PEAK DISCHARGES FOR SELECTED FREQUENCIES

Report prepared for: autodelin
Time: 09:13 Date: 03/31/2008

Watershed Name: DRY 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:

$$Q(T)=(10.0\hat{}C0(T))*(CHR1\hat{}C1(T))* \ . \ . \ . \ (CHRn\hat{}Cn(T))$$

Q(T)	=	Peak Discharge for Return Period T
Cx(T)	=	Coefficient x for Return Period T
CHR1	=	The First Watershed Characteristic
CHRn	=	The nth Watershed Characteristic

Note: * = multiplication, ^ = exponentiation

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

WESTERN INTERIOR WATERSHEDS - < 2875 FEET

WATERSHED ELEVATION = 2330 FEET

For western interior watersheds with mean elevations below 2875 feet, peaks are estimated using the prediction equations for western interior watersheds below 3000 feet.

Prediction Equation for Interior Watersheds < 3000 Feet

$$Q(T)=(10.0\hat{}C0(T))*(X1\hat{}C1(T))*(X2\hat{}C2(T)*(X3\hat{}C3(T))*(X4\hat{}C4(T))*(X5\hat{}C5(T))$$

Q(T)	=	Peak Discharge for Return Period T	
Cx(T)	=	Coefficient x for Return Period T	
X1	=	Drainage area	(square miles)
X2	=	Mean watershed slope	(degrees)
X3	=	2-year 24-hour precipitation intensity	(inches)
X4	=		
X5	=		

Note: * = multiplication, ^ = exponentiation

Prediction Equation Coefficients

Return Period T	Coefficients C0(T)	C1(T)	C2(T)	C3(T)	C4(T)	C5(T)
2	9.607E-01	9.004E-01	4.695E-01	8.481E-01		
5	1.162E+00	9.042E-01	4.735E-01	7.355E-01		
10	1.267E+00	9.064E-01	4.688E-01	6.937E-01		
20	1.351E+00	9.081E-01	4.633E-01	6.651E-01		
25	1.375E+00	9.086E-01	4.615E-01	6.578E-01		
50	1.443E+00	9.101E-01	4.559E-01	6.390E-01		
100	1.503E+00	9.114E-01	4.501E-01	6.252E-01		

500 1.620E+00 9.141E-01 4.365E-01 6.059E-01

Required Watershed Characteristics

Drainage area	(square miles)	14.500
Mean watershed slope	(degrees)	9.360
2-year 24-hour precipitation intensity	(inches)	1.650

PEAK DISCHARGE ESTIMATES BASED ON PREDICTION EQUATIONS

Return Period	Peak Flow	95% Confidence Lower Limit	95% Confidence Upper Limit
years	cfs	cfs	cfs
2	443	235	838
5	680	361	1280
10	843	443	1600
20	1000	518	1930
25	1050	541	2040
50	1210	610	2390
100	1360	674	2760
500	1730	810	3690

REFERENCES

Cooper, R.M., Estimation of peak discharges for rural, unregulated streams in western Oregon: U.S. Geological Survey Scietific 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.

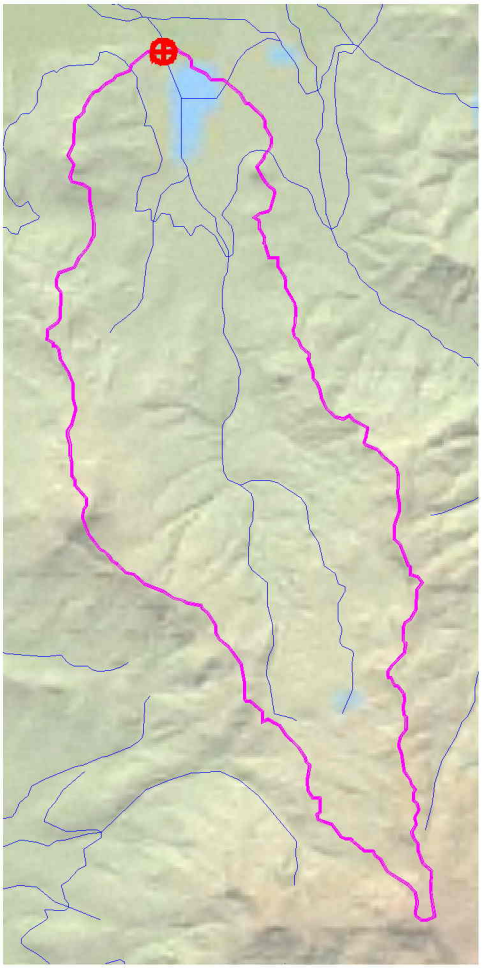
Interagency Advisory Committee on Water Data, 1982, Guidelines for determining flood flow frequency: Bulletin 17B of the Hydrology Subcommittee, Office of Water Data Coordination, U.S. Geological Survey, Reston, Virginia, 28 p.

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.

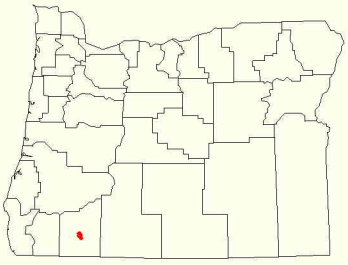


0 1 mile

Pour point

Watershed boundary

N



This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Report and output shapefile is avilable for 7 days at:

http://www1.wrd.state.or.us/files/wars/080331.091332.zip