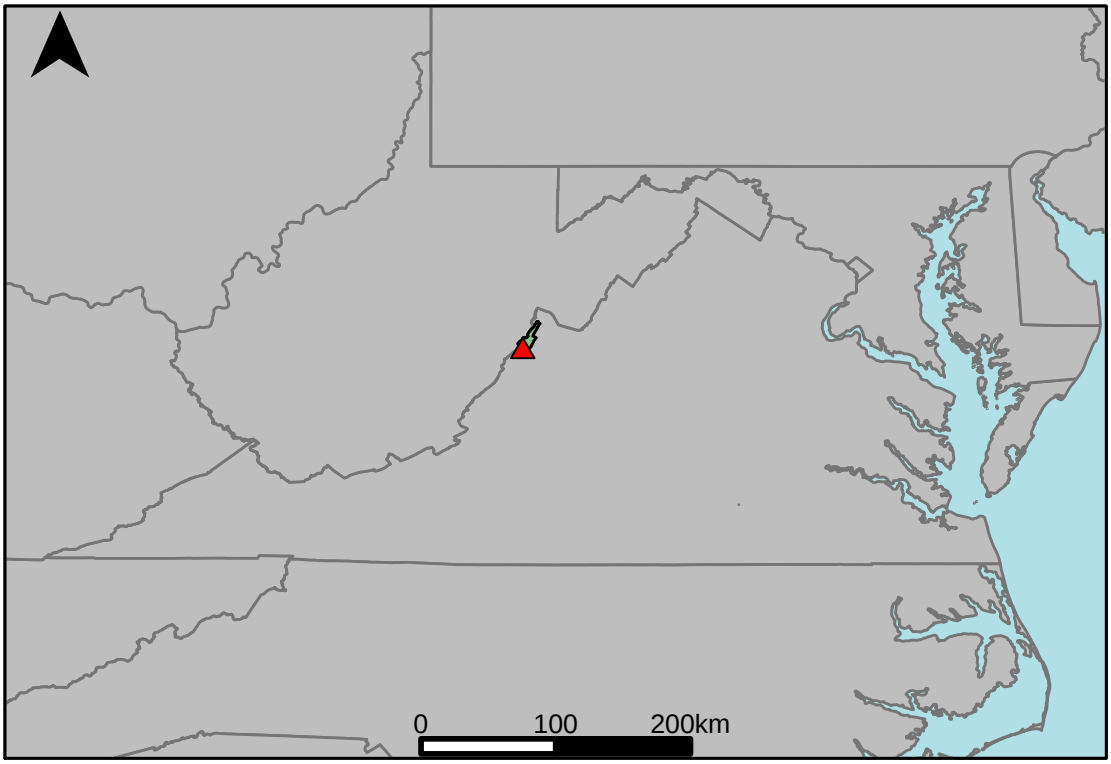
Appendix A.2: USGS Gage 02011460 vs. JU1_6290_6590 Upper James River



This river segment follows part of the flow of the Back Creek, a tributary of the James. The gage is located in Bath County (Lat. 38°14'43.4", Long. -79°46'07.2"), approximately 15 miles southwest of Monterey, VA. Drainage area is 60.9 sq. miles. This gage started taking data in 1974 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 -2.16%, with 45% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	6	7.52	25.3
Feb. Low Flow	12	12	0
Mar. Low Flow	27	32.6	20.7
Apr. Low Flow	30	27.1	-9.67
May Low Flow	34	25.8	-24.1
Jun. Low Flow	59	49.2	-16.6
Jul. Low Flow	46	34.1	-25.9
Aug. Low Flow	32	16.9	-47.2
Sep. Low Flow	12	2.26	-81.2
Oct. Low Flow	6.8	1.29	-81
Nov. Low Flow	6.5	1.52	-76.6
Dec. Low Flow	4	0.81	-79.8

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	92.8	94.8	2.16
Jan. Mean Flow	135	119	-11.9
Feb. Mean Flow	131	141	7.63
Mar. Mean Flow	189	204	7.94
Apr. Mean Flow	139	131	-5.76
May Mean Flow	135	112	-17
Jun. Mean Flow	64.9	56.7	-12.6
Jul. Mean Flow	32.4	36.8	13.6
Aug. Mean Flow	26.3	37	40.7
Sep. Mean Flow	35.1	60.4	72.1
Oct. Mean Flow	27.5	44.2	60.7
Nov. Mean Flow	97.8	107	9.41
Dec. Mean Flow	103	91.9	-10.8

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	44	106	141
Feb. High Flow	371	334	-9.97
Mar. High Flow	570	304	-46.7
Apr. High Flow	465	503	8.17
May High Flow	295	525	78
Jun. High Flow	604	927	53.5
Jul. High Flow	354	365	3.11
Aug. High Flow	472	504	6.78
Sep. High Flow	159	237	49.1
Oct. High Flow	122	156	27.9
Nov. High Flow	49	143	192
Dec. High Flow	53	233	340

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	0.87	0.01	-99.2
Med. 1 Day Min	3.1	0.09	-97
Min. 3 Day Min	0.99	0.01	-99.3
Med. 3 Day Min	3.33	0.15	-95.5
Min. 7 Day Min	1.04	0.01	-99.1
Med. 7 Day Min	3.6	0.32	-91.2
Min. 30 Day Min	1.81	0.1	-94.3
Med. 30 Day Min	6.26	4.62	-26.2
Min. 90 Day Min	4.6	3.87	-15.9
Med. 90 Day Min	16.9	23.5	39.1
7Q10	1.95	0.02	-99.1
Year of 90-Day Min. Flow	1999	1999	0
Drought Year Mean	39.1	62.5	59.8
Mean Baseflow	35.3	32.3	-8.5

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	6280	7180	14.3
Med. 1 Day Max	1500	1290	-14
Max. 3 Day Max	3760	4650	23.7
Med. 3 Day Max	853	891	4.45
Max. 7 Day Max	1750	2280	30.3
Med. 7 Day Max	553	560	1.27
Max. 30 Day Max	525	640	21.9
Med. 30 Day Max	300	289	-3.67
Max. 90 Day Max	320	374	16.9
Med. 90 Day Max	183	185	1.09

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	2.6	0.04	-98.6
5% Non-Exceedance	4.2	0.81	-80.7
50% Non-Exceedance	44.6	44.8	0.45
95% Non-Exceedance	318	337	5.97
99% Non-Exceedance	779	876	12.5
Sept. 10% Non-Exceedance	3.19	0.55	-82.8

Fig. 1: Hydrograph

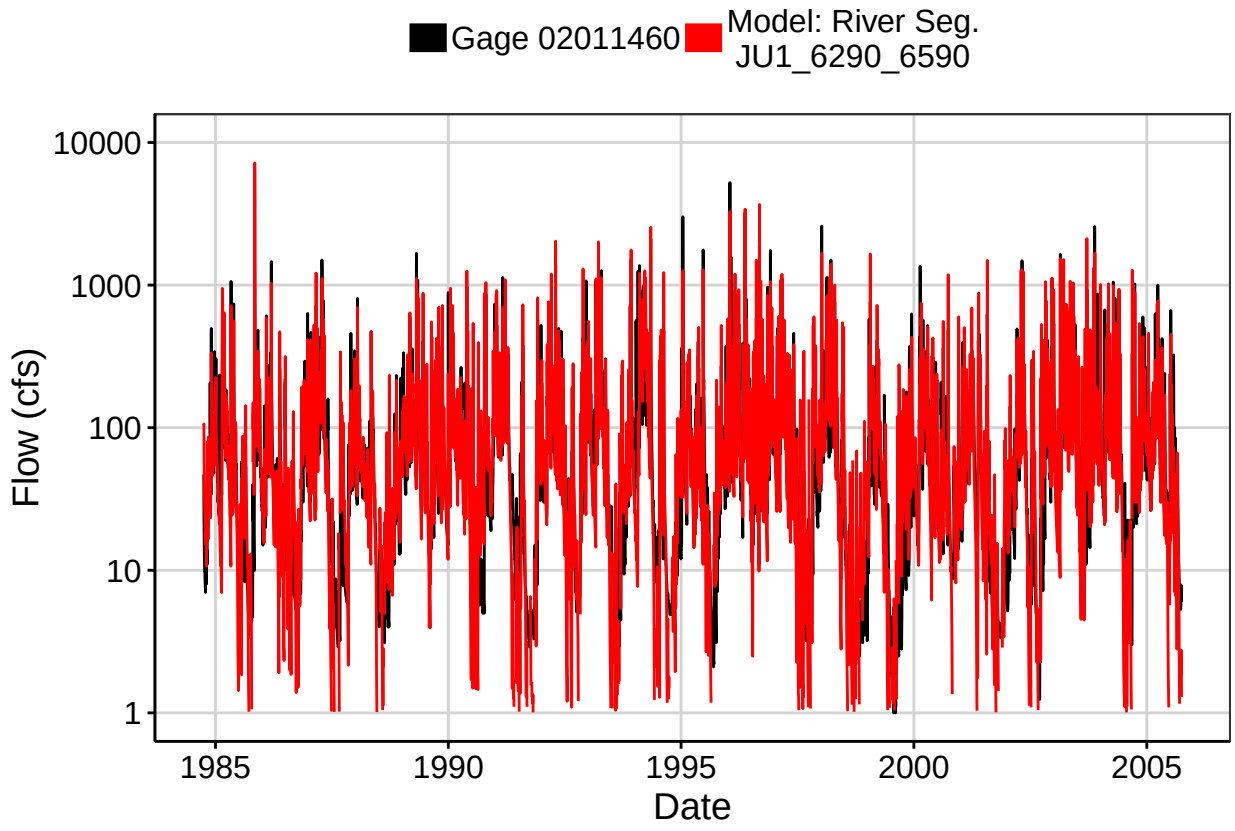


Fig. 2: Zoomed Hydrograph

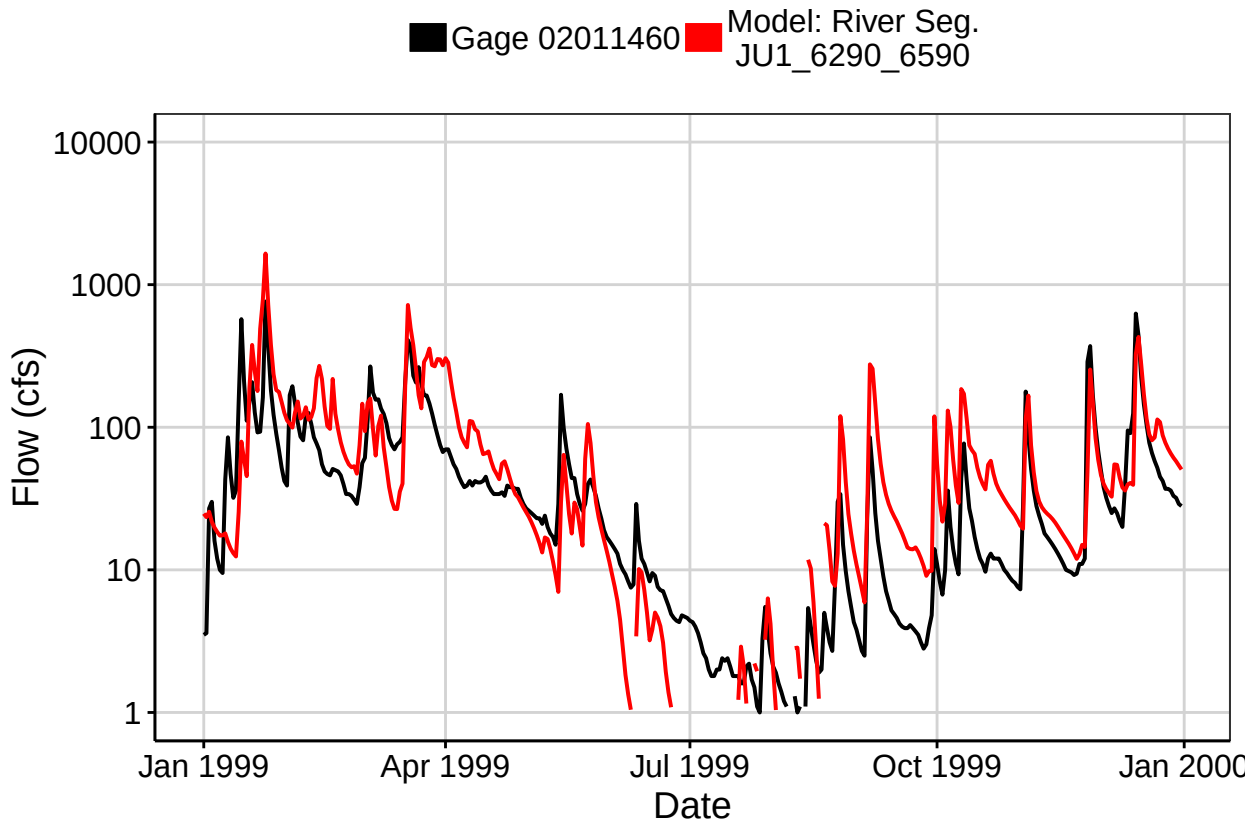


Fig. 3: Flow Exceedance

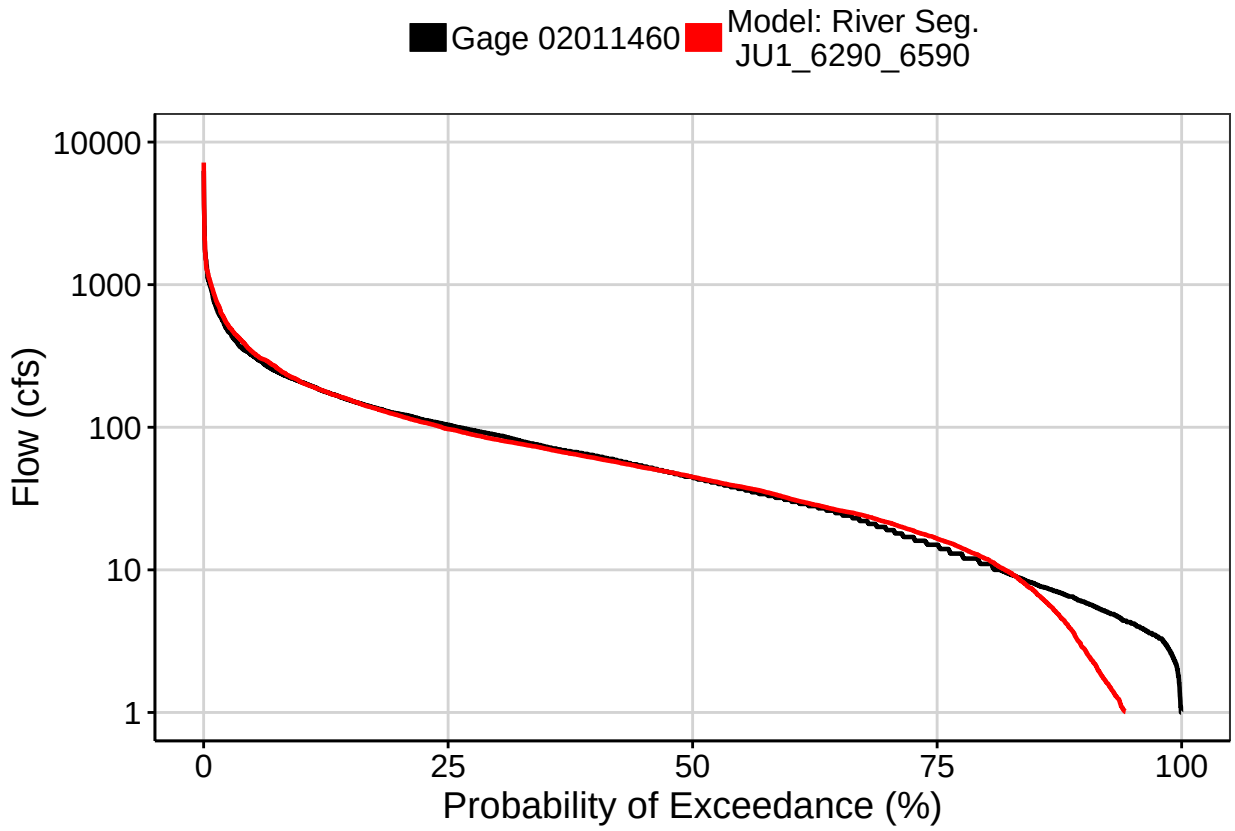


Fig. 4: Baseflow

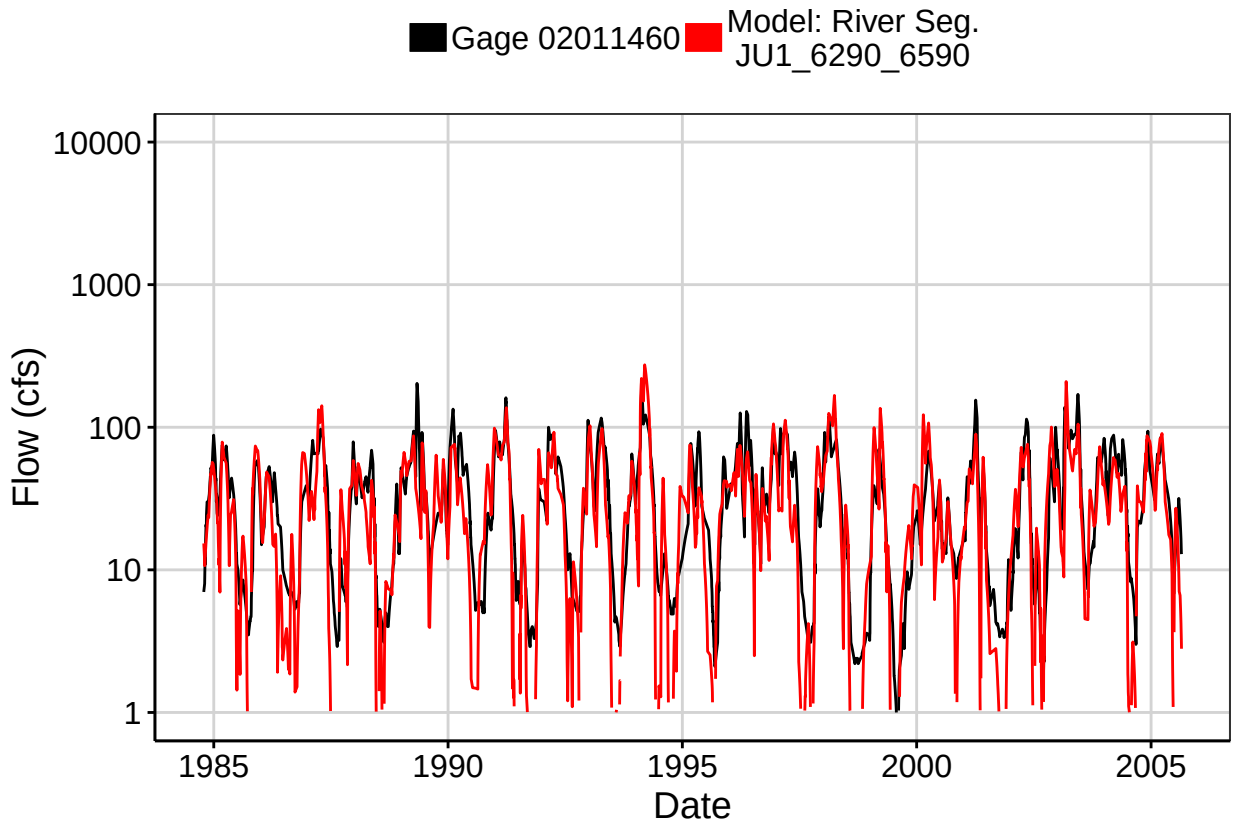


Fig. 5: Combined Baseflow

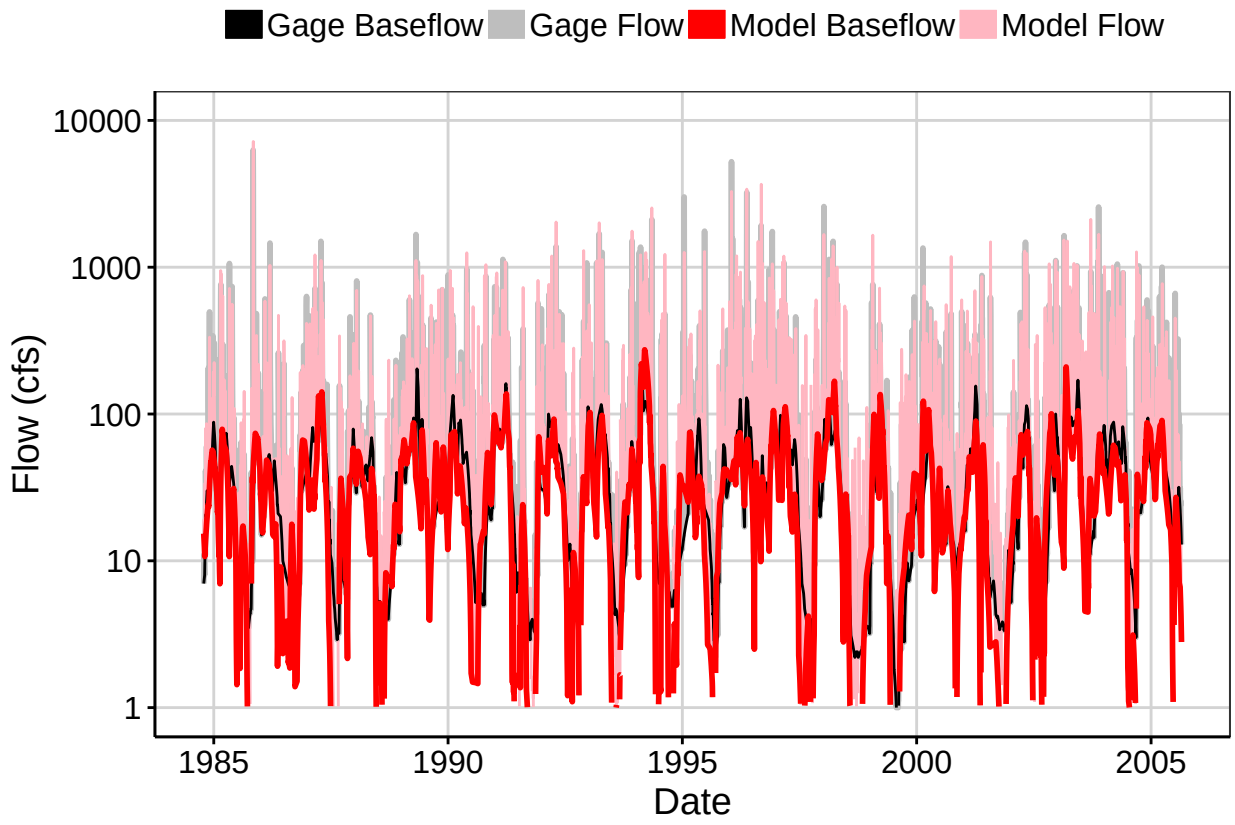


Fig. 6: Largest Error Segment

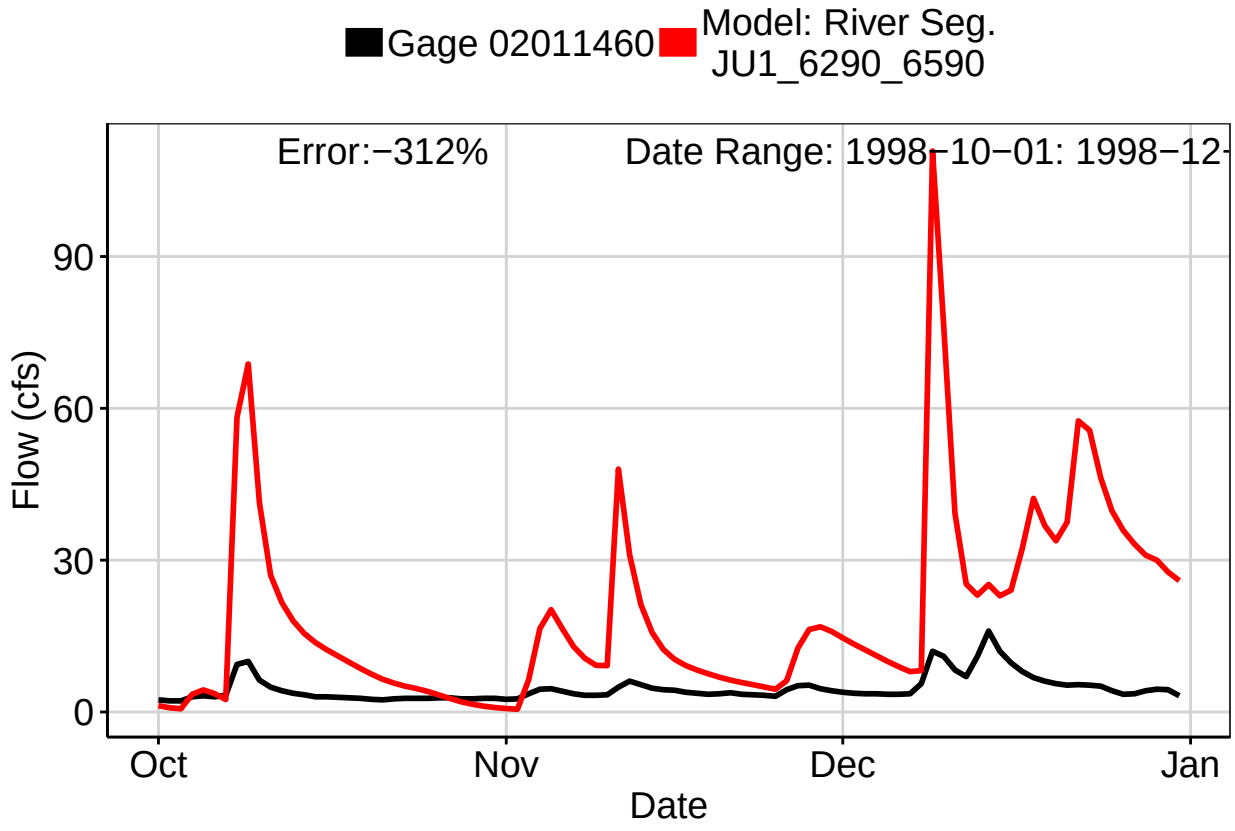


Fig. 7: Second Largest Error Segment

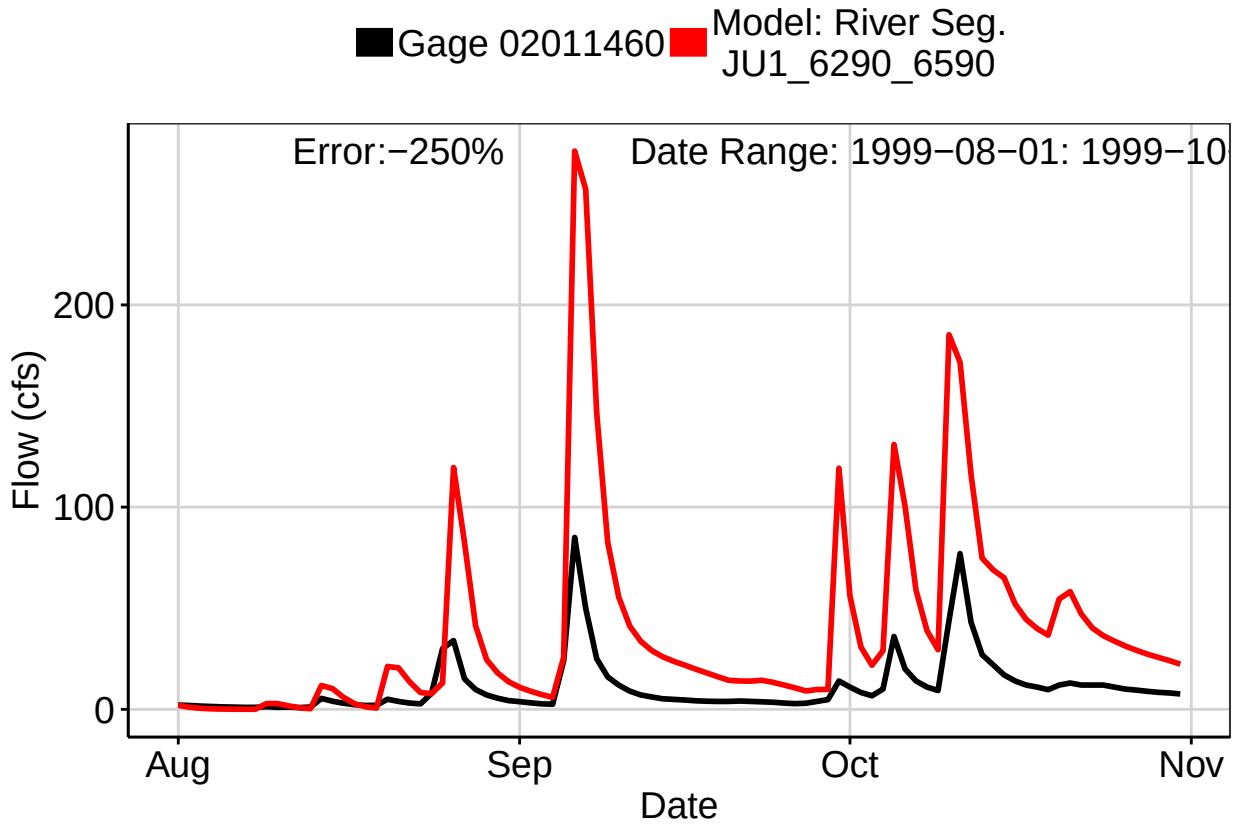


Fig. 8: Third Largest Error Segment

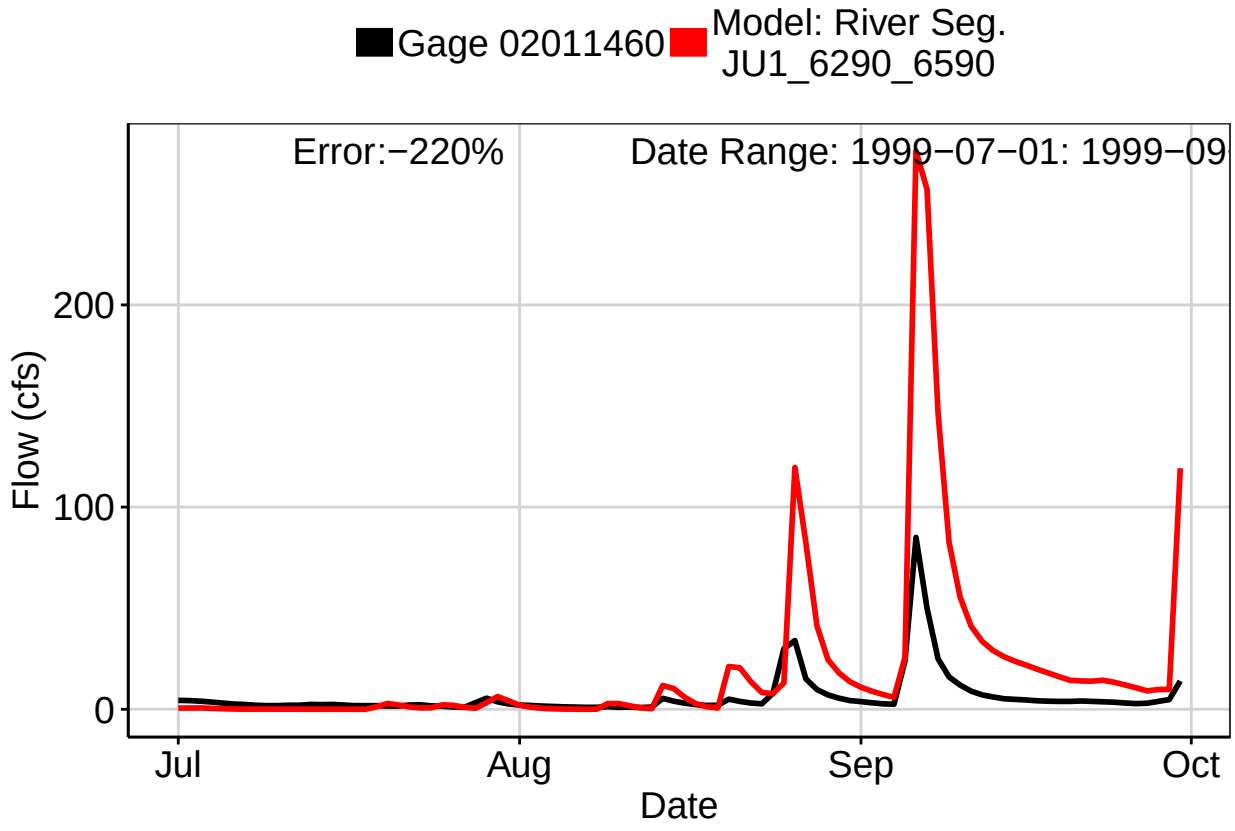


Fig. 9: Residuals Plot