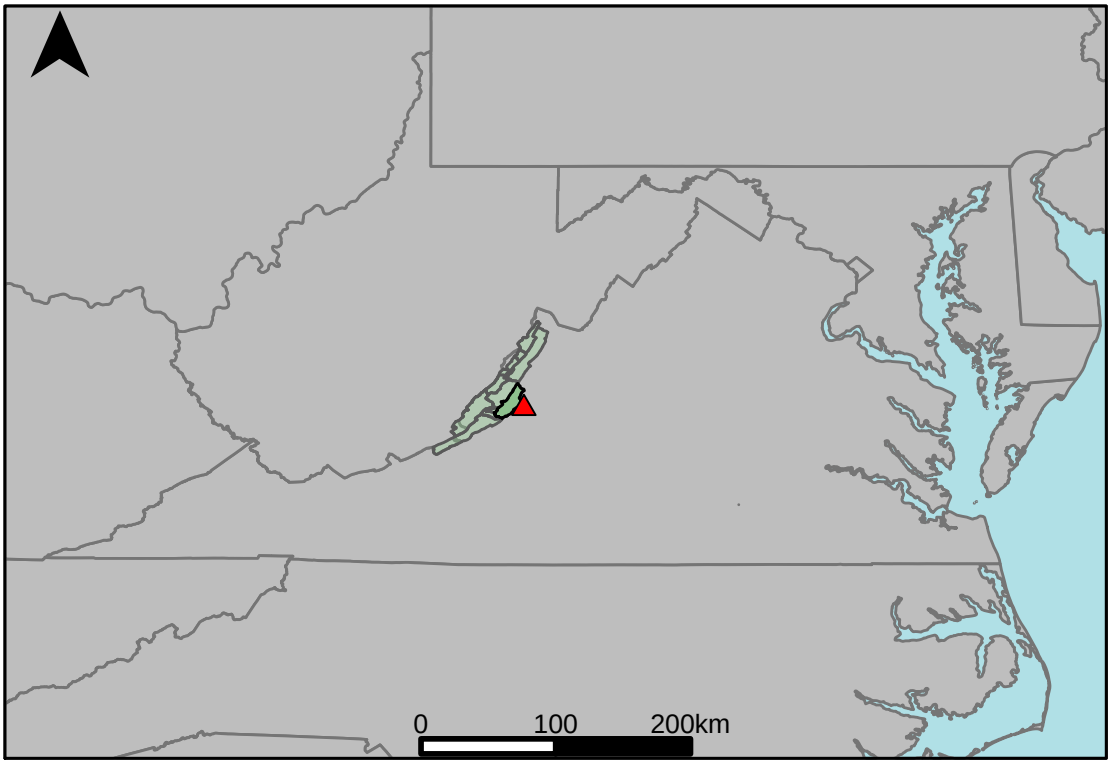
Appendix A.10: USGS Gage 02016000 vs. JU4_7000_7300 Upper James River



This river segment follows part of the flow of the Cowpasture River, a tributary of the James. The gage is located in Alleghany County (Lat. 37°47'30.5", Long. -79°45'34.2"), approximately 1.5 miles west of Iron Gate, VA. Drainage area is 461 sq. miles. This gage started taking data in 1925 and is still taking data. Low flows are affected by springs and by occasional regulation from unknown sources. The average daily discharge error between the model and gage data for the 20 year timespan was 11.1%, with 41.7% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	86	96.6	12.3
Feb. Low Flow	108	116	7.41
Mar. Low Flow	175	190	8.57
Apr. Low Flow	210	251	19.5
May Low Flow	251	329	31.1
Jun. Low Flow	327	450	37.6
Jul. Low Flow	304	274	-9.87
Aug. Low Flow	238	207	-13
Sep. Low Flow	132	138	4.55
Oct. Low Flow	99	108	9.09
Nov. Low Flow	94	105	11.7
Dec. Low Flow	81	88.1	8.77

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	570	507	-11.1
Jan. Mean Flow	785	628	-20
Feb. Mean Flow	796	870	9.3
Mar. Mean Flow	1080	1020	-5.56
Apr. Mean Flow	885	761	-14
May Mean Flow	747	579	-22.5
Jun. Mean Flow	436	397	-8.94
Jul. Mean Flow	216	221	2.31
Aug. Mean Flow	183	192	4.92
Sep. Mean Flow	349	341	-2.29
Oct. Mean Flow	227	264	16.3
Nov. Mean Flow	547	409	-25.2
Dec. Mean Flow	607	433	-28.7

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	212	207	-2.36
Feb. High Flow	1360	810	-40.4
Mar. High Flow	2680	798	-70.2
Apr. High Flow	3070	1380	-55
May High Flow	1450	1500	3.45
Jun. High Flow	3270	3200	-2.14
Jul. High Flow	1730	1860	7.51
Aug. High Flow	2160	1470	-31.9
Sep. High Flow	650	496	-23.7
Oct. High Flow	604	357	-40.9
Nov. High Flow	259	302	16.6
Dec. High Flow	292	220	-24.7

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	46	45.7	-0.65
Med. 1 Day Min	76	77.1	1.45
Min. 3 Day Min	46.3	46.9	1.3
Med. 3 Day Min	77	78.1	1.43
Min. 7 Day Min	47.9	49.1	2.51
Med. 7 Day Min	79	80.4	1.77
Min. 30 Day Min	55.4	56.6	2.17
Med. 30 Day Min	90.6	93.5	3.2
Min. 90 Day Min	86.8	83.9	-3.34
Med. 90 Day Min	140	150	7.14
7Q10	63.9	57.6	-9.86
Year of 90-Day Min. Flow	1999	1999	0
Drought Year Mean	283	319	12.7
Mean Baseflow	250	300	20

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	33900	25100	-26
Med. 1 Day Max	10000	5210	-47.9
Max. 3 Day Max	19000	11200	-41.1
Med. 3 Day Max	6280	3400	-45.9
Max. 7 Day Max	9080	6050	-33.4
Med. 7 Day Max	3630	2280	-37.2
Max. 30 Day Max	3170	2810	-11.4
Med. 30 Day Max	1750	1400	-20
Max. 90 Day Max	1920	1860	-3.12
Med. 90 Day Max	1110	914	-17.7

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	70	60.9	-13
5% Non-Exceedance	81	84.9	4.81
50% Non-Exceedance	273	275	0.73
95% Non-Exceedance	1880	1540	-18.1
99% Non-Exceedance	4910	3570	-27.3
Sept. 10% Non-Exceedance	77	83.6	8.57

Fig. 1: Hydrograph

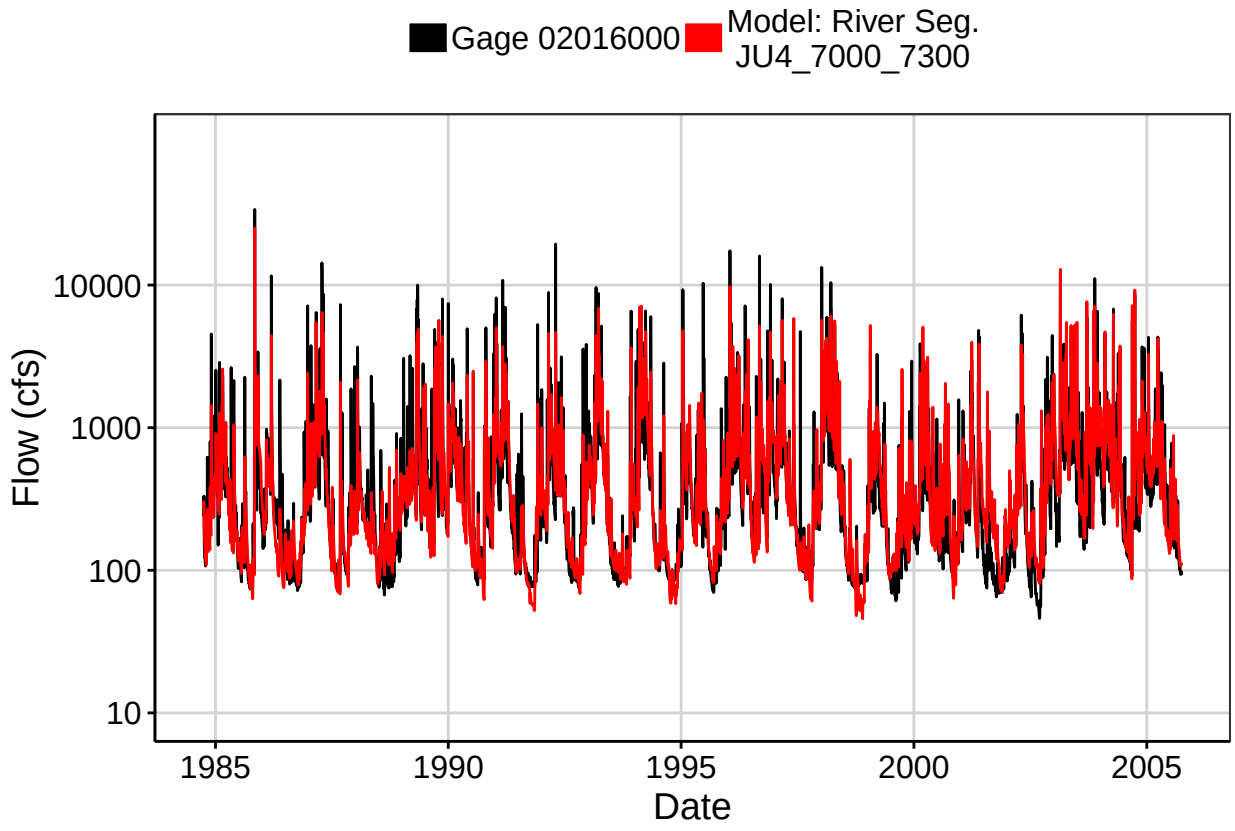


Fig. 2: Zoomed Hydrograph

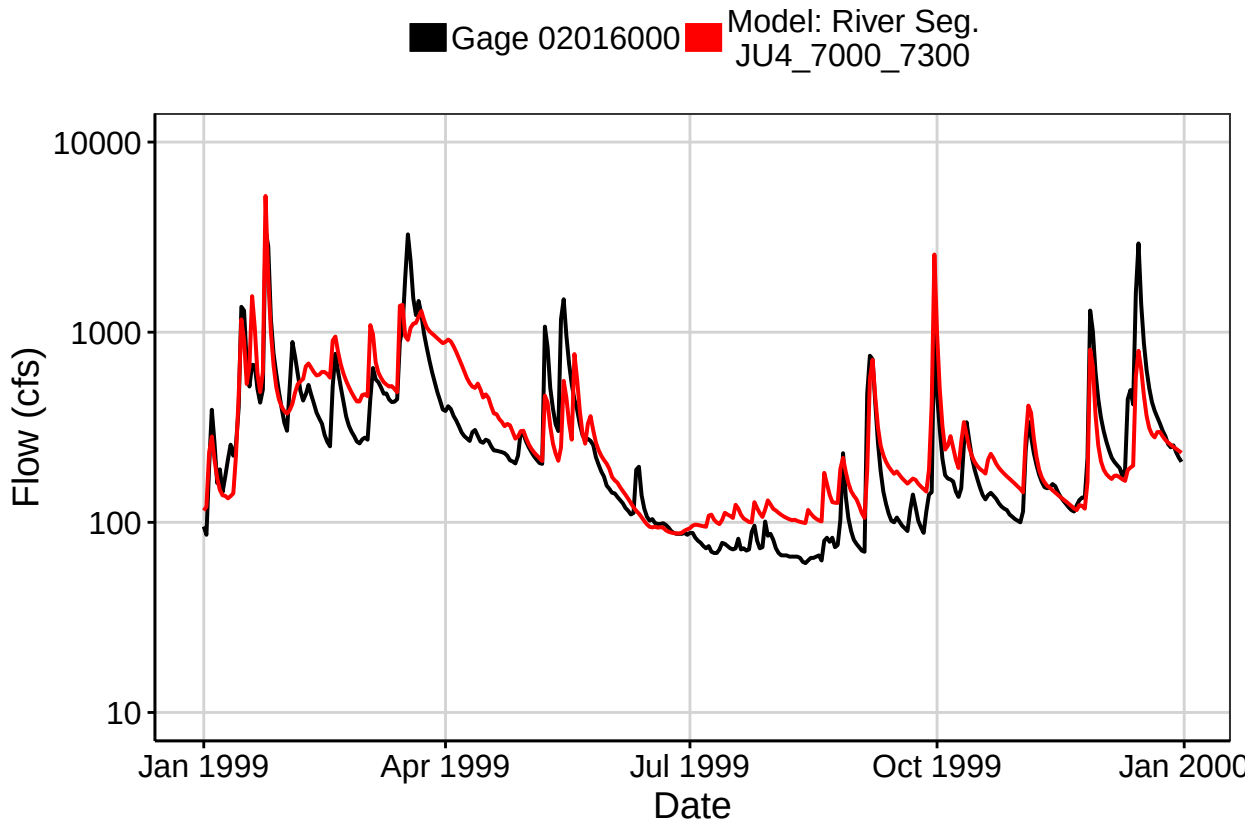


Fig. 3: Flow Exceedance

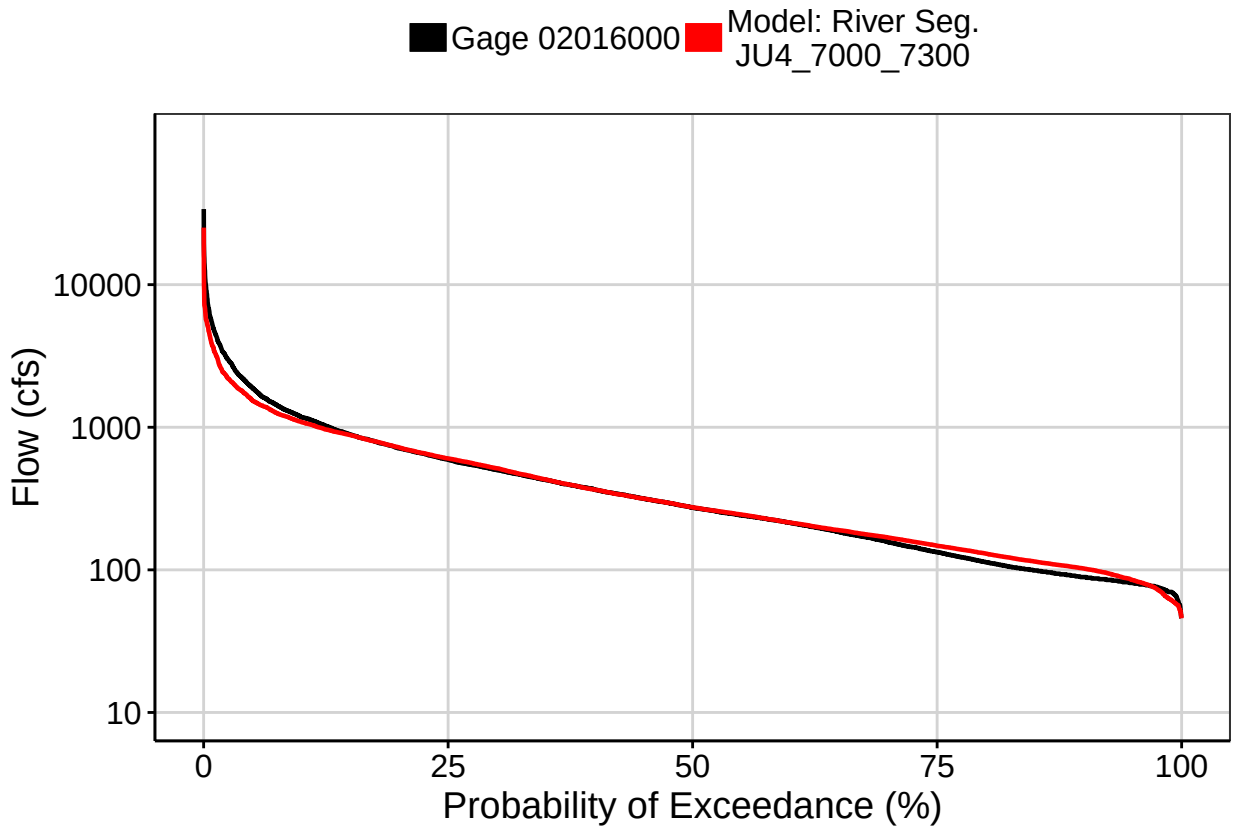


Fig. 4: Baseflow

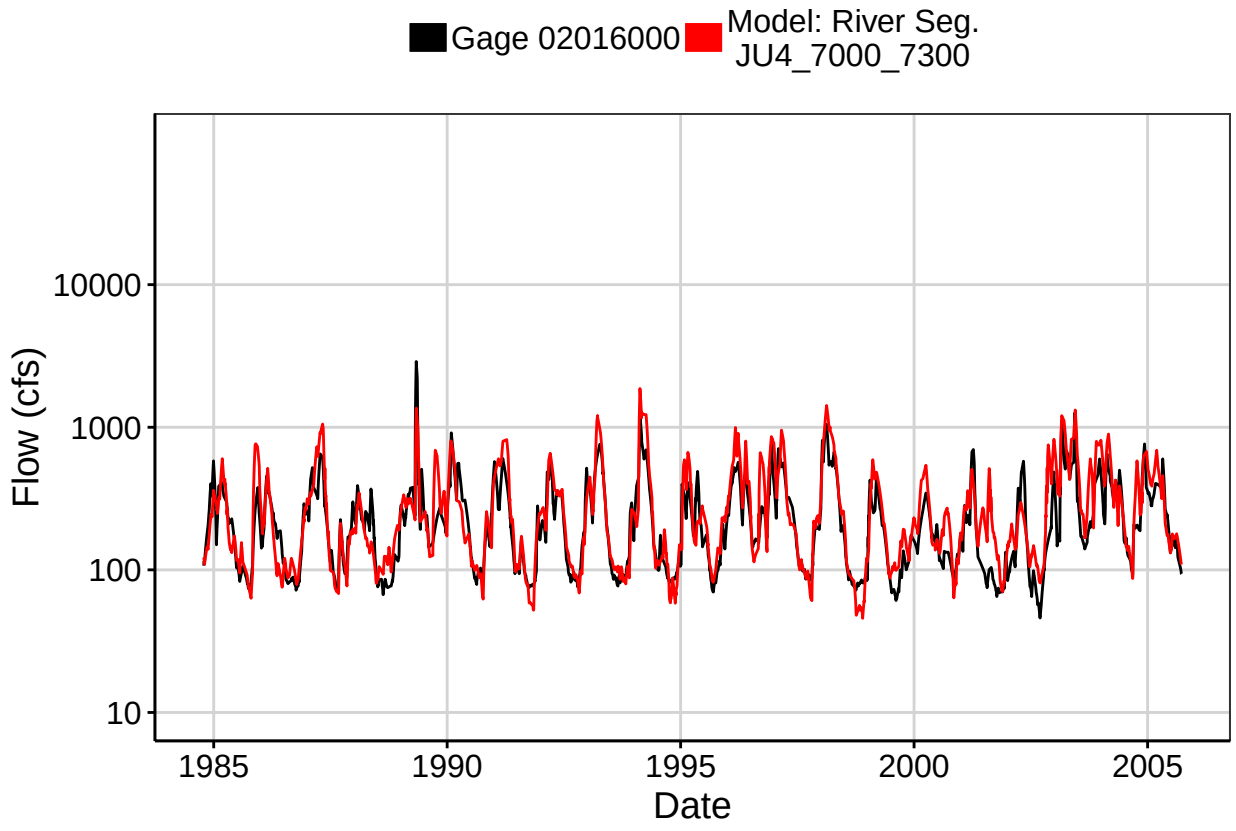


Fig. 5: Combined Baseflow

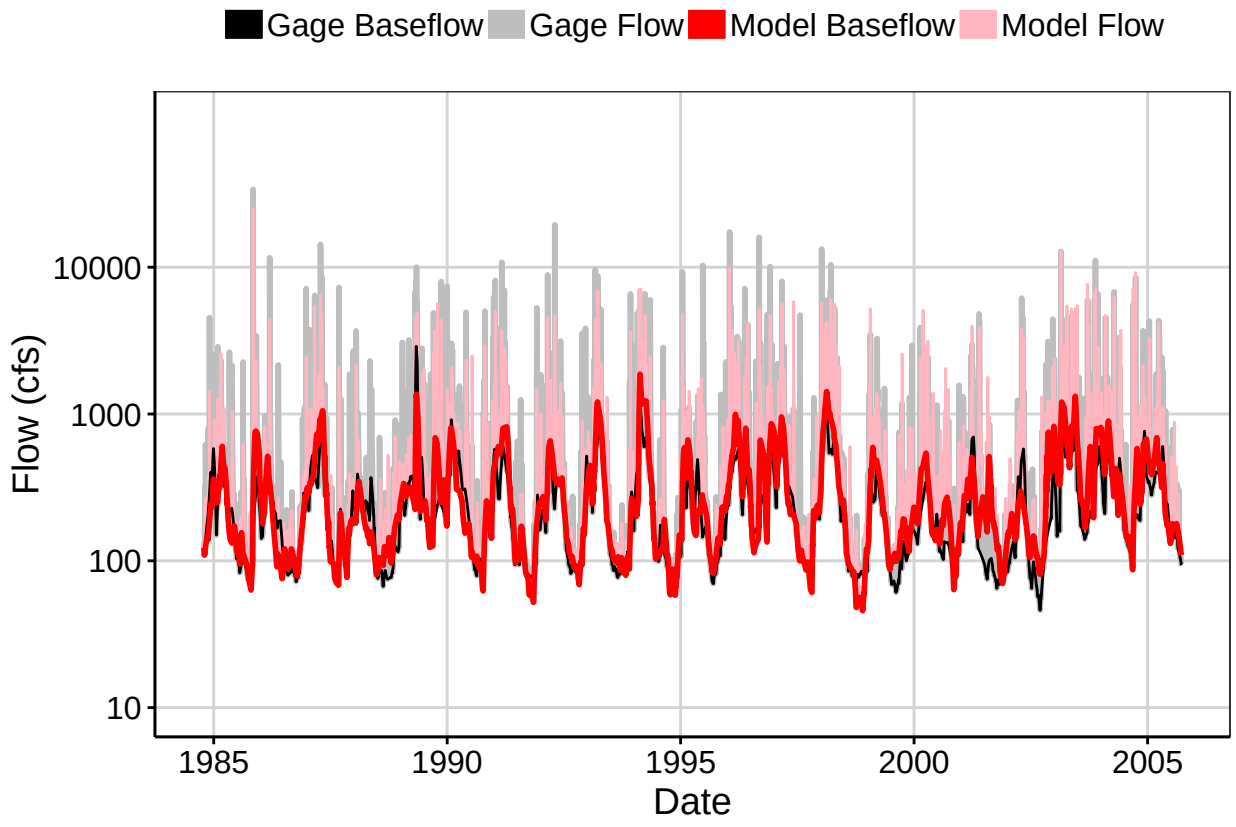


Fig. 6: Largest Error Segment

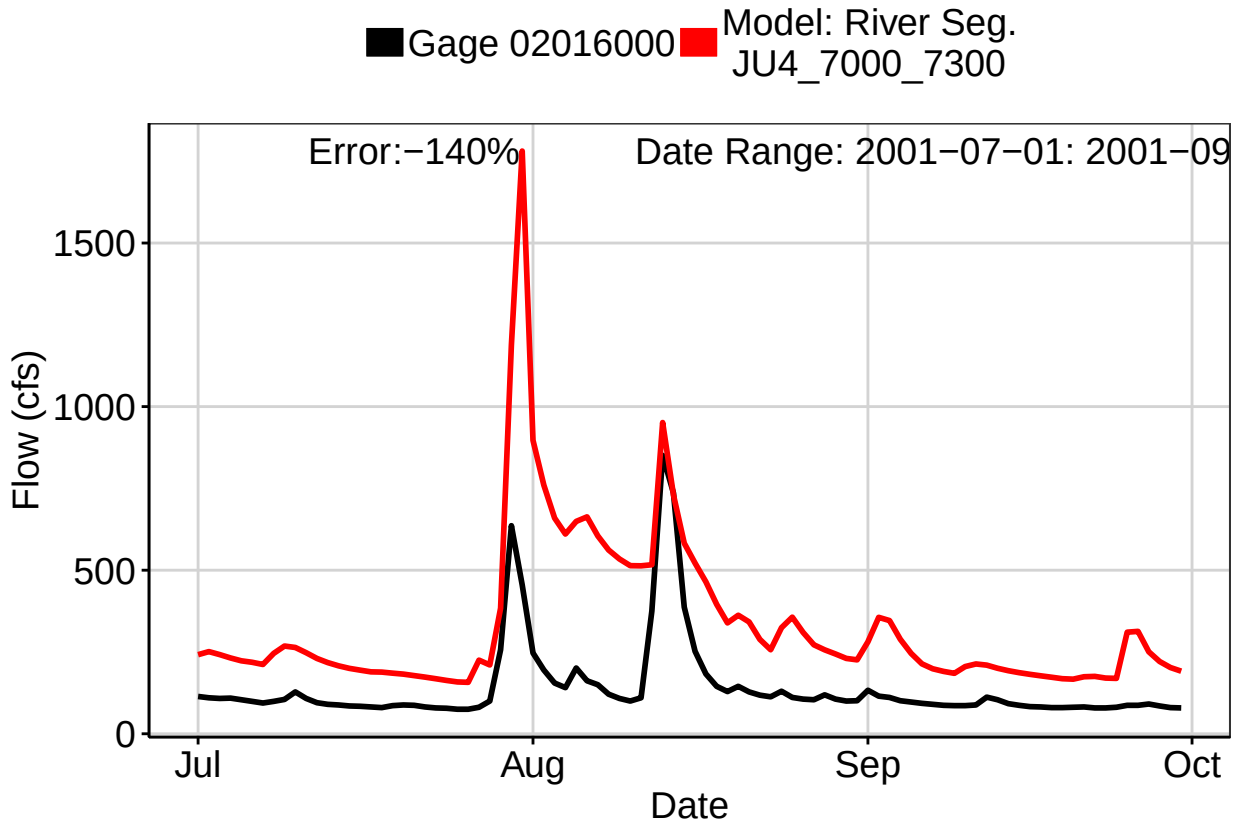


Fig. 7: Second Largest Error Segment

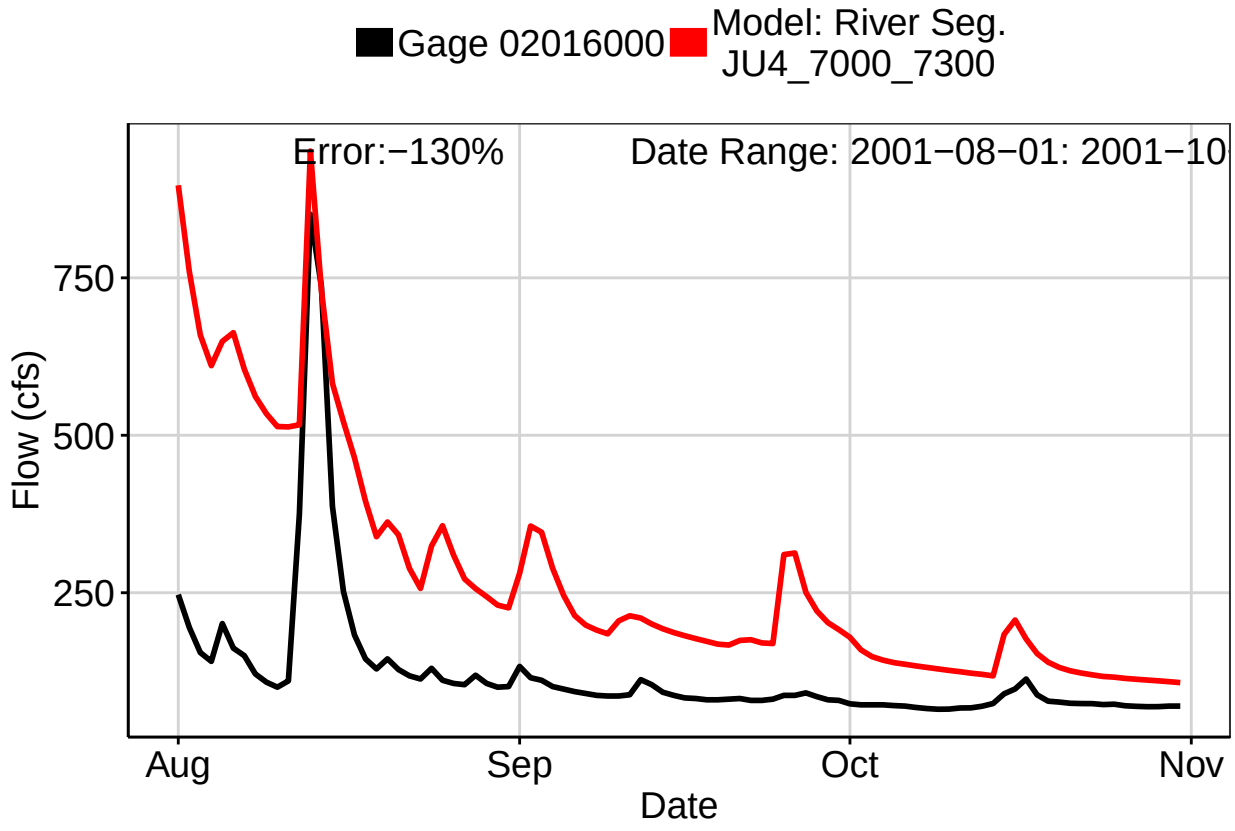


Fig. 8: Third Largest Error Segment

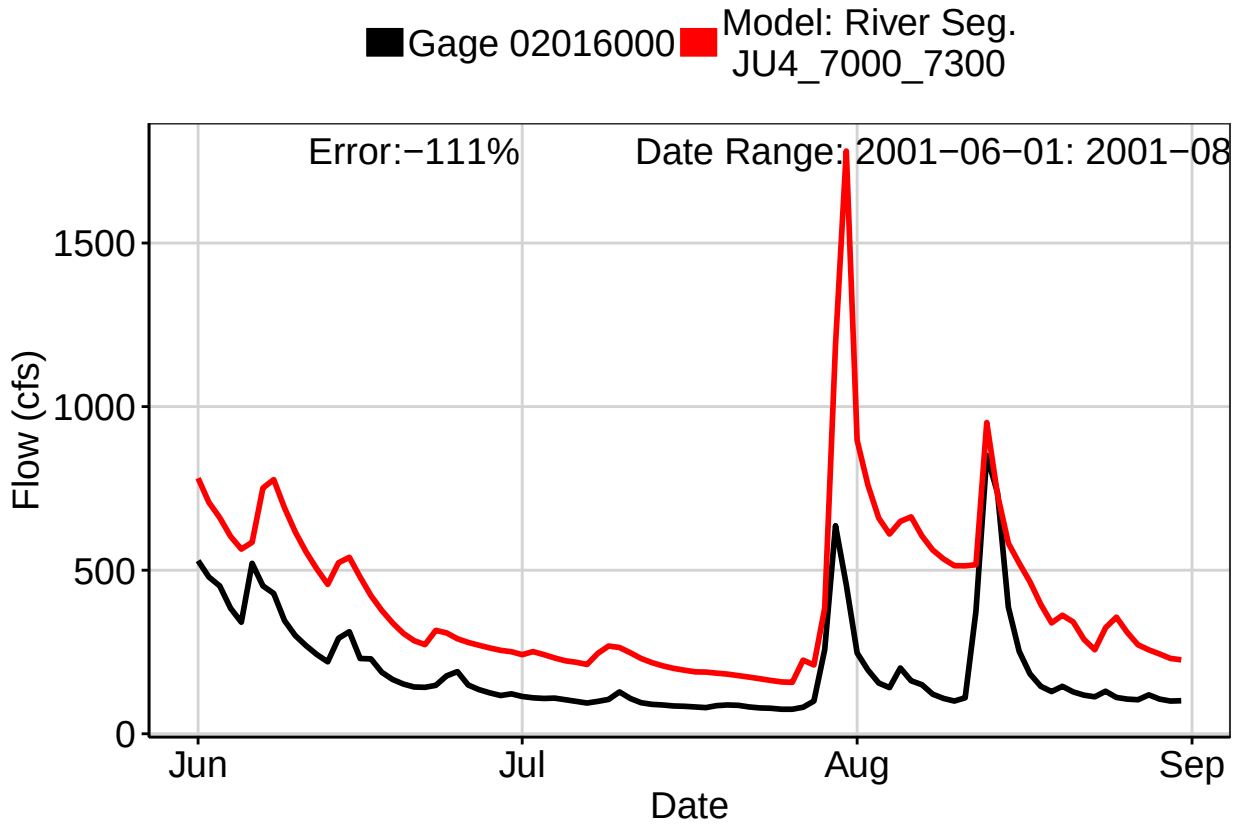


Fig. 9: Residuals Plot