Appendix A.22: USGS Gage 02027500 vs. JL1_7080_7190 Lower James River

This river segment follows part of the flow of the Piney River, a tributary of the James. The gage is located in Amherst County (Lat. 37°42'08.5", Long. -79°01'39.1"), approximately 8.5 miles north of Amherst, VA. Drainage area is 47.7 sq. miles. This gage started taking data in 1949 and is still taking data. Periodic dewatering of upstream quarries adds a small amount of inflow at times. The average daily discharge error between the model and gage data for the 20 year timespan was 20.4%, with 64.6% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	15	17.3	15.3
Feb. Low Flow	26	24.9	-4.23
Mar. Low Flow	41	42.1	2.68
Apr. Low Flow	47	48.5	3.19
May Low Flow	53	56.6	6.79
Jun. Low Flow	66	57.7	-12.6
Jul. Low Flow	59	38.3	-35.1
Aug. Low Flow	45	26.7	-40.7
Sep. Low Flow	27	16.2	-40
Oct. Low Flow	13	8.52	-34.5
Nov. Low Flow	10	9.65	-3.5
Dec. Low Flow	8.6	9.71	12.9

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	96.6	76.9	-20.4
Jan. Mean Flow	126	95.9	-23.9
Feb. Mean Flow	113	103	-8.85
Mar. Mean Flow	145	116	-20
Apr. Mean Flow	141	94.9	-32.7
May Mean Flow	111	77.9	-29.8
Jun. Mean Flow	89.6	64.5	-28
Jul. Mean Flow	43.3	40.4	-6.7
Aug. Mean Flow	35.4	38.1	7.63
Sep. Mean Flow	76.6	74.6	-2.61
Oct. Mean Flow	58.6	56.7	-3.24
Nov. Mean Flow	111	81.2	-26.8
Dec. Mean Flow	110	83.2	-24.4

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	67	82.5	23.1
Feb. High Flow	195	278	42.6
Mar. High Flow	207	167	-19.3
Apr. High Flow	269	167	-37.9
May High Flow	180	168	-6.67
Jun. High Flow	281	380	35.2
Jul. High Flow	255	212	-16.9
Aug. High Flow	168	152	-9.52
Sep. High Flow	104	92.7	-10.9
Oct. High Flow	79	85.7	8.48
Nov. High Flow	53	56	5.66
Dec. High Flow	61	65.1	6.72

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	0.31	1.01	226
Med. 1 Day Min	5.6	4.18	-25.4
Min. 3 Day Min	0.44	1.02	130
Med. 3 Day Min	5.97	4.75	-20.4
Min. 7 Day Min	0.66	1.05	58.9
Med. 7 Day Min	6.39	5.36	-16.1
Min. 30 Day Min	1.56	1.77	13.5
Med. 30 Day Min	9.54	9.34	-2.1
Min. 90 Day Min	4.97	6.87	38.2
Med. 90 Day Min	22.5	26	15.6
7Q10	2.16	1.41	-34.7
Year of 90-Day Min. Flow	2002	1999	100
Drought Year Mean	29.3	25.2	-14
Mean Baseflow	50.1	43.6	-13

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	8110	2500	-69.2
Med. 1 Day Max	1300	1080	-16.9
Max. 3 Day Max	4360	1250	-71.3
Med. 3 Day Max	928	566	-39
Max. 7 Day Max	2230	684	-69.3
Med. 7 Day Max	577	368	-36.2
Max. 30 Day Max	654	315	-51.8
Med. 30 Day Max	289	178	-38.4
Max. 90 Day Max	318	234	-26.4
Med. 90 Day Max	185	129	-30.3

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	3.1	2.1	-32.3
5% Non-Exceedance	7	6.43	-8.14
50% Non-Exceedance	60	52.7	-12.2
95% Non-Exceedance	281	214	-23.8
99% Non-Exceedance	624	480	-23.1
Sept. 10% Non-Exceedance	4.79	6.31	31.7

Fig. 1: Hydrograph

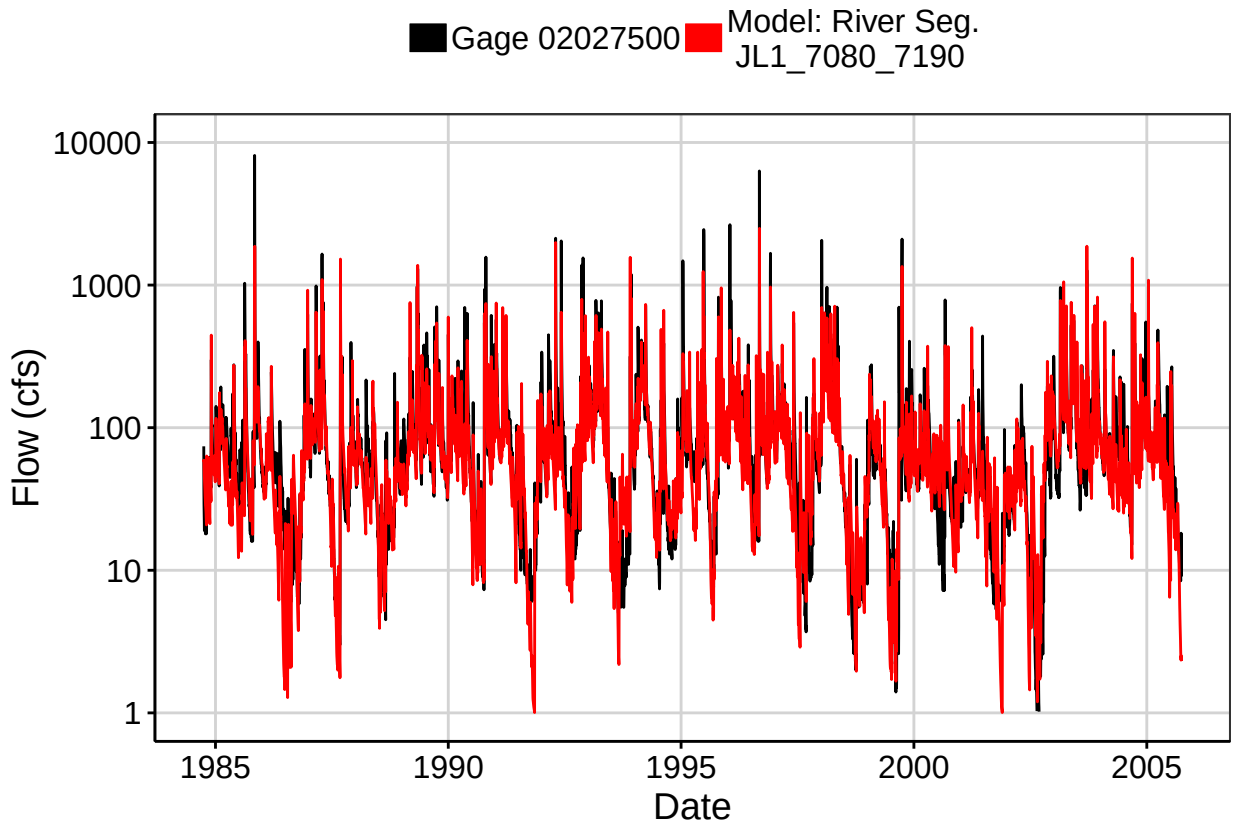

Fig. 2: Zoomed Hydrograph

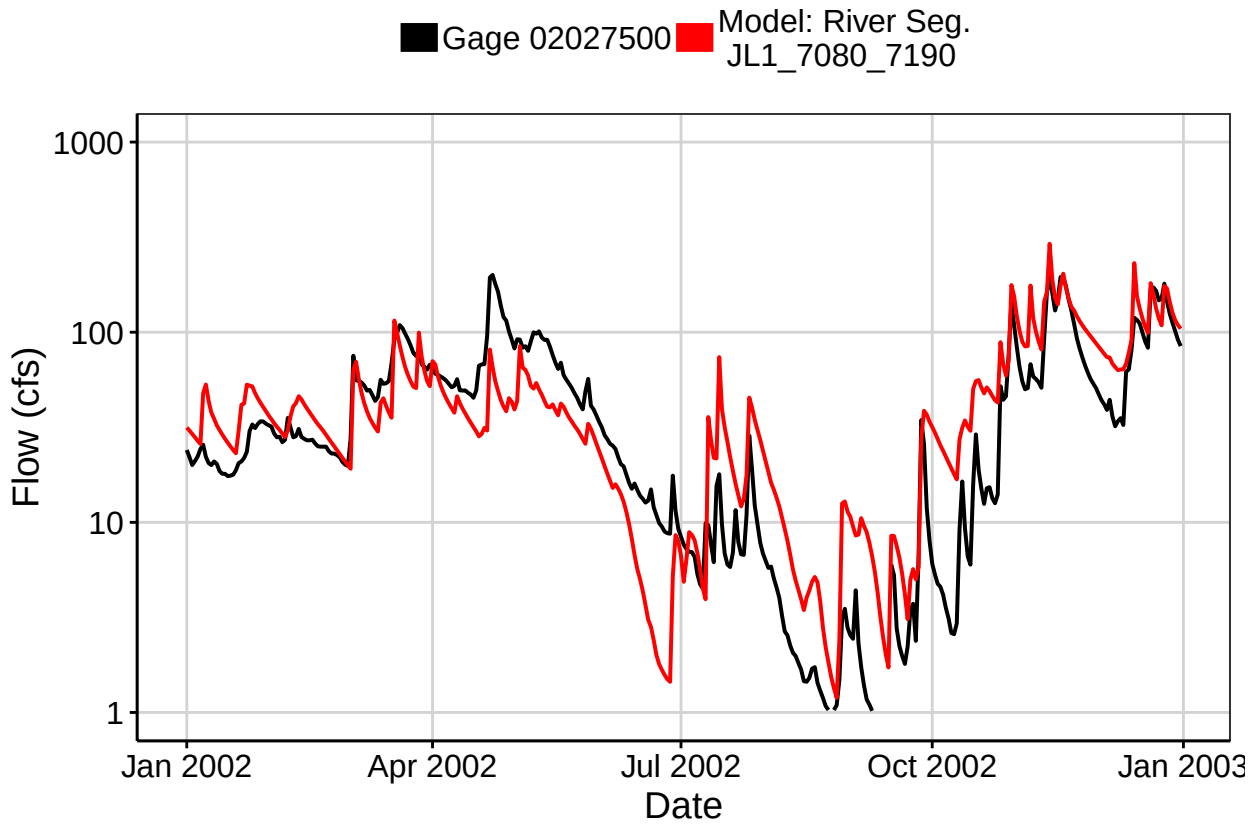

Fig. 3: Flow Exceedance

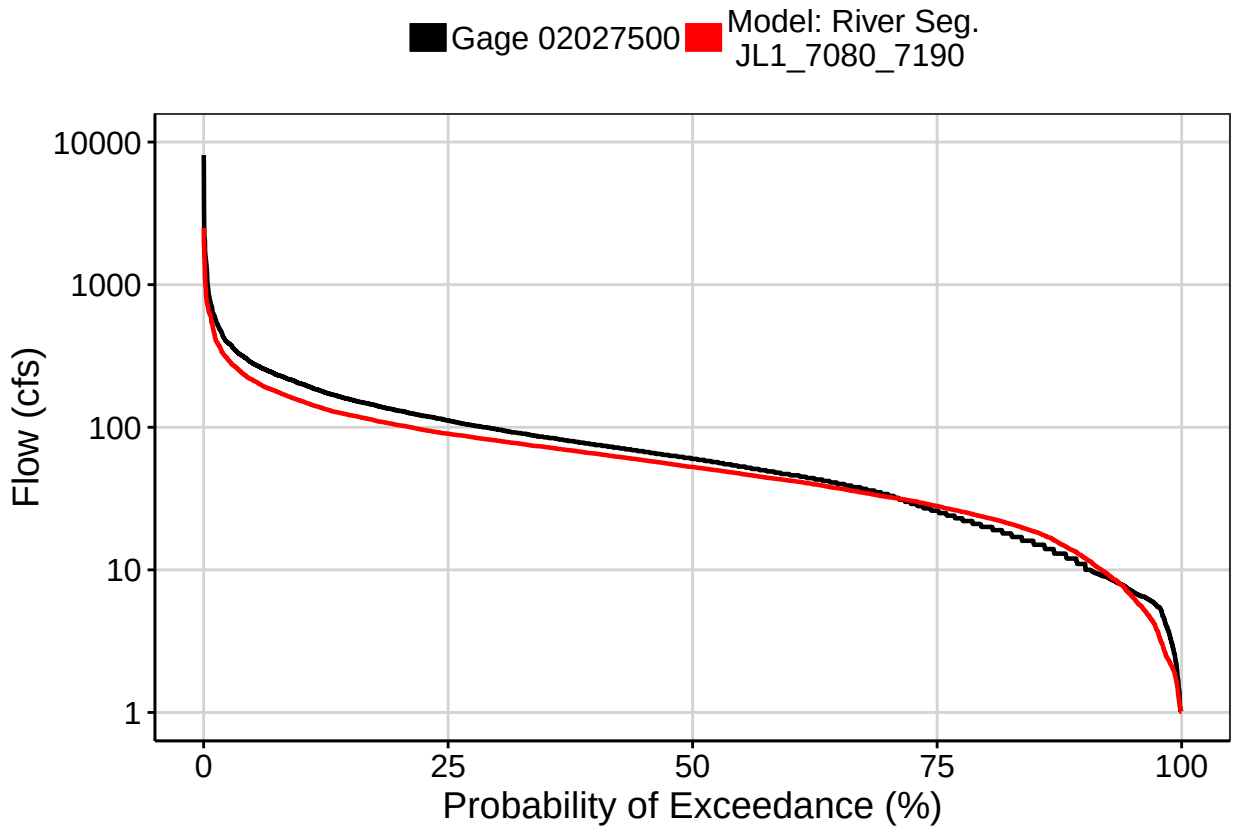

Fig. 4: Baseflow

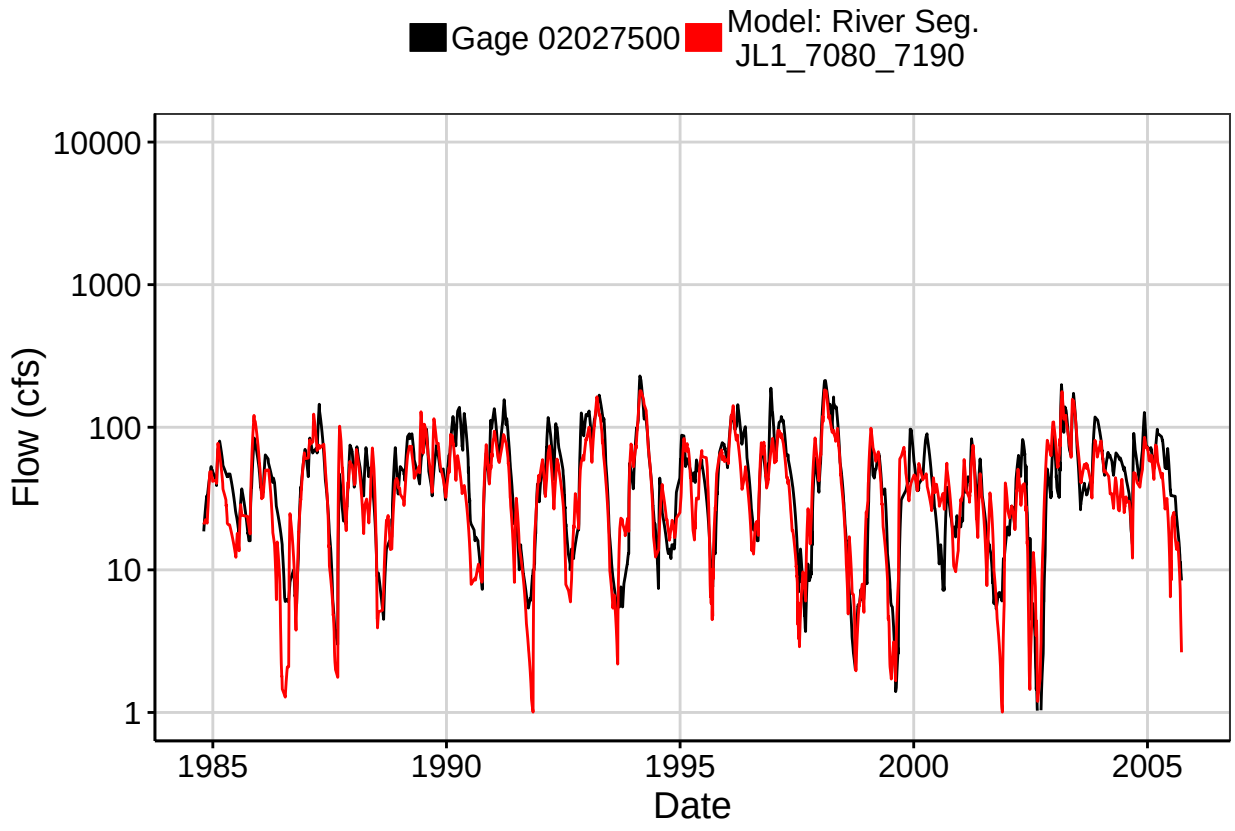

Fig. 5: Combined Baseflow

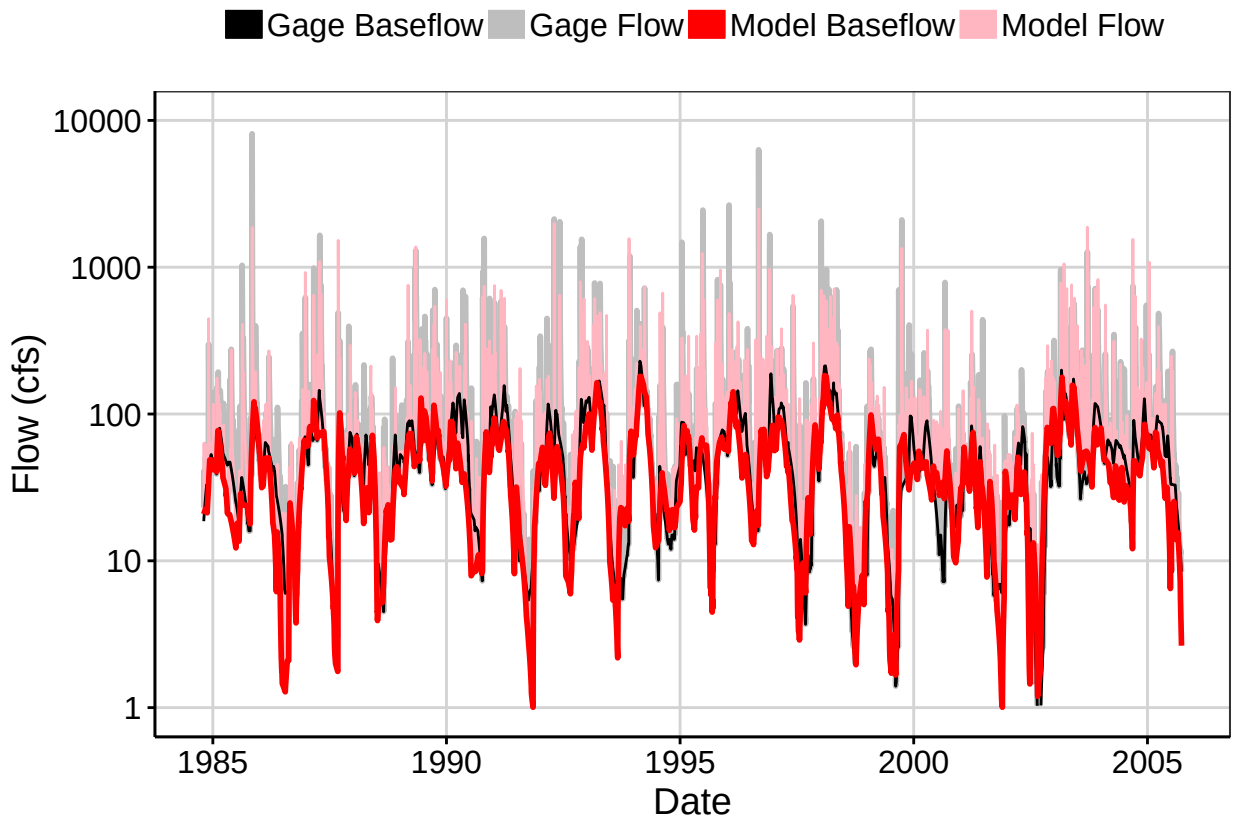

Fig. 6: Largest Error Segment

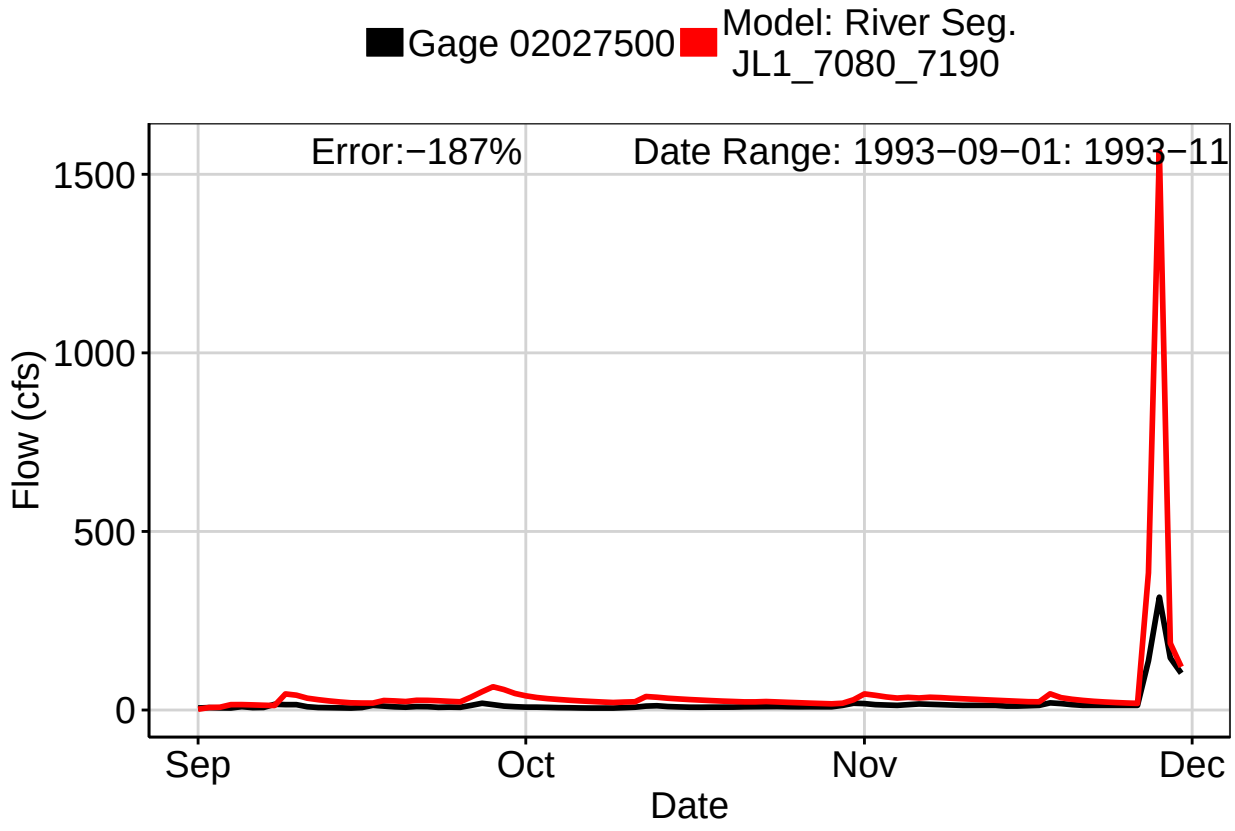

Fig. 7: Second Largest Error Segment

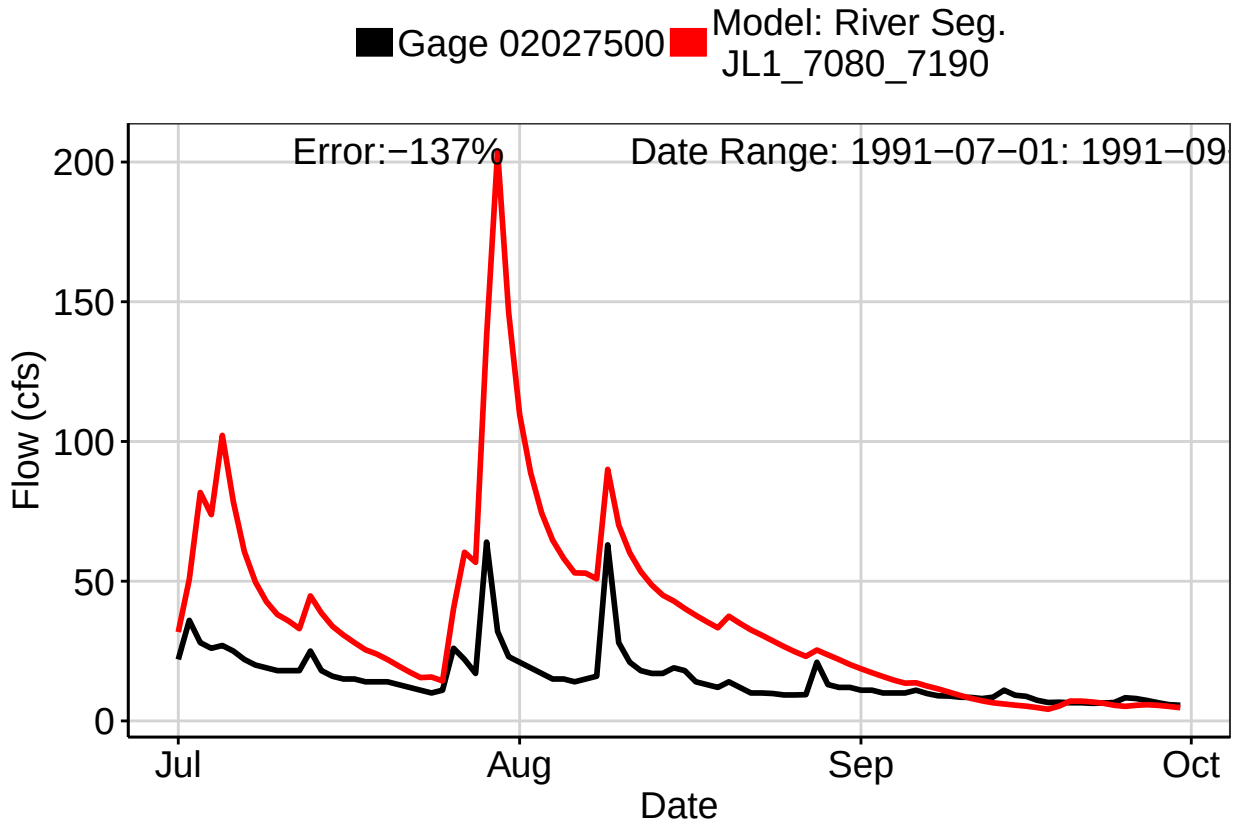

Fig. 8: Third Largest Error Segment

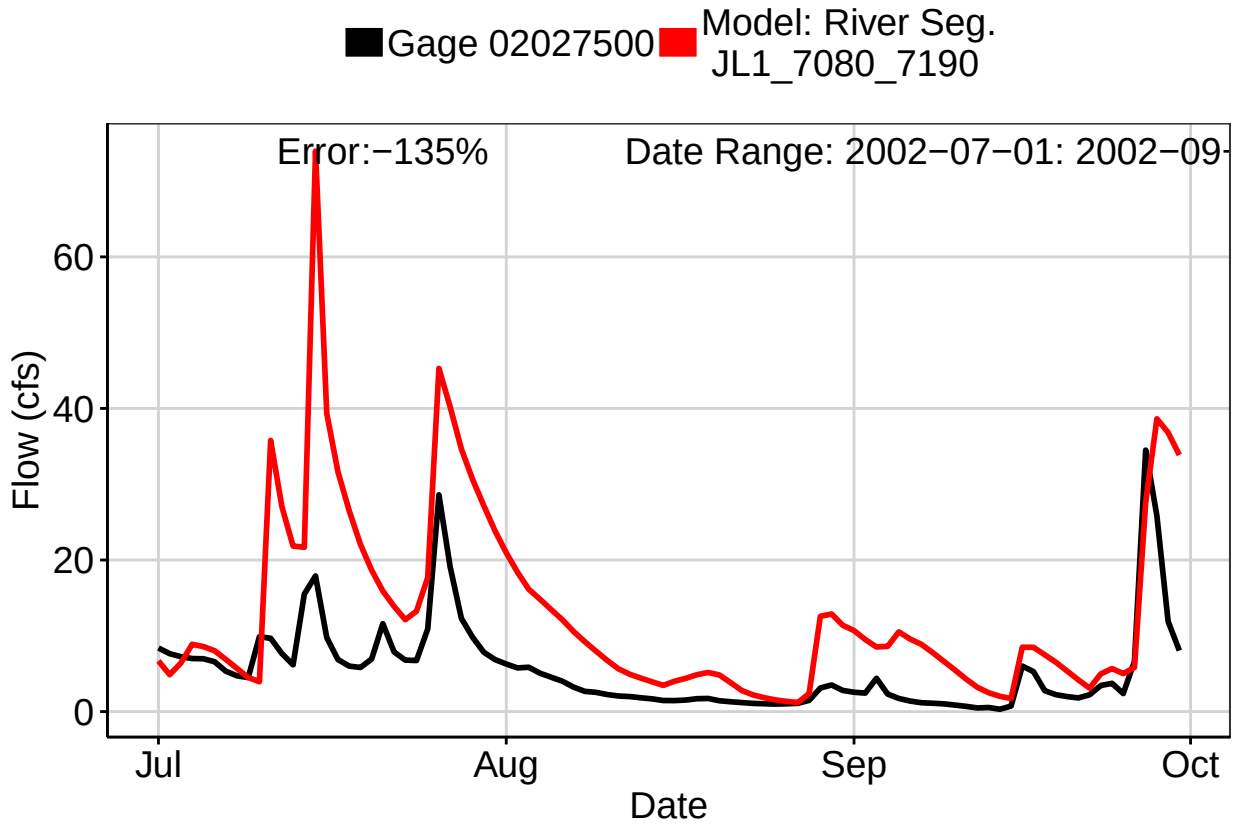

Fig. 9: Residuals Plot