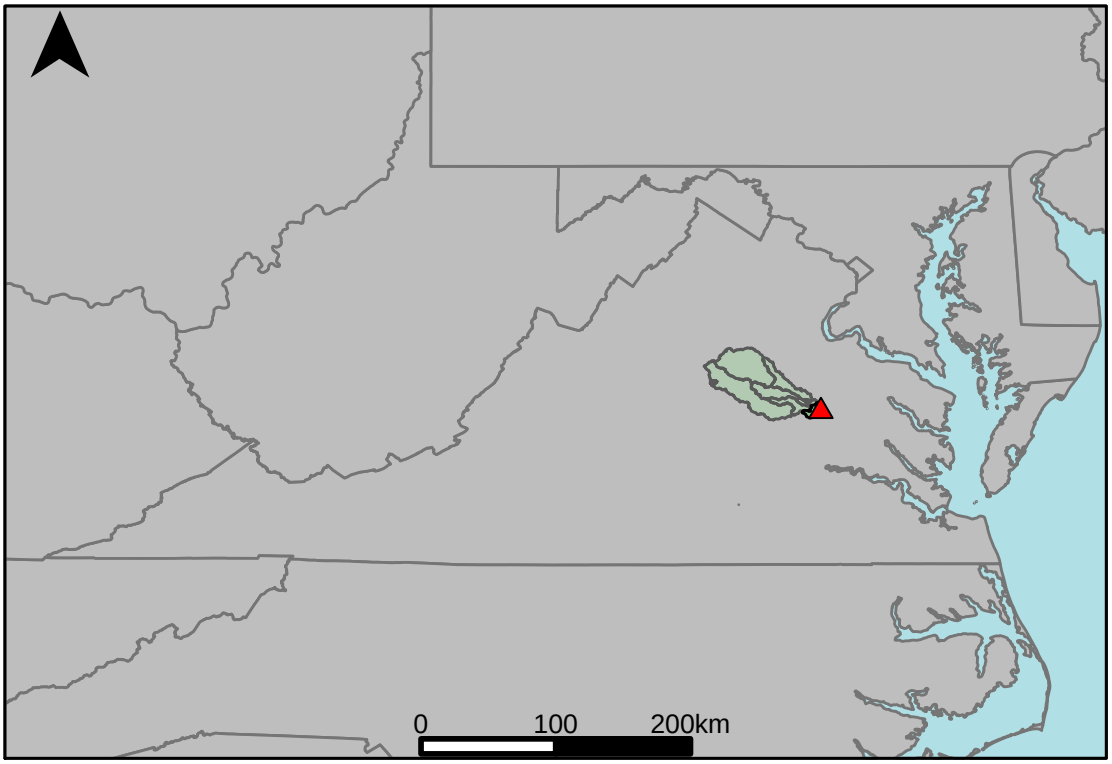
Appendix D.5: USGS Gage 01673000 vs. YP4_6720_6750 Pamunkey River



This river segment follows part of the flow of the Pamunkey River, a tributary of the York. The gage is located in Hanover County (Lat. 37°46'03.5", Long. -77°19'55.9"), approximately 7.7 miles east of Ashland, VA. Drainage area is 1078 sq. miles. This gage started taking data in 1941 and is still taking data. There has been some regulation of flow since January 1972 by Lake Anna and occasional diurnal fluctuations at low flow are caused by an upstream mill. Unknown amounts of diversions occur for upstream irrigation. The average daily discharge error between the model and gage data for the 20 year timespan was 5.69%, with 30.8% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	98	89.1	-9.08
Feb. Low Flow	212	160	-24.5
Mar. Low Flow	339	344	1.47
Apr. Low Flow	536	591	10.3
May Low Flow	728	701	-3.71
Jun. Low Flow	626	598	-4.47
Jul. Low Flow	597	535	-10.4
Aug. Low Flow	364	349	-4.12
Sep. Low Flow	179	183	2.23
Oct. Low Flow	114	104	-8.77
Nov. Low Flow	100	103	3
Dec. Low Flow	78	83.6	7.18

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	1020	962	-5.69
Jan. Mean Flow	1380	1380	0
Feb. Mean Flow	1730	1670	-3.47
Mar. Mean Flow	1940	1890	-2.58
Apr. Mean Flow	1540	1340	-13
May Mean Flow	1070	937	-12.4
Jun. Mean Flow	664	636	-4.22
Jul. Mean Flow	461	455	-1.3
Aug. Mean Flow	422	402	-4.74
Sep. Mean Flow	558	656	17.6
Oct. Mean Flow	414	421	1.69
Nov. Mean Flow	864	799	-7.52
Dec. Mean Flow	1200	1010	-15.8

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	782	474	-39.4
Feb. High Flow	3050	1770	-42
Mar. High Flow	3590	1990	-44.6
Apr. High Flow	2800	3330	18.9
May High Flow	3940	2880	-26.9
Jun. High Flow	5500	4410	-19.8
Jul. High Flow	4980	4110	-17.5
Aug. High Flow	2170	1640	-24.4
Sep. High Flow	1620	902	-44.3
Oct. High Flow	1150	656	-43
Nov. High Flow	574	571	-0.52
Dec. High Flow	566	296	-47.7

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	23.8	41.1	72.7
Med. 1 Day Min	70	63.5	-9.29
Min. 3 Day Min	29.3	41.3	41
Med. 3 Day Min	72.3	64.3	-11.1
Min. 7 Day Min	33.2	41.7	25.6
Med. 7 Day Min	77.6	67	-13.7
Min. 30 Day Min	37.7	49.1	30.2
Med. 30 Day Min	103	101	-1.94
Min. 90 Day Min	53.3	75.6	41.8
Med. 90 Day Min	264	206	-22
7Q10	45.2	46.6	3.1
Year of 90-Day Min. Flow	2002	2002	0
Drought Year Mean	147	137	-6.8
Mean Baseflow	432	464	7.41

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	20400	27900	36.8
Med. 1 Day Max	9250	12300	33
Max. 3 Day Max	18600	22900	23.1
Med. 3 Day Max	8340	10700	28.3
Max. 7 Day Max	13400	17000	26.9
Med. 7 Day Max	6620	7560	14.2
Max. 30 Day Max	8010	6830	-14.7
Med. 30 Day Max	2710	2790	2.95
Max. 90 Day Max	5390	4740	-12.1
Med. 90 Day Max	2030	1840	-9.36

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	53	51.4	-3.02
5% Non-Exceedance	77	70.9	-7.92
50% Non-Exceedance	522	514	-1.53
95% Non-Exceedance	4070	3500	-14
99% Non-Exceedance	8580	8100	-5.59
Sept. 10% Non-Exceedance	62	62.3	0.48

Fig. 1: Hydrograph

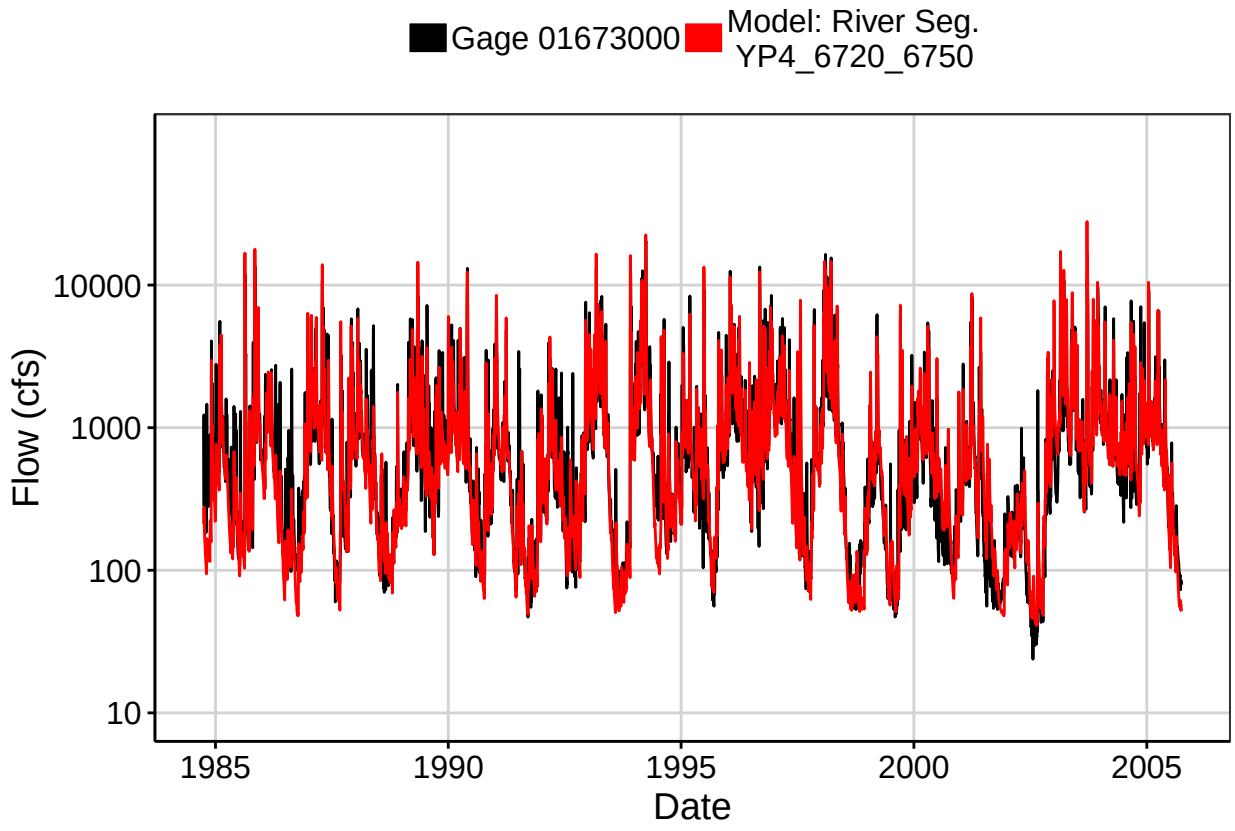


Fig. 2: Zoomed Hydrograph

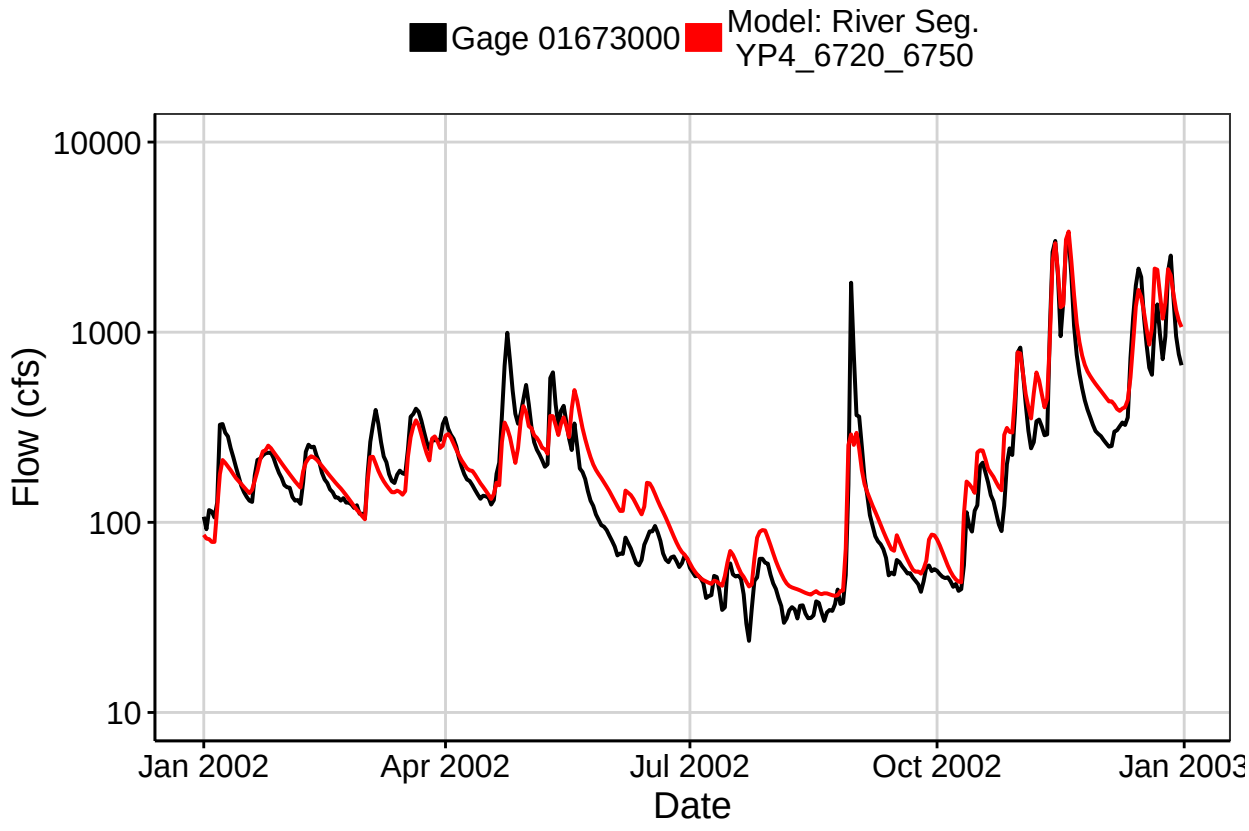


Fig. 3: Flow Exceedance

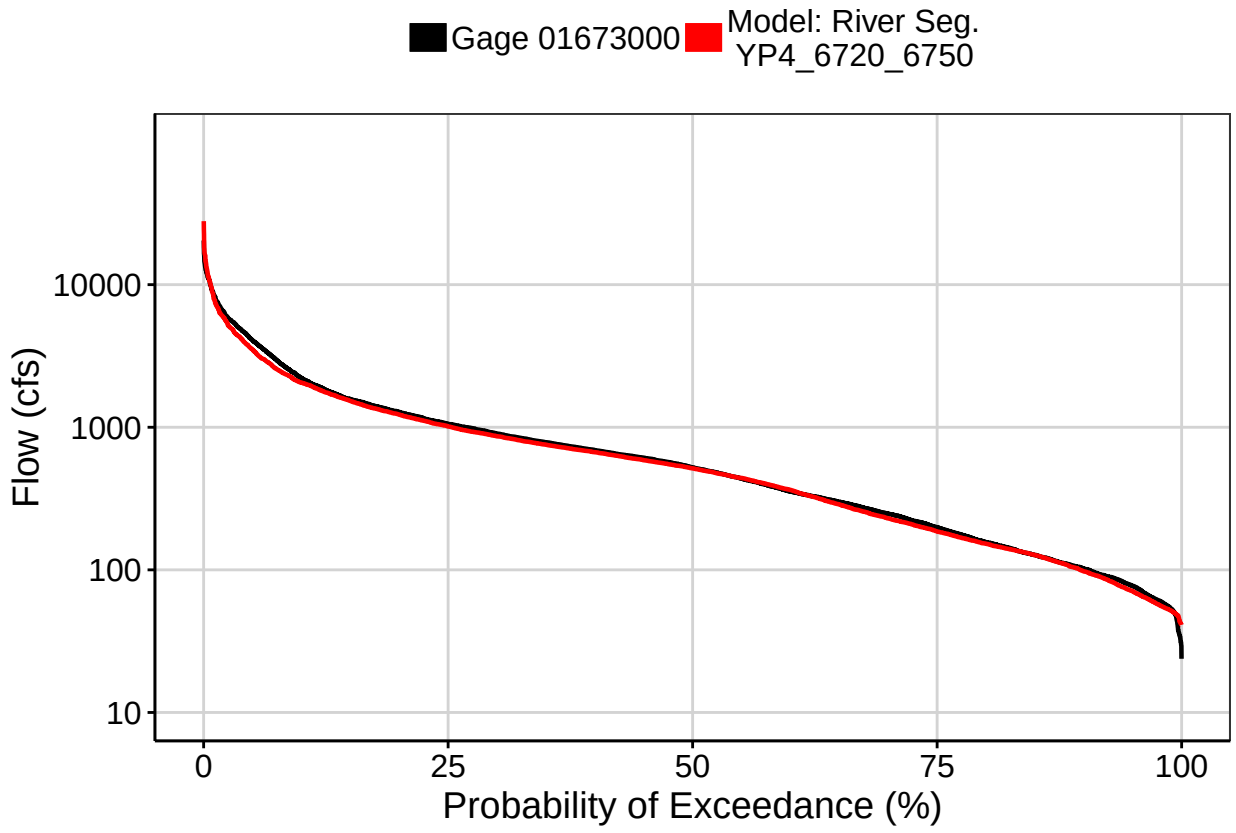


Fig. 4: Baseflow

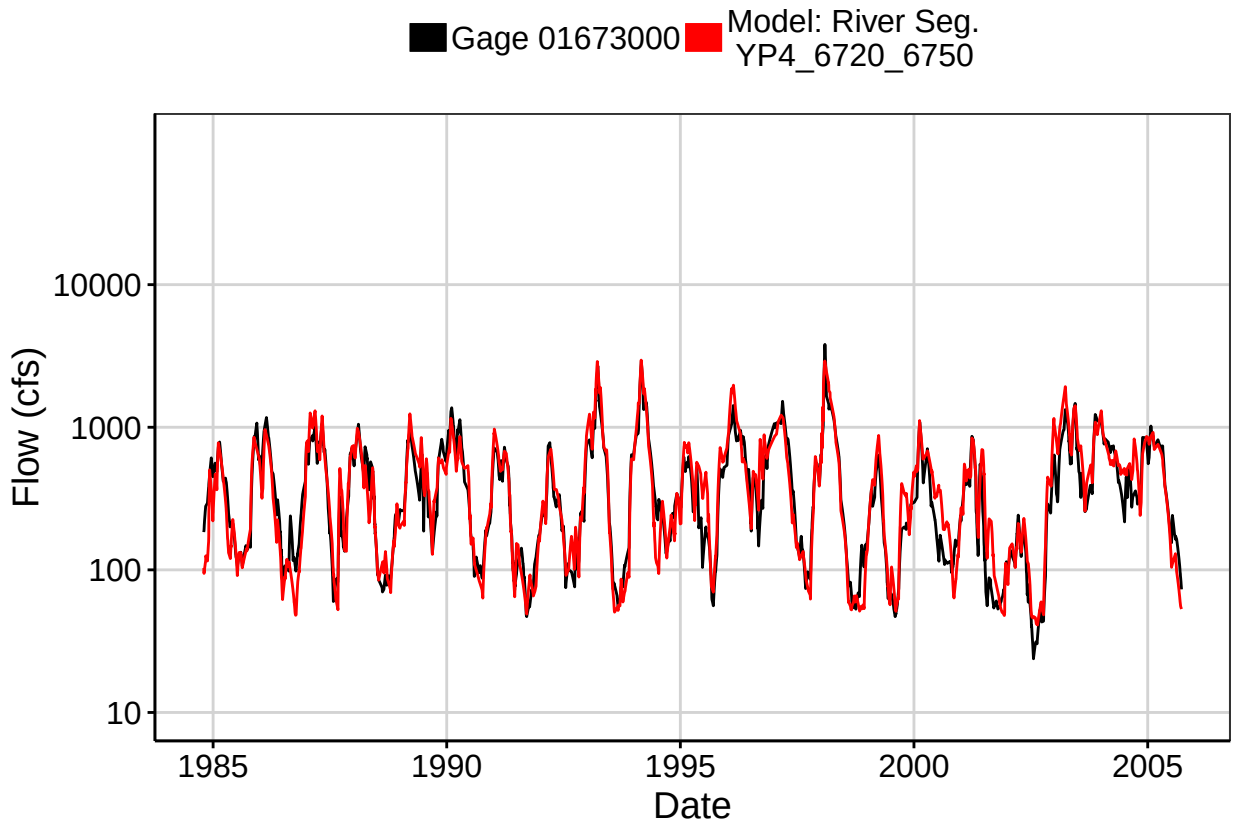


Fig. 5: Combined Baseflow

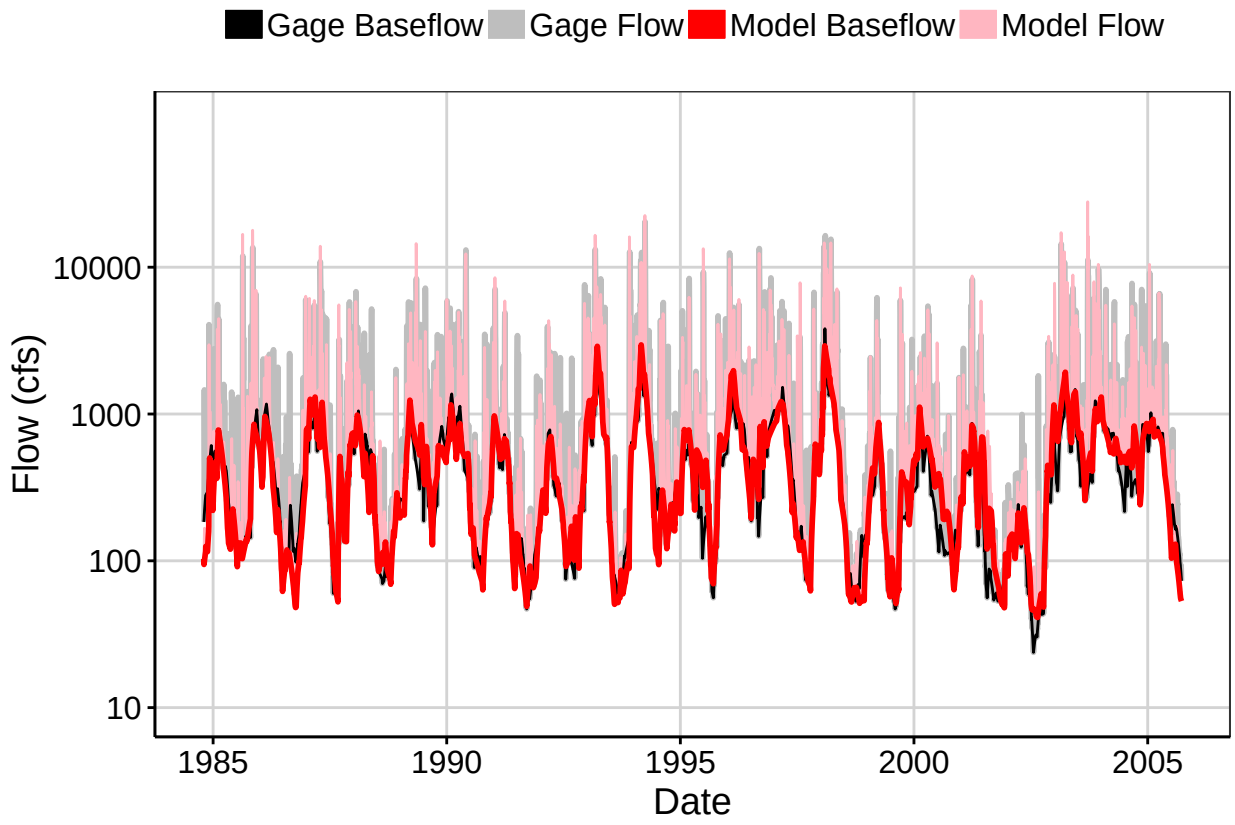


Fig. 6: Largest Error Segment

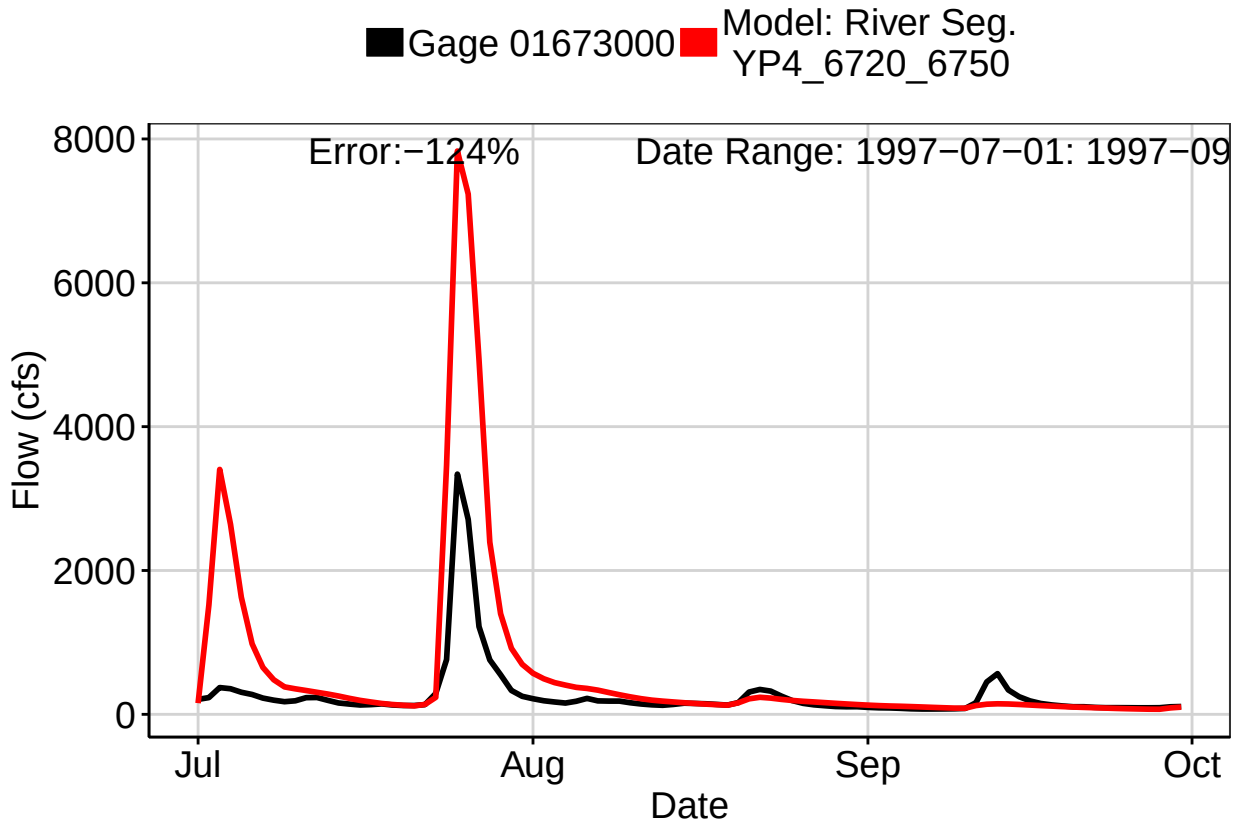


Fig. 7: Second Largest Error Segment

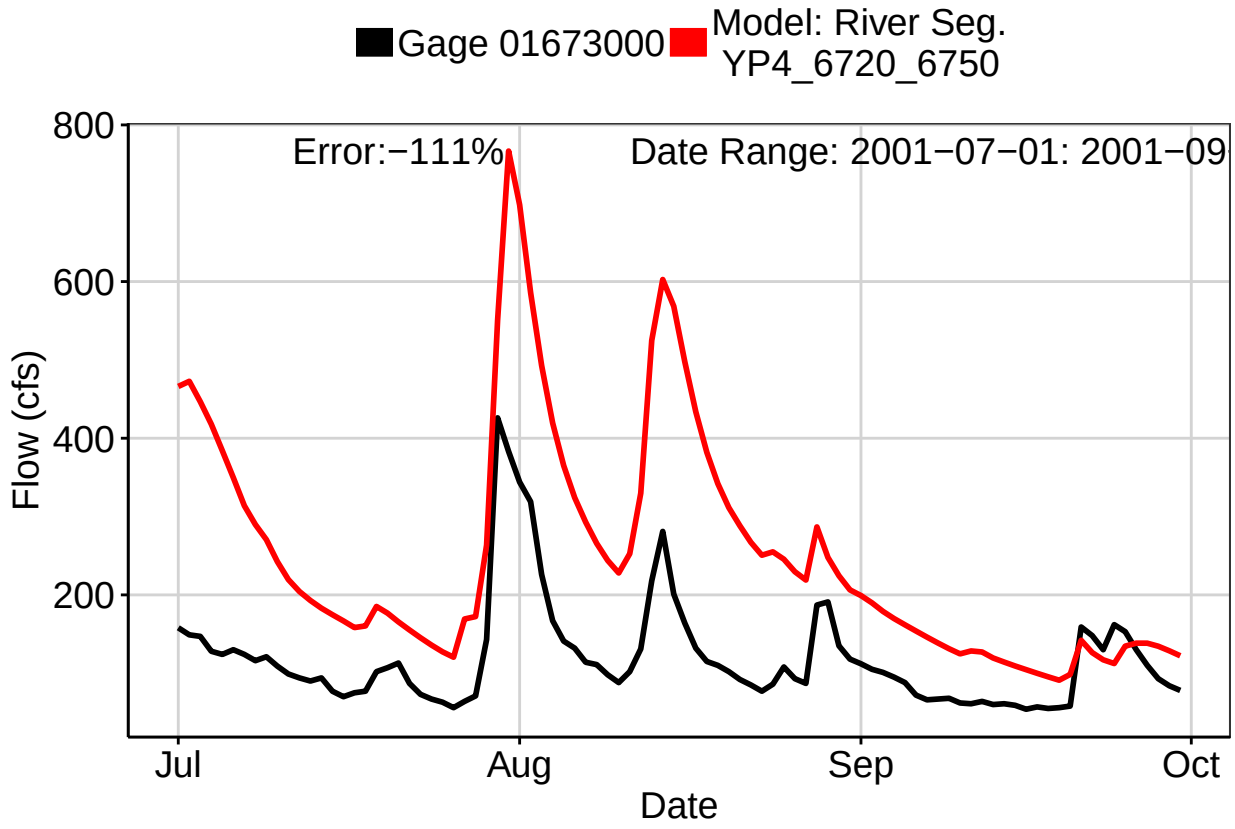


Fig. 8: Third Largest Error Segment

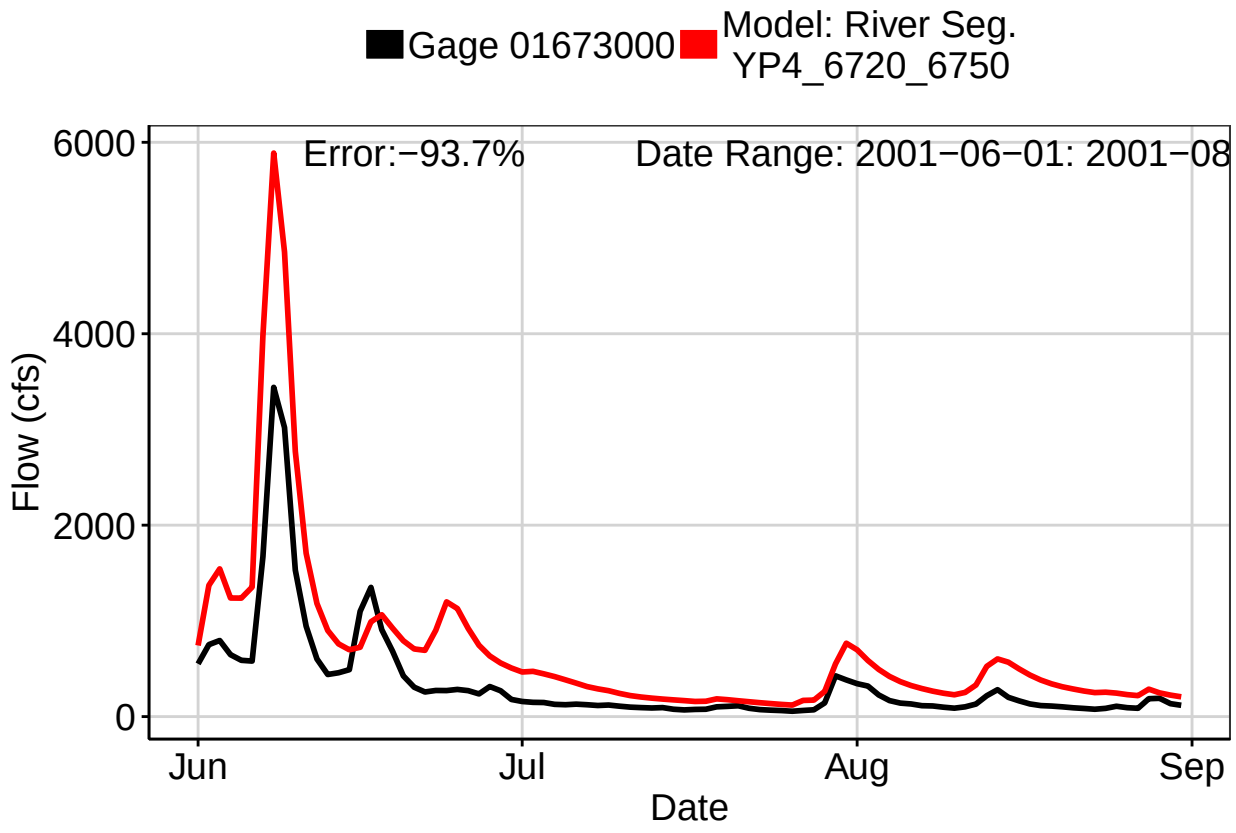


Fig. 9: Residuals Plot