WIN:	25243.00	**Project Name:**	
Town:	South Bristol	**Stream Name:**	u/n
Route No.	ME129	**Bridge Name:**	u/n
Asset ID:	890444	**Analysis by:**	csh
Lat:	43.94784 **Long:** -69.55558	**Date:**	8/26/2022

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	3.99	1.54	985.6	Watershed Area *DRNAREA*
W	0.54	0.2	132.4	Wetlands area (by NWI)
P_c	456379	4866890		watershed centroid (E, N; UTM 19N; meters)
County	Lincoln			*choose county from drop-down menu*

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

Watershed Characteristics from StreamStats

STORAGE	13.93	
STORNWI	13.43	NWI Wetlands %
SANDGRAVF	0.00	sand & gravel aquifer as decimal fraction of watershed A
ELEV	136.2	mean basin elevation (ft)
BSLDEM10M	6.61	mean basin slope (%)
COASTDIST	34.00	distance from the coast (mi)
ELEVMAX	266.8	maximum basin elevation (ft)
LC06WATER	0	percent of drainage basin land cover as open water
PRECIP	45.6	mean annual precipitation
STATSGOA	0.79	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

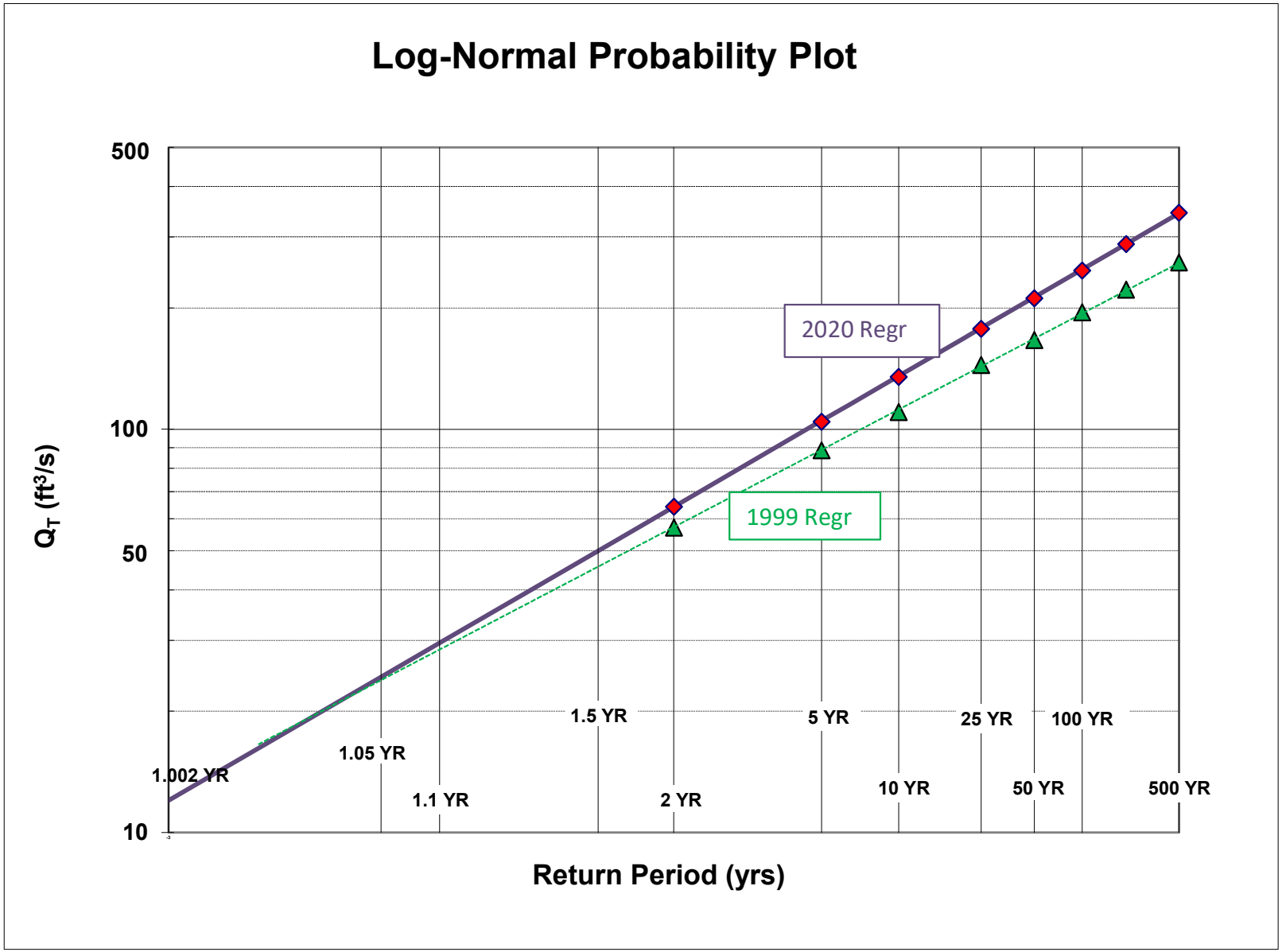
Lombard, P.J. & G.A. Hodgkins, 2015.
Peak flow regression equations for small, ungaged streams: in Maine: Comparing Map-Based to Field-Based Variables
SIR 2015-4059, USGS, Augusta, ME

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			30	***30***
2	3.22	57	64	***65***
5	4.10	89	104	***105***
10	4.83	110	135	***135***
25	5.84	144	177	***175***
50	6.59	166	211	***210***
100	7.39	195	247	***245***
200	8.33	222	288	***290***
500	9.85	259	344	***345***

Calculated Bankfull Width: 12.7 **ft**

Instructions:
Enter values in blue cells only, watershed data from StreamStats
Copy I24 values from Stream Stats
Use results under "Design"
Check against gage data and FEMA studies if available
Questions? Check with ENV / Hydrology Section


Log-Normal Probability Plot
500
100
50
10
Q_T (ft³/s)
2020 Regr
1999 Regr
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)

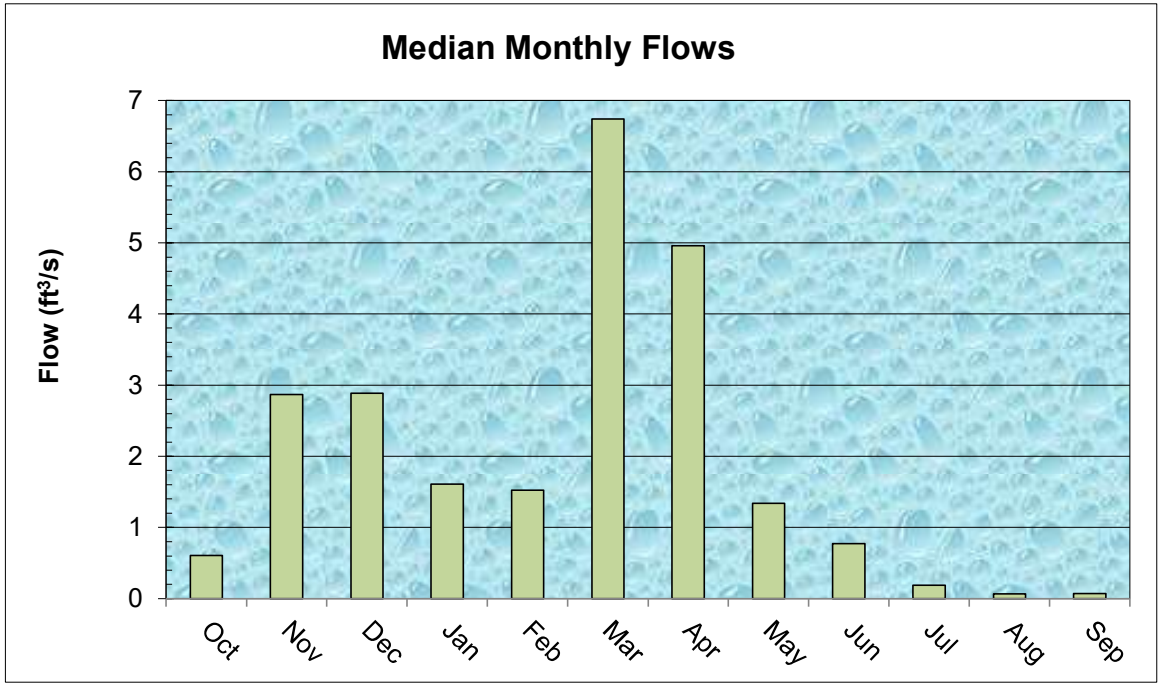
WIN:	25243.00	**Project Name:**	0
Town:	South Bristol	**Stream Name:**	u/n
Route No.	ME129	**Bridge Name:**	u/n
Asset ID:	890444	**Analysis by:**	csh
Lat:	43.94784 **Long:** -69.55558	**Date:**	8/26/2022

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
	1.54	*A*	Area (mi^2)
456379	4866890	P_c	Watershed centroid (E,N; UTM; Zone 19; meters)
	33.43	*DIST*	Distance from Coastal reference line (mi)
	45.6	*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	**1.61**	0.0456
Feb	**1.52**	0.0432
Mar	**6.74**	0.1910
Apr	**4.96**	0.1405
May	**1.34**	0.0379
Jun	**0.77**	0.0219
Jul	**0.19**	0.0053
Aug	**0.06**	0.0018
Sep	**0.07**	0.0020
Oct	**0.61**	0.0172
Nov	**2.87**	0.0813
Dec	**2.89**	0.0818



Q_{bf}	**8.2**	
ann avg	**3.4**	
ann med	**1.4**	
$Q_{1.002}$	**12.0**	
$Q_{1.01}$	**16.5**	
$Q_{1.05}$	**24.3**	
Q_{bf}	**35.1**	assume v = 4ft/s

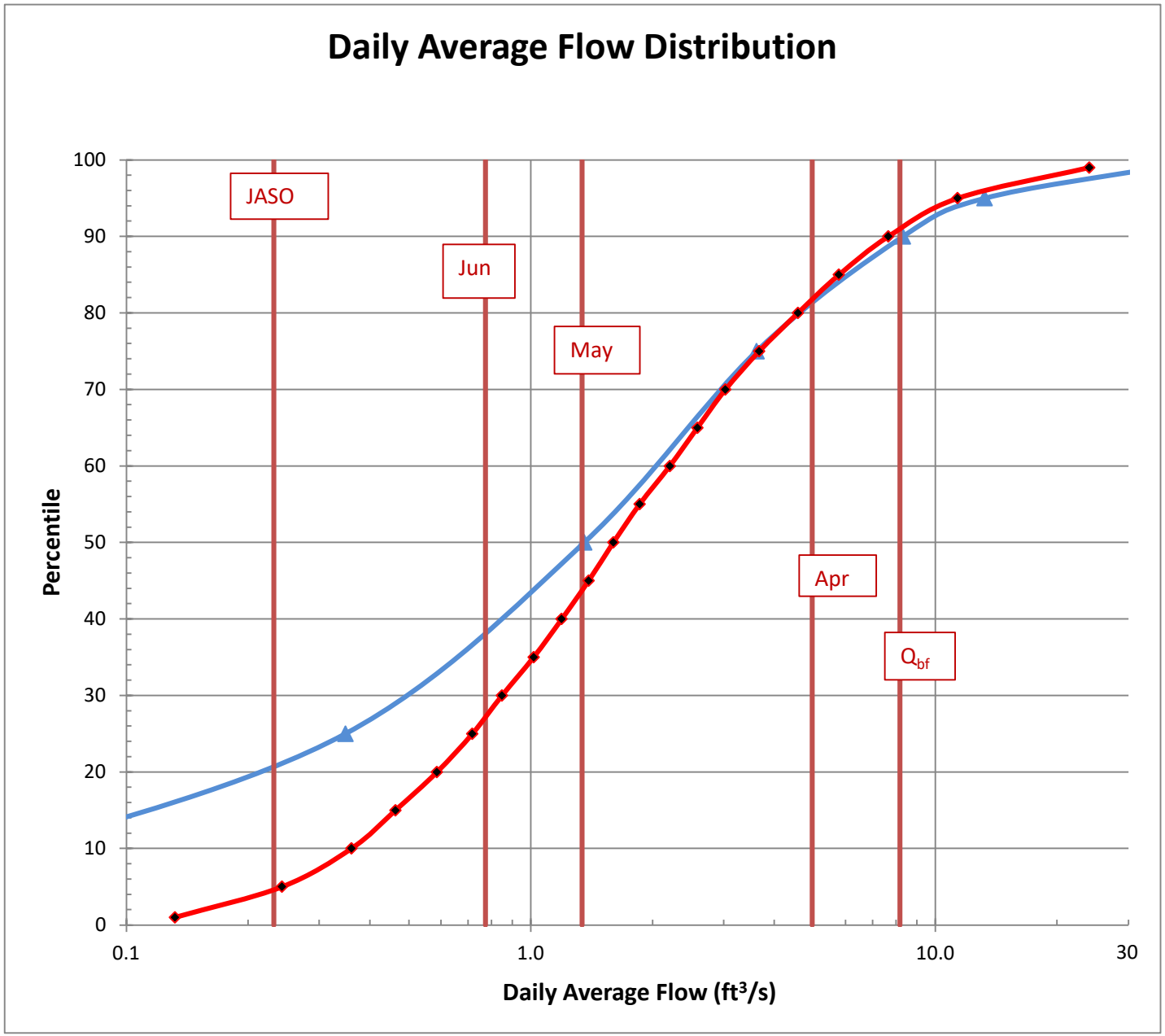
W_{bf}	**12.7**	estimated bankfull width (ft)
d_{bf}	**0.7**	estimated bankfull depth (ft)
A_{bf}	**6.6**	estimated bankfull flow area (ft^2)

References

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

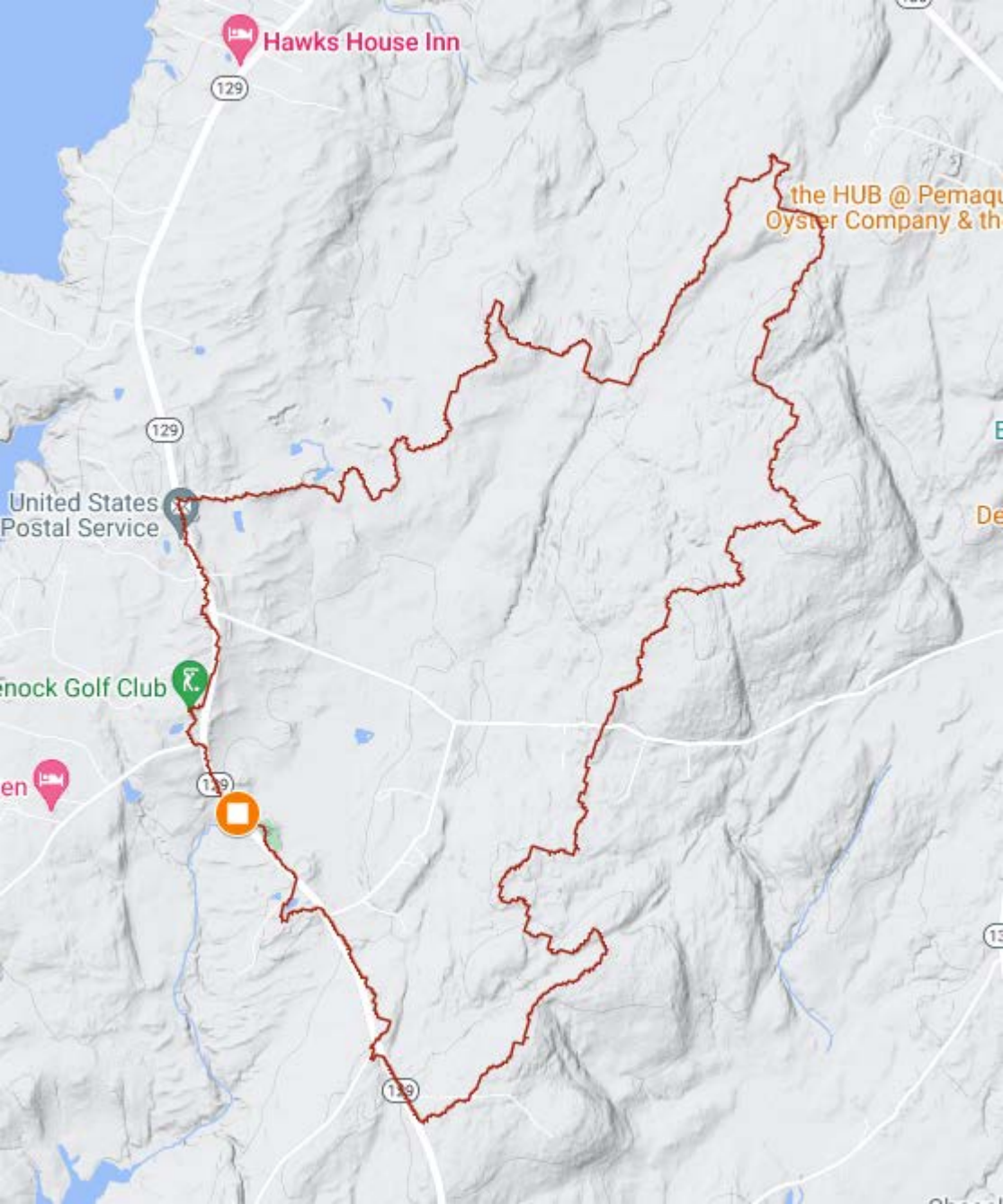
Dudley, 2004. Estimating Monthly Streamflows … , SIR 2004-5026

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



	Daily Avg Flow Dist	
	A_{ws} = (mi^2)	1.5
	Q (ft^3/s)	
Pctl	**Median**	**84th pctl**
1.00E-06	0.00	0.00
1	0.13	0.23
5	0.24	0.39
10	0.36	0.54
15	0.46	0.68
20	0.59	0.82
25	0.72	0.96
30	0.85	1.09
35	1.02	1.25
40	1.19	1.44
45	1.39	1.63
50	1.60	1.92
55	1.86	2.23
60	2.21	2.62
65	2.58	3.06
70	3.03	3.57
75	3.67	4.29
80	4.58	5.12
85	5.78	6.56
90	7.65	8.81
95	11.35	13.70
99	24.01	31.61

Q_{bf}	8.2
$Q_{1.002}$	12.0
$Q_{1.1}$	29.5
Q_2	64.3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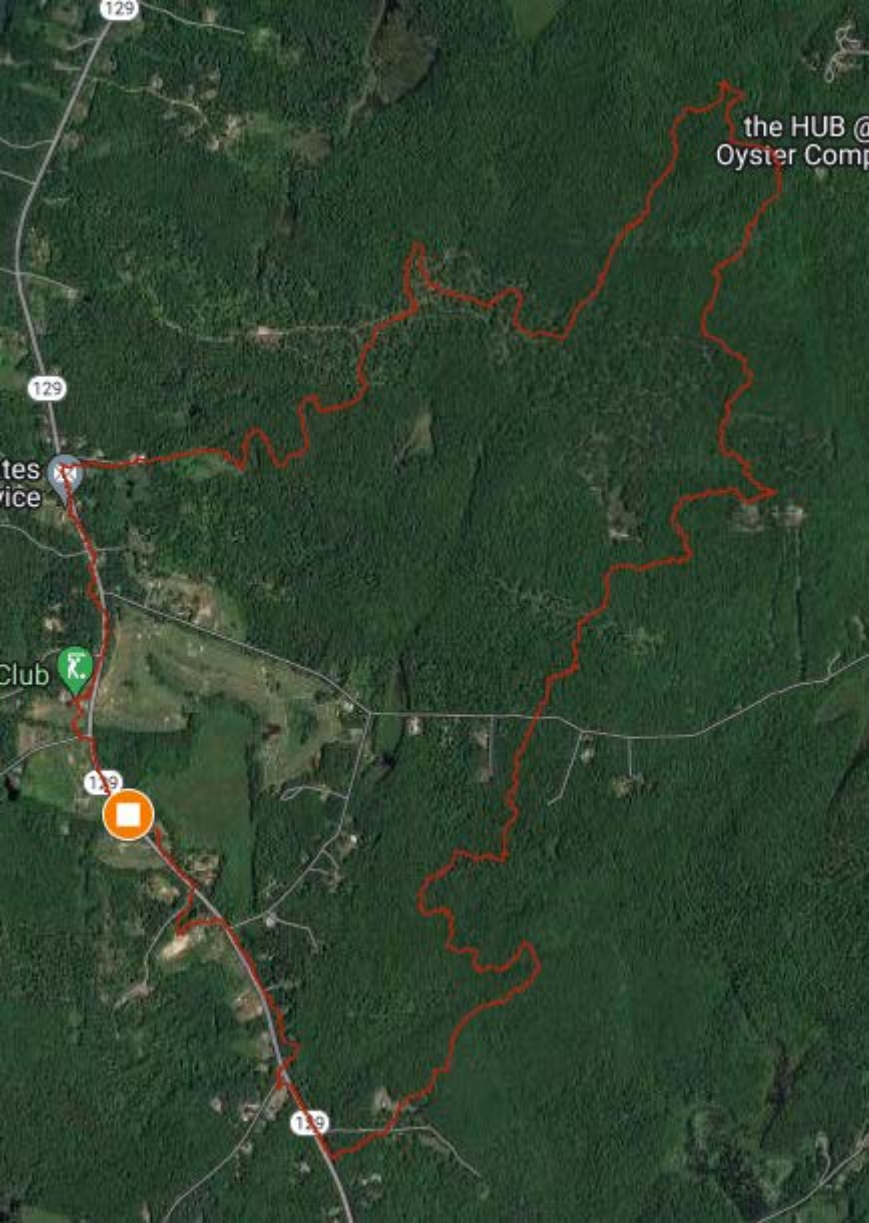
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So Bristol 25243 ME129 LC#890444

Region ID: ME
Workspace ID: ME20220826151513936000
Clicked Point (Latitude, Longitude): 43.94786, -69.55558
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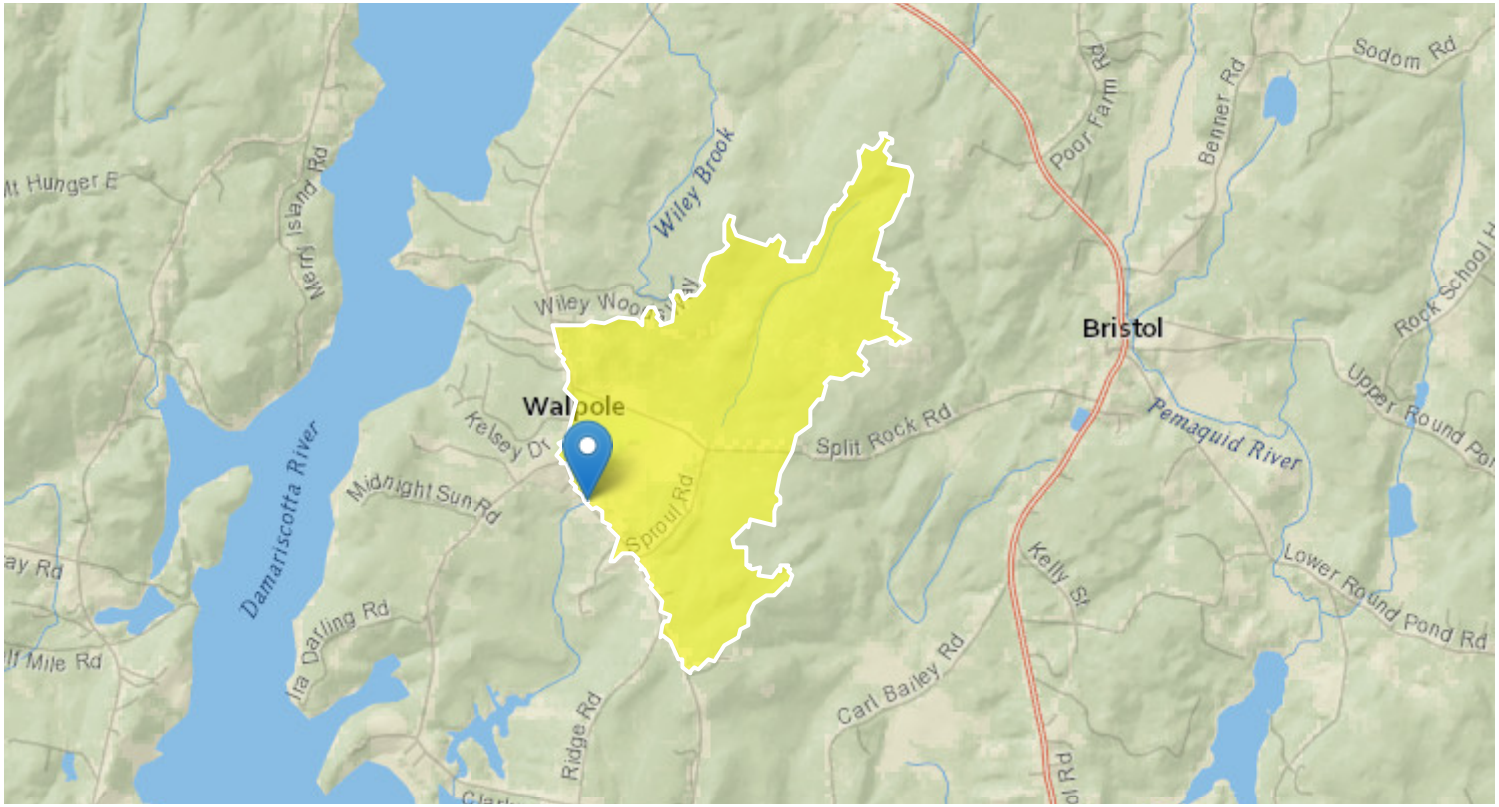

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM10M	Mean basin slope computed from 10 m DEM	6.61	percent
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	456379.08	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	4866890.32	meters
COASTDIST	Shortest distance from the coastline to the basin centroid	34	miles
DRNAREA	Area that drains to a point on a stream	1.54	square miles
ELEV	Mean Basin Elevation	136.2	feet
ELEVMAX	Maximum basin elevation	266.8	feet
I24H100Y	Maximum 24-hour precipitation that occurs on average once in 100 years	7.39	inches
I24H10Y	Maximum 24-hour precipitation that occurs on average once in 10 years	4.83	inches
I24H200Y	Maximum 24-hour precipitation that occurs on average once in 200 years	8.33	inches
I24H25Y	Maximum 24-hour precipitation that occurs on average once in 25 years	5.84	inches
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precipitation intensity index	3.22	inches
I24H500Y	Maximum 24-hour precipitation that occurs on average once in 500 years	9.85	inches
I24H50Y	Maximum 24-hour precipitation that occurs on average once in 50 years	6.59	inches
I24H5Y	Maximum 24-hour precipitation that occurs on average once in 5 years	4.1	inches
JULAVPRE	Mean July Precipitation	3.45	inches
LC06WATER	Percent of open water, class 11, from NLCD 2006	0	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	11.4	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.73	percent
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	0	percent

Parameter Code	Parameter Description	Value	Unit
PRDECFEB90	Basin average mean precipitation for December to February from PRISM 1961-1990	12.1	inches
PRECIP	Mean Annual Precipitation	45.6	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	0.79	percent
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	13.927	percent
STORNWI	Percentage of strorage (combined water bodies and wetlands) from the Nationa Wetlands Inventory	13.43	percent

Peak-Flow Statistics

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.54	square miles	0.26	5680
I24H2Y	24 Hour 2 Year Precipitation	3.22	inches	1.92	4.17
STORAGE	Percent Storage	13.927	percent	0	29.4
I24H5Y	24 Hour 5 Year Precipitation	4.1	inches	2.48	5.38
I24H10Y	24 Hour 10 Year Precipitation	4.83	inches	2.84	6.38
I24H25Y	24 Hour 25 Year Precipitation	5.84	inches	3.3	7.75
I24H50Y	24 Hour 50 Year Precipitation	6.59	inches	3.65	8.79

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
I24H100Y	24 Hour 100 Year Precipitation	7.39	inches	3.99	9.88
I24H200Y	24 Hour 200 YearPrecipitation	8.33	inches	5.26	11.1
I24H500Y	24 Hour 500 Year Precipitation	9.85	inches	5.95	13.1

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

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	ASEp
50-percent AEP flood	64.3	ft^3/s	34.4	120	39.1
20-percent AEP flood	104	ft^3/s	56.4	192	38.1
10-percent AEP flood	135	ft^3/s	72.1	253	38.9
4-percent AEP flood	177	ft^3/s	93.3	336	39.9
2-percent AEP flood	211	ft^3/s	109	407	39.7
1-percent AEP flood	247	ft^3/s	129	474	40.7
0.5-percent AEP flood	288	ft^3/s	145	573	42.8
0.2-percent AEP flood	344	ft^3/s	170	694	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

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.54	square miles	14.9	1419
SANDGRAVAF	Fraction of Sand and Gravel Aquifers	0	dimensionless	0	0.212
ELEV	Mean Basin Elevation	136.2	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	0.00203	ft^3/s
5 Percent Duration	0.0164	ft^3/s
10 Percent Duration	0.0534	ft^3/s
25 Percent Duration	0.348	ft^3/s
50 Percent Duration	1.35	ft^3/s
75 Percent Duration	3.62	ft^3/s
90 Percent Duration	8.31	ft^3/s
95 Percent Duration	13.2	ft^3/s
99 Percent Duration	35.4	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

Annual Flow Statistics Parameters [Statewide Annual SIR 2015 5151]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.54	square miles	14.9	1419
SANDGRAVAF	Fraction of Sand and Gravel Aquifers	0	dimensionless	0	0.212
ELEV	Mean Basin Elevation	136.2	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	3.4	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)

Application Version: 4.10.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1