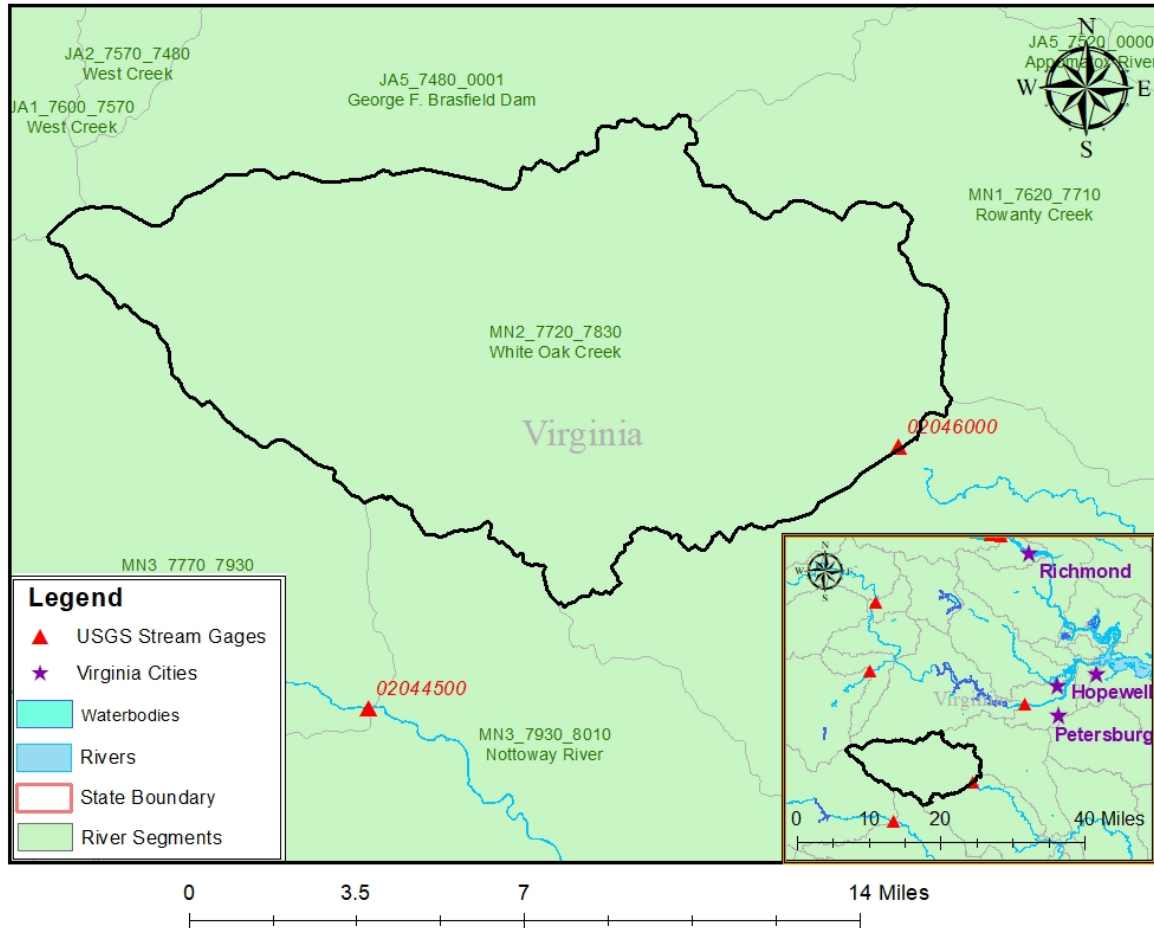# 02046000 vs. MN2_7720_7830

Daniel Hildebrand, Hailey Alspaugh, and Kelsey Reitz

July 11, 2018

This river segment follows part of the flow of the Stony Creek, a tributary of the Meherrin River. The gage is located in Dinwiddie County, VA (Lat 3704'01", Long 7736'10") approximately 15 miles southwest of Petersburg, VA. Drainage area is 113 sq. miles. This gage started taking data in 1946 and is still taking data. A few times a year there is a small increase in flow due to a release from a large pond just upstream of the gage. The average daily discharge error between the model and gage data for the 20 year timespan was 0.96%, with 53.8% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	3	4.89	-63
Feb. Low Flow	14	16.3	-16.4
Mar. Low Flow	22	20.9	5
Apr. Low Flow	34	36.3	-6.76
May Low Flow	66	64.8	1.82
Jun. Low Flow	68	57.9	14.9
Jul. Low Flow	46	35.1	23.7
Aug. Low Flow	23	21.6	6.09
Sep. Low Flow	10	11.5	-15
Oct. Low Flow	4.5	5.35	-18.9
Nov. Low Flow	2.8	6.5	-132
Dec. Low Flow	1.4	5.17	-269

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	104	103	0.96
Jan. Mean Flow	140	143	-2.14
Feb. Mean Flow	167	172	-2.99
Mar. Mean Flow	210	216	-2.86
Apr. Mean Flow	167	146	12.6
May Mean Flow	111	89.3	19.5
Jun. Mean Flow	63.1	46.5	26.3
Jul. Mean Flow	36.7	32.2	12.3
Aug. Mean Flow	52.4	67.3	-28.4
Sep. Mean Flow	81.6	105	-28.7
Oct. Mean Flow	49	49.1	-0.2
Nov. Mean Flow	79.6	76	4.52
Dec. Mean Flow	93.2	97.8	-4.94

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	55	74.8	-36
Feb. High Flow	153	158	-3.27
Mar. High Flow	227	202	11
Apr. High Flow	530	345	34.9
May High Flow	595	406	31.8
Jun. High Flow	770	1090	-41.6
Jul. High Flow	558	364	34.8
Aug. High Flow	292	238	18.5
Sep. High Flow	170	54	68.2
Oct. High Flow	86	57.3	33.4
Nov. High Flow	52	64.5	-24
Dec. High Flow	26	67.1	-158

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	0.00	3.00e-02	-Inf
Med. 1 Day Min	8.90e-01	1.53	-7.19e+01
Min. 3 Day Min	0.00	3.00e-02	-8.81e+13
Med. 3 Day Min	9.30e-01	1.80	-9.35e+01
Min. 7 Day Min	3.00e-02	4.00e-02	-4.30e+01
Med. 7 Day Min	1.08	2.43	-1.25e+02
Min. 30 Day Min	3.50e-01	4.70e-01	-3.58e+01
Med. 30 Day Min	2.25	5.36	-1.38e+02
Min. 90 Day Min	1.94	5.13	-1.64e+02
Med. 90 Day Min	1.89e+01	1.90e+01	-5.30e-01
7Q10	1.50e-01	3.80e-01	-1.48e+02
Year of 90-Day Min. Flow	2.00e+03	2.00e+03	0.00
Drought Year Mean	1.55e+01	2.73e+01	-7.61e+01
Mean Baseflow	3.74e+01	4.02e+01	-7.49

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	8400	13100	-56
Med. 1 Day Max	1970	2500	-26.9
Max. 3 Day Max	4220	4820	-14.2
Med. 3 Day Max	1390	1230	11.5
Max. 7 Day Max	2110	2330	-10.4
Med. 7 Day Max	737	706	4.21
Max. 30 Day Max	832	715	14.1
Med. 30 Day Max	346	330	4.62
Max. 90 Day Max	527	448	15
Med. 90 Day Max	224	209	6.7

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	0.47	1.14	-143
5% Non-Exceedance	1.7	3.91	-130
50% Non-Exceedance	45	44.2	1.78
95% Non-Exceedance	365	317	13.2
99% Non-Exceedance	996	983	1.31
Sept. 10% Non-Exceedance	3.65	0.95	74

Fig. 1: Hydrograph
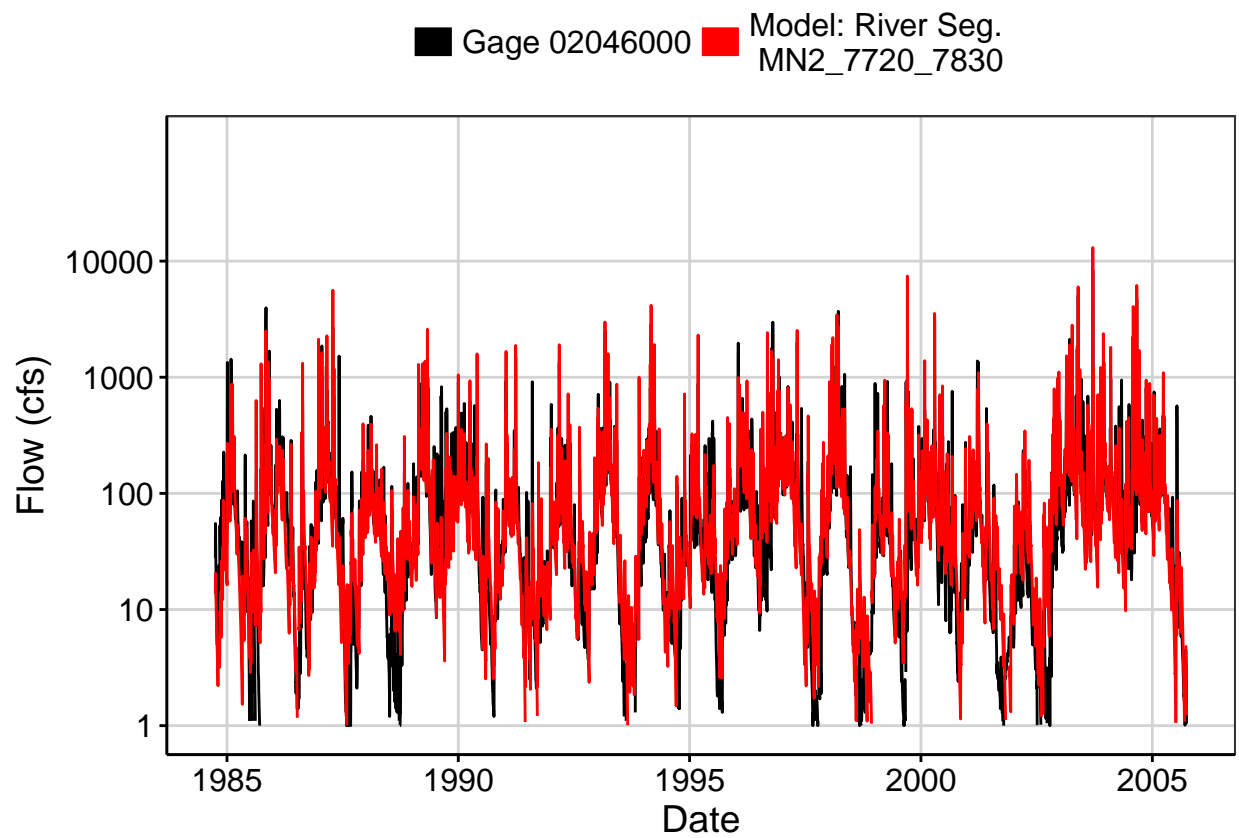
Fig. 2: Zoomed Hydrograph

■ Gage 02046000   ■ Model: River Seg.
                      MN2_7720_7830
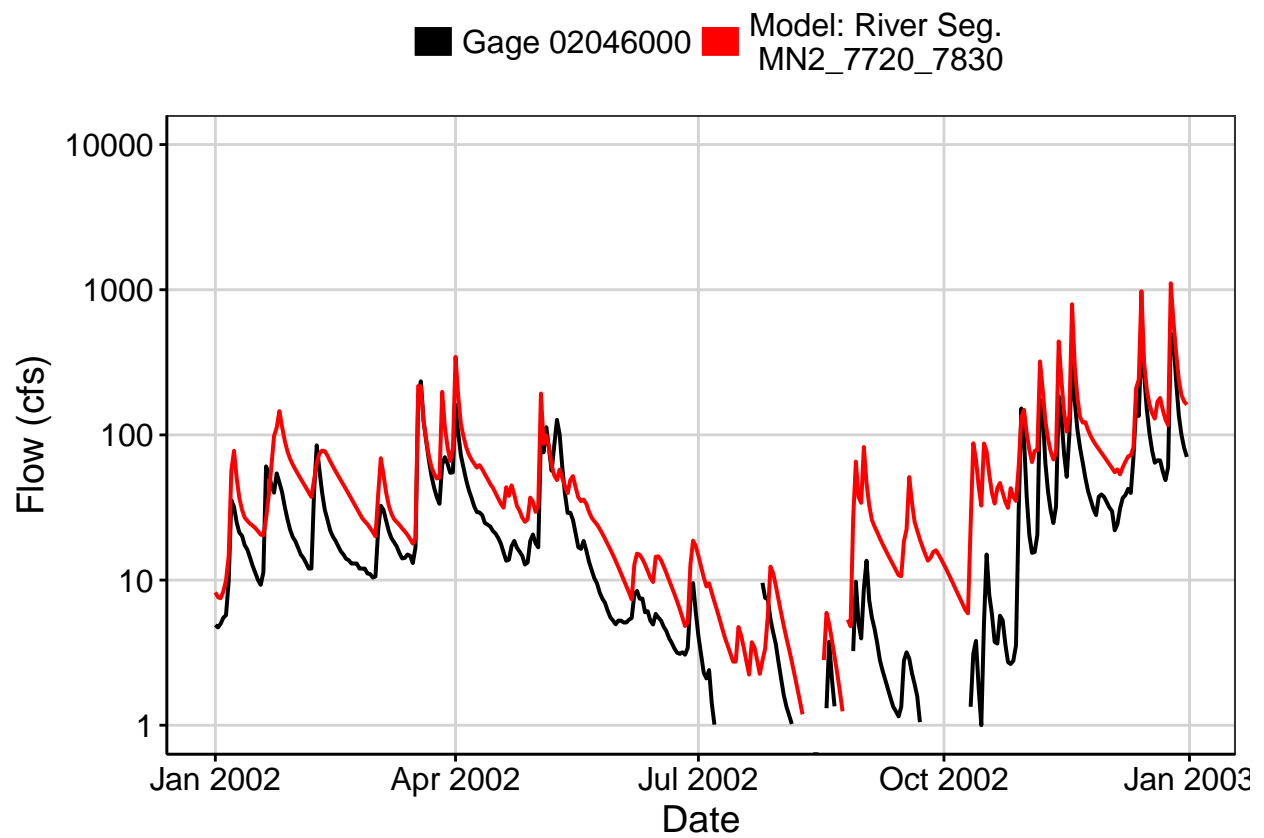
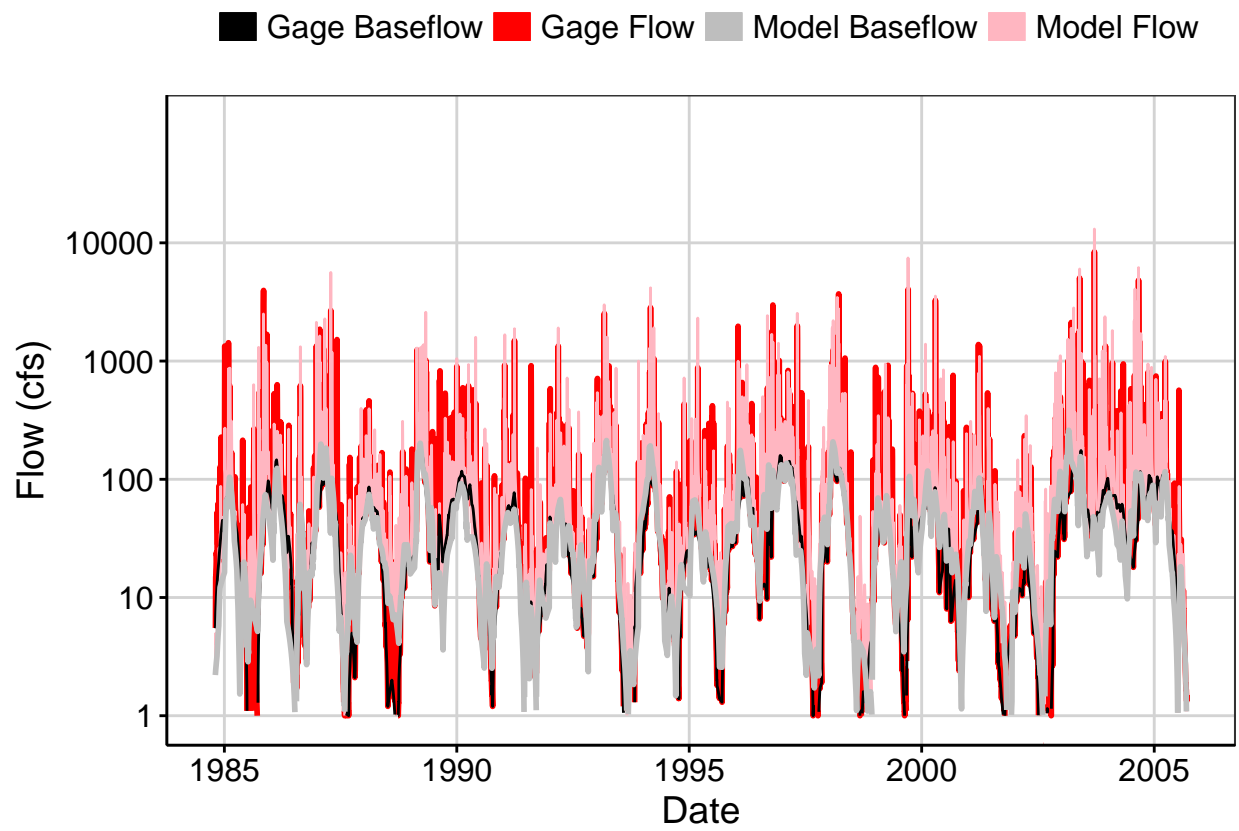# Fig. 3: Flow Exceedance
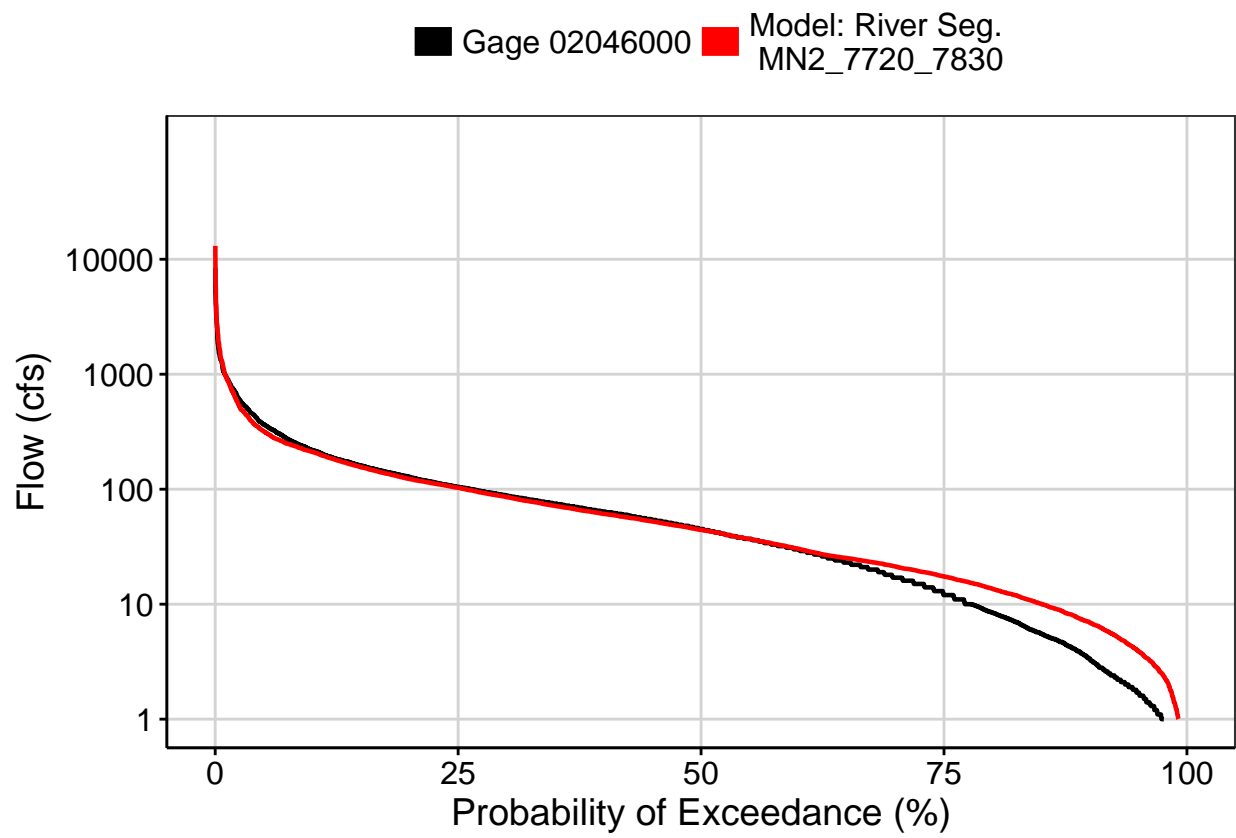
Fig. 4: Baseflow
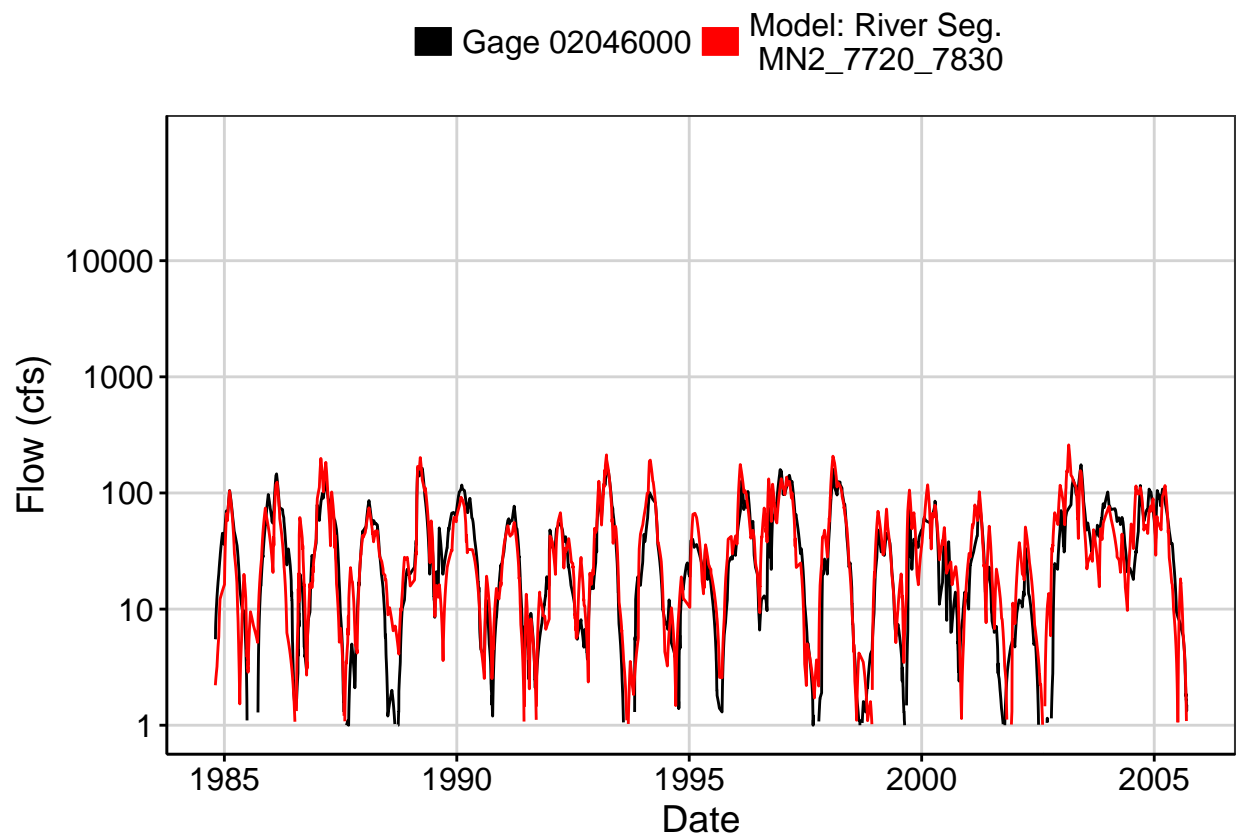
Fig. 5: Combined Baseflow
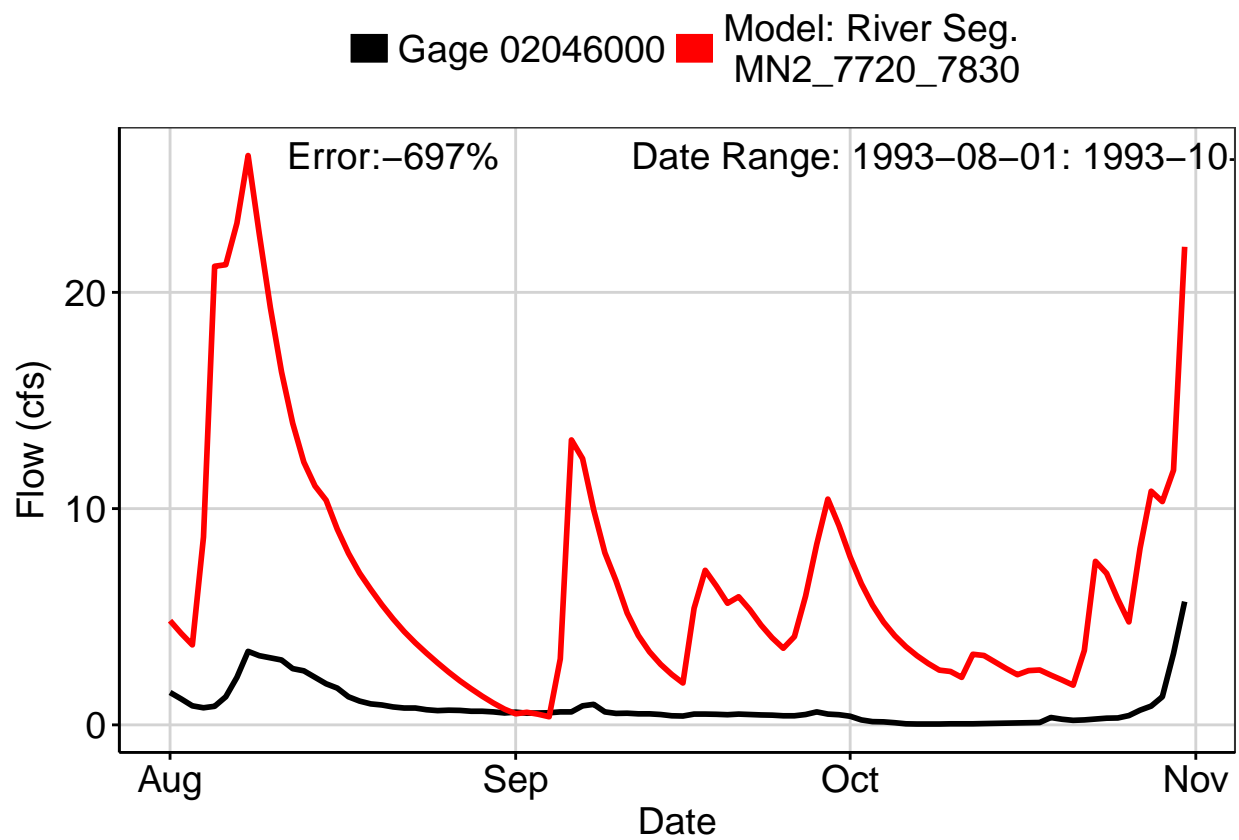
Fig. 6: Largest Error Segment

Fig. 7: Second Largest Error Segment

■ Gage 02046000 ■ Model: River Seg.
MN2_7720_7830

Error:−501%   Date Range: 2002−07−01: 2002−09−

Flow (cfs)

Date
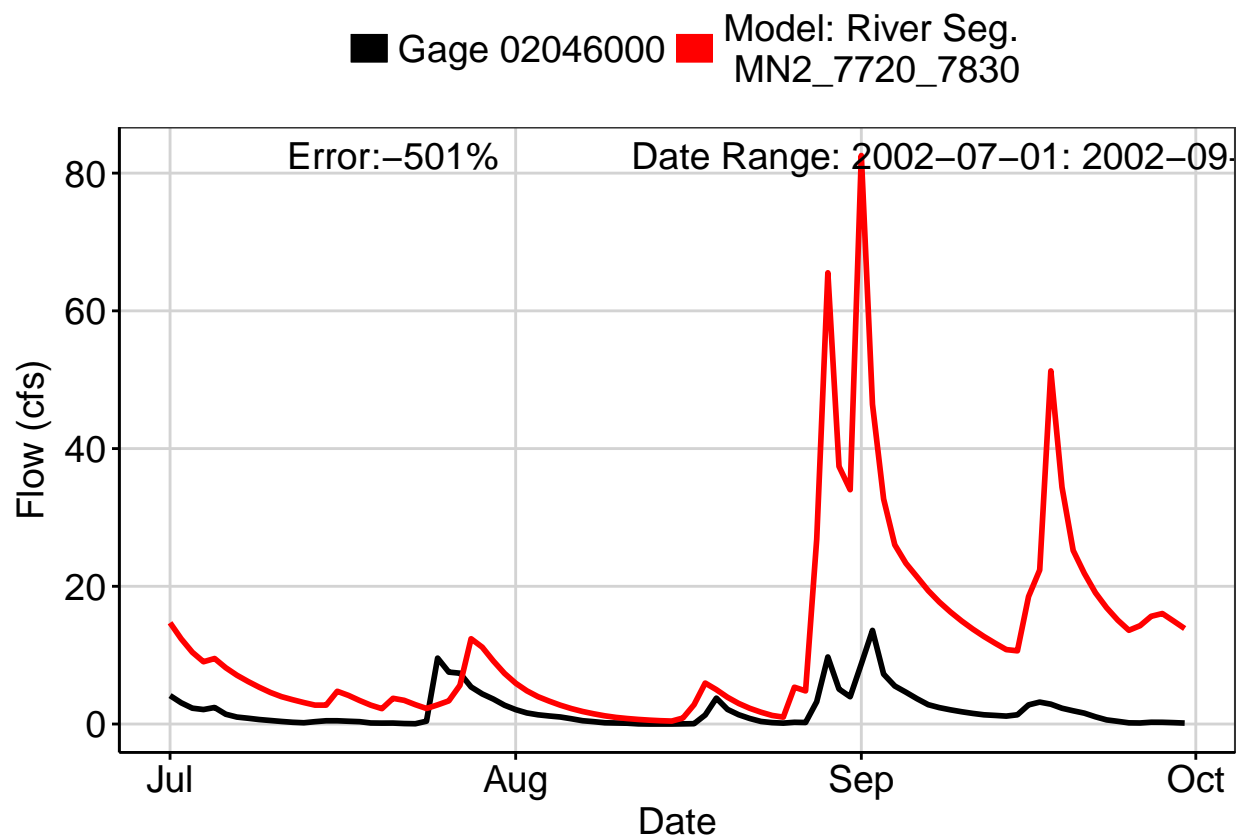
Fig. 8: Third Largest Error Segment

Gage 02046000   Model: River Seg. MN2_7720_7830

Error:−362%   Date Range: 2002−08−01: 2002−10

Fig. 9: Residuals Plot