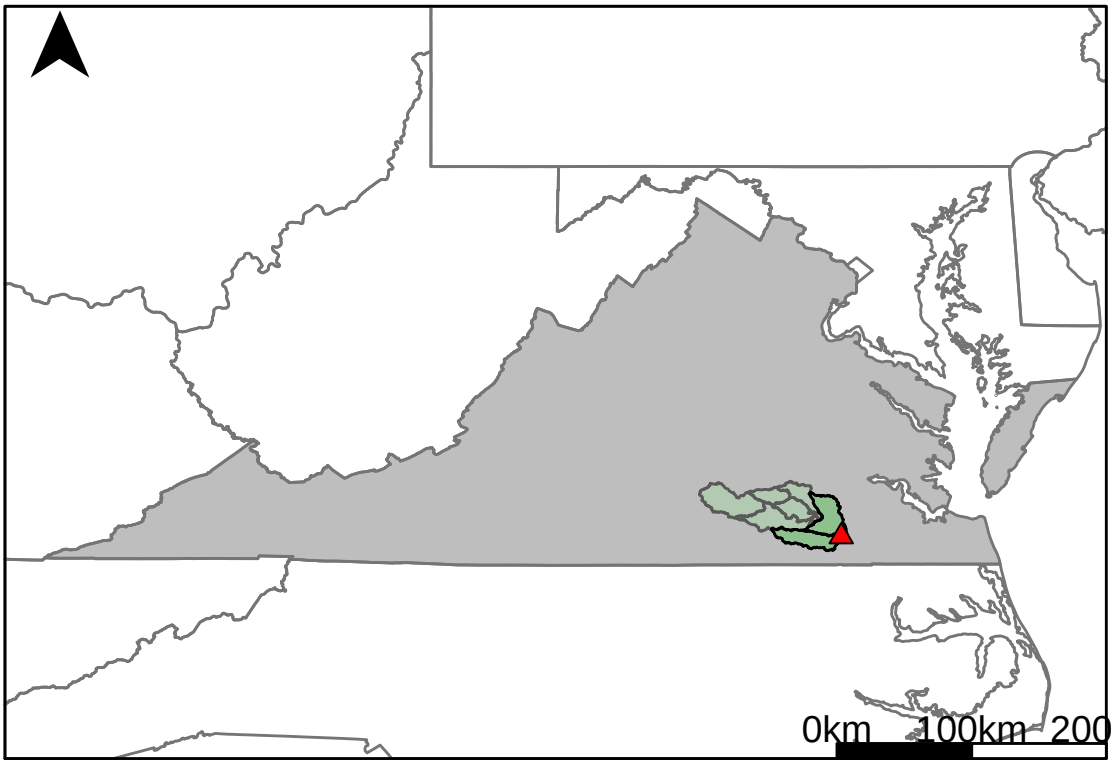
Appendix G.4: USGS Gage 02047000 vs. MN4_7710_8161+MN5_8230_8161



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 15.8%, 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	71.1	-6.12
Feb. Low Flow	156	251	-60.9
Mar. Low Flow	445	373	16.2
Apr. Low Flow	703	534	24
May Low Flow	1090	919	15.7
Jun. Low Flow	1020	690	32.4
Jul. Low Flow	759	454	40.2
Aug. Low Flow	389	218	44
Sep. Low Flow	191	156	18.3
Oct. Low Flow	96	77.1	19.7
Nov. Low Flow	75	89	-18.7
Dec. Low Flow	64	67.3	-5.16

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	1390	1170	15.8
Jan. Mean Flow	1900	1620	14.7
Feb. Mean Flow	2310	1980	14.3
Mar. Mean Flow	2710	2400	11.4
Apr. Mean Flow	2340	1720	26.5
May Mean Flow	1270	985	22.4
Jun. Mean Flow	796	564	29.1
Jul. Mean Flow	505	373	26.1
Aug. Mean Flow	747	660	11.6
Sep. Mean Flow	1330	1260	5.26
Oct. Mean Flow	585	585	0
Nov. Mean Flow	932	828	11.2
Dec. Mean Flow	1340	1110	17.2

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	707	679	3.96
Feb. High Flow	1490	1490	0
Mar. High Flow	1960	1770	9.69
Apr. High Flow	4210	3630	13.8
May High Flow	4790	3970	17.1
Jun. High Flow	4550	6040	-32.7
Jul. High Flow	4900	3730	23.9
Aug. High Flow	3130	2100	32.9
Sep. High Flow	1960	1030	47.4
Oct. High Flow	1090	682	37.4
Nov. High Flow	1500	826	44.9
Dec. High Flow	675	650	3.7

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	13	3.61	72.2
Med. 1 Day Min	42	37.9	9.76
Min. 3 Day Min	14.3	4.08	71.5
Med. 3 Day Min	43.3	39	9.93
Min. 7 Day Min	17.4	4.93	71.7
Med. 7 Day Min	47.4	40.5	14.6
Min. 30 Day Min	30	13.1	56.3
Med. 30 Day Min	82.6	66.1	20
Min. 90 Day Min	41.2	54.9	-33.3
Med. 90 Day Min	235	227	3.4
7Q10	24.6	13.6	44.7
Year of 90-Day Min. Flow	2002	2002	0
Drought Year Mean	316	1170	-270
Mean Baseflow	664	525	20.9

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	34500	37800	-9.57
Med. 1 Day Max	8350	12500	-49.7
Max. 3 Day Max	32700	34800	-6.42
Med. 3 Day Max	8020	11100	-38.4
Max. 7 Day Max	26100	23800	8.81
Med. 7 Day Max	7300	7380	-1.1
Max. 30 Day Max	9190	7750	15.7
Med. 30 Day Max	4040	3340	17.3
Max. 90 Day Max	5420	4810	11.3
Med. 90 Day Max	3020	2270	24.8

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	29.3	24.4	16.7
5% Non-Exceedance	56	47.8	14.6
50% Non-Exceedance	751	582	22.5
95% Non-Exceedance	5000	3970	20.6
99% Non-Exceedance	9160	9860	-7.64
Sept. 10% Non-Exceedance	54.6	45.3	17

Fig. 1: Hydrograph

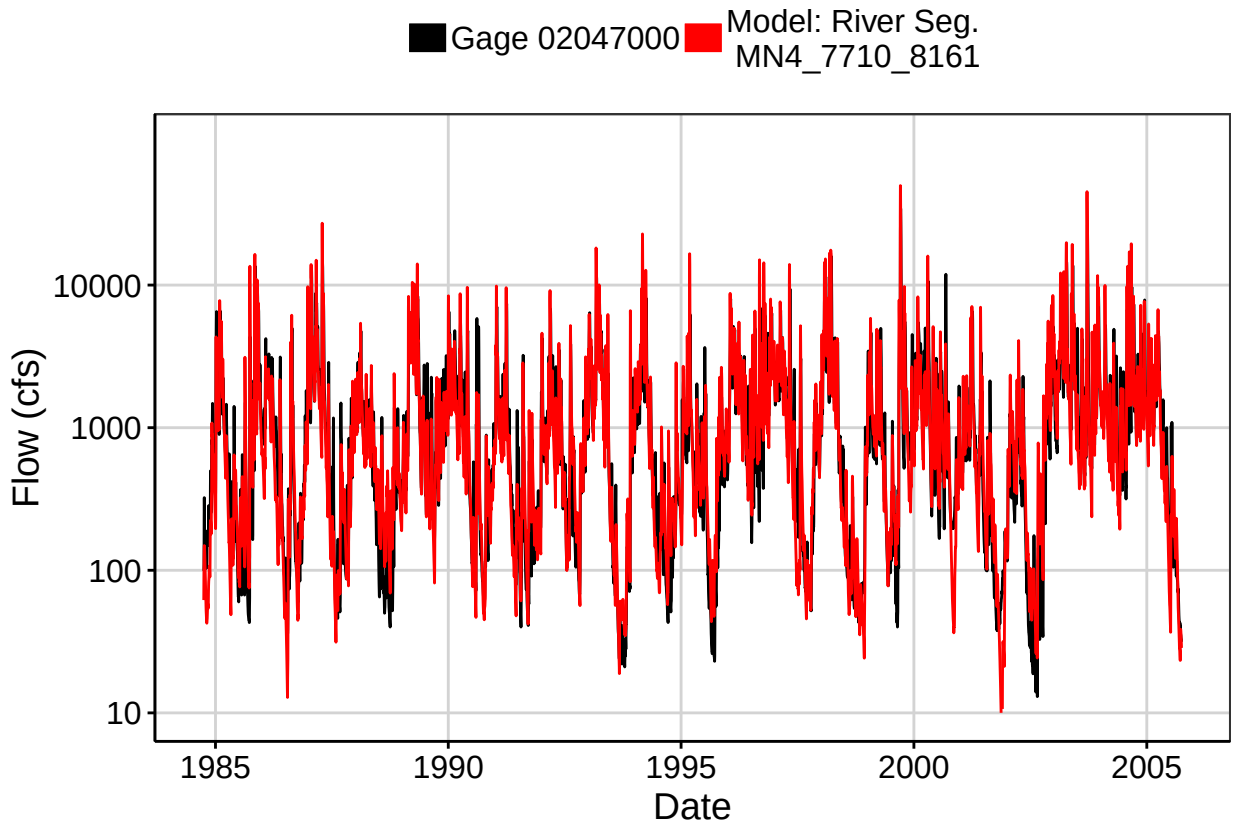


Fig. 2: Zoomed Hydrograph

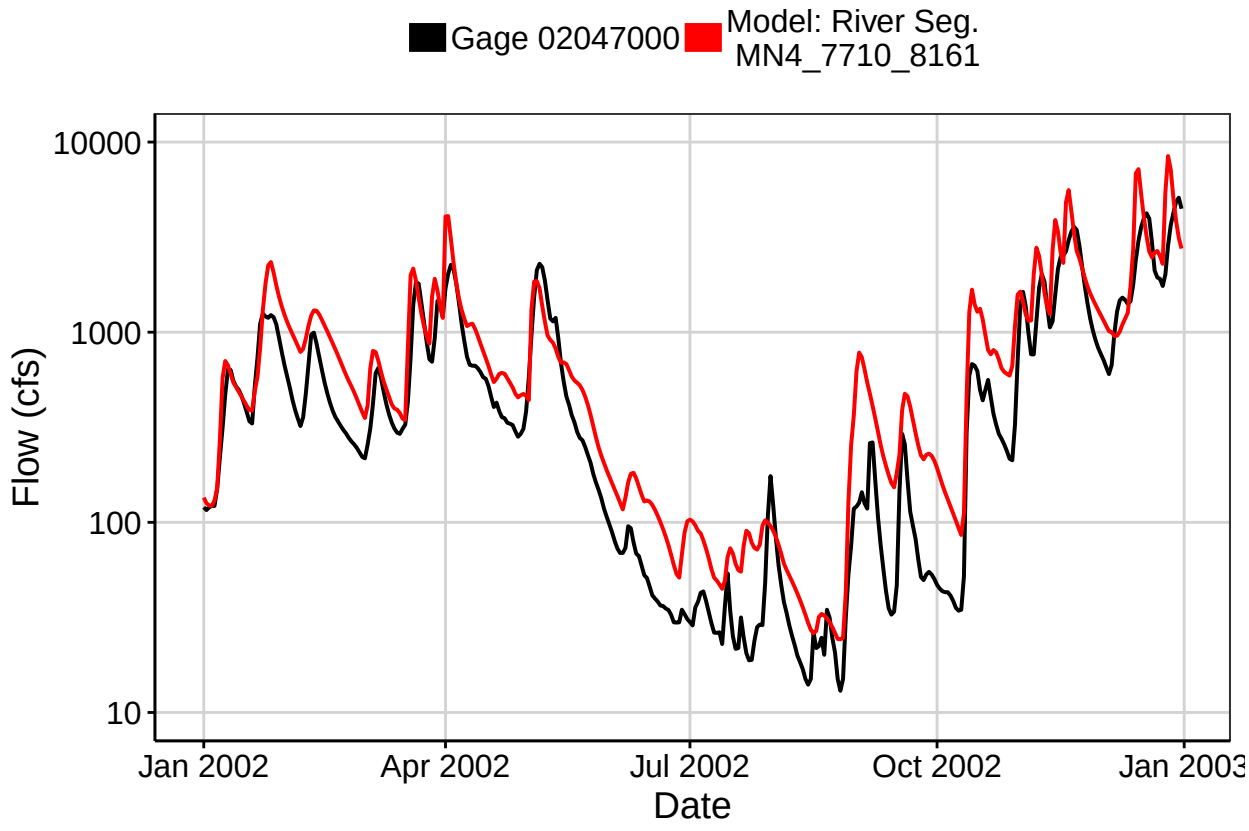


Fig. 3: Flow Exceedance

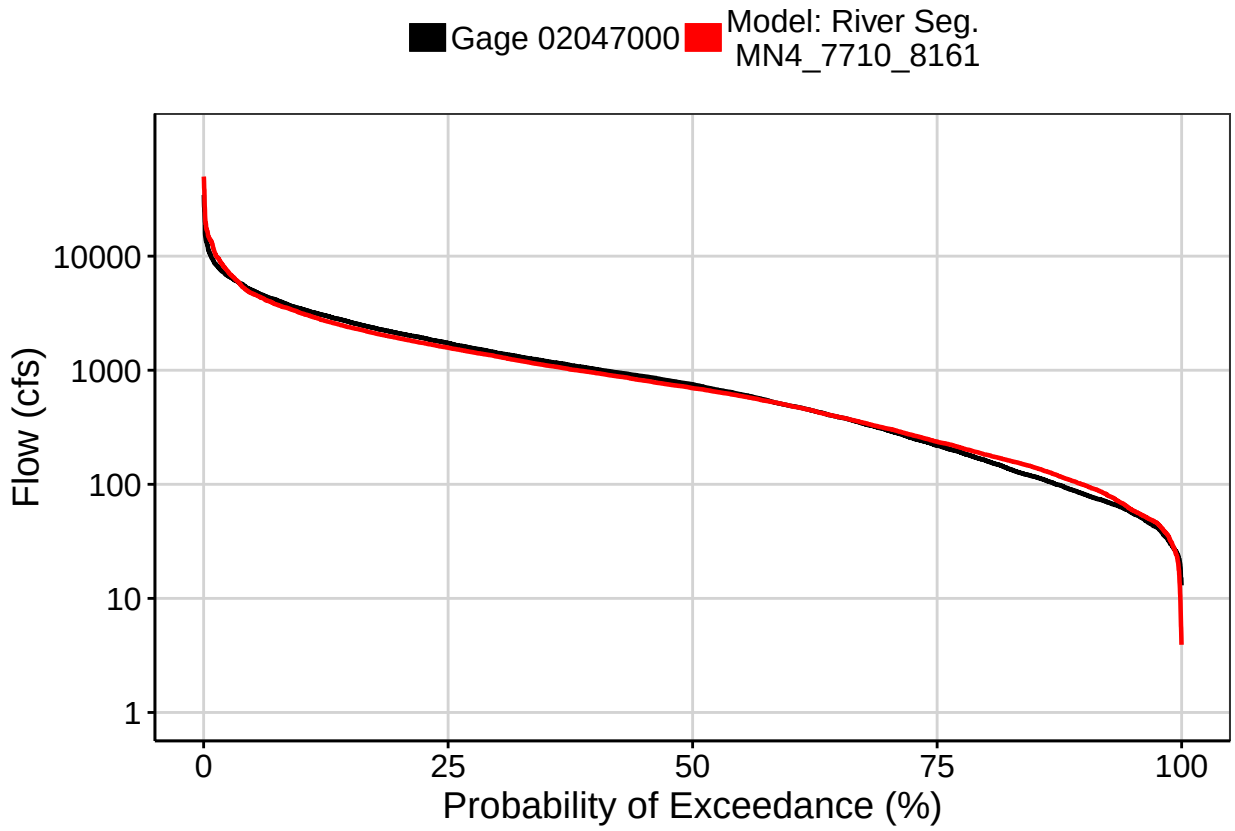


Fig. 4: Baseflow

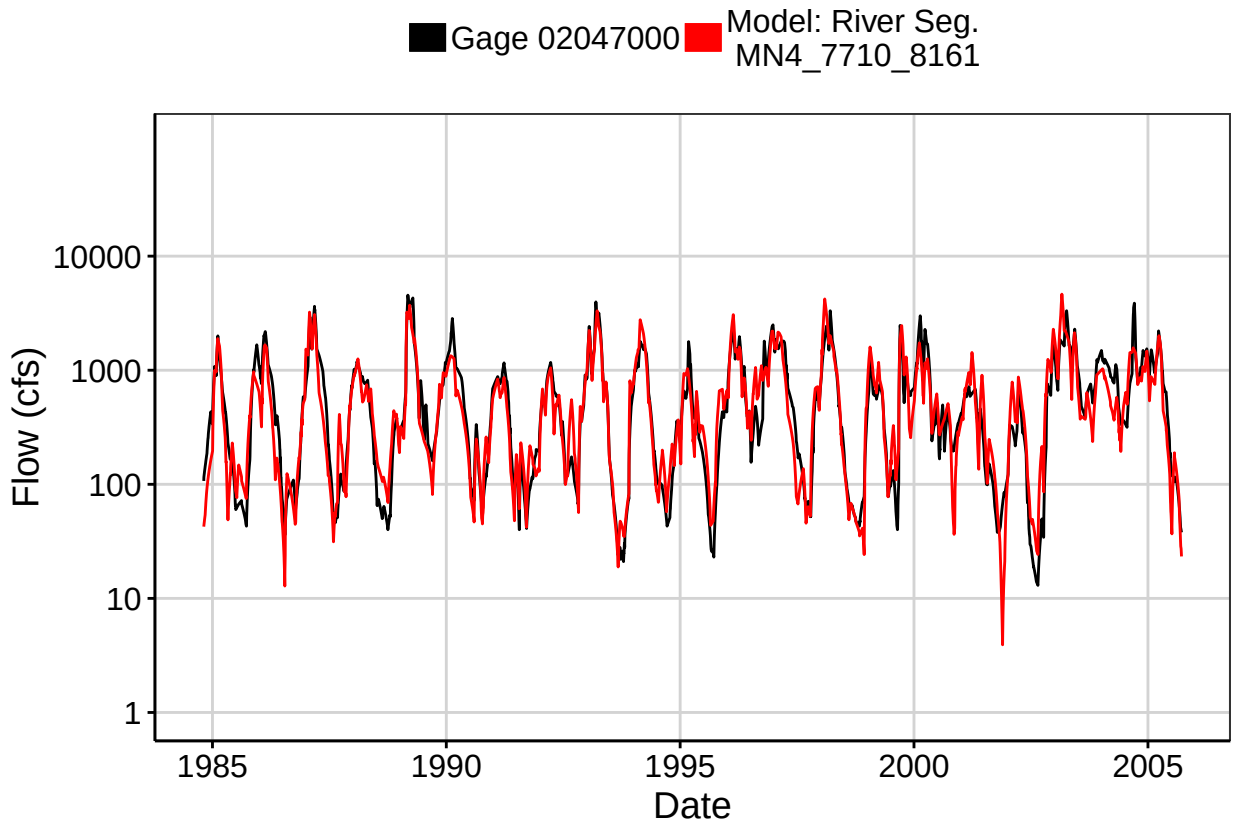


Fig. 5: Combined Baseflow

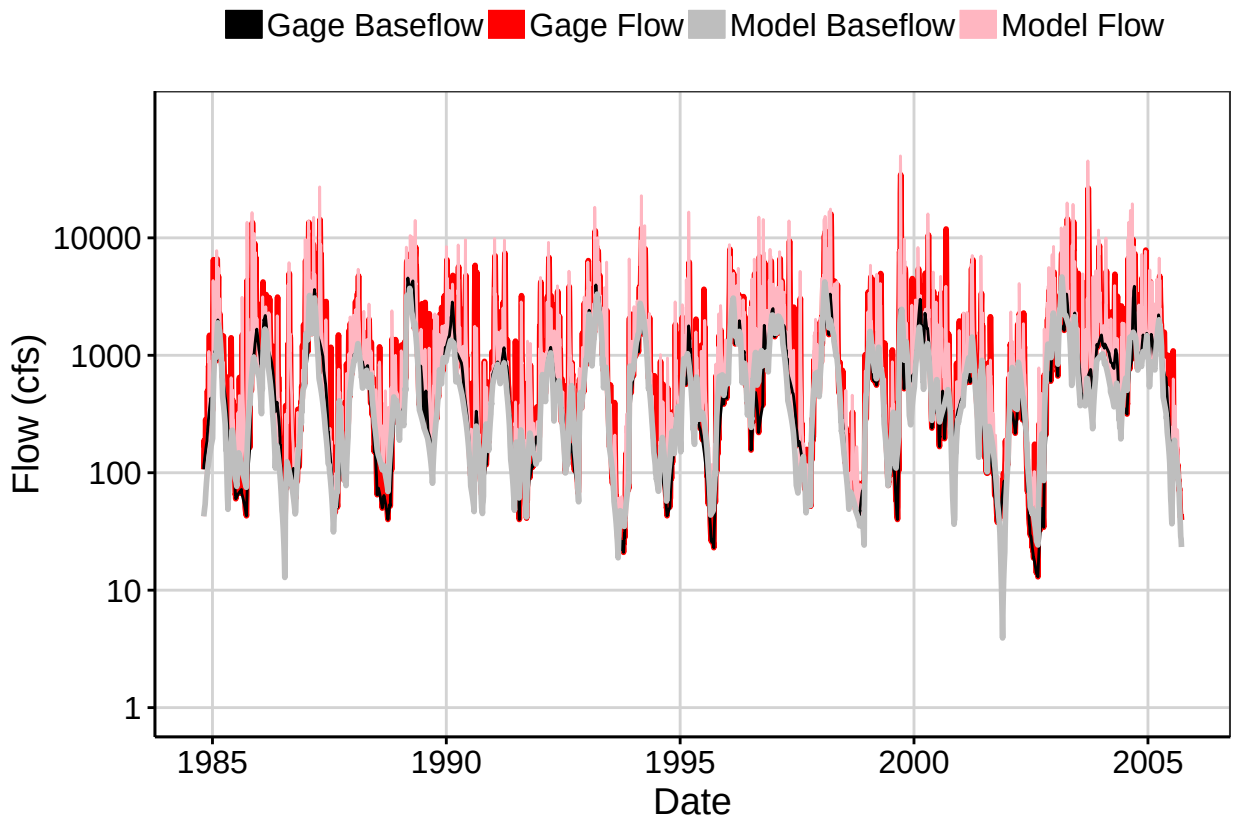


Fig. 6: Largest Error Segment

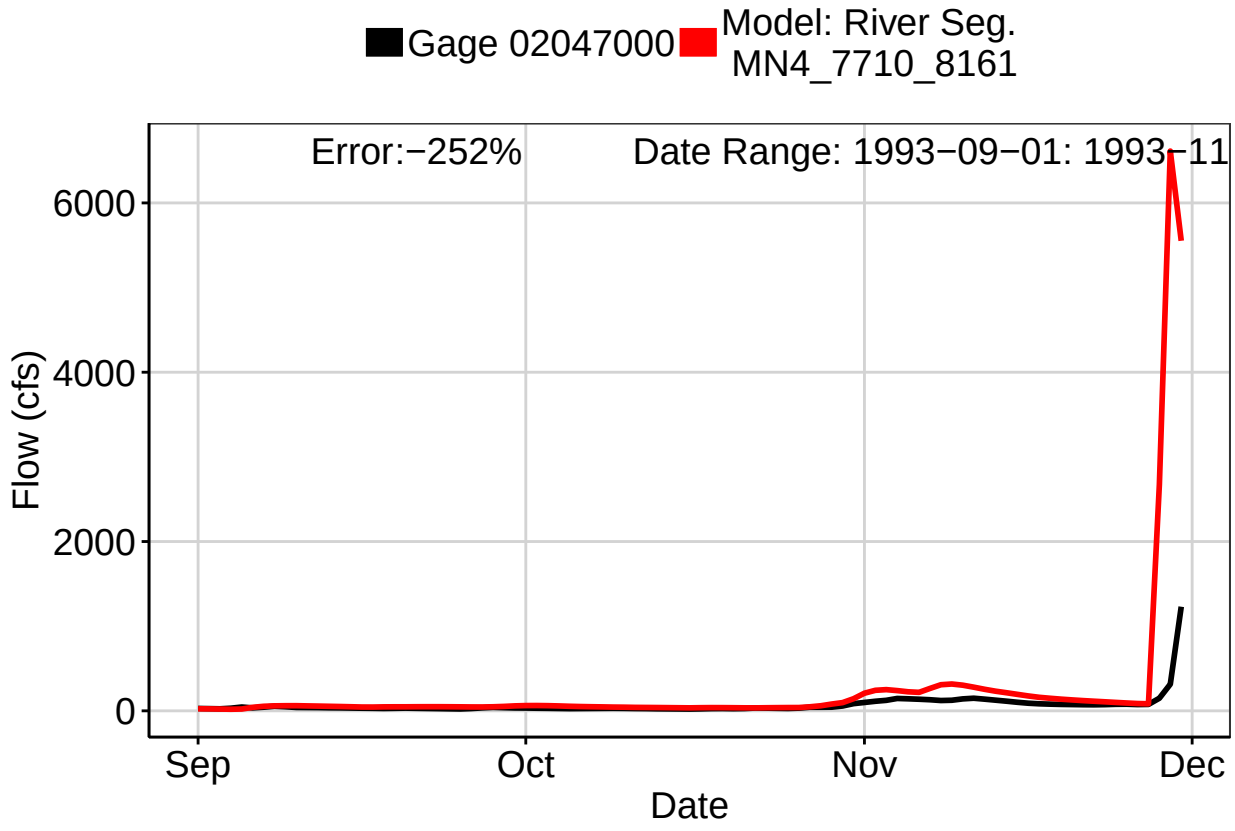


Fig. 7: Second Largest Error Segment

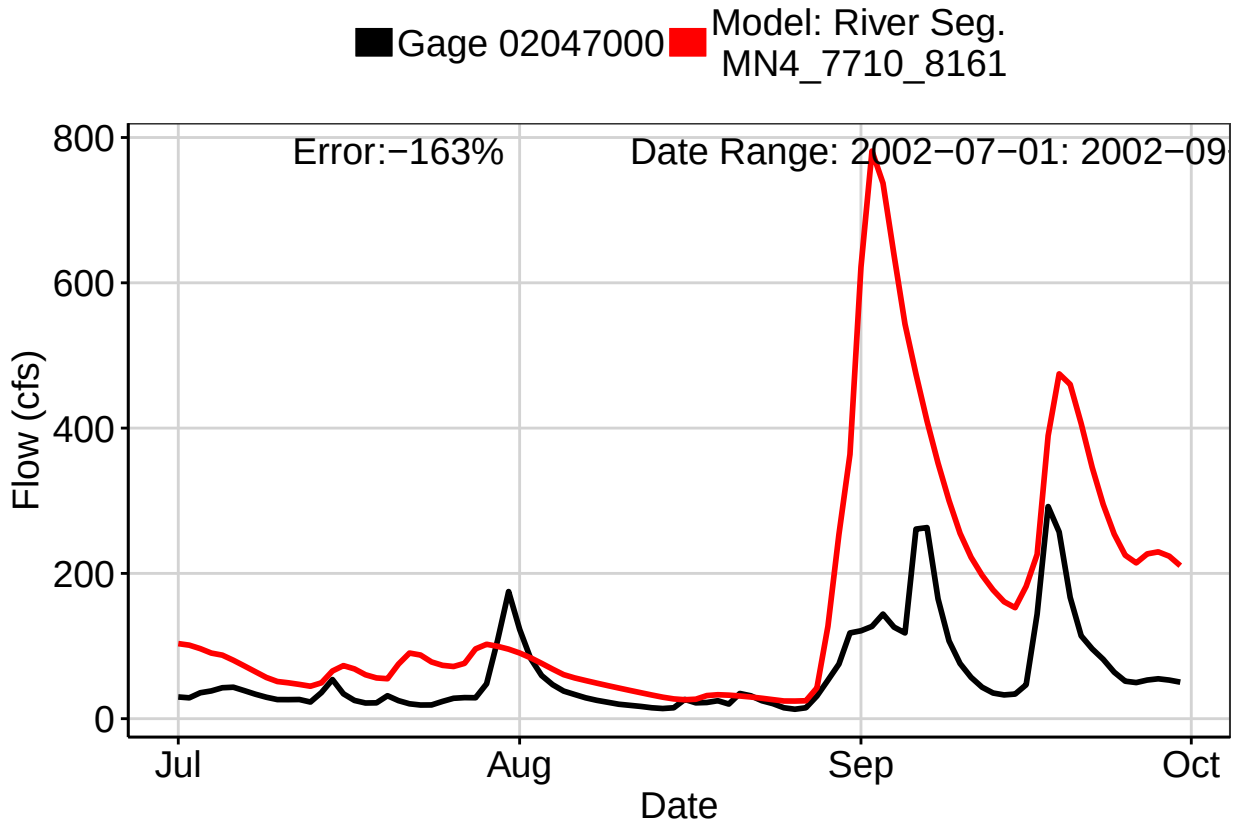


Fig. 8: Third Largest Error Segment

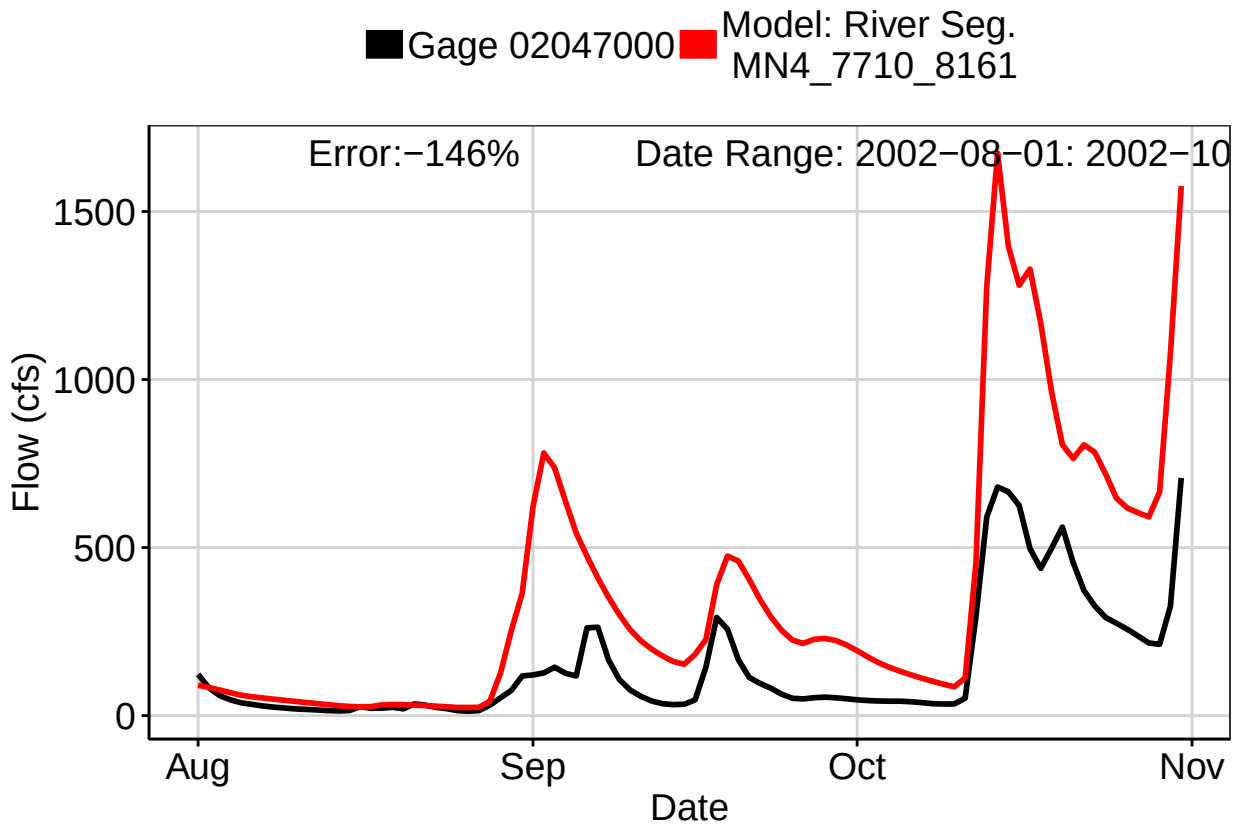


Fig. 9: Residuals Plot