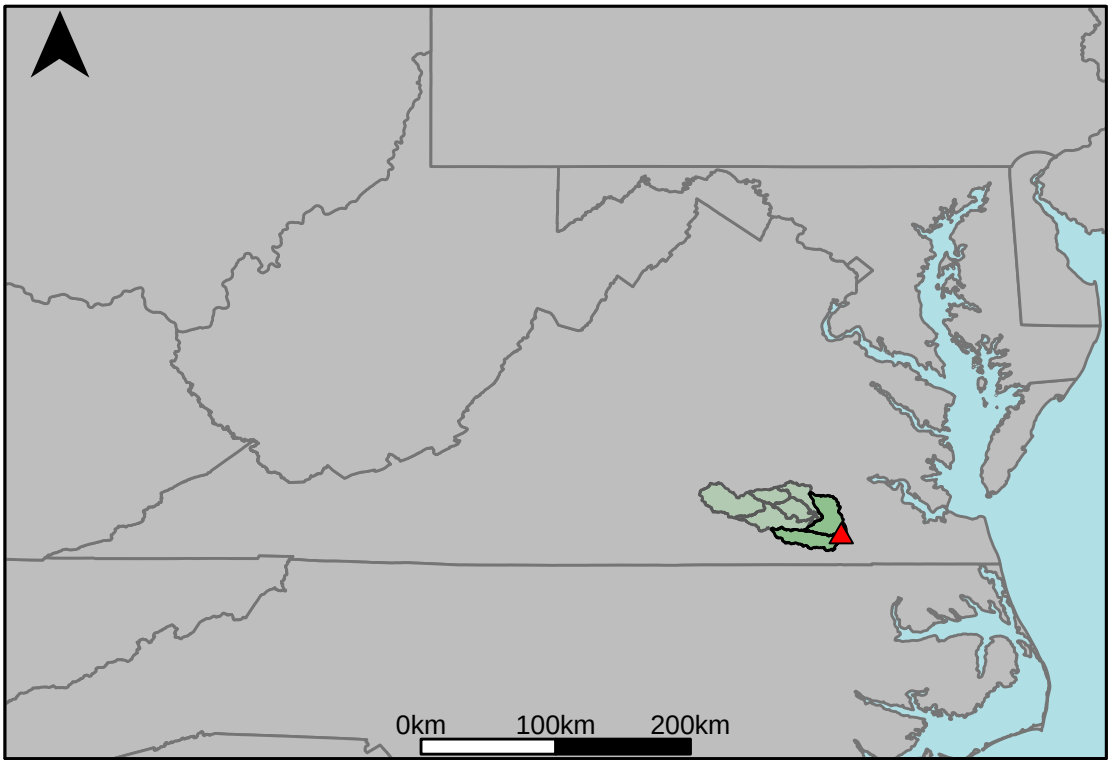
Appendix G.4: USGS Gage 02047000 vs. MN4_7710_8161+MN5_8230_8161



This river segment follows part of the flow of the Nottoway River, a tributary of the Meherrin River. The gage is located in Southampton County, VA (Lat 3646'13", Long 7709'59") approximately 34 miles southeast of Petersburg, VA. Drainage area is 1441 sq. miles. This gage started taking data in 1950 and is still taking data today. The City of Virginia Beach withdraws water downstream of this gage. It is believed that these withdrawals are far enough downstream that they would not drastically affect the gage, but it is unsure. The average daily discharge error between the model and gage data for the 20 year timespan was 0%, with 41.2% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	67	85.9	28.2
Feb. Low Flow	156	306	96.2
Mar. Low Flow	445	446	0.22
Apr. Low Flow	703	660	-6.12
May Low Flow	1090	1090	0
Jun. Low Flow	1020	794	-22.2
Jul. Low Flow	759	529	-30.3
Aug. Low Flow	389	273	-29.8
Sep. Low Flow	191	183	-4.19
Oct. Low Flow	96	99.7	3.85
Nov. Low Flow	75	110	46.7
Dec. Low Flow	64	81.5	27.3

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	1390	1390	0
Jan. Mean Flow	1900	1930	1.58
Feb. Mean Flow	2310	2350	1.73
Mar. Mean Flow	2710	2840	4.8
Apr. Mean Flow	2340	2030	-13.2
May Mean Flow	1270	1150	-9.45
Jun. Mean Flow	796	668	-16.1
Jul. Mean Flow	505	457	-9.5
Aug. Mean Flow	747	801	7.23
Sep. Mean Flow	1330	1520	14.3
Oct. Mean Flow	585	707	20.9
Nov. Mean Flow	932	963	3.33
Dec. Mean Flow	1340	1310	-2.24

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	707	876	23.9
Feb. High Flow	1490	1890	26.8
Mar. High Flow	1960	2090	6.63
Apr. High Flow	4210	4330	2.85
May High Flow	4790	5000	4.38
Jun. High Flow	4550	6730	47.9
Jul. High Flow	4900	4390	-10.4
Aug. High Flow	3130	2460	-21.4
Sep. High Flow	1960	1110	-43.4
Oct. High Flow	1090	765	-29.8
Nov. High Flow	1500	1000	-33.3
Dec. High Flow	675	852	26.2

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	13	3.92	-69.8
Med. 1 Day Min	42	43.7	4.05
Min. 3 Day Min	14.3	4.48	-68.7
Med. 3 Day Min	43.3	45.9	6
Min. 7 Day Min	17.4	5.48	-68.5
Med. 7 Day Min	47.4	49.3	4.01
Min. 30 Day Min	30	16.6	-44.7
Med. 30 Day Min	82.6	74.5	-9.81
Min. 90 Day Min	41.2	66.4	61.2
Med. 90 Day Min	235	279	18.7
7Q10	24.6	16.5	-32.9
Year of 90-Day Min. Flow	2002	2002	0
Drought Year Mean	316	438	38.6
Mean Baseflow	664	629	-5.27

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	34500	49900	44.6
Med. 1 Day Max	8350	15000	79.6
Max. 3 Day Max	32700	45600	39.4
Med. 3 Day Max	8020	13100	63.3
Max. 7 Day Max	26100	31500	20.7
Med. 7 Day Max	7300	8540	17
Max. 30 Day Max	9190	10100	9.9
Med. 30 Day Max	4040	3870	-4.21
Max. 90 Day Max	5420	5620	3.69
Med. 90 Day Max	3020	2610	-13.6

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	29.3	30.8	5.12
5% Non-Exceedance	56	59.4	6.07
50% Non-Exceedance	751	697	-7.19
95% Non-Exceedance	5000	4700	-6
99% Non-Exceedance	9160	11600	26.6
Sept. 10% Non-Exceedance	54.6	42.5	-22.2

Fig. 1: Hydrograph

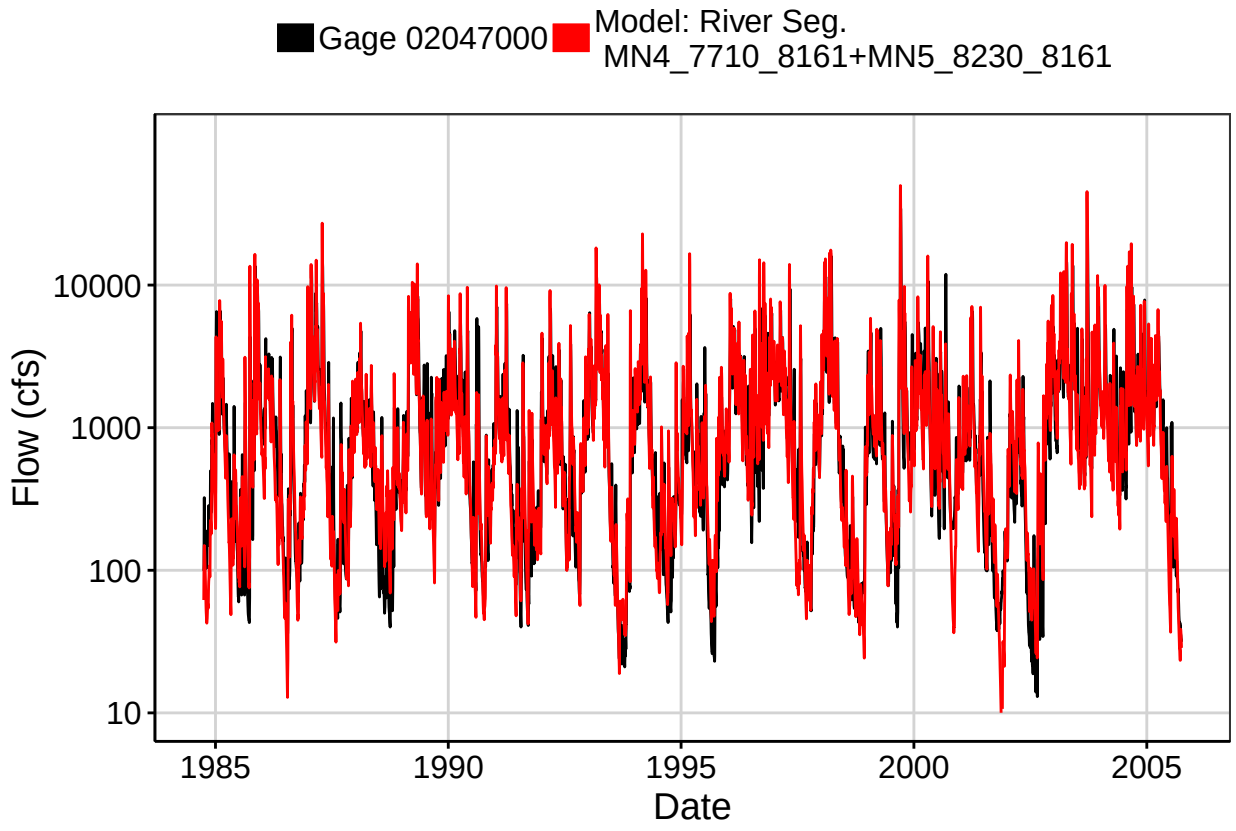


Fig. 2: Zoomed Hydrograph

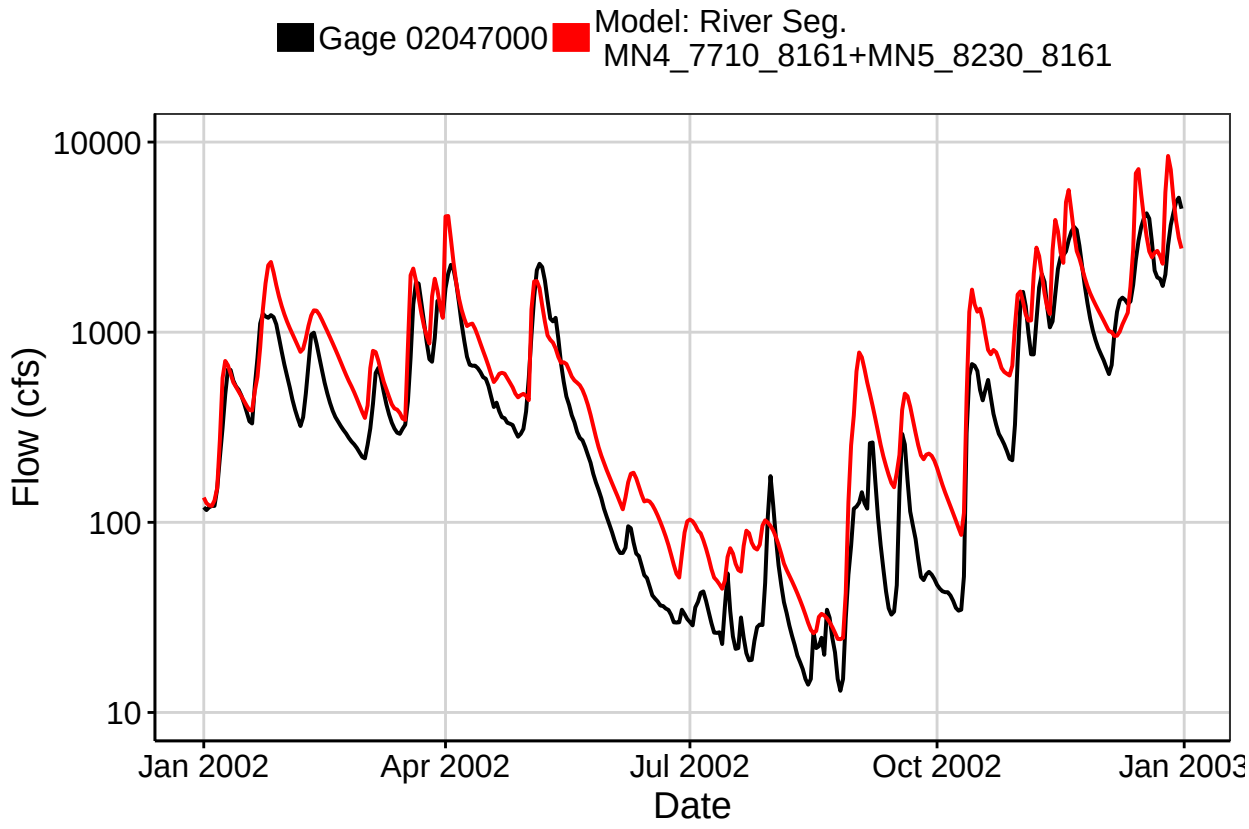


Fig. 3: Flow Exceedance

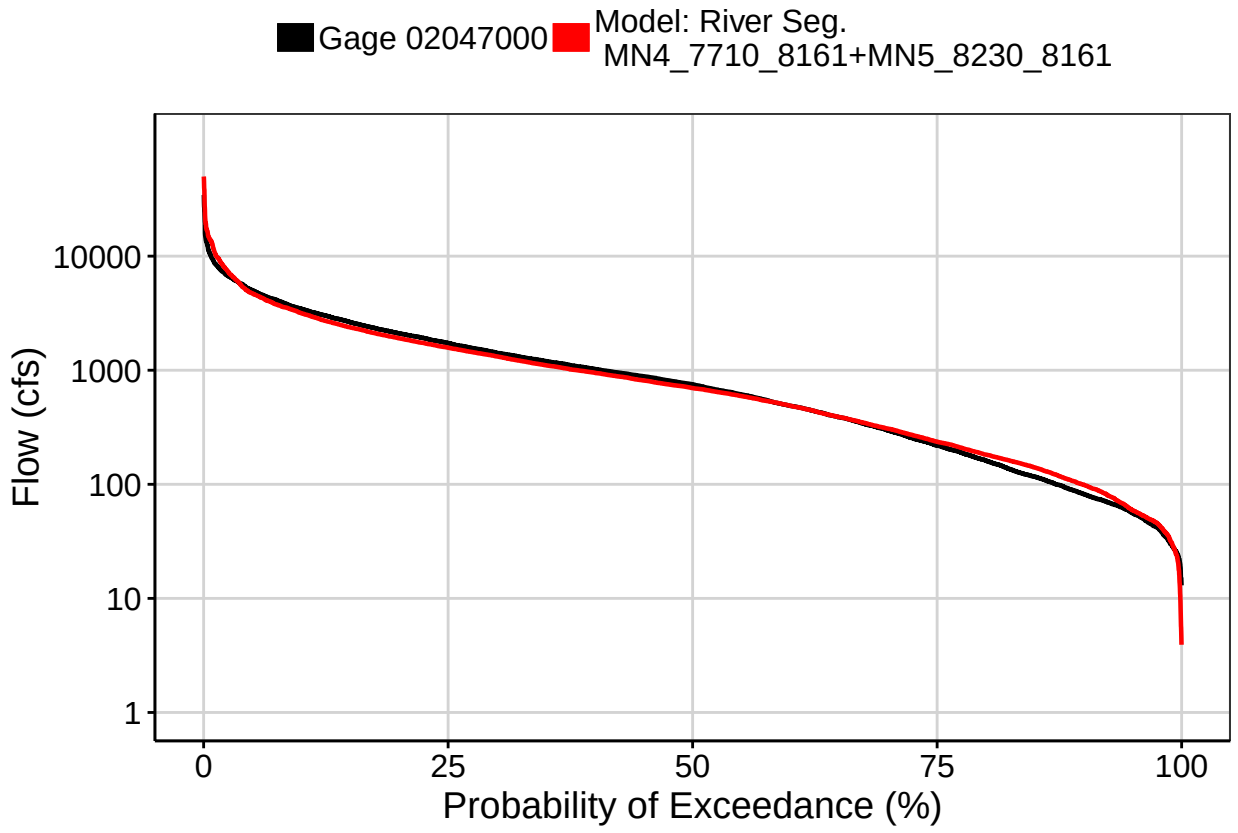


Fig. 4: Baseflow

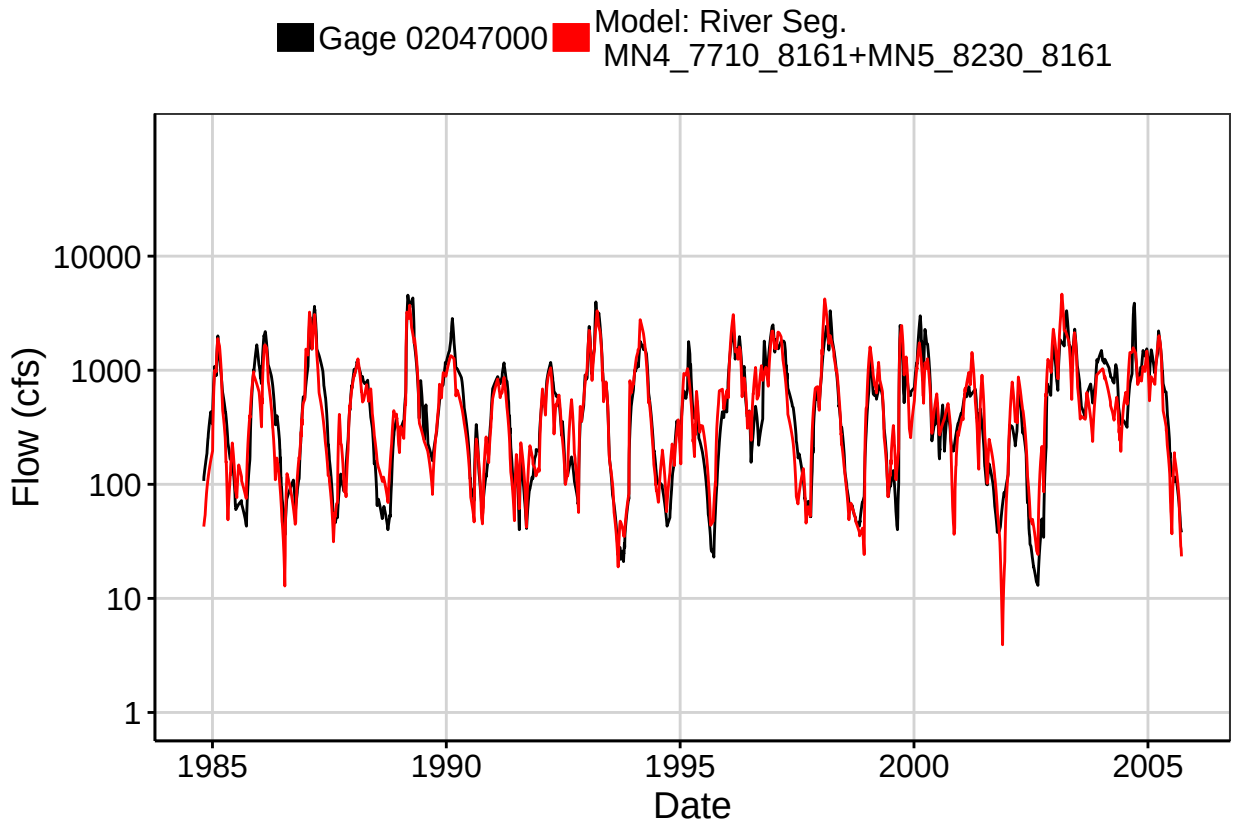


Fig. 5: Combined Baseflow

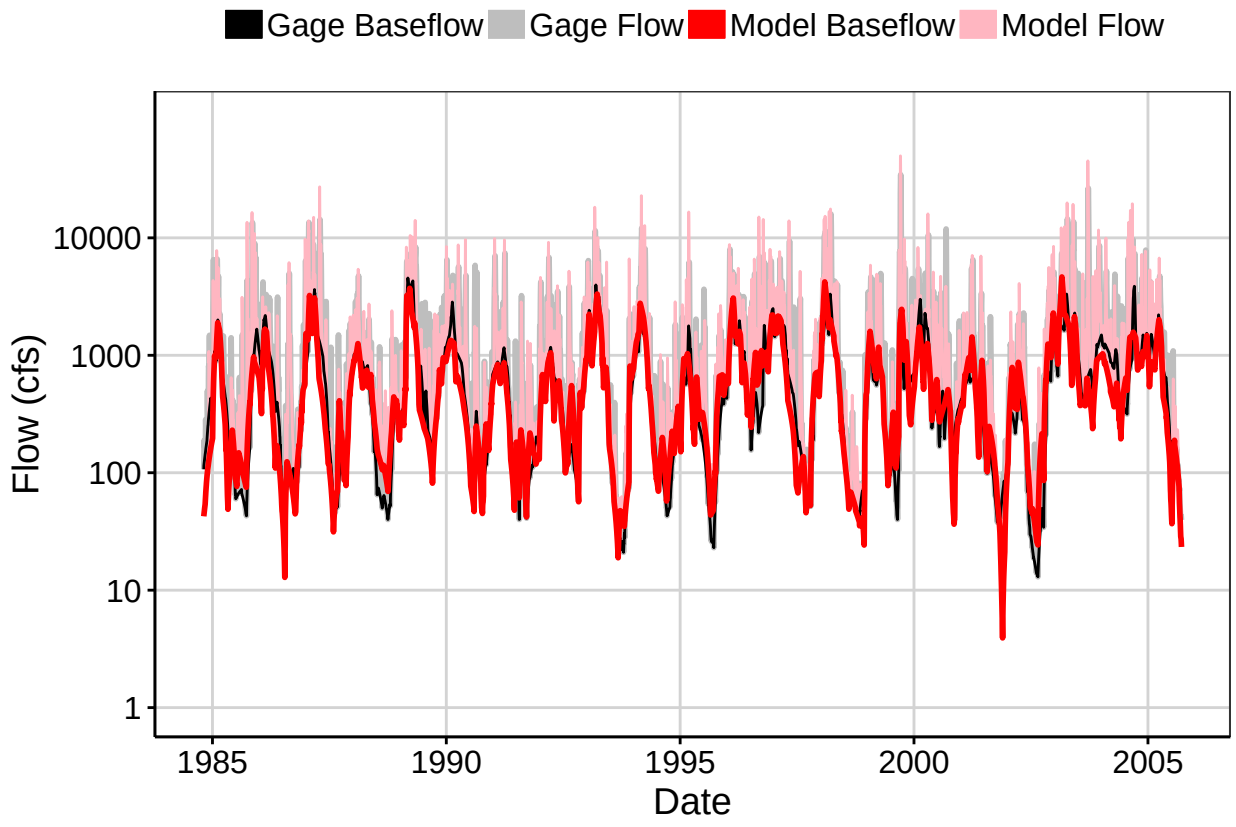


Fig. 6: Largest Error Segment

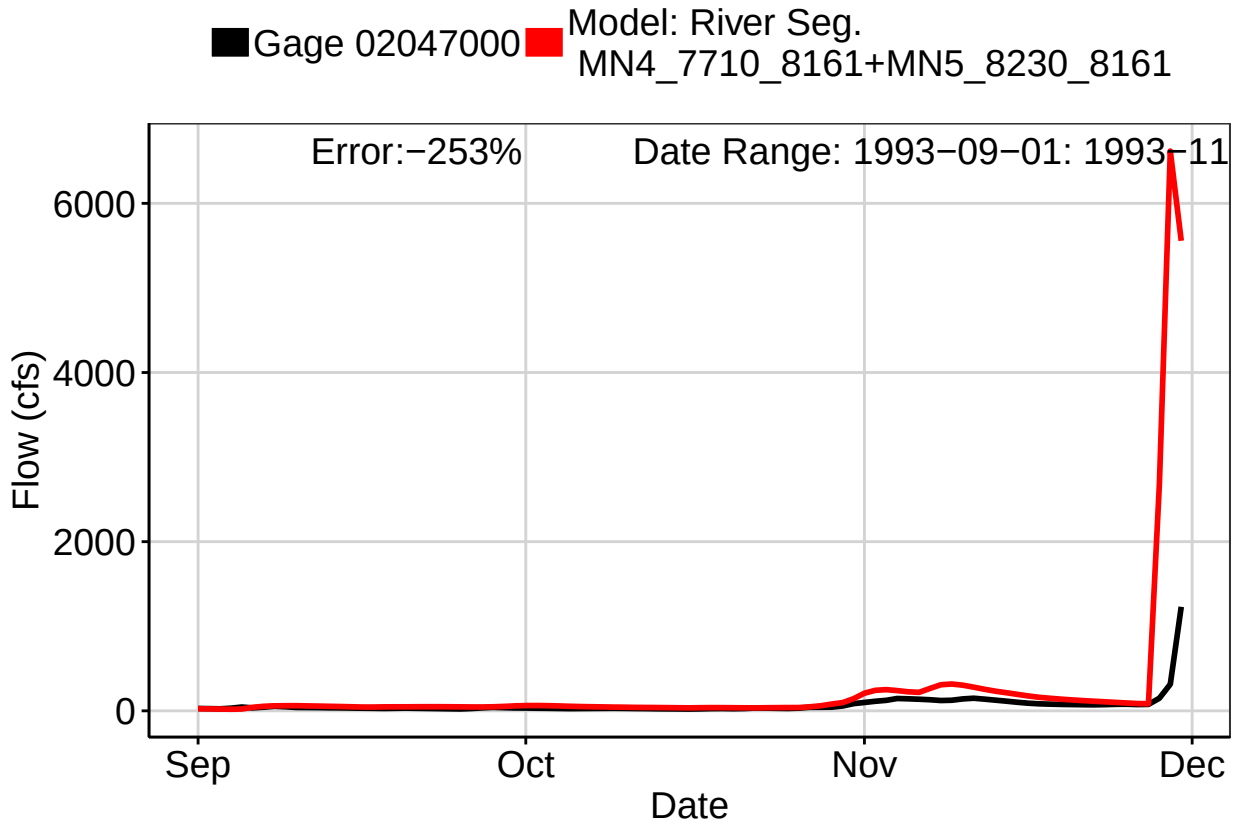


Fig. 7: Second Largest Error Segment

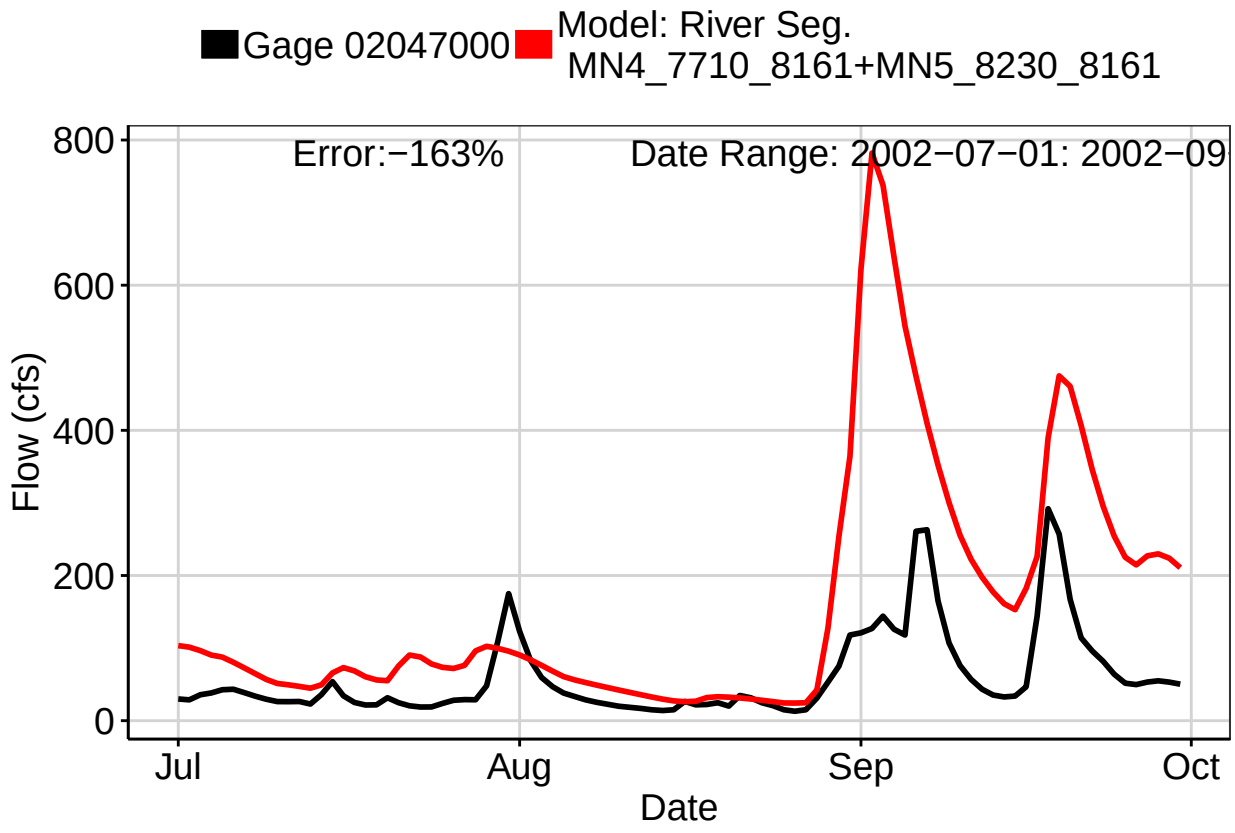


Fig. 8: Third Largest Error Segment

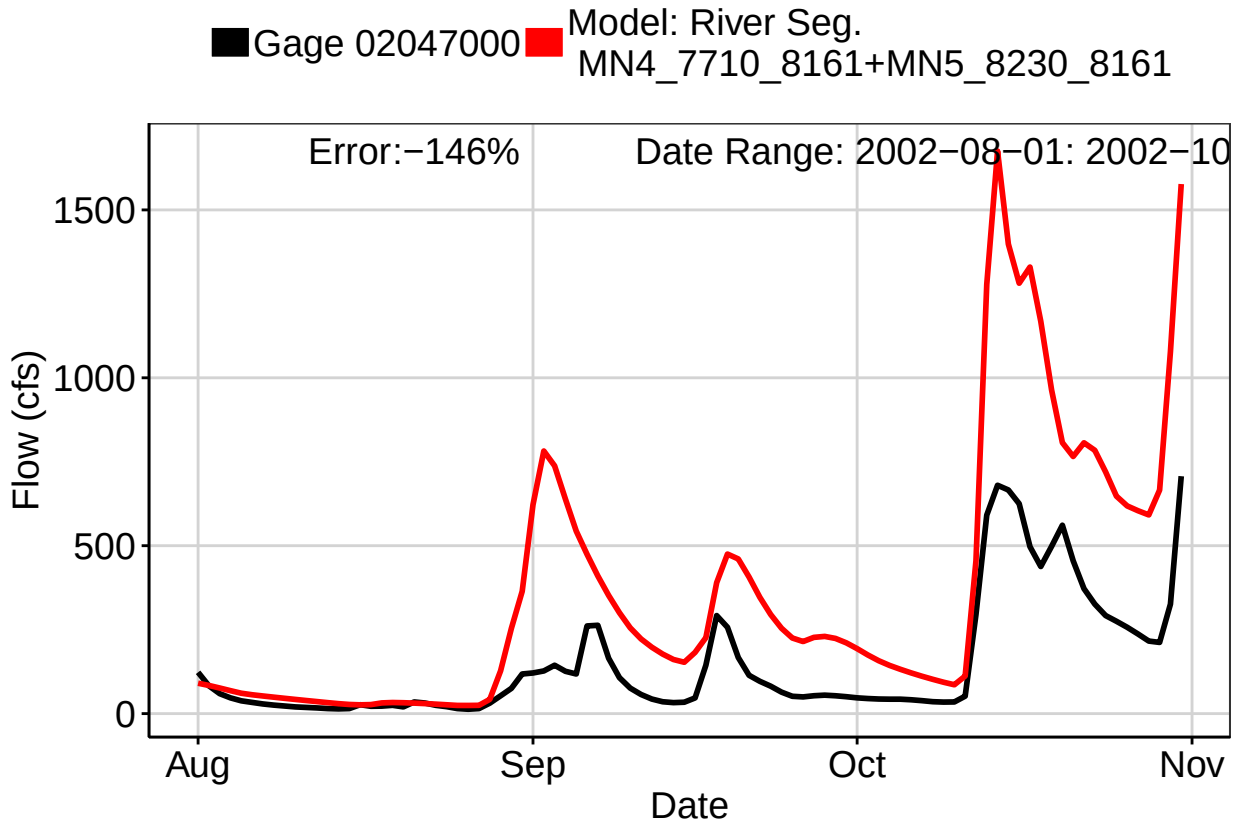


Fig. 9: Residuals Plot