

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

STATION ID: 45K090
STATION NAME: White River near Plain, WA
WATER YEAR: 2009
AUTHOR: Tyler W. Burks

Introduction

Watershed Description

White River originates in the glaciers and snowfields of prominent peaks and ridgelines (White Mountain, Tenpeak Mountain, High Pass, and Buck Mountain) located due south of Glacier Peak, and flows southeast into Lake Wenatchee. The watershed is bound on the east by Chiwawa Ridge and the west by Wenatchee Ridge. Land cover above the gage consists of predominantly coniferous forest, but also includes riparian woodlands, alpine shrubland, montane grassland, and bedrock/talus slopes. Mean annual precipitation across the watershed above this gage location is 107 inches (U.S. Weather Bureau, 1965).

Gage Location

The telemetered stream gaging station on the White River near Plain was installed on September 19, 2002. The gage is located off Forest Service Road 6400, at the Forest Service Road 6434 (Sears Creek) bridge on the left bank. This location is approximately seven river miles upstream from Lake Wenatchee.

Table 1.

Drainage Area (square miles)	149 (USGS, 2014)
Latitude (degrees, minutes, seconds)	47°52'28" N
Longitude (degrees, minutes, seconds)	120°52'15" W

Discharge

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	702
Median Annual Discharge (cfs)	389
Maximum Daily Mean Discharge (cfs)	4,600
Minimum Daily Mean Discharge (cfs)	115
Maximum Instantaneous Discharge (cfs)	6,960
Minimum Instantaneous Discharge (cfs)	110
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	1,710
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	185
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

Six discharge measurements were taken, ranging from 113 to 731 cfs. Snowmelt runoff began early April, and reached its peak on June 6, 2009, after a period of warm weather. The minimum discharge was recorded during baseflow conditions on September 30, 2009. One other event of note occurred in early January that had significance locally and in western Washington. It was a "pineapple express" rain event that occurred after low elevation snowfall. Though somewhat muted at this gage, flooding and landslides occurred locally, closing HWY 97 over Blewett Pass for 10 days. Widespread flooding again occurred in western Washington, closing I-5 at Chehalis for two days.

Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	1.0%
Weighted Rating Error (% of discharge)	12.8%
Total Potential Error (% of discharge)	13.8%

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	#801	#702	
Period of Ratings	10/01/2008-11/12/2008	11/06/2008-09/30/2009	
Range of Ratings (cfs)	87-12,600	42.2-12,600	
No. of Defining Measurements	8	15	
Rating Error (%)	10.7%	13.0%	

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

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Period of Ratings			
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Rating Error (%)			

Narrative

The water year began with Table 801, carrying over from the previous water year. In early November, a significant fall rain event occurred. Table 801 was phased into Table 702 (a clone of Table 7) across this period in which the rapidly rising stage scoured the control. Table 702 was valid for the remainder of the water year.

Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	2.84
Maximum Recorded Stage (feet)	13.97
Range of Recorded Stage (feet)	11.13
Number of Un-Reported Days	27
Number of Days Qualified as Estimates	54
Number of Days Qualified as Unreliable Estimates	0

Narrative

Due to the presence of strong sensitivity drift between the logger and the PGI observations, the following equation was applied to the stage record for this water year: $-0.031X+0.087$ $r^2=-0.93$. Unreported days were due to an ice-impacted channel in which the stage-discharge relationship was not valid. The stage record is considered a questionable estimate for 2 days during the water year due to partial ice influence during a storm event. The other 52 days were qualified as estimates because PGI observations were determined indirectly prior to installation of the wire weight gage, or were after ice-impacted days prior to ice free observations.

Modeled Discharge

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	None
Range of Modeled Stage (feet)	---
Range of Modeled Discharge (cfs)	---
Valid Period for Model	---
Model Confidence	---

Surveys

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

Type	Date
Station	10/21/2008

Activities Completed

The damaged staff gage was replaced with a wire weight gage in conjunction with a gaging station level survey towards the end of October. The datum of the PGI was preserved.