

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: 2011
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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)	279
Median Annual Discharge (cfs)	195
Maximum Daily Mean Discharge (cfs)	2170
Minimum Daily Mean Discharge (cfs)	9.6
Maximum Instantaneous Discharge (cfs)	2780
Minimum Instantaneous Discharge (cfs)	9.1
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	641
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	26
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 16.3 to 746 cfs. Two notable flow events occurred during the water year. Peaks occurred during mid-May, due to typical warming and snowmelt runoff. The recorded maximum discharge occurred on January 17, 2011, following a significant rain-on-snow event. The minimum discharge was recorded during baseflow conditions on September 23, 2011. 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)	6.0%
Weighted Rating Error (% of discharge)	14.3%
Total Potential Error (% of discharge)	20.3%

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	#6	#7	#601
Period of Ratings	10/01/2010-01/19/2011	12/12/2010-02/17/2011	01/19/2011-09/15/2011
Range of Ratings (cfs)	3.75-5880	5.15-5880	3.75-5880
No. of Defining Measurements	43	9	43
Rating Error (%)	14.9%	12.5%	14.9%

Rating Table No.	#701	#602	
Period of Ratings	08/09/2011-9/30/2011	09/26/2011-9/30/2011	
Range of Ratings (cfs)	5.15-5880	3.75-5880	
No. of Defining Measurements	9	43	
Rating Error (%)	12.5%	14.9%	

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

Narrative

The water year began with Table #6 carrying over from the previous water year. Beginning in mid-December, two rain-on-snow events, coupled with an ice-impacted channel, resulted in filling of the control and the creation of Table #7. After a brief persistence, gradual scour occurred, returning the channel to a previously stable condition (Table #601, a clone of Table #6). Later in the summer as the creek was approaching baseflow conditions, the deposition of fine sediment and leaves filled the control, resulting in Table #701, a clone of Table #7. The water year ended in the midst of a phased period. Table #701 is transitioning to Table #602 through small rain events scouring leaves and fine sediment from the control.

Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	0.75
Maximum Recorded Stage (feet)	4.87
Range of Recorded Stage (feet)	4.12
Number of Un-Reported Days	34
Number of Days Qualified as Estimates	89
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 89 days during the water year. Seven of the days qualified as estimates because a high flow model was used to extrapolate the measured range of discharge. Eighteen 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 64 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	09/19/2007

Activities Completed

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