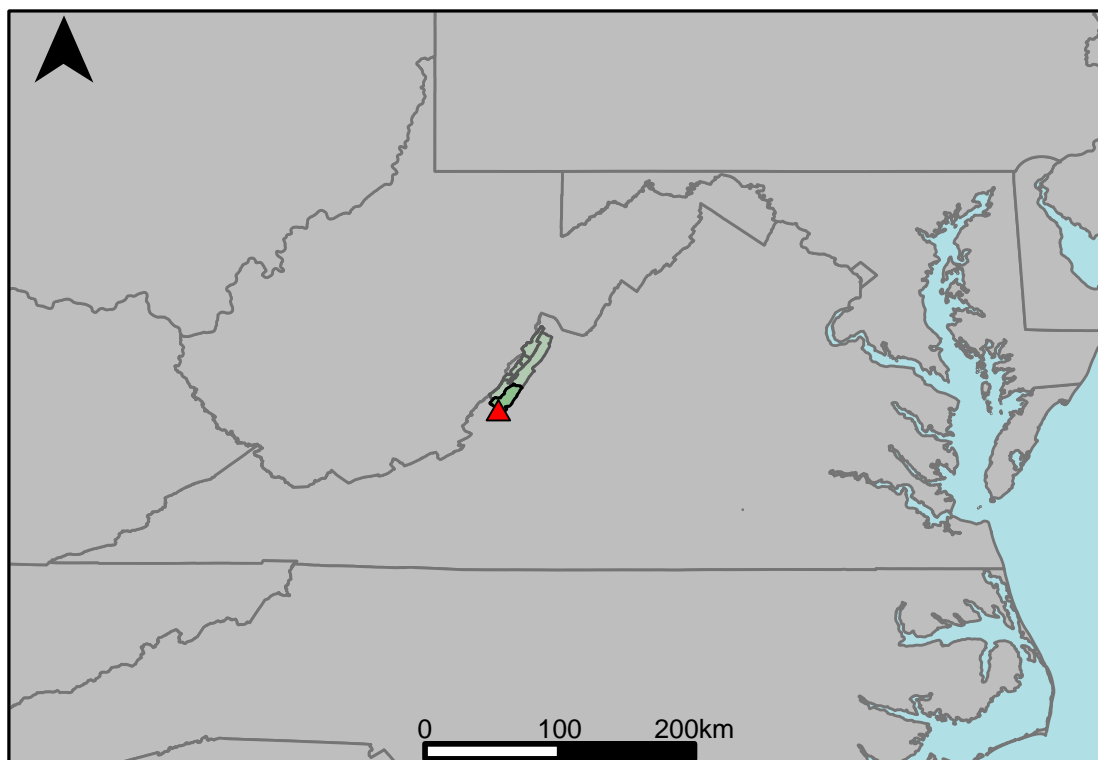


Appendix A.8: USGS Gage 02013100 vs. JU3_6950_7330 Upper James River



This river segment follows part of the flow of the Jackson River, a tributary of the James. The gage is located in Alleghany County (Lat. 37°47'19.5", Long. -80°00'02.2"), approximately 1 mile northwest of Covington, VA. Drainage area is 612 sq. miles. This gage started taking data in 1974 and is still taking data. There are small diurnal fluctuations at low flow caused by the Westvaco plant 0.8 mi upstream and occasionally by a dam on Dunlap Creek 12.7 mi upstream. Diversion by Westvaco plant averages 47 cfs for industrial use of which approximately 42 cfs is returned upstream from this station. A diversion 2.0 mi upstream averages less than 4.0 cfs. Flow has been regulated since December 1979 by Lake Moomaw (station 02011795) 19.9 mi upstream; since October 1984 by Back Creek Lake 47.9 mi upstream; and since January 1985 by Little Back Creek Lake 51.0 mi upstream, amounts unknown. The average daily discharge error between the model and gage data for the 20 year timespan was 7.69%, with 48.3% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	226	158	-30.1
Feb. Low Flow	210	154	-26.7
Mar. Low Flow	227	195	-14.1
Apr. Low Flow	250	257	2.8
May Low Flow	314	334	6.37
Jun. Low Flow	552	607	9.96
Jul. Low Flow	398	329	-17.3
Aug. Low Flow	336	277	-17.6
Sep. Low Flow	327	247	-24.5
Oct. Low Flow	324	255	-21.3
Nov. Low Flow	313	251	-19.8
Dec. Low Flow	286	205	-28.3

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	715	660	-7.69
Jan. Mean Flow	831	721	-13.2
Feb. Mean Flow	1020	1060	3.92
Mar. Mean Flow	1400	1460	4.29
Apr. Mean Flow	1120	1050	-6.25
May Mean Flow	971	749	-22.9
Jun. Mean Flow	617	524	-15.1
Jul. Mean Flow	391	339	-13.3
Aug. Mean Flow	359	326	-9.19
Sep. Mean Flow	422	413	-2.13
Oct. Mean Flow	311	368	18.3
Nov. Mean Flow	576	448	-22.2
Dec. Mean Flow	588	490	-16.7

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	319	237	-25.7
Feb. High Flow	619	461	-25.5
Mar. High Flow	1440	609	-57.7
Apr. High Flow	2980	1190	-60.1
May High Flow	2480	1330	-46.4
Jun. High Flow	3900	2900	-25.6
Jul. High Flow	2850	2360	-17.2
Aug. High Flow	2840	1400	-50.7
Sep. High Flow	687	854	24.3
Oct. High Flow	507	410	-19.1
Nov. High Flow	414	342	-17.4
Dec. High Flow	377	345	-8.49

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	156	81.3	-47.9
Med. 1 Day Min	206	142	-31.1
Min. 3 Day Min	159	81.9	-48.5
Med. 3 Day Min	208	144	-30.8
Min. 7 Day Min	164	83.1	-49.3
Med. 7 Day Min	210	148	-29.5
Min. 30 Day Min	176	89.4	-49.2
Med. 30 Day Min	225	164	-27.1
Min. 90 Day Min	198	117	-40.9
Med. 90 Day Min	303	216	-28.7
7Q10	176	107	-39.2
Year of 90-Day Min. Flow	1995	1999	100
Drought Year Mean	526	406	-22.8
Mean Baseflow	387	428	10.6

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	15100	13500	-10.6
Med. 1 Day Max	5650	4650	-17.7
Max. 3 Day Max	9770	8210	-16
Med. 3 Day Max	4870	3650	-25.1
Max. 7 Day Max	6830	6130	-10.2
Med. 7 Day Max	3930	2910	-26
Max. 30 Day Max	3600	3880	7.78
Med. 30 Day Max	2050	1870	-8.78
Max. 90 Day Max	2240	2770	23.7
Med. 90 Day Max	1290	1310	1.55

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	186	112	-39.8
5% Non-Exceedance	207	152	-26.6
50% Non-Exceedance	367	309	-15.8
95% Non-Exceedance	2540	2160	-15
99% Non-Exceedance	5050	3990	-21
Sept. 10% Non-Exceedance	268	190	-29.1

Fig. 1: Hydrograph

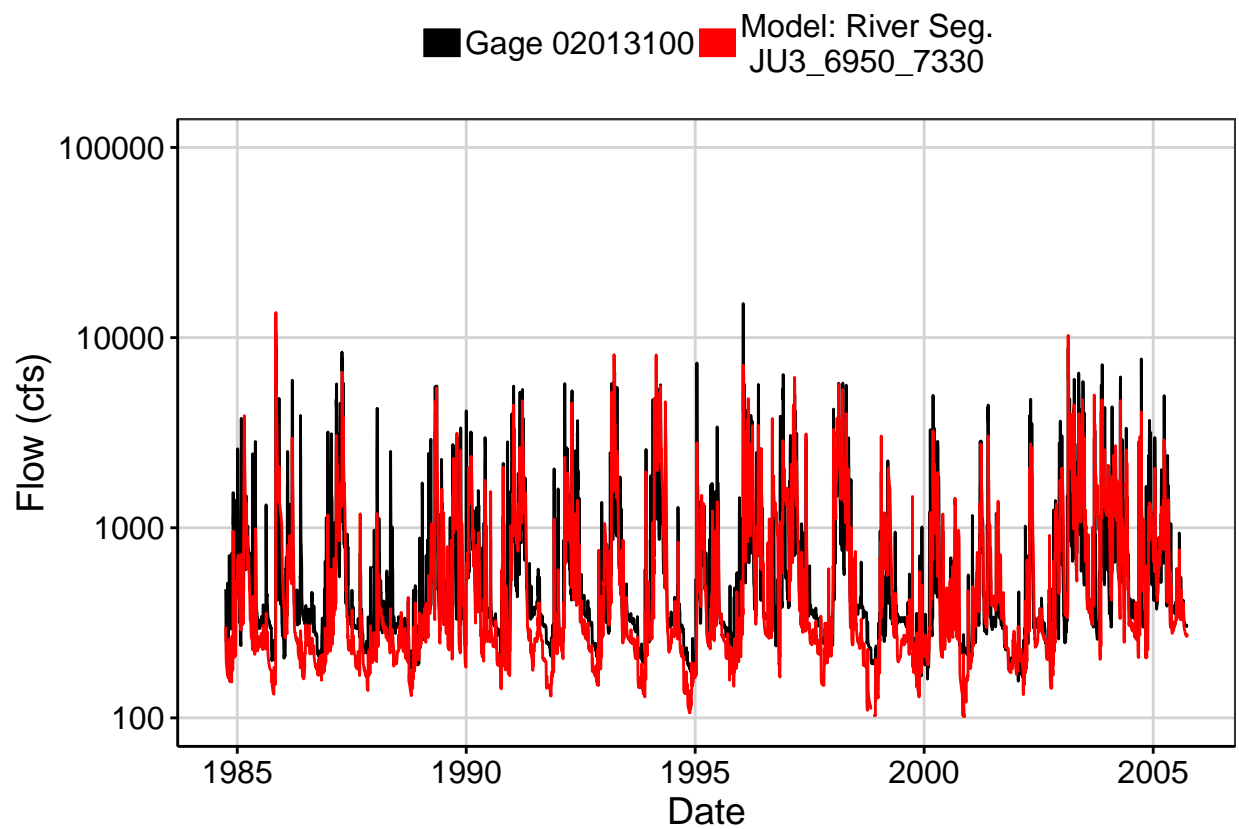


Fig. 2: Zoomed Hydrograph

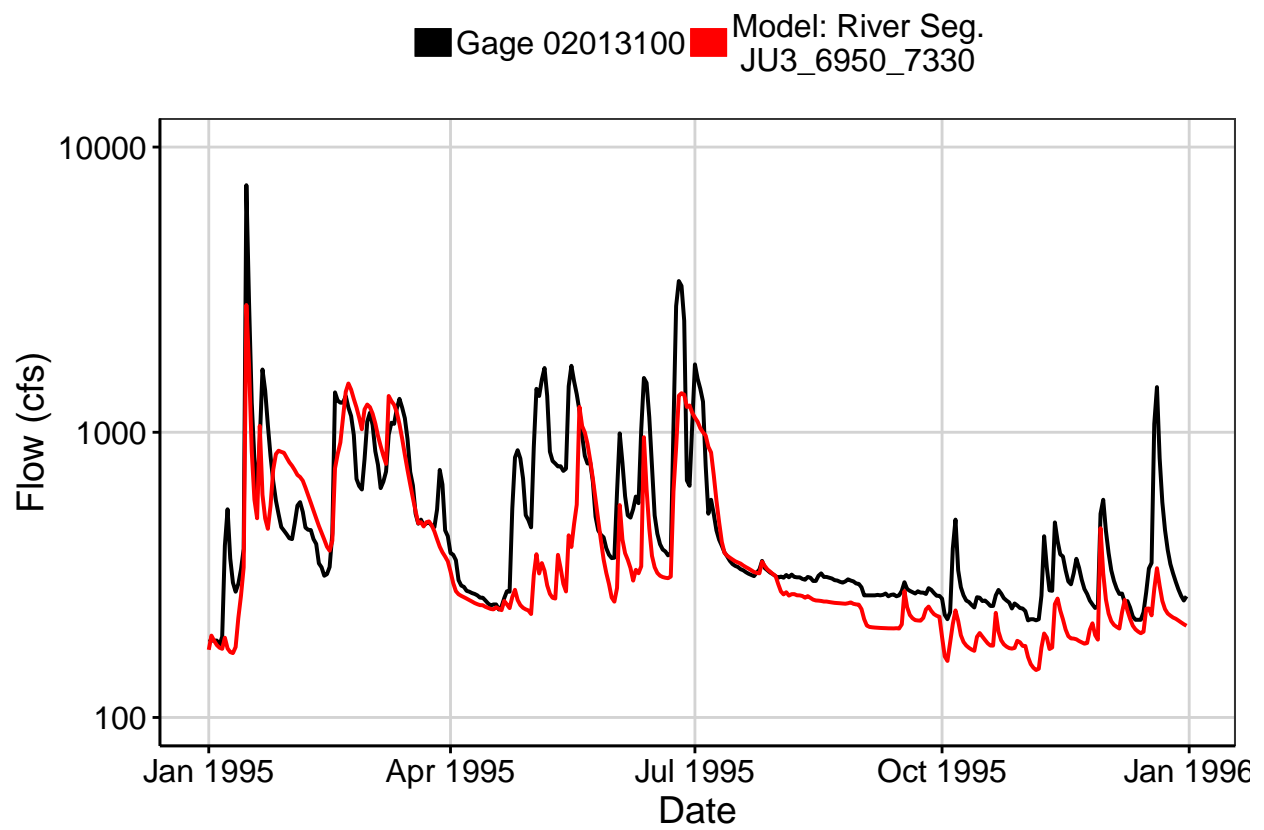


Fig. 3: Flow Exceedance

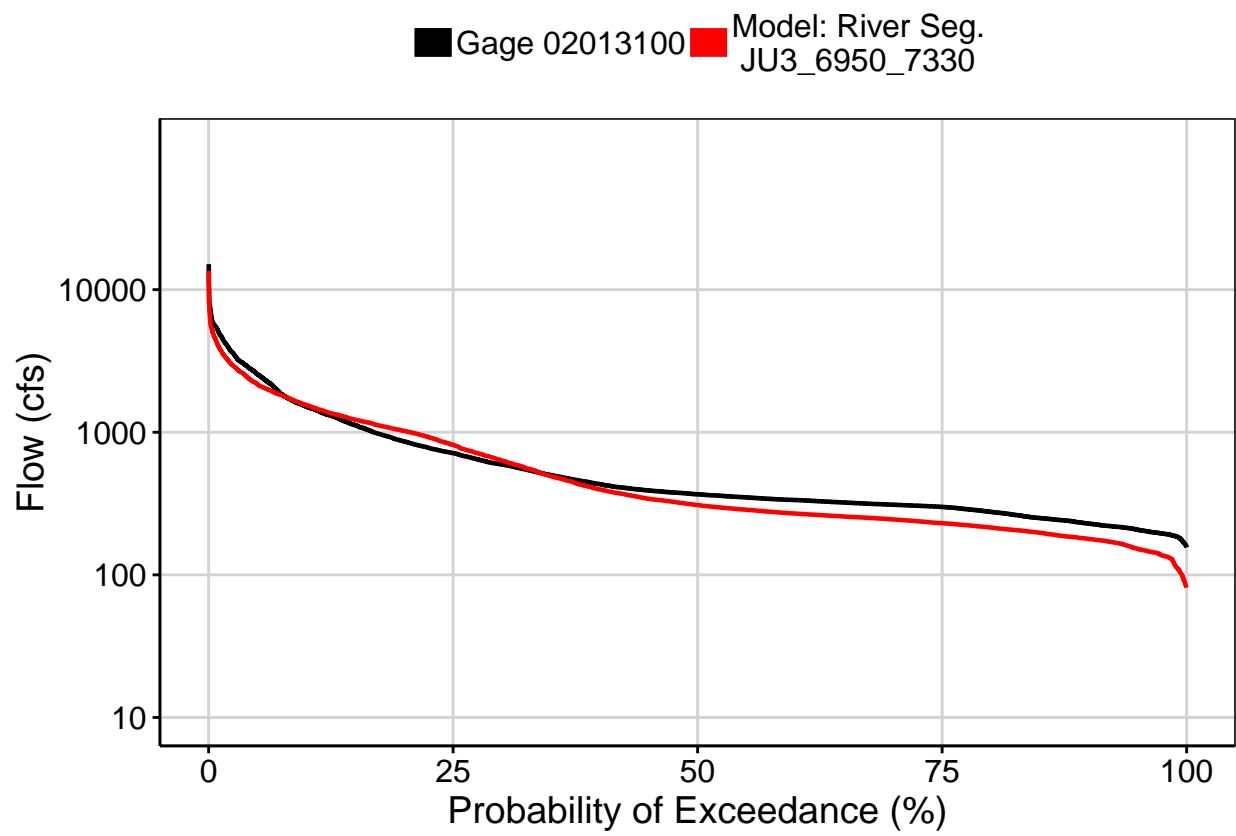


Fig. 4: Baseflow

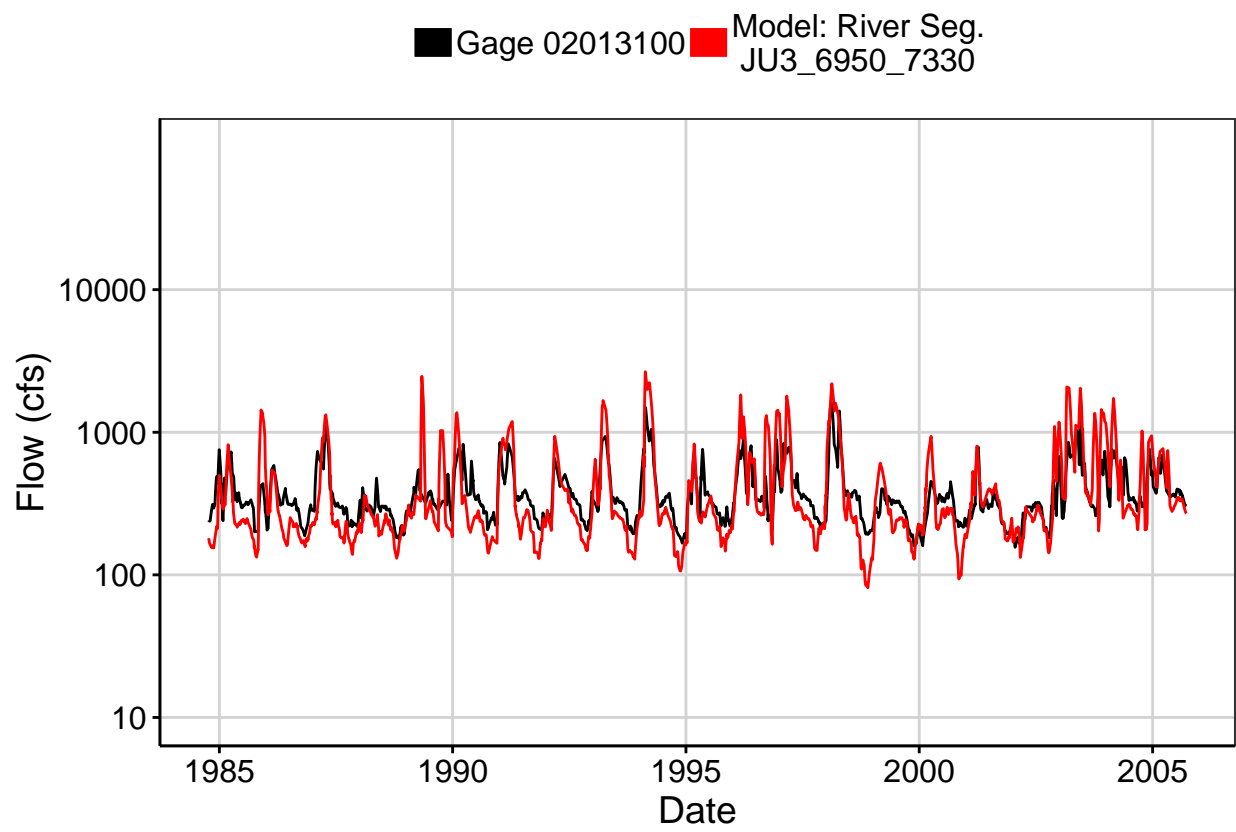


Fig. 5: Combined Baseflow

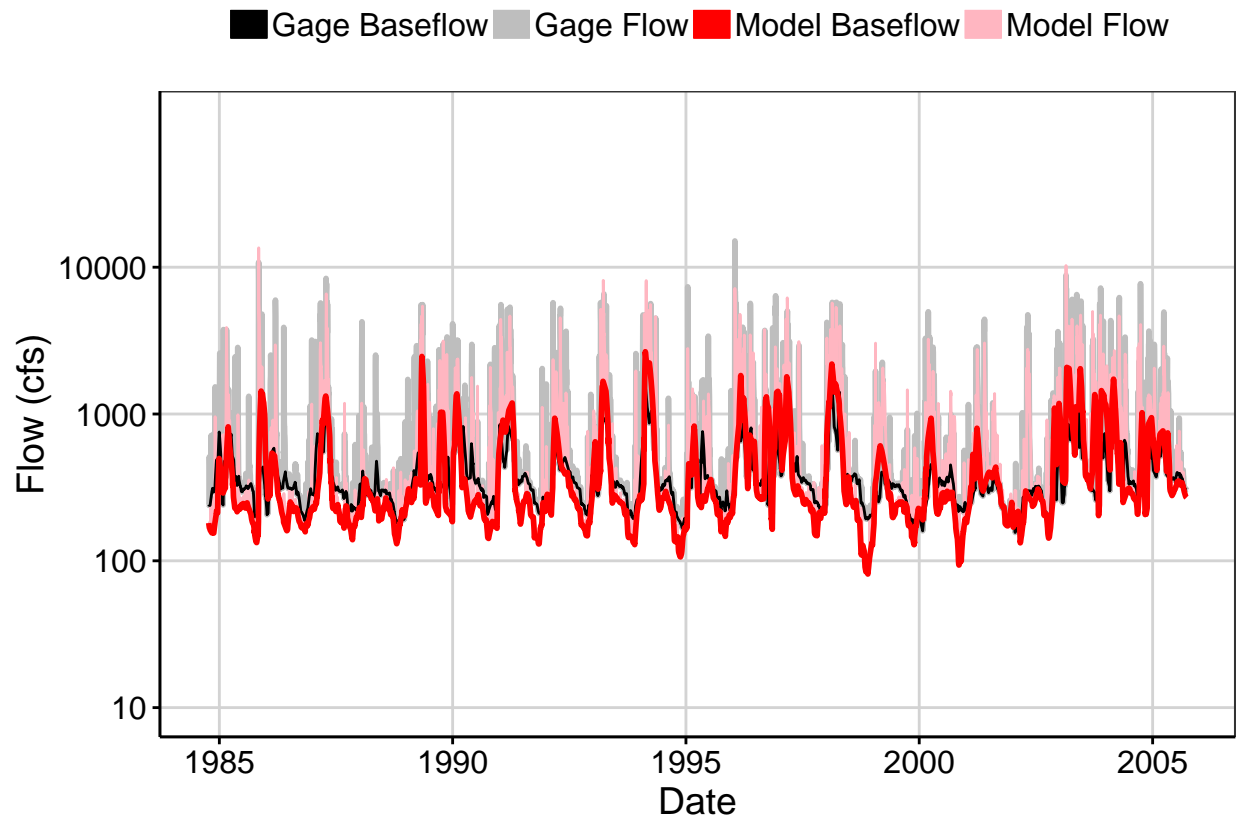


Fig. 6: Largest Error Segment

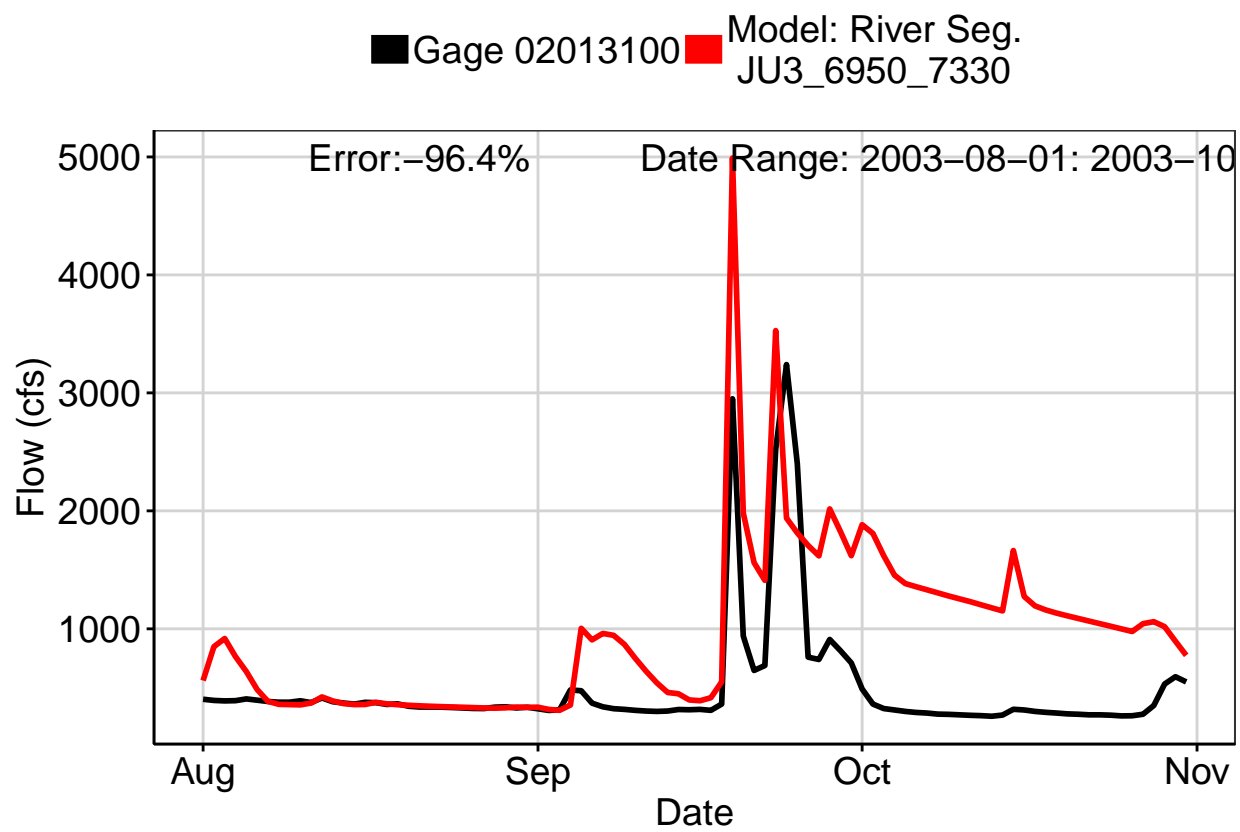


Fig. 7: Second Largest Error Segment

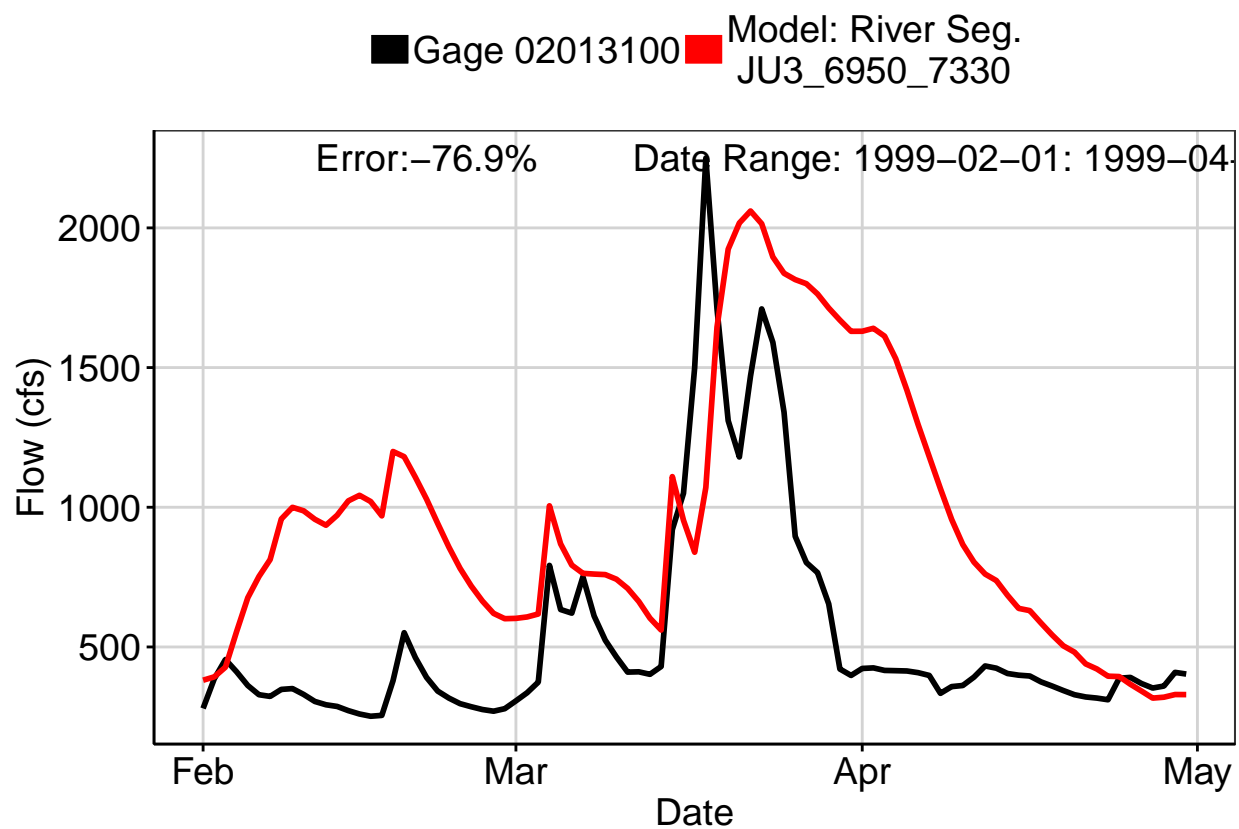


Fig. 8: Third Largest Error Segment

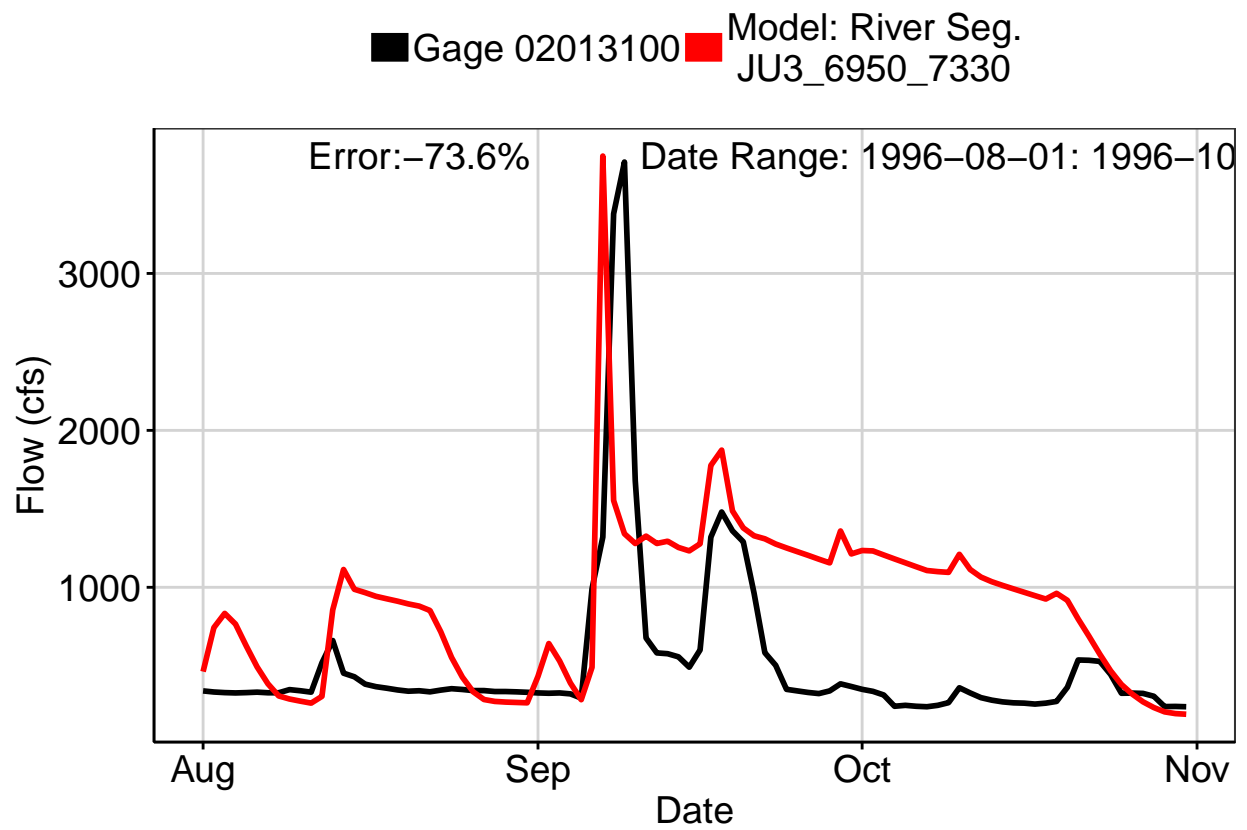


Fig. 9: Residuals Plot

