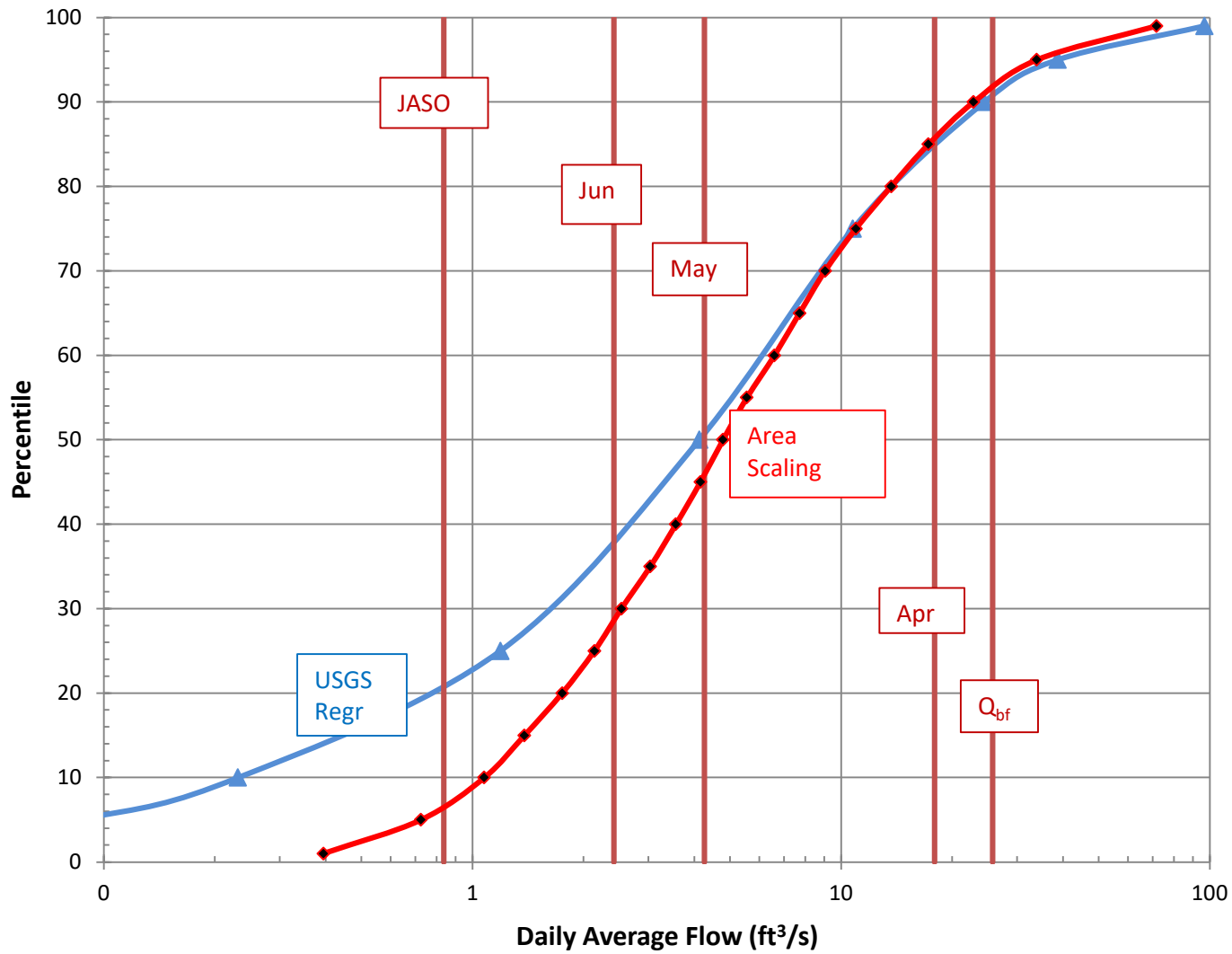
W <sub>bf</sub>	20.4	estimated bankfull width (ft)
d <sub>bf</sub>	1.0	estimated bankfull depth (ft)
A <sub>bf</sub>	16.9	estimated bankfull flow area (ft <sup>2</sup> )



**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 Average Flow Distribution



## Daily Avg Flow Dist

$A_{ws} = (mi^2)$  4.6

Q (ft<sup>3</sup>/s)

Pctl	Median	84 <sup>th</sup> pctl
1	0.39	0.70
5	0.72	1.17
10	1.08	1.62
15	1.38	2.02
20	1.75	2.45
25	2.14	2.87
30	2.53	3.27
35	3.04	3.74
40	3.56	4.30
45	4.15	4.86
50	4.78	5.74
55	5.55	6.68
60	6.59	7.84
65	7.71	9.13
70	9.04	10.65
75	10.96	12.81
80	13.67	15.29
85	17.25	19.60
90	22.85	26.32
95	33.91	40.92
99	71.72	94.42

Q<sub>bf</sub> 25.8

Q<sub>1.002</sub> 23.7

Q<sub>1.1</sub> 51.6

Q<sub>2</sub> 101.2

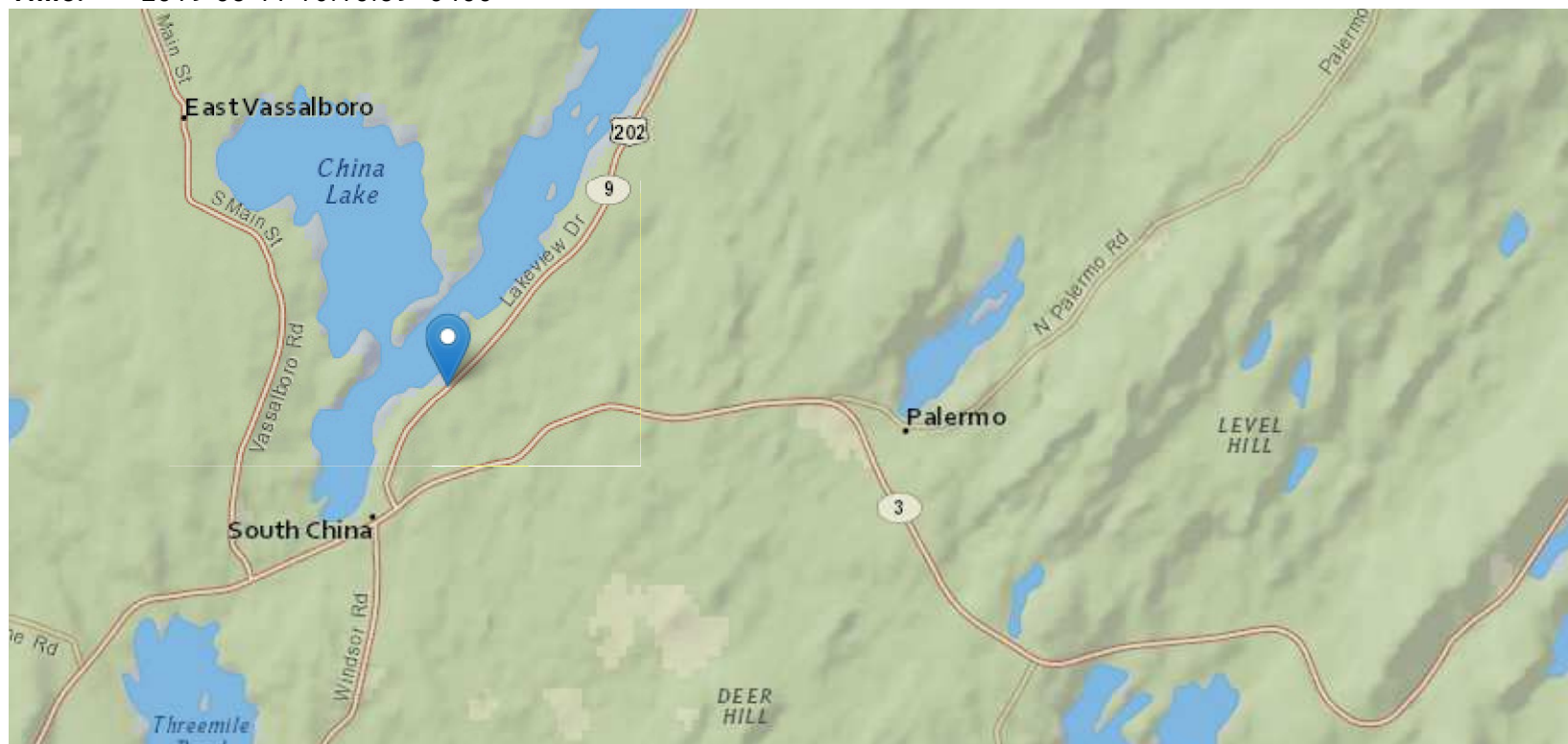
# StreamStats Report China 24271 LgCul 266578

Region ID: ME

Workspace ID: ME20190311201024367000

Clicked Point (Latitude, Longitude): 44.41286, -69.55749

Time: 2019-03-11 16:10:39 -0400



Basin Characteristics

<b>Parameter Code</b>	<b>Parameter Description</b>	<b>Value</b>	<b>Unit</b>
DRNAREA	Area that drains to a point on a stream	4.6	square miles
STORNWI	Percentage of storage (combined water bodies and wetlands) from the National Wetlands Inventory	22.27	percent
BSLDEM10M	Mean basin slope computed from 10 m DEM	4.65	percent
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	457749.48	feet
CENTROIDY	Basin centroid vertical (y) location in state plane units	4918264.09	feet
COASTDIST	Shortest distance from the coastline to the basin centroid	61	miles
ELEV	Mean Basin Elevation	318.3	feet
ELEVMAX	Maximum basin elevation	479.4	feet
LC06WATER	Percent of open water, class 11, from NLCD 2006	0.06	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	8.17	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	1.39	percent
PRECIP	Mean Annual Precipitation	42.6	inches
SANDGRAVAF	Fraction of land surface underlain by sand and gravel aquifers	0	dimensionless
SANDGRAVAP	Percentage of land surface underlain by sand and gravel aquifers	0	percent
STATSGOA	Percentage of area of Hydrologic Soil Type A from STATSGO	0	percent

Bankfull Statistics Parameters [Central and Coastal Bankfull 2004 5042]

<b>Parameter Code</b>	<b>Parameter Name</b>	<b>Value</b>	<b>Units</b>	<b>Min Limit</b>	<b>Max Limit</b>
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Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4.6	square miles	2.92	298

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

Statistic	Value	Unit
Bankfull Streamflow	25.8	ft <sup>3</sup> /s
Bankfull Width	17	ft
Bankfull Depth	0.998	ft
Bankfull Area	16.9	ft <sup>2</sup>

*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>)**

Peak-Flow Statistics Parameters [Statewide Peak Flow DA LT 12sqmi 2015 5049]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4.6	square miles	0.31	12
STORNWI	Percentage of Storage from NWI	22.27	percent	0	22.2

Peak-Flow Statistics Disclaimers [Statewide Peak Flow DA LT 12sqmi 2015 5049]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

## Peak-Flow Statistics Flow Report [Statewide Peak Flow DA LT 12sqmi 2015 5049]

<b>Statistic</b>	<b>Value</b>	<b>Unit</b>
1.01 Year Peak Flood	31.4	ft <sup>3</sup> /s
2 Year Peak Flood	101	ft <sup>3</sup> /s
5 Year Peak Flood	155	ft <sup>3</sup> /s
10 Year Peak Flood	190	ft <sup>3</sup> /s
25 Year Peak Flood	249	ft <sup>3</sup> /s
50 Year Peak Flood	282	ft <sup>3</sup> /s
100 Year Peak Flood	330	ft <sup>3</sup> /s
250 Year Peak Flood	362	ft <sup>3</sup> /s
500 Year Peak Flood	432	ft <sup>3</sup> /s

*Peak-Flow Statistics Citations*

**Lombard, P.J., and Hodgkins, G.A., 2015, Peak flow regression equations for small, ungaged streams in Maine—Comparing map-based to field-based variables: U.S. Geological Survey Scientific Investigations Report 2015–5049, 12 p. (<http://dx.doi.org/10.3133/sir20155049>)**

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Application Version: 4.3.0