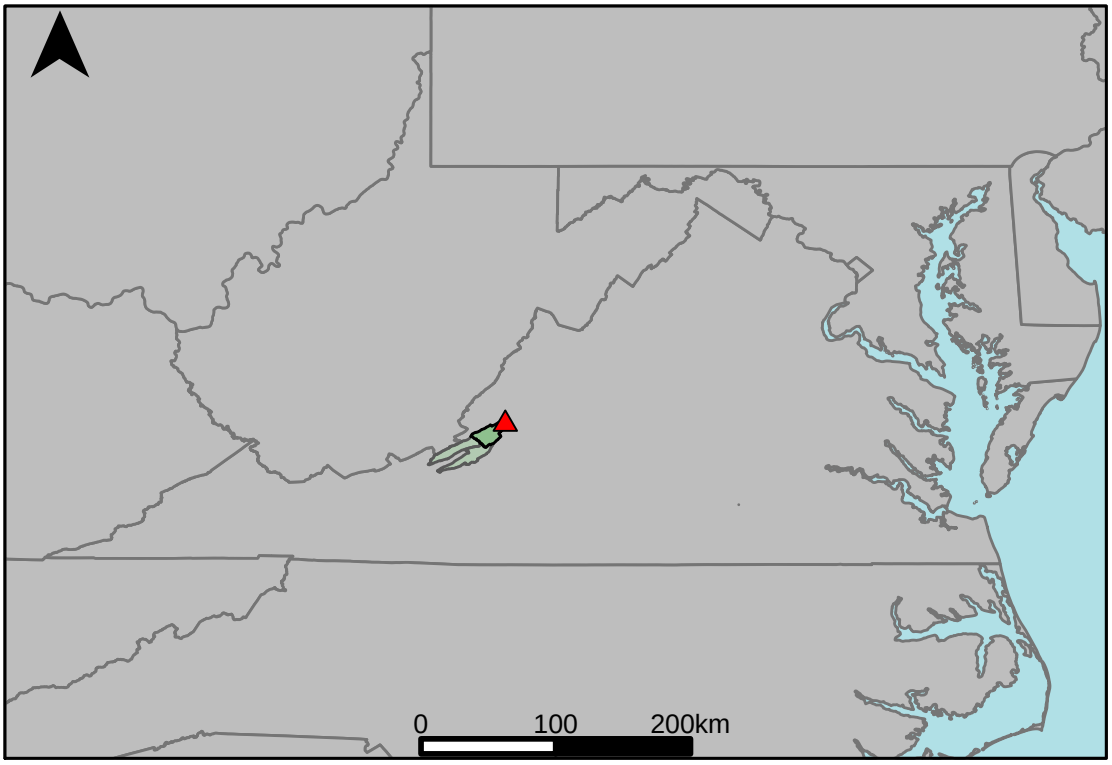
Appendix A.13: USGS Gage 02018000 vs. JU3_7490_7400 Upper James River



This river segment follows part of the flow of the Craig Creek, a tributary of the James. The gage is located in Botetourt County (Lat. 37°39'57.5", Long. -79°54'41.2"), approximately 8.8 miles southeast of Covington, VA. Drainage area is 329 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 -1%, with 43.8% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	49	56.2	14.7
Feb. Low Flow	68	101	48.5
Mar. Low Flow	120	206	71.7
Apr. Low Flow	140	232	65.7
May Low Flow	186	326	75.3
Jun. Low Flow	278	356	28.1
Jul. Low Flow	229	220	-3.93
Aug. Low Flow	153	164	7.19
Sep. Low Flow	75	94.3	25.7
Oct. Low Flow	50	15.7	-68.6
Nov. Low Flow	45	26.5	-41.1
Dec. Low Flow	44	23.4	-46.8

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	401	405	1
Jan. Mean Flow	574	557	-2.96
Feb. Mean Flow	642	683	6.39
Mar. Mean Flow	748	689	-7.89
Apr. Mean Flow	657	554	-15.7
May Mean Flow	503	460	-8.55
Jun. Mean Flow	346	332	-4.05
Jul. Mean Flow	144	153	6.25
Aug. Mean Flow	121	152	25.6
Sep. Mean Flow	215	296	37.7
Oct. Mean Flow	160	228	42.5
Nov. Mean Flow	345	371	7.54
Dec. Mean Flow	378	407	7.67

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	173	213	23.1
Feb. High Flow	781	513	-34.3
Mar. High Flow	1520	640	-57.9
Apr. High Flow	1750	1220	-30.3
May High Flow	1670	1190	-28.7
Jun. High Flow	2850	1840	-35.4
Jul. High Flow	1440	1410	-2.08
Aug. High Flow	1210	1220	0.83
Sep. High Flow	329	583	77.2
Oct. High Flow	246	229	-6.91
Nov. High Flow	140	210	50
Dec. High Flow	143	269	88.1

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	22.7	0.42	-98.2
Med. 1 Day Min	40	7.41	-81.5
Min. 3 Day Min	22.8	0.42	-98.2
Med. 3 Day Min	40.3	8.29	-79.4
Min. 7 Day Min	23.5	0.42	-98.2
Med. 7 Day Min	41.1	9.23	-77.5
Min. 30 Day Min	27.9	0.6	-97.9
Med. 30 Day Min	47.3	27.3	-42.3
Min. 90 Day Min	44.2	44.9	1.58
Med. 90 Day Min	85.7	105	22.5
7Q10	31.6	1.53	-95.2
Year of 90-Day Min. Flow	2002	1993	100
Drought Year Mean	140	177	26.4
Mean Baseflow	177	220	24.3

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	21000	18800	-10.5
Med. 1 Day Max	6110	4810	-21.3
Max. 3 Day Max	15200	8140	-46.4
Med. 3 Day Max	3690	2990	-19
Max. 7 Day Max	7300	4100	-43.8
Med. 7 Day Max	2610	1930	-26.1
Max. 30 Day Max	2480	2050	-17.3
Med. 30 Day Max	1270	1020	-19.7
Max. 90 Day Max	1520	1380	-9.21
Med. 90 Day Max	729	663	-9.05

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	34.3	3.44	-90
5% Non-Exceedance	43	18.2	-57.7
50% Non-Exceedance	188	264	40.4
95% Non-Exceedance	1360	1210	-11
99% Non-Exceedance	3370	2870	-14.8
Sept. 10% Non-Exceedance	38	9.2	-75.8

Fig. 1: Hydrograph

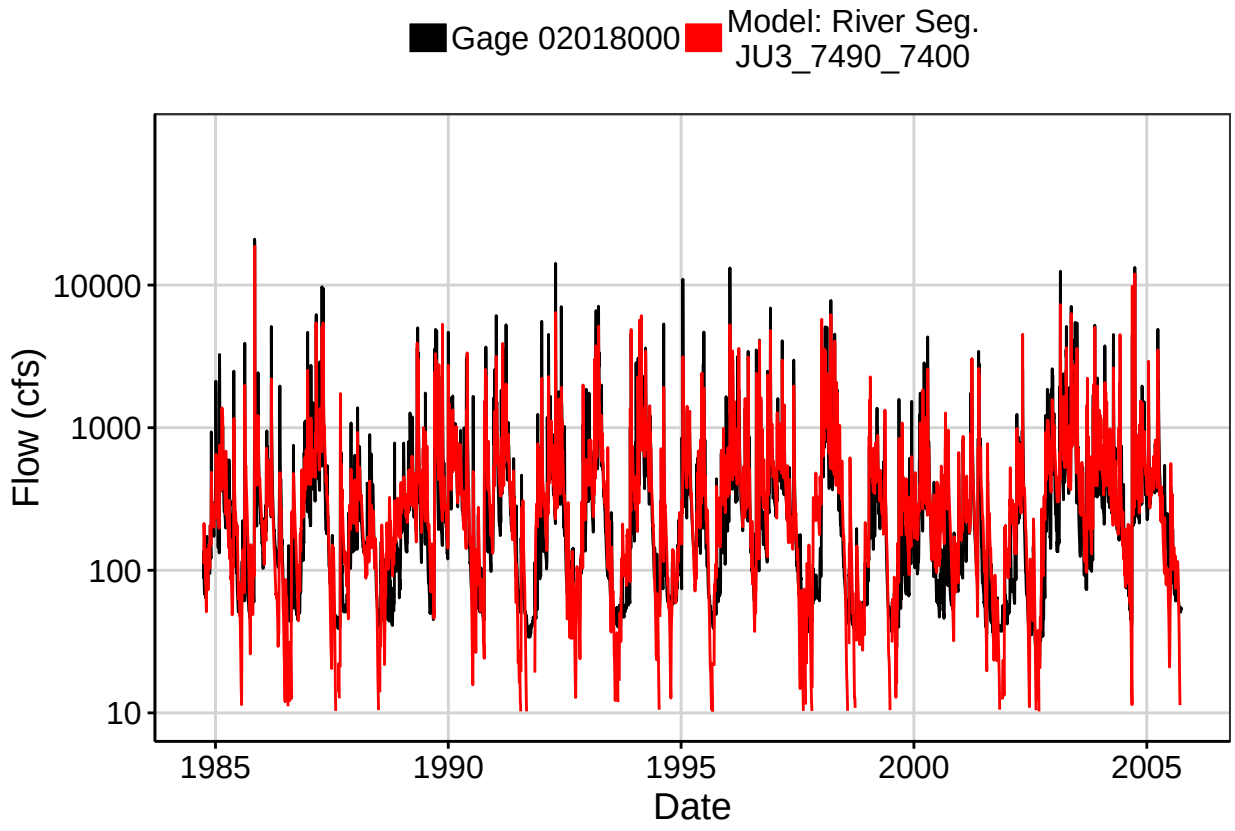


Fig. 2: Zoomed Hydrograph

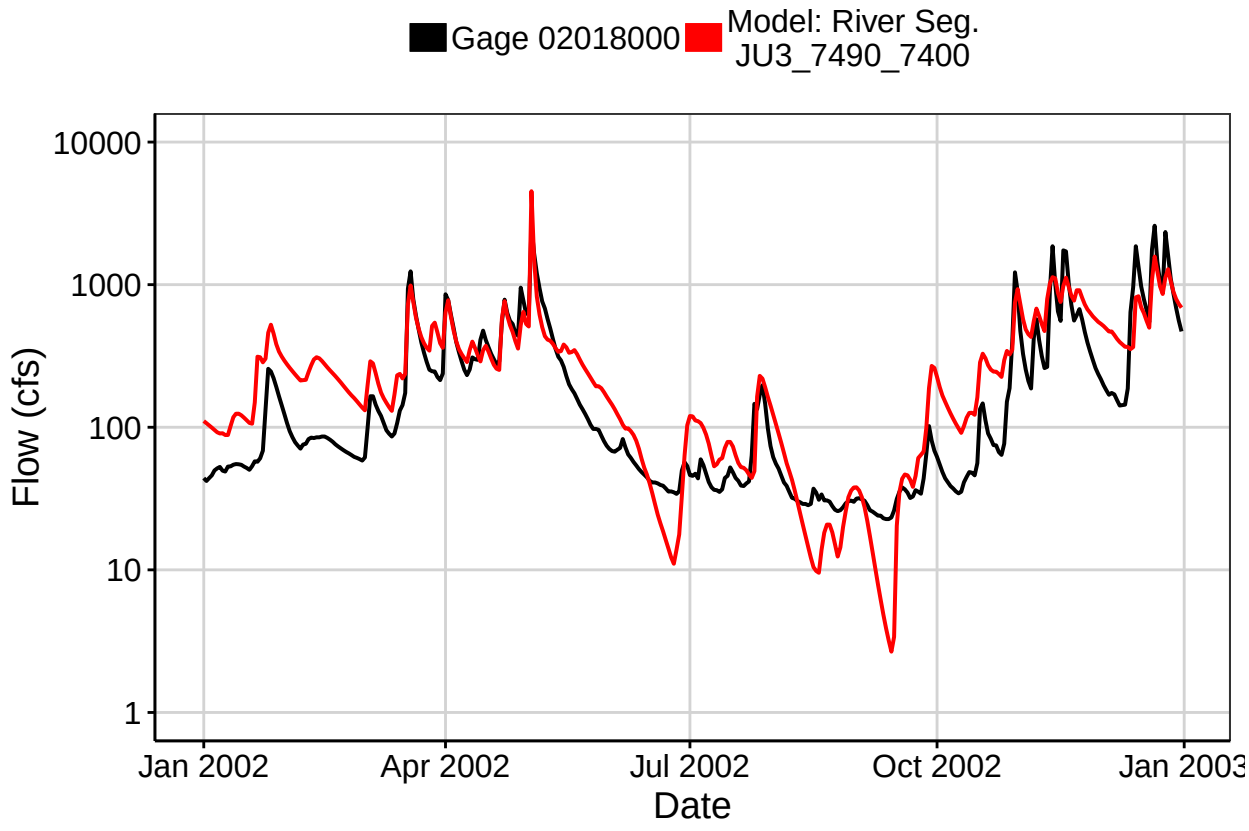


Fig. 3: Flow Exceedance

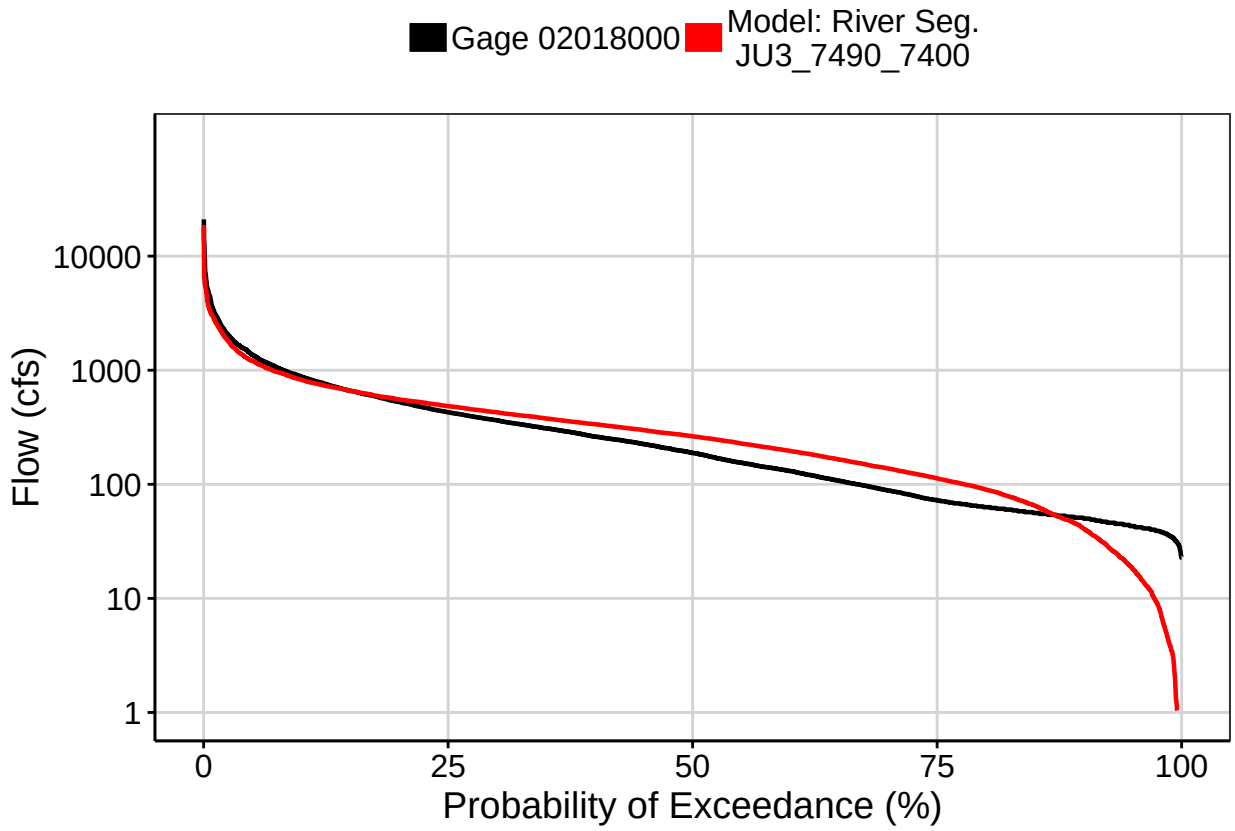


Fig. 4: Baseflow

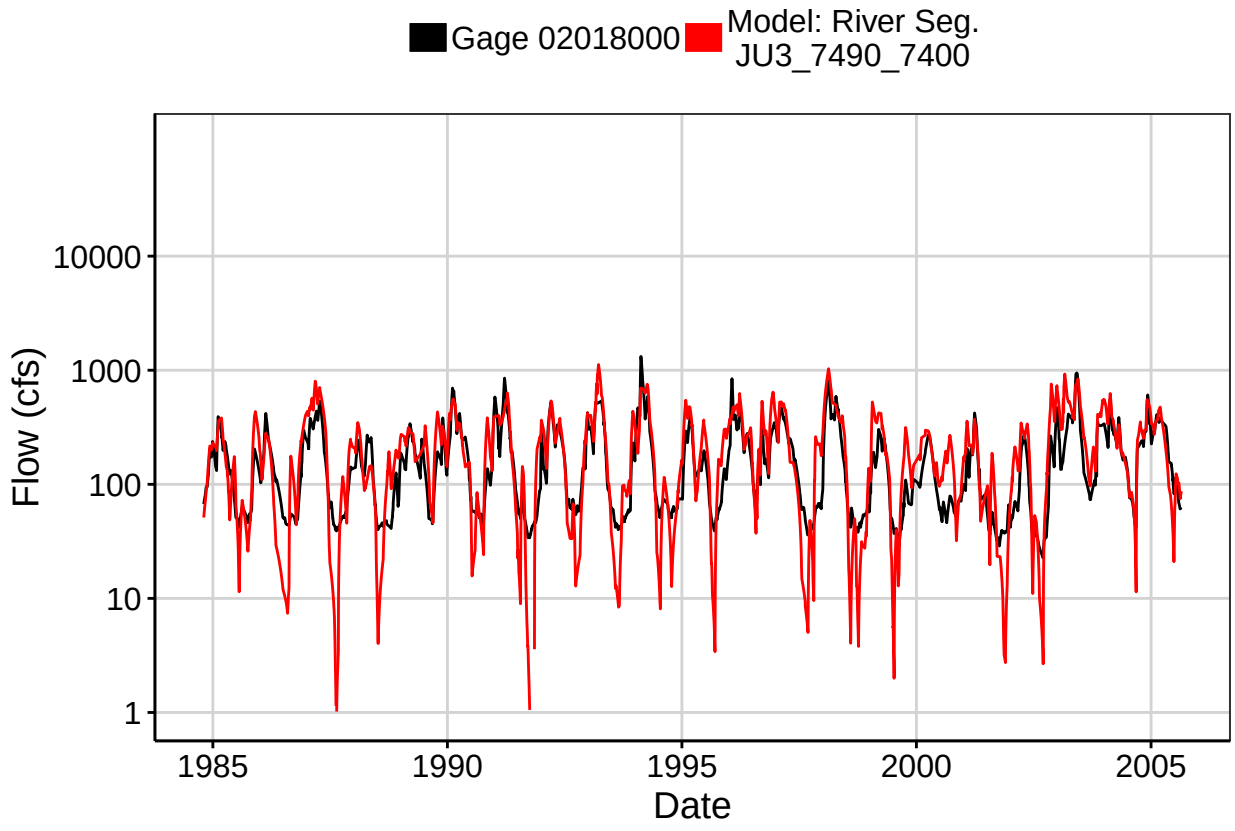


Fig. 5: Combined Baseflow

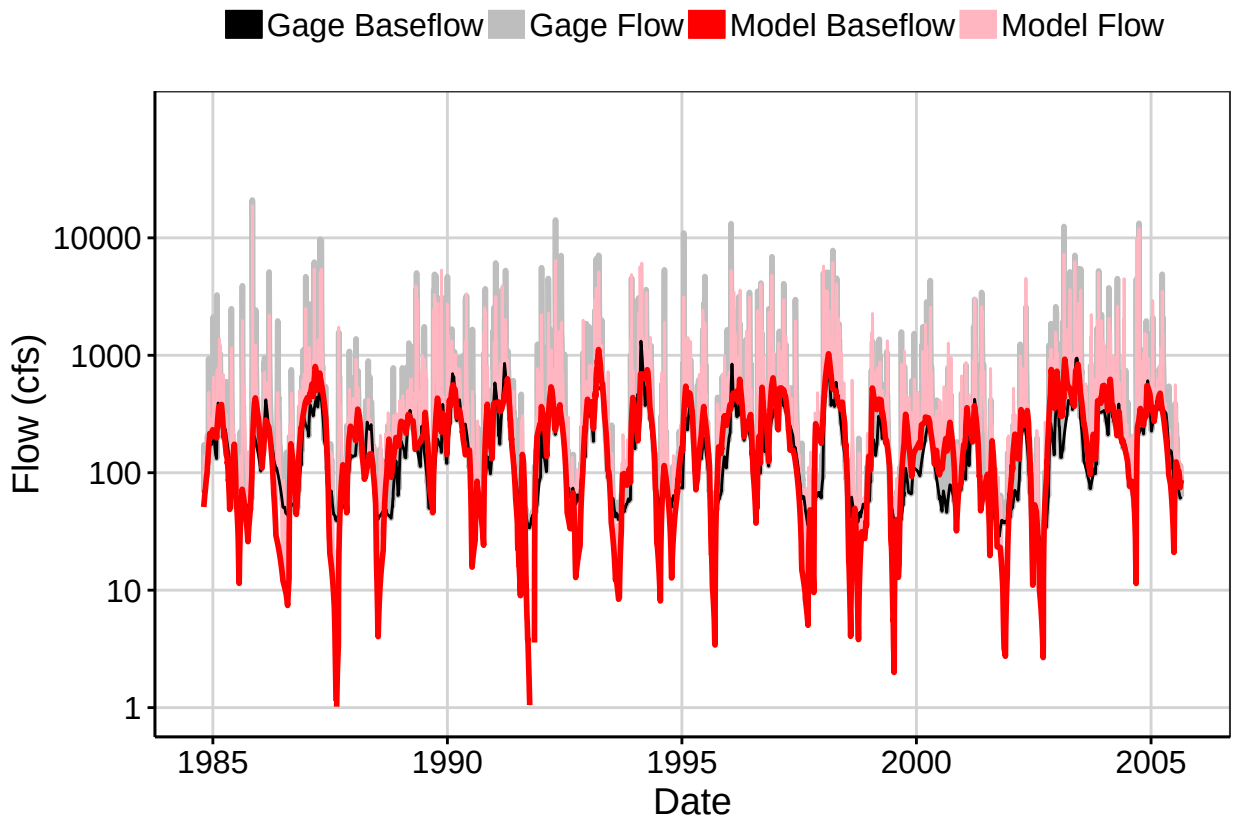


Fig. 6: Largest Error Segment

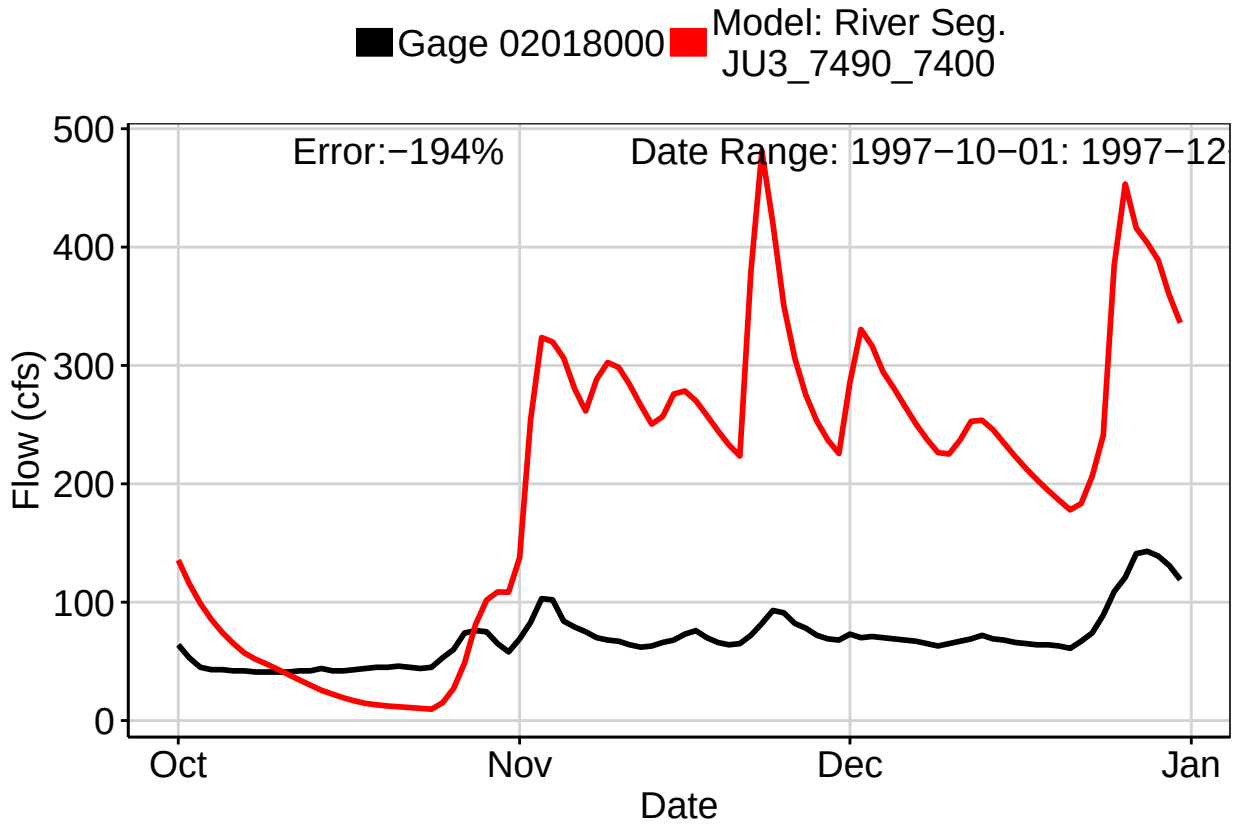


Fig. 7: Second Largest Error Segment

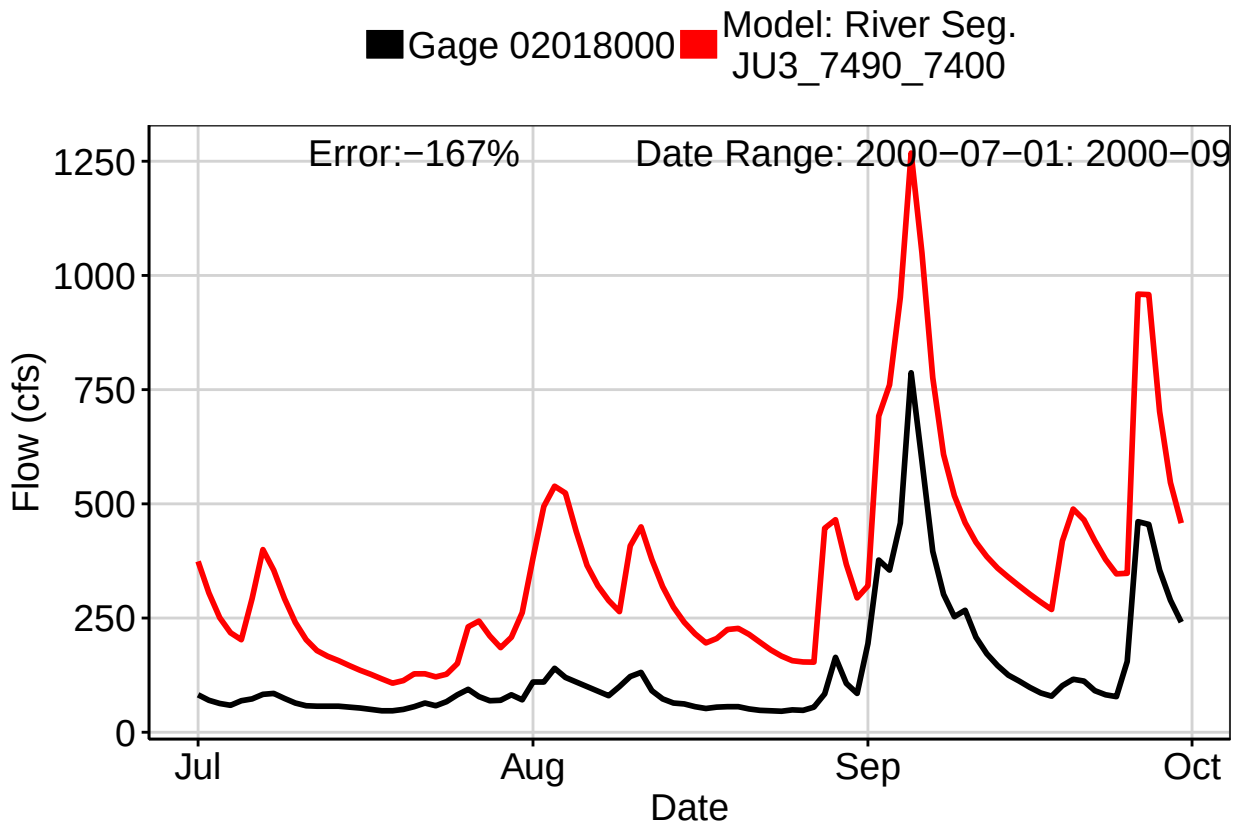


Fig. 8: Third Largest Error Segment

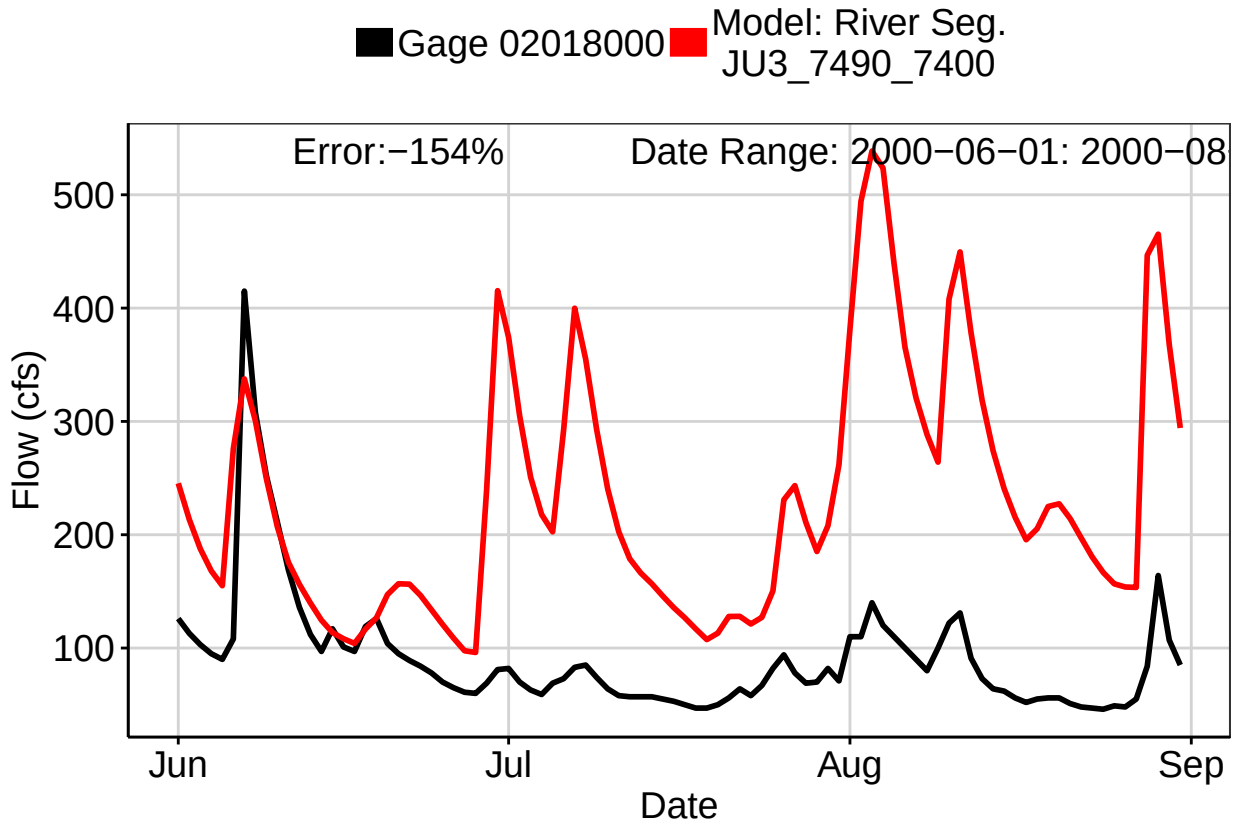


Fig. 9: Residuals Plot