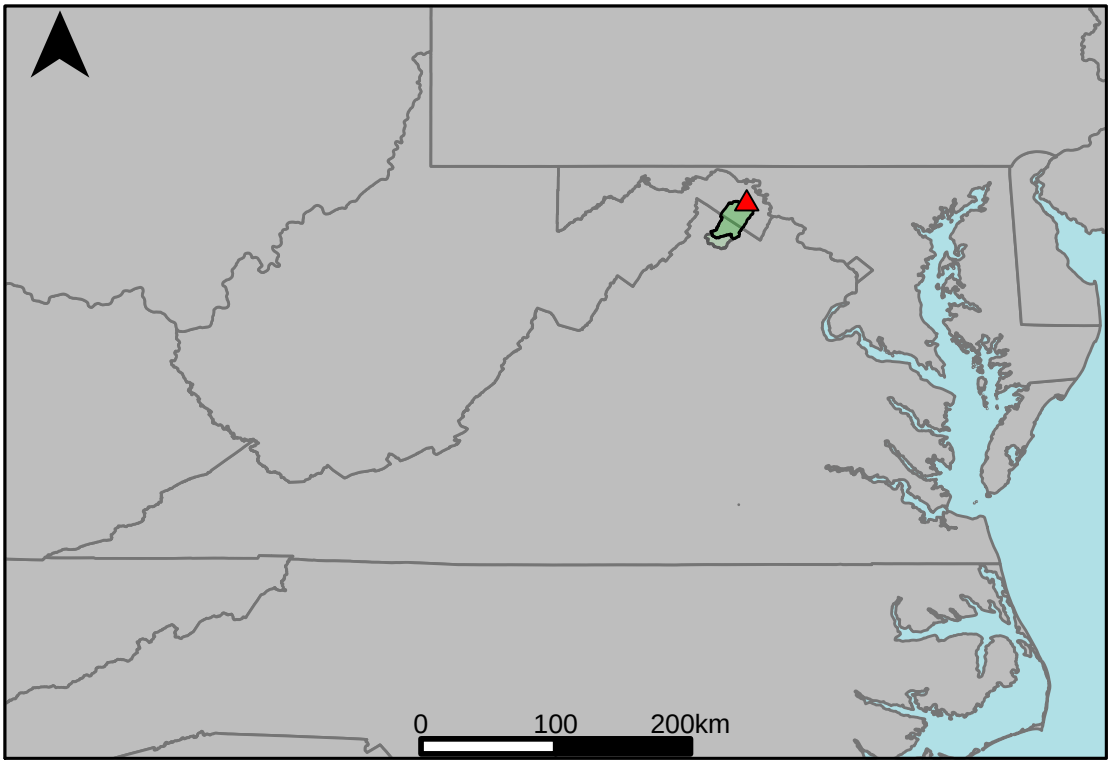
Appendix B.2: USGS Gage 01616500 vs. PU2_4220_3900 Upper Potomac River



This river segment follows part of the flow of the Opequon Creek, a tributary of the Potomac. The gage is located in Berkeley County (Lat. 39°25'25.4", Long. -77°56'19""), approximately 19 miles north of Berryville, VA. Drainage area is 273 sq. miles. This gage started taking data in 1947 and is still taking data. There are no known anthropogenic alterations in this area that would affect the flow conditions. The average daily discharge error between the model and gage data for the 20 year timespan was 0.74%, with 19.2% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	66	61.6	-6.67
Feb. Low Flow	74	73.8	-0.27
Mar. Low Flow	112	105	-6.25
Apr. Low Flow	123	133	8.13
May Low Flow	142	176	23.9
Jun. Low Flow	153	189	23.5
Jul. Low Flow	164	162	-1.22
Aug. Low Flow	117	136	16.2
Sep. Low Flow	109	117	7.34
Oct. Low Flow	85	86.2	1.41
Nov. Low Flow	71	66.7	-6.06
Dec. Low Flow	64	58.1	-9.22

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	271	269	-0.74
Jan. Mean Flow	326	305	-6.44
Feb. Mean Flow	347	378	8.93
Mar. Mean Flow	525	512	-2.48
Apr. Mean Flow	391	384	-1.79
May Mean Flow	315	305	-3.17
Jun. Mean Flow	212	212	0
Jul. Mean Flow	144	151	4.86
Aug. Mean Flow	141	140	-0.71
Sep. Mean Flow	179	212	18.4
Oct. Mean Flow	167	162	-2.99
Nov. Mean Flow	225	225	0
Dec. Mean Flow	287	255	-11.1

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	175	209	19.4
Feb. High Flow	633	782	23.5
Mar. High Flow	676	609	-9.91
Apr. High Flow	751	492	-34.5
May High Flow	545	492	-9.72
Jun. High Flow	1670	1530	-8.38
Jul. High Flow	719	718	-0.14
Aug. High Flow	666	593	-11
Sep. High Flow	367	340	-7.36
Oct. High Flow	203	231	13.8
Nov. High Flow	162	228	40.7
Dec. High Flow	282	240	-14.9

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	37	20.9	-43.5
Med. 1 Day Min	52	49.1	-5.58
Min. 3 Day Min	37.3	21	-43.7
Med. 3 Day Min	52.7	49.9	-5.31
Min. 7 Day Min	38	21.2	-44.2
Med. 7 Day Min	60.3	51.2	-15.1
Min. 30 Day Min	40.2	25.1	-37.6
Med. 30 Day Min	68.4	59	-13.7
Min. 90 Day Min	52.7	35.2	-33.2
Med. 90 Day Min	102	107	4.9
7Q10	41.6	22.8	-45.2
Year of 90-Day Min. Flow	1999	1999	0
Drought Year Mean	119	128	7.56
Mean Baseflow	154	153	-0.65

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	15000	10400	-30.7
Med. 1 Day Max	4120	3690	-10.4
Max. 3 Day Max	7260	7520	3.58
Med. 3 Day Max	2420	2160	-10.7
Max. 7 Day Max	3780	3750	-0.79
Med. 7 Day Max	1360	1200	-11.8
Max. 30 Day Max	1600	1430	-10.6
Med. 30 Day Max	716	707	-1.26
Max. 90 Day Max	1080	932	-13.7
Med. 90 Day Max	413	433	4.84

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	44	29.3	-33.4
5% Non-Exceedance	53	43.5	-17.9
50% Non-Exceedance	150	165	10
95% Non-Exceedance	805	763	-5.22
99% Non-Exceedance	2090	2090	0
Sept. 10% Non-Exceedance	47	38.9	-17.2

Fig. 1: Hydrograph

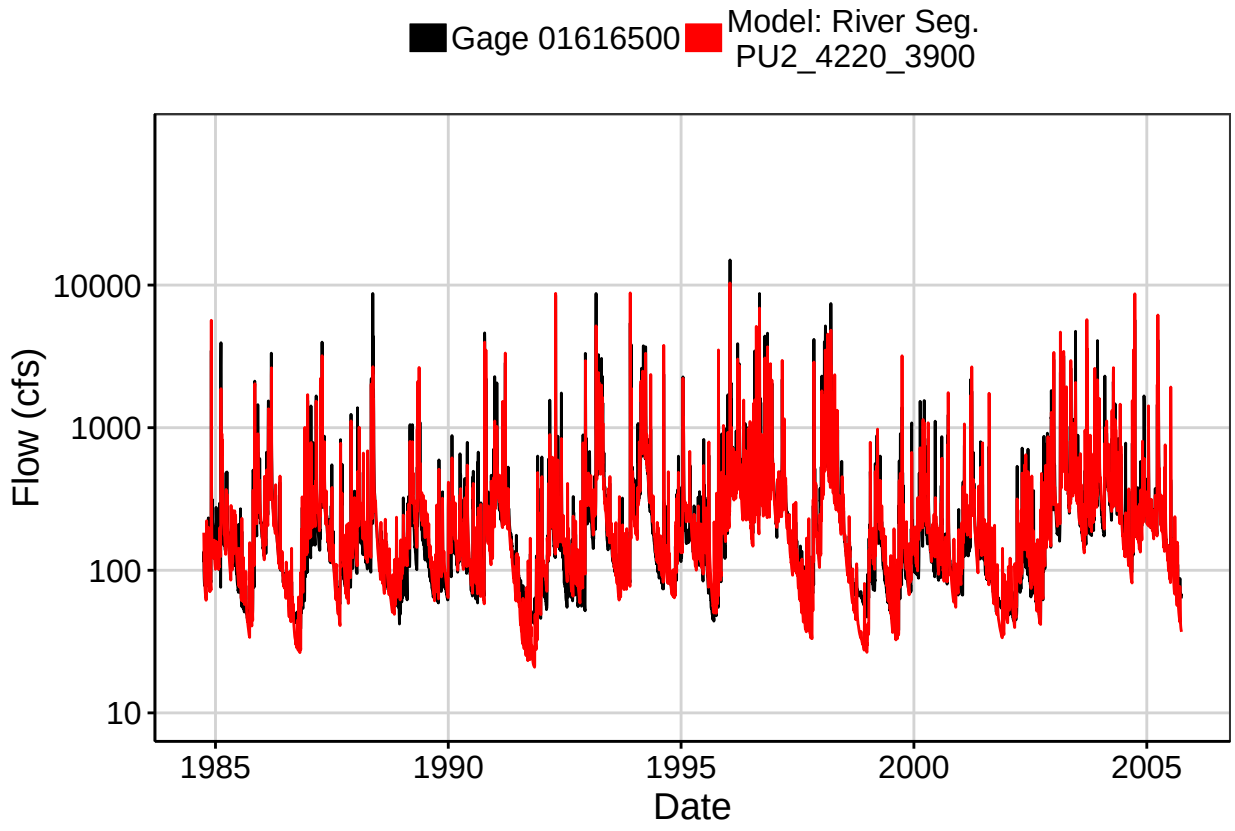


Fig. 2: Zoomed Hydrograph

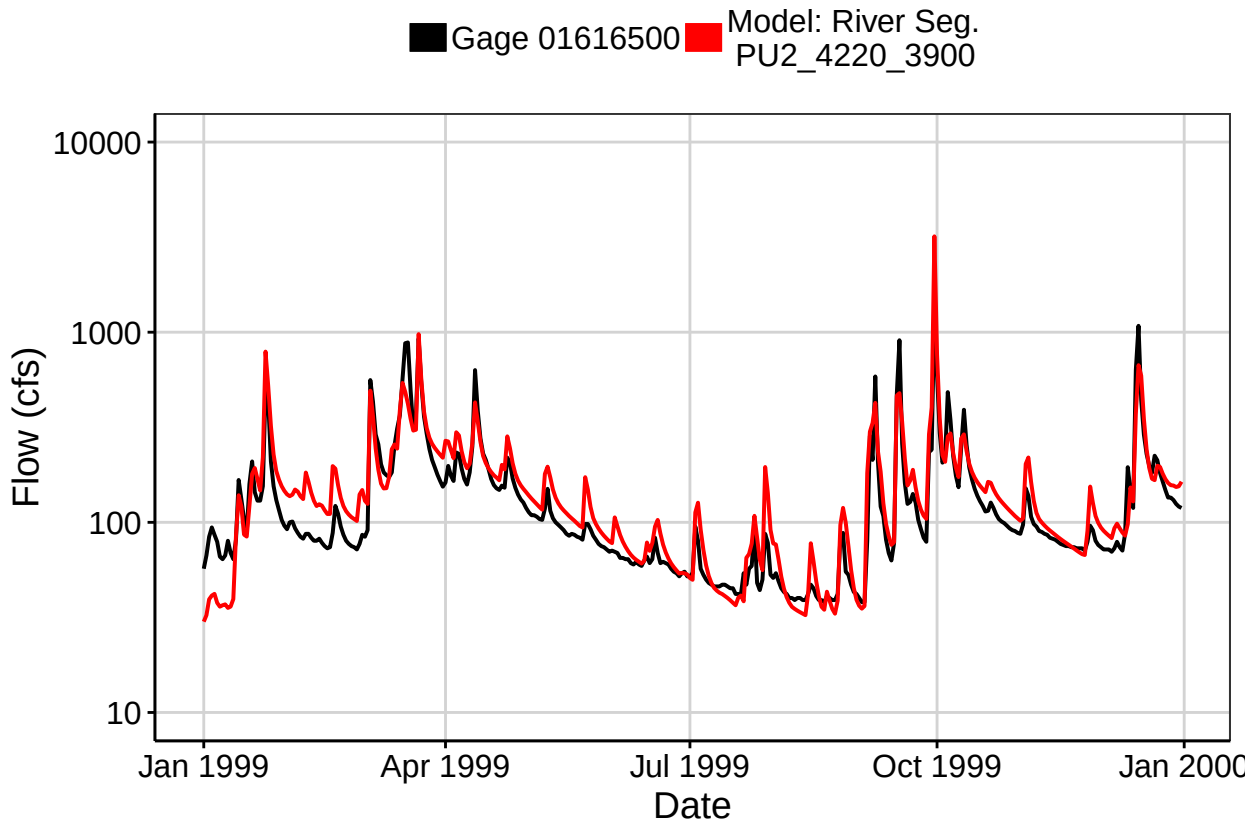


Fig. 3: Flow Exceedance

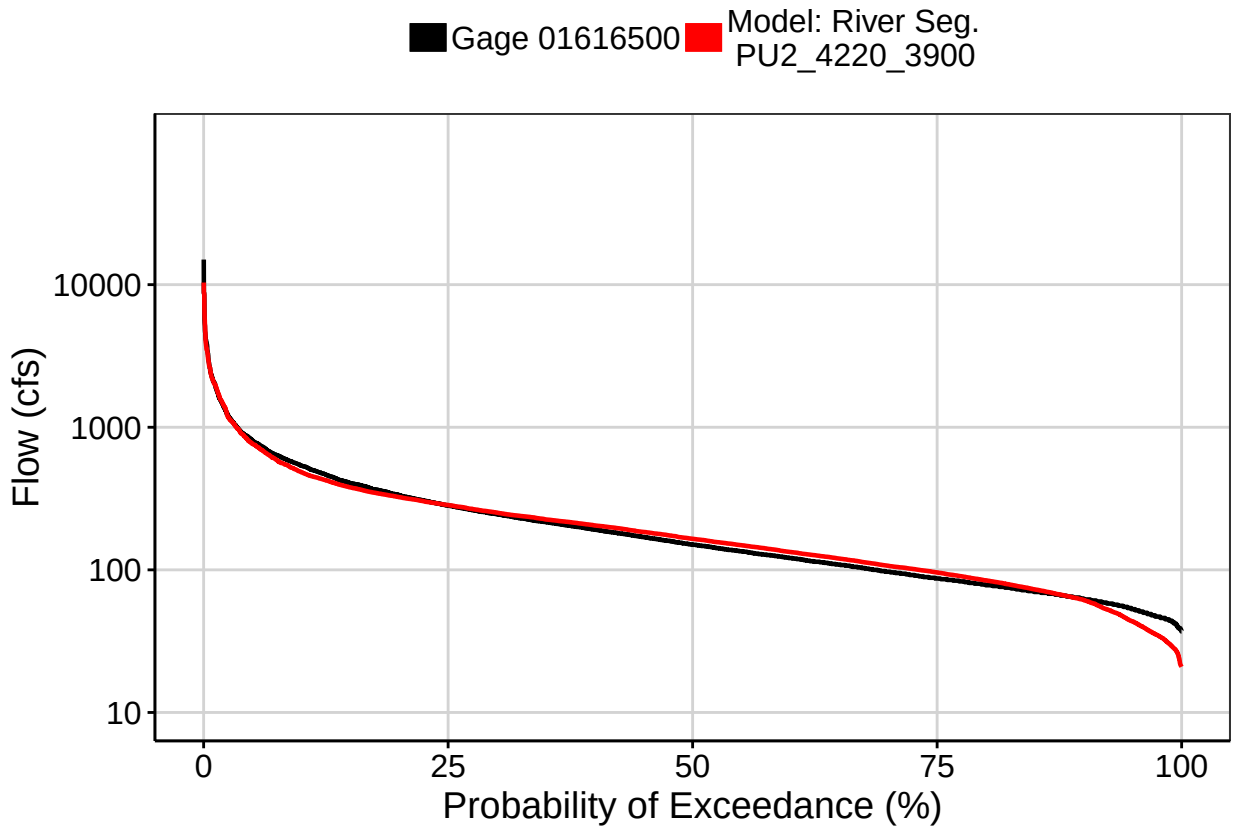


Fig. 4: Baseflow

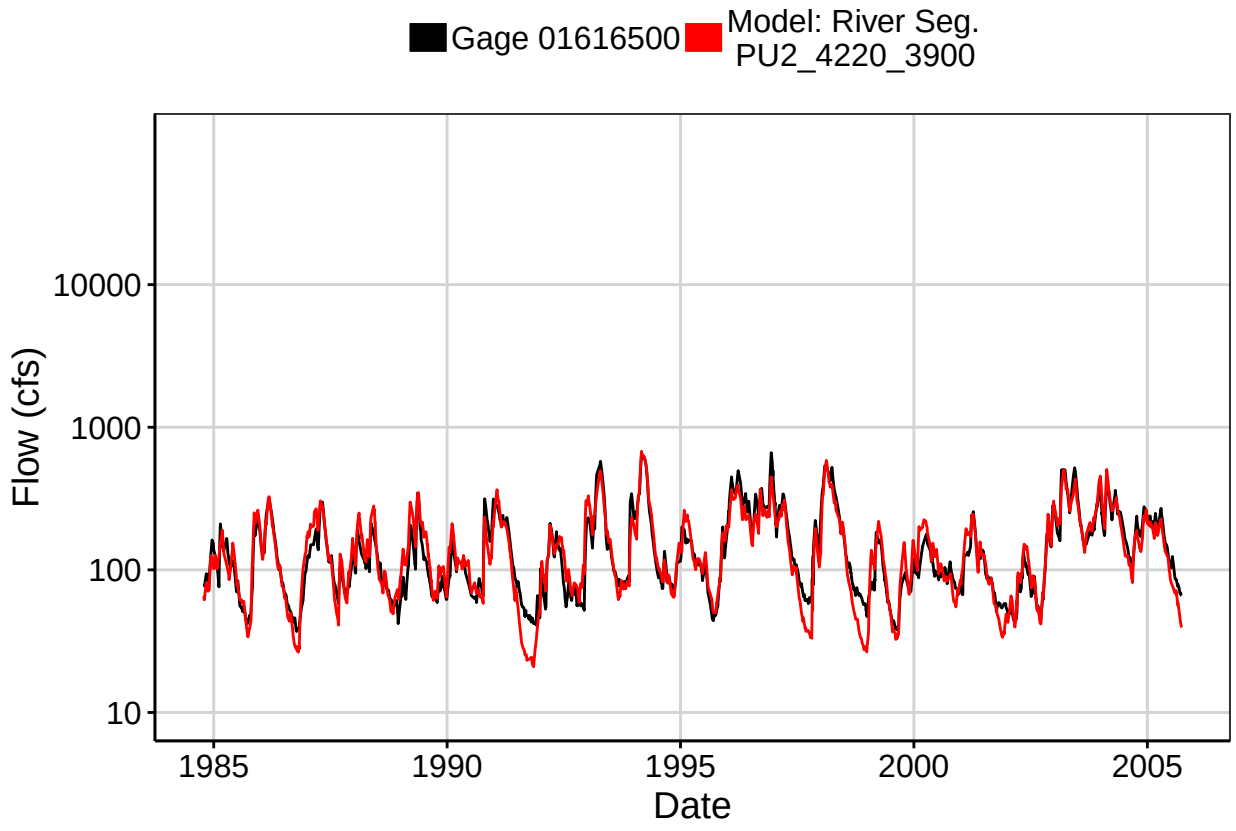


Fig. 5: Combined Baseflow

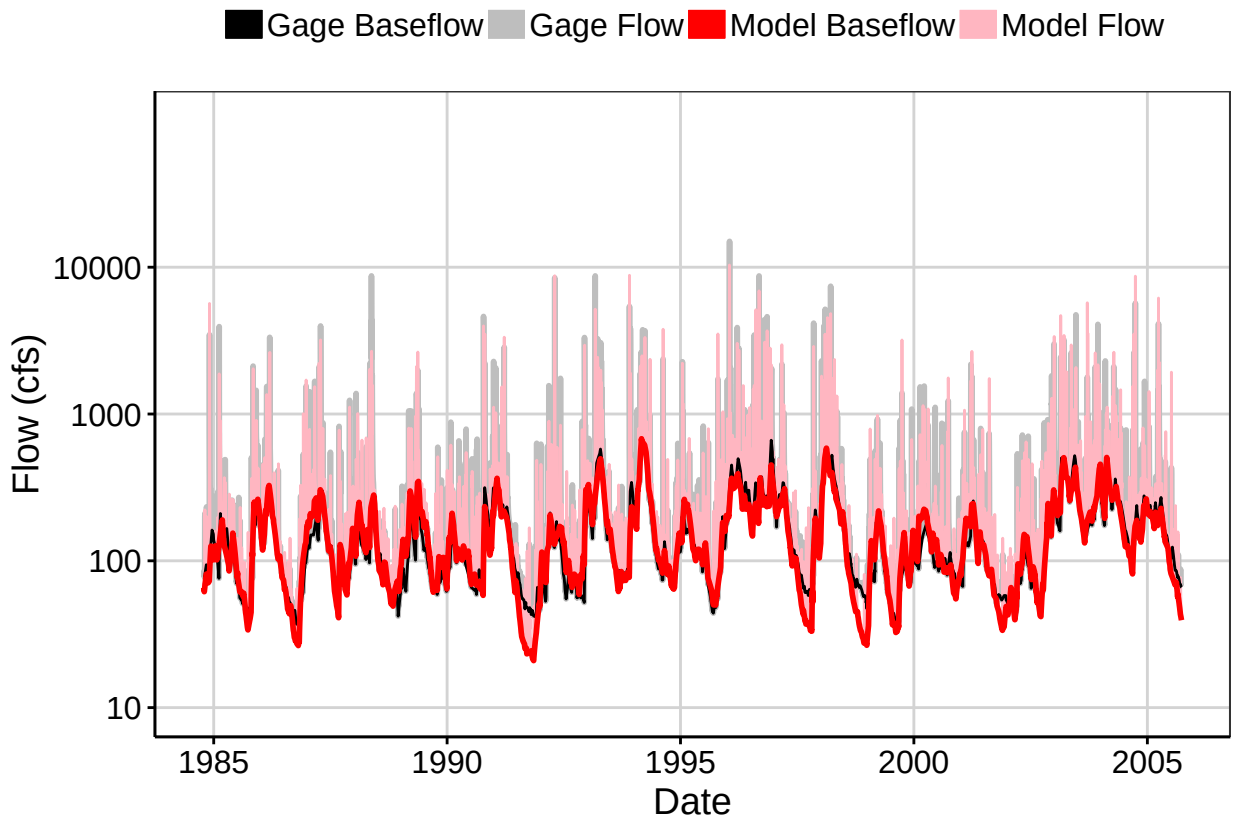


Fig. 6: Largest Error Segment

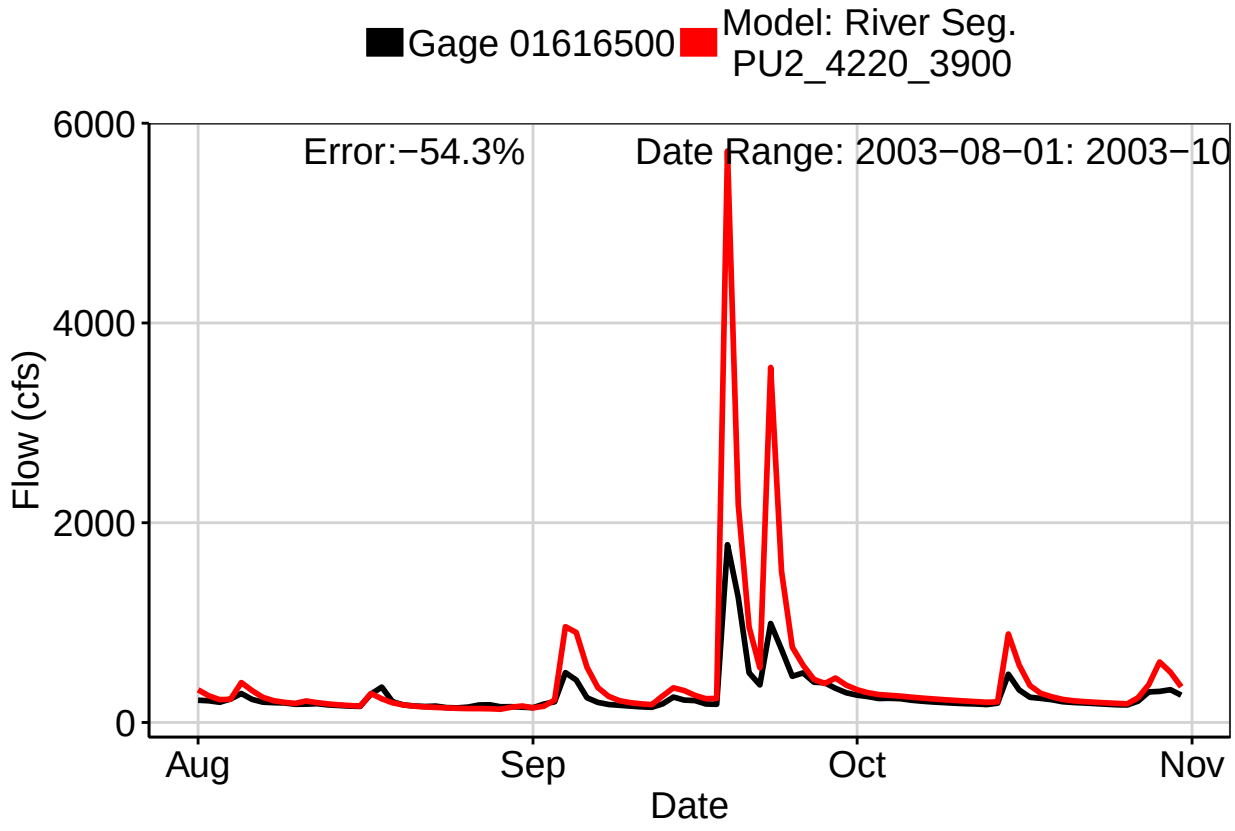


Fig. 7: Second Largest Error Segment

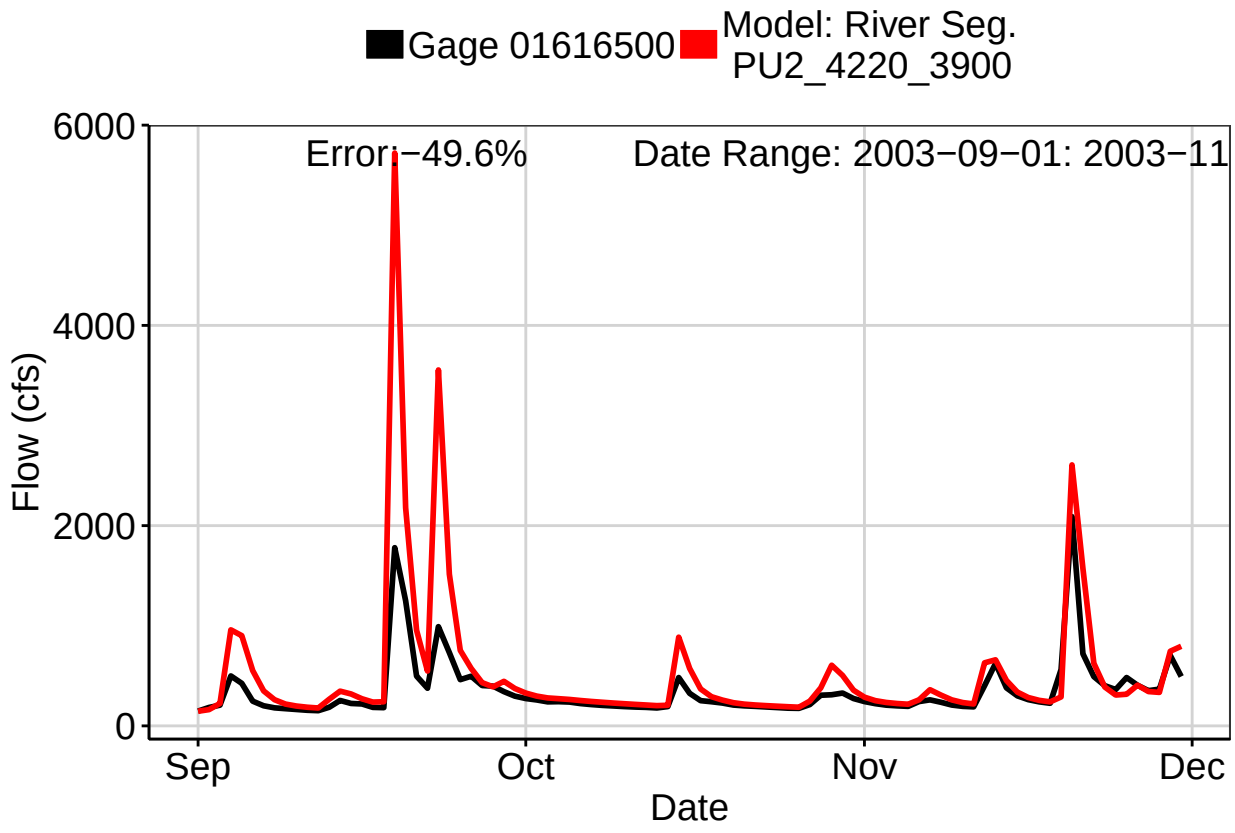


Fig. 8: Third Largest Error Segment

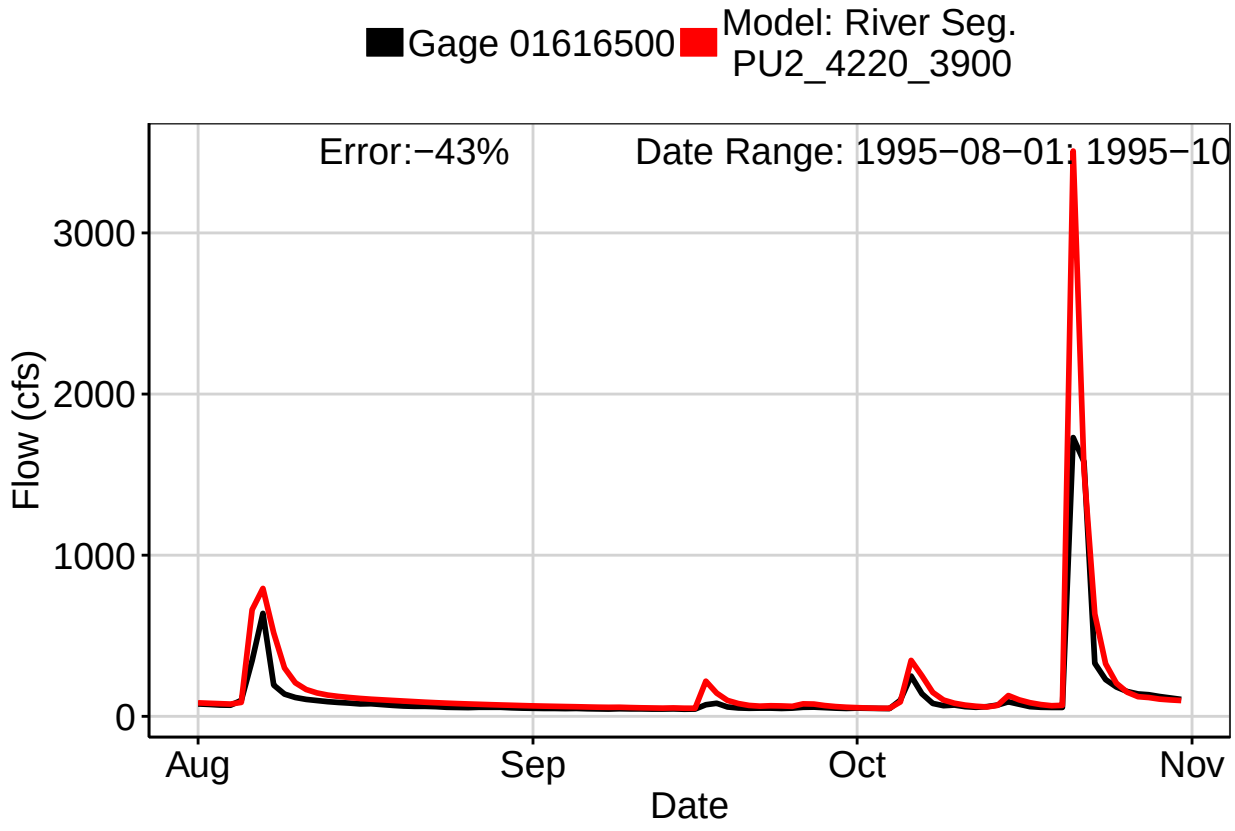


Fig. 9: Residuals Plot