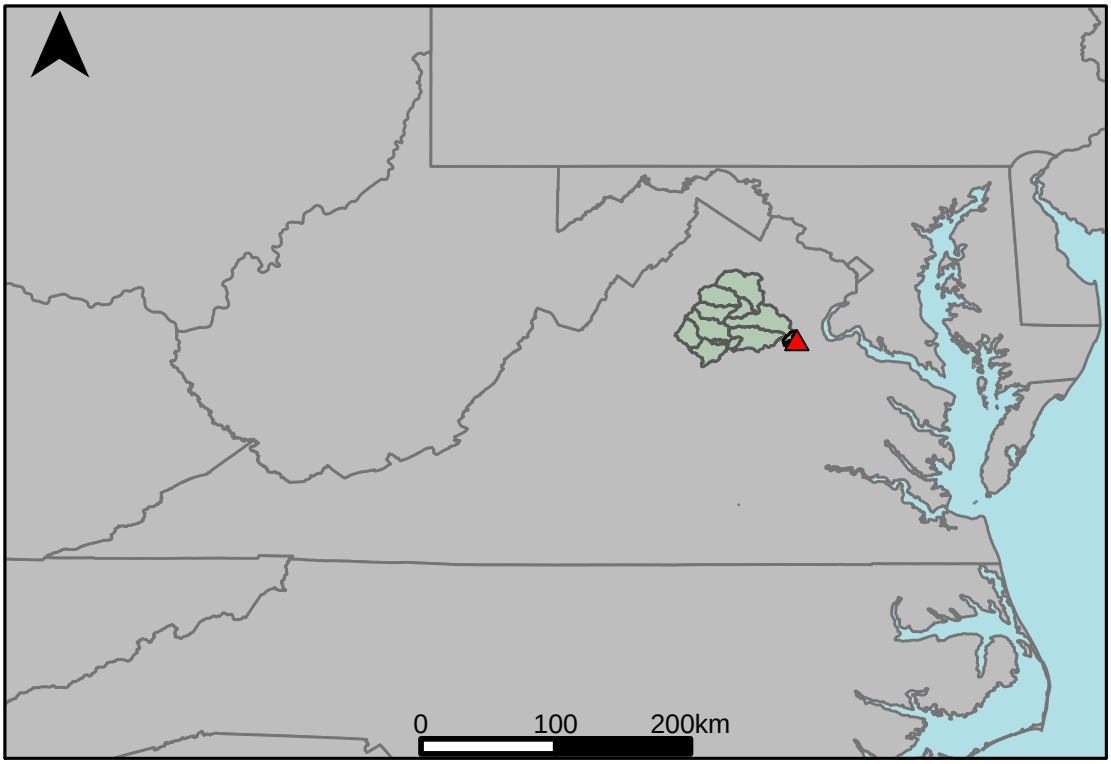
Appendix C.6: USGS Gage 01668000 vs. RU5_6030_0001 Upper Rappahannock River



This river segment follows part of the flow of the Rapphannock River, a tributary of the Rappahannock. The gage is located in Stafford County (Lat. 38°18'30.5", Long. -77°31'44.9"), approximately 2.3 miles northwest of Fredericksburg, VA. Drainage area is 1595 sq. miles. This gage started taking data in 1907 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 -4%, with 42.9% of its rolling three month time spans above 20% error.

Table 1: Monthly Low Flows

	USGS Gage	Model	Pct. Error
Jan. Low Flow	287	337	17.4
Feb. Low Flow	406	436	7.39
Mar. Low Flow	789	935	18.5
Apr. Low Flow	824	1080	31.1
May Low Flow	966	1160	20.1
Jun. Low Flow	964	1170	21.4
Jul. Low Flow	1160	1040	-10.3
Aug. Low Flow	670	646	-3.58
Sep. Low Flow	459	538	17.2
Oct. Low Flow	281	269	-4.27
Nov. Low Flow	197	262	33
Dec. Low Flow	138	186	34.8

Table 2: Monthly Average Flows

	USGS Gage	Model	Pct. Error
Overall Mean Flow	1750	1820	4
Jan. Mean Flow	2340	2390	2.14
Feb. Mean Flow	2330	2820	21
Mar. Mean Flow	2960	3170	7.09
Apr. Mean Flow	2340	2260	-3.42
May Mean Flow	1960	1790	-8.67
Jun. Mean Flow	1460	1250	-14.4
Jul. Mean Flow	898	1060	18
Aug. Mean Flow	640	805	25.8
Sep. Mean Flow	1310	1530	16.8
Oct. Mean Flow	1020	1090	6.86
Nov. Mean Flow	1800	1780	-1.11
Dec. Mean Flow	1960	1990	1.53

Table 3: Monthly High Flows

	USGS Gage	Model	Pct. Error
Jan. High Flow	1500	2070	38
Feb. High Flow	9120	4980	-45.4
Mar. High Flow	7500	4110	-45.2
Apr. High Flow	9000	4830	-46.3
May High Flow	3570	3830	7.28
Jun. High Flow	8950	7500	-16.2
Jul. High Flow	5570	5090	-8.62
Aug. High Flow	4160	3480	-16.3
Sep. High Flow	3200	3670	14.7
Oct. High Flow	2780	2040	-26.6
Nov. High Flow	1680	1110	-33.9
Dec. High Flow	1380	1990	44.2

Table 4: Period Low Flows

	USGS Gage	Model	Pct. Error
Min. 1 Day Min	8.8	18.4	109
Med. 1 Day Min	113	133	17.7
Min. 3 Day Min	8.8	19.7	124
Med. 3 Day Min	117	140	19.7
Min. 7 Day Min	9.76	23.5	141
Med. 7 Day Min	123	154	25.2
Min. 30 Day Min	35.2	60.3	71.3
Med. 30 Day Min	183	228	24.6
Min. 90 Day Min	85.1	167	96.2
Med. 90 Day Min	463	563	21.6
7Q10	36.6	61.5	68
Year of 90-Day Min. Flow	2002	1999	100
Drought Year Mean	440	419	-4.77
Mean Baseflow	834	985	18.1

Table 5: Period High Flows

	USGS Gage	Model	Pct. Error
Max. 1 Day Max	54600	54500	-0.18
Med. 1 Day Max	25700	23600	-8.17
Max. 3 Day Max	40700	41800	2.7
Med. 3 Day Max	16300	15100	-7.36
Max. 7 Day Max	22500	27100	20.4
Med. 7 Day Max	12000	8710	-27.4
Max. 30 Day Max	10200	11100	8.82
Med. 30 Day Max	5040	4250	-15.7
Max. 90 Day Max	6840	7260	6.14
Med. 90 Day Max	2910	2790	-4.12

Table 6: Non-Exceedance Flows

	USGS Gage	Model	Pct. Error
1% Non-Exceedance	61.7	91.9	48.9
5% Non-Exceedance	134	178	32.8
50% Non-Exceedance	983	1110	12.9
95% Non-Exceedance	5460	5330	-2.38
99% Non-Exceedance	14300	14700	2.8
Sept. 10% Non-Exceedance	98	153	56.1

Fig. 1: Hydrograph

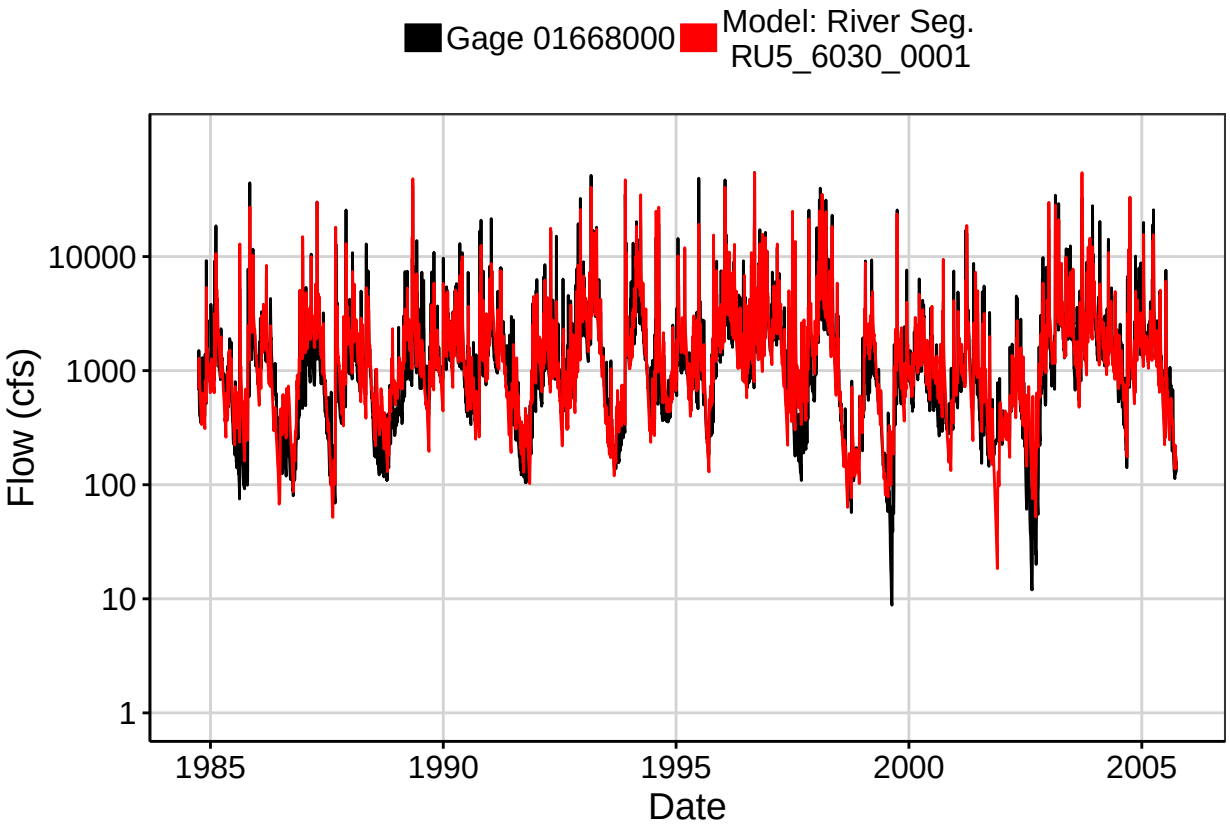


Fig. 2: Zoomed Hydrograph

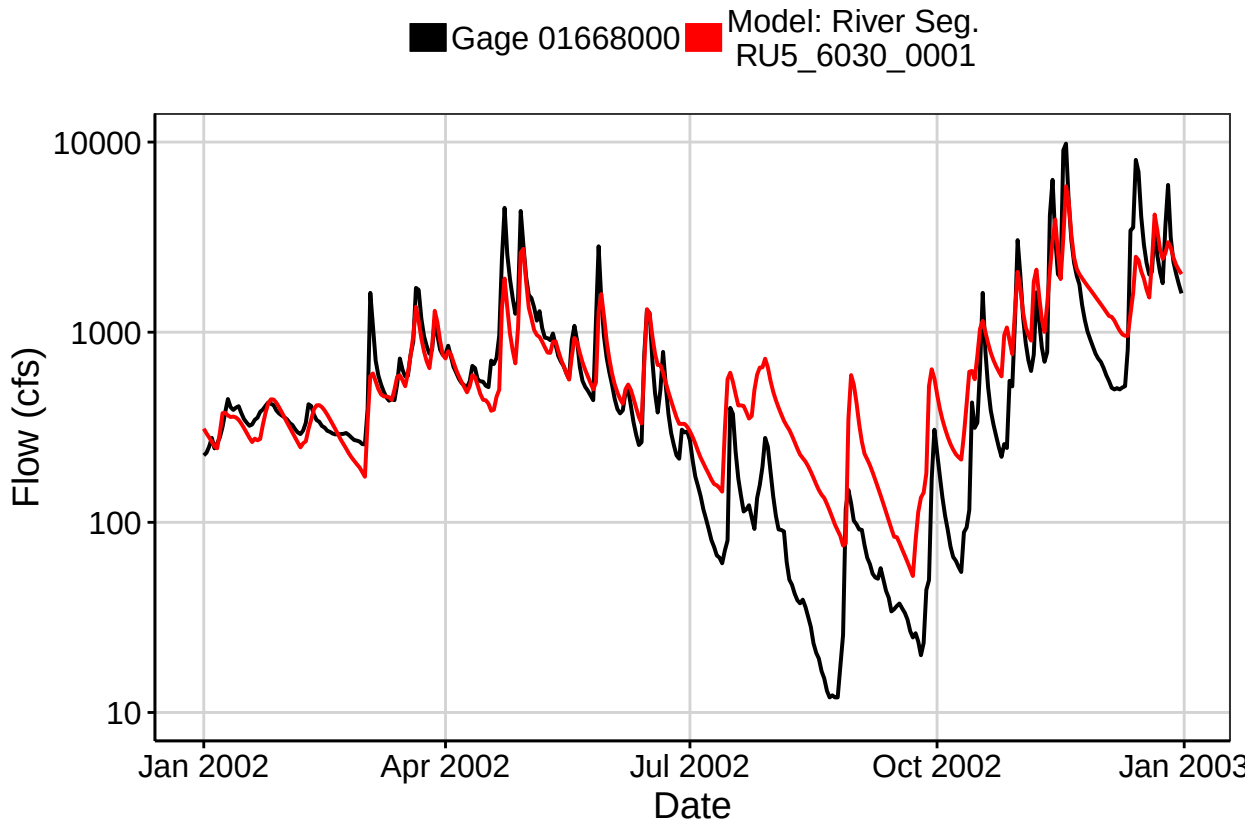


Fig. 3: Flow Exceedance

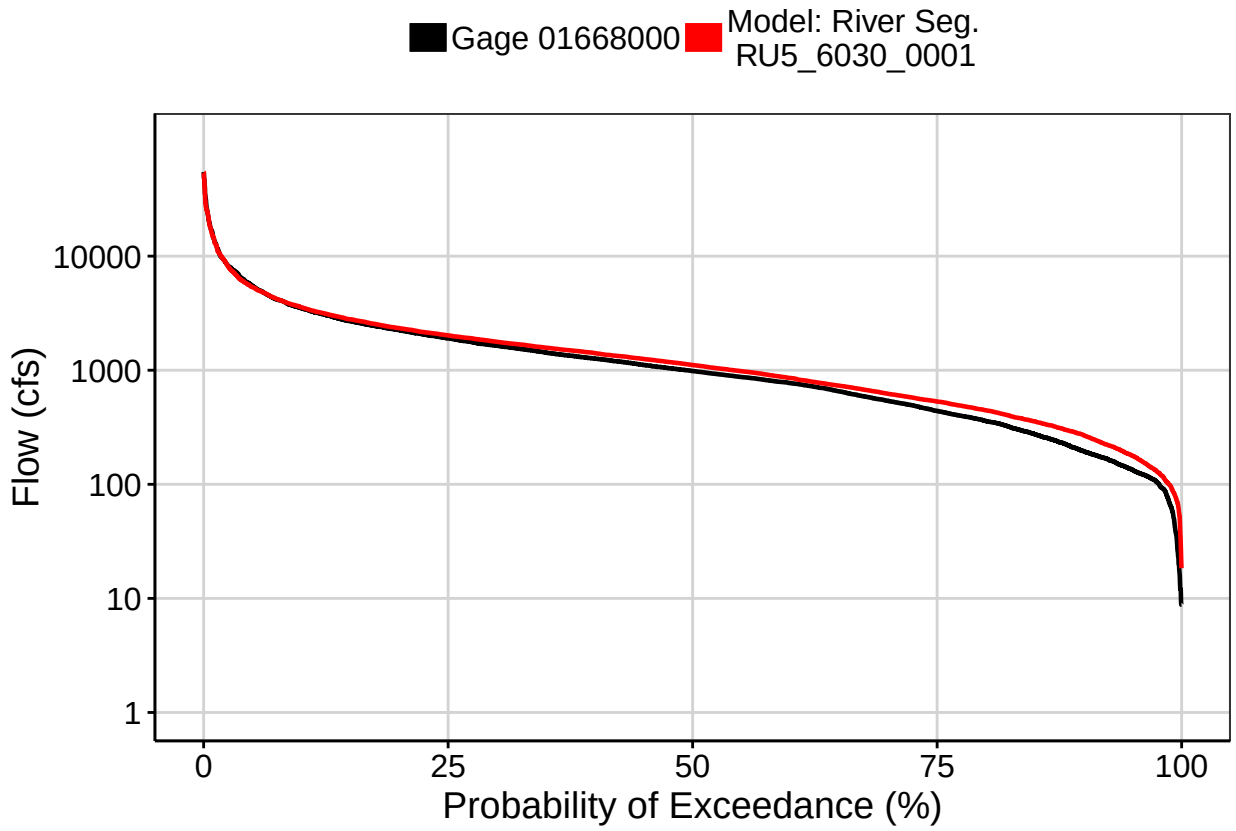


Fig. 4: Baseflow

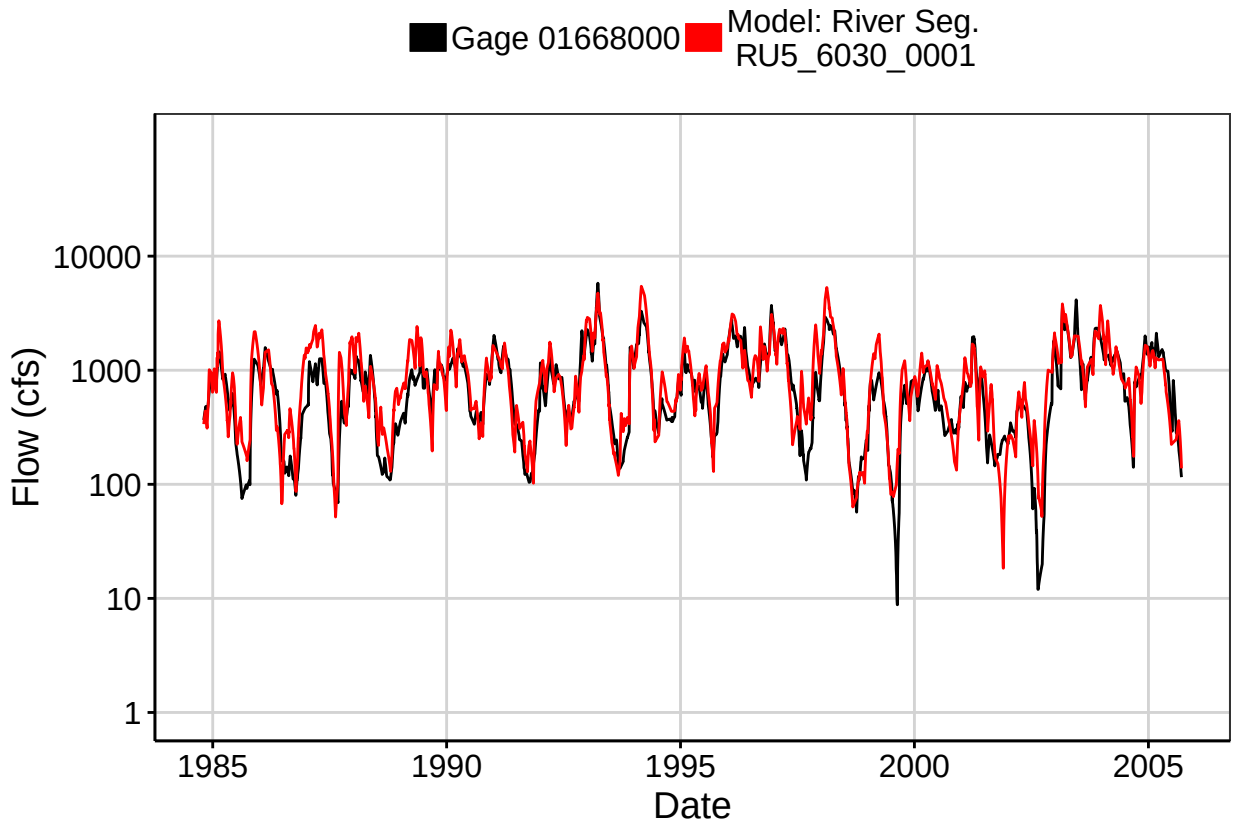


Fig. 5: Combined Baseflow

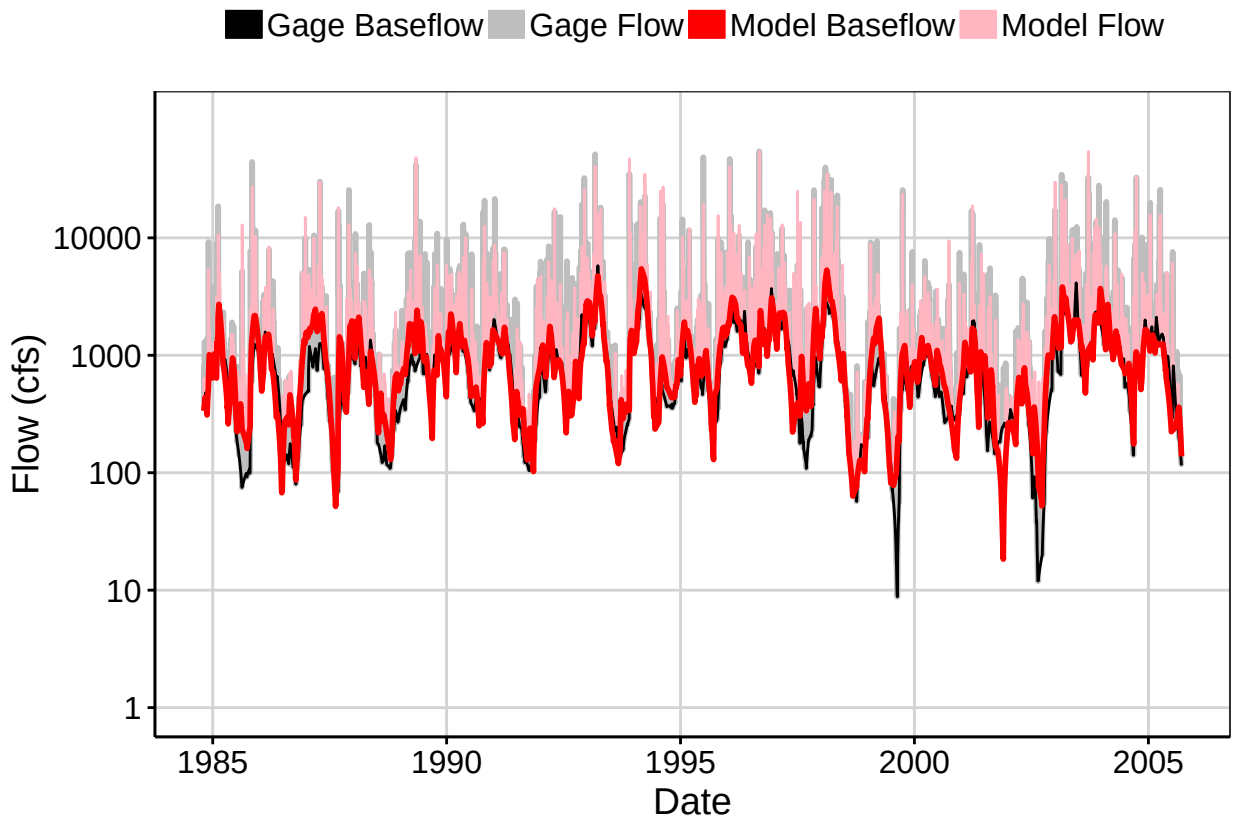


Fig. 6: Largest Error Segment

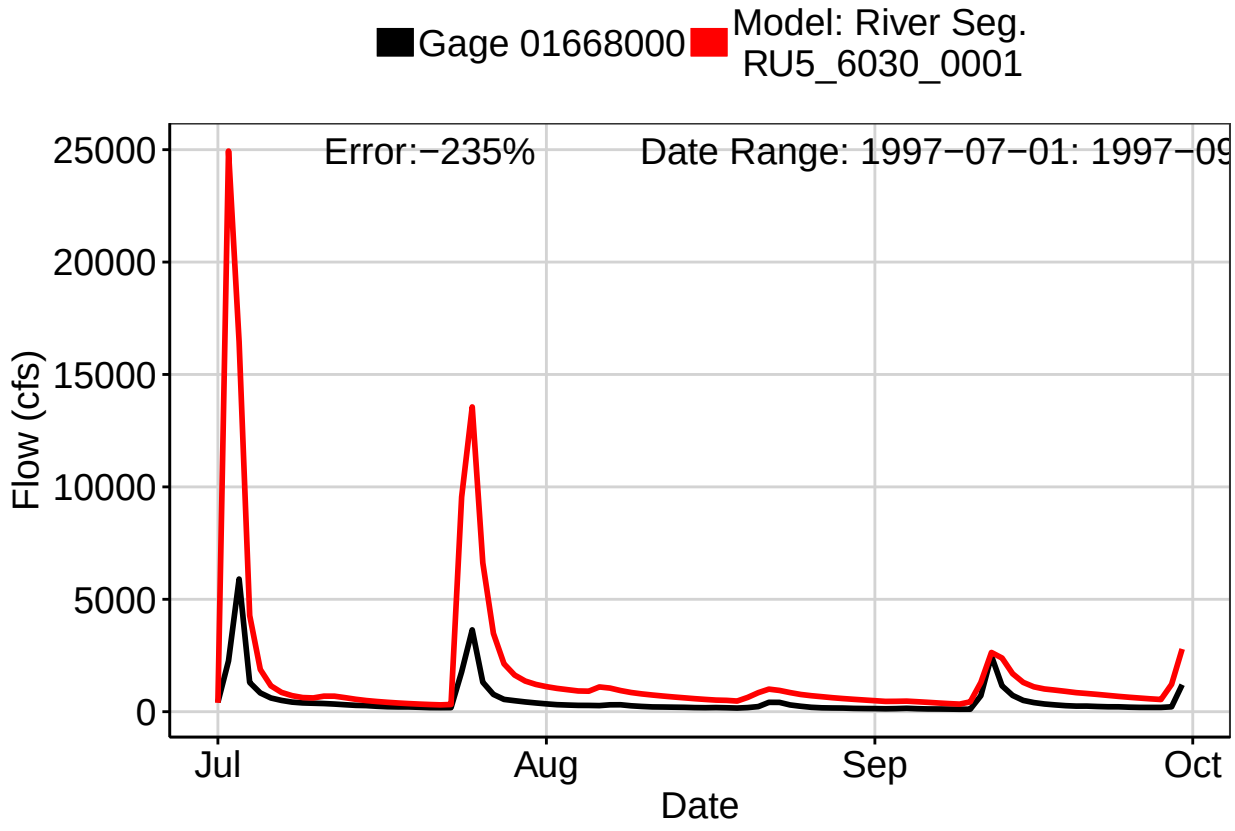


Fig. 7: Second Largest Error Segment

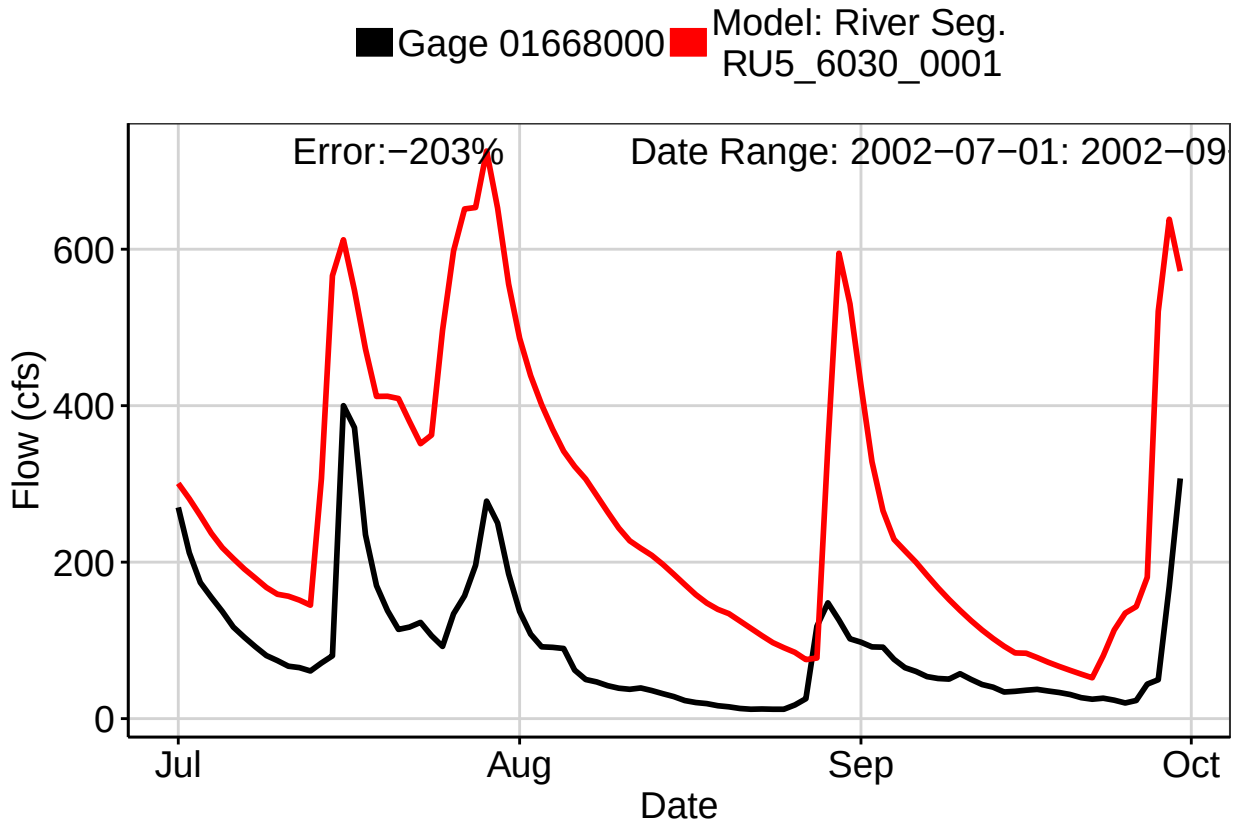


Fig. 8: Third Largest Error Segment

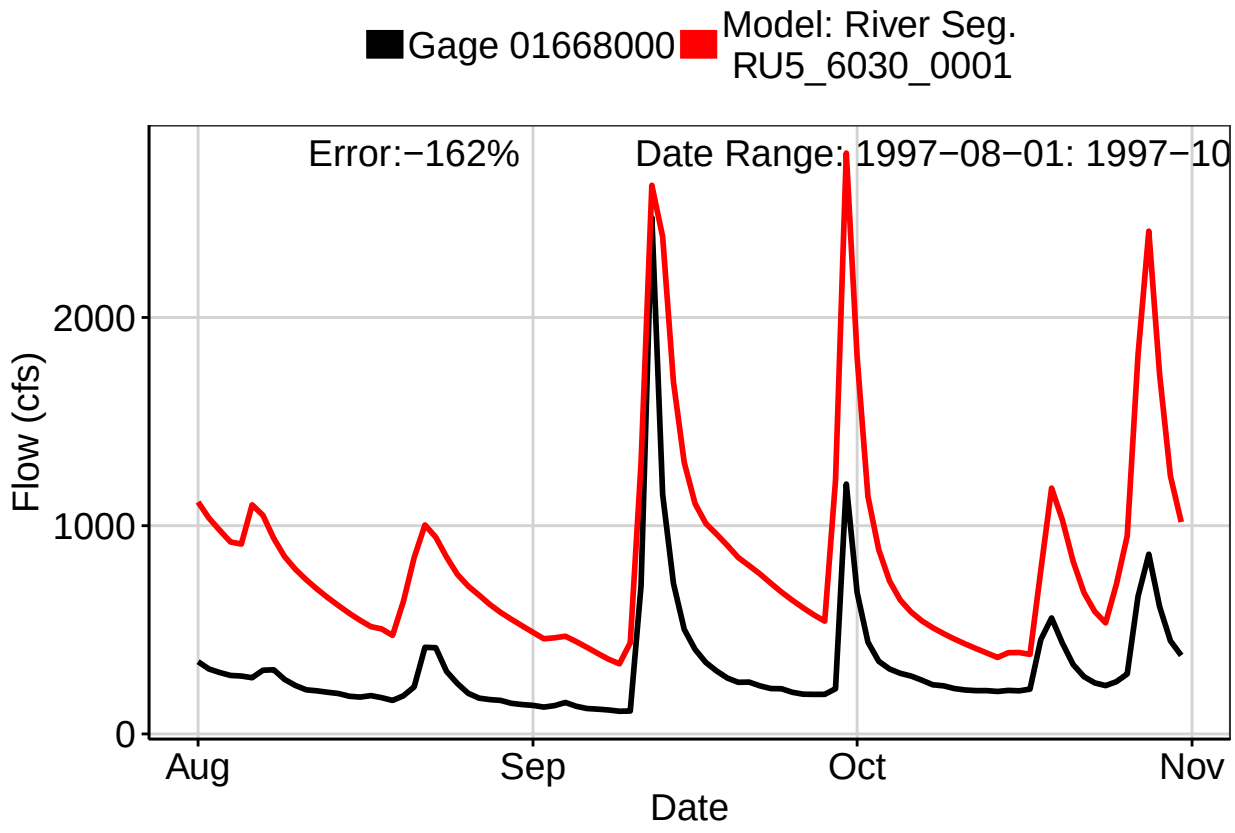


Fig. 9: Residuals Plot