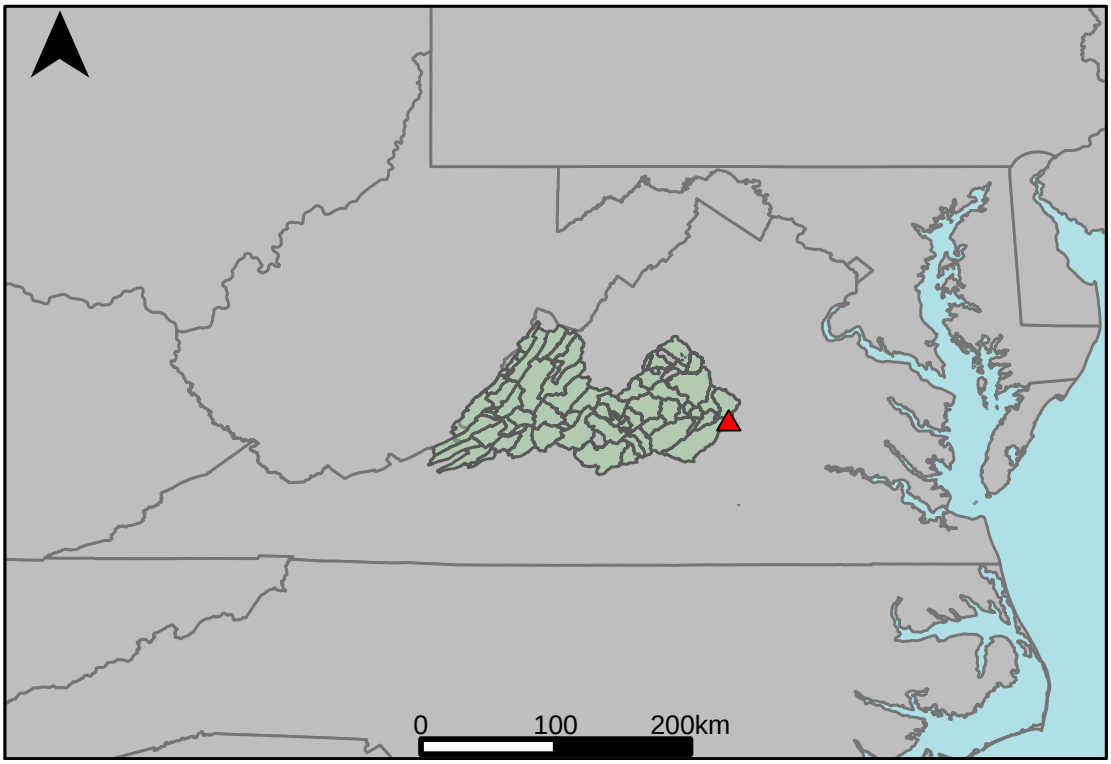
Appendix A.32: USGS Gage 02035000 vs. JL7_7100_7030 Lower James River



This river segment follows part of the flow of the James River, a tributary of the James. The gage is located in Goochland County (Lat. 37°40'15.5", Long. -78°05'09.0"), approximately 7 miles southeast of Columbia, VA. Drainage area is 6252 sq. miles. This gage started taking data in 1899 and is still taking data. Moderate diurnal fluctuations are caused by powerplants upstream. 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 1.24%, with 20.8% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	1250	1320	5.6
Feb. Low Flow	1770	2010	13.6
Mar. Low Flow	2960	3520	18.9
Apr. Low Flow	3150	4290	36.2
May Low Flow	4620	5610	21.4
Jun. Low Flow	5560	5700	2.52
Jul. Low Flow	5020	4160	-17.1
Aug. Low Flow	4010	3240	-19.2
Sep. Low Flow	2320	2130	-8.19
Oct. Low Flow	1630	1360	-16.6
Nov. Low Flow	1460	1280	-12.3
Dec. Low Flow	1120	1070	-4.46

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	7240	7150	-1.24
Jan. Mean Flow	9450	8970	-5.08
Feb. Mean Flow	10300	11100	7.77
Mar. Mean Flow	12600	12600	0
Apr. Mean Flow	11000	10100	-8.18
May Mean Flow	8740	7690	-12
Jun. Mean Flow	6100	5860	-3.93
Jul. Mean Flow	3680	3650	-0.82
Aug. Mean Flow	2990	2920	-2.34
Sep. Mean Flow	4960	5450	9.88
Oct. Mean Flow	3680	4330	17.7
Nov. Mean Flow	6350	6530	2.83
Dec. Mean Flow	7270	6940	-4.54

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	4640	4850	4.53
Feb. High Flow	19900	12700	-36.2
Mar. High Flow	18300	13100	-28.4
Apr. High Flow	22800	16600	-27.2
May High Flow	17600	13400	-23.9
Jun. High Flow	30300	27500	-9.24
Jul. High Flow	27600	25400	-7.97
Aug. High Flow	14100	11600	-17.7
Sep. High Flow	8150	8970	10.1
Oct. High Flow	6360	5190	-18.4
Nov. High Flow	5120	3590	-29.9
Dec. High Flow	4510	3780	-16.2

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	447	344	-23
Med. 1 Day Min	950	787	-17.2
Min. 3 Day Min	487	350	-28.1
Med. 3 Day Min	1010	801	-20.7
Min. 7 Day Min	497	361	-27.4
Med. 7 Day Min	1130	834	-26.2
Min. 30 Day Min	692	431	-37.7
Med. 30 Day Min	1390	1320	-5.04
Min. 90 Day Min	872	825	-5.39
Med. 90 Day Min	2290	2180	-4.8
7Q10	741	467	-37
Year of 90-Day Min. Flow	2002	1999	100
Drought Year Mean	2130	2140	0.47
Mean Baseflow	4000	4350	8.75

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	199000	191000	-4.02
Med. 1 Day Max	71600	58900	-17.7
Max. 3 Day Max	149000	145000	-2.68
Med. 3 Day Max	58300	45700	-21.6
Max. 7 Day Max	89400	83300	-6.82
Med. 7 Day Max	40100	32100	-20
Max. 30 Day Max	37100	35500	-4.31
Med. 30 Day Max	20200	18200	-9.9
Max. 90 Day Max	26700	26300	-1.5
Med. 90 Day Max	13500	13200	-2.22

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	786	518	-34.1
5% Non-Exceedance	1170	795	-32.1
50% Non-Exceedance	4410	4690	6.35
95% Non-Exceedance	22500	21700	-3.56
99% Non-Exceedance	46500	45500	-2.15
Sept. 10% Non-Exceedance	1080	786	-27.2

Fig. 1: Hydrograph

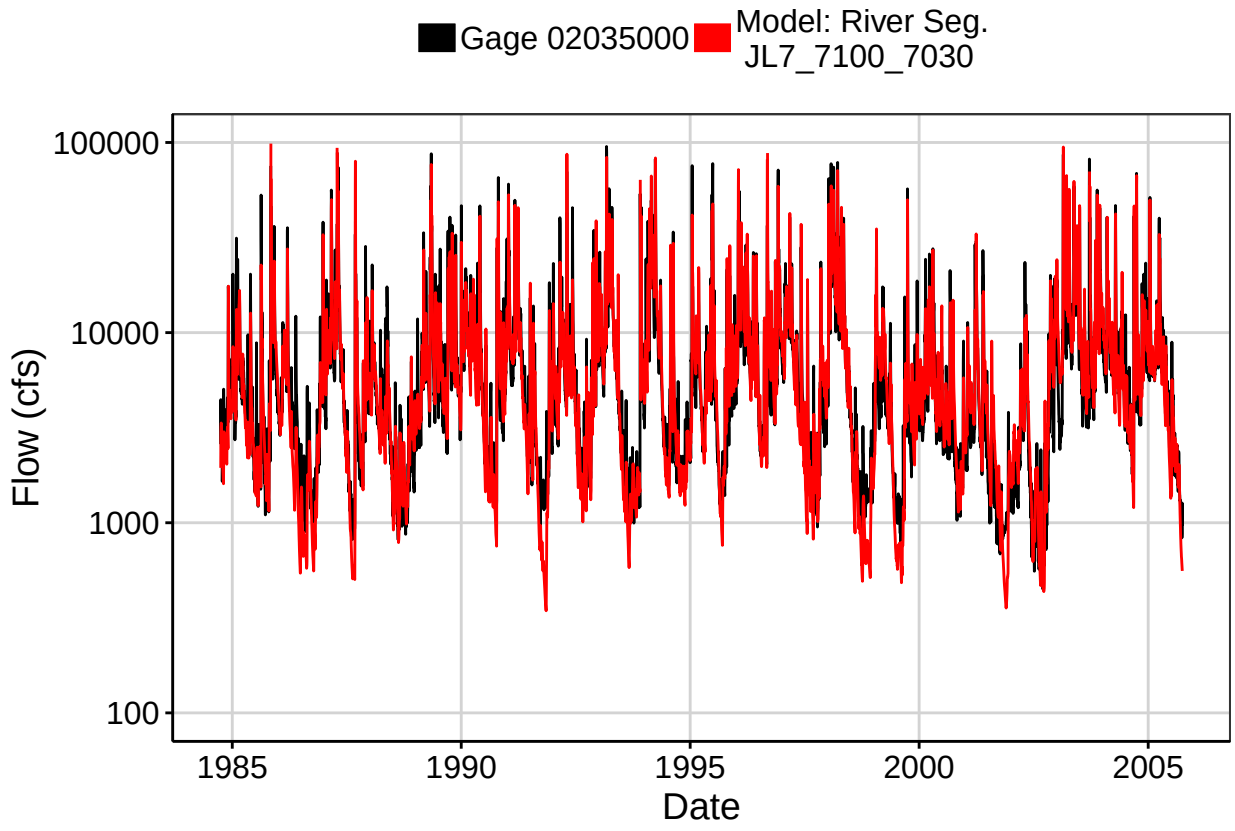


Fig. 2: Zoomed Hydrograph

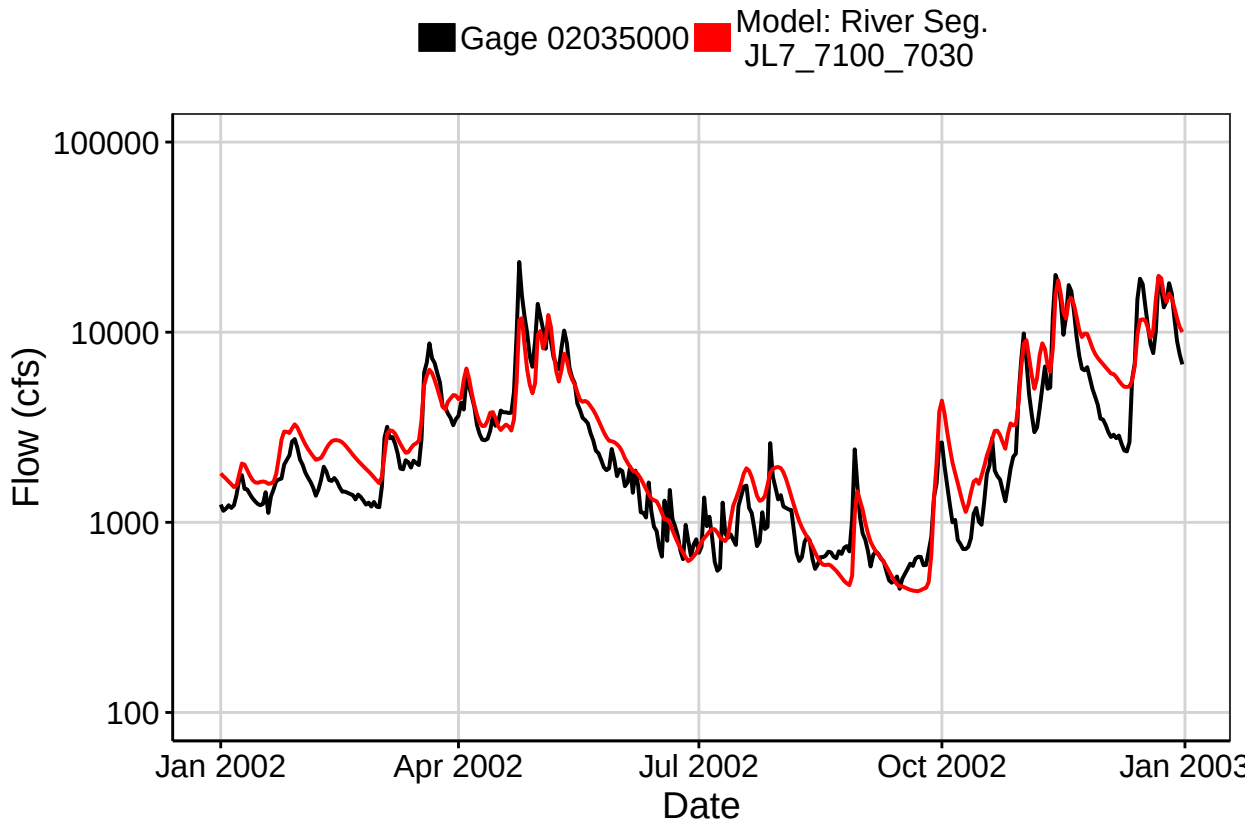


Fig. 3: Flow Exceedance

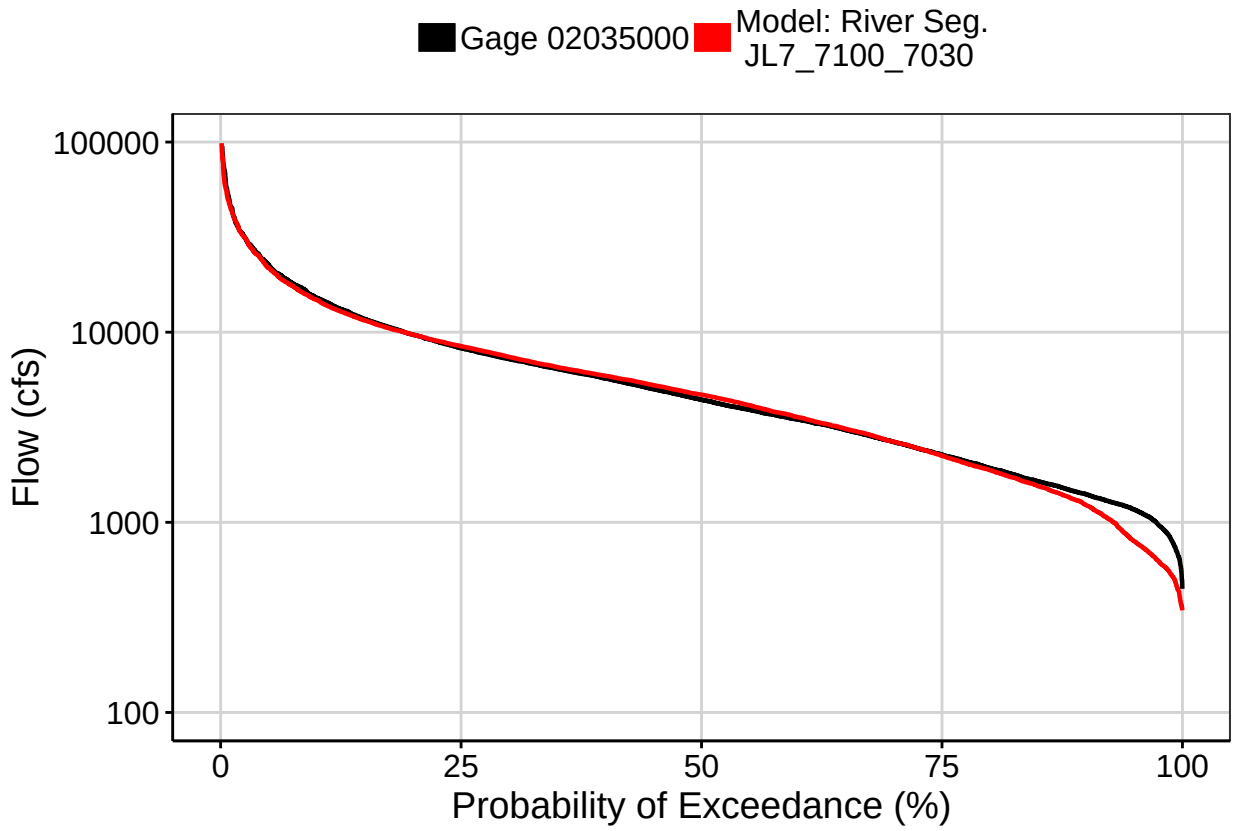


Fig. 4: Baseflow

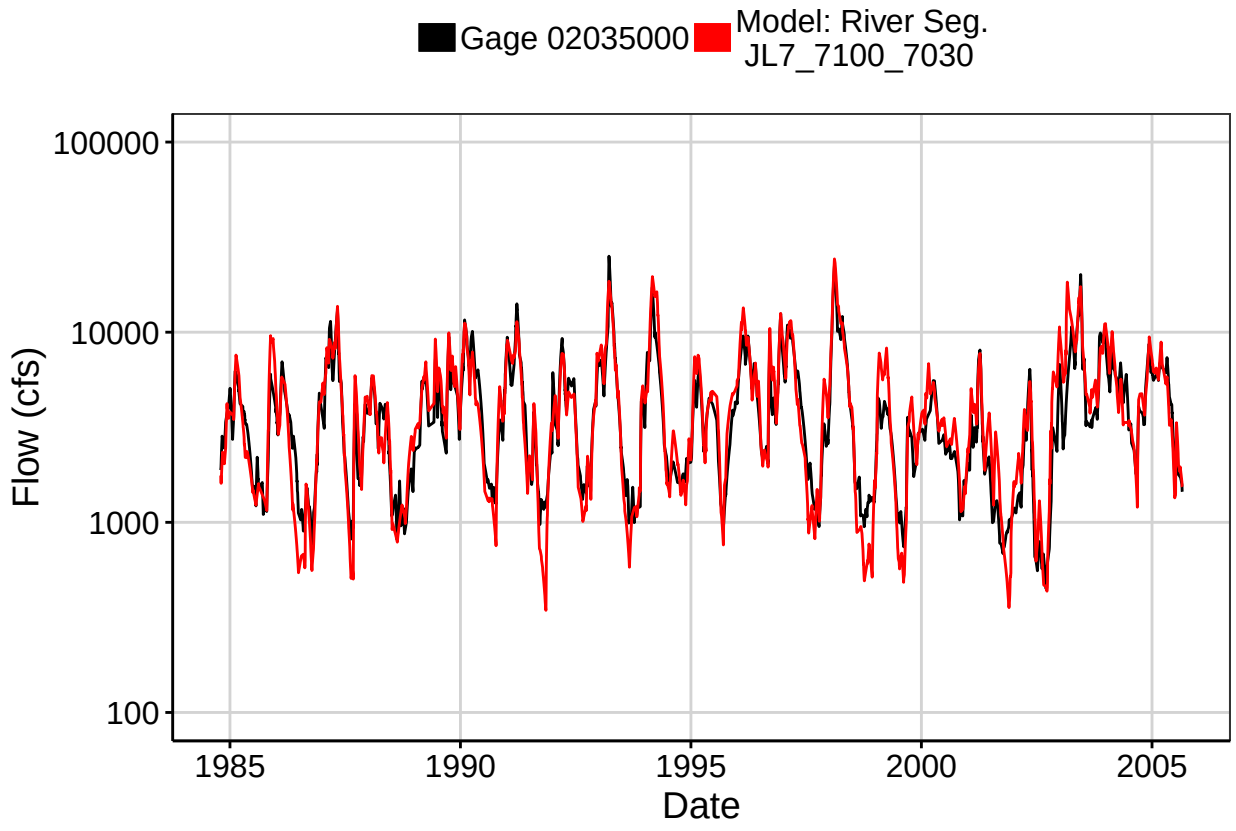


Fig. 5: Combined Baseflow

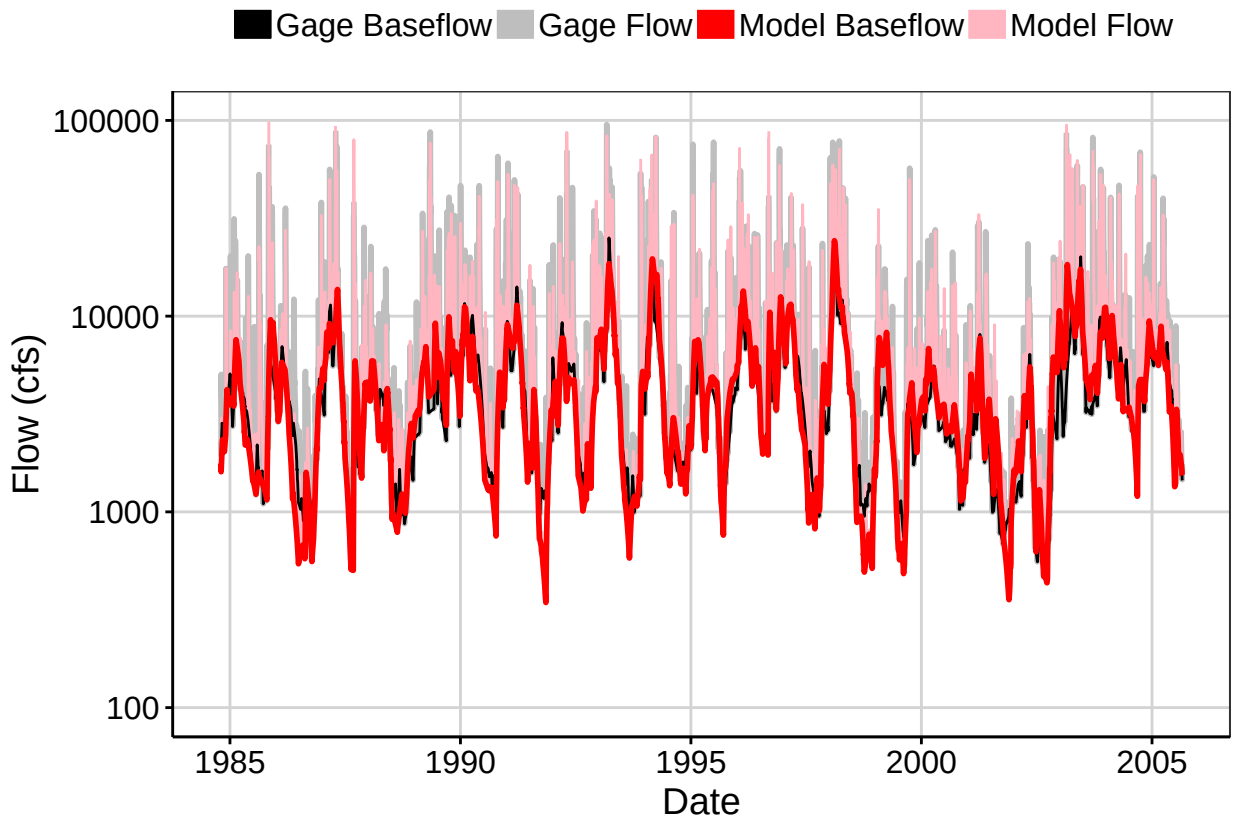


Fig. 6: Largest Error Segment

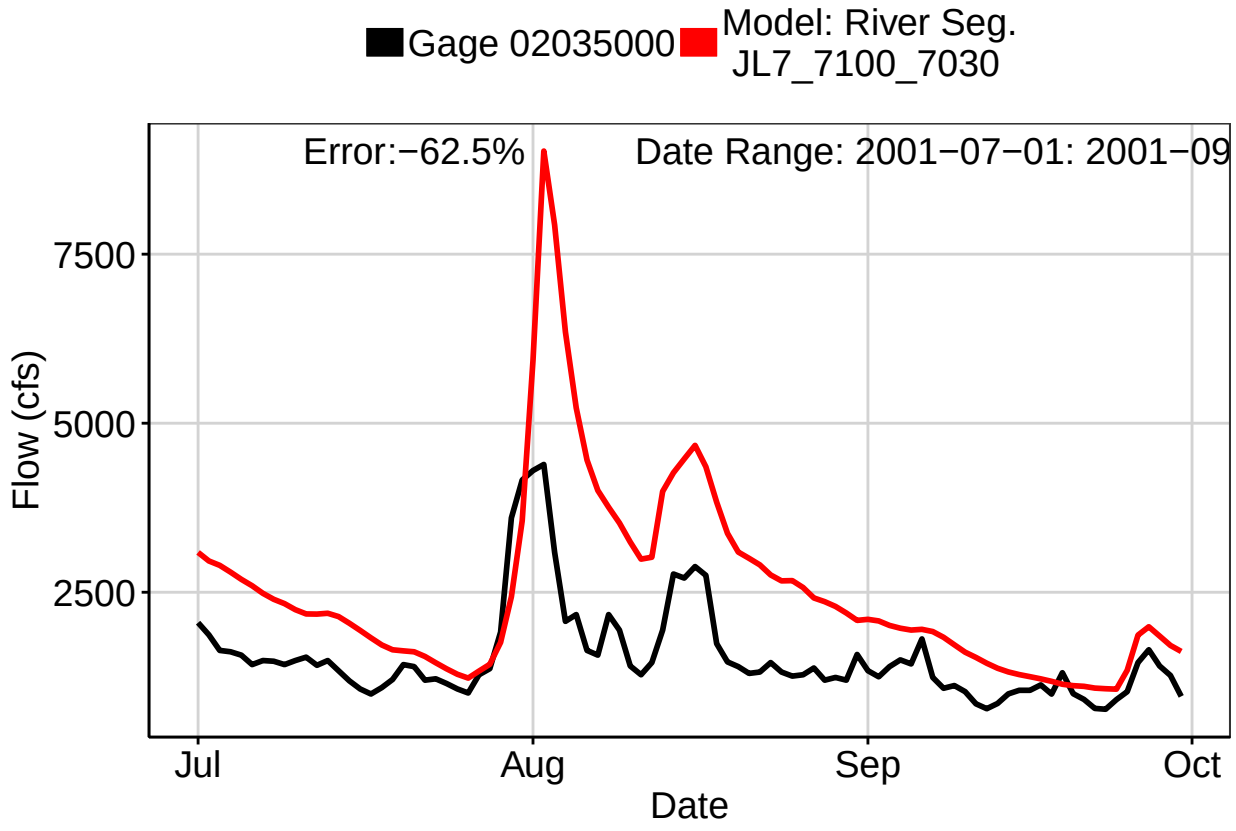


Fig. 7: Second Largest Error Segment

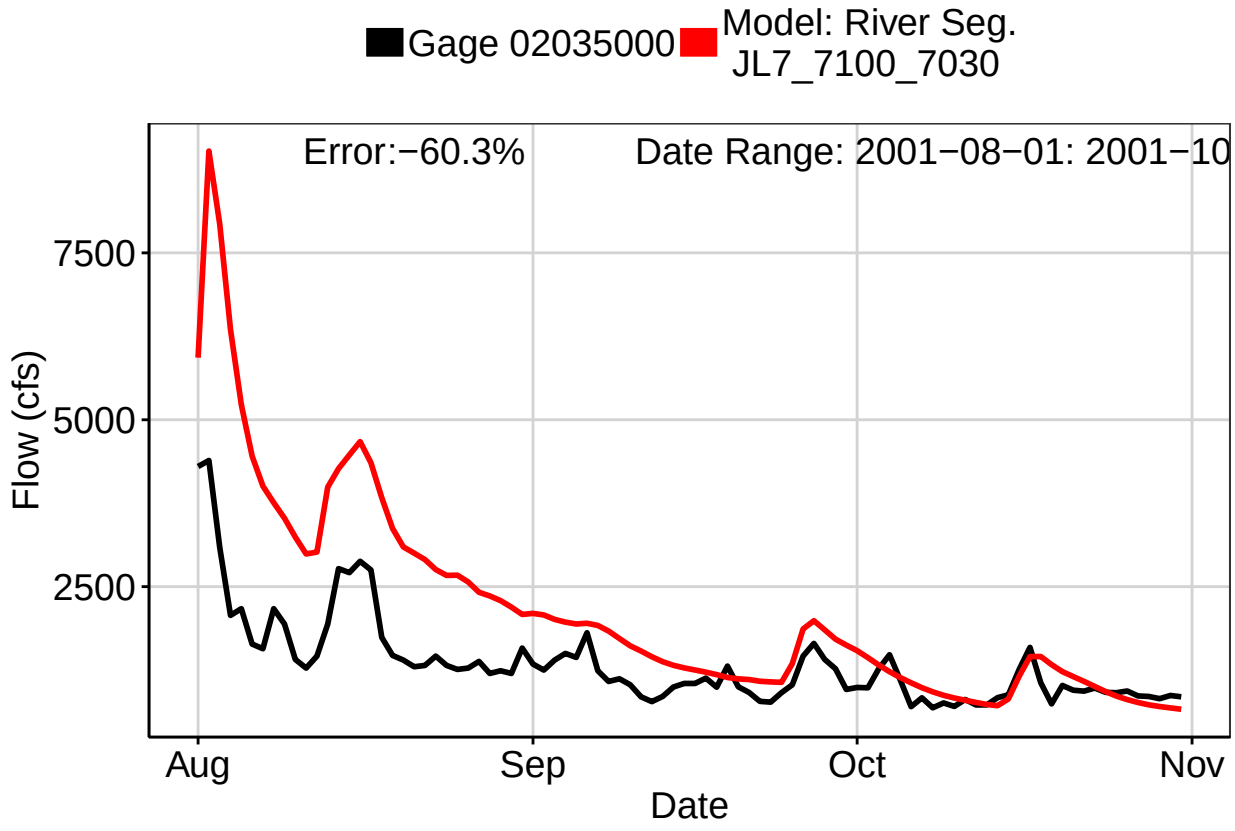


Fig. 8: Third Largest Error Segment

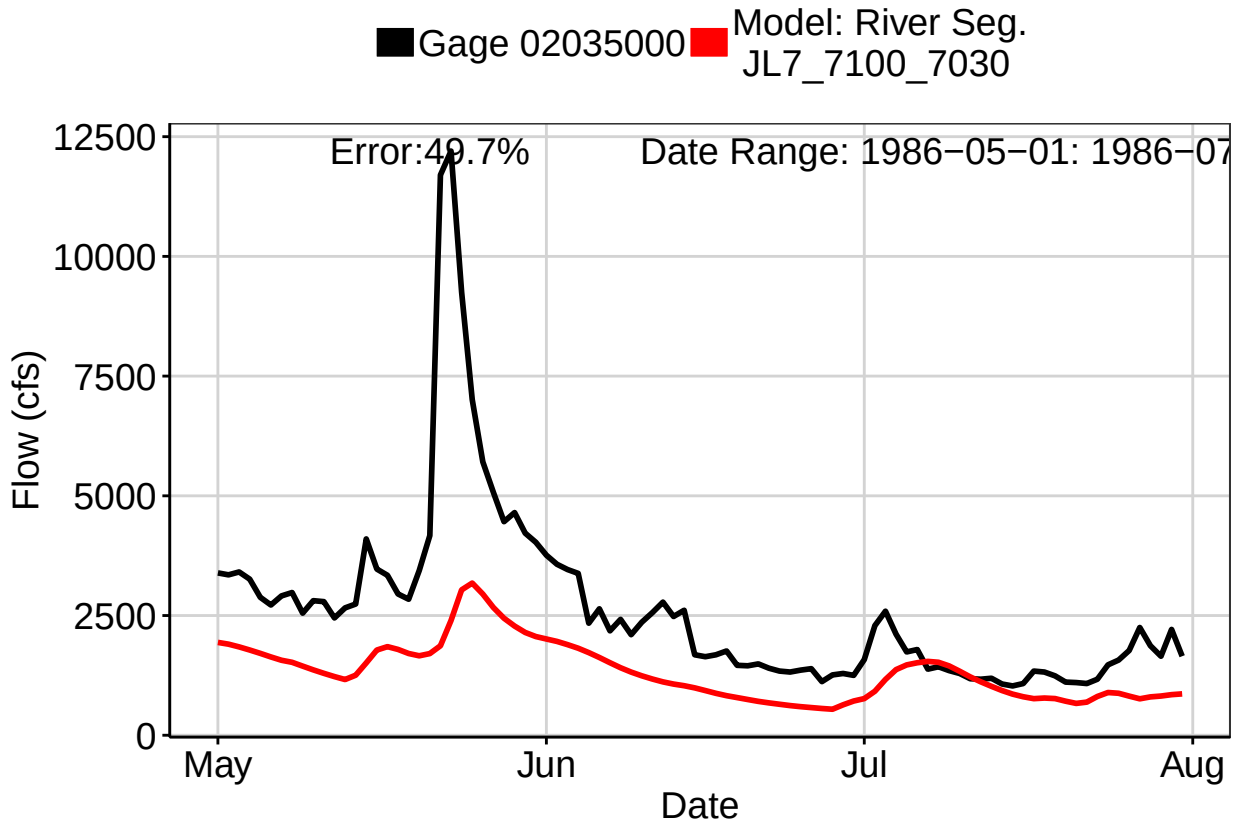


Fig. 9: Residuals Plot