

WASHINGTON DEPARTMENT OF ECOLOGY
ENVIRONMENTAL ASSESSMENT PROGRAM
FRESHWATER MONITORING UNIT
STREAM DISCHARGE TECHNICAL NOTES

STATION ID: 45F070
STATION NAME: Peshastin Creek at Green Bridge Road
WATER YEAR: 2012
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Introduction

Watershed Description

Peshastin Creek originates in the snowfields of the eastern slopes of the central Cascade Mountain range and flows into the Wenatchee River at river mile 17. The watershed is bounded by both the Stuart Range (Mount Stuart: 9,415 ft) and the Wenatchee Mountains. Land cover above the gage consists of predominantly coniferous forest, but also includes alpine shrubland, montane grassland, bedrock/talus slopes, and riparian woodlands. A large portion of the lower watershed is used for agricultural production (tree fruit). Mean annual precipitation across the watershed above this gage location is 36 inches (U.S. Weather Bureau, 1965).

Gage Location

The telemetered stream gaging station on Peshastin Creek at Green Bridge Road was installed on September 20, 2002. The gage is located at the Green Bridge Road bridge on the right bank, approximately 1.4 miles upstream of the mouth.

Table 1.

Drainage Area (square miles)	134 (USGS, 2013)
Latitude (degrees, minutes, seconds)	47°33'09" N
Longitude (degrees, minutes, seconds)	120°36'13" W

Discharge

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	217
Median Annual Discharge (cfs)	80
Maximum Daily Mean Discharge (cfs)	1640
Minimum Daily Mean Discharge (cfs)	6.3
Maximum Instantaneous Discharge (cfs)	1730
Minimum Instantaneous Discharge (cfs)	5.8
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	541
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	24
Number of Days Discharge is Greater Than Range of Ratings	0
Number of Days Discharge is Less Than Range of Ratings	0

Note: Statistics displayed in Table 2 may not include values in which the predicted discharge exceeds the range of ratings.

Narrative

Eight discharge measurements were taken, ranging from 23 to 668 cfs. The creek was free of ice and snow nearly a month ahead of schedule this water year. Snowmelt runoff began in late-February, and reached its peak on April 25, 2012, after a rapid warming trend punctuated by rain events. The minimum discharge was recorded during baseflow conditions on September 15, 2012. Discharge was influenced by upstream seasonal irrigation operations, most notably during the month of September.

Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	4.9%
Weighted Rating Error (% of discharge)	14.2%
Total Potential Error (% of discharge)	19.1%

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	#701	#602	#702
Period of Ratings	10/01/2011-11/01/2011	10/01/2011-12/06/2011	11/23/2011-02/22/2012
Range of Ratings (cfs)	5.15-5880	3.75-5880	5.15-5880
No. of Defining Measurements	9	43	9
Rating Error (%)	12.5%	14.9%	12.5%

Rating Table No.	#603		
Period of Ratings	02/21/2012-9/30/2012		
Range of Ratings (cfs)	3.75-5880		
No. of Defining Measurements	43		
Rating Error (%)	14.9%		

Rating Table No.			
Period of Ratings			
Range of Ratings (cfs)			
No. of Defining Measurements			
Rating Error (%)			

Narrative

The water year began in the midst of a phased period. Table #701 transitioned to Table #602 through small rain events that scoured leaves and fine sediment from the control. A short time later, Table #602 phased into Table #702 as the result of ice gradually forming in the channel, artificially filling the control. Finally, Table #702 transitioned to Table #603 at the onset of spring runoff. A small storm event quickly scoured the control. Table #603 is a clone of Table #6, which represents the most stable and persistent channel condition for this station's period of record.

Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	0.56
Maximum Recorded Stage (feet)	3.96
Range of Recorded Stage (feet)	3.40
Number of Un-Reported Days	47
Number of Days Qualified as Estimates	50
Number of Days Qualified as Unreliable Estimates	0

Narrative

Unreported days were due to an ice-impacted channel in which the stage-discharge relationship was not valid. The stage record is considered an estimate for 50 days during the water year. Four of the days qualified as estimates because a high flow model was used to extrapolate the measured range of discharge. Seven of the days were qualified as estimates because the logger drift exceeded 20 percent, and the difference in reported discharge was greater than 0.50 cfs. The remaining 39 qualified days occurred following or in-between periods of ice-impacted data prior to the first ice-free gage index observation.

Modeled Discharge

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	Slope Conveyance
Range of Modeled Stage (feet)	3.64 to 6.73
Range of Modeled Discharge (cfs)	1440 to 5880
Valid Period for Model	11/12/2006 to NOW
Model Confidence	+/-1.25%

Surveys

Table 7. Survey Type and Date (station, cross section, longitudinal)

Type	Date
Station Levels	10/31/2011

Activities Completed

Station levels were updated in conjunction with the high flow survey used in the slope conveyance model. Due to rating stability, the model was applied retroactively to water year 2007 to the present.