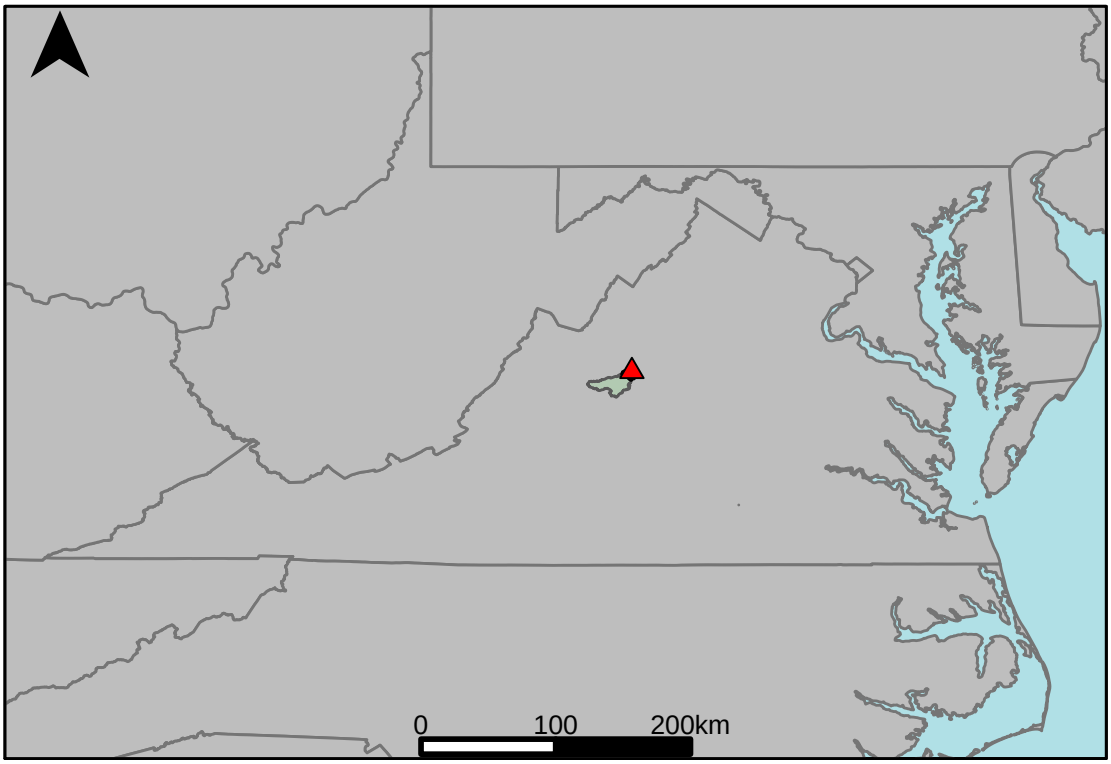
Appendix B.6: USGS Gage 01626850 vs. PS2_6660_6490 Shenandoah River



This river segment follows part of the flow of the South River, a tributary of the Potomac. The gage is located in Waynesboro County (Lat. 38°05'19.5", Long. -78°52'37.1"), approximately 2 miles northeast of Waynesboro, VA. Drainage area is 148 sq. miles. This gage started taking data in 1974 but was decommissioned in 2018. There are discharges from wastewater treatment plants upstream, originating from well fields. The average daily discharge error between the model and gage data for the 20 year timespan was 6.88%, with 62.9% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	61	42.3	-30.7
Feb. Low Flow	74	68.1	-7.97
Mar. Low Flow	100	99.5	-0.5
Apr. Low Flow	105	114	8.57
May Low Flow	136	131	-3.68
Jun. Low Flow	136	137	0.74
Jul. Low Flow	136	110	-19.1
Aug. Low Flow	116	119	2.59
Sep. Low Flow	79	75.9	-3.92
Oct. Low Flow	69	52.7	-23.6
Nov. Low Flow	59	45	-23.7
Dec. Low Flow	56	43	-23.2

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	218	203	-6.88
Jan. Mean Flow	309	243	-21.4
Feb. Mean Flow	222	269	21.2
Mar. Mean Flow	345	308	-10.7
Apr. Mean Flow	339	255	-24.8
May Mean Flow	238	221	-7.14
Jun. Mean Flow	182	167	-8.24
Jul. Mean Flow	130	139	6.92
Aug. Mean Flow	115	110	-4.35
Sep. Mean Flow	161	174	8.07
Oct. Mean Flow	139	159	14.4
Nov. Mean Flow	267	220	-17.6
Dec. Mean Flow	187	193	3.21

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	119	209	75.6
Feb. High Flow	531	724	36.3
Mar. High Flow	453	625	38
Apr. High Flow	686	813	18.5
May High Flow	348	441	26.7
Jun. High Flow	602	758	25.9
Jul. High Flow	508	524	3.15
Aug. High Flow	530	380	-28.3
Sep. High Flow	214	308	43.9
Oct. High Flow	145	397	174
Nov. High Flow	129	253	96.1
Dec. High Flow	100	139	39

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	47	14.3	-69.6
Med. 1 Day Min	54	34.9	-35.4
Min. 3 Day Min	48.7	15.2	-68.8
Med. 3 Day Min	54.7	35.6	-34.9
Min. 7 Day Min	49.9	16.9	-66.1
Med. 7 Day Min	55.2	38.5	-30.3
Min. 30 Day Min	52.3	26.7	-48.9
Med. 30 Day Min	60.4	52.3	-13.4
Min. 90 Day Min	61.2	34.8	-43.1
Med. 90 Day Min	77.7	86.1	10.8
7Q10	50.4	22.5	-55.4
Year of 90-Day Min. Flow	1986	1986	0
Drought Year Mean	238	178	-25.2
Mean Baseflow	116	112	-3.45

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	12000	10000	-16.7
Med. 1 Day Max	2080	2730	31.2
Max. 3 Day Max	8670	5240	-39.6
Med. 3 Day Max	1730	1570	-9.25
Max. 7 Day Max	4960	2820	-43.1
Med. 7 Day Max	1290	1160	-10.1
Max. 30 Day Max	1550	962	-37.9
Med. 30 Day Max	594	584	-1.68
Max. 90 Day Max	655	578	-11.8
Med. 90 Day Max	361	322	-10.8

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	51.2	24.7	-51.8
5% Non-Exceedance	57	39.6	-30.5
50% Non-Exceedance	129	135	4.65
95% Non-Exceedance	608	551	-9.38
99% Non-Exceedance	1650	1450	-12.1
Sept. 10% Non-Exceedance	55	38.5	-30

Fig. 1: Hydrograph

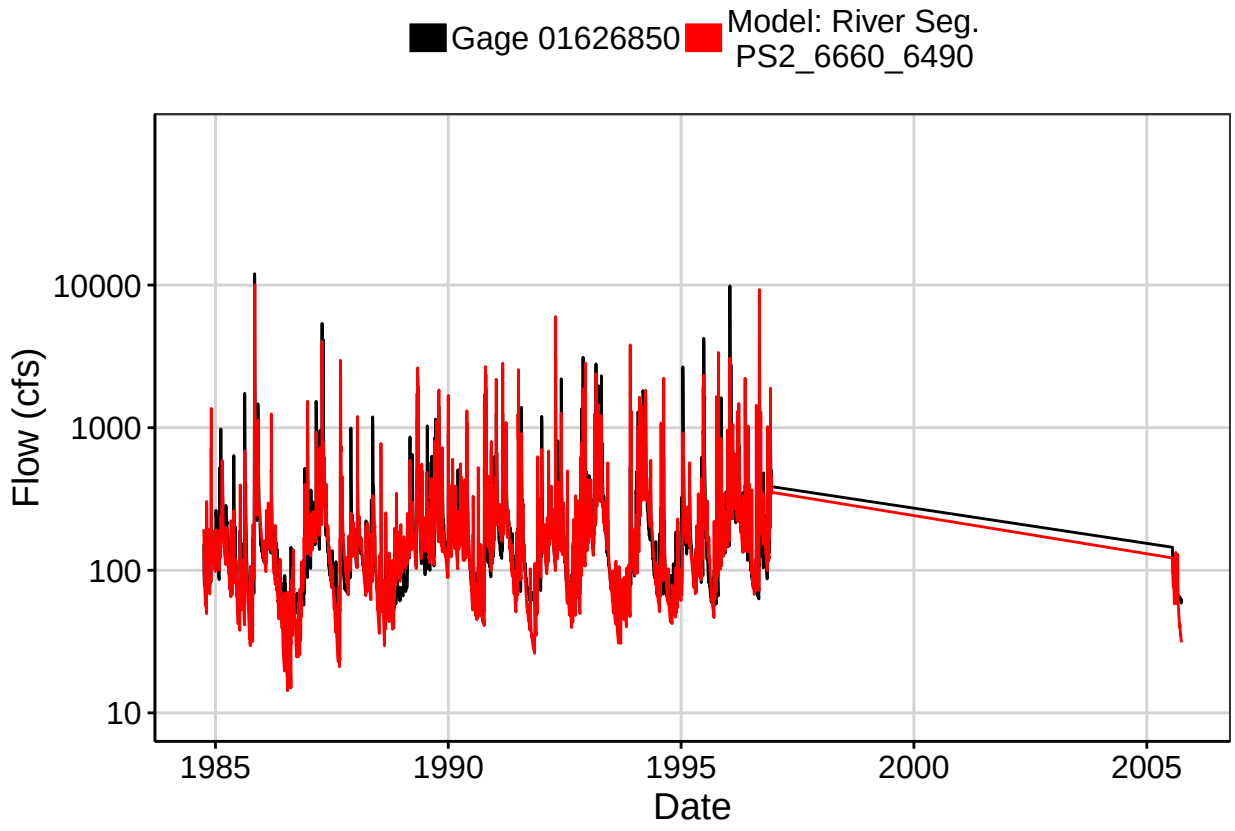


Fig. 2: Zoomed Hydrograph

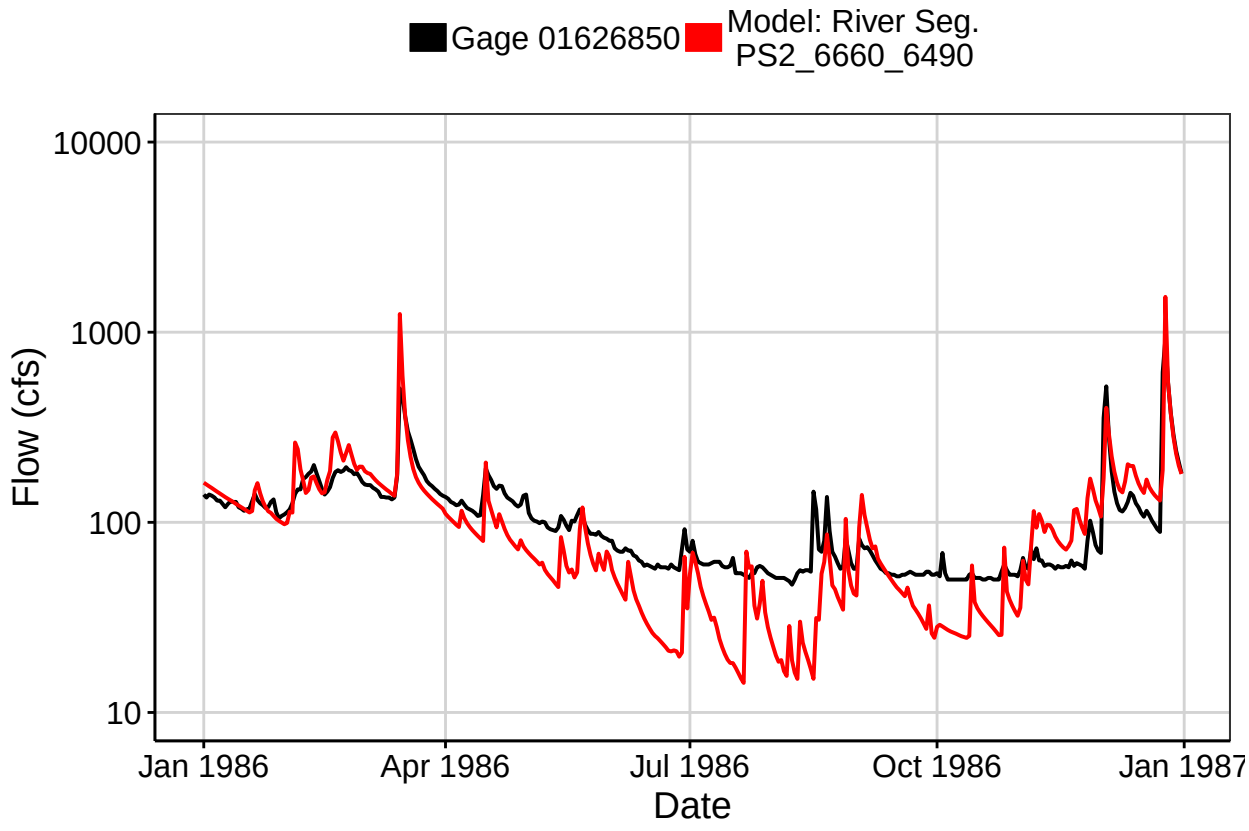


Fig. 3: Flow Exceedance

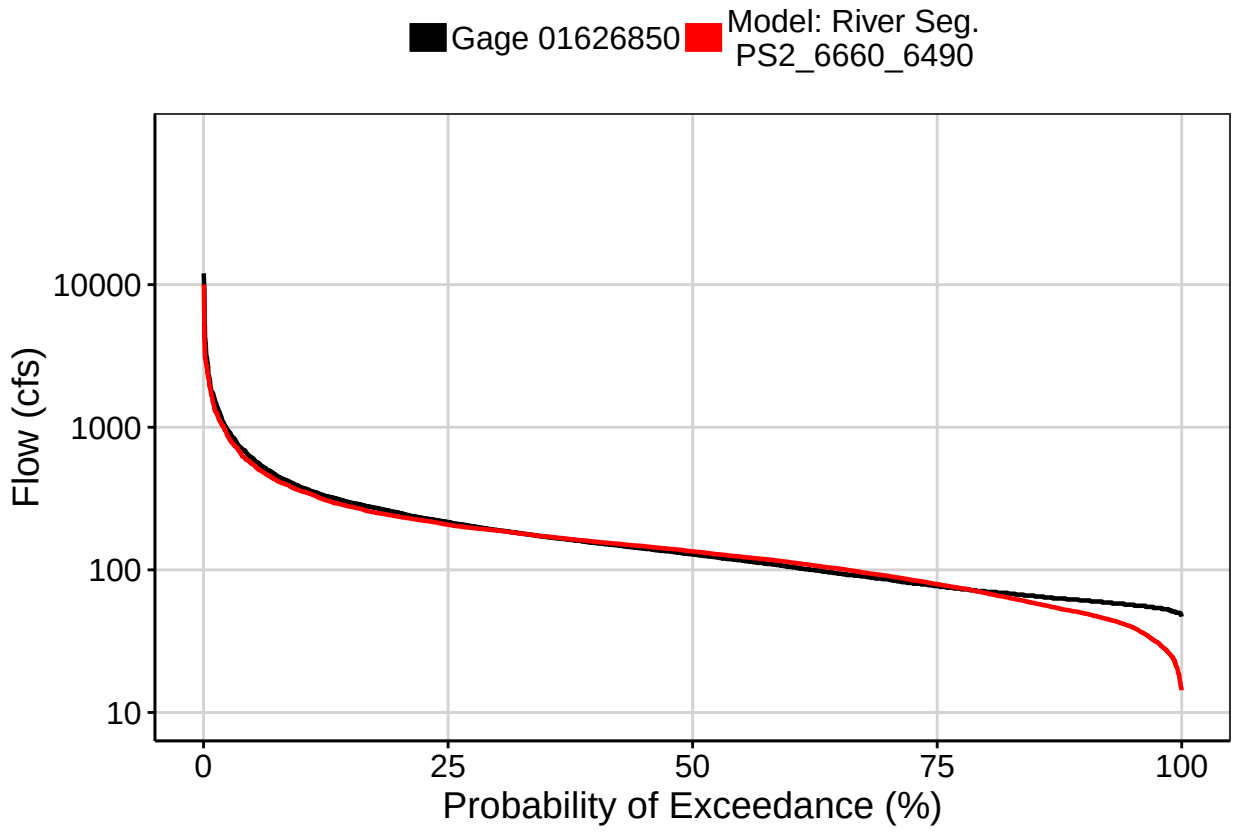


Fig. 4: Baseflow

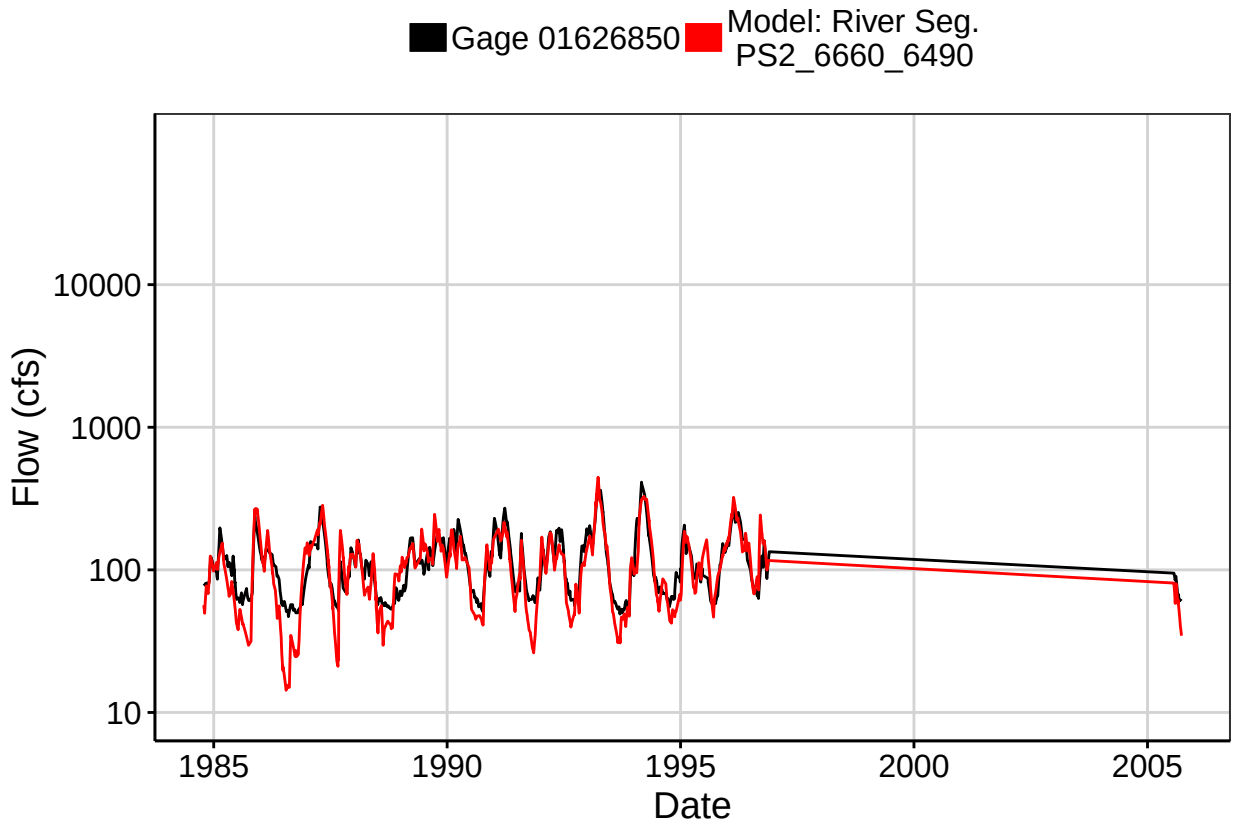


Fig. 5: Combined Baseflow

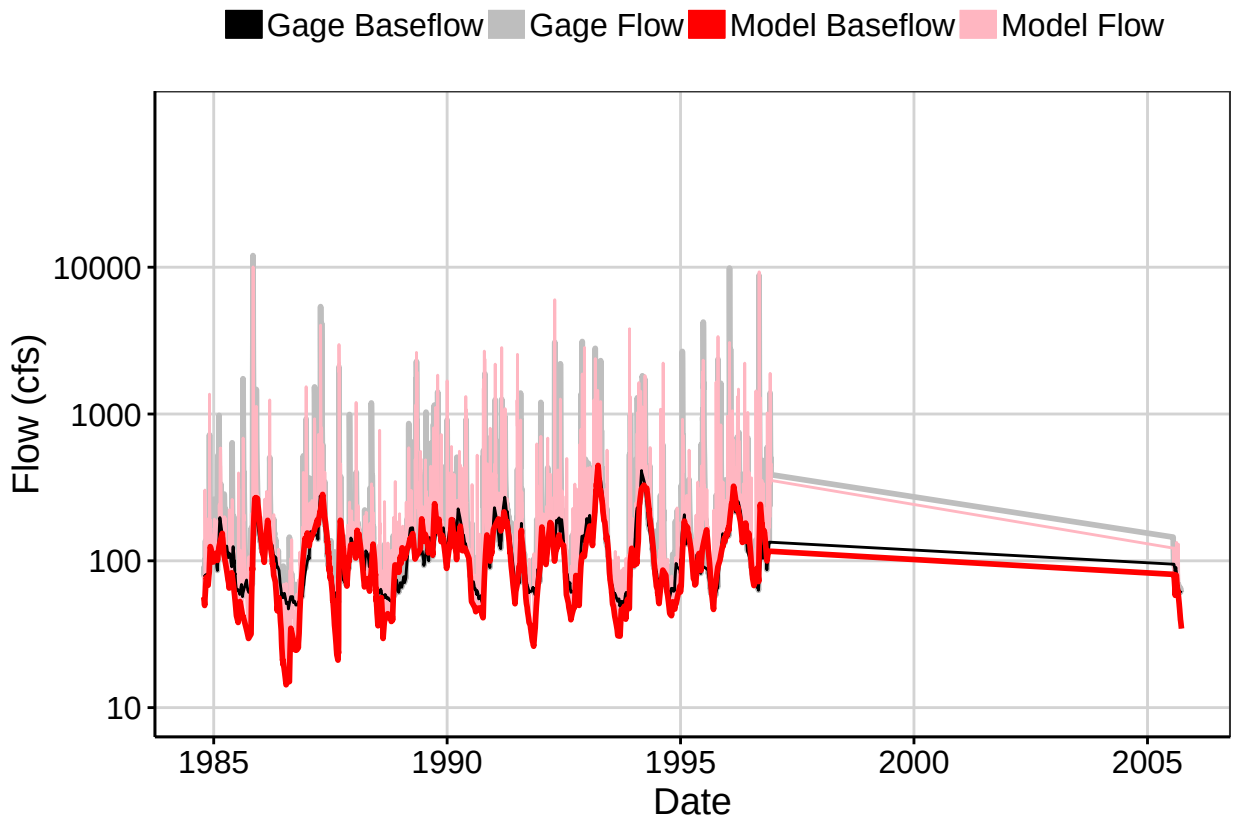


Fig. 6: Largest Error Segment

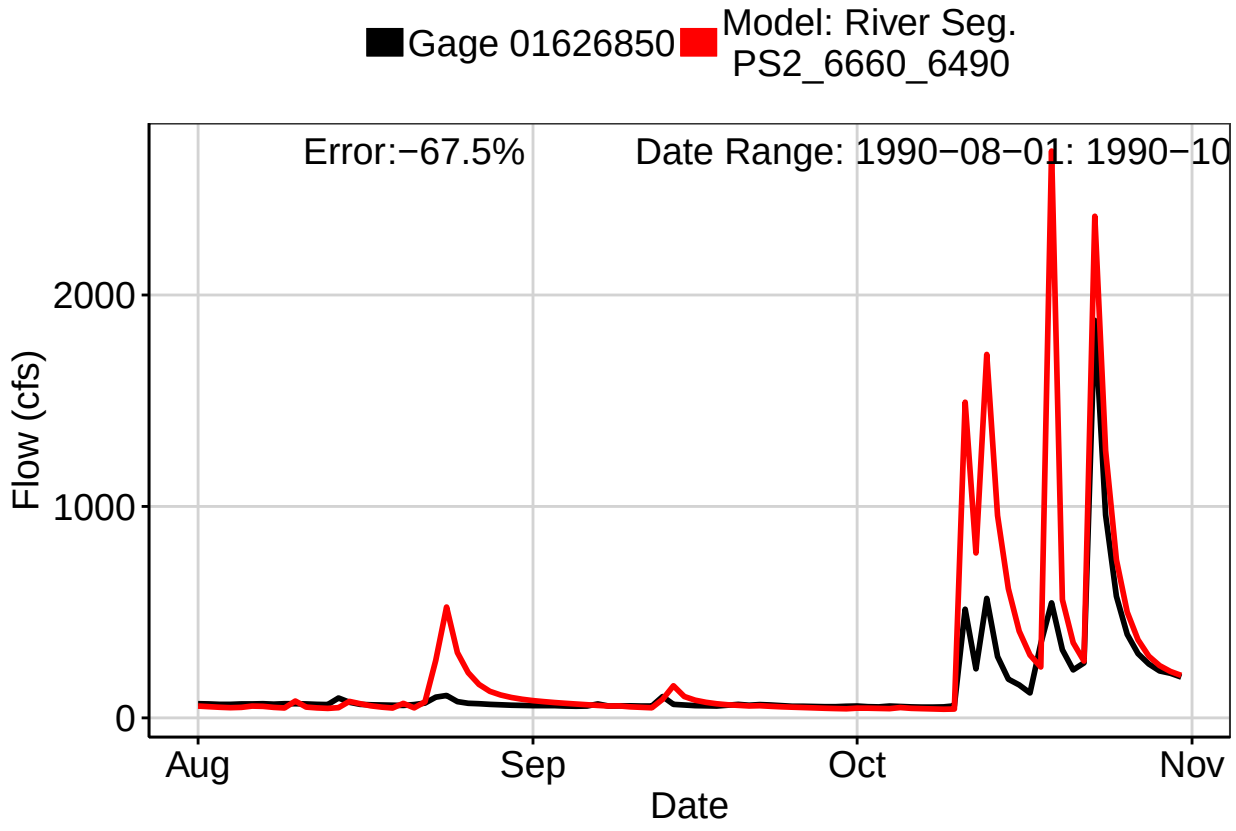


Fig. 7: Second Largest Error Segment

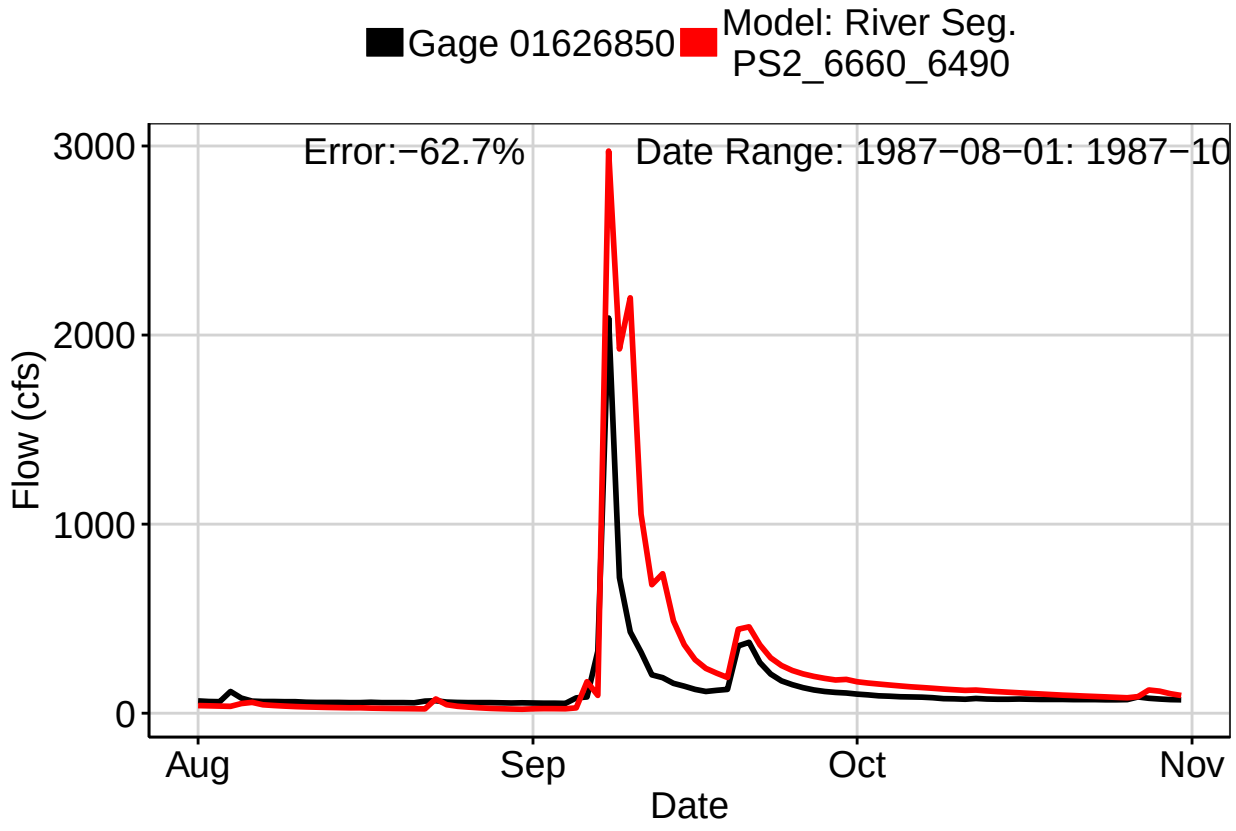


Fig. 8: Third Largest Error Segment

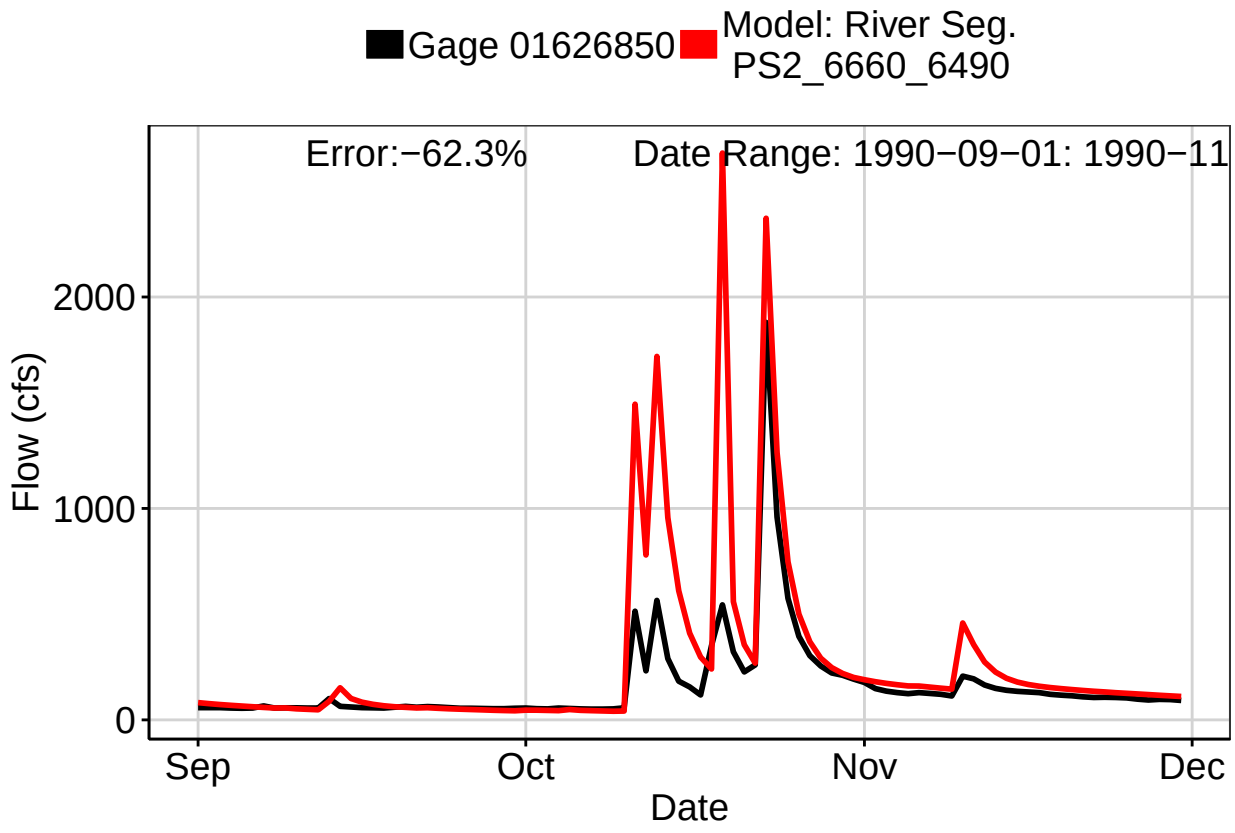


Fig. 9: Residuals Plot