

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: 2005
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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)	508
Median Annual Discharge (cfs)	364
Maximum Daily Mean Discharge (cfs)	2640
Minimum Daily Mean Discharge (cfs)	67
Maximum Instantaneous Discharge (cfs)	4040
Minimum Instantaneous Discharge (cfs)	64
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	1050
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	162
Number of Days Discharge is Greater Than Range of Ratings	3
Number of Days Discharge is Less Than Range of Ratings	27

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

Narrative

Four discharge measurements were taken, ranging from 81 to 2450 cfs. A drought was declared statewide in March of 2005. In the Wenatchee River watershed, precipitation and snowpack were below normal. Snowpack was further diminished by notable rain-on-snow events during the winter months. As a result, the duration and magnitude of spring runoff was diminished.

Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	1.7%
Weighted Rating Error (% of discharge)	5.7%
Total Potential Error (% of discharge)	7.4%

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	#4	#5	#6
Period of Ratings	10/1/2004-9/20/2005	9/20/2005-9/20/2005	9/20/2005-9/30/2005
Range of Ratings (cfs)	63.2-6,600	52.8-12,600	52.8-12,600
No. of Defining Measurements	7	0	23
Rating Error (%)	5.4%	----	14.8%

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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Narrative

The water year began with Table 4 (an updated version of Table 3) incorporating new measurements and enhanced rating-development techniques. Towards the end of September, Table 4 was phased into Table 5 to represent a gradual scour of the control prior to staff gage replacement. This table was estimated based on offsetting Table 6 (-0.17ft), and was valid for a brief period in order to maintain datum continuity. Finally, Table 6 became valid when the staff gage was replaced on September 20, 2005, and continues to represent periods of scour throughout the period of record.

Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	2.41
Maximum Recorded Stage (feet)	14.52
Range of Recorded Stage (feet)	12.11
Number of Un-Reported Days	3
Number of Days Qualified as Estimates	15
Number of Days Qualified as Unreliable Estimates	0

Narrative

The maximum stage was recorded on January 19, 2005, during a winter storm. The minimum stage was recorded on September 19, 2005, during baseflow conditions. Unreported days were due to rating-table exceedances. The stage record is considered a reliable estimate for 15 days during the end of the water year due to logger drift exceeding 20% (8 days). The remainder of the days discharge values were calculated using an estimated stage-discharge relationship (Table 5). Staff gage observations were also reliably calculated from a regression of historical reference point observations between January and September until the staff gage was replaced.

Modeled Discharge

Table 6. Model Summary

Model Type (Slope conveyance, other, 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
N/A	N/A

Activities Completed

The staff gage was damaged in January during a high flow event. It was replaced on September 20, 2005.