

Appendix B - Upper Eightmile Creek PEAK DISCHARGES FOR SELECTED FREQUENCIES

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Watershed Name: EIGHTMILE CR

PEAK DISCHARGE CALCULATION BY PREDICTION EQUATION

Peak discharges for the ungaged watershed have been determined from a set of hydrologic prediction equations derived using generalized least squares. The models relate peak discharges to physical watershed characteristics such as area and precipitation. The equations take this form:

$$Q(T) = (10.0^{C_0(T)}) * (CHR_1^{C_1(T)}) * \dots * (CHR_n^{C_n(T)})$$

 $Q(T)$ = Peak Discharge for Return Period T
 $C_x(T)$ = Coefficient x for Return Period T
 CHR_1 = The First Watershed Characteristic
 CHR_n = The nth Watershed Characteristic

Note: * = multiplication, ^ = exponentiation

For this ungaged watershed, peak discharges were estimated using prediction equations for this flood region:

EAST SIDE WATERSHEDS - NORTH CENTRAL

Prediction Equation for East Side Watersheds - North Central

$$Q(T) = (10.0^{C_0(T)}) * (X_1^{C_1(T)}) * (X_2^{C_2(T)}) * (X_3^{C_3(T)}) * (X_4^{C_4(T)}) * (X_5^{C_5(T)})$$

 $Q(T)$ = Peak Discharge for Return Period T
 $C_x(T)$ = Coefficient x for Return Period T
 X_1 = Drainage area (square miles)
 X_2 = Mean January precipitation (inches)
 X_3 = Mean July precipitation (inches)
 X_4 = Soil storage capacity (inches)
 X_5 =

Note: * = multiplication, ^ = exponentiation

Prediction Equation Coefficients

Return Period T	Coefficients					
T	$C_0(T)$	$C_1(T)$	$C_2(T)$	$C_3(T)$	$C_4(T)$	$C_5(T)$
2	1.500E+00	7.947E-01	1.335E+00	-5.420E-01	1.337E+00	
5	2.175E+00	7.783E-01	1.037E+00	-7.030E-01	1.615E+00	
10	2.402E+00	7.706E-01	8.967E-01	-8.129E-01	1.622E+00	
20	2.533E+00	7.638E-01	7.993E-01	-9.225E-01	1.574E+00	
25	2.565E+00	7.617E-01	7.737E-01	-9.569E-01	1.556E+00	
50	2.648E+00	7.559E-01	7.050E-01	-1.059E+00	1.499E+00	
100	2.716E+00	7.507E-01	6.468E-01	-1.154E+00	1.445E+00	
500	2.847E+00	7.407E-01	5.300E-01	-1.348E+00	1.330E+00	

Required Watershed Characteristics

 Drainage area (square miles) 4.090
 Mean January precipitation (inches) 9.980

Culvert Scour Assessment

Appendix B - Upper Eightmile Creek

Mean July precipitation	(inches)	0.940
Soil storage capacity	(inches)	0.150

 WARNING: WATERSHED CHARACTERISTICS ARE OUT OF BOUNDS

One or more of the required watershed characteristics is an extrapolation from the set used to develop the regression equations.

PEAK DISCHARGES HAVE BEEN CALCULATED, BUT SHOULD BE USED WITH CAUTION.

EAST SIDE WATERSHEDS - NORTH CENTRAL Bounds on Required Watershed Characteristics

Drainage area	(square miles)	0.29 to	1630.06
Mean January precipitation	(inches)	1.52 to	7.97
Mean July precipitation	(inches)	0.23 to	1.28
Soil storage capacity	(inches)	0.10 to	0.20

PEAK DISCHARGE ESTIMATES BASED ON PREDICTION EQUATIONS

Return Period years	Peak Flow cfs	95% Confidence	
		Lower Limit cfs	Upper Limit cfs
2	171	52.0	562
5	237	99.1	567
10	285	133	613
20	336	162	698
25	353	170	733
50	406	191	863
100	460	206	1030
500	589	221	1570

REFERENCES

Cooper, R.M., Estimation of peak discharges for rural, unregulated streams in western Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5116, 134 p.

Cooper, R.M., Estimation of peak discharges for rural, unregulated streams in eastern Oregon: Oregon Water Resources Department Open File Report SW 06-00, 150 p.

Thomas, B.E., Hjalmarson, H.W., and Waltemeyer, S.D., 1993, Methods for estimating magnitude and frequency of floods in the Southwestern United States: U.S. Geological Survey Open-File Report 93-419, 211 p.

Harris, D.D., Hubbard, L.E. and Hubbard, L.E., 1979, Magnitude and frequency of floods in western Oregon: U.S. Geological Survey Open-File Report, 79-553, 29 p.

Harris, D.D., and Hubbard, L.E., 1982. Magnitude and frequency of floods in eastern Oregon: U.S. Geological Survey Water Resources Investigations Report 82-4078, 39 p.

Sumioka, S.S., Kresch, D.L., and Kasnick, K.D., 1997, Magnitude and frequency of floods in Washington: U.S. Geological Survey Water Resources Investigations Report 97-4277, 91 p.

Appendix B - Upper Eightmile Creek

Interagency Advisory Committee on Water Data, 1982, Guidelines for determining flood flow frequency: Bulletin 17B of the Hydrology Subcommittee, Office of Water Data Coordination, U.S. Geological Survey, Reston, Virginia, 28 p.

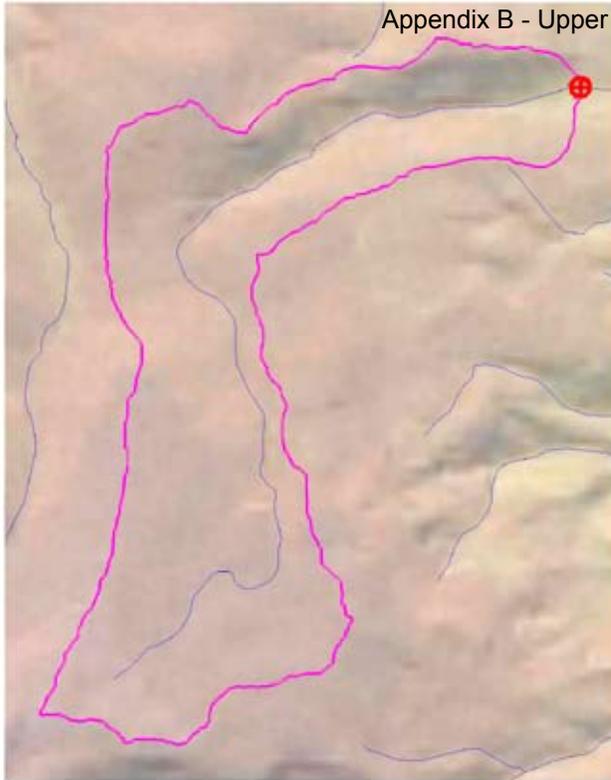
Riggs, H.C., 1973, Regional analysis of streamflow characteristics: U.S. Geological Survey Techniques of Water Resources Investigations, book 4, chapter B3, 15 p.

Tasker, G.D., and Stedinger, J.R., 1989, An operational GLS model for hydrologic regression: Journal of Hydrology, v. 111, p. 361-375

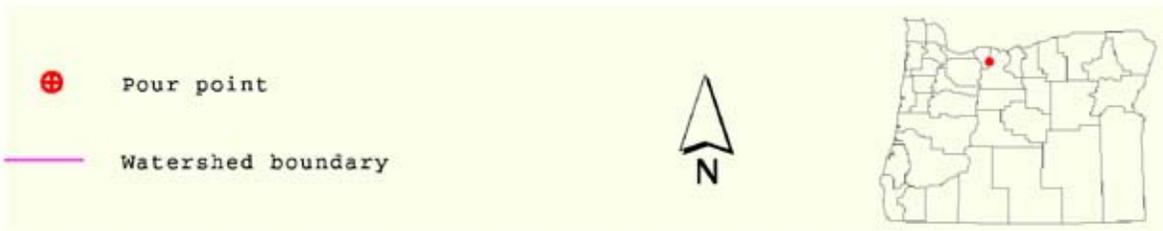
Wiley, J.B., Atkins, Jr., J.T., and Tasker, G.D., 2000, Magnitude and frequency of peak discharges for rural, unregulated streams in West Virginia: U.S. Geological Survey Water-Resources Investigations Report 00-4080, 93 p.

Culvert Scour Assessment

Appendix B - Upper Eightmile Creek



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