Appendix A.14: USGS Gage 02018500 vs. JU1_7750_7560 Upper James River

This river segment follows part of the flow of the Catawba Creek, a tributary of the James. The gage is located in Botetourt County (Lat. 37°28'05.5", Long. -80°00'19.2"), approximately 7.7 miles west of Fincastle, VA. Drainage area is 34.3 sq. miles. This gage started taking data in 1943 and is still taking data. From October 1953 to October 1976, monthly means were adjusted for withdrawals by the Citadel Cement Corporation. The average daily discharge error between the model and gage data for the 20 year timespan was 0%, with 64.2% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	3.9	5.63	44.4
Feb. Low Flow	5.7	7.3	28.1
Mar. Low Flow	6.6	12	81.8
Apr. Low Flow	7	14.3	104
May Low Flow	16	23.3	45.6
Jun. Low Flow	23.9	24.7	3.35
Jul. Low Flow	14	17.9	27.9
Aug. Low Flow	12.3	13.2	7.32
Sep. Low Flow	7.8	10.5	34.6
Oct. Low Flow	5.9	4.72	-20
Nov. Low Flow	4.2	3.83	-8.81
Dec. Low Flow	4.22	2.95	-30.1

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	35.8	35.8	0
Jan. Mean Flow	38.5	45	16.9
Feb. Mean Flow	56.9	56.1	-1.41
Mar. Mean Flow	68.7	62.1	-9.61
Apr. Mean Flow	63.4	53.8	-15.1
May Mean Flow	41.5	41	-1.2
Jun. Mean Flow	36.2	33.1	-8.56
Jul. Mean Flow	14.4	18.6	29.2
Aug. Mean Flow	12.6	13.5	7.14
Sep. Mean Flow	25.4	28.8	13.4
Oct. Mean Flow	13.7	19.5	42.3
Nov. Mean Flow	35.2	30.8	-12.5
Dec. Mean Flow	25.3	28.8	13.8

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	14	20.6	47.1
Feb. High Flow	26	77	196
Mar. High Flow	44	59.3	34.8
Apr. High Flow	113	122	7.96
May High Flow	137	105	-23.4
Jun. High Flow	201	223	10.9
Jul. High Flow	124	121	-2.42
Aug. High Flow	51	108	112
Sep. High Flow	27	51.6	91.1
Oct. High Flow	21	50.1	139
Nov. High Flow	14	24.3	73.6
Dec. High Flow	14	21.9	56.4

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	0.25	0	-100
Med. 1 Day Min	2.9	0.58	-80.1
Min. 3 Day Min	0.27	0	-100
Med. 3 Day Min	3.2	0.88	-72.6
Min. 7 Day Min	0.36	0	-100
Med. 7 Day Min	3.44	1.82	-47.1
Min. 30 Day Min	0.98	0.84	-15.2
Med. 30 Day Min	4.82	4.35	-9.75
Min. 90 Day Min	1.49	2.55	71.1
Med. 90 Day Min	7.09	9.67	36.4
7Q10	1.29	0	-100
Year of 90-Day Min. Flow	2002	2002	0
Drought Year Mean	3.95	7.85	98.7
Mean Baseflow	14.5	18.1	24.8

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	7400	2600	-64.9
Med. 1 Day Max	967	623	-35.6
Max. 3 Day Max	3000	1210	-59.7
Med. 3 Day Max	536	326	-39.2
Max. 7 Day Max	1440	590	-59
Med. 7 Day Max	290	206	-29
Max. 30 Day Max	395	218	-44.8
Med. 30 Day Max	126	103	-18.3
Max. 90 Day Max	198	151	-23.7
Med. 90 Day Max	69.9	69.9	0

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	1.34	0	-99.9
5% Non-Exceedance	2.9	2.23	-23.1
50% Non-Exceedance	12	19	58.3
95% Non-Exceedance	118	107	-9.32
99% Non-Exceedance	403	316	-21.6
Sept. 10% Non-Exceedance	2.8	2.62	-6.43

Fig. 1: Hydrograph

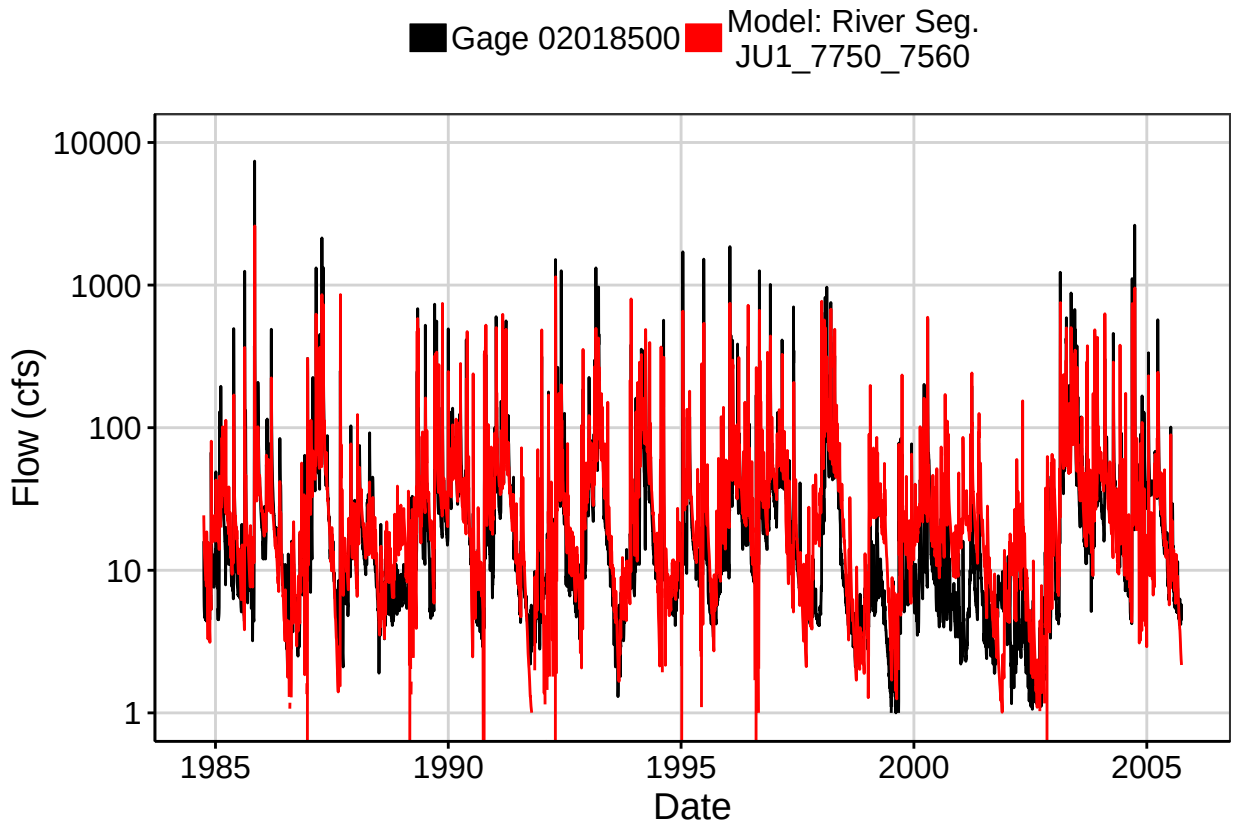

Fig. 2: Zoomed Hydrograph

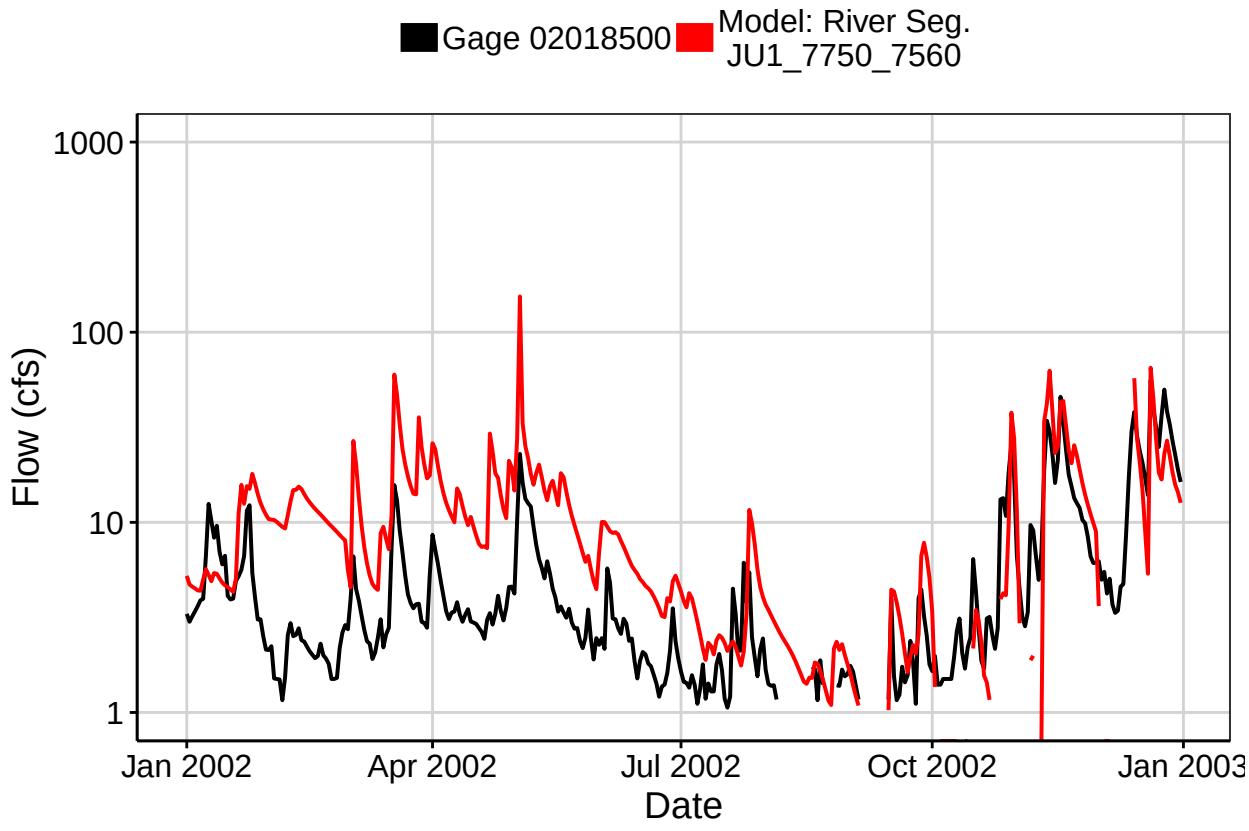

Fig. 3: Flow Exceedance

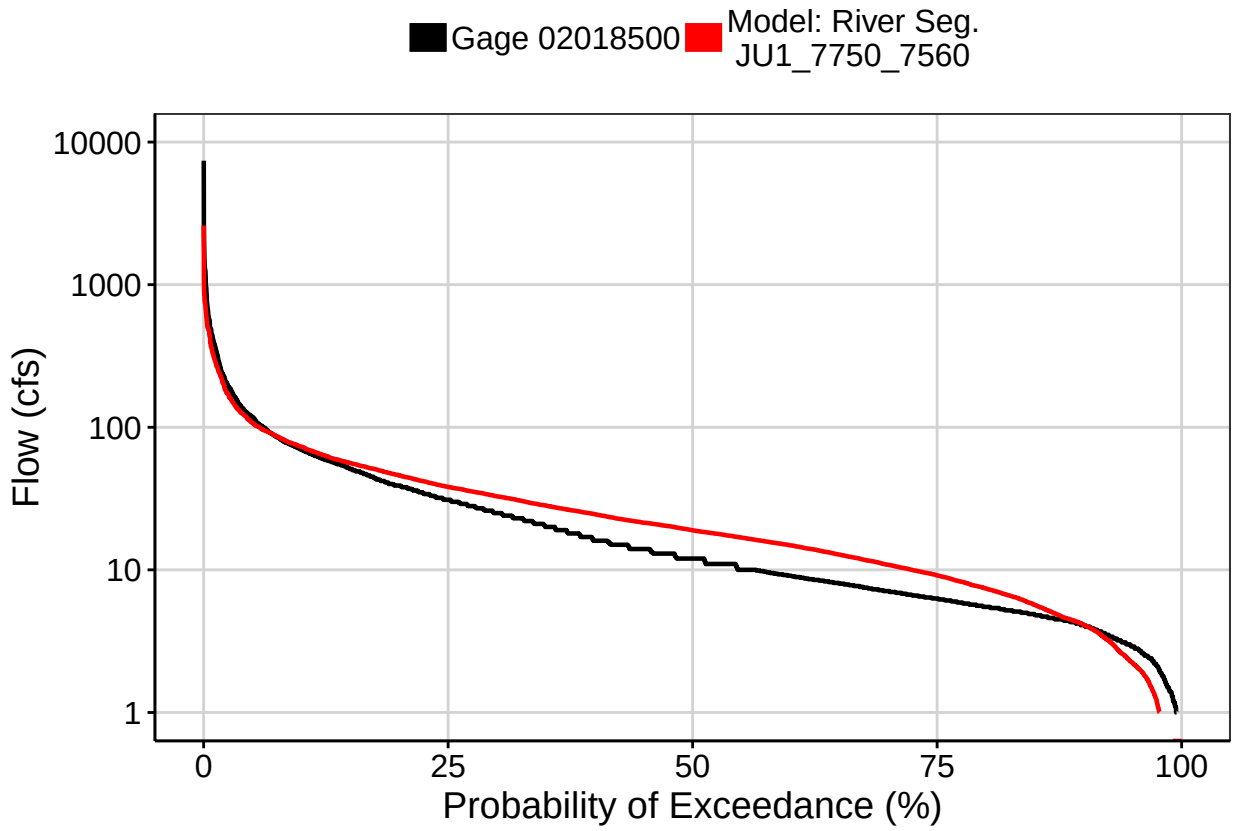

Fig. 4: Baseflow

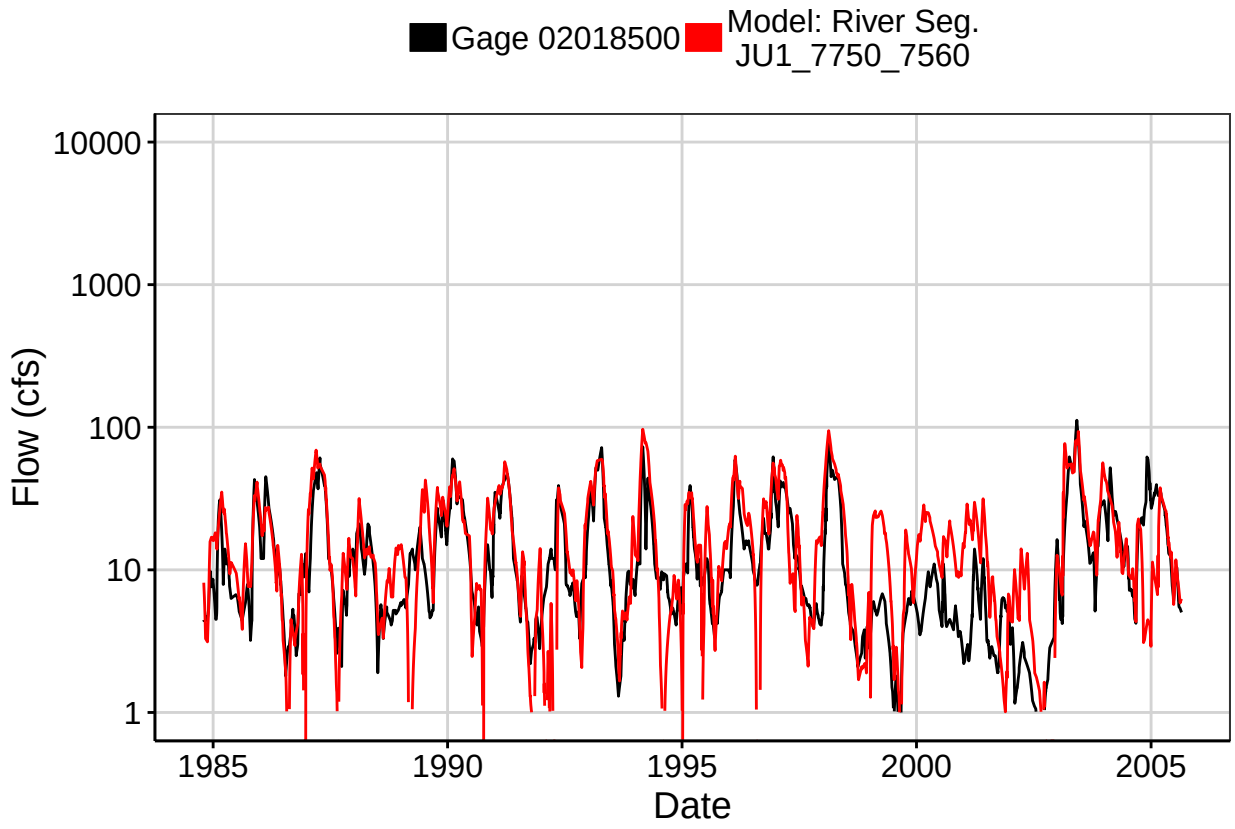

Fig. 5: Combined Baseflow

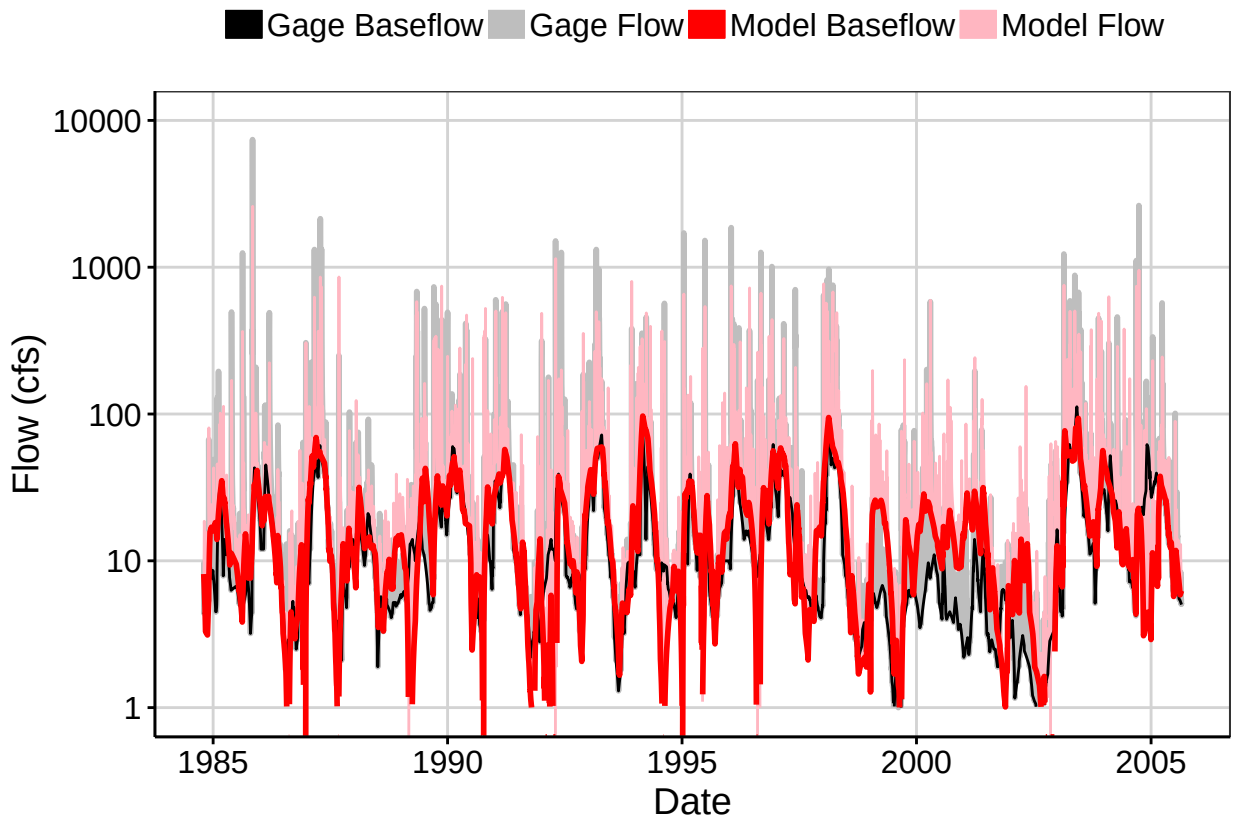

Fig. 6: Largest Error Segment

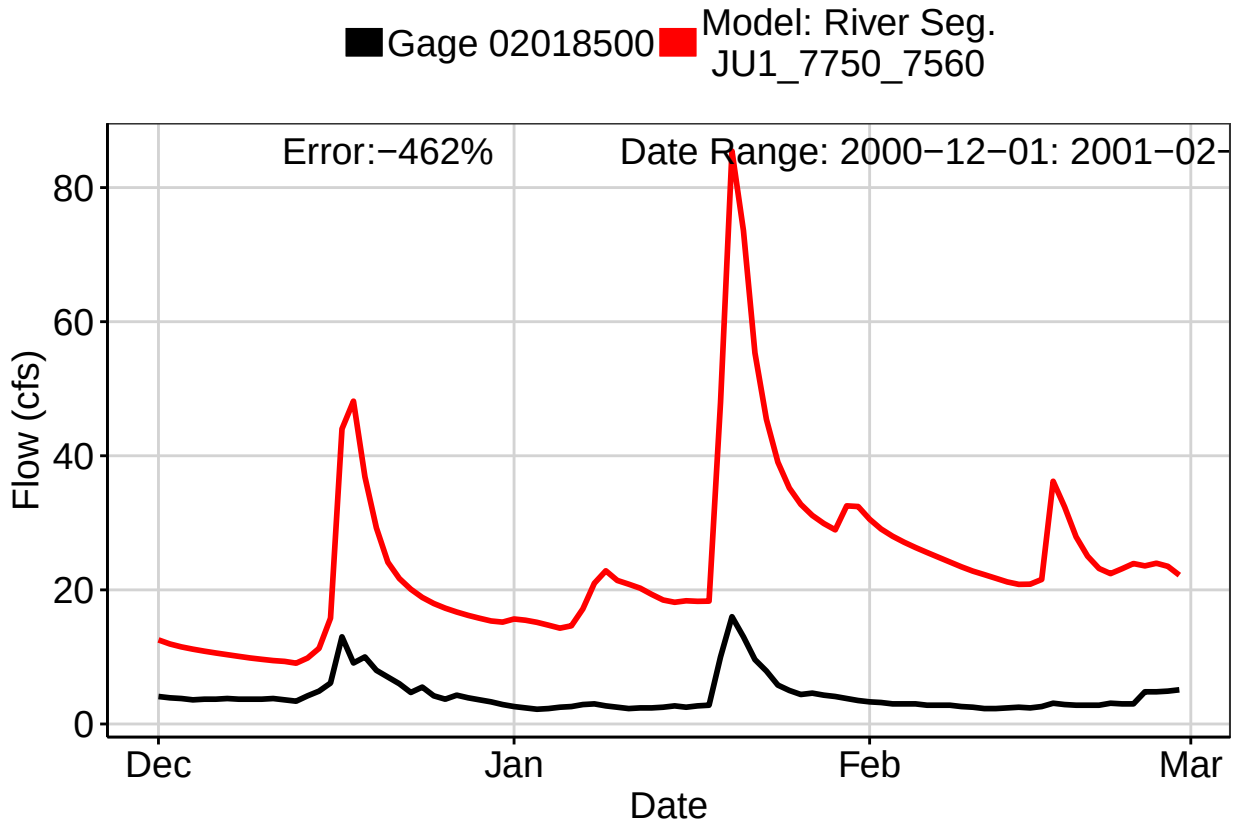

Fig. 7: Second Largest Error Segment

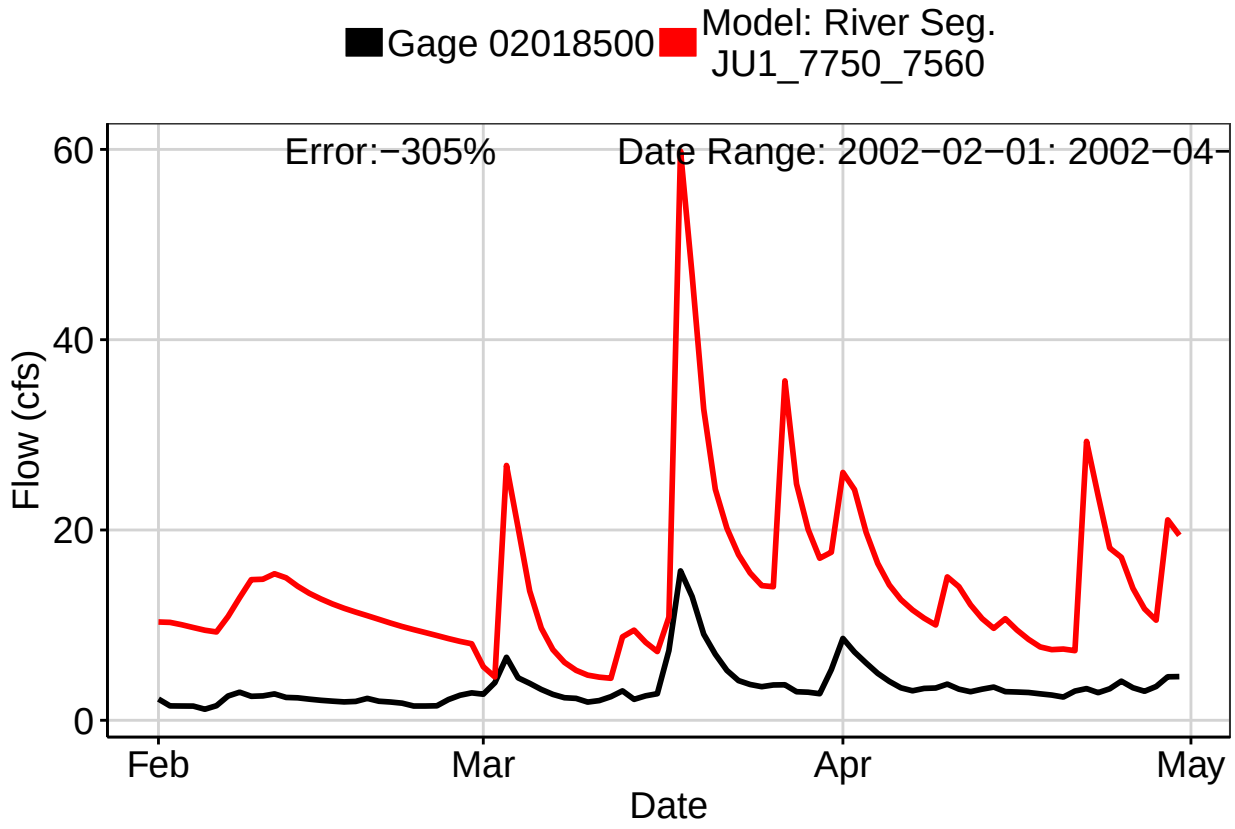

Fig. 8: Third Largest Error Segment

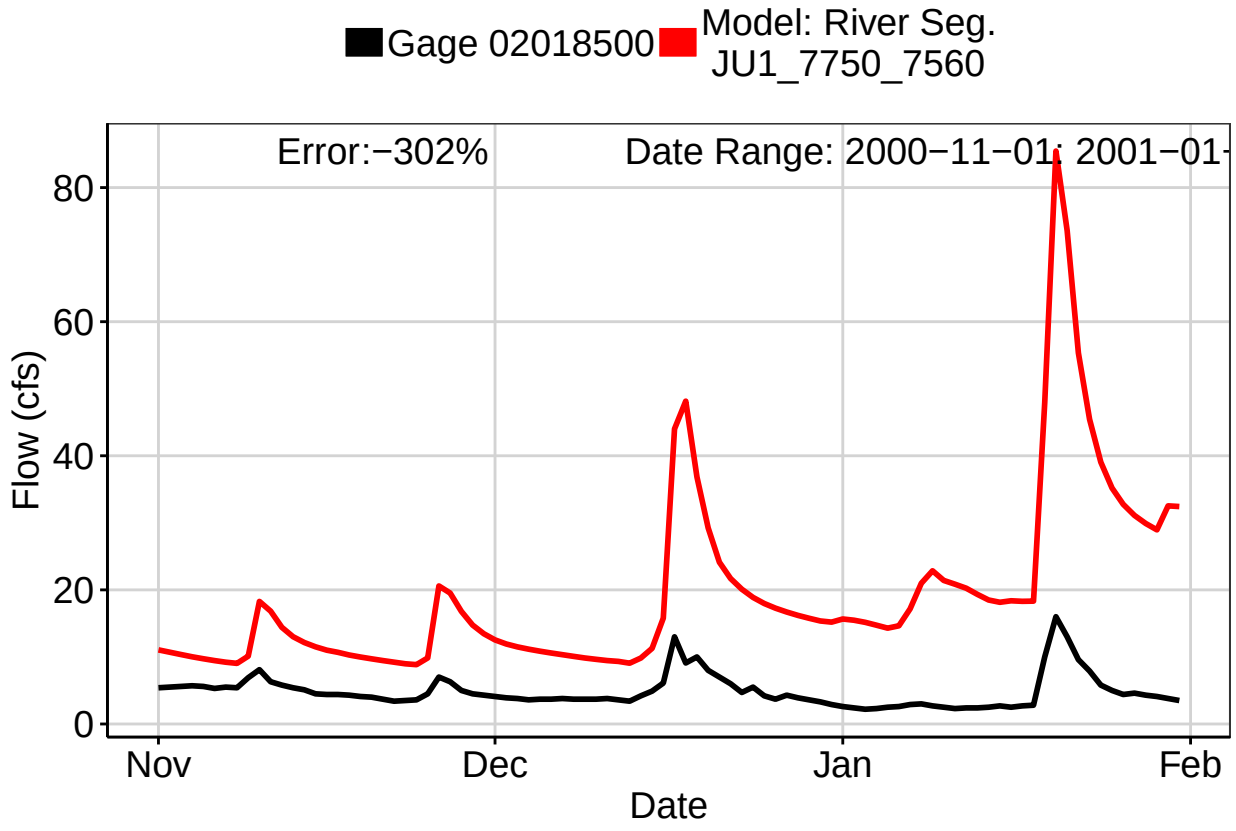

Fig. 9: Residuals Plot