Appendix X

Scenario Results for the Five Pilot Watersheds

Contents

Apalachicola-Chattahoochee-Flint Basin, HSPF Model X-3
Apalachicola-Chattahoochee-Flint Basin, SWAT Model X-21
Verde-Salt-San Pedro Basins, HSPF Model..... X-38
Verde-Salt-San Pedro Basins, SWAT Model..... X-59
Minnesota River (Upper Mississippi Basin), HSPF Model X-75
Minnesota River (Upper Mississippi Basin), SWAT Model..... X-91
Susquehanna River Basin, HSPF Model X-109
Susquehanna River Basin, SWAT Model X-121
Willamette River Basin, HSPF Model..... X-140
Willamette River Basin, SWAT Model..... X-154

Apalachicola-Chattahoochee-Flint Basin, HSPF Model Results at Downstream Stationk

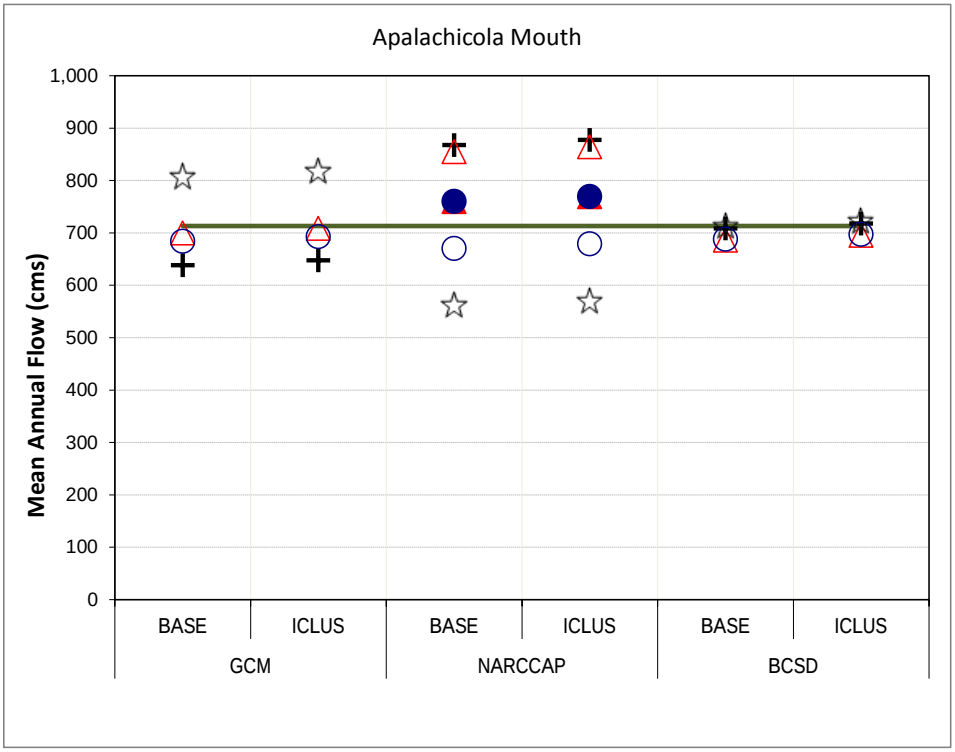

Figure 1. Mean Annual Flow (cms), Apalachicola River at Mouth (HSPF)

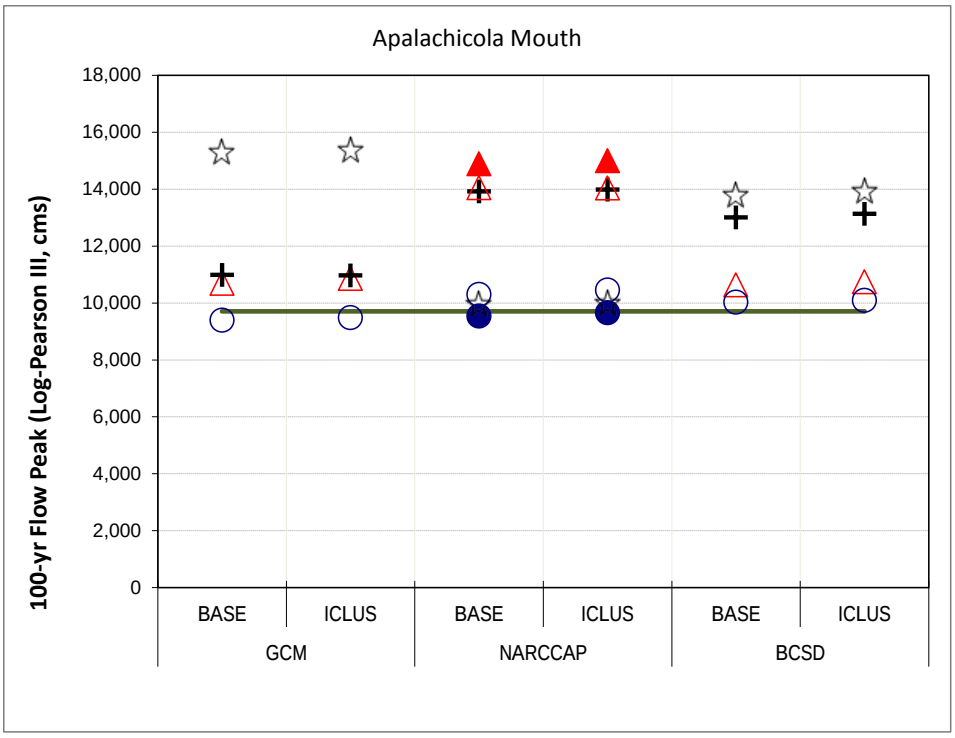

Figure 2. 100-yr Flow Peak (Log-Pearson III, cms), Apalachicola River at Mouth (HSPF)

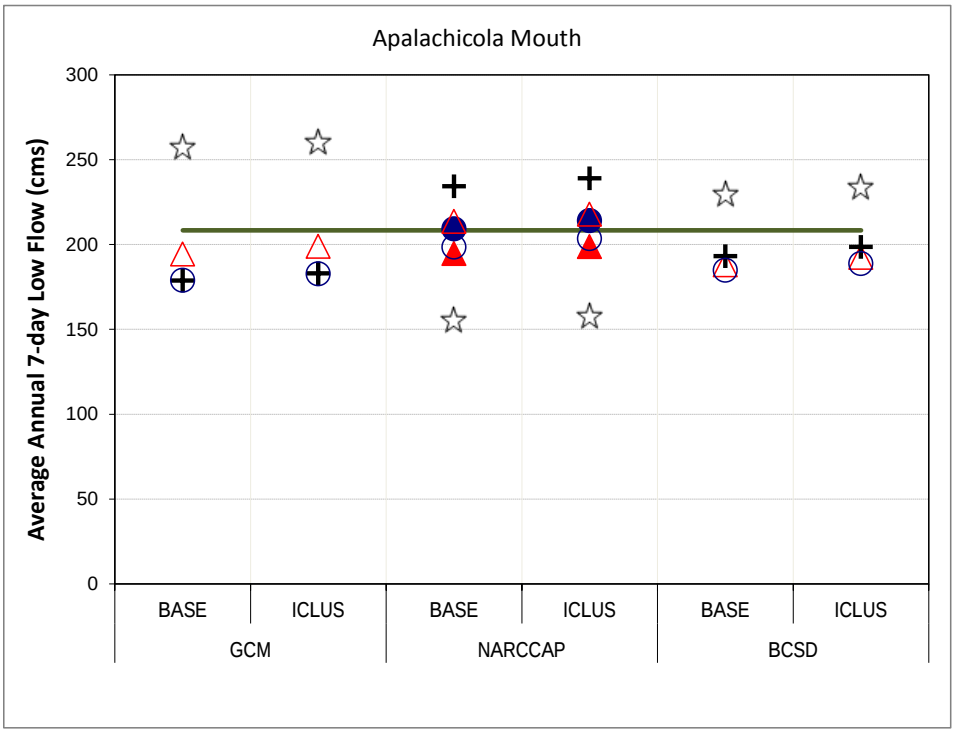

Figure 3. Average Annual 7-day Low Flow (cms), Apalachicola River at Mouth (HSPF)

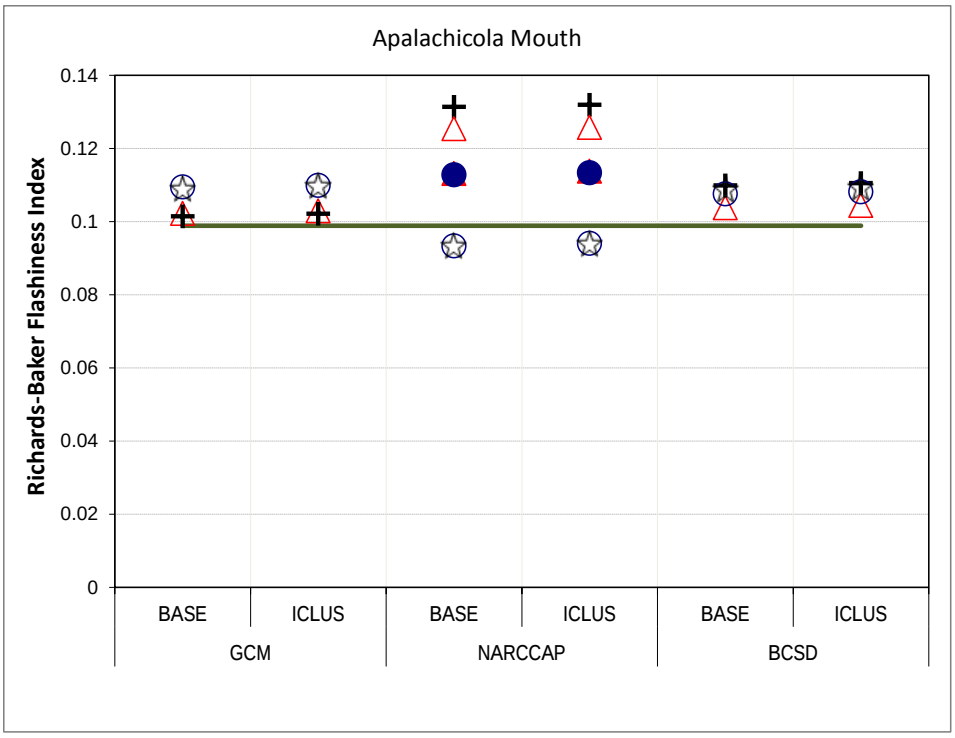

Figure 4. Richards-Baker Flashiness Index, Average Annual 7-day Low Flow (cms), Apalachicola River at Mouth (HSPF)

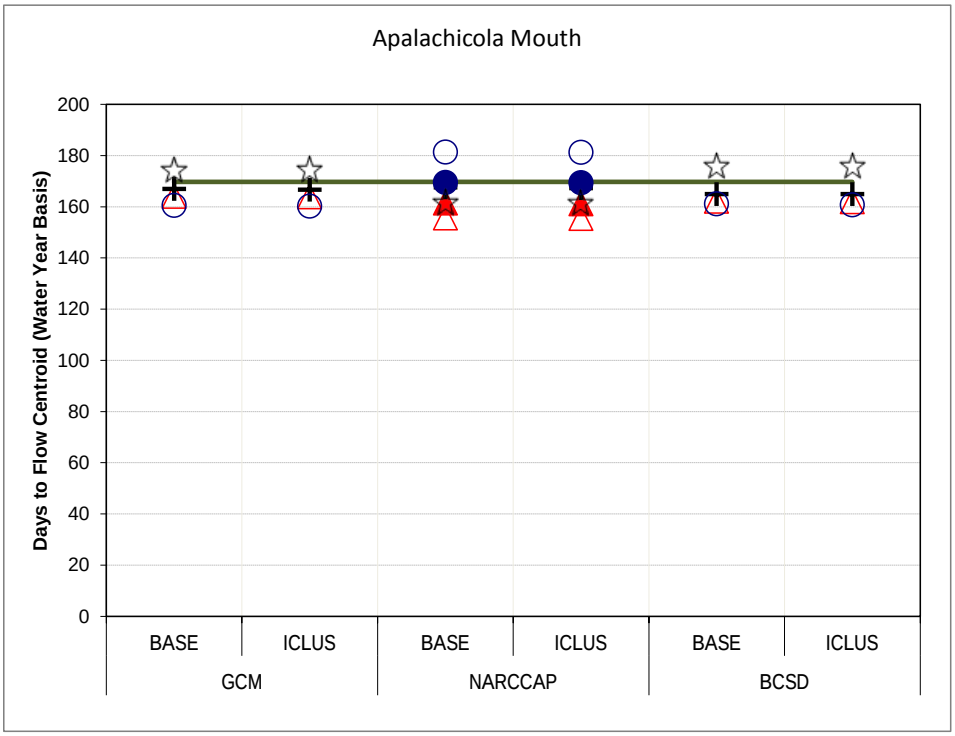

Figure 5. Days to Flow Centroid (Water Year Basis), Apalachicola River at Mouth (HSPF)

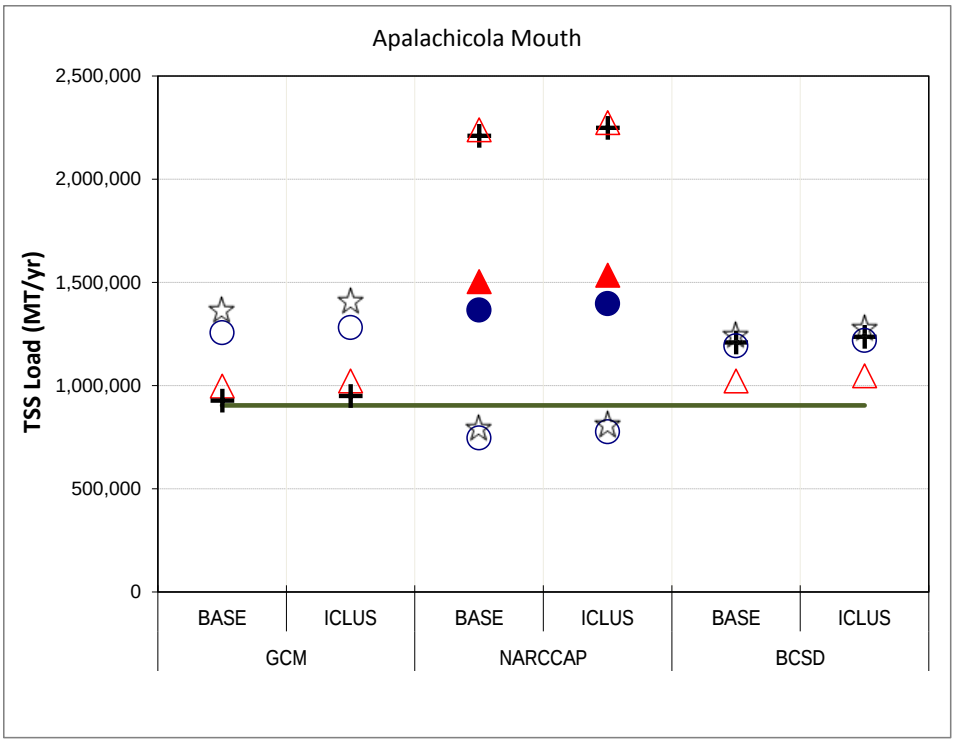

Figure 6. TSS Load (MT/yr), Apalachicola River at Mouth (HSPF)

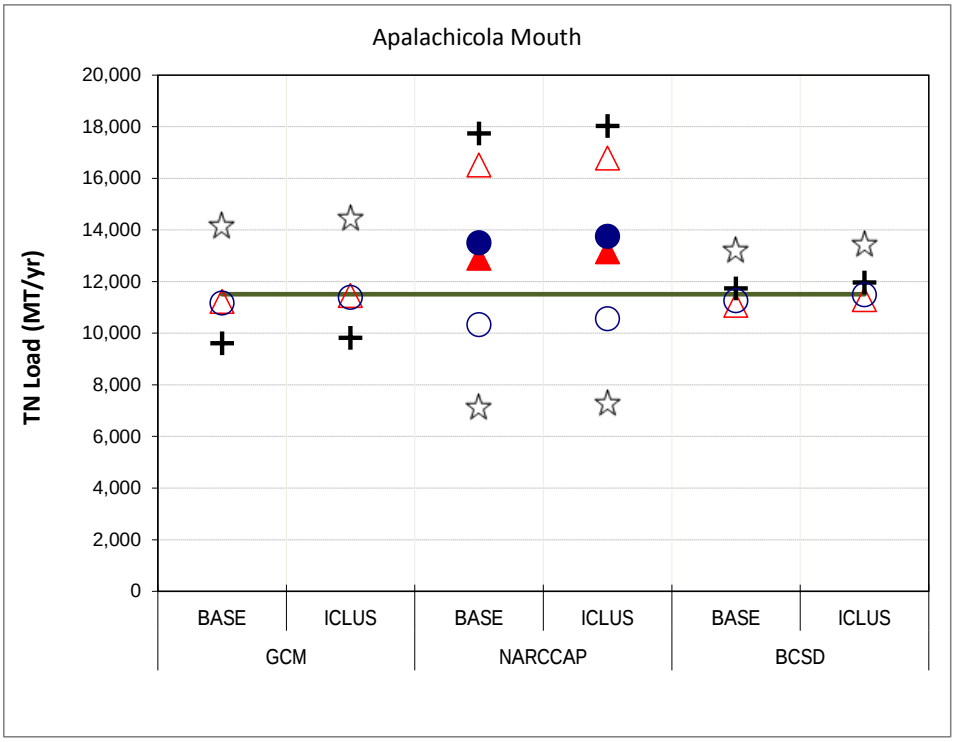

Figure 7. TN Load (MT/yr), Apalachicola River at Mouth (HSPF)

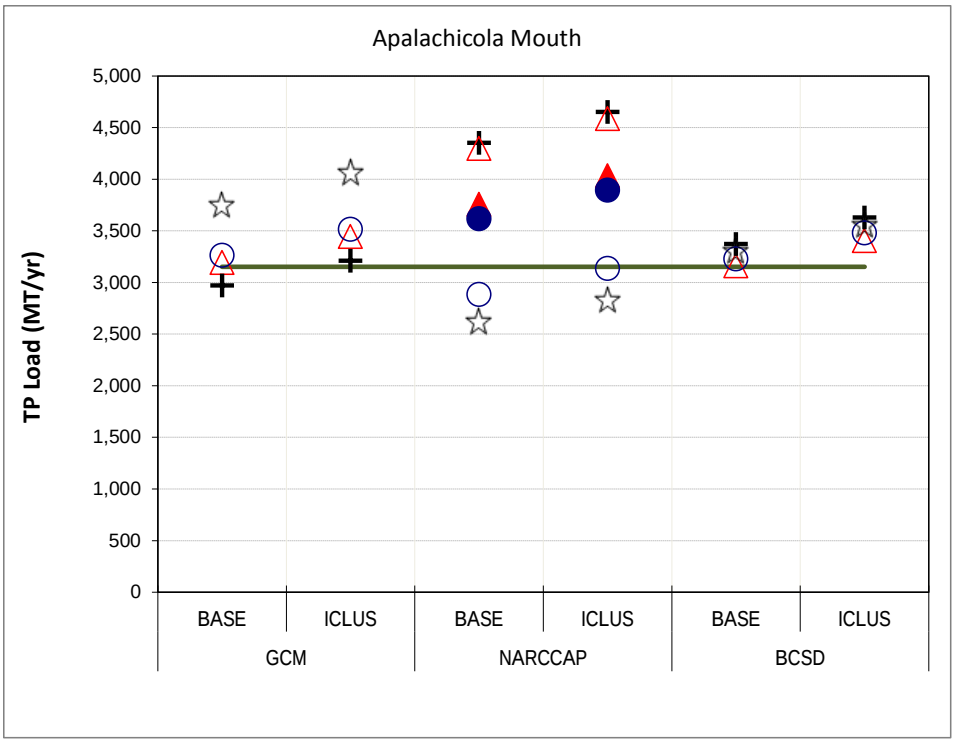

Figure 8. TP Load (MT/yr), Apalachicola River at Mouth (HSPF)

Results at Multiple Stations

Table 1. Summary of Range of Change Relative to Existing Conditions for NARCCAP Dynamically Downscaled Scenarios, Apalachicola-Chattahoochee-Flint Basin HSPF Model

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Flint River near Montezuma (gage 02349605)								
Flow	-18.62%	8.70%	6.49%	20.02%	-18.44%	8.67%	6.47%	19.92%
TSS	-13.15%	40.66%	41.77%	94.31%	-15.22%	32.89%	33.16%	76.35%
TN	-23.92%	17.08%	14.35%	36.43%	-23.37%	16.27%	13.57%	34.78%
TP	-15.02%	21.84%	18.58%	41.91%	-14.72%	19.58%	16.26%	37.40%
Chattahoochee River near Cornelia (gage 02331600)								
Flow	-5.84%	5.18%	4.56%	11.13%	-5.82%	5.19%	4.56%	11.11%
TSS	20.99%	51.30%	56.56%	99.56%	20.06%	47.02%	51.73%	90.90%
TN	-3.45%	11.31%	11.24%	21.95%	-3.52%	11.00%	10.91%	21.35%
TP	3.50%	19.70%	18.22%	32.21%	2.87%	18.66%	17.19%	30.49%
Peachtree Creek (gage 02336300)								
Flow	-11.06%	6.31%	5.58%	14.40%	-10.62%	6.32%	5.59%	14.24%
TSS	-6.08%	17.47%	14.88%	27.63%	-6.21%	16.92%	14.10%	25.95%
TN	-8.98%	6.82%	5.84%	13.47%	-8.76%	6.48%	5.39%	12.48%
TP	-9.95%	12.15%	9.31%	18.03%	-9.98%	11.86%	9.02%	17.51%
Chattahoochee at Atlanta (gage 02336000)								
Flow	-13.84%	0.51%	0.07%	8.41%	-13.36%	0.89%	0.41%	8.65%
TSS	-9.66%	22.22%	21.98%	47.03%	-10.37%	19.29%	17.43%	36.75%
TN	-8.27%	3.57%	3.35%	10.66%	-8.55%	3.37%	3.06%	9.91%
TP	-9.55%	10.03%	7.95%	19.82%	-10.73%	8.98%	6.77%	17.76%
Ichawaynochaway Creek (gage 02353500)								
Flow	-18.49%	9.21%	5.64%	23.80%	-18.48%	9.21%	5.64%	23.80%
TSS	-0.63%	138.28%	140.22%	282.06%	-0.64%	137.95%	139.86%	281.35%
TN	-25.45%	20.94%	14.52%	45.86%	-25.45%	20.93%	14.51%	45.85%
TP	-15.16%	38.74%	33.16%	77.57%	-15.16%	38.72%	33.14%	77.51%
Chattahoochee River at West Point (gage 02339500)								

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Flow	-14.64%	2.82%	1.71%	11.46%	-14.26%	3.00%	1.90%	11.54%
TSS	-11.13%	32.90%	31.91%	72.52%	-13.41%	26.00%	25.48%	58.86%
TN	-14.38%	6.47%	5.20%	18.35%	-14.34%	6.24%	4.96%	17.66%
TP	-10.14%	10.65%	8.03%	20.33%	-11.18%	10.21%	7.43%	19.53%
Chattahoochee River near Columbia (gage 02343801)								
Flow	-17.57%	5.35%	3.73%	16.78%	-17.30%	5.40%	3.79%	16.72%
TSS	-7.19%	55.37%	57.84%	127.37%	-6.08%	53.44%	55.81%	122.70%
TN	-25.53%	13.71%	11.00%	36.63%	-25.29%	13.47%	10.77%	35.95%
TP	-12.29%	11.02%	8.54%	23.25%	-12.62%	10.86%	8.29%	22.77%
Flint River at Newton (gage 02353000)								
Flow	-17.76%	9.62%	6.69%	21.63%	-17.66%	9.60%	6.68%	21.56%
TSS	-1.54%	61.44%	59.67%	131.16%	-3.84%	56.79%	54.98%	121.31%
TN	-22.22%	19.43%	15.16%	40.01%	-22.16%	19.16%	14.91%	39.49%
TP	-12.51%	24.78%	20.68%	46.91%	-12.75%	23.48%	19.40%	44.40%
Apalachicola River at Seminole (gage 02358000)								
Flow	-18.57%	7.23%	4.89%	19.75%	-18.38%	7.24%	4.91%	19.68%
TSS	-8.60%	68.64%	70.10%	150.58%	-7.25%	65.74%	67.07%	144.64%
TN	-26.90%	18.07%	14.00%	43.52%	-26.77%	17.86%	13.81%	43.01%
TP	-13.60%	16.94%	13.63%	34.81%	-13.77%	16.36%	13.03%	33.52%
Apalachicola Mouth								
Flow	-20.76%	6.58%	4.66%	21.68%	-20.57%	6.60%	4.68%	21.59%
TSS	-17.46%	58.76%	63.45%	147.71%	-16.56%	57.62%	62.15%	144.58%
TN	-37.64%	14.70%	13.18%	54.13%	-37.39%	14.64%	13.09%	53.65%
TP	-16.43%	16.96%	13.90%	38.06%	-16.39%	16.47%	13.37%	36.72%

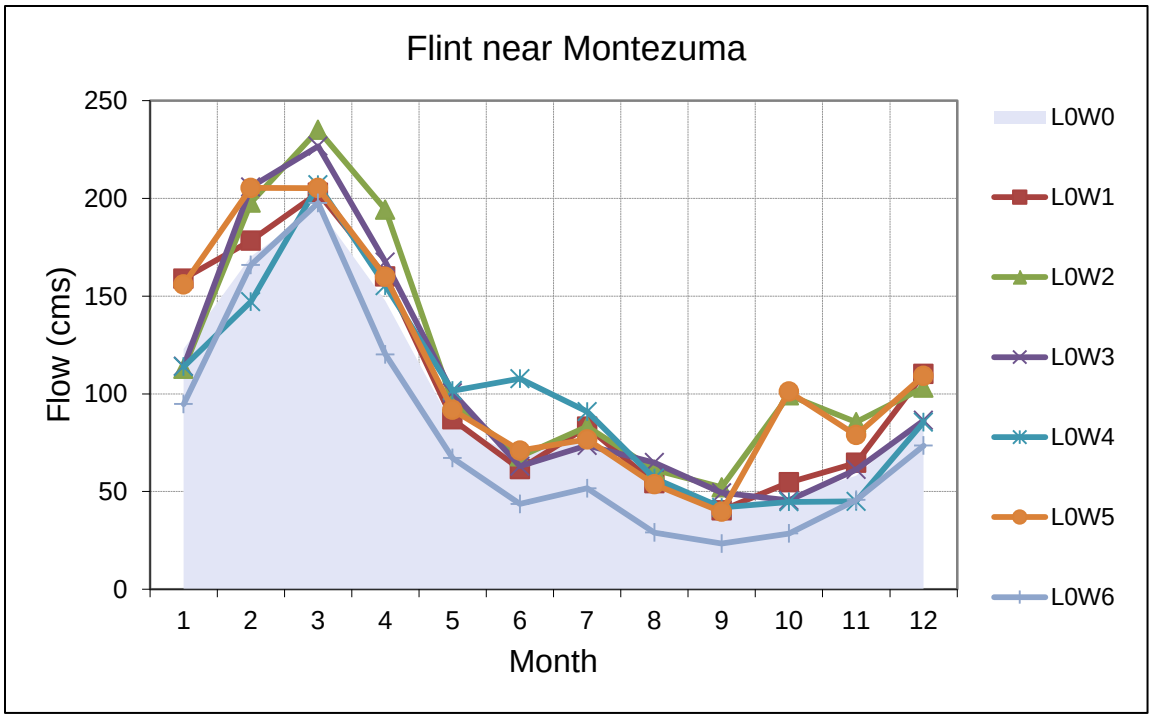

Figure 9. Monthly Average Flows, Flint River near Montezuma (HSPF)

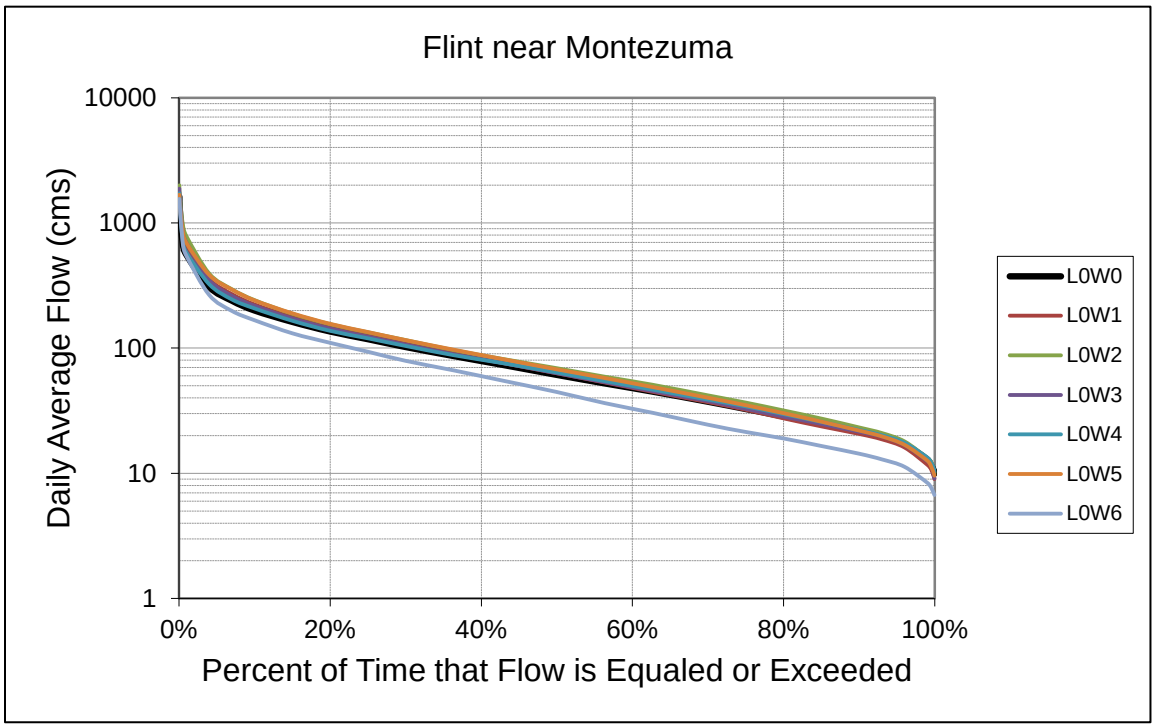

Figure 10. Flow Duration, Flint River near Montezuma (HSPF)

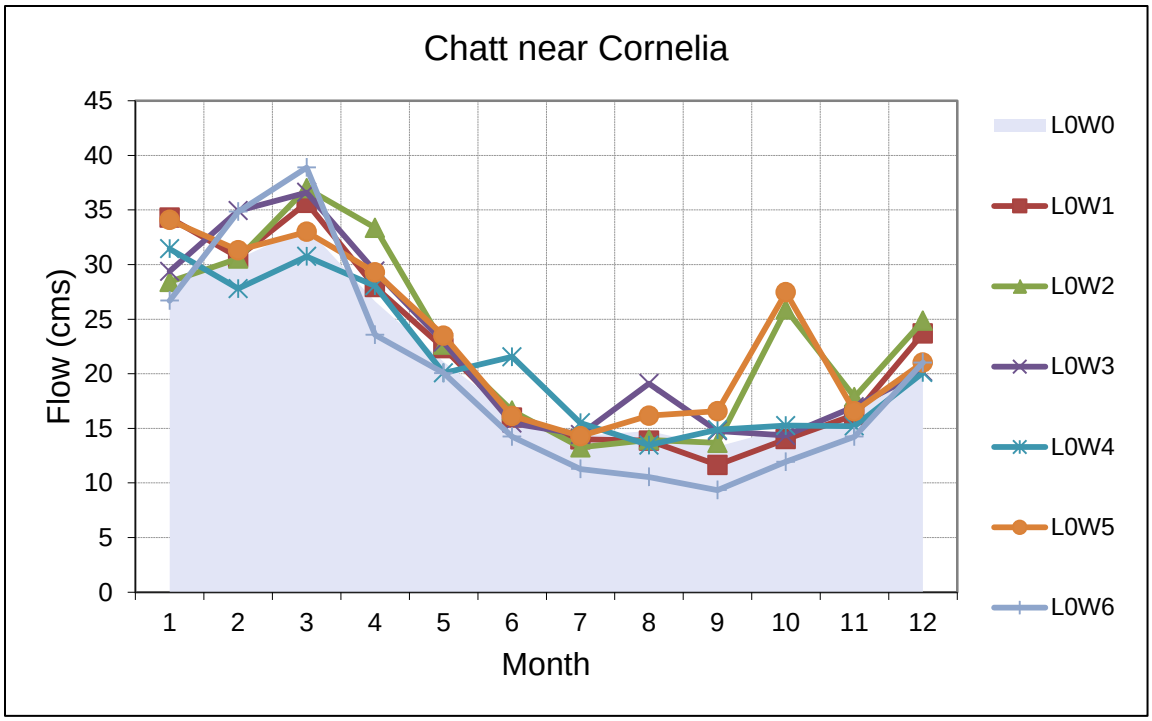

Figure 11. Monthly Average Flows, Chattahoochee River near Cornelia (HSPF)

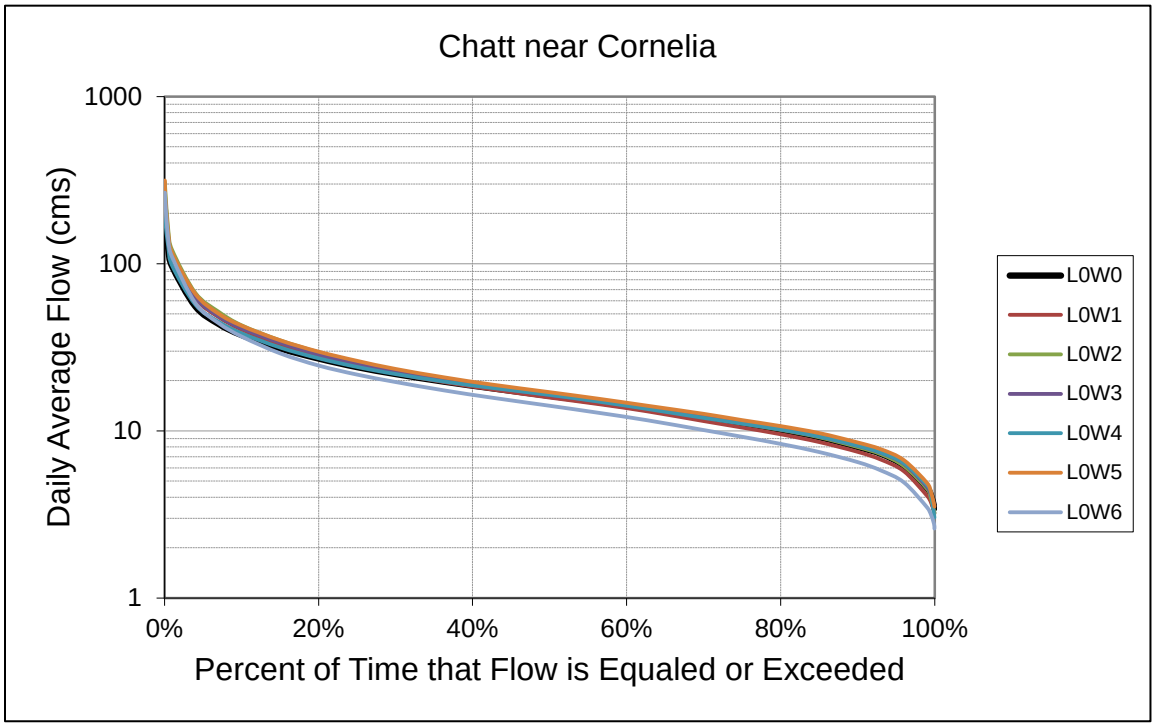

Figure 12. Flow Duration, Chattahoochee River near Cornelia (HSPF)

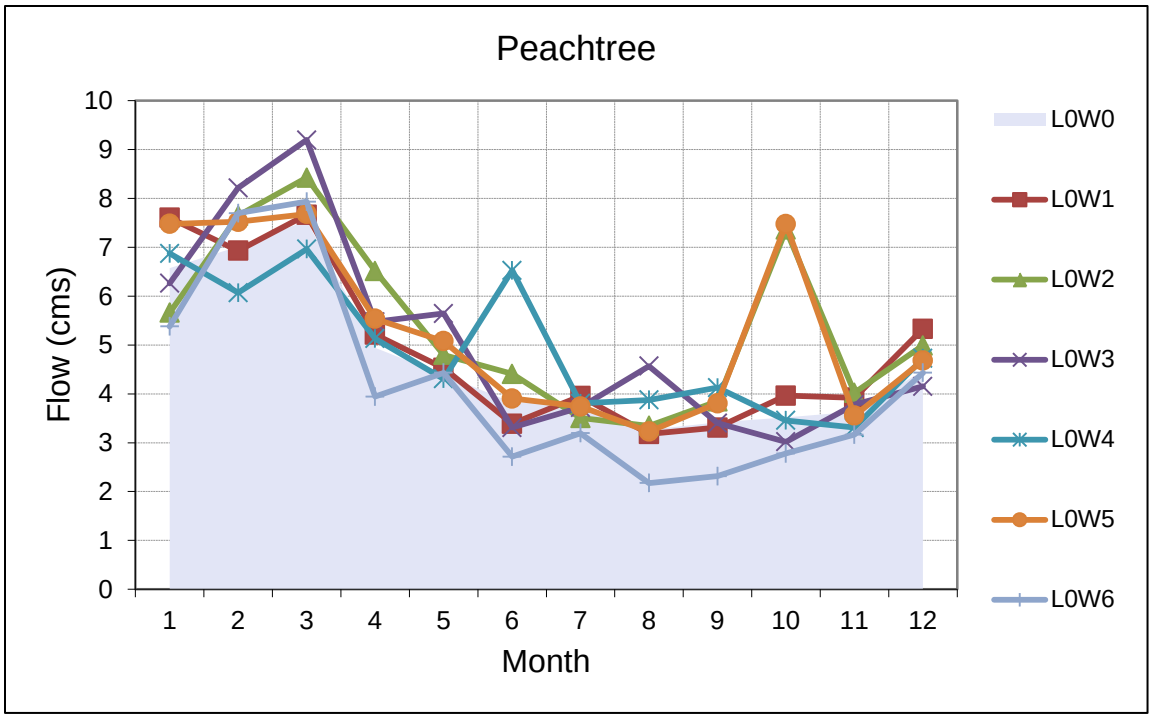

Figure 13. Monthly Average Flows, Peachtree Creek (HSPF)

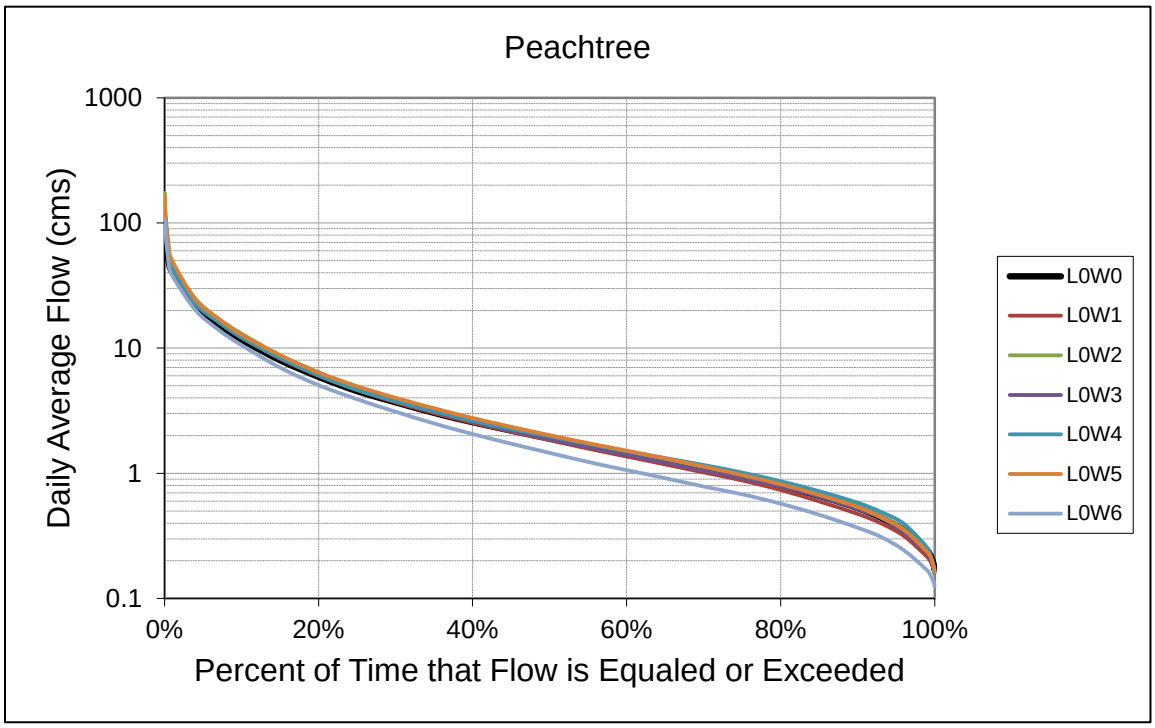

Figure 14. Flow Duration, Peachtree Creek (HSPF)

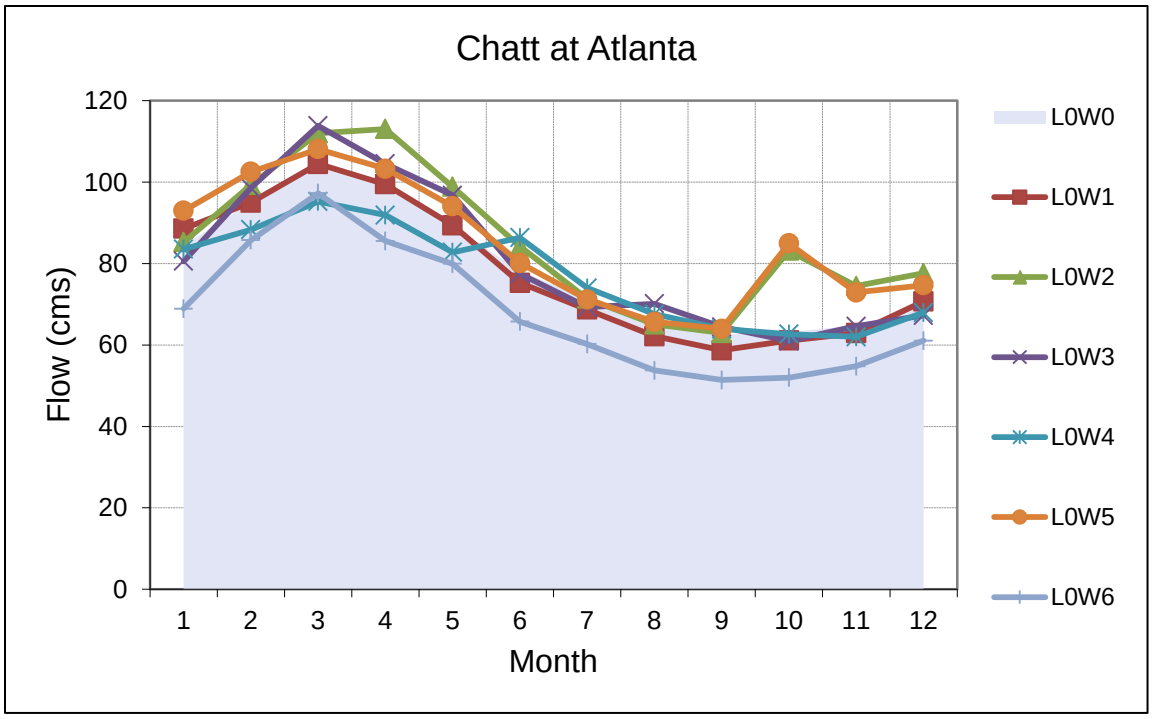

Figure 15. Monthly Average Flows, Chattahoochee River at Atlanta (HSPF)

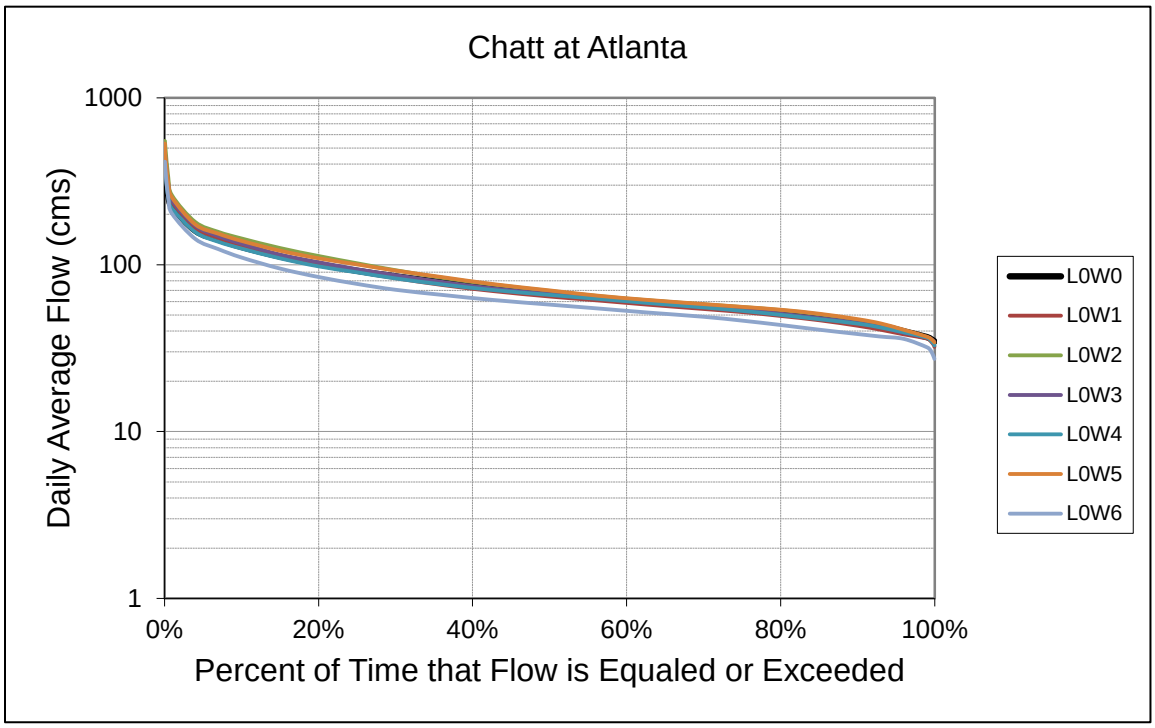

Figure 16. Flow Duration, Chattahoochee River at Atlanta (HSPF)

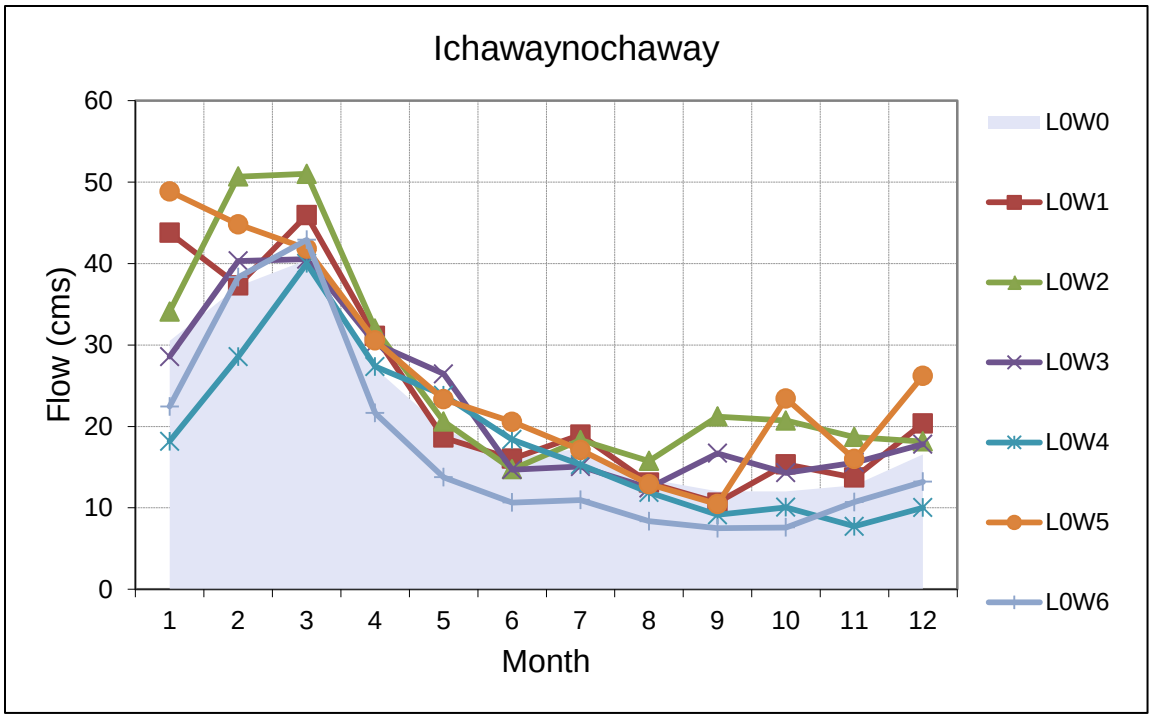

Figure 17. Monthly Average Flows, Ichawaynochaway Creek (HSPF)

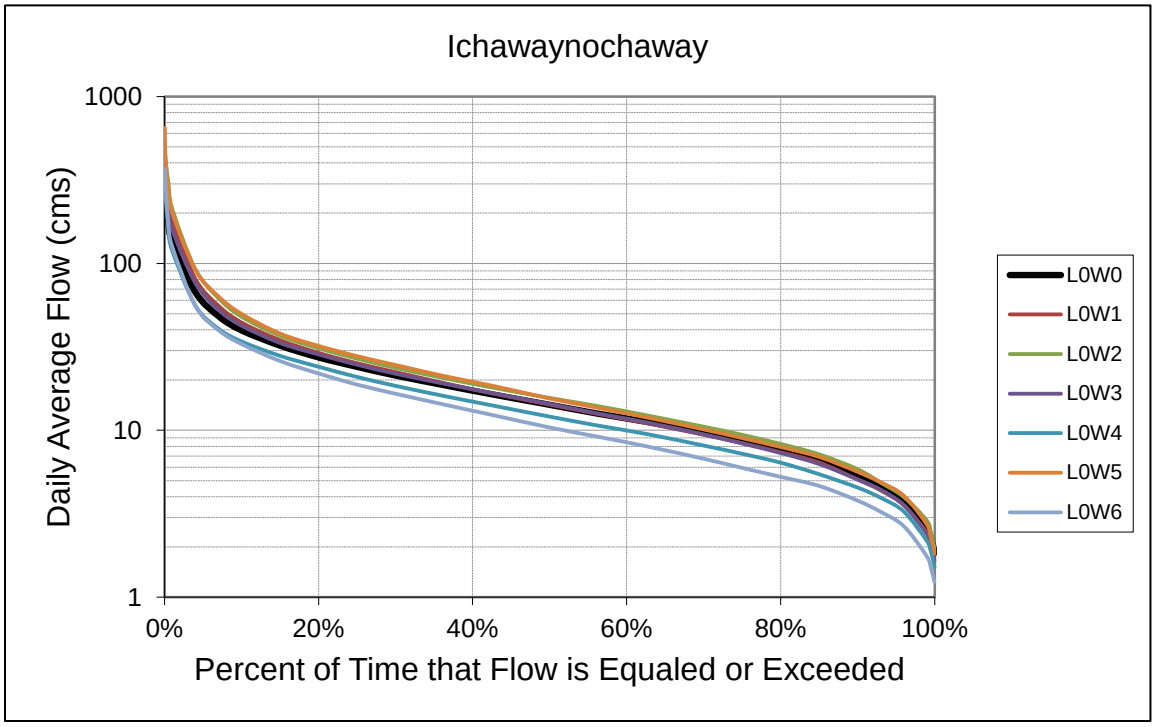

Figure 18. Flow Duration, Ichawaynochaway Creek (HSPF)

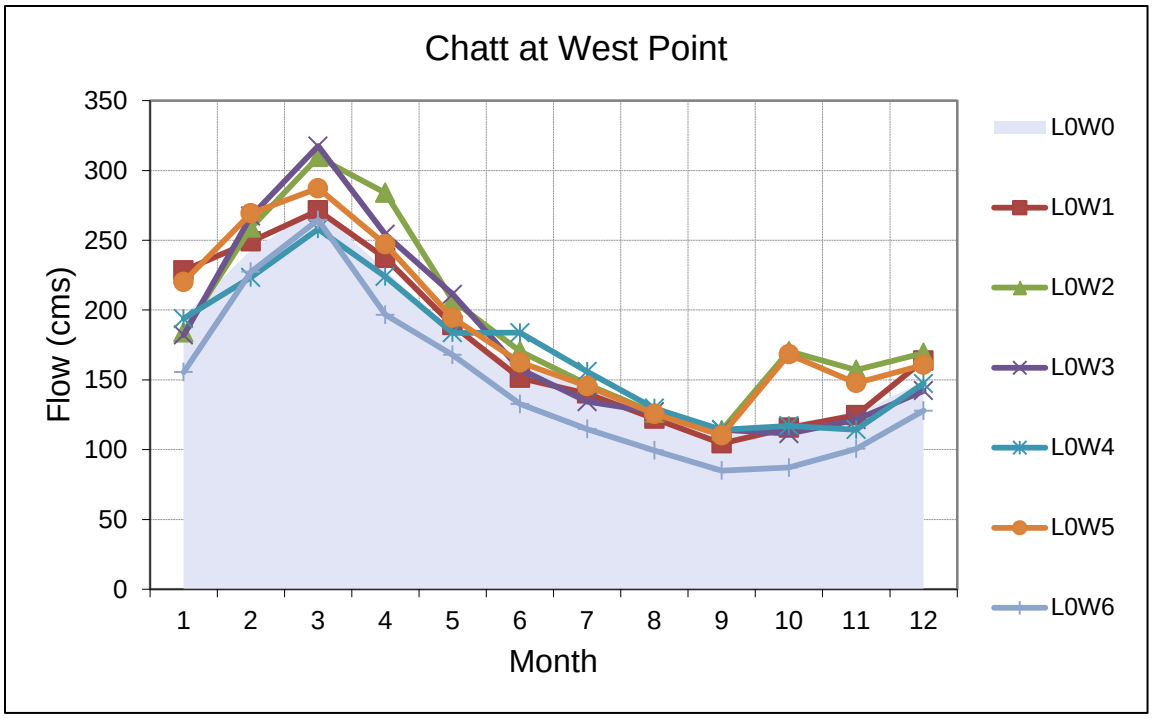

Figure 19. Monthly Average Flows, Chattahoochee River at West Point (HSPF)

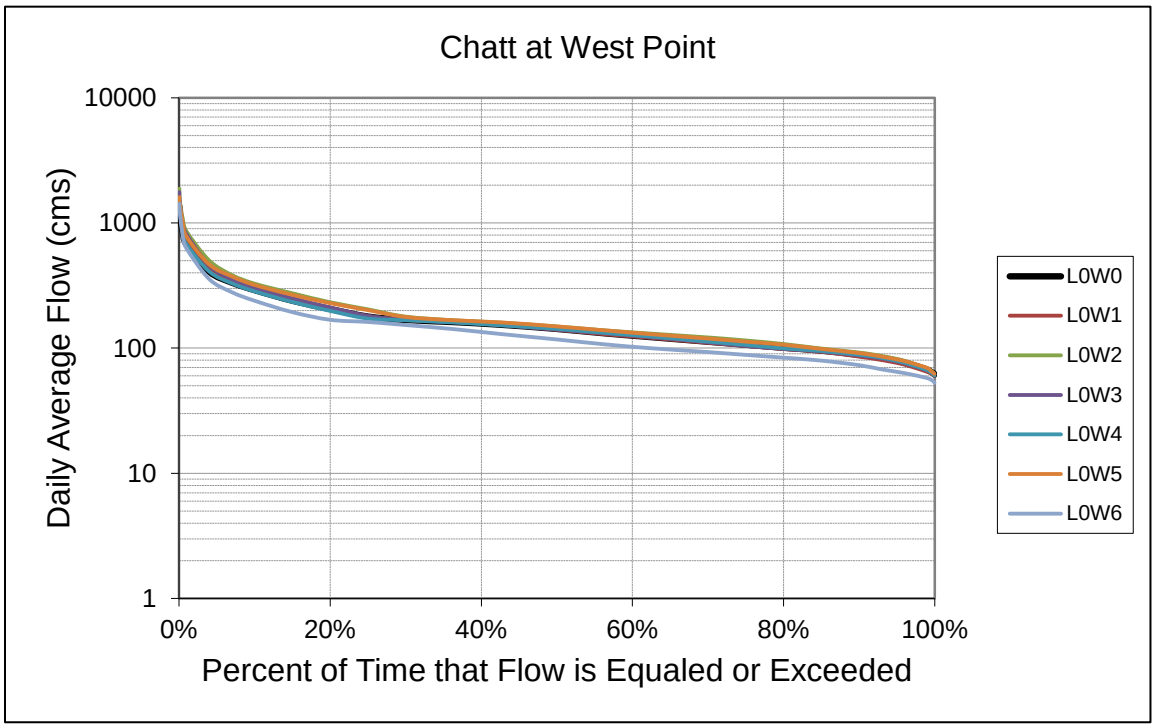

Figure 20. Flow Duration, Chattahoochee River at West Point (HSPF)

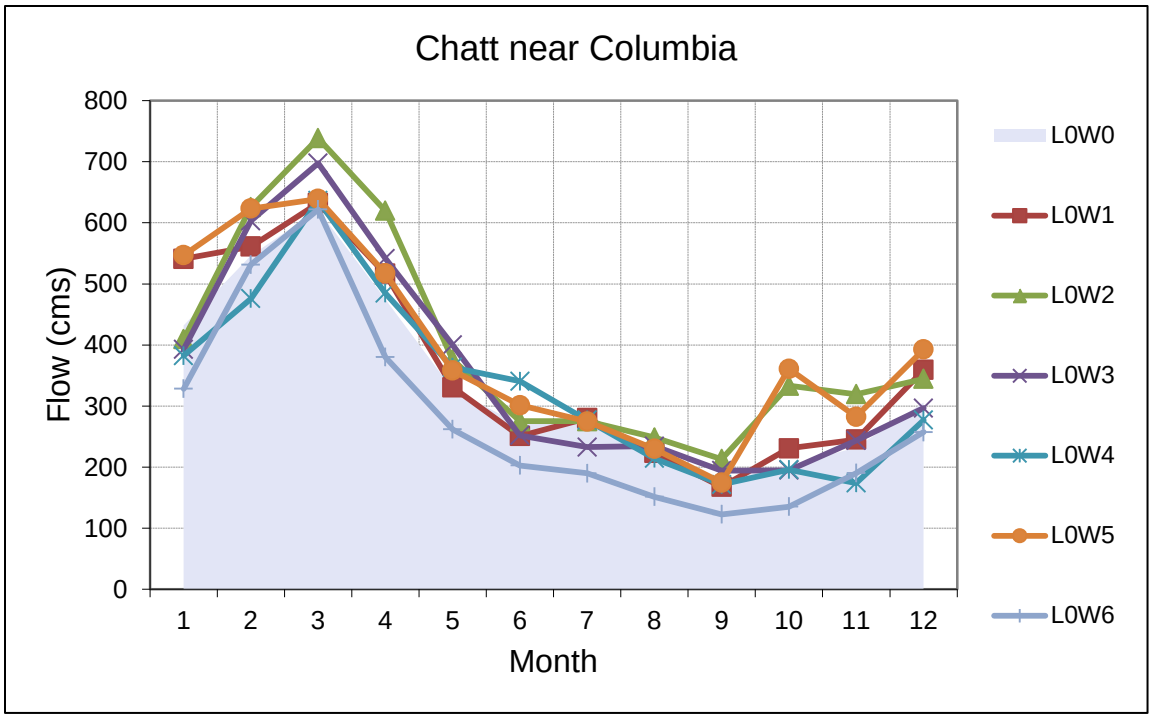

Figure 21. Monthly Average Flows, Chattahoochee River near Columbia (HSPF)

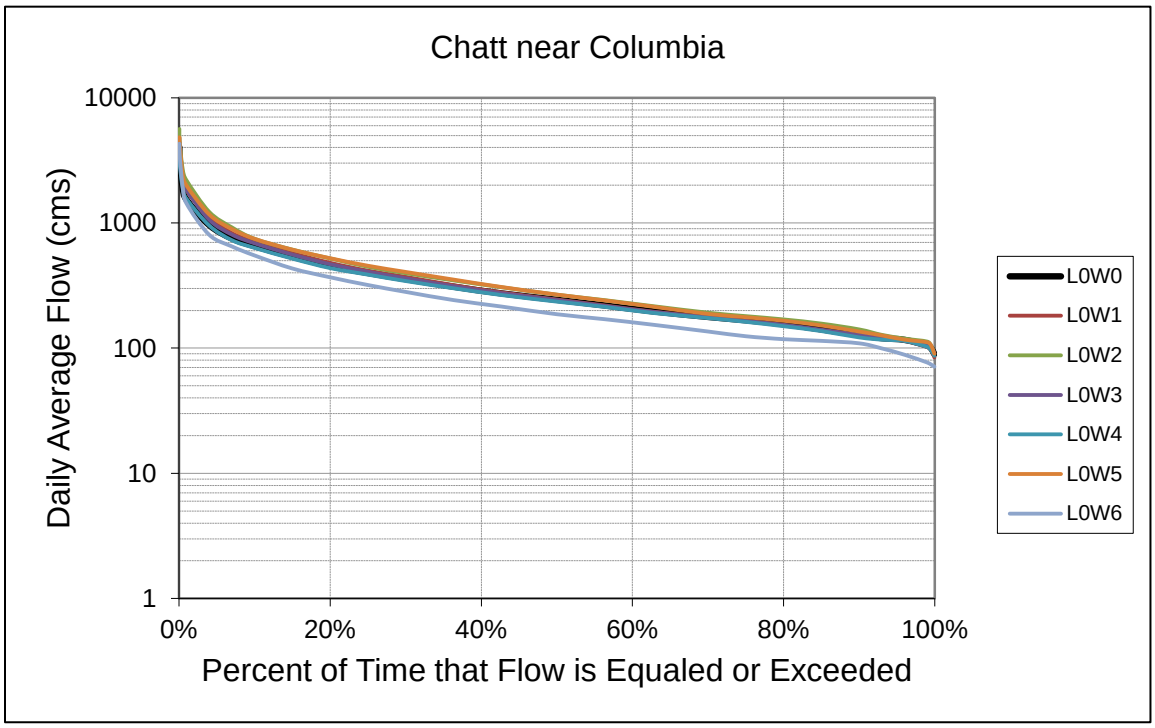

Figure 22. Flow Duration, Chattahoochee River near Columbia (HSPF)

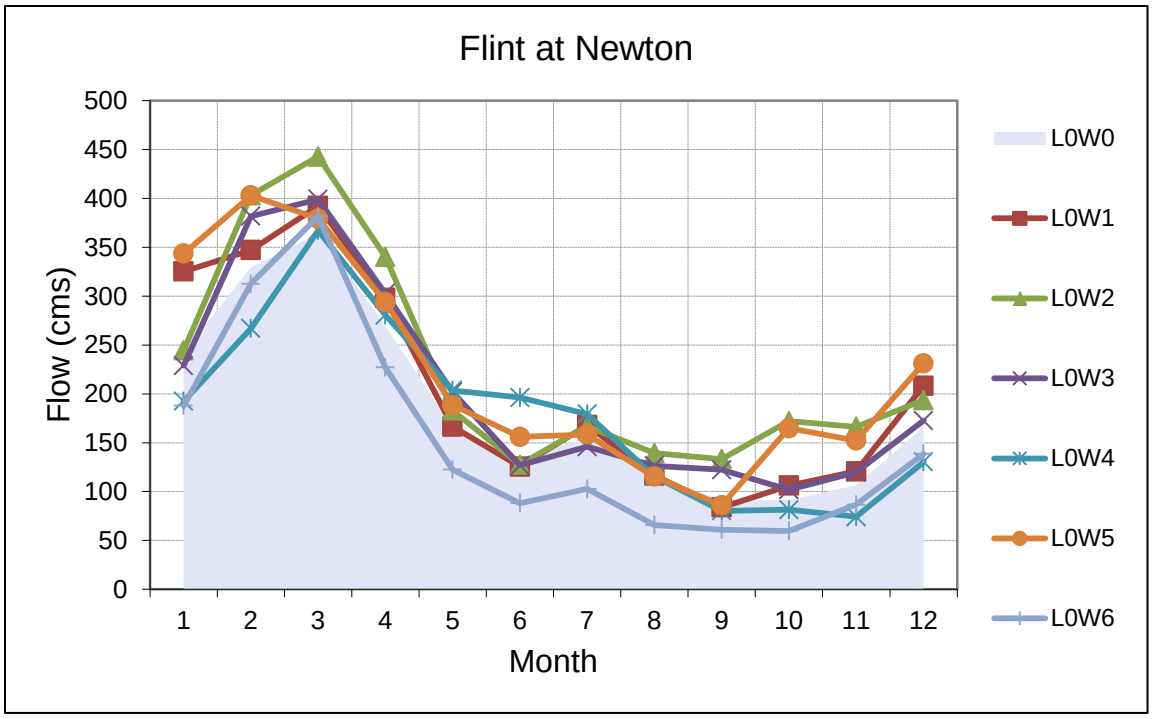

Figure 23. Monthly Average Flows, Flint River at Newton (HSPF)

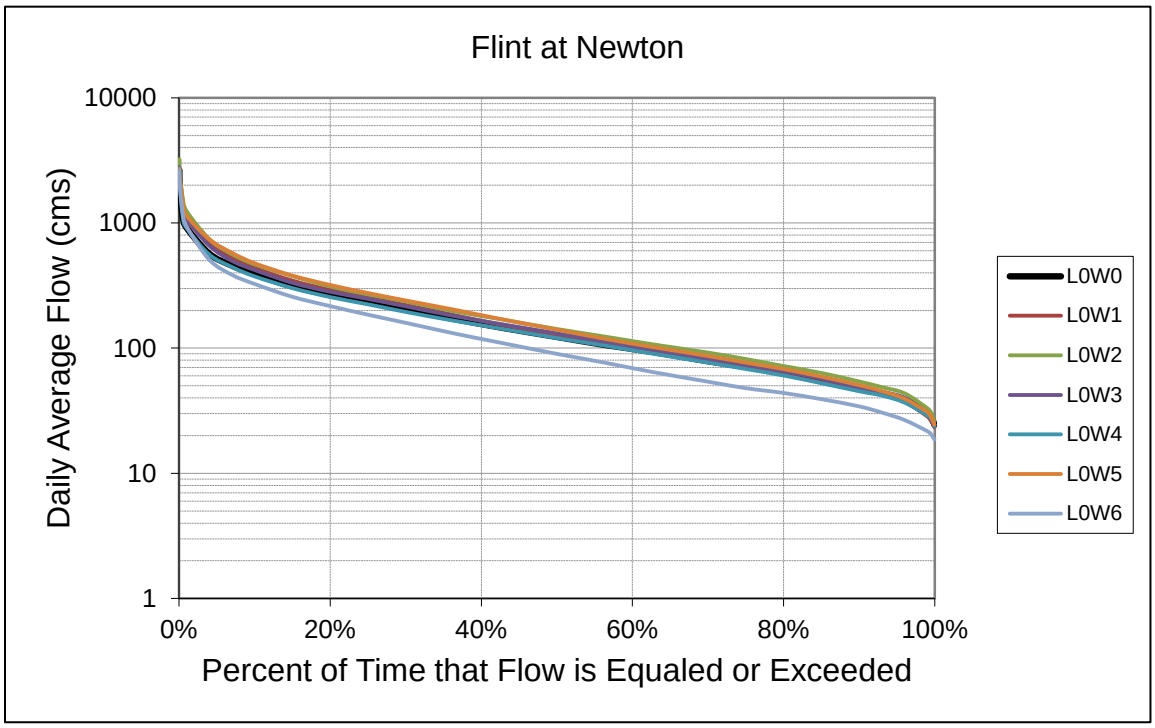

Figure 24. Flow Duration, Flint River at Newton (HSPF)

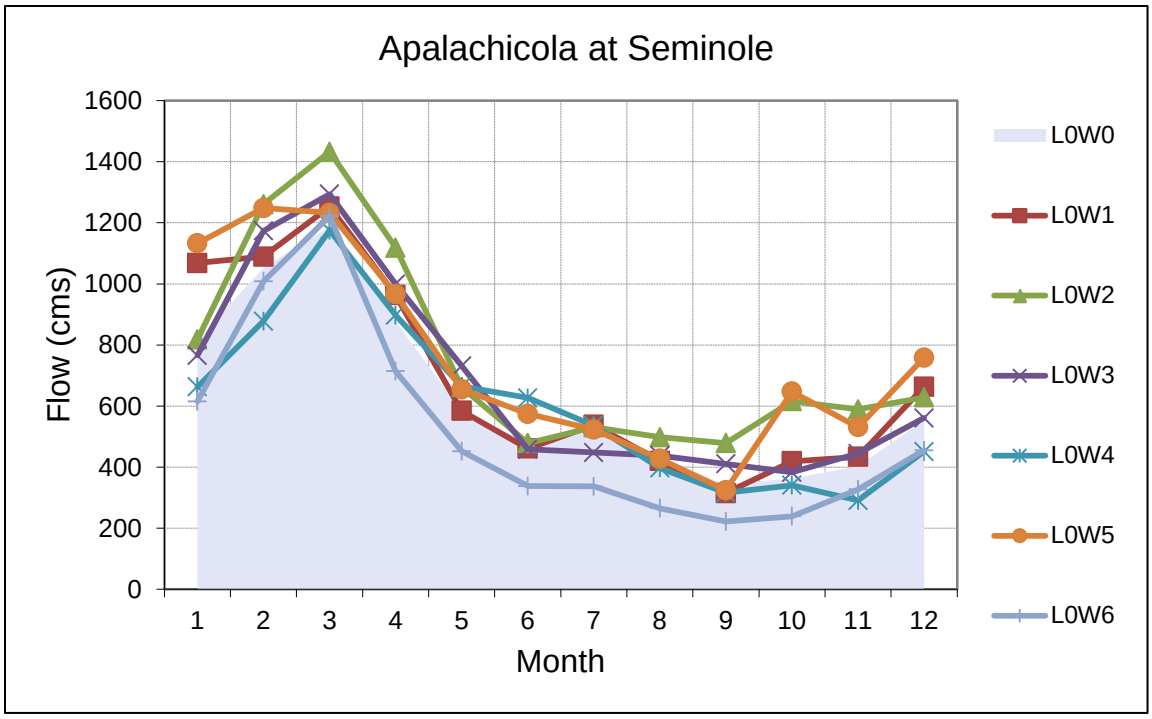

Figure 25. Monthly Average Flows, Apalachicola River at Seminole (HSPF)

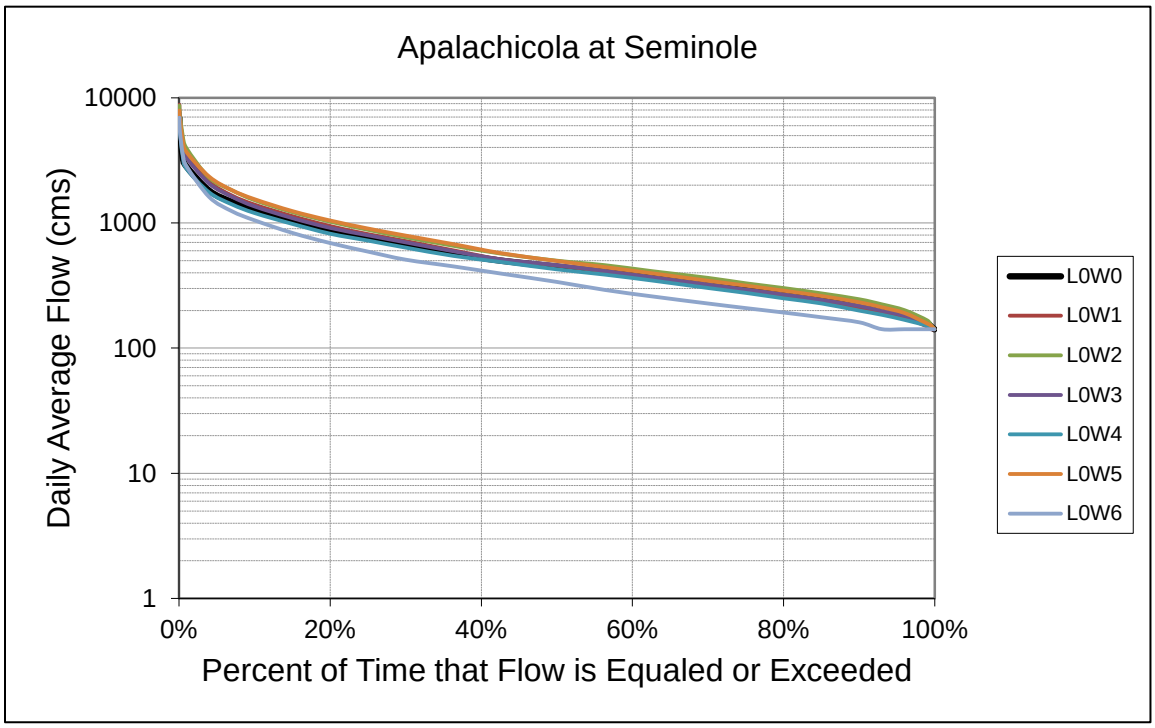

Figure 26. Flow Duration, Apalachicola River at Seminole (HSPF)

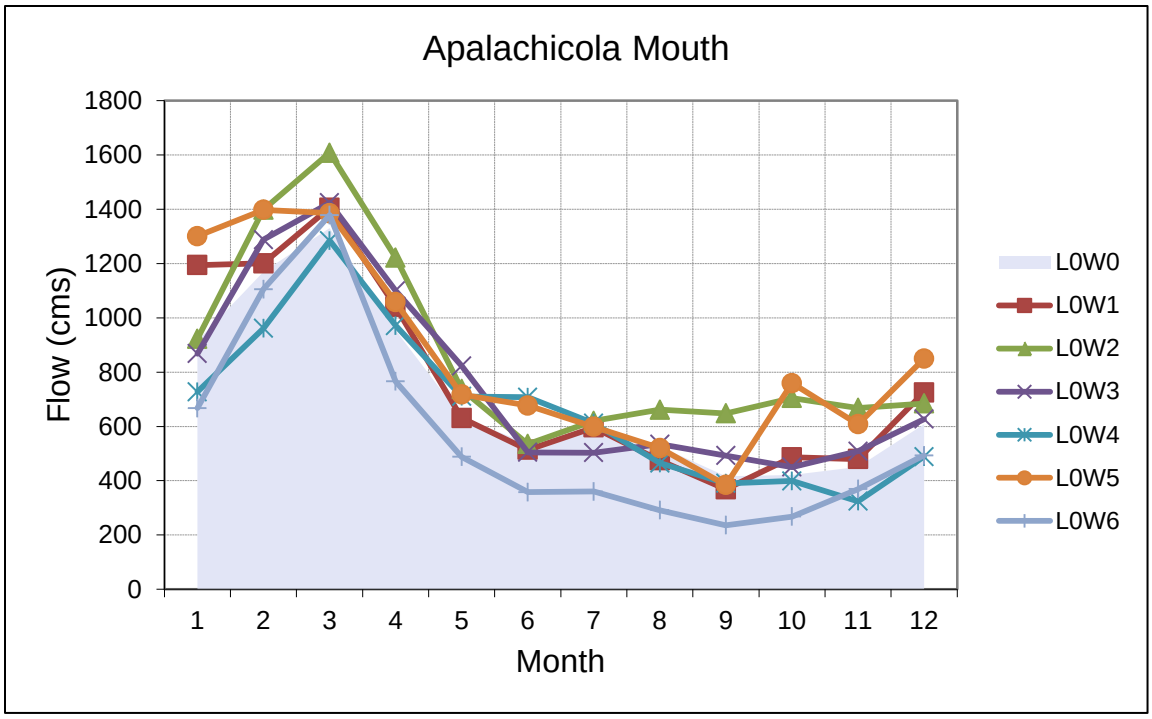

Figure 27. Monthly Average Flows, Apalachicola River at Mouth (HSPF)

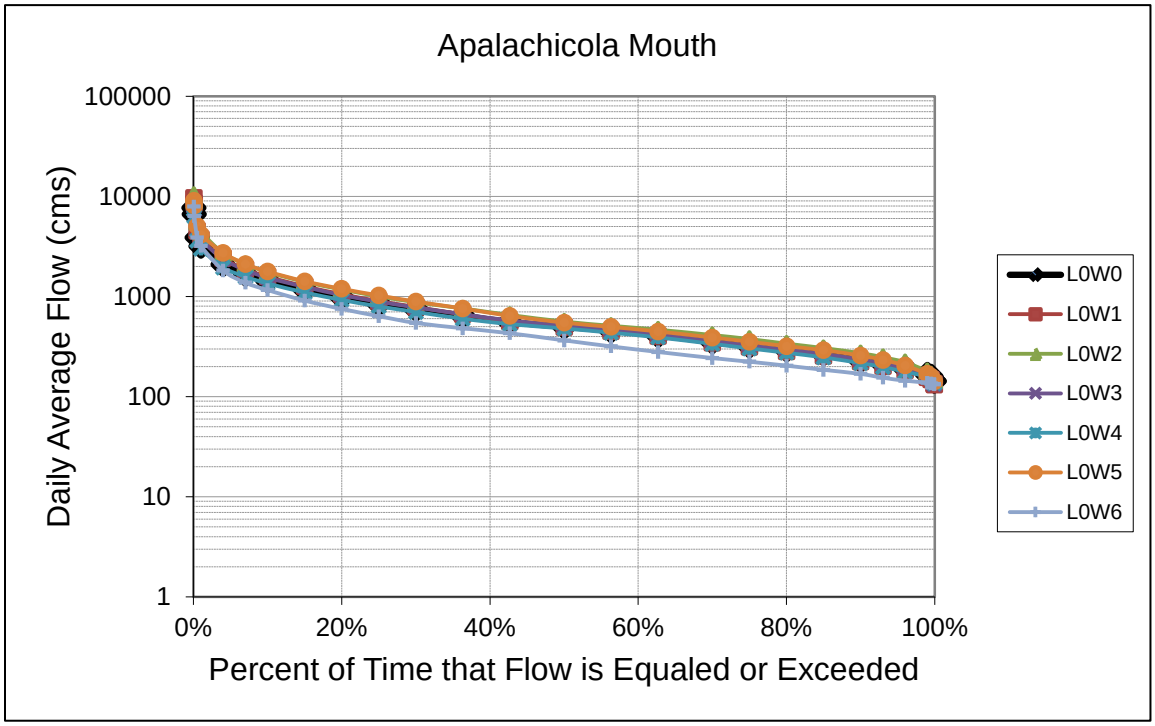

Figure 28. Flow Duration, Apalachicola River at Mouth (HSPF)

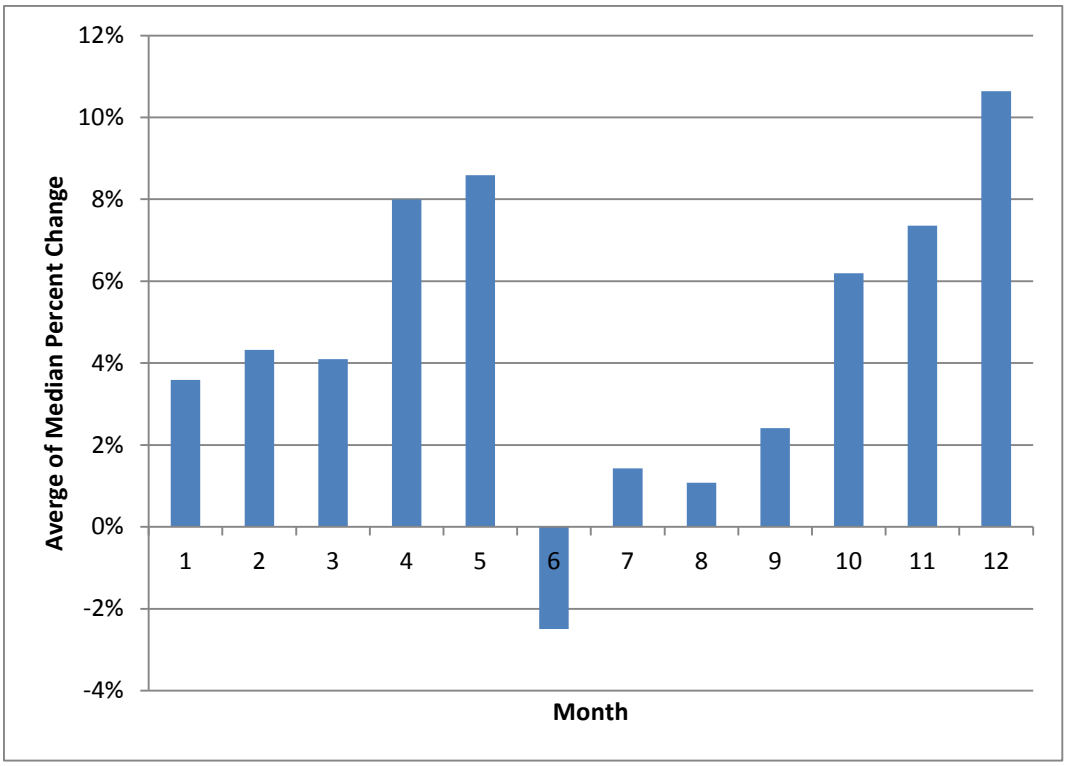

Figure 29. Average of Median Percent Change in Flow; NARCCAP Scenarios W1-W6 at all Stations, Apalachicola-Chattahoochee-Flint Basin (HSPF)

Apalachicola-Chattahoochee-Flint Basin, SWAT Model Results at Downstream Station

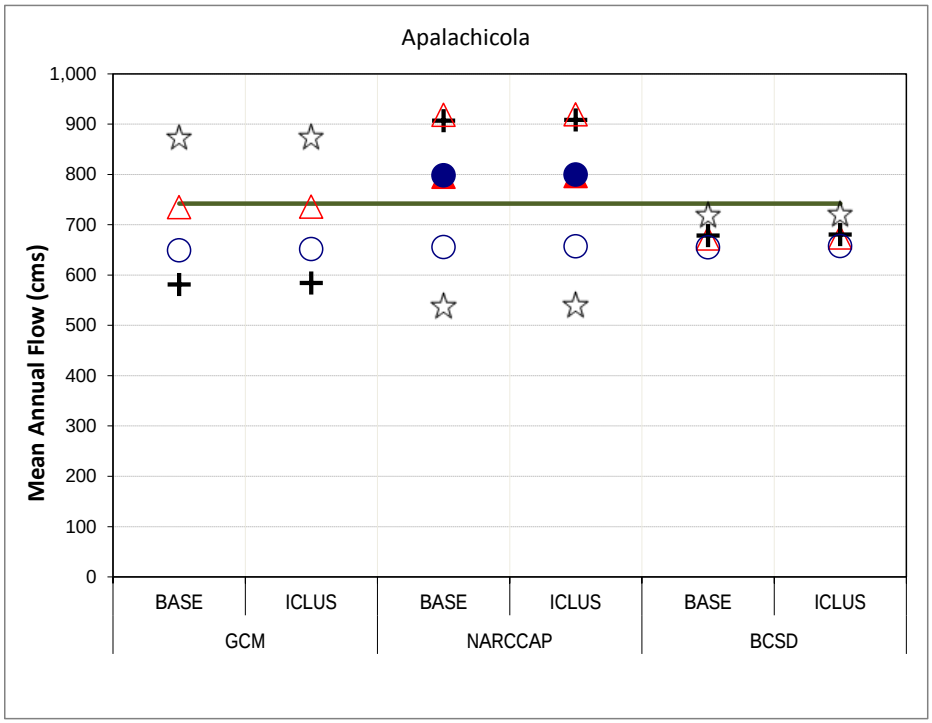

Figure 30. Mean Annual Flow, Apalachicola River at Mouth (SWAT)

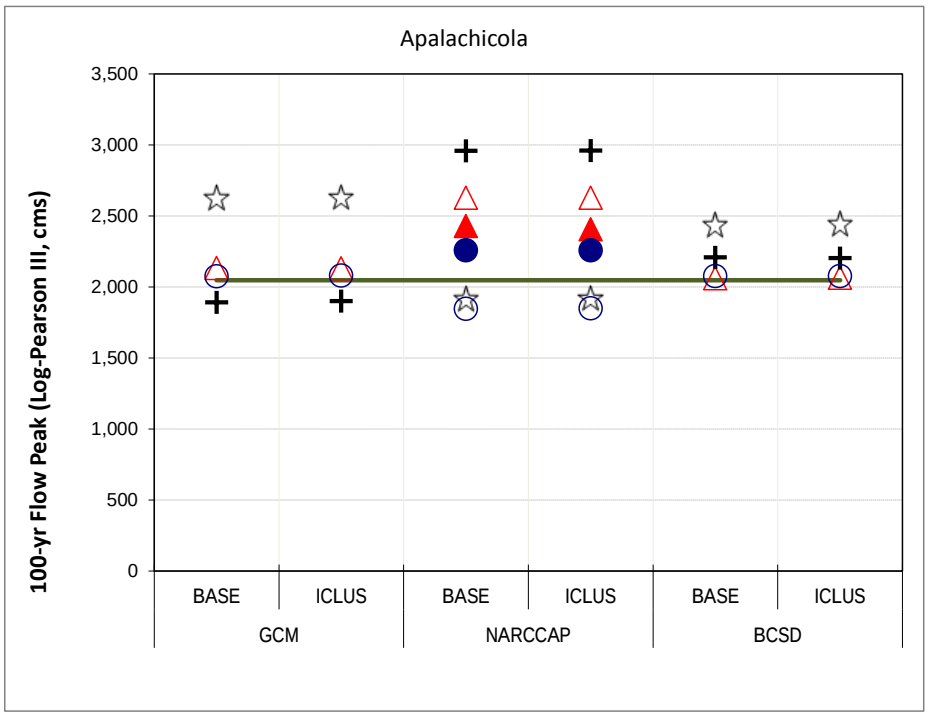

Figure 31. 100-yr flow Peak (Log-Pearson III), Apalachicola River at Mouth (SWAT)

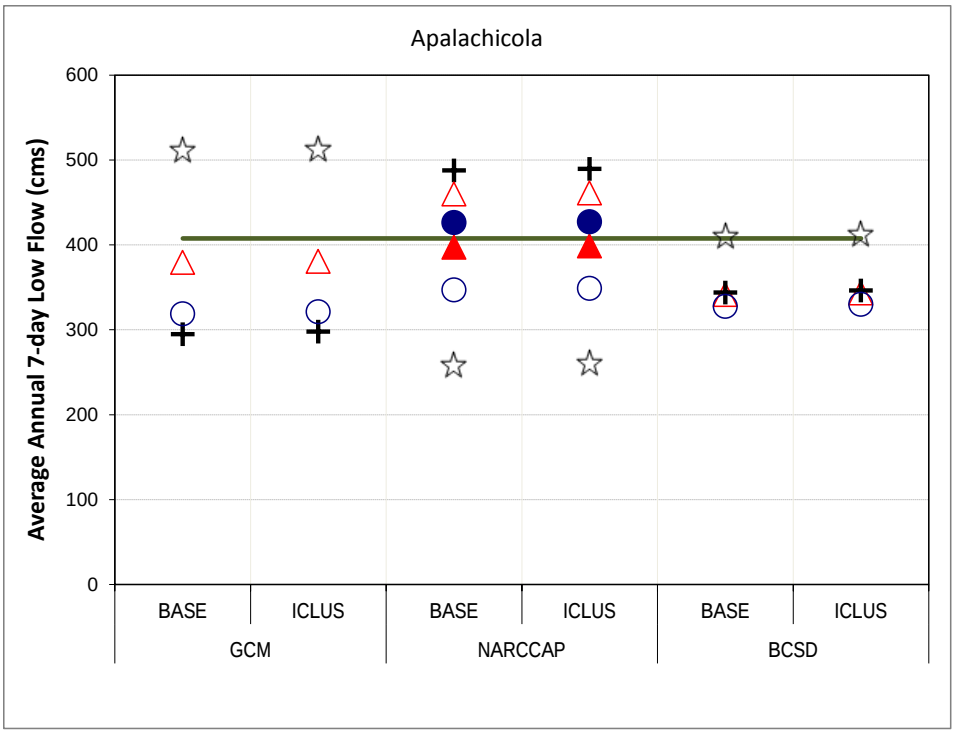

Figure 32. Average Annual 7-day Low Flow, Apalachicola River at Mouth (SWAT)

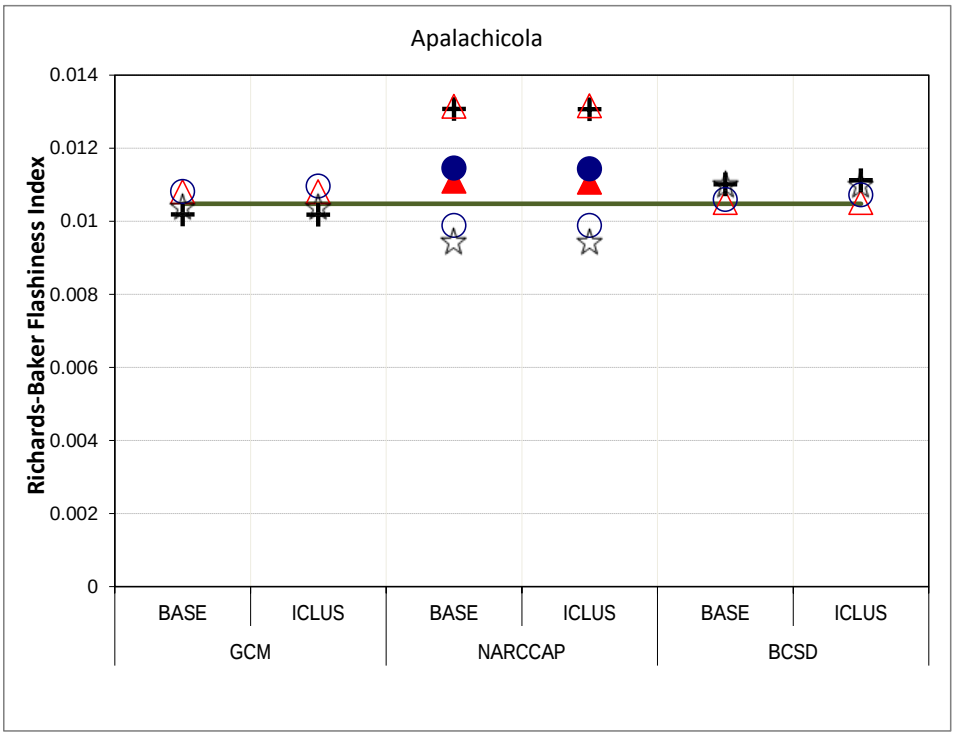

Figure 33. Richards-Baker Flashiness Index, Apalachicola River at Mouth (SWAT)

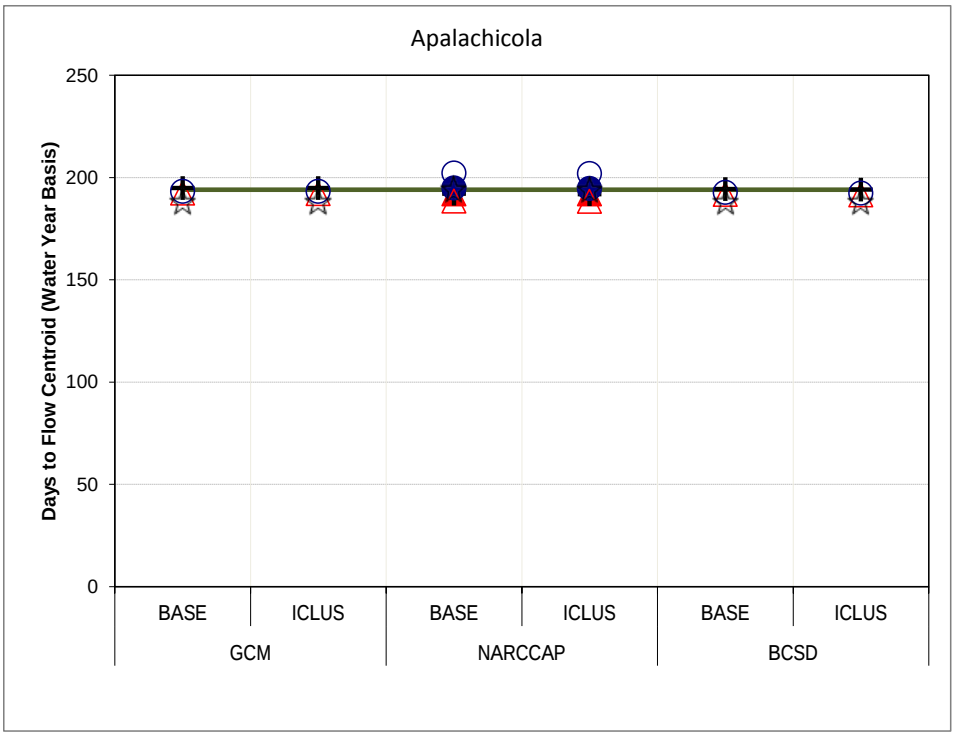

Figure 34. Days to Flow Centroid, Apalachicola River at Mouth (SWAT)

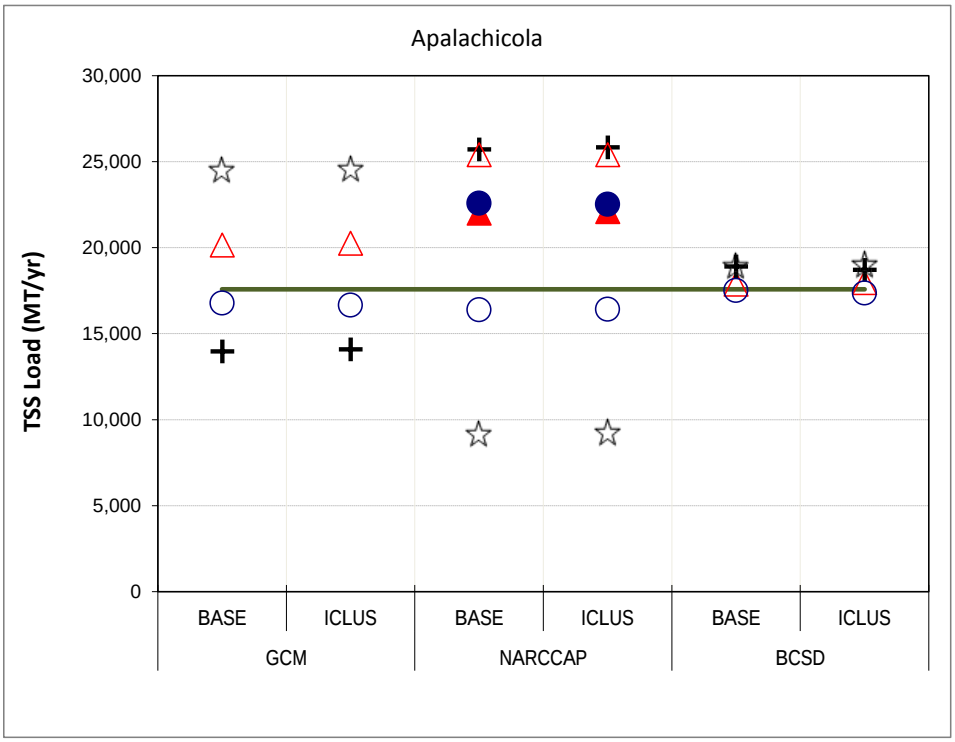

Figure 35. TSS Load, Apalachicola River at Mouth (SWAT)

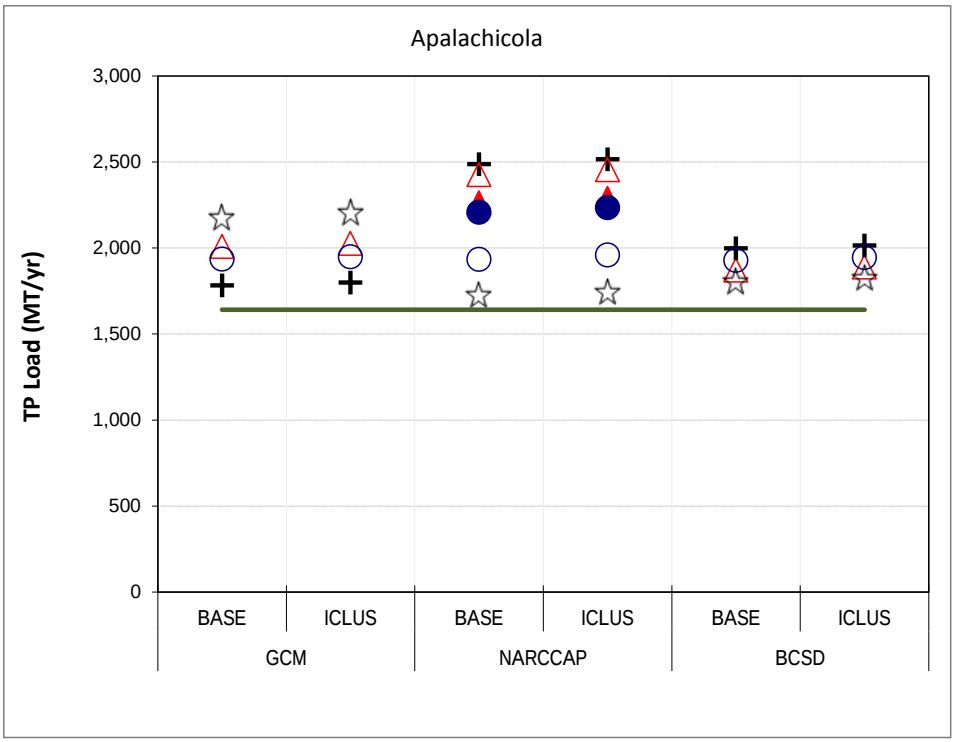

Figure 36. TP Load, Apalachicola River at Mouth (SWAT)

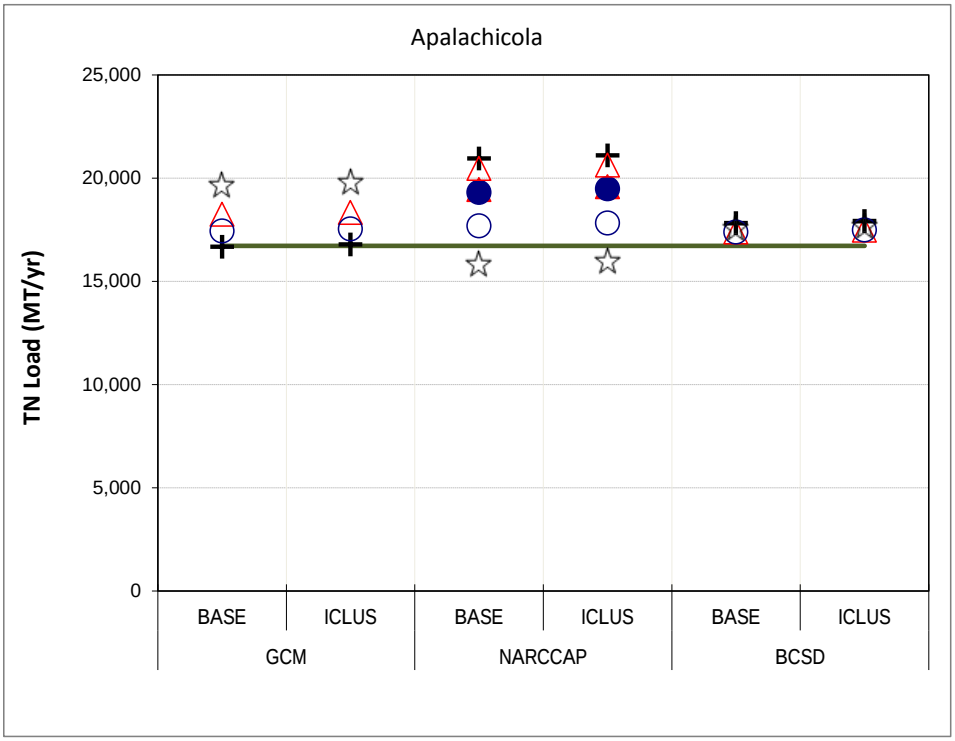

Figure 37. TN Load, Apalachicola River at Mouth (SWAT)

Results at Multiple Stations

Table 2. Summary of Range of Change Relative to Existing Conditions for NARCCAP Dynamically Downscaled Scenarios, Apalachicola-Chattahoochee-Flint Basin SWAT Model

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Chattahoochee at Atlanta HUC 03130001								
Flow	-4.97%	15.45%	14.11%	23.72%	-4.52%	15.17%	13.98%	23.28%
TSS	5.73%	40.72%	34.45%	49.87%	7.02%	35.31%	31.78%	46.32%
TN	3.07%	11.73%	10.27%	12.43%	5.05%	14.50%	13.06%	15.71%
TP	19.25%	35.55%	33.73%	38.87%	18.55%	37.32%	35.00%	41.04%
Middle Chattahoochee – Lake Harding HUC 03130002								
Flow	-14.55%	14.78%	11.98%	24.84%	-14.15%	14.49%	11.81%	24.58%
TSS	-16.80%	49.05%	44.01%	77.45%	-15.78%	48.57%	43.61%	76.55%
TN	-2.12%	5.91%	5.11%	7.86%	-1.84%	6.30%	5.49%	8.28%
TP	8.33%	26.99%	24.78%	31.90%	7.72%	27.42%	25.08%	32.49%
Middle Chattahoochee – WF George HUC 03130003								
Flow	-18.68%	12.52%	9.37%	24.24%	-18.37%	12.34%	9.28%	23.94%
TSS	-14.99%	59.60%	52.46%	92.84%	-14.31%	59.50%	52.32%	92.49%
TN	-1.24%	9.81%	8.61%	12.95%	-0.98%	10.20%	8.99%	13.35%
TP	8.01%	29.42%	26.82%	36.55%	7.66%	29.68%	27.02%	36.92%
Lower Chattahoochee HUC 03130004								
Flow	-19.63%	11.89%	8.52%	24.74%	-19.35%	11.74%	8.44%	24.48%
TSS	-30.48%	26.43%	21.16%	55.50%	-29.74%	27.07%	21.83%	56.08%
TN	-1.48%	10.33%	9.07%	14.40%	-1.22%	10.68%	9.41%	14.77%
TP	9.76%	29.85%	27.41%	37.97%	9.47%	30.05%	27.57%	38.25%
Peachtree Creek (gage 02336300)								
Flow	-7.54%	17.56%	16.16%	27.69%	-7.00%	16.48%	15.25%	26.39%
TSS	-5.41%	31.74%	27.21%	43.52%	-2.24%	30.58%	26.46%	41.69%
TN	20.49%	32.31%	33.30%	49.14%	25.31%	38.46%	40.42%	59.42%
TP	32.59%	45.86%	48.09%	64.21%	35.39%	51.13%	53.11%	72.85%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Upper Flint HUC 03130005								
Flow	-21.50%	11.78%	8.12%	22.24%	-21.32%	11.44%	7.86%	21.87%
TSS	-20.29%	33.66%	27.97%	50.19%	-20.18%	33.00%	27.52%	49.49%
TN	8.28%	38.60%	32.62%	41.83%	8.72%	39.65%	33.73%	42.82%
TP	19.70%	62.54%	54.68%	66.95%	18.54%	61.28%	53.50%	66.48%
Middle Flint HUC 03130006								
Flow	-23.41%	11.34%	6.51%	23.31%	-23.28%	11.20%	6.41%	23.10%
TSS	-24.04%	29.06%	21.37%	50.70%	-23.84%	28.81%	21.26%	50.79%
TN	1.80%	39.97%	31.73%	45.52%	2.33%	41.64%	32.75%	46.13%
TP	8.52%	50.28%	42.57%	59.55%	8.42%	50.47%	42.62%	59.46%
Kinchafonee-Muckalee HUC 03130007								
Flow	-23.90%	10.90%	5.58%	24.80%	-23.75%	10.99%	5.69%	24.88%
TSS	-27.37%	16.78%	8.52%	29.04%	-27.09%	16.63%	8.42%	28.94%
TN	-2.98%	37.39%	31.24%	48.55%	-1.72%	40.15%	33.23%	50.51%
TP	0.10%	39.40%	34.00%	51.33%	0.79%	41.44%	35.46%	53.06%
Lower Flint HUC 03130008								
Flow	-25.22%	10.59%	4.96%	24.78%	-25.12%	10.50%	4.90%	24.64%
TSS	-26.70%	23.36%	15.83%	46.79%	-26.59%	23.20%	15.78%	46.57%
TN	-1.07%	35.94%	28.43%	45.00%	-0.82%	36.87%	28.99%	45.39%
TP	7.81%	44.98%	38.40%	56.09%	7.71%	45.09%	38.44%	56.16%
Ichawaynochaway HUC 03130009								
Flow	-30.02%	6.79%	0.18%	22.33%	-30.02%	6.79%	0.19%	22.33%
TSS	-28.90%	12.70%	5.06%	31.45%	-28.89%	12.70%	5.07%	31.51%
TN	-3.74%	31.14%	26.85%	52.16%	-3.86%	31.19%	26.84%	52.19%
TP	8.37%	39.07%	34.88%	55.22%	8.28%	39.13%	34.89%	55.27%
Spring HUC 03130010								
Flow	-31.06%	3.87%	-1.58%	22.04%	-31.05%	3.88%	-1.57%	22.05%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
TSS	-31.24%	8.99%	3.96%	33.14%	-31.26%	8.98%	3.95%	33.11%
TN	-11.68%	27.23%	19.99%	45.46%	-11.61%	27.33%	20.12%	45.70%
TP	2.54%	35.05%	29.00%	49.26%	2.56%	35.06%	29.07%	49.43%
Apalachicola HUC 03130011								
Flow	-27.10%	7.37%	3.66%	23.75%	-26.92%	7.28%	3.62%	23.58%
TSS	-47.39%	26.84%	15.07%	46.35%	-47.25%	26.16%	14.63%	46.09%
TN	-4.82%	15.84%	13.38%	25.28%	-4.56%	16.26%	13.74%	25.62%
TP	5.56%	36.17%	32.51%	51.52%	5.41%	36.25%	32.58%	51.62%
Chipola HUC 03130012								
Flow	-45.73%	-8.86%	-8.70%	22.72%	-45.71%	-8.84%	-8.69%	22.73%
TSS	-46.43%	1.58%	7.65%	62.14%	-46.52%	1.58%	7.63%	62.12%
TN	-20.99%	13.68%	16.33%	63.05%	-21.17%	13.55%	16.34%	63.38%
TP	-6.27%	28.47%	29.53%	72.78%	-6.62%	28.23%	29.46%	73.13%

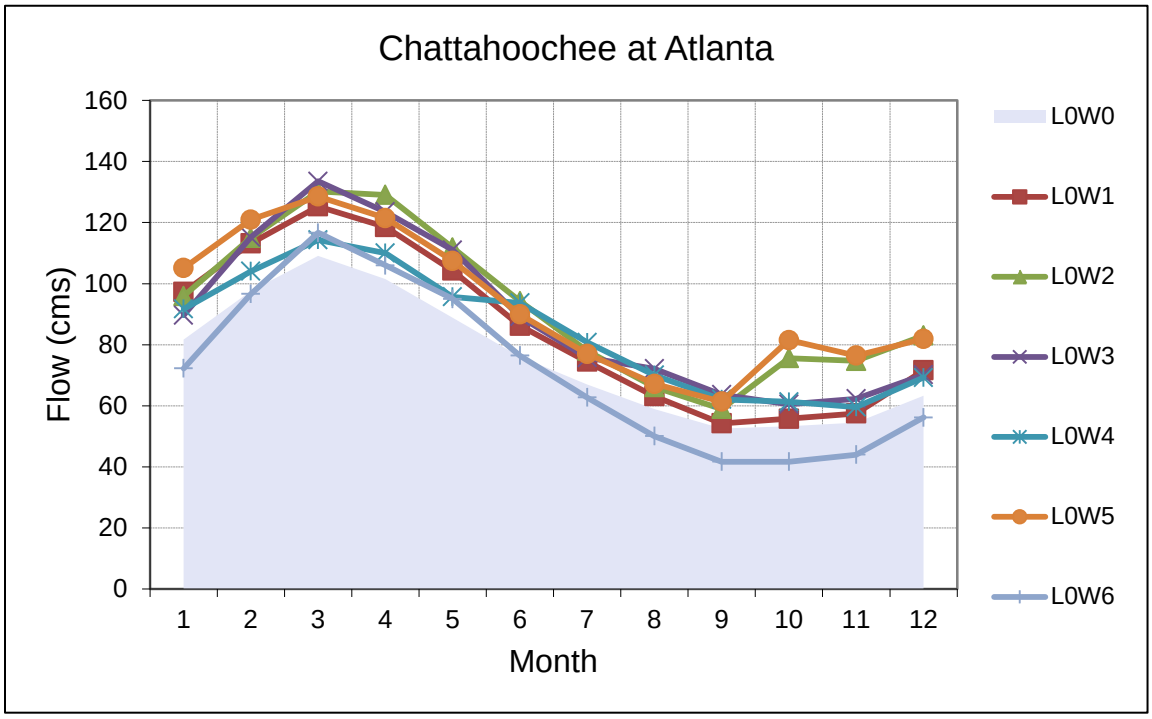

Figure 38. Monthly Average Flows, Chattahoochee River at Atlanta (SWAT)

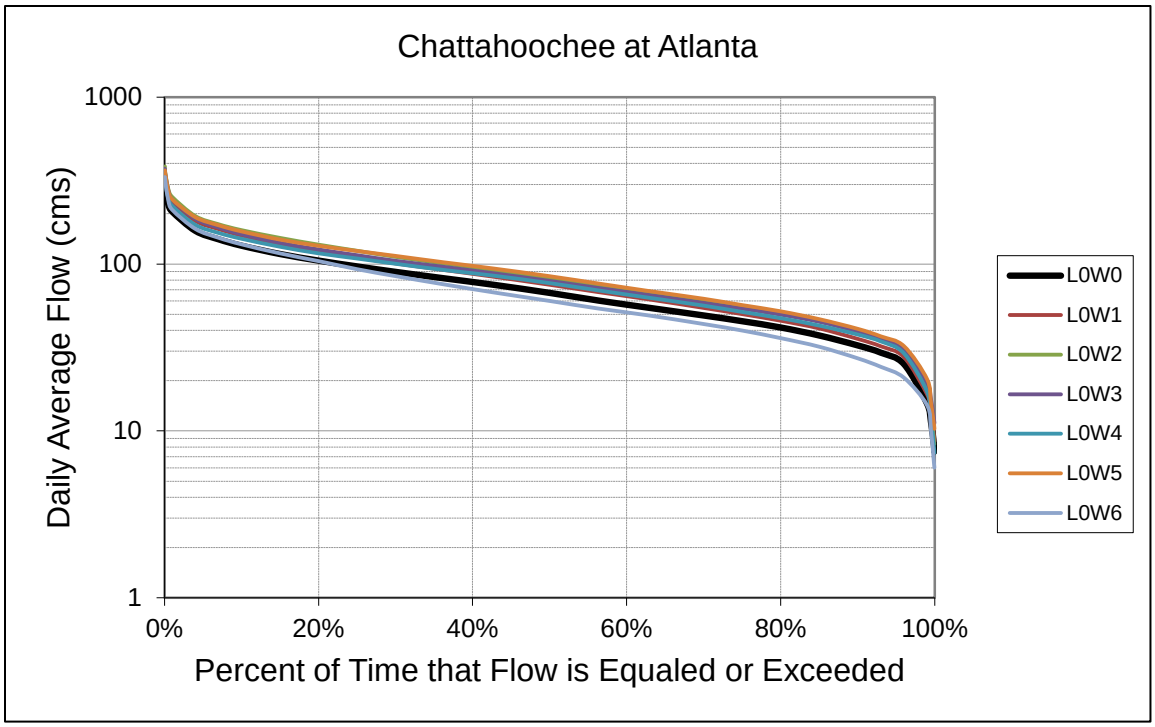

Figure 39. Flow Duration, Chattahoochee River at Atlanta (SWAT)

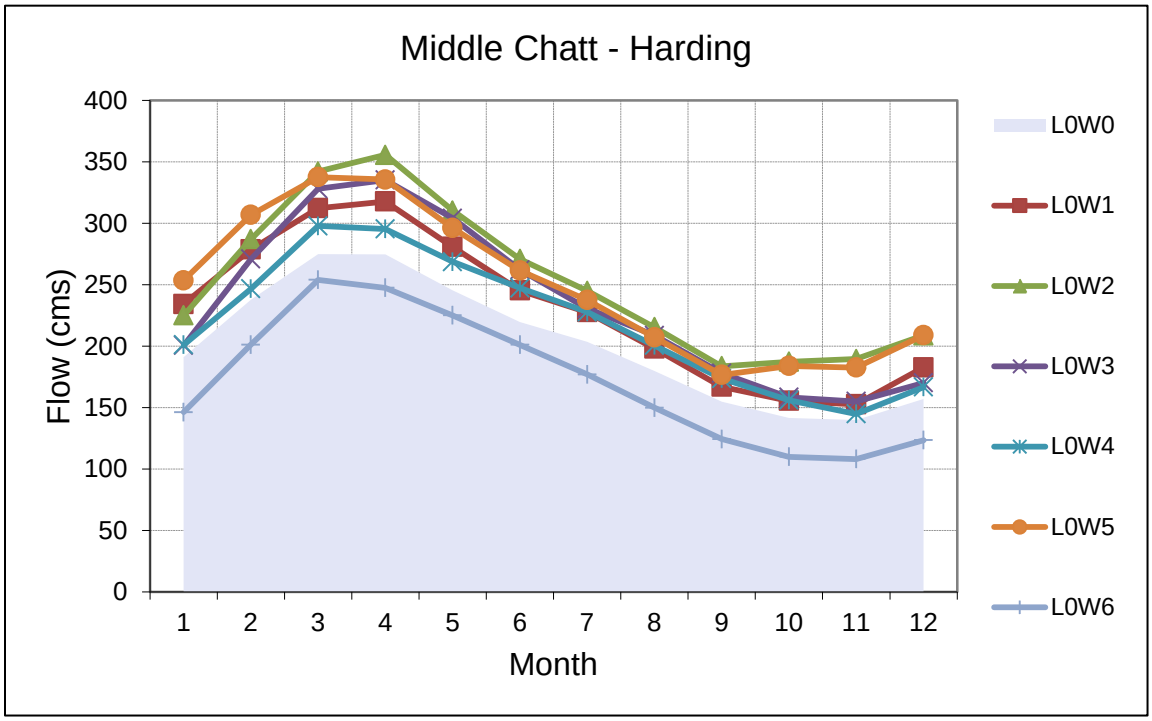

Figure 40. Monthly Average Flows, Middle Chattahoochee River at Harding (SWAT)

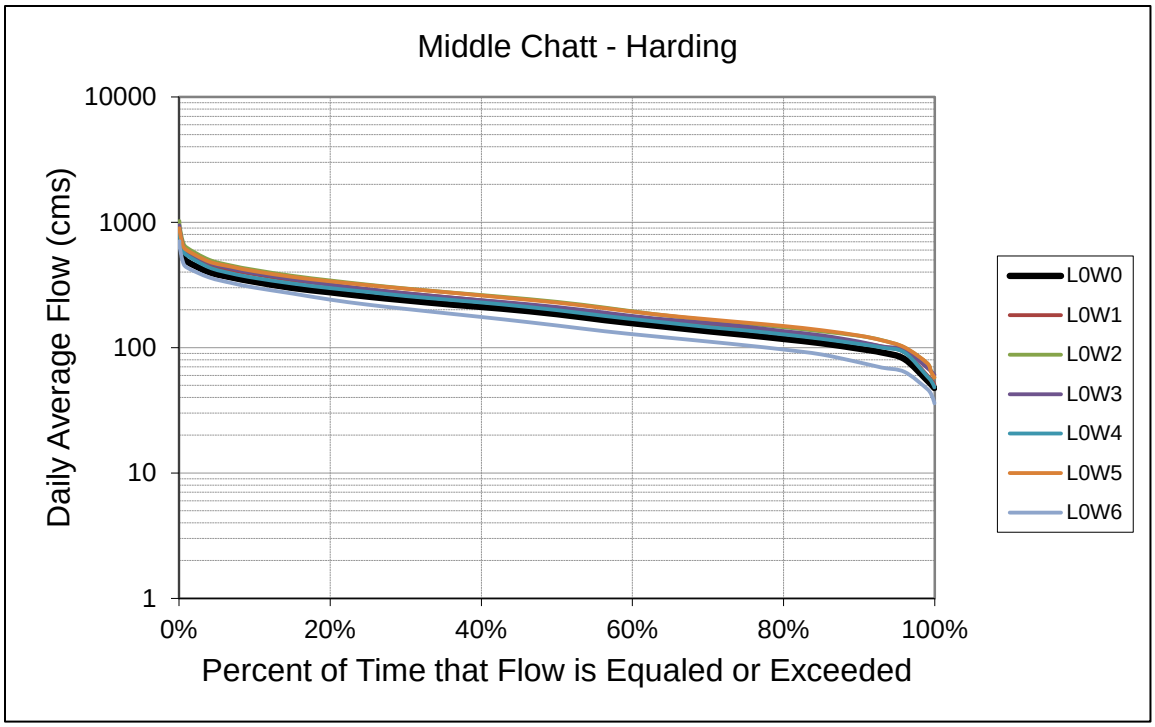

Figure 41. Flow Duration, Middle Chattahoochee River at Harding (SWAT)

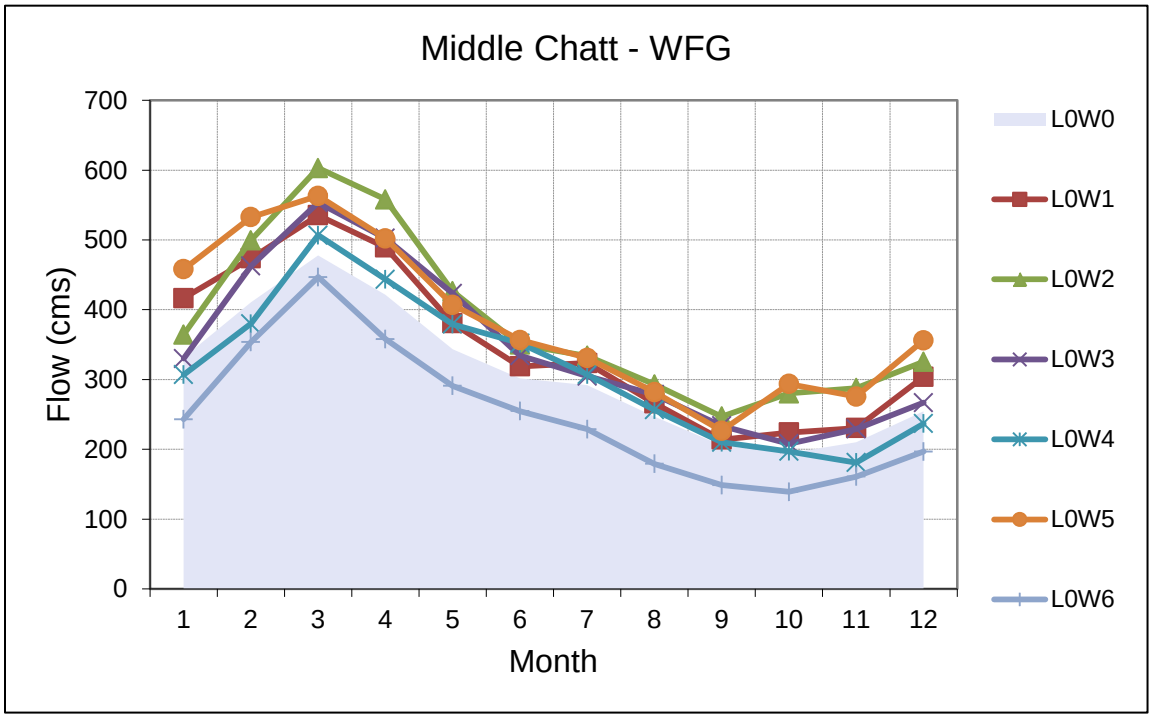

Figure 42. Monthly Average Flows, Middle Chattahoochee River at WF Geroge (SWAT)

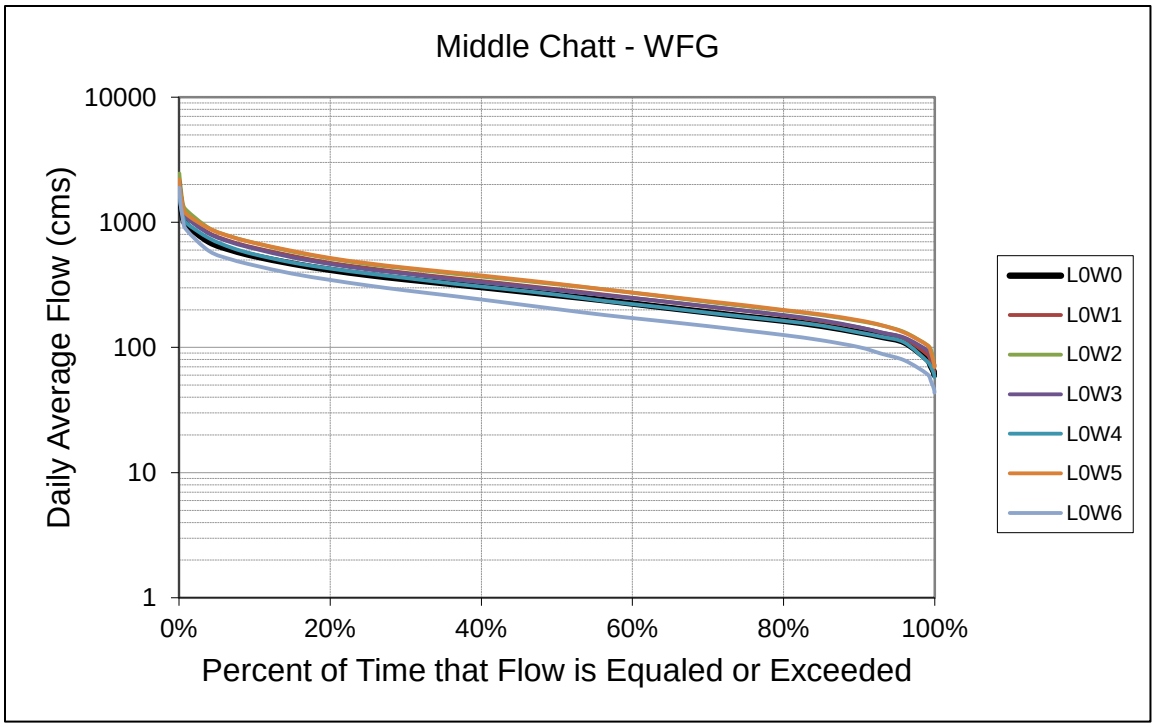

Figure 43. Flow Duration, Middle Chattahoochee River at WF George (SWAT)

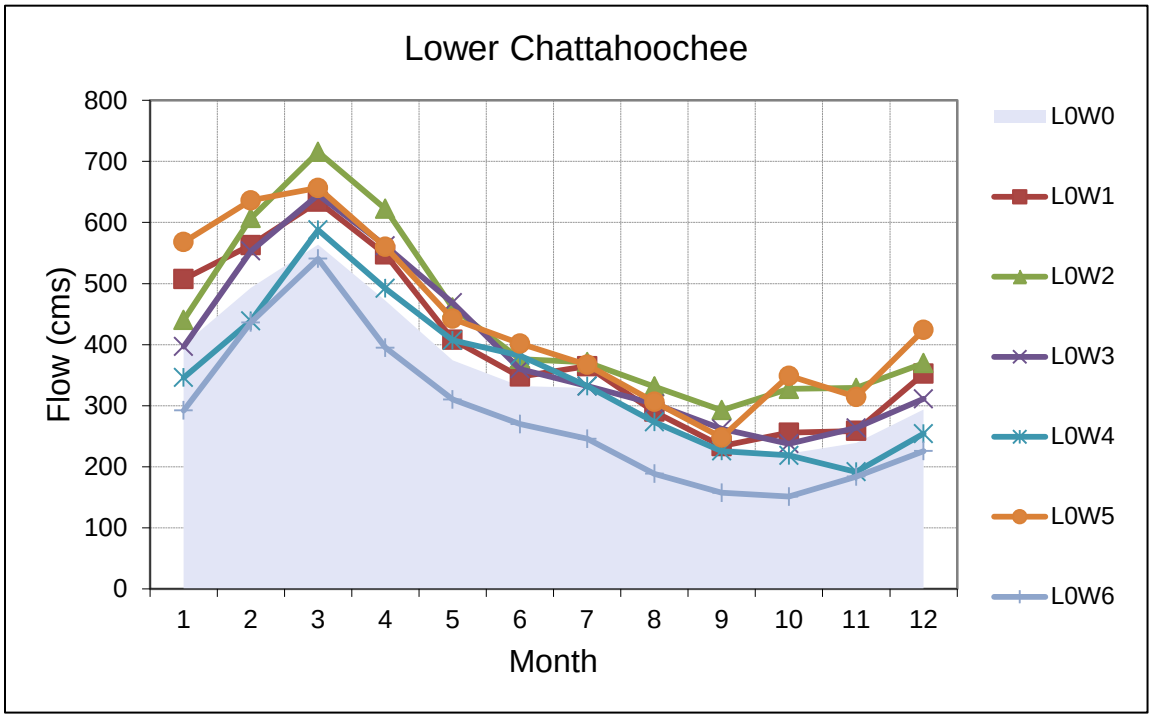

Figure 44. Monthly Average Flows, Lower Chattahoochee River (SWAT)

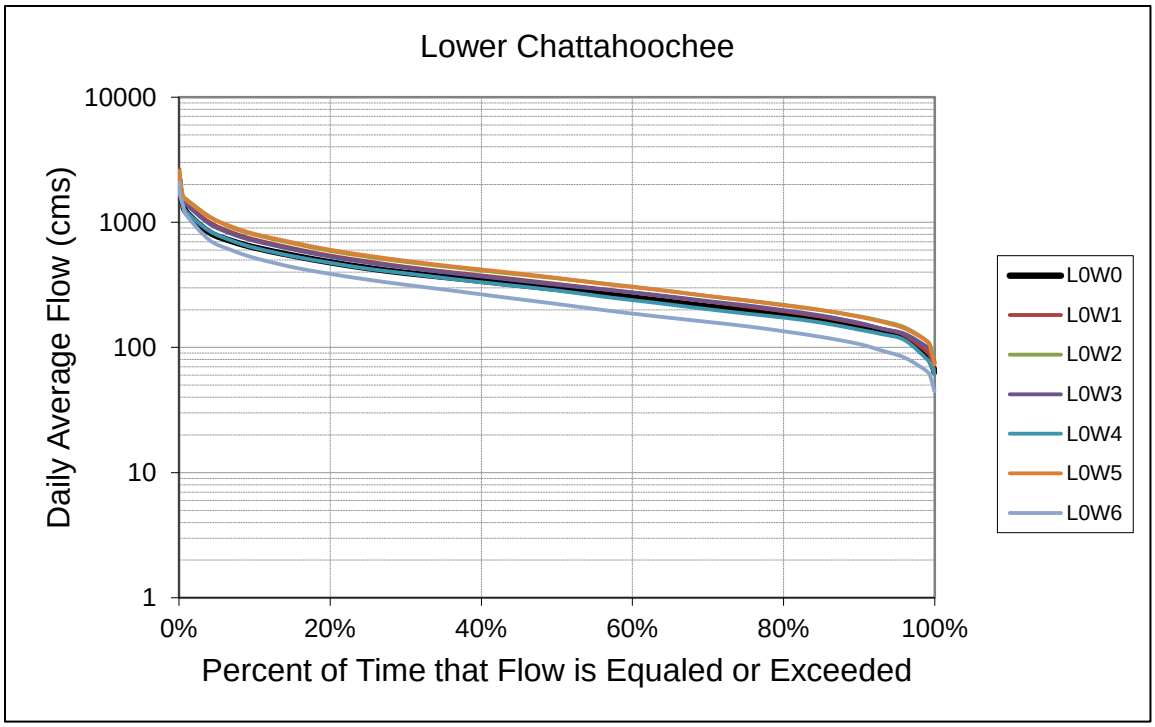

Figure 45. Flow Duration, Lower Chattahoochee River (SWAT)

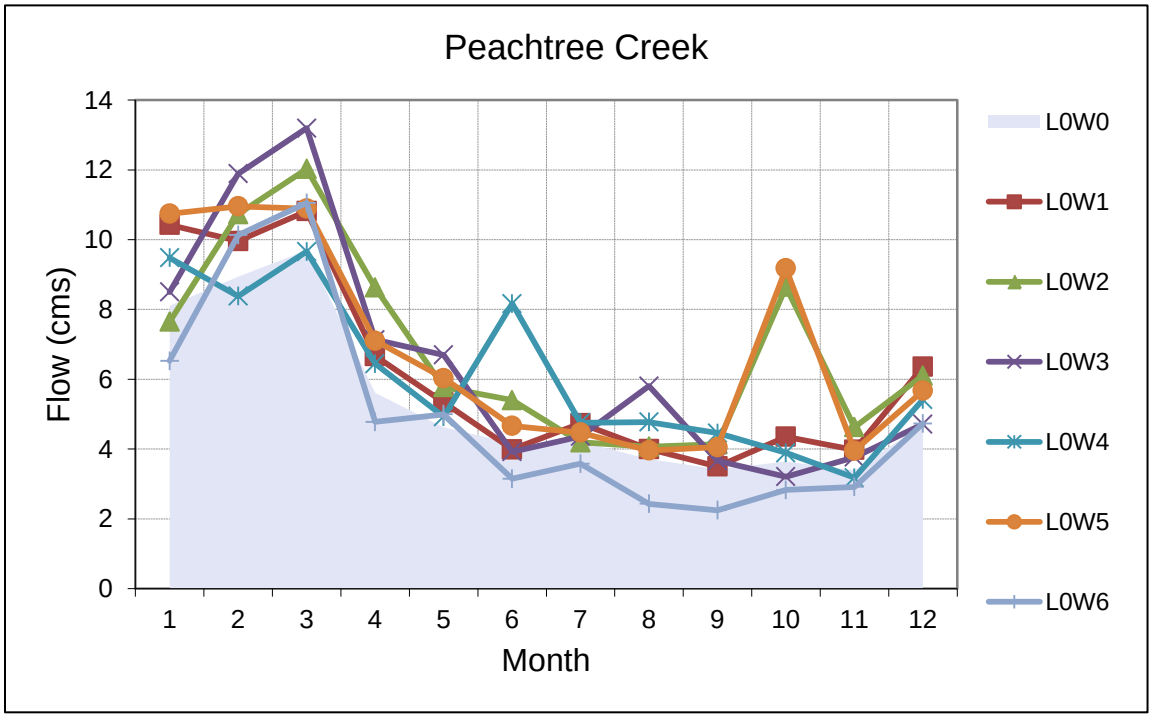

Figure 46. Monthly Average Flows, Peachtree Creek (SWAT)

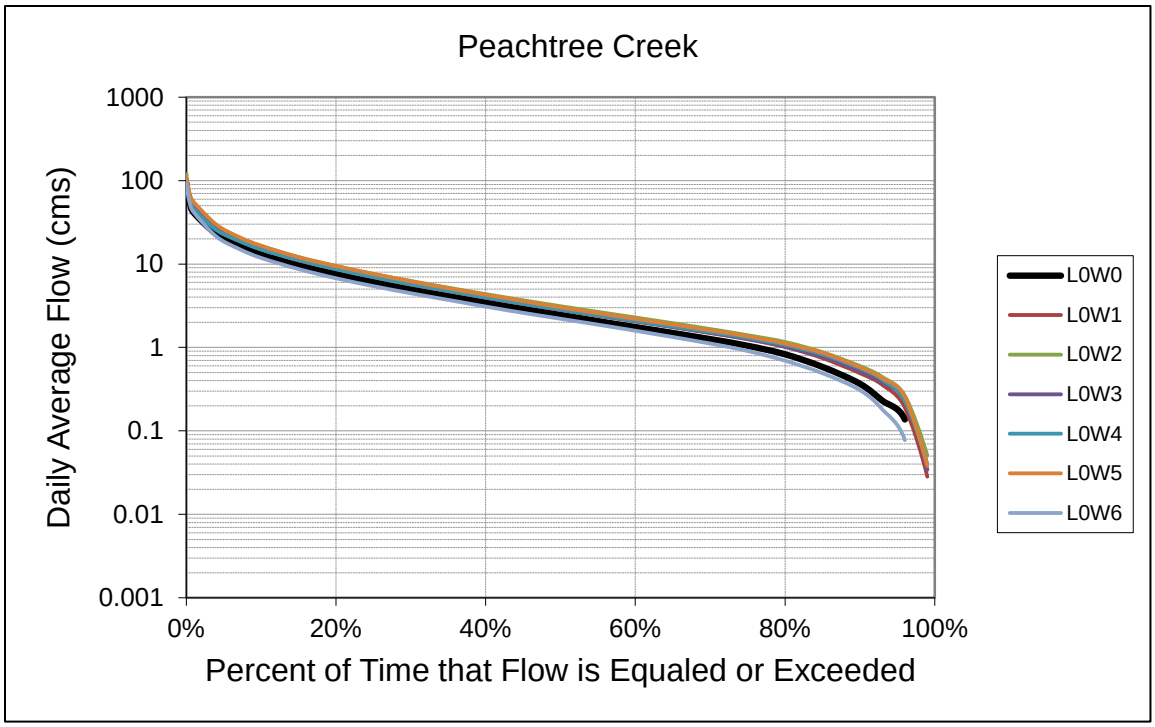

Figure 47. Flow Duration, Peachtree Creek (SWAT)

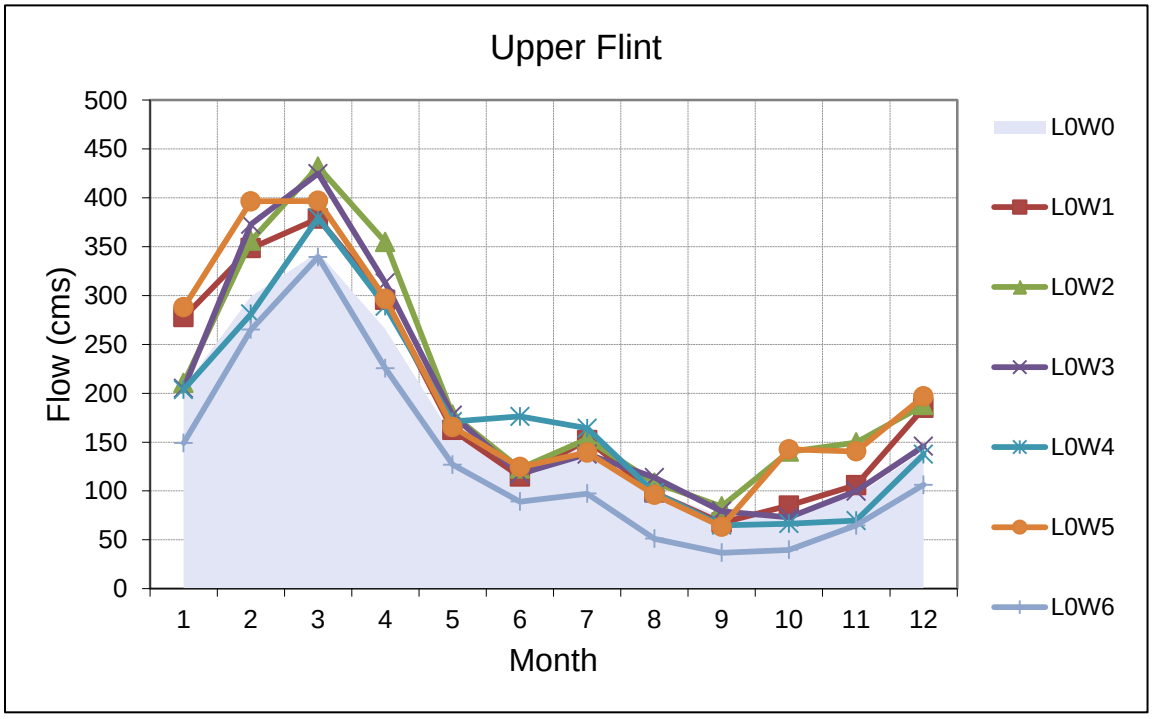

Figure 48. Monthly Average Flows, Upper Flint River (SWAT)

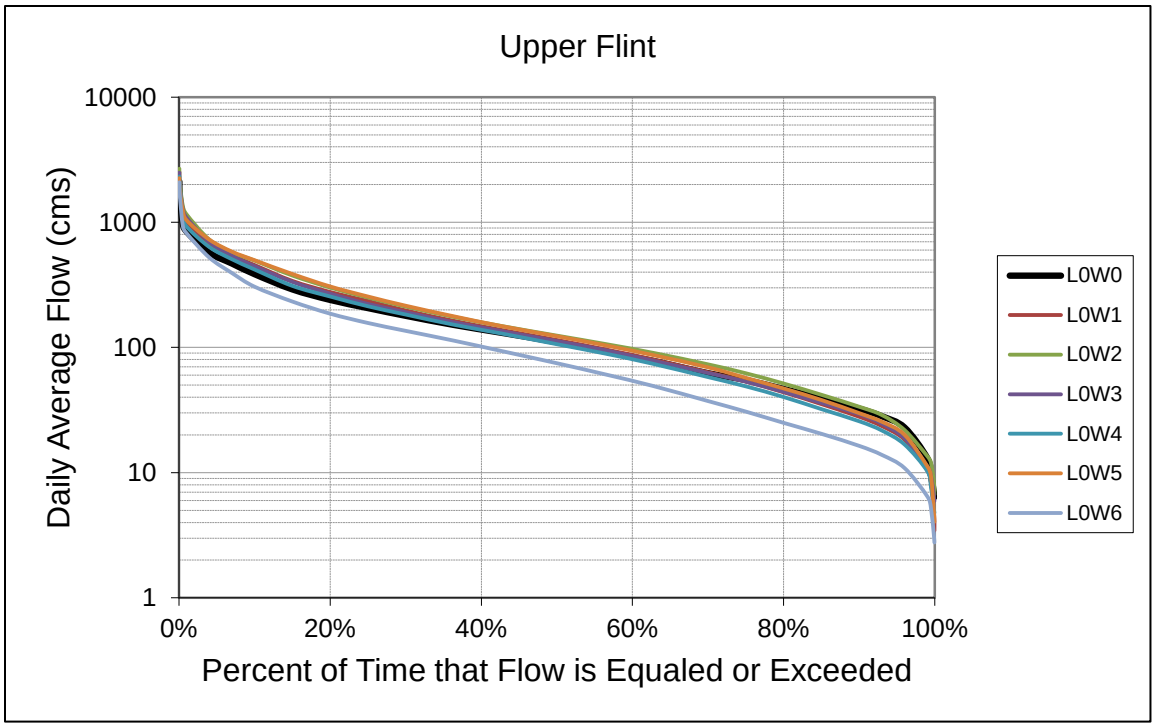

Figure 49. Flow Duration, Upper Flint River (SWAT)

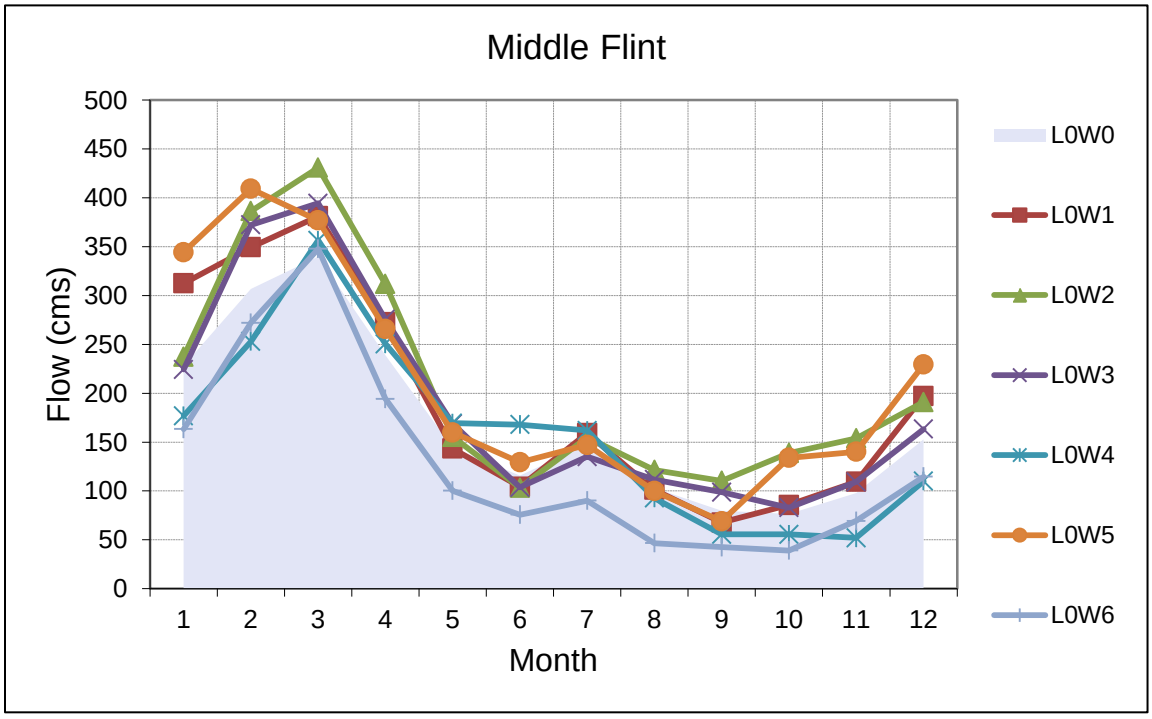

Figure 50. Monthly Average Flows, Middle Flint River (SWAT)

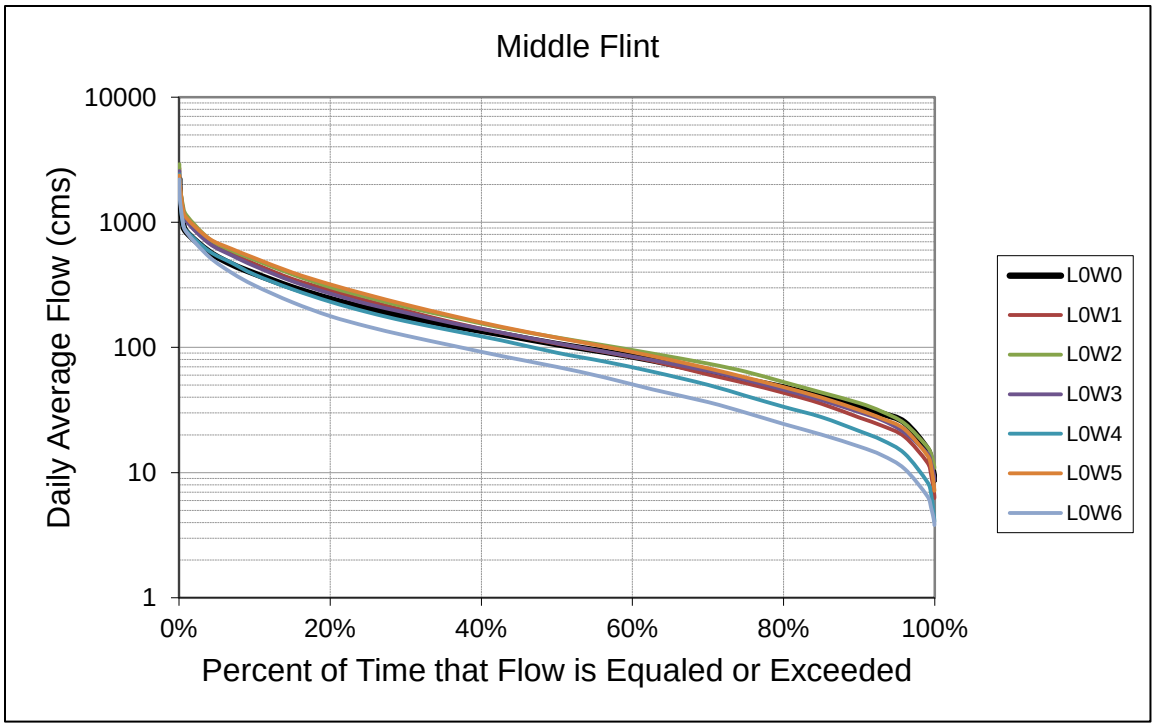

Figure 51. Flow Duration, Middle Flint River (SWAT)

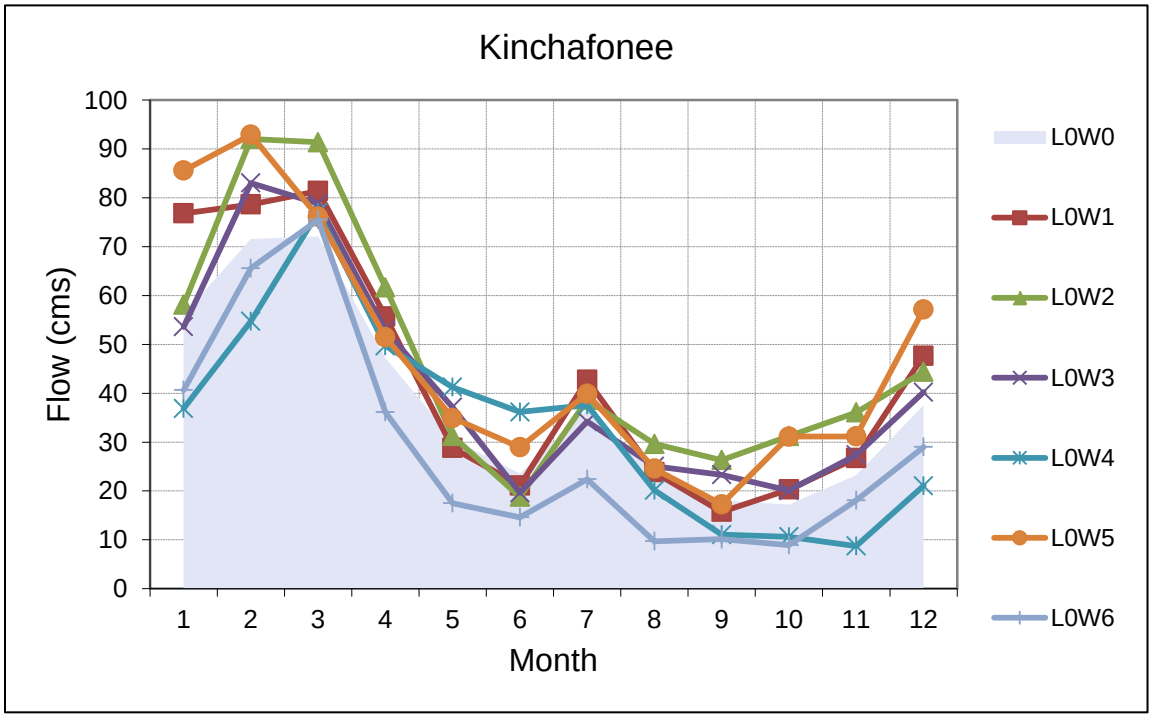

Figure 52. Monthly Average Flows, Kinchafonee River (SWAT)

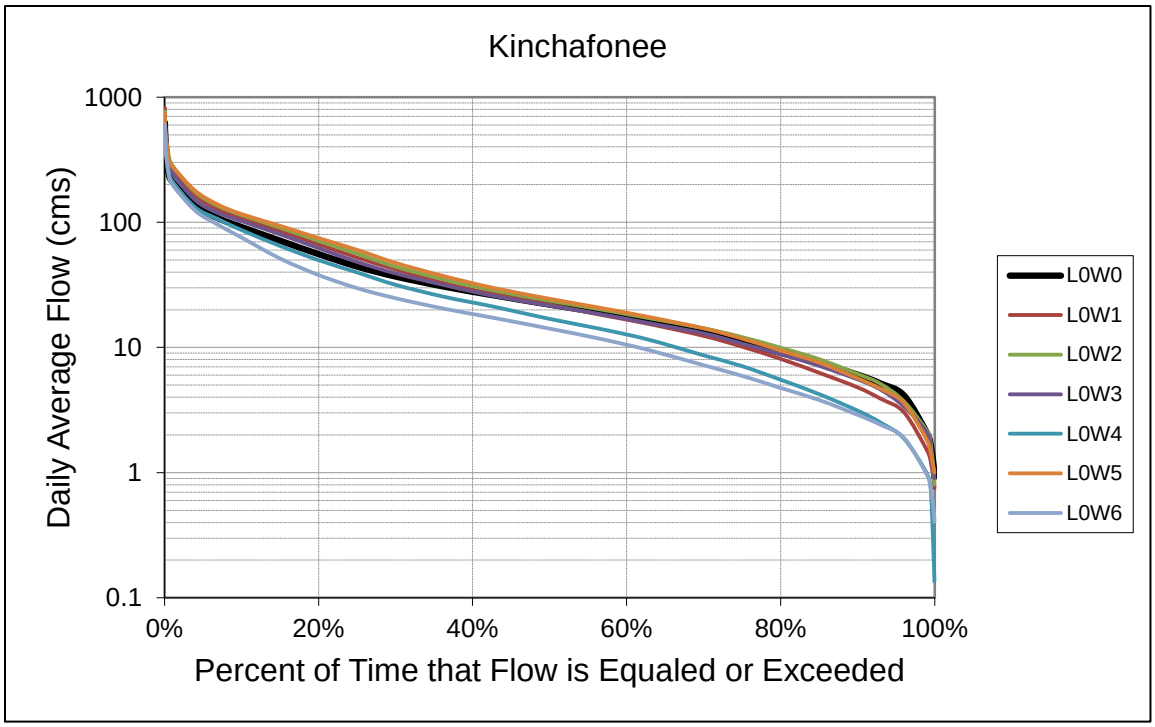

Figure 53. Flow Duration, Kinchafonee River (SWAT)

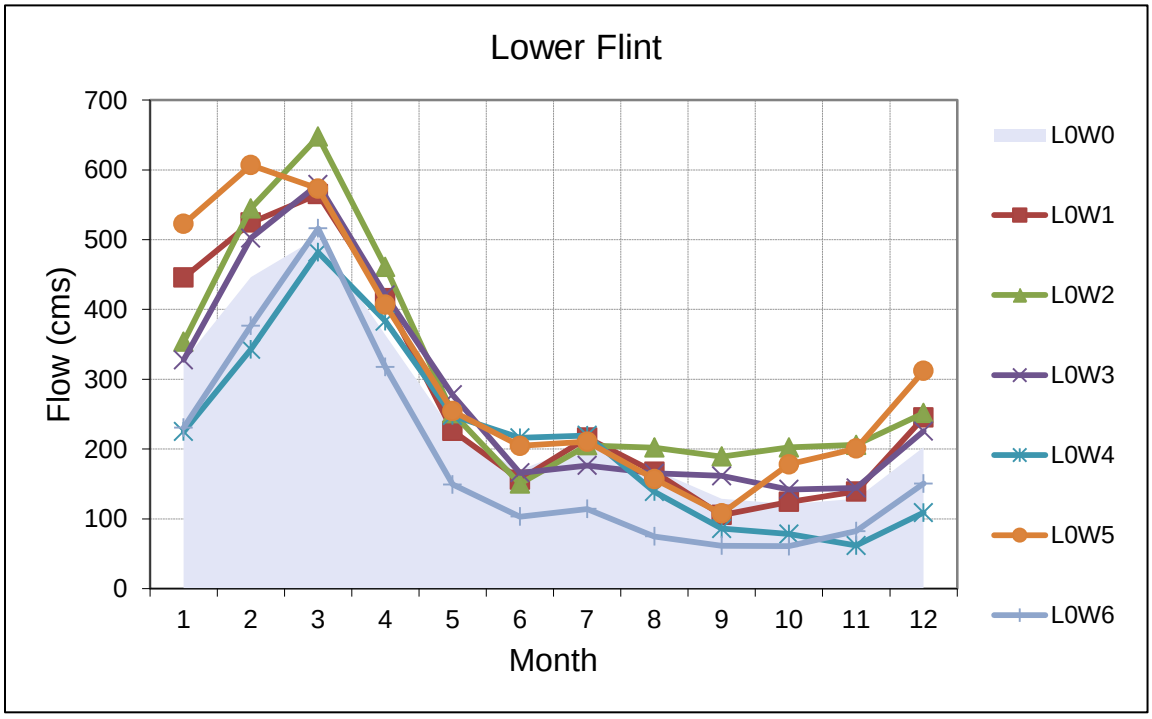

Figure 54. Monthly Average Flows, Lower Flint River (SWAT)

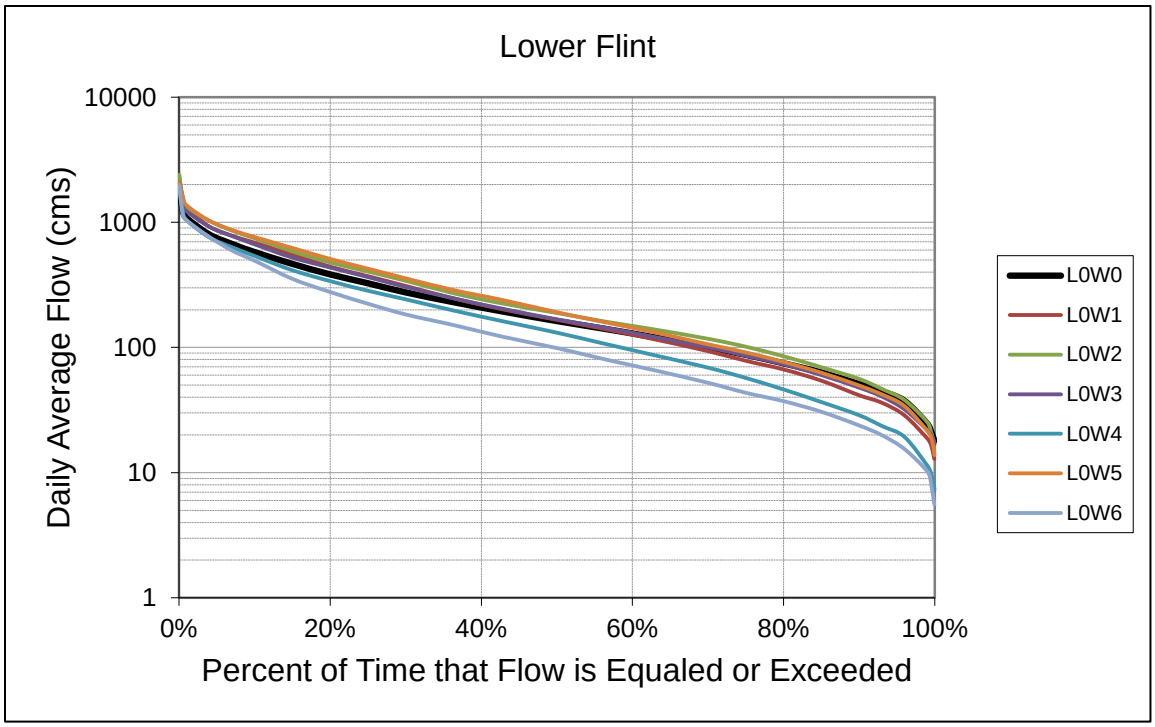

Figure 55. Flow Duration, Lower Flint River (SWAT)

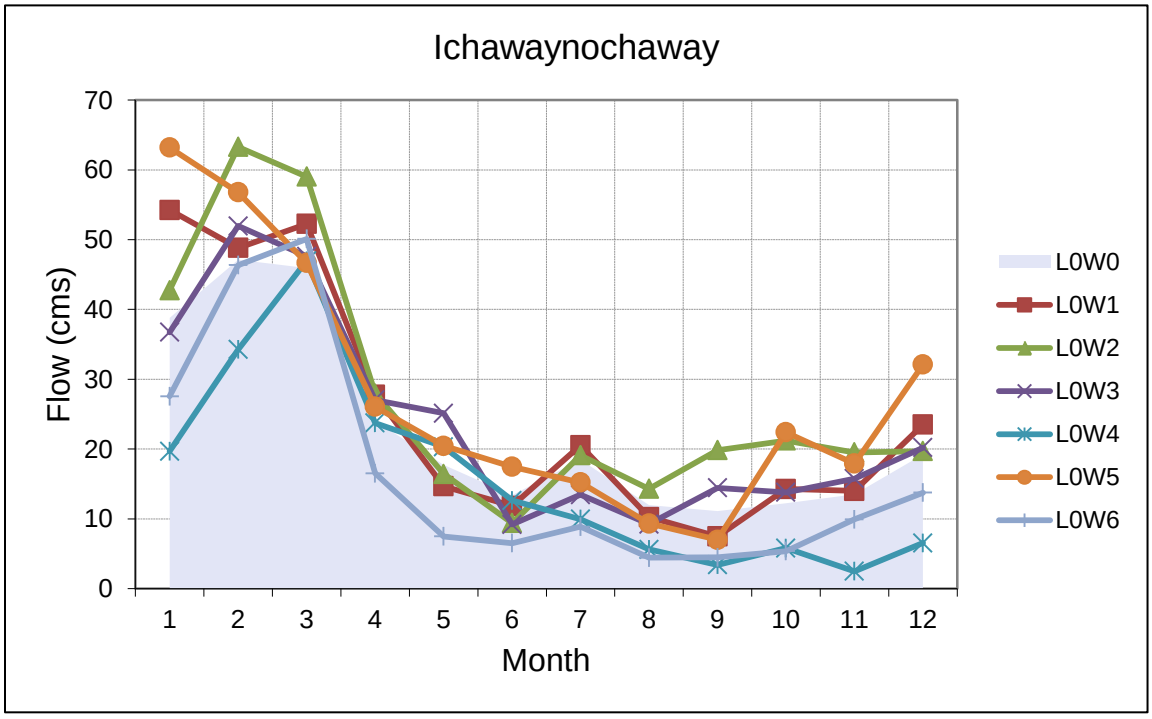

Figure 56. Monthly Average Flows, Ichawaynochaway Creek (SWAT)

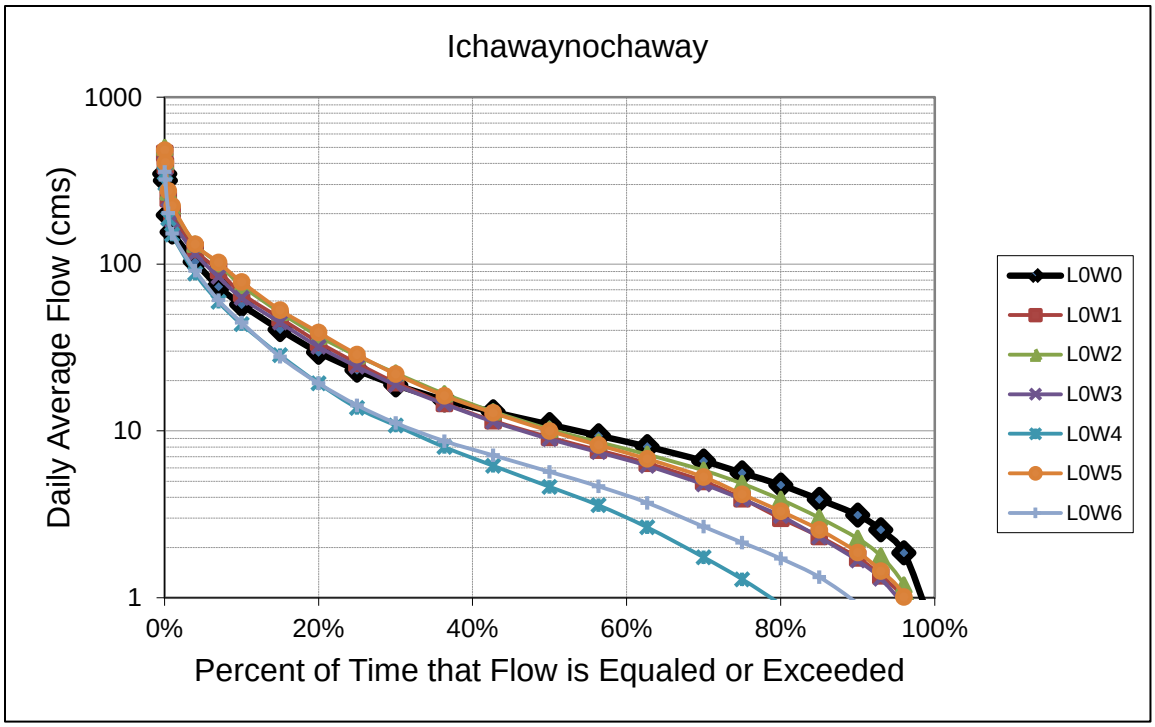

Figure 57. Flow Duration, Ichawaynochaway Creek (SWAT)

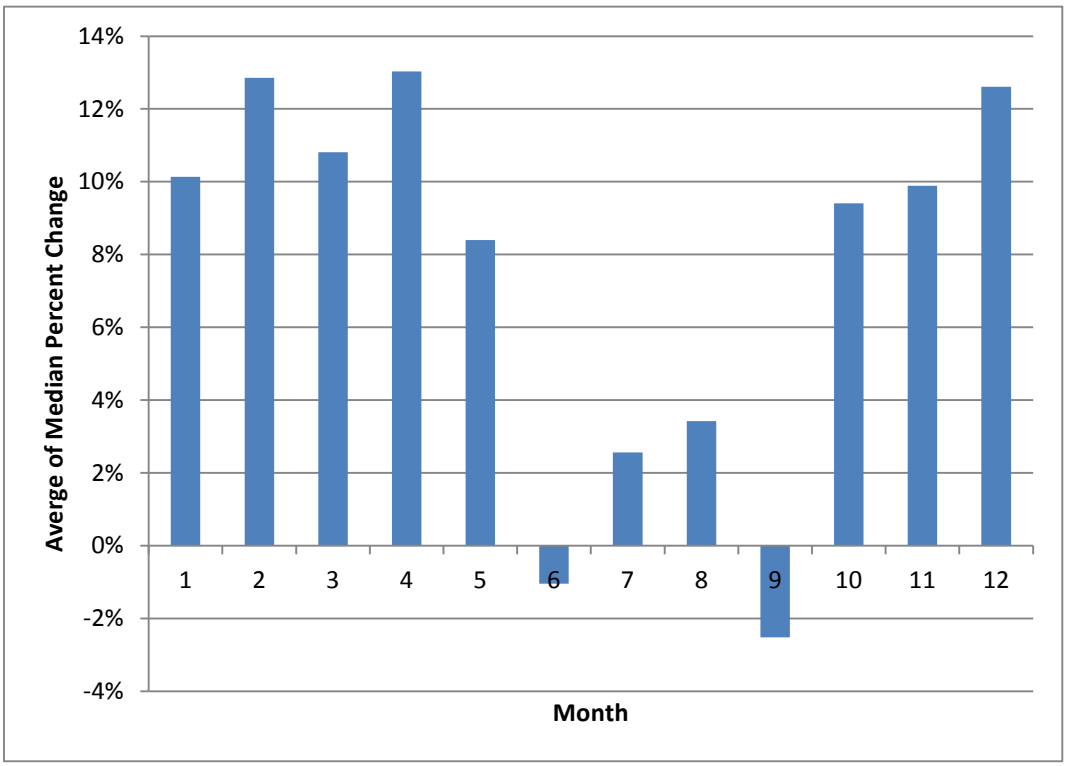

Figure 58. Average of Median Percent Change in Flow; NARCCAP Scenarios W1-W6 at all Stations, Apalachicola-Chattahoochee-Flint Basin (SWAT)

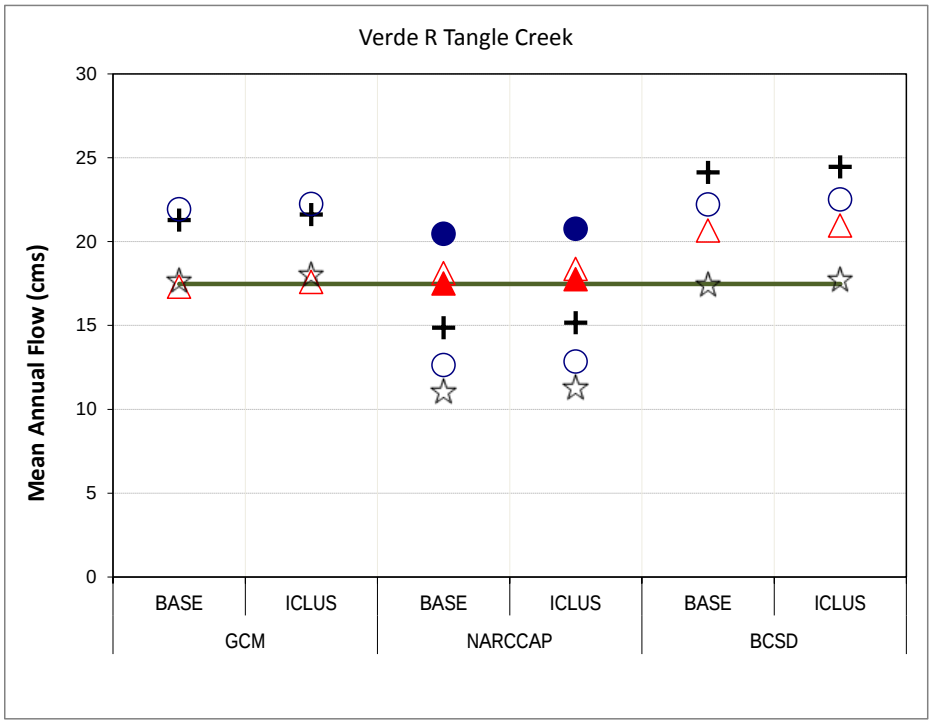

Figure 59. Mean Annual Flow, Verde River below Tangle Creek (HSPF)

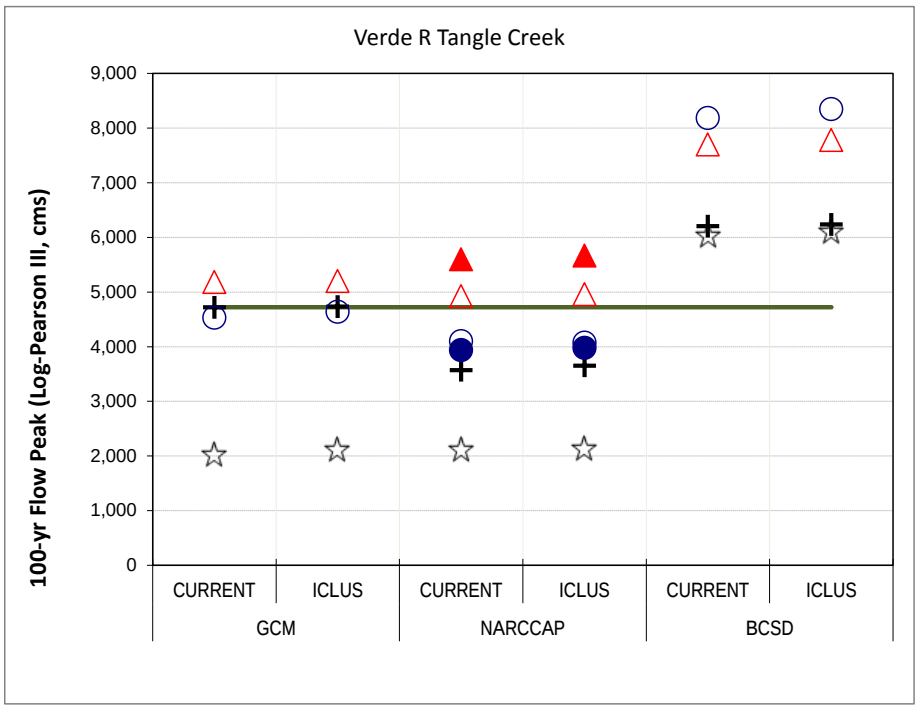

Figure 60. 100-yr Flow Peak, Verde River below Tangle Creek (HSPF)

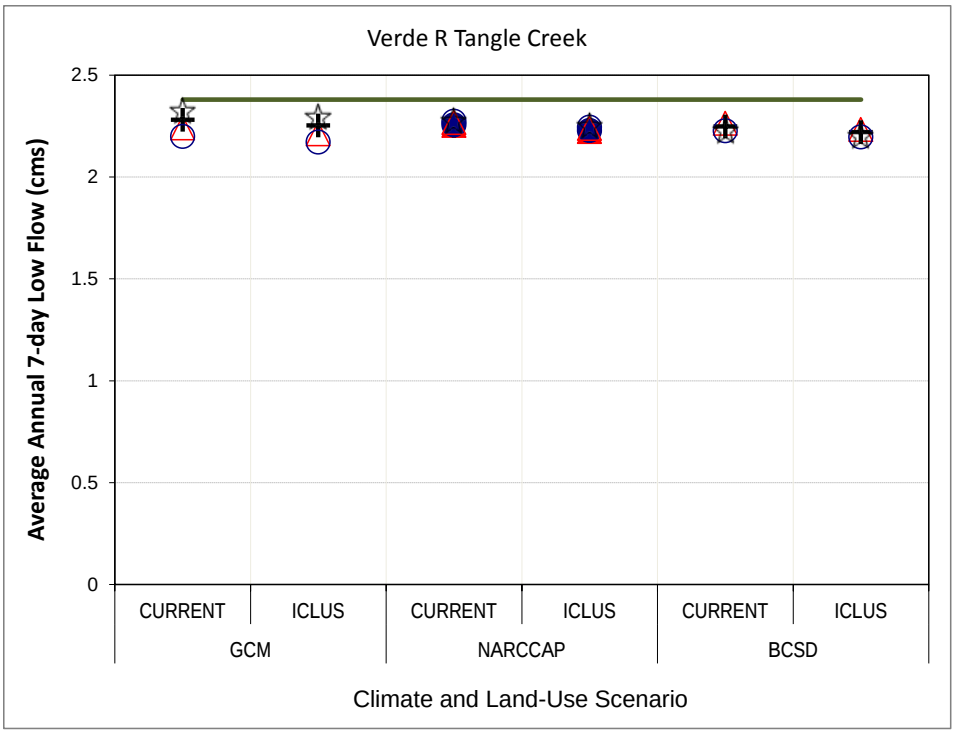

Figure 61. Average Annual 7-day Low Flow, Verde River below Tangle Creek (HSPF)

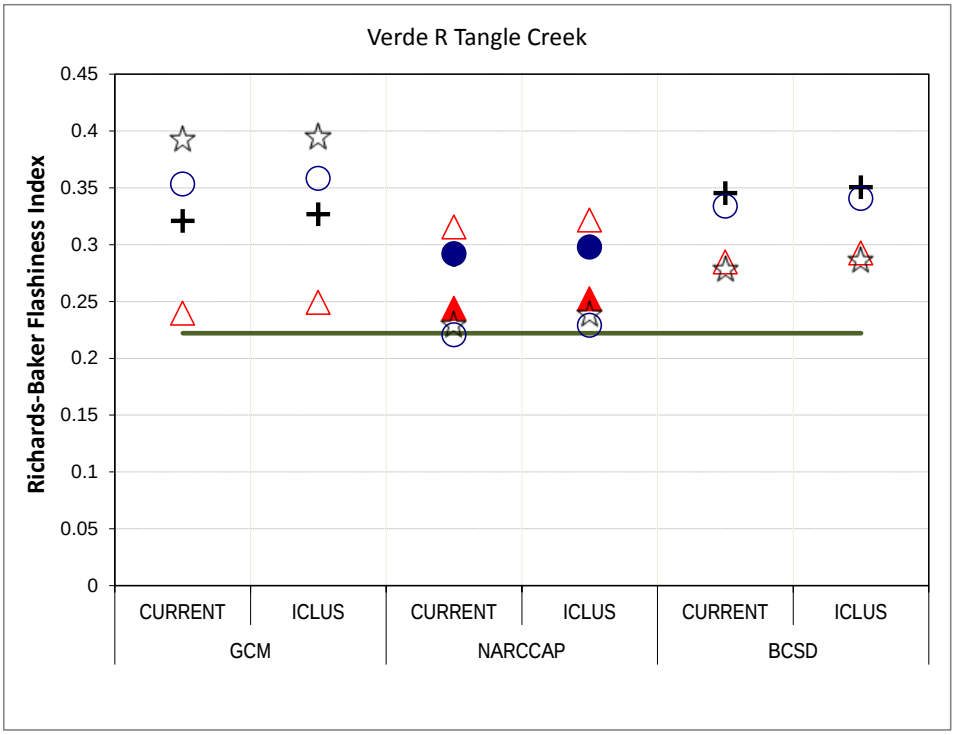

Figure 62. Richards-Baker Flashiness Index, Verde River below Tangle Creek (HSPF)

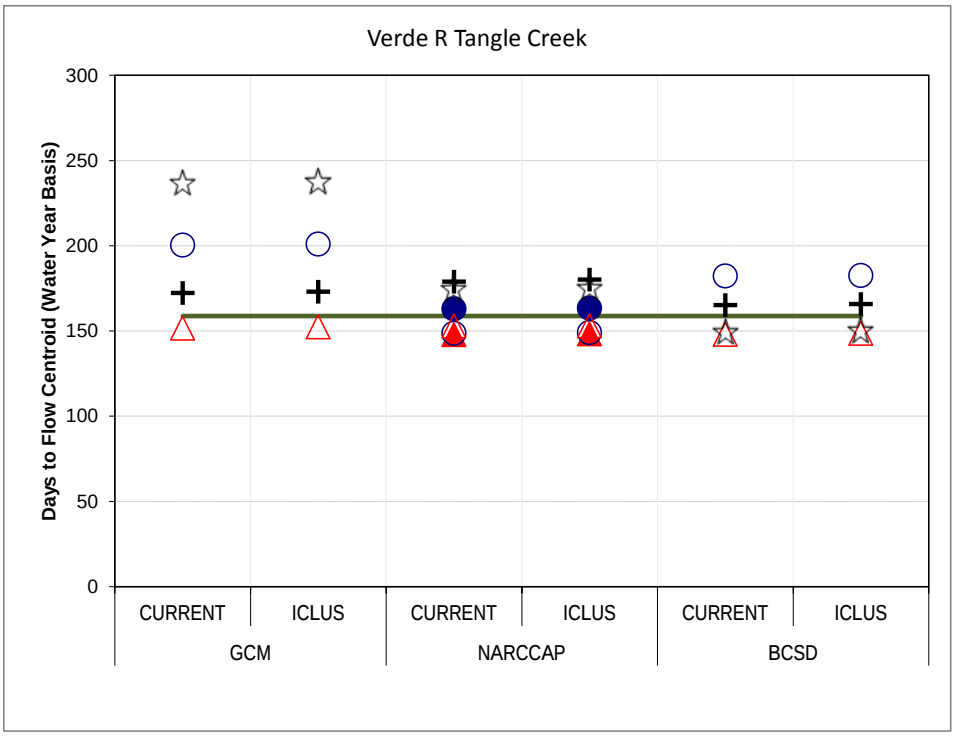

Figure 63. Days to flow Centroid, Verde River below Tangle Creek (HSPF)

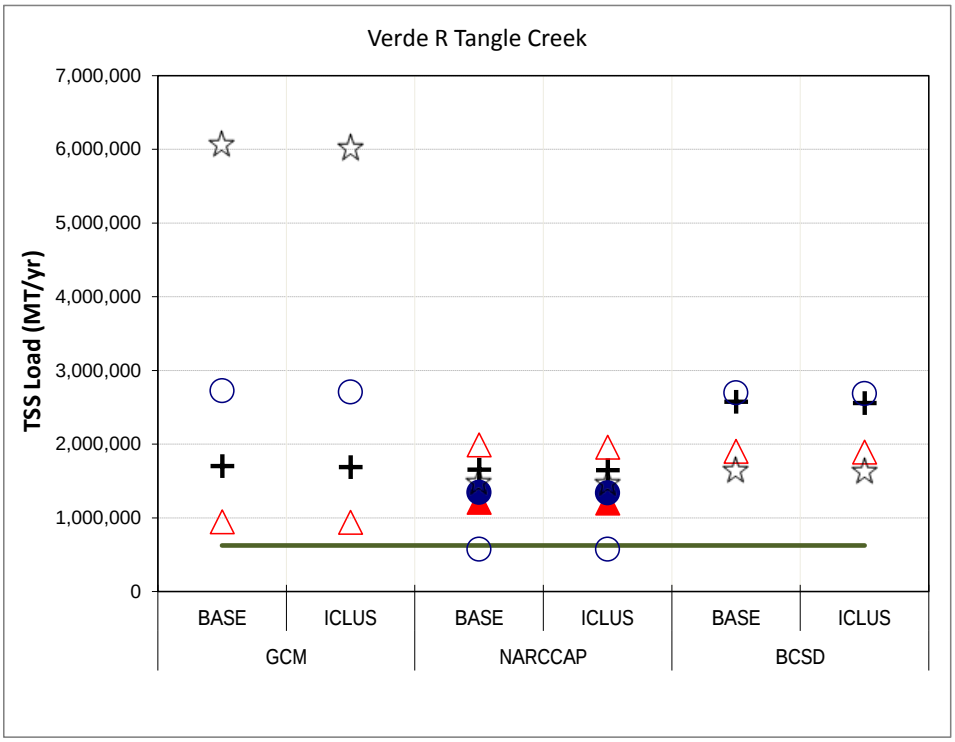

Figure 64. TSS Load, Verde River below Tangle Creek (HSPF)

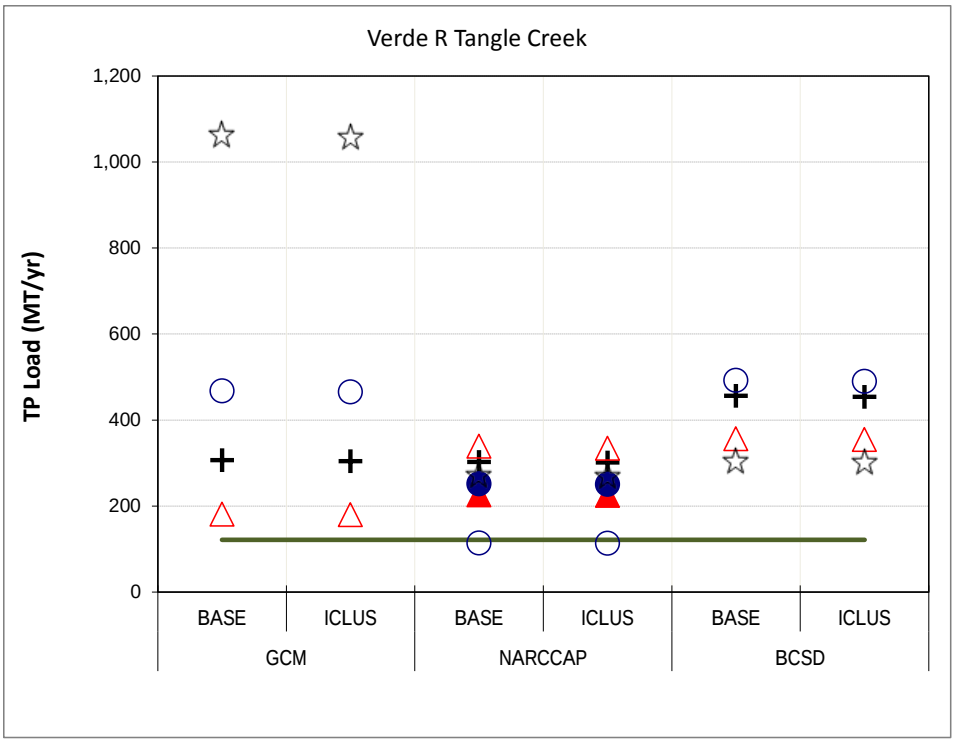

Figure 65. TP Load, Verde River below Tangle Creek (HSPF)

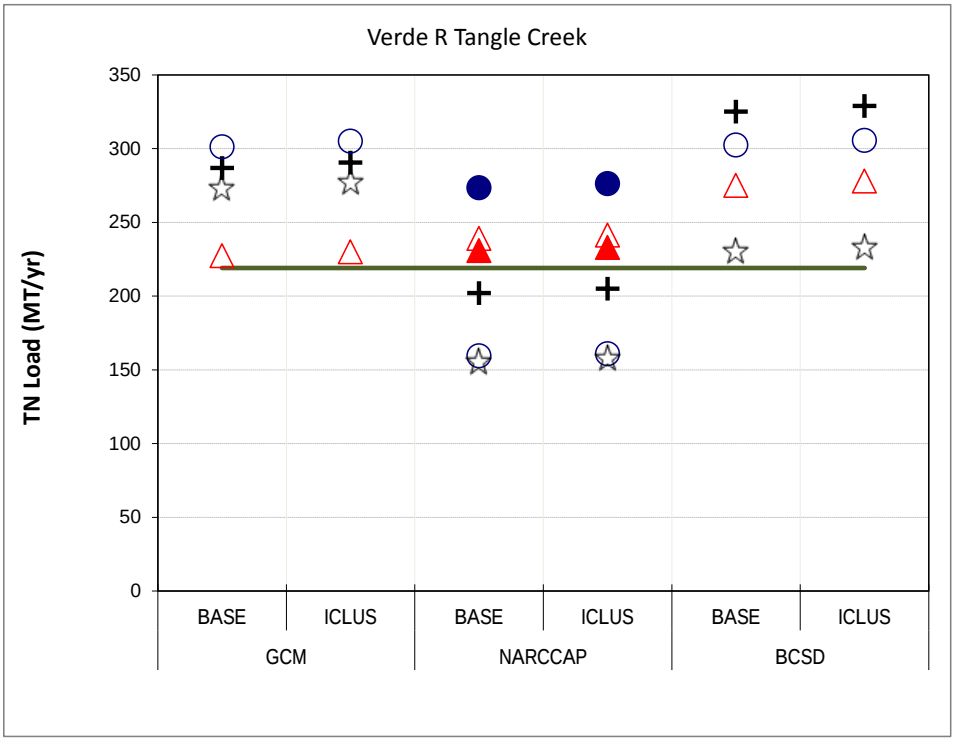

Figure 66. TN Load, Verde River below Tangle Creek (HSPF)

Results at Multiple Stations

Table 3. Summary of Range of Change Relative to Existing Conditions for NARCCAP Dynamically Downscaled Scenarios, Verde-Salt-San Pedro Basins (HSPF)

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Verde River nr Paulden (gage 09503700)								
Flow	-19.22%	13.20%	4.35%	21.91%	-19.77%	11.36%	2.87%	20.01%
TSS	-46.64%	279.87%	325.08%	921.15%	-46.06%	264.17%	308.86%	890.16%
TN	-24.46%	17.02%	6.57%	24.87%	-26.72%	15.54%	6.06%	23.92%
TP	-35.96%	215.57%	248.32%	702.29%	-35.51%	210.93%	244.42%	702.04%
Verde River nr Clarkdale (gage 09504000)								
Flow	-28.25%	-3.86%	-6.28%	16.58%	-28.44%	-3.93%	-6.39%	16.14%
TSS	-54.11%	117.39%	154.81%	443.83%	-53.86%	113.80%	152.75%	439.42%
TN	-31.46%	2.79%	-1.53%	26.70%	-32.01%	2.92%	-1.43%	26.45%
TP	-50.03%	82.97%	115.72%	349.54%	-49.86%	81.08%	115.16%	348.35%
Oak Creek at Sedona (gage 09504430)								
Flow	-38.15%	-19.65%	-18.62%	14.90%	-37.84%	-19.53%	-18.48%	14.93%
TSS	-61.24%	-22.59%	11.14%	164.74%	-61.06%	-21.83%	11.97%	167.07%
TN	-35.08%	-11.82%	-10.35%	33.10%	-35.14%	-11.77%	-10.23%	33.35%
TP	-56.30%	-21.87%	8.85%	146.41%	-56.16%	-21.22%	9.58%	148.54%
Oak Creek at Cornville (gage 09504500)								
Flow	-37.33%	-18.41%	-17.40%	15.51%	-36.86%	-18.22%	-17.19%	15.51%
TSS	-61.08%	-23.51%	11.98%	164.82%	-60.86%	-22.75%	12.66%	166.85%
TN	-28.75%	-9.49%	-8.30%	26.81%	-28.89%	-9.43%	-8.15%	27.18%
TP	-52.97%	-22.59%	7.87%	135.13%	-52.89%	-21.97%	8.55%	137.46%
West Clear Creek at Camp Verde (gage 09505800)								
Flow	-43.20%	-18.41%	-16.72%	10.66%	-43.12%	-18.37%	-16.70%	10.65%
TSS	-44.58%	73.76%	63.12%	161.47%	-44.63%	73.64%	62.98%	161.31%
TN	-43.49%	-16.25%	-13.93%	18.10%	-43.41%	-16.20%	-13.90%	18.13%
TP	-41.20%	58.84%	51.02%	135.70%	-41.22%	58.66%	50.85%	135.47%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Verde River at Camp Verde (gage 09506000)								
Flow	-39.47%	-10.71%	-12.65%	17.18%	-38.81%	-10.51%	-12.50%	16.91%
TSS	-37.08%	97.58%	107.27%	280.92%	-36.84%	96.97%	105.74%	275.63%
TN	-33.23%	-3.95%	-6.35%	26.09%	-32.66%	-3.65%	-6.14%	26.13%
TP	-34.75%	79.98%	87.03%	222.59%	-34.52%	79.70%	86.04%	218.97%
East Verde River nr Childs (gage 09507980)								
Flow	-34.22%	-9.91%	-9.06%	11.98%	-34.20%	-9.91%	-9.06%	11.98%
TSS	60.12%	202.10%	219.40%	478.93%	60.11%	202.07%	219.38%	478.93%
TN	-19.93%	-7.00%	-5.28%	16.29%	-19.91%	-7.00%	-5.27%	16.29%
TP	54.92%	189.14%	205.77%	451.05%	54.92%	189.12%	205.75%	451.05%
Verde River below Tangle Creek (gage 09508500)								
Flow	-36.24%	-7.44%	-9.71%	17.07%	-35.83%	-7.36%	-9.65%	16.89%
TSS	-8.29%	127.73%	120.35%	217.62%	-8.01%	127.01%	119.53%	214.23%
TN	-28.54%	-1.20%	-4.04%	24.81%	-28.17%	-1.01%	-3.91%	24.85%
TP	-6.45%	116.26%	106.51%	178.54%	-6.17%	115.84%	106.05%	176.27%
Salt River nr Roosevelt (gage 09498500)								
Flow	-39.83%	-27.83%	-20.06%	25.58%	-39.80%	-27.83%	-20.06%	25.51%
TSS	-0.96%	142.09%	930.13%	4839.81 %	-1.01%	141.98%	929.57%	4836.98 %
TN	-33.90%	-20.75%	-10.78%	35.77%	-33.89%	-20.79%	-10.82%	35.70%
TP	4.11%	145.45%	962.01%	5023.14 %	4.05%	145.33%	961.41%	5020.12 %
Salt River Outlet								
Flow	-38.23%	-22.22%	-16.28%	24.37%	-38.21%	-22.23%	-16.29%	24.33%
TSS	14.29%	218.77%	865.40%	4239.97 %	14.27%	218.68%	865.08%	4238.43 %
TN	-34.80%	-18.63%	-10.07%	31.43%	-34.79%	-18.66%	-10.09%	31.39%
TP	15.63%	225.65%	899.44%	4422.64 %	15.61%	225.54%	899.09%	4420.97 %
San Pedro River nr Redington (gage 09472000)								

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Flow	-33.37%	-1.82%	19.76%	87.15%	-33.37%	-1.83%	19.76%	87.13%
TSS	-63.44%	447.10%	647.37%	1888.65%	-63.43%	447.01%	647.19%	1888.12%
TN	-53.16%	295.85%	429.27%	1268.83%	-53.14%	295.76%	429.10%	1268.31%
TP	-28.80%	-13.76%	5.12%	56.11%	-28.79%	-13.77%	5.12%	56.10%
Aravaipa Crk nr Mammoth (gage 09473000)								
Flow	-1.83%	5.17%	12.10%	36.57%	-1.99%	4.52%	11.57%	36.08%
TSS	-0.17%	6.59%	69.35%	338.59%	-0.22%	6.70%	69.41%	338.36%
TN	-0.15%	20.28%	171.24%	814.29%	-0.42%	20.85%	170.75%	809.21%
TP	-0.30%	-0.06%	0.87%	3.28%	-0.35%	-0.09%	0.84%	3.29%
San Pedro River Outlet								
Flow	-15.97%	2.69%	18.78%	70.25%	-16.15%	2.32%	18.36%	69.40%
TSS	-9.43%	72.40%	176.29%	672.54%	-9.46%	72.38%	176.10%	671.55%
TN	-19.88%	129.84%	312.06%	1179.94%	-19.86%	129.61%	310.88%	1174.21%
TP	-2.32%	-0.88%	1.66%	8.51%	-2.41%	-0.96%	1.62%	8.51%

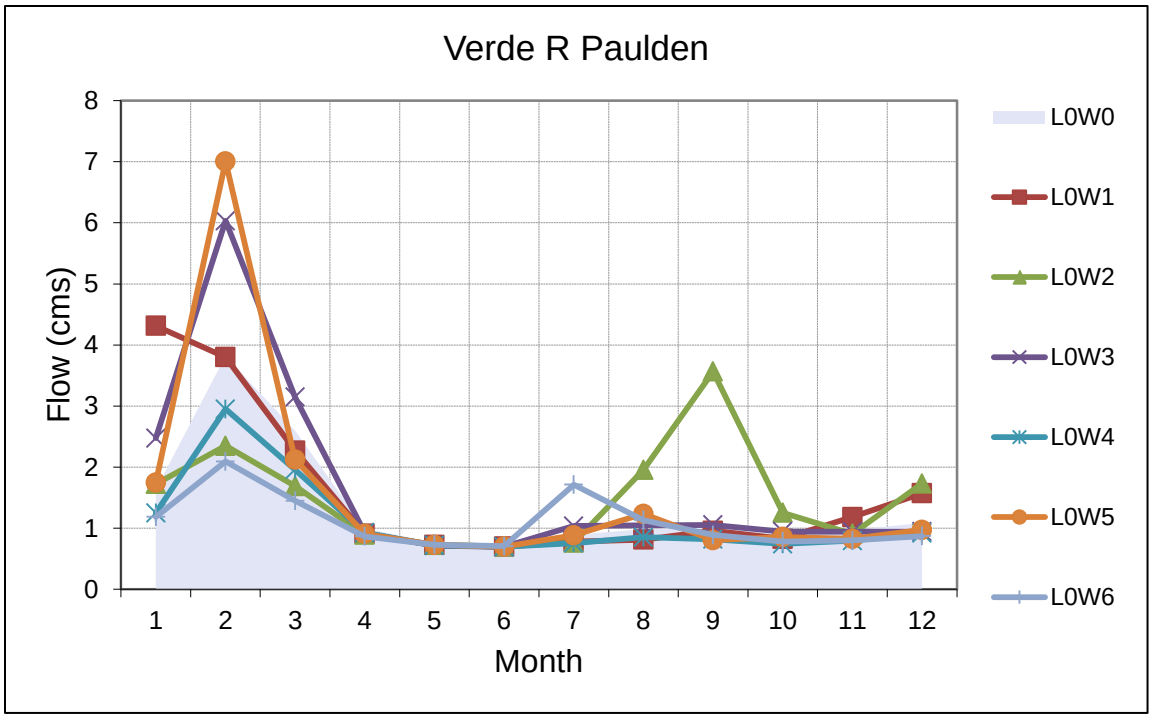

Figure 67. Monthly Average Flows, Verde River near Paulden (HSPF)

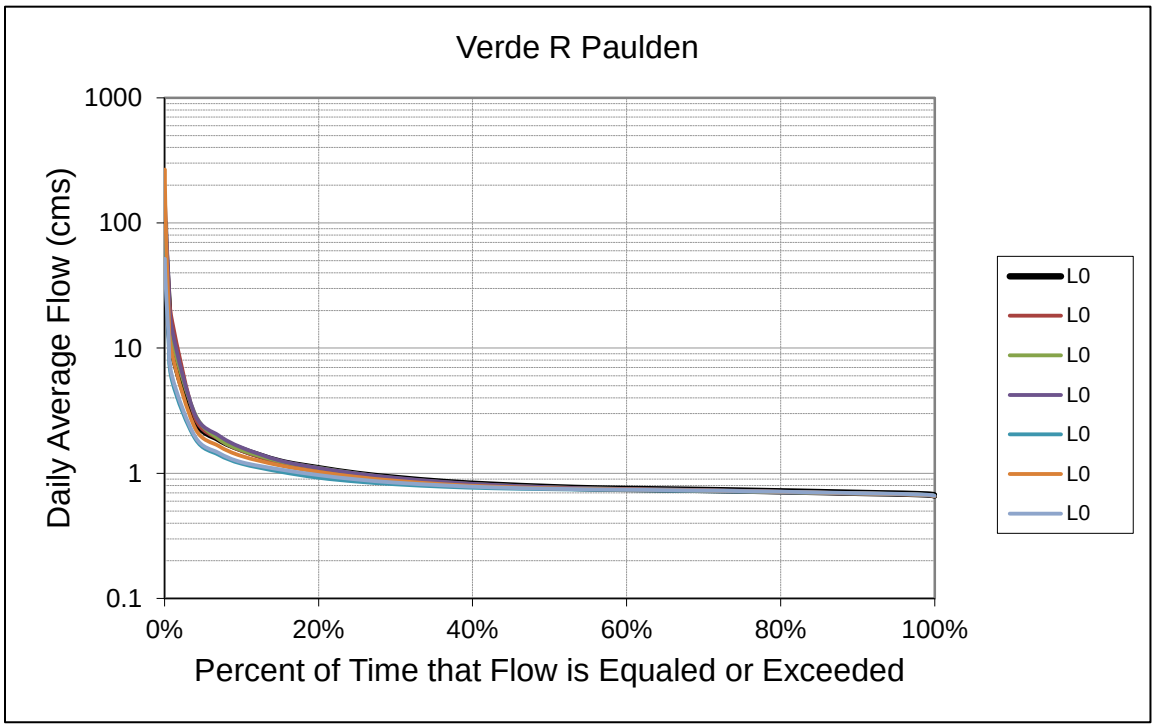

Figure 68. Flow Duration, Verde River near Paulden (HSPF)

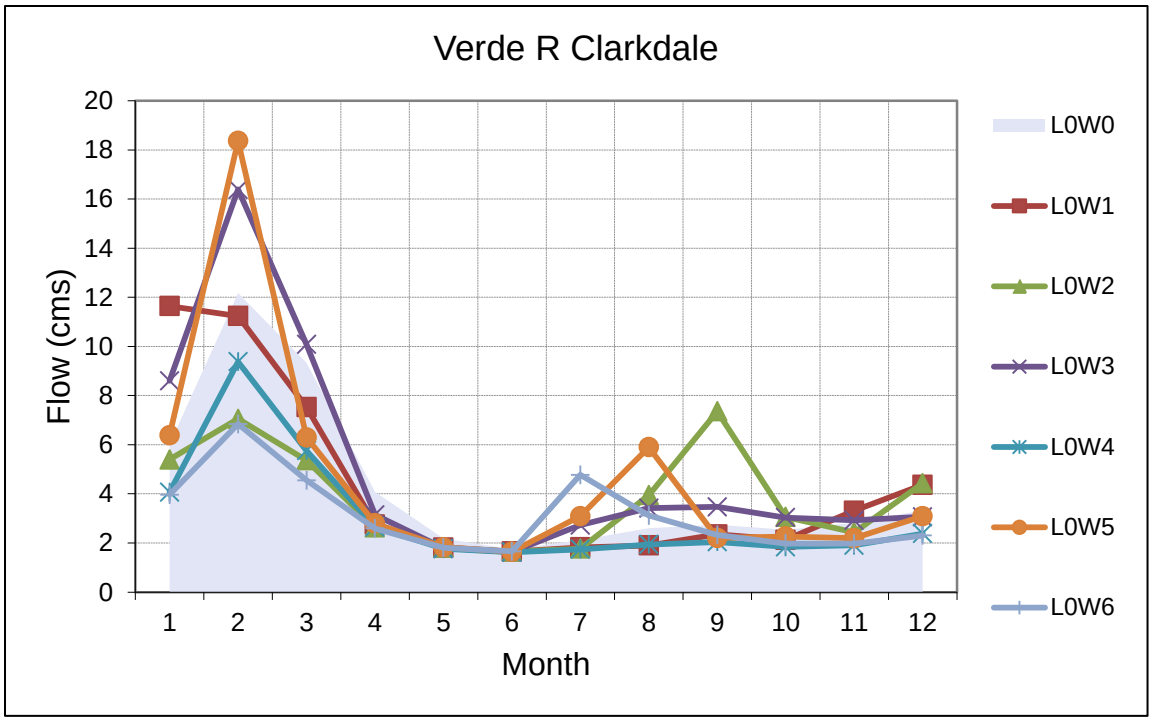

Figure 69. Monthly Average Flows, Verde River near Clarkdale (HSPF)

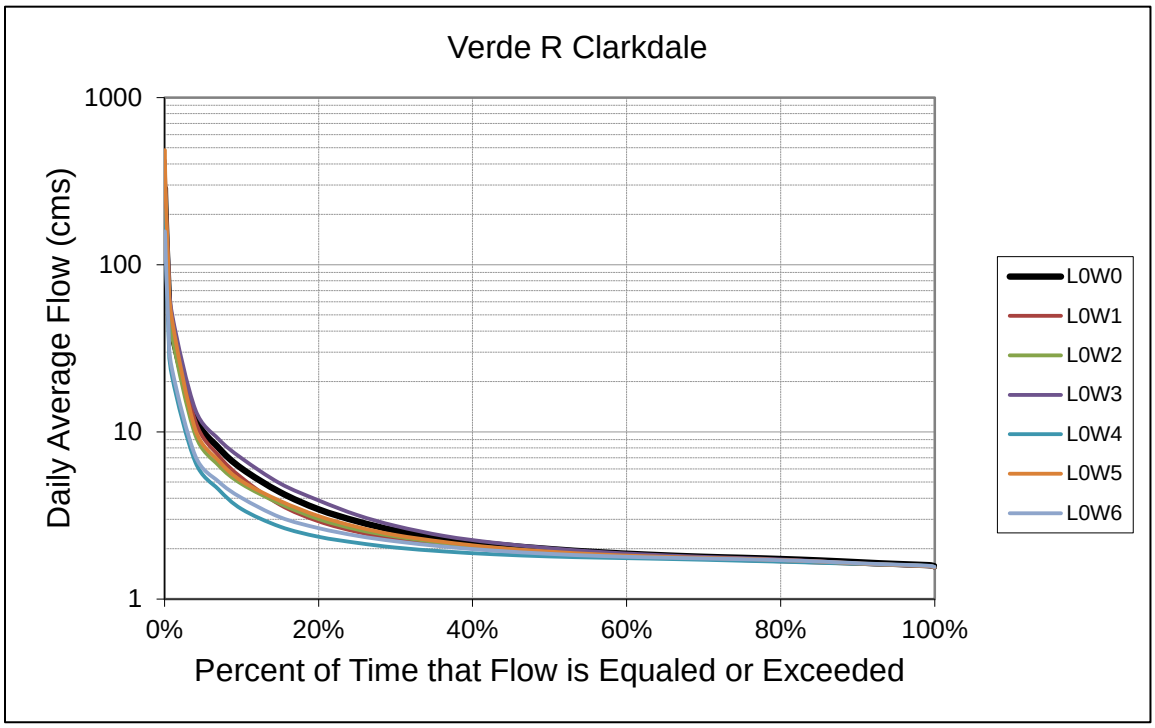

Figure 70. Flow Duration, Verde River near Clarkdale (HSPF)

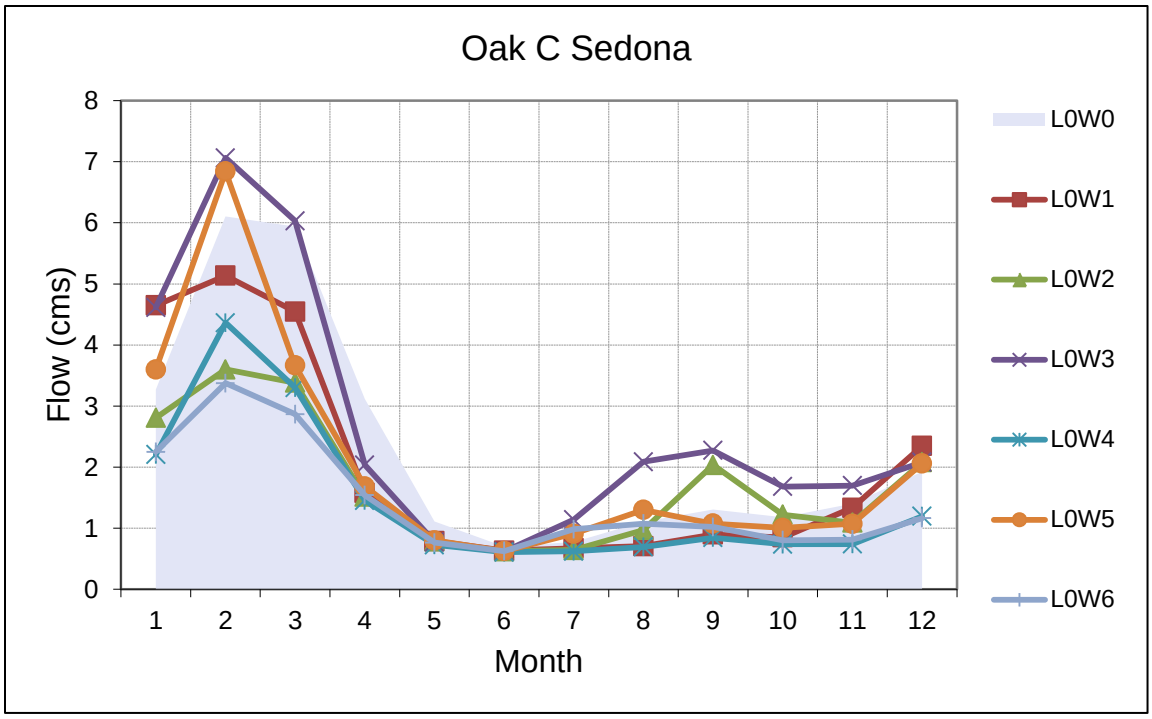

Figure 71. Monthly Average Flows, Oak Creek at Sedona (HSPF)

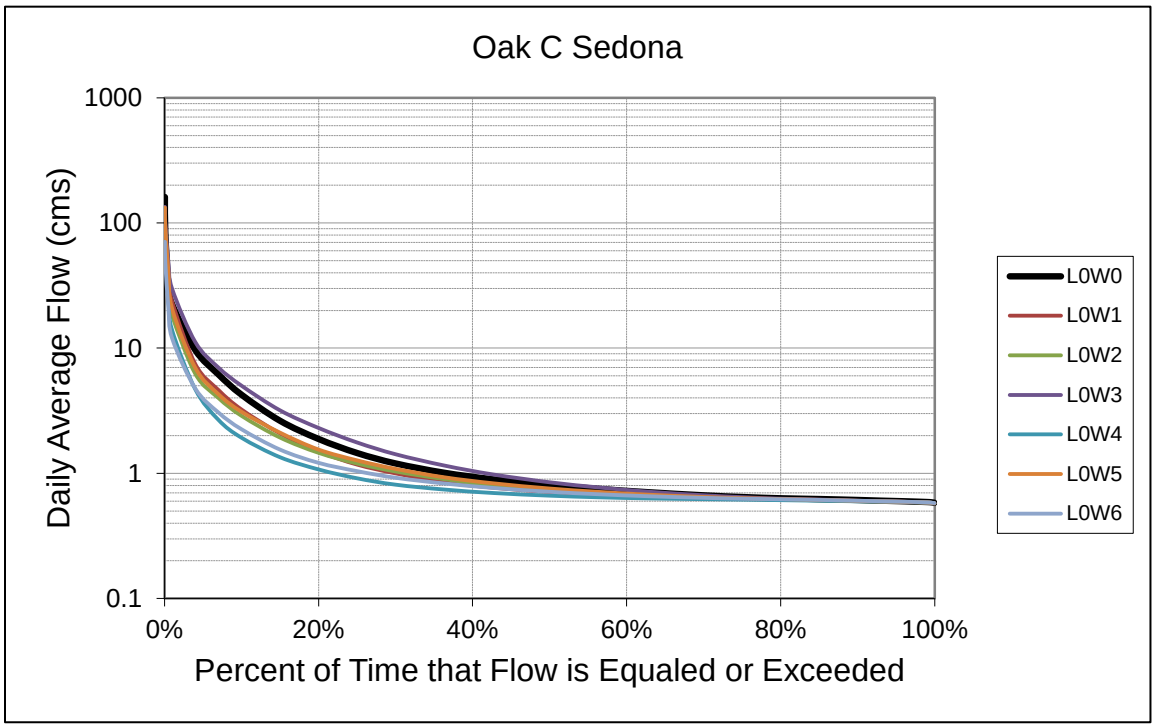

Figure 72. Flow Duration, Oak Creek at Sedona (HSPF)

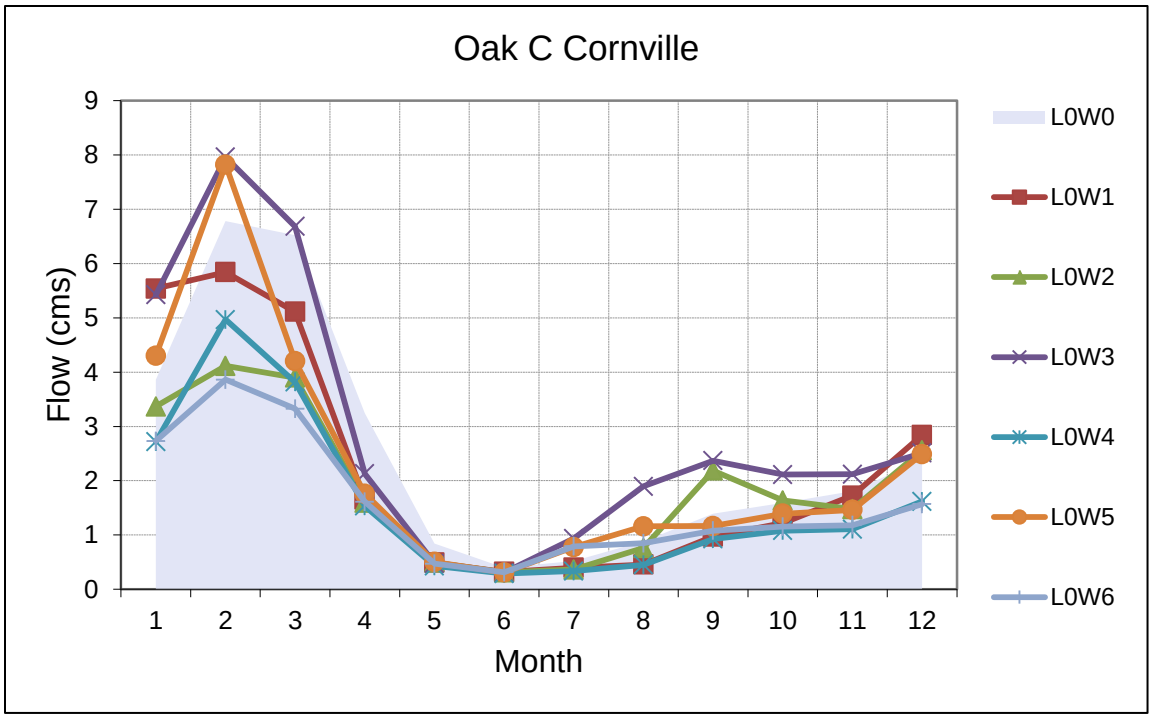

Figure 73. Monthly Average Flows, Oak Creek at Cornville (HSPF)

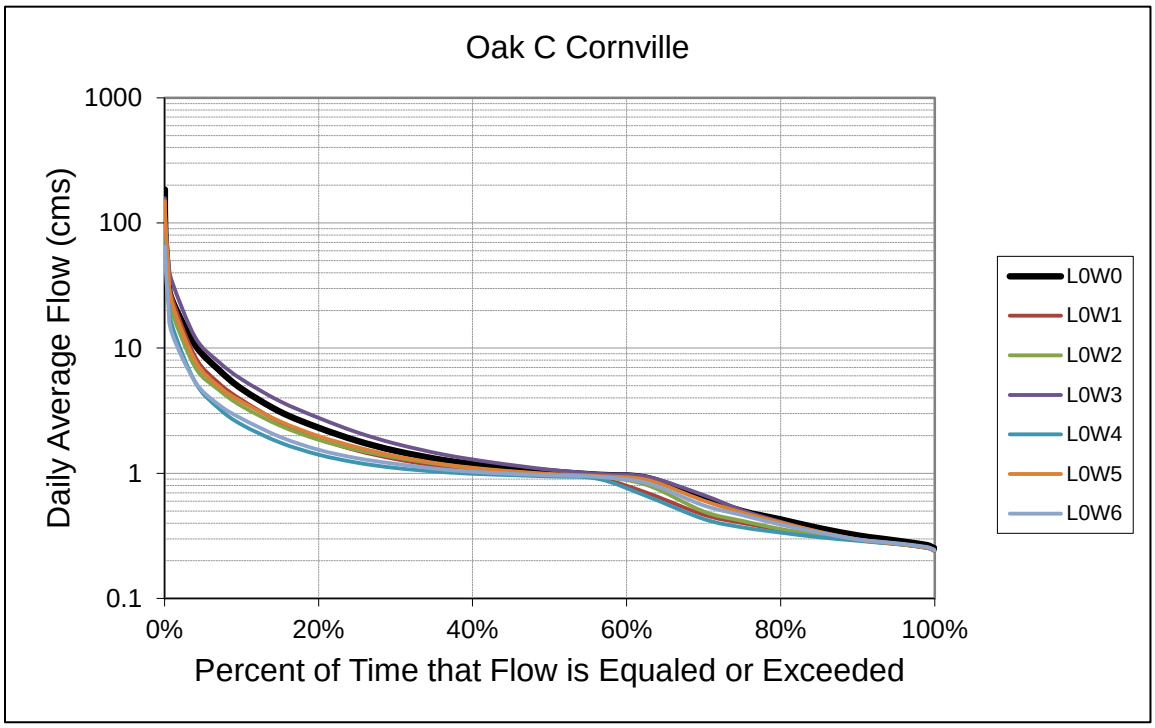

Figure 74. Flow Duration, Oak Creek at Cornville (HSPF)

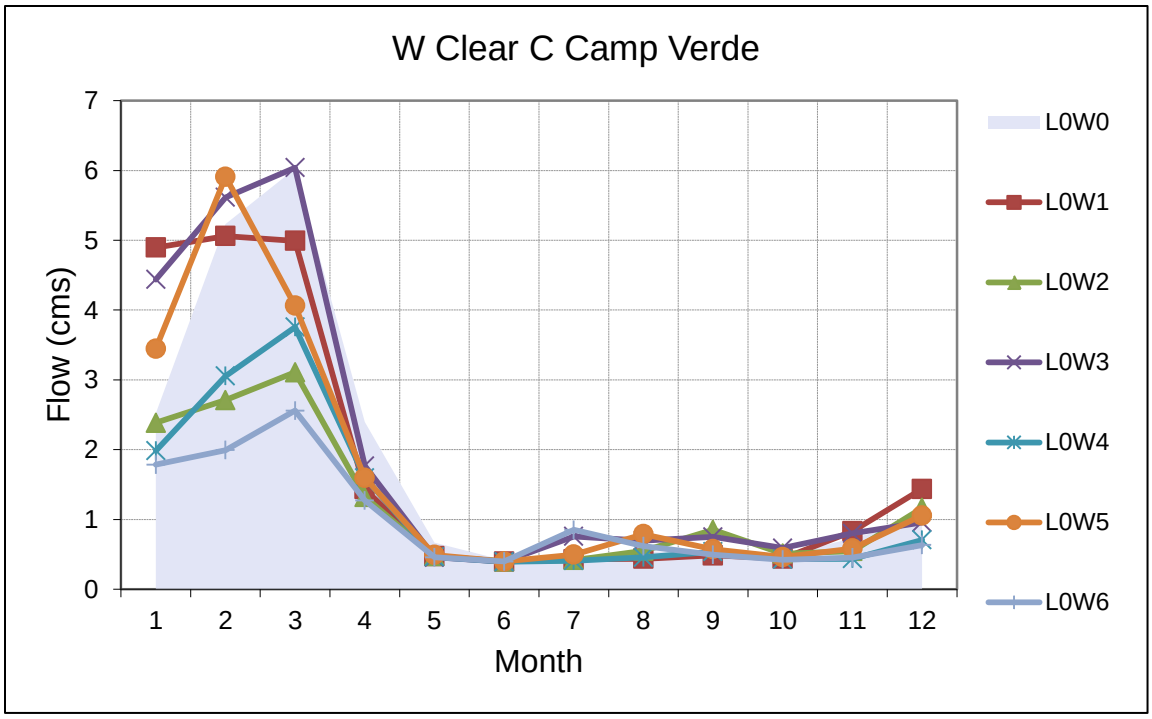

Figure 75. Monthly Average Flows, West Clear Creek at Camp Verde (HSPF)

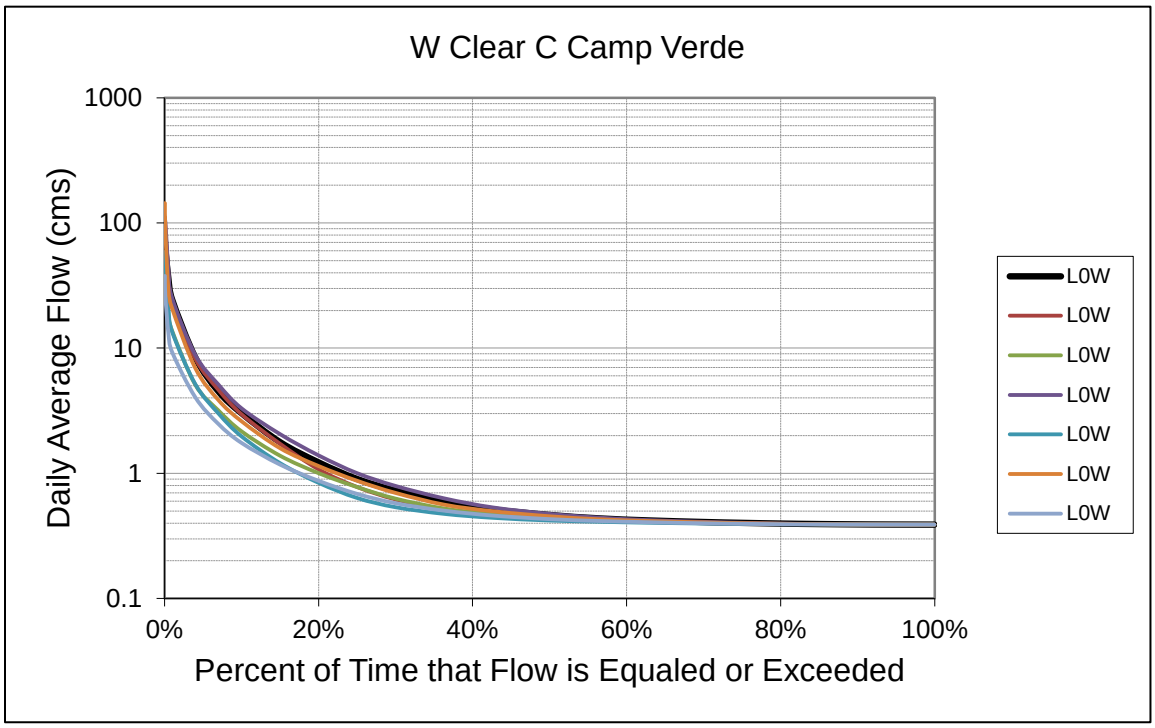

Figure 76. Flow Duration, West Clear Creek at Camp Verde (HSPF)

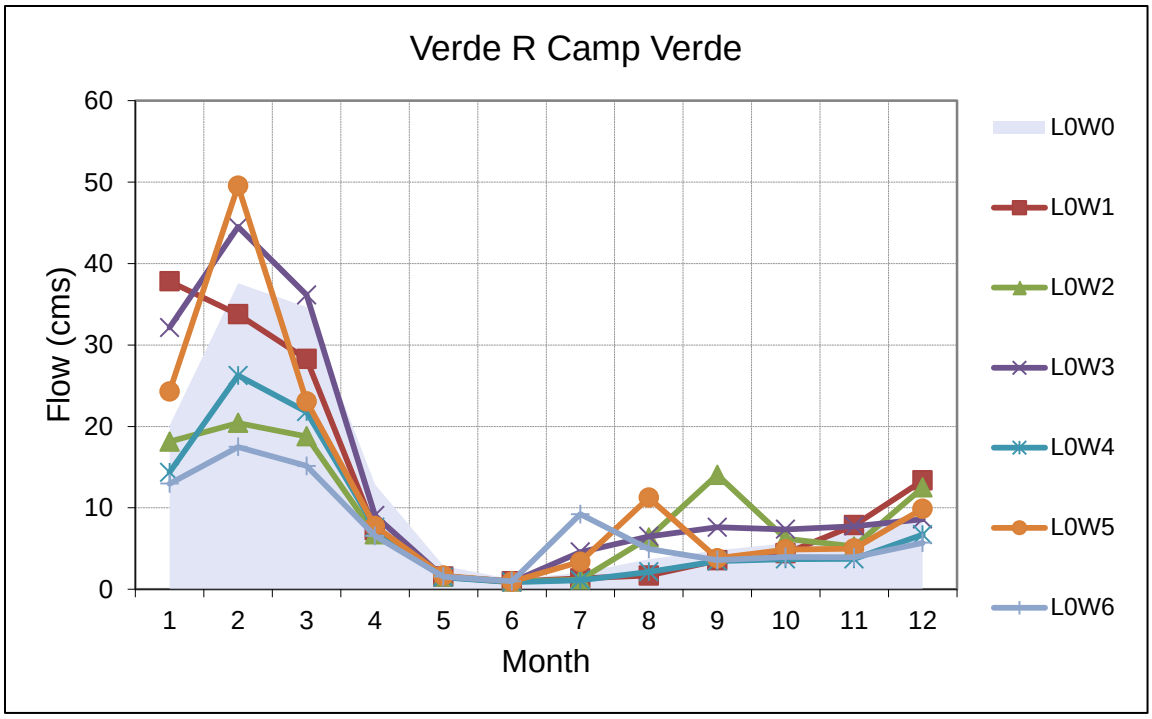

Figure 77. Monthly Average Flows, Verde River at Camp Verde (HSPF)

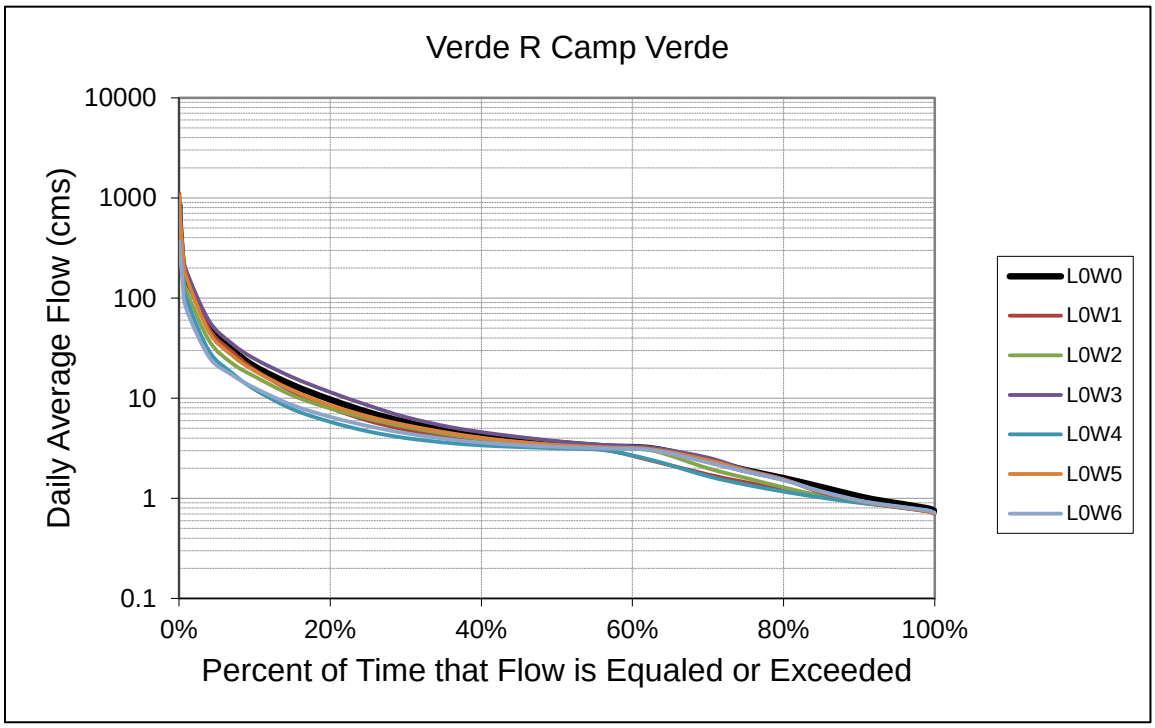

Figure 78. Flow Durations, Verde River at Camp Verde (HSPF)

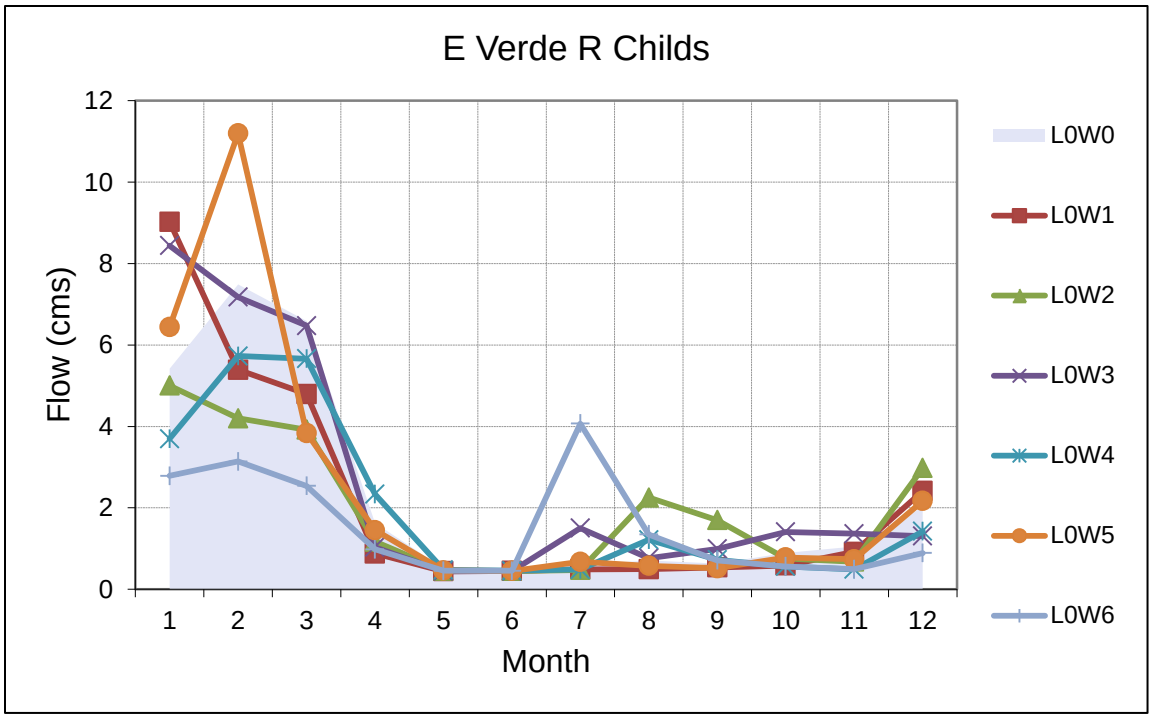

Figure 79. Monthly Average Flows, East Verde River at Childs (HSPF)

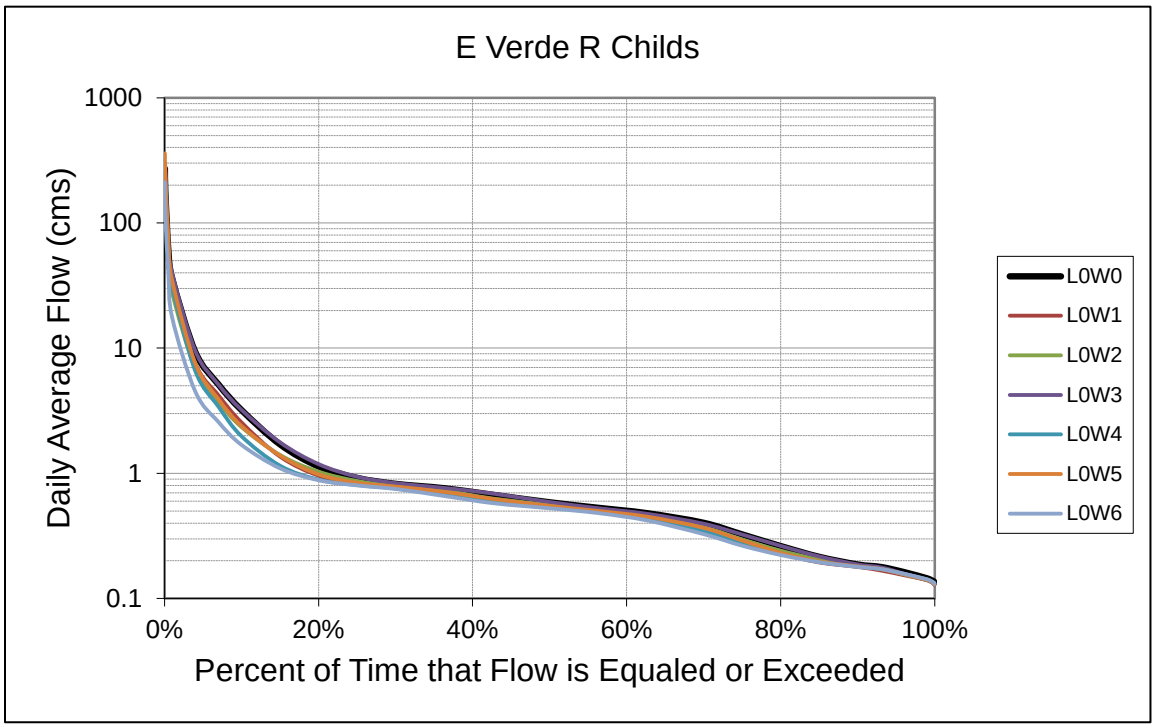

Figure 80. Flow Duration, East Verde River at Childs (HSPF)

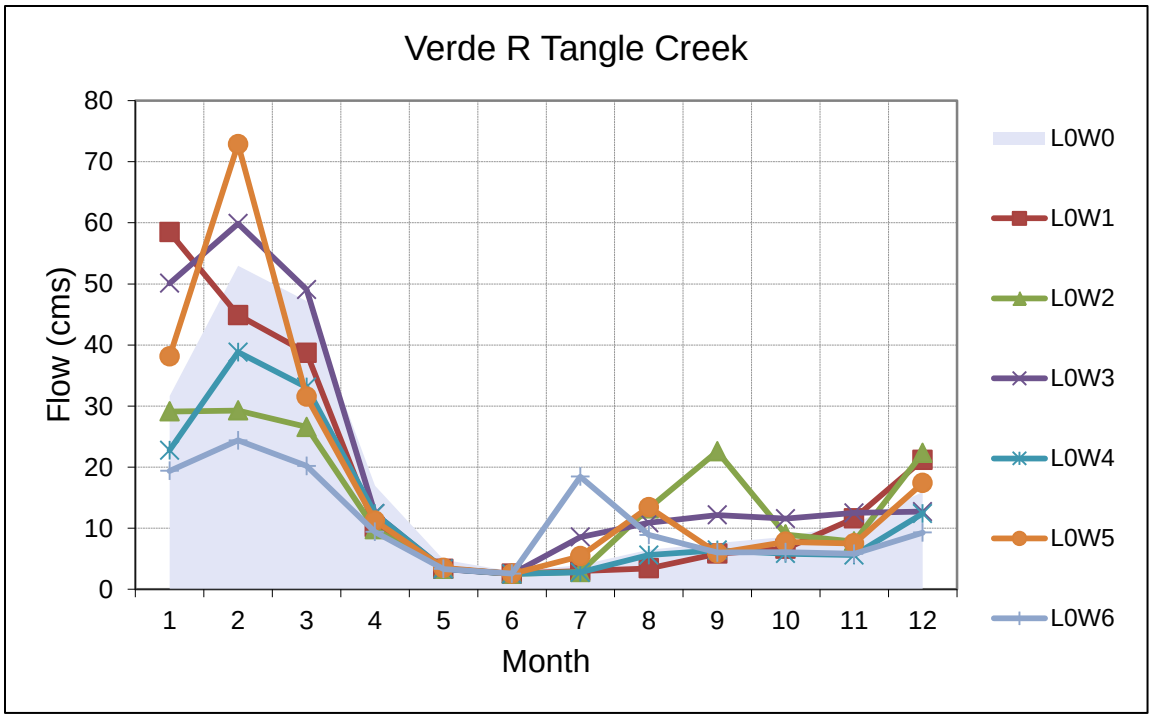

Figure 81. Monthly Average Flows, Verde River at Tangle Creek (HSPF)

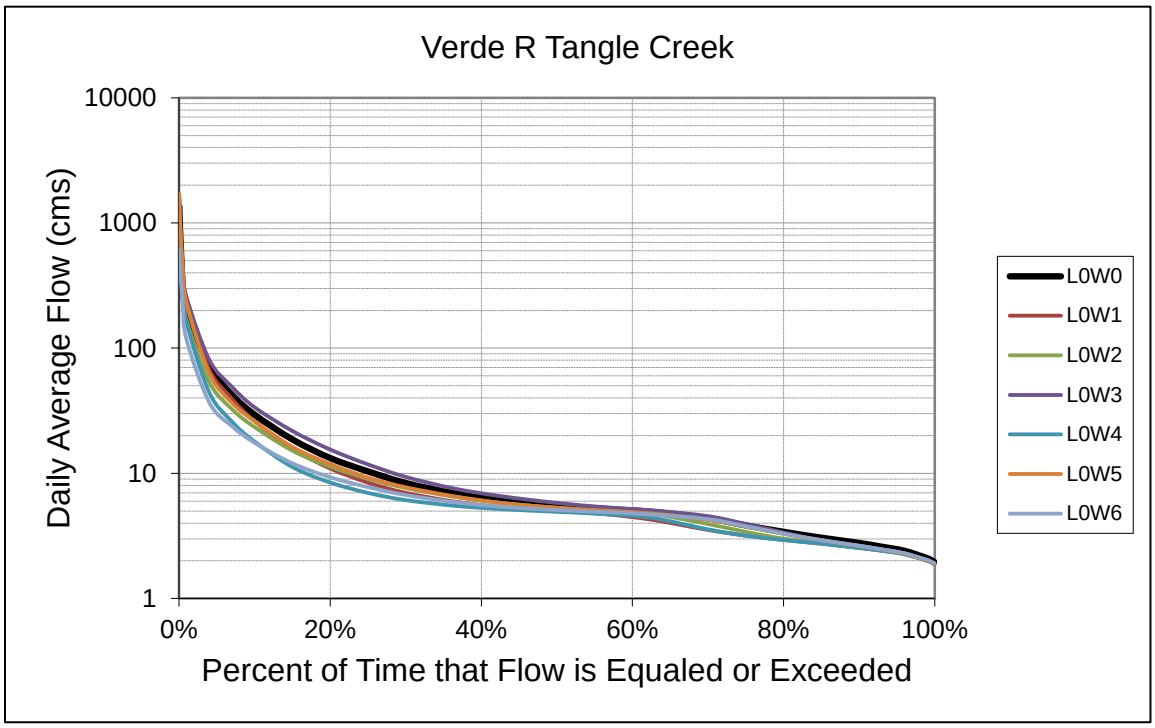

Figure 82. Flow Duration, Verde River at Tangle Creek (HSPF)

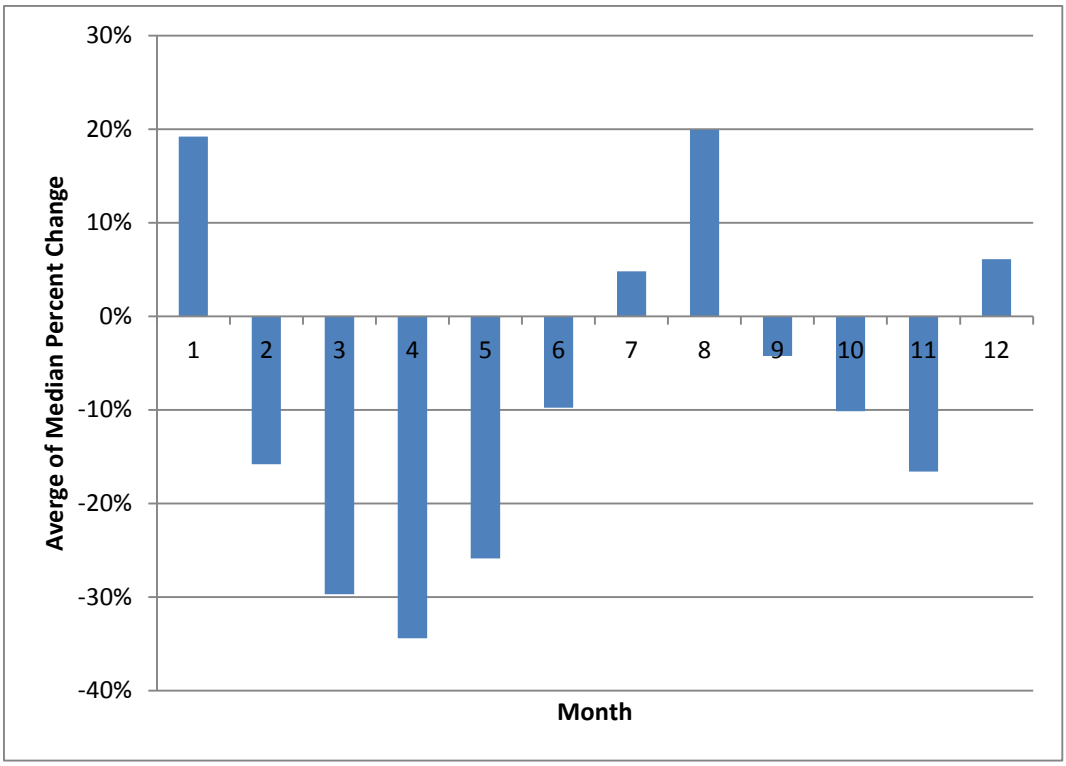

Figure 83. Average of Median Percent Change in Flow; NARCCAP Scenarios W1-W6 at all Stations, Verde-Basin (HSPF)

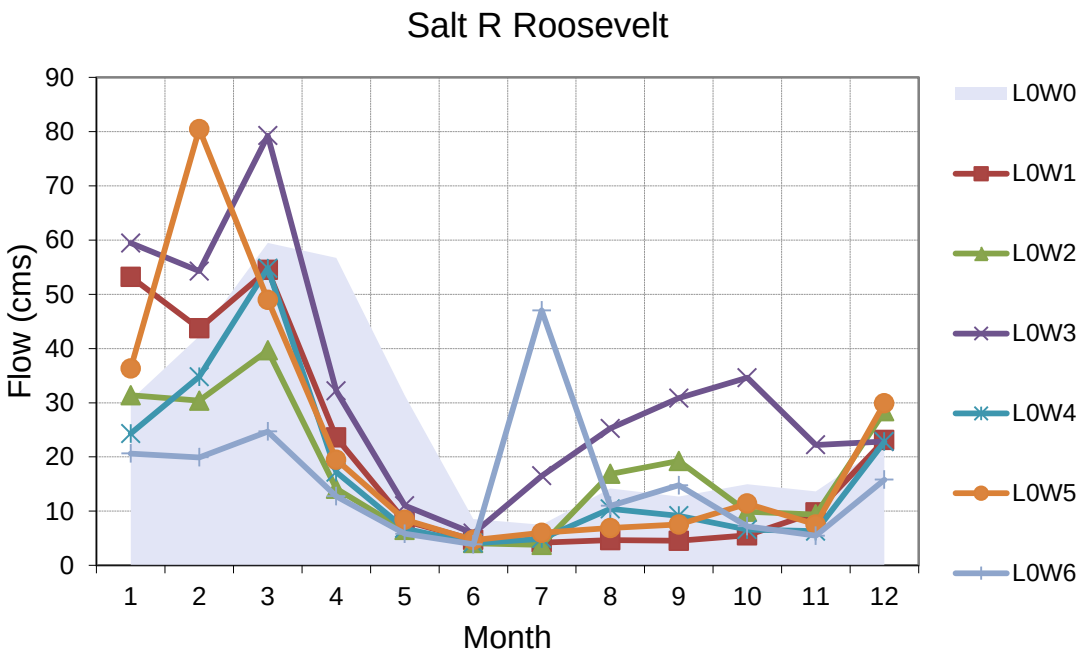

Figure 84. Monthly Average Flows, Salt River nr Roosevelt (HSPF)

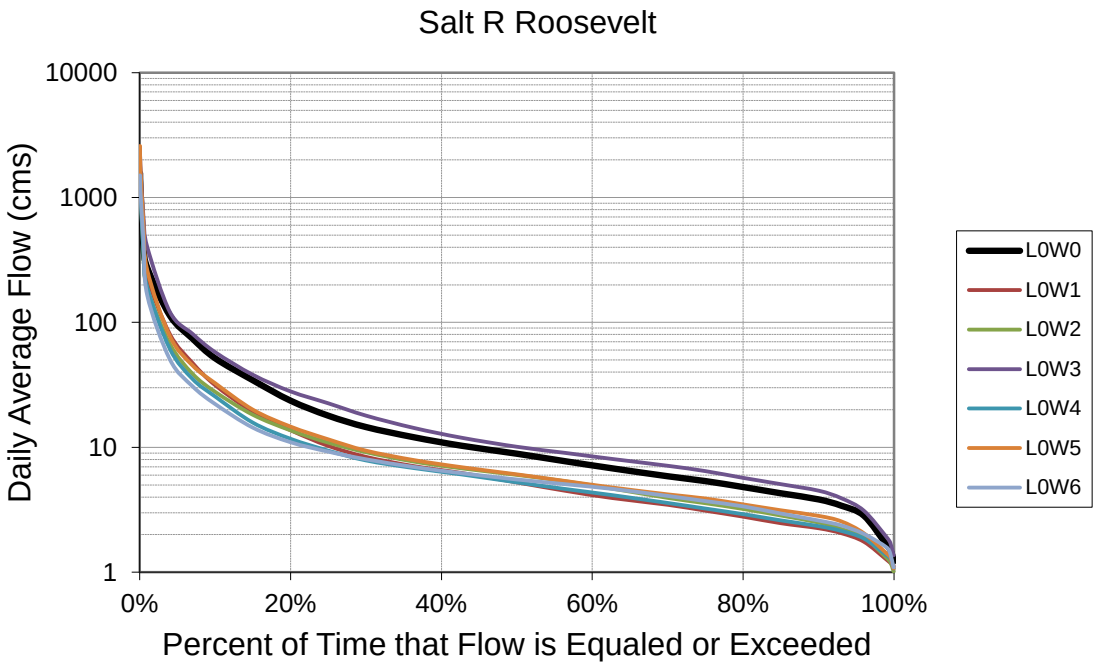

Figure 85. Flow Duration, Salt River nr Roosevelt (HSPF)

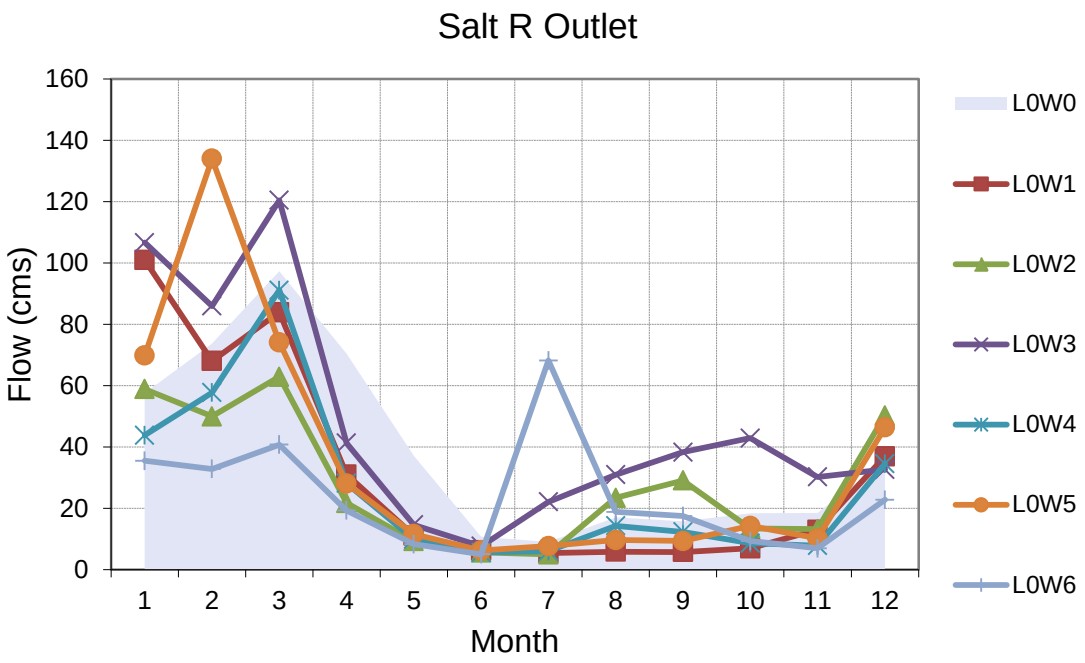

Figure 86. Monthly Average Flows, Salt River at Outlet (HSPF)

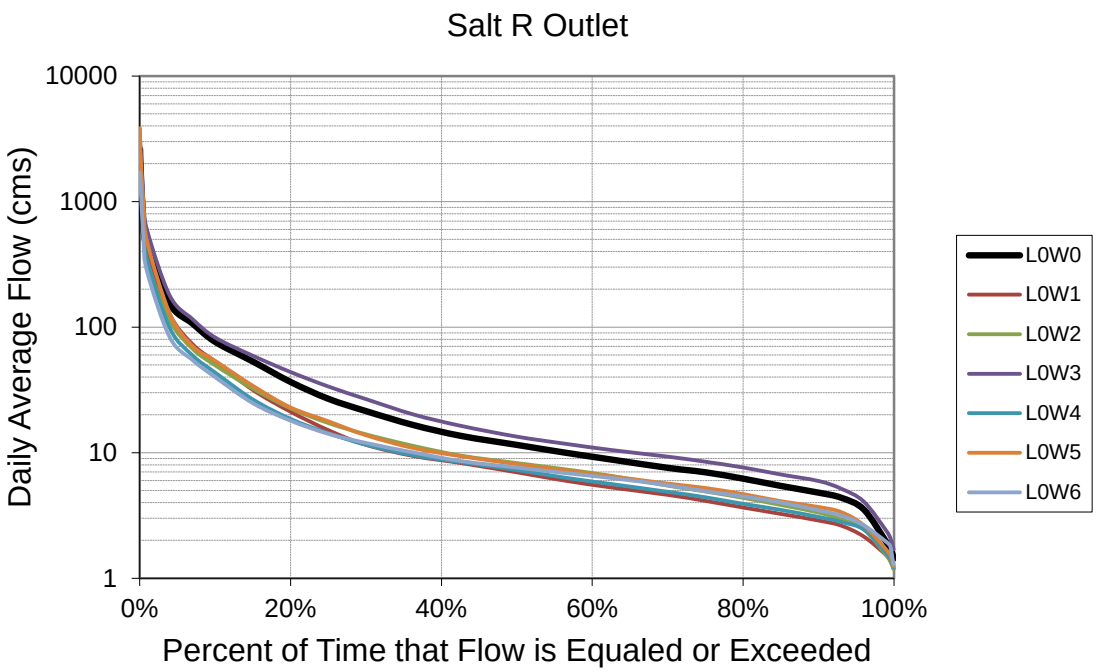

Figure 87. Flow Duration, Salt River at Outlet (HSPF)

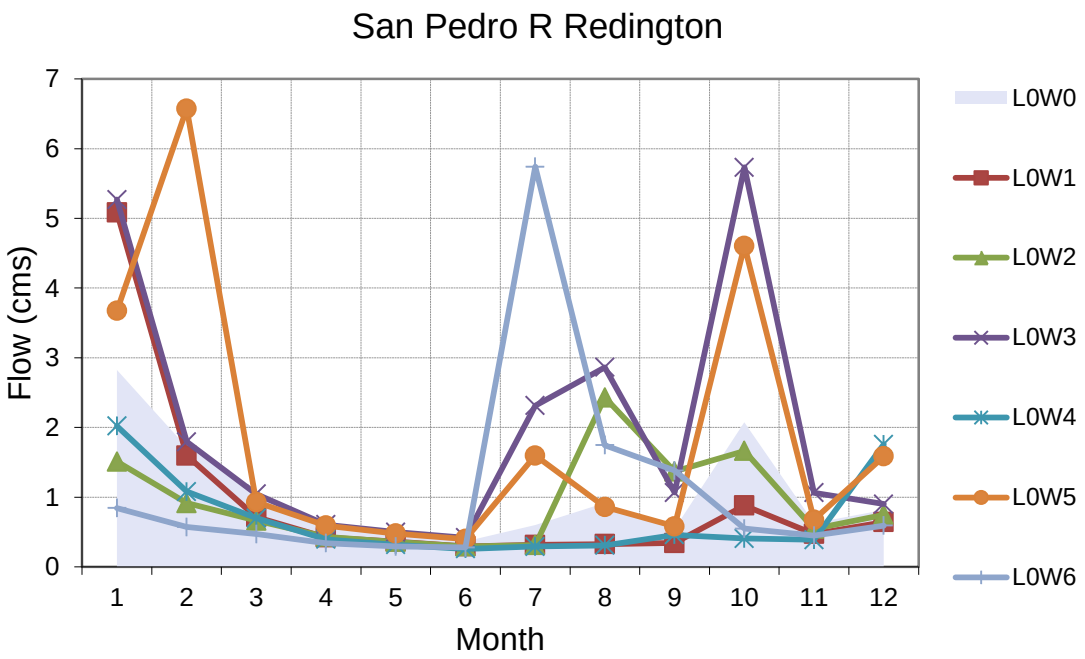

Figure 88. Monthly Average Flows, San Pedro River at Redington (HSPF)

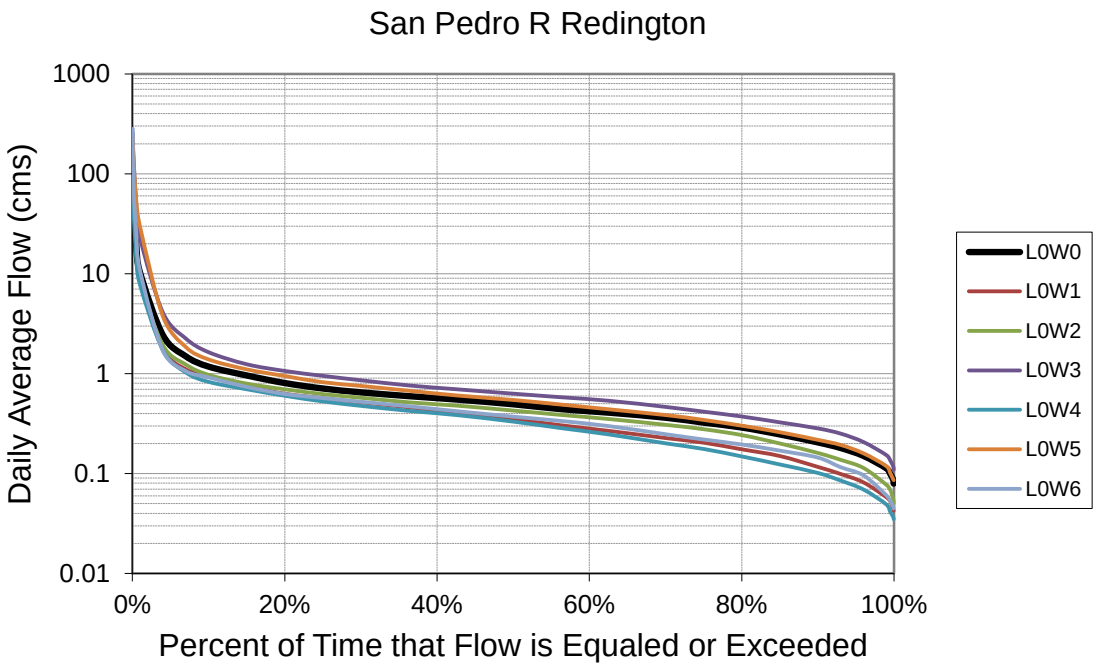

Figure 89. Flow Duration, San Pedro River at Redington (HSPF)

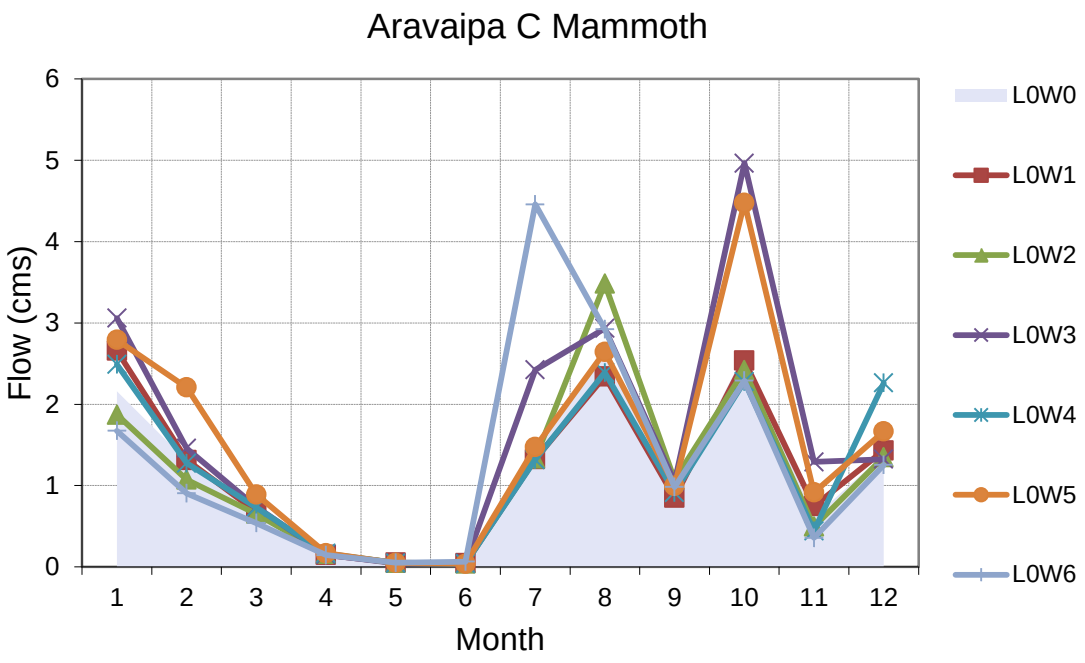

Figure 90. Monthly Average Flows, Aravaipa Creek at Mammoth (HSPF)

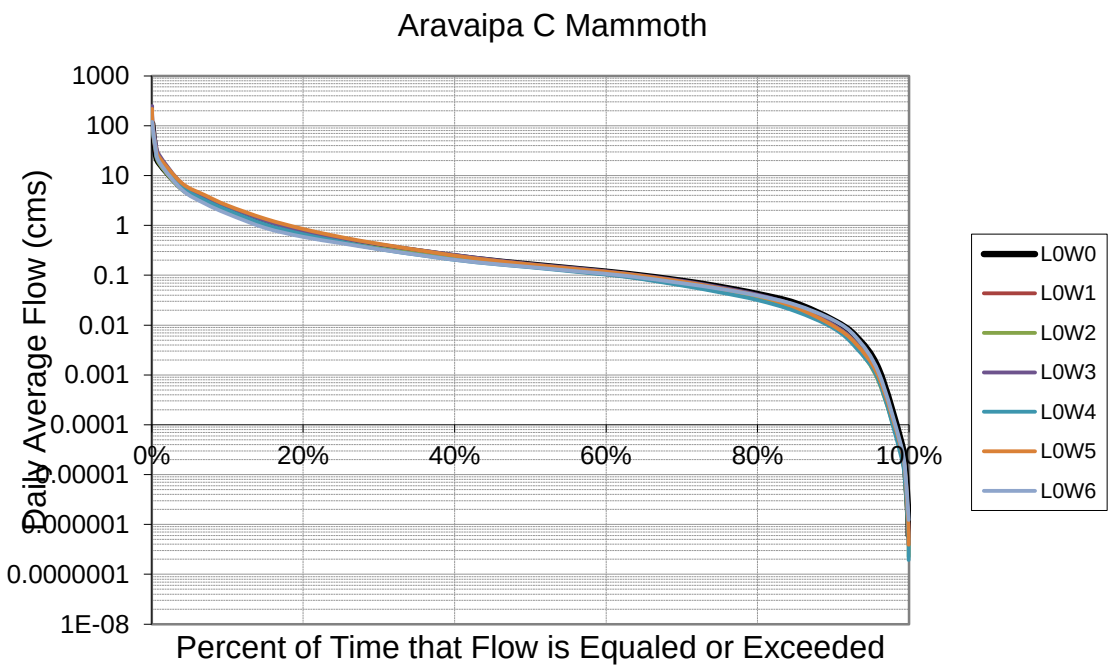

Figure 91. Flow Duration, Aravaipa Creek at Mammoth (HSPF)

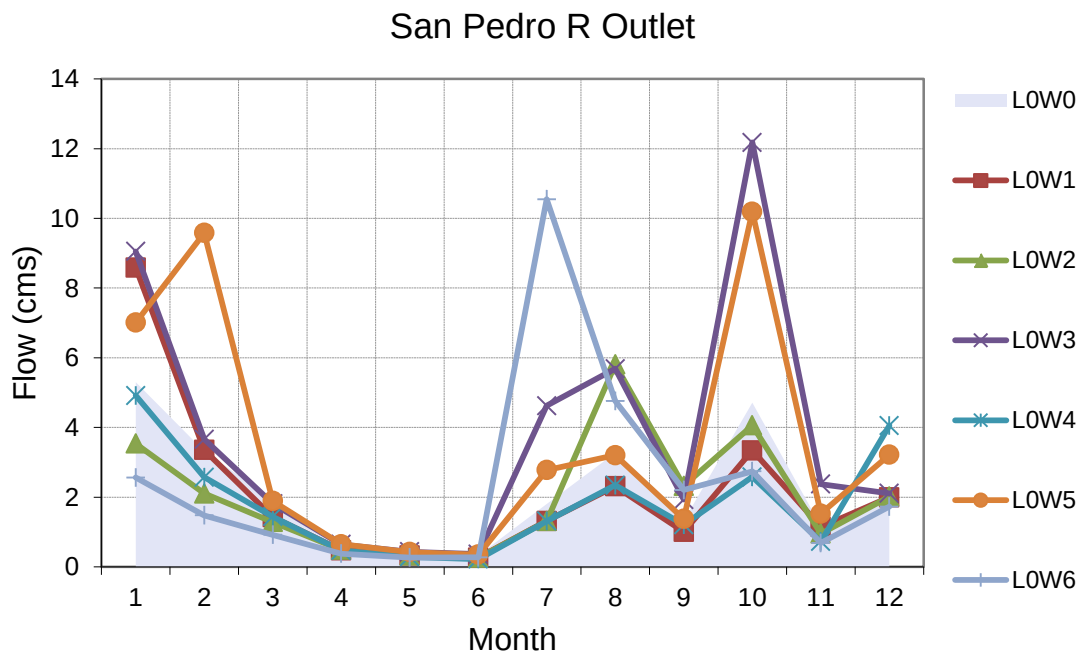

Figure 92. Monthly Average Flows, San Pedro River at Outlet (HSPF)

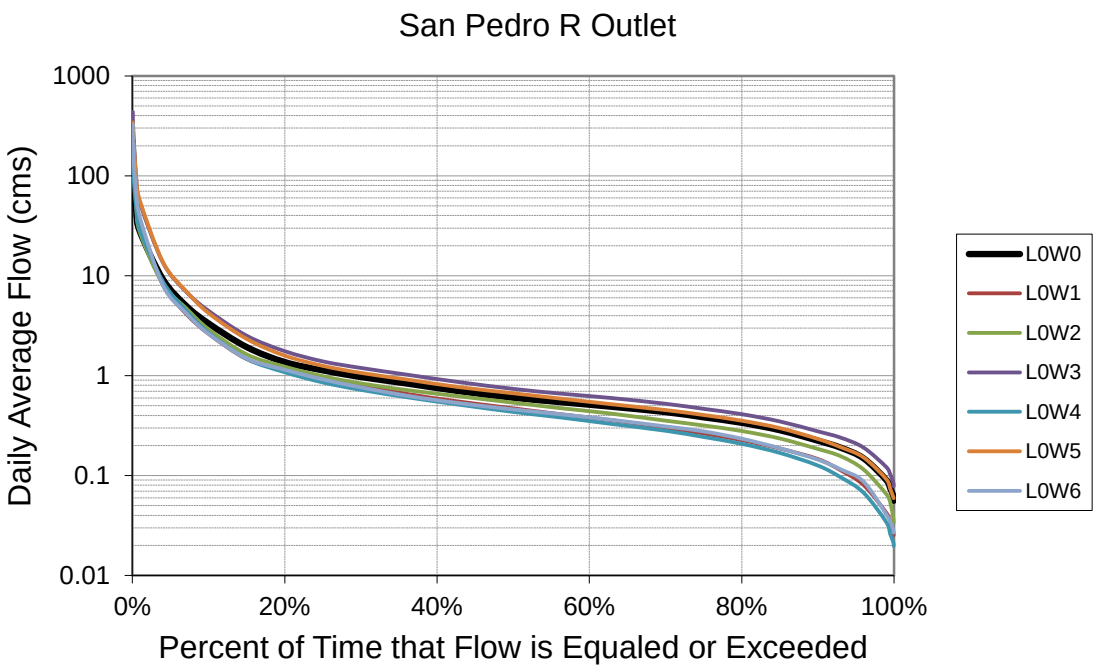

Figure 93. Flow Duration, San Pedro River at Outlet (HSPF)

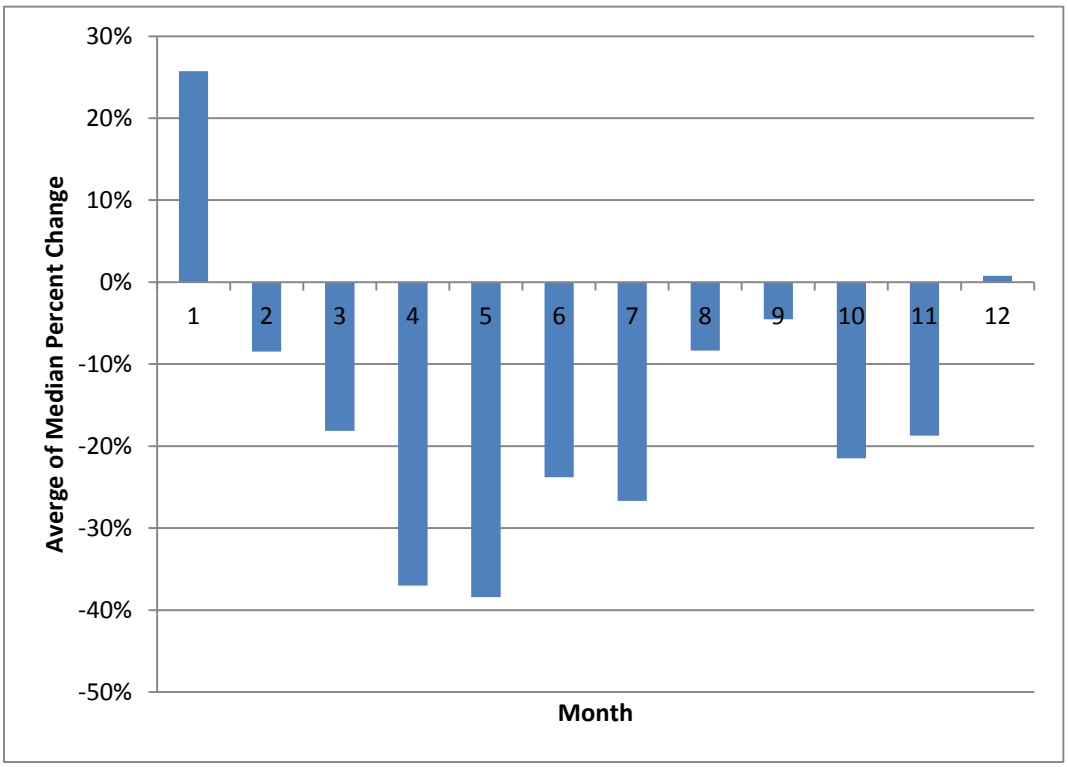

Figure 94. Average of Median Percent Change in Flow; NARCCAP Scenarios W1-W6 at all Stations, Salt and San Pedro Basins (HSPF)

Verde-Salt-San Pedro Basins, SWAT Model
Results at Downstream Station

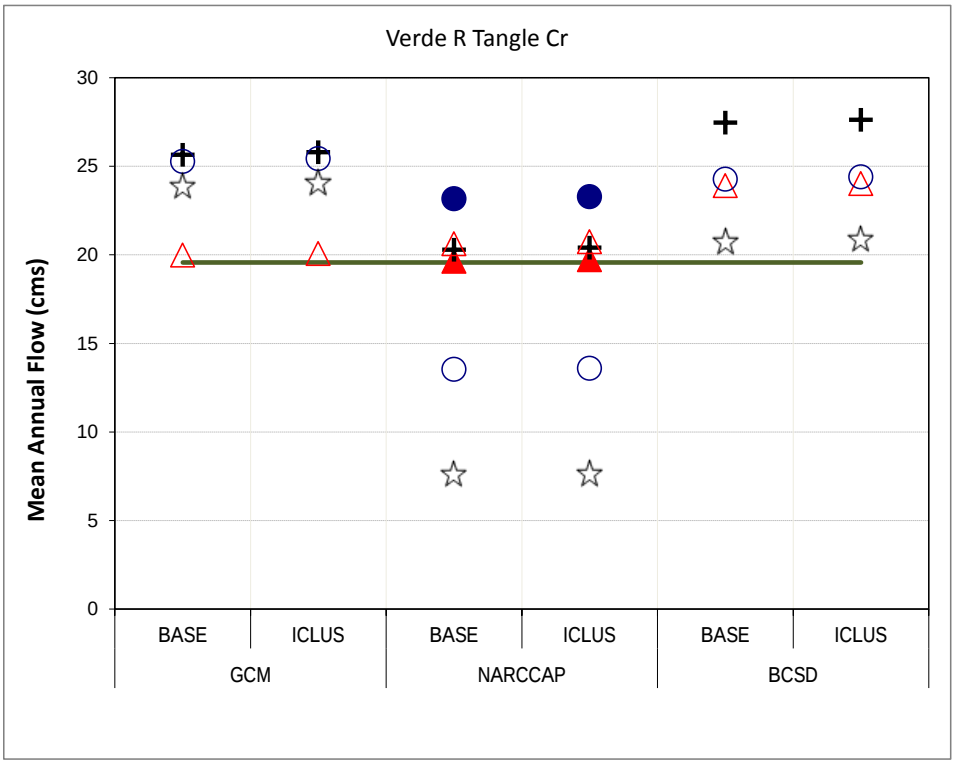

Figure 95. Mean Annual Flow, Verde River below Tangle Creek (SWAT)

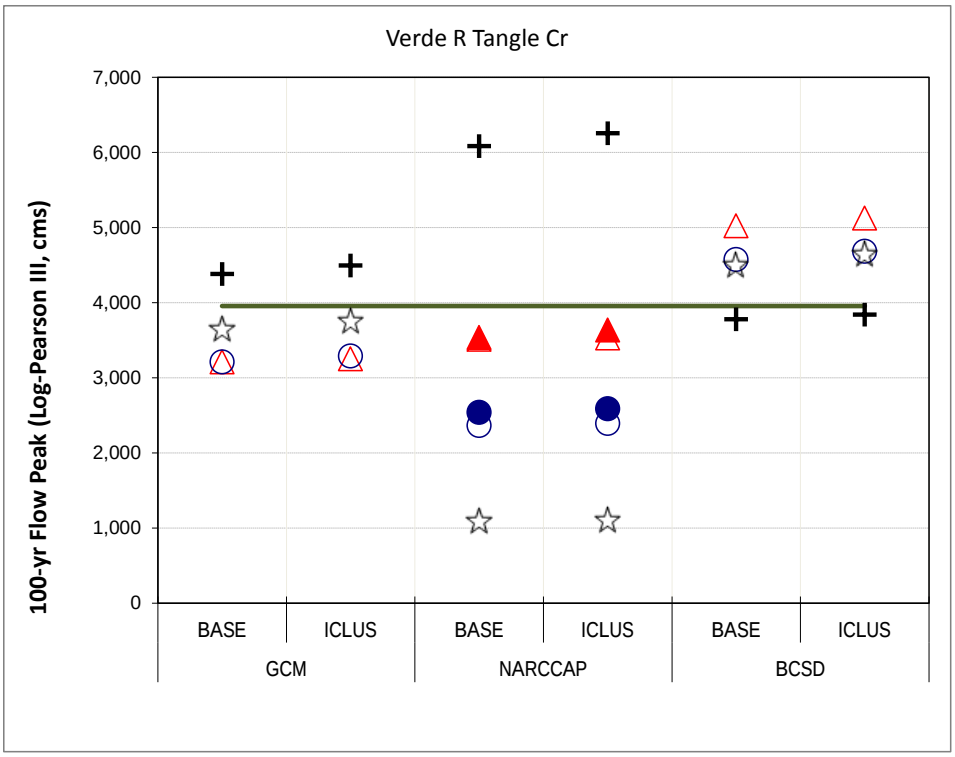

Figure 96. 100-yr Flow Peak, Verde River below Tangle Creek (SWAT)

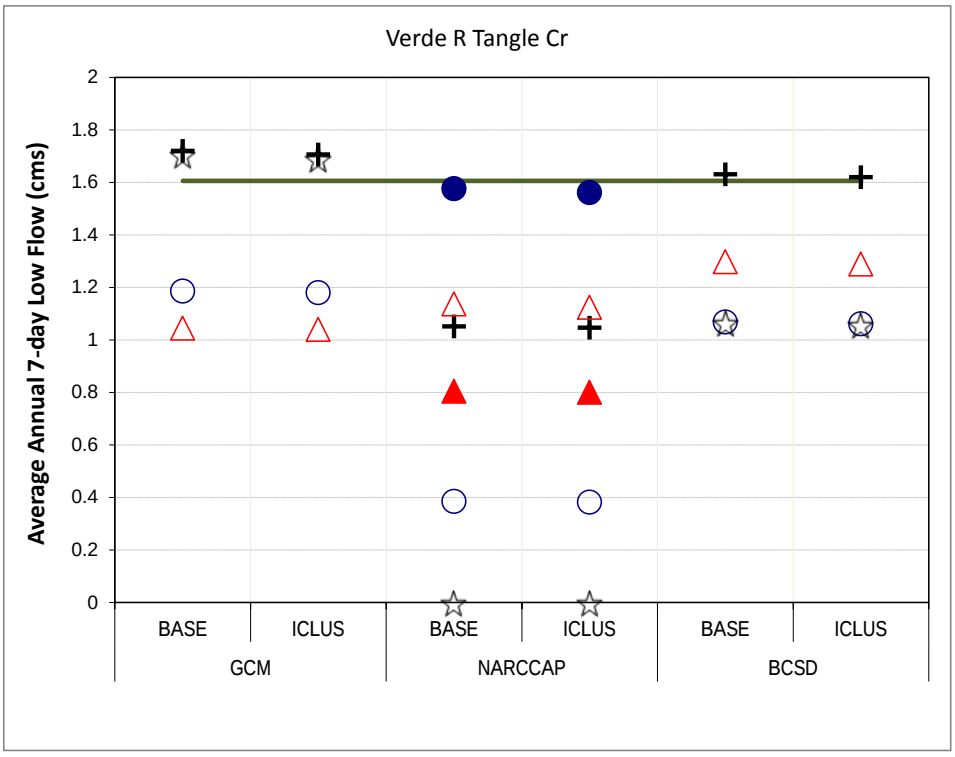

Figure 97. Average Annual 7-day Low Flow, Verde River below Tangle Creek (SWAT)

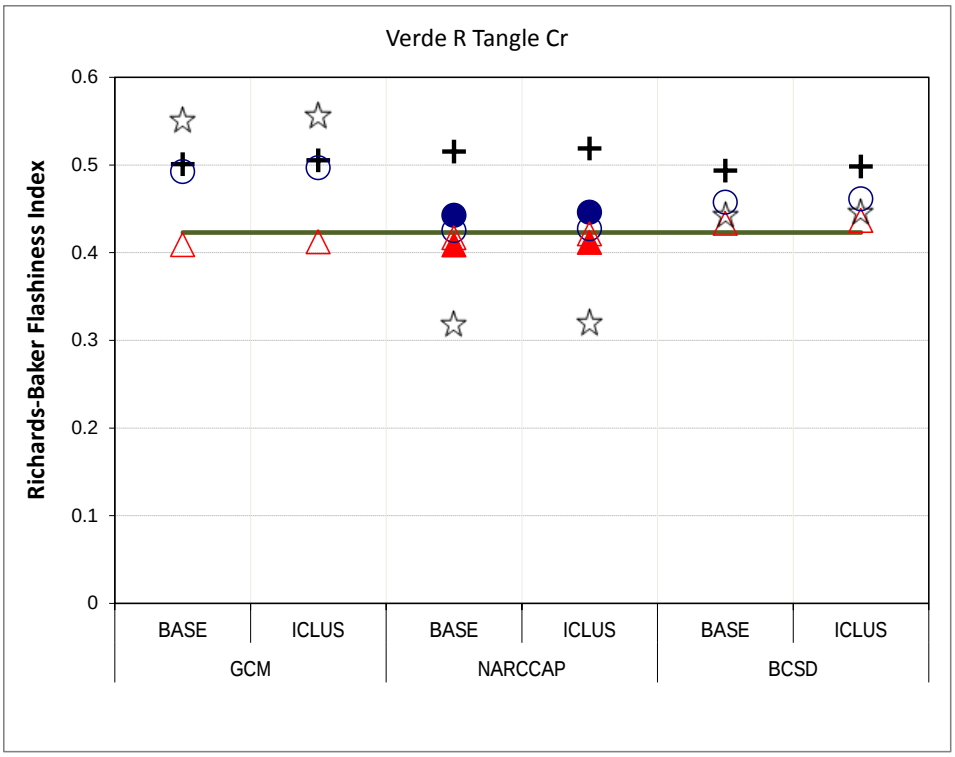

Figure 98. Richards-Baker Flashiness Index, Verde River below Tangle Creek (SWAT)

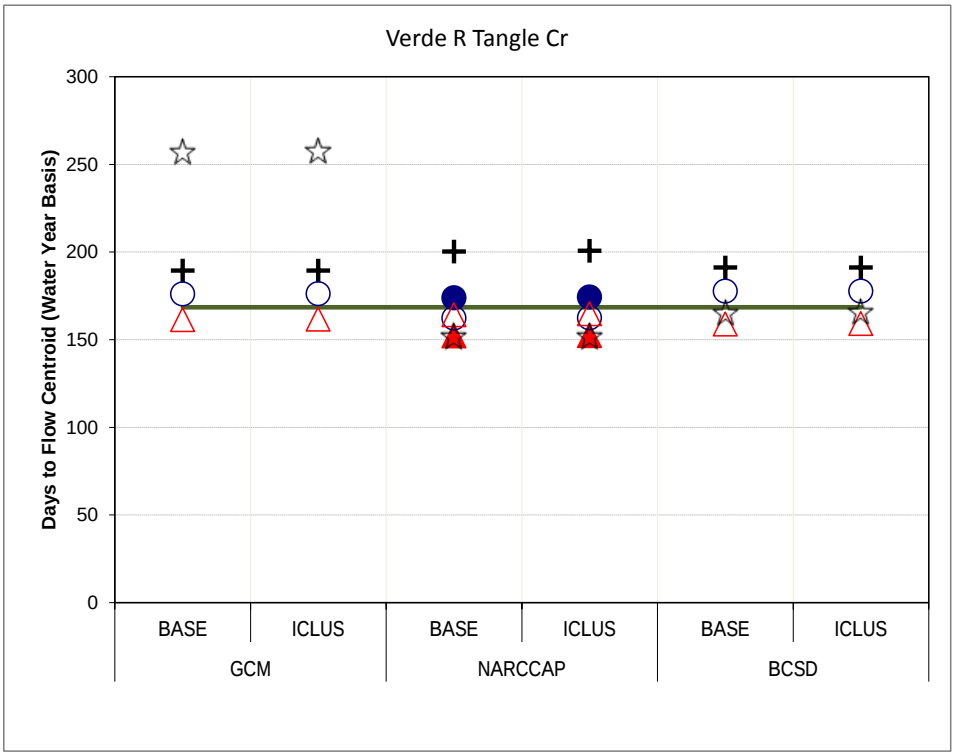

Figure 99. Days to Flow Centroid, Verde River below Tangle Creek (SWAT)

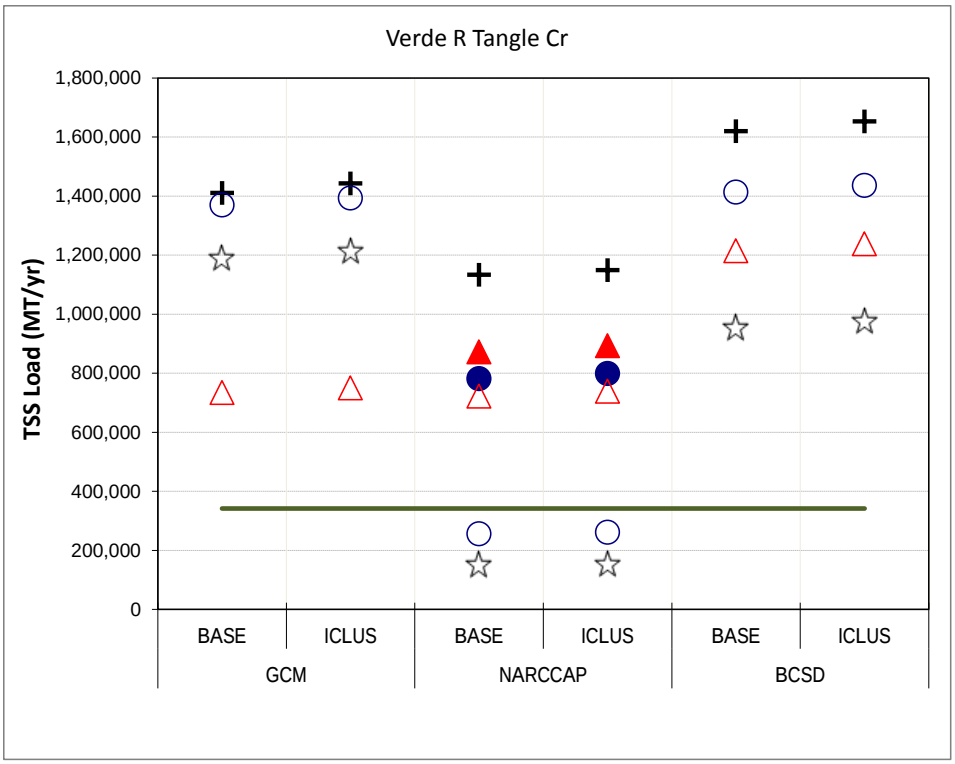

Figure 100. TSS Load, Verde River below Tangle Creek (SWAT)

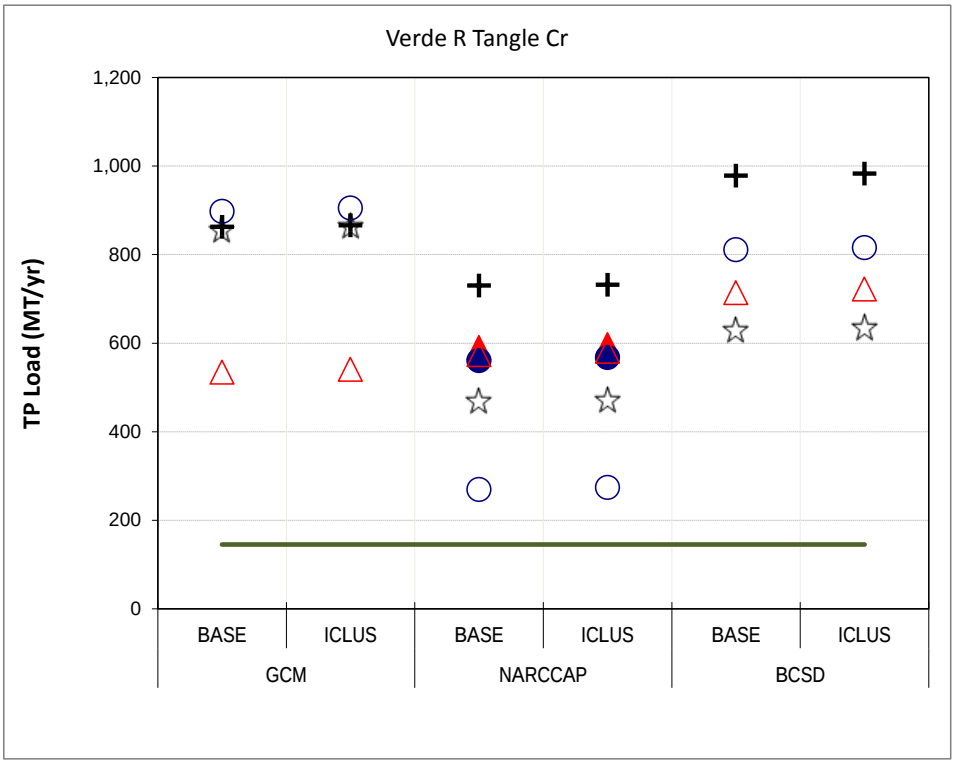

Figure 101. TP Load, Verde River below Tangle Creek (SWAT)

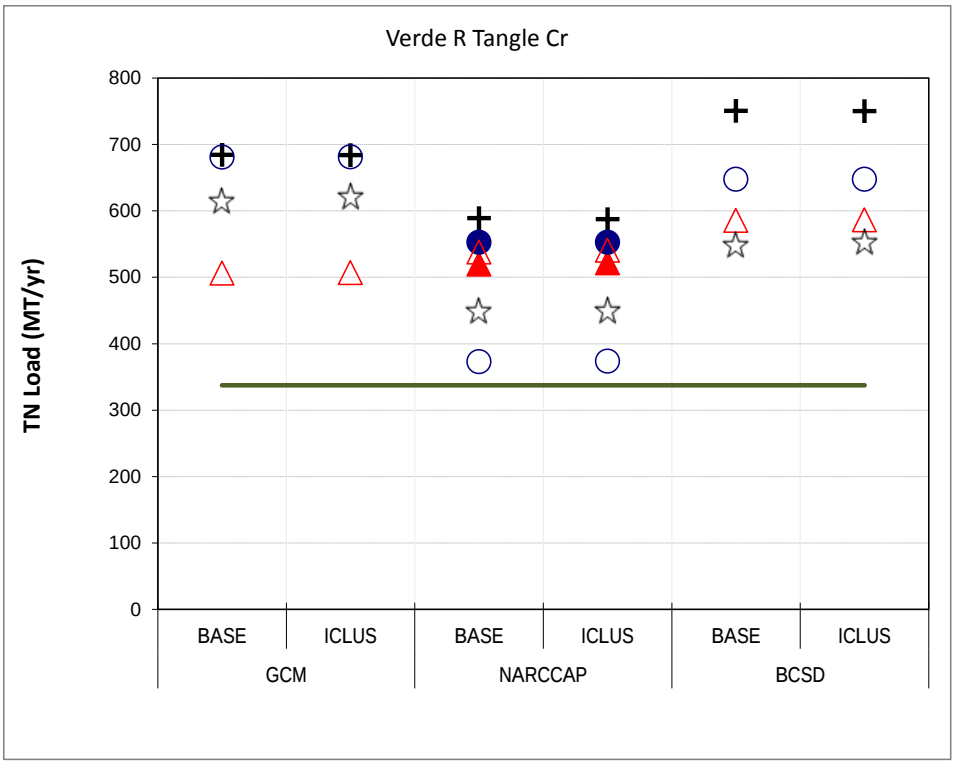

Figure 102. TN Load, Verde River below Tangle Creek (SWAT)

Results at Multiple Stations

Table 4. Summary of Range of Change Relative to Existing Conditions for NARCCAP Dynamically Downscaled Scenarios, Verde-Salt-San Pedro Basins, SWAT Model

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
West Clear Creek (gage 09505800)								
Flow	-87.93%	-68.10%	-69.82%	-54.47%	-87.91%	-68.08%	-69.79%	-54.43%
TSS	543.91%	3311.03%	3021.91 %	5220.10 %	552.58%	3325.16 %	3034.34 %	5235.42 %
TN	21.54%	123.92%	115.04%	190.03%	21.12%	123.31%	114.49%	189.35%
TP	-15.30%	195.72%	169.16%	296.84%	-14.76%	196.78%	170.16%	298.27%
East Verde (gage 09507980)								
Flow	-66.54%	-16.20%	-21.46%	4.52%	-66.54%	-16.21%	-21.47%	4.51%
TSS	-78.88%	-11.01%	-18.43%	15.93%	-78.81%	-11.01%	-18.42%	15.89%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
TN	-29.56%	32.19%	24.06%	47.16%	-29.53%	32.12%	24.01%	47.03%
TP	-73.79%	-20.35%	-25.56%	0.91%	-73.77%	-20.22%	-25.48%	0.97%
Oak Creek at Sedona (gage 09504430)								
Flow	-26.58%	25.10%	23.80%	88.54%	-26.55%	24.98%	23.69%	88.29%
TSS	-12.39%	54.46%	54.84%	144.80%	-12.97%	52.63%	52.78%	140.72%
TN	-14.21%	-5.00%	-5.55%	1.10%	-14.16%	-4.96%	-5.46%	1.32%
TP	-10.82%	50.38%	51.52%	128.63%	-11.36%	49.10%	50.05%	125.88%
Verde R nr Camp Verde (gage 09506000)								
Flow	-60.26%	5.11%	-10.05%	18.48%	-60.38%	4.95%	-10.21%	18.22%
TSS	-46.00%	148.54%	108.65%	233.25%	-47.03%	145.93%	106.06%	227.65%
TN	10.21%	72.87%	64.09%	99.87%	11.36%	74.50%	65.57%	100.72%
TP	108.69%	357.05%	327.69%	495.44%	108.58%	354.07%	323.53%	485.56%
Verde R nr Clarkdale (gage 09504000)								
Flow	-41.14%	40.02%	19.88%	51.52%	-41.65%	39.32%	19.19%	50.94%
TSS	40.26%	323.83%	346.55%	855.28%	38.05%	318.14%	336.94%	824.50%
TN	25.20%	111.17%	109.75%	191.14%	27.62%	114.61%	111.88%	191.47%
TP	285.71%	780.15%	831.65%	1480.95 %	275.32%	749.04%	794.13%	1403.92 %
Verde R below Tangle Crk (gage 09508500)								
Flow	-60.72%	1.99%	-10.64%	18.41%	-60.81%	1.89%	-10.75%	18.22%
TSS	-54.22%	119.71%	91.02%	231.21%	-55.24%	117.36%	88.48%	225.00%
TN	10.57%	56.75%	49.38%	74.63%	11.33%	58.16%	50.29%	75.01%
TP	85.59%	290.98%	267.10%	403.13%	85.91%	289.64%	264.76%	396.67%
Salt River nr Roosevelt (gage 09498500)								
Flow	-57.18%	-10.92%	-3.41%	69.62%	-57.18%	-10.95%	-3.43%	69.56%
TSS	-72.06%	-14.60%	-4.17%	100.90%	-72.07%	-14.65%	-4.23%	100.71%
TN	-16.91%	9.14%	19.70%	77.68%	-16.91%	9.21%	19.77%	77.78%
TP	-10.18%	43.82%	59.75%	161.34%	-10.35%	43.58%	59.45%	160.79%
Aravaipa Cr nr Mammoth (gage 09473000)								

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Flow	-84.35%	-12.33%	1.99%	90.11%	-84.35%	-12.33%	1.99%	90.11%
TSS	-93.09%	9.80%	44.27%	220.47%	-93.09%	9.77%	44.24%	220.40%
TN	-0.71%	37.01%	44.84%	110.18%	-0.73%	36.82%	44.68%	109.88%
TP	-89.99%	18.57%	56.87%	252.59%	-89.94%	18.54%	56.66%	251.78%
San Pedro R nr Redington (gage 0947200)								
Flow	-70.72%	5.05%	18.43%	118.68%	-70.83%	5.05%	18.40%	118.56%
TSS	-65.76%	11.84%	47.17%	212.38%	-65.93%	11.39%	47.37%	213.42%
TN	-17.50%	68.76%	131.04%	355.31%	-17.86%	68.34%	129.83%	352.89%
TP	-84.13%	57.68%	73.97%	322.07%	-84.06%	57.10%	73.46%	320.27%

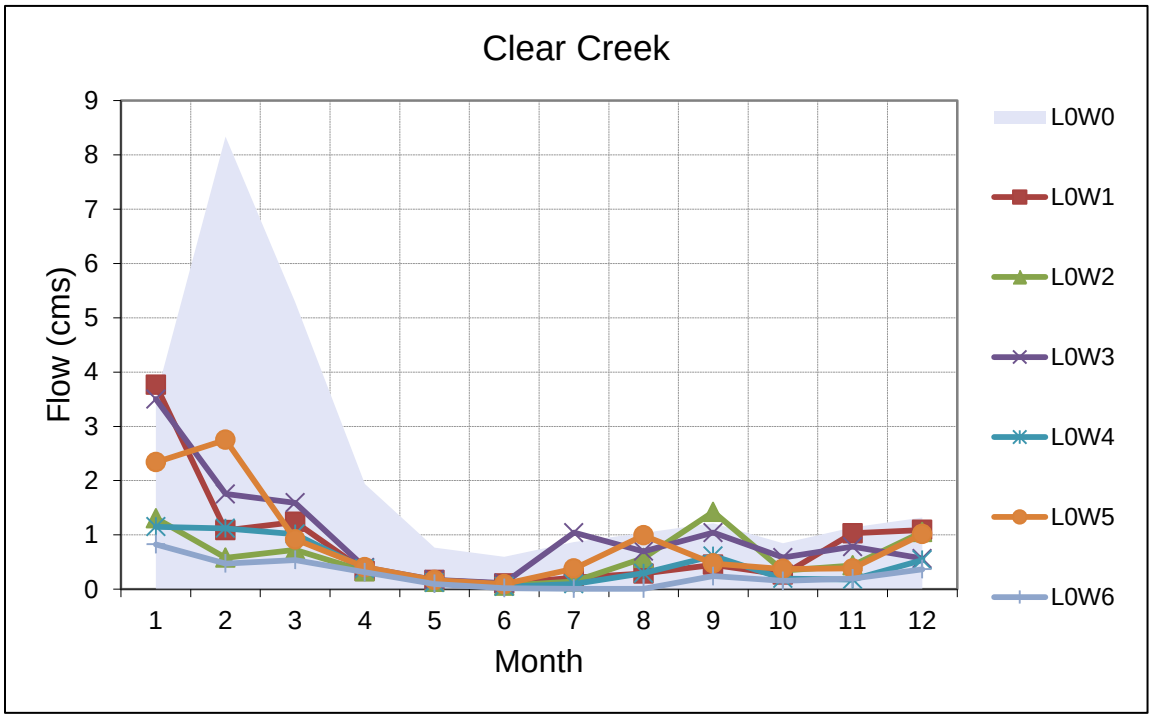

Figure 103. Monthly Average Flows, Clear Creek (SWAT)

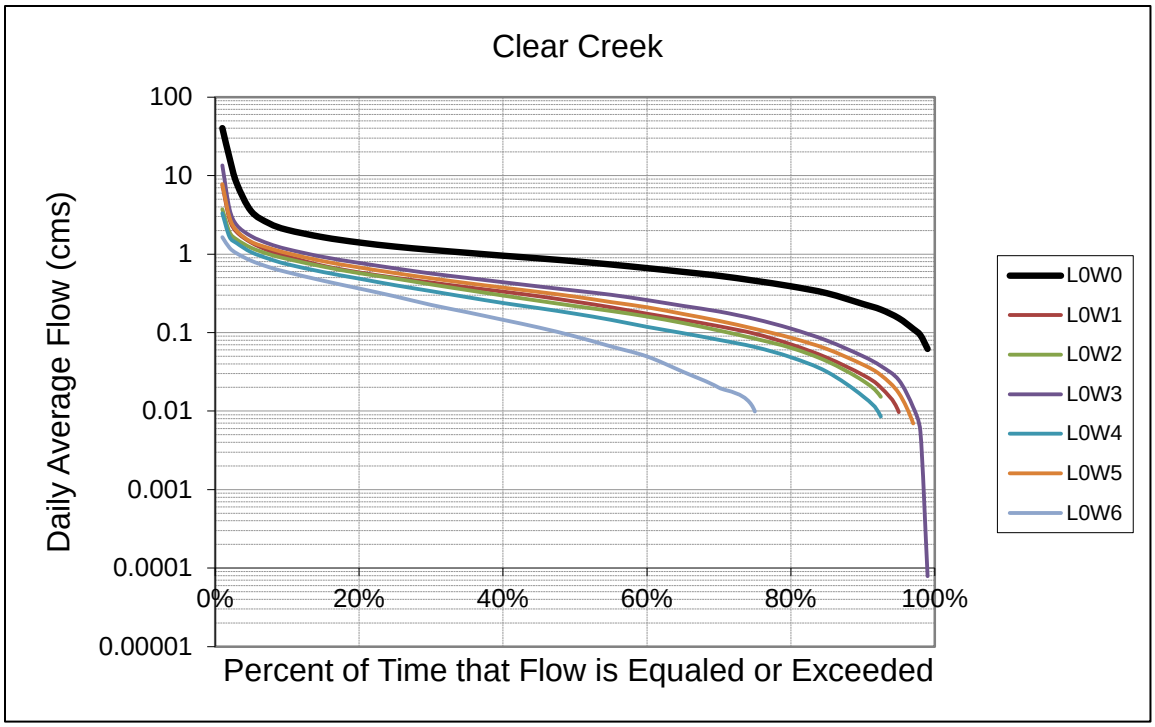

Figure 104. Flow Duration, Clear Creek (SWAT)

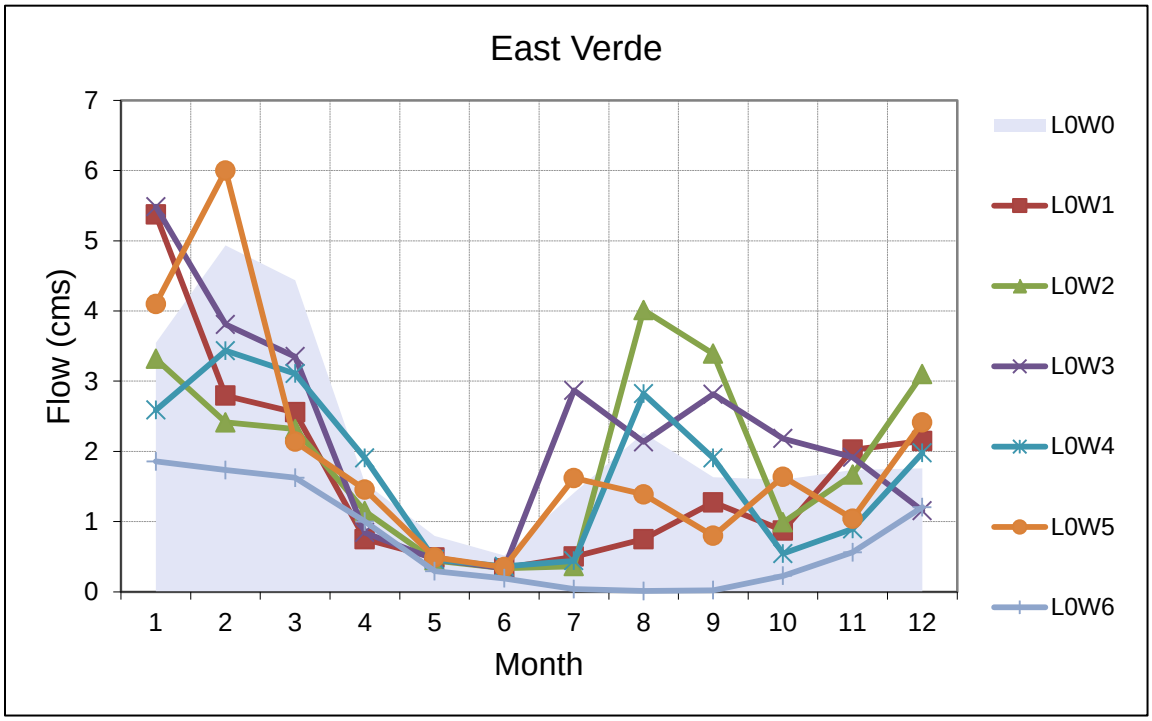

Figure 105. Monthly Average Flows, East Verde River (SWAT)

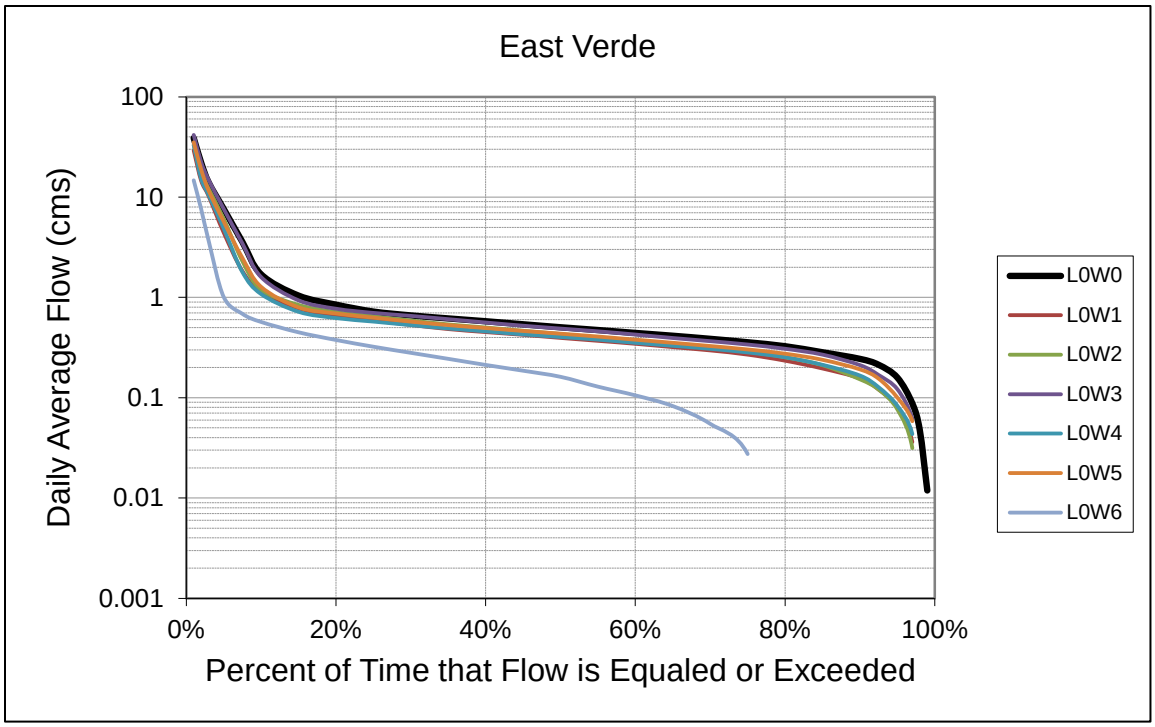

Figure 106. Flow Duration, East Verde River (SWAT)

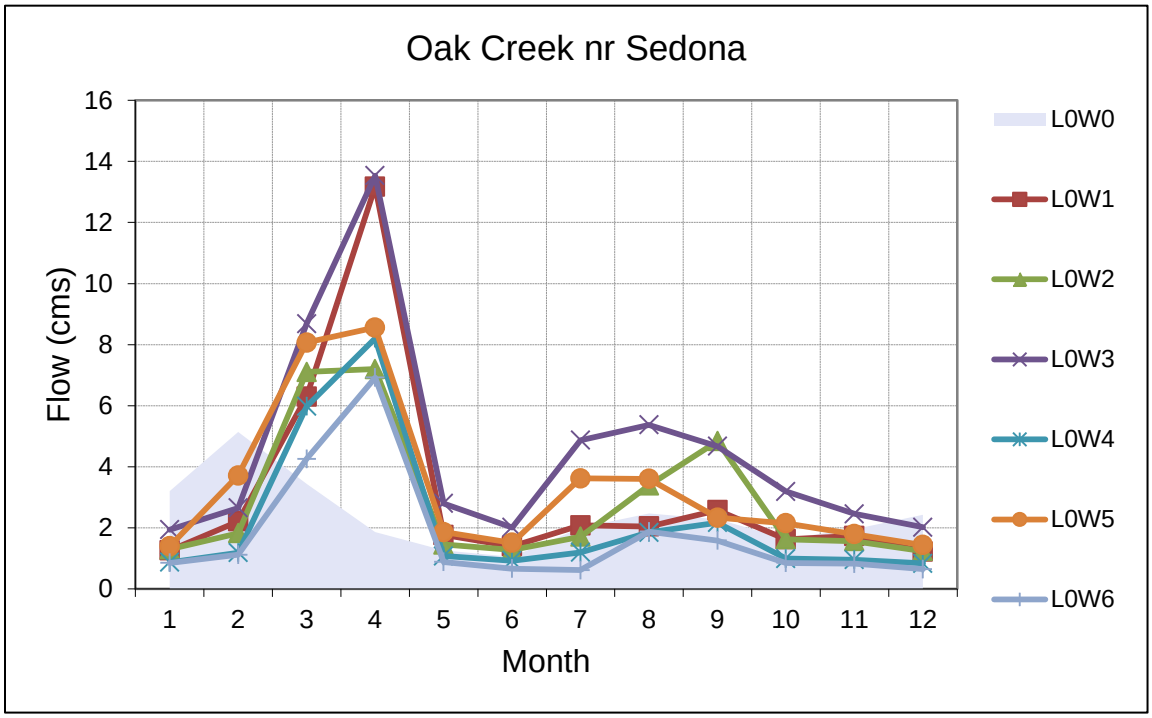

Figure 107. Monthly Average Flows, Oak Creek near Sedona (SWAT)

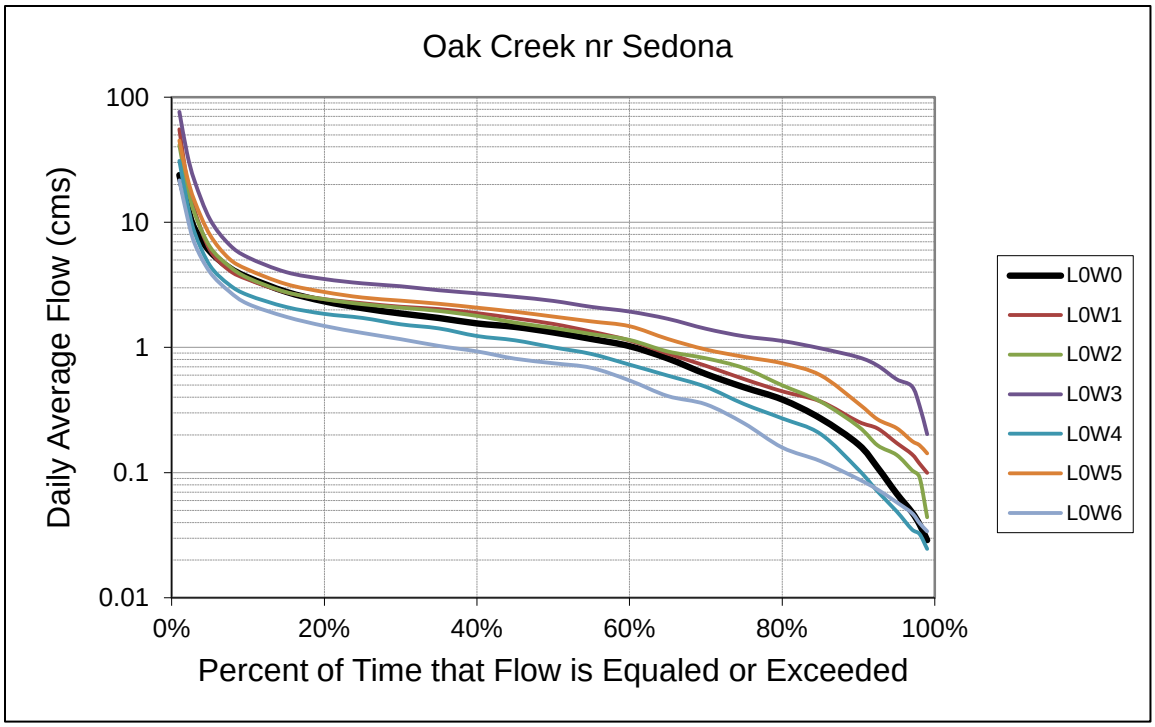

Figure 108. Flow Duration, Oak Creek near Sedona (SWAT)

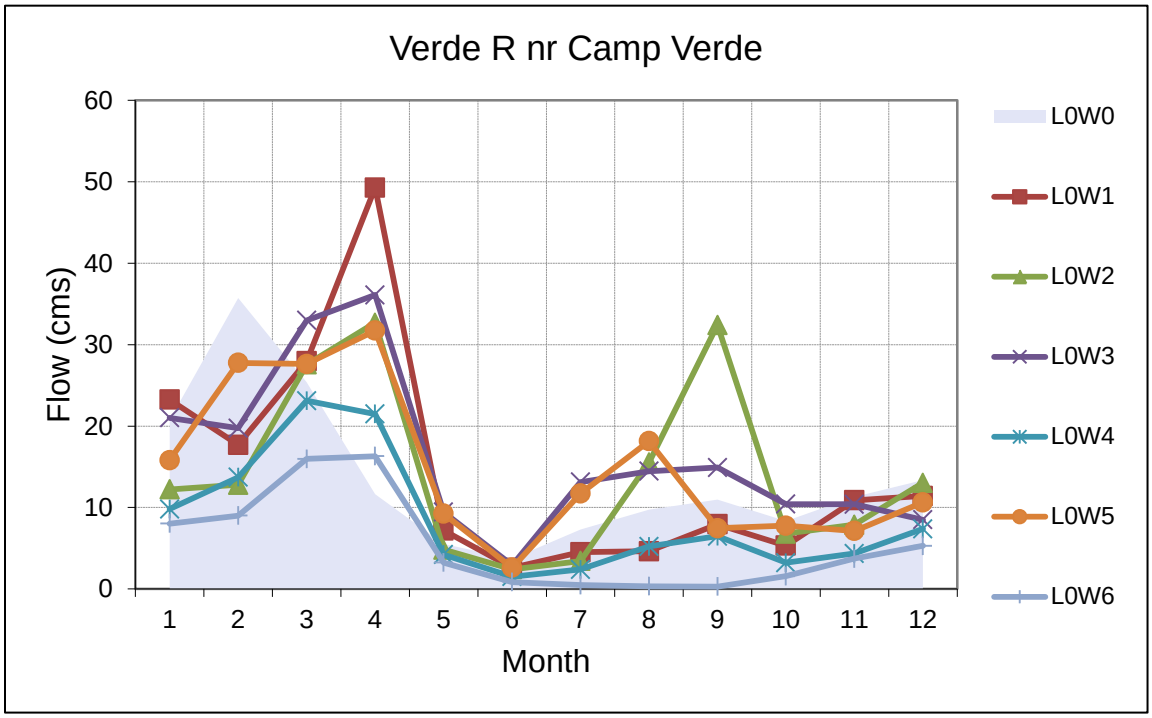

Figure 109. Monthly Average Flows, Verde River near Camp Verde (SWAT)

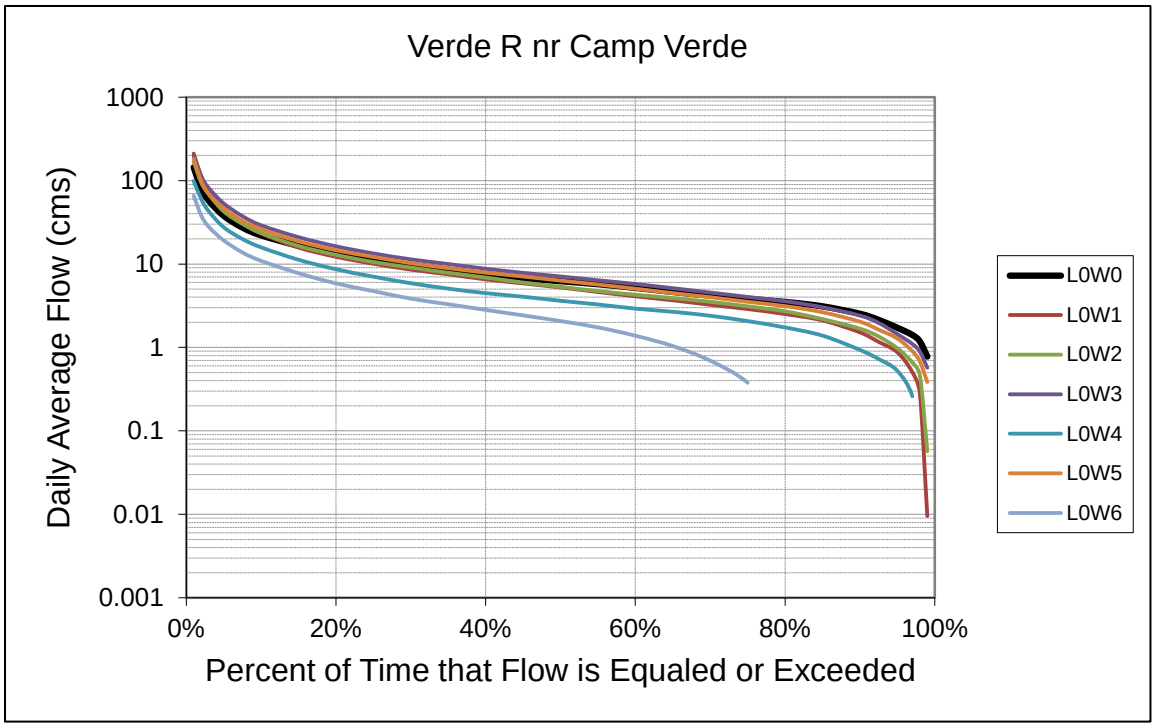

Figure 110. Flow Duration, Verde River near Camp Verde (SWAT)

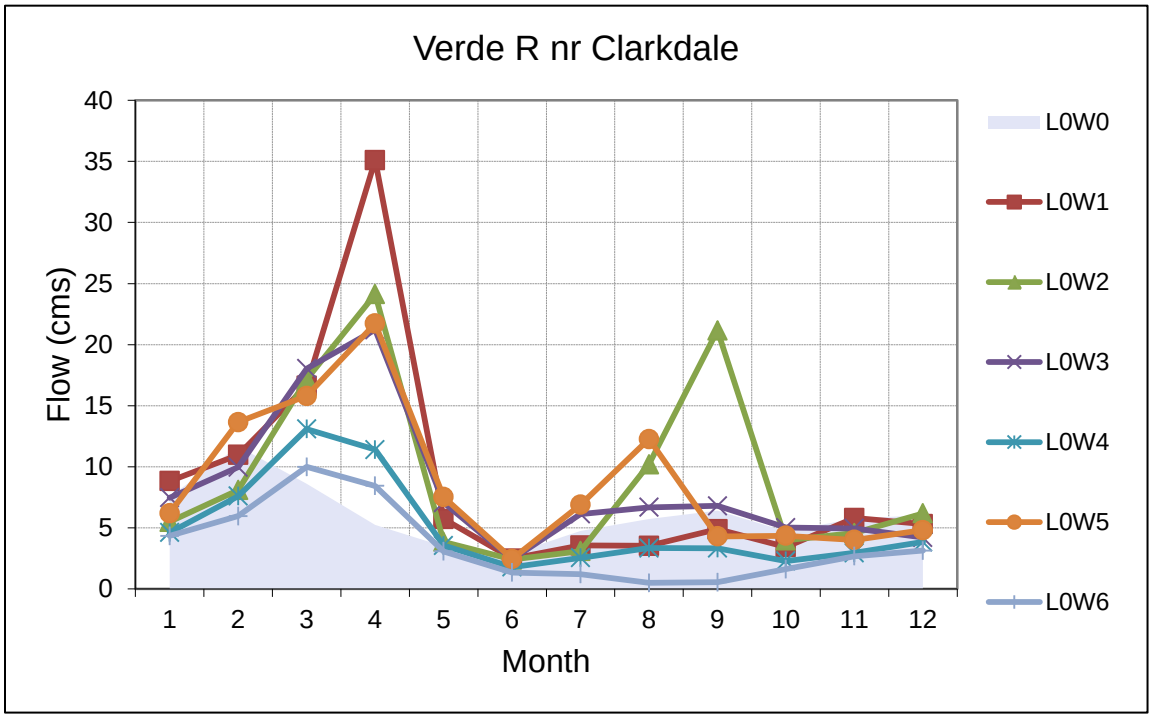

Figure 111. Monthly Average Flows, Verde River near Clarkdale (SWAT)

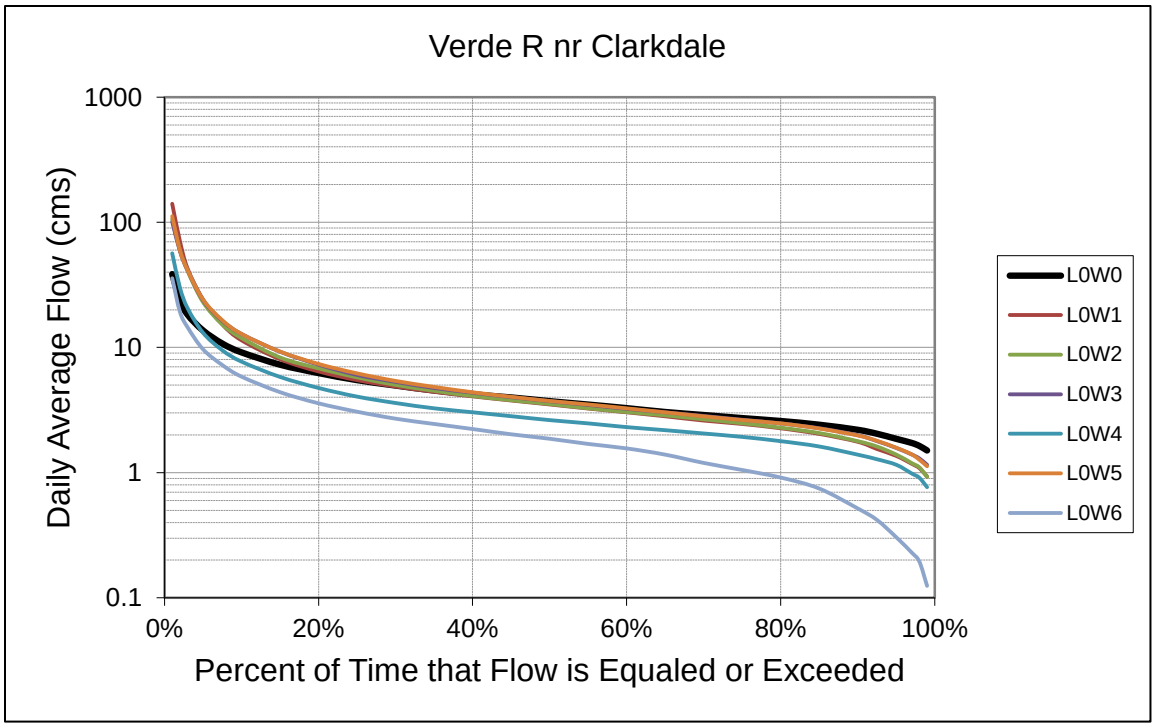

Figure 112. Flow Duration, Verde River near Clarkdale (SWAT)

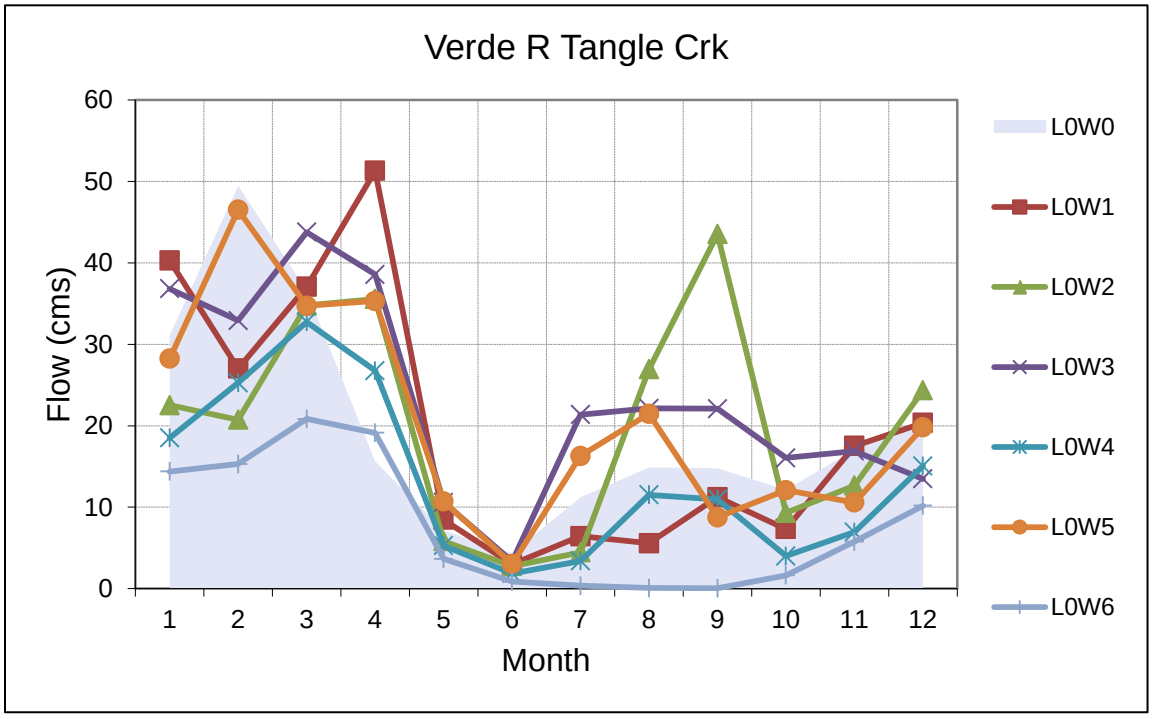

Figure 113. Monthly Average Flows, Verde River below Tangle Creek (SWAT)

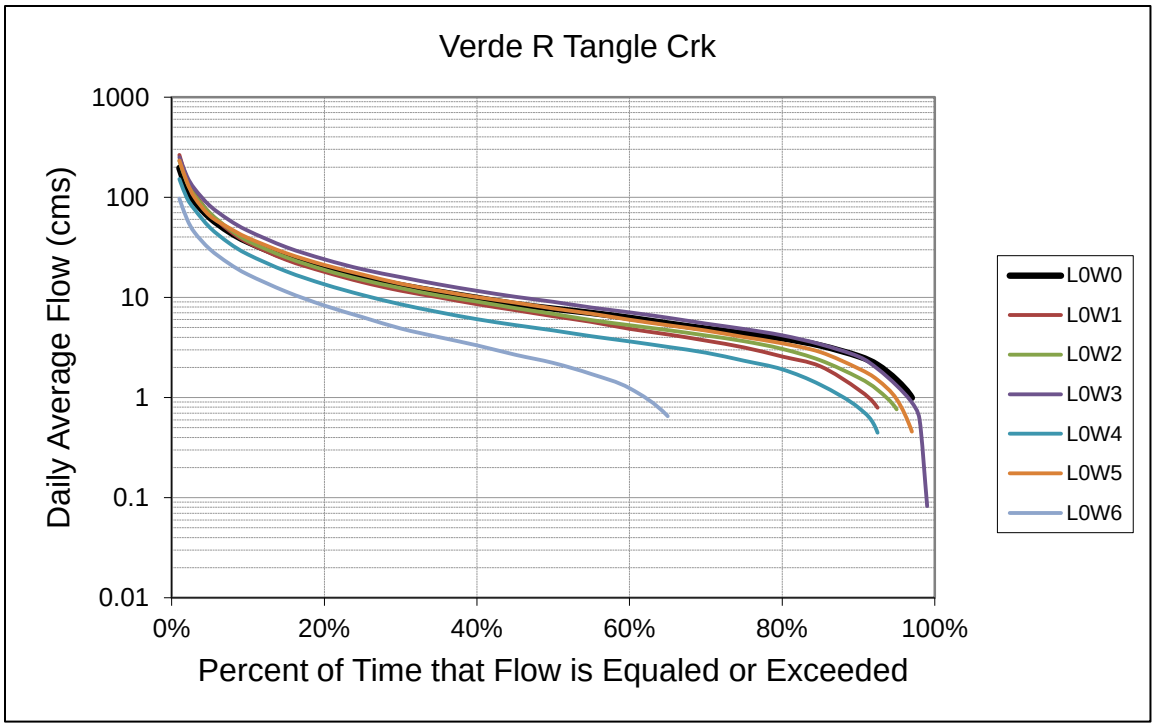

Figure 114. Flow Duration, Verde River below Tangle Creek (SWAT)

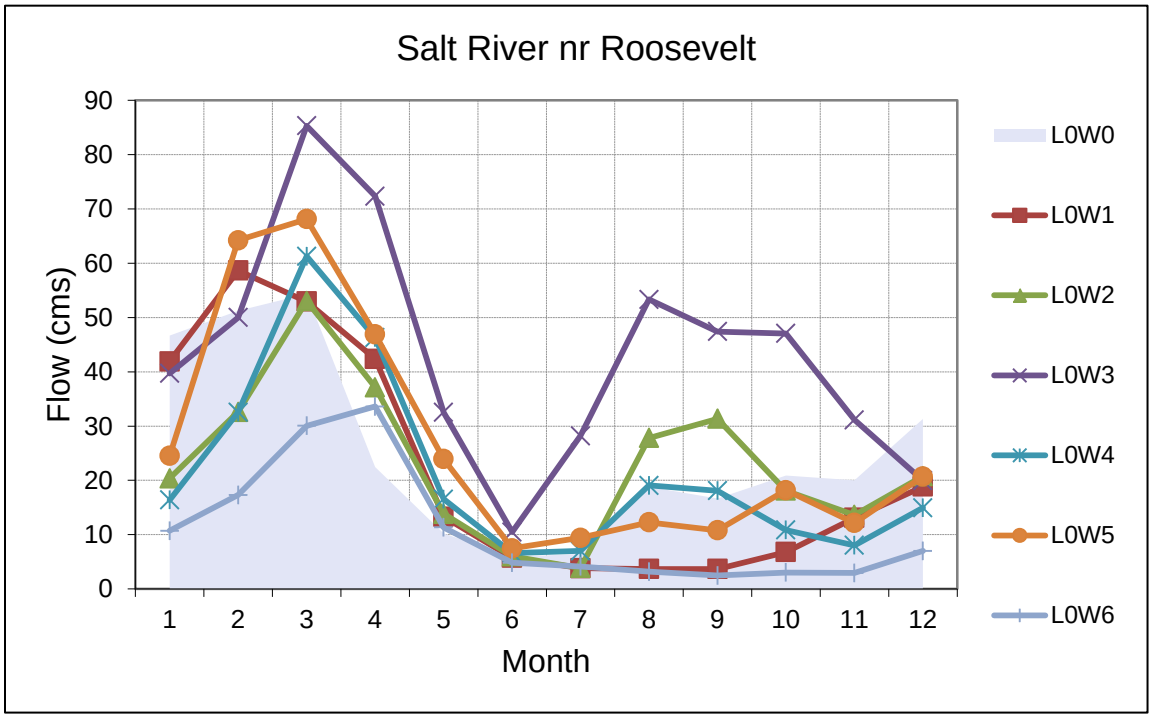

Figure 115. Monthly Average Flows, Salt River near Roosevelt (SWAT)

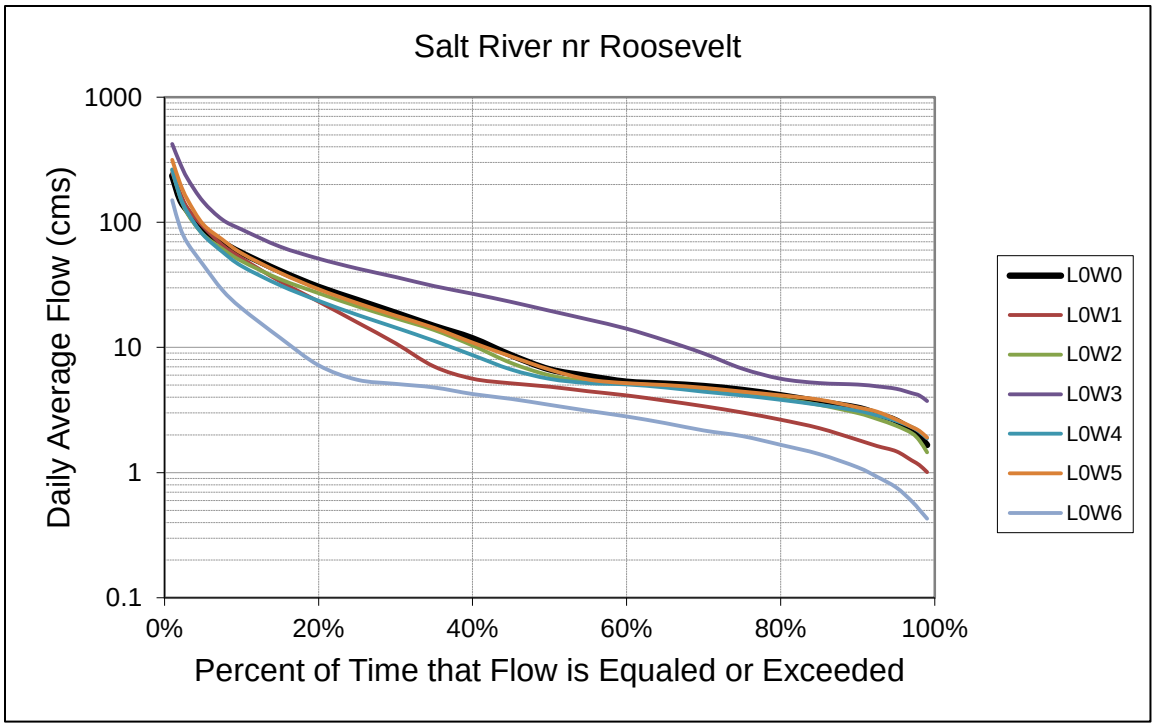

Figure 116. Flow Duration, Salt River near Roosevelt (SWAT)

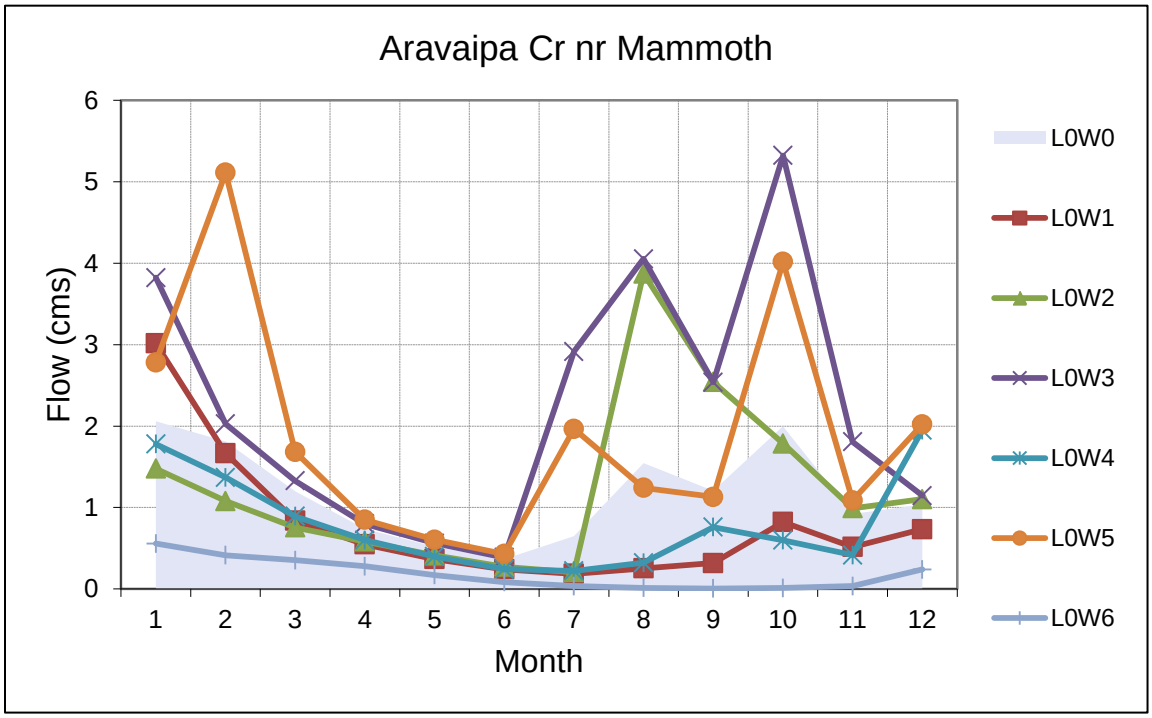

Figure 117. Monthly Average Flows, Aravaipa Creek near Mammoth (SWAT)

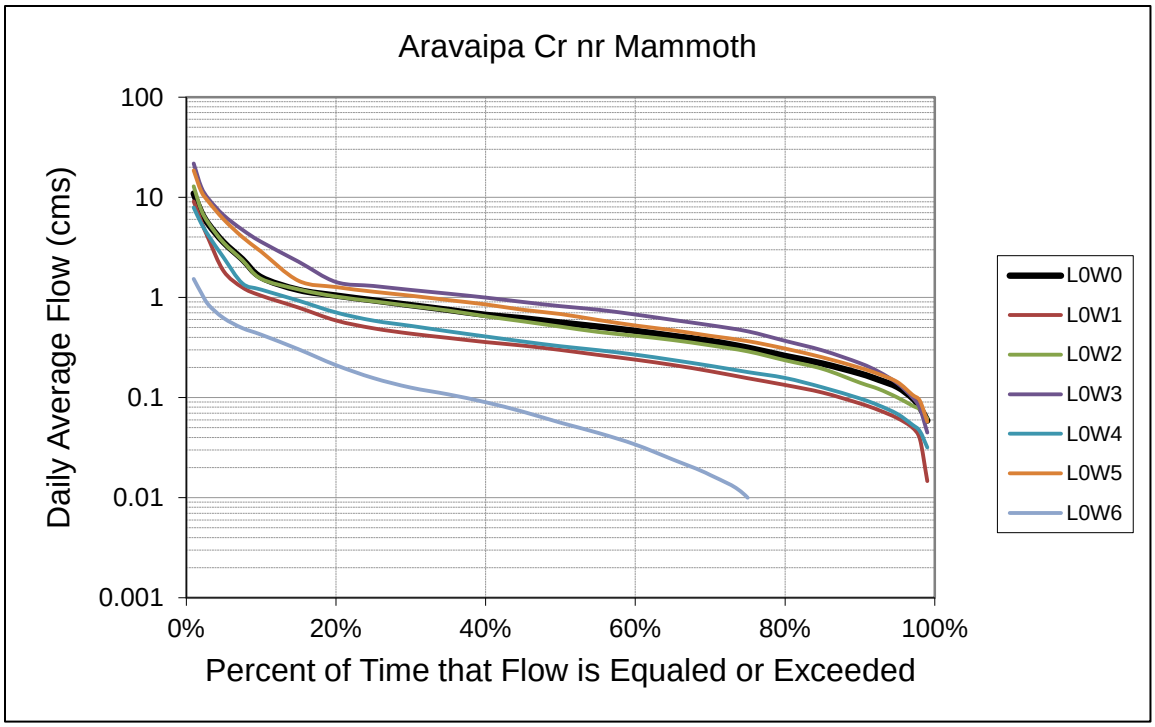

Figure 118. Flow Duration, Aravaipa Creek near Mammoth (SWAT)

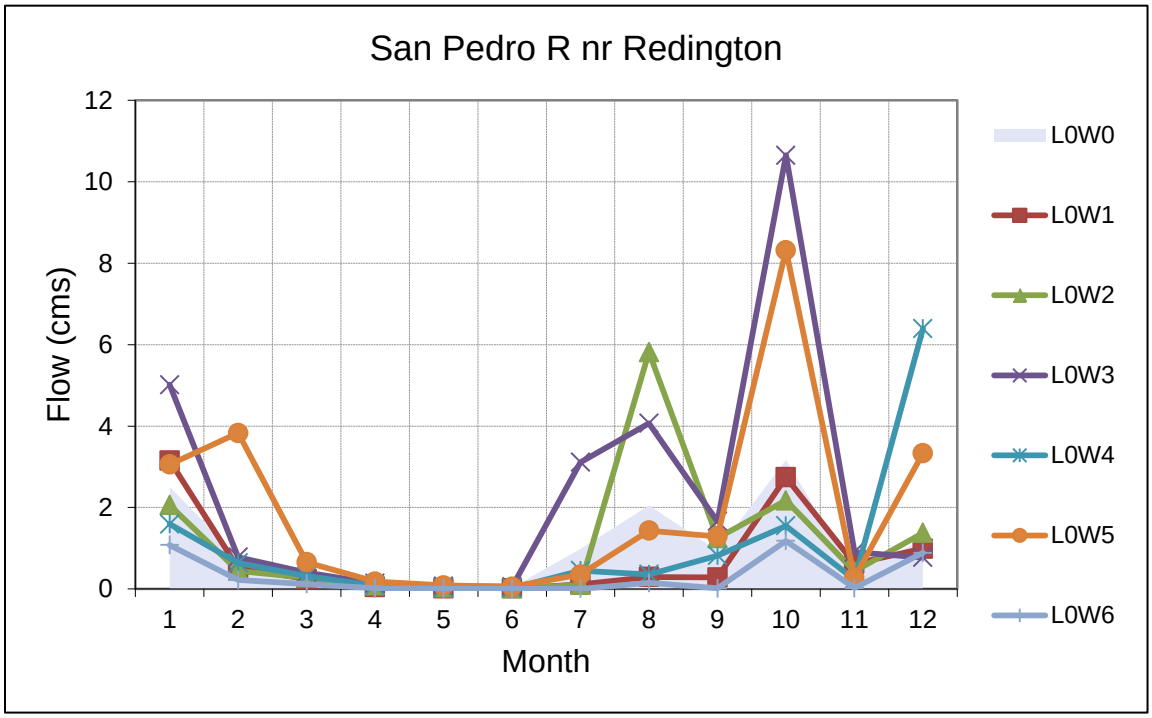

Figure 119. Monthly Average Flows, San Pedro River near Redington (SWAT)

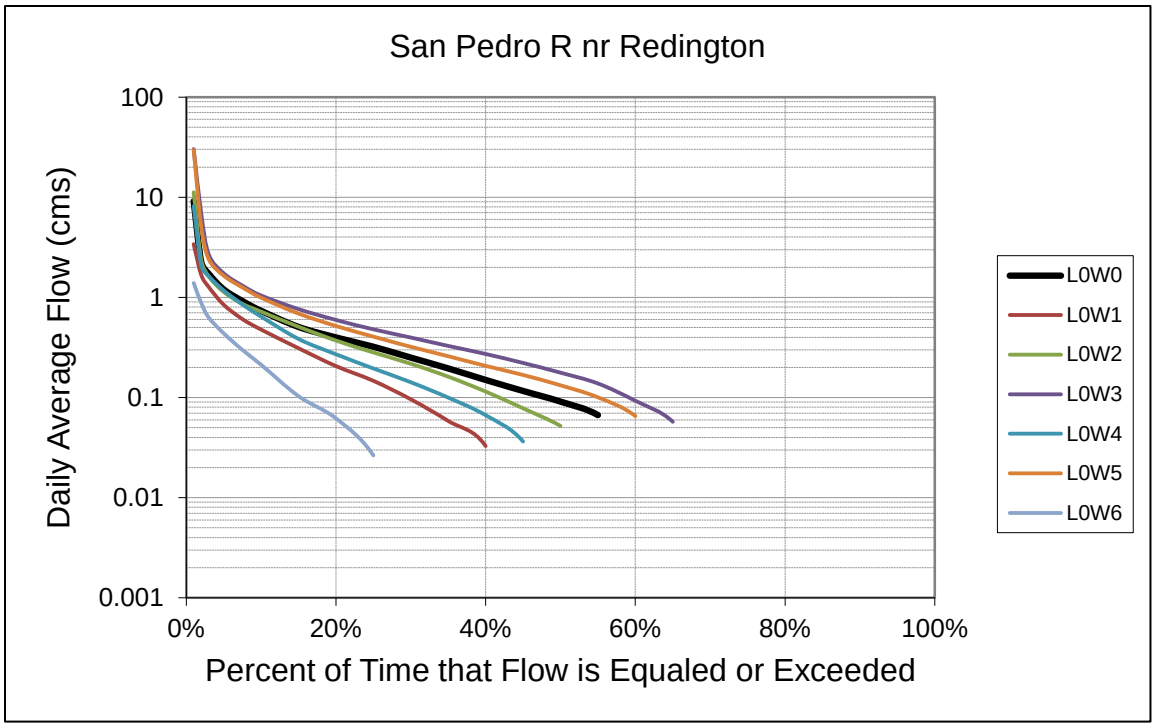

Figure 120. Flow Duration, San Pedro River near Redington (SWAT)

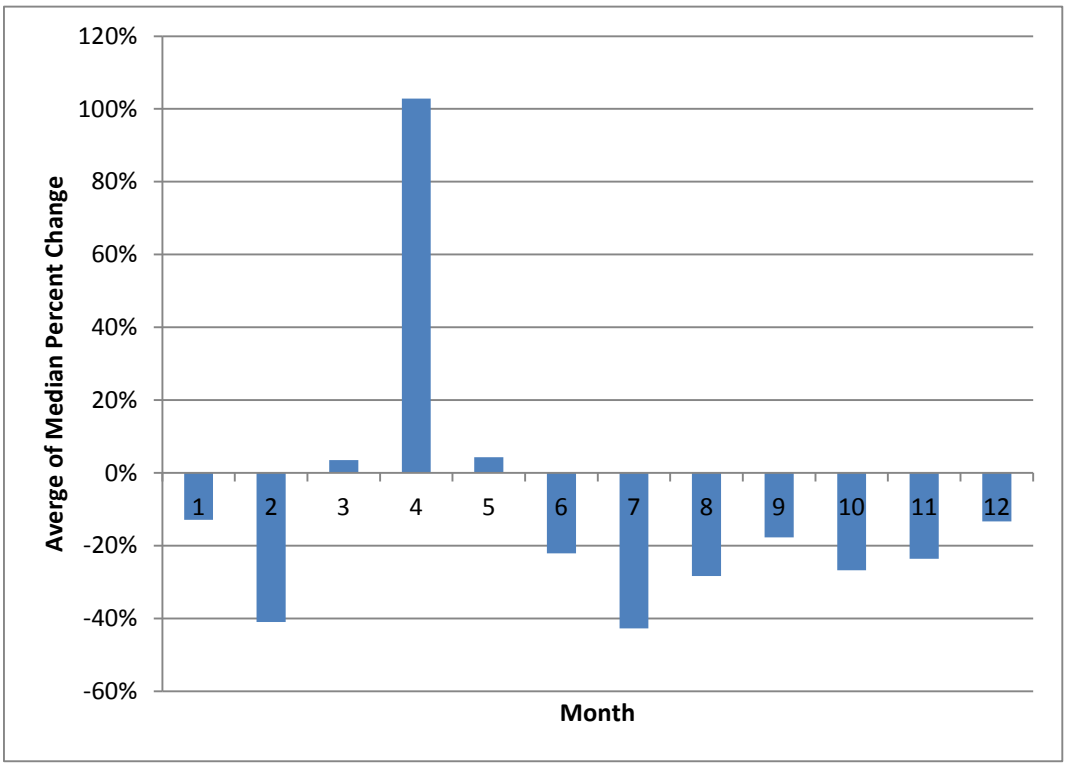

Figure 121. Average of Median Percent Change in Flow; NARCCAP Scenarios W1-W6 at all Stations, Verde-Salt-San Pedro Basins (SWAT)

Minnesota River (Upper Mississippi Basin), HSPF Model Results at Downstream Station

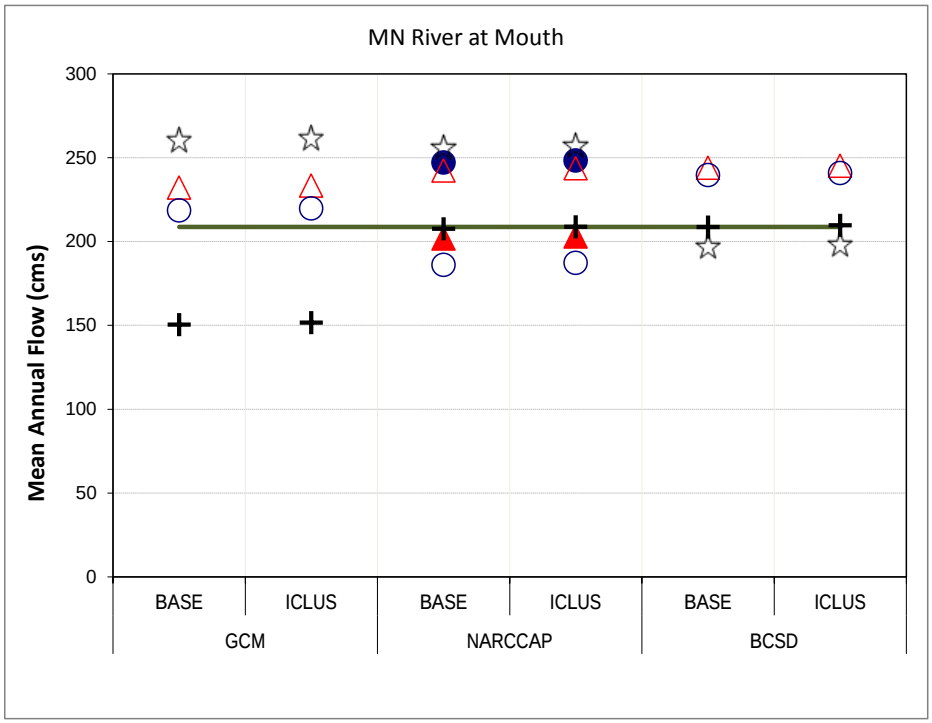

Figure 122. Mean Annual Flow, Minnesota River at Mouth (HSPF)

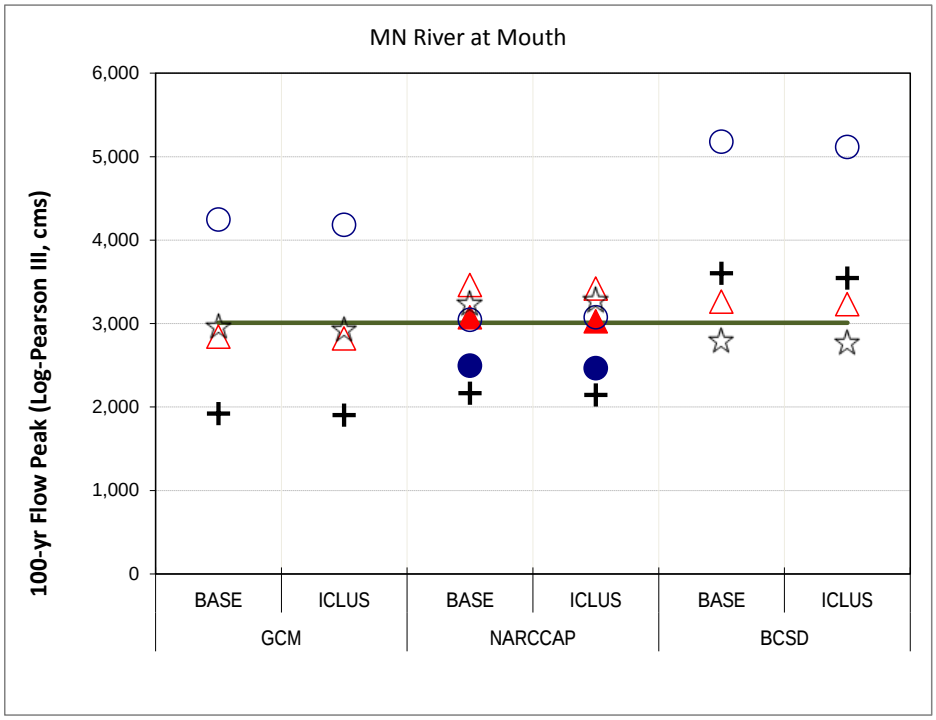

Figure 123. 100-yr Flow Peak, Minnesota River at Mouth (HSPF)

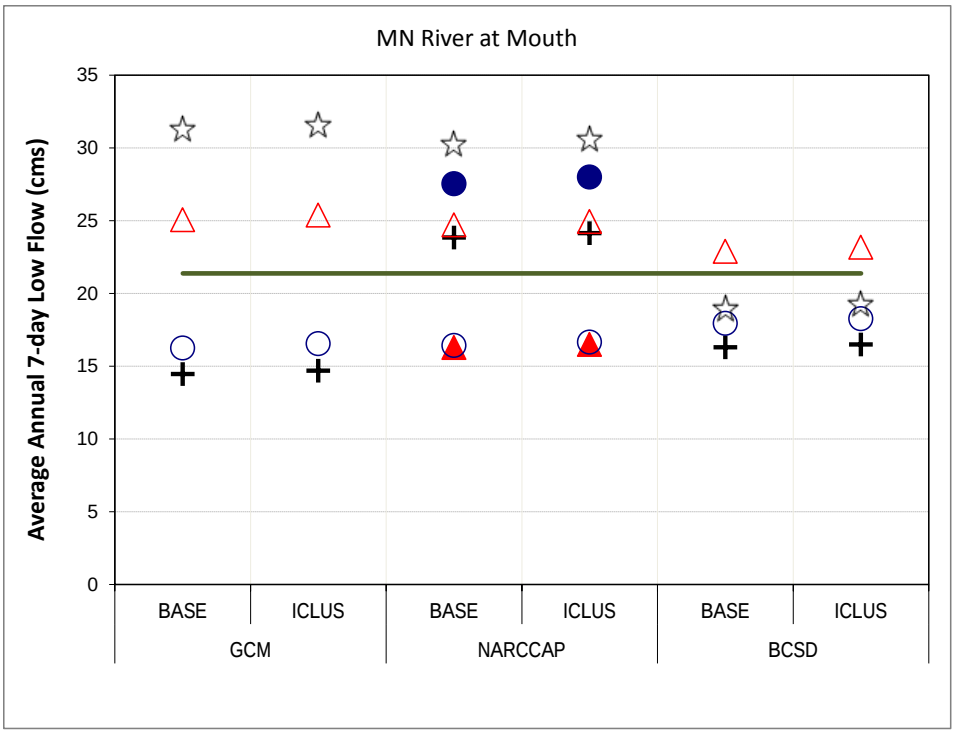

Figure 124. Average Annual 7-day Low Flow, Minnesota River at Mouth (HSPF)

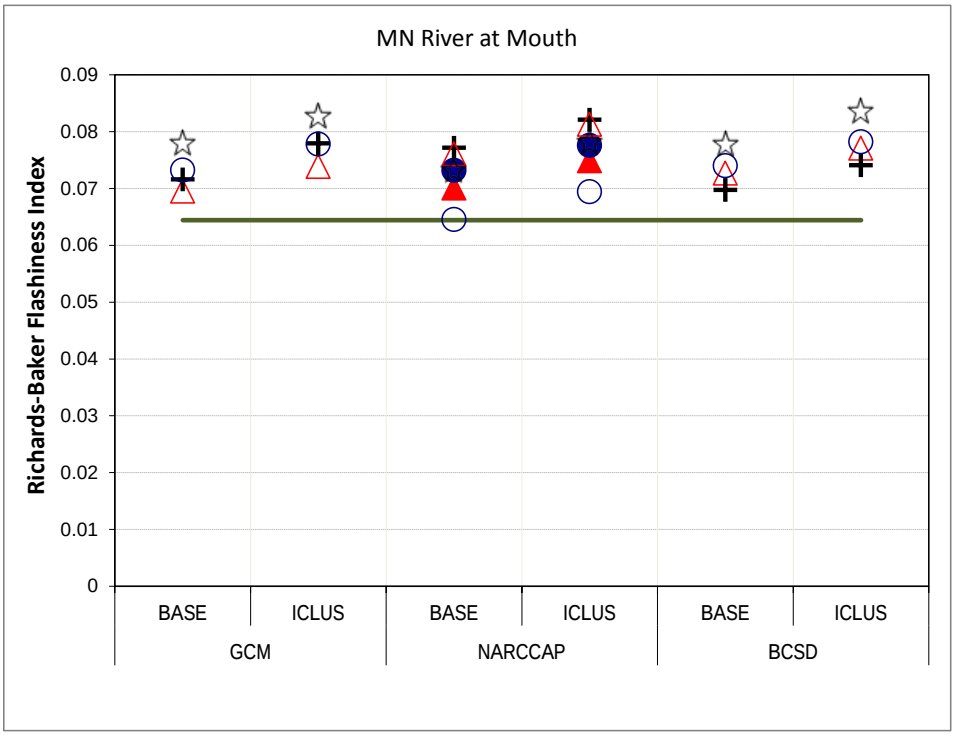

Figure 125. Richards-Baker Flashiness Index, Minnesota River at Mouth (HSPF)

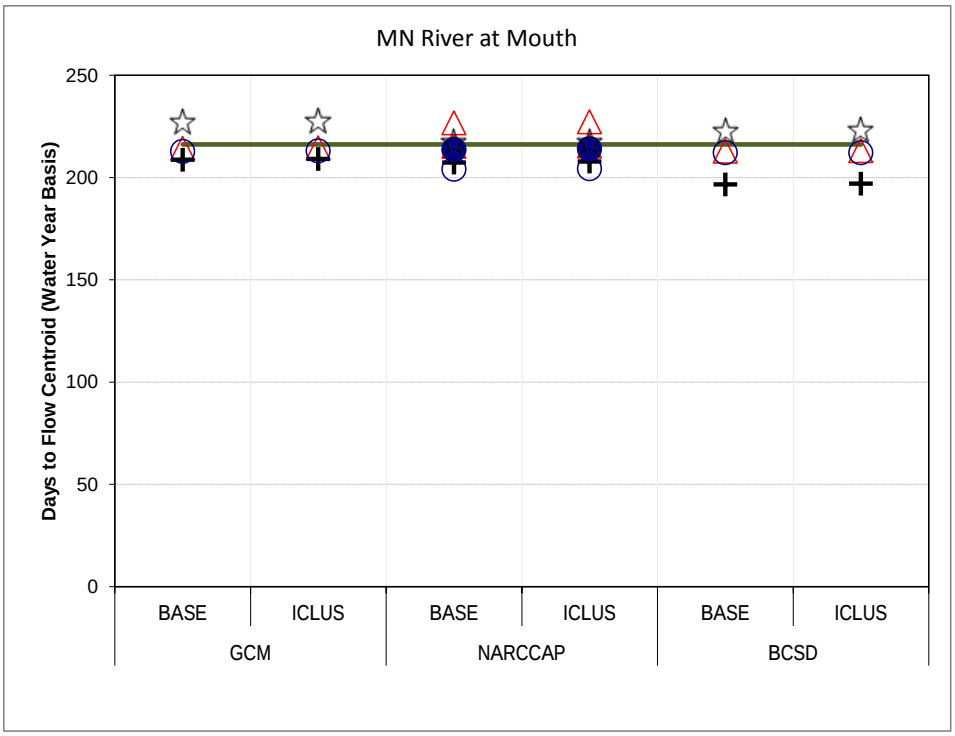

Figure 126. Days Flow to Centroid, Minnesota River at Mouth (HSPF)

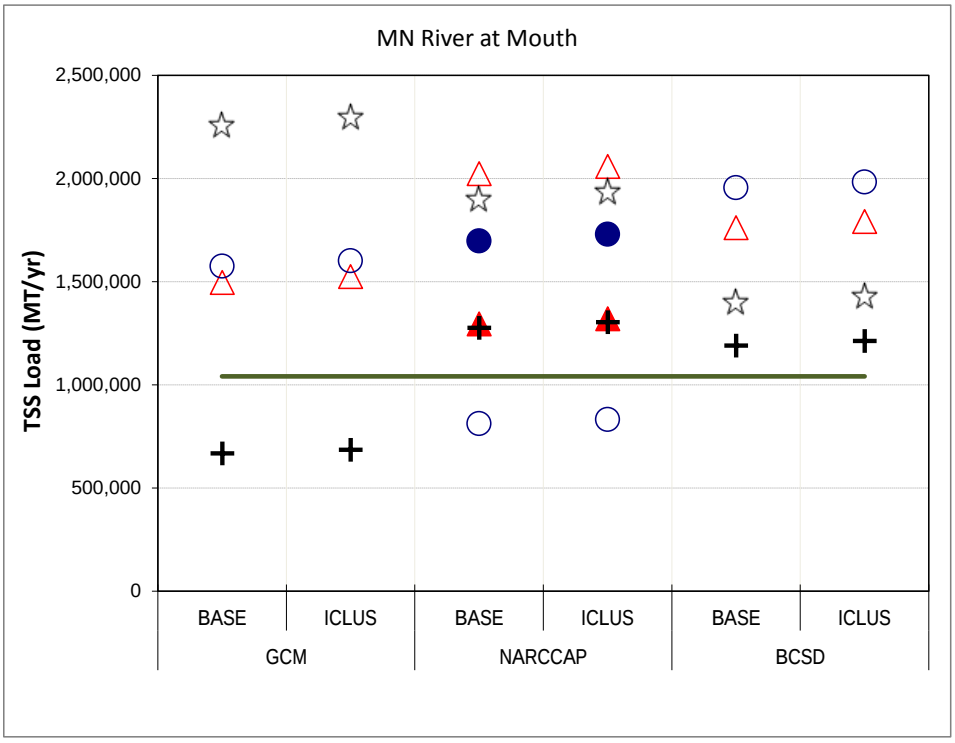

Figure 127. TSS Load, Minnesota River at Mouth (HSPF)

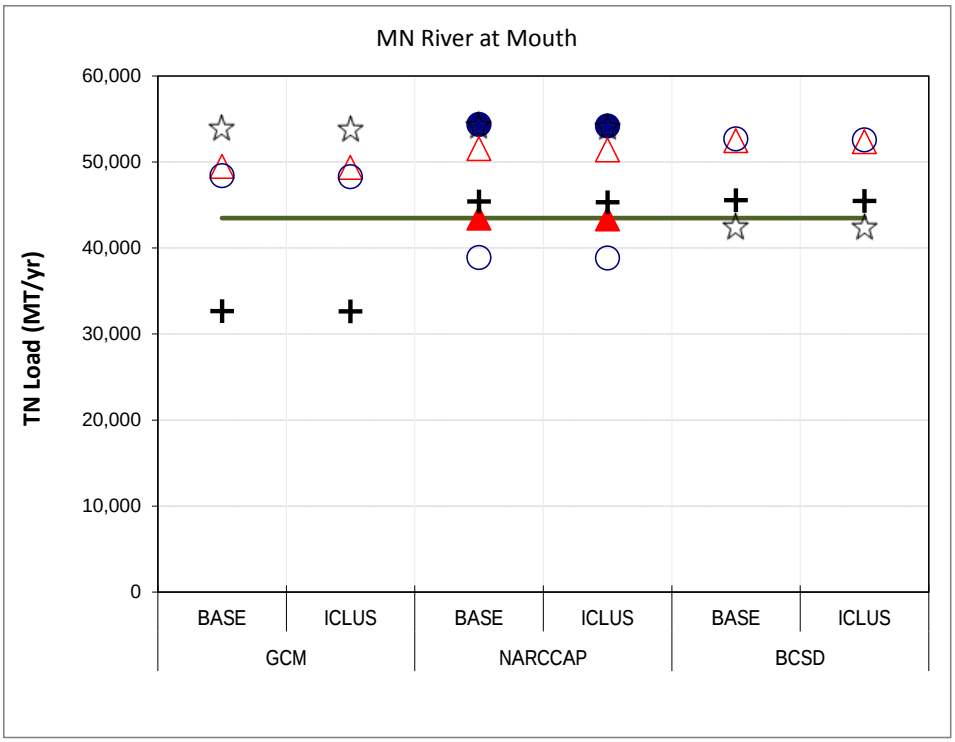

Figure 128. TN Load, Minnesota River at Mouth (HSPF)

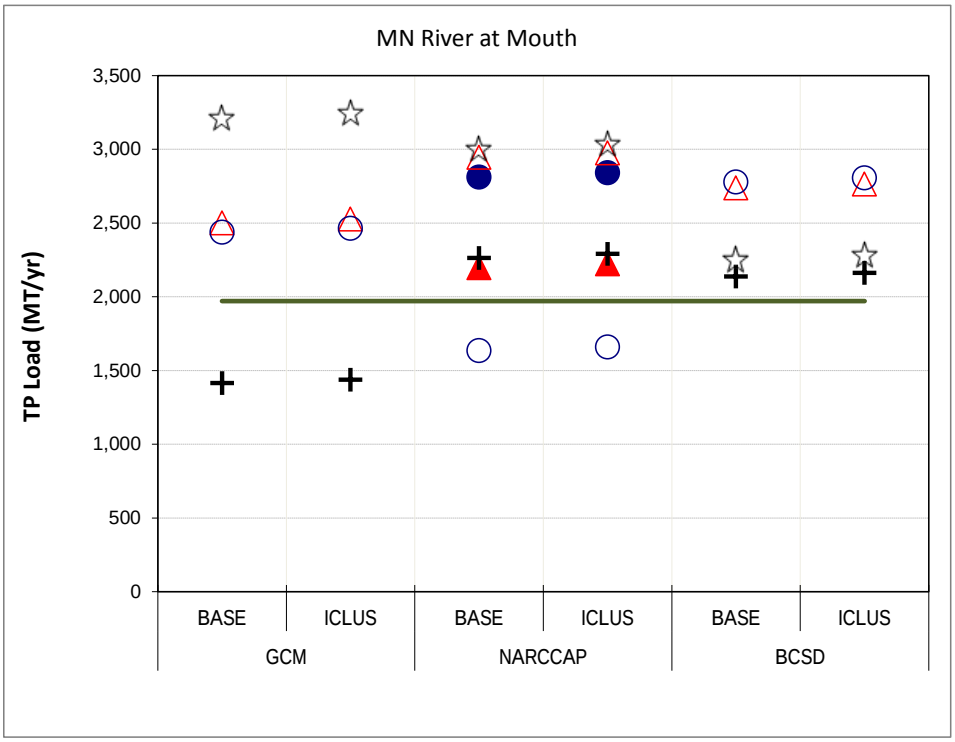

Figure 129. TP Load, Minnesota River at Mouth (HSPF)

Results at Multiple Stations

Table 5. Summary of Range of Change Relative to Existing Conditions for NARCCAP Dynamically Downscaled Scenarios, Minnesota River Basin (HSPF)

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Yellow Medicine River (gage 05313500)								
Flow	-10.06%	9.40%	7.36%	20.56%	-10.06%	9.40%	7.36%	20.56%
TSS	-3.34%	46.70%	35.03%	59.07%	-3.34%	46.70%	35.03%	59.07%
TN	-6.39%	11.21%	9.90%	25.60%	-6.39%	11.21%	9.90%	25.60%
TP	-1.76%	31.49%	24.62%	45.60%	-1.76%	31.49%	24.62%	45.60%
Redwood River (gage 05316500)								
Flow	-4.49%	6.06%	7.85%	19.63%	-4.49%	6.06%	7.85%	19.63%
TSS	16.60%	57.24%	46.60%	60.37%	16.60%	57.23%	46.60%	60.37%
TN	-5.15%	13.05%	11.20%	27.70%	-5.15%	13.05%	11.20%	27.70%
TP	4.81%	27.67%	25.86%	45.04%	4.81%	27.67%	25.86%	45.04%
Cottonwood River (gage 05317000)								
Flow	-6.44%	5.79%	7.01%	20.75%	-6.44%	5.79%	7.01%	20.75%
TSS	-10.25%	52.99%	45.40%	90.03%	-10.25%	52.99%	45.40%	90.03%
TN	-5.65%	11.50%	13.10%	31.28%	-5.65%	11.50%	13.10%	31.28%
TP	-9.23%	42.09%	36.16%	67.39%	-9.23%	42.09%	36.16%	67.39%
Watonwan River (gage 05319500)								
Flow	-14.52%	13.51%	7.94%	24.23%	-14.52%	13.51%	7.94%	24.23%
TSS	-51.07%	75.47%	52.86%	119.88 %	-51.07%	75.46%	52.86%	119.87 %
TN	-12.09%	22.67%	18.00%	39.28%	-12.09%	22.67%	18.00%	39.28%
TP	-30.36%	42.97%	28.82%	59.21%	-30.36%	42.97%	28.82%	59.21%
Blue Earth River (gage 05320000)								
Flow	-17.47%	11.89%	6.06%	19.42%	-17.46%	11.89%	6.06%	19.42%
TSS	-42.34%	70.22%	47.96%	93.08%	-42.34%	70.22%	47.96%	93.08%
TN	-14.64%	14.34%	10.30%	26.52%	-14.64%	14.34%	10.30%	26.52%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
TP	-26.44%	35.32%	22.11%	42.29%	-26.44%	35.32%	22.11%	42.29%
LeSueur River (gage 05320500)								
Flow	-16.91%	14.00%	7.53%	22.37%	-16.91%	14.00%	7.53%	22.36%
TSS	-36.35%	45.96%	29.11%	62.79%	-36.34%	45.95%	29.10%	62.78%
TN	-15.26%	10.17%	5.53%	19.82%	-15.26%	10.17%	5.53%	19.81%
TP	-21.68%	32.09%	20.28%	39.93%	-21.68%	32.09%	20.28%	39.93%
Minnesota River at Mankato (gage 05325000)								
Flow	-10.06%	7.15%	6.94%	21.84%	-10.06%	7.15%	6.94%	21.84%
TSS	-21.39%	43.35%	42.43%	86.59%	-21.39%	43.35%	42.43%	86.58%
TN	-10.65%	10.70%	9.44%	23.23%	-10.65%	10.70%	9.44%	23.23%
TP	-16.40%	28.88%	25.91%	50.99%	-16.40%	28.87%	25.91%	50.99%
Minnesota River nr Jordan (gage 05330000)								
Flow	-10.66%	7.67%	7.15%	22.77%	-10.65%	7.67%	7.15%	22.76%
TSS	-21.05%	46.52%	46.52%	97.42%	-21.04%	46.37%	46.37%	97.12%
TN	-10.80%	11.65%	10.45%	25.23%	-10.79%	11.64%	10.43%	25.19%
TP	-17.31%	29.59%	26.31%	53.21%	-17.29%	29.55%	26.28%	53.16%
Minnesota River at Mouth								
Flow	-10.83%	7.79%	7.16%	23.12%	-10.79%	7.80%	7.15%	23.05%
TSS	-22.00%	43.74%	44.32%	94.35%	-22.04%	42.85%	43.43%	92.79%
TN	-10.57%	11.48%	10.39%	25.07%	-10.54%	11.40%	10.31%	24.88%
TP	-17.10%	28.68%	25.64%	52.72%	-16.95%	28.44%	25.43%	52.40%

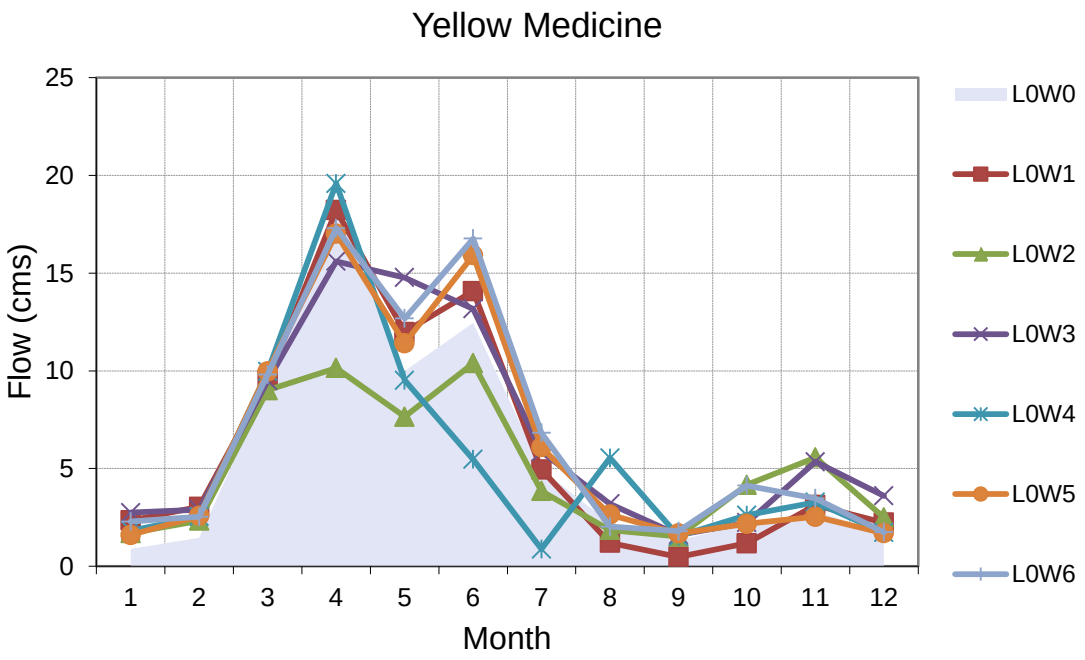

Figure 130. Monthly Average Flows, Yellow Medicine River (HSPF)

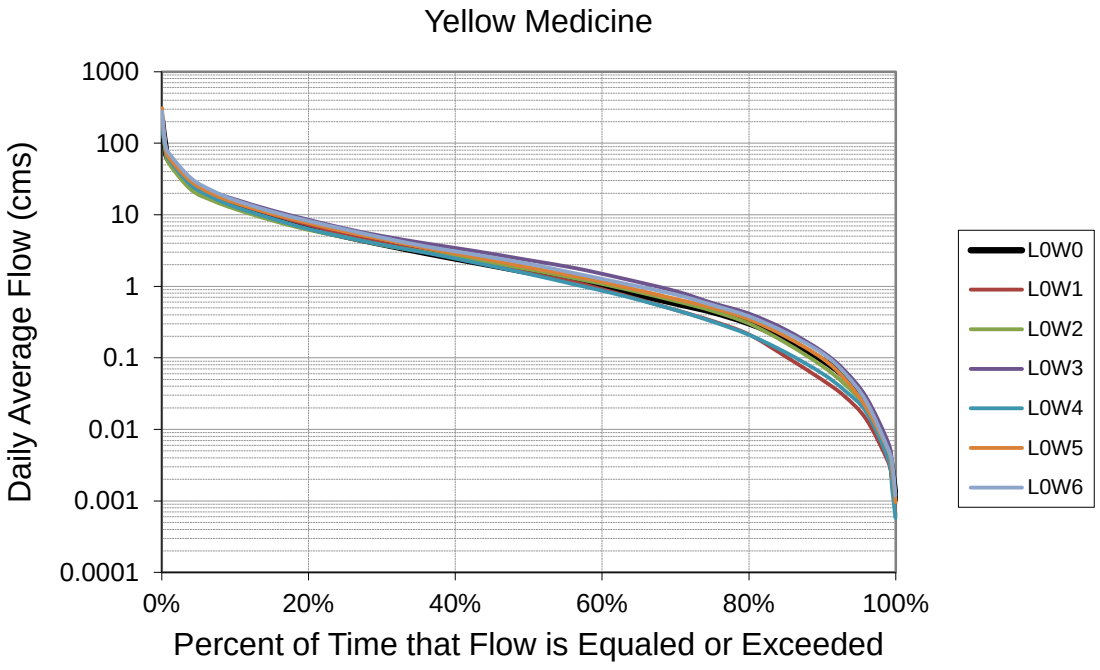

Figure 131. Flow Duration, Yellow Medicine River (HSPF)

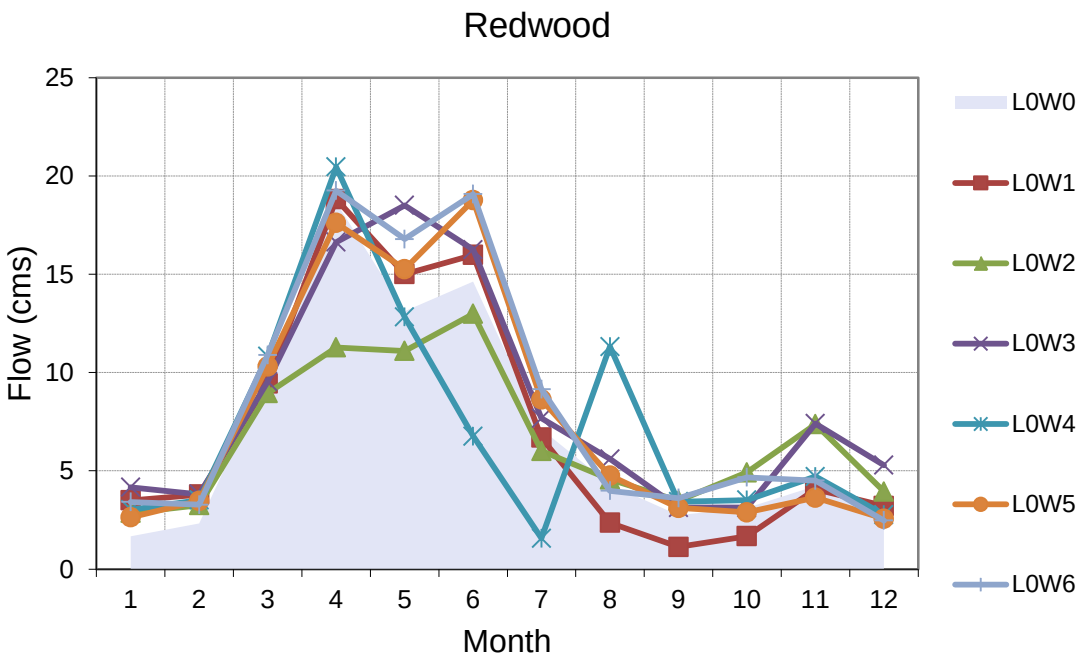

Figure 132. Monthly Average Flows, Redwood River (HSPF)

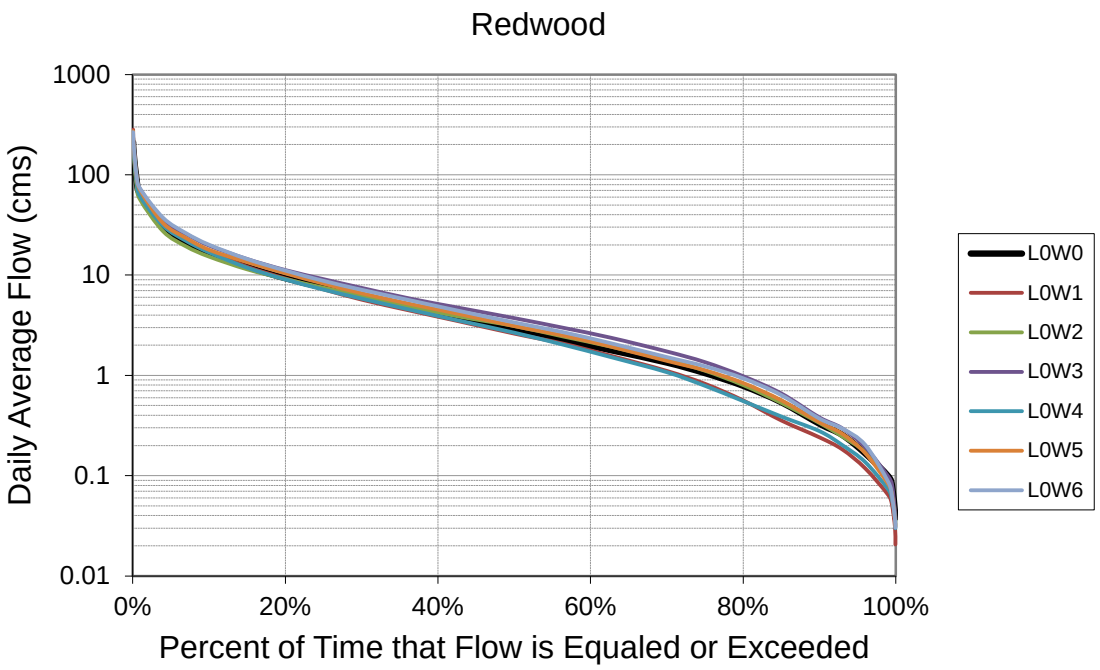

Figure 133. Flow Duration, Redwood River (HSPF)

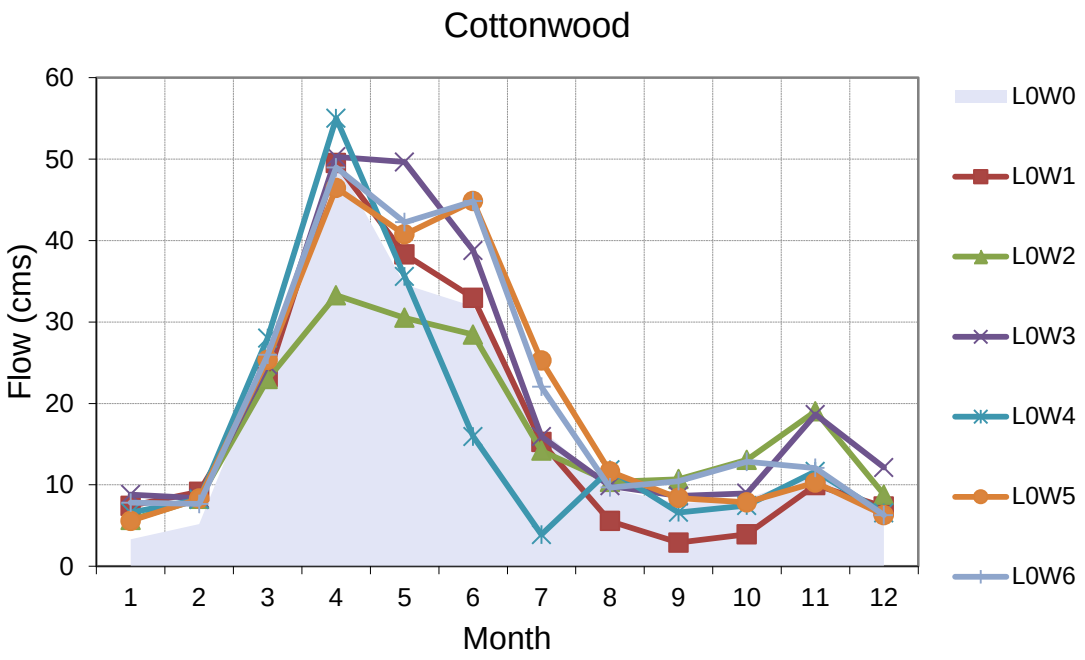

Figure 134. Monthly Average Flows, Cottonwood River (HSPF)

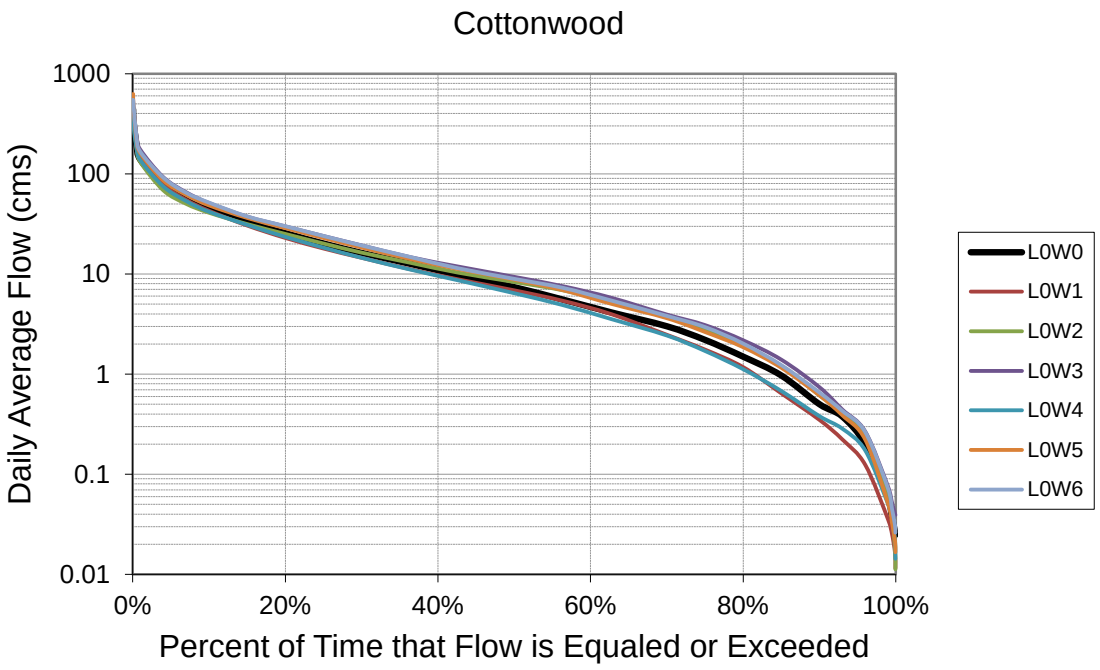

Figure 135. Flow Duration, Cottonwood River (HSPF)

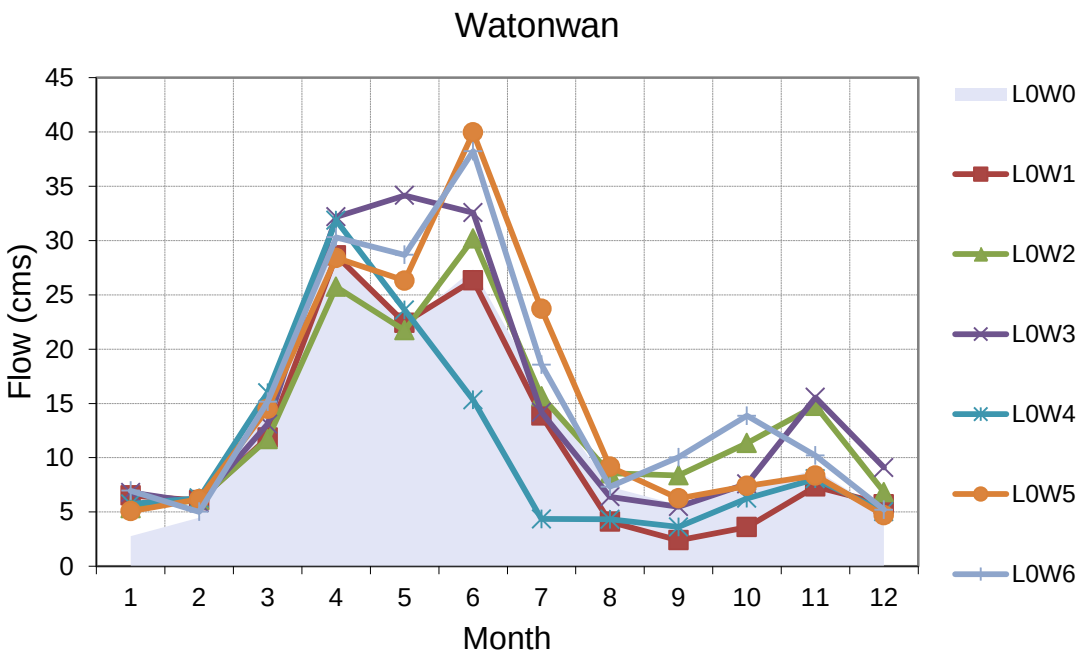

Figure 136. Monthly Average Flows, Watonwan River (HSPF)

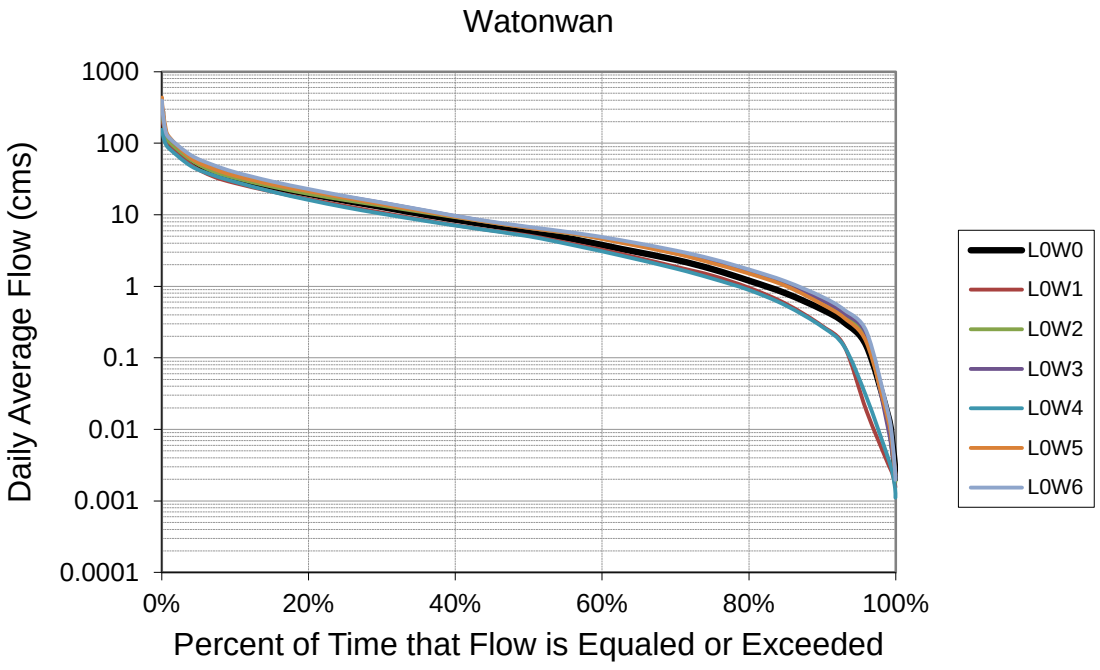

Figure 137. Flow Duration, Watonwan River (HSPF)

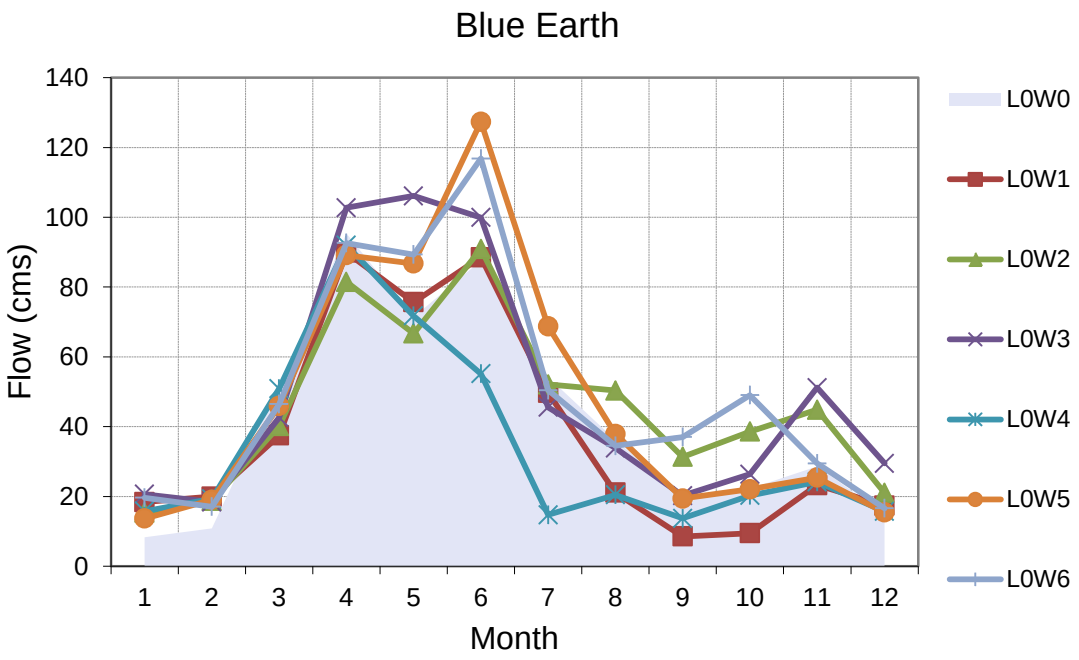

Figure 138. Monthly Average Flows, Blue Earth River (HSPF)

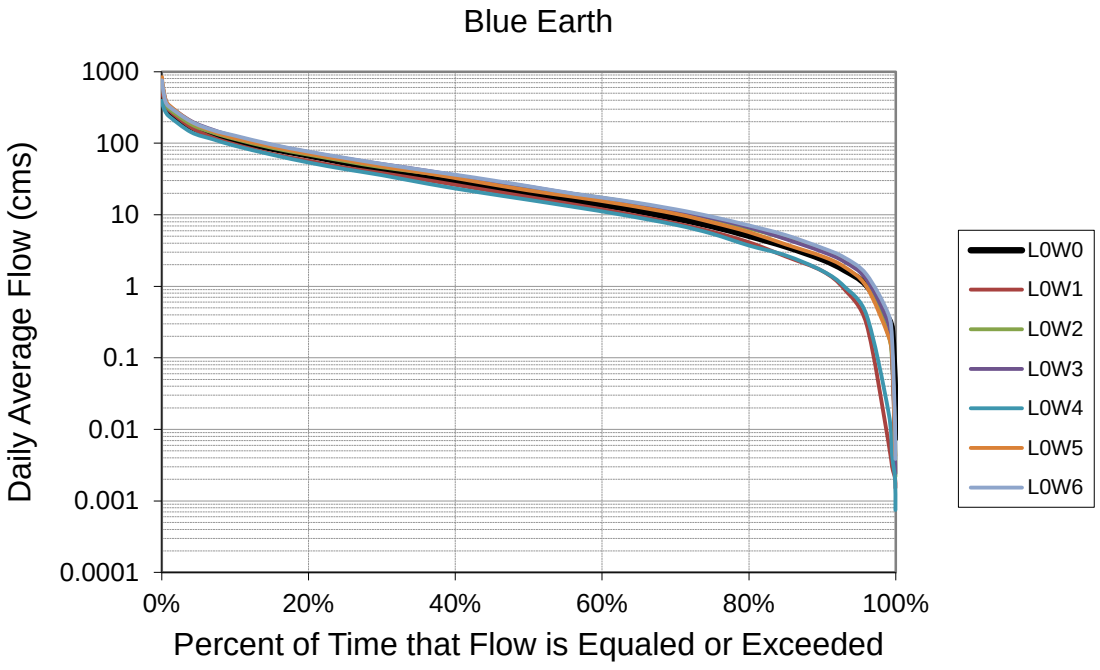

Figure 139. Flow Duration, Blue Earth River (HSPF)

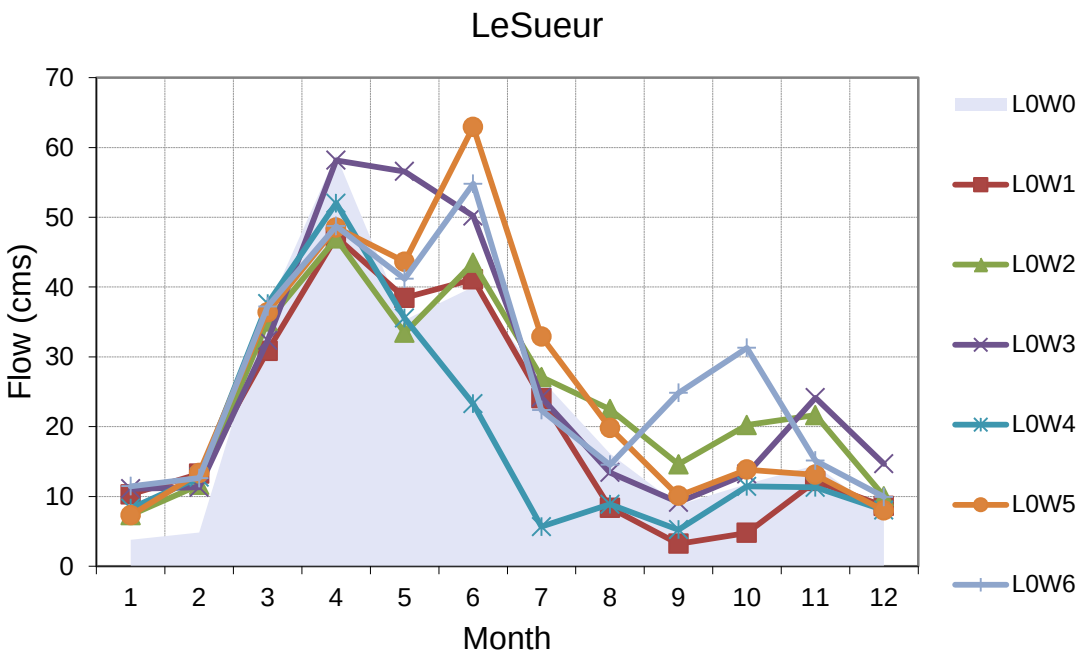

Figure 140. Monthly Average Flows, Le Sueur River (HSPF)

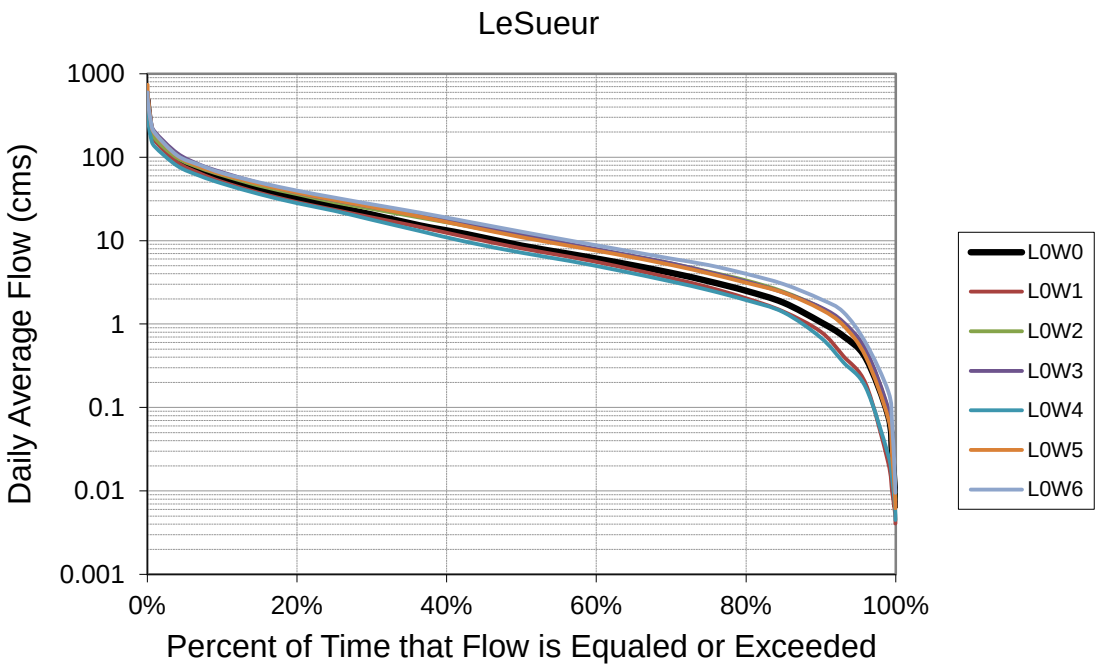

Figure 141. Flow Duration, Le Sueur River (HSPF)

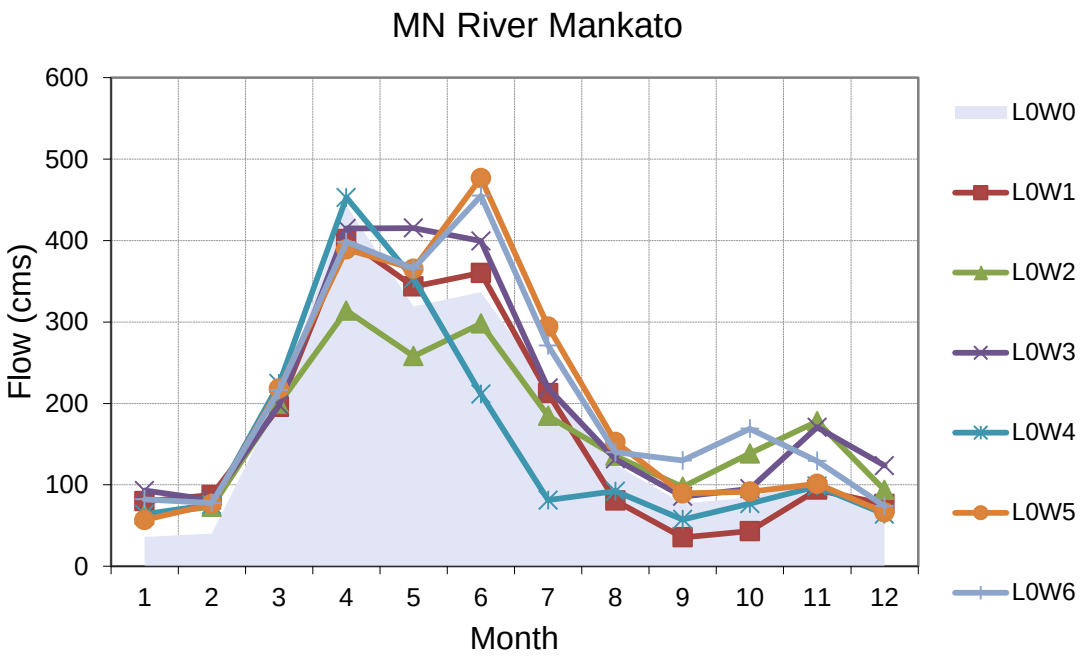

Figure 142. Monthly Average Flows, Minnesota River at Mankato (HSPF)

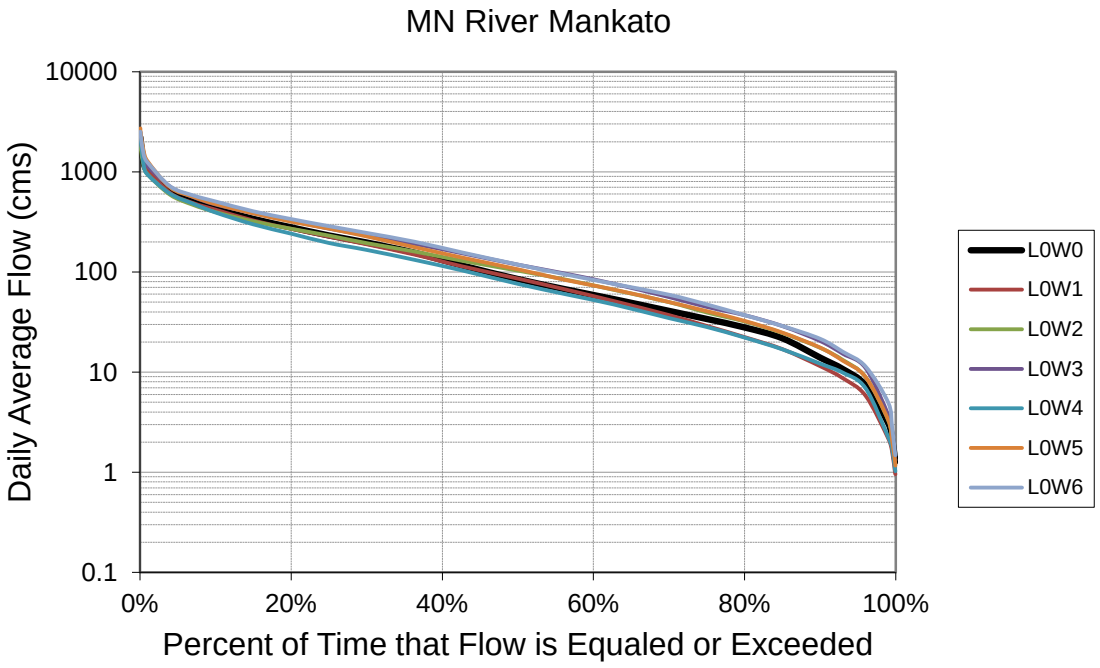

Figure 143. Flow Duration, Minnesota River at Mankato (HSPF)

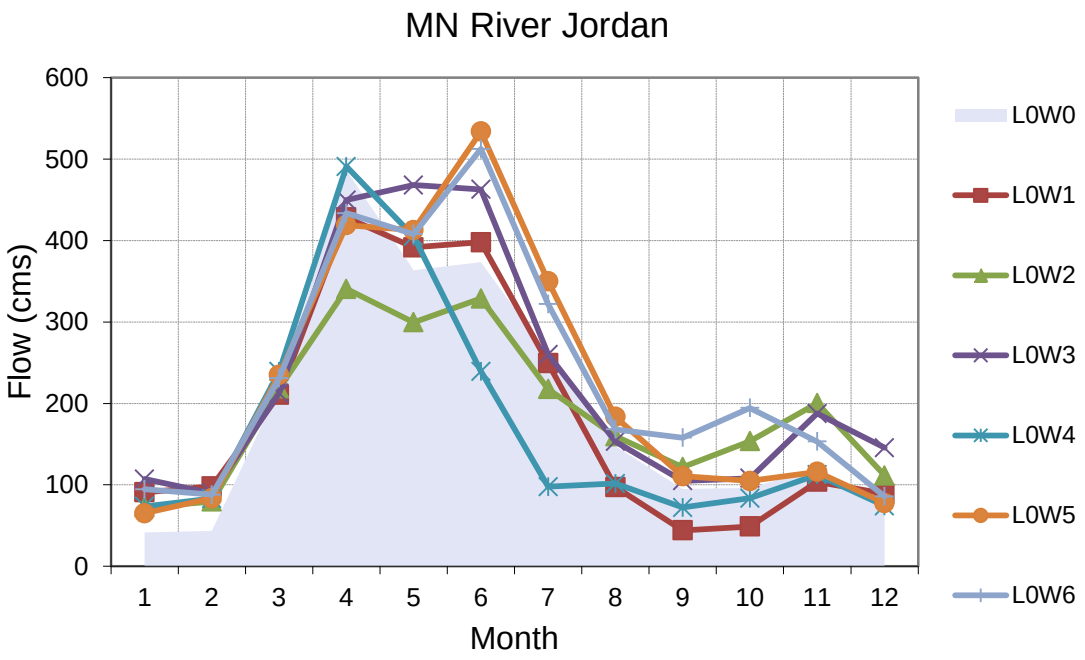

Figure 144. Monthly Average Flows, Minnesota River near Jordan (HSPF)

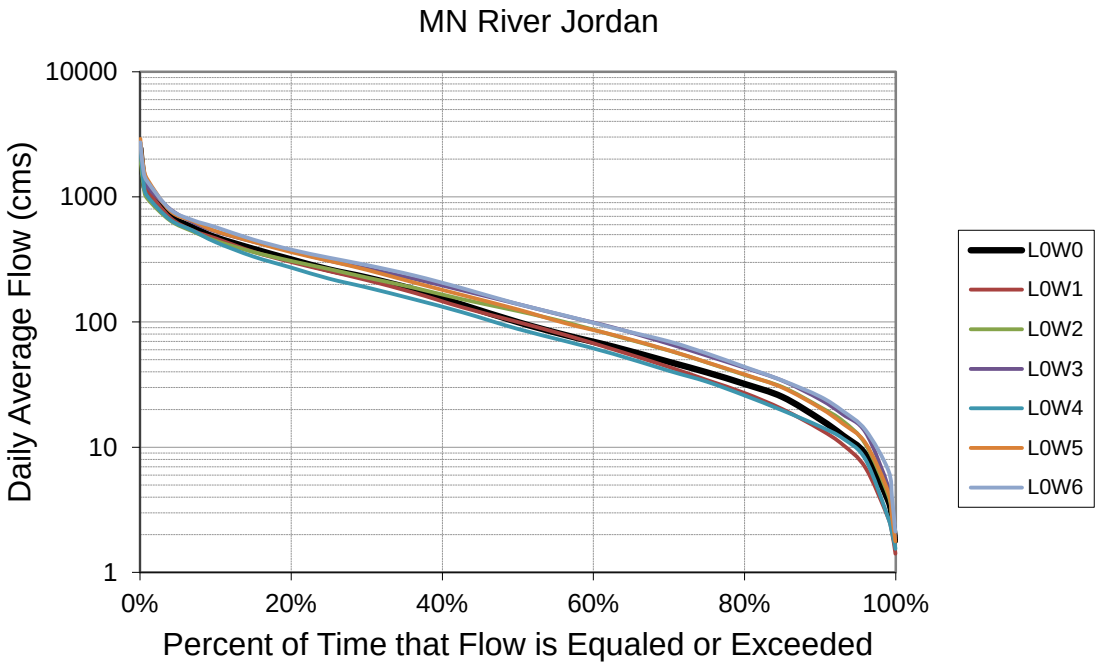

Figure 145. Flow Duration, Minnesota River near Jordan (HSPF)

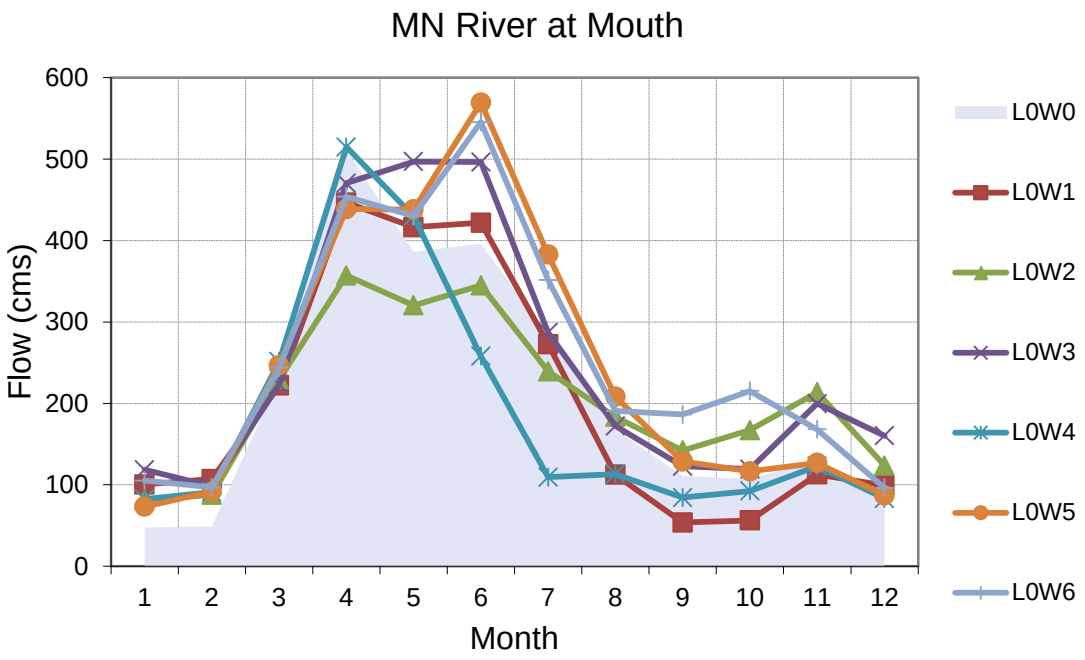

Figure 146. Monthly Average Flows, Minnesota River at Mouth (HSPF)

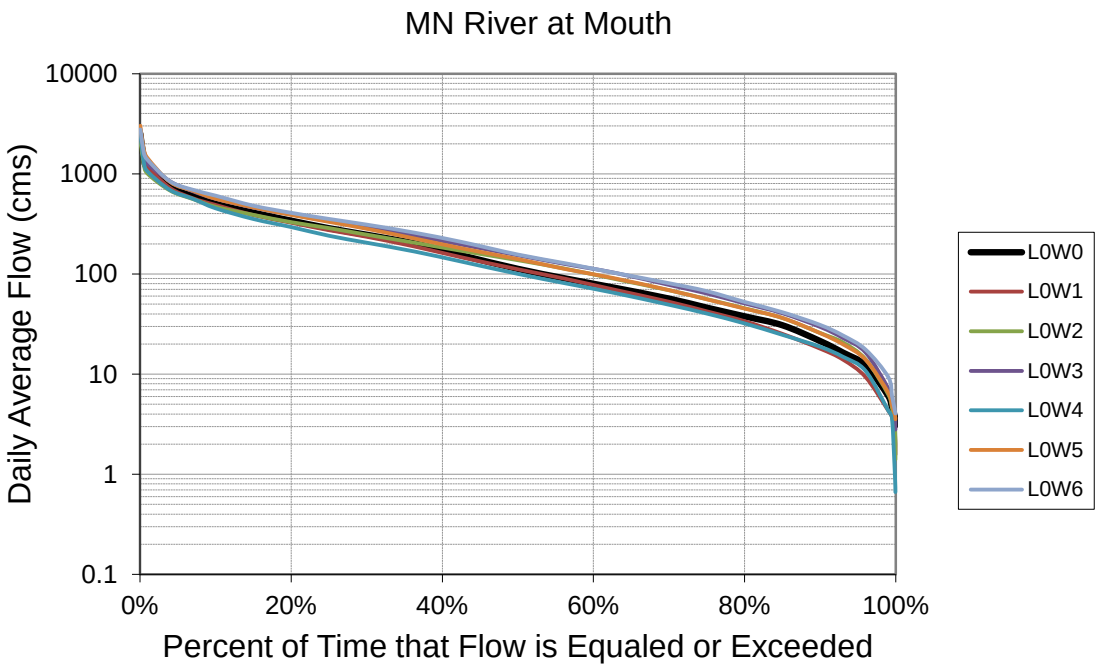

Figure 147. Flow Duration, Minnesota River at Mouth (HSPF)

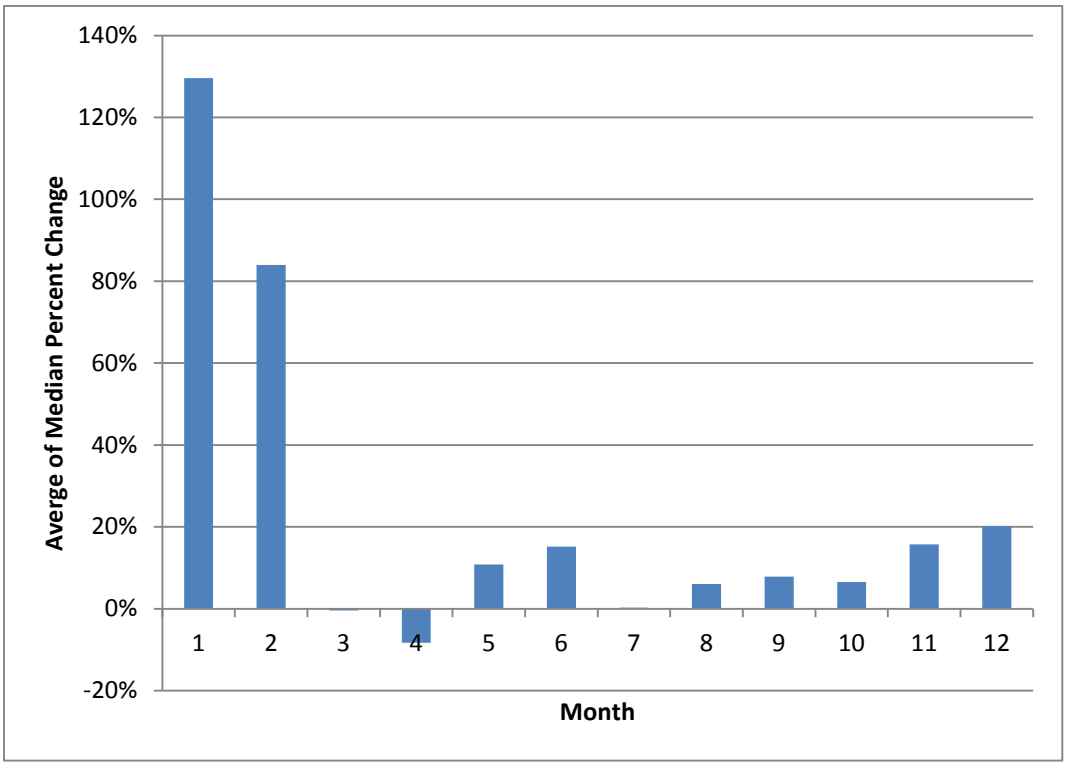

Figure 148. Average of Median Percent Change in Flow; NARCCAP Scenarios W1-W6 at all Stations, Minnesota River Basin (HSPF)

Minnesota River (Upper Mississippi Basin), SWAT Model Results at Downstream Station

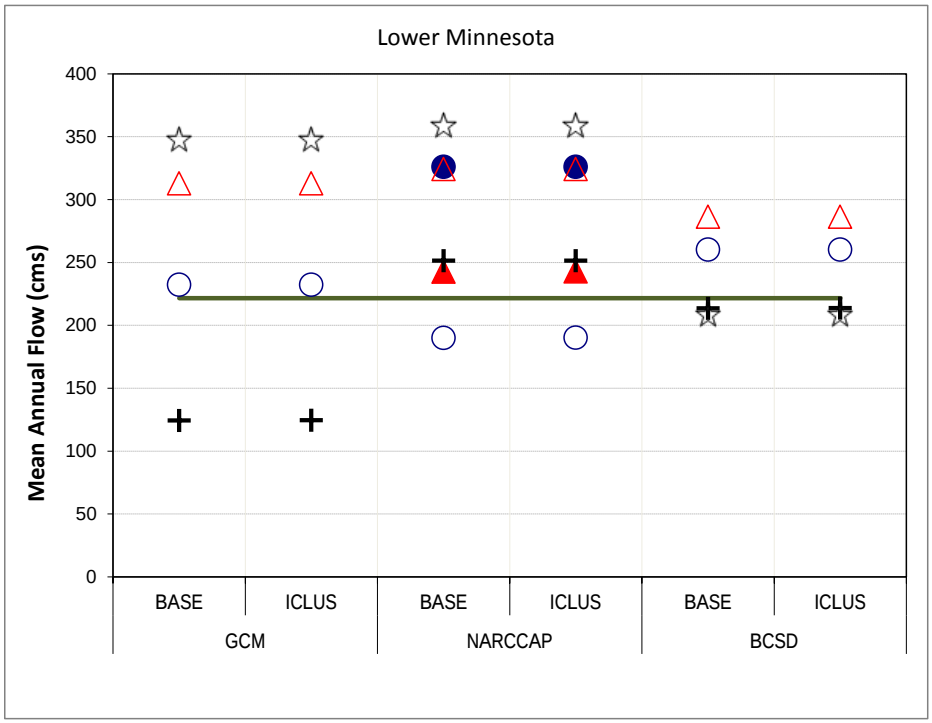

Figure 149. Mean Annual Flow, Lower Minnesota River (SWAT)

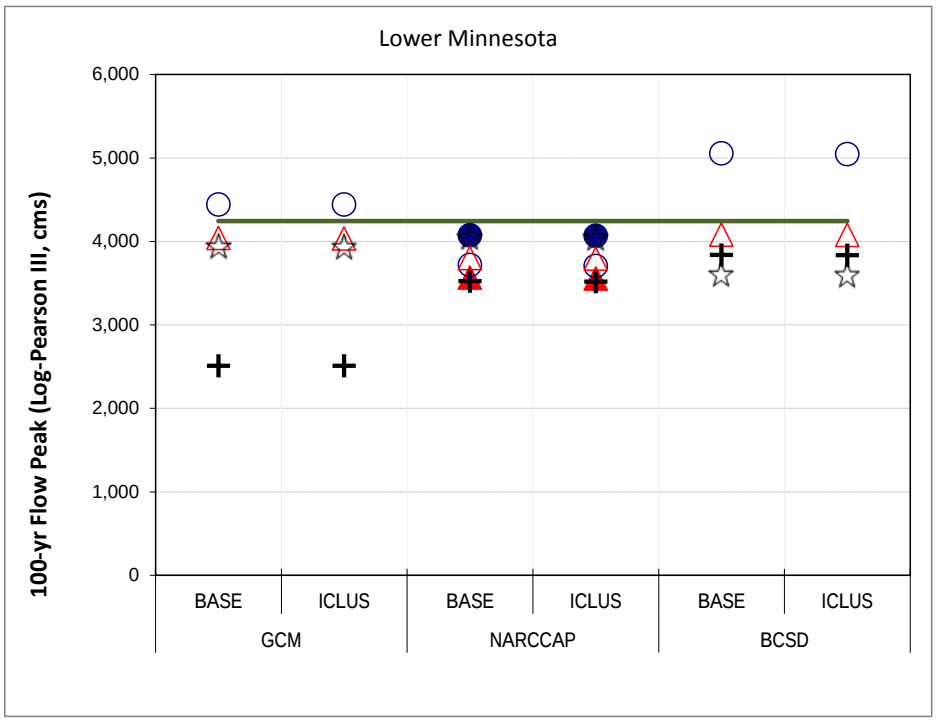

Figure 150. 100-yr Flow Peak, Lower Minnesota River (SWAT)

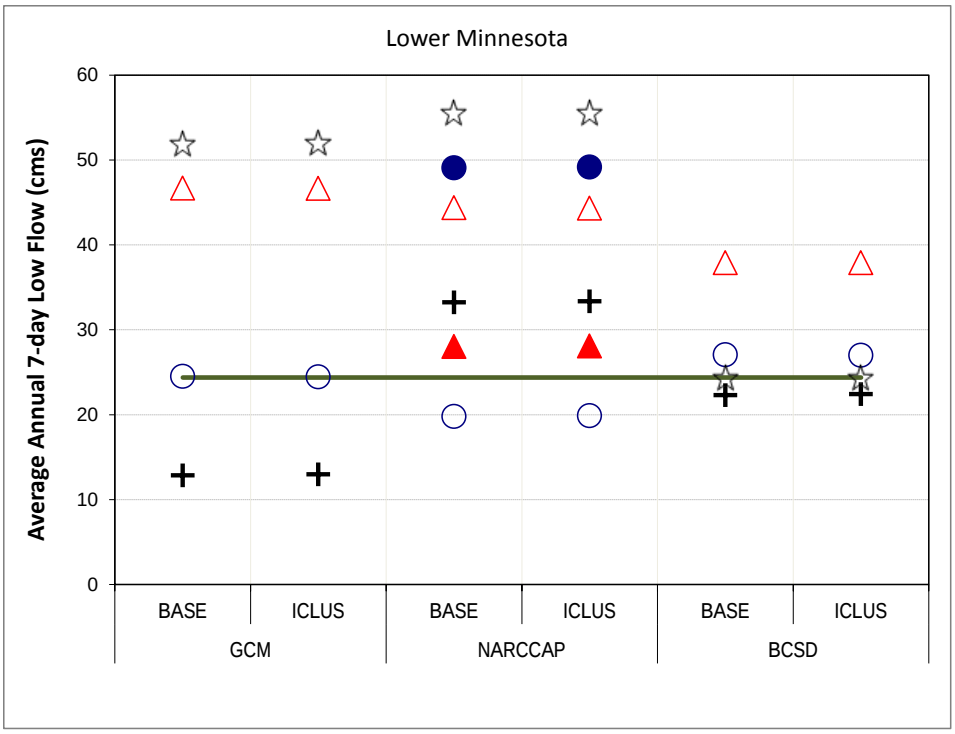

Figure 151. Average Annual 7-day Low Flow, Lower Minnesota River (SWAT)

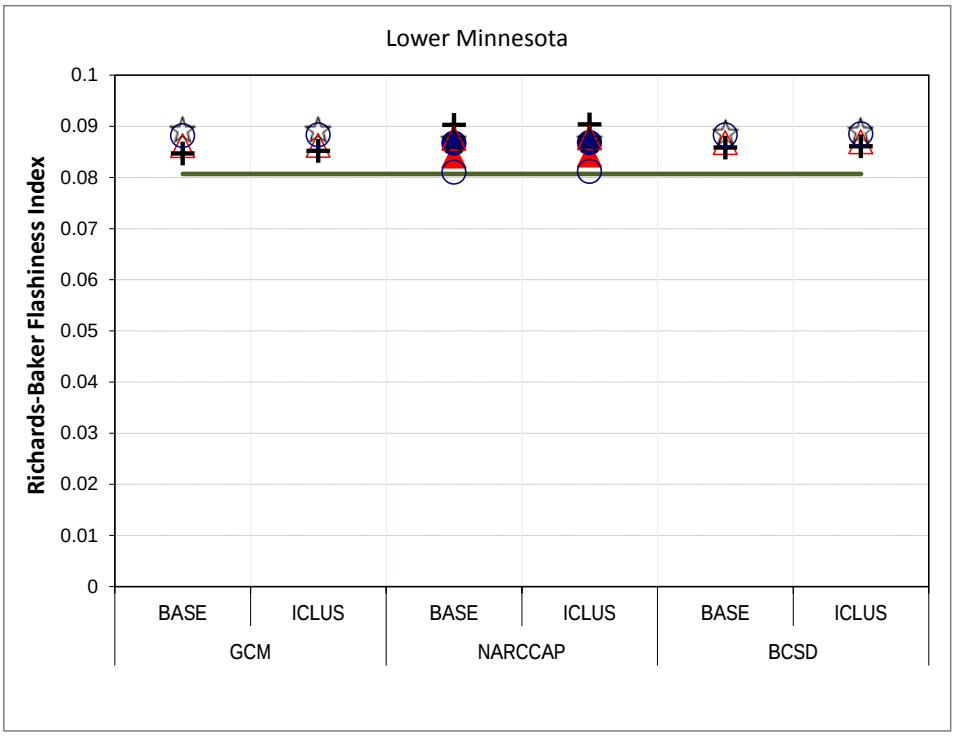

Figure 152. Richards-Baker Flashiness Index, Lower Minnesota River (SWAT)

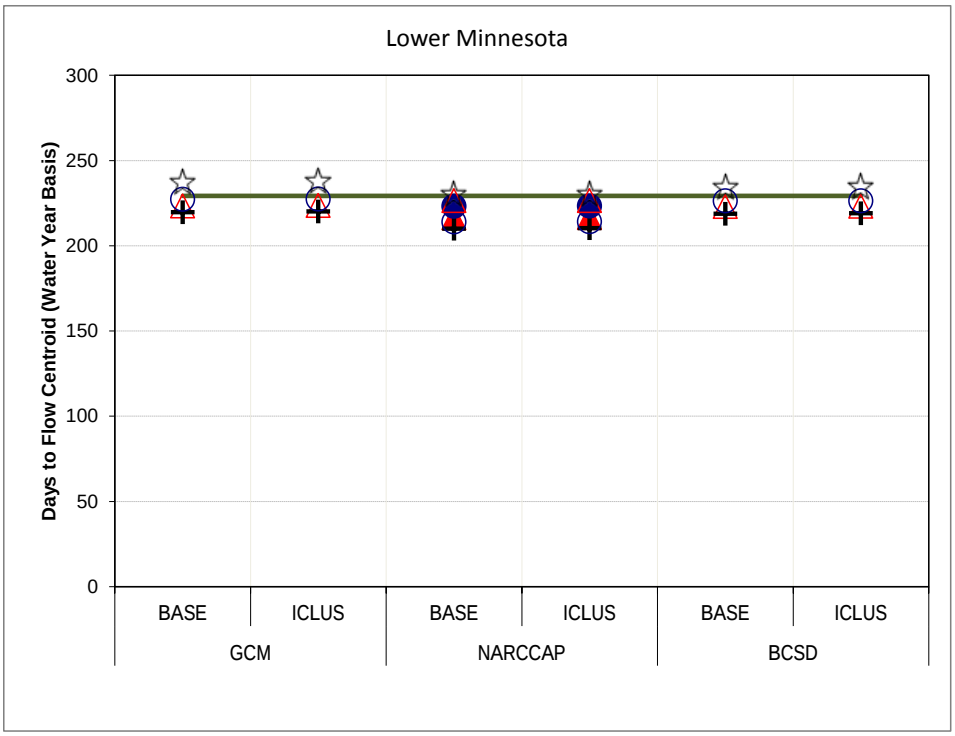

Figure 153. Days to Flow Centroid, Lower Minnesota River (SWAT)

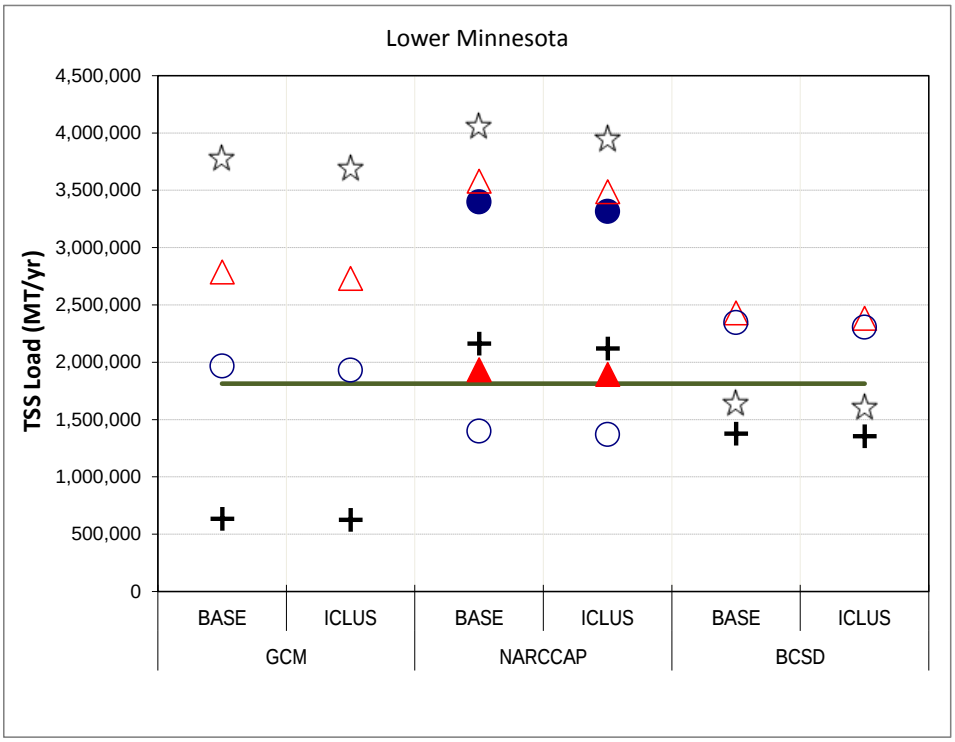

Figure 154. TSS Load, Lower Minnesota River (SWAT)

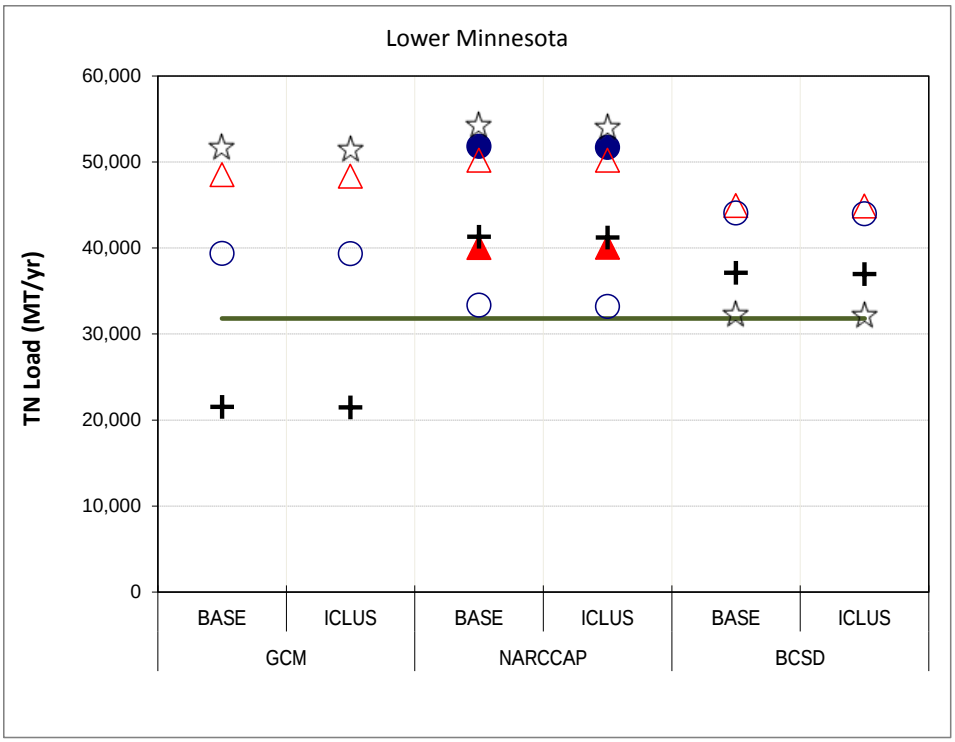

Figure 155. TN Load, Lower Minnesota River (SWAT)

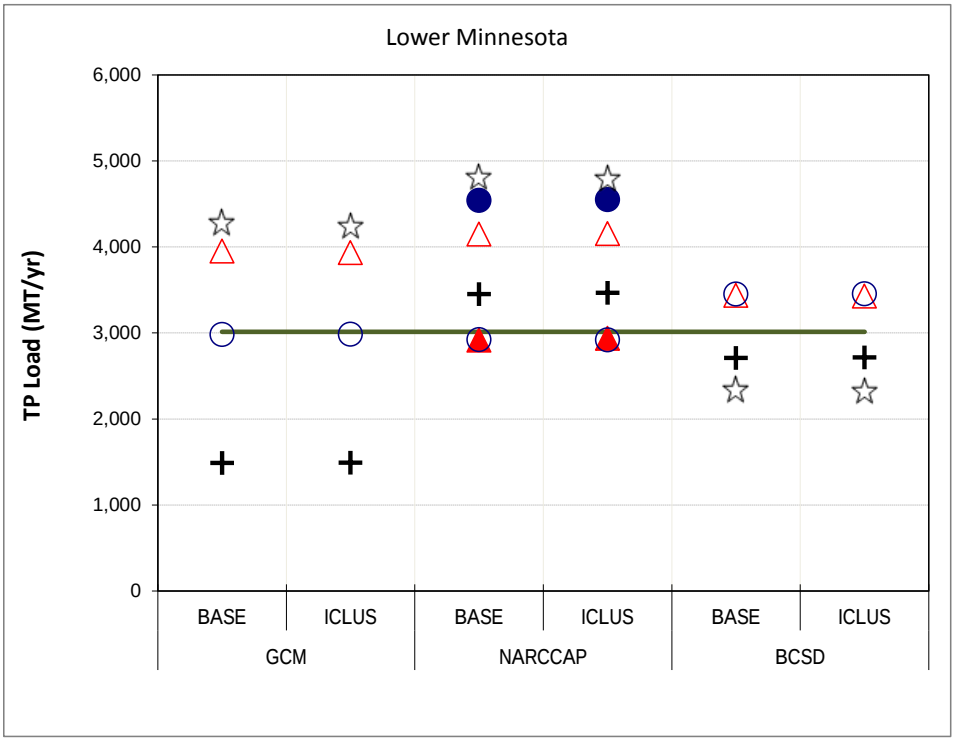

Figure 156. TP Load, Lower Minnesota River (SWAT)

Results at Multiple Stations

Table 6. Summary of Range of Change Relative to Existing Conditions for NARCCAP Dynamically Downscaled Scenarios, Minnesota River Basin SWAT Model

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Upper Minnesota HUC 07020001								
Flow	-3.95%	39.98%	36.17%	85.38%	-3.95%	39.98%	36.17%	85.38%
TSS	-17.42%	44.98%	47.84%	127.01%	-17.42%	44.98%	47.84%	127.01%
TN	19.73%	70.17%	67.01%	122.77%	19.73%	70.19%	67.03%	122.80%
TP	-12.85%	20.85%	25.01%	75.93%	-12.85%	20.87%	25.03%	75.97%
Pomme de Terre HUC 07020003								
Flow	-6.62%	33.48%	32.66%	77.84%	-6.62%	33.48%	32.66%	77.84%
TSS	-21.07%	30.07%	39.65%	115.54%	-21.07%	30.07%	39.65%	115.54%
TN	13.41%	53.98%	56.56%	107.51%	13.41%	53.99%	56.57%	107.53%
TP	-19.42%	16.76%	24.47%	83.00%	-19.42%	16.79%	24.50%	83.04%
Lac qui Parle HUC 07020002								
Flow	-7.31%	36.35%	32.40%	71.11%	-7.31%	36.35%	32.40%	71.11%
TSS	-17.12%	35.86%	33.84%	100.96%	-17.12%	35.86%	33.84%	100.96%
TN	9.56%	54.59%	48.18%	83.64%	9.56%	54.60%	48.18%	83.64%
TP	-13.85%	16.56%	18.02%	57.03%	-13.86%	16.57%	18.03%	57.05%
Yellow Medicine River HUC 07020004 (part)								
Flow	-7.92%	34.59%	31.53%	67.46%	-7.92%	34.59%	31.53%	67.46%
TSS	-16.42%	41.72%	36.16%	94.48%	-16.42%	41.72%	36.16%	94.48%
TN	0.03%	50.01%	43.94%	78.07%	0.12%	50.02%	43.97%	78.07%
TP	-20.52%	18.54%	18.61%	54.03%	-20.52%	18.55%	18.62%	54.05%
Chippewa River HUC 07020005								
Flow	-9.95%	25.69%	23.79%	65.55%	-9.95%	25.68%	23.79%	65.55%
TSS	-22.48%	32.97%	40.29%	126.59%	-22.48%	32.97%	40.29%	126.59%
TN	-0.76%	36.51%	36.79%	78.51%	-0.76%	36.53%	36.81%	78.50%
TP	-24.54%	10.93%	17.45%	70.94%	-24.56%	10.91%	17.46%	70.89%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Redwood River HUC 07020006								
Flow	-3.78%	24.23%	25.92%	53.95%	-3.78%	24.23%	25.92%	53.94%
TSS	-6.11%	32.18%	36.06%	86.18%	-6.11%	32.18%	36.06%	86.18%
TN	-0.31%	36.42%	34.70%	64.01%	-0.31%	36.43%	34.70%	64.02%
TP	-5.61%	13.19%	16.08%	44.46%	-5.61%	13.20%	16.09%	44.46%
Middle Minnesota HUC 07020007								
Flow	-12.67%	29.75%	27.94%	62.35%	-12.67%	29.74%	27.94%	62.34%
TSS	-17.81%	52.83%	47.38%	101.14%	-17.81%	52.82%	47.38%	101.13%
TN	4.32%	43.11%	41.13%	70.64%	4.36%	43.18%	41.21%	70.72%
TP	-5.46%	25.85%	24.83%	59.67%	-5.39%	25.92%	24.88%	59.72%
Cottonwood HUC 07020008								
Flow	-10.24%	33.77%	31.00%	61.72%	-10.24%	33.77%	31.00%	61.72%
TSS	-5.91%	43.69%	48.11%	104.61%	-5.91%	43.69%	48.11%	104.61%
TN	4.22%	45.84%	44.97%	75.87%	4.22%	45.84%	44.97%	75.87%
TP	-5.03%	20.93%	25.34%	63.13%	-5.03%	20.93%	25.34%	63.13%
Blue Earth HUC 07020009								
Flow	-20.61%	33.56%	22.74%	49.17%	-20.61%	33.55%	22.74%	49.17%
TSS	-24.04%	57.91%	45.79%	98.51%	-24.04%	57.91%	45.78%	98.50%
TN	-11.15%	45.50%	35.07%	63.82%	-11.14%	45.55%	35.09%	63.86%
TP	-19.24%	39.82%	29.02%	67.12%	-19.24%	39.90%	29.07%	67.19%
Watonwan HUC 07020010								
Flow	-23.39%	40.81%	28.64%	65.41%	-23.39%	40.81%	28.64%	65.41%
TSS	-30.63%	62.21%	52.72%	124.99%	-30.63%	62.21%	52.72%	124.98%
TN	-23.34%	46.15%	38.06%	89.14%	-23.34%	46.15%	38.05%	89.14%
TP	-31.51%	38.20%	31.53%	92.71%	-31.52%	38.19%	31.51%	92.70%
Le Sueur HUC 07020011								
Flow	-13.79%	31.64%	21.83%	43.28%	-13.80%	31.63%	21.81%	43.26%
TSS	-5.12%	52.63%	41.27%	75.30%	-5.12%	52.63%	41.27%	75.29%
TN	-0.63%	41.60%	33.83%	56.00%	-0.23%	42.25%	34.33%	56.43%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
TP	-5.35%	35.45%	28.50%	57.54%	-4.78%	36.34%	29.17%	58.15%
Lower Minnesota HUC 07020012								
Flow	-14.28%	29.82%	27.39%	62.41%	-14.34%	29.59%	27.16%	62.09%
TSS	-22.81%	53.38%	52.06%	124.50%	-22.87%	52.90%	51.41%	122.93%
TN	4.88%	43.83%	42.08%	71.13%	4.88%	44.37%	42.44%	71.09%
TP	-3.26%	26.08%	26.14%	60.28%	-2.52%	27.28%	27.15%	60.74%
Minnesota River at Jordan (gage 05330000)								
Flow	-13.54%	30.38%	28.14%	63.25%	-13.58%	30.31%	28.07%	63.16%
TSS	-19.49%	53.66%	51.35%	115.45%	-19.48%	53.58%	51.27%	115.24%
TN	5.17%	42.75%	41.55%	70.98%	5.17%	42.84%	41.58%	70.91%
TP	-6.65%	23.91%	24.52%	59.80%	-6.28%	24.19%	24.68%	59.53%
Minnesota River at Mankato (gage 05325000)								
Flow	-13.01%	30.10%	28.11%	62.93%	-13.01%	30.09%	28.10%	62.93%
TSS	-17.21%	50.29%	46.00%	101.54%	-17.21%	50.28%	46.00%	101.52%
TN	4.83%	42.80%	41.32%	70.91%	4.85%	42.85%	41.38%	70.97%
TP	-5.52%	25.21%	24.99%	59.64%	-5.49%	25.27%	25.02%	59.65%

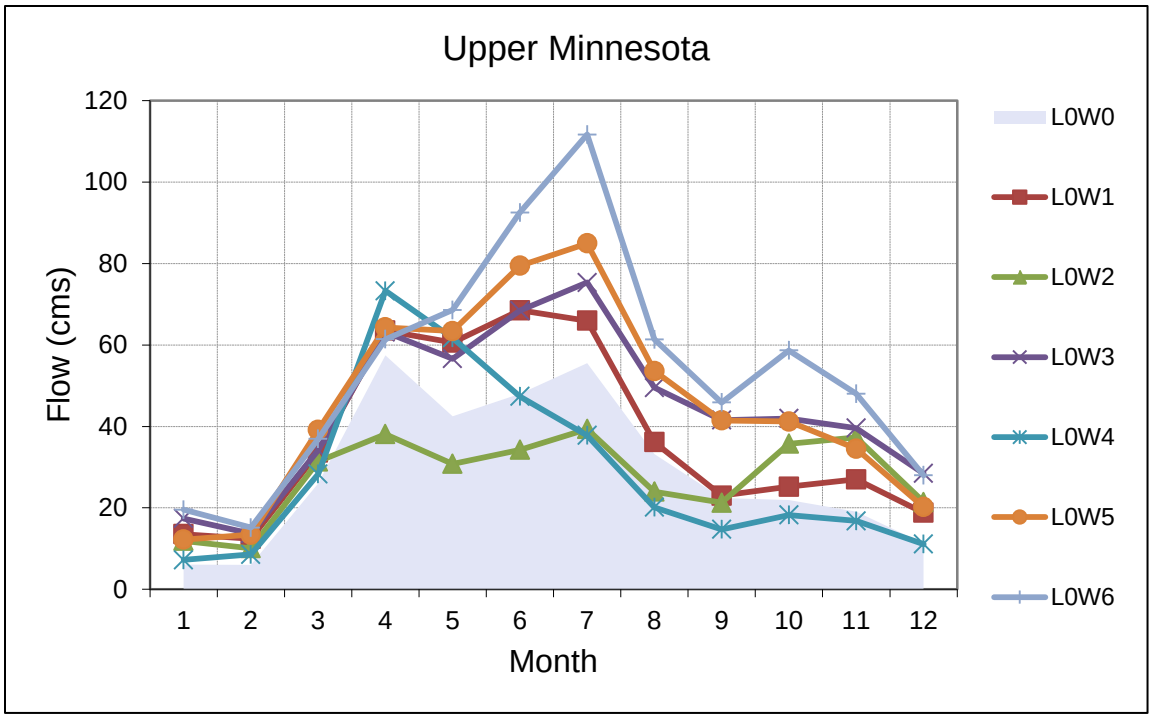

Figure 56. Monthly Average Flows, Upper Minnesota River (SWAT)

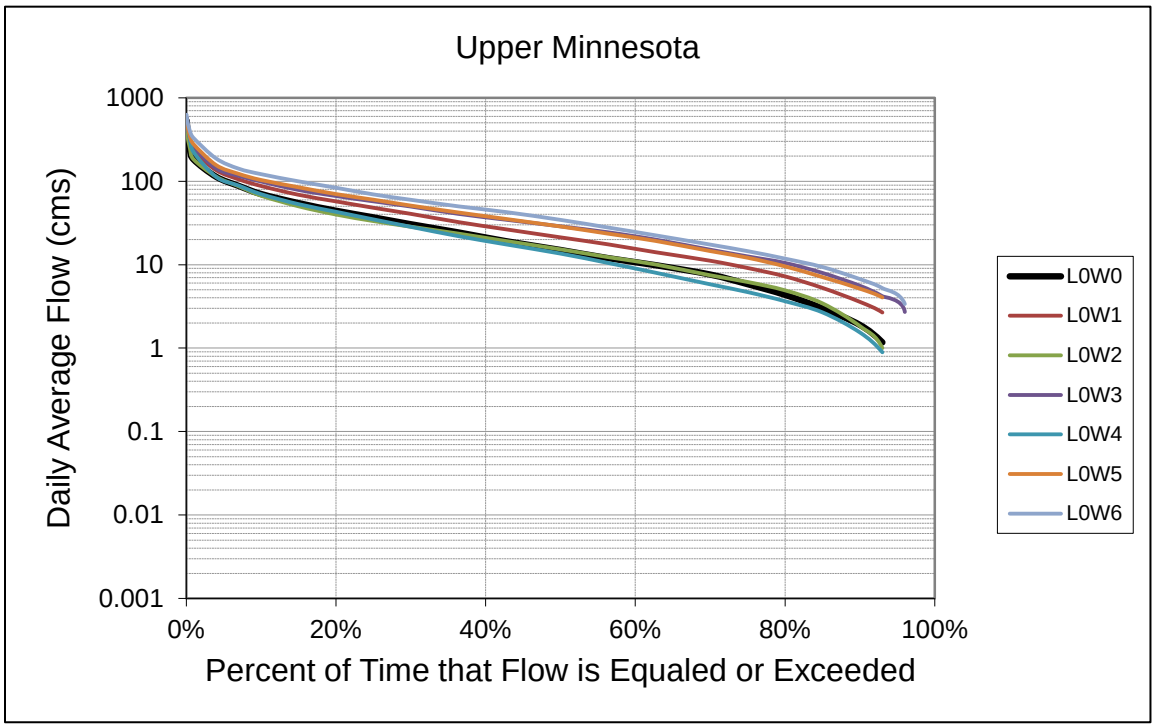

Figure 158. Flow Duration, Upper Minnesota River (SWAT)

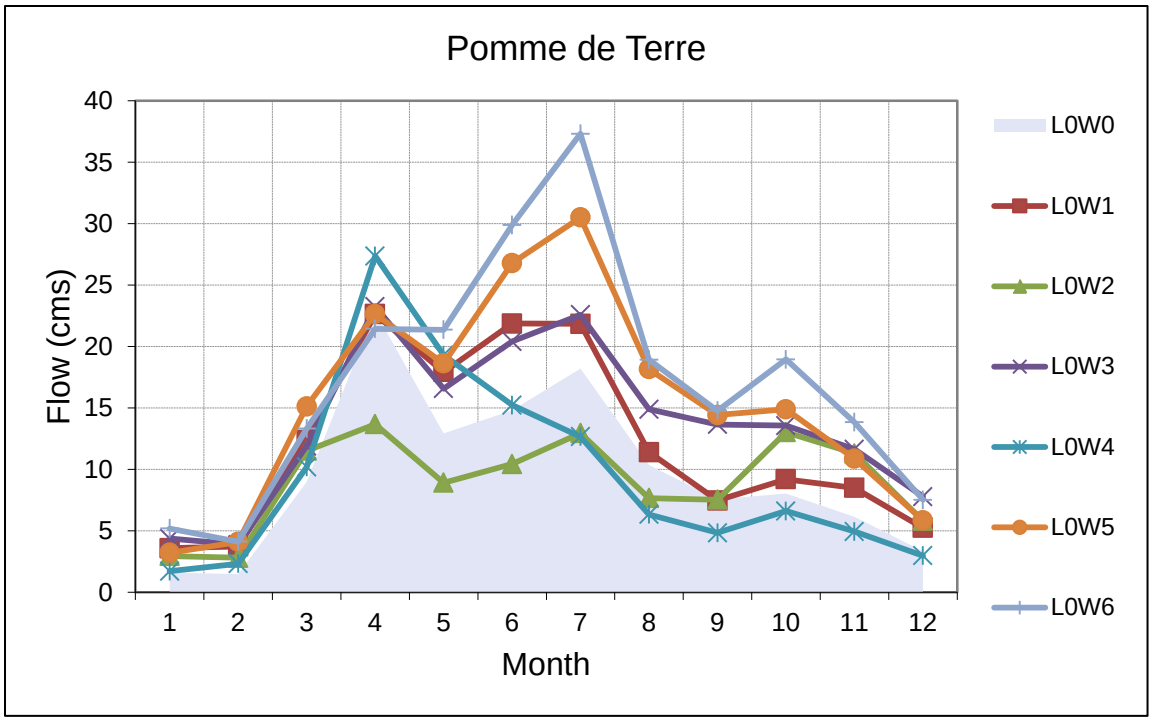

Figure 159. Monthly Average Flows, Pomme de Terre (SWAT)

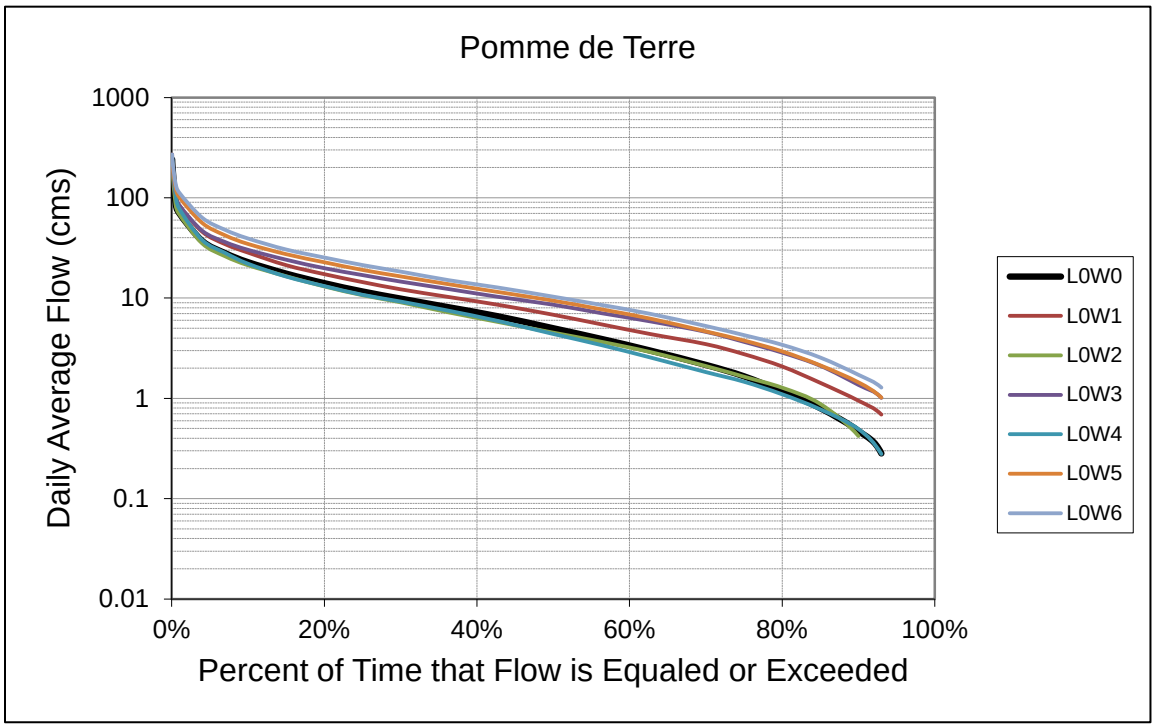

Figure 160. Flow Duration, Pomme de Terre (SWAT)

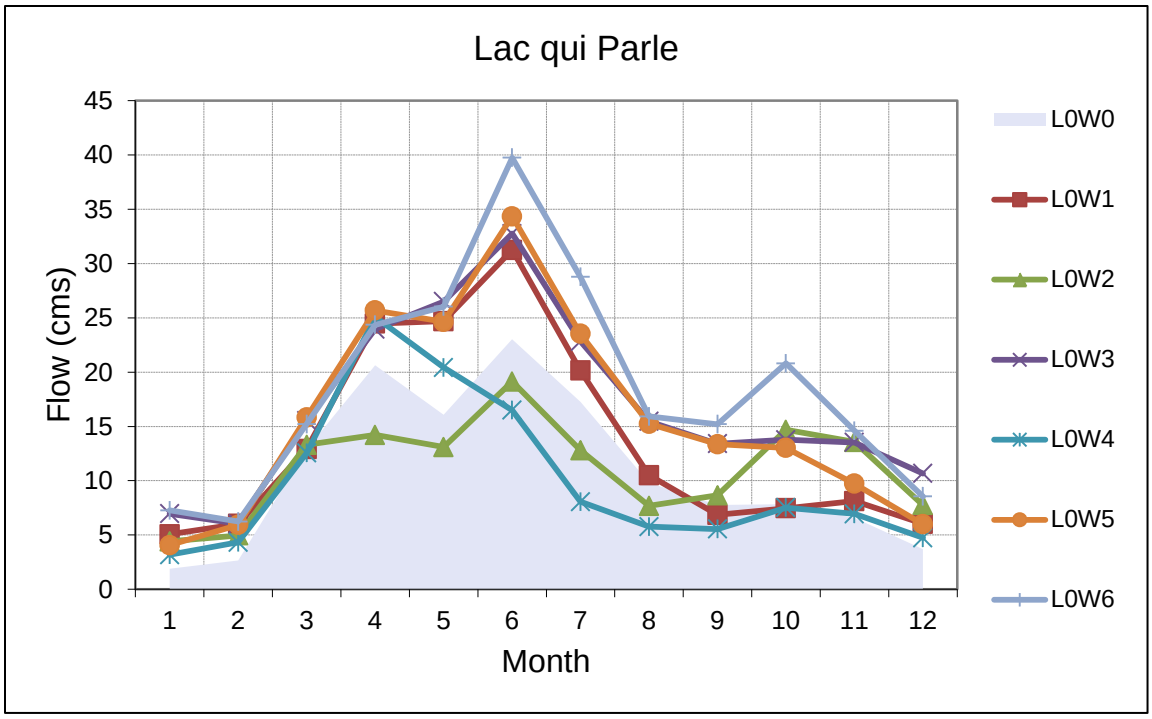

Figure 161. Monthly Average Flows, Minnesota River at Lac qui Parle (SWAT)

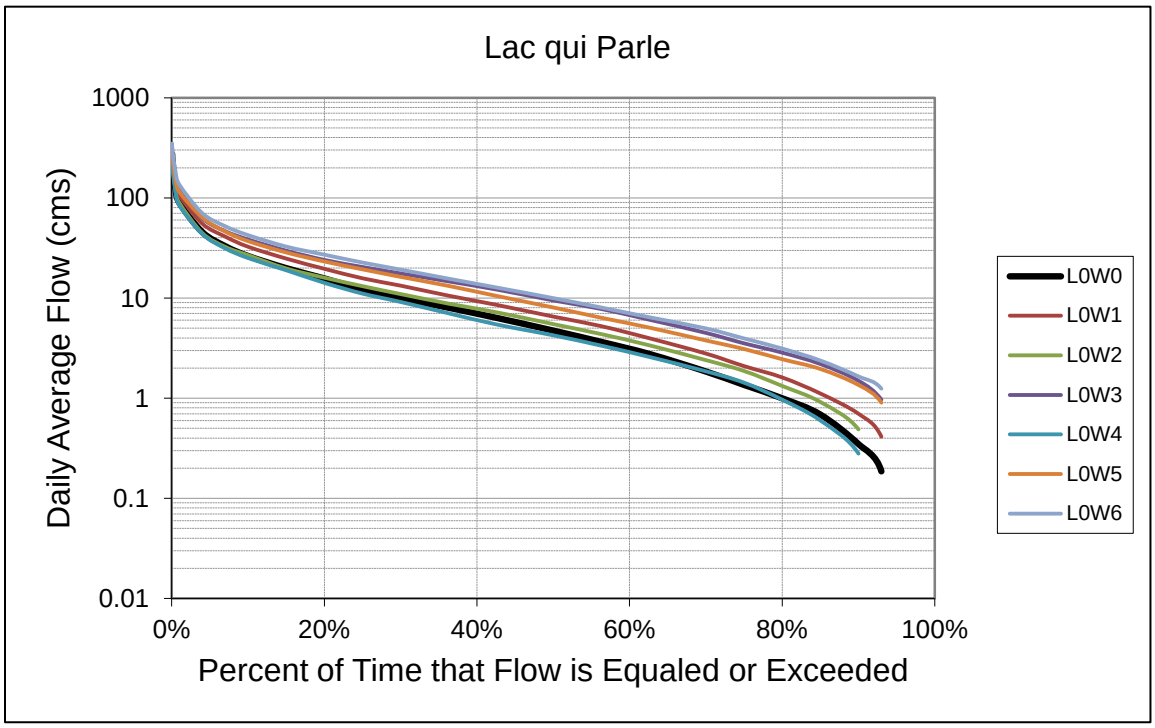

Figure 162. Flow Duration, Minnesota River at Lac qui Parle (SWAT)

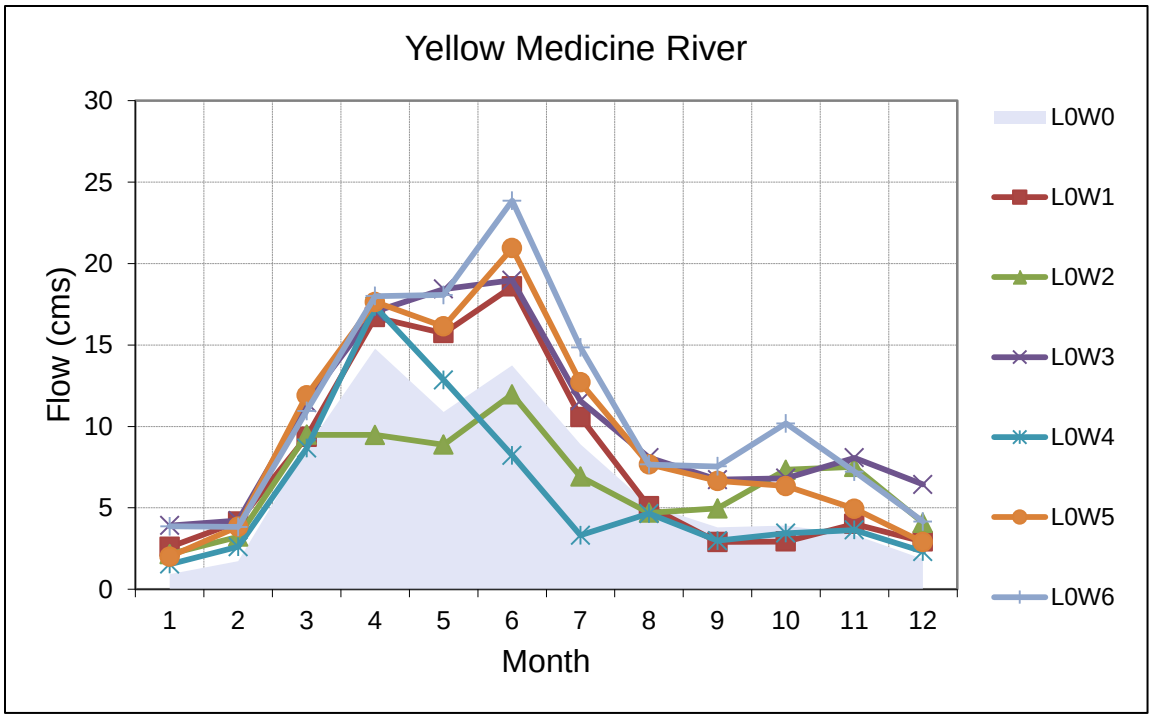

Figure 163. Monthly Average Flows, Yellow Medicine River (SWAT)

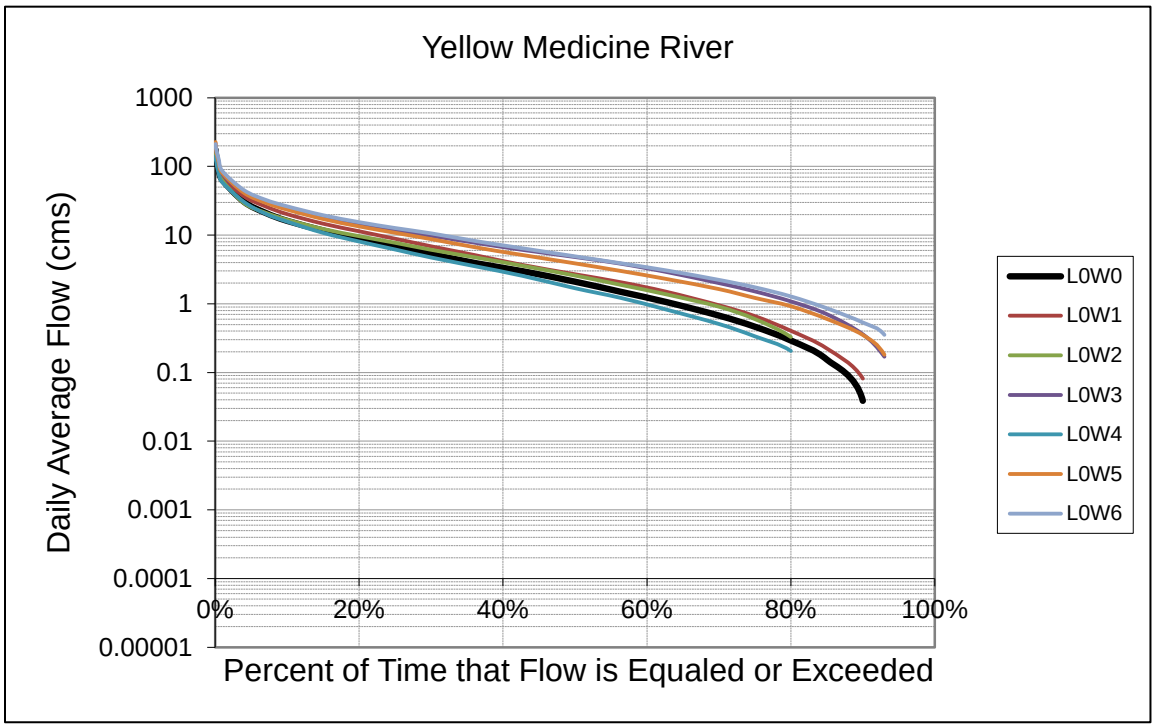

Figure 164. Flow Duration, Yellow Medicine River (SWAT)

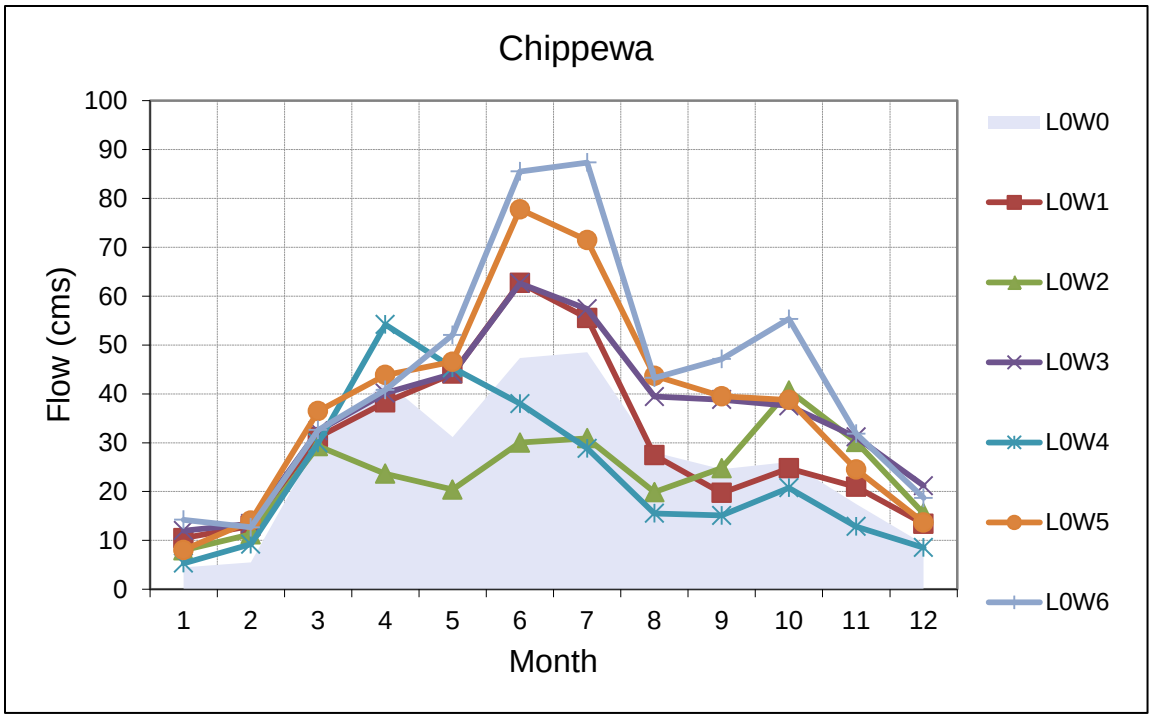

Figure 165. Monthly Average Flows, Chippewa River (SWAT)

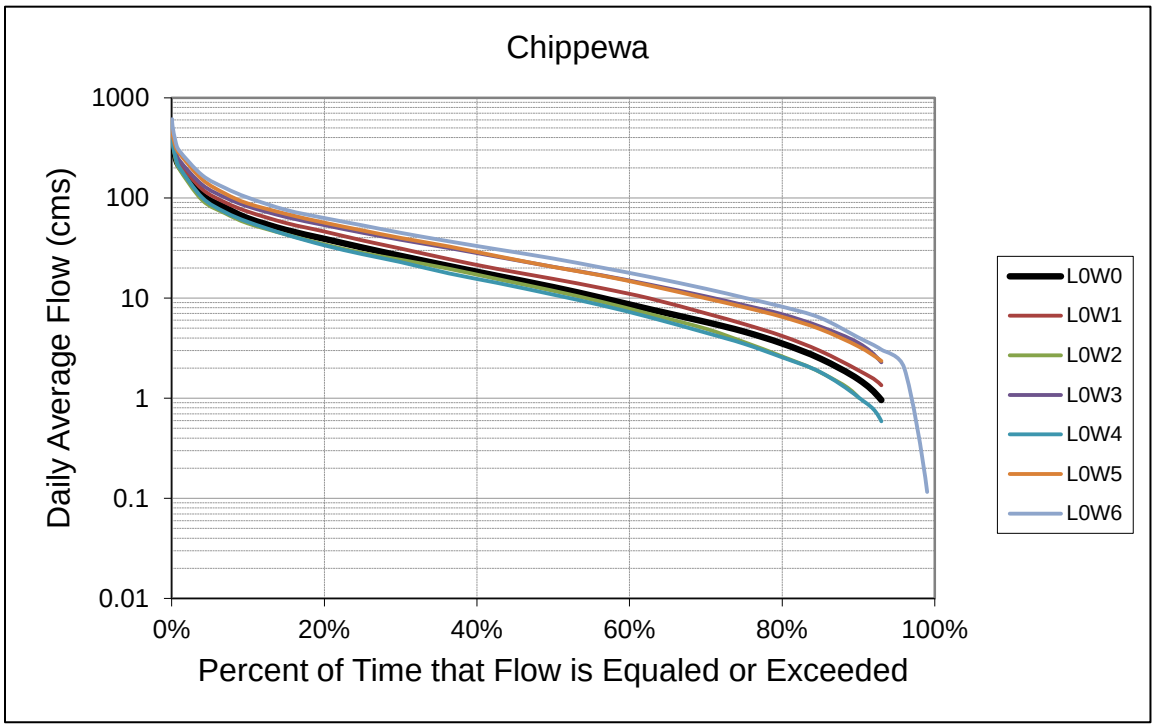

Figure 166. Flow Duration, Chippewa River (SWAT)

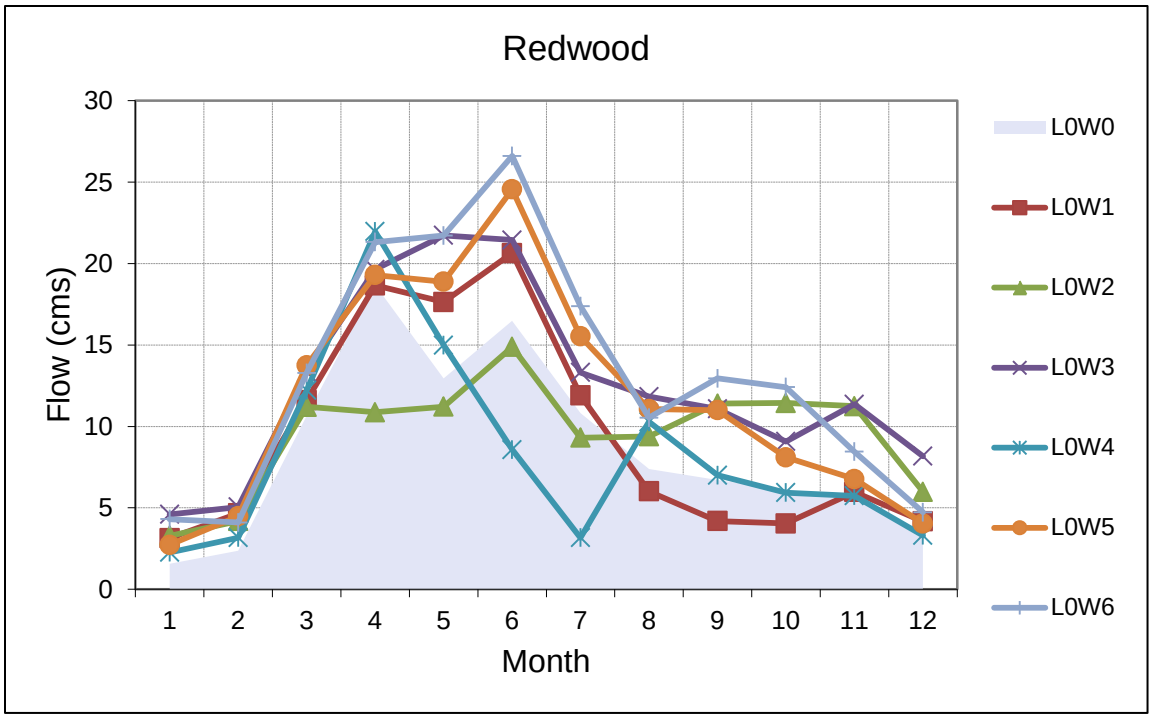

Figure 167. Monthly Average Flows, Redwood River (SWAT)

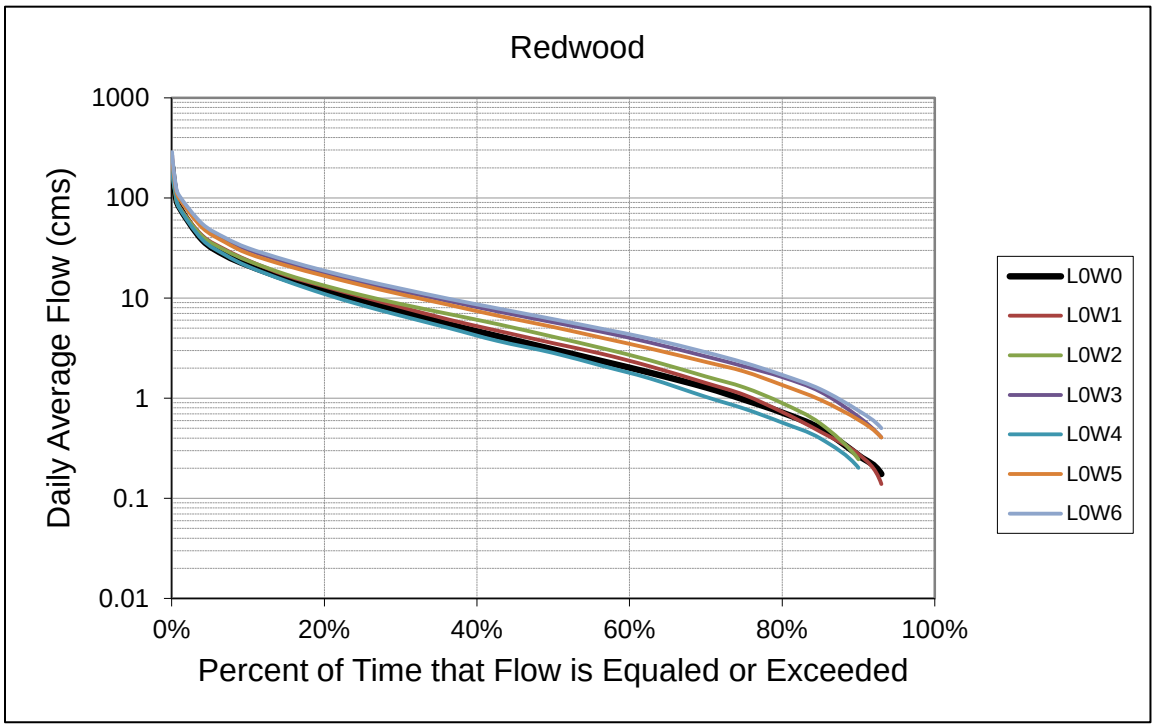

Figure 168. Flow Duration, Redwood River (SWAT)

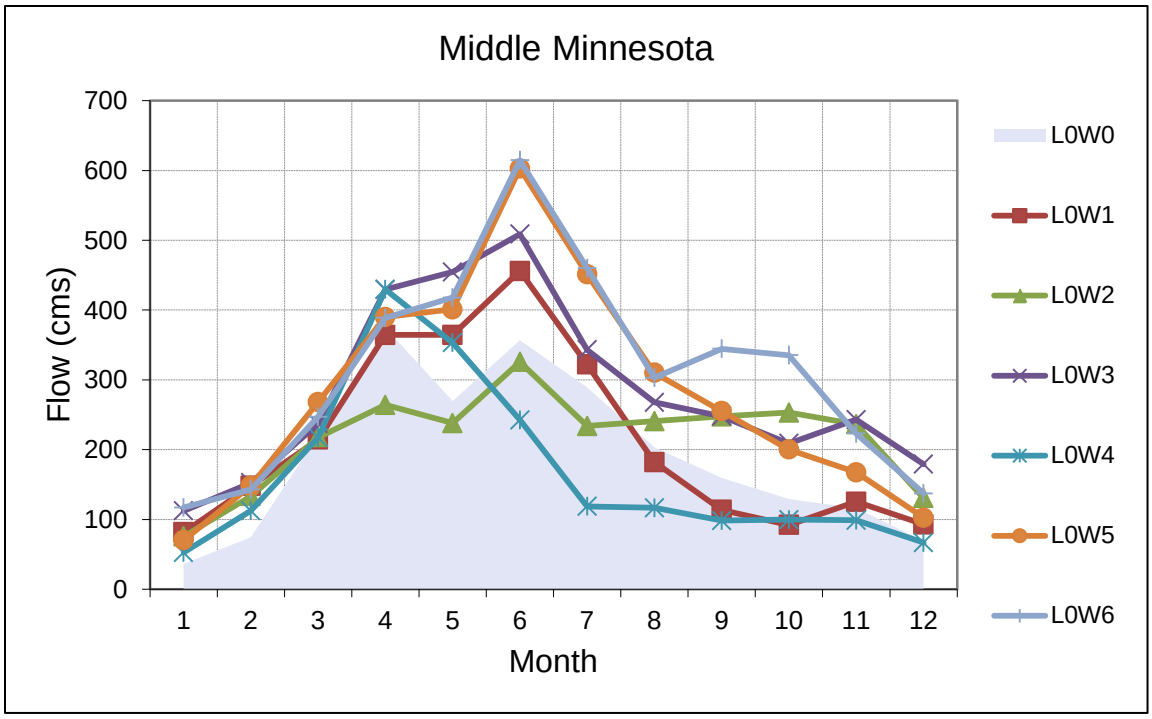

Figure 169. Monthly Average Flows, Middle Minnesota River (SWAT)

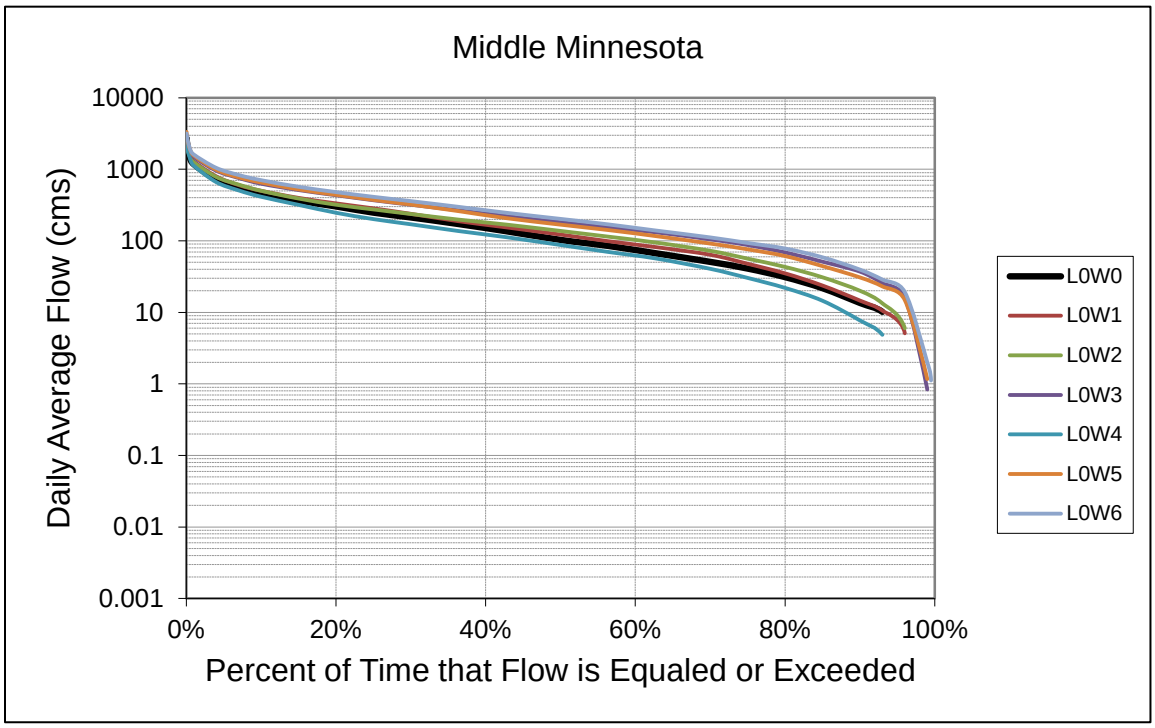

Figure 170. Flow Duration, Middle Minnesota River (SWAT)

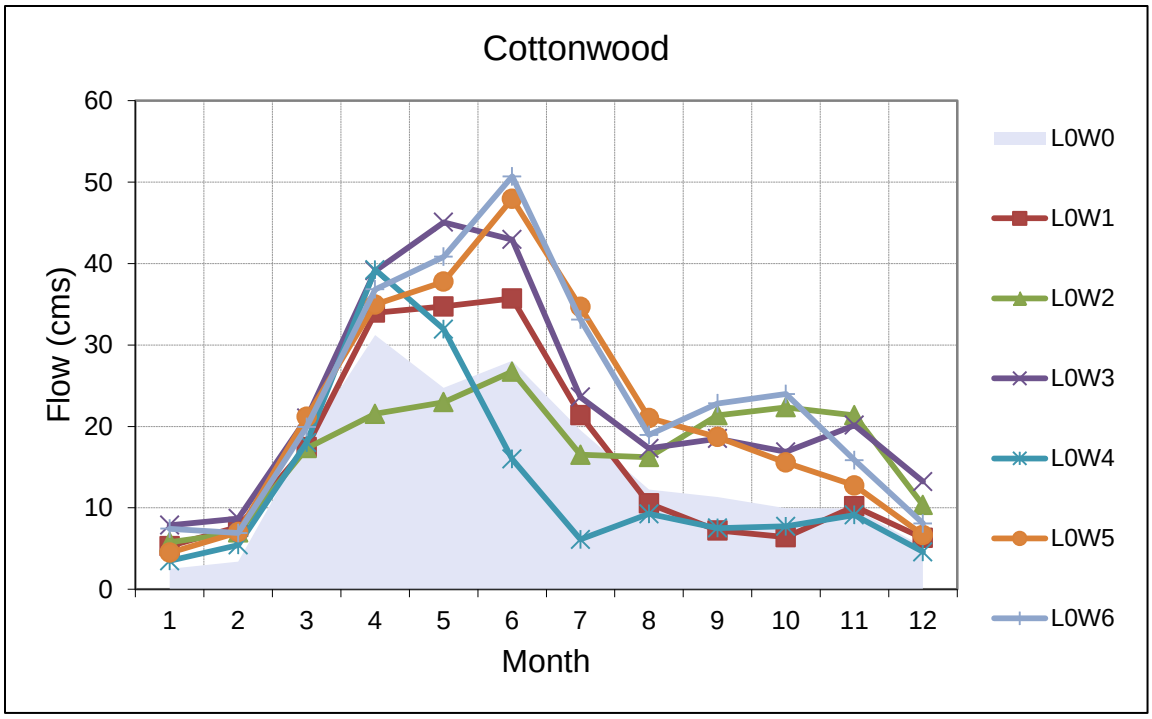

Figure 171. Monthly Average Flows, Cottonwood River (SWAT)

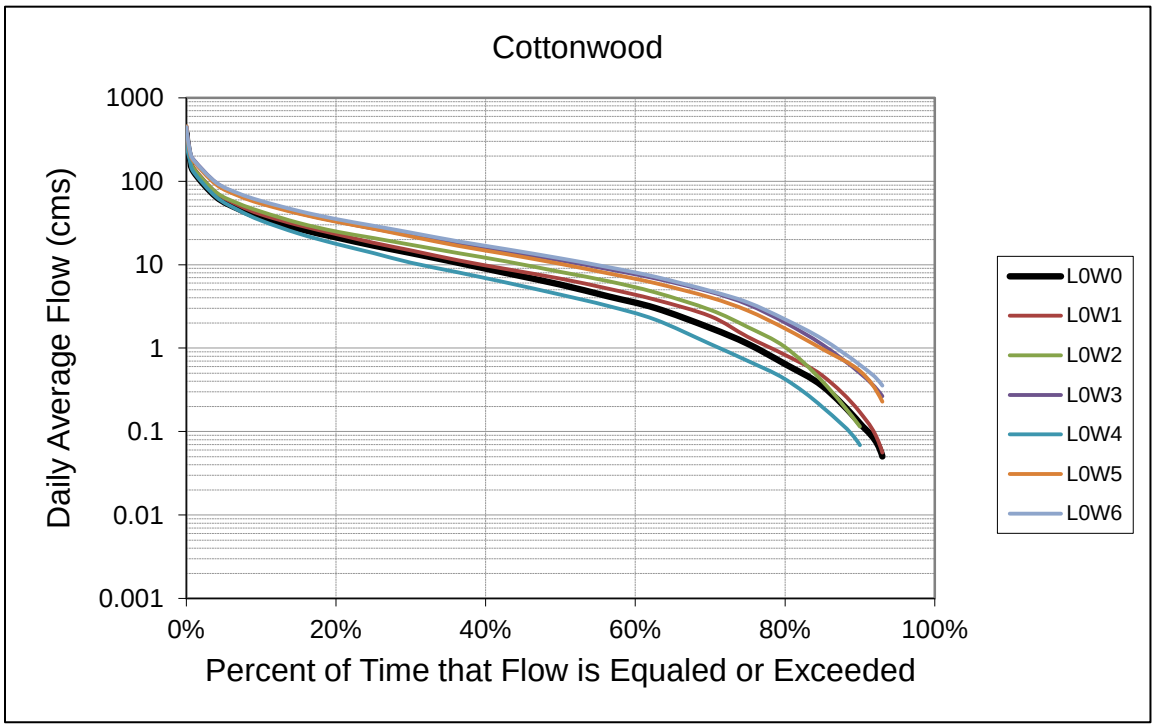

Figure 172. Flow Duration, Cottonwood River (SWAT)

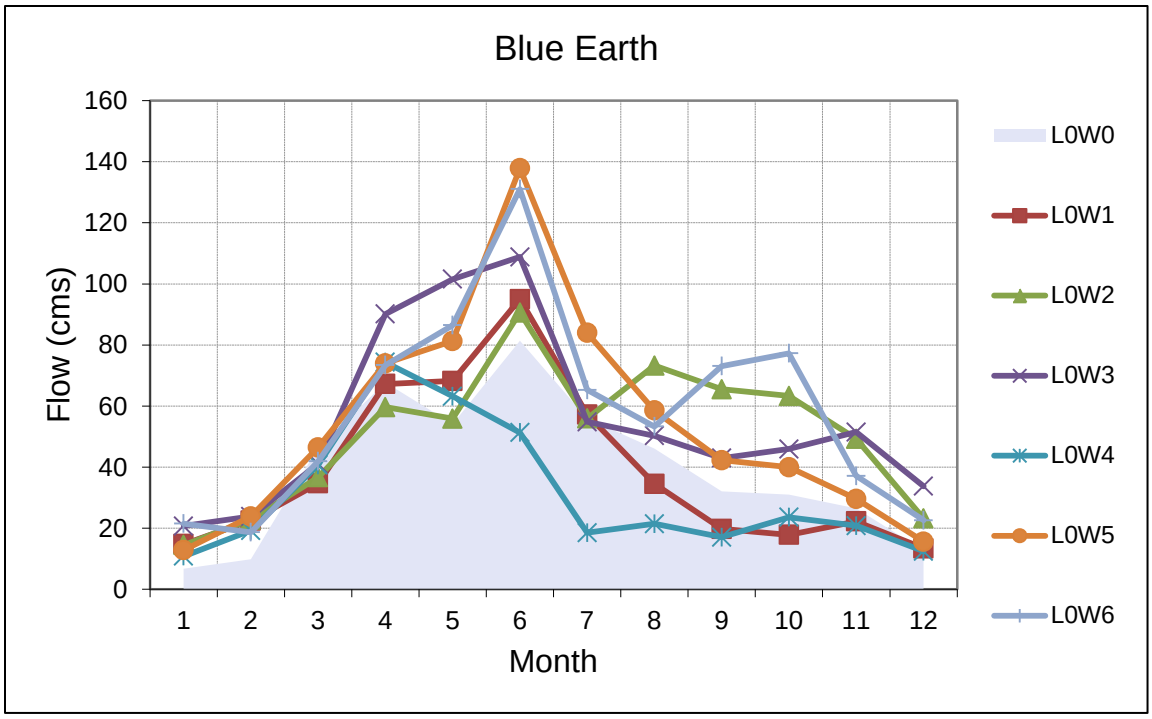

Figure 173. Monthly Average Flows, Blue Earth River (SWAT)

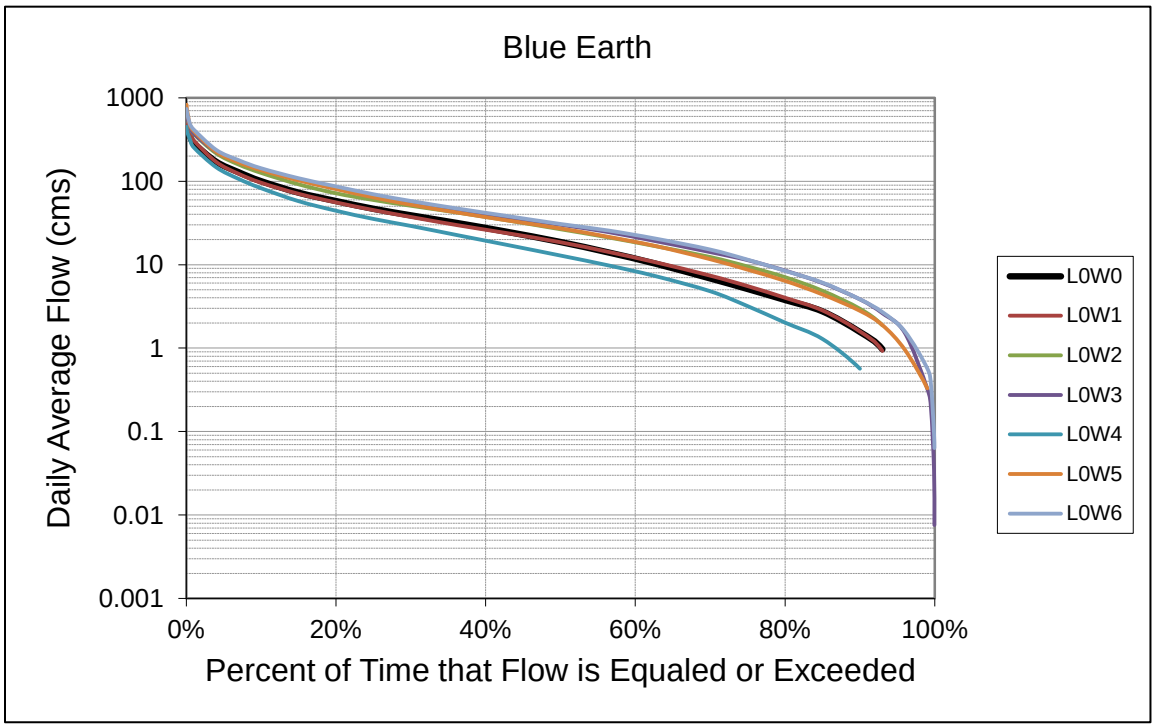

Figure 174. Flow Duration, Blue Earth River (SWAT)

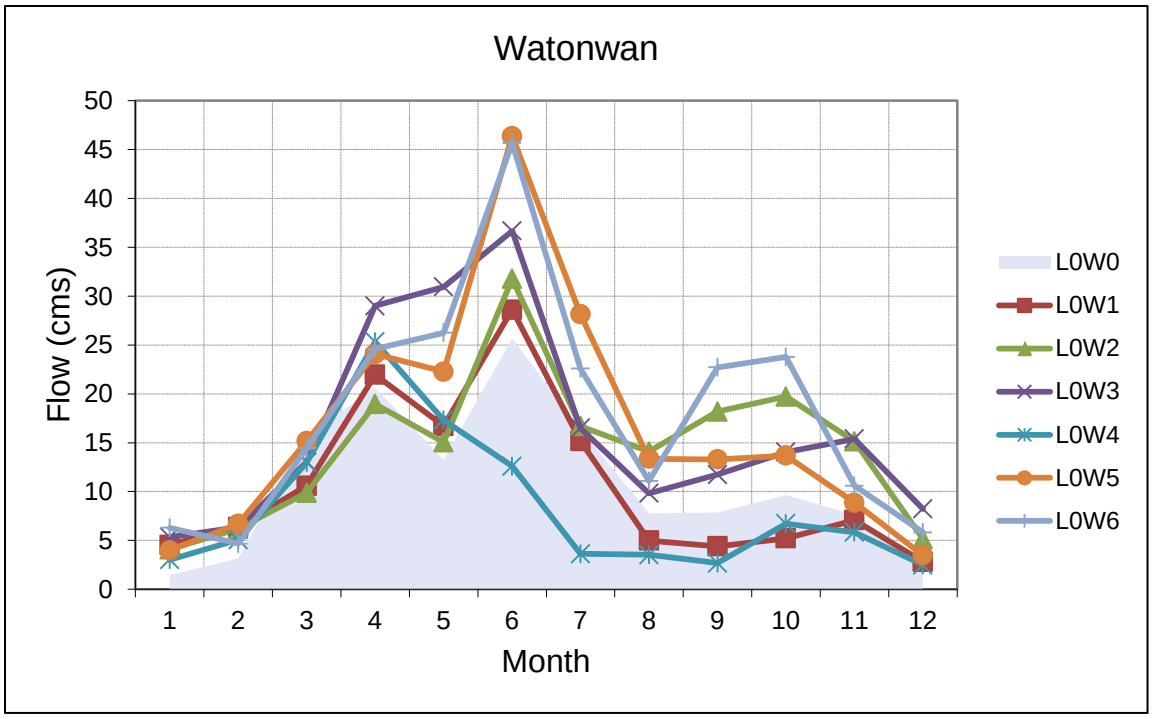

Figure 175. Monthly Average Flows, Watowan River (SWAT)

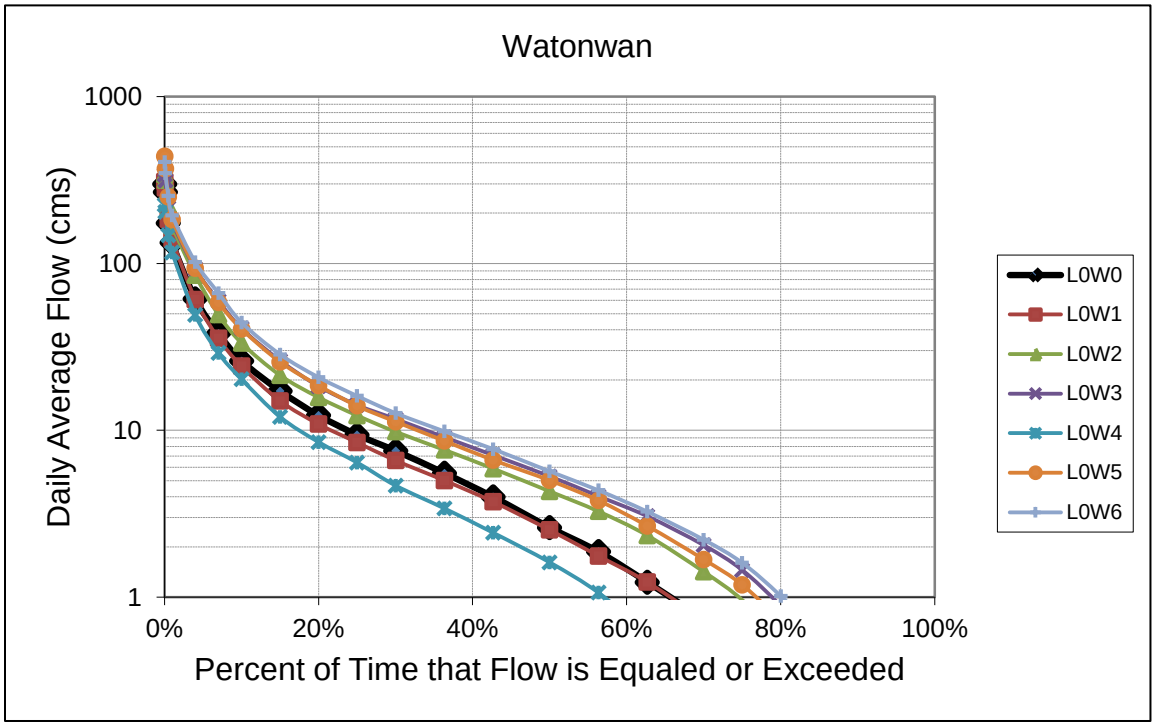

Figure 176. Flow Duration, Watowan River (SWAT)

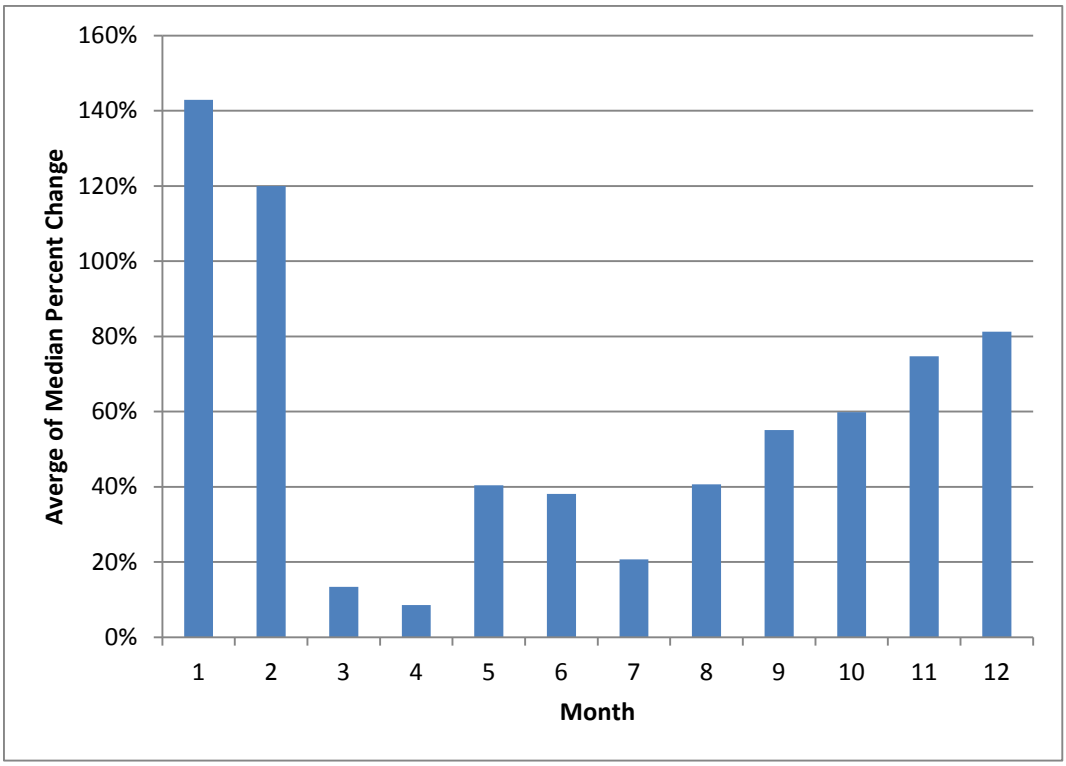

Figure 177. Average of Median Percent Change in Flow; NARCCAP Scenarios W1-W6 at all Stations, Minnesota River Basin (SWAT)

Susquehanna River Basin, HSPF Model
Results at Downstream Station

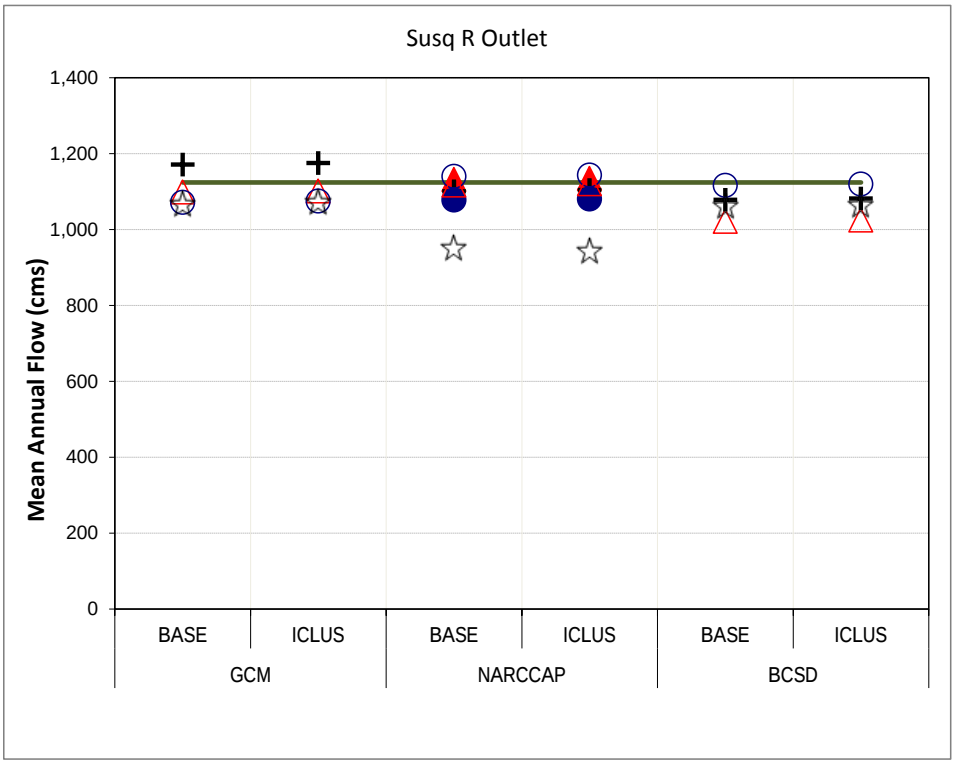

Figure 178. Mean Annual Flow, Susquehanna River Outlet (HSPF)

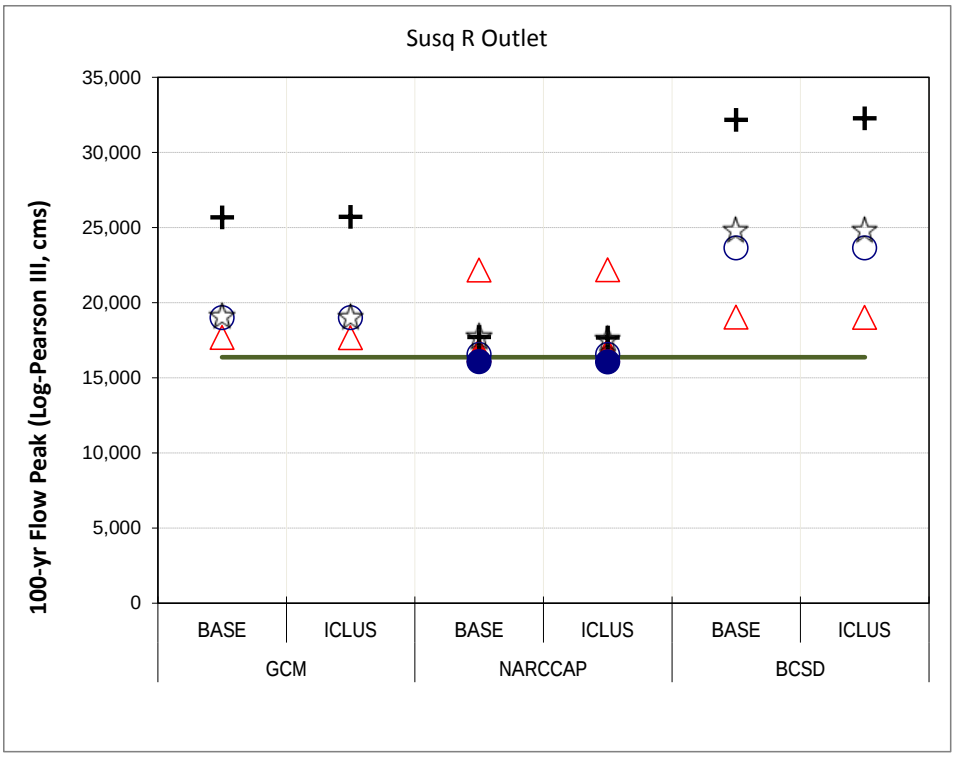

Figure 179. 100-yr Flow Peak, Susquehanna River Outlet (HSPF)

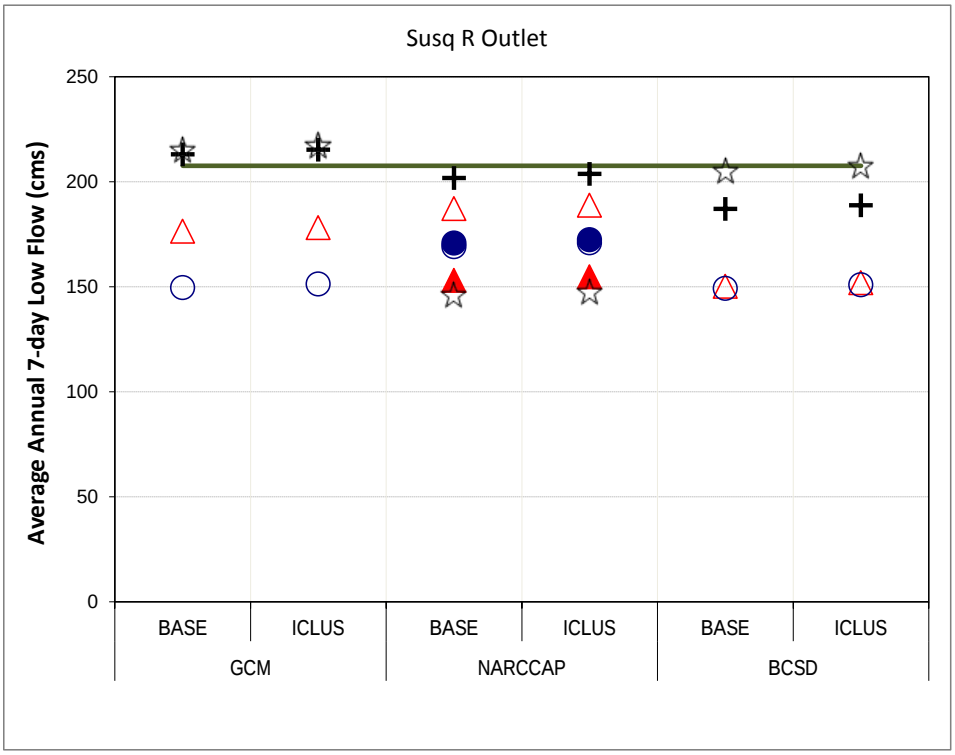

Figure 180. Average Annual 7-day Low Flow, Susquehanna River Outlet (HSPF)

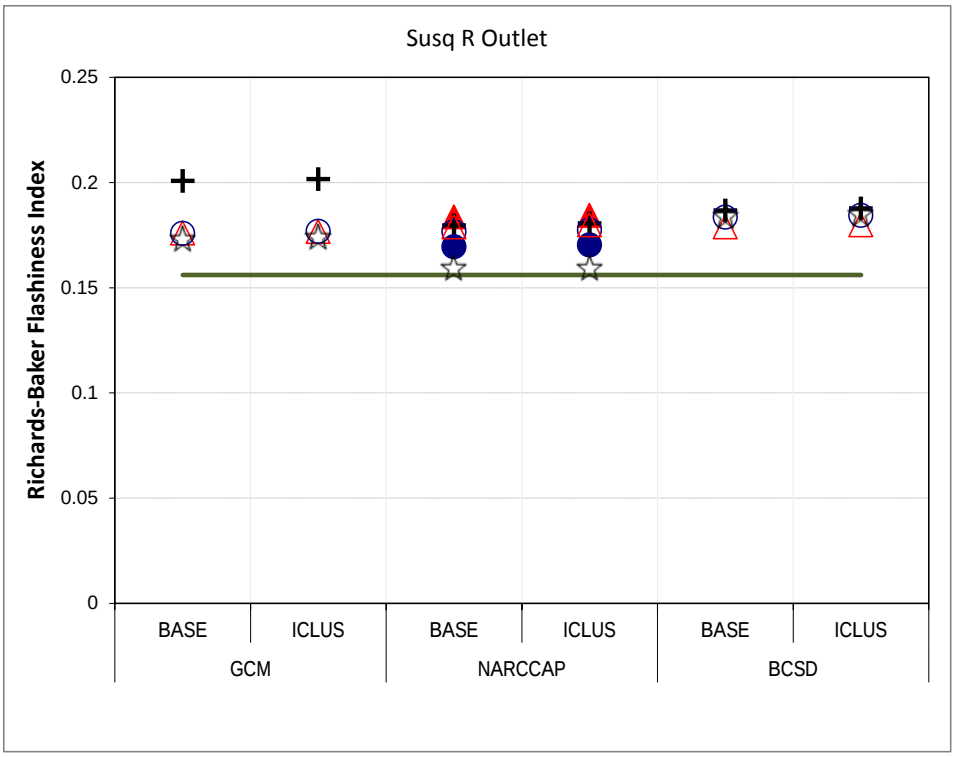

Figure 181. Richards-Baker Flashiness Index, Susquehanna River Outlet (HSPF)

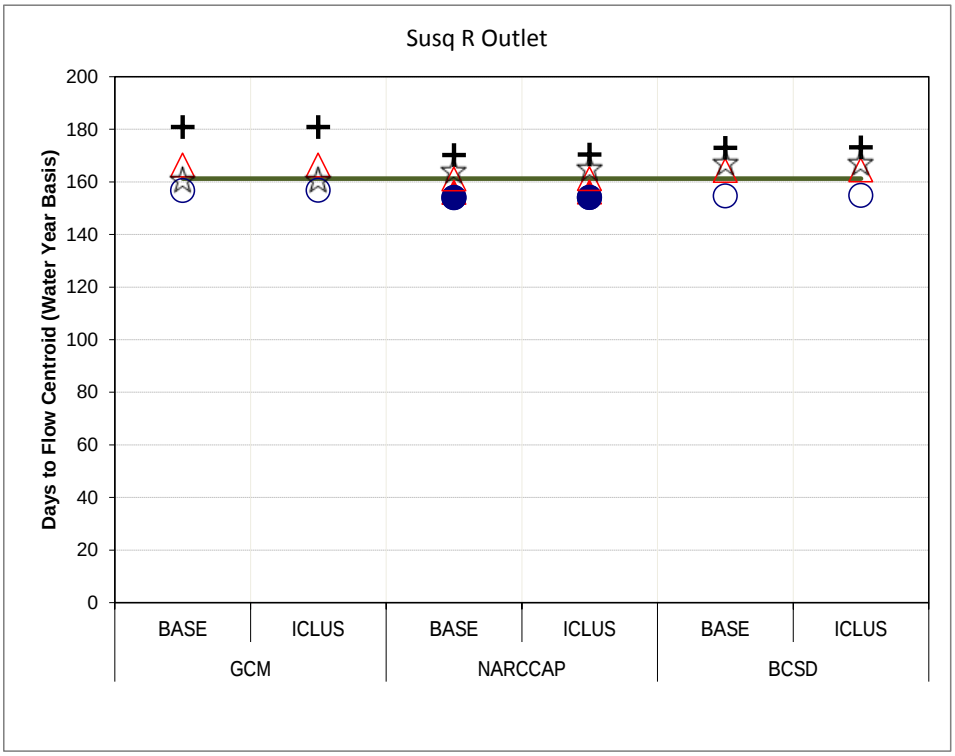

Figure 182. Days to Flow Centroid, Susquehanna River Outlet (HSPF)

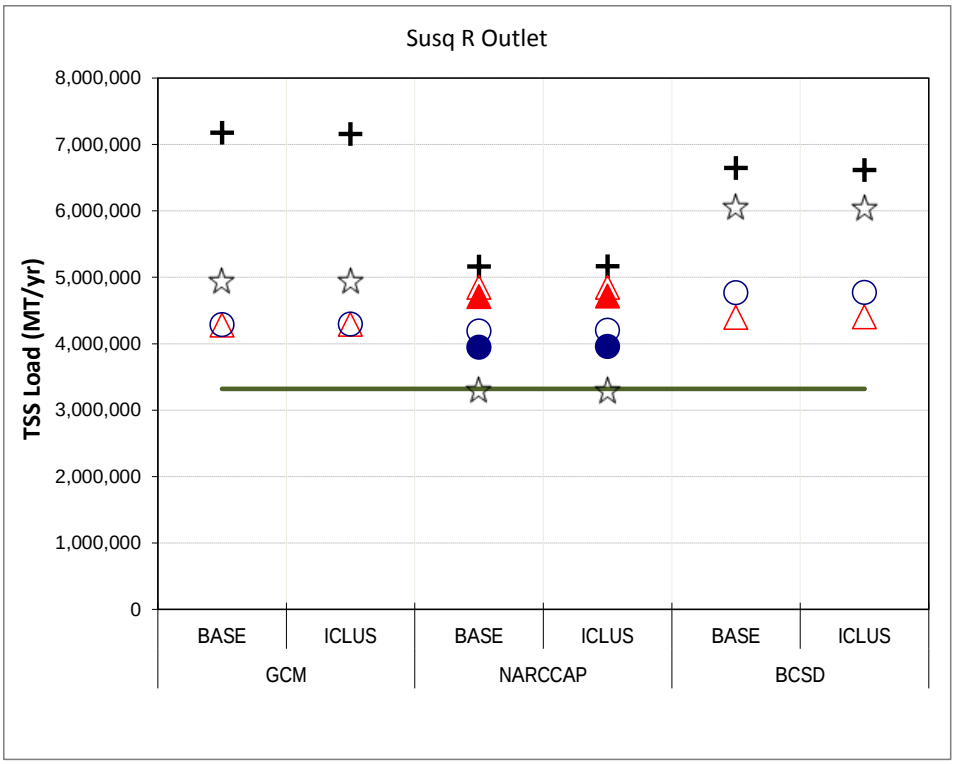

Figure 183. TSS Load, Susquehanna River Outlet (HSPF)

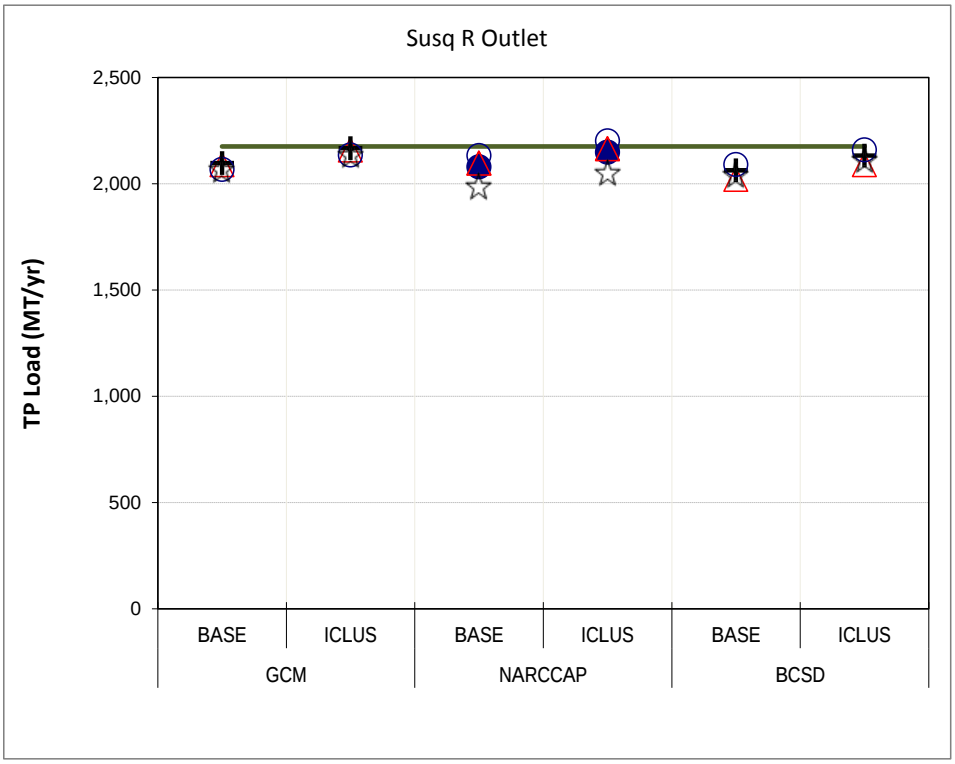

Figure 184. TP Load, Susquehanna River Outlet (HSPF)

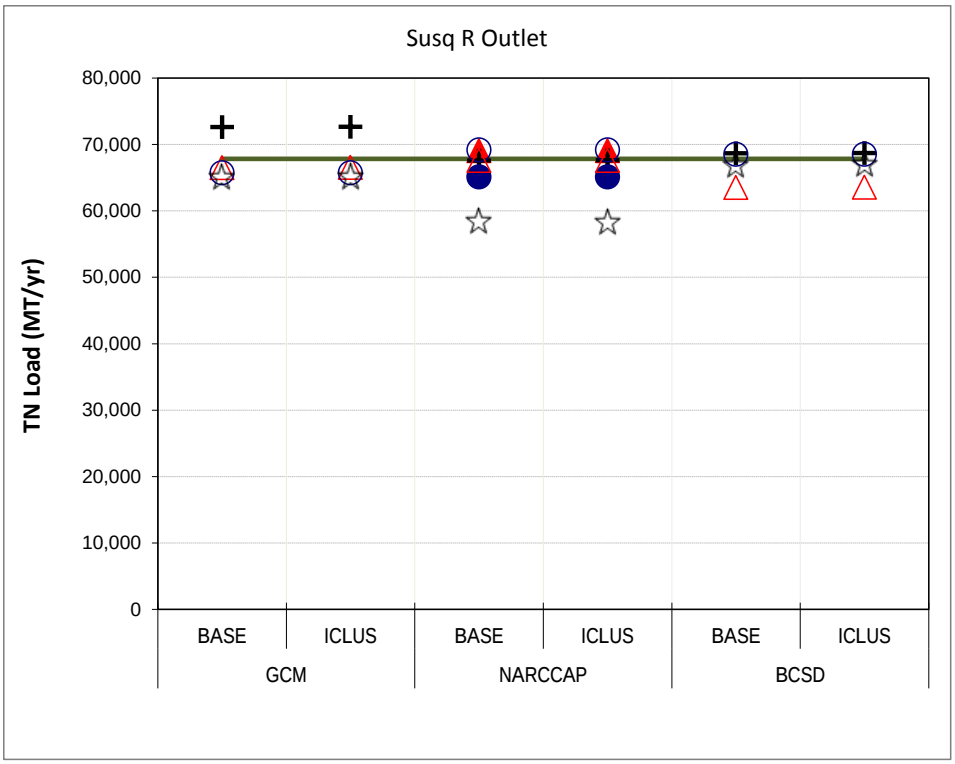

Figure 185. TN Load, Susquehanna River Outlet (HSPF)

Results at Multiple Stations

Table 7. Summary of Range of Change Relative to Existing Conditions for NARCCAP Dynamically Downscaled Scenarios, Susquehanna River Basin HSPF Model

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Raystown Branch Juniata River at Saxton (gage 01562000)								
Flow	-17.99%	-3.61%	-1.61%	14.36%	-17.99%	-3.61%	-1.61%	14.36%
TSS	-17.18%	42.95%	45.51%	115.70 %	-17.18%	42.95%	45.51%	115.70 %
TN	-17.45%	-2.53%	-0.70%	16.09%	-17.45%	-2.53%	-0.70%	16.09%
TP	-13.26%	-6.66%	-6.21%	2.03%	-13.26%	-6.66%	-6.21%	2.03%
WB Susquehanna River at Lewisberg								
Flow	-20.17%	-2.47%	-5.30%	0.18%	-20.14%	-2.45%	-5.29%	0.20%
TSS	-4.00%	28.43%	26.18%	44.79%	-4.02%	28.31%	26.08%	44.63%
TN	-15.17%	-0.43%	-3.23%	1.51%	-15.12%	-0.40%	-3.21%	1.51%
TP	-7.37%	-3.41%	-3.88%	-2.38%	-7.35%	-3.39%	-3.86%	-2.36%
Susquehanna River at Danville (gage 01540500)								
Flow	-14.40%	-1.67%	-3.58%	-0.50%	-14.40%	-1.67%	-3.58%	-0.50%
TSS	5.03%	30.55%	30.01%	57.81%	5.03%	30.55%	30.01%	57.81%
TN	-13.56%	-1.86%	-3.74%	-1.10%	-13.56%	-1.85%	-3.74%	-1.10%
TP	-7.90%	-4.19%	-4.77%	-3.53%	-7.90%	-4.19%	-4.77%	-3.53%
Susquehanna River at Marietta (gage 01576000)								
Flow	-15.39%	-1.56%	-3.51%	1.06%	-16.29%	-1.54%	-3.65%	1.06%
TSS	0.59%	33.94%	30.88%	53.97%	-0.32%	33.81%	30.60%	53.76%
TN	-13.82%	-0.79%	-2.74%	1.48%	-14.16%	-0.77%	-2.79%	1.47%
TP	-8.00%	-3.87%	-4.28%	-2.19%	-8.14%	-3.83%	-4.27%	-2.16%
Susquehanna River Outlet								
Flow	-15.14%	-1.35%	-3.33%	1.40%	-15.95%	-1.32%	-3.44%	1.41%
TSS	0.15%	33.95%	31.38%	55.42%	-0.62%	33.68%	30.94%	54.89%
TN	-13.43%	-0.36%	-2.39%	1.99%	-13.71%	-0.33%	-2.44%	1.96%
TP	-8.39%	-3.98%	-4.40%	-2.02%	-8.41%	-3.87%	-4.33%	-1.96%

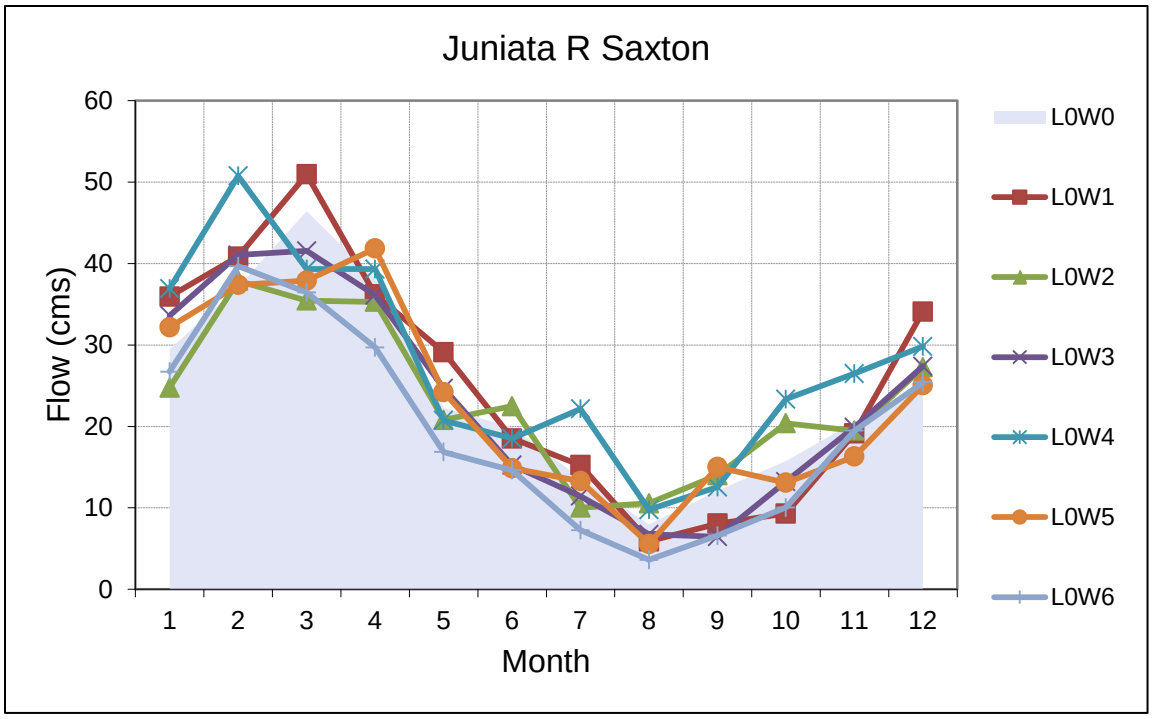

Figure 186. Monthly Average Flow, Raystown Branch Juniata River at Saxton (HSPF)

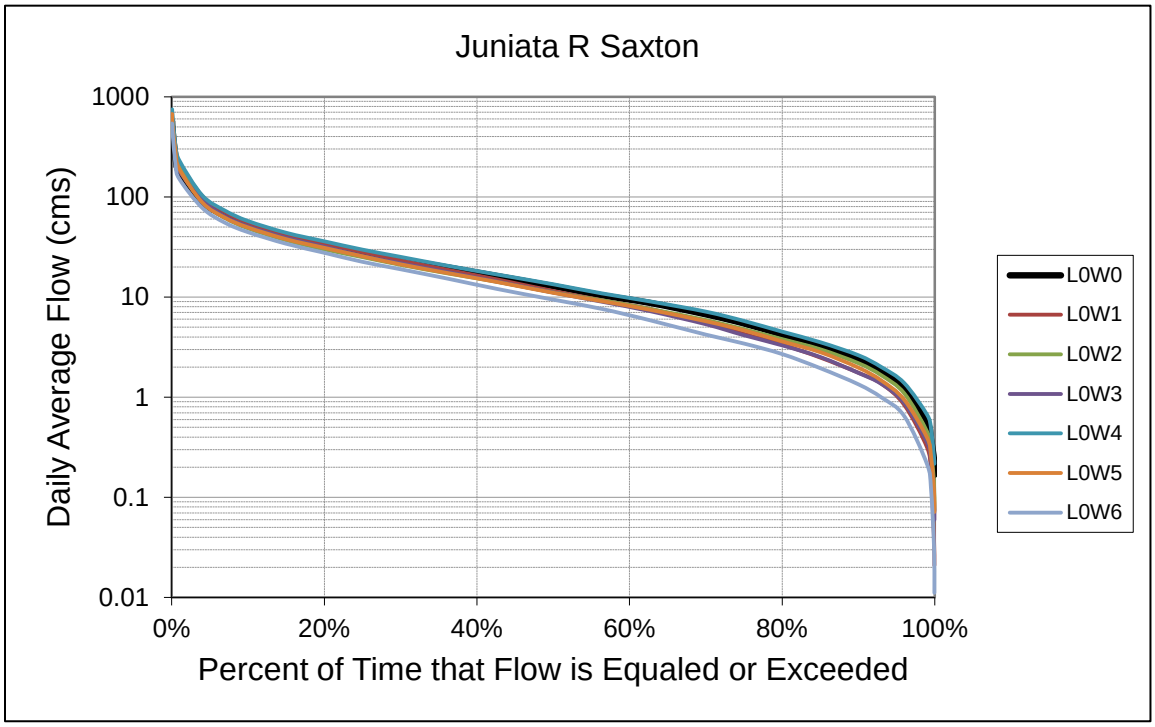

Figure 187. Flow Duration, Raystown Branch Juniata River at Saxton (HSPF)

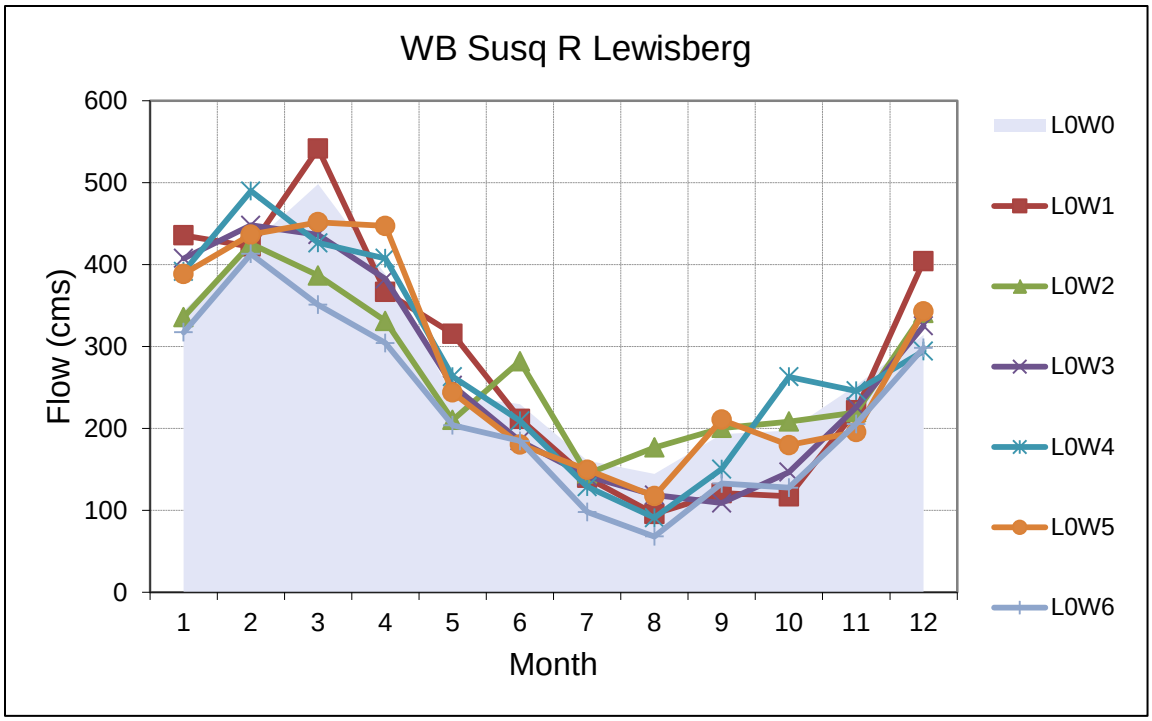

Figure 188. Monthly Average Flow, West Branch Susquehanna River at Lewisberg (HSPF)

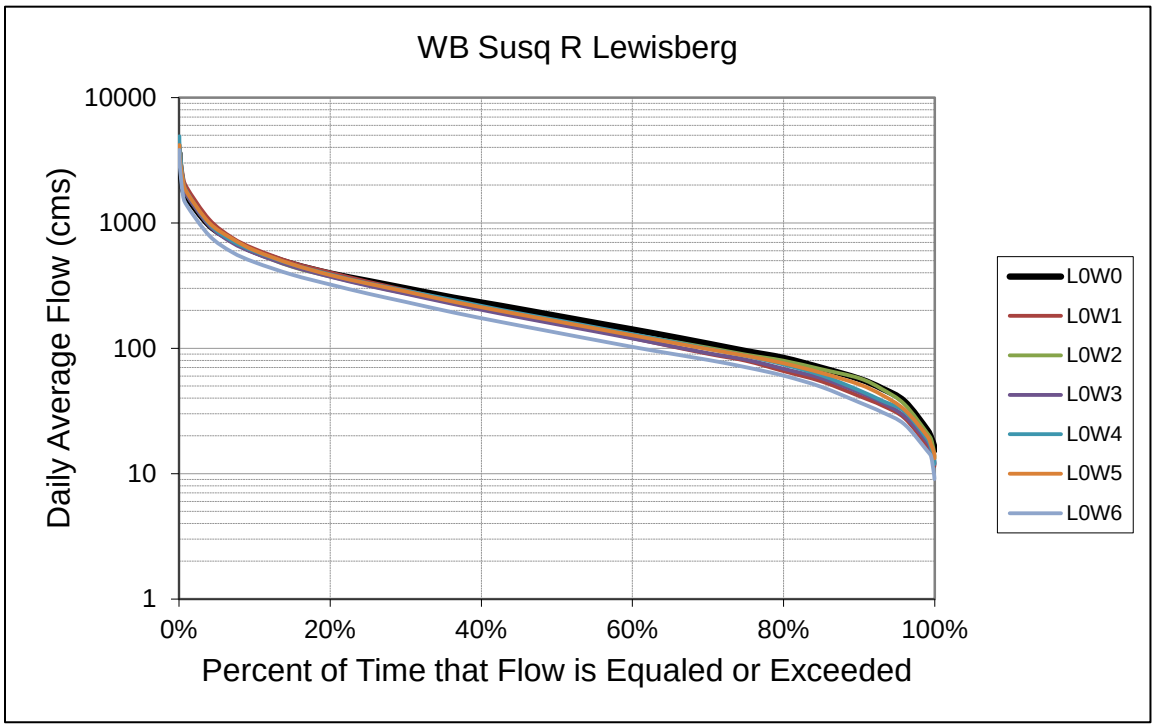

Figure 189. Flow Duration, West Branch Susquehanna River at Lewisberg (HSPF)

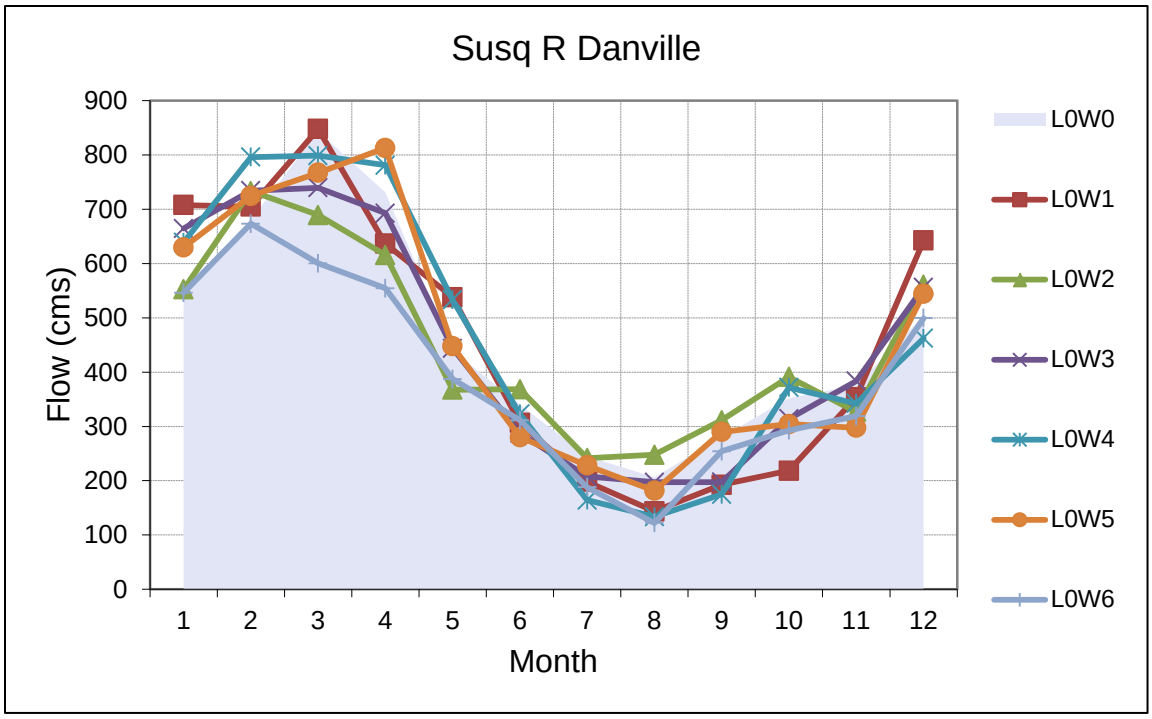

Figure 190. Monthly Average Flow, Susquehanna River at Danville (HSPF)

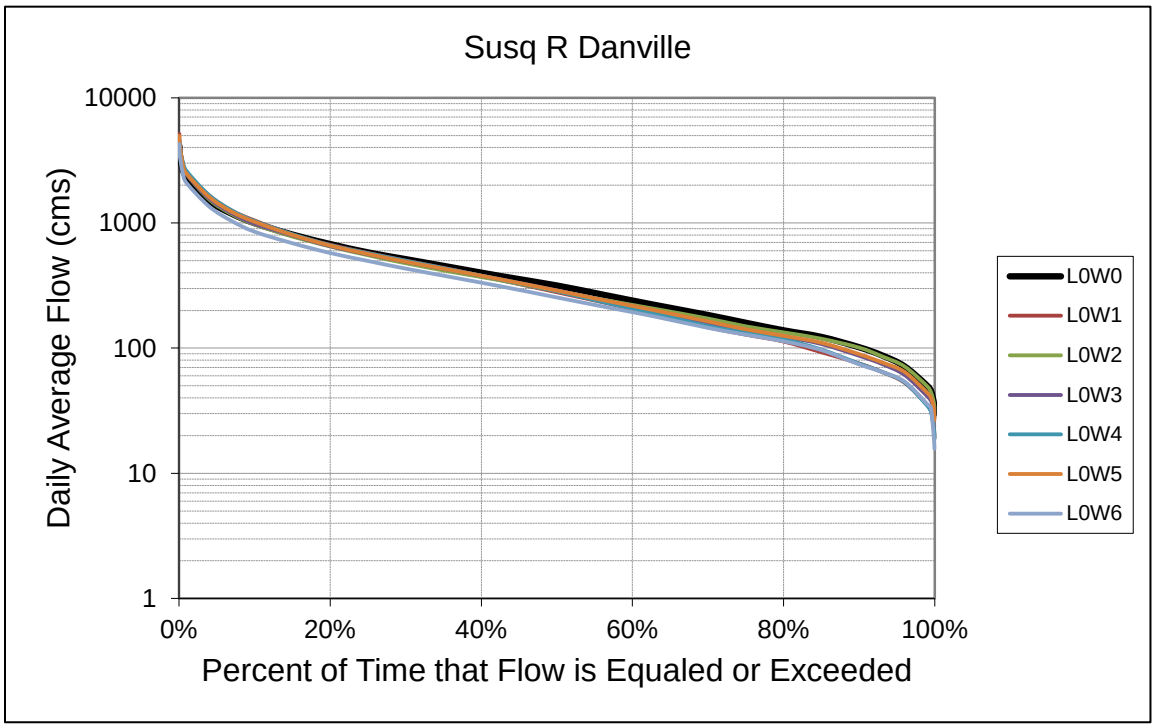

Figure 191. Flow Duration, Susquehanna River at Danville (HSPF)

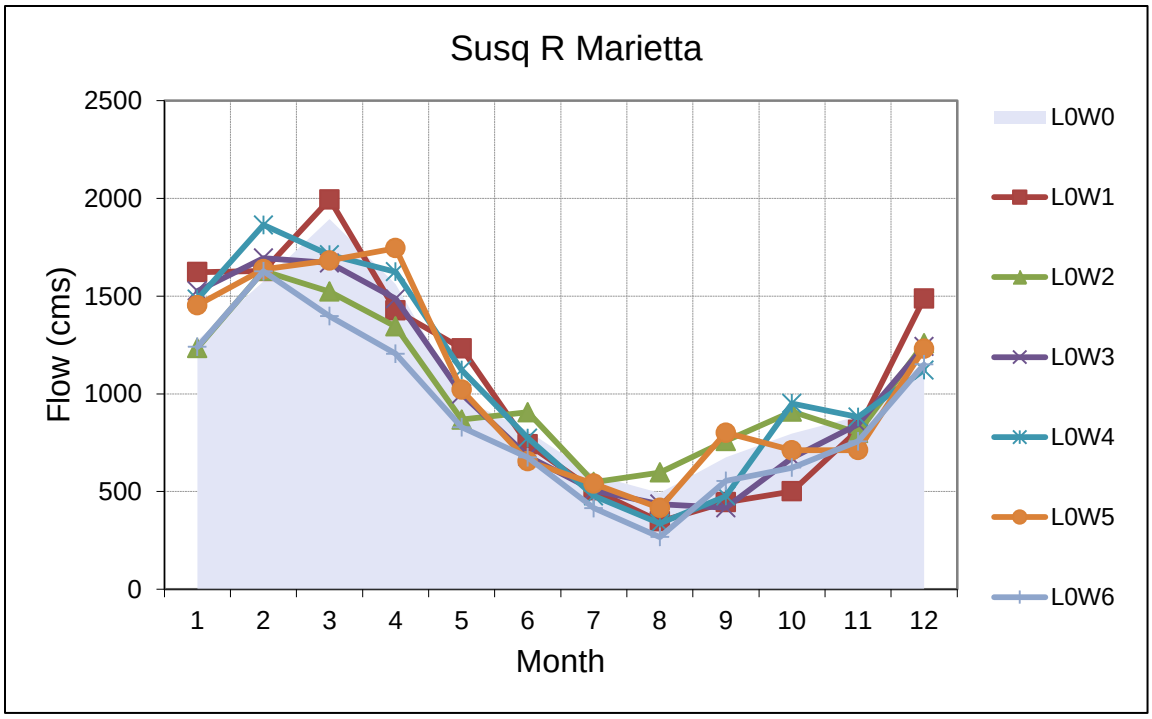

Figure 192. Monthly Average Flow, Susquehanna River at Marietta (HSPF)

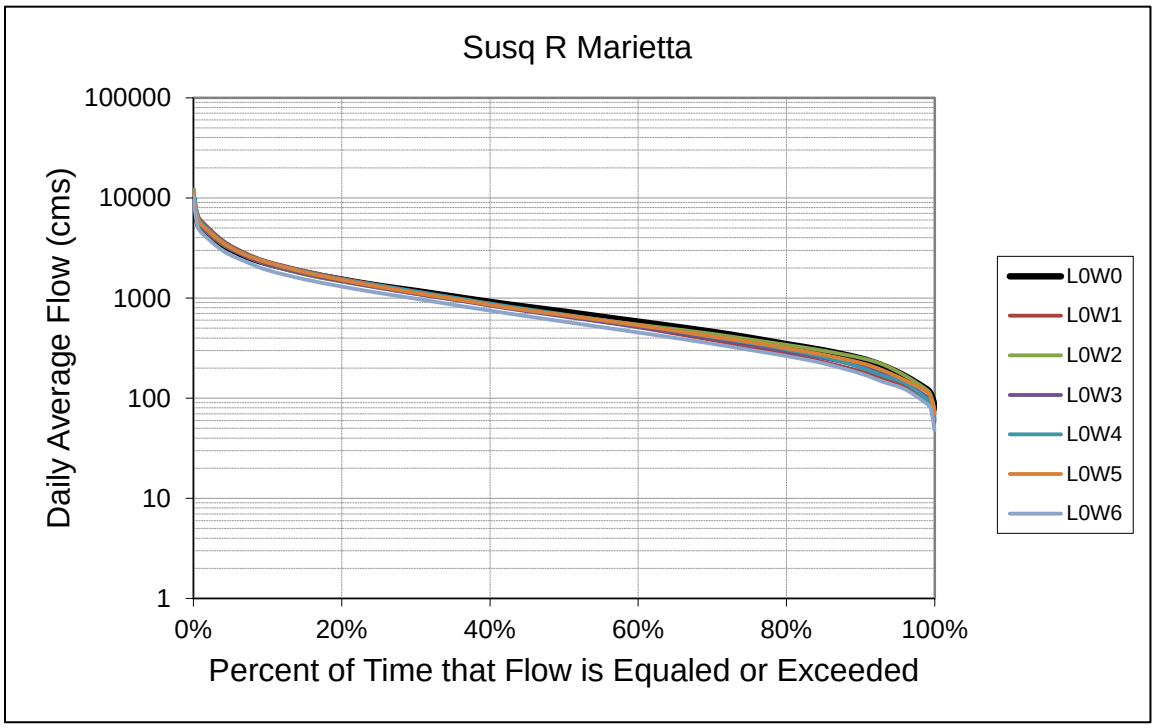

Figure 193. Flow Duration, Susquehanna River at Marietta (HSPF)

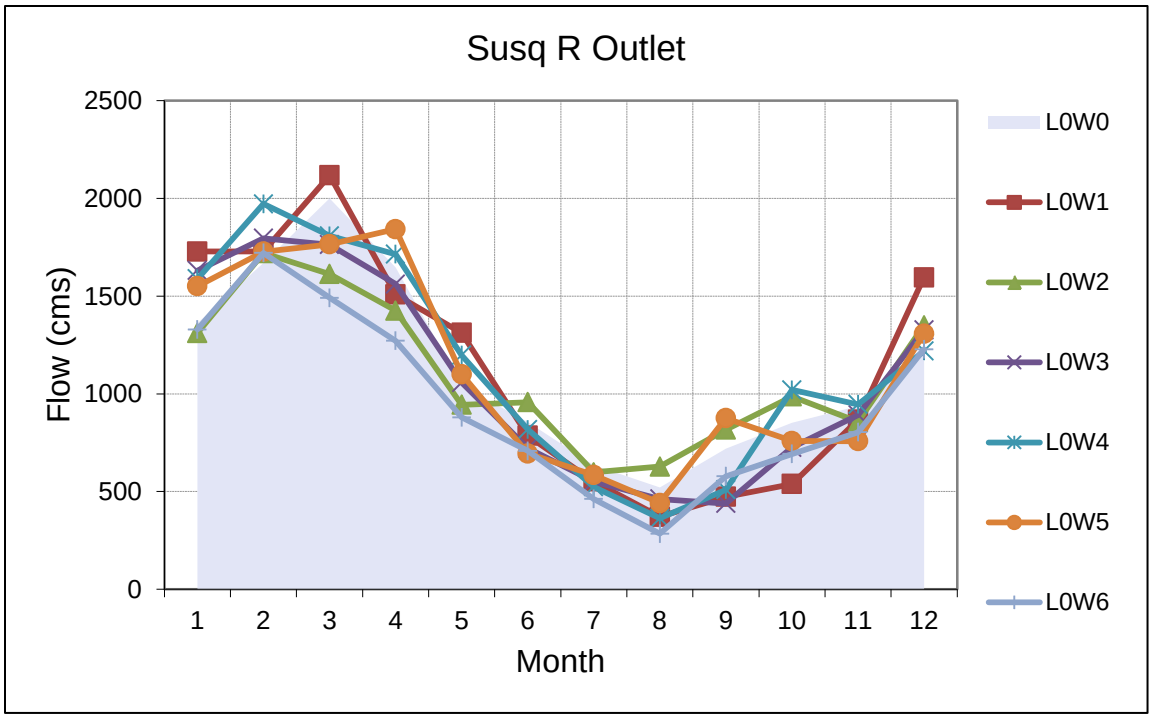

Figure 194. Monthly Average Flow, Susquehanna River at Outlet (HSPF)

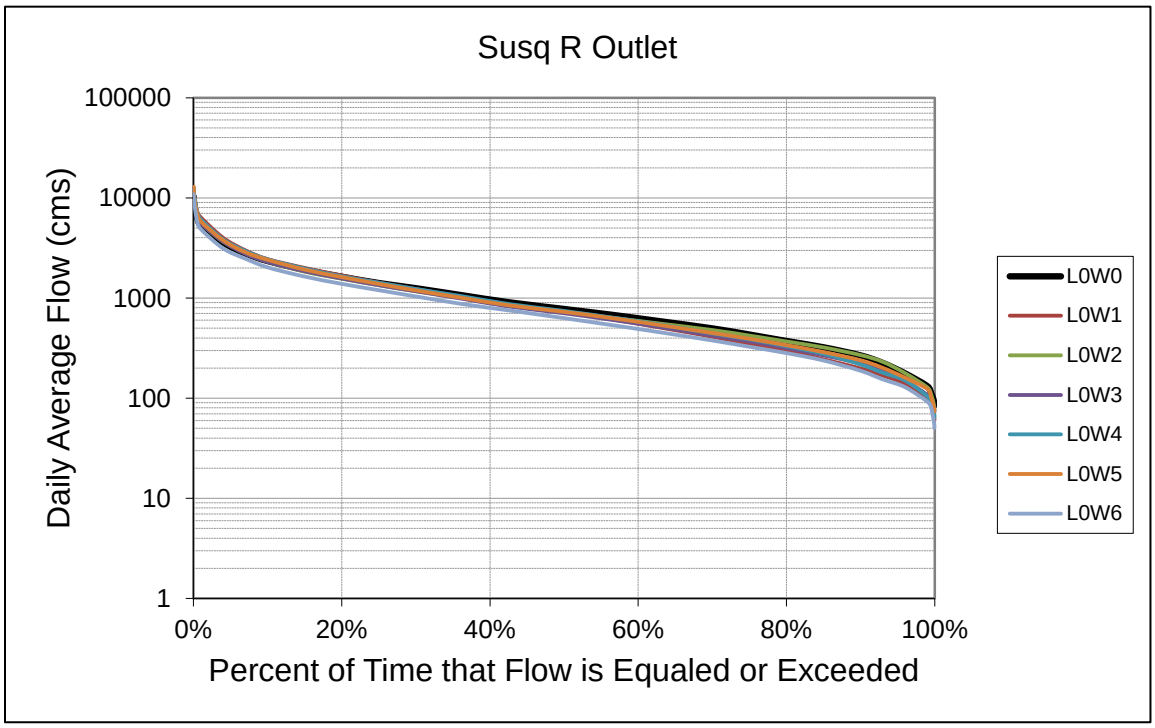

Figure 195. Flow Duration, Susquehanna River at Outlet (HSPF)

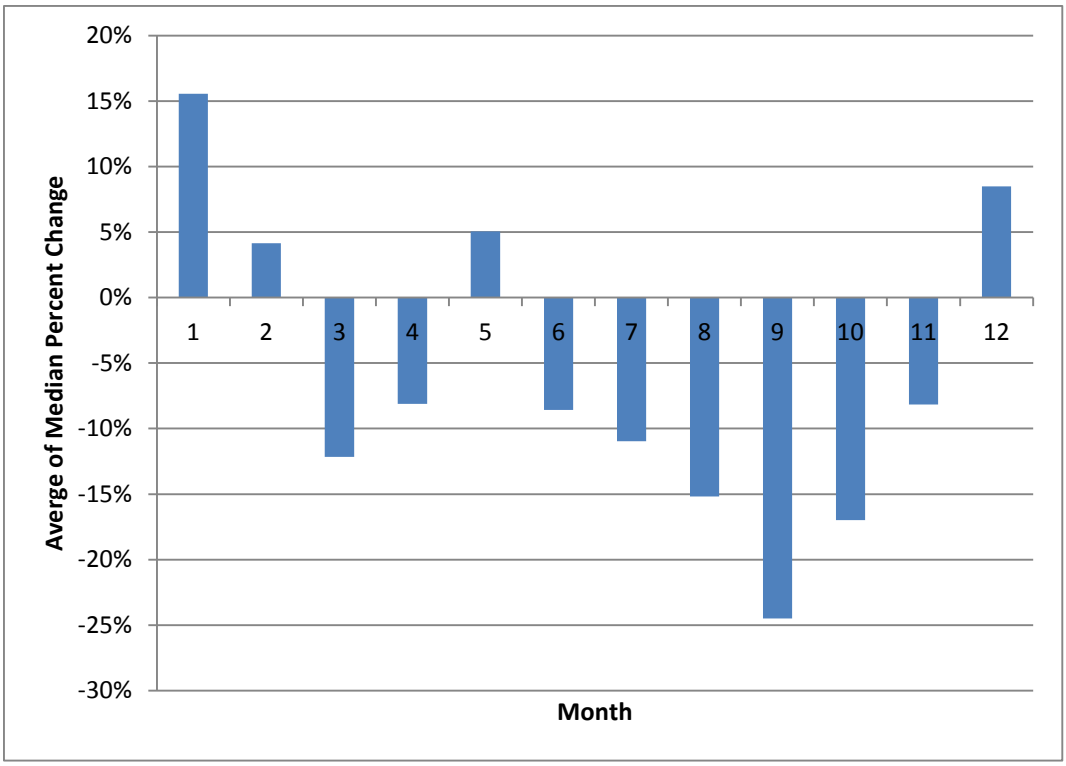

Figure 196. Average of Median Percent Change in Flow; NARCCAP Scenarios W1-W6 at all Stations, Susquehanna River Basin (HSPF)

Susquehanna River Basin, SWAT Model
Results at Downstream Station

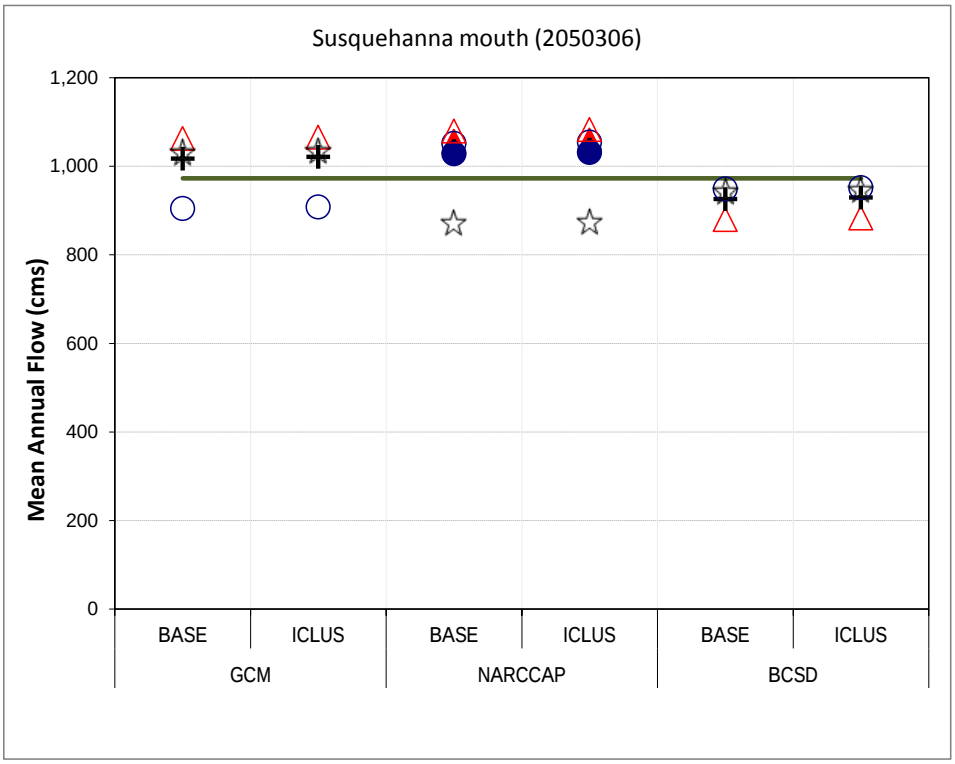

Figure 197. Mean Annual Flow, Susquehanna River Mouth (SWAT)

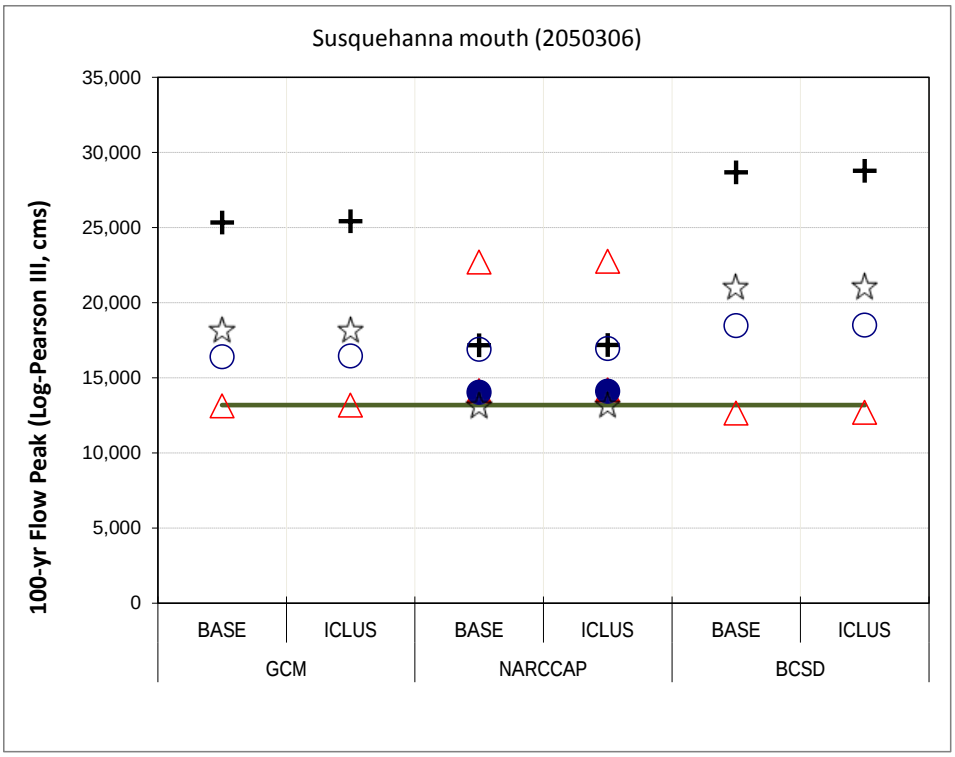

Figure 198. 100-yr Flow Peak, Susquehanna River Mouth (SWAT)

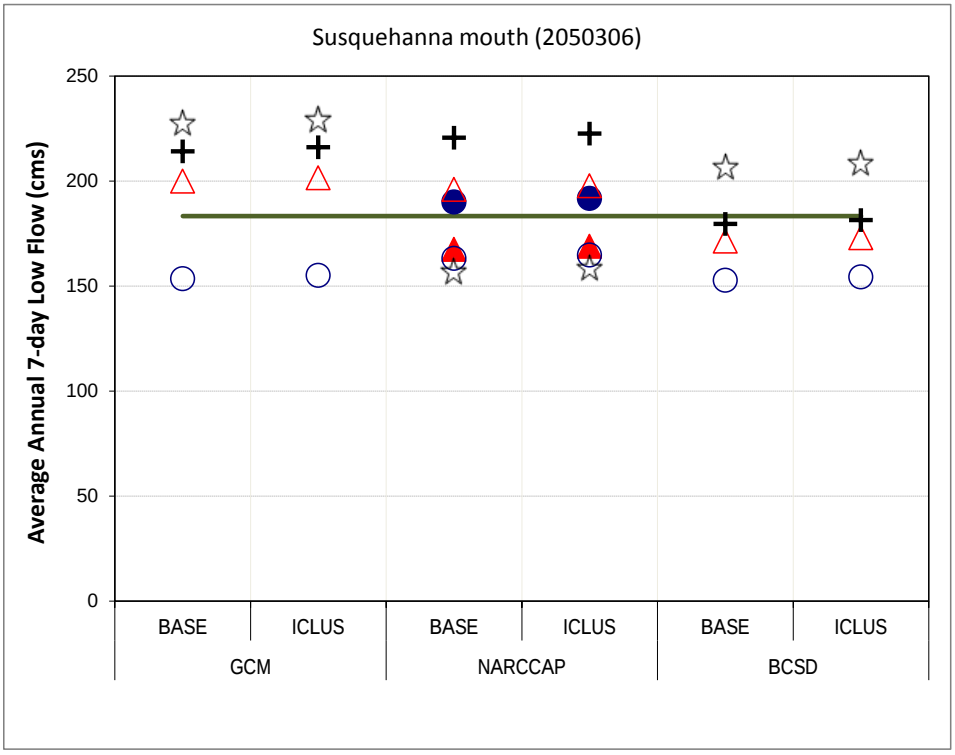

Figure 199. Average Annual 7-day Low Flow, Susquehanna River Mouth (SWAT)

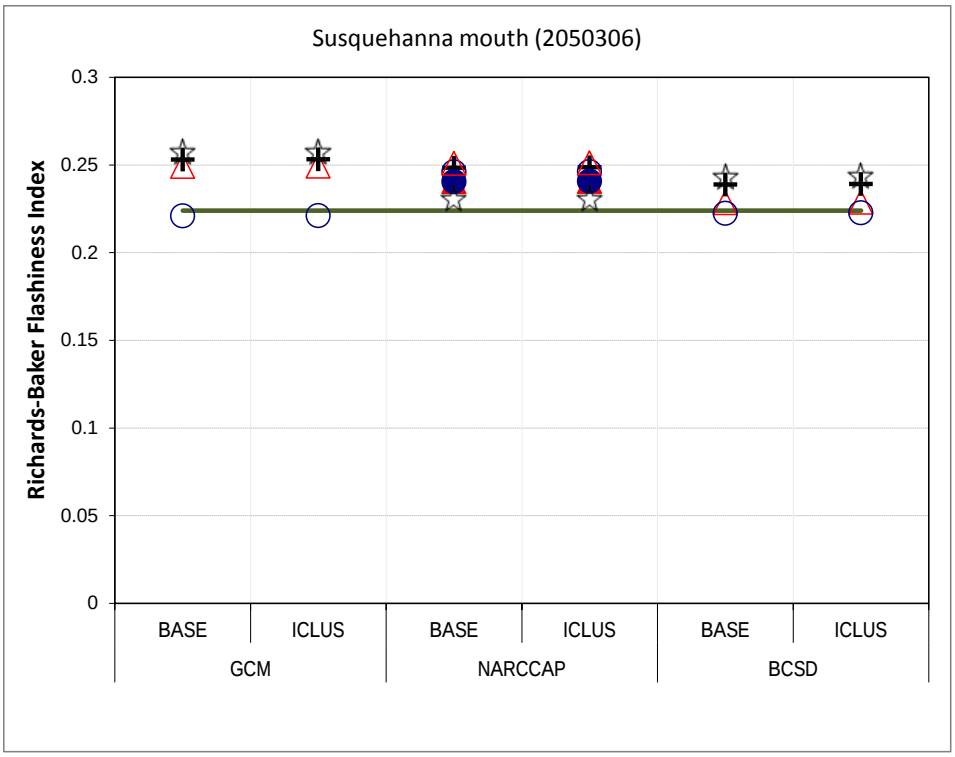

Figure 200. Richards-Baker Flashiness Index, Susquehanna River Mouth (SWAT)

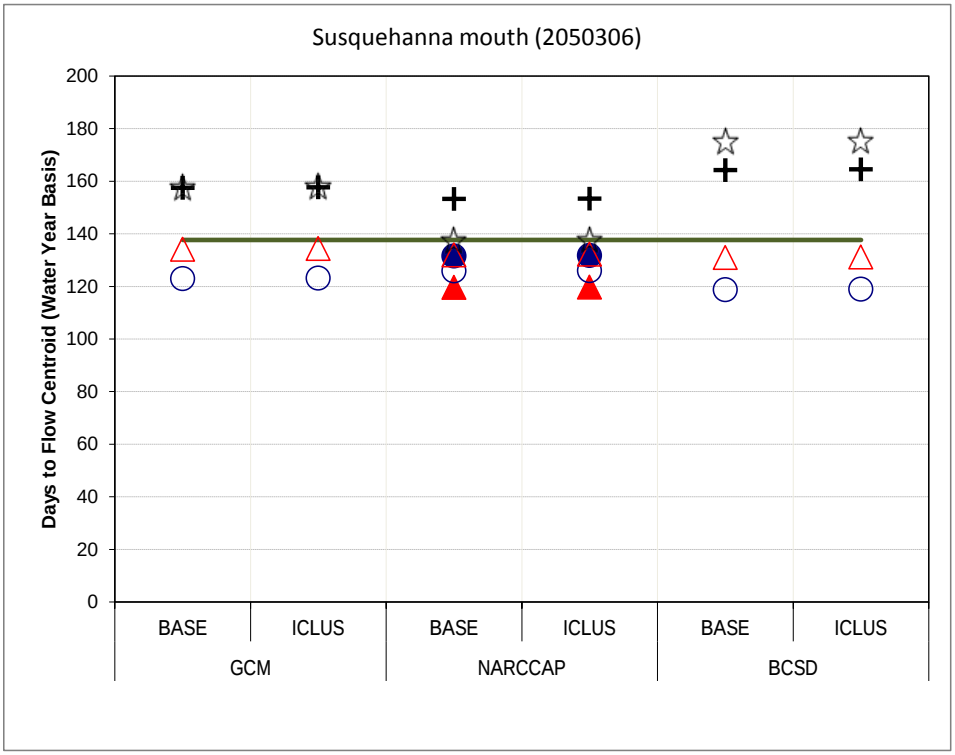

Figure 201. Days to Flow Centroid, Susquehanna River Mouth (SWAT)

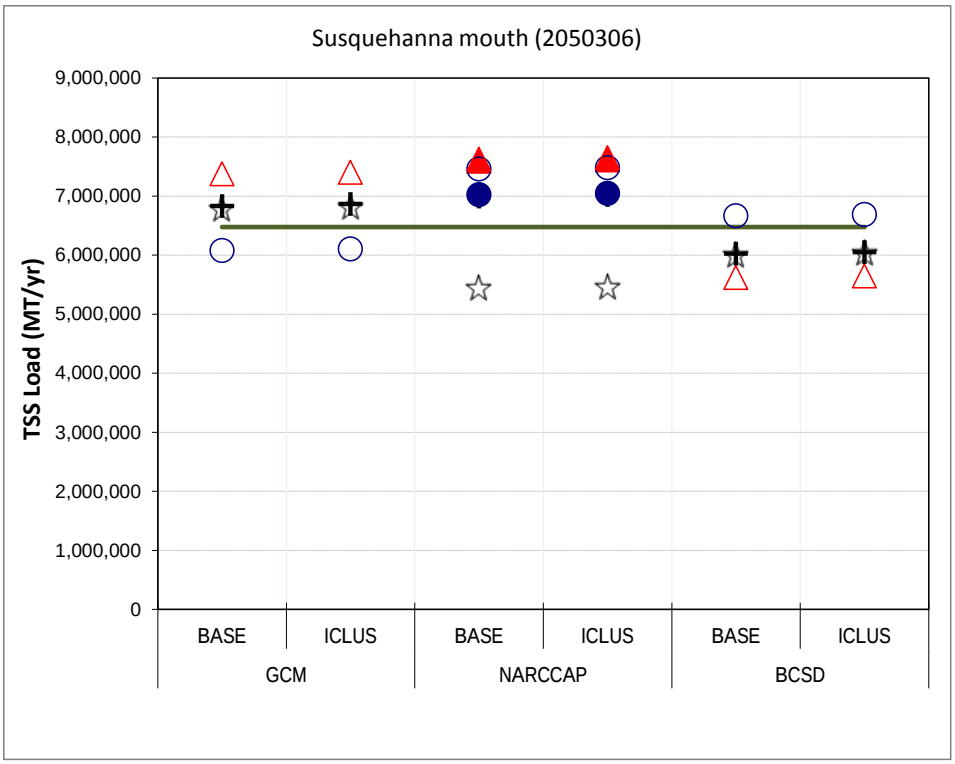

Figure 202. TSS Load, Susquehanna River Mouth (SWAT)

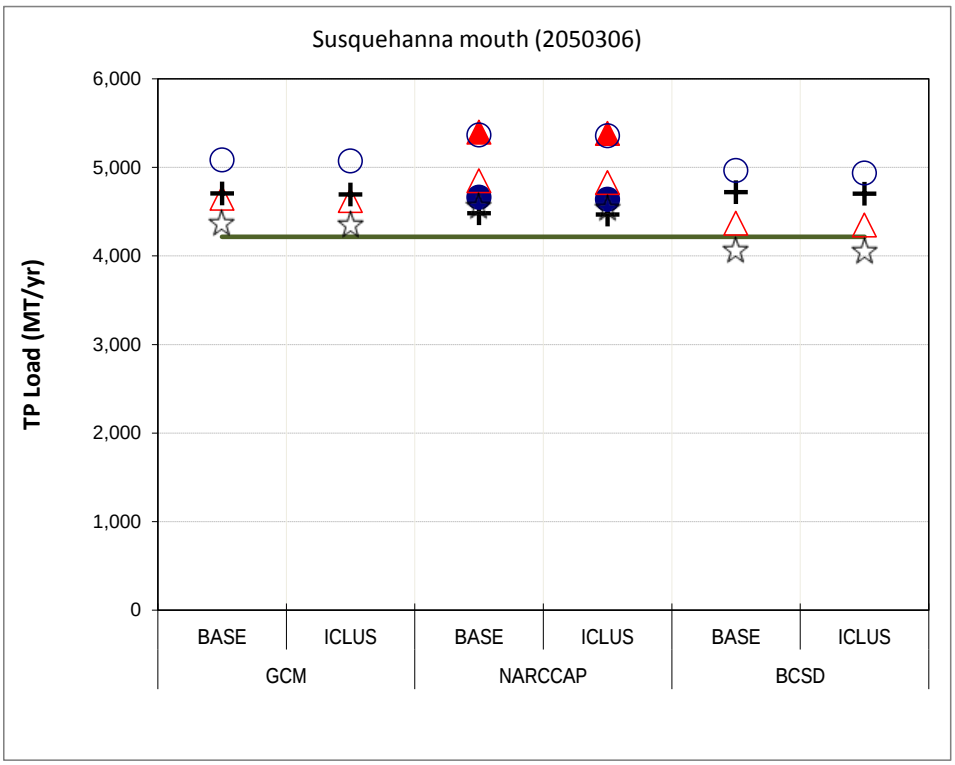

Figure 203. TP Load, Susquehanna River Mouth (SWAT)

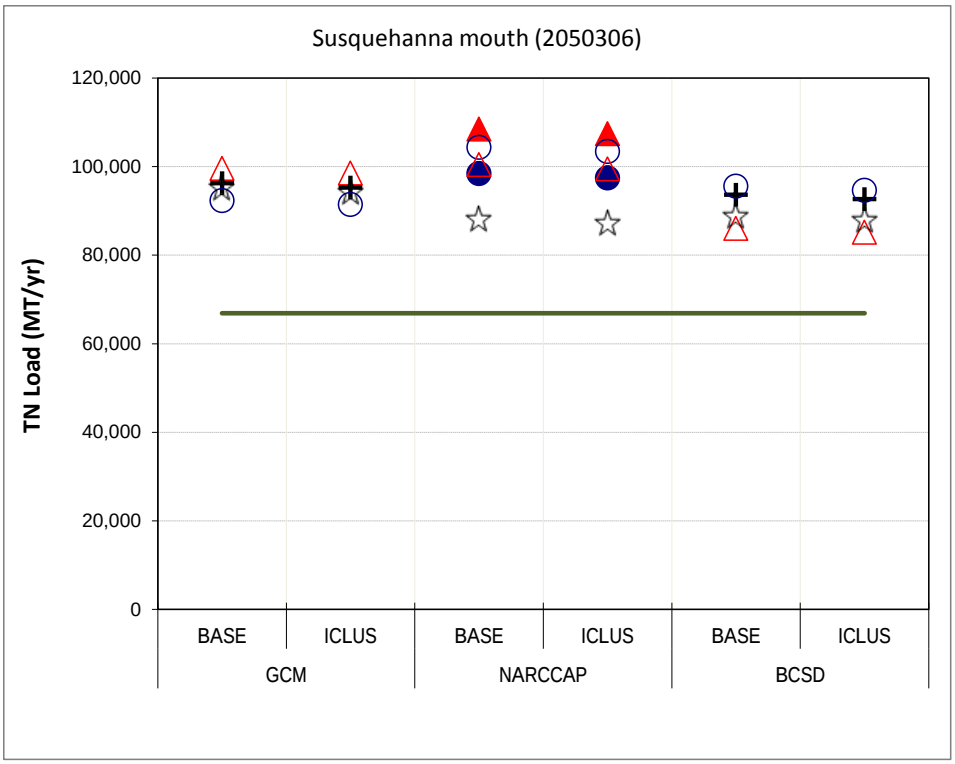

Figure 204. TN Load, Susquehanna River Mouth (SWAT)

Results at Multiple Stations

Table 8. Summary of Range of Change Relative to Existing Conditions for NARCCAP Dynamically Downscaled Scenarios, Susquehanna River Basin (SWAT)

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Upper Susquehanna HUC 02050101								
Flow	-2.93%	12.56%	10.45%	15.50%	-2.93%	12.56%	10.45%	15.50%
TSS	-5.62%	18.17%	14.02%	21.68%	-5.62%	18.17%	14.02%	21.67%
TN	45.88%	75.36%	76.83%	99.64%	45.88%	75.36%	76.83%	99.64%
TP	3.04%	27.68%	27.36%	59.62%	3.05%	27.69%	27.37%	59.64%
Chenango HUC 02050102								
Flow	-1.33%	13.06%	10.39%	16.13%	-1.32%	13.06%	10.39%	16.13%
TSS	-6.39%	15.86%	13.94%	24.18%	-6.42%	15.82%	13.90%	24.14%
TN	32.00%	48.75%	51.04%	68.74%	31.98%	48.73%	51.02%	68.71%
TP	6.83%	14.34%	12.96%	16.77%	6.78%	14.30%	12.92%	16.72%
Owego-Wappasening HUC 02050103								
Flow	-2.16%	12.58%	10.35%	16.13%	-2.16%	12.58%	10.35%	16.13%
TSS	-8.14%	17.35%	13.91%	25.19%	-8.13%	17.36%	13.91%	25.20%
TN	39.16%	61.49%	63.16%	82.59%	39.15%	61.46%	63.13%	82.56%
TP	1.55%	14.40%	13.10%	24.10%	1.53%	14.36%	13.07%	24.07%
Tioga HUC 02050104								
Flow	-5.57%	12.57%	10.25%	16.43%	-5.57%	12.57%	10.25%	16.43%
TSS	-9.02%	17.47%	14.23%	25.28%	-9.02%	17.48%	14.23%	25.28%
TN	21.38%	42.38%	39.90%	52.61%	21.37%	42.37%	39.90%	52.60%
TP	-6.17%	10.06%	7.86%	13.87%	-6.17%	10.05%	7.85%	13.87%
Chemung HUC 02050105								
Flow	-4.38%	12.63%	10.18%	19.43%	-4.38%	12.63%	10.18%	19.43%
TSS	-12.77%	19.73%	18.69%	44.35%	-12.77%	19.73%	18.69%	44.35%
TN	28.01%	49.52%	46.02%	57.58%	28.01%	49.52%	46.02%	57.58%
TP	-1.02%	13.10%	12.22%	20.53%	-1.02%	13.10%	12.22%	20.53%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Upper Susquehanna - Lackawanna HUC 02050107								
Flow	-5.85%	8.79%	7.24%	14.08%	-5.85%	8.79%	7.24%	14.08%
TSS	-10.13%	17.56%	13.91%	24.94%	-10.13%	17.56%	13.91%	24.95%
TN	25.64%	44.63%	43.97%	58.47%	25.64%	44.62%	43.96%	58.46%
TP	3.34%	14.91%	13.94%	20.04%	3.33%	14.90%	13.93%	20.03%
Upper West Branch Susquehanna HUC 02050201								
Flow	-23.80%	-2.72%	-4.76%	2.53%	-23.81%	-2.73%	-4.77%	2.52%
TSS	4.05%	63.07%	57.82%	82.45%	4.02%	63.02%	57.77%	82.39%
TN	67.29%	94.34%	90.48%	99.00%	67.27%	94.17%	90.42%	99.04%
TP	33.51%	45.30%	44.90%	57.08%	33.74%	45.08%	44.99%	57.26%
Sinnemahoning HUC 02050202								
Flow	-14.29%	5.33%	3.08%	9.54%	-14.29%	5.33%	3.08%	9.54%
TSS	-14.32%	17.04%	14.25%	26.19%	-14.32%	17.04%	14.25%	26.19%
TN	36.24%	62.62%	62.69%	84.45%	36.15%	62.48%	62.56%	84.28%
TP	-4.98%	23.38%	22.14%	44.63%	-5.09%	23.17%	21.94%	44.37%
Pine HUC 02050205								
Flow	-8.36%	9.77%	6.66%	11.67%	-8.36%	9.77%	6.66%	11.67%
TSS	-10.51%	16.48%	12.22%	20.93%	-10.51%	16.48%	12.22%	20.93%
TN	-2.43%	23.34%	22.34%	37.97%	-2.43%	23.31%	22.32%	37.95%
TP	-24.19%	9.79%	5.12%	22.56%	-24.13%	9.77%	5.11%	22.53%
Lower West Branch Susquehanna HUC 02050206								
Flow	-14.99%	3.29%	0.92%	7.08%	-14.94%	3.32%	0.95%	7.11%
TSS	-20.99%	3.46%	0.98%	9.63%	-20.89%	3.57%	1.09%	9.73%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
TN	20.95%	38.10%	37.14%	48.13%	20.71%	37.79%	36.90%	47.89%
TP	5.23%	19.50%	25.19%	46.70%	4.95%	19.21%	25.15%	47.18%
Lower Susquehanna - Penns HUC 02050301								
Flow	-9.65%	6.11%	4.62%	11.36%	-9.64%	6.12%	4.63%	11.37%
TSS	-16.11%	11.76%	8.58%	19.88%	-16.10%	11.77%	8.58%	19.89%
TN	25.20%	42.75%	42.26%	55.42%	25.13%	42.68%	42.20%	55.35%
TP	7.40%	14.40%	18.75%	32.05%	7.24%	14.23%	18.66%	32.22%
Raystown HUC 02050303								
Flow	-14.94%	9.00%	7.75%	25.79%	-14.94%	9.00%	7.75%	25.79%
TSS	-16.49%	32.88%	34.95%	82.05%	-16.49%	32.88%	34.95%	82.05%
TN	57.89%	80.61%	84.77%	110.76%	57.90%	80.62%	84.78%	110.78%
TP	-1.88%	21.52%	25.52%	47.14%	-1.86%	21.55%	25.55%	47.19%
Lower Juniata HUC 02050304								
Flow	-10.44%	10.01%	7.44%	14.53%	-10.43%	10.02%	7.44%	14.53%
TSS	-11.79%	17.24%	13.86%	24.60%	-11.78%	17.29%	13.89%	24.64%
TN	41.30%	55.01%	57.70%	76.08%	41.29%	55.01%	57.69%	76.09%
TP	-2.88%	5.01%	5.03%	14.45%	-2.90%	5.02%	5.03%	14.45%
Susquehanna mouth HUC 02050306								
Flow	-10.08%	7.19%	4.92%	10.98%	-9.97%	7.27%	5.00%	11.04%
TSS	-15.67%	11.82%	8.49%	17.75%	-15.55%	11.90%	8.59%	17.84%
TN	32.30%	48.76%	49.18%	62.17%	32.07%	48.51%	48.96%	61.94%
TP	6.27%	12.74%	15.92%	27.94%	6.28%	12.63%	15.92%	28.09%
Susquehanna River at Marietta (gage 01576000)								
Flow	-9.97%	6.97%	4.96%	11.18%	-9.94%	6.99%	4.98%	11.19%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
TSS	-15.13%	12.16%	8.77%	18.47%	-15.12%	12.12%	8.74%	18.43%
TN	29.75%	46.51%	46.61%	59.51%	29.62%	46.37%	46.49%	59.40%
TP	6.04%	12.82%	16.08%	28.35%	5.91%	12.68%	16.02%	28.45%

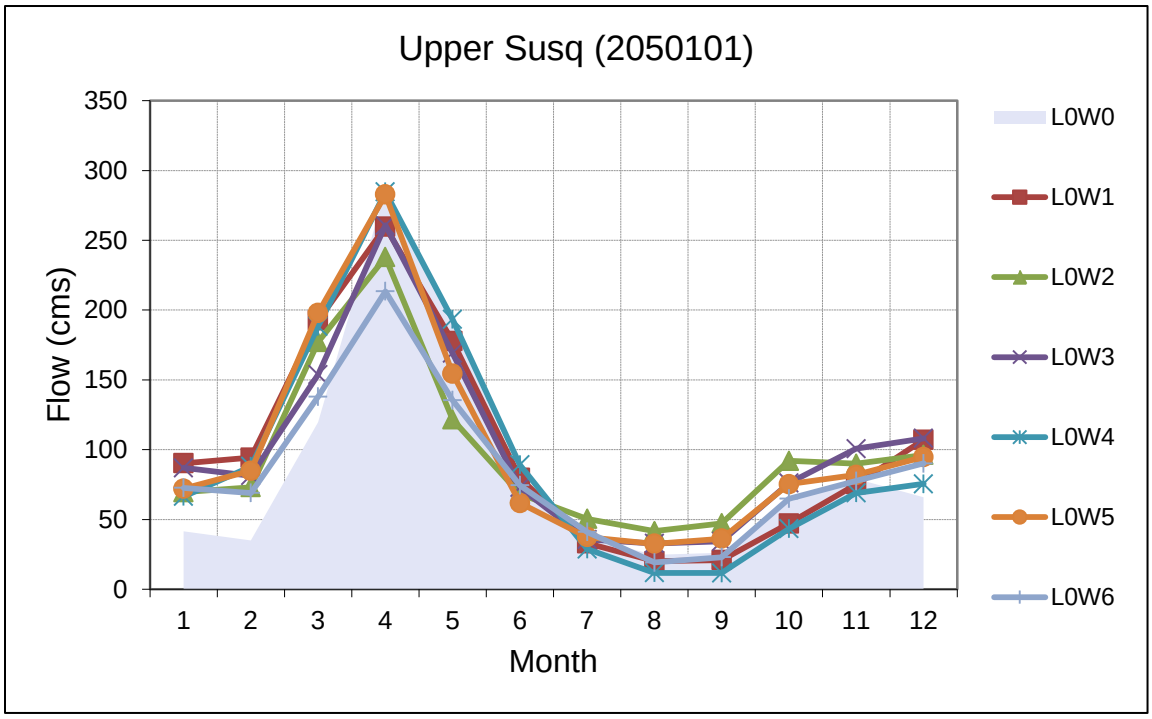

Figure 205. Monthly Average Flows, Upper Susquehanna River (SWAT)

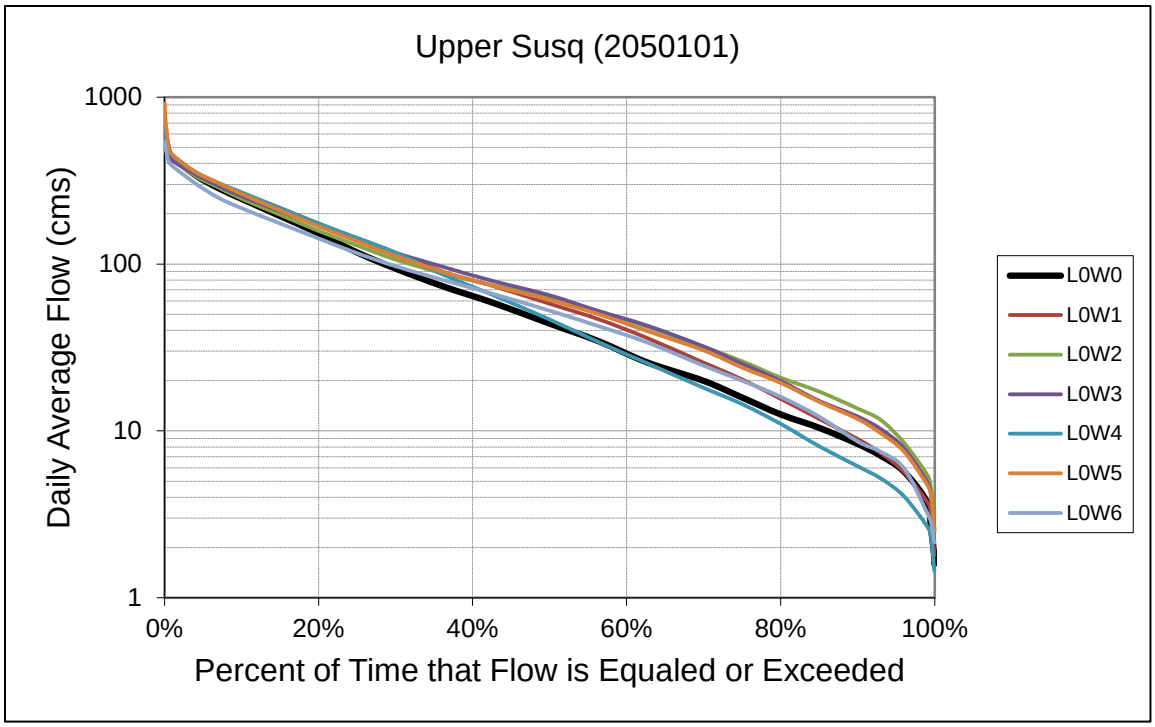

Figure 206. Flow Duration, Upper Susquehanna River (SWAT)

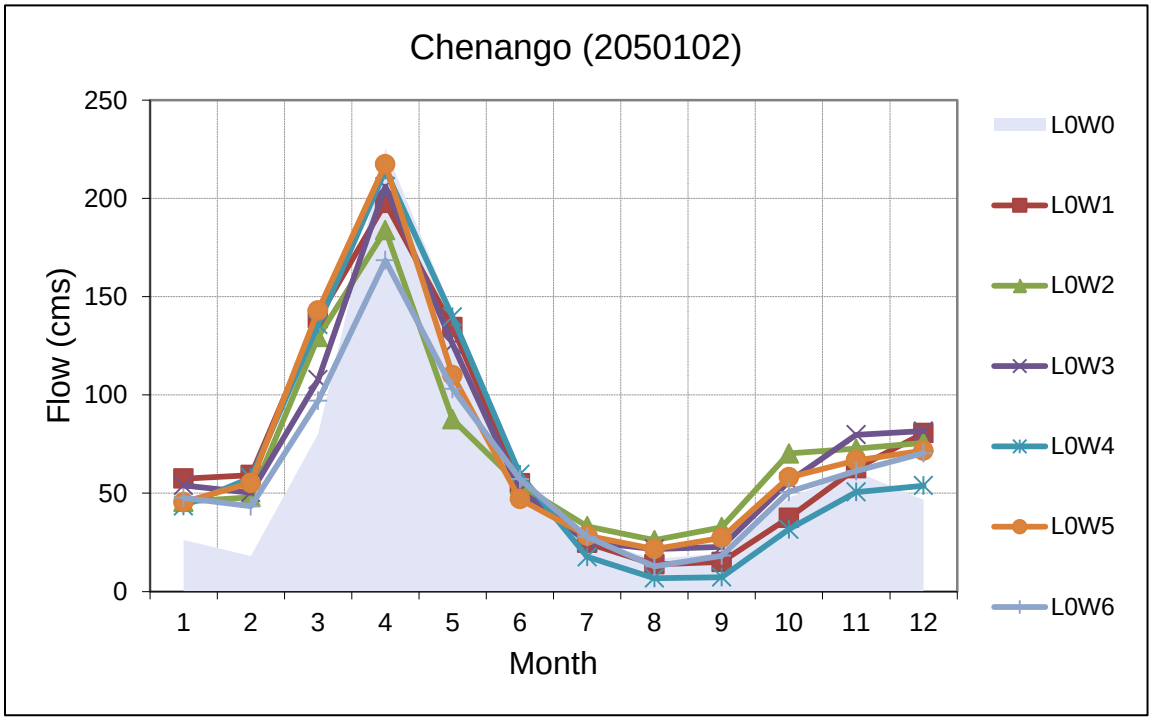

Figure 207. Monthly Average Flows, Chenango (SWAT)

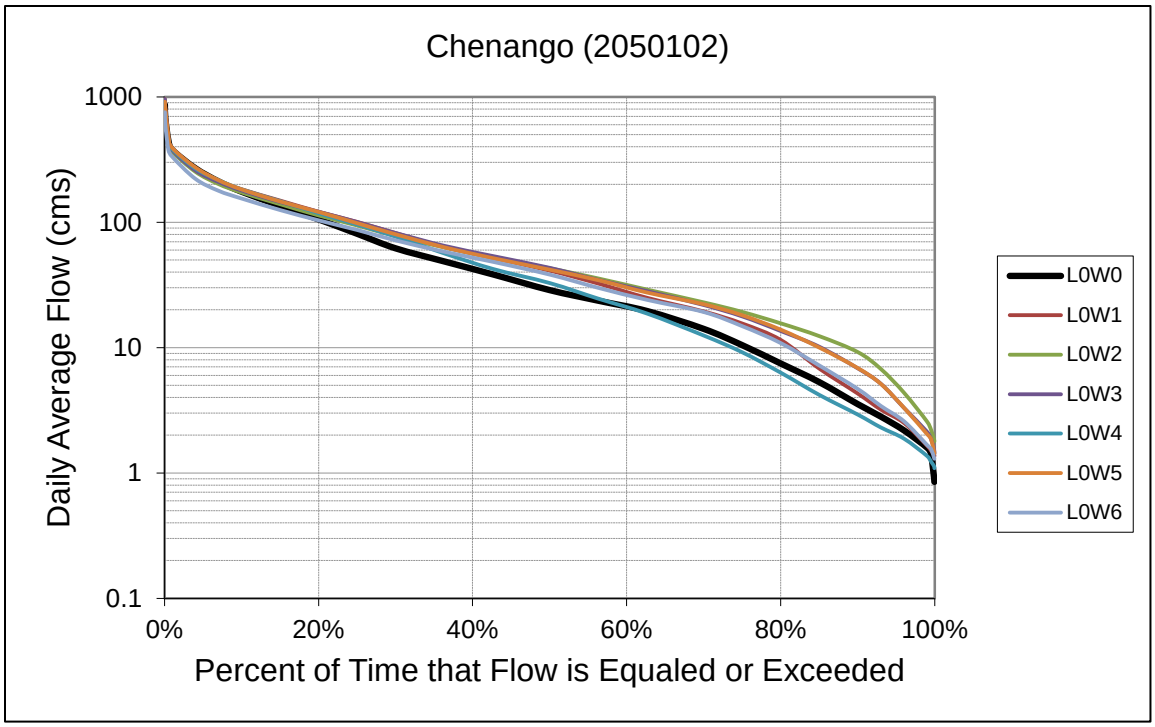

Figure 208. Flow Duration, Chenango (SWAT)

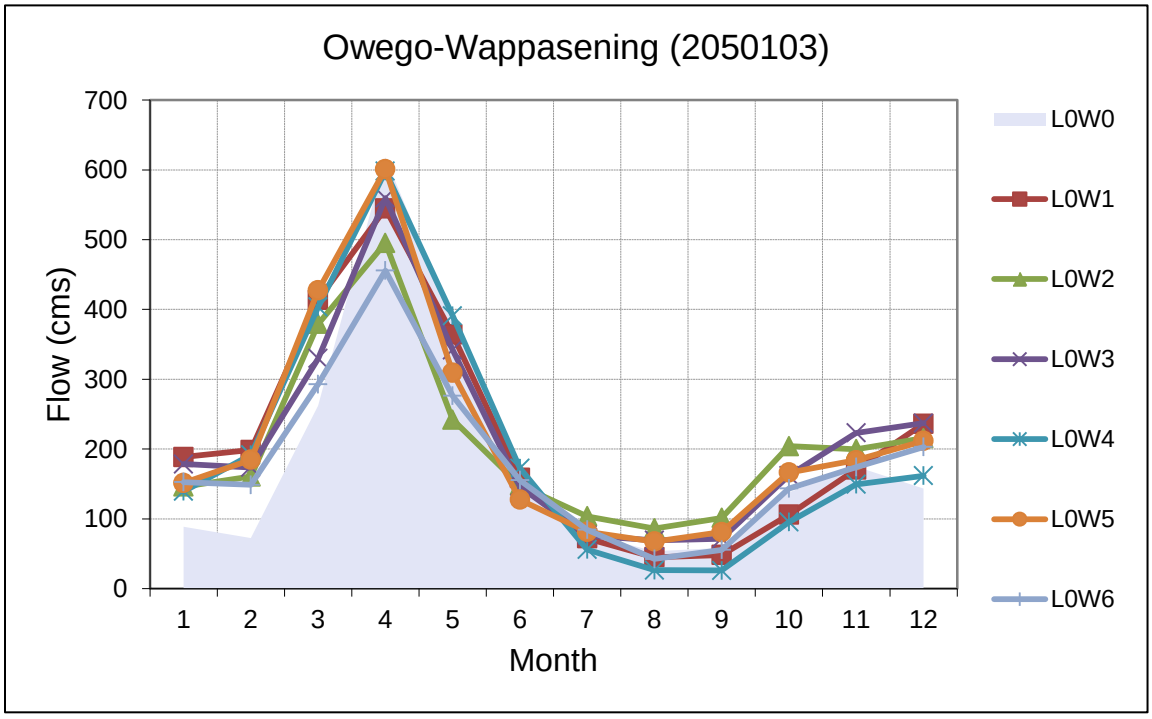

Figure 209. Monthly Average Flows, Owego-Wappasening (SWAT)

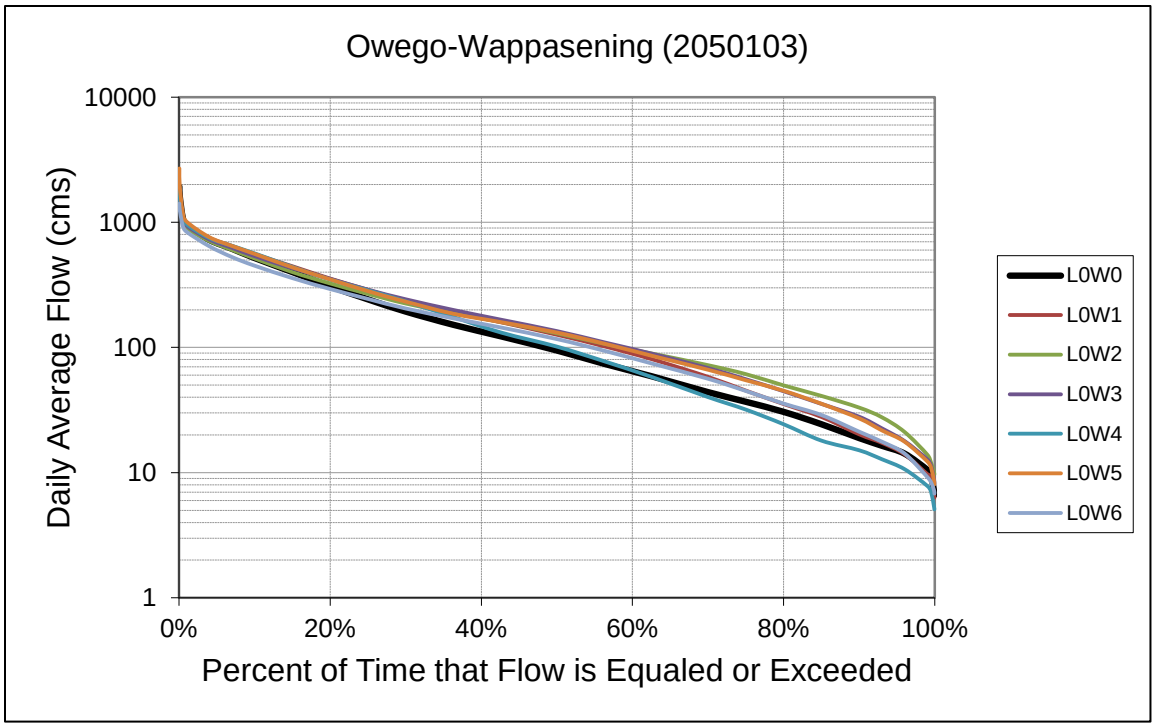

Figure 210. Flow Duration, Owego-Wappasening (SWAT)

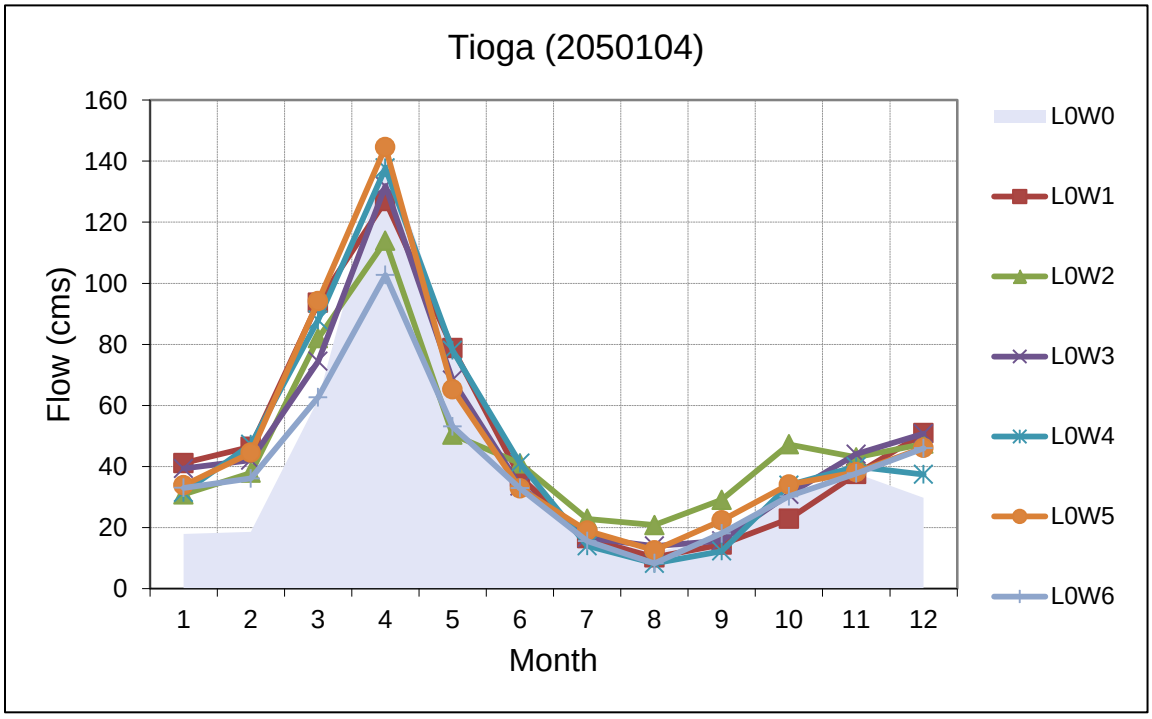

Figure 211. Monthly Average Flows, Tioga (SWAT)

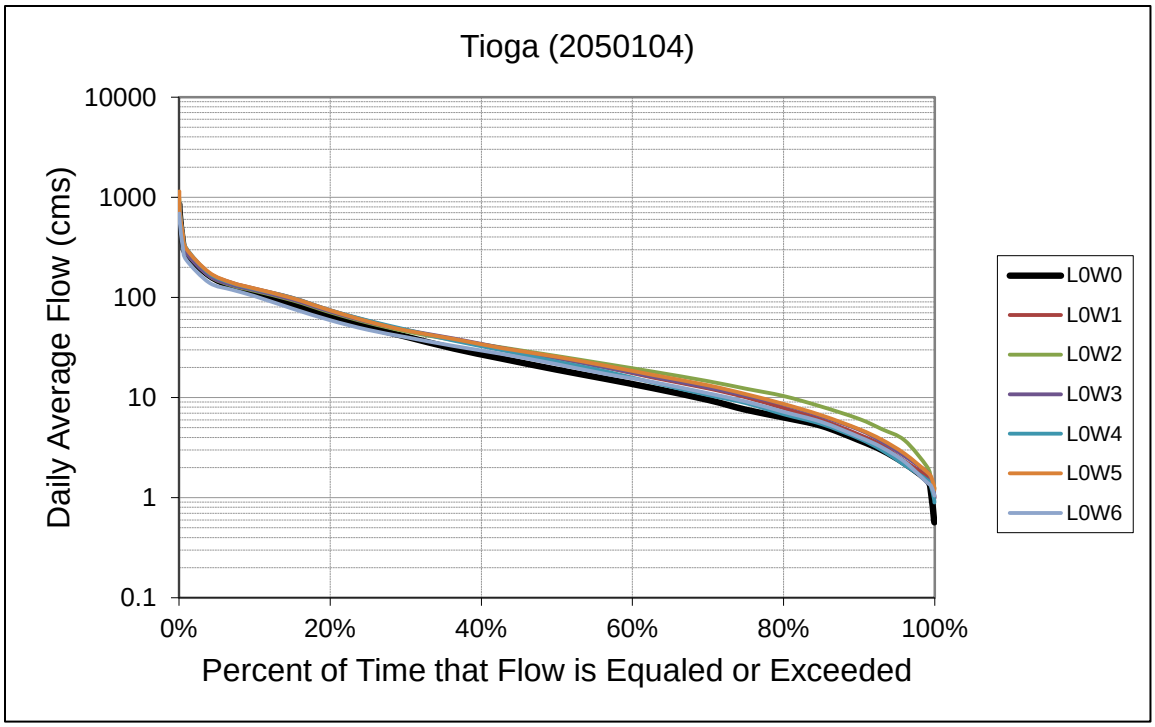

Figure 212. Flow Duration, Tioga (SWAT)

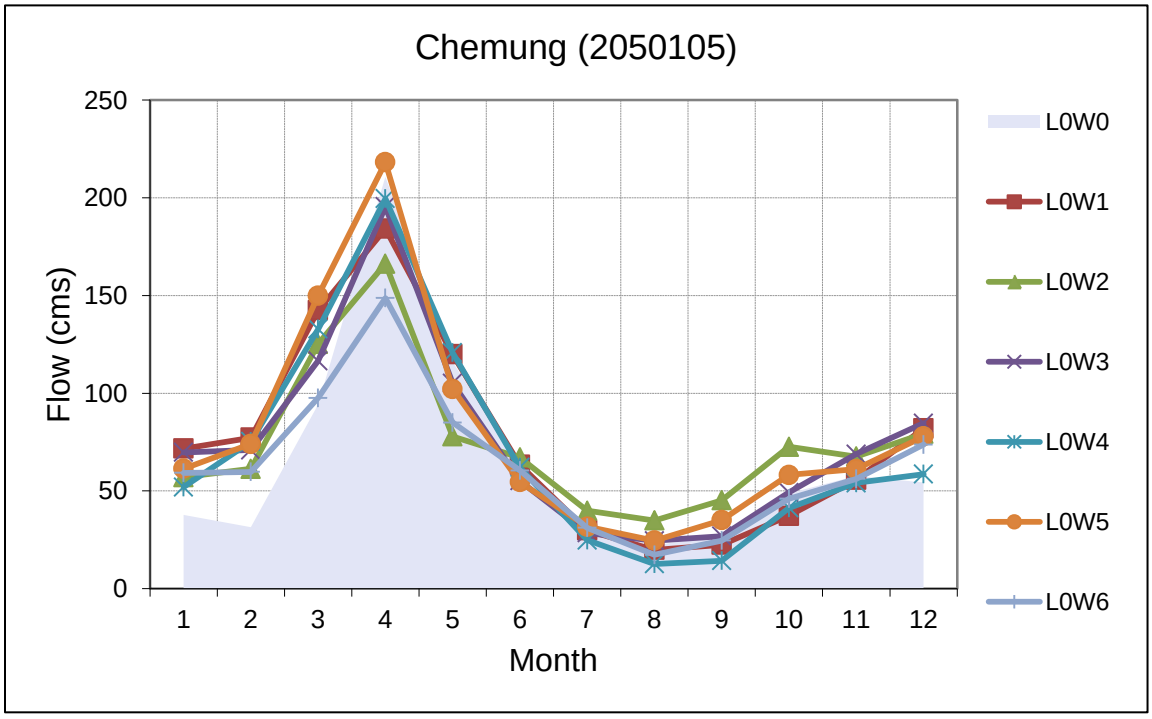

Figure 213. Monthly Average Flows, Chemung (SWAT)

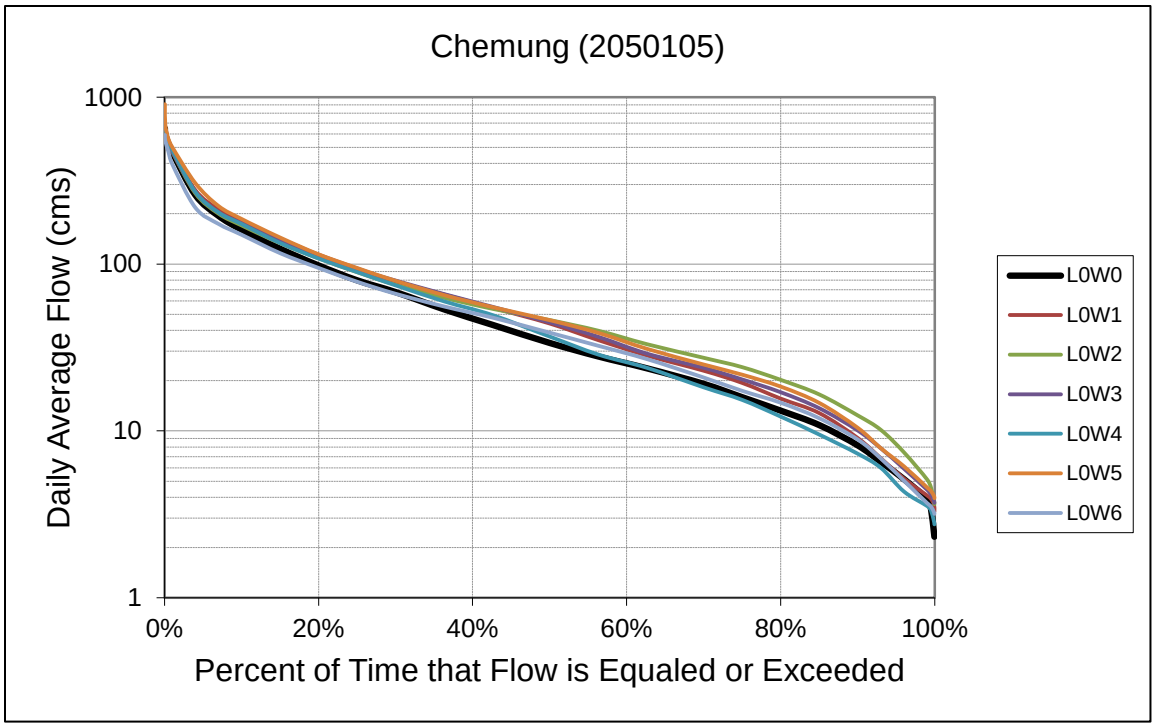

Figure 214. Flow Duration, Chemung (SWAT)

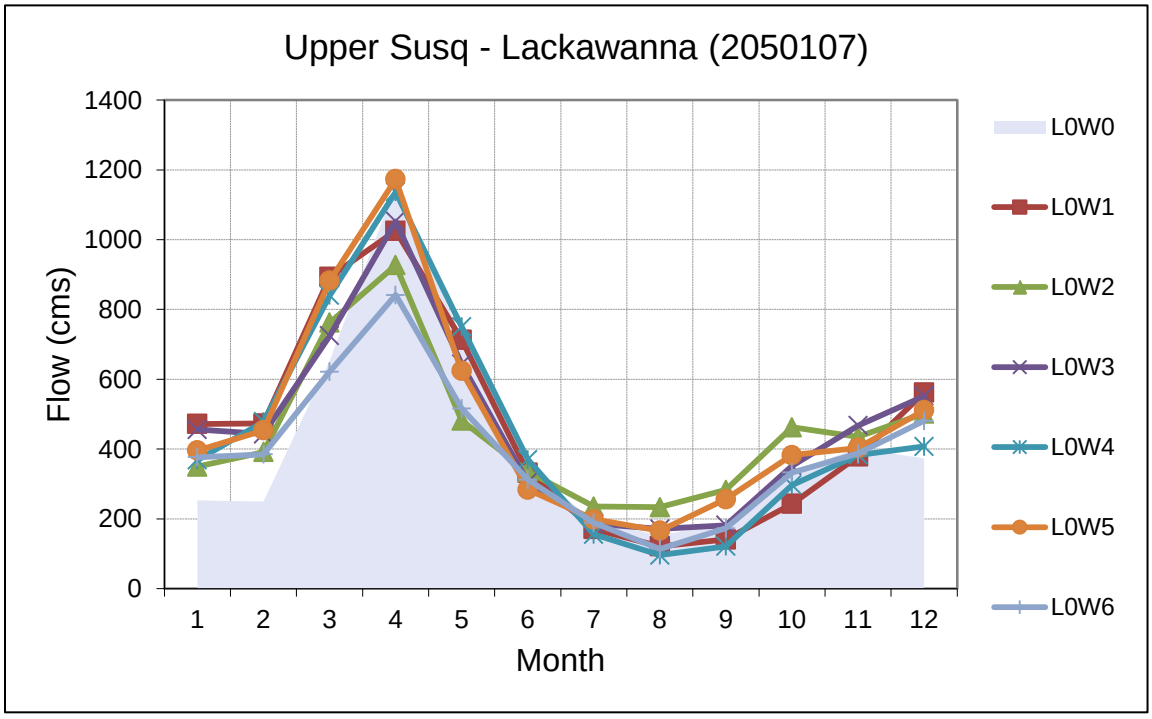

Figure 215. Monthly Average Flows, Upper Susquehanna River - Lackawanna (SWAT)

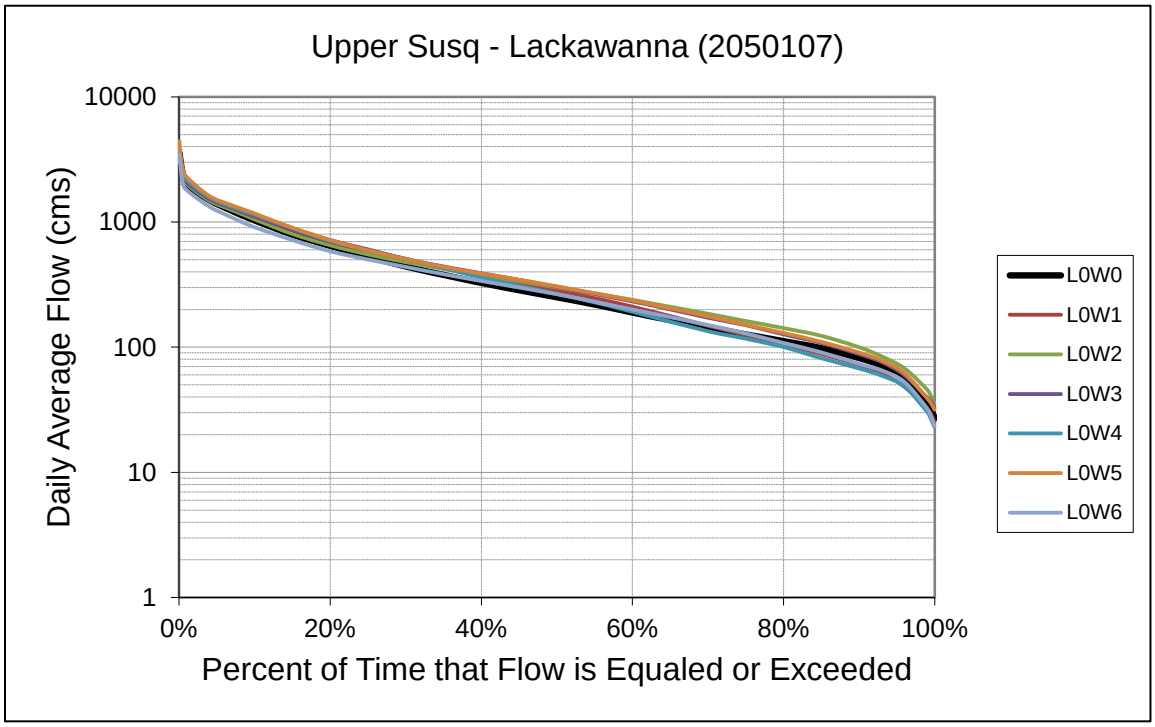

Figure 216. Flow Duration, Upper Susquehanna River - Lackawanna (SWAT)

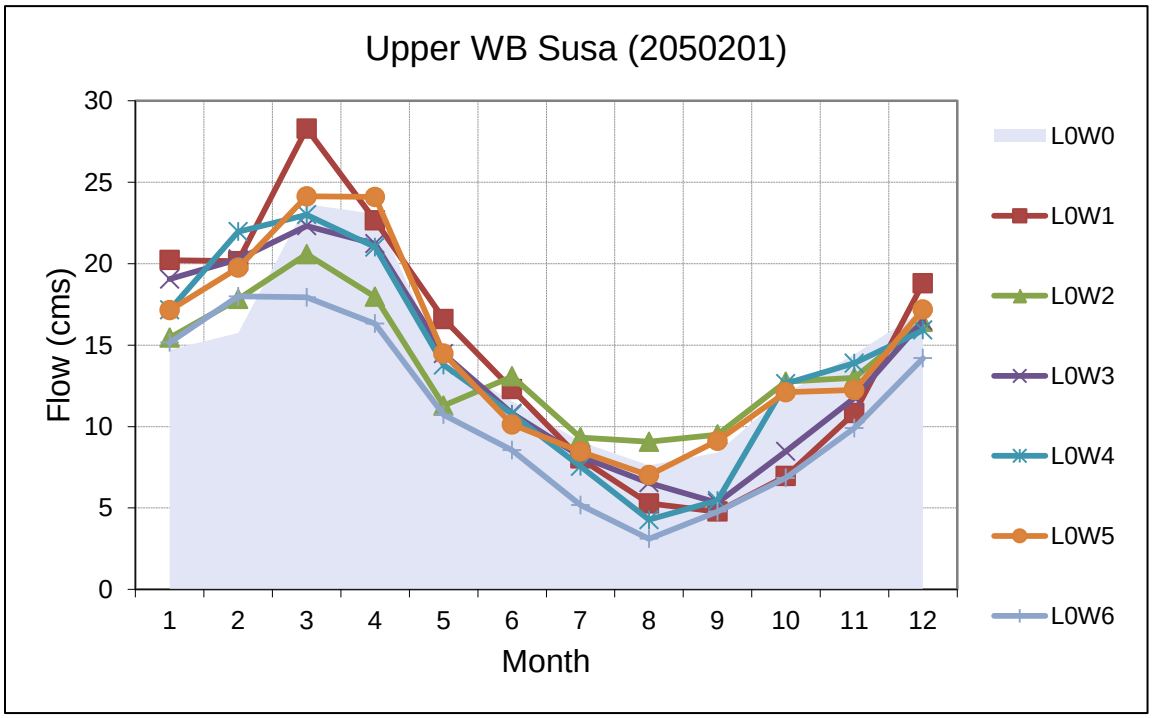

Figure 217. Monthly Average Flows, Upper West Branch Susquehanna River (SWAT)

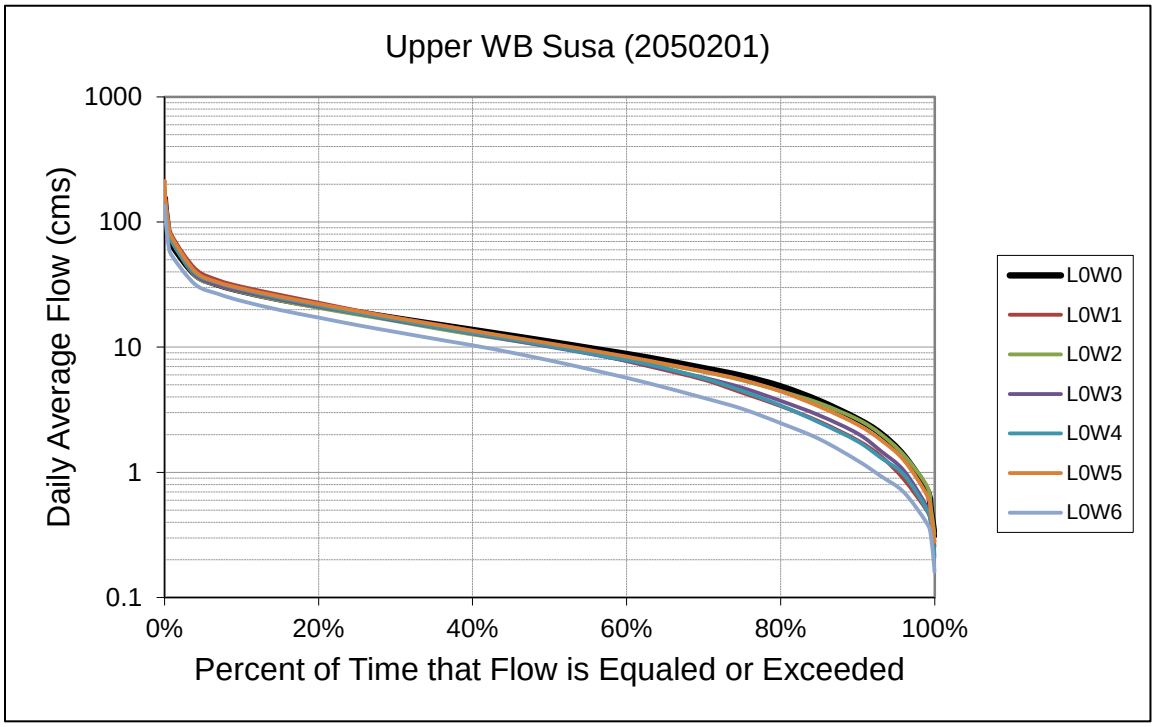

Figure 218. Flow Duration, Upper West Branch Susquehanna River (SWAT)

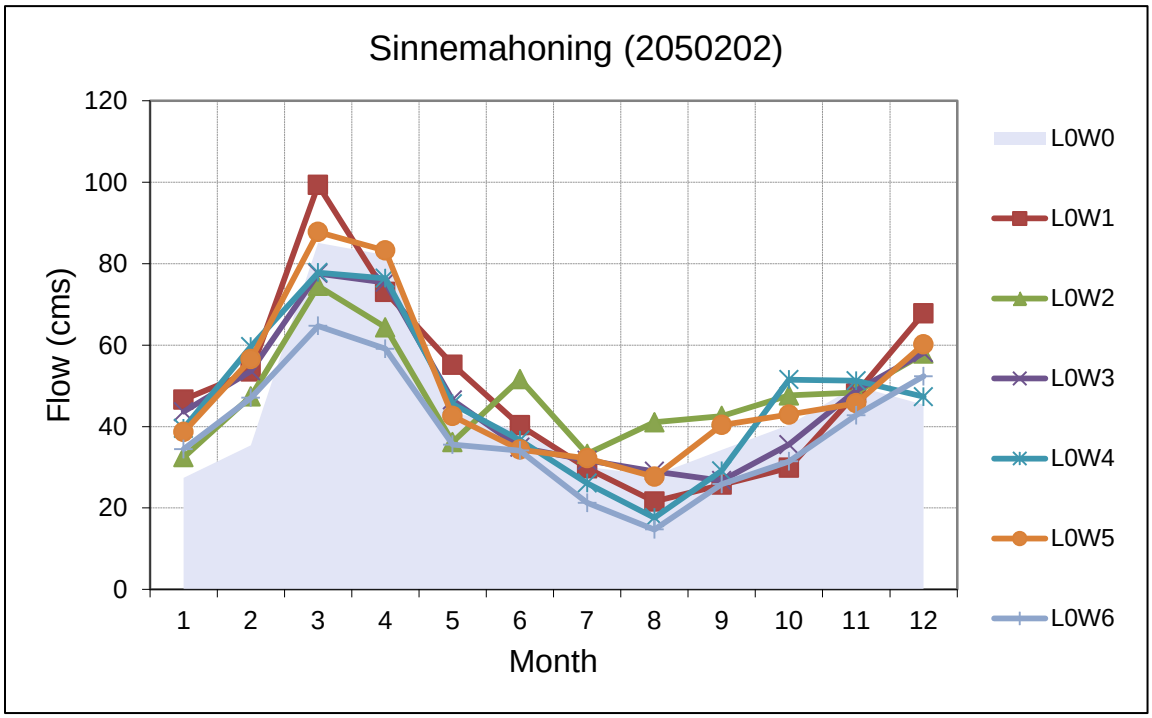

Figure 219. Monthly Average Flows, Sinnemahoning (SWAT)

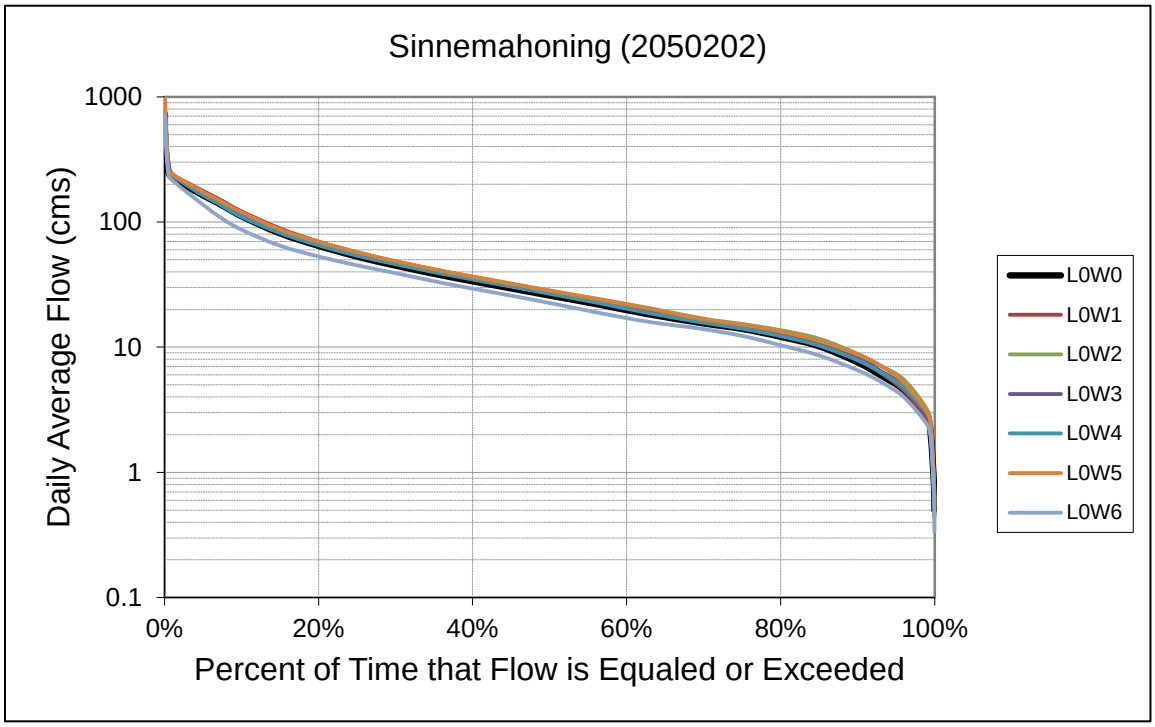

Figure 220. Flow Duration, Sinnemahoning (SWAT)

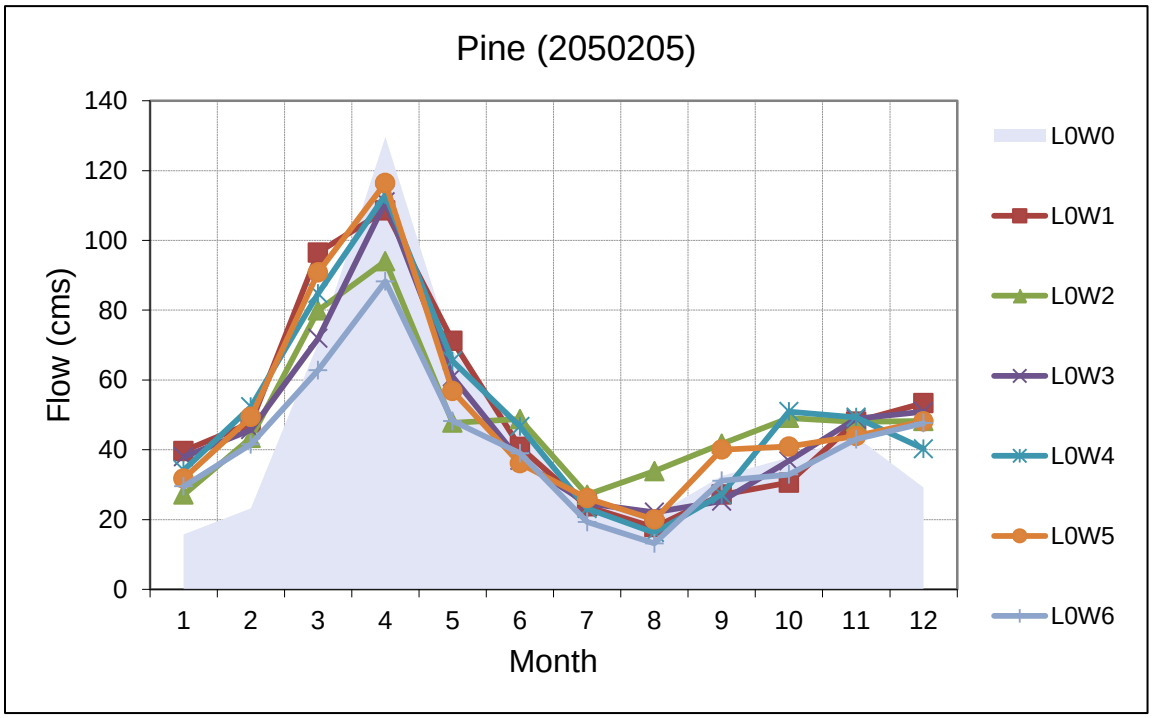

Figure 221. Monthly Average Flows, Pine (SWAT)

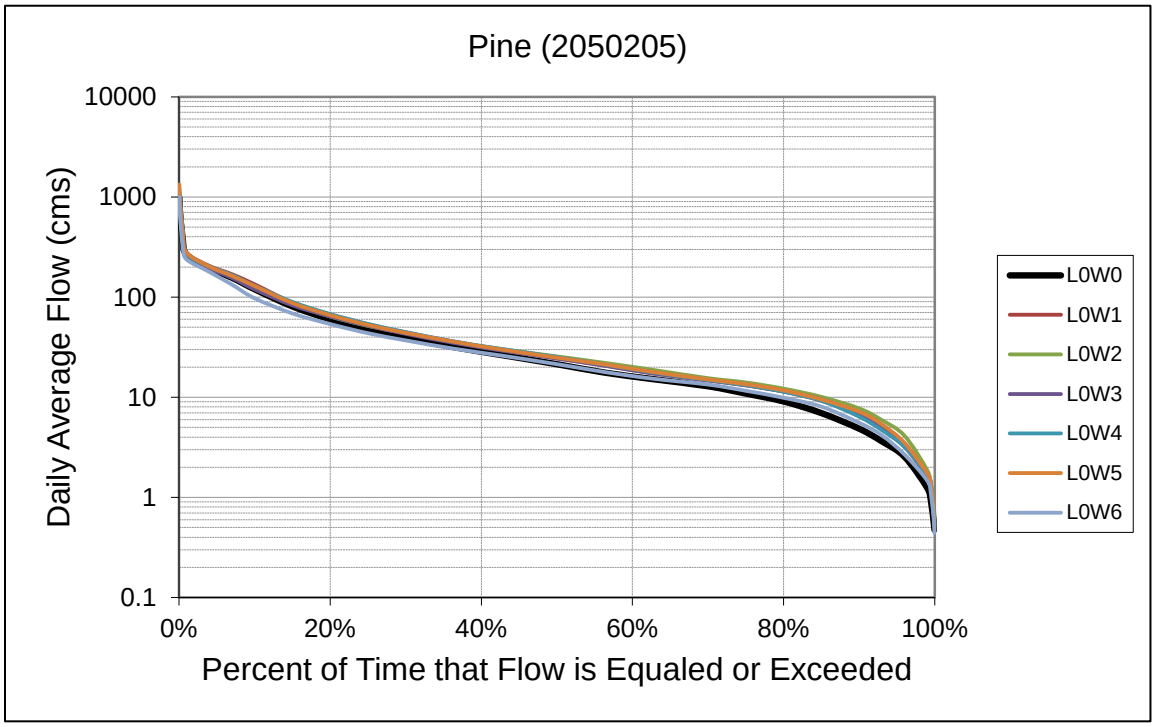

Figure 222. Flow Duration, Pine (SWAT)

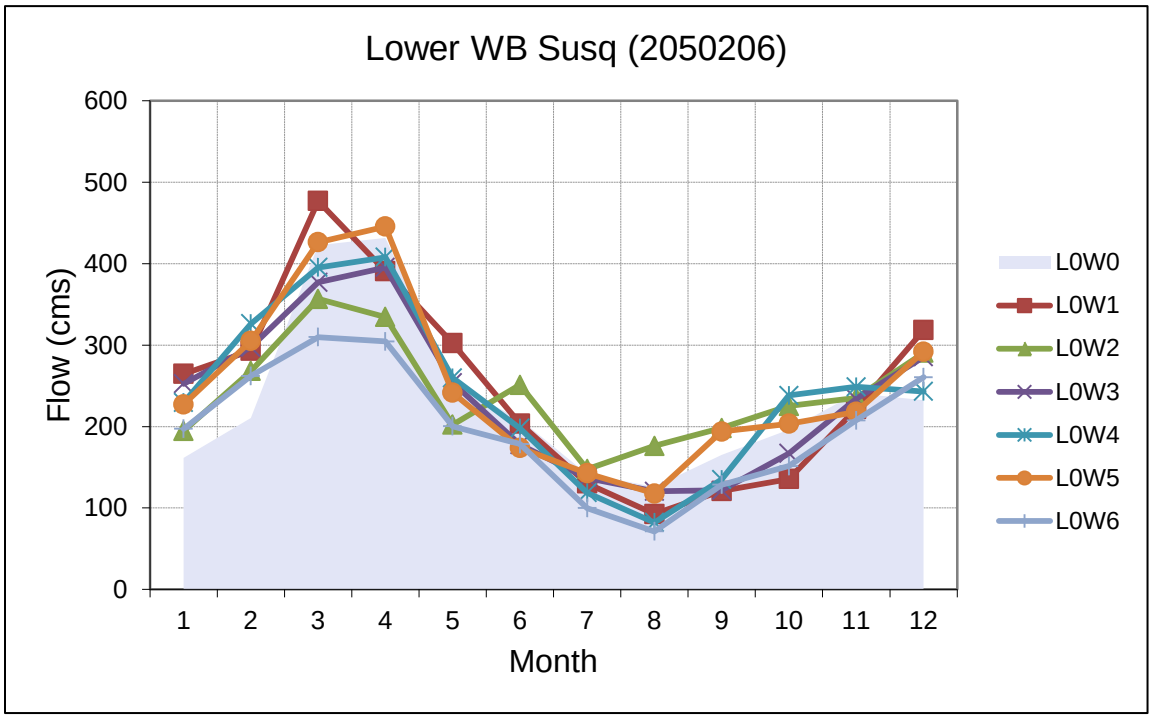

Figure 223. Monthly Average Flows, Lower West Branch Susquehanna River (SWAT)

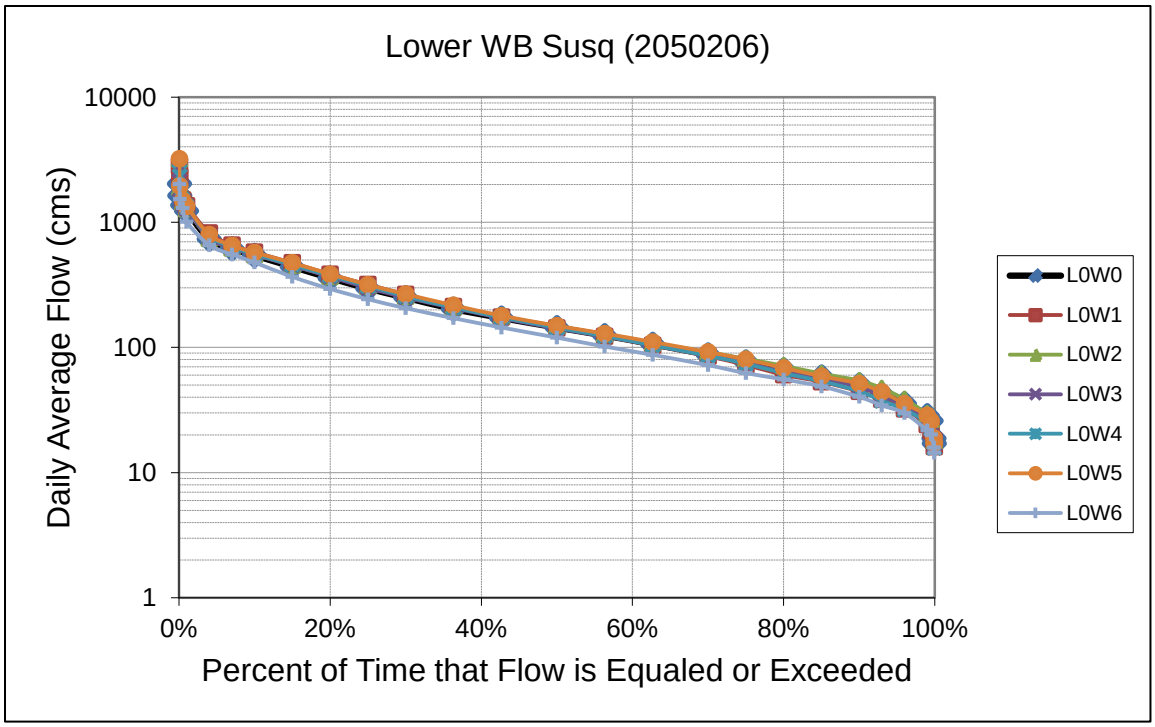

Figure 224. Flow Duration, Lower West Branch Susquehanna River (SWAT)

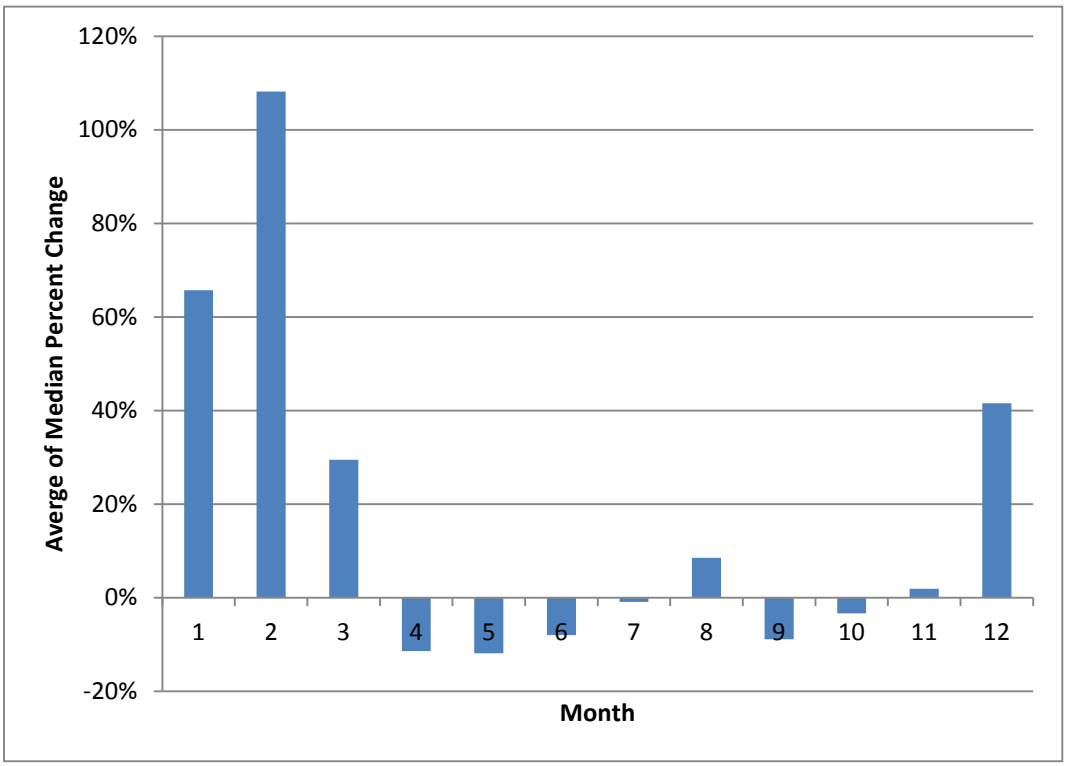

Figure 225. Average of Median Percent Change in Flow; NARCCAP Scenarios W1-W6 at all Stations, Susquehanna River Basin (SWAT)

Willamette River Basin, HSPF Model
Results at Downstream Station

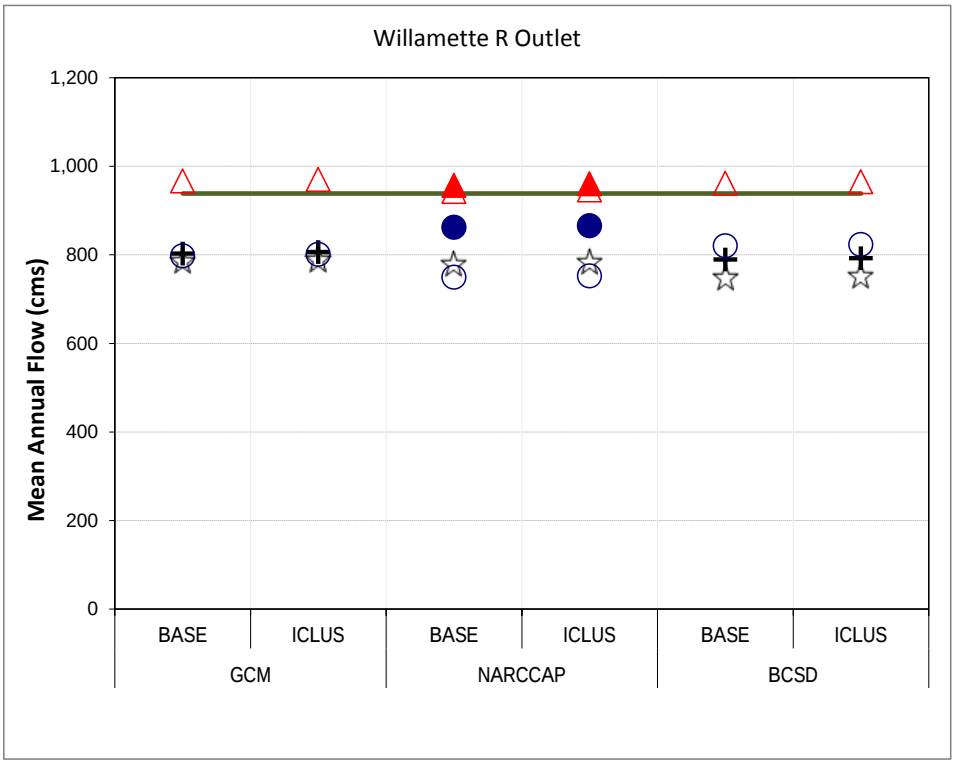

Figure 226. Mean Annual Flow, Willamette River Outlet (HSPF)

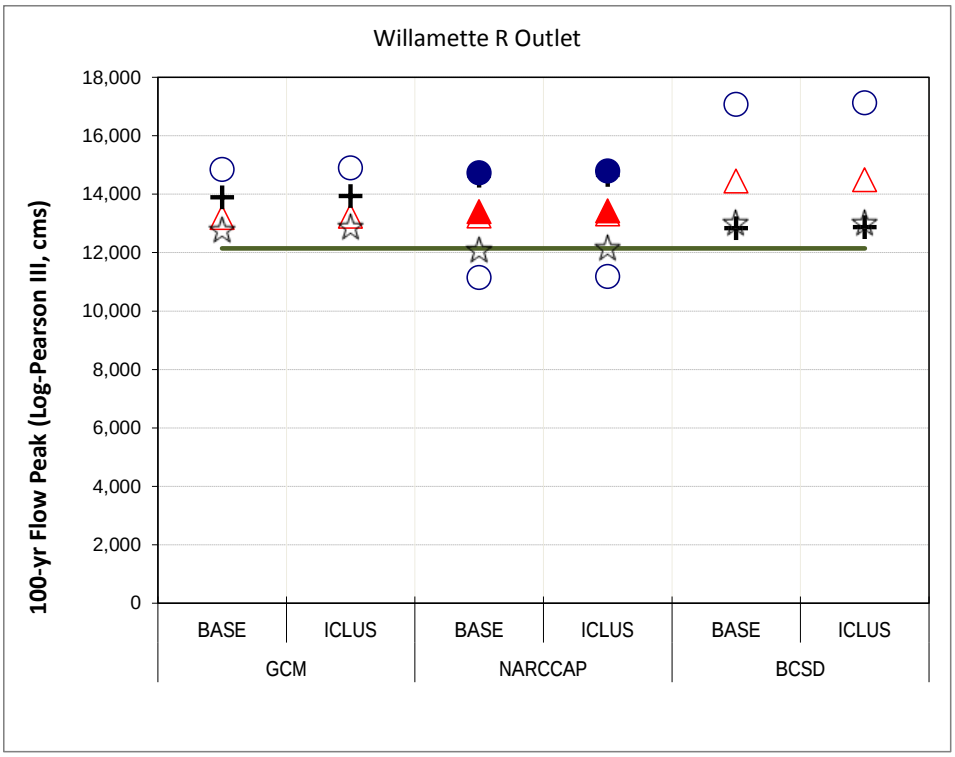

Figure 227. 100-yr Flow Peak, Willamette River Outlet (HSPF)

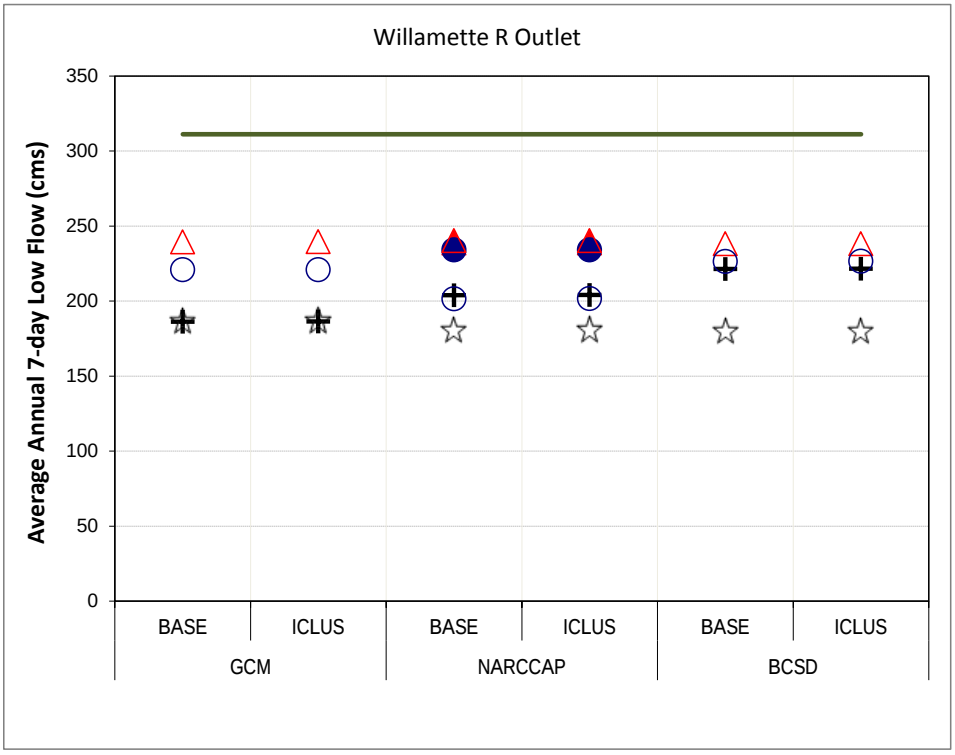

Figure 228. Average Annual 7-day Low Flow, Willamette River Outlet (HSPF)

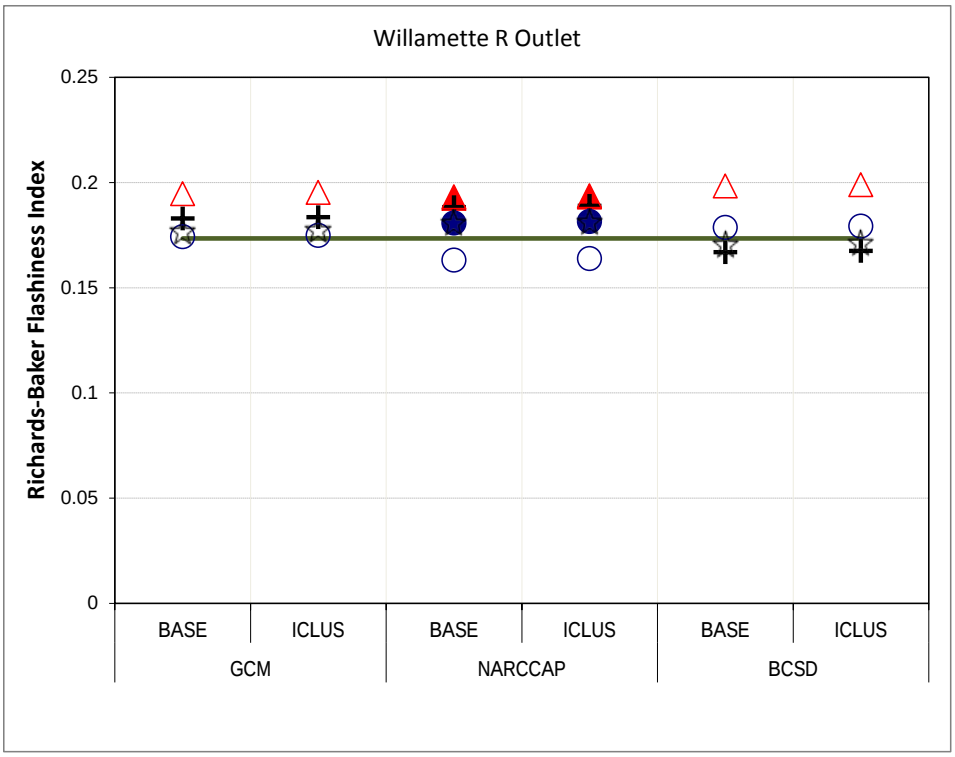

Figure 229. Richards-Baker Flashiness Index, Willamette River Outlet (HSPF)

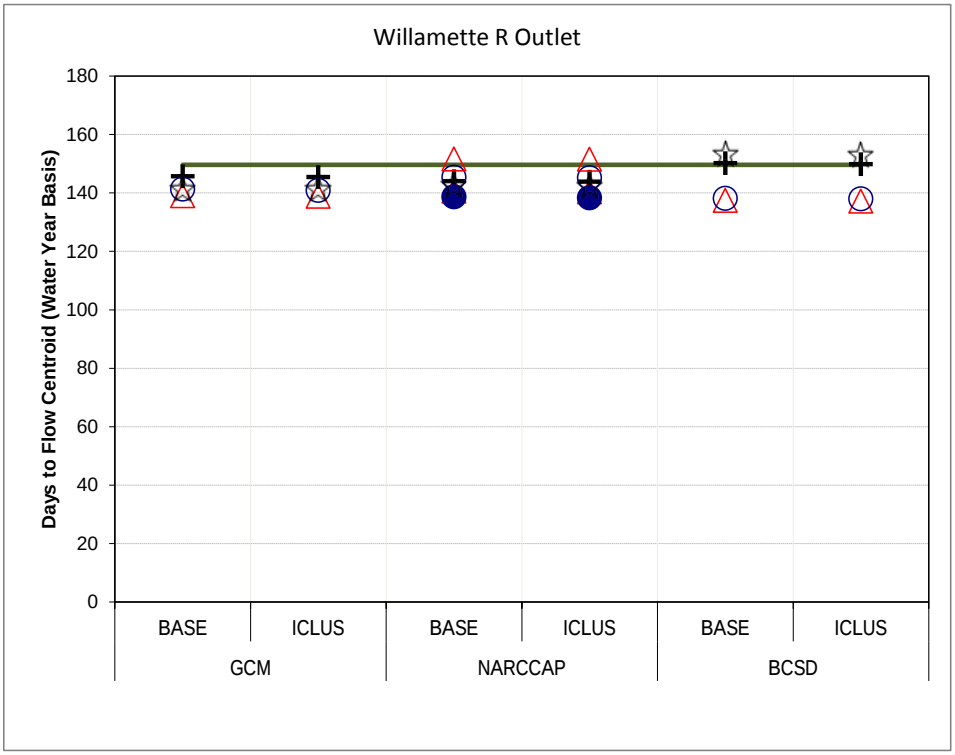

Figure 230. Days to Flow Centroid, Willamette River Outlet (HSPF)

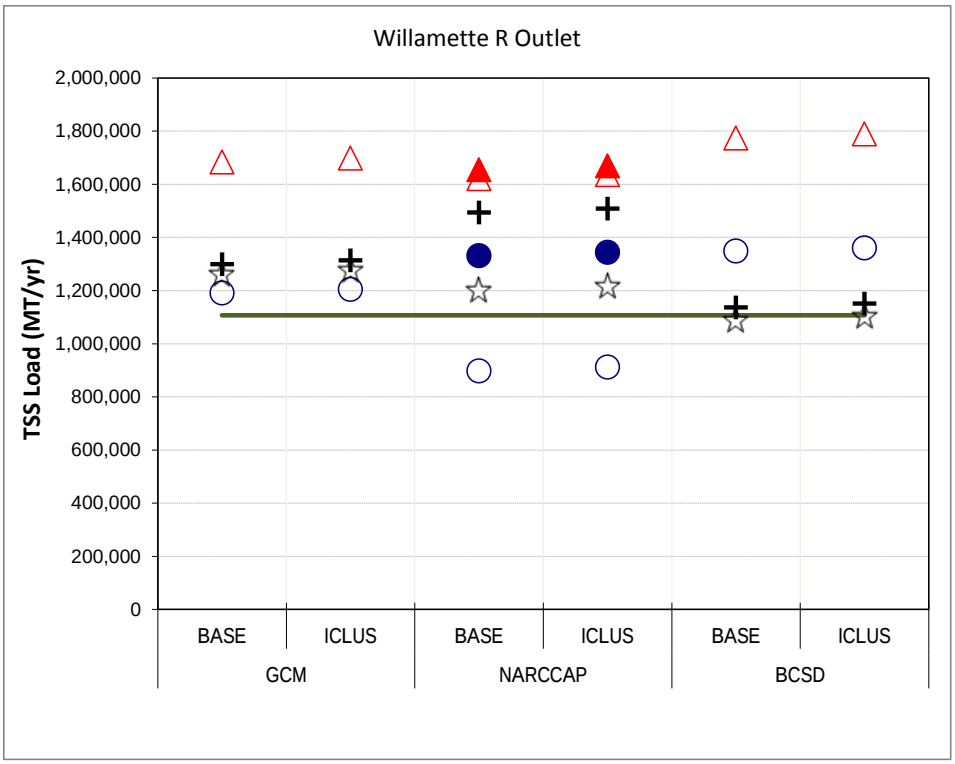

Figure231. TSS Load, Willamette River Outlet (HSPF)

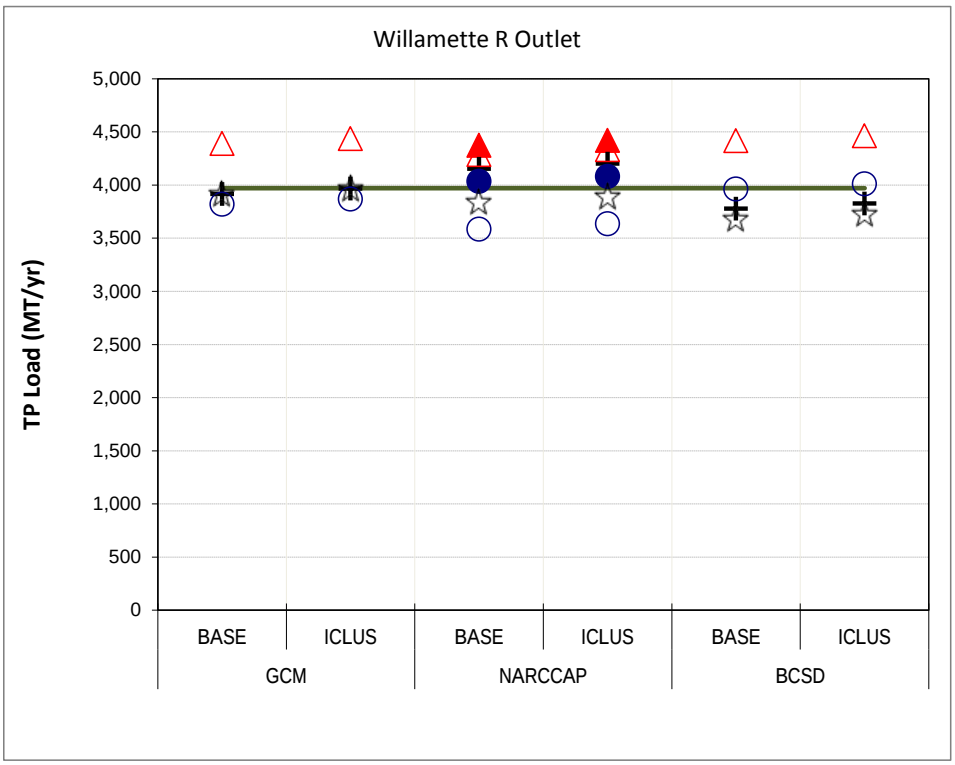

Figure 232. TP Load, Willamette River Outlet (HSPF)

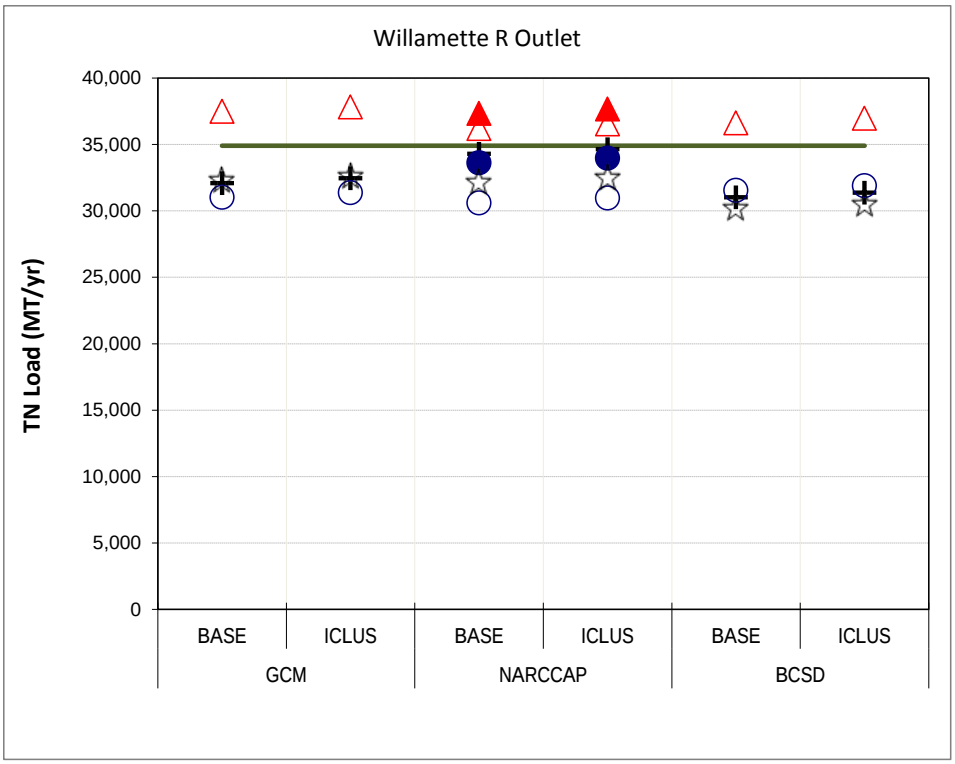

Figure 233. TN Load, Willamette River Outlet (HSPF)

Results at Multiple Stations

Table 9. Summary of Range of Change Relative to Existing Conditions for NARCCAP Dynamically Downscale Scenarios, Willamette River Basin HSPF Model

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Tualatin River at West Linn (gage 14207500)								
Flow	-13.42%	-4.50%	-1.79%	12.35%	-13.02%	-4.18%	-1.62%	12.02%
TSS	-25.17%	10.27%	15.01%	48.58%	-23.87%	8.88%	13.31%	44.17%
TN	-10.72%	-3.96%	-2.59%	6.34%	-9.95%	-3.88%	-2.55%	5.71%
TP	-14.21%	0.17%	1.56%	15.23%	-12.79%	-0.07%	1.24%	13.34%
Pudding River at Aurora (gage 1402000)								
Flow	-16.00%	-2.54%	-2.68%	11.19%	-15.86%	-2.48%	-2.63%	11.10%
TSS	-30.22%	28.41%	16.43%	46.12%	-29.58%	27.24%	15.64%	44.45%
TN	-15.76%	-2.60%	-2.92%	10.07%	-15.31%	-2.64%	-2.90%	9.73%
TP	-19.31%	8.63%	3.67%	19.98%	-18.64%	8.16%	3.42%	19.06%
South Yamhill River at McMinnville (gage 14194150)								
Flow	-13.06%	-3.46%	-1.22%	11.94%	-13.05%	-3.45%	-1.22%	11.93%
TSS	-25.38%	15.18%	13.24%	44.55%	-25.29%	15.03%	13.12%	44.25%
TN	-13.03%	-2.56%	-1.42%	9.66%	-12.98%	-2.57%	-1.42%	9.62%
TP	-17.48%	4.54%	4.02%	21.59%	-17.38%	4.49%	3.99%	21.44%
Mohawk River nr Springfield (gage 14165000)								
Flow	-16.75%	-3.37%	-2.88%	10.17%	-16.74%	-3.37%	-2.88%	10.16%
TSS	-31.73%	16.15%	10.93%	36.72%	-	16.10%	10.90%	36.66%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
					31.69%			
TN	-18.86%	-2.17%	-3.61%	8.92%	-18.81%	-2.18%	-3.60%	8.90%
TP	-26.14%	8.44%	3.67%	20.10%	-26.05%	8.39%	3.64%	20.02%
Willamette River at Salem (gage 14191000)								
Flow	-21.09%	-8.49%	-8.99%	1.03%	-21.07%	-8.48%	-8.98%	1.04%
TSS	-17.43%	30.36%	25.97%	50.61%	-17.40%	30.24%	25.88%	50.47%
TN	-13.71%	-2.48%	-2.43%	7.65%	-13.66%	-2.49%	-2.43%	7.61%
TP	-12.82%	6.46%	4.40%	15.17%	-12.77%	6.41%	4.37%	15.09%
Willamette River Outlet								
Flow	-20.16%	-8.10%	-8.42%	1.96%	-20.10%	-8.06%	-8.38%	1.98%
TSS	-18.90%	27.60%	23.54%	49.49%	-18.75%	27.05%	23.10%	48.68%
TN	-12.36%	-2.72%	-2.46%	6.96%	-12.19%	-2.73%	-2.45%	6.82%
TP	-9.71%	3.12%	1.96%	10.17%	-9.58%	3.03%	1.90%	9.95%

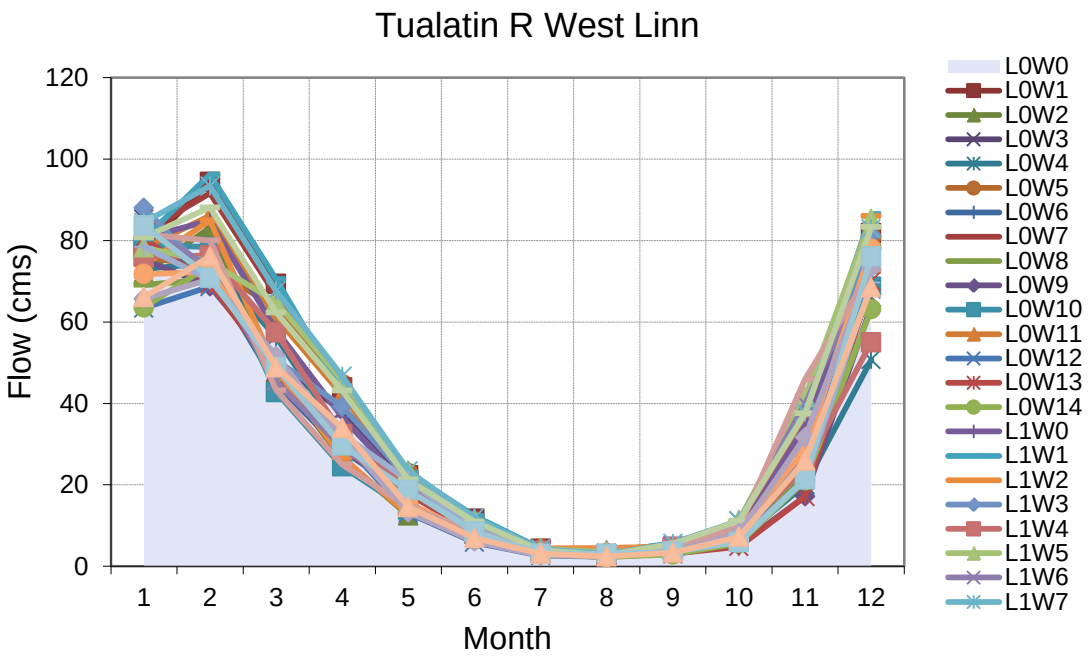

Figure 234. Monthly Average Flows, Tualatin River at West Linn (HSPF)

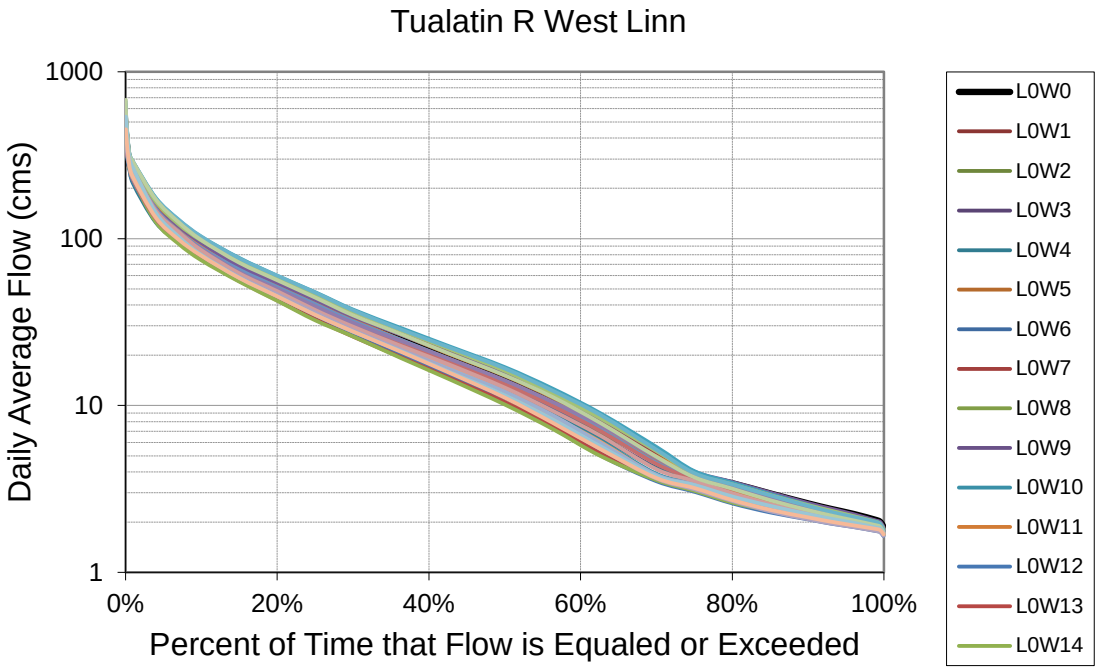

Figure 235. Flow Duration, Tualatin River at West Linn (HSPF)

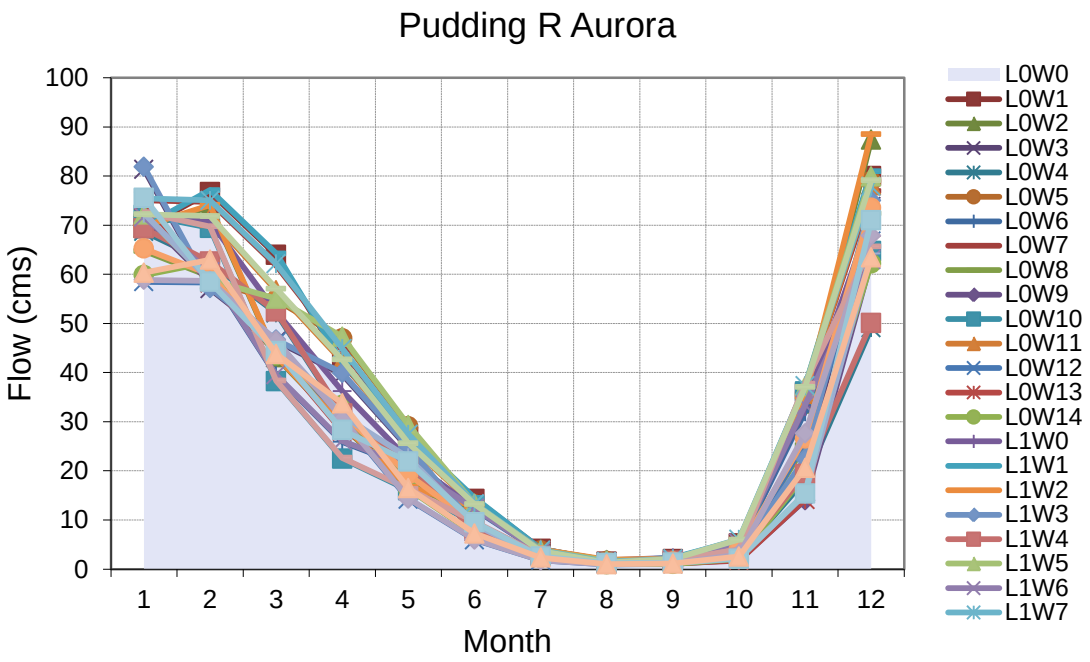

Figure 236. Monthly Average Flows, Pudding River at Aurora (HSPF)

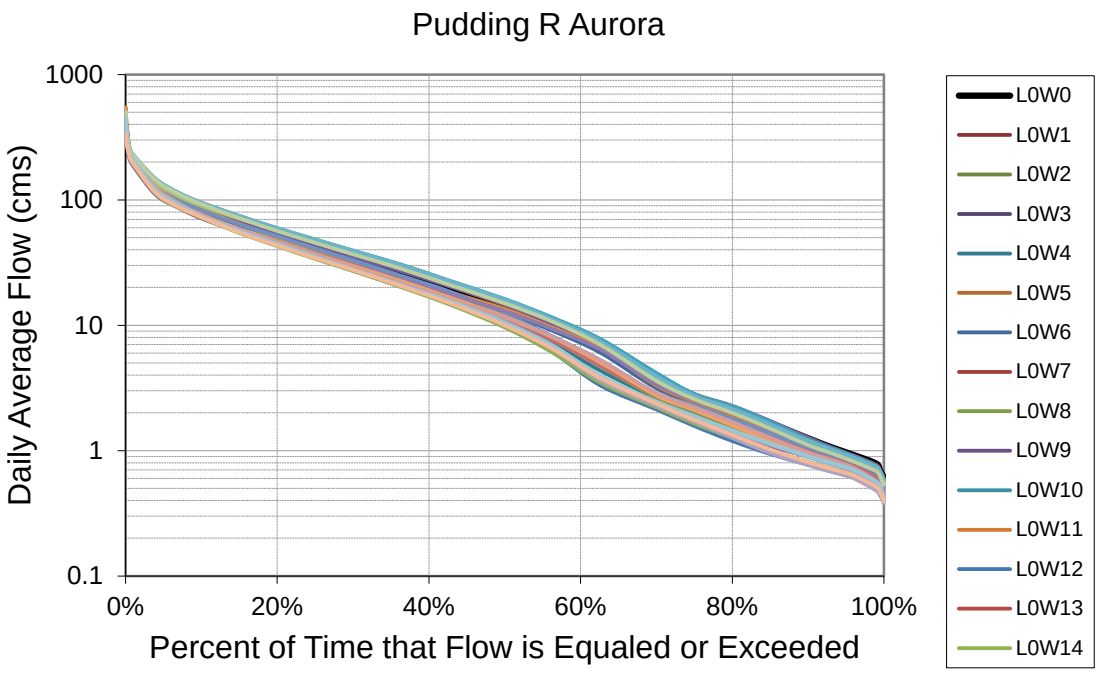

Figure 237. Flow Duration, Pudding River at Aurora (HSPF)

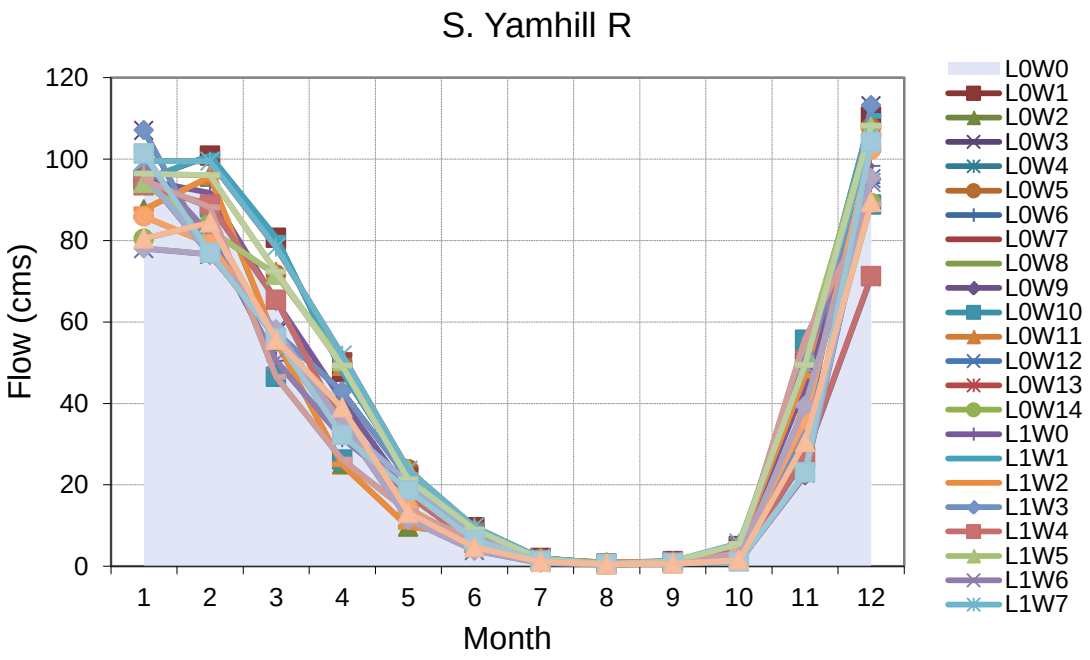

Figure 238. Monthly Average Flows, South Yamhill River (HSPF)

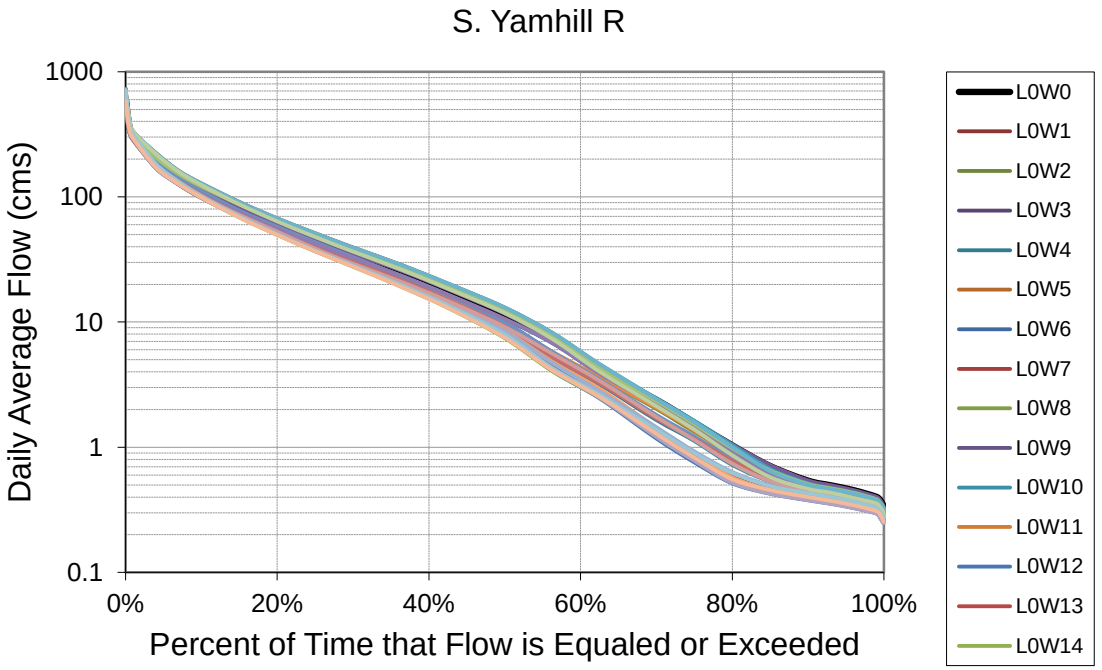

Figure 239. Flow Duration, South Yamhill River (HSPF)

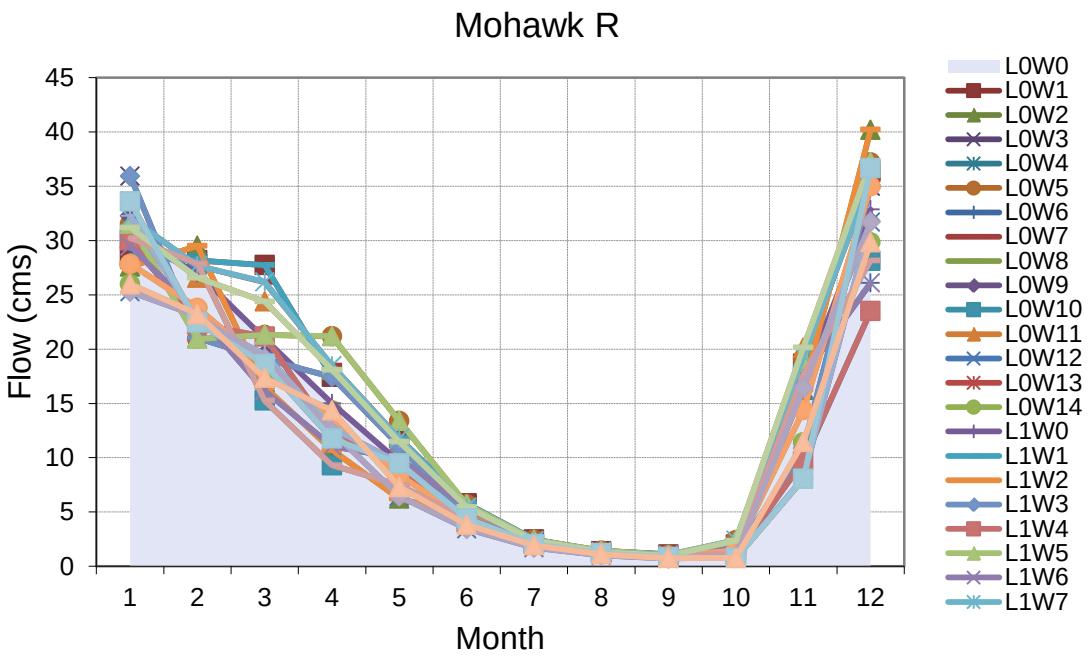

Figure 240. Monthly Average Flows, Mohawk River (HSPF)

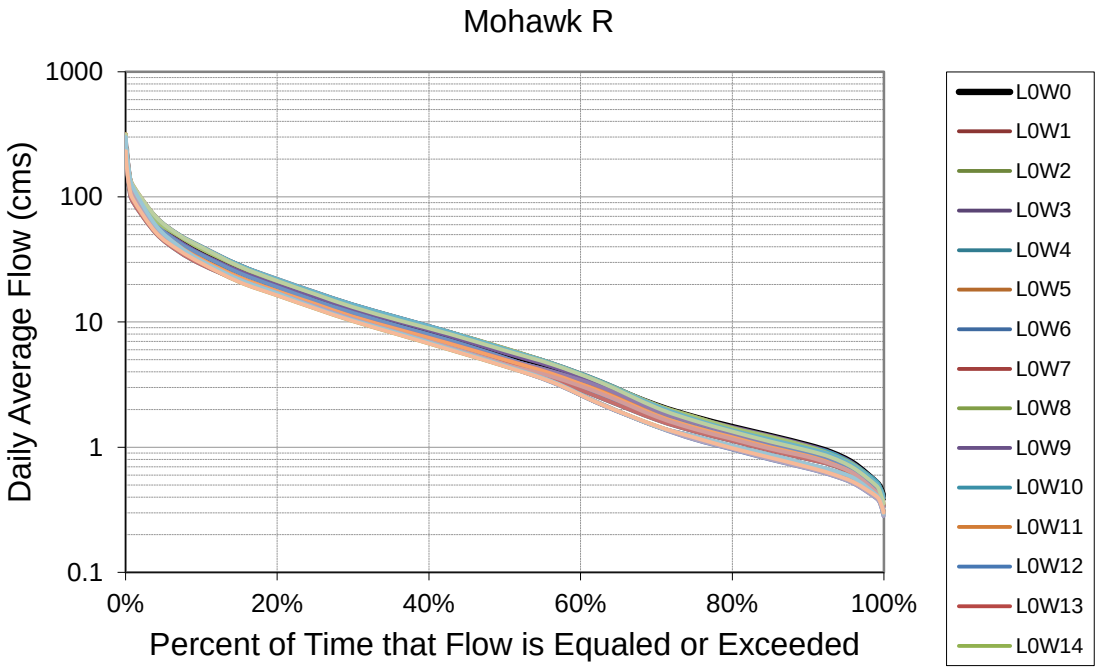

Figure 241. Flow Duration, Mohawk River (HSPF)

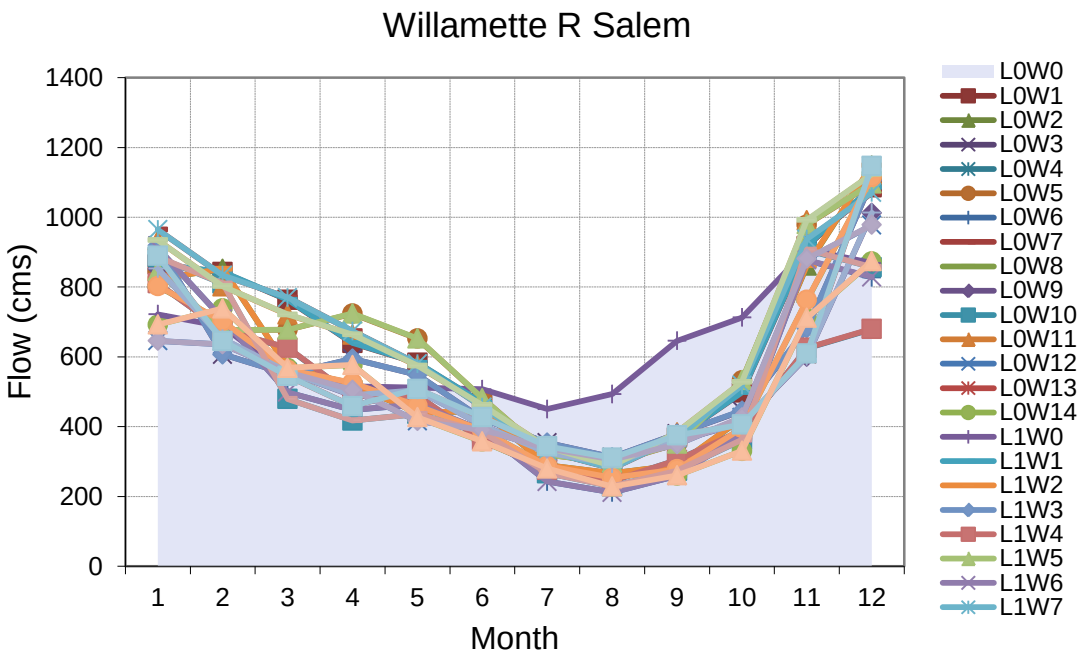

Figure 242. Monthly Average Flows, Willamette River at Salem (HSPF)

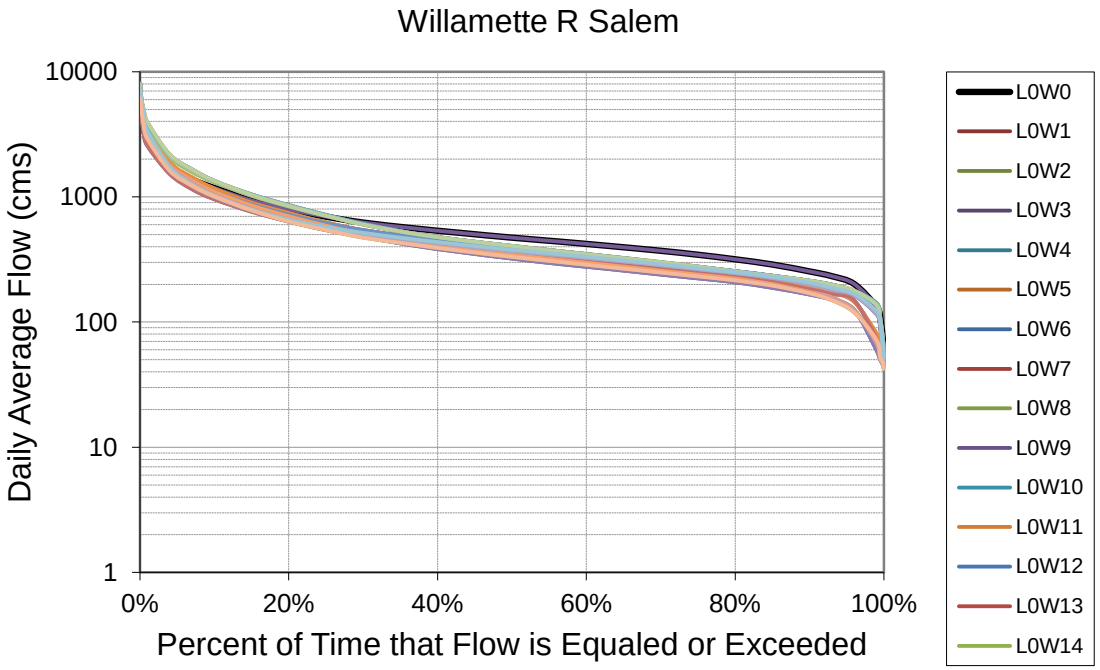

Figure 243. Flow Duration, Willamette River at Salem (HSPF)

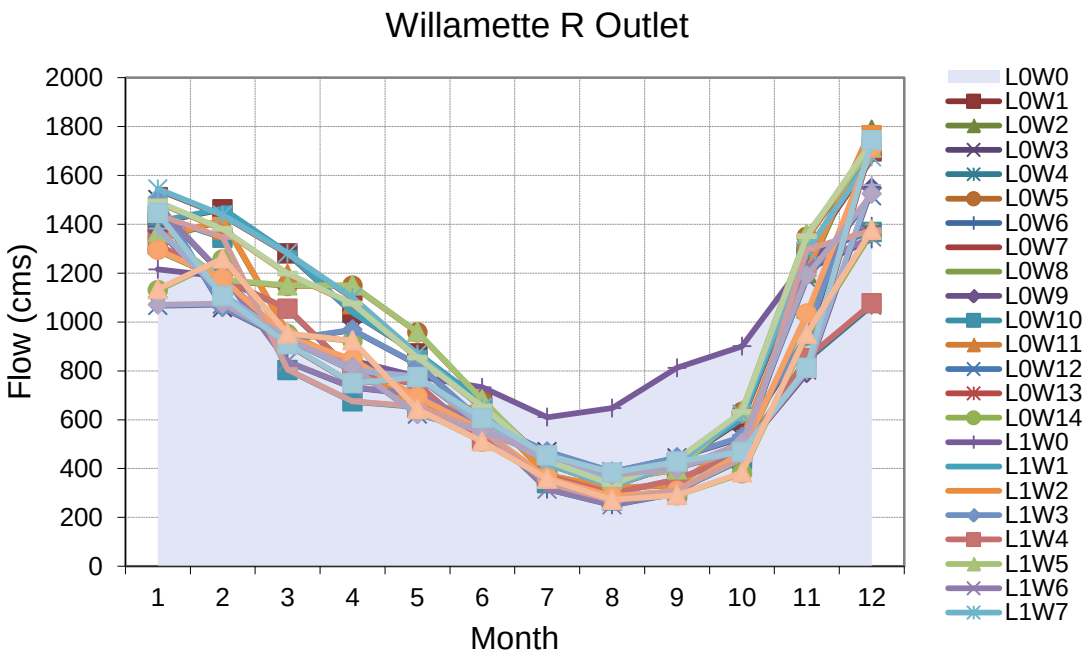

Figure 244. Monthly Average Flows, Willamette River Outlet (HSPF)

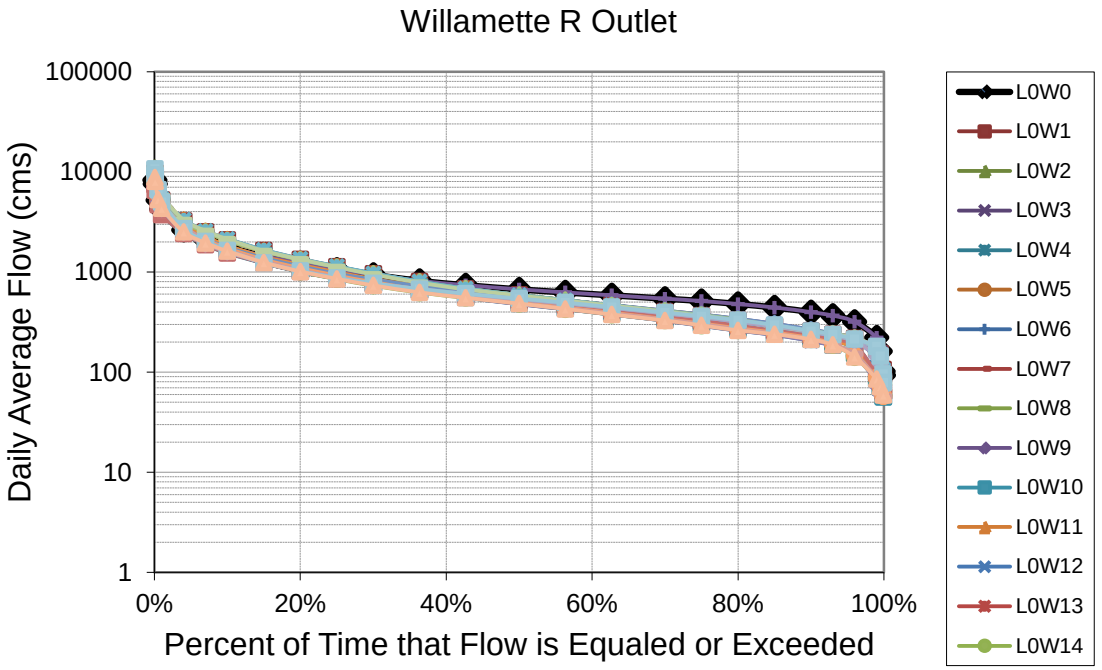

Figure 245. Flow Duration, Willamette River Outlet (HSPF)

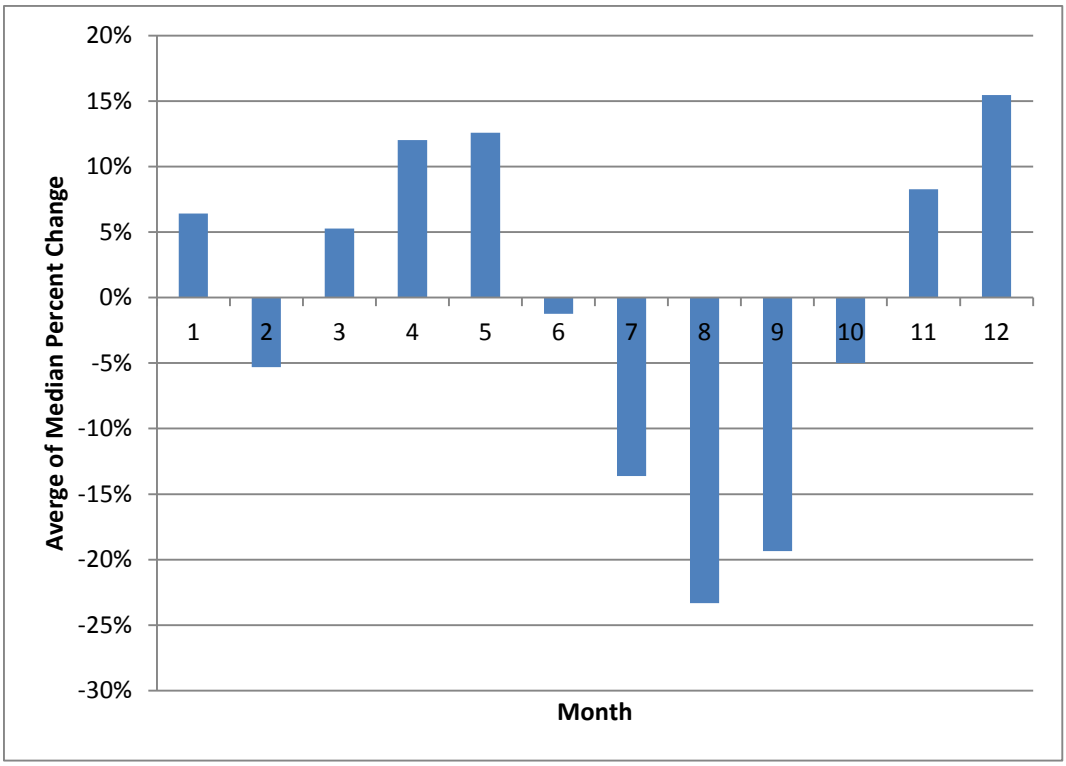

Figure 246. Average of Median Percent Change in Flow; NARCCAP Scenarios W1-W6 at all Stations, Willamette River Basin (HSPF)

Willamette River Basin, SWAT Model
Results at Downstream Station

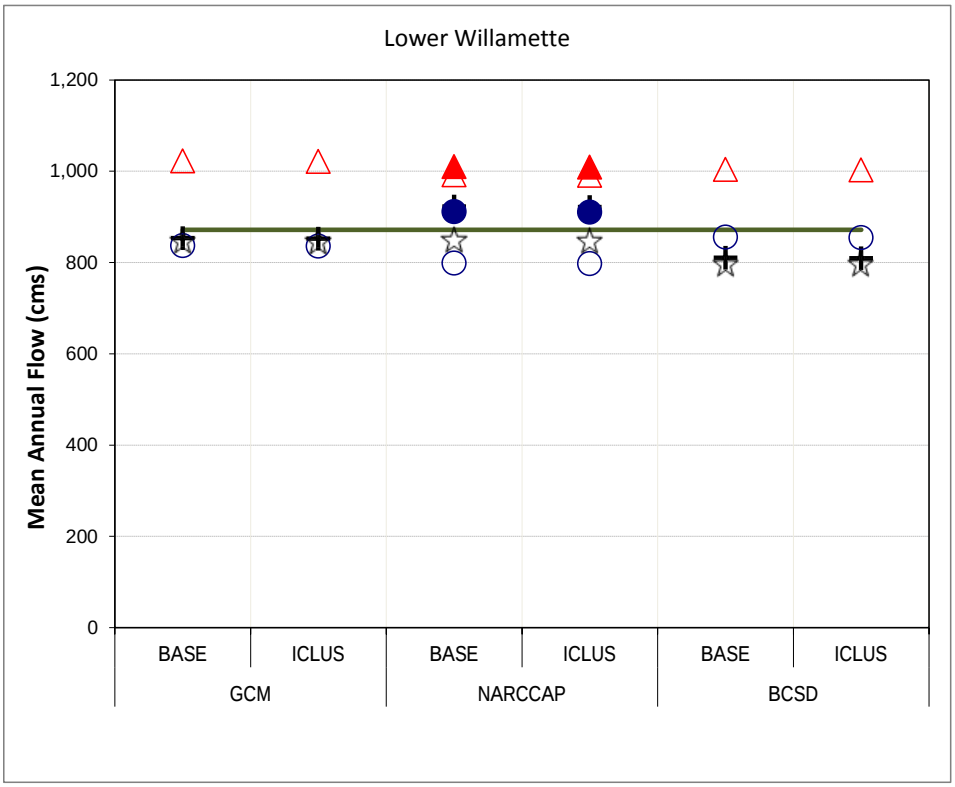

Figure 247. Mean Annual Flow, Lower Willamette River (SWAT)

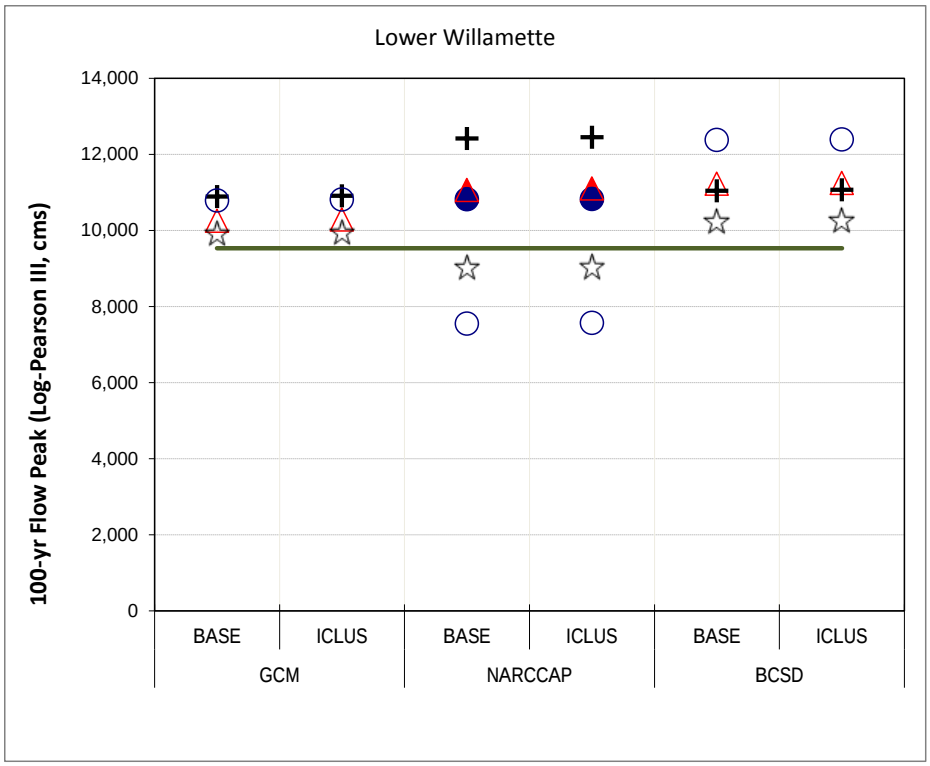

Figure 248. 100-yr Flow Peak, Lower Willamette River (SWAT)

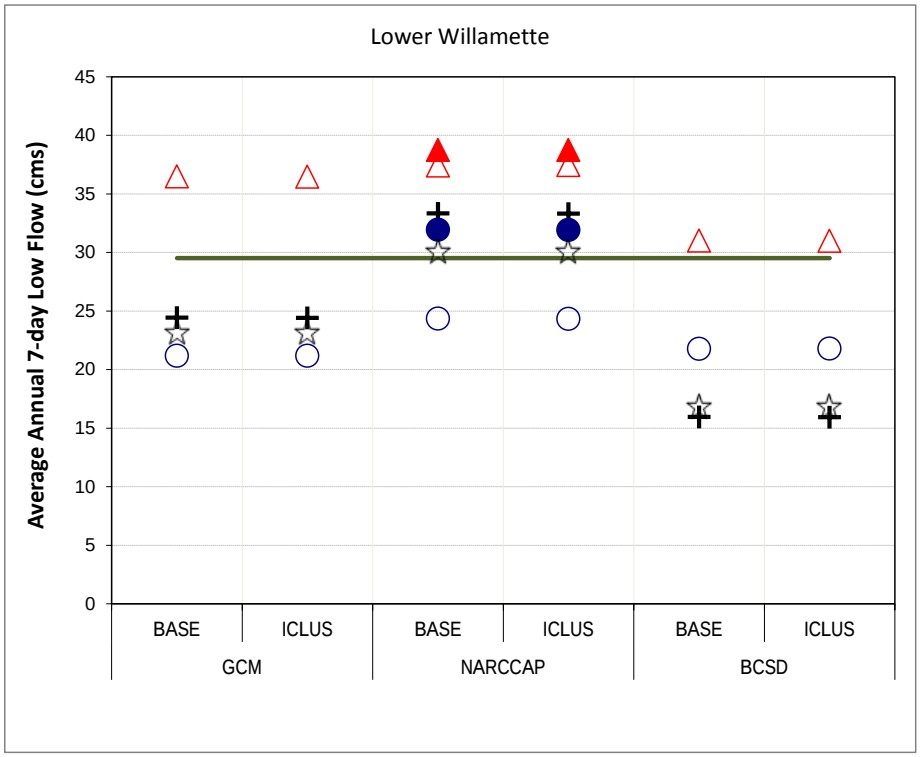

Figure 249. Average Annual 7-day Low Flow, Lower Willamette River (SWAT)

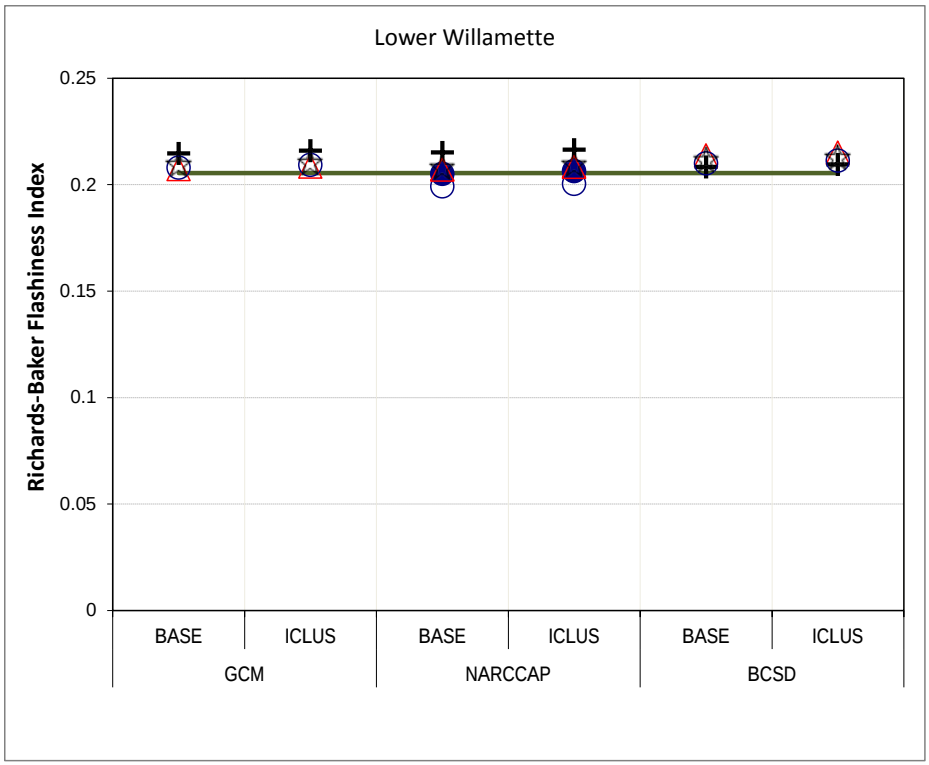

Figure 250. Richards-Baker Flashiness Index, Lower Willamette River (SWAT)

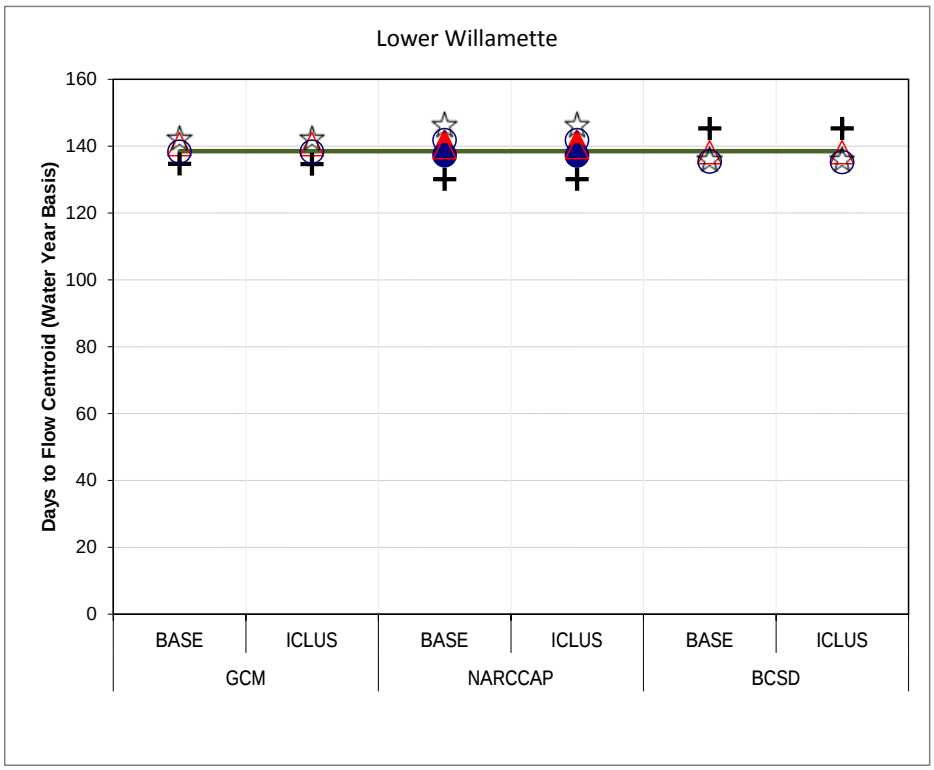

Figure 251. Days to Flow Centroid, Lower Willamette River (SWAT)

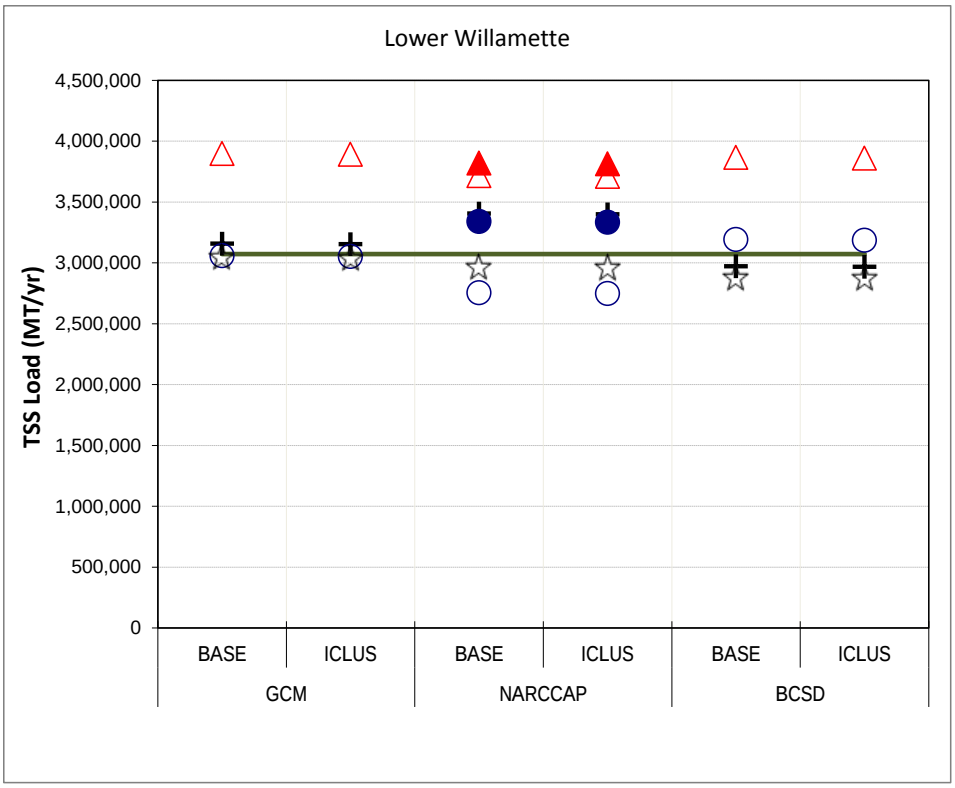

Figure 252. TSS Load, Lower Willamette River (SWAT)

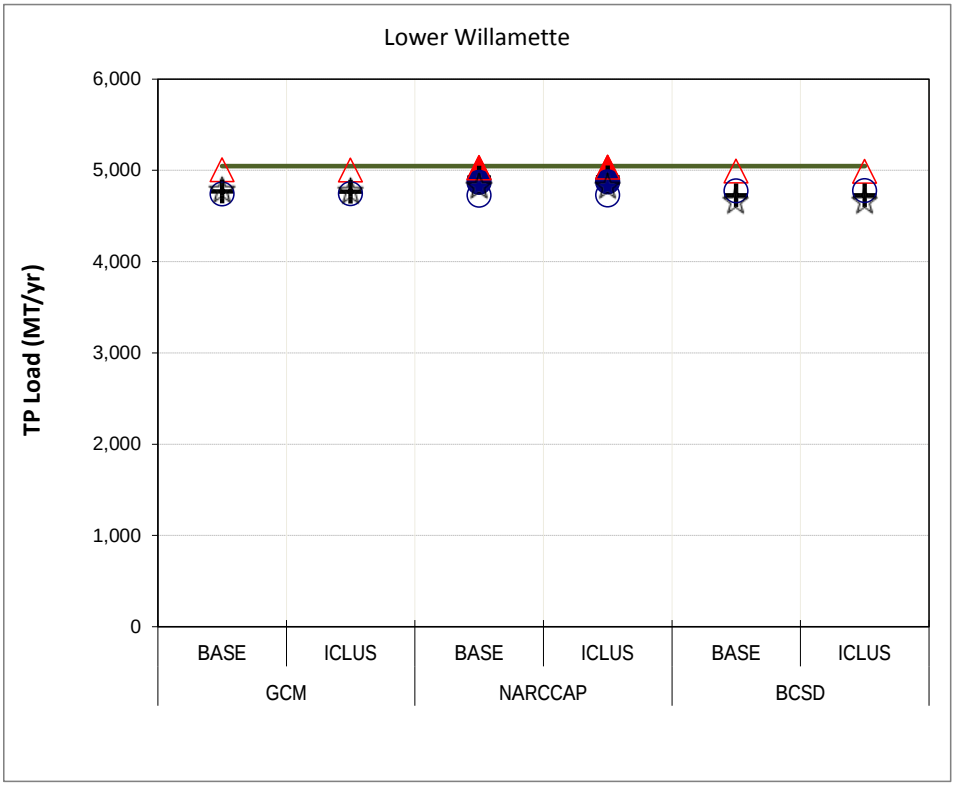

Figure 253. TP Load, Lower Willamette River (SWAT)

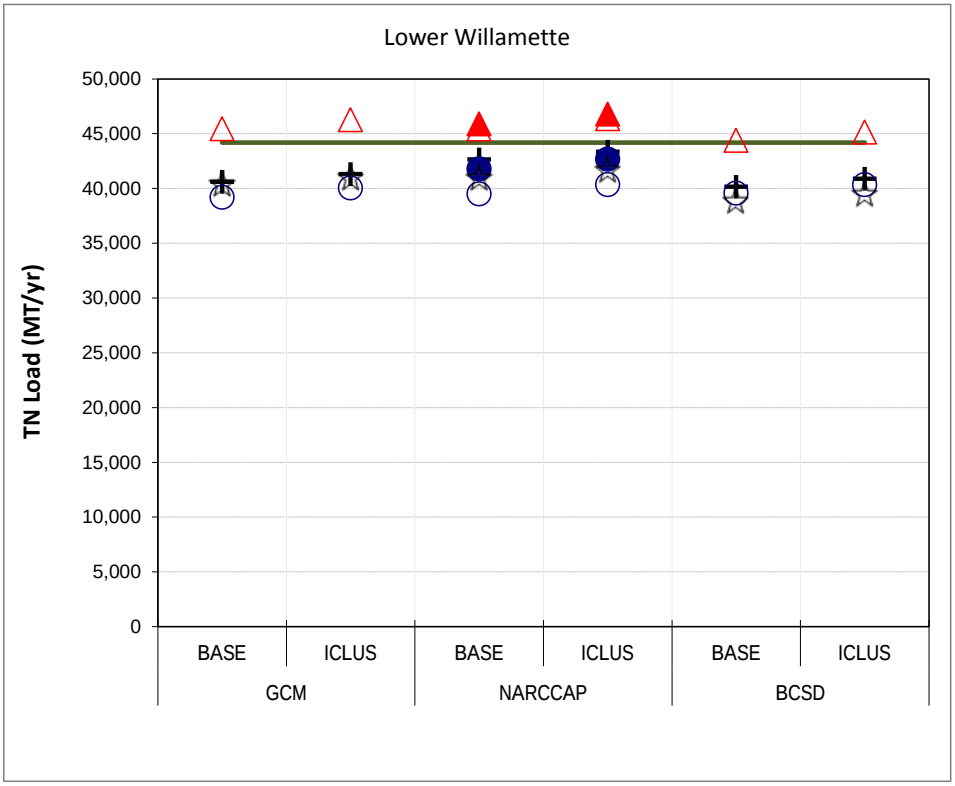

Figure 254. TN Load, Lower Willamette River (SWAT)

Results at Multiple Stations

Table 10. Summary of Range of Change Relative to Existing Conditions for NARCCAP Dynamically Downscaled Scenarios, Willamette River Basin (SWAT)

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Middle Fork Willamette HUC 17090001								
Flow	-17.51%	0.03%	-1.70%	10.39%	-17.51%	0.03%	-1.69%	10.40%
TSS	91.02%	132.96%	135.57%	177.73%	91.33%	133.31%	135.95%	178.19%
TN	49.94%	84.32%	82.64%	110.23%	48.72%	82.46%	80.90%	108.15%
TP	86.17%	142.56%	140.77%	183.53%	83.96%	139.23%	137.48%	179.48%
Coast Fork Willamette HUC 17090002								
Flow	-4.95%	6.37%	7.28%	19.55%	-4.98%	6.34%	7.26%	19.53%
TSS	-4.93%	29.49%	31.31%	63.92%	-4.65%	29.73%	31.54%	64.12%
TN	-14.77%	2.84%	4.93%	24.75%	-15.48%	1.50%	3.68%	23.30%
TP	-19.61%	5.31%	6.77%	31.82%	-19.46%	5.08%	6.60%	31.67%
Upper Willamette HUC 17090003								
Flow	-10.42%	3.89%	2.92%	12.86%	-10.43%	3.89%	2.91%	12.85%
TSS	-1.01%	13.58%	15.18%	31.82%	-0.99%	13.61%	15.20%	31.85%
TN	-7.23%	2.07%	3.41%	13.70%	-7.45%	1.78%	3.13%	13.40%
TP	-10.15%	-0.27%	-0.29%	7.20%	-10.21%	-0.32%	-0.32%	7.20%
McKenzie HUC 17090004								
Flow	-12.39%	5.32%	2.24%	10.76%	-12.39%	5.32%	2.24%	10.76%
TSS	-0.95%	114.25%	105.67%	218.42%	-0.94%	114.53%	105.97%	219.11%
TN	-1.52%	27.74%	22.02%	36.83%	-1.70%	27.11%	21.48%	35.94%
TP	-10.56%	35.02%	24.38%	48.46%	-10.63%	34.55%	24.02%	47.80%
North Santiam HUC 17090005								
Flow	-9.28%	5.21%	5.32%	16.94%	-9.29%	5.21%	5.31%	16.94%
TSS	-7.60%	6.79%	9.26%	29.41%	-7.14%	7.29%	9.76%	29.96%
TN	-14.08%	-3.80%	-3.19%	5.72%	-14.56%	-4.43%	-3.77%	5.07%
TP	-19.42%	-7.42%	-7.20%	1.44%	-19.68%	-7.63%	-7.41%	1.15%
South Santiam HUC 17090006								

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
Flow	-7.77%	4.90%	6.28%	18.21%	-7.77%	4.90%	6.28%	18.21%
TSS	-8.09%	9.51%	11.57%	32.22%	-8.09%	9.51%	11.57%	32.23%
TN	-15.63%	-5.85%	-4.99%	5.14%	-15.62%	-5.90%	-5.02%	5.08%
TP	-19.81%	-8.02%	-7.75%	3.02%	-19.76%	-8.05%	-7.74%	3.01%
Middle Willamette HUC 17090007								
Flow	-8.45%	4.70%	4.53%	15.28%	-8.49%	4.69%	4.51%	15.27%
TSS	-9.71%	8.31%	8.06%	24.61%	-9.65%	8.42%	8.17%	24.70%
TN	-11.45%	-4.78%	-3.64%	3.94%	-11.71%	-5.36%	-4.16%	3.37%
TP	-7.59%	-3.62%	-3.50%	-0.47%	-7.42%	-3.43%	-3.33%	-0.31%
Yamhill HUC 17090008								
Flow	-3.30%	7.65%	9.71%	23.21%	-3.33%	7.64%	9.69%	23.20%
TSS	-8.27%	9.81%	11.30%	30.05%	-8.26%	9.86%	11.35%	30.13%
TN	-14.22%	-6.23%	-5.40%	3.24%	-14.41%	-6.57%	-5.69%	2.98%
TP	-18.00%	-8.13%	-7.82%	0.31%	-18.03%	-8.09%	-7.75%	0.39%
Pudding River at Aurora (gage 14202000)								
Flow	1.31%	5.72%	6.17%	12.04%	1.19%	5.65%	6.09%	11.96%
TSS	0.39%	5.98%	6.80%	15.12%	0.24%	5.94%	6.62%	14.68%
TN	-23.37%	-19.63%	-19.35%	-15.64%	-23.55%	-20.07%	-19.75%	-16.04%
TP	-20.73%	-13.83%	-14.92%	-11.96%	-19.81%	-12.77%	-13.98%	-10.77%
Tualatin HUC 17090010								
Flow	-5.04%	6.49%	8.24%	22.16%	-5.34%	6.31%	8.07%	22.08%
TSS	-7.91%	8.21%	10.43%	29.32%	-8.05%	8.02%	10.51%	29.99%
TN	-12.32%	-7.81%	-6.10%	0.58%	-11.86%	-8.34%	-6.41%	0.15%
TP	-11.04%	-2.89%	-2.18%	5.07%	-10.48%	-2.70%	-1.79%	5.34%
Clackamas HUC 17090011								
Flow	-8.10%	9.04%	7.61%	20.18%	-8.13%	9.01%	7.58%	20.15%
TSS	-8.89%	10.94%	9.11%	27.42%	-8.86%	10.91%	9.10%	27.41%
TN	-7.16%	1.37%	1.83%	9.21%	-7.05%	1.34%	1.88%	9.16%

	Results without LU Change				Results with LU Change			
	Min	Median	Mean	Max	Min	Median	Mean	Max
TP	-7.68%	0.66%	-0.08%	4.89%	-7.28%	1.31%	0.55%	5.60%
Lower Willamette HUC 17090012								
Flow	-8.35%	5.20%	4.91%	15.89%	-8.39%	5.18%	4.89%	15.87%
TSS	-10.38%	9.78%	8.57%	24.33%	-10.31%	9.90%	8.68%	24.49%
TN	-10.62%	-4.47%	-3.33%	3.87%	-10.86%	-4.99%	-3.80%	3.36%
TP	-6.34%	-3.02%	-2.86%	-0.32%	-6.16%	-2.84%	-2.68%	-0.14%
Williamette River at Salem (gage 14191000)								
Flow	-9.99%	4.30%	3.70%	14.23%	-10.00%	4.30%	3.70%	14.23%
TSS	-9.58%	11.57%	9.93%	24.93%	-9.51%	11.67%	10.03%	25.04%
TN	-9.63%	-0.42%	0.79%	10.54%	-9.95%	-0.83%	0.41%	10.15%
TP	-13.20%	-3.34%	-3.23%	4.13%	-13.30%	-3.34%	-3.24%	4.19%
Mohawk River nr Springfield (gage 14165000)								
Flow	-8.80%	3.09%	2.34%	12.39%	-8.80%	3.09%	2.34%	12.39%
TSS	6.65%	2391.16 %	2875.55 %	8244.24 %	17.29%	2396.01 %	2878.21 %	8232.58 %
TN	8.19%	80.12%	63.54%	102.34%	6.78%	76.20%	60.19%	97.67%
TP	-1.08%	132.86%	101.95%	165.98%	-2.24%	128.33%	98.19%	160.61%

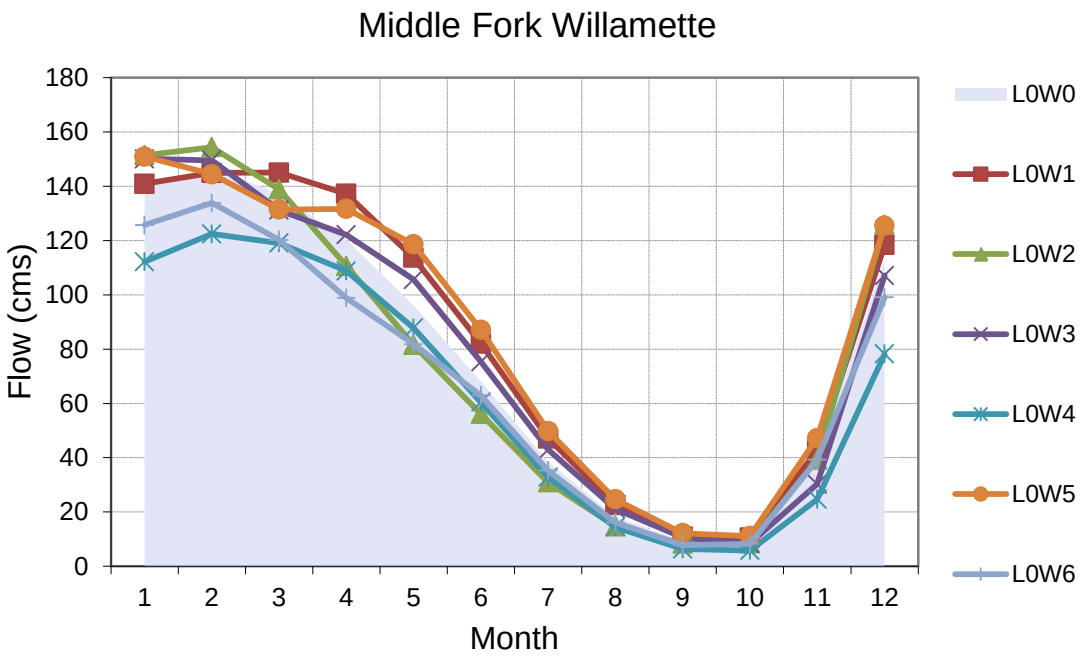

Figure 255. Monthly Average Flows, Middle Fork Willamette River (SWAT)

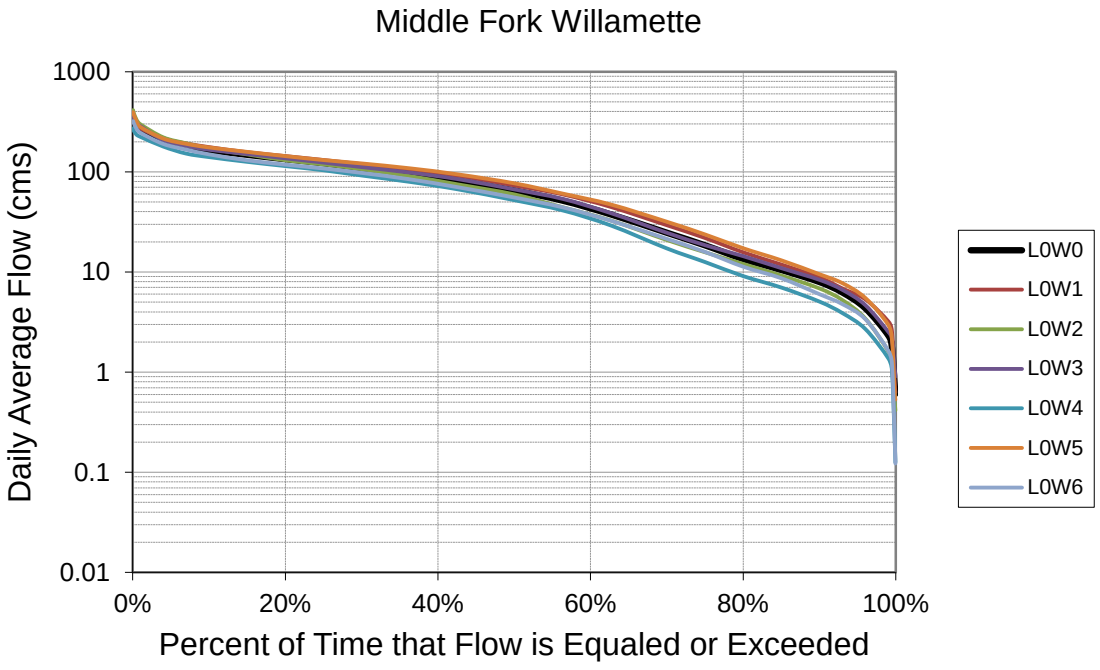

Figure 256. Flow Duration, Middle Fork Willamette River (SWAT)

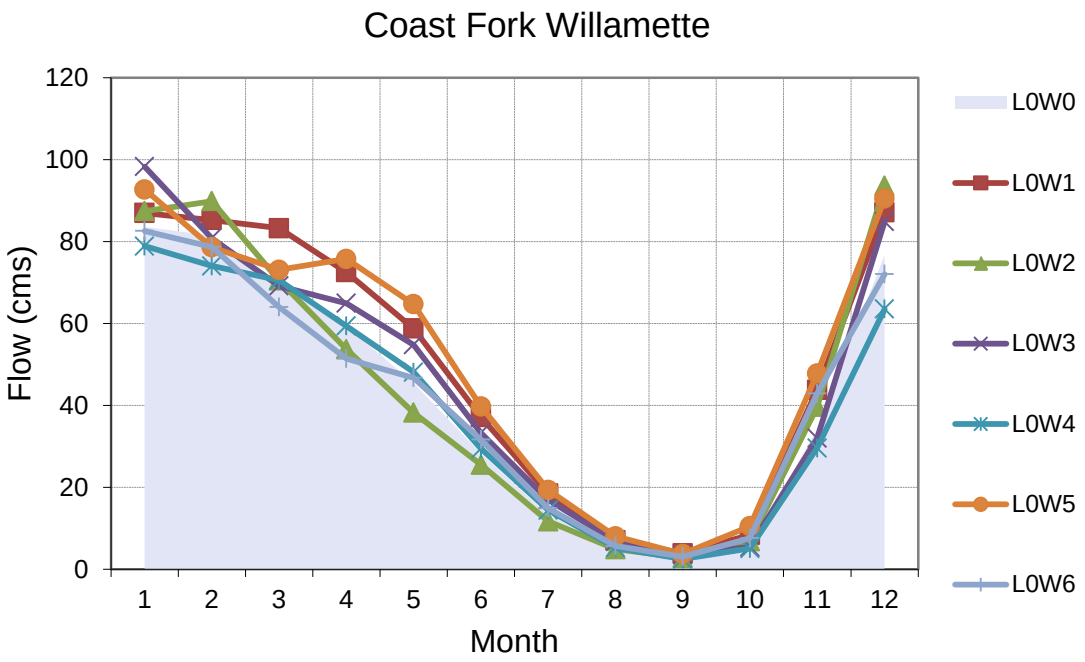

Figure 257. Monthly Average Flows, Coast Fork Willamette River (SWAT)

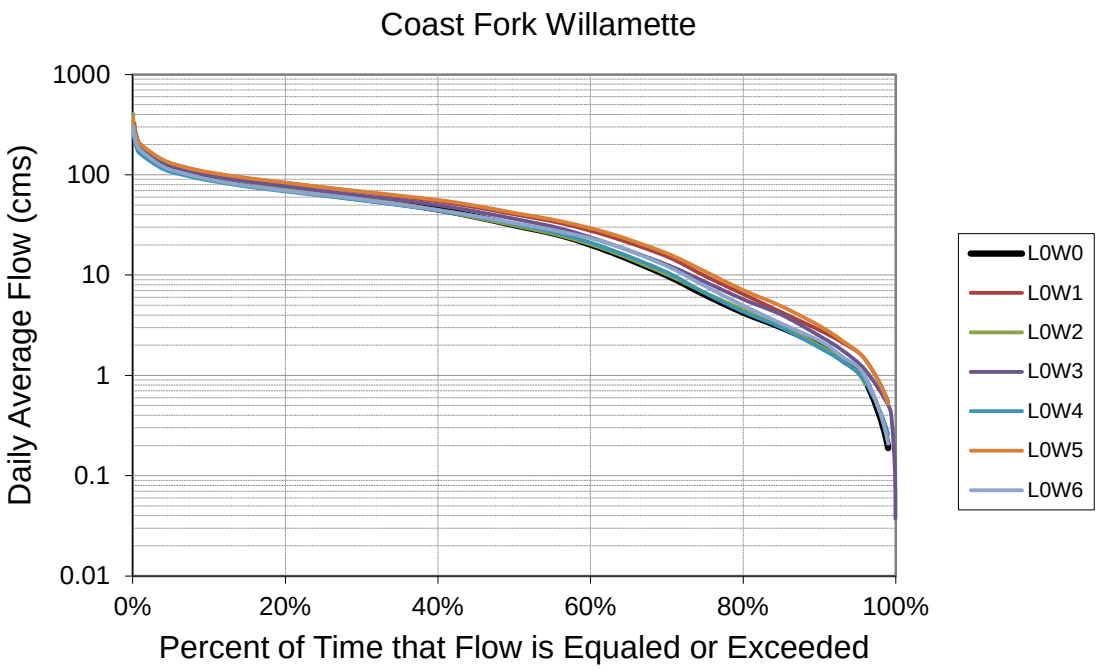

Figure 258. Flow Duration, Coast Fork Willamette River (SWAT)

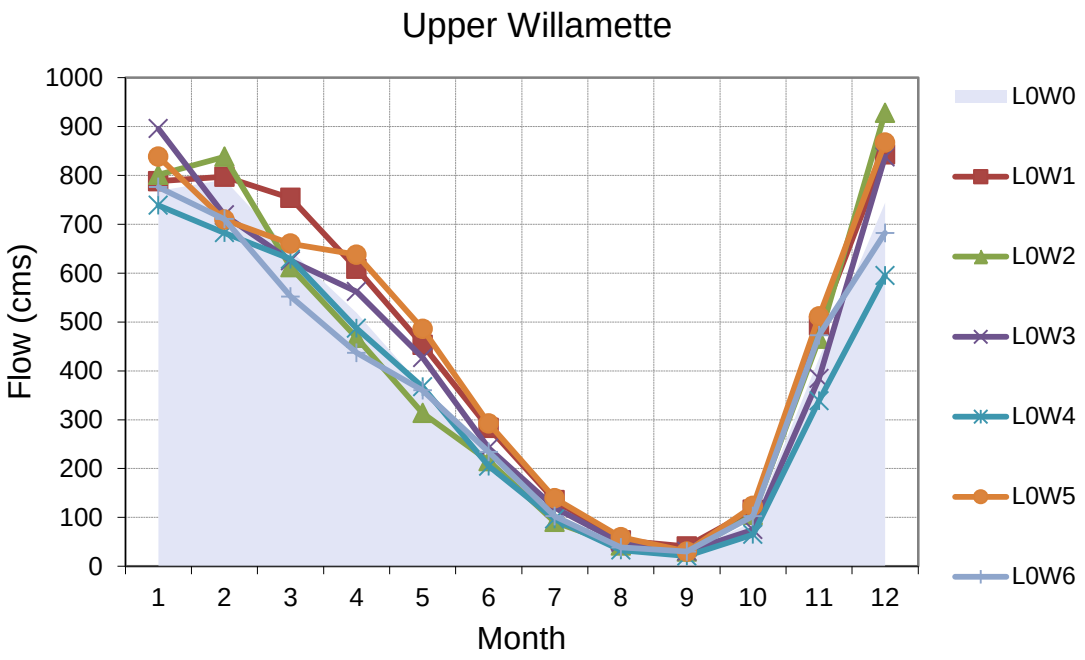

Figure 259. Monthly Average Flows, Upper Willamette River (SWAT)

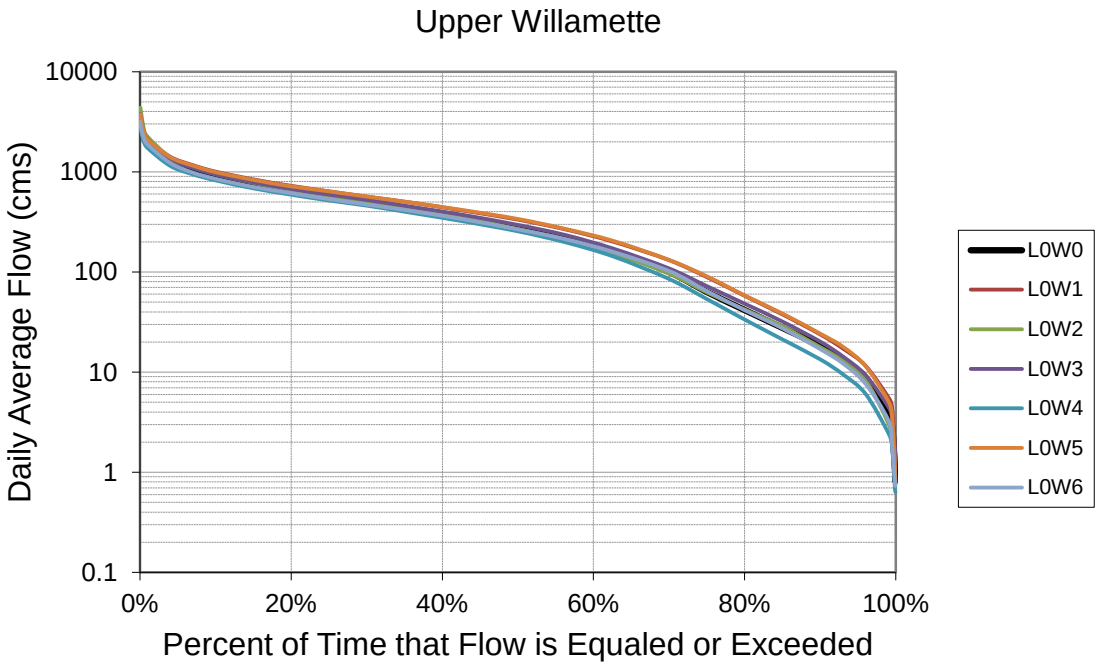

Figure 260. Flow Duration, Upper Willamette River (SWAT)

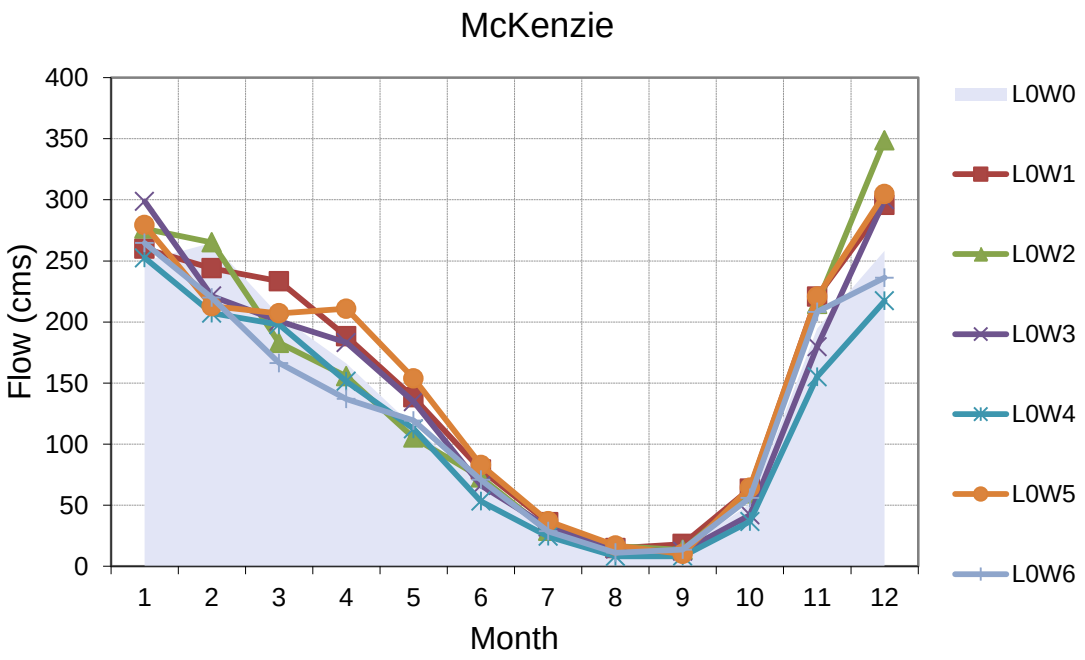

Figure 261. Monthly Average Flows, McKenzie River (SWAT)

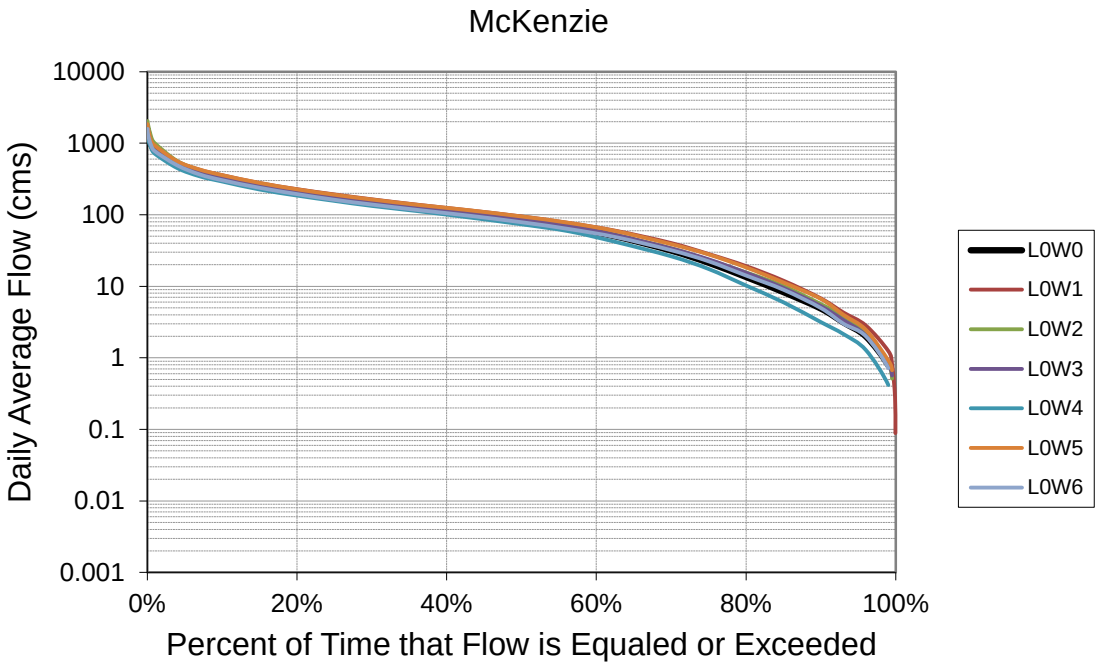

Figure 262. Flow Duration, McKenzie River (SWAT)

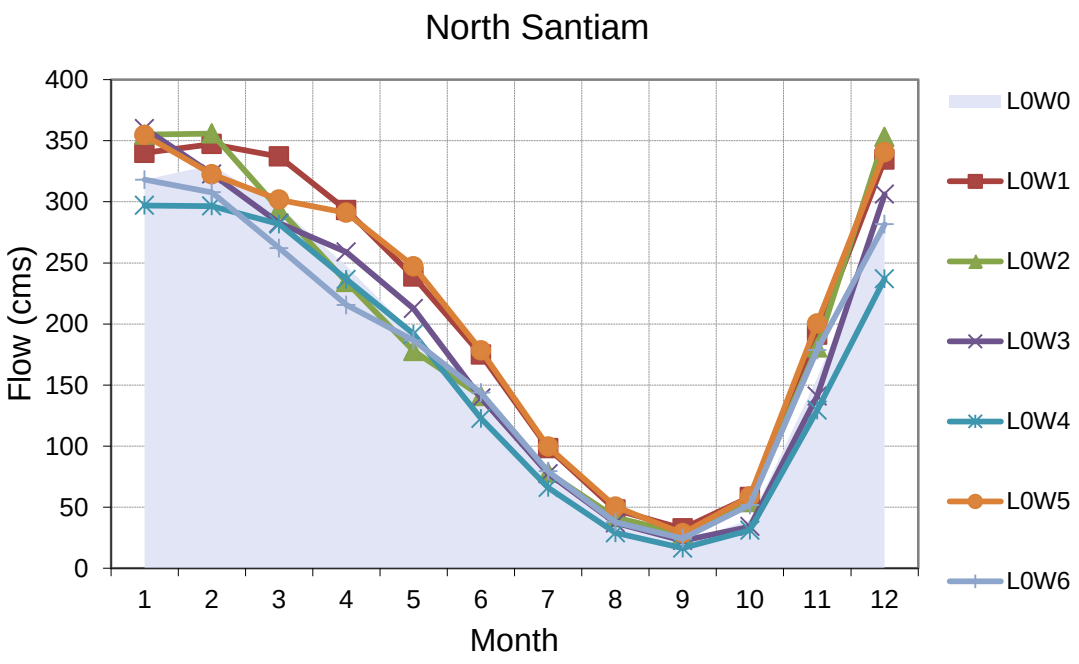

Figure 263. Monthly Average Flows, North Santiam River (SWAT)

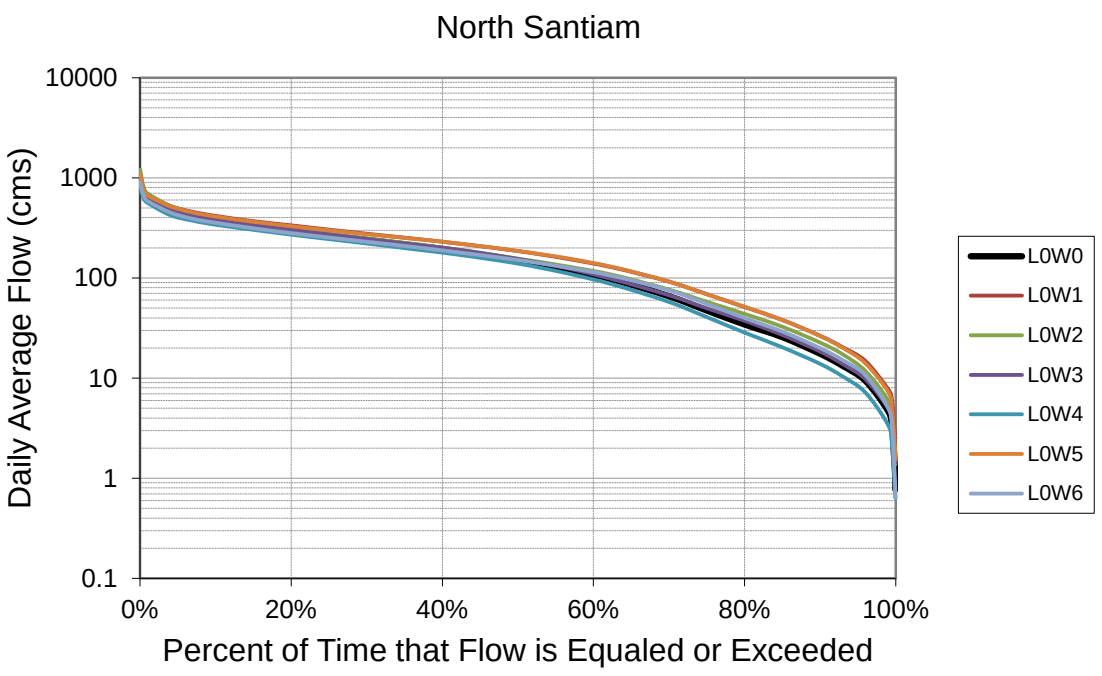

Figure 264. Flow Duration, North Santiam River (SWAT)

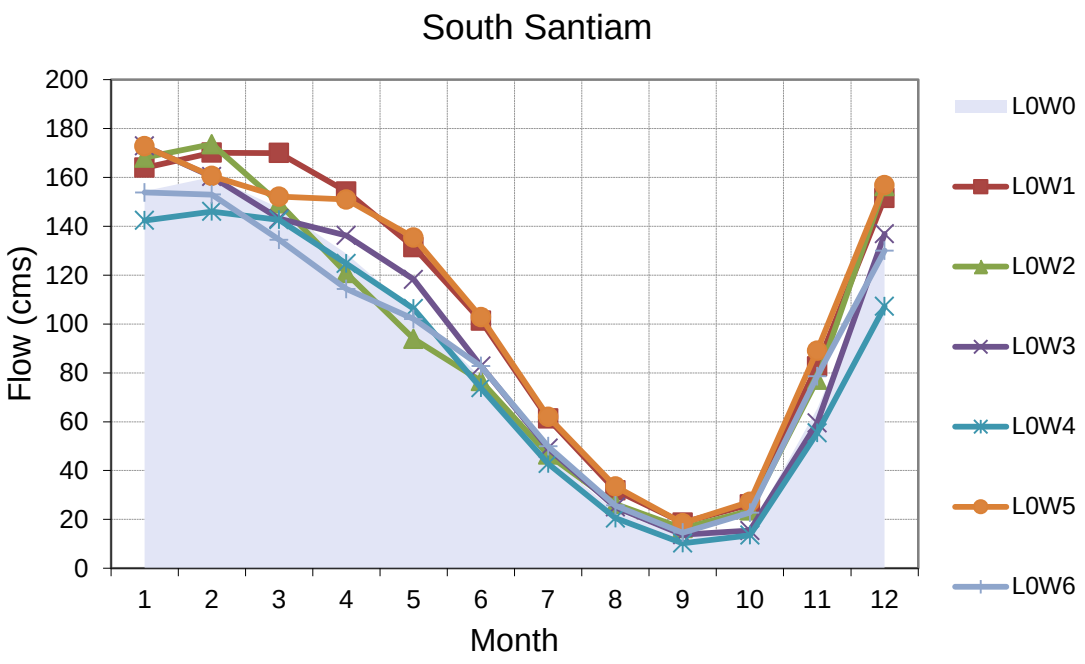

Figure 265. Monthly Average Flows, South Santiam River (SWAT)

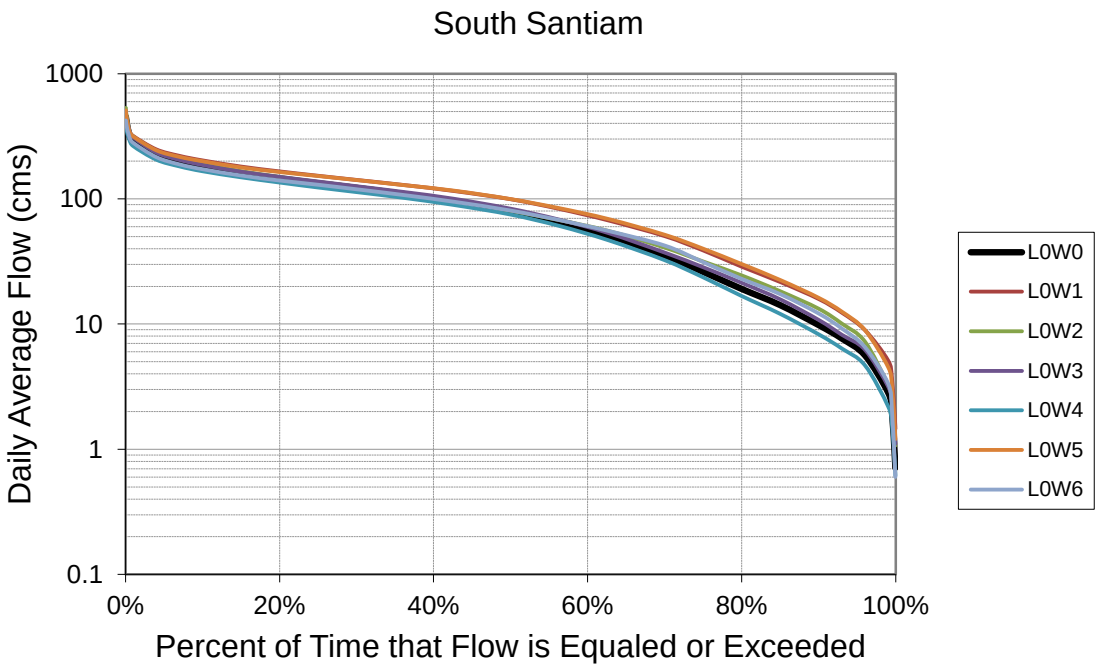

Figure 266. Flow Duration, South Santiam River (SWAT)

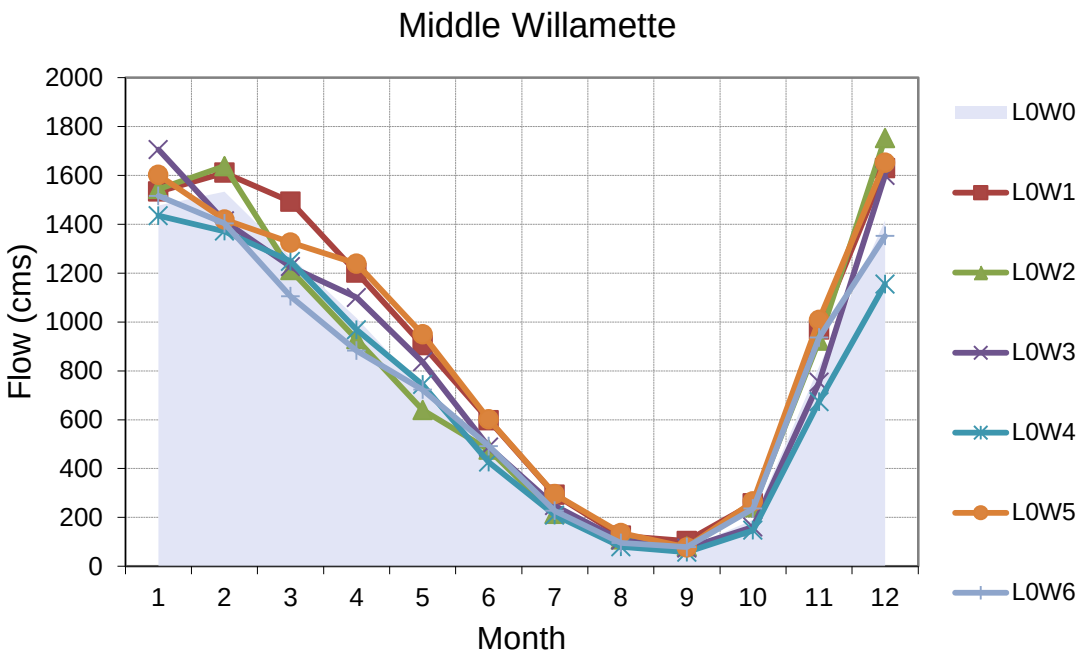

Figure 267. Monthly Average Flows, Middle Willamette River (SWAT)

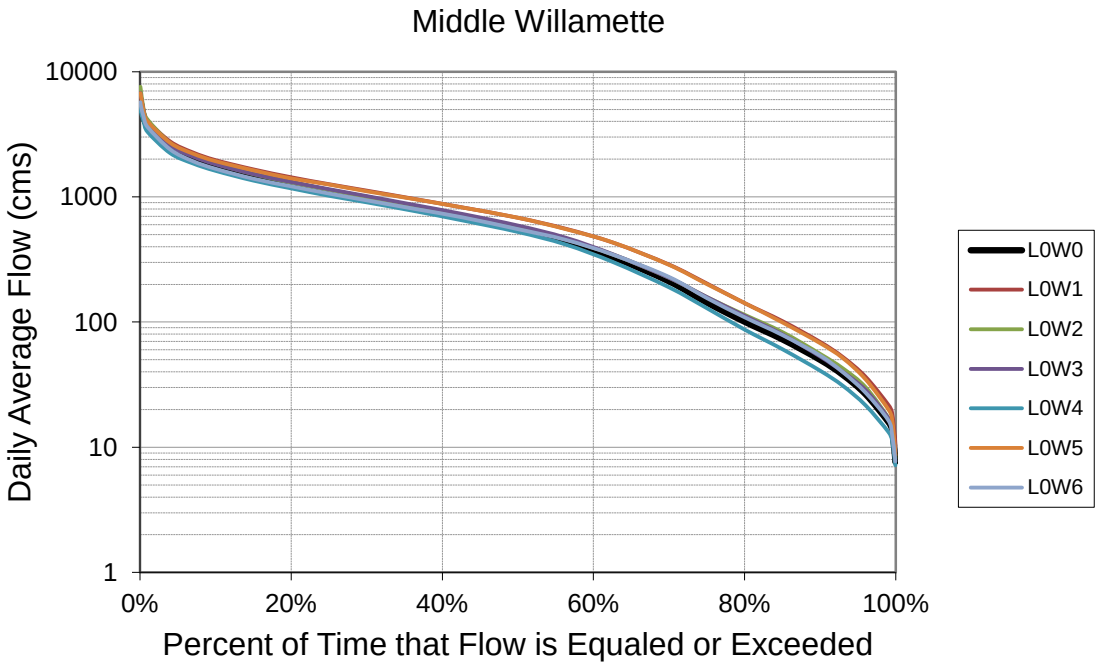

Figure 268. Flow Duration, Middle Willamette River (SWAT)

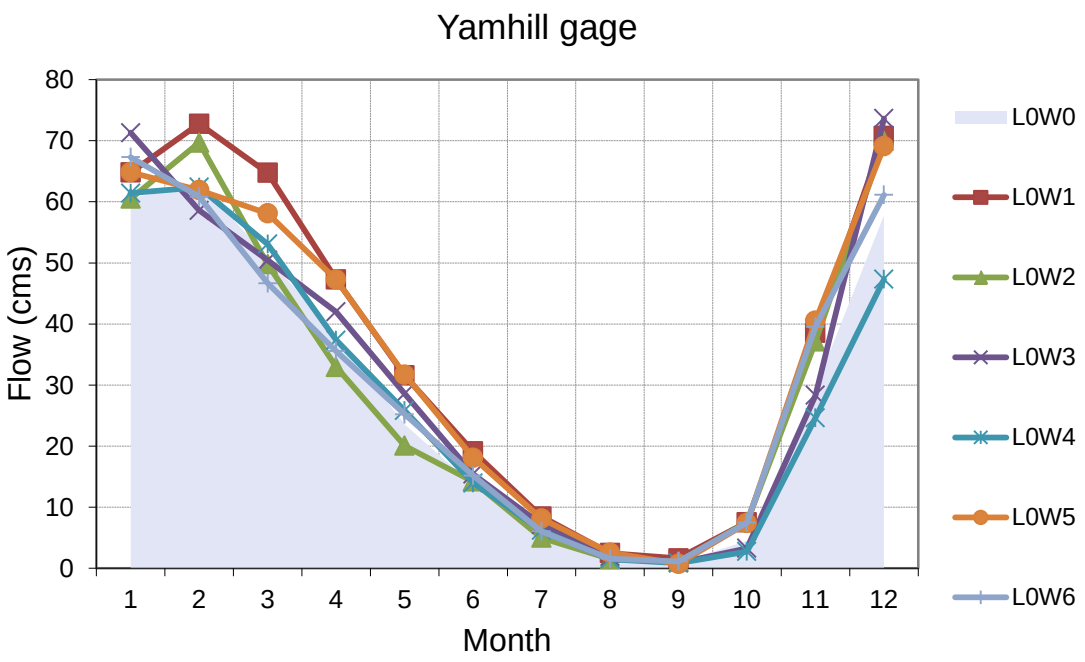

Figure 269. Monthly Average Flows, Yamhill River (SWAT)

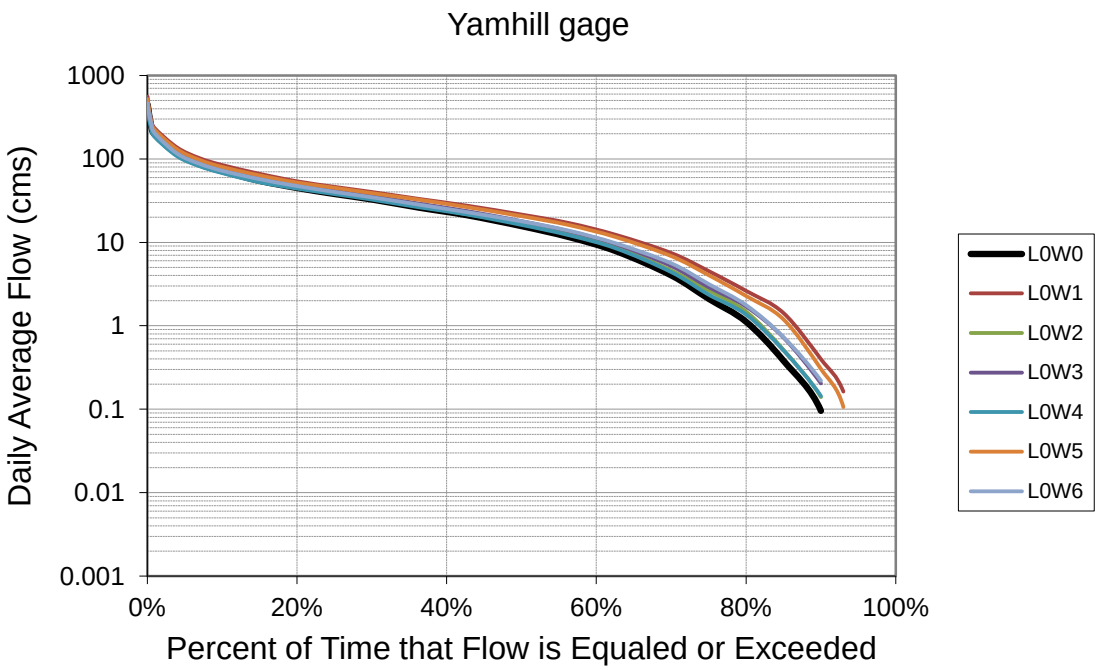

Figure 270. Flow Duration, Yamhill River (SWAT)

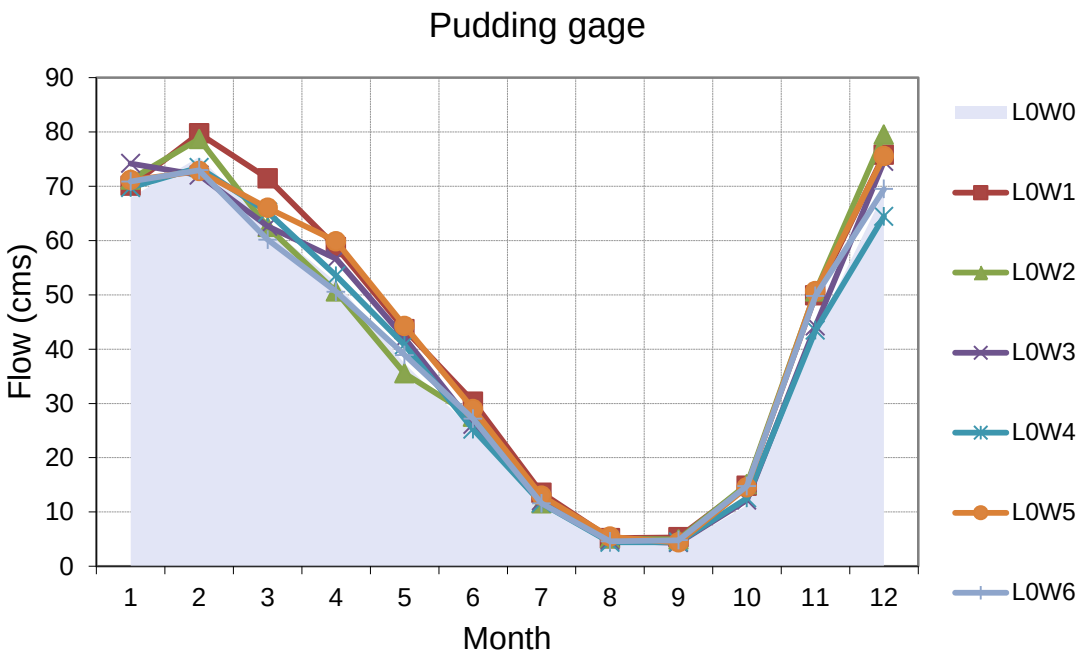

Figure 271. Monthly Average Flows, Pudding River (SWAT)

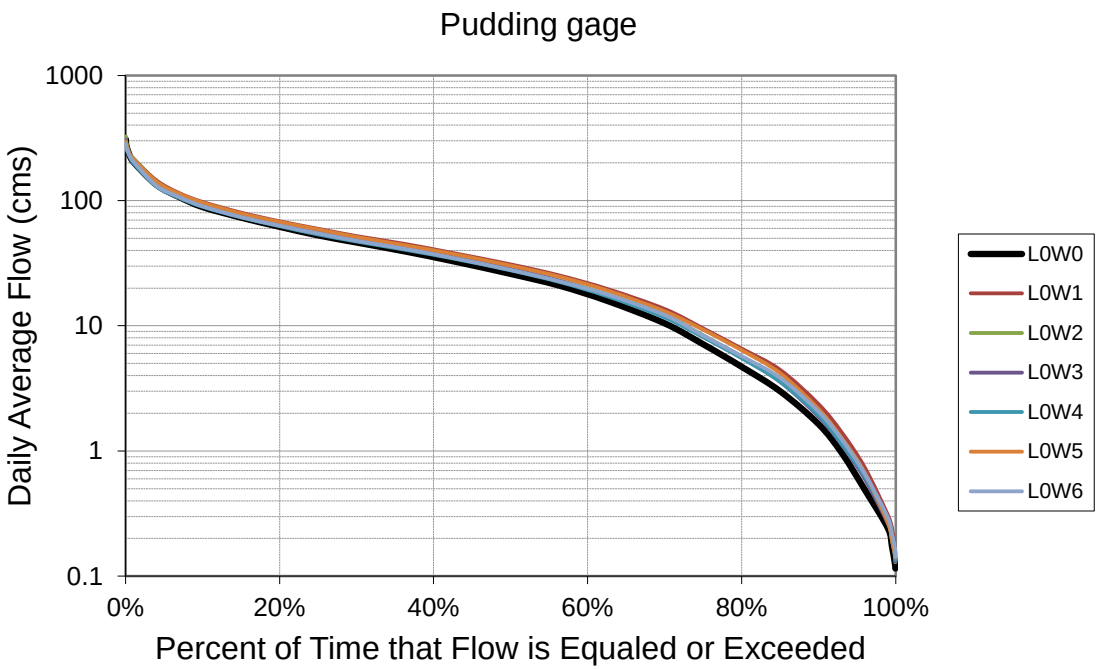

Figure 272. Flow Duration, Pudding River (SWAT)

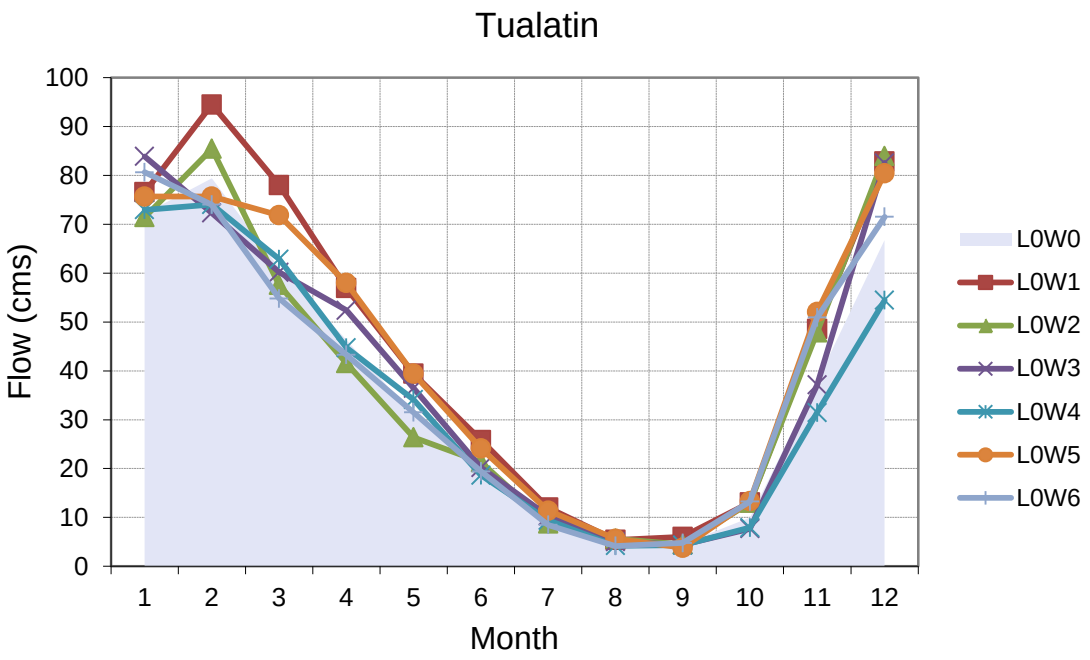

Figure 273. Monthly Average Flows, Tualatin River (SWAT)

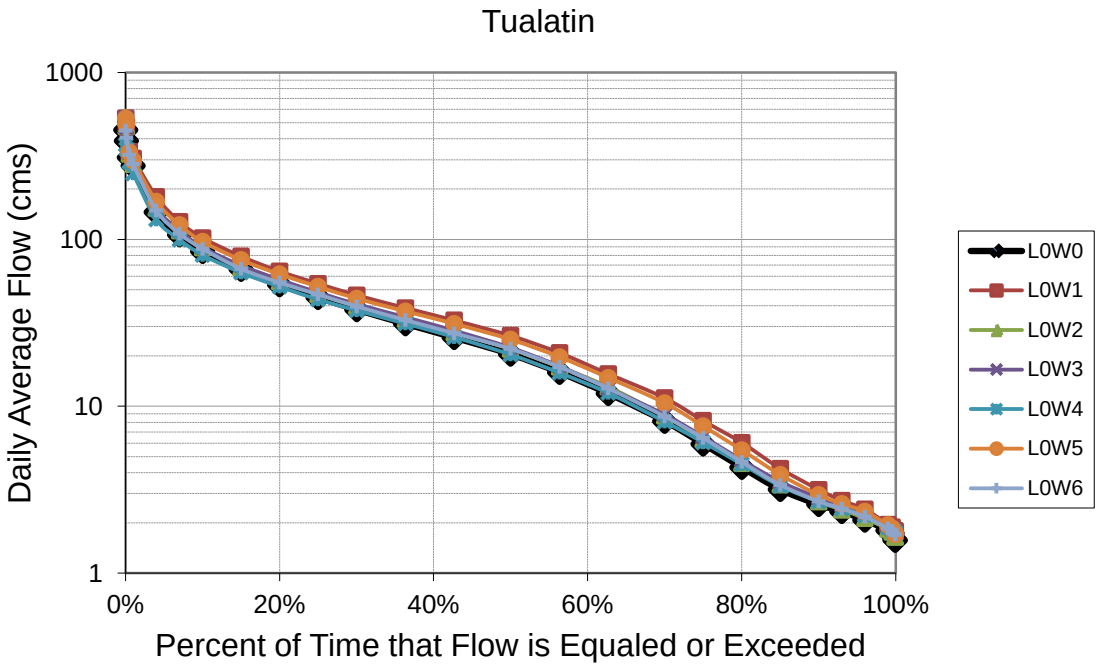

Figure 274. Flow Duration, Tualatin River (SWAT)

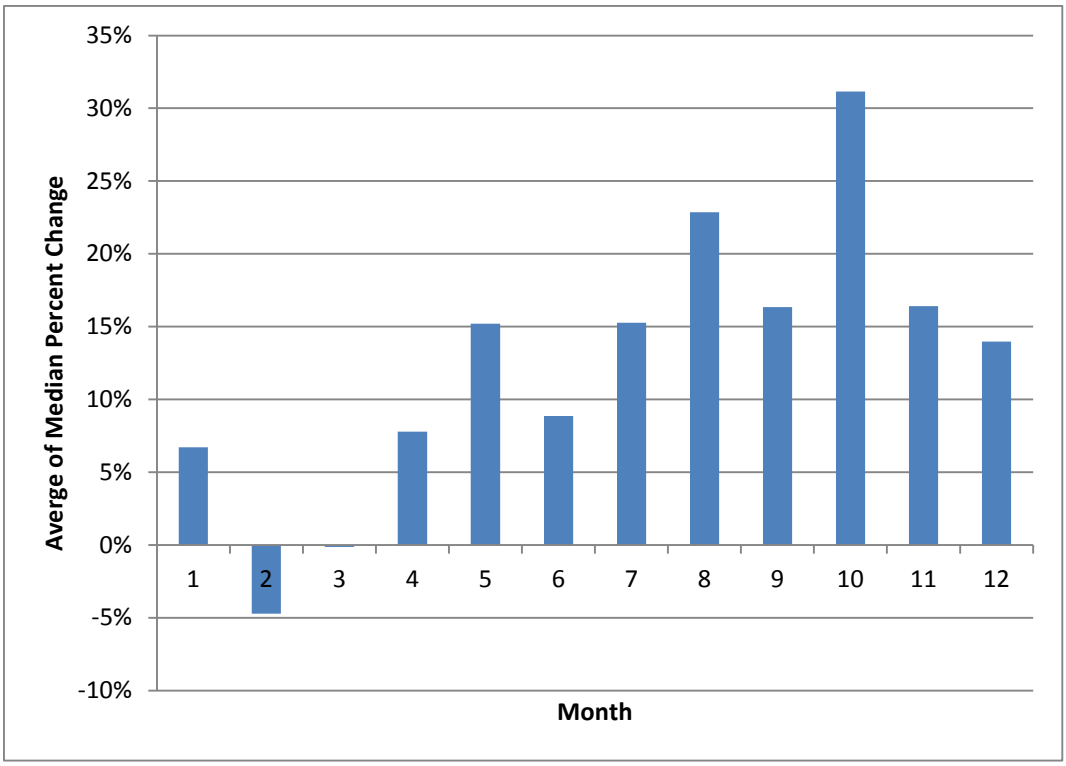

Figure 275. Average of Median Percent Change in Flow; NARCCAP Scenarios W1-W6 at all Stations, Willamette River Basin (SWAT)