

Appendix A – Ochlockonee River Model Calibration

This appendix provides detailed calibration plots for each station and parameter available for the Ochlockonee River water quality model.

Time Series – provides a comparison of the all the measured data to the model simulated data over the entire simulation period for visual inspection. If any measured data had a remark code indicating below detection it will appear as flagged data and will be represented by a blue dot. Flagged data is not considered in the quantitative statistical calculations.

Probability Distribution – provides a comparison of the probability distribution of measured and simulated data. This method uses paired measured and simulation data to determine the probability curve.

1 to 1 – plots the paired measured and simulated values against one another. The red line represents a perfect calibration, the blue line represents the linear fit of measured/simulated fit.

Statistics –

- Num Obs – represents the number of measurements used in calculation
- R^2 – correlation coefficient between sim and obs.
- NSE – Nash-Sutcliffe efficiency between sim and obs,
- RMSE – root mean square error
- d – Index of Agreement
- Percentiles – provides a numeric comparison of the percentile distribution of sim and obs.

Annual Analysis -- For flow, total nitrogen, total phosphorus and chlorophyll a annual boxplots are presented for the simulation period for each station. The black dots represent the measured data, the blue box and whiskers represent the model simulated results. The whiskers represent the range of the model simulated results. Average model simulated results are represented by a green dot, average measured data is represented by a red diamond.

For chlorophyll a, total nitrogen and total phosphorus annual boxplot figures are present to illustrate model performance year by year.

Flow Calibration

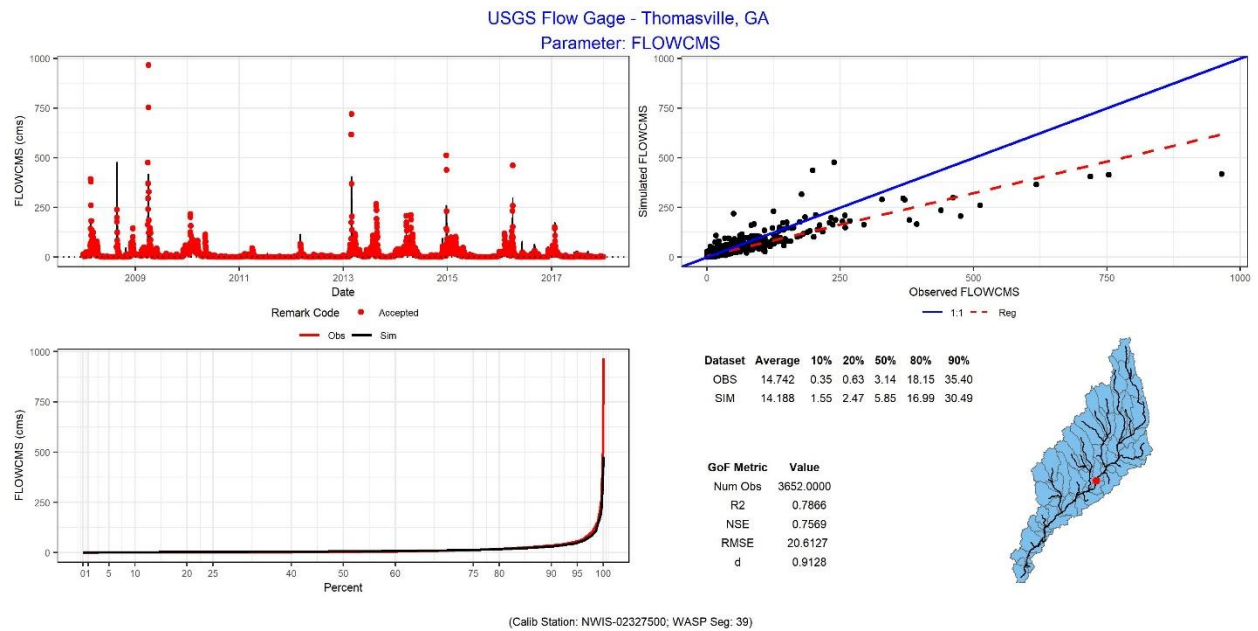


Figure 1 USGS 02327500 Ochlockonee River near Thomasville, GA

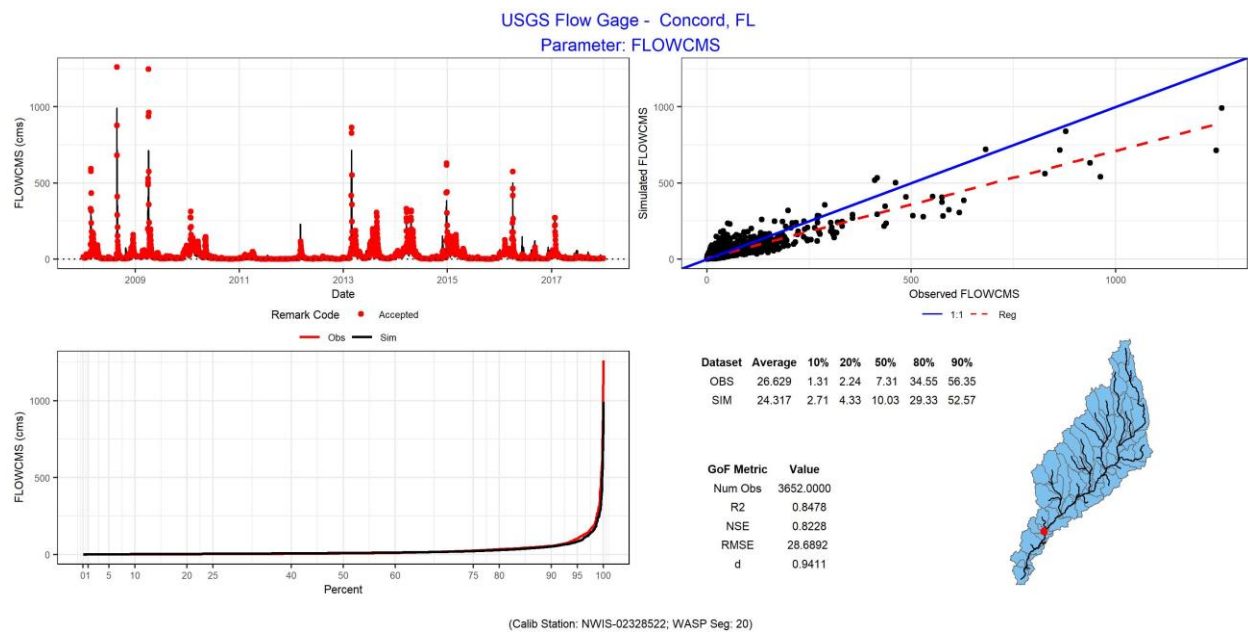


Figure 2 USGS 02328522 Ochlockonee River near Concord, FL

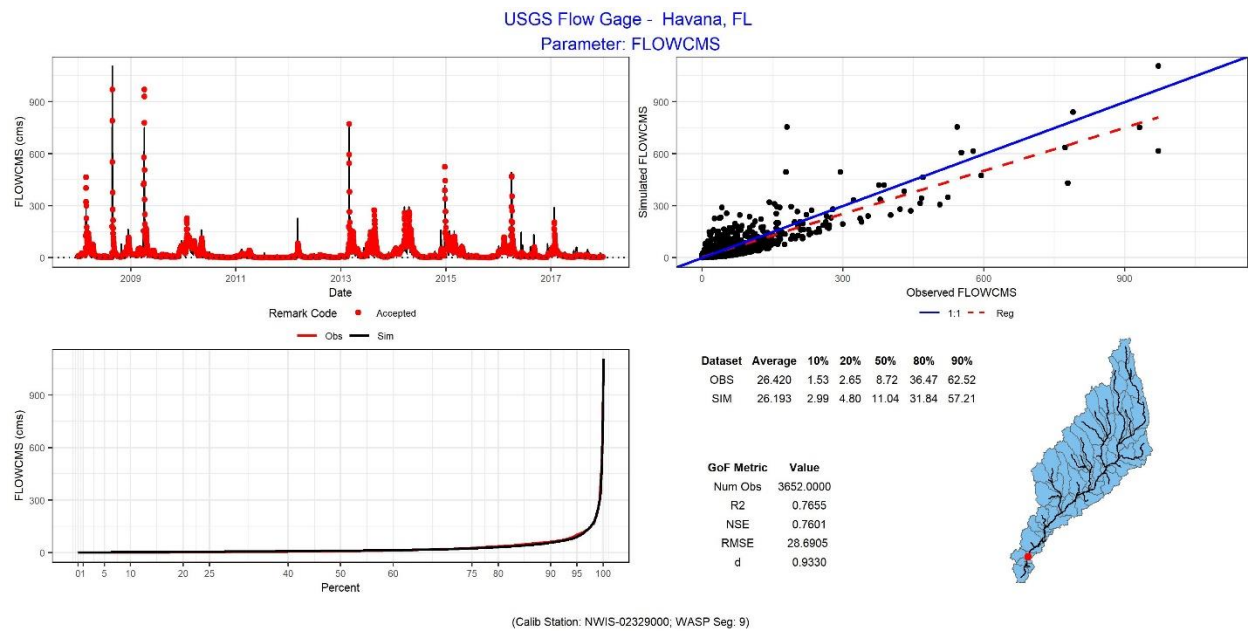


Figure 3 USGS 02329000 Ochlockonee River near Havana, FL

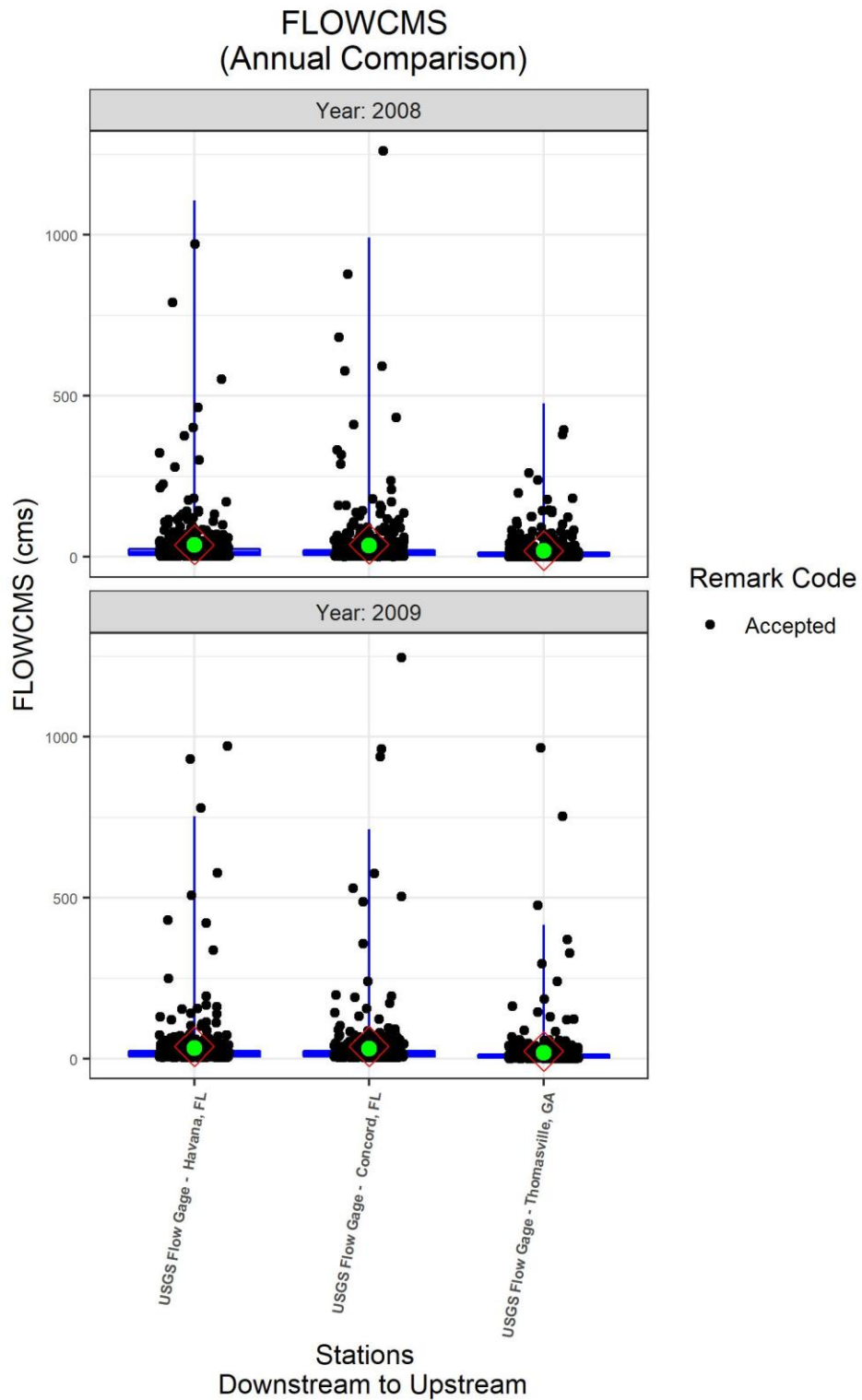


Figure 4 Ochlockonee River Flow Comparison Observed vs. Simulated 2008-2009

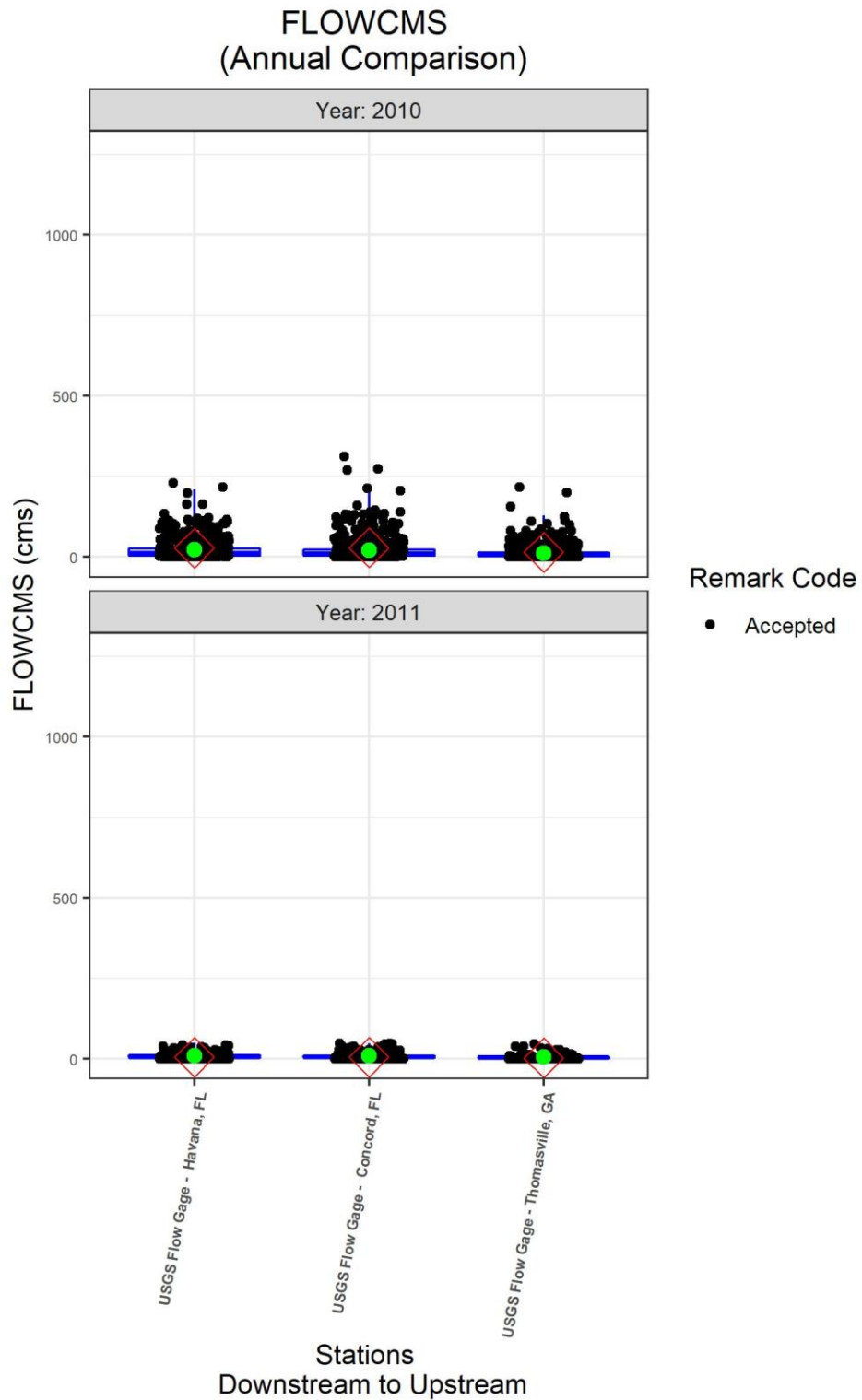


Figure 5 Ochlockonee River Flow Comparison Observed vs. Simulated 2010-2011

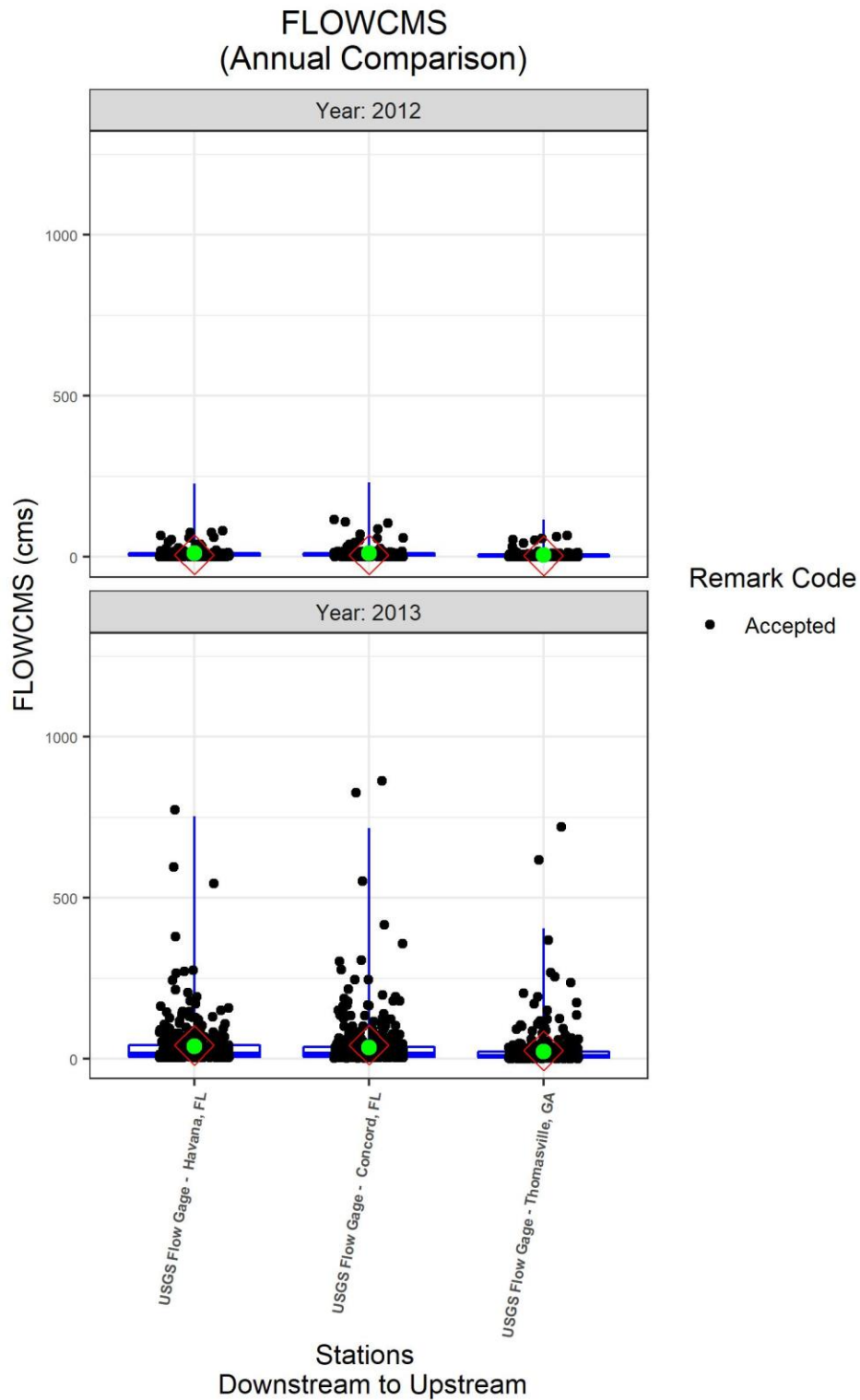


Figure 6 Ochlockonee River Flow Comparison Observed vs. Simulated 2012-2013

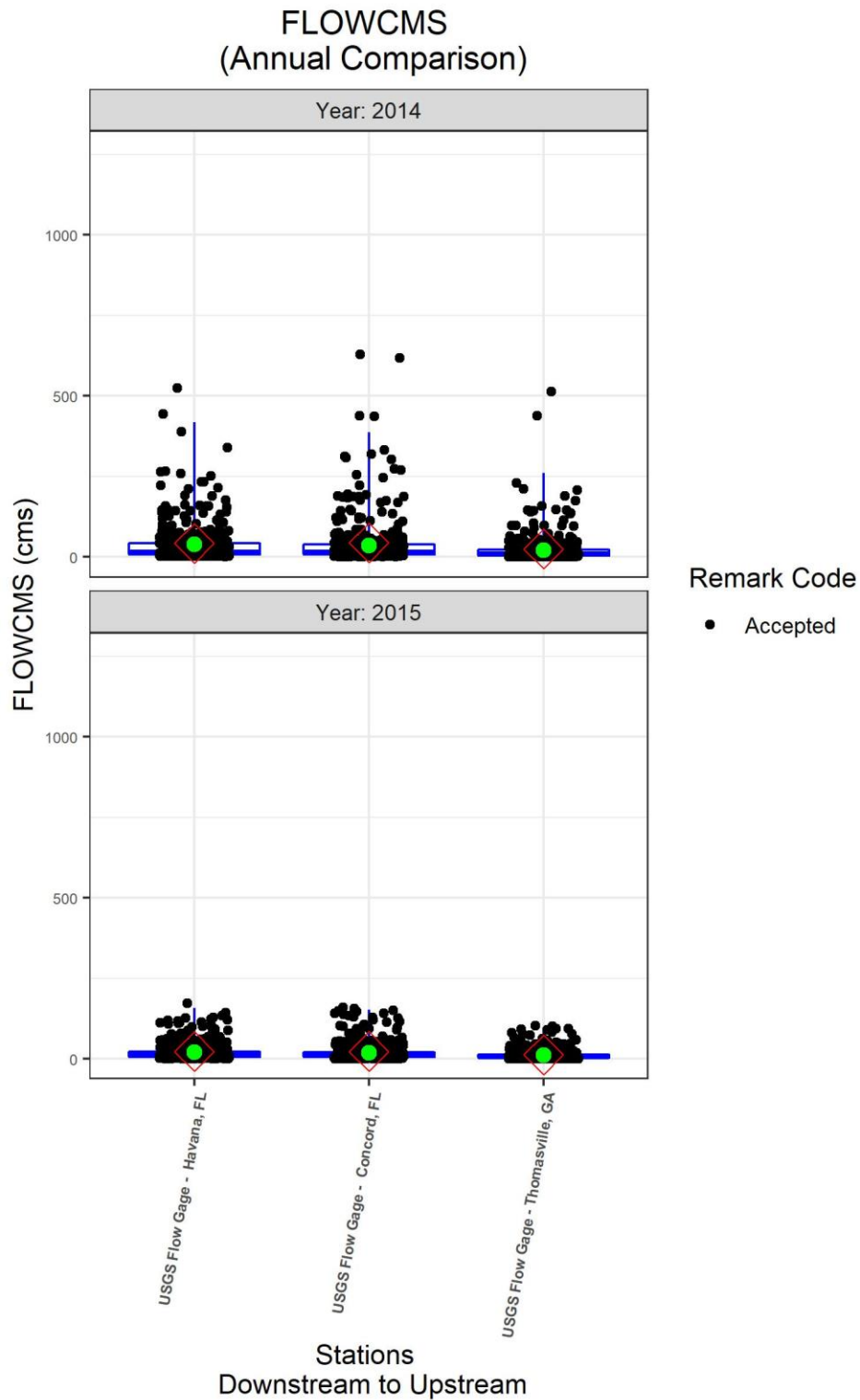


Figure 7 Ochlockonee River Flow Comparison Observed vs. Simulated 2014-2015

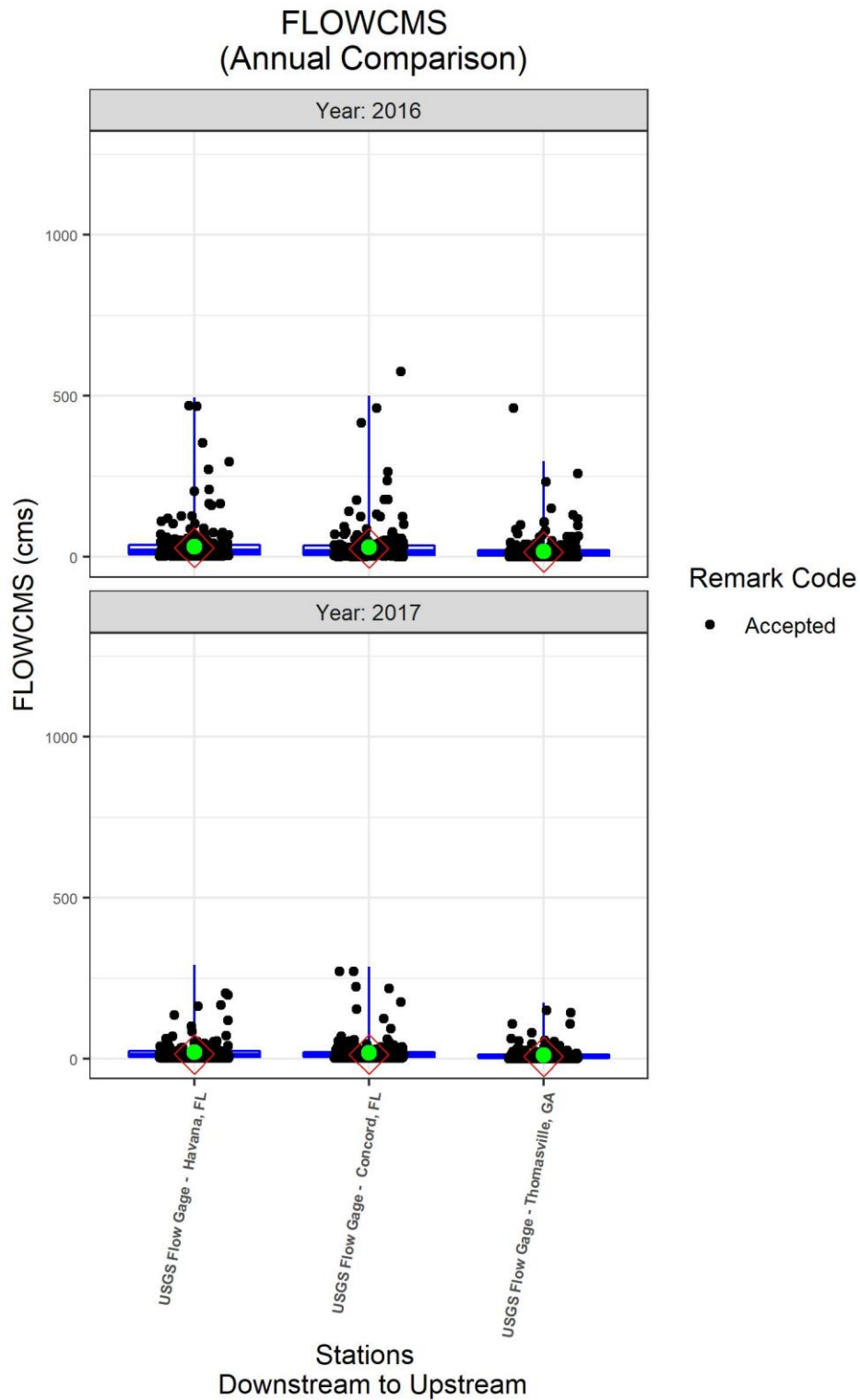


Figure 8 Ochlockonee River Flow Comparison Observed vs. Simulated 2016-2017

Water Quality

Total Nitrogen

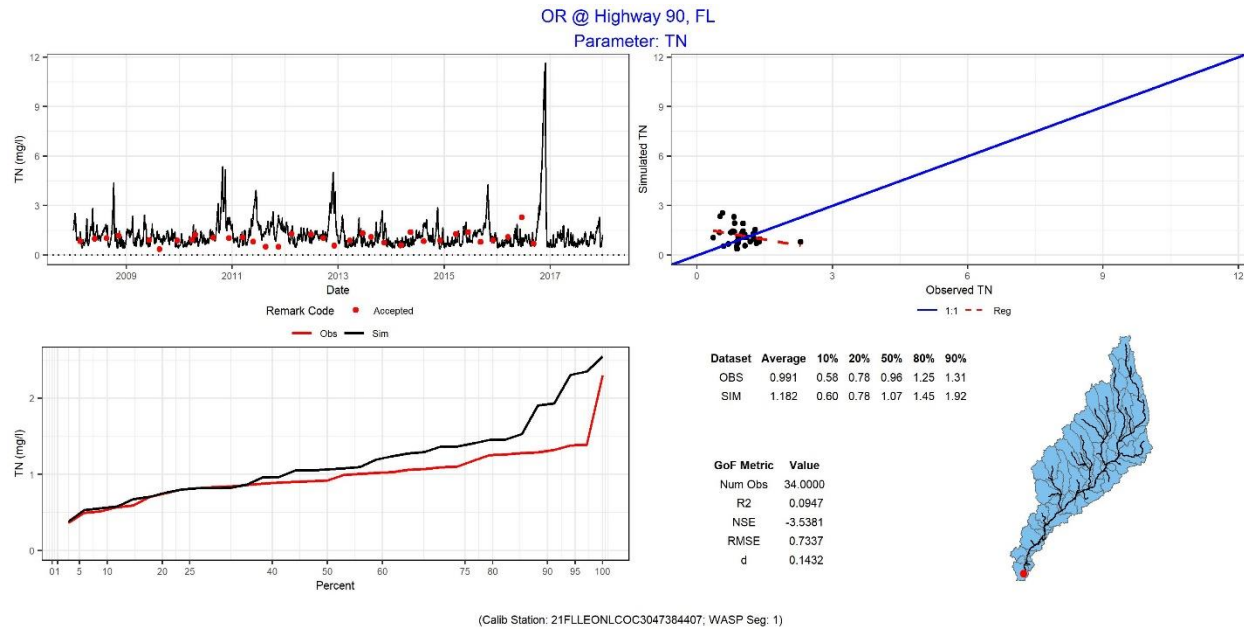


Figure 9 Total Nitrogen - Ochlockonee River at Highway 90, FL

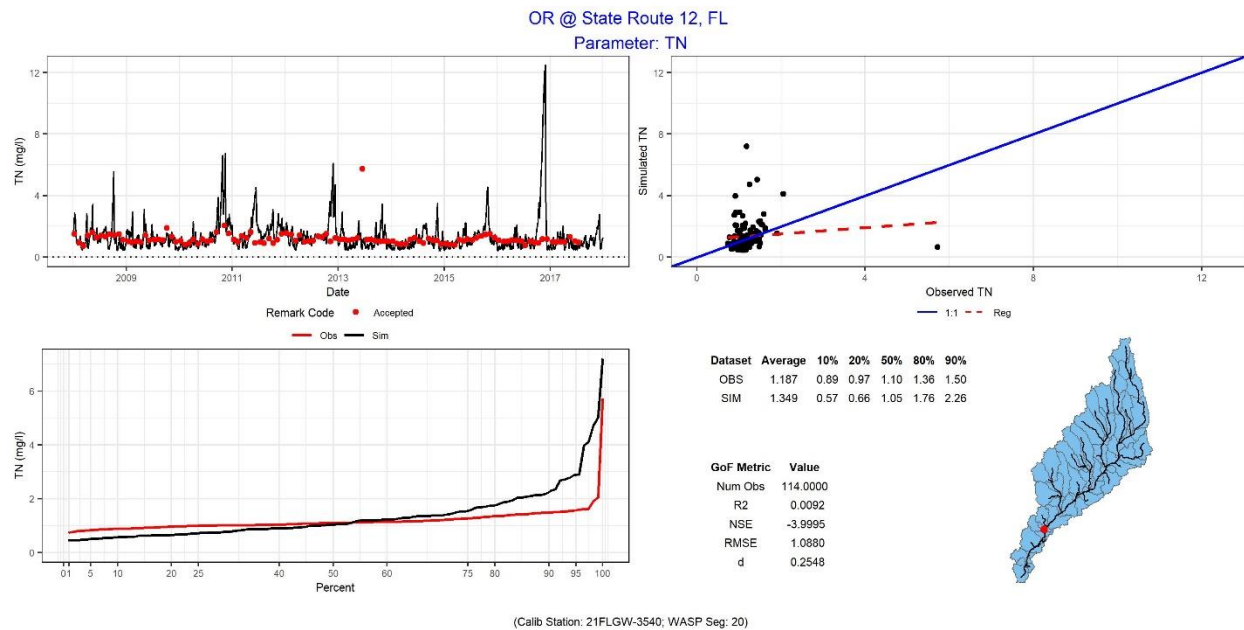


Figure 10 Total Nitrogen - Ochlockonee River at State Route 12, FL

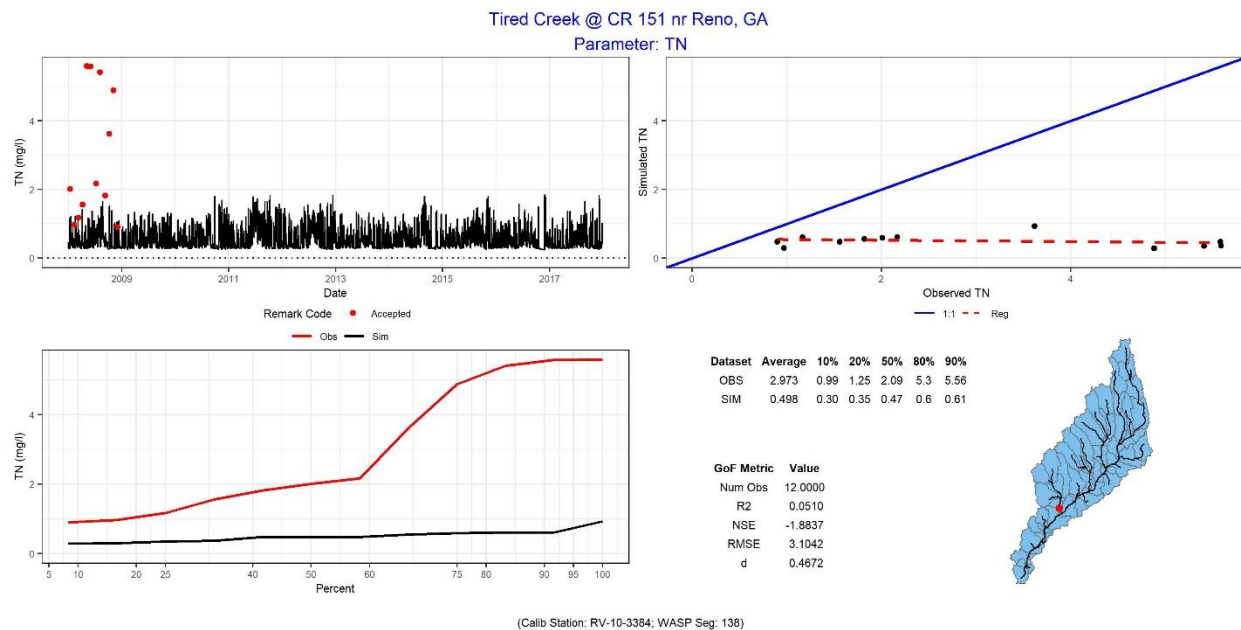


Figure 11 Total Nitrogen - Tired Creek at County Road 151 near Reno, GA

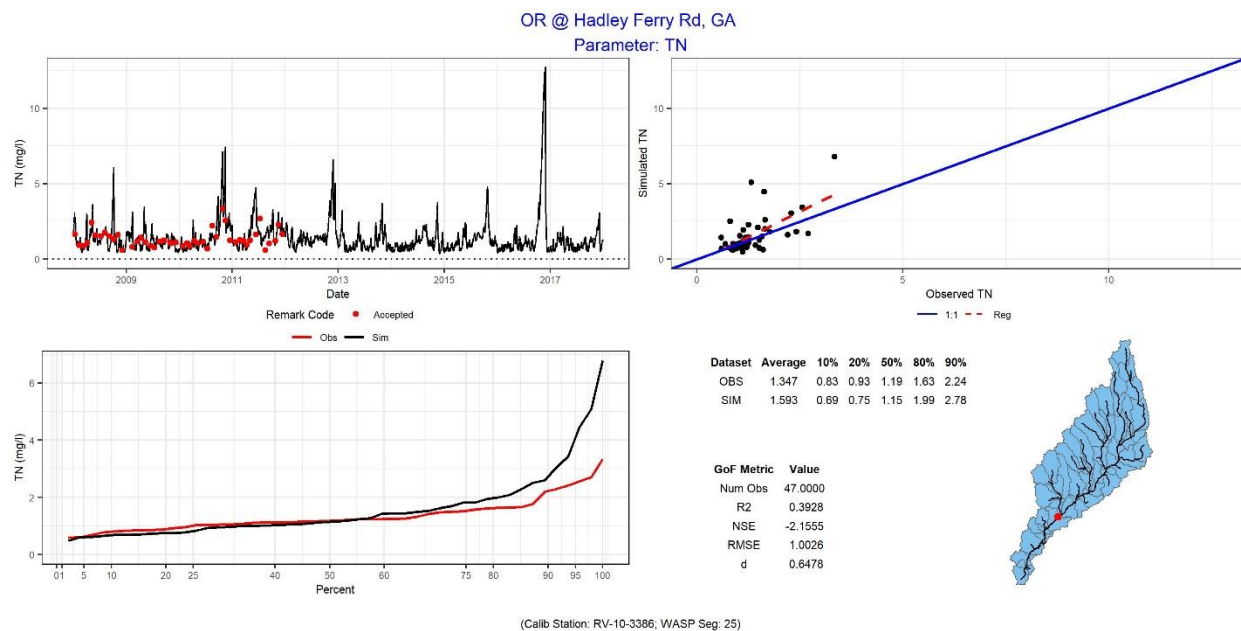


Figure 12 Total Nitrogen - Ochlockonee River @ Hadley Ferry Rd. nr Calvary, GA

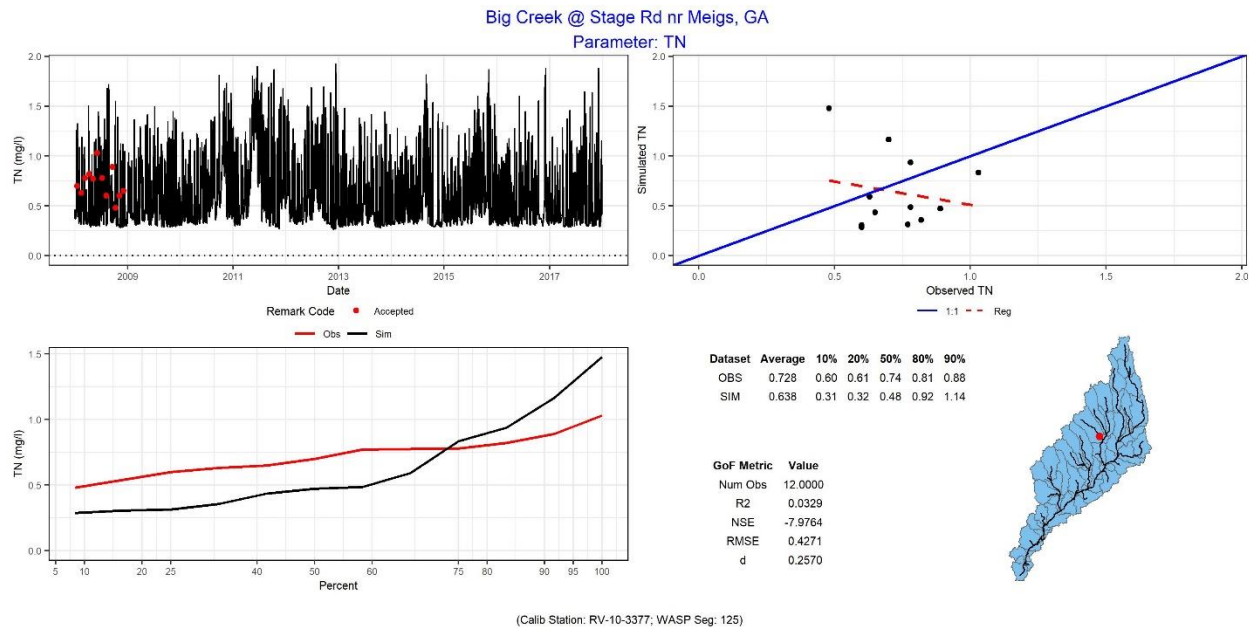


Figure 13 Total Nitrogen - Big Creek at Stage Road near Meigs, GA

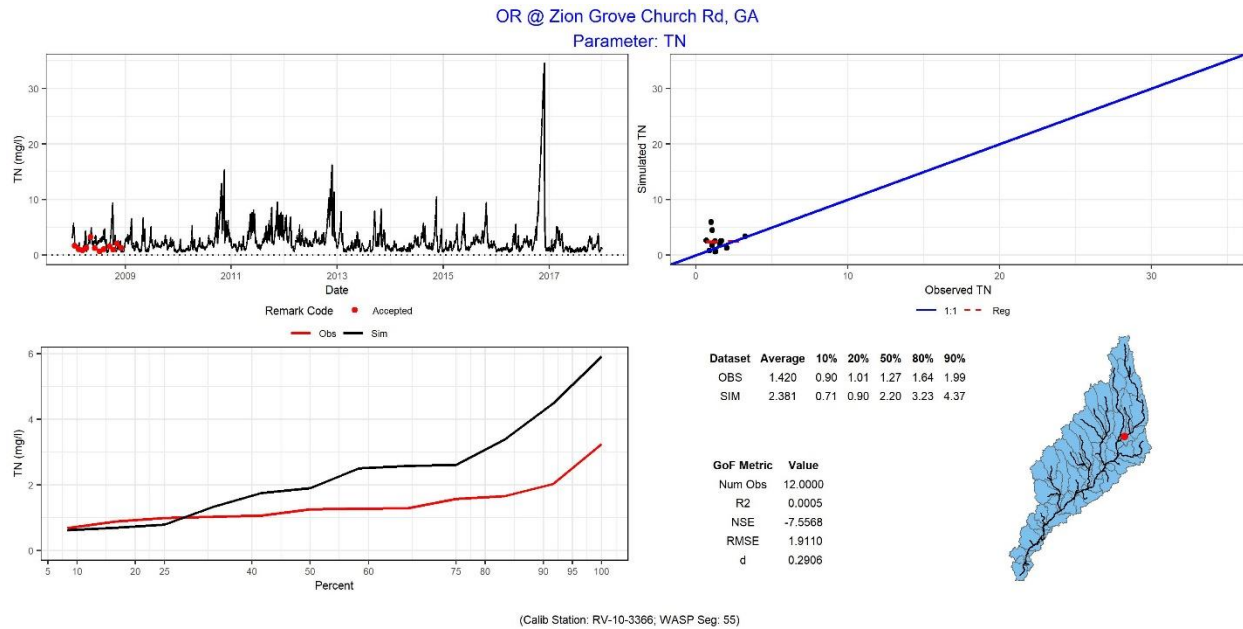


Figure 14 Total Nitrogen - Ochlockonee River at Zion Grove Church Rd. near Coolidge, GA

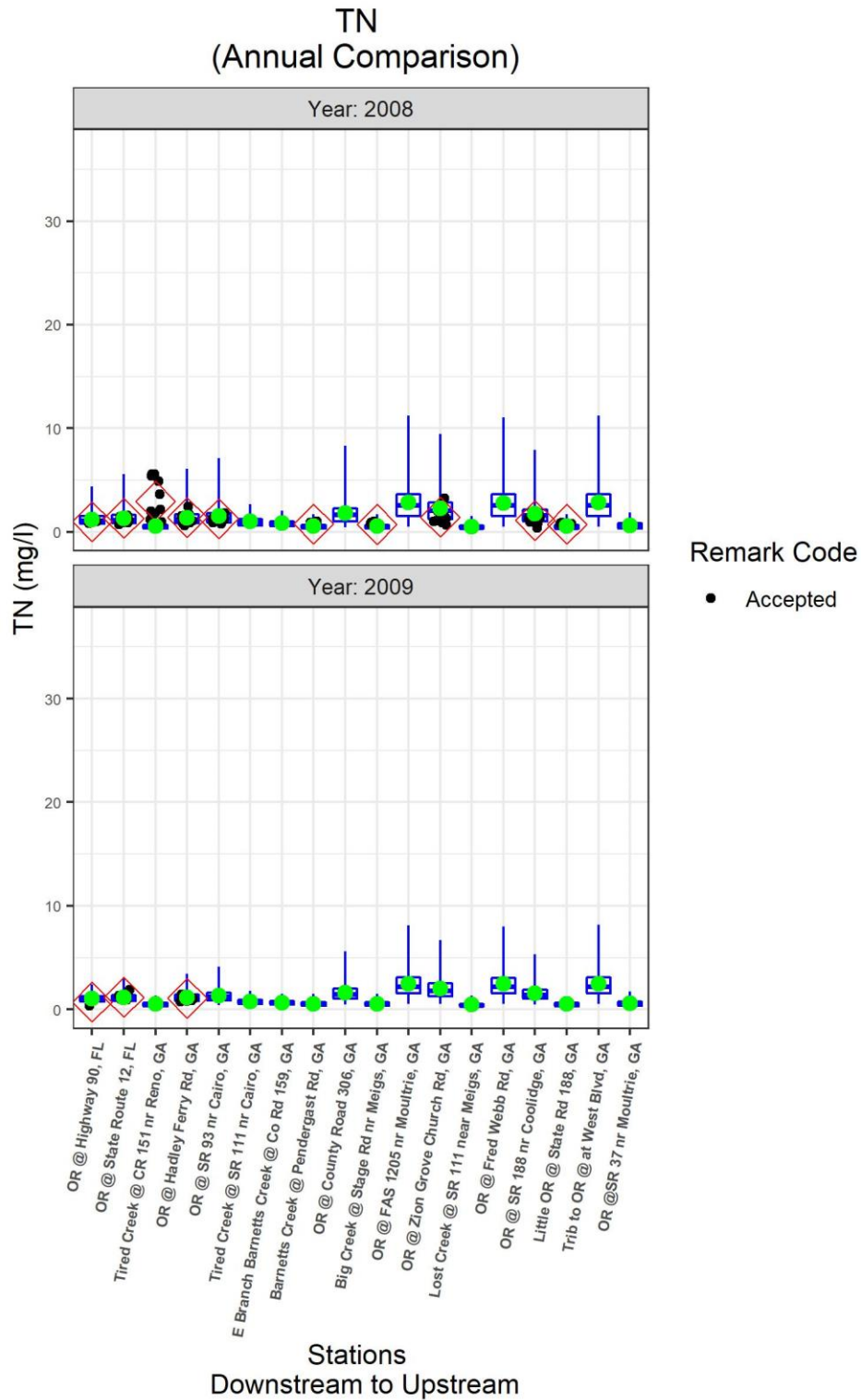


Figure 15 Ochlockonee River Total Nitrogen Comparison Observed vs. Simulated 2008-2009

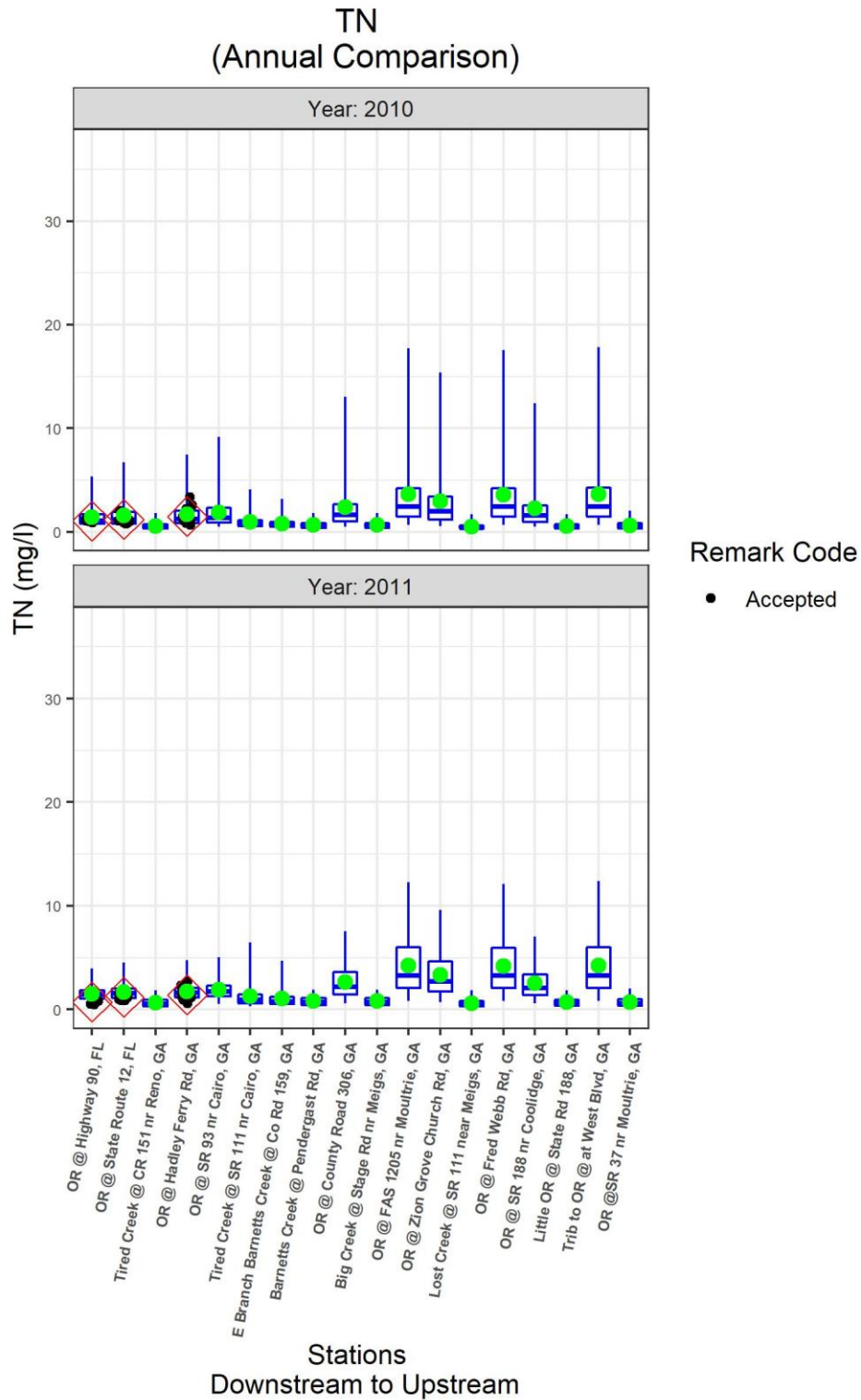


Figure 16 Ochlockonee River Total Nitrogen Comparison Observed vs. Simulated 2010-2011

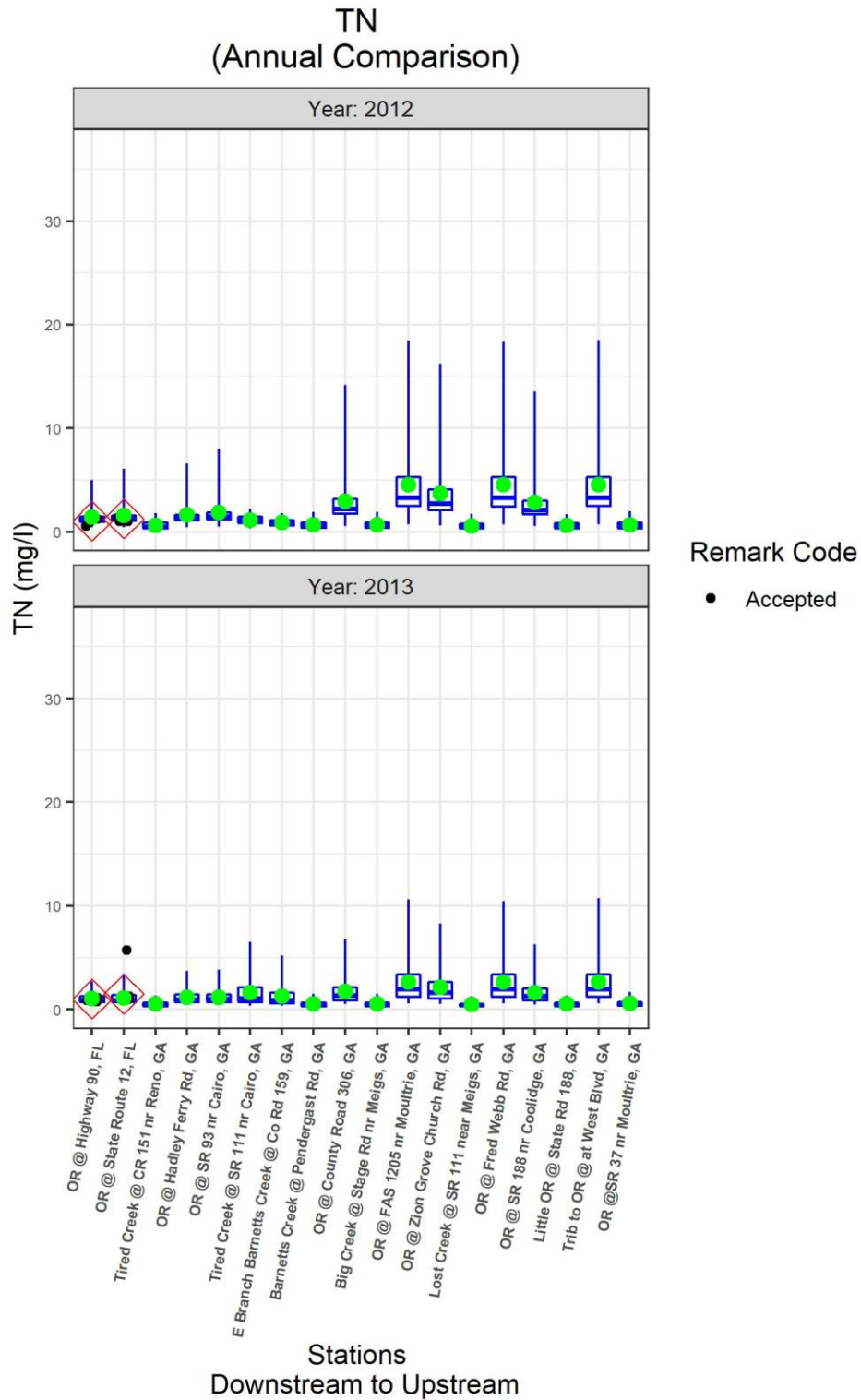


Figure 17 Ochlockonee River Total Nitrogen Comparison Observed vs. Simulated 2012-2013

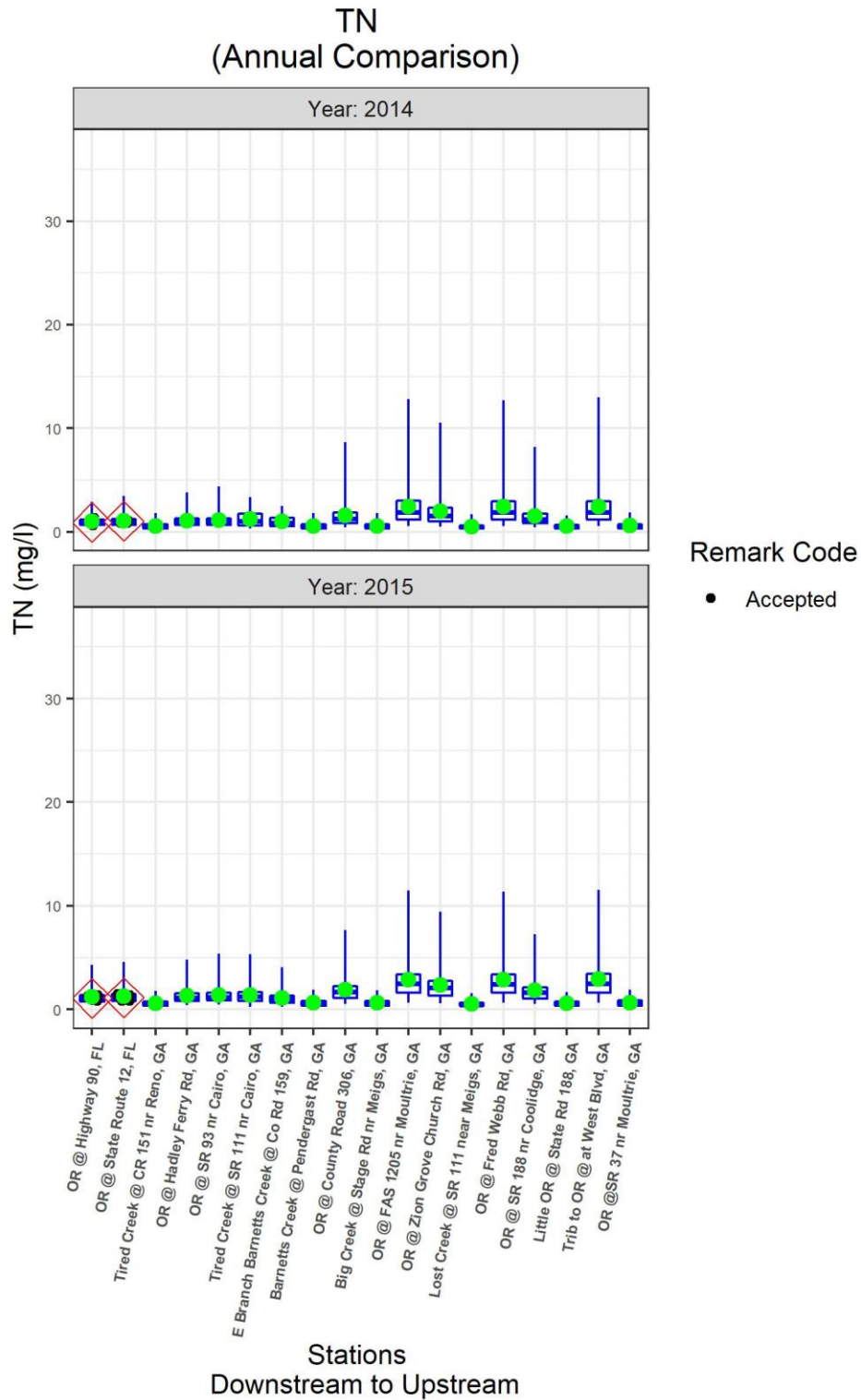


Figure 18 Ochlockonee River Total Nitrogen Comparison Observed vs. Simulated 2014-2015

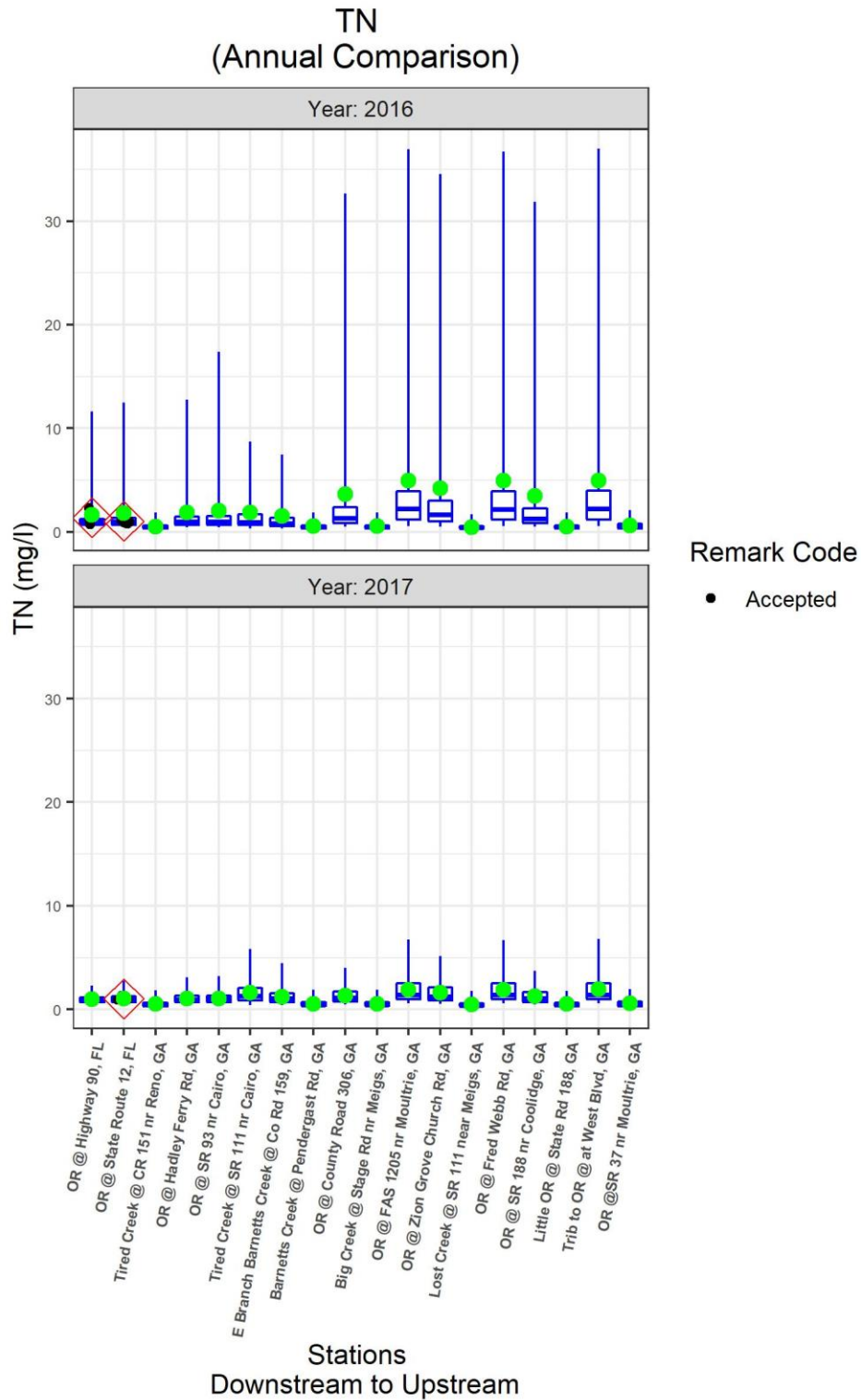


Figure 19 Ochlockonee River Total Nitrogen Comparison Observed vs. Simulated 2016-2017

Ammonia

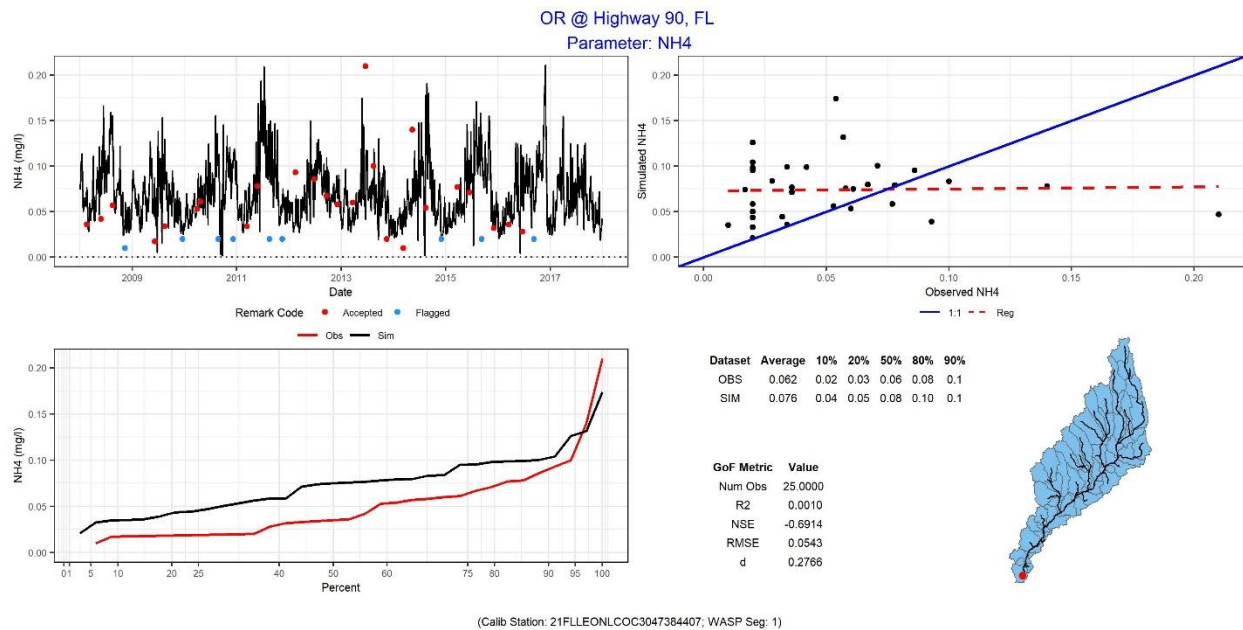


Figure 20 Total Nitrogen - Ochlockonee River at Highway 90, FL

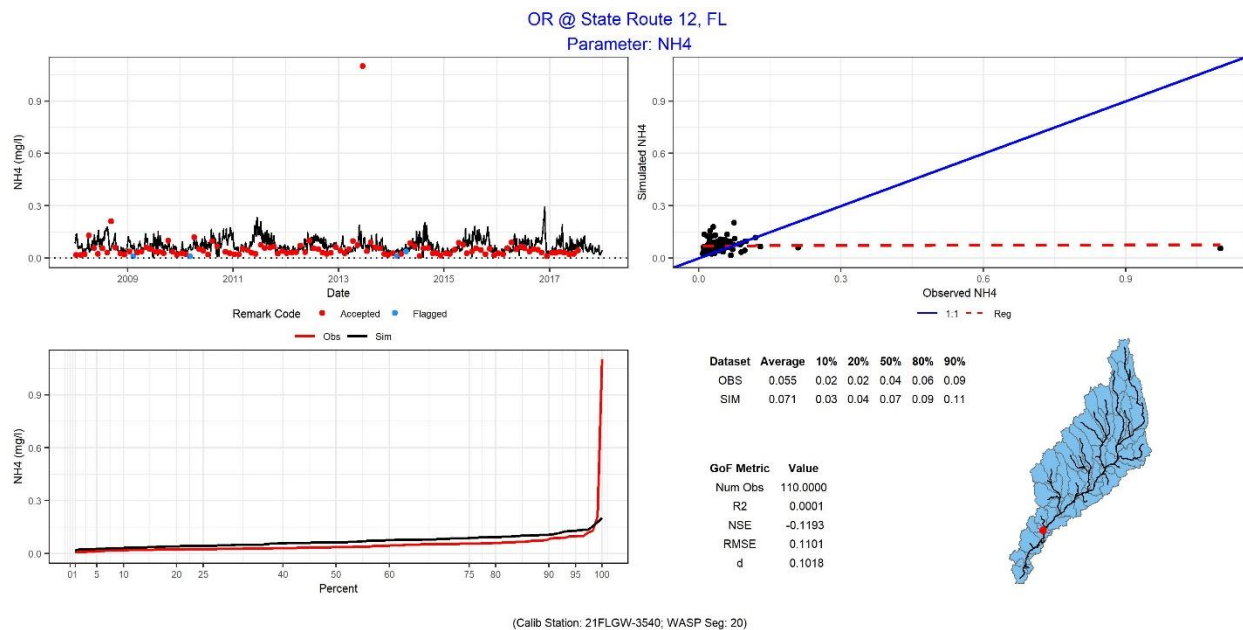


Figure 21 Ammonia - Ochlockonee River at State Route 12, FL

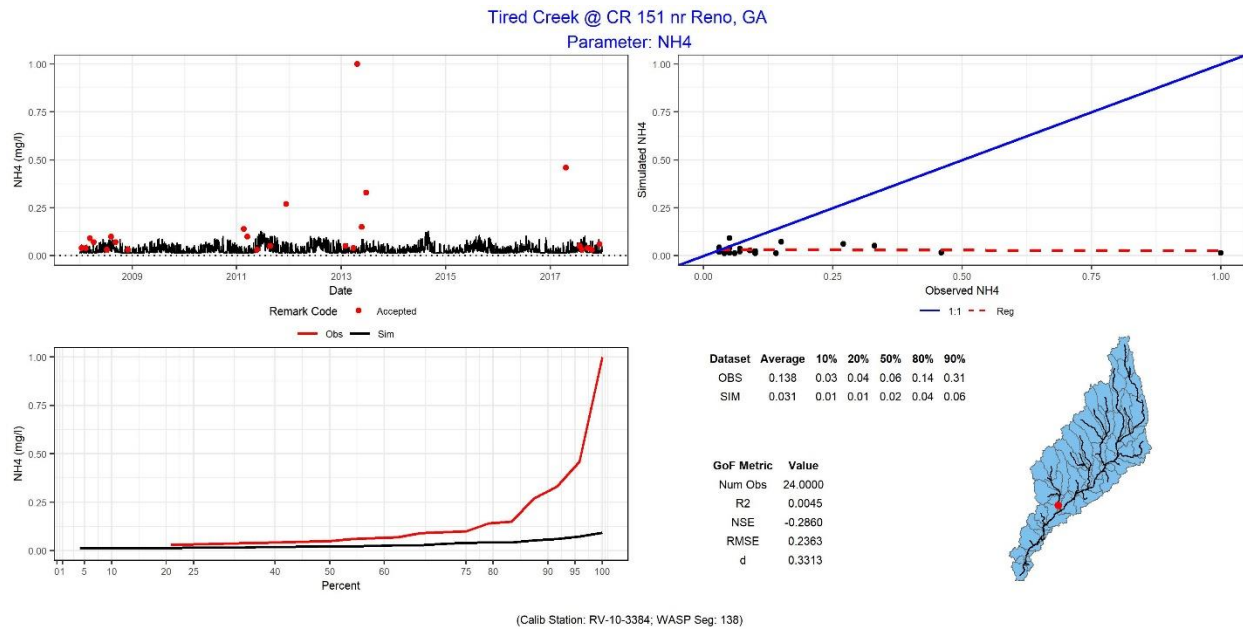


Figure 22 Ammonia - Tired Creek at County Road 151 near Reno, GA

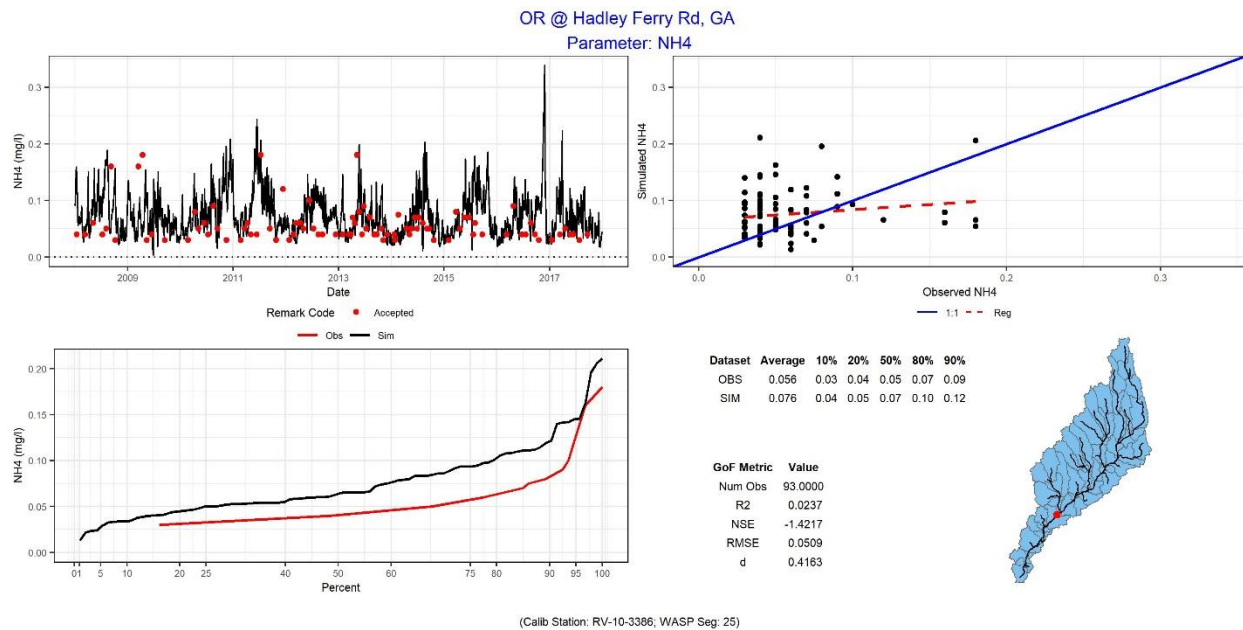


Figure 23 Ammonia - Ochlockonee River @ Hadley Ferry Rd. nr Calvary, GA

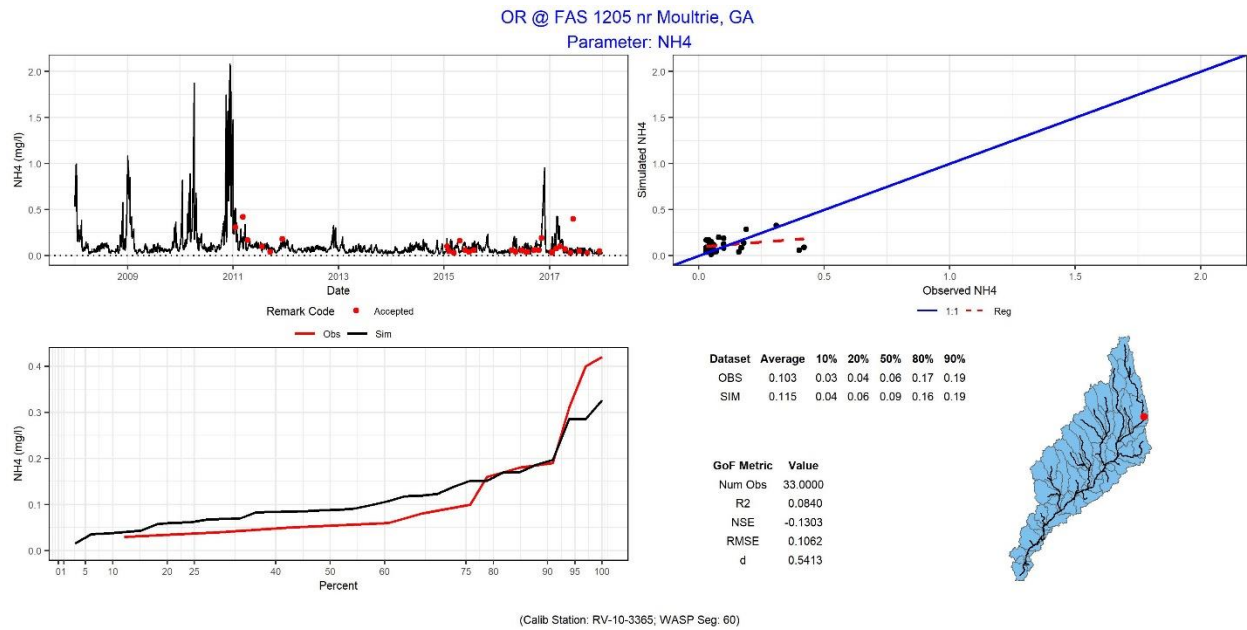


Figure 24 Ammonia - Ochlockonee River - FAS 1205 near Moultrie, GA

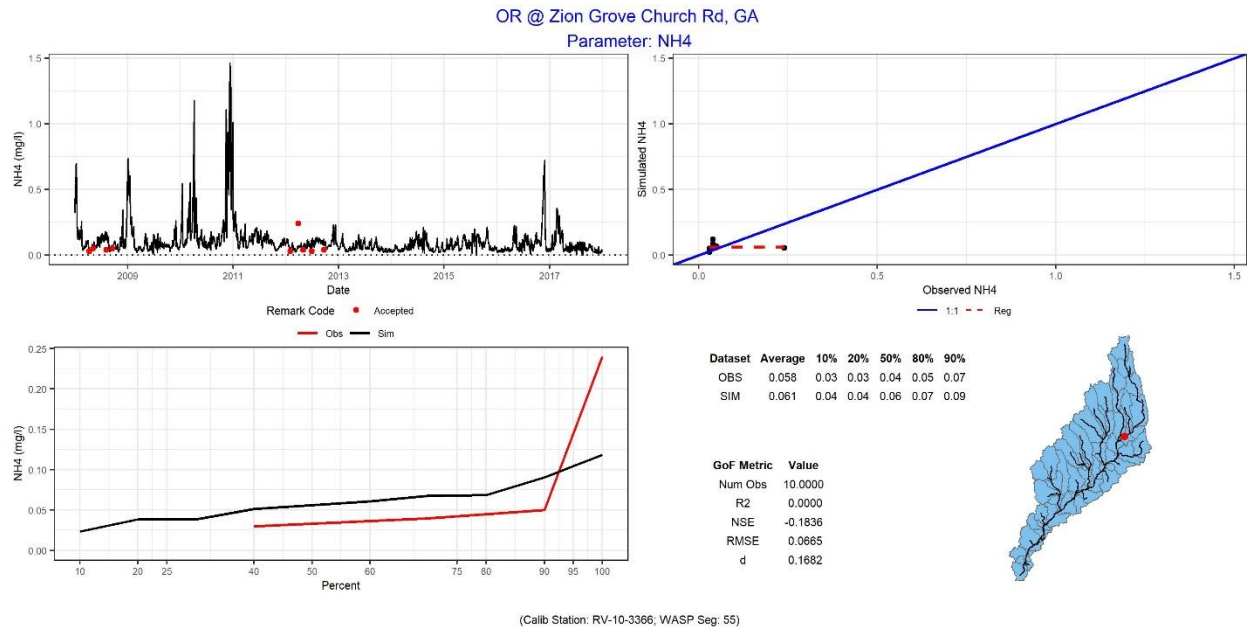


Figure 25 Ammonia - Ochlockonee River at Zion Grove Church Rd. near Coolidge, GA

Nitrate

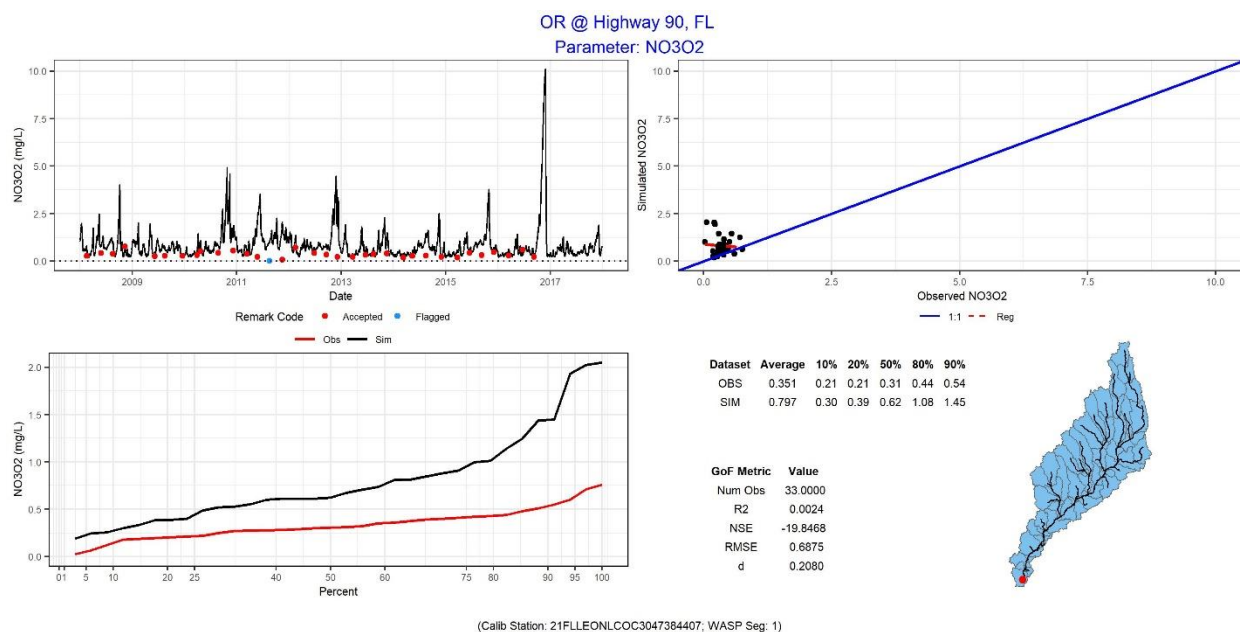


Figure 26 Nitrate - Ochlockonee River at Highway 90, FL

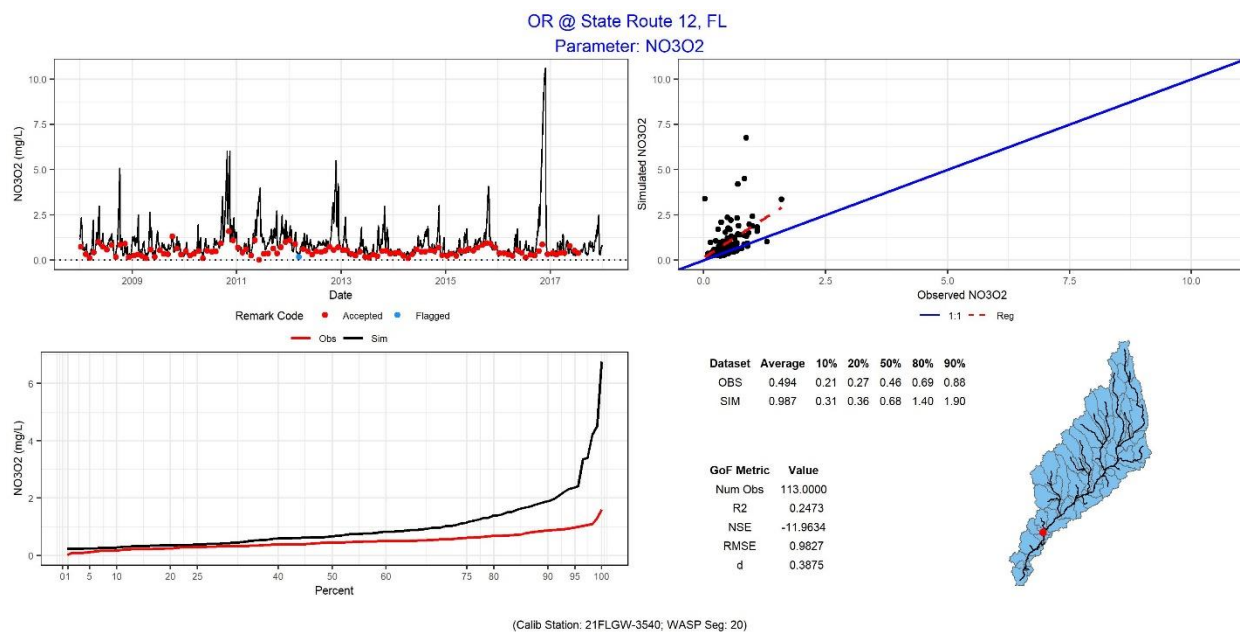


Figure 27 Nitrate - Ochlockonee River at State Route 12, FL

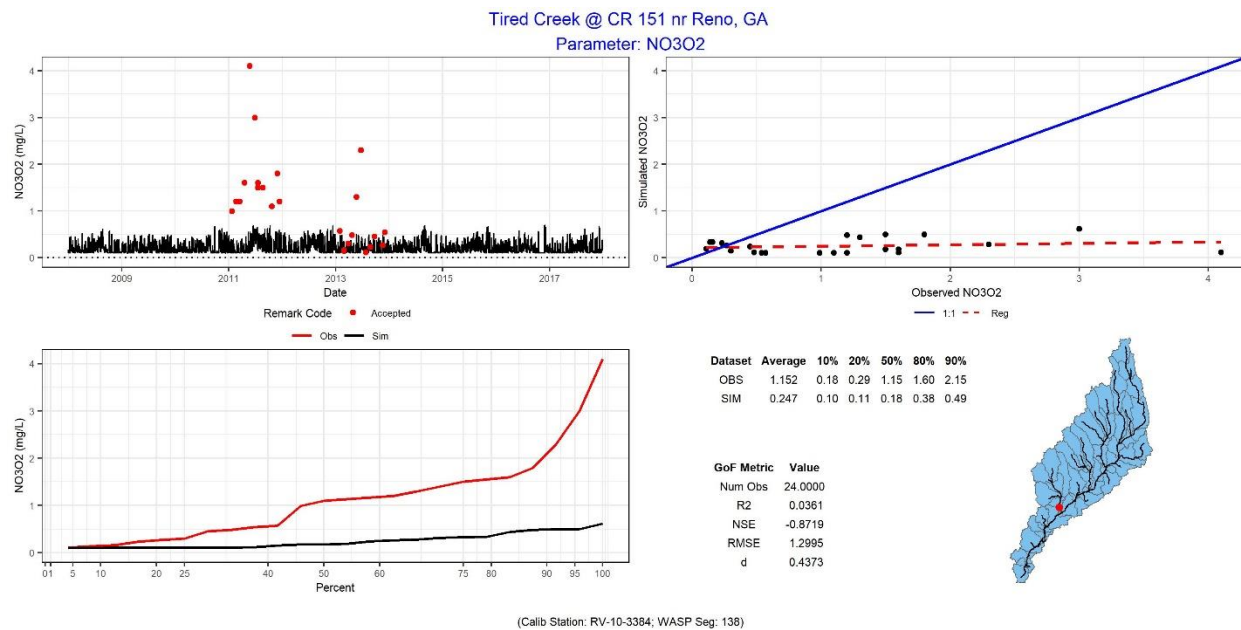


Figure 28 Nitrate - Tired Creek at County Road 151 near Reno, GA

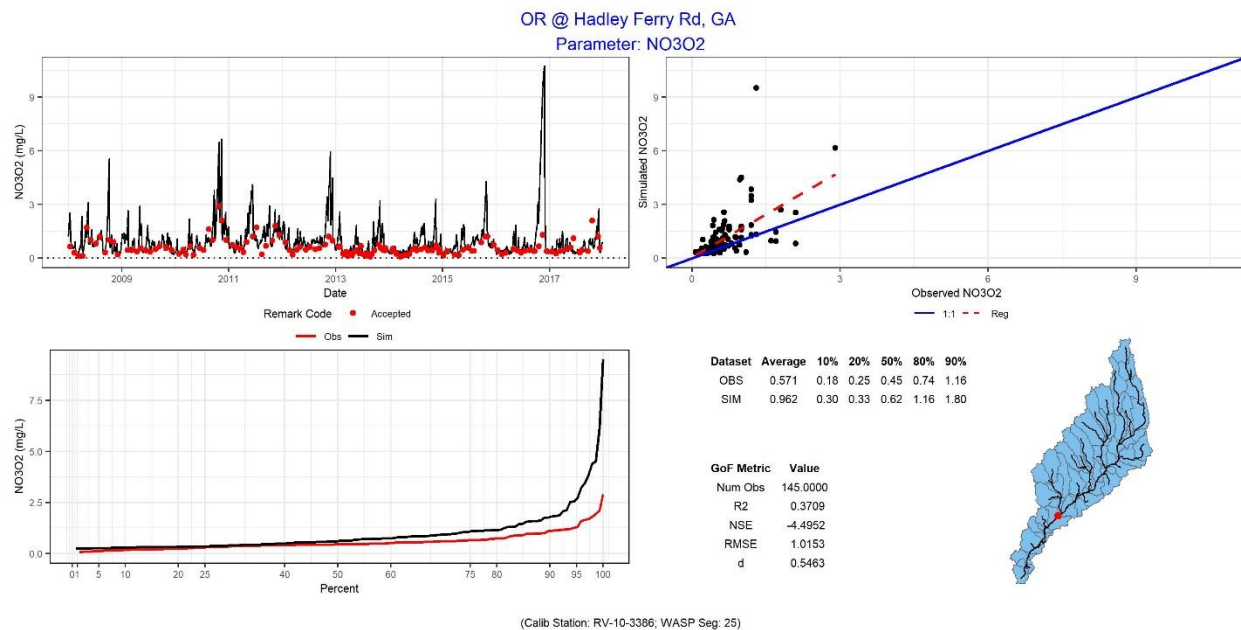


Figure 29 Nitrate - Ochlockonee River @ Hadley Ferry Rd. nr Calvary, GA

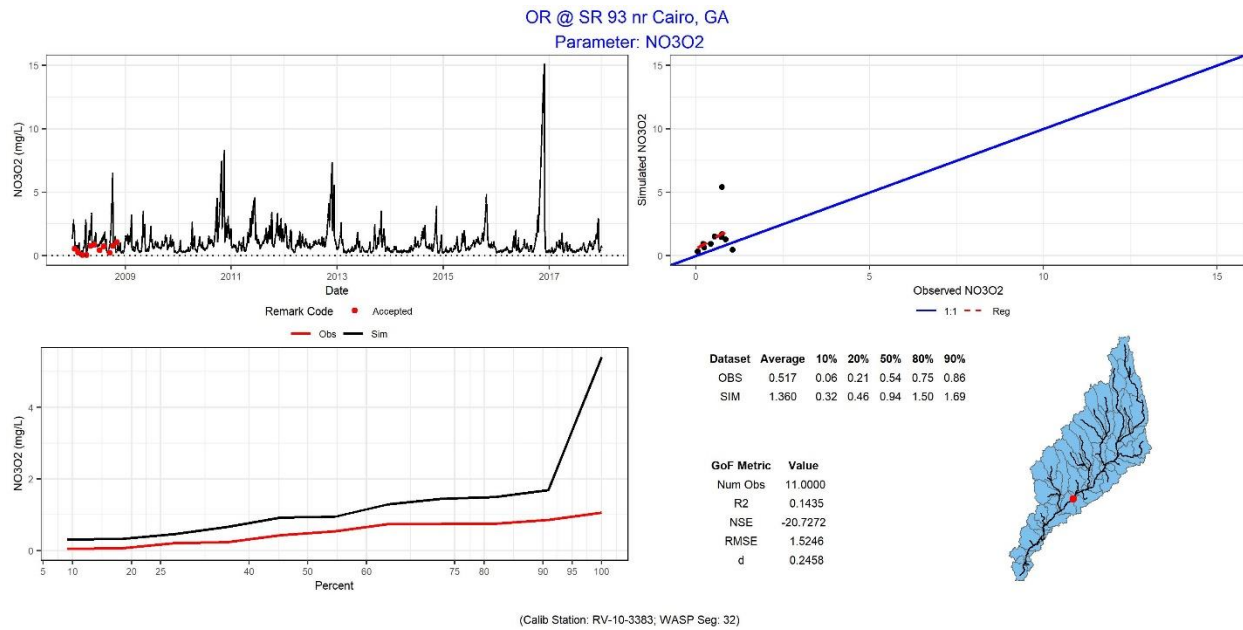


Figure 30 Nitrate - Ochlockonee River - SR 93 near Cairo, GA

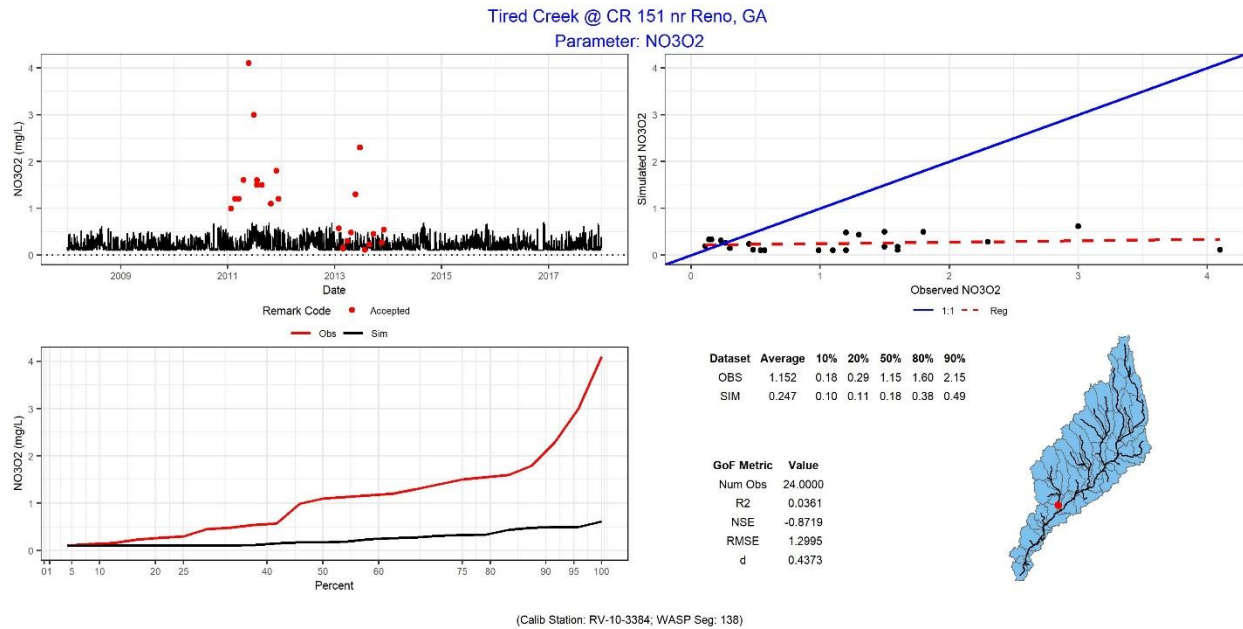


Figure 31 Nitrate - Tired Creek at County Road 151 near Reno, GA

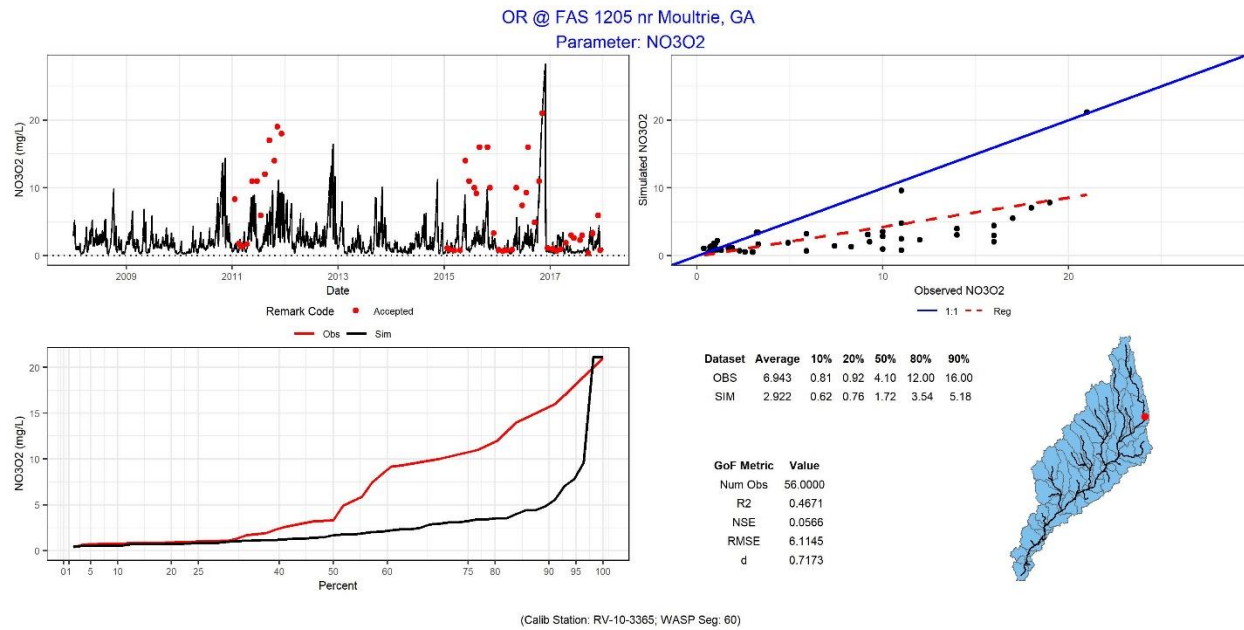


Figure 32 Nitrate - Ochlockonee River - FAS 1205 near Moultrie, GA

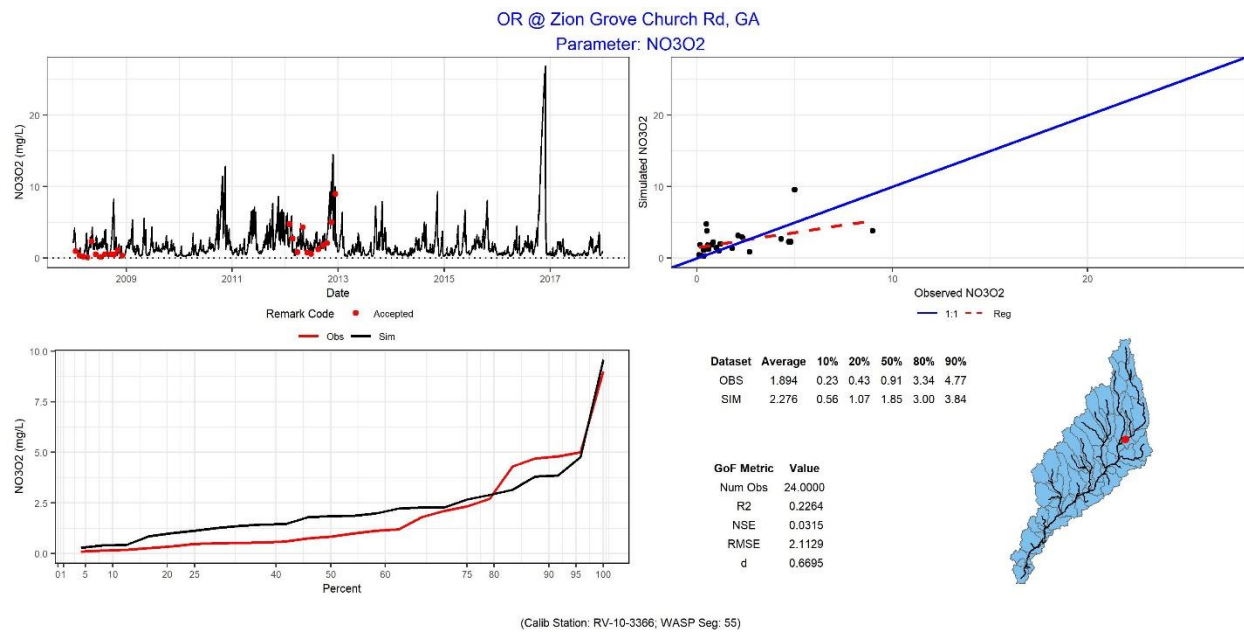


Figure 33 Nitrate - Ochlockonee River at Zion Grove Church Rd. near Coolidge, GA

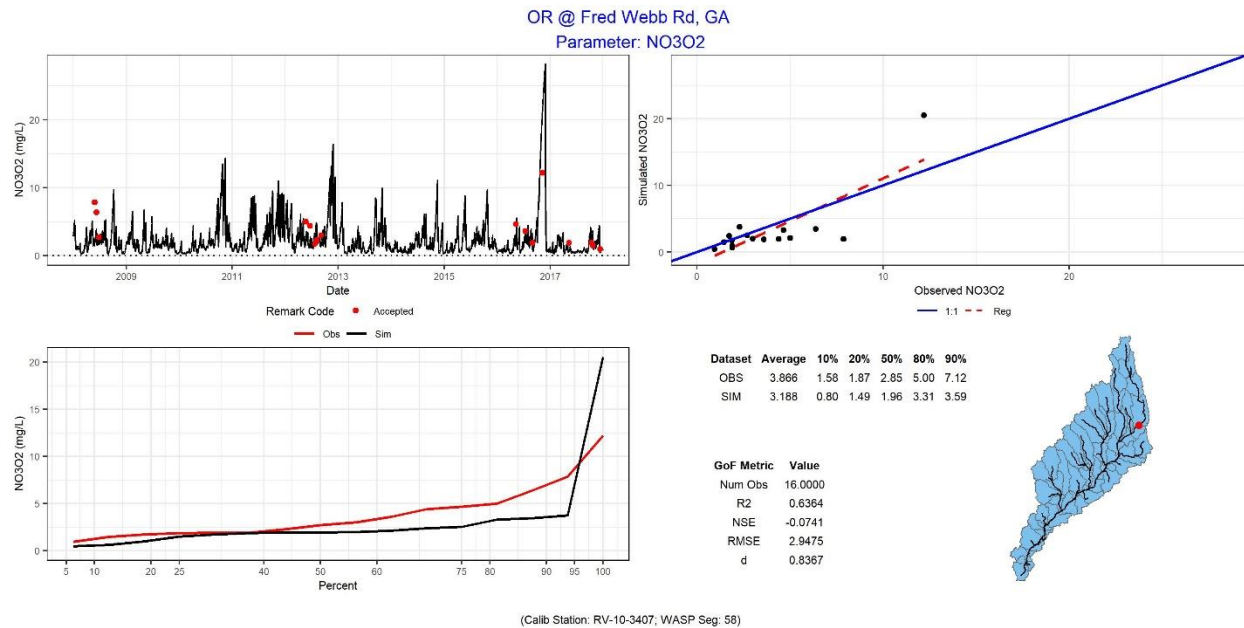


Figure 34 Nitrate - Ochlockonee River at Fred Webb Rd, GA

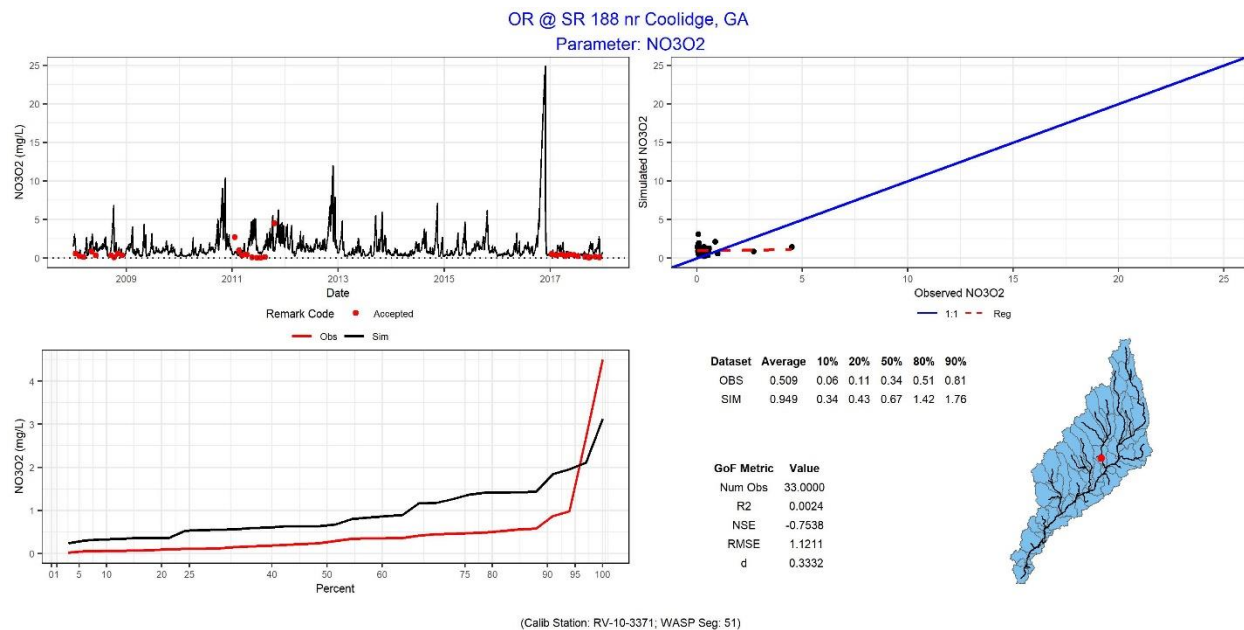


Figure 35 Nitrate - Ochlockonee River at SR 188 near Coolidge, GA

Total Phosphorus

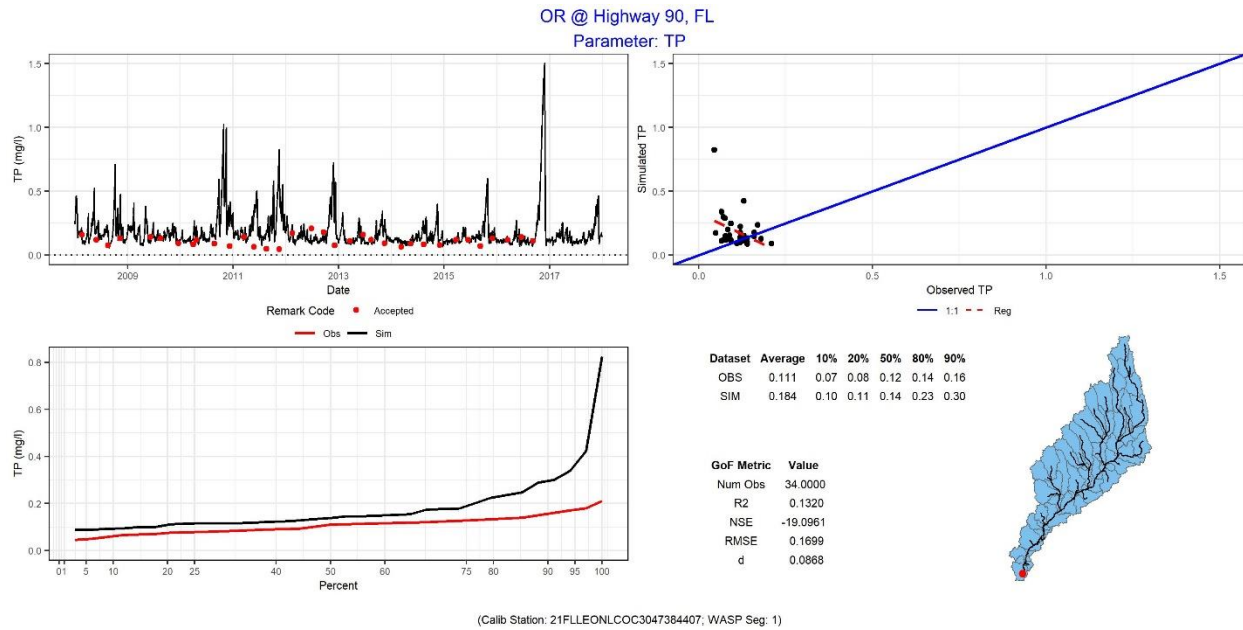


Figure 36 Total Phosphorus - Ochlockonee River at Highway 90, FL

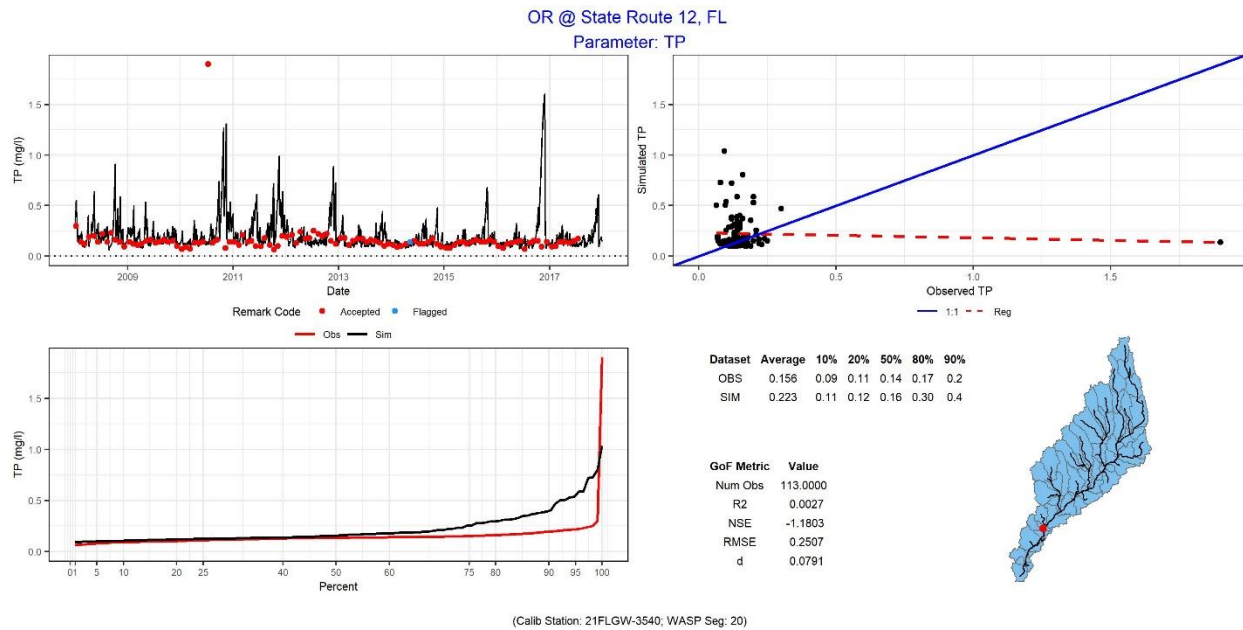


Figure 37 Total Phosphorus - Ochlockonee River at State Route 12, FL

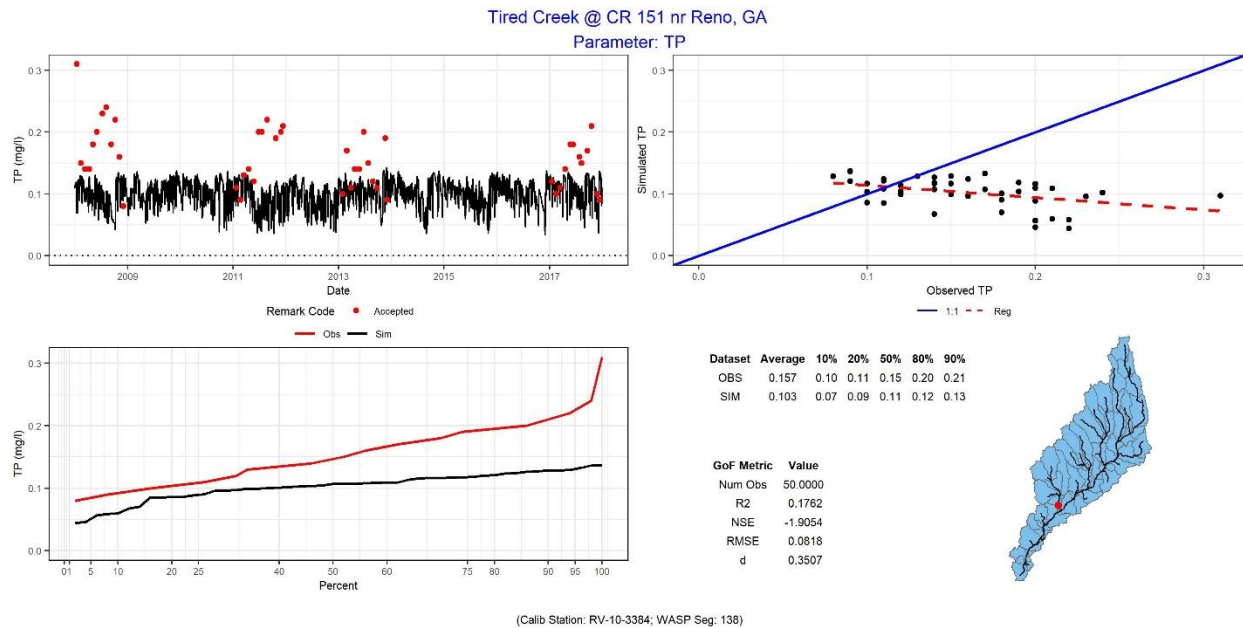


Figure 38 Total Phosphorus - Tired Creek at County Road 151 near Reno, GA

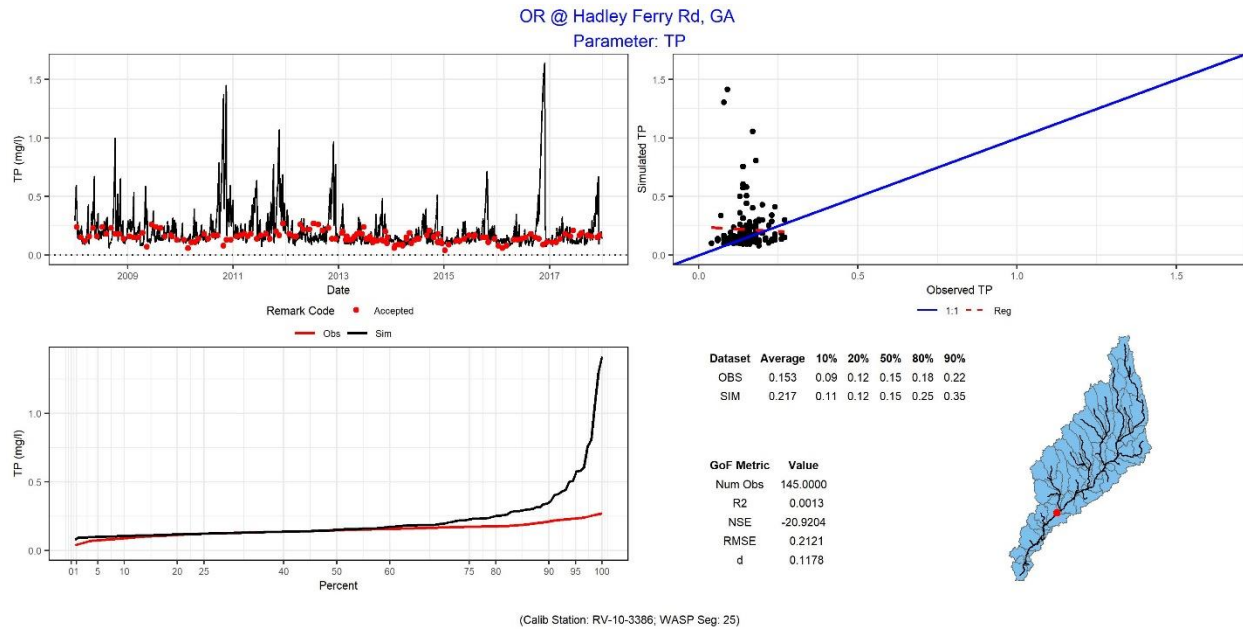


Figure 39 Total Phosphorus - Ochlockonee River @ Hadley Ferry Rd. nr Calvary, GA

OR @ SR 93 nr Cairo, GA
Parameter: TP

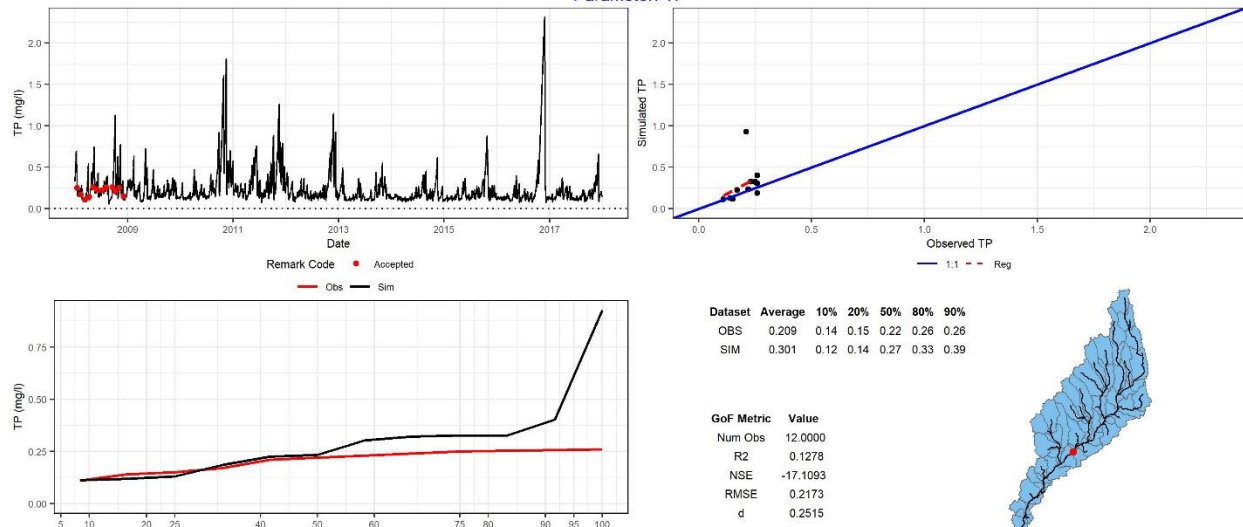


Figure 40 Total Phosphorus - Ochlockonee River - SR 93 near Cairo, GA

Tired Creek @ SR 111 nr Cairo, GA
Parameter: TP

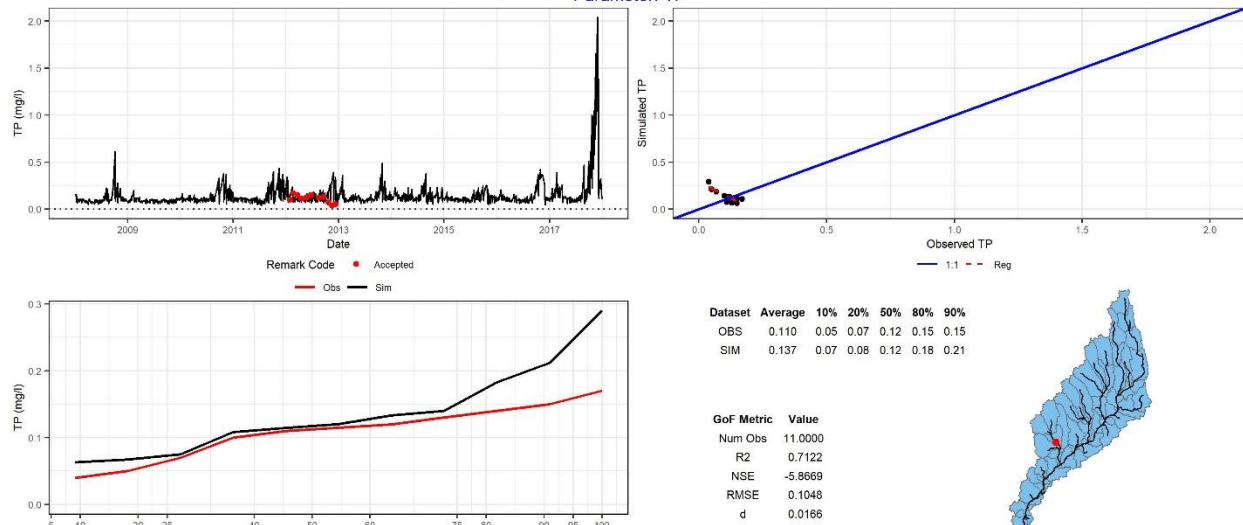


Figure 41 Total Phosphorus - Tired Creek at State Road 111 near Cairo, GA

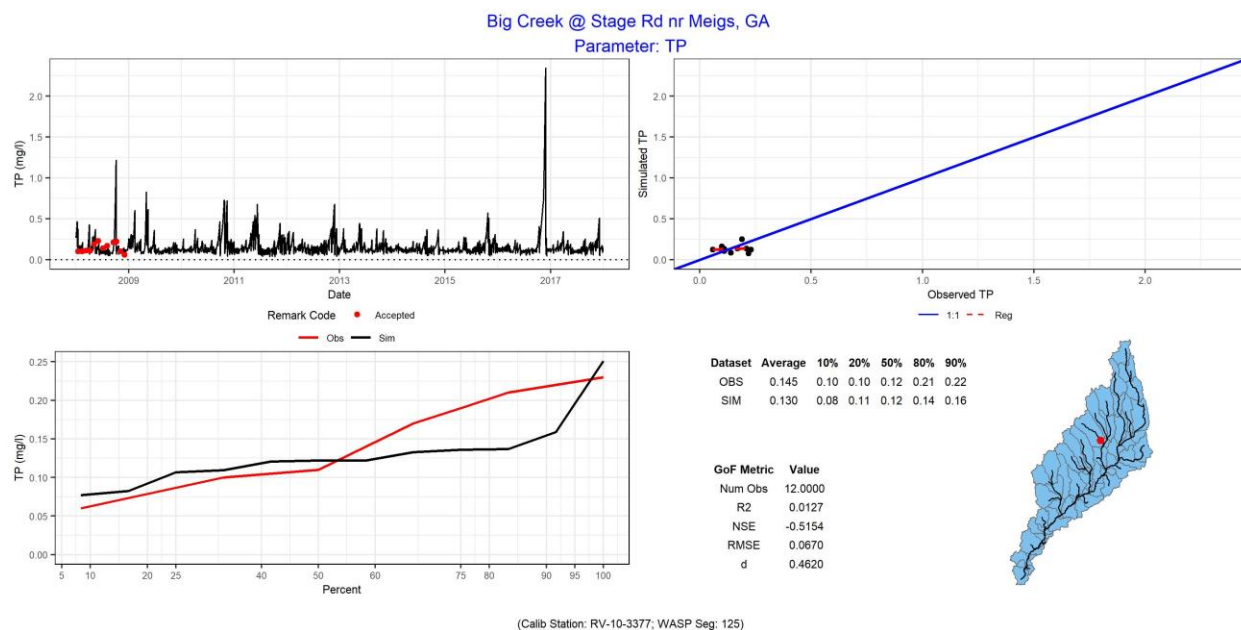


Figure 42 Total Phosphorus - Big Creek at Stage Road near Meigs, GA

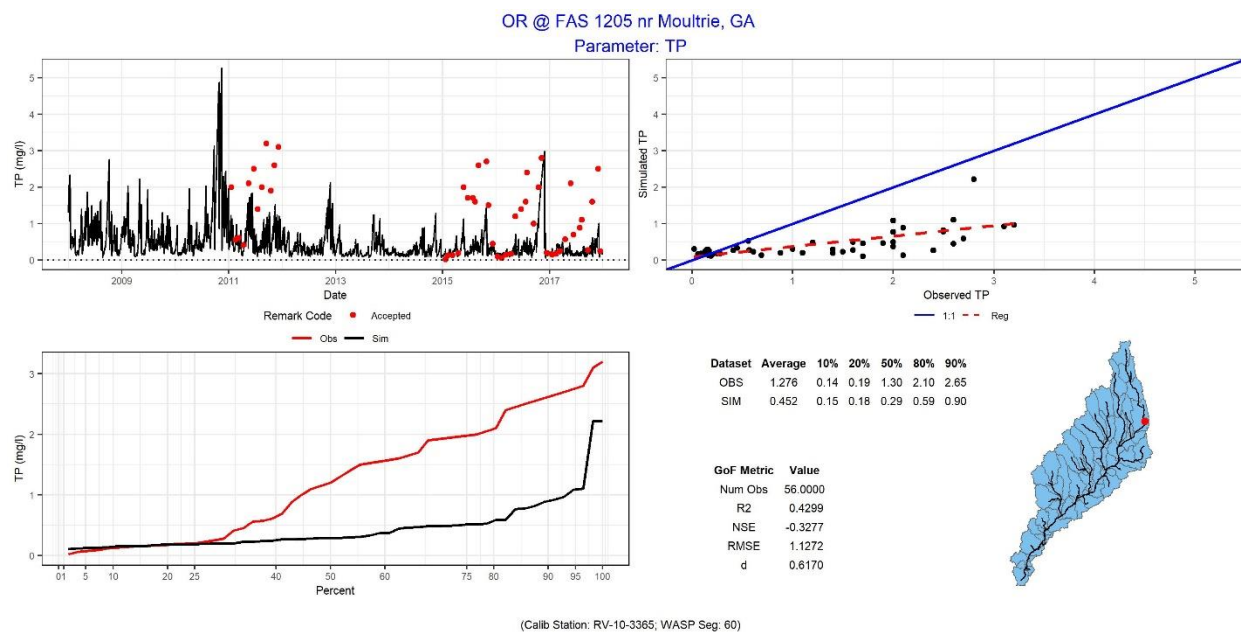


Figure 43 Total Phosphorus - Ochlockonee River - FAS 1205 near Moultrie, GA

OR @ Zion Grove Church Rd, GA
Parameter: TP

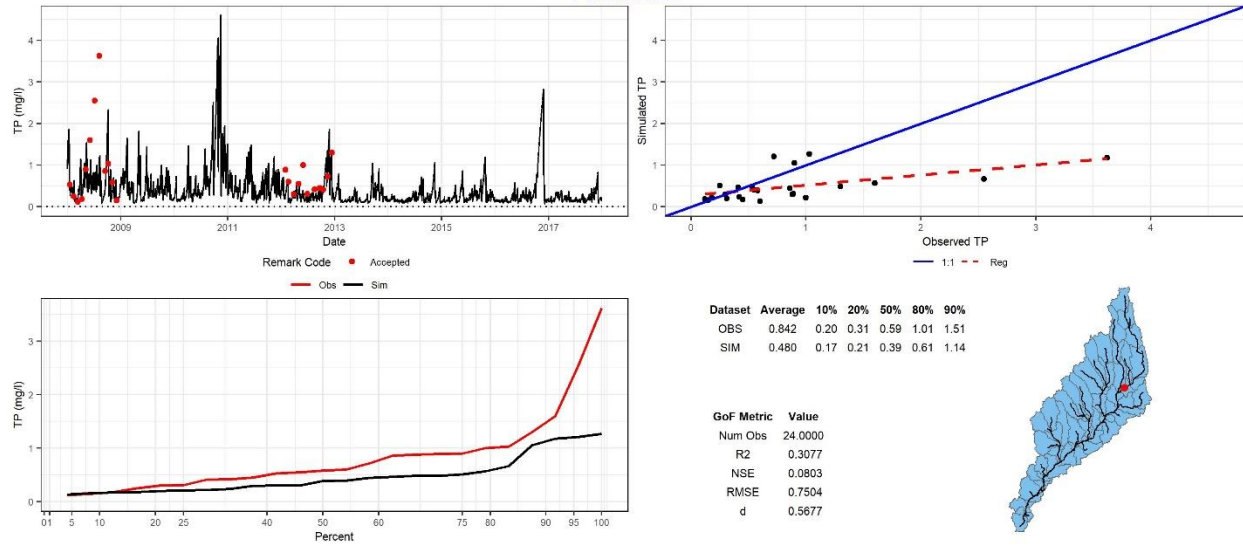


Figure 44 Total Phosphorus - Ochlockonee River at Zion Grove Church Rd. near Coolidge, GA

OR @ Fred Webb Rd, GA
Parameter: TP

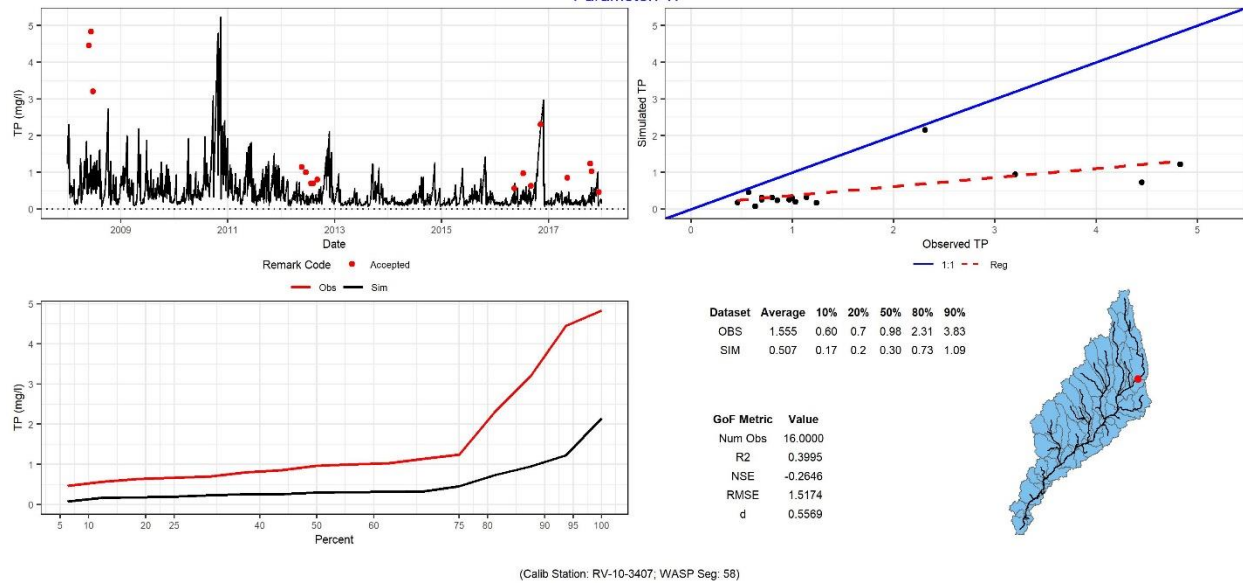


Figure 45 Total Phosphorus - Ochlockonee River at Fred Webb Rd, GA

OR @ SR 188 nr Coolidge, GA
Parameter: TP

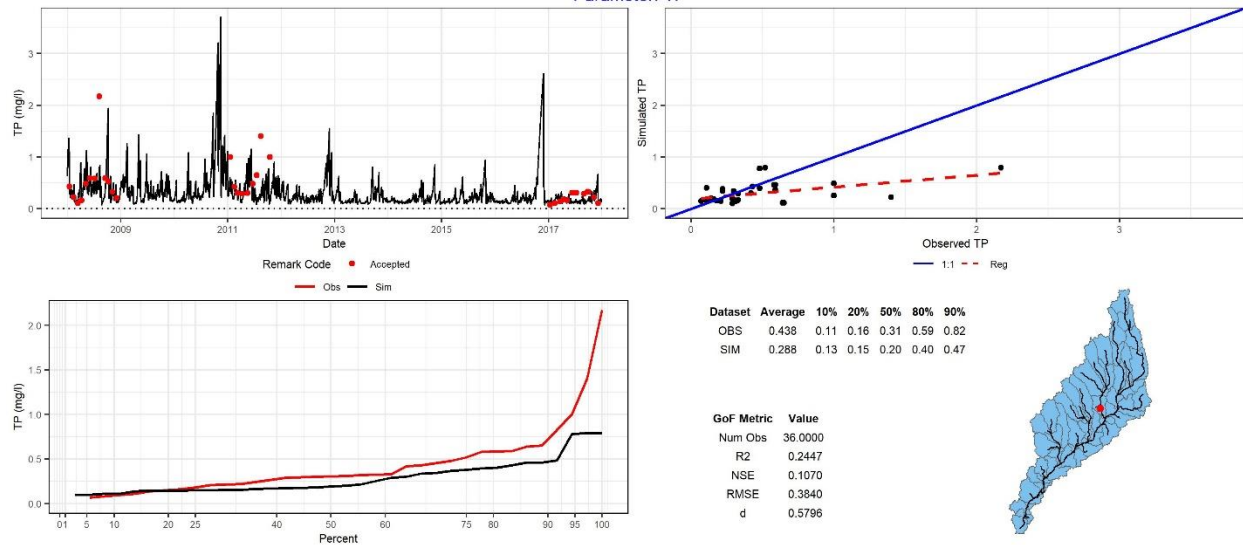


Figure 46 Total Phosphorus - Ochlockonee River at SR 188 near Coolidge, GA

Trib to OR @ at West Blvd, GA
Parameter: TP

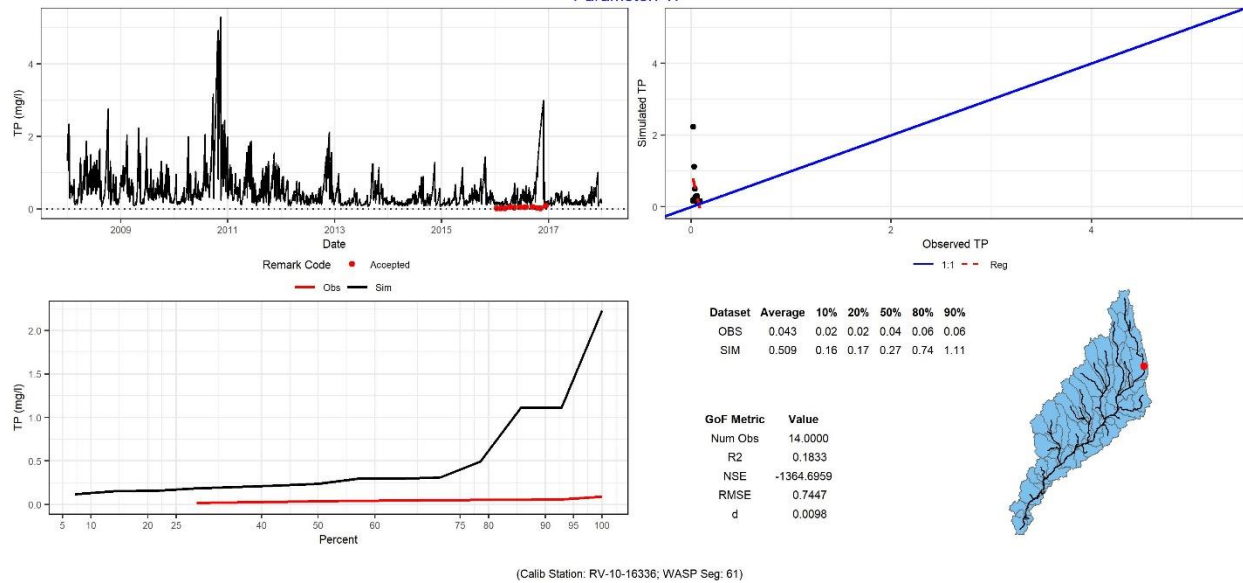


Figure 47 Total Phosphorus - Trib to Ochlockonee River at West Blvd near Moultrie, GA

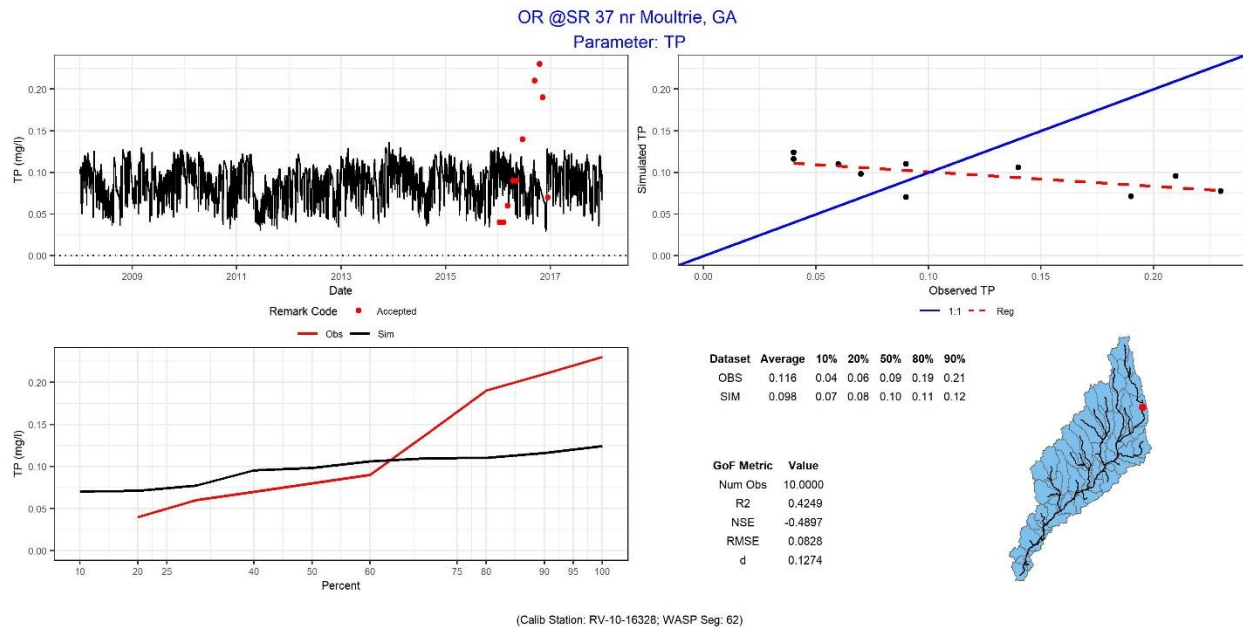


Figure 48 Total Phosphorus - Ochlockonee River @ SR 37 near Moultrie, GA

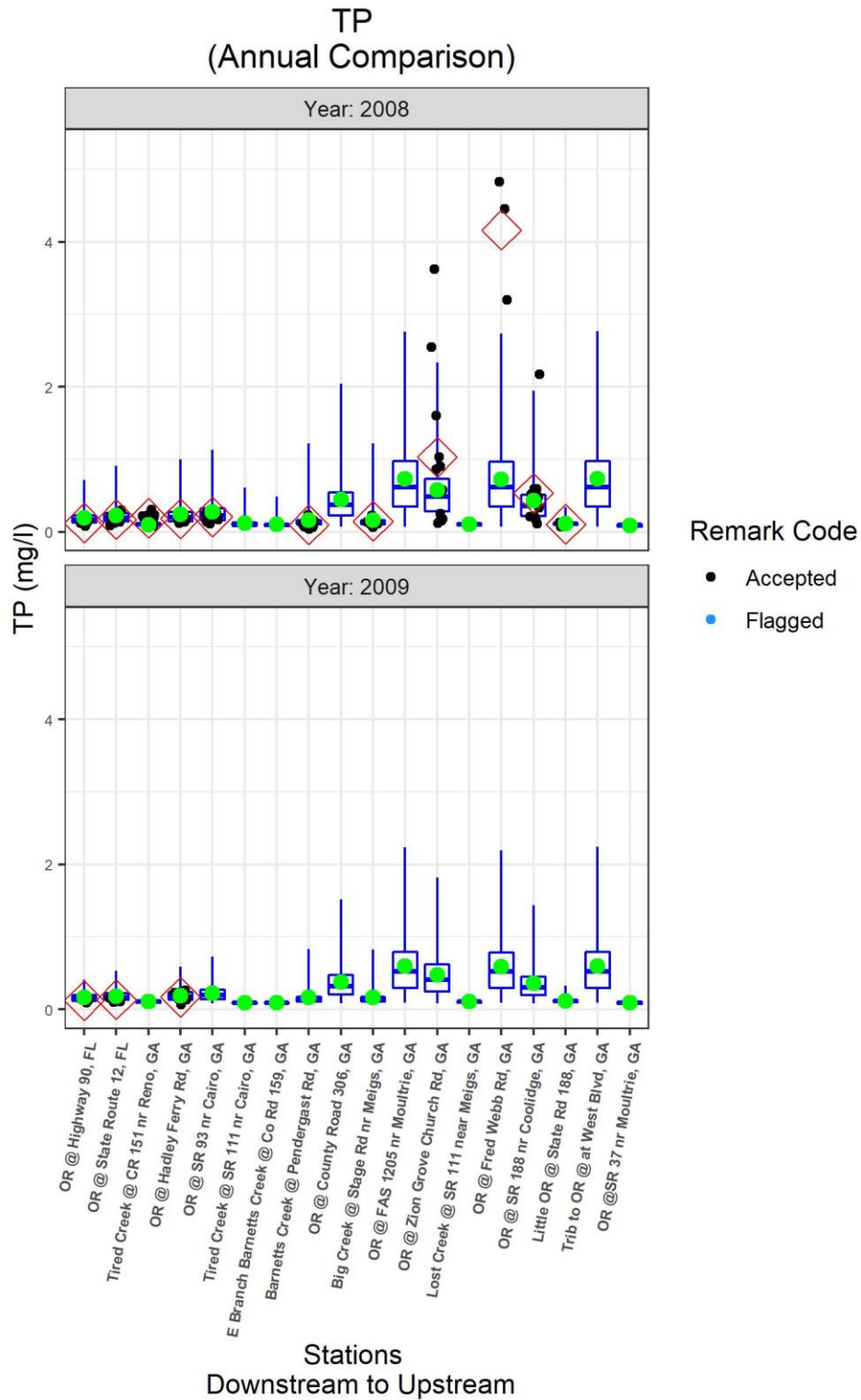


Figure 49 Ochlockonee River Total Phosphorus Comparison Observed vs. Simulated 2008 - 2009

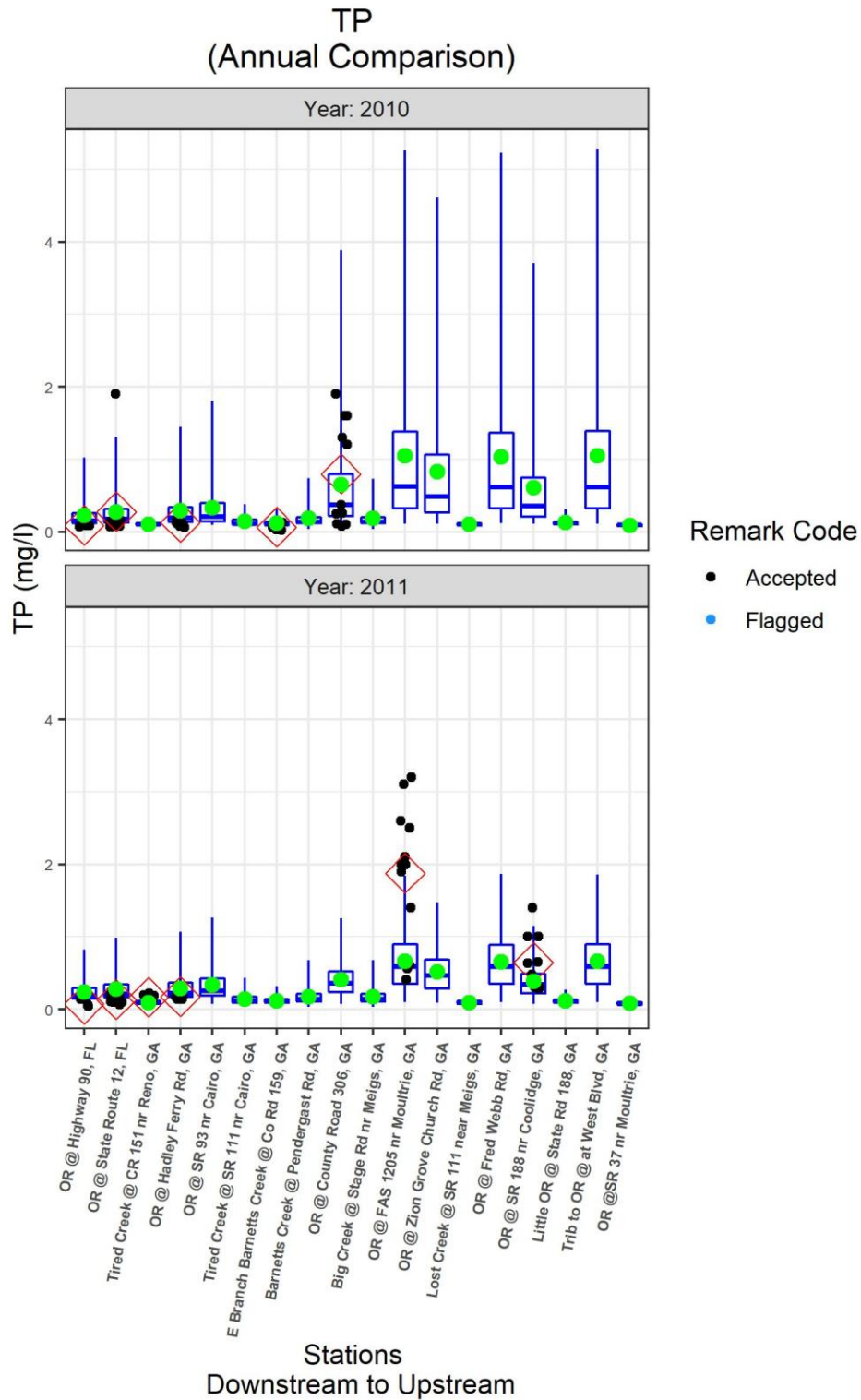


Figure 50 Ochlockonee River Total Phosphorus Comparison Observed vs. Simulated 2010 - 2011

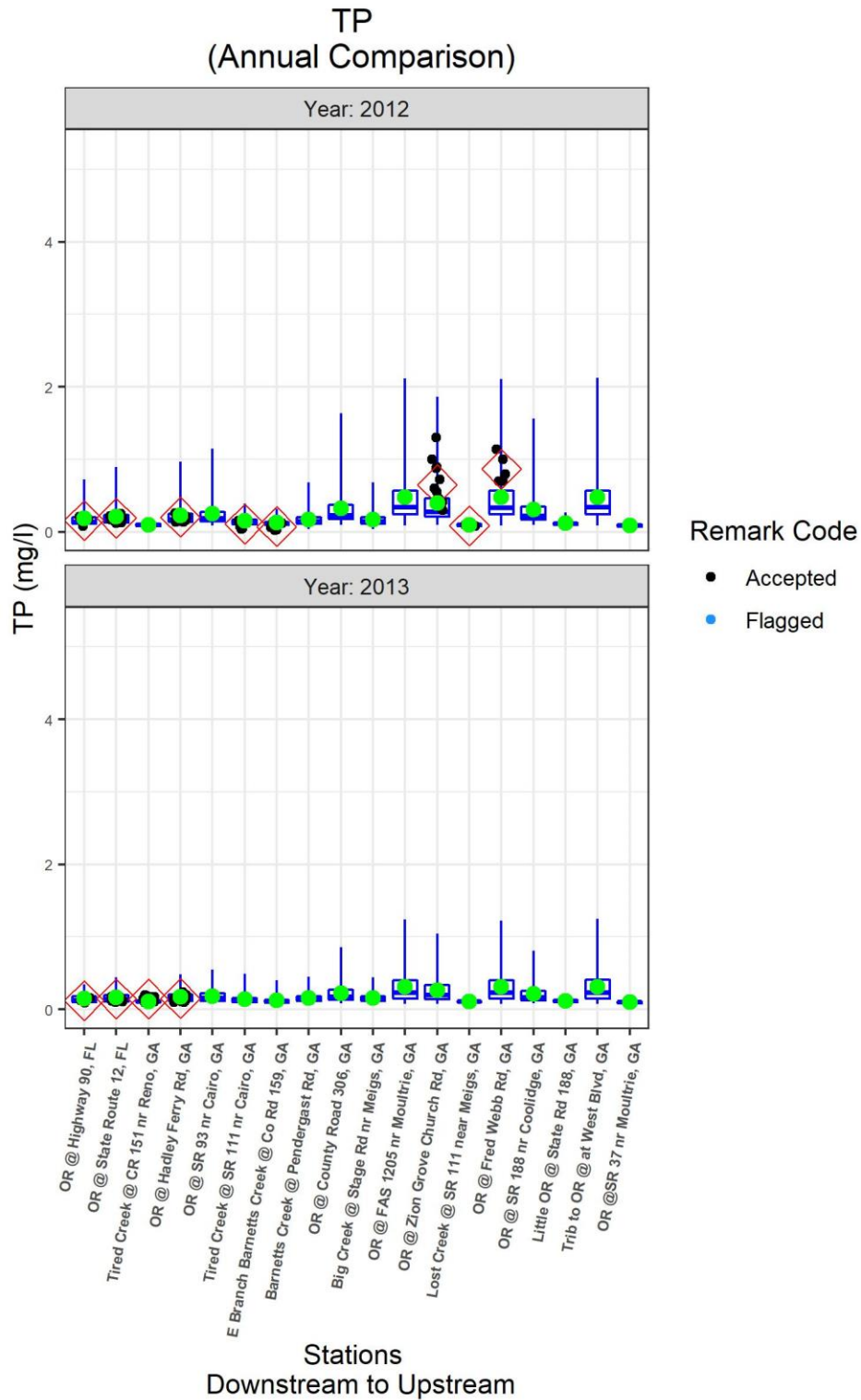


Figure 51 Ochlockonee River Total Phosphorus Comparison Observed vs. Simulated 2012 - 2013

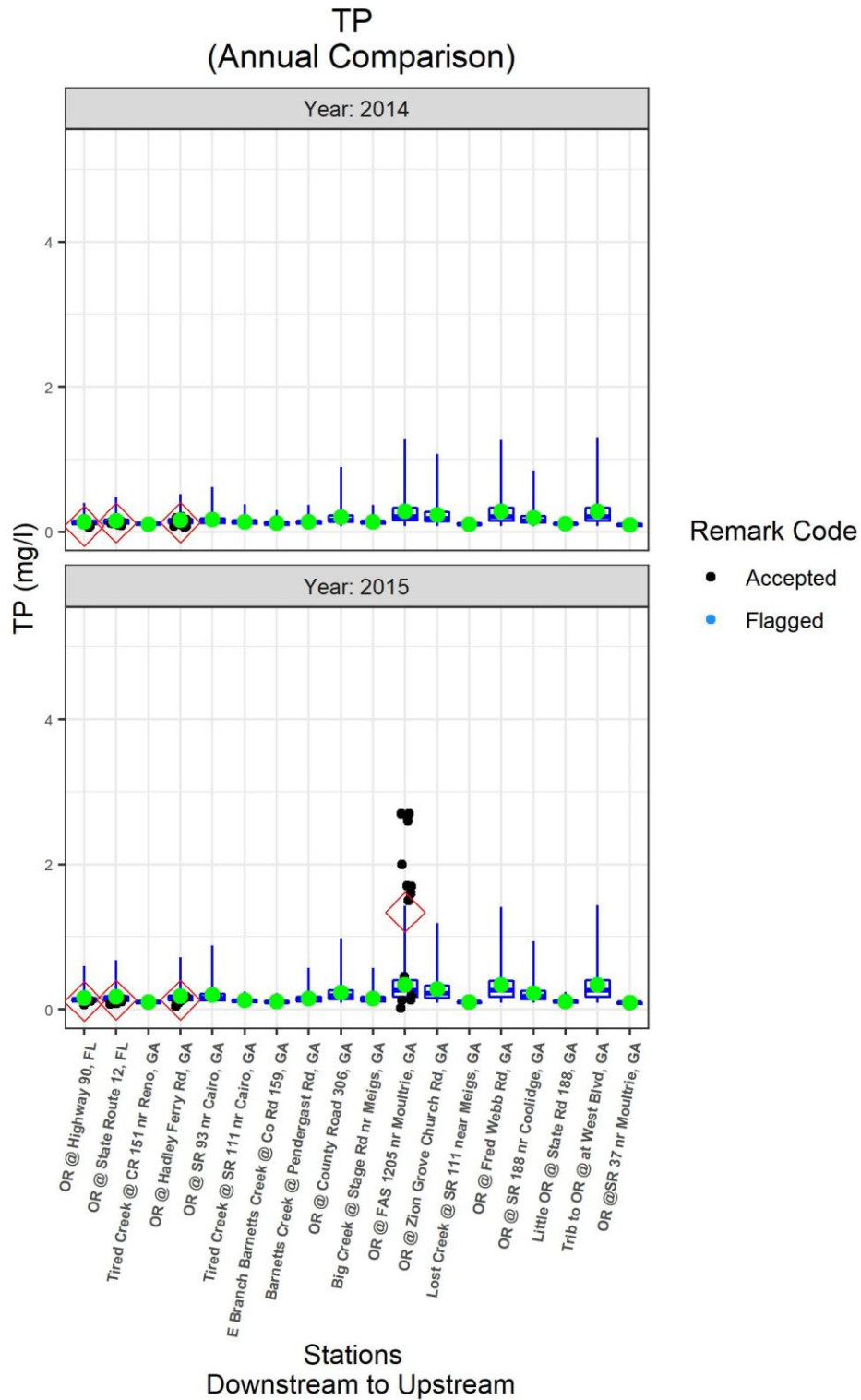


Figure 52 Ochlockonee River Total Phosphorus Comparison Observed vs. Simulated 2014 - 2015

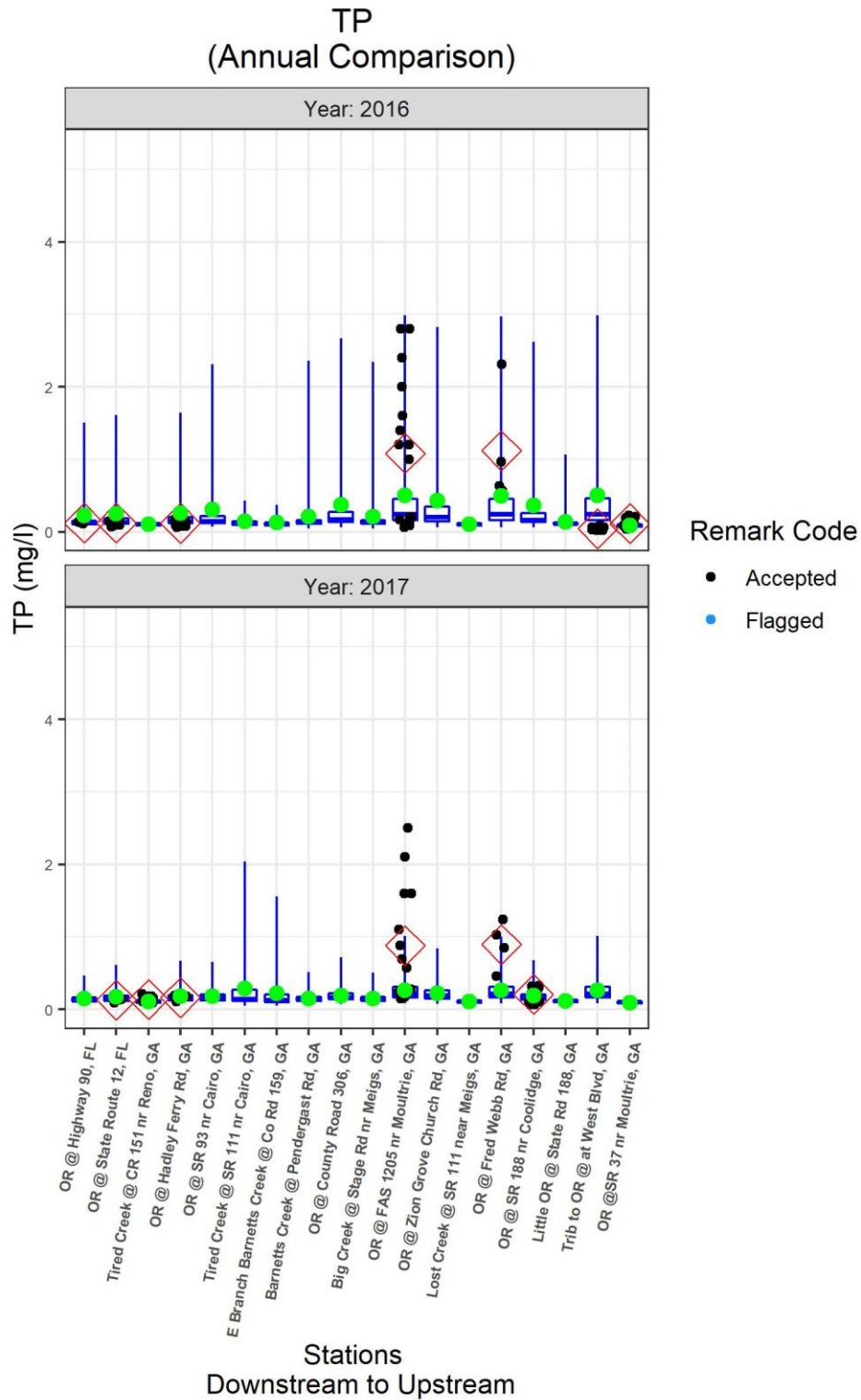


Figure 53 Ochlockonee River Total Phosphorus Comparison Observed vs. Simulated 2016 - 2017

Chlorophyll a

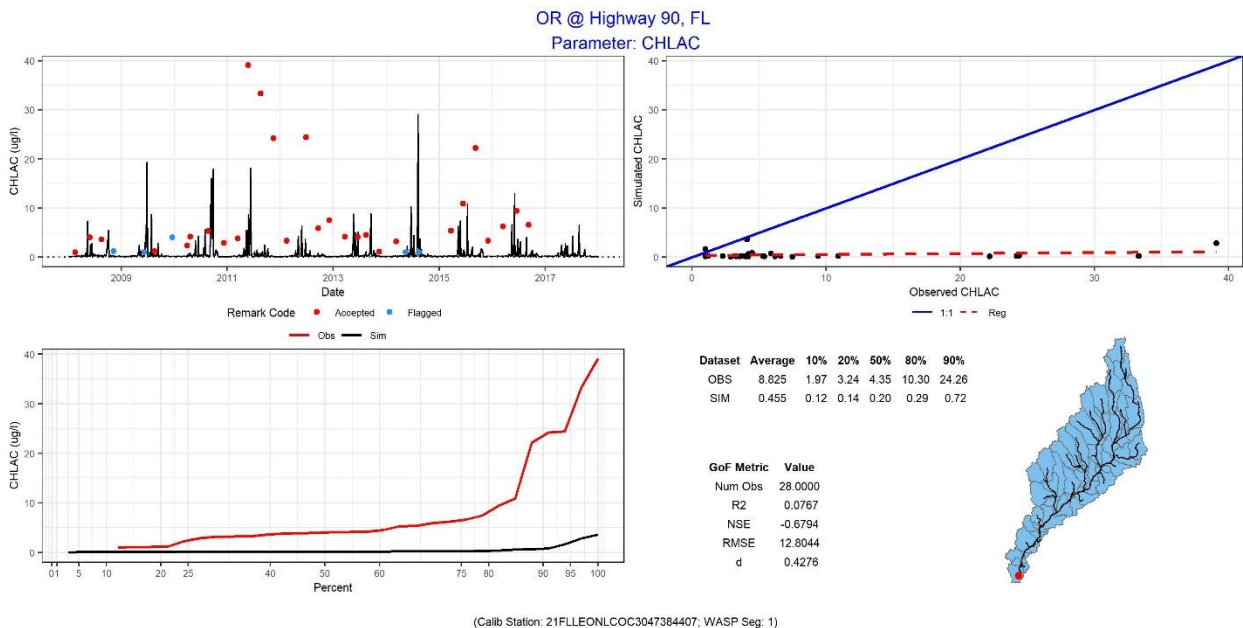


Figure 54 Chlorophyll a - Ochlockonee River at Highway 90, FL

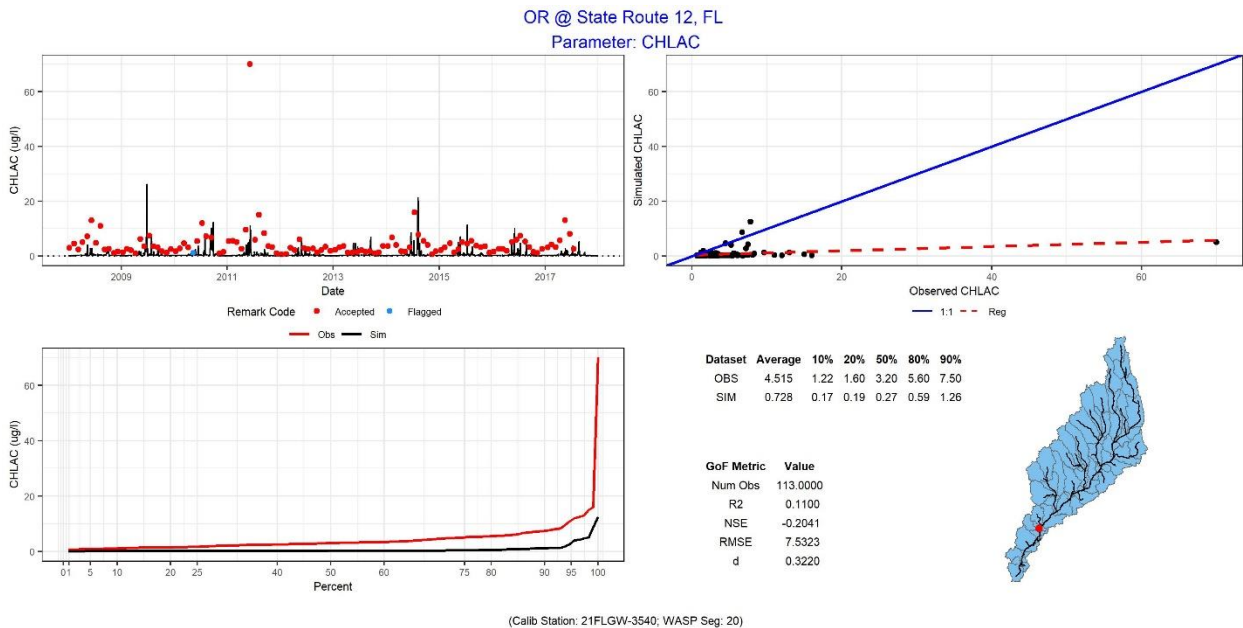


Figure 55 Chlorophyll a - Ochlockonee River at State Route 12, FL

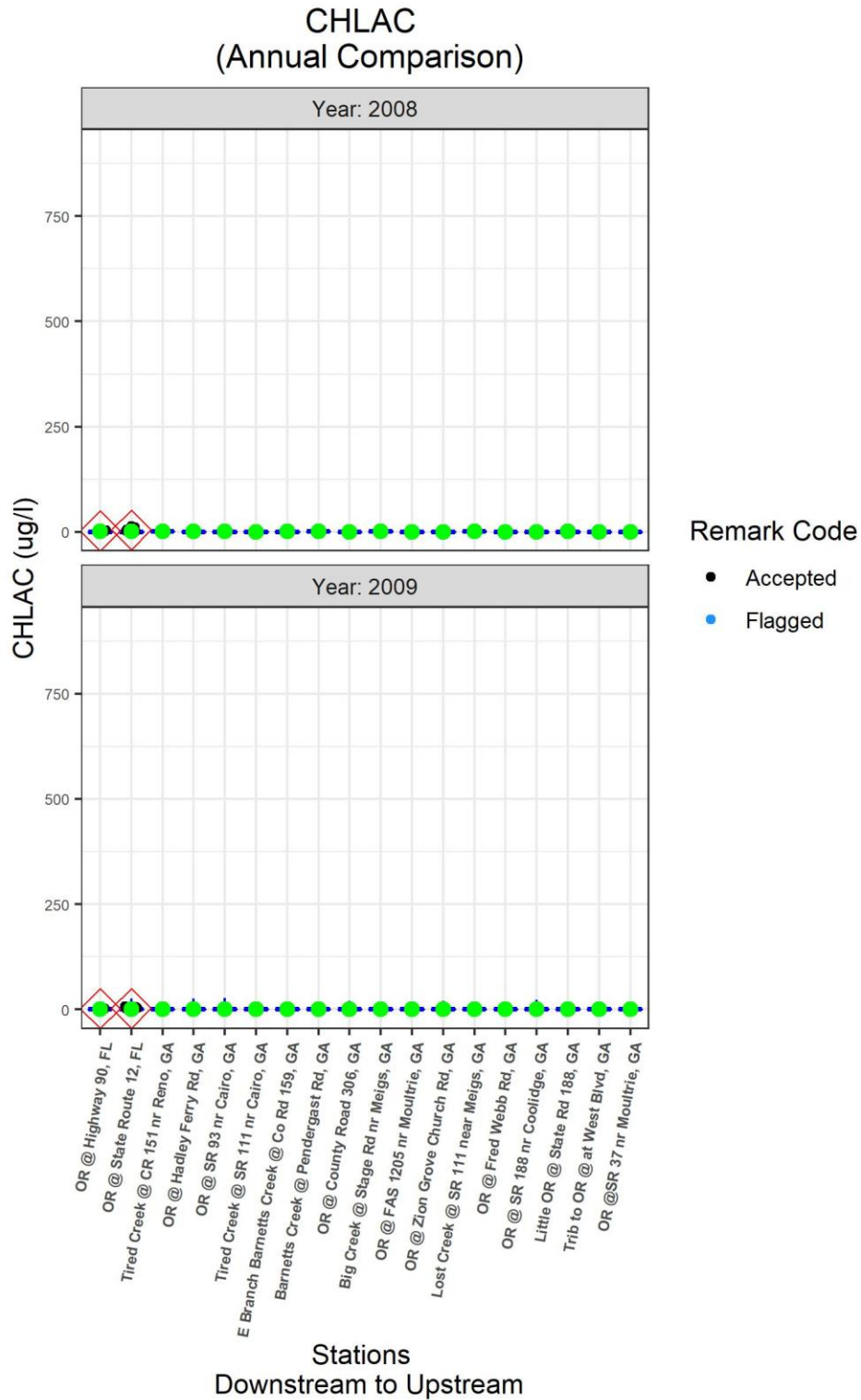


Figure 56 Ochlockonee River Chlorophyll a Comparison Observed vs. Simulated 2008 - 2009

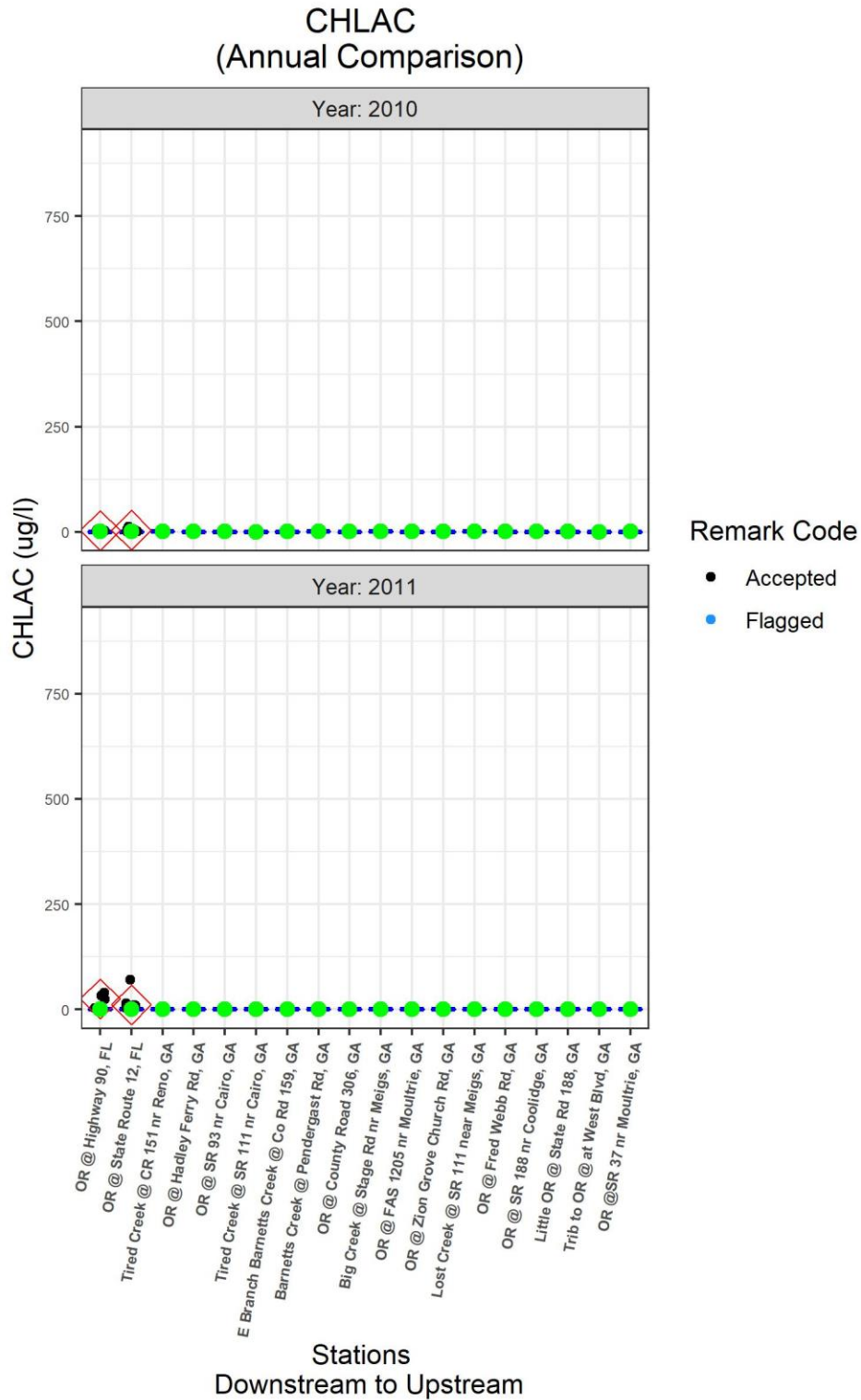


Figure 57 Ochlockonee River Chlorophyll a Comparison Observed vs. Simulated 2010 - 2011

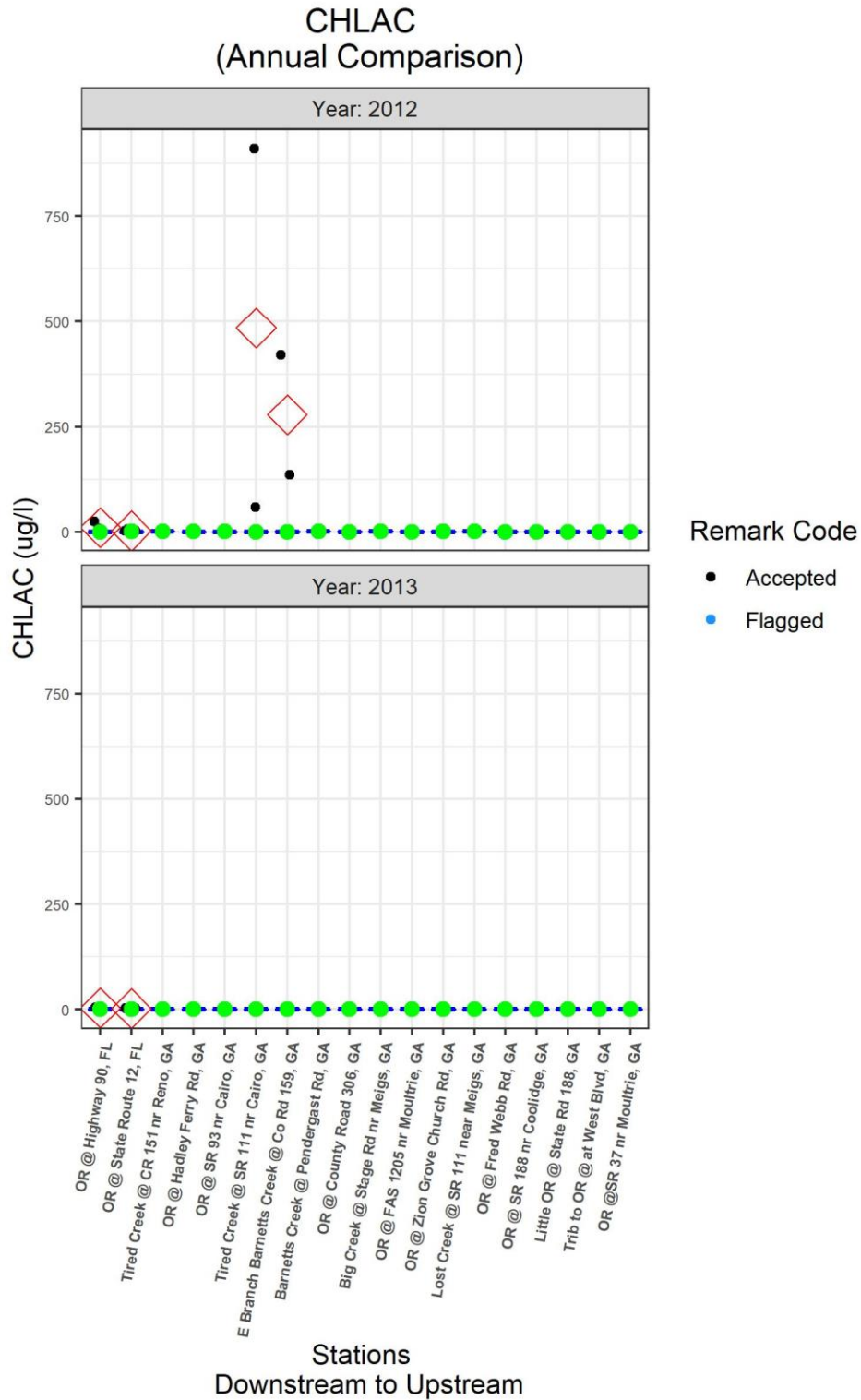


Figure 58 Ochlockonee River Chlorophyll a Comparison Observed vs. Simulated 2012 - 2013

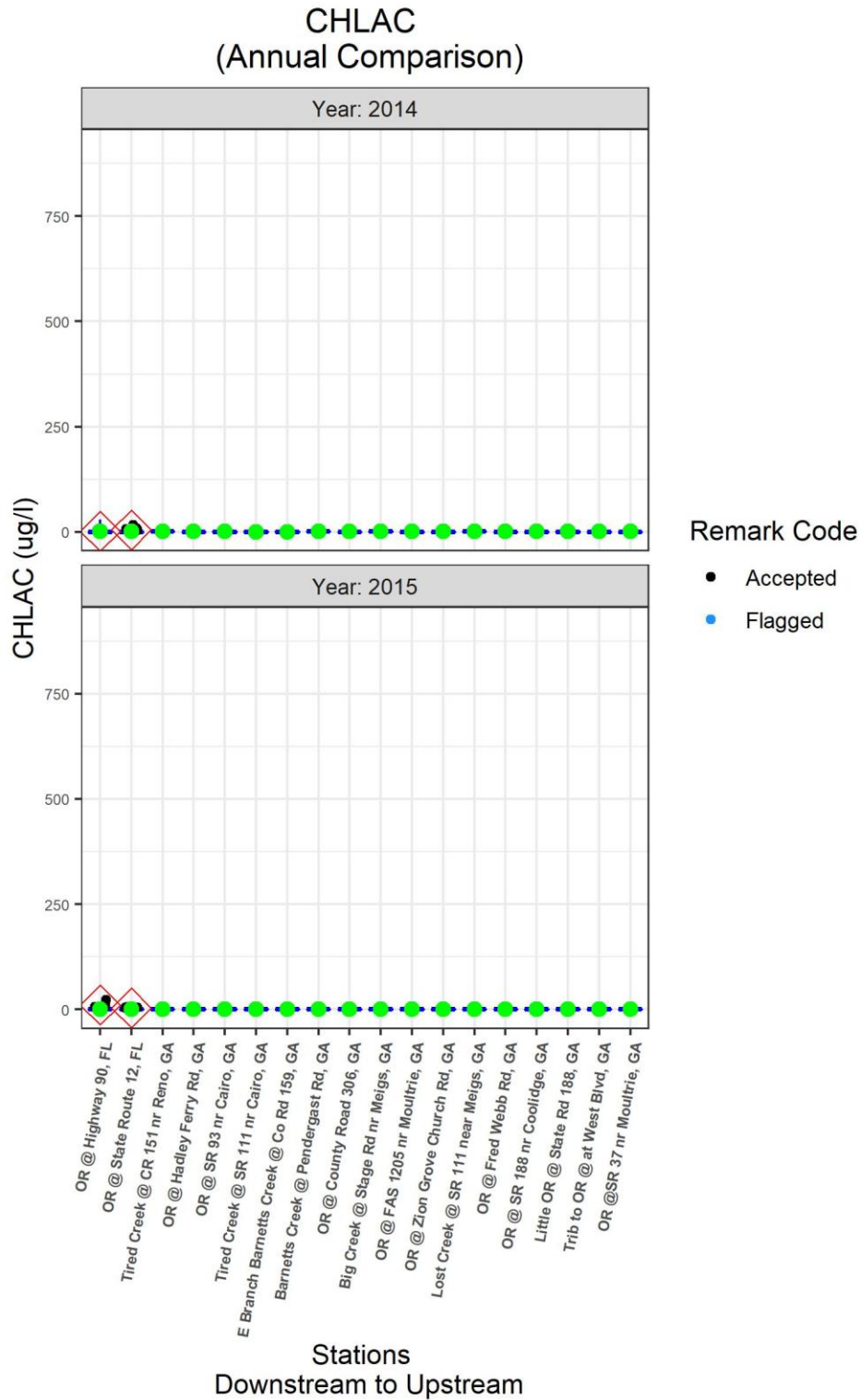


Figure 59 Ochlockonee River Chlorophyll a Comparison Observed vs. Simulated 2014 - 2015

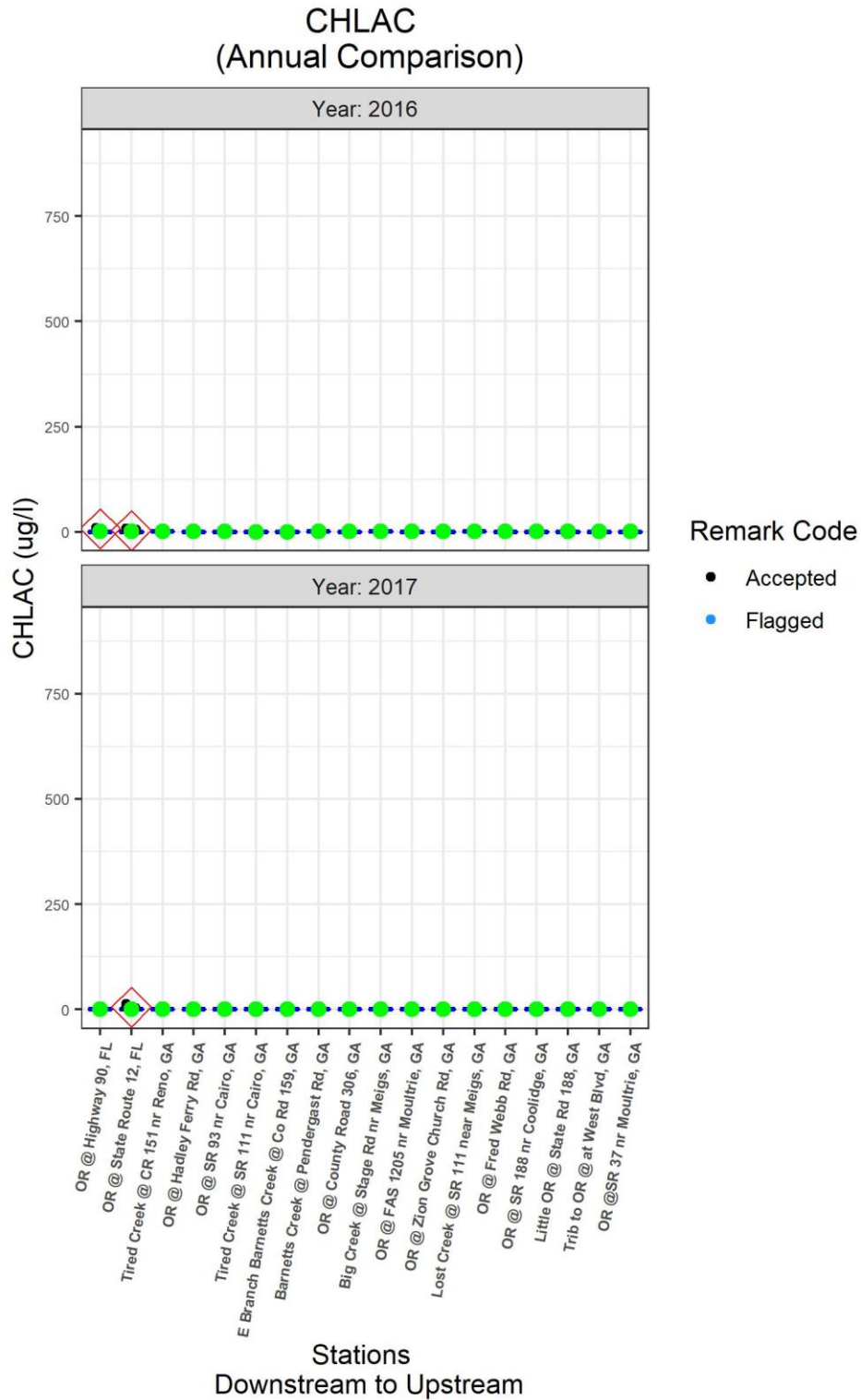


Figure 60 Ochlockonee River Chlorophyll a Comparison Observed vs. Simulated 2016 - 2017

Dissolved Oxygen

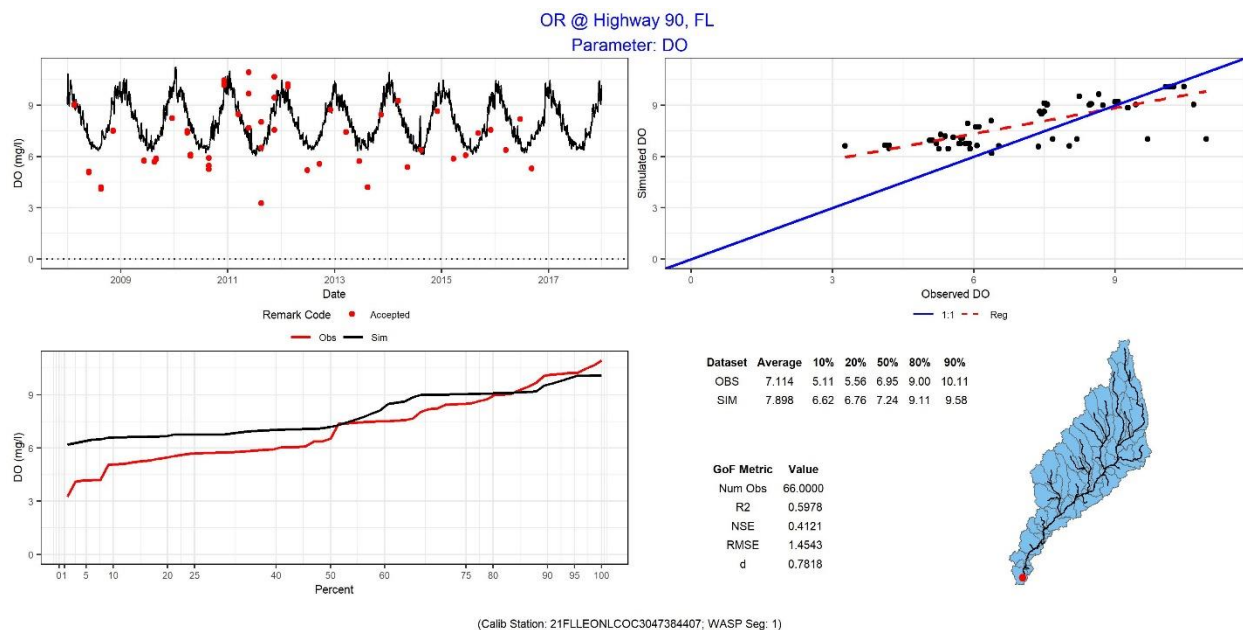


Figure 61 Dissolved Oxygen - Ochlockonee River at Highway 90, FL

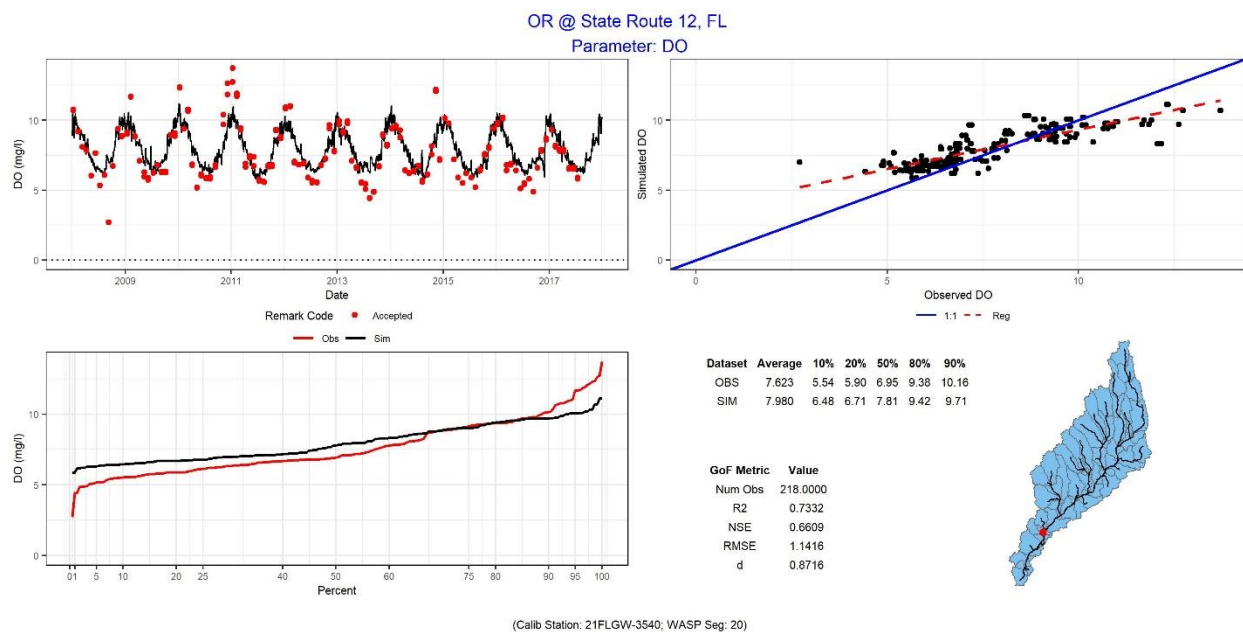


Figure 62 Dissolved Oxygen - Ochlockonee River at State Route 12, FL

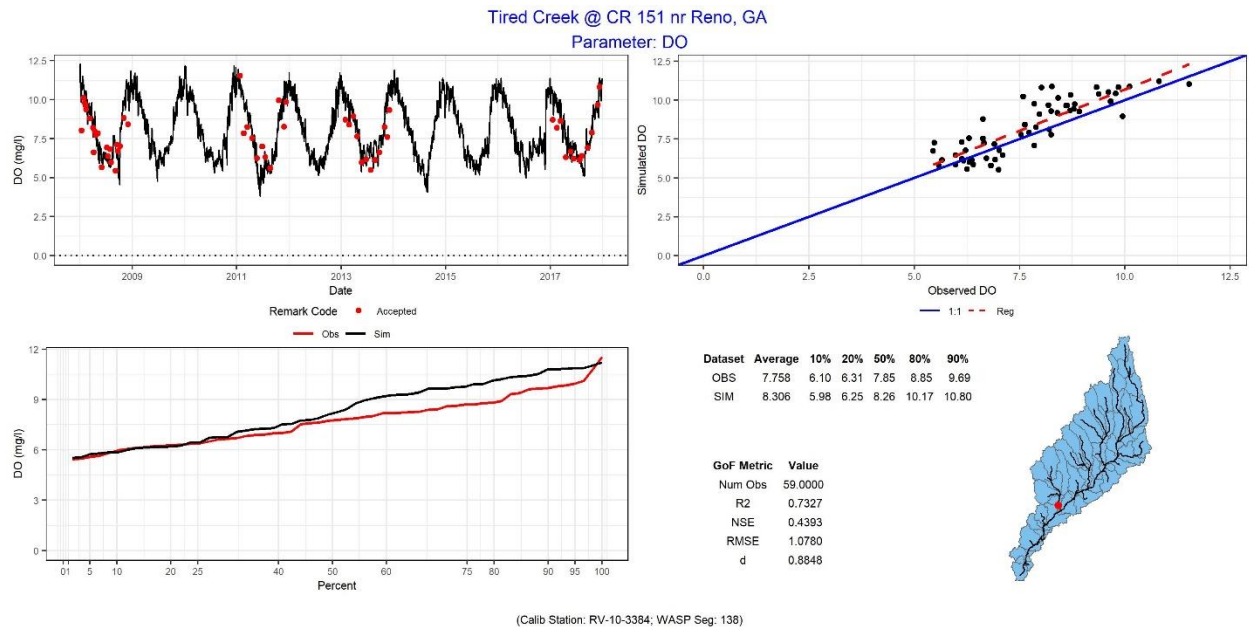


Figure 63 Dissolved Oxygen - Tired Creek at County Road 151 near Reno, GA

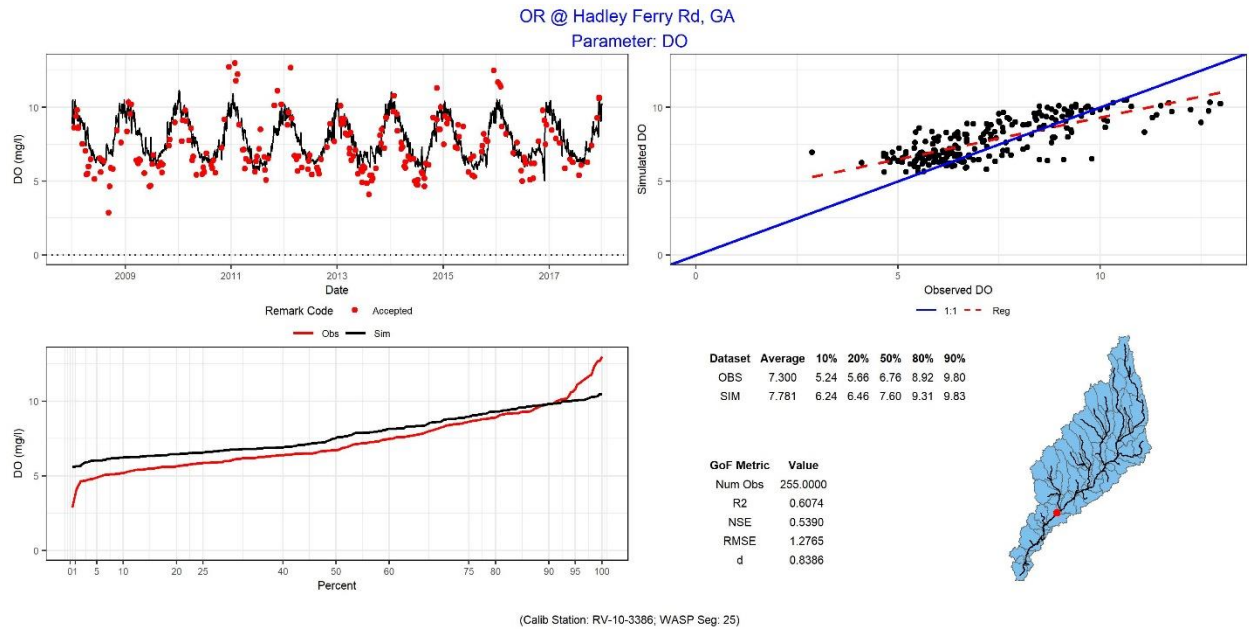


Figure 64 Dissolved Oxygen - Ochlockonee River @ Hadley Ferry Rd. nr Calvary, GA

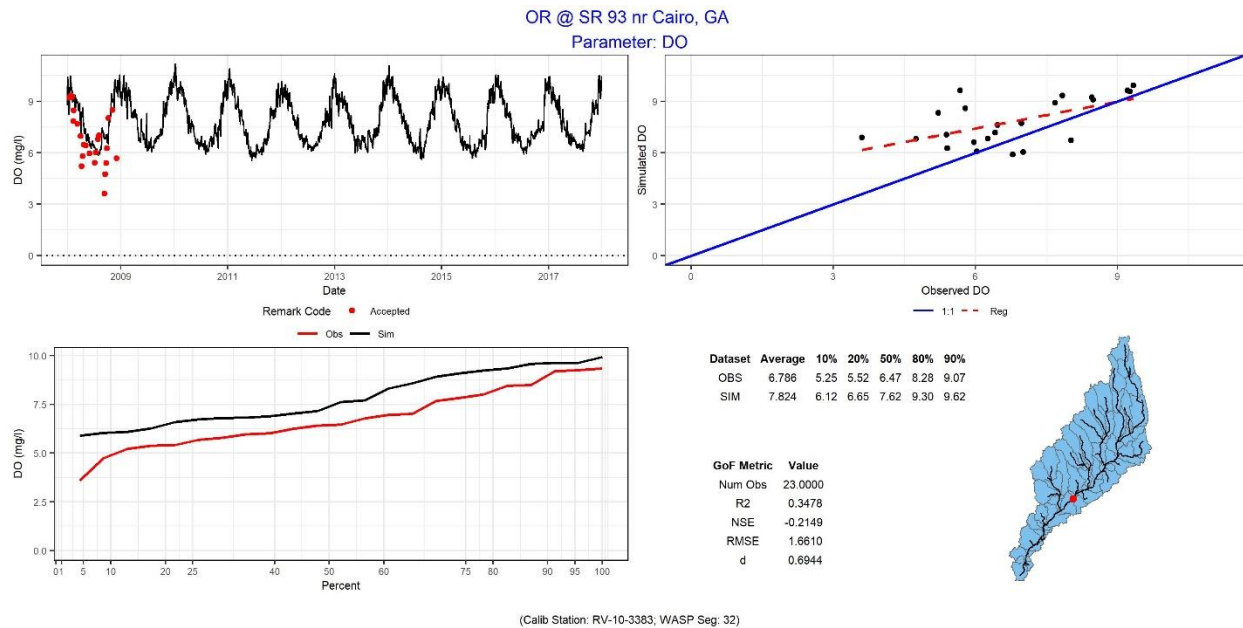


Figure 65 Dissolved Oxygen - Ochlockonee River - SR 93 near Cairo, GA

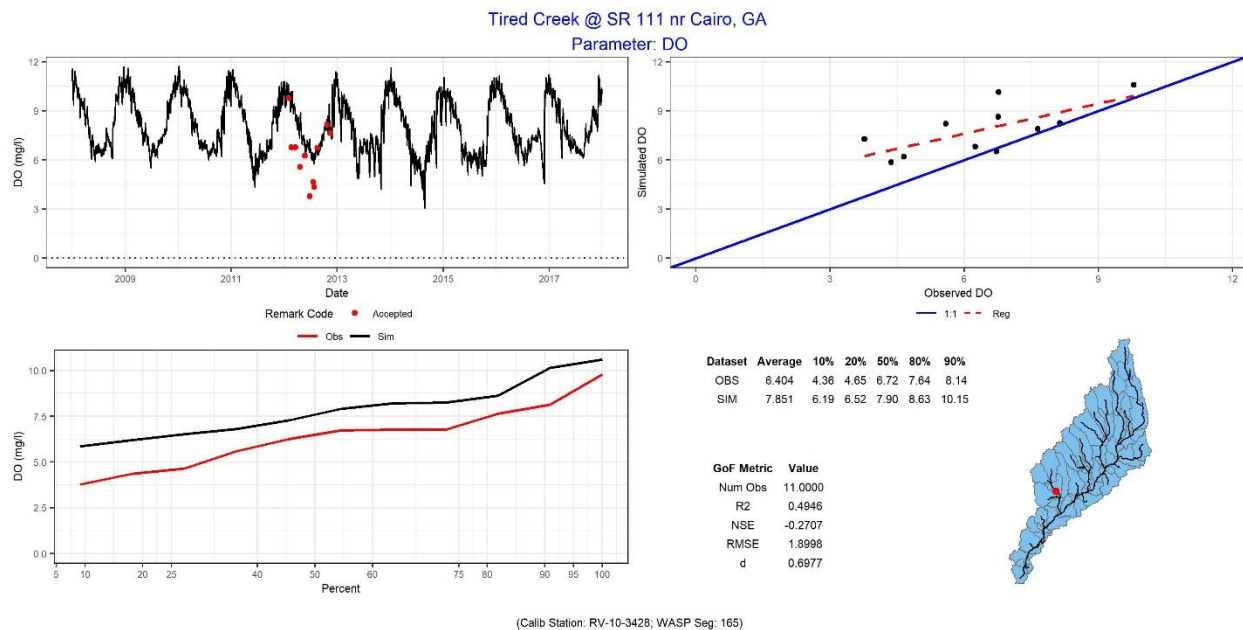


Figure 66 Dissolved Oxygen - Tired Creek at State Road 111 near Cairo, GA

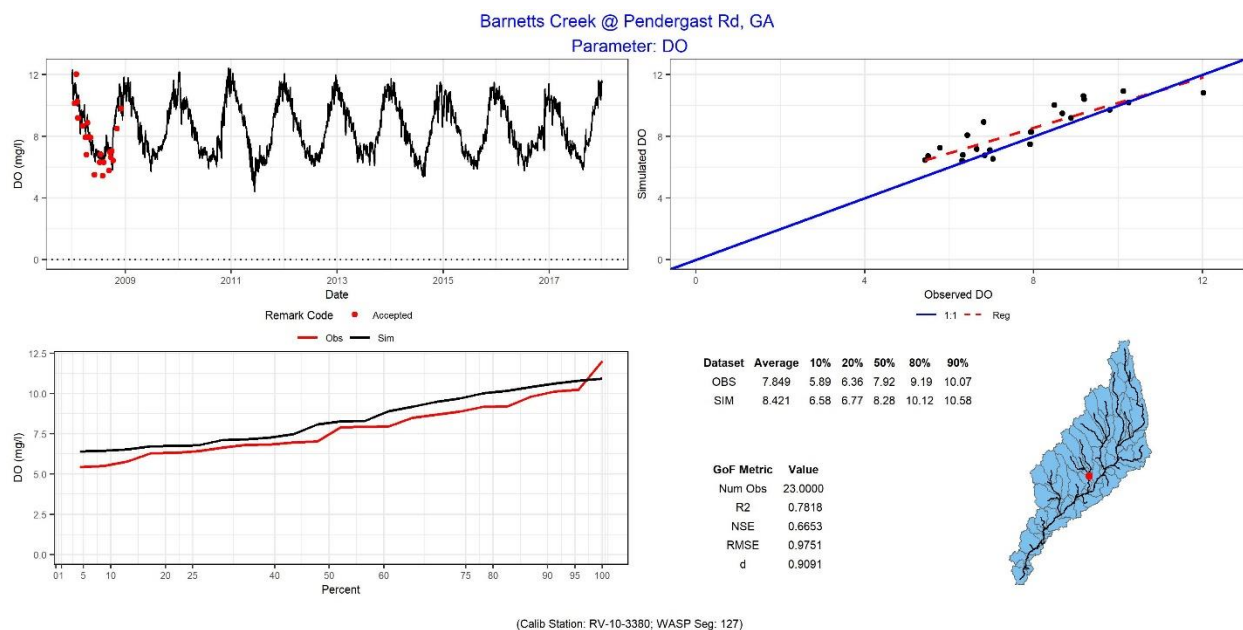


Figure 67 Dissolved Oxygen - Barnetts Creek at Pendergast Rd. / Old Thomasville Rd.

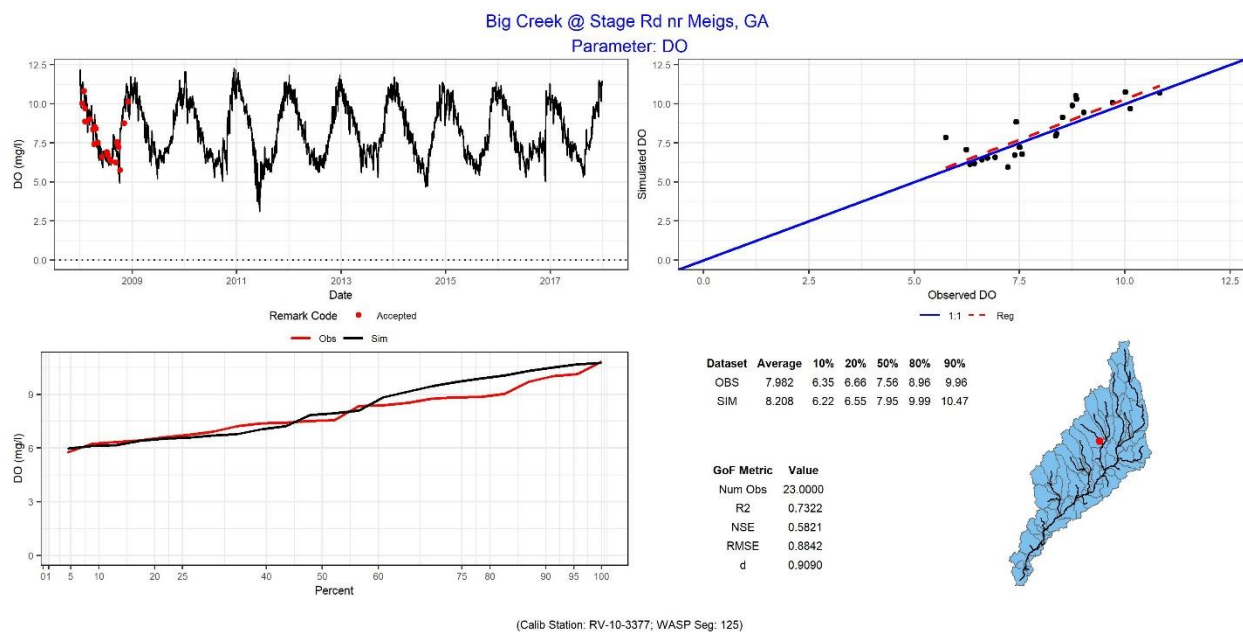


Figure 68 Dissolved Oxygen - Big Creek at Stage Road near Meigs, GA

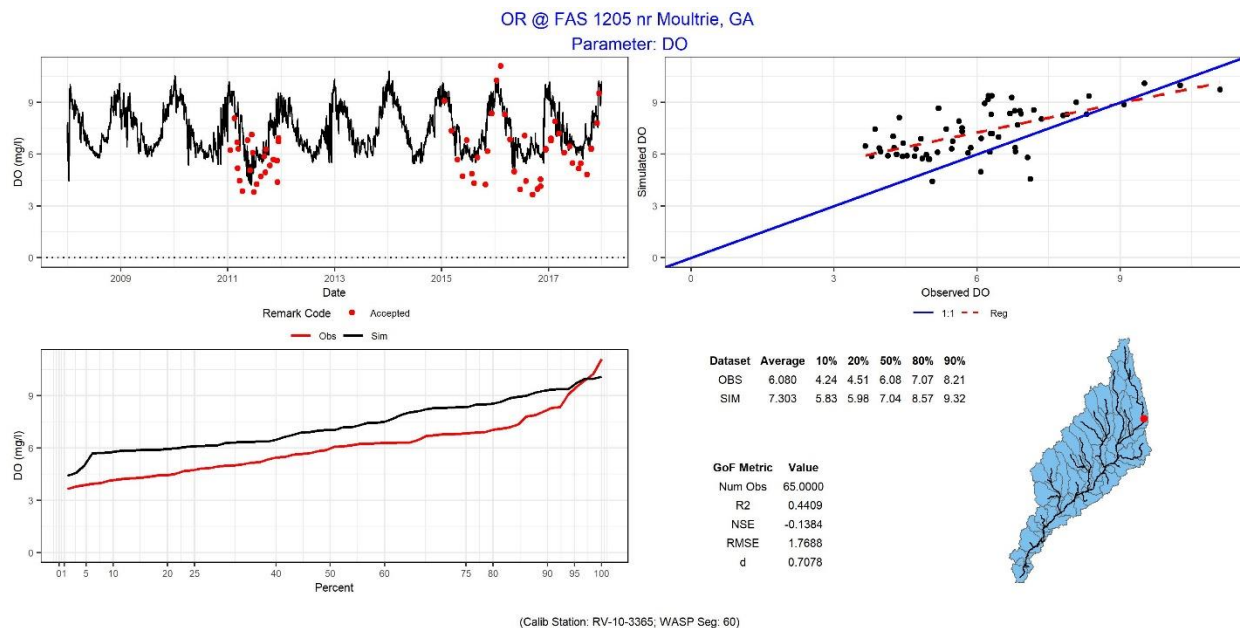


Figure 69 Dissolved Oxygen - Ochlockonee River - FAS 1205 near Moultrie, GA

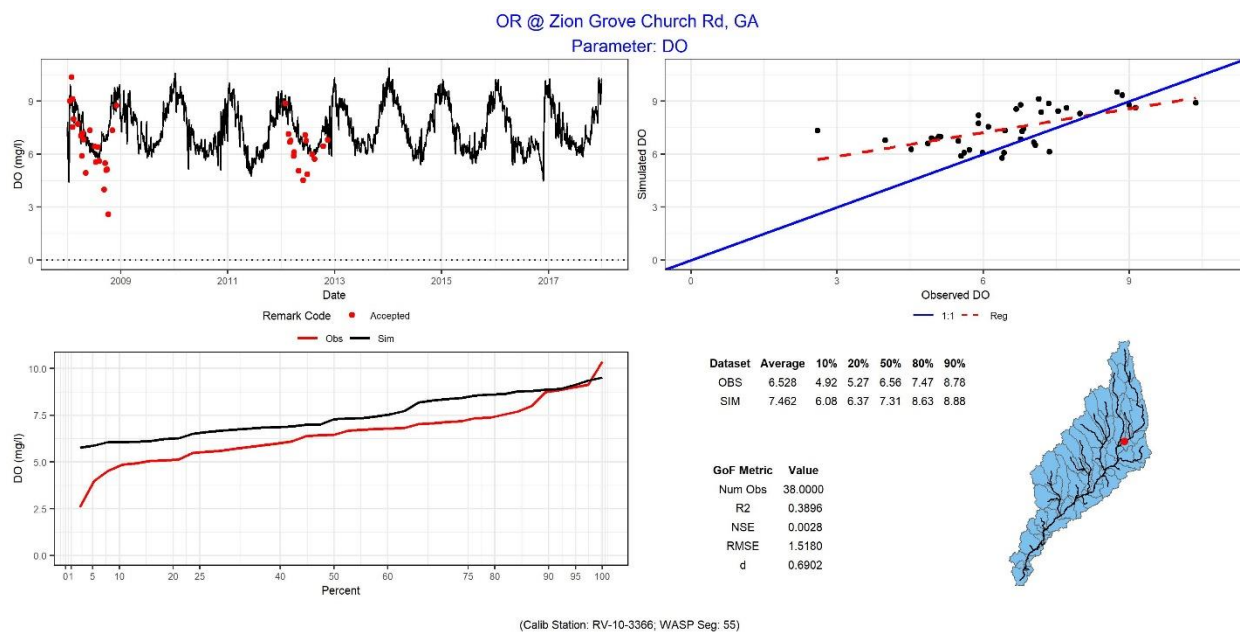


Figure 70 Dissolved Oxygen - Ochlockonee River at Zion Grove Church Rd. near Coolidge, GA

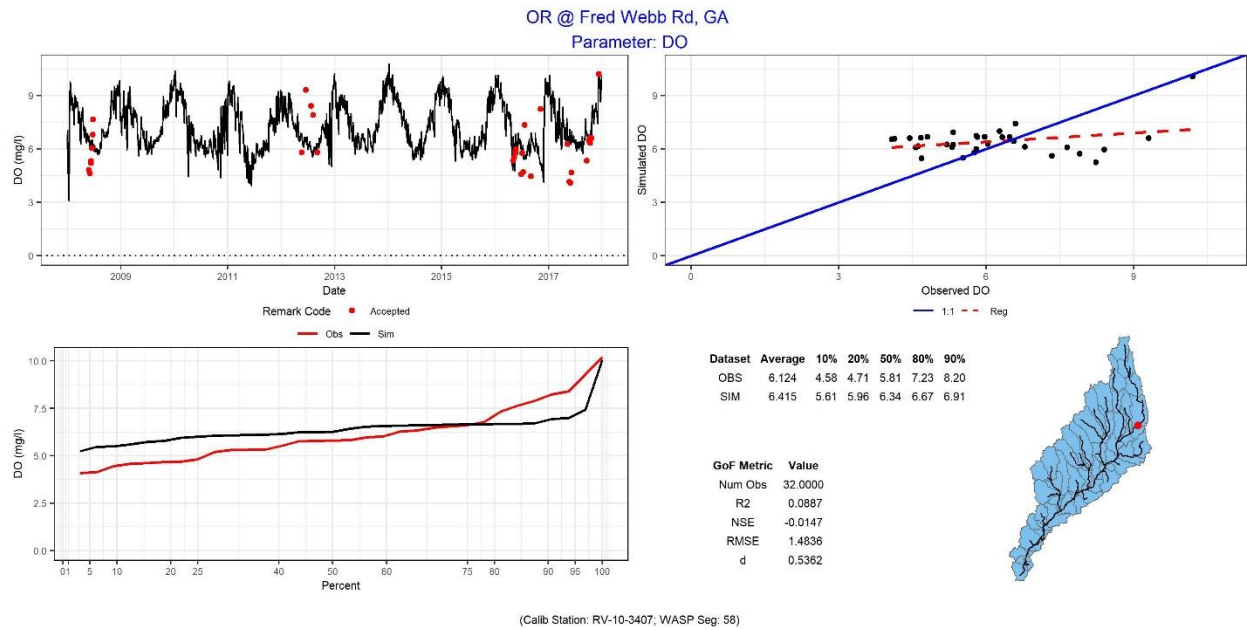


Figure 71 Dissolved Oxygen - Ochlockonee River at Fred Webb Rd, GA

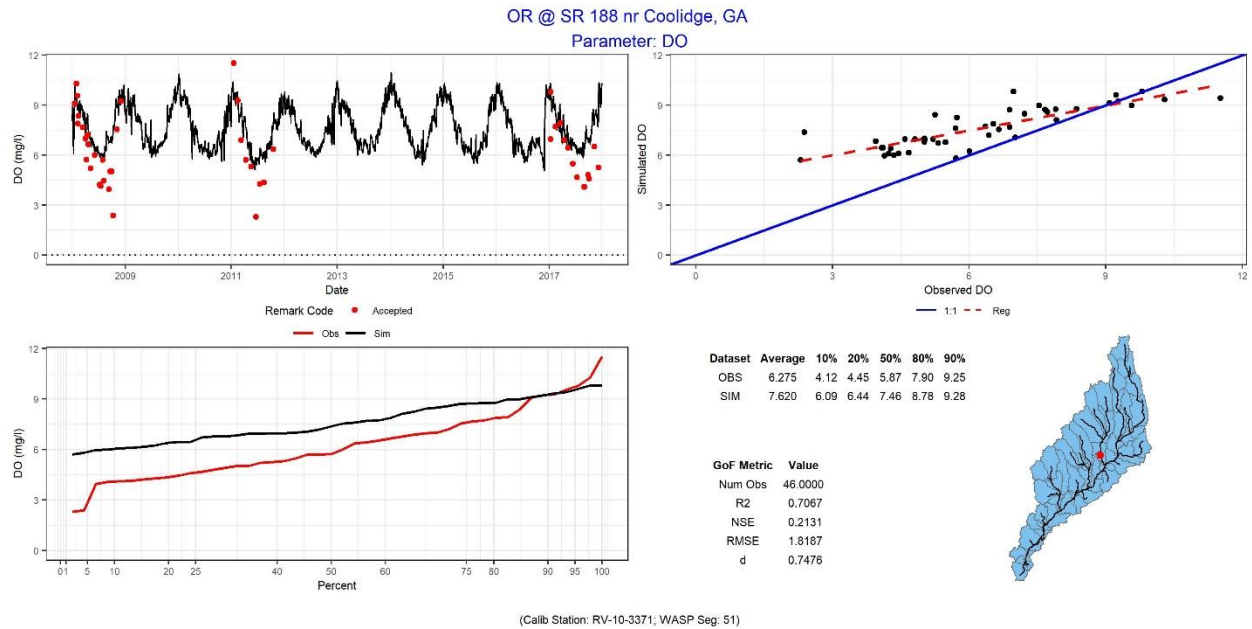


Figure 72 Dissolved Oxygen - Ochlockonee River at SR 188 near Coolidge, GA

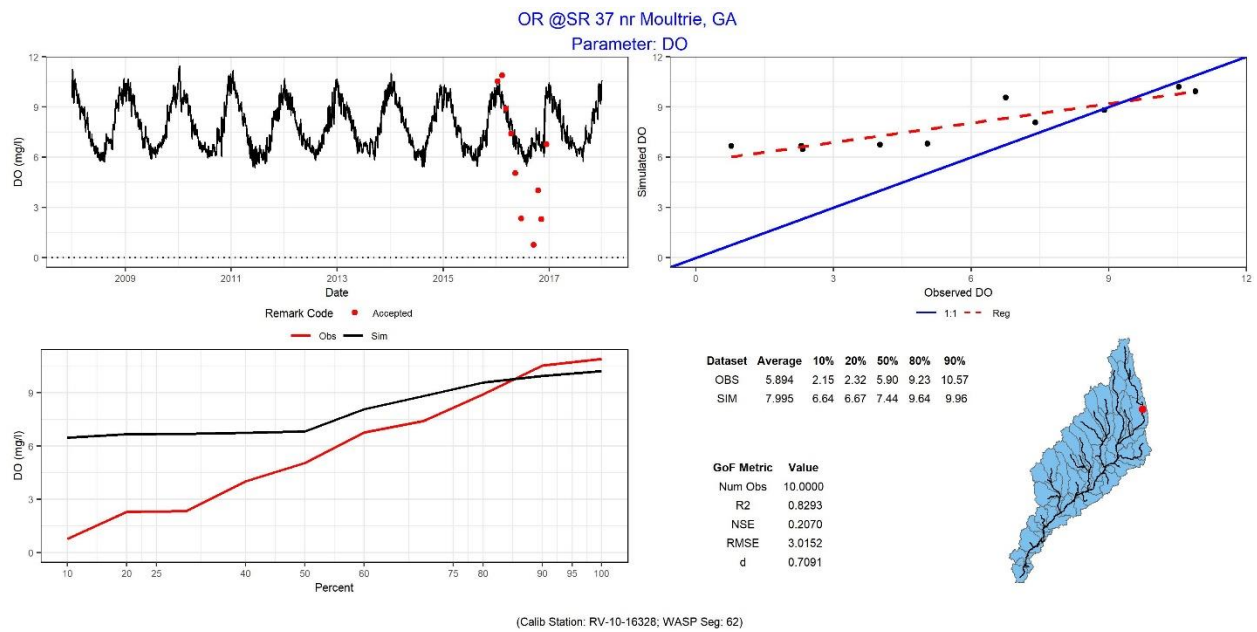


Figure 73 Dissolved Oxygen - Ochlockonee River @ SR 37 near Moultrie, GA

Carbonaceous Biochemical Oxygen Demand

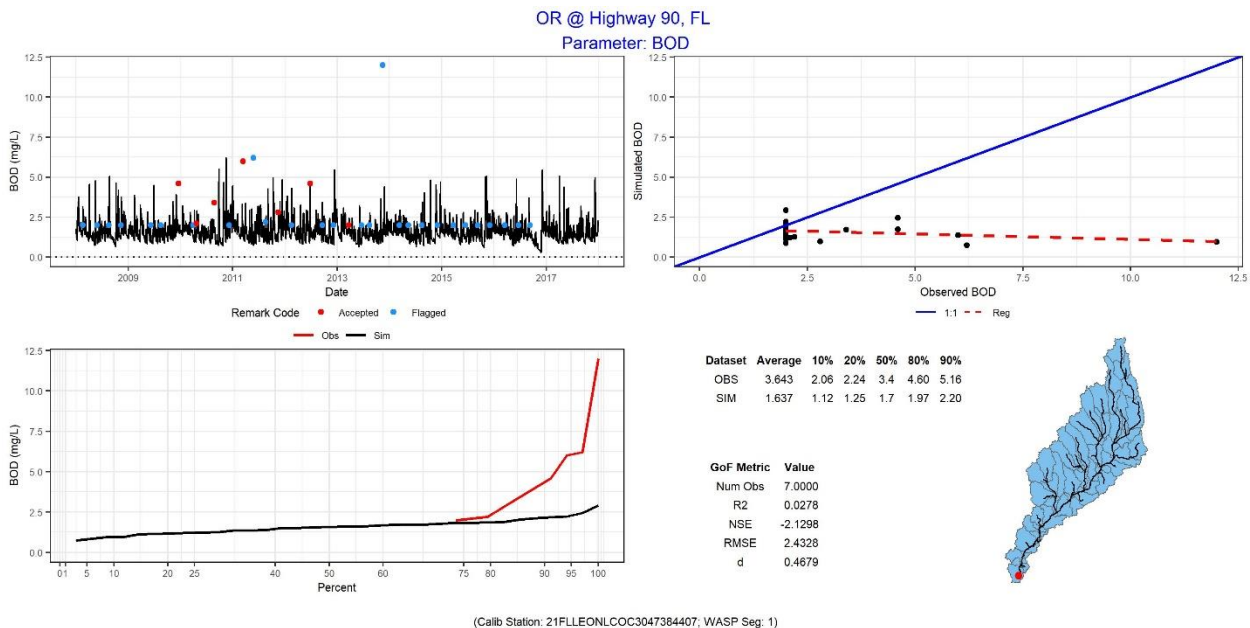


Figure 74 CBOD - Ochlockonee River at Highway 90, FL

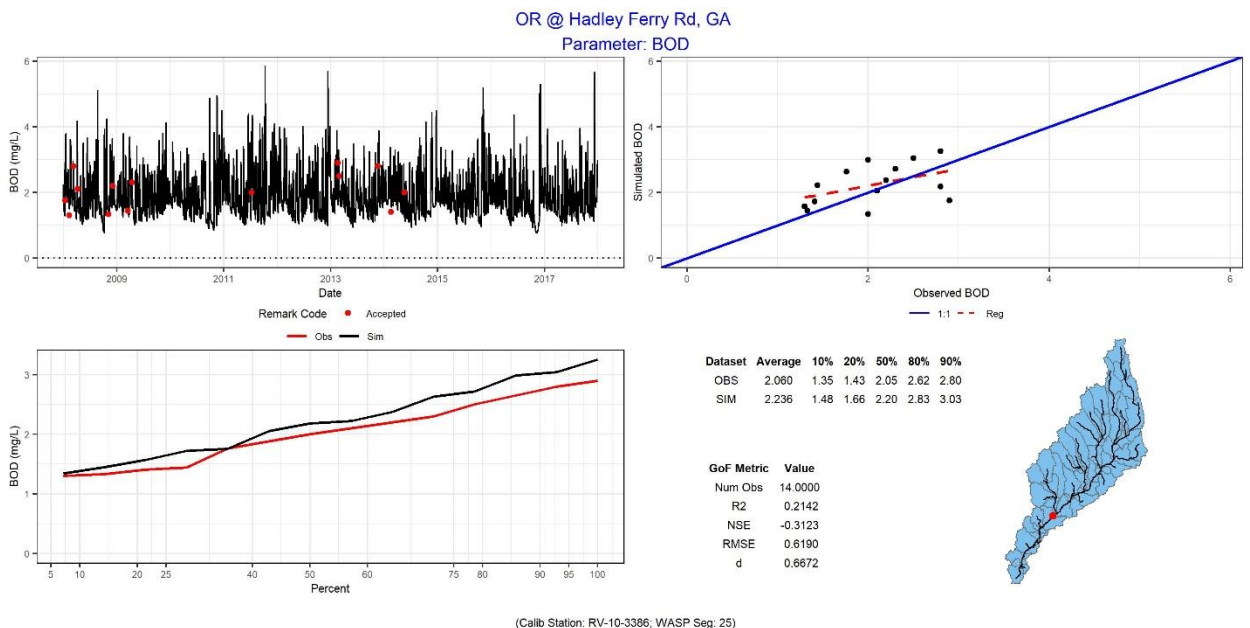


Figure 75 CBOD - Ochlockonee River @ Hadley Ferry Rd. nr Calvary, GA

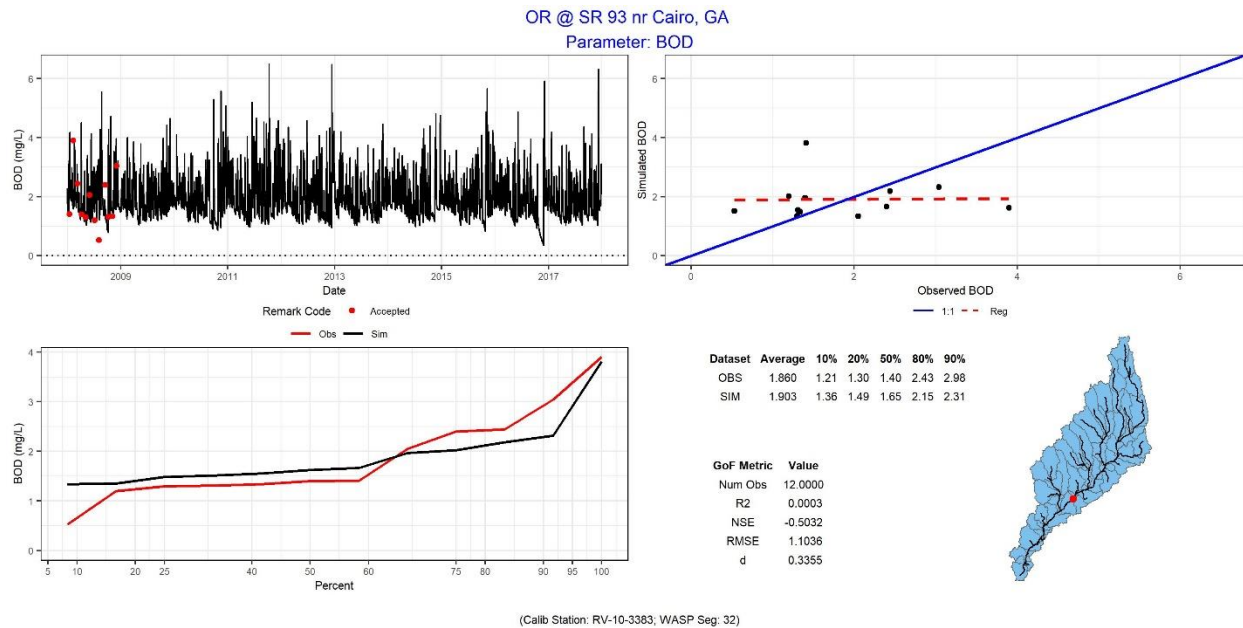


Figure 76 CBOD - Ochlockonee River - SR 93 near Cairo, GA

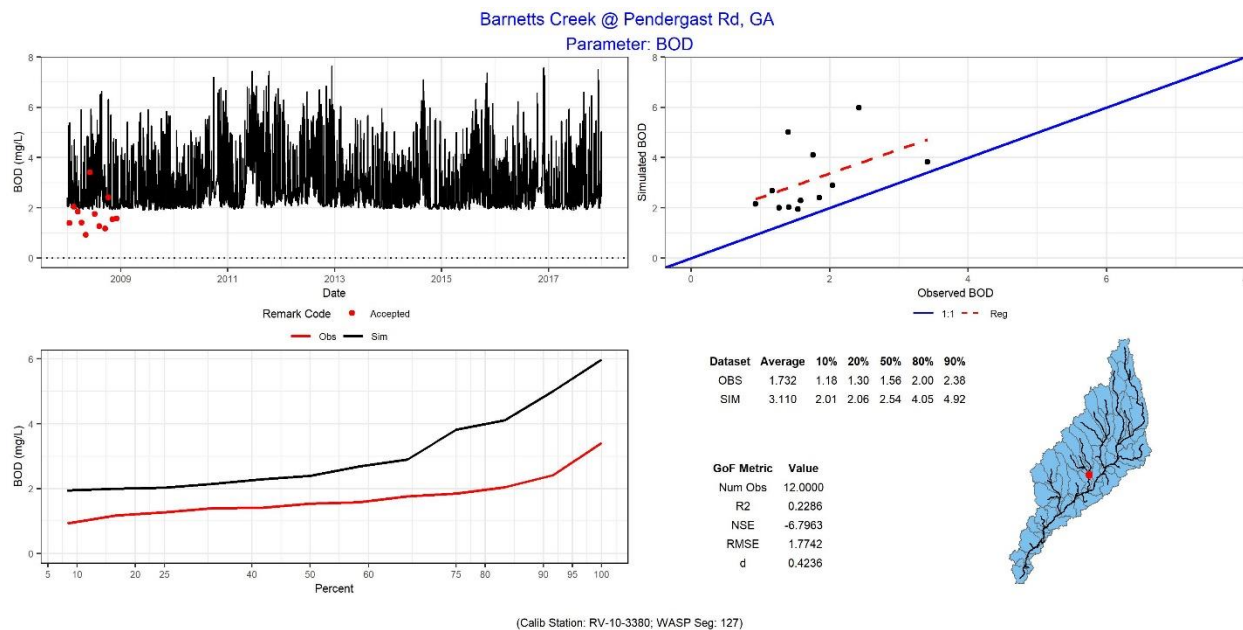


Figure 77 CBOD - Barnetts Creek at Pendergast Rd. / Old Thomasville Rd.

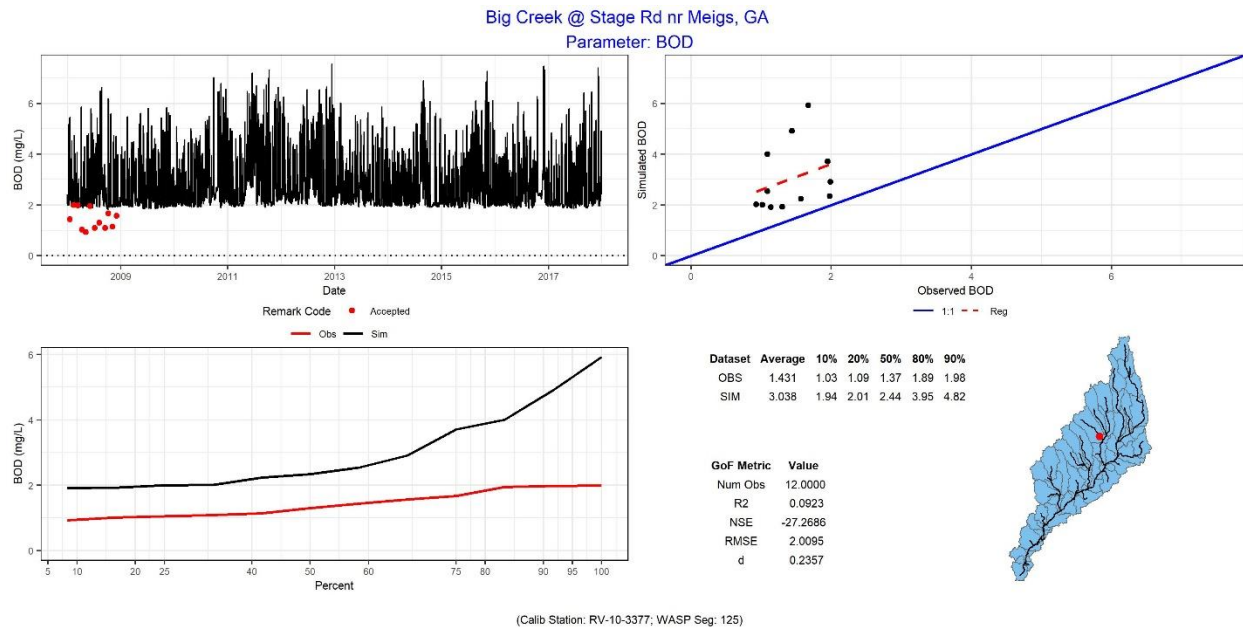


Figure 78 CBOD - Big Creek at Stage Road near Meigs, GA

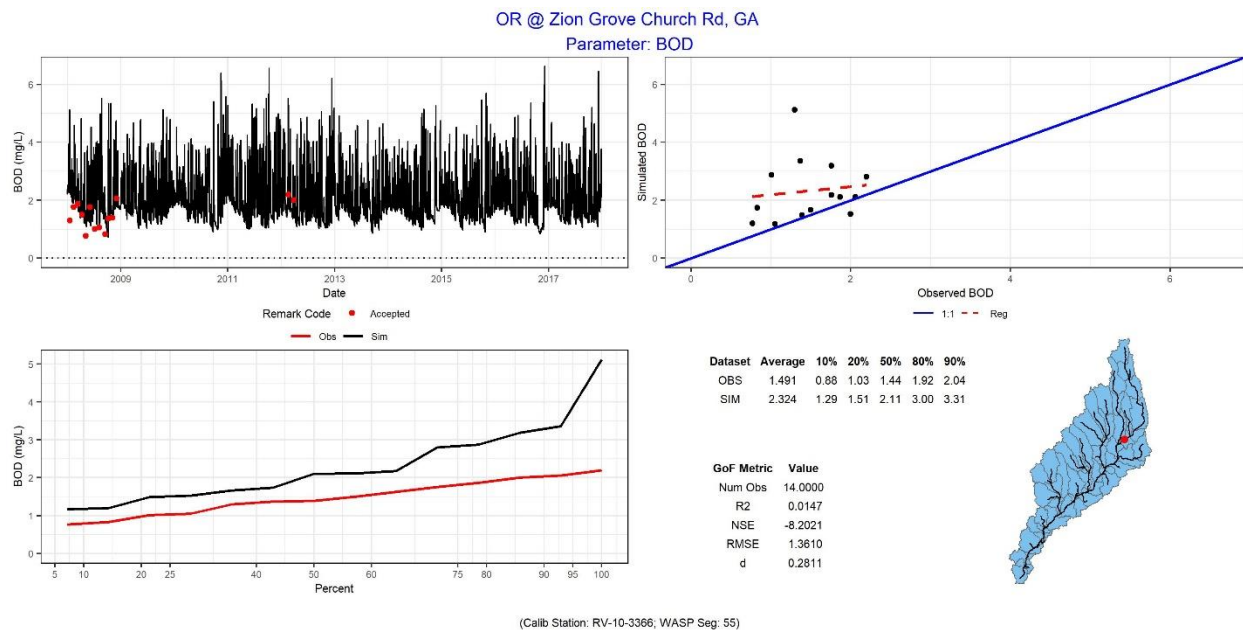


Figure 79 CBOD - Ochlockonee River at Zion Grove Church Rd. near Coolidge, GA

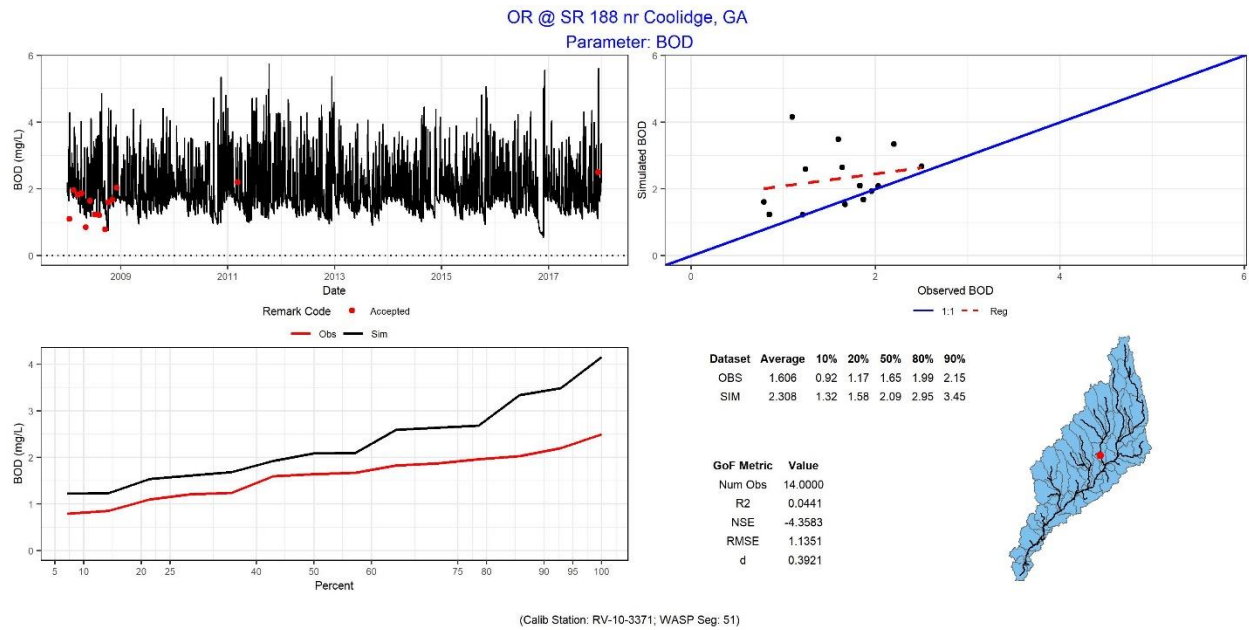


Figure 80 BOD - Ochlockonee River at SR 188 near Coolidge, GA

Total Suspended Solids

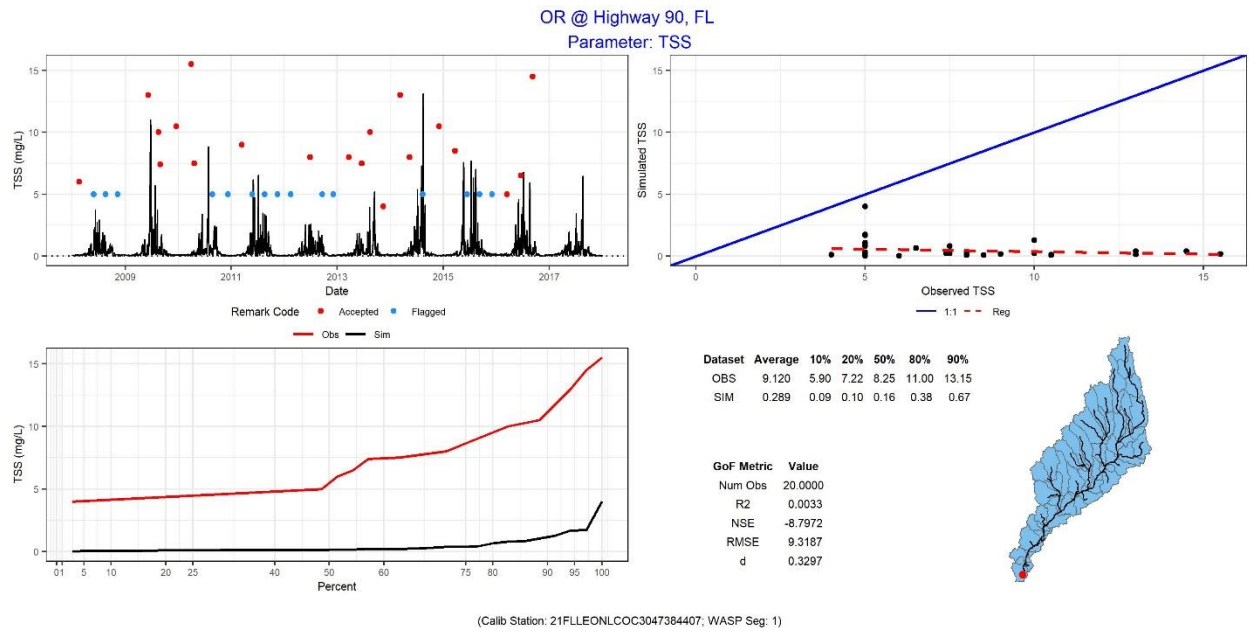


Figure 81 TSS - Ochlockonee River at Highway 90, FL

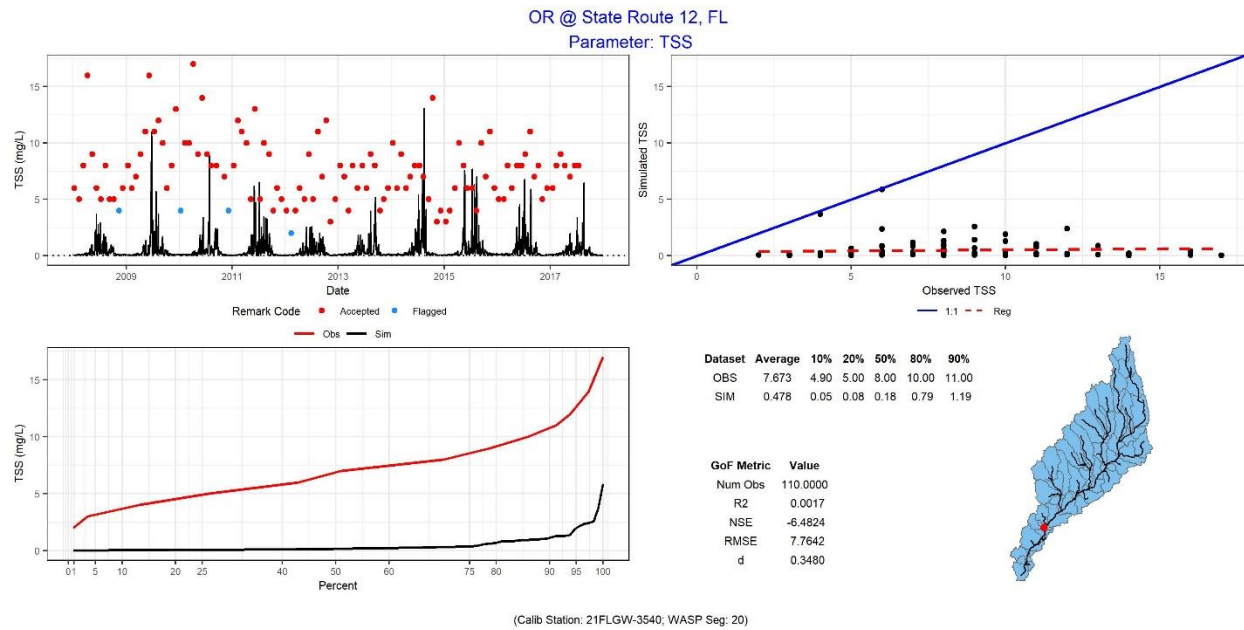


Figure 82 TSS - Ochlockonee River at State Route 12, FL

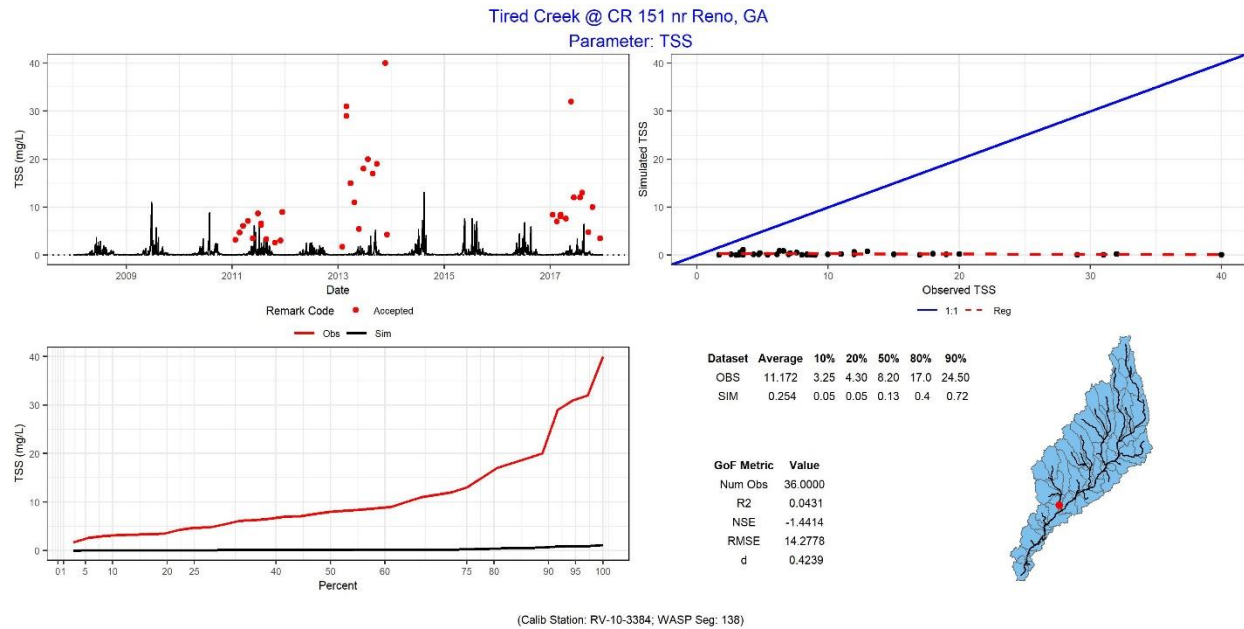


Figure 83 TSS - Tired Creek at County Road 151 near Reno, GA

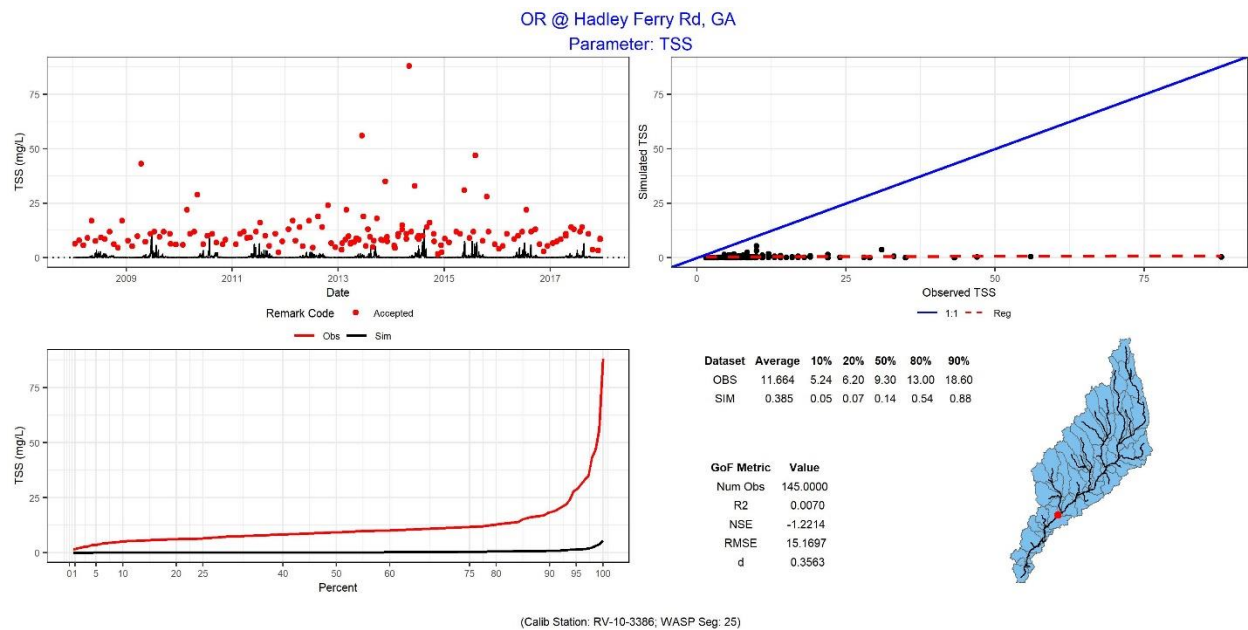


Figure 84 TSS - Ochlockonee River @ Hadley Ferry Rd. nr Calvary, GA

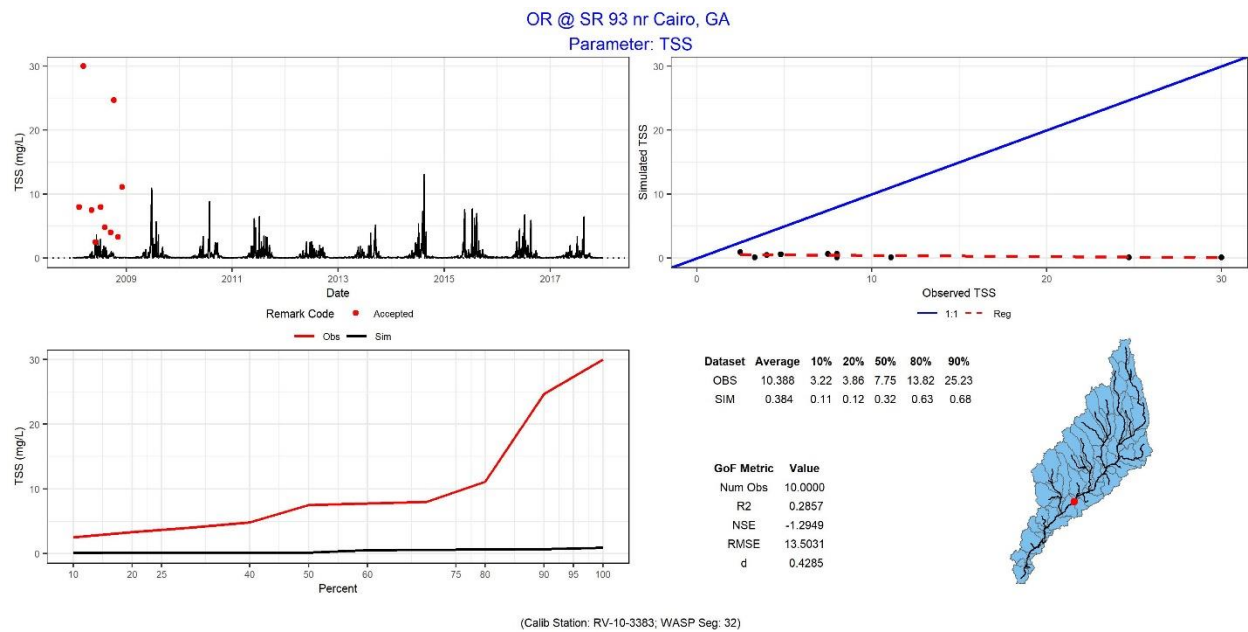


Figure 85 TSS - Ochlockonee River - SR 93 near Cairo, GA

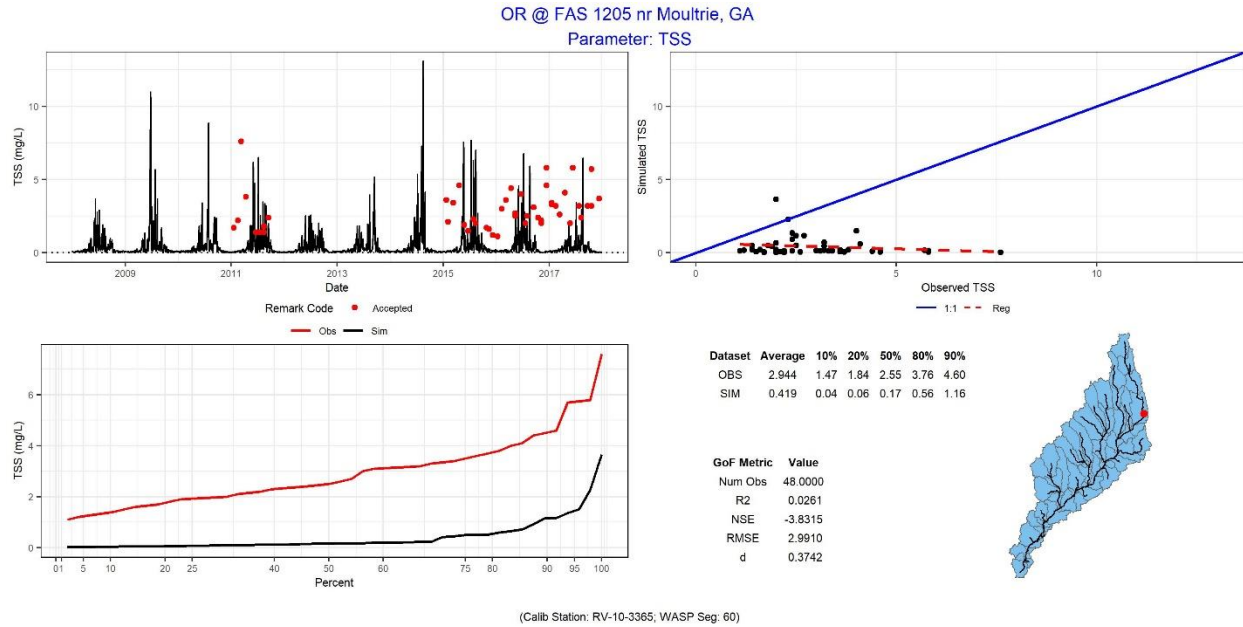


Figure 86 TSS - Ochlockonee River - FAS 1205 near Moultrie, GA

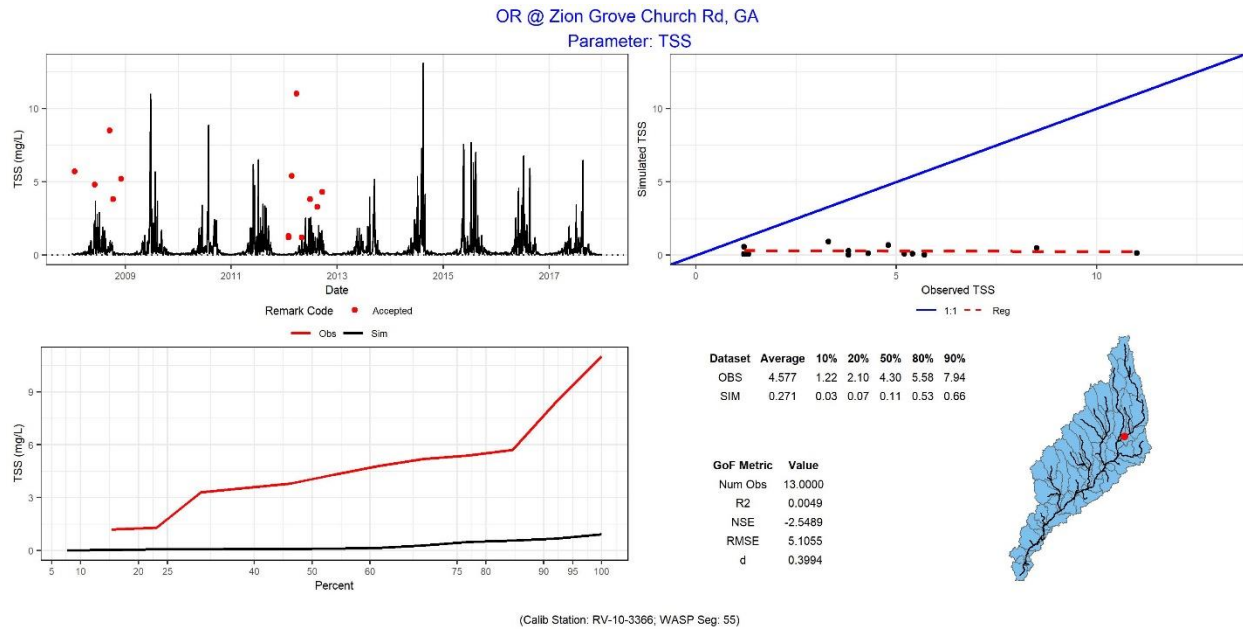


Figure 87 TSS - Ochlockonee River at Zion Grove Church Rd. near Coolidge, GA

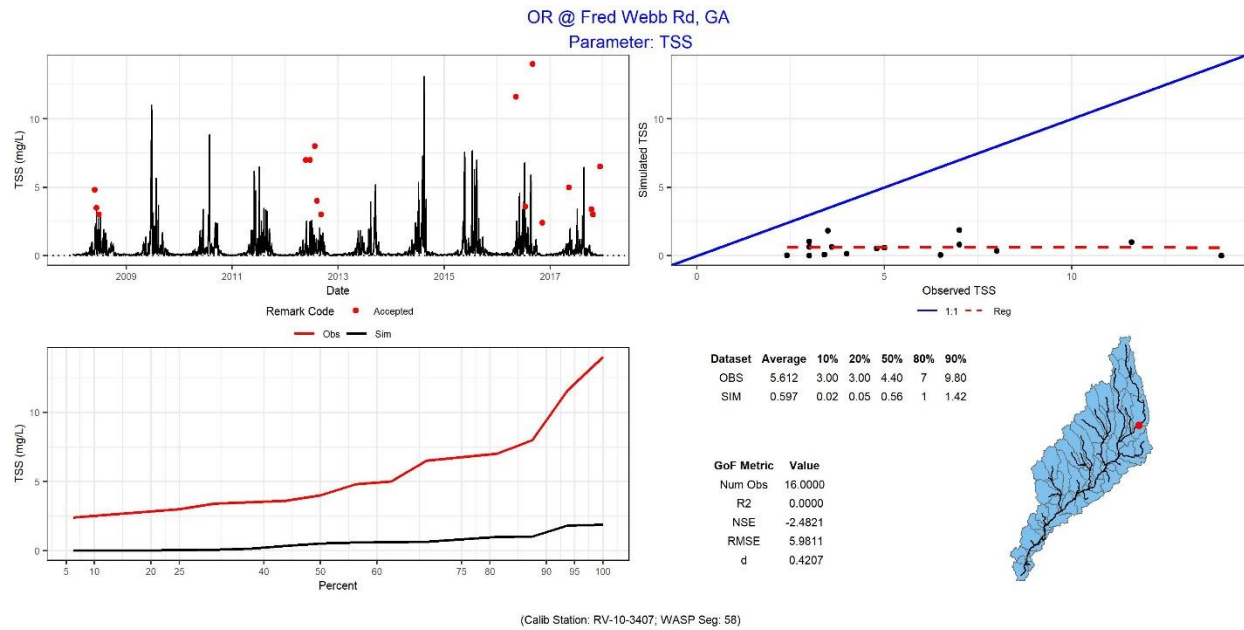


Figure 88 TSS - Ochlockonee River at Fred Webb Rd, GA

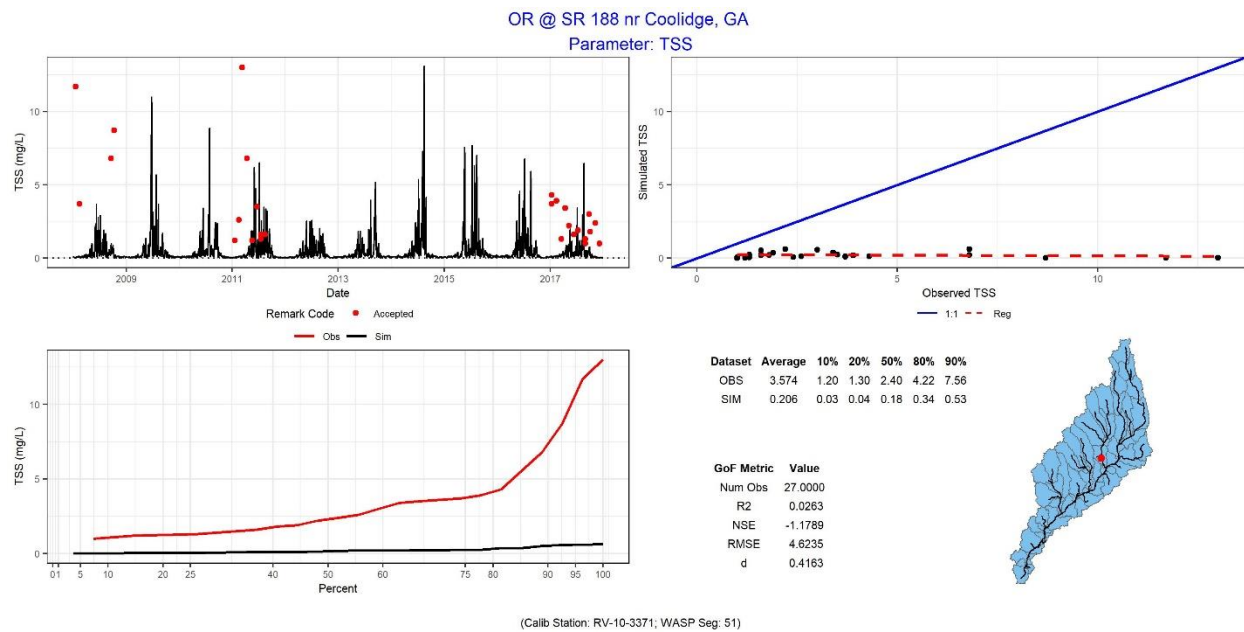


Figure 89 TSS - Ochlockonee River at SR 188 near Coolidge, GA

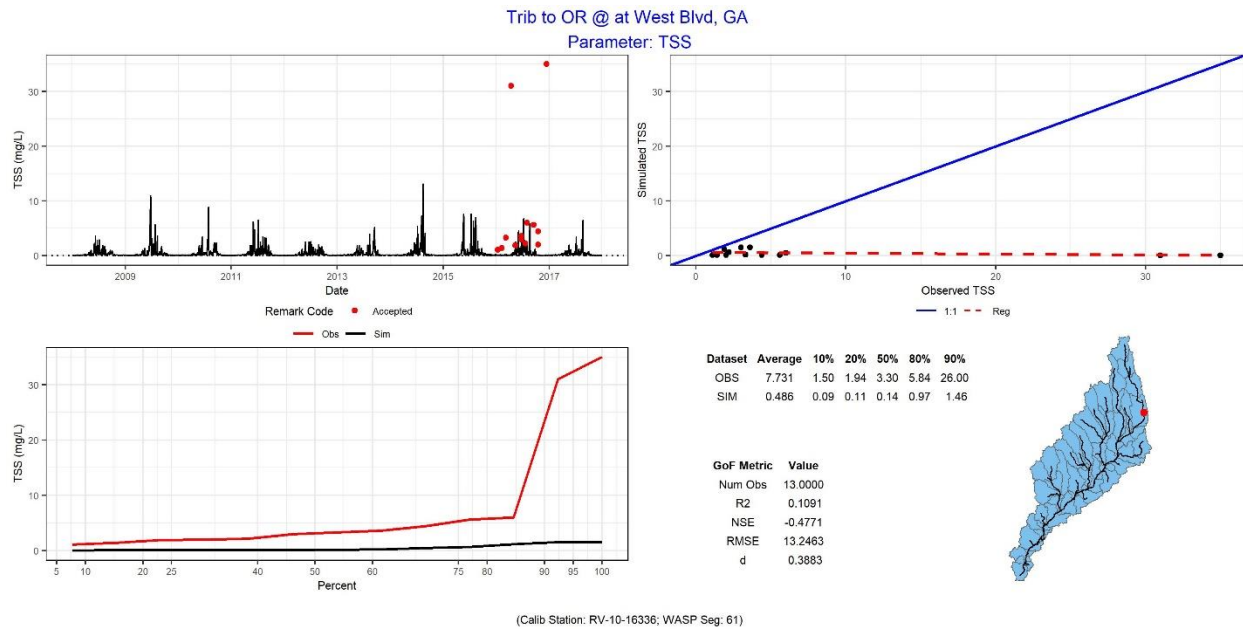


Figure 90 TSS - Trib to Ochlockonee River at West Blvd near Moultrie, GA

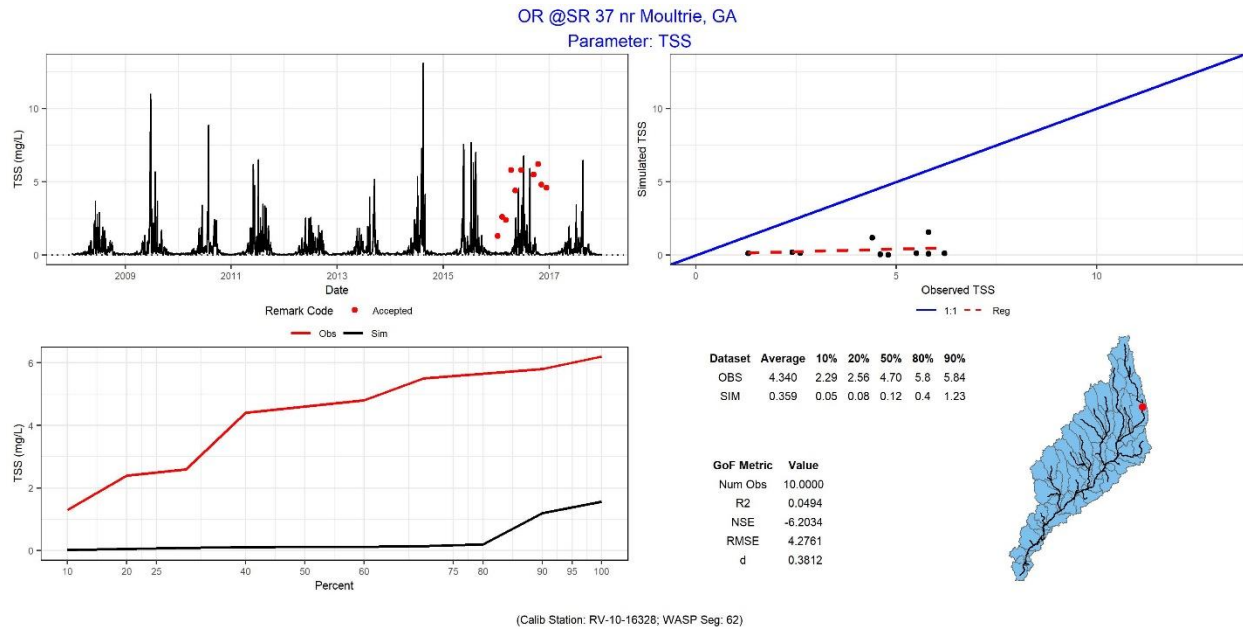


Figure 91 TSS - Ochlockonee River @ SR 37 near Moultrie, GA

Temperature

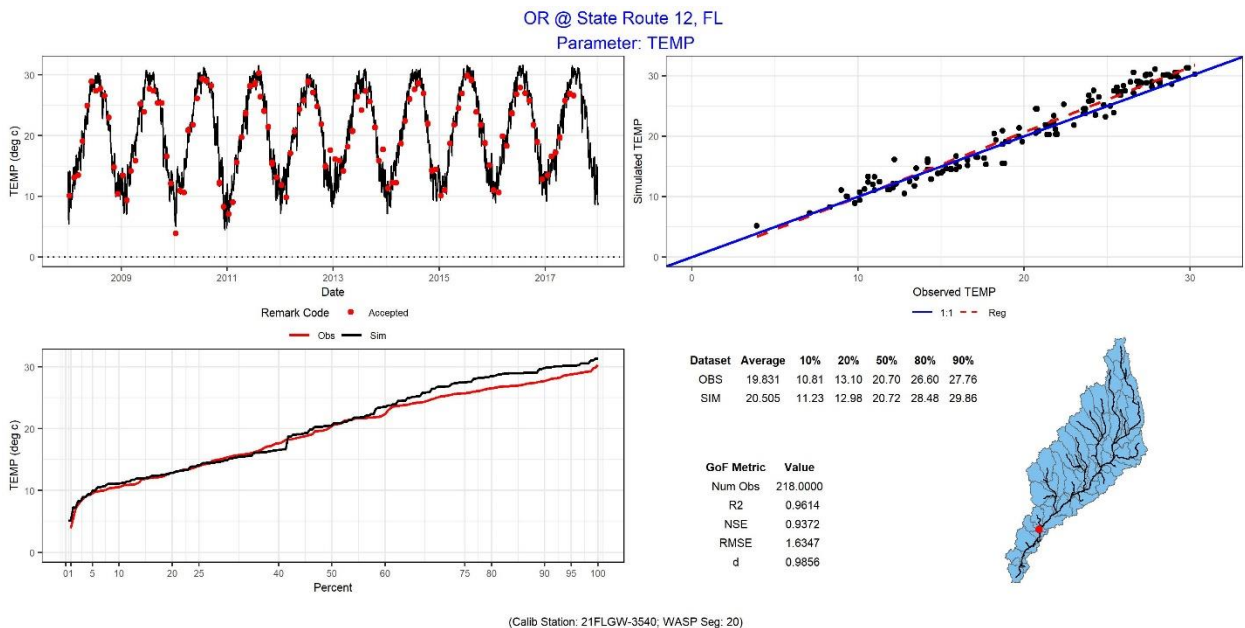


Figure 92 Water Temperature - Ochlockonee River at State Route 12, FL

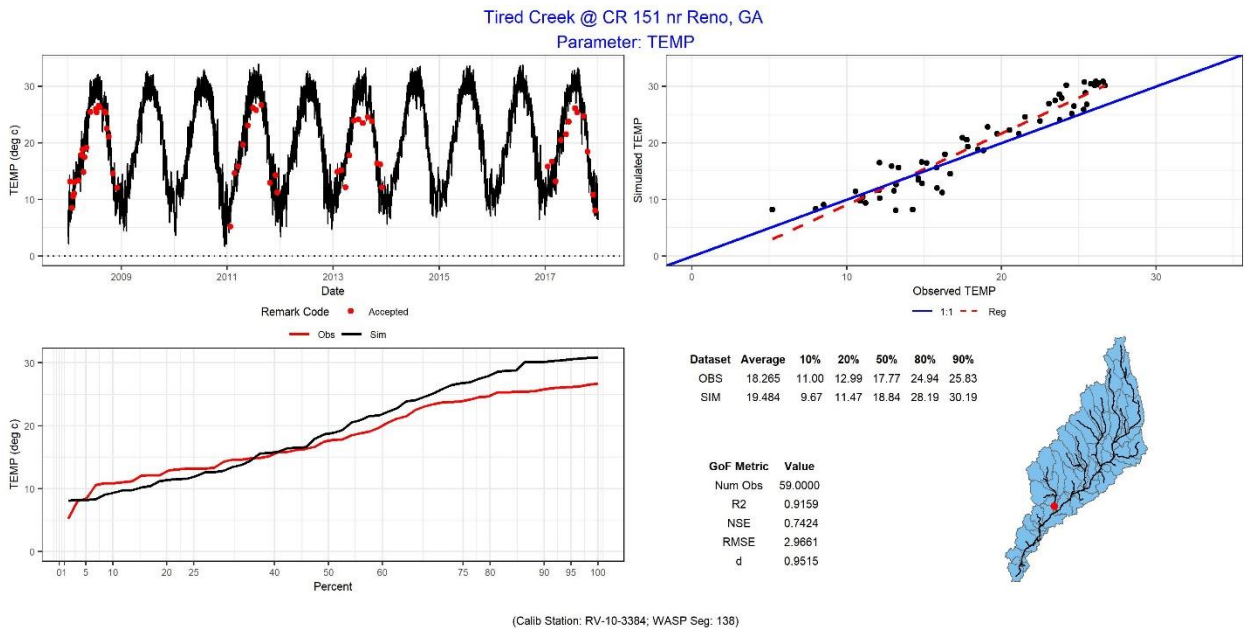


Figure 93 Water Temperature - Tired Creek at County Road 151 near Reno, GA

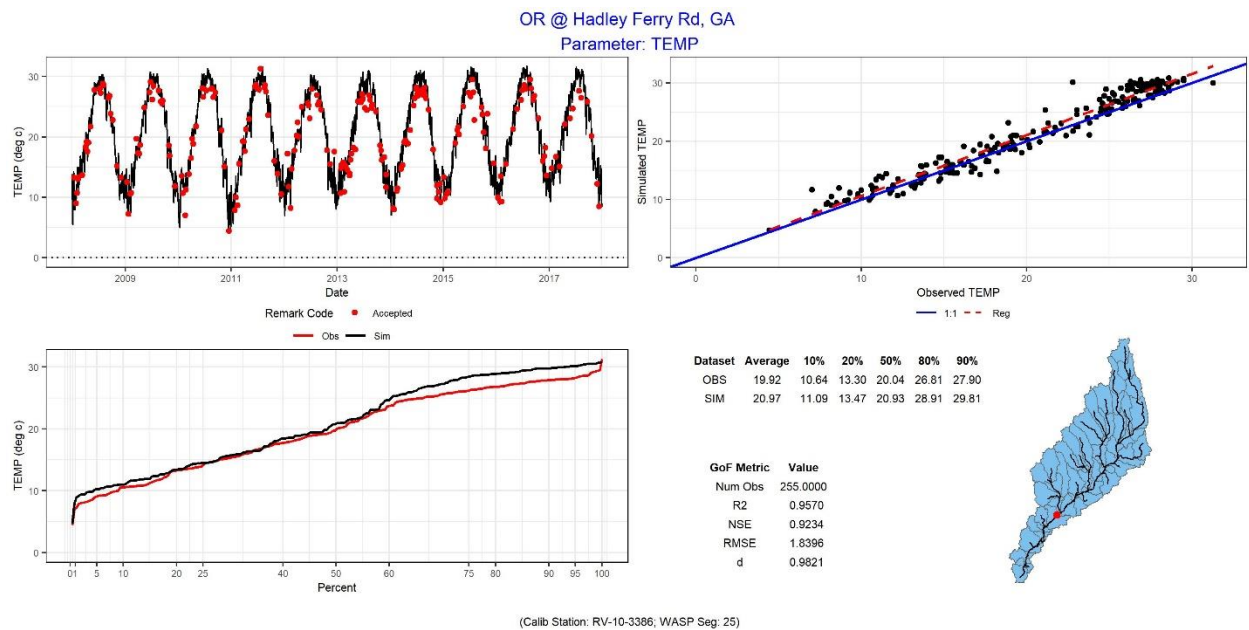


Figure 94 Water Temperature - Ochlockonee River @ Hadley Ferry Rd. nr Calvary, GA

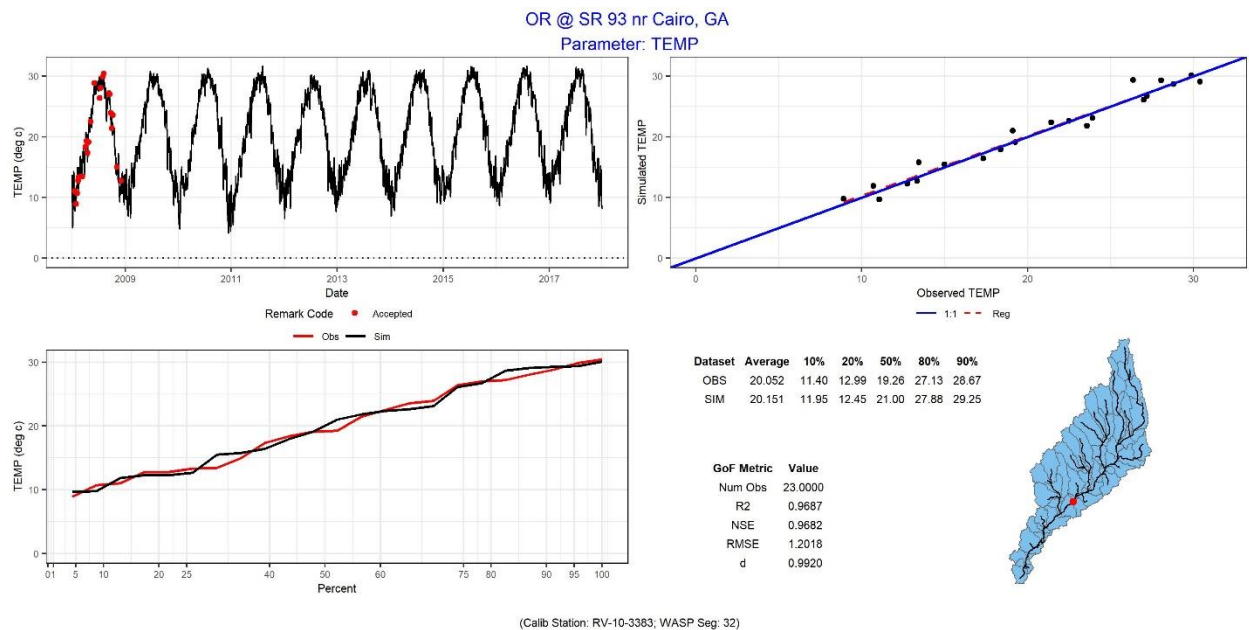


Figure 95 Water Temperature - Ochlockonee River - SR 93 near Cairo, GA

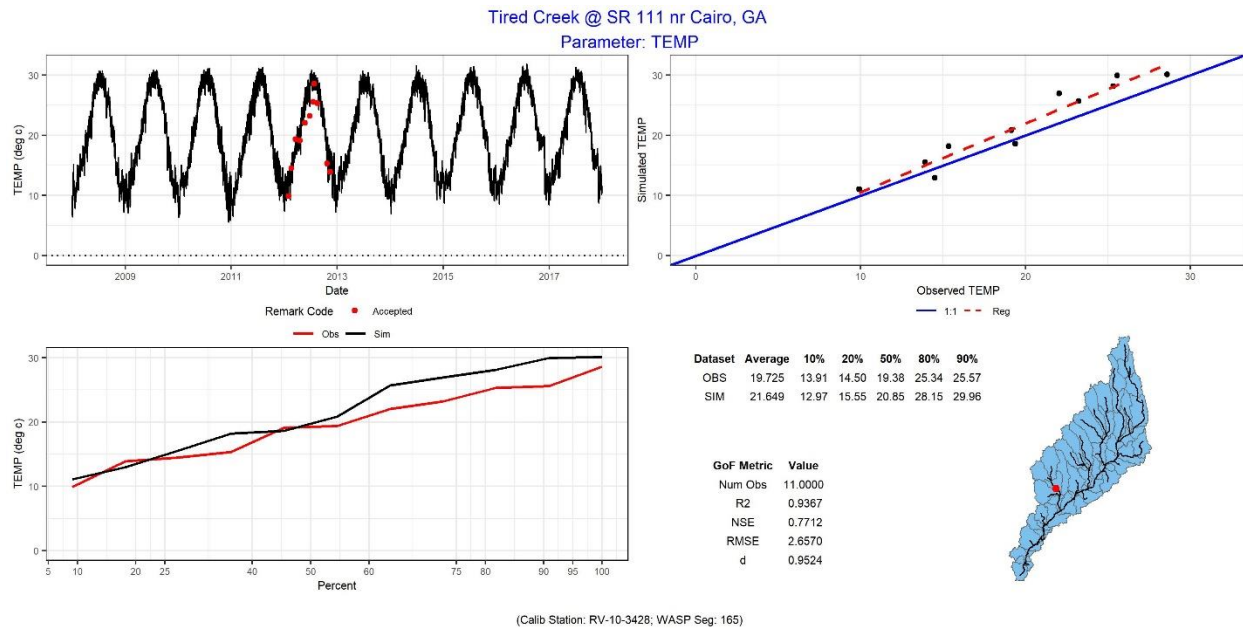


Figure 96 Water Temperature - Tired Creek at State Road 111 near Cairo, GA

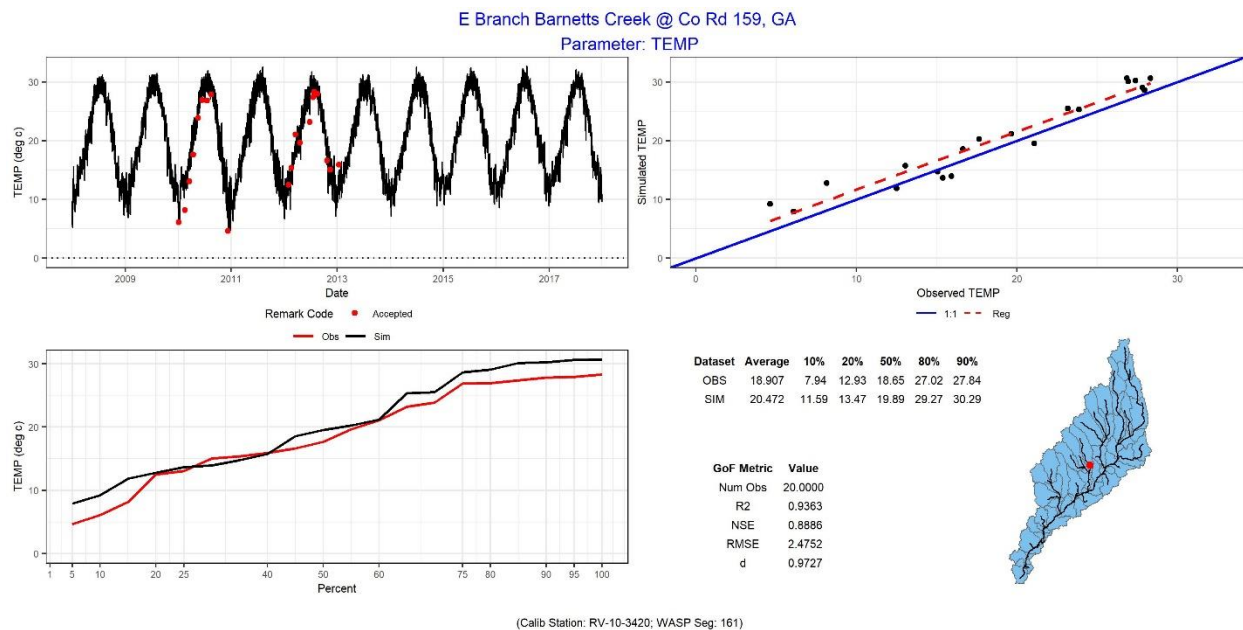


Figure 97 Water Temperature - East Branch Barnetts Creek @ Co Rd 159 nr Ochlockonee, GA

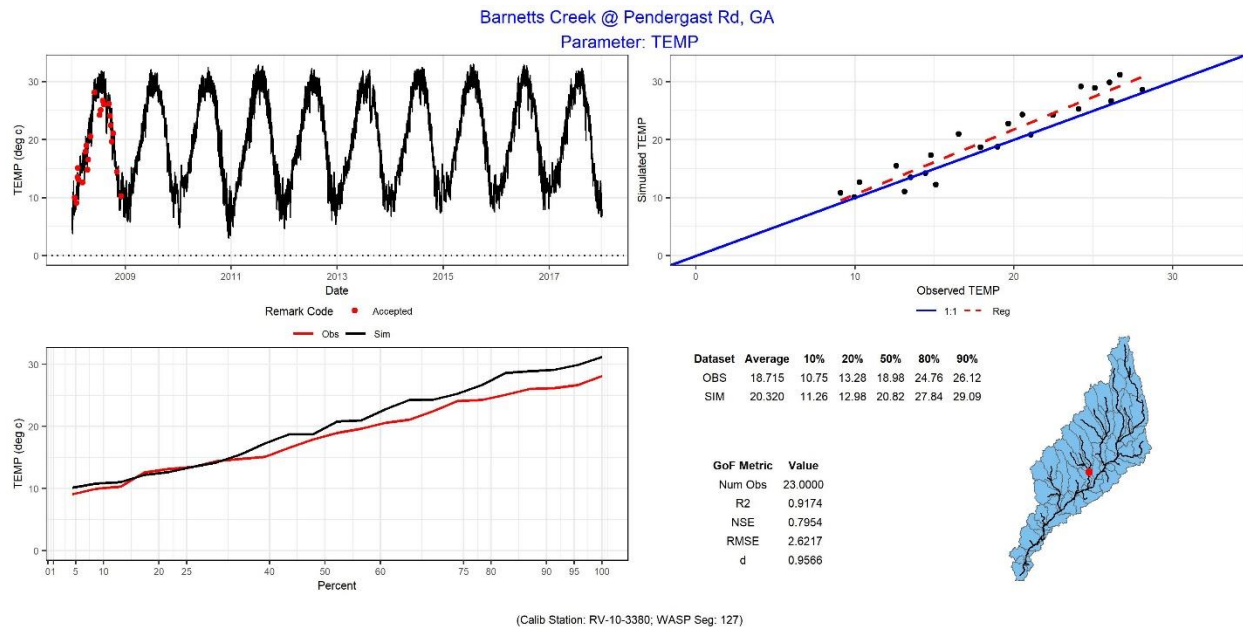


Figure 98 Water Temperature - Barnetts Creek at Pendergast Rd. / Old Thomasville Rd

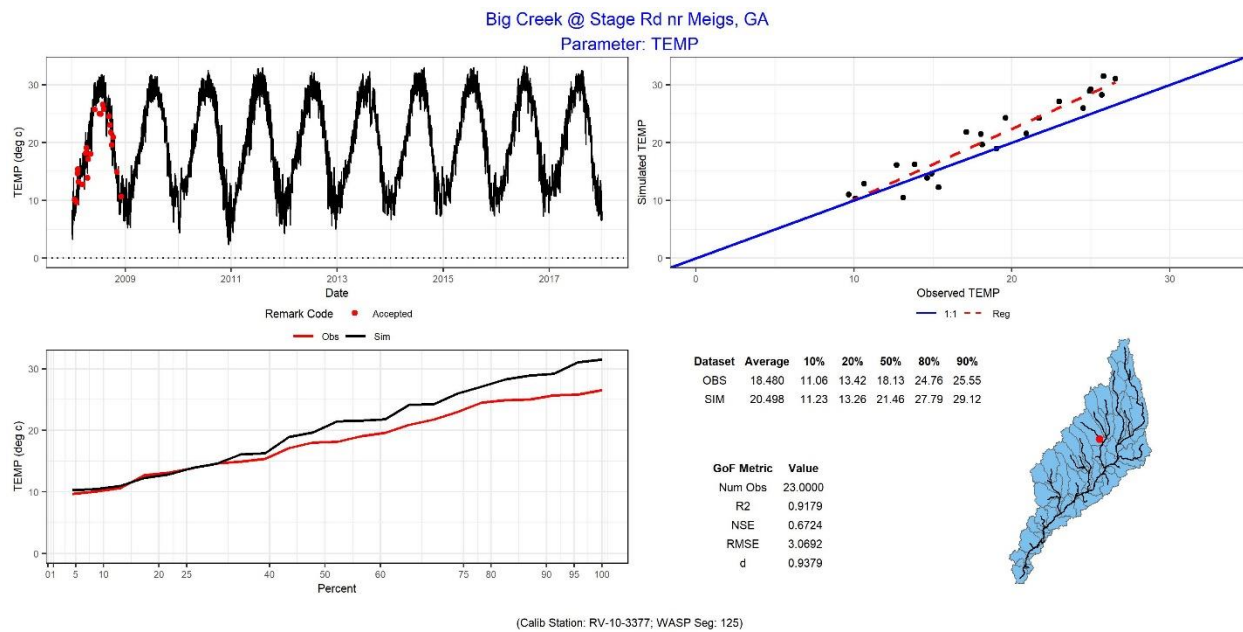


Figure 99 Water Temperature - Big Creek at Stage Road near Meigs, GA

OR @ FAS 1205 nr Moultrie, GA
Parameter: TEMP

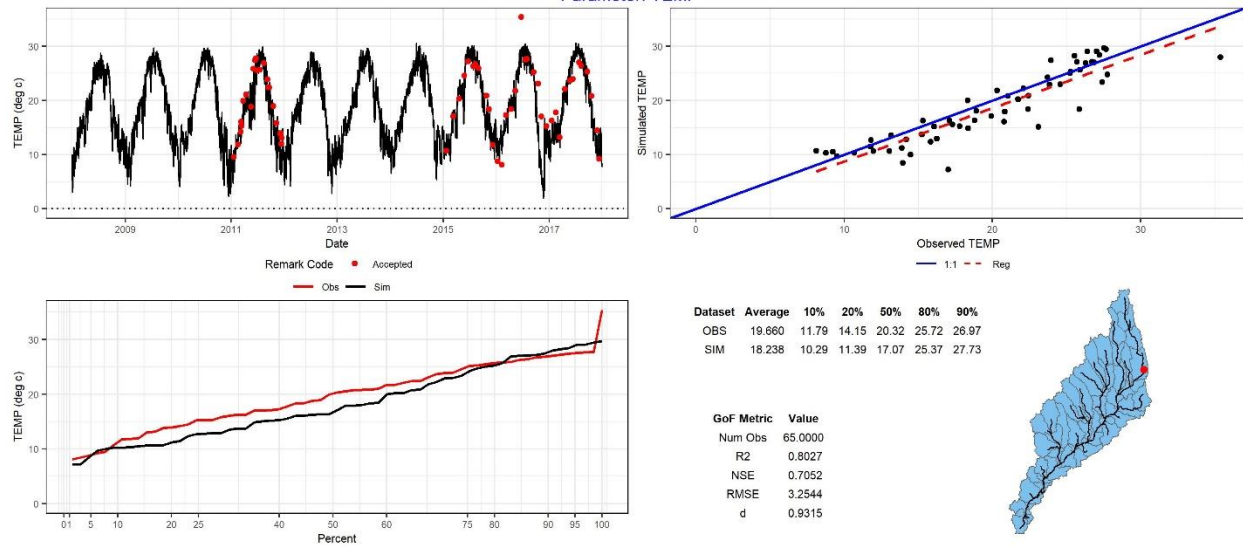


Figure 100 Water Temperature - Ochlockonee River - FAS 1205 near Moultrie, GA

OR @ Zion Grove Church Rd, GA
Parameter: TEMP

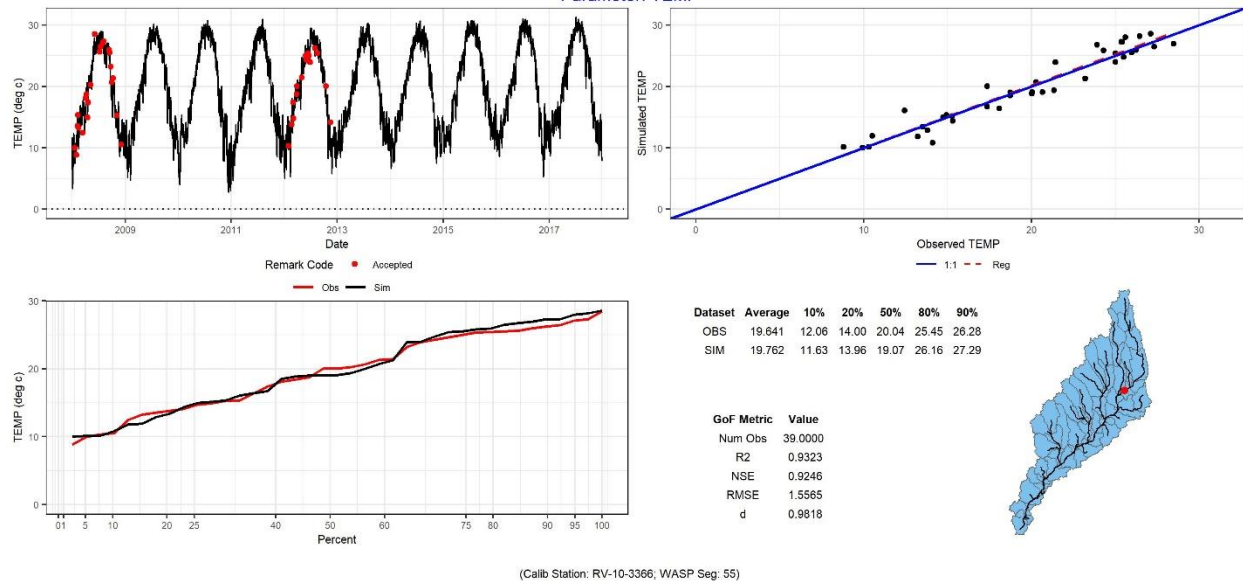


Figure 101 Water Temperature - Ochlockonee River at Zion Grove Church Rd. near Coolidge, GA

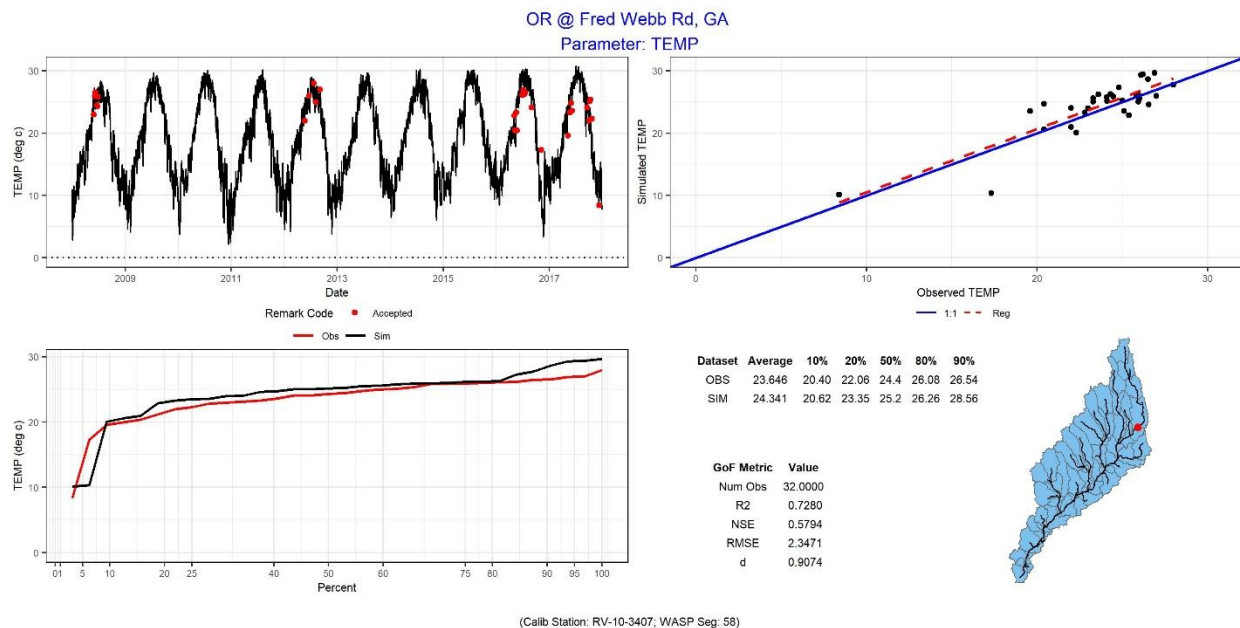


Figure 102 Water Temperature - Ochlockonee River at Fred Webb Rd, GA

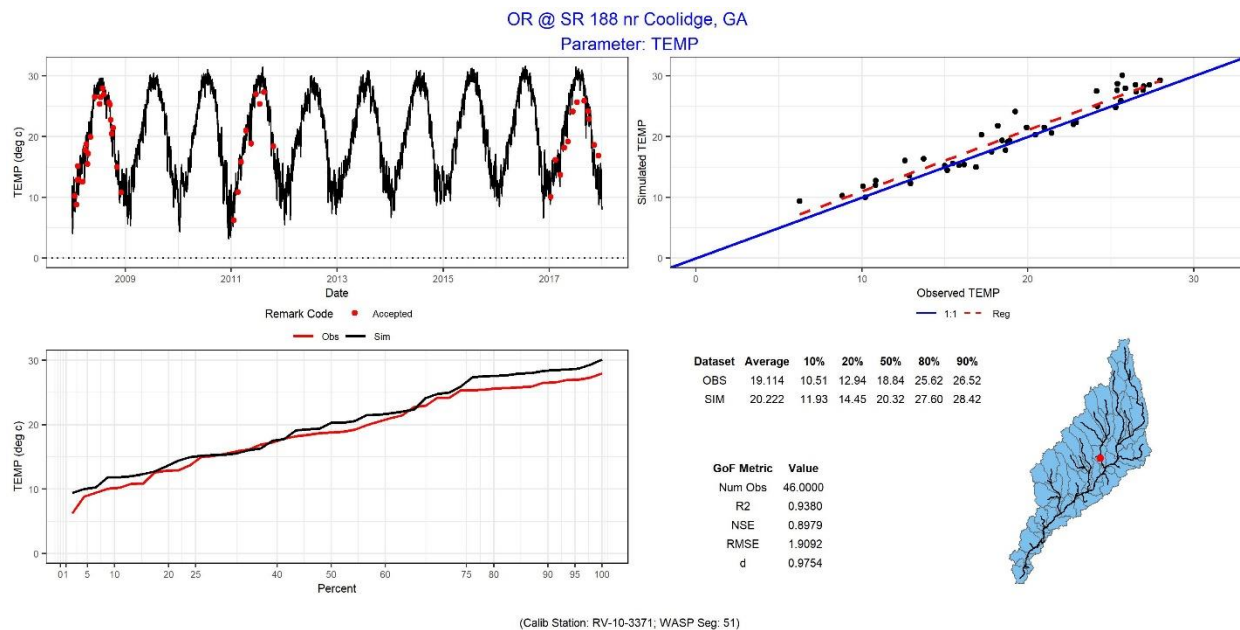


Figure 103 Water Temperature - Ochlockonee River at SR 188 near Coolidge, GA

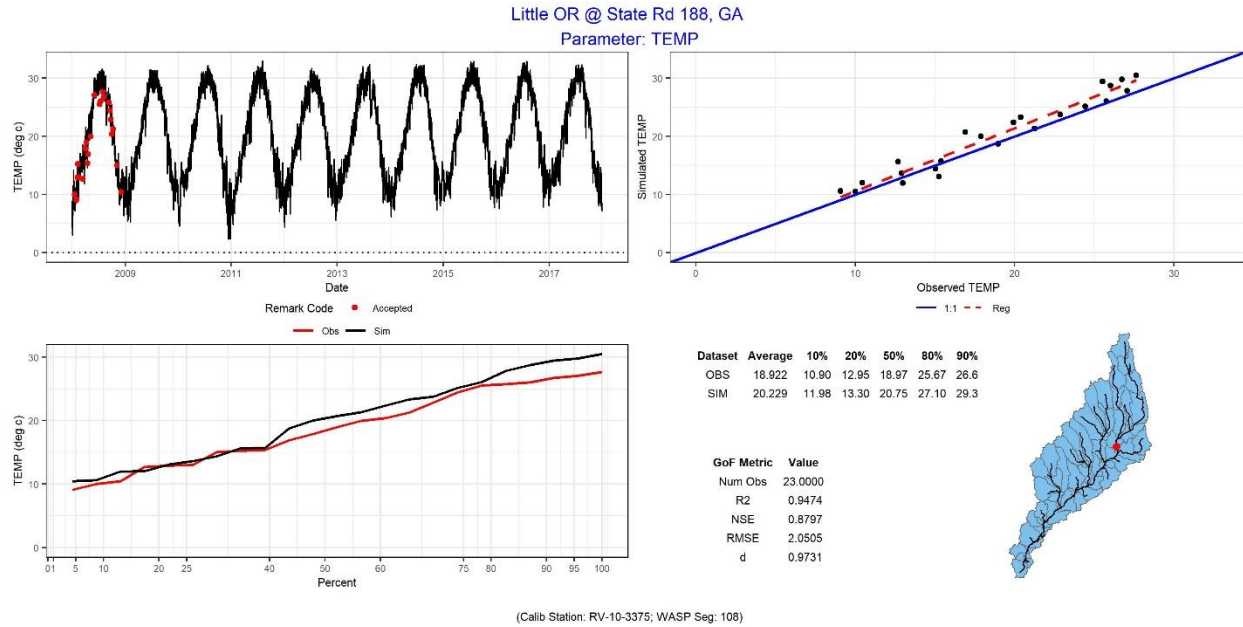


Figure 104 Water Temperature - Little Ochlockonee River at State Rd 188 nr Ochlockonee, GA

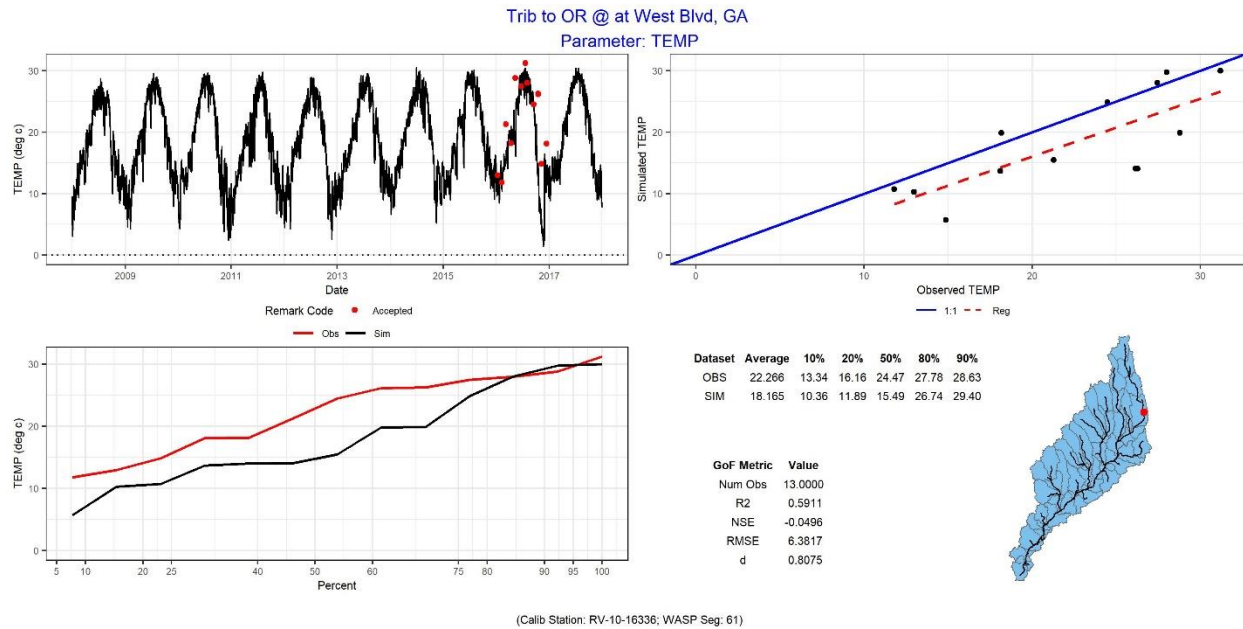


Figure 105 Water Temperature - Trib to Ochlockonee River at West Blvd near Moultrie, GA

OR @SR 37 nr Moultrie, GA
Parameter: TEMP

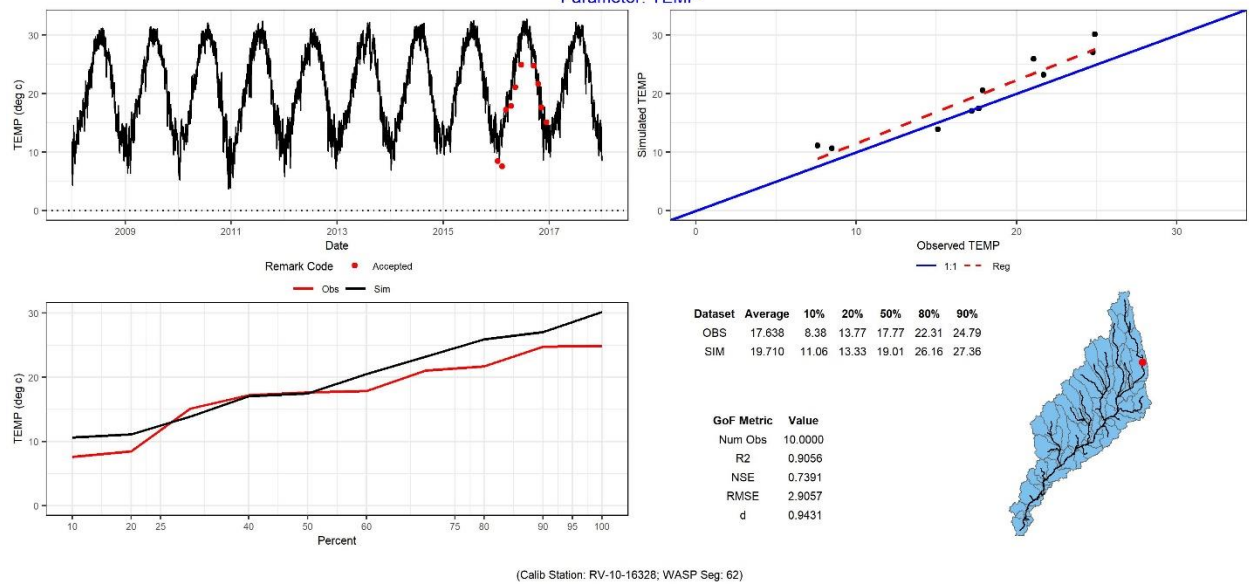


Figure 106 Water Temperature - Ochlockonee River @ SR 37 near Moultrie, GA

Appendix B – Little River Model Calibration

This appendix provides detailed calibration plots for each station and parameter available for the Little River water quality model.

Time Series – provides a comparison of the all the measured data to the model simulated data over the entire simulation period for visual inspection. If any measured data had a remark code indicating below detection it will appear as flagged data and will be represented by a blue dot. Flagged data is not considered in the quantitative statistical calculations.

Probability Distribution – provides a comparison of the probability distribution of measured and simulated data. This method uses paired measured and simulation data to determine the probability curve.

1 to 1 – plots the paired measured and simulated values against one another. The red line represents a perfect calibration, the blue line represents the linear fit of measured/simulated fit.

Statistics –

- Num Obs – represents the number of measurements used in calculation
- R^2 – correlation coefficient between sim and obs.
- NSE – Nash-Sutcliffe efficiency between sim and obs,
- RMSE – root mean square error
- d – Index of Agreement
- Percentiles – provides a numeric comparison of the percentile distribution of sim and obs.

Annual Analysis -- For flow, total nitrogen, total phosphorus and chlorophyll a annual boxplots are presented for the simulation period for each station. The black dots represent the measured data, the blue box and whiskers represent the model simulated results. The whiskers represent the range of the model simulated results. Average model simulated results are represented by a green dot, average measured data is represented by a red diamond.

For chlorophyll a, total nitrogen and total phosphorus annual boxplot figures are present to illustrate model performance year by year.

Flow Calibration

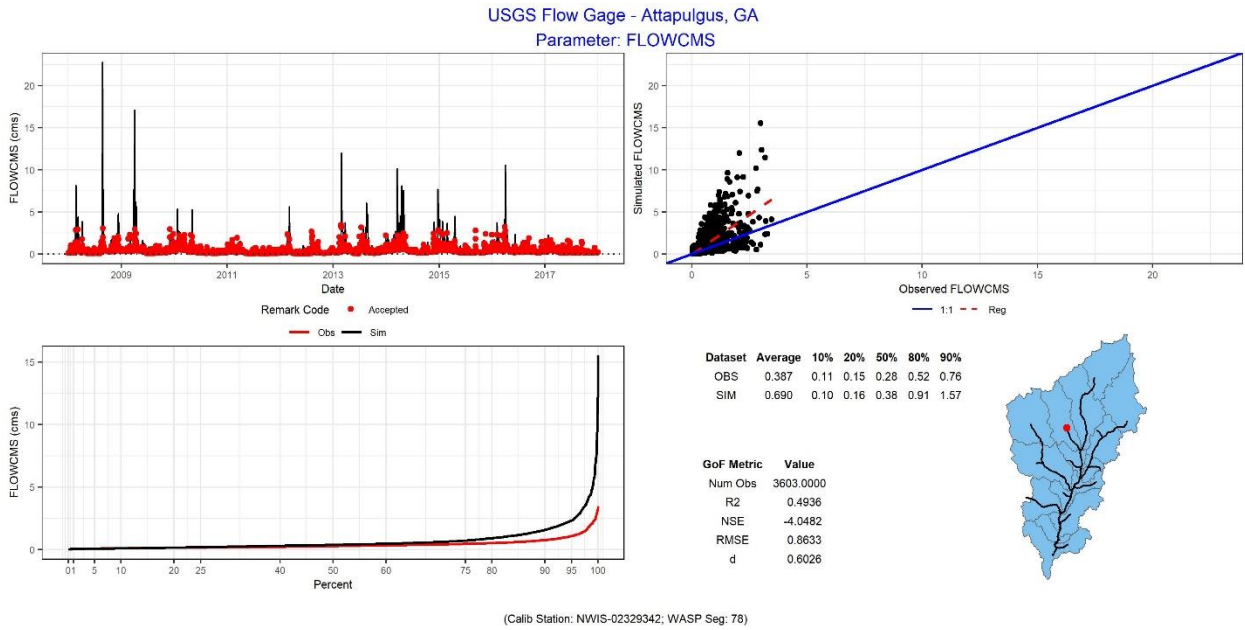


Figure 107 USGS 02329342 Little Attapulguss Creek at Attapulcus, GA

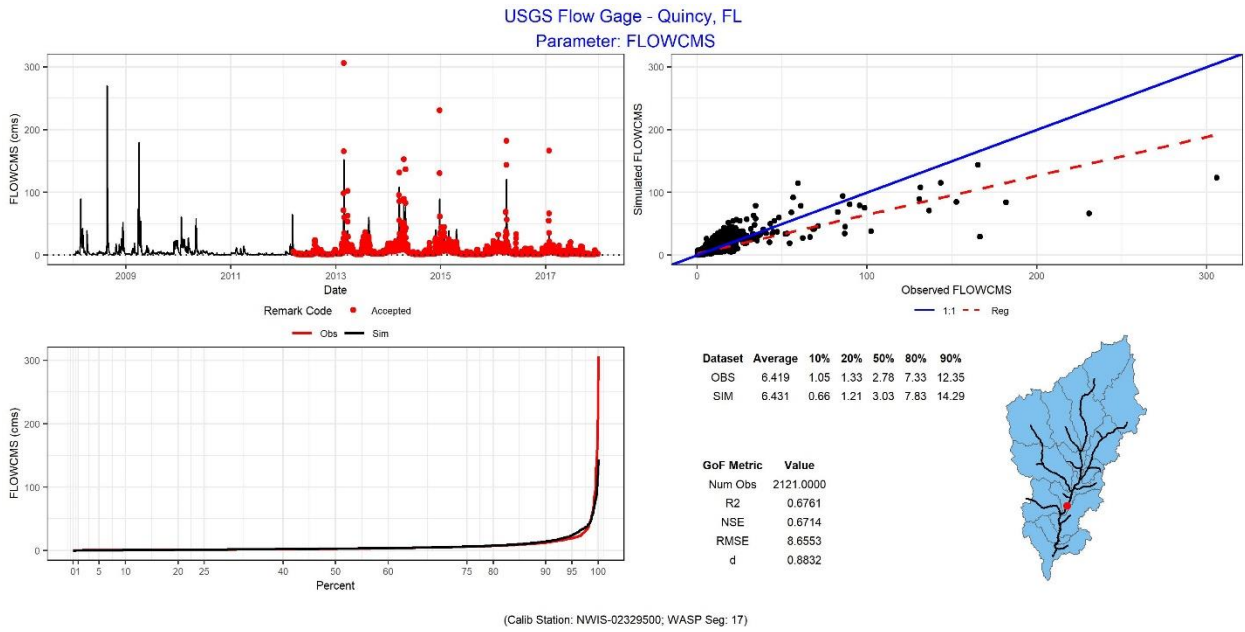


Figure 108 USGS 02329500 Little River near Quincy, FL

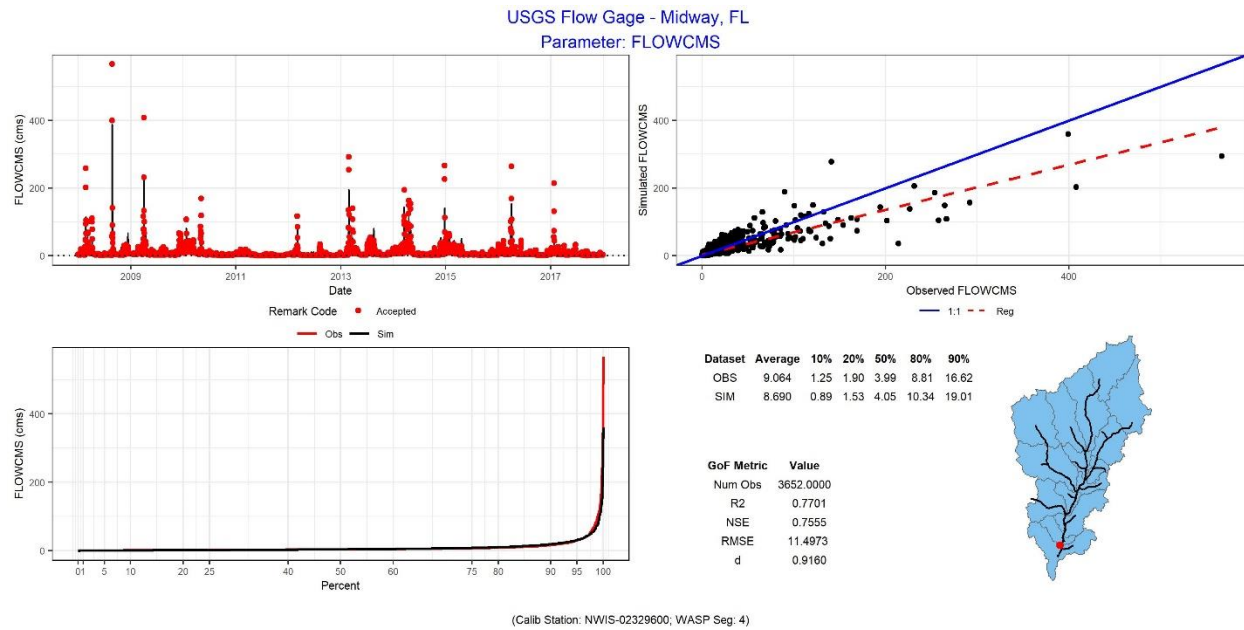


Figure 109 USGS 02329600 Little River near Midway, FL

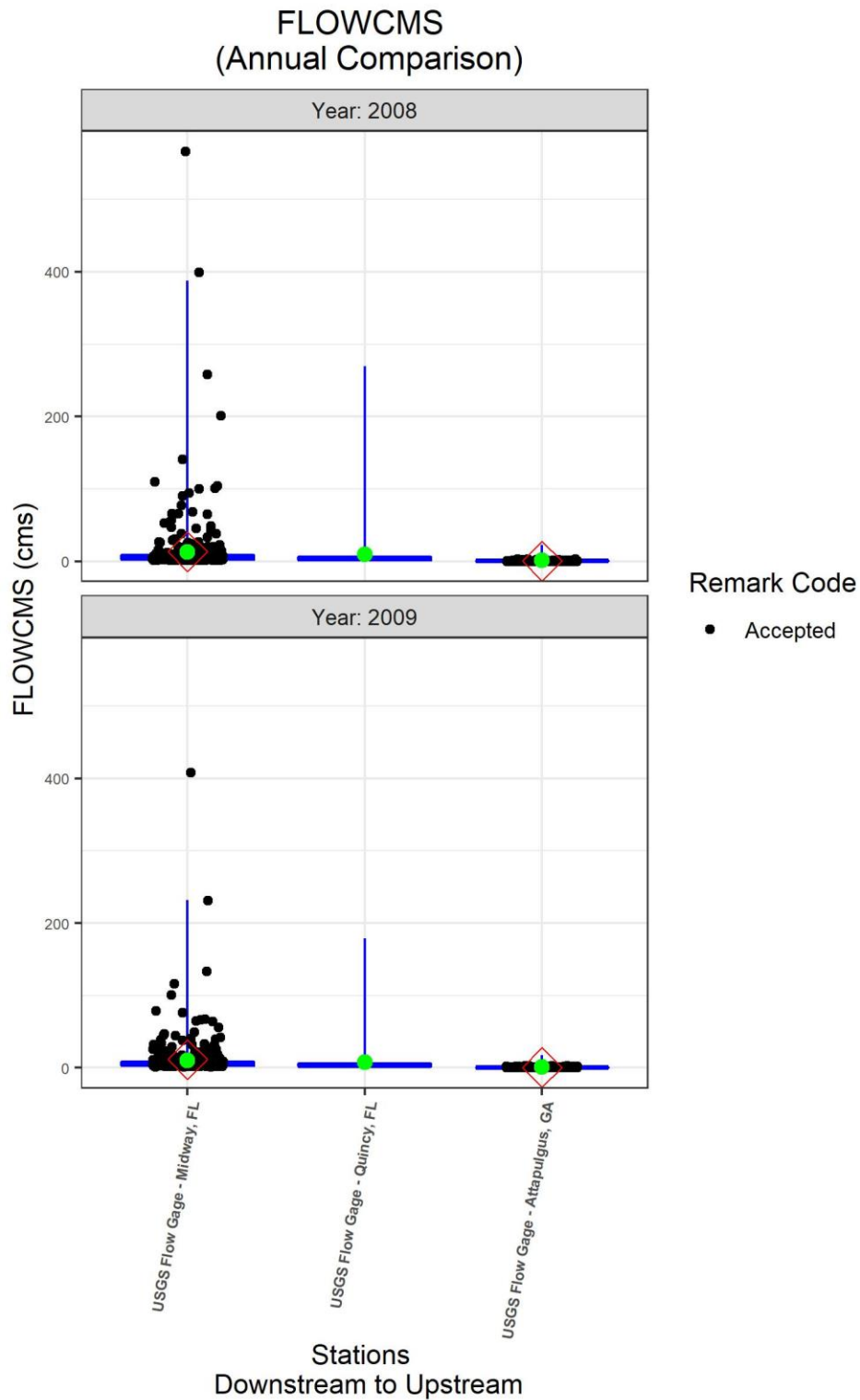


Figure 110 Little River Flow Comparison Observed vs. Simulated 2008-2009

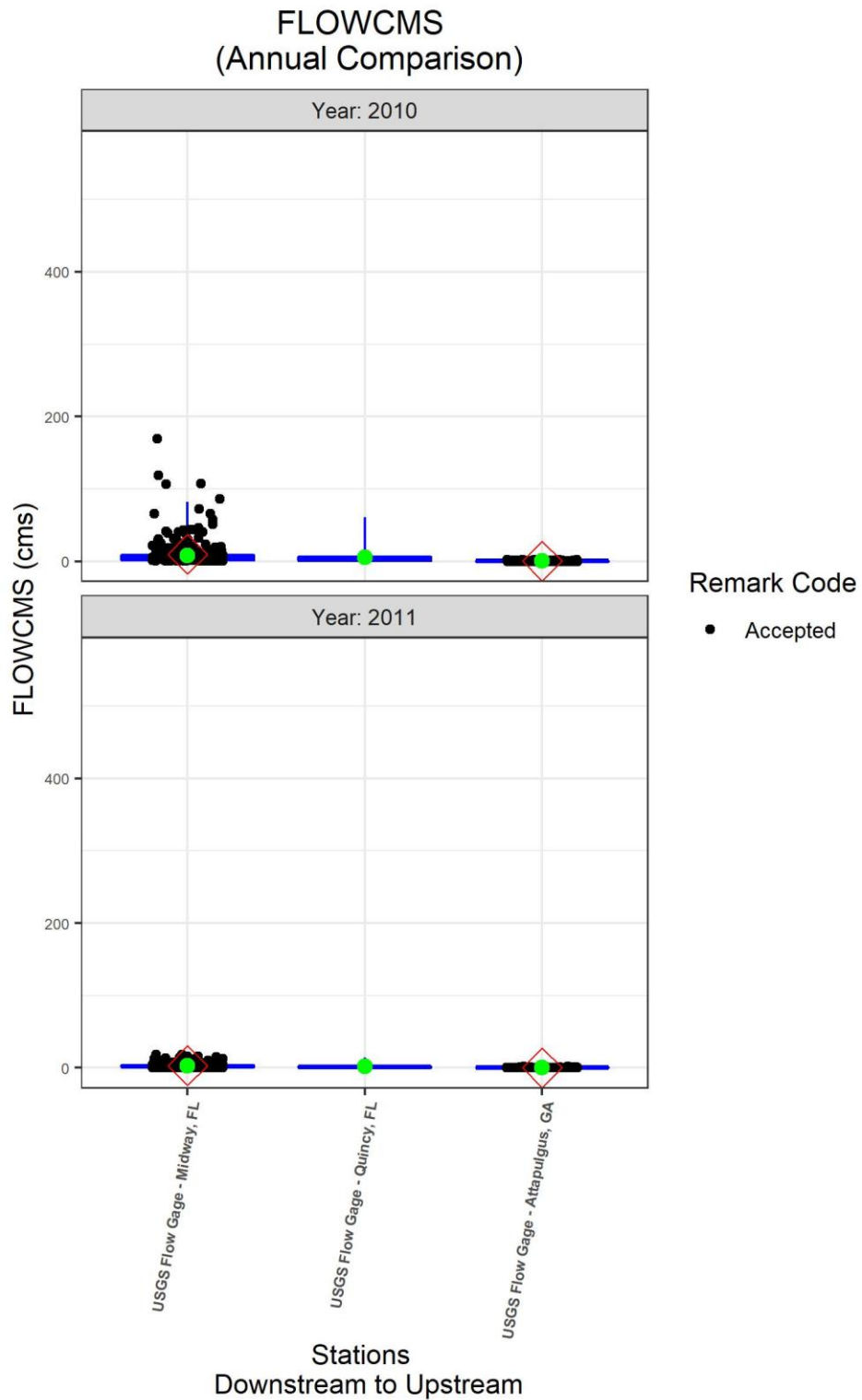


Figure 111 Little River Flow Comparison Observed vs. Simulated 2010-2011

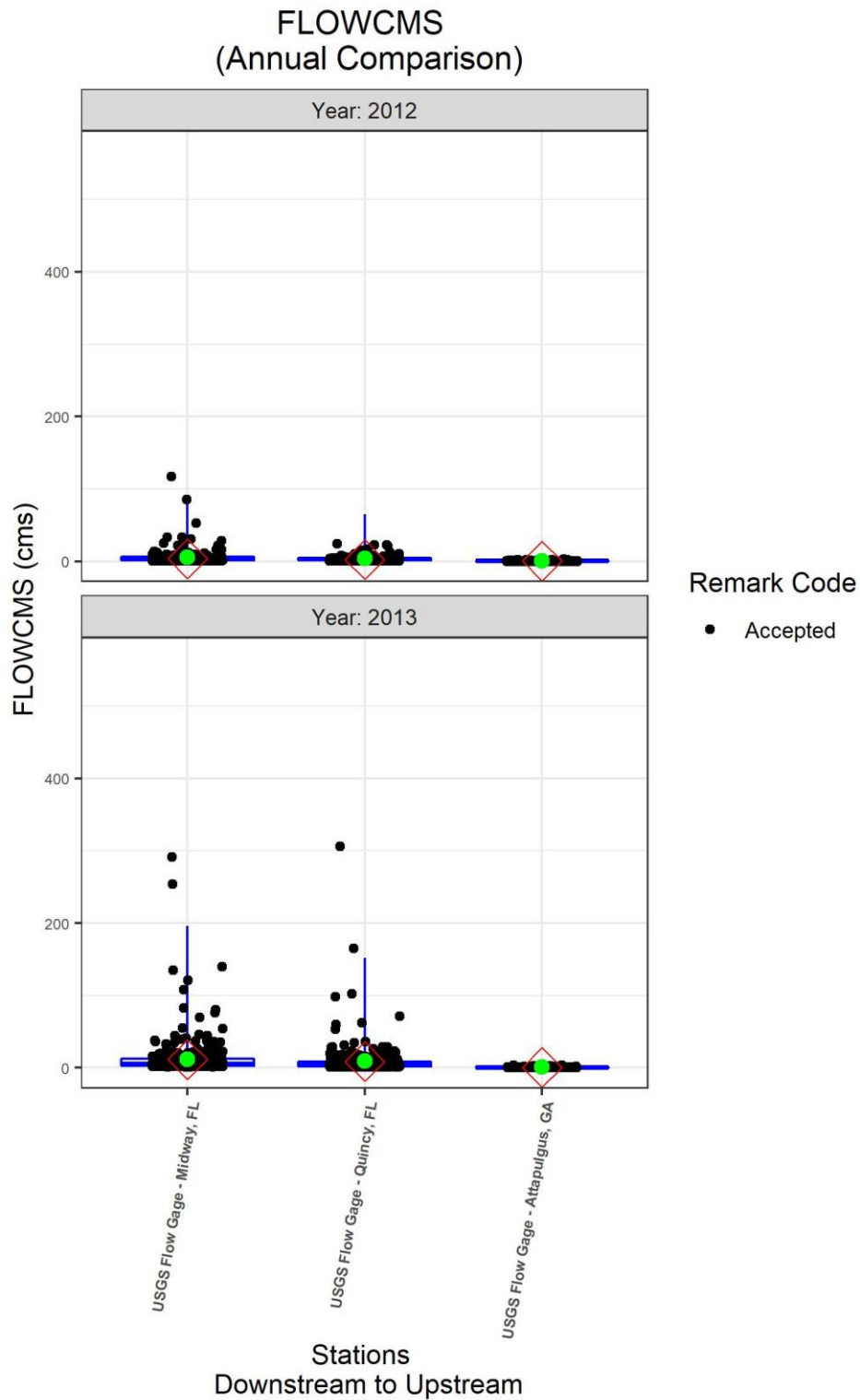


Figure 112 Little River Flow Comparison Observed vs. Simulated 2012-2013

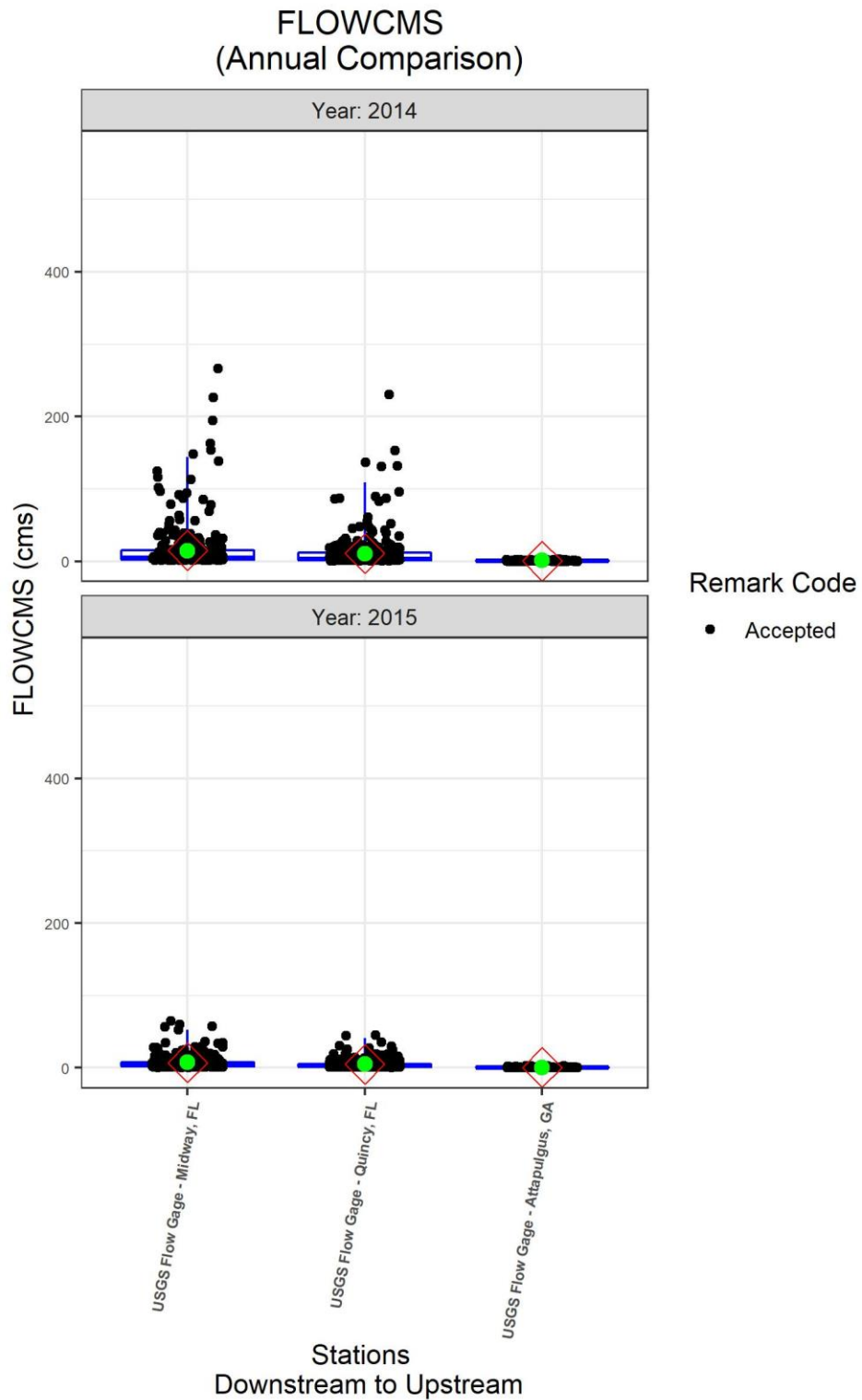


Figure 113 Little River Flow Comparison Observed vs. Simulated 2014-2015

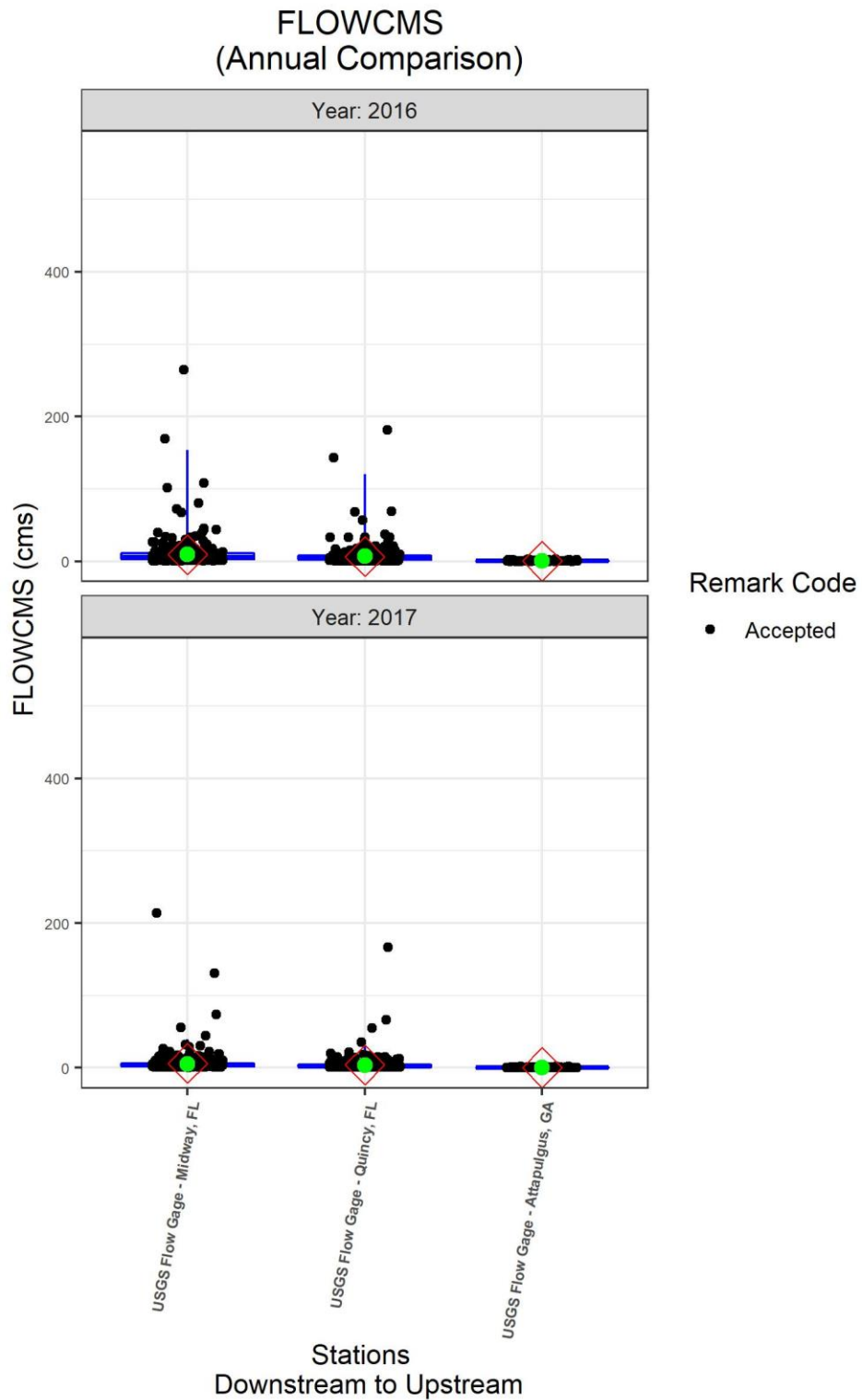


Figure 114 Little River Flow Comparison Observed vs. Simulated 2016-2017

Water Quality

Total Nitrogen

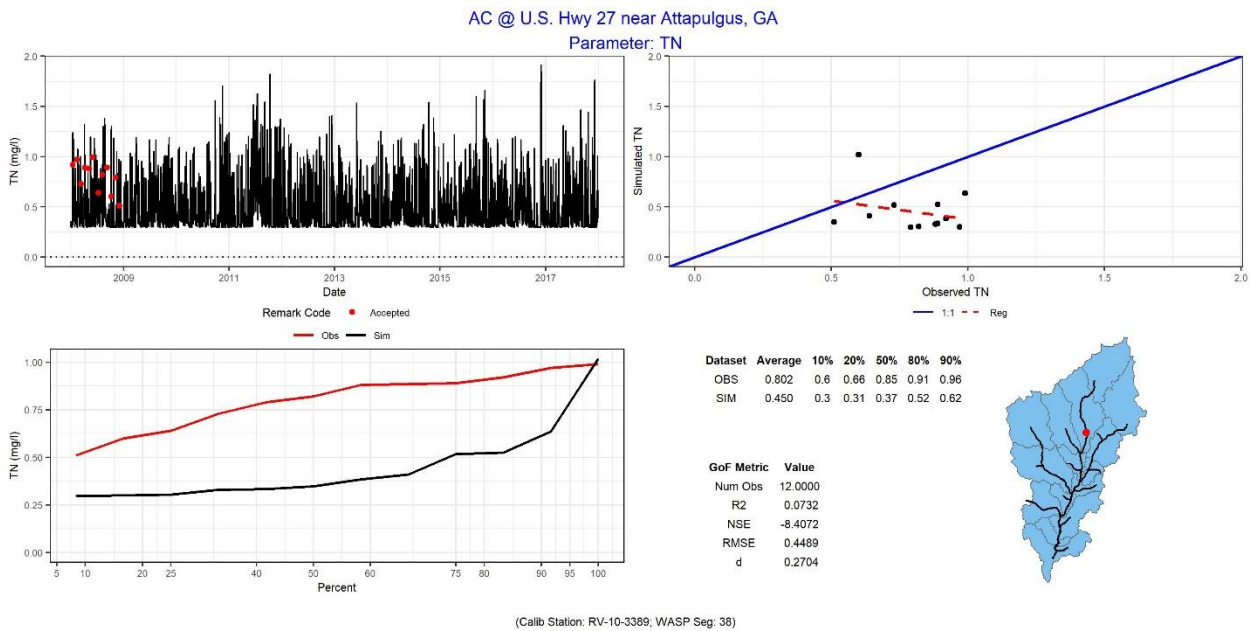


Figure 115 Total Nitrogen - Attapulgus Creek at U.S. Hwy 27 near Attapulgus, GA

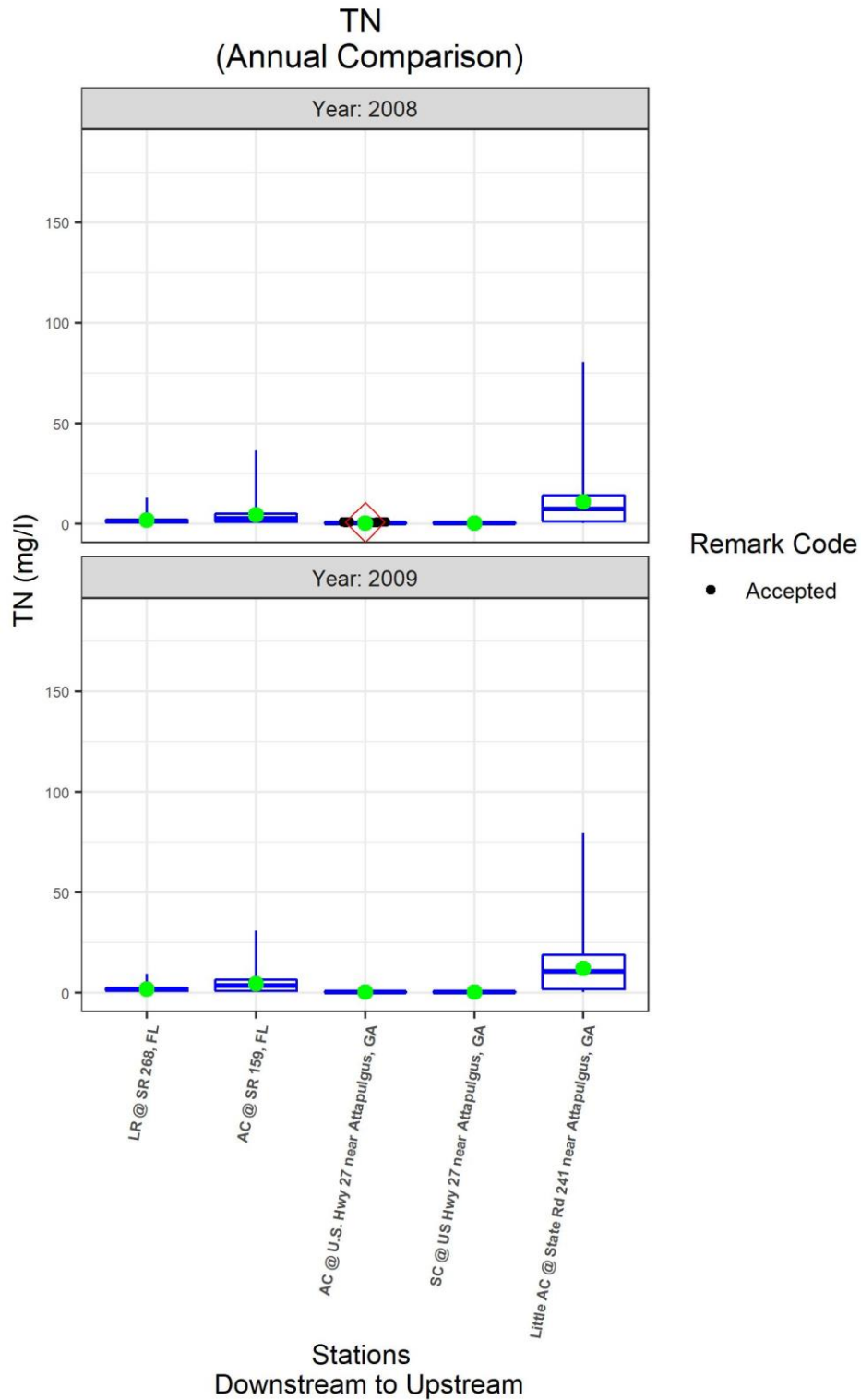


Figure 116 Little River Total Nitrogen Comparison Observed vs. Simulated 2008-2009

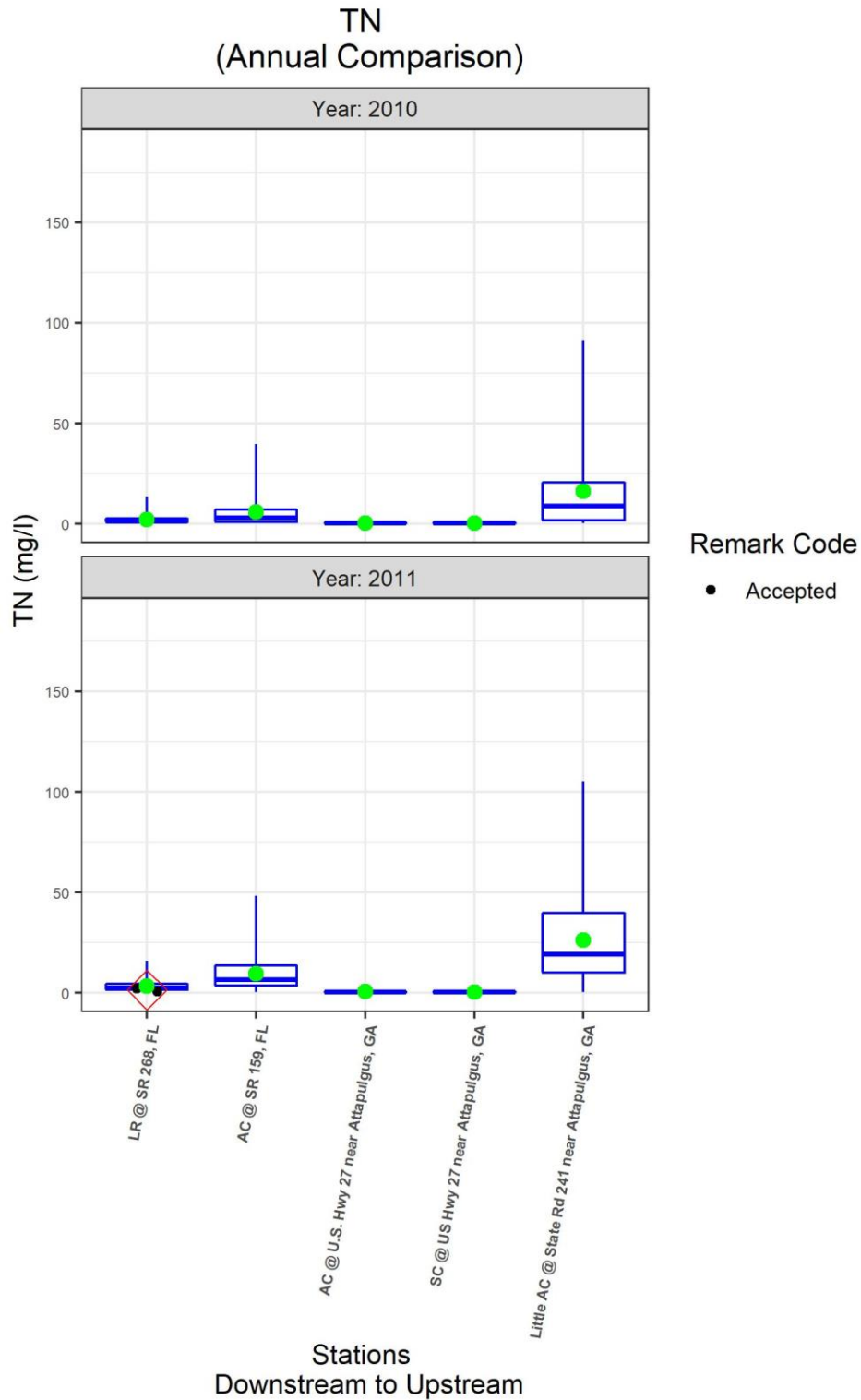


Figure 117 Little River Total Nitrogen Comparison Observed vs. Simulated 2010-2011

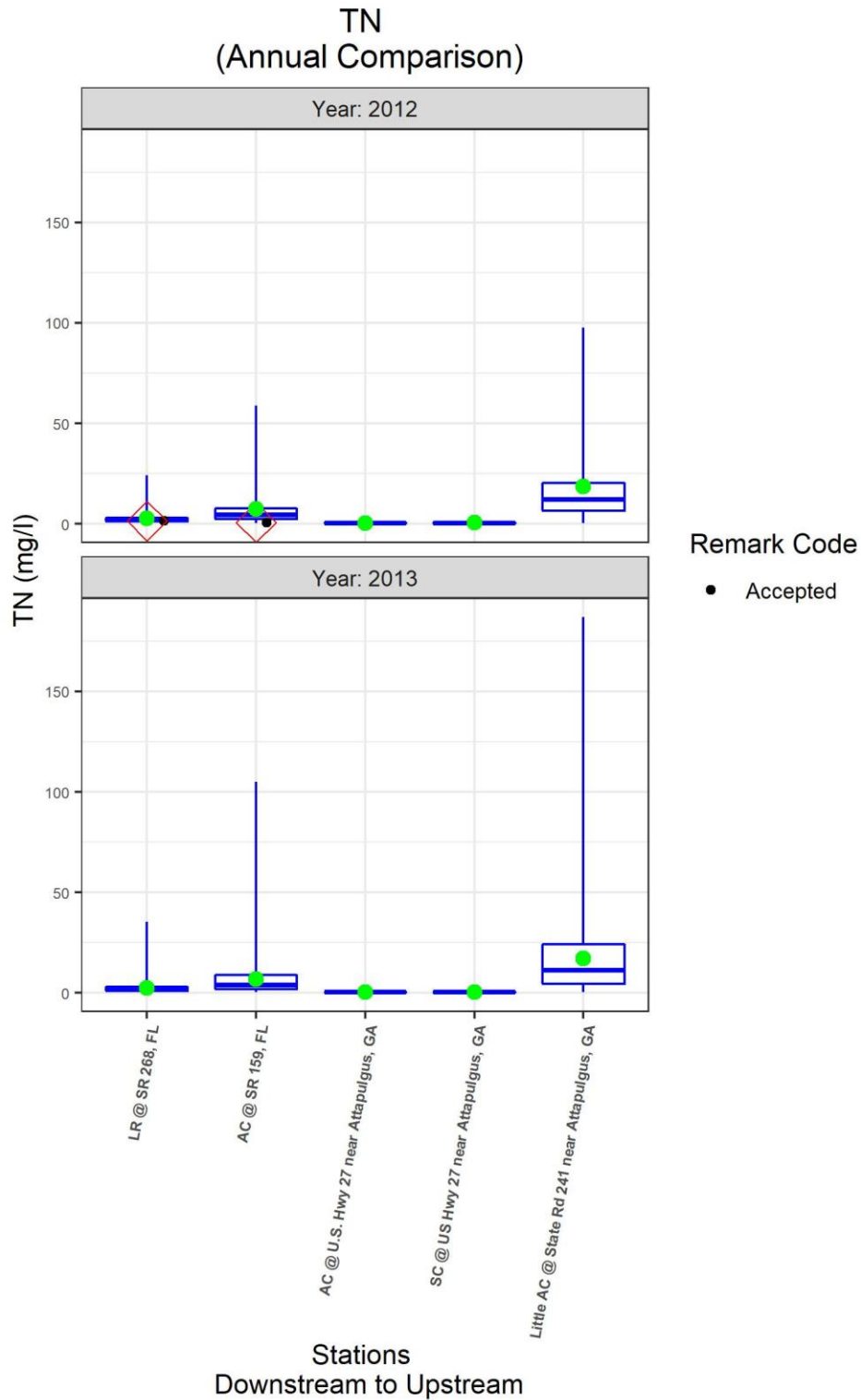


Figure 118 Little River Total Nitrogen Comparison Observed vs. Simulated 2012-2013

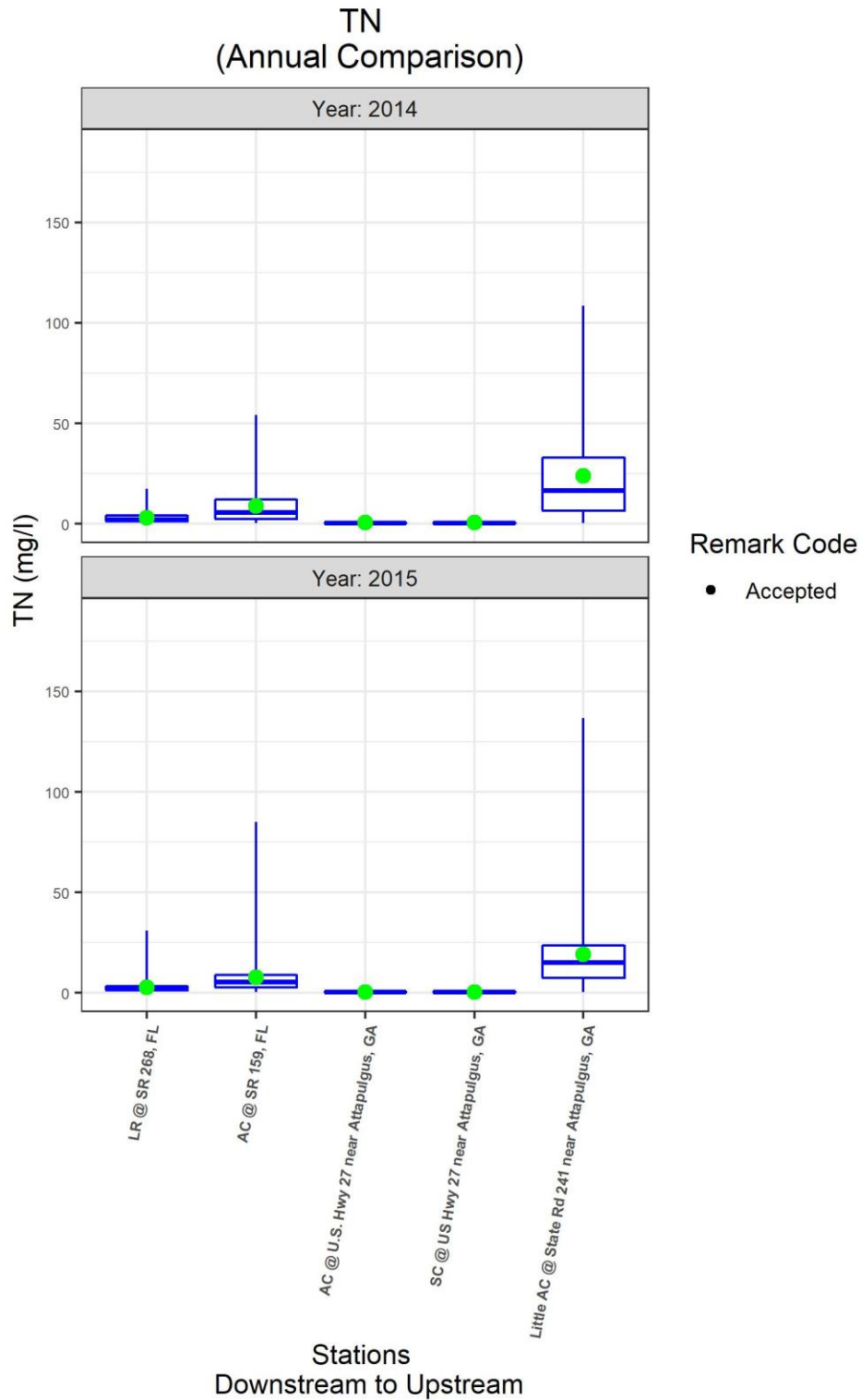


Figure 119 Little River Total Nitrogen Comparison Observed vs. Simulated 2014-2015

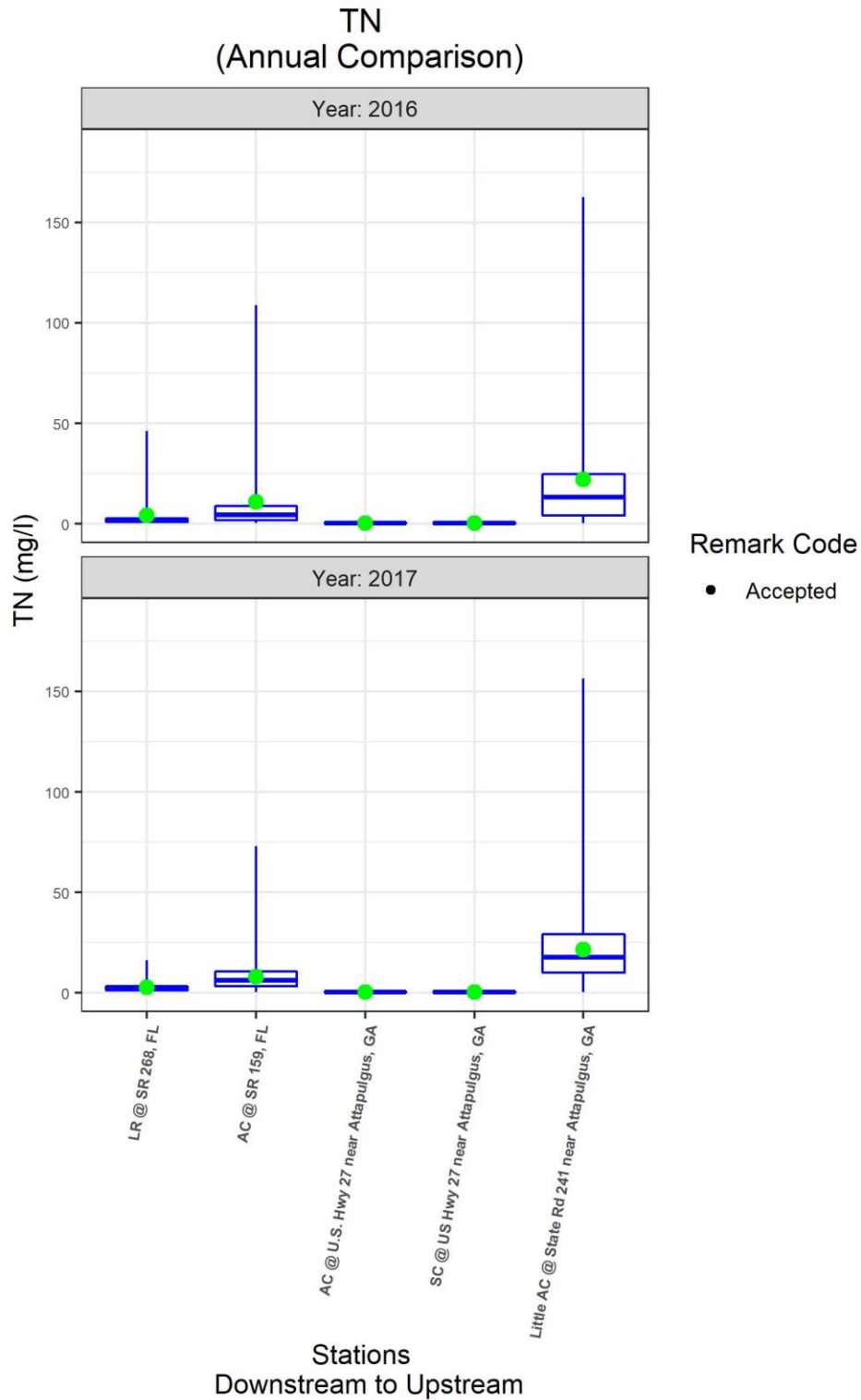


Figure 120 Little River Total Nitrogen Comparison Observed vs. Simulated 2016-2017

Ammonia

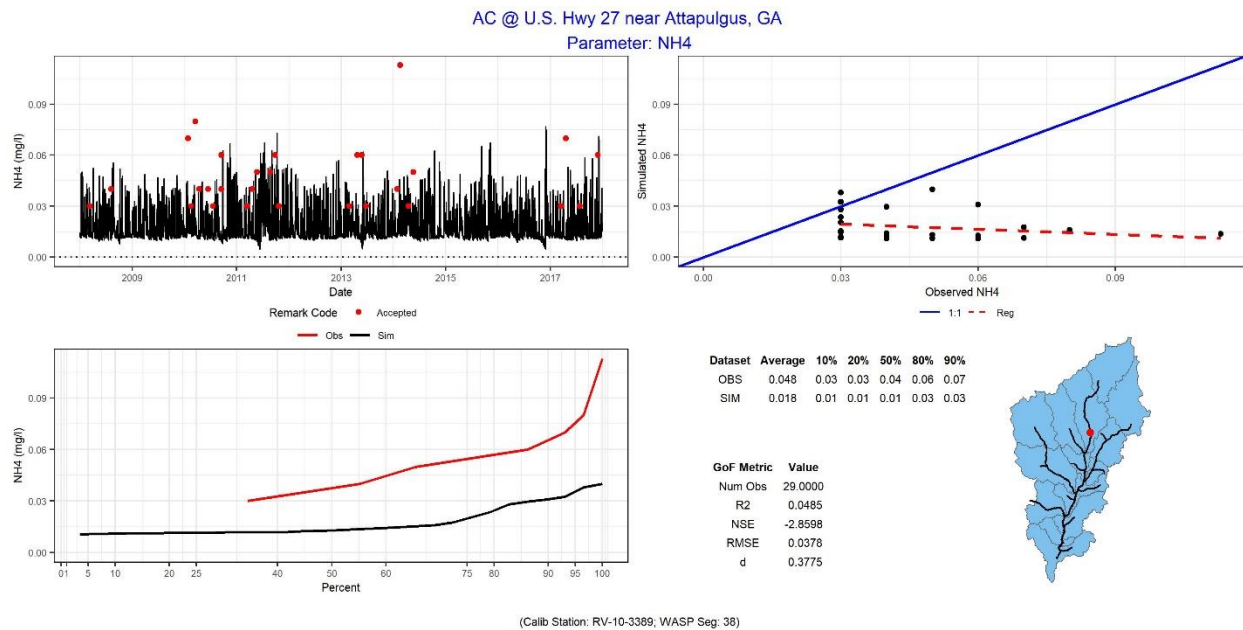


Figure 121 Ammonia - Attapulgus Creek at U.S. Hwy 27 near Attapulgus, GA

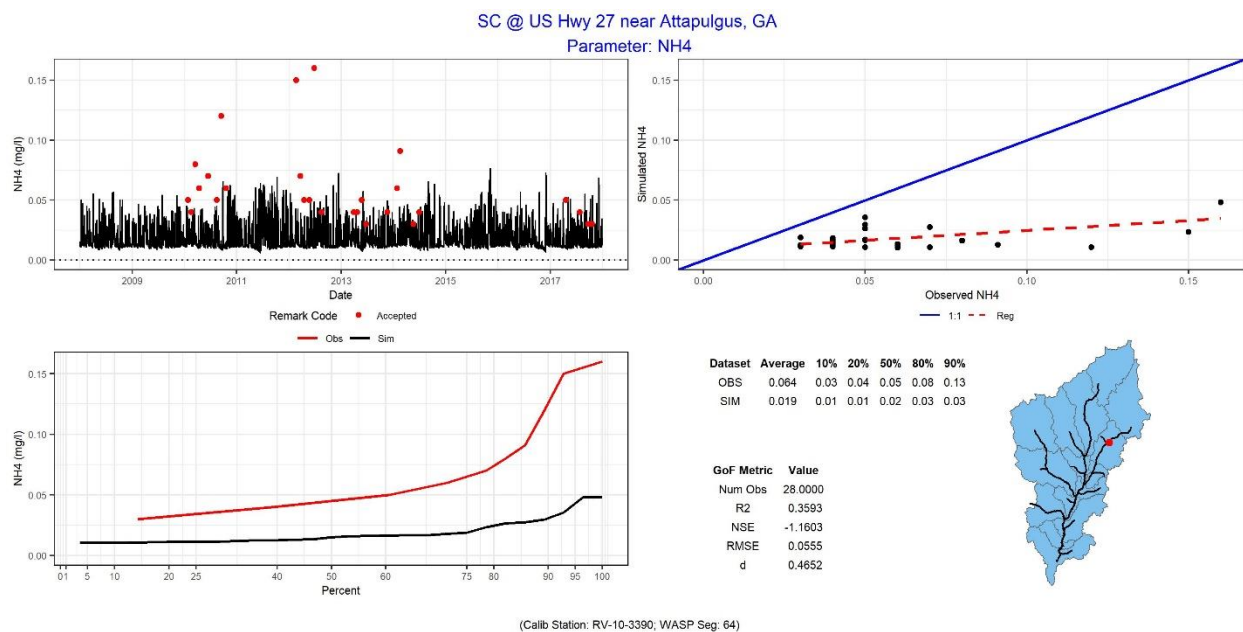


Figure 122 Ammonia - Swamp Creek at US Hwy 27 near Attapulgus, GA

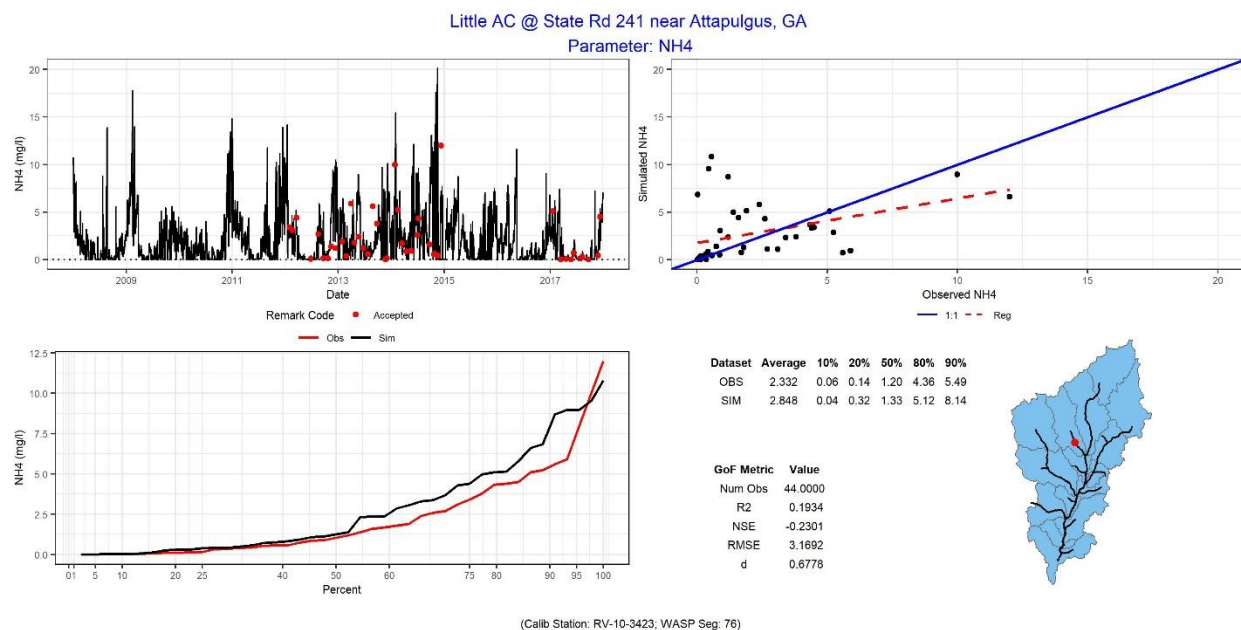


Figure 123 Ammonia - Little Attapulgus Creek at State Rd 241 near Attapulgus, GA

Nitrate

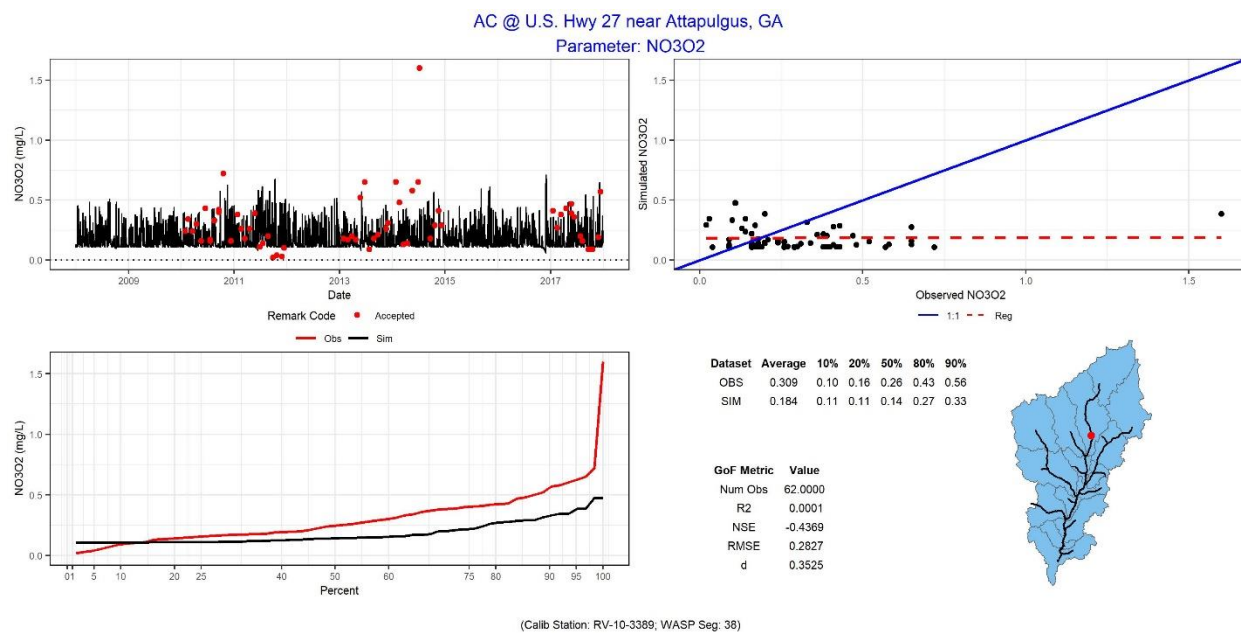


Figure 124 Nitrate - Attapulgus Creek at U.S. Hwy 27 near Attapulgus, GA

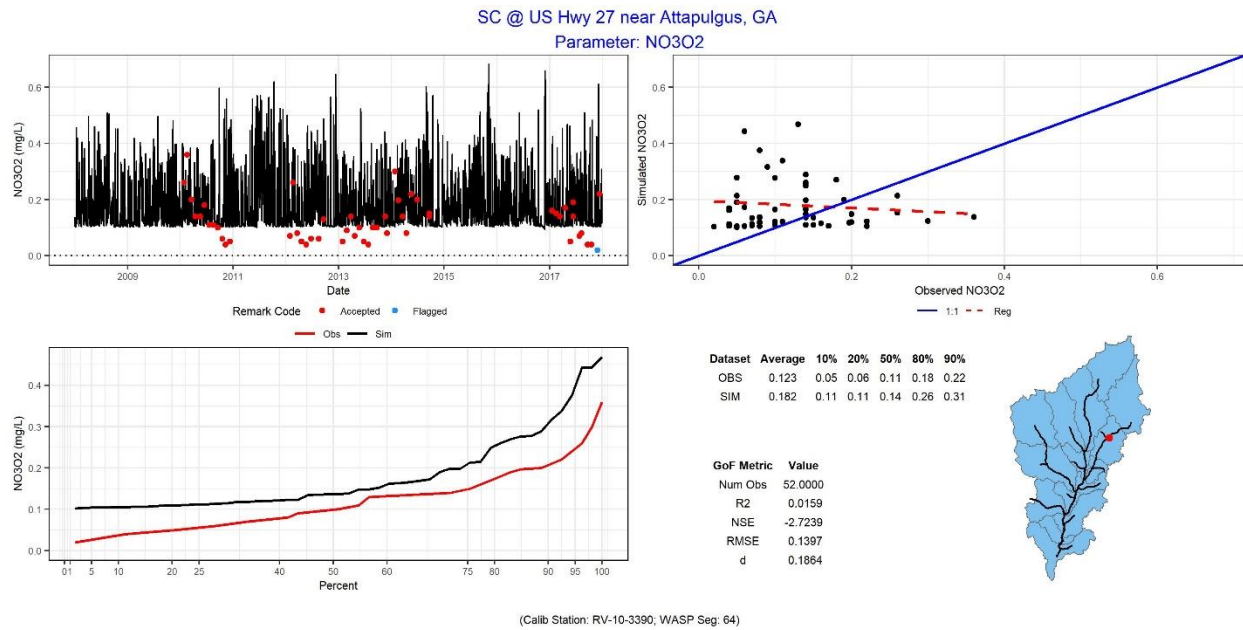


Figure 125 Nitrate - Swamp Creek at US Hwy 27 near Attapulgus, GA

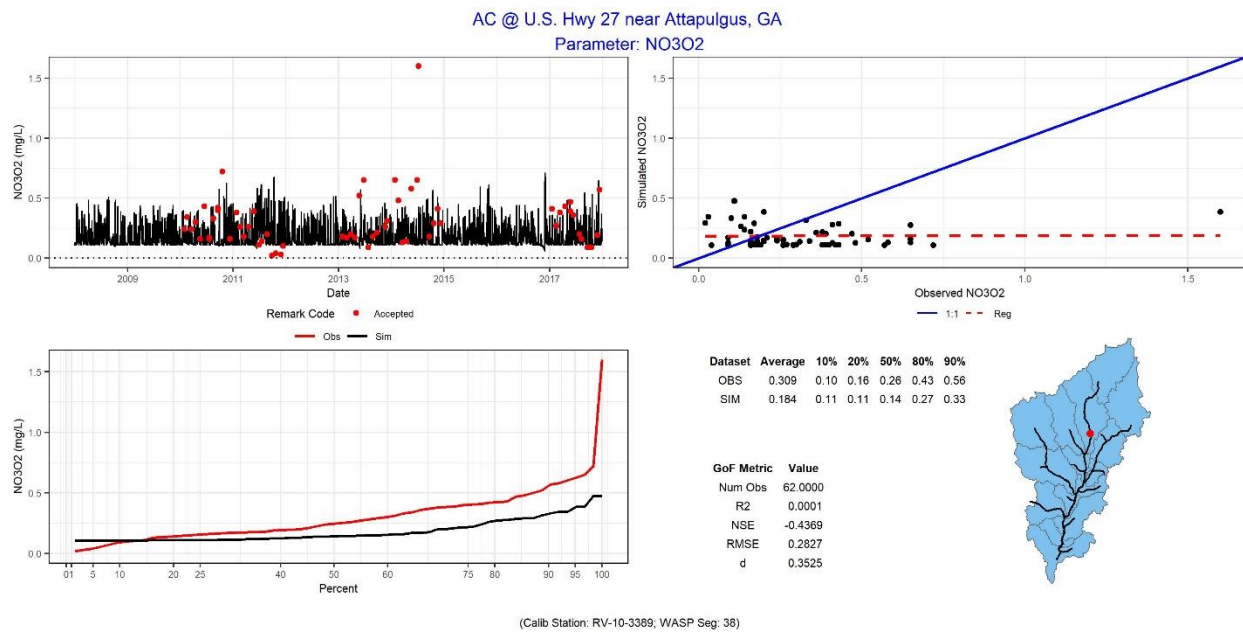


Figure 126 Nitrate – Attapulgus Creek near Attapulgus, GA

Total Phosphorus

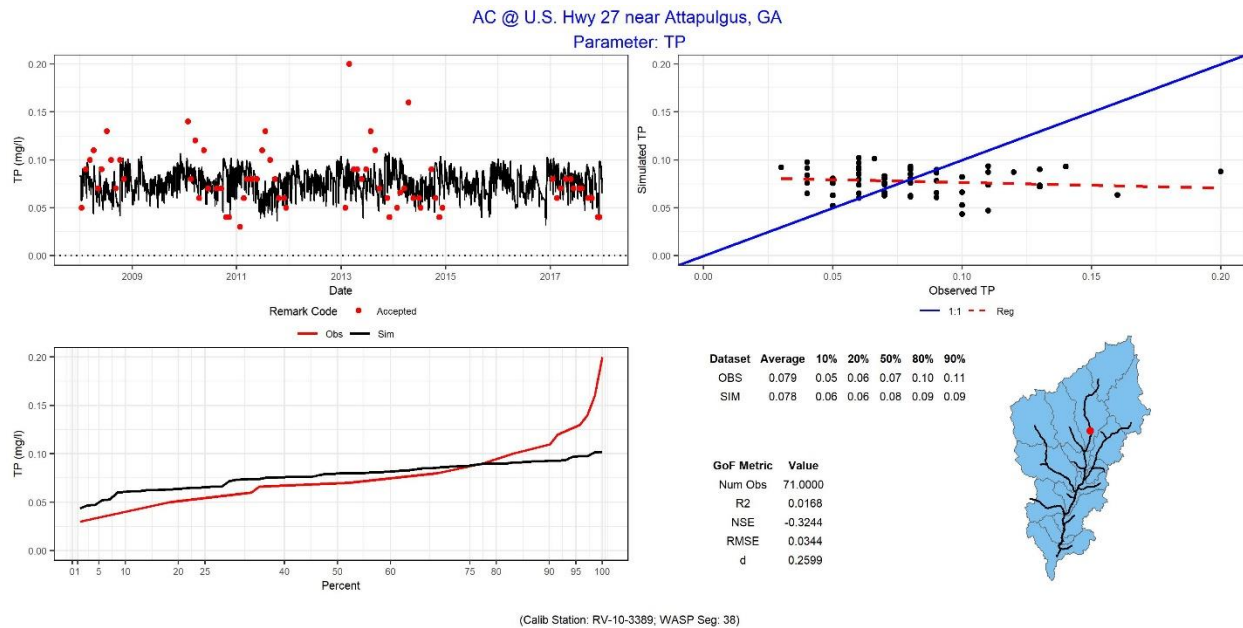


Figure 127 Total Phosphorus - Attapulgus Creek at U.S. Hwy 27 near Attapulgus, GA

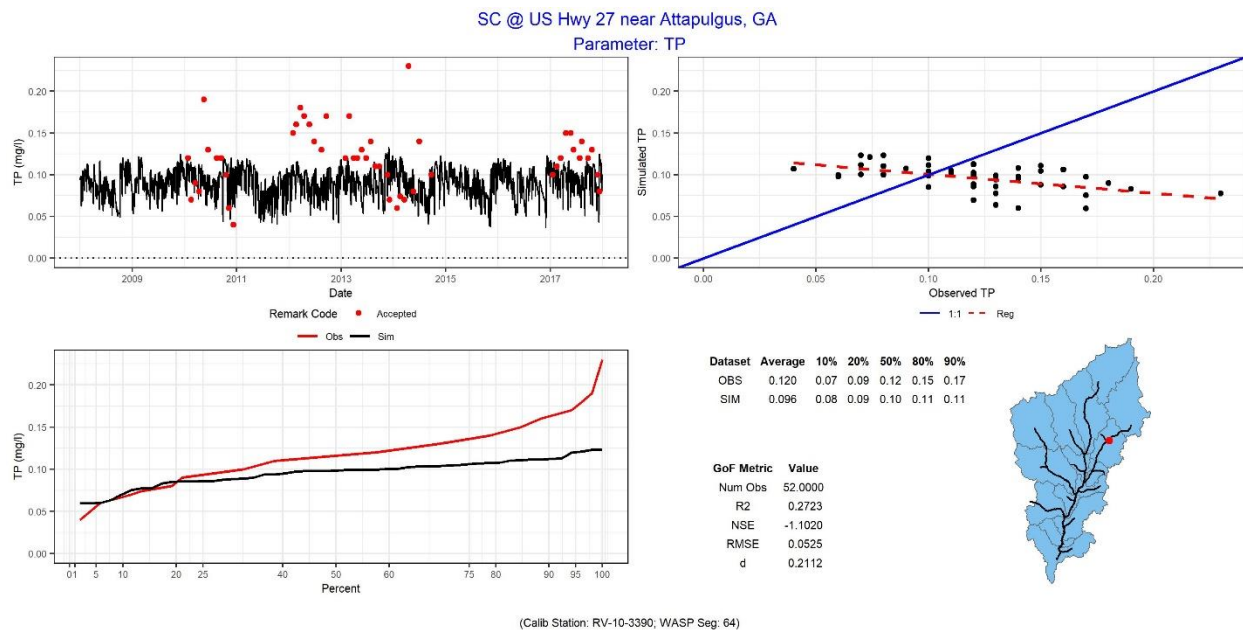


Figure 128 Total Phosphorus - Swamp Creek at US Hwy 27 near Attapulgus, GA

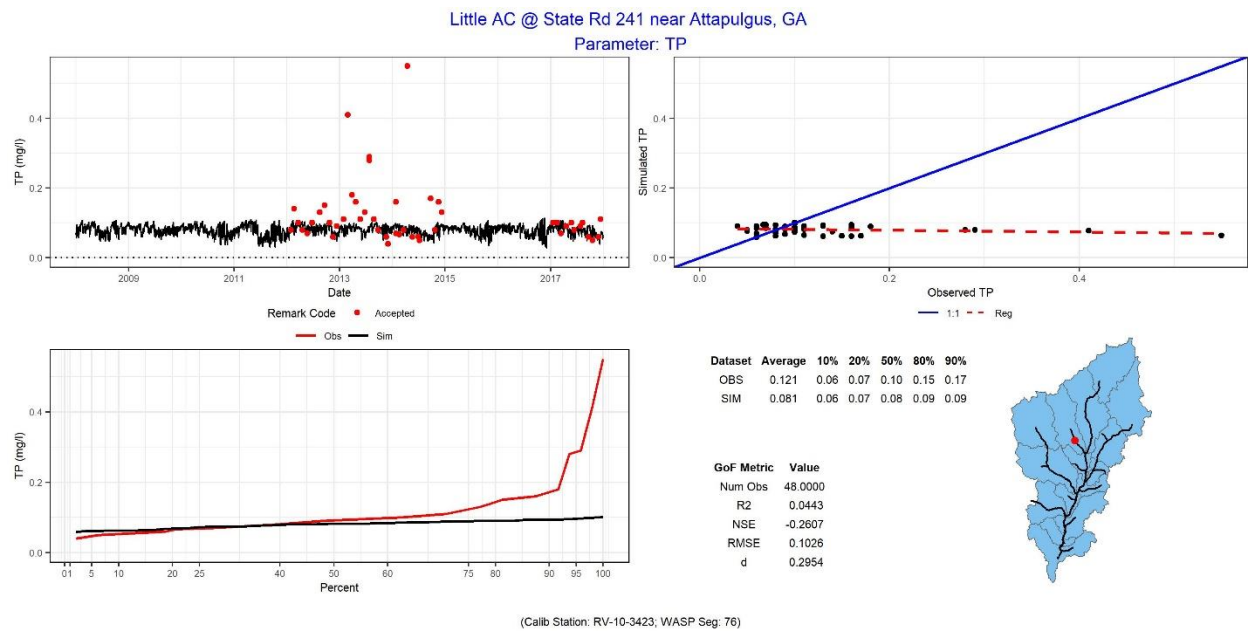


Figure 129 Total Phosphorus - Little Attapulgus Creek at State Rd 241 near Attapulgus, GA

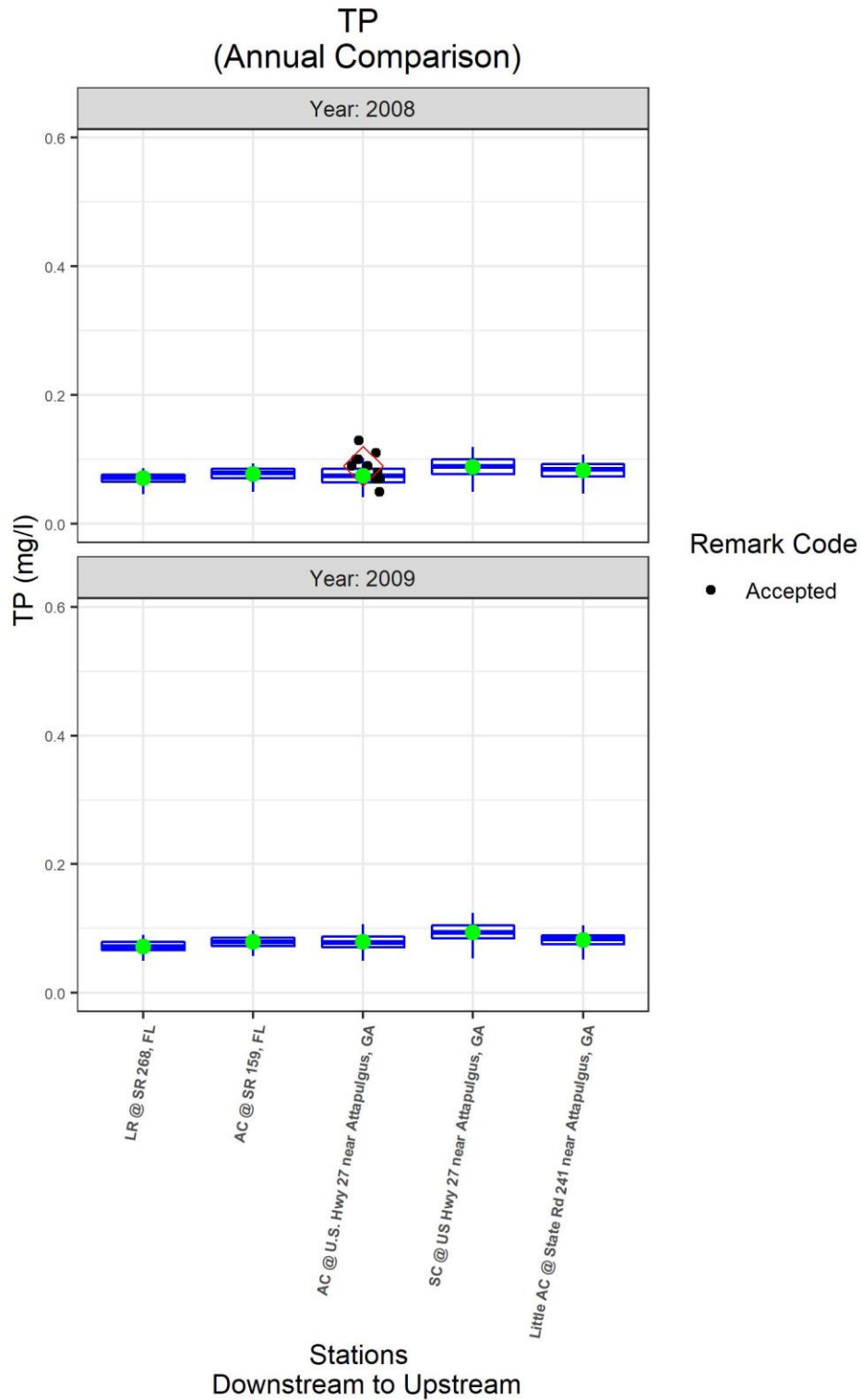


Figure 130 Little River Total Phosphorus Comparison Observed vs. Simulated 2008-2009

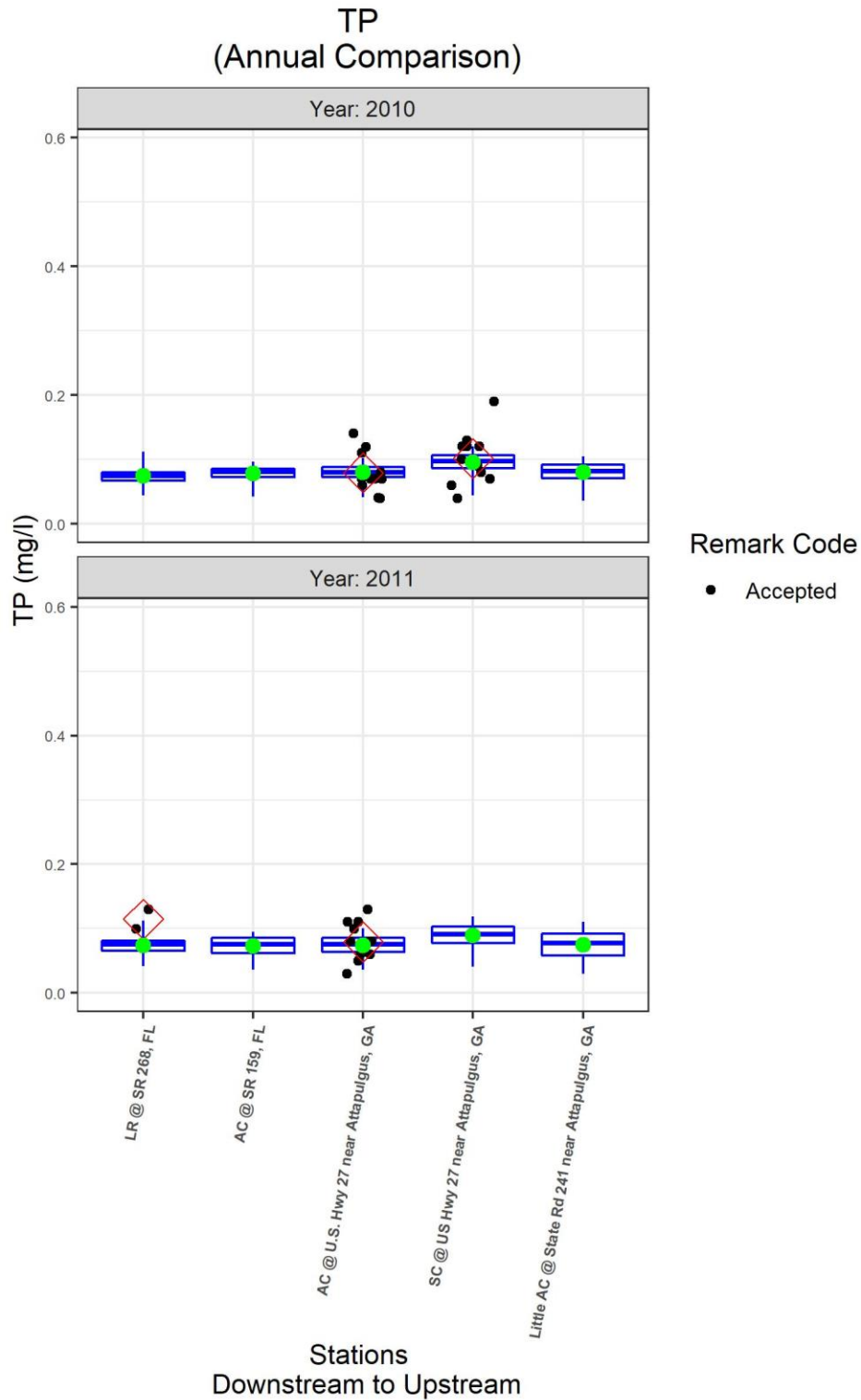


Figure 131 Little River Total Phosphorus Comparison Observed vs. Simulated 2010-2011

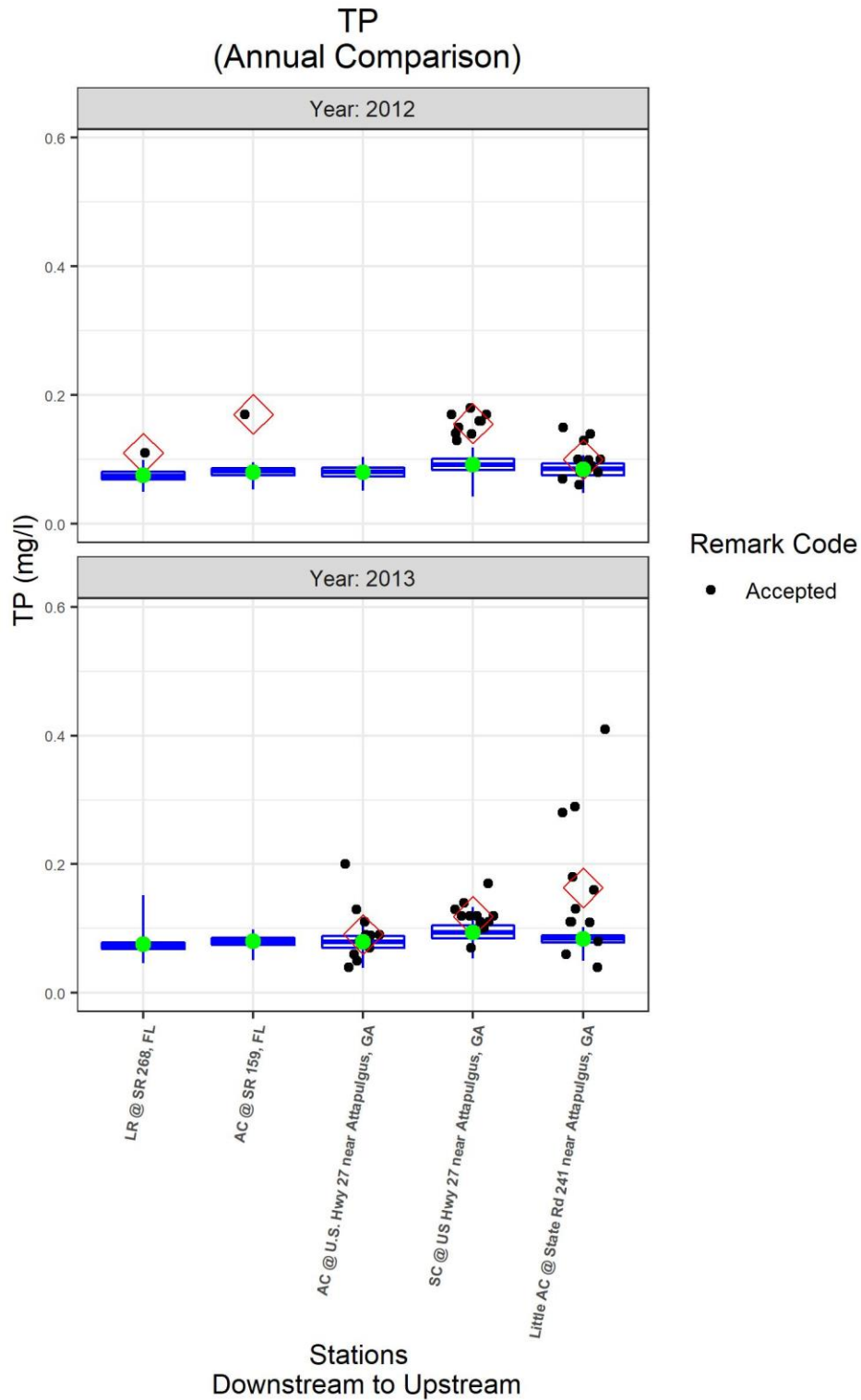


Figure 132 Little River Total Phosphorus Comparison Observed vs. Simulated 2012-2013

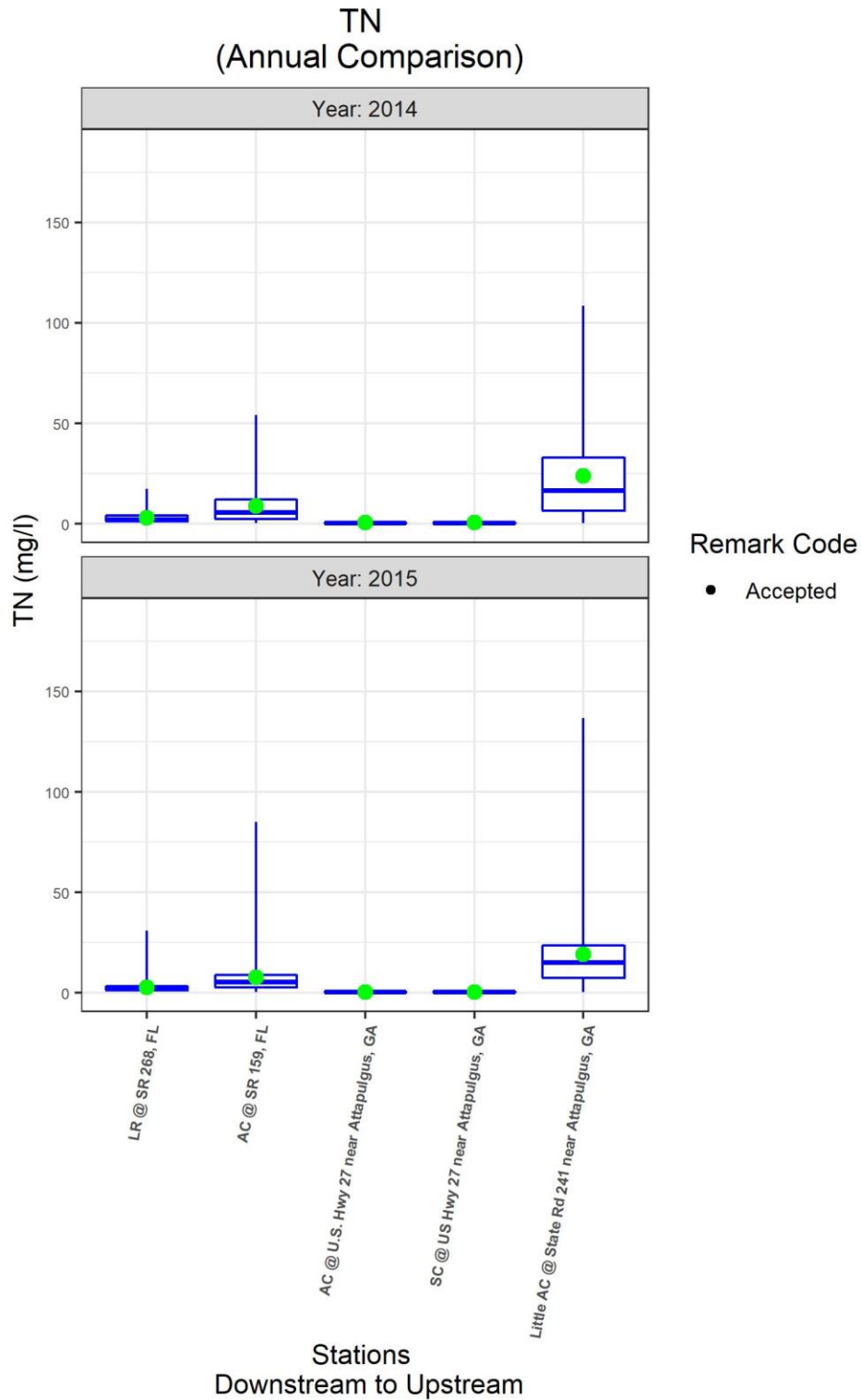


Figure 133 Little River Total Phosphorus Comparison Observed vs. Simulated 2014-2015

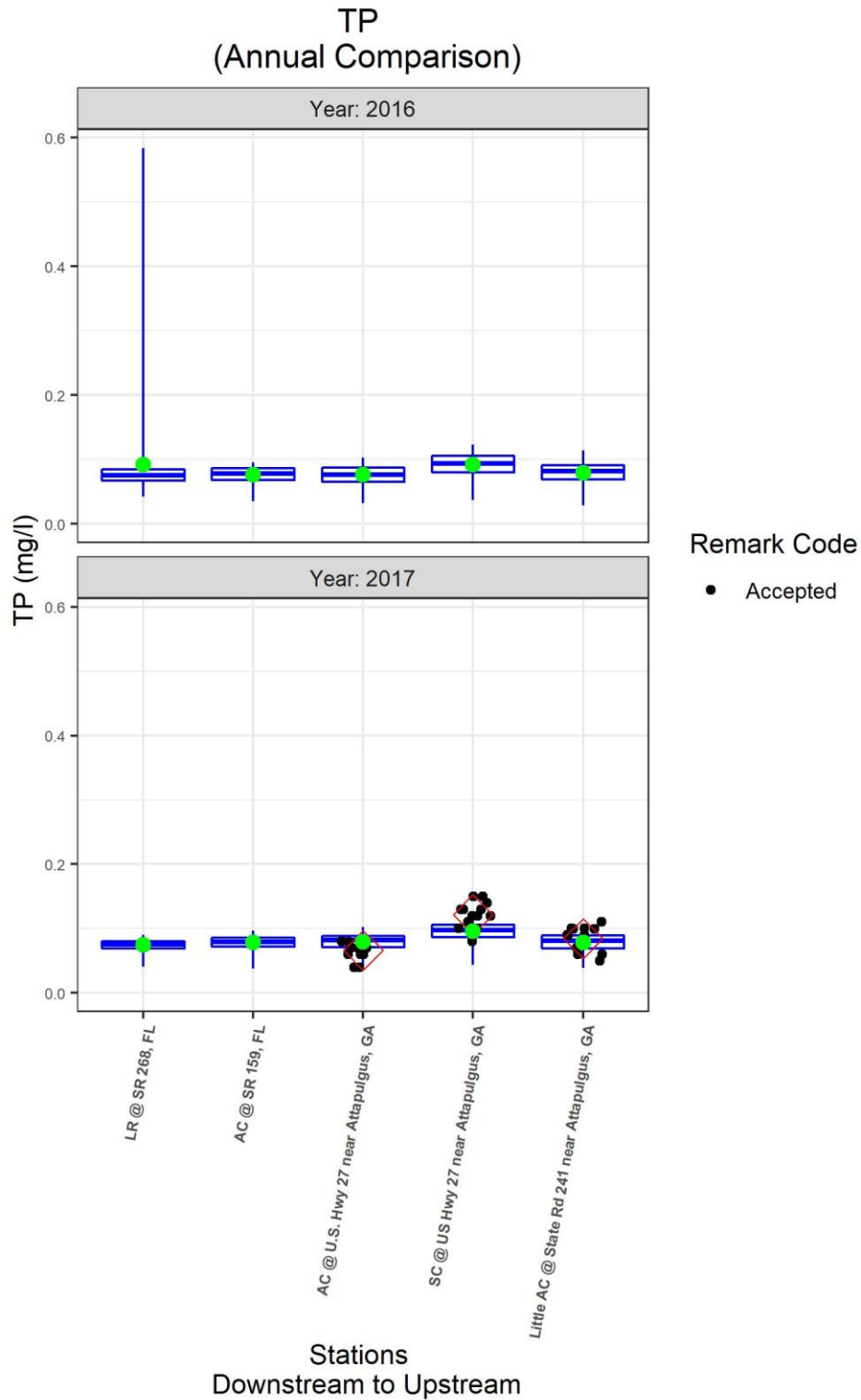


Figure 134 Little River Total Phosphorus Comparison Observed vs. Simulated 2016-2017

Chlorophyll a

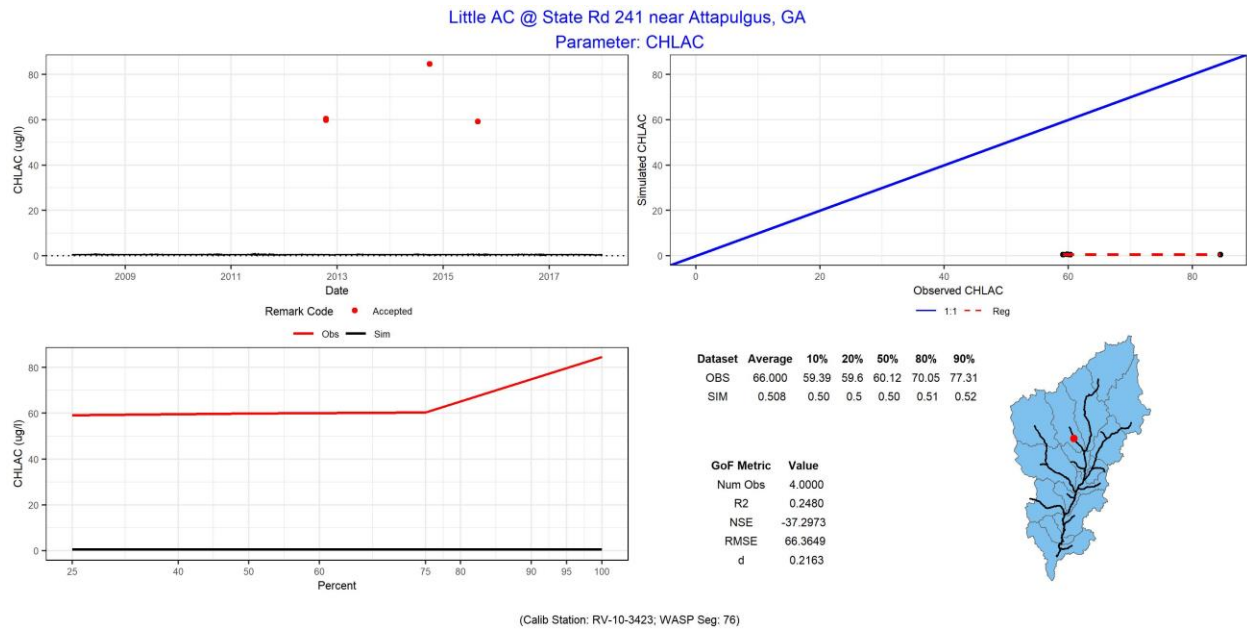


Figure 135 Chlorophyll a - Little Attapulgus Creek at State Rd 241 near Attapulgus, GA

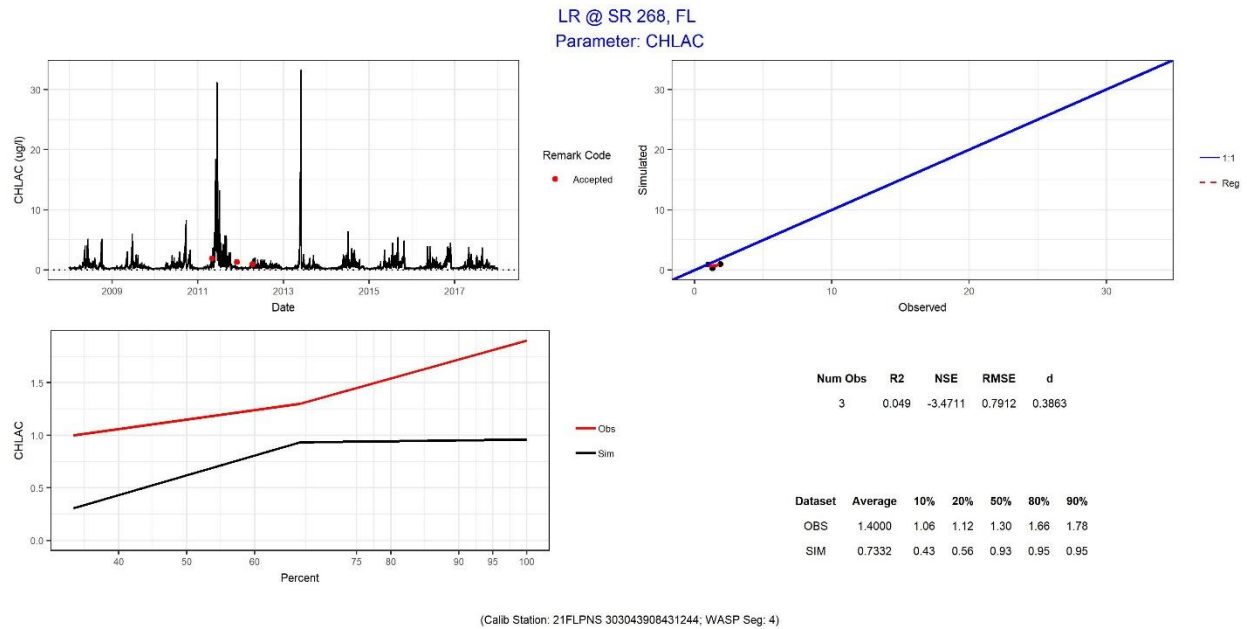


Figure 136 Chlorophyll a – Little River at SR 268, FL

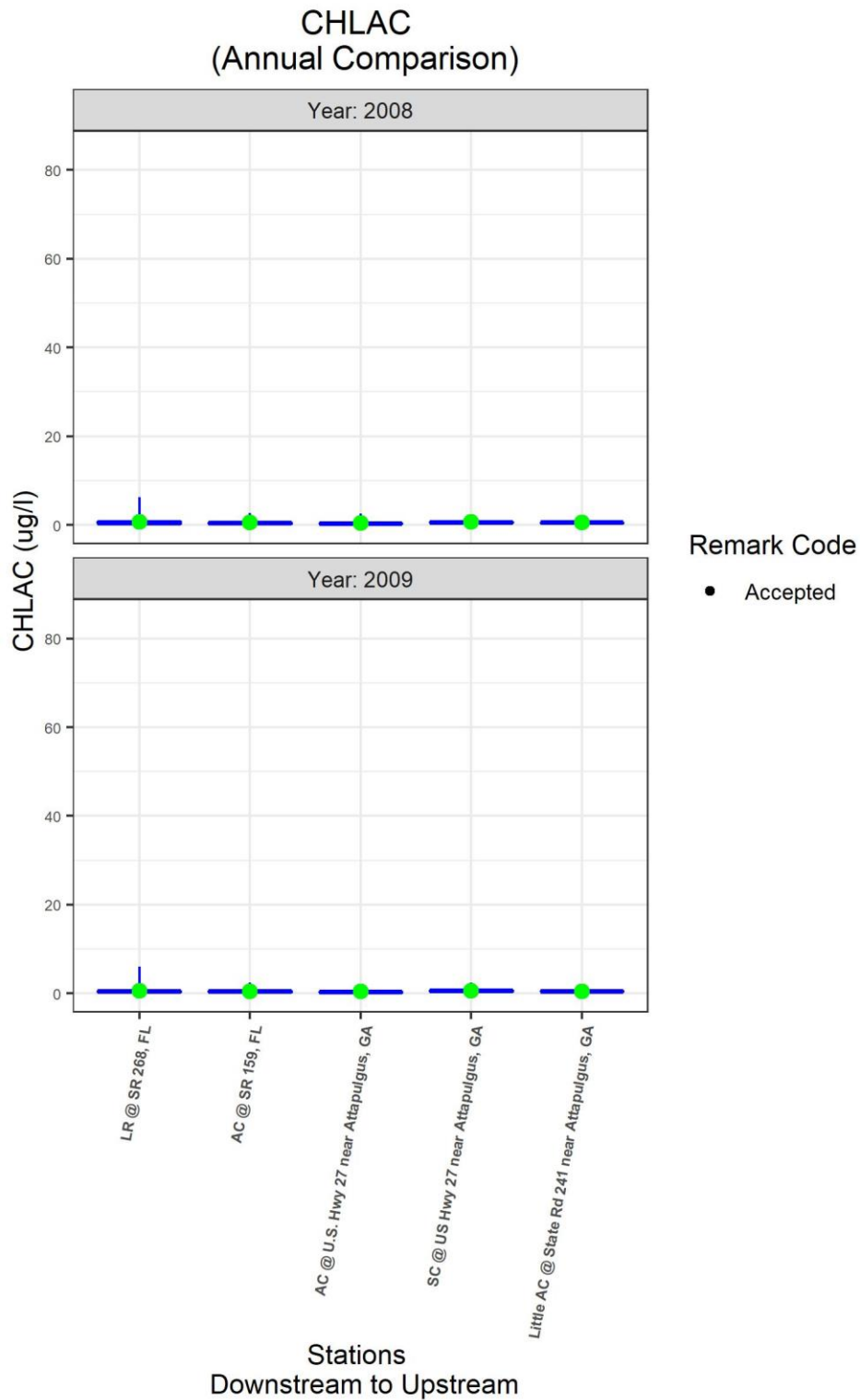


Figure 137 Little River Chlorophyll a Comparison Observed vs. Simulated 2008-2009

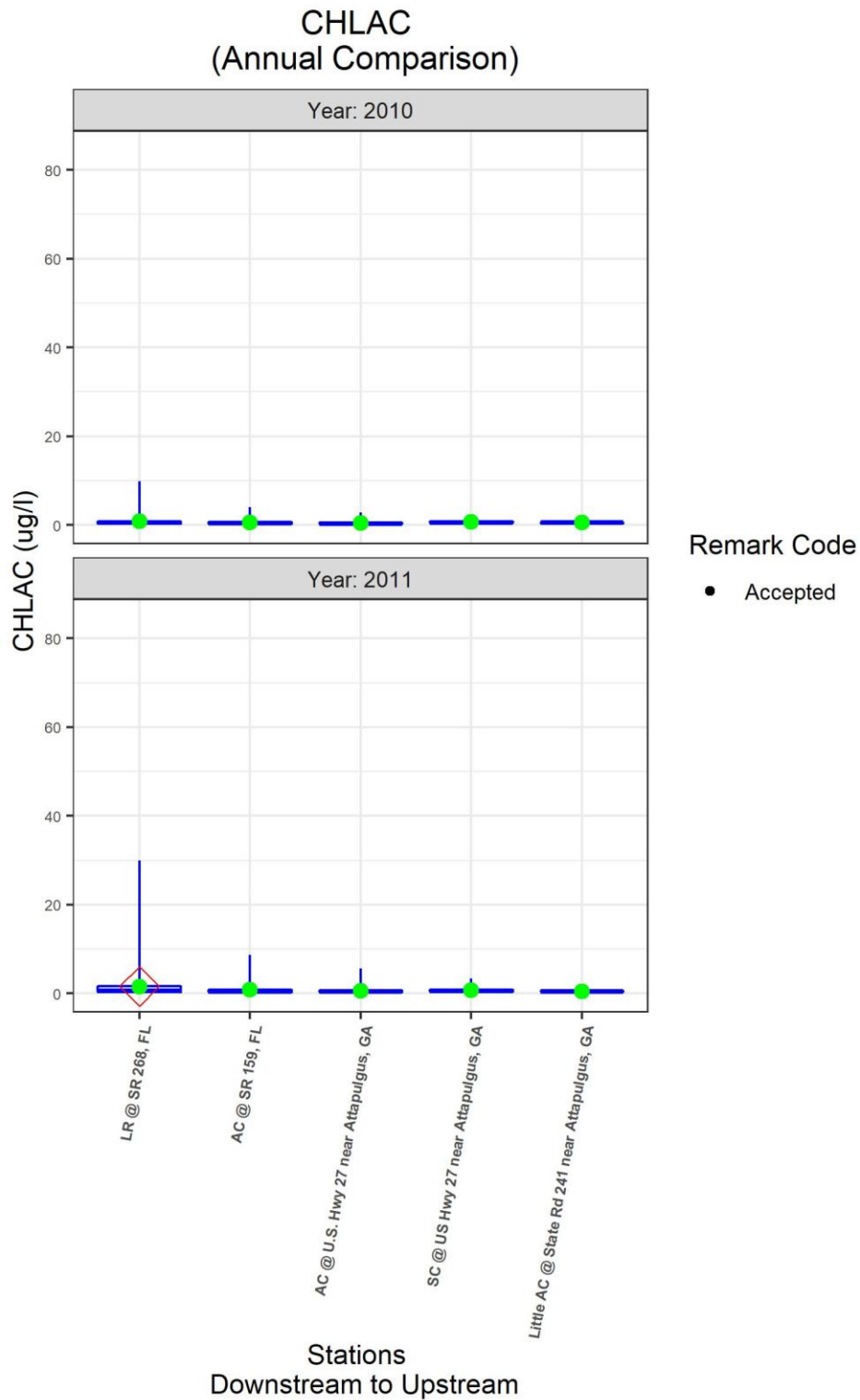


Figure 138 Little River Chlorophyll a Comparison Observed vs. Simulated 2010-2011

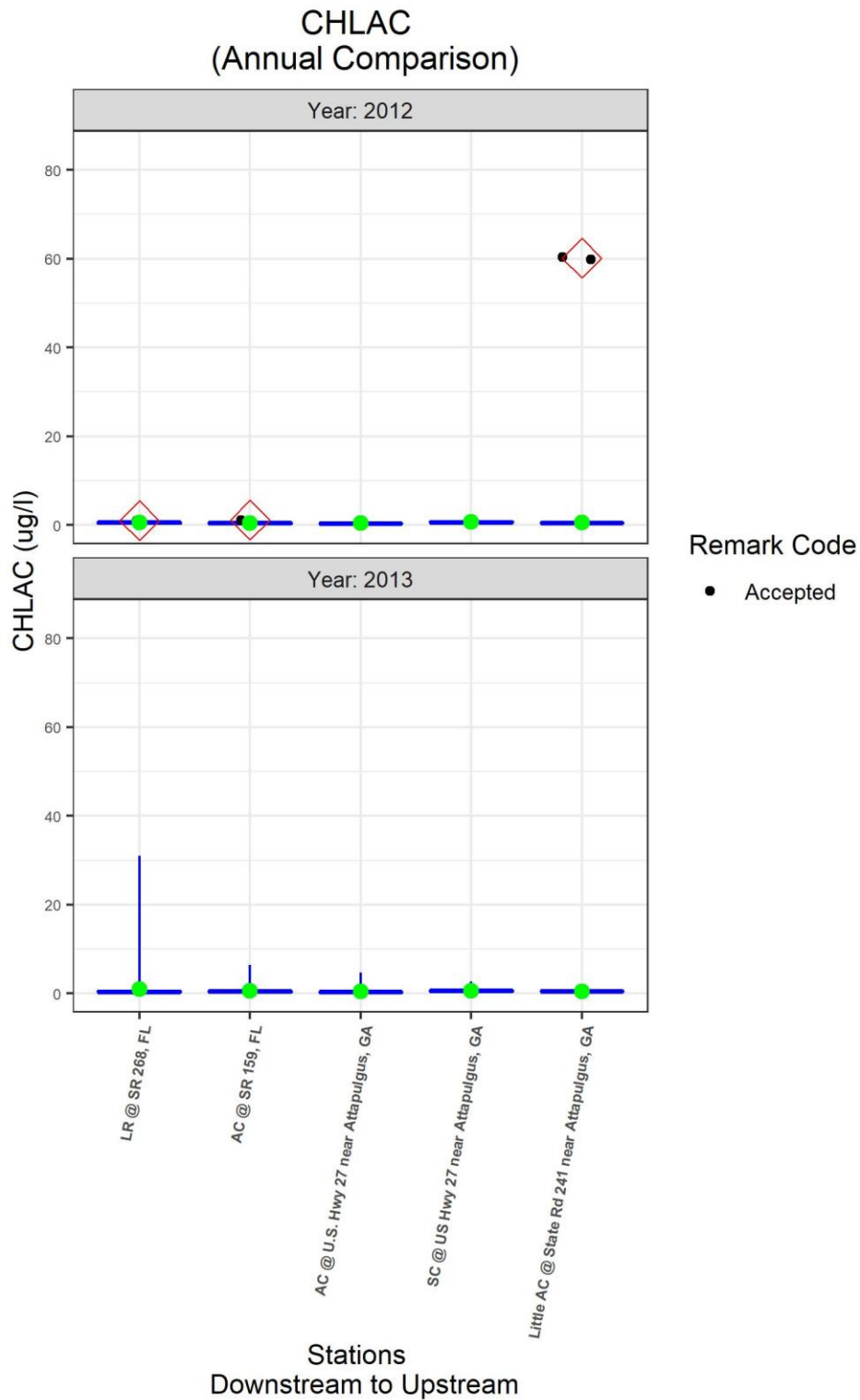


Figure 139 Little River Chlorophyll a Comparison Observed vs. Simulated 2012-2013

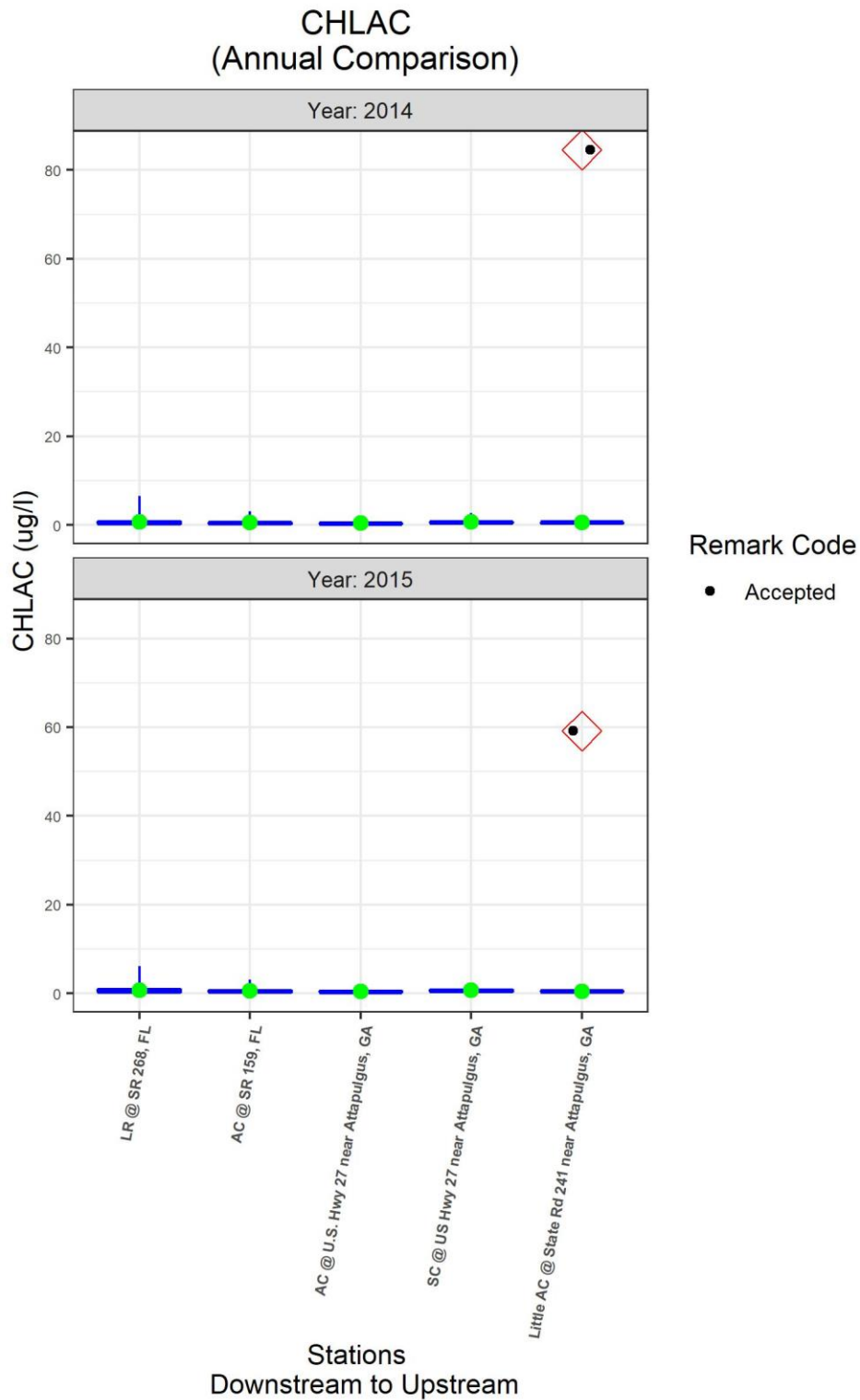


Figure 140 Little River Chlorophyll a Comparison Observed vs. Simulated 2014-2015

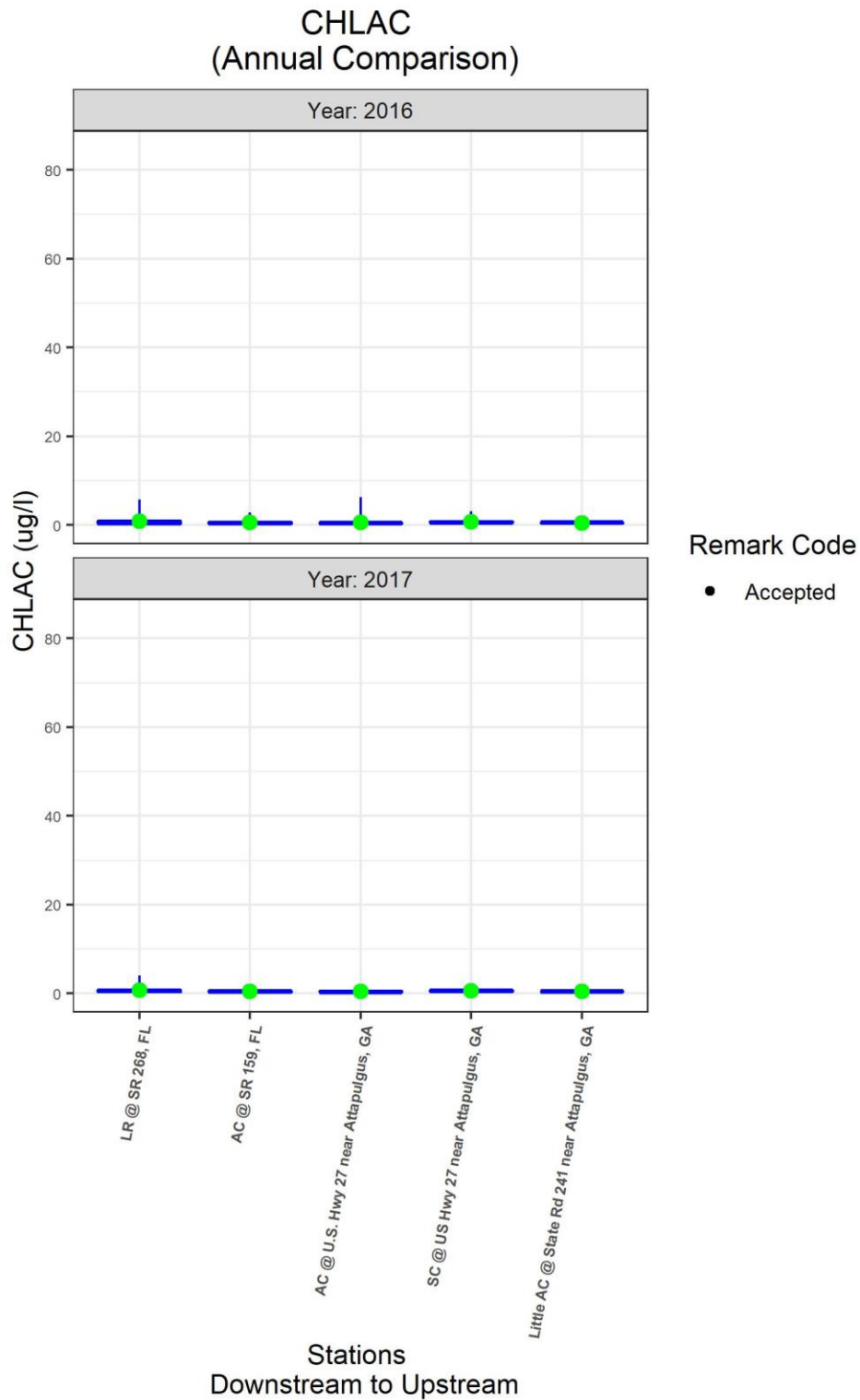


Figure 141 Little River Chlorophyll a Comparison Observed vs. Simulated 2016-2017

Dissolved Oxygen

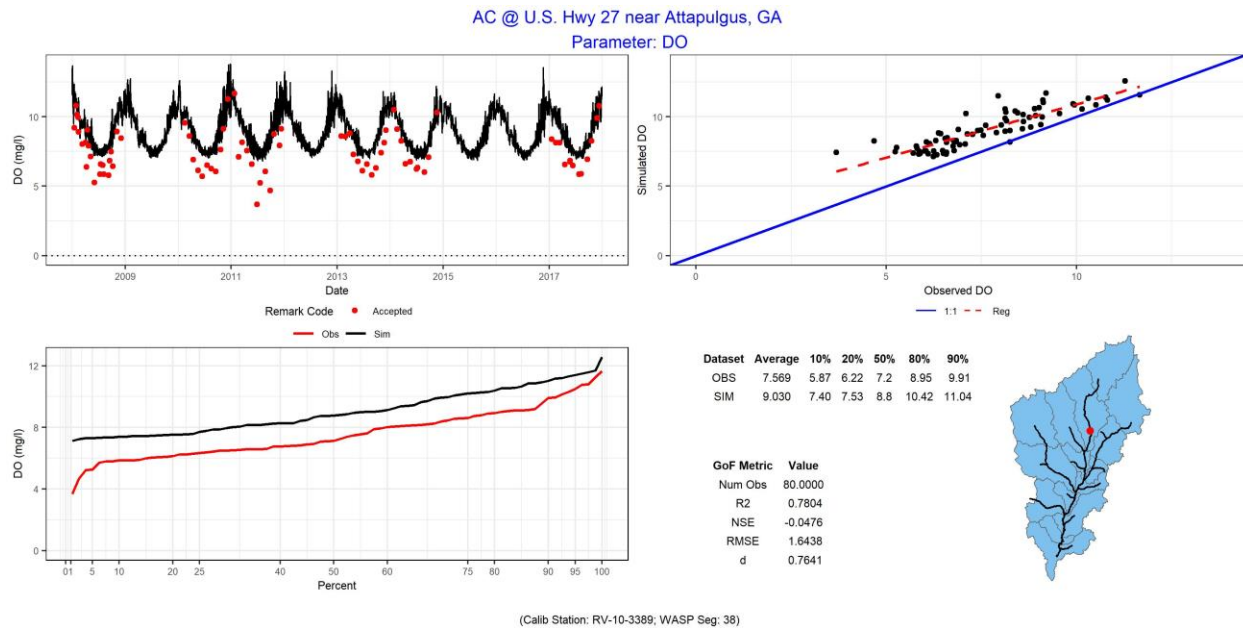


Figure 142 Dissolved Oxygen - Attapulgus Creek at U.S. Hwy 27 near Attapulgus, GA

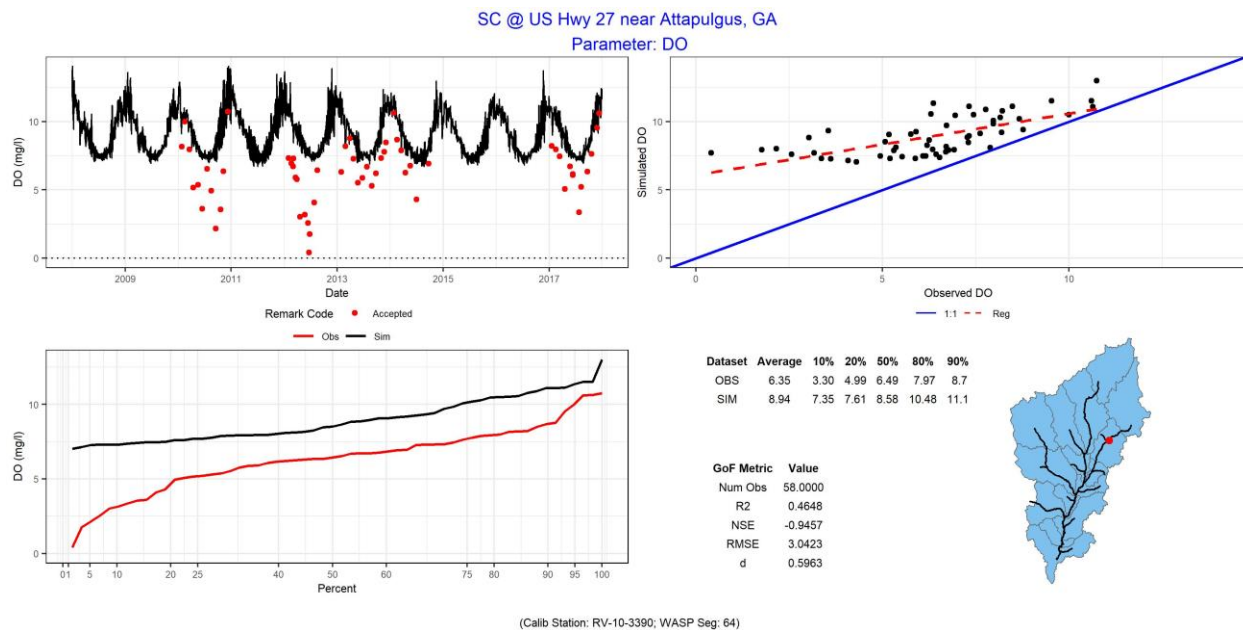


Figure 143 Dissolved Oxygen - Swamp Creek at US Hwy 27 near Attapulgus, GA

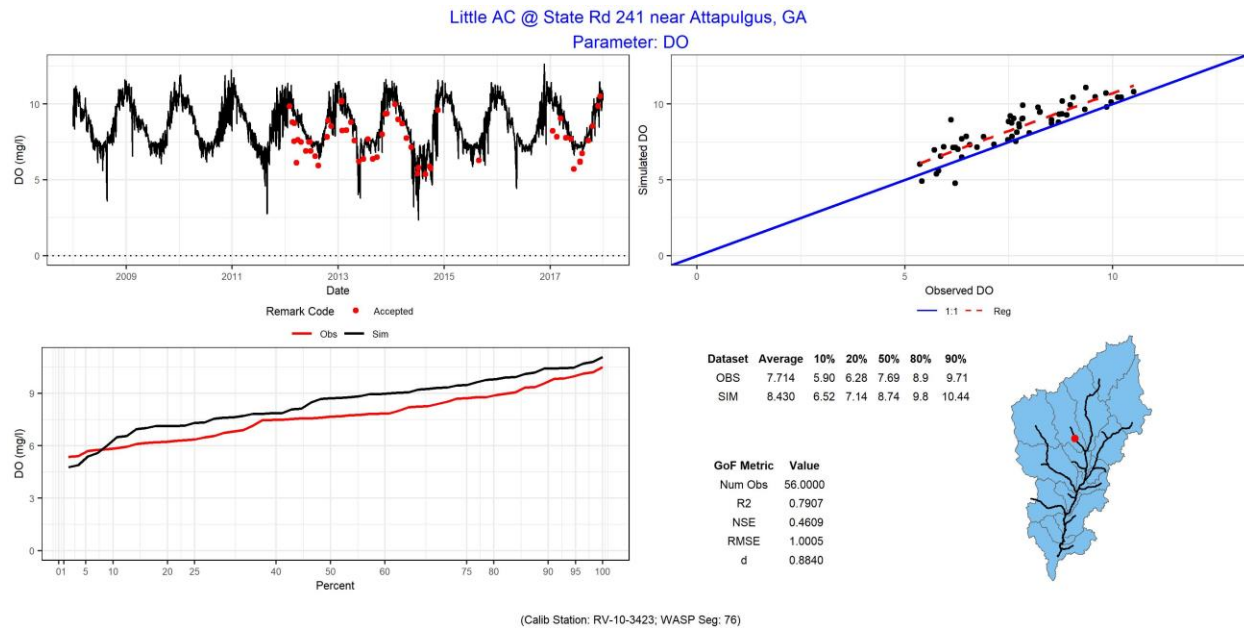


Figure 144 Dissolved Oxygen - Little Attapulgus Creek at State Rd 241 near Attapulgus, GA

Carbonaceous Biochemical Oxygen Demand

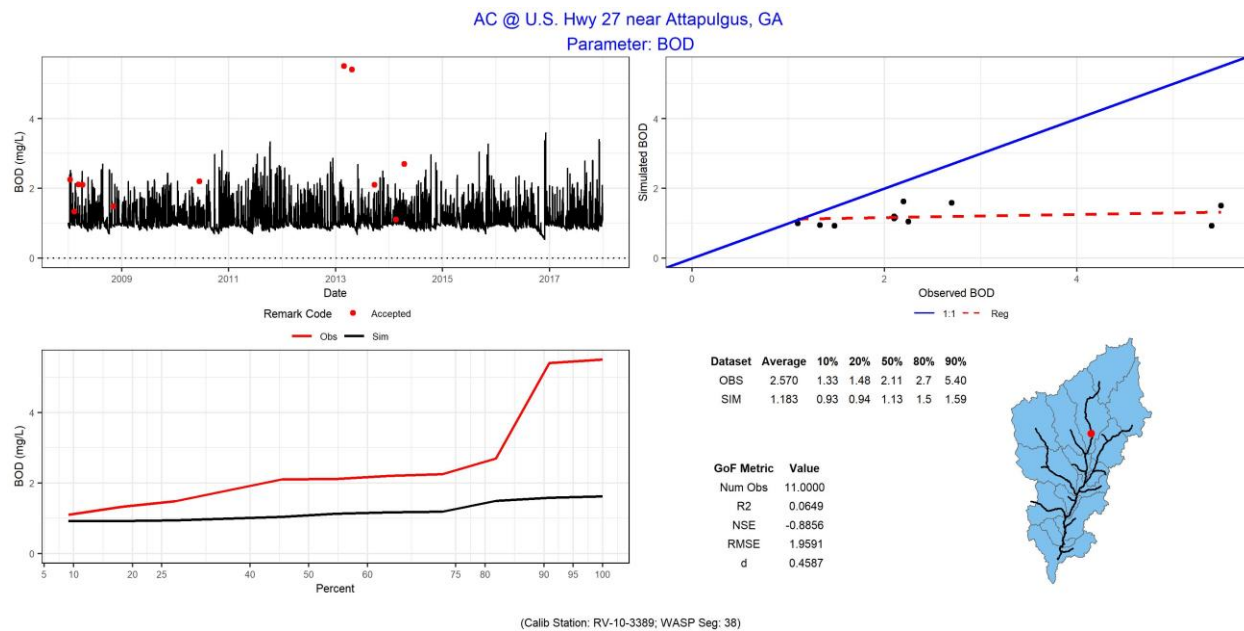
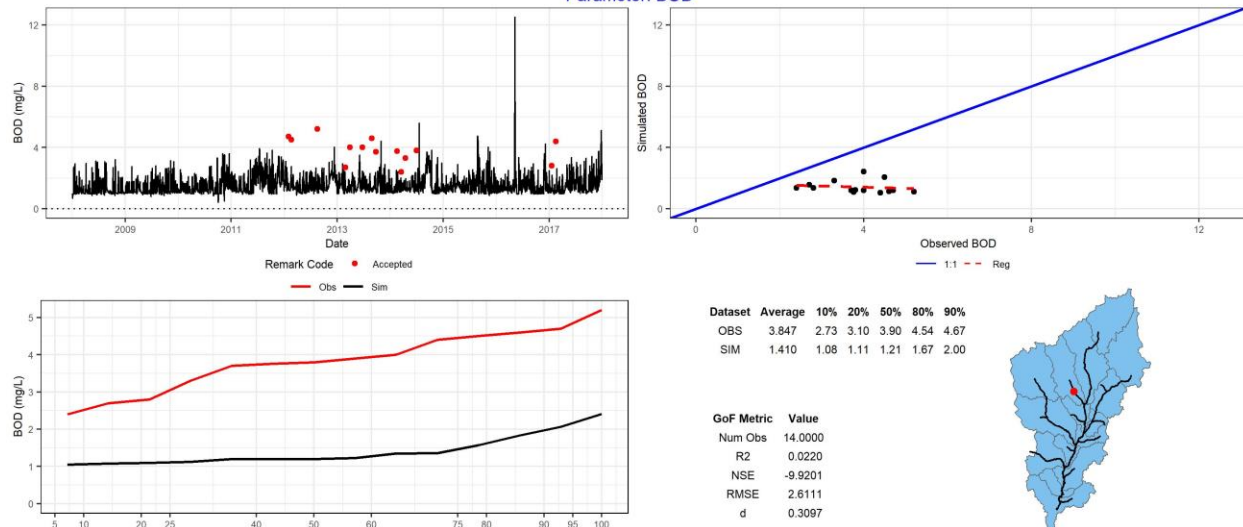


Figure 145 CBOD - Attapulgus Creek at U.S. Hwy 27 near Attapulgus, GA

Little AC @ State Rd 241 near Attapulgus, GA

Parameter: BOD

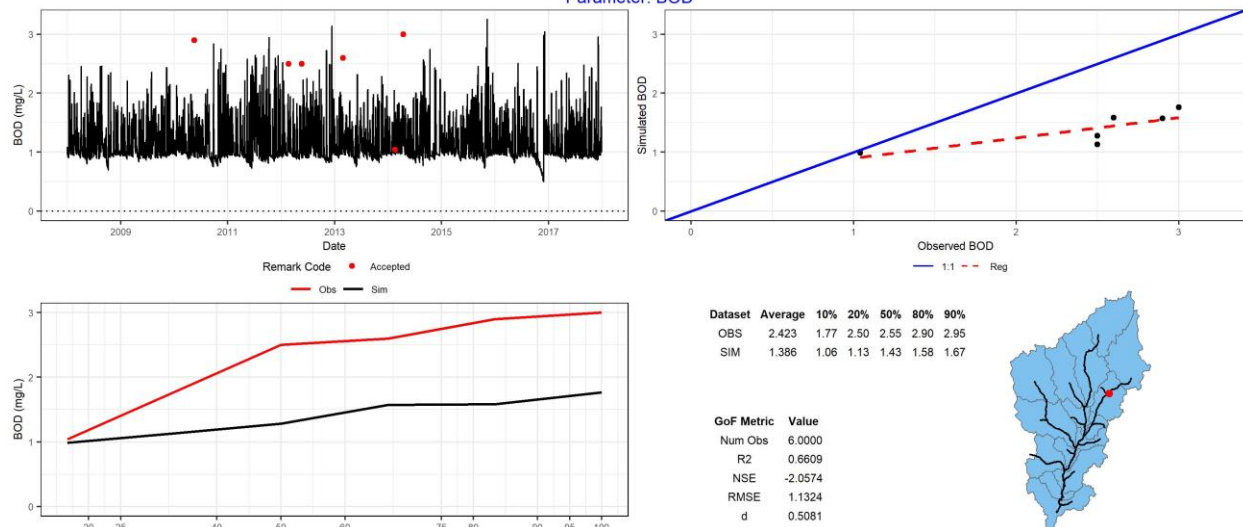


(Calib Station: RV-10-3423; WASP Seg: 76)

Figure 146 CBOD - Little Attapulgus Creek at State Rd 241 near Attapulgus, GA

SC @ US Hwy 27 near Attapulgus, GA

Parameter: BOD



(Calib Station: RV-10-3390; WASP Seg: 64)

Figure 147 Stamp Creek at US Highway 27 Near Attapulgus, GA

Total Suspended Solids

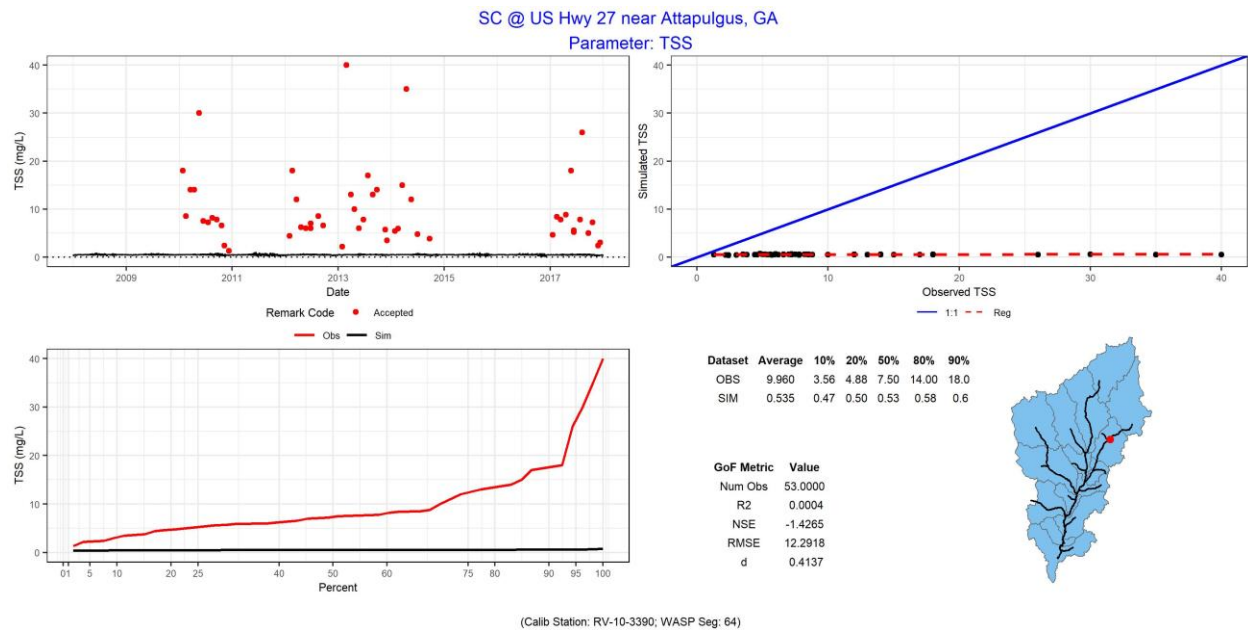


Figure 148 TSS - Swamp Creek at US Hwy 27 near Attapulgus, GA

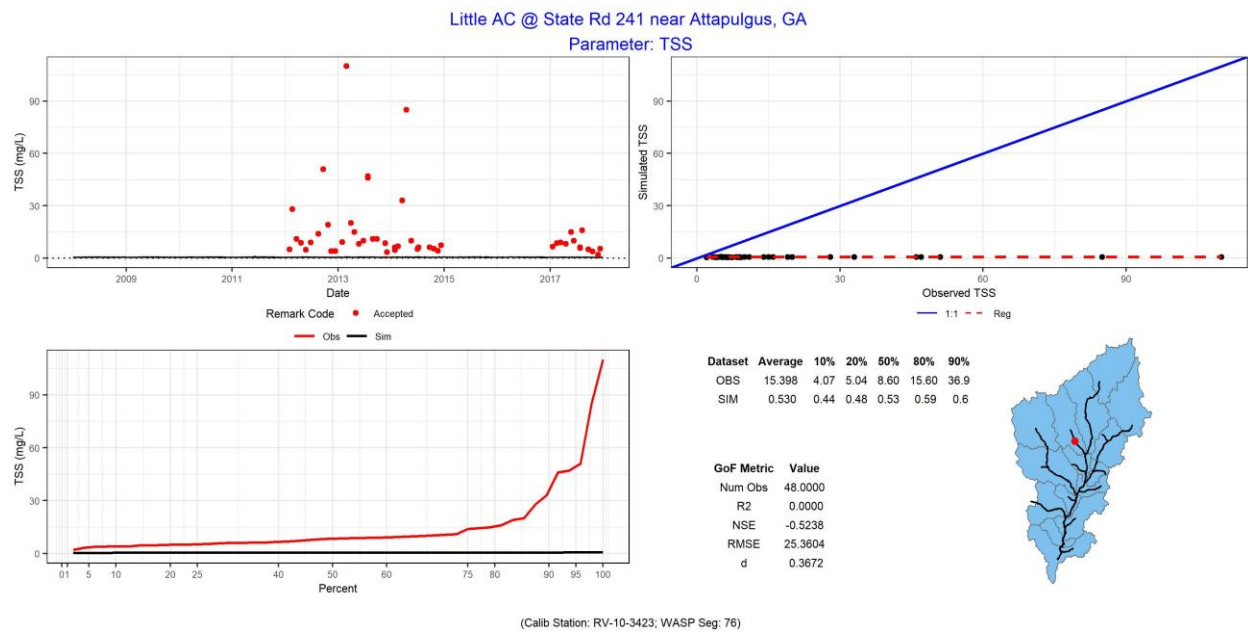


Figure 149 TSS - Little Attapulgus Creek at State Rd 241 near Attapulgus, GA

Temperature

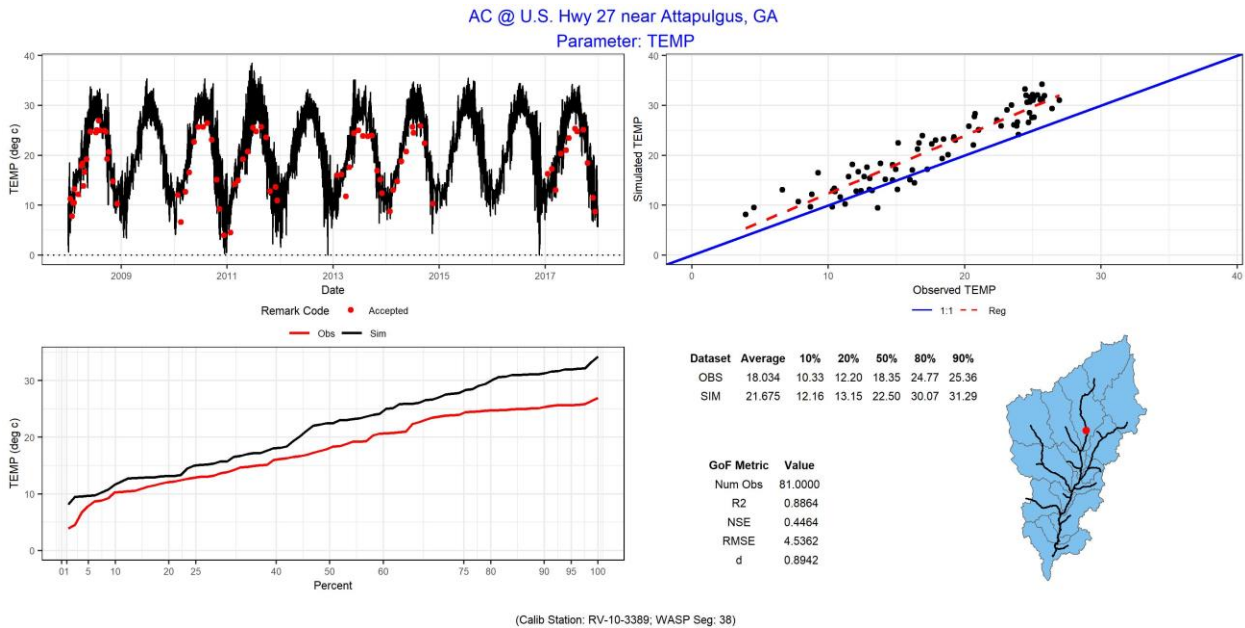


Figure 150 Water Temperature - Attapulgus Creek at U.S. Hwy 27 near Attapulgus, GA

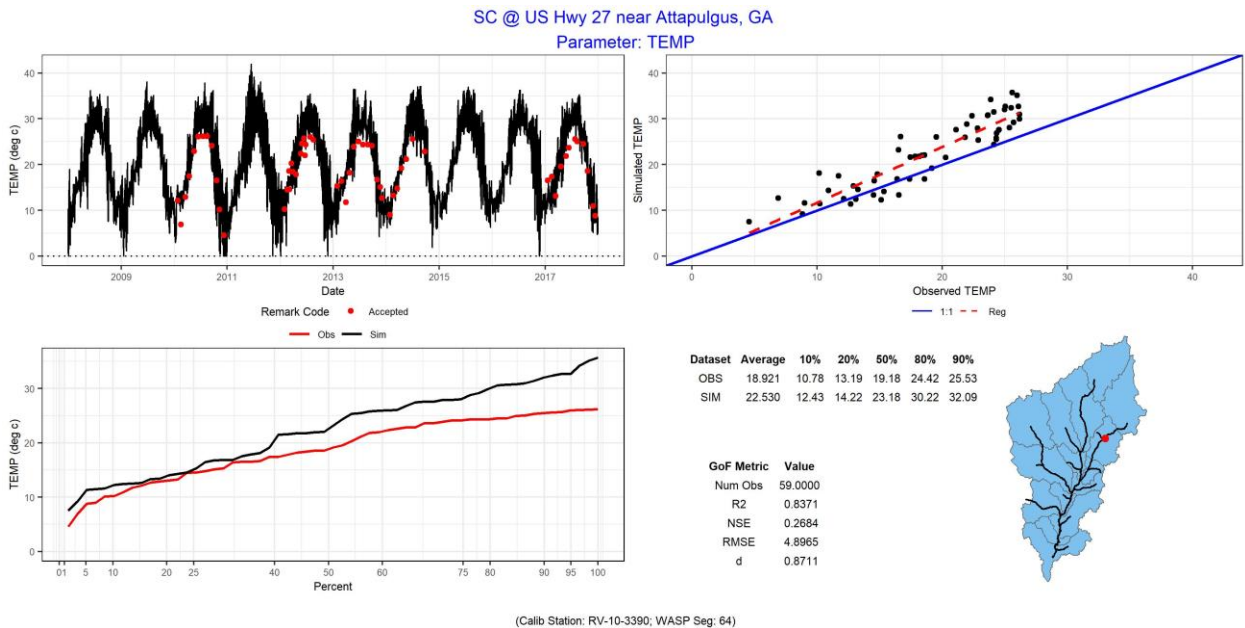


Figure 151 Water Temperature - Swamp Creek at US Hwy 27 near Attapulgus, GA

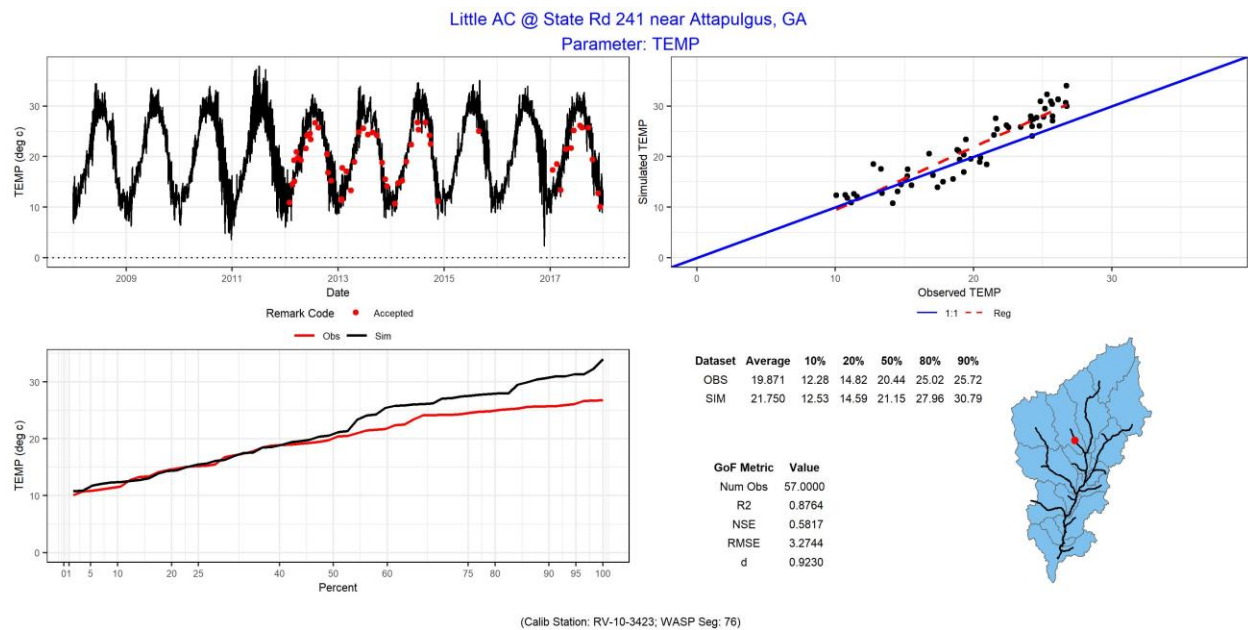


Figure 152 Water Temperature - Little Attapulgus Creek at State Rd 241 near Attapulgus, GA

Appendix C – Lake Talquin Hydrodynamic and Water Quality Calibration

This appendix provides detailed calibration plots for each station and parameter available for the Lake Talquin water quality model.

Time Series – provides a comparison of the all the measured data to the model simulated data over the entire simulation period for visual inspection. If any measured data had a remark code indicating below detection it will appear as flagged data and will be represented by a blue dot. Flagged data is not considered in the quantitative statistical calculations.

Probability Distribution – provides a comparison of the probability distribution of measured and simulated data. This method uses paired measured and simulation data to determine the probability curve.

1 to 1 – plots the paired measured and simulated values against one another. The red line represents a perfect calibration, the blue line represents the linear fit of measured/simulated fit.

Statistics –

- Num Obs – represents the number of measurements used in calculation
- R^2 – correlation coefficient between sim and obs.
- NSE – Nash-Sutcliffe efficiency between sim and obs,
- RMSE – root mean square error
- d – Index of Agreement
- Percentiles – provides a numeric comparison of the percentile distribution of sim and obs.

Annual Analysis -- For flow, total nitrogen, total phosphorus and chlorophyll a annual boxplots are presented for the simulation period for each station. The black dots represent the measured data, the blue box and whiskers represent the model simulated results. The whiskers represent the range of the model simulated results. Average model simulated results are represented by a green dot, average measured data is represented by a red diamond.

For chlorophyll a, total nitrogen and total phosphorus annual boxplot figures are present to illustrate model performance year by year.

Dam Outflow

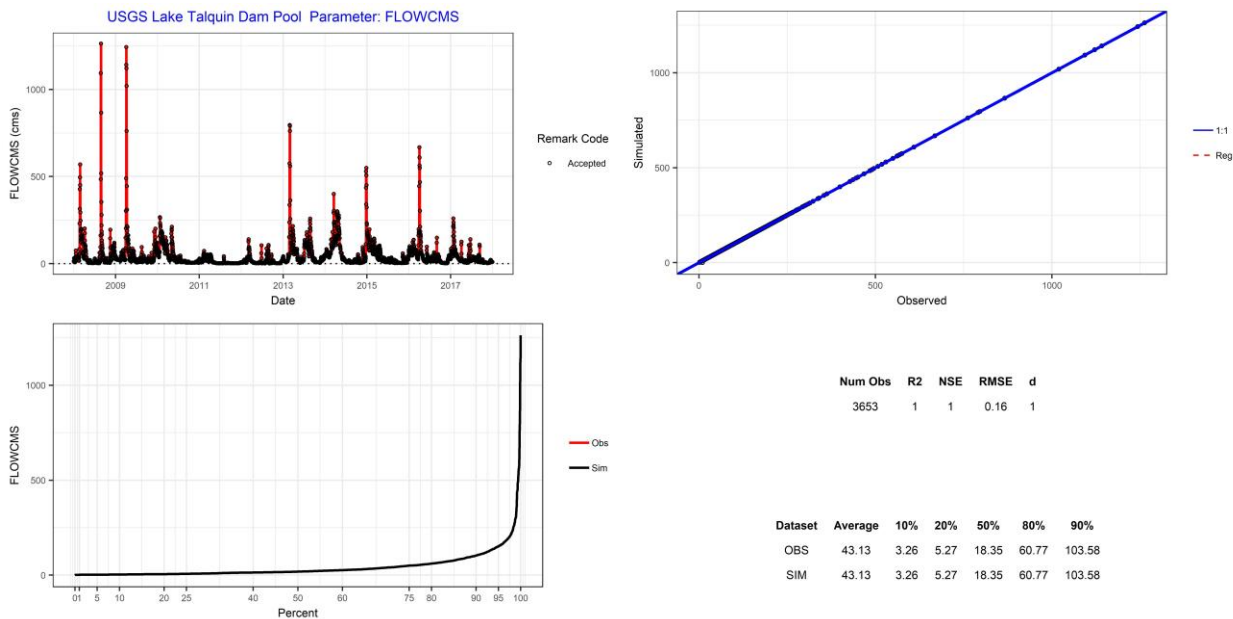


Figure 153 Lake Talquin Outflow at the Dam

Water Surface Elevation

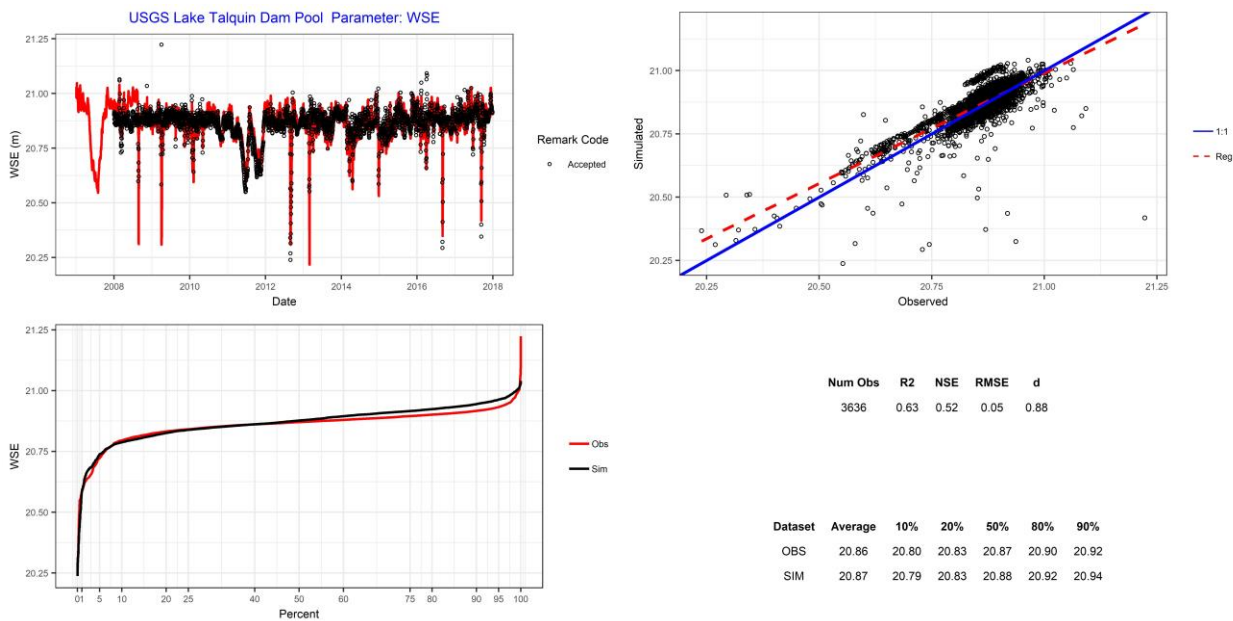
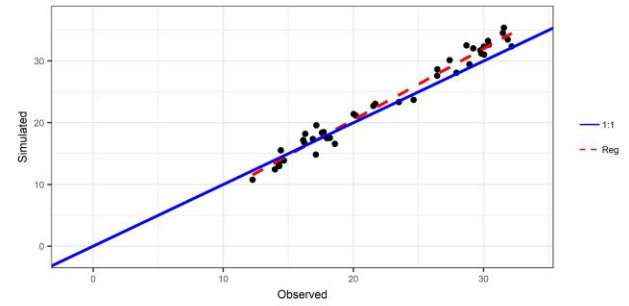
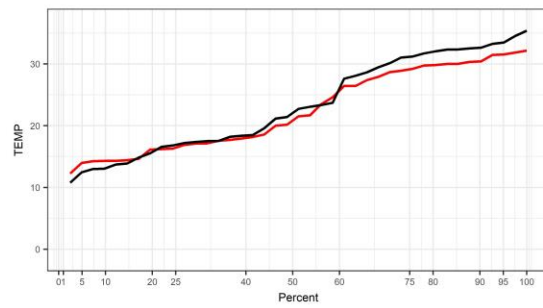
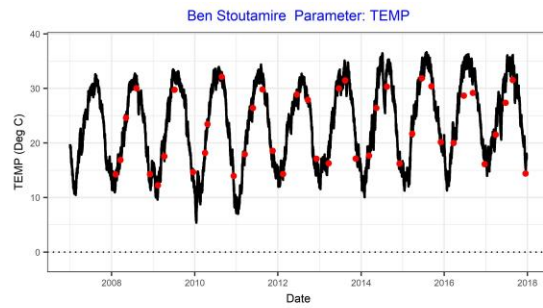


Figure 154 Lake Talquin Water Surface Elevation

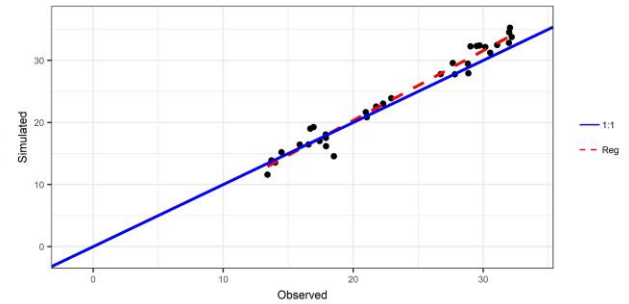
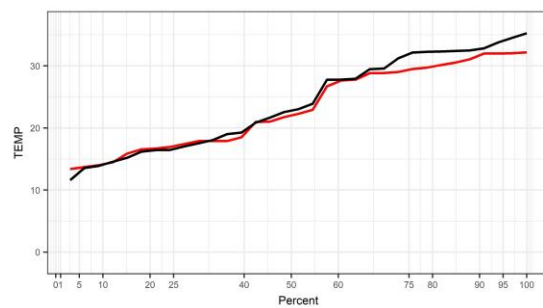
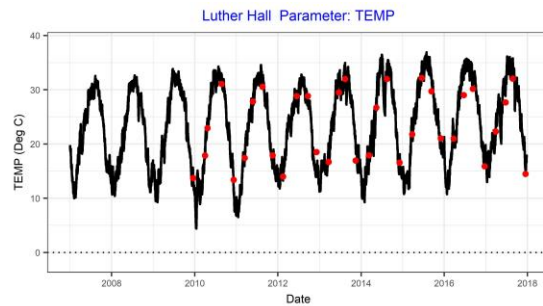
Water Temperature



Num Obs	R2	NSE	RMSE	d
41	0.98	0.95	1.77	0.98

Dataset	Average	10%	20%	50%	80%	90%
OBS	22.48	14.32	16.21	21.53	29.83	30.41
SIM	23.34	13.72	16.58	22.72	32.06	32.64

Figure 155 Water Temperature – Lake Talquin at Ben Stoutamire



Num Obs	R2	NSE	RMSE	d
33	0.97	0.95	1.7	0.99

Dataset	Average	10%	20%	50%	80%	90%
OBS	23.29	14.77	16.80	22.30	29.98	31.80
SIM	24.02	14.70	16.46	23.05	32.30	32.76

Figure 156 Water Temperature – Lake Talquin at Luther Hall

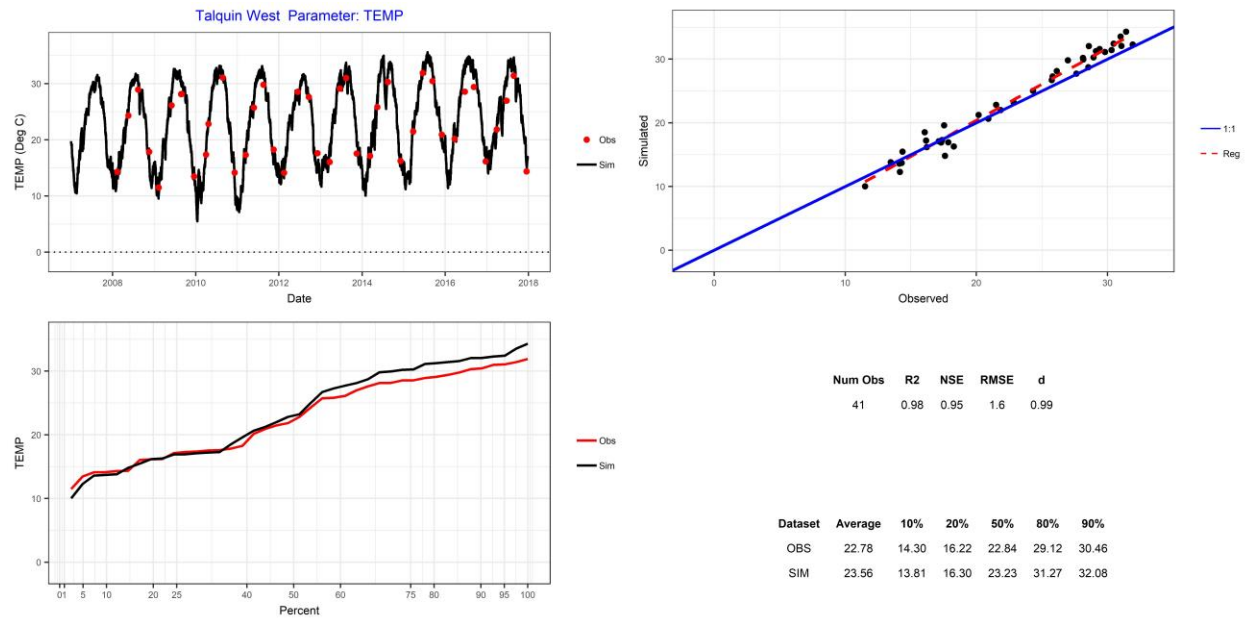


Figure 157 Water Temperature – Lake Talquin at Talquin West

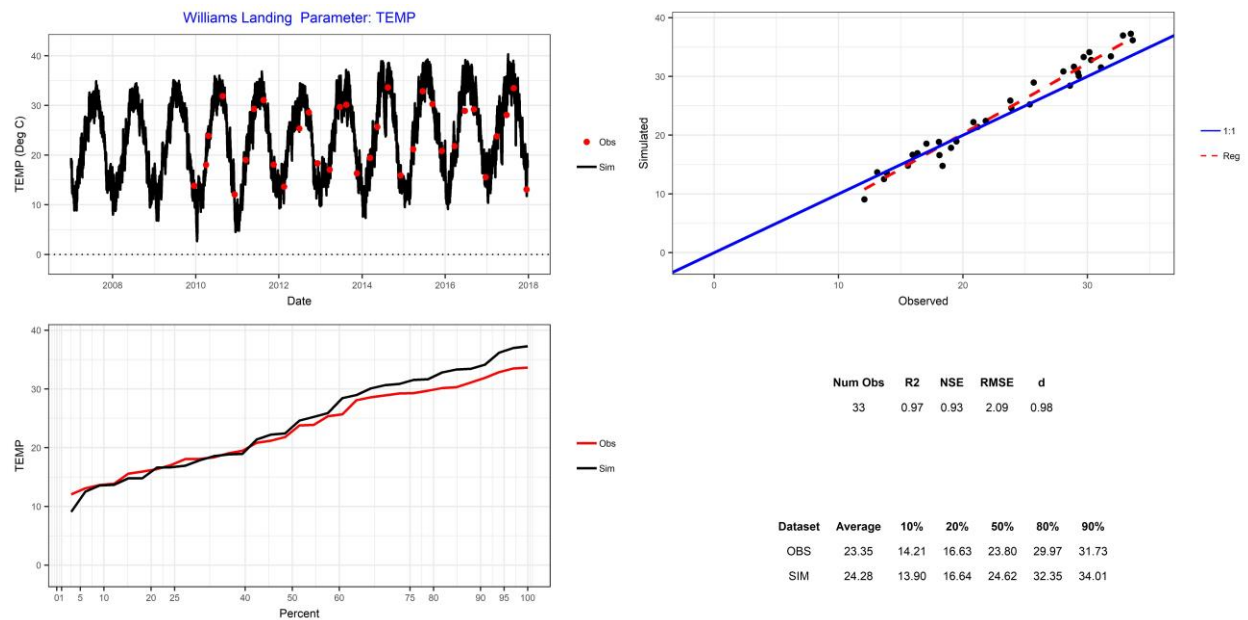


Figure 158 Water Temperature – Lake Talquin at Williams landing

Total Nitrogen

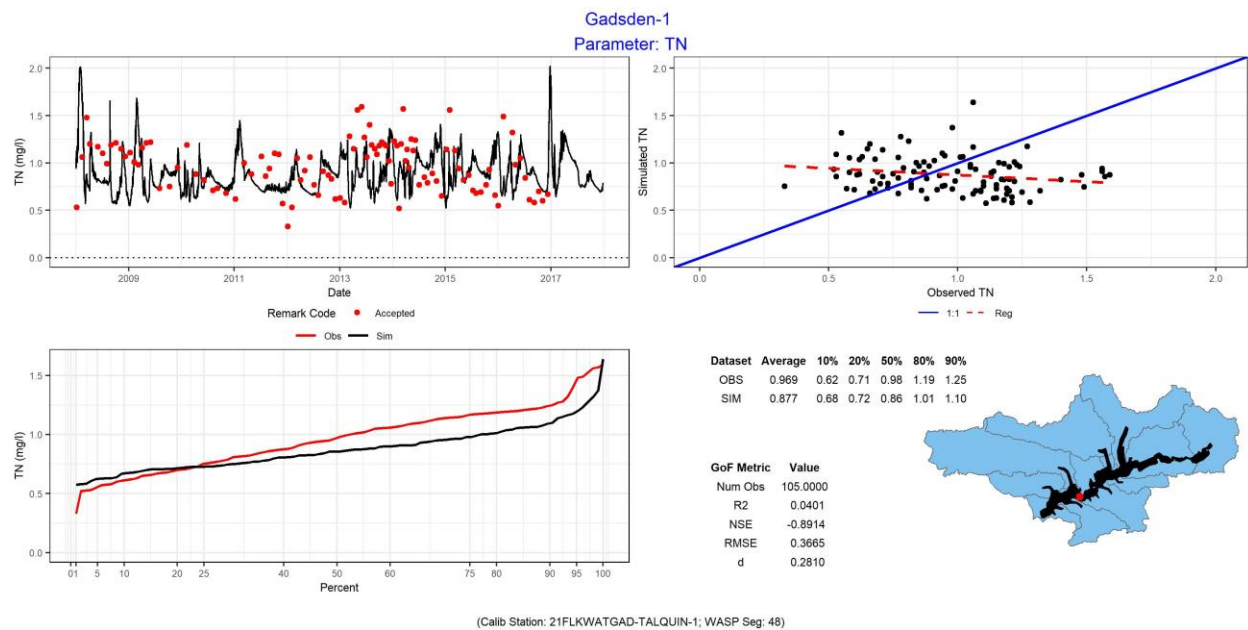


Figure 159 Total Nitrogen – Lake Talquin at Gadsden 1

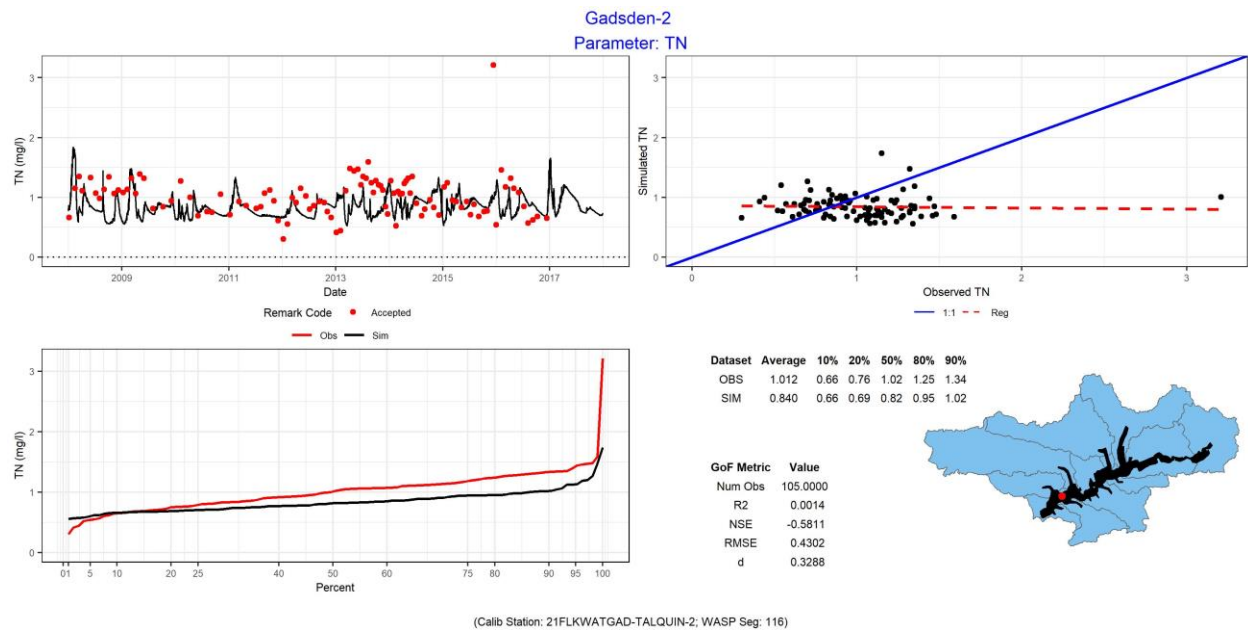


Figure 160 Total Nitrogen – Lake Talquin at Gadsden 2

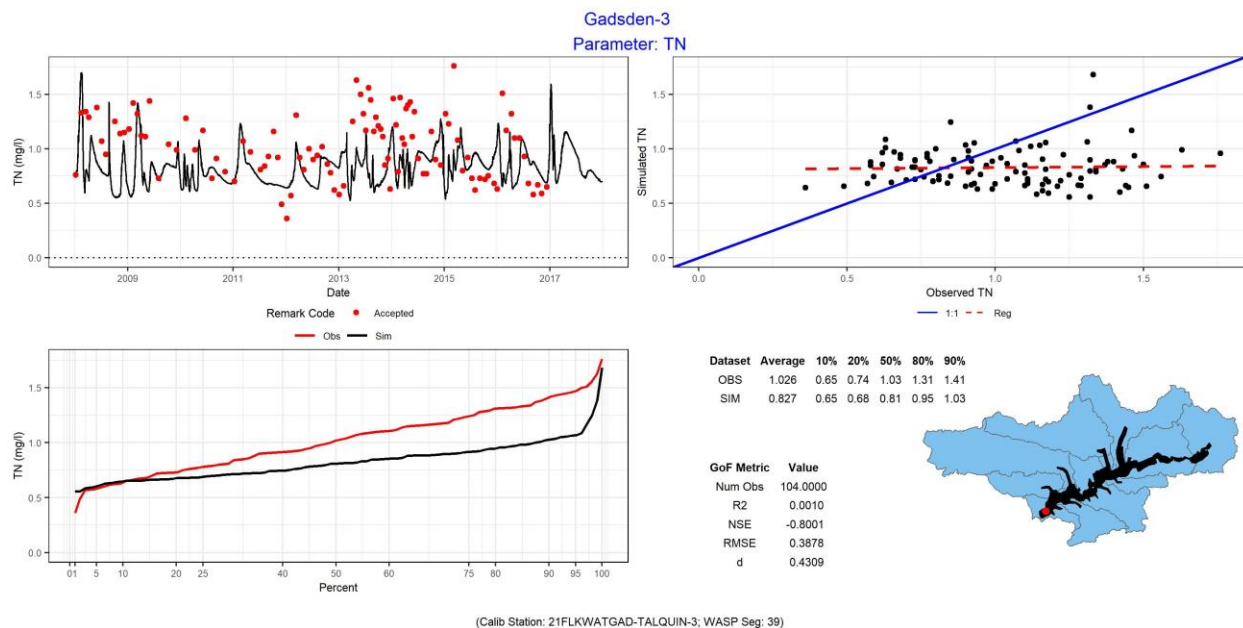


Figure 161 Total Nitrogen – Lake Talquin at Gadsden 3

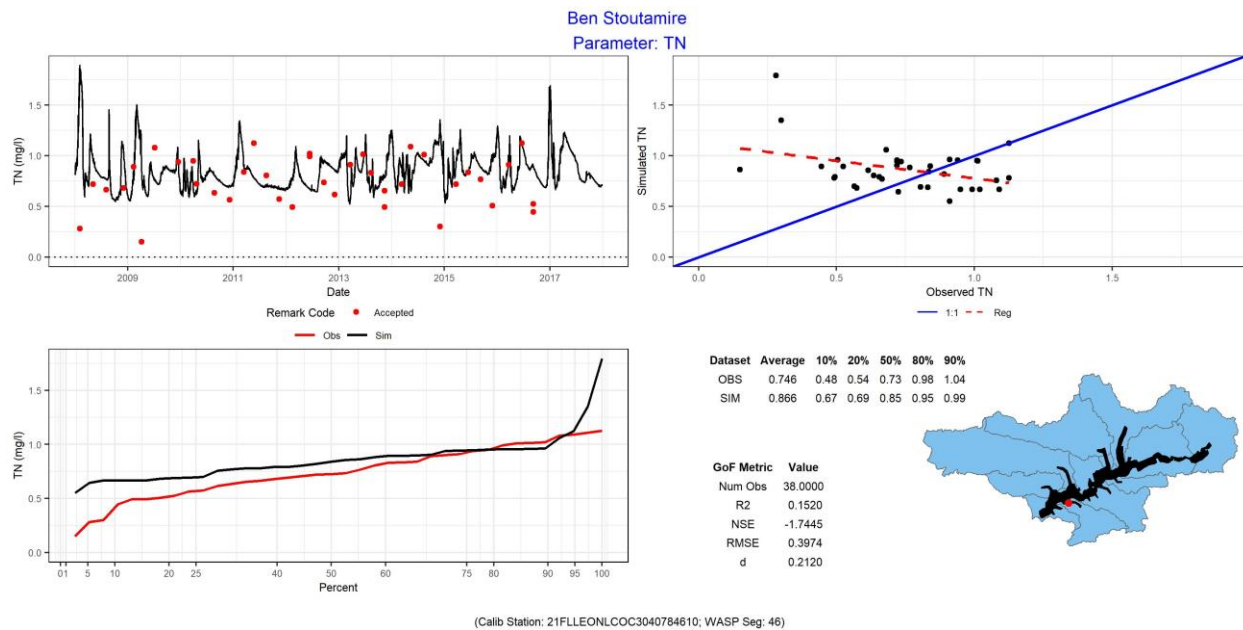


Figure 162 Total Nitrogen – Lake Talquin at Ben Stoutamire

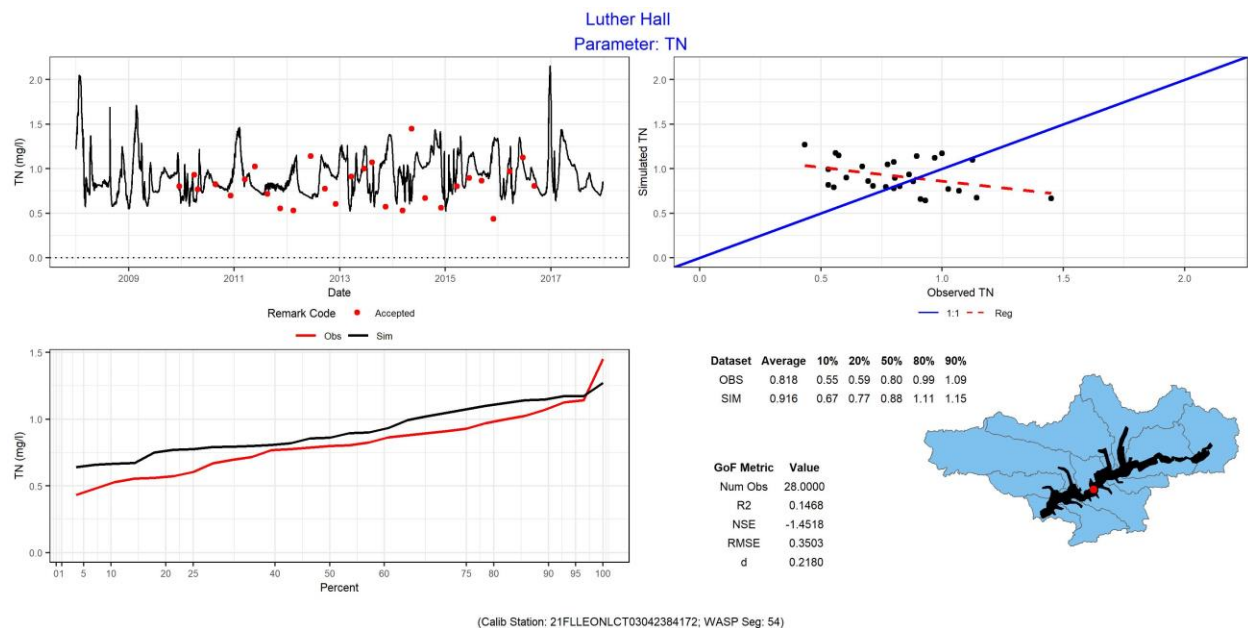


Figure 163 Total Nitrogen – Lake Talquin at Luther Hall

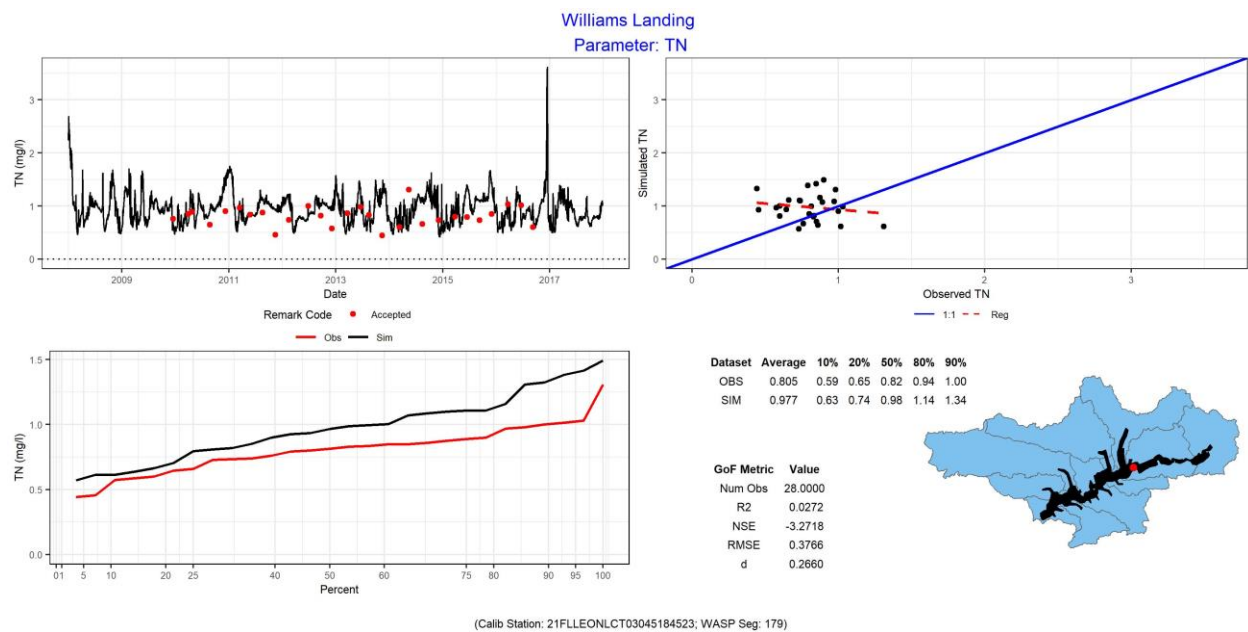


Figure 164 Total Nitrogen – Lake Talquin at Williams Landing

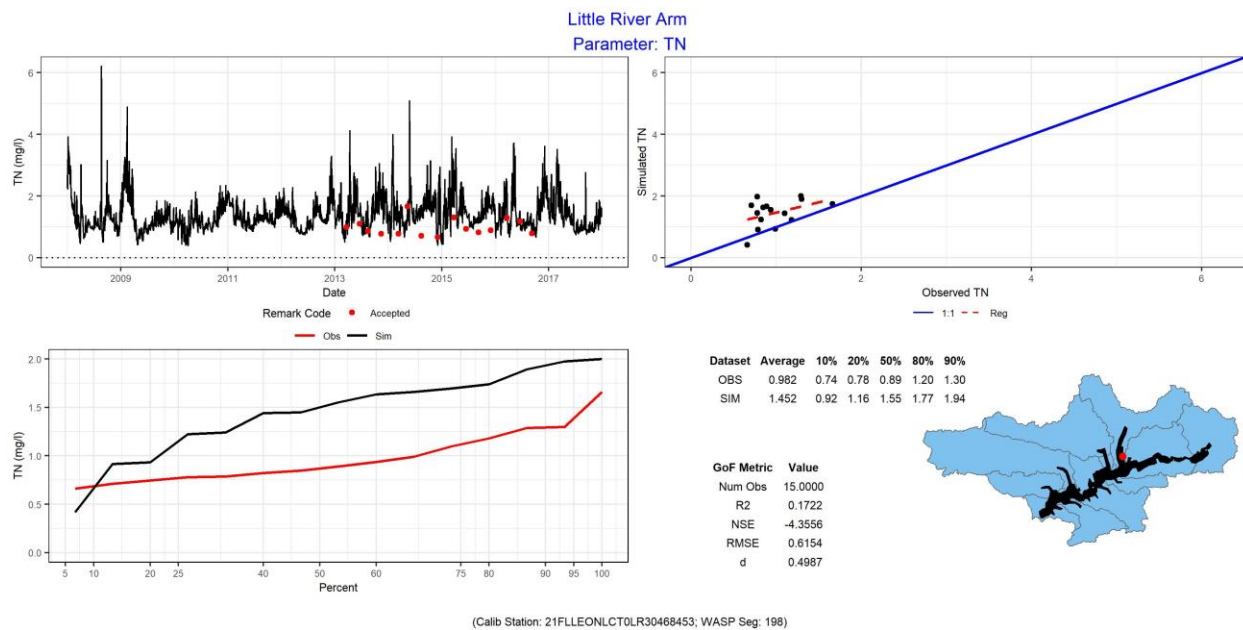


Figure 165 Total Nitrogen – Lake Talquin at Little River Arm

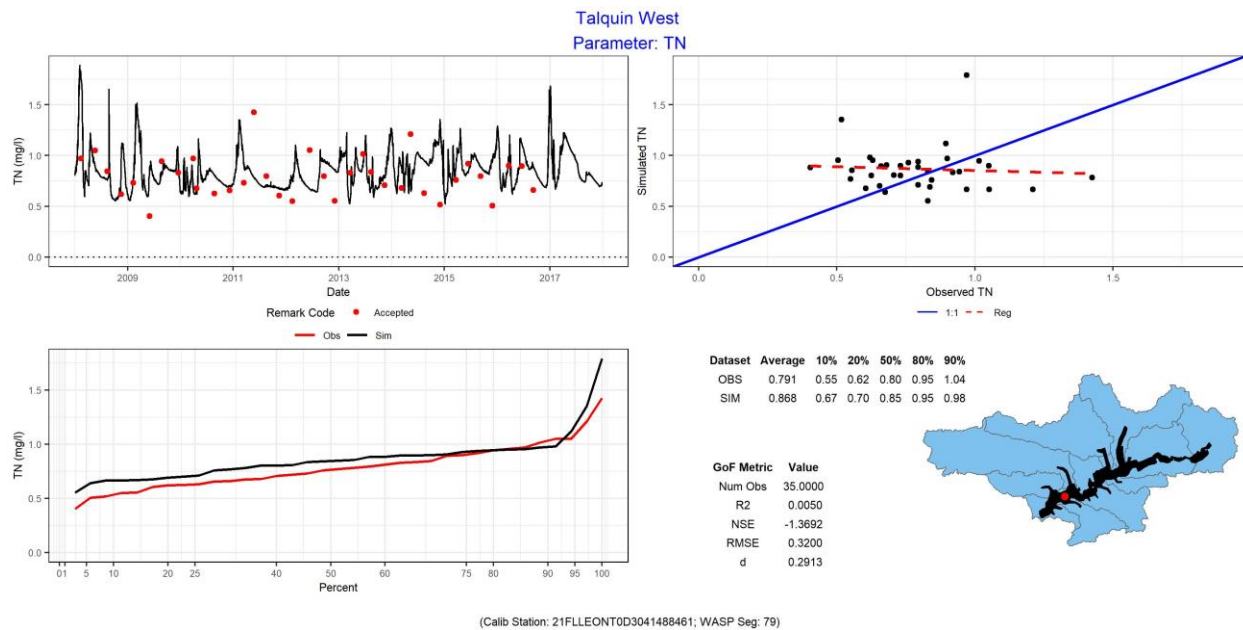


Figure 166 Total Nitrogen – Lake Talquin at Talquin West

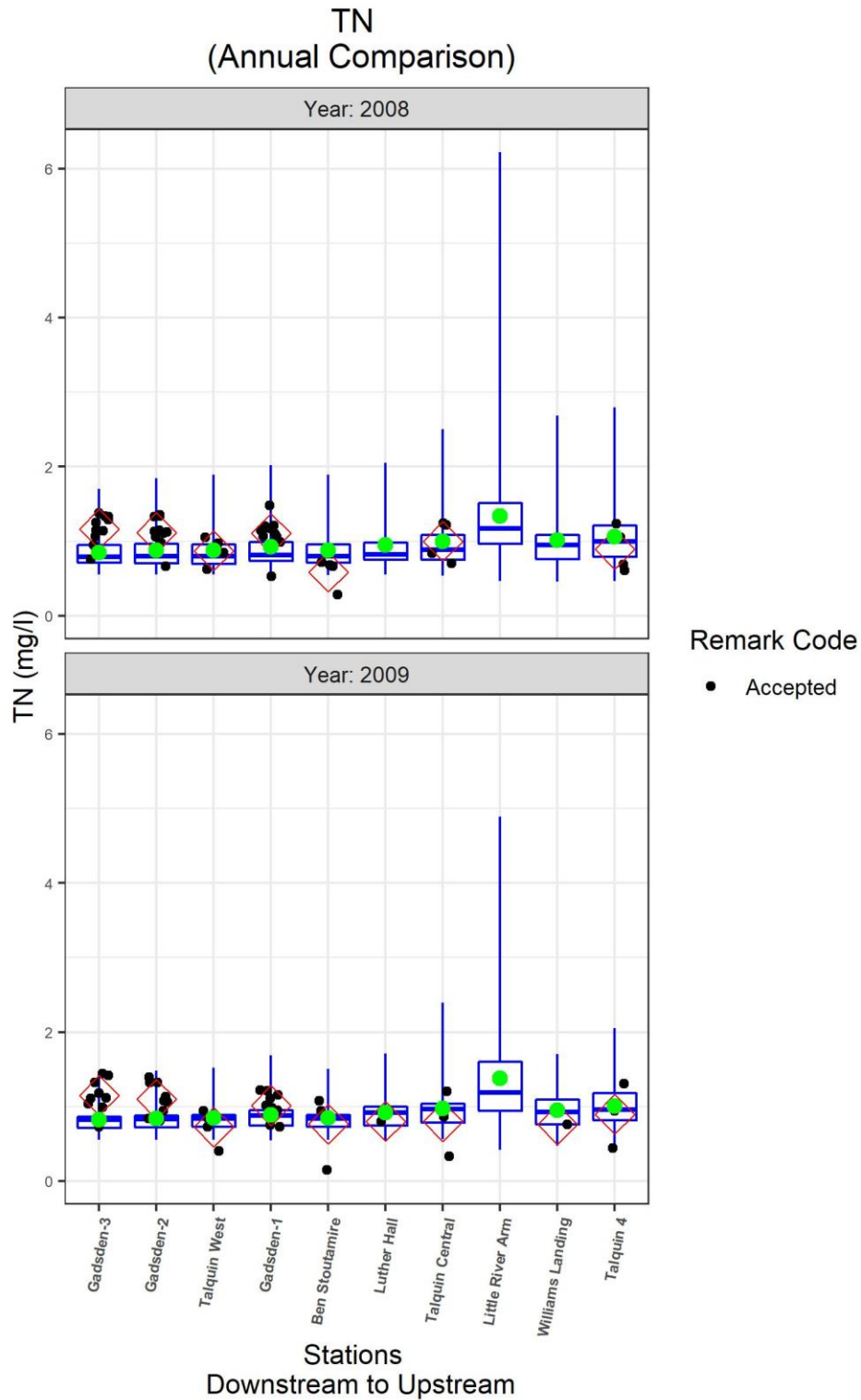


Figure 167 Lake Talquin Total Nitrogen Comparison Observed vs. Simulated 2008-2009

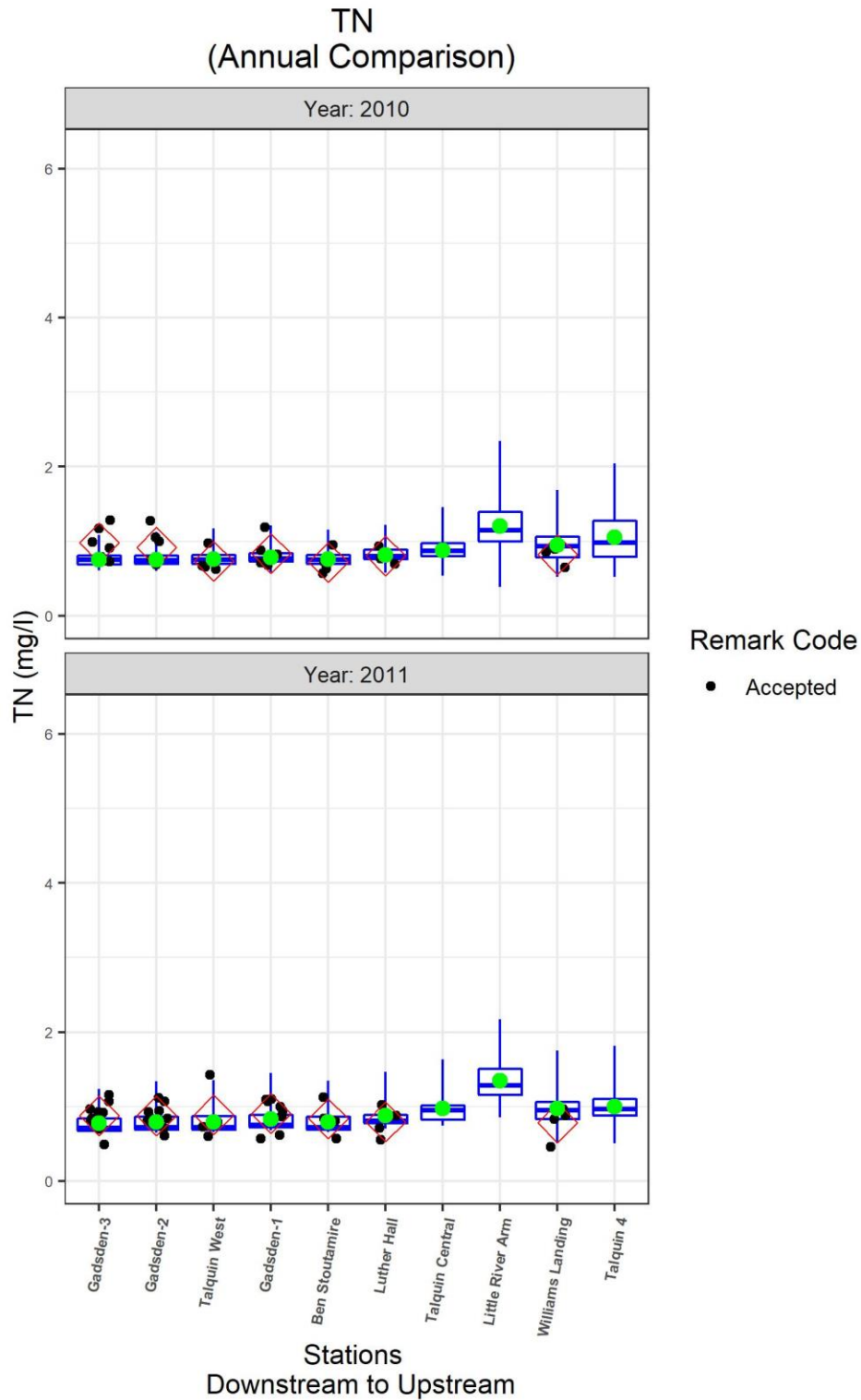


Figure 168 Lake Talquin Total Nitrogen Comparison Observed vs. Simulated 2010 - 2011

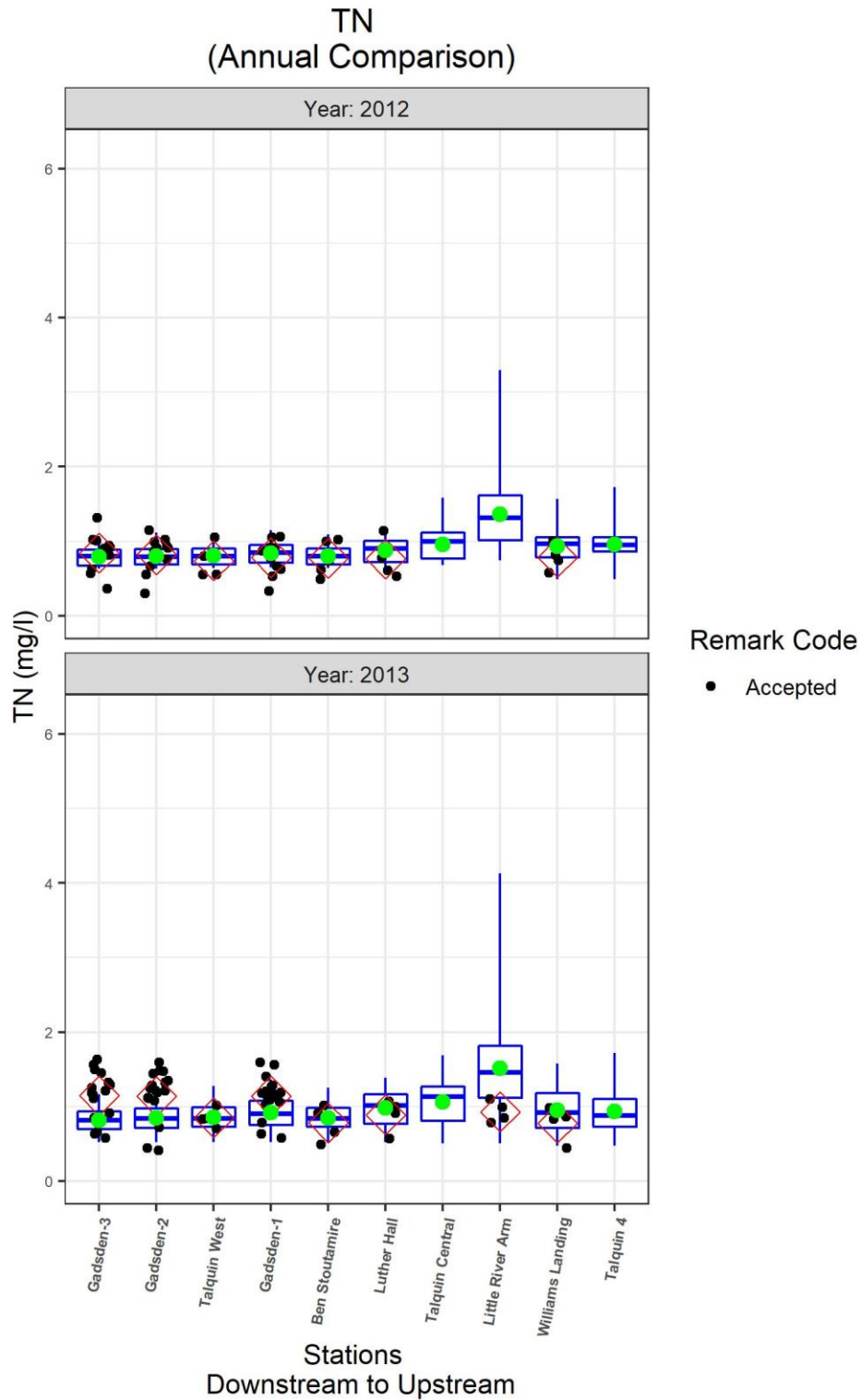


Figure 169 Lake Talquin Total Nitrogen Comparison Observed vs. Simulated 2012 - 2013

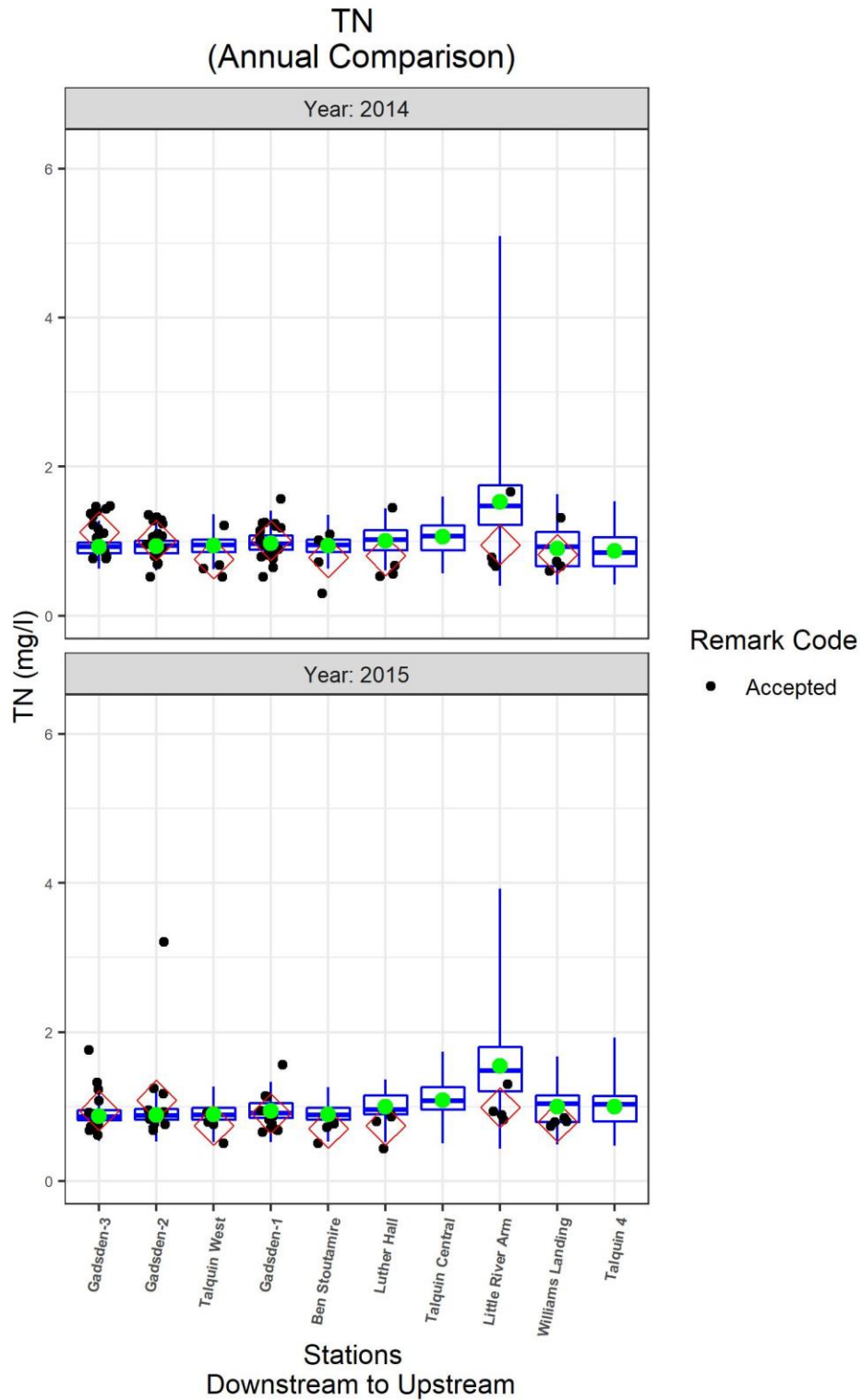


Figure 170 Lake Talquin Total Nitrogen Comparison Observed vs. Simulated 2014 -2015

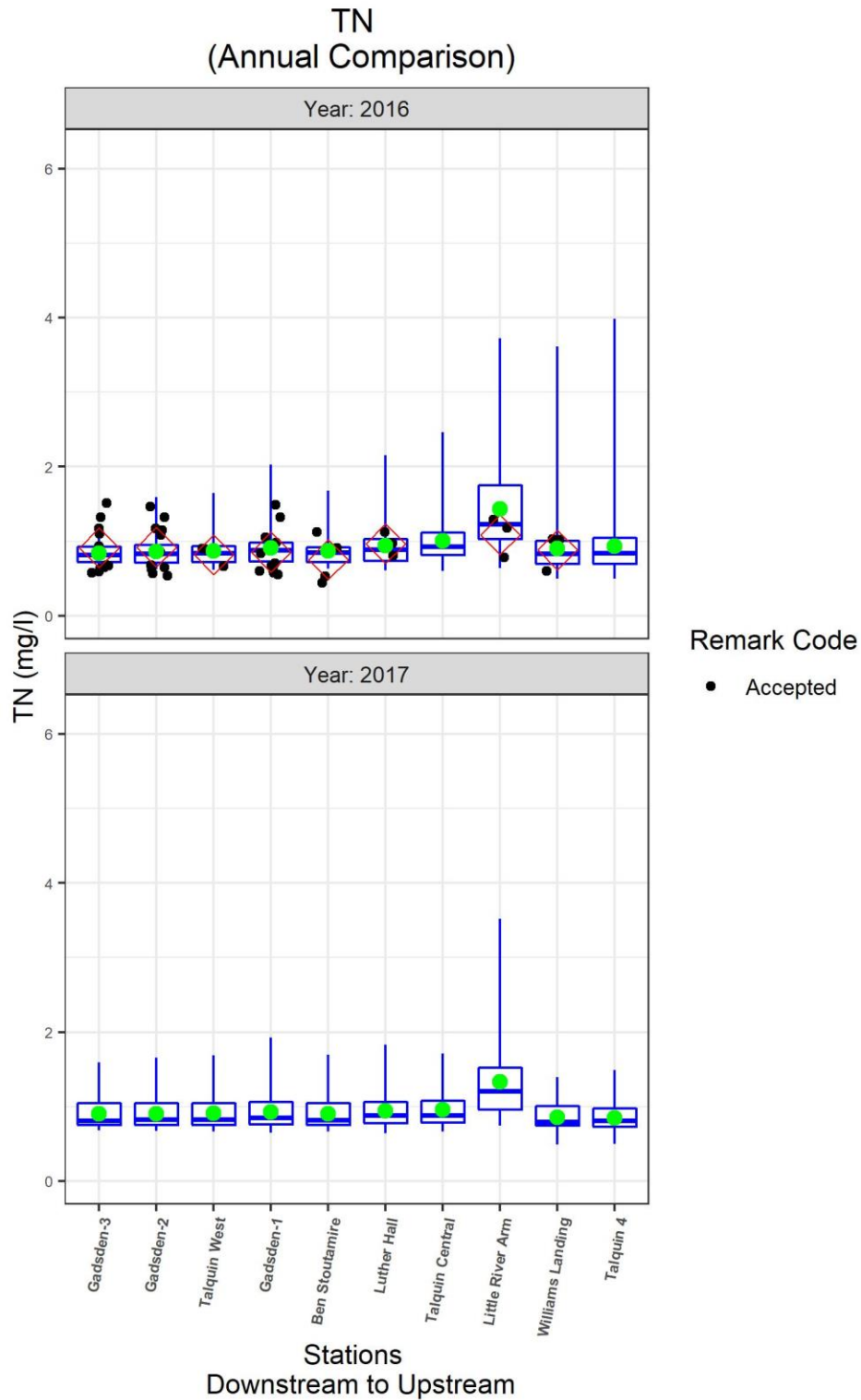


Figure 171 Lake Talquin Total Nitrogen Comparison Observed vs. Simulated 2016 - 2017

Ammonia

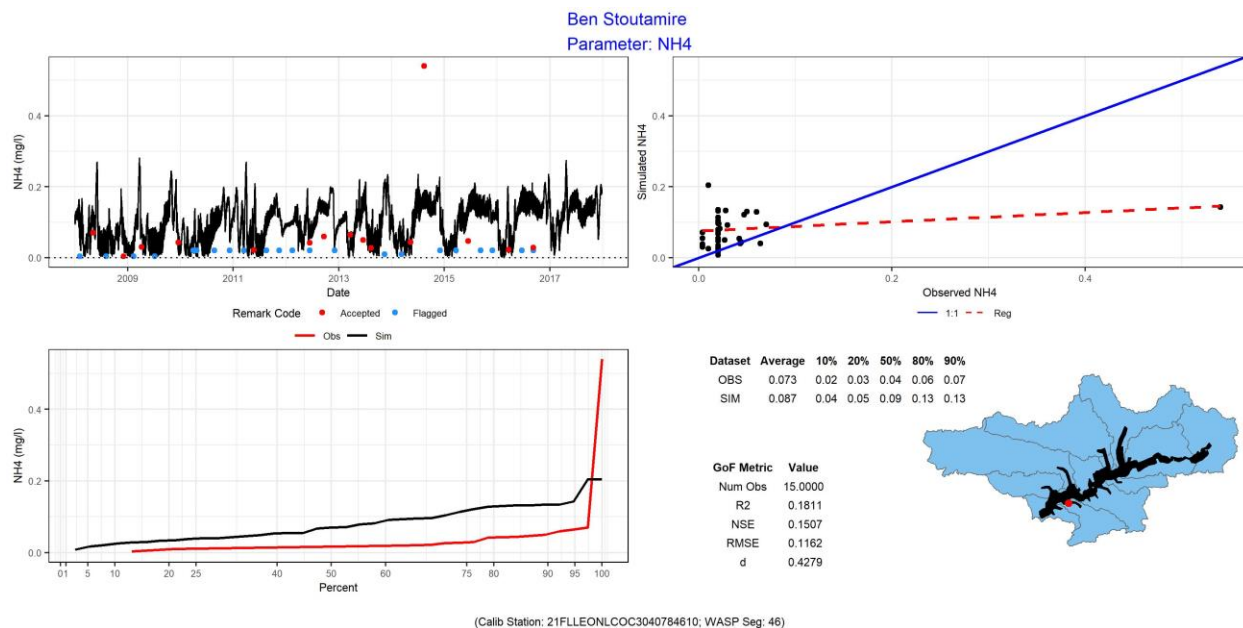


Figure 172 Total Nitrogen – Lake Talquin at Ben Stoutamire

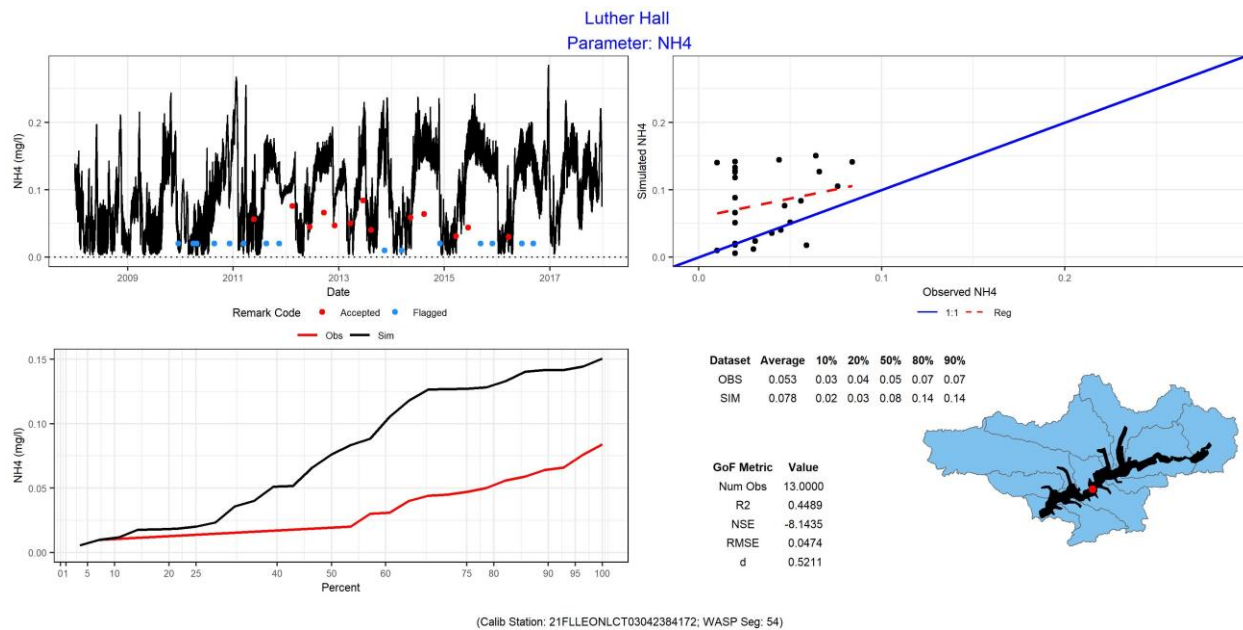


Figure 173 Total Nitrogen – Lake Talquin at Luther Hall

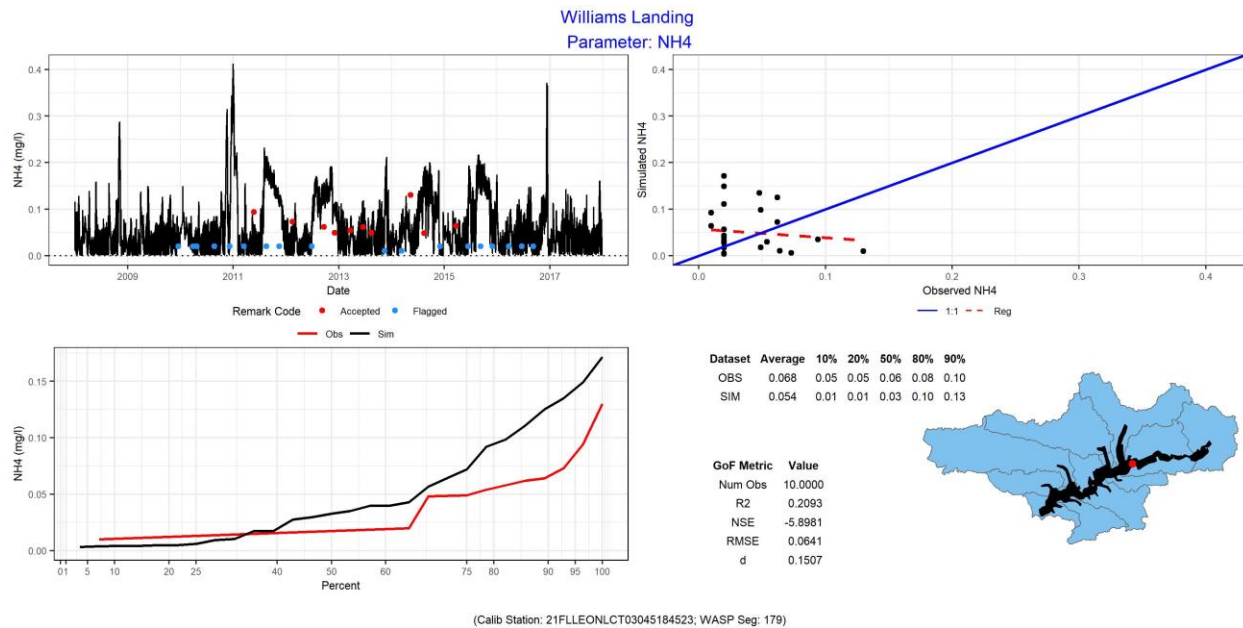


Figure 174 Total Nitrogen – Lake Talquin at Williams Landing

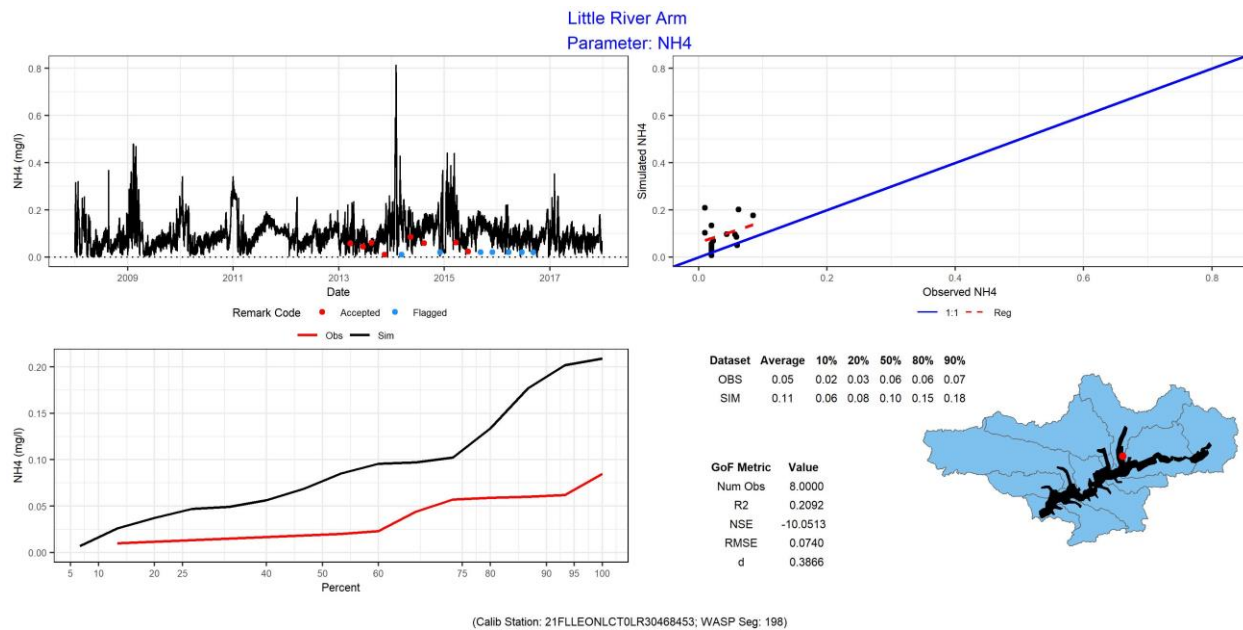


Figure 175 Total Nitrogen – Lake Talquin at Little River Arm

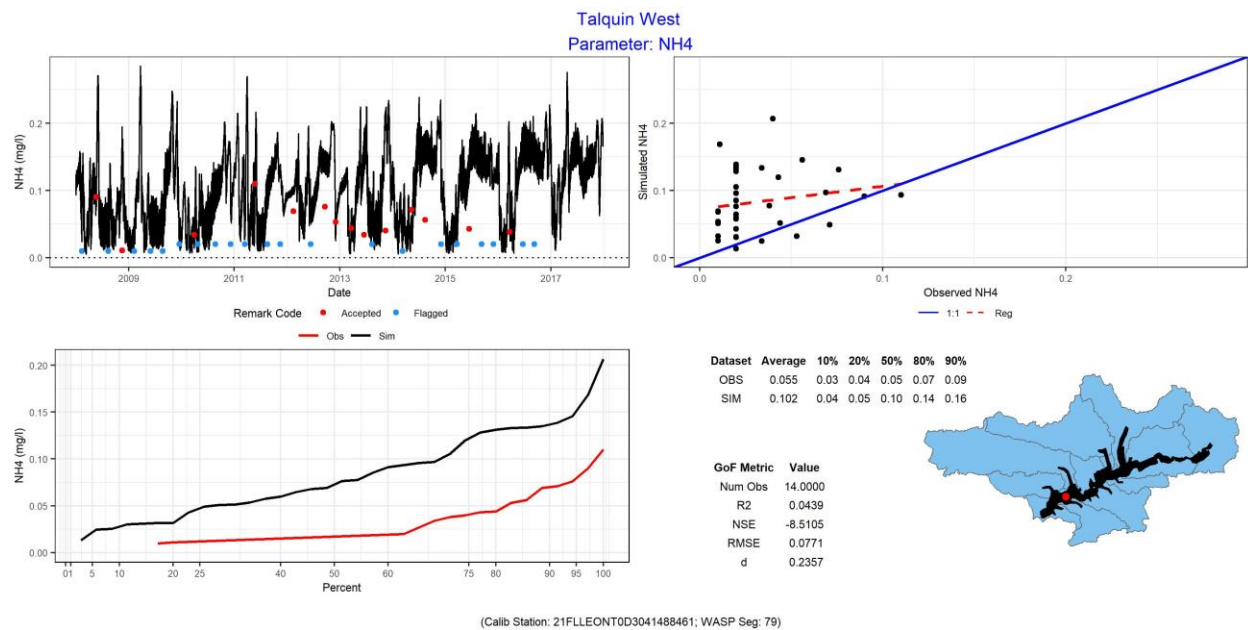


Figure 176 Total Nitrogen – Lake Talquin at Talquin West

Nitrate

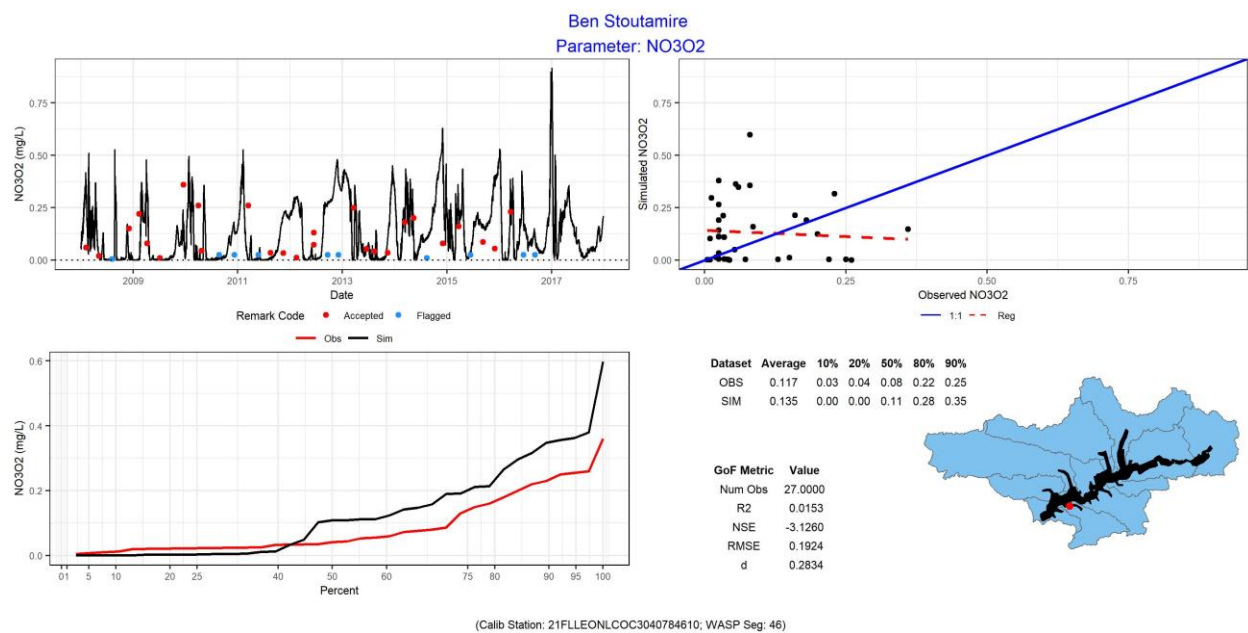


Figure 177 Nitrate – Lake Talquin at Ben Stoutamire

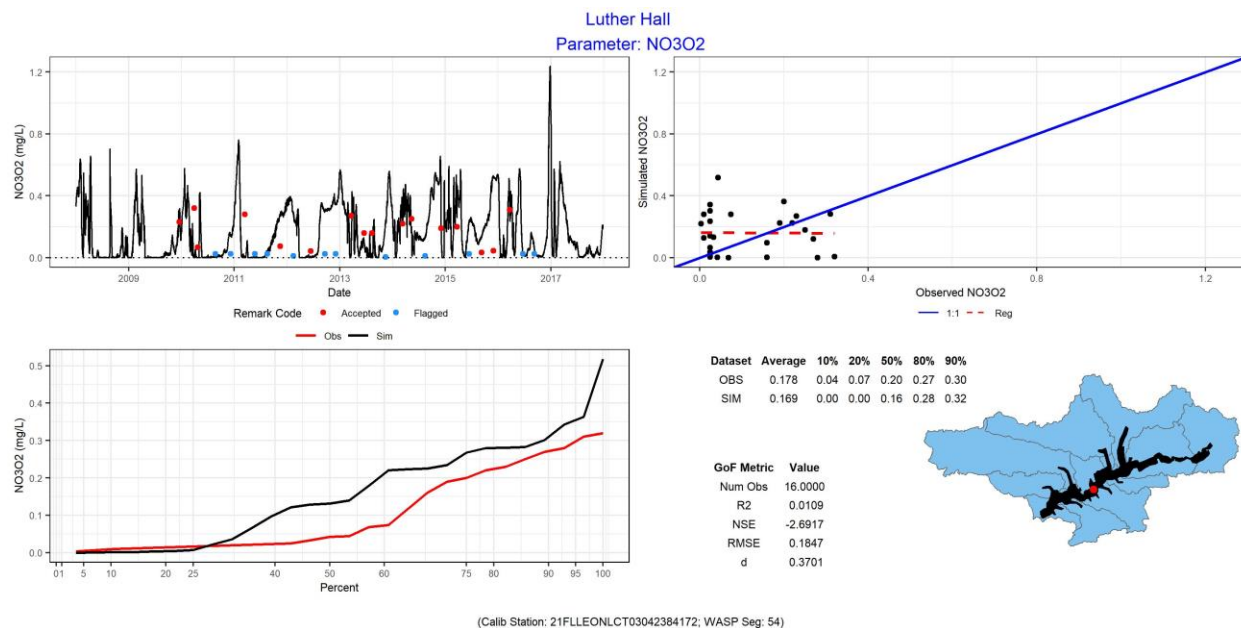


Figure 178 Nitrate - Lake Talquin at Luther Hall

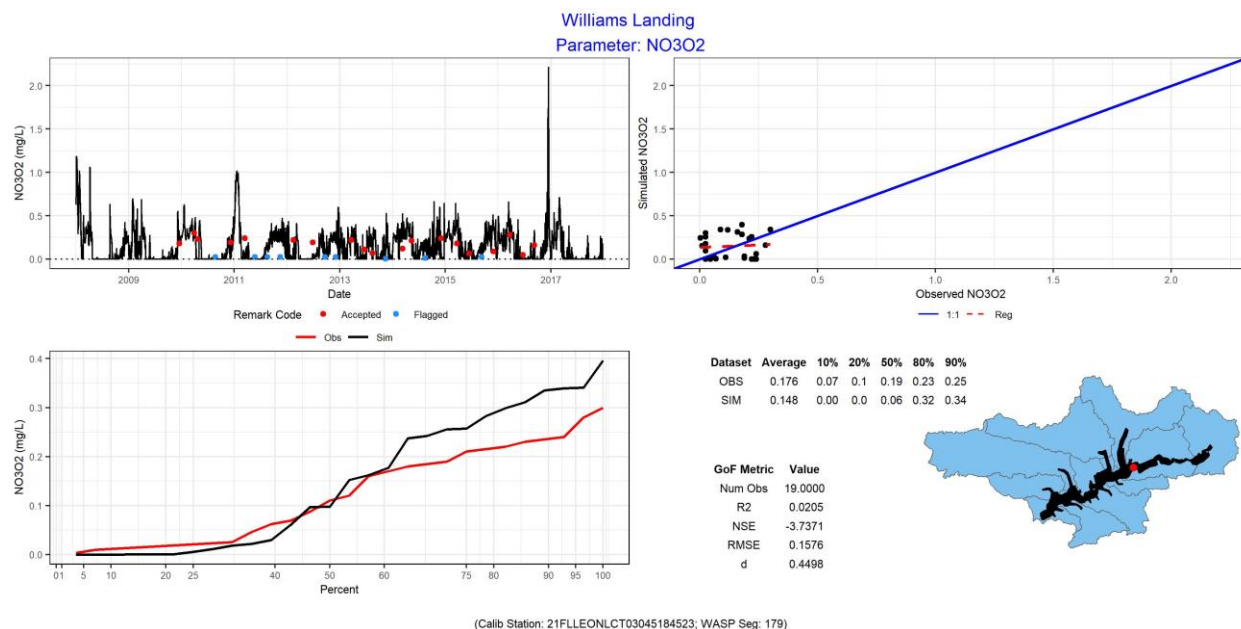


Figure 179 Nitrate – Lake Talquin at Williams Landing

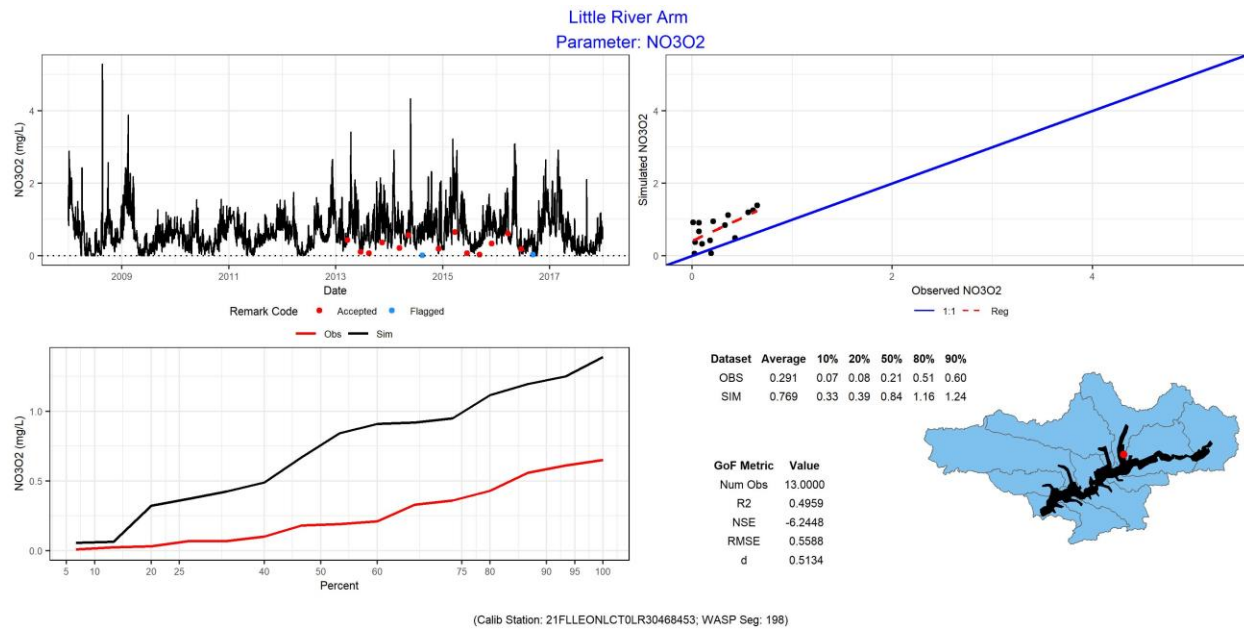


Figure 180 Nitrate – Lake Talquin at Little River Arm

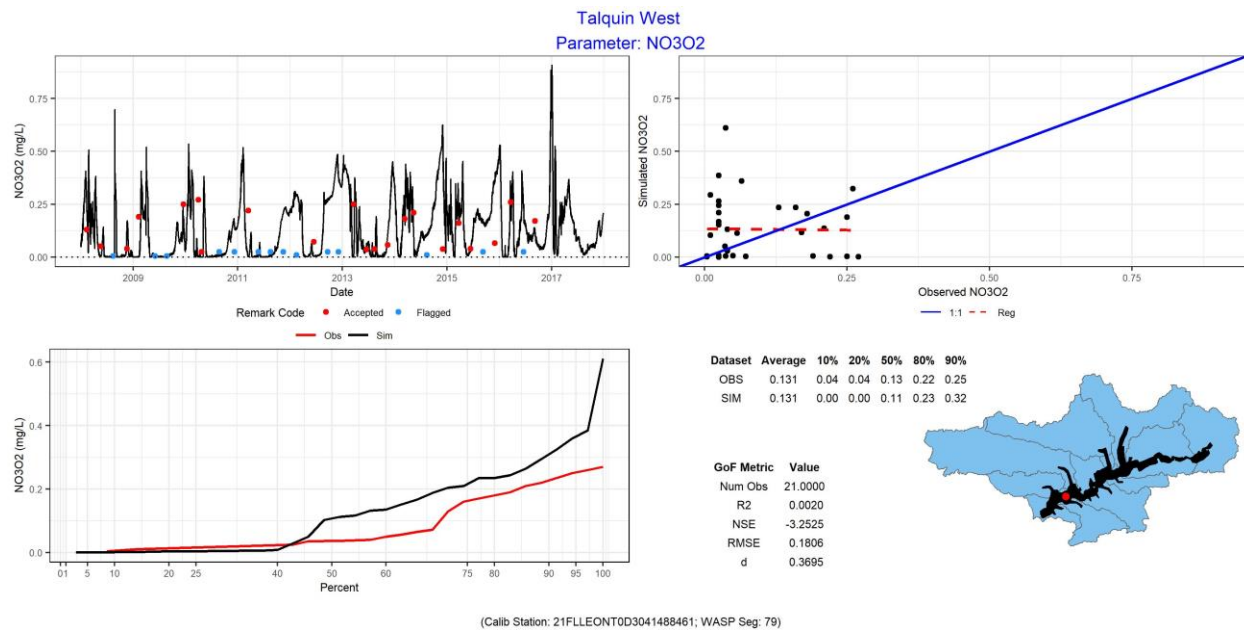


Figure 181 Nitrate – Lake Talquin at Talquin West

Total Phosphorus

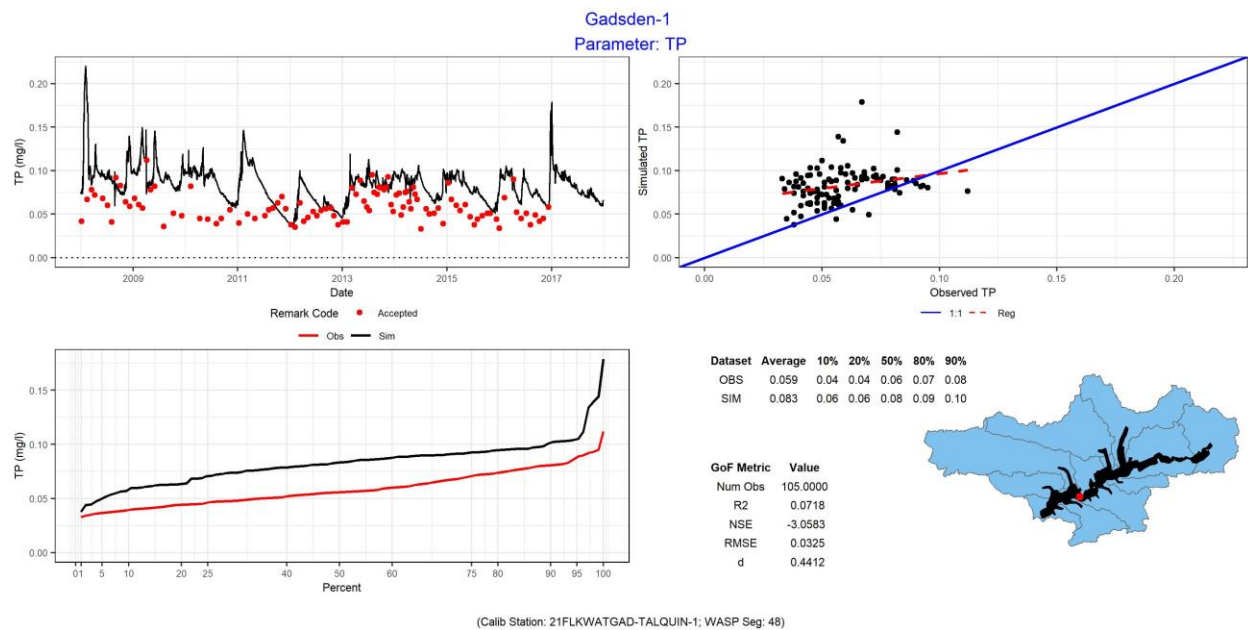


Figure 182 Total Phosphorus – Lake Talquin at Gadsden 1

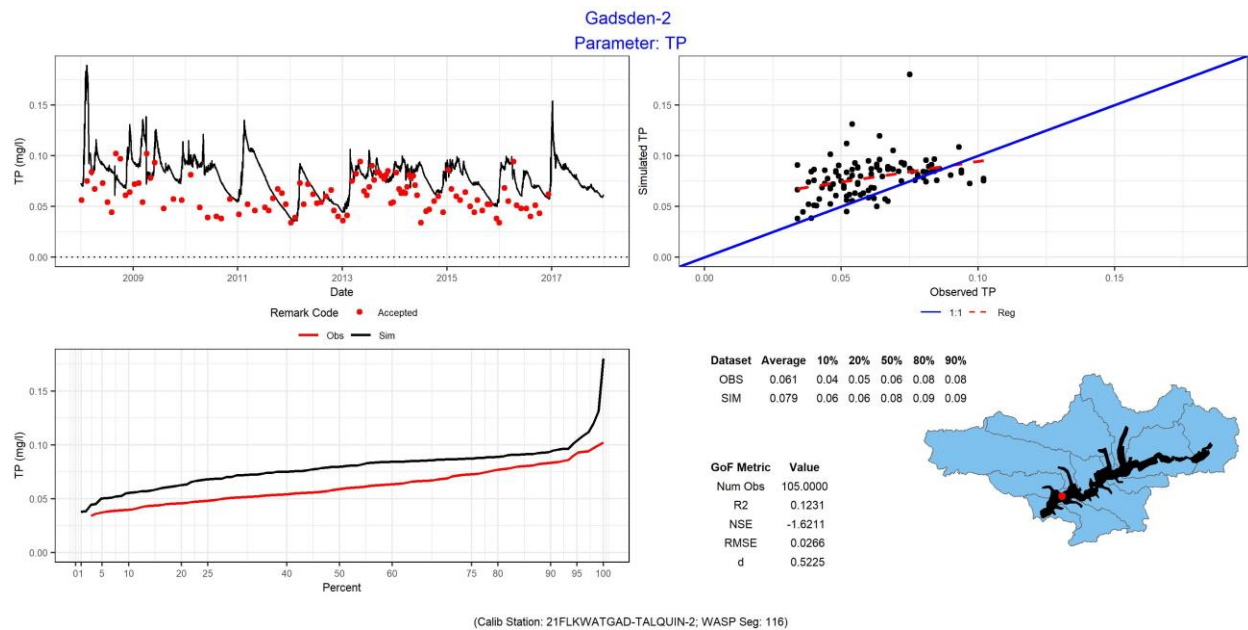


Figure 183 Total Phosphorus – Lake Talquin at Gadsden 2

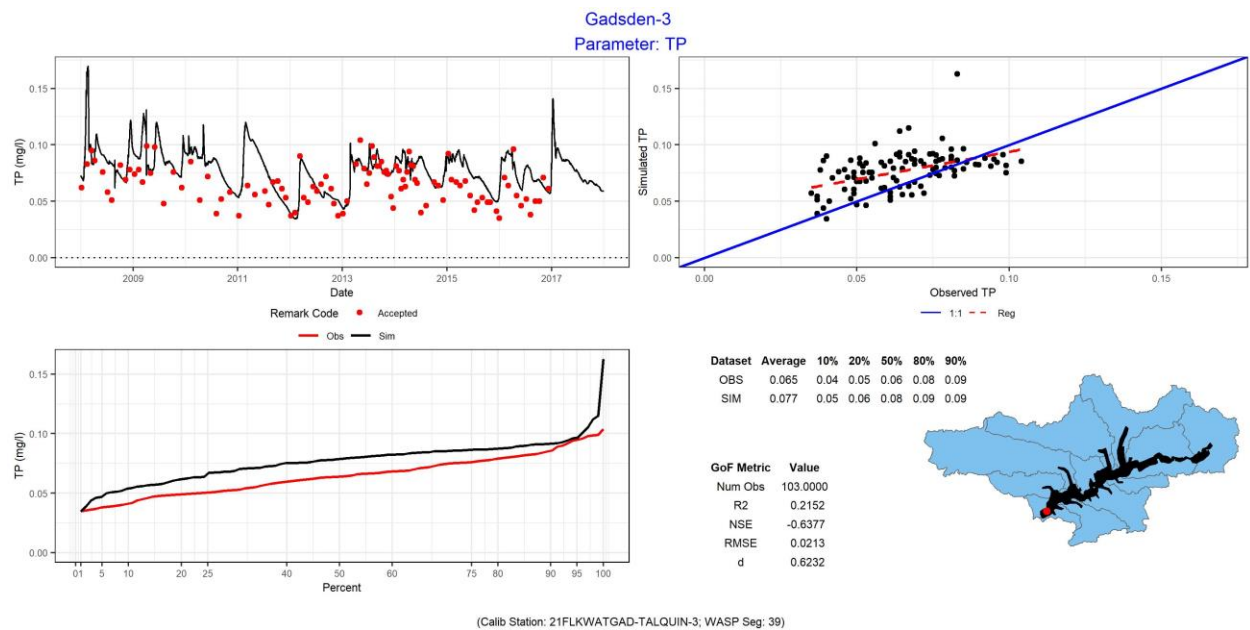


Figure 184 Total Phosphorus – Lake Talquin at Gadsden 3

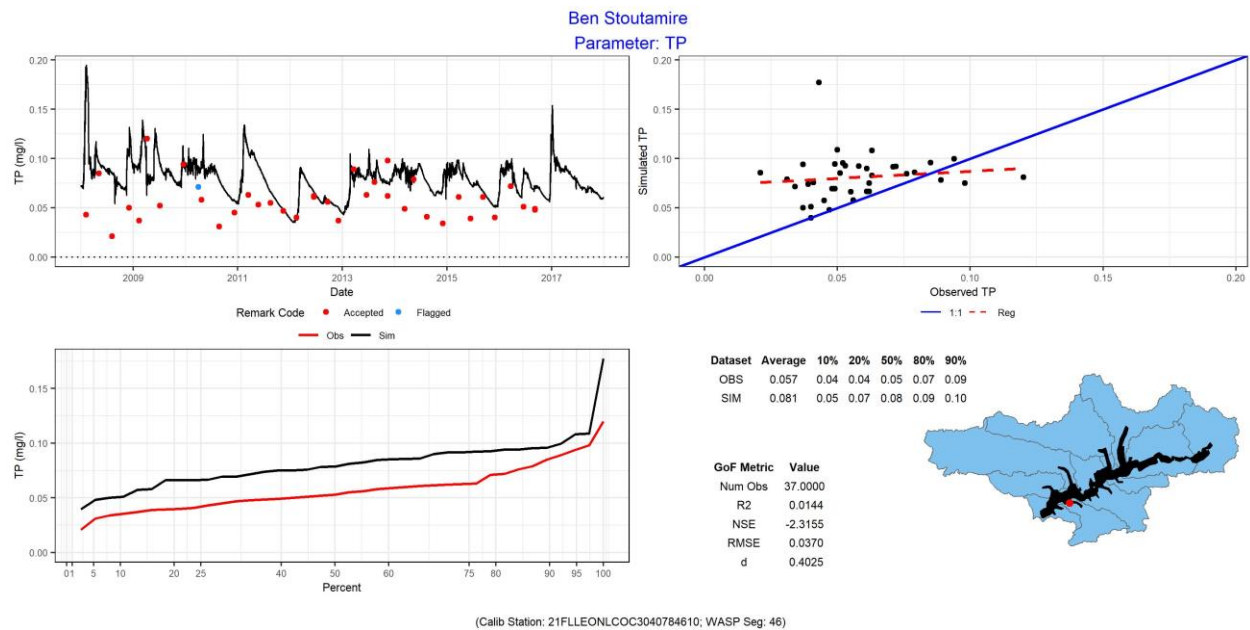


Figure 185 Total Phosphorus – Lake Talquin at Ben Stoutamire

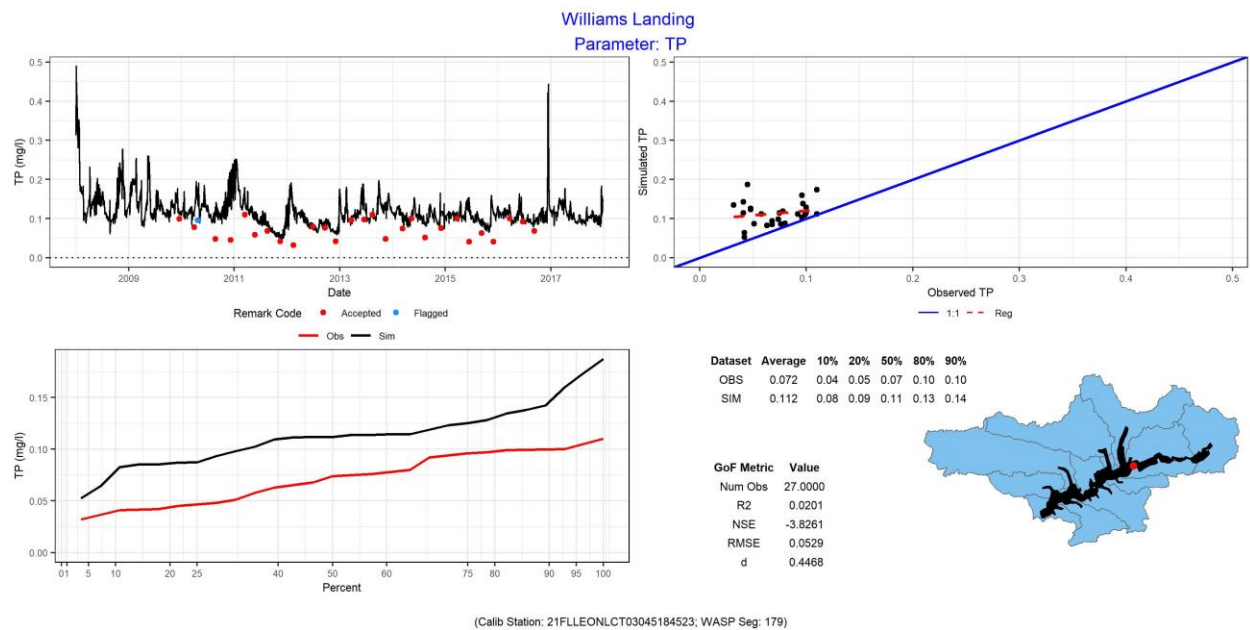


Figure 186 Total Phosphorus – Lake Talquin at Williams Landing

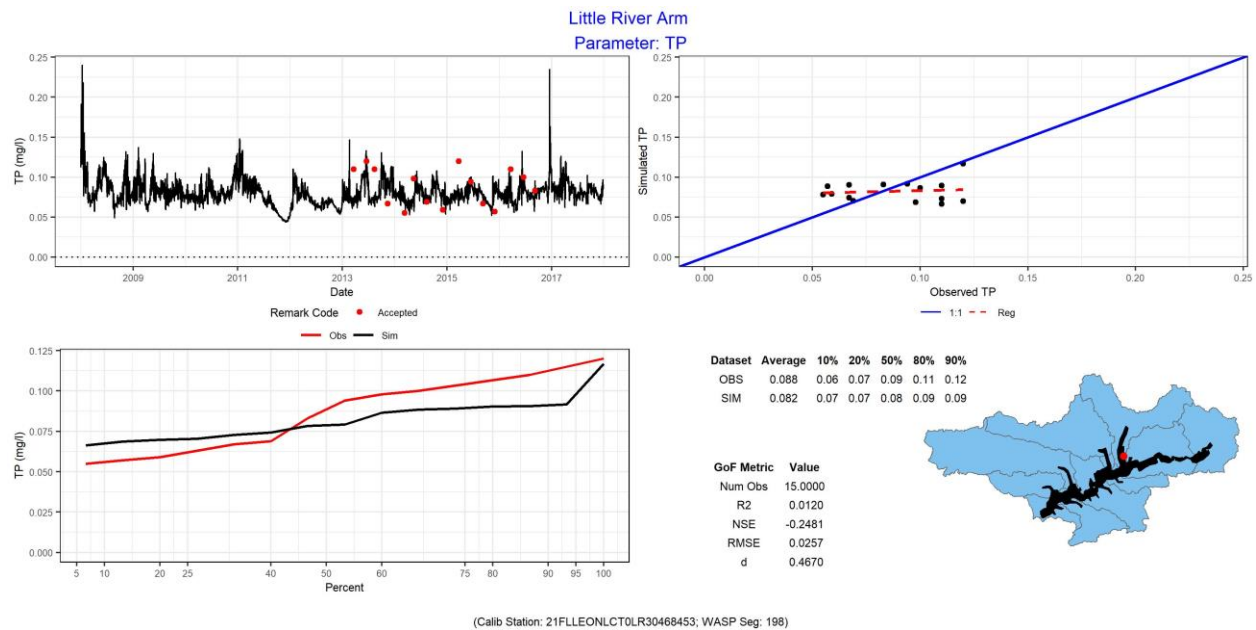


Figure 187 Total Phosphorus – Lake Talquin at Little River Arm

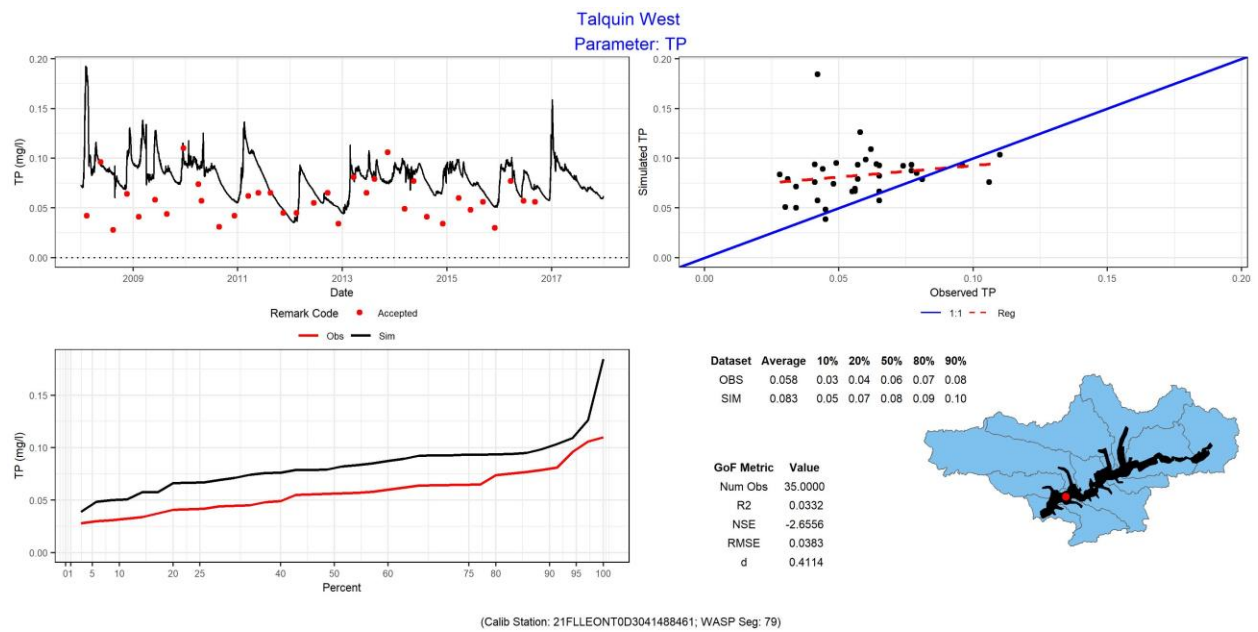


Figure 188 Total Phosphorus – Lake Talquin at Talquin West

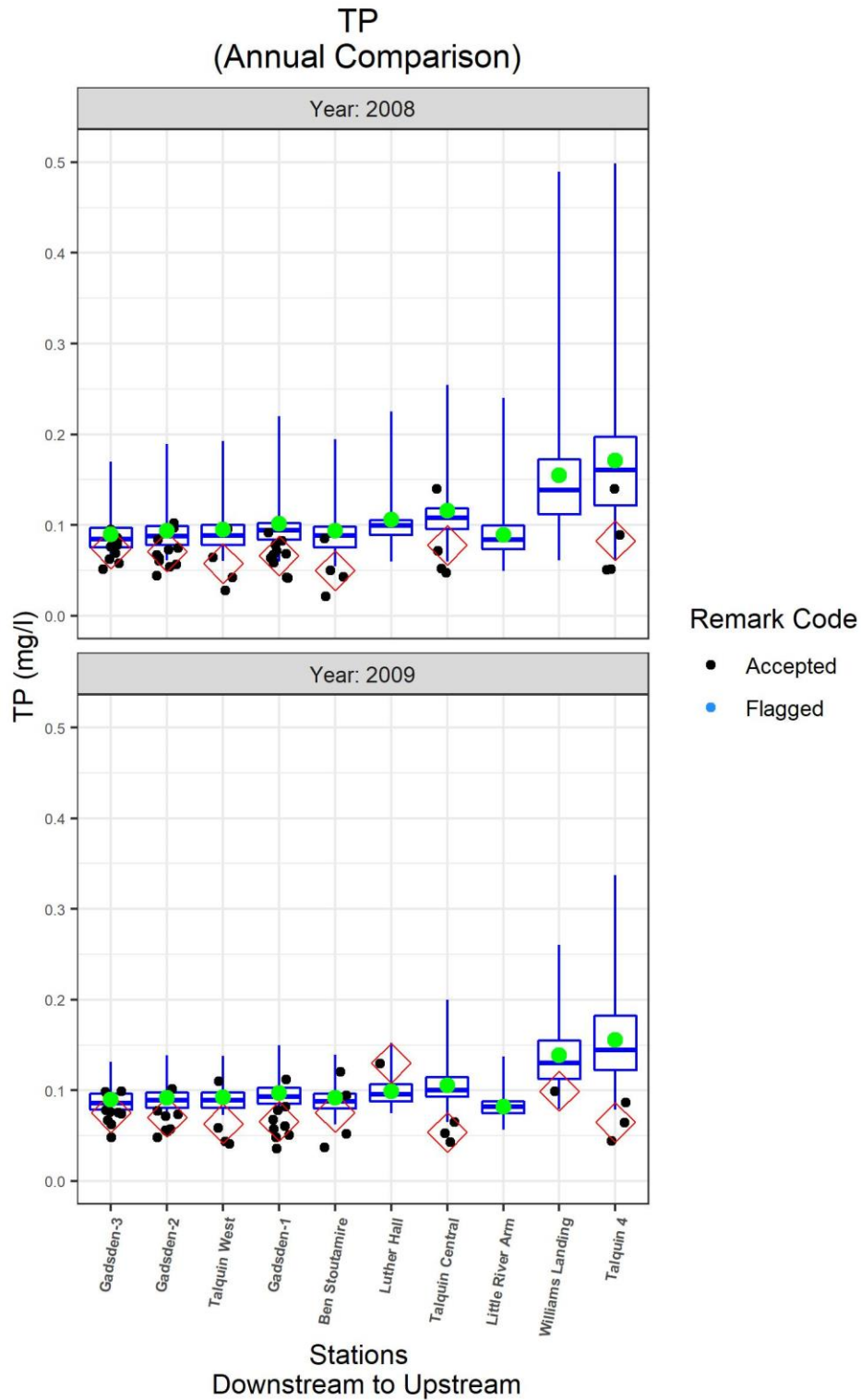


Figure 189 Lake Talquin Total Phosphorus Comparison Observed vs. Simulated 2008-2009

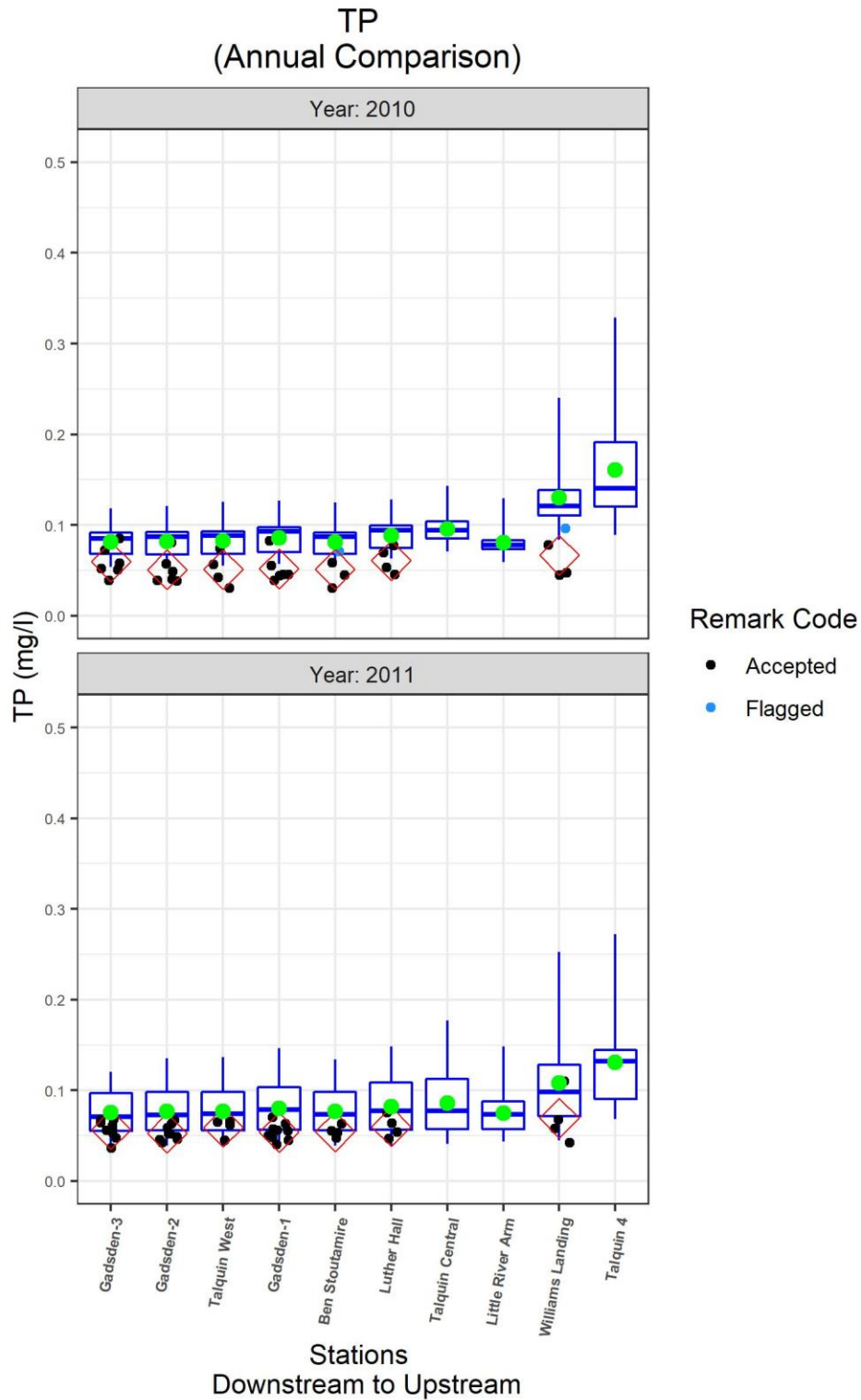


Figure 190 Lake Talquin Total Phosphorus Comparison Observed vs. Simulated 2010 - 2011

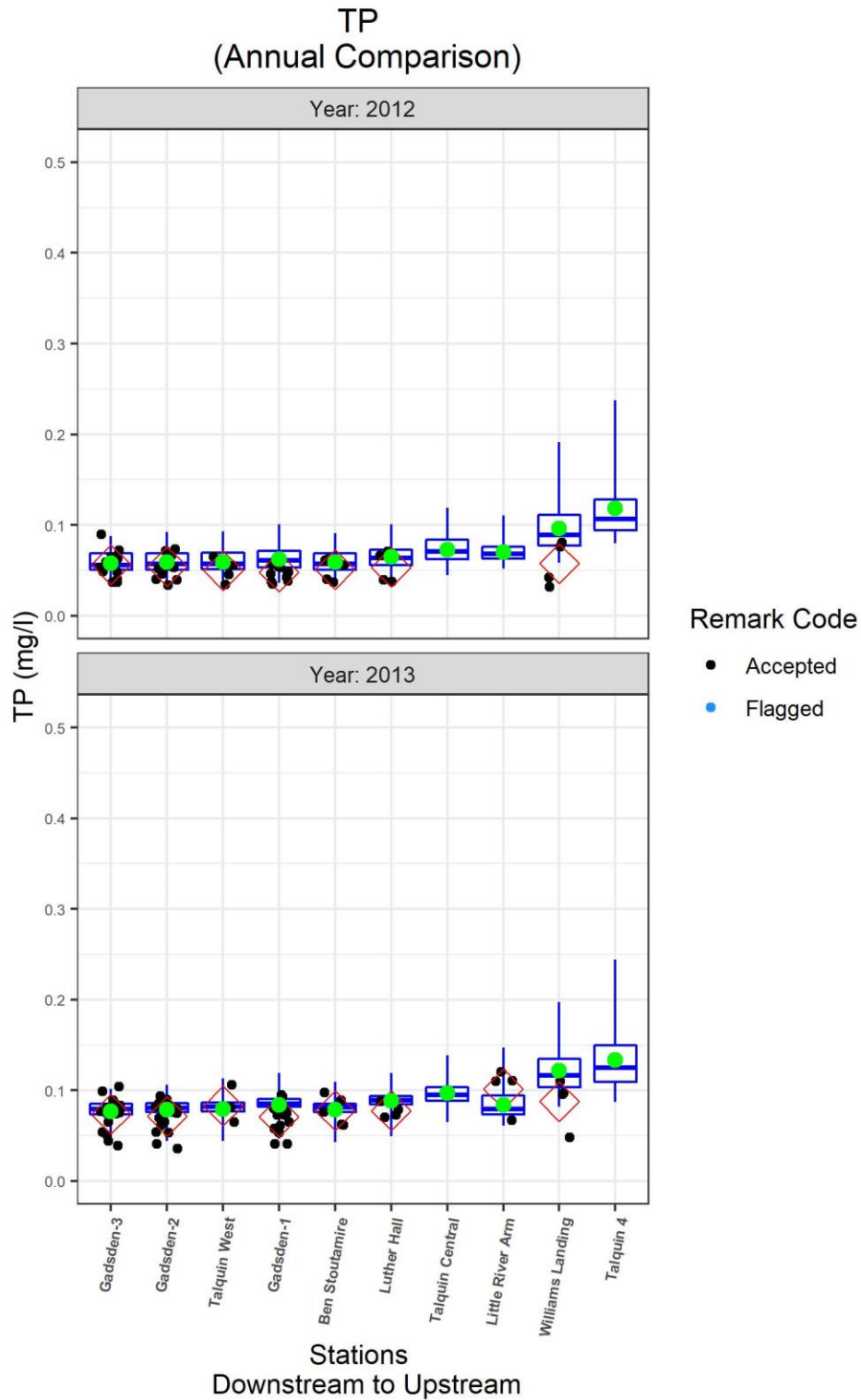


Figure 191 Lake Talquin Total Phosphorus Comparison Observed vs. Simulated 2012 - 2013

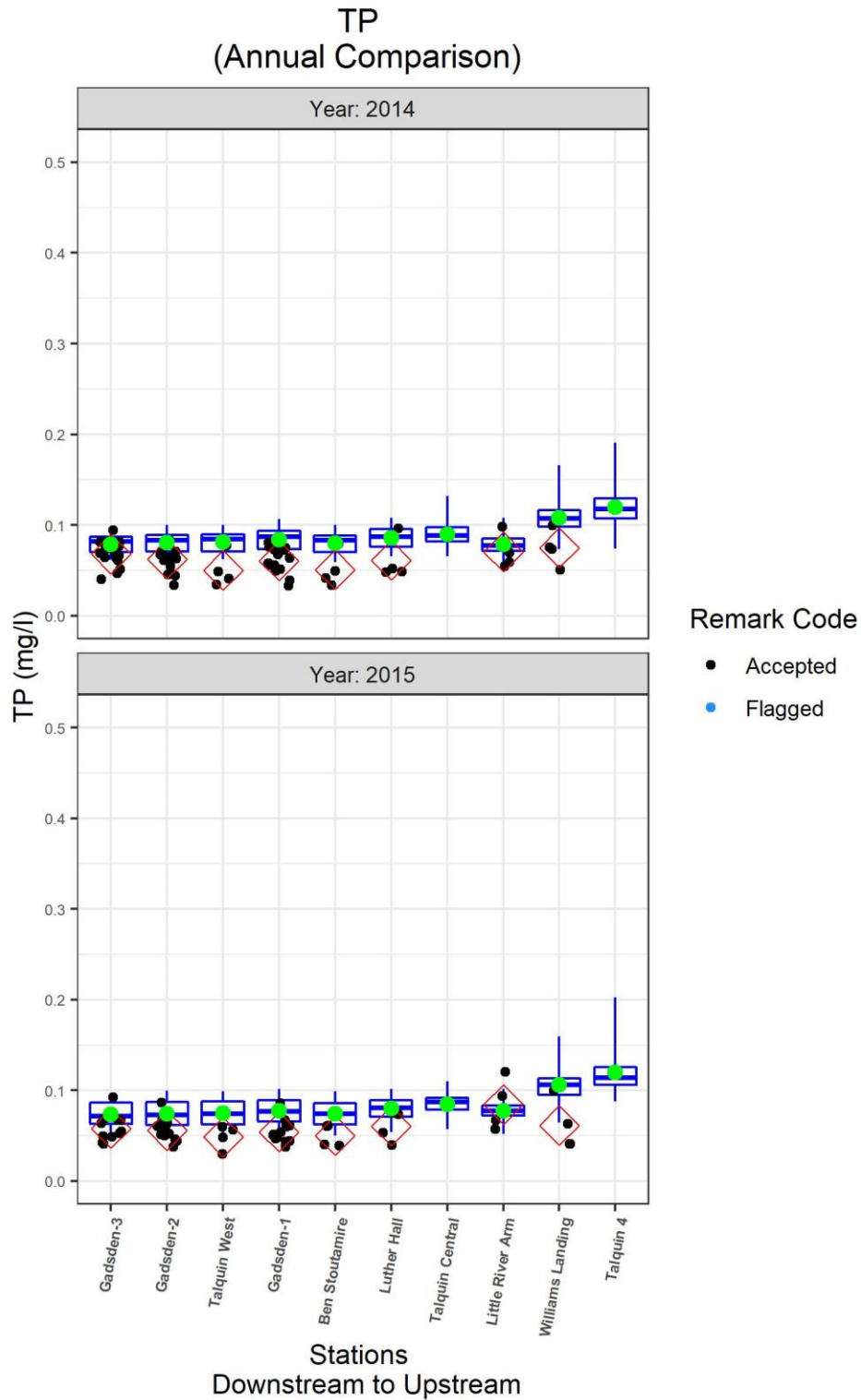


Figure 192 Lake Talquin Total Phosphorus Comparison Observed vs. Simulated 2014 -2015

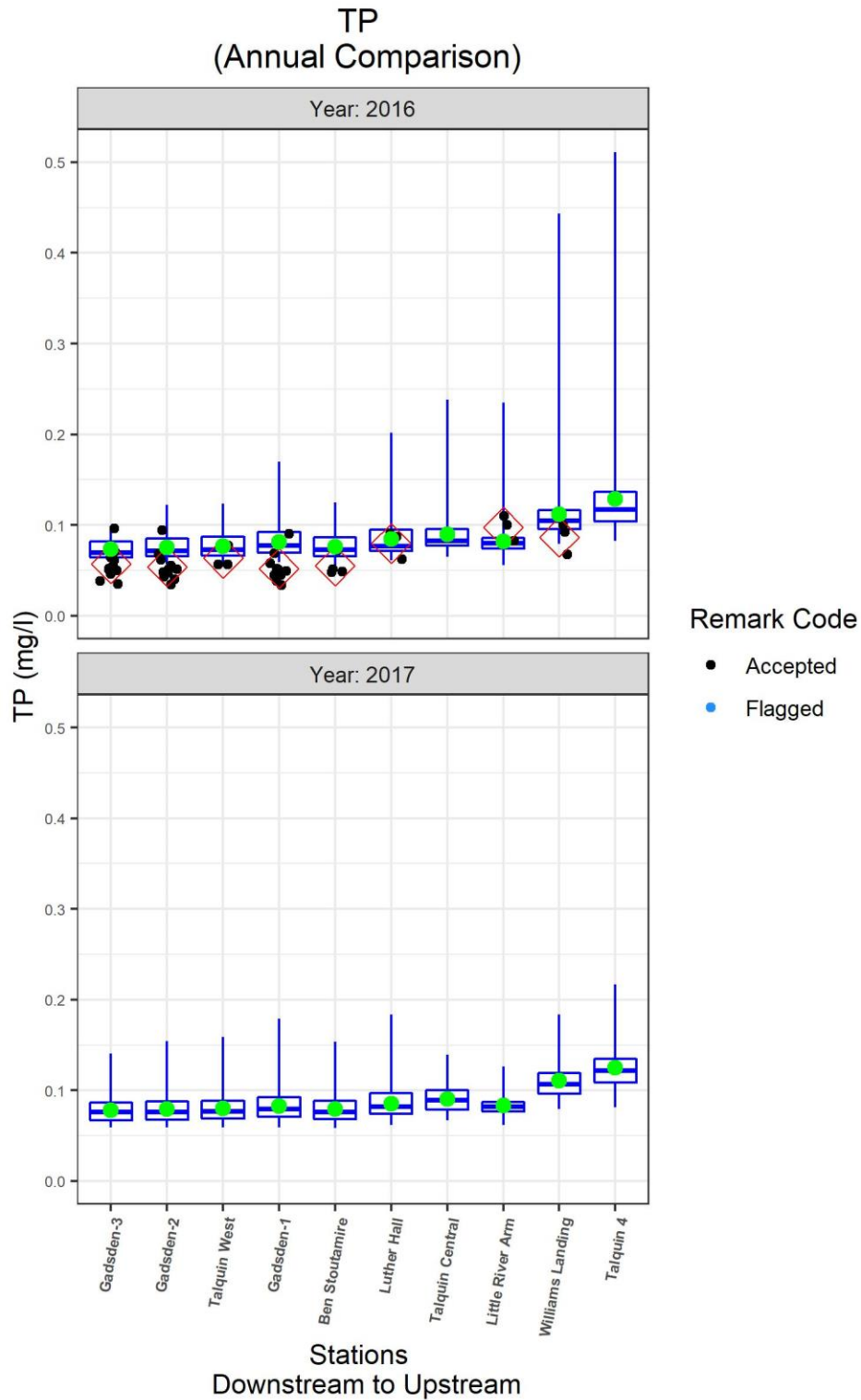


Figure 193 Lake Talquin Total Phosphorus Comparison Observed vs. Simulated 2016 - 2017

Chlorophyll a

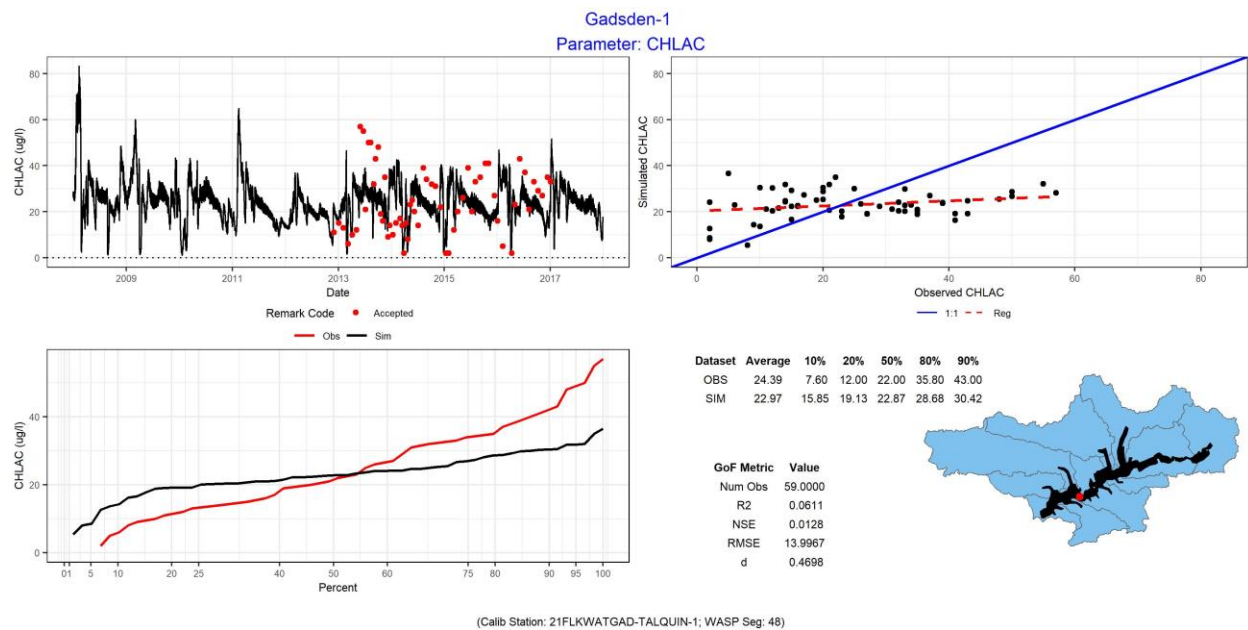


Figure 194 Chlorophyll a – Lake Talquin at Gadsden 1

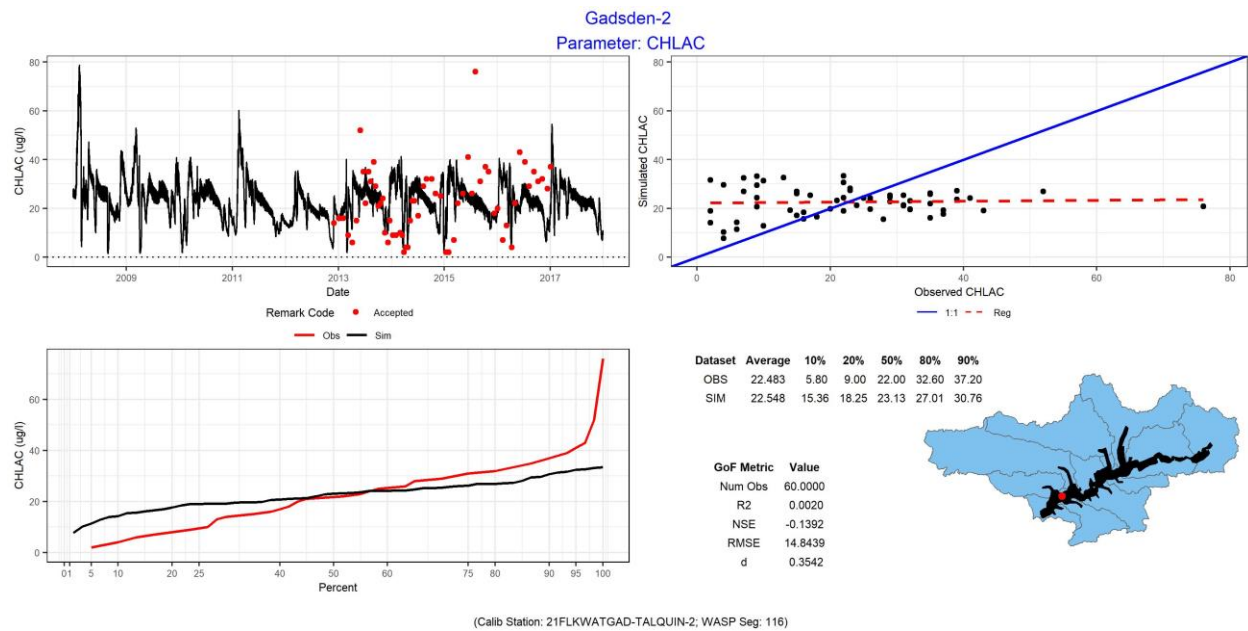


Figure 195 Chlorophyll a – Lake Talquin at Gadsden 2

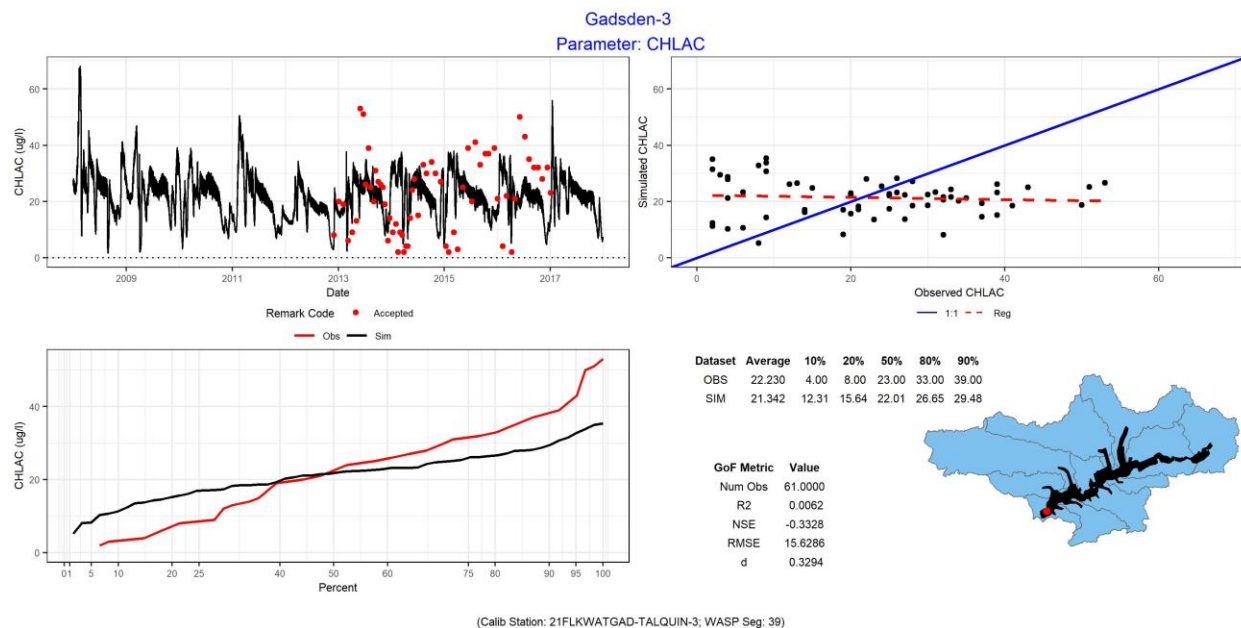


Figure 196 Chlorophyll a – Lake Talquin at Gadsden 3

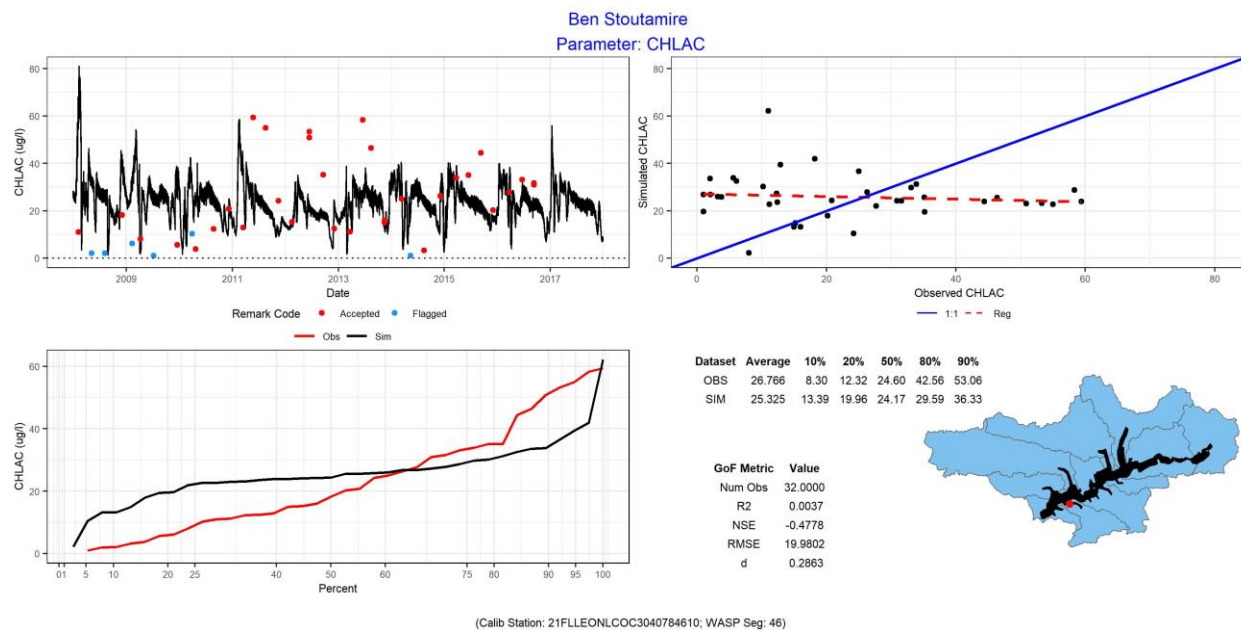


Figure 197 Chlorophyll a – Lake Talquin at Ben Stoutamire

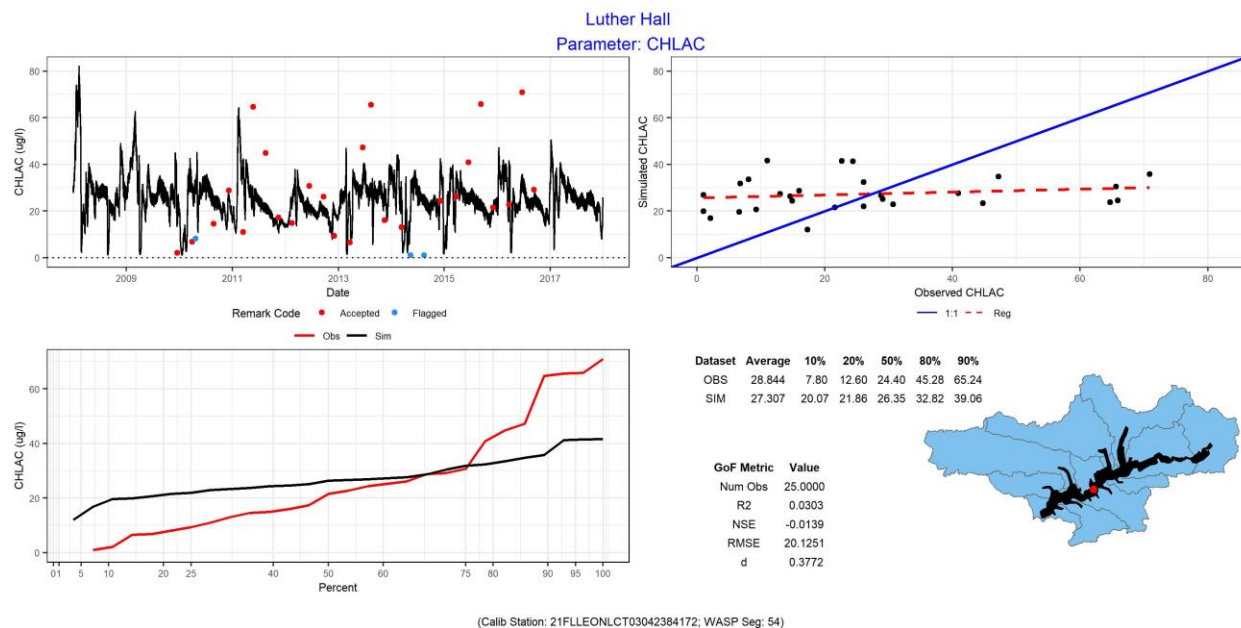


Figure 198 Chlorophyll a – Lake Talquin at Luther Hall

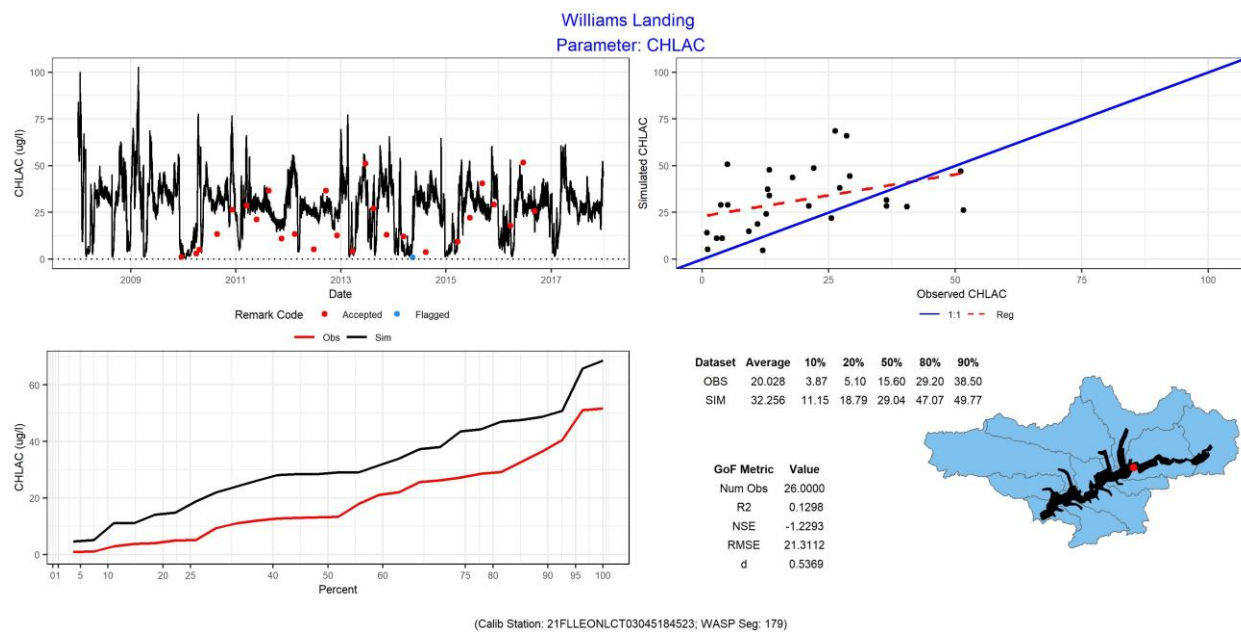


Figure 199 Chlorophyll a – Lake Talquin at Williams Landing

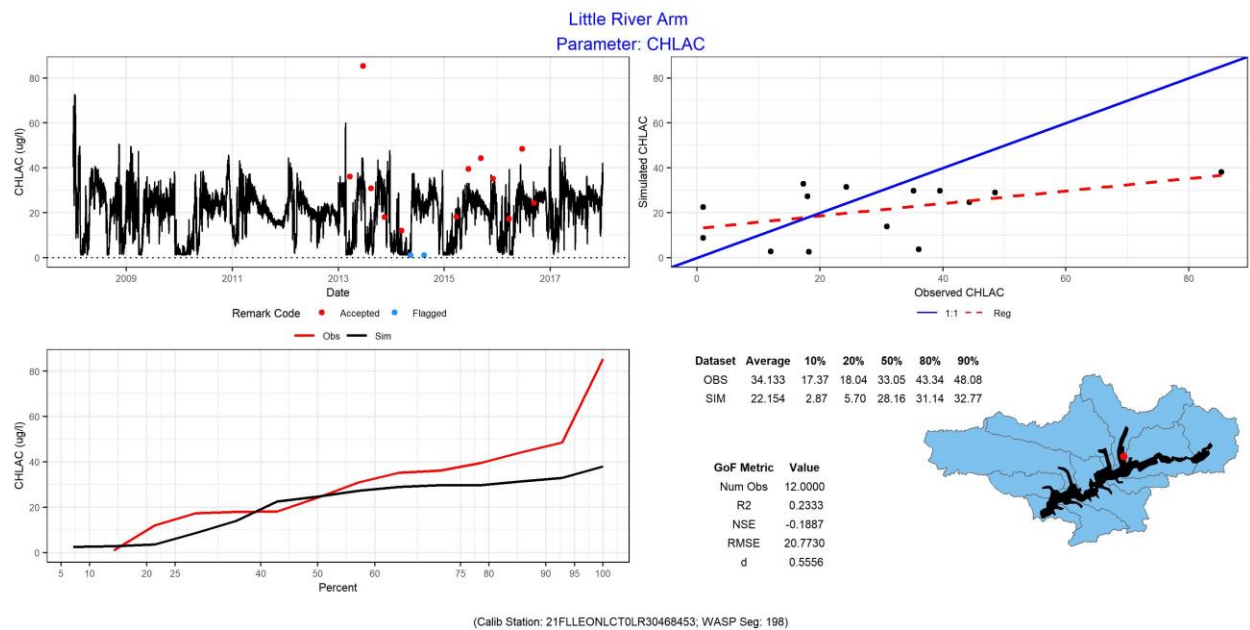


Figure 200 Chlorophyll a – Lake Talquin at Little River Arm

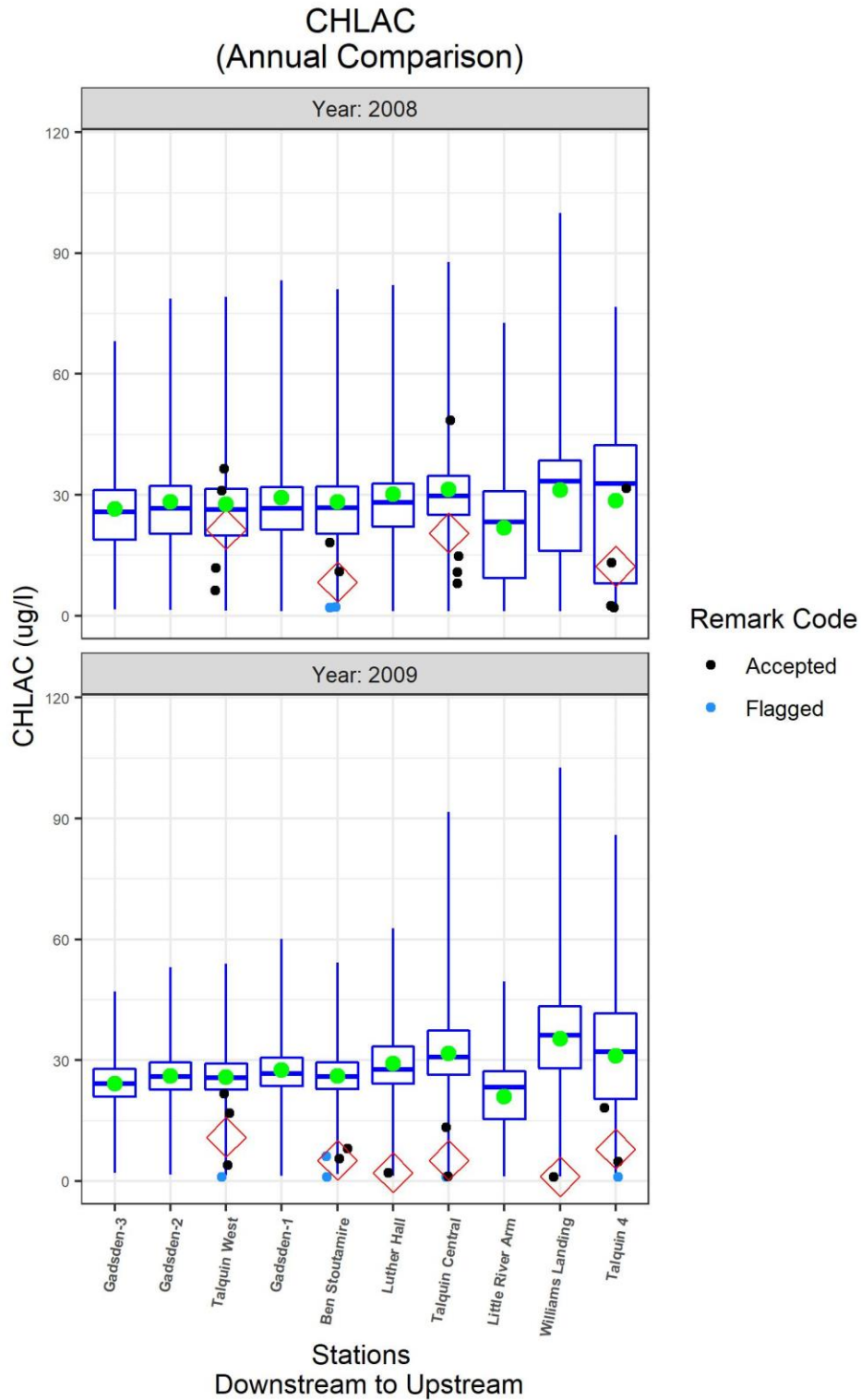


Figure 201 Lake Talquin Chlorophyll a Comparison Observed vs. Simulated 2008-2009

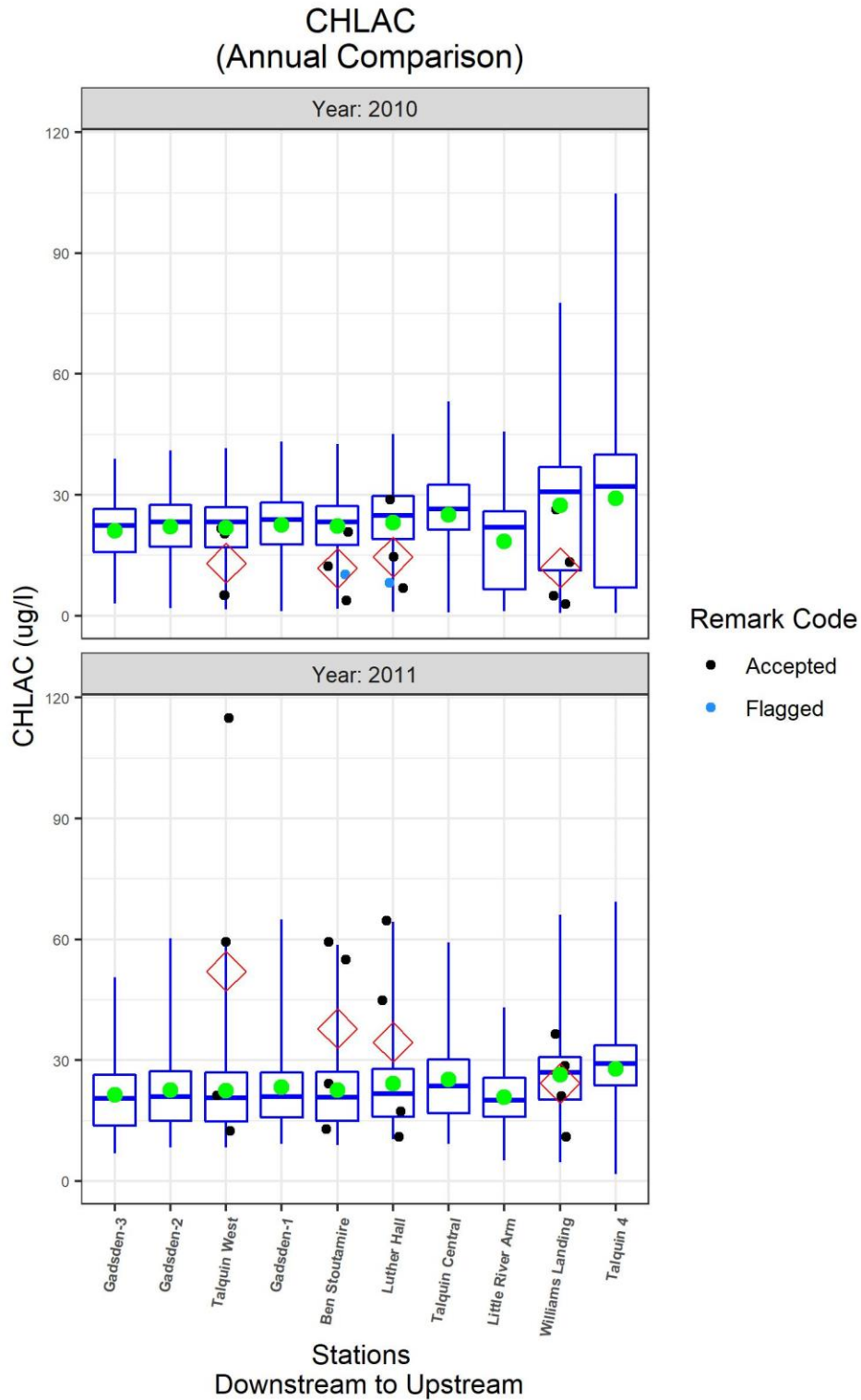


Figure 202 Lake Talquin Chlorophyll a Comparison Observed vs. Simulated 2010 - 2011

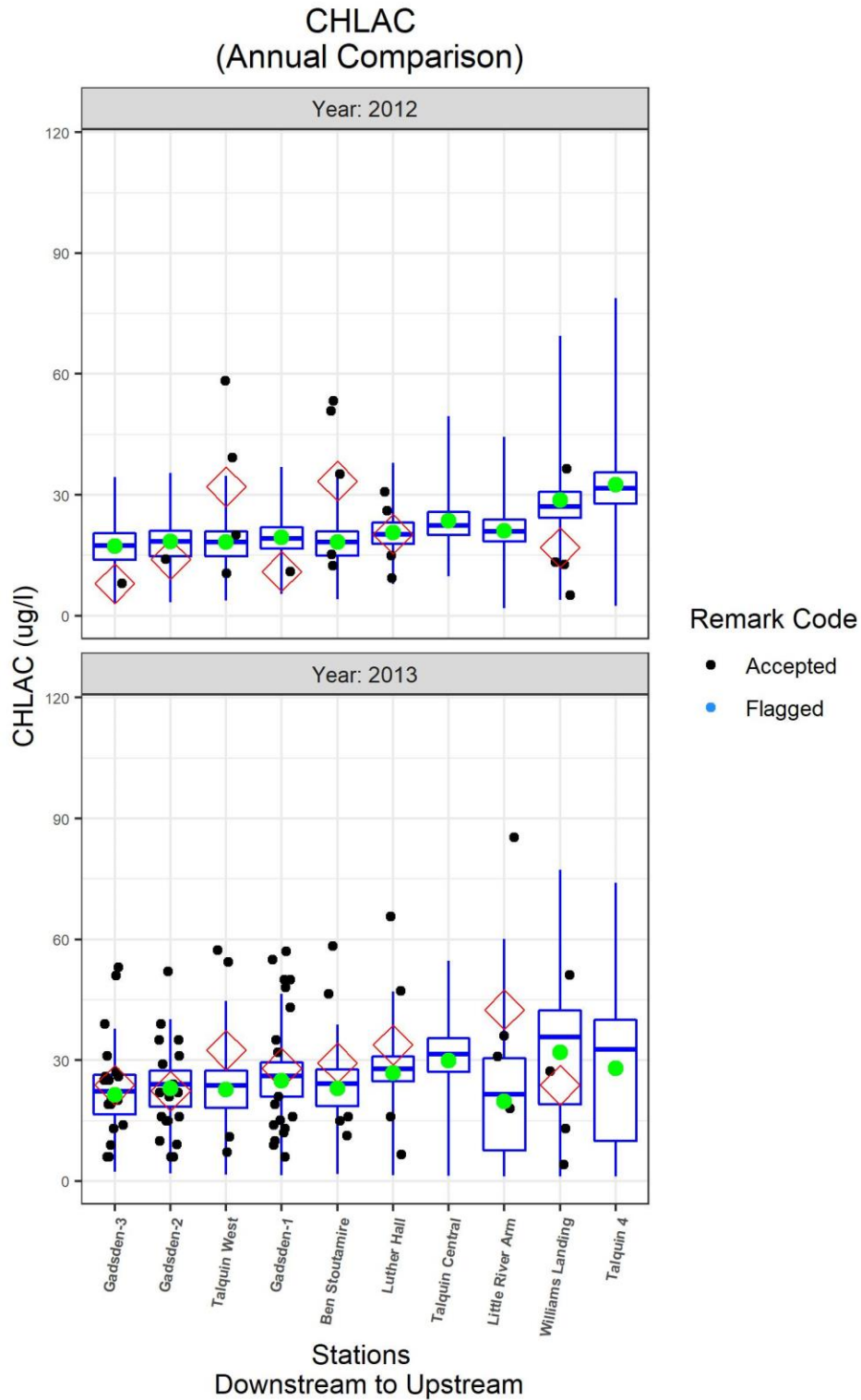


Figure 203 Lake Talquin Chlorophyll a Comparison Observed vs. Simulated 2012 - 2013

Year: 2014

Year: 2015

CHLAC (ug/l)

Remark Code

- Accepted
- Flagged

Stations
Downstream to Upstream

Gadsden-3, Gadsden-2, Talquin West, Gadsden-1, Ben Stoutamire, Luther Hall, Talquin Central, Little River Arm, Williams Landing, Talquin 4

Figure 204 Lake Talquin Chlorophyll a Comparison Observed vs. Simulated 2014-2015

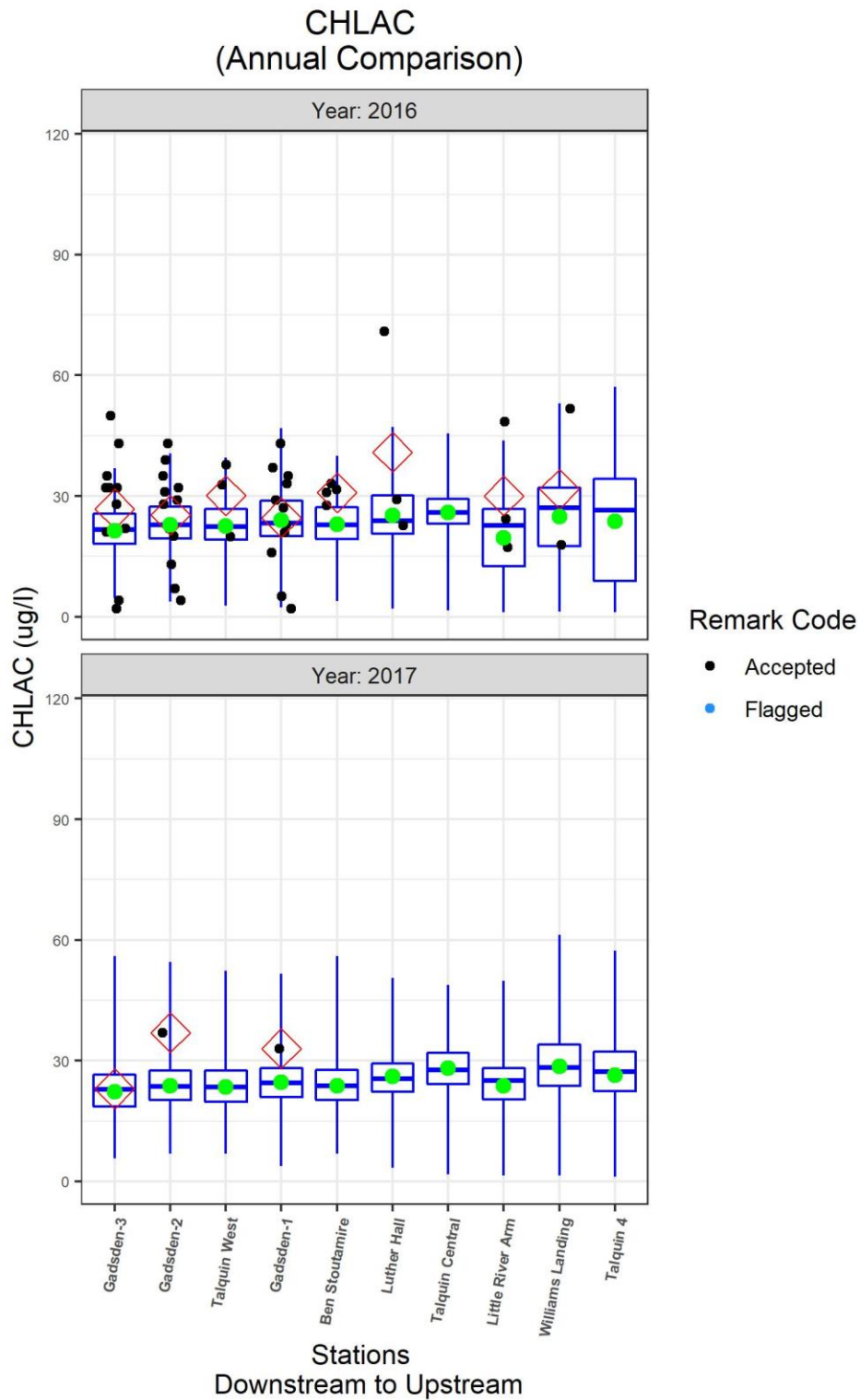


Figure 205 Lake Talquin Chlorophyll a Comparison Observed vs. Simulated 2016 - 2017

Ammonia

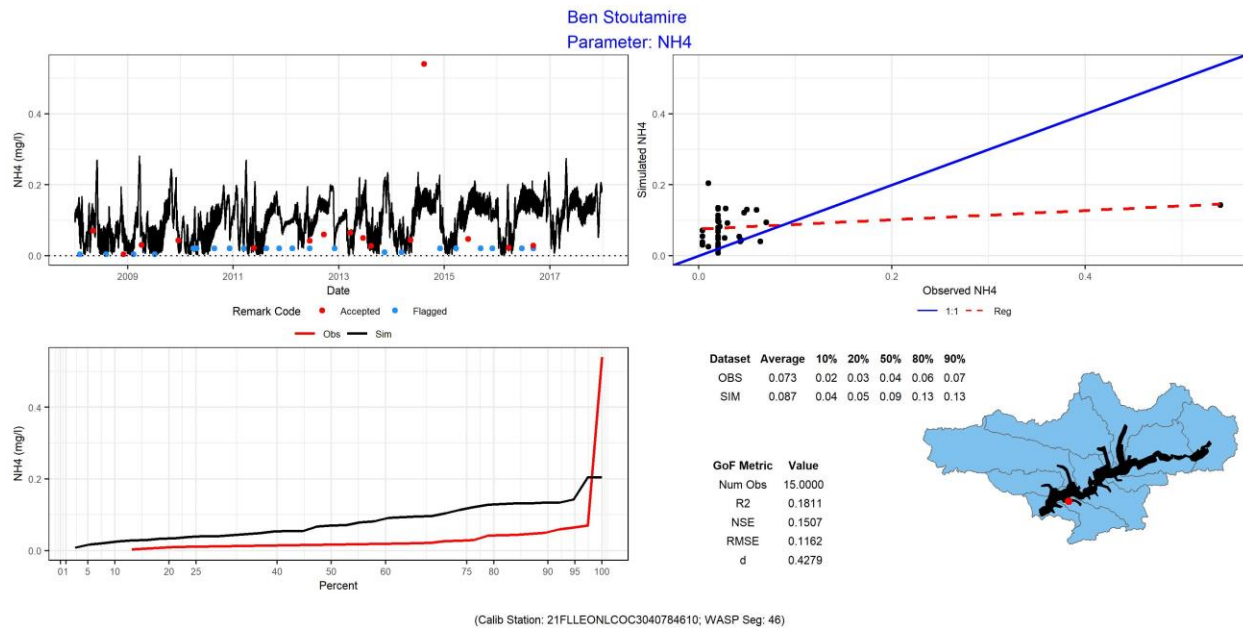


Figure 206 Ammonia – Lake Talquin at Ben Stoutamire

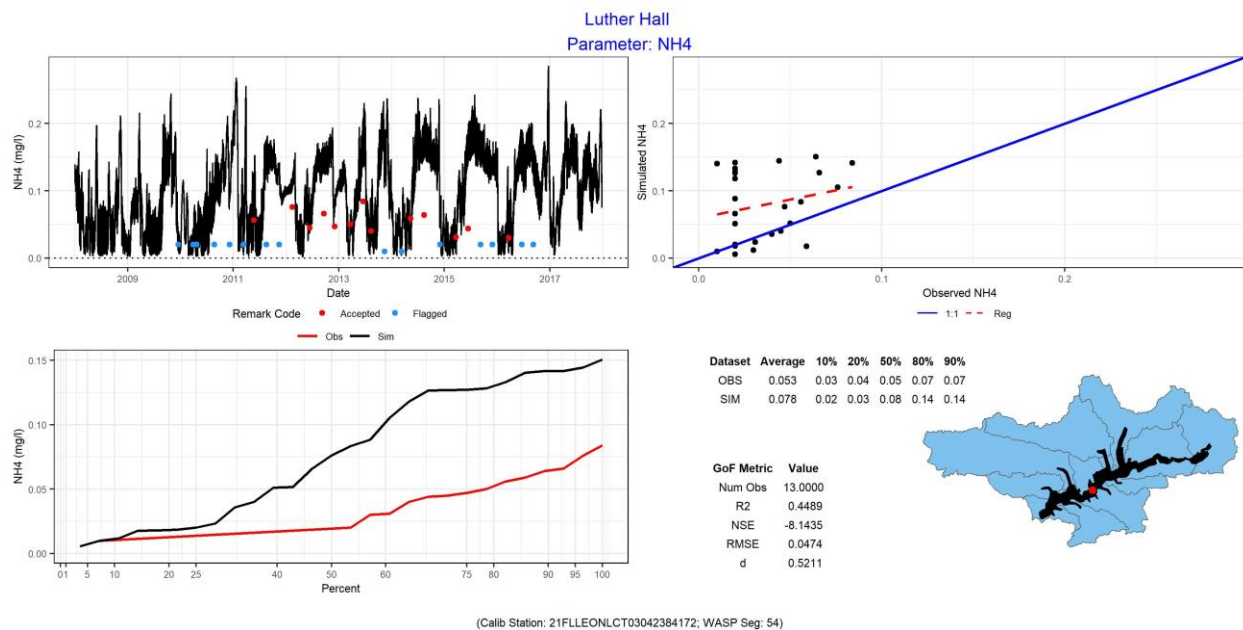


Figure 207 Ammonia – Lake Talquin at Luther Hall

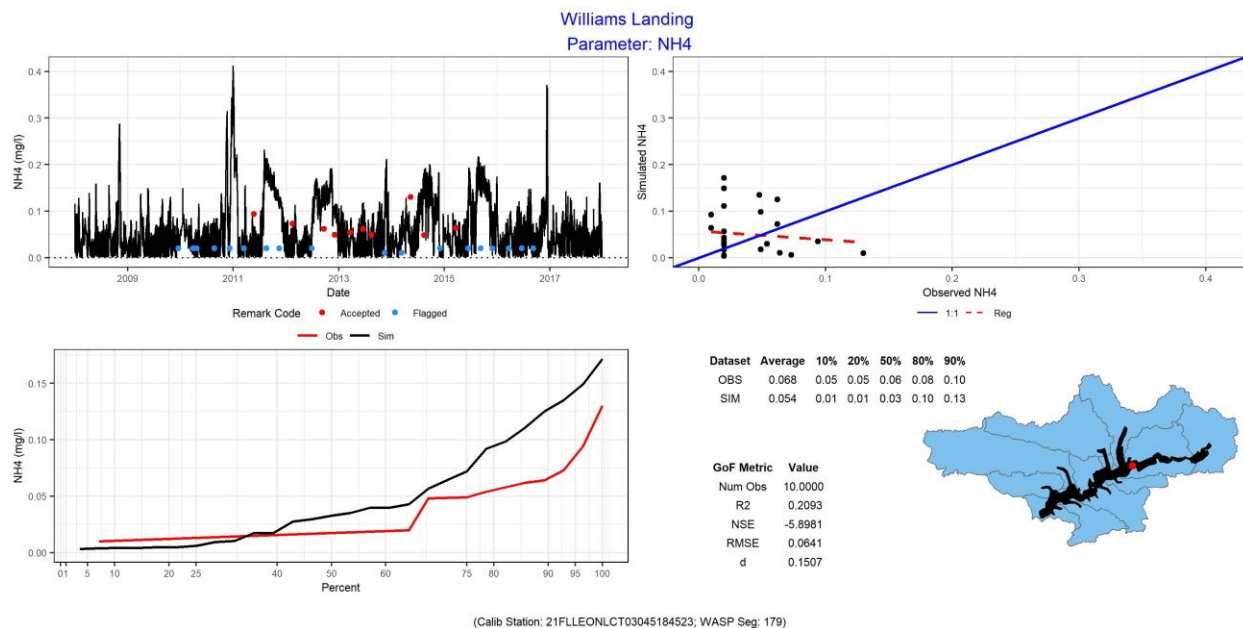


Figure 208 Ammonia – Lake Talquin at Williams Landing

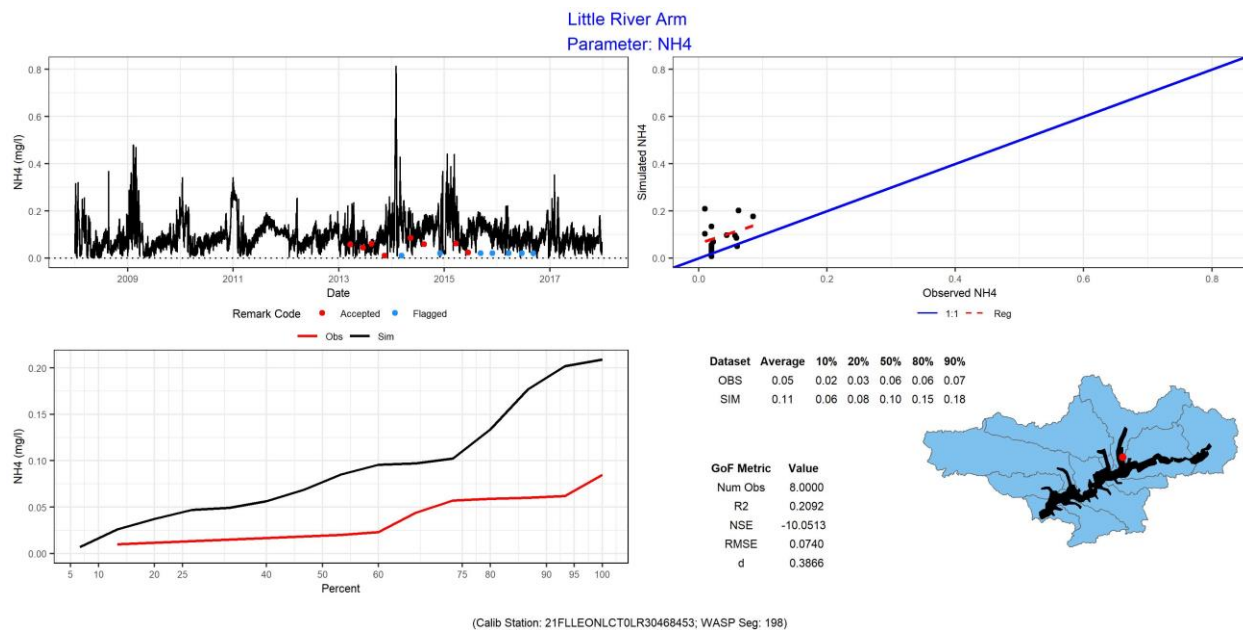


Figure 209 Ammonia – Lake Talquin at Little River Arm

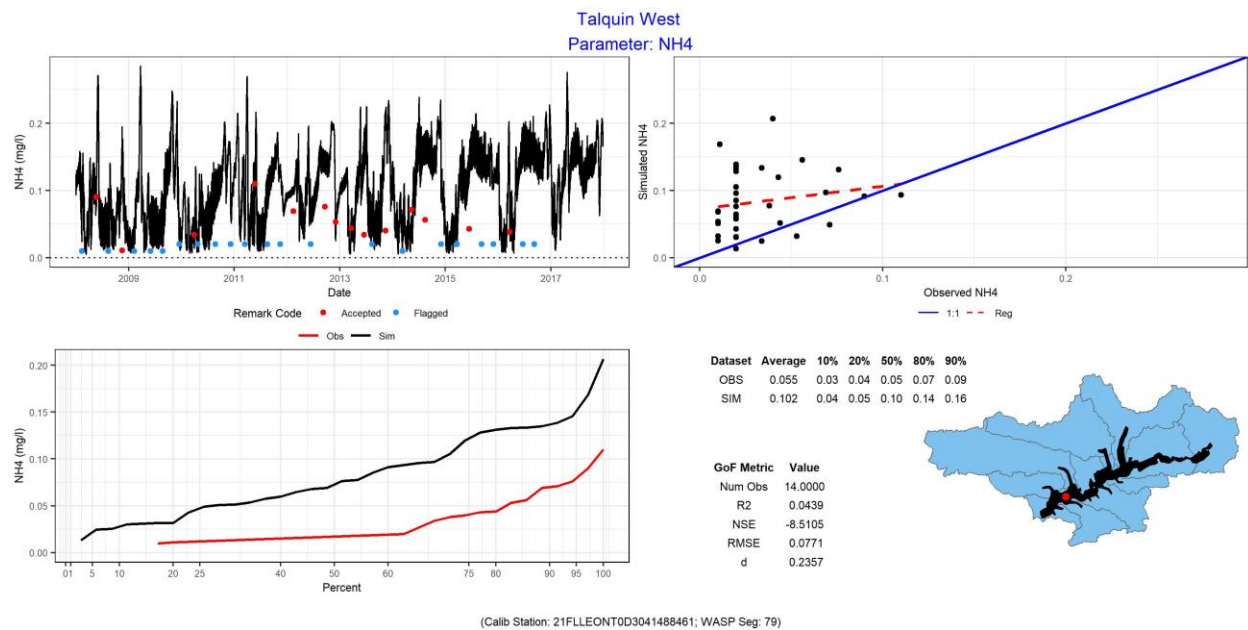


Figure 210 Ammonia – Lake Talquin at Talquin West

Dissolved Oxygen

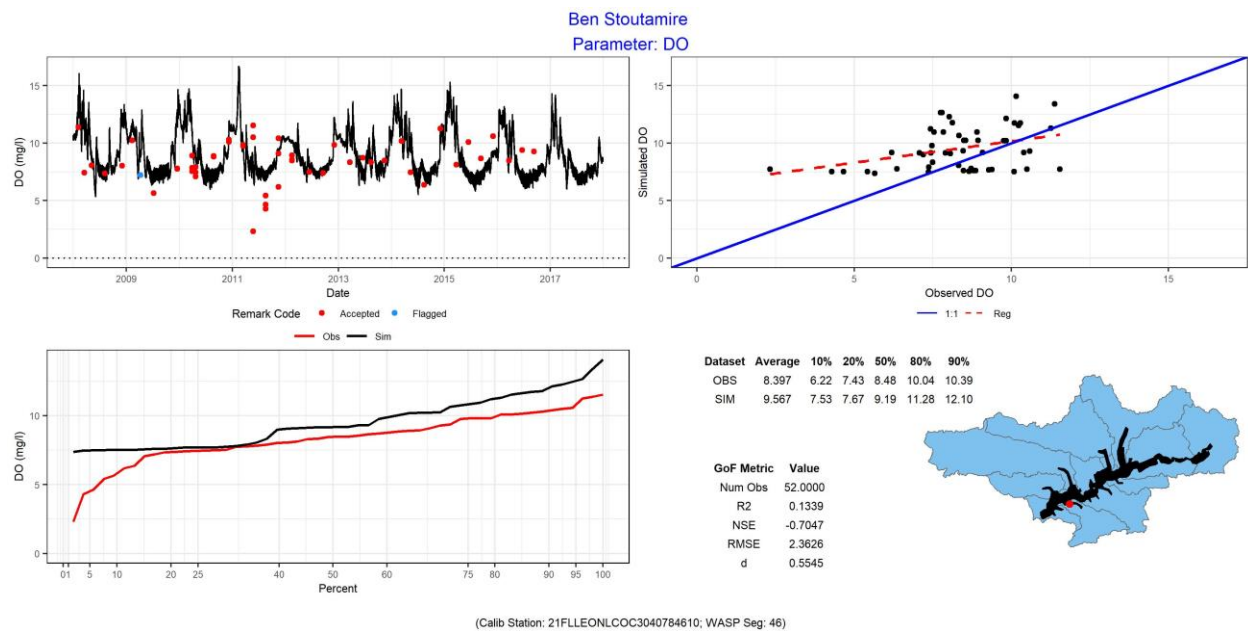


Figure 211 Dissolved Oxygen – Lake Talquin at Ben Stoutamire

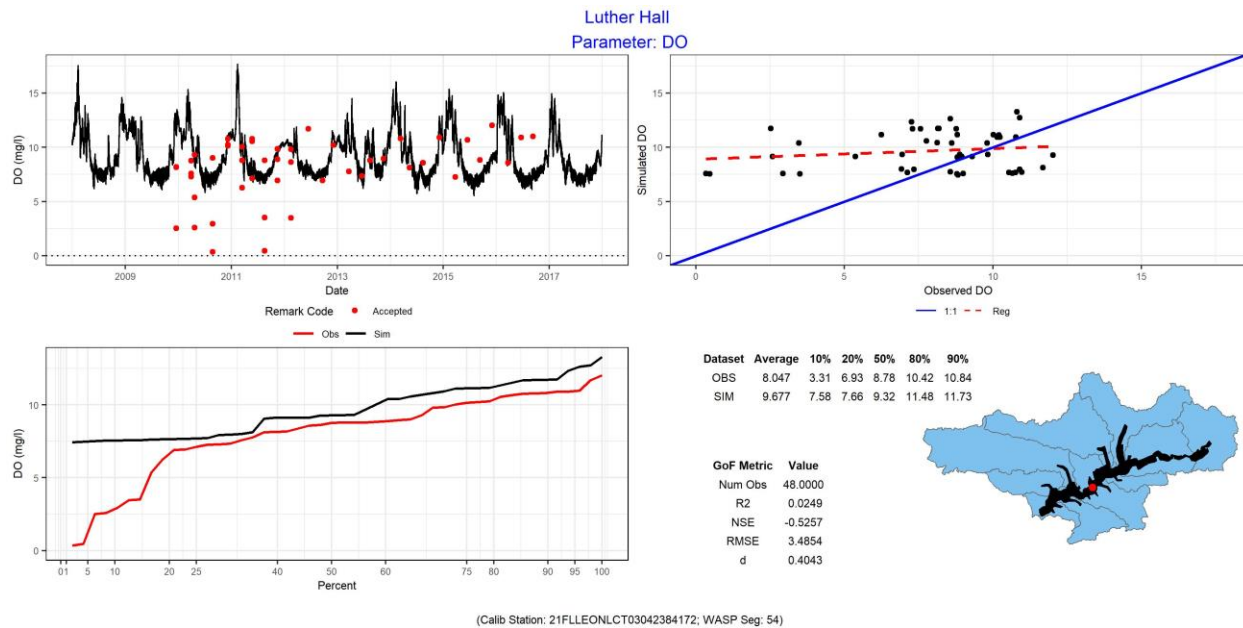


Figure 212 Dissolved Oxygen – Lake Talquin at Luther Hall

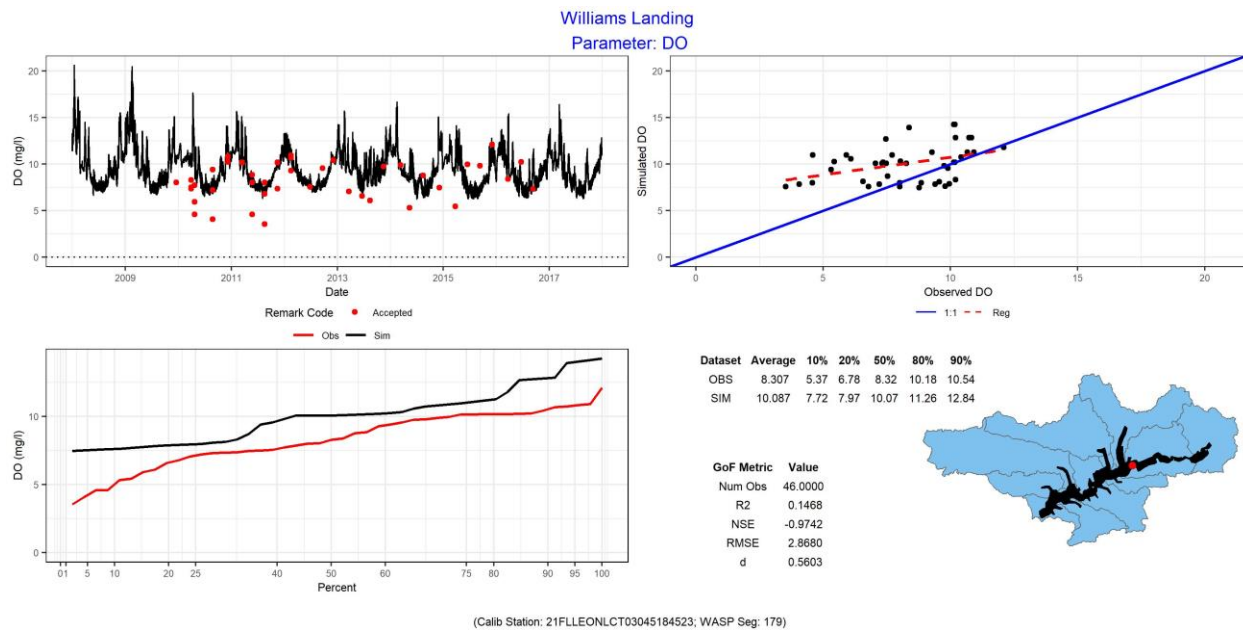


Figure 213 Dissolved Oxygen – Lake Talquin at Williams Landing

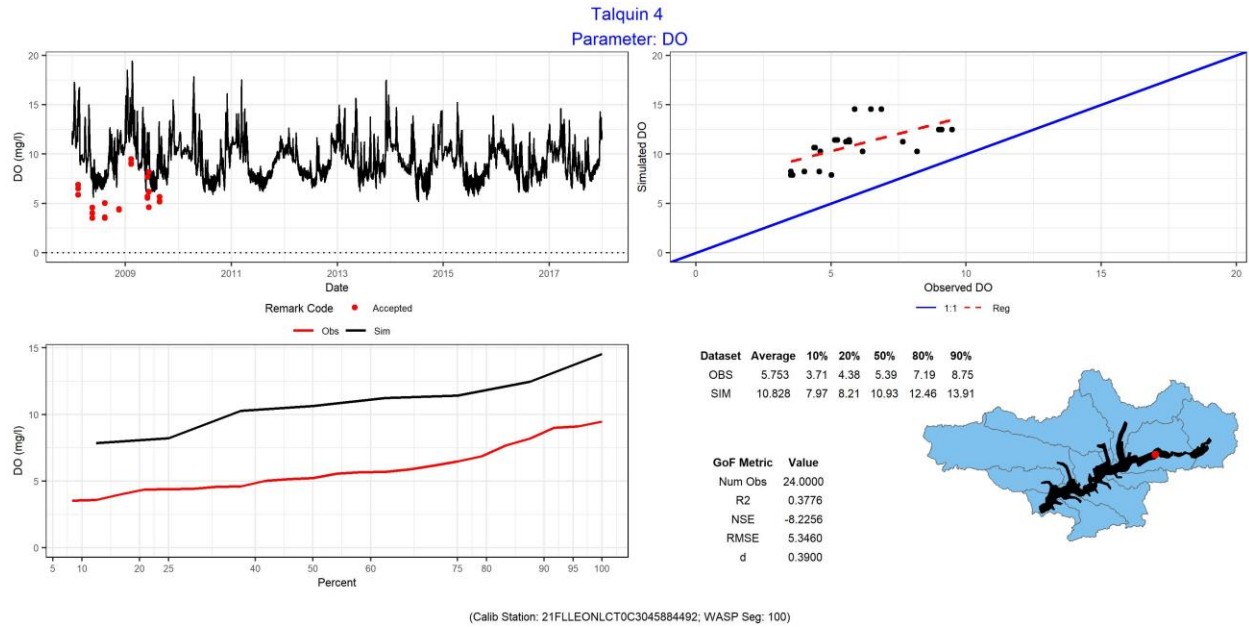


Figure 214 Dissolved Oxygen – Lake Talquin at Talquin 4

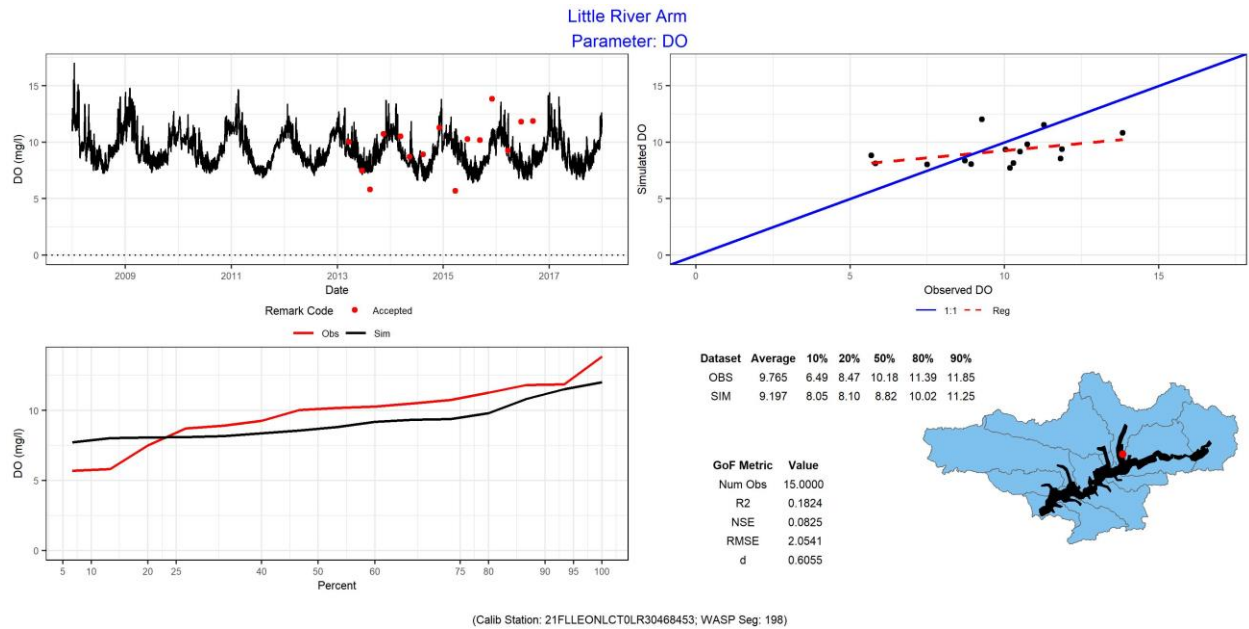


Figure 215 Dissolved Oxygen – Lake Talquin at Little River Arm

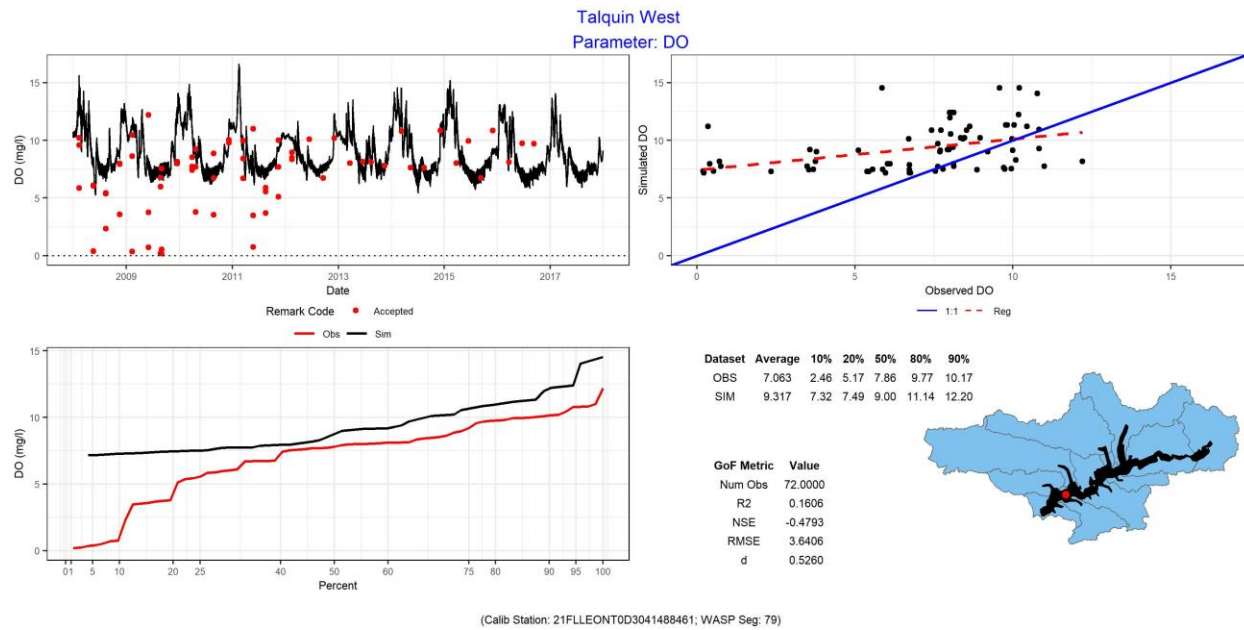


Figure 216 Dissolved Oxygen – Lake Talquin at Talquin West

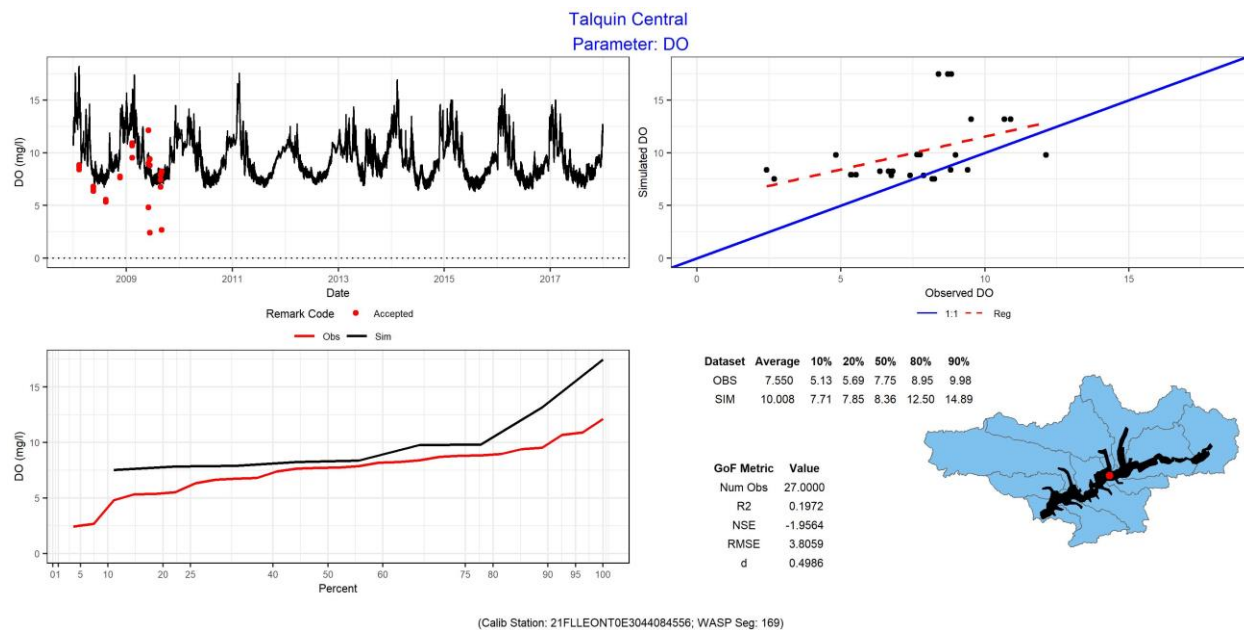


Figure 217 Dissolved Oxygen – Lake Talquin at Talquin Central

Carbonaceous Biochemical Oxygen Demand

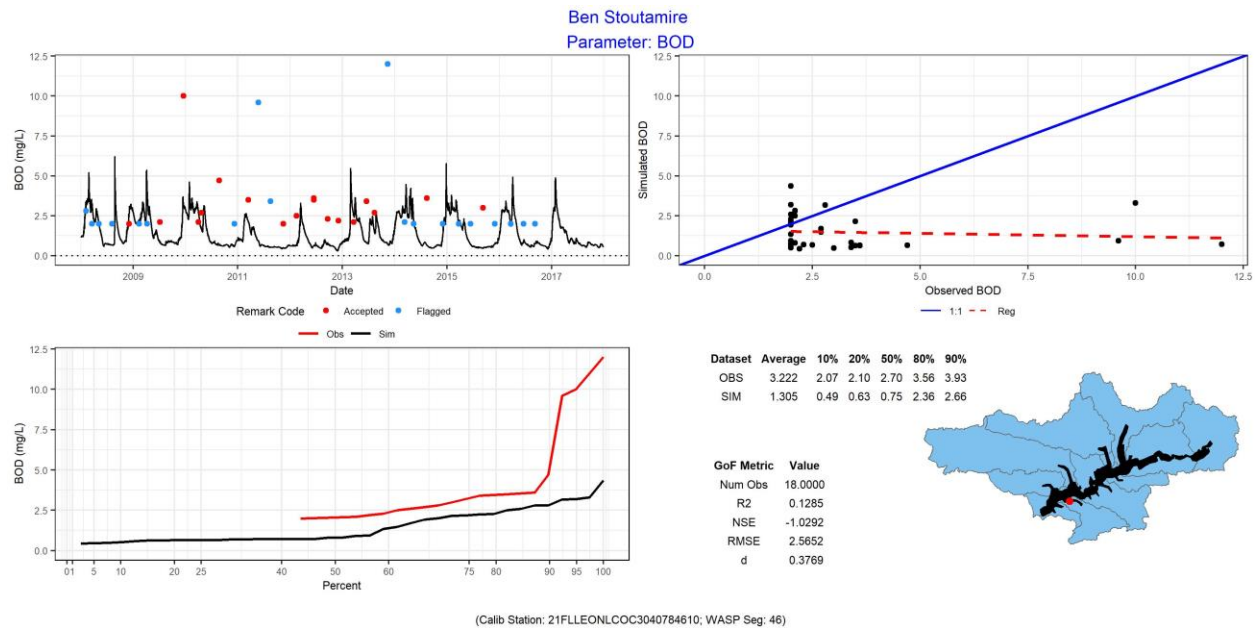


Figure 218 CBOD – Lake Talquin at Ben Stoutamire

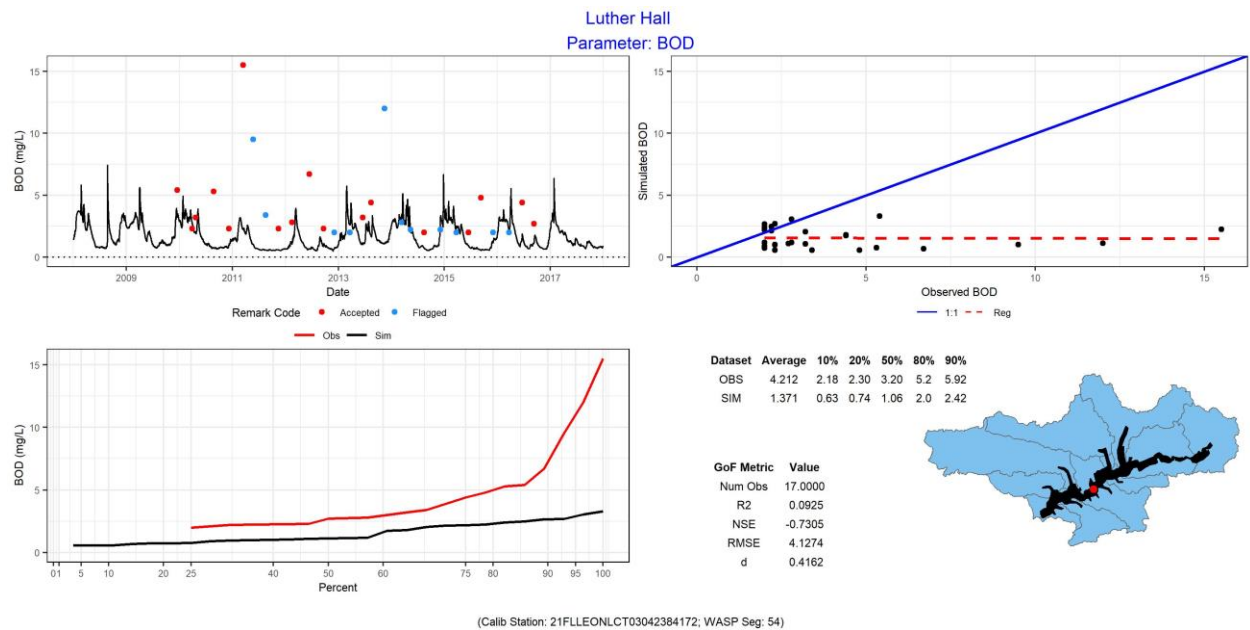


Figure 219 CBOD – Lake Talquin at Luther Hall

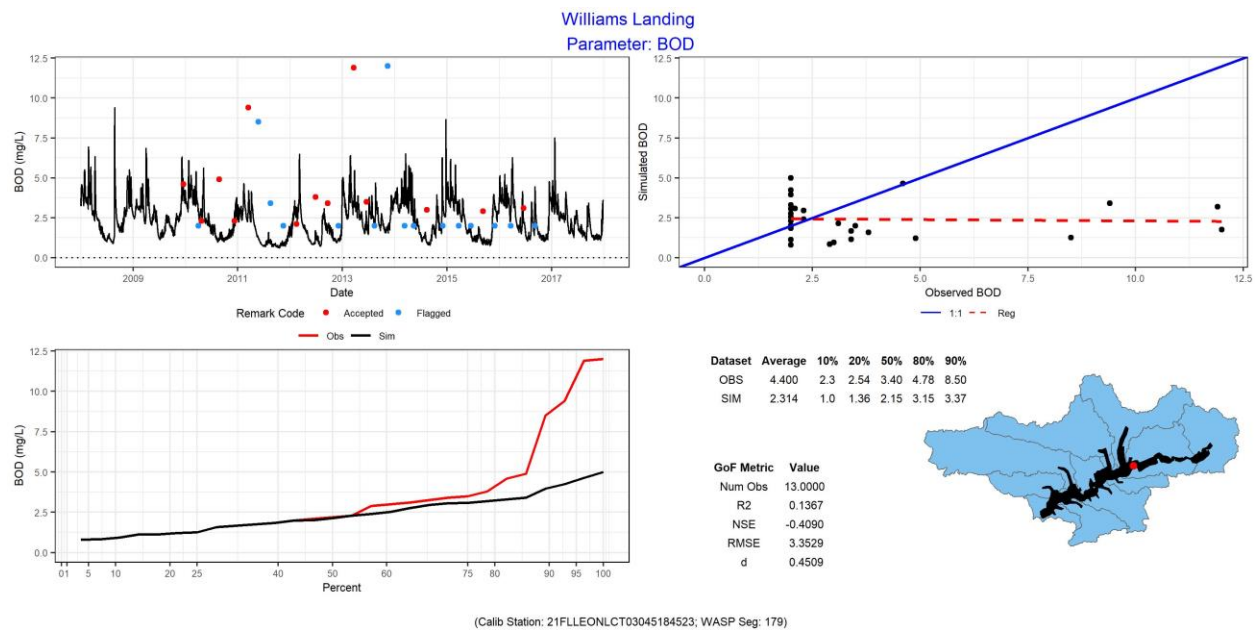


Figure 220 CBOD – Lake Talquin at Williams Landing

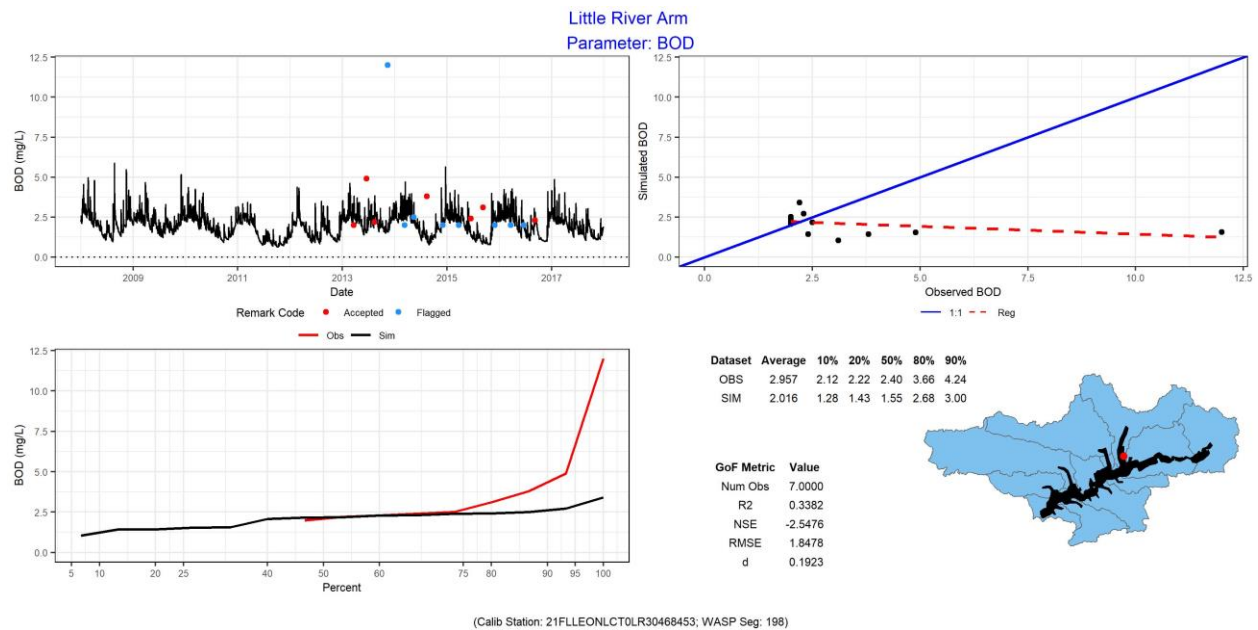


Figure 221 CBOD – Lake Talquin at Little River Arm

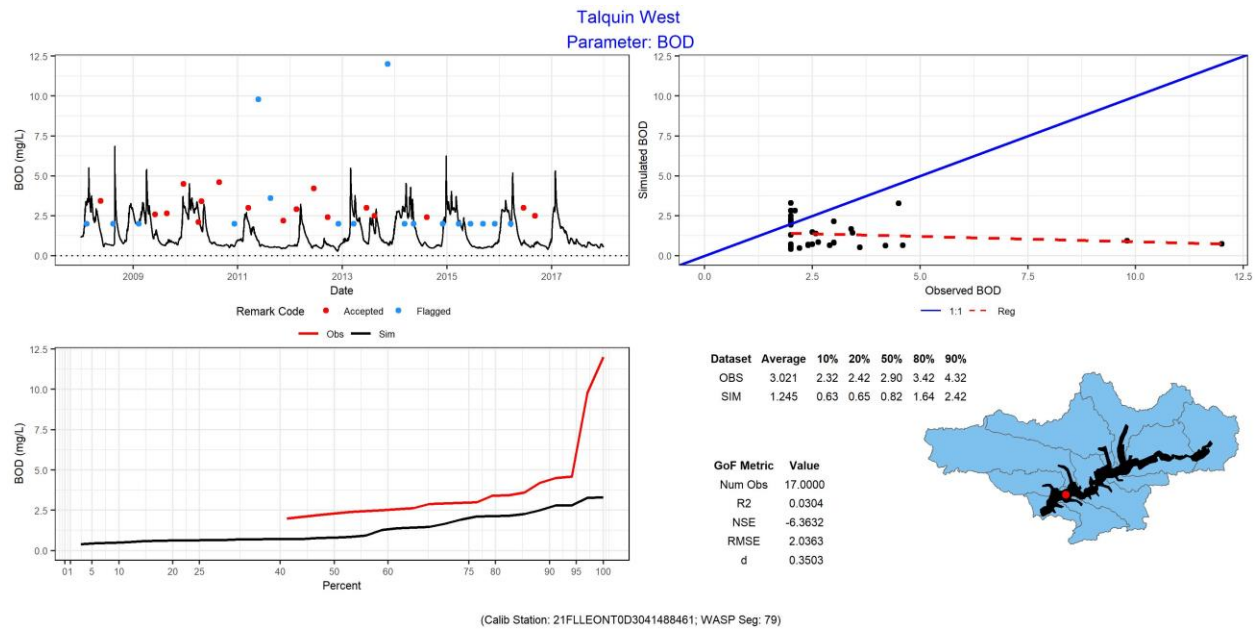


Figure 222 CBOD – Lake Talquin at Talquin West

Total Suspended Solids

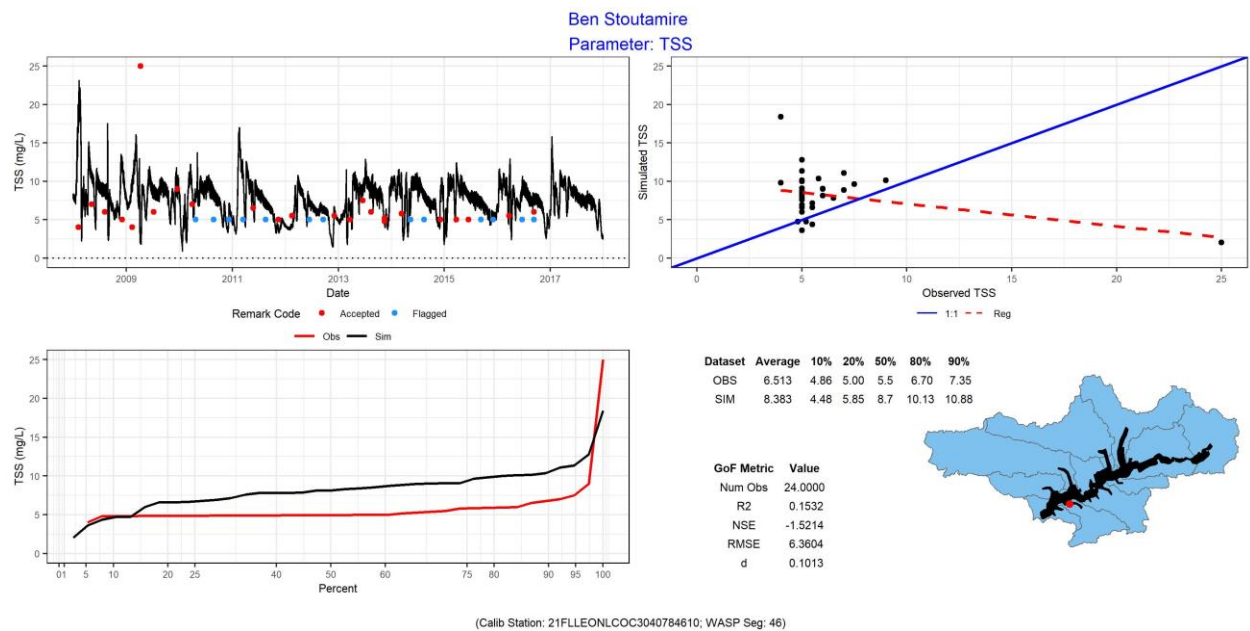


Figure 223 TSS – Lake Talquin at Ben Stoutamire

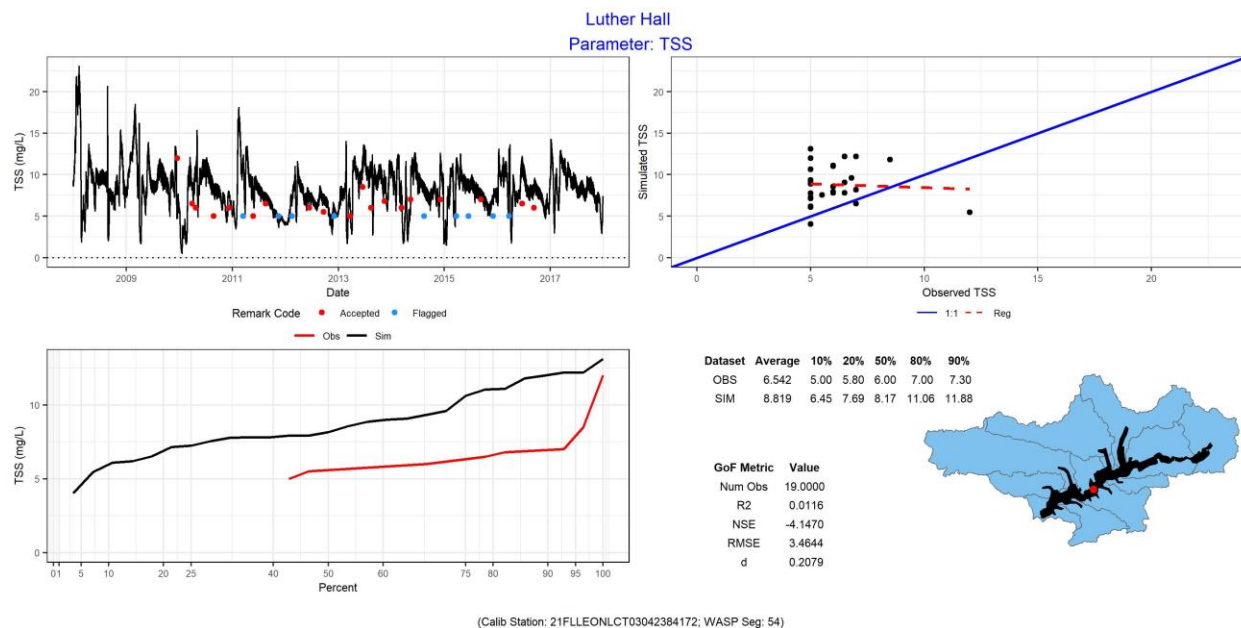


Figure 224 TSS – Lake Talquin at Luther Hall

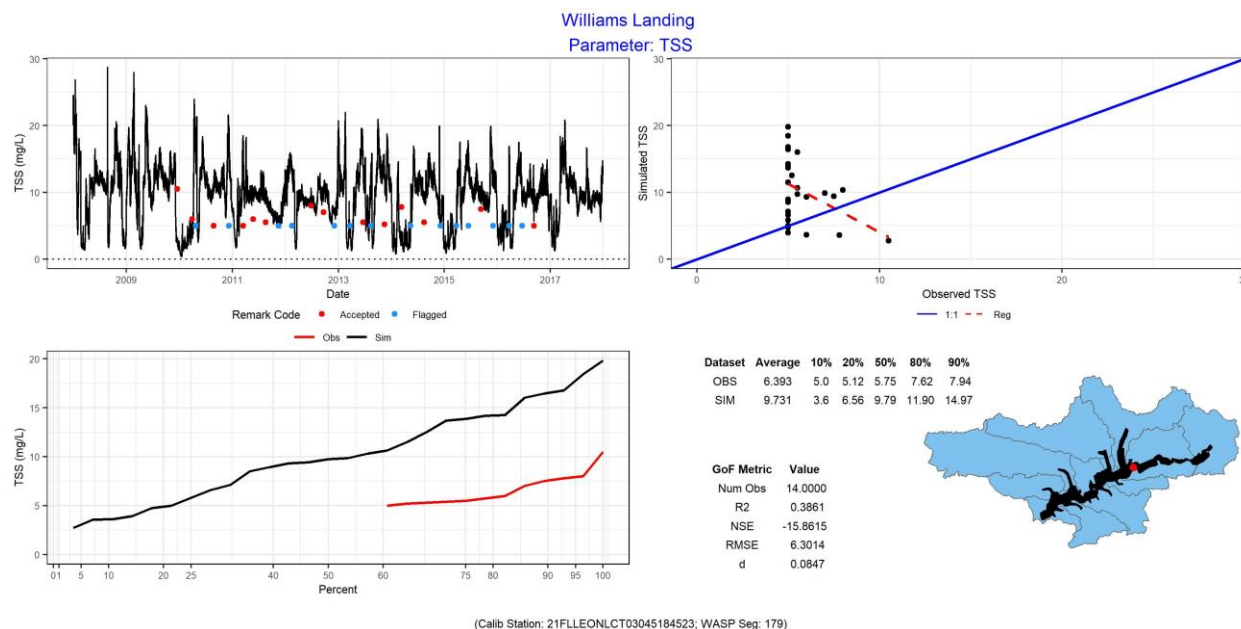


Figure 225 TSS – Lake Talquin at Williams Landing

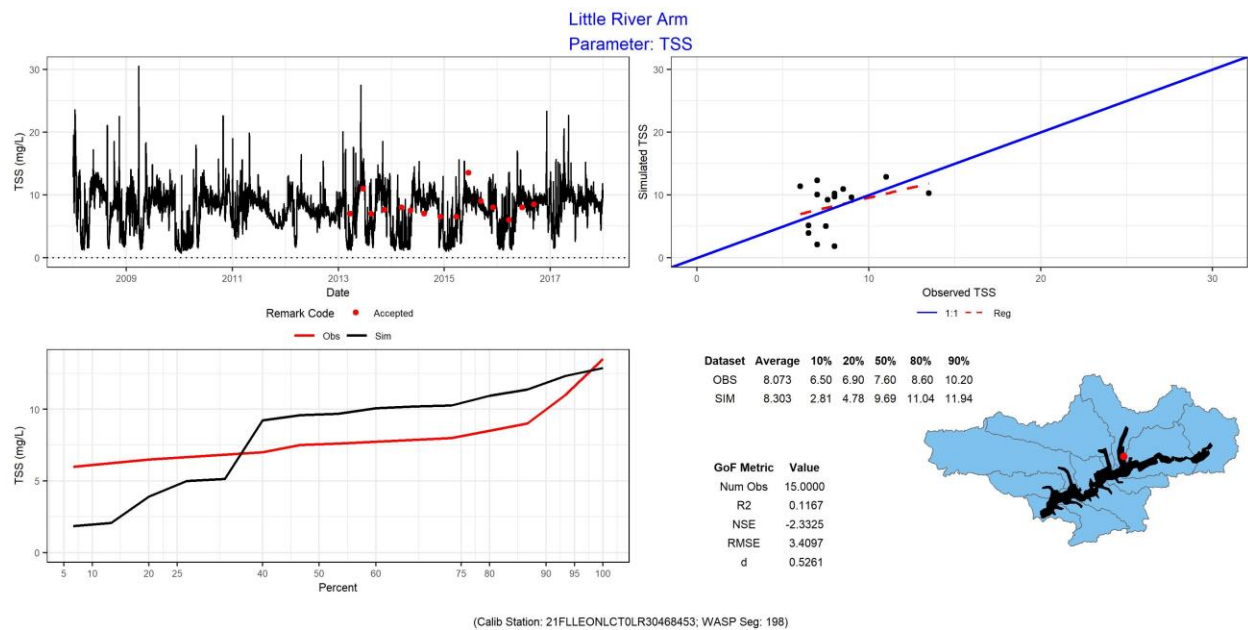


Figure 226 TSS – Lake Talquin at Little River Arm

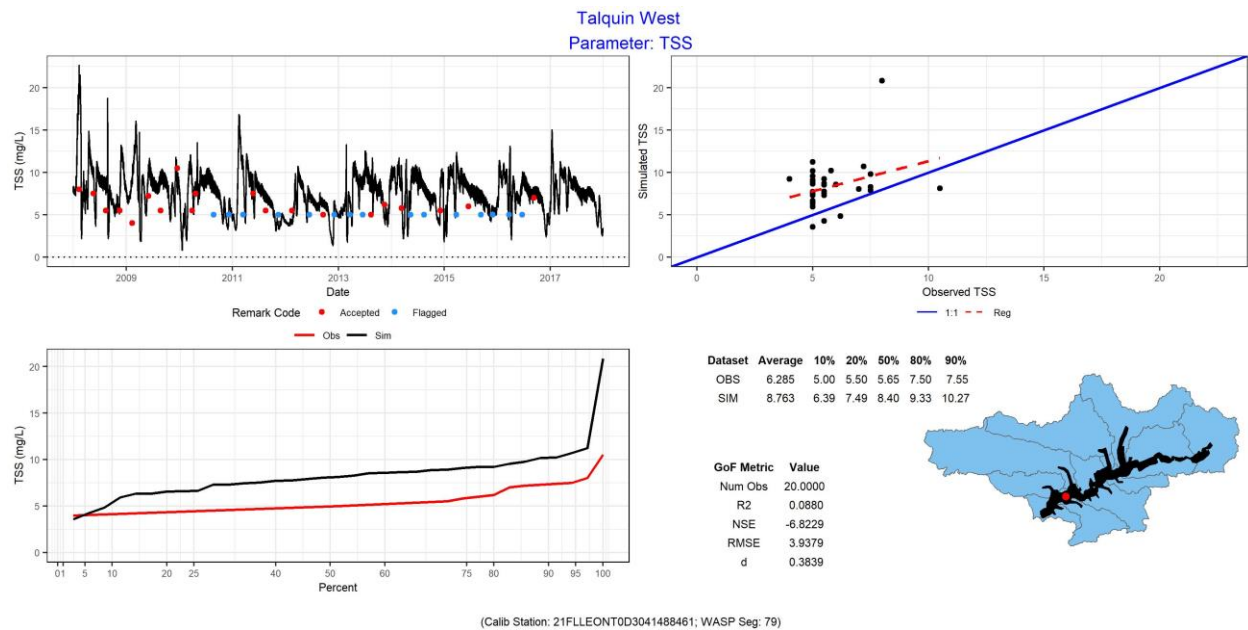


Figure 227 TSS – Lake Talquin at Talquin West