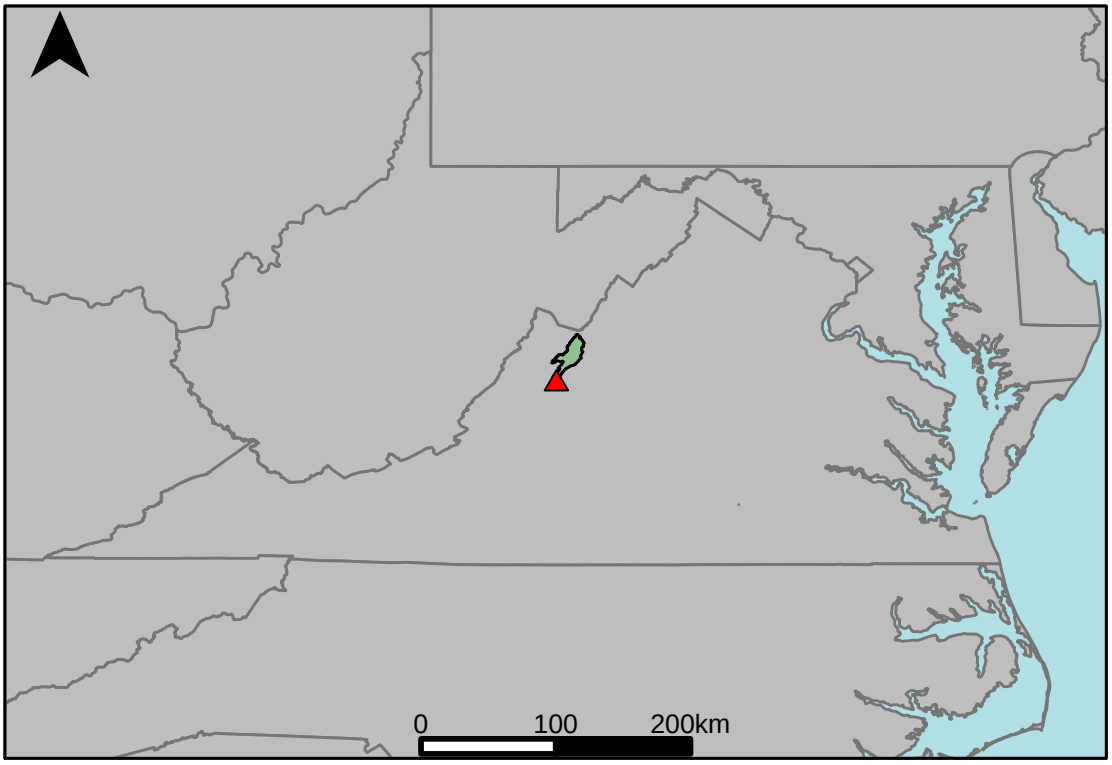
Appendix A.16: USGS Gage 02020500 vs. JU2_6410_6640 Upper James River



This river segment follows part of the flow of the Calfpasture River, a tributary of the James. The gage is located in Rockbridge County (Lat. 37°59'16.5", Long. -79°29'37.2"), approximately 1 mile east of Goshen, VA. Drainage area is 141 sq. miles. This gage started taking data in 1938 and is still taking data. There are no known anthropogenic alterations in this area that would affect the flow conditions. The average daily discharge error between the model and gage data for the 20 year timespan was 0%, with 62.5% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	6.64	18.8	183
Feb. Low Flow	18	38.4	113
Mar. Low Flow	45.1	90.7	101
Apr. Low Flow	48	94.3	96.5
May Low Flow	62	107	72.6
Jun. Low Flow	86	117	36
Jul. Low Flow	70	66.3	-5.29
Aug. Low Flow	46	43.3	-5.87
Sep. Low Flow	16.8	10.5	-37.5
Oct. Low Flow	12	5.9	-50.8
Nov. Low Flow	8.9	7.91	-11.1
Dec. Low Flow	6.4	5.78	-9.69

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	179	179	0
Jan. Mean Flow	255	229	-10.2
Feb. Mean Flow	228	246	7.89
Mar. Mean Flow	340	305	-10.3
Apr. Mean Flow	284	233	-18
May Mean Flow	234	178	-23.9
Jun. Mean Flow	130	132	1.54
Jul. Mean Flow	50.5	83.9	66.1
Aug. Mean Flow	55.3	79	42.9
Sep. Mean Flow	127	190	49.6
Oct. Mean Flow	60.5	121	100
Nov. Mean Flow	199	186	-6.53
Dec. Mean Flow	194	174	-10.3

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	53	152	187
Feb. High Flow	697	446	-36
Mar. High Flow	1120	317	-71.7
Apr. High Flow	1220	711	-41.7
May High Flow	581	324	-44.2
Jun. High Flow	1290	745	-42.2
Jul. High Flow	758	655	-13.6
Aug. High Flow	983	353	-64.1
Sep. High Flow	147	165	12.2
Oct. High Flow	81	242	199
Nov. High Flow	69.3	183	164
Dec. High Flow	35.5	130	266

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	0.41	0.32	-21.2
Med. 1 Day Min	5.6	2.46	-56.1
Min. 3 Day Min	0.43	0.33	-22.8
Med. 3 Day Min	5.93	2.59	-56.3
Min. 7 Day Min	0.67	0.36	-46.7
Med. 7 Day Min	6.46	2.93	-54.6
Min. 30 Day Min	1.66	1.06	-36.1
Med. 30 Day Min	8.42	10.3	22.3
Min. 90 Day Min	5.39	5	-7.24
Med. 90 Day Min	31.1	48.1	54.7
7Q10	1.96	0.77	-60.7
Year of 90-Day Min. Flow	1999	1999	0
Drought Year Mean	80.5	96.3	19.6
Mean Baseflow	56.5	80.1	41.8

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	21900	12400	-43.4
Med. 1 Day Max	2830	2960	4.59
Max. 3 Day Max	11900	6390	-46.3
Med. 3 Day Max	1940	1670	-13.9
Max. 7 Day Max	5540	3310	-40.3
Med. 7 Day Max	1320	1200	-9.09
Max. 30 Day Max	1590	1080	-32.1
Med. 30 Day Max	589	603	2.38
Max. 90 Day Max	656	609	-7.16
Med. 90 Day Max	341	318	-6.74

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	3	1.19	-60.3
5% Non-Exceedance	5.6	4.54	-18.9
50% Non-Exceedance	68	103	51.5
95% Non-Exceedance	709	589	-16.9
99% Non-Exceedance	1640	1490	-9.15
Sept. 10% Non-Exceedance	5	2.96	-40.8

Fig. 1: Hydrograph

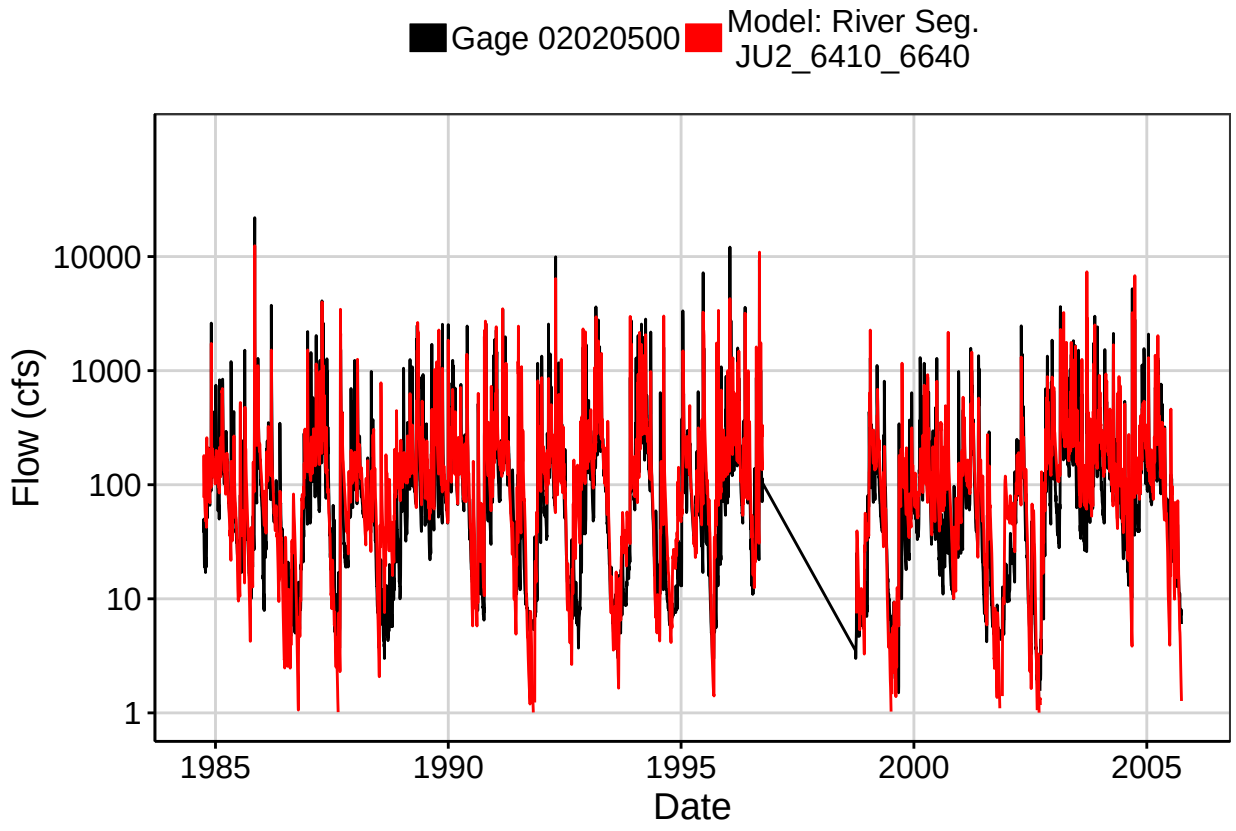


Fig. 2: Zoomed Hydrograph

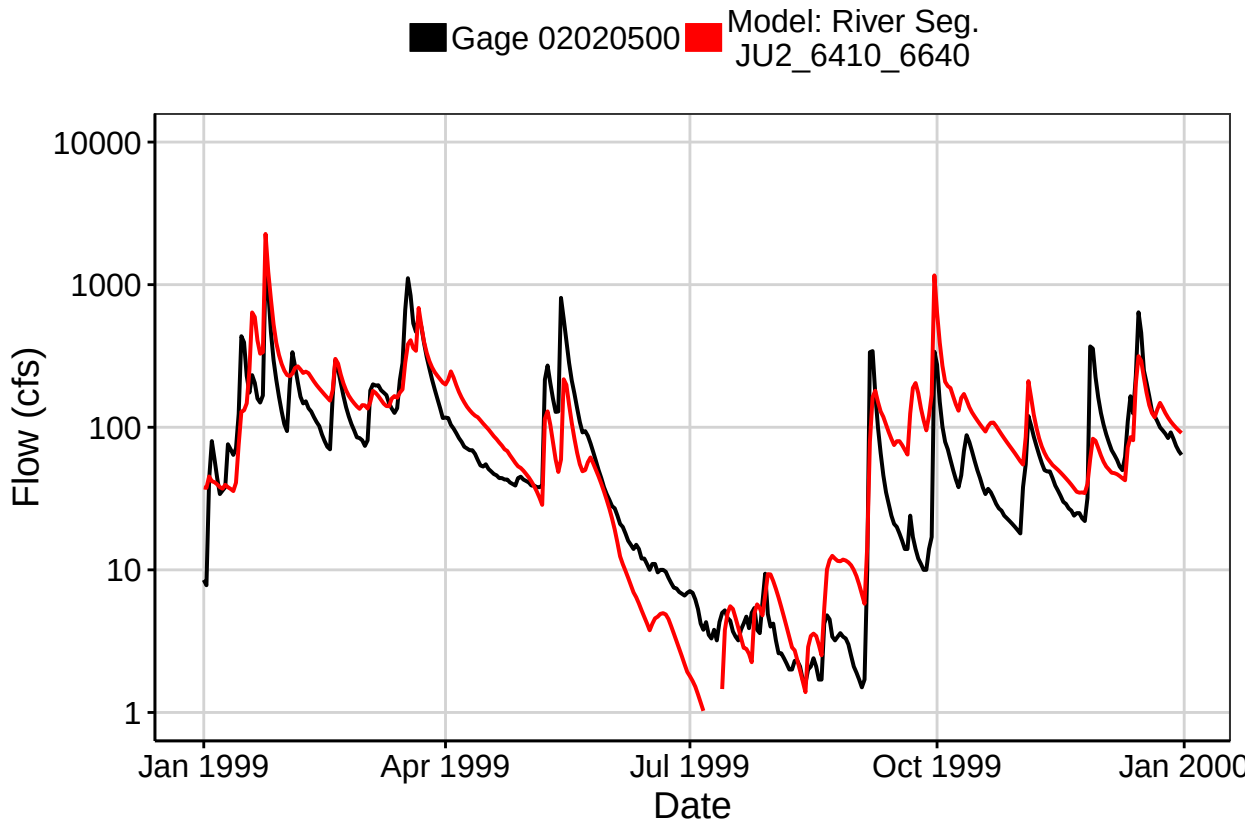


Fig. 3: Flow Exceedance

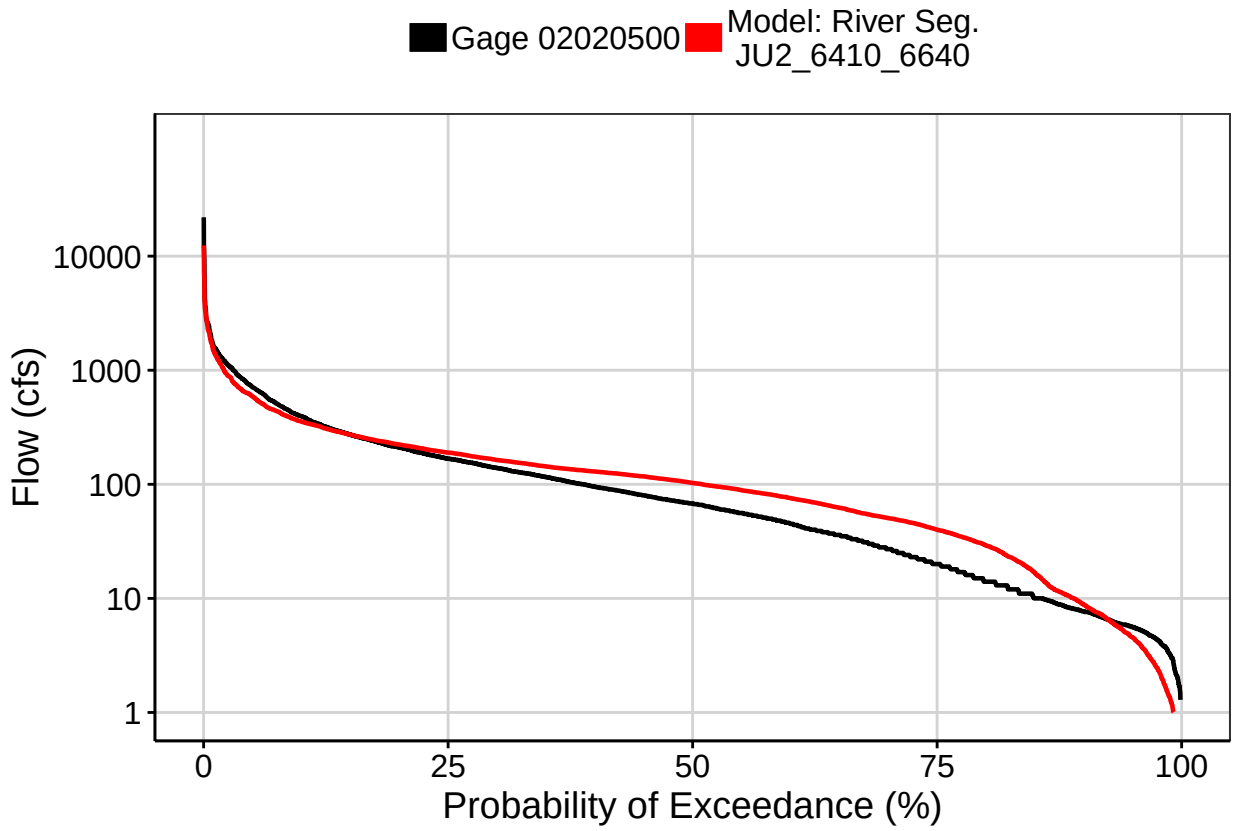


Fig. 4: Baseflow

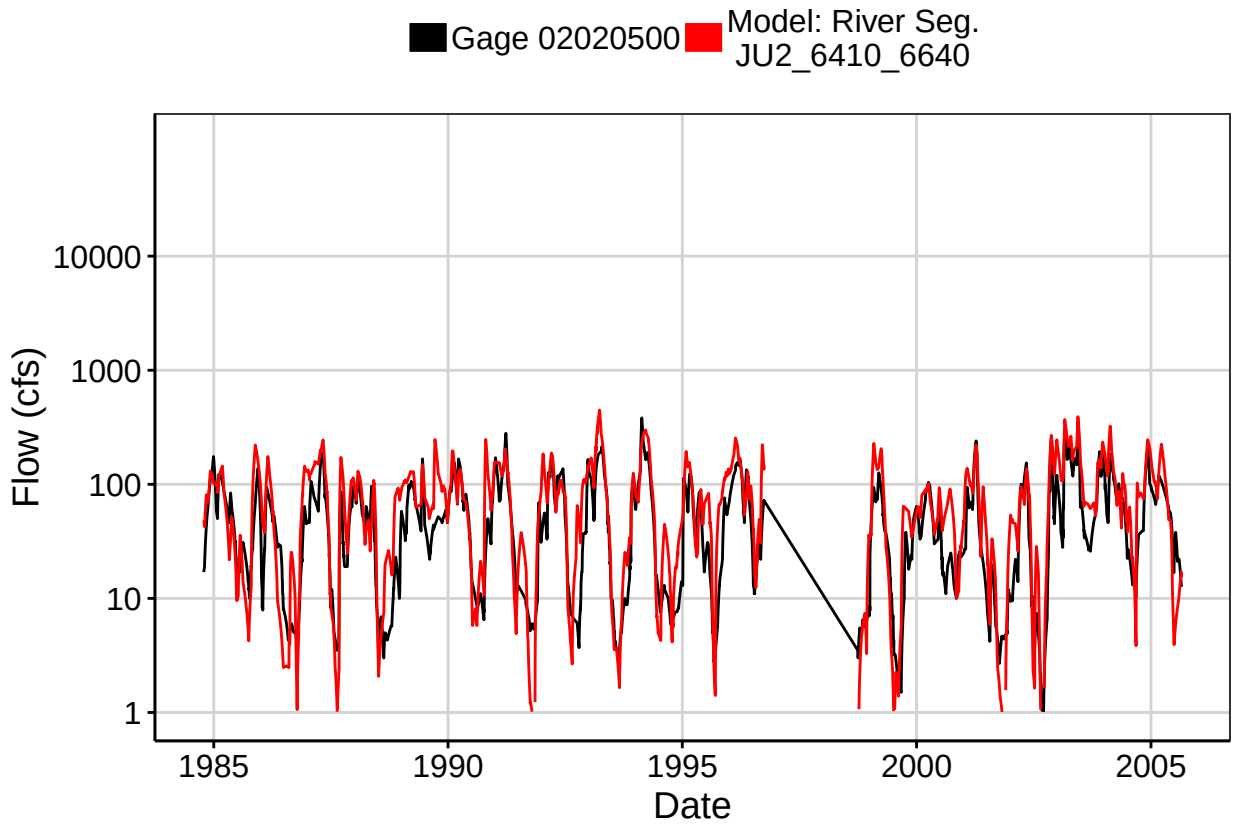


Fig. 5: Combined Baseflow

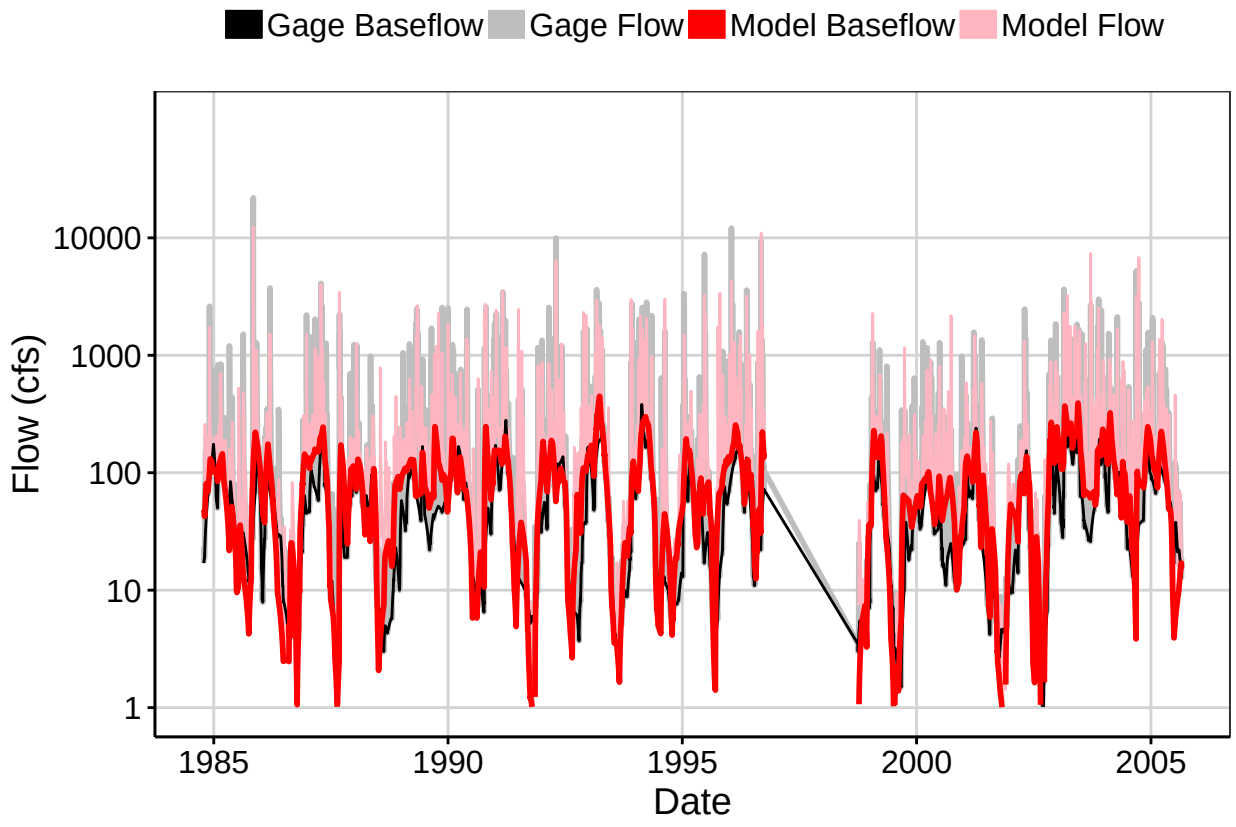


Fig. 6: Largest Error Segment

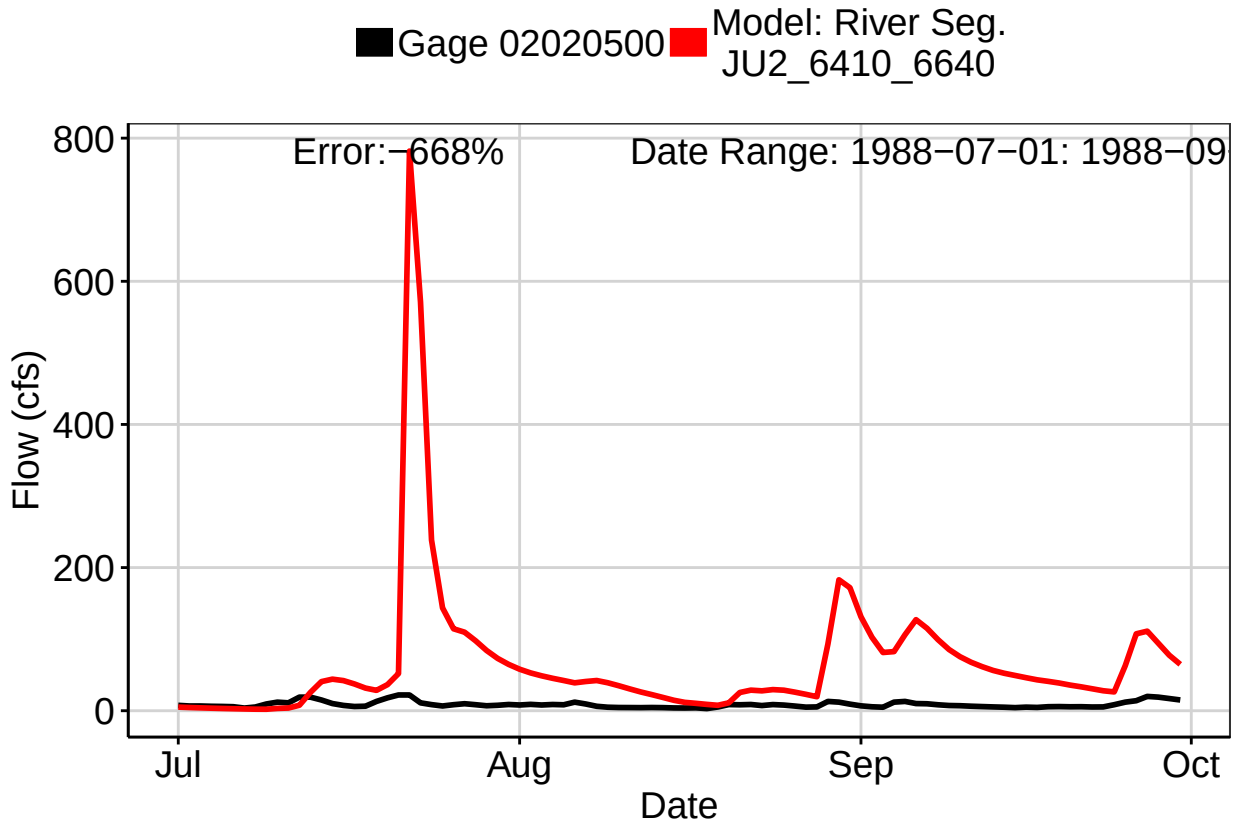


Fig. 7: Second Largest Error Segment

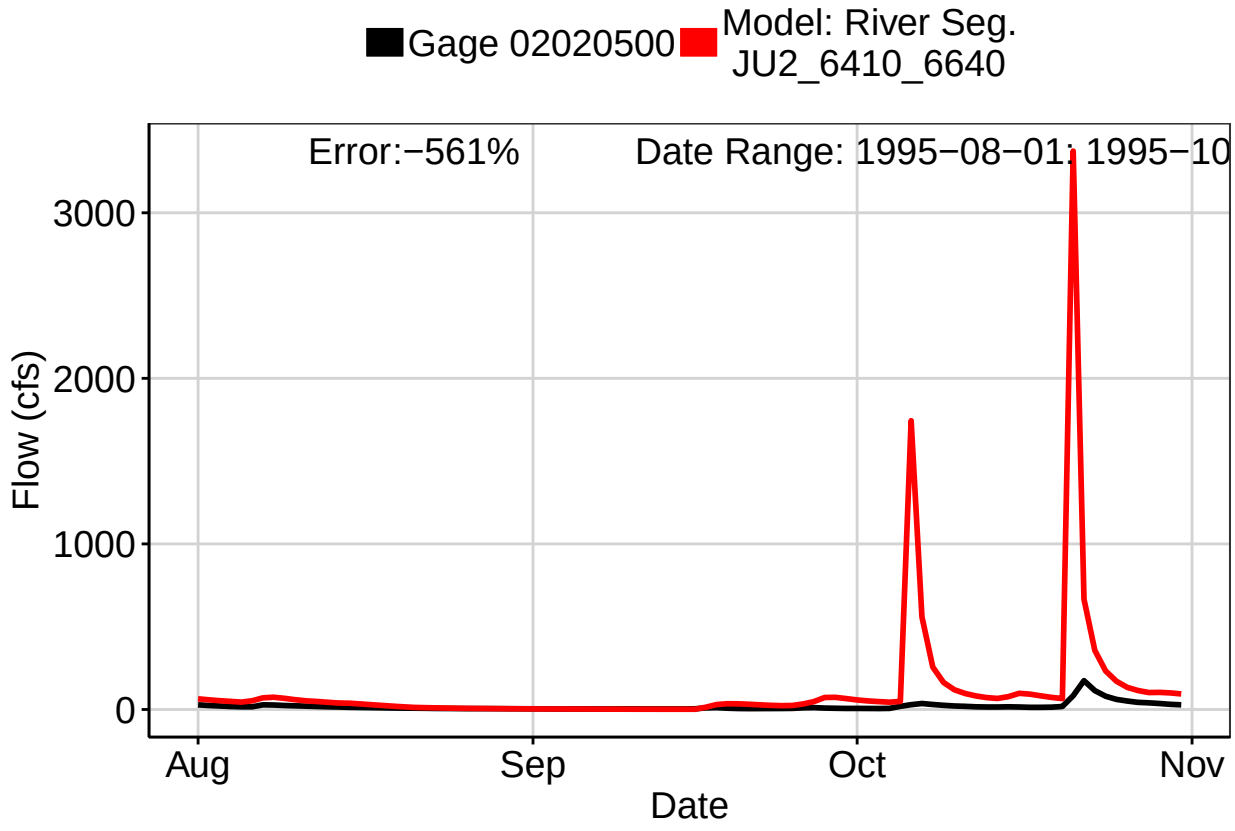


Fig. 8: Third Largest Error Segment

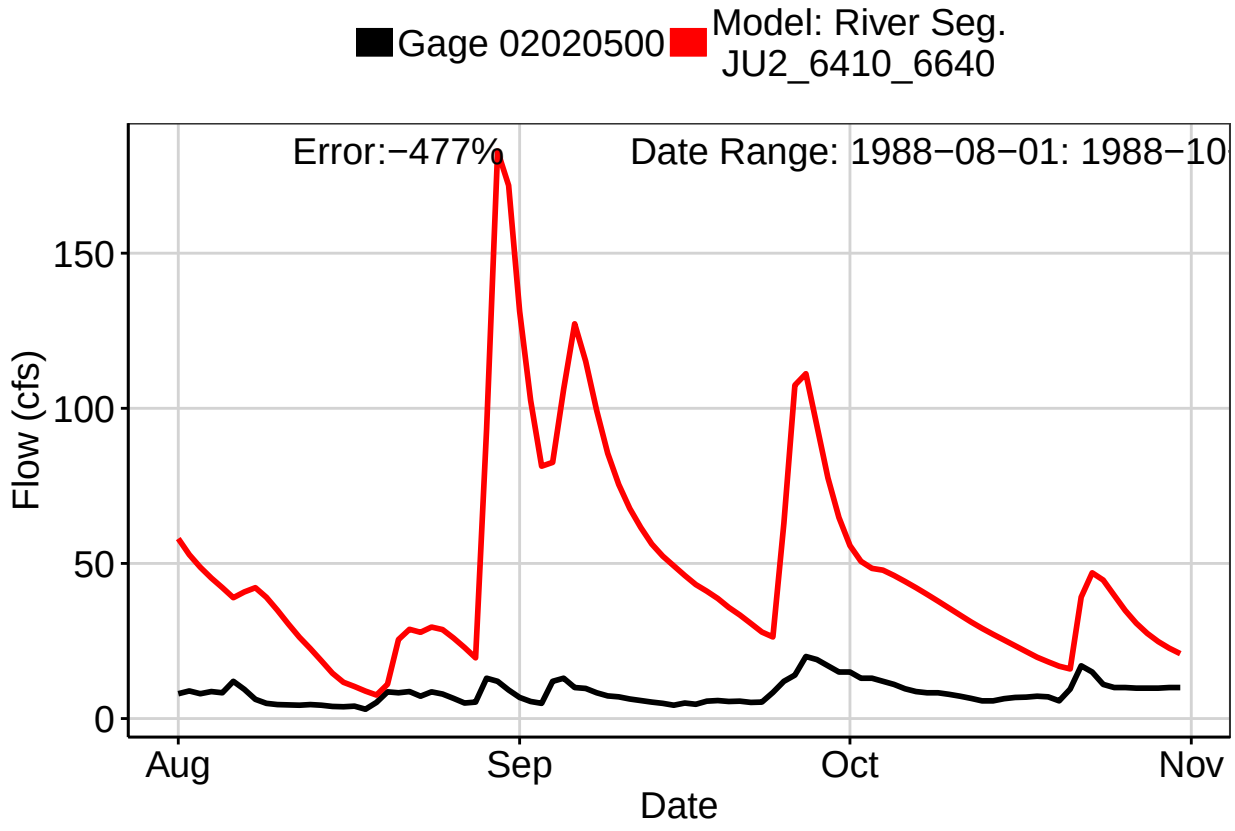


Fig. 9: Residuals Plot