

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: 2014
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Introduction

Watershed Description

The 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 peaks are White Mountain, Tenpeak Mountain, High Pass, and Buck Mountain located due south of Glacier Peak.

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. We

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, approximately seven river miles upstream from Lake Wenatchee.

Table 1. Basin Area and Legal Description

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

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	880
Median Annual Discharge (cfs)	468
Maximum Daily Mean Discharge (cfs)	3890
Minimum Daily Mean Discharge (cfs)	146
Maximum Instantaneous Discharge (cfs)	4550
Minimum Instantaneous Discharge (cfs)	139
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	2200
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	223
Number of Days Discharge is Greater Than Range of Ratings	0
Number of Days Discharge is Less Than Range of Ratings	0
Number of Un-Reported Days	19
Number of Days Qualified as Estimates	10
Number of Modeled Days	0

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

Table 2 Discussion (Discharge Statistics)

In Water Year (WY) 2014, discharge at the White River near Plain gaging station peaked on May 17, 2014, and was at its lowest point was on September 14, 2014. Six discharge measurements were collected in WY 2014 at this station, ranging from 223 cfs measured on January 6, 2014 to 2271 cfs on May 20, 2014.

Nineteen days of discharge data were unreported, all due to ice in the channel rendering the stage-discharge relationship invalid. Ten days of data were qualified as estimates because they were between a period of ice-impacted data and a return to ice-free channel conditions.

All discharges on ice-free days in WY 2014 fell within the valid range of the active rating.

Table 3. Error Analysis Summary.

Potential Logger Drift Error (% of discharge)	0.4%
Potential Weighted Rating Error (% of discharge)	15.0%
Total Potential Error (% of discharge)	15.4%

Table 3 Discussion (Error Analysis)

Logger drift was minimal at this station once the stage record was corrected to account for sensitivity drift (see Stage Record discussion on page 4).

The majority of the potential error at this station is related to measurement uncertainty. The physical characteristics of the river limit the options for measuring cross-sections, resulting in measurements being conducted in a sub-optimal location. Rip rap along the left bank and a wide eddy on the right side of the channel contribute to measurement uncertainty. In addition, at higher flows the river carries a substantial amount of very fine sediment, which has a tendency to foul mechanical flow meters and limits the ability of the ADCP to penetrate to sufficient depth. Due to the challenges presented by the physical characteristics of the measurement section, a large number of the measurements used to develop the rating were rated Fair or Poor, and this is reflected in the Weighted Rating Error statistic.

Table 4. Stage Record Summary

Minimum Recorded Stage (feet)	2.94
Maximum Recorded Stage (feet)	11.06
Range of Recorded Stage (feet)	8.12

Table 4 Discussion (Stage Record)

Due to the presence of strong sensitivity drift between the logger and the PGI observations ($r^2=0.98$), the following equation was applied to the stage record for this water year: - $0.037X+0.113$.

Table 5. Rating Table Summary

Rating Table No.	602		
Period of Ratings	04/05/2013 to NOW		
Range of Ratings (cfs)	53cfs to 12600 c		
No. of Defining Measurements	31		
Rating Error (%)	15.0%		

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

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

Table 5 Discussion (Rating Tables)

Rating Table #602 was valid for all of WY 2014. Table #602 is a duplicate of Table #6, and represents the most stable stage-discharge relationship at this station.

Table 6. Model Summary

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

Table 6 Discussion (Modeled Data)

N/A

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

Type	Date
None	N/A

Table 7 Discussion (Surveys)

N/A

Activities Completed

No activities outside standard station visits and flow measurements were conducted at this station in WY 2014.
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Appendix