WIN:	24267.00	**Project Name:**	
Town:	Eagle Lake	**Stream Name:**	Thibadeau Brook
Route No.	ME 11	**Bridge Name:**	
Asset ID:	941218	**Analysis by:**	CSH
Lat:	47.03117 **Long:** 68.59556	**Date:**	7/29/2019

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

Enter data in blue cells only!

ver. 2018 Jul 09

	km²	mi²	ac	*Enter data in [mi²]*
A	3.26	1.26	806.4	Watershed Area *DRNAREA*
W	0.23	0.1	56.4	Wetlands area (by NWI)
P_c	528983	5209424		watershed centroid (E, N; UTM 19N; meters)
County	Aroostook S			*choose county from drop-down menu*
pptA				mean annual precipitation (inches; by look-up)
A (km²)	3.26	**Conf Lvl**	0.67	
W (%)	7.00			NWI Wetlands % *STORNWI*

Worksheet prepared by:
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207-557-1052
Charles.Hebson@maine.gov

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

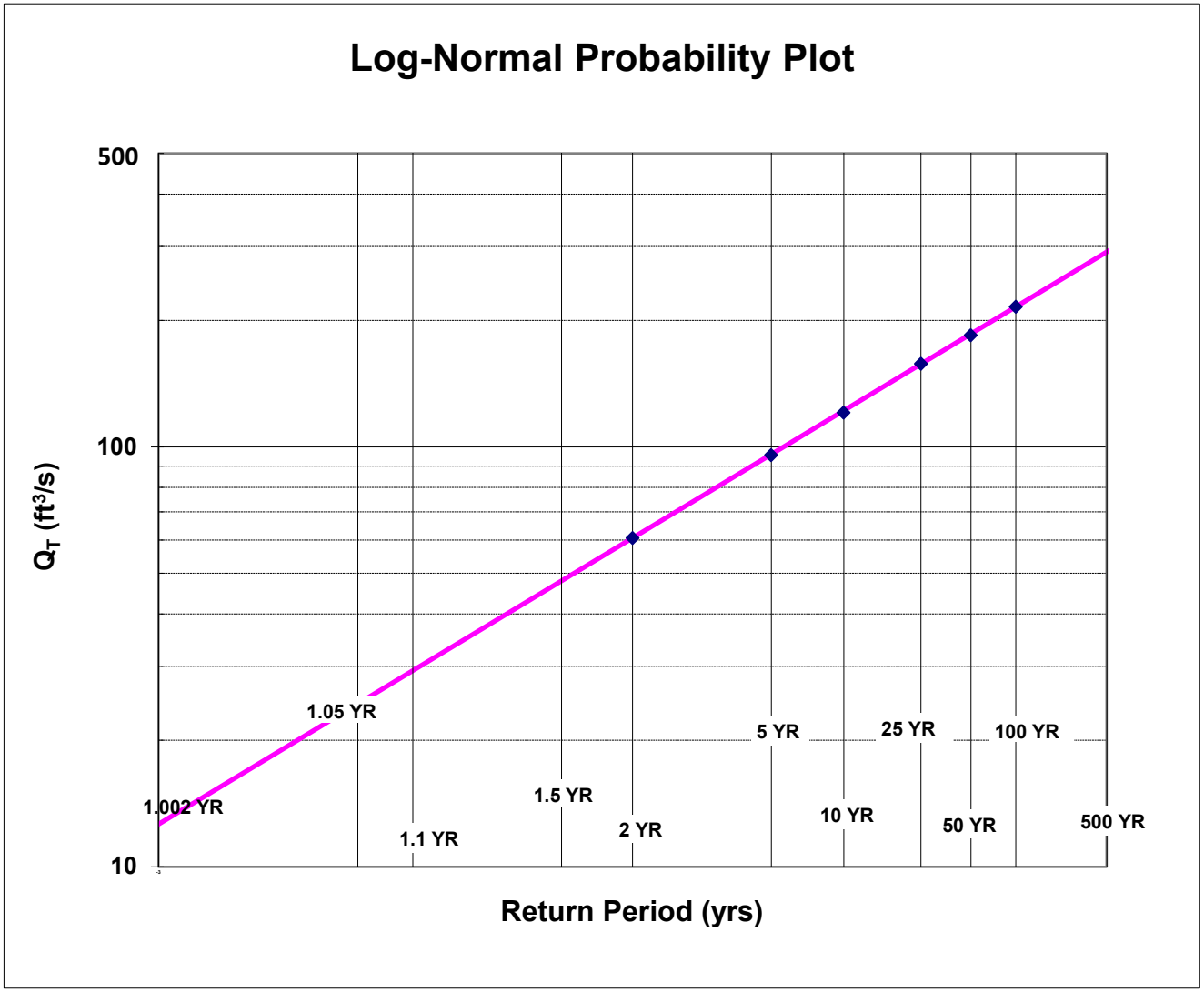
Watershed Characteristics for Monthly & Daily Flows

EAVG	916.4	mean basin elevation (ft)
SLOPE	9.44	mean basin slope (%)
EMAX	1172.2	maximum basin elevation (ft)
WATER	0	percent of drainage basin land cover classified as open water
PRECIP	38.2	mean annual precipitation
SG	0.00	sand & gravel aquifer as decimal fraction of watershed A
HGA	0	mean basin percentage of hydrological soil group A
DIST	195.00	distance from the coast (mi)

Ret Pd T (yr)	Peak Flow Estimate Lower	Q_T (m^3/s)	Upper	Q_T (ft^3/s)
1.1		0.83		29.3
2		1.72		60.7
5		2.71		95.6
10		3.42		120.7
25		4.47		157.8
50		5.23		184.6
100		6.11		215.9
500		8.25		291.5

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
500
100
10
Q_T (ft³/s)
1.002 YR
1.05 YR
1.1 YR
1.5 YR
2 YR
5 YR
10 YR
25 YR
50 YR
100 YR
500 YR
Return Period (yrs)

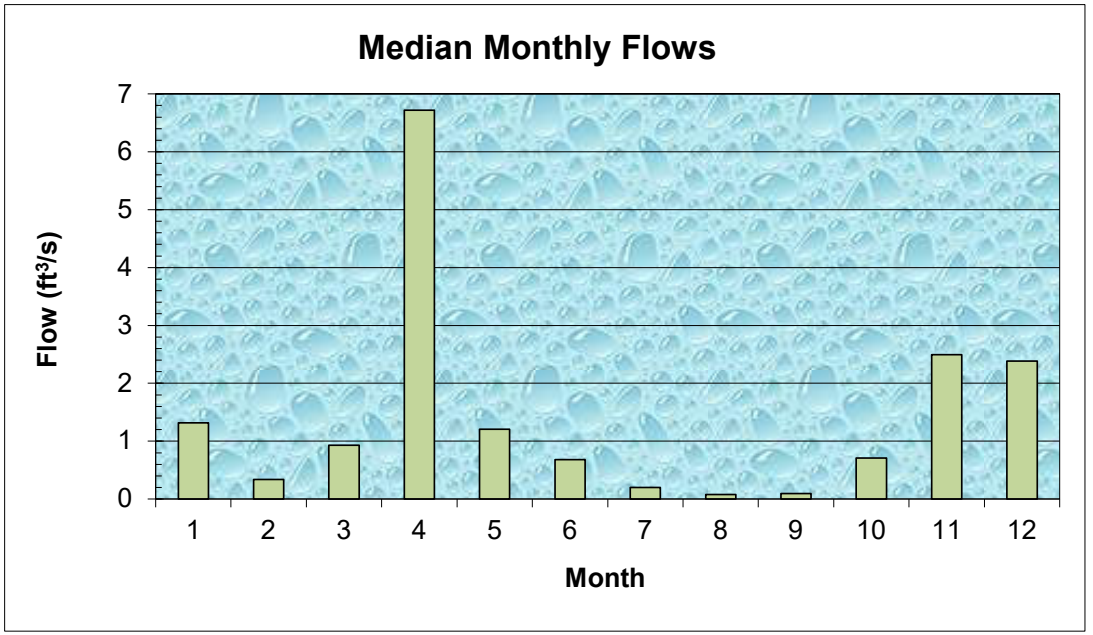
WIN:	24267.00	**Project Name:**	0
Town:	Eagle Lake	**Stream Name:**	Thibadeau Brook
Route No.	ME 11	**Bridge Name:**	0
Asset ID:	941218	**Analysis by:**	CSH
Lat:	47.03117 **Long:** 68.59556	**Date:**	7/29/2019

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
	1.26	*A*	Area (mi^2)
528983	5209424	P_c	Watershed centroid (E,N; UTM; Zone 19; meters)
	194.09	*DIST*	Distance from Coastal reference line (mi)
	38.2	*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	**1.32**	0.0374
Feb	**0.34**	0.0096
Mar	**0.93**	0.0264
Apr	**6.72**	0.1904
May	**1.21**	0.0342
Jun	**0.68**	0.0193
Jul	**0.20**	0.0057
Aug	**0.08**	0.0022
Sep	**0.10**	0.0027
Oct	**0.71**	0.0200
Nov	**2.49**	0.0706
Dec	**2.38**	0.0676



Q_{bf}	**6.6**	
ann avg	**3.2**	
ann med	**1.2**	
$Q_{1.002}$	**12.6**	
$Q_{1.01}$	**17.0**	
$Q_{1.05}$	**24.4**	
Q_{bf}	**30.0**	assume v = 4ft/s

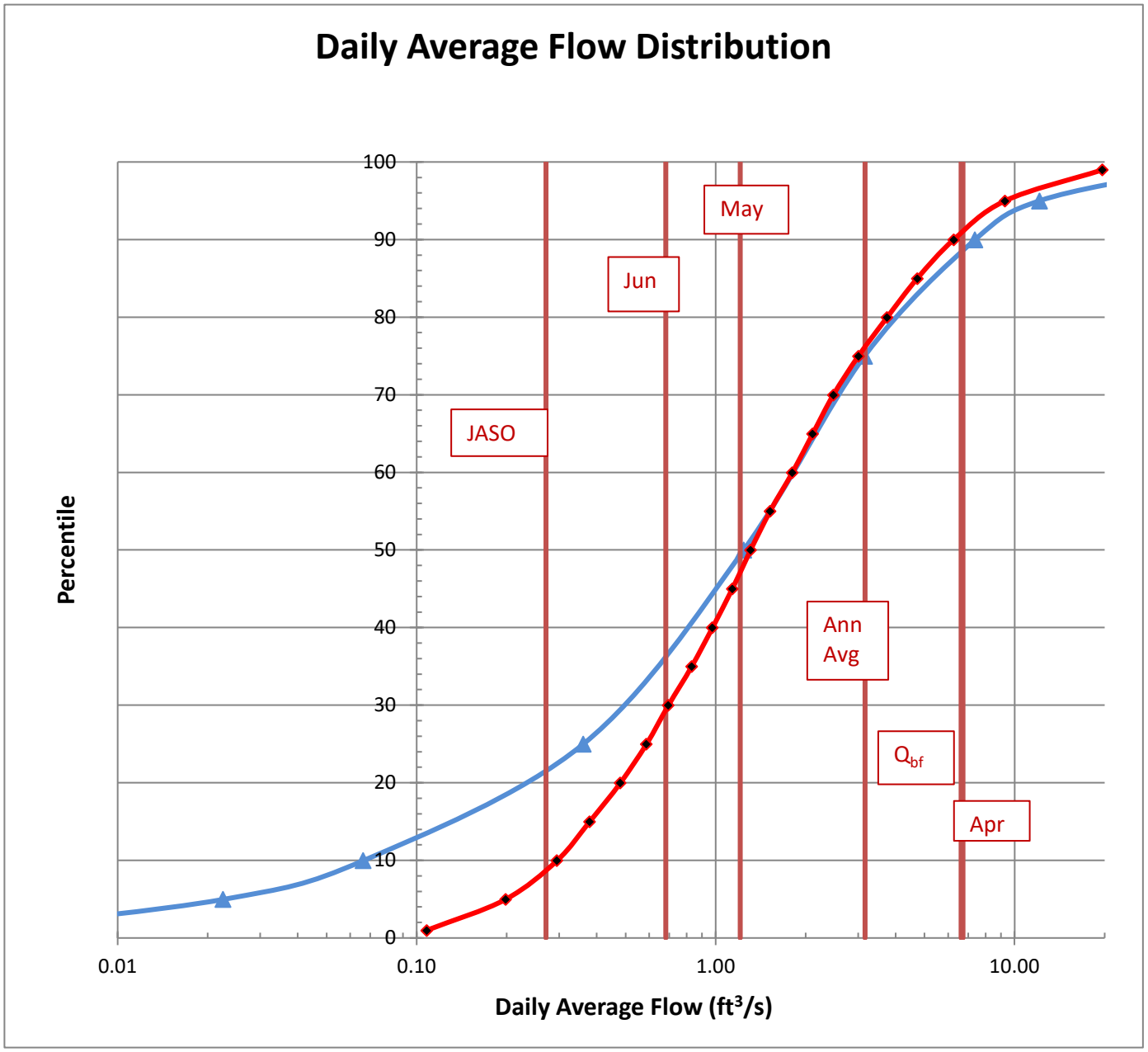
W_{bf}	**11.7**	estimated bankfull width (ft)
d_{bf}	**0.6**	estimated bankfull depth (ft)
A_{bf}	**5.6**	estimated bankfull flow area (ft^2)

References

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

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

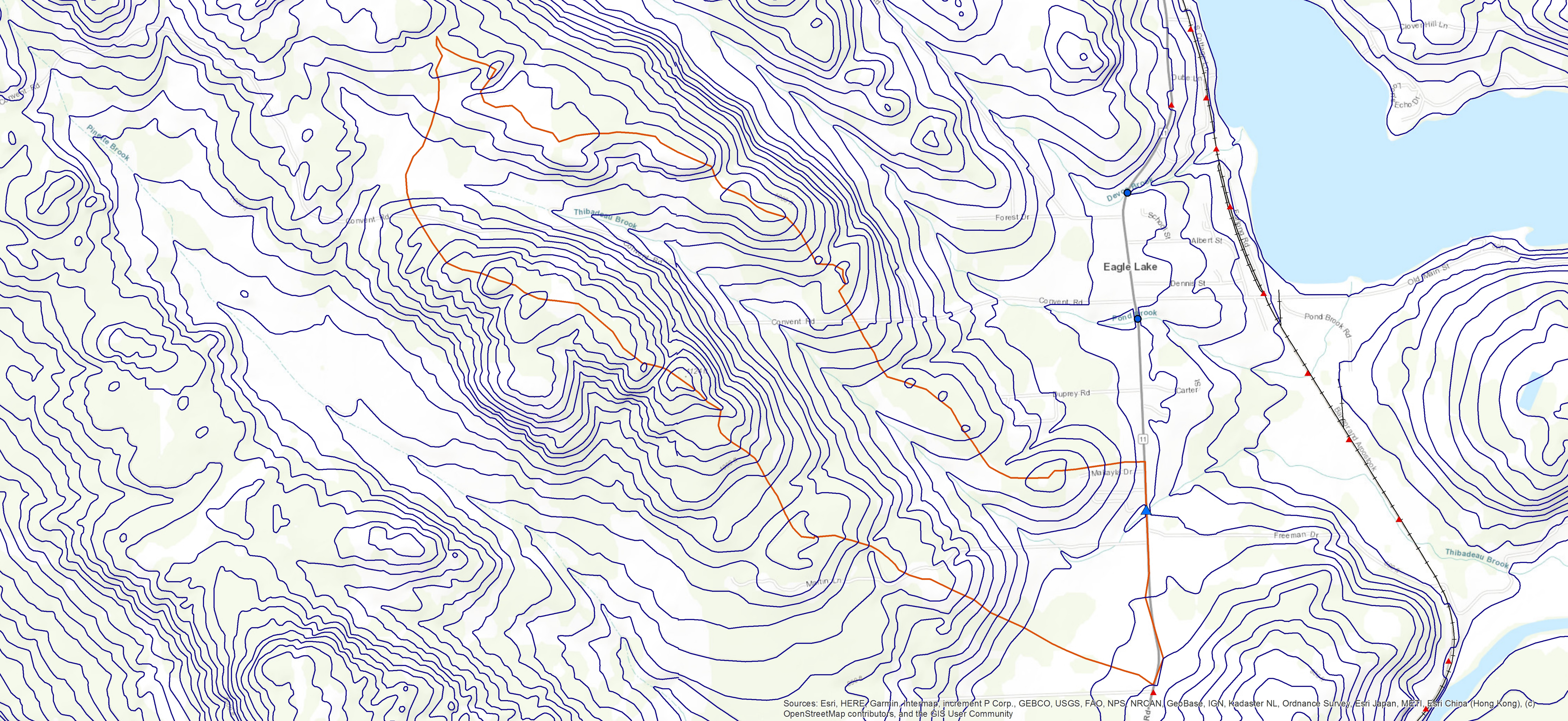
Dudley, R.W., 2015. Regression Equations for Monthly and Annual Mean..., USGS SIR 2015-5151



Daily Avg Flow Dist	
A_{ws} = (mi^2)	1.3
Q (ft^3/s)	

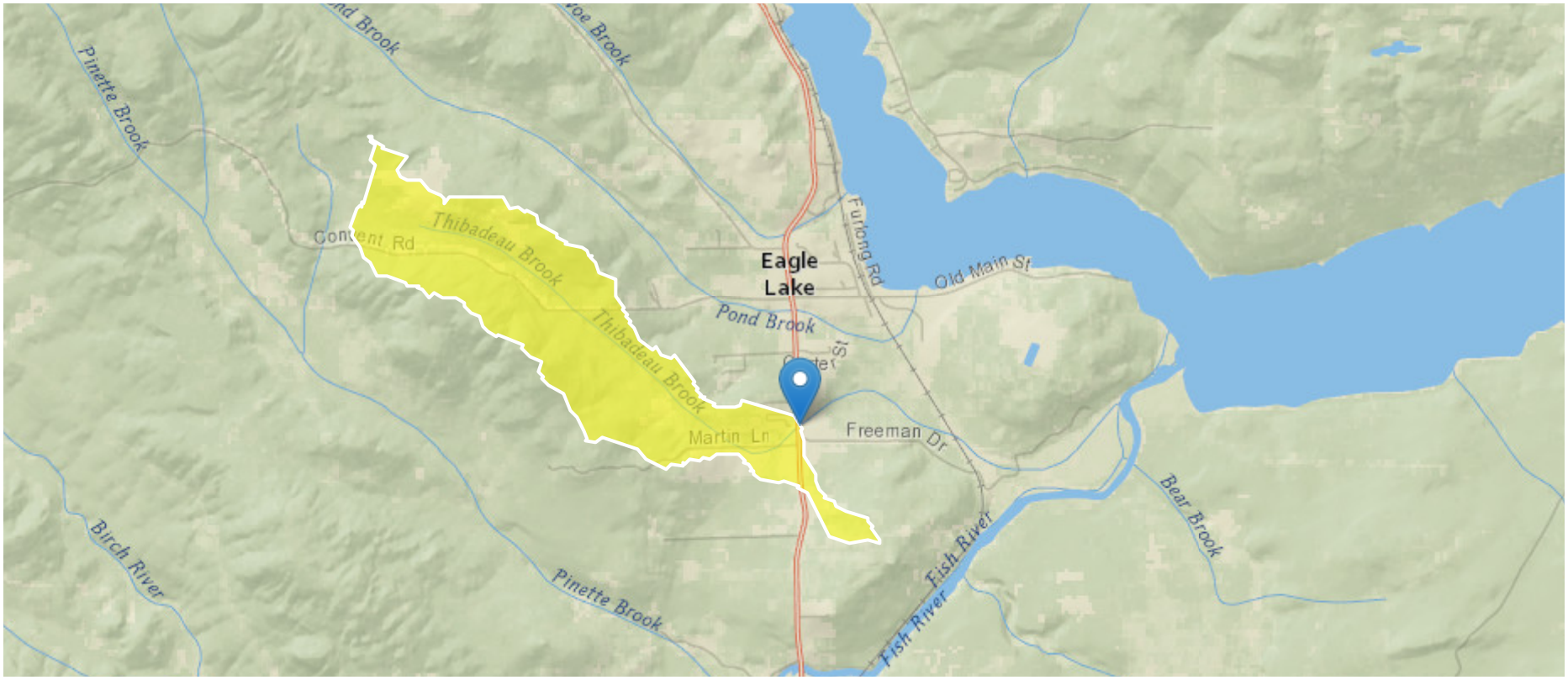
Pctl	Median	84th pctl
1	0.11	0.19
5	0.20	0.32
10	0.29	0.44
15	0.38	0.55
20	0.48	0.67
25	0.59	0.79
30	0.69	0.90
35	0.83	1.02
40	0.98	1.18
45	1.14	1.33
50	1.31	1.57
55	1.52	1.83
60	1.81	2.15
65	2.11	2.50
70	2.48	2.92
75	3.00	3.51
80	3.74	4.19
85	4.73	5.37
90	6.26	7.21
95	9.29	11.21
99	19.64	25.86

Q_{bf}	6.6
$Q_{1.002}$	12.6
$Q_{1.1}$	29.3
Q_2	60.7


Convent Rd
Pinette Brook
Thibadeau Brook
Eagle Lake
Forest Dr
Albert St
Dennis St
Pond Brook
Pond Brook Rd
Dupre y Rd
Carter St
Makayla Dr
Freeman Dr
Martin Ln
Clover Hill Ln
Echo Dr
Dube Ln
Old Main St
11
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Eagle Lake 24267 ME-11 941218

Region ID: ME
Workspace ID: ME20190729234436299000
Clicked Point (Latitude, Longitude): 47.03117, -68.59556
Time: 2019-07-29 19:45:01 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.2	square miles
STORNWI	Percentage of storage (combined water bodies and wetlands) from the National Wetlands Inventory	7	percent
SANDGRAVAF	Fraction of land surface underlain by sand and gravel aquifers	0	dimensionless
ELEV	Mean Basin Elevation	916.4	feet
BSLDEM10M	Mean basin slope computed from 10 m DEM	9.44	percent
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	528982.61	feet
CENTROIDY	Basin centroid vertical (y) location in state plane units	5209423.97	feet
COASTDIST	Shortest distance from the coastline to the basin centroid	195	miles
ELEVMAX	Maximum basin elevation	1172.2	feet
LC06WATER	Percent of open water, class 11, from NLCD 2006	0	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	3.47	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.45	percent
PRECIP	Mean Annual Precipitation	38.2	inches
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

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	1.2	square miles	0.31	12

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
STORNWI	Percentage of Storage from NWI	7	percent	0	22.2

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

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

Statistic	Value	Unit	SEp
1.01 Year Peak Flood	17.6	ft^3/s	38
2 Year Peak Flood	58.3	ft^3/s	34
5 Year Peak Flood	91.9	ft^3/s	35
10 Year Peak Flood	116	ft^3/s	37
25 Year Peak Flood	152	ft^3/s	39
50 Year Peak Flood	177	ft^3/s	41
100 Year Peak Flood	207	ft^3/s	42
250 Year Peak Flood	235	ft^3/s	44
500 Year Peak Flood	280	ft^3/s	47

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)

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.2	square miles	14.9	1419

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
SANDGRAVAF	Fraction of Sand and Gravel Aquifers	0	dimensionless	0	0.212
ELEV	Mean Basin Elevation	916.4	feet	239	2120

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

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

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

Statistic	Value	Unit
1 Percent Duration	0.00301	ft^3/s
5 Percent Duration	0.0211	ft^3/s
10 Percent Duration	0.0624	ft^3/s
25 Percent Duration	0.342	ft^3/s
50 Percent Duration	1.18	ft^3/s
75 Percent Duration	3	ft^3/s
90 Percent Duration	7.03	ft^3/s
95 Percent Duration	11.6	ft^3/s
99 Percent Duration	34.4	ft^3/s

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	1.2	square miles	14.9	1419
SANDGRAVAF	Fraction of Sand and Gravel Aquifers	0	dimensionless	0	0.212
ELEV	Mean Basin Elevation	916.4	feet	239	2120

Annual Flow Statistics Disclaimers[Statewide Annual SIR 2015 5151]

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

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

Statistic	Value	Unit
Mean Annual Flow	3.01	ft^3/s

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)

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