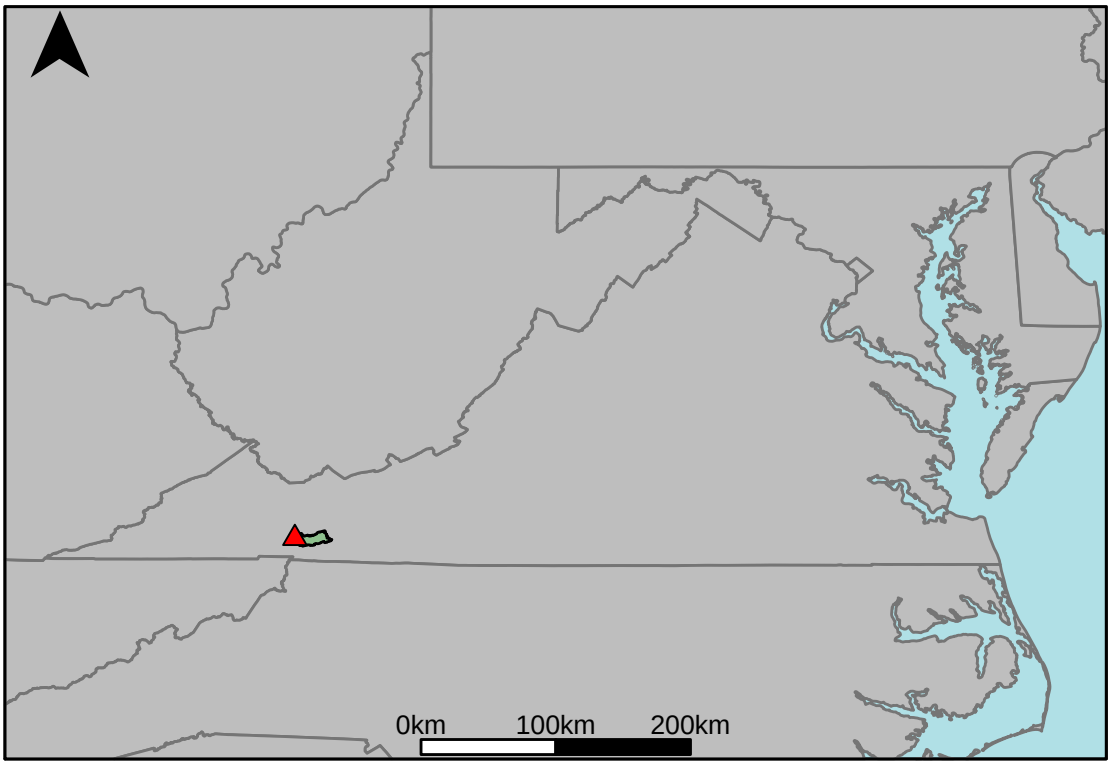
Appendix D: Holston River Gages
Appendix D.1: USGS Gage 03471500 vs. TU2_8950_9040



This river segment follows part of the flow of the South Fork of the Holston River, a tributary of the Tennessee River. The gage is located in Smyth County, VA (Lat 3645'37", Long 8137'53") approximately 33 miles northeast of Bristol, VA. Drainage area is 76.6 sq. miles. This gage started taking data in 1920 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 1.83%, with 44.6% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	25	18.5	-26
Feb. Low Flow	30	29.9	-0.33
Mar. Low Flow	42	43.6	3.81
Apr. Low Flow	47	55.3	17.7
May Low Flow	77	66.6	-13.5
Jun. Low Flow	92	89.2	-3.04
Jul. Low Flow	91	66.1	-27.4
Aug. Low Flow	67	46.6	-30.4
Sep. Low Flow	47	33.2	-29.4
Oct. Low Flow	35.9	24.3	-32.3
Nov. Low Flow	31	25.8	-16.8
Dec. Low Flow	25	21.8	-12.8

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	109	107	-1.83
Jan. Mean Flow	144	139	-3.47
Feb. Mean Flow	192	197	2.6
Mar. Mean Flow	197	200	1.52
Apr. Mean Flow	169	148	-12.4
May Mean Flow	131	102	-22.1
Jun. Mean Flow	96.9	84.1	-13.2
Jul. Mean Flow	70.6	60.3	-14.6
Aug. Mean Flow	54.1	60.4	11.6
Sep. Mean Flow	51.7	53.9	4.26
Oct. Mean Flow	42.8	57	33.2
Nov. Mean Flow	68.2	78.7	15.4
Dec. Mean Flow	95.7	104	8.67

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	47	52	10.6
Feb. High Flow	122	119	-2.46
Mar. High Flow	318	185	-41.8
Apr. High Flow	439	426	-2.96
May High Flow	524	555	5.92
Jun. High Flow	730	564	-22.7
Jul. High Flow	322	313	-2.8
Aug. High Flow	356	236	-33.7
Sep. High Flow	203	142	-30
Oct. High Flow	105	103	-1.9
Nov. High Flow	69	79.5	15.2
Dec. High Flow	53	75	41.5

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	16	2.48	-84.5
Med. 1 Day Min	22	9.4	-57.3
Min. 3 Day Min	16	2.66	-83.4
Med. 3 Day Min	22.7	10.7	-52.9
Min. 7 Day Min	16.6	3	-81.9
Med. 7 Day Min	22.9	12.2	-46.7
Min. 30 Day Min	17.3	6.95	-59.8
Med. 30 Day Min	25.9	17.2	-33.6
Min. 90 Day Min	20.2	20.9	3.47
Med. 90 Day Min	34.2	34.9	2.05
7Q10	19.1	5.46	-71.4
Year of 90-Day Min. Flow	1988	1988	0
Drought Year Mean	53.8	48	-10.8
Mean Baseflow	62.1	61.6	-0.8

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	3780	2330	-38.4
Med. 1 Day Max	1470	1240	-15.6
Max. 3 Day Max	2090	1470	-29.7
Med. 3 Day Max	900	754	-16.2
Max. 7 Day Max	1090	855	-21.6
Med. 7 Day Max	556	482	-13.3
Max. 30 Day Max	581	556	-4.3
Med. 30 Day Max	271	261	-3.69
Max. 90 Day Max	377	370	-1.86
Med. 90 Day Max	207	210	1.45

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	20	8.74	-56.3
5% Non-Exceedance	23	15.5	-32.6
50% Non-Exceedance	68	69.6	2.35
95% Non-Exceedance	308	289	-6.17
99% Non-Exceedance	686	645	-5.98
Sept. 10% Non-Exceedance	13.1	22	67.9

Fig. 1: Hydrograph

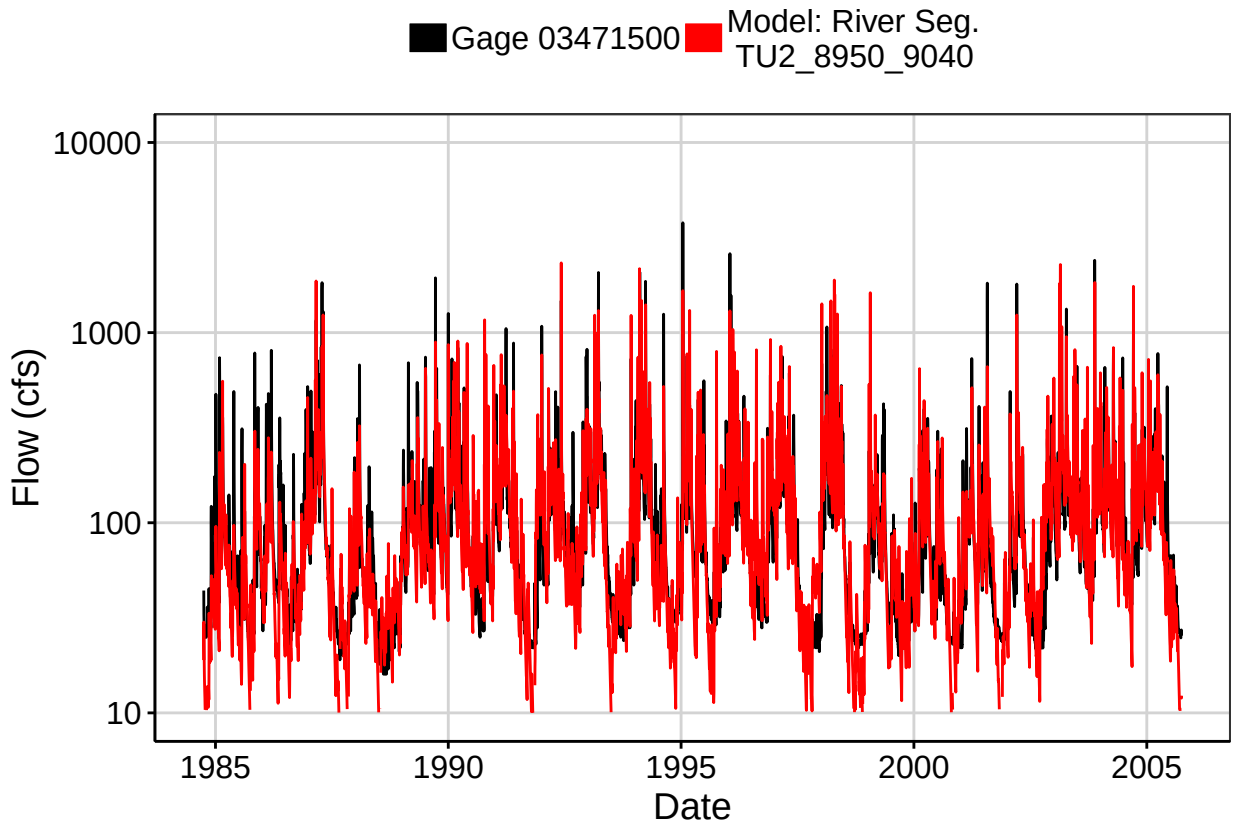


Fig. 2: Zoomed Hydrograph

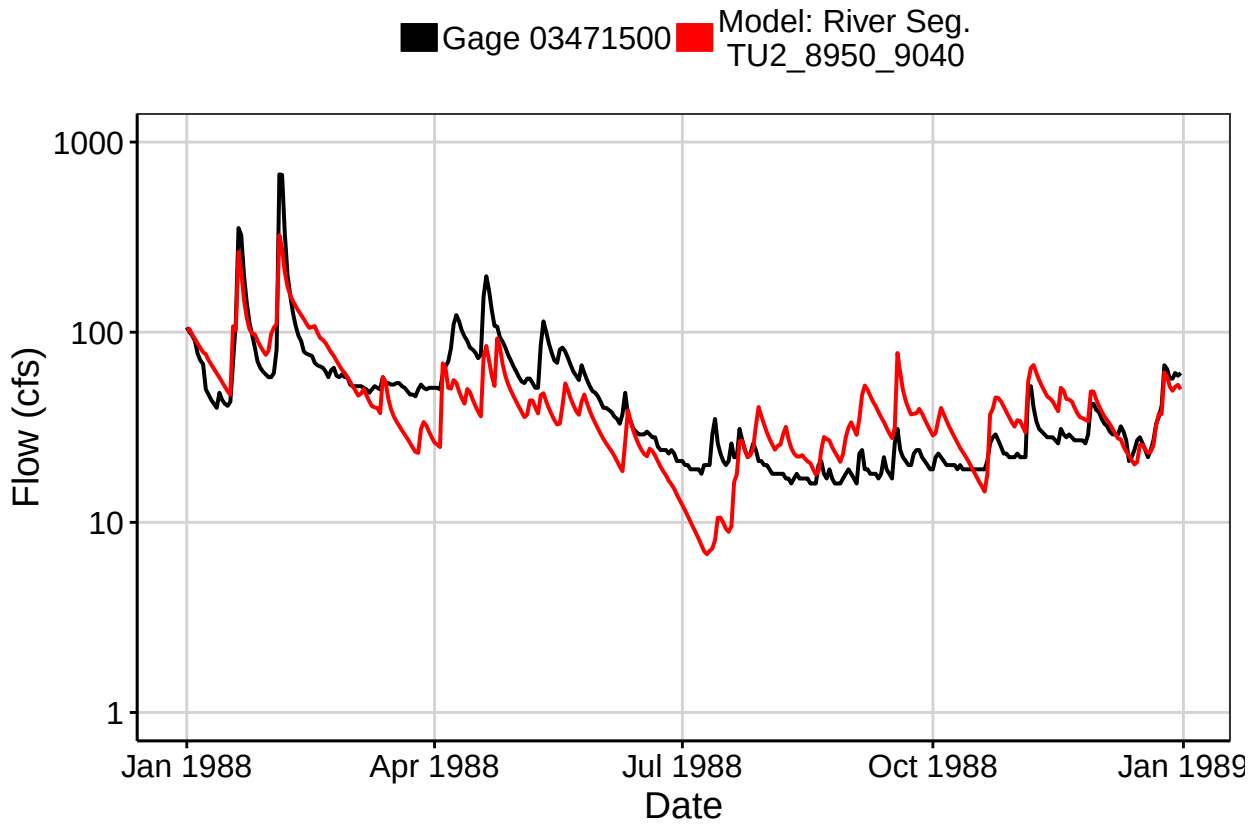


Fig. 3: Flow Exceedance

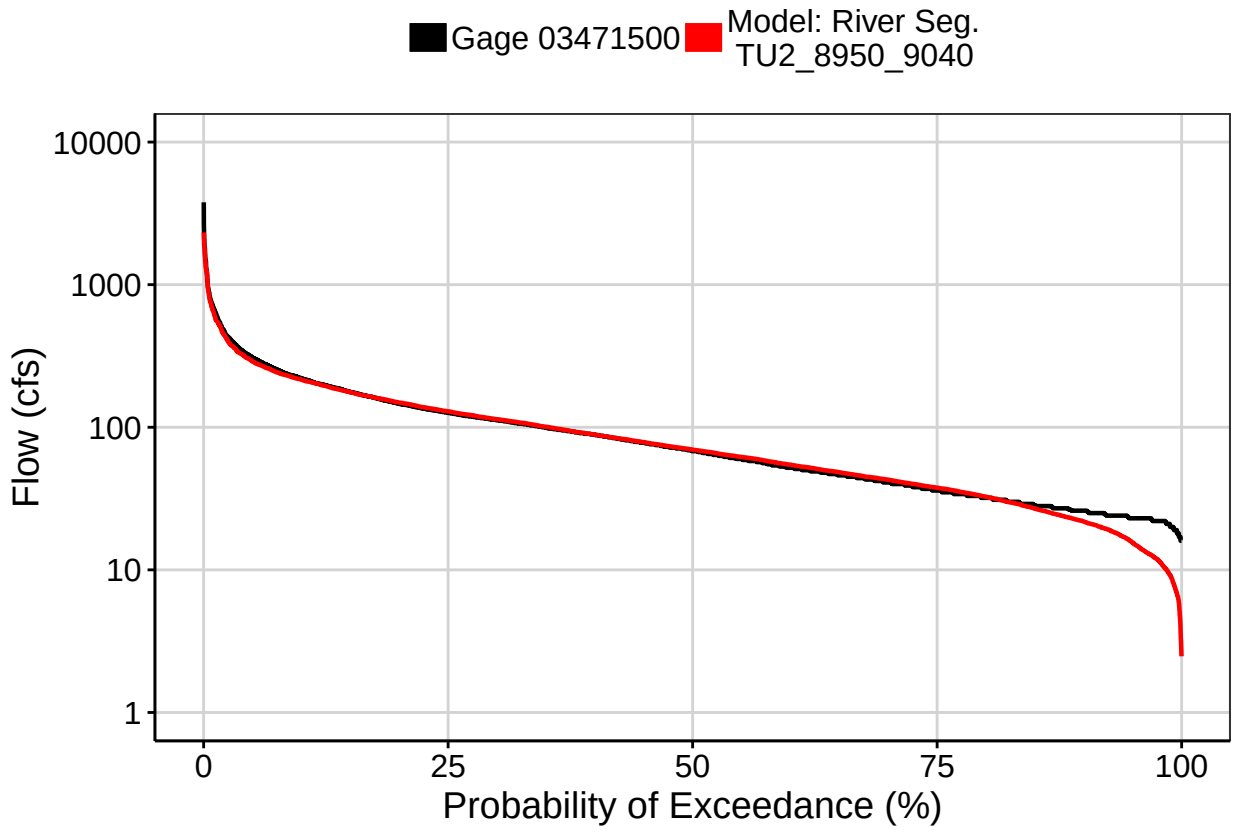


Fig. 4: Baseflow

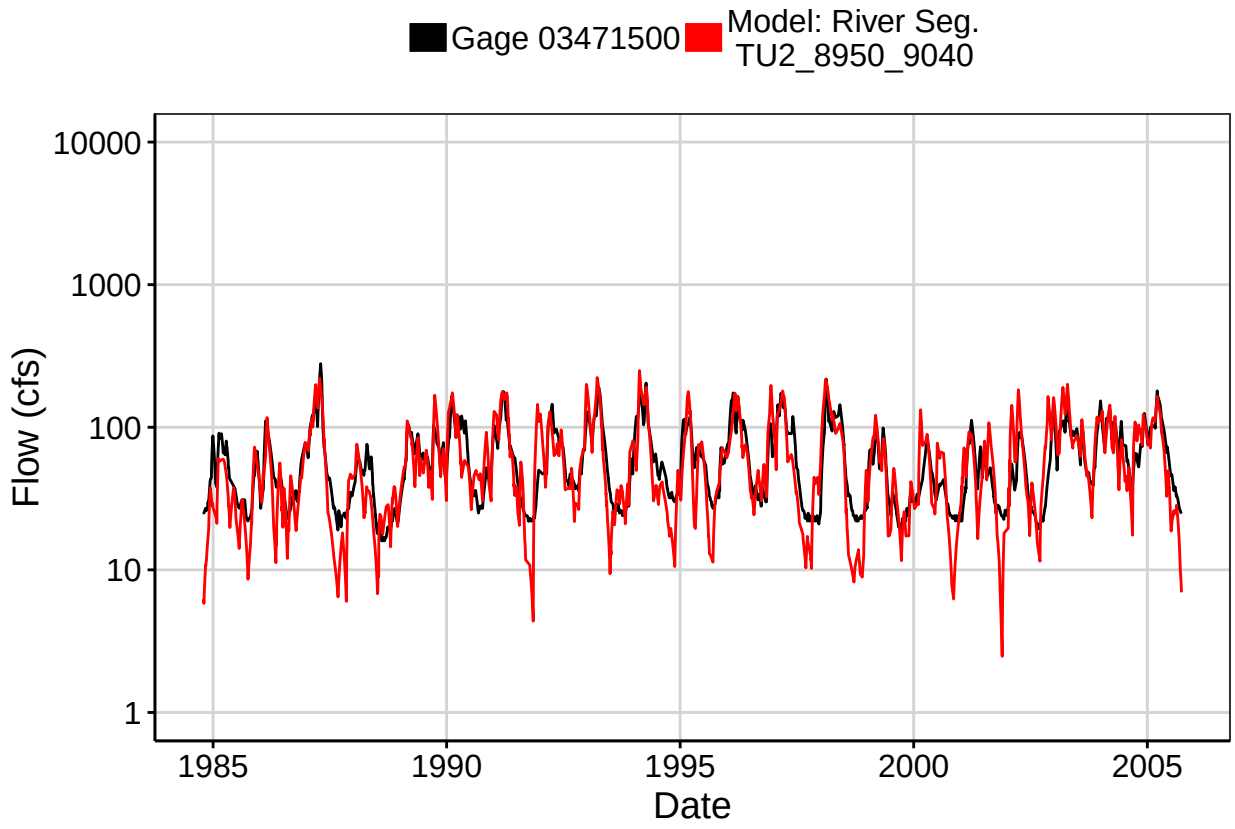


Fig. 5: Combined Baseflow

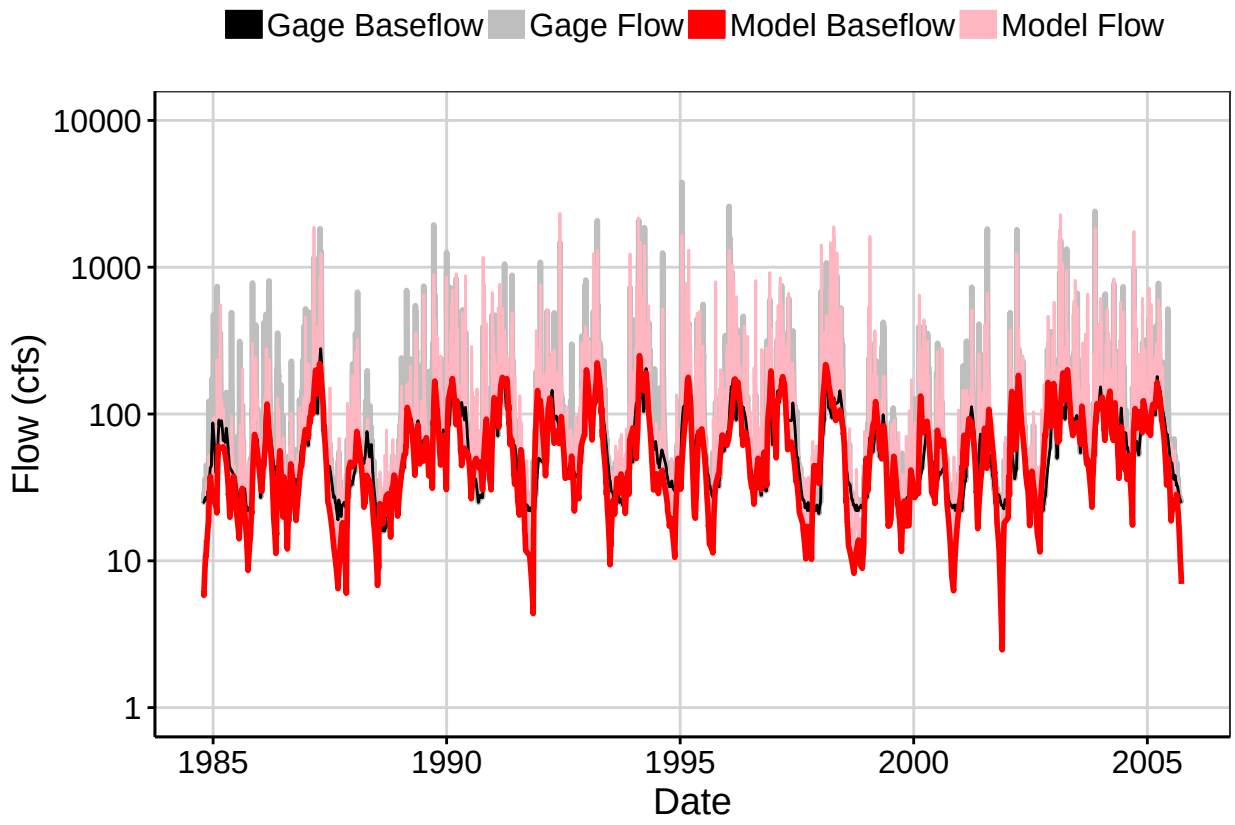


Fig. 6: Largest Error Segment

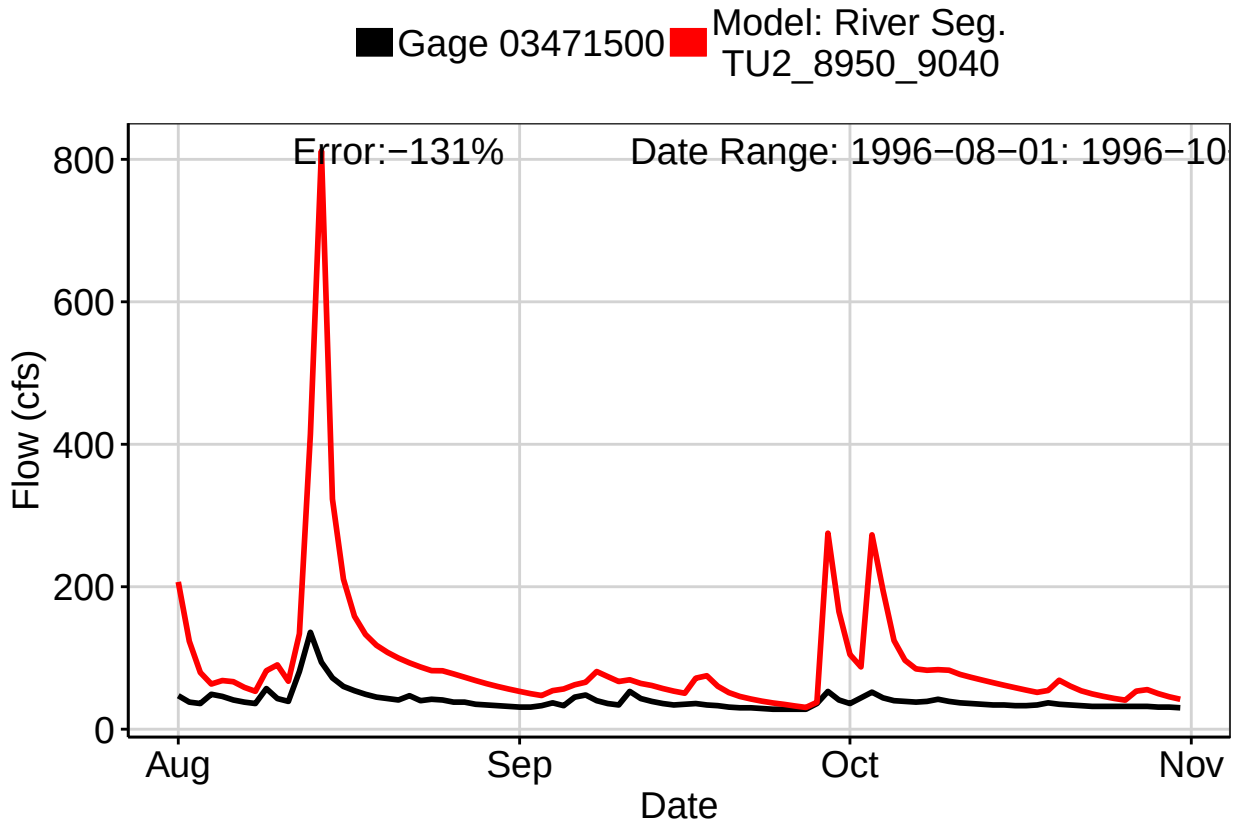


Fig. 7: Second Largest Error Segment

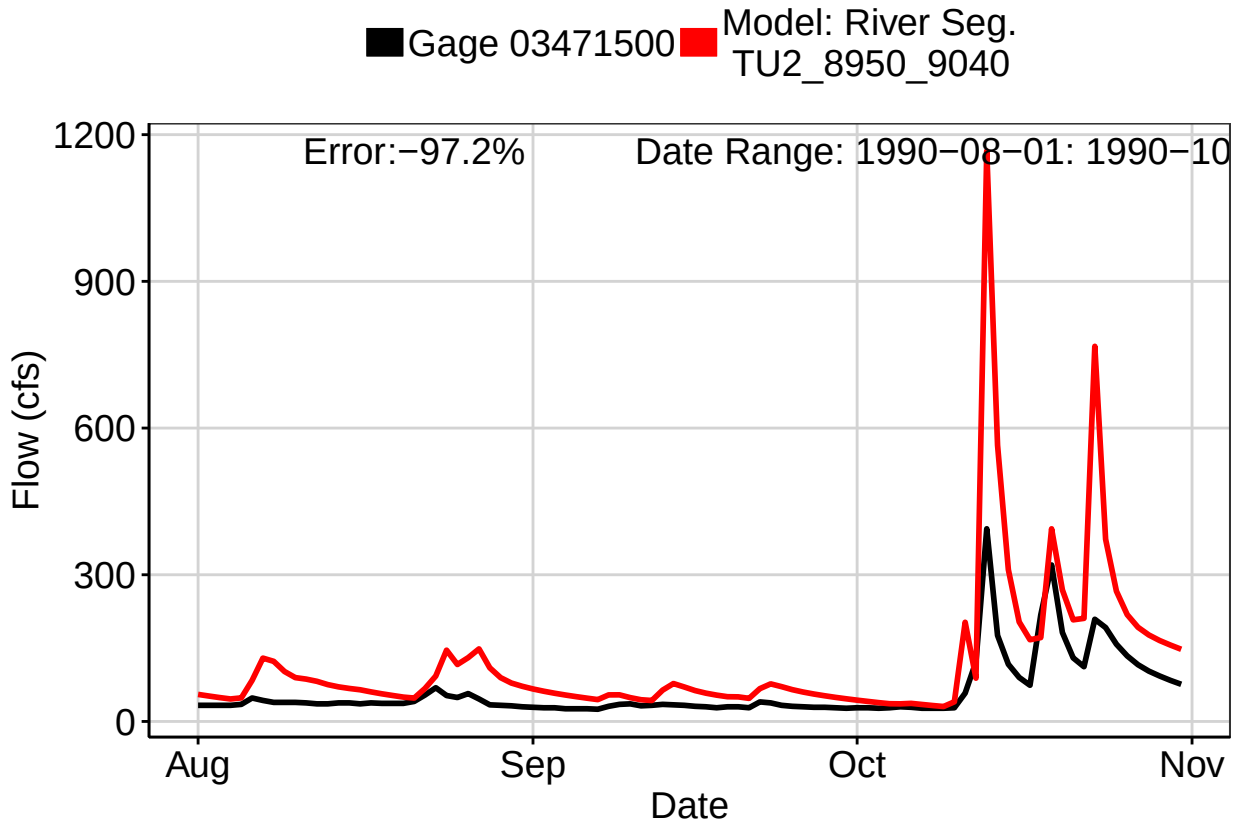


Fig. 8: Third Largest Error Segment

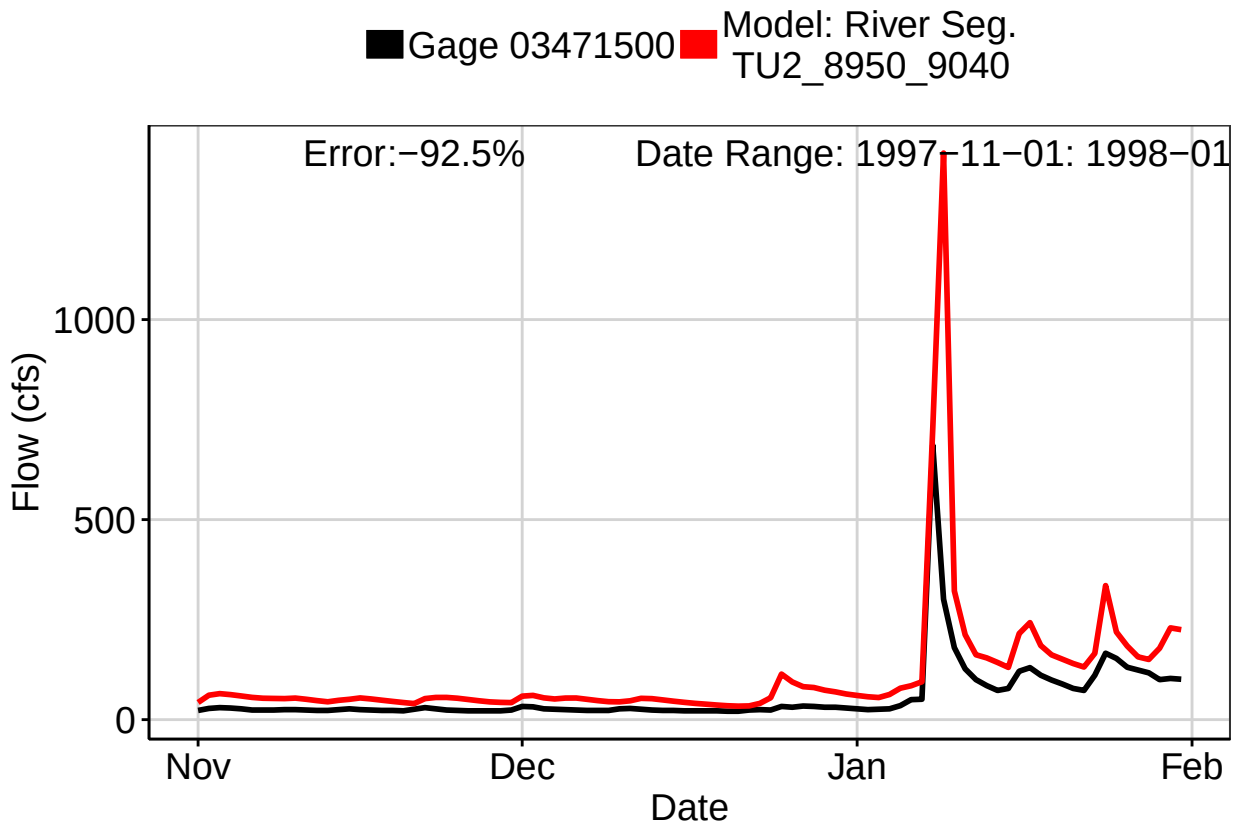


Fig. 9: Residuals Plot