# Appendix for Model 03070107

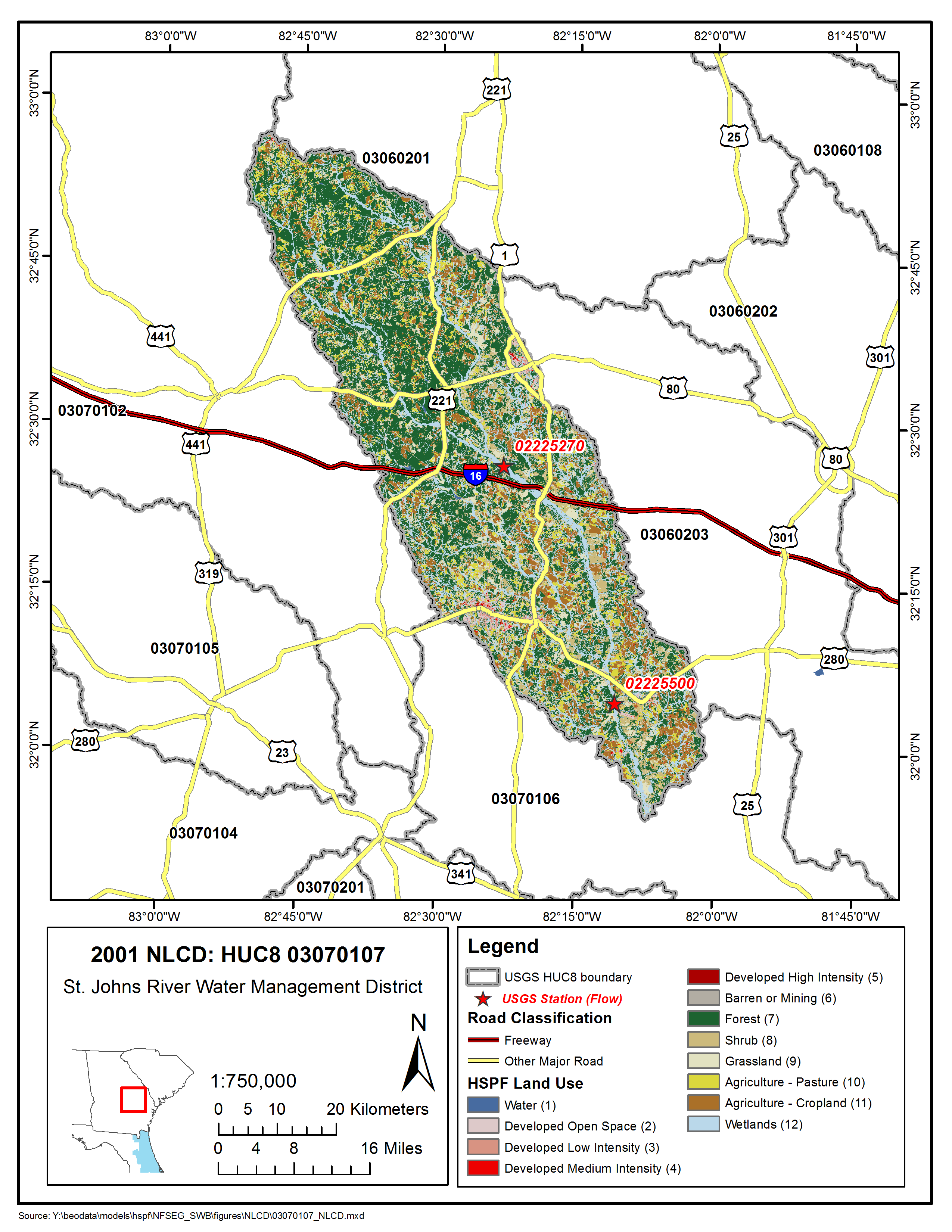


Figure 03070107-1: Land Cover from the National Land Cover Database.

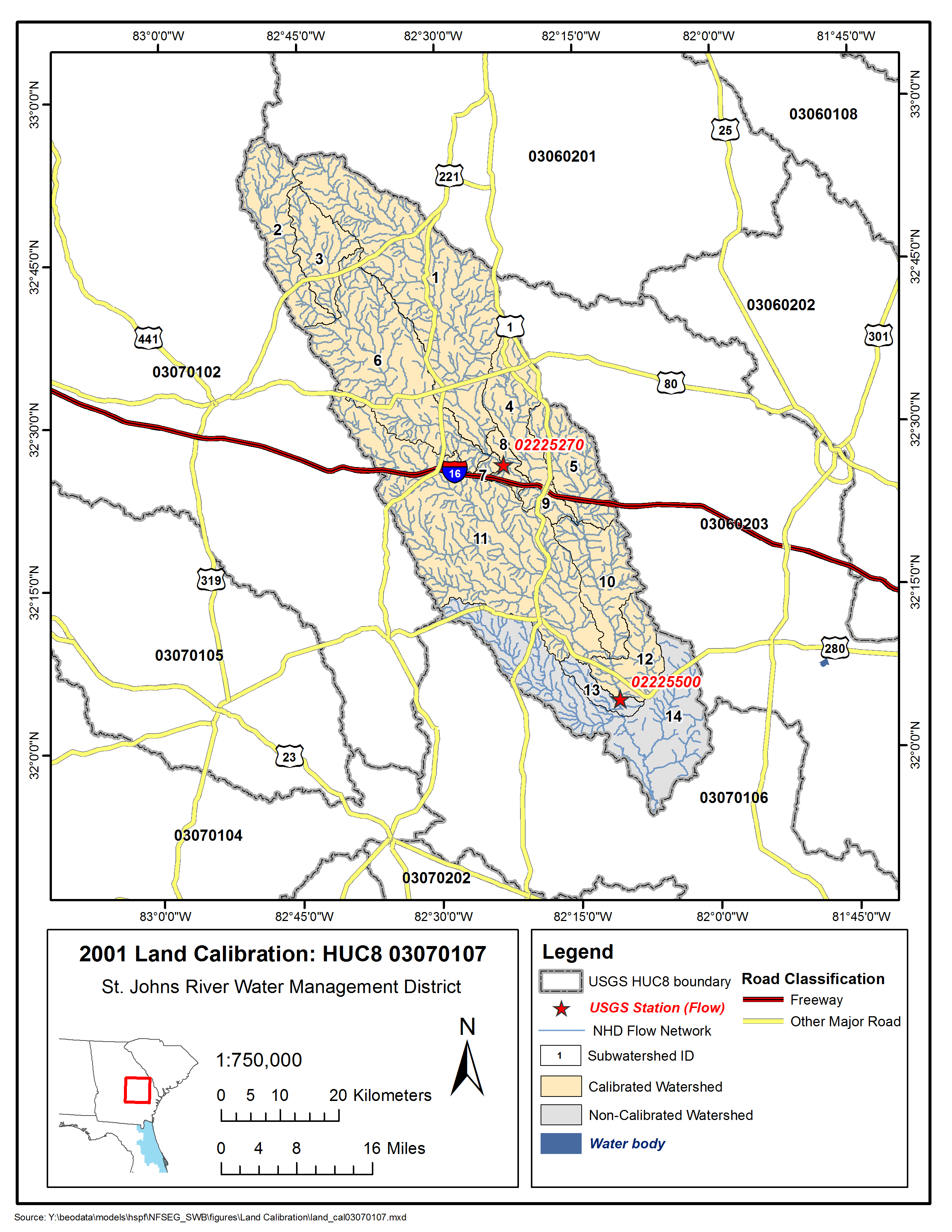


Figure 03070107-2: Calibrated sub-watersheds.

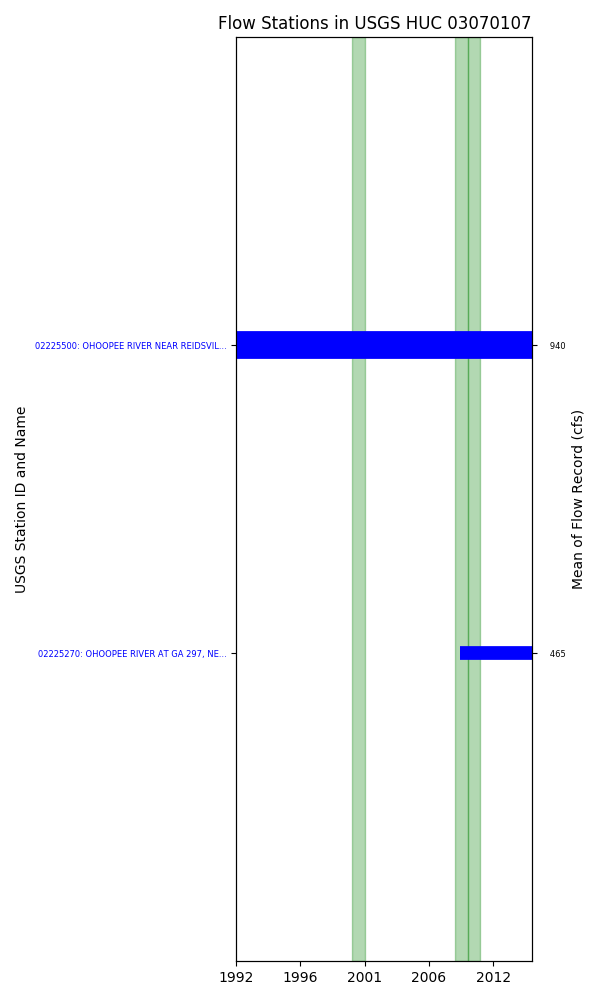


Figure 03070107-3: Station period of record. Blue color identifies gauges used for calibration.

## HSPF Reach 07, USGS Gauge 02225270

Table 03070107-1: Comparison Statistics Between HSPF Reach 07 and USGS Gauge 02225270.

|  |  |
| --- | --- |
| Statistic | Value |
| Bias | -110.89 |
| Standard error | 327.12 |
| Relative bias | -0.23 |
| Relative standard error | 0.42 |
| Nash-Sutcliffe coefficient | 0.82 |
| Kling-Gupta coefficient | 0.66 |
| Coefficient of efficiency | 0.76 |
| Index of agreement | 0.87 |

Table 03070107-2: Hydrologic Indices Between USGS Gauge 02225270 and HSPF Reach 07.

|  |  |  |  |
| --- | --- | --- | --- |
| Hydrologic Index and description (Olden and Poff, 2003) | Observed 02225270 | Simulated Reach 07 | Percent Difference |
| MA1: Mean, all daily flows | 473.85 | 364.85 | -23.00 |
| MA2: Median, all daily flows | 53.00 | 74.90 | 41.33 |
| MA3: CV, all daily flows | 133.63 | 114.50 | -14.32 |
| MA4: CV, log of all daily flows | 194.77 | 166.95 | -14.28 |
| MA5: Mean daily flow / median daily flow | 8.94 | 4.87 | -45.52 |
| MA9: (Q10 - Q90) / median daily flow | 24.81 | 13.94 | -43.82 |
| MA10: (Q20 - Q80) / median daily flow | 11.45 | 6.80 | -40.56 |
| MA11: (Q25 - Q75) / median daily flow | 7.08 | 4.50 | -36.42 |
| MA12: Mean monthly flow, January | 517.32 | 452.91 | -12.45 |
| MA13: Mean monthly flow, February | 960.57 | 810.00 | -15.68 |
| MA14: Mean monthly flow, March | 615.69 | 535.02 | -13.10 |
| MA15: Mean monthly flow, April | 300.19 | 232.13 | -22.67 |
| MA16: Mean monthly flow, May | 182.19 | 100.02 | -45.10 |
| MA17: Mean monthly flow, June | 384.26 | 168.08 | -56.26 |
| MA18: Mean monthly flow, July | 473.08 | 190.78 | -59.67 |
| MA19: Mean monthly flow, August | 361.05 | 305.16 | -15.48 |
| MA20: Mean monthly flow, September | 77.78 | 92.79 | 19.31 |
| MA21: Mean monthly flow, October | 36.79 | 54.57 | 48.34 |
| MA22: Mean monthly flow, November | 95.67 | 93.82 | -1.93 |
| MA23: Mean monthly flow, December | 484.77 | 419.14 | -13.54 |
| ML1: Mean minimum monthly flow, January | 276.80 | 242.61 | -12.35 |
| ML2: Mean minimum monthly flow, February | 303.25 | 288.46 | -4.88 |
| ML3: Mean minimum monthly flow, March | 378.75 | 400.74 | 5.81 |
| ML4: Mean minimum monthly flow, April | 140.12 | 111.77 | -20.23 |
| ML5: Mean minimum monthly flow, May | 31.77 | 43.19 | 35.95 |
| ML6: Mean minimum monthly flow, June | 19.57 | 33.50 | 71.19 |
| ML7: Mean minimum monthly flow, July | 124.75 | 76.64 | -38.57 |
| ML8: Mean minimum monthly flow, August | 46.00 | 51.93 | 12.90 |
| ML9: Mean minimum monthly flow, September | 23.29 | 21.87 | -6.11 |
| ML10: Mean minimum monthly flow, October | 19.83 | 30.44 | 53.49 |
| ML11: Mean minimum monthly flow, November | 33.56 | 49.97 | 48.89 |
| ML12: Mean minimum monthly flow, December | 100.66 | 119.74 | 18.96 |
| ML13: CV of minimum monthly flows | 194.54 | 170.39 | -12.41 |
| ML14: Mean minimum daily flow / mean median annual flow | 0.11 | 0.09 | -14.18 |
| ML15: Mean minimum annual flow / mean annual flow | 0.04 | 0.04 | -0.79 |
| ML16: Median minimum annual flow / median annual flow | 0.02 | 0.05 | 125.57 |
| ML20: Ratio of baseflow volume to total flow volume | 0.42 | 0.52 | 24.93 |
| ML22: Mean annual minimum flow divided by catchment area | 0.05 | 0.04 | -13.08 |
| RA1: Mean of positive changes from one day to next (rise rate) | 159.14 | 72.07 |  |
| RA2: CV, mean of positive changes from one day to next (rise rate) | 315.53 | 331.49 |  |
| RA3: Mean of negative changes from one day to next (fall rate) | 87.98 | 35.21 |  |
| RA4: CV, mean of negative changes from one day to next (fall rate) | 270.18 | 231.74 |  |
| RA5: Ratio of days that are higher than previous day | 0.34 | 0.33 |  |
| RA6: Median of difference in log of flows over two consecutive days of rising | 0.17 | 0.09 |  |
| RA7: Median of difference in log of flows over two consecutive days of falling | 0.13 | 0.08 |  |
| RA8: Number of flow reversals from one day to the next | 57.83 | 55.50 |  |
| RA9: CV, number of flow reversals from one day to the next | 53.09 | 52.61 |  |

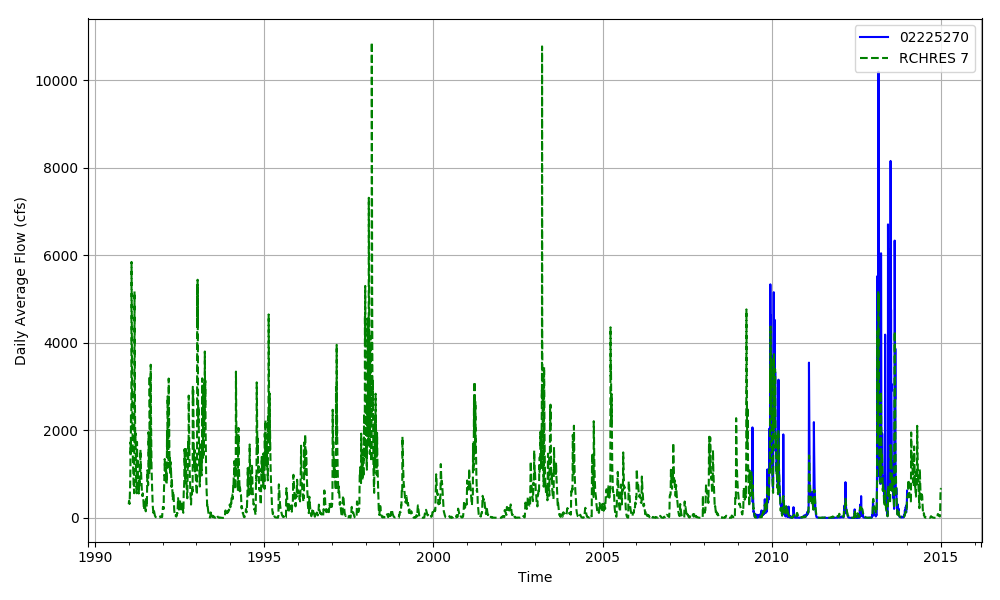


Figure 03070107-4: Daily flow for HSFP reach 07 and USGS station 02225270.

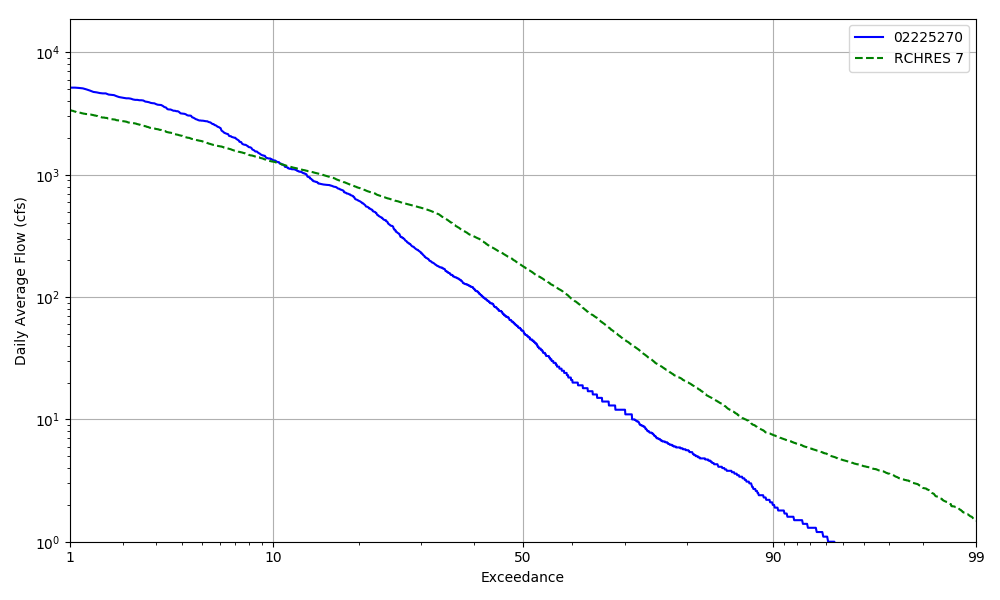


Figure 03070107-5: Daily exceedance for HSFP reach 07 and USGS station 02225270.

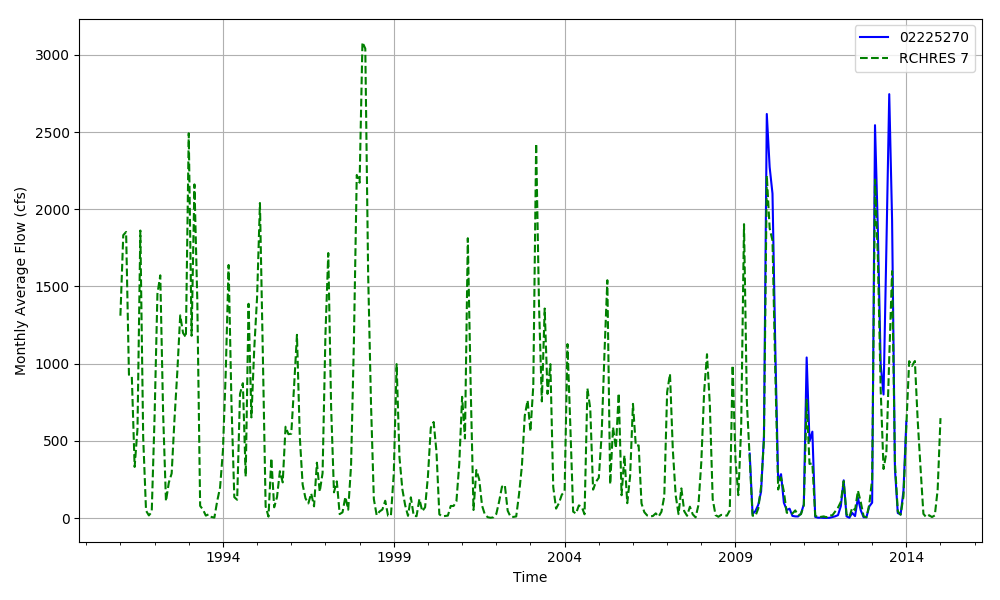


Figure 03070107-6: Monthly flow for HSFP reach 07 and USGS station 02225270.

## HSPF Reach 12, USGS Gauge 02225500

Table 03070107-3: Comparison Statistics Between HSPF Reach 12 and USGS Gauge 02225500.

|  |  |
| --- | --- |
| Statistic | Value |
| Bias | 10.08 |
| Standard error | 336.11 |
| Relative bias | 0.01 |
| Relative standard error | 0.27 |
| Nash-Sutcliffe coefficient | 0.93 |
| Kling-Gupta coefficient | 0.95 |
| Coefficient of efficiency | 0.77 |
| Index of agreement | 0.88 |

Table 03070107-4: Hydrologic Indices Between USGS Gauge 02225500 and HSPF Reach 12.

|  |  |  |  |
| --- | --- | --- | --- |
| Hydrologic Index and description (Olden and Poff, 2003) | Observed 02225500 | Simulated Reach 12 | Percent Difference |
| MA1: Mean, all daily flows | 982.84 | 993.39 | 1.07 |
| MA2: Median, all daily flows | 326.00 | 443.14 | 35.93 |
| MA3: CV, all daily flows | 128.13 | 112.61 | -12.11 |
| MA4: CV, log of all daily flows | 129.84 | 121.14 | -6.70 |
| MA5: Mean daily flow / median daily flow | 3.01 | 2.24 | -25.64 |
| MA9: (Q10 - Q90) / median daily flow | 8.07 | 5.79 | -28.17 |
| MA10: (Q20 - Q80) / median daily flow | 4.76 | 3.35 | -29.67 |
| MA11: (Q25 - Q75) / median daily flow | 3.57 | 2.62 | -26.46 |
| MA12: Mean monthly flow, January | 1451.33 | 1472.24 | 1.44 |
| MA13: Mean monthly flow, February | 2112.92 | 2075.05 | -1.79 |
| MA14: Mean monthly flow, March | 2265.34 | 2124.32 | -6.23 |
| MA15: Mean monthly flow, April | 1351.92 | 1264.34 | -6.48 |
| MA16: Mean monthly flow, May | 496.71 | 442.51 | -10.91 |
| MA17: Mean monthly flow, June | 489.94 | 454.56 | -7.22 |
| MA18: Mean monthly flow, July | 418.10 | 468.50 | 12.06 |
| MA19: Mean monthly flow, August | 669.91 | 726.34 | 8.42 |
| MA20: Mean monthly flow, September | 448.40 | 502.12 | 11.98 |
| MA21: Mean monthly flow, October | 434.53 | 526.84 | 21.24 |
| MA22: Mean monthly flow, November | 386.77 | 506.54 | 30.97 |
| MA23: Mean monthly flow, December | 877.01 | 955.83 | 8.99 |
| ML1: Mean minimum monthly flow, January | 653.25 | 640.84 | -1.90 |
| ML2: Mean minimum monthly flow, February | 1005.74 | 993.67 | -1.20 |
| ML3: Mean minimum monthly flow, March | 1022.30 | 946.51 | -7.41 |
| ML4: Mean minimum monthly flow, April | 490.48 | 518.33 | 5.68 |
| ML5: Mean minimum monthly flow, May | 171.26 | 170.32 | -0.55 |
| ML6: Mean minimum monthly flow, June | 115.09 | 111.46 | -3.15 |
| ML7: Mean minimum monthly flow, July | 161.00 | 200.86 | 24.76 |
| ML8: Mean minimum monthly flow, August | 213.65 | 319.76 | 49.66 |
| ML9: Mean minimum monthly flow, September | 99.57 | 138.61 | 39.21 |
| ML10: Mean minimum monthly flow, October | 118.48 | 164.01 | 38.43 |
| ML11: Mean minimum monthly flow, November | 188.04 | 282.10 | 50.02 |
| ML12: Mean minimum monthly flow, December | 374.61 | 462.33 | 23.42 |
| ML13: CV of minimum monthly flows | 141.03 | 129.59 | -8.11 |
| ML14: Mean minimum daily flow / mean median annual flow | 0.16 | 0.05 | -71.63 |
| ML15: Mean minimum annual flow / mean annual flow | 0.07 | 0.03 | -54.87 |
| ML16: Median minimum annual flow / median annual flow | 0.13 | 0.01 | -90.44 |
| ML20: Ratio of baseflow volume to total flow volume | 0.56 | 0.59 | 6.49 |
| ML22: Mean annual minimum flow divided by catchment area | 0.47 | 0.34 | -27.14 |
| RA1: Mean of positive changes from one day to next (rise rate) | 210.21 | 182.37 |  |
| RA2: CV, mean of positive changes from one day to next (rise rate) | 252.44 | 320.86 |  |
| RA3: Mean of negative changes from one day to next (fall rate) | 111.47 | 86.05 |  |
| RA4: CV, mean of negative changes from one day to next (fall rate) | 278.07 | 236.16 |  |
| RA5: Ratio of days that are higher than previous day | 0.33 | 0.32 |  |
| RA6: Median of difference in log of flows over two consecutive days of rising | 0.10 | 0.09 |  |
| RA7: Median of difference in log of flows over two consecutive days of falling | 0.07 | 0.07 |  |
| RA8: Number of flow reversals from one day to the next | 62.38 | 53.83 |  |
| RA9: CV, number of flow reversals from one day to the next | 18.11 | 24.87 |  |

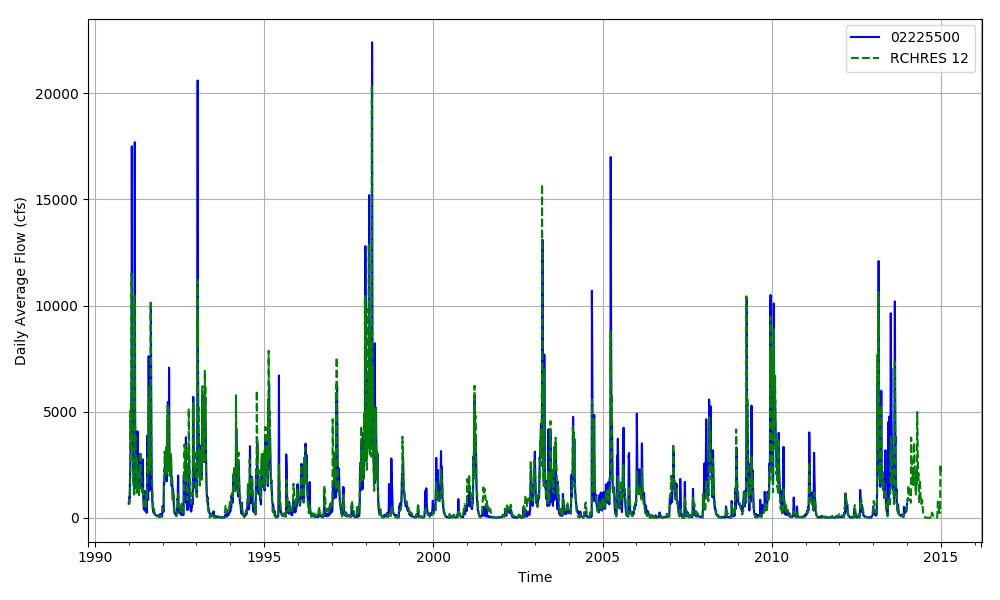


Figure 03070107-7: Daily flow for HSFP reach 12 and USGS station 02225500.

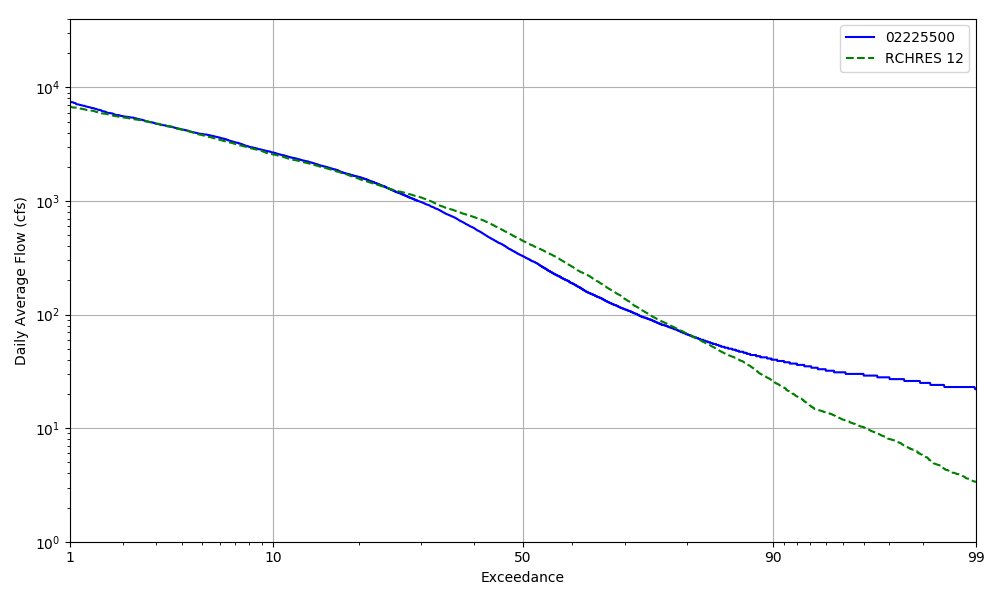


Figure 03070107-8: Daily exceedance for HSFP reach 12 and USGS station 02225500.

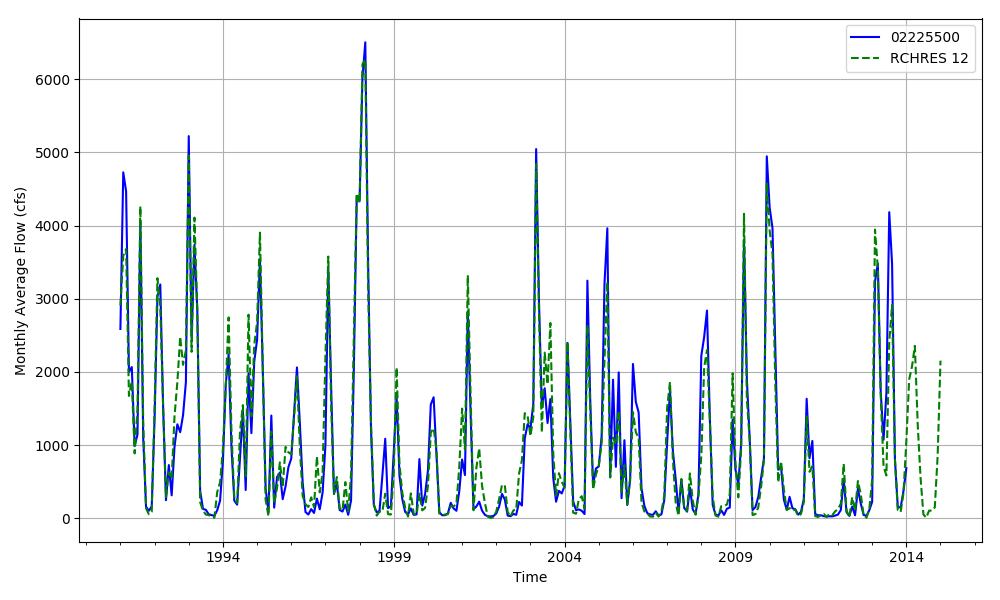


Figure 03070107-9: Monthly flow for HSFP reach 12 and USGS station 02225500.