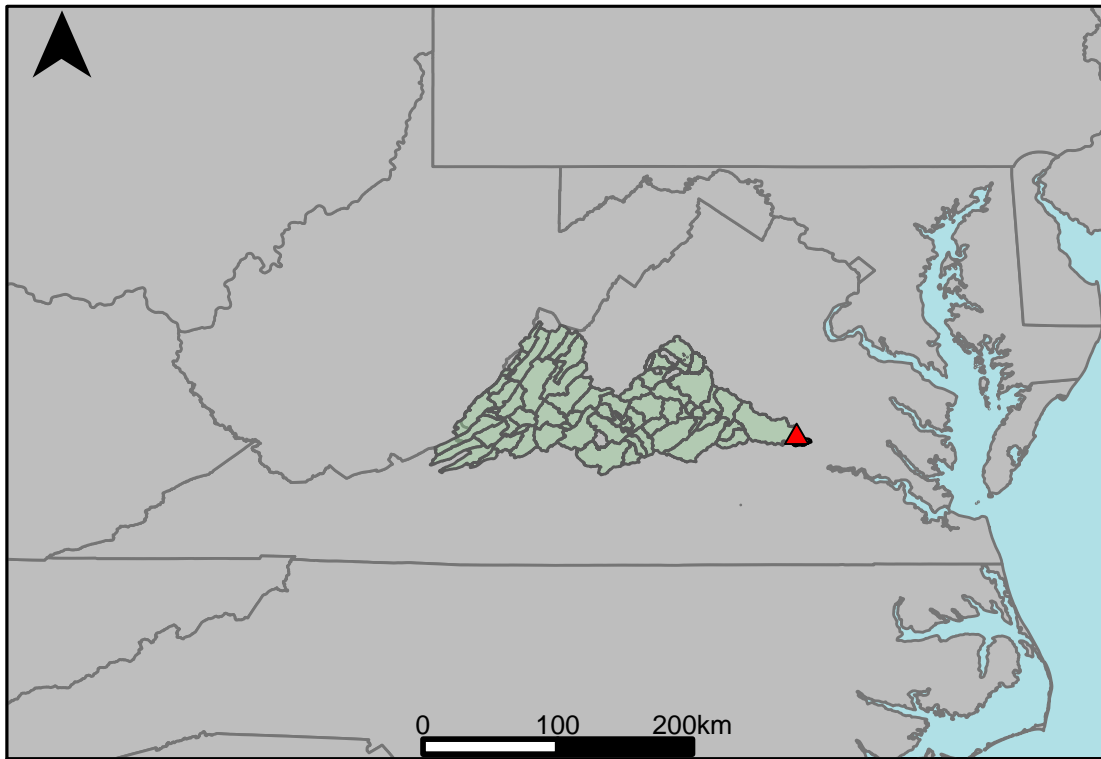


# Appendix A.34: USGS Gage 02037500 vs. JL7\_7070\_0001 Lower James River



This river segment follows part of the flow of the James River, a tributary of the James. The gage is located in Henrico County (Lat. 37°33'47.5", Long. -77°32'49.0"), approximately 4.5 miles northwest of Richmond, VA. Drainage area is 6753 sq. miles. This gage started taking data in 1934 and is still taking data. Diversions of 40 cfs to 90 cfs occur from the river downstream of the gage except during periods of low flow. Flow is regulated by powerplants upstream. Above 18.2 ft stage, there is interchange of flow with James River and Kanawha Canal. Records of daily discharge include diversions by the city of Richmond but do not include flow in the James River and Kanawha Canal (station 02037000) which diverts around this station. Since 1982, low flows during summer months are augmented by releases from Lake Moomaw. The average daily discharge error between the model and gage data for the 20 year timespan was -1.76%, with 21.7% of its rolling three month time spans above 20% error.

**Table 1: Monthly Low Flows**

	USGS Gage	Model	Pct. Error
Jan. Low Flow	1260	1380	9.52
Feb. Low Flow	1810	2040	12.7
Mar. Low Flow	3060	3630	18.6
Apr. Low Flow	3420	4660	36.3
May Low Flow	4740	5890	24.3
Jun. Low Flow	5650	5840	3.36
Jul. Low Flow	5310	4540	-14.5
Aug. Low Flow	4040	3470	-14.1
Sep. Low Flow	2170	2330	7.37
Oct. Low Flow	1610	1360	-15.5
Nov. Low Flow	1410	1340	-4.96
Dec. Low Flow	1070	1060	-0.94

**Table 2: Monthly Average Flows**

	USGS Gage	Model	Pct. Error
Overall Mean Flow	7400	7530	1.76
Jan. Mean Flow	9800	9370	-4.39
Feb. Mean Flow	10700	11700	9.35
Mar. Mean Flow	12900	13300	3.1
Apr. Mean Flow	11400	10900	-4.39
May Mean Flow	8770	8040	-8.32
Jun. Mean Flow	5980	6110	2.17
Jul. Mean Flow	3600	3850	6.94
Aug. Mean Flow	2880	3130	8.68
Sep. Mean Flow	4810	5590	16.2
Oct. Mean Flow	3840	4600	19.8
Nov. Mean Flow	6620	6780	2.42
Dec. Mean Flow	7680	7350	-4.3

**Table 3: Monthly High Flows**

	USGS Gage	Model	Pct. Error
Jan. High Flow	4270	4510	5.62
Feb. High Flow	19400	12200	-37.1
Mar. High Flow	19300	12100	-37.3
Apr. High Flow	22900	16600	-27.5
May High Flow	20000	13500	-32.5
Jun. High Flow	30000	25600	-14.7
Jul. High Flow	30400	28200	-7.24
Aug. High Flow	13700	11500	-16.1
Sep. High Flow	7870	9990	26.9
Oct. High Flow	6240	5060	-18.9
Nov. High Flow	4570	3490	-23.6
Dec. High Flow	4700	3460	-26.4

**Table 4: Period Low Flows**

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	328	279	-14.9
Med. 1 Day Min	913	832	-8.87
Min. 3 Day Min	346	279	-19.4
Med. 3 Day Min	997	858	-13.9
Min. 7 Day Min	392	283	-27.8
Med. 7 Day Min	1130	891	-21.2
Min. 30 Day Min	652	341	-47.7
Med. 30 Day Min	1430	1380	-3.5
Min. 90 Day Min	799	788	-1.38
Med. 90 Day Min	2200	2240	1.82
7Q10	569	424	-25.5
Year of 90-Day Min. Flow	2002	1999	100
Drought Year Mean	2110	2100	-0.47
Mean Baseflow	4120	4640	12.6

**Table 5: Period High Flows**

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	206000	156000	-24.3
Med. 1 Day Max	70100	52500	-25.1
Max. 3 Day Max	160000	134000	-16.2
Med. 3 Day Max	58100	46100	-20.7
Max. 7 Day Max	100000	88300	-11.7
Med. 7 Day Max	41700	33500	-19.7
Max. 30 Day Max	38800	38100	-1.8
Med. 30 Day Max	21000	19100	-9.05
Max. 90 Day Max	28300	28300	0
Med. 90 Day Max	14300	14000	-2.1

**Table 6: Non-Exceedance Flows**

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	659	465	-29.4
5% Non-Exceedance	1070	809	-24.4
50% Non-Exceedance	4520	4970	9.96
95% Non-Exceedance	22500	23400	4
99% Non-Exceedance	48800	46000	-5.74
Sept. 10% Non-Exceedance	983	821	-16.5

**Fig. 1: Hydrograph**

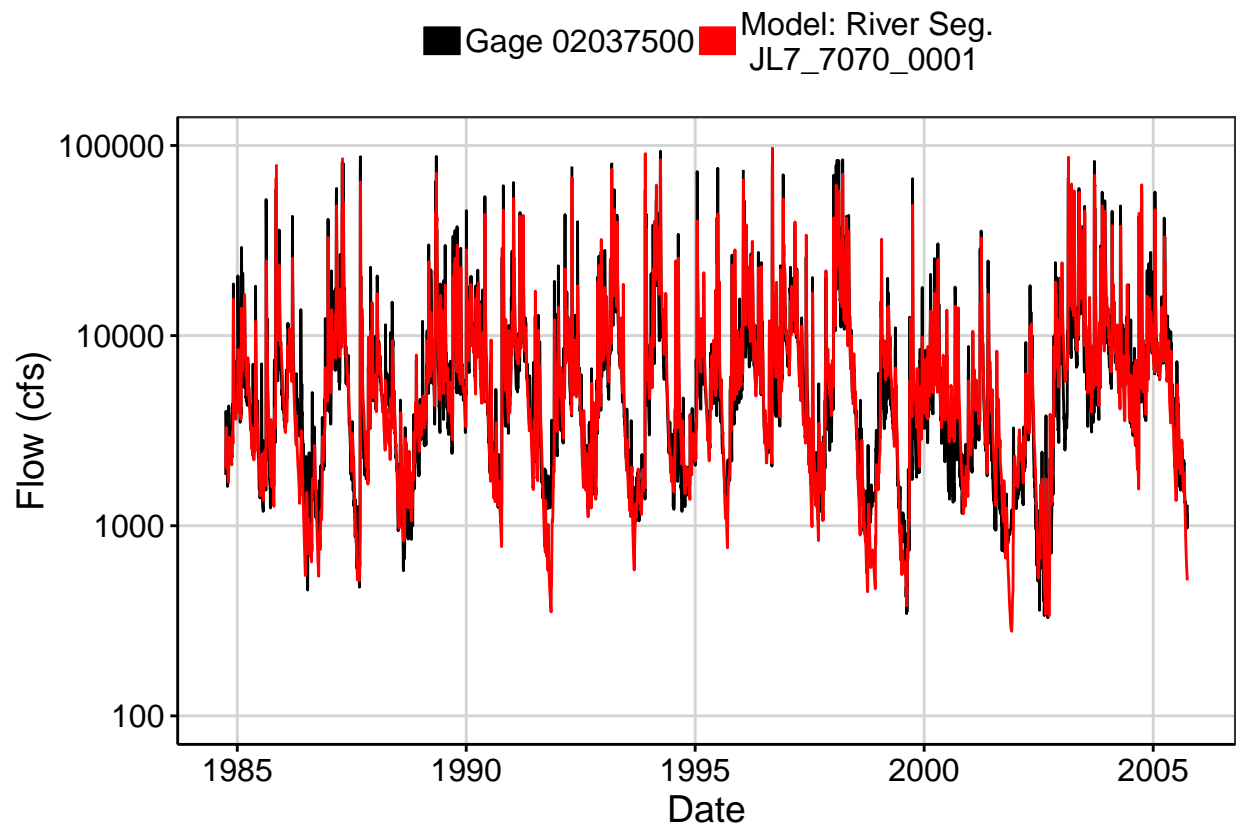


Fig. 2: Zoomed Hydrograph

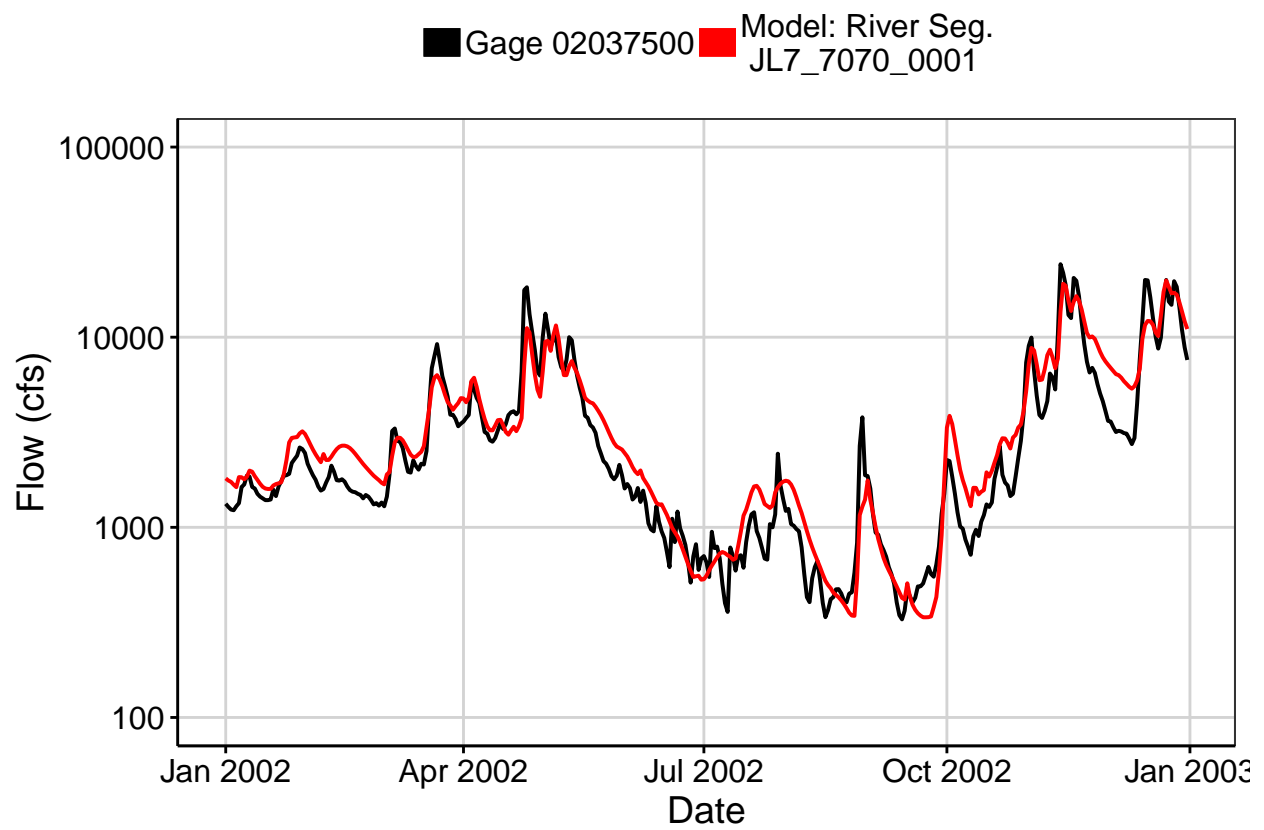


Fig. 3: Flow Exceedance

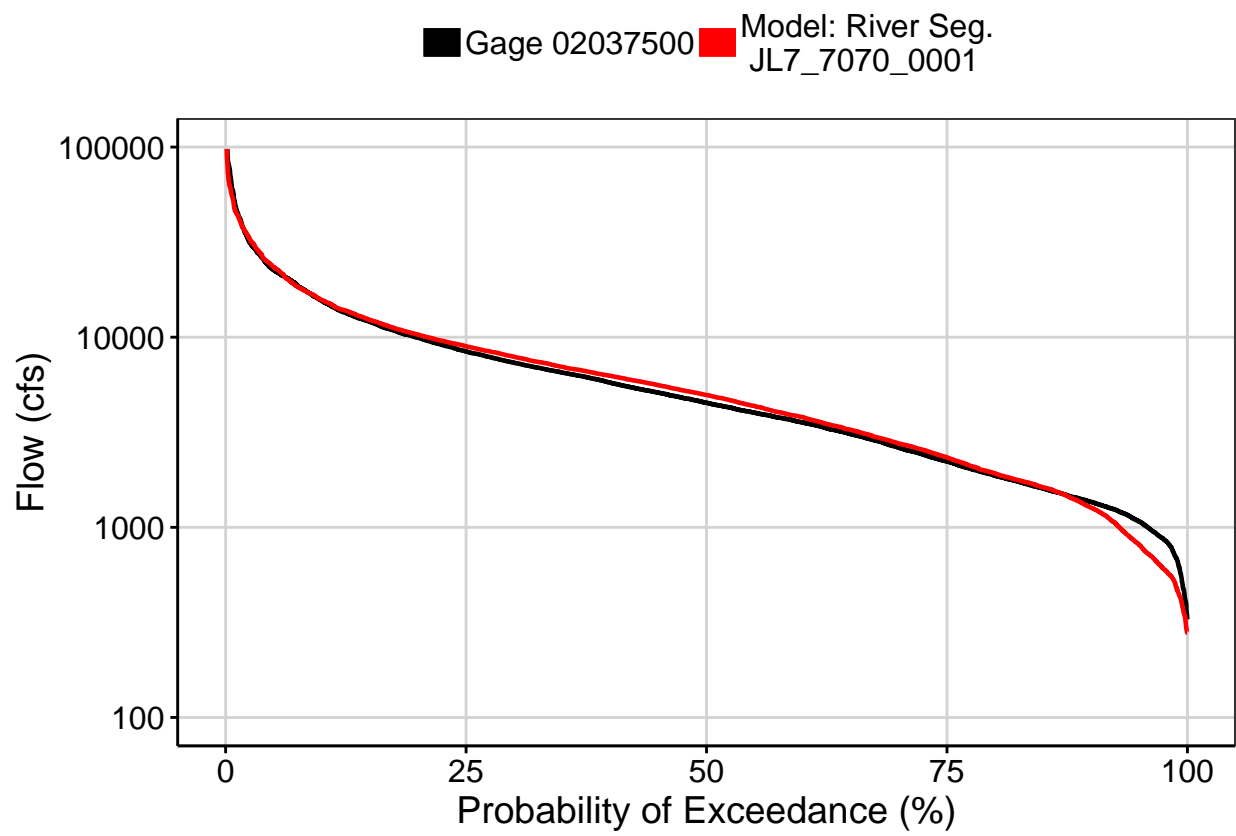


Fig. 4: Baseflow

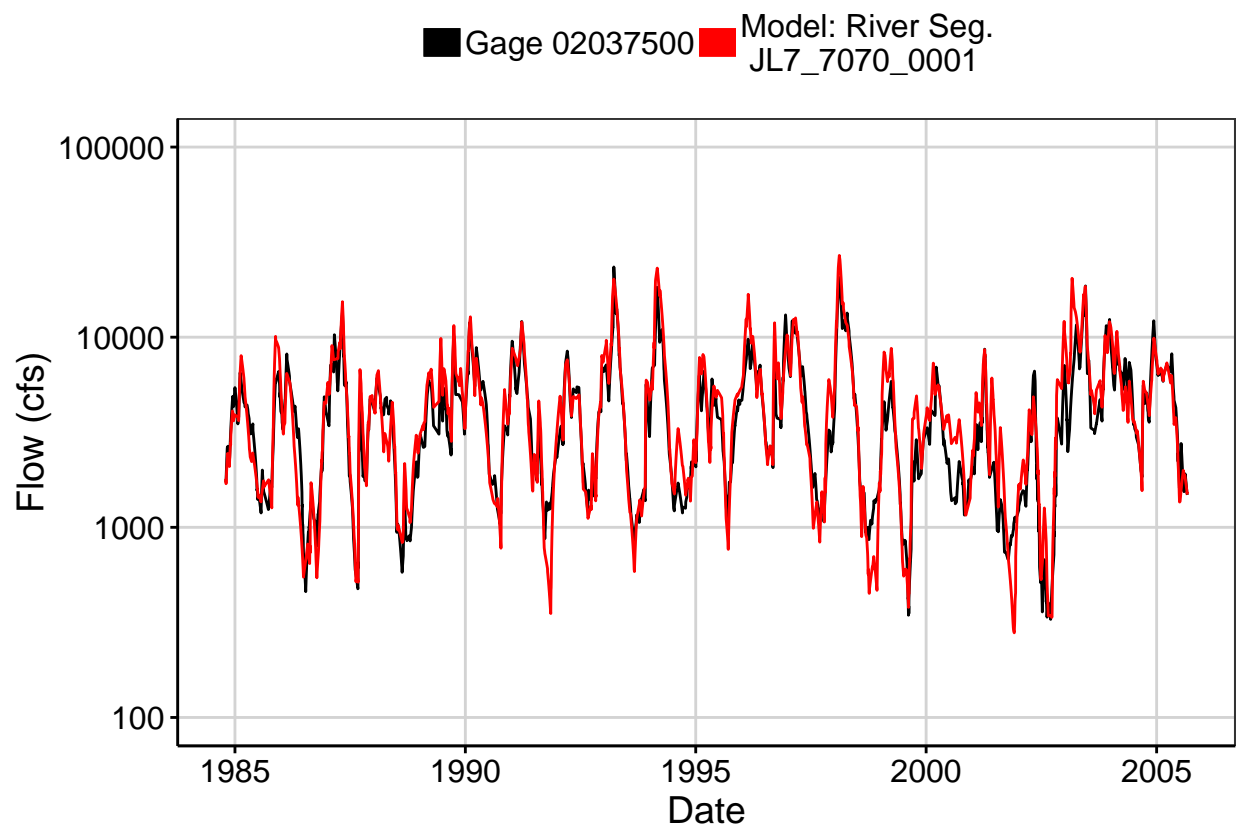


Fig. 5: Combined Baseflow

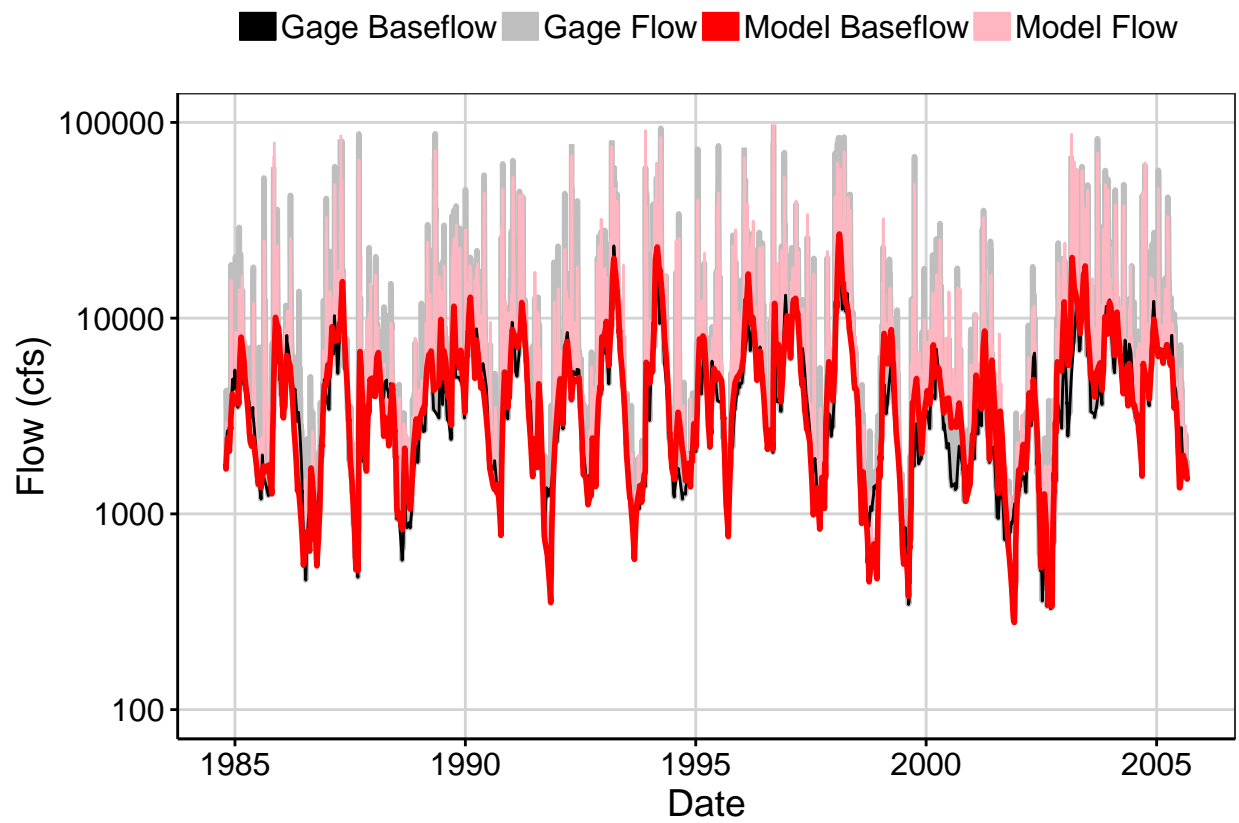




Fig. 6: Largest Error Segment

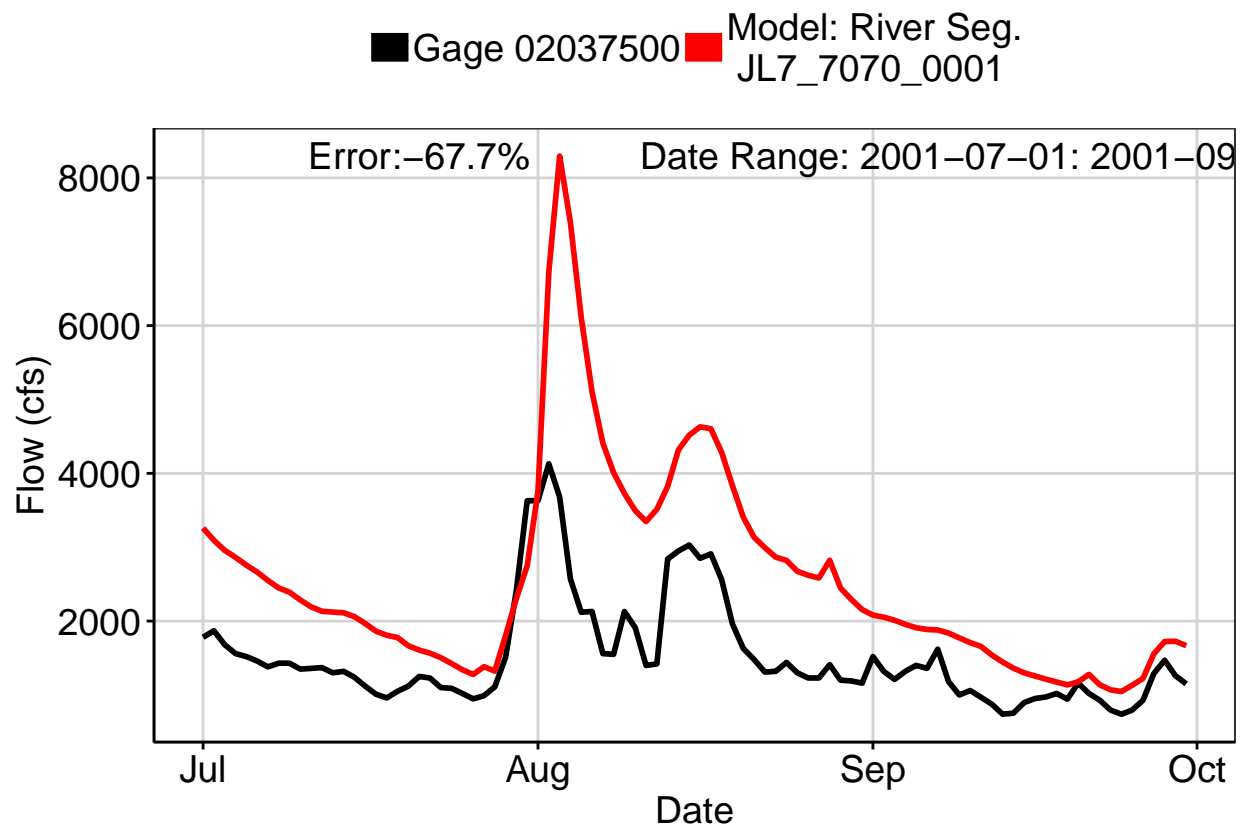


Fig. 7: Second Largest Error Segment

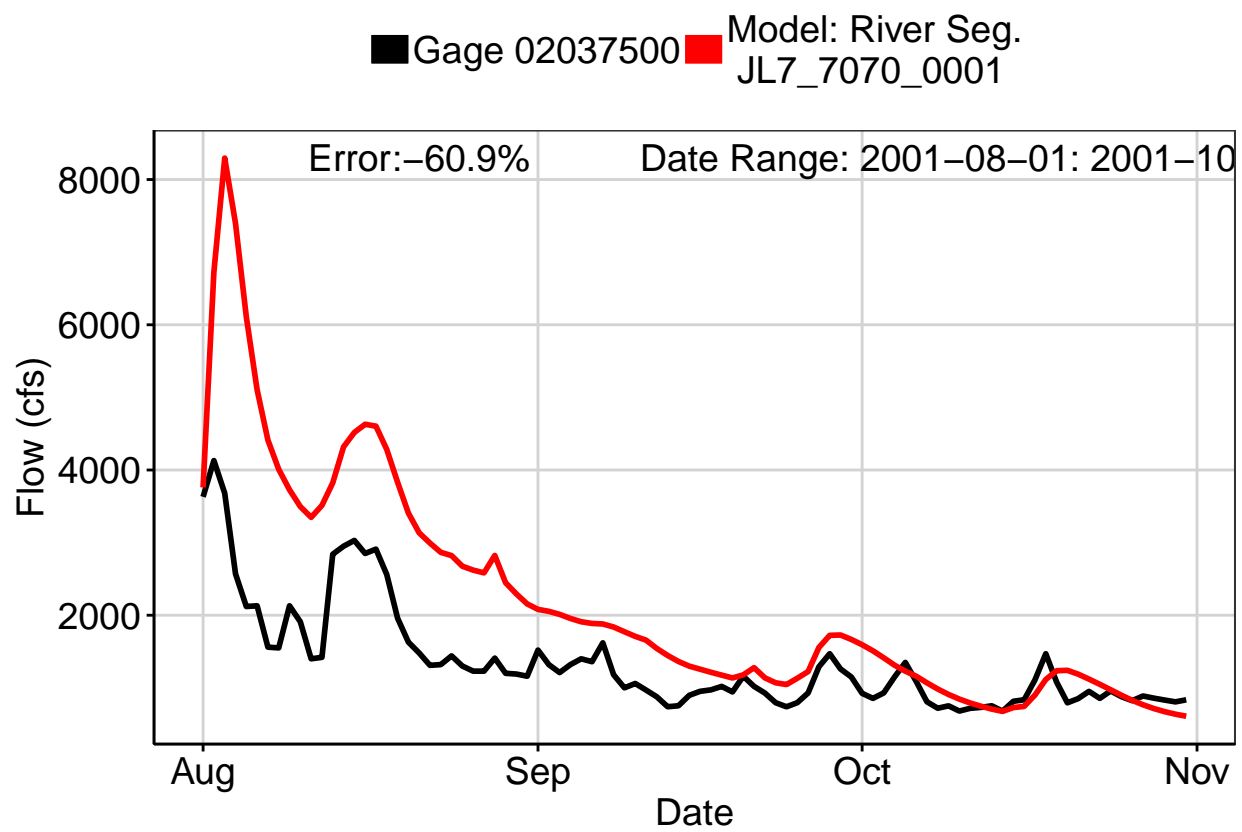


Fig. 8: Third Largest Error Segment

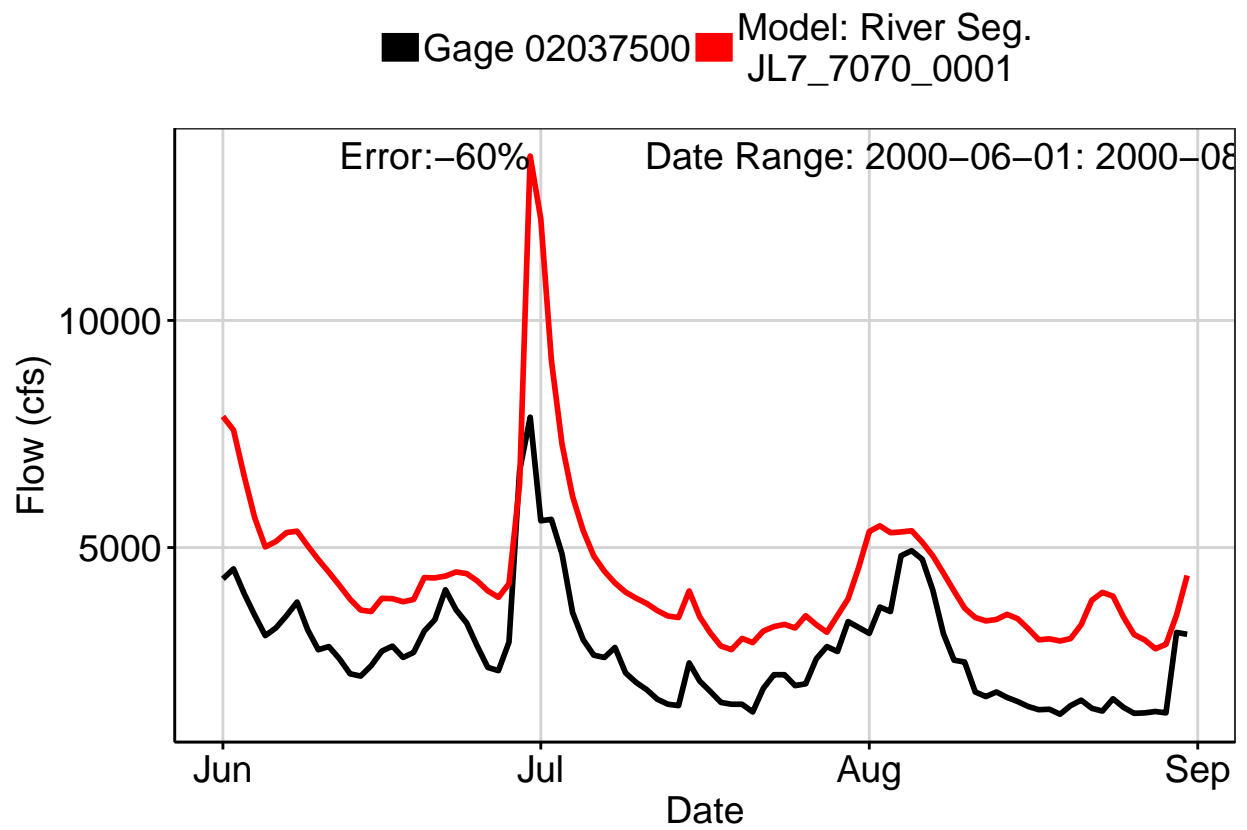


Fig. 9: Residuals Plot

