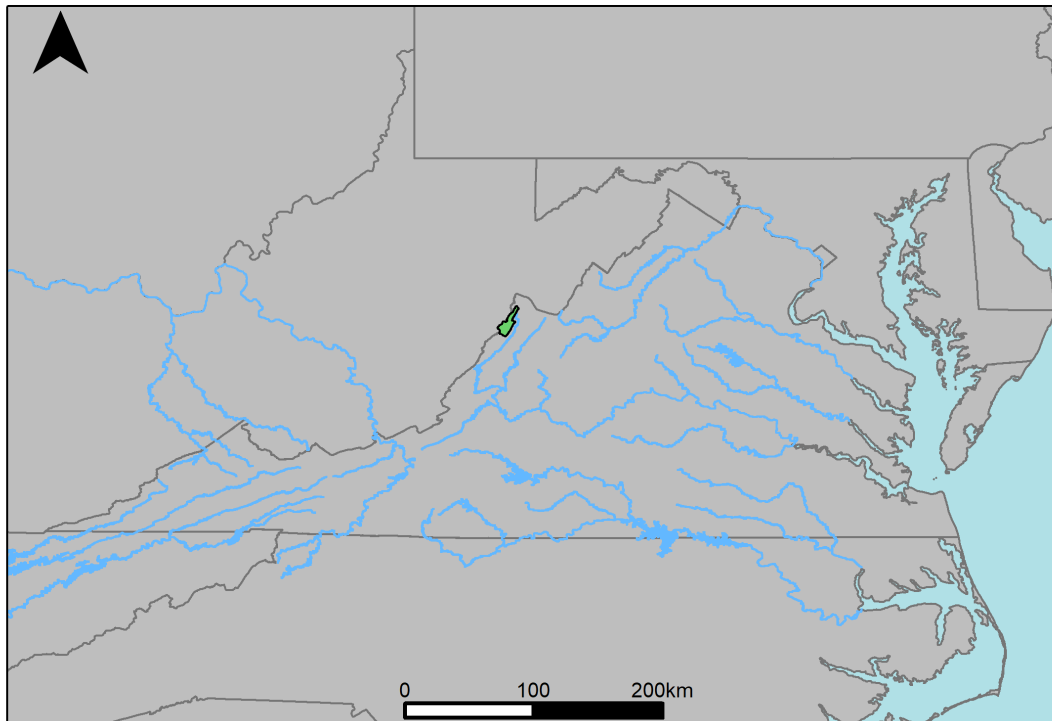


River Segment JU1_6290_6590: VA Hydro Run 11 vs. VA Hydro Run 14



The average daily discharge change between scenario 1 and scenario 2 for the 20 year timespan was 2.49055%, with 0% of its rolling three month time spans above 20% difference.

Table 1: Monthly Low Flows

	VA Hydro: Base	VA Hydro: CC: Precip 50, Temp 50	Pct. Difference
Jan. Low Flow	9.81	9.85	0.36
Feb. Low Flow	18.4	18.4	0.01
Mar. Low Flow	37	38.4	3.64
Apr. Low Flow	40.2	41.3	2.72
May Low Flow	39.2	40.8	4.15
Jun. Low Flow	47.5	51.3	8.01
Jul. Low Flow	26.3	25.9	-1.67
Aug. Low Flow	19.1	19.1	0.32
Sep. Low Flow	2.05	1.99	-2.98
Oct. Low Flow	2.03	1.92	-5.56
Nov. Low Flow	0.42	0.41	-3.76
Dec. Low Flow	1.43	1.36	-4.63

Table 2: Monthly Average Flows

	VA Hydro: Base	VA Hydro: CC: Precip 50, Temp 50	Pct. Difference
Overall Mean Flow	91.3	93.6	2.49
Jan. Mean Flow	138	145	4.89
Feb. Mean Flow	124	126	0.91
Mar. Mean Flow	163	162	-0.6
Apr. Mean Flow	103	108	4.2
May Mean Flow	98.2	102	4.08
Jun. Mean Flow	52.5	52.1	-0.89
Jul. Mean Flow	35.3	34.2	-3.03
Aug. Mean Flow	43.2	42.7	-1.11
Sep. Mean Flow	58.7	60.9	3.69
Oct. Mean Flow	56.6	57.6	1.64
Nov. Mean Flow	113	116	2.77
Dec. Mean Flow	111	119	6.96

Table 3: Monthly High Flows

	VA Hydro: Base	VA Hydro: CC: Precip 50, Temp 50	Pct. Difference
Jan. High Flow	109	112	2.6
Feb. High Flow	383	393	2.52
Mar. High Flow	397	398	0.38
Apr. High Flow	548	500	-8.79
May High Flow	330	382	16
Jun. High Flow	510	524	2.79
Jul. High Flow	362	405	11.7
Aug. High Flow	323	324	0.24
Sep. High Flow	156	157	0.08
Oct. High Flow	133	133	0.4
Nov. High Flow	73.4	72.3	-1.43
Dec. High Flow	86.4	89.8	3.97

Table 4: Period Low Flows

	VA Hydro: Base	VA Hydro: CC: Precip 50, Temp 50	Pct. Difference
Min. 1 Day Min	0.03	0.03	-4.48
Med. 1 Day Min	0.14	0.13	-5.48
Min. 3 Day Min	0.03	0.03	-4.65
Med. 3 Day Min	0.21	0.2	-4.32
Min. 7 Day Min	0.04	0.03	-4.53
Med. 7 Day Min	0.29	0.28	-2.95
Min. 30 Day Min	0.32	0.3	-7.24
Med. 30 Day Min	2.94	2.7	-8.01
Min. 90 Day Min	3.5	3.22	-7.98
Med. 90 Day Min	19.4	18.7	-3.37
7Q10	0.05	0.05	-3.24
Year of 90-Day Min. Flow	2000	2000	0
Drought Year Mean	44.6	46.1	3.36
Mean Baseflow	32.2	33.4	3.58

Table 5: Period High Flows

	VA Hydro: Base	VA Hydro: CC: Precip 50, Temp 50	Pct. Difference
Max. 1 Day Max	5640	5650	0.18
Med. 1 Day Max	1180	1220	4.1
Max. 3 Day Max	3690	3700	0.18
Med. 3 Day Max	821	860	4.67
Max. 7 Day Max	1760	1770	0.13
Med. 7 Day Max	484	508	4.96
Max. 30 Day Max	521	522	0.13
Med. 30 Day Max	260	272	4.62
Max. 90 Day Max	251	257	2.67
Med. 90 Day Max	166	172	3.42

Table 6: Non-Exceedance Flows

	VA Hydro: Base	VA Hydro: CC: Precip 50, Temp 50	Pct. Difference
1% Non-Exceedance	0.12	0.12	-2.82
5% Non-Exceedance	0.86	0.81	-5.99
50% Non-Exceedance	50	51.1	2.31
95% Non-Exceedance	311	323	3.78
99% Non-Exceedance	780	758	-2.8
Sept. 10% Non-Exceedance	0.74	0.7	-6.19

Fig. 1: Hydrograph

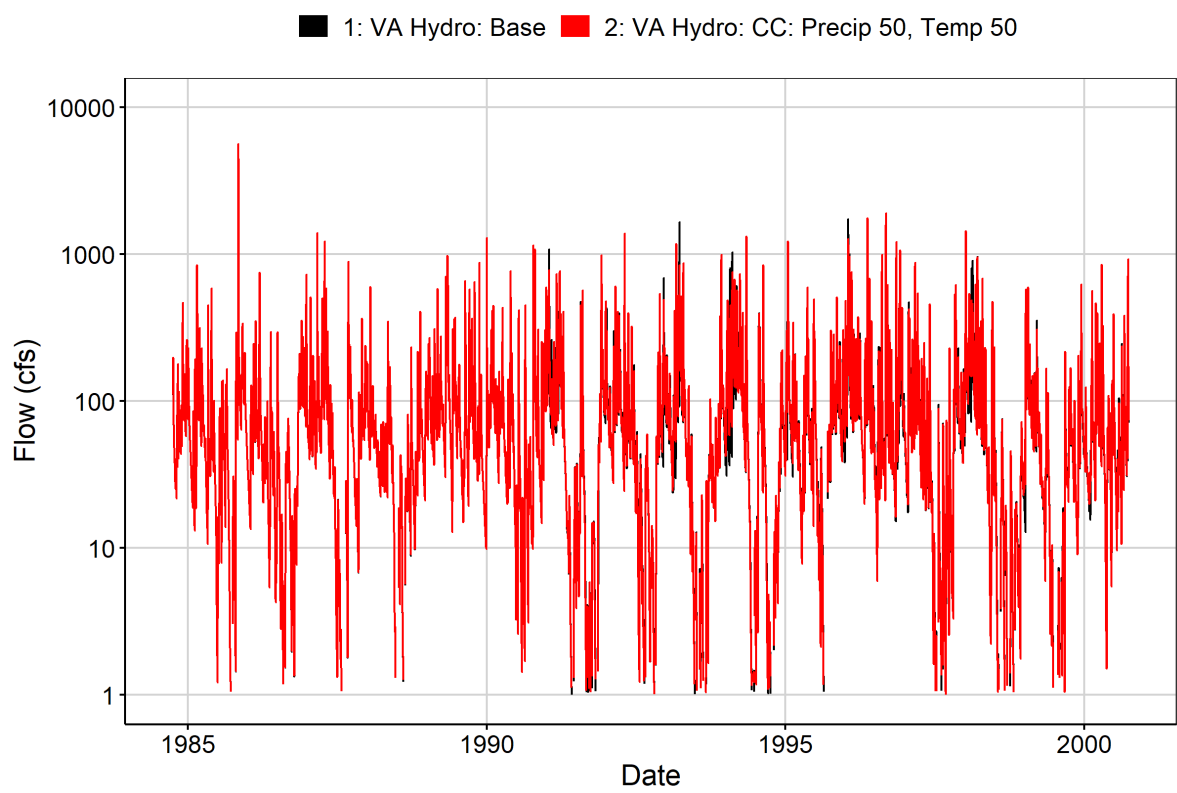


Fig. 2: Zoomed Hydrograph

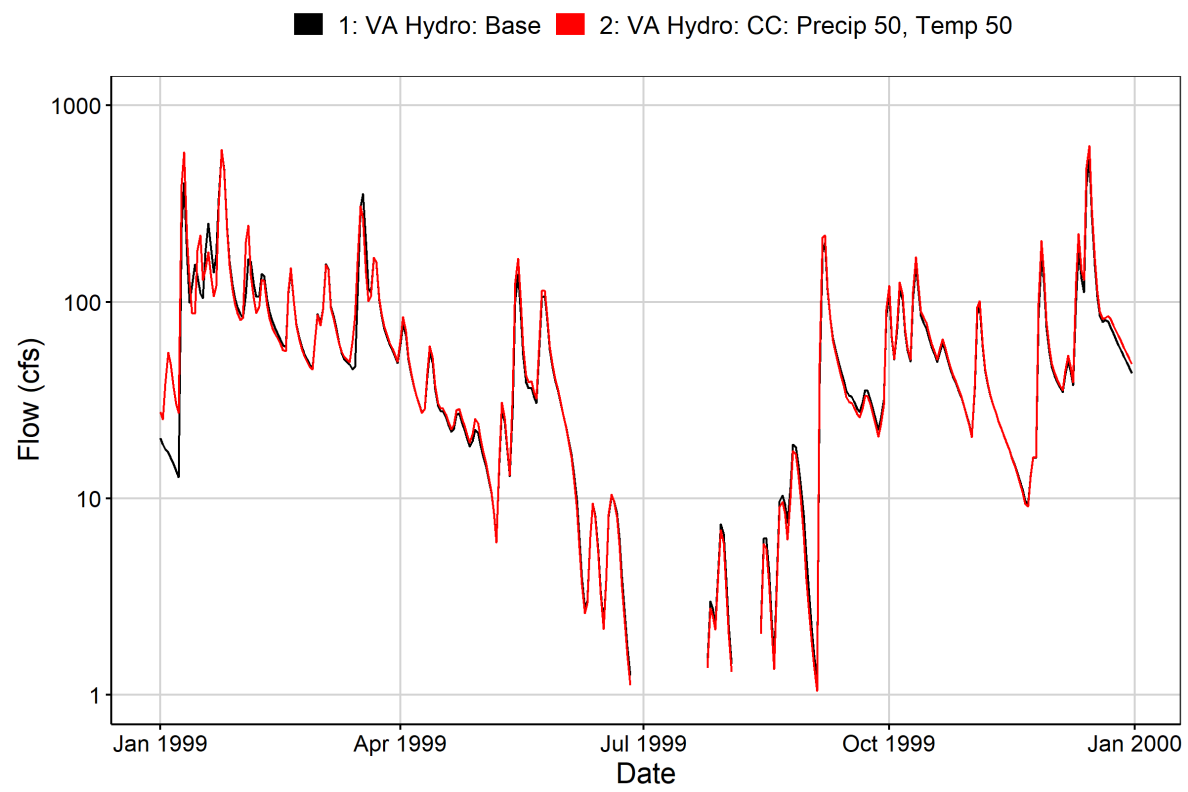


Fig. 3: Flow Exceedance

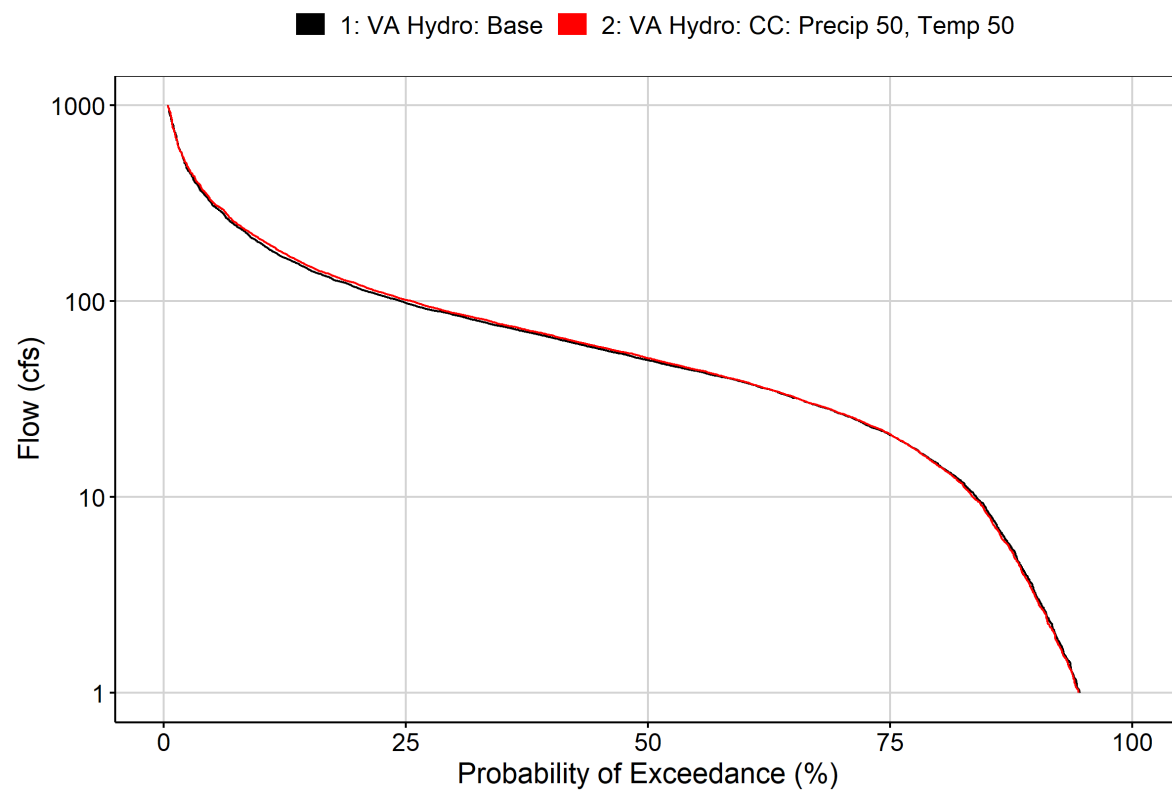


Fig. 4: Baseflow

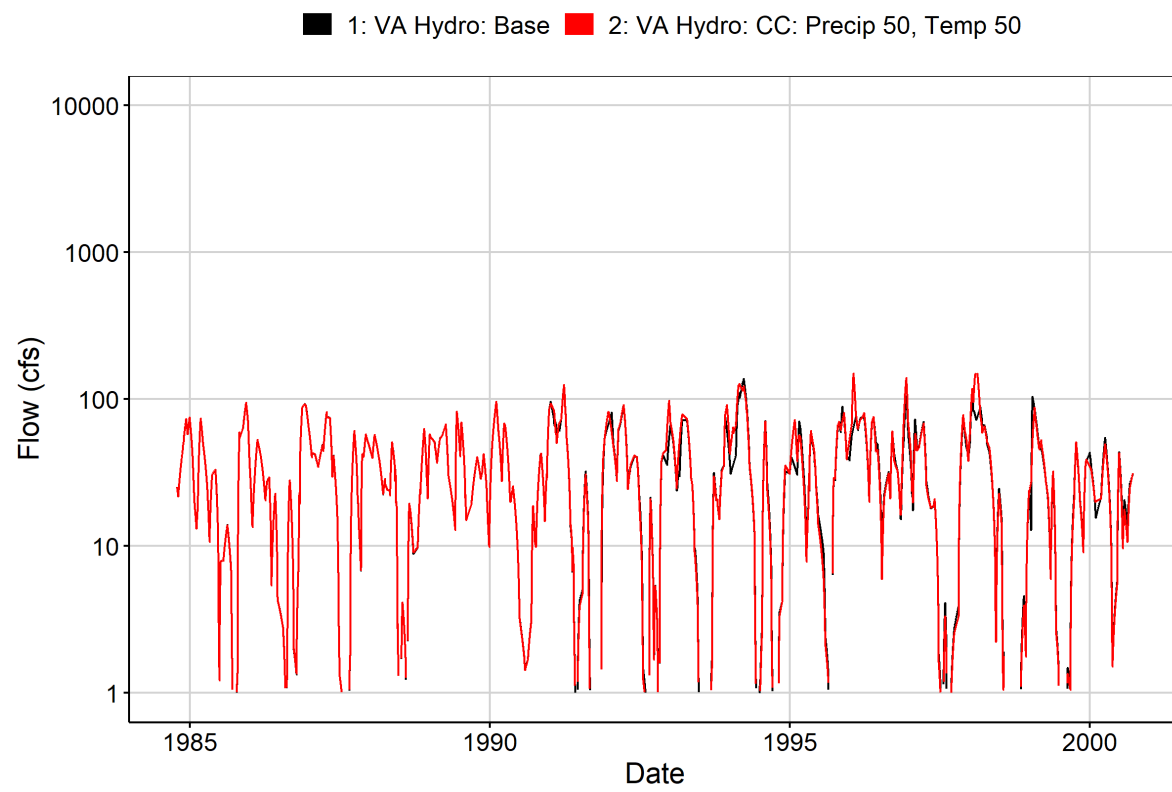


Fig. 5: Combined Baseflow

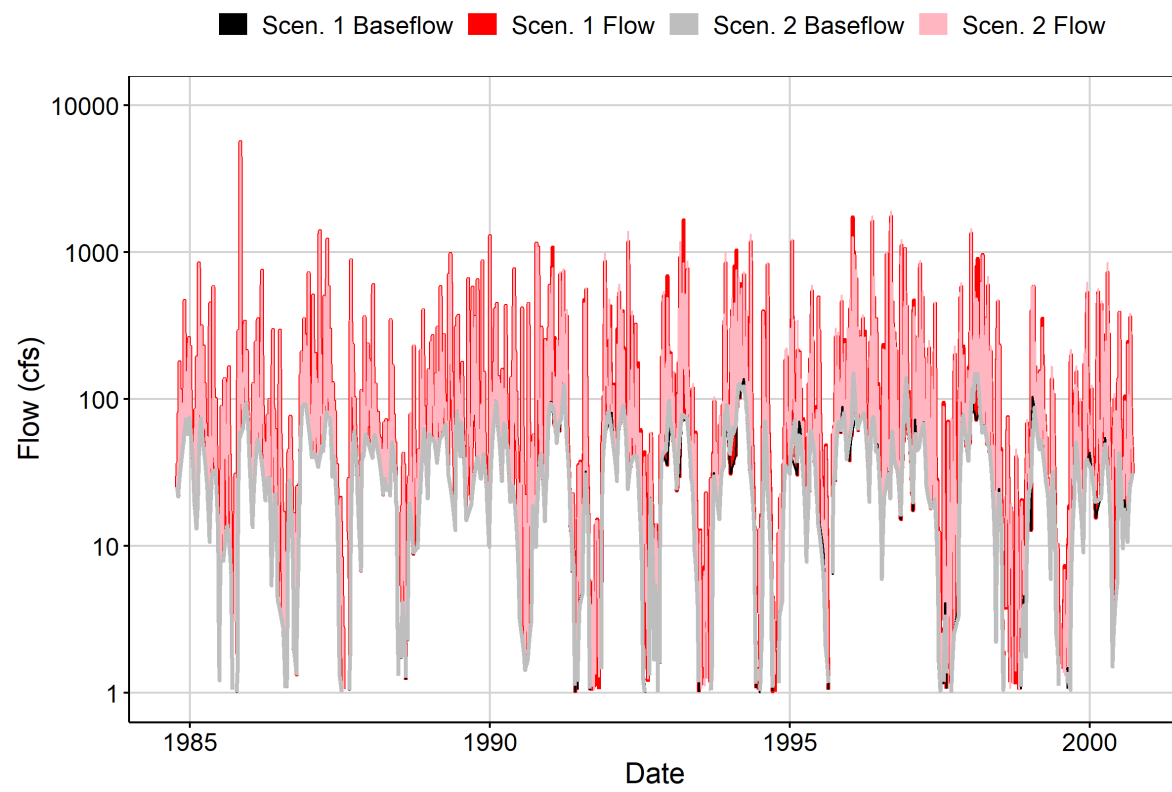


Fig. 6: Largest Difference Period

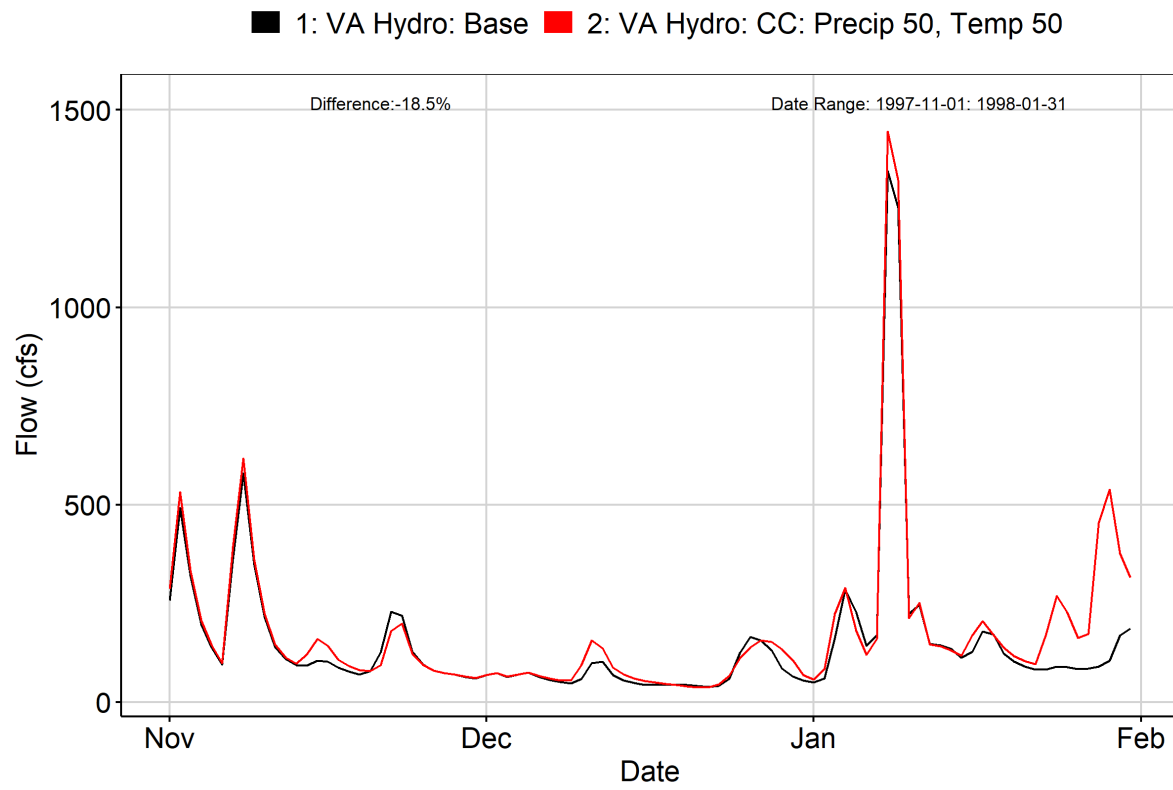


Fig. 7: Second Largest Difference Period

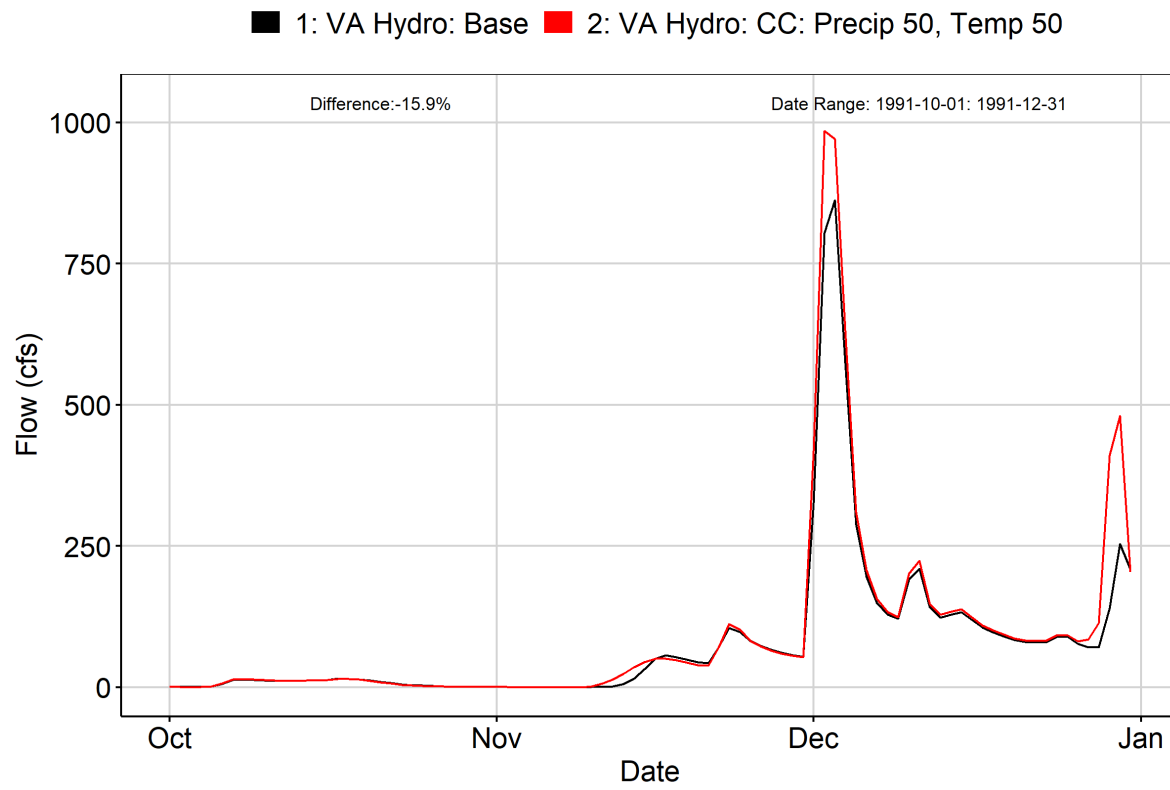


Fig. 8: Third Largest Difference Period

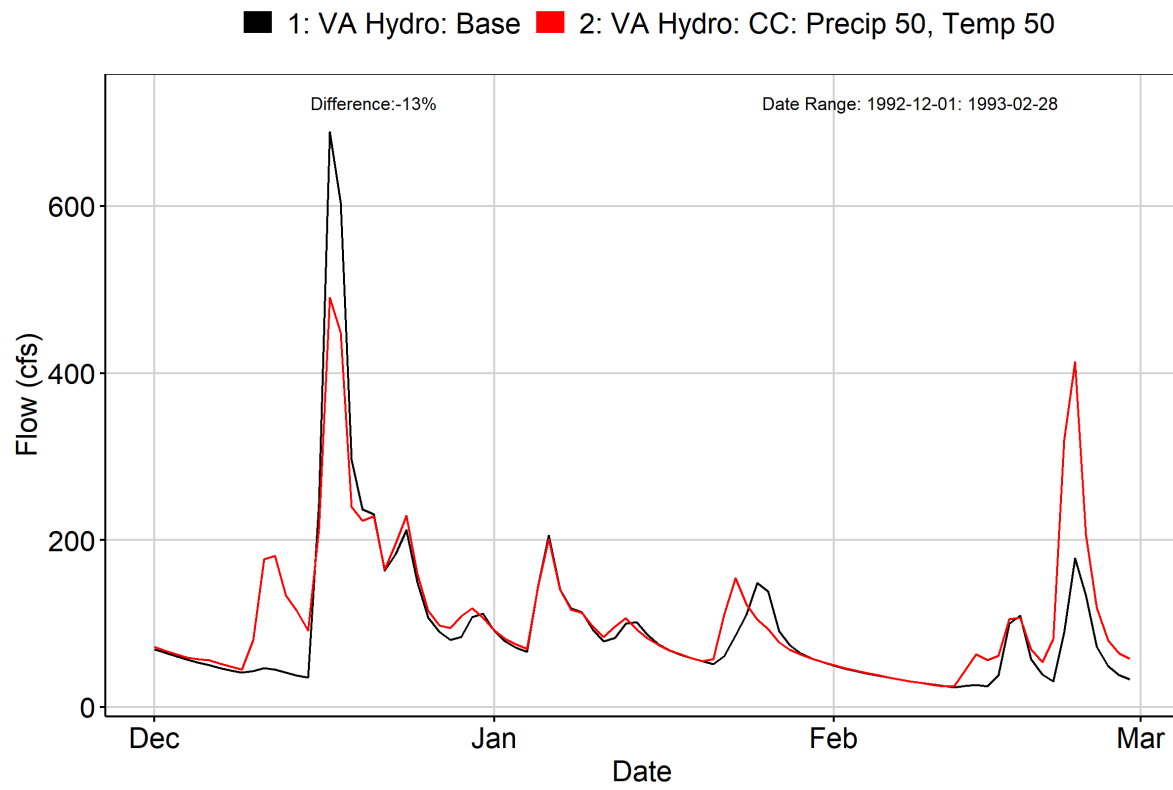


Fig. 9A: Residuals Plot

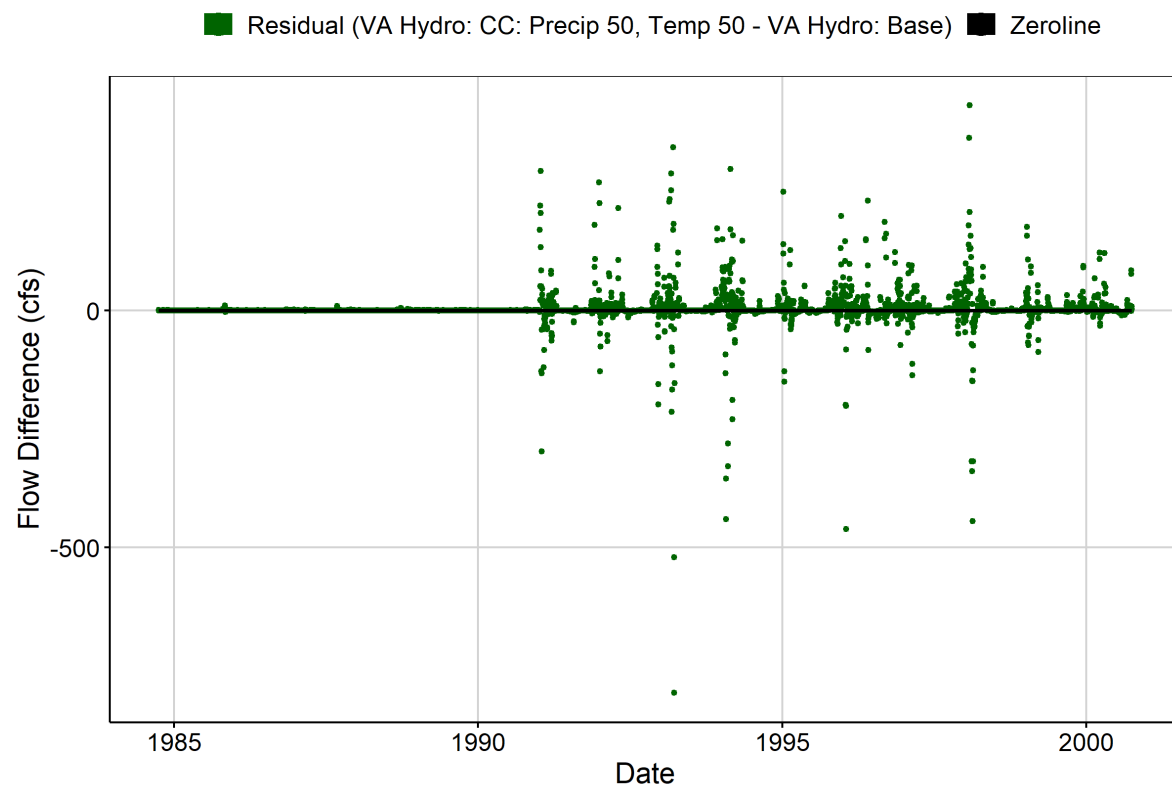


Fig. 9B: Area Weighted Residuals Plot

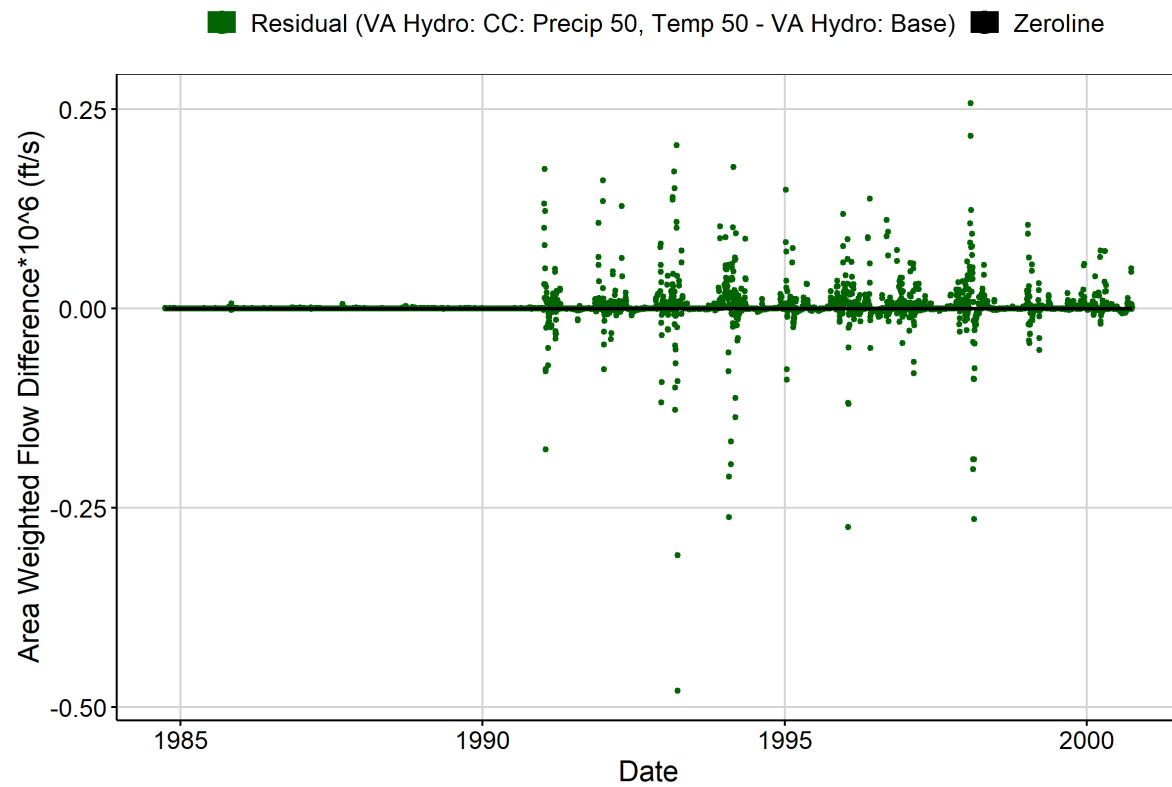
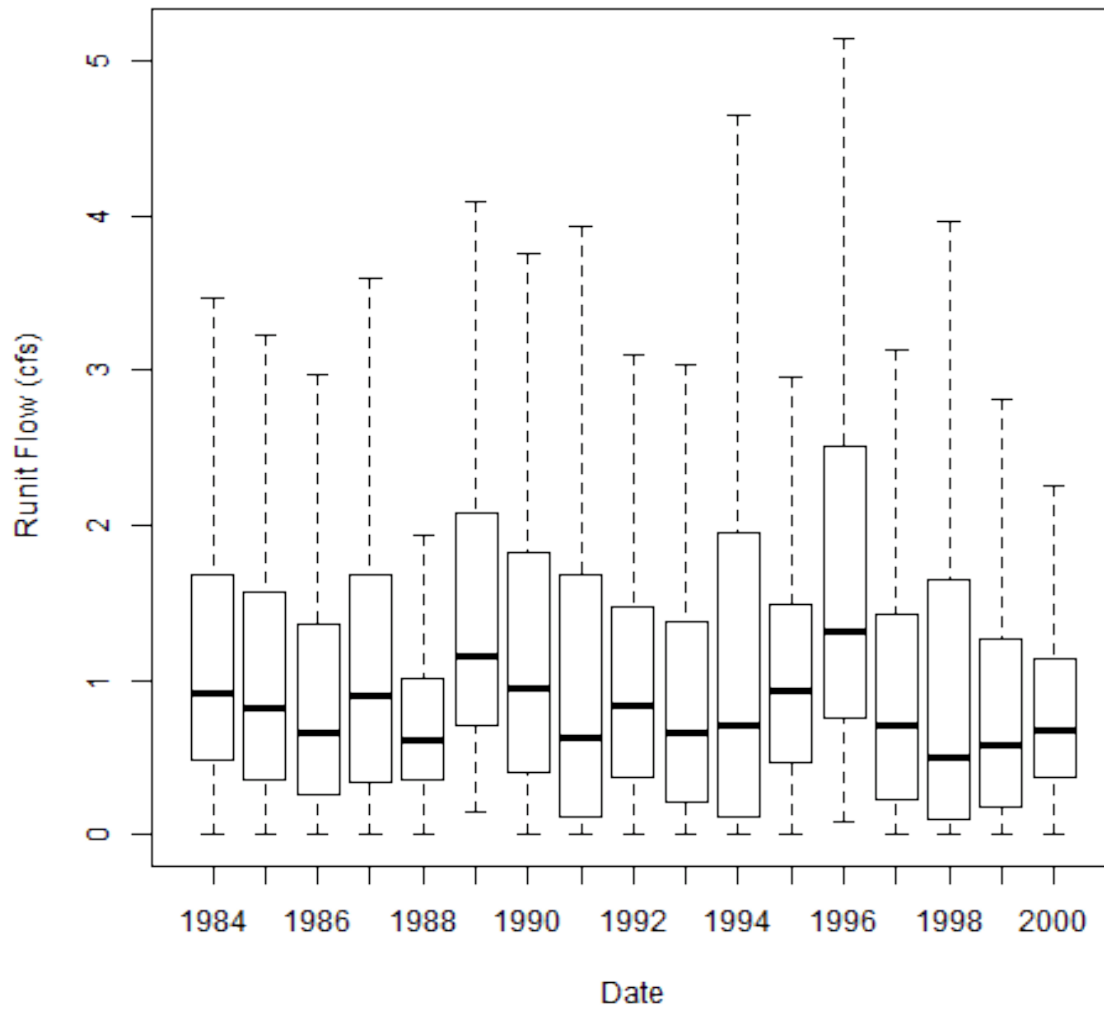


Fig. 10: VA Hydro Scen. 1 Runit Values (Outliers Excluded)



Tab: Annual IQR of Local Runoff Inflows

	IQR of Runit Flows (cfs/sq. mi) [25th, 75th]
1984	1.2 [0.482, 1.68]
1985	1.22 [0.349, 1.57]
1986	1.11 [0.262, 1.37]
1987	1.34 [0.335, 1.68]
1988	0.656 [0.354, 1.01]
1989	1.39 [0.704, 2.09]
1990	1.41 [0.406, 1.82]
1991	1.56 [0.109, 1.67]

	IQR of Runit Flows (cfs/sq. mi) [25th, 75th]	
1992	1.09	[0.368, 1.46]
1993	1.17	[0.211, 1.38]
1994	1.83	[0.119, 1.95]
1995	1.02	[0.474, 1.49]
1996	1.76	[0.763, 2.52]
1997	1.19	[0.234, 1.42]
1998	1.55	[0.1, 1.65]
1999	1.09	[0.183, 1.27]
2000	0.773	[0.367, 1.14]

Fig. 11: Smallest Difference Period

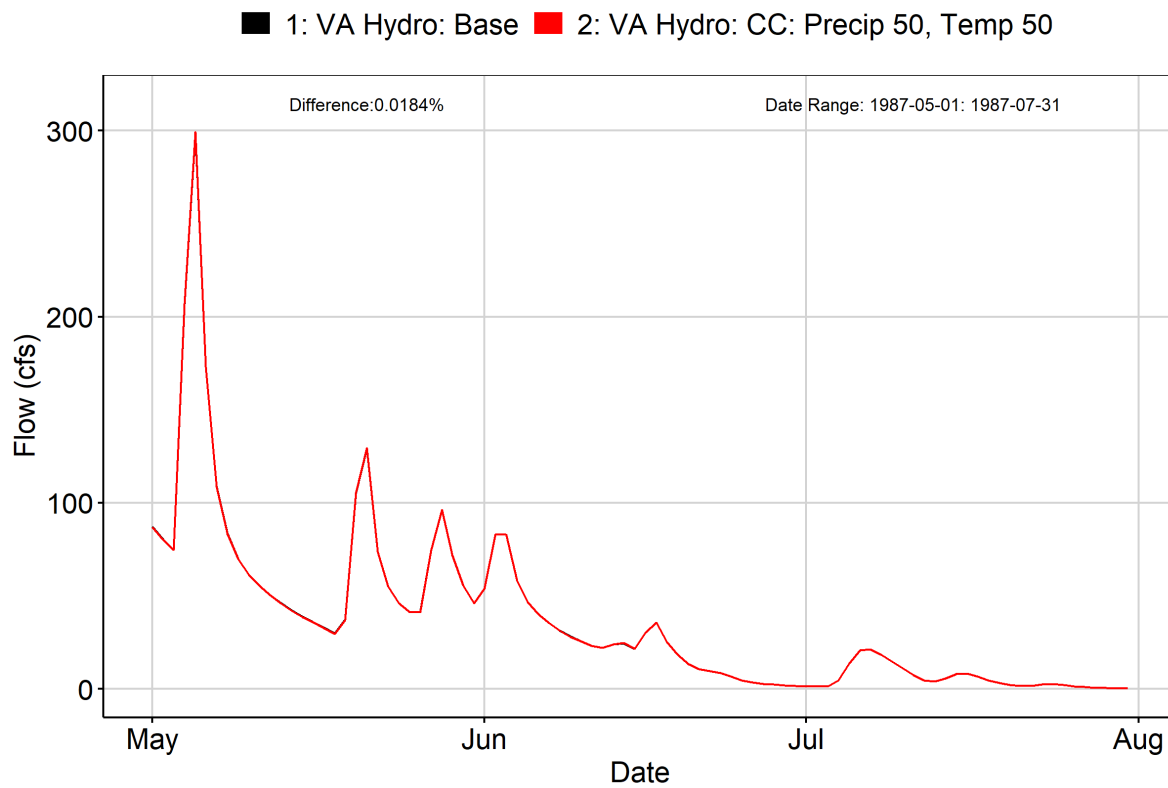


Fig. 12: Second Smallest Difference Period

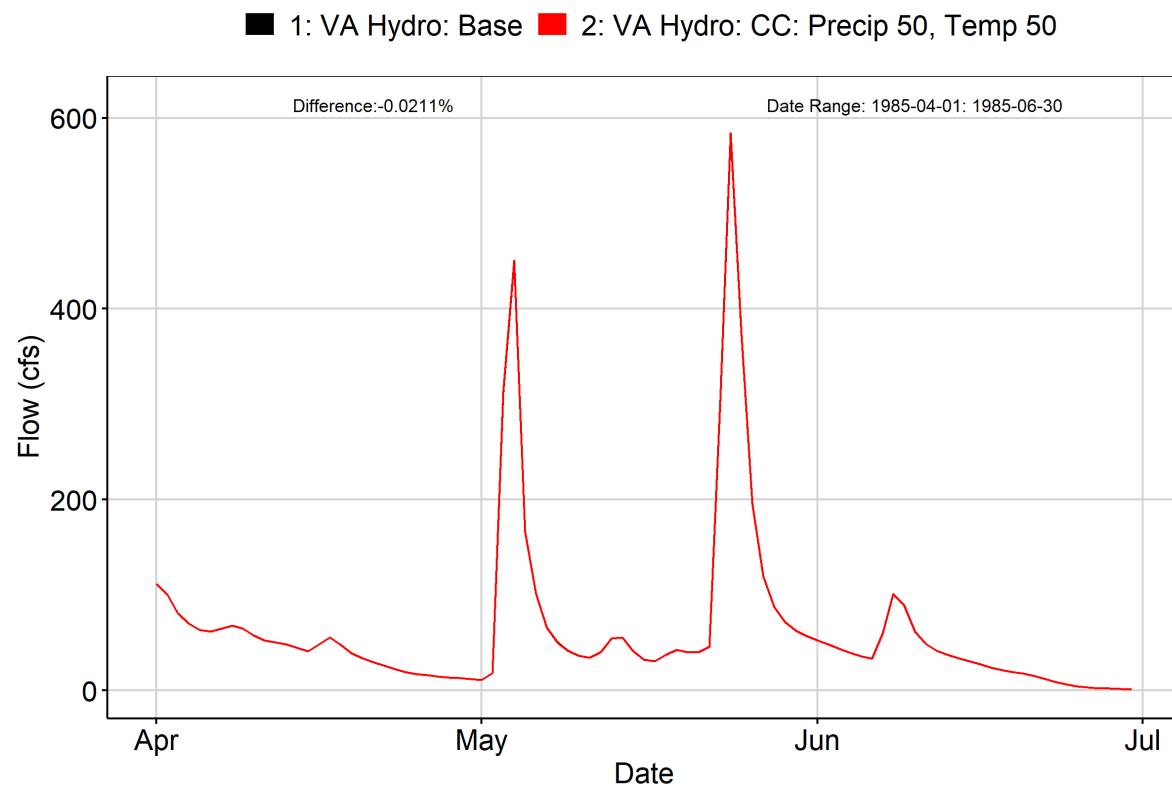
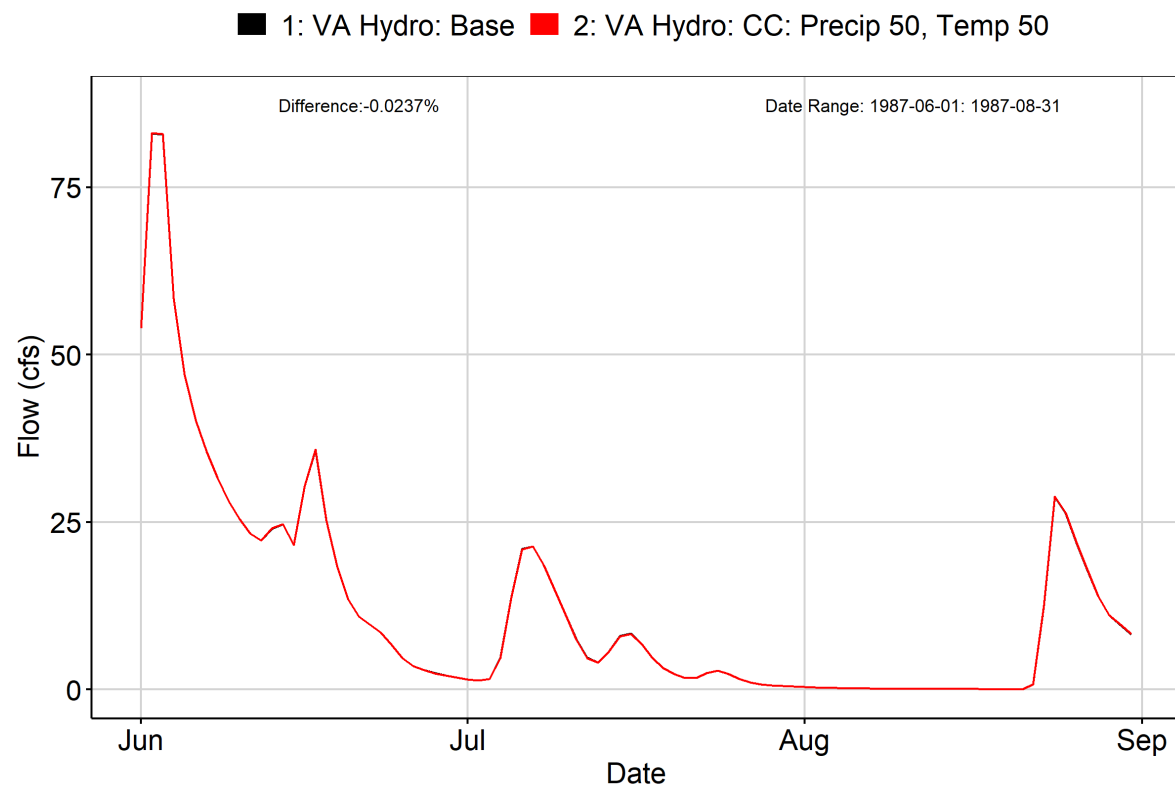


Fig. 13: Third Smallest Difference Period



Additional Tables: Land-River Segment Flow Metrics

Tab: Mean Flows by Flow Type: LR-Seg cbp6_N51017_JU1_6290_6590

	Mean Unit Flow (cfs/sq. mi)
SURface Outflow	0.00144
InterFloW Outflow	0.00034
Active GroundWater Outflow	0.000508

Tab: Ratio of Zero-Flow Days by Flow Type: LR-Seg cbp6_N51017_JU1_6290_6590

	Ratio of Days with Zero Flow to Total Days
SURface Outflow	0.637
InterFloW Outflow	0.494
Active GroundWater Outflow	0.33

Tab: IQR for SURface Outflow: LR-Seg cbp6_N51017_JU1_6290_6590

	IQR of Unit Flows (cfs/sq. mi) [25th, 75th]
1984	1.78e-05 [0, 1.78e-05]
1985	8.29e-06 [0, 8.29e-06]
1986	9.29e-06 [0, 9.29e-06]
1987	2.69e-05 [0, 2.69e-05]
1988	1.04e-06 [0, 1.04e-06]
1989	6.57e-05 [0, 6.57e-05]
1990	1.25e-05 [0, 1.25e-05]
1991	6.08e-06 [0, 6.08e-06]
1992	9.96e-06 [0, 9.96e-06]
1993	9.89e-06 [0, 9.89e-06]
1994	1.63e-05 [0, 1.63e-05]
1995	1.43e-05 [0, 1.43e-05]
1996	8.17e-05 [0, 8.17e-05]
1997	6.44e-06 [0, 6.44e-06]
1998	5.91e-06 [0, 5.91e-06]
1999	2.92e-06 [0, 2.92e-06]
2000	3.53e-06 [0, 3.53e-06]

Tab: IQR for InterFloW Outflow: LR-Seg cbp6_N51017_JU1_6290_6590

	IQR of Unit Flows (cfs/sq. mi) [25th, 75th]	
1984	7.28e-05	[0, 7.28e-05]
1985	5.55e-05	[0, 5.55e-05]
1986	3.37e-05	[0, 3.37e-05]
1987	7.82e-05	[0, 7.82e-05]
1988	3.94e-05	[0, 3.94e-05]
1989	0.000247	[0, 0.000247]
1990	0.000152	[0, 0.000152]
1991	6.1e-05	[0, 6.1e-05]
1992	6.98e-05	[0, 6.98e-05]
1993	7.43e-05	[0, 7.43e-05]
1994	8.87e-05	[0, 8.87e-05]
1995	7.64e-05	[0, 7.64e-05]
1996	0.000277	[0, 0.000277]
1997	9.36e-05	[0, 9.36e-05]
1998	6.8e-05	[0, 6.8e-05]
1999	6.15e-05	[0, 6.15e-05]
2000	6.75e-05	[0, 6.75e-05]

Tab: IQR for Active GroundWater Outflow: LR-Seg cbp6_N51017_JU1_6290_6590

	IQR of Unit Flows (cfs/sq. mi) [25th, 75th]	
1984	0.000803	[0, 0.000803]
1985	0.000939	[0, 0.000939]
1986	0.000712	[0, 0.000712]
1987	0.000931	[0, 0.000931]
1988	0.000617	[0, 0.000617]
1989	0.0011	[0, 0.0011]
1990	0.000918	[0, 0.000918]
1991	0.000848	[0, 0.000848]
1992	0.000933	[0, 0.000933]
1993	0.000916	[0, 0.000916]
1994	0.000935	[0, 0.000935]
1995	0.000798	[0, 0.000798]
1996	0.00117	[0, 0.00117]
1997	0.000748	[0, 0.000748]
1998	0.000902	[0, 0.000902]
1999	0.000567	[0, 0.000567]
2000	0.000661	[0, 0.000661]

Tab: Mean Flows by Land Use: LR-Seg cbp6_N51017_JU1_6290_6590

	Mean Unit Flow (cfs/sq. mi)
aop	0.000542
cch	0.000705
cci	0.00112
ccn	0.000737
cfr	0.000491
cir	0.00112
cmo	0.000514
cnr	0.00112
ctg	0.000705
dbl	0.000568
fnp	0.00112
for	0.000492
fsp	0.00112
gom	0.000568
gwm	0.000568
hfr	0.000581
lhy	0.000542
mch	0.000705
mci	0.00112
mcn	0.000737
mir	0.00112
mnr	0.00112
mtg	0.000705
nch	0.000705
nci	0.00112
nir	0.00112
nnr	0.00112
ntg	0.000705
oac	0.000568
ohy	0.000542
osp	0.000514
pas	0.000542
sch	0.000568
scl	0.000568
sgg	0.000568
sho	0.00112
som	0.000568
soy	0.000568
stb	0.00112
stf	0.00112
swm	0.000568
wfp	0.000492
wto	0.000492

Tab: Ratio of Zero-Flow Days by Land Use: LR-Seg cbp6_N51017_JU1_6290_6590

	Ratio of Days with Zero Flow to Total Days
aop	0.285
cch	0.289
cci	0.887
ccn	0.278
cfr	0.331
cir	0.887
cmo	0.307
cnr	0.887
ctg	0.289
dbl	0.284
fnp	0.887
for	0.343
fsp	0.887
gom	0.284
gwm	0.284
hfr	0.278
lhy	0.287
mch	0.289
mci	0.887
mcn	0.278
mir	0.887
mnr	0.887
mtg	0.289
nch	0.289
nci	0.887
nir	0.887
nnr	0.887
ntg	0.289
oac	0.284
ohy	0.287
osp	0.305
pas	0.287
sch	0.284
scl	0.284
sgg	0.284
sho	0.887
som	0.284
soy	0.284
stb	0.887
stf	0.887
swm	0.284
wfp	0.343
wto	0.343

Tab: Mean Flows by Flow Type: LR-Seg cbp6_N51091_JU1_6290_6590

	Mean Unit Flow (cfs/sq. mi)
SURface Outflow	0.00158
InterFloW Outflow	0.000576
Active GroundWater Outflow	0.000631

Tab: Ratio of Zero-Flow Days by Flow Type: LR-Seg cbp6_N51091_JU1_6290_6590

	Ratio of Days with Zero Flow to Total Days
SURface Outflow	0.594
InterFloW Outflow	0.443
Active GroundWater Outflow	0.362

Tab: IQR for SURface Outflow: LR-Seg cbp6_N51091_JU1_6290_6590

	IQR of Unit Flows (cfs/sq. mi) [25th, 75th]
1984	3.97e-05 [0, 3.97e-05]
1985	3.38e-05 [0, 3.38e-05]
1986	2.87e-05 [0, 2.87e-05]
1987	8.32e-05 [0, 8.32e-05]
1988	9.2e-06 [0, 9.2e-06]
1989	0.000305 [0, 0.000305]
1990	3.69e-05 [0, 3.69e-05]
1991	2.35e-05 [0, 2.35e-05]
1992	2.04e-05 [0, 2.04e-05]
1993	1.13e-05 [0, 1.13e-05]
1994	1.72e-05 [0, 1.72e-05]
1995	5.6e-05 [0, 5.6e-05]
1996	0.000464 [0, 0.000464]
1997	1.91e-05 [0, 1.91e-05]
1998	2.07e-05 [0, 2.07e-05]
1999	9.55e-06 [0, 9.55e-06]
2000	9.64e-06 [0, 9.64e-06]

Tab: IQR for InterFlow Outflow: LR-Seg cbp6_N51091_JU1_6290_6590

	IQR of Unit Flows (cfs/sq. mi) [25th, 75th]	
1984	0.000202	[0, 0.000202]
1985	0.00022	[0, 0.00022]
1986	0.000183	[0, 0.000183]
1987	0.000278	[0, 0.000278]
1988	0.000119	[0, 0.000119]
1989	0.000552	[0, 0.000552]
1990	0.000459	[0, 0.000459]
1991	0.000151	[0, 0.000151]
1992	0.000214	[0, 0.000214]
1993	0.000169	[0, 0.000169]
1994	0.000245	[0, 0.000245]
1995	0.00034	[0, 0.00034]
1996	0.000879	[0, 0.000879]
1997	0.000302	[0, 0.000302]
1998	0.000188	[0, 0.000188]
1999	0.000143	[0, 0.000143]
2000	0.000196	[0, 0.000196]

Tab: IQR for Active GroundWater Outflow: LR-Seg cbp6_N51091_JU1_6290_6590

	IQR of Unit Flows (cfs/sq. mi) [25th, 75th]	
1984	0.00131	[0, 0.00131]
1985	0.0011	[0, 0.0011]
1986	0.00103	[0, 0.00103]
1987	0.0011	[0, 0.0011]
1988	0.000863	[0, 0.000863]
1989	0.00131	[0, 0.00131]
1990	0.00107	[0, 0.00107]
1991	0.00114	[0, 0.00114]
1992	0.00111	[0, 0.00111]
1993	0.000988	[0, 0.000988]
1994	0.00115	[0, 0.00115]
1995	0.00114	[0, 0.00114]
1996	0.00138	[0, 0.00138]
1997	0.000794	[0, 0.000794]
1998	0.000871	[0, 0.000871]
1999	0.000845	[0, 0.000845]
2000	0.000868	[0, 0.000868]

Tab: Mean Flows by Land Use: LR-Seg cbp6_N51091_JU1_6290_6590

	Mean Unit Flow (cfs/sq. mi)
aop	0.000788
cch	0.000876
cci	0.00117
ccn	0.000899
cfr	0.000775
cir	0.00117
cmo	0.00078
cnr	0.00117
ctg	0.000876
dbl	0.000801
fnp	0.00117
for	0.000776
fsp	0.00117
gom	0.000801
gwm	0.000801
hfr	0.000809
lhy	0.000788
mch	0.000876
mci	0.00117
mcn	0.000899
mir	0.00117
mnr	0.00117
mtg	0.000876
nch	0.000876
nci	0.00117
nir	0.00117
nnr	0.00117
ntg	0.000876
oac	0.000801
ohy	0.000788
osp	0.00078
pas	0.000788
sch	0.000801
scl	0.000801
sgg	0.000801
sho	0.00117
som	0.000801
soy	0.000801
stb	0.00117
stf	0.00117
swm	0.000801
wfp	0.000776
wto	0.000776

Tab: Ratio of Zero-Flow Days by Land Use: LR-Seg cbp6__N51091_JU1_6290_6590

	Ratio of Days with Zero Flow to Total Days
aop	0.26
cch	0.275
cci	0.872
ccn	0.251
cfr	0.313
cir	0.872
cmo	0.277
cnr	0.872
ctg	0.275
dbl	0.254
fnp	0.869
for	0.328
fsp	0.869
gom	0.254
gwm	0.254
hfr	0.262
lhy	0.259
mch	0.275
mci	0.872
mcn	0.251
mir	0.872
mnr	0.872
mtg	0.275
nch	0.275
nci	0.872
nir	0.872
nnr	0.872
ntg	0.275
oac	0.254
ohy	0.259
osp	0.278
pas	0.259
sch	0.254
scl	0.254
sgg	0.254
sho	0.872
som	0.254
soy	0.254
stb	0.872
stf	0.872
swm	0.254
wfp	0.328
wto	0.328

Additional Figures: Land-River Segment Flow Boxplots

Fig: Annual SURO Flows for LR-seg cbp6_N51017_JU1_6290_6590

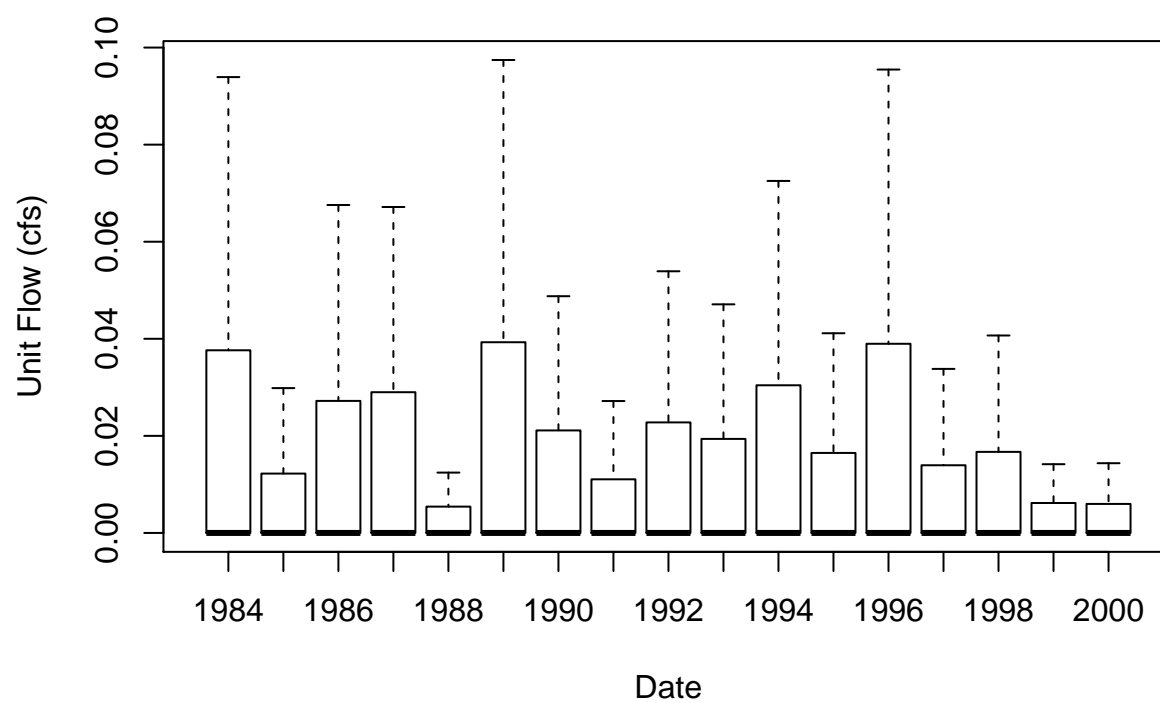


Fig: Annual IFWO Flows for LR-seg cbp6_N51017_JU1_6290_6590

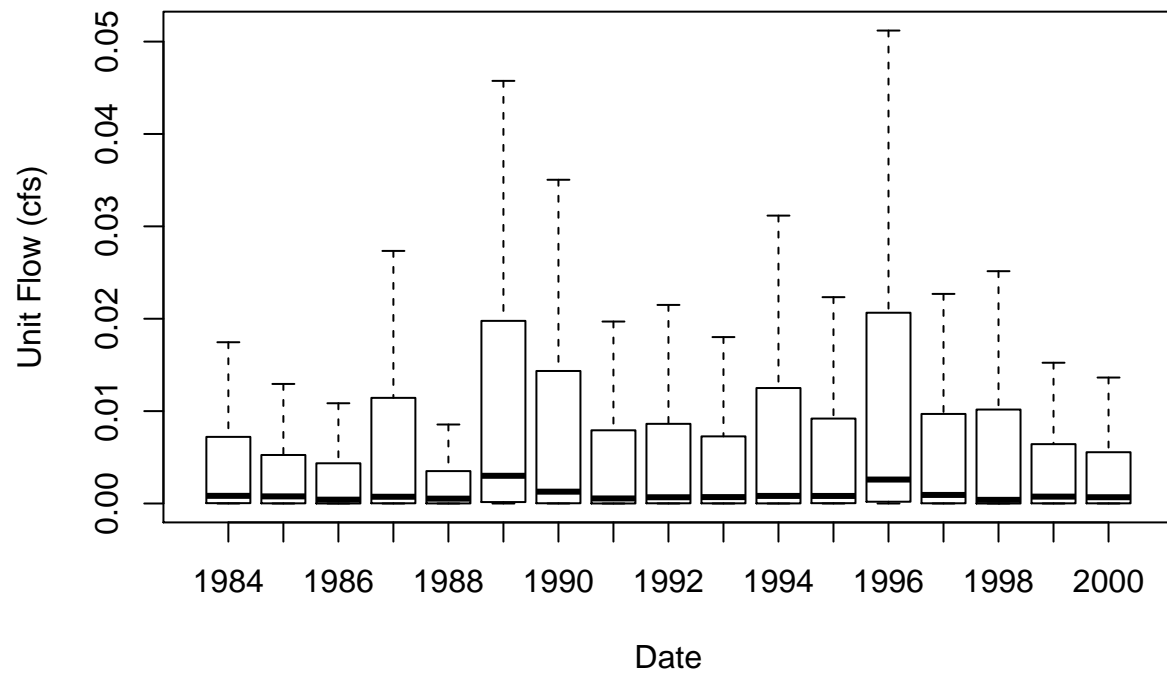


Fig: Annual AGWO Flows for LR-seg cbp6_N51017_JU1_6290_6590

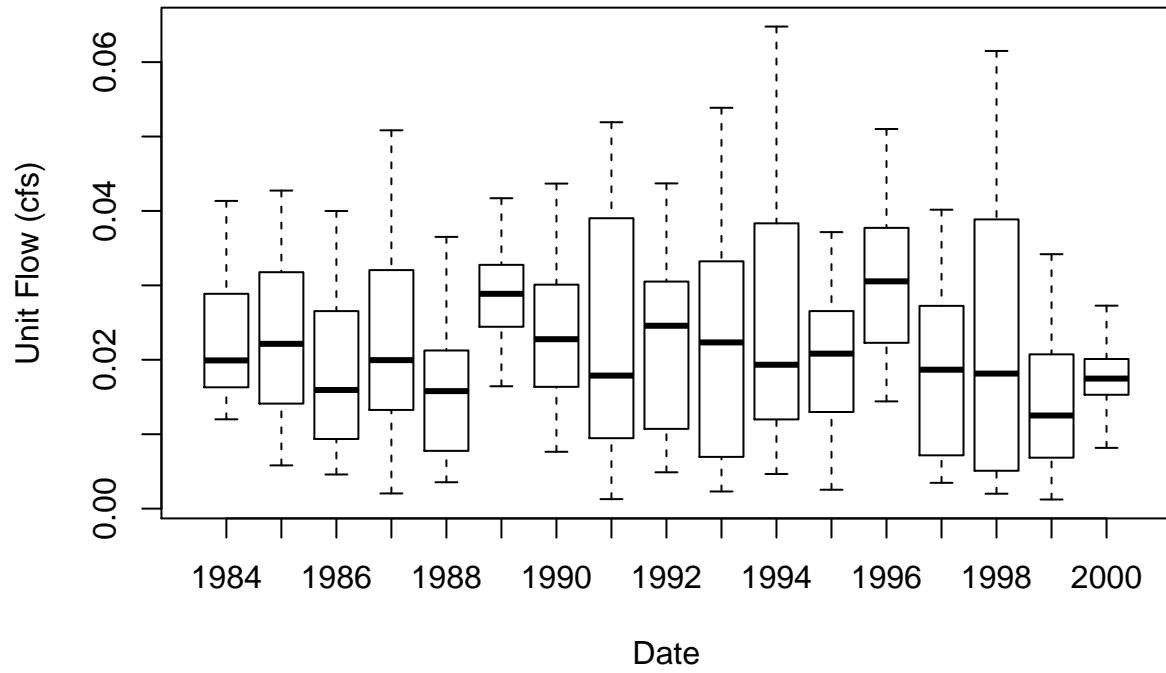


Fig: Annual SURO Flows for LR-seg cbp6_N51091_JU1_6290_6590

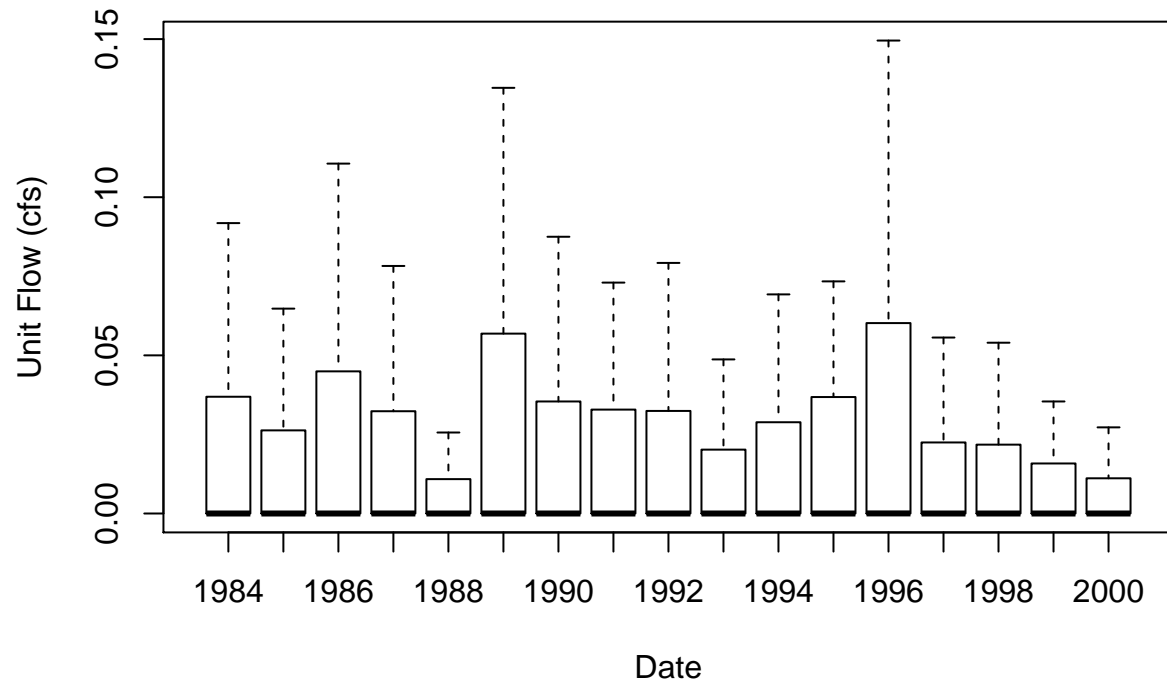


Fig: Annual IFWO Flows for LR-seg cbp6_N51091_JU1_6290_6590

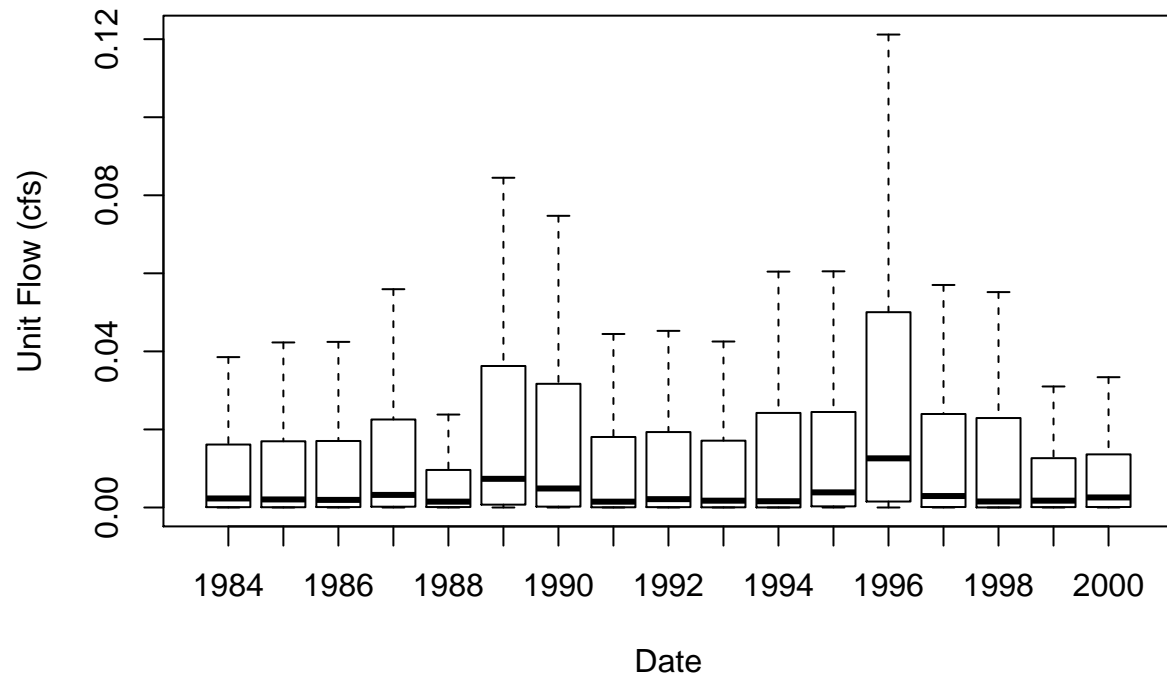


Fig: Annual AGWO Flows for LR-seg cbp6_N51091_JU1_6290_6590

