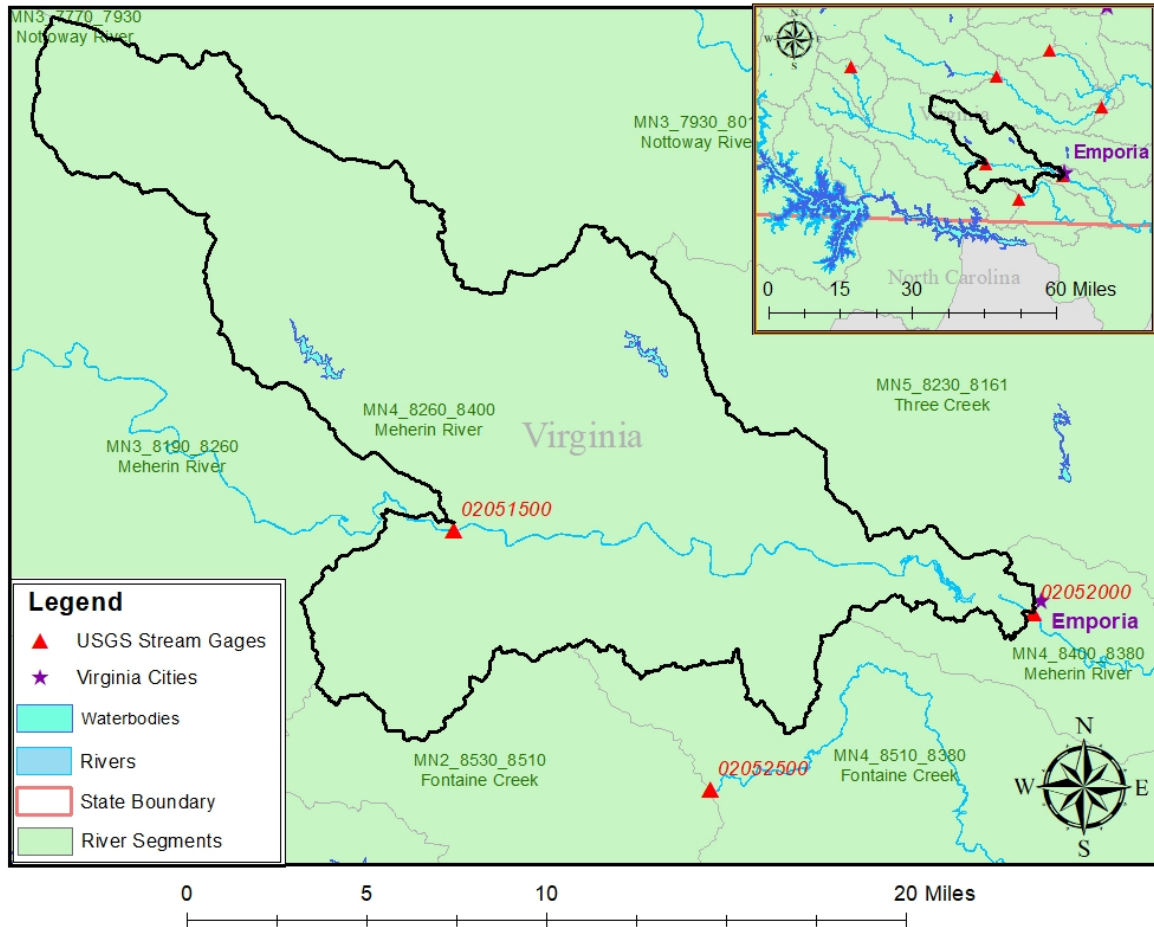# 02052000 vs. MN4_8260_8400

Daniel Hildebrand, Hailey Alspaugh, and Kelsey Reitz

July 11, 2018

This river segment follows part of the flow of the Meherrin River. The gage is located in Emporia City, VA (Lat 3641'24", Long 7732'27") approximately 0.3 miles north of Emporia, VA. Drainage area is 744 sq. miles. This gage started taking data in 1951 and is still taking data. The flow in this area is regulated by the Virginia Electric Power Companys dam that is 0.8 miles upstream. The average daily discharge error between the model and gage data for the 20 year timespan was 4.68%, with 45.4% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	61	58	4.92
Feb. Low Flow	151	142	5.96
Mar. Low Flow	166	181	-9.04
Apr. Low Flow	298	308	-3.36
May Low Flow	397	528	-33
Jun. Low Flow	413	398	3.63
Jul. Low Flow	348	299	14.1
Aug. Low Flow	176	168	4.55
Sep. Low Flow	112	114	-1.79
Oct. Low Flow	60	75.3	-25.5
Nov. Low Flow	52	57.5	-10.6
Dec. Low Flow	58	66	-13.8

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	727	693	4.68
Jan. Mean Flow	1010	928	8.12
Feb. Mean Flow	1130	1160	-2.65
Mar. Mean Flow	1430	1450	-1.4
Apr. Mean Flow	1120	1060	5.36
May Mean Flow	701	597	14.8
Jun. Mean Flow	451	391	13.3
Jul. Mean Flow	306	250	18.3
Aug. Mean Flow	364	358	1.65
Sep. Mean Flow	647	658	-1.7
Oct. Mean Flow	299	357	-19.4
Nov. Mean Flow	599	518	13.5
Dec. Mean Flow	702	640	8.83

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	637	380	40.3
Feb. High Flow	1710	996	41.8
Mar. High Flow	2910	1150	60.5
Apr. High Flow	4550	2610	42.6
May High Flow	4230	2440	42.3
Jun. High Flow	5020	3520	29.9
Jul. High Flow	4200	3000	28.6
Aug. High Flow	1940	1010	47.9
Sep. High Flow	782	379	51.5
Oct. High Flow	1040	342	67.1
Nov. High Flow	1180	751	36.4
Dec. High Flow	470	378	19.6

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	3.6	7.26	-102
Med. 1 Day Min	21	39	-85.7
Min. 3 Day Min	4.29	7.41	-72.7
Med. 3 Day Min	28.7	41.8	-45.6
Min. 7 Day Min	6.36	8.17	-28.5
Med. 7 Day Min	40.9	47.3	-15.6
Min. 30 Day Min	13.5	12.5	7.41
Med. 30 Day Min	81	62.9	22.3
Min. 90 Day Min	25	33.8	-35.2
Med. 90 Day Min	162	120	25.9
7Q10	15.1	15.3	-1.32
Year of 90-Day Min. Flow	2002	2002	0
Drought Year Mean	165	228	-38.2
Mean Baseflow	260	324	-24.6

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	18000	29300	-62.8
Med. 1 Day Max	8320	7680	7.69
Max. 3 Day Max	16800	18600	-10.7
Med. 3 Day Max	6910	6420	7.09
Max. 7 Day Max	10700	12300	-15
Med. 7 Day Max	4080	4500	-10.3
Max. 30 Day Max	4370	4190	4.12
Med. 30 Day Max	1870	1880	-0.54
Max. 90 Day Max	2990	2880	3.68
Med. 90 Day Max	1410	1370	2.84

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	16.5	21.3	-29.1
5% Non-Exceedance	48	43.8	8.75
50% Non-Exceedance	334	342	-2.4
95% Non-Exceedance	2820	2440	13.5
99% Non-Exceedance	6700	5710	14.8
Sept. 10% Non-Exceedance	39.9	33	17.3

Fig. 1: Hydrograph
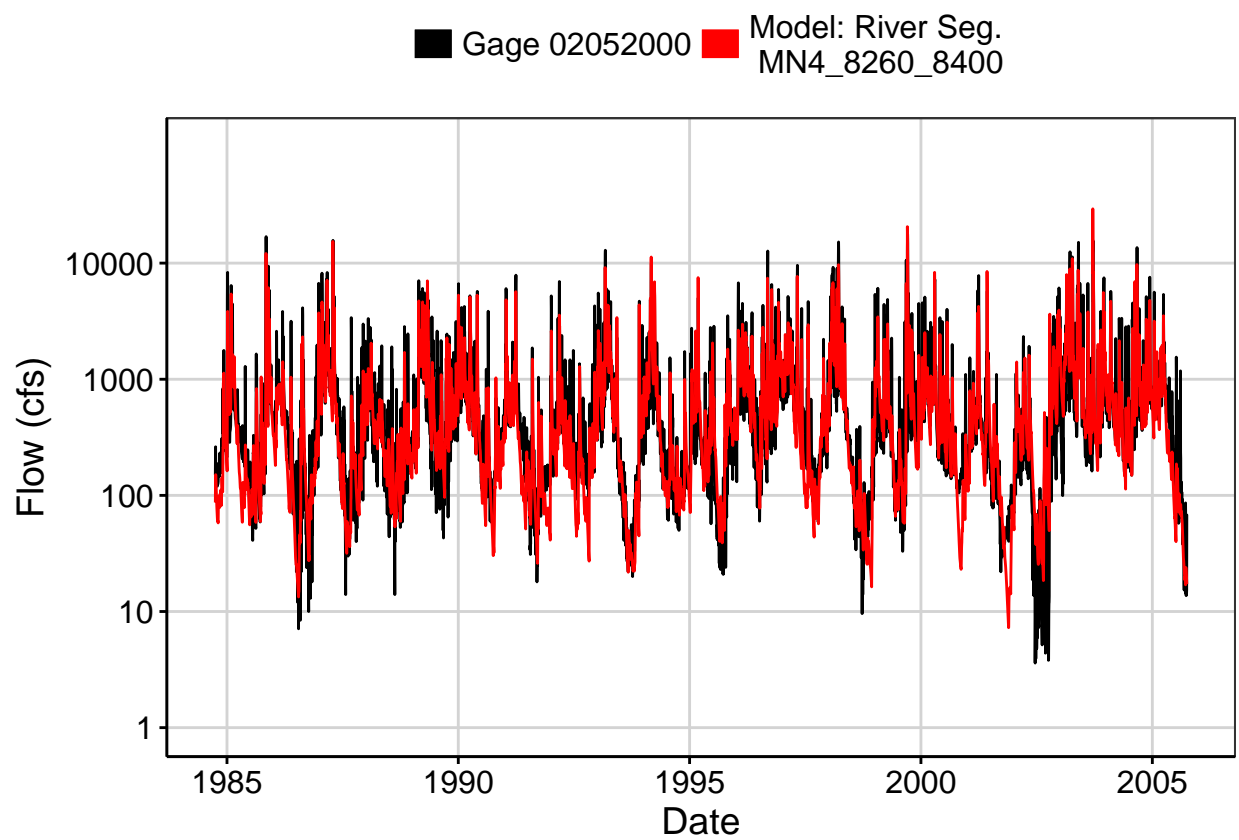
Fig. 2: Zoomed Hydrograph
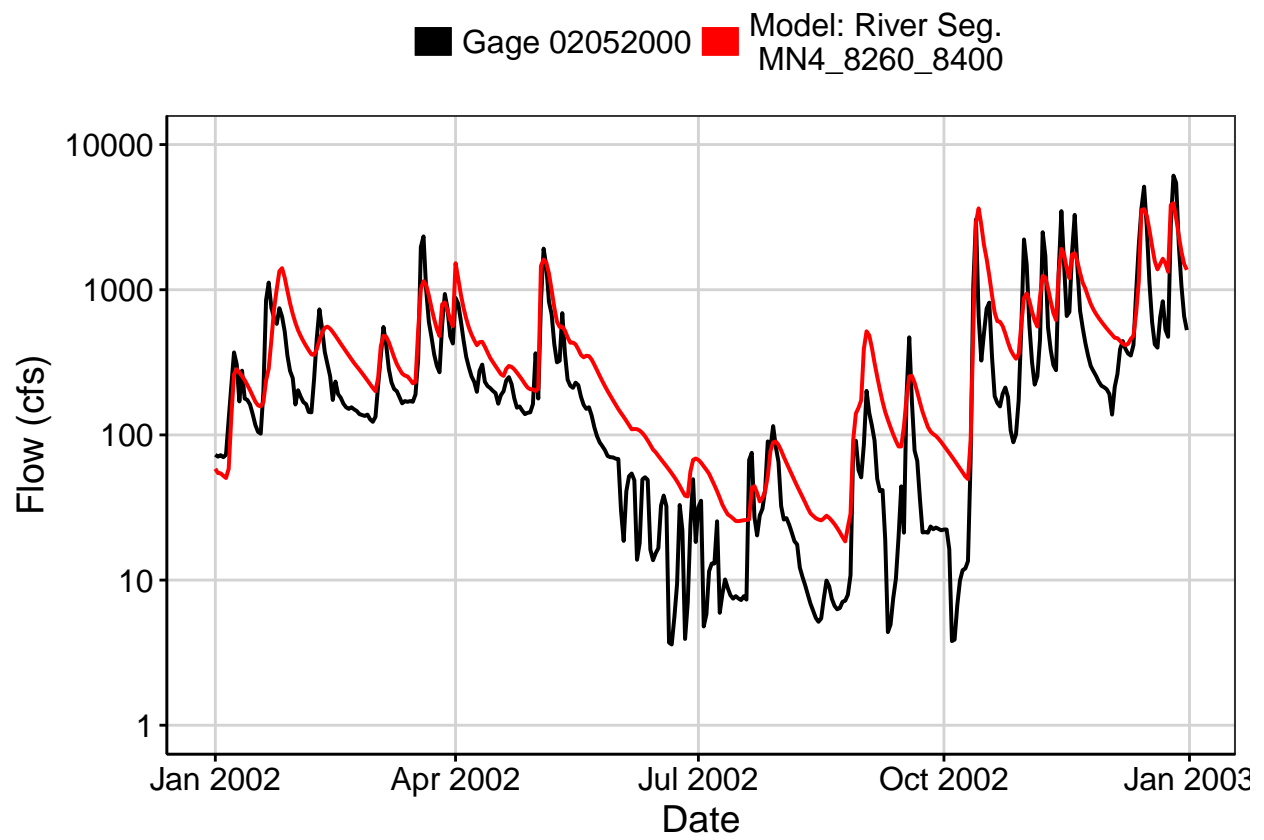
Fig. 3: Flow Exceedance

Fig. 4: Baseflow

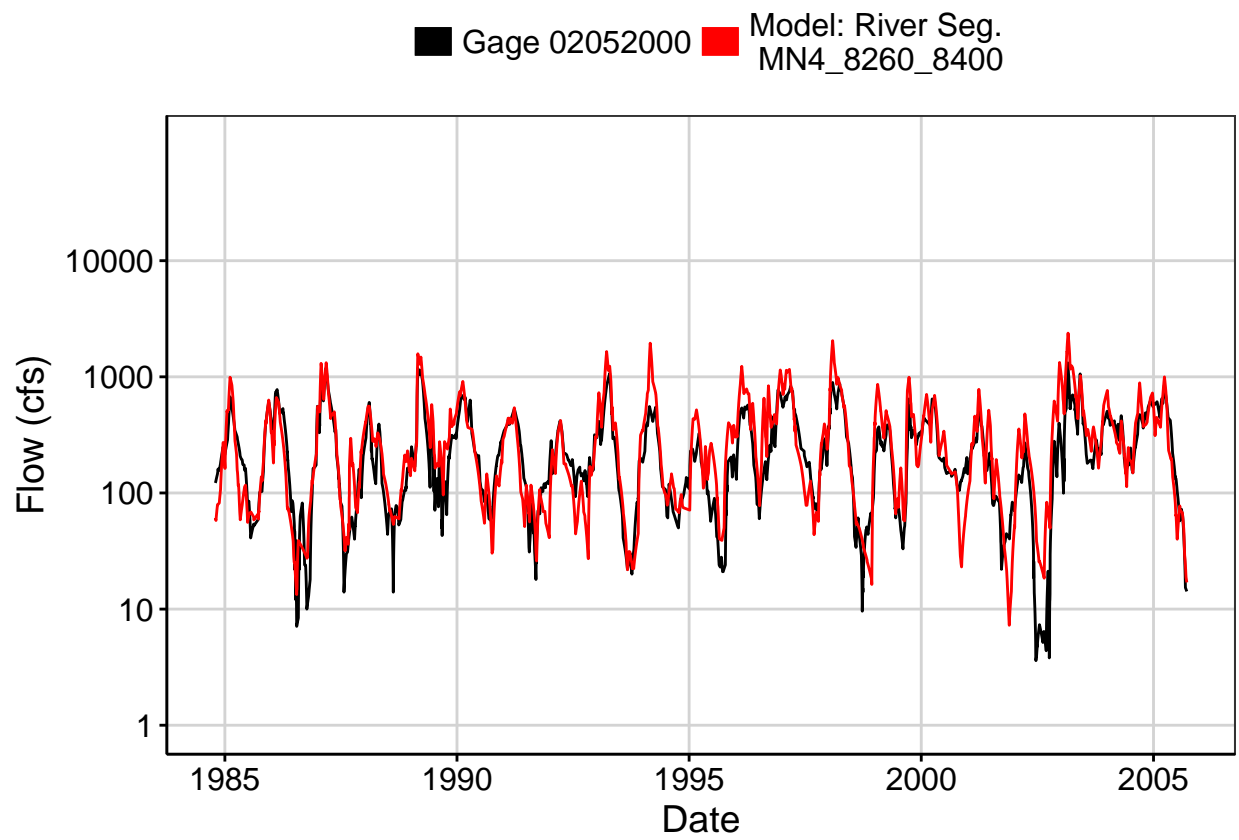Legend: Gage 02052000 (black), Model: River Seg. MN4_8260_8400 (red)
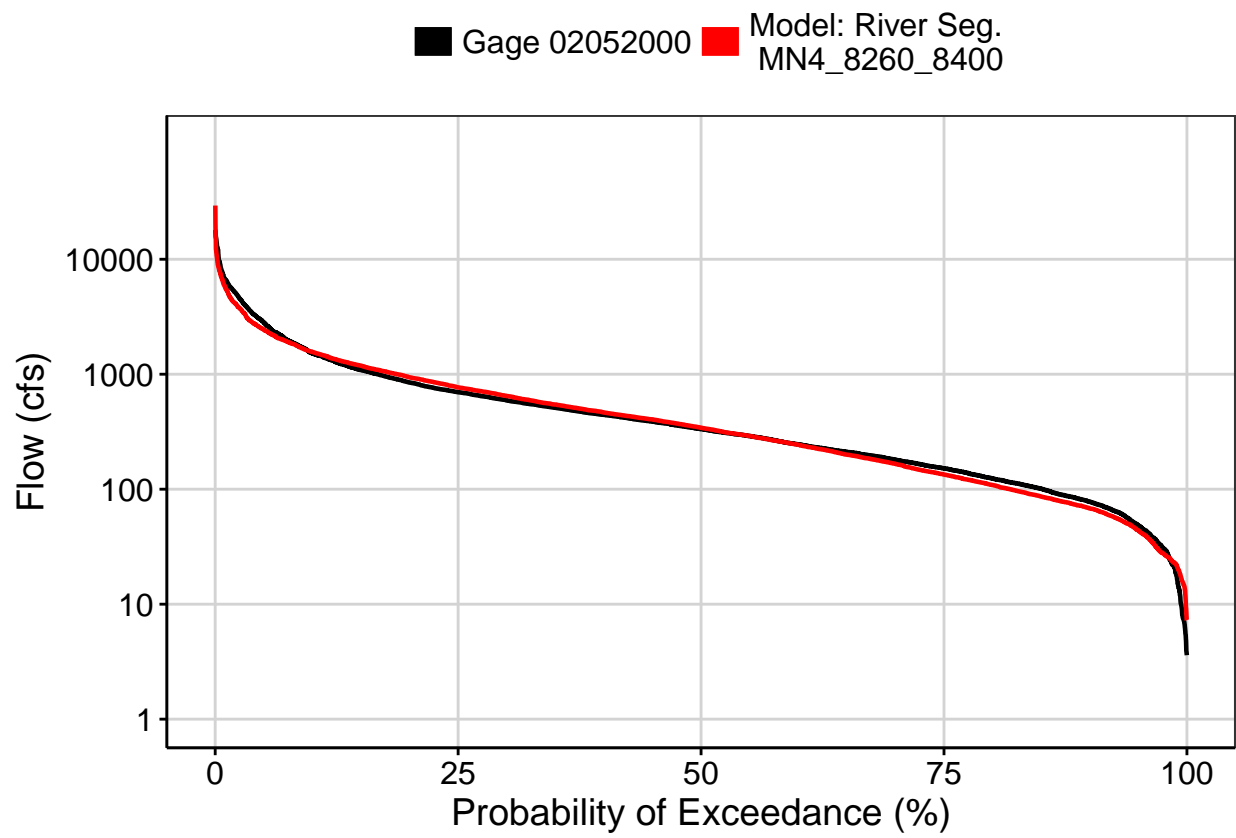
Fig. 5: Combined Baseflow
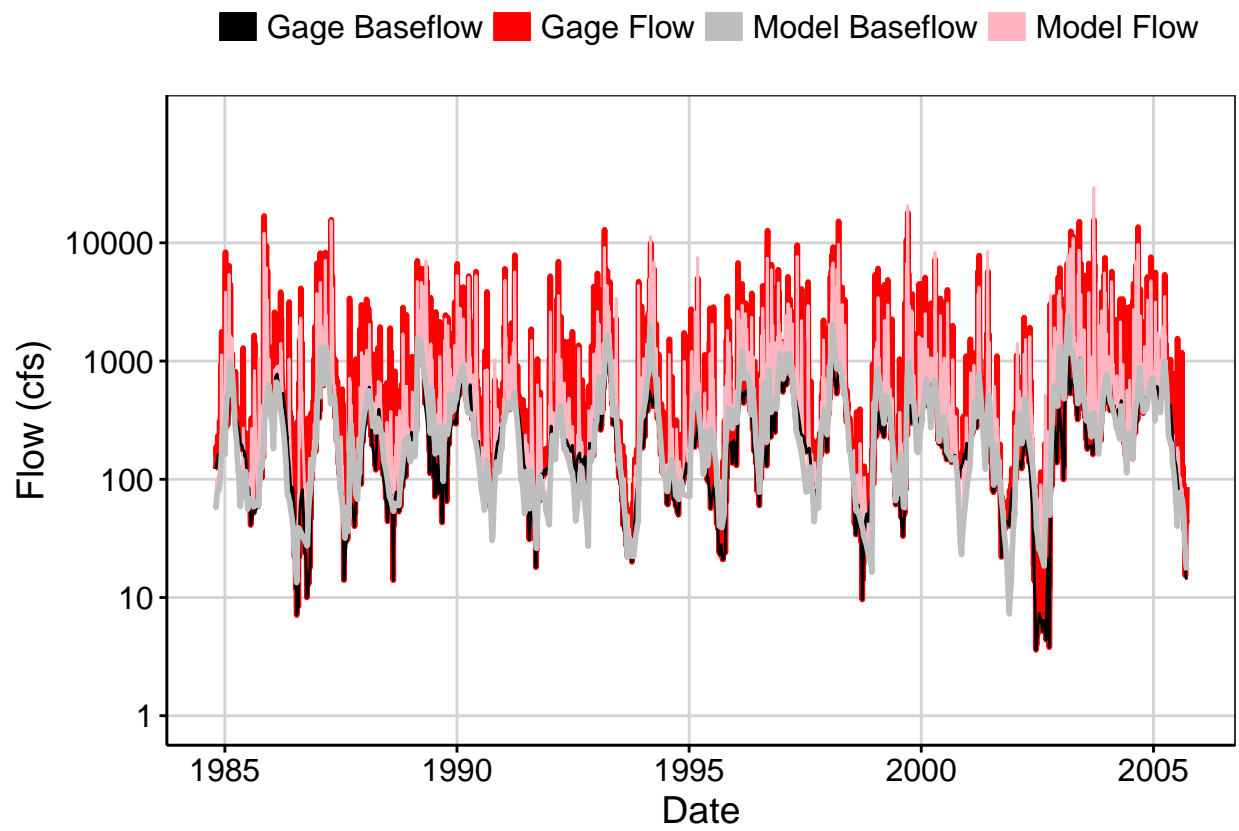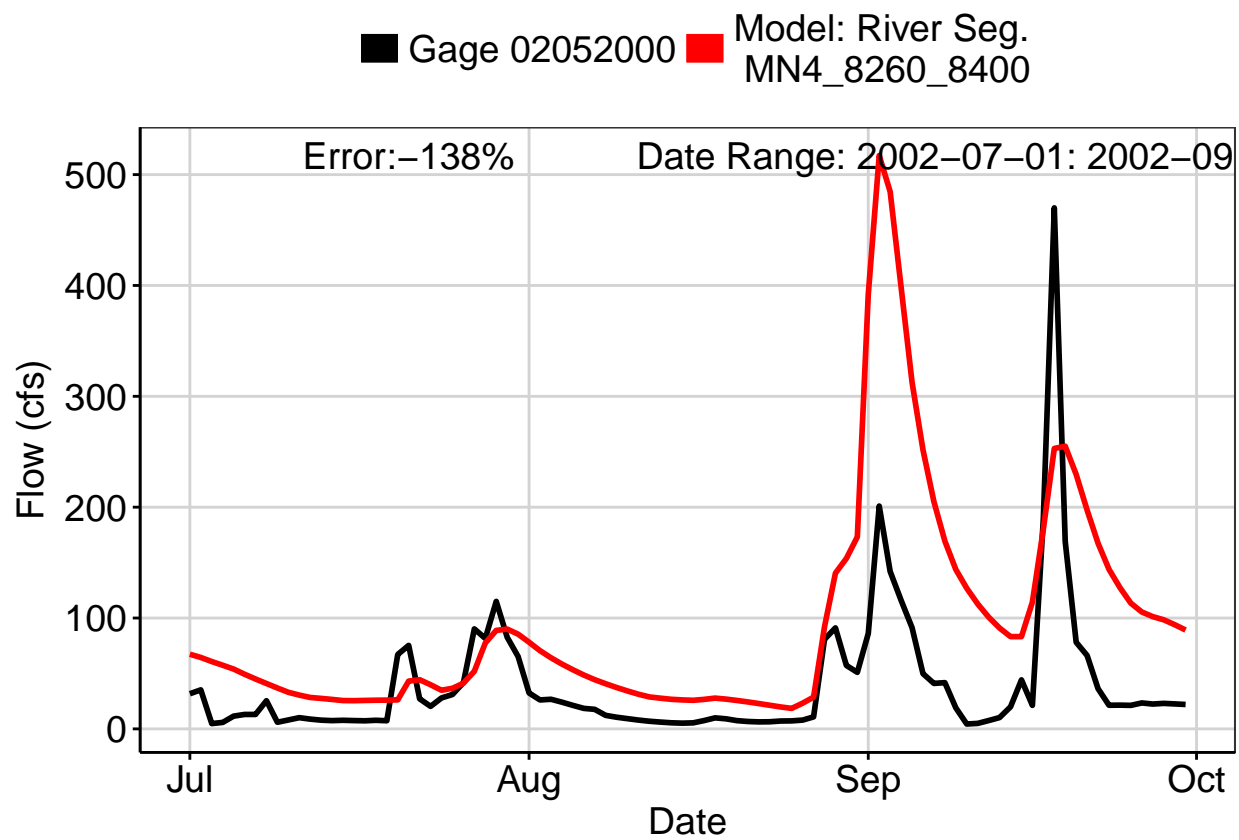
Fig. 6: Largest Error Segment

Fig. 6: Largest Error Segment

Fig. 7: Second Largest Error Segment
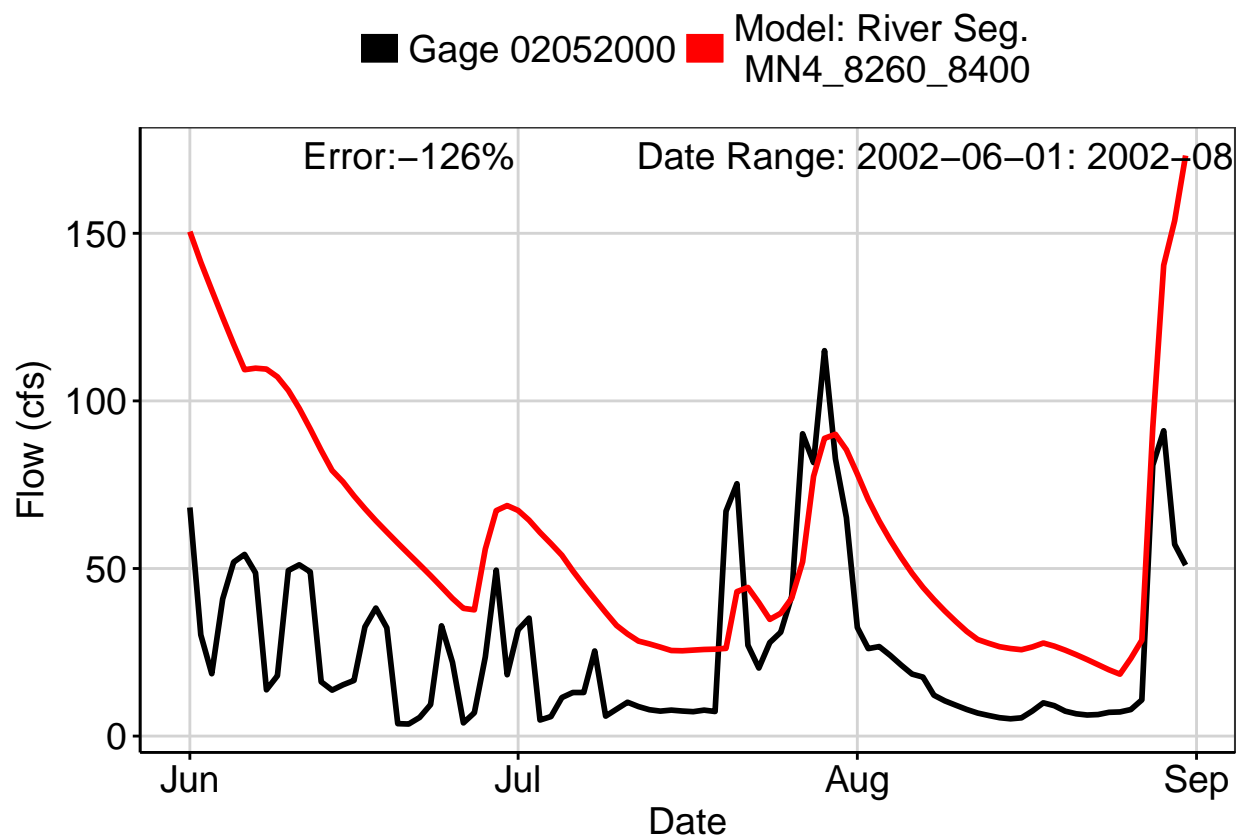
Fig. 8: Third Largest Error Segment

Gage 02052000 ■ Model: River Seg. MN4_8260_8400

Error:−104%   Date Range: 2002−08−01: 2002−10

Fig. 9: Residuals Plot