

Station Description and Analysis for Salmon Creek Gaging Station near Juneau, Alaska for the 2017 Water Year

LOCATION.—Lat 58°19'57", long 134°27'57" referenced to North American Datum of 1927, and Lat 58°19'56", long 134°28'04" referenced to World Geodetic System 1984. Gage is located on the left bank (when facing downstream), about 0.3 mi upstream from the mouth and 2.5 mi northwest of Juneau.

DRAINAGE AREA.—Drainage area 9.69 mi² as reported by the USGS, flows are regulated.

ESTABLISHMENT AND HISTORY.—Gage established on April 27, 2016 at the same location of U.S. Geological gaging station number 15051010.

GAGE.—A Campbell Scientific CS450 vented and temperature compensated transducer is coupled to a Campbell Scientific CR6 data logger and records stage data in 15 minute intervals. The transducer is housed in 1 inch galvanized pipe and set and referenced to vertical datum established by the U.S. Geological Survey (see reference marks). Additional equipment housed in a gage house on left bank.

CONTROL.—Low flow control is a boulder/cobble riffle immediately below the orifice and staff gage. The channel is the control at medium and high stages. Shifting from the rating is possible at all stages as the gage reach can be alternately scoured and filled.

DISCHARGE MEASUREMENTS.—Measurements are made by wading in the vicinity of the gage. High flow measurements can be measured from a bridge approximately 0.25 mi downstream.

FLOODS.—U.S. Geological Survey recorded a maximum discharge of 2110 ft³/s, Nov. 22, 2005 and gage height 4.20 ft. Minimum discharge recorded by the U.S. Geological Survey was 3.5 ft³/s, March 17-20, 2006.

WINTER FLOW.—The stage-discharge relationship will be periodically affected by ice during cold periods most winters.

REGULATION AND DIVERSIONS.—Flow is regulated by Salmon Creek Reservoir located 2 miles upstream. Diversion upstream for off-stream hydropower plant; outflow from the plant goes into Gastineau Channel and is not included in the discharge records.

ACCURACY.— Accuracy of the discharge records should be fair to good with the exception of ice affected record which will be fair to poor.

REFERENCE MARKS.—The gage is referenced to several vertical reference marks (RMs) established by the U.S. Geological Survey to accurately track vertical datum for the gage. The existing gage will continue to reference these RMs to maintain accurate vertical datum.

RM 1 – Brass cap anchored in concrete 2 feet shoreward of the orifice on left bank, elevation 2.44 feet. This RM is the base RM from which to begin level surveys.

RM 4 – Lag bolt driven in 3 foot diameter spruce tree 20 feet from the left edge of water and 30 feet upstream of the orifice and outside staff gage, elevation 10.82 feet.

RP 1 – ¼ inch anchor bolt drilled in concrete block 1 foot upstream of orifice, elevation 2.44 feet.

RM 5 – ¼ inch lag bolt on upstream side of two foot diameter cottonwood 25 feet from left edge of water and 12 feet downstream of the orifice, elevation 8.574 feet.

RM 6 – ¼ inch lag bolt on upstream side of 1 foot diameter spruce tree, 15 feet from the left edge of water and 15 feet upstream of the orifice, elevation 7.774 feet.

STATION ANALYSIS

GAGE HEIGHT RECORD.—The gage height record is complete for the 2017 water year with no periods of missing record.

GAGE HEIGHT CORRECTIONS.—Gage height corrections to the recorder are used to adjust for differences between the recorded values and readings of the outside reference gage during site visits. A plot of corrected gage heights and measured field values of gage height is shown below in figures 1 and 2.

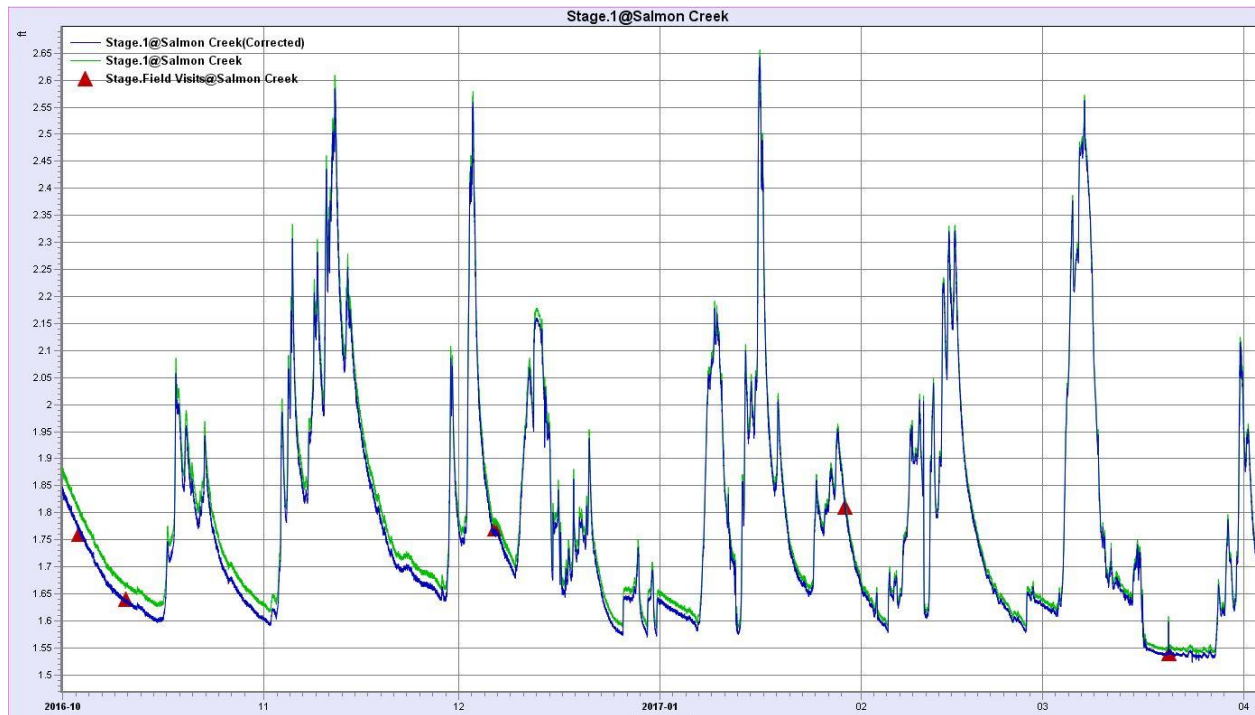
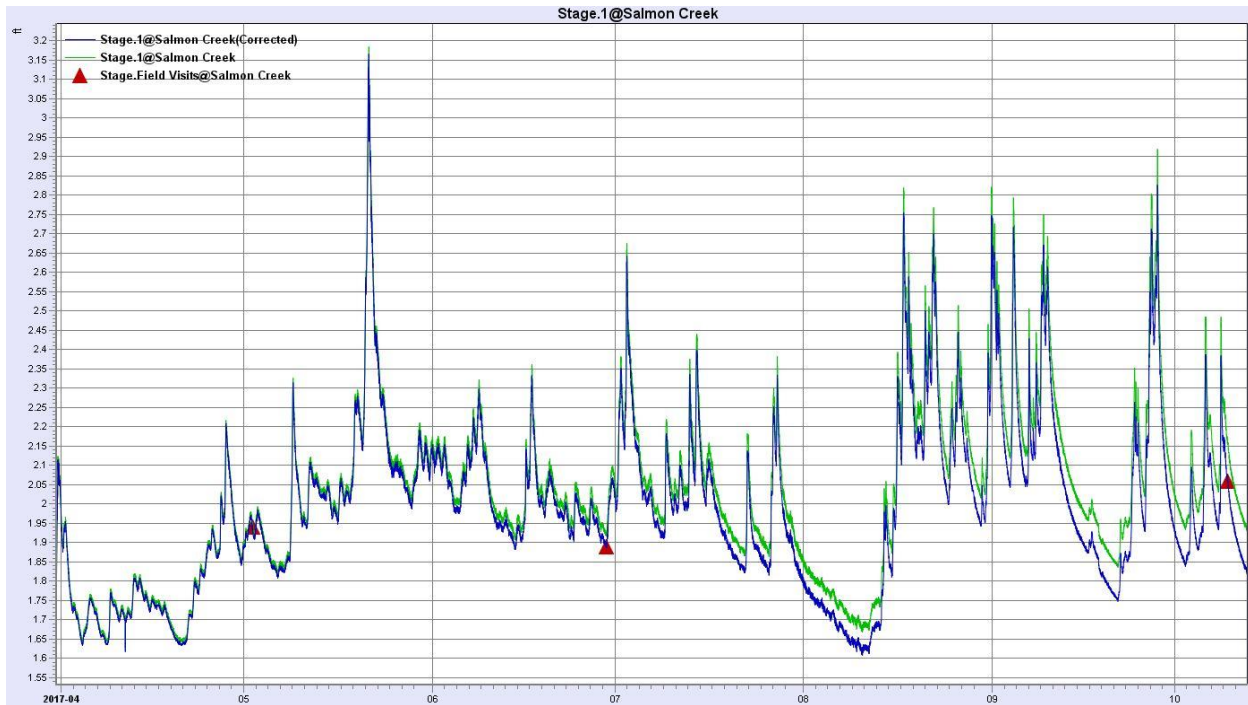


Figure 1. Stage data from Salmon Creek gaging station showing raw and corrected recorded values and field readings from the outside reference gage (Oct. 2016 through April 2017).



Stage data from Salmon Creek gaging station showing raw and corrected recorded values and field readings from the outside reference gage (April 2017 through October 2017).

Corrections to gage height were applied as follows:

9/14/16 to 10/10/16: correction of -0.05 ft prorated to -0.03 ft

10/10/16 to 1/29/17: correction of -0.03 ft prorated to -0.01 ft

1/29/17 to 5/02/17: correction of -0.01 ft

5/02/17 to 6/29/17: correction of -0.01 ft prorated to -0.03 ft

6/29/17 to 10/09/17: correction of -0.03 ft prorated to -0.10 ft

DATUM CORRECTIONS.— Level survey conducted on May 22, 2016. No datum corrections were needed.

RATING.— Rating 1 was developed by the USGS and continued in use for the 2017 water year with two stage variable shifts. The gage reach is under section control at low to midrange discharges. The gage reach is subject to scour and fill during peak flows and during lower discharges when salmon spawn throughout the gage reach. Nine discharge measurements were used for rating analysis for the 2017 water year, including one discharge measurement conducted by the USGS. Discharge measurements ranged from 12.8 to 38.7 ft³/s. Rating curve and rating equation points are shown below:

Rating Curve

Salmon Creek Rating 2017 Water Year - Used to compute discharge with stage variable shift.

Label: Salmon Creek

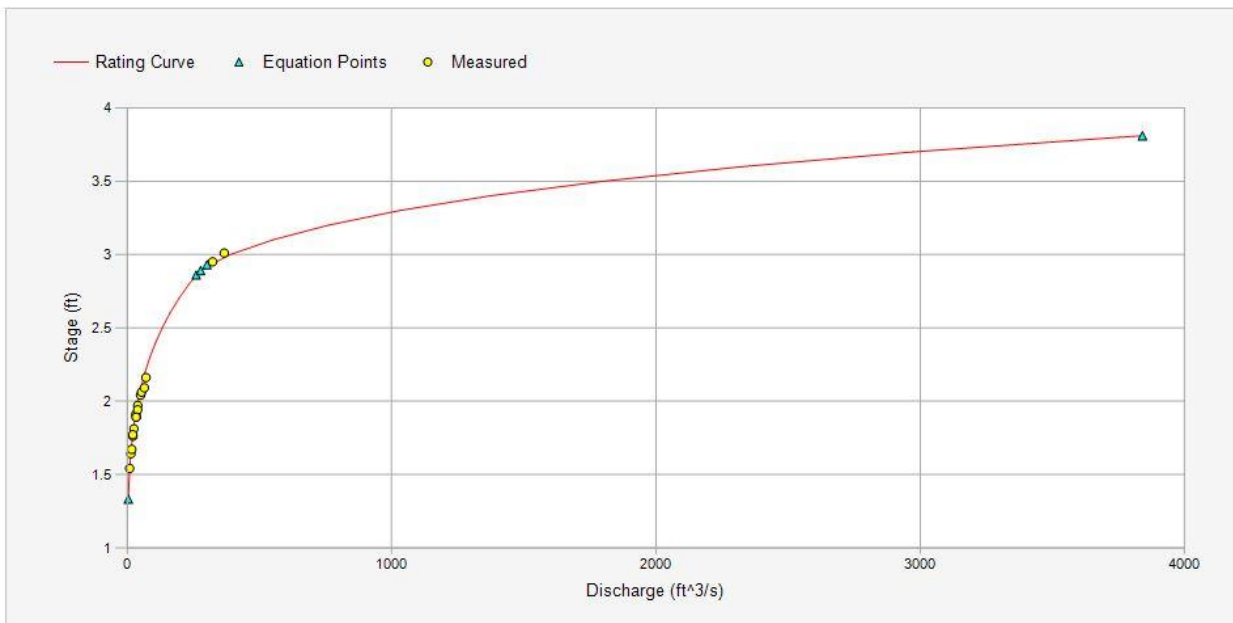
Description: Site ID-Salmon Creek

Curve on: January 19, 2018

Curve Start Date: April 20, 2015

Location:

Salmon Creek Juneau



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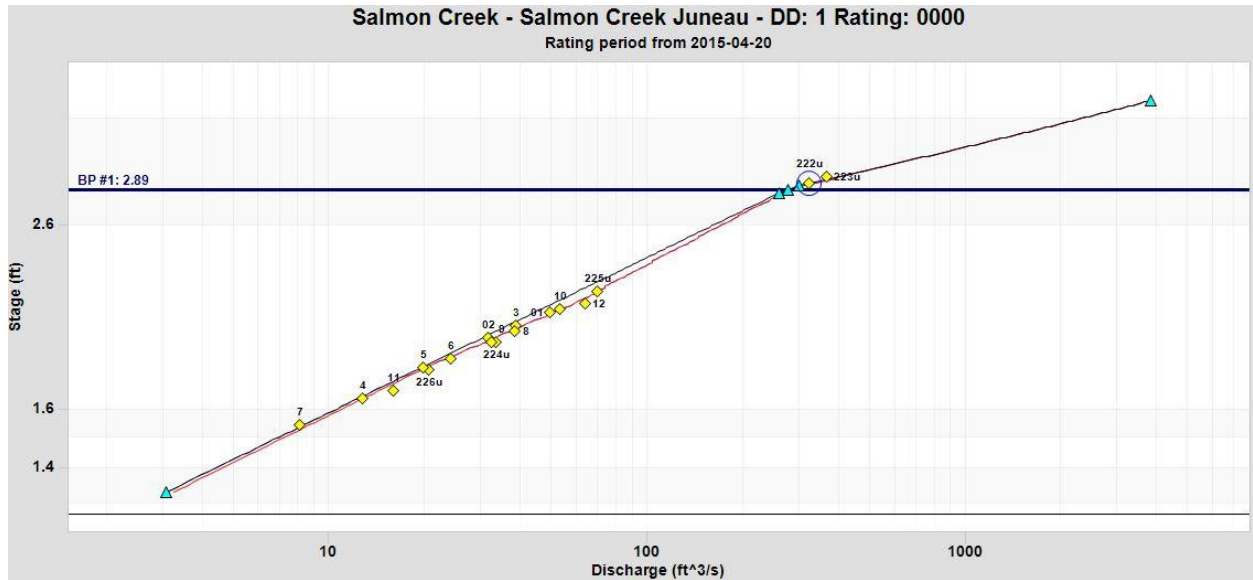
Location:

Salmon Creek Juneau

Stage (ft)	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
1.00	0.00	0.00	0.00	0.00	4.41	7.00	10.59	15.39	21.66	29.65
2.00	39.66	51.99	66.97	84.96	106.32	131.45	160.76	194.69	233.68	282.63
3.00	389.17	550.06	760.28	1,030.42	1,372.48	1,799.96	2,327.99	2,973.35	3,754.63	3,841.00

DISCHARGE RECORD.—Rating number 1 was used to compute discharge with two stage variable shifts to adjust for slight scour conditions. The shifts were defined by measurements 1-6 (shift 1) and 7-10 (shift 2). The two shifts are quite similar and both reflect minor scour conditions. The shifted rating is shown below. The stage variable shift is in effect below stages of 3.08 feet.

Stage record was subject to backwater from ice from Dec. 9-16, Jan. 6-12, Feb. 5-10, and Mar. 3-16. Discharges during periods of ice were estimated from examination of the stage record, comparison with Juneau weather records and hydrographic comparison with the Mendenhall River near Juneau. Hydrographic comparison with the Mendenhall is poor.

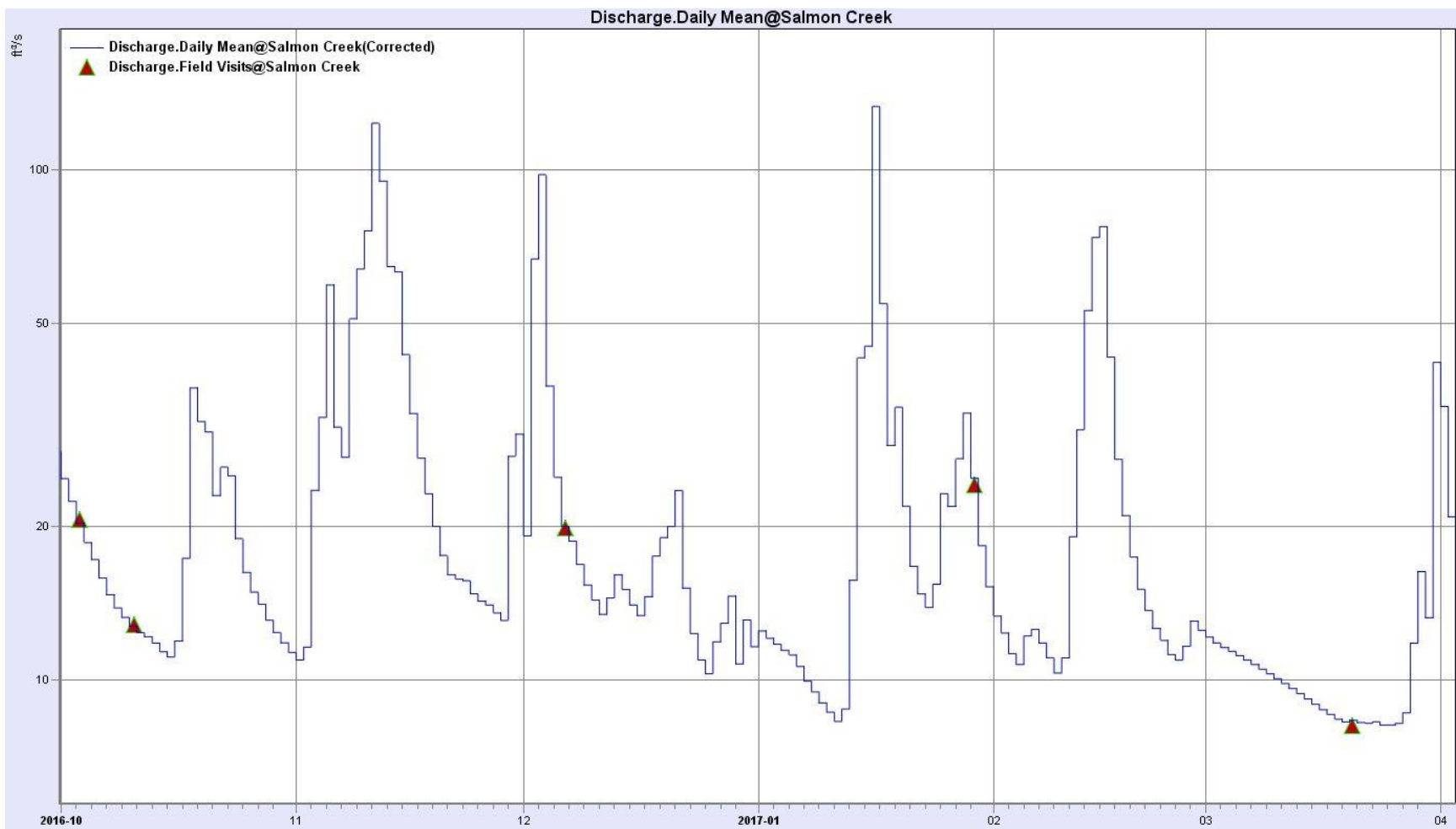


REMARKS.— Records of discharge are complete. Discharge records are fair due to drift in stage recordings and the relatively poor gage reach and lack of cross sections available to consistently make good discharge measurements. The stage variable shifts used to compute discharges for the 2017 would not be needed if a slight offset adjustment was made to the existing rating. If future measurements follow similar patterns the rating will be recomputed to better fit the observed measurements under 300 ft³/s.

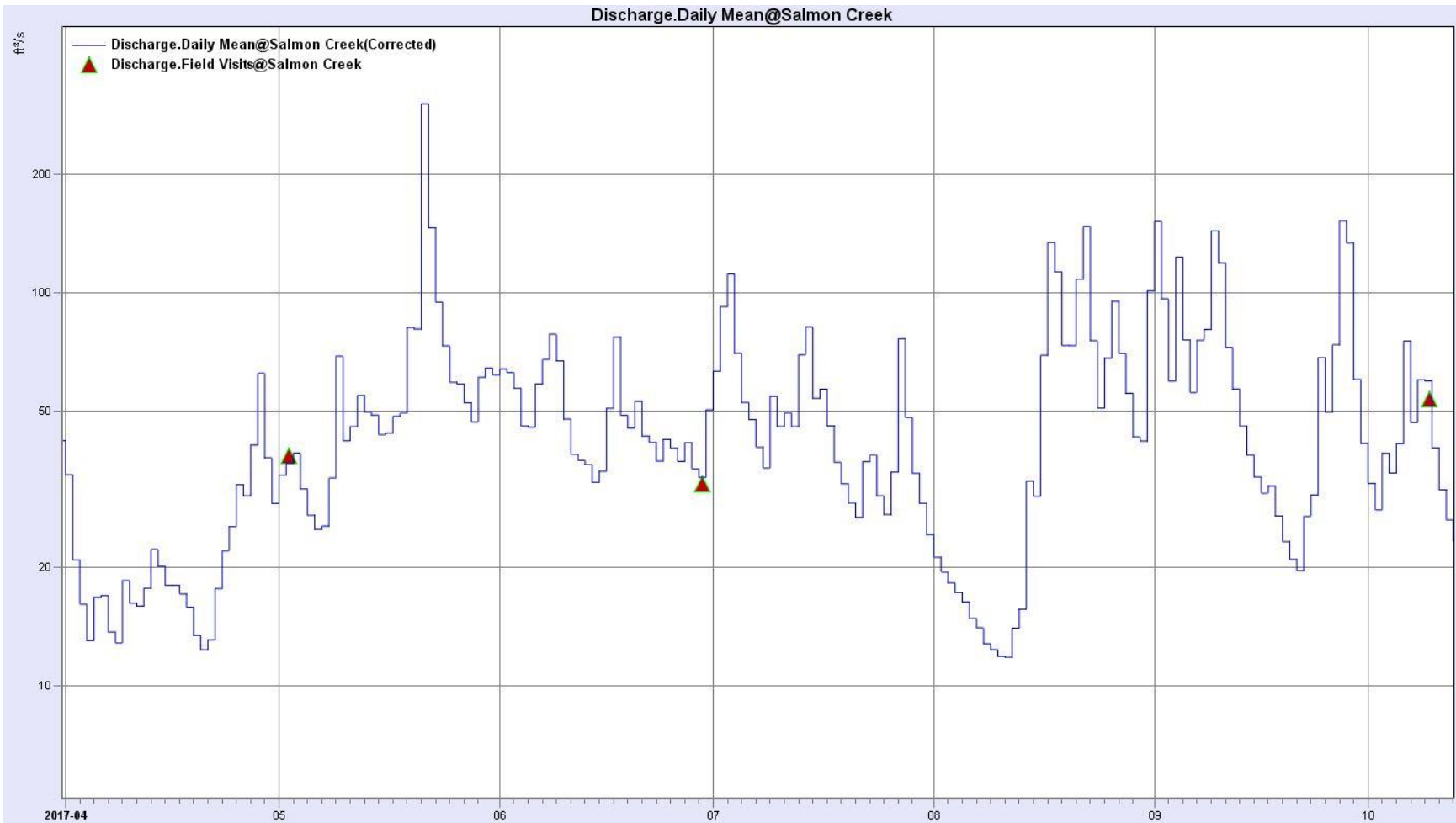
The following file was included as an attachment to this document:

Salmon Creek 15 min. 2017 Final.

Salmon Creek Daily Mean 2017 WY Final.



Computed daily mean discharge and field measurements for Salmon Creek near Juneau, Alaska from October 2016 to April 2017.



Computed daily mean discharge and field measurements for Salmon Creek near Juneau, Alaska from April 2017 to October 2017.

Daily Mean by Year

Identifier: Discharge.Daily Mean@Salmon Creek
Location: Salmon Creek Juneau
Units: ft³/s
Filter: None

Daily Mean 2017 Water Year - Daily Mean Discharge at Salmon Creek near Jun

Year:	2016		Aggr:	39	Min:	8.2	Max:	560					
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1	25 UN	11 UN	19 UN	12 UN	13 UN	12 UN	34 UN	34 UN	64 UN	63 UN	21 UN	150 UN	
2	22 UN	12 UN	67 UN	12 UN	12 UN	12 UN	21 UN	37 UN	62 UN	92 UN	19 UN	96 UN	
3	20 UN	24 UN	98 UN	12 UN	11 UN	12 EF	16 UN	39 UN	57 UN	110 UN	18 UN	59 UN	
4	19 UN	33 UN	38 UN	11 UN	11 UN	11 EF	13 UN	32 UN	46 UN	70 UN	17 UN	120 UN	
5	17 UN	59 UN	25 UN	11 UN	12 EF	11 EF	17 UN	27 UN	45 UN	52 UN	16 UN	76 UN	
6	16 UN	31 UN	20 UN	11 EF	13 EF	11 EF	17 UN	25 UN	59 UN	47 UN	15 UN	56 UN	
7	15 UN	27 UN	19 UN	9.9 EF	12 EF	11 EF	14 UN	25 UN	68 UN	40 UN	14 UN	75 UN	
8	14 UN	51 UN	17 UN	9.5 EF	11 EF	10 EF	13 UN	34 UN	78 UN	36 UN	13 UN	80 UN	
9	13 UN	64 UN	15 EF	9.0 EF	10 EF	10 EF	19 UN	69 UN	67 UN	54 UN	12 UN	140 UN	
10	13 UN	76 UN	14 EF	8.6 EF	11 EF	10 EF	16 UN	42 UN	48 UN	46 UN	12 UN	120 UN	
11	12 UN	120 UN	13 EF	8.3 EF	19 UN	9.8 EF	16 UN	46 UN	39 UN	49 UN	12 UN	72 UN	
12	12 UN	95 UN	14 EF	8.8 EF	31 UN	9.6 EF	18 UN	55 UN	37 UN	46 UN	14 UN	57 UN	
13	12 UN	65 UN	16 EF	16 UN	53 UN	9.4 EF	22 UN	50 UN	36 UN	69 UN	16 UN	46 UN	
14	11 UN	63 UN	15 EF	43 UN	74 UN	9.2 EF	20 UN	49 UN	33 UN	82 UN	33 UN	39 UN	
15	11 UN	43 UN	14 EF	45 UN	77 UN	9.0 EF	18 UN	43 UN	35 UN	54 UN	30 UN	34 UN	
16	12 UN	33 UN	13 EF	130 UN	43 UN	8.7 EF	18 UN	44 UN	51 UN	57 UN	69 UN	31 UN	
17	17 UN	27 UN	15 UN	55 UN	27 UN	8.6 UN	17 UN	48 UN	77 UN	46 UN	130 UN	32 UN	
18	37 UN	23 UN	17 UN	29 UN	21 UN	8.4 UN	16 UN	49 UN	49 UN	37 UN	110 UN	27 UN	
19	32 UN	20 UN	19 UN	34 UN	17 UN	8.3 UN	13 UN	81 UN	45 UN	33 UN	73 UN	23 UN	
20	31 UN	18 UN	20 UN	22 UN	15 UN	8.3 UN	12 UN	81 UN	53 UN	29 UN	73 UN	21 UN	
21	23 UN	16 UN	24 UN	17 UN	14 UN	8.2 UN	13 UN	300 UN	43 UN	27 UN	110 UN	20 UN	
22	26 UN	16 UN	15 UN	15 UN	13 UN	8.2 UN	18 UN	150 UN	42 UN	37 UN	150 UN	27 UN	
23	25 UN	16 UN	12 UN	14 UN	12 UN	8.3 UN	22 UN	94 UN	37 UN	39 UN	75 UN	31 UN	
24	19 UN	15 UN	11 UN	15 UN	11 UN	8.2 UN	25 UN	73 UN	42 UN	30 UN	51 UN	68 UN	
25	16 UN	14 UN	10 UN	23 UN	11 UN	8.2 UN	32 UN	59 UN	40 UN	27 UN	68 UN	50 UN	
26	15 UN	14 UN	12 UN	22 UN	12 UN	8.2 UN	30 UN	58 UN	37 UN	35 UN	95 UN	74 UN	
27	14 UN	14 UN	13 UN	27 UN	13 UN	8.6 UN	41 UN	52 UN	41 UN	76 UN	70 UN	150 UN	
28	13 UN	13 UN	15 UN	33 UN	13 UN	12 UN	62 UN	47 UN	36 UN	48 UN	55 UN	130 UN	
29	12 UN	27 UN	11 UN	25 UN		16 UN	38 UN	61 UN	34 UN	35 UN	43 UN	60 UN	
30	12 UN	30 UN	13 UN	18 UN		13 UN	29 UN	64 UN	50 UN	29 UN	42 UN	41 UN	
31	11 UN		12 UN	15 UN		42 UN		62 UN		24 UN	100 UN		
Aggr	18	36	21	23	21	11	22	62	48	49	51	67	
Min	11	11	10	8.3	10	8.2	12	25	33	24	12	20	
Max	37	120	98	130	77	42	62	300	78	110	150	150	

Date Processed: January 19, 2018 18:10

