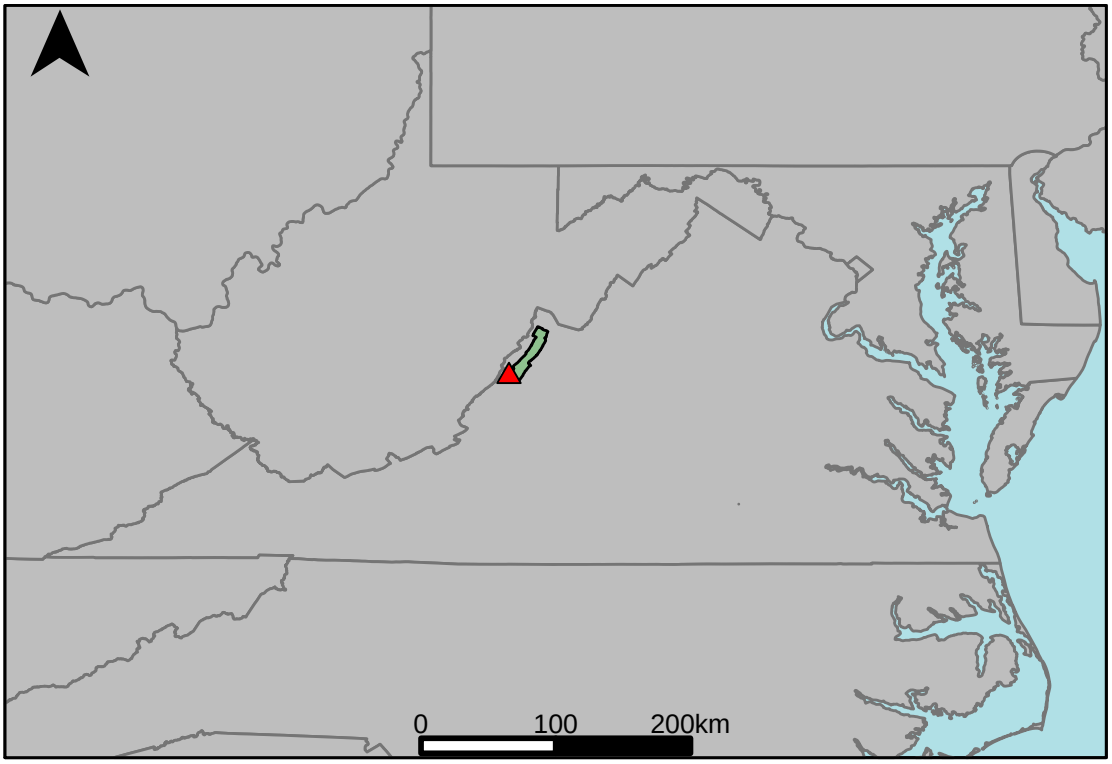
Appendix A: James River Basin
Appendix A.1: USGS Gage 02011400 vs. JU3_6380_6900 Upper James River



This river segment follows part of the flow of the Jackson River, a tributary of the James. The gage is located in Bath County (Lat. 38°02'32.4", Long. -79°52'53.2"), approximately 15 miles north of Clifton Forge, VA. Drainage area is 157 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 -20.2%, with 54.6% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	25	20.7	-17.2
Feb. Low Flow	32	38.1	19.1
Mar. Low Flow	46	79.3	72.4
Apr. Low Flow	65	83.5	28.5
May Low Flow	75	97.7	30.3
Jun. Low Flow	116	158	36.2
Jul. Low Flow	100	102	2
Aug. Low Flow	87	58.4	-32.9
Sep. Low Flow	45	23.9	-46.9
Oct. Low Flow	33	19.8	-40
Nov. Low Flow	30	15.9	-47
Dec. Low Flow	25	9.8	-60.8

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	168	202	20.2
Jan. Mean Flow	226	265	17.3
Feb. Mean Flow	230	354	53.9
Mar. Mean Flow	337	437	29.7
Apr. Mean Flow	275	290	5.45
May Mean Flow	233	223	-4.29
Jun. Mean Flow	136	130	-4.41
Jul. Mean Flow	67.1	71.5	6.56
Aug. Mean Flow	52.8	70.2	33
Sep. Mean Flow	80	116	45
Oct. Mean Flow	59.1	84.2	42.5
Nov. Mean Flow	153	199	30.1
Dec. Mean Flow	168	194	15.5

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	67	131	95.5
Feb. High Flow	354	339	-4.24
Mar. High Flow	526	489	-7.03
Apr. High Flow	676	681	0.74
May High Flow	400	884	121
Jun. High Flow	1010	1360	34.7
Jul. High Flow	517	762	47.4
Aug. High Flow	729	659	-9.6
Sep. High Flow	237	245	3.38
Oct. High Flow	139	198	42.4
Nov. High Flow	84	96	14.3
Dec. High Flow	71	118	66.2

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	12.7	2.18	-82.8
Med. 1 Day Min	21	7.13	-66
Min. 3 Day Min	12.8	2.23	-82.6
Med. 3 Day Min	21.6	7.32	-66.1
Min. 7 Day Min	13.1	2.35	-82.1
Med. 7 Day Min	23.2	8.55	-63.1
Min. 30 Day Min	15.5	4.27	-72.5
Med. 30 Day Min	26.4	22.2	-15.9
Min. 90 Day Min	20.8	14.2	-31.7
Med. 90 Day Min	46.2	46.3	0.22
7Q10	16.3	3.14	-80.7
Year of 90-Day Min. Flow	2002	1999	100
Drought Year Mean	87.8	113	28.7
Mean Baseflow	83	94.3	13.6

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	8820	16700	89.3
Med. 1 Day Max	2160	2610	20.8
Max. 3 Day Max	5030	7980	58.6
Med. 3 Day Max	1530	1790	17
Max. 7 Day Max	2520	4110	63.1
Med. 7 Day Max	989	1190	20.3
Max. 30 Day Max	879	1190	35.4
Med. 30 Day Max	517	603	16.6
Max. 90 Day Max	546	830	52
Med. 90 Day Max	324	405	25

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	16	4.06	-74.6
5% Non-Exceedance	22	10.6	-51.8
50% Non-Exceedance	88	109	23.9
95% Non-Exceedance	547	680	24.3
99% Non-Exceedance	1270	1530	20.5
Sept. 10% Non-Exceedance	19	8.38	-55.9

Fig. 1: Hydrograph

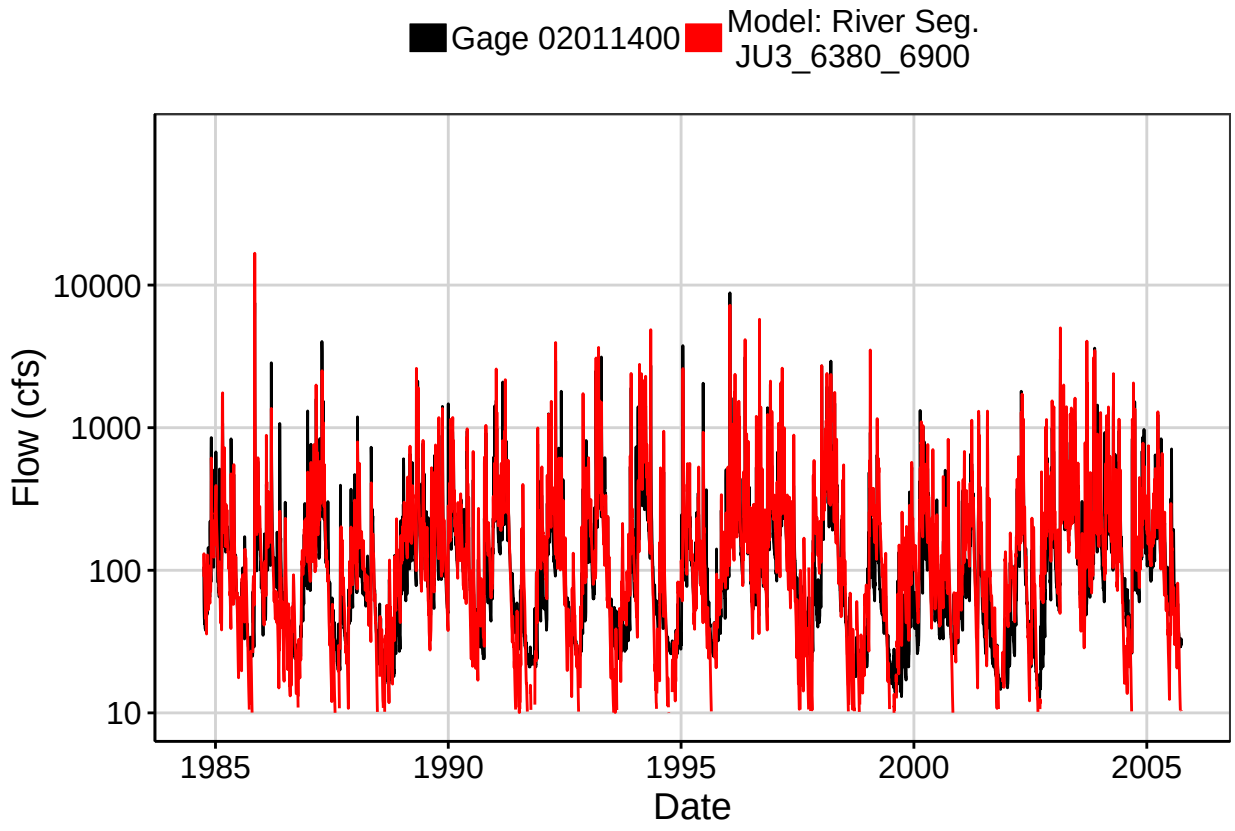


Fig. 2: Zoomed Hydrograph

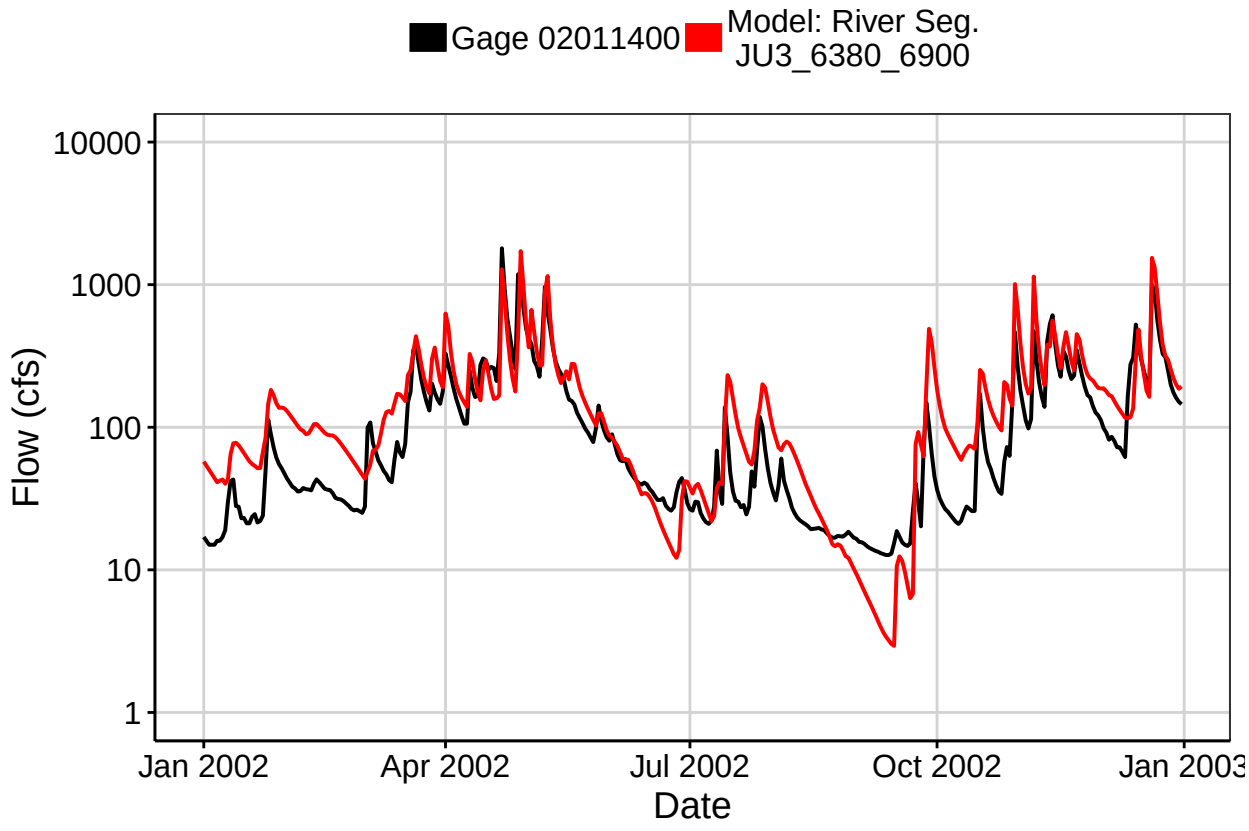


Fig. 3: Flow Exceedance

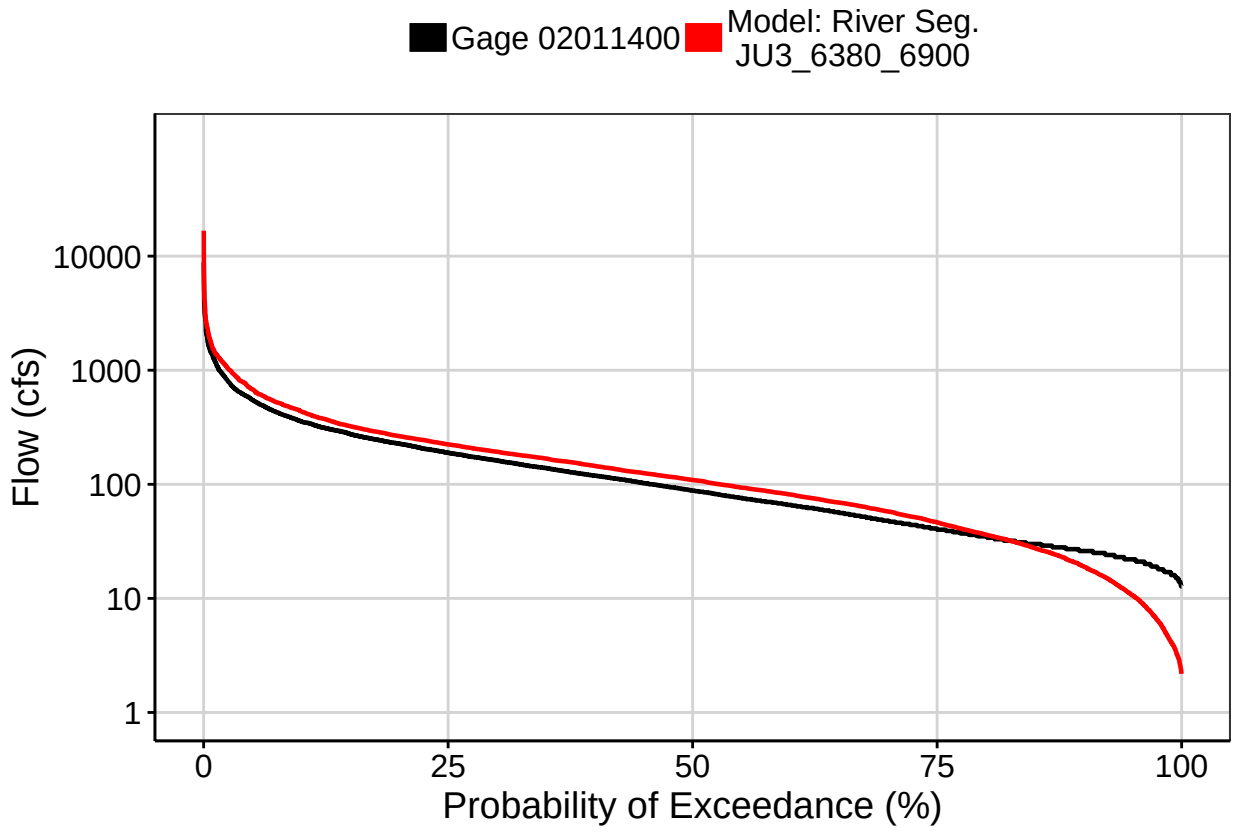


Fig. 4: Baseflow

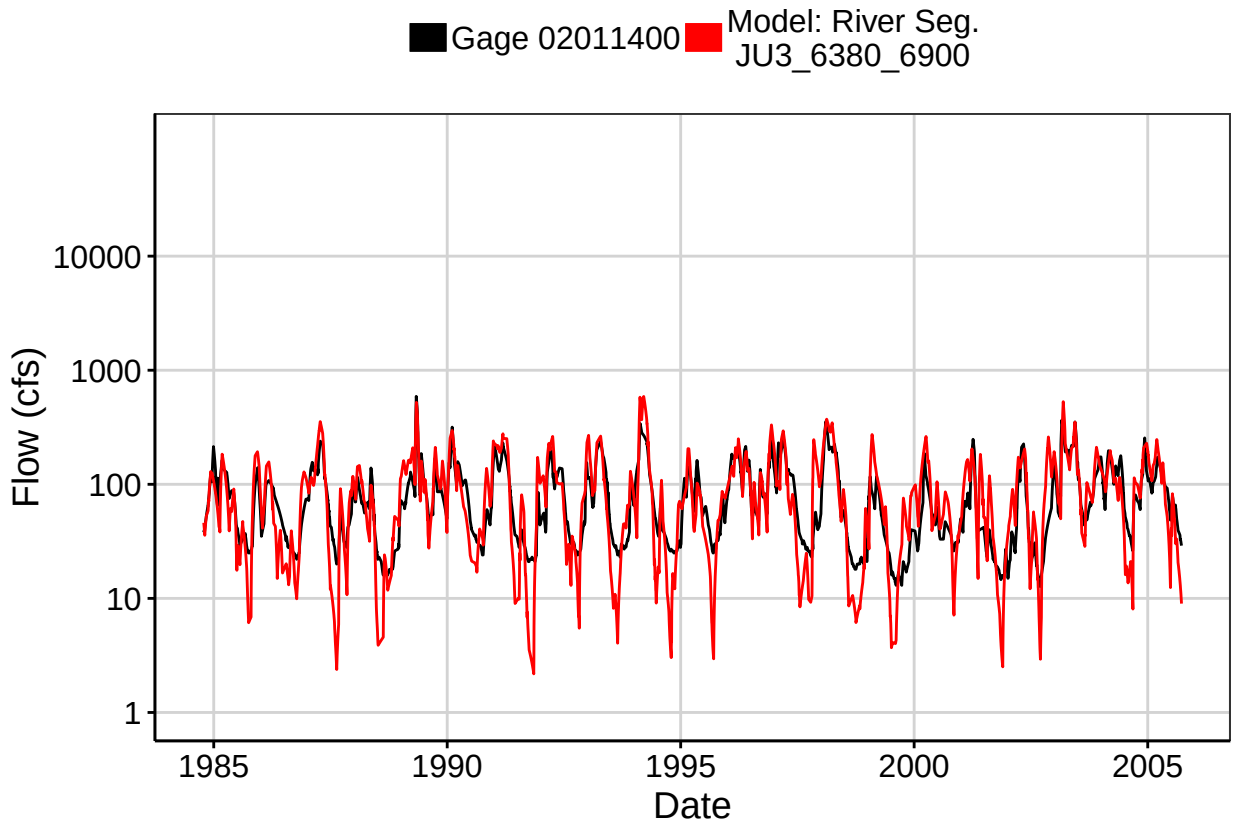


Fig. 5: Combined Baseflow

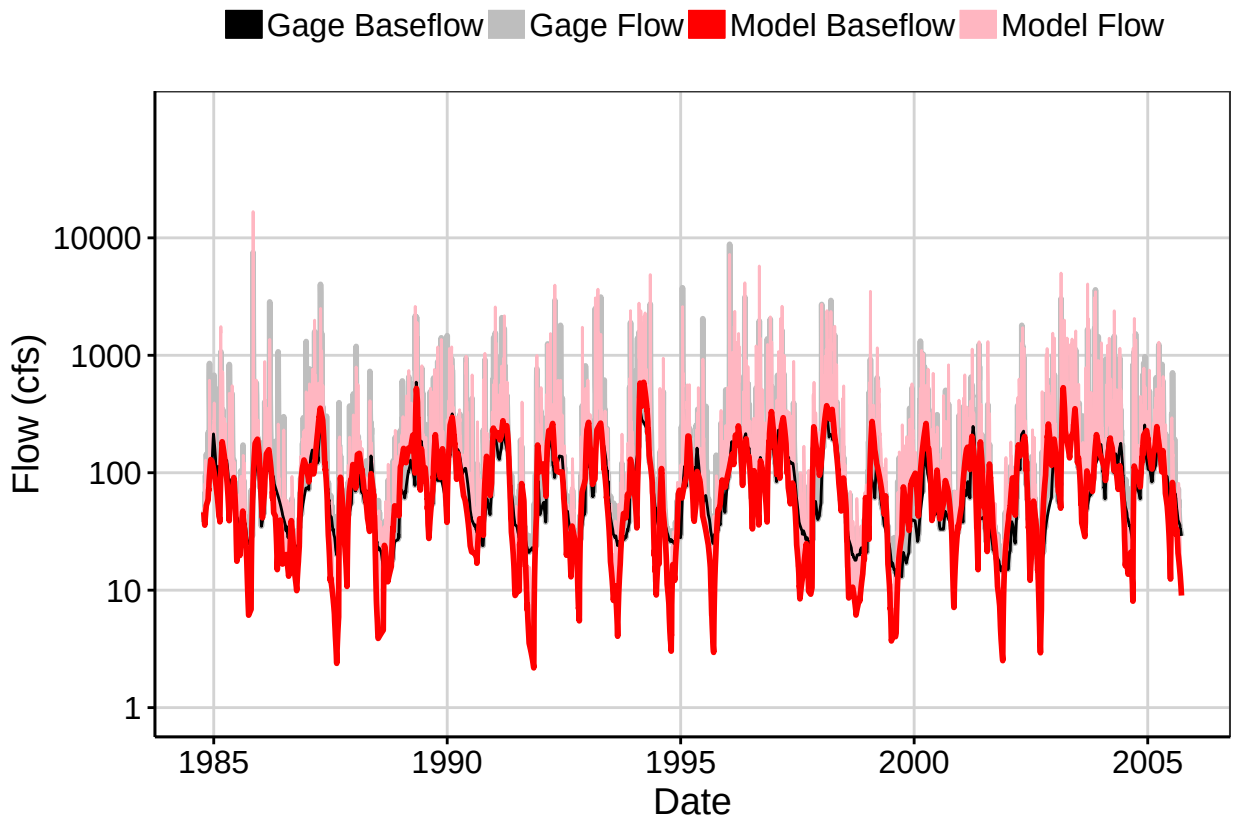


Fig. 6: Largest Error Segment

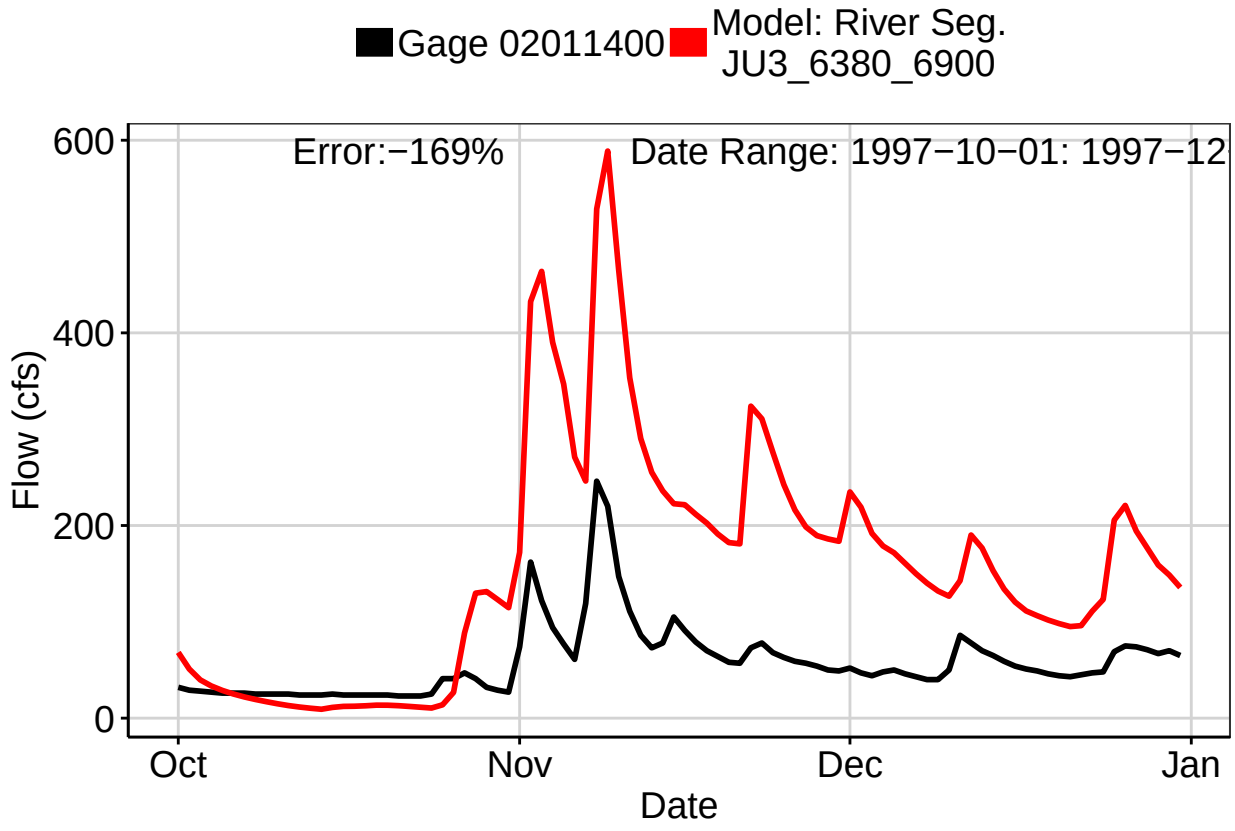


Fig. 7: Second Largest Error Segment

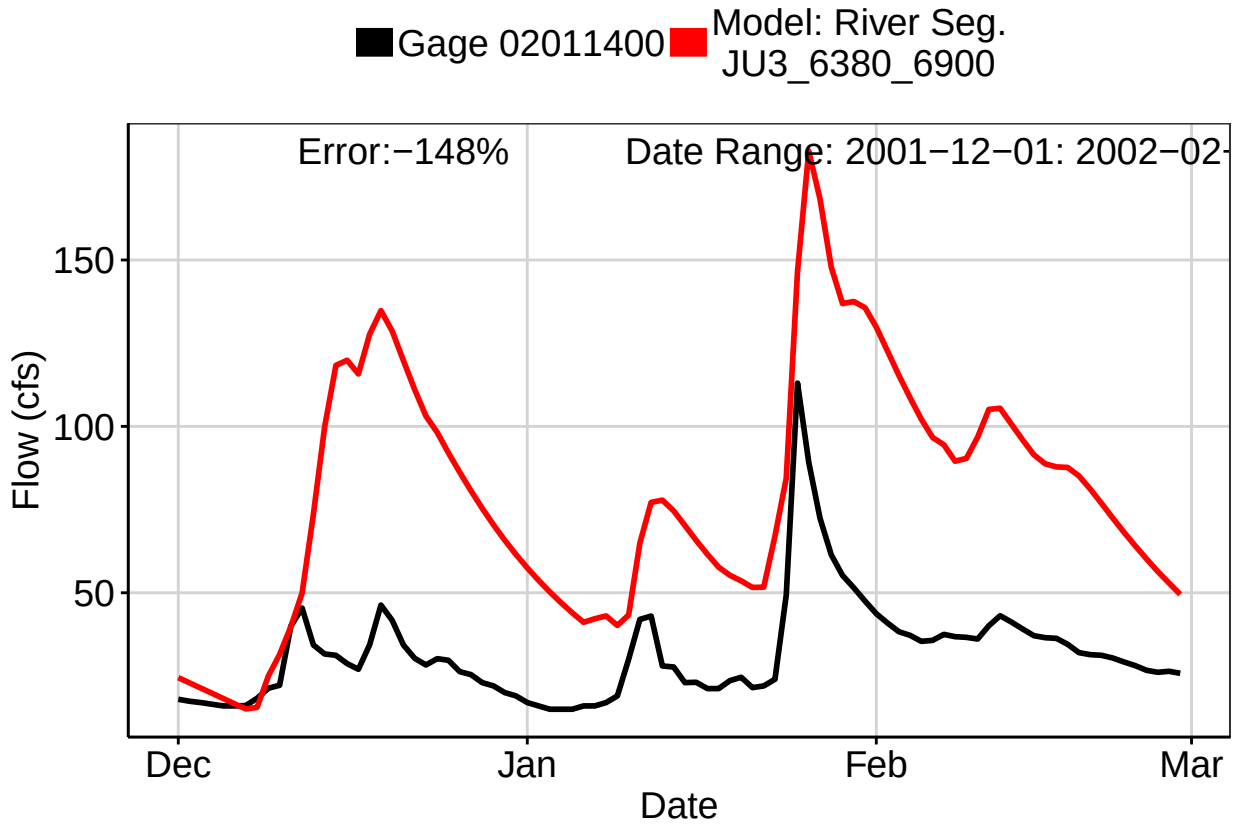


Fig. 8: Third Largest Error Segment

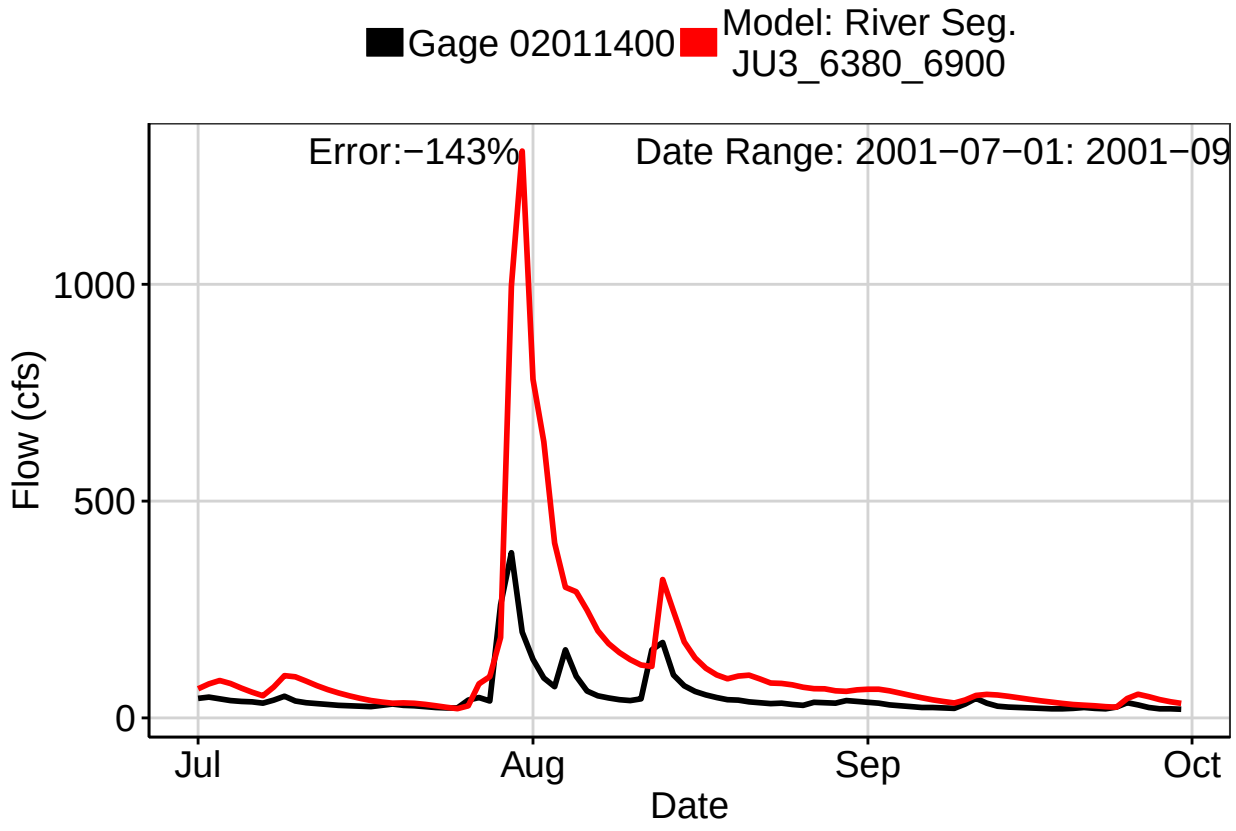


Fig. 9: Residuals Plot