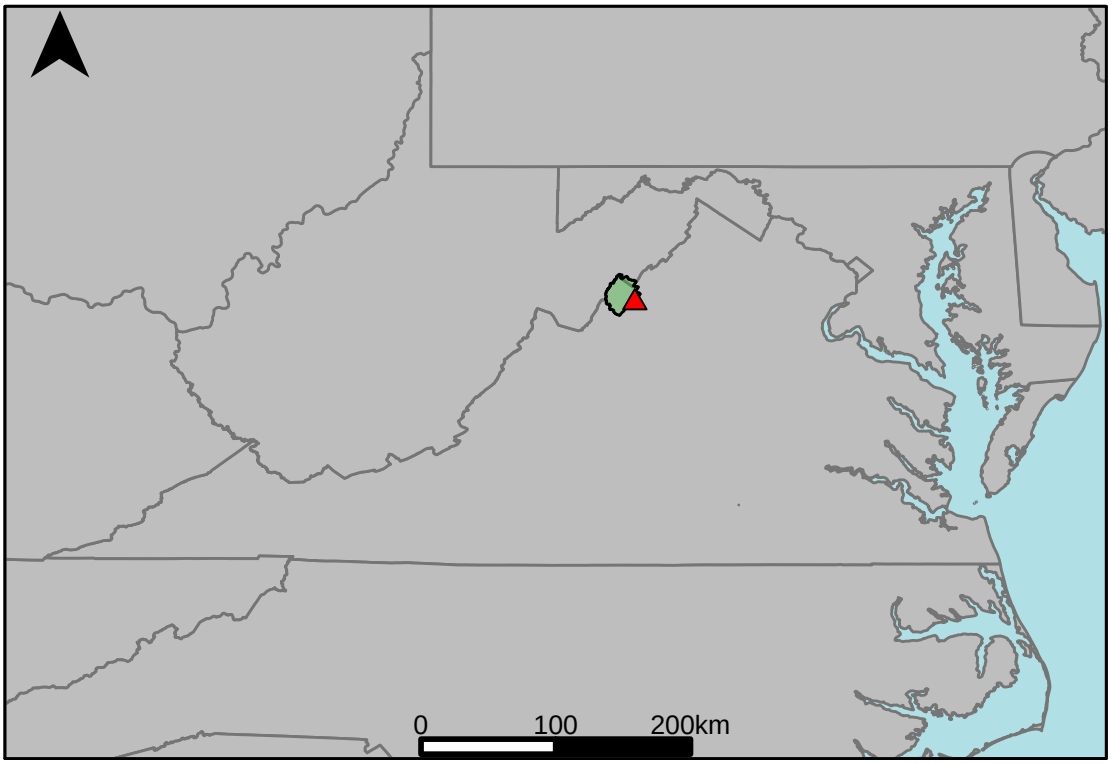
Appendix B.11: USGS Gage 01632000 vs. PS2_5550_5560 Shenandoah River



This river segment follows part of the flow of the North Fork of Shenandoah River, a tributary of the Potomac. The gage is located in Rockingham County (Lat. 38°38'13.4", Long. -78°51'10.1"), approximately 3.4 miles northwest of Broadway, VA. Drainage area is 210 sq. miles. This gage started taking data in 1925 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 5.21%, with 55.8% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	5.5	11.1	102
Feb. Low Flow	16	20.4	27.5
Mar. Low Flow	43	64.4	49.8
Apr. Low Flow	48	76.9	60.2
May Low Flow	56	96.5	72.3
Jun. Low Flow	95	106	11.6
Jul. Low Flow	69	72.9	5.65
Aug. Low Flow	47.3	30.4	-35.7
Sep. Low Flow	20.6	10.6	-48.5
Oct. Low Flow	8.4	5.62	-33.1
Nov. Low Flow	6.8	3.67	-46
Dec. Low Flow	5.08	1.76	-65.4

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	211	200	-5.21
Jan. Mean Flow	263	237	-9.89
Feb. Mean Flow	260	306	17.7
Mar. Mean Flow	423	427	0.95
Apr. Mean Flow	337	266	-21.1
May Mean Flow	297	199	-33
Jun. Mean Flow	151	114	-24.5
Jul. Mean Flow	65.7	71.9	9.44
Aug. Mean Flow	71	88.1	24.1
Sep. Mean Flow	169	204	20.7
Oct. Mean Flow	81.2	103	26.8
Nov. Mean Flow	228	223	-2.19
Dec. Mean Flow	191	165	-13.6

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	51	171	235
Feb. High Flow	1140	700	-38.6
Mar. High Flow	571	386	-32.4
Apr. High Flow	904	774	-14.4
May High Flow	509	639	25.5
Jun. High Flow	2050	1910	-6.83
Jul. High Flow	714	838	17.4
Aug. High Flow	1380	668	-51.6
Sep. High Flow	402	287	-28.6
Oct. High Flow	412	156	-62.1
Nov. High Flow	68	106	55.9
Dec. High Flow	39.8	67.6	69.8

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	0.39	0.25	-36.7
Med. 1 Day Min	2.57	1.17	-54.5
Min. 3 Day Min	0.4	0.28	-30
Med. 3 Day Min	2.57	1.23	-52.1
Min. 7 Day Min	0.42	0.3	-29.5
Med. 7 Day Min	2.77	1.68	-39.4
Min. 30 Day Min	0.58	0.54	-7.08
Med. 30 Day Min	4.11	7.29	77.4
Min. 90 Day Min	2.77	4.25	53.4
Med. 90 Day Min	33.6	33.4	-0.6
7Q10	0.92	0.47	-48.9
Year of 90-Day Min. Flow	1988	1999	100
Drought Year Mean	141	101	-28.4
Mean Baseflow	65.1	77.3	18.7

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	26400	18500	-29.9
Med. 1 Day Max	4530	3880	-14.3
Max. 3 Day Max	14600	12300	-15.8
Med. 3 Day Max	2930	1750	-40.3
Max. 7 Day Max	7290	6020	-17.4
Med. 7 Day Max	1570	1060	-32.5
Max. 30 Day Max	1900	1700	-10.5
Med. 30 Day Max	700	566	-19.1
Max. 90 Day Max	878	927	5.58
Med. 90 Day Max	407	324	-20.4

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	1.29	0.62	-52
5% Non-Exceedance	2.52	2.27	-9.92
50% Non-Exceedance	70	90.1	28.7
95% Non-Exceedance	773	701	-9.31
99% Non-Exceedance	2310	1900	-17.7
Sept. 10% Non-Exceedance	1.5	1.16	-22.7

Fig. 1: Hydrograph

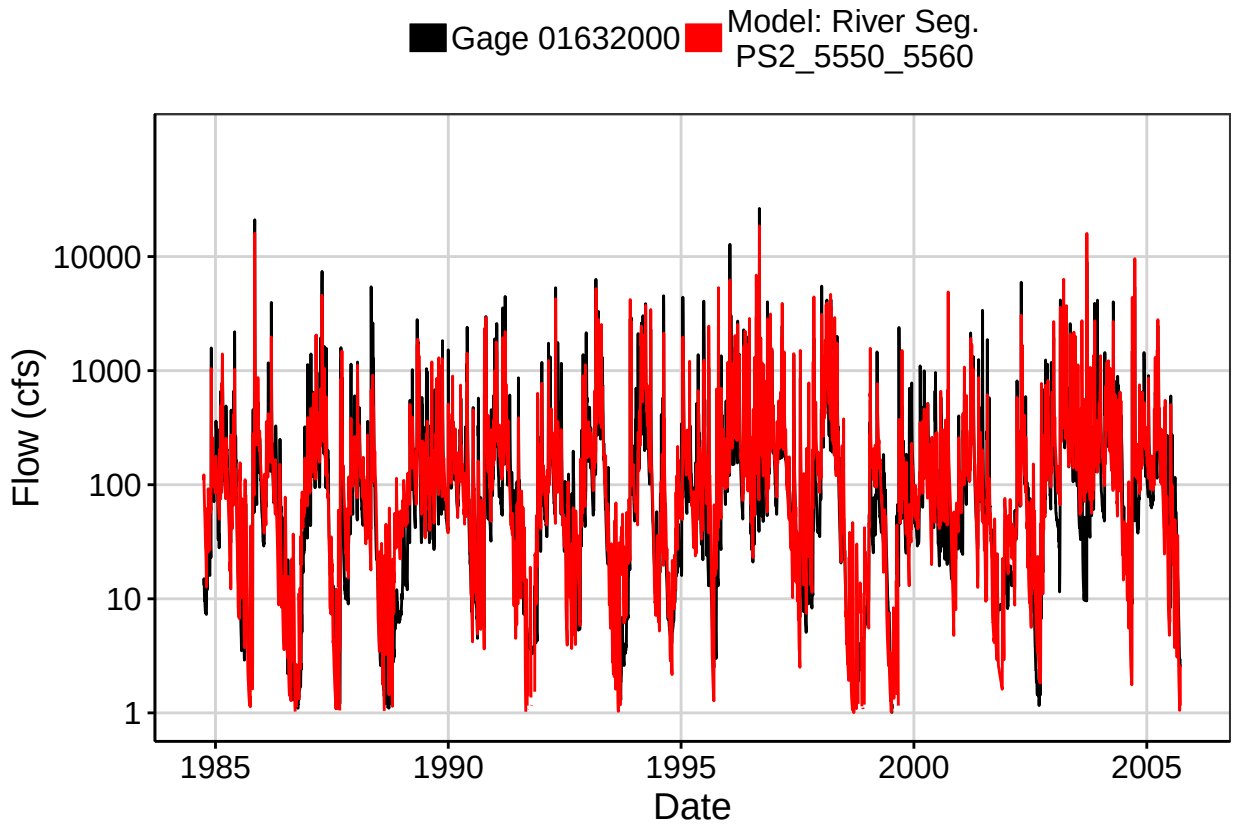


Fig. 2: Zoomed Hydrograph

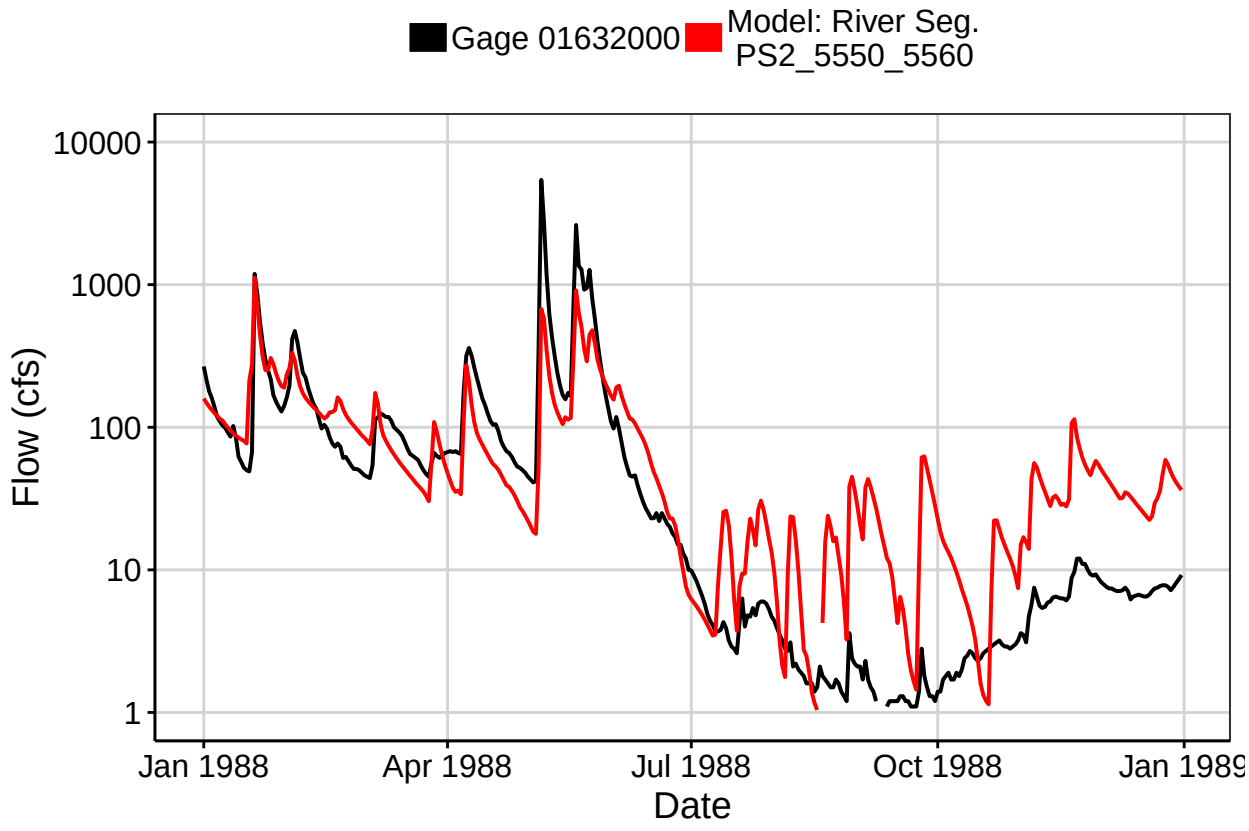


Fig. 3: Flow Exceedance

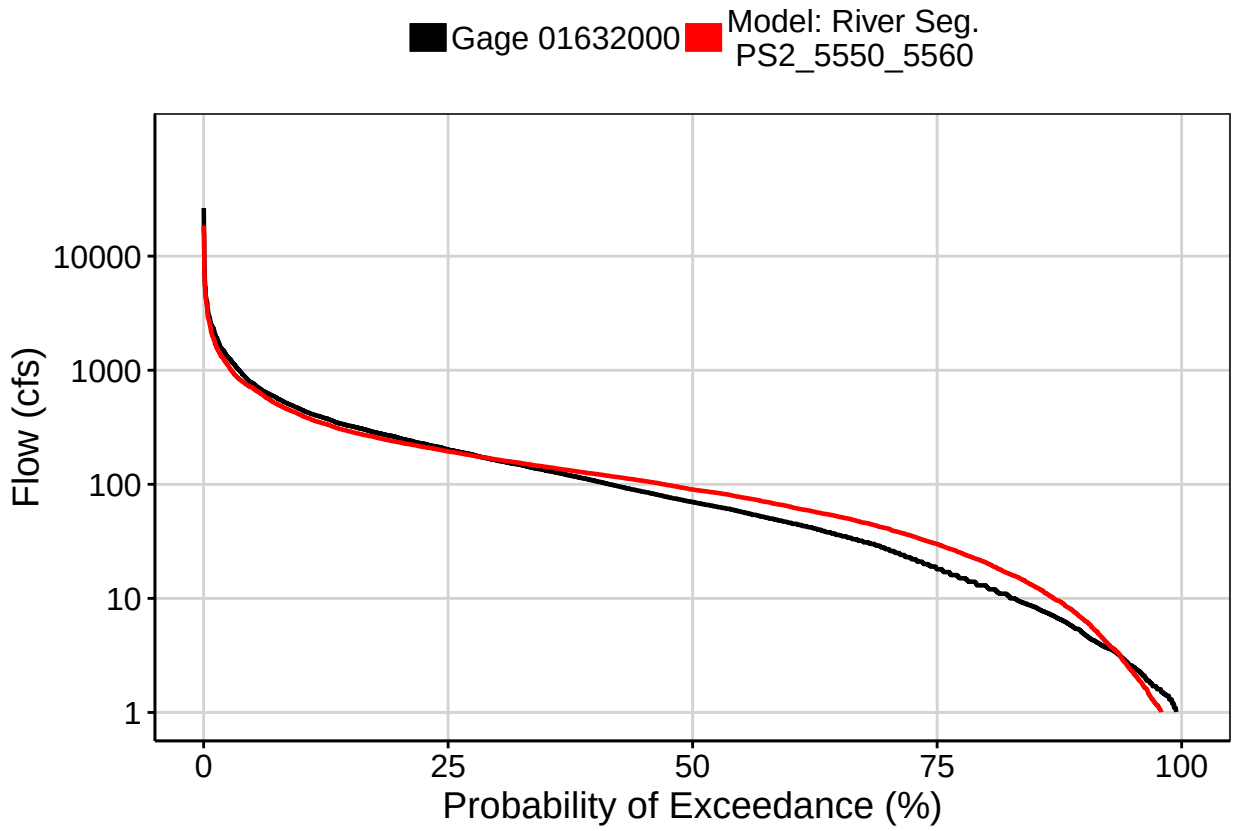


Fig. 4: Baseflow

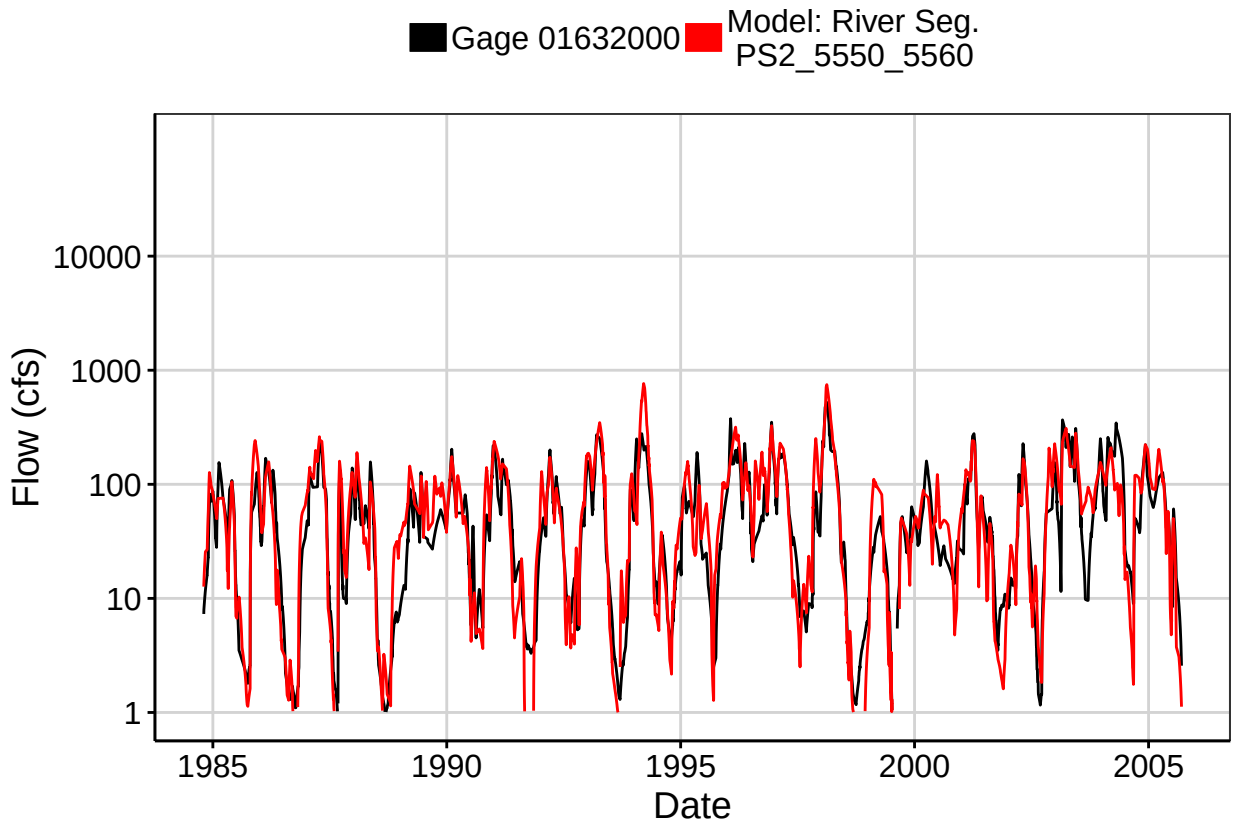


Fig. 5: Combined Baseflow

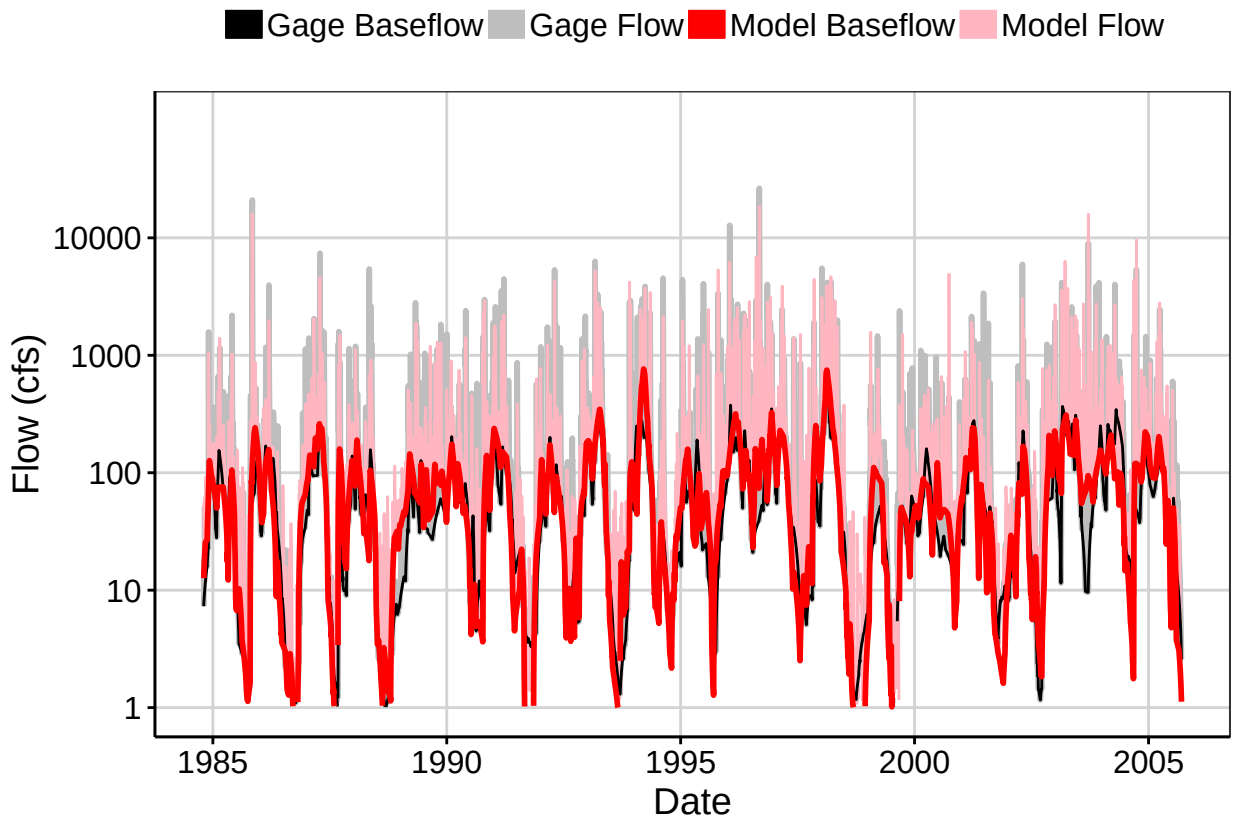


Fig. 6: Largest Error Segment

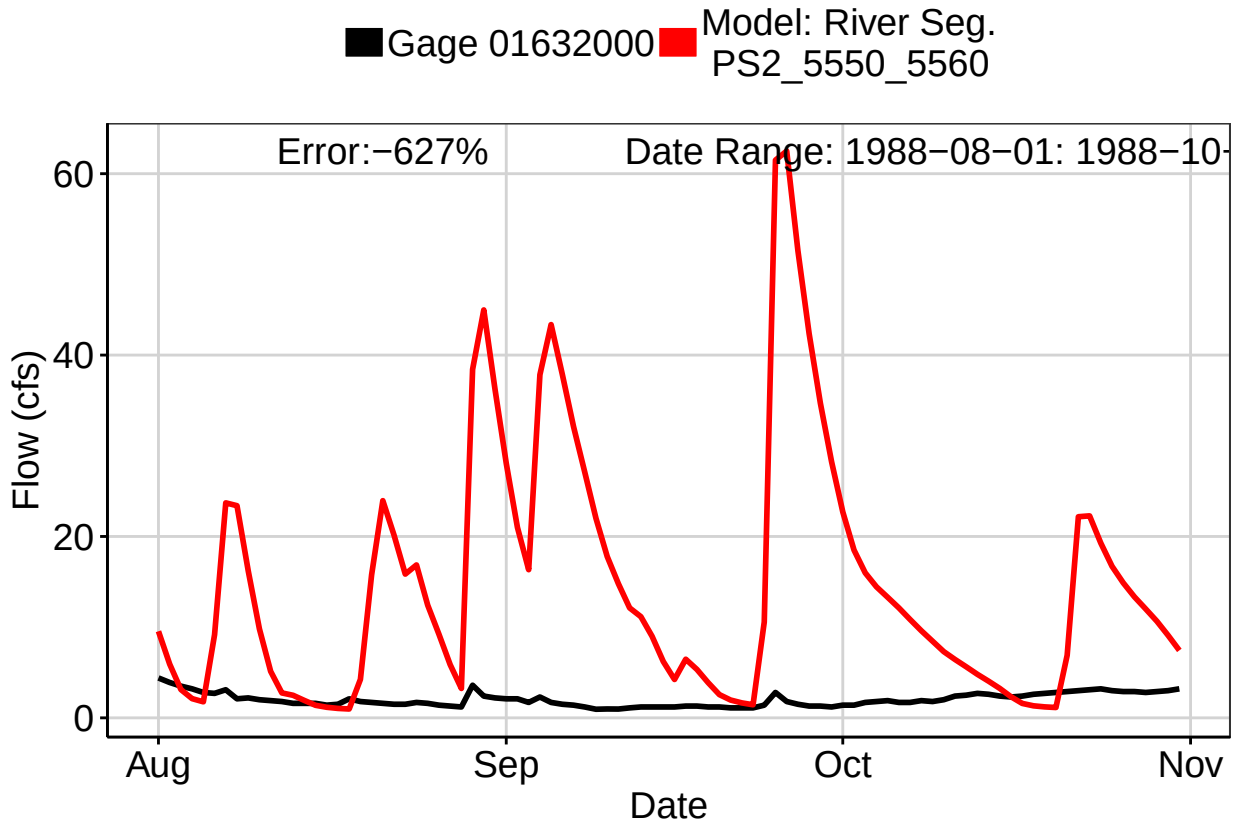


Fig. 7: Second Largest Error Segment

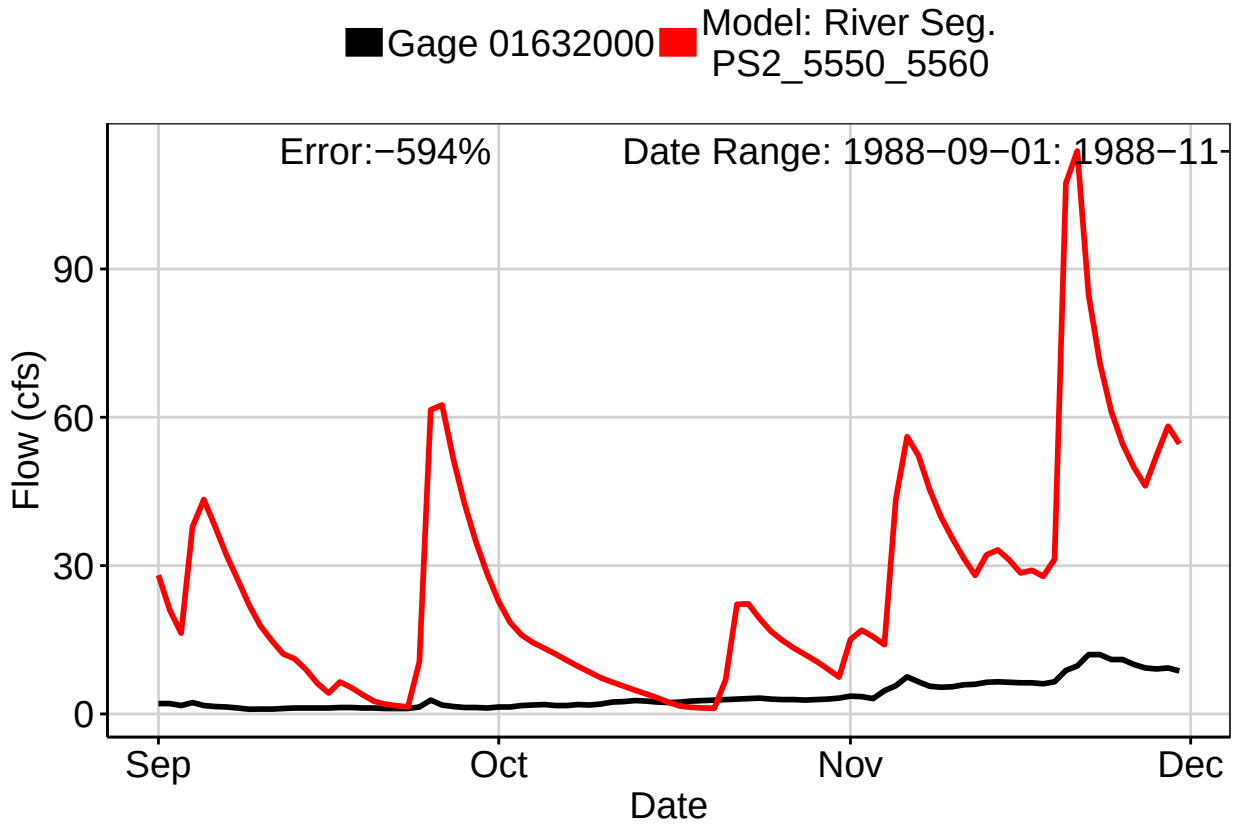


Fig. 8: Third Largest Error Segment

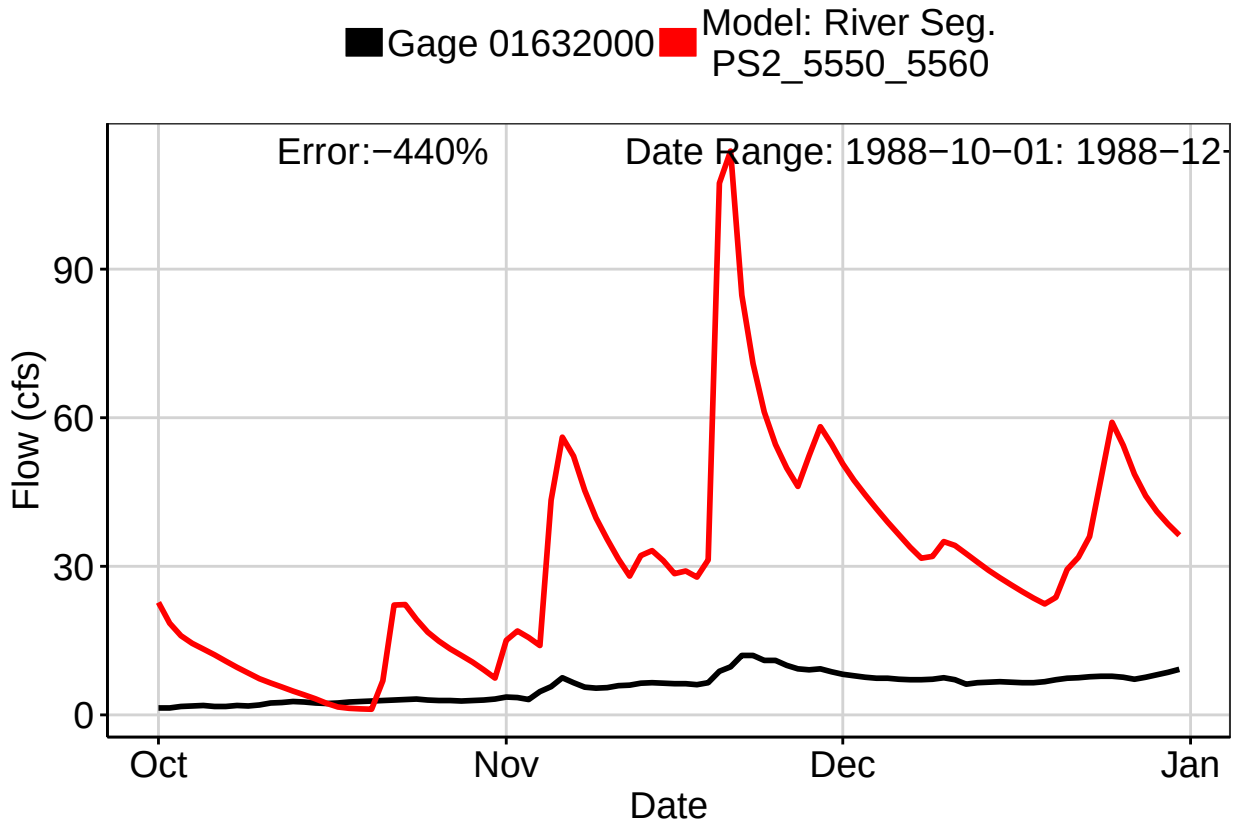


Fig. 9: Residuals Plot