

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

STATION ID: 01C070
STATION NAME: Hutchinson Creek near Acme
WATER YEAR: 2011
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Introduction

Watershed Description

Hutchinson Creek drains a forested basin in the North Cascades foothills that lies between Bowman Mountain on the east and its confluence with the South Fork Nooksack River on the west. The creek supports populations of steelhead, coho salmon, and cutthroat trout. Above the gage the basin ranges in elevation from 530 feet up to 4220 feet along the mountain ridges to the east. The mean elevation is 1750 feet. About 72 percent of the area is covered by forest canopy. Average annual precipitation is about 70 inches.

Gage Location

This streamgage is located on the left bank at an unmarked Washington State Department of Natural Resources bridge off Mosquito Lake Road in Whatcom County, WA.

Table 1. Basin Area and Legal Description

Drainage Area (square miles)	14.0
Latitude (degrees, minutes, seconds)	48° 43' 27.84" N
Longitude (degrees, minutes, seconds)	-122° 9' 7.92" W

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	59
Median Annual Discharge (cfs)	51
Maximum Daily Mean Discharge (cfs)	318
Minimum Daily Mean Discharge (cfs)	5.5
Maximum Instantaneous Discharge (cfs)	382
Minimum Instantaneous Discharge (cfs)	5.0
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	115
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	8.5
Number of Days Discharge is Greater Than Range of Ratings	5
Number of Days Discharge is Less Than Range of Ratings	0
Number of Un-Reported Days	5
Number of Days Qualified as Estimates	216
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)

Discharge at Hutchinson Creek near Acme gaging station reached its lowest point September 7, 2011. Discharge in Hutchinson Creek peaked December 13, 2010.

Five days were greater than the range of rating. These exceedances correspond to a large winter storm event in December of 2011. Five days also is the total number of unreported days for Water Year 2011.

Two hundred sixteen days were qualified as estimates. These days were qualified as estimates based on logger drift error assessment.

Table 3. Error Analysis Summary.

Potential Logger Drift Error (% of discharge)	25.4
Potential Weighted Rating Error (% of discharge)	11.5
Total Potential Error (% of discharge)	36.9

Table 3 Discussion (Error Analysis)

The majority of the total potential error comes from logger drift error. There is no specific cause noted that would identify why so much of the potential error is associated with logger drift. Logger drift refers to the difference between raw and adjusted discharge. Logger drift can be caused by a number of factors. Some of these factors include low battery voltage, a clogged orifice line, or burial of the terminal end of the stage measurement device.

The remainder of the total potential error is from uncertainty in reported discharge for Water Year 2011 is from potential weighted rating error. Potential rating error is based on the difference between the discharge predicted by the rating table and the measured discharge that has been adjusted to the highest potential error based on the quality of the measurement. Several of the measurements conducted during Water Year 2011 had fair and poor ratings. These lower ratings are most likely due to turbulence from boulders and bedrock in the measurement cross-section.

Table 4. Stage Record Summary

Minimum Recorded Stage (feet)	1.09
Maximum Recorded Stage (feet)	4.77
Range of Recorded Stage (feet)	3.68

Table 4 Discussion (Stage Record)

Minimum stage occurred during summer low flow conditions in early September 2011. Maximum stage occurred during a large December storm event in 2010.
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Table 5. Rating Table Summary

Rating Table No.	10	12	
Period of Ratings	10/1/10-11/16/10	10/31/10-9/30/11	
Range of Ratings (cfs)	0-1,490	0-392	
No. of Defining Measurements	11	29	
Rating Error (%)	11.1	11.6	

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 10 is a carry over from WY 2010.

Scouring of the gage pool over several small storm events in early to mid November 2010 led to Rating 12.

Table 6. Model Summary

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

Table 6 Discussion (Modeled Data)

none

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

Type	Date
none	n/a

Table 7 Discussion (Surveys)

n/a

Activities Completed

None.

Appendix

None.