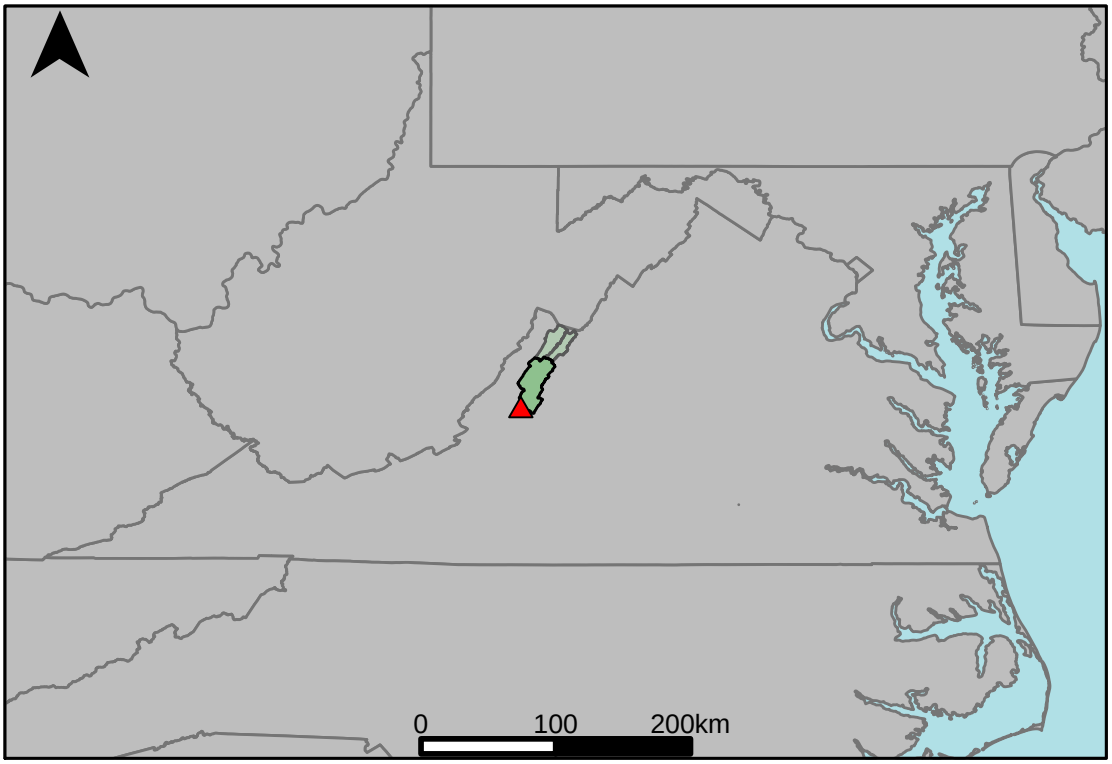
Appendix A.11: USGS Gage 02016500 vs. JU3_6650_7300 Upper James River



This river segment follows part of the flow of the James River, a tributary of the James. The gage is located in Botetourt County (Lat. 37°46'25.5", Long. -79°47'04.2"), approximately 1.8 miles southeast of Iron Gate, VA. Drainage area is 1371 sq. miles. This gage started taking data in 1925 and is still taking data. Flow has been regulated since December 1979 by Lake Moomaw (station 02011795) 43.7 mi upstream; since October 1984 by Back Creek Lake 71.7 mi upstream; and since January 1985 by Little Back Creek Lake 74.8 mi upstream, amounts unknown. The average daily discharge error between the model and gage data for the 20 year timespan was -5.33%, with 42.5% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	362	282	-22.1
Feb. Low Flow	404	473	17.1
Mar. Low Flow	514	679	32.1
Apr. Low Flow	600	864	44
May Low Flow	769	1010	31.3
Jun. Low Flow	1240	1220	-1.61
Jul. Low Flow	965	952	-1.35
Aug. Low Flow	766	631	-17.6
Sep. Low Flow	580	355	-38.8
Oct. Low Flow	531	280	-47.3
Nov. Low Flow	493	227	-54
Dec. Low Flow	431	194	-55

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	1690	1780	5.33
Jan. Mean Flow	2130	2290	7.51
Feb. Mean Flow	2420	2990	23.6
Mar. Mean Flow	3280	3430	4.57
Apr. Mean Flow	2690	2430	-9.67
May Mean Flow	2250	1990	-11.6
Jun. Mean Flow	1410	1330	-5.67
Jul. Mean Flow	774	740	-4.39
Aug. Mean Flow	668	684	2.4
Sep. Mean Flow	985	1240	25.9
Oct. Mean Flow	717	854	19.1
Nov. Mean Flow	1490	1770	18.8
Dec. Mean Flow	1570	1670	6.37

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	775	1230	58.7
Feb. High Flow	3170	4290	35.3
Mar. High Flow	5570	3980	-28.5
Apr. High Flow	6710	6150	-8.35
May High Flow	4910	6620	34.8
Jun. High Flow	8970	11800	31.5
Jul. High Flow	7480	7220	-3.48
Aug. High Flow	5900	6110	3.56
Sep. High Flow	1780	2850	60.1
Oct. High Flow	1220	1870	53.3
Nov. High Flow	1070	1380	29
Dec. High Flow	833	1430	71.7

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	250	94.9	-62
Med. 1 Day Min	358	169	-52.8
Min. 3 Day Min	252	98.4	-61
Med. 3 Day Min	362	173	-52.2
Min. 7 Day Min	260	100	-61.5
Med. 7 Day Min	369	183	-50.4
Min. 30 Day Min	297	120	-59.6
Med. 30 Day Min	407	278	-31.7
Min. 90 Day Min	380	213	-43.9
Med. 90 Day Min	587	504	-14.1
7Q10	305	114	-62.6
Year of 90-Day Min. Flow	2002	1999	100
Drought Year Mean	863	962	11.5
Mean Baseflow	844	854	1.18

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	67500	137000	103
Med. 1 Day Max	19200	24600	28.1
Max. 3 Day Max	41200	68000	65
Med. 3 Day Max	13800	16900	22.5
Max. 7 Day Max	22400	33000	47.3
Med. 7 Day Max	10600	9680	-8.68
Max. 30 Day Max	9590	9780	1.98
Med. 30 Day Max	4840	5310	9.71
Max. 90 Day Max	5480	6430	17.3
Med. 90 Day Max	3250	3320	2.15

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	332	131	-60.5
5% Non-Exceedance	375	196	-47.7
50% Non-Exceedance	872	1010	15.8
95% Non-Exceedance	5980	5820	-2.68
99% Non-Exceedance	12100	13500	11.6
Sept. 10% Non-Exceedance	394	173	-56.1

Fig. 1: Hydrograph

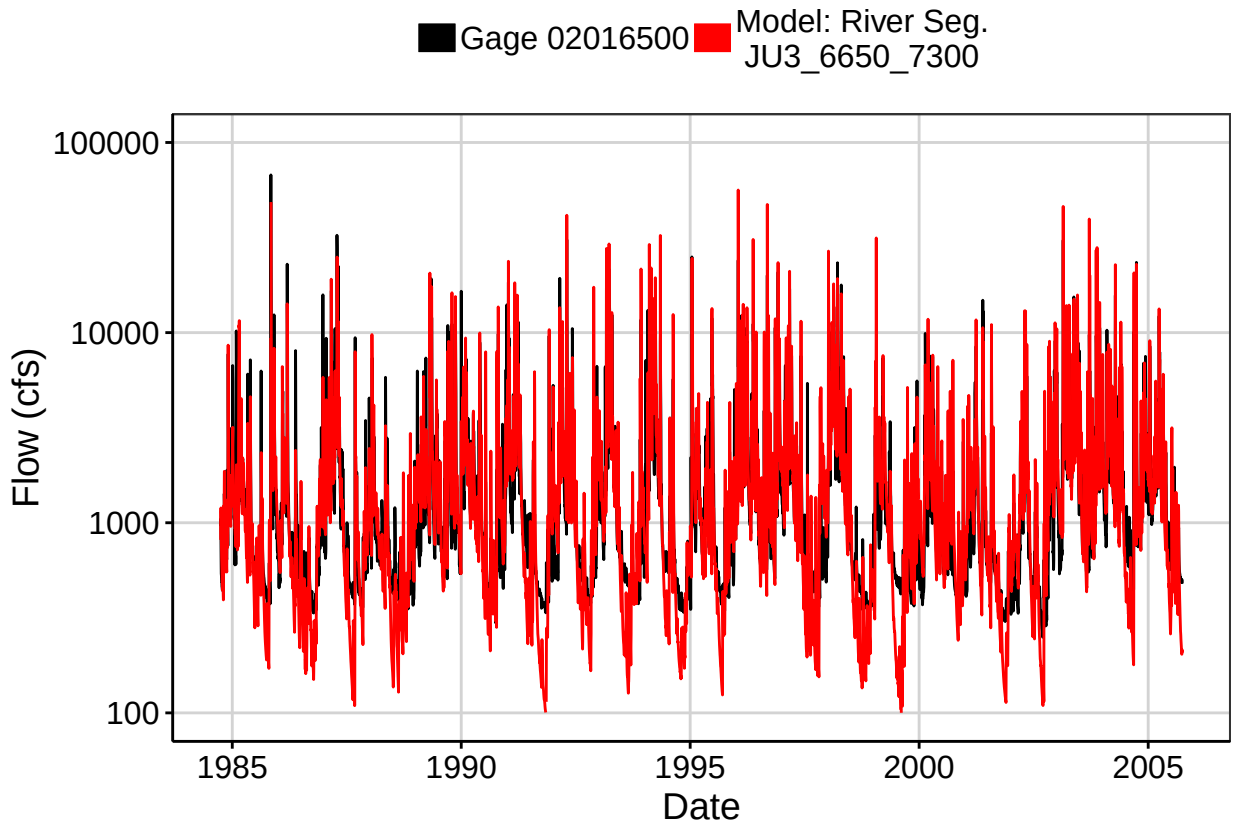


Fig. 2: Zoomed Hydrograph

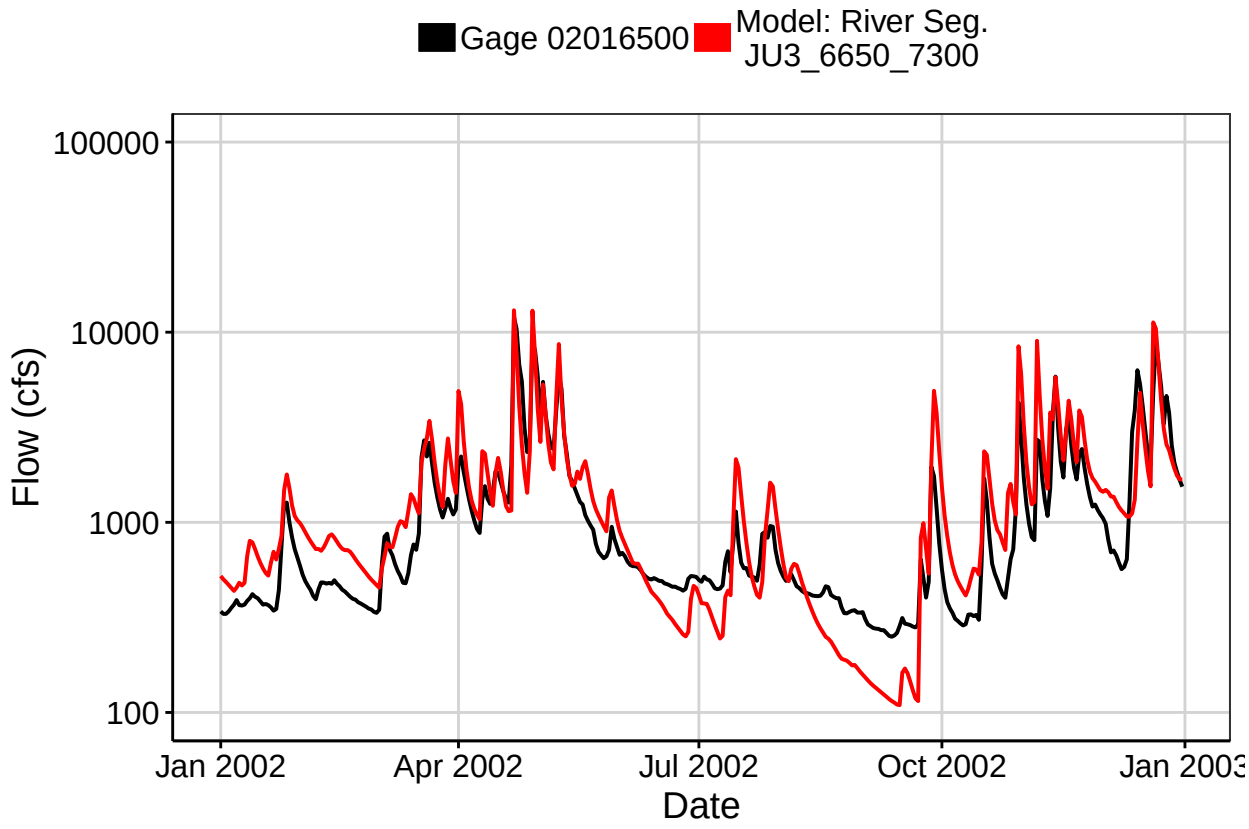


Fig. 3: Flow Exceedance

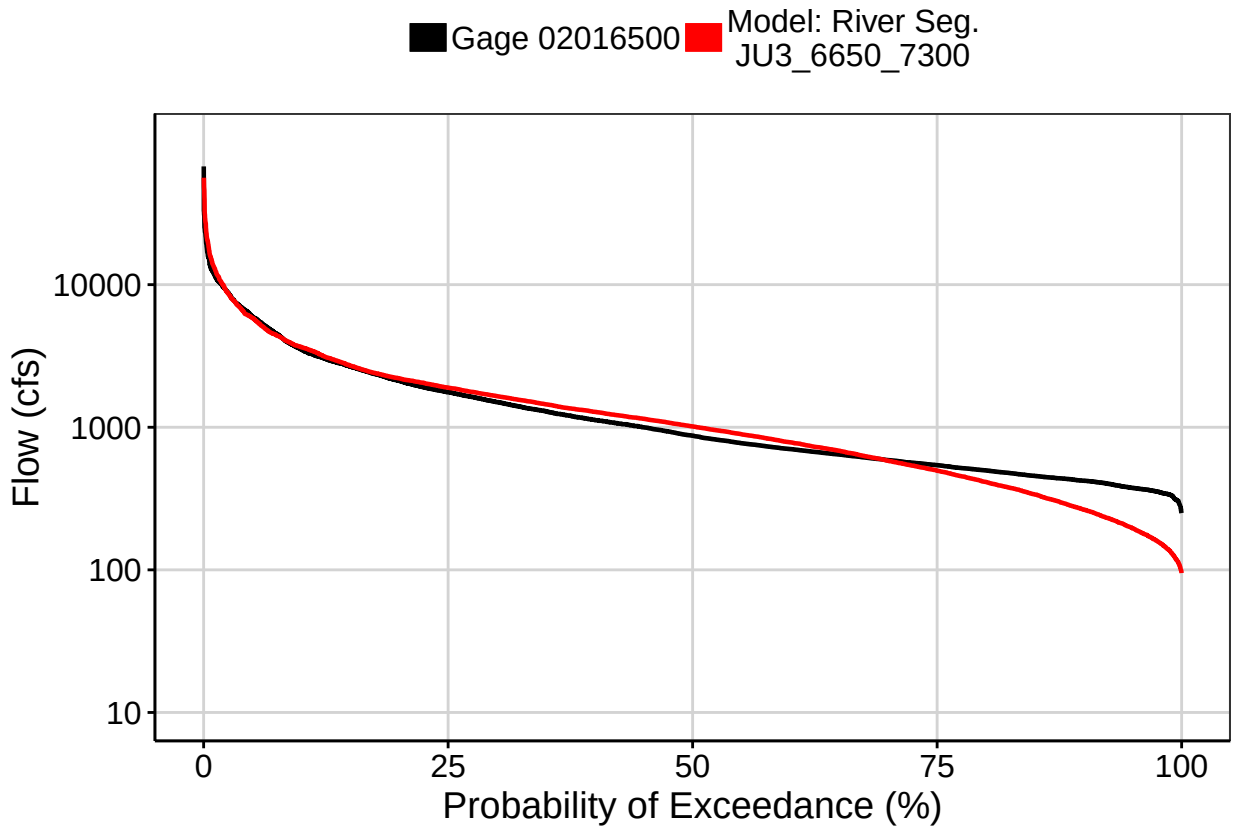


Fig. 4: Baseflow

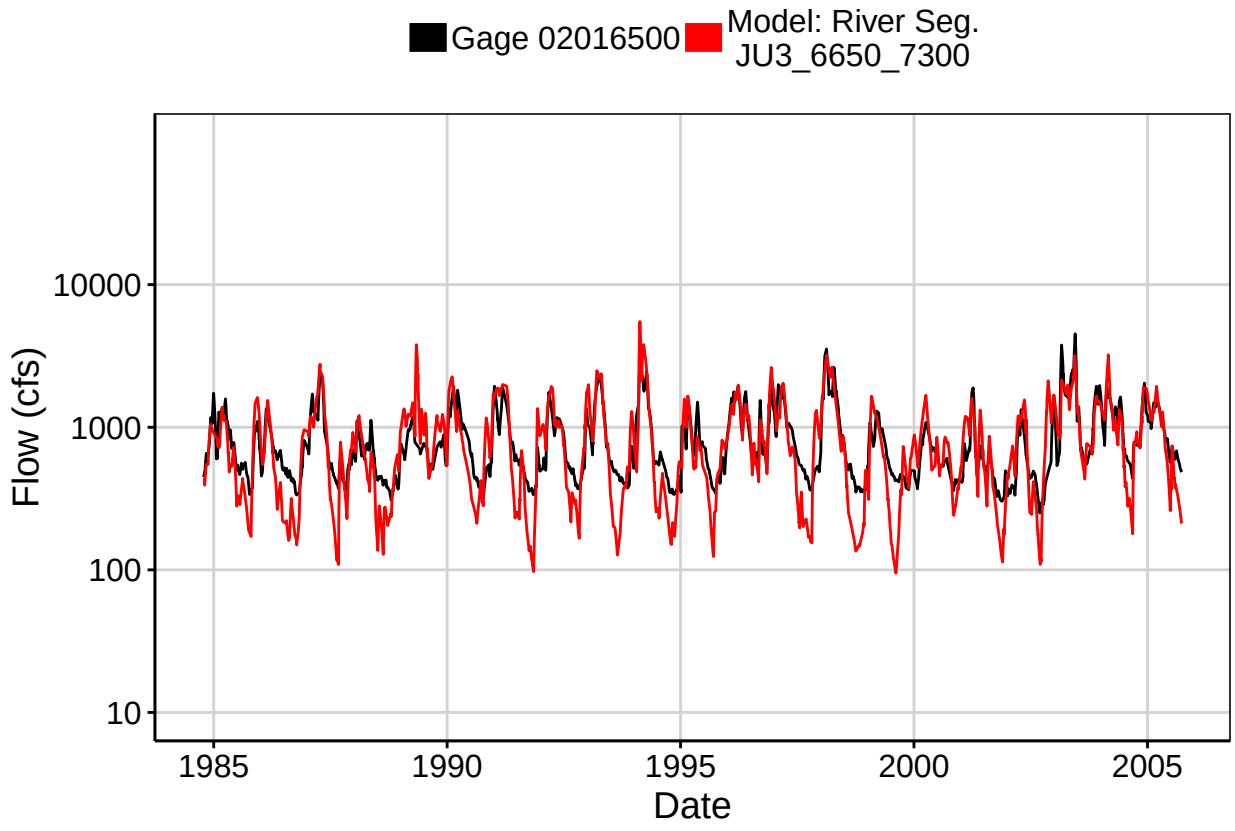


Fig. 5: Combined Baseflow

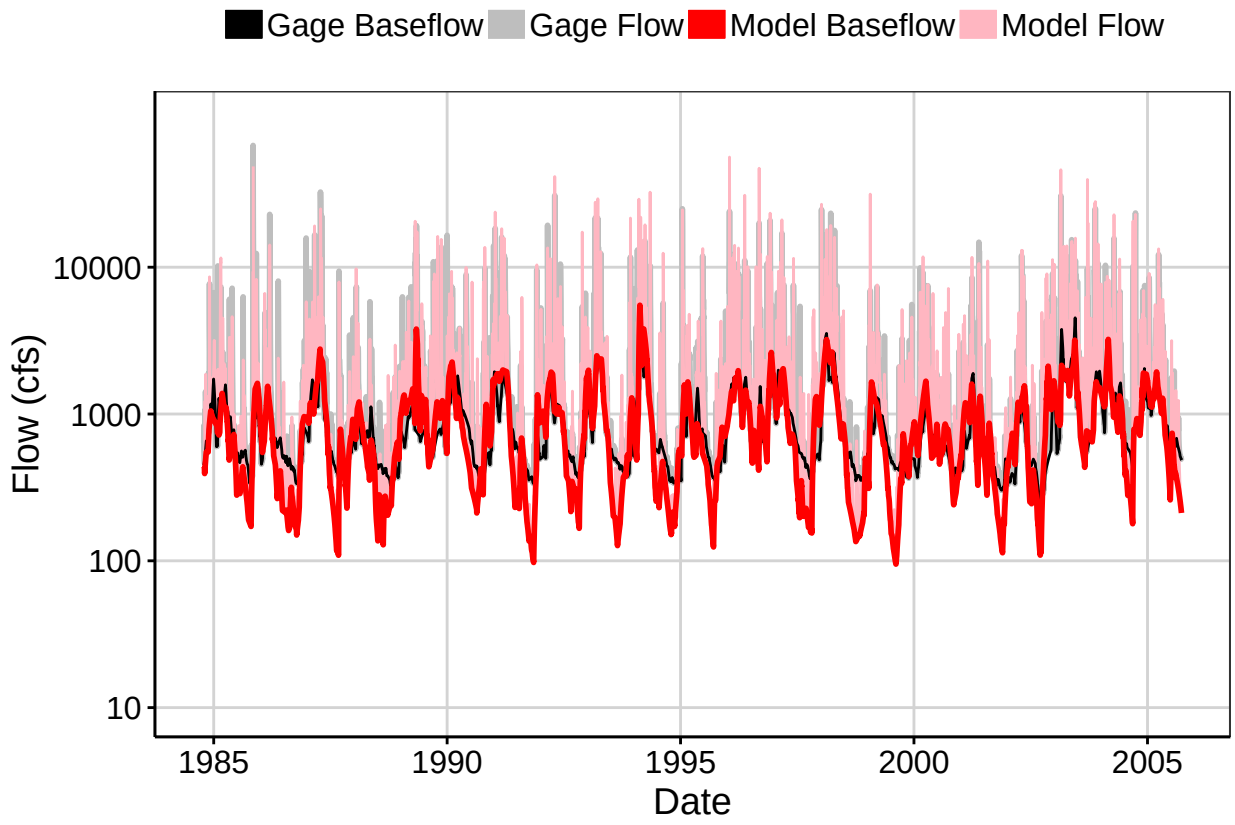


Fig. 6: Largest Error Segment

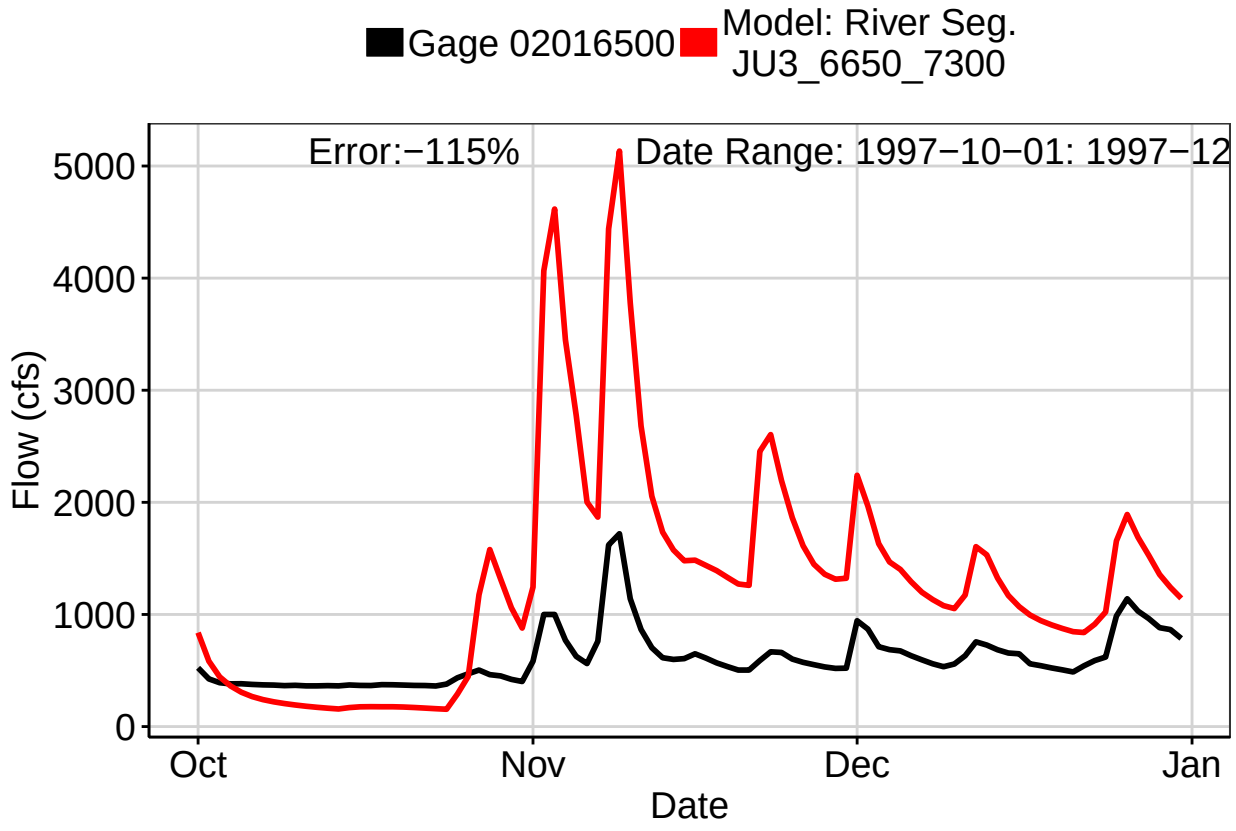


Fig. 7: Second Largest Error Segment

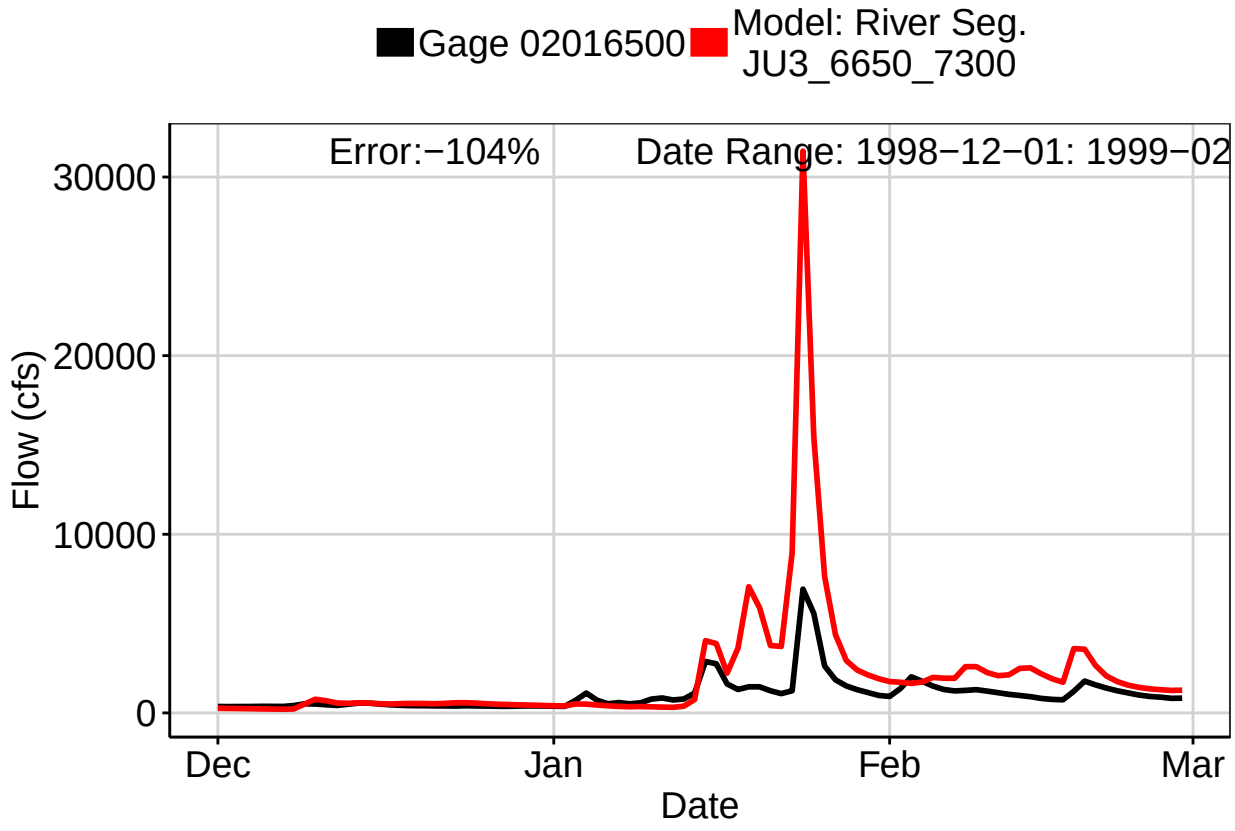


Fig. 8: Third Largest Error Segment

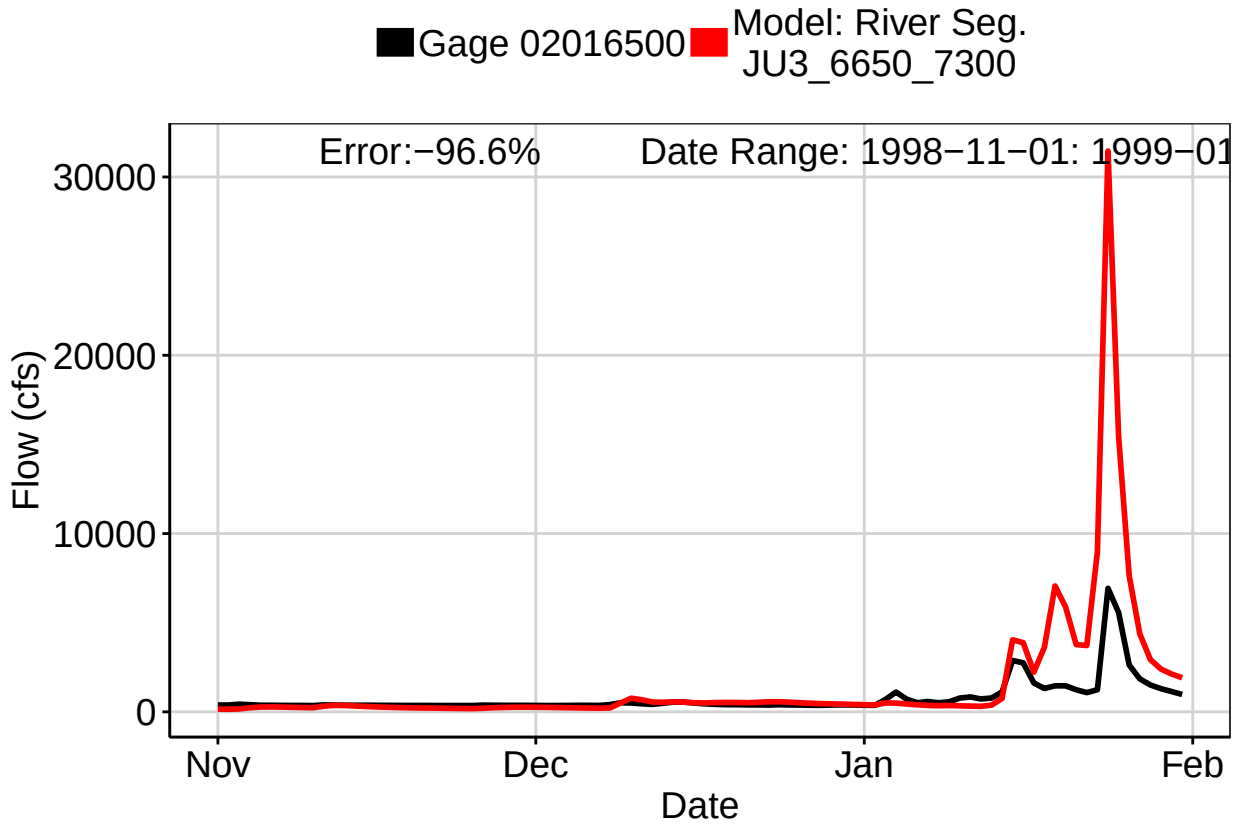


Fig. 9: Residuals Plot