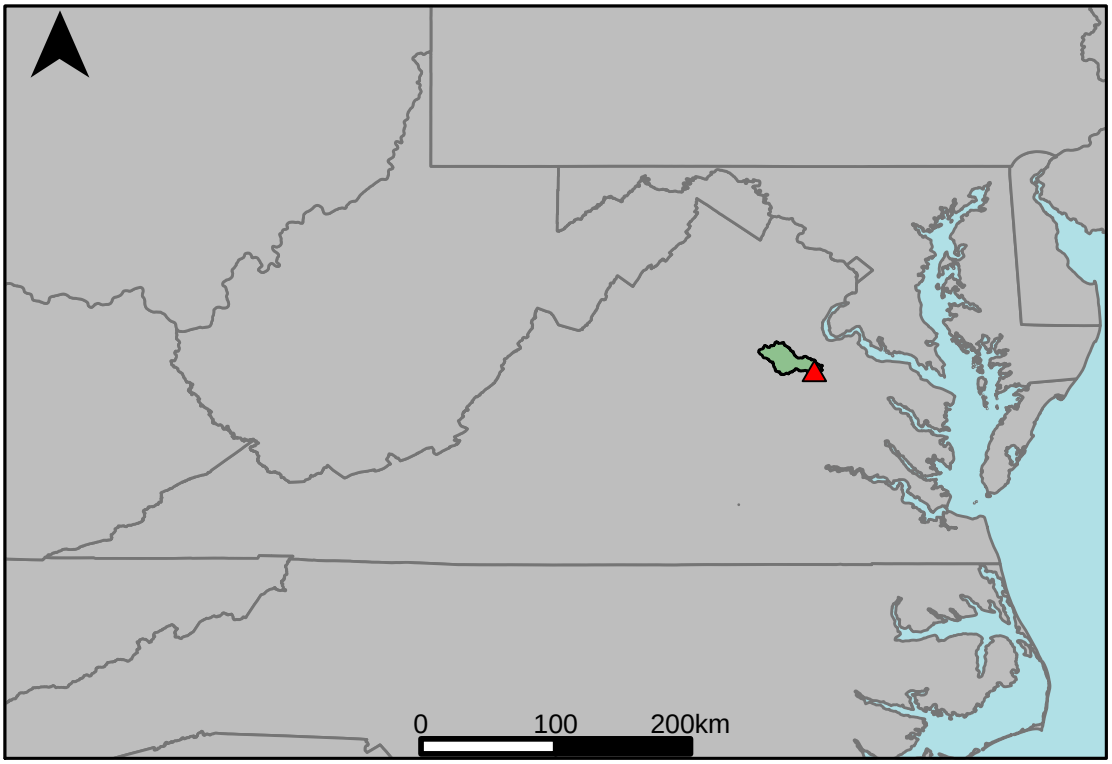
Appendix D.7: USGS Gage 01674000 vs. YM2_6120_6430 Mattaponi River



This river segment follows part of the flow of the Mattaponi River, a tributary of the York. The gage is located in Caroline County (Lat. 38°03'42.5", Long. -77°23'08.9"), approximately 2.1 miles west of Bowling Green, VA. Drainage area is 256 sq. miles. This gage started taking data in 1942 and is still taking data. There are some diurnal fluctuations from a gristmill upstream on the Po River. The average daily discharge error between the model and gage data for the 20 year timespan was 1.34%, with 51.7% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	7.6	8.26	8.68
Feb. Low Flow	27	23.4	-13.3
Mar. Low Flow	70	80.3	14.7
Apr. Low Flow	120	130	8.33
May Low Flow	147	182	23.8
Jun. Low Flow	151	139	-7.95
Jul. Low Flow	121	124	2.48
Aug. Low Flow	53	46.2	-12.8
Sep. Low Flow	23	20.2	-12.2
Oct. Low Flow	10.9	6.54	-40
Nov. Low Flow	6.9	6.14	-11
Dec. Low Flow	2.7	3.94	45.9

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	224	221	-1.34
Jan. Mean Flow	334	344	2.99
Feb. Mean Flow	408	427	4.66
Mar. Mean Flow	462	466	0.87
Apr. Mean Flow	353	304	-13.9
May Mean Flow	228	202	-11.4
Jun. Mean Flow	118	108	-8.47
Jul. Mean Flow	69.2	79.9	15.5
Aug. Mean Flow	62.7	66.4	5.9
Sep. Mean Flow	90	131	45.6
Oct. Mean Flow	91.8	97.2	5.88
Nov. Mean Flow	200	196	-2
Dec. Mean Flow	279	245	-12.2

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	240	143	-40.4
Feb. High Flow	473	654	38.3
Mar. High Flow	712	478	-32.9
Apr. High Flow	662	831	25.5
May High Flow	720	711	-1.25
Jun. High Flow	1250	1220	-2.4
Jul. High Flow	1140	720	-36.8
Aug. High Flow	596	350	-41.3
Sep. High Flow	400	180	-55
Oct. High Flow	240	113	-52.9
Nov. High Flow	123	94	-23.6
Dec. High Flow	64	51.7	-19.2

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	0.00	0.00	NaN
Med. 1 Day Min	2.00	1.66	-1.70e+01
Min. 3 Day Min	0.00	0.00	-Inf
Med. 3 Day Min	2.23	2.26	1.35
Min. 7 Day Min	0.00	0.00	-Inf
Med. 7 Day Min	2.79	3.46	2.40e+01
Min. 30 Day Min	0.00	1.80e-01	-3.76e+14
Med. 30 Day Min	6.03	8.24	3.67e+01
Min. 90 Day Min	8.10e-01	3.64	3.52e+02
Med. 90 Day Min	2.84e+01	3.04e+01	7.04
7Q10	0.00	0.00	1.67e+03
Year of 90-Day Min. Flow	2.00e+03	2.00e+03	1.00e+02
Drought Year Mean	2.33e+01	1.97e+01	-1.55e+01
Mean Baseflow	9.64e+01	1.01e+02	4.77

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	7140	6290	-11.9
Med. 1 Day Max	2400	2870	19.6
Max. 3 Day Max	5930	5270	-11.1
Med. 3 Day Max	1810	2240	23.8
Max. 7 Day Max	3400	4240	24.7
Med. 7 Day Max	1240	1380	11.3
Max. 30 Day Max	1940	1700	-12.4
Med. 30 Day Max	621	664	6.92
Max. 90 Day Max	1330	1180	-11.3
Med. 90 Day Max	445	430	-3.37

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	0.01	0	-100
5% Non-Exceedance	2.2	3.15	43.2
50% Non-Exceedance	105	106	0.95
95% Non-Exceedance	778	764	-1.8
99% Non-Exceedance	1970	2360	19.8
Sept. 10% Non-Exceedance	1.38	1.91	38.4

Fig. 1: Hydrograph

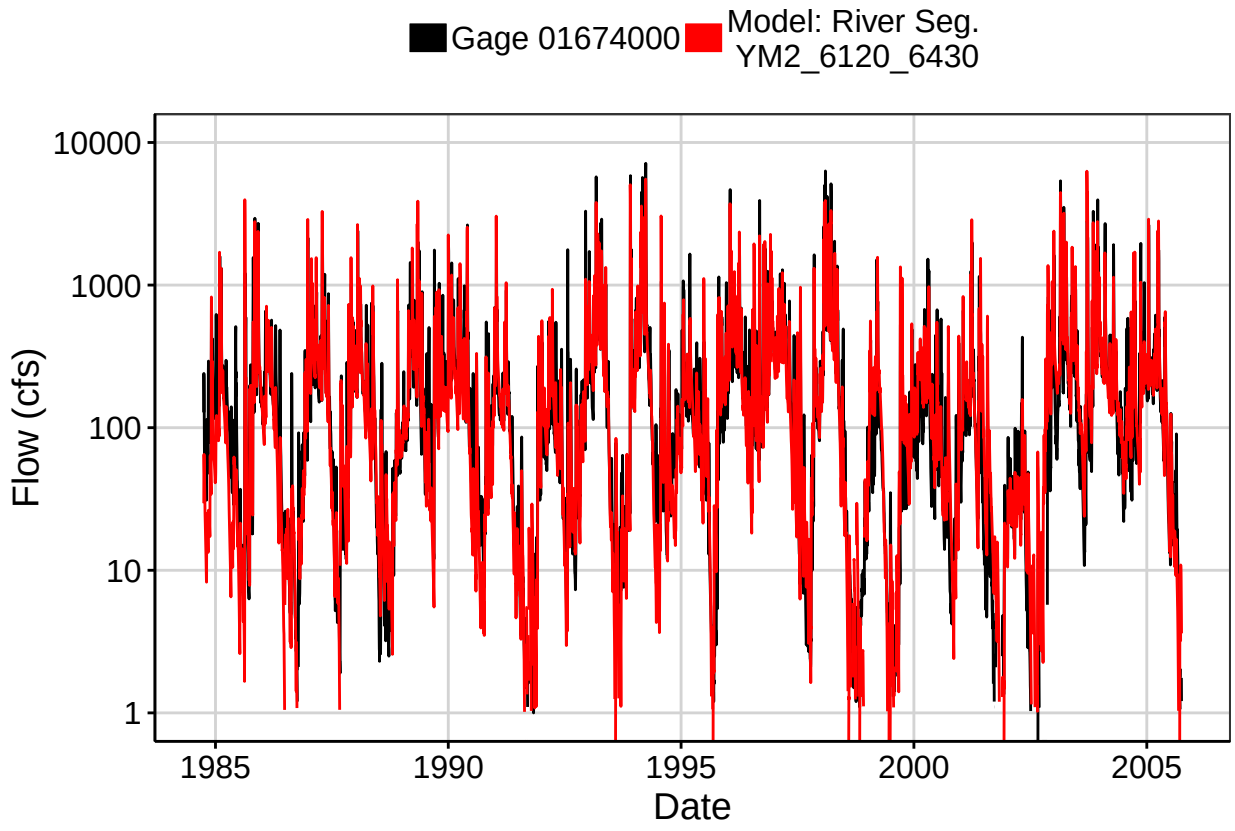


Fig. 2: Zoomed Hydrograph

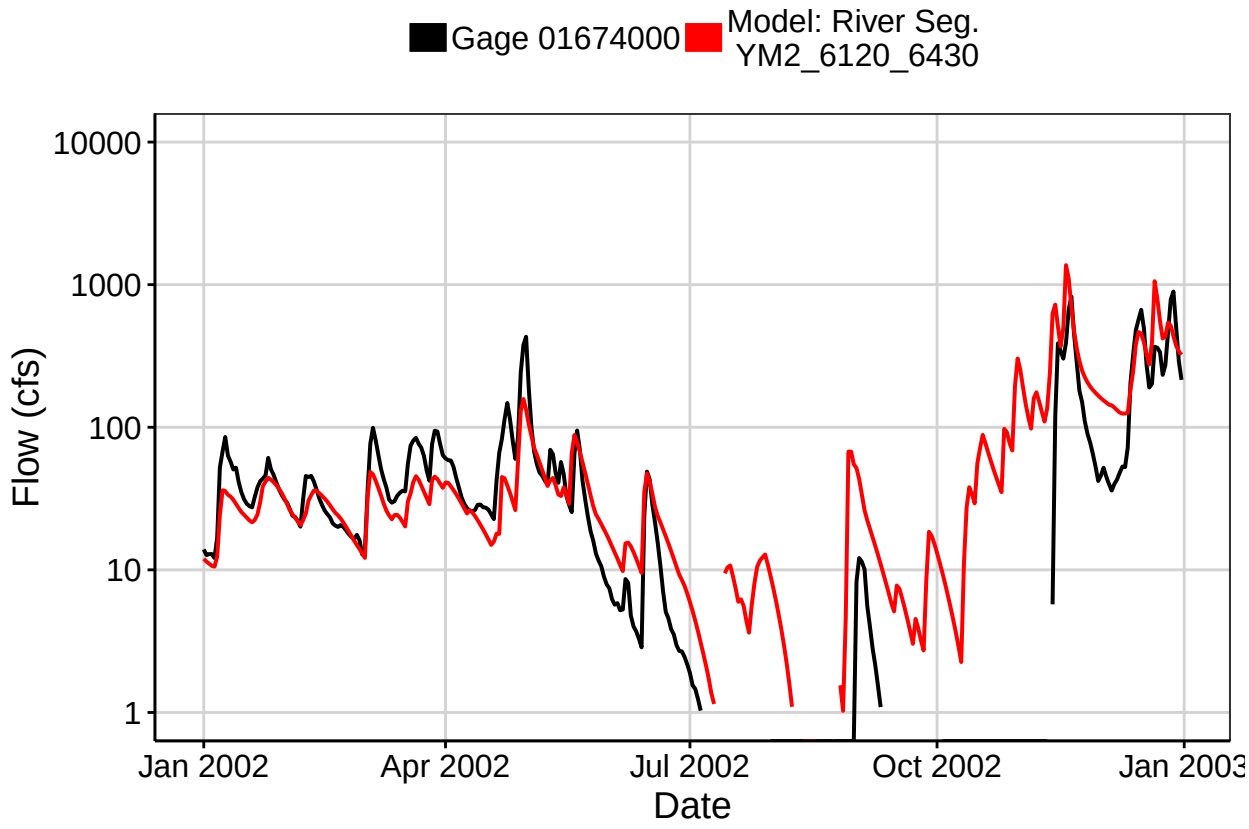


Fig. 3: Flow Exceedance

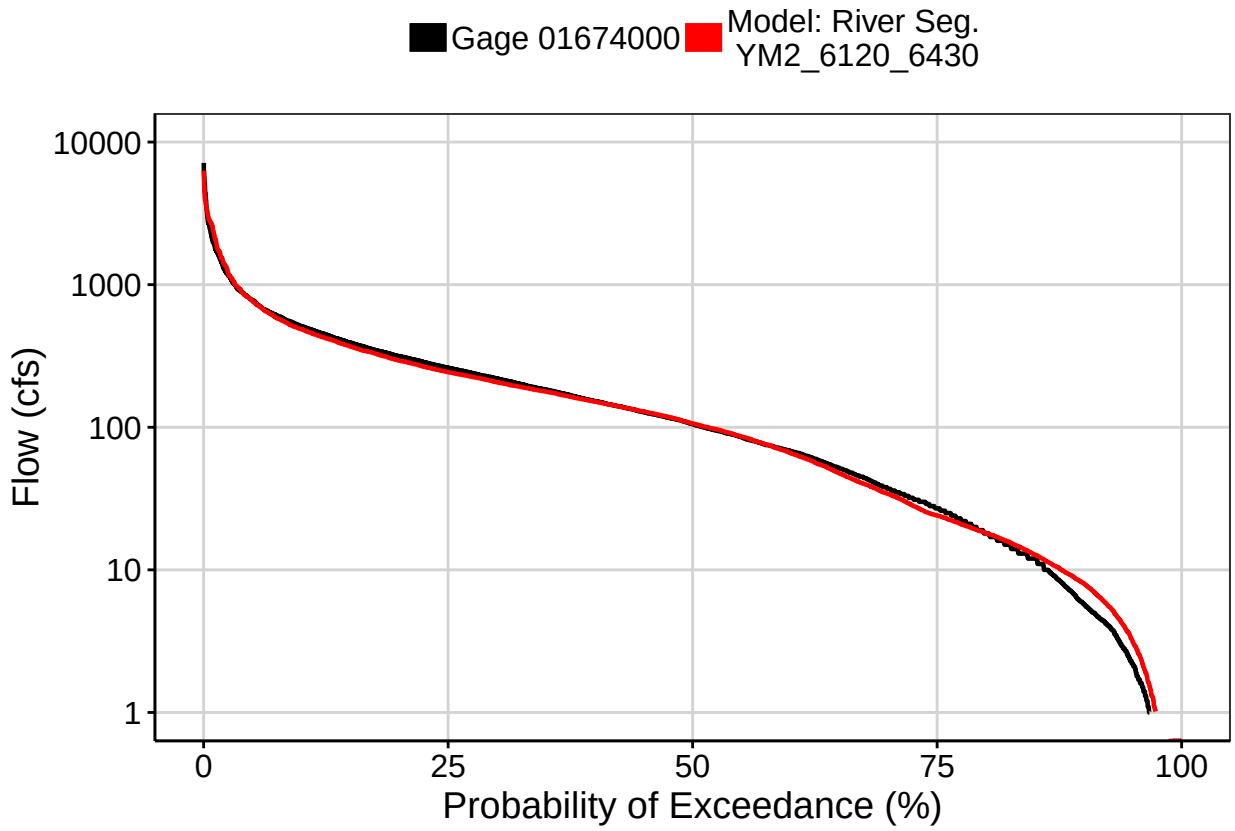


Fig. 4: Baseflow

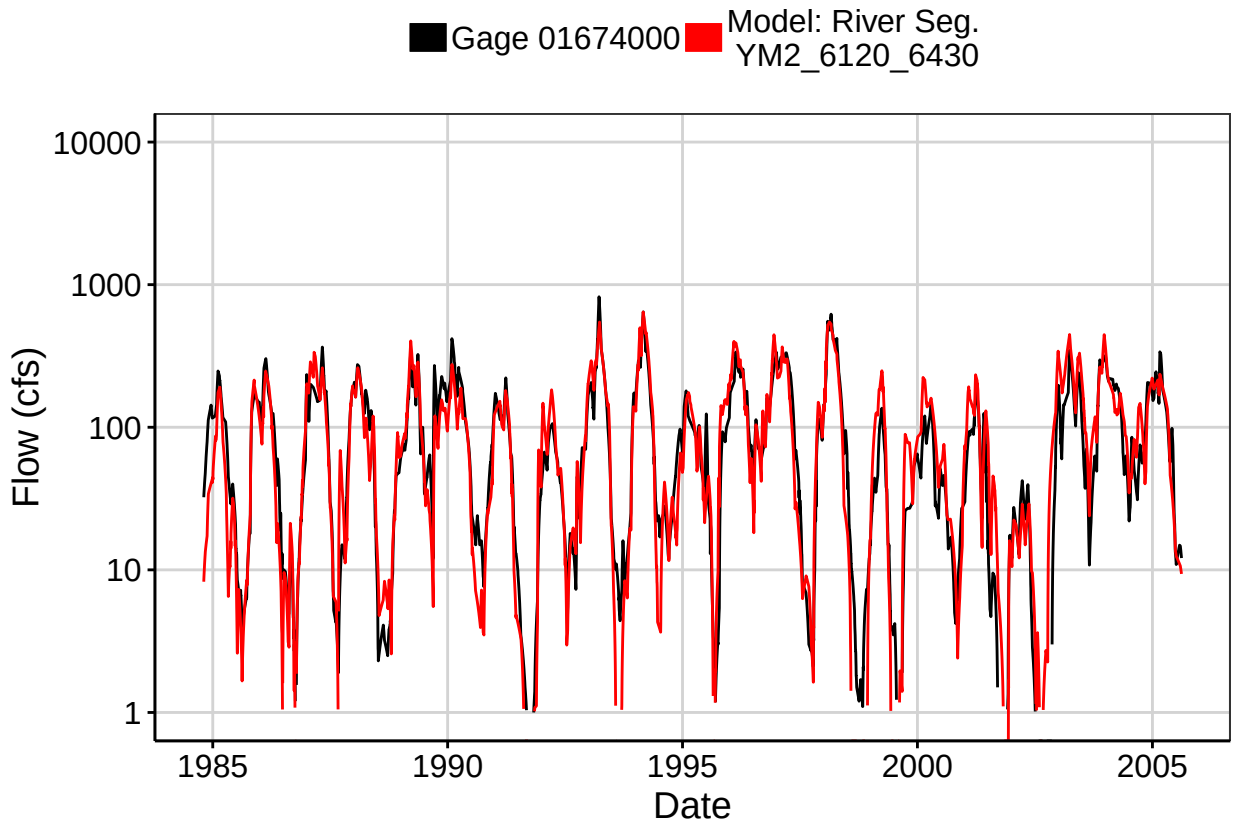


Fig. 5: Combined Baseflow

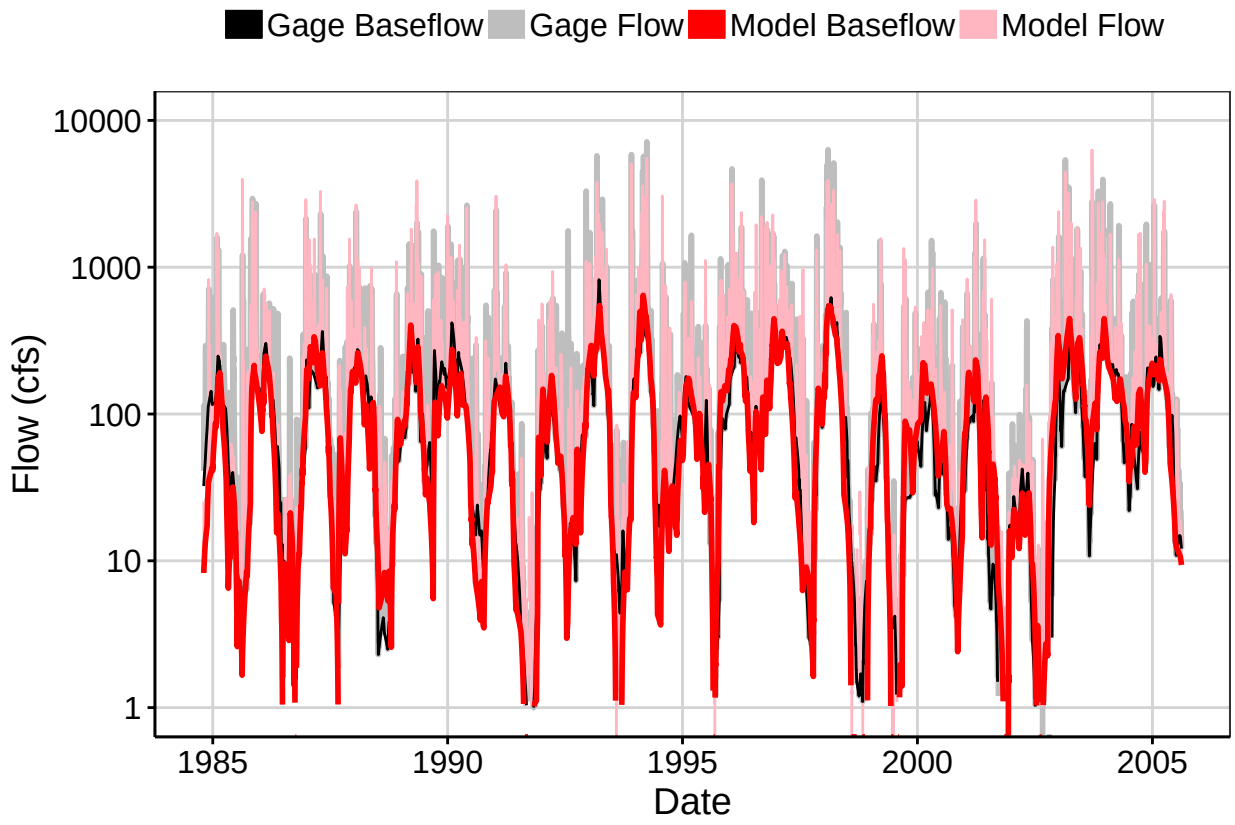


Fig. 6: Largest Error Segment

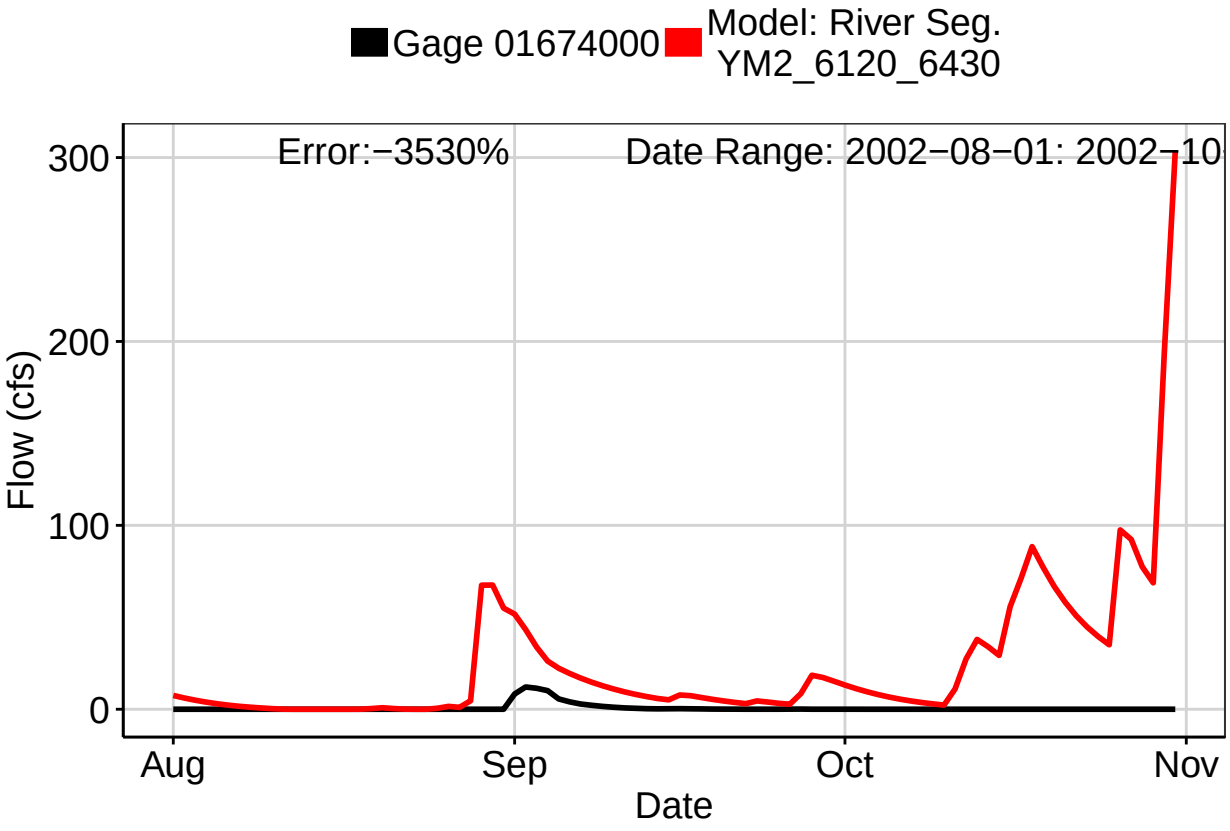


Fig. 7: Second Largest Error Segment

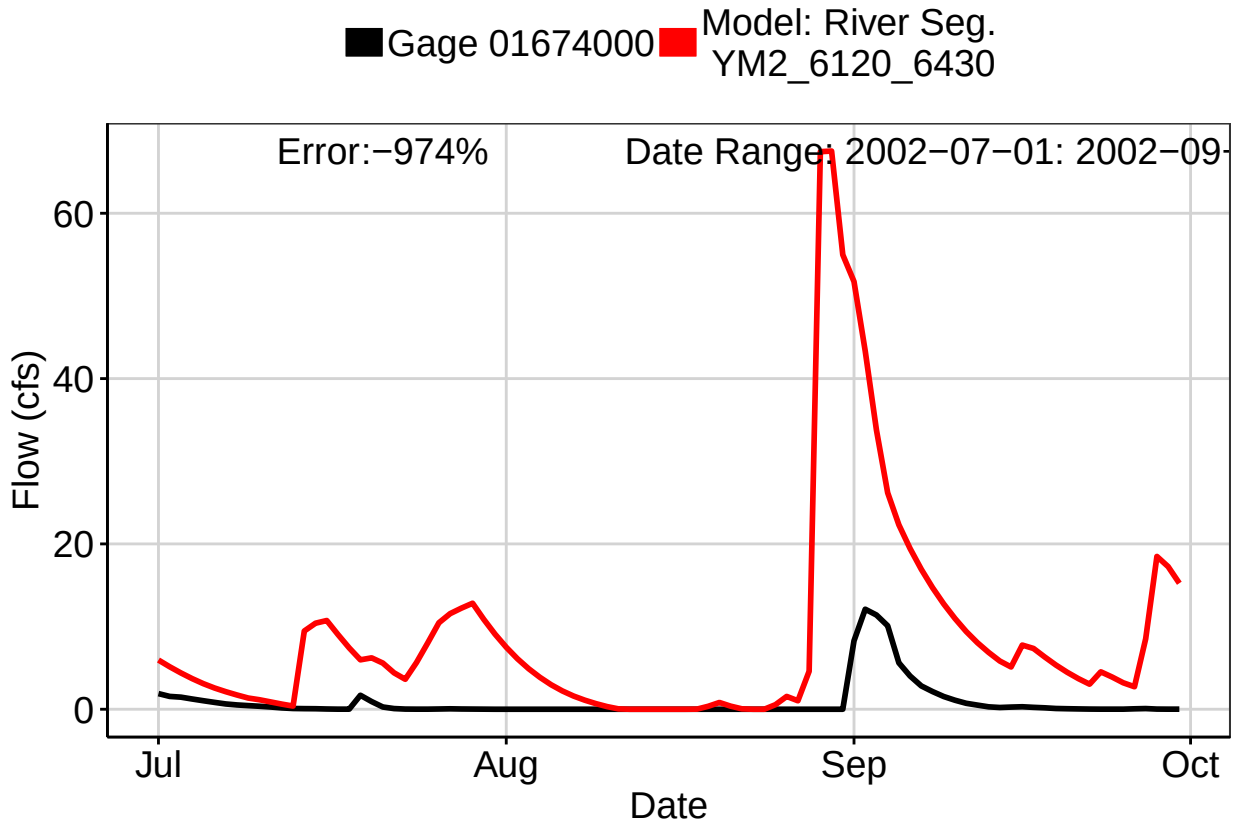


Fig. 8: Third Largest Error Segment

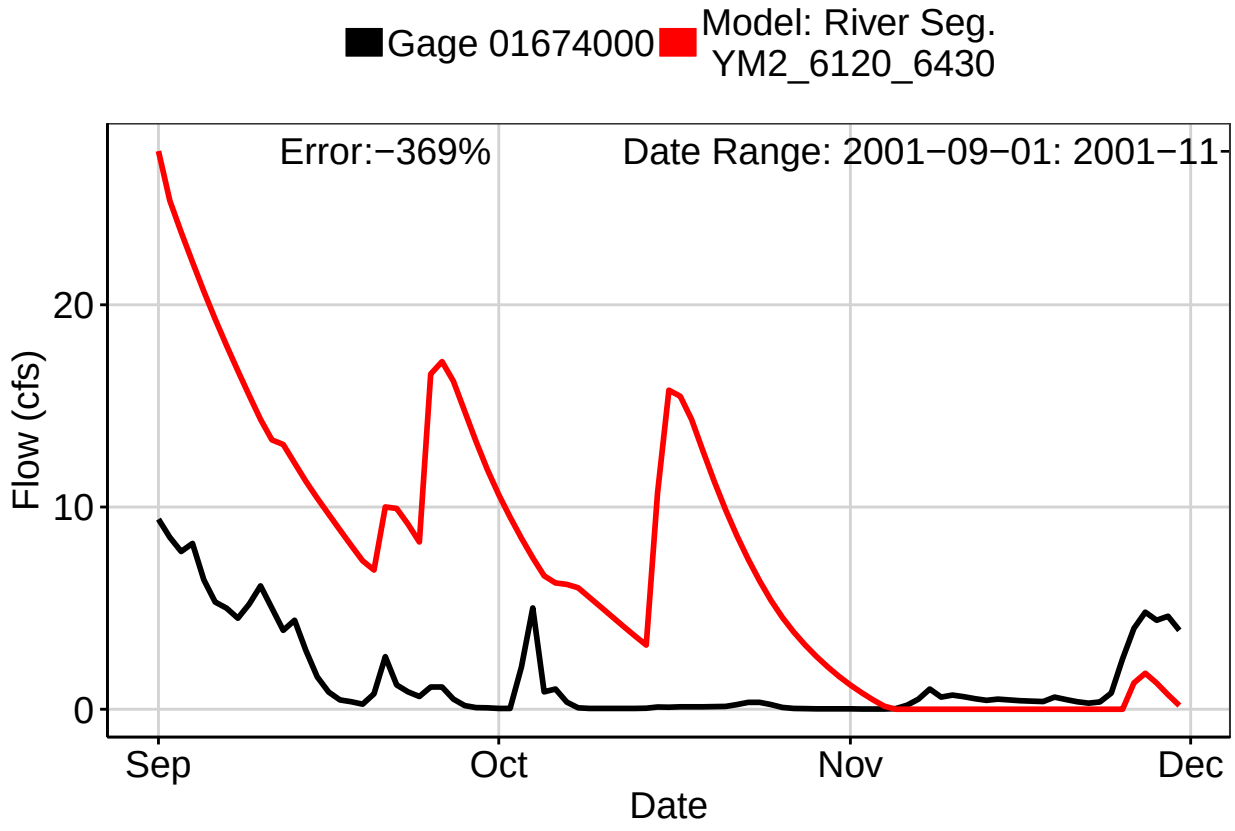


Fig. 9: Residuals Plot