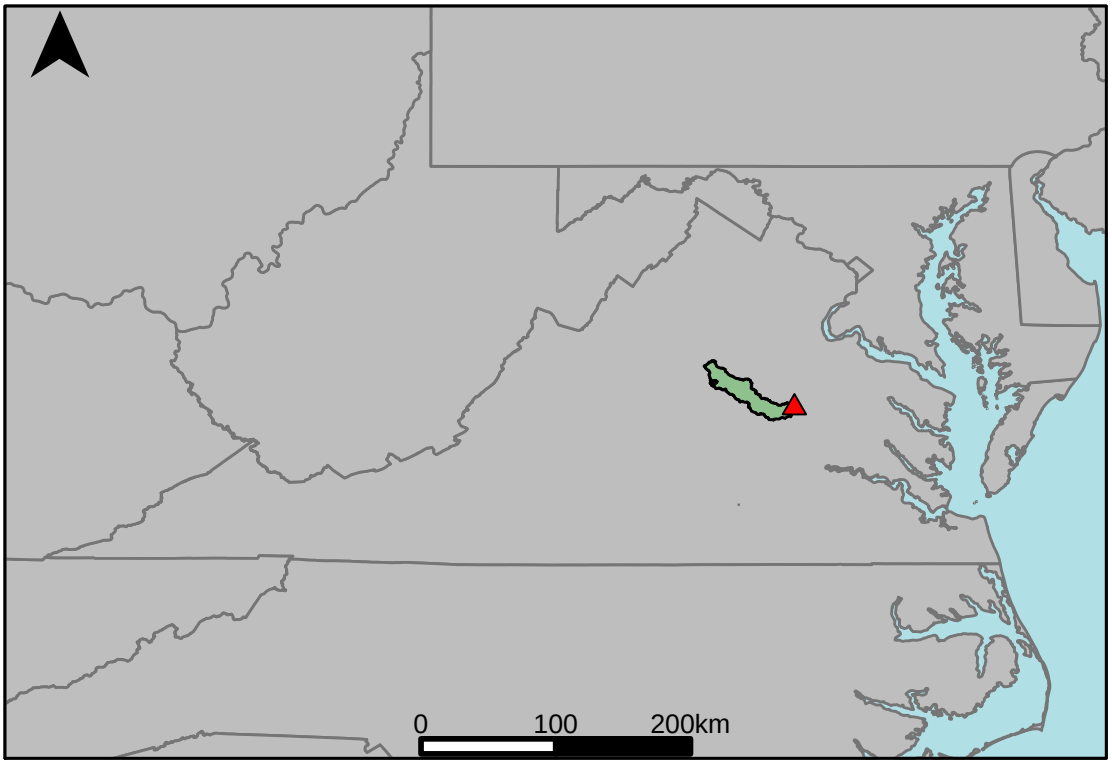
Appendix D.4: USGS Gage 01672500 vs. YP3_6470_6690 Pamunkey River



This river segment follows part of the flow of the South Anna River, a tributary of the York. The gage is located in Hanover County (Lat. 37°47'48.5", Long. -77°32'55.9"), approximately 5.1 miles northwest of Ashland, VA. Drainage area is 395 sq. miles. This gage started taking data in 1930 and is still taking data. Since 1966, a diversion 150 ft upstream has averaged less than 0.6 cfs, but the capacity of the diversion is about 1.5 cfs. The average daily discharge error between the model and gage data for the 20 year timespan was 2.38%, with 58.8% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	54	26.7	-50.6
Feb. Low Flow	99	41.6	-58
Mar. Low Flow	190	132	-30.5
Apr. Low Flow	221	212	-4.07
May Low Flow	271	253	-6.64
Jun. Low Flow	251	199	-20.7
Jul. Low Flow	214	180	-15.9
Aug. Low Flow	132	119	-9.85
Sep. Low Flow	71.6	59	-17.6
Oct. Low Flow	48.5	21	-56.7
Nov. Low Flow	39.4	16.9	-57.1
Dec. Low Flow	25	7.09	-71.6

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	378	369	-2.38
Jan. Mean Flow	525	547	4.19
Feb. Mean Flow	546	555	1.65
Mar. Mean Flow	658	684	3.95
Apr. Mean Flow	521	470	-9.79
May Mean Flow	387	355	-8.27
Jun. Mean Flow	216	214	-0.93
Jul. Mean Flow	222	191	-14
Aug. Mean Flow	213	167	-21.6
Sep. Mean Flow	222	285	28.4
Oct. Mean Flow	181	180	-0.55
Nov. Mean Flow	380	376	-1.05
Dec. Mean Flow	506	451	-10.9

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	485	232	-52.2
Feb. High Flow	1280	1310	2.34
Mar. High Flow	1830	1530	-16.4
Apr. High Flow	1670	1860	11.4
May High Flow	1600	1180	-26.2
Jun. High Flow	1810	1840	1.66
Jul. High Flow	1170	1270	8.55
Aug. High Flow	882	818	-7.26
Sep. High Flow	485	399	-17.7
Oct. High Flow	916	363	-60.4
Nov. High Flow	280	159	-43.2
Dec. High Flow	289	138	-52.2

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	11	0	-100
Med. 1 Day Min	17	1.82	-89.3
Min. 3 Day Min	12.7	0	-100
Med. 3 Day Min	18.3	2.87	-84.3
Min. 7 Day Min	13.4	0	-100
Med. 7 Day Min	20.4	4.9	-76
Min. 30 Day Min	18.7	2.1	-88.8
Med. 30 Day Min	30.9	17.1	-44.7
Min. 90 Day Min	35.8	14.6	-59.2
Med. 90 Day Min	101	74	-26.7
7Q10	14.2	0	-100
Year of 90-Day Min. Flow	1993	1993	0
Drought Year Mean	465	512	10.1
Mean Baseflow	168	152	-9.52

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	7680	19300	151
Med. 1 Day Max	3650	6830	87.1
Max. 3 Day Max	7280	10100	38.7
Med. 3 Day Max	3270	5380	64.5
Max. 7 Day Max	4770	6750	41.5
Med. 7 Day Max	2580	3360	30.2
Max. 30 Day Max	1940	2140	10.3
Med. 30 Day Max	1140	1200	5.26
Max. 90 Day Max	1290	1380	6.98
Med. 90 Day Max	724	736	1.66

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	17	0.08	-99.5
5% Non-Exceedance	29	10.8	-62.8
50% Non-Exceedance	218	195	-10.6
95% Non-Exceedance	1330	1330	0
99% Non-Exceedance	2930	3260	11.3
Sept. 10% Non-Exceedance	20	2.82	-85.9

Fig. 1: Hydrograph

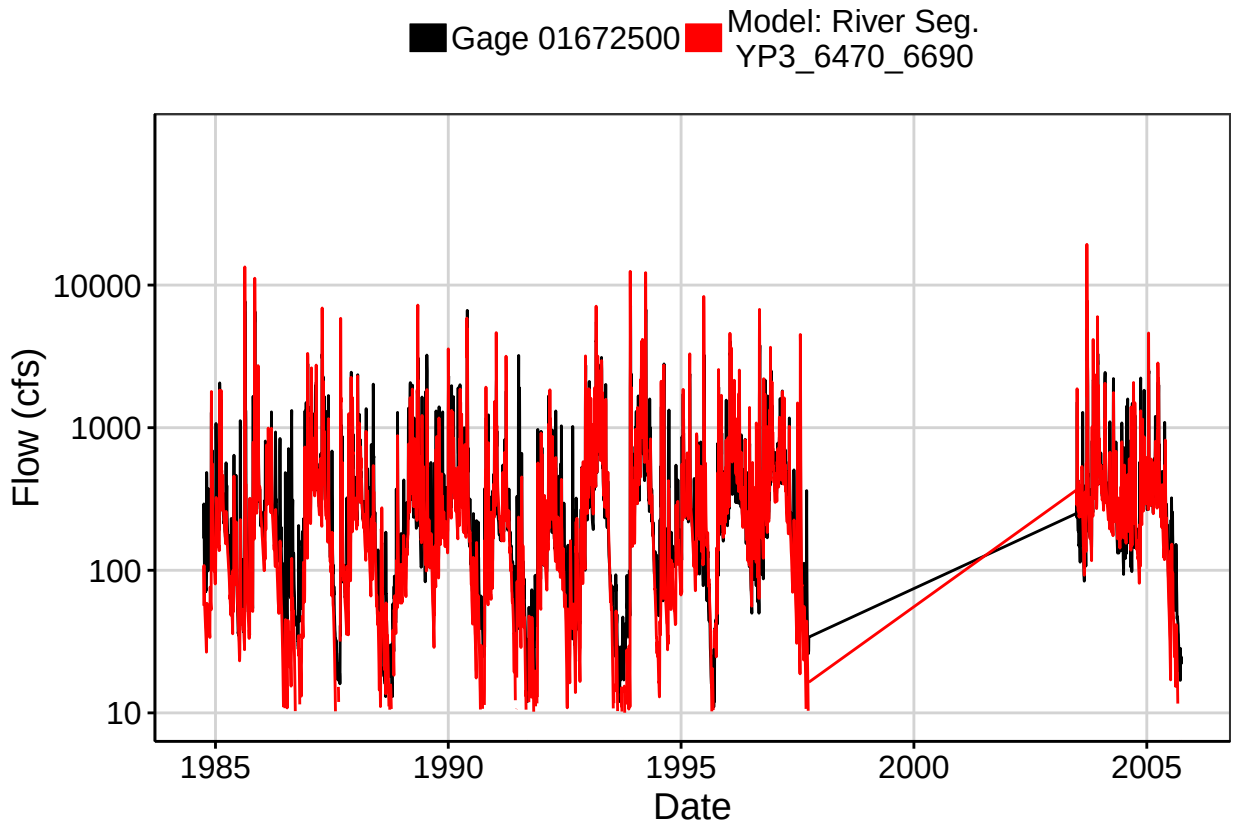


Fig. 2: Zoomed Hydrograph

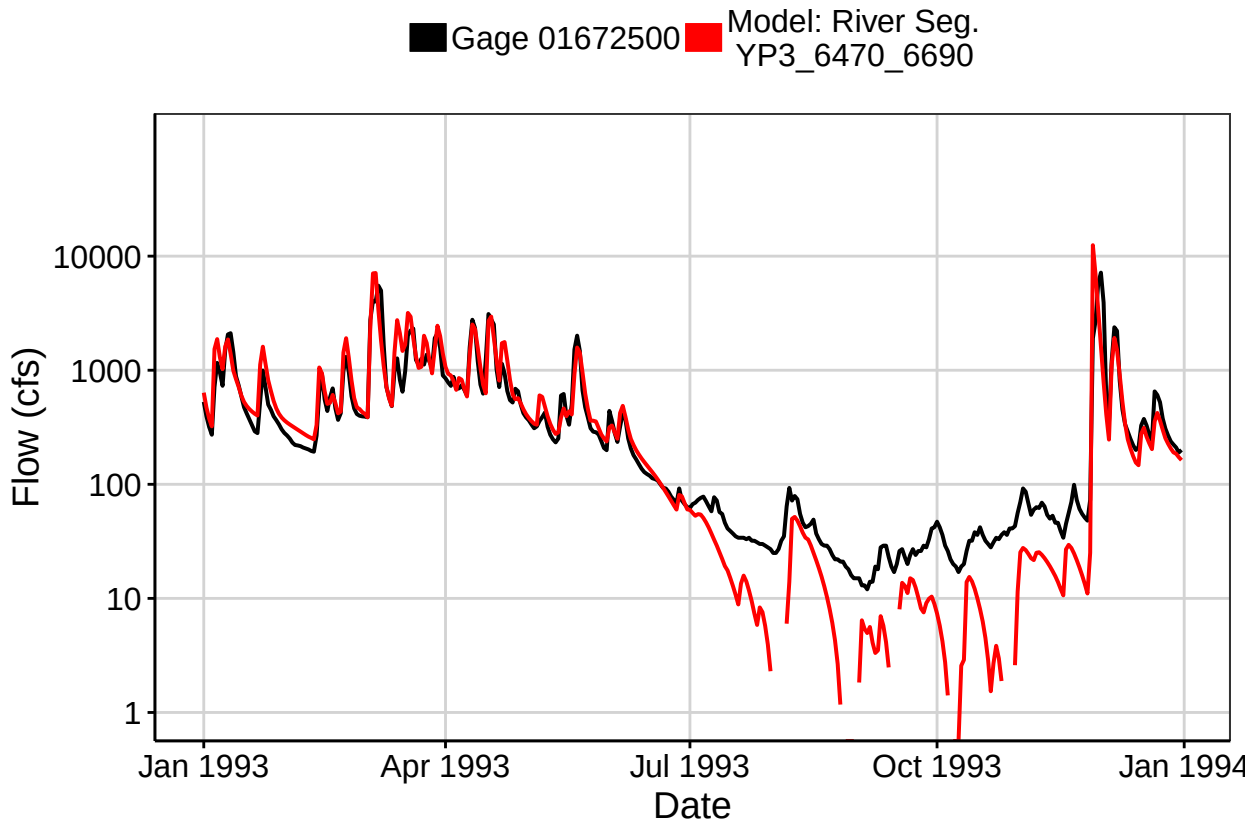


Fig. 3: Flow Exceedance

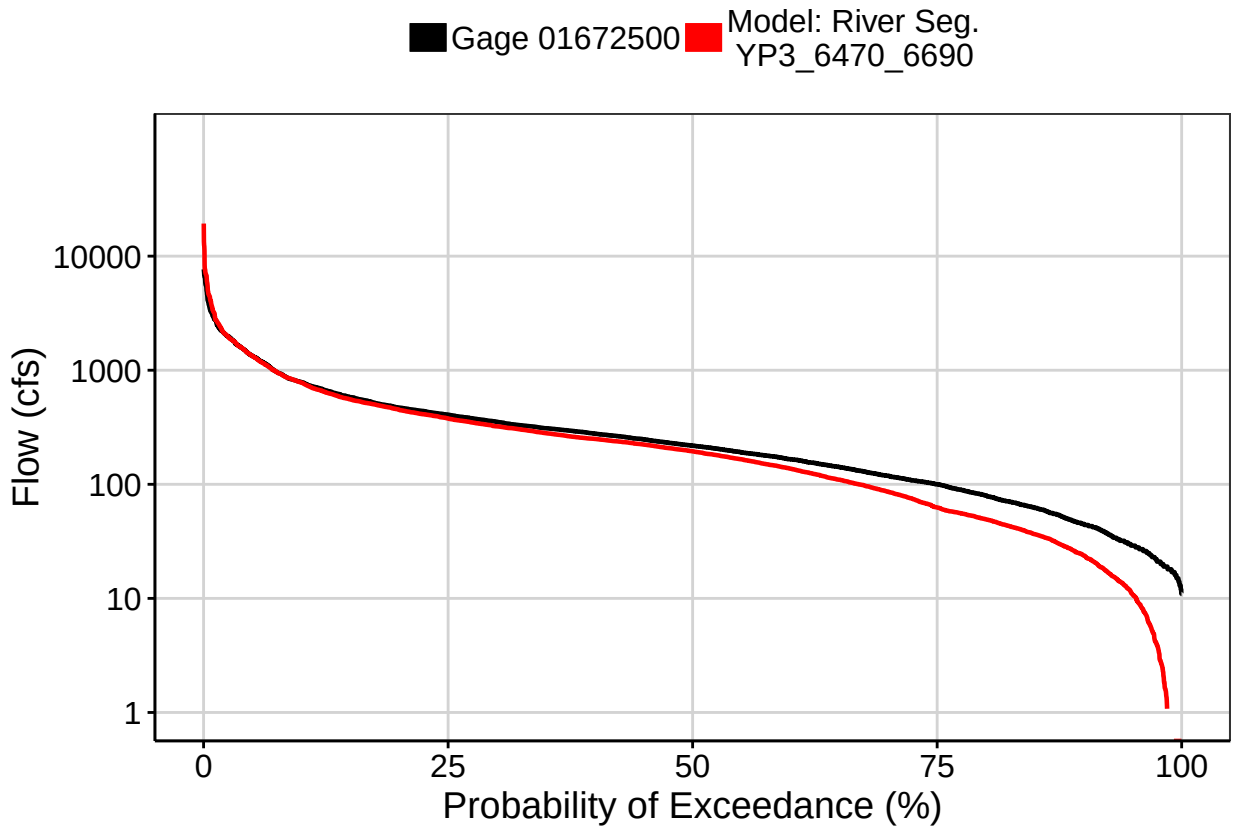


Fig. 4: Baseflow

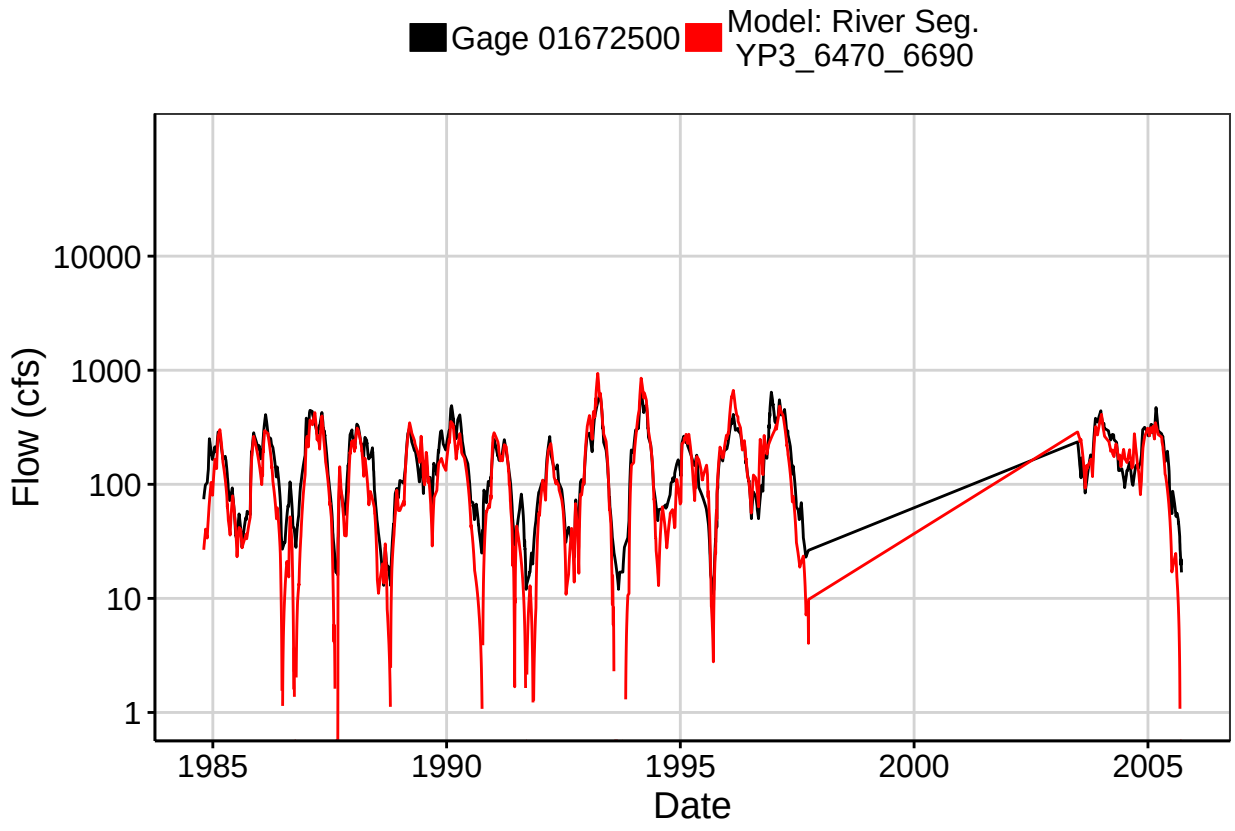


Fig. 5: Combined Baseflow

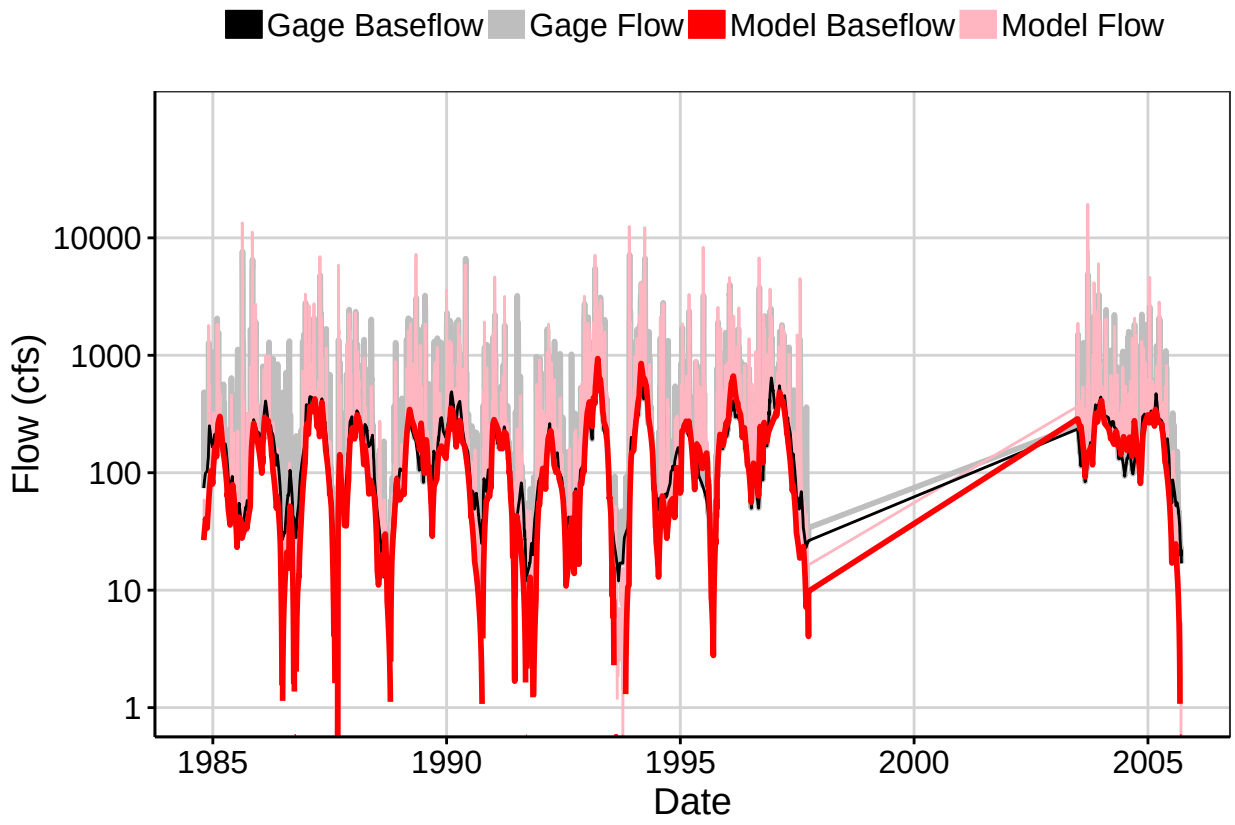


Fig. 6: Largest Error Segment

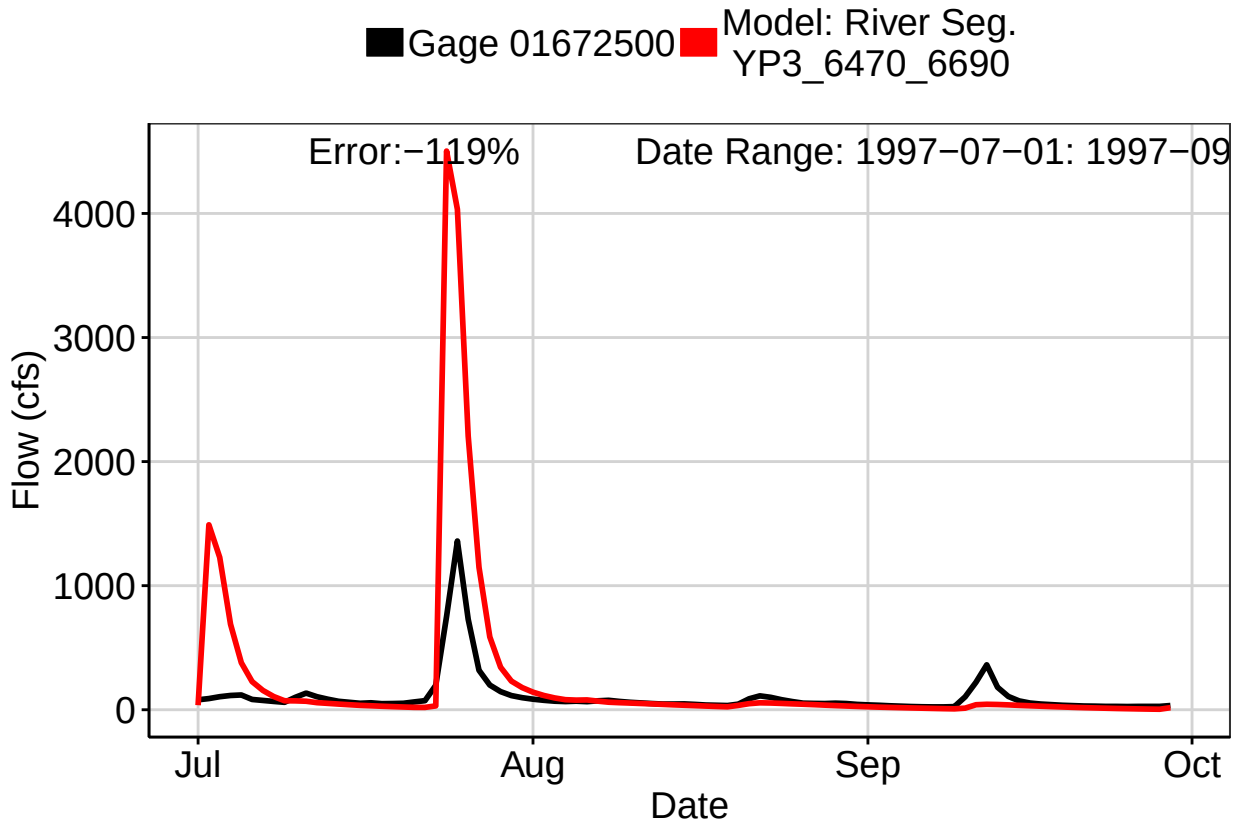


Fig. 7: Second Largest Error Segment

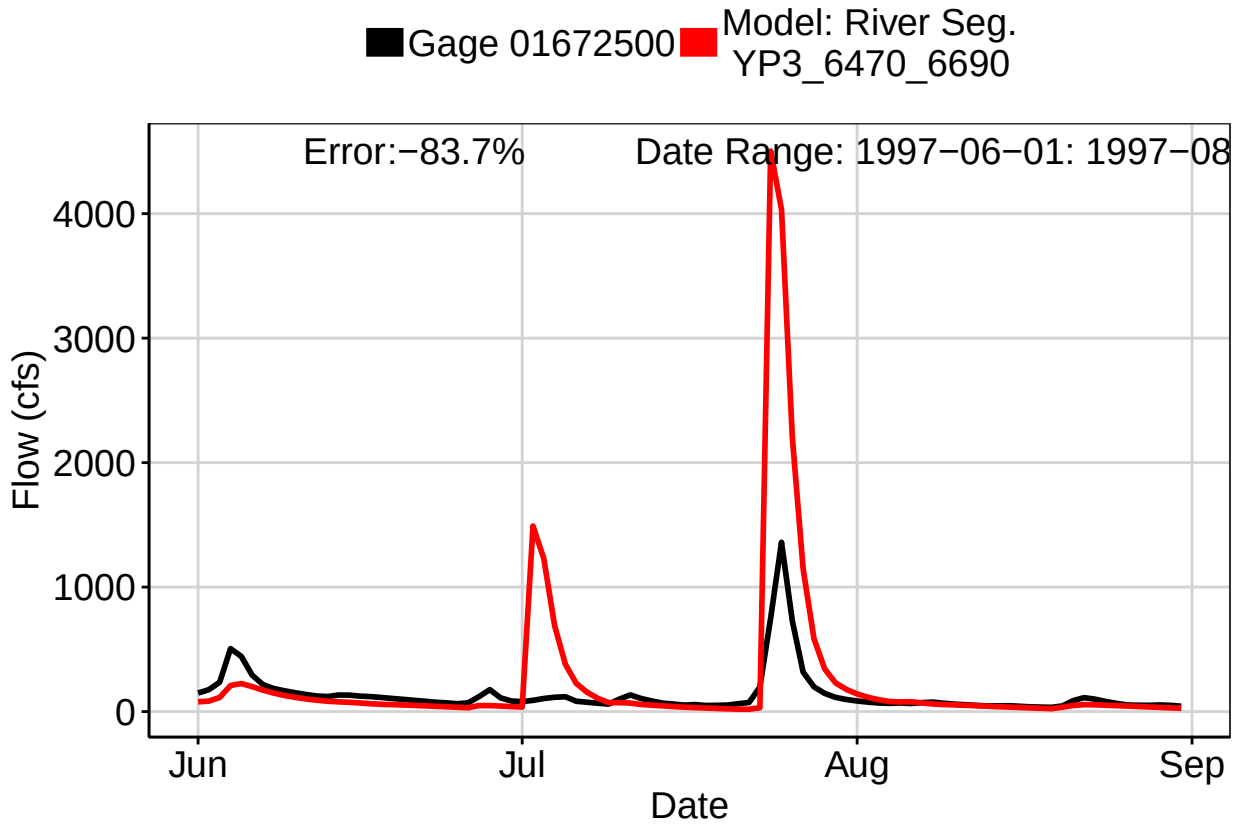


Fig. 8: Third Largest Error Segment

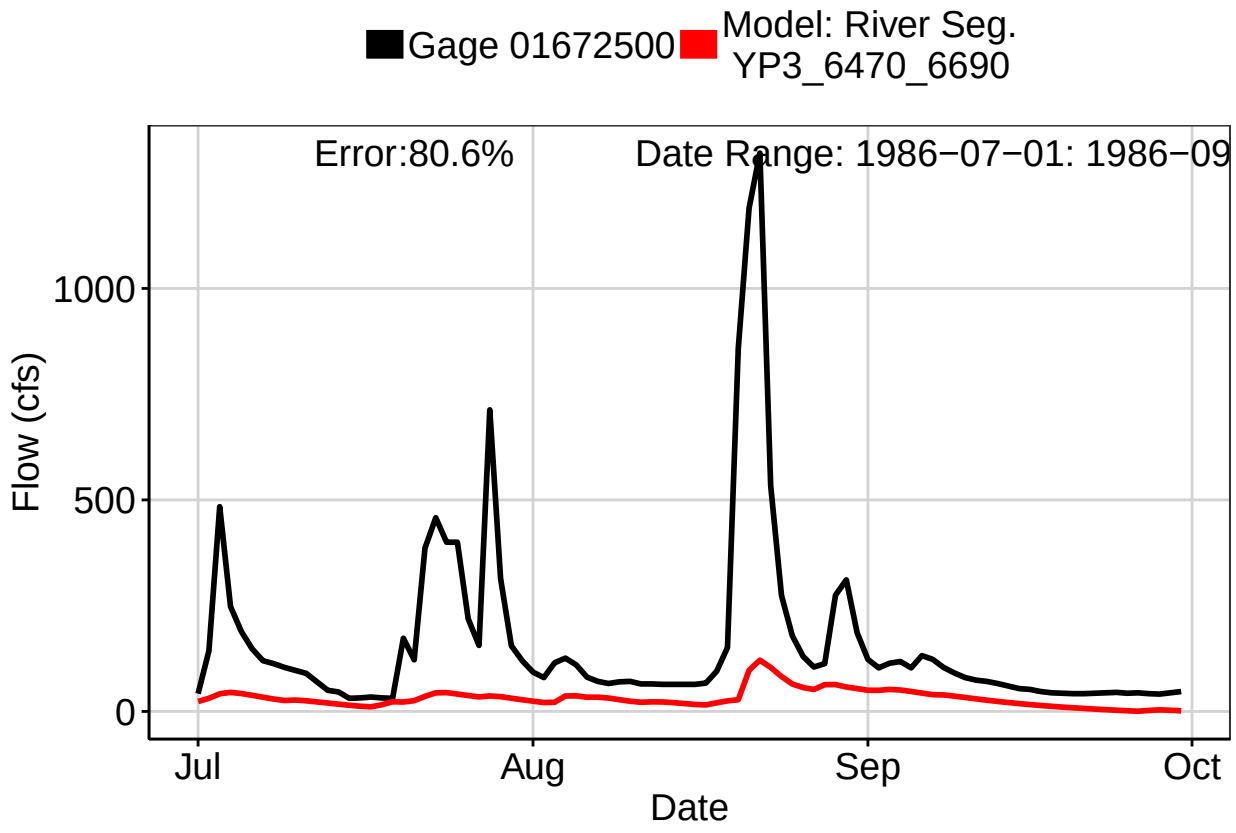


Fig. 9: Residuals Plot