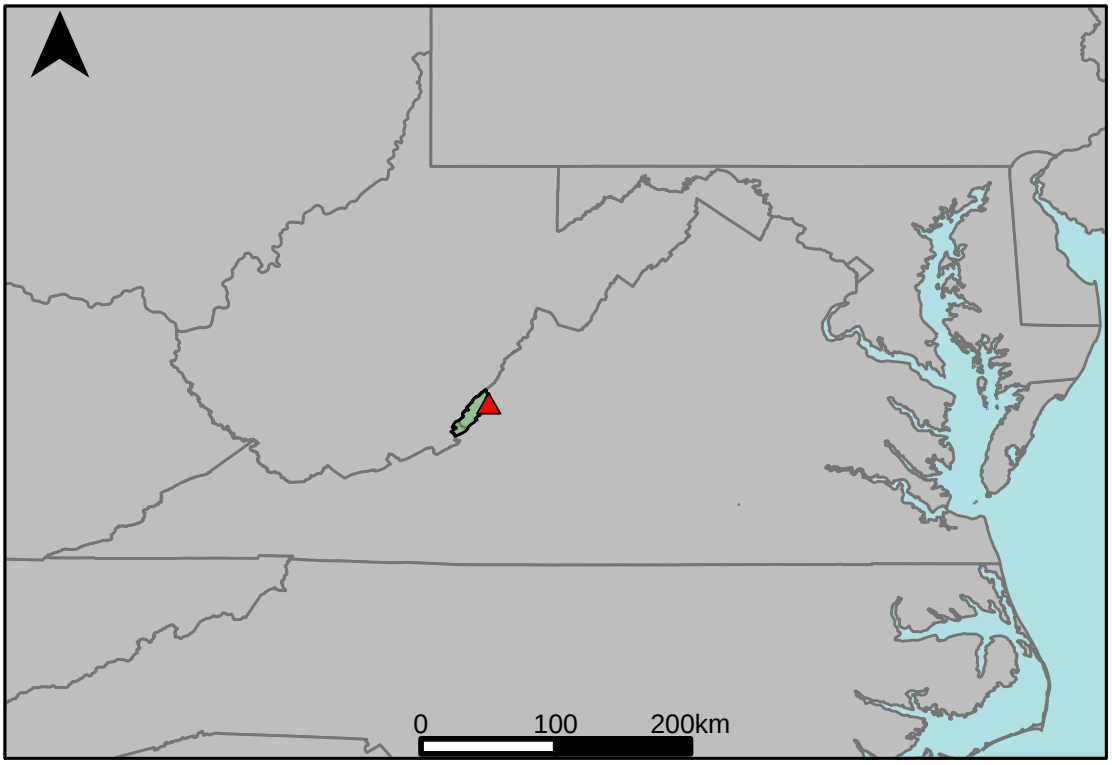
Appendix A.7: USGS Gage 02013000 vs. JU2_7140_7330 Upper James River



This river segment follows part of the flow of the Dunlap Creek, a tributary of the James. The gage is located in Alleghany County (Lat. 37°48'10.4", Long. -80°02'49.2"), approximately 3.7 miles northwest of Covington, VA. Drainage area is 162 sq. miles. This gage started taking data in 1928 and is still taking data. There are occasional diurnal fluctuations caused by a dam 7.9 mi upstream. The average daily discharge error between the model and gage data for the 20 year timespan was 1.69%, with 45.8% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	19	21.3	12.1
Feb. Low Flow	27	41.7	54.4
Mar. Low Flow	40	75.5	88.8
Apr. Low Flow	56	107	91.1
May Low Flow	70	134	91.4
Jun. Low Flow	120	152	26.7
Jul. Low Flow	90	103	14.4
Aug. Low Flow	53	68.2	28.7
Sep. Low Flow	28.3	22.7	-19.8
Oct. Low Flow	22	3.52	-84
Nov. Low Flow	19	3.23	-83
Dec. Low Flow	17	2.91	-82.9

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	178	175	-1.69
Jan. Mean Flow	253	246	-2.77
Feb. Mean Flow	316	328	3.8
Mar. Mean Flow	382	328	-14.1
Apr. Mean Flow	281	250	-11
May Mean Flow	245	202	-17.6
Jun. Mean Flow	122	131	7.38
Jul. Mean Flow	52.5	58.1	10.7
Aug. Mean Flow	39.9	39.5	-1
Sep. Mean Flow	75.7	124	63.8
Oct. Mean Flow	60	80.6	34.3
Nov. Mean Flow	145	163	12.4
Dec. Mean Flow	177	168	-5.08

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	42	76.1	81.2
Feb. High Flow	273	386	41.4
Mar. High Flow	843	437	-48.2
Apr. High Flow	1130	695	-38.5
May High Flow	912	901	-1.21
Jun. High Flow	1600	1460	-8.75
Jul. High Flow	655	804	22.7
Aug. High Flow	629	725	15.3
Sep. High Flow	165	239	44.8
Oct. High Flow	133	118	-11.3
Nov. High Flow	90	120	33.3
Dec. High Flow	85	74.3	-12.6

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	8.9	0.09	-99
Med. 1 Day Min	15	1.59	-89.4
Min. 3 Day Min	8.93	0.09	-99
Med. 3 Day Min	15.3	1.72	-88.8
Min. 7 Day Min	9.14	0.09	-99
Med. 7 Day Min	15.7	1.87	-88.1
Min. 30 Day Min	11	0.31	-97.2
Med. 30 Day Min	18.5	7.34	-60.3
Min. 90 Day Min	15.4	9.02	-41.4
Med. 90 Day Min	34	29.2	-14.1
7Q10	11.8	0.34	-97.1
Year of 90-Day Min. Flow	1999	1999	0
Drought Year Mean	88	109	23.9
Mean Baseflow	68.3	84.4	23.6

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	10400	14000	34.6
Med. 1 Day Max	3360	3190	-5.06
Max. 3 Day Max	4630	5790	25.1
Med. 3 Day Max	2080	1600	-23.1
Max. 7 Day Max	2270	2730	20.3
Med. 7 Day Max	1200	1010	-15.8
Max. 30 Day Max	1120	930	-17
Med. 30 Day Max	522	457	-12.5
Max. 90 Day Max	676	639	-5.47
Med. 90 Day Max	347	305	-12.1

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	12.9	0.76	-94.1
5% Non-Exceedance	16	3.23	-79.8
50% Non-Exceedance	72	98.8	37.2
95% Non-Exceedance	621	532	-14.3
99% Non-Exceedance	1770	1720	-2.82
Sept. 10% Non-Exceedance	15	1.38	-90.8

Fig. 1: Hydrograph

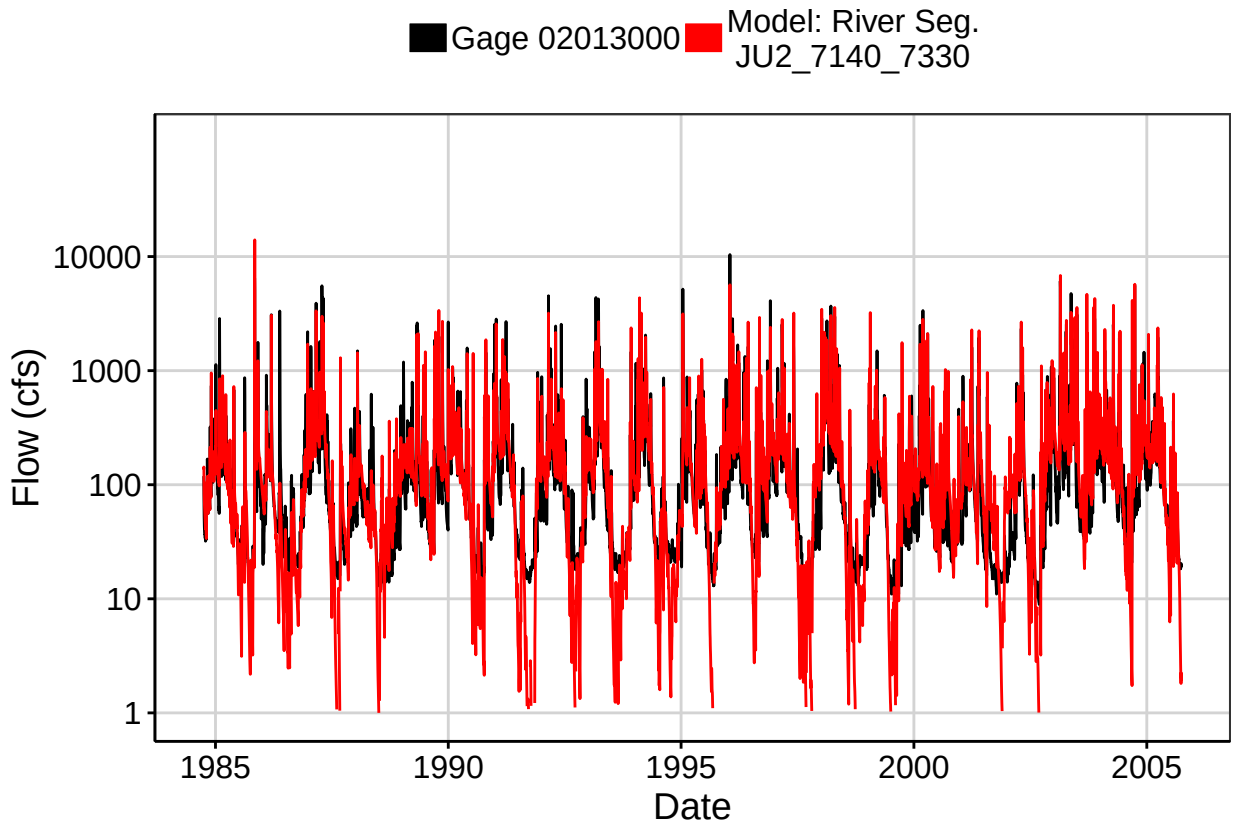


Fig. 2: Zoomed Hydrograph

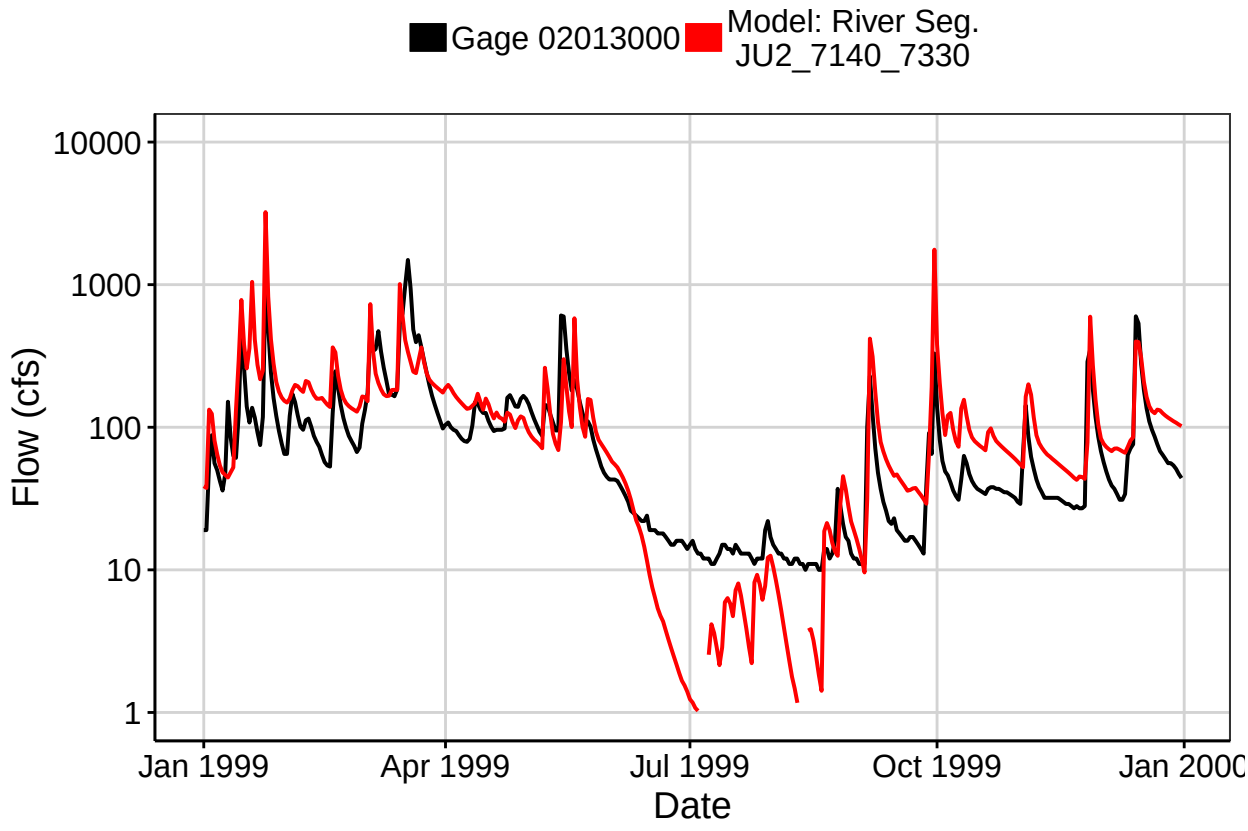


Fig. 3: Flow Exceedance

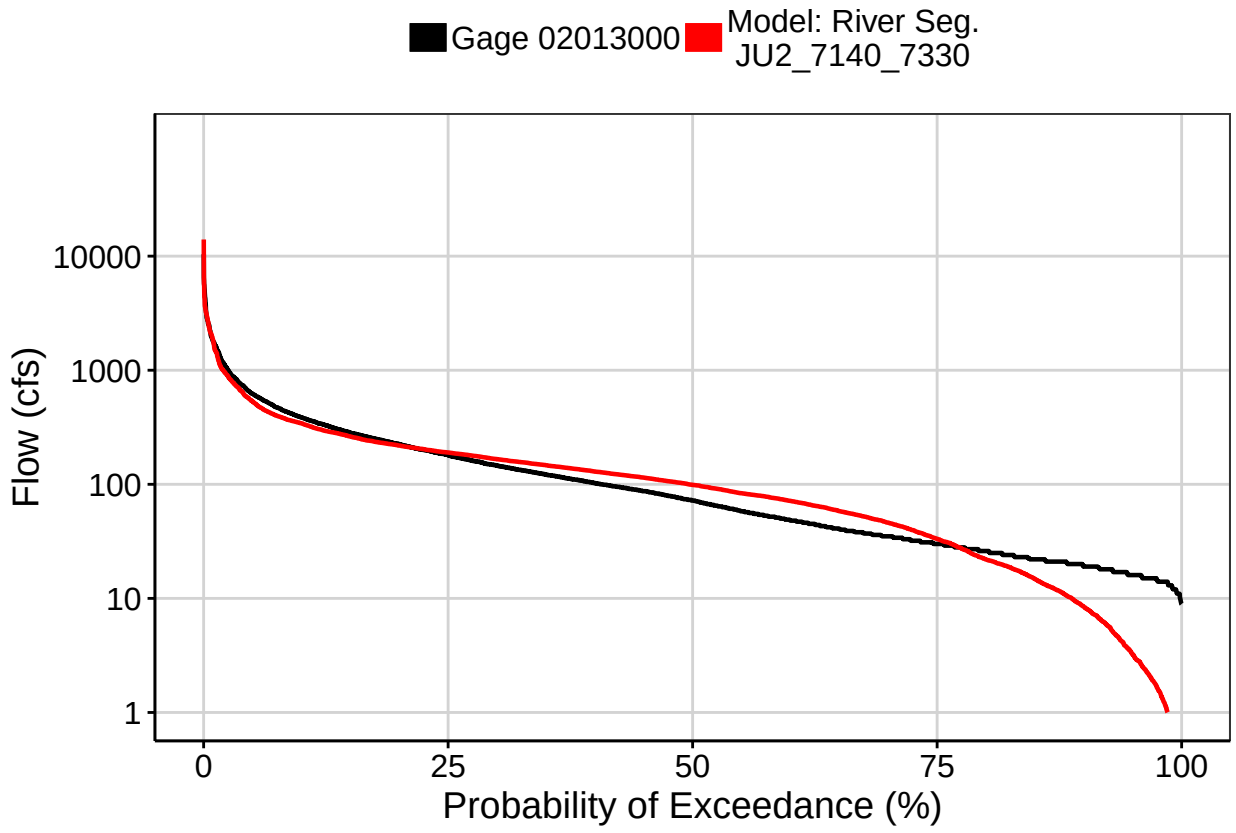


Fig. 4: Baseflow

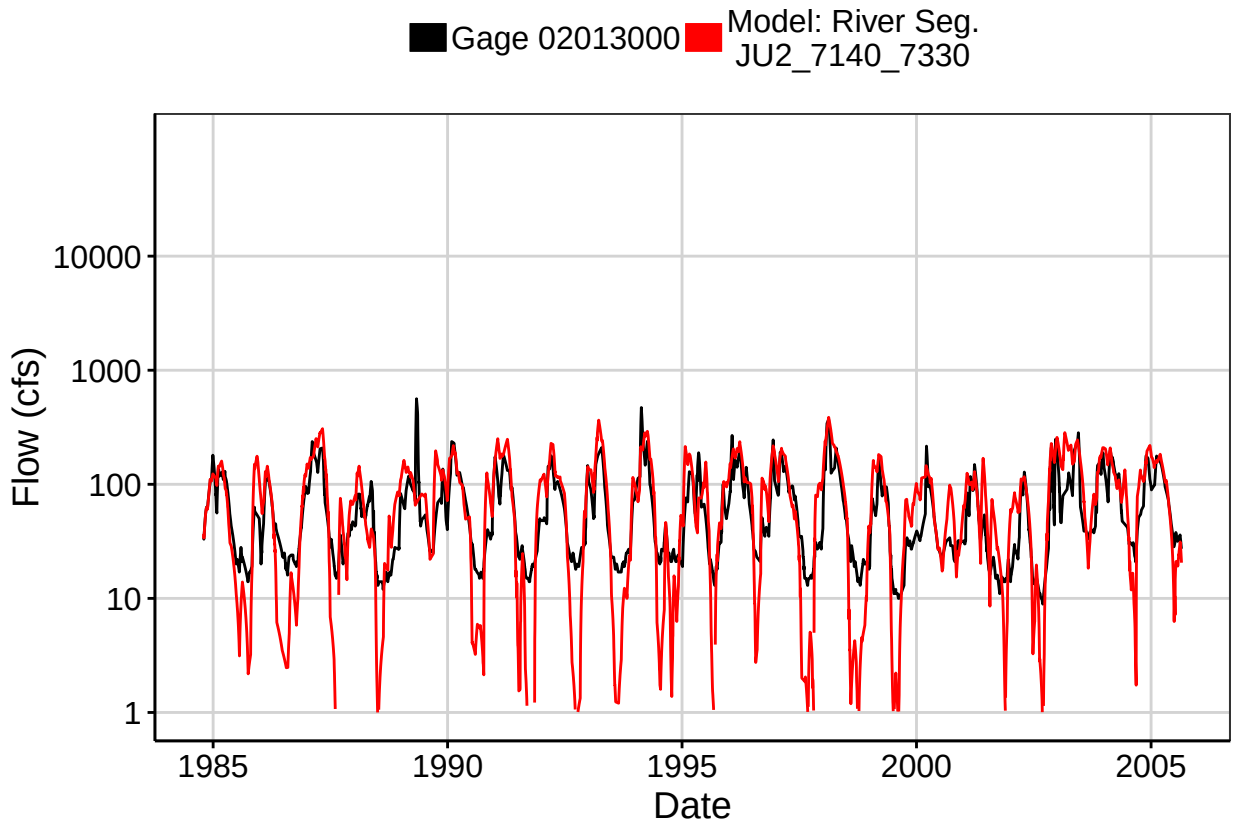


Fig. 5: Combined Baseflow

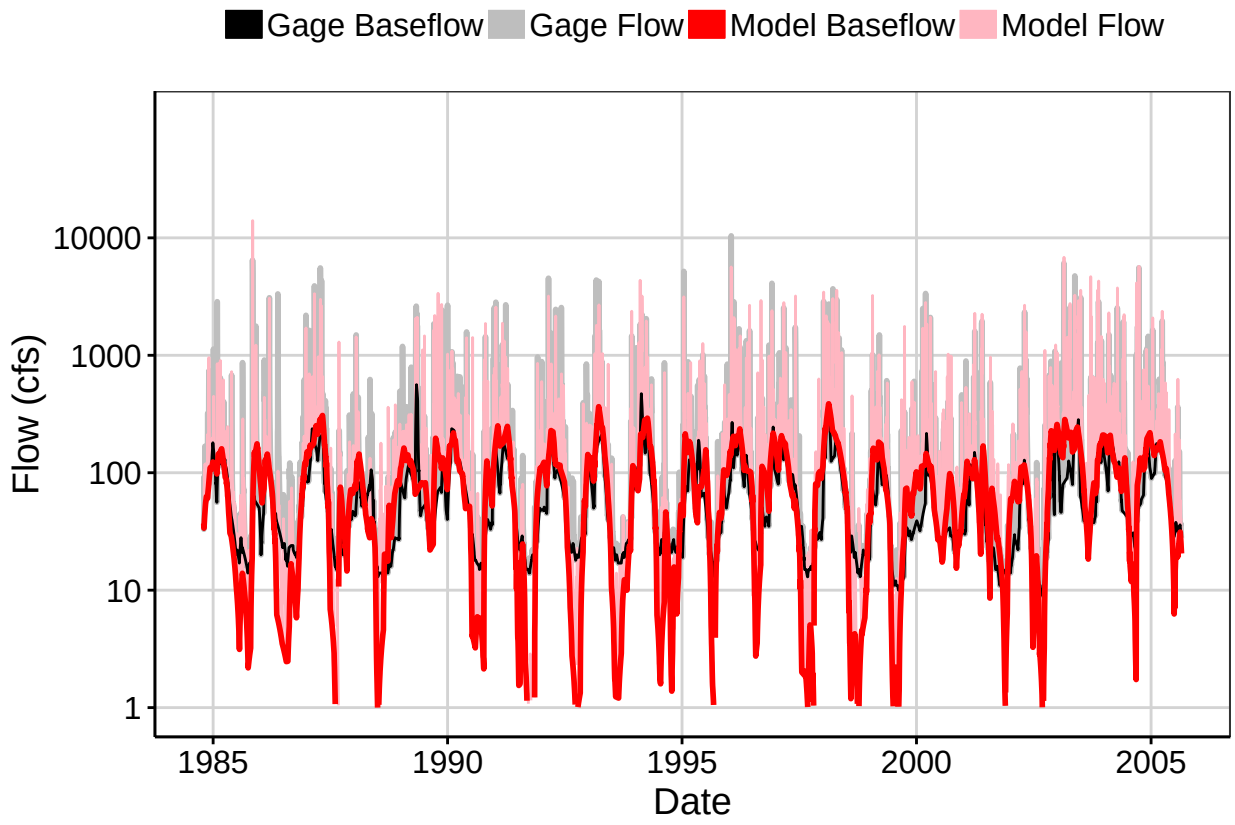


Fig. 6: Largest Error Segment

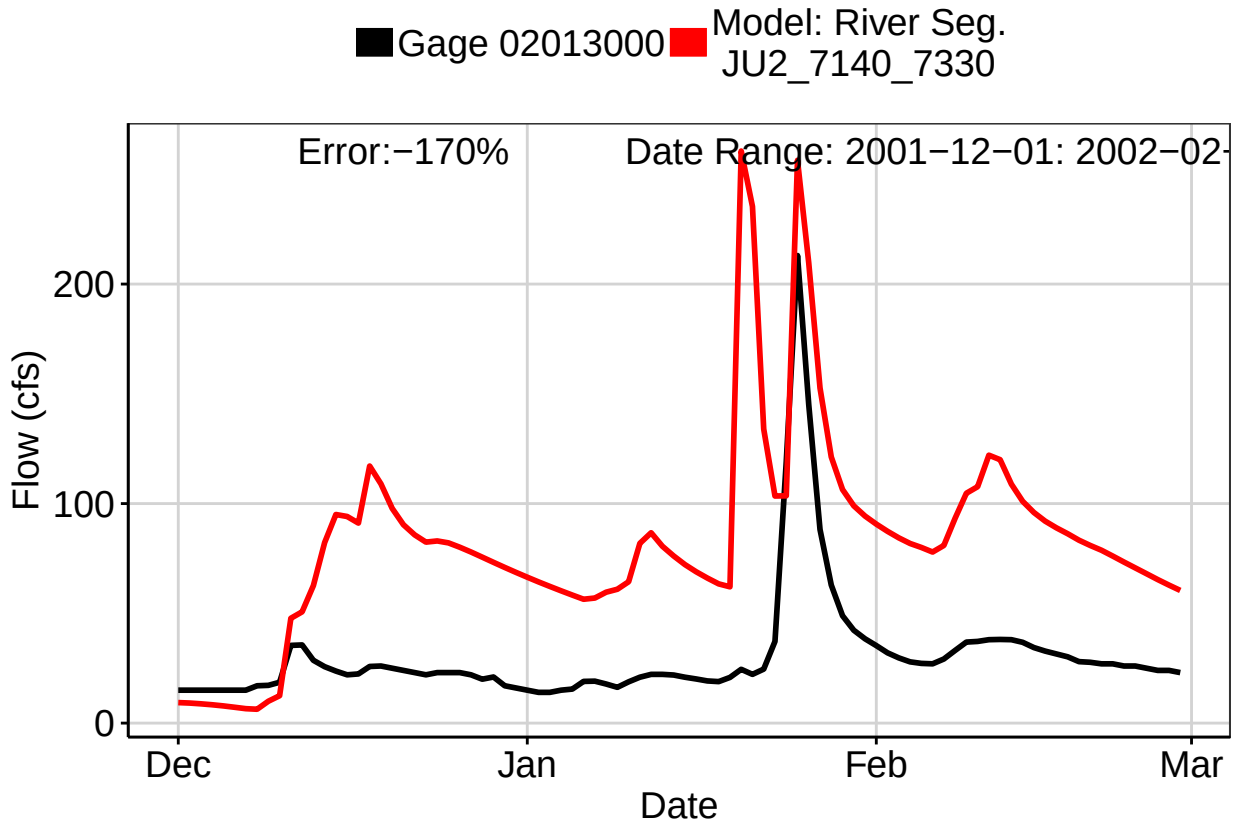


Fig. 7: Second Largest Error Segment

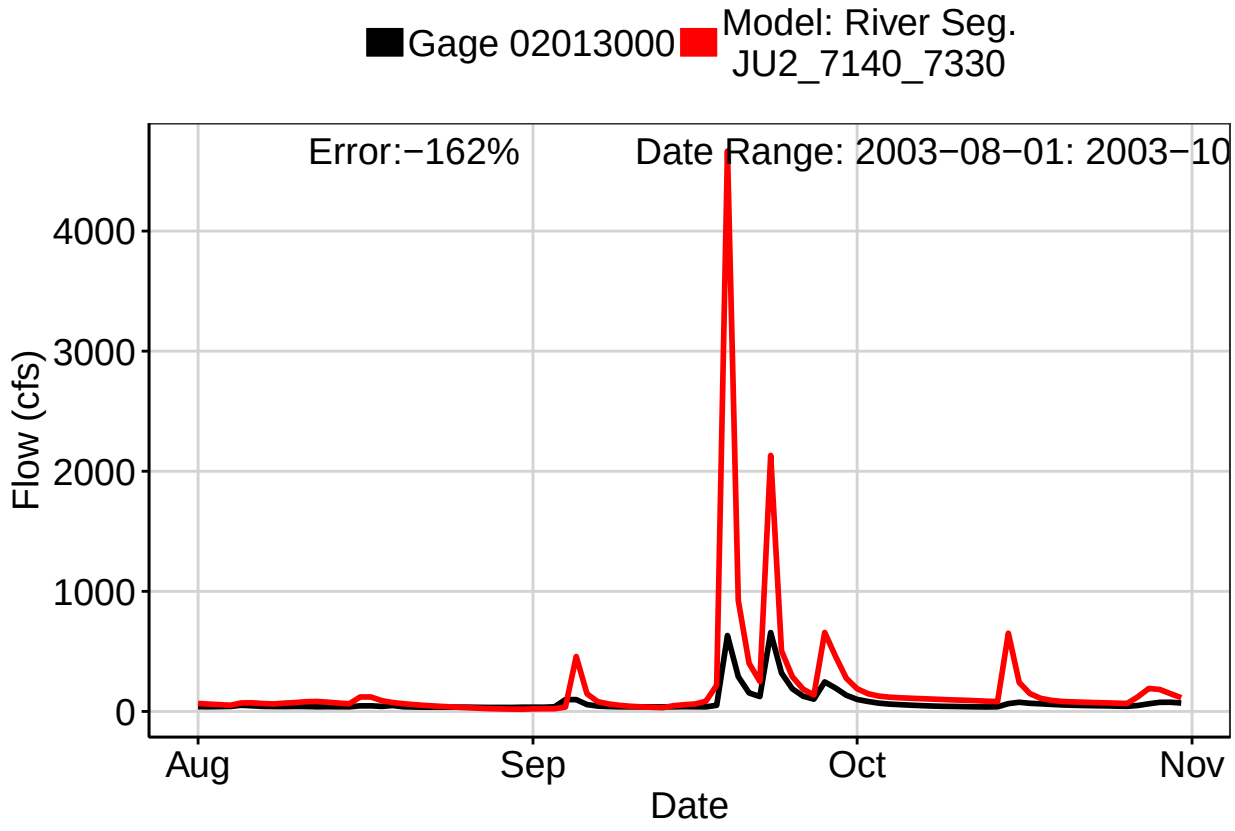


Fig. 8: Third Largest Error Segment

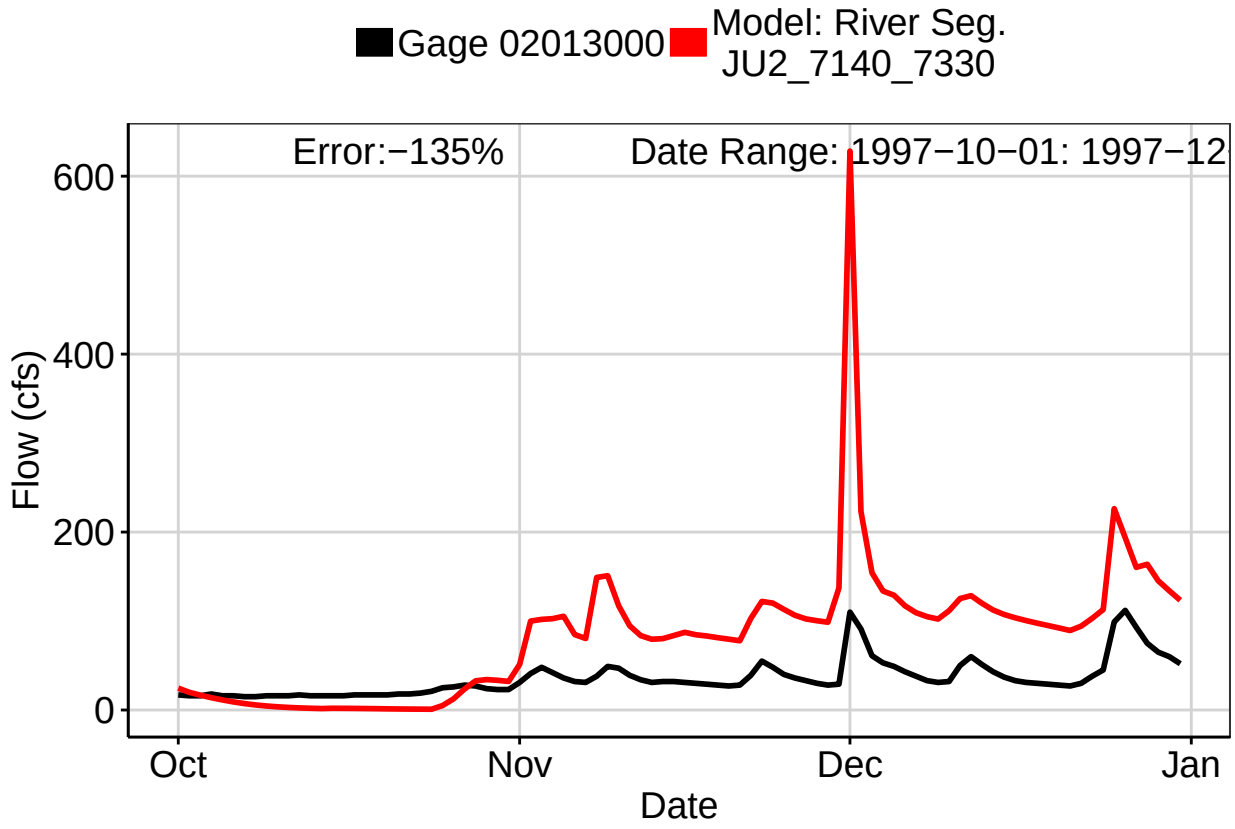


Fig. 9: Residuals Plot