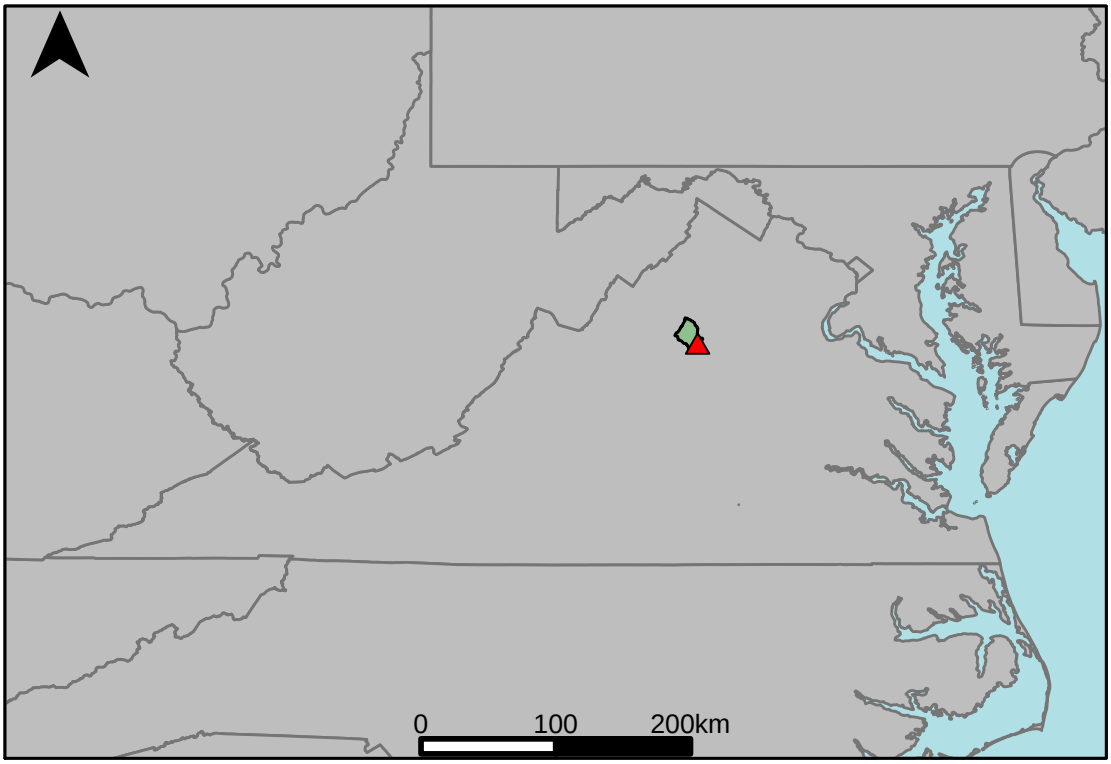
Appendix C.3: USGS Gage 01665500 vs. RU2_6090_6220 Upper Rappahannock River



This river segment follows part of the flow of the Rapidan River, a tributary of the Rappahannock. The gage is located in Madison County (Lat. 38°16'50.5", Long. -78°20'25.0"), approximately 5.2 miles east of Standardsville, VA. Drainage area is 115 sq. miles. This gage started taking data in 1942 and is still taking data. There has been a diversion 0.4 mi upstream since 1973. The average daily discharge error between the model and gage data for the 20 year timespan was 0%, with 63.7% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	24.5	28.7	17.1
Feb. Low Flow	49.5	39.6	-20
Mar. Low Flow	66.8	79.8	19.5
Apr. Low Flow	70.5	70.7	0.28
May Low Flow	78	89.6	14.9
Jun. Low Flow	96.5	93.5	-3.11
Jul. Low Flow	99	67.4	-31.9
Aug. Low Flow	66	42.7	-35.3
Sep. Low Flow	39.8	44.4	11.6
Oct. Low Flow	23	24.7	7.39
Nov. Low Flow	20	34.4	72
Dec. Low Flow	17.9	23.9	33.5

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	155	155	0
Jan. Mean Flow	169	184	8.88
Feb. Mean Flow	154	193	25.3
Mar. Mean Flow	217	251	15.7
Apr. Mean Flow	220	182	-17.3
May Mean Flow	160	140	-12.5
Jun. Mean Flow	191	121	-36.6
Jul. Mean Flow	71.3	101	41.7
Aug. Mean Flow	59.6	82.6	38.6
Sep. Mean Flow	167	159	-4.79
Oct. Mean Flow	105	104	-0.95
Nov. Mean Flow	168	169	0.6
Dec. Mean Flow	169	165	-2.37

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	130	174	33.8
Feb. High Flow	376	352	-6.38
Mar. High Flow	516	348	-32.6
Apr. High Flow	460	355	-22.8
May High Flow	230	302	31.3
Jun. High Flow	542	587	8.3
Jul. High Flow	436	295	-32.3
Aug. High Flow	221	294	33
Sep. High Flow	188	203	7.98
Oct. High Flow	179	225	25.7
Nov. High Flow	100	123	23
Dec. High Flow	133	150	12.8

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	0.45	2.54	464
Med. 1 Day Min	10	13	30
Min. 3 Day Min	0.66	2.77	318
Med. 3 Day Min	10.7	14	30.8
Min. 7 Day Min	1.09	3.26	199
Med. 7 Day Min	12.4	16.8	35.5
Min. 30 Day Min	3.33	6.87	106
Med. 30 Day Min	18.9	27.7	46.6
Min. 90 Day Min	10.1	19.6	94.1
Med. 90 Day Min	54.3	63.5	16.9
7Q10	3.02	4.93	63.2
Year of 90-Day Min. Flow	2002	1999	100
Drought Year Mean	50.2	46.4	-7.57
Mean Baseflow	77.4	79.9	3.23

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	29400	9720	-66.9
Med. 1 Day Max	2490	2890	16.1
Max. 3 Day Max	14900	3650	-75.5
Med. 3 Day Max	1310	1440	9.92
Max. 7 Day Max	6920	2060	-70.2
Med. 7 Day Max	874	748	-14.4
Max. 30 Day Max	1680	726	-56.8
Med. 30 Day Max	422	369	-12.6
Max. 90 Day Max	622	503	-19.1
Med. 90 Day Max	257	245	-4.67

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	5.18	8.55	65.1
5% Non-Exceedance	13	16.9	30
50% Non-Exceedance	91.4	95.8	4.81
95% Non-Exceedance	433	418	-3.46
99% Non-Exceedance	1040	1160	11.5
Sept. 10% Non-Exceedance	12	16.5	37.5

Fig. 1: Hydrograph

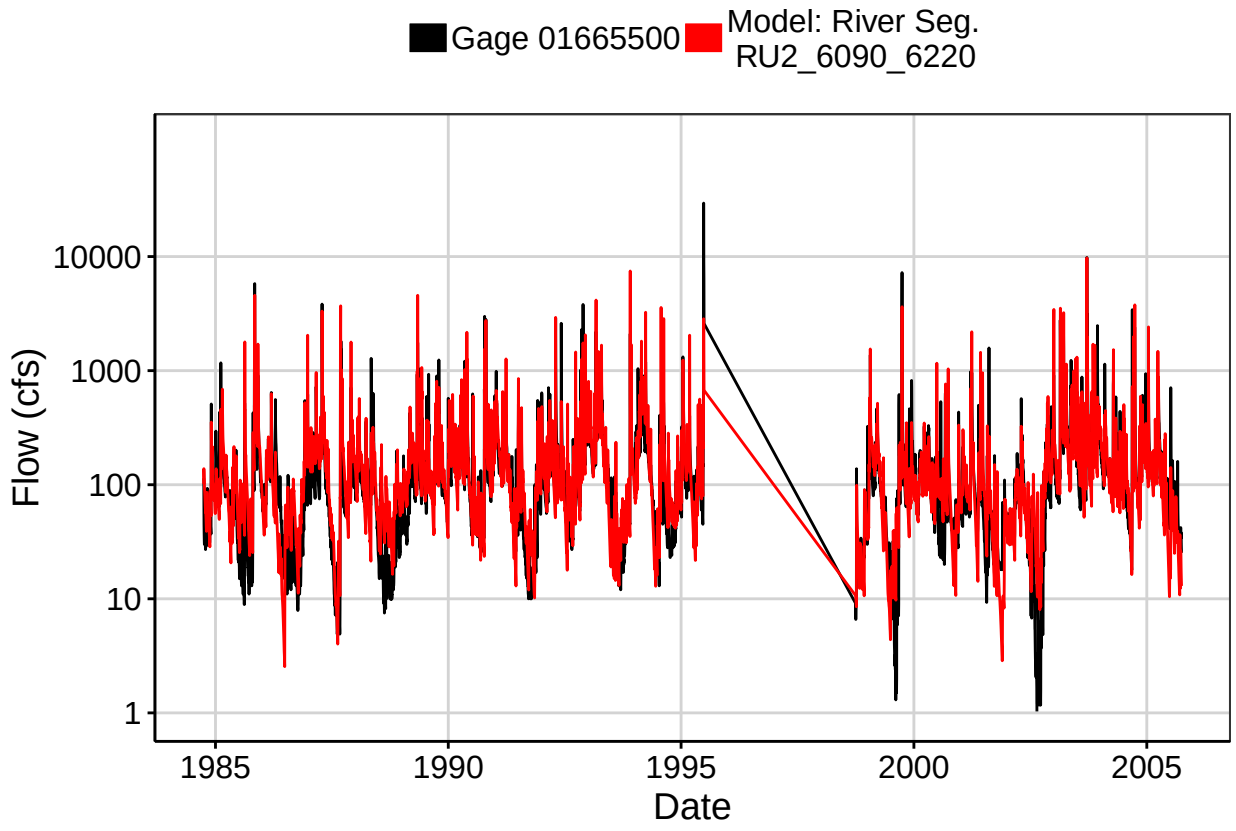


Fig. 2: Zoomed Hydrograph

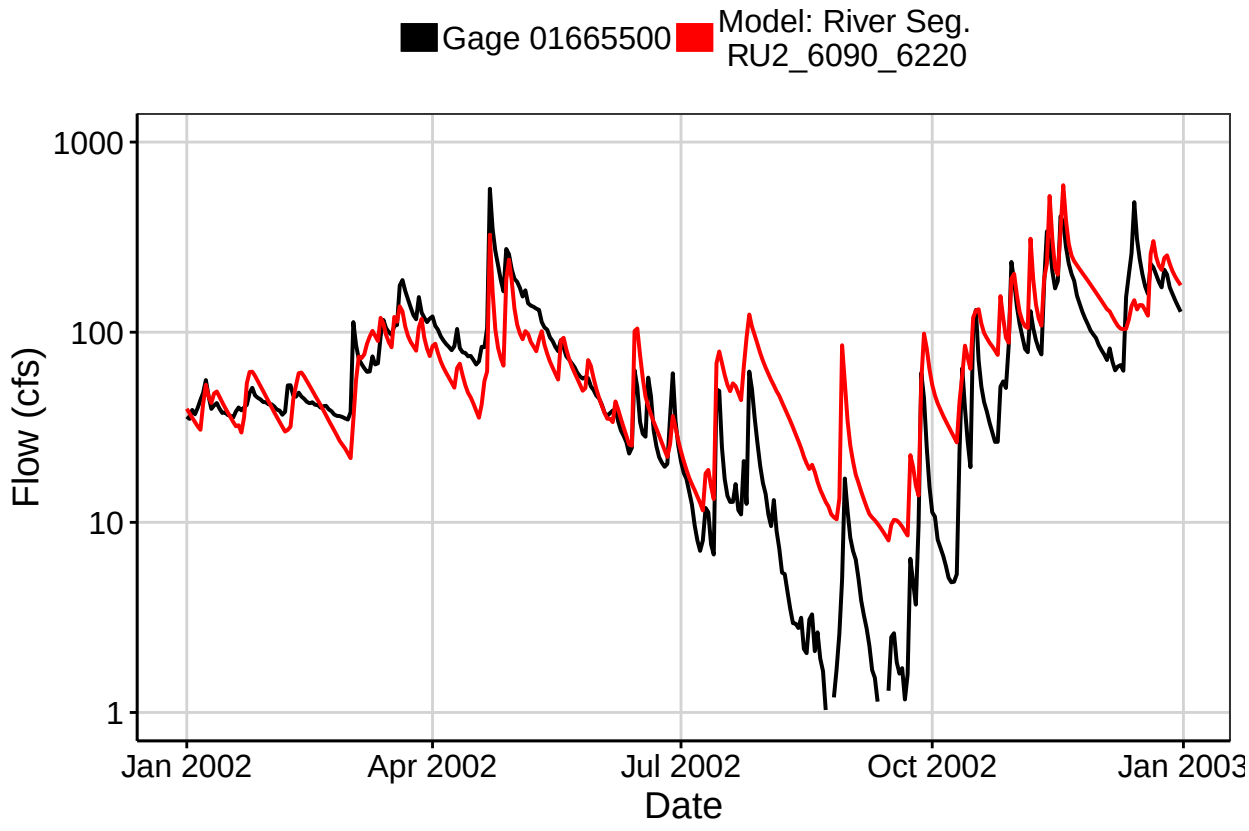


Fig. 3: Flow Exceedance

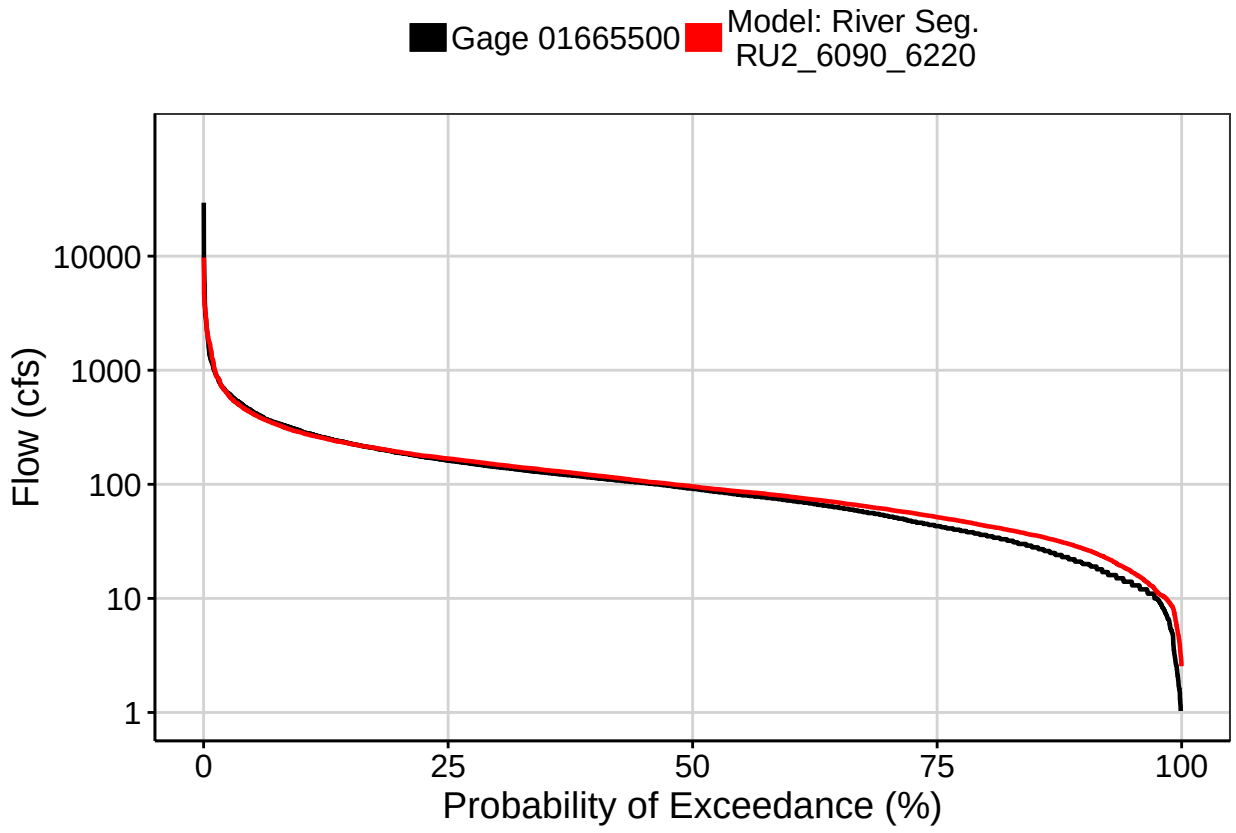


Fig. 4: Baseflow

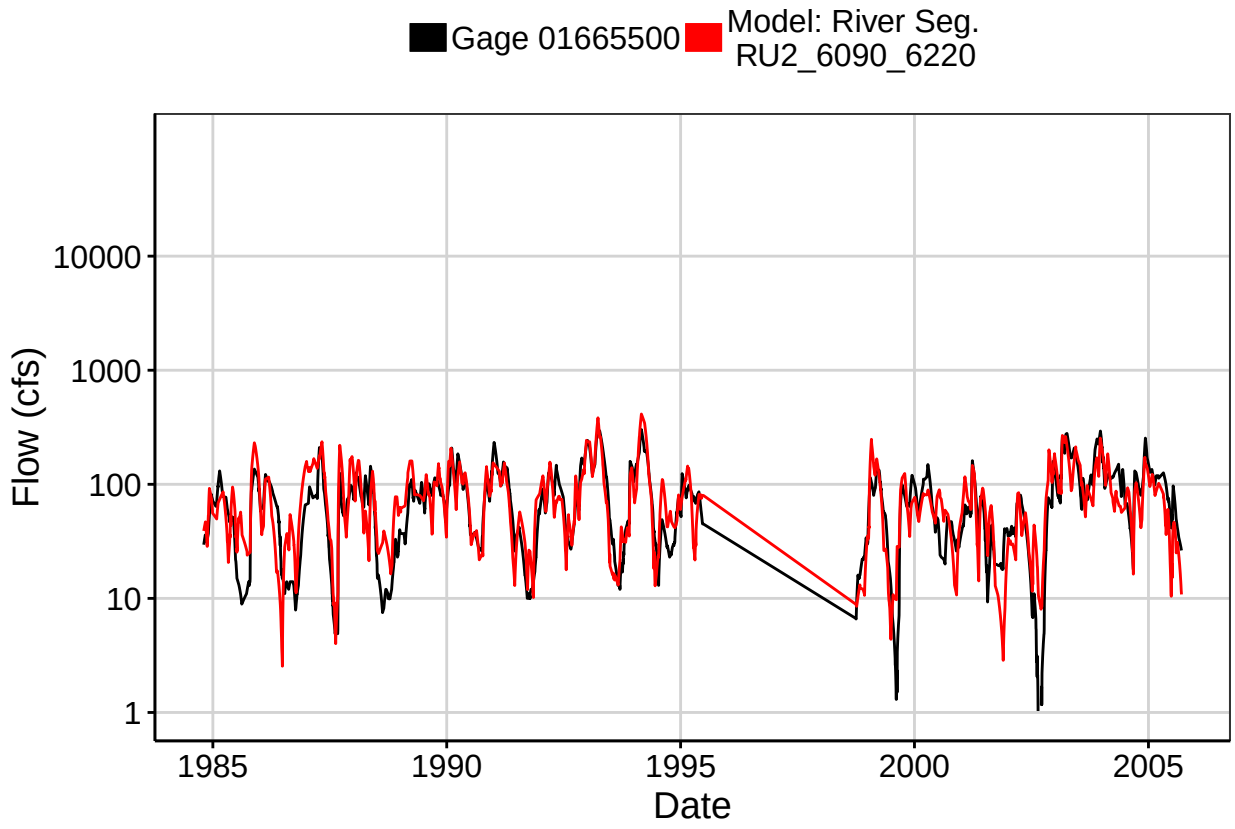


Fig. 5: Combined Baseflow

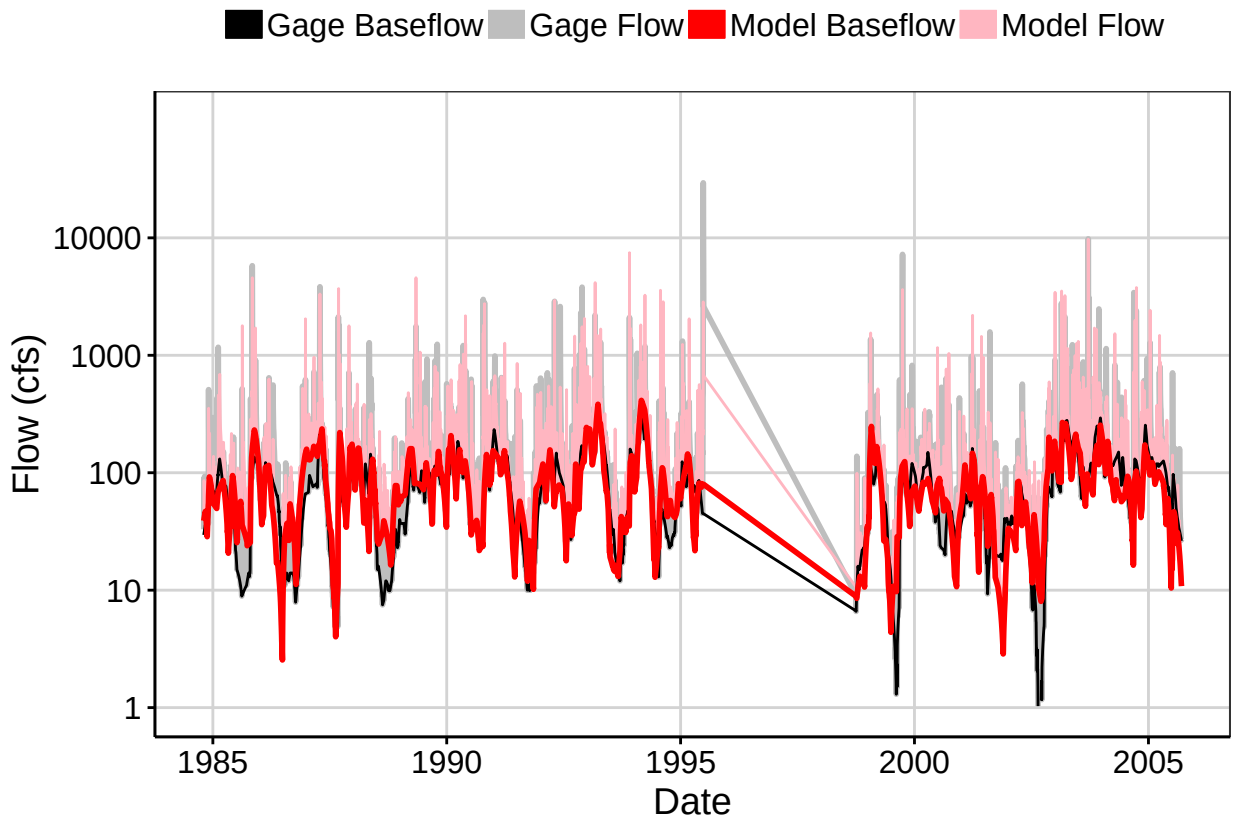


Fig. 6: Largest Error Segment

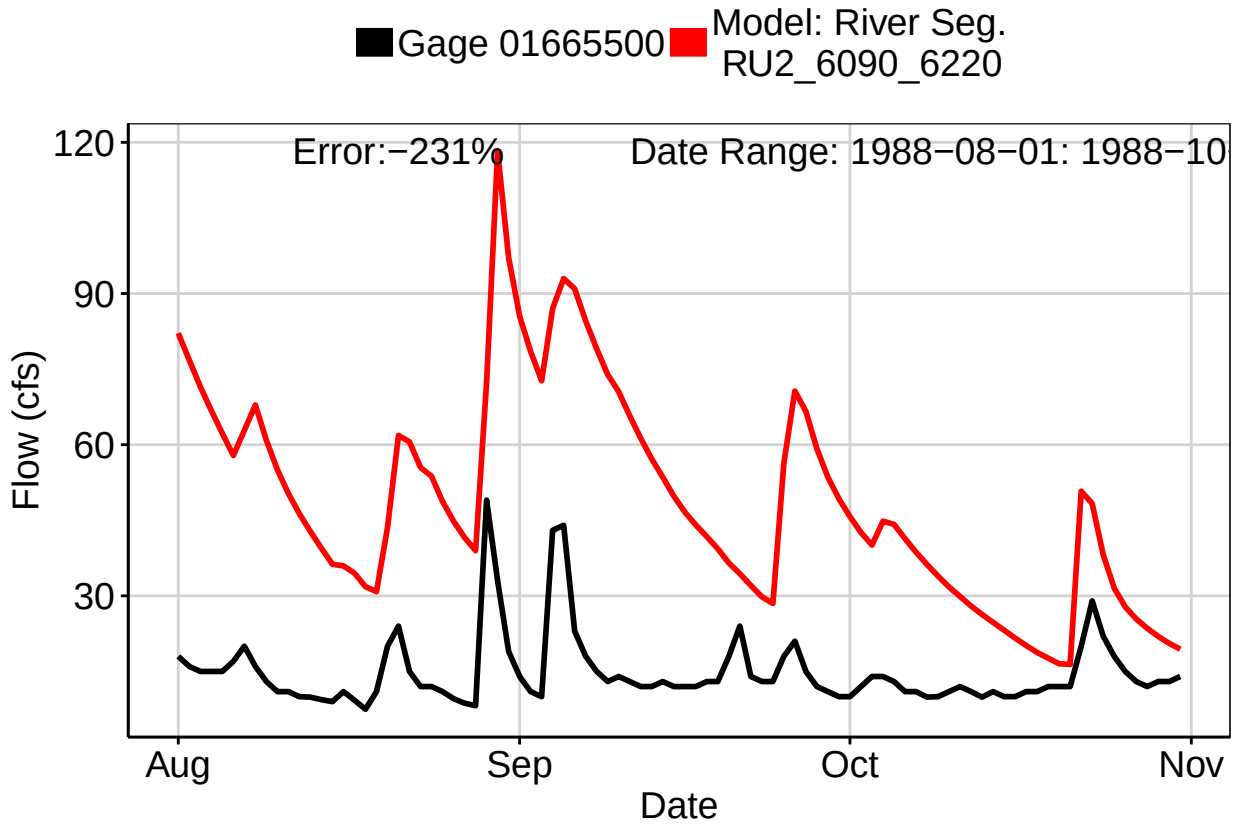


Fig. 7: Second Largest Error Segment

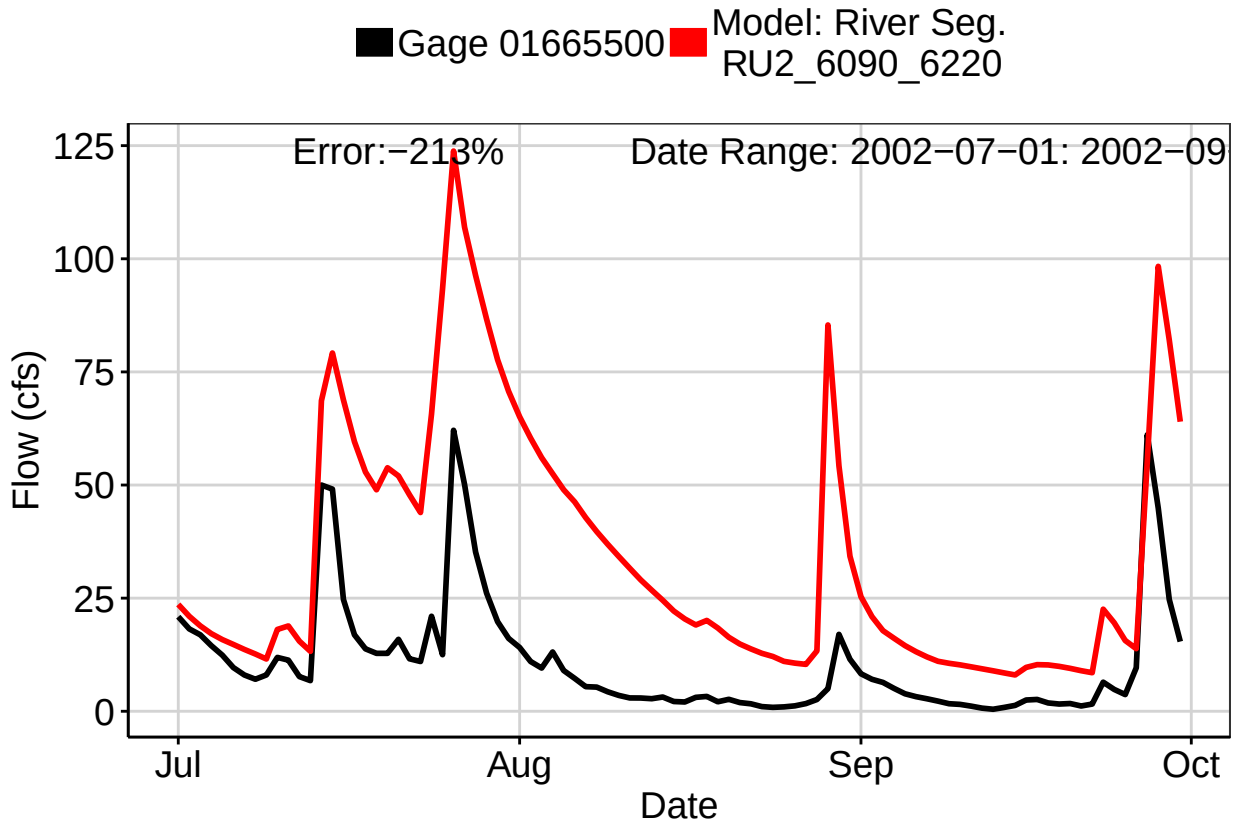


Fig. 8: Third Largest Error Segment

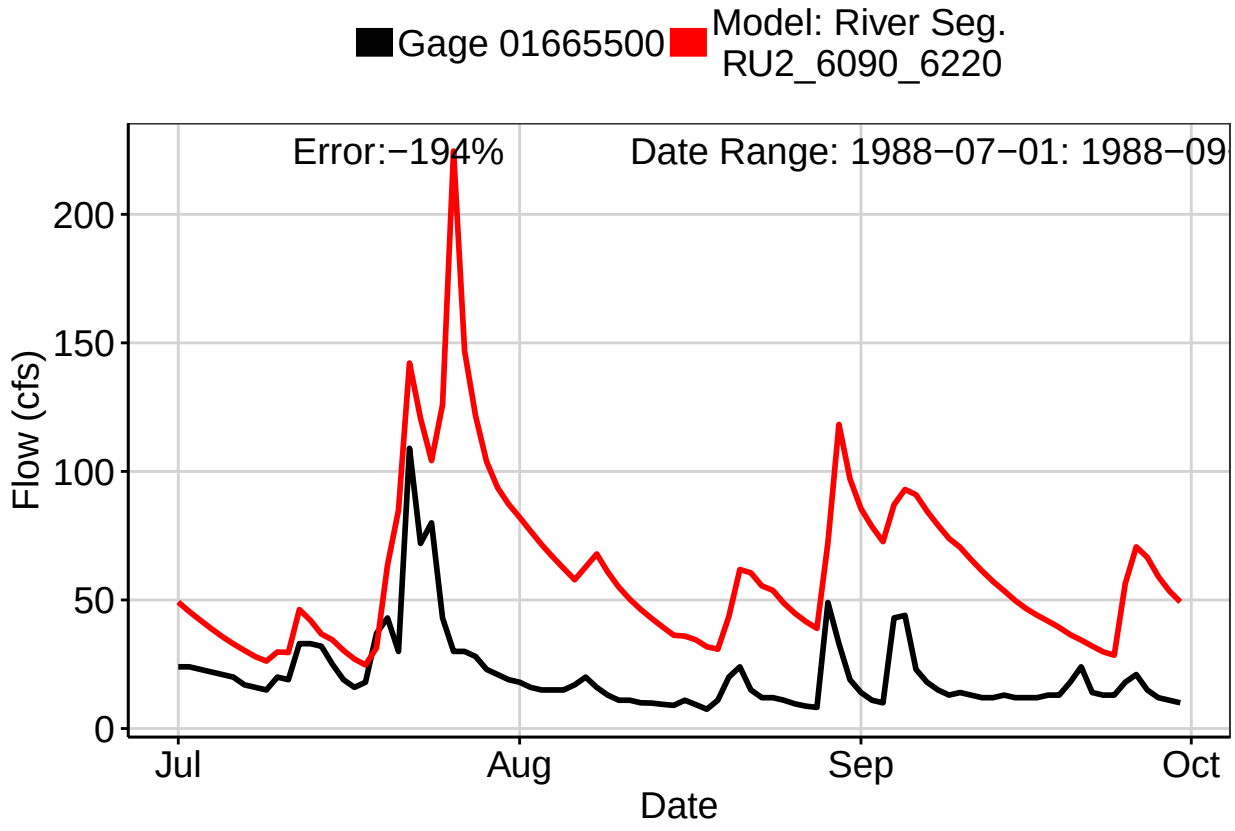


Fig. 9: Residuals Plot