

NORTHWEST DISTRICT • OCHLOCKONEE–ST. MARKS BASIN

Draft TMDL Report
Attachment 1
Lake Talquin Nutrient and DO TMDLs
Data Summary, Data,
Figures, and Tables

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B.1 Lake Talquin Watershed

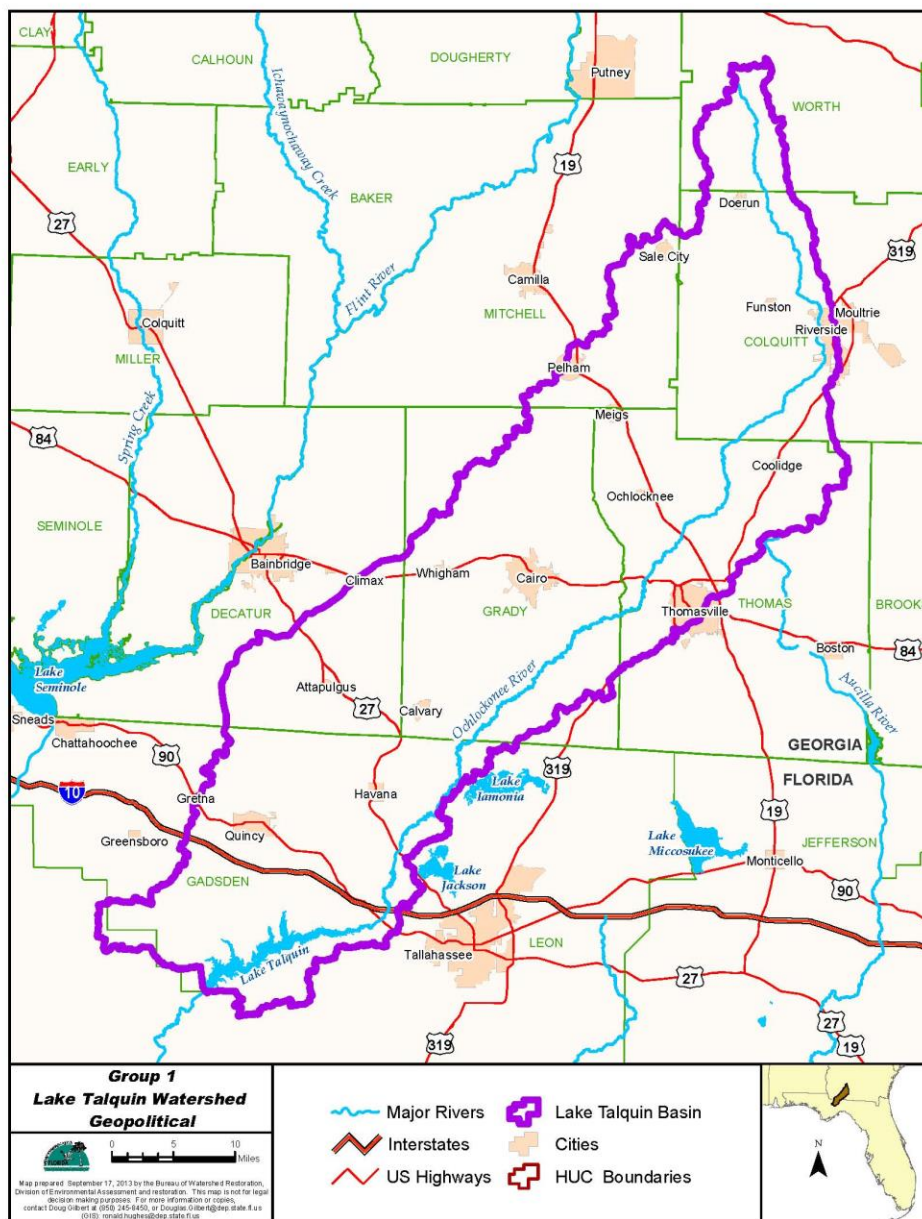


Figure B.1.1. Location of the Lake Talquin Watershed in the Ochlockonee–St. Marks Basin

Table B.1.1. Lake Talquin Subbasin Area and Data Review

Lake Talquin Watershed Subbasin	WBID	Inlet to Lake Talquin	Assessed	Acres	SqMile	Percent of Watershed
Upper Ochlockonee	1297E	Y	Y	690204.8	1078.4	69.3
Hunter Creek	787	Y	ND	1590.9	2.5	0.2
Double Branch Creek	798	Y	ND	2678.7	4.2	0.3
Mule Creek	804	Y	ND	1271.6	2.0	0.1
Pole Branch	831	Y	ND	504.1	0.8	0.1
Little River	424	Y	Y	24357.4	38.1	2.4
Attapulcus Creek (to the Little River)	Georgia	N	2013 Study	41089.1	64.2	4.1
Little Attapulcus Creek (to Attapulcus)	Georgia	N	2013 Study	15957.7	24.9	1.6
Swamp Creek (to Little River)	427	N	N	36558.6	57.1	3.7
Salem Creek (to Little River)	480	N	N	3537.0	5.5	0.4
Willacoochee Creek (to Little River)	410	N	N	41591.6	65.0	4.2
Quincy Creek (to Little River)	(1303 and 1303a)	N	N	25110.5	39.2	2.5
Hurricane Creek (to Little River)	540	N	N	8208.5	12.8	0.8
Monroe Creek (to Little River)	711	N	N	5204.2	8.1	0.5
Richlander Creek	680	Y	Y	5801.6	9.1	0.6
Rocky Comfort Creek	1304	Y	Y	27760.2	43.4	2.8
Bear Creek	757	Y	Y	7582.7	11.9	0.8
Bear Creek Outlet	(part of 757)	Y	Y	18301.3	28.6	1.8
McIntosh Branch (between Bear and Ocklawaha)	849	Y	ND	490.8	0.8	0.0
Cuban Branch	(part of 1297C)	Y	ND	689.6	1.1	0.1
Ocklawaha Creek	811	Y	Y	19884.1	31.1	2.0
Hammock Creek	879	Y	Y	4466.9	7.0	0.4
Freeman Creek	954	Y	Y	4970.8	7.8	0.5
Harvey Creek	921	Y	Y	5297.4	8.3	0.5
Polk Creek	896	Y	Y	2806.4	4.4	0.3
Total Watershed				995,916.6	1,556.2	100.0
Lake Talquin	1297C and 1297D	N	Y	8189.3	12.8	
Ochlockonee River below Lake Talquin	1297B	N	Y			

Table B.1.2. Lake Talquin Watershed Area in Florida and Georgia

Watershed	Sq miles	Percent
Total area	1556.2	100.0
Florida	418.7	26.9
Georgia	1137.5	73.1
Ochlockonee River	1078.4	69.3
Little River	315.0	20.2
All Other	162.7	10.5

B.2 Rainfall

The annual average rainfall during 1980–2012 was 58.7 inches. From 2006 through 2012 (modeled period), years within an inch of the long-term average were considered as average years and include 2009 (58.1), 2010 (58.6), and 2012 (59.3). Dry years would be years with annual average rainfall less than 57.7 inches and includes 2006 (49.4), 2007 (44.5), and 2011 (34.8). The year 2011, with only 34.8 inches of rainfall, was the driest year during the period examined (1980 - 2012). Wet years would be years with greater than 59.7 inches of rainfall and includes 2008 (60.4). The period 2006 through 2012 included one wet year, three dry years, and three average years (**Figure B.2.3** and **Table B.2.1**).

From the data in **Figure B.2.4**, it can be seen that each year starts with increasing rainfall through March, followed by a drier period in April and May (among the driest months of the year). The months of June, July, and August are the wettest months.

B.2 Rainfall Tallahassee Regional Airport 1980–2013

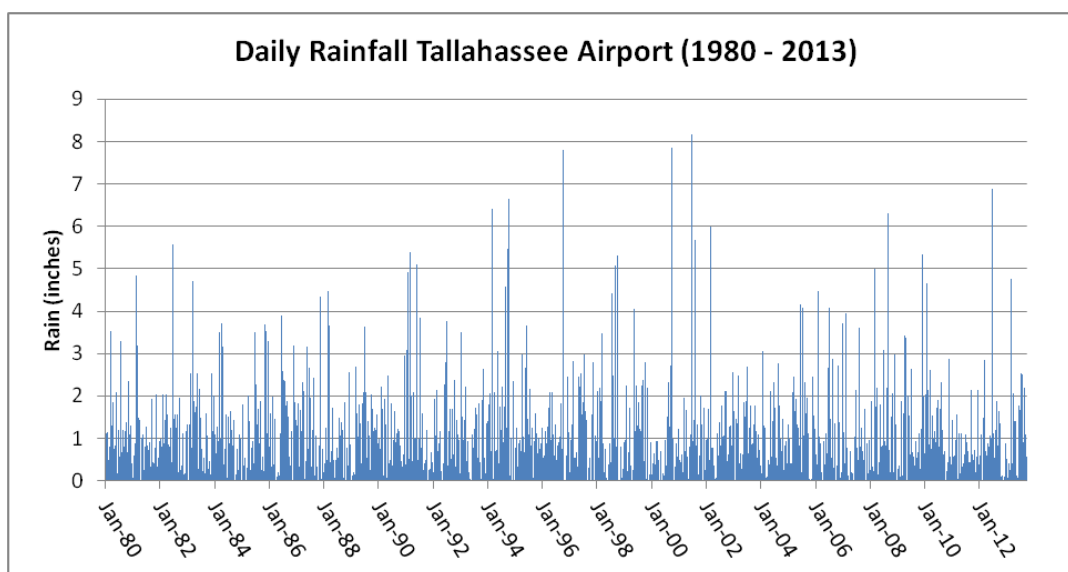


Figure B.2.1. Daily Rainfall 1980–2013 Tallahassee Regional Airport

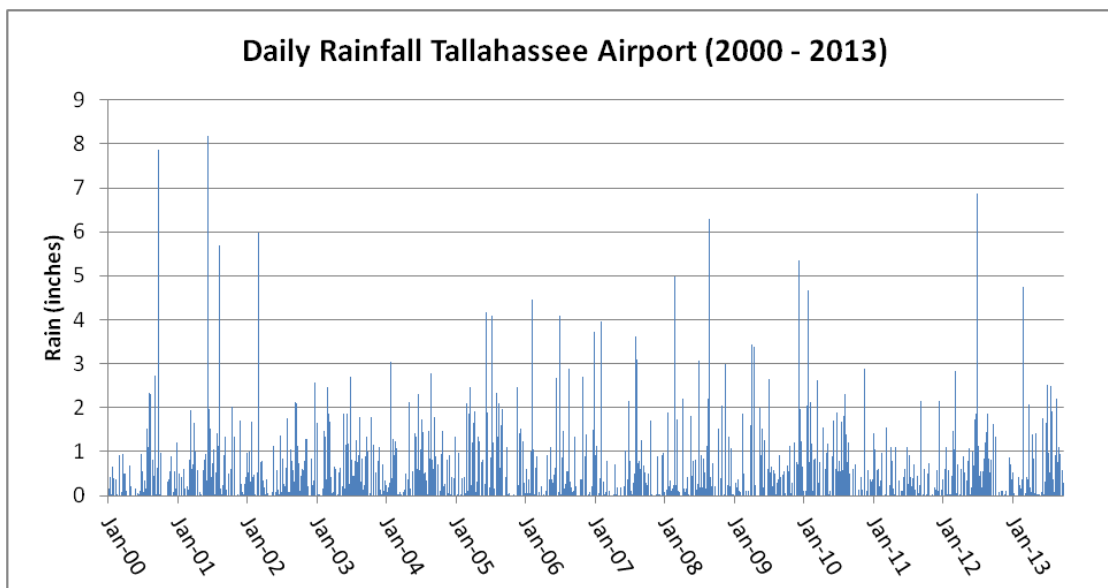


Figure B.2.2. Daily Rainfall 2000–13 Tallahassee Regional Airport

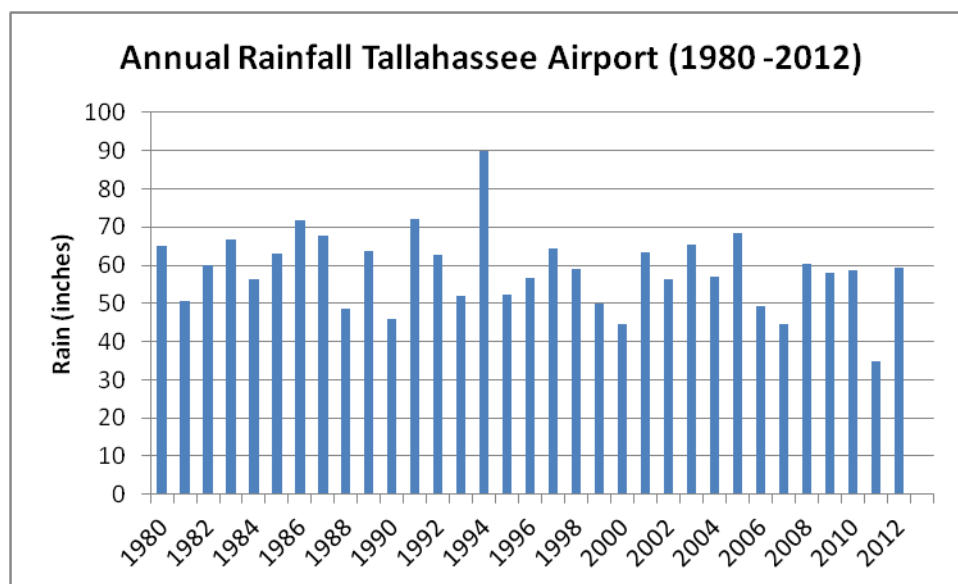


Figure B.2.3. Annual Average Rainfall 1980–2012 Tallahassee Regional Airport

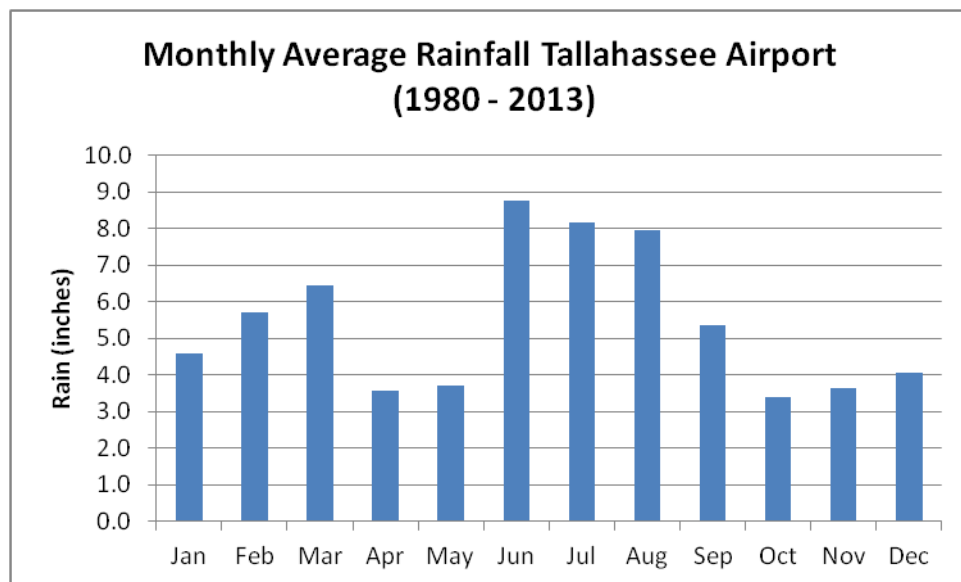


Figure B.2.4. Monthly Average Rainfall 1980–2013 Tallahassee Regional Airport

Table B.2.1. Annual Rainfall Tallahassee Regional Airport

Year	Rain (inches)
1980	65.1
1981	50.7
1982	60.1
1983	66.9
1984	56.2
1985	62.9
1986	71.8
1987	67.8
1988	48.5
1989	63.6
1990	45.7
1991	72.3
1992	62.8
1993	52.0
1994	89.9
1995	52.4
1996	56.7
1997	64.3
1998	58.9
1999	50.1
2000	44.5
2001	63.5
2002	56.4
2003	65.3
2004	56.9
2005	68.3
2006	49.4
2007	44.5
2008	60.4
2009	58.1
2010	58.6
2011	34.8
2012	59.3
Average	58.7

Table B.2.2. Monthly Rainfall Tallahassee Regional Airport

Month	Rain (inches)
Jan	4.6
Feb	5.7
Mar	6.5
Apr	3.6
May	3.7
Jun	8.8
Jul	8.2
Aug	8.0
Sep	5.4
Oct	3.4
Nov	3.6
Dec	4.1

B.3 River Flows

Below are all of the tables and figures for the daily average measured flows at Ochlockonee River above Lake Talquin (Hwy 27, near Havana, FL, USGS gauge 02329000), Little River just above Lake Talquin (Hwy 268, near Midway, FL, USGS gauge 02329600), Ochlockonee River below Lake Talquin (just below Hwy 20, near Bloxam, FL., USGS gauge 02330000), and spot flow measurements on Richlander Creek (State RD. 65B), Rocky Comfort Creek (State Rd. 65B), Bear Creek (Hwy 267), and Ocklawaha Creek (Hwy 267).

From the data in **Figure B.3.7** and **Table B.3.1**, it can be seen that the Ochlockonee River average flow of 766.7 cfs is slightly greater than 3 times the average flow of 254.5 cfs for the Little River and that while there are ~ 13 small streams flowing into the lake, the two main rivers make up 84.7 % of the outflow from the lake (**Figure B.3.11** and **Table B.3.1**). The monthly average flow in **Figure B.3.12**, shows that the highest flows occur from January through April with a large drop in flow during May, corresponding to the drop in rainfall during April and May, slightly increasing through August and then declining through the fall lagging a bit with monthly rainfall (**Figure B.2.4**). There are 13 small streams that discharge directly to Lake Talquin. Of these, 4 have had flows measured sporadically between 1956 and 2013. As seen on **Figures B.3.11** through **B.3.20** and **Table B.3.1**, these data indicate that the flows from these small streams may make up only 6.6 % of the outflow from the lake and that Ocklawaha Creek, with an average flow of 49 cfs, makes up about 60 % of the flow from these streams.

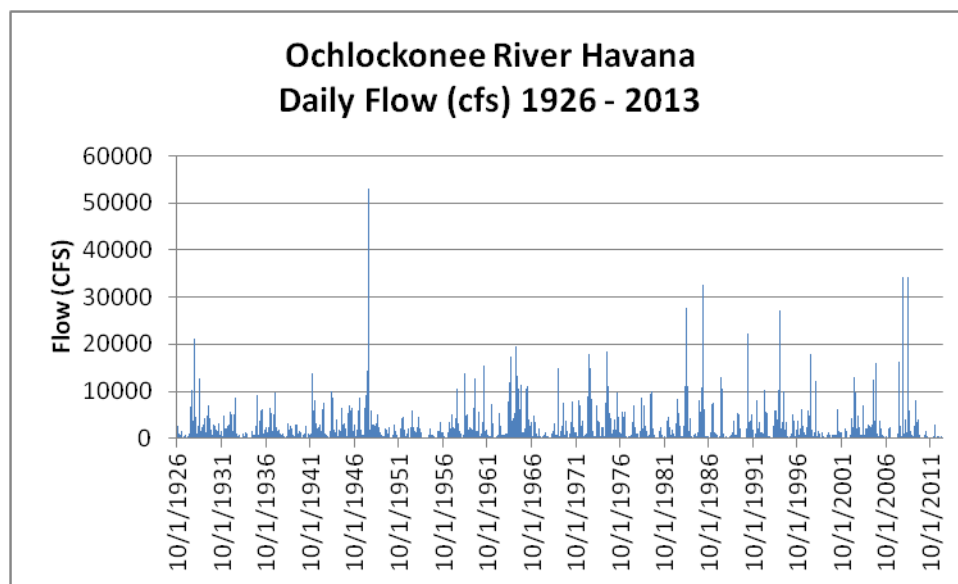


Figure B.3.1. Ochlockonee River Daily Flow above Lake Talquin 1926–2013

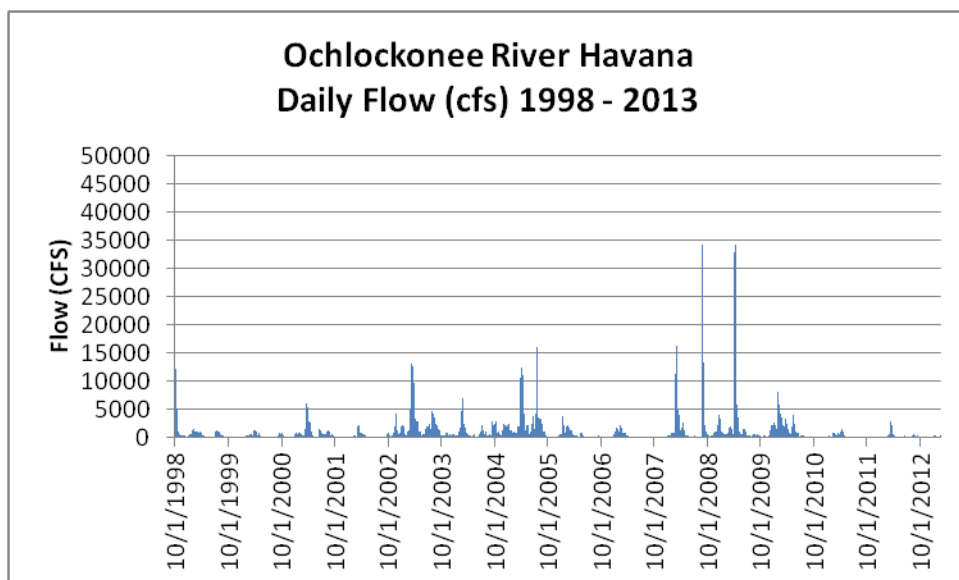


Figure B.3.2. Ochlockonee River daily flow above Lake Talquin 1998–2013

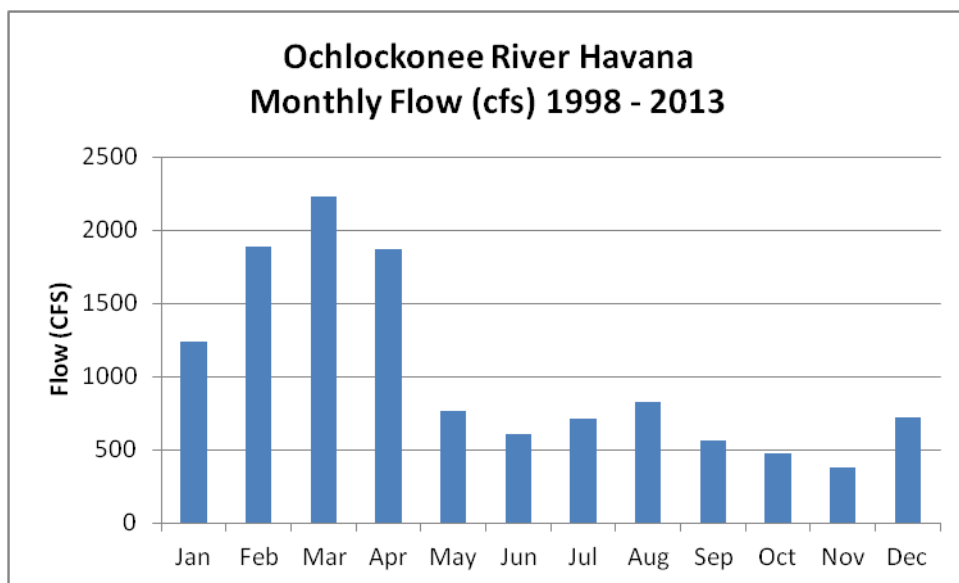


Figure B.3.3. Ochlockonee River Monthly Flow above Lake Talquin 1998–2013

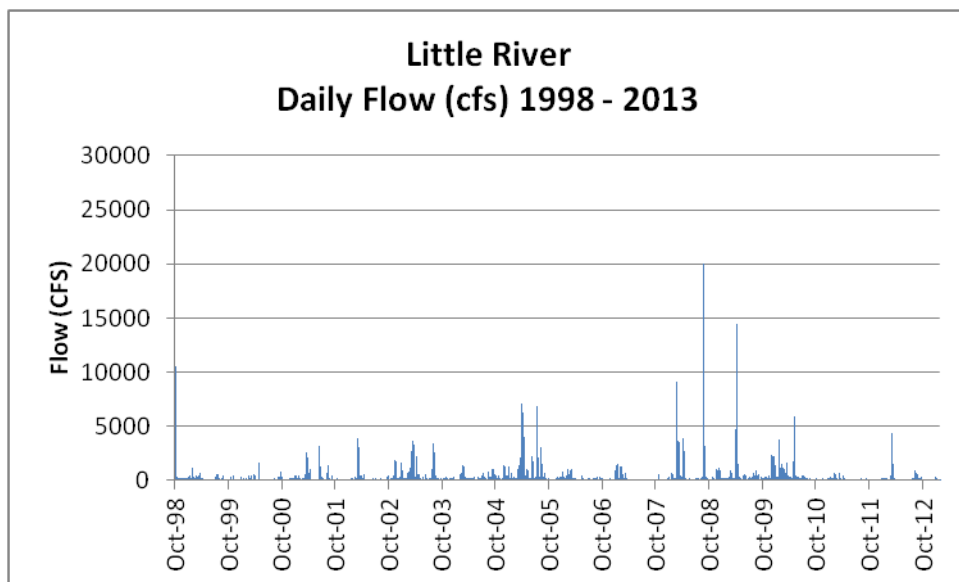


Figure B.3.4. Little River Daily Flow into Lake Talquin 1998–2013

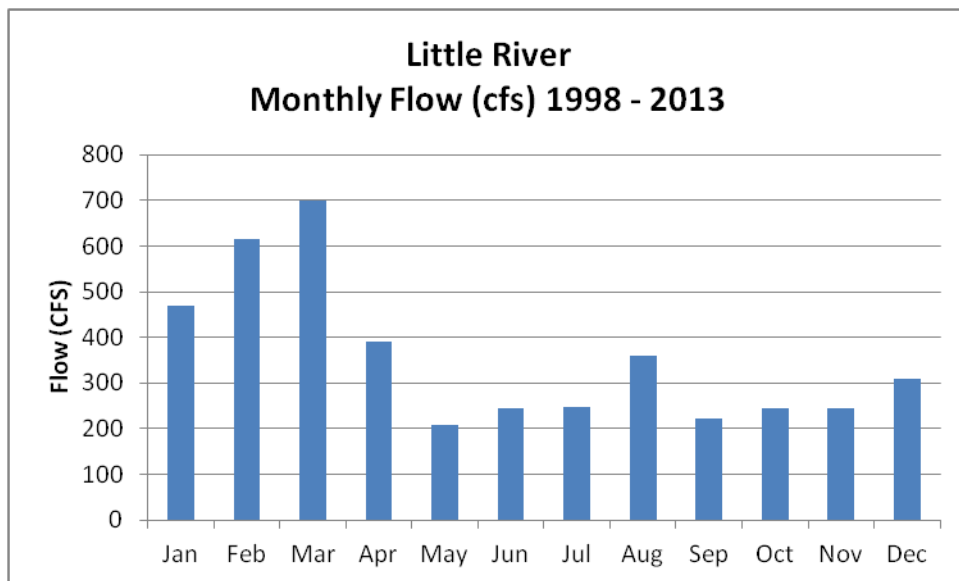


Figure B.3.5. Little River Monthly Flow into Lake Talquin 1998–2013

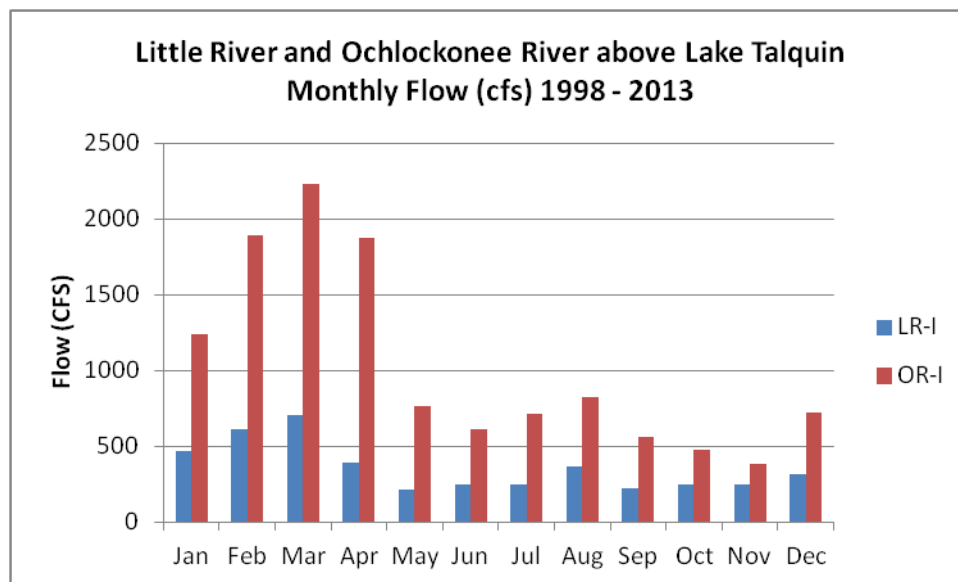


Figure B.3.6. Little and Ochlockonee River Monthly Flow into Lake Talquin 1998–2013

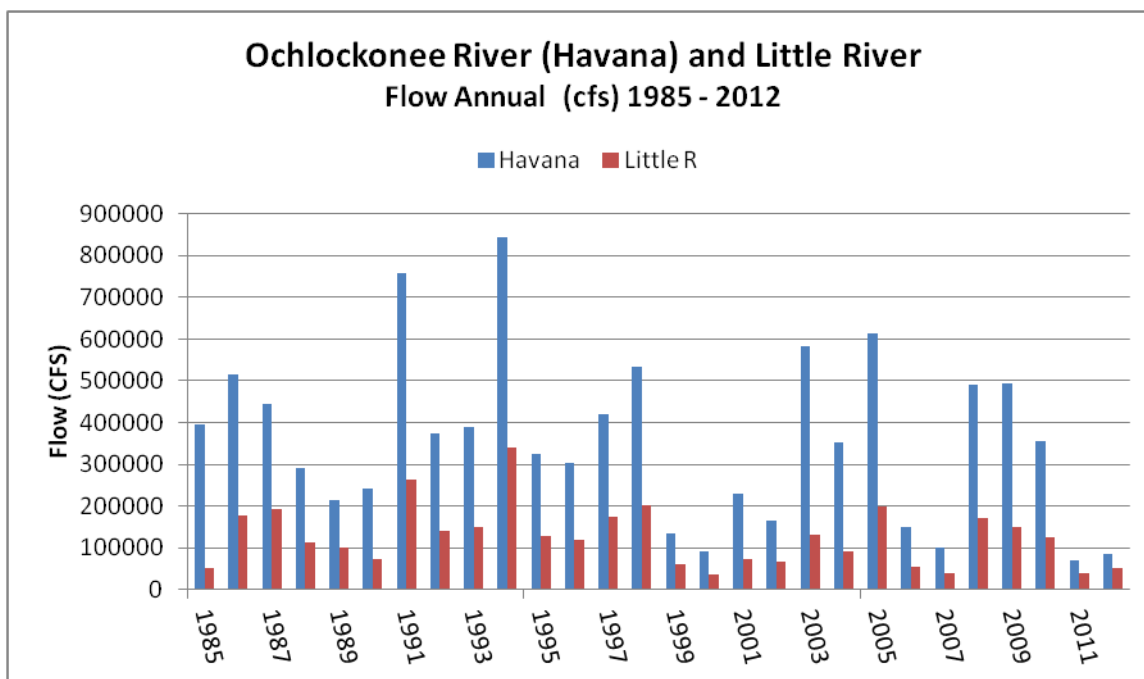


Figure B.3.7. Little and Ochlockonee River Annual Flow into Lake Talquin 1985–2013

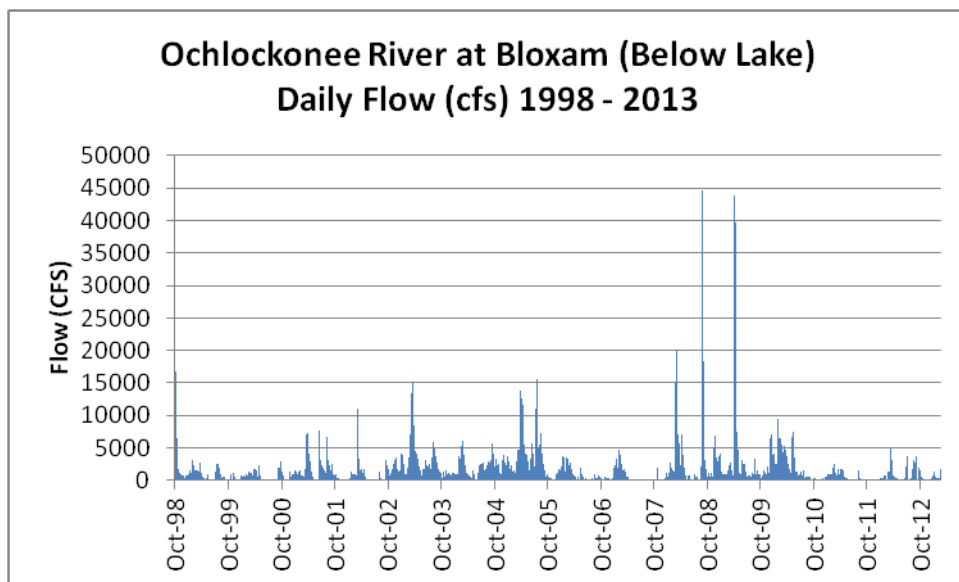


Figure B.3.8. Ochlockonee River Daily Flow out of Lake Talquin 1998–2013

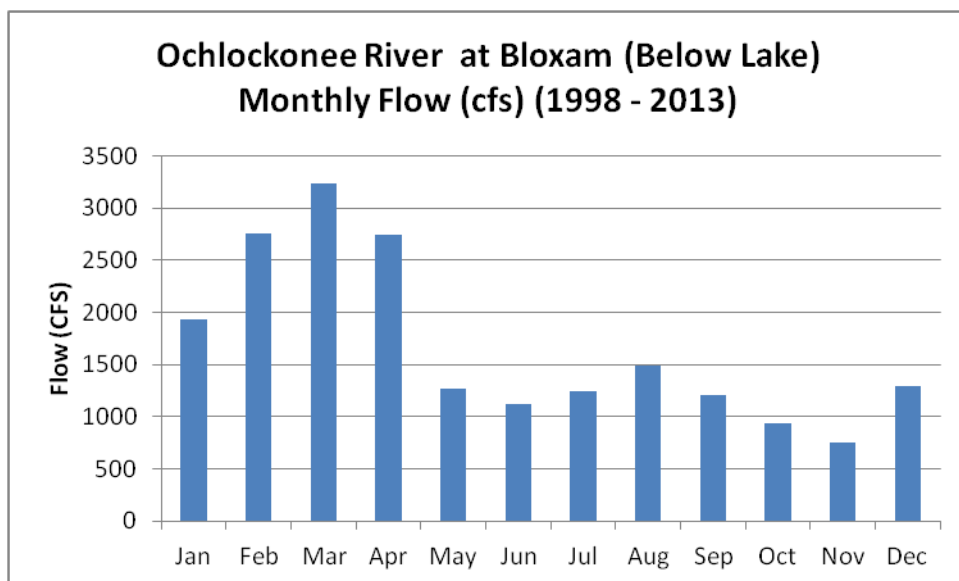


Figure B.3.9. Ochlockonee River Monthly Flow out of Lake Talquin 1998–2013

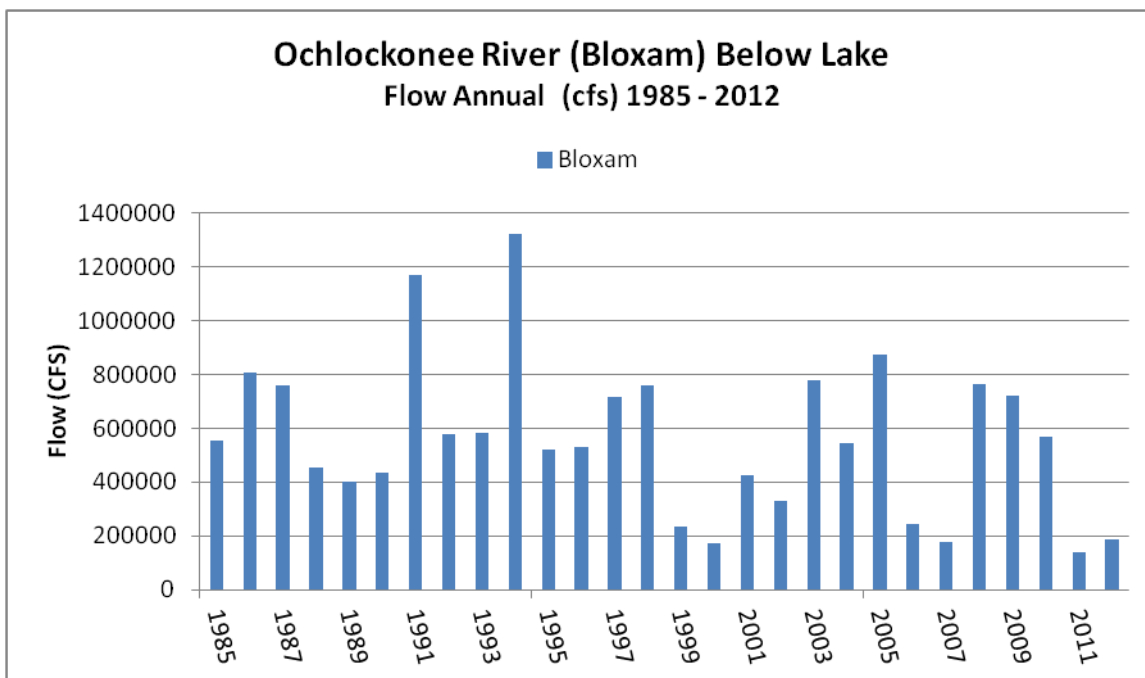


Figure B.3.10. Ochlockonee River Annual Flow out of Lake Talquin 1998–2013

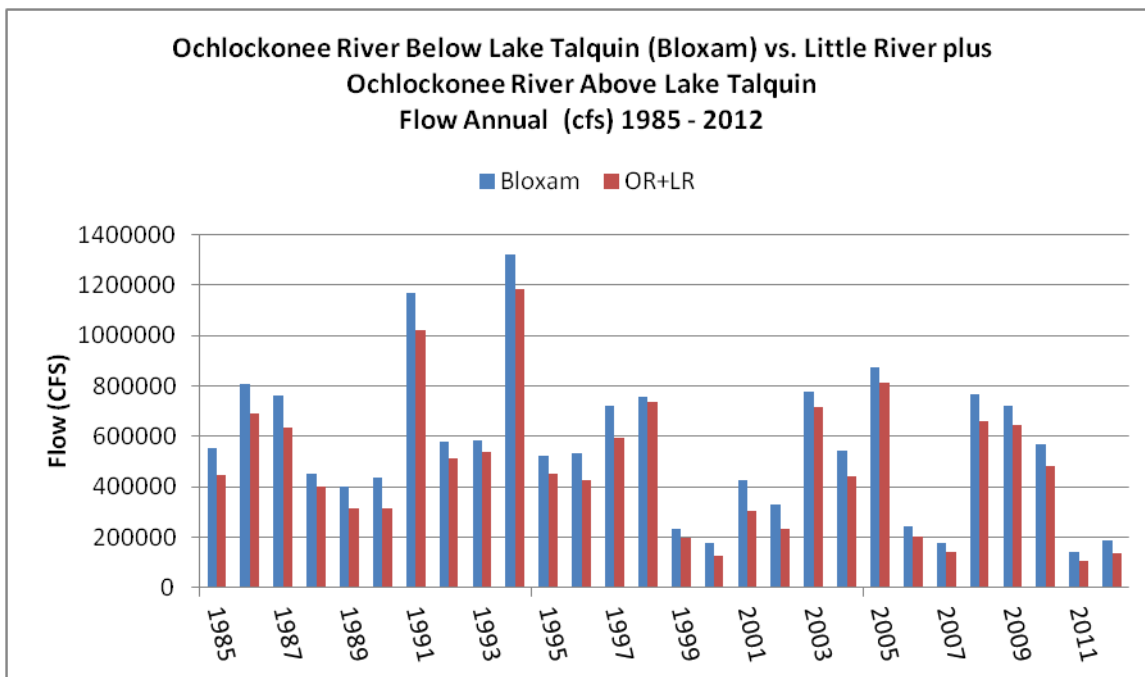


Figure B.3.11. Little and Ochlockonee River Annual Flow in and Ochlockonee River Flow out of Lake Talquin 1985–2013

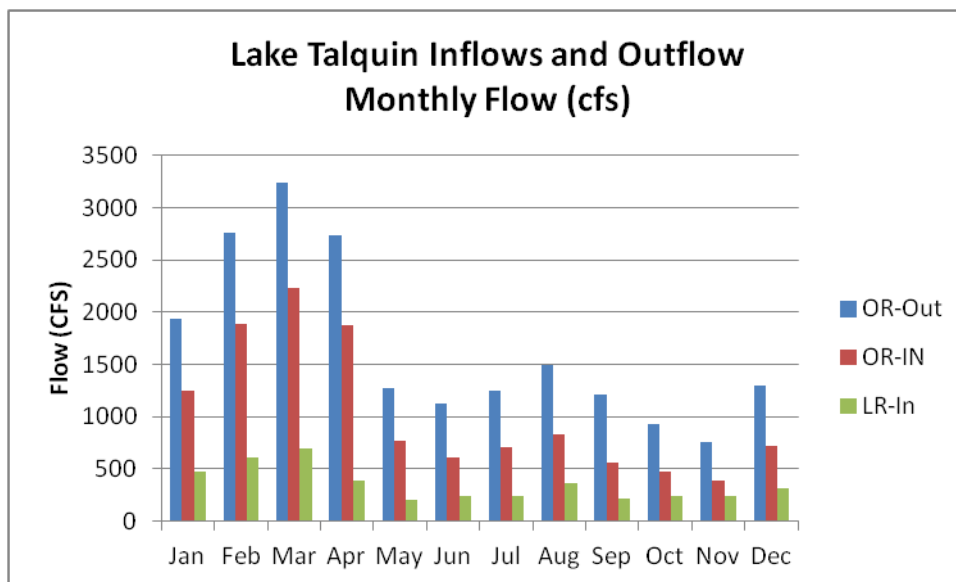


Figure B.3.12. Little and Ochlockonee River Monthly Flow in and Ochlockonee River Flow out of Lake Talquin 1985–2013

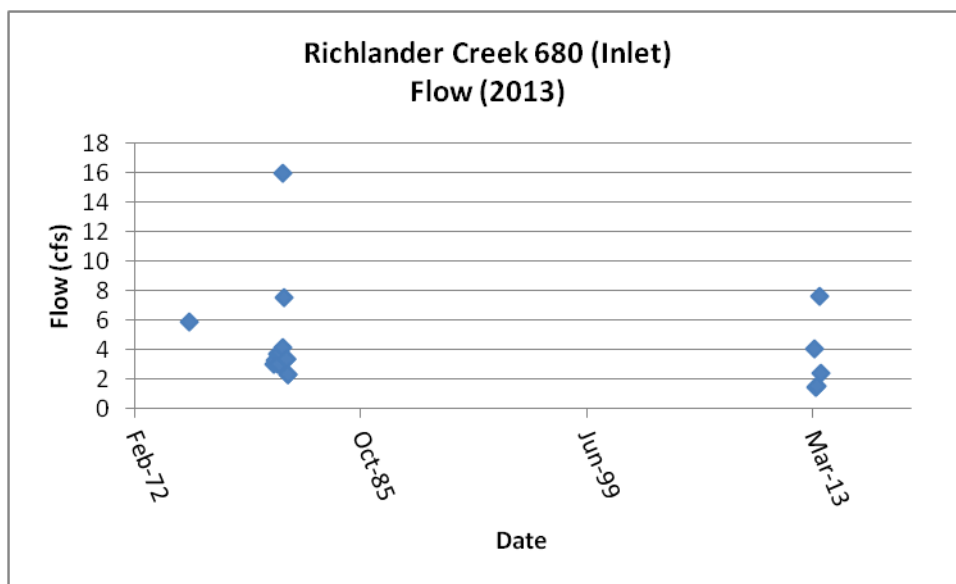


Figure B.3.13. Richlander Creek Measured Flow (cfs) 1975–2013

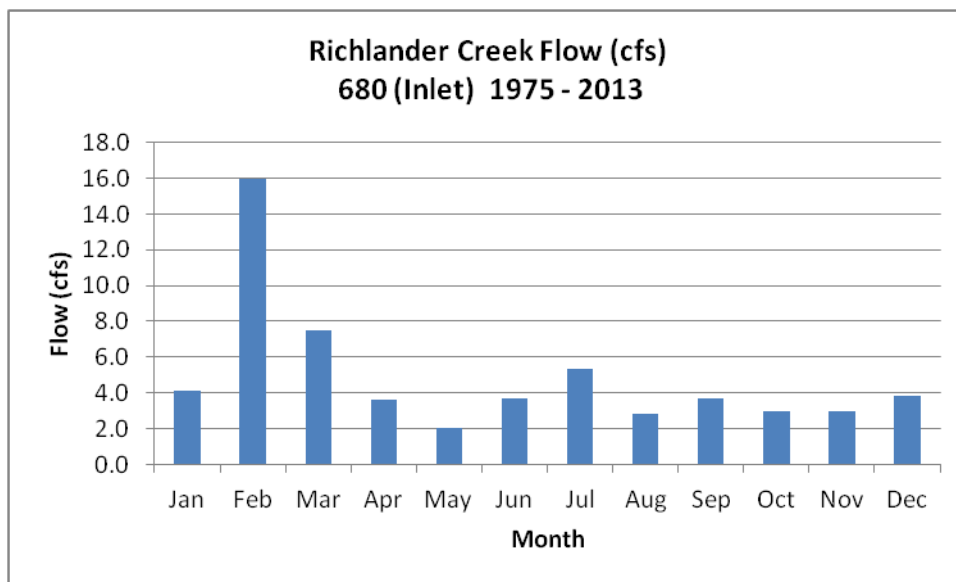


Figure B.3.14. Richlander Creek Monthly Average Flow (cfs) 1975–2013

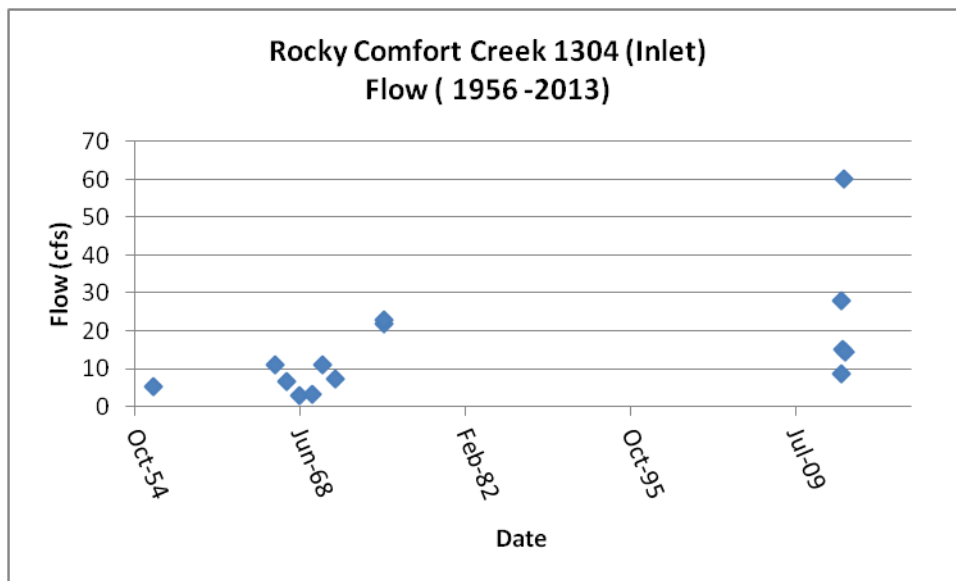


Figure B.3.15. Rocky Comfort Creek Measured Flow (cfs) 1975–2013

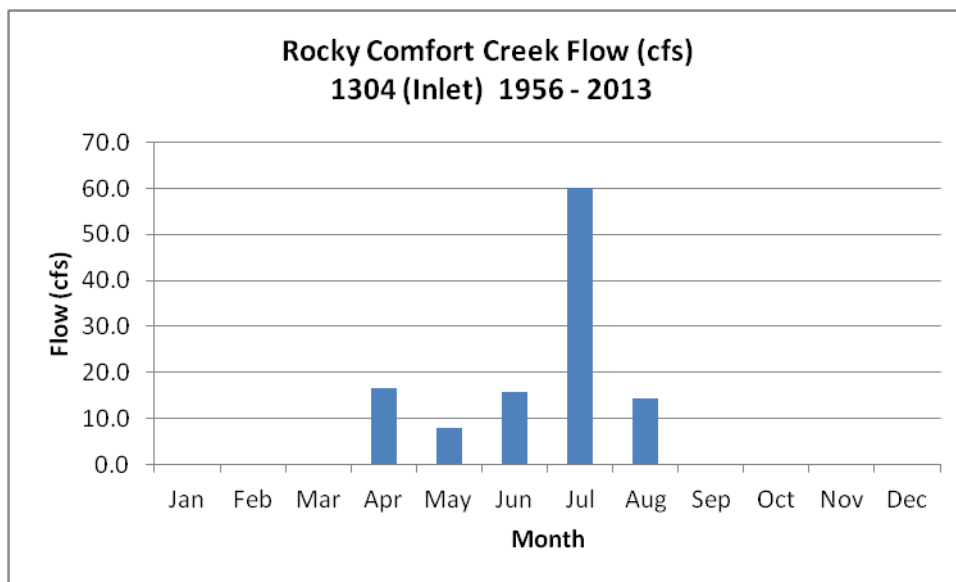


Figure B.3.16. Rocky Comfort Creek Monthly Average Flow (cfs) 1956–2013

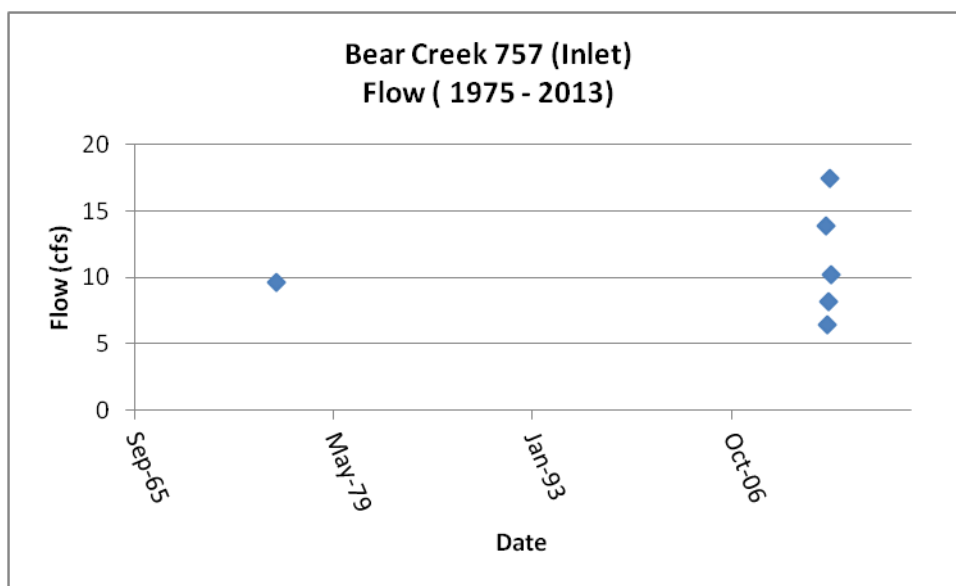


Figure B.3.17. Bear Creek Measured Flow (cfs) 1975–2013

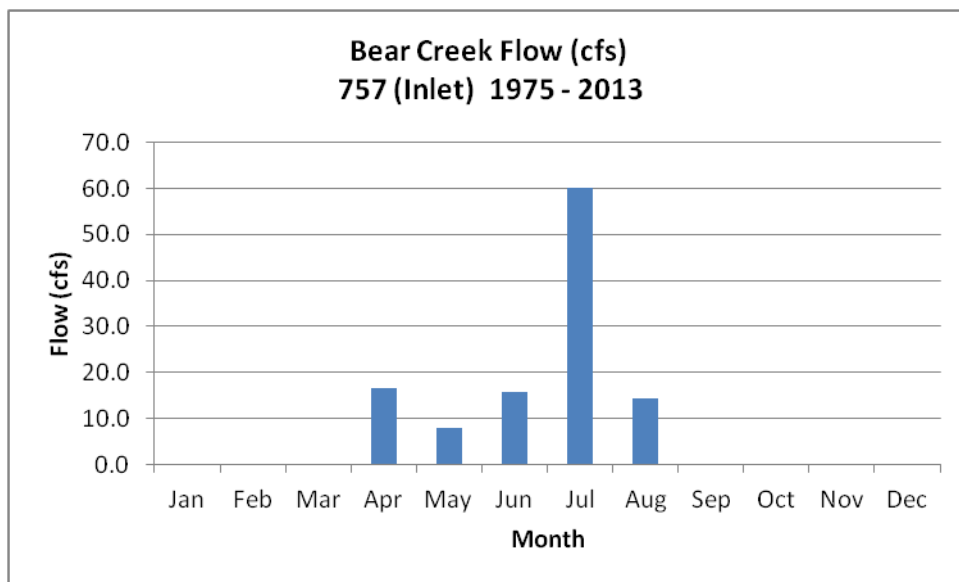


Figure B.3.18. Bear Creek Monthly Average Flow (cfs) 1975–2013

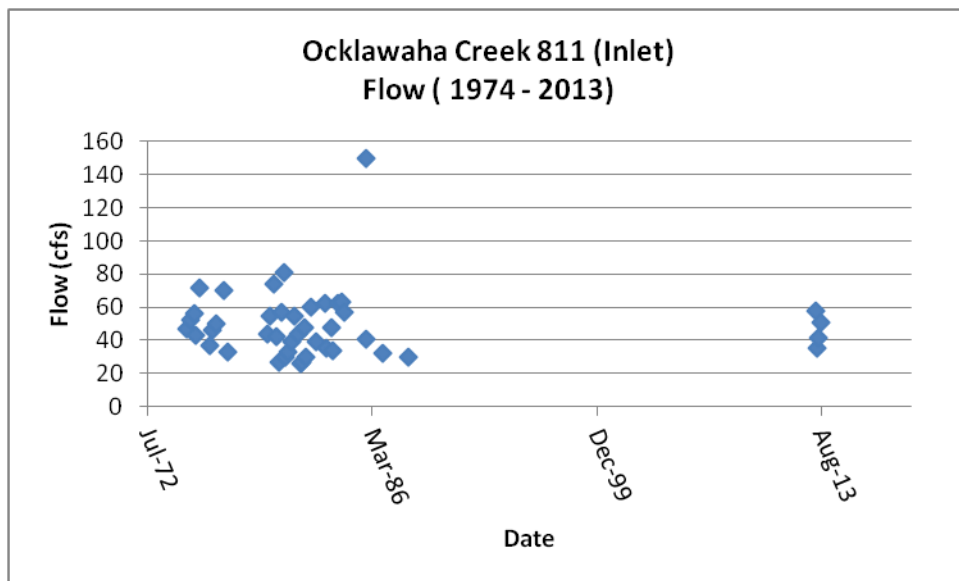


Figure B.3.19. Ocklawaha Creek Measured Flow (cfs) 1974–2013

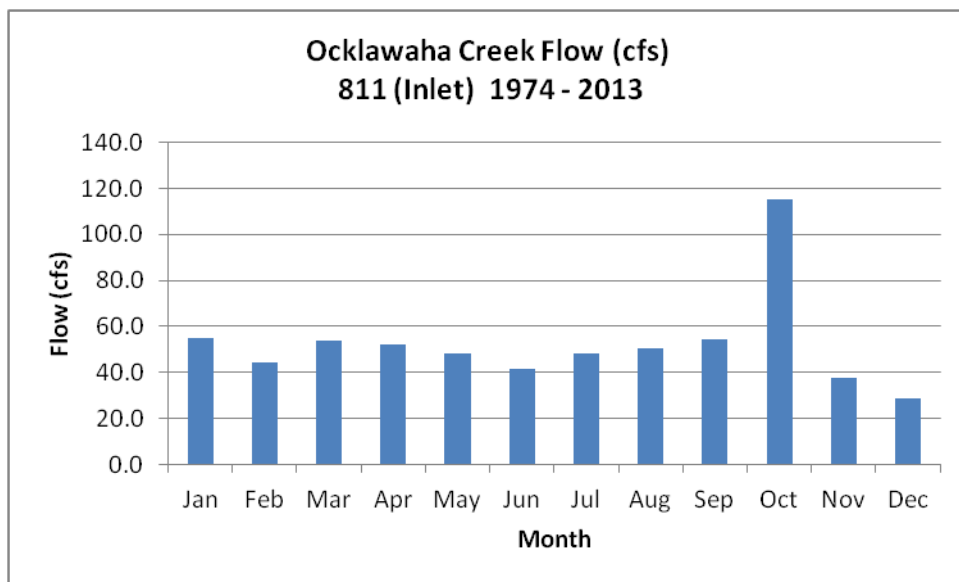


Figure B.3.20. Ocklawaha Creek Monthly Average Flow (cfs) 1974–2013

Table B.3.1. Flow Summaries

Category	Unit	Ochlockonee River at Concord	Ochlockonee River at Havana	Little River	Ochlockonee + Little River	Richlander	Rocky Comfort	Bear	Ocklawaha	Ochlockonee River at Bloxam
		10/1/1998-2/1/2013	10/1/1998-2/1/2013	10/1/1998-2/1/2013	10/1/1998-2/1/2013	1975 - 2013 (20 results)	1956 - 2013 (14 results)	1975 - 2013 (6 results)	1974 - 2013 (43 results)	10/1/1998-2/1/2013
Min	cfs	6.8	9.4	4.3		1.5	3.0	6.5	26.0	39.0
Max	cfs	44,500.0	34,300.0	20,000.0		16.0	60.1	17.5	150.0	44,600.0
Median	cfs	248.0	290.0	116.0	406.0	3.4	11.0	9.9	46.0	559.0
Mean	cfs	770.3	766.7	254.5	1,021.2	4.3	15.6	11.0	49.2	1,205.6
10th	cfs	39.0	49.0	24.0	73.0	2.2	3.9	7.3	30.0	101.9
75th	cfs	789.0	791.0	232.0	1,023.0	4.0	20.3	13.0	57.0	1,430.0
90th	cfs	1,750.0	1,820.0	434.7	2,254.7	7.5	26.4	15.7	68.6	2,860.0
Count		5250	5250	5234		20	14	6	43	5250

Table B.3.2. Flow and Load Estimates

Basin	Flow (mean)	Flow Percent	TN-GM	TN	TN	TP-GM	TP	TP
	cfs	Percent	(mg/L)	(lbs/day)	Percent Load	(mg/L)	(lbs/day)	Percent Load
OR-I	797.7	66.2	1.05	4517.7	59.6	0.107	460.4	69.5
LR-I	282.7	23.4	1.8	2744.7	36.2	0.102	155.5	23.5
Tribs-G	80.1	6.6	0.54	233.3	3.1	0.097	41.9	6.3
Tribs-L*	45.1	3.7	0.37	90.0	1.2	0.018	4.4	0.7
Total	1205.6	100		7585.7	100		662.2	100
OR-O	1205.6			4812.0			357.7	

B.4 Water Quality Data

Summary data is presented for subbasins draining directly to Lake Talquin, starting with WBID 1297E, the Ochlockonee River above Lake Talquin (OR-I) and proceeding in a counter clockwise direction around the lake following the order in **Table B.1.1**. **Figure B.1.2** shows the location of each subbasin in **Table B.1.1**. Several streams are not described, as there is no data in IWR Run 47 for these watersheds. These include, Hunter Creek (WBID 787), Double Branch Creek (WBID 798), Mule Creek (WBID 804), Pole Branch (WBID 831), McIntosh Branch (WBID 849), and Cuban Branch (stations are in Lake Talquin WBID 1297C).

B.4A Ochlockonee River Above Lake Talquin WBID 1297E

This WBID is not impaired for DO or nutrients.

Table B.4A.1, lists the 46 stations that have been sampled in the Upper Ochlockonee River (WBID 1297E) watershed. **Figure B.4A.1** depicts the station locations.

Tables B.4A.5 and **B.4A.6** and **Figures B.4A.4** and **B.4A.5**, provide the results for alkalinity. These data show that the Ochlockonee River above Lake Talquin has a period of record (POR) geomean (GM) alkalinity of 16.7 mg/L. The data indicate that the alkalinity for the period (2005–2013) is elevated over the POR (GM 29.0 mg/L vs. 16.7 mg/L). The seasonal pattern indicates that the alkalinity is lowest in the first three months of the year (~10.0 mg/L) and gradually increases through the year to high in November of 30.0 mg/L. This pattern for alkalinity is inversely related to river flow (highest in first three months of the year) (**Figure B.3.12**).

Tables B.4A.5 and **B.4A.6** and **Figures B.4A.6** and **B.4A.7**, provide the results for true color. These data show that the Ochlockonee River above Lake Talquin has a POR GM color of 62.5 PCU. The data indicate that the GM color for the period (2005–2013) of 61.7 PCU is similar to the POR color. The seasonal pattern indicates that the color is highest in the first half of the year (~80.0 PCU) with an average color for July of over 100 PCU, then decreasing through the fall and early winter. This pattern for color appears to be weakly related to river flow (highest color in first half of year when flows are higher and lower in the second half of the year **Figure B.3.12**).

Tables B.4A.5 and **B.4A.6** and **Figures B.4A.9** through **B.4A.12**, provide the results for TN. These data show that the Ochlockonee River above Lake Talquin has a POR GM TN of 0.92 mg/L. The data (**Figure B.4A.11**) indicate that the recent (2005–2013) TN GM of 1.05 mg/L is slightly greater than the TN GM for the POR and the new threshold AGM concentration for TN in the Panhandle East nutrient Watershed Region of 1.03 mg/L. The data also indicate that the overall trend is for declining AGM TN concentrations. This trend is driven by the relatively higher AGM concentrations that occurred from 1980 through 1990. The seasonal pattern indicates that the TN concentration increases from January through April, declines through July,

increases through October and then declines to January. This pattern for TN, high in April and October is not clearly related to rainfall and flow (**Figures B.2.4 and B.3.12**).

Tables B.4A.5 and B.4A.6 and Figures B.4A.13 and B.4A.14, provide the results for NH₄-N. These data show that the Ochlockonee River above Lake Talquin has a POR GM NH₄-N of 0.061 mg/L. The data indicate that the recent (2005–2013) NH₄-N GM of 0.036 mg/L is about half of the POR concentration and that the overall trend is for declining concentrations. This trend is driven by the relatively higher concentrations that occurred up until ~1996.

Tables B.4A.5 and B.4A.6 and Figures B.4A.15 and B.4A.16, provide the results for NO₃-N. These data show that the Ochlockonee River above Lake Talquin has a POR GM NO₃-N of 0.316 mg/L. The data indicate that the recent (2005–2013) NO₃-N GM of 0.329 mg/L is about the same as the POR concentration and that there does not appear to be a trend for this constituent.

Tables B.4A.5 and B.4A.6 and Figures B.4A.18 through B.4A.21, provide the results for TP. These data show that the Ochlockonee River above Lake Talquin has a POR GM TP of 0.158 mg/L. The data (**Figure B.4A.20**) indicate that the recent (2005–2013) TP GM of 0.107 mg/L is slightly less than the TP GM for the POR and the new threshold AGM concentration for TP of 0.18 mg/L. The data also indicate that the overall trend is for declining AGM TP concentrations. This trend is driven by the relatively higher AGM concentrations that occurred from 1972 through 1990. The seasonal pattern indicates that the TP concentration decrease slightly from January through March, are slightly higher from April through August and highest during the fall and early winter. This pattern for TP is not clearly related to rainfall or flow (**Figures B.2.4 and B.3.12**).

Tables B.4A.5 and B.4A.6 and Figures B.4A.22 and B.4A.23, provide the results for PO₄-P. These data show that the Ochlockonee River above Lake Talquin has a POR GM PO₄-P of 0.12 mg/L. The data indicate that the recent (2005–2013) PO₄-P GM of 0.046 mg/L is less than half of the POR concentration and that the overall trend is for declining concentrations. This trend is driven by the relatively higher concentrations that occurred up until ~1996.

Tables B.4A.5 and B.4A.6 and Figures B.4A.24 through B.4A.27, provide the results for CChla. These data show that the Ochlockonee River above Lake Talquin has a POR GM CChla of 2.2 ug/L. The data (**Figure B.4A.26**) indicate that the recent (2005–2013) CChla GM of 2.5 ug/L is not significantly different from the CChla GM for the POR and significantly less than the new threshold AGM concentration for CChla of 20.0 ug/L. The data also indicate that the overall trend is for increasing AGM CChla concentrations. This trend is driven by the relatively higher AGM concentration of ~10.0 ug/L that occurred in 2011. The seasonal pattern indicates that the CChla concentrations peak in May decrease significantly in June, increasing through August, then are reduced in September and October, increased during November and back down in December. This pattern may be influenced by varying detection limits over time and by data provider. The pattern in CChla appears partially related to rainfall and flow (**Figures B.2.4 and**

B.3.12), with increasing flow/rain corresponding, in general, to periods of decreasing CChla concentrations.

Tables B.4A.5 and B.4A.6 and Figures B.4A.28 through B.4A.30, provide the results for BOD5. These data show that the Ochlockonee River above Lake Talquin has a POR GM BOD5 of 1.3 mg/L. The data indicate that the recent (2005–2013) BOD5 GM of 1.9 mg/L is not significantly different than the POR concentration. Variable detection limits over time may be having an influence on the data. There is no apparent overall trend.

Tables B.4A.5 and B.4A.6 and Figures B.4A.31 and B.4A.32, provide the results for DO. These data show that the Ochlockonee River above Lake Talquin has a POR GM DO of 6.2 mg/L. The data indicate that the recent (2005–2013) DO GM of 6.6 mg/L is not significantly different than the POR concentration. There is no apparent overall trend in time. Seasonal data indicate that the monthly average DO is always over 5.0 mg/L (**Figure B.4A.32**).

Tables B.4A.5 and B.4A.6 and Figures B.4A.33 through B.4A.35, provide the results for percent DO saturation. These data show that the Ochlockonee River above Lake Talquin has a POR GM DOSAT of 71.9 %. The data indicate that the recent (2005–2013) DOSAT GM of 74.9 % is slightly higher than the GM for the POR. The data do not appear to have a long-term trend. The data presented in **Figure B.4A.33** indicates that there are sufficient results below the new 67 % saturation DO criterion to warrant further investigation. The seasonal pattern indicates that the DOSAT is lowest in April and highest in June and November.

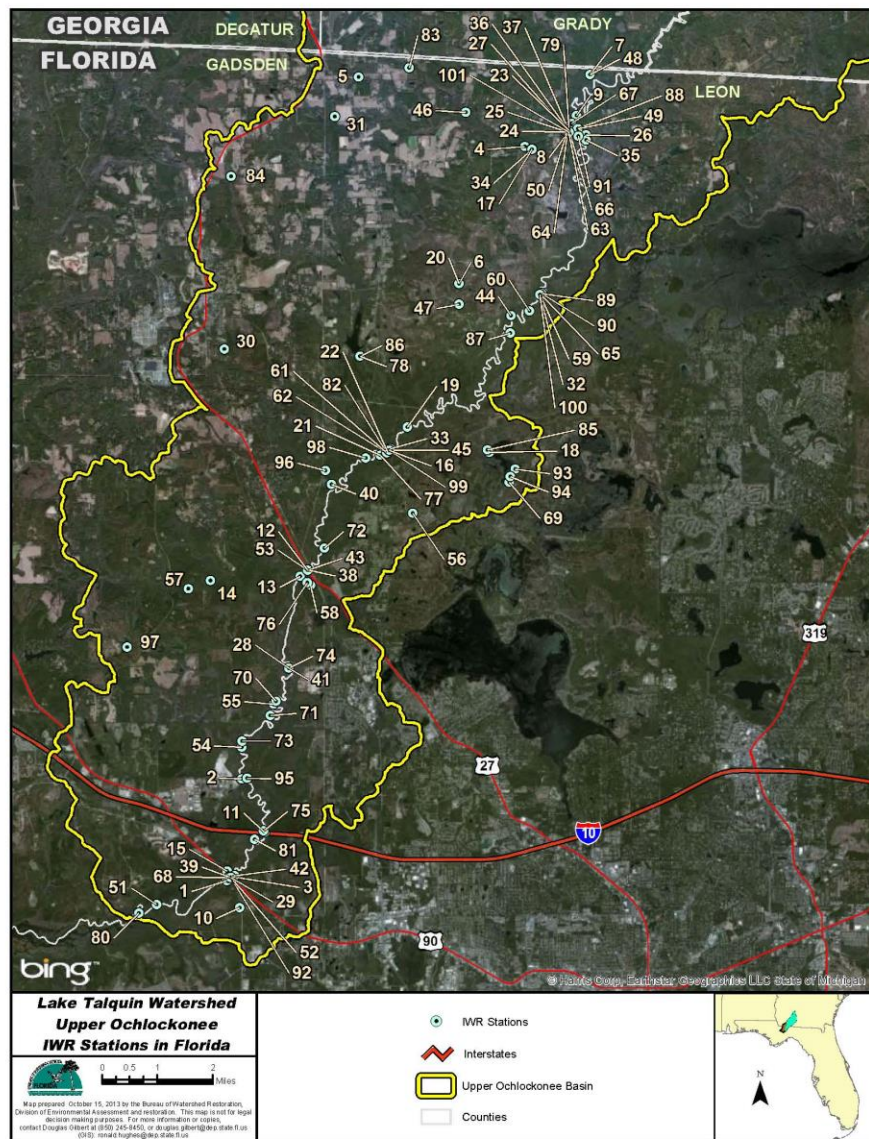
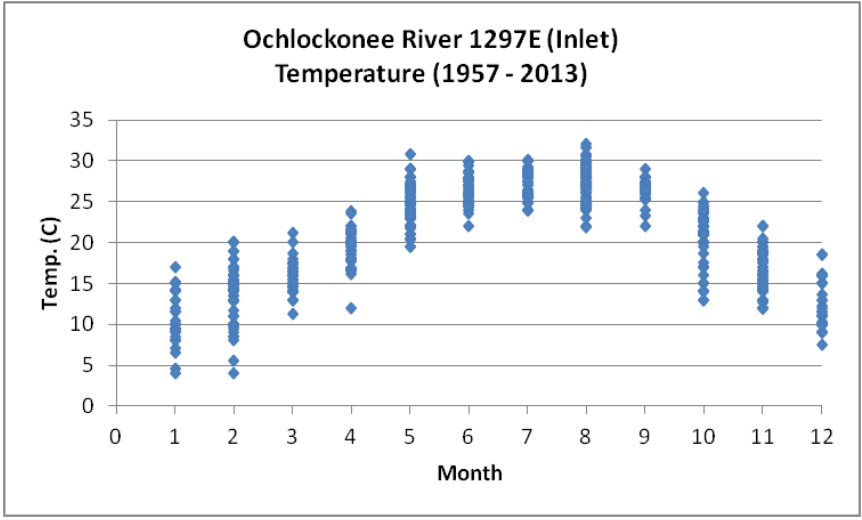
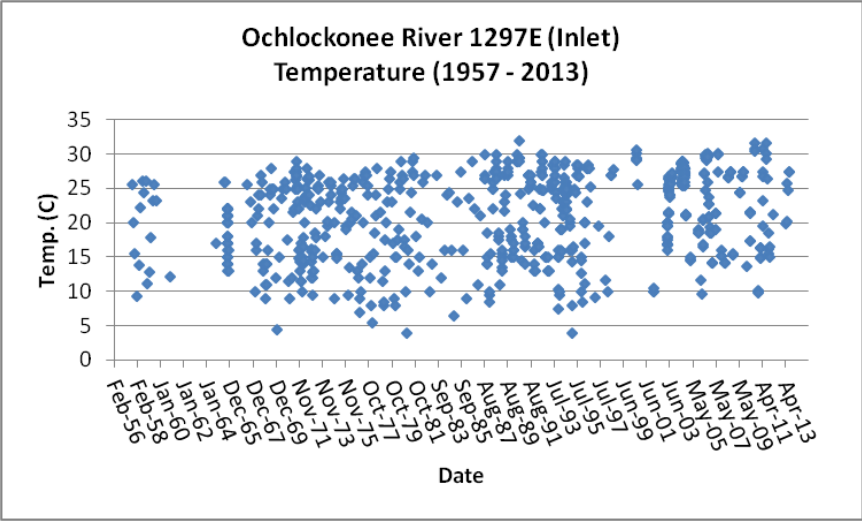


Figure B.4A.1. Ochlockonee River WBIDs 1297E and 1297F Station Locations



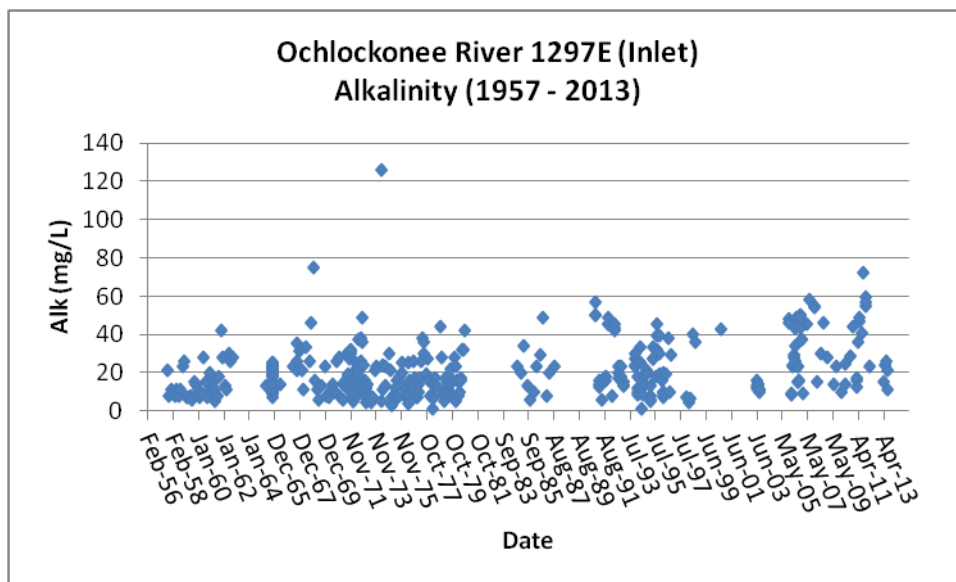


Figure B.4A.4. Ochlockonee River WBID 1297E Daily Average Alkalinity 1957–2013

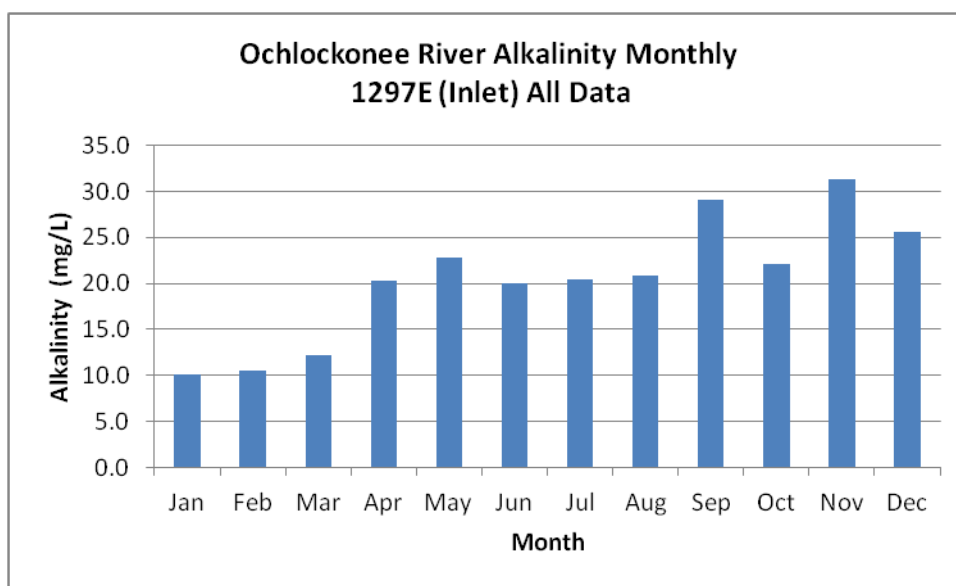


Figure B.4A.5. Ochlockonee River WBID 1297E Monthly Average Alkalinity 1957–2013

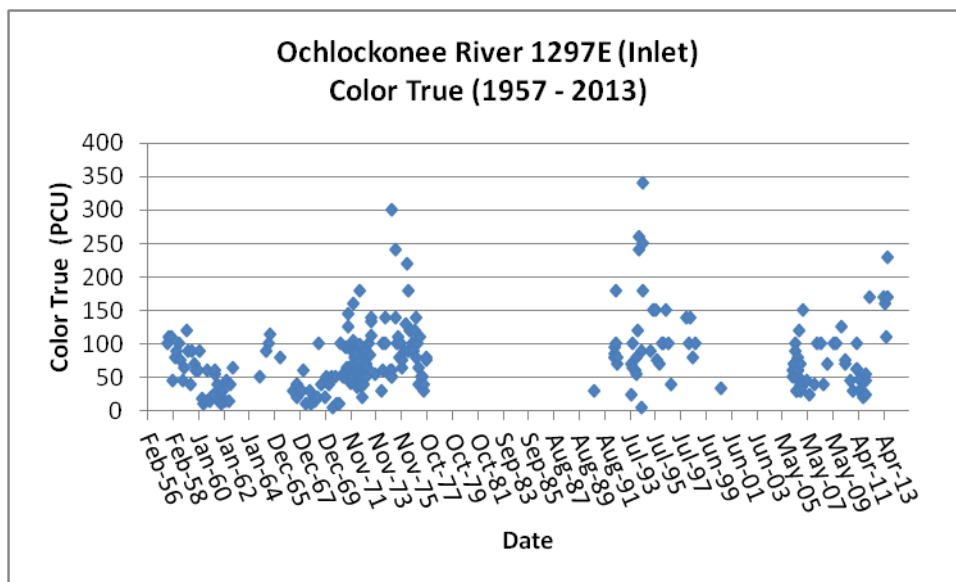


Figure B.4A.6. Ochlockonee River WBID 1297E Daily Average True Color 1957–2013

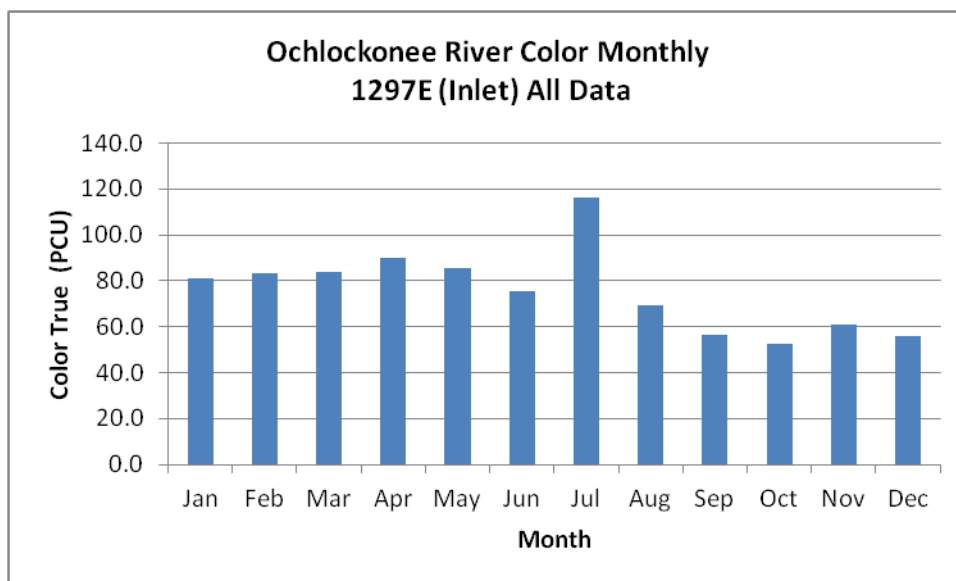


Figure B.4A.7. Ochlockonee River WBID 1297E Monthly Average True Color 1957–2013

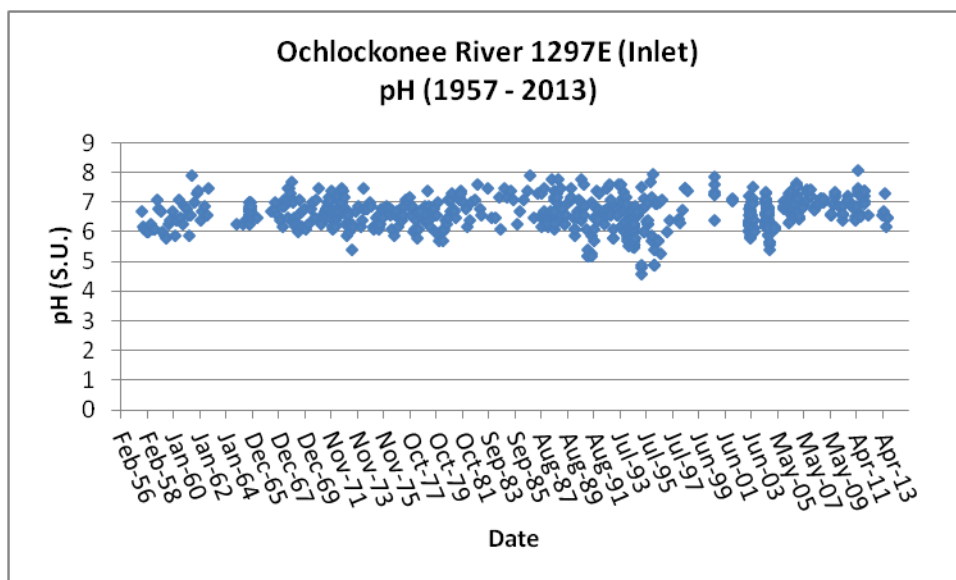


Figure B.4A.8. Ochlockonee River WBID 1297E Daily pH 1957–2013

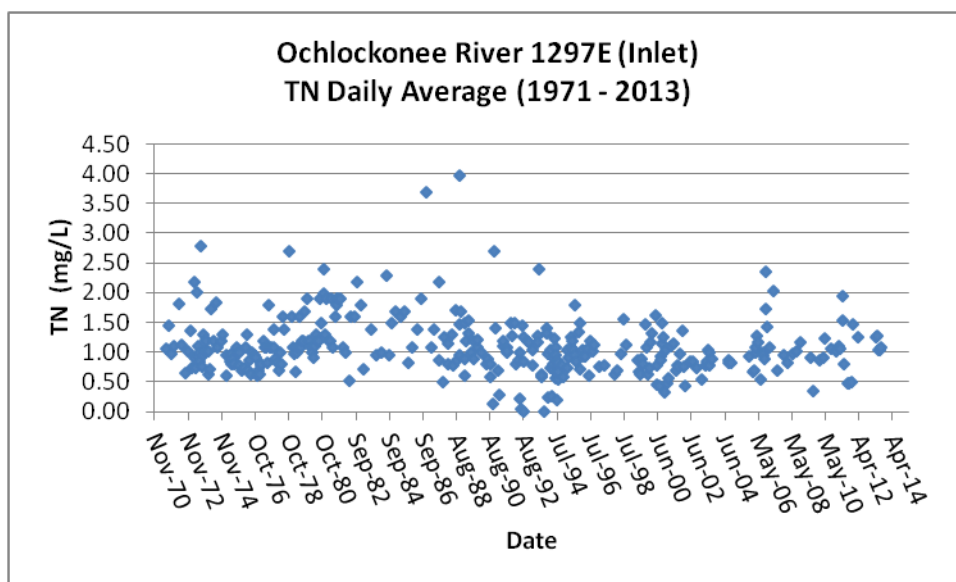


Figure B.4A.9. Ochlockonee River WBID 1297E Daily Average TN 1971–2013

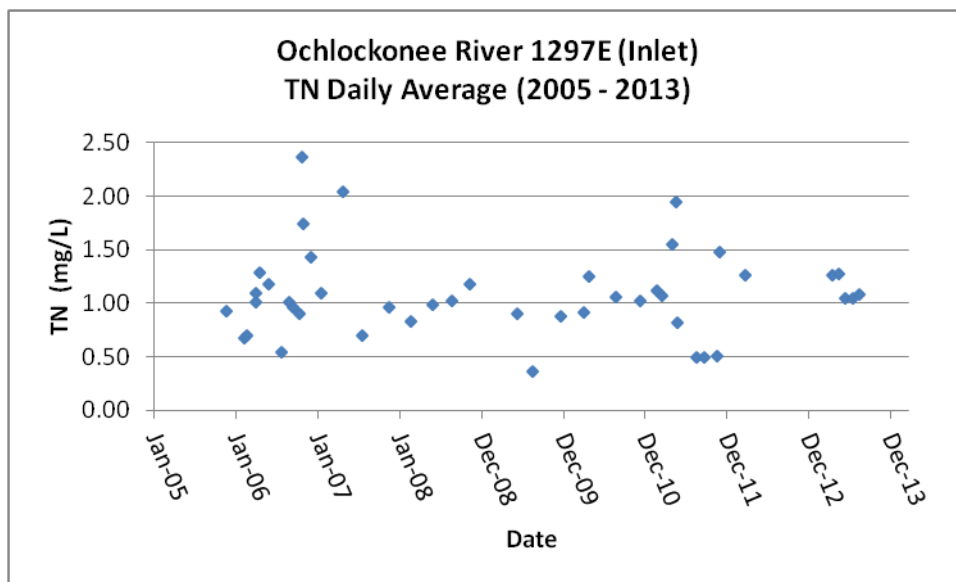


Figure B.4A.10. Ochlockonee River WBID 1297E Daily Average TN 2005–2013

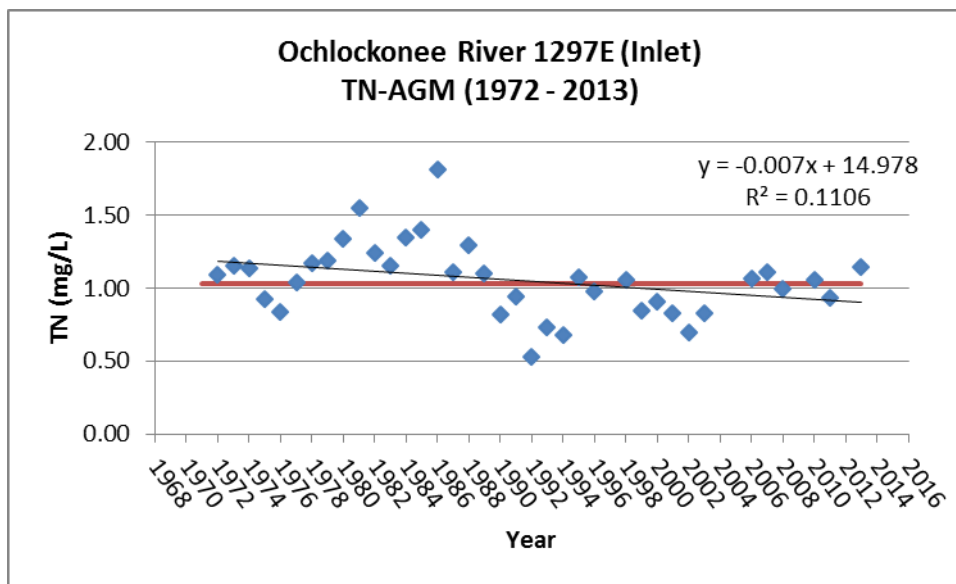


Figure B.4A.11. Ochlockonee River WBID 1297E TN Annual Geomean 1972–2013

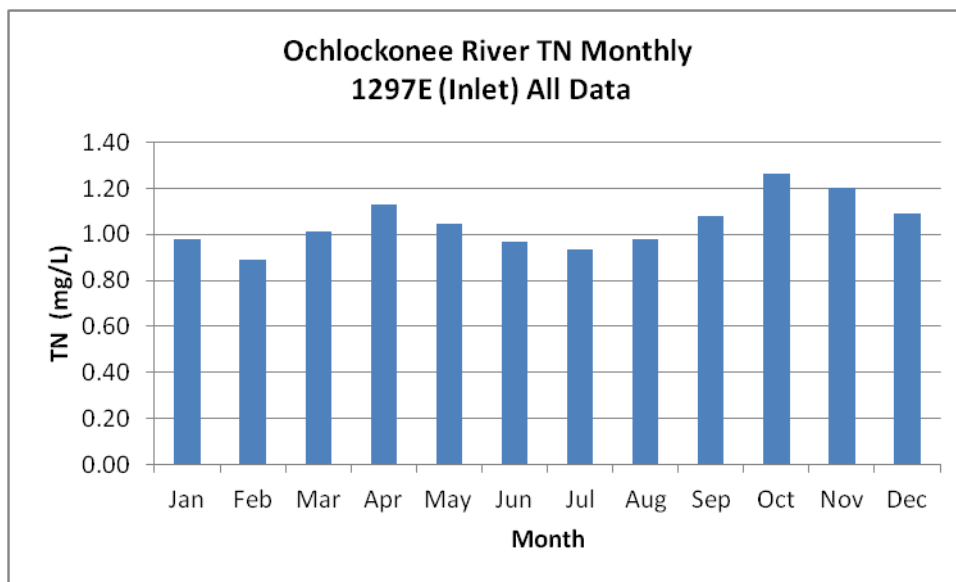


Figure B.4A.12. Ochlockonee River WBID 1297E Monthly Average TN 1972–2013

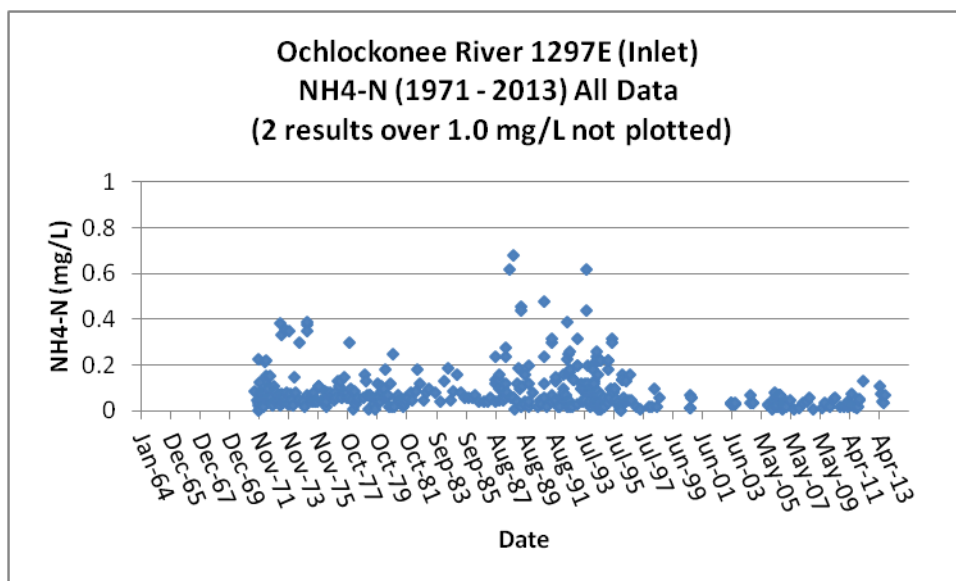


Figure B.4A.13. Ochlockonee River WBID 1297E Daily Average Ammonia-N 1971–2013

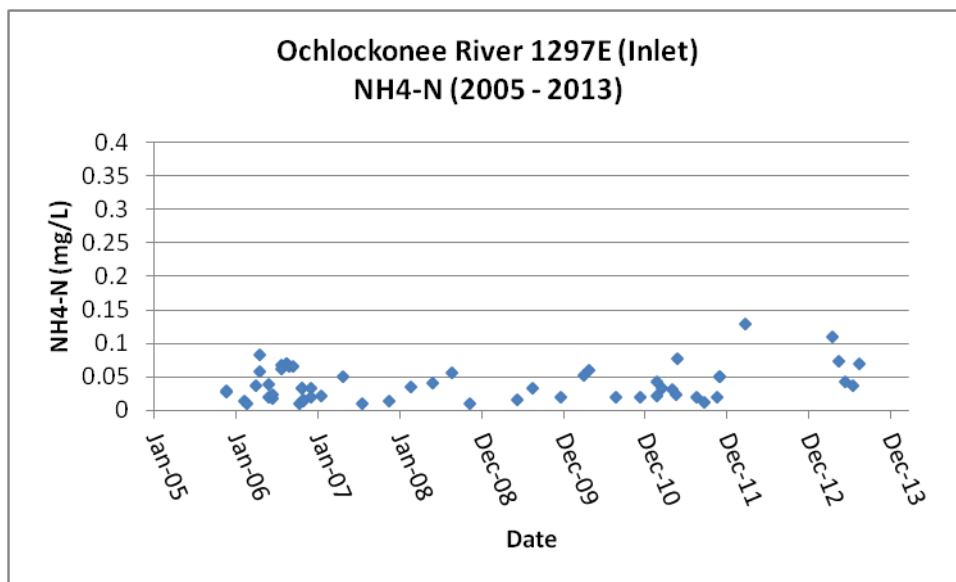


Figure B.4A.14. Ochlockonee River WBID 1297E Daily Average Ammonia-N 2005–2013

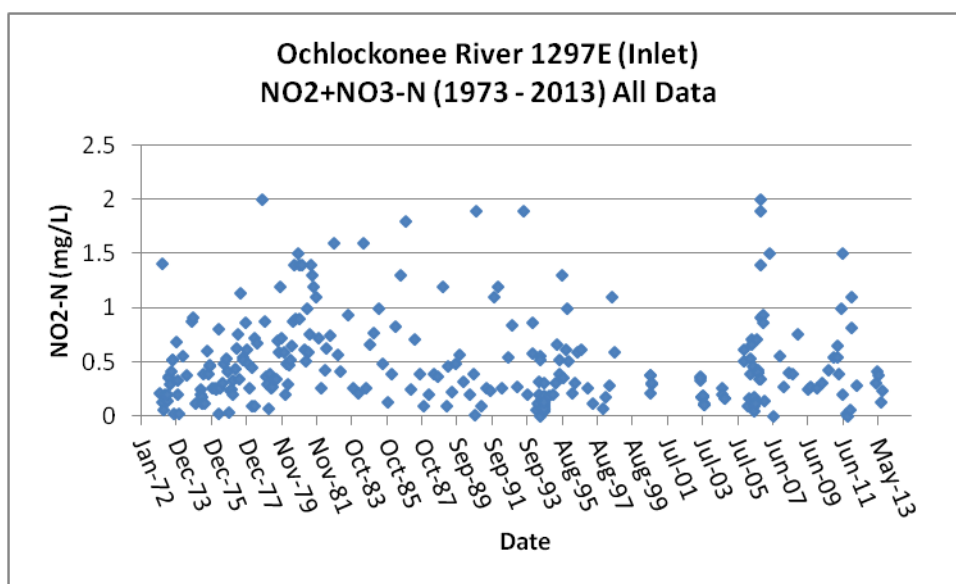


Figure B.4A.15. Ochlockonee River WBID 1297E Daily Average Nitrate/Nitrite-N 1973–2013

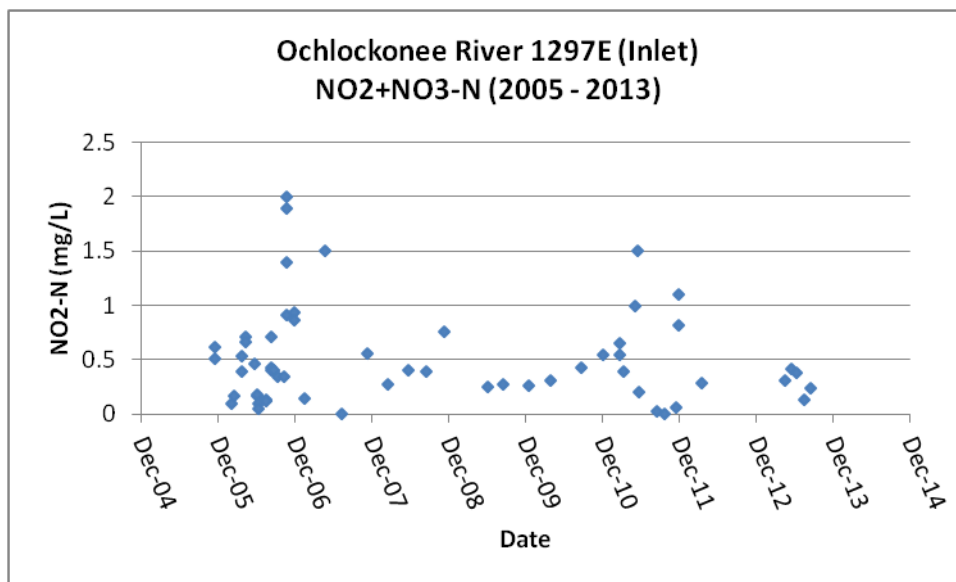


Figure B.4A.16. Ochlockonee River WBID 1297E Daily Average Nitrate/Nitrite-N 2005–2013

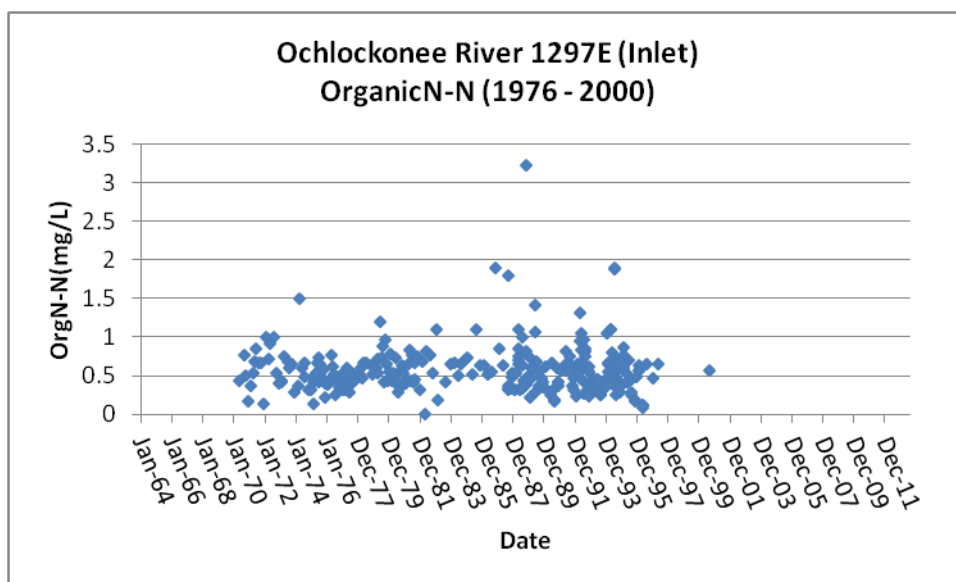


Figure B.4A.17. Ochlockonee River WBID 1297E Daily Average Organic-N 1976–2000

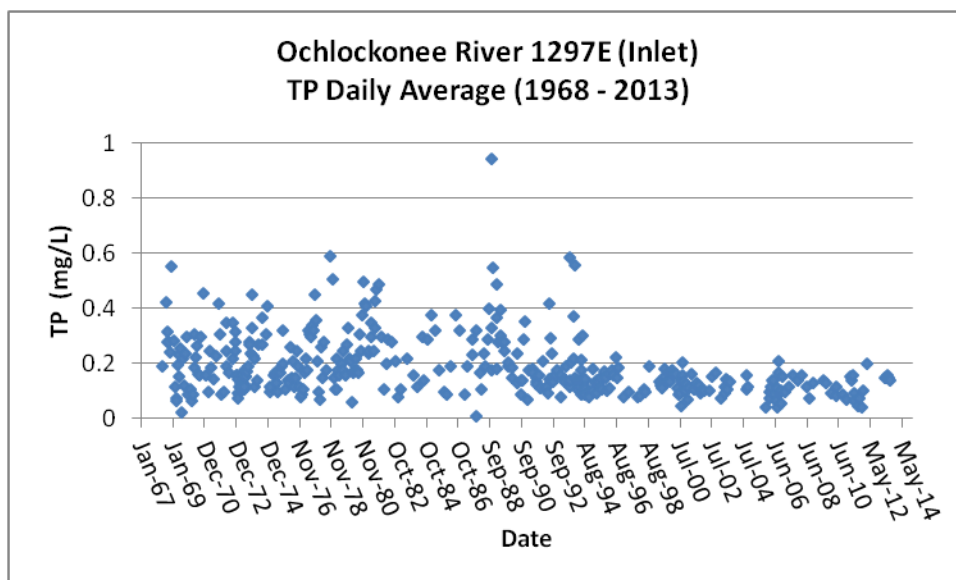


Figure B.4A.18. Ochlockonee River WBID 1297E Daily Average TP 1968–2013

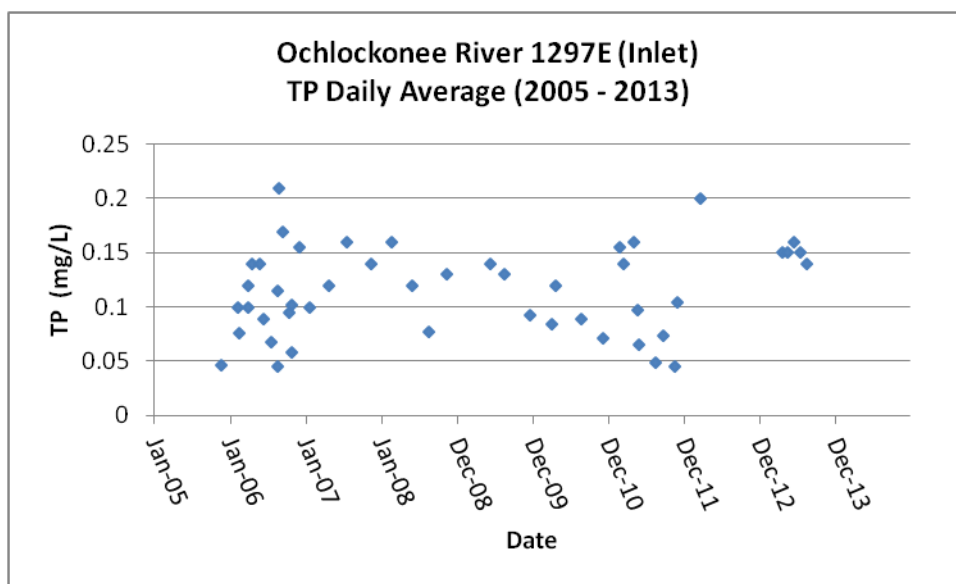


Figure B.4A.19. Ochlockonee River WBID 1297E Daily Average TP 2005–2013

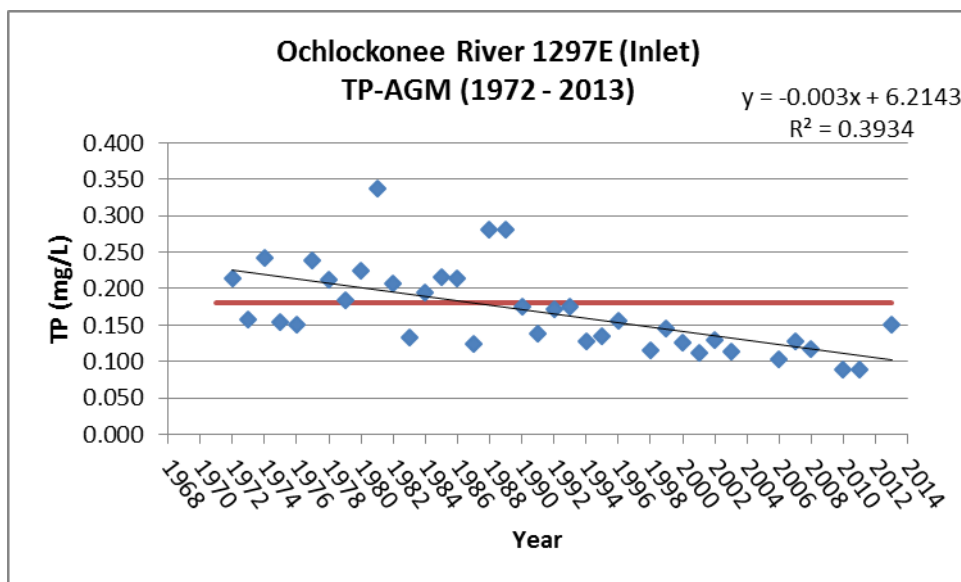


Figure B.4A.20. Ochlockonee River WBID 1297E Annual Geomean TP 1972–2013

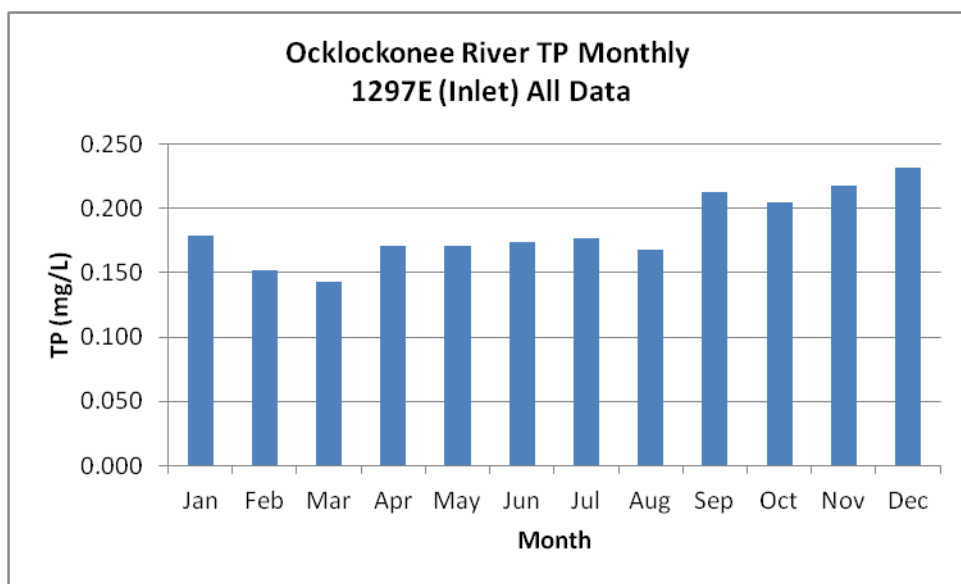


Figure B.4A.21. Ochlockonee River WBID 1297E Monthly Average TP 1968–2013

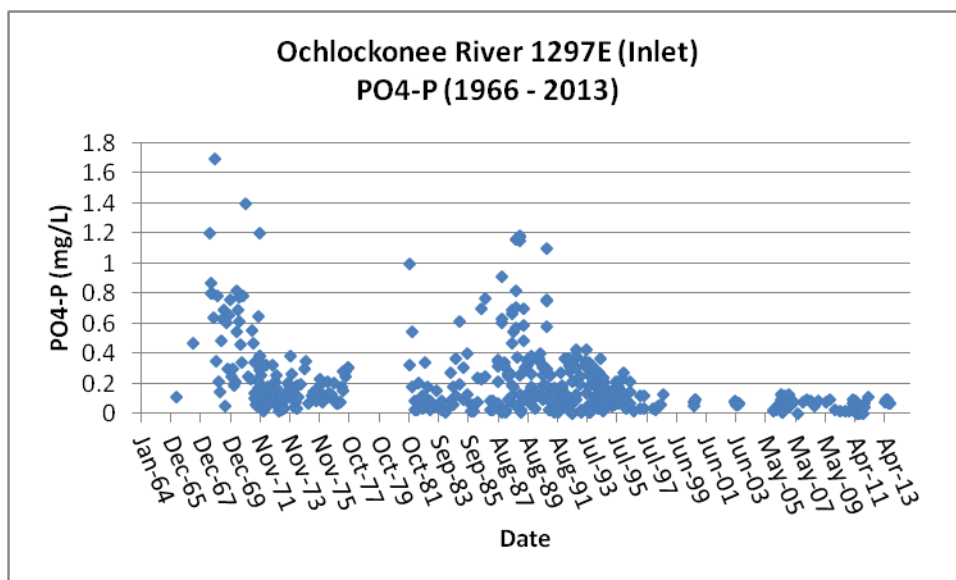


Figure B.4A.22. Ochlockonee River WBID 1297E Daily Average Orthophosphate-P 1966–2013

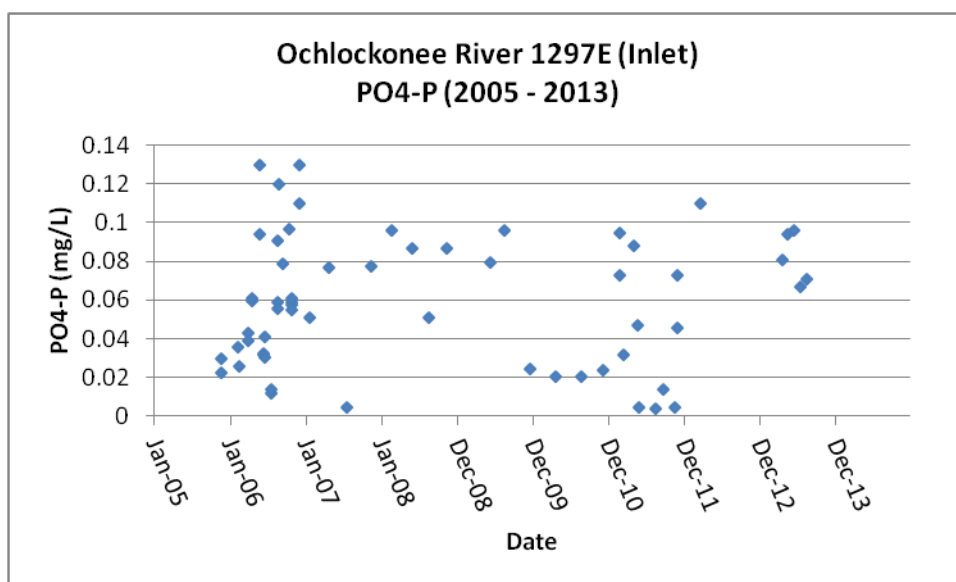


Figure B.4A.23. Ochlockonee River WBID 1297E Daily Average Orthophosphate-P 2005–2013

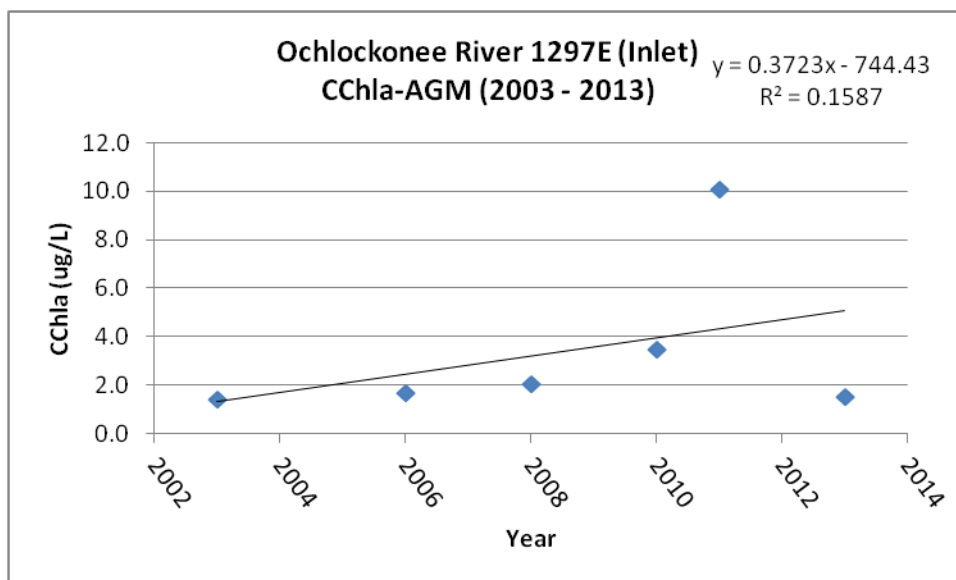


Figure B.4A.26. Ochlockonee River WBID 1297E Annual Geomean CChla 1988–2013

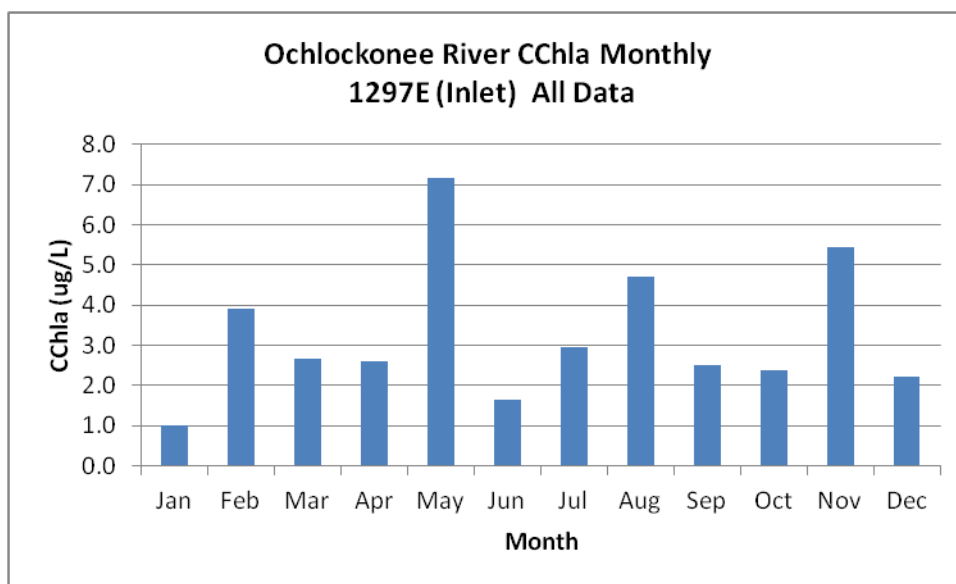


Figure B.4A.27. Ochlockonee River WBID 1297E Monthly Average CChla 1988–2013

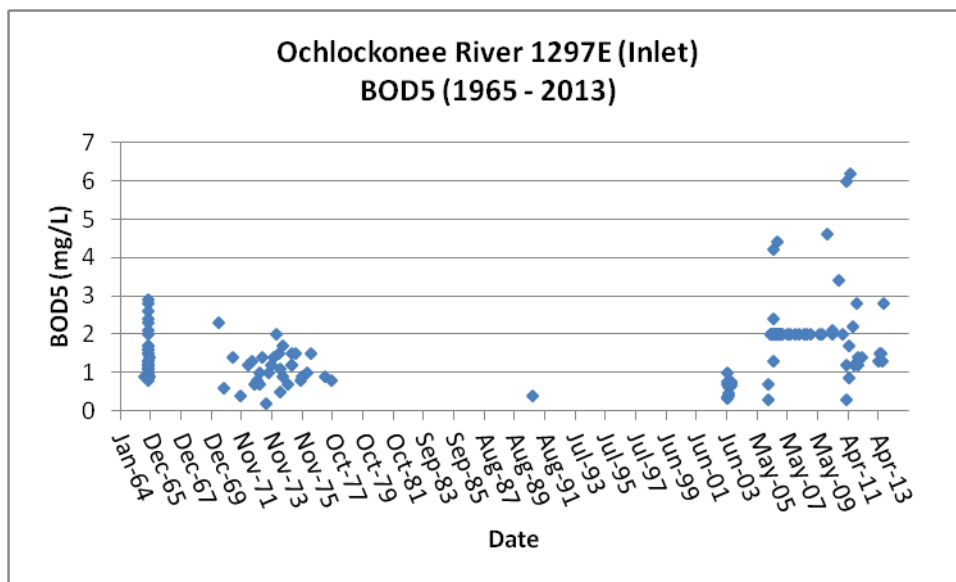


Figure B.4A.28. Ochlockonee River WBID 1297E Daily Average BOD5 1965–2013

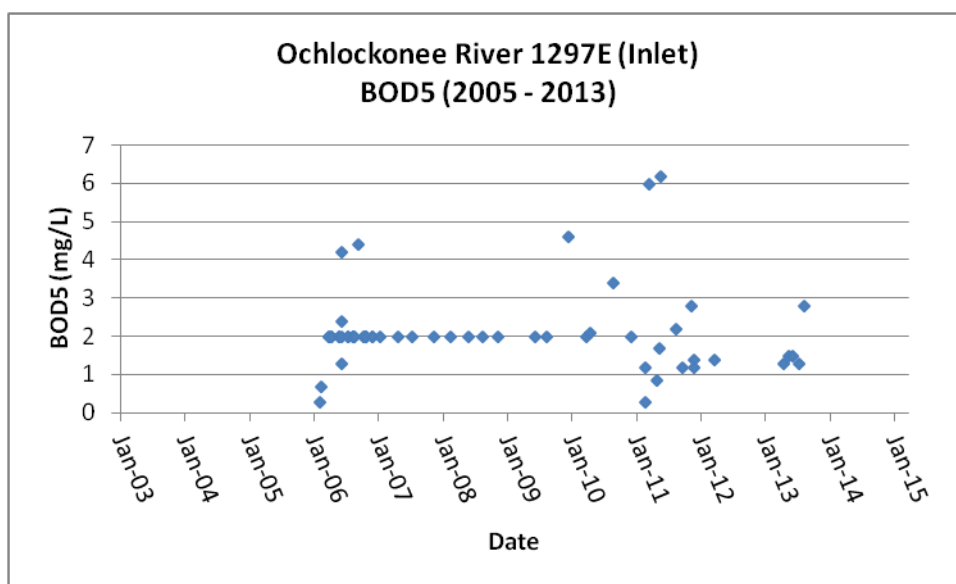


Figure B.4A.29. Ochlockonee River WBID 1297E Daily Average BOD5 2005–2013

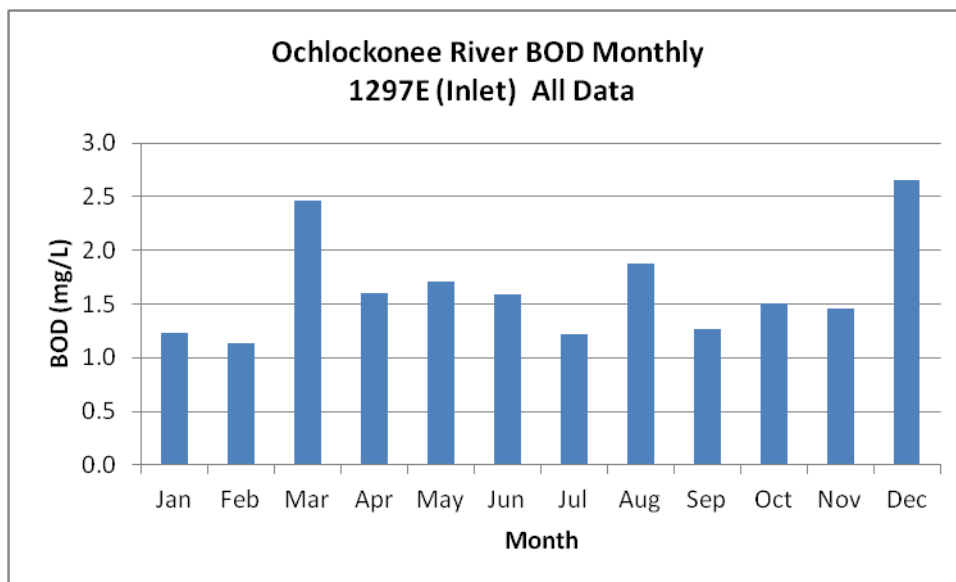


Figure B.4A.30. Ochlockonee River WBID 1297E Monthly Average BOD5 1965–2013

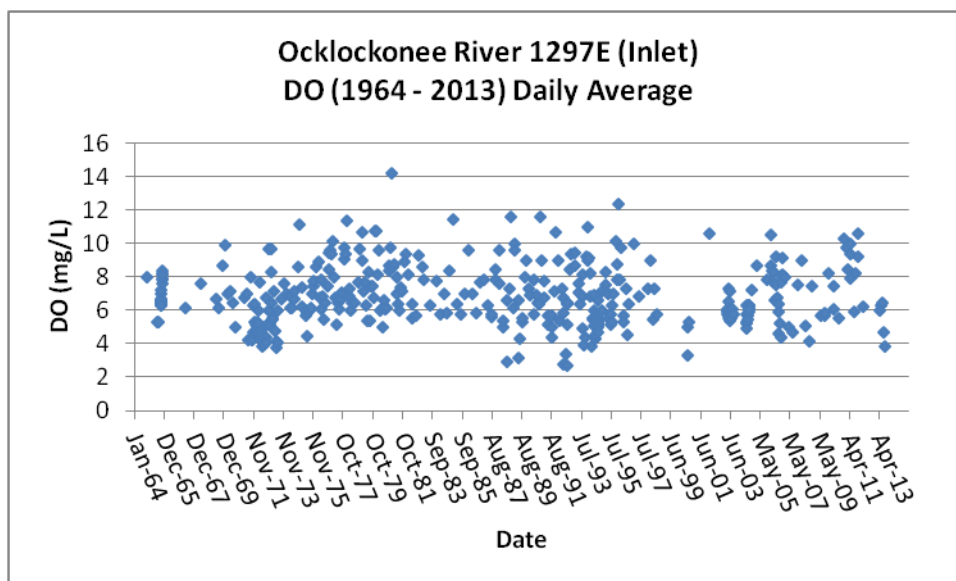


Figure B.4A.31. Ochlockonee River WBID 1297E Daily Average DO 1964–2013

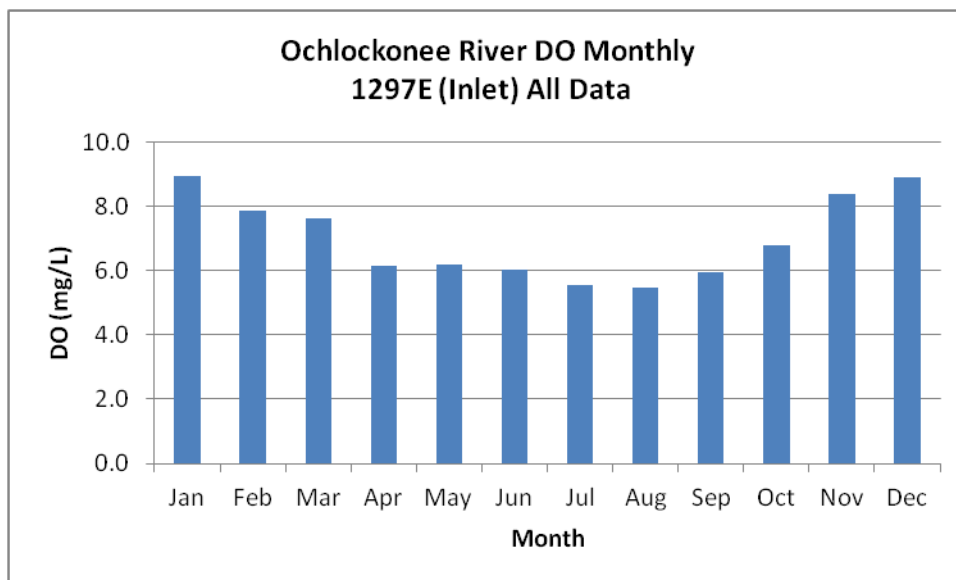


Figure B.4A.32. Ochlockonee River WBID 1297E Monthly Average DO 1964–2013

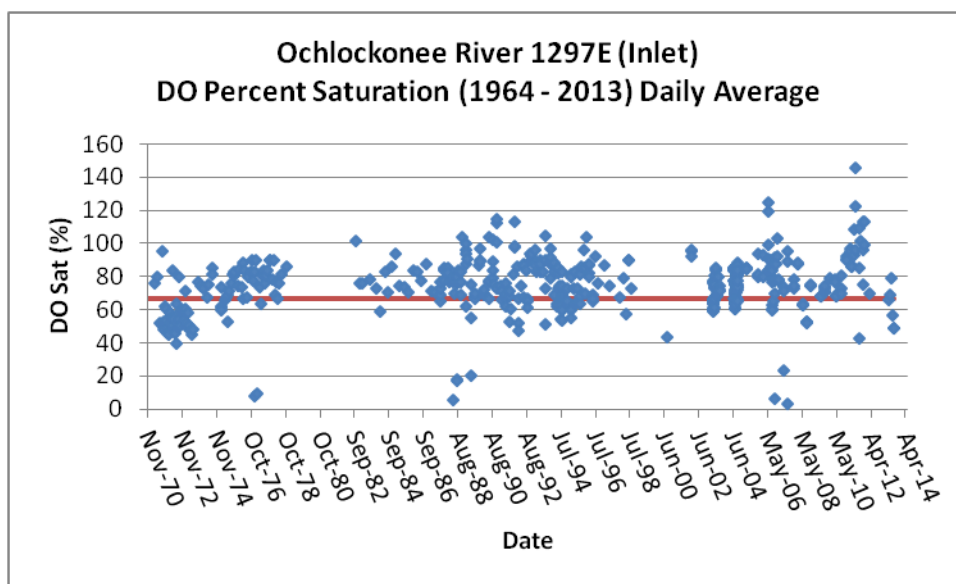
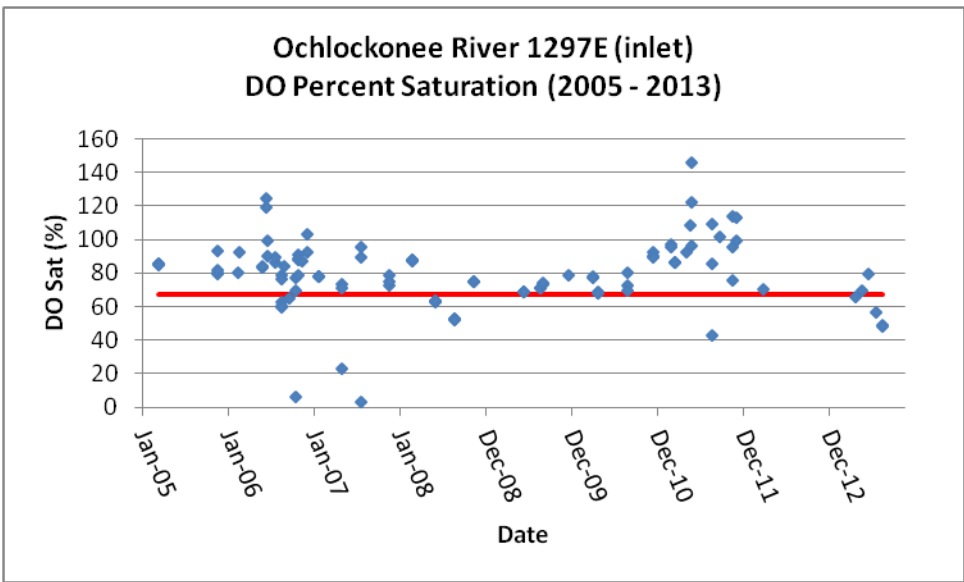
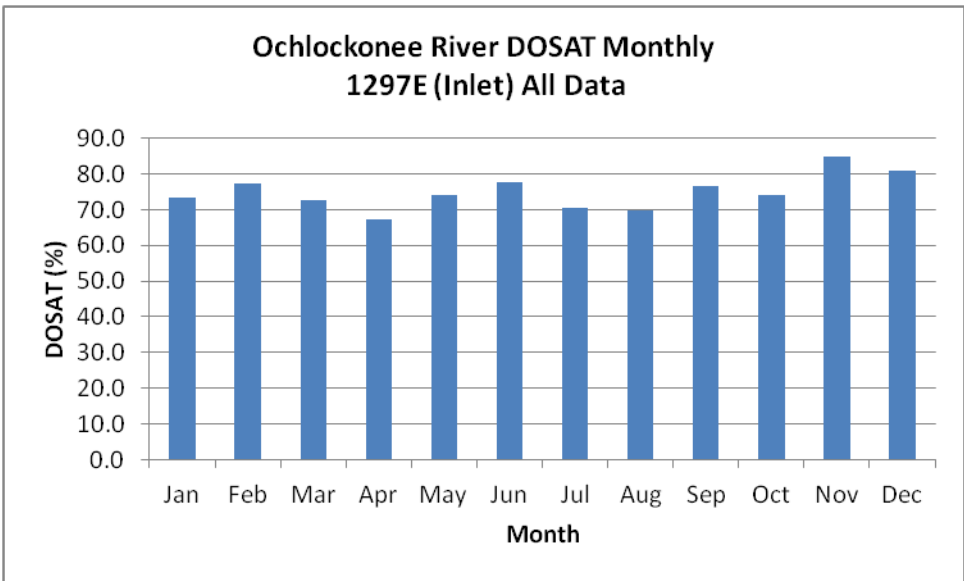


Figure B.4A.33. Ochlockonee River WBID 1297E Daily Average DO Percent Saturation 1964–2013



**Figure B.4A.34. Ochlockonee River WBID 1297E Daily Average DO Percent Saturation
2005–2013**



**Figure B.4A.35. Ochlockonee River WBID 1297E Monthly Average DO Percent Saturation
1964–2013**

Table B.4A.1. Ochlockonee River WBID 1297E Water Quality Stations

WBID	Station Number	Station Name	Begin Date	End Date
1297E	21FLA 22020004	OCHLOCKONEE R US 90	1964	1990
1297E	21FLGW 8623	NWA-HS-1003 OCHLOCKONEE RIVER	2000	2000
1297E	112WRD 02329252	OCHLOCKONEE RIVER AT OCHLOCKONEE, FLA.	1975	1975
1297E	21FLPNS 22020077	Three Pole Ck W of SR260, .31 mi S of US90	1995	1996
1297E	21FLKWATLEO-OC-RIVER-3	Leon-Ochlockonee River-3-3	1999	2003
1297E	21FLGW S468	OCHLOCKONEE R. NR HAVANA	1997	1998
1297E	21FLGW 22865	NW1-LR-2024 OCHLOCKONEE RIVER	2004	2004
1297E	11EPALES1239E1	OCHLOCKONEE RIVER	1973	1974
1297E	21FLWQA 303507108421337	Ochlockonee River at SR 157	2002	2002
1297E	21FLGFWFGFCNW0282	OCHOLCKONEE RIVER NO. NEK. C-T ZONE ON PLOT	1988	1989
1297E	21FLBRA 1297E-C	1297E - Ochlockonee River - 300m dwnstr of SR-153	2006	2006
1297E	21FLA 22020013	OCHLOCKONEE R OLD IRON BR FLA 15	1974	1975
1297E	21FLPNS W0131	Ochlockonee River At Tower Road (also 21FLFWF)	0	0
1297E	21FLEONLCOCC047384407	Ochlockonee River @ 90	2006	2010
1297E	21FLBRA 1297E-B	1297E - Ochlockonee River - At SR-153	2006	2006
1297E	21FLWQA 303314308423028	Ochlockonee River at US 27	2002	2002
1297E	21FLMCGLT01-90	Ochlockonee River north of Lake Talquin off the Hi	2000	2000
1297E	21FLGFWFGFCNW0131	OCHLOCKONEE RIVER AT TOWER ROAD	1987	1996
1297E	21FLBRA 1297E-A	1297E - Ochlockonee River - 120m upstream or US 90	2006	2006
1297E	112WRD 02329000	OCHLOCKONEE RIVER NR HAVANA, FLA.	1957	1997
1297E	21FLMCGLT03	Ochlockonee River @ Old Banbridge Road - lat/long	1992	1994
1297E	21FLGW 22845	NW1-LR-2008 OCHLOCKONEE RIVER	2004	2004
1297E	21FLPNS 302824108424258	Ochlockonee River @ US90 (also 21FLWQA)	0	0
1297E	21FLNWFD303314084230301	OCHLOCKONEE RIVER @ US27	1995	1996
1297E	21FLKWATLEO-OC-RIVER-2	Leon-Ochlockonee River-2-2	1999	2003
1297E	21FLGFWFGFCNW0283	OCHLOCKONEE RIVER ORMA C-T ZONE ON PLOT	1988	1989
1297E	21FLGFWF03120003-LJ-05	Lake Jackson Station 5	1996	1999
1297E	1113S050645045	OCHLOCKONEE R U S 27 N W TALLAHA	1965	1965
1297E	21FLGFWFGFCNW0132	OCHLOCKONEE RIVER AT OLD BAINBRIDGE ROAD	1987	1996
1297E	21FLGFWF03120003-OR-03	Ochlockonee River Station 3	1996	1996
1297E	21FLNWFD302824084242801	Ochlockonee River @ US 90	1993	1994
1297E	21FLKWATLEO-OC-RIVER-1	Leon-Ochlockonee River-1-1	1999	2003
1297E	21FLGW 8643	NWA-HS-1040 OCHLOCKONEE RIVER	2000	2000
1297E	21FLGW 22866	NW1-LR-2039 OCHLOCKONEE RIVER	2004	2004
1297E	21FLGW 22843	NW1-LR-2005 OCHLOCKONEE RIVER	2004	2004
1297E	21FLGFWF03120003-OR-02	Ochlockonee River Station 2	1996	1996
1297E	21FLBRA 1297E-D	1297E - Ochlockonee River - at I-10	2006	2006
1297E	21FLA 22020014	OCHLOCKONEE R AT US 27	1974	1975

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WBID	Station Number	Station Name	Begin Date	End Date
1297E	21FLPNS 1297E-D	Ochlockonee River 1297-E-D	2006	2006
1297E	21FLA 22020032	LAKE TALQUIN MOUTH OCHLOCKONEE R	1974	1974
1297E	1113S050644895	OCHLOCKONEE R HWY 10 TALLAHASSEE	1965	1965
1297E	21FLPNS GFCNW0132	Ochlockonee River at Old Bainbridge Rd	1999	1999
1297E	21FLWQA 302824108424258	Ochlockonee River at US 90	2002	2006
1297E	21FLGW 8636	NWA-HS-1028 OCHLOCKONEE RIVER	2000	2000
1297E	1113S050645050	OCHLOCKONEE R HWY 263 N W TALLAH	1965	1965
1297E	21FLPNS T03	Ochlockonee River @ Old Banbridge Road - L(also 21FMCGL)	0	0
1297F	21FLNWFD5230	Bryants Mill Creek above Ochlockonee	1992	1992
1297F	21FLMCGLT05	Ochlockonee River @ Highway 12 - lat/long estimate	1992	1994
1297F	21FLBRA 1297F-D	1297F - Ochlockonee River - 500m upstrm of Bridge SR 12	2007	2007
1297F	21FLWQA 304008908418183	Ochlockonee River at SR 12	2002	2006
1297F	21FLMCGLT01	Ochlockonee River, state road 12	1992	2006
1297F	21FLGFWF03120003-OR-05	Ochlockonee River Station 5	1996	1996
1297F	21FLA 22020011	OCHLOCKONEE R E CONCORD FLA 12	1965	1980
1297F	112WRD 02328500	OCHLOCKONEE RIVER NR CONCORD FLA	1975	1977
1297F	21FLGW 38479	Z1-LR-4001 OCHLOCKONEE RIVER	2010	2010
1297F	1113S050645090	OCHLOCKONEE R HWY 12 N TALLAHASS	1965	1965
1297F	21FLPNS 22020011	OCHLOCKONEE R E CONCORD FLA 12	2001	2001
1297F	21FLGW S296	OCHLOCKONEE R. SR12	1997	1998
1297F	21FLWQA 303714608419216	Ochlockonee River at Colonel Lester's dock	0	0
1297F	21FLNWFD304102084175601	Bryants Mill Cr. ab Ochlockonee	1992	1992
1297F	21FLNWFD304011084180901	Ochlockonee Riv ab Bryants Mill Cr.	1992	1992
1297F	21FLGFWFGFCNW0133	OCHLOCKONEE RIVER AT HIGHWAY 12	1987	1996
1297F	21FLGW 39370	Z1-LR-4001R OCHLOCKONEE RIVER	0	0
1297F	21FLGW 22864	NW1-LR-2014 OCHLOCKONEE RIVER	2004	2004
1297F	21FLNWFD304008084181901	Ochlockonee River @ C.R. 12	1992	1996
1297F	21FLEONLCOC3066984305	Ochlockonee River @ Fairbanks Fairy	2006	2010
1297F	21FLGW 37909	Z1-LR-3001R OCHLOCKONEE RIVER	2009	2009
1297F	21FLGW 3540	OCHLOCKONEE RIVER AT S.R. 12	2007	2010
1297F	21FLBRA 1297F-C	1298F - - 250m upstrm bridge SR 12	2007	2007
1297F	21FLGW 3540	OCHLOCKONEE RIVER AT S.R. 12	2007	2010
1297F	21FLGW 22863	NW1-LR-2011 OCHLOCKONEE RIVER	2004	2004
1297F	21FLNWFD5229	Ochlockonee River Above Bryants Mill	1992	1992
1297F	21FLGW 37499	Z1-LR-3001 OCHLOCKONEE RIVER	2009	2009
1297F	21FLGW 37499	Z1-LR-3001 OCHLOCKONEE RIVER	2009	2009
1297F	21FLBRA 1297F-B	1297F - Ochlockonee River - 300m dwnstr of Fairbanks Ferry R	2006	2007
1297F	21FLGW 38479	Z1-LR-4001 OCHLOCKONEE RIVER	2010	2010

WBID	Station Number	Station Name	Begin Date	End Date
1297F	21FLBRA 1297F-A	1297F - Ochlockonee River - At Fairbanks Ferry Rd	2006	2007

Table B.4A.2. Ochlockonee River WBID 1297E Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
1297E	Alkalinity (mg/L)	1957 - 2013	16.7
1297E	Color-True (PCU)	1957 - 2013	62.5

Table B.4A.3. Ochlockonee River WBID 1297E DO Percent Saturation vs. 67 % Criterion

Year	Category	Result
1964 - 2013	Count	587
	Number P	394
	Number F	193
	Percent (%) F	32.9
2005-2013	Count	105
	Number P	83
	Number F	22
	Percent F	21.0

Table B.4A.4. Ochlockonee River WBID 1297E Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN (mg/L)	TP (mg/L)	TN/TP	CChla (ug/L)
	AGM	AGM	Ratio	AGM
1971		0.207		
1972	1.09	0.214	5.1	
1973	1.15	0.158	7.3	
1974	1.14	0.243	4.7	
1975	0.92	0.155	6.0	
1976	0.83	0.150	5.5	
1977	1.04	0.239	4.4	
1978	1.17	0.212	5.5	
1979	1.19	0.184	6.5	
1980	1.34	0.224	6.0	
1981	1.55	0.337	4.6	
1982	1.24	0.206	6.0	
1983	1.15	0.133	8.7	
1984	1.35	0.196	6.9	
1985	1.40	0.216	6.5	
1986	1.81	0.214	8.5	
1987	1.11	0.124	8.9	
1988	1.30	0.280	4.6	
1989	1.10	0.281	3.9	
1990	0.82	0.176	4.7	
1991	0.94	0.139	6.8	
1992	0.53	0.172	3.1	
1993	0.73	0.176	4.2	
1994	0.68	0.127	5.3	
1995	1.08	0.135	8.0	
1996	0.98	0.157	6.2	
1997				
1998	1.06	0.115	9.2	
1999	0.84	0.146	5.8	
2000	0.90	0.125	7.2	
2001	0.83	0.112	7.4	
2002	0.70	0.130	5.4	
2003	0.83	0.114	7.3	1.4
2004				
2005				
2006	1.07	0.104	10.3	1.7
2007	1.11	0.128	8.7	

Year	TN (mg/L)	TP (mg/L)	TN/TP	CChla (ug/L)
2008	1.00	0.118	8.5	2.0
2009				
2010	1.06	0.089	11.8	3.5
2011	0.94	0.090	10.4	10.1
2012				
2013	1.14	0.150	7.6	1.5

Table B.4A.5. Ochlockonee River WBID 1297E Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	1957 - 2013	743	4.0	32.0	23.3	21.6	20.6
Alkalinity	mg/L	1957 - 2013	392	1.0	126.0	16.3	20.7	16.7
pH	S.U.	1957 - 2013	748	4.6	8.1	6.6		
Color	PCU	1957 - 2013	256	5.0	340.0	67.0	77.2	62.5
TN	mg/L	1971 - 2013	534	0.02	4.01	0.99	1.04	0.920
NH4-N	mg/L	1971 - 2013	448	0.001	2.78	0.06	0.10	0.061
NO23	mg/L	1973 - 2013	293	0.004	2.00	0.35	0.47	0.316
OrgN	mg/L	1976 - 2000	321	0.01	3.24	0.55	0.58	0.517
TP	mg/L	1968 - 2013	602	0.004	0.945	0.150	0.181	0.158
PO4-P	mg/L	1968 - 2013	558	0.004	1.700	0.120	0.198	0.120
CChla	ug/L	1988 - 2013	82	1.0	39.1	1.8	3.7	2.2
BOD5	mg/L	1965 - 2013	137	0.2	6.2	1.4	1.6	1.3
DO	mg/L	1964 - 2013	687	0.1	14.2	6.5	6.6	6.2
%DOSat	%	1964 - 2013	587	3.5	146.3	74.1	74.3	71.9

Table B.4A.6. Ochlockonee River WBID 1297E Water Quality Data Summary Verified Period Plus (2005–13)

Constituent	Units	Verified Period+	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2013	109	9.7	31.6	21.3	21.9	21.0
Alkalinity	mg/L	2005 - 2013	61	8.3	72.0	30.0	33.3	29.0
pH	S.U.	2005 - 2013	109	6.1	8.1	6.9		
Color	PCU	2005 - 2013	53	21.0	230.0	60.0	73.2	61.7
TN	mg/L	2005 - 2013	53	0.36	2.44	1.05	1.13	1.05
NH4-N	mg/L	2005 - 2013	58	0.01	1.50	0.03	0.07	0.036
NO23	mg/L	2005 - 2013	58	0.004	2.00	0.40	0.51	0.329
OrgN	mg/L	2005 - 2013						
TP	mg/L	2005 - 2013	57	0.040	0.210	0.120	0.115	0.107
PO4-P	mg/L	2005 - 2013	59	0.004	0.130	0.059	0.059	0.046
CChla	ug/L	2005 - 2013	59	1.0	39.1	2.6	4.3	2.5
BOD5	mg/L	2005 - 2013	58	0.3	6.2	2.0	2.1	1.9
DO	mg/L	2005 - 2013	109	0.3	11.4	7.5	7.1	6.6
%DOSat	%	2005 - 2013	105	3.5	146.3	79.0	79.6	74.9

B.4B Little Attapulugus Creek and Attapulugus River

Figures B.4B.1 through **B.4B.12** and **Tables B.4B.1** through **B.4B.11** depict the station locations and data for this area. **Table B.4B.1** lists the 3 stations that were sampled in the Little Attapulugus Creek and Attapulugus Creek during the 2013 Study.

Station TQNS03 is located on Little Attapulugus Creek just west of Attapulugus Ga, off Faceville-Attapulugus Rd, upstream of the BASF facility. Station TQNS04 is on Little Attapulugus Creek off Hwy 241, just downstream of the BASF facility. Station TQNS02 is located off Hwy 159 on Attapulugus Creek, below the confluence with the Little Attapulugus Creek (**Figure B.4B.1**).

Data for alkalinity indicate a doubling in concentration below the BASF facility from a GM of 12.0 mg/L upstream to 24.0 mg/L downstream (**Figure B.4B.2**).

Data for dissolved versus total nitrogen (GM of sample events) indicates that 97 % of the total nitrogen is dissolved. The data show that downstream of the facility the GM NH₄-N is 124 times the upstream concentration, NO₃-N is 43 times, and Org-N 2 times. Overall the TN downstream is increased 28 times the upstream concentration (**Figure B.4B.4**).

The TP (**Figure B.4B.8**) and PO₄-P (**Figure B.4B.9**) GM downstream concentrations are about twice the upstream values.

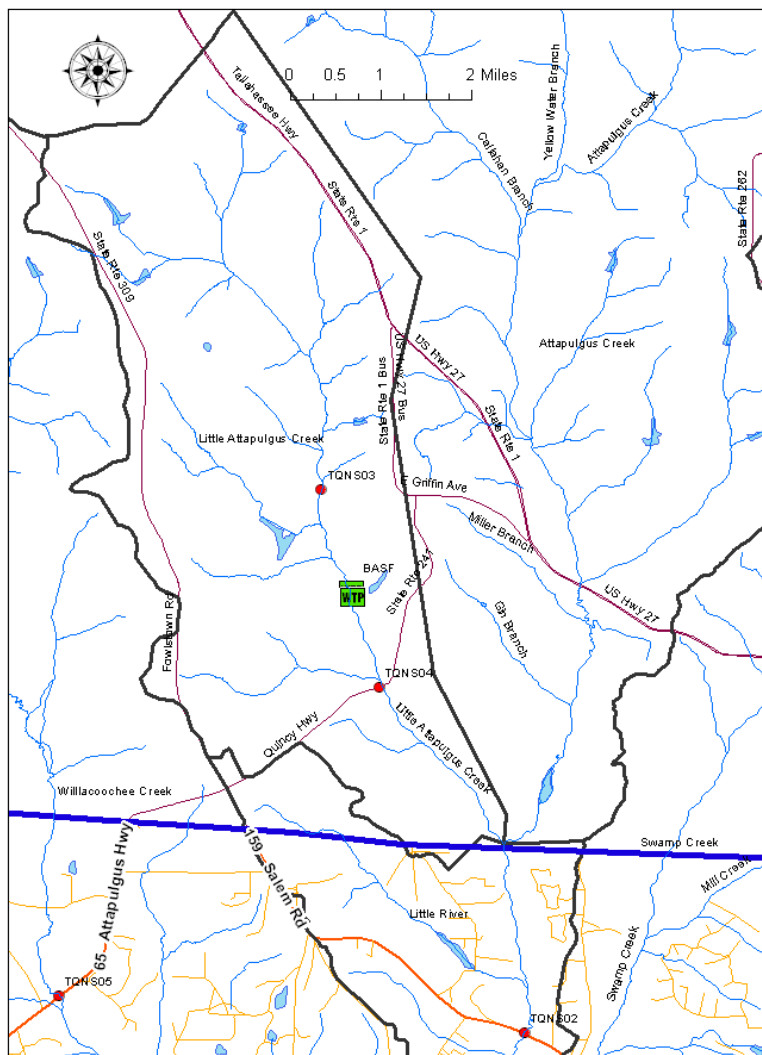


Figure B.4B.1. Little Attapulgus and Attapulgus 2013 Study Sites and BASF facility

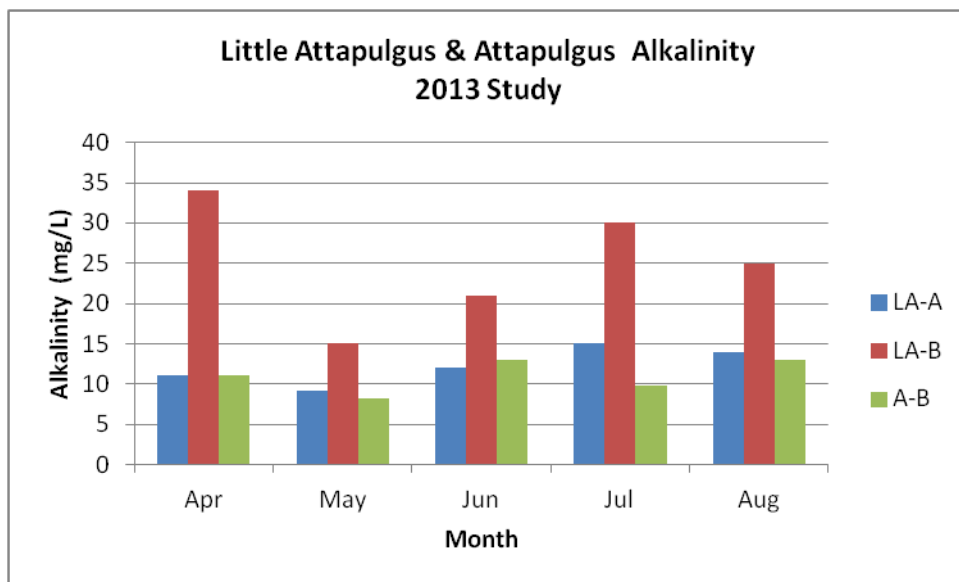


Figure B.4B.2. Little Attapulcus and Attapulcus Alkalinity 2013

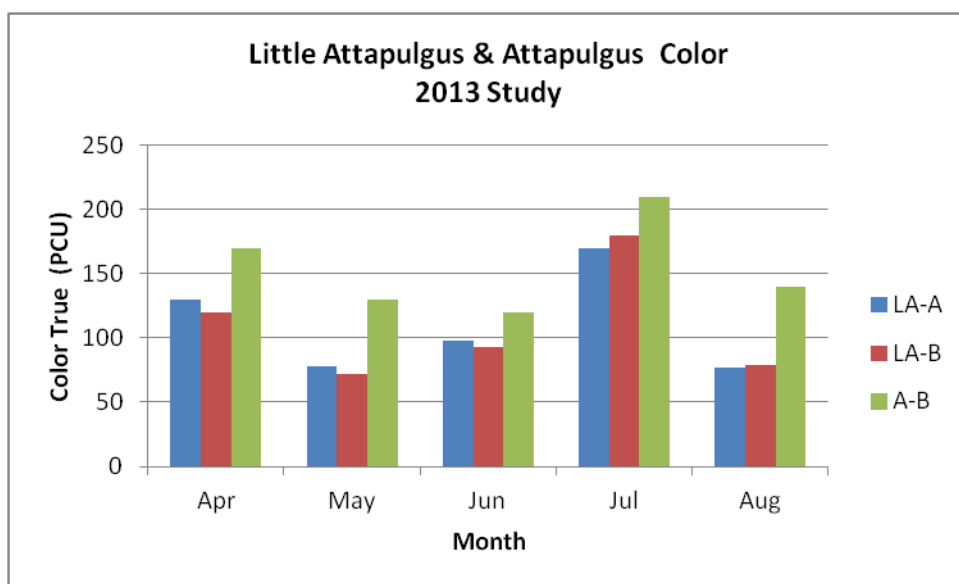


Figure B.4B.3. Little Attapulcus and Attapulcus True Color 2013

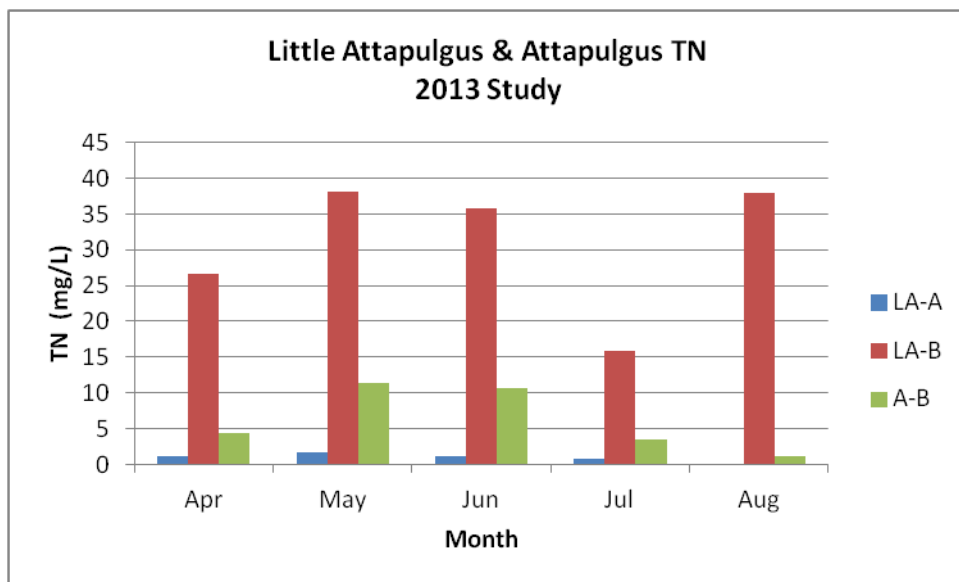


Figure B.4B.4. Little Attapulgis and Attapulgis TN 2013

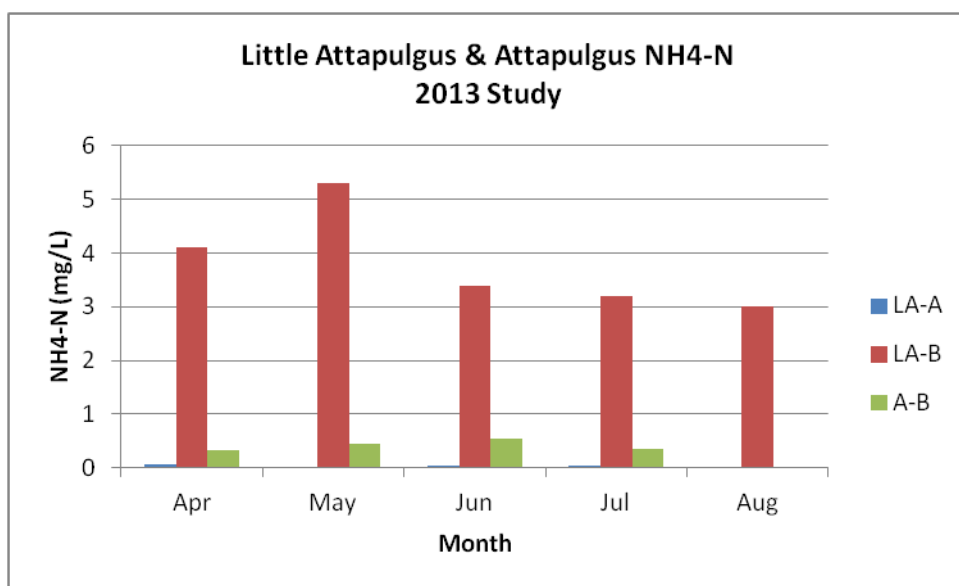


Figure B.4B.5. Little Attapulgis and Attapulgis Ammonia-N 2013

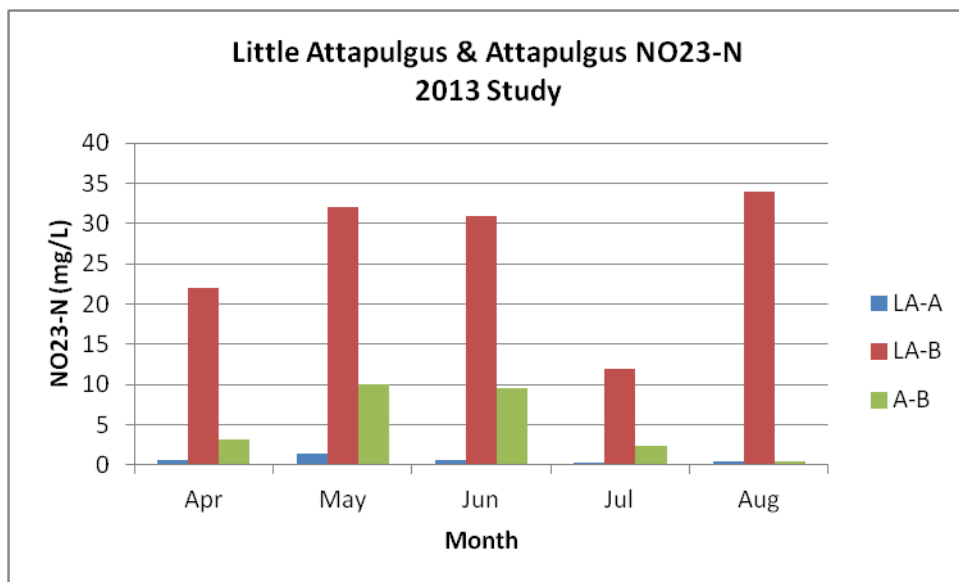


Figure B.4B.6. Little Attapulgis and Attapulgis Nitrate/Nitrite-N 2013

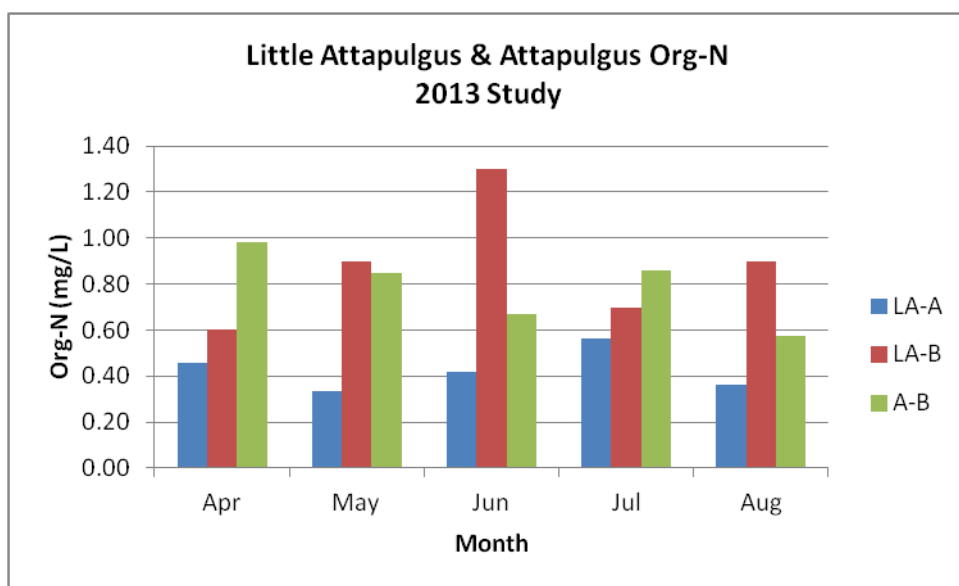


Figure B.4B.7. Little Attapulgis and Attapulgis Organic-N 2013

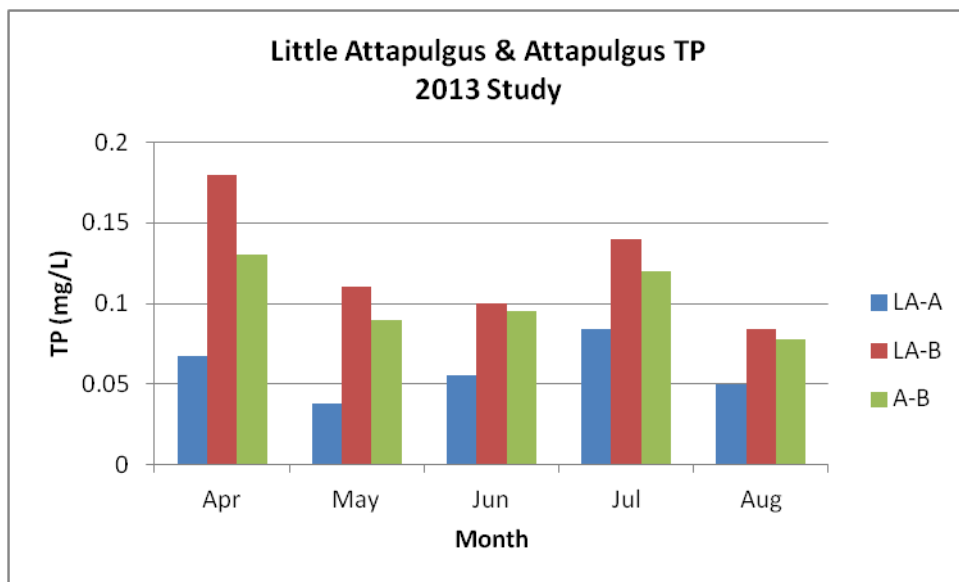


Figure B.4B.8. Little Attapulgis and Attapulgis TP 2013

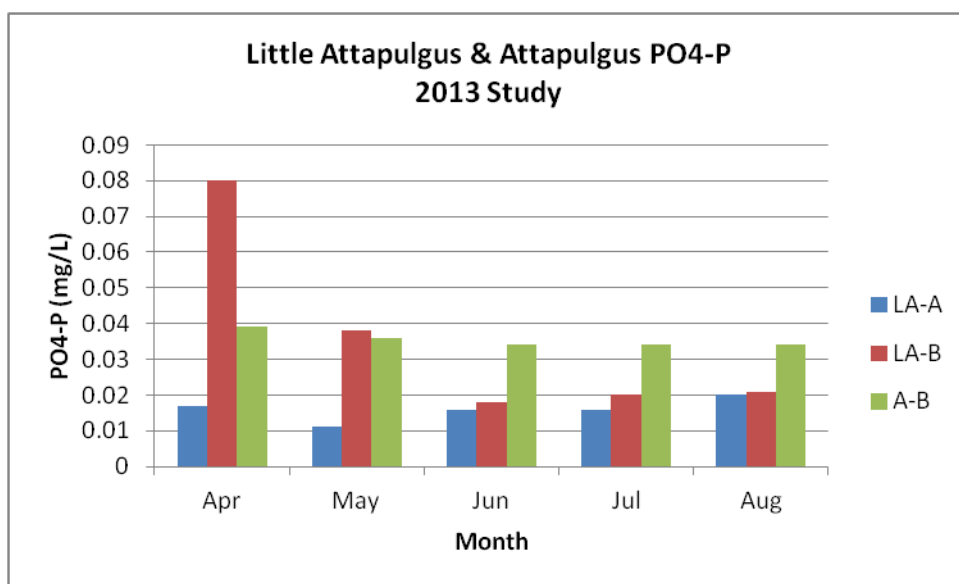


Figure B.4B.9. Little Attapulgis and Attapulgis Orthophosphate-P 2013

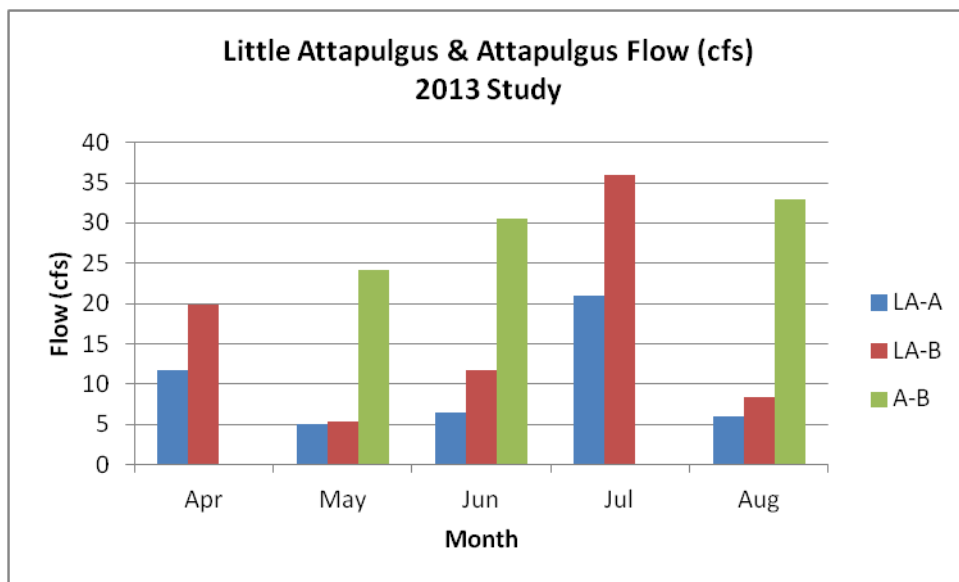


Figure B.4B.10. Little Attapulgus and Attapulgus Flow 2013

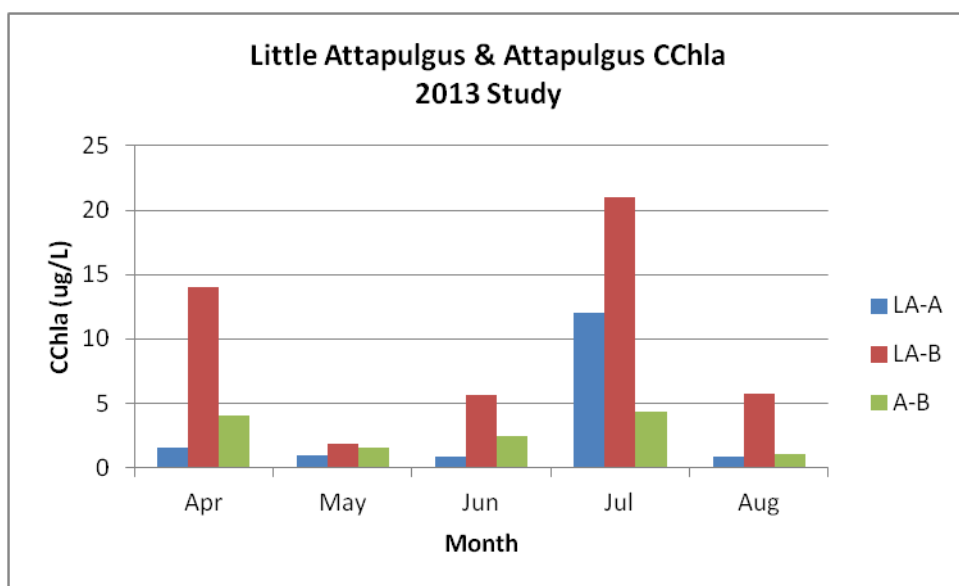


Figure B.4B.11. Little Attapulgus and Attapulgus CChla 2013

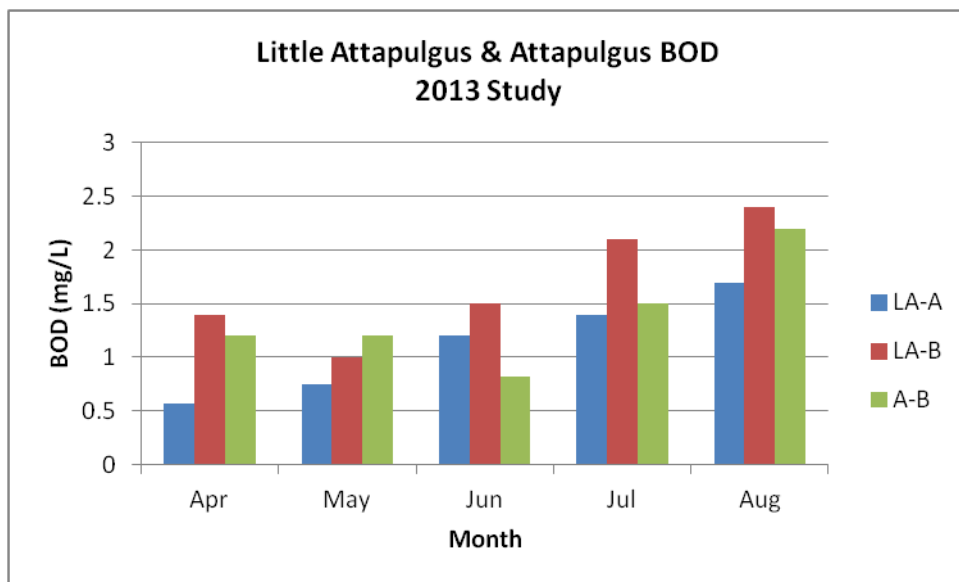


Figure B.4B.12. Little Attapulcus and Attapulcus BOD5 2013

Table B.4B.1. Little Attapulugus and Attapulugus Stations 2013

WBID	Station Number	Station Name	Begin Date	End Date
424	21FLWQA303946008427477	ATTAPULGUS RIVER ON HWY 159 (SALEM ROAD)	2013	2013
GA_A_BASF	21FLWQA304459608430046	LITTLE ATTAPULGUS RIVER ABOVE BASF ON 309 FACEVILLE ATTAPULGUS RD	2013	2013
GA_A_BASF	21FLWQA304305808429256	LITTLE ATTAPULGUS RIVER BELOW BASF ON HWY 241	2013	2013

Table B.4B.2. Little Attapulugus and Attapulugus Alkalinity 2013

		LA- Above	LA- Below	Attapulugus
Alkalinity	Min	9.1	15.0	8.2
	Max	15.0	34.0	13.0
	Median	12.0	25.0	11.0
	Mean	12.2	25.0	11.0
	Geomean	12.0	24.0	10.8
	Count	5	5	5

Table B.4B.3. Little Attapulugus and Attapulugus True Color 2013

		LA- Above	LA- Below	Attapulugus
Color	Min	77.0	72.0	120.0
	Max	170.0	180.0	210.0
	Median	98.0	93.0	140.0
	Mean	110.6	108.8	154.0
	Geomean	105.4	102.7	150.8
	Count	5	5	5

Table B.4B.4. Little Attapulugus and Attapulugus TN 2013

		LA-Above	LA-Below	Attapulugus
TN	Min	0.79	15.90	1.08
	Max	1.76	38.20	11.30
	Median	1.10	35.70	4.40
	Mean	1.13	30.88	6.20
	Geomean	1.08	29.39	4.58
	Count	5	5	5

Table B.4B.5. Little Attapulugus and Attapulugus NH4-N 2013

		LA-Above	LA-Below	Attapulugus
NH4-N	Min	0.02	3.00	0.02
	Max	0.05	5.30	0.53
	Median	0.03	3.40	0.34
	Mean	0.04	3.80	0.33
	Geomean	0.03	3.72	0.21
	Count	5	5	5

Table B.4B.6. Little Attapulugus and Attapulugus NO23-N 2013

		LA-Above	LA-Below	Attapulugus
NO23-N	Min	0.23	12.00	0.49
	Max	1.40	34.00	10.00
	Median	0.64	31.00	3.10
	Mean	0.67	26.20	5.08
	Geomean	0.56	24.54	3.19
	Count	5	5	5

Table B.4B.7. Little Attapulcus and Attapulcus Organic-N 2013

Constituent	Category	LA- Above	LA- Below	Attapulcus
Org-N (mg/L)	Min	0.33	0.60	0.57
	Max	0.57	1.30	0.98
	Median	0.42	0.90	0.85
	Mean	0.43	0.88	0.79
	Geomean	0.42	0.85	0.77

Table B.4B.8. Little Attapulcus and Attapulcus TP 2013

Constituent	Category	LA- Above	LA- Below	Attapulcus
TP (mg/L)	Min	0.038	0.084	0.078
	Max	0.084	0.180	0.130
	Median	0.055	0.110	0.095
	Mean	0.059	0.123	0.103
	Geomean	0.057	0.118	0.101

Table B.4B.9. Little Attapulcus and Attapulcus PO4-P 2013

Constituent	Category	LA- Above	LA- Below	Attapulcus
PO4-P (mg/L)	Min	0.011	0.018	0.034
	Max	0.020	0.080	0.039
	Median	0.016	0.021	0.034
	Mean	0.016	0.035	0.035
	Geomean	0.016	0.030	0.035

Table B.4B.10. Little Attapulgis and Attapulgis CChla 2013

Constituent	Category	LA- Above	LA- Below	Attapulgis
CChla (ug/L)	Min	0.8	1.9	1.1
	Max	12.0	21.0	4.4
	Median	1.0	5.7	2.5
	Mean	3.3	9.6	2.7
	Geomean	1.7	7.1	2.4

Table B.4B.11. Little Attapulgis and Attapulgis BOD5 2013

Constituent	Category	LA- Above	LA- Below	Attapulgis
BOD5 (mg/L)	Min	0.6	1.0	0.8
	Max	1.7	2.4	2.2
	Median	1.2	1.5	1.2
	Mean	1.1	1.7	1.4
	Geomean	1.0	1.6	1.3

B.4C Little River WBID 424

This WBID is not impaired for DO or nutrients.

Table B.4C.1, lists the 39 stations that have been sampled in the Little River WBID 424. **Figure B.4C.1** depicts the station locations.

Tables B.4C.5 and **B.4C.6** and **Figures B.4C.4** and **B.4C.5** provide the results for alkalinity. These data show that the Little River above Lake Talquin has a POR GM alkalinity of 13.7 mg/L. The data indicate that the alkalinity for the period (2005–2013) is elevated over the POR (GM 20.8 mg/L vs. 13.7 mg/L). The seasonal pattern indicates that the alkalinity is lowest in the first two months of the year (~10.0 mg/L) with a maximum in March (~25 mg/L) and then varying with 7 mg/L the rest of the year. This pattern for alkalinity is not clearly related to river flow or rainfall (**Figures B.3.12** and **B.2.4**). Data collection in 2013 indicates that the BASF facility on the Little Attapulugus maybe increasing the alkalinity in that creek and that this may have an effect on the seasonal pattern.

Tables B.4C.5 and **B.4C.6** and **Figures B.4C.6** and **B.4C.7** provide the results for true color. These data show that the Little River above Lake Talquin has a POR GM color of 63.1 PCU, very similar to the Ochlockonee River above Lake Talquin (62.5 PCU). The data indicate that the GM color for the period (2005–2013) of 76.4 PCU is slightly greater than the POR color. The seasonal pattern indicates that the color is high in January and decreases as monthly flow increases through March. Color goes up in April to the January levels and then declines through June. Color is highest in July and August when flows are low and at the lowest levels through the fall and early winter when flows are low. This pattern for color appears to be weakly related to river flow (**Figure B.3.12**).

Tables B.4C.5 and **B.4C.6** and **Figures B.4C.9** through **B.4C.12** provide the results for TN. These data show that the Little River above Lake Talquin has a POR GM TN of 1.75 mg/L. The data (**Figure B.4C.11**) indicate that the recent (2005–2013) TN GM of 1.80 mg/L is similar to the POR TN GM for the POR and greater than the new threshold AGM concentration for TN of 1.03 mg/L. The data also indicate that there is no overall trend for AGM TN concentrations. This is in direct contrast to the Ochlockonee River above the lake which shows a declining trend. The seasonal pattern indicates that the TN concentration increases from January through April, declines through June, progressively increases through November and then declines in December. This pattern for TN is similar to the Ochlockonee River above the lake and not clearly related to flow or rainfall (**Figures B.3.12** and **B.2.4**).

Tables B.4C.5 and **B.4C.6** and **Figures B.4C.13** and **B.4C.14** provide the results for NH₄-N. These data show that the Little River above Lake Talquin has a POR GM NH₄-N of 0.07 mg/L, slightly greater than the Ochlockonee River (0.061 mg/L). The data indicate that the recent (2005–2013) NH₄-N GM of 0.057 mg/L is less than the POR concentration. There is no clear trend for NH₄-N concentrations.

Tables B.4C.5 and B.4C.6 and Figures B.4C.15 and B.4C.16 provide the results for NO₂₃-N. These data show that the Little River above Lake Talquin has a POR GM NO₂₃-N of 0.91 mg/L, significantly greater than the 0.316 mg/L value for the Ochlockonee River above the lake. The data indicate that the recent (2005–2013) NO₂₃-N GM of 0.904 mg/L is about the same as the POR concentration. There does not appear to be a trend for this constituent.

Tables B.4C.5 and B.4C.6 and Figures B.4C.18 through B.4C.21 provide the results for TP. These data show that the Little River above Lake Talquin has a POR GM TP of 0.125 mg/L, slightly less than the value for the Ochlockonee River above the lake (0.158 mg/L). The data indicate that the recent (2005–2013) TP GM of 0.102 mg/L is slightly less than the TP GM for the POR and the new threshold AGM concentration for TP of 0.18 mg/L. The data also indicate that the overall trend is a slight reduction in the AGM TP concentrations over time (**Figure B.4C.20**). This trend is driven by the relatively higher AGM concentrations that occurred from 1972 through 1973. The seasonal pattern indicates that the TP concentration are greatest in January, stay fairly consistent through July, increase in August and then gradual decline through the rest of the year. This pattern for TP is not clearly related to flow or rainfall (**Figures B.3.12 and B.2.4**).

Tables B.4C.5 and B.4C.6 and Figures B.4C.22 and B.4C.23 provide the results for PO₄-P. These data show that the Little River above Lake Talquin has a POR GM PO₄-P of 0.061 mg/L, about half of the POR value for the Ochlockonee River above the lake (0.12 mg/L). The data indicate that the recent (2005–2013) PO₄-P GM of 0.038 mg/L is also less than the value of 0.046 mg/L for the Ochlockonee River and is reduced over the POR concentration and that the overall trend is for declining concentrations. This trend is driven by the relatively higher concentrations in the 1970's.

Tables B.4C.5 and B.4C.6 and Figures B.4C.24 through B.4C.27 provide the results for CChla. These data show that the Little River above Lake Talquin has a POR GM CChla of 2.2 ug/L (same as the Ochlockonee River). The data indicate that the recent (2005–2013) CChla GM of 1.8 ug/L is not significantly different from the CChla GM for the POR and significantly less than the 20.0 ug/L new threshold AGM concentration for CChla. The data also indicate that the overall trend is for decreasing AGM CChla concentrations (**Figure B.4C.26**). This trend is driven by the relatively higher AGM concentration in 1992, reductions in detection limits over time, and the large number of less than detect results. The seasonal pattern indicates that the CChla concentrations are above the detection limits during the middle of the growing season, peaking in July and mostly less than detection during the remaining months of the year. This pattern may be influenced by varying detection limits over time. The pattern in CChla does not appear to be related to flow or rainfall (**Figures B.3.12 and B.2.4**).

Tables B.4C.5 and B.4C.6 and Figures B.4C.28 through B.4C.30 provide the results for BOD₅. These data show that the Little River above Lake Talquin has a POR GM BOD₅ of 1.3 mg/L (same as the Ochlockonee River). The data indicate that the recent (2005–2013) BOD₅ GM of 1.0 mg/L is not significantly different than the POR concentration. Variable detection limits over time may be having an influence on the data. The BOD₅ concentrations have come down over

time, but this could be due changes in detection limits between data collected in the 1970's and more recent results.

Tables B.4C.5 and B.4C.6 and Figures B.4C.31 and B.4C.32 provide the results for DO. These data show that the Little River above Lake Talquin has a POR GM DO of 7.4 mg/L. The data indicate that the recent (2005–2013) DO GM of 7.8 mg/L is not significantly different than the POR concentration. The DO concentrations may have increased slightly since the 1970's. Seasonal data indicate that the monthly average DO is never less than 6.0 mg/L (**Figure B.4C.32**).

Tables B.4C.5 and B.4C.6 and Figures B.4C.33 through B.4C.35 provide the results for percent DO saturation. These data show that the Little River above Lake Talquin has a POR GM DOSAT of 77.2 %. The data indicate that the recent (2005–2013) DOSAT GM of 87.2 % is slightly higher than the GM for the POR. The data presented in **Figure B.4C.34** indicates that there are is not an issue with the new 67 % saturation DO criterion. The data do not appear to have a long-term trend (**Figure B.4C.33**). The seasonal pattern indicates that the DOSAT is lowest in June and October and highest in November.

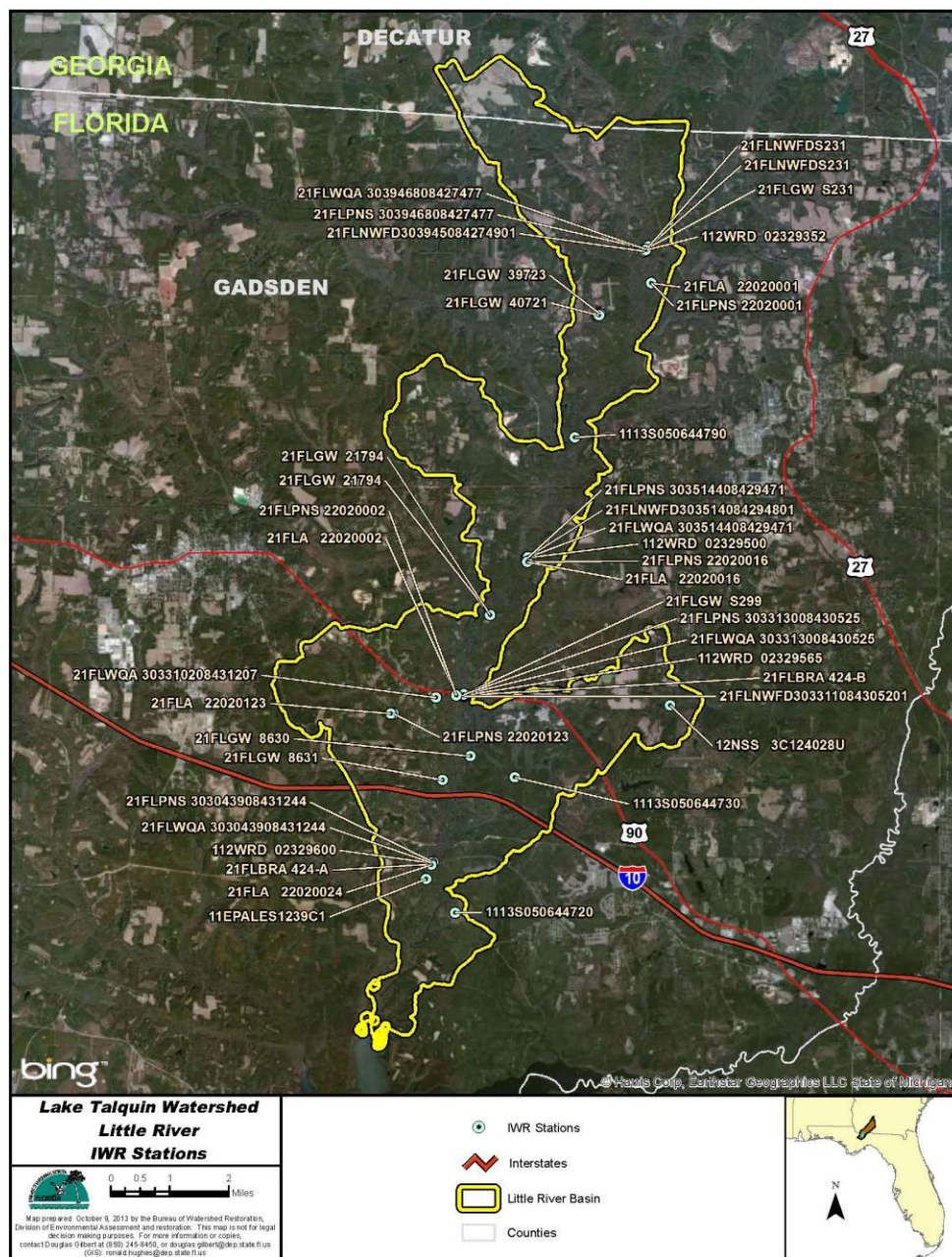


Figure B.4C.1. Little River WBID 424 IWR Station Locations

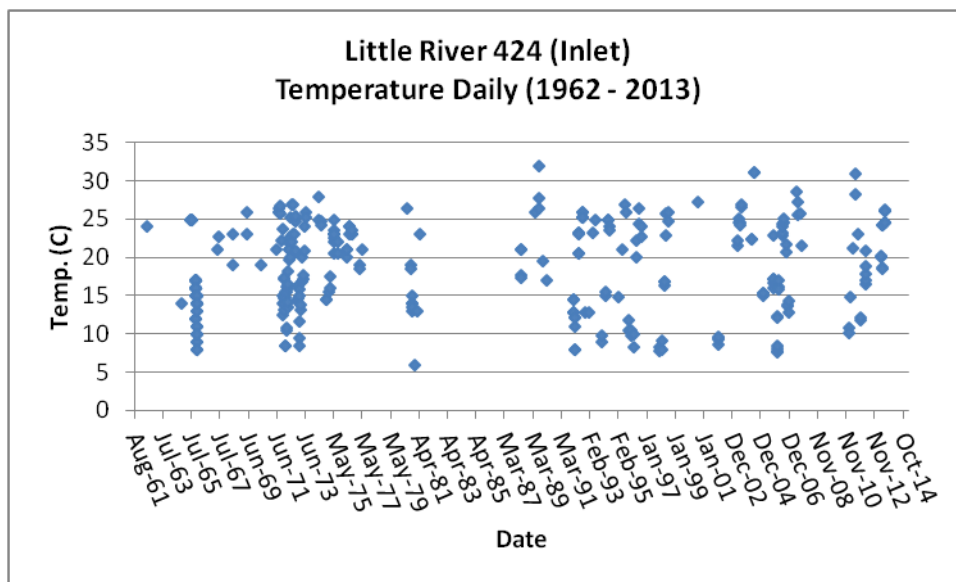


Figure B.4C.2. Little River WBID 424 Daily Temperature 1962–2013

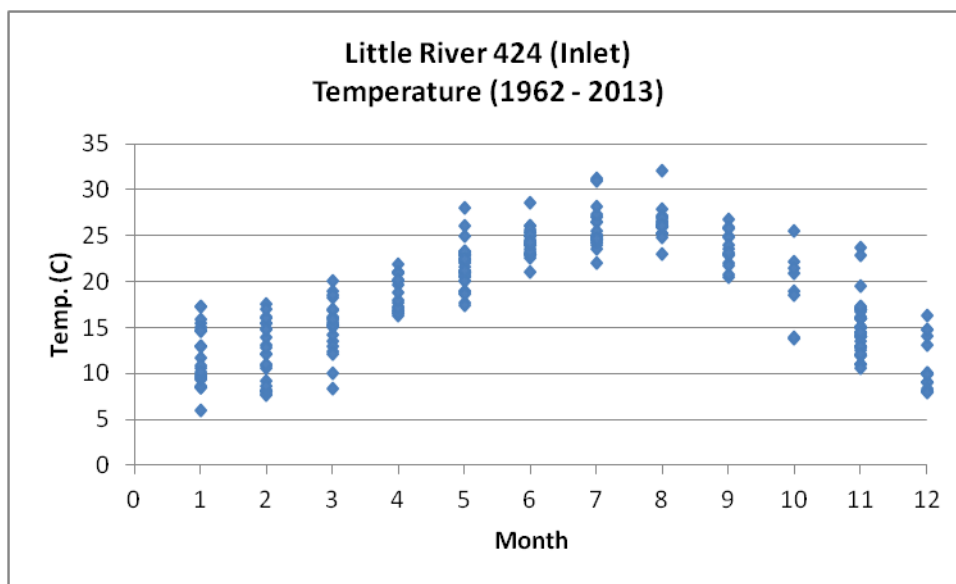


Figure B.4C.3. Little River WBID 424 Monthly Temperature 1962–2013

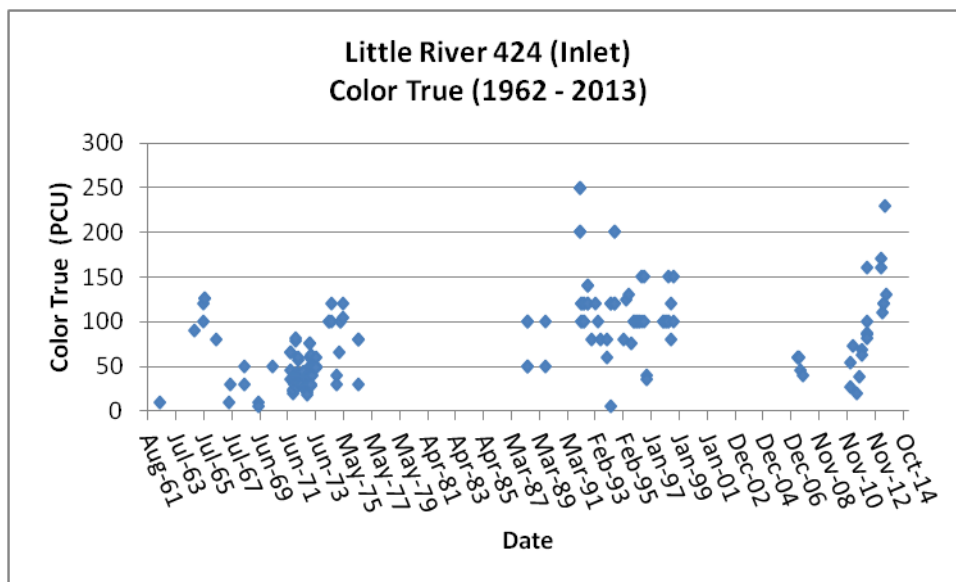


Figure B.4C.6. Little River WBID 424 Daily Average True Color 1962–2013

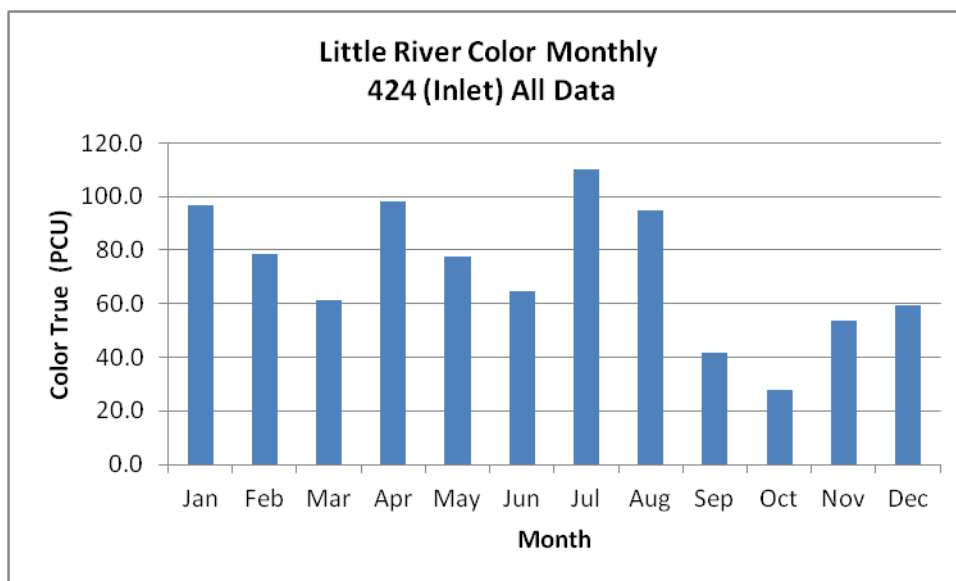


Figure B.4C.7. Little River WBID 424 Monthly Average True Color 1962–2013

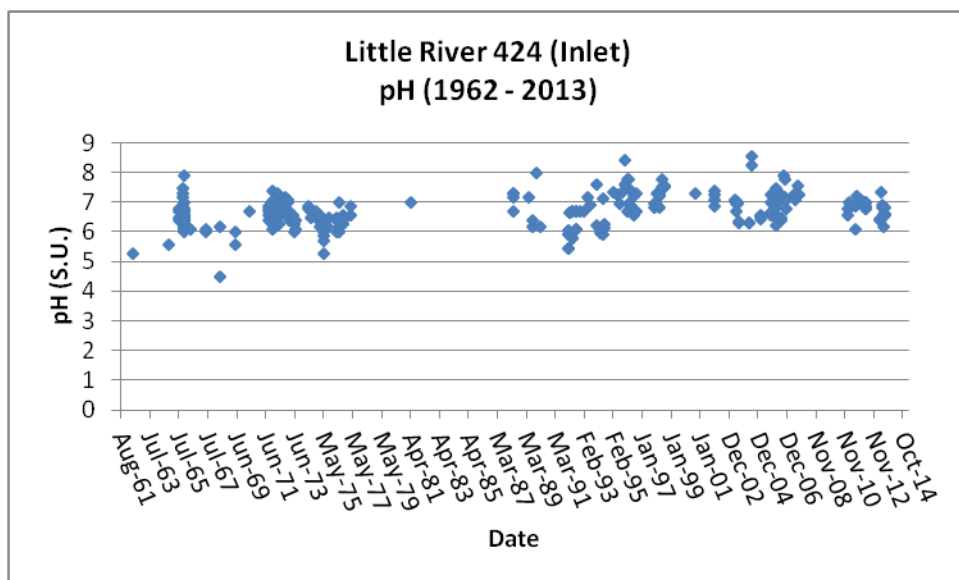


Figure B.4C.8. Little River WBID 424 Daily pH 1962–2013

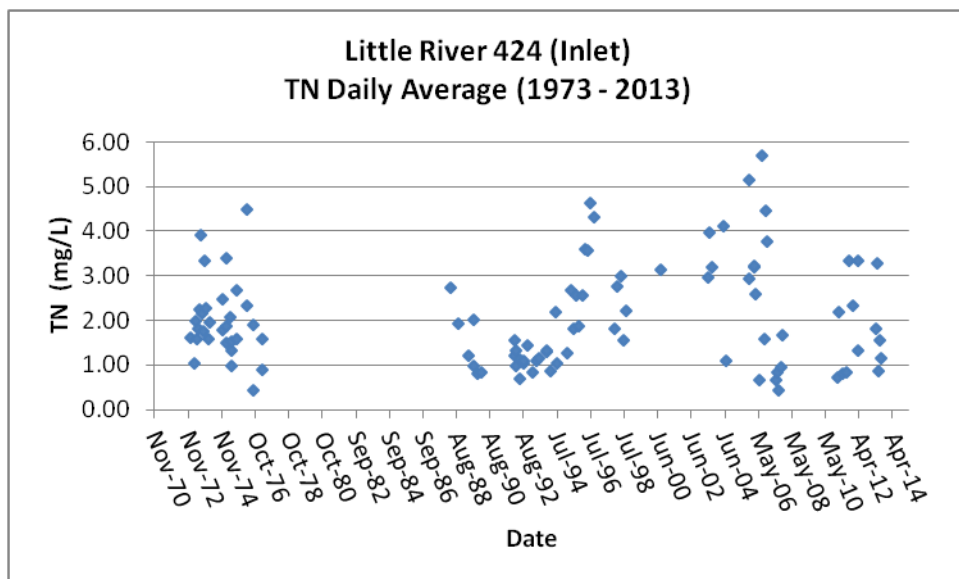


Figure B.4C.9. Little River WBID 424 Daily Average TN 1973–2013

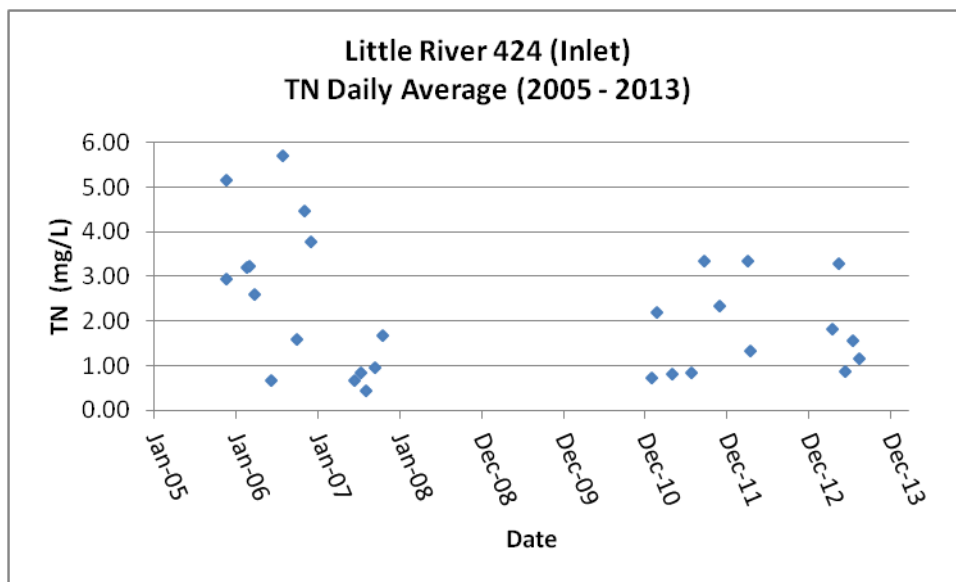


Figure B.4C.10. Little River WBID 424 Daily Average TN 2005–2013

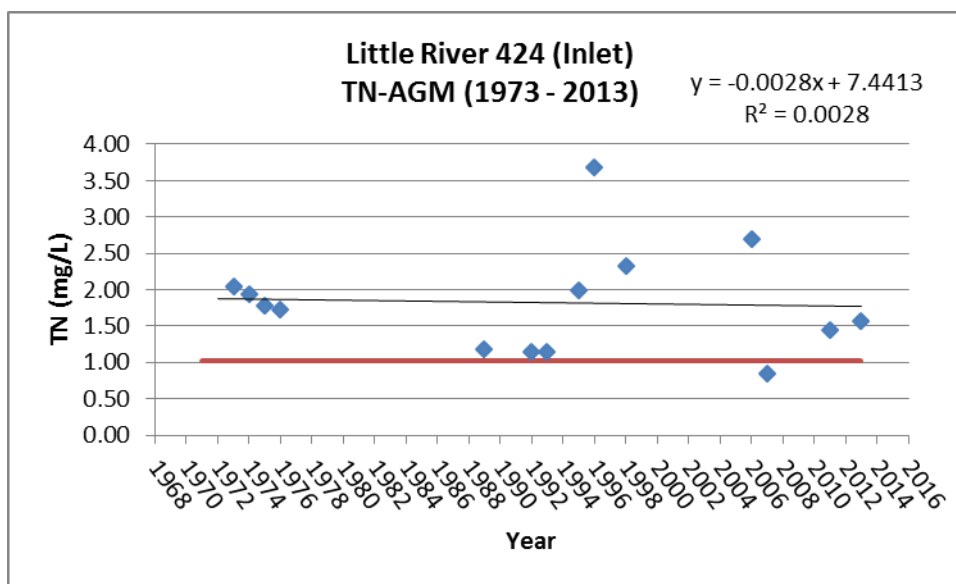


Figure B.4C.11. Little River WBID 424 TN Annual Geomean 1973–2013

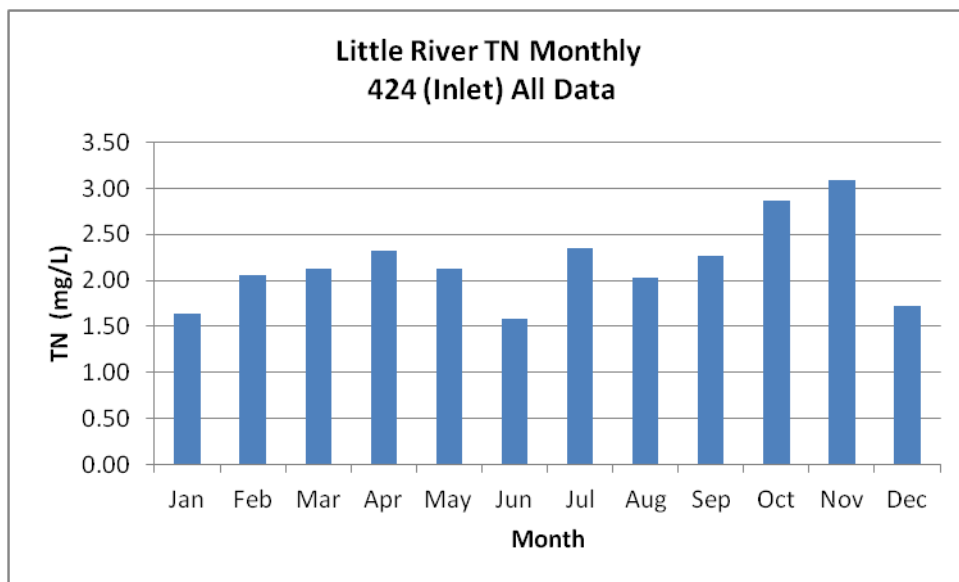


Figure B.4C.12. Little River WBID 424 Monthly Average TN 1973–2013

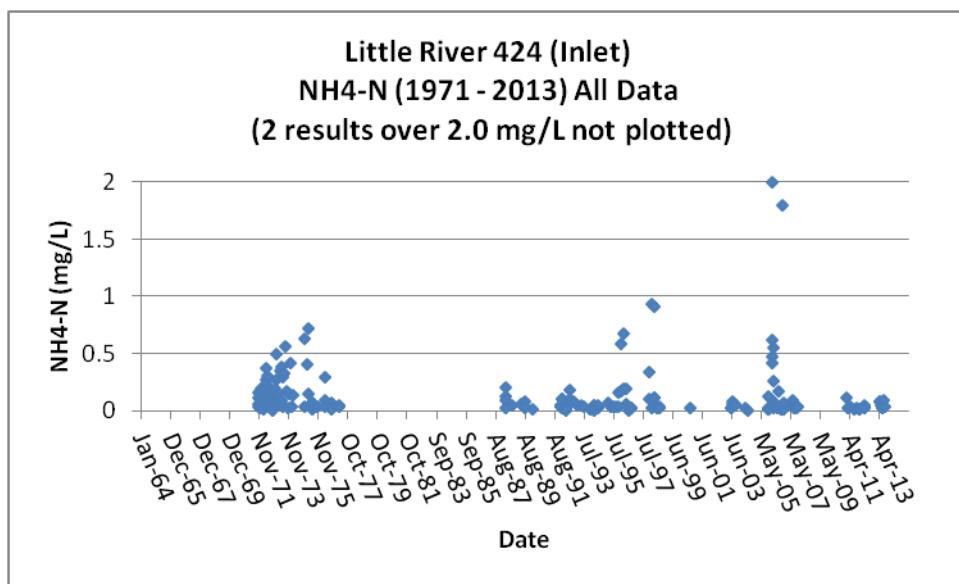


Figure B.4C.13. Little River WBID 424 Daily Average Ammonia-N 1971–2013

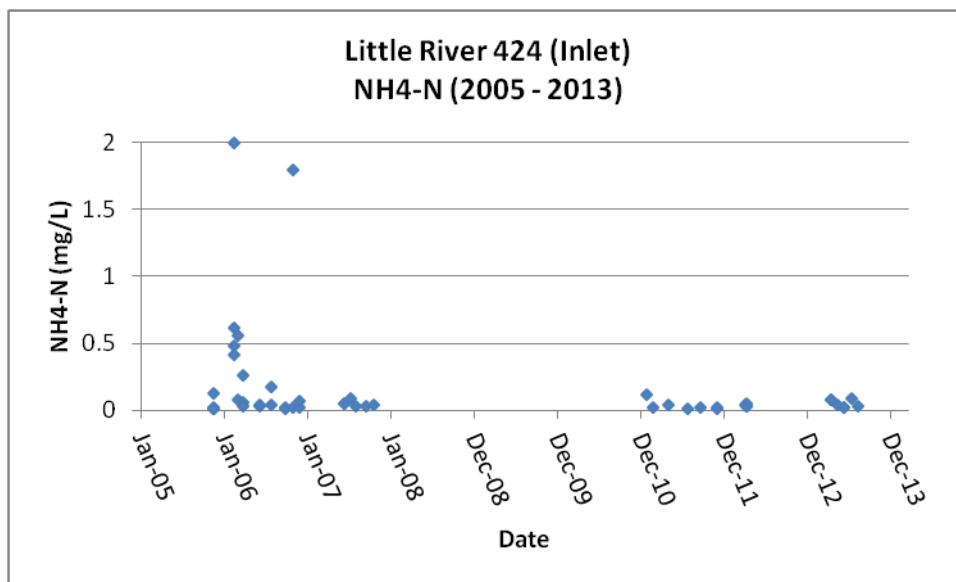


Figure B.4C.14. Little River WBID 424 Daily Average Ammonia-N 2005–2013

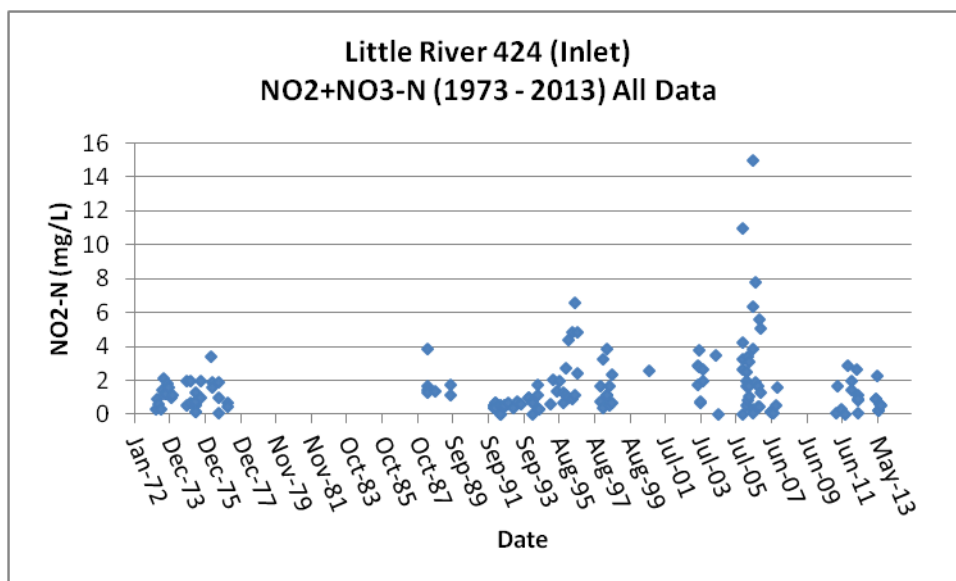


Figure B.4C.15. Little River WBID 424 Daily Average Nitrate/Nitrite-N 1973–2013

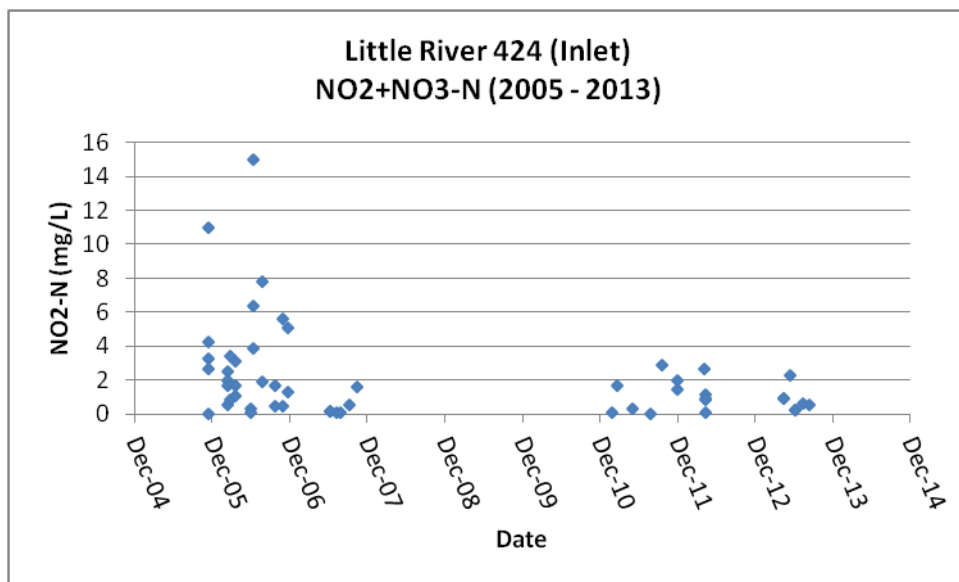


Figure B.4C.16. Little River WBID 424 Daily Average Nitrate/Nitrite-N 2005–2013

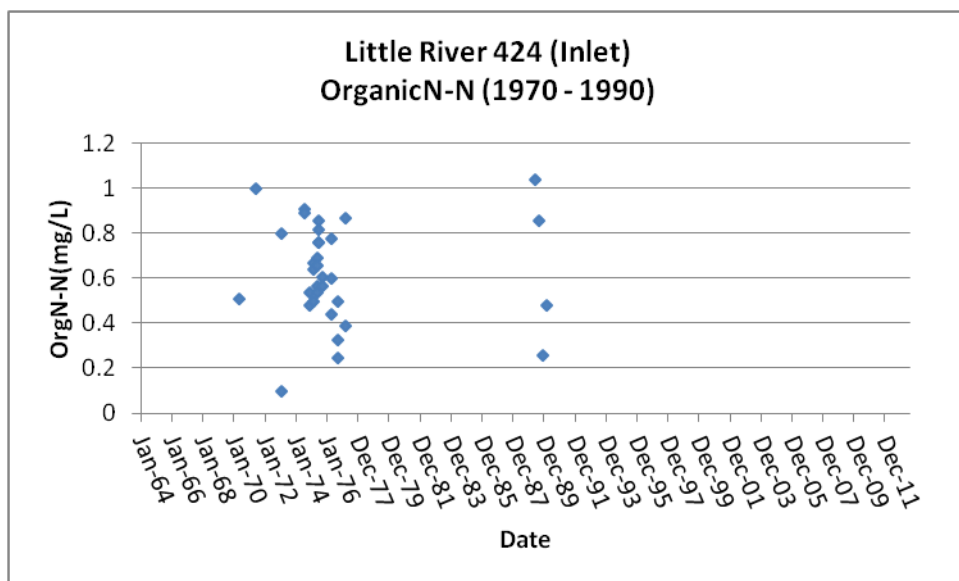


Figure B.4C.17. Little River WBID 424 Daily Average Organic-N 1970–1990

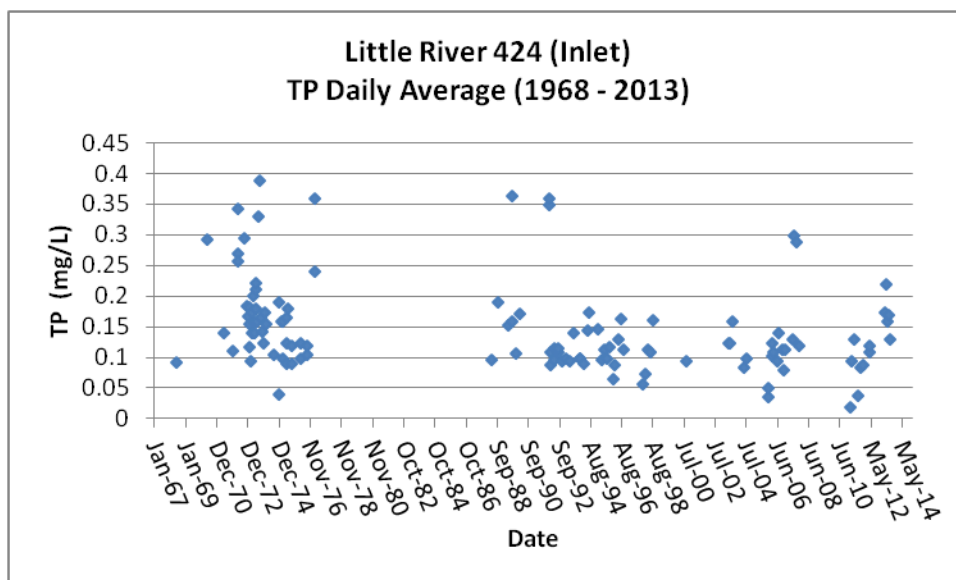


Figure B.4C.18. Little River WBID 424 Daily Average TP 1968–2013

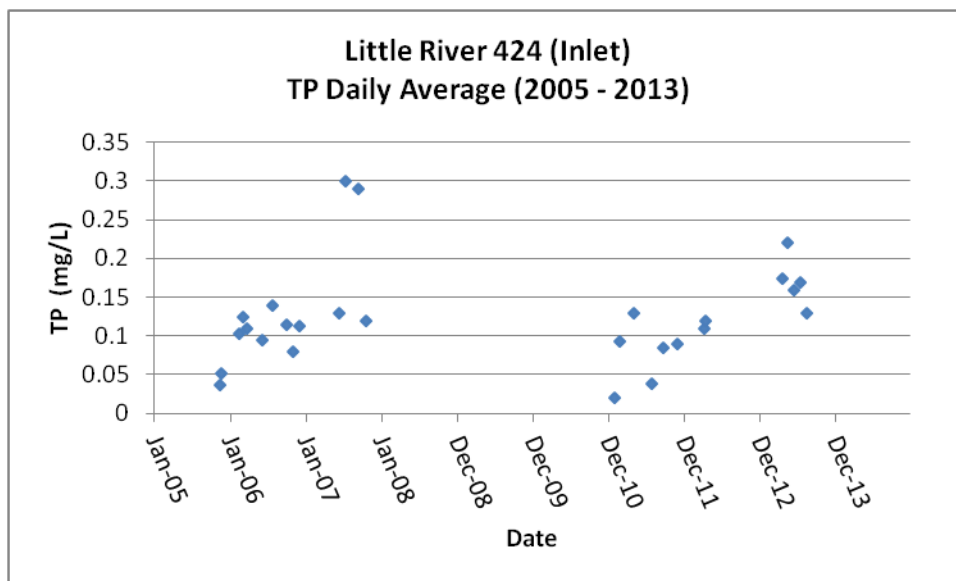


Figure B.4C.19. Little River WBID 424 Daily Average TP 2005–2013

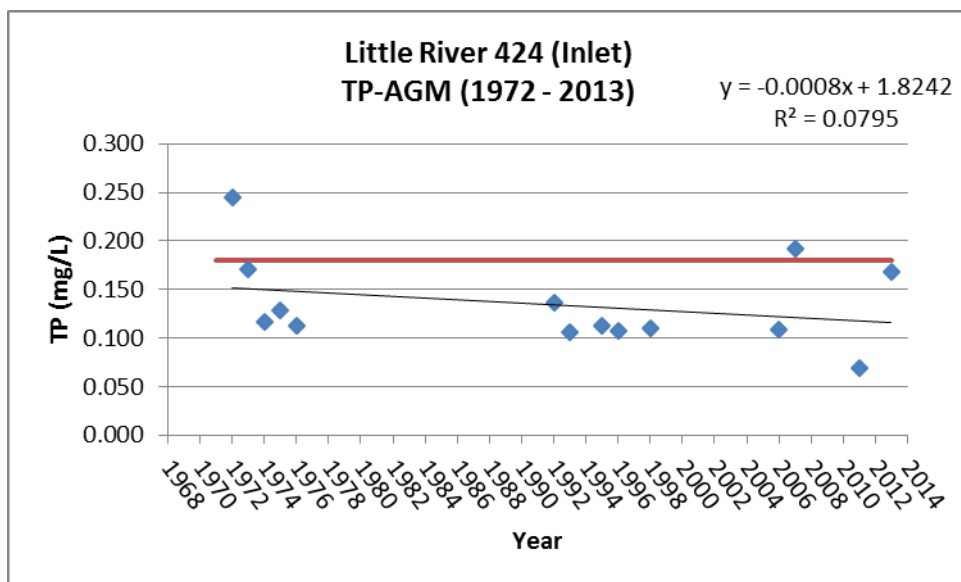


Figure B.4C.20. Little River WBID 424 Annual Geomean TP 1972–2013

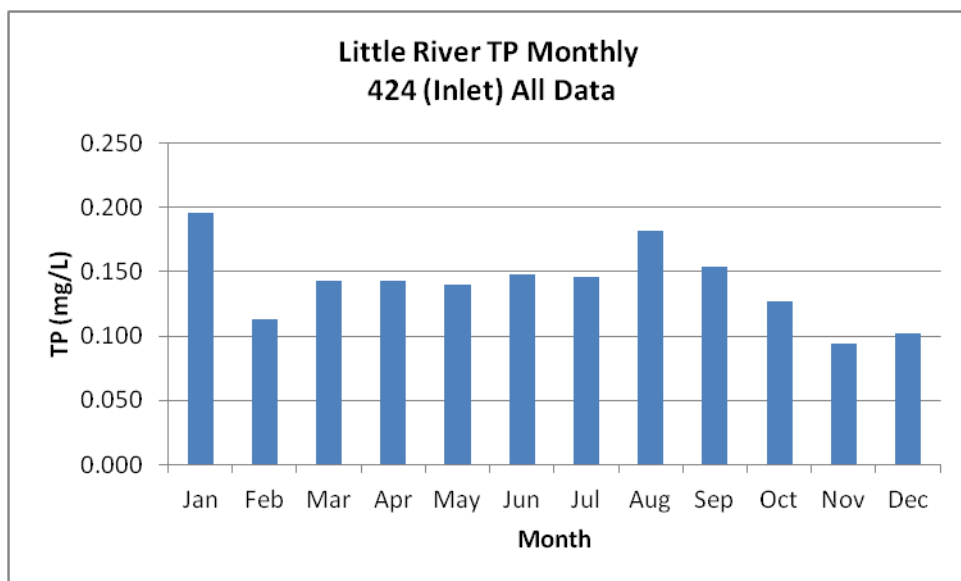


Figure B.4C.21. Little River WBID 424 Monthly Average TP 1968–2013

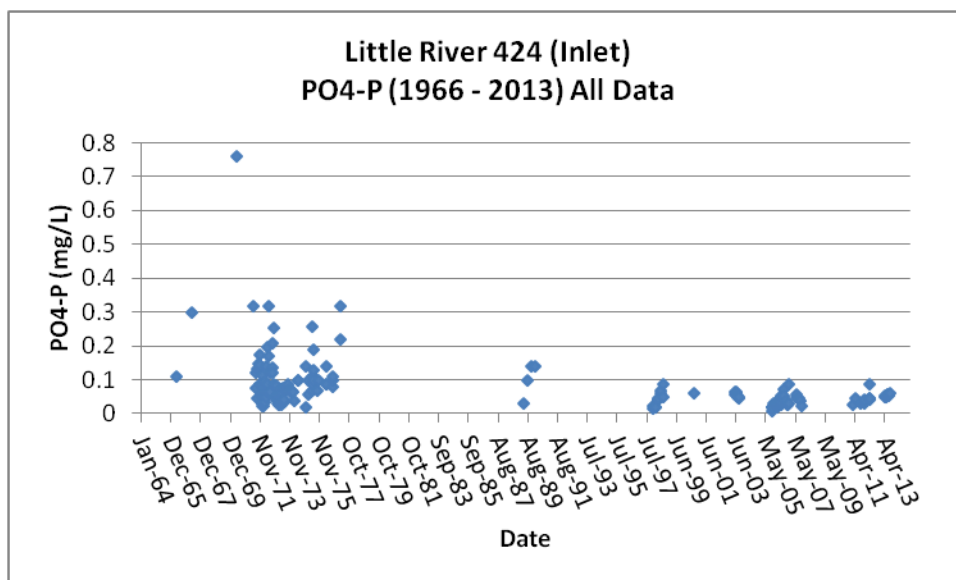


Figure B.4C.22. Little River WBID 424 Daily Average Orthophosphate-P 1966–2013

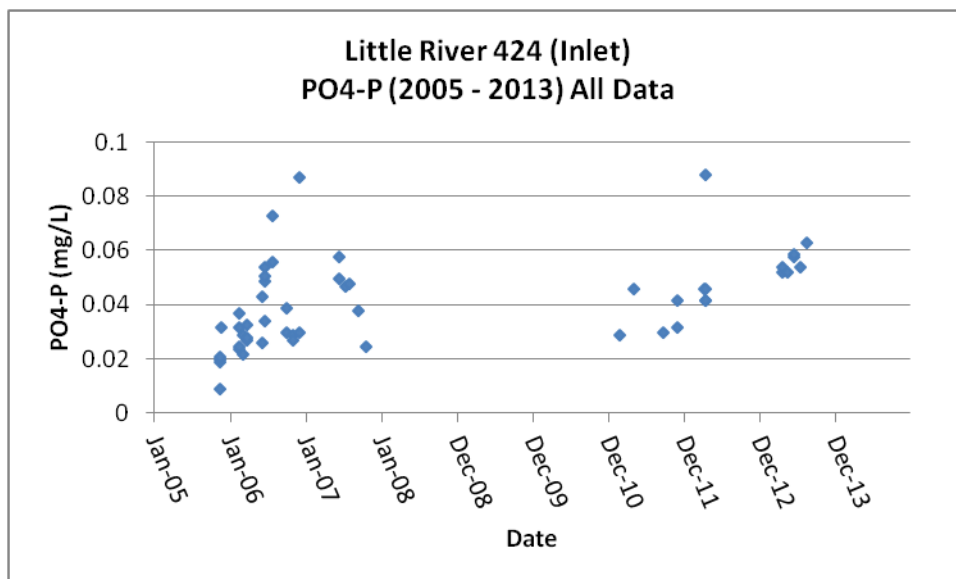


Figure B.4C.23. Little River WBID 424 Daily Average Orthophosphate-P 2005–2013

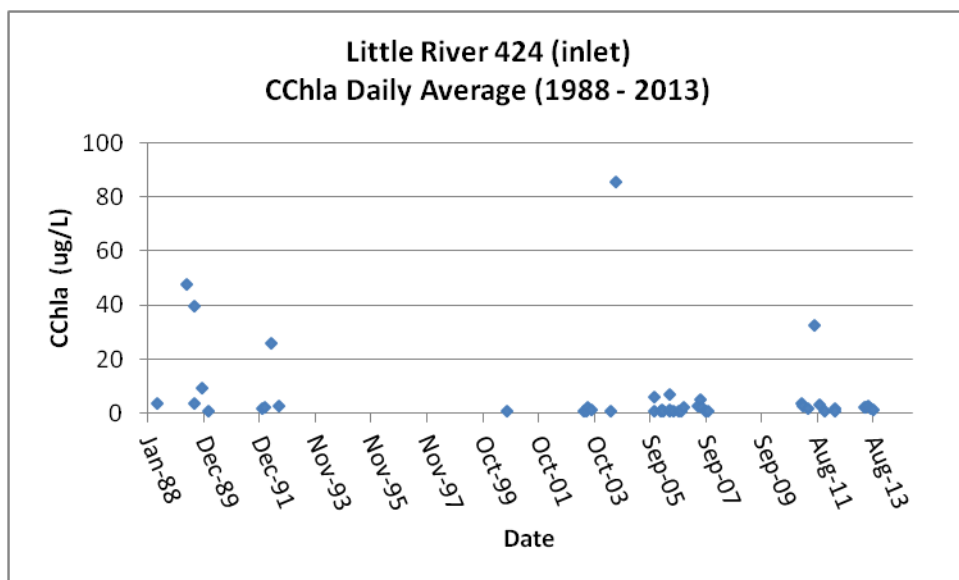


Figure B.4C.24. Little River WBID 424 Daily Average CChla 1988–2013

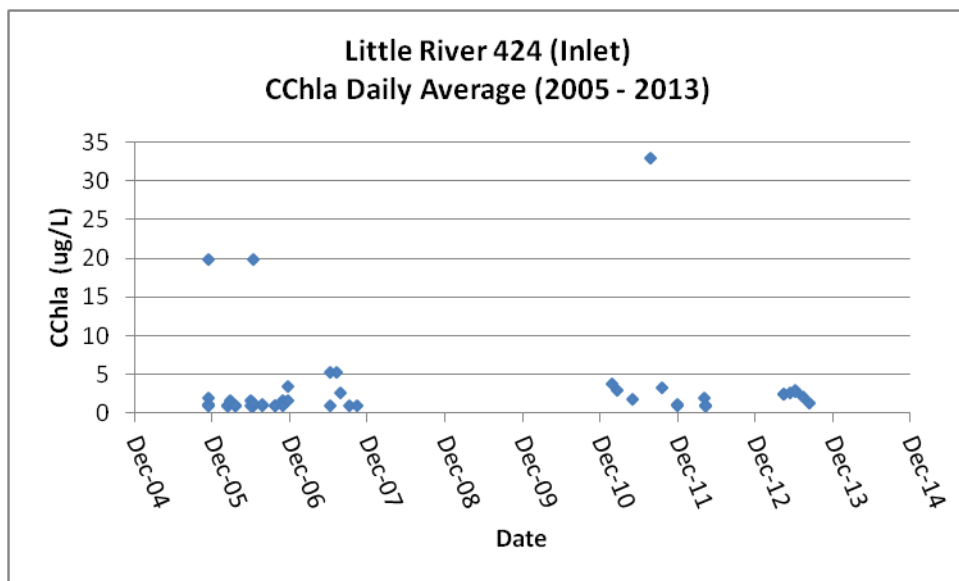


Figure B.4C.25. Little River WBID 424 Daily Average CChla 2005–2013

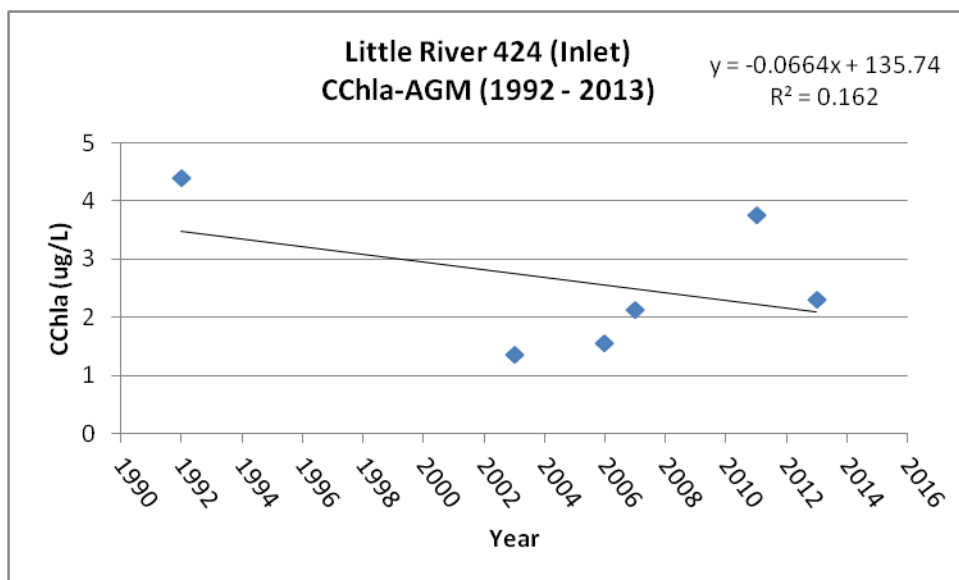


Figure B.4C.26. Little River WBID 424 Annual Geomean CChla 1992–2013

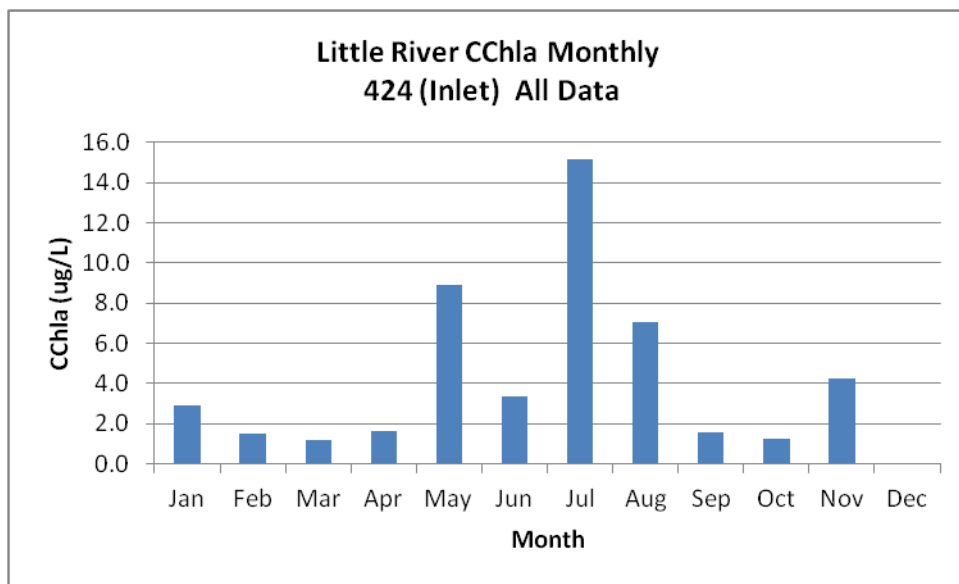


Figure B.4C.27. Little River WBID 424 Monthly Average CChla 1988–2013

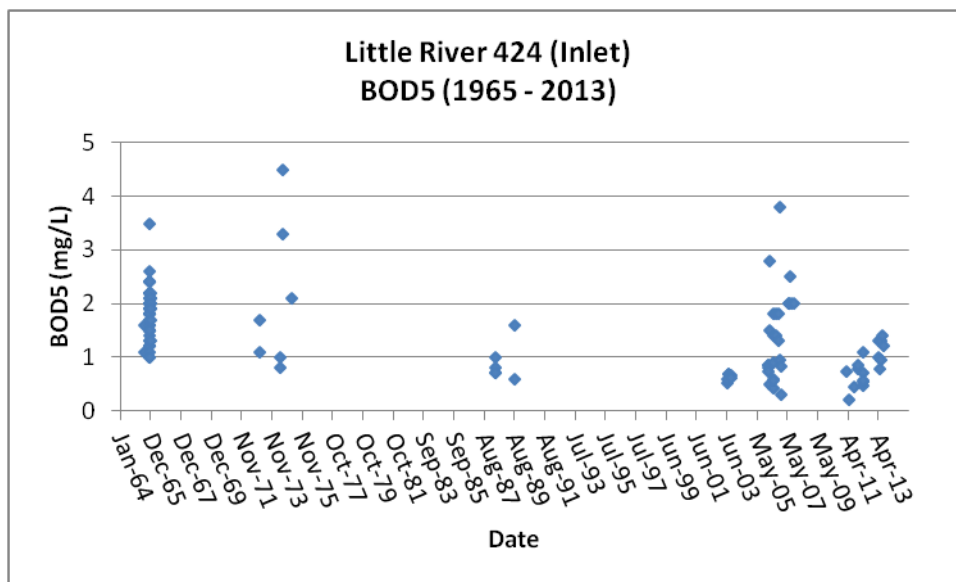


Figure B.4C.28. Little River WBID 424 Daily Average BOD5 1965–2013

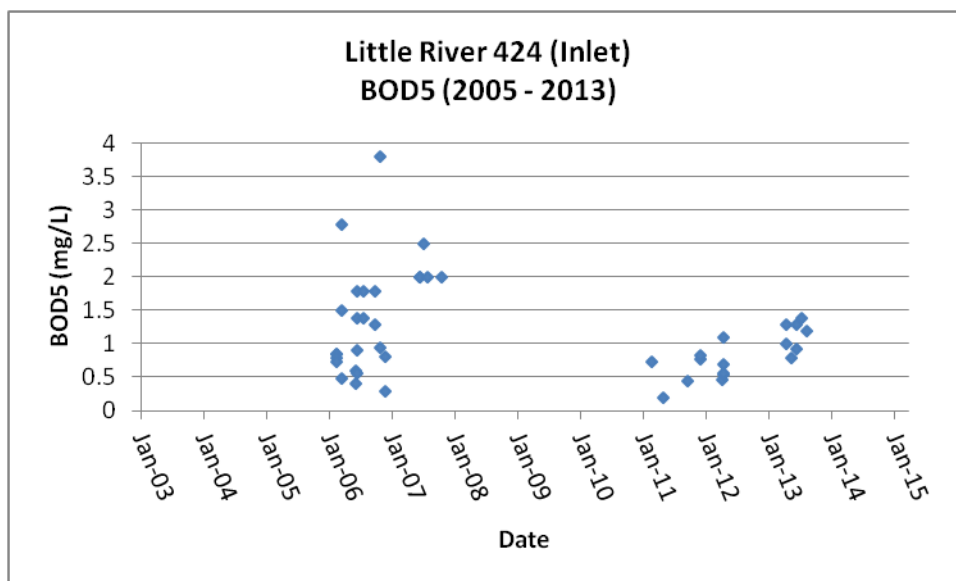


Figure B.4C.29. Little River WBID 424 Daily Average BOD5 2005–2013

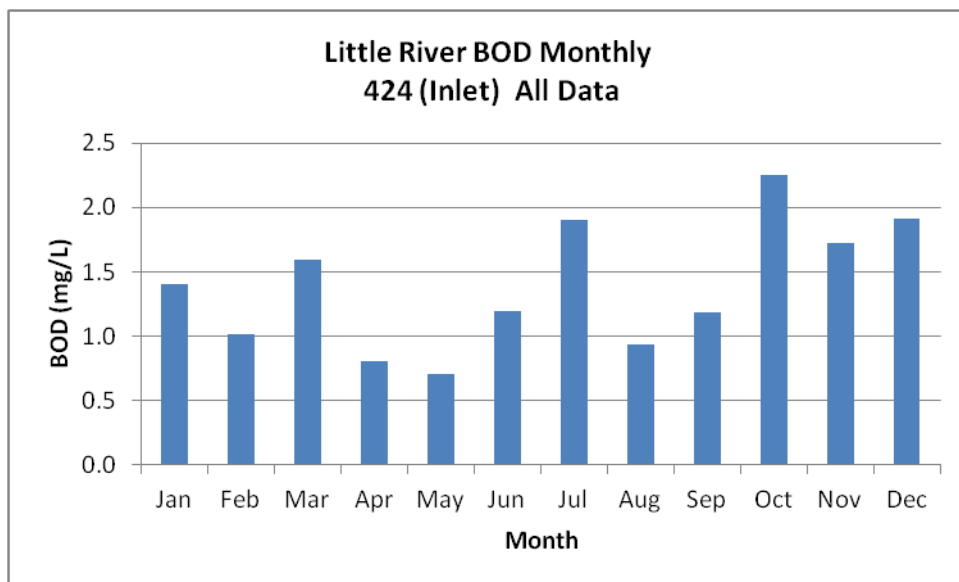


Figure B.4C.30. Little River WBID 424 Monthly Average BOD5 1965–2013

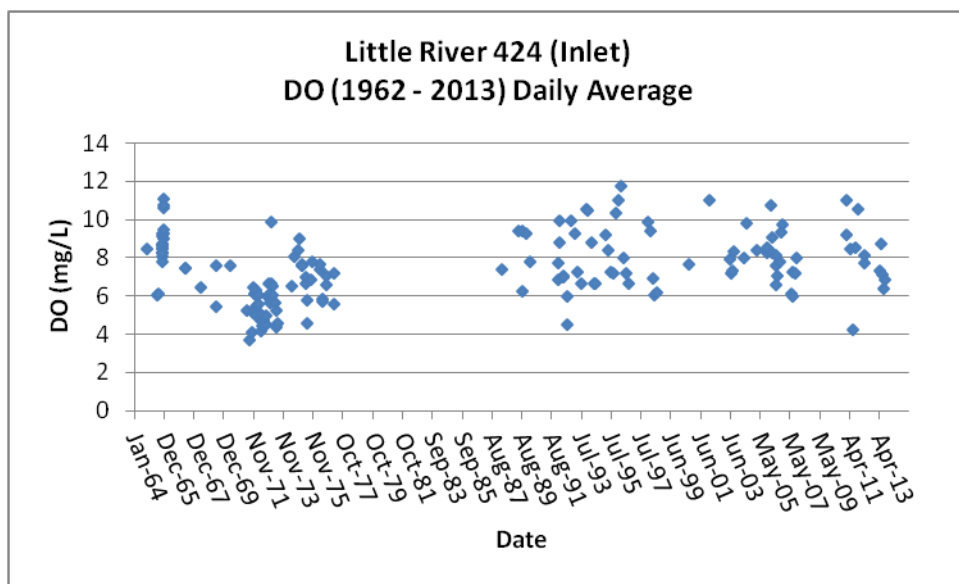


Figure B.4C.31. Little River WBID 424 Daily Average DO 1962–2013

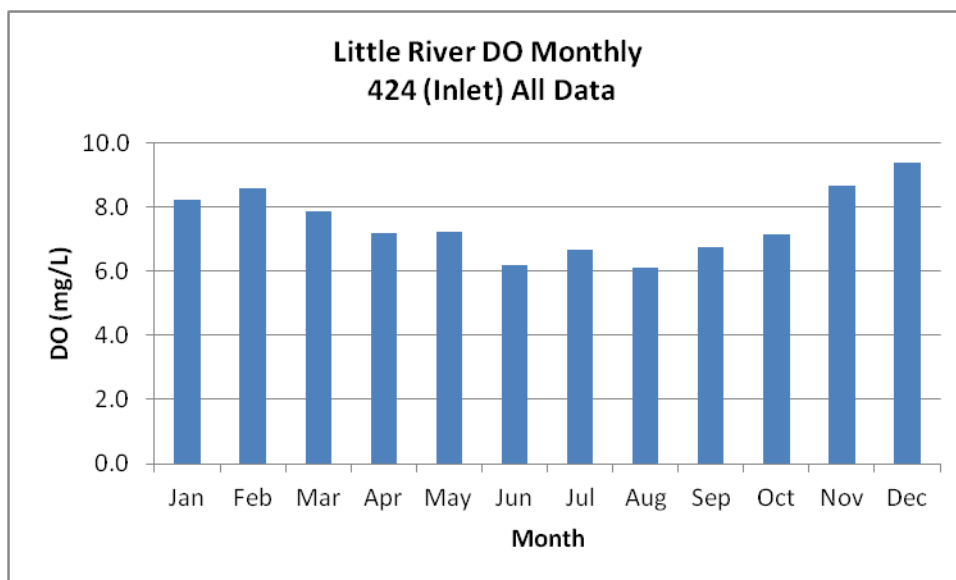


Figure B.4C.32. Little River WBID 424 Monthly Average DO 1962–2013

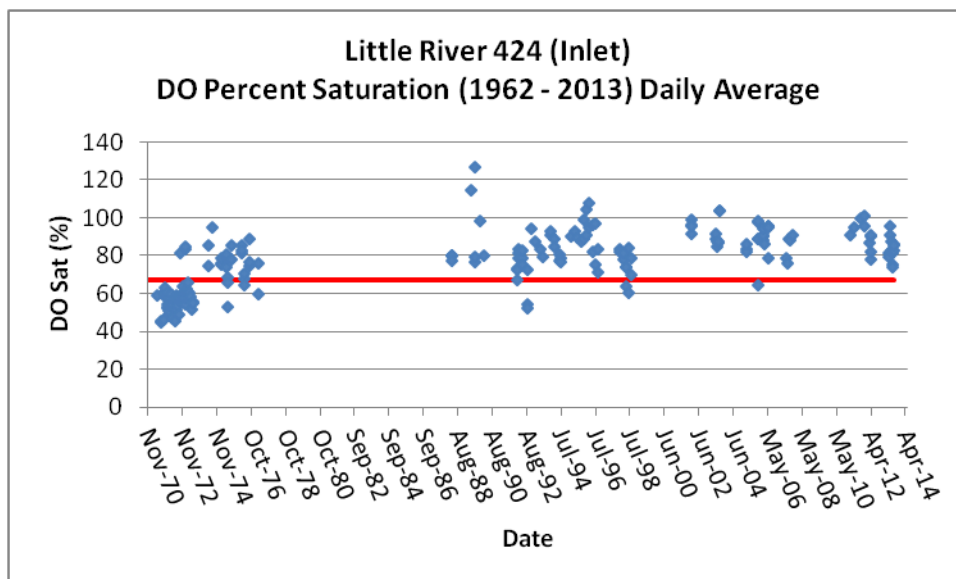


Figure B.4C.33. Little River WBID 424 Daily Average DO Percent Saturation 1962–2013

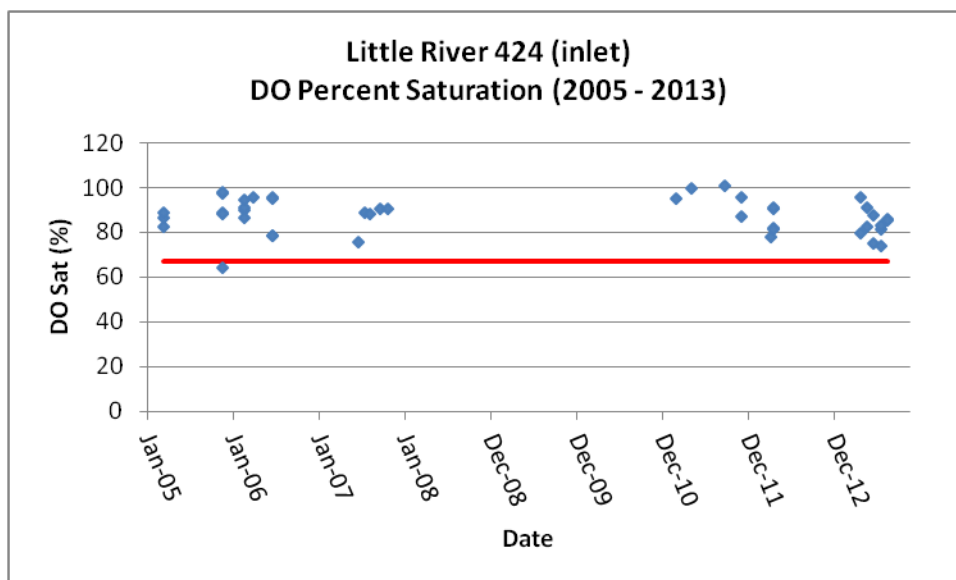


Figure B.4C.34. Little River WBID 424 Daily Average DO Percent Saturation 2005–2013

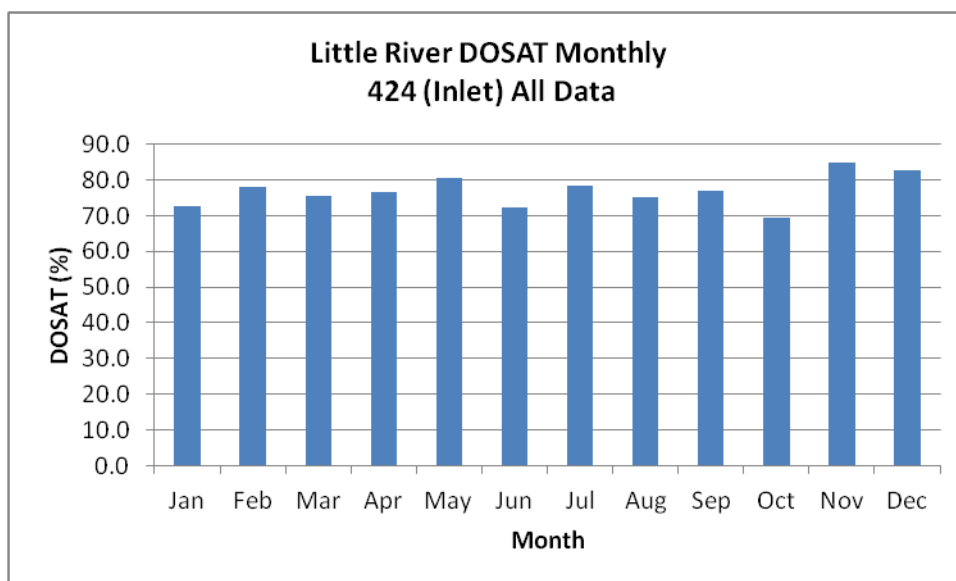


Figure B.4C.35. Little River WBID 424 Monthly Average DO Percent Saturation 1962–2013

Table B.4C.1. Little River WBID 424 IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
424	21FLPNS 22020002	LITTLE R US HWY 90	1999	1999
424	21FLBRA 424-A	424 - Little River - far dwnstrm from bridge on SR 268	2007	2007
424	21FLGW 8630	NWA-HS-1016 LITTLE RIVER	2000	2000
424	1113S050644790	ATTAPULGUS CR HWY 159 NE QUINCY	1965	1965
424	112WRD 02329500	LITTLE RIVER NR QUINCY, FLA.	1966	1981
424	21FLWQA 303043908431244	Little River at SR 268	2002	2006
424	21FLNWFD303311084305201	Little River @ U.S. 90	1992	1996
424	21FLGW S299	LITTLE RIVER @ US 90	1997	1998
424	21FLGW 8631	NWA-HS-1018 G CREEK	2000	2000
424	11EPALES1239C1	LITTLE RIVER	1973	1974
424	21FLPNS 303514408429471	Little River At SR 12 (also 21FLWQA)	0	0
424	21FLPNS 303313008430525	Little River At US 90 (also 21FLWQA)	0	0
424	21FLGW 21794	NW1-SS-2041 LITTLE RIVER	2004	2004
424	112WRD 02329565	LITTLE RIVER NR LITTMAN, FLA.	1975	1981
424	1113S050644730	LITTLE R US 90 HWY 10 SE QUINCY	1965	1965
424	21FLWQA 303946808427477	Attapulugus Creek at SR 159	2002	2006
424	21FLPNS 22020001	ATTAPULGUS CR FLA 159 NW JAMISON	1996	1996
424	21FLNWFD5231	Attapulugus Cr. at 159 ab Willacoochee Cr.	2008	2008
424	1113S050644720	LITTLE R HWY 268 SE QUINCY	1965	1965
424	21FLPNS 303043908431244	Little River at SR 268	2006	2006
424	21FLBRA 424-B	424 - Little River - Bridge on Highway 90	2007	2007
424	21FLNWFD303945084274901	Attapulugus Cr. @ 159 ab Willacoochee Cr.	1992	1996
424	21FLGW S231	ATTAPULGUS CR 159	1997	1998
424	21FLWQA 303310208431207	Trib at Rentz Road 0.25 miles South of US 90	0	0
424	112WRD 02329600	LITTLE RIVER NR MIDWAY, FLA.	1967	1981
424	21FLGW 39723	Z1-SL-5007 UNNAMED SMALL LAKE	0	0
424	21FLA 22020016	LITTLE R AT BR ON FLA 12	1973	1989
424	21FLGW 21794	NW1-SS-2041 LITTLE RIVER	2004	2004
424	21FLA 22020024	LITTLE R SR 268	1965	1988
424	21FLPNS 303946808427477	Attapulugus Creek at SR 159	2006	2006
424	21FLNWFD5231	Attapulugus Cr. at 159 ab Willacoochee Cr.	2008	2008
424	21FLNWFD303514084294801	Little River @ SR 12	1993	1994
424	21FLWQA 303313008430525	Little River at US 90	2002	2006
424	21FLA 22020002	LITTLE R US HWY 90	1962	1989
424	21FLWQA 303514408429471	Little River at SR 12	2002	2006
424	21FLPNS 22020016	LITTLE R AT BR ON FLA 12	1996	1996
424	21FLGW 40721	Z1-SL-5007R UNNAMED SMALL LAKE	0	0
424	21FLA 22020001	ATTAPULGUS CR FLA 159 NW JAMISON	1965	1988

WBID	Station Number	Station Name	Begin Date	End Date
424	112WRD 02329352	ATTAPULGUS CREEK AT JAMIESON, FLA	1974	1981

Table B.4C.2. Little River WBID 424 Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
424	Alkalinity (mg/L)	1965 - 2013	13.7
424	Color-True (PCU)	1962 - 2013	63.1

Table B.4C.3. Little River WBID 424 DO Percent Saturation vs. 67 % Criterion

Year	Category	Result
1962 - 2013	Count	266
	Number P	194
	Number F	67
	Percent F	25.2
2005 - 2013	Count	44
	Number P	43
	Number F	1
	Percent F	2.3

Table B.4C.4. Little River WBID 424 Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN (mg/L)	TP (mg/L)	TN/TP	CChla (ug/L)
	AGM	AGM	Ratio	AGM
1971				
1972		0.245		
1973	2.04	0.170	12.0	
1974	1.95	0.117	16.7	
1975	1.78	0.128	13.9	
1976	1.73	0.112	15.5	
1977				
1978				
1979				
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989	1.19			
1990				
1991				
1992	1.15	0.136	8.4	4.4
1993	1.14	0.106	10.8	
1994				
1995	1.98	0.113	17.5	
1996	3.68	0.107	34.3	
1997				
1998	2.32	0.111	21.0	
1999				
2000				
2001				
2002				
2003				1.4
2004				
2005				
2006	2.70	0.109	24.8	1.6
2007	0.84	0.192	4.4	2.1
2008				

Year	TN (mg/L)	TP (mg/L)	TN/TP	CChla (ug/L)
2009				
2010				
2011	1.44	0.069	20.7	3.8
2012				
2013	1.57	0.169	9.3	2.3

Table B.4C.5. Little River WBID 424 Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	1962 - 2013	319	6.0	32.0	17.3	18.4	17.4
Alkalinity	mg/L	1962 - 2013	219	1.0	100.0	14.0	15.6	13.7
pH	S.U.	1962 - 2013	301	4.5	8.6	6.7		
Color	PCU	1962 - 2013	175	5.0	250.0	73.0	77.9	63.1
TN	mg/L	1973 - 2013	162	0.07	11.69	1.69	2.18	1.75
NH4-N	mg/L	1971 - 2013	218	0.001	8.97	0.06	0.19	0.07
NO23	mg/L	1973 - 2013	160	0.004	15.00	1.02	1.62	0.91
OrgN	mg/L	1970 - 1990	33	0.10	1.04	0.61	0.63	0.58
TP	mg/L	1968 - 2013	184	0.020	0.560	0.120	0.141	0.125
PO4-P	mg/L	1966 - 2013	173	0.009	0.760	0.058	0.079	0.061
CChla	ug/L	1988 - 2013	78	1.0	86.0	1.6	5.4	2.2
BOD5	mg/L	1965 - 2013	118	0.2	4.5	1.5	1.5	1.3
DO	mg/L	1962 - 2013	299	0.5	12.2	7.6	7.6	7.4
%DOSat	%	1962 - 2013	266	44.8	127.0	82.0	78.7	77.2

Table B.4C.6. Little River WBID 424 Water Quality Data Summary Verified Period Plus (2005–2013)

Constituent	Units	Verified Period+	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2013	60	7.6	31.0	18.7	19.1	18.1
Alkalinity	mg/L	2005 - 2013	50	7.0	100.0	21.0	24.0	20.8
pH	S.U.	2005 - 2013	60	6.1	7.9	6.9		
Color	PCU	2005 - 2013	24	19.0	230.0	77.5	90.0	76.4
TN	mg/L	2005 - 2013	49	0.39	11.69	1.75	2.47	1.80
NH4-N	mg/L	2005 - 2013	49	0.01	2.00	0.04	0.17	0.057
NO23	mg/L	2005 - 2013	52	0.004	15.00	1.25	2.14	0.904
OrgN	mg/L							
TP	mg/L	2005 - 2013	46	0.020	0.300	0.110	0.116	0.102
PO4-P	mg/L	2005 - 2013	51	0.009	0.088	0.039	0.041	0.038
CChla	ug/L	2005 - 2013	53	1.0	33.0	1.3	3.0	1.8
BOD5	mg/L	2005 - 2013	43	0.2	3.8	0.9	1.2	1.0
DO	mg/L	2005 - 2013	62	0.5	11.2	8.2	8.2	7.8
%DOSat	%	2005 - 2013	44	64.7	101.3	88.6	87.5	87.2

B.4D Richlander Creek WBID 680 Drains to Lake Talquin

This WBID is not impaired for DO or nutrients.

Table B.4D.1 lists the 5 stations that have been sampled in Richlander Creek WBID 680. **Figure B.4D.1** depicts the station locations. For most constituents there are less than 10 results over the POR.

Tables B.4D.5 and **B.4D.6** and **Figures B.4D.4** and **B.4D.5** provide the results for alkalinity. These data show that Richlander Creek has a POR GM alkalinity of 18.5 mg/L. It should be noted that all of the alkalinity data is from 2013. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4D.5 and **B.4D.6** and **Figures B.4D.6** and **B.4D.7** provide the results for true color. These data show that Richlander Creek has a POR GM color of 97.2 PCU, higher than the color for either the Little or Ochlockonee Rivers. The data indicate that the GM color for the period (2005–2013) of 96.1 PCU is similar to the POR color. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4D.5 and **B.4D.6** and **Figures B.4D.8** through **B.4D.11** provide the results for TN. These data show that Richlander Creek has a POR GM TN of 0.86 mg/L. The data indicate that the recent (2005–2013) TN GM of 0.71 mg/L is reduced over the POR TN GM for the POR and less than the new 1.03 mg/L threshold AGM concentration for TN (**Figure B.4D.10**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4D.5 and **B.4D.6** and **Figure B.4D.12** provide the results for NH₄-N. These data show that Richlander Creek has a POR GM NH₄-N of 0.05 mg/L. The data indicate that the recent (2005–2013) NH₄-N GM of 0.03 mg/L is less than the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4D.5 and **B.4D.6** and **Figure B.4D.13** provide the results for NO₃-N. These data show that Richlander Creek has a POR GM NO₃-N of 0.23 mg/L, significantly less than either the Little or Ochlockonee Rivers. The data indicate that the recent (2005–2013) NO₃-N GM of 0.26 mg/L is about the same as the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4D.5 and **B.4D.6** and **Figures B.4D.14** through **B.4D.17** provide the results for TP. These data show that Richlander Creek has a POR GM TP of 0.109 mg/L. The data indicate that the recent (2005–2013) TP GM of 0.11 mg/L is the same as the TP GM for the POR and less than the 0.18 mg/L threshold AGM concentration for TP. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4D.5 and **B.4D.6** and **Figure B.4D.18** provide the results for PO₄-P. These data show that Richlander Creek has a POR GM PO₄-P of 0.034 mg/L. The data indicate that the recent

(2005–2013) PO4-P GM of 0.037 mg/L is similar to the POR concentration. There is insufficient data to accurately determine long-term or seasonal patterns.

Tables B.4D.5 and B.4D.6 and Figures B.4D.19 through B.4D.21 provide the results for CChla. These data show that Richlander Creek has a POR GM CChla of 1.4 ug/L. The data indicate that the recent (2005–2013) CChla GM of 1.5 ug/L is not significantly different from the CChla GM for the POR and significantly less than the new 20.0 ug/L threshold AGM concentration for CChla. The data set has a large number of less than detect results. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4D.5 and B.4D.6 and Figures B.4D.22 and B.4D.23 provide the results for BOD5. These data show that Richlander Creek has a POR GM BOD5 of 0.8 mg/L. All of the results are from 2013. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4D.5 and B.4D.6 and Figures B.4D.24 and B.4D.25 provide the results for DO. These data show that Richlander Creek has a POR GM DO of 8.0 mg/L. The data indicate that the recent (2005–2013) DO GM of 9.2 mg/L is greater than the POR concentration. The monthly average DO is never less than 6.0 mg/L (**Figure B.4D.25**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4D.5 and B.4D.6 and Figures B.4D.26 and B.4D.27 provide the results for percent DO saturation. These data show that Richlander Creek has a POR GM DOSAT of 98.7 %. The data indicate that the recent (2005–2013) DOSAT GM of 105.0 % is slightly higher than the GM for the POR. The data presented in **Figure B.4D.26** indicates that there is not an issue with low DO under the new 67 % saturation criterion. There is insufficient data to determine accurate long-term or seasonal patterns.

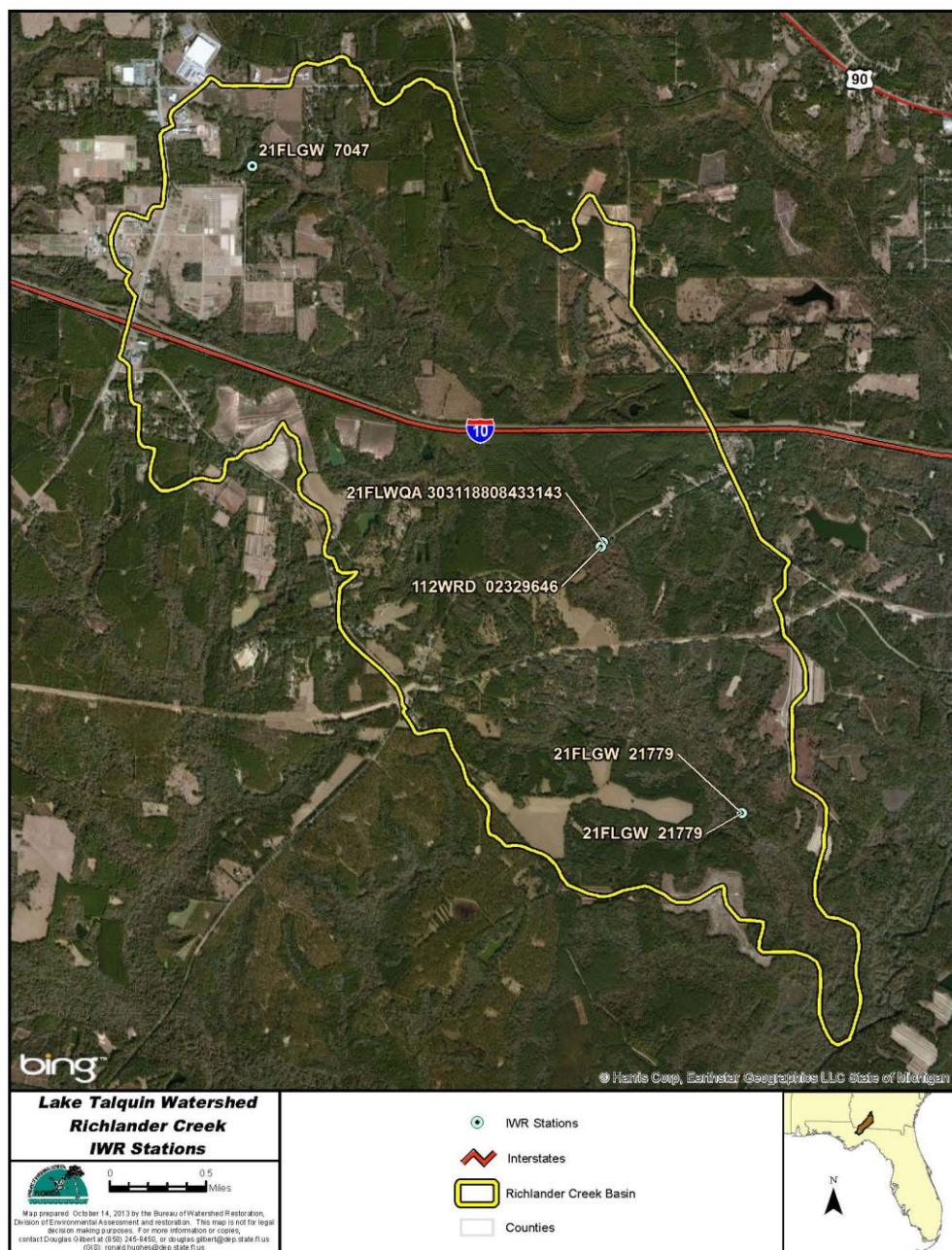


Figure B.4D.1. Richlander Creek WBID 680 IWR Stations

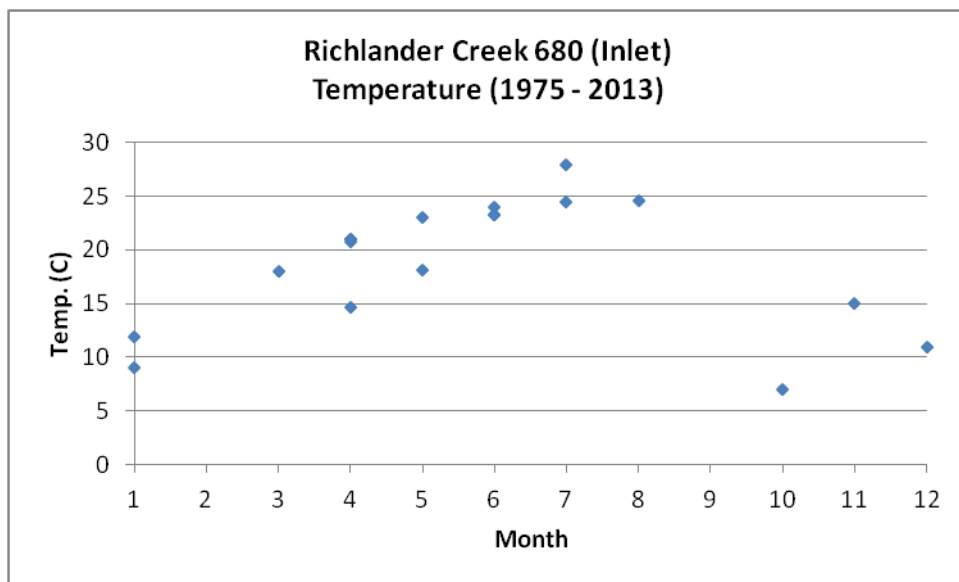


Figure B.4D.2. Richlander Creek WBID 680 Monthly Temperature 1975–2013

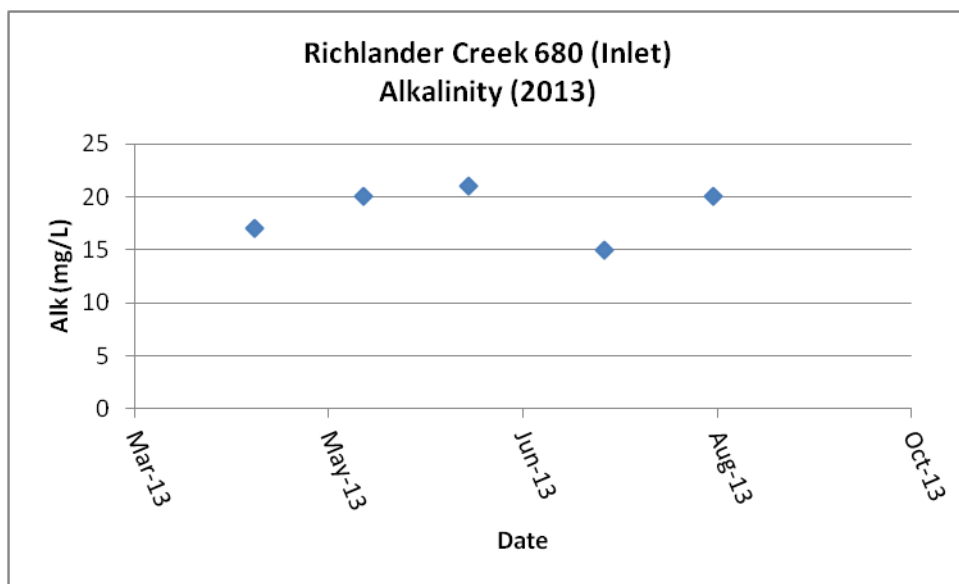


Figure B.4D.3. Richlander Creek WBID 680 Daily Average Alkalinity 2013

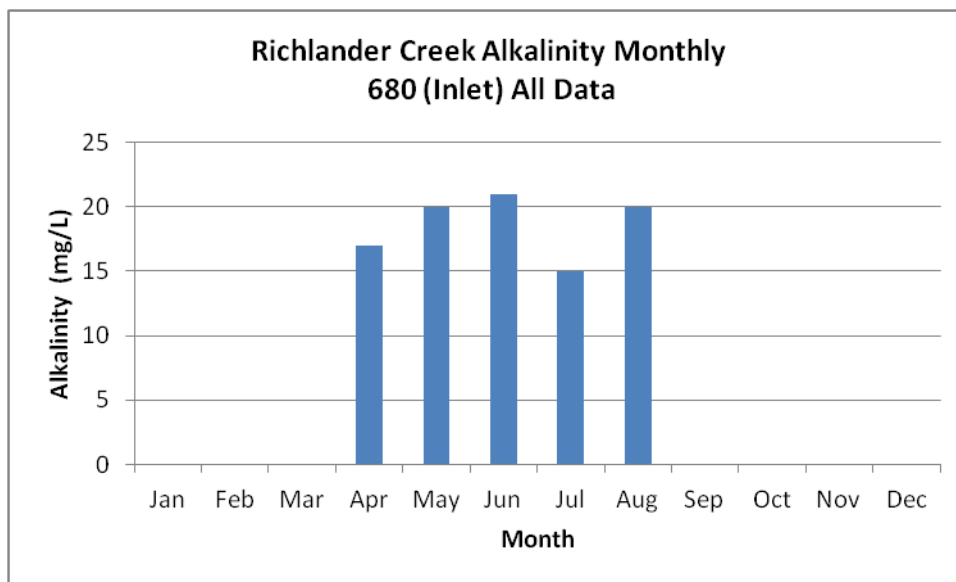


Figure B.4D.4. Richlander Creek WBID 680 Monthly Average Alkalinity 2013

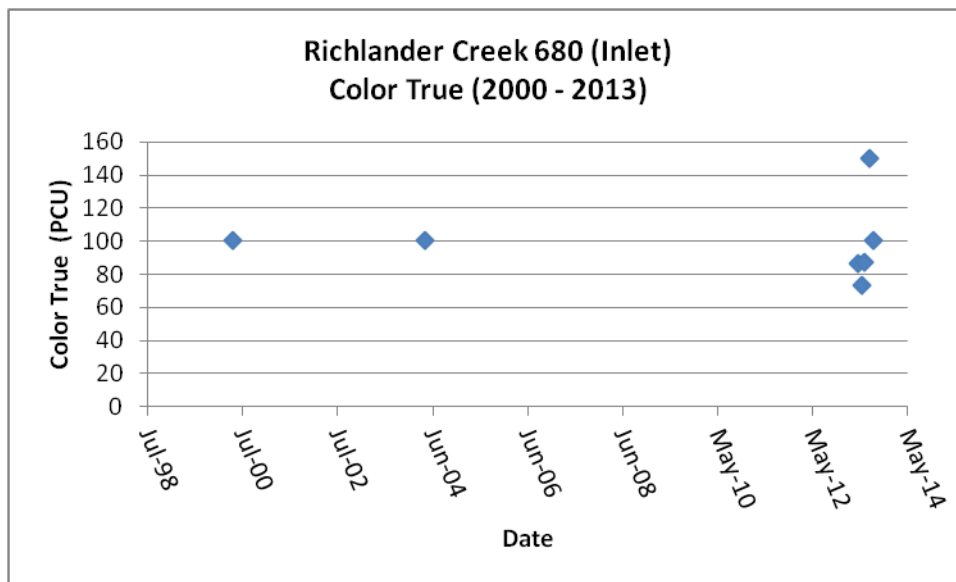


Figure B.4D.5. Richlander Creek WBID 680 Daily Average True Color 2000–2013

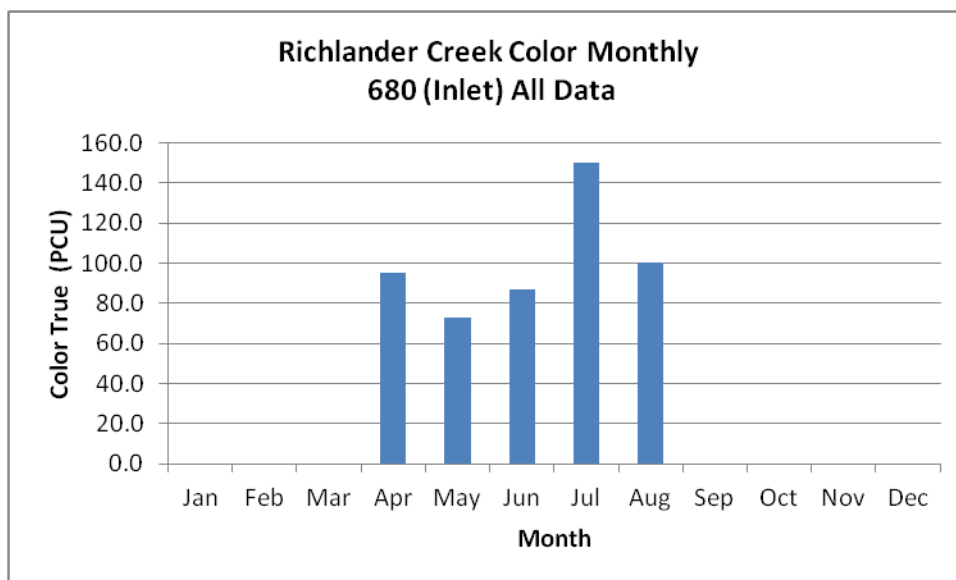


Figure B.4D.6. Richlander Creek WBID 680 Monthly Average True Color 2000–2013

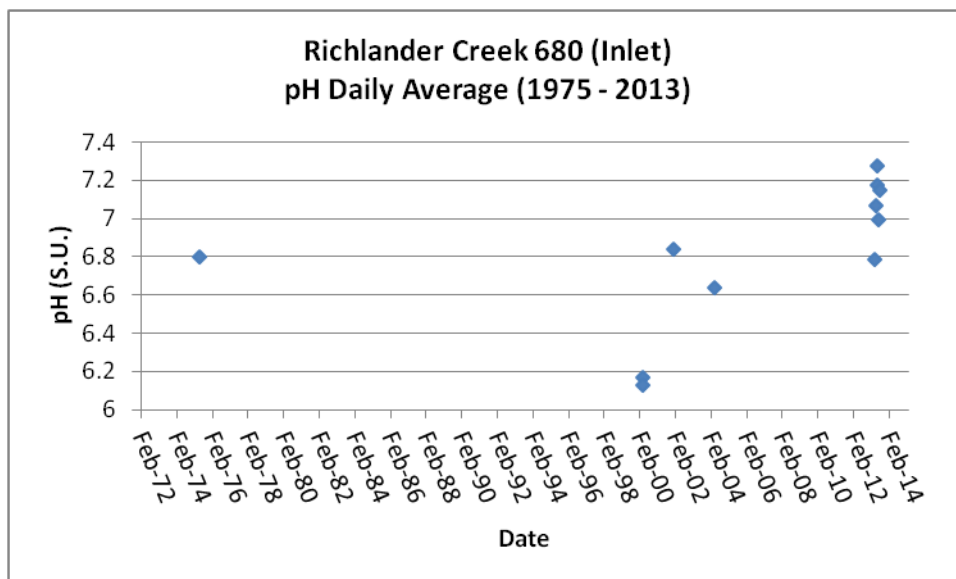


Figure B.4D.7. Richlander Creek WBID 680 Daily pH 1975–2013

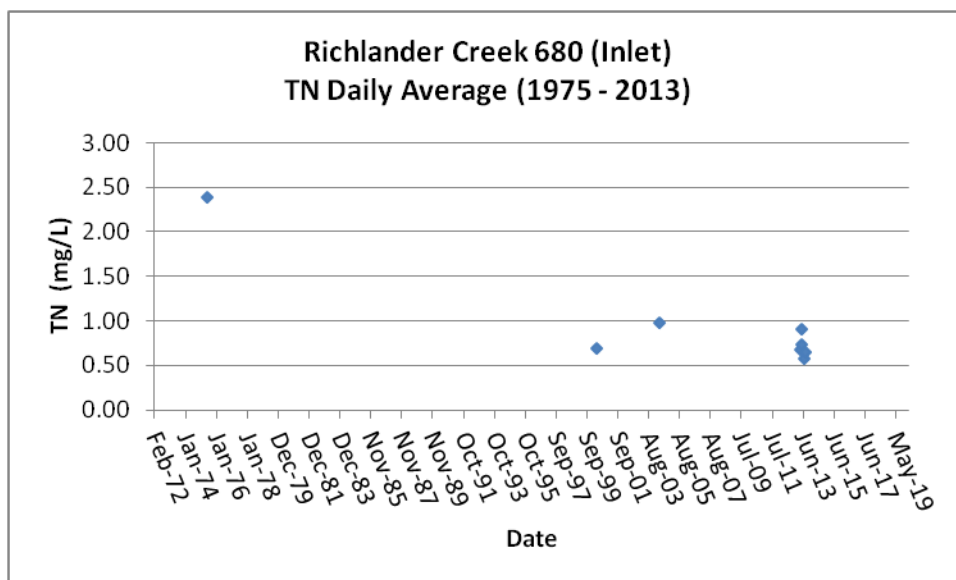


Figure B.4D.8. Richlander Creek WBID 680 Daily Average TN 1975–2013

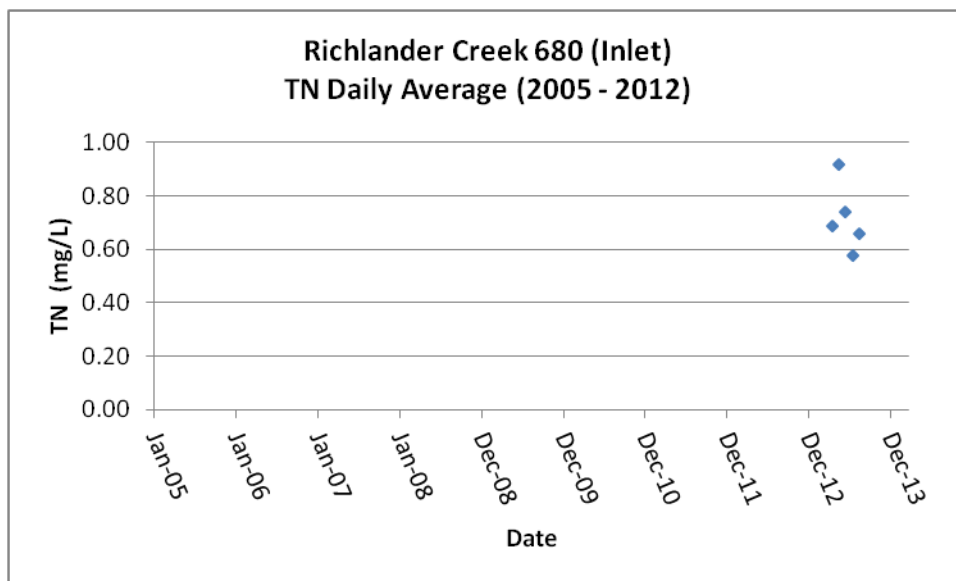


Figure B.4D.9. Richlander Creek WBID 680 Daily Average TN 2005–2013

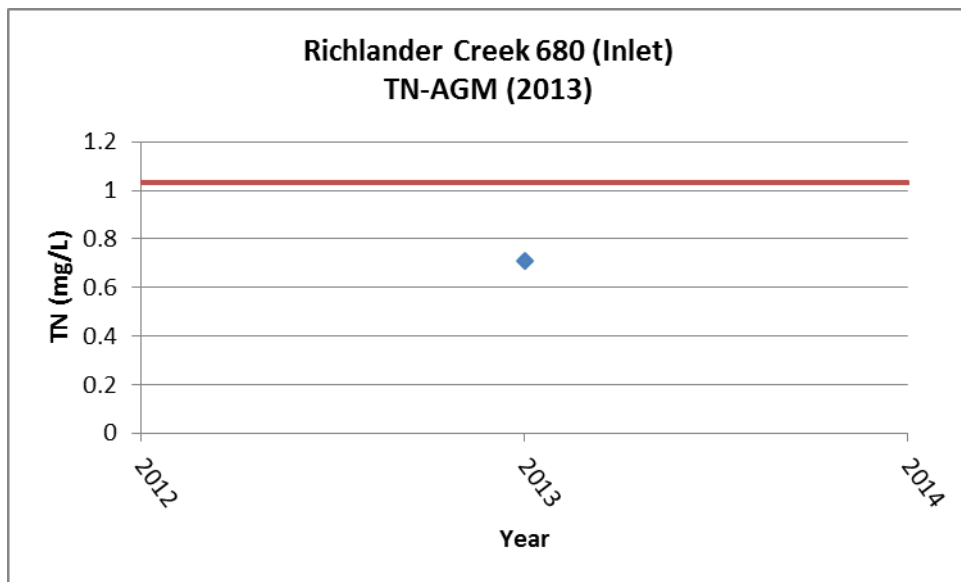


Figure B.4D.10. Richlander Creek WBID 680 TN Annual Geomean 2013

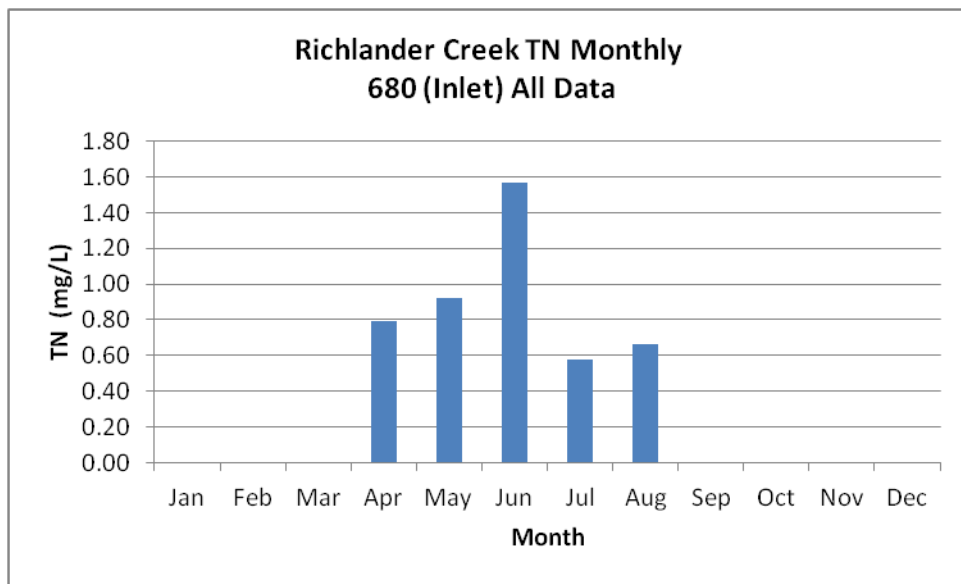


Figure B.4D.11. Richlander Creek WBID 680 Monthly Average TN 1975–2013

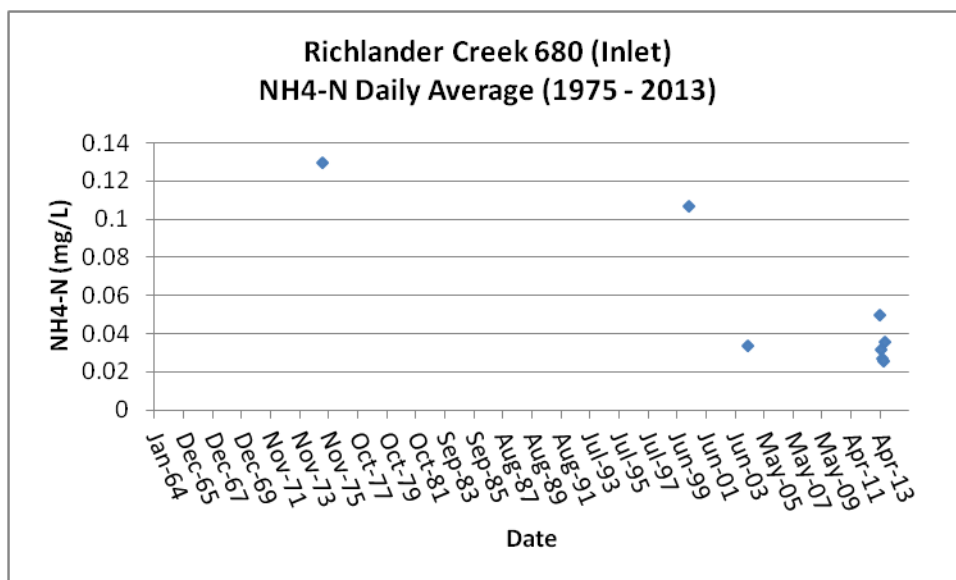


Figure B.4D.12. Richlander Creek WBID 680 Daily Average Ammonia-N 1975–2013

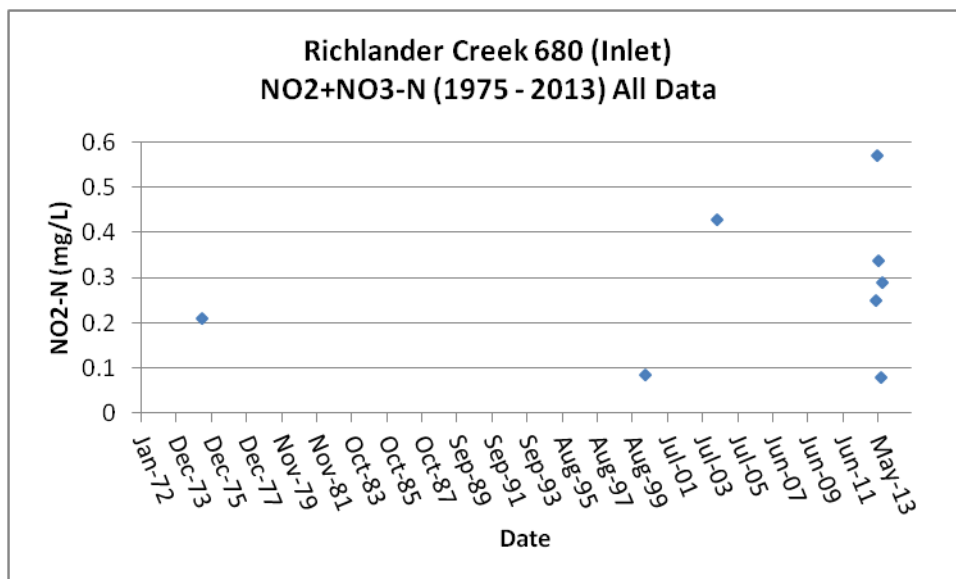


Figure B.4D.13. Richlander Creek WBID 680 Daily Average Nitrate/Nitrite-N 1975–2013

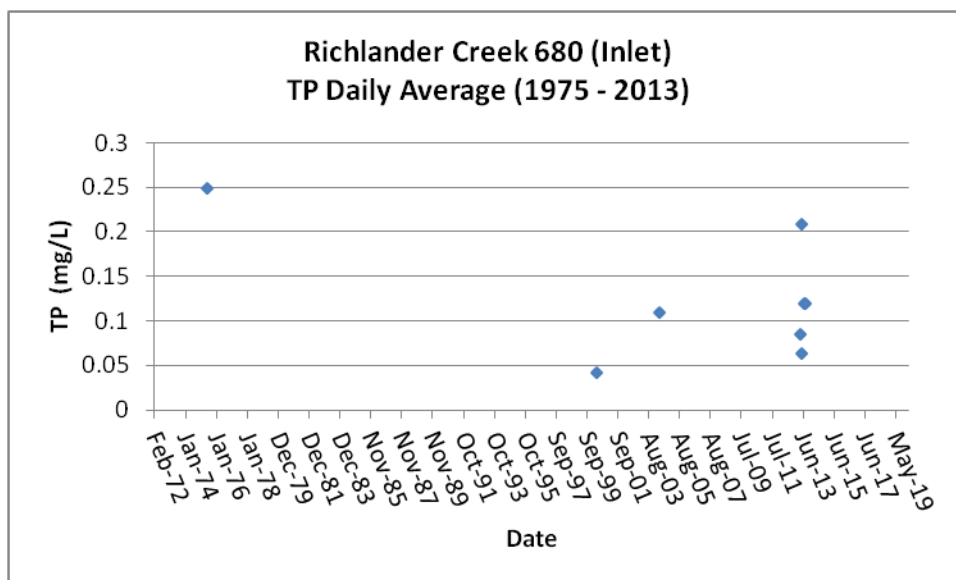


Figure B.4D.14. Richlander Creek WBID 680 Daily Average TP 1975–2013

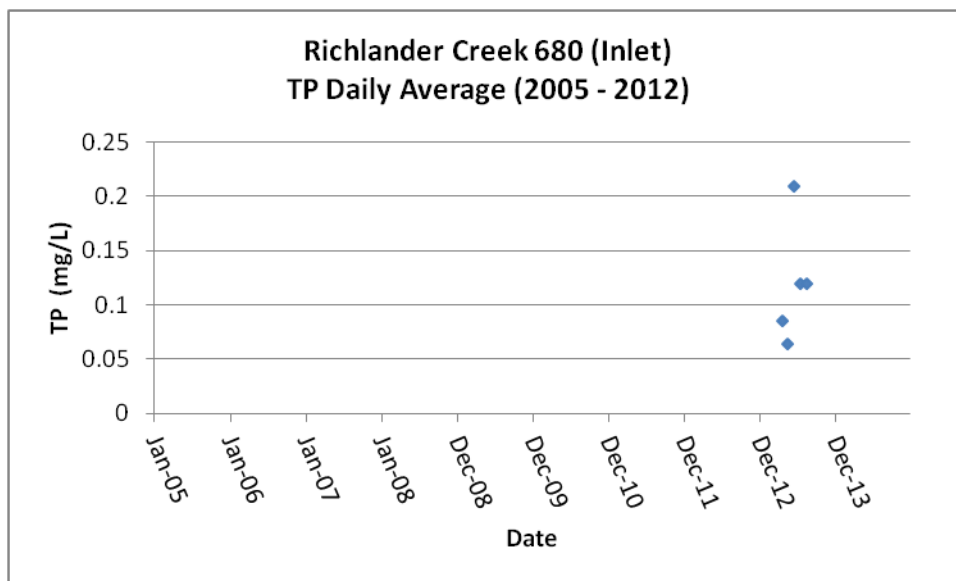


Figure B.4D.15. Richlander Creek WBID 680 Daily Average TP 2005–2013

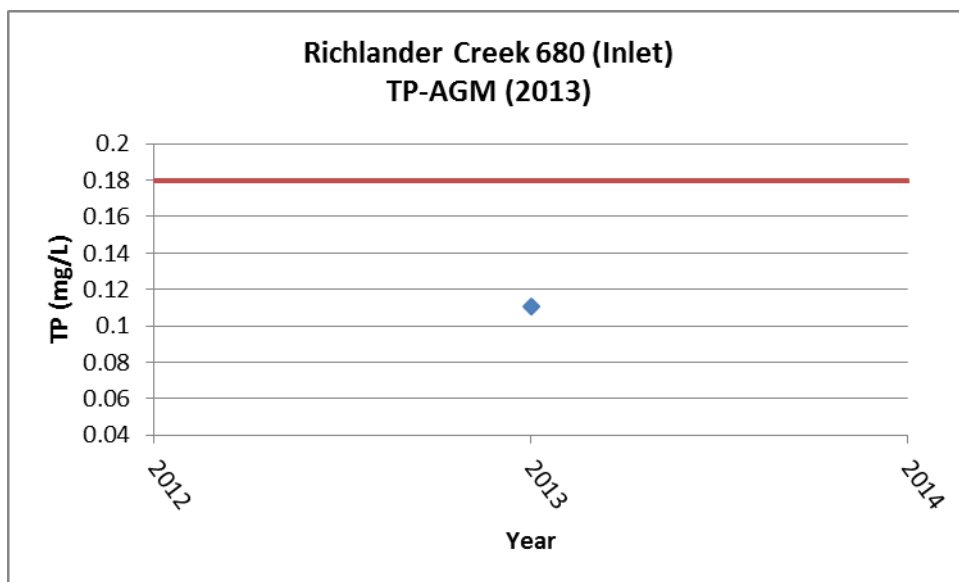


Figure B.4D.16. Richlander Creek WBID 680 Annual Geomean TP 2013

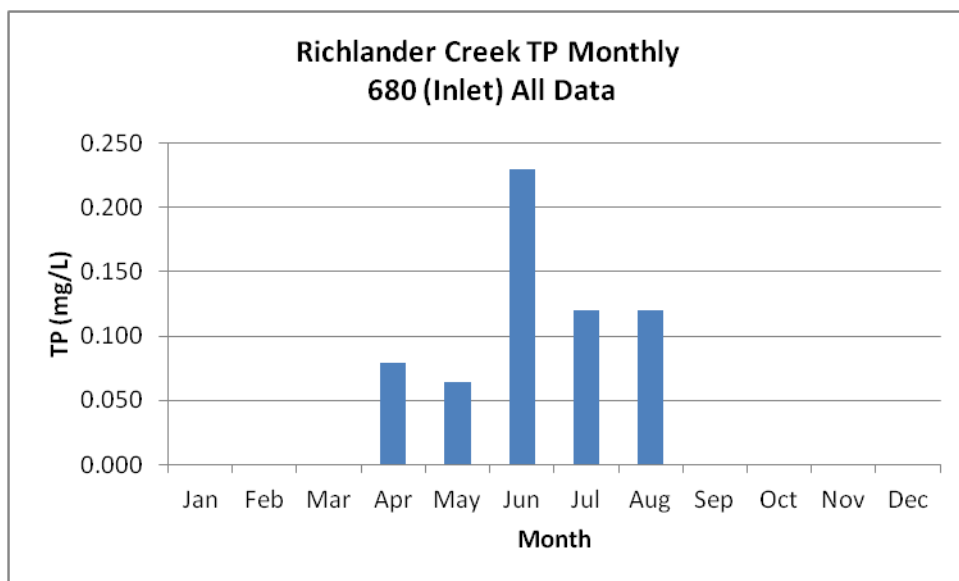


Figure B.4D.17. Richlander Creek WBID 680 Monthly Average TP 1975–2013

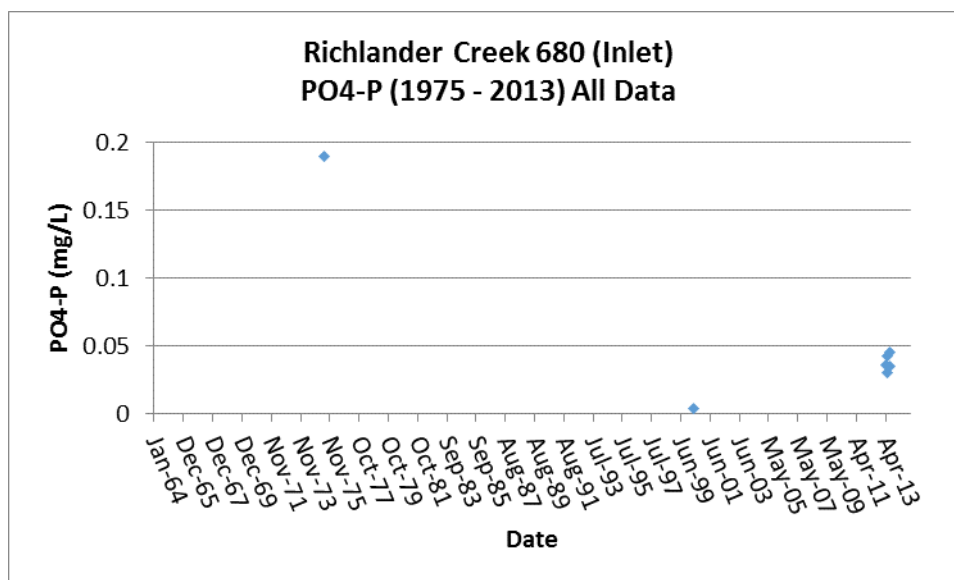


Figure B.4D.18. Richlander Creek WBID 680 Daily Average Orthophosphate-P 1975–2013

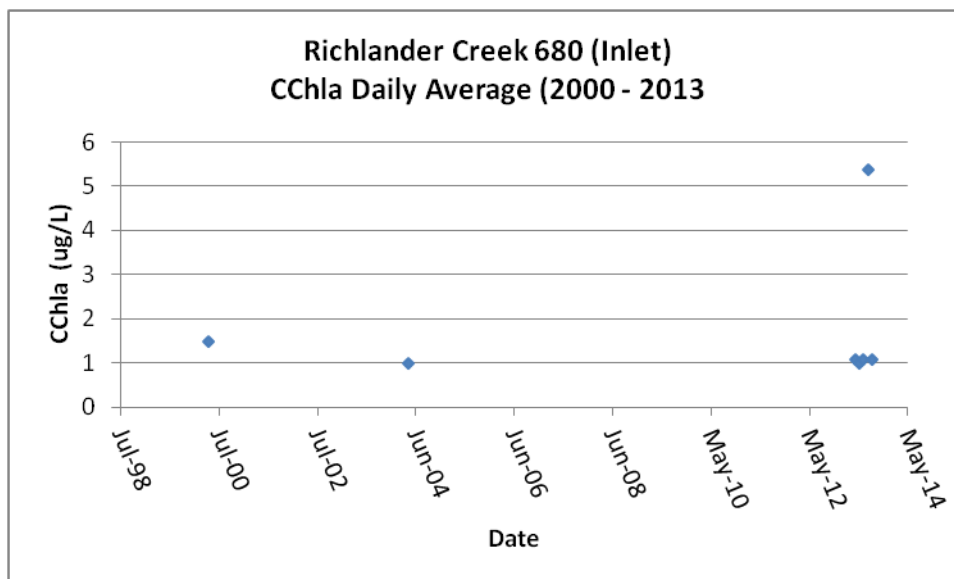


Figure B.4D.19. Richlander Creek WBID 680 Daily Average CChla 2000–2013

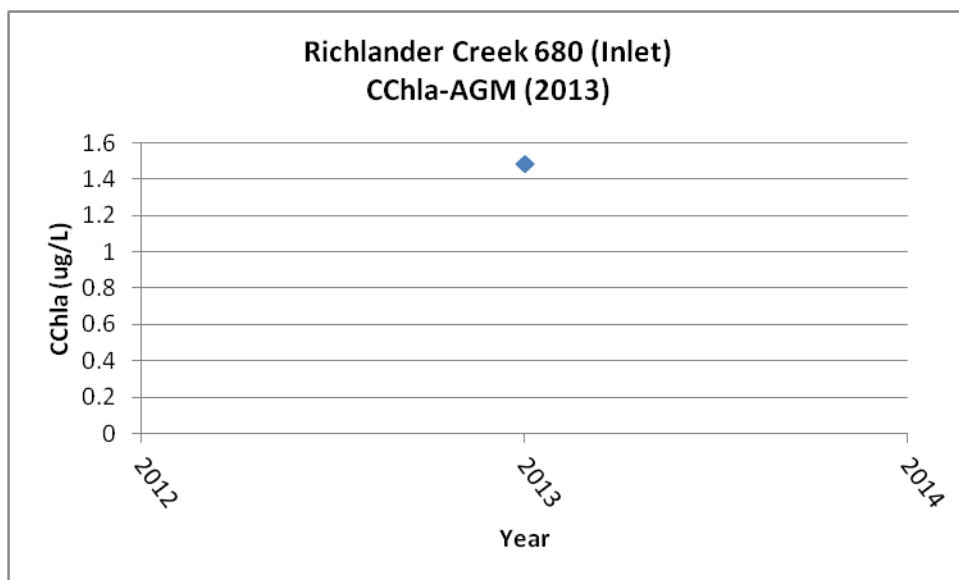


Figure B.4D.20. Richlander Creek WBID 680 Annual Geomean CChla 2013

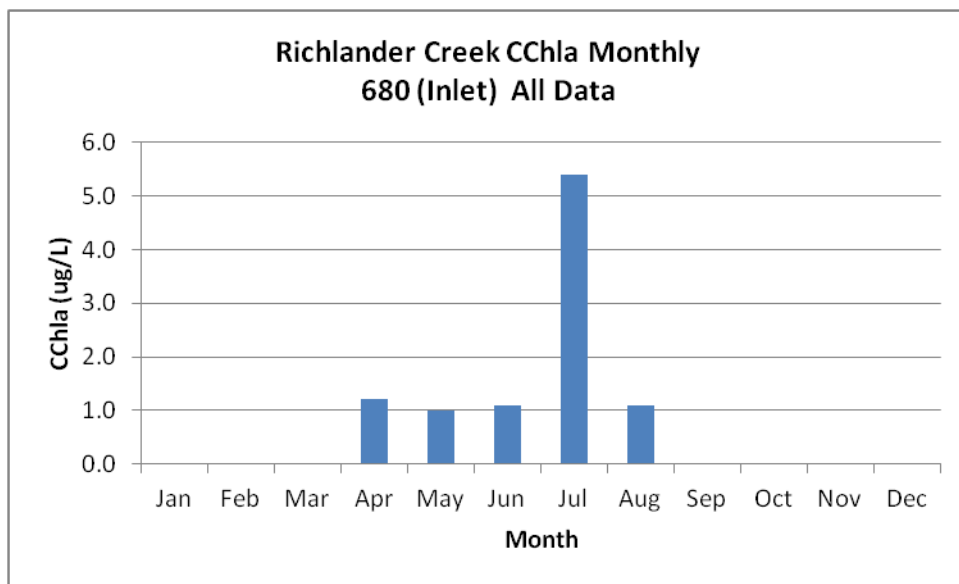


Figure B.4D.21. Richlander Creek WBID 680 Monthly Average CChla 2000–2013

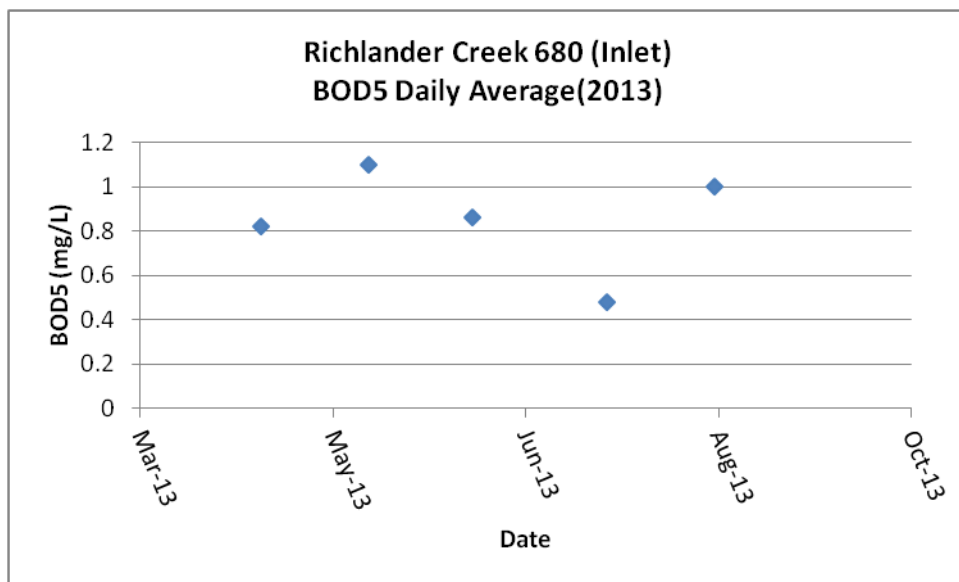


Figure B.4D.22. Richlander Creek WBID 680 Daily Average BOD5 2013

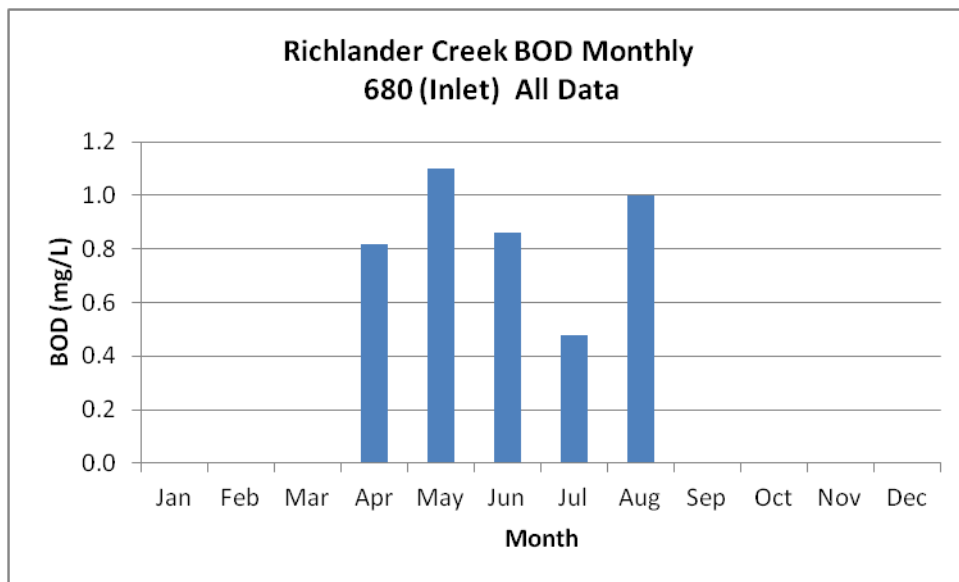


Figure B.4D.23. Richlander Creek WBID 680 Monthly Average BOD5 2013

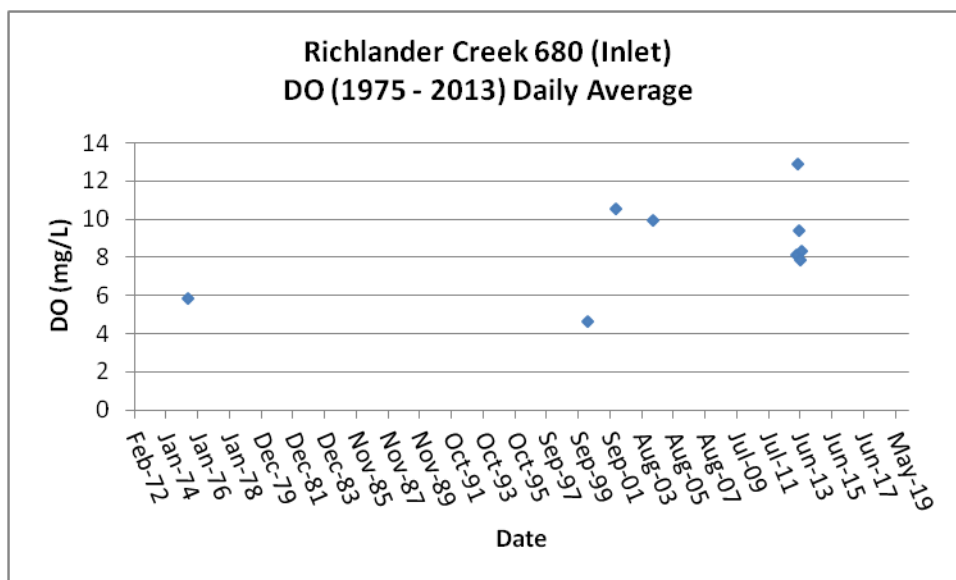


Figure B.4D.24. Richlander Creek WBID 680 Daily Average DO 1975–2013

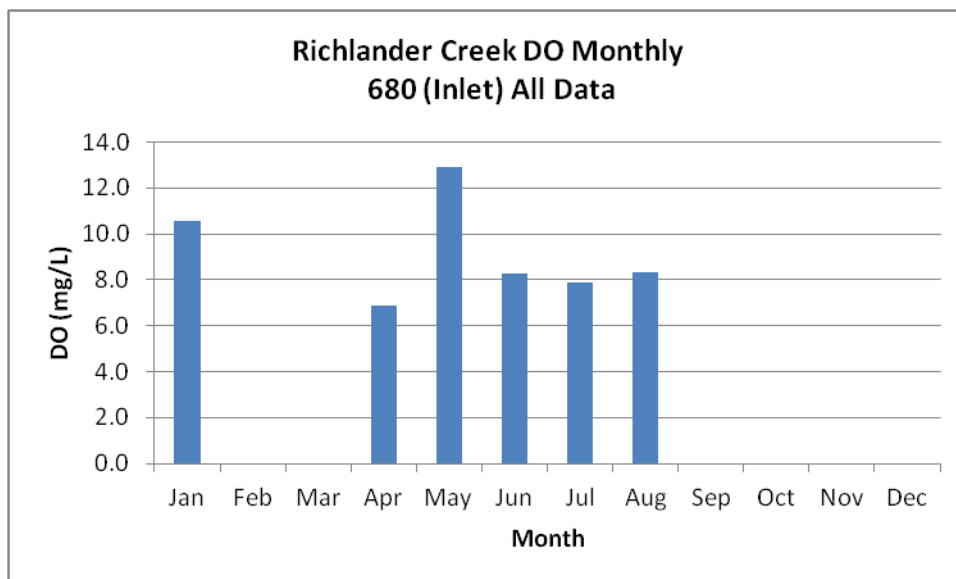


Figure B.4D.25. Richlander Creek WBID 680 Monthly Average DO 1975–2013

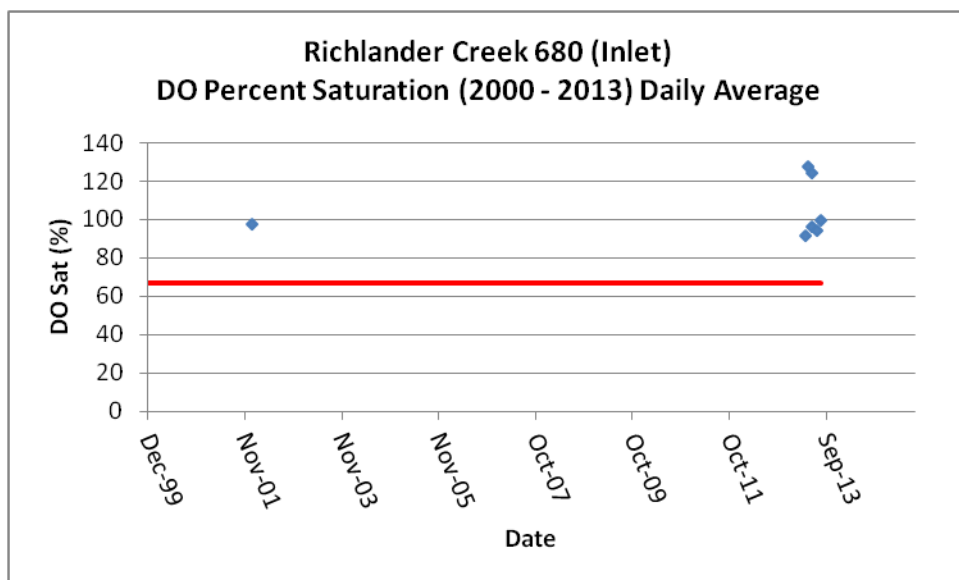


Figure B.4D.26. Richlander Creek WBID 680 Daily Average DO Percent Saturation 2000–2013

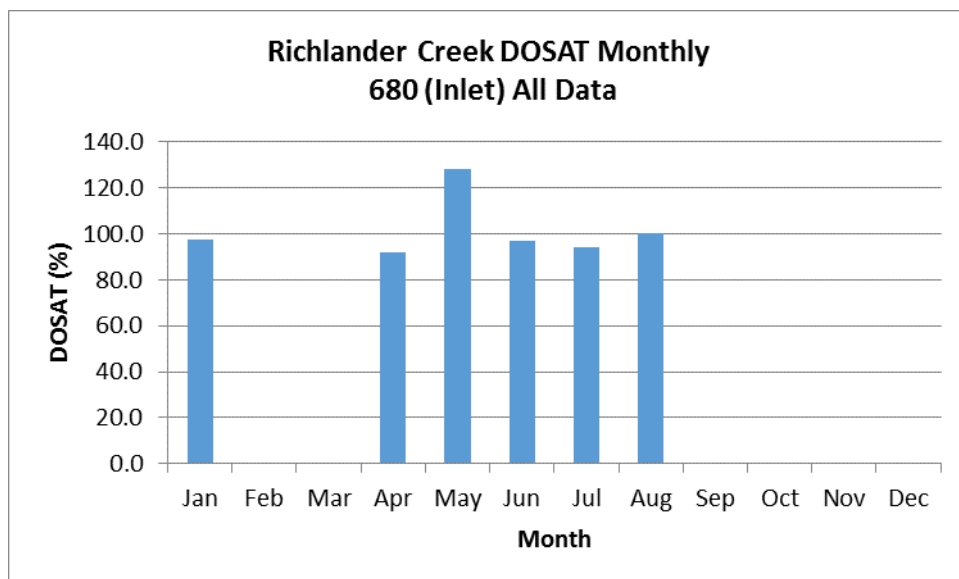


Figure B.4D.27. Richlander Creek WBID 680 Monthly Average DO Percent Saturation 2000–2013

Table B.4D.1. Richlander Creek WBID 680 IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
680	21FLGW 21779	NW1-SS-2002 RICHLANDER CREEK	2004	2004
680	21FLGW 21779	NW1-SS-2002 RICHLANDER CREEK	2004	2004
680	21FLGW 7047	NWA-SL-1008 UNNAMED FARM POND	2000	2000
680	21FLWQA 303118808433143	Richlander Creek at SR 65B	2002	2002
680	112WRD 02329646	RICHLANDER CREEK NR QUINCY FLA	1975	1981

Table B.4D.2. Richlander Creek WBID 680 Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
680	Alkalinity (mg/L)	2013	18.5
680	Color-True (PCU)	2000 - 2013	97.2

Table B.4D.3. Richlander Creek WBID 680 DO Percent Saturation vs. 67 % Criterion

Year	Category	Result
1975 - 2013	Count	8
	Number P	7
	Number F	1
	Percent F	12.5
2005-2013	Count	6
	Number P	6
	Number F	0
	Percent F	0.0

Table B.4D.4. Richlander Creek WBID 680 Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN	TP	TN/TP	CChla
	AGM	AGM	Ratio	AGM
2013	0.71	0.110	6.4	1.5

Table B.4D.5. Richlander Creek WBID 680 Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	1975 - 2013	18	7.0	28.0	20.9	18.8	17.7
Alkalinity	mg/L	2013	5	15.0	21.0	20.0	18.6	18.5
pH	S.U.	1975 - 2013	11	6.1	7.3	6.8	NA	NA
Color	PCU	2000 - 2013	7	73.0	150.0	100.0	99.4	97.2
TN	mg/L	1975 - 2013	8	0.58	2.40	0.72	0.96	0.86
NH4-N	mg/L	1975 - 2013	8	0.026	0.13	0.04	0.06	0.05
NO23	mg/L	1975 - 2013	8	0.080	0.57	0.27	0.28	0.23
OrgN	mg/L	1975	1	2.10	2.10	2.10	2.10	2.10
TP	mg/L	1975 - 2013	8	0.043	0.250	0.115	0.125	0.109
PO4-P	mg/L	1975 - 2013	7	0.004	0.190	0.036	0.055	0.034
CChla	ug/L	2000 - 2013	7	1.0	5.4	1.1	1.7	1.4
BOD5	mg/L	2013	5	0.5	1.1	0.9	0.9	0.8
DO	mg/L	1975 - 2013	11	4.6	12.9	8.2	8.4	8.0
%DOSat	%	1975 - 2013	8	69.0	128.2	97.1	100.3	98.7

Table B.4D.6. Richlander Creek WBID 680 Water Quality Data Summary Verified Period Plus (2005–2013)

Constituent	Units	Verified Period +	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2013	6	18.2	24.7	23.3	22.5	22.4
Alkalinity	mg/L	2005 - 2013	5	15.0	21.0	20.0	18.6	18.5
pH	S.U.	2005 - 2013	6	6.8	7.3	7.1	NA	NA
Color	PCU	2005 - 2013	5	73.0	150.0	87.0	99.2	96.1
TN	mg/L	2005 - 2013	5	0.58	0.92	0.69	0.72	0.71
NH4-N	mg/L	2005 - 2013	5	0.026	0.05	0.03	0.03	0.03
NO23	mg/L	2005 - 2013	5	0.080	0.57	0.29	0.31	0.26
OrgN	mg/L							
TP	mg/L	2005 - 2013	5	0.064	0.210	0.120	0.120	0.110
PO4-P	mg/L	2005 - 2013	5	0.030	0.045	0.036	0.038	0.037
CChla	ug/L	2005 - 2013	5	1.0	5.4	1.1	1.9	1.5
BOD5	mg/L	2005 - 2013	5	0.5	1.1	0.9	0.9	0.8
DO	mg/L	2005 - 2013	6	7.9	12.9	8.3	9.4	9.2
%DOSat	%	2005 - 2013	6	91.7	128.2	98.4	106.0	105.0

B.4E Rocky Comfort WBID 1304 Drains to Lake Talquin

This WBID is not impaired for DO or nutrients.

Table B.4E.1 lists the 8 stations that have been sampled in Rocky Comfort Creek WBID 1304. **Figure B.4E.1** depicts the station locations. For most constituents there are less than 25 results over the POR. About half the data is from 1950–1970’s and the rest was collected after 2000.

Tables B.4E.5 and **B.4E.6** and **Figures B.4E.3** and **B.4E.4** provide the results for alkalinity. These data show that Rocky Comfort Creek has a POR GM alkalinity of 14.1 mg/L. The data indicate that the GM for the period (2005–2013) of 22.4 is similar to the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4E.5 and **B.4E.6** and **Figures B.4E.6** and **B.4E.7** provide the results for true color. These data show that Rocky Comfort Creek has a POR GM color of 64.3 PCU. The data indicate that the GM color for the period (2005–2013) of 83.7 PCU is higher than the POR color. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4E.5 and **B.4E.6** and **Figures B.4E.8** through **B.4E.11** provide the results for TN. These data show that Rocky Comfort Creek has a POR GM TN of 0.75 mg/L. The data indicate that the recent (2005–2013) TN GM of 0.78 mg/L is similar to the POR TN GM for the POR and less than the new 1.03 mg/L threshold AGM concentration for TN (**Figure B.4E.10**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4E.5 and **B.4E.6** and **Figure B.4E.12** provide the results for NH₄-N. These data show that Rocky Comfort Creek has a POR GM NH₄-N of 0.03 mg/L, less than either the Little or Ochlockonee Rivers. The data indicate that the recent (2005–2013) NH₄-N GM of 0.02 mg/L is less than the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4E.5 and **B.4E.6** and **Figure B.4E.13** provide the results for NO₃-N. These data show that Rocky Comfort Creek has a POR GM NO₃-N of 0.08 mg/L, significantly less than either the Little or Ochlockonee Rivers. The data indicate that the recent (2005–2013) NO₃-N GM of 0.06 mg/L is slightly less than the POR concentration, indicating a slight reduction since the 1970’s. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4E.5 and **B.4E.6** and **Figures B.4E.14** through **B.4E.17** provide the results for TP. These data show that Rocky Comfort Creek has a POR GM TP of 0.136 mg/L. The data indicate that the recent (2005–2013) TP GM of 0.177 mg/L is slightly greater than the TP GM for the POR and very close to the new 0.18 mg/L threshold AGM concentration for TP. The only year with sufficient data to calculate an AGM is 2013 (0.256 mg/L) and the result is greater than the new threshold AGM concentration for TP (**Figure B.4E.16**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4E.5 and B.4E.6 and Figure B.4E.18 provide the results for PO₄-P. These data show that Rocky Comfort Creek has a POR GM PO₄-P of 0.093 mg/L. The data indicate that the recent (2005–2013) PO₄-P GM of 0.082 mg/L is similar to the POR concentration. These concentrations are about twice as high as the Little and Ochlockonee Rivers as well as the adjacent Richlander Creek. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4E.5 and B.4E.6 and Figures B.4E.19 through B.4E.21 provide the results for CChla. These data show that Rocky Comfort Creek has a POR GM CChla of 3.8 ug/L. The data indicate that the recent (2005–2013) CChla GM of 5.7 ug/L is slightly greater than the CChla GM for the POR and significantly less than the new 20.0 ug/L threshold AGM concentration for CChla (**Figure B.4E.20**). These data indicate an increase in CChla concentrations over time. The CChla, while low, is elevated over the Little and Ochlockonee Rivers as well as the adjacent Richlander Creek. This pattern is also similar to the PO₄-P results. The data set has a large number of less than detection results. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4E.5 and B.4E.6 and Figures B.4E.22 and B.4E.23 provide the results for BOD₅. These data show that Rocky Comfort Creek has a POR GM BOD₅ of 1.1 mg/L. All of the results are from 2013. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4E.5 and B.4E.6 and Figures B.4E.24 and B.4E.25 provide the results for DO. These data show that Rocky Comfort Creek has a POR GM DO of 5.8 mg/L. The data indicate that the recent (2005–2013) DO GM of 4.3 mg/L is less than the POR concentration and less than the old criterion of 5.0 mg/L. The monthly average DO drops below 4.0 mg/L for April (**Figure B.4E.25**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4E.5 and B.4E.6 and Figures B.4E.26 and B.4E.27 provide the results for percent DO saturation. These data show that Rocky Comfort Creek has a POR GM DOSAT of 86.3 %. The data indicate that the recent (2005–2013) DOSAT GM of 93.5 % is slightly higher than the GM for the POR. The data presented in **Figure B.4E.26** do not indicate an issue with the new 67 % saturation DO criterion. There is insufficient data to determine accurate long-term or seasonal patterns.

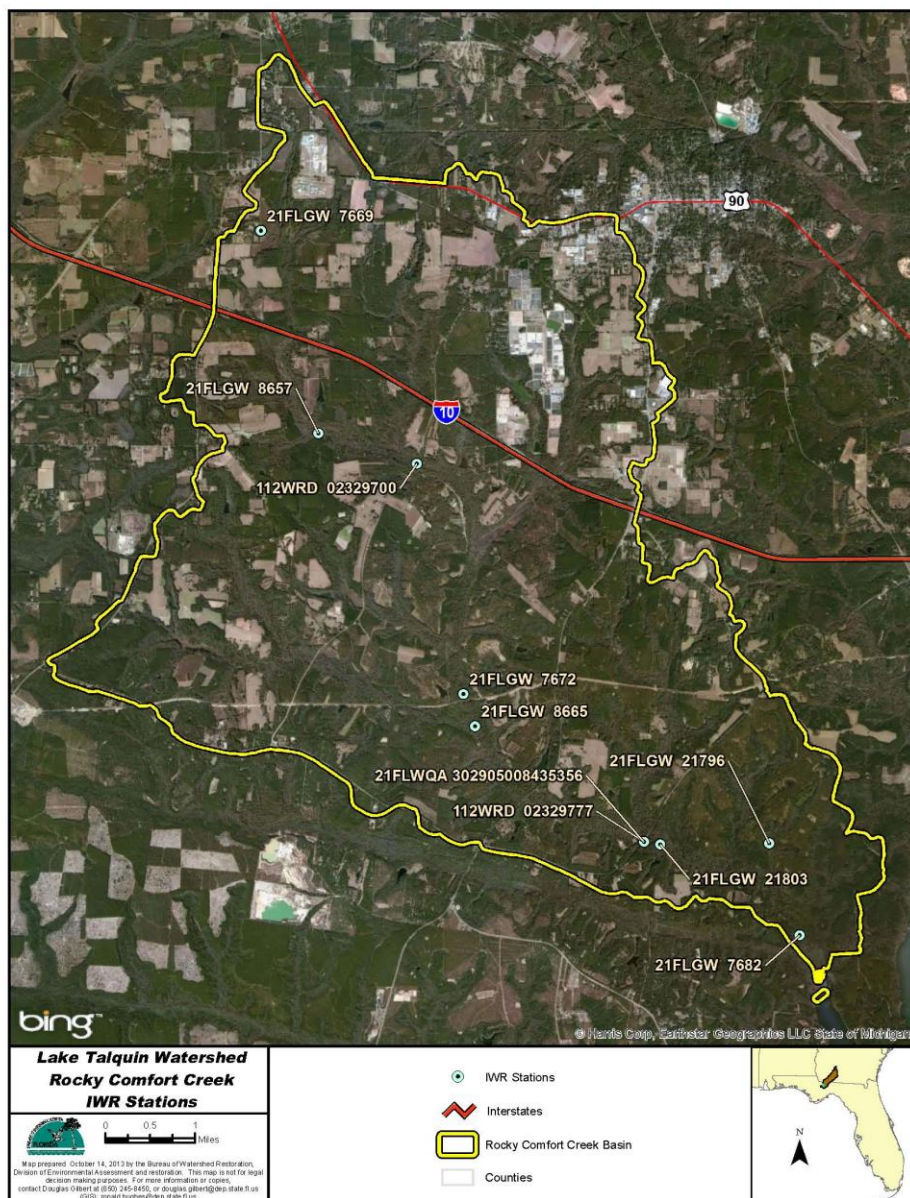


Figure B.4E.1. Rocky Comfort Creek WBID 1304 IWR Stations

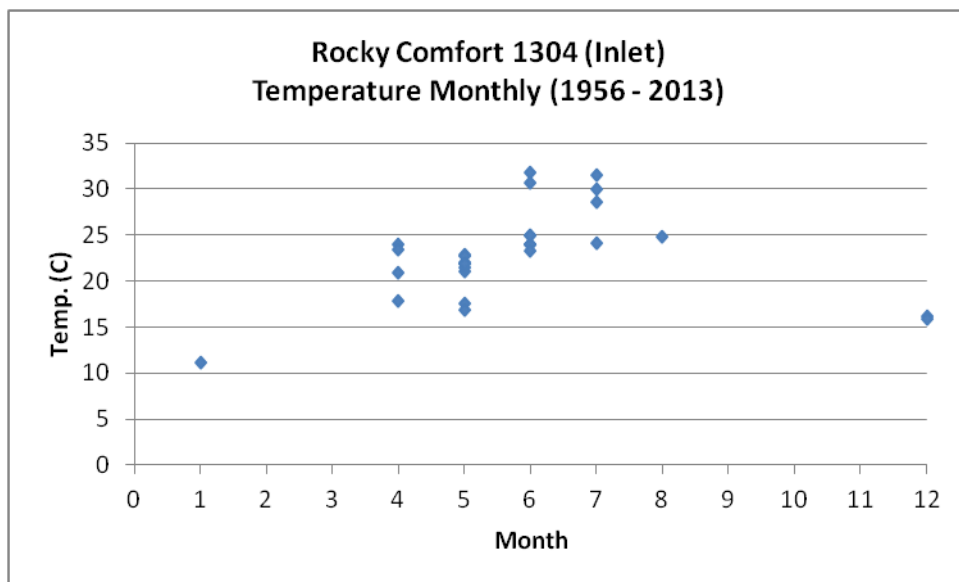


Figure B.4E.2. Rocky Comfort Creek WBID 1304 Monthly Temperature 1956–2013

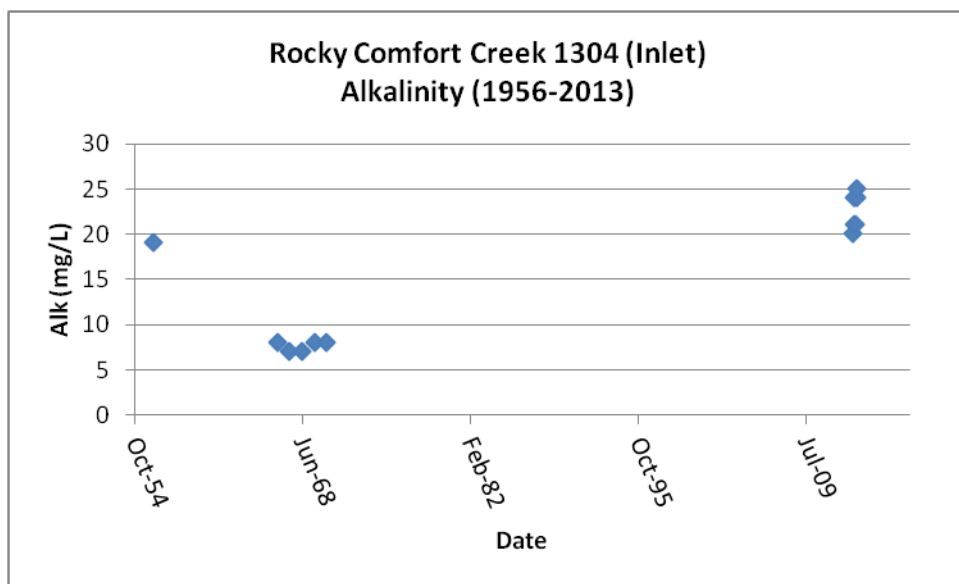


Figure B.4E.3. Rocky Comfort Creek WBID 1304 Daily Average Alkalinity 1956–2013

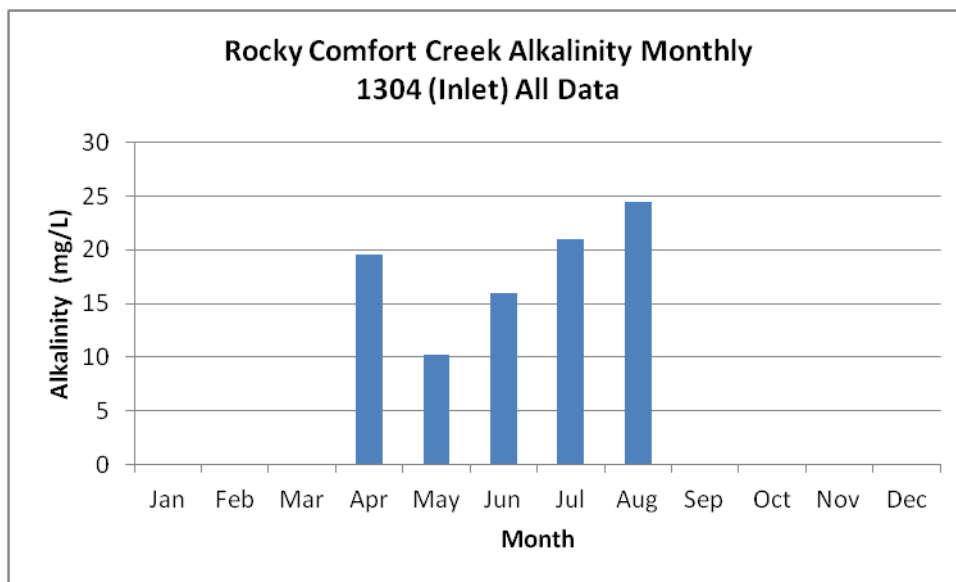


Figure B.4E.4. Rocky Comfort Creek WBID 1304 Monthly Average Alkalinity 1956–2013

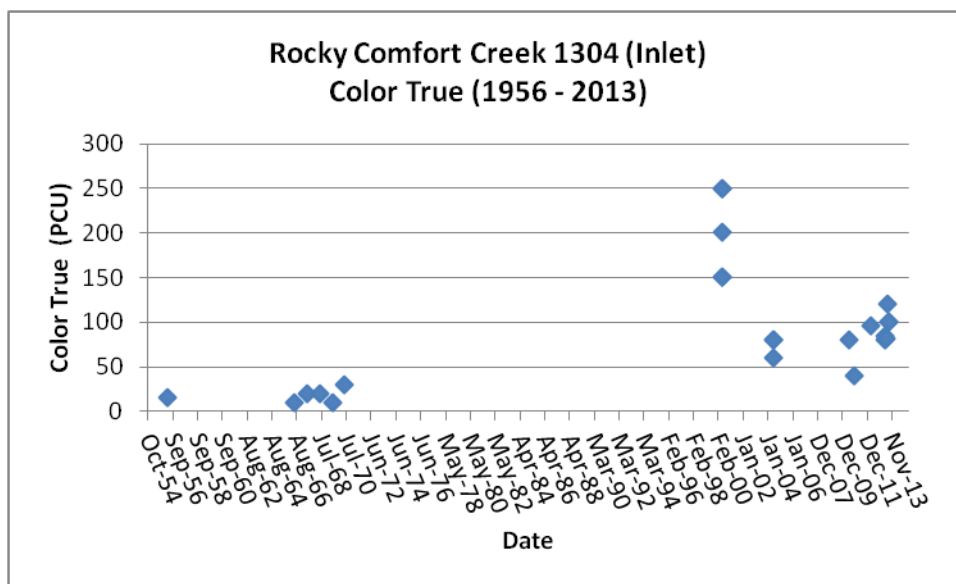


Figure B.4E.5. Rocky Comfort Creek WBID 1304 Daily Average True Color 1956–2013

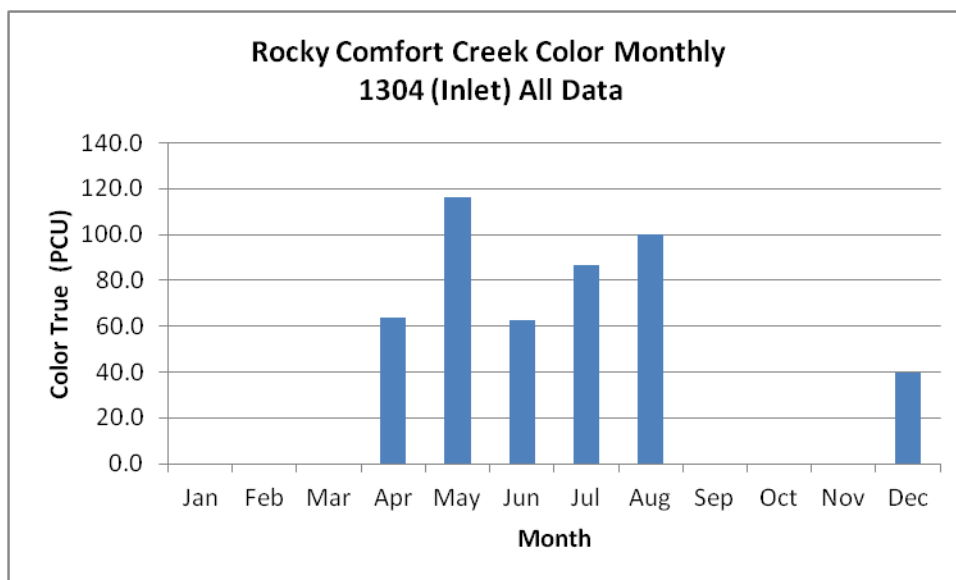


Figure B.4E.6. Rocky Comfort Creek WBID 1304 Monthly Average True Color 1956–2013

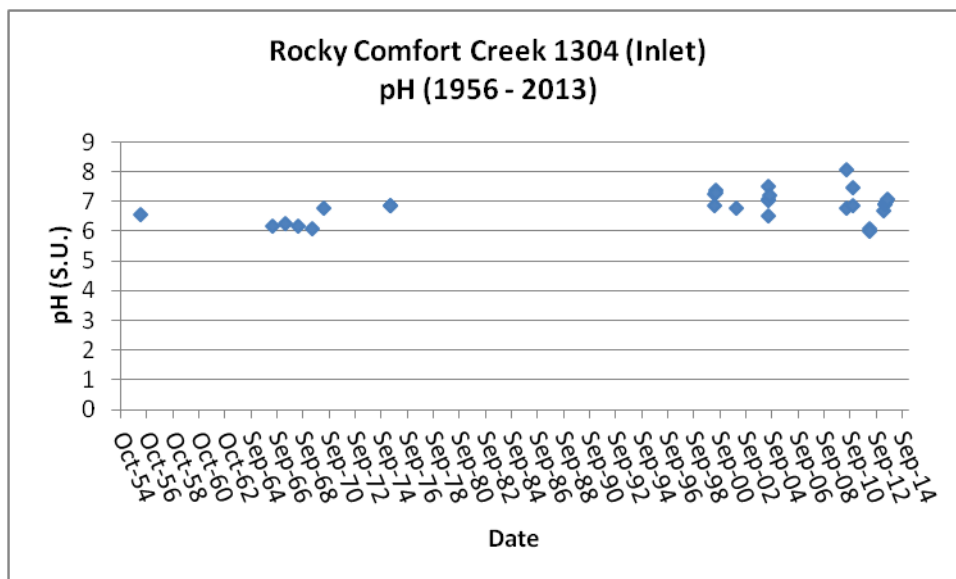


Figure B.4E.7. Rocky Comfort Creek WBID 1304 Daily pH 1956–2013

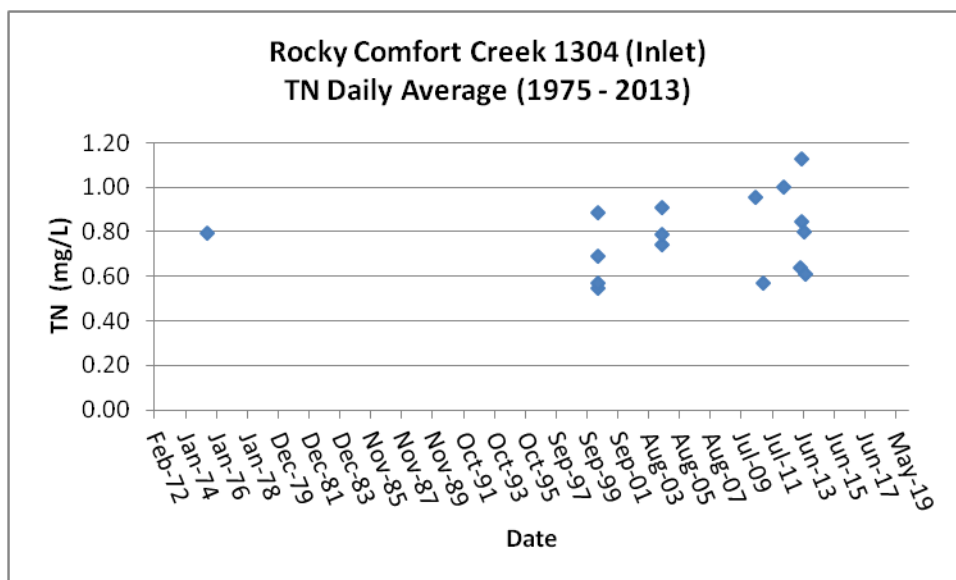


Figure B.4E.8. Rocky Comfort Creek WBID 1304 Daily Average TN 1975–2013

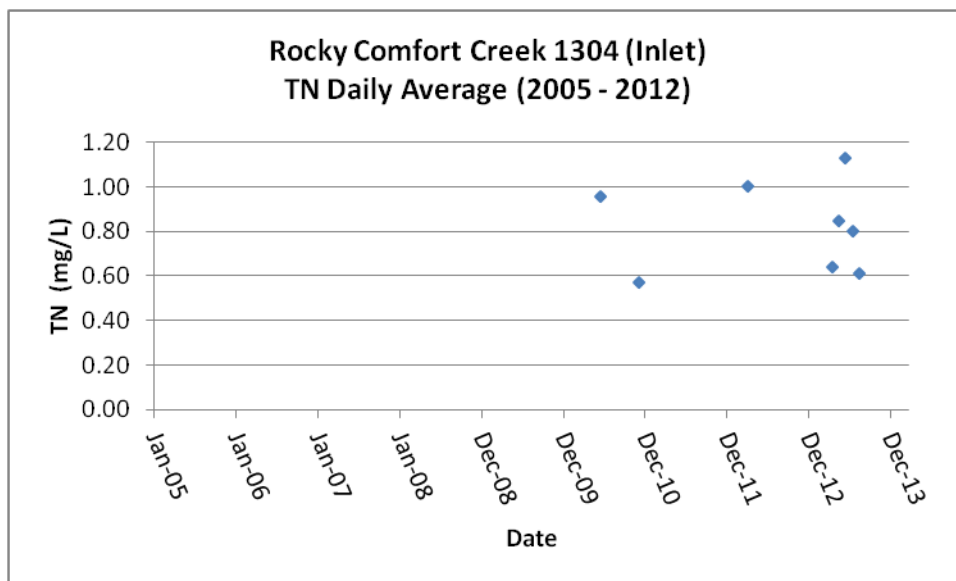


Figure B.4E.9 Rocky Comfort Creek WBID 1304 Daily Average TN 2005–2013

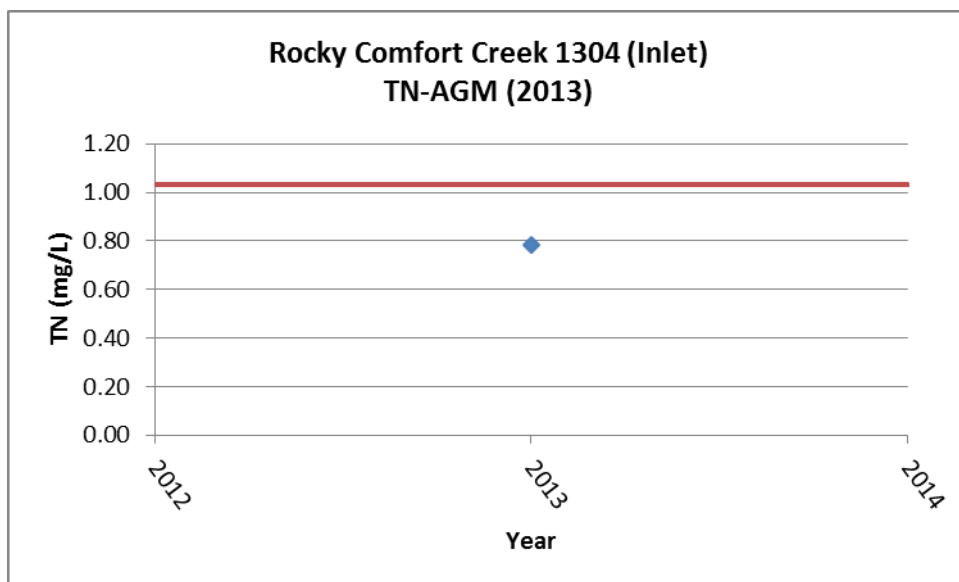


Figure B.4E.10. Rocky Comfort Creek WBID 1304 TN Annual Geomean 2013

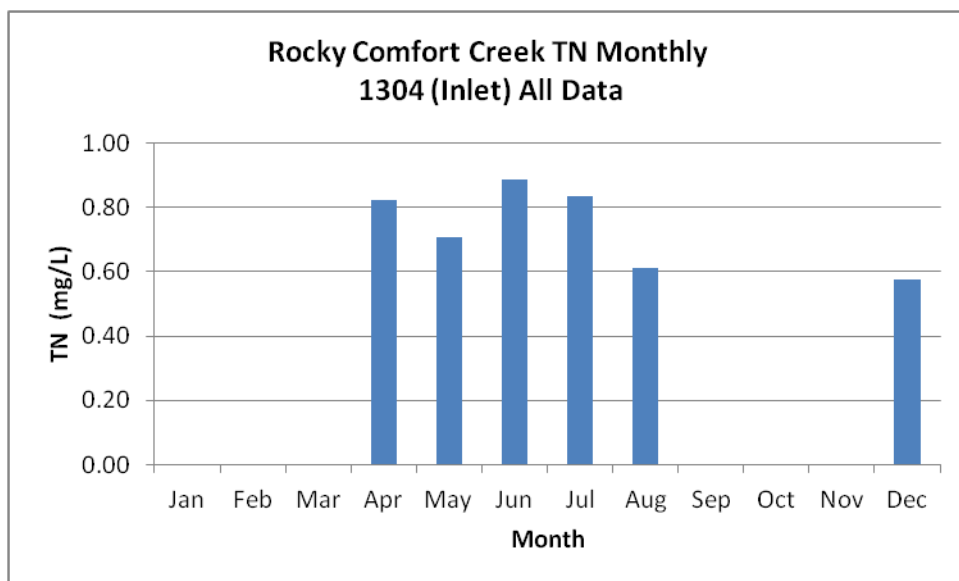


Figure B.4E.11. Rocky Comfort Creek WBID 1304 Monthly Average TN 1975–2013

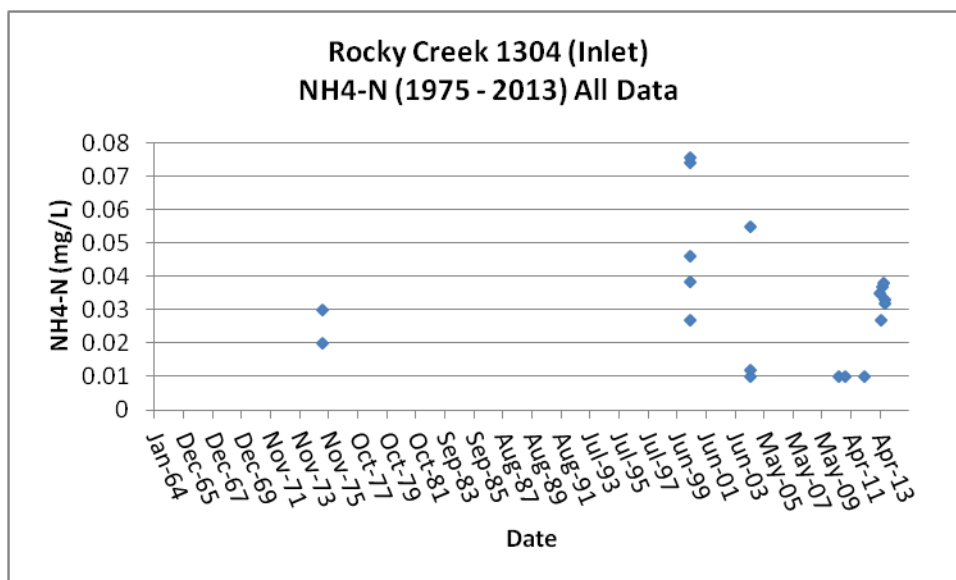


Figure B.4E.12. Rocky Comfort Creek WBID 1304 Daily Average Ammonia-N 1975–2013

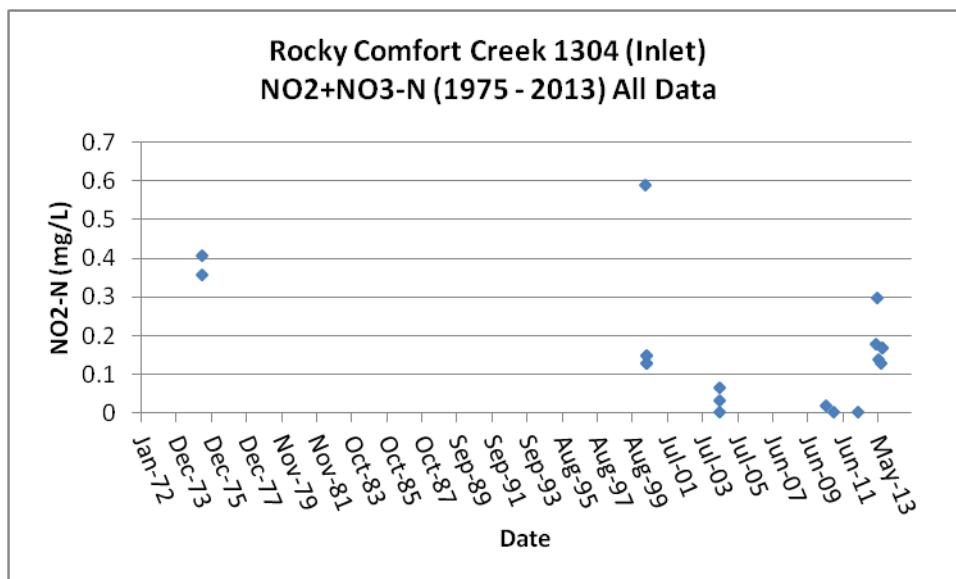


Figure B.4E.13. Rocky Comfort Creek WBID 1304 Daily Average Nitrate/Nitrite-N1975–2013

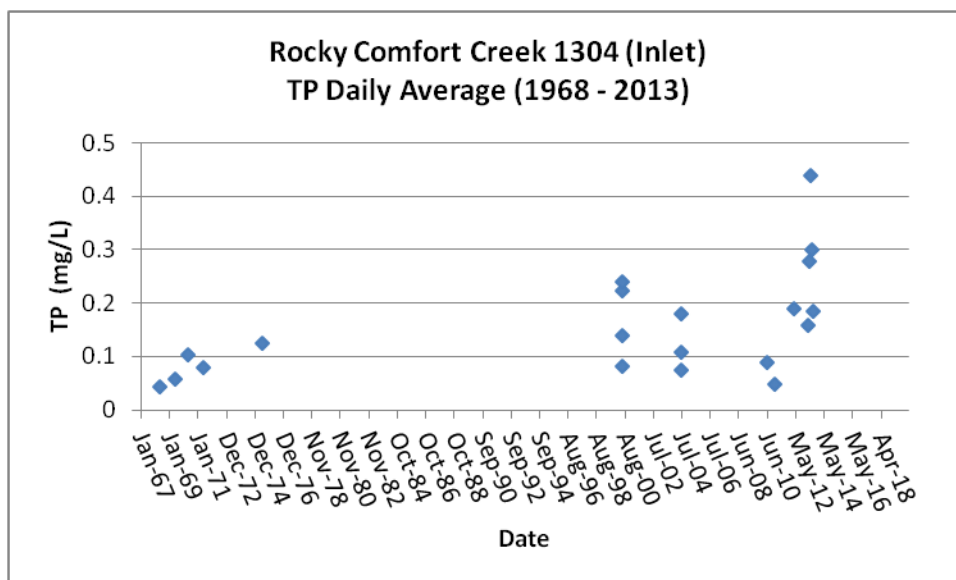


Figure B.4E.14. Rocky Comfort Creek WBID 1304 Daily Average TP 1968–2013

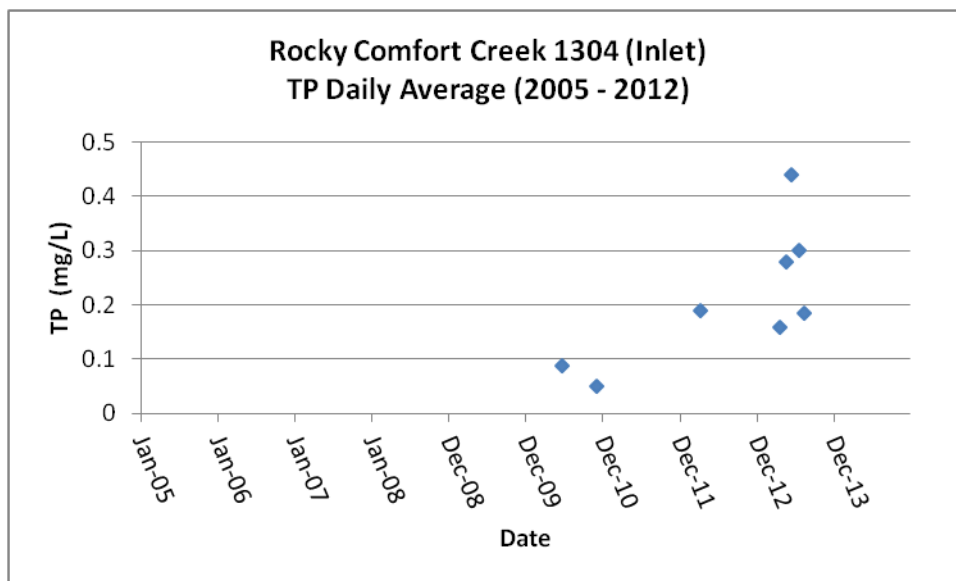


Figure B.4E.15. Rocky Comfort Creek WBID 1304 Daily Average TP 2005–2013

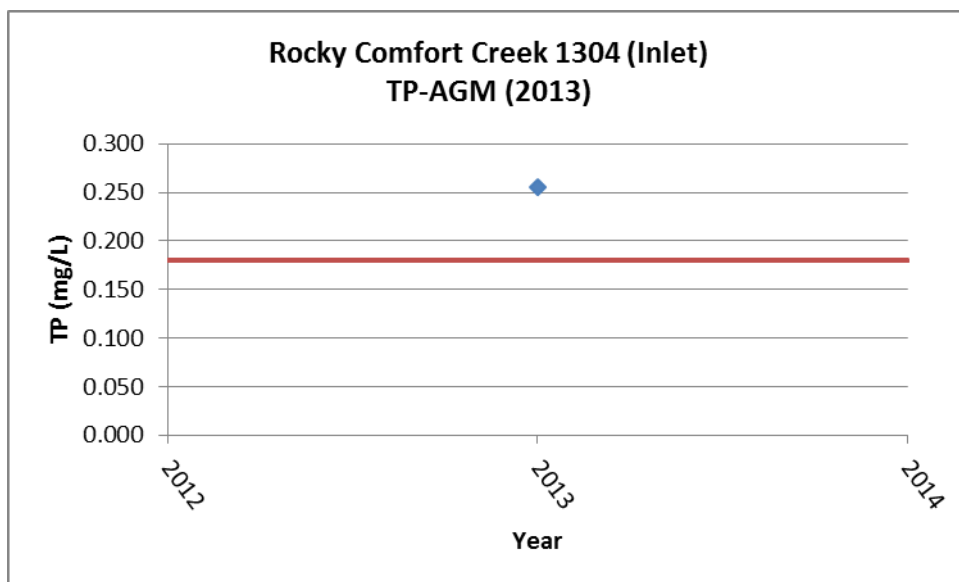


Figure B.4E.16. Rocky Comfort Creek WBID 1304 Annual Geomean TP 2013

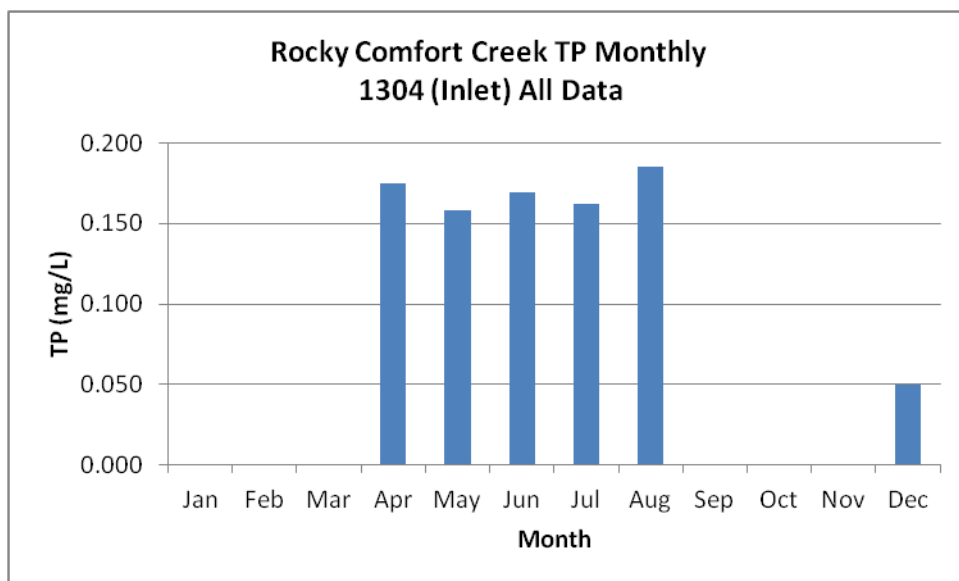


Figure B.4E.17. Rocky Comfort Creek WBID 1304 Monthly Average TP 1968–2013

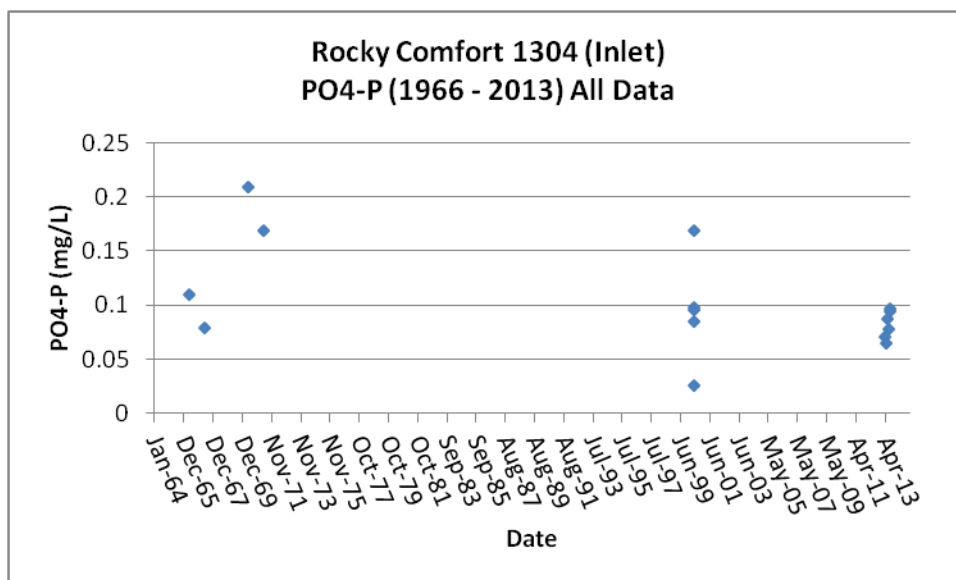


Figure B.4E.18. Rocky Comfort Creek WBID 1304 Daily Average Orthophosphate-P 1966–2013

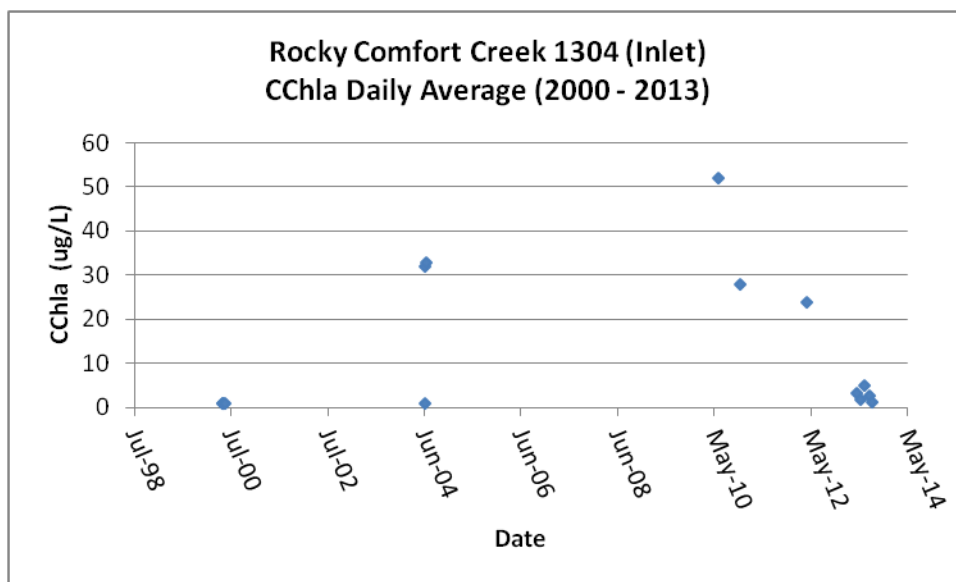


Figure B.4E.19. Rocky Comfort Creek WBID 1304 Daily Average CChla 2000–2013

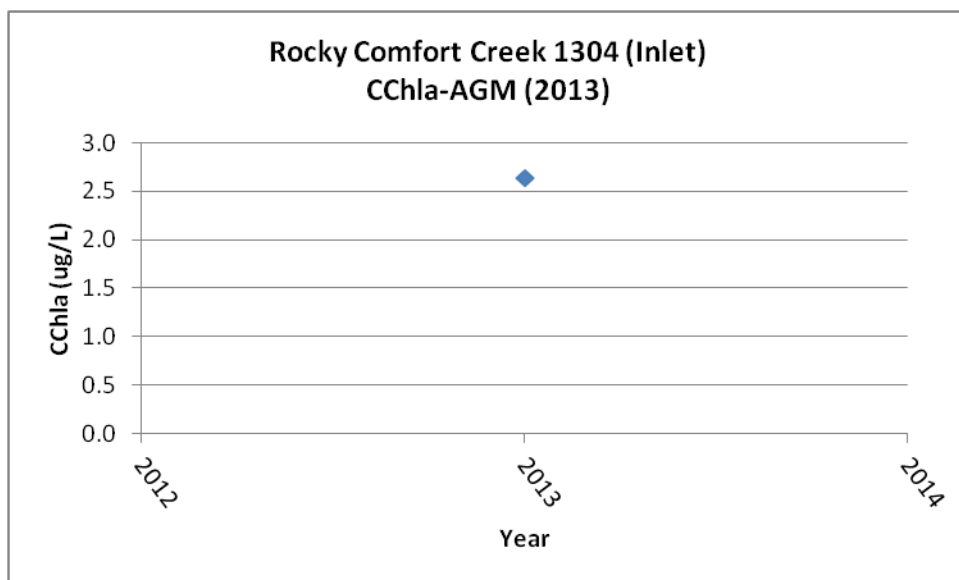


Figure B.4E.20. Rocky Comfort Creek WBID 1304 Annual Geomean CChla 2013

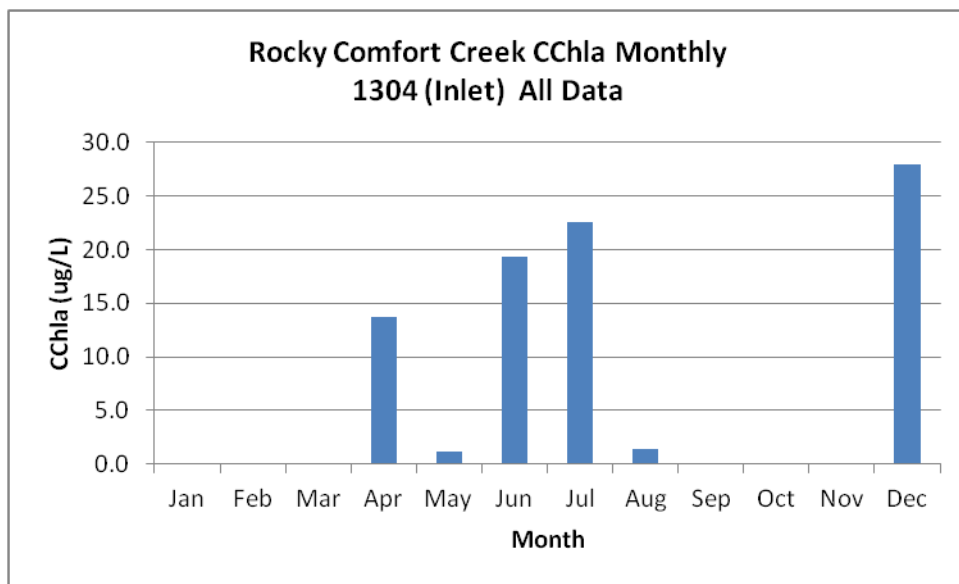


Figure B.4E.21. Rocky Comfort Creek WBID 1304 Monthly Average CChla 2000–2013

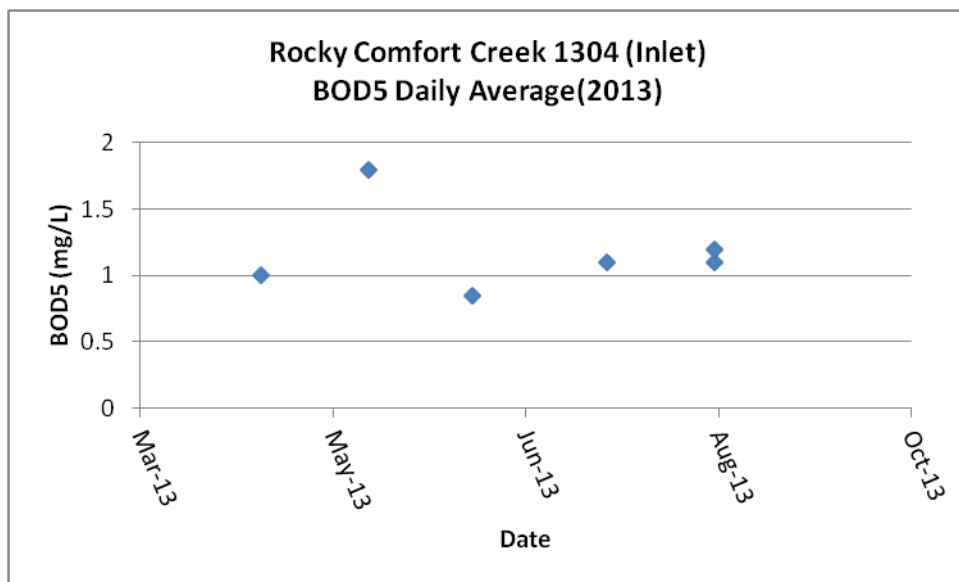


Figure B.4E.22. Rocky Comfort Creek WBID 1304 Daily Average BOD5 2013

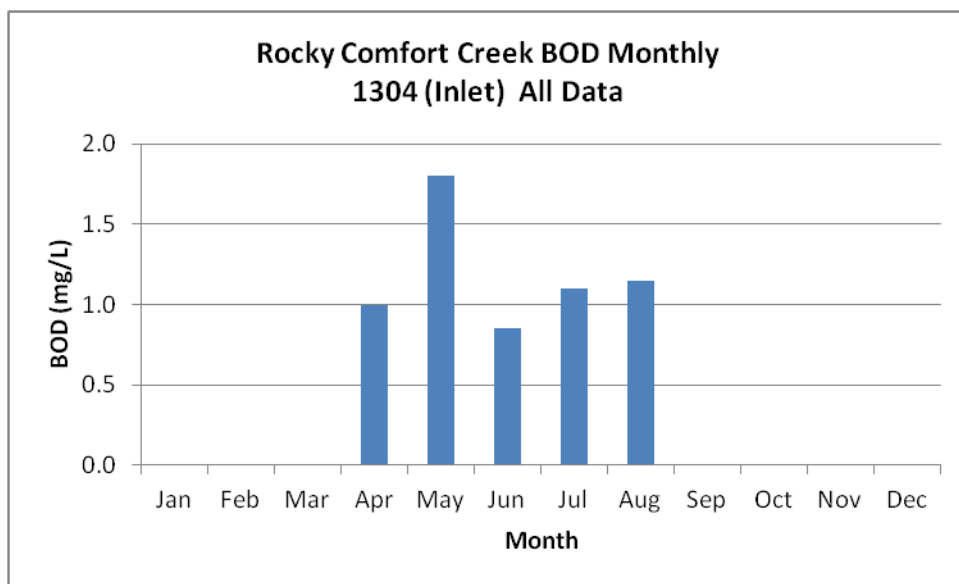


Figure B.4E.23. Rocky Comfort Creek WBID 1304 Monthly Average BOD5 2013

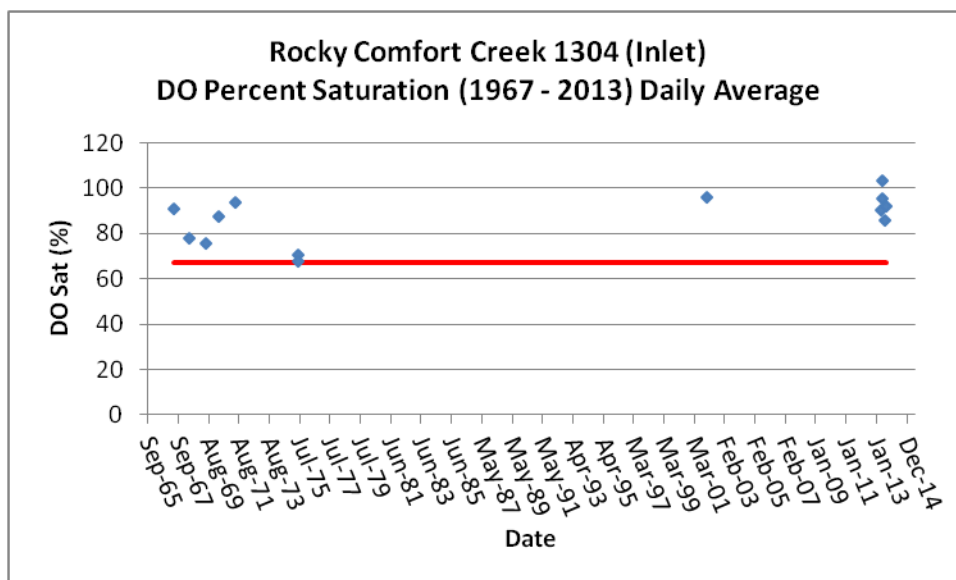


Figure B.4E.26. Rocky Comfort Creek WBID 1304 Daily Average DO Percent Saturation 1967–2013

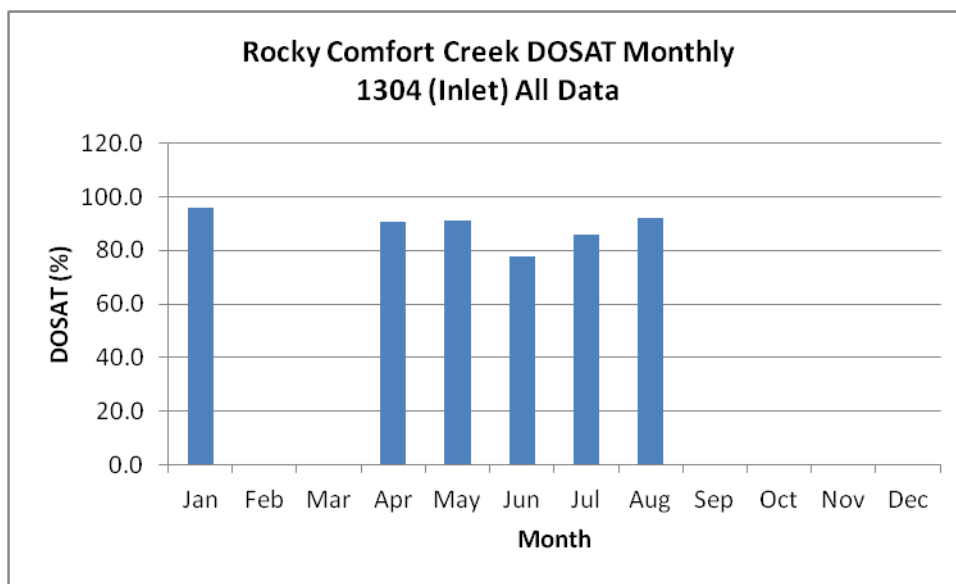


Figure B.4E.27. Rocky Comfort Creek WBID 1304 Monthly Average DO Percent Saturation 1967–2013

Table B.4E.1. Rocky Comfort Creek WBID 1304 IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
1304	21FLWQA 302905008435356	Rocky Comfort Creek at SR 65B	2002	2002
1304	112WRD 02329700	ROCKY COMFORT CREEK NR QUINCY, FLA.	1956	1975
1304	112WRD 02329777	ROCKY COMFORT CREEK NR WETUMPKA, FLA.	1975	1975
1304	21FLGW 7669	NWA-LS-1018 UNNAMED STREAM	2000	2000
1304	21FLGW 7672	NWA-LS-1024 ROCKY COMFORT CREEK	2000	2000
1304	21FLGW 21803	NW1-SS-2065 ROCKY COMFORT CREEK	2004	2004
1304	21FLGW 7682	NWA-LS-1041 ROCKY COMFORT CREEK	2000	2000
1304	21FLGW 8657	NWA-LS-1046 ROCKY COMFORT CREEK	2000	2000

Table B.4E.2. Rocky Comfort Creek WBID 1304 Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
1304	Alkalinity (mg/L)	1956 - 2013	14.1
1304	Color-True (PCU)	1956 - 2013	64.3

Table B.4E.3. Rocky Comfort Creek WBID 1304 DO Percent Saturation vs. 67 % Criterion

Year	Category	Result
1967 - 2013	Count	12
	Number P	11
	Number F	1
	Percent F	8.3
2005-2013	Count	5
	Number P	5
	Number F	0
	Percent F	0.0

Table B.4E.4. Rocky Comfort Creek WBID 1304 Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN	TP	TN/TP	CChla
-	AGM	AGM	Ratio	AGM
2013	0.79	0.256	3.1	2.6

Table B.4E.5. Rocky Comfort Creek WBID 1304 Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	1956 - 2013	29	11.1	31.8	23.3	22.9	22.4
Alkalinity	mg/L	1956 - 2013	12	7.0	25.0	19.5	16.0	14.1
pH	S.U.	1956 - 2013	29	6.0	8.1	6.9	NA	NA
Color	PCU	1956 - 2013	23	10.0	250.0	80.0	91.6	64.3
TN	mg/L	1975 - 2013	19	0.55	1.13	0.75	0.77	0.75
NH4-N	mg/L	1975 - 2013	19	0.010	0.08	0.03	0.03	0.03
NO23	mg/L	1975 - 2013	19	0.004	0.59	0.14	0.17	0.08
OrgN	mg/L	1970 - 1975	4	0.36	0.45	0.39	0.40	0.40
TP	mg/L	1968 - 2013	23	0.046	0.440	0.140	0.161	0.136
PO4-P	mg/L	1966 - 2013	15	0.026	0.210	0.095	0.103	0.093
CChla	ug/L	2000 - 2013	17	1.0	52.0	1.9	11.2	3.8
BOD5	mg/L	2013	6	0.9	1.8	1.1	1.2	1.1
DO	mg/L	1967 - 2013	28	0.8	10.6	7.2	6.7	5.8
%DOSat	%	1967 - 2013	13	68.0	103.8	90.8	87.0	86.3

Table B.4E.6. Rocky Comfort Creek WBID 1304 Water Quality Data Summary Verified Period Plus (2005–2013)

Constituent	Units	Verified Period +	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2013	11	15.9	31.8	23.4	22.9	22.3
Alkalinity	mg/L	2005 - 2013	6	20.0	25.0	22.5	22.5	22.4
pH	S.U.	2005 - 2013	11	6.0	8.1	6.9	NA	NA
Color	PCU	2005 - 2013	9	40.0	120.0	84.0	86.8	83.7
TN	mg/L	2005 - 2013	9	0.57	1.13	0.80	0.80	0.78
NH4-N	mg/L	2005 - 2013	9	0.010	0.04	0.03	0.03	0.02
NO23	mg/L	2005 - 2013	9	0.004	0.30	0.14	0.12	0.06
OrgN	mg/L							
TP	mg/L	2005 - 2013	9	0.050	0.440	0.190	0.209	0.177
PO4-P	mg/L	2005 - 2013	6	0.066	0.097	0.084	0.083	0.082
CChla	ug/L	2005 - 2013	9	1.4	52.0	3.4	13.3	5.7
BOD5	mg/L	2005 - 2013	6	0.9	1.8	1.1	1.2	1.1
DO	mg/L	2005 - 2013	11	0.8	10.5	7.6	6.0	4.3
%DOSat	%	2005 - 2013	5	85.9	103.8	92.0	93.7	93.5

B.4F Bear Creek WBID 757 Drains to Lake Talquin

This WBID is not impaired for DO or nutrients.

Table B.4F.1, lists the 13 stations that have been sampled in Bear Creek WBID 757. **Figure B.4F.1** depicts the station locations. About one third of the data was collected between 1973 and 1990.

Tables B.4F.5 and B.4F.6 and Figures B.4F.3 and B.4F.4 provide the results for alkalinity. These data show that Bear Creek has a POR GM alkalinity of 2.4 mg/L. The data indicate that the GM for the period (2005–2013) of 2.3 mg/L is similar to the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4F.5 and B.4F.6 and Figures B.4F.5 and B.4F.6 provide the results for true color. These data show that Bear Creek has a POR GM color of 54.6 PCU. The data indicate that the GM color for the period (2005–2013) of 46.0 PCU is less than the POR color. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4F.5 and B.4F.6 and Figures B.4F.8 through B.4F.11 provide the results for TN. These data show that Bear Creek has a POR GM TN of 0.42 mg/L. The data indicate that the recent (2005–2013) TN GM of 0.36 mg/L is slightly less than the POR TN GM for the POR and less than the new 1.03 mg/L threshold AGM concentration for TN (**Figure B.4F.10**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4F.5 and B.4E.6 and Figure B.4F.12 provide the results for NH₄-N. These data show that Bear Creek has a POR GM NH₄-N of 0.03 mg/L, less than either the Little or Ochlockonee Rivers. The data indicate that the recent (2005–2013) NH₄-N GM of 0.02 mg/L is less than the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4F.5 and B.4F.6 and Figure B.4F.13 provide the results for NO₃-N. These data show that Bear Creek has a POR GM NO₃-N of 0.03 mg/L, significantly less than either the Little or Ochlockonee Rivers. The data indicate that the recent (2005–2013) NO₃-N GM of 0.04 mg/L is slightly greater than the POR concentration, indicating a slight increase since the 1970's. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4F.5 and B.4F.6 and Figures B.4F.14 through B.4F.17 provide the results for TP. These data show that Bear Creek has a POR GM TP of 0.080 mg/L. The data indicate that the recent (2005–2013) TP GM of 0.081 mg/L is not different from the TP GM for the POR and significantly less than the 0.18 mg/L new threshold AGM concentration for TP (**Figure B.4F.16**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4F.5 and B.4F.6 and Figure B.4F.18 provide the results for PO₄-P. These data show that Bear Creek has a POR GM PO₄-P of 0.045 mg/L. The data indicate that the recent (2005–2013) PO₄-P GM of 0.045 mg/L is the same as the POR concentration. These concentrations are

similar to the Little and Ochlockonee Rivers as well as the adjacent Richlander Creek. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4F.5 and B.4F.6 and Figures B.4F.19 through B.4F.21 provide the results for CChla. These data show that Bear Creek has a POR GM CChla of 2.1 ug/L. The data indicate that the recent (2005–2013) CChla GM of 2.3 ug/L is similar to the CChla GM for the POR and significantly less than the new 20.0 ug/L threshold AGM concentration for CChla (**Figure B.4F.20**). The data set has a large number of less than detection results. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4F.5 and B.4F.6 and Figures B.4F.22 and B.4F.23 provide the results for BOD5. These data show that Bear Creek has a POR GM BOD5 of 1.6 mg/L as well as 1.6 mg/L for the period 2005–2013). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4F.5 and B.4F.6 and Figures B.4F.24 and B.4F.25 provide the results for DO. These data show that Bear Creek has a POR GM DO of 7.7 mg/L. The data indicate that the recent (2005–2013) DO GM of 8.2 mg/L is slightly greater than the POR concentration and the old criterion of 5.0 mg/L. The monthly average DO never drops below 5.0 mg/L (**Figure B.4F.25**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4F.5 and B.4F.6 and Figures B.4F.26 and B.4F.27 provide the results for percent DO saturation. These data show that Bear Creek has a POR GM DOSAT of 94.1 %. The data indicate that the recent (2005–2013) DOSAT GM of 96 % is slightly higher than the GM for the POR. The data presented in **Figure B.4F.26** do not indicate an issue with the new DO percent saturation criterion. There is insufficient data to determine accurate long-term or seasonal patterns.

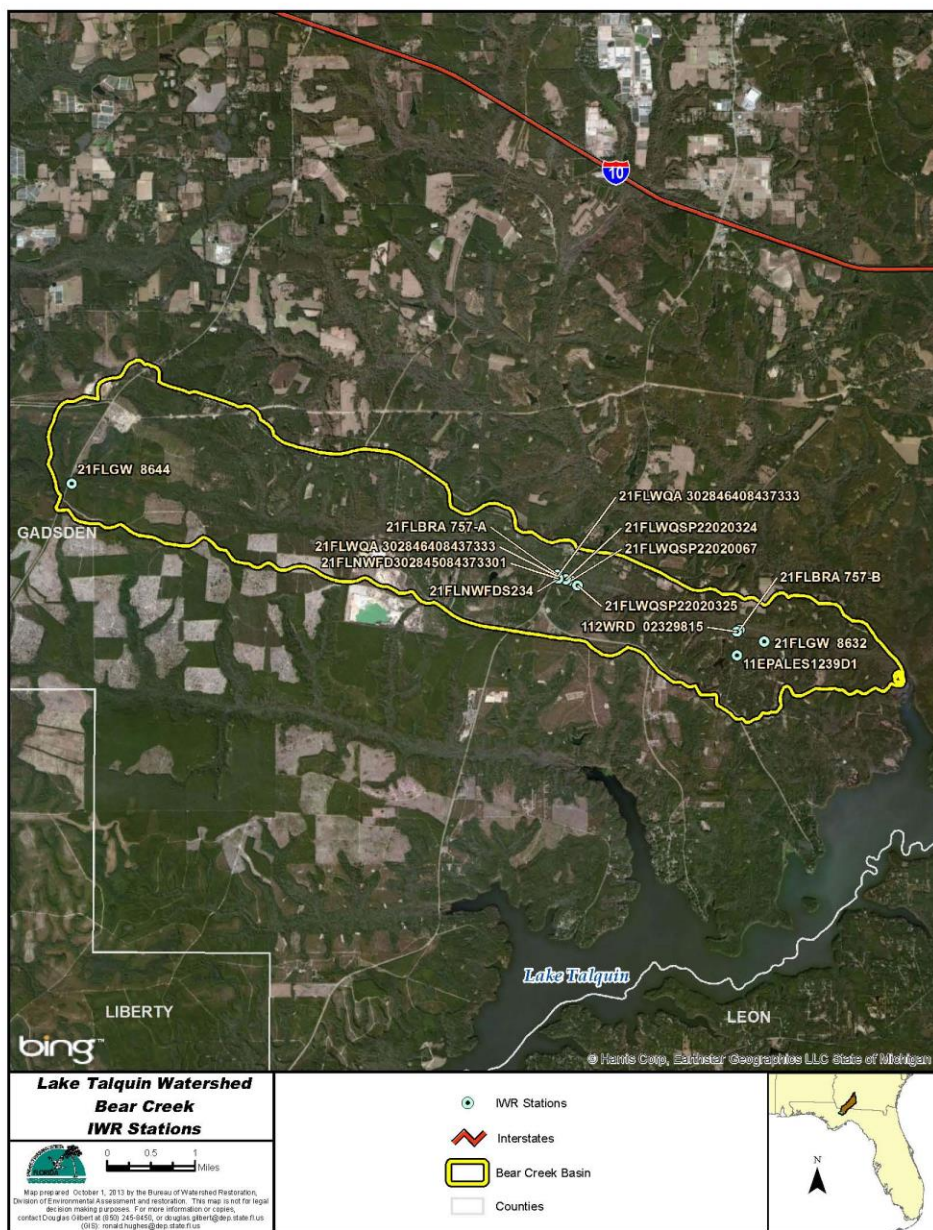


Figure B.4F.1. Bear Creek WBID 757 IWR Stations

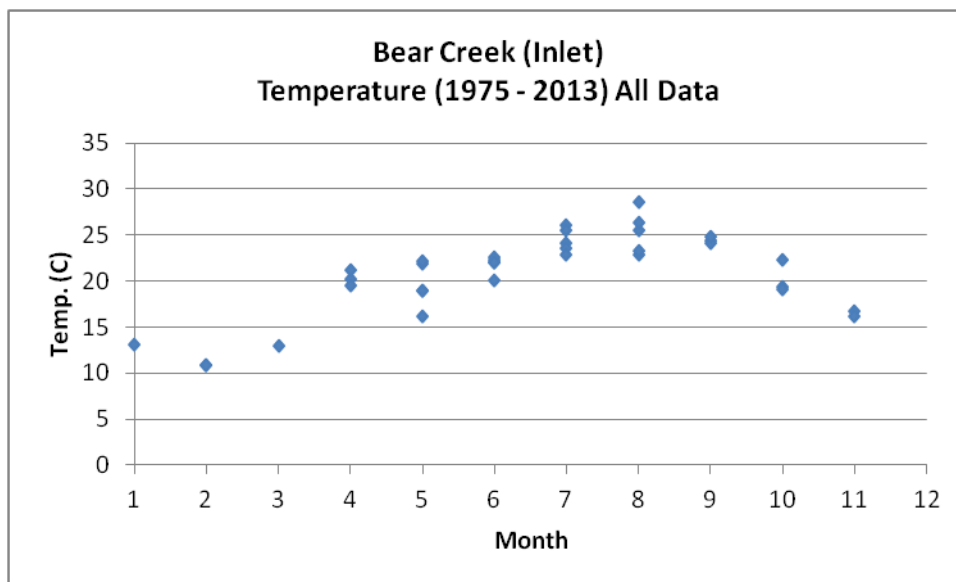


Figure B.4F.2. Bear Creek WBID 757 Monthly Temperature 1975–2013

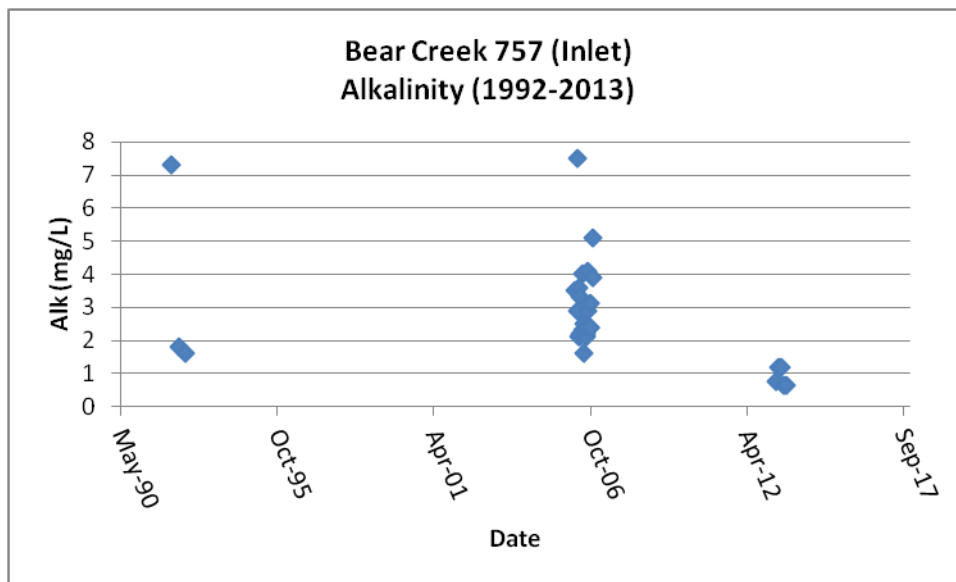


Figure B.4F.3. Bear Creek WBID 757 Daily Average Alkalinity 1992–2013

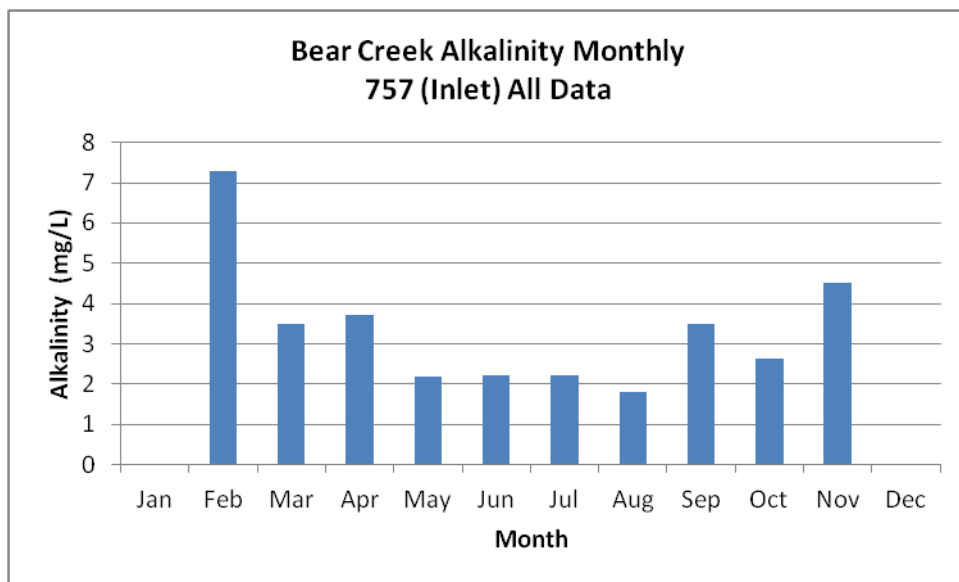


Figure B.4F.4. Bear Creek WBID 757 Monthly Average Alkalinity 1992–2013

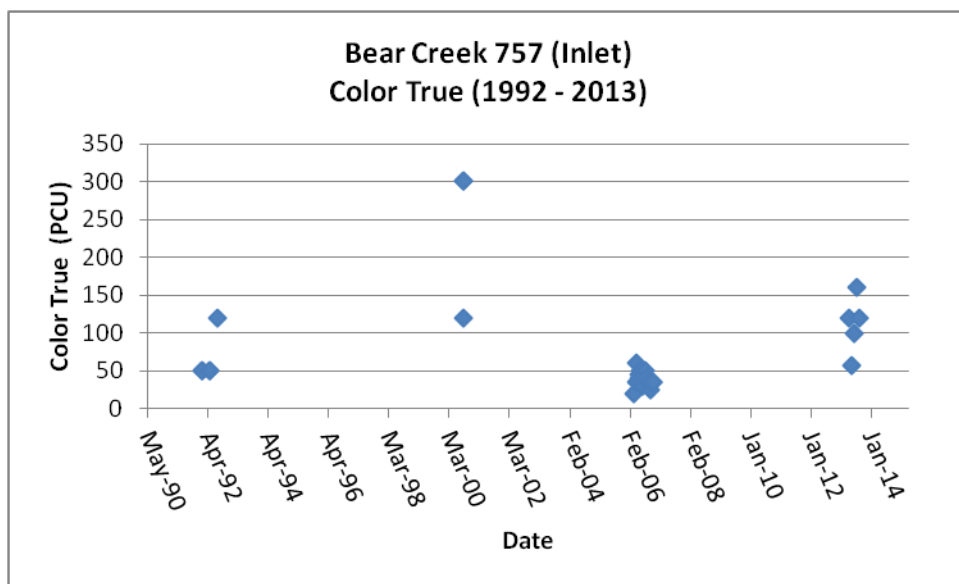


Figure B.4F.5. Bear Creek WBID 757 Daily Average True Color 1992–2013

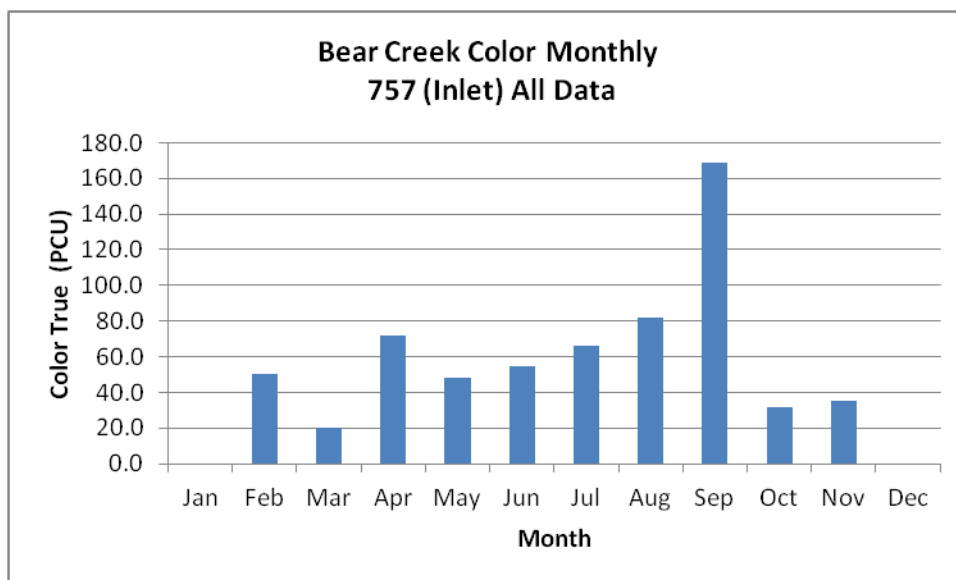


Figure B.4F.6. Bear Creek WBID 757 Monthly Average True Color 1992–2013

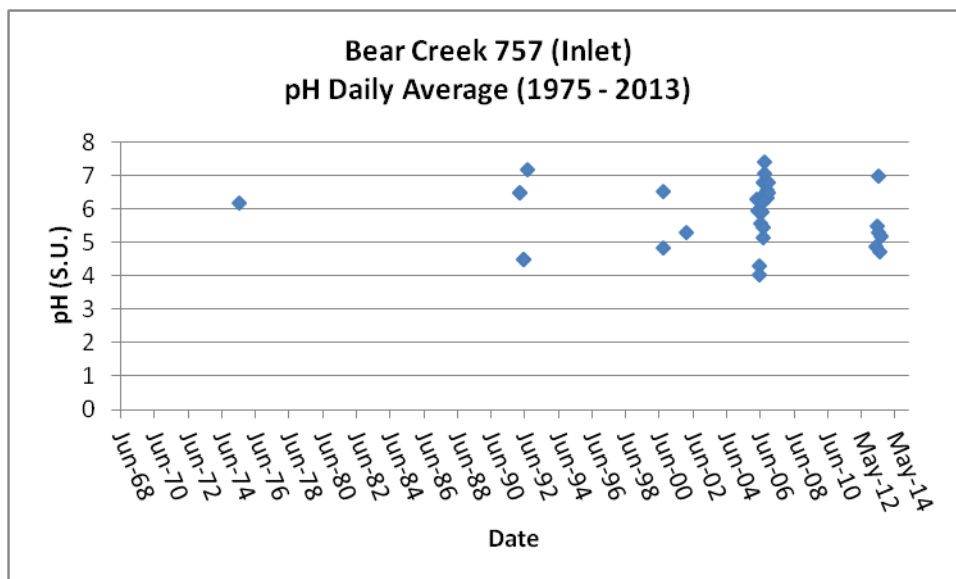


Figure B.4F.7. Bear Creek WBID 757 Daily pH 1975–2013

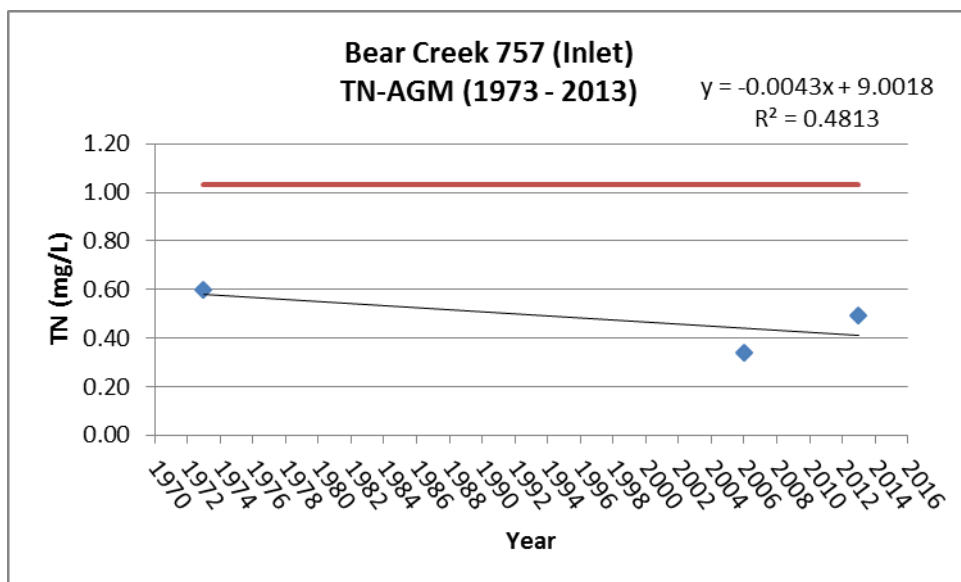


Figure B.4F.10. Bear Creek WBID 757 TN Annual Geomean 1973–2013

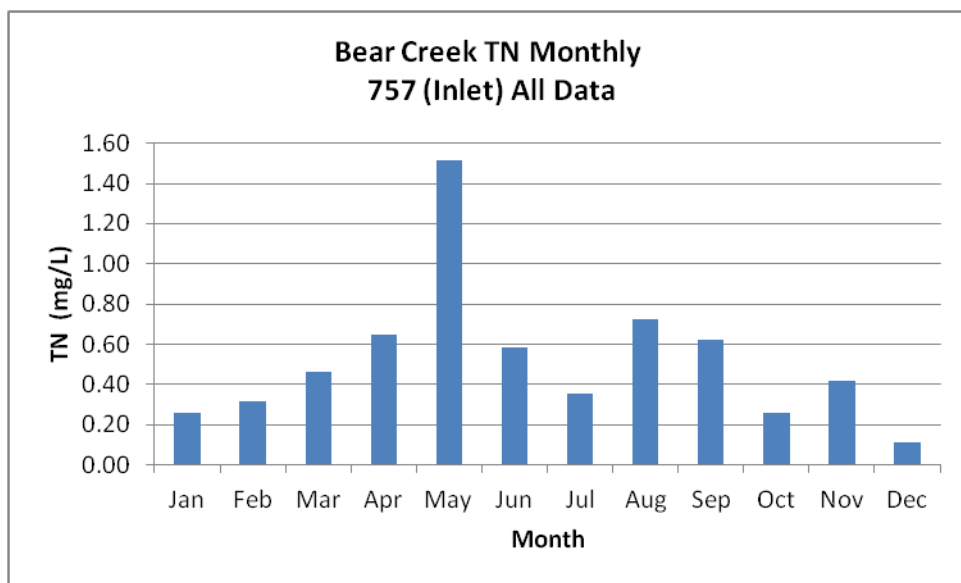


Figure B.4F.11. Bear Creek WBID 757 Monthly Average TN 1973–2013

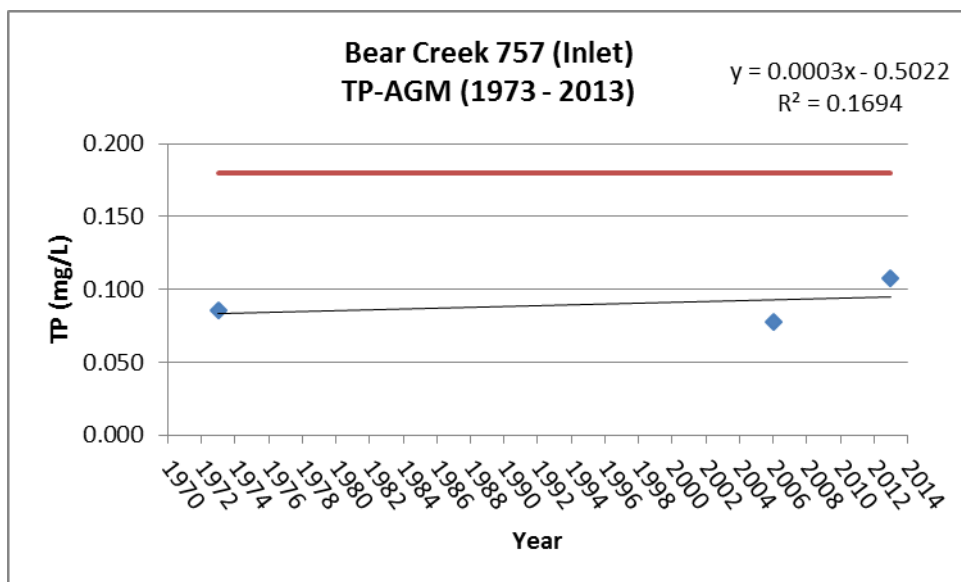


Figure B.4F.16. Bear Creek WBID 757 Annual Geomean TP 1973 2013

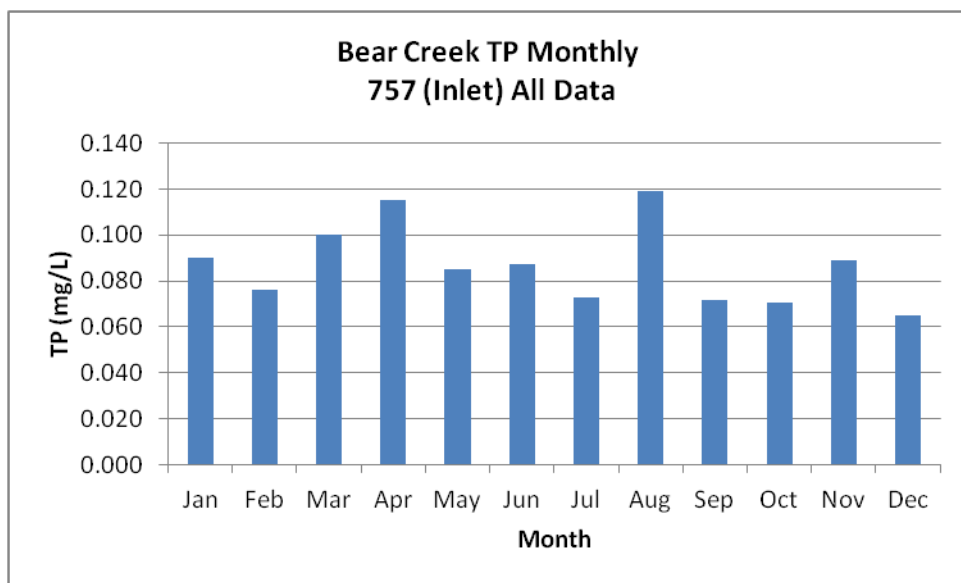


Figure B.4F.17. Bear Creek WBID 757 Monthly Average TP 1973–2013

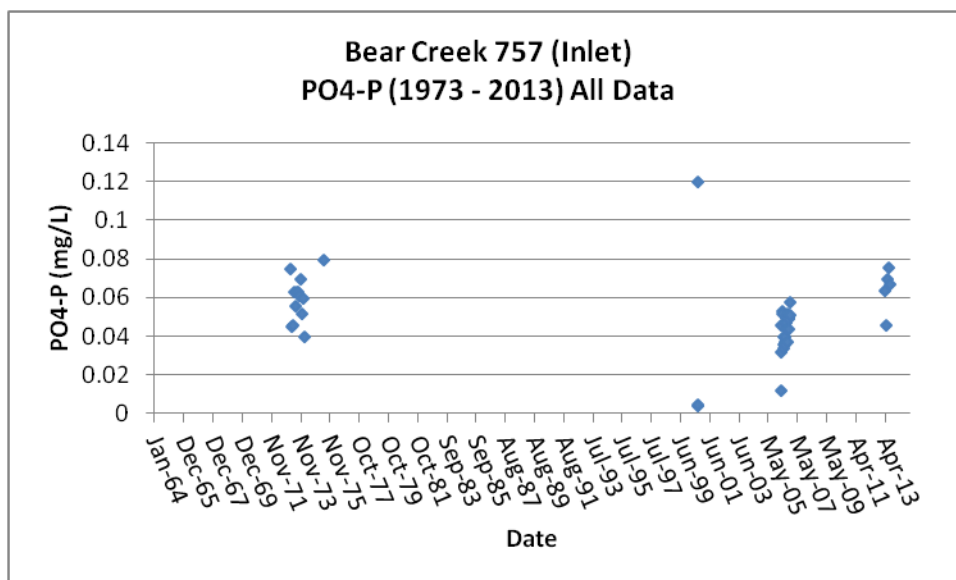


Figure B.4F.18. Bear Creek WBID 757 Daily Average Orthophosphate-P 1973–2013

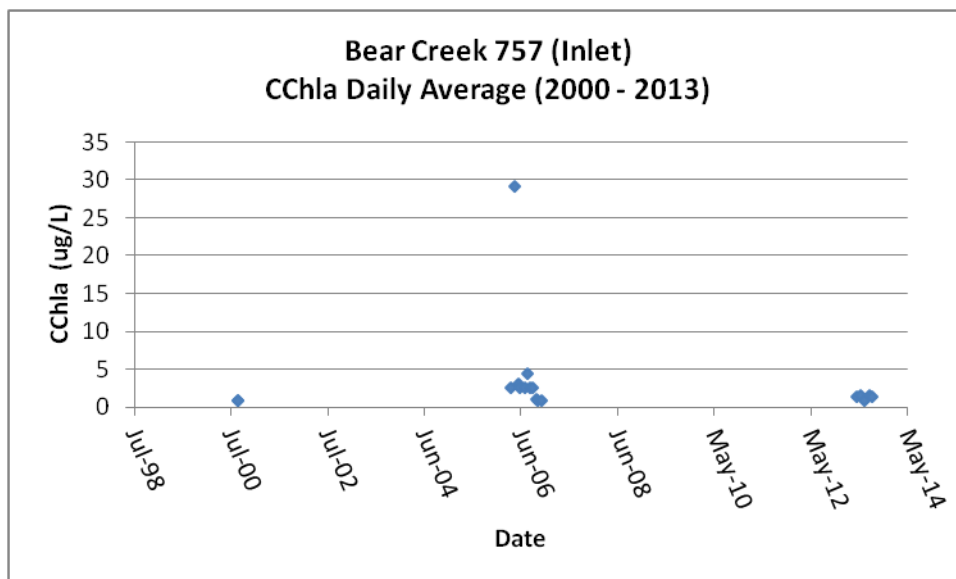


Figure B.4F.19. Bear Creek WBID 757 Daily Average CChla 2000–2013

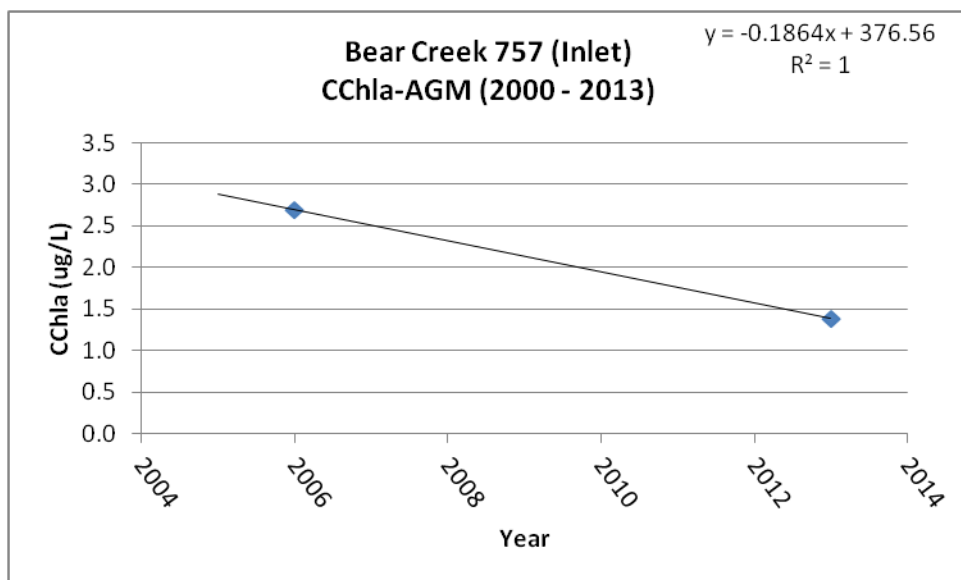


Figure B.4F.20. Bear Creek WBID 757 Annual Geomean CChla 2006–2013

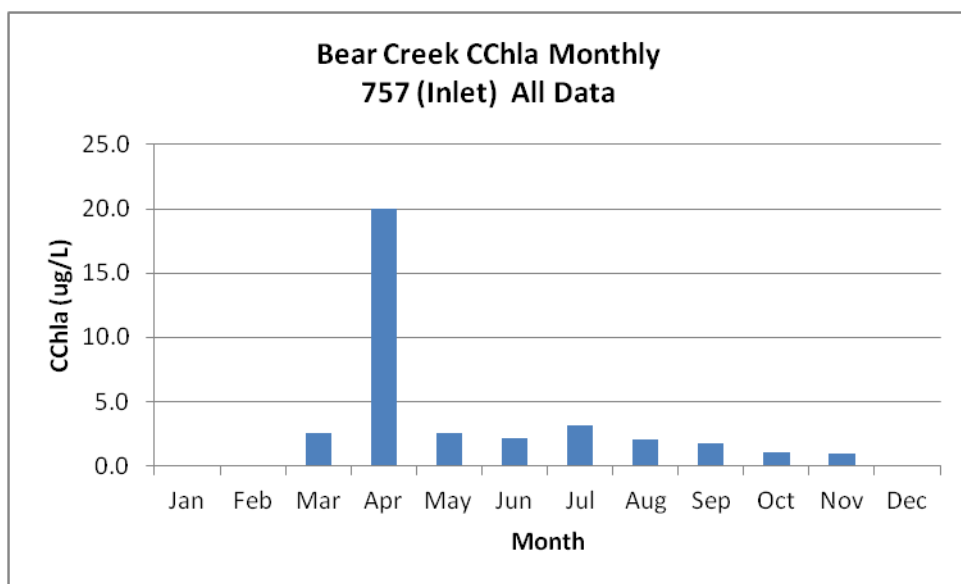


Figure B.4F.21. Bear Creek WBID 757 Monthly Average CChla 2000–2013

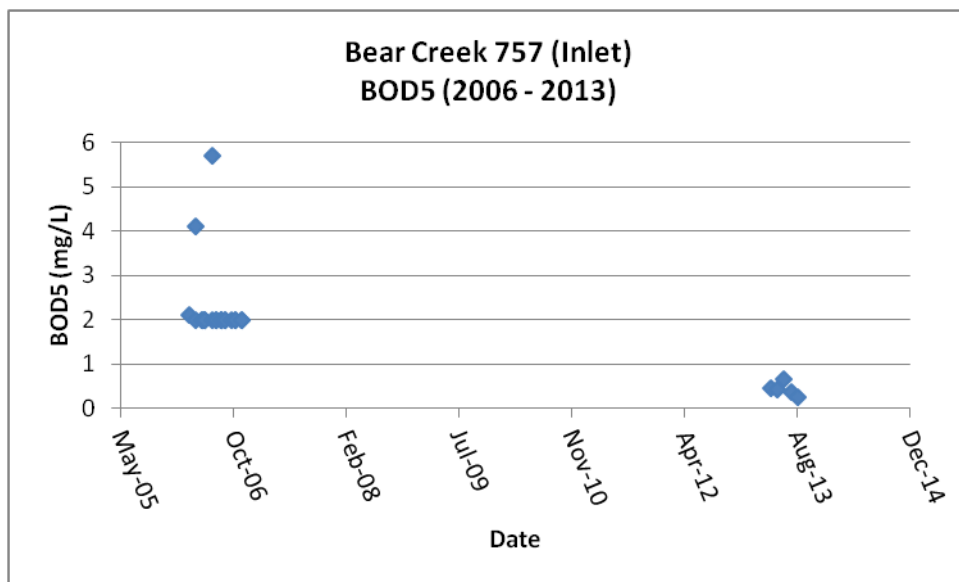


Figure B.4F.22. Bear Creek WBID 757 Daily Average BOD5 2006–2013

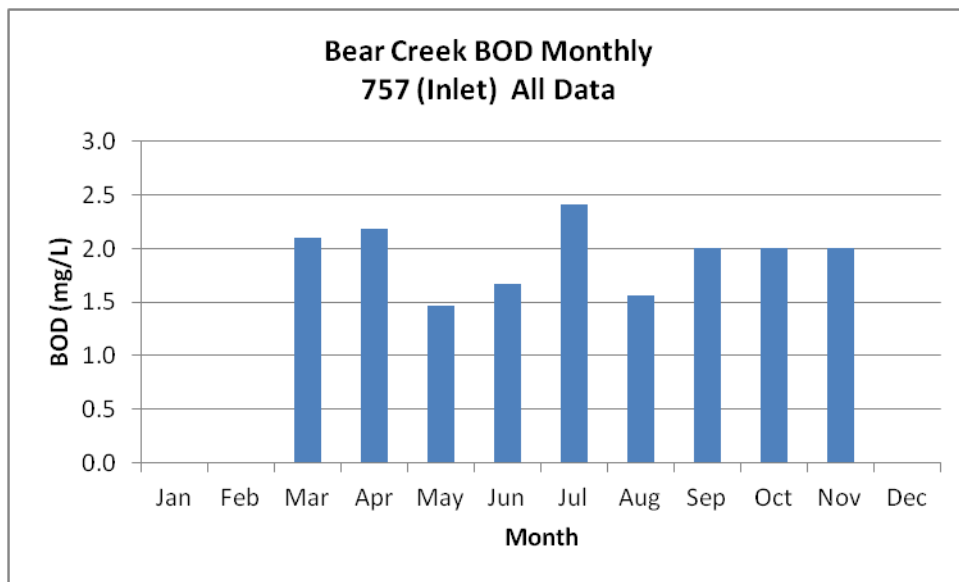


Figure B.4F.23. Bear Creek WBID 757 Monthly Average BOD5 2006–2013

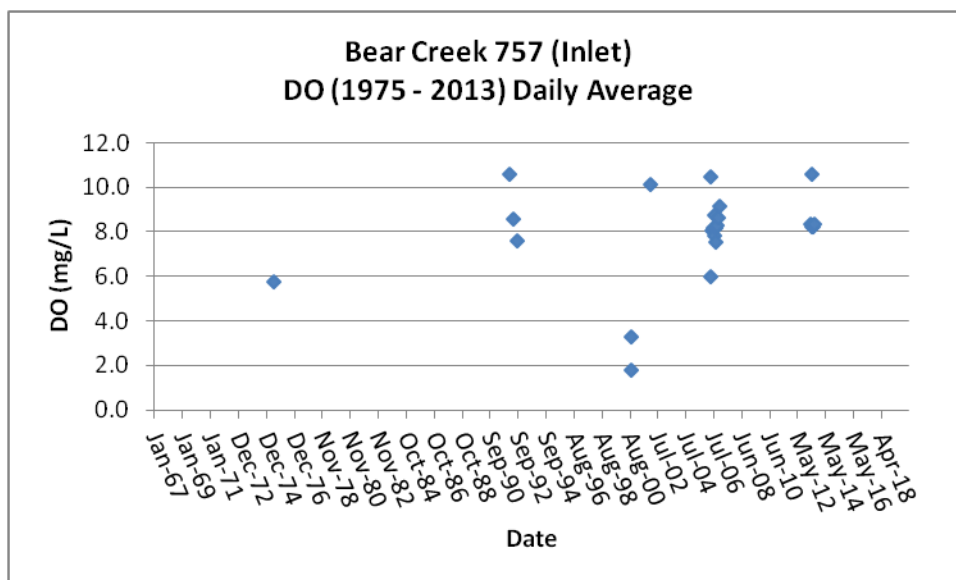


Figure B.4F.24. Bear Creek WBID 757 Daily Average DO 1975–2013

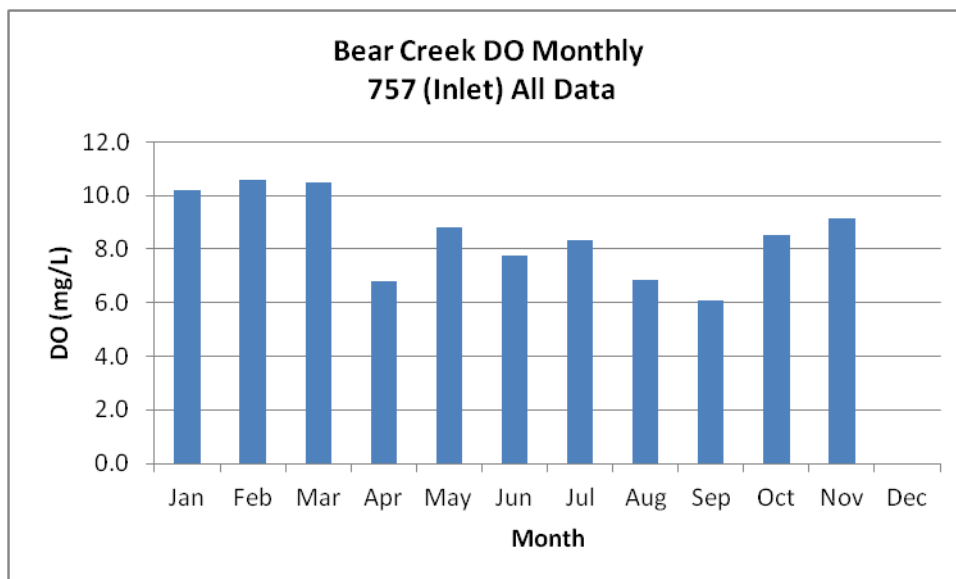


Figure B.4F.25. Bear Creek WBID 757 Monthly Average DO 1975–2013

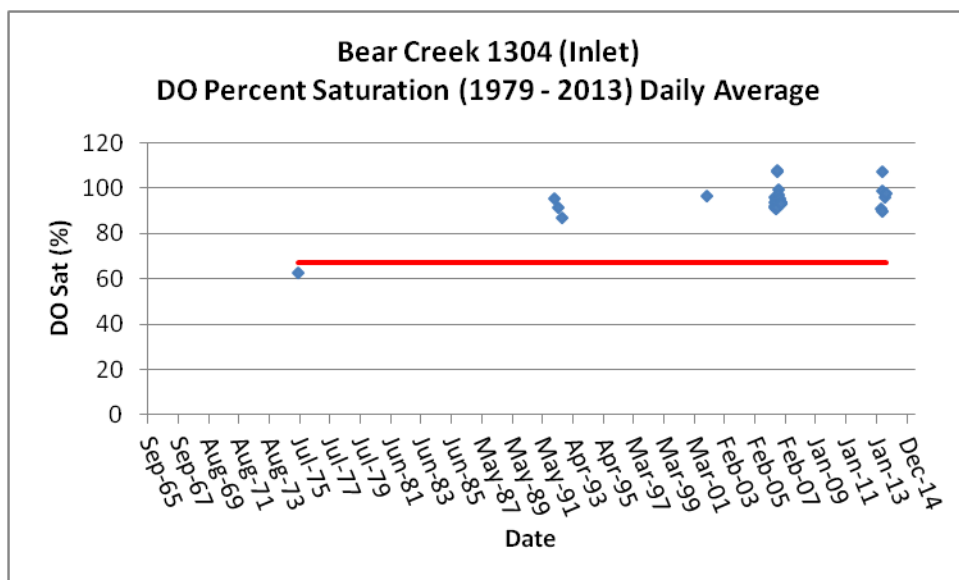


Figure B.4F.26. Bear Creek WBID 757 Daily Average DO Percent Saturation 1979–2013

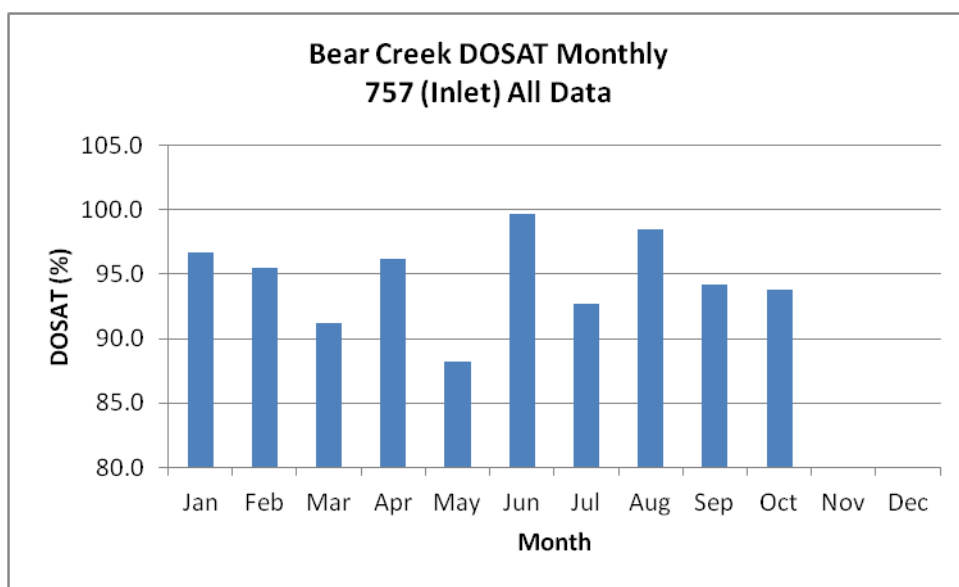


Figure B.4F.27. Bear Creek WBID 757 Monthly Average DO Percent Saturation 1979–2013

Table B.4F.1. Bear Creek WBID 757 IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
757	21FLWQA 302846408437333	Bear Creek at SR 267	2003	2003
757	11EPALES1239D1	BEAR CREEK	1973	1974
757	21FLGW 8632	NWA-HS-1023 BEAR CREEK (GADSDEN CO)	2000	2000
757	21FLWQA 302846408437333	Bear Creek at SR 267	2003	2003
757	21FLBRA 757-B	757 - Bear Creek - at Bear Creek Rd	2006	2006
757	21FLWQSP22020067	Hester-dendy method study - Bear Creek - Bottom HD	2009	2009
757	21FLBRA 757-A	757 - Bear Creek - At SR-267	2006	2006
757	112WRD 02329815	BEAR CREEK NR WETUMPKA, FLA.	1975	1975
757	21FLNWFD302845084373301	Bear Cr. ab Rocky Comfort @ 267	1992	1992
757	21FLGW 8644	NWA-HS-1041 BEAR CREEK (GADSDEN CO)	2000	2000
757	21FLWQSP22020324	Bear Creek Site 1	2009	2009
757	21FLNWFD5234	Bear Creek	1992	1992
757	21FLWQSP22020325	Bear Creek Site 3	2009	2009

Table B.4F.2. Bear Creek WBID 757 Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
757	Alkalinity (mg/L)	1992 - 2013	2.4
757	Color-True (PCU)	1992 - 2013	54.6

Table B.4F.3. Bear Creek WBID 757 DO Percent Saturation vs. 67 % Criterion

Year	Category	Results
1975 - 2013	Count	28
	Number P	27
	Number F	1
	Percent F	3.6
2005 - 2013	Count	23
	Number P	23
	Number F	0
	Percent F	0.0

Table B.4F.4. Bear Creek WBID 757 Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN	TP	TN/TP	CChla
	AGM	AGM	Ratio	AGM
1973	0.60	0.086	7.0	
2006	0.34	0.078	4.4	2.7
2013	0.50	0.107	4.6	1.4

Table B.4F.5. Bear Creek WBID 757 Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	1975 - 2013	35	10.9	28.6	22.0	20.9	20.4
Alkalinity	mg/L	1992 - 2013	30	0.7	7.5	2.4	2.8	2.4
pH	S.U.	1975 - 2013	35	4.1	7.4	6.0	NA	NA
Color	PCU	1992 - 2013	35	20.0	300.0	45.0	70.2	54.6
TN	mg/L	1973 - 2013	43	0.11	6.96	0.39	0.62	0.42
NH4-N	mg/L	1973 - 2013	48	0.009	0.25	0.03	0.04	0.03
NO23	mg/L	1973 - 2013	48	0.004	0.09	0.04	0.04	0.03
OrgN	mg/L							
TP	mg/L	1973 - 2013	48	0.023	0.290	0.084	0.089	0.080
PO4-P	mg/L	1973 - 2013	43	0.004	0.120	0.050	0.051	0.045
CChla	ug/L	2000 - 2013	30	1.0	56.0	2.6	3.9	2.1
BOD5	mg/L	2006 - 2013	27	0.3	5.7	2.0	1.9	1.6
DO	mg/L	1975 - 2013	35	1.8	10.6	8.4	8.1	7.7
%DOSat	%	1979 - 2013	28	63.0	108.3	94.1	94.5	94.1

Table B.4F.6. Bear Creek WBID 757 Water Quality Data Summary Verified Period Plus (2005–2013)

Constituent	Units	Verified Period +	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2013	26	12.9	26.4	22.2	21.6	21.3
Alkalinity	mg/L	2005 - 2013	27	0.7	7.5	2.4	2.7	2.3
pH	S.U.	2005 - 2013	26	4.1	7.4	6.0	NA	NA
Color	PCU	2005 - 2013	27	20.0	160.0	40.0	52.5	46.0
TN	mg/L	2005 - 2013	22	0.12	1.26	0.37	0.41	0.37
NH4-N	mg/L	2005 - 2013	27	0.010	0.14	0.03	0.03	0.02
NO23	mg/L	2005 - 2013	27	0.004	0.09	0.05	0.05	0.04
OrgN	mg/L							
TP	mg/L	2005 - 2013	27	0.031	0.220	0.083	0.088	0.081
PO4-P	mg/L	2005 - 2013	27	0.012	0.076	0.047	0.047	0.045
CChla	ug/L	2005 - 2013	27	1.0	56.0	2.6	4.2	2.3
BOD5	mg/L	2005 - 2013	27	0.3	5.7	2.0	1.9	1.6
DO	mg/L	2005 - 2013	26	3.5	10.6	8.4	8.3	8.2
%DOSat	%	2005 - 2013	23	89.9	108.3	94.1	96.2	96.0

B.4G Ocklawaha Creek WBID 811 Drains to Lake Talquin

This WBID is not impaired for DO or nutrients.

Table B.4G.1 lists the 11 stations that have been sampled in Bear Creek WBID 757. **Figure B.4G.1** depicts the station locations.

Tables B.4G.5 and **B.4G.6** and **Figures B.4G.3** and **B.4G.4** provide the results for alkalinity. These data show that Ocklawaha Creek has a POR GM alkalinity of 1.3 mg/L. The data indicate that the GM for the period (2005–2013) of 1.3 mg/L is the same as the POR concentration. The limited data indicate higher alkalinity in the summer (up to 6 mg/L). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4G.5 and **B.4G.6** and **Figures B.4G.5** and **B.4G.6** provide the results for true color. These data show that Ocklawaha Creek has a POR GM color of 64.5 PCU. The data indicate that the GM color for the period (2005–2013) of 52.7 PCU is slightly lower than the POR color. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4G.5 and **B.4G.6** and **Figures B.4G.8** through **B.4G.11** provide the results for TN. These data show that Ocklawaha Creek has a POR GM TN of 0.37 mg/L. The data indicate that the recent (2005–2013) TN GM of 0.30 mg/L is similar to the POR TN GM for the POR and significantly less than the 1.03 mg/L new threshold AGM concentration for TN (**Figure B.4G.10**). There were two years during the 1970's and two years during the recent period (2005–2013) with sufficient data to calculate AGM concentrations. These results show that the TN concentrations have not changed significantly over time. The limited data indicate higher concentrations of TN during May and June (~1.0 mg/L) with concentrations less than 0.4 mg/L for much of the remaining months. There is insufficient data to determine accurate long-term or accurate seasonal patterns.

Tables B.4G.5 and **B.4E.6** and **Figure B.4G.12** provide the results for NH₄-N. These data show that Ocklawaha Creek has a POR GM NH₄-N of 0.02 mg/L, less than either the Little or Ocklawaha Rivers. The data indicate that the recent (2005–2013) NH₄-N GM of 0.01 mg/L is less than the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4G.5 and **B.4G.6** and **Figure B.4G.13** provide the results for NO₃-N. These data show that Ocklawaha Creek has a POR GM NO₃-N of 0.02 mg/L, significantly less than either the Little or Ochlockonee Rivers. The data indicate that the recent (2005–2013) NO₃-N GM of 0.02 mg/L is the same as the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4G.5 and **B.4G.6** and **Figures B.4G.14** through **B.4G.17** provide the results for TP. These data show that Ocklawaha Creek has a POR GM TP of 0.016 mg/L. The data indicate that the recent (2005–2013) TP GM of 0.019 mg/L is slightly greater than the TP GM for the POR and significantly less than the new 0.18 mg/L threshold AGM concentration for TP. There were

two years during the 1970's and two years during the recent period (2005–2013) with sufficient data to calculate AGM concentrations. These results show that the TP concentrations have not changed significantly over time (**Figure B.4G.16**). Similar to TN, the highest concentrations of TP occur during May and June. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4G.5 and B.4G.6 and Figure B.4G.18 provide the results for PO₄-P. These data show that Ocklawaha Creek has a POR GM PO₄-P of 0.008 mg/L. The data indicate that the recent (2005–2013) PO₄-P GM of 0.005 mg/L is less than the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4G.5 and B.4G.6 and Figures B.4G.19 through B.4G.21 provide the results for CChla. These data show that Ocklawaha Creek has a POR GM CChla of 2.2 ug/L. The data indicate that the recent (2005–2013) CChla GM of 1.9 ug/L is similar to the CChla GM for the POR and significantly less than the new 20.0 ug/L threshold AGM concentration for CChla (**Figure B.4G.20**). The data set has a large number of less than detection results. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4G.5 and B.4G.6 and Figures B.4G.22 and B.4G.23 provide the results for BOD₅. These data show that Ocklawaha Creek has a POR GM BOD₅ of 1.5 mg/L. All of the results are from the period 2006 - 2013. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4G.5 and B.4G.6 and Figures B.4G.24 and B.4G.25 provide the results for DO. These data show that Ocklawaha Creek has a POR GM DO of 8.2 mg/L. The data indicate that the recent (2005–2013) DO GM of 8.4 mg/L is equivalent to the POR concentration. The monthly average DO never drops below 6.0 mg/L (**Figure B.4G.25**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4G.5 and B.4G.6 and Figures B.4G.26 and B.4G.27 provide the results for percent DO saturation. These data show that Ocklawaha Creek has a POR GM DOSAT of 91.5 %. The data indicate that the recent (2005–2013) DOSAT GM of 95.0 % is the same as the GM for the POR. The data presented in **Figure B.4G.26** do not indicate an issue with the new DO percent saturation criterion. There is insufficient data to determine accurate long-term or seasonal patterns.



Figure B.4G.1. Ocklawaha Creek WBID 811 IWR Stations

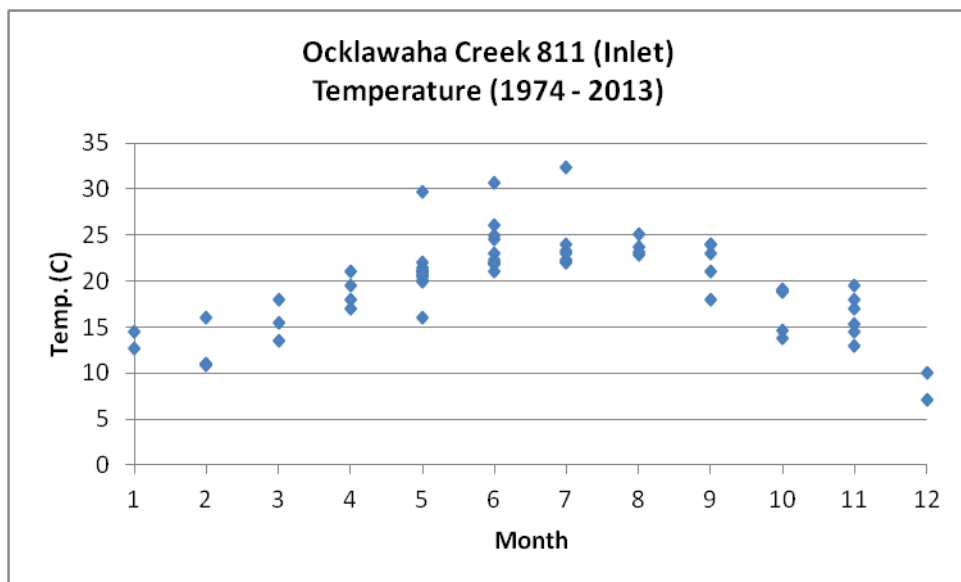


Figure B.4G.2. Ocklawaha Creek WBID 811 Monthly Temperature 1974 - 2013

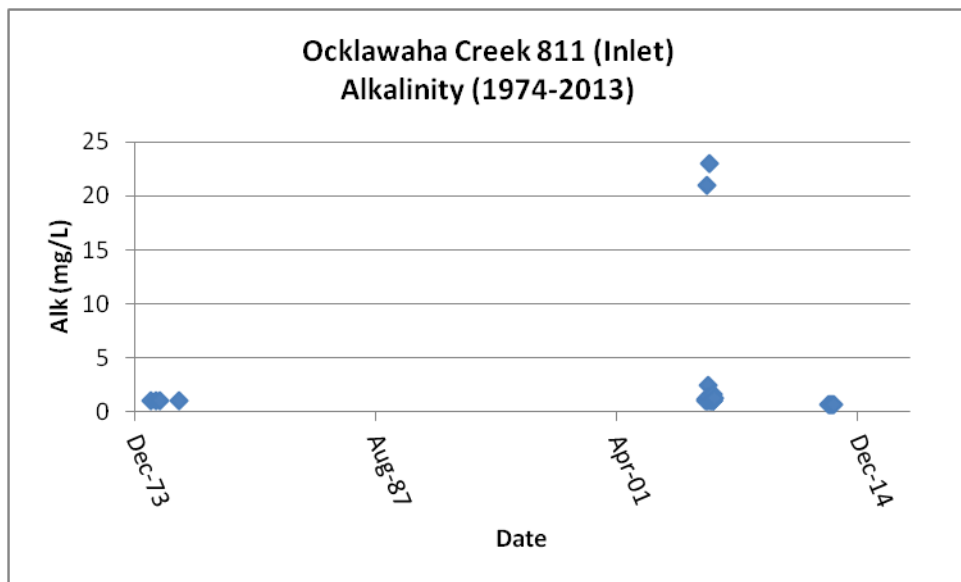


Figure B.4G.3. Ocklawaha Creek WBID 811 Daily Average Alkalinity 1974 - 2013

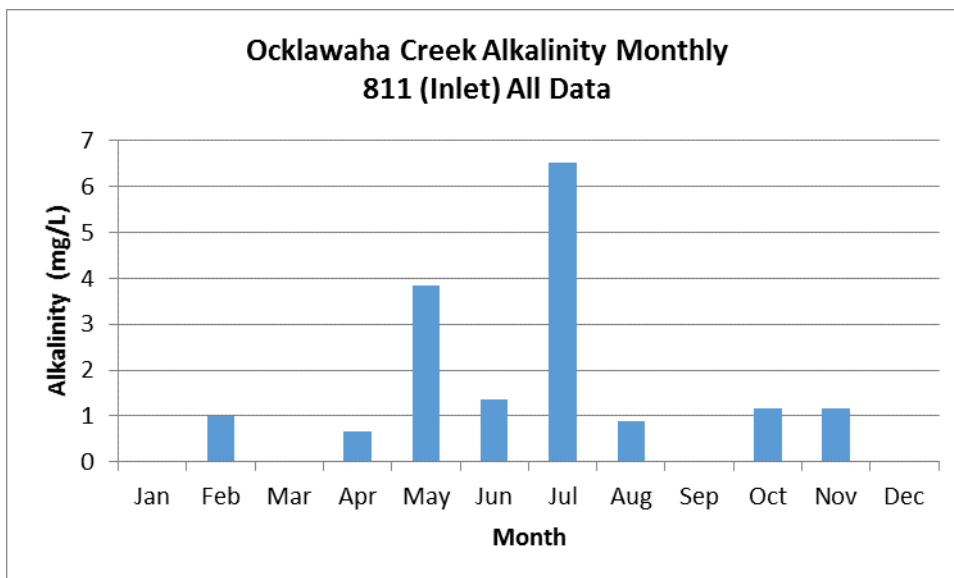


Figure B.4G.4. Ocklawaha Creek WBID 811 Monthly Average Alkalinity 1974–2013

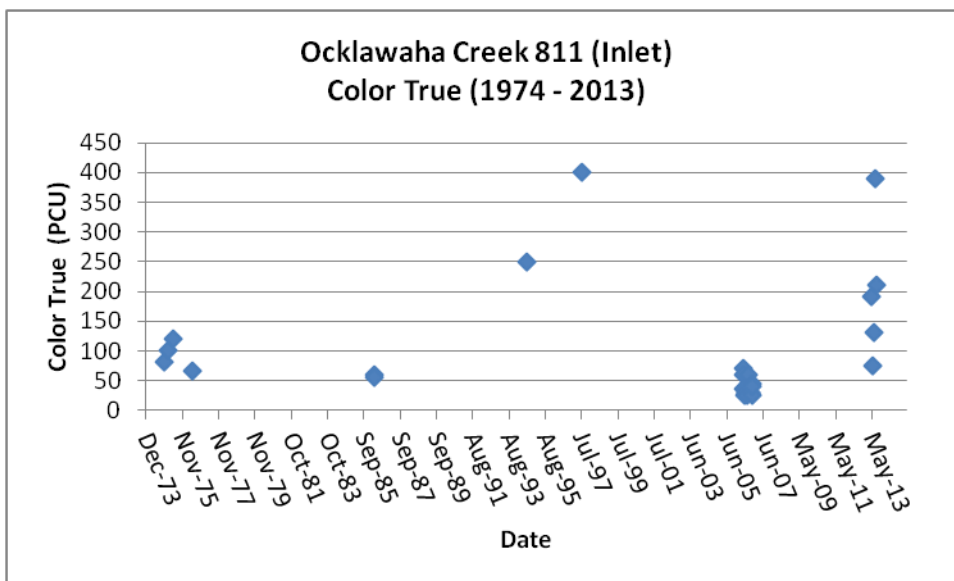


Figure B.4G.5. Ocklawaha Creek WBID 811 Daily Average True Color 1974–2013

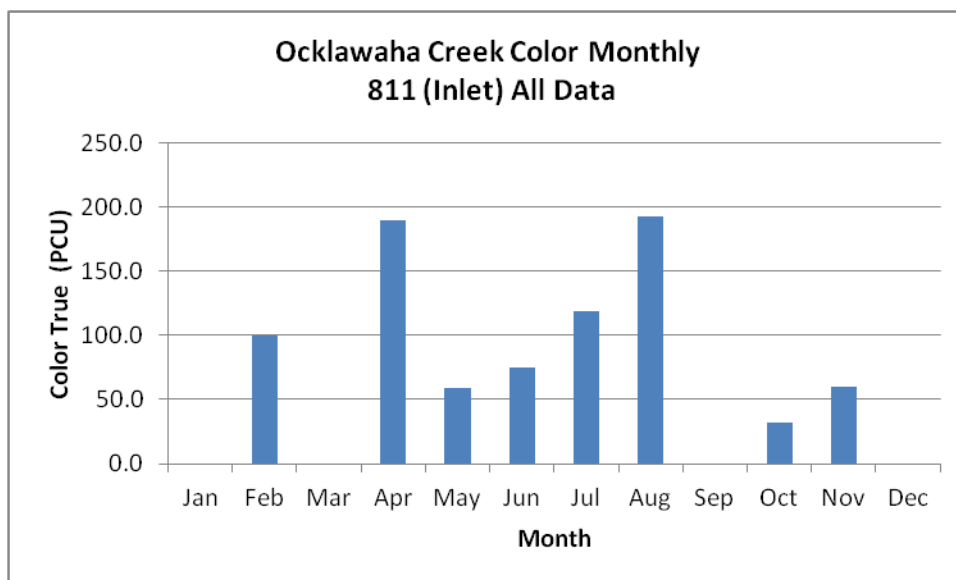


Figure B.4G.6. Ocklawaha Creek WBID 811 Monthly Average True Color 1974–2013

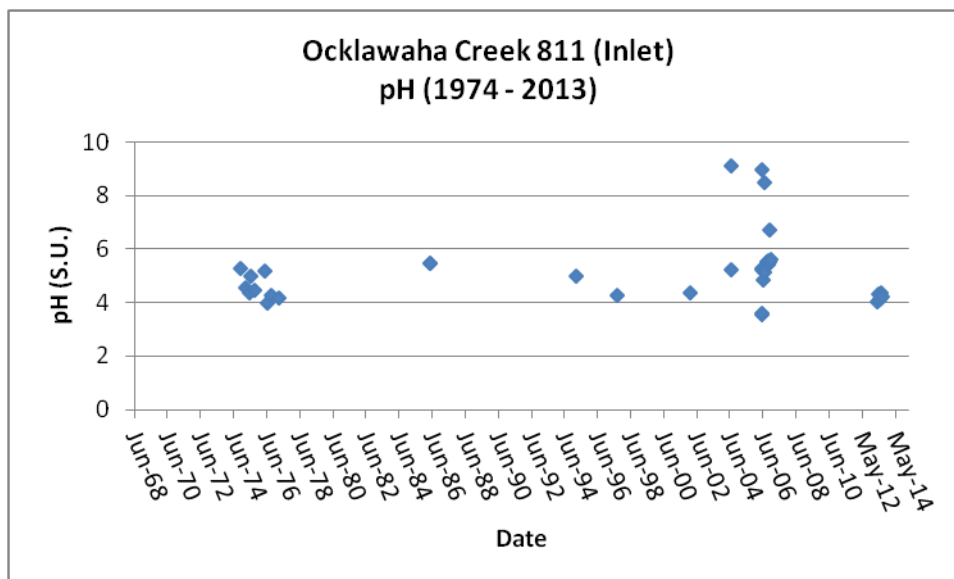


Figure B.4G.7. Ocklawaha Creek WBID 811 Daily pH 1974–2013

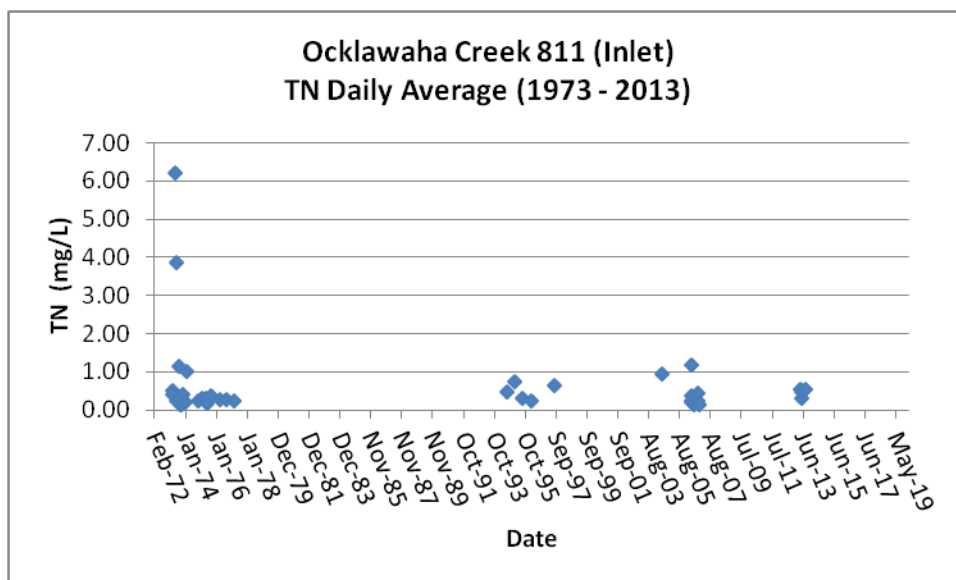


Figure B.4G.8. Ocklawaha Creek WBID 811 Daily Average TN 1973–2013

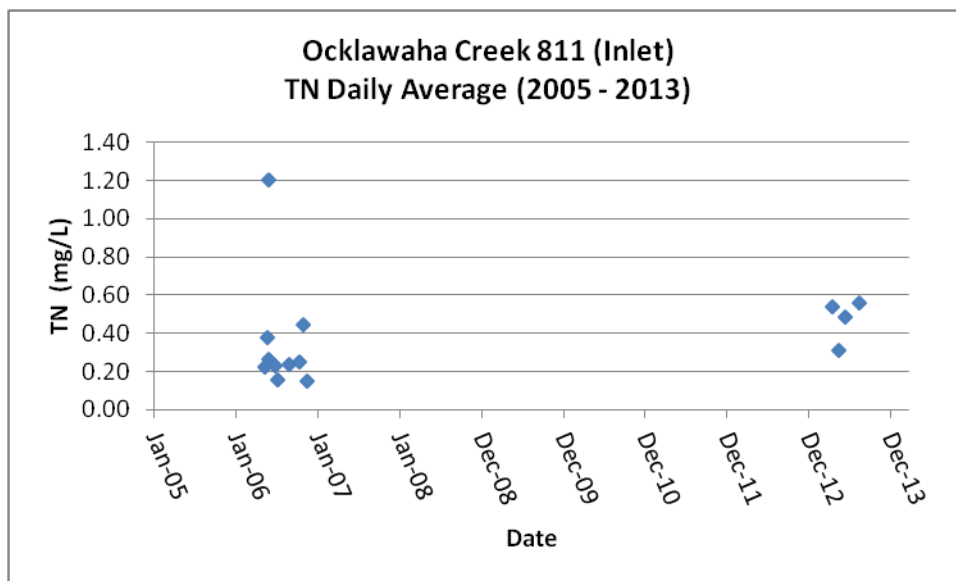


Figure B.4G.9. Ocklawaha Creek WBID 811 Daily Average TN 2005–2013

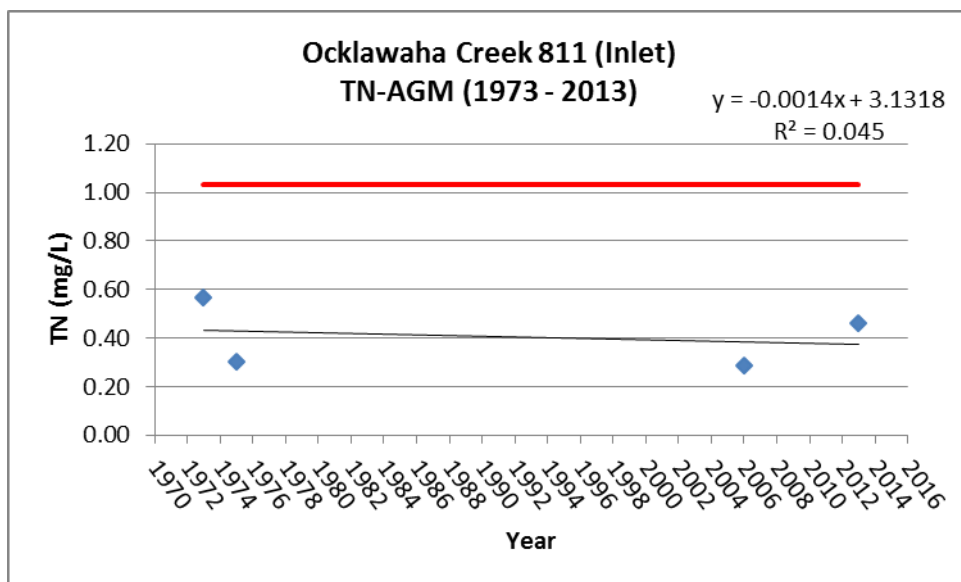


Figure B.4G.10. Ocklawaha Creek WBID 811 TN Annual Geomean 1973–2013

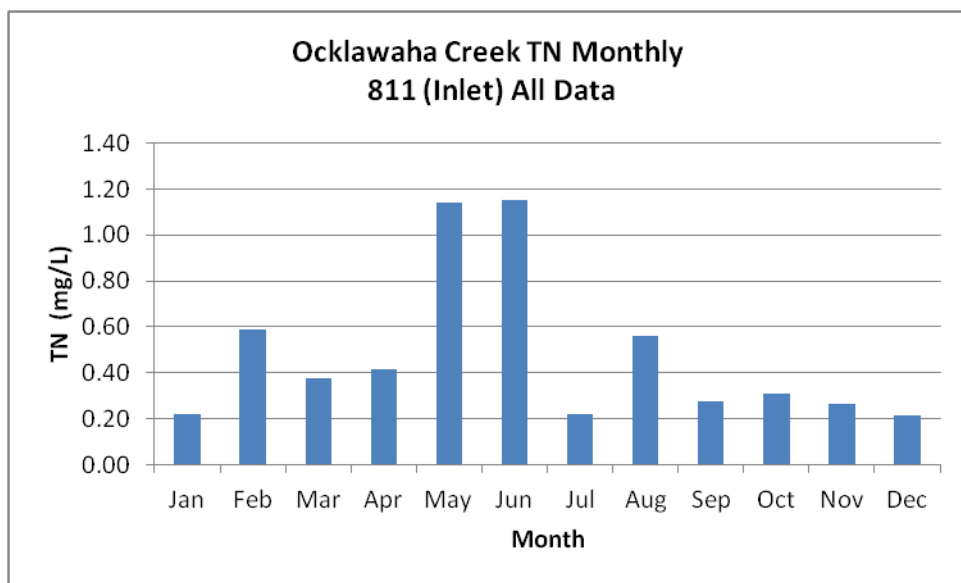


Figure B.4G.11. Ocklawaha Creek WBID 811 Monthly Average TN 1973–2013

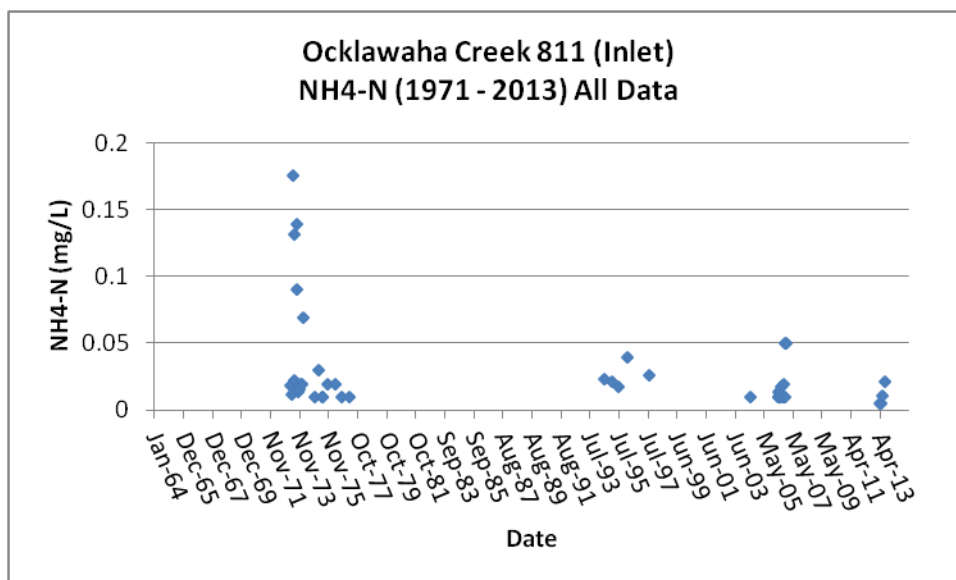


Figure B.4G.12. Ocklawaha Creek WBID 811 Daily Average Ammonia-N 1971–2013

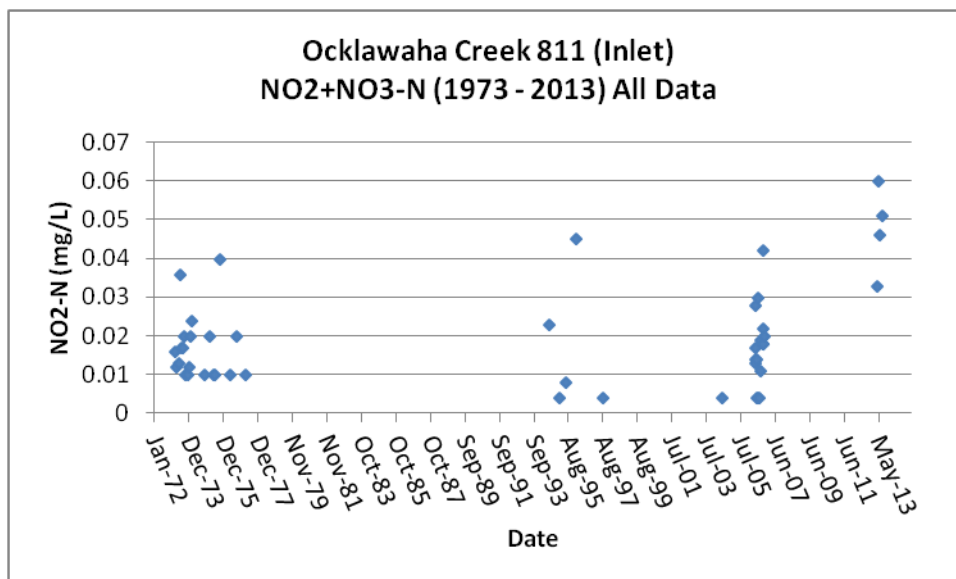


Figure B.4G.13. Ocklawaha Creek WBID 811 Daily Average Nitrate/Nitrite-N 1973–2013

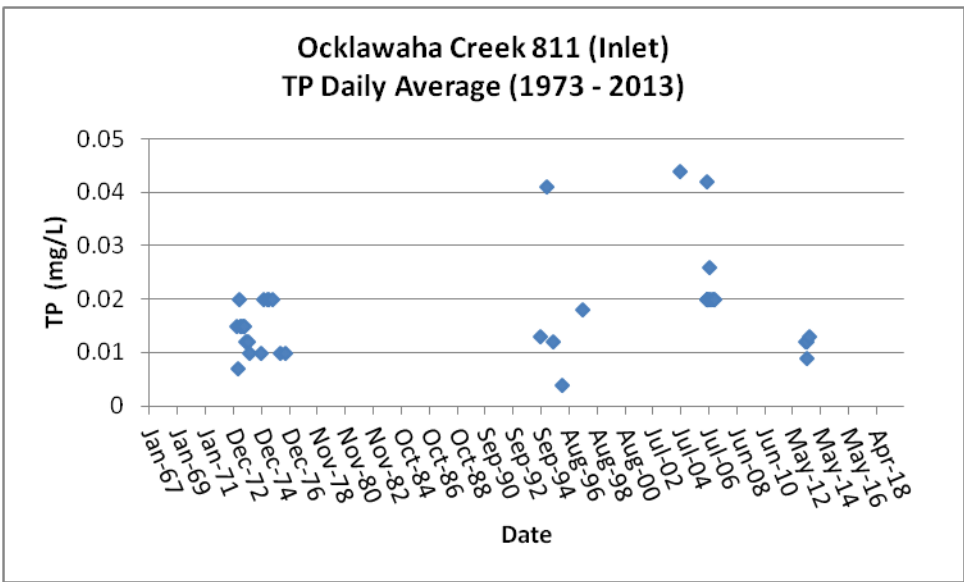


Figure B.4G.14. Ocklawaha Creek WBID 811 Daily Average TP 1973–2013

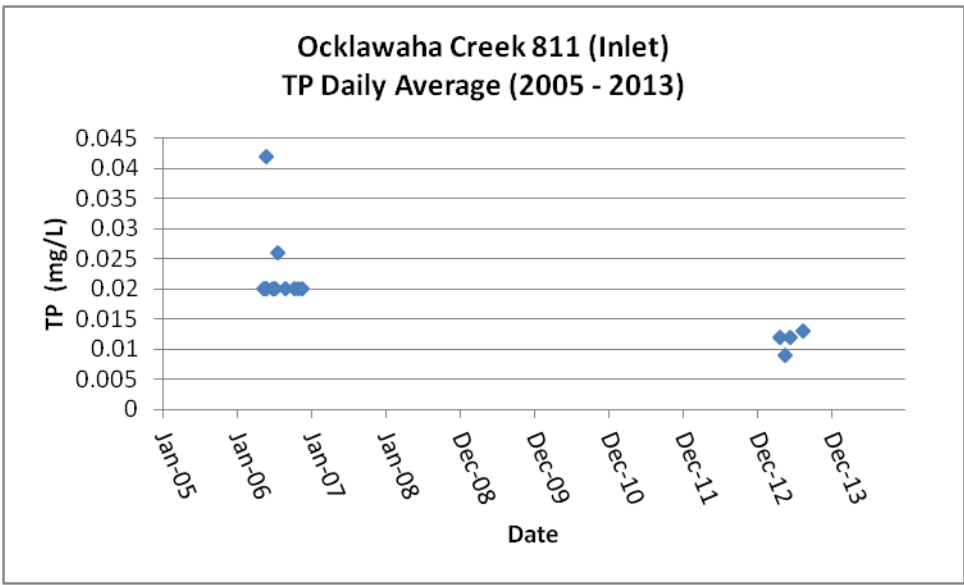


Figure B.4G.15. Ocklawaha Creek WBID 811 Daily Average TP 2005–2013

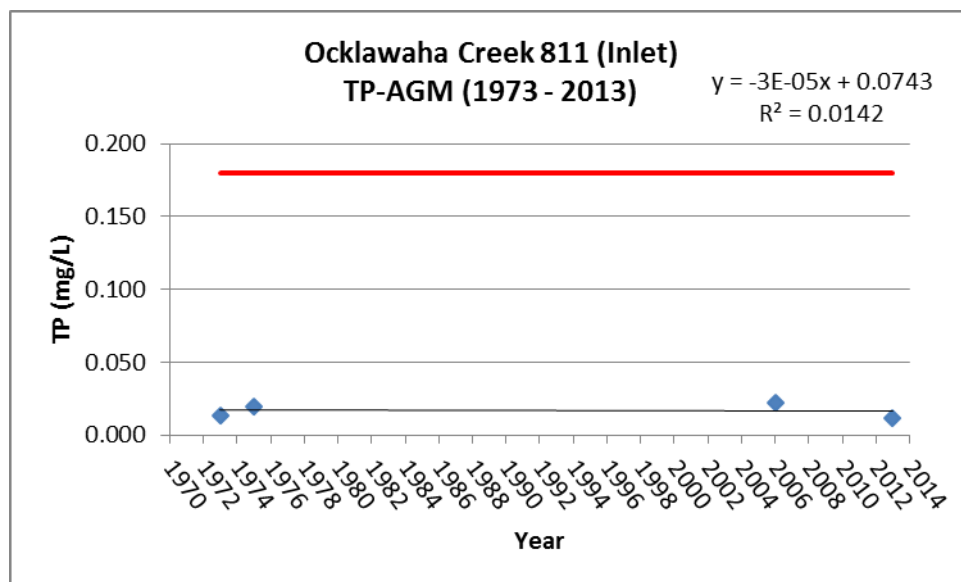


Figure B.4G.16. Ocklawaha Creek WBID 811 Annual Geomean TP 1973–2013

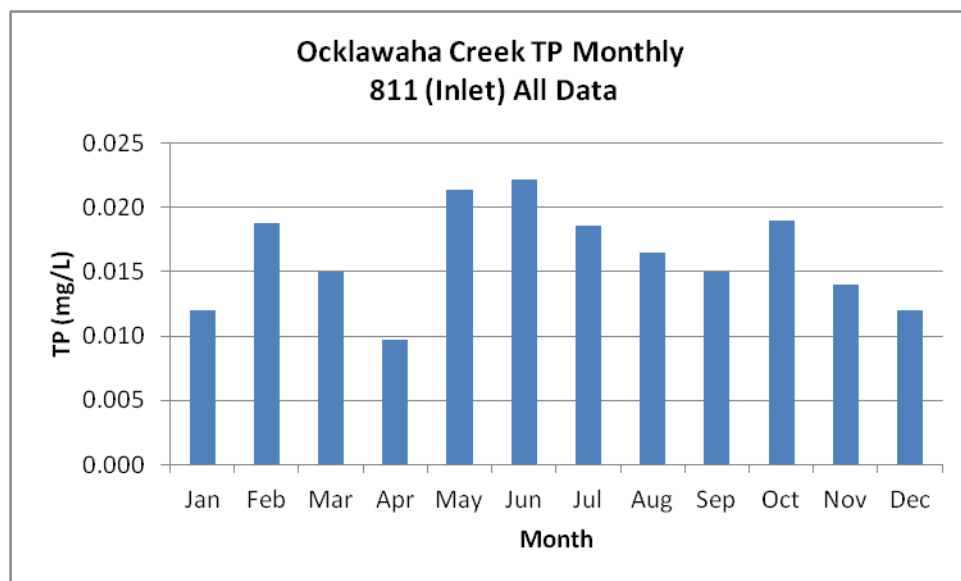


Figure B.4G.17. Ocklawaha Creek WBID 811 Monthly Average TP 1973–2013

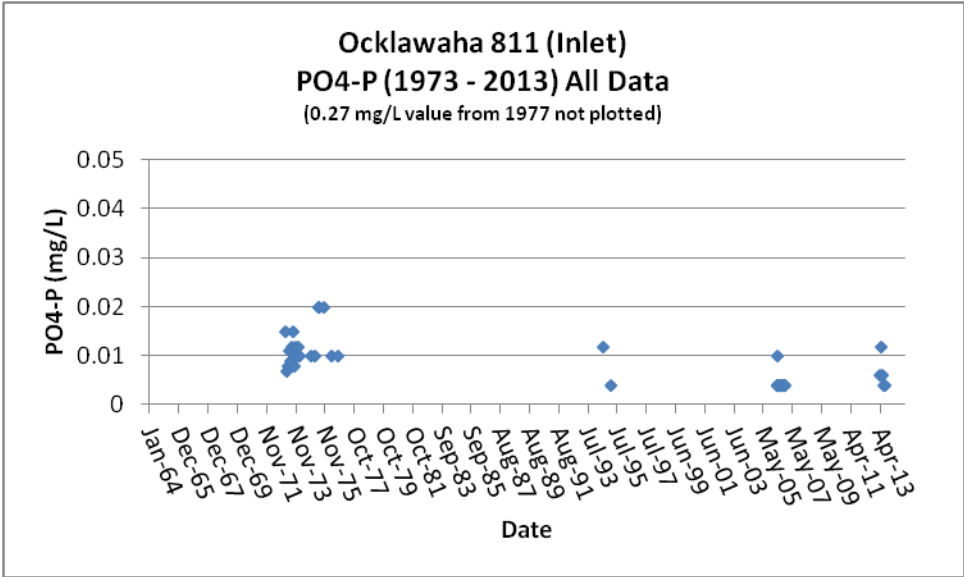


Figure B.4G.18. Ocklawaha Creek WBID 811 Daily Average Orthophosphate-P 1973–2013

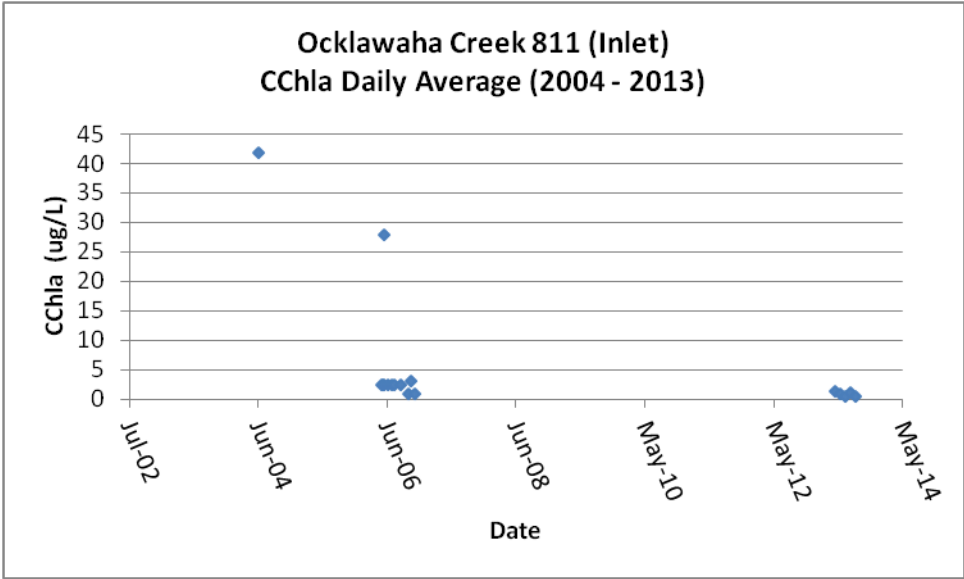


Figure B.4G.19. Ocklawaha Creek WBID 811 Daily Average CChla 2004–2013

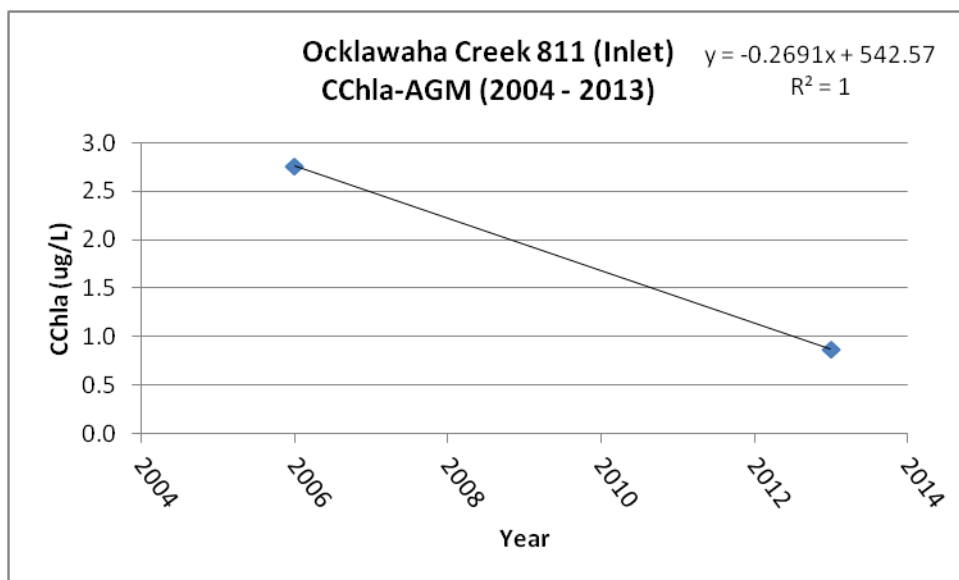


Figure B.4G.20. Ocklawaha Creek WBID 811 Annual Geomean CChla 2004–2013

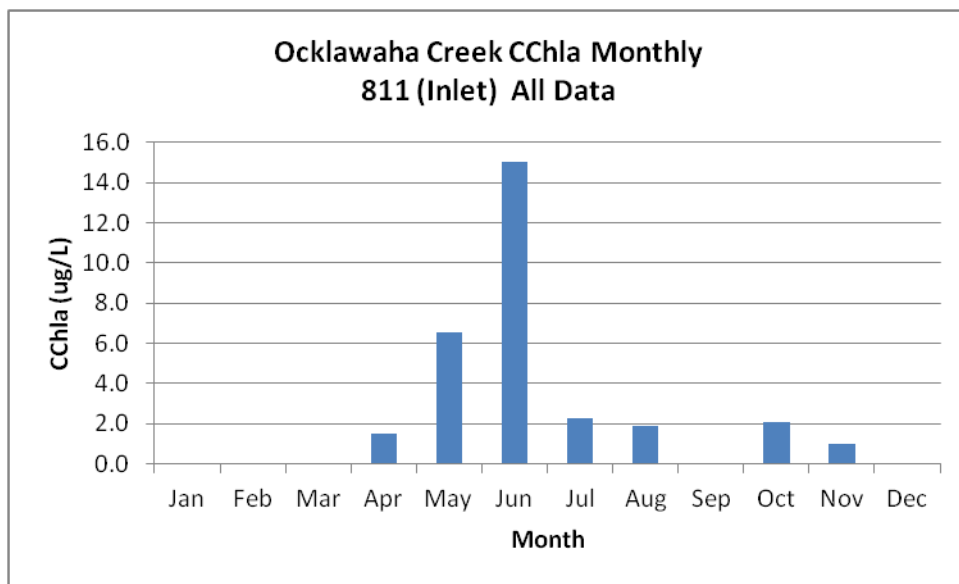
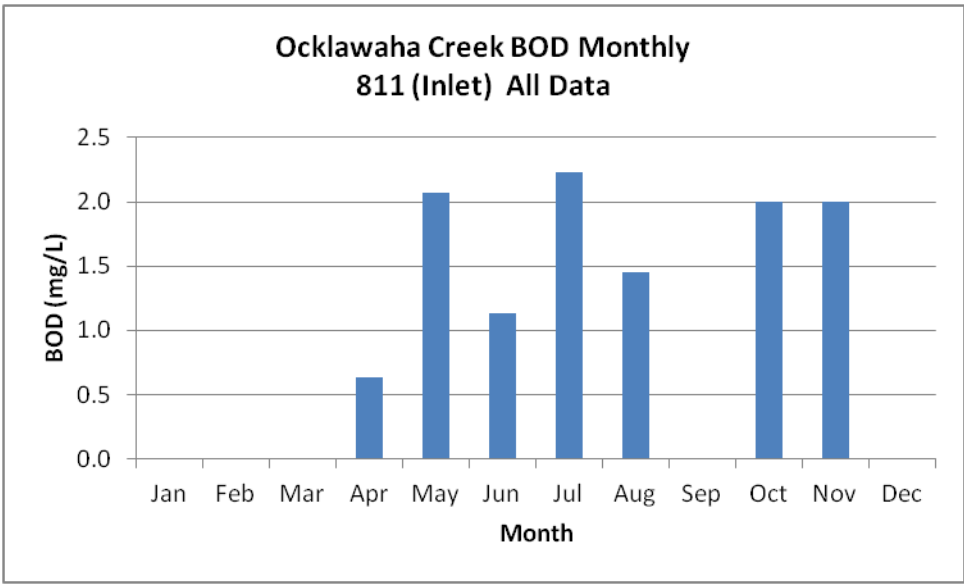
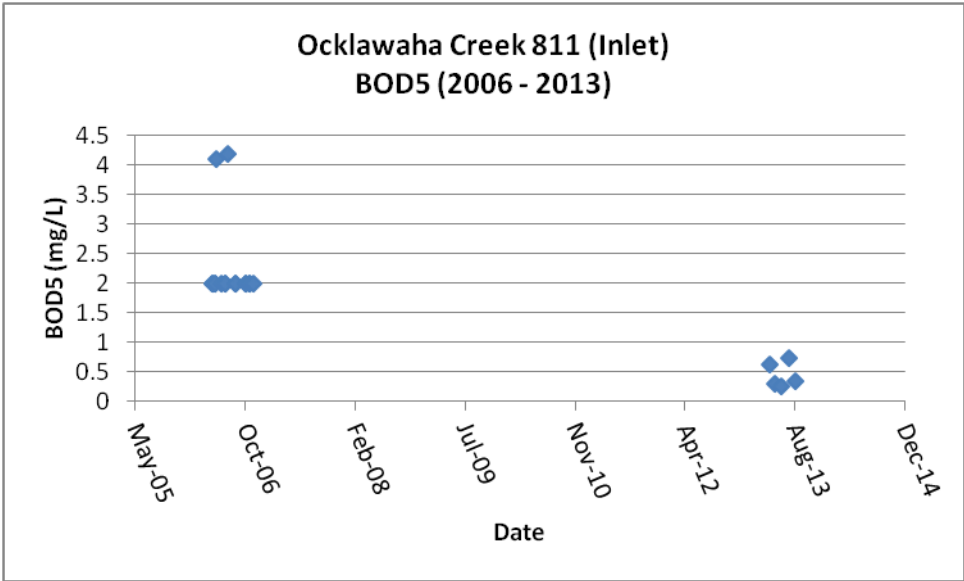


Figure B.4G.21. Ocklawaha Creek WBID 811 Monthly Average CChla 2004–2013



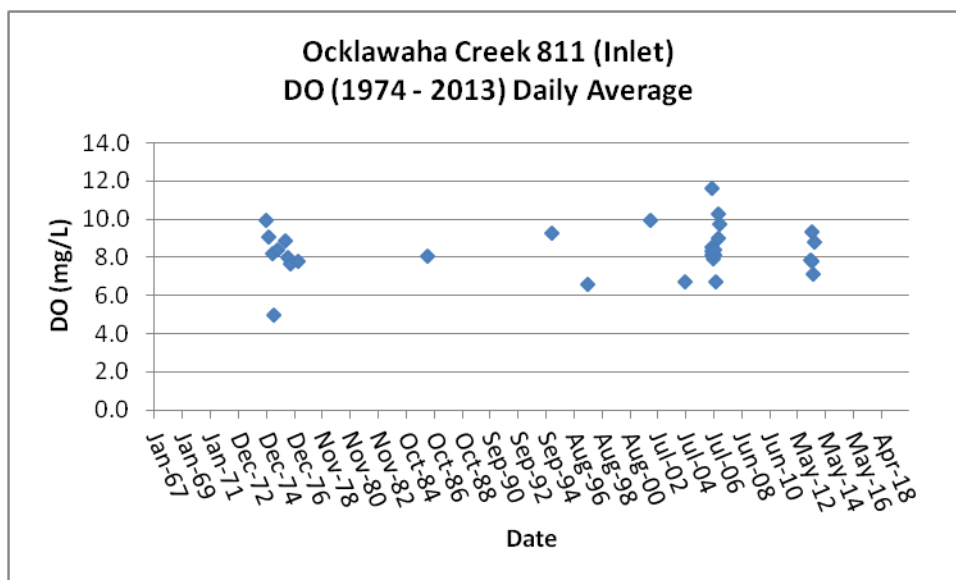


Figure B.4G.24. Ocklawaha Creek WBID 811 Daily Average DO 1974–2013

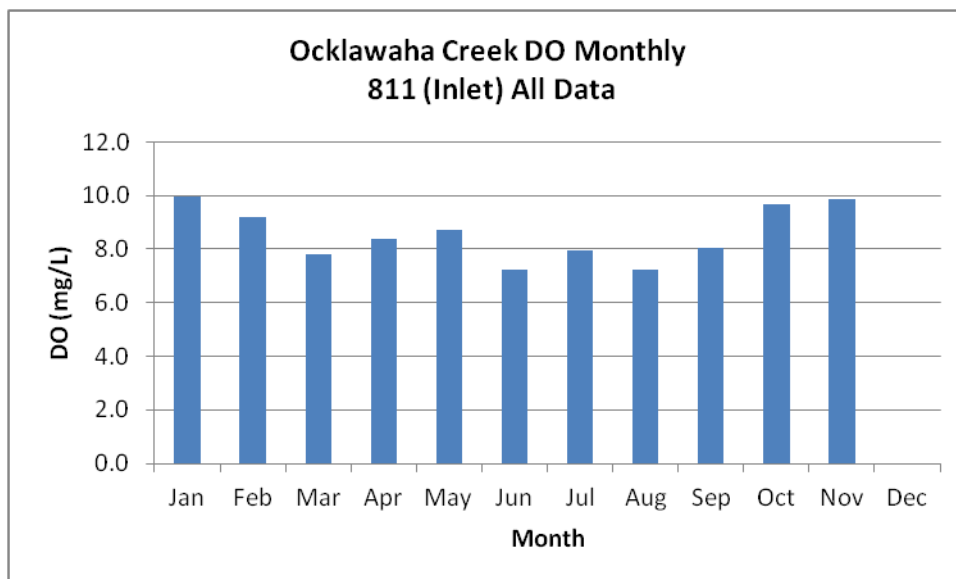


Figure B.4G.25. Ocklawaha Creek WBID 811 Monthly Average DO 1974–2013

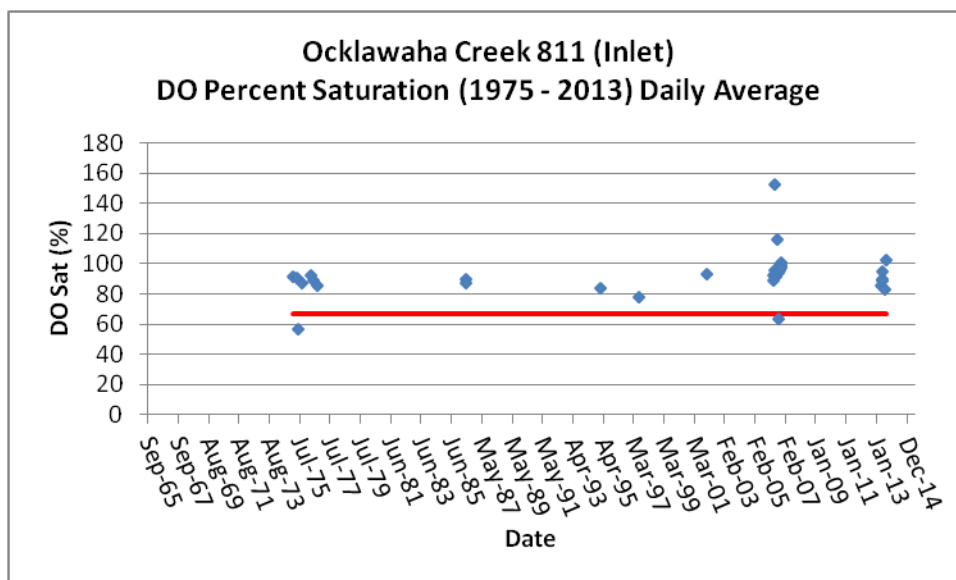


Figure B.4G.26. Ocklawaha Creek WBID 811 Daily Average DO Percent Saturation 1975–2013

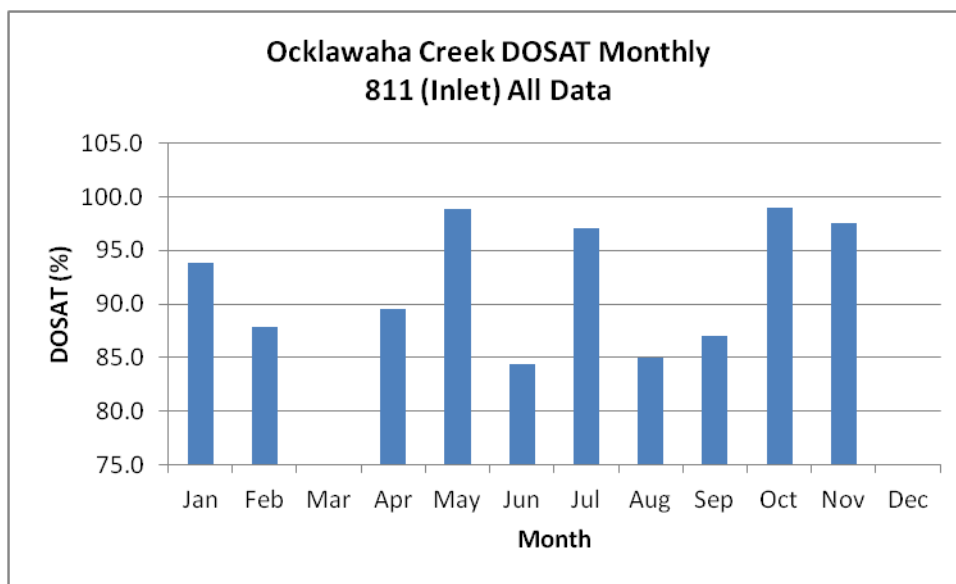


Figure B.4G.27. Ocklawaha Creek WBID 811 Monthly Average DO Percent Saturation 1975–2013

Table B.4G.1. Ocklawaha Creek WBID 811 IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
811	21FLBRA 811-A	811 - Ocklawaha Creek - at SR-65	2006	2006
811	21FLPNS 22020062	Ocklawaha Ck, SR 267, S of Quincy	1994	2009
811	12NSS 3C124038U	OCKLAWAHA CREEK	1986	1986
811	21FLWQSP22020322	Ocklawaha Site 2	2009	2009
811	112WRD 02329877	OCKLAWAHA CREEK NR WETUMPKA, FLA.	1974	1988
811	21FLWQSP22020323	Ocklawaha Site 3	2009	2009
811	21FLBRA 811-B	811 - Ocklawaha Creek - At SR-267	2006	2006
811	21FLA 22020062	OKLAWAHA CR. S.R.267 S.OF QUINCY ECOREG.65H	1994	1997
811	12NSS 3C124038L	OCKLAWAHA CREEK	1986	1986
811	21FLWQA 302701708438351	Ocklawaha Creek at SR 267	2002	2002
811	11EPALES1239B1	OCKLAWAHA CREEK	1973	1974

Table B.4G.2. Ocklawaha Creek WBID 811 Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
811	Alkalinity (mg/L)	1974 - 2013	1.3
811	Color-True (PCU)	1974 - 2013	64.5

Table B.4G.3. Ocklawaha Creek WBID 811 DO Percent Saturation vs. 67 % Criterion

Year	Category	Result
1975 - 2013	Count	35
	Number P	33
	Number F	2
	Percent F	5.7
2005-2013	Count	23
	Number P	22
	Number F	1
	Percent F	4.3

Table B.4G.4. Ocklawaha Creek WBID 811 Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN	TP	TN/TP	CChla
	AGM	AGM	Ratio	AGM
1973	0.57	0.014	41.5	
1975	0.30	0.020	15.2	
2006	0.29	0.022	13.2	2.8
2013	0.46	0.011	40.6	0.9

Table B.4G.5. Ocklawaha Creek WBID 811 Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	1975 - 2013	66	7.0	32.4	21.0	19.8	19.1
Alkalinity	mg/L	1992 - 2013	25	0.7	23.0	1.0	2.7	1.3
pH	S.U.	1975 - 2013	39	3.6	9.1	5.0	NA	NA
Color	PCU	1992 - 2013	29	25.0	400.0	60.0	94.5	64.5
TN	mg/L	1973 - 2013	45	0.11	6.21	0.29	0.60	0.37
NH4-N	mg/L	1973 - 2013	46	0.005	0.18	0.02	0.03	0.02
NO23	mg/L	1973 - 2013	46	0.004	0.06	0.02	0.02	0.02
OrgN	mg/L							
TP	mg/L	1973 - 2013	45	0.004	0.044	0.020	0.018	0.016
PO4-P	mg/L	1973 - 2013	43	0.004	0.270	0.008	0.014	0.008
CChla	ug/L	2000 - 2013	22	0.6	42.0	2.6	5.0	2.2
BOD5	mg/L	2006 - 2013	21	0.3	4.2	2.0	1.8	1.5
DO	mg/L	1975 - 2013	39	3.8	11.6	8.3	8.3	8.2
%DOSat	%	1979 - 2013	35	57.0	152.9	92.0	92.6	91.5

Table B.4G.6. Ocklawaha Creek WBID 811 Water Quality Data Summary Verified Period Plus (2005–2013)

Constituent	Units	Verified Period +	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2013	23	13.7	32.4	21.9	21.3	20.9
Alkalinity	mg/L	2005 - 2013	21	0.7	23.0	1.0	3.1	1.3
pH	S.U.	2005 - 2013	23	3.6	9.0	5.2	NA	NA
Color	PCU	2005 - 2013	21	25.0	390.0	40.0	76.7	52.7
TN	mg/L	2005 - 2013	19	0.11	1.20	0.27	0.36	0.30
NH4-N	mg/L	2005 - 2013	20	0.005	0.05	0.01	0.02	0.01
NO23	mg/L	2005 - 2013	20	0.004	0.06	0.02	0.02	0.02
OrgN	mg/L							
TP	mg/L	2005 - 2013	20	0.009	0.042	0.020	0.020	0.019
PO4-P	mg/L	2005 - 2013	21	0.004	0.012	0.004	0.005	0.005
CChla	ug/L	2005 - 2013	21	0.6	28.0	2.6	3.2	1.9
BOD5	mg/L	2005 - 2013	21	0.3	4.2	2.0	1.8	1.5
DO	mg/L	2005 - 2013	23	5.5	11.6	8.3	8.5	8.4
%DOSat	%	2005 - 2013	23	63.4	152.9	94.7	96.1	95.0

B.4H Hammock Creek WBID 879 Drains to Lake Talquin

This WBID is impaired for low DO linked to BOD.

The DO impairment for Hammock Creek is based on low DO measured at Station 21FLBRA-879-A (**Figures B.4H.1 and B.4H.26**). As can be seen in **Figures B.4H.27 through B.4H.29**, this station is located in the interface between the creek and the lake within a delta that has been forming since the lake was created in the 1920's. The area around the bridge is scoured out and the permanent pool within the delta (lake backwater effect) is not representative of a stream or a lake. DEP is proposing to delist this impairment due to a flaw in the analysis (inappropriate station location). The location of the primary station in the WBID is representative of the water quality in an area experiencing backwater effects from the lake as the stream drains into the delta, the data is presented below.

Table B.4H.1 lists the 3 stations that have been sampled in Hammock Creek WBID 879. **Figure B.4H.1** depicts the station locations.

Tables B.4H.5 and B.4H.6 and Figures B.4H.3 and B.4H.4 provide the results for alkalinity. All of the data is from 2006. These data show that Hammock Creek has a POR GM alkalinity of 16.6 mg/L. The limited data indicate that alkalinity varies seasonally, with higher alkalinity between June and October (over 20 mg/L). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4H.5 and B.4H.6 and Figures B.4H.5 and B.4H.6 provide the results for true color. All of the data is from 2006. These data show that Hammock Creek has a POR GM color of 38.1 PCU. The limited data show that color and alkalinity vary inversely to each other and that alkalinity appears to vary directly with rainfall. The lowest color occurs in July, the month with the second highest rainfall. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4H.5 and B.4H.6 and Figures B.4H.8 through B.4H.10 provide the results for TN. All but two of the results come from 2006. These data show that Hammock Creek has a POR GM TN of 0.75 mg/L (**Figure B.4H.9**), slightly less than the 1.03 mg/L new AGM threshold. The limited data indicate higher concentrations of TN in May through September (~ 0.80 mg/L) with concentrations gradually declining through December (0.5 mg/L). There is insufficient data to determine accurate long-term or accurate seasonal patterns.

Tables B.4H.5 and B.4H.6 and Figure B.4H.11 provide the results for NH₄-N. All but two of the results come from 2006. These data show that Hammock Creek has a POR GM NH₄-N of 0.02 mg/L. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4H.5 and B.4H.6 and Figure B.4H.12 provide the results for NO₃-N. All but two of the results come from 2006. These data show that Hammock Creek has a POR GM NO₃-N of 0.02 mg/L. The data indicate that the recent (2005–2013) NO₃-N GM of 0.02 mg/L is the same as the POR concentration. There is insufficient data to determine long-term or seasonal patterns.

Tables B.4H.5 and B.4H.6 and Figures B.4H.13 through B.4H.15 provide the results for TP. All but one of the results comes from 2006. These data show that Hammock Creek has a POR GM TP of 0.031 mg/L. The data indicate that the recent (2005–2013) TP GM of 0.032 mg/L is equivalent to the POR value and significantly less than the new threshold AGM concentration for TP for streams of 0.18 mg/L (**Figure B.4H.14**). Similar to TN, the highest concentrations of TP occur during May through August. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4H.5 and B.4H.6 and Figure B.4H.16 provide the results for PO₄-P. All but one of the results comes from 2006. These data show that Hammock Creek has a POR GM PO₄-P of 0.005 mg/L. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4H.5 and B.4H.6 and Figures B.4H.17 through B.4H.19 provide the results for CChla. All but two of the results come from 2006. These data show that Hammock Creek has a POR GM CChla of 3.2 ug/L. These data indicate that the POR GM concentration is significantly less than the new threshold AGM concentration for CChla (**Figure B.4H.18**). The data set has a large number of less than detection results, with varying detection limits. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4H.5 and B.4H.6 and Figures B.4H.20 and B.4H.21 provide the results for BOD₅. All of the results come from 2006. These data show that Hammock Creek has a POR GM BOD₅ of 3.4 mg/L. These limited data indicate highest during the months May through September (~ 4.0 to 9.9 mg/L) and less than detection in the remaining months. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4H.5 and B.4H.6 and Figures B.4H.22 and B.4H.23 provide the results for DO. All but four of the results come from 2006. These data show that Hammock Creek has a POR GM DO of 6.0 mg/L. The monthly average DO drops below 5.0 mg/L in August and October (**Figure B.4H.23**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4H.5 and B.4H.6 and Figures B.4H.24 and B.4H.25 provide the results for percent DO saturation. All but one of the results comes from 2006. These data show that Hammock Creek has a POR GM DOSAT of 71.1 %. The data presented in **Figure B.4H.24** indicate a potential issue with the new DO percent saturation criterion. However, as noted above the location of the station with low percent saturations may not be representative of a stream or a lake. There is insufficient data to determine accurate long-term or seasonal patterns.

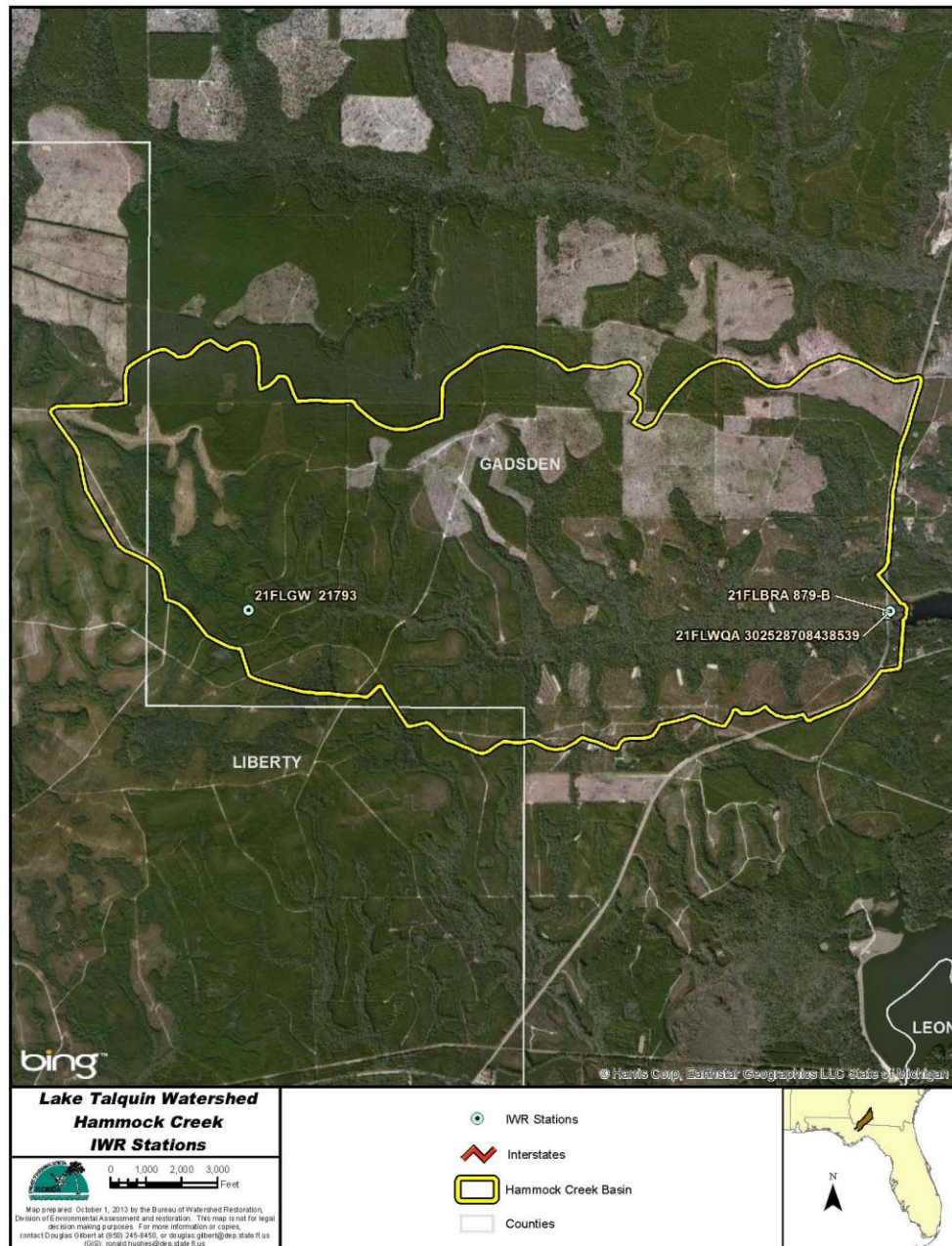


Figure B.4H.1. Hammock Creek WBID 879 IWR Stations

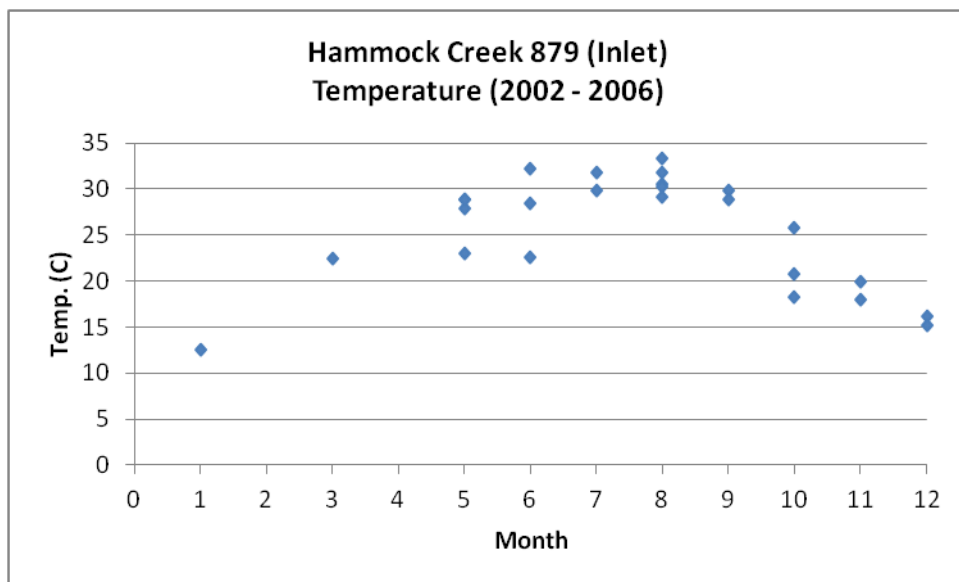


Figure B.4H.2. Hammock Creek WBID 879 Monthly Temperature 1974–2013

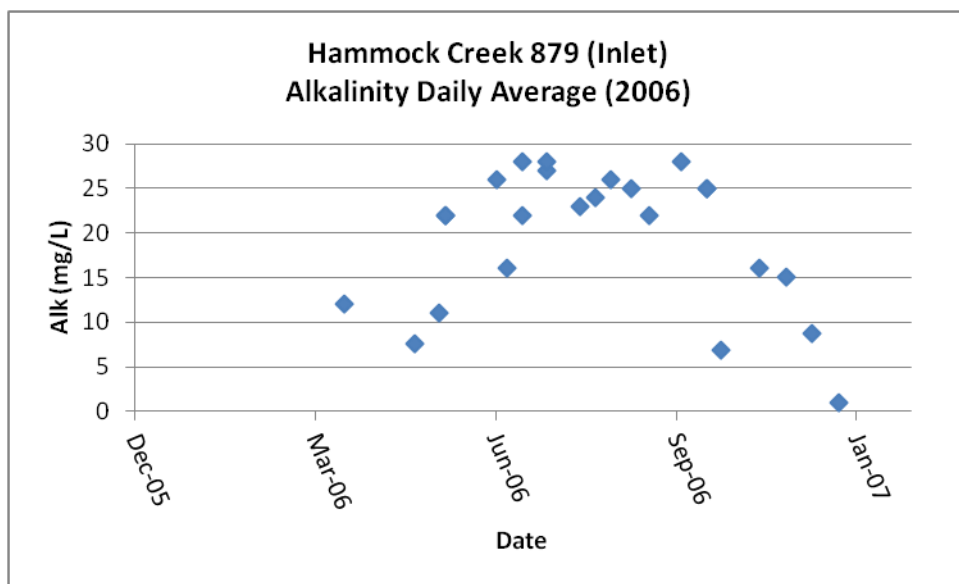


Figure B.4H.3. Hammock Creek WBID 879 Daily Average Alkalinity 1974–2013

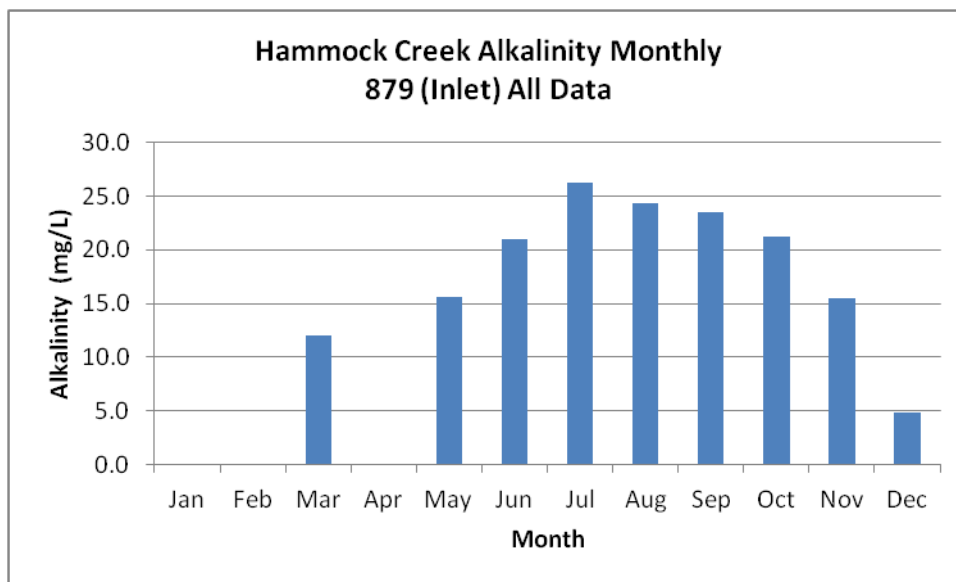


Figure B.4H.4. Hammock Creek WBID 879 Monthly Average Alkalinity 1974–2013

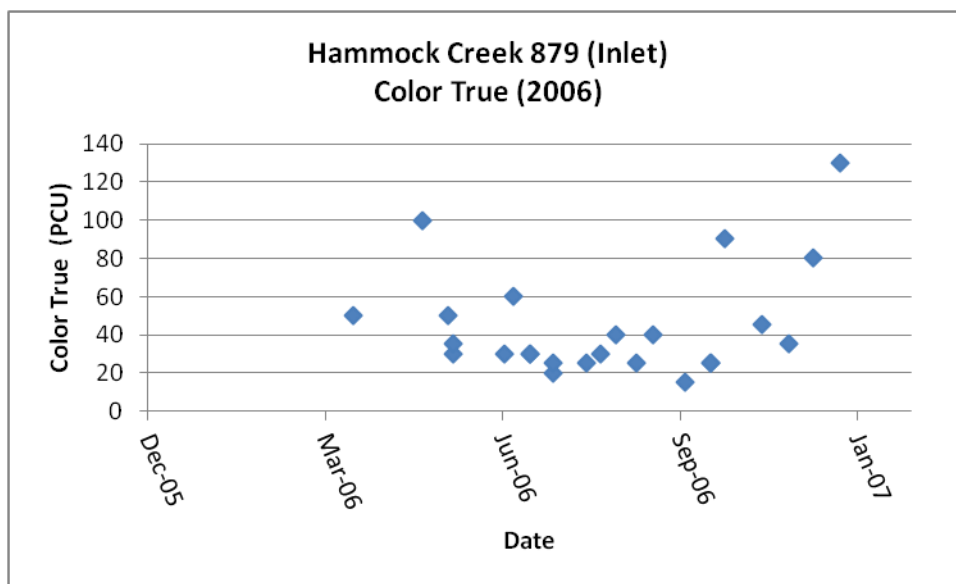


Figure B.4H.5. Hammock Creek WBID 879 Daily Average True Color 1974–2013

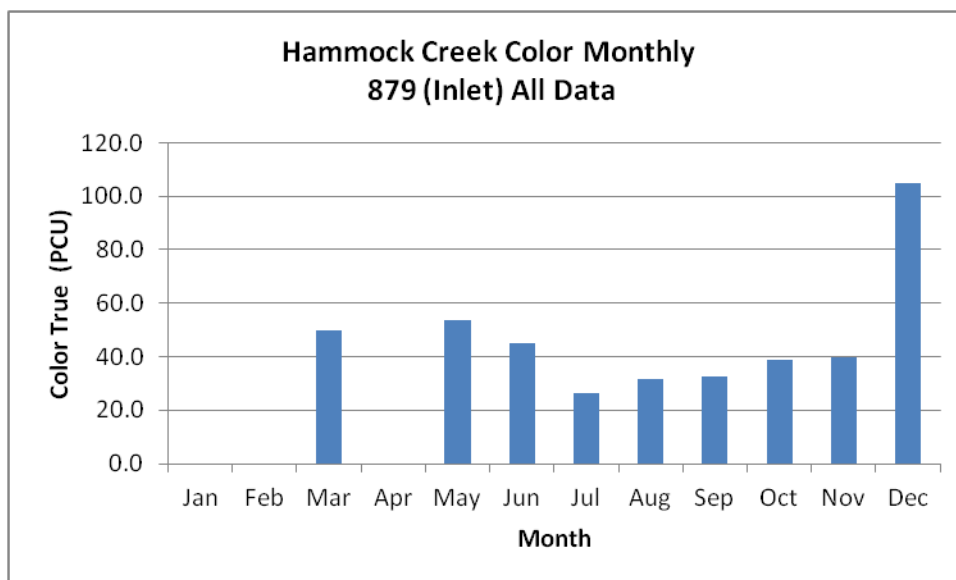


Figure B.4H.6. Hammock Creek WBID 879 Monthly Average True Color 1974–2013

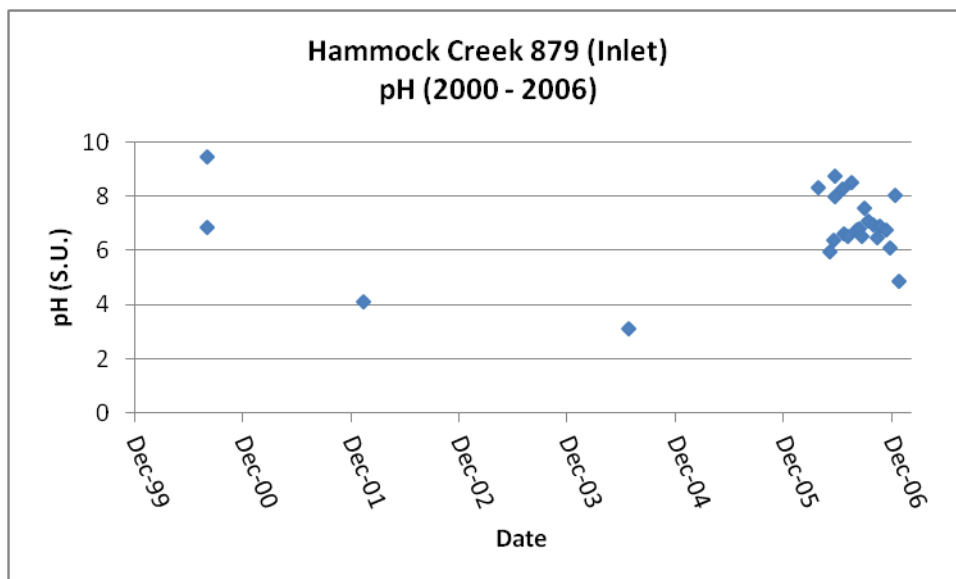


Figure B.4H.7. Hammock Creek WBID 879 Daily pH 1974–2013

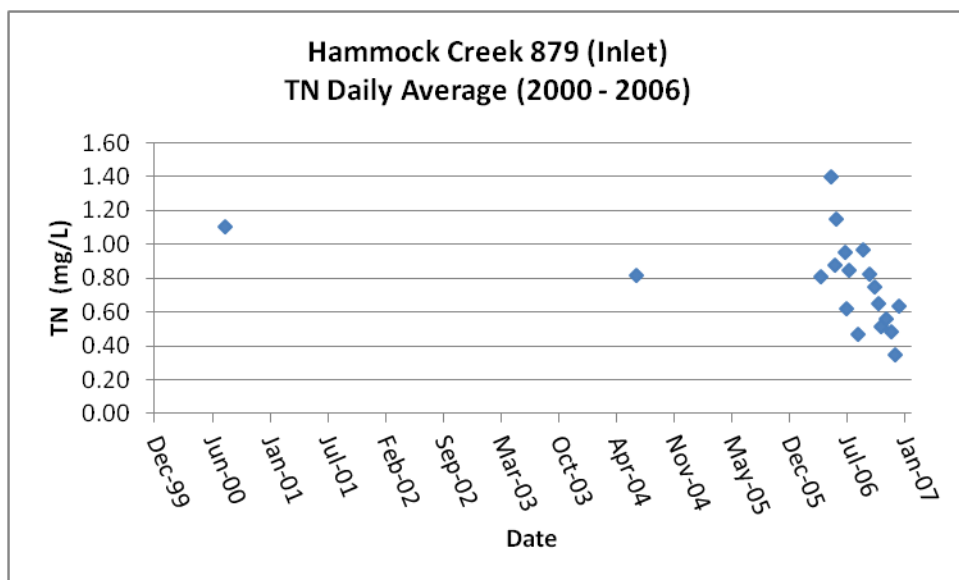


Figure B.4H.8. Hammock Creek WBID 879 Daily Average TN 1973–2013

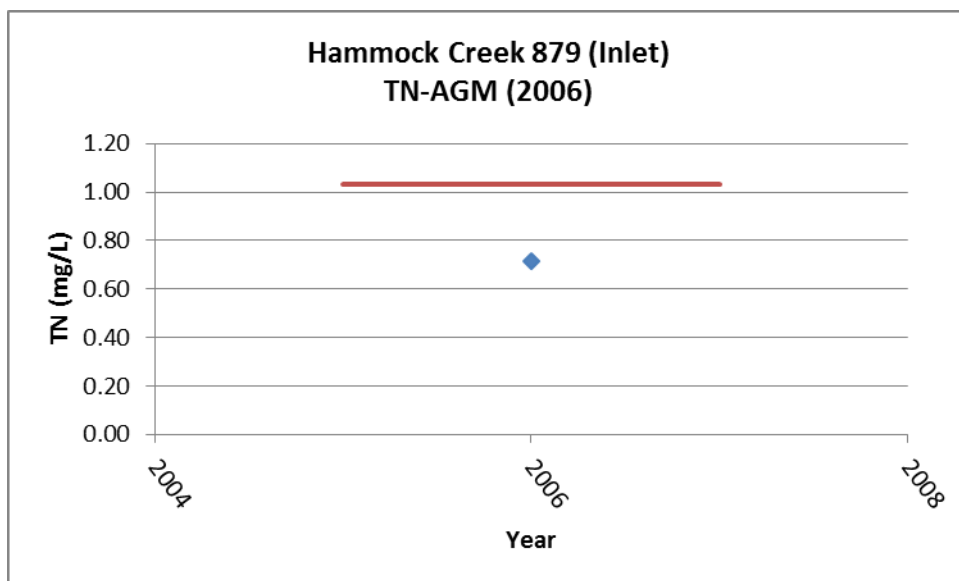


Figure B.4H.9. Hammock Creek WBID 879 TN Annual Geomean 1973–2013

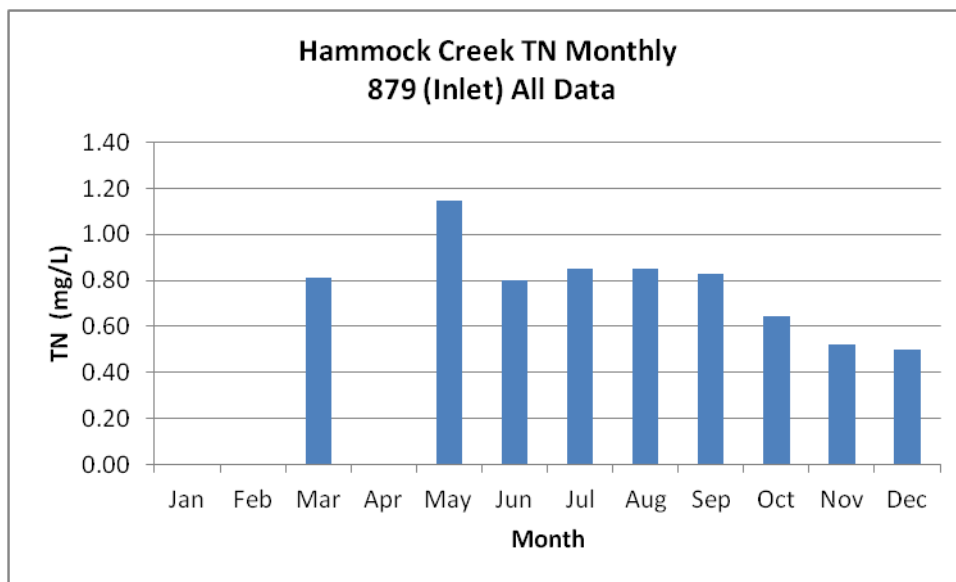


Figure B.4H.10. Hammock Creek WBID 879 Monthly Average TN 1973–2013

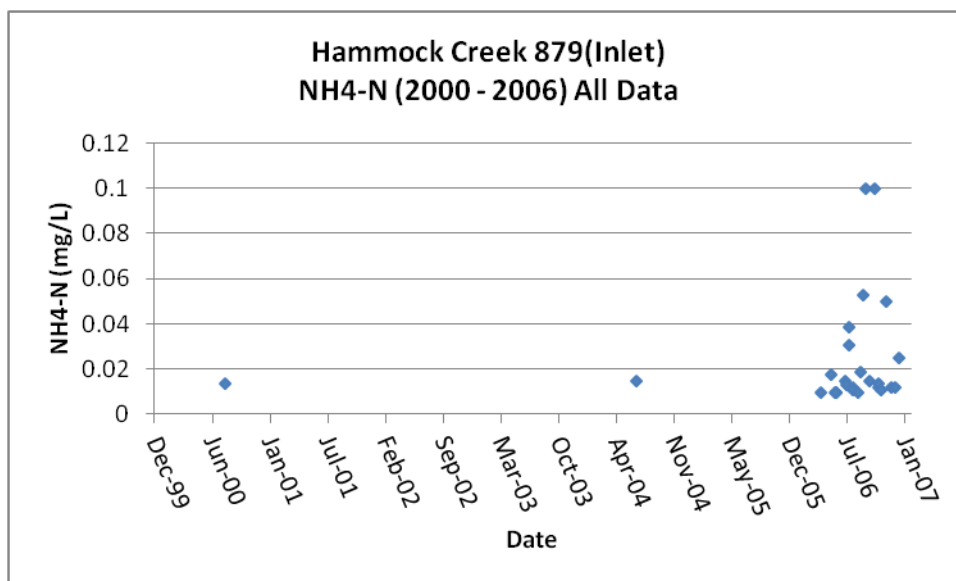


Figure B.4H.11. Hammock Creek WBID 879 Daily Average Ammonia-N 1971–2013

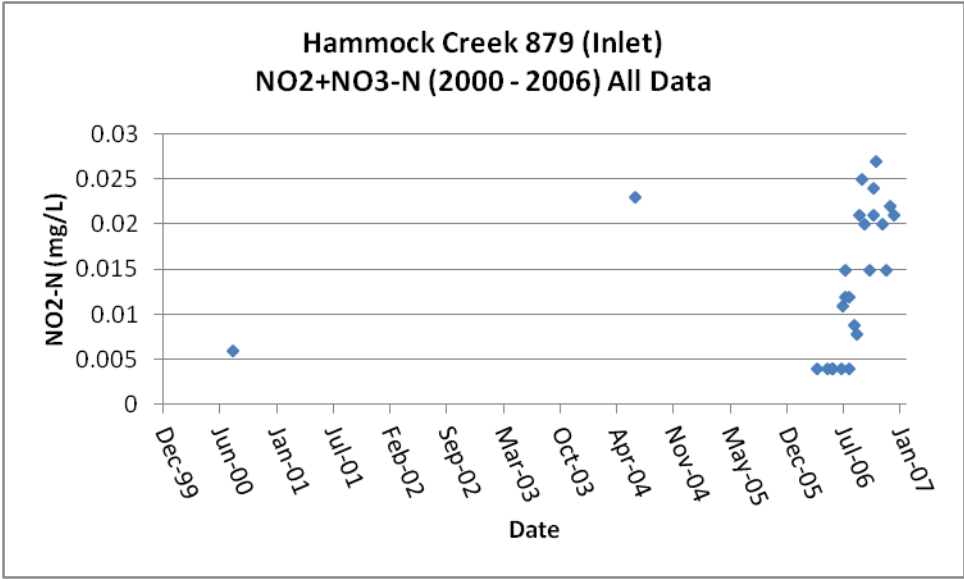


Figure B.4H.12. Hammock Creek WBID 879 Daily Average Nitrate/Nitrite-N 1973–2013

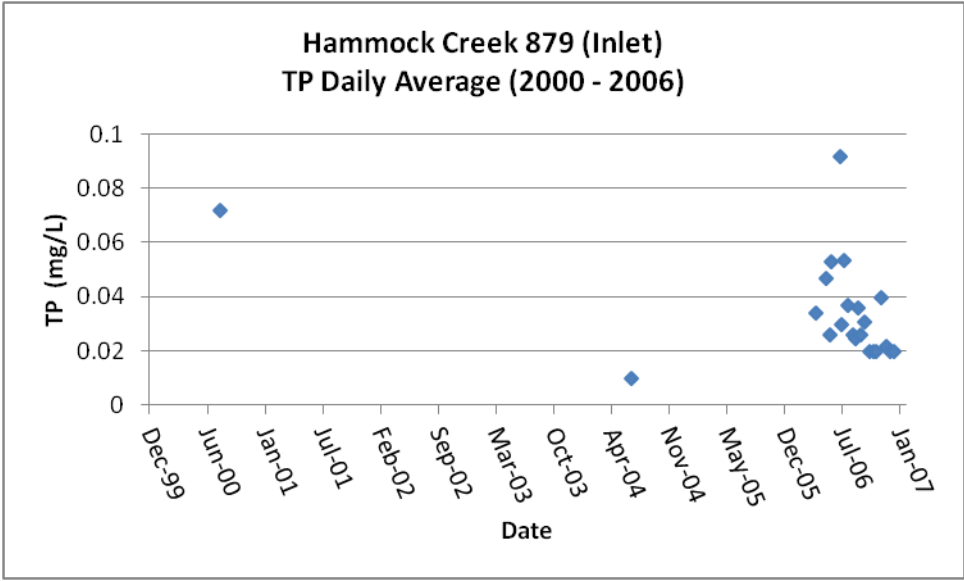


Figure B.4H.13. Hammock Creek WBID 879 Daily Average TP 1973–2013

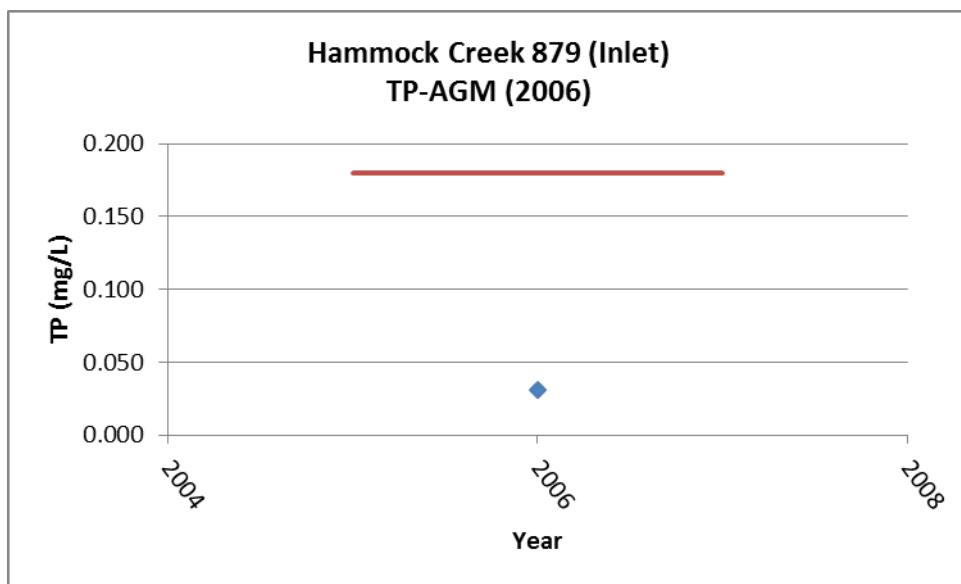


Figure B.4H.14. Hammock Creek WBID 879 Annual Geomean TP 1973–2013

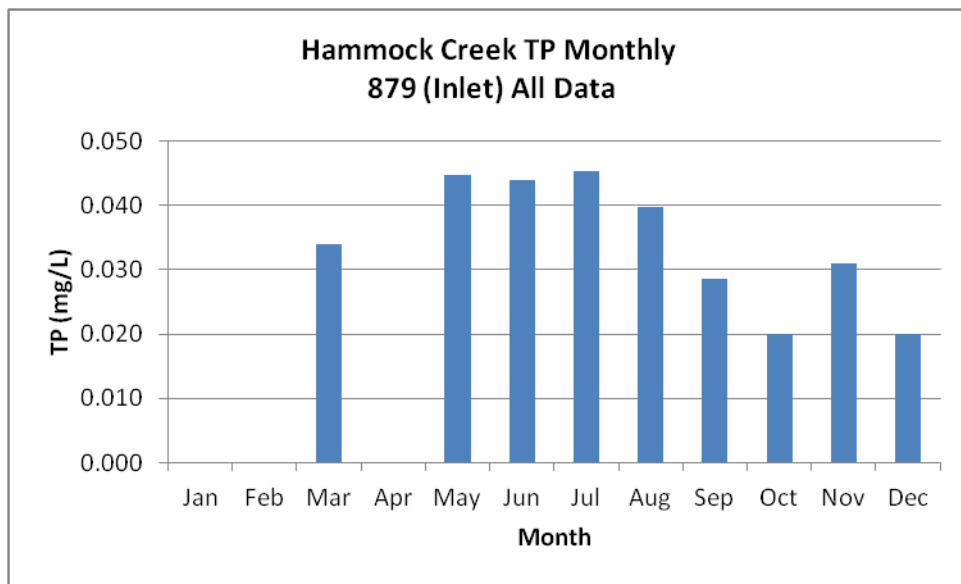


Figure B.4H.15. Hammock Creek WBID 879 Monthly Average TP 1973–2013

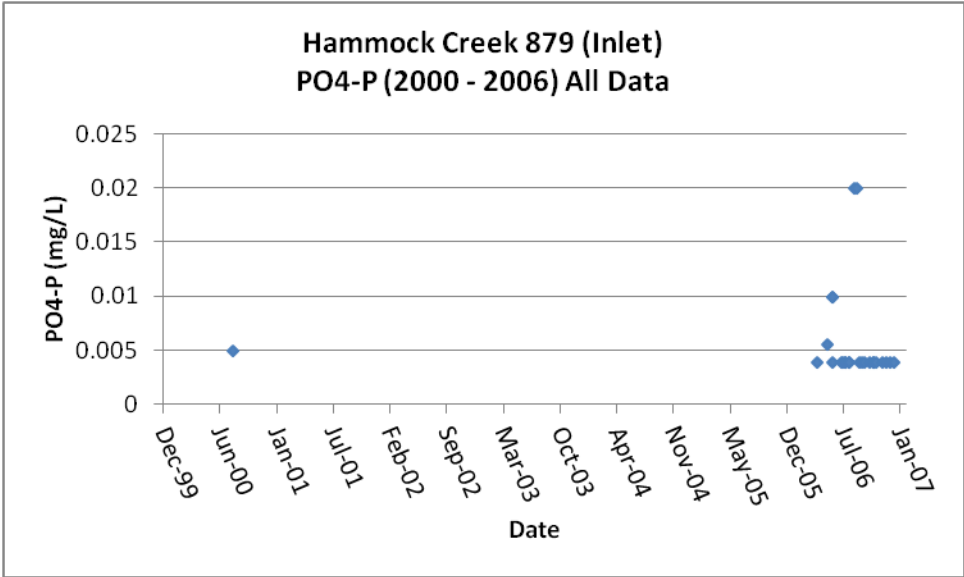


Figure B.4H.16. Hammock Creek WBID 879 Daily Average Orthophosphate-P 1973–2013

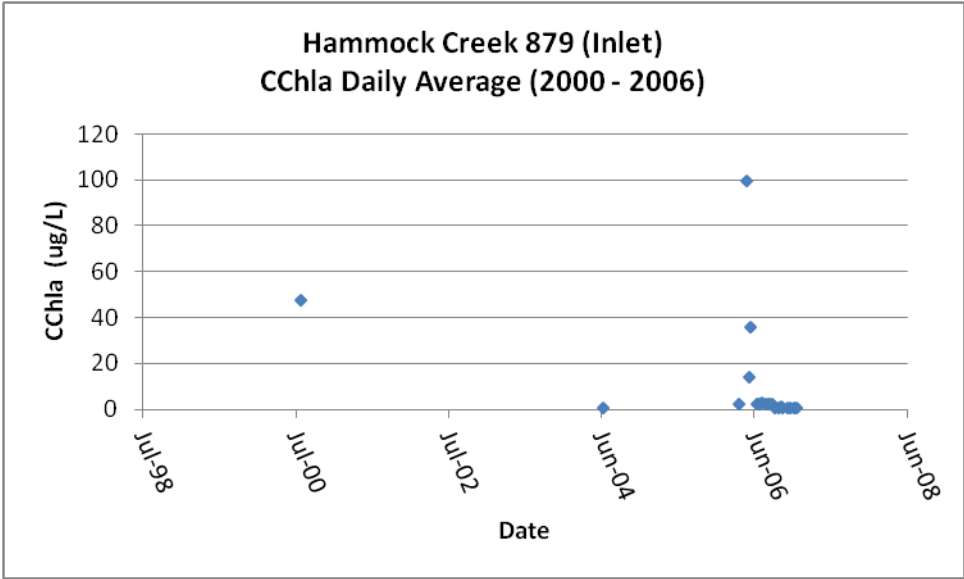


Figure B.4H.17. Hammock Creek WBID 879 Daily Average CChla 2004–2013

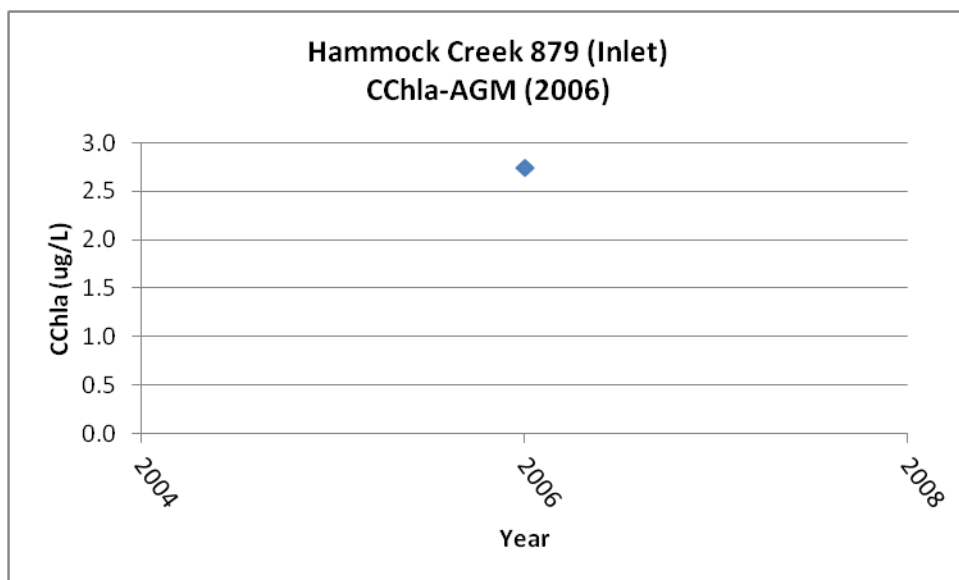


Figure B.4H.18. Hammock Creek WBID 879 Annual Geomean CChla 2004–2013

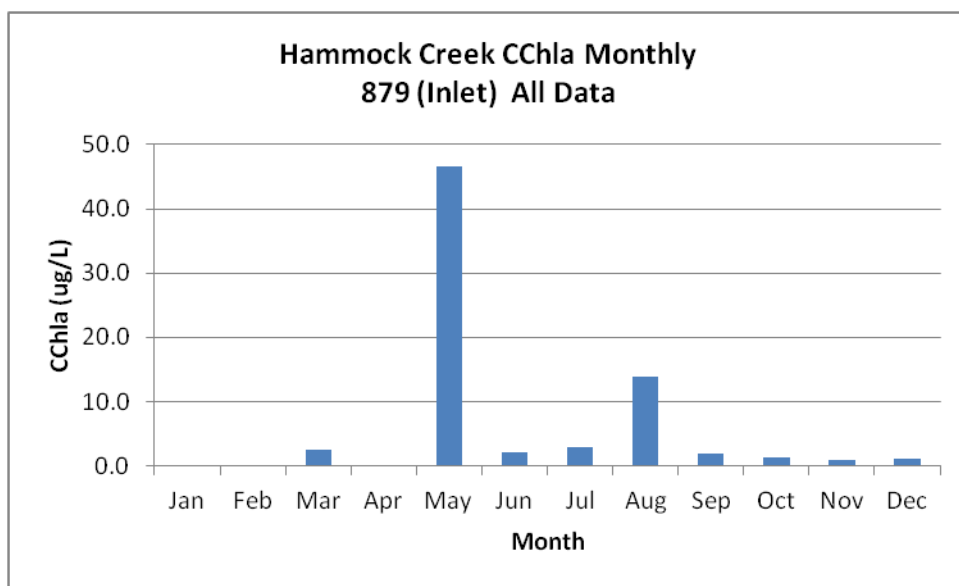


Figure B.4H.19. Hammock Creek WBID 879 Monthly Average CChla 2004–2013

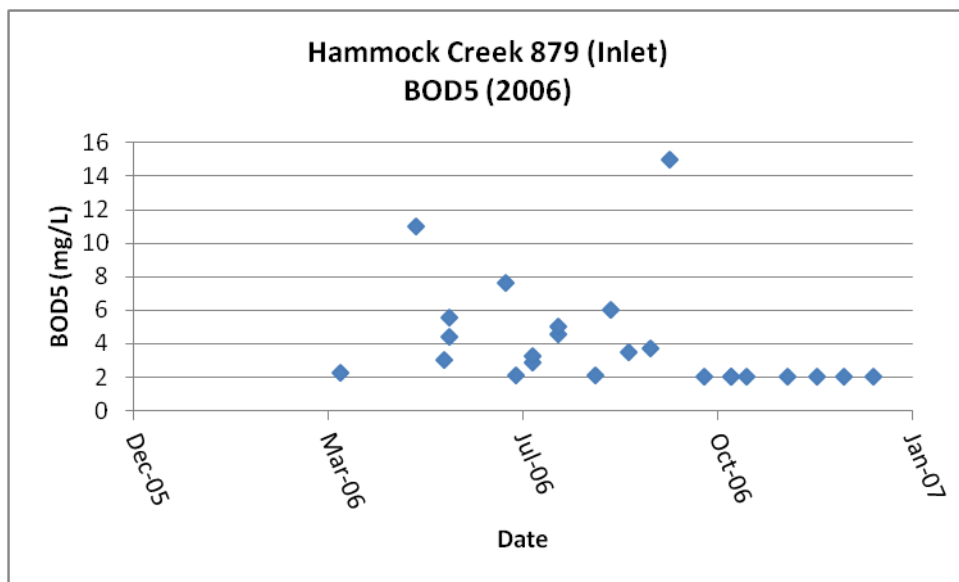


Figure B.4H.20. Hammock Creek WBID 879 Daily Average BOD5 2006–2013

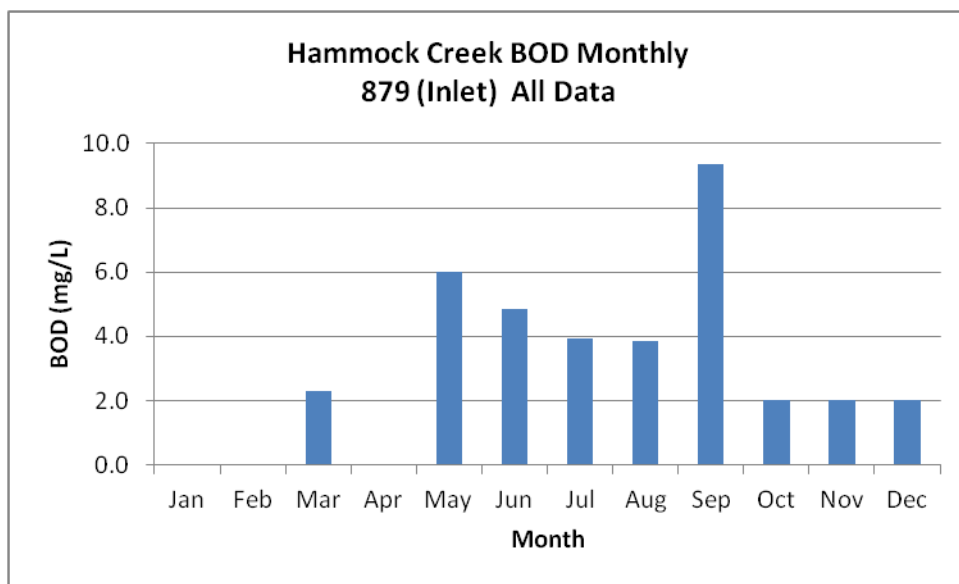


Figure B.4H.21. Hammock Creek WBID 879 Monthly Average BOD5 2006–2013

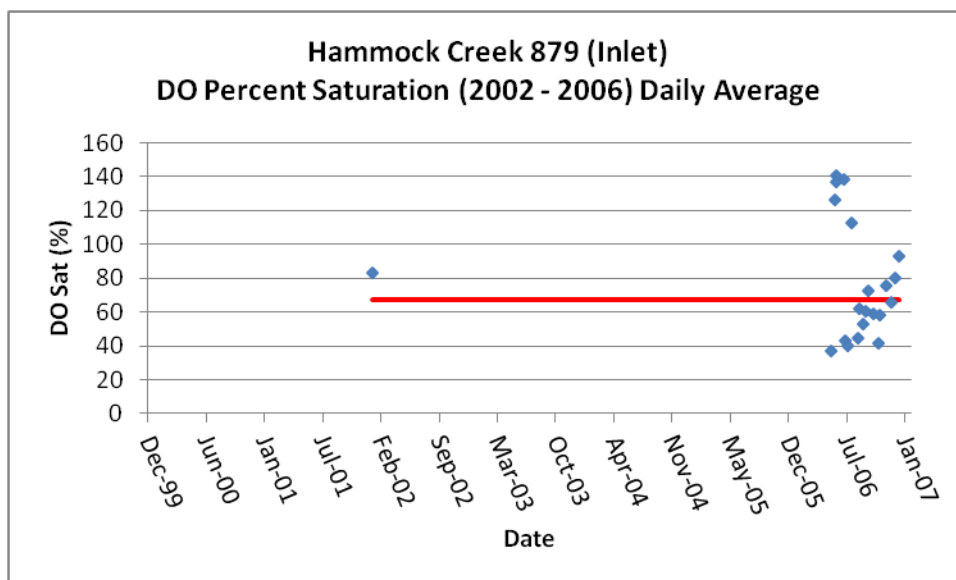


Figure B.4H.24. Hammock Creek WBID 879 Daily Average DO Percent Saturation 1975–2013

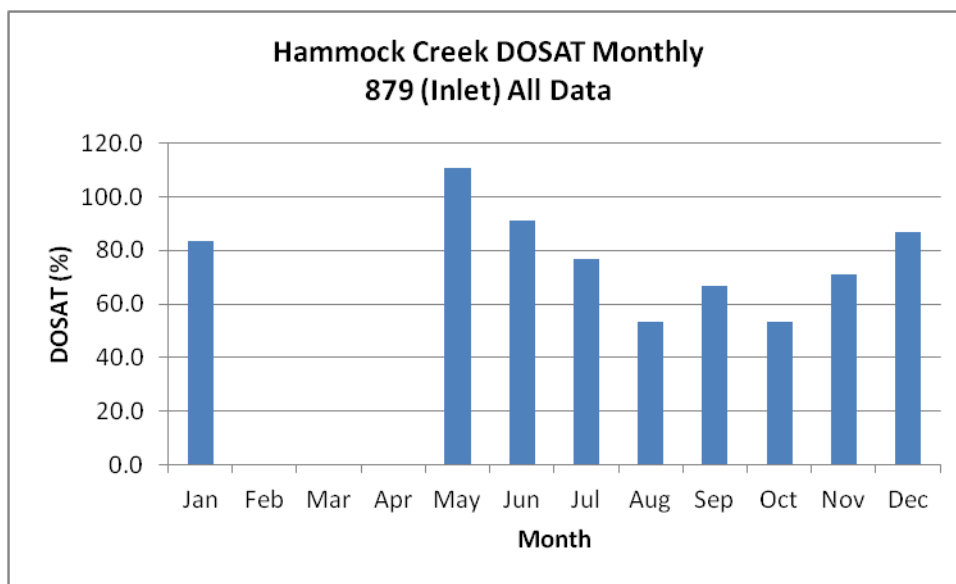


Figure B.4H.25. Hammock Creek WBID 879 Monthly Average DO Percent Saturation 1975–2013

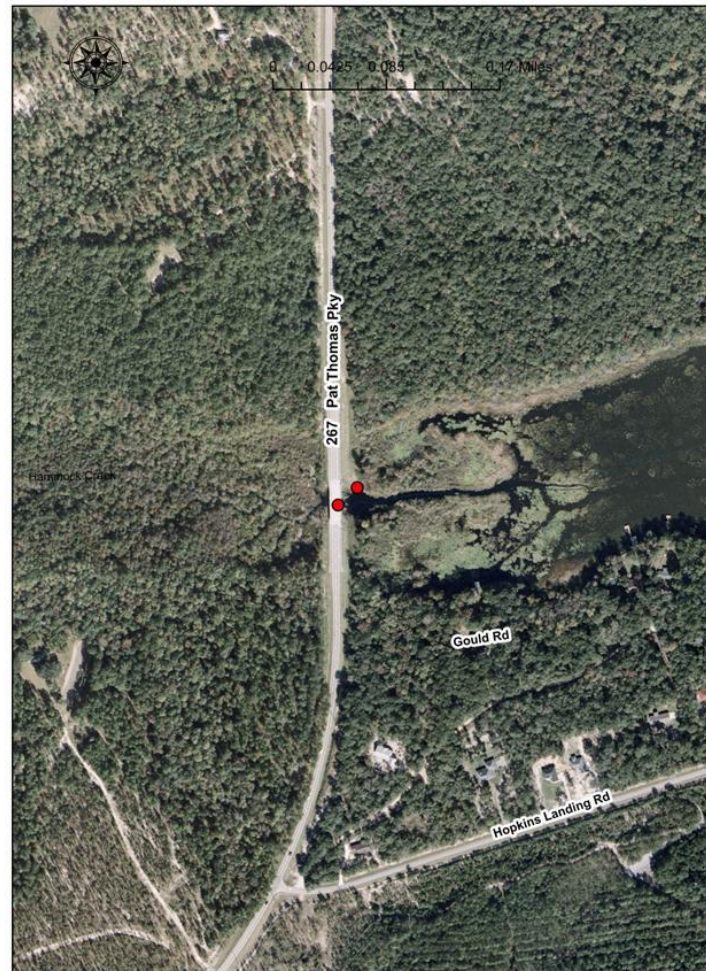


Figure B.4H.26. Hammock Creek Station with low DO



Figure B.4H.27. Hammock Creek Station Location below Bridge



Figure B.4H.28. Hammock Creek Station Looking Downstream into Lake Talquin DO



Figure B.4H.29. Hammock Creek Station Upstream of Bridge

Table B.4H.1. Hammock Creek WBID 879 IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
879	21FLGW 21793	NW1-SS-2040 HAMMOCK CREEK	2004	2004
879	21FLWQA 302528708438539	Hammock Creek at SR 267	2002	2002
879	21FLBRA 879-B	879 - Hammock Creek - at SR 267	2006	2006

Table B.4H.2. Hammock Creek WBID 879 Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
879	Alkalinity	2002 - 2006	16.6
879	Color-True	2006	38.1

Table B.4H.3. Hammock Creek WBID 879 DO Percent Saturation vs. 67 % Criterion

Year	Category	Result
2002 - 2006	Count	21
	Number P	10
	Number F	11
	Percent F	52.4
2005-2013	Count	20
	Number P	9
	Number F	11
	Percent F	55.0

Table B.4H.4. Hammock Creek WBID 879 Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN	TP	TN/TP	CChla
	AGM	AGM	Ratio	AGM
2006	0.72	0.031	23.2	2.8

Table B.4H.5. Hammock Creek WBID 879 Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2000/2006	25	12.5	33.3	28.4	25.4	24.6
Alkalinity	mg/L	2006	24	1.0	28.0	22.0	19.5	16.6
pH	S.U.	2000/2006	25	3.2	9.5	6.8	6.9	NA
Color	PCU	2006	24	15.0	130.0	32.5	44.4	38.1
TN	mg/L	2000/2006	22	0.35	1.40	0.82	0.80	0.75
NH4-N	mg/L	2000/2006	26	0.010	0.10	0.01	0.02	0.02
NO23	mg/L	2000/2006	26	0.004	0.03	0.01	0.01	0.01
OrgN	mg/L							
TP	mg/L	2000/2006	26	0.010	0.092	0.028	0.036	0.031
PO4-P	mg/L	2000/2006	25	0.004	0.020	0.004	0.006	0.005
CChla	ug/L	2000/2006	26	1.0	100.0	2.6	10.6	3.2
BOD5	mg/L	2006	24	2.0	15.0	3.0	4.1	3.4
DO	mg/L	2000/2006	25	2.9	11.1	6.0	6.6	6.0
%DOSat	%	2002/2006	21	37.6	141.0	66.0	77.7	71.1

Table B.4H.6. Hammock Creek WBID 879 Water Quality Data Summary Verified Period Plus (2005–2013)

Constituent	Units	Verified Period +	Count	Min	Max	Median	Mean	Geomean
Temperature	C	VP (2005 - 2013)	21	15.2	33.3	28.4	25.7	25.0
Alkalinity	mg/L	VP (2005 - 2013)	24	1.0	28.0	22.0	19.5	16.6
pH	S.U.	VP (2005 - 2013)	25	3.2	9.5	6.8	NA	NA
Color	PCU	VP (2005 - 2013)	24	15.0	130.0	32.5	44.4	38.1
TN	mg/L	VP (2005 - 2013)	20	0.35	1.40	0.79	0.78	0.74
NH4-N	mg/L	VP (2005 - 2013)	24	0.010	0.10	0.01	0.03	0.02
NO23	mg/L	VP (2005 - 2013)	24	0.004	0.03	0.01	0.01	0.01
OrgN	mg/L							
TP	mg/L	VP (2005 - 2013)	24	0.020	0.092	0.028	0.035	0.032
PO4-P	mg/L	VP (2005 - 2013)	24	0.004	0.020	0.004	0.006	0.005
CChla	ug/L	VP (2005 - 2013)	24	1.0	100.0	2.6	9.4	3.0
BOD5	mg/L	VP (2005 - 2013)	24	2.0	15.0	3.0	4.1	3.4
DO	mg/L	VP (2005 - 2013)	21	3.1	11.1	5.6	6.5	5.9
%DOSat	%	VP (2005 - 2013)	20	37.6	141.0	64.1	77.4	70.5

B.4I Freeman Creek WBID 954 Drains to Lake Talquin

This WBID is not impaired for DO or nutrients.

Table B.4I.1 lists the 7 stations that have been sampled in Freeman Creek WBID 954. **Figure B.4I.1** depicts the station locations.

Tables B.4I.5 and **B.4I.6** and **Figures B.4I.3** and **B.4I.4** provide the results for alkalinity. These data show that Freeman Creek has a POR GM alkalinity of 2.4 mg/L. All data were collected between 2006 and 2012. The limited data indicate higher monthly average alkalinity in the summer (up to 10 mg/L). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4I.5 and **B.4I.6** and **Figures B.4I.5** and **B.4I.6** provide the results for true color. These data show that Freeman Creek has a POR GM color of 81.6 PCU. All data were collected between 2006 and 2012. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4I.5 and **B.4I.6** and **Figures B.4I.8** through **B.4I.11** provide the results for TN. These data show that Freeman Creek has a POR GM TN of 0.46 mg/L. The data indicate that the recent (2005–2013) TN GM of 0.39 mg/L is similar to the POR TN GM for the POR and significantly less than the new 1.03 mg/L threshold AGM concentration for TN (**Figure B.4I.10**). There were four years during 2007–2011 with sufficient data to calculate AGM concentrations. These results show that the TN concentrations may be increasing over time. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4I.5 and **B.4I.6** and **Figure B.4I.12** provide the results for NH₄-N. These data show that Freeman Creek has a POR GM NH₄-N of 0.03 mg/L, less than either the Little or Ocklawaha Rivers. The data indicate that the recent (2005–2013) NH₄-N GM of 0.02 mg/L is less than the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4I.5 and **B.4I.6** and **Figure B.4I.13** provide the results for NO₃-N. These data show that Freeman Creek has a POR GM NO₃-N of 0.01 mg/L, significantly less than either the Little or Ochlockonee Rivers. The data indicate that the recent (2005–2013) NO₃-N GM of 0.01 mg/L is the same as the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4I.5 and **B.4I.6** and **Figures B.4I.14** through **B.4I.17** provide the results for TP. These data show that Freeman Creek has a POR GM TP of 0.016 mg/L. The data indicate that the recent (2005–2013) TP GM of 0.01 mg/L is less than the TP GM for the POR and significantly less than the new 0.18 mg/L threshold AGM concentration for TP. There were four years during 2007–2011 with sufficient data to calculate AGM concentrations. These results show that the TP concentrations may be increasing over time (**Figure B.4I.17**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4.I5 and B.4I.6 and Figure B.4I.18 provide the results for PO₄-P. These data show that Freeman Creek has a POR GM PO₄-P of 0.007 mg/L. The data indicate that the recent (2005–2013) PO₄-P GM of 0.005 mg/L is less than the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4I.5 and B.4I.6 and Figures B.4I.19 through B.4I.21 provide the results for CChla. These data show that Freeman Creek has a POR GM CChla of 2.3 ug/L. The data indicate that the recent (2005–2013) CChla GM of 1.4 ug/L is similar to the CChla GM for the POR and significantly less than the new threshold AGM concentration for CChla (**Figure B.4I.22**). The data set has a large number of less than detection results. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4.I5 and B.4I.6 and Figures B.4I.22 and B.4I.23 provide the results for BOD₅. These data show that Freeman Creek has a POR GM BOD₅ of 1.5 mg/L. All of the results are from the period 2006 - 2013. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4.I5 and B.4I.6 and Figures B.4I.24 and B.4I.25 provide the results for DO. These data show that Freeman Creek has a POR GM DO of 6.5 mg/L. The data indicate that the recent (2005–2013) DO GM of 6.7 mg/L is equivalent to the POR concentration. The monthly average DO drops to ~ 4.0 in July and August (**Figure B.4I.27**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4.I5 and B.4I.6 and Figures B.4I.26 and B.4I.27 provide the results for percent DO saturation. These data show that Freeman Creek has a POR GM DOSAT of 65.9 %. The data indicate that the recent (2005–2013) DOSAT GM of 62.0 %, slightly lower than the GM for the POR. The data presented in **Figure B.4I.28** indicate a potential issue with the new DO 67 percent saturation criterion. There is insufficient data to determine accurate long-term or seasonal patterns.

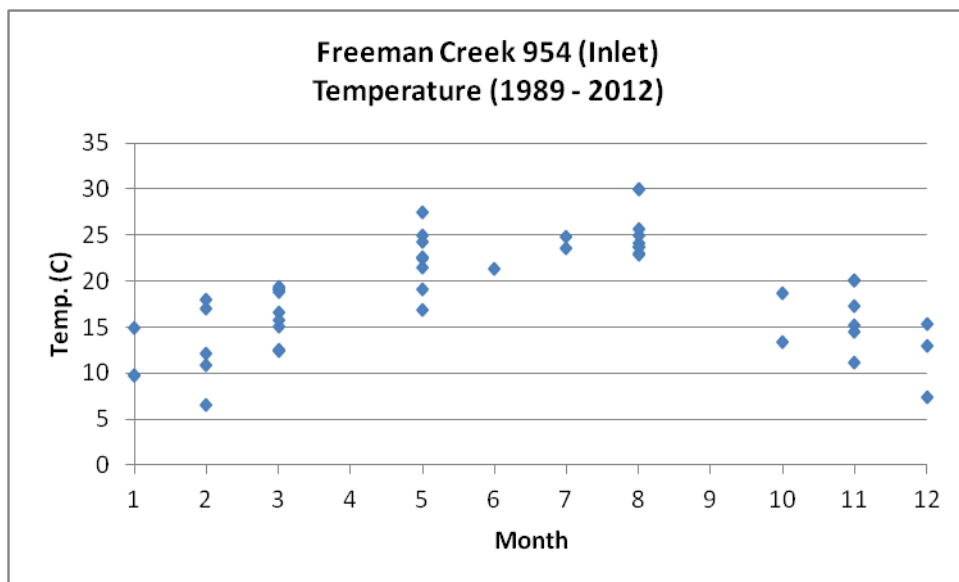


Figure B.4I.2. Freeman Creek WBID 954 Monthly Temperature 1989–2012

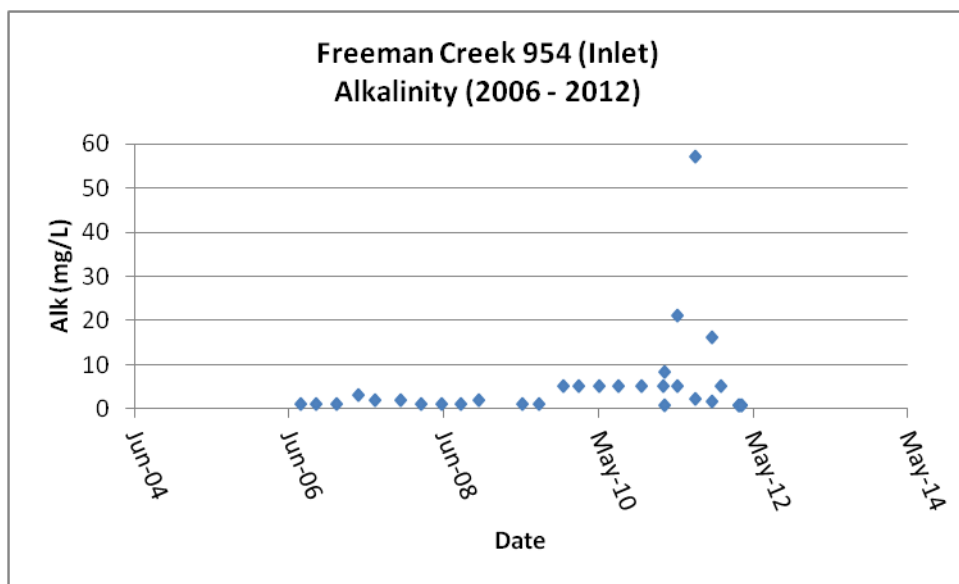


Figure B.4I.3. Freeman Creek WBID 954 Daily Average Alkalinity 2006–2012

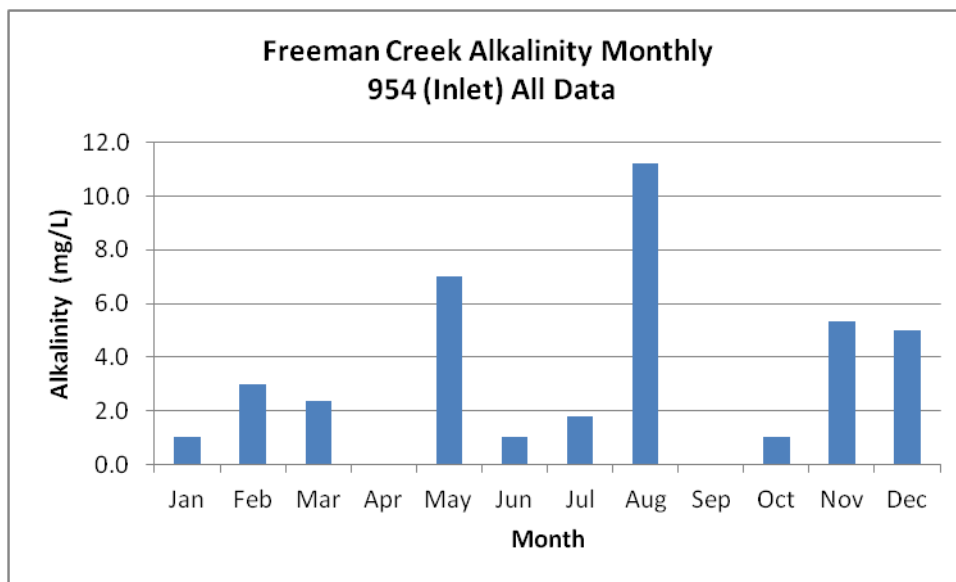


Figure B.4I.4. Freeman Creek WBID 954 Monthly Average Alkalinity 2006–2012

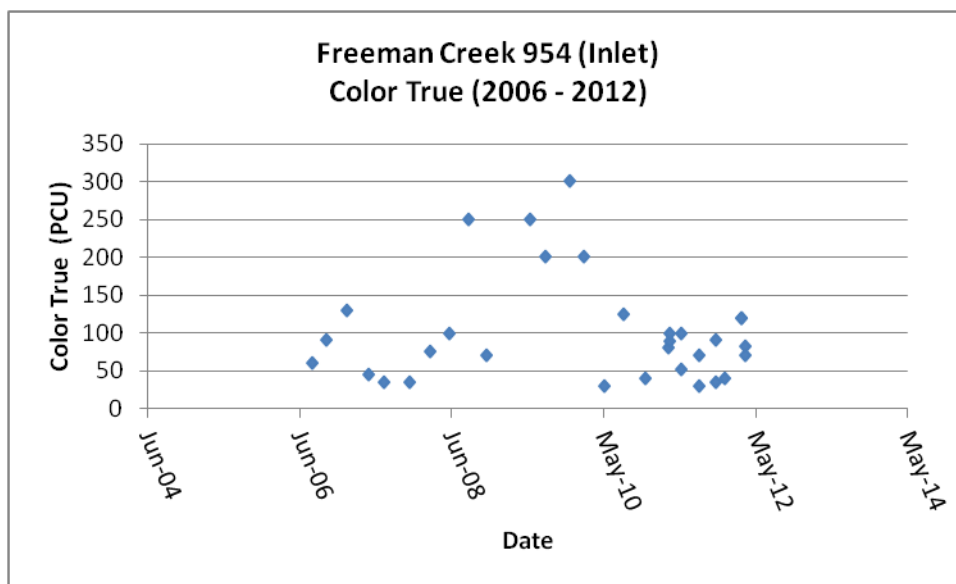


Figure B.4I.5. Freeman Creek WBID 954 Daily Average True Color 2006–2012

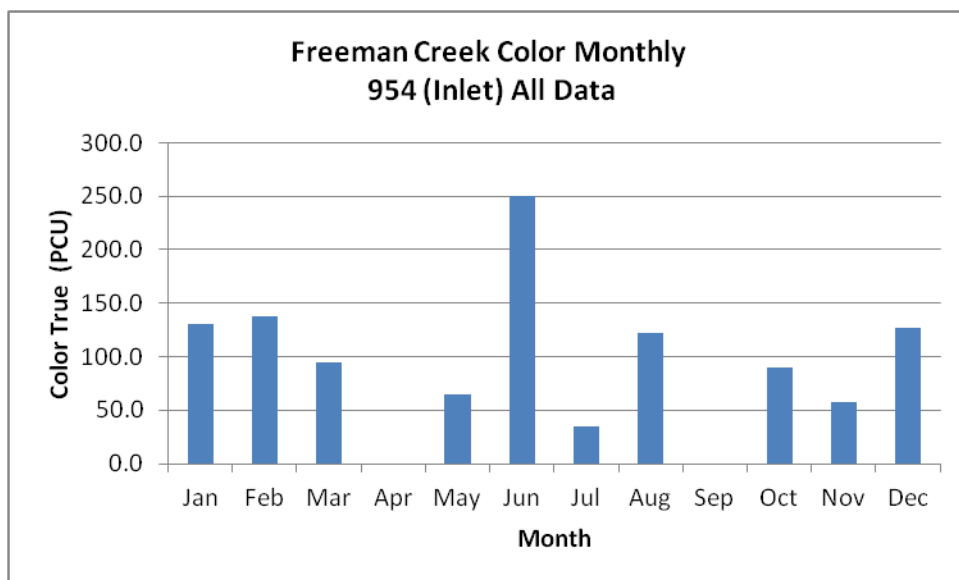


Figure B.4I.6. Freeman Creek WBID 954 Monthly Average True Color 2006–2012

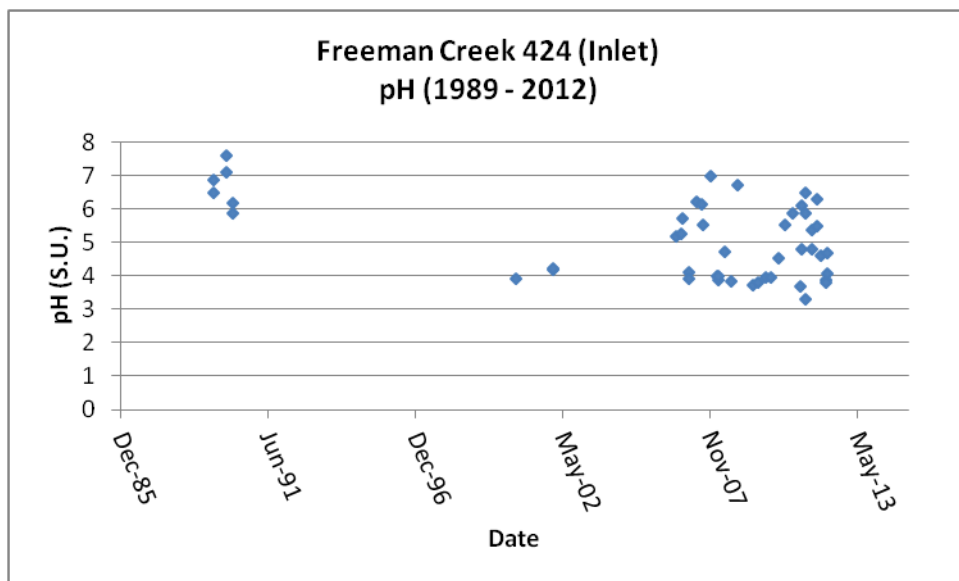


Figure B.4I.7. Freeman Creek WBID 954 Daily pH 1989–2012

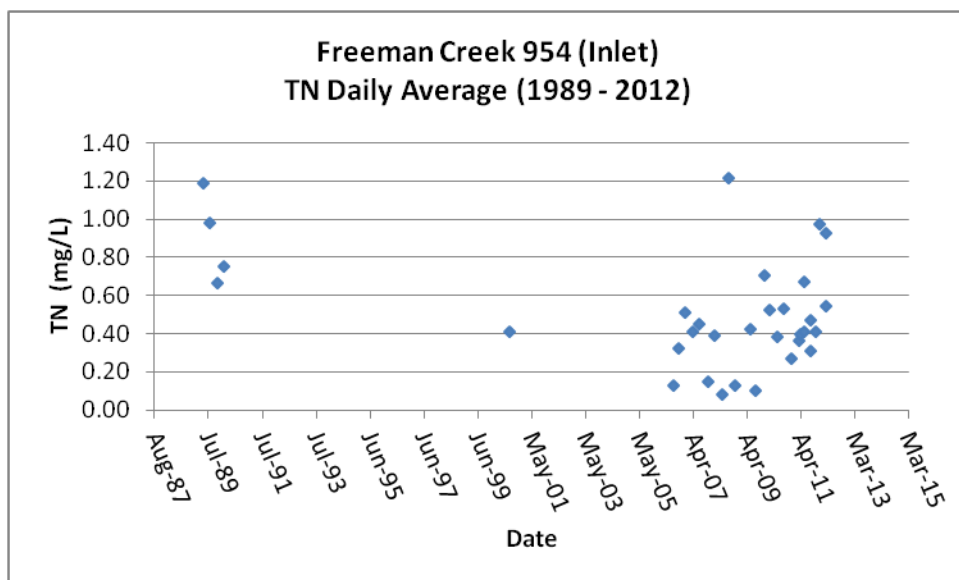


Figure B.4I.8. Freeman Creek WBID 954 Daily Average TN 1989–2012

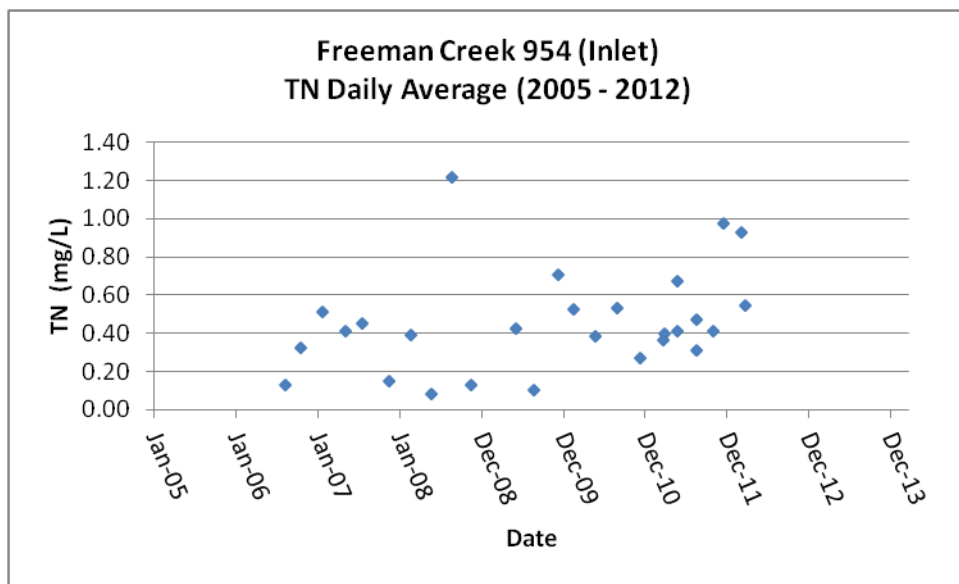


Figure B.4I.9. Freeman Creek WBID 954 Daily Average TN 2005–2012

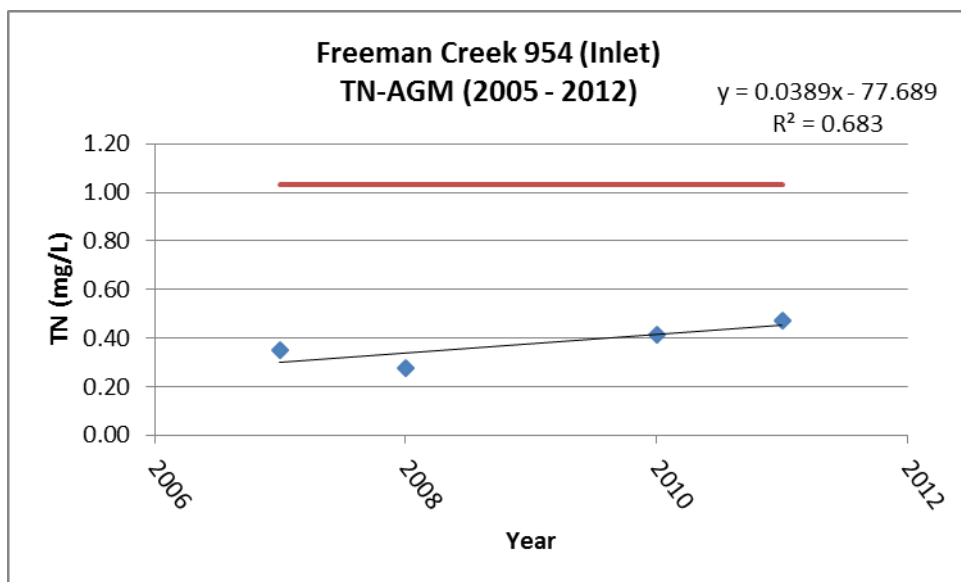


Figure B.4I.10. Freeman Creek WBID 954 TN Annual Geomean 2005–2012

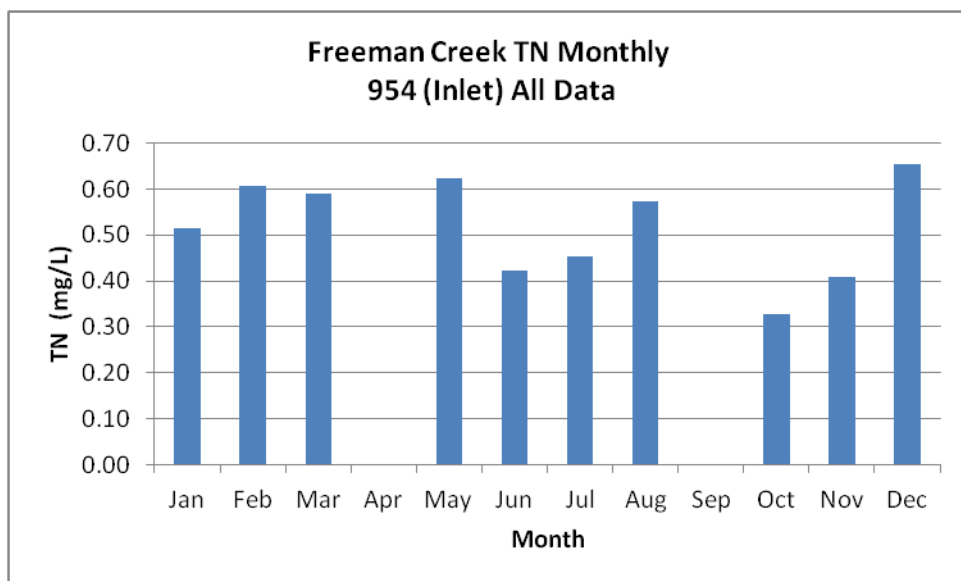


Figure B.4I.11. Freeman Creek WBID 954 Monthly Average TN 1989–2012

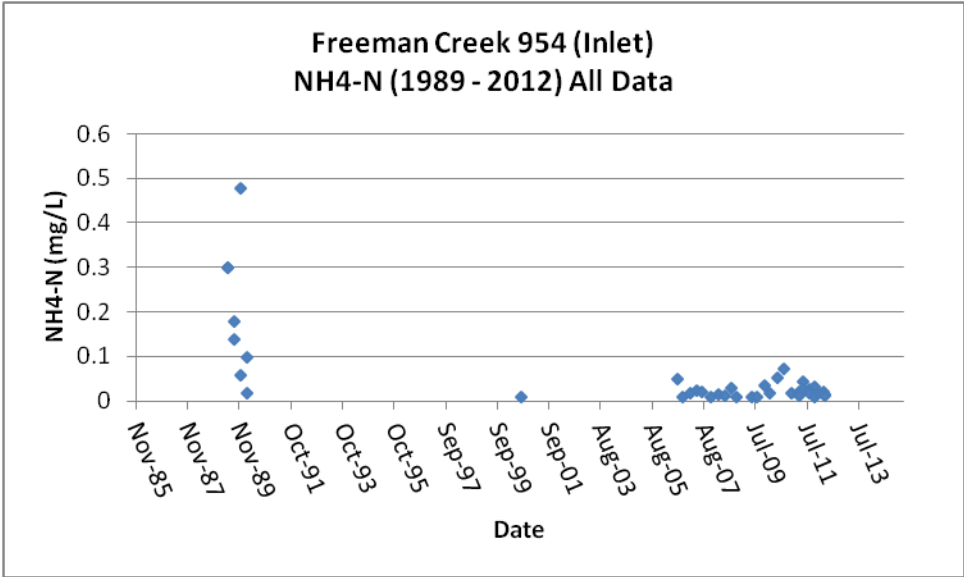


Figure B.4I.12. Freeman Creek WBID 954 Daily Average Ammonia-N 1989–2012

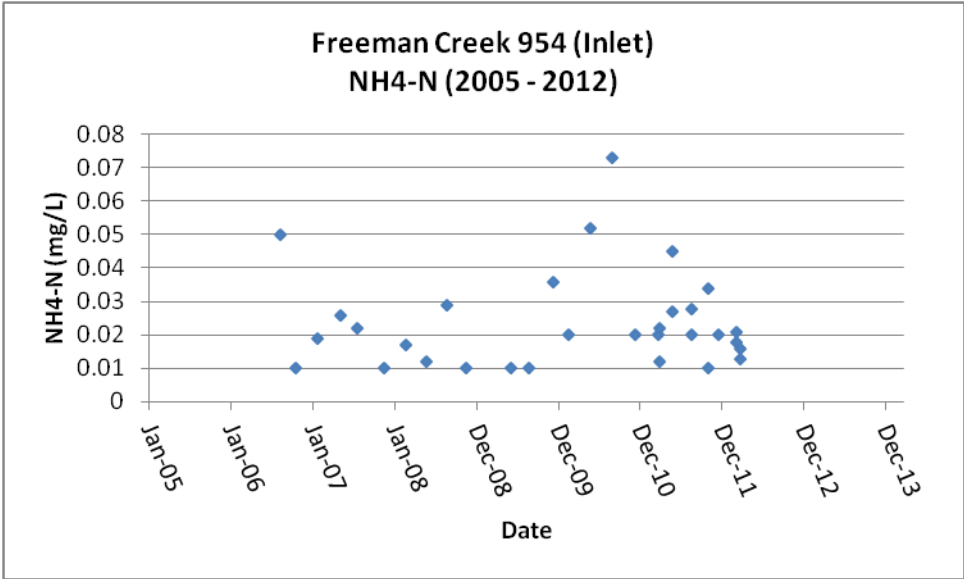


Figure B.4I.13. Freeman Creek WBID 954 Daily Average Ammonia-N 2005–2013

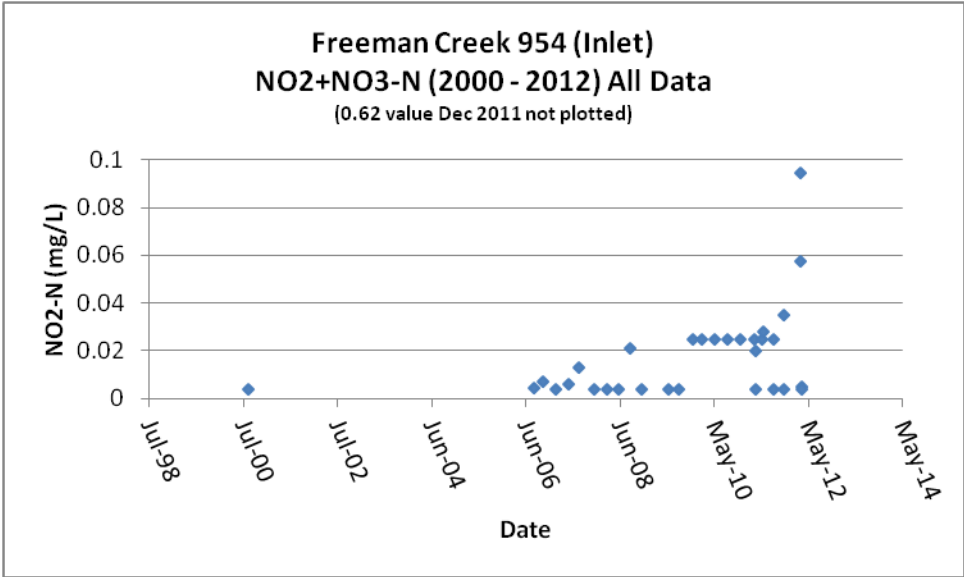


Figure B.4I.14. Freeman Creek WBID 954 Daily Average Nitrate/Nitrite-N 2000–2012

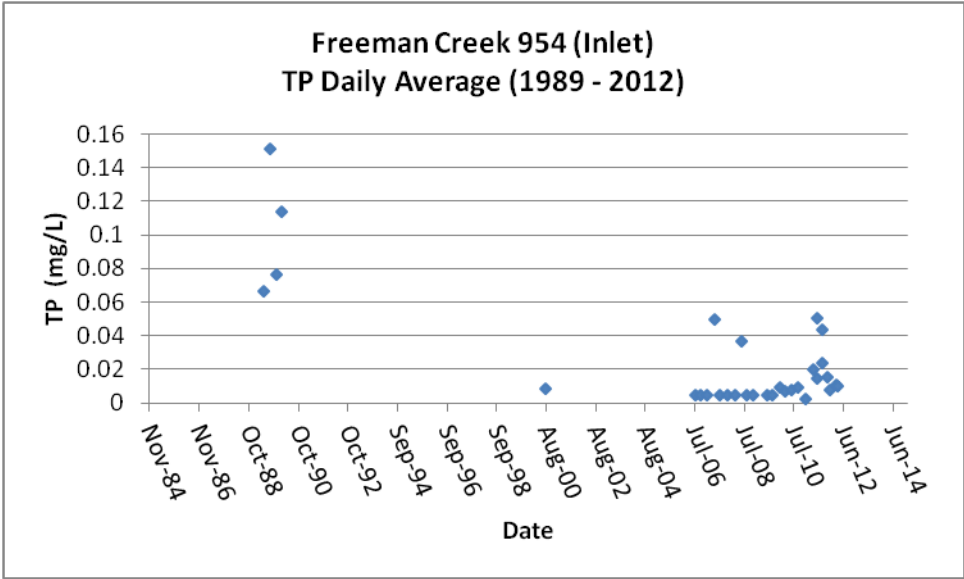


Figure B.4I.15. Freeman Creek WBID 954 Daily Average TP 1989–2012

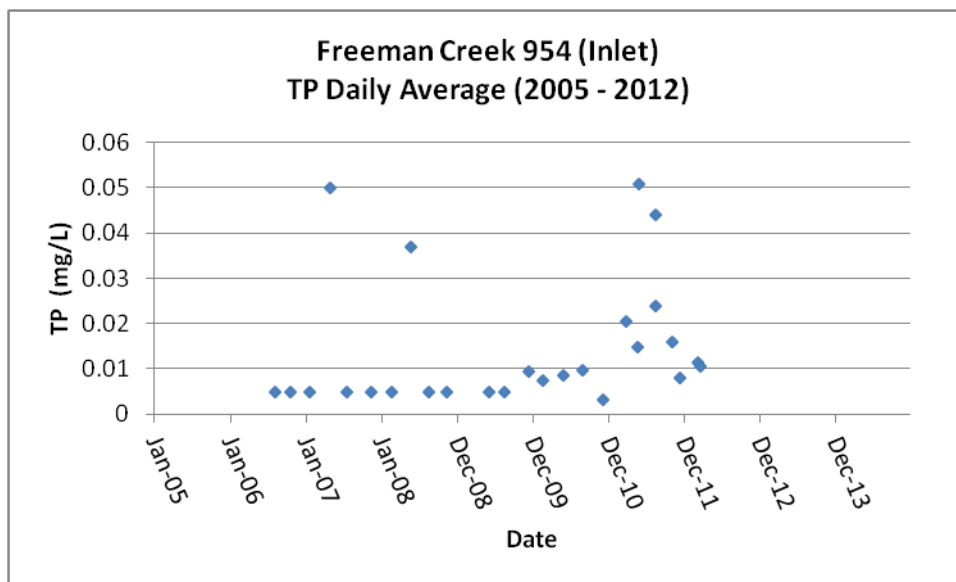


Figure B.4I.16. Freeman Creek WBID 954 Daily Average TP 2005–2012

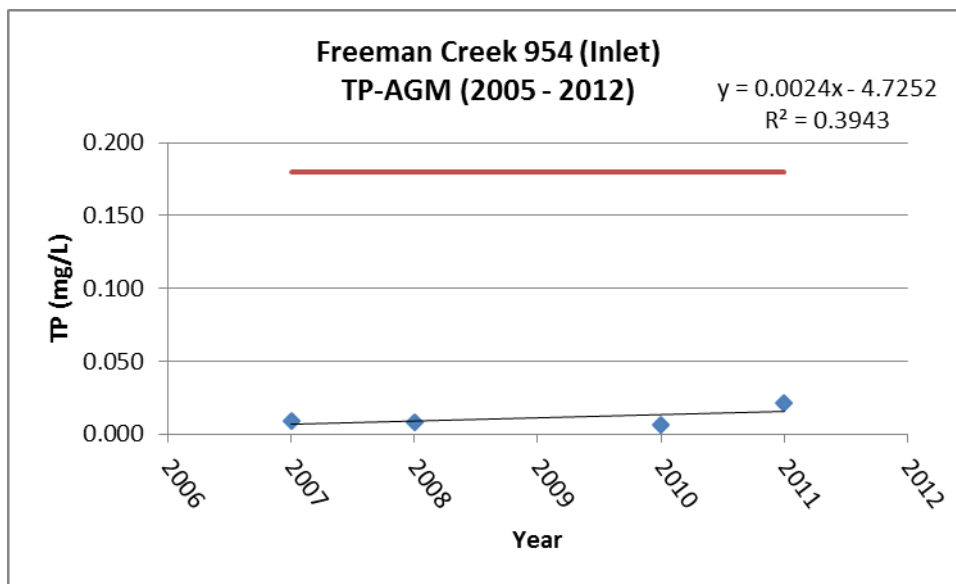


Figure B.4I.17. Freeman Creek WBID 954 Annual Geomean TP 2005–2013

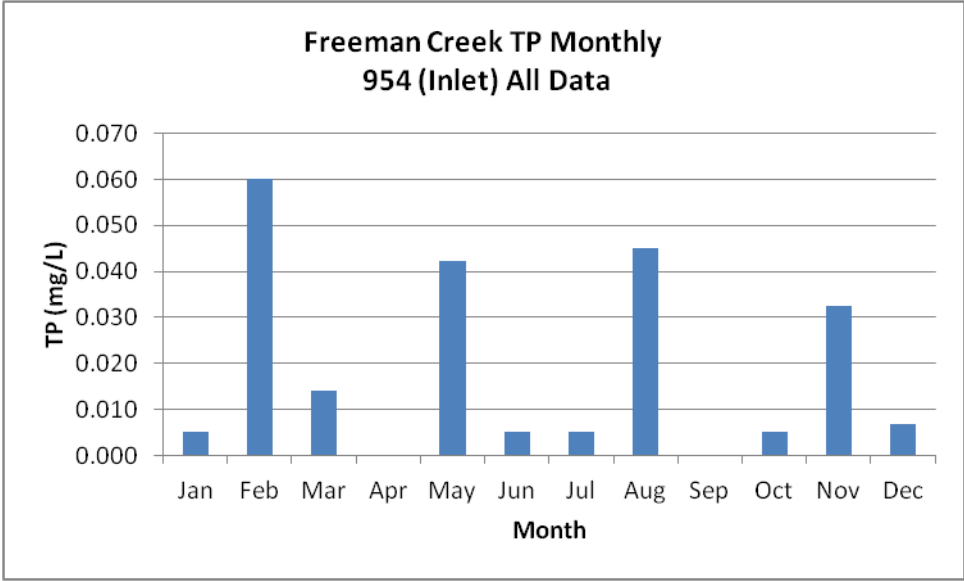


Figure B.4I.18. Freeman Creek WBID 954 Monthly Average TP 1989–2012

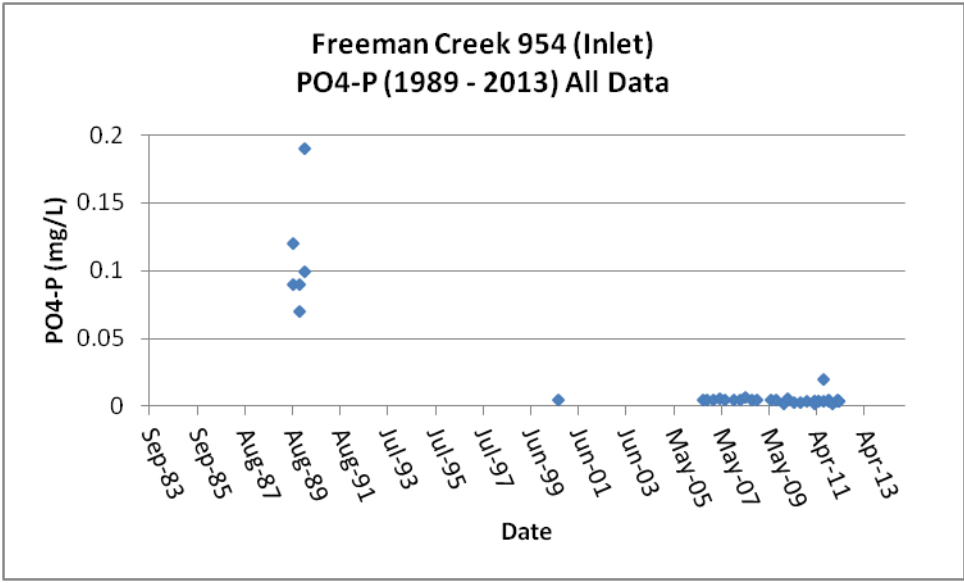


Figure B.4I.19. Freeman Creek WBID 954 Daily Average Orthophosphate-P 1989–2012

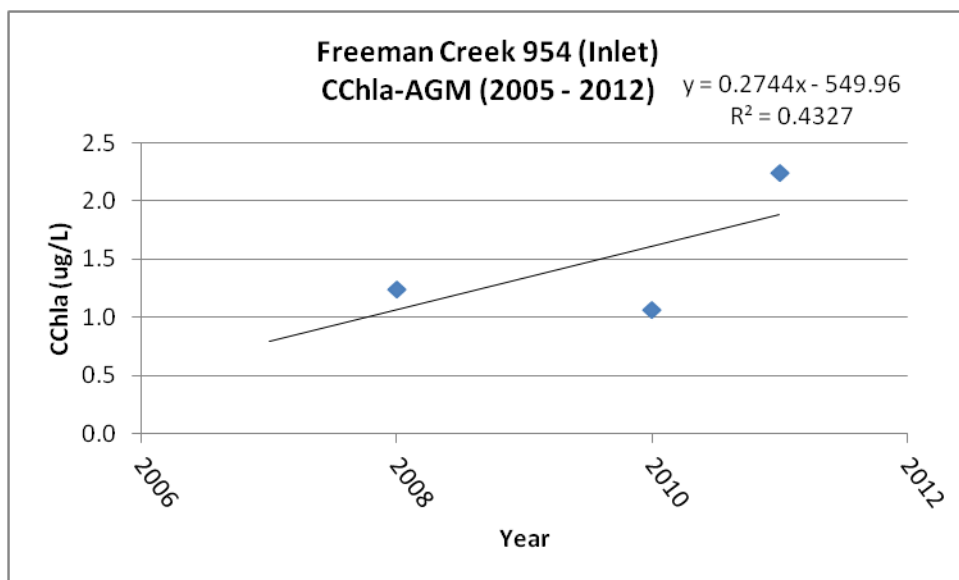


Figure B.4I.22. Freeman Creek WBID 954 Annual Geomean CChla 2005–2013

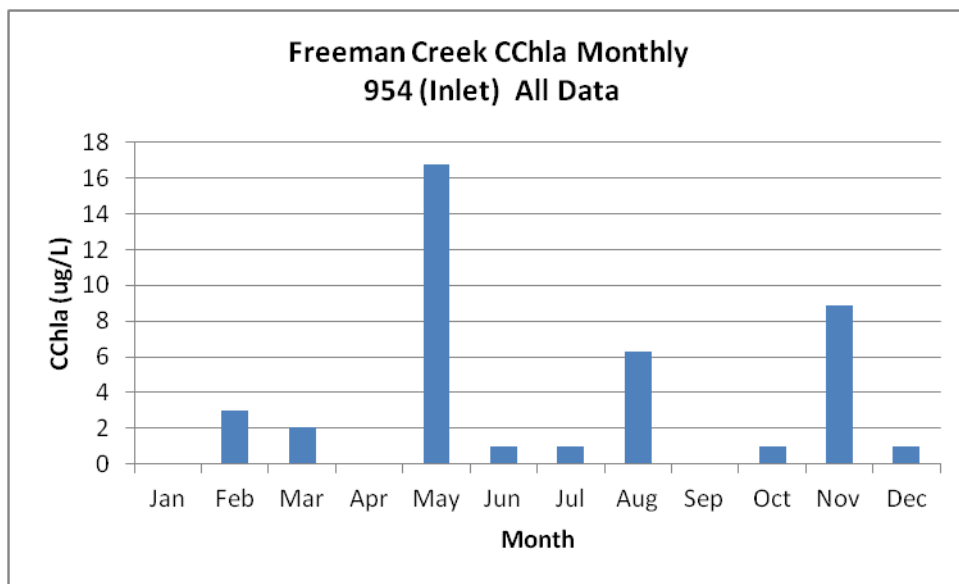
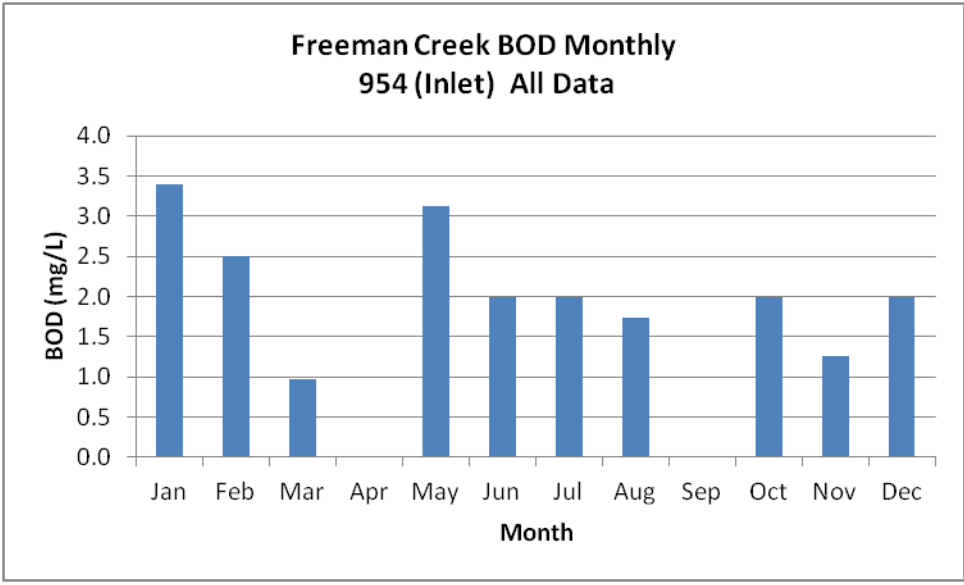
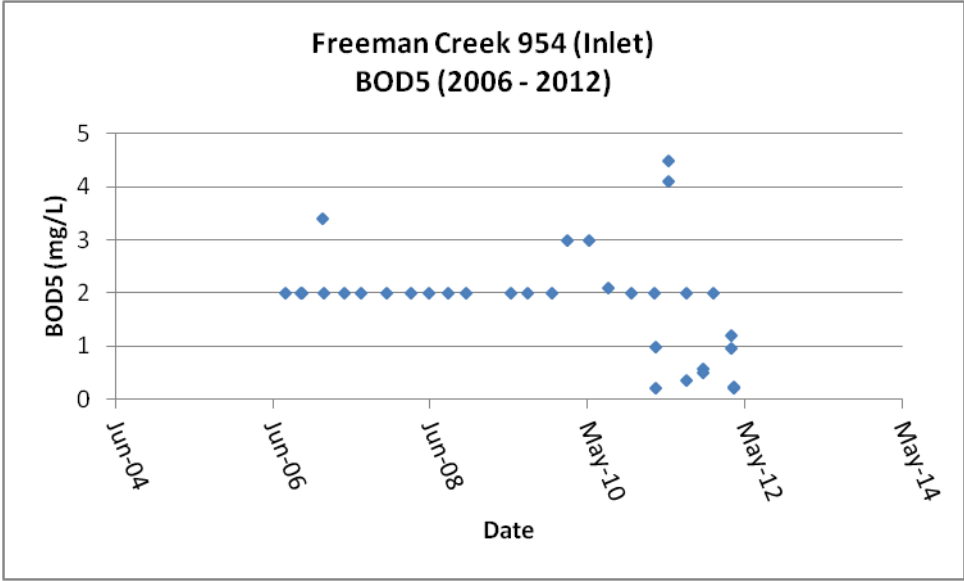


Figure B.4I.23. Freeman Creek WBID 954 Monthly Average CChla 1989–2012



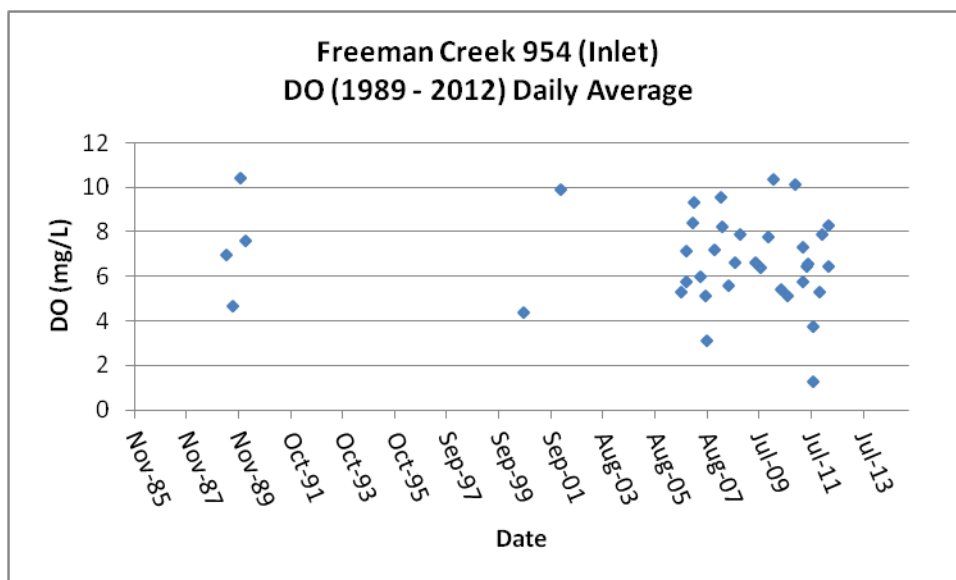


Figure B.4I.26. Freeman Creek WBID 954 Daily Average DO 1989–2012

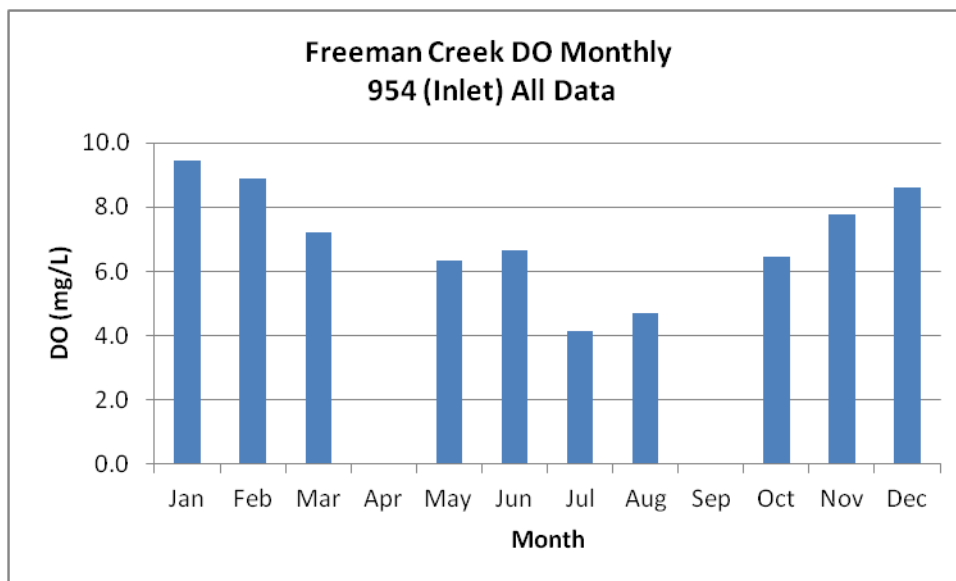


Figure B.4I.27. Freeman Creek WBID 954 Monthly Average DO 1989–2012

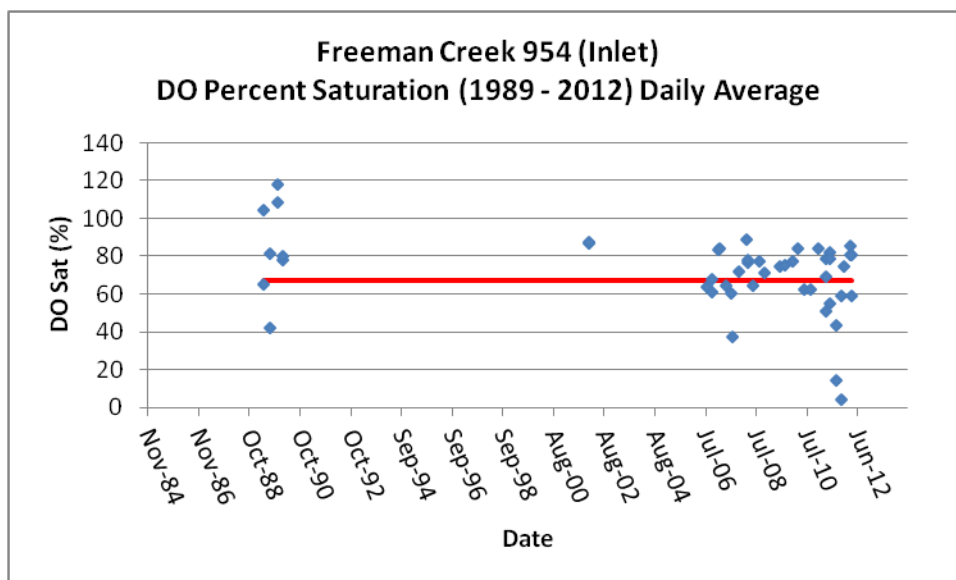


Figure B.4I.28. Freeman Creek WBID 954 Daily Average DO Percent Saturation 1989–2012

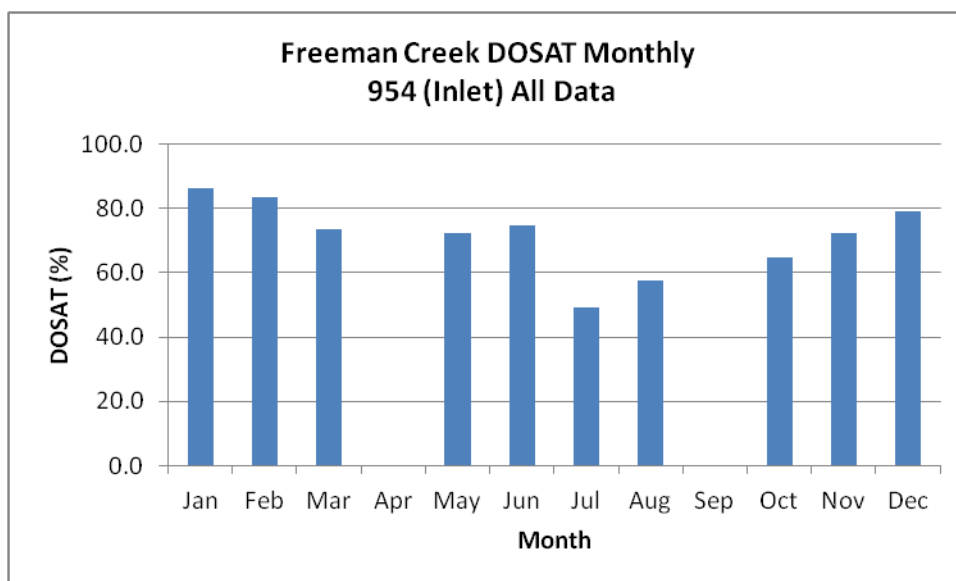


Figure B.4I.29. Freeman Creek WBID 954 Monthly Average DO Percent Saturation 1989–2012

Table B.4I.1. Freeman Creek WBID 954 IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
954	21FLGW 8629	NWA-HS-1015 FREEMAN CREEK	2000	2000
954	21FLLEONLCOC3038884584	Freeman Creek @ 267	2011	2011
954	21FLPNS NONSTORET313	Freeman Creek at SR 267	1998	1998
954	21FLWQA 302403708435358	Freeman Creek at SR 20	2002	2002
954	21FLPNS 3038884584	Freeman Creek @ 267 (also 21FLLEON)	0	0
954	21FLPNS 302403708435358	Freeman Creek At SR 20 (also 21FLWQA)	0	0
954	21FLLEONLCOC3038884584	Freeman Creek @ 267	2011	2011

Table B.4I.2. Freeman Creek WBID 954 Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
954	Alkalinity (mg/L)	2006-2012	2.4
954	Color-True (PCU)	2006-2013	81.6

Table B.4I.3. Freeman Creek WBID 954 DO Percent Saturation vs. 67 % Criterion

Year	Category	Result
1989 - 2012	Count	47
	Number P	30
	Number F	17
	Percent F	36.2
2005-2012	Count	37
	Number P	22
	Number F	15
	Percent F	40.5

Table B.4I.4. Freeman Creek WBID 954 Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN	TP	TN/TP	CChla
	AGM	AGM	Ratio	AGM
2007	0.35	0.009	39.3	
2008	0.27	0.008	33.2	1.2
2009				
2010	0.42	0.007	62.8	1.1
2011	0.47	0.021	22.0	2.2

Table B.4I.5. Freeman Creek WBID 954 Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	1989 - 2012	48	6.5	30.0	19.0	18.5	17.5
Alkalinity	mg/L	2006 - 2012	31	0.7	57.1	1.8	5.4	2.4
pH	S.U.	1989 - 2012	46	3.3	7.6	4.8	NA	NA
Color	PCU	2006 - 2012	31	30.0	300.0	83.0	100.4	81.6
TN	mg/L	1989 - 2012	40	0.09	1.25	0.48	0.56	0.46
NH4-N	mg/L	1989 - 2012	40	0.010	0.48	0.02	0.06	0.03
NO23	mg/L	2000 - 2012	32	0.004	0.62	0.01	0.04	0.01
OrgN	mg/L	1989 - 1990	8	0.34	0.90	0.56	0.61	0.56
TP	mg/L	1989 - 2012	39	0.003	0.156	0.010	0.032	0.016
PO4-P	mg/L	1989 - 2012	38	0.003	0.190	0.005	0.022	0.007
CChla	ug/L	1989 - 2012	37	1.0	74.0	1.0	6.7	2.3
BOD5	mg/L	2006 - 2012	33	0.2	4.5	2.0	1.9	1.5
DO	mg/L	1989 - 2012	48	1.3	10.9	6.9	6.9	6.5
%DOSat	%	1989 - 2012	45	4.6	118.5	75.5	71.4	65.9

Table B.4I.6. Freeman Creek WBID 954 Water Quality Data Summary Verified Period (2005–2012)

Constituent	Units	Verified Period	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2012	37	6.5	25.6	18.7	17.8	17.0
Alkalinity	mg/L	2005 - 2012	31	0.7	57.1	1.8	5.4	2.4
pH	S.U.	2005 - 2012	36	3.3	7.0	4.7	NA	NA
Color	PCU	2005 - 2012	31	30.0	300.0	83.0	100.4	81.6
TN	mg/L	2005 - 2012	31	0.09	1.22	0.42	0.47	0.39
NH4-N	mg/L	2005 - 2012	31	0.010	0.07	0.02	0.02	0.02
NO23	mg/L	2005 - 2012	31	0.004	0.62	0.01	0.04	0.01
OrgN	mg/L							
TP	mg/L	2005 - 2012	30	0.003	0.051	0.009	0.014	0.010
PO4-P	mg/L	2005 - 2012	31	0.003	0.020	0.005	0.005	0.005
CChla	ug/L	2005 - 2012	28	1.0	74.0	1.0	4.1	1.4
BOD5	mg/L	2005 - 2012	33	0.2	4.5	2.0	1.9	1.5
DO	mg/L	2005 - 2012	37	1.3	10.4	7.1	7.0	6.7
%DOSat	%	2005 - 2012	37	4.6	89.2	74.9	68.4	62.0

B.4J Harvey Creek WBID 921 Drains to Lake Talquin

This WBID is not impaired for DO or nutrients.

Table B.4J.1 lists the 9 stations that have been sampled in Harvey Creek WBID 921. **Figure B.4J.1** depicts the station locations.

Tables B.4J.5 and **B.4J.6** and **Figures B.4J.3** and **B.4J.4** provide the results for alkalinity. These data show that Harvey Creek has a POR GM alkalinity of 3.9 mg/L. All data were collected between 2006 and 2012. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4J.5 and **B.4J.6** and **Figures B.4J.5** and **B.4J.6** provide the results for true color. These data show that Harvey Creek has a POR GM color of 28.7 PCU. All data were collected between 2006 and 2012. The data indicate that Harvey Creek has the lowest color of any of the tributaries to Lake Talquin. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4J.5 and **B.4J.6** and **Figures B.4J.8** through **B.4J.11** provide the results for TN. These data show that Harvey Creek has a POR GM TN of 0.26 mg/L. The data indicate that the recent (2005–2013) TN GM of 0.25 mg/L is equivalent to the POR TN GM for the POR and significantly less than the new 1.03 mg/L threshold AGM concentration for TN (**Figure B.4J.10**). There were five years during 2006 - 2011 with sufficient data to calculate AGM concentrations. These results show that the TN concentrations may be increasing over time. The limited data indicate highest concentrations of TN during June (~0.8 mg/L) with concentrations less than 0.4 mg/L for much of the remaining months. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4J.5 and **B.4J.6** and **Figure B.4J.12** provide the results for NH₄-N. These data show that Harvey Creek has a POR GM NH₄-N of 0.02 mg/L. The data indicate that the recent (2005–2013) NH₄-N GM of 0.02 mg/L is the same as the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4J.5 and **B.4J.6** and **Figure B.4J.13** provide the results for NO₃-N. These data show that Harvey Creek has a POR GM NO₃-N of 0.02 mg/L. The data indicate that the recent (2005–2013) NO₃-N GM of 0.02 mg/L is the same as the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4J.5 and **B.4J.6** and **Figures B.4J.14** through **B.4J.17** provide the results for TP. These data show that Harvey Creek has a POR GM TP of 0.012 mg/L. The data indicate that the recent (2005–2013) TP GM of 0.011 mg/L is equivalent to the TP GM for the POR and significantly less than the new 0.18 mg/L threshold AGM concentration for TP. There were four years between 2006 and 2011 with sufficient data to calculate AGM concentrations. These results indicate that TP concentrations have decreased over time (**Figure B.4J.16**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4J.5 and B.4J.6 and Figure B.4J.18 provide the results for PO₄-P. These data show that Harvey Creek has a POR GM PO₄-P of 0.005 mg/L. The data indicate that the recent (2005–2013) PO₄-P GM of 0.005 mg/L is equivalent to the POR concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4J.5 and B.4J.6 and Figures B.4J.19 through B.4J.21 provide the results for CChla. These data show that Harvey Creek has a POR GM CChla of 1.5 ug/L. The data indicate that the recent (2005–2013) CChla GM of 1.5 ug/L is the same as the CChla GM for the POR and significantly less than the new threshold AGM concentration for CChla (**Figure B.4J.20**). The data set has a large number of less than detection results. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4J.5 and B.4J.6 and Figures B.4J.22 and B.4J.23 provide the results for BOD₅. These data show that Harvey Creek has a POR GM BOD₅ of 2.4 mg/L. All of the results are from the period 2006 - 2013. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4J.5 and B.4J.6 and Figures B.4J.24 and B.4J.25 provide the results for DO. These data show that Harvey Creek has a POR GM DO of 8.7 mg/L. The data indicate that the recent (2005–2013) DO GM of 8.8 mg/L is equivalent to the POR concentration. The monthly average DO never drops below 7.0 mg/L (**Figure B.4J.25**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4J.5 and B.4J.6 and Figures B.4J.26 and B.4J.27 provide the results for percent DO saturation. These data show that Harvey Creek has a POR GM DOSAT of 92.1 %. The data indicate that the recent (2005–2013) DOSAT GM of 93.1 % is similar to the GM for the POR. The data presented in **Figure B.4J.26** do not indicate an issue with the new DO percent saturation criterion. There is insufficient data to determine accurate long-term or seasonal patterns.



Figure B.4J.1. Harvey Creek WBID 921 IWR Stations

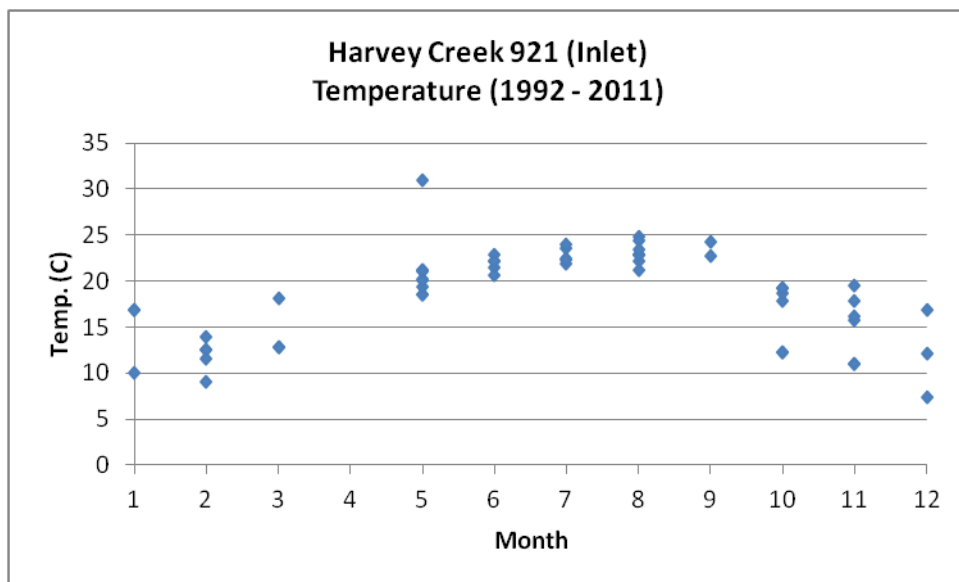


Figure B.4J.2. Harvey Creek WBID 921 Monthly Temperature 1992–2011

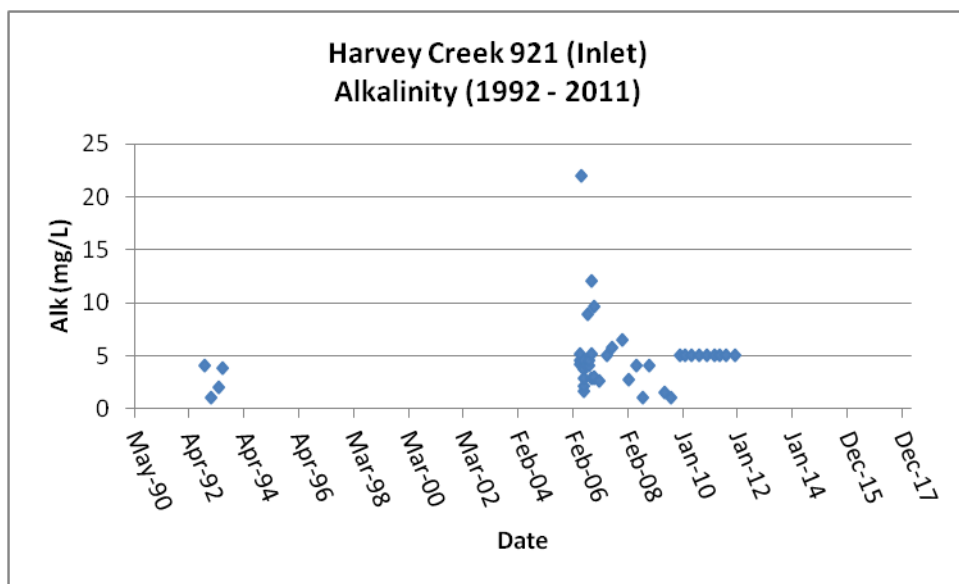


Figure B.4J.3. Harvey Creek WBID 921 Daily Average Alkalinity 1992–2011

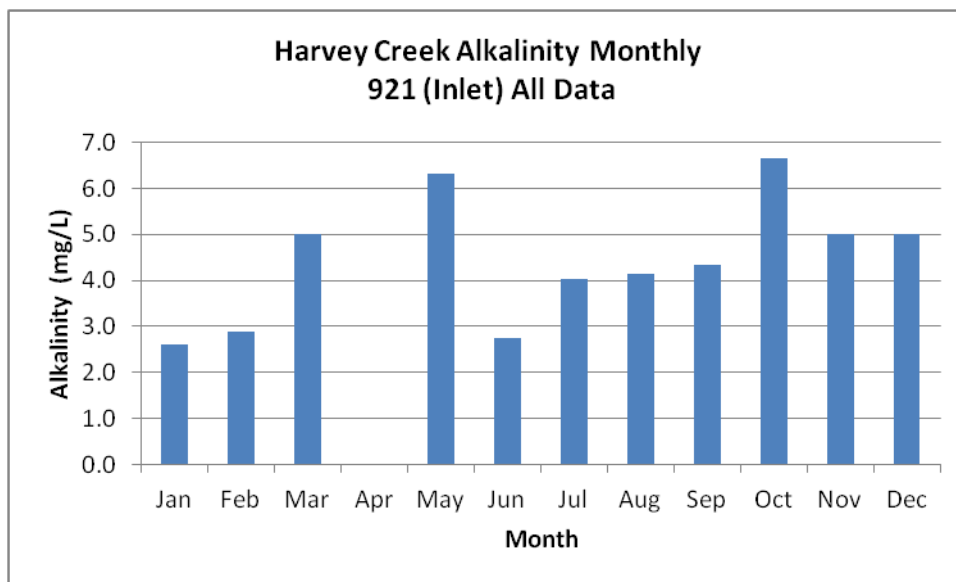


Figure B.4J.4. Harvey Creek WBID 921 Monthly Average Alkalinity 1992–2011

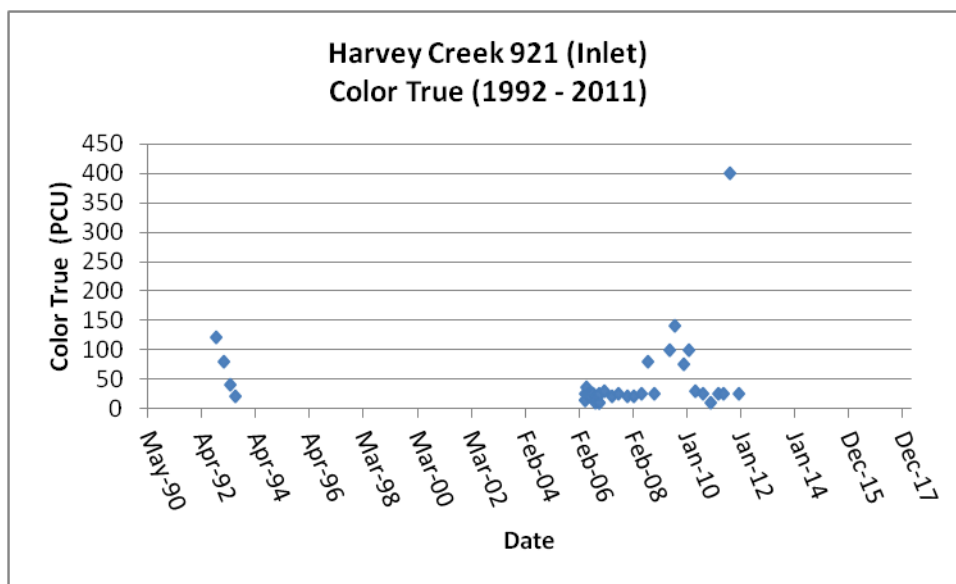


Figure B.4J.5. Harvey Creek WBID 921 Daily Average True Color 1992–2013

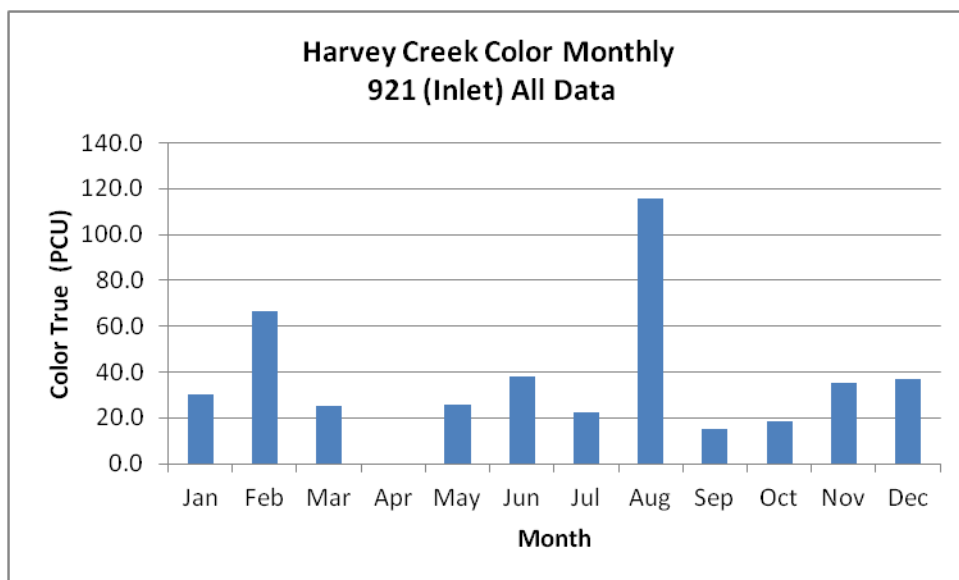


Figure B.4J.6. Harvey Creek WBID 921 Monthly Average True Color 1992–2013

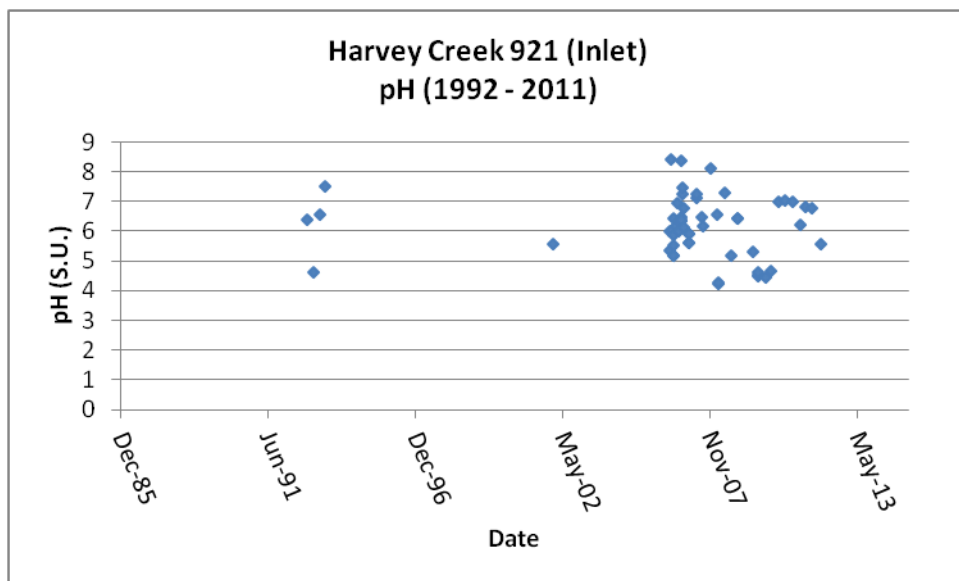


Figure B.4J.7. Harvey Creek WBID 921 Daily pH 1992–2011

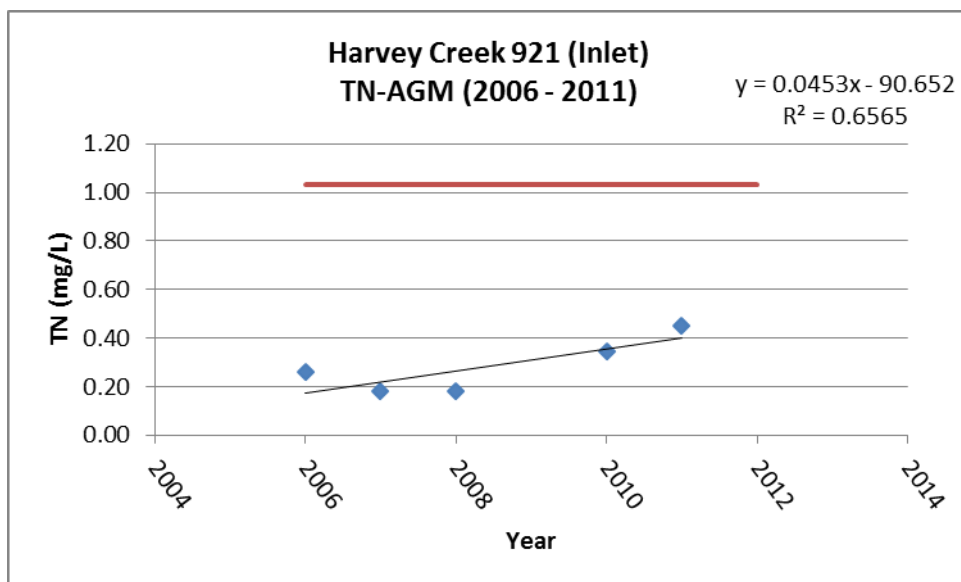


Figure B.4J.10. Harvey Creek WBID 921 TN Annual Geomean 2006–2013

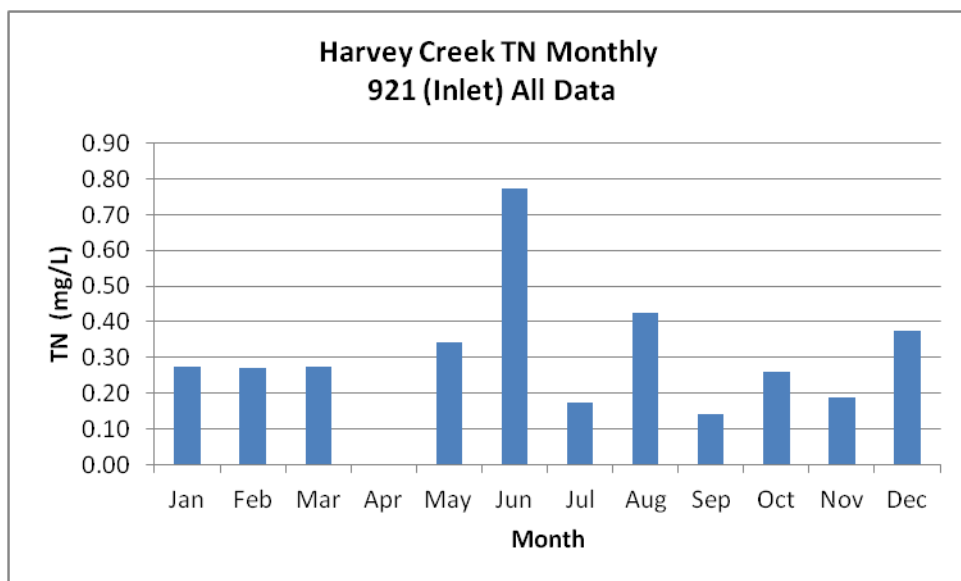


Figure B.4J.11. Harvey Creek WBID 921 Monthly Average TN 1992–2011

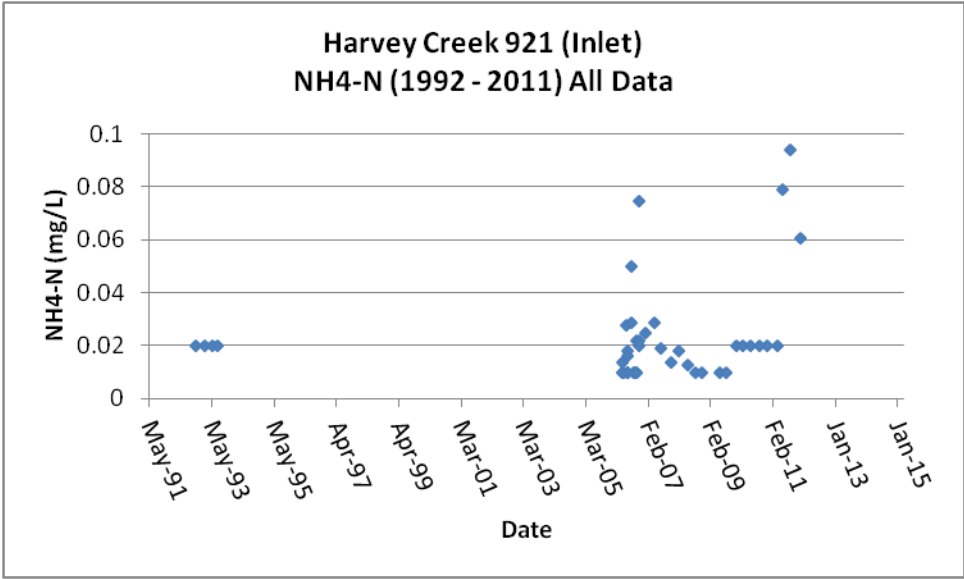


Figure B.4J.12. Harvey Creek WBID 921 Daily Average Ammonia-N 1992–2011

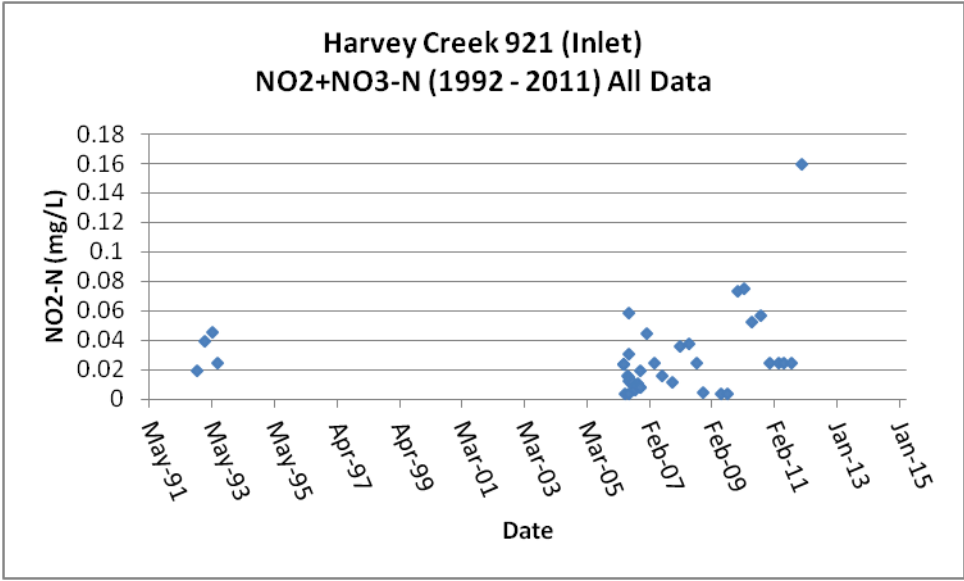


Figure B.4J.13. Harvey Creek WBID 921 Daily Average Nitrate/Nitrite-N 1992–2011

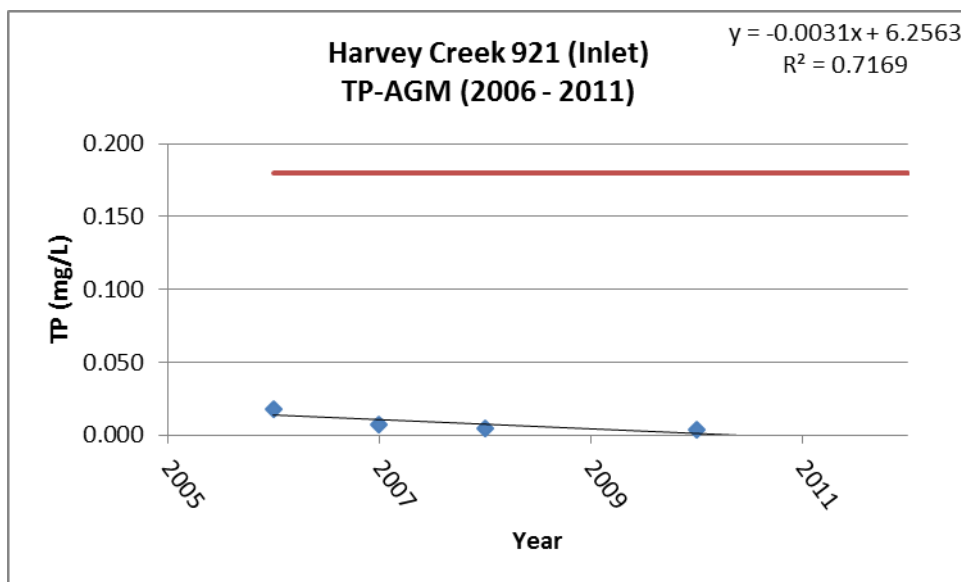


Figure B.4J.16. Harvey Creek WBID 921 Annual Geomean TP 2006–2011

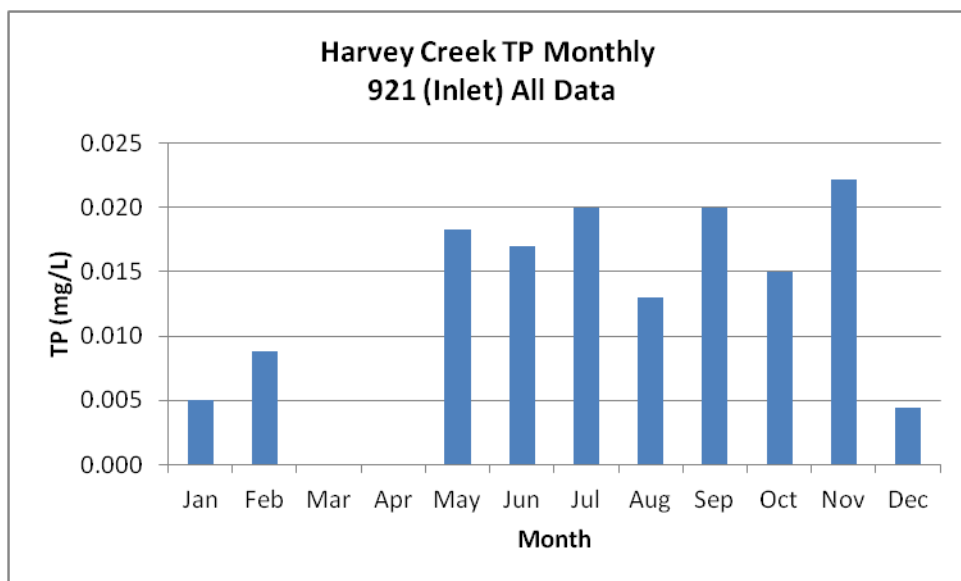


Figure B.4J.17. Harvey Creek WBID 921 Monthly Average TP 1992–2011

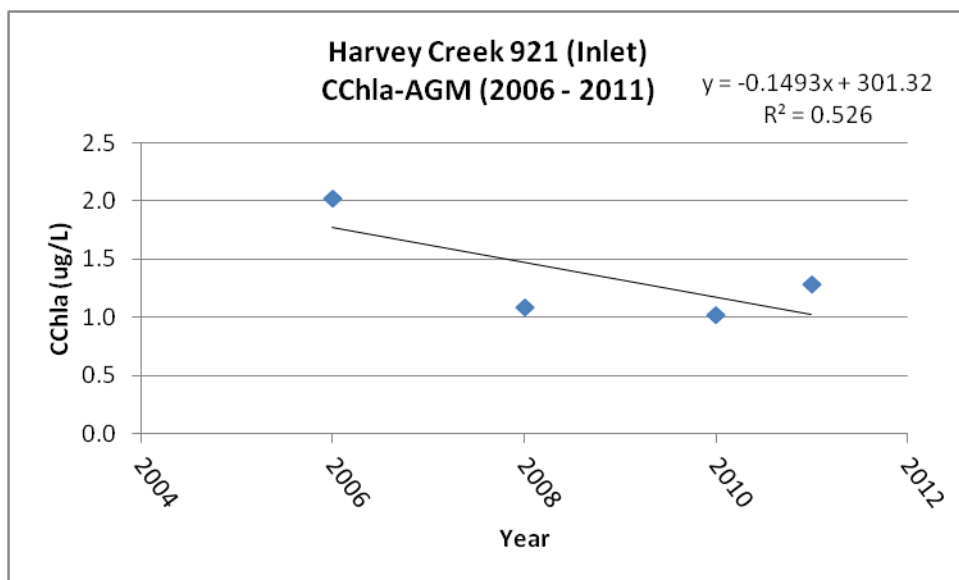


Figure B.4J.20. Harvey Creek WBID 921 Annual Geomean CChla 2006–2013

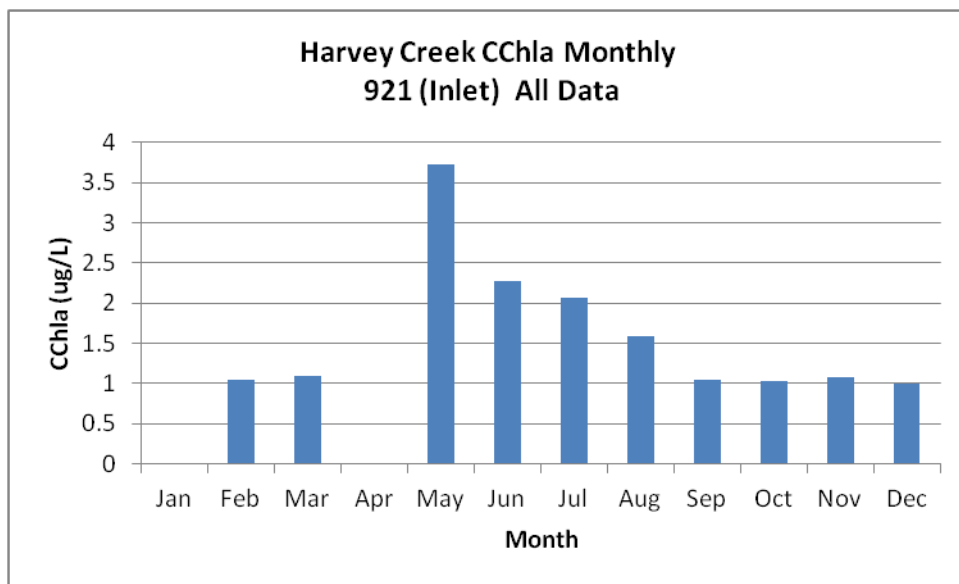
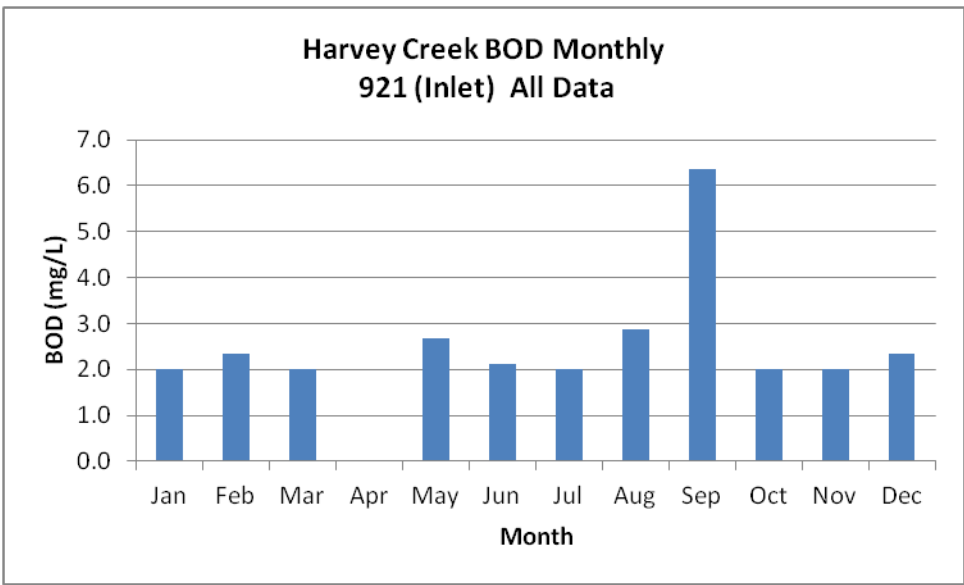
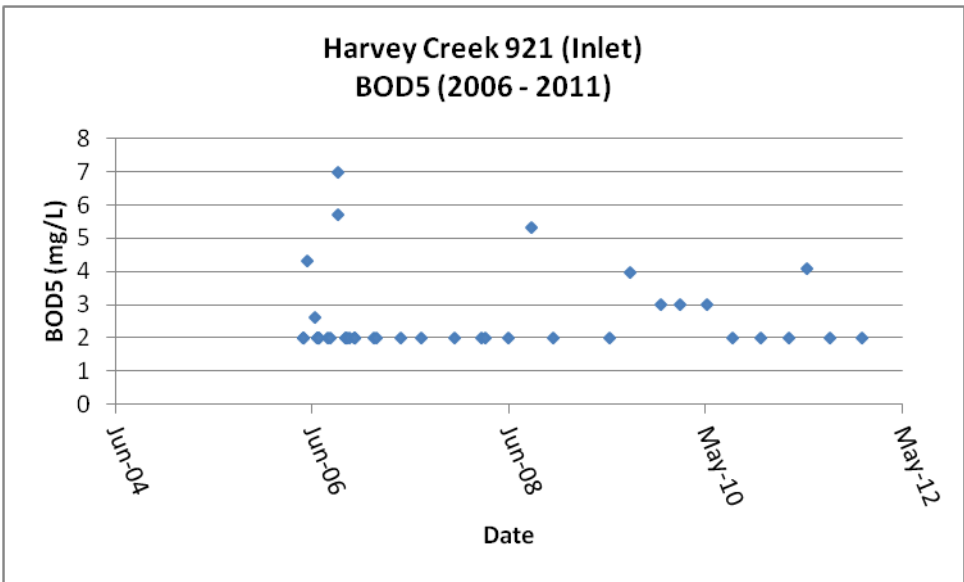


Figure B.4J.21. Harvey Creek WBID 921 Monthly Average CChla 2006–2011



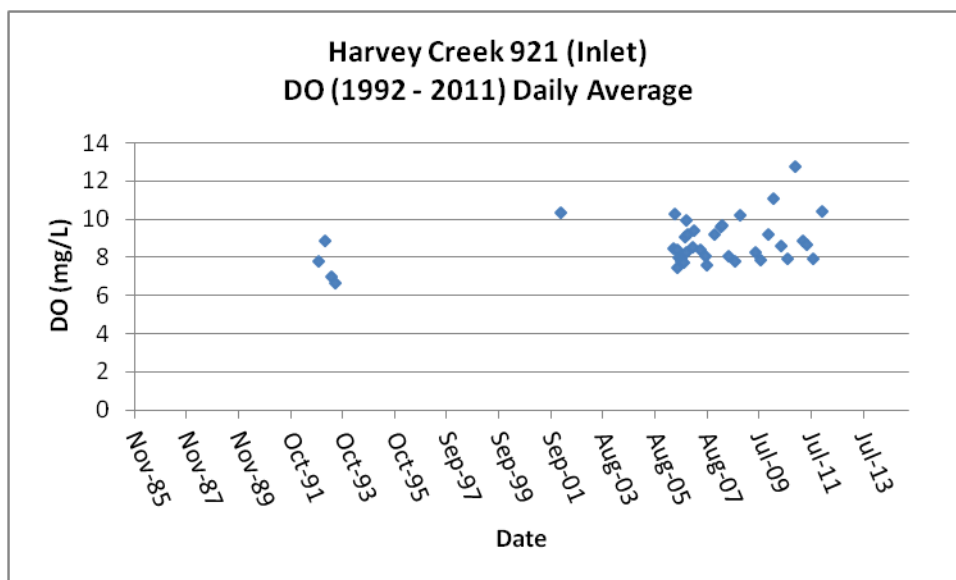


Figure B.4J.24. Harvey Creek WBID 921 Daily Average DO 1992–2011

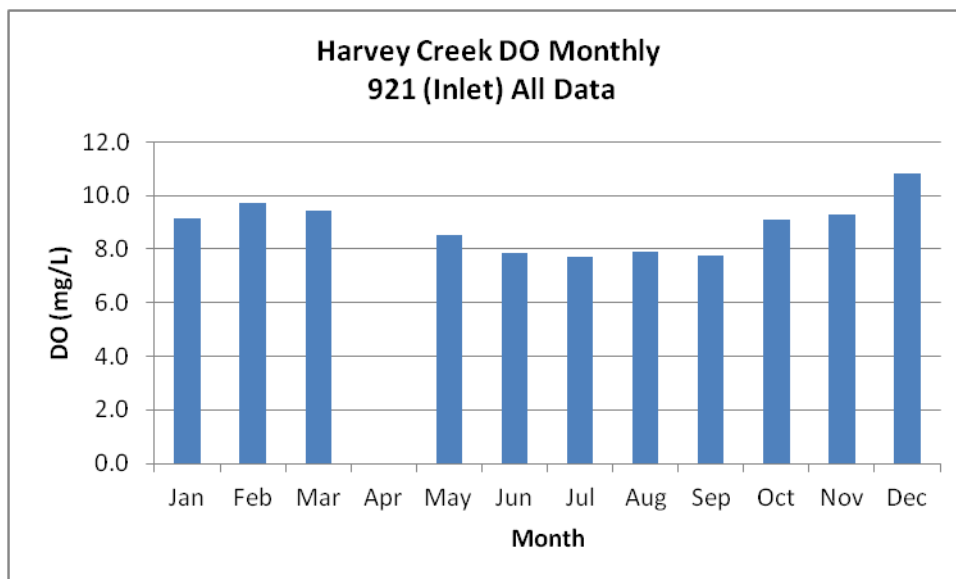


Figure B.4J.25. Harvey Creek WBID 921 Monthly Average DO 1992–2011

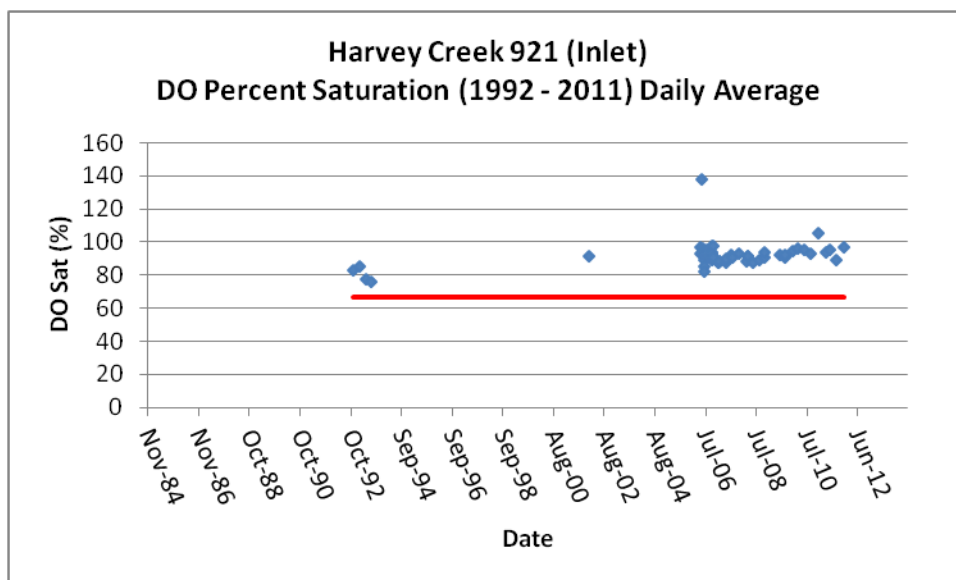


Figure B.4J.26. Harvey Creek WBID 921 Daily Average DO Percent Saturation 1992–2011

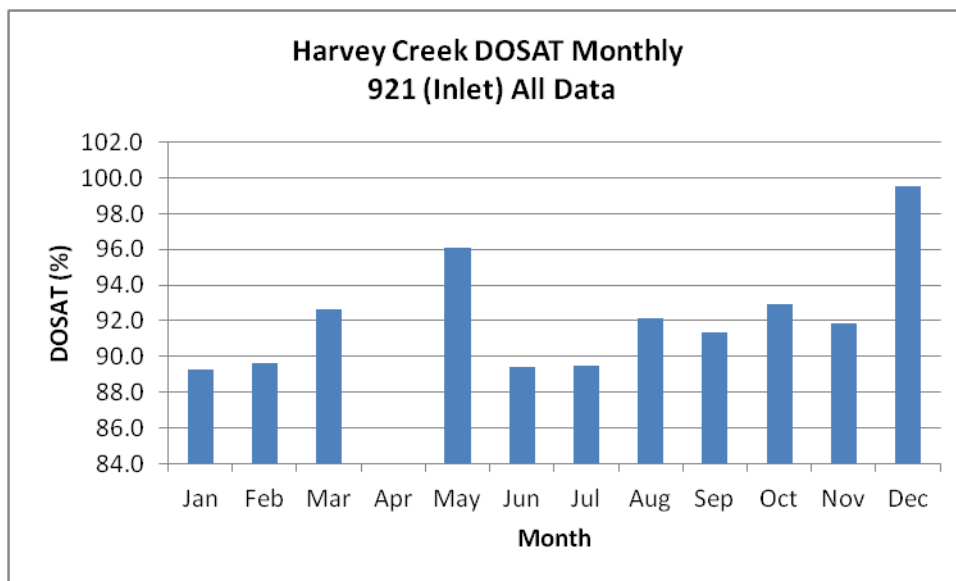


Figure B.4J.27. Harvey Creek WBID 921 Monthly Average DO Percent Saturation 1992–2011

Table B.4J.1. Harvey Creek WBID 921 IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
921	21FLPNS 921-C	Harvey Creek 921-C	2006	2006
921	21FLNWFD302449084330501	Harvey Creek @ Hwy. 20	1992	1993
921	21FLBRA 921-A	921 - Harvey Creek - at Joe Thomas Rd	2006	2006
921	21FLLEONLCOC3041384551	Harvey Creek @ 20	2010	2010
921	21FLPNS 22020318	Harvey crk- Hwy 20	1998	1999
921	21FLLEONLCOC3041384551	Harvey Creek @ 20	2010	2010
921	21FLWQA 302449908433059	Harvey Creek at SR 20	2002	2002
921	21FLBRA 921-C	921 - Harvey Creek - at SR 20	2006	2006
921	21FLBRA 921-B	921 - Harvey Creek - at Joe Thomas Rd II	2006	2006

Table B.4J.2. Harvey Creek WBID 921 Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
954	Alkalinity (mg/L)	1992 - 2011	3.9
954	Color-True (PCU)	1992 - 2011	28.7

Table B.4J.3. Harvey Creek WBID 921 DO Percent Saturation vs. 67 % Criterion

Year	Category	Result
1989 - 2012	Count	55
	Number P	55
	Number F	0
	Percent F	0.0
2005 - 2012	Count	50
	Number P	50
	Number F	0
	Percent F	0.0

Table B.4J.4. Harvey Creek WBID 921 Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN	TP	TN/TP	CChla
	AGM	AGM	Ratio	AGM
2006	0.26	0.017	14.8	2.0
2007	0.18	0.008	23.5	
2008	0.18	0.005	36.1	1.1
2009				
2010	0.34	0.003	98.4	1.0
2011	0.45			1.3

Table B.4J.5. Harvey Creek WBID 921 Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	1989 - 2012	55	7.3	31.0	19.4	18.5	17.8
Alkalinity	mg/L	2006 - 2012	43	1.0	22.0	4.2	4.7	3.9
pH	S.U.	1989 - 2012	55	4.3	8.4	6.3	N A	NA
Color	PCU	2006 - 2012	43	10.0	400.0	25.0	43.4	28.7
TN	mg/L	1989 - 2012	43	0.09	1.33	0.25	0.35	0.26
NH4-N	mg/L	1989 - 2012	43	0.010	0.09	0.02	0.02	0.02
NO23	mg/L	2000 - 2012	43	0.004	0.16	0.02	0.03	0.02
OrgN	mg/L							
TP	mg/L	1989 - 2012	42	0.002	0.051	0.020	0.016	0.012
PO4-P	mg/L	1989 - 2012	39	0.003	0.042	0.004	0.006	0.005
CChla	ug/L	1989 - 2012	36	1.0	17.0	1.1	2.0	1.5
BOD5	mg/L	2006 - 2012	42	2.0	7.0	2.0	2.5	2.4
DO	mg/L	1989 - 2012	55	6.7	12.8	8.5	8.7	8.7
%DOSat	%	1989 - 2012	55	76.1	138.4	91.8	92.4	92.1

Table B.4J.6. Harvey Creek WBID 921 Water Quality Data Summary Verified Period (2005–2012)

Constituent	Units	Verified Period	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2012	50	7.3	31.0	19.3	18.7	17.9
Alkalinity	mg/L	2005 - 2012	39	1.0	22.0	4.6	4.9	4.1
pH	S.U.	2005 - 2012	50	4.3	8.4	6.2	NA	NA
Color	PCU	2005 - 2012	39	10.0	400.0	25.0	41.2	27.0
TN	mg/L	2005 - 2012	39	0.09	1.33	0.25	0.35	0.25
NH4-N	mg/L	2005 - 2012	39	0.010	0.09	0.02	0.02	0.02
NO23	mg/L	2005 - 2012	39	0.004	0.16	0.02	0.03	0.02
OrgN	mg/L							
TP	mg/L	2005 - 2012	38	0.002	0.051	0.020	0.015	0.011
PO4-P	mg/L	2005 - 2012	39	0.003	0.042	0.004	0.006	0.005
CChla	ug/L	2005 - 2012	36	1.0	17.0	1.1	2.0	1.5
BOD5	mg/L	2005 - 2012	42	2.0	7.0	2.0	2.5	2.4
DO	mg/L	2005 - 2012	51	7.2	12.8	8.5	8.8	8.8
%DOSat	%	2005 - 2012	50	82.6	138.4	92.5	93.3	93.1

B.4K Polk Creek WBID 896 Drains to Lake Talquin

This WBID is not impaired for DO or nutrients.

Table B.4K.1 lists the 6 stations that have been sampled in Polk Creek WBID 896. **Figure B.4K.1** depicts the station locations.

Tables B.4K.5 and B.4K.6 and Figures B.4K.3 and B.4K.4 provide the results for alkalinity. These data show that Polk Creek has a POR GM alkalinity of 4.6 mg/L. All of the data is from the period 2006–2011. The limited data indicate higher alkalinity in the summer (up to 16 mg/L). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4K.5 and B.4K.6 and Figures B.4K.5 and B.4K.6 provide the results for true color. These data show that Polk Creek has a POR GM color of 87.2 PCU. All of the data is from the period 2006–2011. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4K.5 and B.4K.6 and Figures B.4K.8 through B.4K.11 provide the results for TN. These data show that Polk Creek has a POR GM TN of 0.46 mg/L. All of the data is from the period 2006–2011. There were four years during the period 2006–2011 with sufficient data to calculate AGM concentrations (**Figure B.4K.9**). These results show that the TN concentrations have not changed significantly over time and remain below the 1.03 mg/L TN AGM threshold concentration. The limited data indicate higher concentrations of TN during May and June (~0.65 mg/L) with concentrations less than 0.5 mg/L for much of the remaining months. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4K.5 and B.4K.6 and Figure B.4K.12 provide the results for NH₄-N. These data show that Polk Creek has a POR GM NH₄-N of 0.02 mg/L. All of the data is from the period 2006–2011. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4K.5 and B.4K.6 and Figure B.4K.13 provide the results for NO₃-N. These data show that Polk Creek has a POR GM NO₃-N of 0.02 mg/L. All of the data is from the period 2006–2011. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4K.5 and B.4K.6 and Figures B.4K.14 through B.4K.17 provide the results for TP. These data show that Polk Creek has a POR GM TP of 0.033 mg/L. All of the data is from the period 2006–2011. There were four years during the period 2006 - 2011 with sufficient data to calculate AGM concentrations. These results show that the TP concentrations maybe increasing over time (**Figure B14**), but remain below the new 0.18 mg/L AGM threshold concentration. Similar to TN, the highest concentrations of TP occur during May and June. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4K.5 and B.4K.6 and Figure B.4K.18 provide the results for PO₄-P. These data show that Polk Creek has a POR GM PO₄-P of 0.023 mg/L. All of the data is from the period 2006–

2011. The PO₄-P concentration appears elevated relative to the TP concentration. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4K.5 and B.4K.6 and Figures B.4K.19 through B.4K.21 provide the results for CChla. These data show that Polk Creek has a POR GM CChla of 1.6 ug/L. All of the data is from the period 2006–2011. There were three years between 2006 and 2011 with sufficient data to calculate AGM concentrations. These AGM concentrations are significantly less than the new threshold AGM concentration for CChla (**Figure B.4K.18**). The data set has a large number of less than detection results. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4K.5 and B.4K.6 and Figures B.4K.22 and B.4K.23 provide the results for BOD₅. These data show that Polk Creek has a POR GM BOD₅ of 2.3 mg/L. All of the results are from the period 2006 - 2011. There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4K.5 and B.4K.6 and Figures B.4K.24 and B.4K.25 provide the results for DO. These data show that Polk Creek has a POR GM DO of 8.7 mg/L. The data indicate that the recent (2005–2013) DO GM of 8.6 mg/L is equivalent to the POR concentration. The monthly average DO never drops below 6.0 mg/L (**Figure B.4K.23**). There is insufficient data to determine accurate long-term or seasonal patterns.

Tables B.4K.5 and B.4K.6 and Figures B.4K.26 and B.4K.27 provide the results for percent DO saturation. These data show that Polk Creek has a POR GM DOSAT of 96.0 %. The data indicate that the recent (2005–2013) DOSAT GM is the same as the GM for the POR. The data presented in **Figure B.4K.24** do not indicate an issue with the new DO percent saturation criterion. There is insufficient data to determine accurate long-term or seasonal patterns.



Figure B.4K.1. Polk Creek WBID 896 IWR Stations

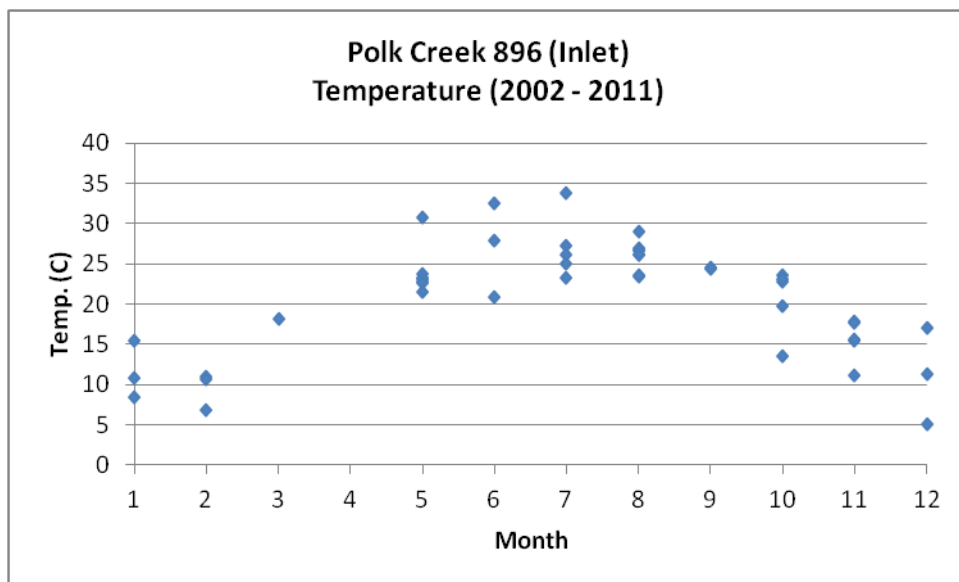


Figure B.4K.2. Polk Creek WBID 896 Monthly Temperature 2002–2011

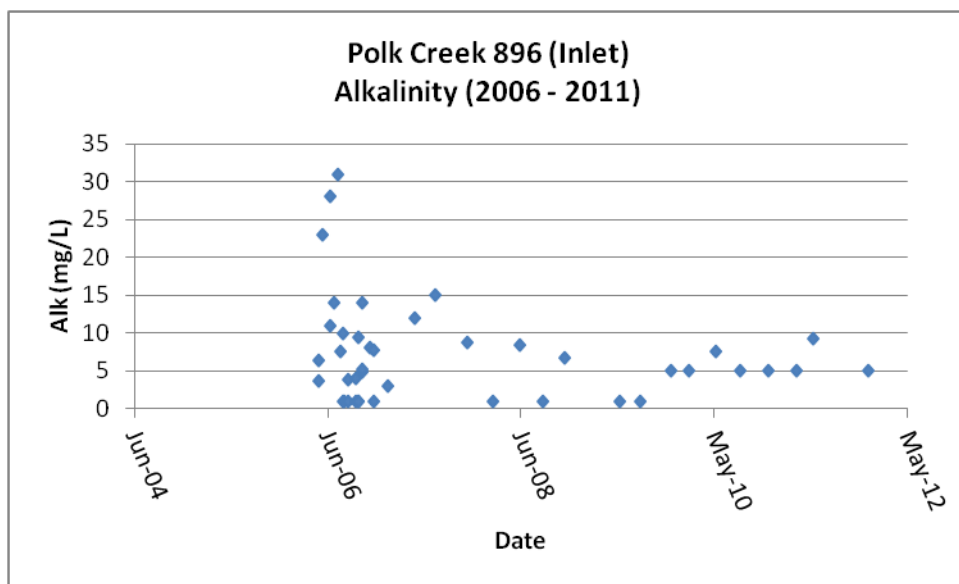


Figure B.4K.3. Polk Creek WBID 896 Daily Average Alkalinity 2006–2011

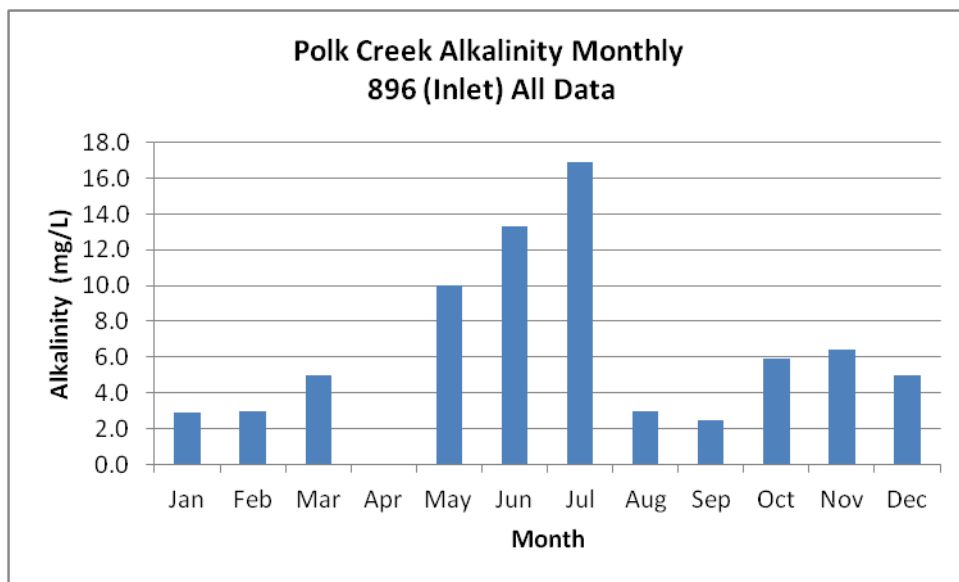


Figure B.4K.4. Polk Creek WBID 896 Monthly Average Alkalinity 2006–2011

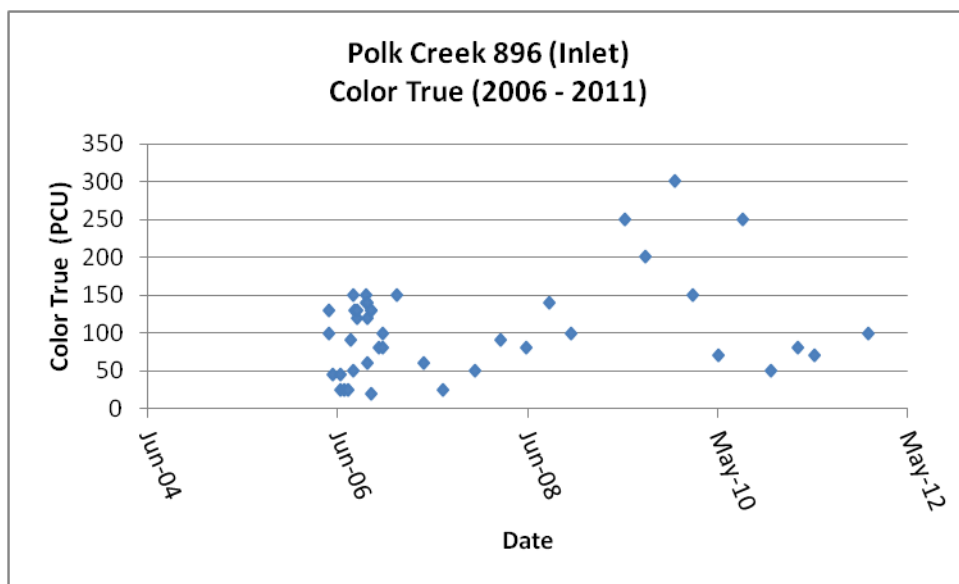


Figure B.4K.5. Polk Creek WBID 896 Daily Average True Color 2006–2011

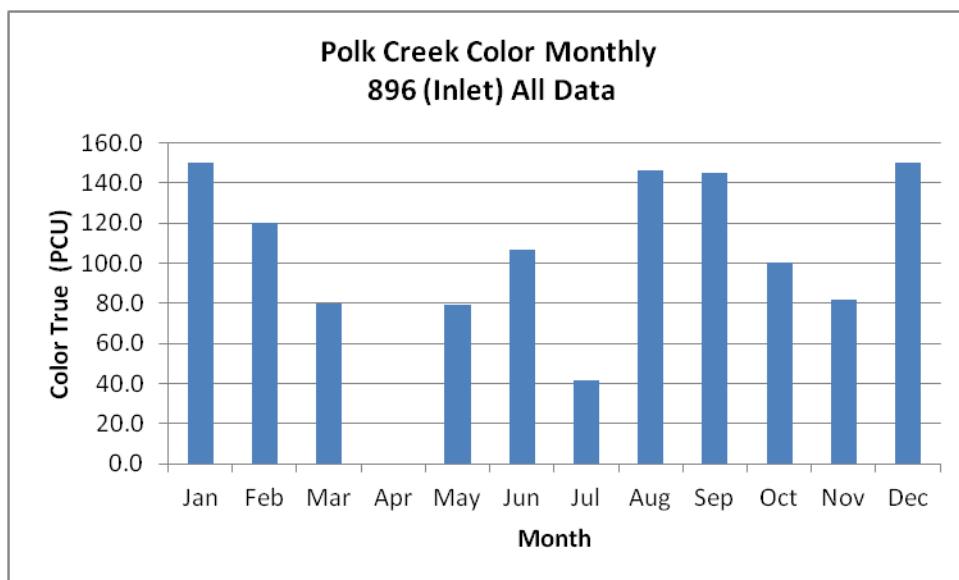


Figure B.4K.6. Polk Creek WBID 896 Monthly Average True Color 2006–2011

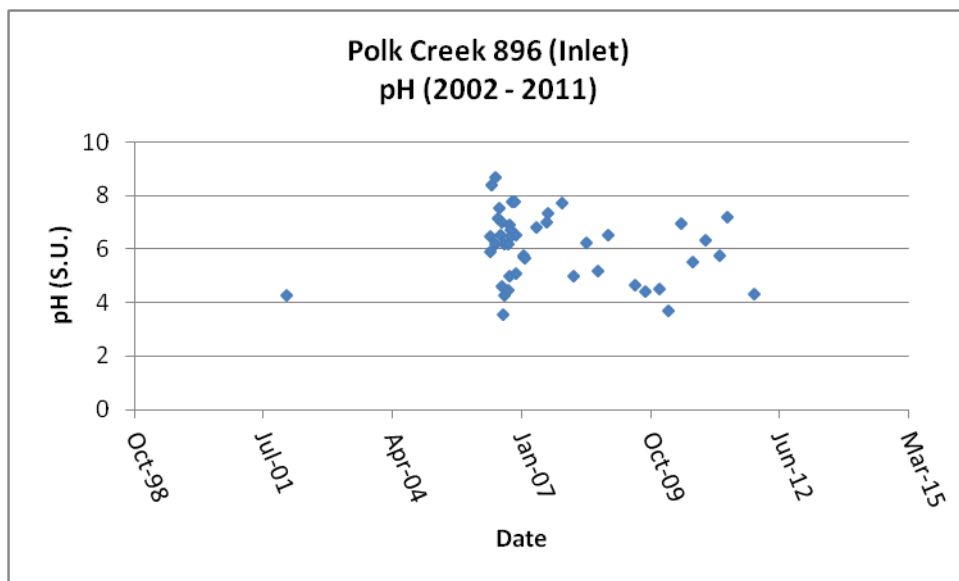


Figure B.4K.7. Polk Creek WBID 896 Daily pH 2002–2011

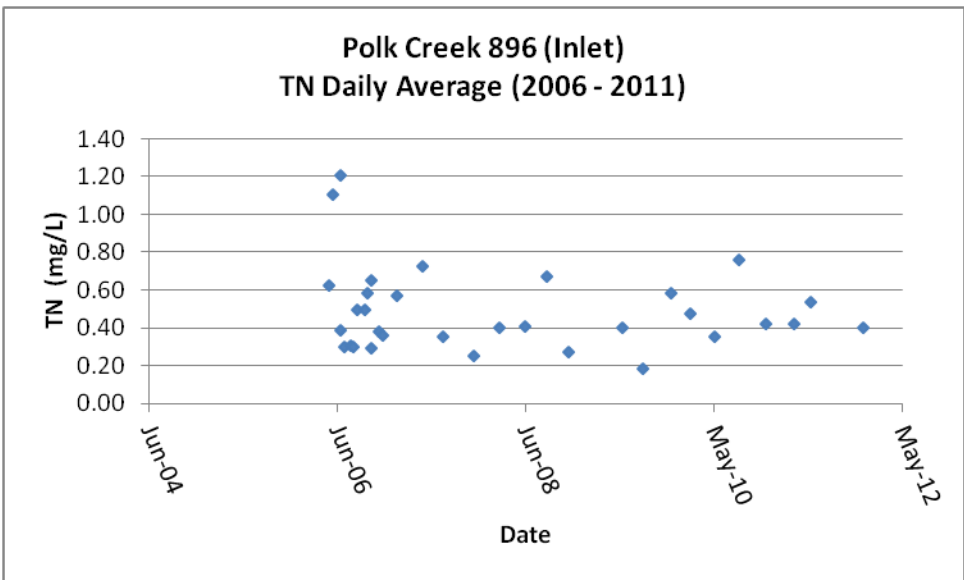


Figure B.4K.8. Polk Creek WBID 896 Daily Average TN2006–2011

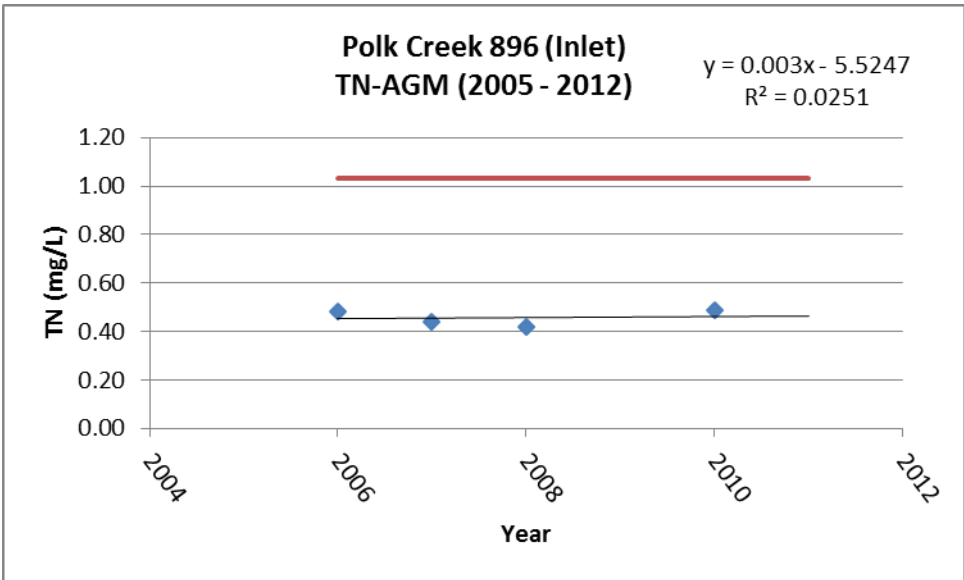


Figure B.4K.9. Polk Creek WBID 896 TN Annual Geomean 2005–2011

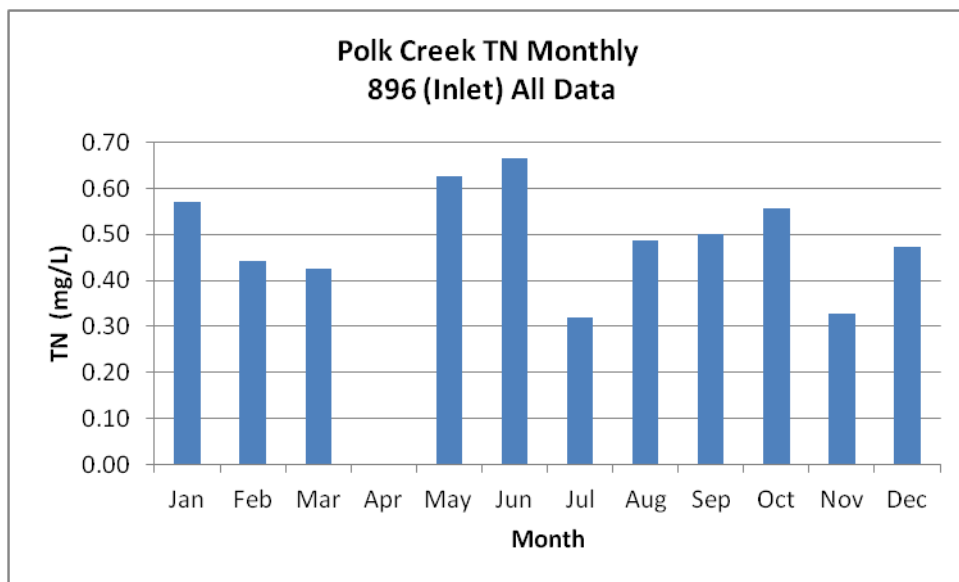


Figure B.4K.10. Polk Creek WBID 896 Monthly Average TN 2005–2011

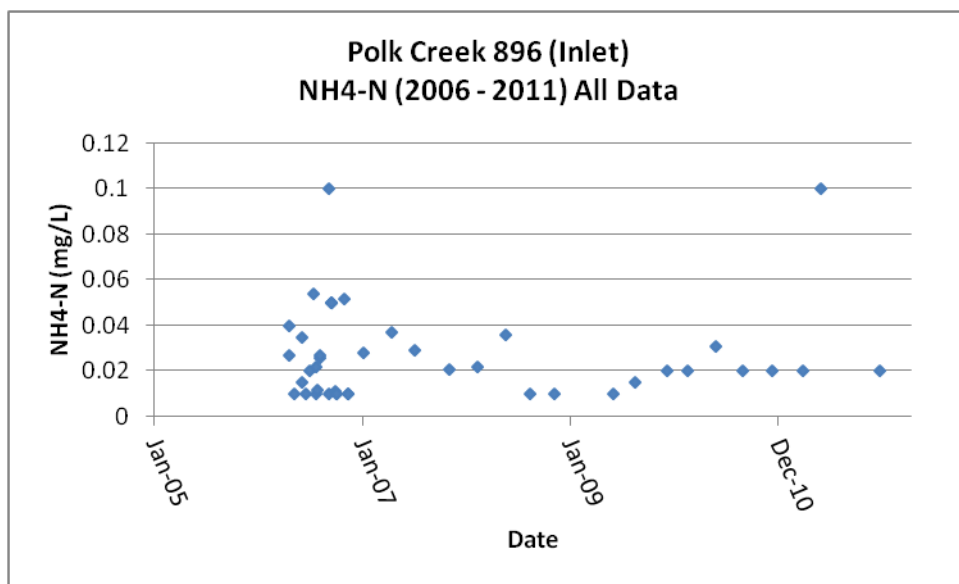


Figure B.4K.11. Polk Creek WBID 896 Daily Average Ammonia-N 2006–2011

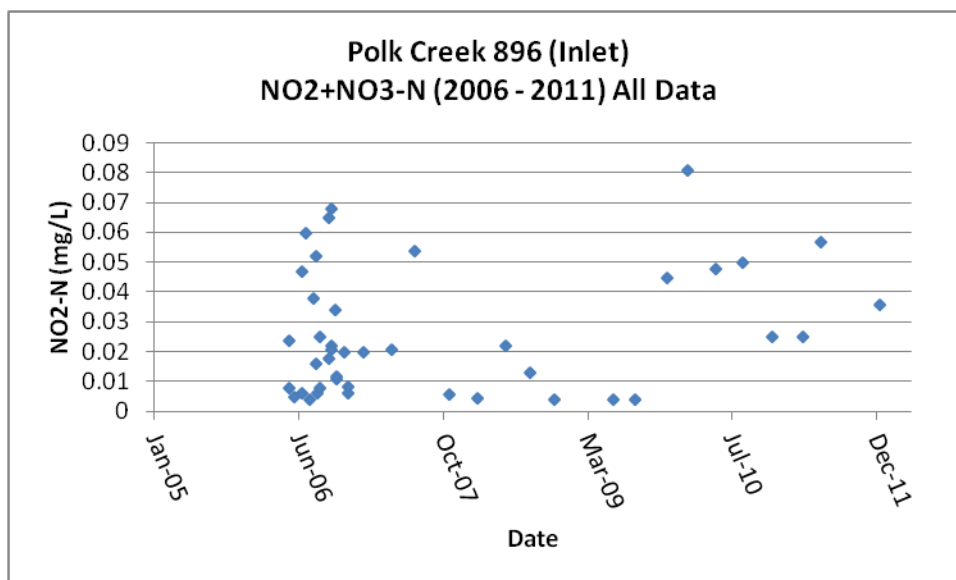


Figure B.4K.12. Polk Creek WBID 896 Daily Average Nitrate/Nitrite-N 2006–2011

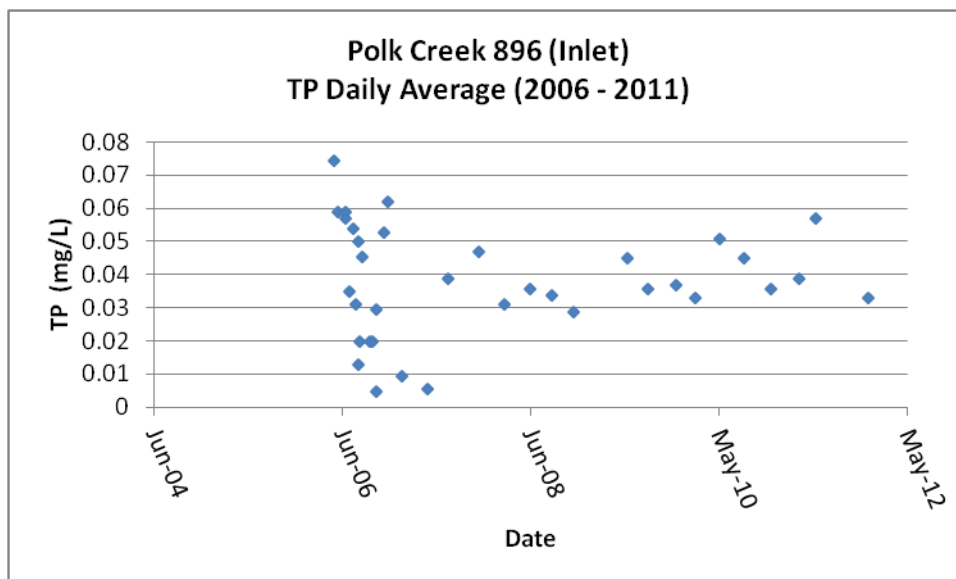


Figure B.4K.13. Polk Creek WBID 896 Daily Average TP 2006–2011

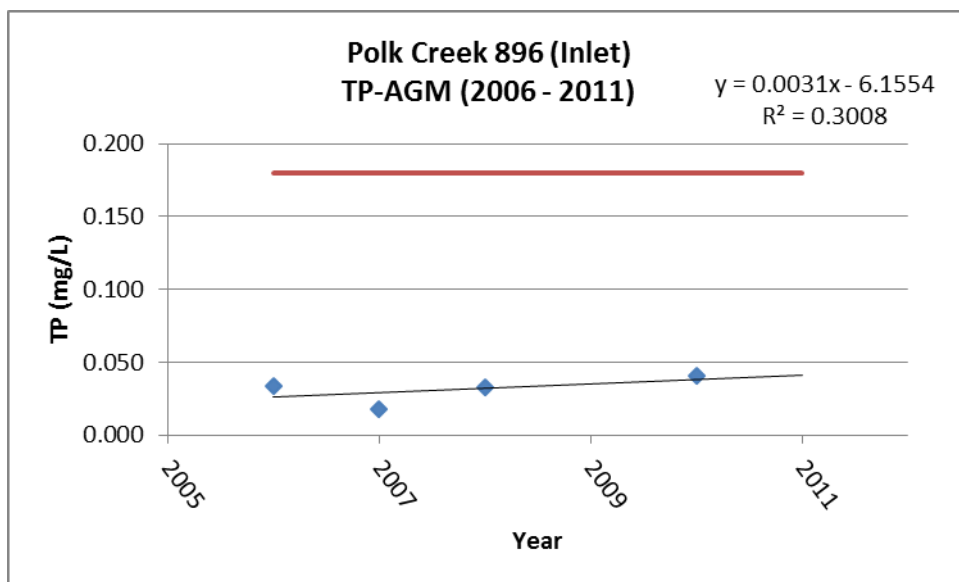


Figure B.4K.14. Polk Creek WBID 896 Annual Geomean TP 2006–2011

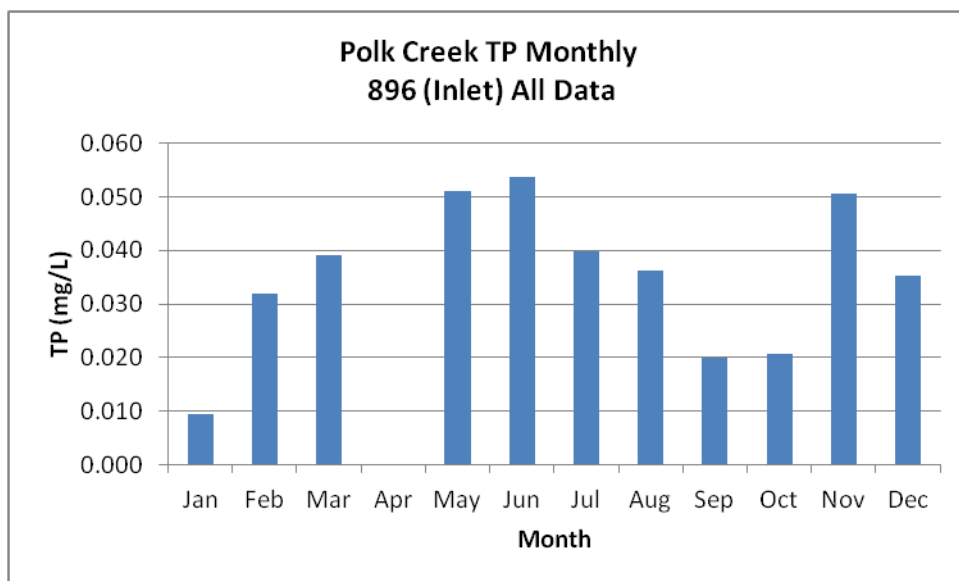


Figure B.4K.15. Polk Creek WBID 896 Monthly Average TP 2006–2011

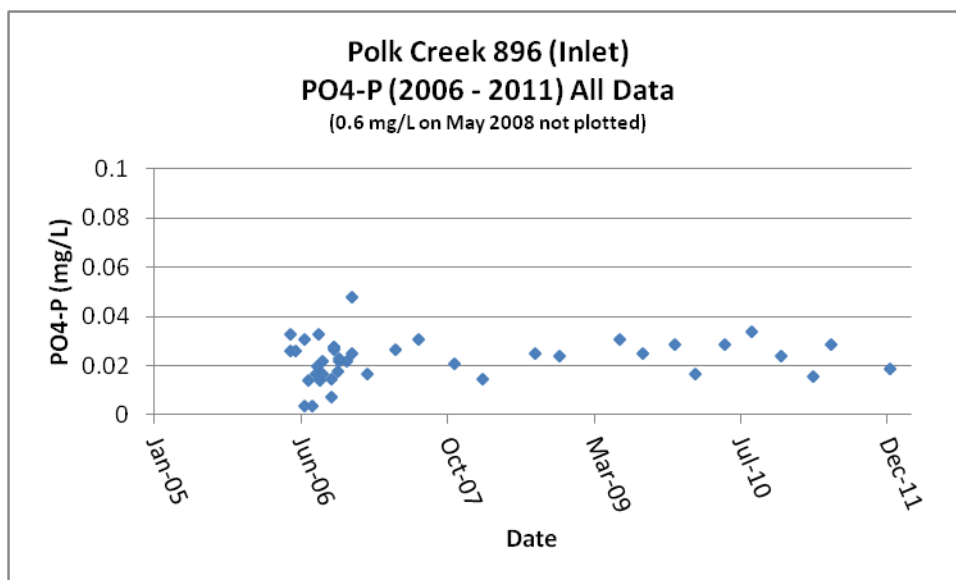


Figure B.4K.16. Polk Creek WBID 896 Daily Average Orthophosphate-P 2006–2011

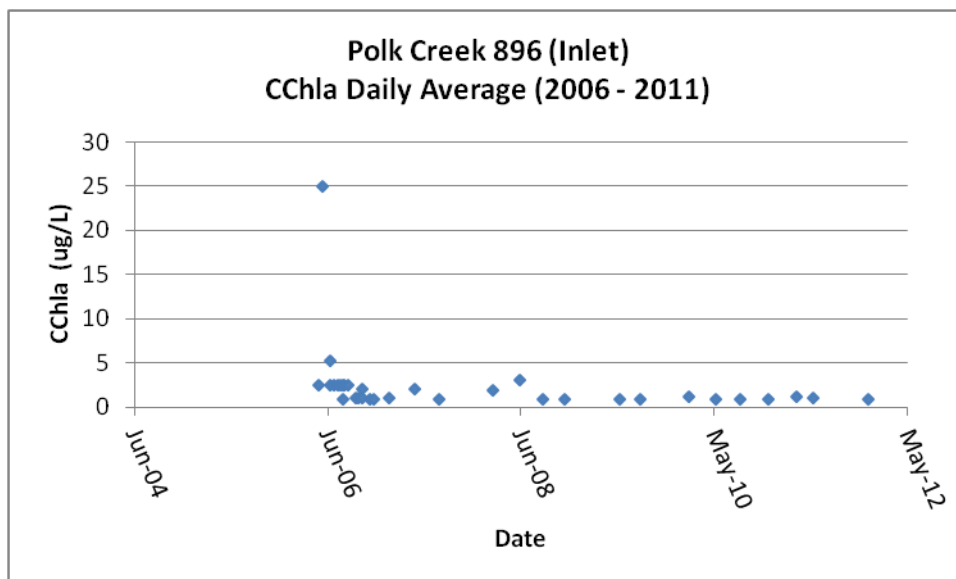


Figure B.4K.17. Polk Creek WBID 896 Daily Average CChla 2005–2011

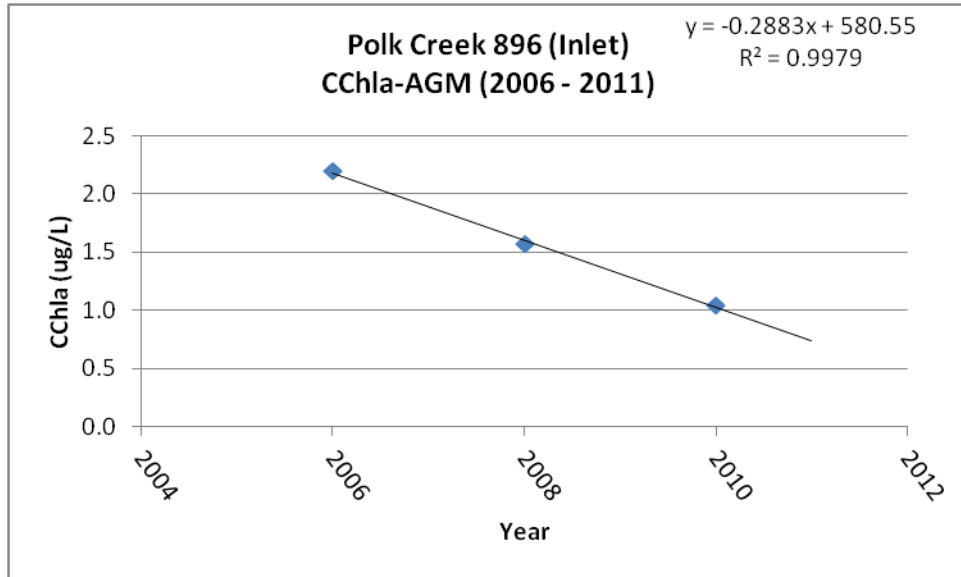


Figure B.4K.18. Polk Creek WBID 896 Annual Geomean CChla 2006–2011

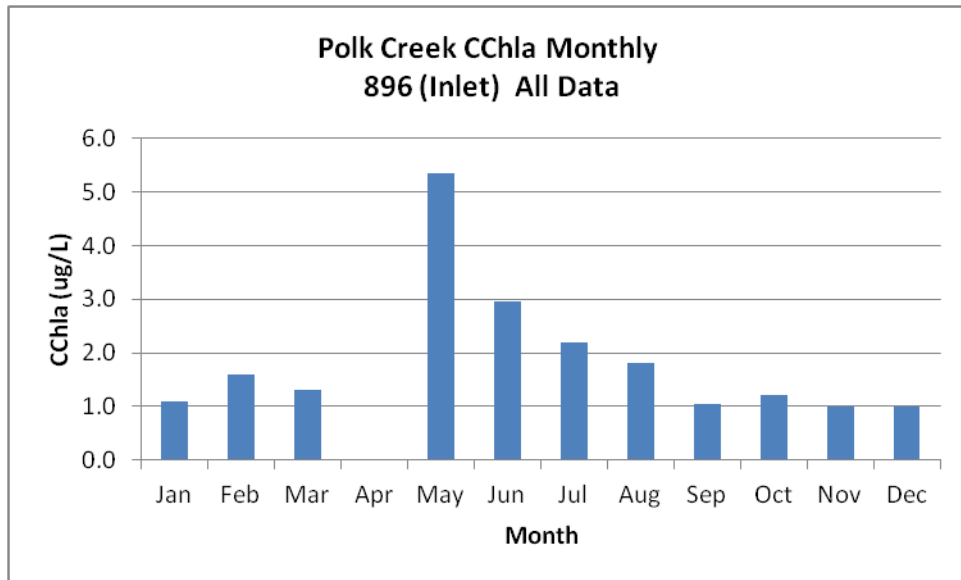


Figure B.4K.19. Polk Creek WBID 896 Monthly Average CChla 2006–2011

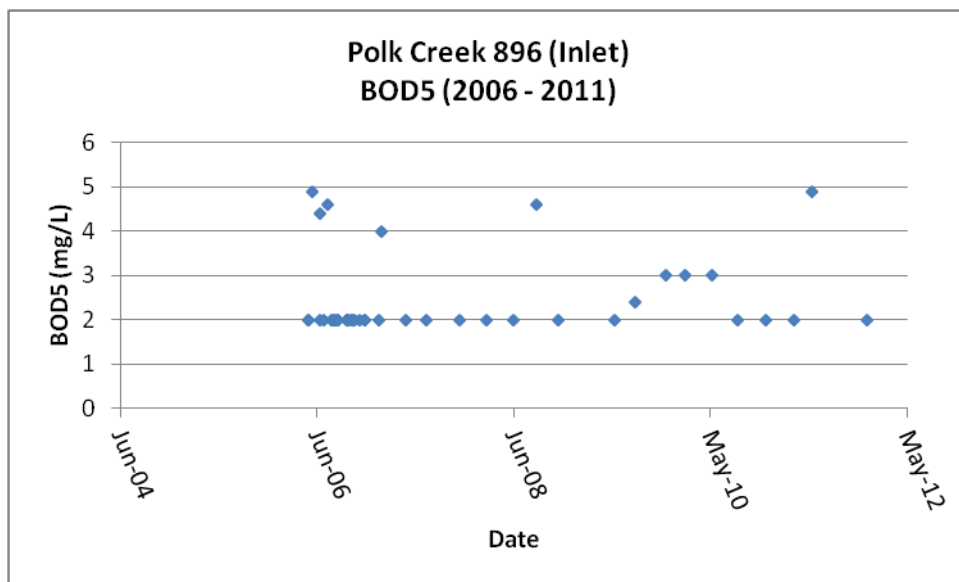


Figure B.4K.20. Polk Creek WBID 896 Daily Average BOD5–2011

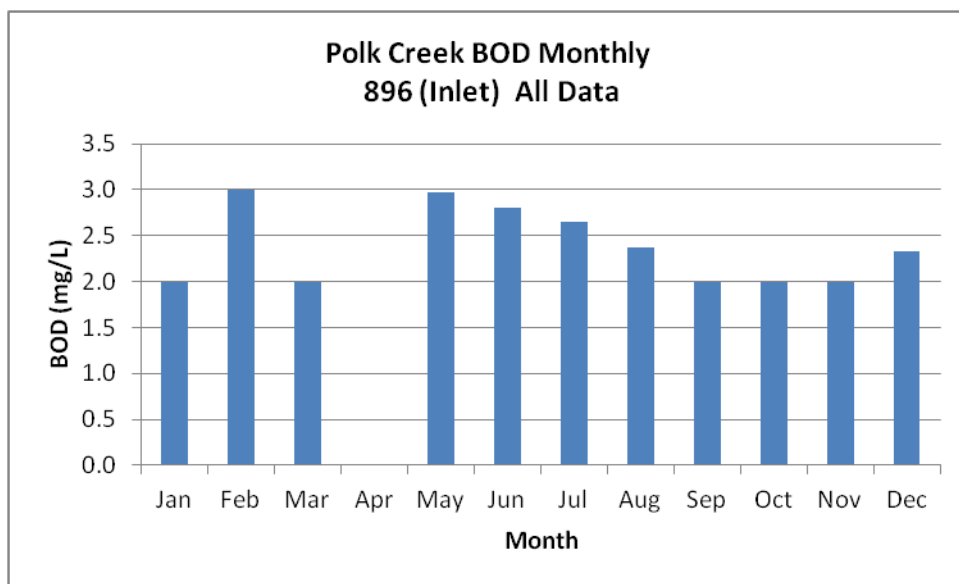


Figure B.4K.21. Polk Creek WBID 896 Monthly Average BOD5 2006–2011

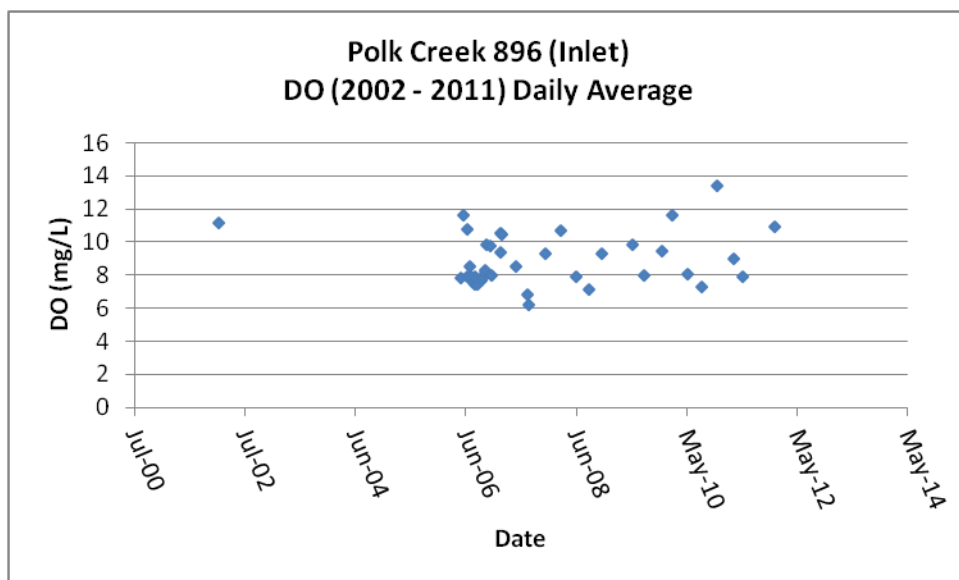


Figure B.4K.22. Polk Creek WBID 896 Daily Average DO 2002–2011

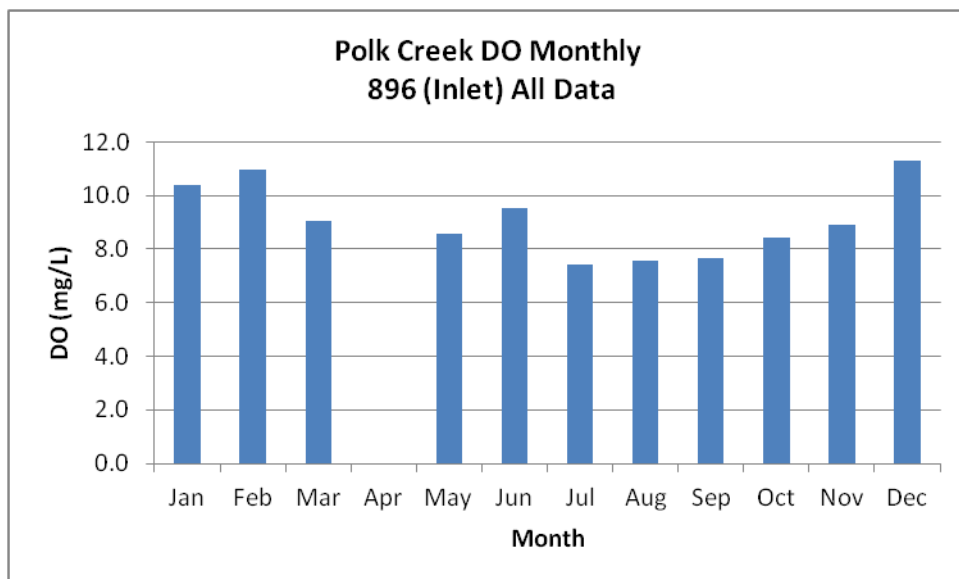


Figure B.4K.23. Polk Creek WBID 896 Monthly Average DO 2002–2011

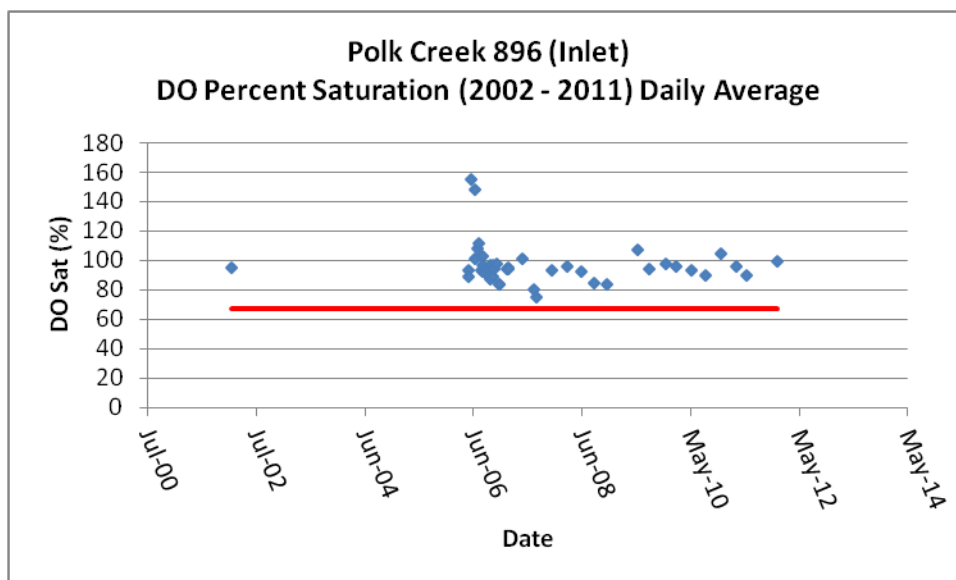


Figure B.4K.24. Polk Creek WBID 896 Daily Average DO Percent Saturation 2002–2011

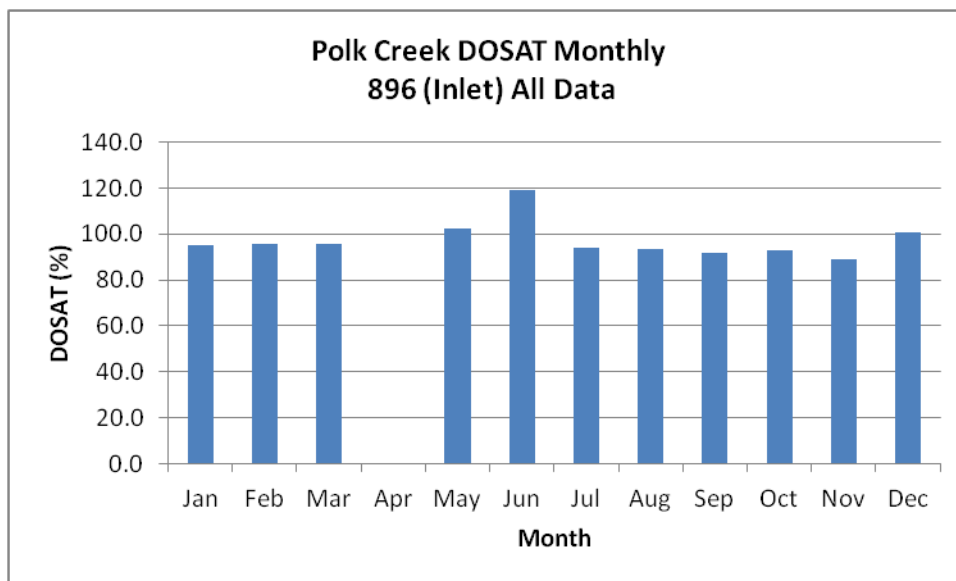


Figure B.4K.25. Polk Creek WBID 896 Monthly Average DO Percent Saturation 2002–2011

Table B.4K.1. Polk Creek WBID 896 IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
896	21FLPNS 22020319	Polk Creek-below hywy 20	1998	1998
896	21FLBRA 896-A	896 - Polk Creek - at highway 20	2006	2006
896	21FLLEONLCOC3043084529	Polk Creek @ 20	2010	2010
896	21FLLEONLCOC3043084529	Polk Creek @ 20	2010	2010
896	21FLBRA 896-B	896 - Polk Creek - at Sir Richard Rd.	2006	2006
896	21FLWQA 302550108431457	Polk Creek at SR 20	2002	2002

Table B.4K.2. Polk Creek WBID 896 Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
896	Alkalinity (mg/L)	2006 - 2011	4.6
896	Color-True (PCU)	2006 - 2011	87.2

Table B.4K.3. Polk Creek WBID 896 DO Percent Saturation vs. 67 % Criterion

Year	Category	Result
2002 - 2011	Count	45
	Number P	45
	Number F	0
	Percent F	0.0
2005 - 2012	Count	44
	Number P	44
	Number F	0
	Percent F	0.0

Table B.4K.4. Polk Creek WBID 896 Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN	TP	TN/TP	CChla
	AGM	AGM	Ratio	AGM
2006	0.48	0.034	14.2	2.2
2007	0.44	0.018	24.7	
2008	0.42	0.032	12.9	1.6
2009				
2010	0.49	0.041	12.0	1.0

Table B.4K.5. Polk Creek WBID 896 Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2002 - 2011	45	5.0	33.8	23.0	20.8	19.3
Alkalinity	mg/L	2006 - 2011	42	1.0	31.0	5.0	7.2	4.6
pH	S.U.	2002 - 2011	45	3.6	8.7	6.2	NA	NA
Color	PCU	2006 - 2011	42	20.0	300.0	100.0	105.5	87.2
TN	mg/L	2006 - 2011	39	0.18	1.21	0.43	0.50	0.46
NH4-N	mg/L	2006 - 2011	42	0.010	0.10	0.02	0.03	0.02
NO23	mg/L	2006 - 2011	42	0.004	0.08	0.02	0.03	0.02
OrgN	mg/L							
TP	mg/L	2006 - 2011	42	0.005	0.099	0.036	0.038	0.033
PO4-P	mg/L	2006 - 2011	42	0.004	0.600	0.024	0.037	0.023
CChla	ug/L	2006 - 2011	40	1.0	25.0	1.1	2.3	1.6
BOD5	mg/L	2006 - 2011	44	2.0	4.9	2.0	2.4	2.3
DO	mg/L	2002 - 2011	45	6.3	13.4	8.1	8.8	8.7
%DOSat	%	2002 - 2011	45	75.5	155.8	94.6	96.8	96.0

Table B.4K.6. Polk Creek WBID 896 Water Quality Data Summary Verified Period (2005–2012)

Constituent	Units	Verified Period	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2011	44	5.0	33.8	23.0	21.1	19.7
Alkalinity	mg/L	2005 - 2011	42	1.0	31.0	5.0	7.2	4.6
pH	S.U.	2005 - 2011	44	3.6	8.7	6.2	NA	NA
Color	PCU	2005 - 2011	42	20.0	300.0	100.0	105.5	87.2
TN	mg/L	2005 - 2011	39	0.18	1.21	0.43	0.50	0.46
NH4-N	mg/L	2005 - 2011	42	0.010	0.10	0.02	0.03	0.02
NO23	mg/L	2005 - 2011	42	0.004	0.08	0.02	0.03	0.02
OrgN	mg/L							
TP	mg/L	2005 - 2011	42	0.005	0.099	0.036	0.038	0.033
PO4-P	mg/L	2005 - 2011	42	0.004	0.600	0.024	0.037	0.023
CChla	ug/L	2005 - 2011	40	1.0	25.0	1.1	2.3	1.6
BOD5	mg/L	2005 - 2011	44	2.0	4.9	2.0	2.4	2.3
DO	mg/L	2005 - 2011	44	6.3	13.4	8.1	8.7	8.6
%DOSat	%	2005 - 2011	44	75.5	155.8	94.5	96.9	96.0

B.4L Upper Lake Talquin WBID 1297D

This WBID is verified impaired for nutrients due to elevated TSI (Chapter 2 of TMDL Report). Florida has newly adopted criteria for dissolved oxygen, total nitrogen, total phosphorous, and chlorophyll a (Chapter 3 of TMDL Report). DEP has not formally assessed the data for the Lake Talquin watershed under the new criteria. However, based on preliminary analysis, it is highly likely that Lake Talquin, currently listed as verified impaired for DO and nutrients will still be listed as verified impaired under the new criteria. Based on extensive analysis of data from lakes in Florida, DEP has concluded that the health of lakes is best related to the area in the state in which the lake exists, the long-term color and alkalinity of the lake, and the level of nutrients and CChla present in the lake and maintaining an appropriate level of dissolved oxygen as compared to the percent saturation criterion for DO (Chapter 3 of TMDL Report). These data are best assessed as the long-term geomean (GM) for color and alkalinity and as the annual geomean for TN, TP, and CChla. As such, the presentation of data for the lake will use POR GMs for color and alkalinity and AGMs for nutrients and CChla. Lake Talquin is in the Panhandle East Nutrient Watershed Region (for streams/rivers). The numeric nutrient thresholds contained in Rule 62-302. 531, FAC, for lakes vary depending on color, alkalinity, CChla data sufficiency (for calculating AGM concentrations), and the CChla AGM concentration. The POR GM alkalinity and color for this segment of the lake is 16.8 mg/L and 62.3 PCU. This characterizes this section of the lake as high color, in which case the alkalinity does not impact the threshold concentrations for nutrients and CChla. The threshold for CChla is an AGM greater than 20 ug/L, TP AGM can range between 0.05 mg/L and 0.16 mg/L and TN AGM between 1.27 mg/L and 2.23 mg/L depending on the CChla AGM concentration (Chapter 3 of TMDL Report).

In some graphs for AGM TN, TP and CChla and daily average percent DOSAT (for lakes the DO data is from the upper two meters of the water column) lines are presented that represent the new thresholds. DEP notes that the data presented on these graphs has not been processed in accordance with all of the requirements of the new regulations in rule 62-303, F.A.C. As a result, a determination of compliance with the new criteria cannot be made from these data.

Table B.4L.1 lists the 32 stations that have been sampled in Lake Talquin Upper (WBID 1297D). **Figure B.4L.1** depicts the station locations.

Tables B.4L.5 and **B.4L.6** and **Figures B.4L.5** and **B.4L.6** provide the results for alkalinity. These data show that Lake Talquin Upper has a POR geomean (GM) alkalinity of 16.8 mg/L. The data indicate that the alkalinity for the period (2005–2013) is similar to the POR (GM 16.8 mg/L vs. 16.5 mg/L). The seasonal pattern indicates that the alkalinity is lowest in the first three months of the year (~ 12 mg/L), as flow into the lake and rainfall increase and gradually increases through August to just over 20 mg/L, (corresponding somewhat to changes in incoming flow) and then remaining around 18–19 mg/L for the rest of the year. This pattern for alkalinity is inversely related to river flow (flow highest in first three months of the year **Figure B.3.12**) and alkalinity at the lowest.

Tables B.4L.5 and B.4L.6 and Figures B.4L.7 and B.4L.8 provide the results for true color. These data show that Upper Lake Talquin has a POR GM color of 62.3 PCU, equivalent to the incoming color of the Ochlockonee River of 62.5 and the Little River (63.1). The data indicate that the GM color for the period (2005–2013) of 52.8 PCU is reduced relative to the POR color. The combined mean flow of Ochlockonee and Little Rivers for the period 1998–2013 of 1,021 cfs is slightly less than the flow of 1,080 cfs for the period 2005–2013, although the annual average rainfall was 2.3 inches greater for the earlier period (56.5 vs. 54.2 inches). The seasonal pattern indicates that the color appears more closely related to changes in incoming river flow (increasing with increased flow and decreasing with decreased flow) more so than local rainfall (**Figures B.3.12 and B.2.4**).

Tables B.4L.5 and B.4L.6 and Figures B.4L.10 through B.4L.13 provide the results for TN. These data show that Lake Talquin Upper has a POR GM TN of 0.62 mg/L. The data (**Figure B.4L.12**) indicate that the recent (2005–2013) TN GM of 0.68 mg/L is similar to the TN GM for the POR and less than the new default (1.27 mg/L) threshold AGM concentration for TN. The data also indicate that the overall trend appears to be for increasing AGM TN concentrations. The seasonal pattern indicates that the TN concentration generally increase slightly from January through July, then decreasing through the end of the year. This pattern for TN is not clearly related to flow or rainfall (**Figures B.3.12 and B.2.4**).

Tables B.4L.5 and B.4L.6 and Figures B.4L.14 and B.4L.15 provide the results for NH₄-N. These data show that Lake Talquin Upper has a POR GM NH₄-N of 0.055 mg/L. The data indicate that the recent (2005–2013) NH₄-N GM of 0.033 mg/L is measurably less than the POR concentration and that the overall trend may be masked by the number of results reported as less than detection.

Tables B.4L.5 and B.4L.6 and Figures B.4L.16 and B.4L.17 provide the results for NO₃-N. These data show that Lake Talquin Upper has a POR GM NO₃-N of 0.063 mg/L. The data indicate that the recent (2005–2013) NO₃-N GM of 0.038 mg/L is reduced over the POR concentration and that there does not appear to be a trend for this constituent.

Tables B.4L.5 and B.4L.6 and Figures B.4L.19 through B.4L.22 provide the results for TP. These data show that Lake Talquin Upper has a POR GM TP of 0.045 mg/L. The data (**Figure B.4L.21**) indicate that the recent (2005–2013) TP GM of 0.056 mg/L is measurably greater than the TP GM for the POR and slightly greater than the new 0.05 mg/L threshold AGM concentration for TP. The data also indicate that the overall trend is for increasing AGM TP concentrations. The seasonal pattern is similar to TN, with TP concentration generally increasing through July and then decreasing slightly through the rest of the year. This pattern for TP is not clearly related to flow or rainfall (**Figures B.3.12 and B.2.4**).

Tables B.4L.5 and B.4L.6 and Figures B.4L.22 and B.4L.23 provide the results for PO₄-P. These data show that the Lake Talquin Upper has a POR GM PO₄-P of 0.020 mg/L. The data indicate that the recent (2005–2013) PO₄-P GM of 0.013 mg/L is about half of the POR

concentration and that the overall trend may be masked by the number of results reported as less than detection.

Tables B.4L.5 and B.4L.6 and Figures B.4L.25 through B.4L.28 provide the results for CChla. These data show that Lake Talquin Upper has a POR GM CChla of 5.7 ug/L. The data (**Figure B.4L.27**) indicate that the recent (2005–2013) CChla GM of 5.2 ug/L is similar to the CChla GM for the POR and less than the new threshold AGM concentration for CChla. The data also indicate that the overall trend is for increasing AGM CChla concentrations. The seasonal pattern indicates that the CChla concentrations peak in June decrease significantly in July, then increasing through August, and slowly reducing concentrations for the remaining months of the year. The pattern in CChla may be influenced by heavy rainfall in June through August, bringing in lower CChla concentrations from the rivers, diluting the lake, and reducing the residence time of the lake (**Figures B.3.12 and B.2.4**).

Tables B.4L.5 and B.4L.6 and Figures B.4L.29 through B.4L.31 provide the results for BOD5. These data show that Lake Talquin Upper has a POR GM BOD5 of 1.7 mg/L. The data indicate that the recent (2005–2013) BOD5 GM of 1.8 mg/L is not significantly different than the POR concentration. Variable detection limits over time may be having an influence on the data. There is no apparent overall trend.

Tables B.4L.5 and B.4L.6 and Figures B.4L.32 and B.4L.33 provide the results for DO. These data show that Lake Talquin Upper has a POR GM DO of 6.1 mg/L. The data indicate that the recent (2005–2013) DO GM of 6.4 mg/L is similar to the POR concentration. There is no apparent overall trend in time. Seasonal data indicate that the monthly average DO reaches a minimum of 5.0 mg/L during August and is greater than this for the remaining months of the year (**Figure B.4L.33**).

Tables B.4L.5 and B.4L.6 and Figures B.4L.34 through B.4L.36 provide the results for percent DO saturation. These data show that Lake Talquin Upper has a POR GM DOSAT of 69.3 %. The data indicate that the recent (2005–2013) DOSAT GM of 69.1 % is similar to the GM for the POR. The data do not appear to have a long-term trend. The data presented in **Figure B.4L.34** indicates that there are sufficient results below the new DO criterion to warrant further investigation. The seasonal pattern indicates that the DOSAT is lowest in August.

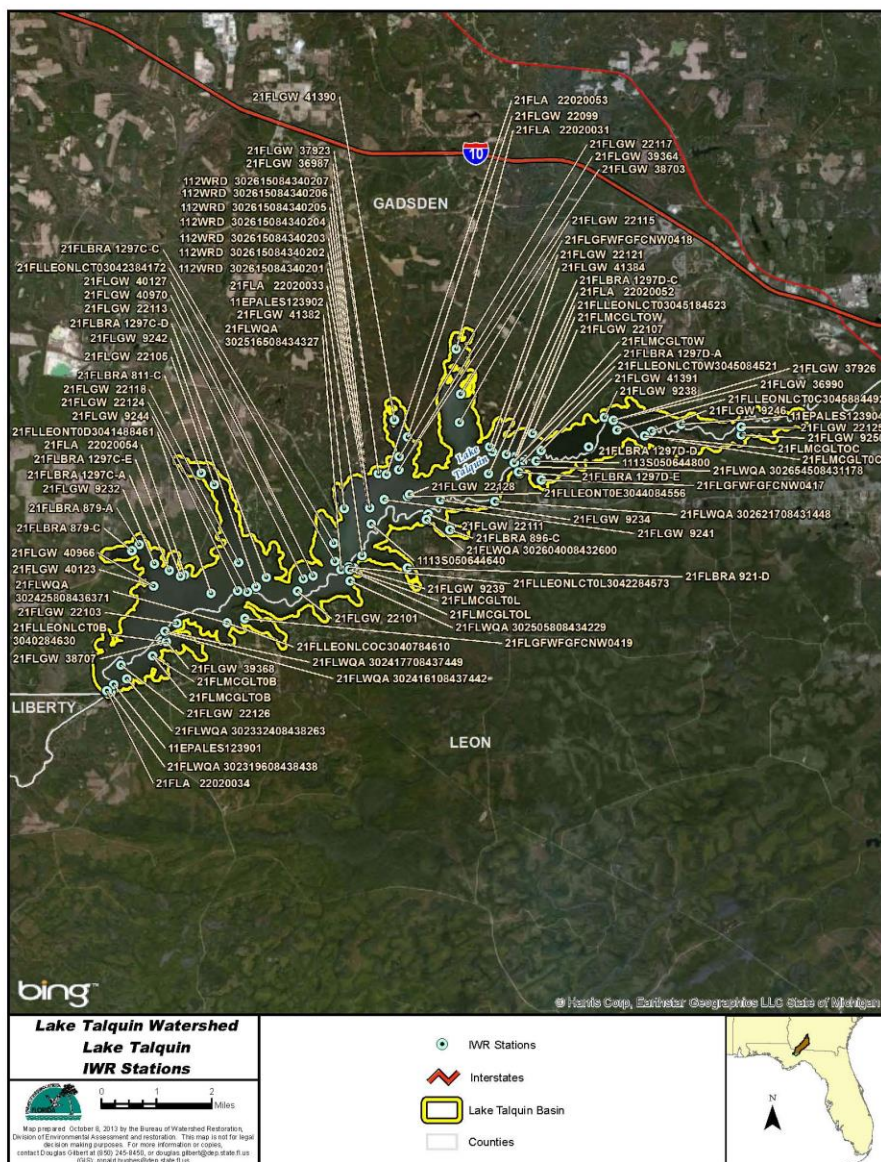


Figure B.4L.1. Lake Talquin WBIDs 1297D and 1297C IWR Stations

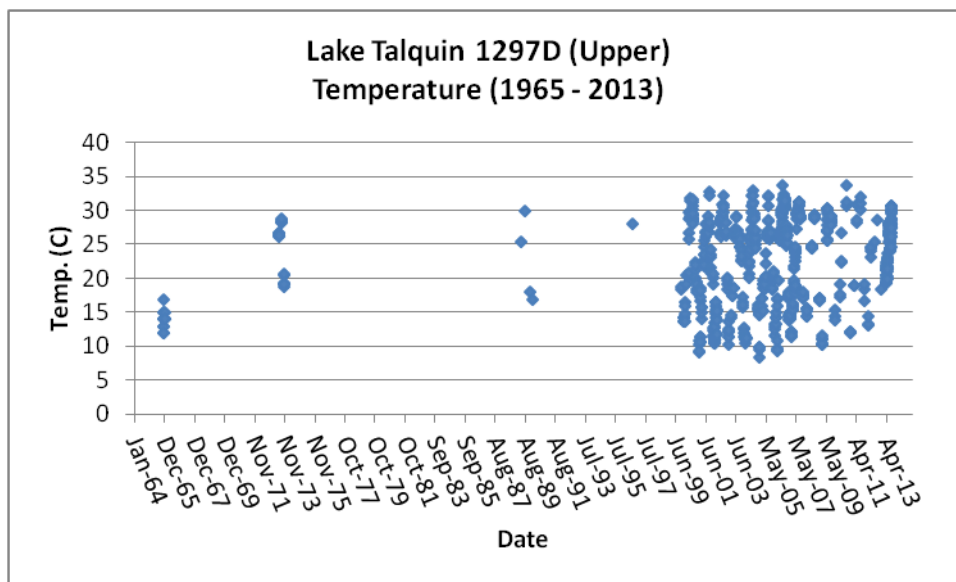


Figure B.4L.2. Lake Talquin Upper WBID 1297D Daily Temperature 1965–2013

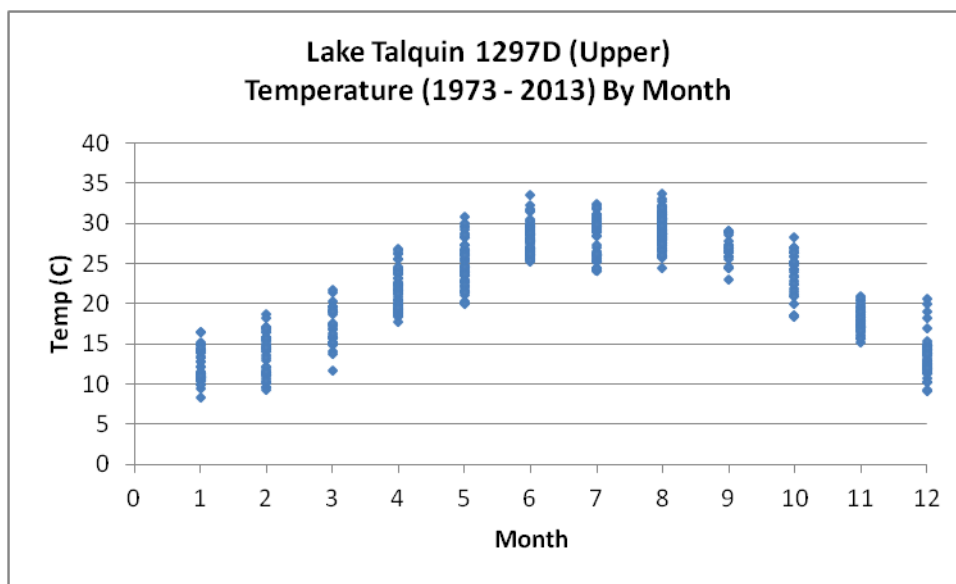


Figure B.4L.3. Lake Talquin Upper WBID 1297D Monthly Temperature 1973–2013

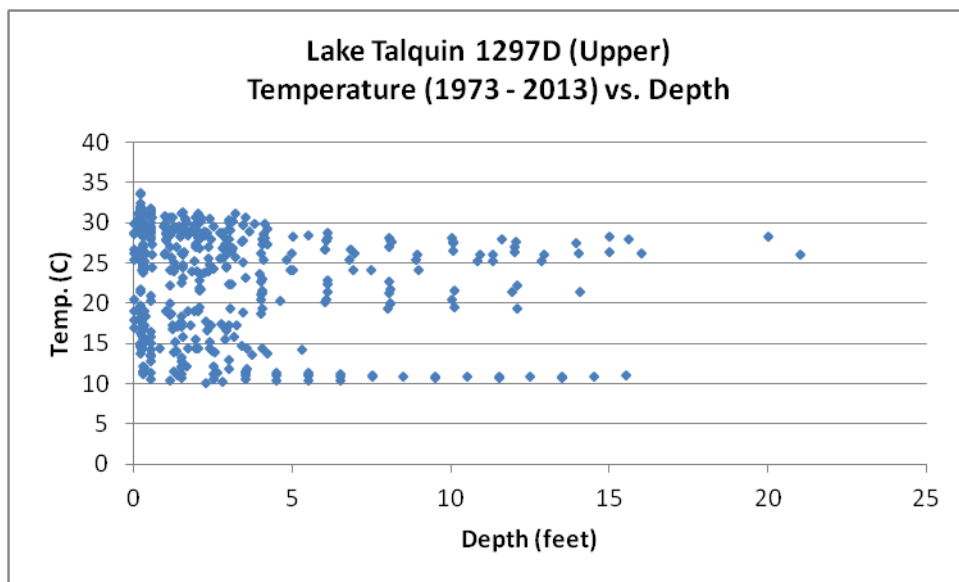


Figure B.4L.4. Lake Talquin Upper WBID 1297D Temperature vs. Depth 1973–2013

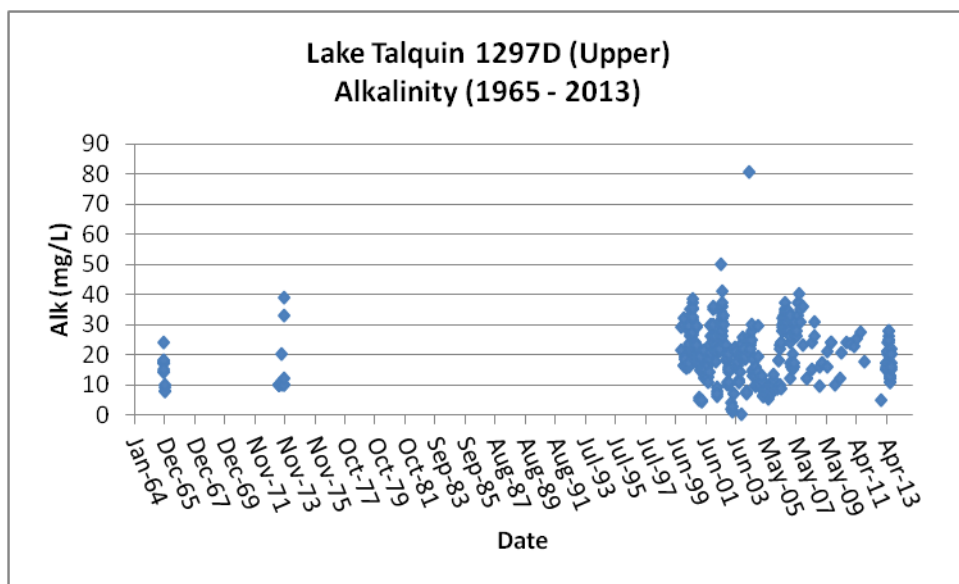


Figure B.4L.5. Lake Talquin Upper WBID 1297D Daily Average Alkalinity 1965–2013

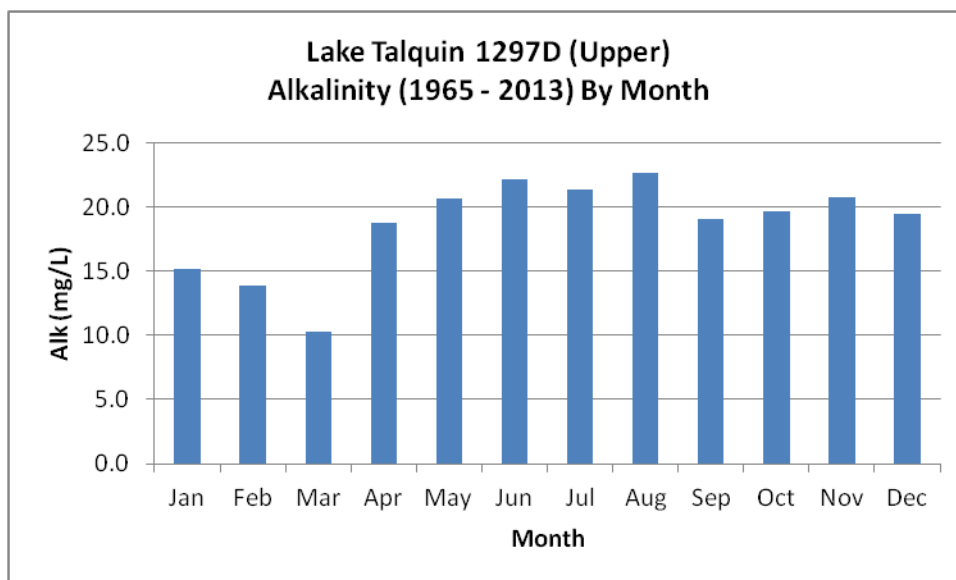


Figure B.4L.6. Lake Talquin Upper WBID 1297D Monthly Average Alkalinity 1965–2013

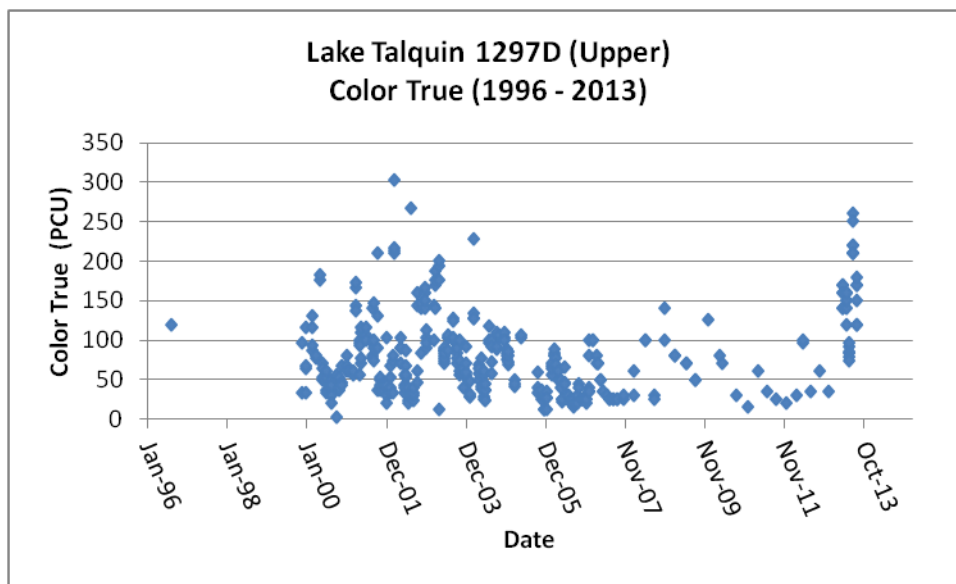


Figure B.4L.7. Lake Talquin Upper WBID 1297D Daily Average True Color 1996–2013

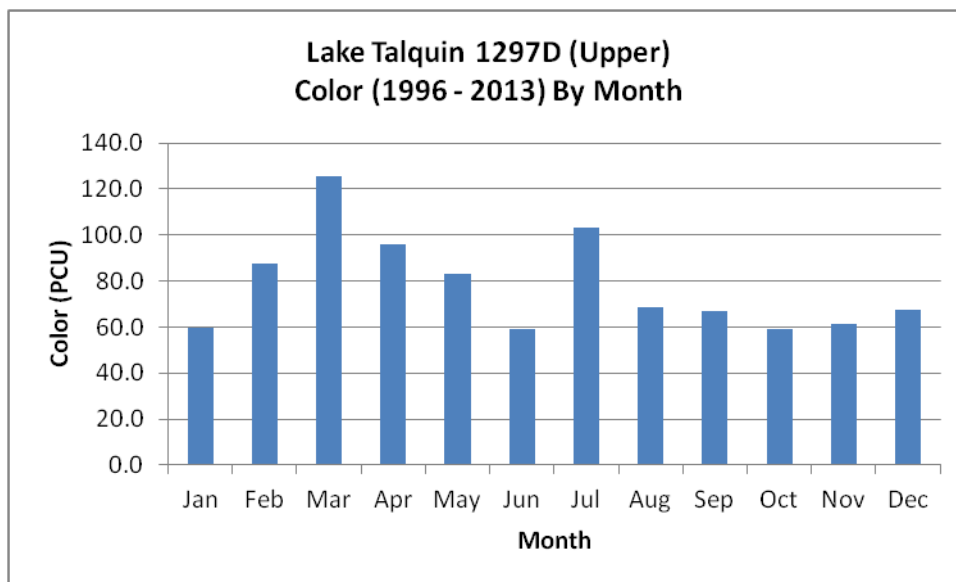


Figure B.4L.8. Lake Talquin Upper WBID 1297D Monthly Average True Color 1996–2013

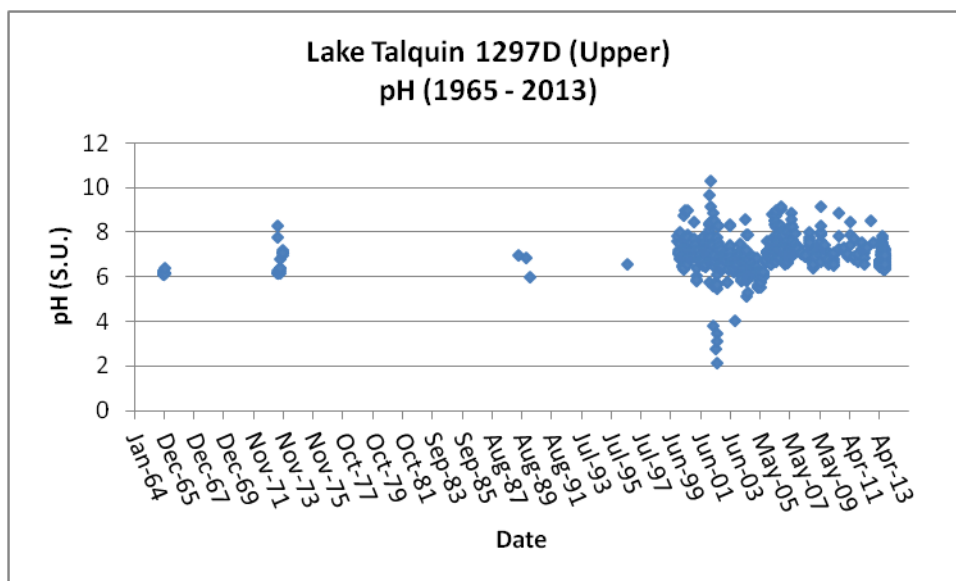


Figure B.4L.9. Lake Talquin Upper WBID 1297D Daily pH 1965–2013

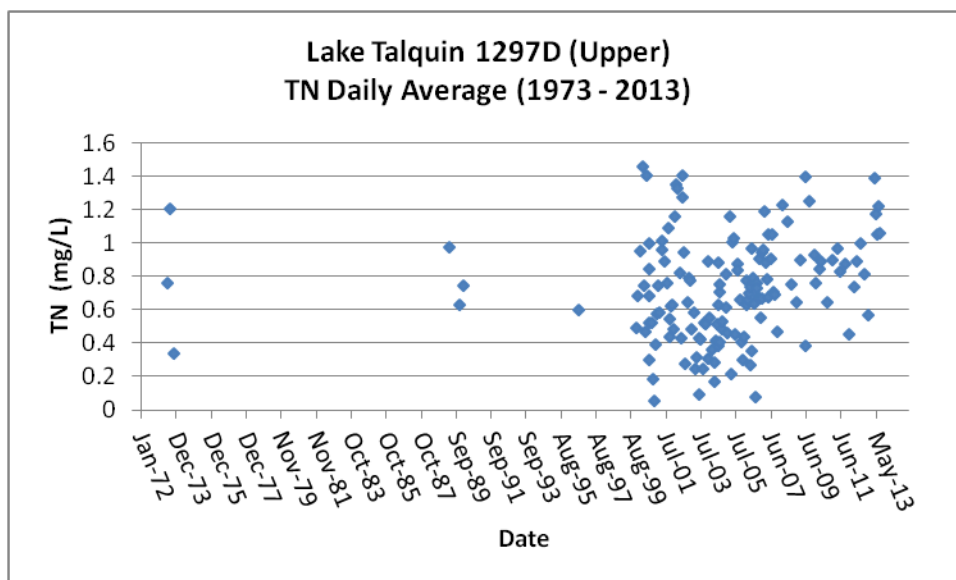


Figure B.4L.10. Lake Talquin Upper WBID 1297D Daily Average TN 1973–2013

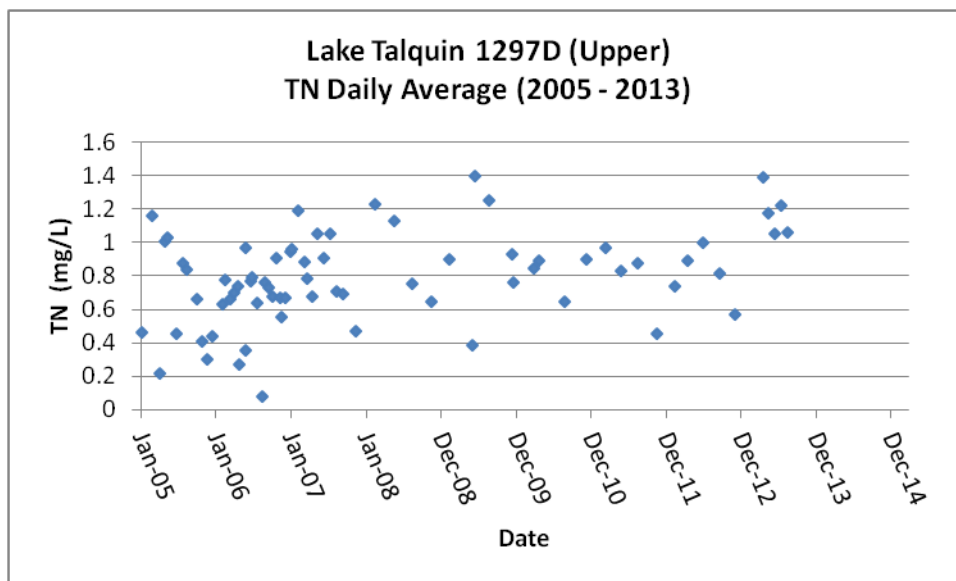


Figure B.4L.11. Lake Talquin Upper WBID 1297D Daily Average TN 2005–2013

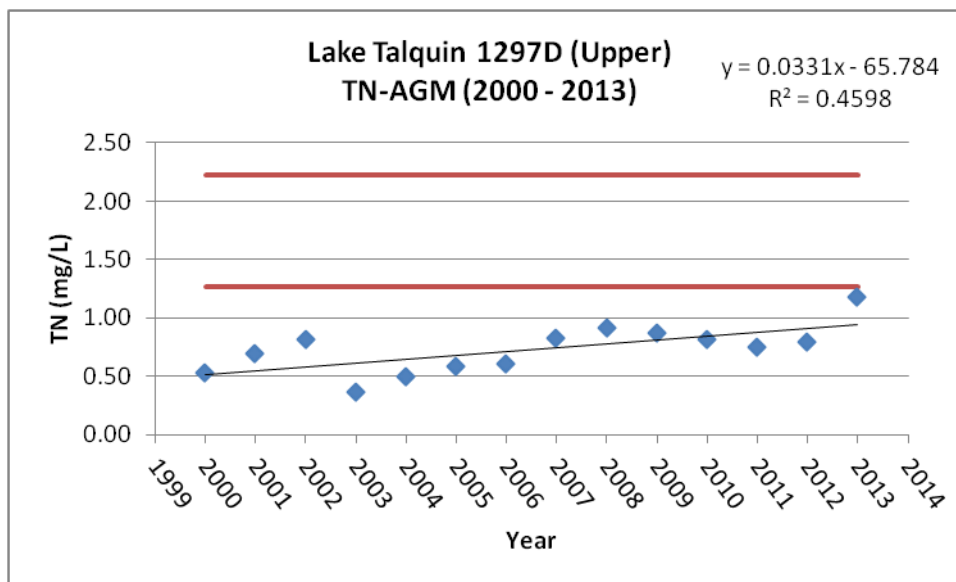


Figure B.4L.12. Lake Talquin Upper WBID 1297D TN Annual Geomean 2000–2013

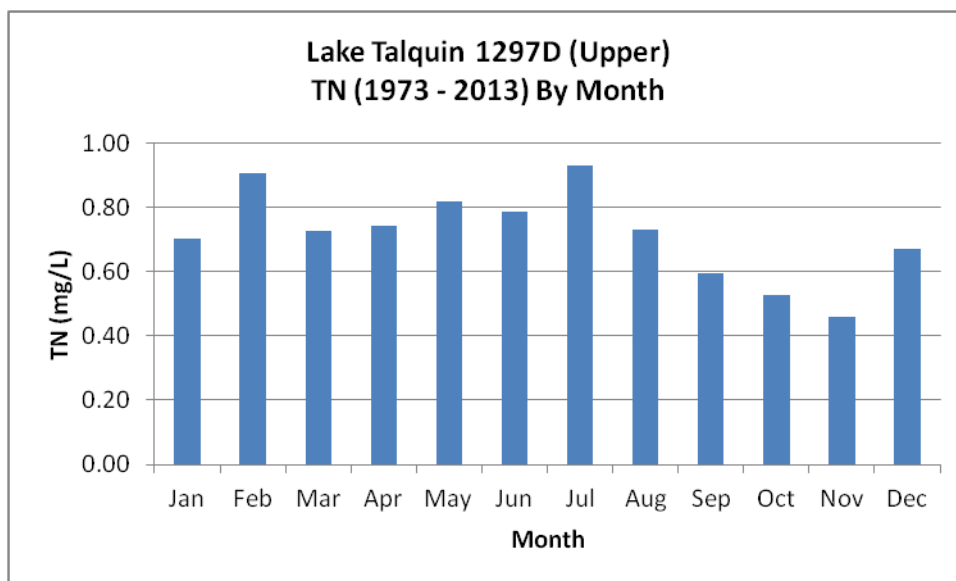


Figure B.4L.13. Lake Talquin Upper WBID 1297D Monthly Average TN 1973–2013

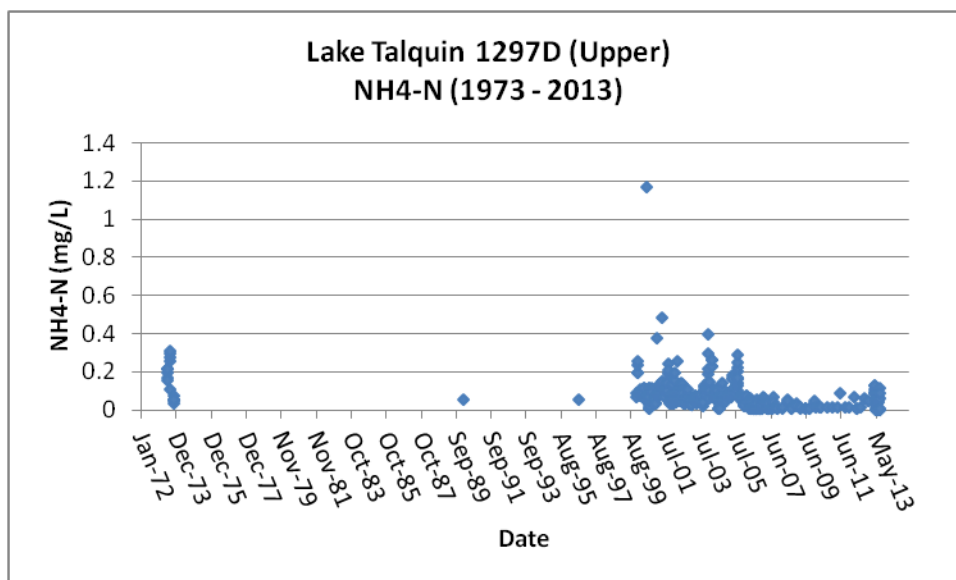


Figure B.4L.14. Lake Talquin Upper WBID 1297D Daily Average Ammonia-N 1973–2013

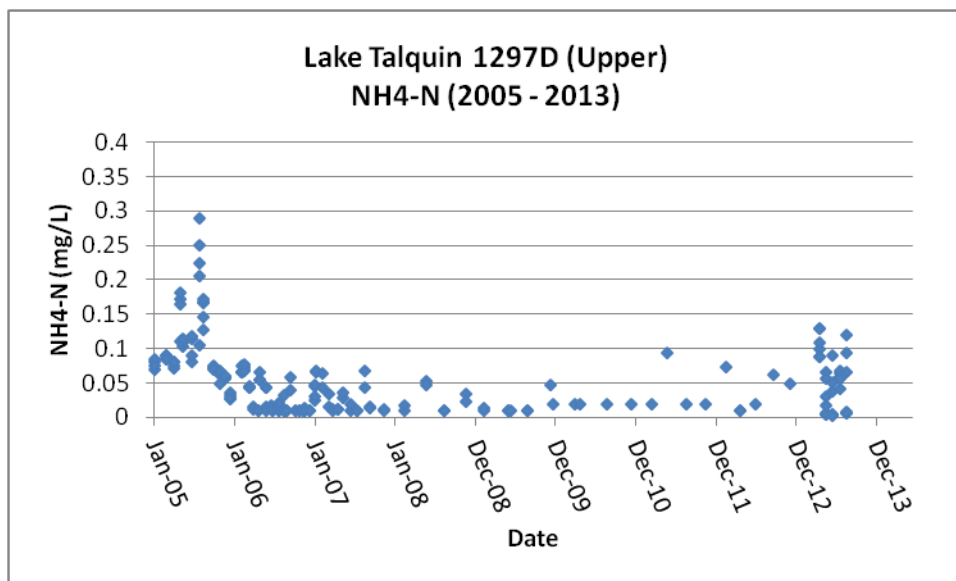


Figure B.4L.15. Lake Talquin Upper WBID 1297D Daily Average Ammonia-N 2005–2013

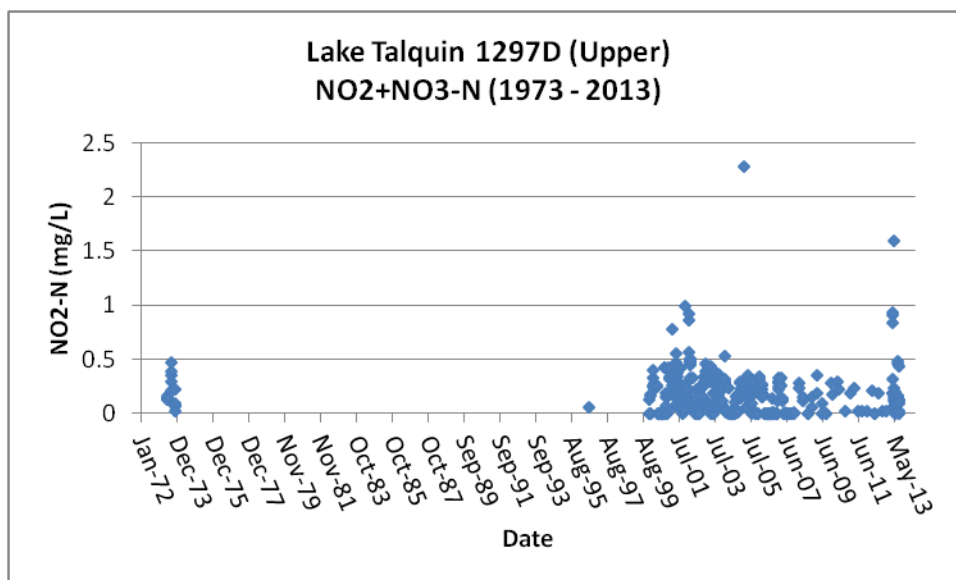


Figure B.4L.16. Lake Talquin Upper WBID 1297D Daily Average Nitrate/Nitrite-N 1973–2013

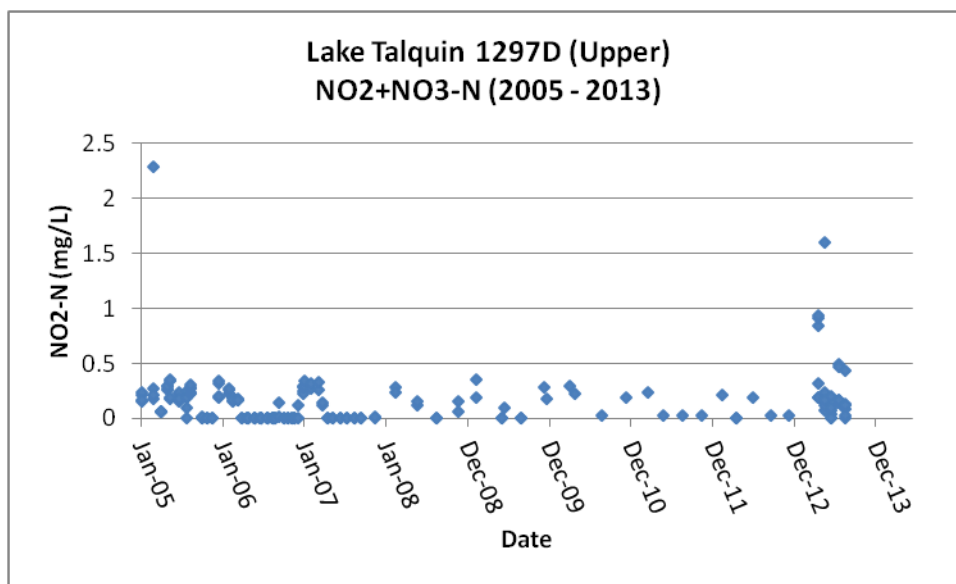


Figure B.4L.17. Lake Talquin Upper WBID 1297D Daily Average Nitrate/Nitrite-N 2005–2013

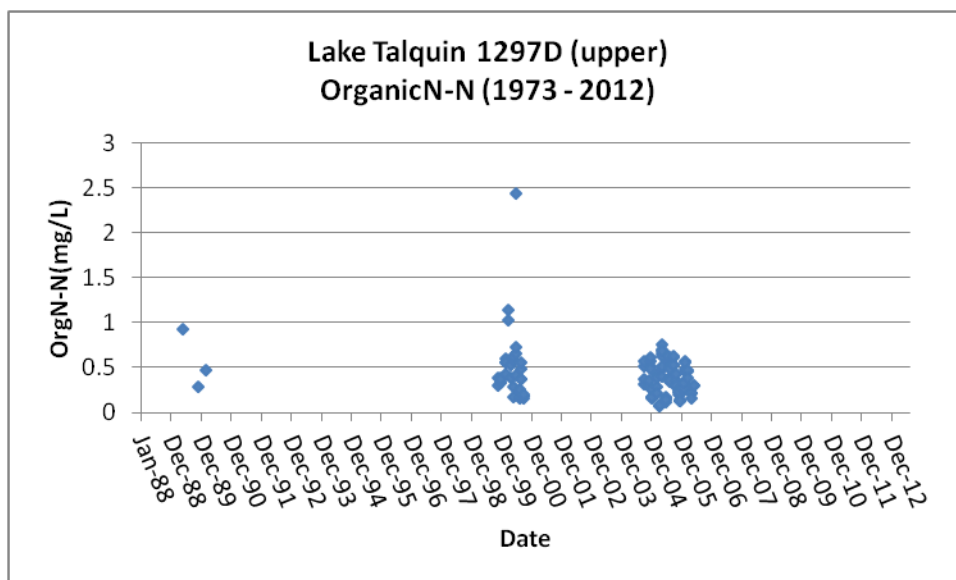


Figure B.4L.18. Lake Talquin Upper WBID 1297D Daily Average Organic-N 1973–2012

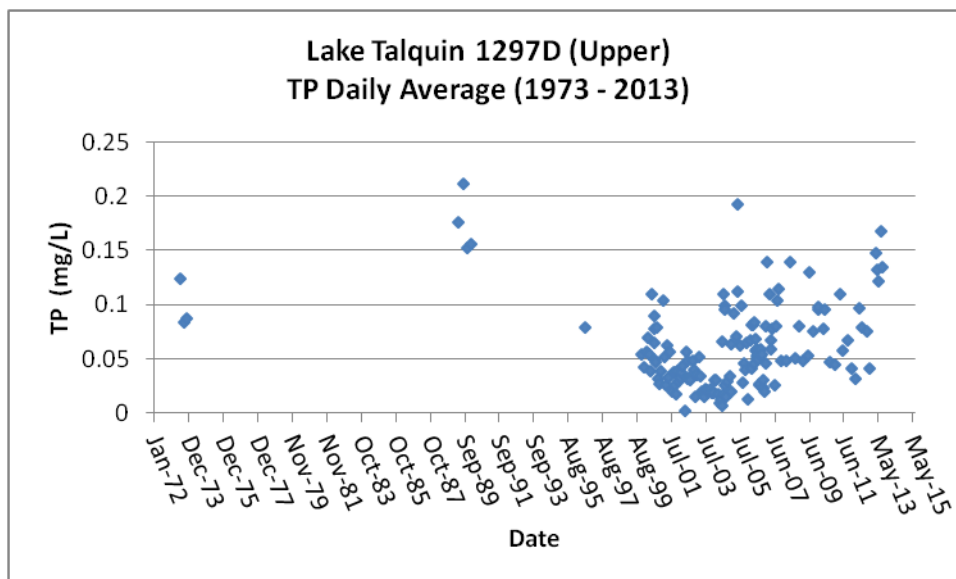


Figure B.4L.19. Lake Talquin Upper WBID 1297D Daily Average TP 1973–2013

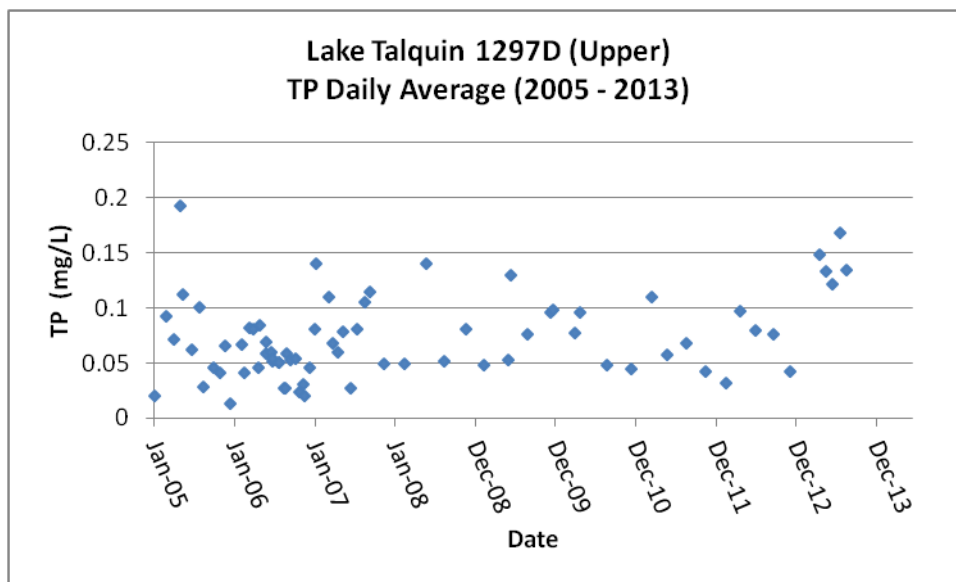


Figure B.4L.20. Lake Talquin Upper WBID 1297D Daily Average TP 2005–2013

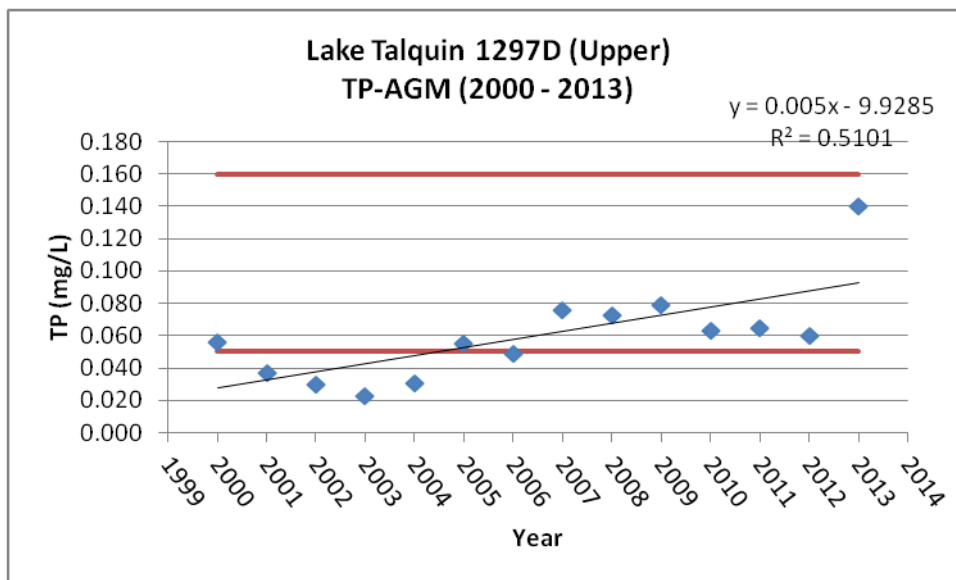


Figure B.4L.21. Lake Talquin Upper WBID 1297D Annual Geomean TP 2000–2013

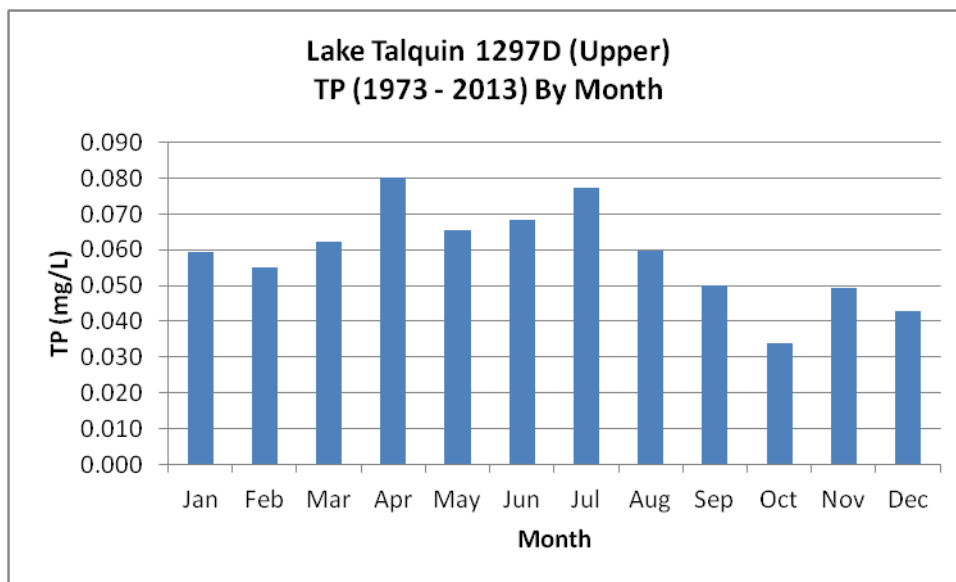


Figure B.4L.22. Lake Talquin Upper WBID 1297D Monthly Average TP 1973–2013

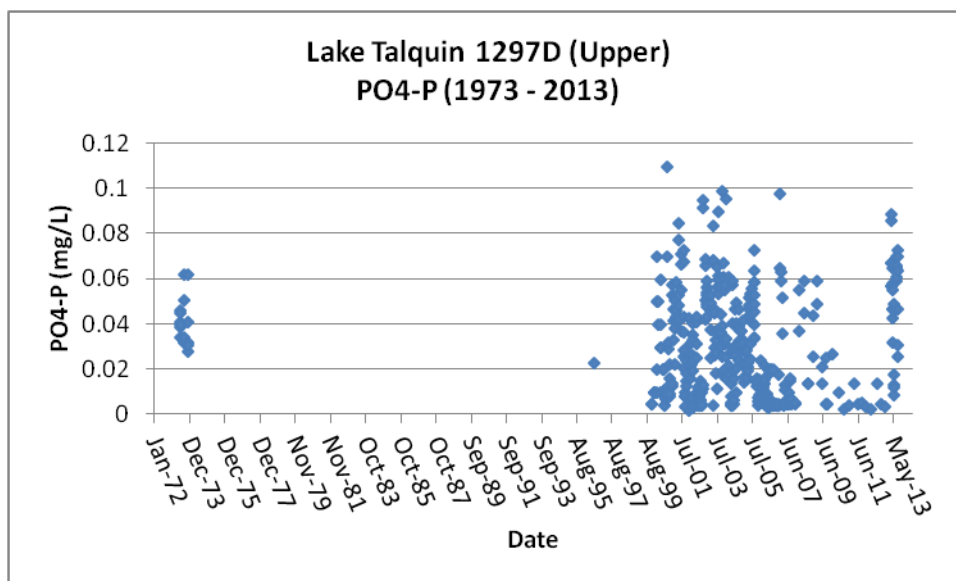


Figure B.4L.23. Lake Talquin Upper WBID 1297D Daily Average Orthophosphate-P 1973–2013

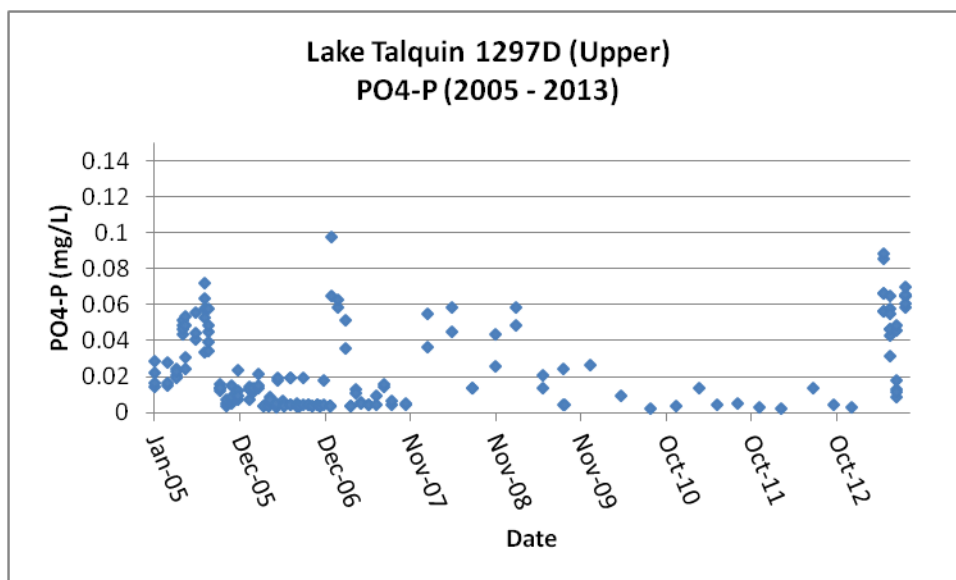


Figure B.4L.24. Lake Talquin Upper WBID 1297D Daily Average Orthophosphate-P 2005–2013

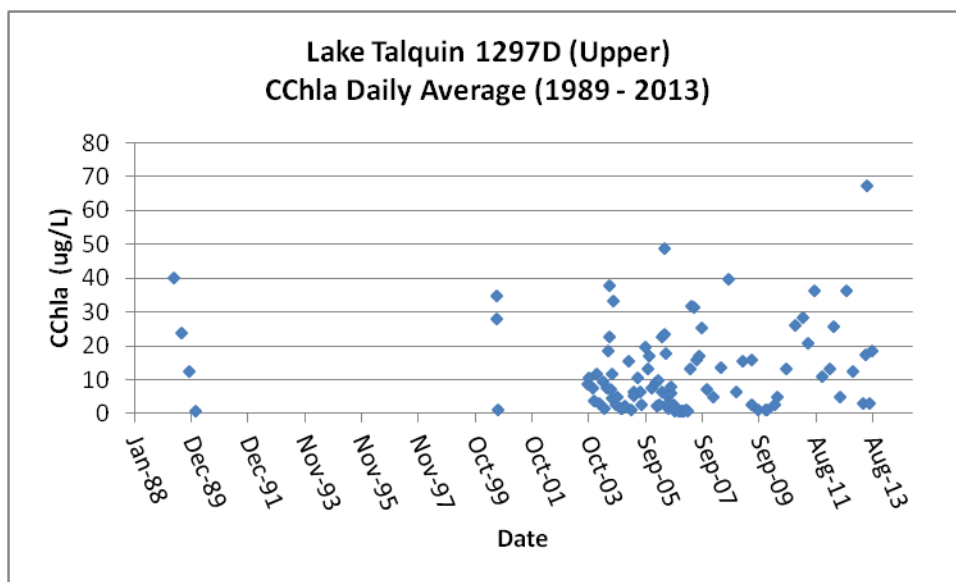


Figure B.4L.25. Lake Talquin Upper WBID 1297D Daily Average CChla 1989–2013

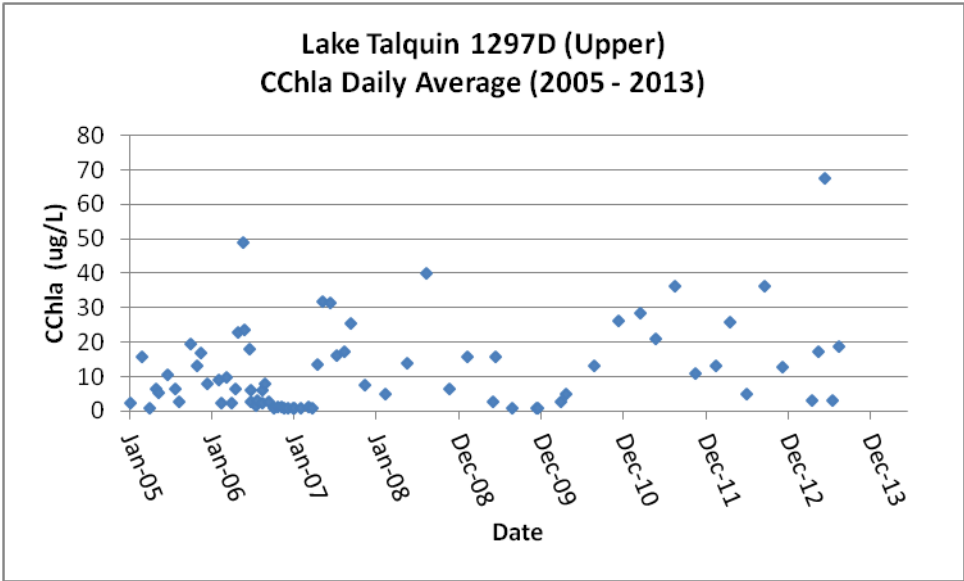


Figure B.4L.26. Lake Talquin Upper WBID 1297D Daily Average CChla 2005–2013

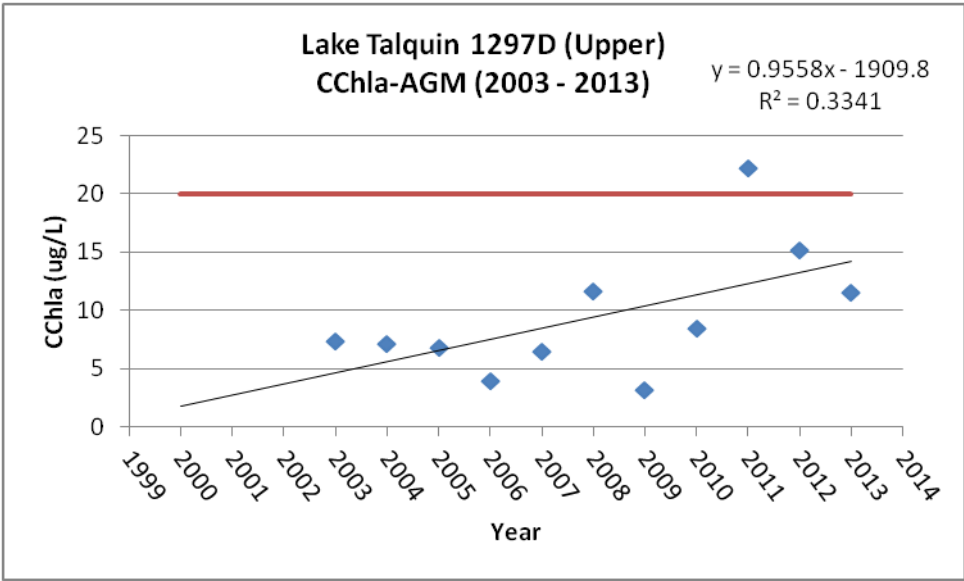


Figure B.4L.27. Lake Talquin Upper WBID 1297D Annual Geomean CChla 2003–2013

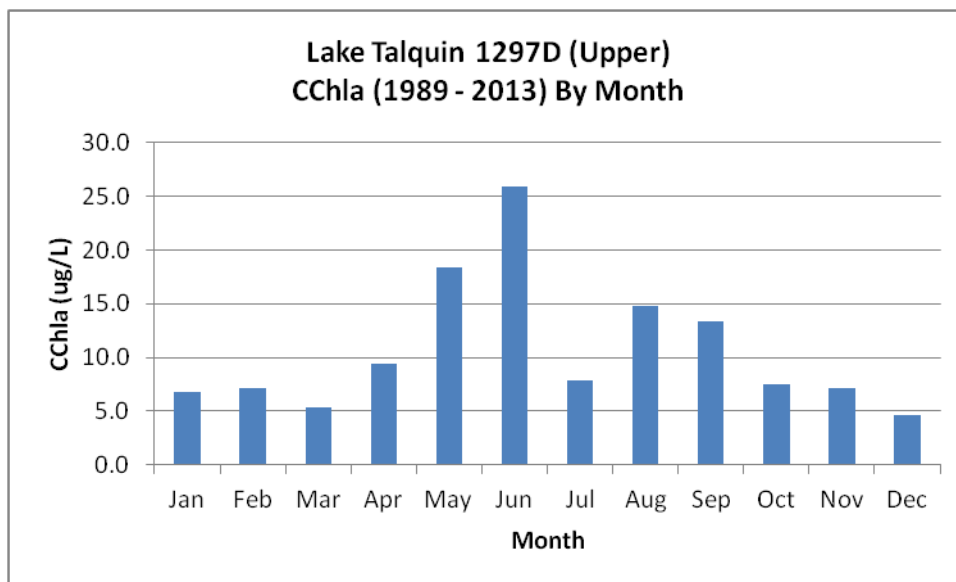


Figure B.4L.28. Lake Talquin Upper WBID 1297D Monthly Average CChla 1989–2013

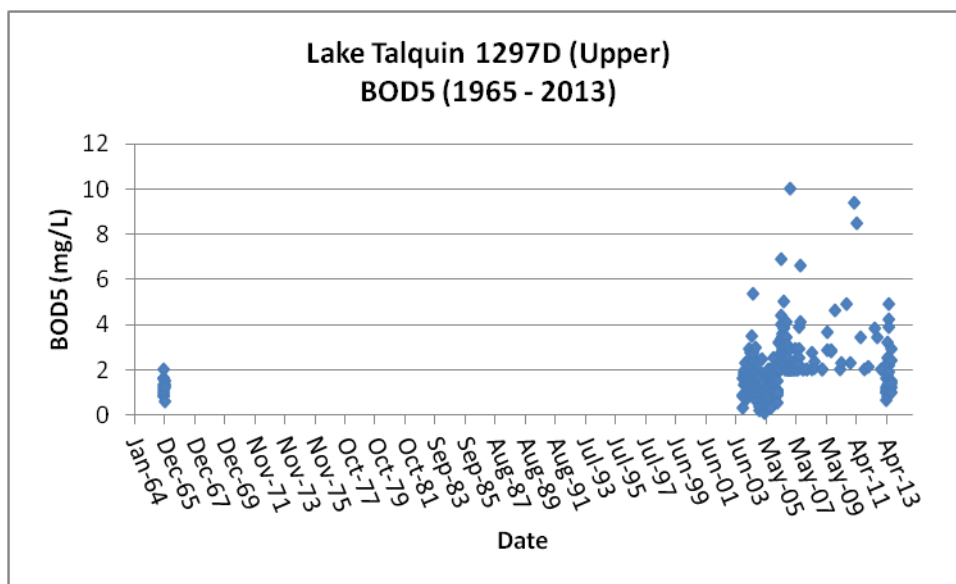


Figure B.4L.29. Lake Talquin Upper WBID 1297D Daily Average BOD5 1965–2013

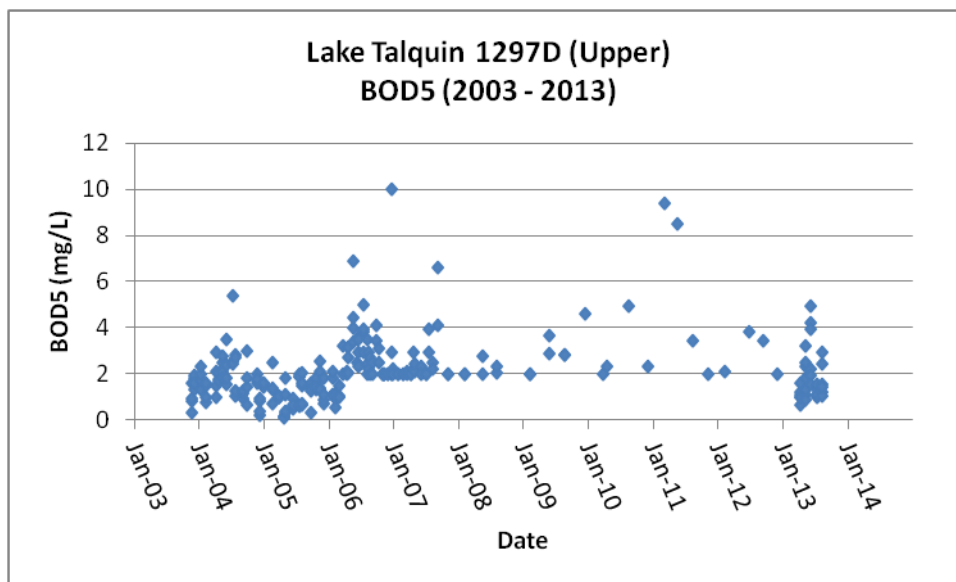


Figure B.4L.30. Lake Talquin Upper WBID 1297D Daily Average BOD5 2003–2013

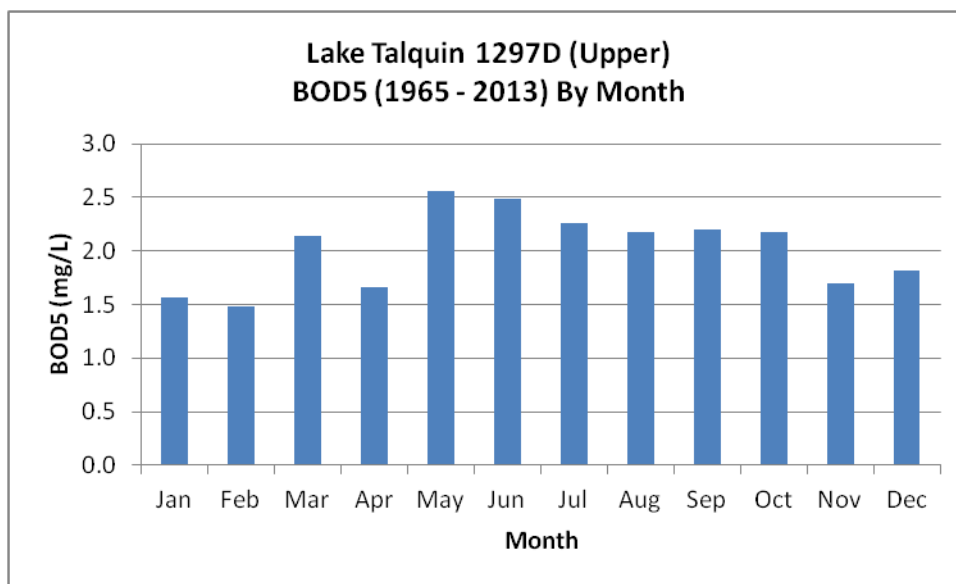


Figure B.4L.31. Lake Talquin Upper WBID 1297D Monthly Average BOD5 1965–2013

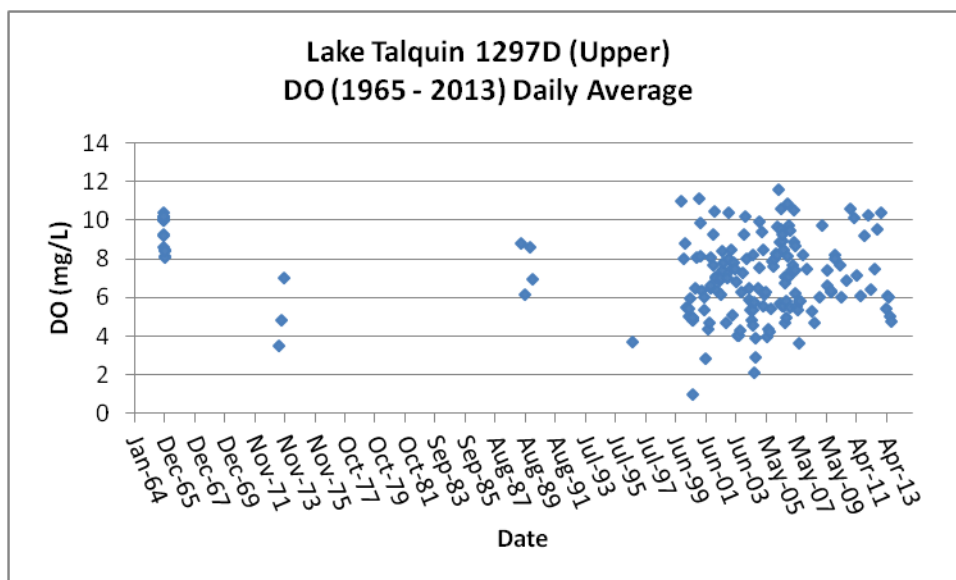


Figure B.4L.32. Lake Talquin Upper WBID 1297D Daily Average DO 1965–2013

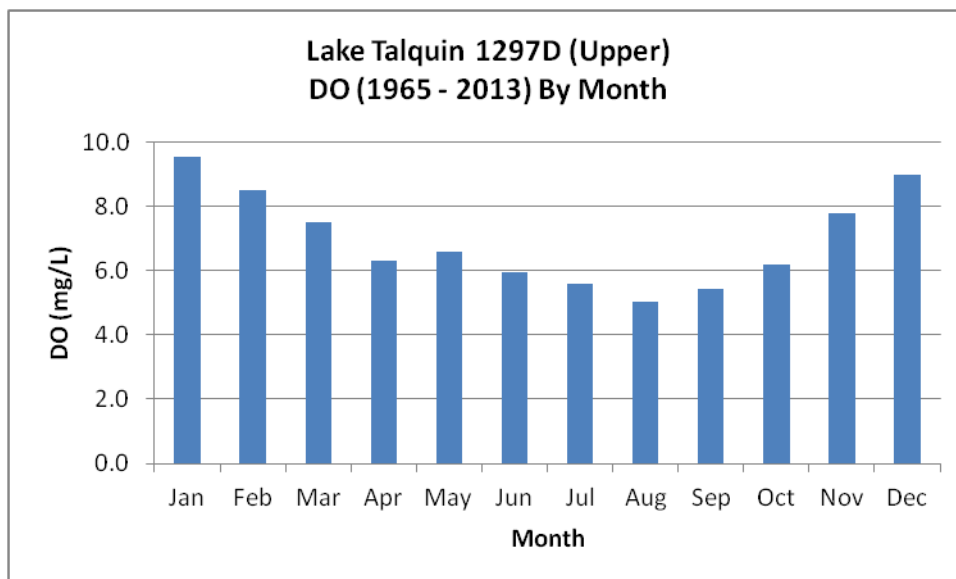


Figure B.4L.33. Lake Talquin Upper WBID 1297D Monthly Average DO 1965–2013

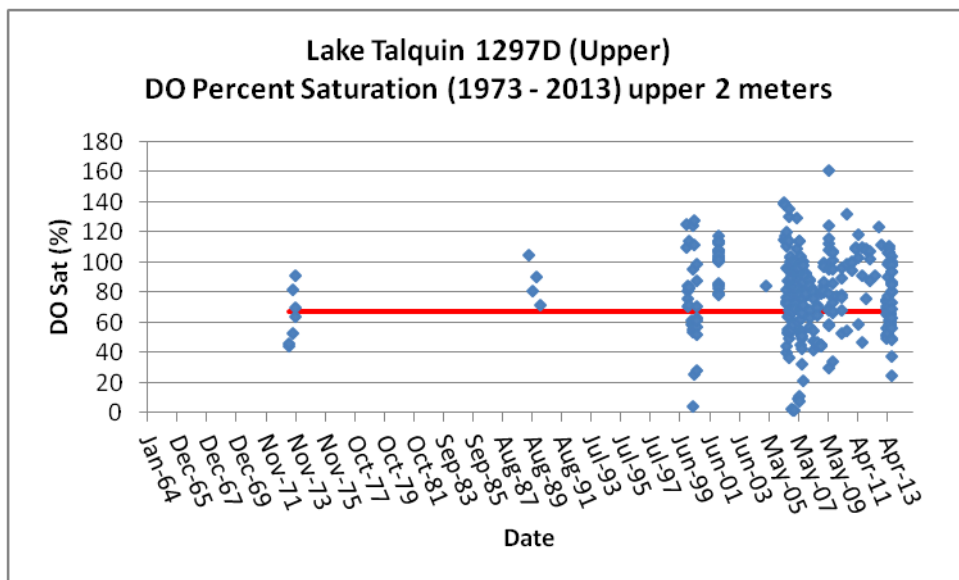


Figure B.4L.34. Lake Talquin Upper WBID 1297D Daily Average DO Percent Saturation 1965–2013

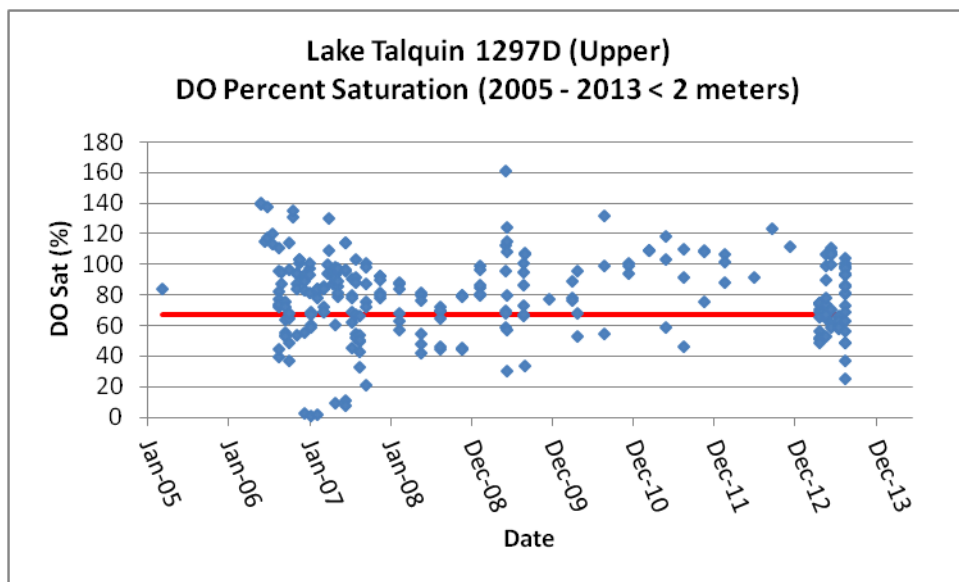


Figure B.4L.35. Lake Talquin Upper WBID 1297D Daily Average DO Percent Saturation 2005–2013

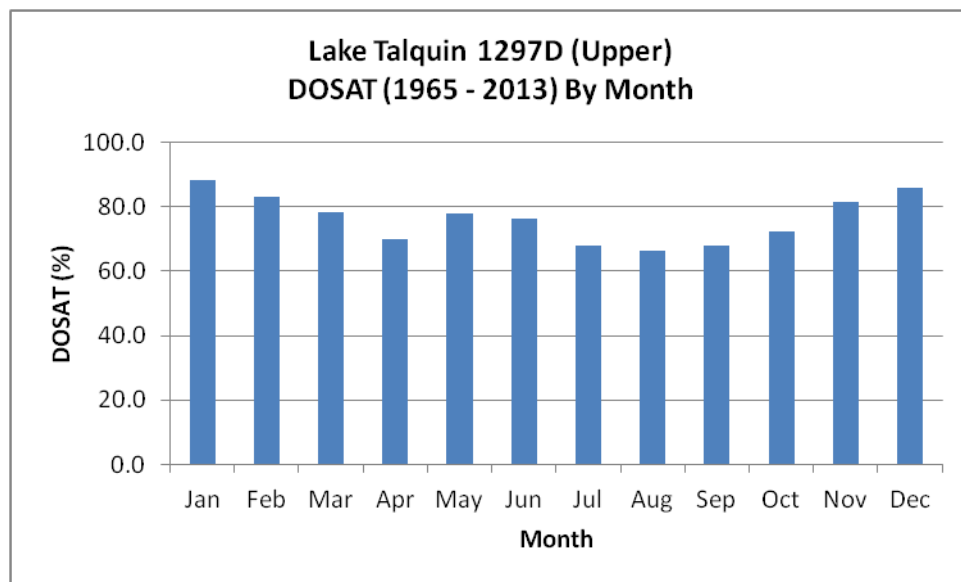


Figure B.4L.36. Lake Talquin Upper WBID 1297D Monthly Average DO Percent Saturation 1965–2013

Table B.4L.1. Lake Talquin WBIDs 1297D IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
1297D	21FLGW 9234	NWA-LL-1004 LAKE TALQUIN	2000	2000
1297D	21FLGW 22111	NW1-LL-2022 LAKE TALQUIN	2004	2004
1297D	21FLMCGLTOC	TOC: Coes Boat Landing. Take boat to channel, 4 m	2000	2000
1297D	21FLEONLCTOW3045084521	Talquin 3	2006	2007
1297D	21FLGW 9250	NWA-LL-1030 LAKE TALQUIN	2000	2000
1297D	21FLGW 37926	Z1-LL-3014R J T BUDD POND	2009	2009
1297D	21FLEONLCTOC3045884492	Talquin 4	2006	2009
1297D	21FLGW 9246	NWA-LL-1047 LAKE TALQUIN	2000	2000
1297D	21FLGW 9238	NWA-LL-1010 LAKE TALQUIN	2000	2000
1297D	21FLBRA 1297D-A	1297D - Lake Talquin - William's Landing	2006	2007
1297D	11EPALES123904	LAKE TALQUIN	1973	1973
1297D	21FLEONLCTO3045184523	Lake Talquin near Williams Landing	2009	2010
1297D	21FLGFWFGFCNW0417	LAKE TALQUIN MIDLAKE BTW WILLIAMS AND HIGH BLUFF	1989	1990
1297D	21FLEONT0E3044084556	Lake Talquin Central	2007	2009
1297D	21FLGW 41391	Z1-LL-6028 LAKE TALQUIN	0	0
1297D	21FLGW 22125	NW1-LL-2049 LAKE TALQUIN	2004	2004
1297D	1113S050644800	LAKE TELQUIN WILLIAMS LANDING	1965	1966
1297D	21FLMCGLTOW	Lake Talquin, Williams Landing, middle of lake	1999	2006
1297D	21FLGW 22107	NW1-LL-2016 LAKE TALQUIN	2004	2004
1297D	21FLBRA 1297D-D	1297D - Lake Talquin - 2km ENE of Williams landing	2006	2006
1297D	21FLA 22020052	LAKE TALQUIN NE OF WILLIAMS LANDING	1996	1996
1297D	21FLWQA 302654508431178	Lake Talquin at Williams Landing	2002	2002
1297D	21FLMCGLTOW	TOW: Williams Landing. Take boat to channel, 4 m d	2000	2000
1297D	21FLGW 36990	Z1-LL-3014 J T BUDD POND	2009	2009
1297D	21FLBRA 1297D-E	1297D - Lake Talquin - inlet W of William's Landing	2006	2006
1297D	21FLBRA 1297D-C	1297D - Lake Talquin - W sect of WBID boundary	2006	2007
1297D	21FLA 22020053	LAKE TALQUIN NEAR NORTH SHORE IN MIDDLE LOBE	1996	1996
1297D	21FLWQA 302621708431448	Lake Talquin at Vause Landing	2002	2002
1297D	21FLMCGLTOC	Lake Talquin, Coes Landing, middle of lake	1999	2006
1297D	21FLGW 41384	Z1-LL-6012 LAKE TALQUIN	0	0
1297D	21FLGW 22128	NW1-LL-2054 LAKE TALQUIN	2004	2004
1297D	21FLGW 22121	NW1-LL-2043 LAKE TALQUIN	2004	2004

Table B.4L.2. Lake Talquin Upper WBID 1297D Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
1297D	Alkalinity (mg/L)	1965 - 2013	16.8
1297D	Color-True (PCU)	1996 - 2013	62.3

Table B.4L.3. Lake Talquin Upper WBID 1297D DO Percent Saturation vs. 67 % Criterion

Year	Category	Result (*)
1965 - 2012	Count	274
	Number P	207
	Number F	67
	Percent F	24.5
2005 - 2012	Count	210
	Number P	160
	Number F	50
	Percent F	23.8

(*) Result based only on upper 2 meters of water column

Table B.4L.4. Lake Talquin Upper WBID 1297D Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN	TP	TN/TP	CChla
	AGM	AGM	Ratio	AGM
2000	0.53	0.056	9.5	
2001	0.70	0.038	18.5	
2002	0.81	0.030	27.0	
2003	0.37	0.023	16.0	7.4
2004	0.50	0.031	16.1	7.1
2005	0.58	0.056	10.4	6.8
2006	0.61	0.049	12.2	4.0
2007	0.83	0.076	10.9	6.5
2008	0.91	0.073	12.5	11.6
2009	0.87	0.079	11.0	3.1
2010	0.81	0.063	12.8	8.4
2011	0.75	0.065	11.5	22.2
2012	0.79	0.060	13.1	15.2
2013	1.18	0.140	8.4	11.6

Table B.4L.5. Lake Talquin Upper WBID 1297D Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	1965 - 2013	716	8.3	33.7	24.2	22.2	21.0
Alkalinity	mg/L	1965 - 2013	402	0.2	80.5	18.8	19.4	16.7
pH	S.U.	1965 - 2013	713	2.2	10.3	7.0	NA	NA
Color	PCU	1996 - 2013	381	2.5	303.3	66.7	77.4	62.3
TN	mg/L	1973 - 2013	444	0.04	3.62	0.68	0.72	0.62
NH4-N	mg/L	1973 - 2013	441	0.003	1.17	0.06	0.08	0.055
NO23	mg/L	1973 - 2013	431	0.001	2.29	0.13	0.17	0.063
OrgN	mg/L	1989 - 2006	114	0.081	2.440	0.378	0.417	0.355
TP	mg/L	1973 - 2013	447	0.002	0.239	0.049	0.059	0.045
PO4-P	mg/L	1973 - 2013	428	0.002	0.110	0.024	0.029	0.020
CChla	ug/L	1989 - 2013	263	0.7	170.0	5.7	11.5	5.7
BOD5	mg/L	1965 - 2013	255	0.1	10.0	2.0	2.0	1.7
DO	mg/L	1965 - 2013	713	0.1	12.5	7.0	6.8	6.1
%DOSat	%	1965 - 2013	656	0.8	161.4	78.4	76.3	69.3

Table B.4L.6. Lake Talquin Upper WBID 1297D Water Quality Data Summary Verified Period Plus (2005–2013)

Constituent	Units	Verified Period+	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2013	404	8.3	33.7	25.2	23.4	21.5
Alkalinity	mg/L	2005 - 2013	164	5.0	40.0	17.0	19.2	16.5
pH	S.U.	2005 - 2013	402	5.5	9.2	7.0	NA	NA
Color	PCU	2005 - 2013	159	11.3	260.0	50.0	69.5	52.8
TN	mg/L	2005 - 2013	183	0.08	2.77	0.82	0.82	0.68
NH4-N	mg/L	2005 - 2013	190	0.003	0.29	0.04	0.05	0.033
NO23	mg/L	2005 - 2013	183	0.004	2.29	0.12	0.16	0.038
OrgN	mg/L	2005 - 2013	65	0.081	0.759	0.355	0.364	0.316
TP	mg/L	2005 - 2013	188	0.004	0.215	0.073	0.080	0.056
PO4-P	mg/L	2005 - 2013	181	0.003	0.098	0.015	0.025	0.013
CChla	ug/L	2005 - 2013	188	0.7	170.0	5.8	12.1	5.2
BOD5	mg/L	2005 - 2013	187	0.1	10.0	2.0	2.2	1.8
DO	mg/L	2005 - 2013	405	0.2	12.4	6.8	6.6	6.4
%DOSat	%	2005 - 2013	380	1.6	161.4	77.2	75.6	69.1

B.4M Lower Lake Talquin WBID 1297C

This WBID is verified impaired for nutrients due to elevated TSI and low DO (Chapter 2). Florida has newly adopted criteria for dissolved oxygen, total nitrogen, total phosphorous, and chlorophyll a (Chapter 3). DEP has not formally assessed the data for the Lake Talquin watershed under the new criteria. However, based on preliminary analysis, it is highly likely that Lake Talquin, verified impaired for DO or nutrients will still be verified impaired under the new criteria. Based on extensive analysis of data from lakes in Florida DEP has concluded that the health of lakes is best related to the area in the state in which the lake exists, the long-term color and alkalinity of the lake, and the level of nutrients and CChla present in the lake and maintaining an appropriate level of dissolved oxygen as compared to the percent saturation criterion for DO (Chapter 3 of TMDL Report). These data are best assessed as the long-term geomean (GM) for color and alkalinity and as the annual geomean for TN, TP, and CChla. As such, the presentation of data for the lake will use POR GMs for color and alkalinity and AGMs for nutrients and CChla. The numeric nutrient thresholds contained in Rule 62-302. 531, FAC, for lakes vary depending on color, alkalinity, CChla data sufficiency (for calculating AGM concentrations), and the CChla AGM concentration. The POR GM alkalinity and color for this segment of the lake is 14.0 mg/L and 53.2 PCU. This characterizes this section of the lake as high color, in which case the alkalinity does not impact the threshold concentrations for nutrients and CChla. The threshold for CChla is an AGM greater than 20 ug/L, TP AGM can range between 0.05 mg/L and 0.16 mg/L and TN AGM between 1.27 mg/L and 2.23 mg/L depending on the CChla AGM concentration (Chapter 3 of TMDL Report).

In some graphs for AGM TN, TP and CChla and daily average percent DOSAT (for lakes the data is from the upper two meters of the water column) lines are presented that represent the new thresholds. DEP notes that the data presented on these graphs has not been processed in accordance with all of the requirements of the new regulations in rule 62-303, F.A.C. As a result, a determination of compliance with the new criteria cannot be made from these data.

Table B.4M.1 lists the 32 stations that have been sampled in Lake Talquin Lower (WBID 1297C). **Figure B.4M.1** depicts the station locations.

Tables B.4M.5 and **B.4M.6** and **Figures B.4M.5** and **B.4M.6** provide the results for alkalinity. These data show that Lake Talquin Lower has a POR GM alkalinity of 14.0 mg/L. The data indicate that the alkalinity for the period (2005–2013) is similar to the POR GM 14.0 mg/L vs. 14.5 mg/L). The seasonal pattern indicates that the alkalinity is lowest in the first three months of the year (~ 12 mg/L), as flow into the lake and rainfall increase and gradually increases through August to just over 20 mg/L, (corresponding somewhat to changes in incoming flow) and then decreasing slightly for the rest of the year. This pattern for alkalinity appears to be inversely related to river flow (flow highest in first three months of the year **Figure B.3.12**) and alkalinity at the lowest.

Tables B.4M.5 and **B.4M.6** and **Figures B.4M.7** and **B.4M.8** provide the results for true color. These data show that Lake Talquin Lower has a POR GM color of 53.2 PCU, lower than the

Upper area of the lake and the incoming color of the Ochlockonee River of 62.5 and the Little River (63.1). The data indicate that the GM color for the period (2005–2013) of 47.7 PCU is reduced relative to the POR color. The combined mean flow of Ochlockonee and Little Rivers for the period 1998–2013 of 1,021 cfs is slightly less than the flow of 1,080 cfs for the period 2005–2013, although the annual average rainfall was 2.3 inches greater for the earlier period (56.5 vs. 54.2 inches). The seasonal pattern indicates that the color appears more closely related to changes in incoming river flow (increasing with increased flow and decreasing with decreased flow) more so than local rainfall (**Figures B.3.12 and B.2.4**).

Tables B.4M.5 and B.4M.6 and Figures B.4M.10 through B.4M.13 provide the results for TN. These data show that Lake Talquin Lower has a POR GM TN of 0.67 mg/L. The data (**Figure B.4M.12**) indicate that the recent (2005–2013) TN GM of 0.80 mg/L is greater than the TN GM for the POR and less than the new default (1.27 mg/L) threshold AGM concentration for TN. The data also indicate that the overall trend appears to be for increasing AGM TN concentrations. The seasonal pattern indicates that the TN concentration generally increase slightly from January through July, then decreasing through the end of the year. This pattern for TN is not clearly related to flow or rainfall (**Figures B.3.12 and B.2.4**).

Tables B.4M.5 and B.4M.6 and Figures B.4M.14 and B.4M.15 provide the results for NH₄-N. These data show that Lake Talquin Lower has a POR GM NH₄-N of 0.055 mg/L. The data indicate that the recent (2005–2013) NH₄-N GM of 0.034 mg/L is measurably less than the POR concentration and that the overall trend may be masked by the number of results reported as less than detection.

Tables B.4M.5 and B.4M.6 and Figures B.4M.16 and B.4M.17 provide the results for NO₃-N. These data show that Lake Talquin Lower has a POR GM NO₃-N of 0.033 mg/L. The data indicate that the recent (2005–2013) NO₃-N GM of 0.031 mg/L is equivalent to the POR concentration and that there does not appear to be a trend for this constituent.

Tables B.4M.5 and B.4M.6 and Figures B.4M.19 through B.4M.22 provide the results for TP. These data show that Lake Talquin Lower has a POR GM TP of 0.043 mg/L. The data (**Figure B.4M.21**) indicate that the recent (2005–2013) TP GM of 0.054 mg/L is measurably greater than the TP GM for the POR and slightly greater than the new threshold AGM concentration for TP. The data also indicate that the overall trend is for increasing AGM TP concentrations. The seasonal pattern is similar to TN, with TP concentration generally increasing through June and then generally decreasing slightly through the rest of the year. This pattern for TP is not clearly related to flow or rainfall (**Figures B.3.12 and B.2.4**).

Tables B.4M.5 and B.4M.6 and Figures B.4M.22 and B.4M.23 provide the results for PO₄-P. These data show that the Lake Talquin Lower has a POR GM PO₄-P of 0.013 mg/L. The data indicate that the recent (2005–2013) PO₄-P GM of 0.009 mg/L is less than the POR concentration and that the overall trend may be masked by the number of results reported as less than detection.

Tables B.4M.5 and B.4M.6 and Figures B.4M.25 through B.4M.28 provide the results for CChla. These data show that Lake Talquin Lower has a POR GM CChla of 10.2 ug/L, about twice as high as the Upper area of the lake. The data (**Figure B.4M.27**) indicate that the recent (2005–2013) CChla GM of 9.2 ug/L is similar to the CChla GM for the POR and less than the new threshold AGM concentration for CChla. The data also indicate that the overall trend is for increasing AGM CChla concentrations. The seasonal pattern indicates that the CChla concentrations peak in June decrease significantly in July, then increasing through August, and slowly reducing concentrations for the remaining months of the year. The pattern in CChla may be influenced by heavy rainfall in June through August, bringing in lower CChla concentrations from the rivers, diluting the lake, and reducing the residence time of the lake (**Figure B.2.4**).

Tables B.4M.5 and B.4M.6 and Figures B.4M.29 through B.4M.31 provide the results for BOD5. These data show that Lake Talquin Lower has a POR GM BOD5 of 1.8 mg/L. The data indicate that the recent (2005–2013) BOD5 GM of 2.0 mg/L is similar to the POR concentration. Variable detection limits over time may be having an influence on the data. There is no apparent overall trend.

Tables B.4M.5 and B.4M.6 and Figures B.4M.32 and B.4M.33 provide the results for DO. These data show that Lake Talquin Lower has a POR GM DO of 6.1 mg/L. The data indicate that the recent (2005–2013) DO GM of 6.4 mg/L is similar to the POR concentration. There is no apparent overall trend in time. Seasonal data indicate that the monthly average DO reaches a minimum of 5.0 mg/L during August and is greater than this for the remaining months of the year (**Figure B.4M.33**).

Tables B.4M.5 and B.4M.6 and Figures B.4M.34 through B.4M.36 provide the results for percent DO saturation. These data show that Lake Talquin Lower has a POR GM DOSAT of 69.3 %. The data indicate that the recent (2005–2013) DOSAT GM of 69.1 % is similar to the GM for the POR. The data do not appear to have a long-term trend. The data presented in **Figure B.4M.34** indicates that there are sufficient results below the new DO criterion to warrant further investigation. The seasonal pattern indicates that the DOSAT is lowest in August.

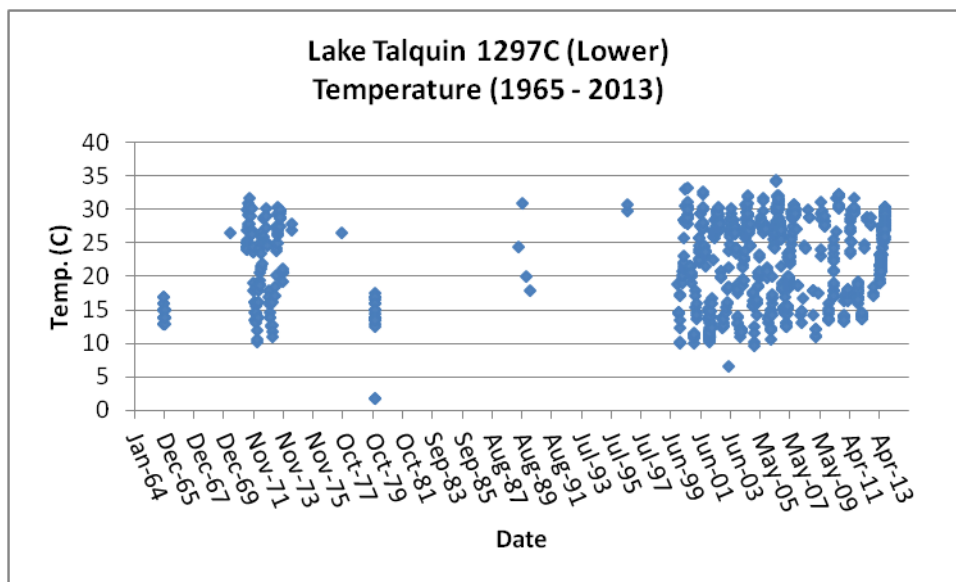


Figure B.4M.2. Lake Talquin Lower WBID 1297C Daily Temperature 1965–2013

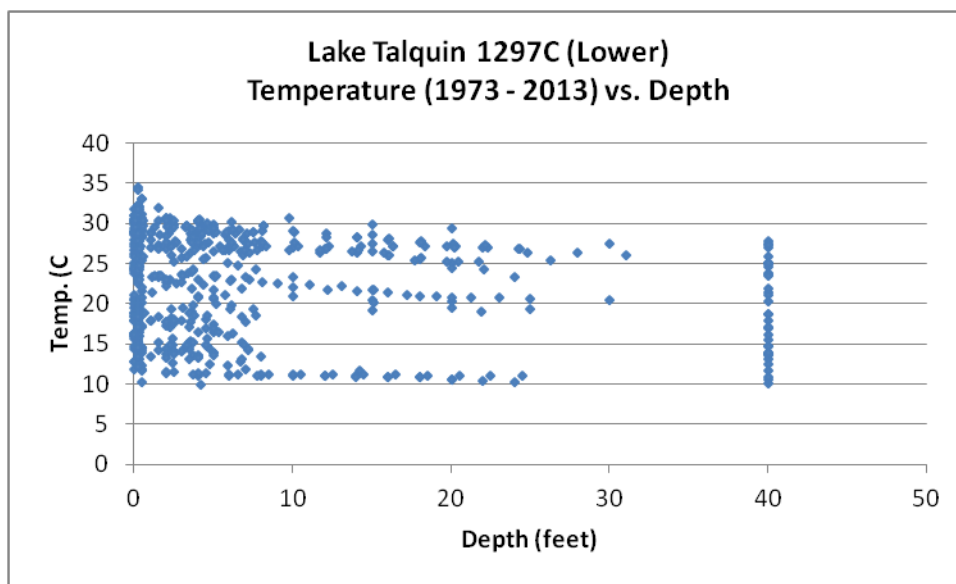


Figure B.4M.3. Lake Talquin Lower WBID 1297C Monthly Temperature 1973–2013

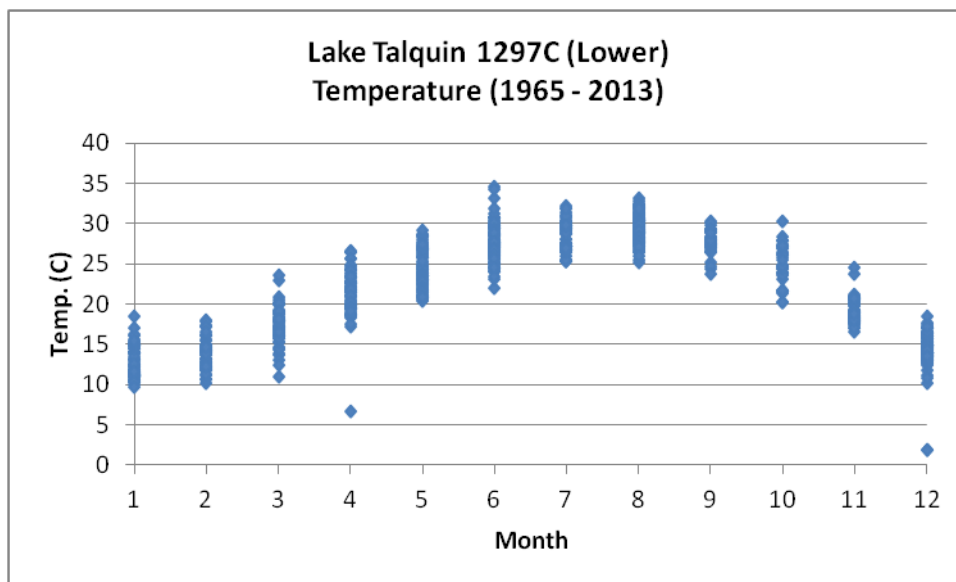


Figure B.4M.4. Lake Talquin Lower WBID 1297C Monthly Temperature 1965–2013

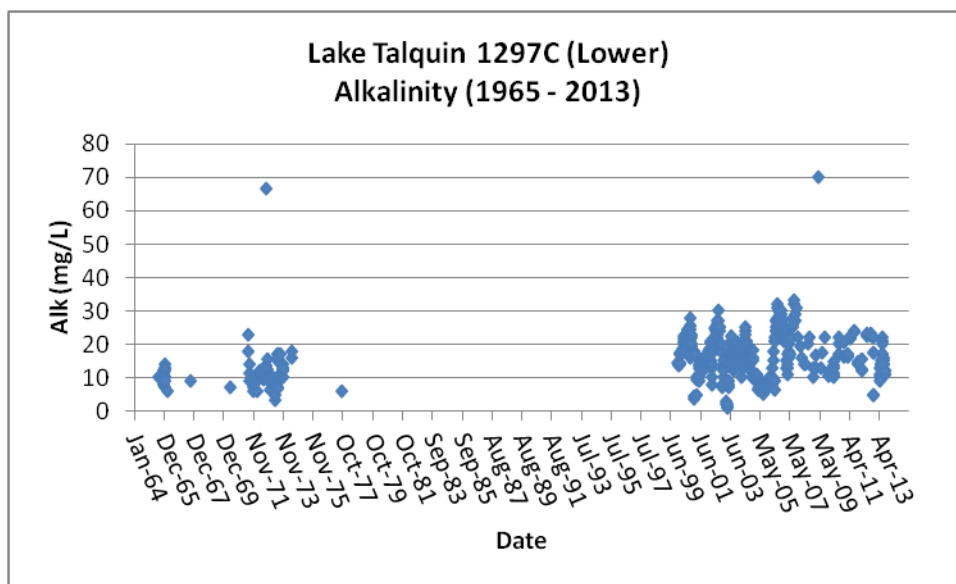


Figure B.4M.5. Lake Talquin Lower WBID 1297C Daily Average Alkalinity 1965–2013

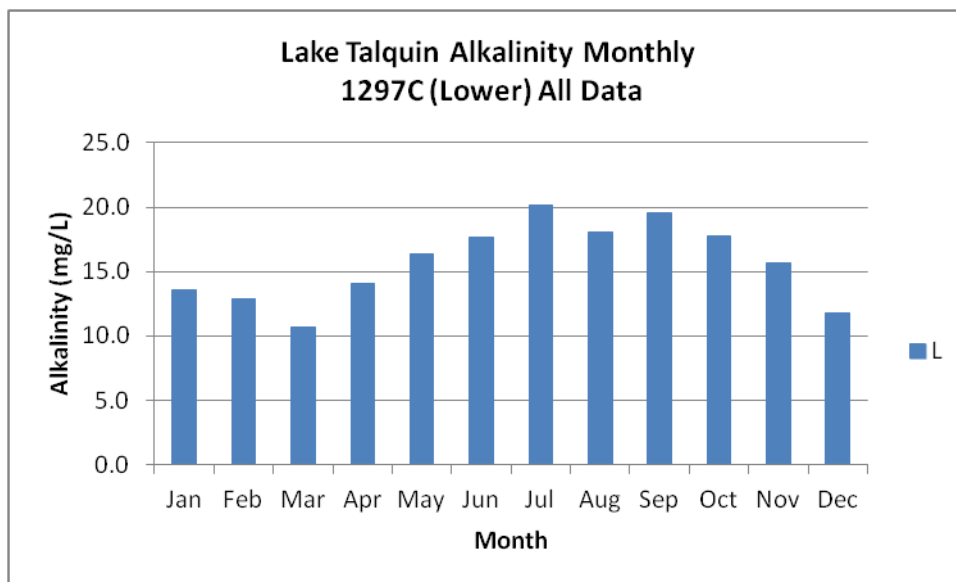


Figure B.4M.6. Lake Talquin Lower WBID 1297C Monthly Average Alkalinity 1965–2013

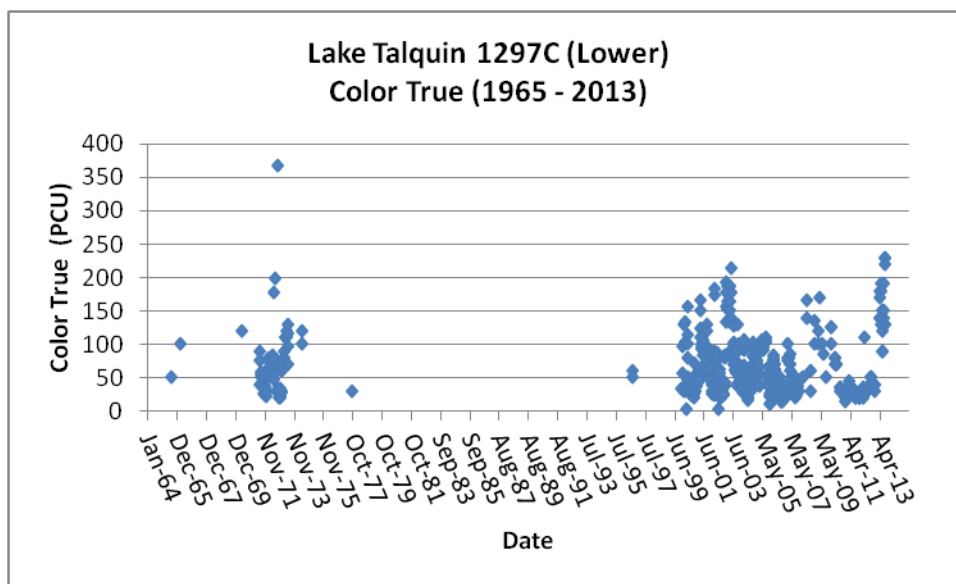


Figure B.4M.7. Lake Talquin Lower WBID 1297C Daily Average True Color 1965–2013

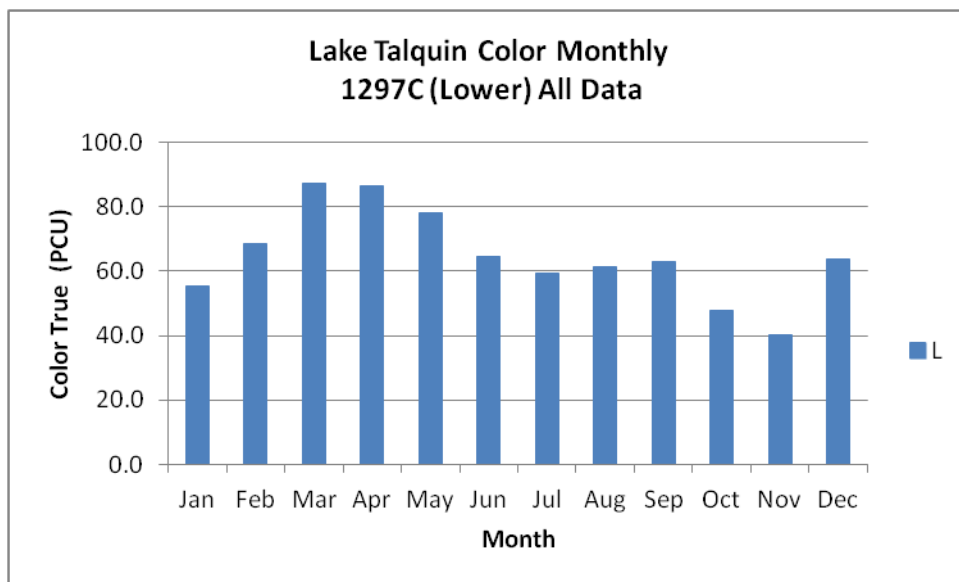


Figure B.4M.8. Lake Talquin Lower WBID 1297C Monthly Average True Color 1965–2013

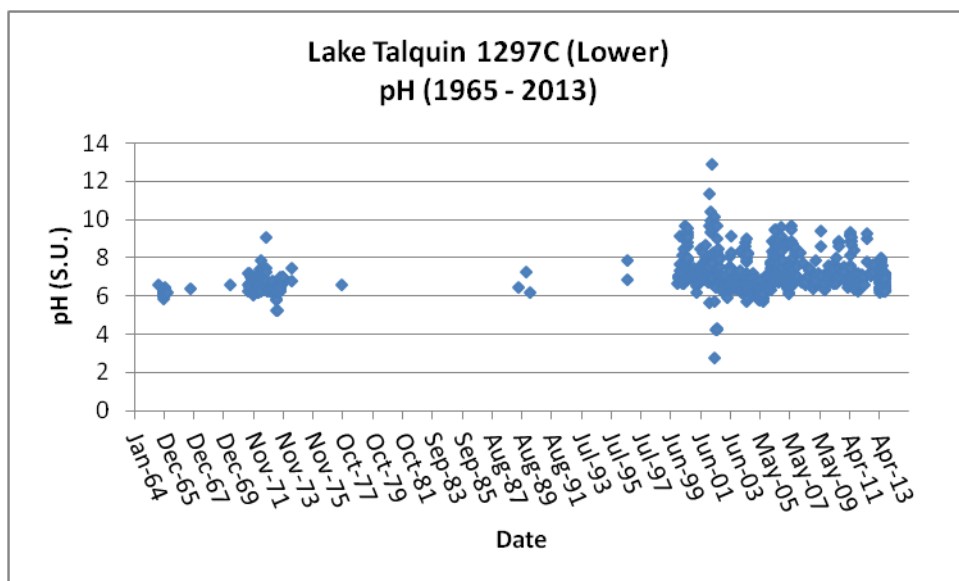


Figure B.4M.9. Lake Talquin Lower WBID 1297C Daily pH 1965–2013

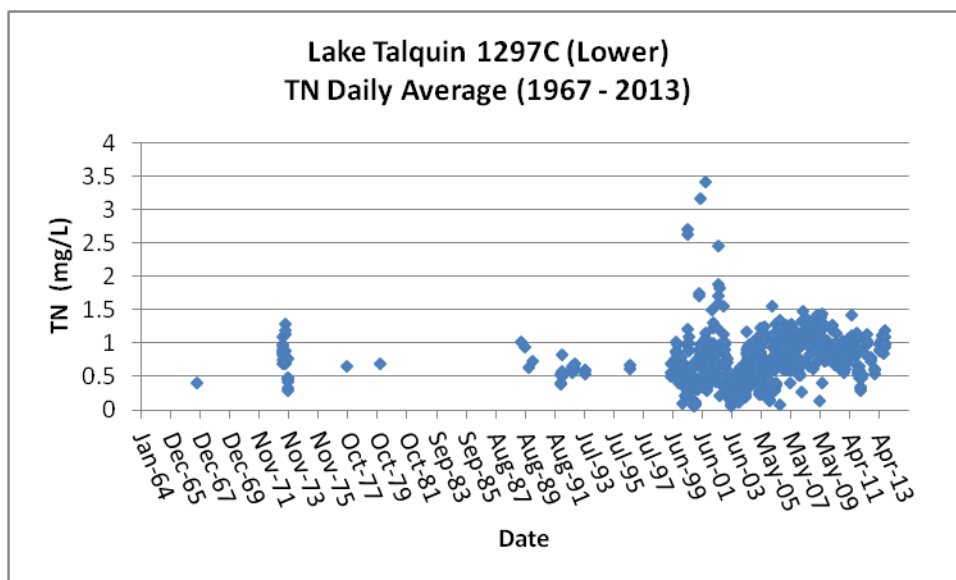


Figure B.4M.10. Lake Talquin Lower WBID 1297C Daily Average TN1967–2013

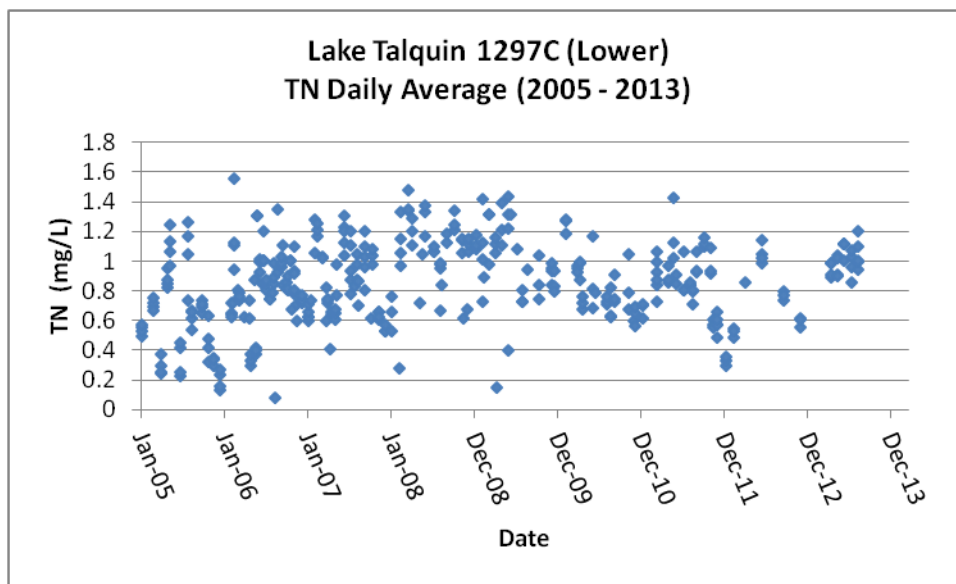


Figure B.4M.11. Lake Talquin Lower WBID 1297C Daily Average TN 2005–2013

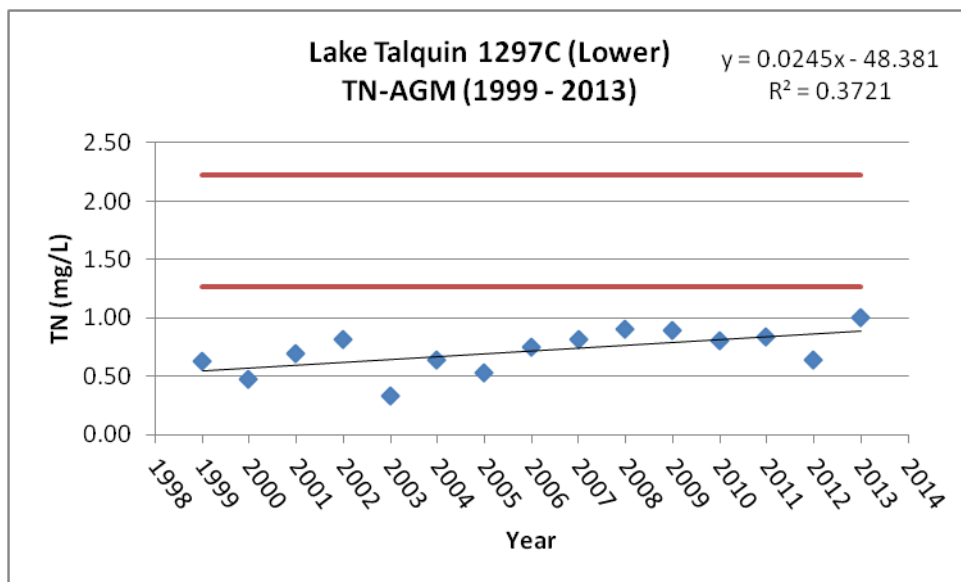


Figure B.4M.12. Lake Talquin Lower WBID 1297C TN Annual Geomean 1999–2013

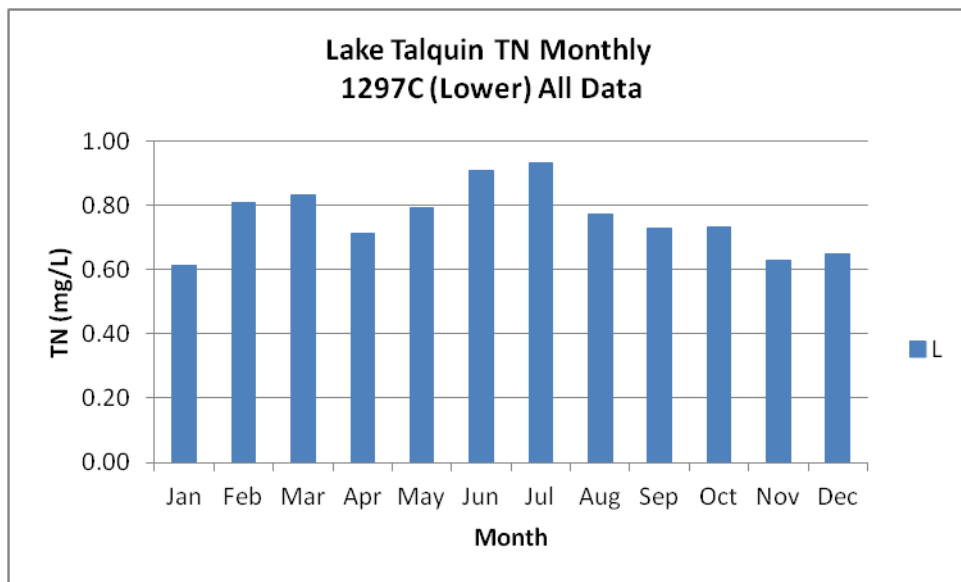


Figure B.4M.13. Lake Talquin Lower WBID 1297C Monthly Average TN 1967–2013

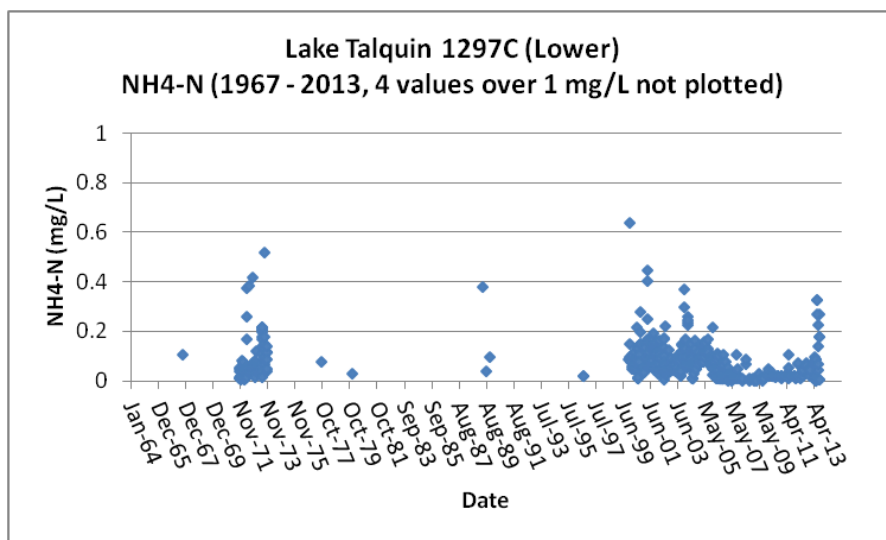


Figure B.4M.14. Lake Talquin Lower WBID 1297C Daily Average Ammonia-N 1967–2013

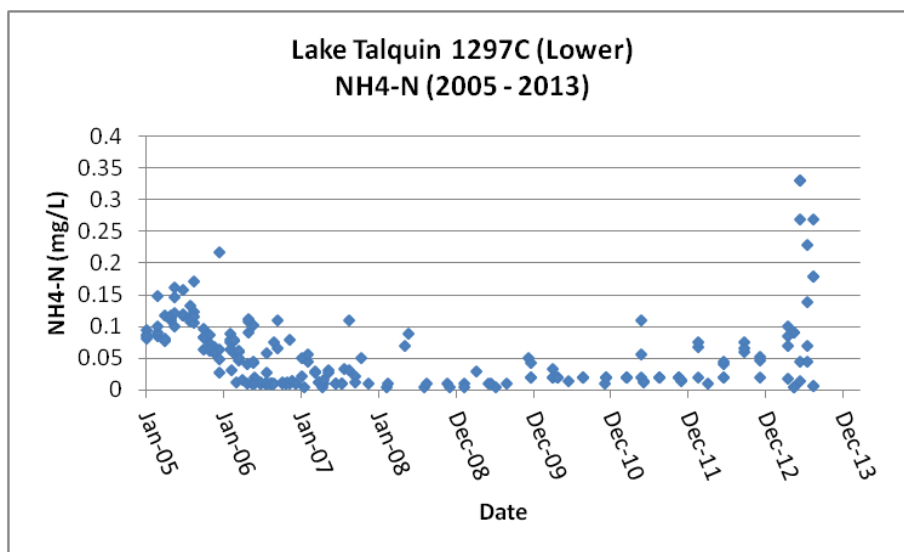


Figure B.4M.15. Lake Talquin Lower WBID 1297C Daily Average Ammonia-N 2005–2013

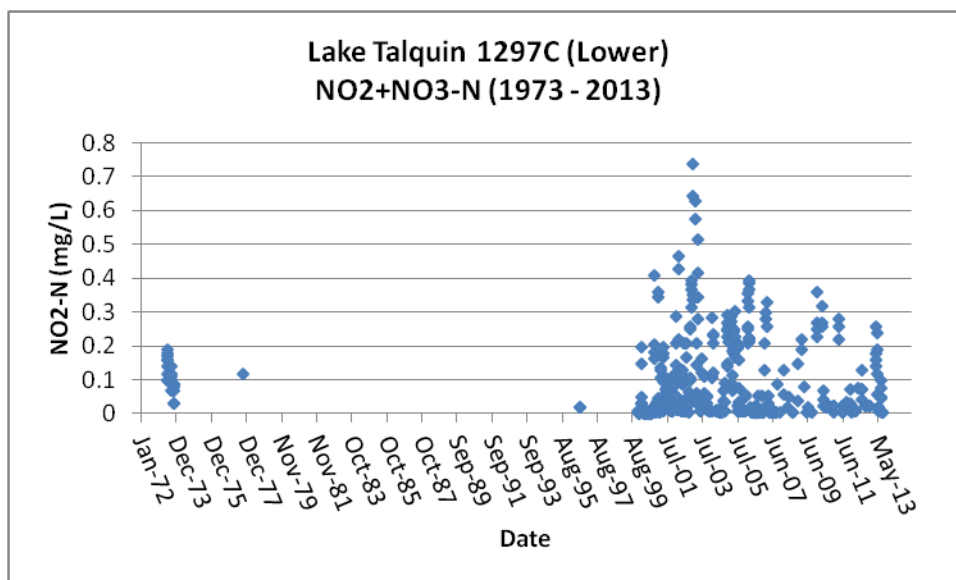


Figure B.4M.16. Lake Talquin Lower WBID 1297C Daily Average Nitrate/Nitrite-N 1973–2013

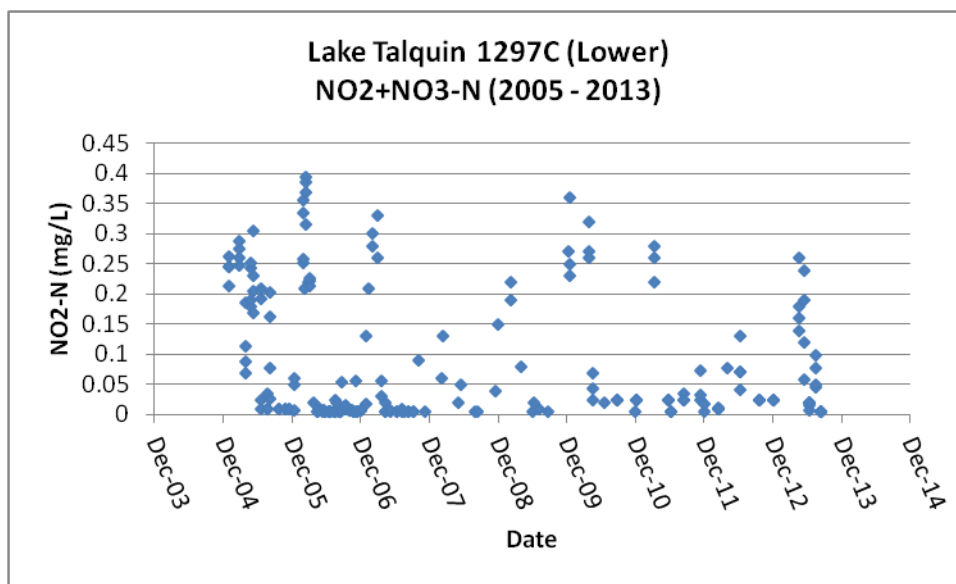


Figure B.4M.17. Lake Talquin Lower WBID 1297C Daily Average Nitrate/Nitrite-N 2005–2013

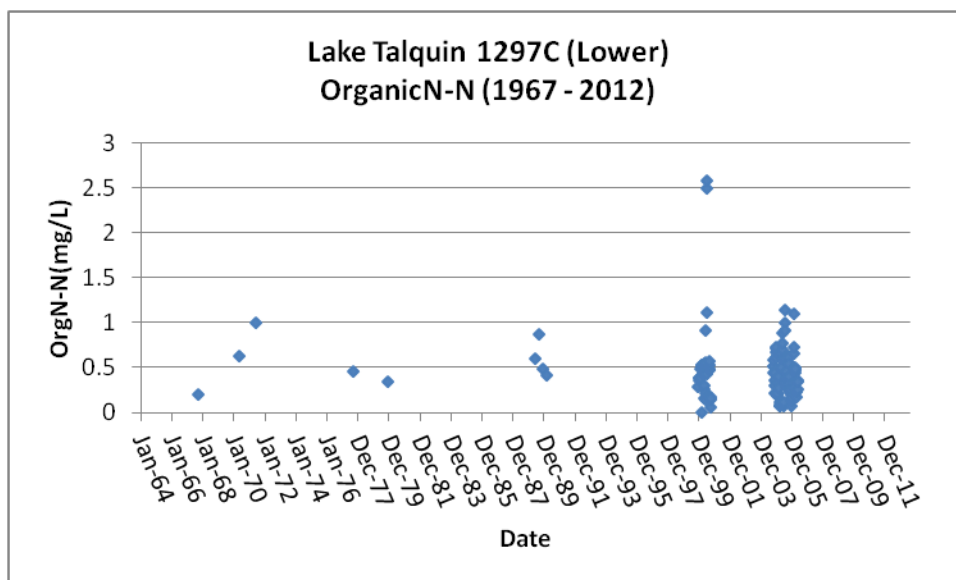


Figure B.4M.18. Lake Talquin Lower WBID 1297C Daily Average Organic-N 1967–2012

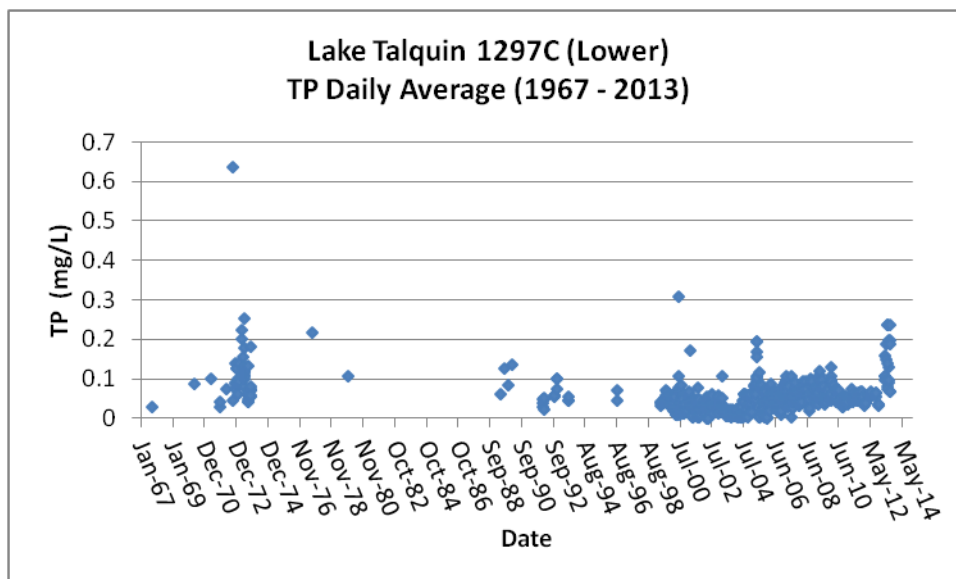


Figure B.4M.19. Lake Talquin Lower WBID 1297C Daily Average TP 1967–2013

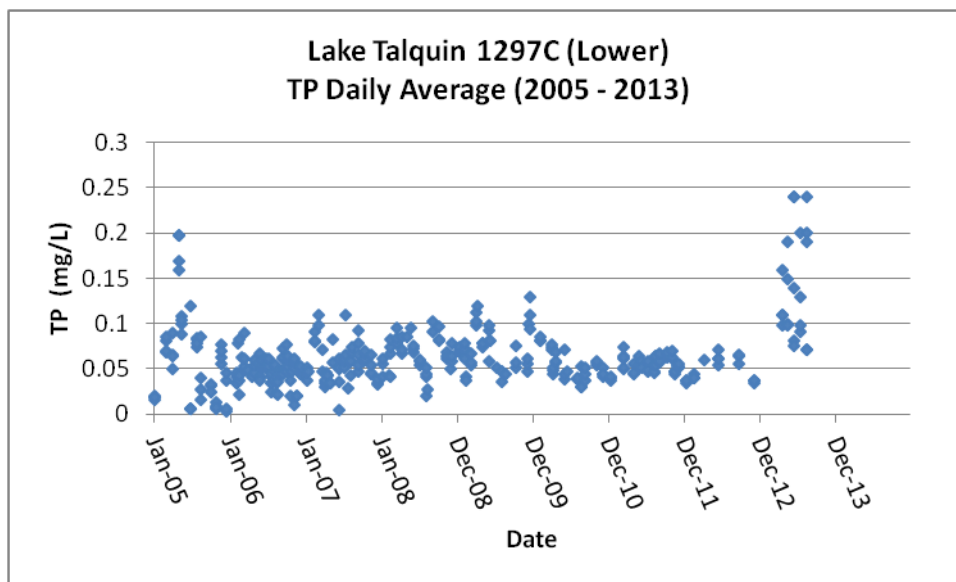


Figure B.4M.20. Lake Talquin Lower WBID 1297C Daily Average TP 2005–2013

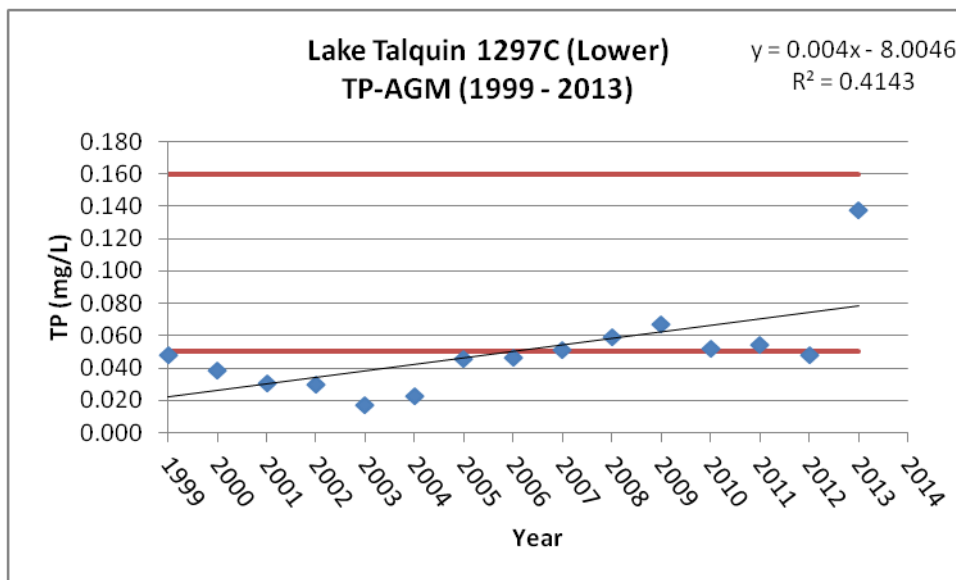


Figure B.4M.21. Lake Talquin Lower WBID 1297C Annual Geomean TP 1999–2013

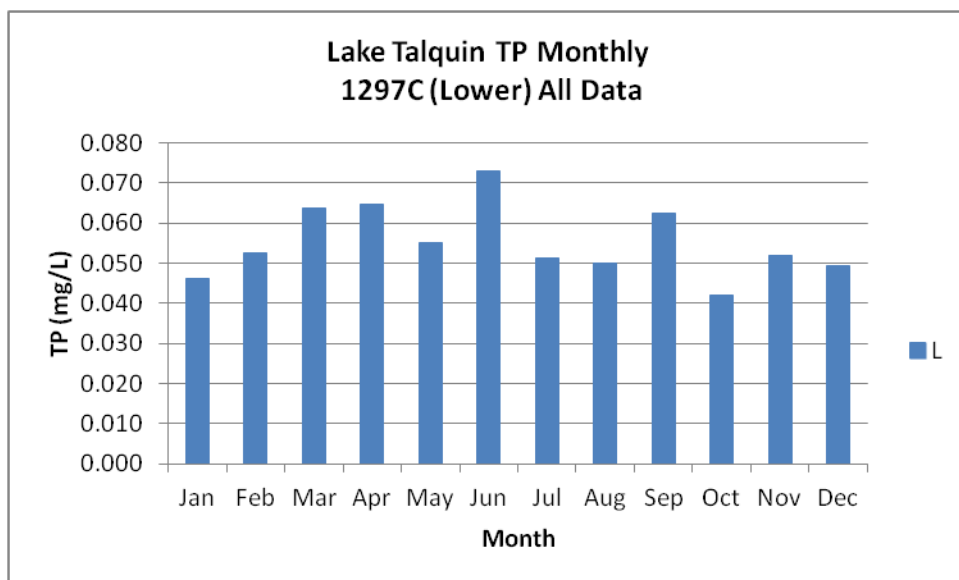


Figure B.4M.22. Lake Talquin Lower WBID 1297C Monthly Average TP 1967–2013

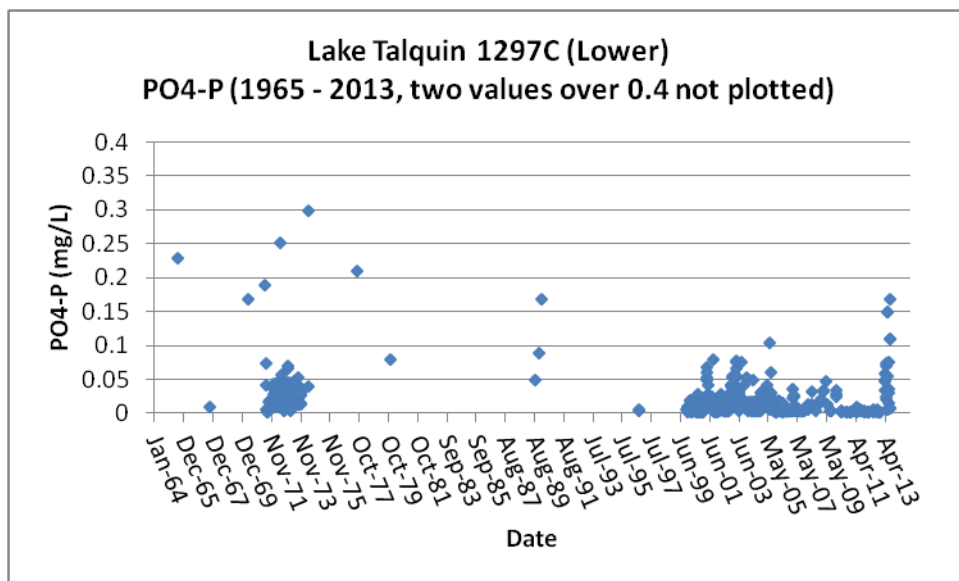


Figure B.4M.23. Lake Talquin Lower WBID 1297C Daily Average Orthophosphate-P 1965–2013

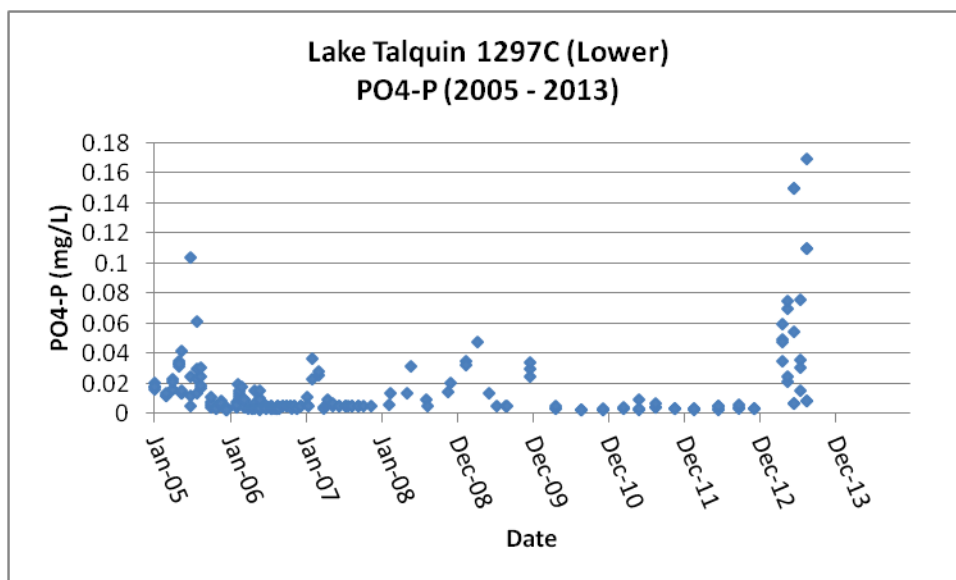


Figure B.4M.24. Lake Talquin Lower WBID 1297C Daily Average Orthophosphate-P 2005–2013

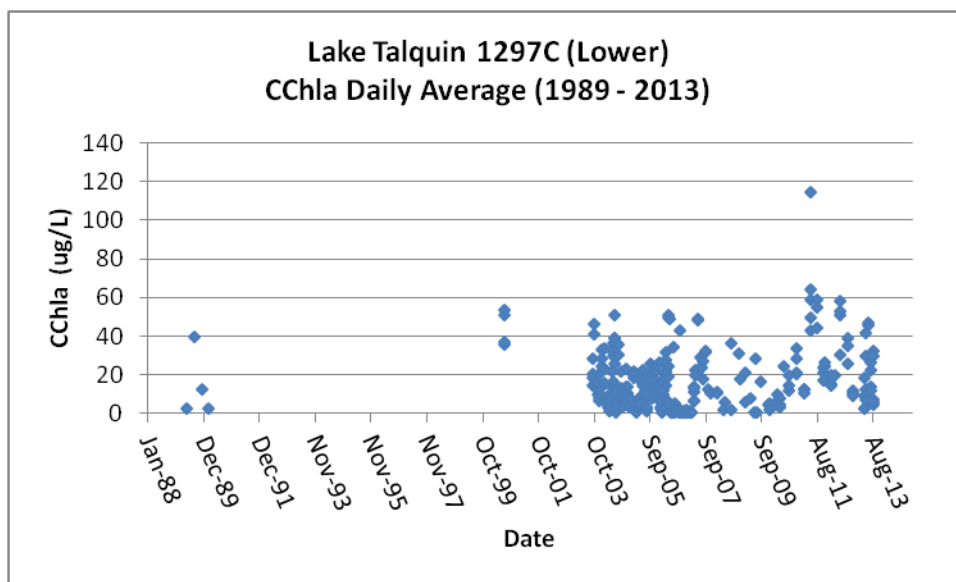


Figure B.4M.25. Lake Talquin Lower WBID 1297C Daily Average CChla 1989–2013

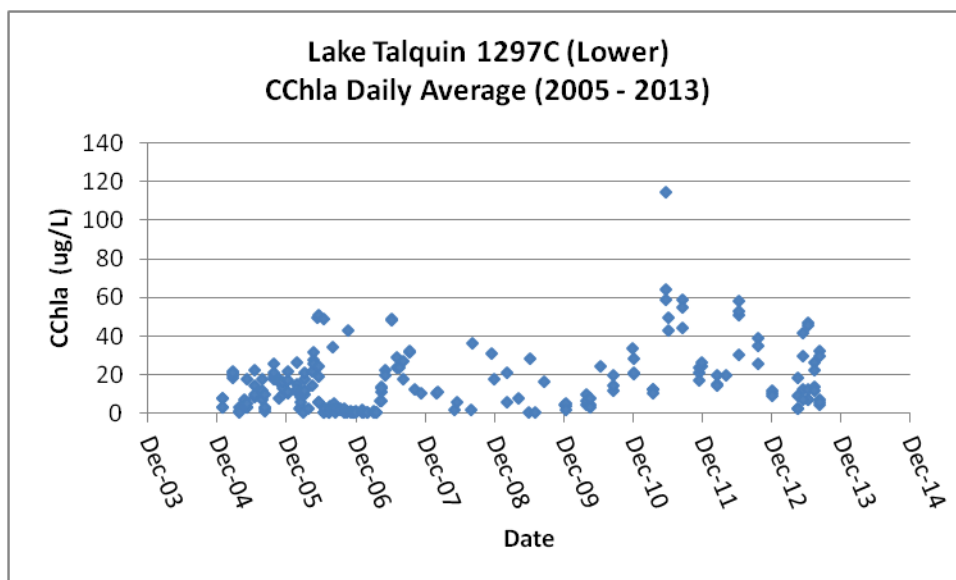


Figure B.4M.26. Lake Talquin Lower WBID 1297C Daily Average CChla 2005–2013

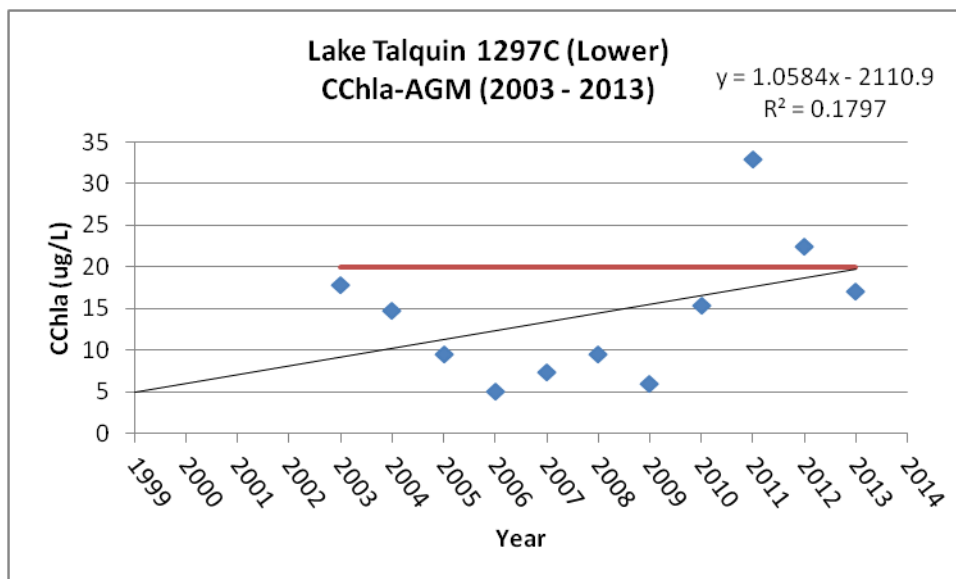


Figure B.4M.27. Lake Talquin Lower WBID 1297C Annual Geomean CChla 2003–2013

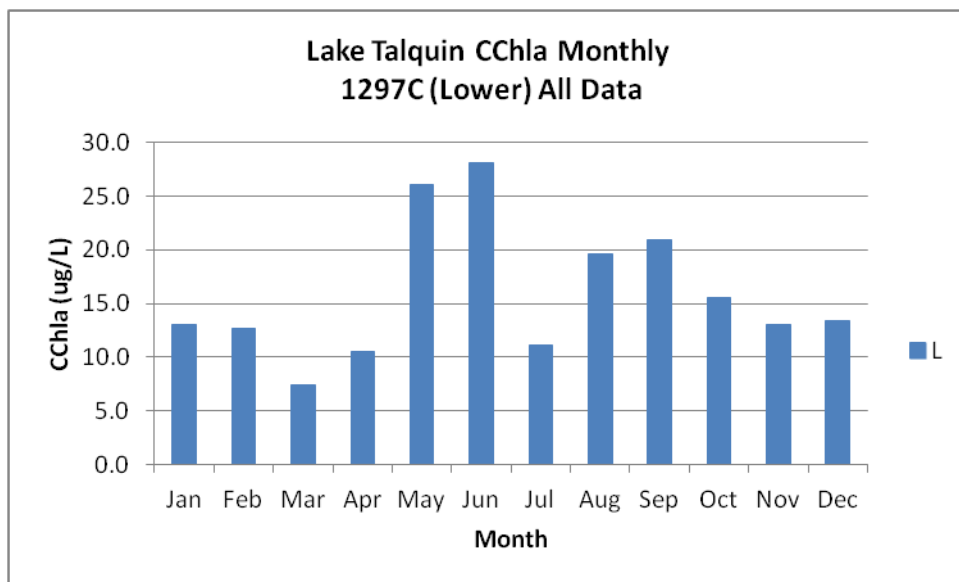


Figure B.4M.28. Lake Talquin Lower WBID 1297C Monthly Average CChla 1989–2013

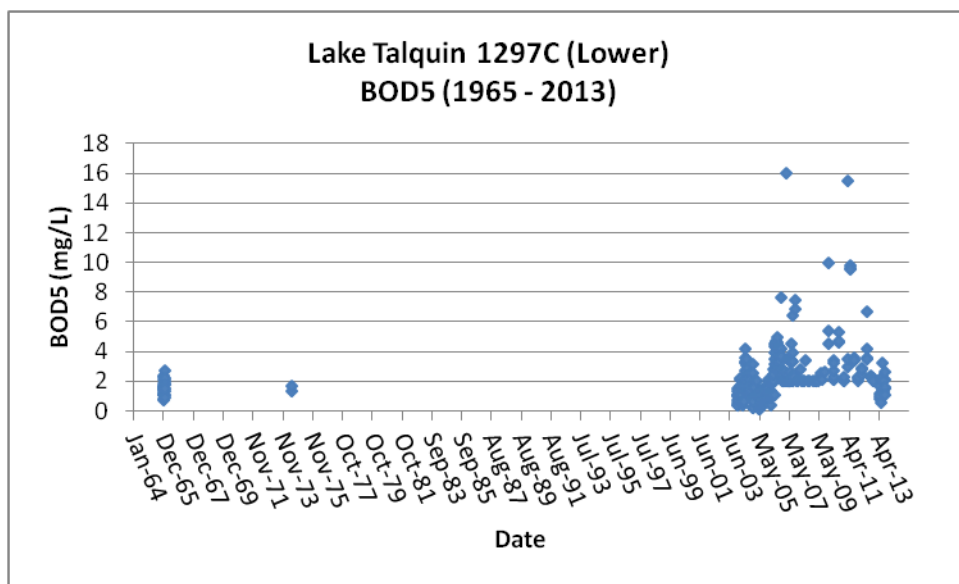


Figure B.4M.29. Lake Talquin Lower WBID 1297C Daily Average BOD5 1965–2013

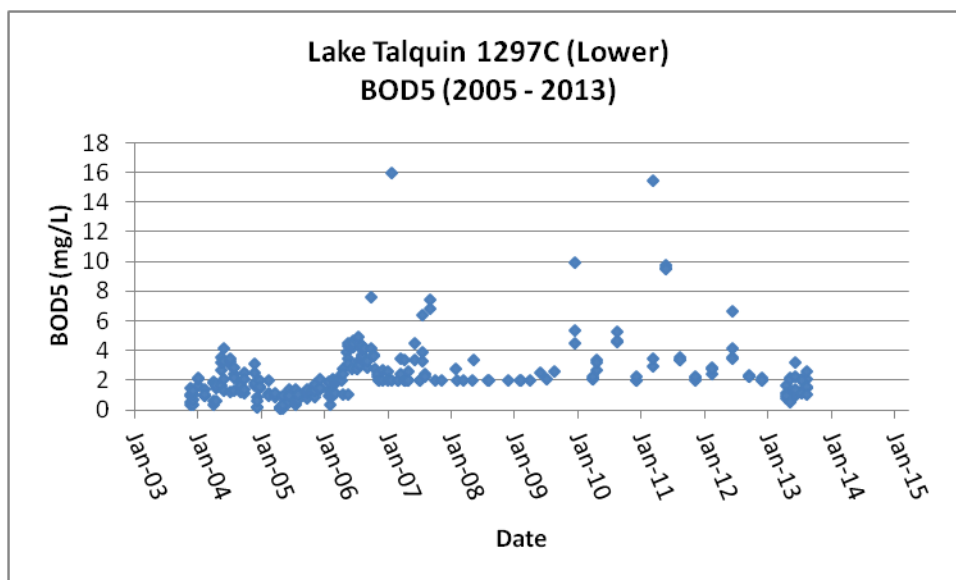


Figure B.4M.30. Lake Talquin Lower WBID 1297C Daily Average BOD5 2005–2013

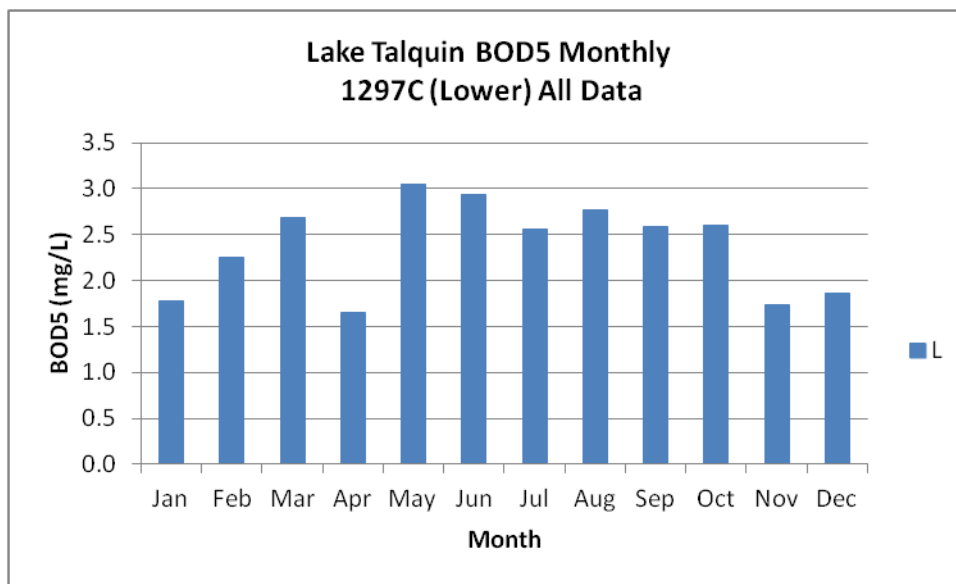


Figure B.4M.31. Lake Talquin Lower WBID 1297C Monthly Average BOD5 1965–2013

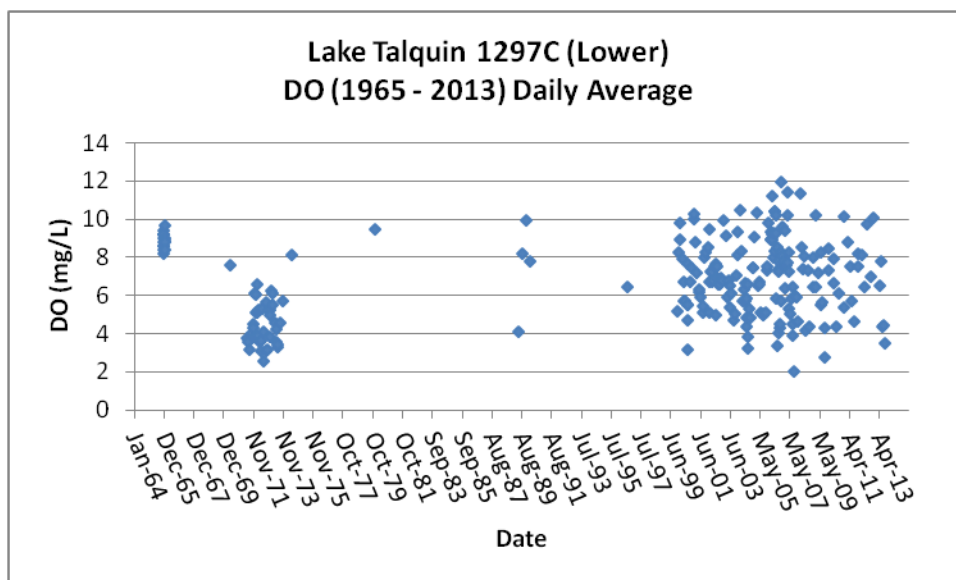


Figure B.4M.32. Lake Talquin Lower WBID 1297C Daily Average DO 1965–2013

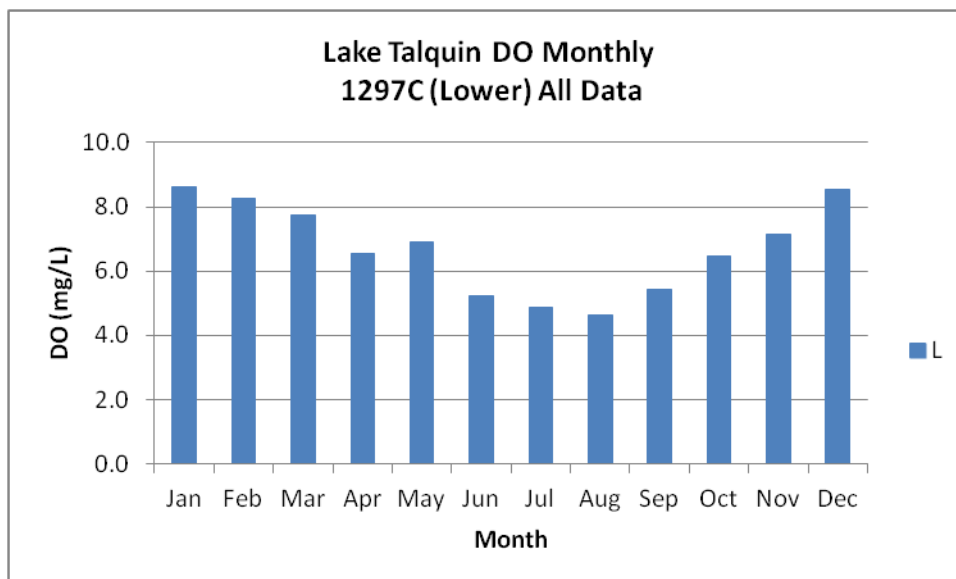


Figure B.4M.33. Lake Talquin Lower WBID 1297C Monthly Average DO 1965–2013

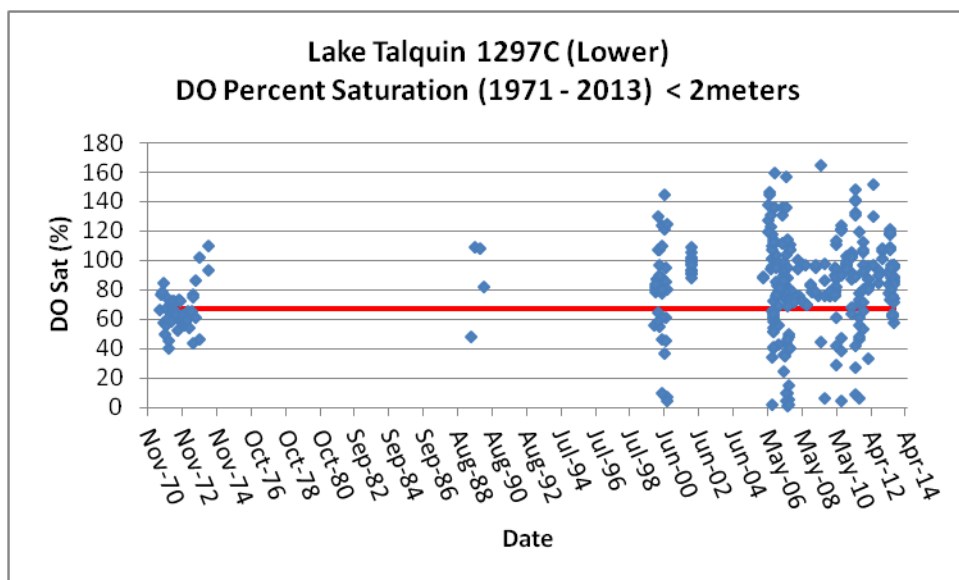


Figure B.4M.34. Lake Talquin Lower WBID 1297C Daily Average DO Percent Saturation 1971–2013

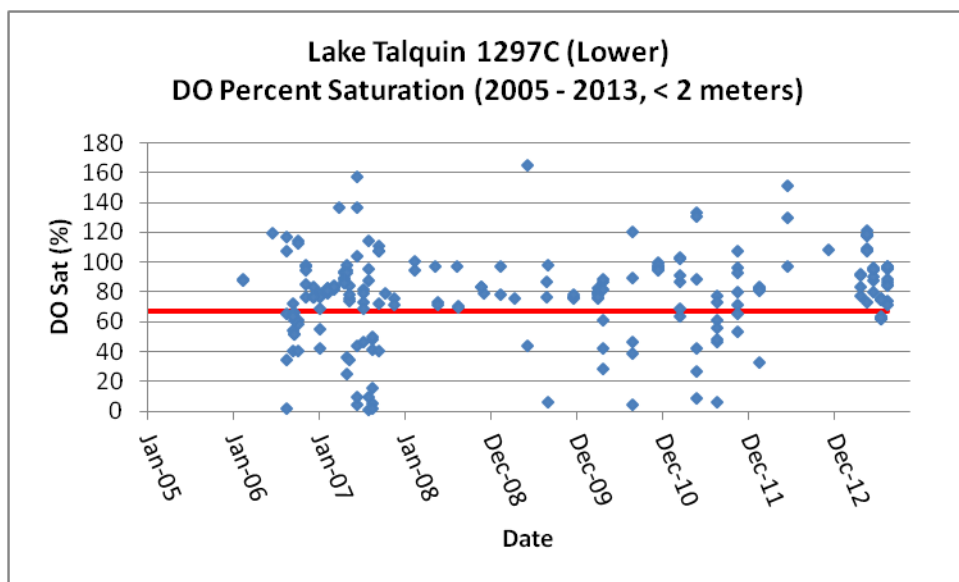


Figure B.4M.35. Lake Talquin Lower WBID 1297C Daily Average DO Percent Saturation 2005–2013

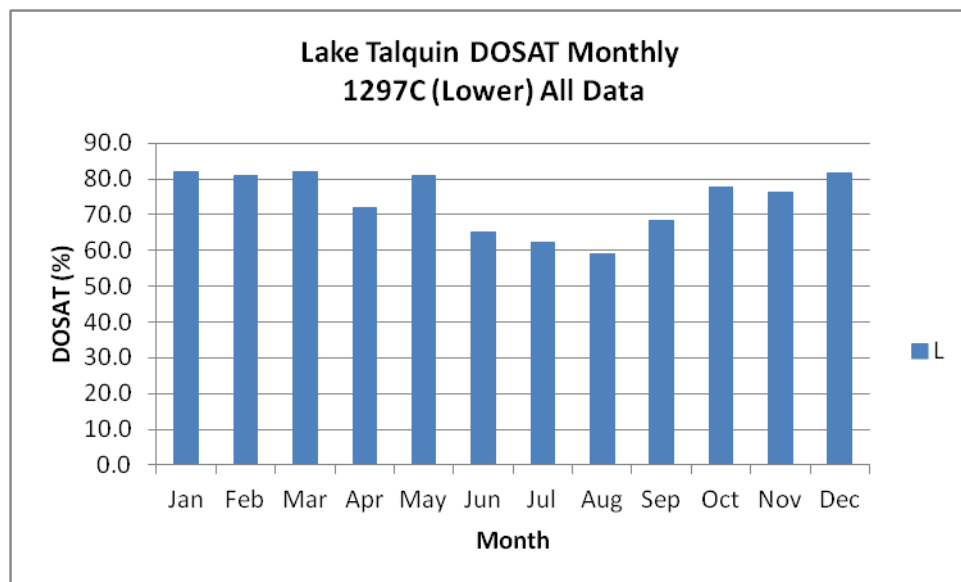


Figure B.4M.36. Lake Talquin Lower WBID 1297C Monthly Average DO Percent Saturation 1965–2013

Table B.4M.1. Lake Talquin WBIDs 1297C IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
1297C	21FLLEONLCT0B3040284630	Talquin 1	2006	2007
1297C	21FLLEONLCT03042384172	Lake Talquin near Luther Hall Landing	2009	2010
1297C	21FLGW 9242	NWA-LL-1015 LAKE TALQUIN	2000	2000
1297C	21FLGW 9239	NWA-LL-1012 LAKE TALQUIN	2000	2000
1297C	21FLGW 39368	Z1-LL-4009R J T BUDD POND	0	0
1297C	21FLGW 38707	Z1-LL-4009 J T BUDD POND	2010	2010
1297C	21FLGW 22124	NW1-LL-2048 LAKE TALQUIN	2004	2004
1297C	21FLGW 22103	NW1-LL-2011 LAKE TALQUIN	2004	2004
1297C	112WRD 302615084340203	LAKE TALQUIN AT 1 MI SW OF CENTER	1979	1979
1297C	21FLGW 37923	Z1-LL-3010R J T BUDD POND	2009	2009
1297C	21FLWQA 302416108437442	Lake Talquin at Blounts Landing	2002	2002
1297C	21FLBRA 1297C-A	1297C - Lake Talquin - Cook's Landing	2006	2006
1297C	112WRD 302615084340201	LAKE TALQUIN AT 4.5 MI WSW OF CENTER	1979	1979
1297C	21FLMCGLT0B	T0B: Lake Talquin at Blount Rd/Lanier Landing. Tak	2000	2000
1297C	21FLMCGLT0L	Lake Talquin, Lewis Hall Landing, middle of lake	1999	2006
1297C	21FLLEONLCOC3040784610	Lake Talquin (Ben Stoutamire Boat Landing)	2005	2010
1297C	112WRD 302615084340205	LAKE TALQUIN AT 2 MI ENE OF CENTER	1979	1979
1297C	21FLGW 9241	NWA-LL-1014 LAKE TALQUIN	2000	2000
1297C	21FLWQA 302332408438263	Lake Talquin at LEW at dock .25 MI UPS dam	0	0
1297C	21FLWQA 302319608438438	Ochlockonee River at dam	2002	2002
1297C	21FLGW 22113	NW1-LL-2026 LAKE TALQUIN	2004	2004
1297C	21FLGW 22101	NW1-LL-2008 LAKE TALQUIN	2004	2004
1297C	21FLA 22020054	LAKE TALQUIN NEAR WHIPPOORWILL MARINA	1996	1996
1297C	21FLGW 36987	Z1-LL-3010 J T BUDD POND	2009	2009
1297C	21FLWQA 302505808434229	Lake Talquin at Halls Landing	2002	2002
1297C	21FLWQA 302417708437449	OCHLOCKONEE RIVER (LAKE TALQUIN) NR BLOUNTS LANDING FROM BO	0	0
1297C	21FLLEONLCT0L3042284573	Talquin 2	2006	2007
1297C	21FLGW 40127	Z1-LL-5009 J T BUDD POND	0	0
1297C	21FLGW 22118	NW1-LL-2038 LAKE TALQUIN	2004	2004
1297C	21FLA 22020033	LAKE TALQUIN MIDDLE OF	1974	1974
1297C	11EPALES123901	LAKE TALQUIN	1973	1973
1297C	112WRD 302615084340202	LAKE TALQUIN AT 3.5 MI WSW OF CENTER	1979	1979
1297C	21FLWQA 302516508434327	Lake Talquin near Halls Landing	0	0
1297C	21FLWQA 302425808436371	Lake Talquin at Ben Stoutmire Landing	2002	2002
1297C	21FLGW 40970	Z1-LL-5009R LAKE TALQUIN	0	0
1297C	21FLGW 40966	Z1-LL-5005R LAKE TALQUIN	0	0
1297C	21FLA 22020034	LAKE TALQUIN DAM SITE	1971	1974
1297C	1113S050644640	OCHLOCKONEE R AT L TELQUIN DAM	1965	1966

WBID	Station Number	Station Name	Begin Date	End Date
1297C	21FLMCGLTOL	TOL: Lake Talquin at Luther Hall Landing. Take boa	2000	2000
1297C	21FLGW 41382	Z1-LL-6008 LAKE TALQUIN	0	0
1297C	21FLGW 40123	Z1-LL-5005 J T BUDD POND	0	0
1297C	112WRD 302615084340204	LAKE TALQUIN (AT CENTER)	1979	1979
1297C	21FLMCGLT0B	Lake Talquin, Southern end, middle of lake	1999	2006
1297C	21FLLEONT0D3041488461	Lake Talquin West	2007	2010
1297C	21FLGW 9244	NWA-LL-1025 LAKE TALQUIN	2000	2000
1297C	21FLGW 22126	NW1-LL-2051 LAKE TALQUIN	2004	2004
1297C	21FLBRA 1297C-E	1297C - Lake Talquin - 350m E of Cook's Landing	2006	2006
1297C	21FLBRA 1297C-D	1297C - Lake Talquin - W-central section	2006	2007
1297C	21FLBRA 1297C-C	1297C - Lake Talquin - Central Section	2006	2007
1297C	112WRD 302615084340207	LAKE TALQUIN AT 6 MI ENE OF CENTER	1979	1979
1297C	112WRD 302615084340206	LAKE TALQUIN AT 4.5 MI ENE OF CENTER	1979	1979

Table B.4M.2. Lake Talquin Lower WBID 1297C Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
1297C	Alkalinity (mg/L)	1965 - 2013	14.0
1297C	Color-True (PCU)	1996 - 2013	53.2

Table B.4M.3. Lake Talquin Lower WBID 1297C DO Percent Saturation vs. 67 % Criterion

Year	Category	Result (*)
1971 - 2013	Count	367
	Number P	274
	Number F	93
	Percent F	25.3
2005-2013	Count	274
	Number P	203
	Number F	71
	Percent F	25.9

(*) Result based only on data from upper 2 meters of water column.

Table B.4M.4. Lake Talquin Lower WBID 1297C Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN	TP	TN/TP	CChla
	AGM	AGM	Ratio	AGM
1972		0.127		
1973		0.116		
1999	0.63	0.048	13.1	
2000	0.48	0.039	12.4	
2001	0.69	0.031	22.4	
2002	0.81	0.030	26.9	
2003	0.33	0.018	18.8	17.8
2004	0.64	0.023	28.1	14.9
2005	0.53	0.046	11.7	9.6
2006	0.75	0.047	16.0	5.1
2007	0.81	0.052	15.8	7.5
2008	0.91	0.059	15.3	9.6
2009	0.89	0.067	13.3	5.9
2010	0.81	0.052	15.5	15.4
2011	0.83	0.055	15.2	33.0
2012	0.64	0.048	13.3	22.5
2013	1.01	0.138	7.3	17.1

Table B.4M.5. Lake Talquin Lower WBID 1297C Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	1965 - 2013	952	1.8	34.5	23.2	22.0	20.9
Alkalinity	mg/L	1965 - 2013	519	1.0	70.0	14.5	15.6	14.0
pH	S.U.	1965 - 2013	915	2.8	12.9	6.9	NA	NA
Color	PCU	1996 - 2013	502	3.3	368.0	55.0	65.4	53.2
TN	mg/L	1973 - 2013	699	0.07	3.43	0.73	0.76	0.67
NH4-N	mg/L	1973 - 2013	558	0.004	3.64	0.06	0.09	0.055
NO23	mg/L	1973 - 2013	451	0.001	0.74	0.03	0.09	0.033
OrgN	mg/L	1989 - 2006	124	0.010	2.580	0.405	0.458	0.359
TP	mg/L	1973 - 2013	724	0.002	0.638	0.049	0.055	0.043
PO4-P	mg/L	1973 - 2013	539	0.002	1.069	0.011	0.025	0.013
CChla	ug/L	1989 - 2013	294	1.0	115.0	12.5	16.7	10.2
BOD5	mg/L	1965 - 2013	296	0.1	16.0	2.0	2.3	1.8
DO	mg/L	1965 - 2013	934	0.0	12.8	7.2	6.6	5.2
%DOSat	%	1965 - 2013	367	1.6	165.4	82.6	81.7	58.5

Table B.4M.6. Lake Talquin Lower WBID 1297C Water Quality Data Summary Verified Period Plus (2005–2013)

Constituent	Units	Verified Period+	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2013	484	9.6	34.5	24.5	23.2	22.4
Alkalinity	mg/L	2005 - 2013	196	5.0	70.0	15.0	16.6	14.5
pH	S.U.	2005 - 2013	484	5.7	9.7	6.9	NA	NA
Color	PCU	2005 - 2013	186	11.3	230.0	47.5	62.0	47.7
TN	mg/L	2005 - 2013	369	0.08	1.56	0.86	0.86	0.80
NH4-N	mg/L	2005 - 2013	214	0.004	0.33	0.04	0.06	0.034
NO23	mg/L	2005 - 2013	205	0.004	0.39	0.03	0.09	0.031
OrgN	mg/L	2005 - 2013	60	0.010	2.580	0.459	0.508	0.389
TP	mg/L	2005 - 2013	373	0.003	0.240	0.056	0.062	0.054
PO4-P	mg/L	2005 - 2013	199	0.003	0.170	0.006	0.016	0.009
CChla	ug/L	2005 - 2013	216	1.0	115.0	11.9	16.1	9.2
BOD5	mg/L	2005 - 2013	210	0.1	16.0	2.0	2.6	2.0
DO	mg/L	2005 - 2013	485	0.0	12.8	7.1	6.5	4.9
%DOSat	%	2005 - 2013	274	1.6	165.4	82.3	78.9	58.1

B.4N Ochlockonee River Outlet WBID 1297B (Below Lake Talquin)

This WBID is not impaired for nutrients or low DO

Table B.4N.1 lists the 21 stations that have been sampled in the Ochlockonee River below Lake Talquin (WBID 1297B). **Figure B.4N.1** depicts the station locations.

Tables B.4N.5 and **B.4N.6** and **Figures B.4N.4** and **B.4N.5** provide the results for alkalinity. These data show that the Ochlockonee River below Lake Talquin has a POR GM alkalinity of 13.6 mg/L. The data indicate that the alkalinity for the period (2005–2013) of 15.8 mg/L is slightly less than the POR. The seasonal pattern indicates that the alkalinity is lowest in the first three months of the year (~ 10 mg/L), as flow into the lake and rainfall increase and gradually increases through the fall and early winter to over 20 mg/L. This pattern for alkalinity appears to be inversely related to river flow (flow highest in first three months of the year **Figure B.3.12**) and alkalinity at the lowest.

Tables B.4N.5 and **B.4N.6** and **Figures B.4N.6** and **B.4N.7** provide the results for true color. These data show that the Ochlockonee River below Lake Talquin has a POR GM color of 57.7 PCU, lower than the Upper area of the lake and the incoming color of the Ochlockonee River of 62.5 and the Little River (63.1). The data indicate that the GM color for the period (2005–2013) of 42.7 PCU is reduced relative to the POR color. The combined mean flow of Ochlockonee and Little Rivers for the period 1998–2013 of 1,021 cfs is slightly less than the flow of 1,080 cfs for the period 2005–2013, although the annual average rainfall was 2.3 inches greater for the earlier period (56.5 vs. 54.2 inches). The seasonal pattern indicates that the color is highest during January through July and reduced during the drier periods in the late summer, fall, and early winter.

Tables B.4N.5 and **B.4N.6** and **Figures B.4N.9** through **B.4N.12** provide the results for TN. These data show that the Ochlockonee River below Lake Talquin has a POR GM TN of 0.62 mg/L. The data (**Figure B.4N.11**) indicate that the recent (2005–2013) TN GM of 0.74 mg/L is greater than the TN GM for the POR and less than new 1.03 mg/L threshold AGM concentration for TN. The data indicate a slight decrease in AGM TN concentrations over values measured in the 1970's. The seasonal pattern indicates that the TN concentration generally increase slightly from January through April, then decreasing through July, increasing through October and then decreasing through the end of the year. This pattern for TN is not clearly related to flow or rainfall (**Figures B.3.12** and **B.2.4**).

Tables B.4N.5 and **B.4N.6** and **Figures B.4N.13** and **B.4N.14** provide the results for NH₄-N. These data show that the Ochlockonee River below Lake Talquin has a POR GM NH₄-N of 0.093 mg/L. The data indicate that the recent (2005–2013) NH₄-N GM of 0.088 mg/L is similar to the POR concentration. The overall trend may be masked by the number of results reported as less than detection.

Tables B.4N.5 and **B.4N.6** and **Figures B.4N.15** and **B.4N.16** provide the results for NO₃-N. These data show that the Ochlockonee River below Lake Talquin has a POR GM NO₃-N of

0.066 mg/L. The data indicate that the recent (2005–2013) NO₃-N GM of 0.069 mg/L is equivalent to the POR concentration and that there does not appear to be a trend for this constituent.

Tables B.4N.5 and B.4N.6 and Figures B.4N.18 through B.4N.21 provide the results for TP. These data show that the Ochlockonee River below Lake Talquin has a POR GM TP of 0.052 mg/L. The data (**Figure B.4N.20**) indicate that the recent (2005–2013) TP GM of 0.055 mg/L is similar to the TP GM for the POR and less than the new 0.18 mg/L threshold AGM concentration for TP. The data also indicate that the overall trend may be for decreasing AGM TP concentrations. The seasonal pattern has TP concentrations lowest during January through March, slightly higher but steady through August, and then at the highest during September through December. This pattern for TP is not clearly related to flow or rainfall (**Figures B.3.12 and B.2.4**).

Tables B.4N.5 and B.4N.6 and Figures B.4N.22 and B.4N.23 provide the results for PO₄-P. These data show that the Ochlockonee River below Lake Talquin has a POR GM PO₄-P of 0.017 mg/L. The data indicate that the recent (2005–2013) PO₄-P GM of 0.010 mg/L is less than the POR concentration and that the overall trend may be masked by the number of results reported as less than detection.

Tables B.4N.5 and B.4N.6 and Figures B.4N.24 through B.4N.27 provide the results for CChla. These data show that the Ochlockonee River below Lake Talquin has a POR GM CChla of 5.1 ug/L. The data (**Figure B.4N.26**) indicate that the recent (2005–2013) CChla GM of 4.2 ug/L is slightly less than the CChla GM for the POR and less than the new threshold AGM concentration for CChla. The data also indicate that the overall trend may be for increasing AGM CChla concentrations. This trend may be related to the increasing trend for CChla in the lake. The seasonal pattern indicates that the CChla concentrations peak in May decrease significantly in June, then increasing through August, and slowly reducing concentrations through October, a third peak in November and decreasing through December. The pattern in CChla may be influenced by heavy rainfall in June through August, bringing in lower CChla concentrations from the lake (**Figure B.2.4**).

Tables B.4N.5 and B.4N.6 and Figures B.4N.28 through B.4N.30 provide the results for BOD₅. These data show that the Ochlockonee River below Lake Talquin has a POR GM BOD₅ of 1.3 mg/L. The data indicate that the recent (2005–2013) BOD₅ GM of 1.8 mg/L is similar to the POR concentration. Variable detection limits over time may be having an influence on the data. There is no apparent overall trend.

Tables B.4N.5 and B.4N.6 and Figures B.4N.31 and B.4N.32 provide the results for DO. These data show that the Ochlockonee River below Lake Talquin has a POR GM DO of 6.4 mg/L. The data indicate that the recent (2005–2013) DO GM of 6.9 mg/L is similar to the POR concentration. There is no apparent overall trend in time. Seasonal data indicate that the monthly average DO reaches a minimum of during July and August of 5.5 mg/L (**Figure B.4N.32**).

Tables B.4N.5 and B.4N.6 and Figures B.4N.33 through B.4N.35 provide the results for percent DO saturation. These data show that the Ochlockonee River below Lake Talquin has a POR GM DOSAT of 72.9 percent. The data indicate that the recent (2005–2013) DOSAT GM of 76.9 % is similar to the GM for the POR. The data do not appear to have a long-term trend. The data presented in **Figure B.4N.33** indicates that there are sufficient results below the new DO criterion to warrant further investigation. The seasonal pattern indicates that the DOSAT is lowest in April.

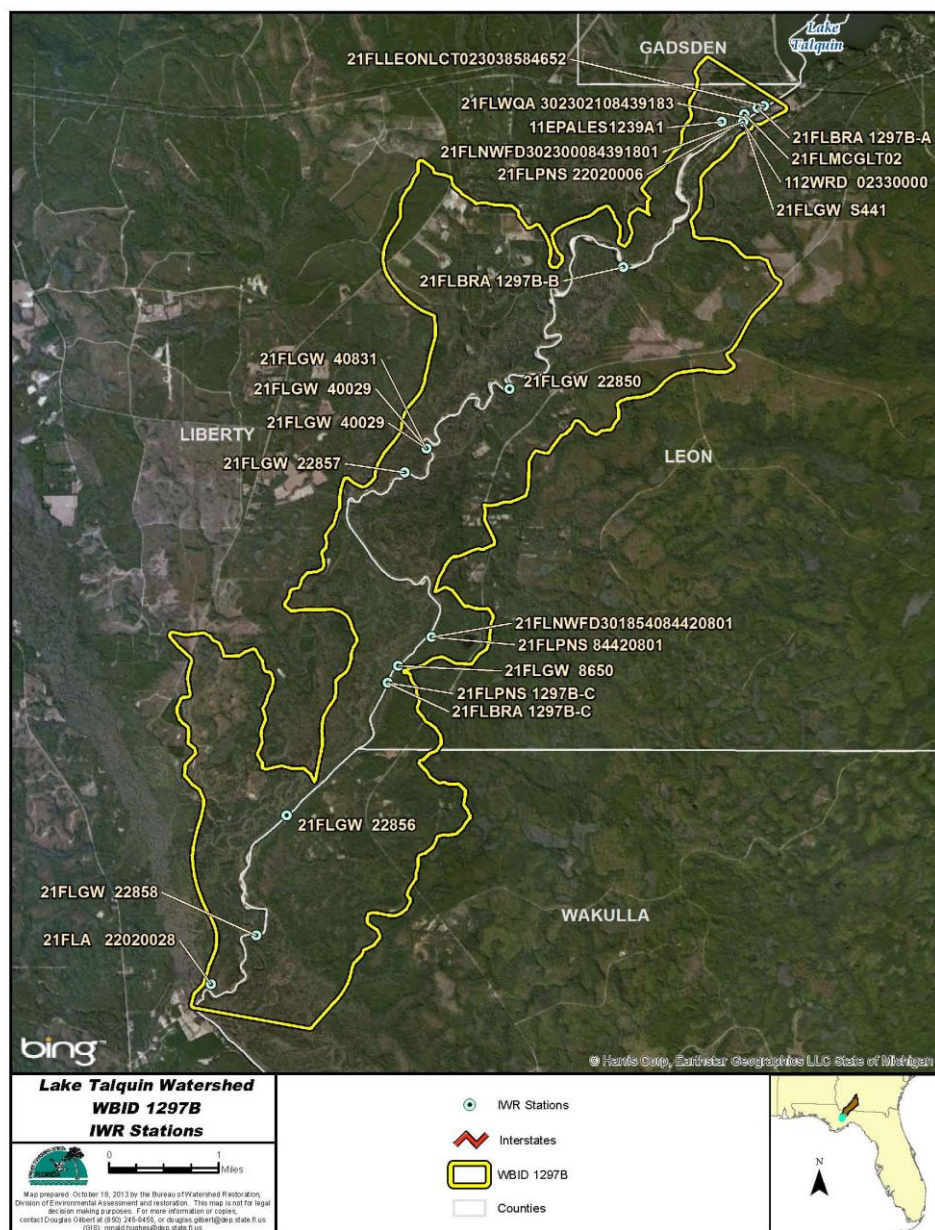


Figure B.4N.1. Ochlockonee River Below Lake Talquin WBID 1297B IWR Stations

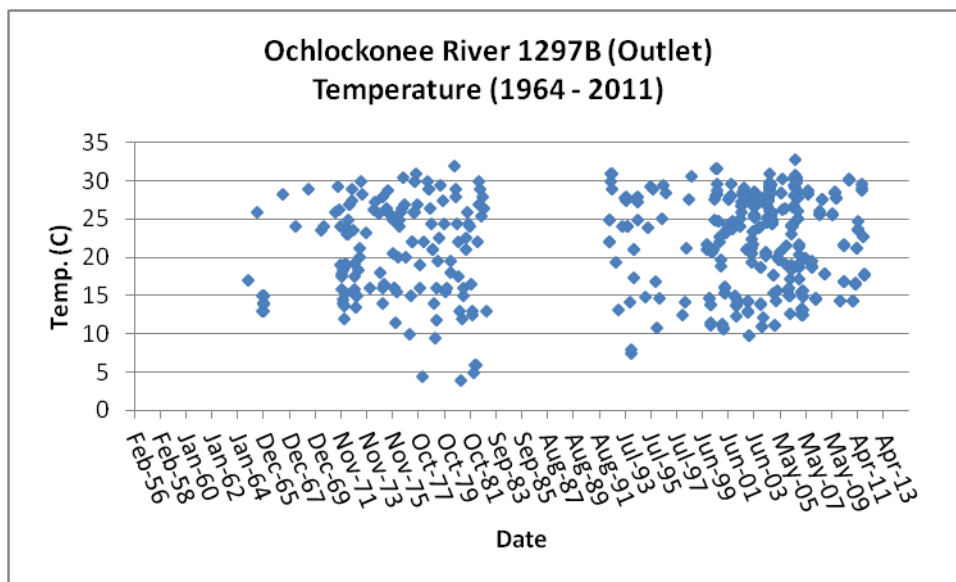


Figure B.4N.2. Ochlockonee River WBID 1297B Outlet Daily Temperature 1964–2011

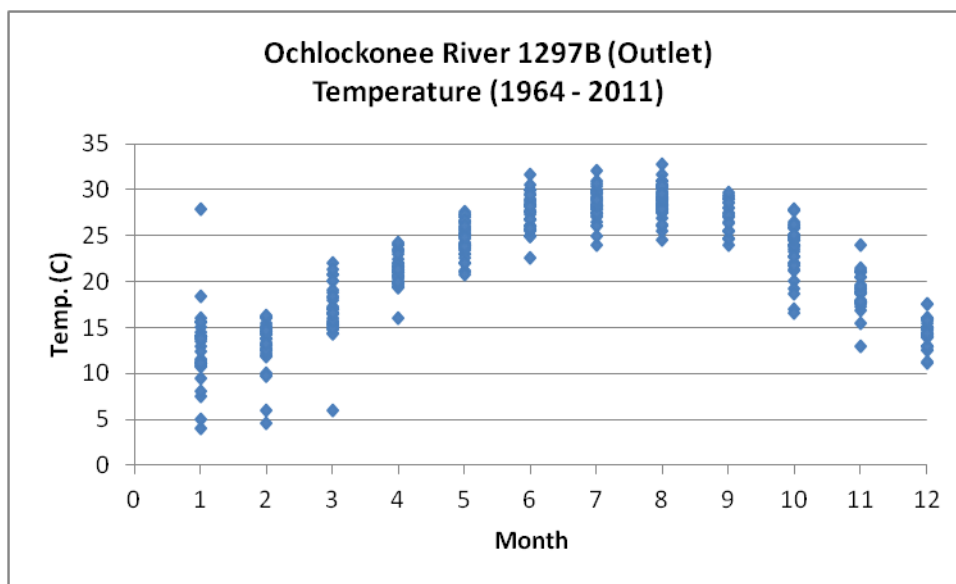


Figure B.4N.3. Ochlockonee River WBID 1297B Outlet Monthly Temperature 1964–2011

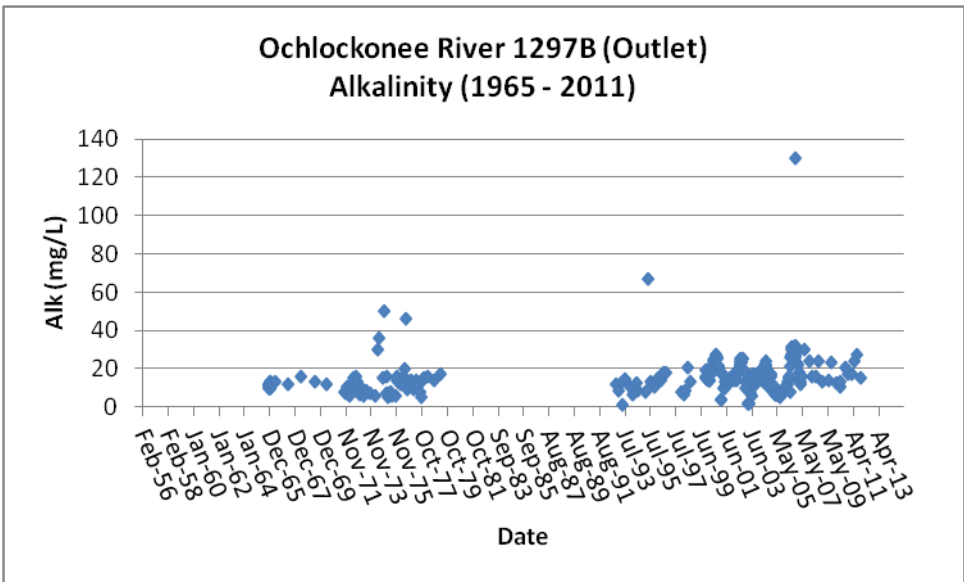


Figure B.4N.4. Ochlockonee River WBID 1297B Outlet Daily Average Alkalinity 1965–2011

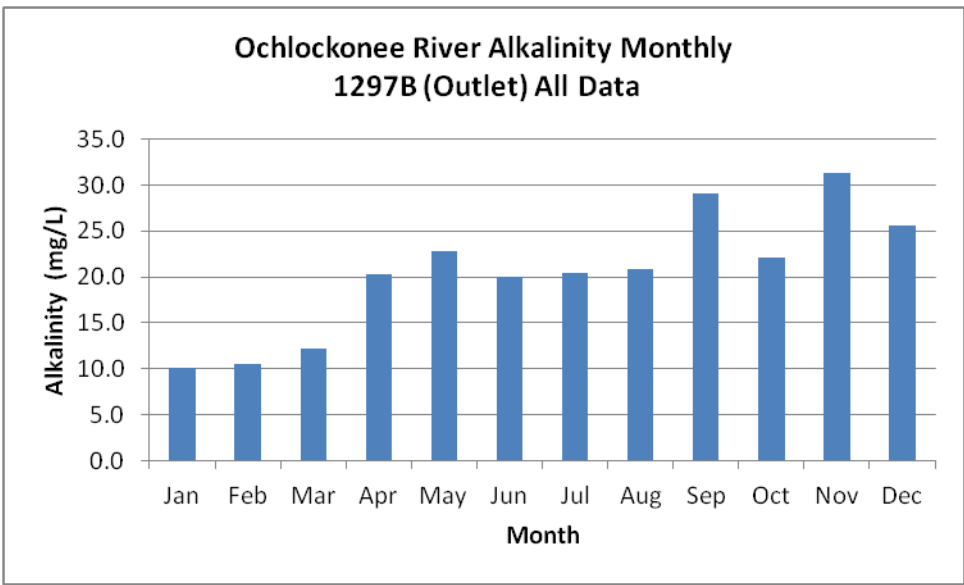


Figure B.4N.5. Ochlockonee River WBID 1297B Outlet Monthly Average Alkalinity 1965–2011

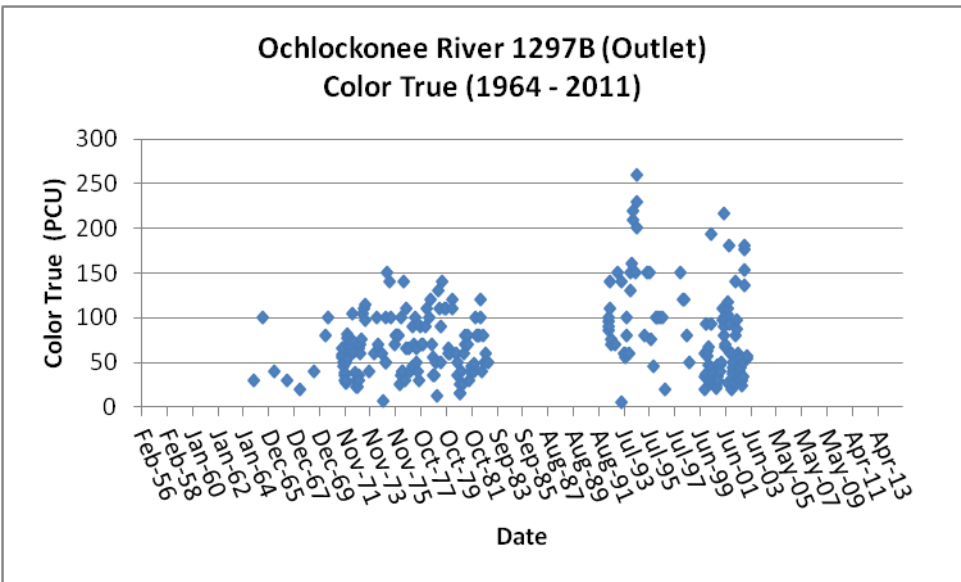


Figure B.4N.6. Ochlockonee River WBID 1297B Outlet Daily Average True Color 1964–2011

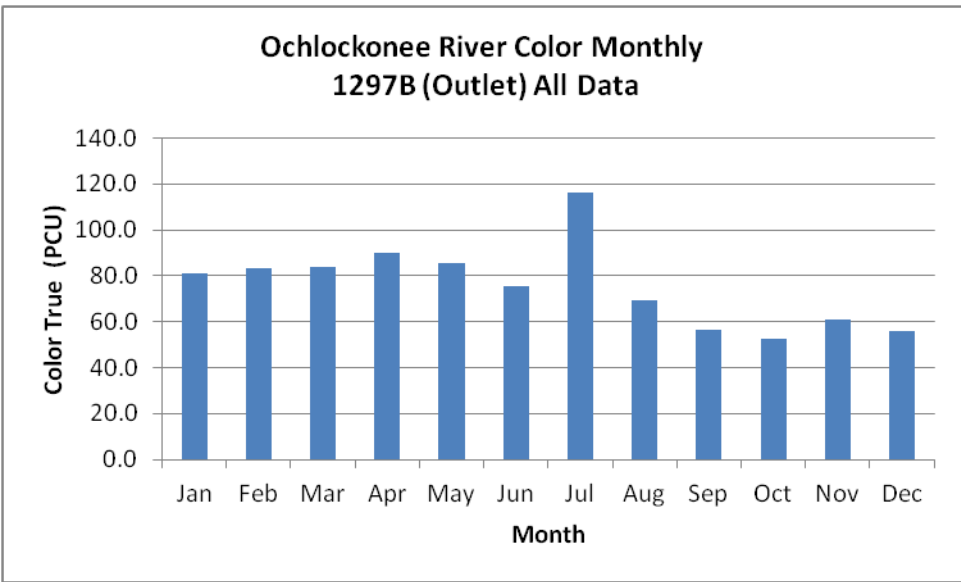


Figure B.4N.7. Ochlockonee River WBID 1297B Outlet Monthly Average True Color 1964–2011

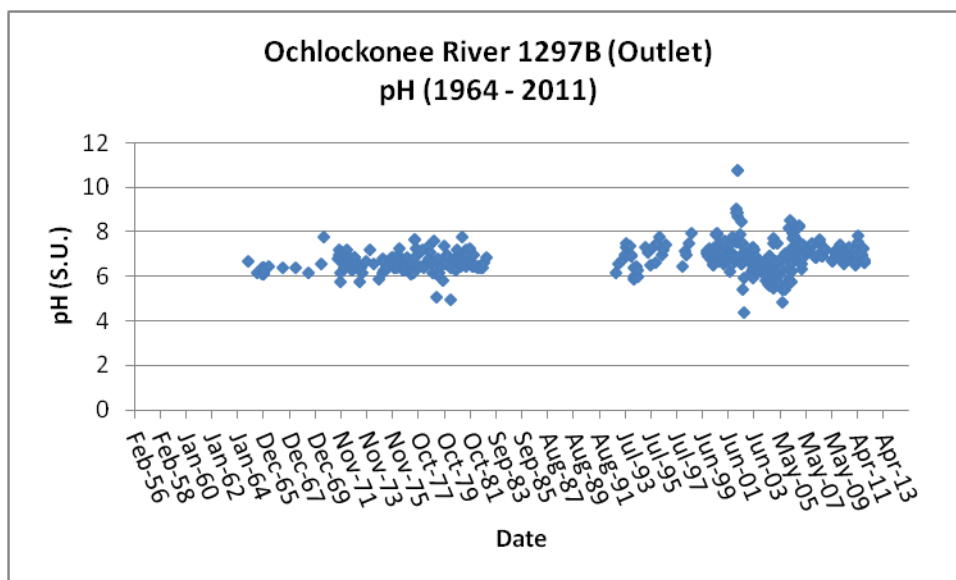


Figure B.4N.8. Ochlockonee River WBID 1297B Outlet Daily pH 1964–2011

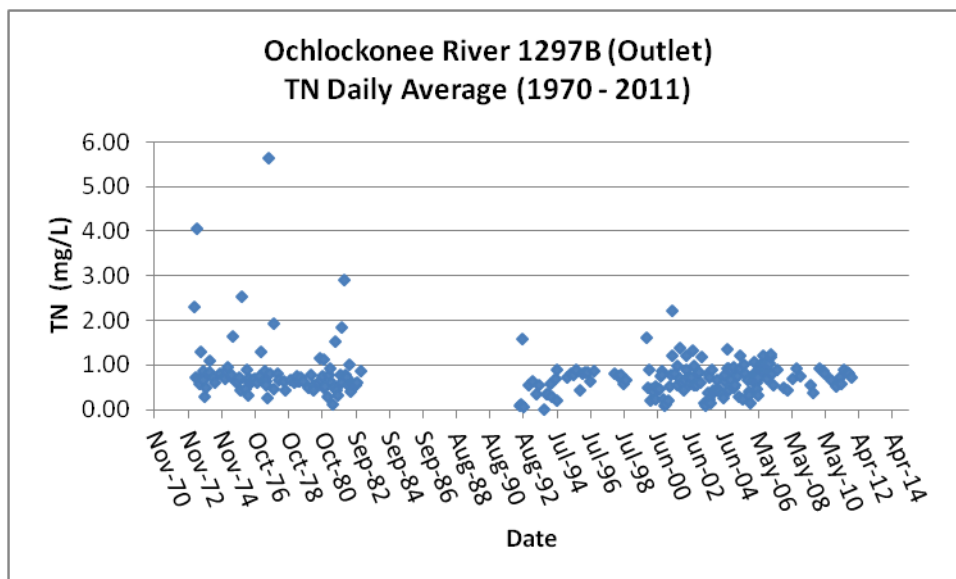


Figure B.4N.9. Ochlockonee River WBID 1297B Outlet Daily Average TN 1970–2011

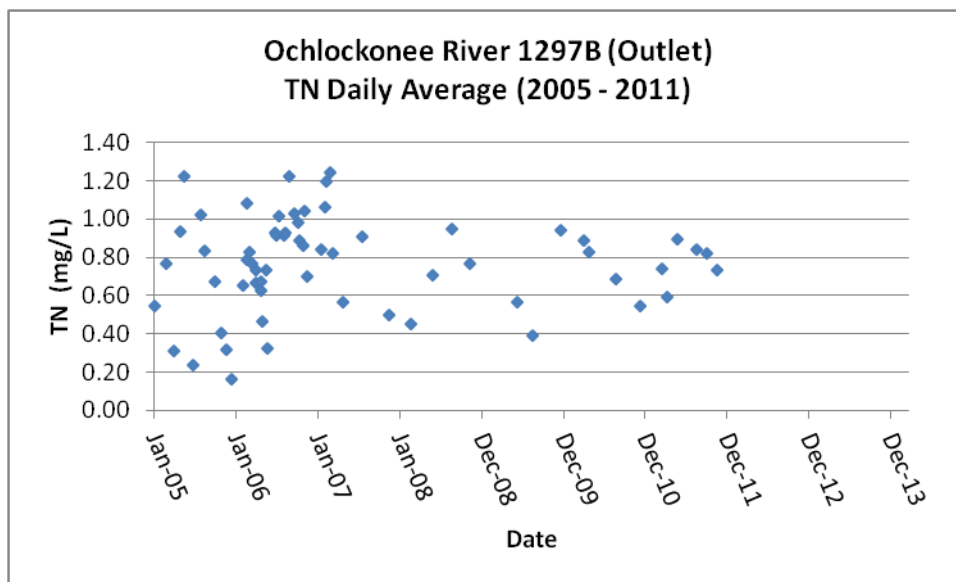


Figure B.4N.10. Ochlockonee River WBID 1297B Outlet Daily Average TN 2005–2011

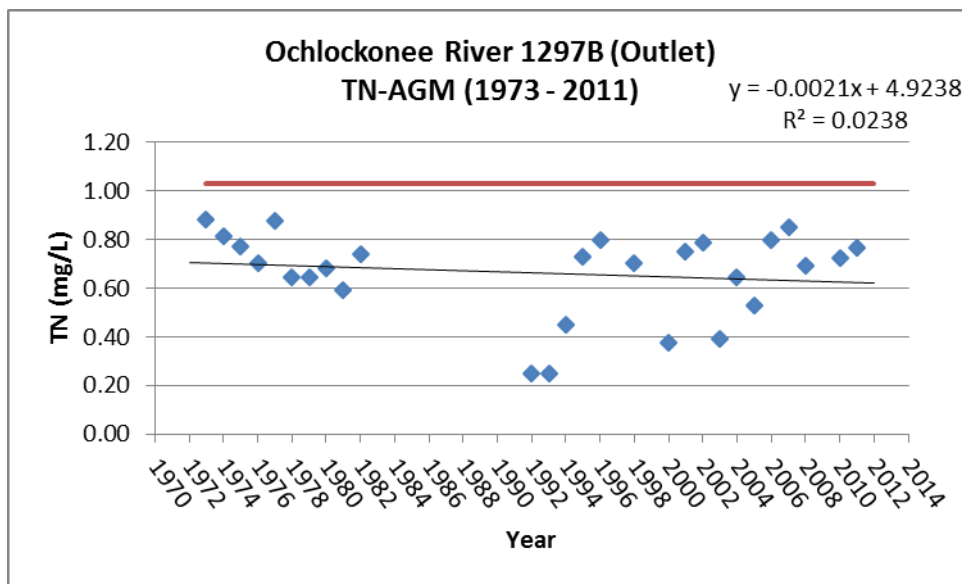


Figure B.4N.11. Ochlockonee River WBID 1297B Outlet TN Annual Geomean 1973–2011

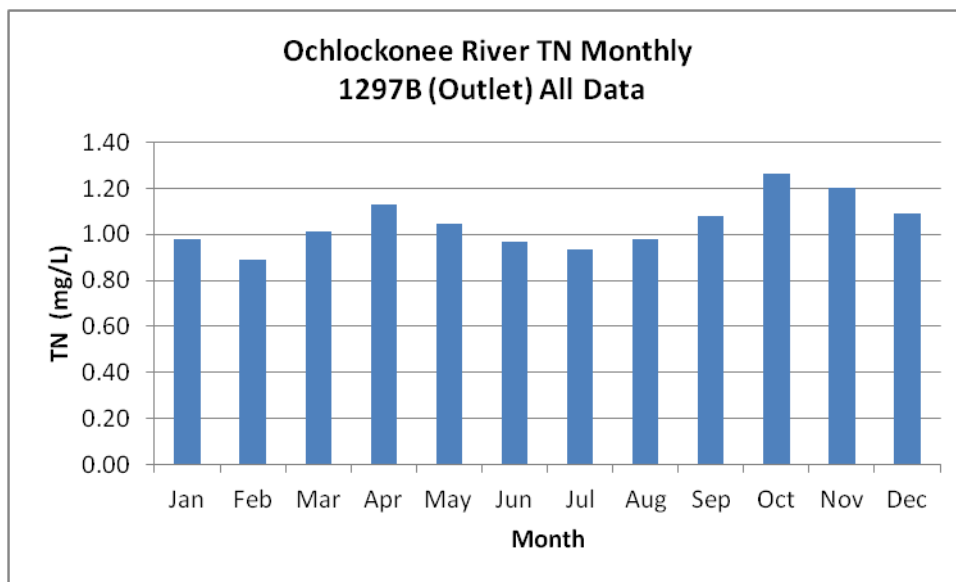


Figure B.4N.12. Ochlockonee River WBID 1297B Outlet Monthly Average TN 1970–2011

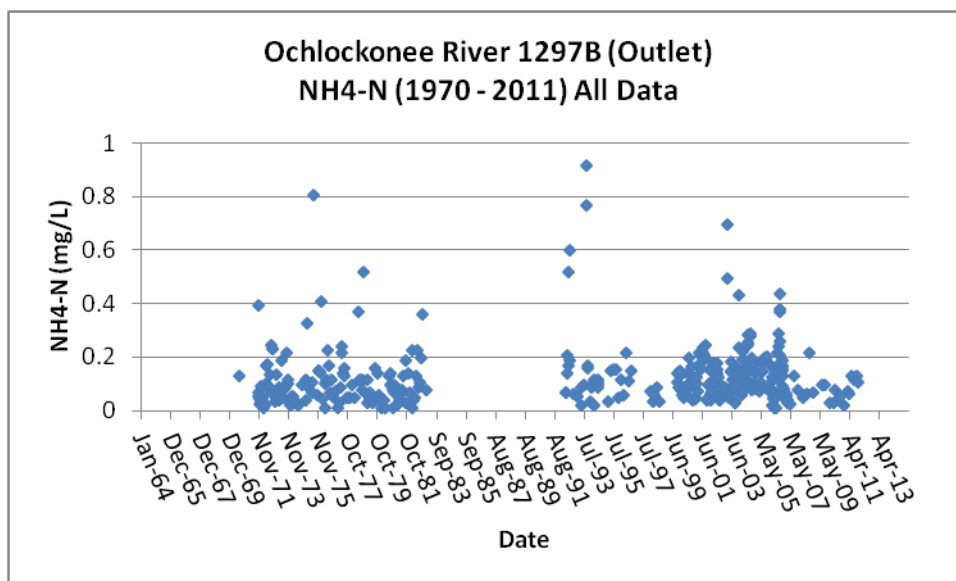


Figure B.4N.13. Ochlockonee River WBID 1297B Outlet Daily Average Ammonia-N 1970–2011

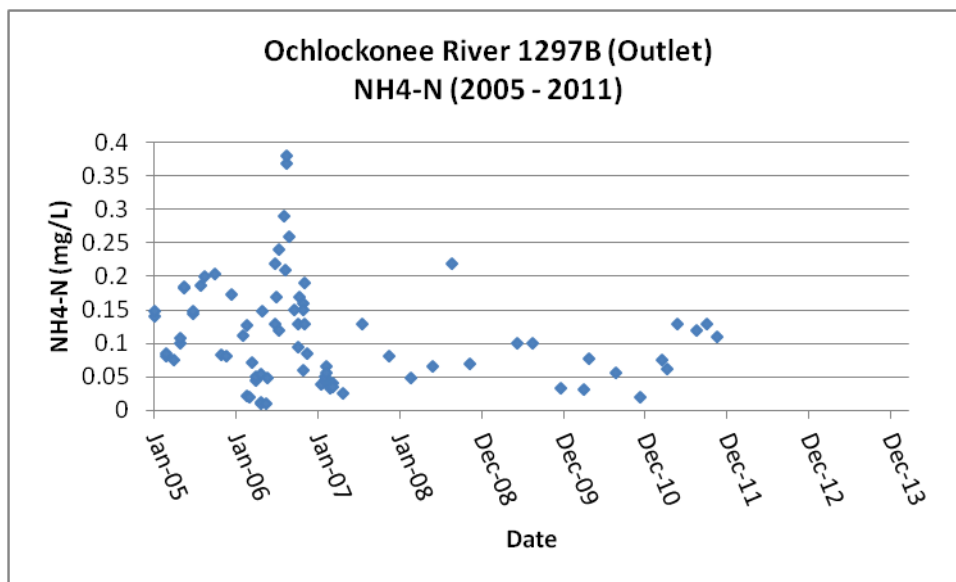


Figure B.4N.14. Ochlockonee River WBID 1297B Outlet Daily Average Ammonia-N 2005–2011

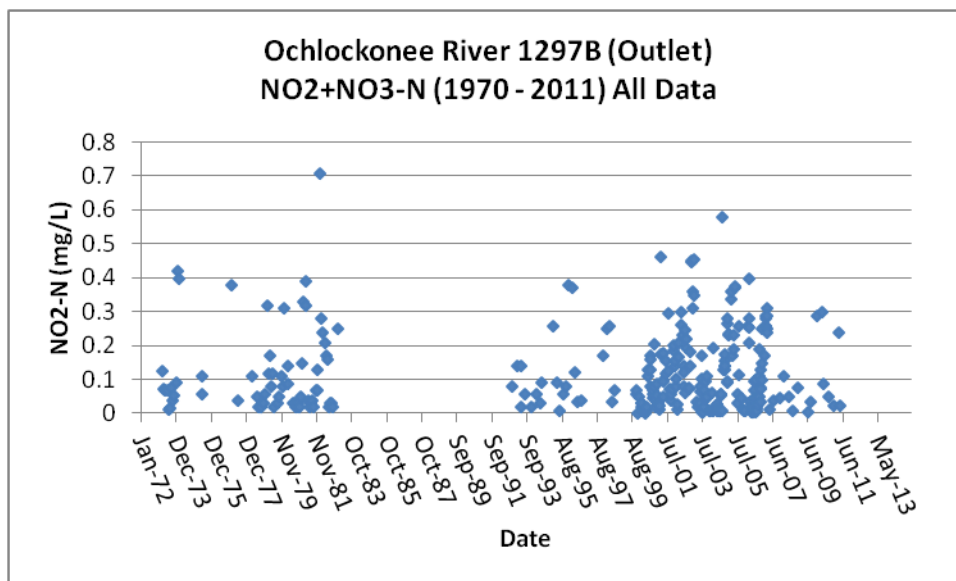


Figure B.4N.15. Ochlockonee River WBID 1297B Outlet Daily Average Nitrate/Nitrite-N 1970–2011

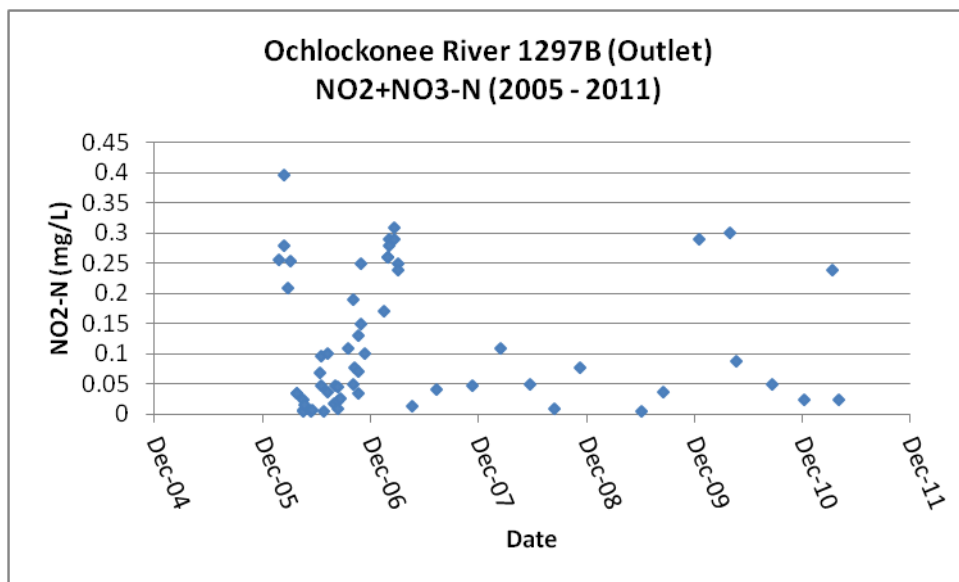


Figure B.4N.16. Ochlockonee River WBID 1297B Outlet Daily Average Nitrate/Nitrite-N 2005–2011

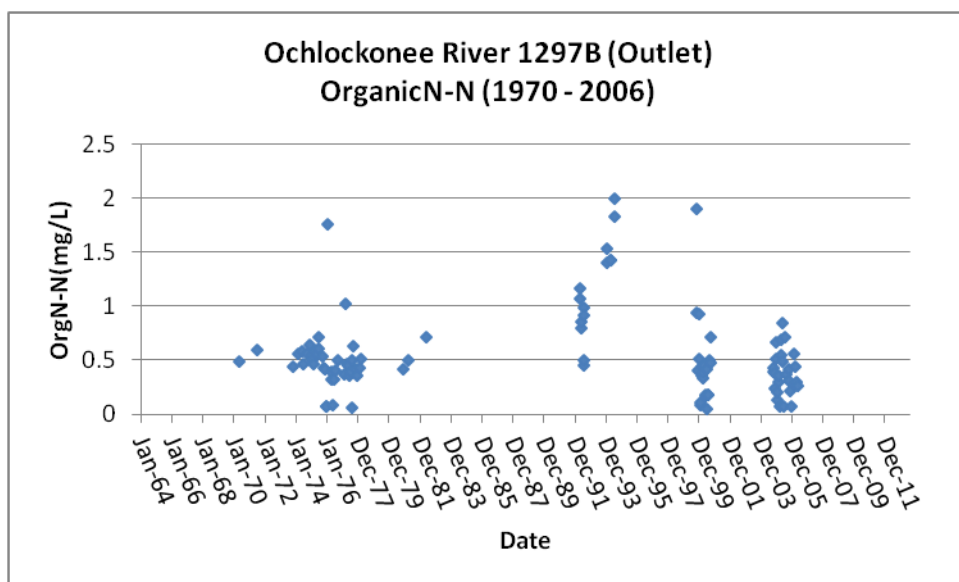


Figure B.4N.17. Ochlockonee River WBID 1297B Outlet Daily Average Organic-N 1970–2006

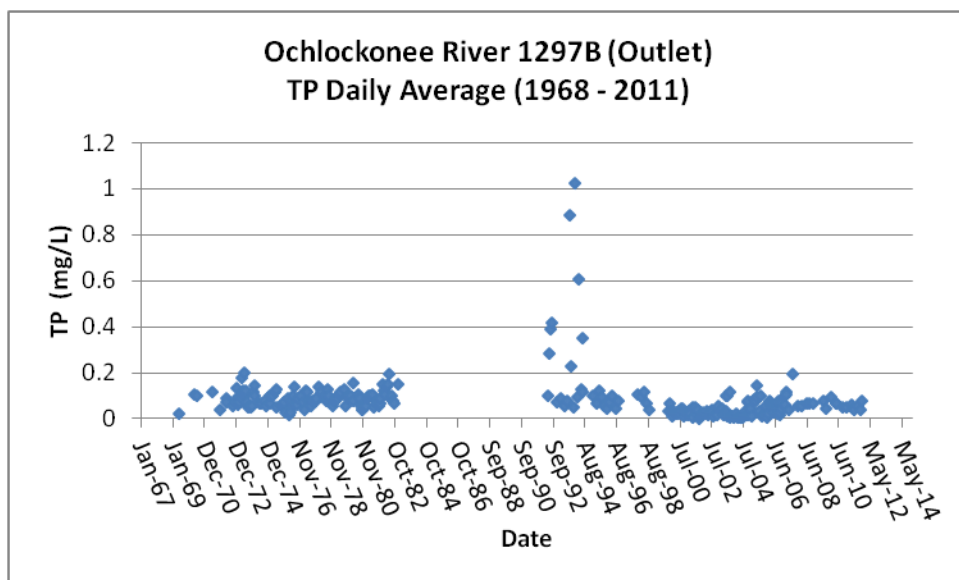


Figure B.4N.18. Ochlockonee River WBID 1297B Outlet Daily Average TP 1968–2011

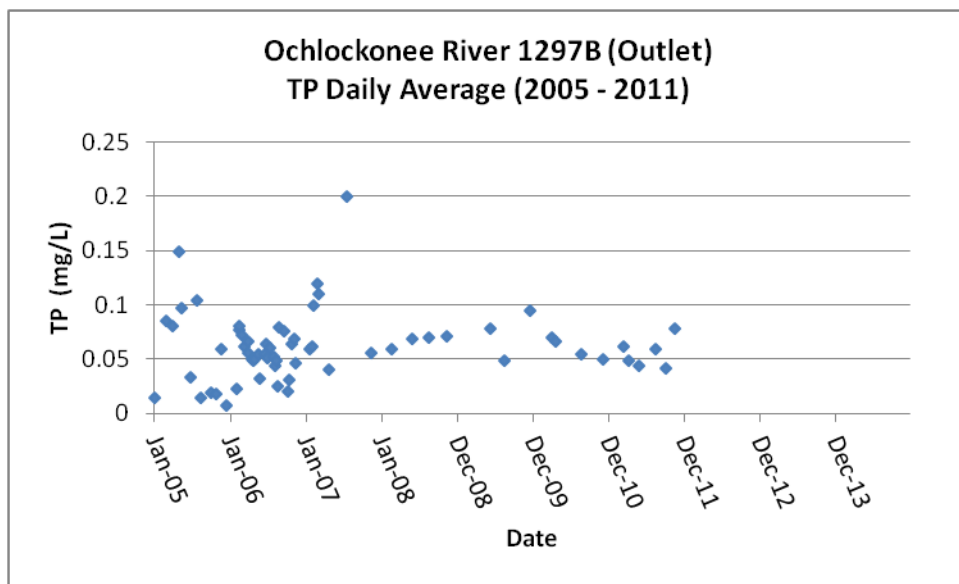


Figure B.4N.19. Ochlockonee River WBID 1297B Outlet Daily Average TP 2005–2011

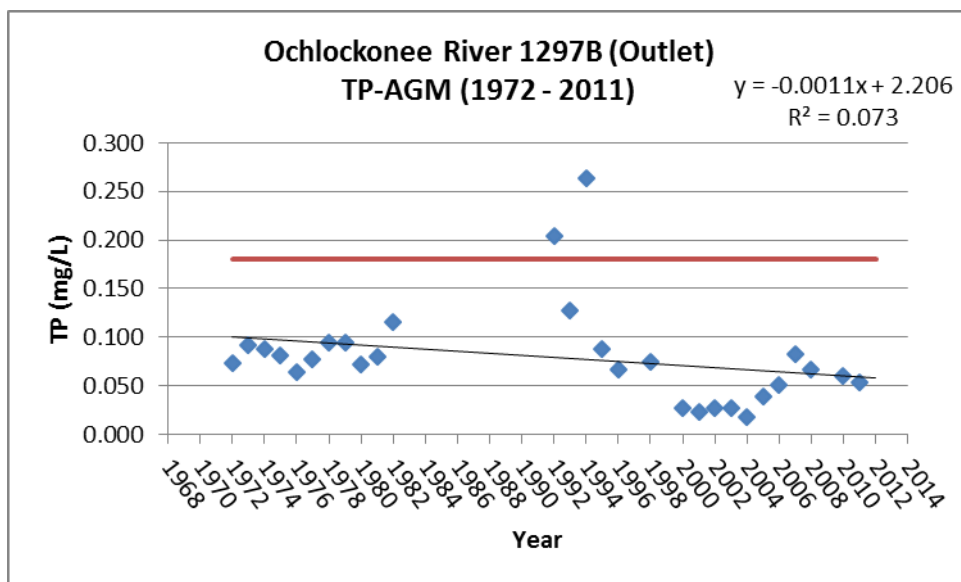


Figure B.4N.20. Ochlockonee River WBID 1297B Outlet Annual Geomean TP 1972–2011

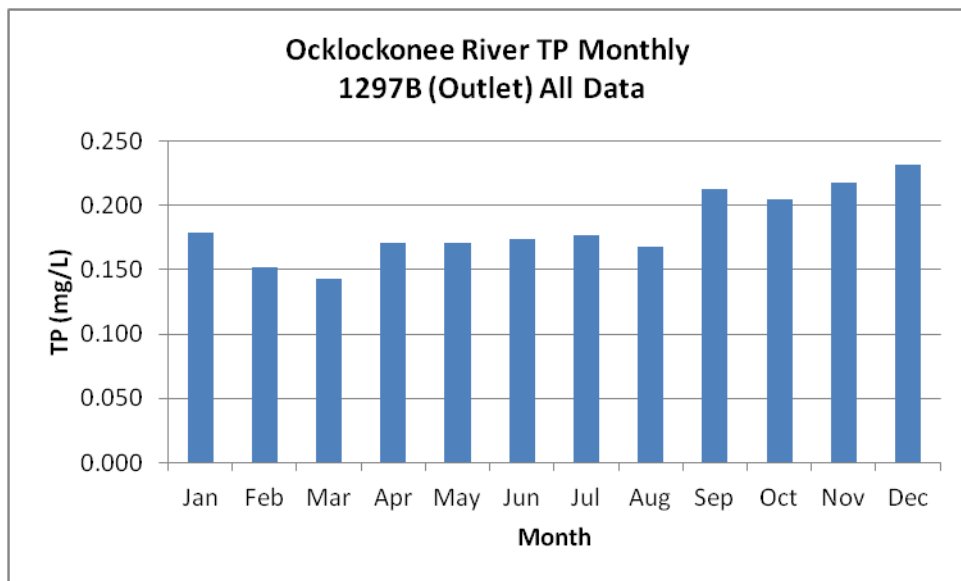


Figure B.4N.21. Ochlockonee River WBID 1297B Outlet Monthly Average TP 1968–2011

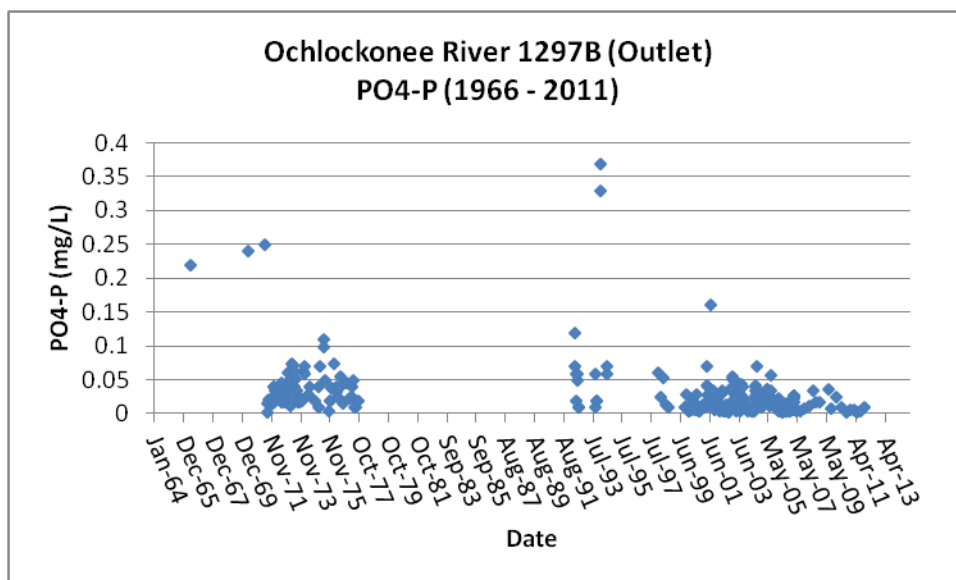


Figure B.4N.22. Ochlockonee River WBID 1297B Outlet Daily Average Orthophosphate-P 1966–2011

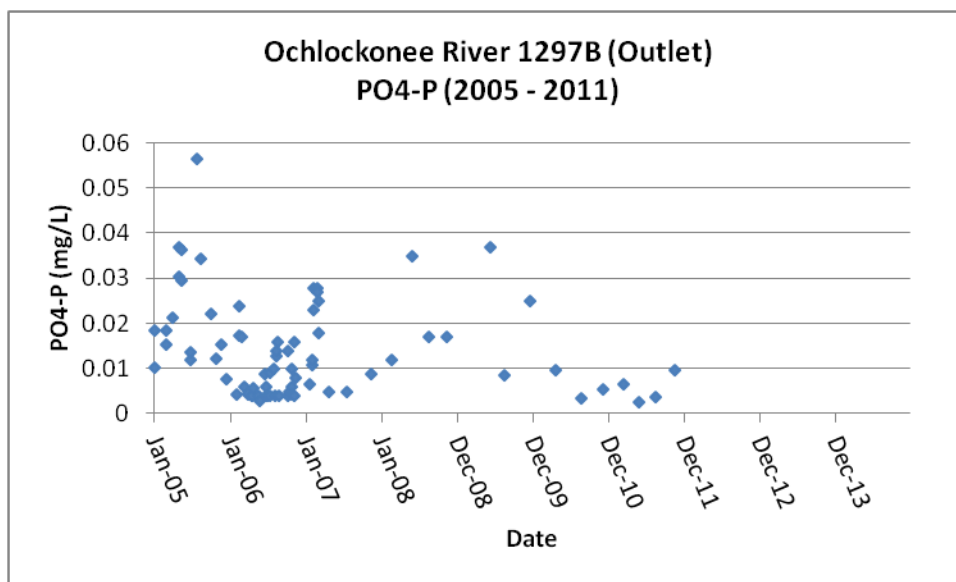


Figure B.4N.23. Ochlockonee River WBID 1297B Outlet Daily Average Orthophosphate-P 2005–2011

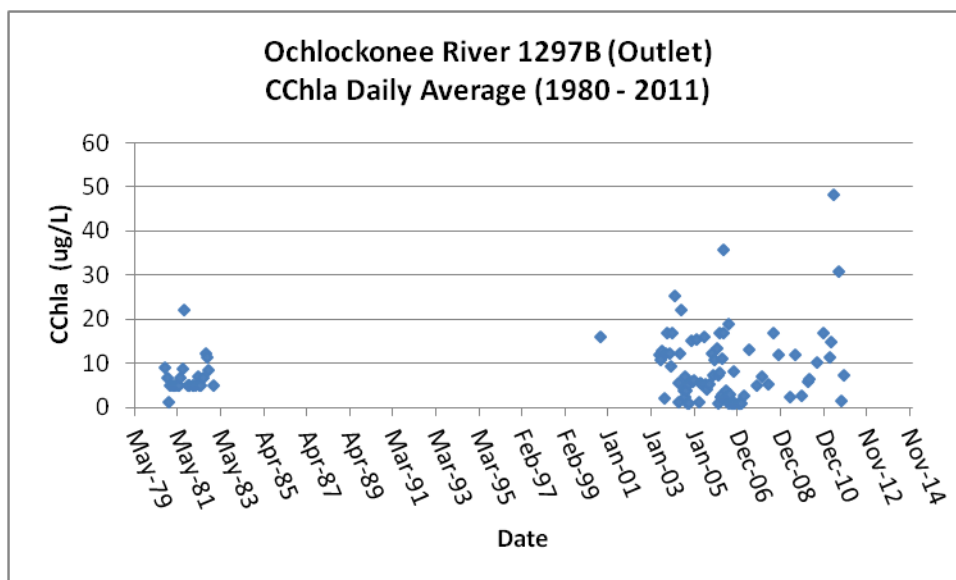


Figure B.4N.24. Ochlockonee River WBID 1297B Outlet Daily Average CChla 1980–2011

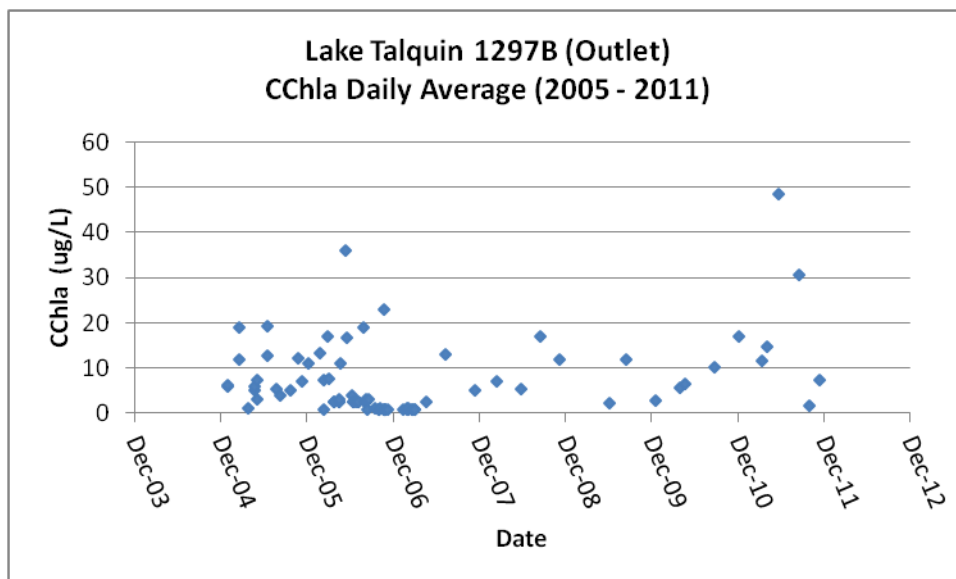


Figure B.4N.25. Ochlockonee River WBID 1297B Outlet Daily Average CChla 2005–2011

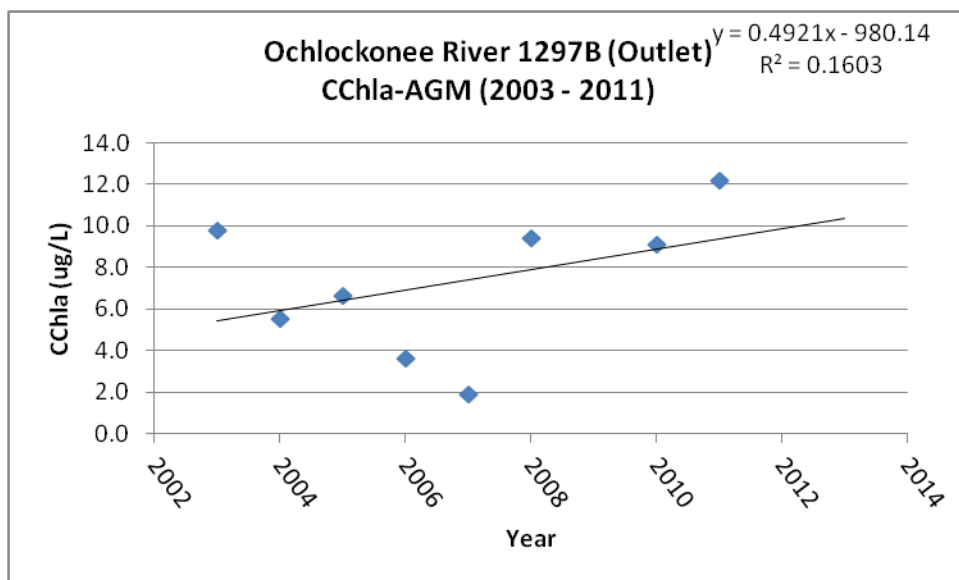


Figure B.4N.26. Ochlockonee River WBID 1297B Outlet Annual Geomean CChla 2003–2011

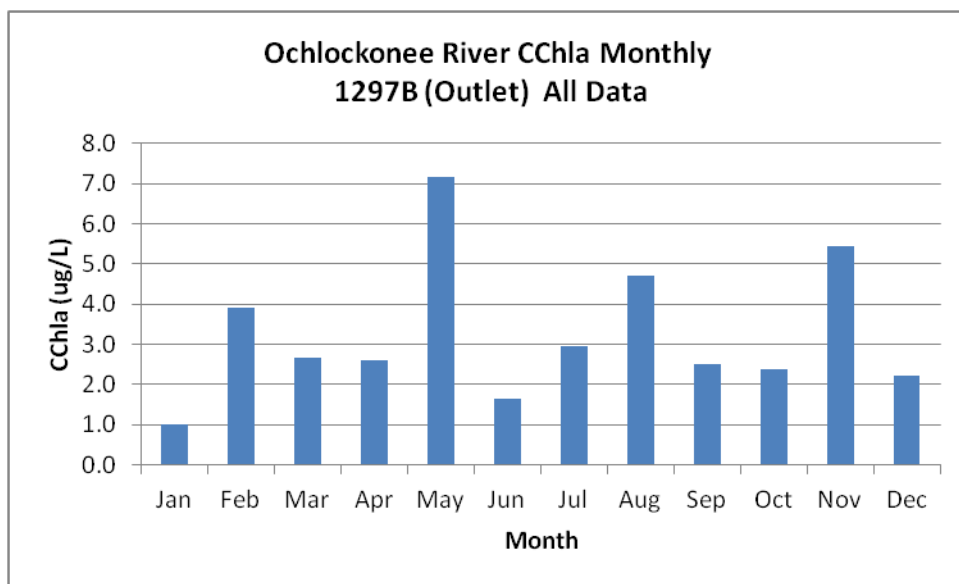


Figure B.4N.27. Ochlockonee River WBID 1297B Outlet Monthly Average CChla 1980–2011

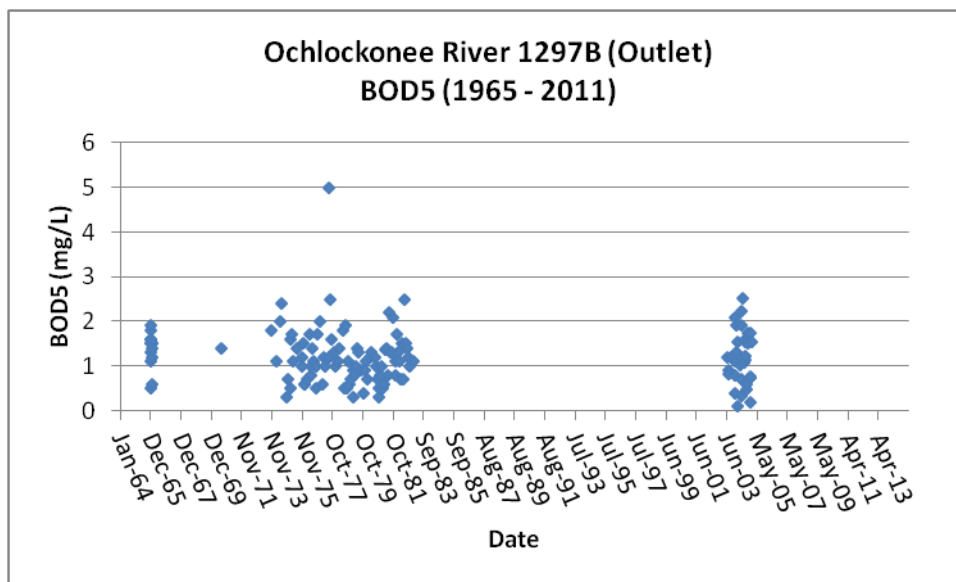


Figure B.4N.28. Ochlockonee River WBID 1297B Outlet Daily Average BOD5 1965–2011

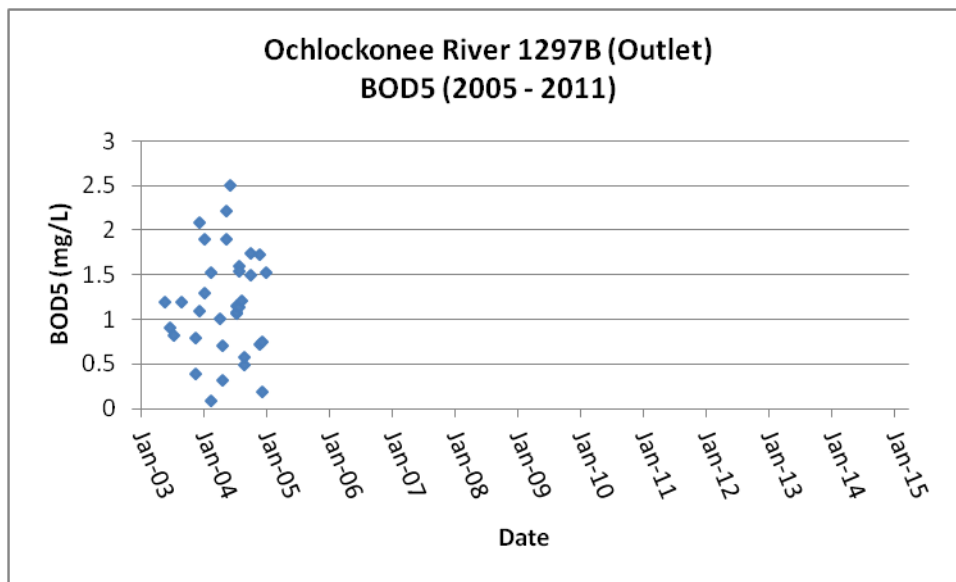


Figure B.4N.29. Ochlockonee River WBID 1297B Outlet Daily Average BOD5 2005–2011

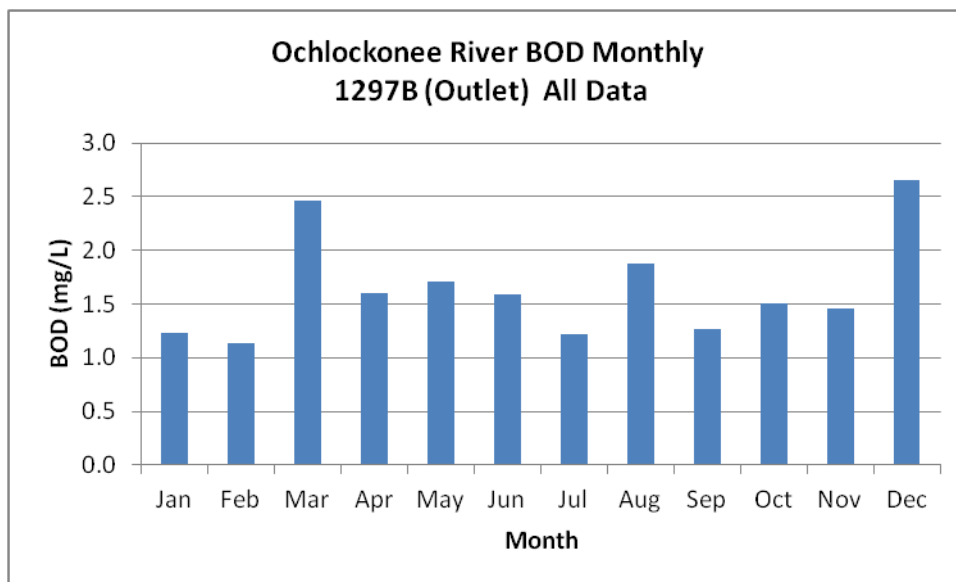


Figure B.4N.30. Ochlockonee River WBID 1297B Outlet Monthly Average BOD5 1965–2011

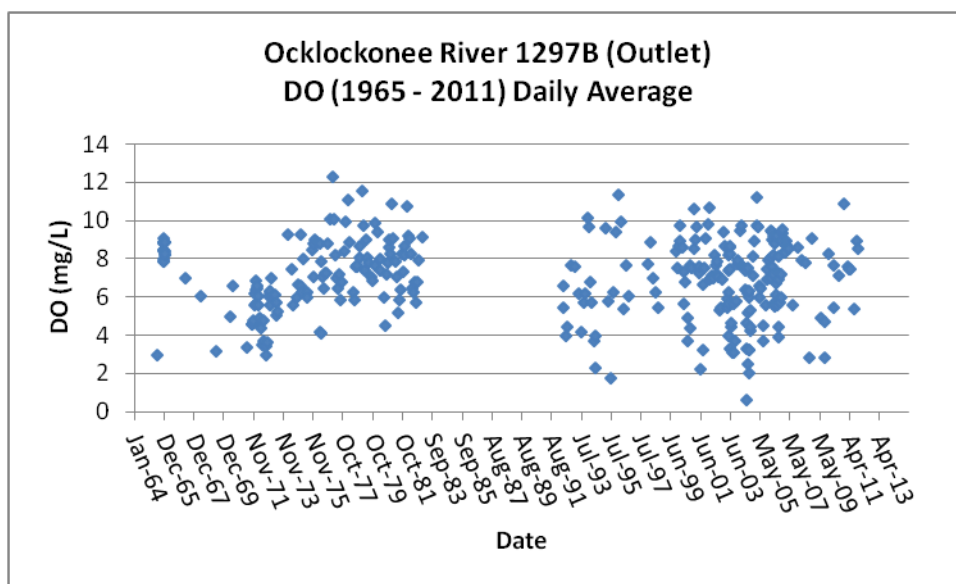


Figure B.4N.31. Ochlockonee River WBID 1297B Outlet Daily Average DO 1965–2011

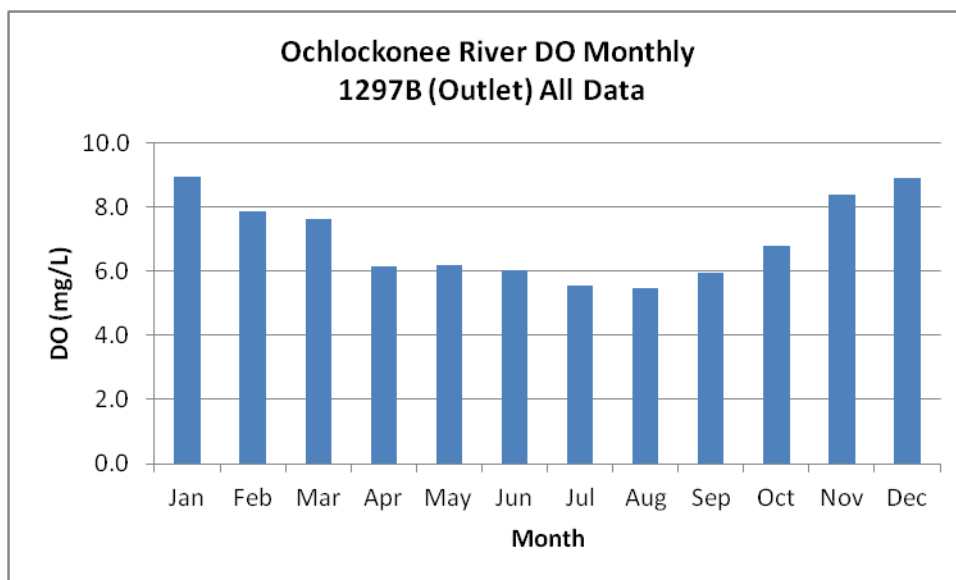


Figure B.4N.32. Ochlockonee River WBID 1297B Outlet Monthly Average DO 1965–2011

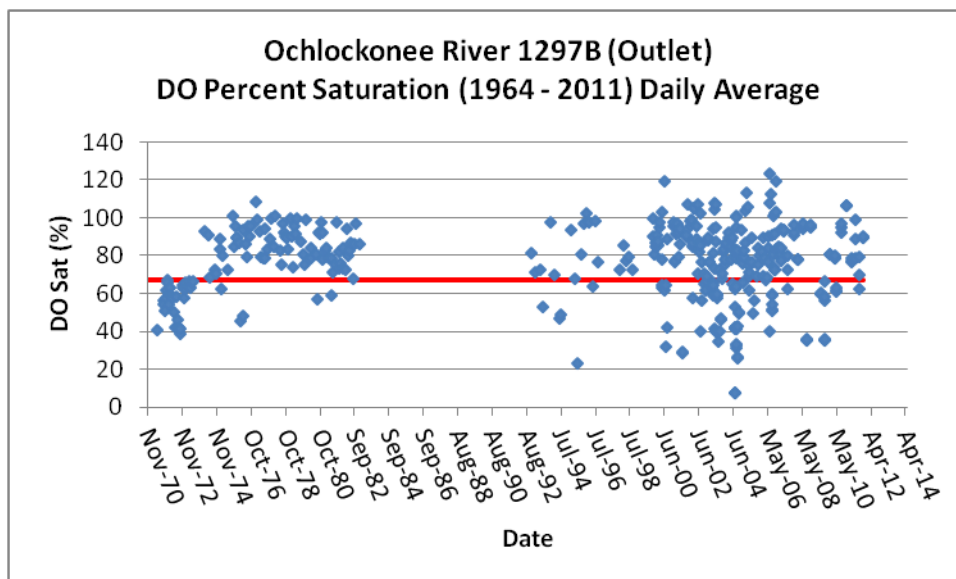


Figure B.4N.33. Ochlockonee River WBID 1297B Outlet Daily Average DO Percent Saturation 1964–2011

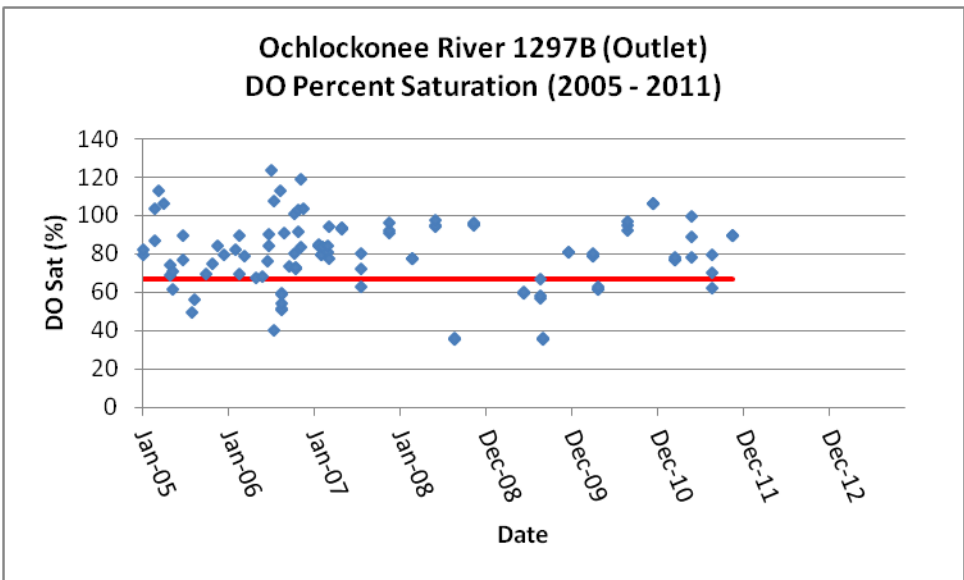


Figure B.4N.34. Ochlockonee River WBID 1297B Outlet Daily Average DO Percent Saturation 2005–2011

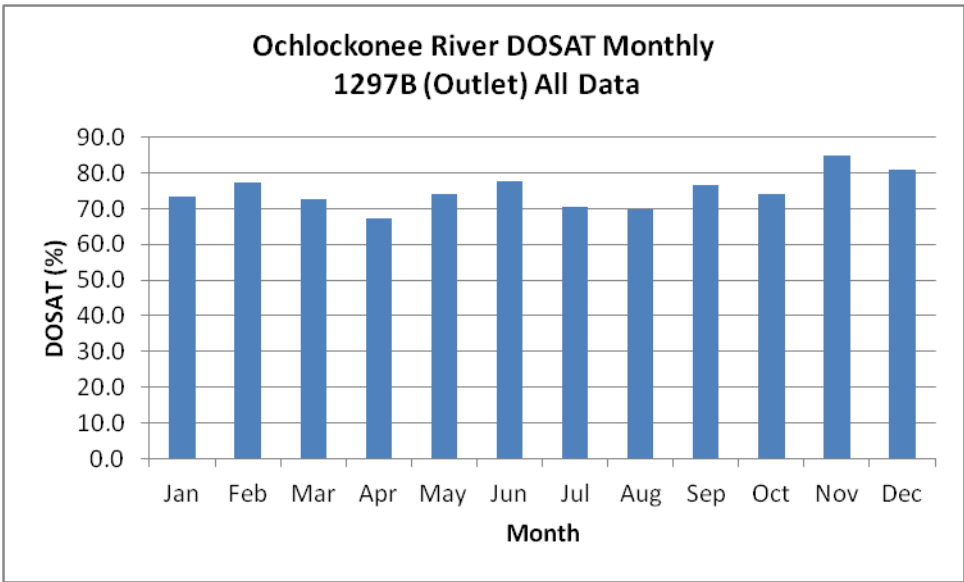


Figure B.4N35. Ochlockonee River WBID 1297B Outlet Monthly Average DO Percent Saturation 1964–2011

Table B.4N.1. Ochlockonee River WBID 1297B Outlet IWR Stations

WBID	Station Number	Station Name	Begin Date	End Date
1297B	112WRD 02330000	OCHLOCKONEE RIVER NR BLOXHAM, FLA.	0	0
1297B	11EPALES1239A1	OCHLOCKONEE RIVER	0	0
1297B	21FLBRA 1297B-A	1297B - Ochlockonee River - at SR-20	2006	2007
1297B	21FLBRA 1297B-B	1297B - Ochlockonee River - at FR-390	2006	2007
1297B	21FLBRA 1297B-C	1297B - Ochlockonee River - unnamed dirt rd S of Sweetwater	2006	2006
1297B	21FLGW 22850	NW1-LR-2009 OCHLOCKONEE RIVER	2004	2004
1297B	21FLGW 22856	NW1-LR-2036 OCHLOCKONEE RIVER	2004	2004
1297B	21FLGW 22857	NW1-LR-2018 OCHLOCKONEE RIVER	2004	2004
1297B	21FLGW 22858	NW1-LR-2029 OCHLOCKONEE RIVER	2004	2004
1297B	21FLGW 40029	Z1-LR-5006 OCHLOCKONEE RIVER	2011	2011
1297B	21FLGW 40831	Z1-LR-5006R OCHLOCKONEE RIVER	2011	2011
1297B	21FLGW 8650	NWA-HS-1052 OCHLOCKONEE RIVER	2000	2000
1297B	21FLGW S441	OCHLOCKONEE RIVER @ HWY 20	0	0
1297B	21FLEONLCT023038584652	Ochlockonee River South of 20	2006	2011
1297B	21FLMCGLT02	Ochlockonee River, south of Lake Talquin	2000	2006
1297B	21FLNWFD301854084420801	Ochlockonee River above Telogia Cr.	0	0
1297B	21FLNWFD302300084391801	Ochlockonee River @ SR 20	0	0
1297B	21FLPNS 1297B-C	Ochlockonee River	0	0
1297B	21FLPNS 22020006	OCHLOCKONEE R AT FLA 20	0	0
1297B	21FLPNS 84420801	Ochlocknee Rv. TMDL	0	0
1297B	21FLWQA 302302108439183	Ochlockonee River at SR 20	2002	2006

Table B.4N.2. Ochlockonee River WBID 1297B Outlet Long-Term Geomean Alkalinity and Color

WBID	Constituent	POR	Geomean
1297B	Alkalinity (mg/L)	1965 - 2011	13.6
1297B	Color-True (PCU)	1964 - 2011	57.7

Table B.4N.3. Ochlockonee River WBID 1297B Outlet DO Percent Saturation vs. 67 % Criterion

Year	Category	Result
1964 - 2013	Count	416
	Number P	301
	Number F	115
	Percent F	27.6
2005 - 2013	Count	115
	Number P	90
	Number F	25
	Percent F	21.7

Table B.4N.4. Ochlockonee River WBID 1297B Outlet Annual Geomean TN, TP, TN/TP Ratio, and CChla

Year	TN (mg/L)	TP (mg/L)	TN/TP	CChla (ug/L)
	AGM	AGM	Ratio	AGM
1971		0.207		
1972	1.09	0.214	5.1	
1973	1.15	0.158	7.3	
1974	1.14	0.243	4.7	
1975	0.92	0.155	6.0	
1976	0.83	0.150	5.5	
1977	1.04	0.239	4.4	
1978	1.17	0.212	5.5	
1979	1.19	0.184	6.5	
1980	1.34	0.224	6.0	
1981	1.55	0.337	4.6	
1982	1.24	0.206	6.0	
1983	1.15	0.133	8.7	
1984	1.35	0.196	6.9	
1985	1.40	0.216	6.5	
1986	1.81	0.214	8.5	
1987	1.11	0.124	8.9	
1988	1.30	0.280	4.6	
1989	1.10	0.281	3.9	
1990	0.82	0.176	4.7	
1991	0.94	0.139	6.8	
1992	0.53	0.172	3.1	
1993	0.73	0.176	4.2	
1994	0.68	0.127	5.3	
1995	1.08	0.135	8.0	
1996	0.98	0.157	6.2	
1997				
1998	1.06	0.115	9.2	
1999	0.84	0.146	5.8	
2000	0.90	0.125	7.2	
2001	0.83	0.112	7.4	
2002	0.70	0.130	5.4	
2003	0.83	0.114	7.3	1.4
2004				
2005				
2006	1.07	0.104	10.3	1.7
2007	1.11	0.128	8.7	

Year	TN (mg/L)	TP (mg/L)	TN/TP	CChla (ug/L)
2008	1.00	0.118	8.5	2.0
2009				
2010	1.06	0.089	11.8	3.5
2011	0.94	0.090	10.4	10.1
2012				
2013	1.14	0.150	7.6	1.5

Table B.4N.5. Ochlockonee River WBID 1297B Outlet Water Quality Data Summary All Data

Constituent	Units	POR	Count	Min	Max	Median	Mean	Geomean
Temperature	C	1964 - 2011	473	4.0	32.8	23.4	21.9	20.8
Alkalinity	mg/L	1964 - 2011	300	1.0	130.0	14.0	15.7	13.6
pH	S.U.	1964 - 2011	472	4.4	10.8	6.8	NA	NA
Color	PCU	1964 - 2011	370	5.0	260.0	60.0	68.7	57.7
TN	mg/L	1970 - 2011	344	0.02	5.65	0.68	0.75	0.62
NH4-N	mg/L	1970 - 2011	389	0.01	0.92	0.10	0.12	0.093
NO23	mg/L	1970 - 2011	297	0.003	0.71	0.07	0.12	0.066
OrgN	mg/L	1970 - 2006	107	0.050	2.000	0.462	0.552	0.433
TP	mg/L	1968 - 2011	374	0.002	1.070	0.060	0.082	0.052
PO4-P	mg/L	1966 - 2011	300	0.002	0.370	0.017	0.028	0.017
CChla	ug/L	1980 - 2011	149	1.0	48.5	5.3	7.8	5.1
BOD5	mg/L	1964 - 2011	213	0.1	6.6	1.4	1.6	1.3
DO	mg/L	1964 - 2011	473	0.2	12.3	7.1	6.9	6.4
%DOSat	%	1964 - 2011	414	7.7	123.7	79.7	76.4	72.9

Table B.4N.6. Ochlockonee River WBID 1297B Outlet Water Quality Data Summary Verified Period (2005–2011)

Constituent	Units	Verified Period	Count	Min	Max	Median	Mean	Geomean
Temperature	C	2005 - 2011	124	11.1	32.8	21.6	22.0	21.2
Alkalinity	mg/L	2005 - 2011	78	5.3	130.0	15.6	19.0	15.8
pH	S.U.	2005 - 2011	127	4.9	8.6	7.1	NA	NA
Color	PCU	2005 - 2011	72	15.0	100.0	42.5	50.1	42.7
TN	mg/L	2005 - 2011	77	0.17	1.49	0.82	0.79	0.74
NH4-N	mg/L	2005 - 2011	80	0.01	0.44	0.10	0.12	0.088
NO23	mg/L	2005 - 2011	81	0.004	0.40	0.08	0.13	0.069
OrgN	mg/L	2005 - 2011	21	0.081	0.846	0.314	0.370	0.302
TP	mg/L	2005 - 2011	81	0.008	0.200	0.060	0.064	0.055
PO4-P	mg/L	2005 - 2011	76	0.003	0.057	0.010	0.014	0.010
CChla	ug/L	2005 - 2011	81	1.0	48.5	4.0	7.3	4.2
BOD5	mg/L	2005 - 2011	77	0.1	6.6	2.0	2.2	1.8
DO	mg/L	2005 - 2011	127	2.8	11.2	7.6	7.2	6.9
%DOSat	%	2005 - 2011	115	35.5	123.7	79.7	79.1	76.9

B.5 Summary of Water Quality Data

The figures below are based on the monthly average results and are presented in the following order for each figure. The Little River (LR-I), Ochlockonee River above Lake Talquin (OR-I), Upper Lake Talquin (LT-U), Lower Lake Talquin (LT-L), and the Ochlockonee River below Lake Talquin (OR-O).

Color:

The monthly average color concentration (**Figure B.5.1**) in the Little River appears more variable than the color in the Ochlockonee River, although both peak in July (corresponding to the month with greatest rainfall) and reach their lowest level during fall and early winter when rainfall is at the minimum. Except for June, the color in the Upper area of the lake (**Figure B.5.2**) is always greater than in the Lower area of the lake and peaks in March, corresponding to the month with the highest inflows from the rivers. Similar to the rivers, the lake color is at its minimum during fall and winter. The color of the Ochlockonee River below the lake (**Figure B.5.3**) more closely follows the pattern in the Lower area lake than the upstream river as it flows into Lake Talquin. The results for the POR color indicate that both major rivers and the Upper area of Lake Talquin have equivalent long-term color concentrations (62.3 PCU–63.1 PCU), while the Lower area of the lake has a POR color concentration of 53.2 and the Ochlockonee River below the lake is 57.3 PCU.

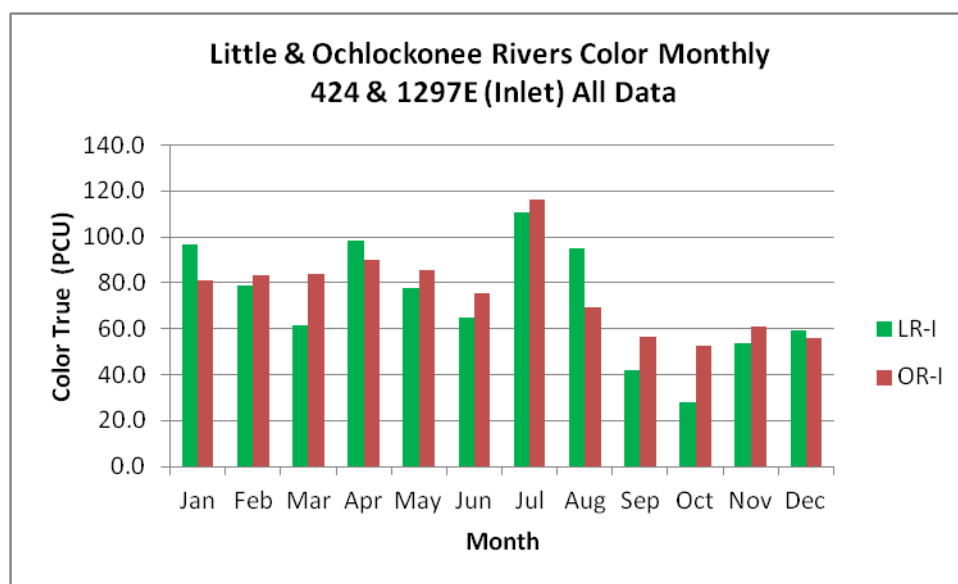


Figure B.5.1. Little and Ochlockonee River WBIDs Monthly Average Color

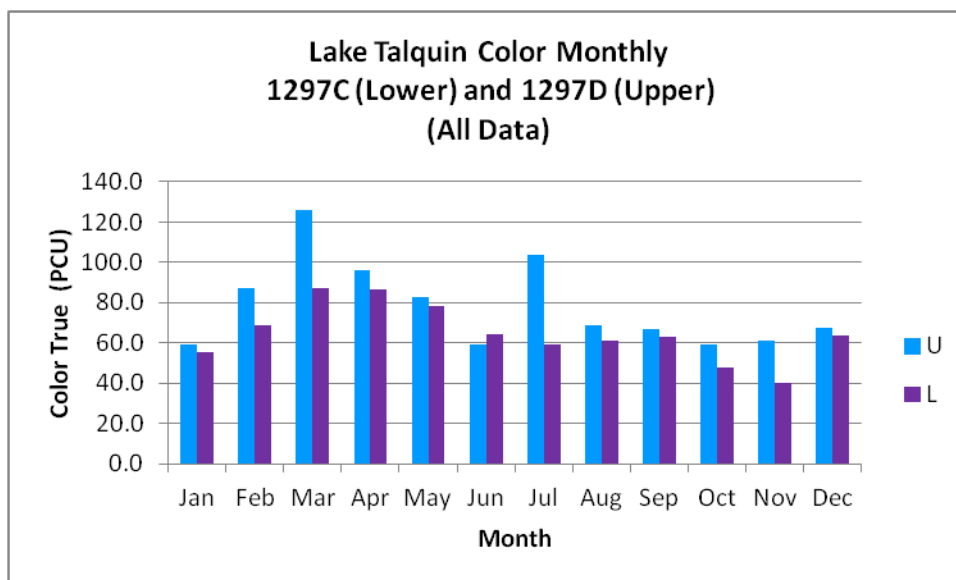


Figure B.5.2. Lake Talquin Upper and Lower WBIDs Monthly Average Color

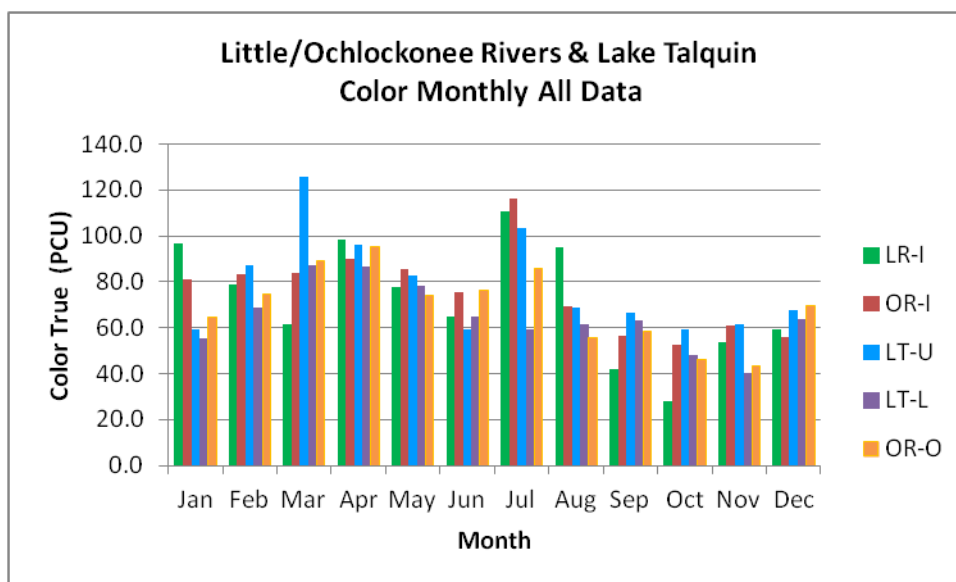


Figure B.5.3. Little/Ochlockonee Rivers and Lake Talquin Upper and Lower WBIDs Monthly Average Color

Alkalinity:

The alkalinity monthly concentration (Figure B.5.4) in the Ochlockonee River appears more variable than in the Little River, although the general patterns are similar with increasing concentrations between January and April, more stable concentrations through August, and higher concentrations during fall, decreasing during the winter months to the lowest levels (January). For most months of the year, the alkalinity in the Upper area of the lake (Figure B.5.5) is always greater than in the Lower area of the lake and peaking in the middle of the summer in both areas of the lake, then generally increasing in the Upper area and decreasing in the Lower portion of the lake. The alkalinity of the Ochlockonee River below the lake (Figure B.5.6) more closely follows the pattern in the Lower area of the lake than the upstream rivers as they flow into Lake Talquin. The results for the POR alkalinity indicate that both the Ochlockonee River above the lake and the Upper area of the lake have equivalent POR alkalinity concentrations (16.7 mg/L) while the Little River above the lake, the Lower area of the lake and the Ochlockonee River below the lake have equivalent POR concentrations (13.6 mg/L–14.0 mg/L).

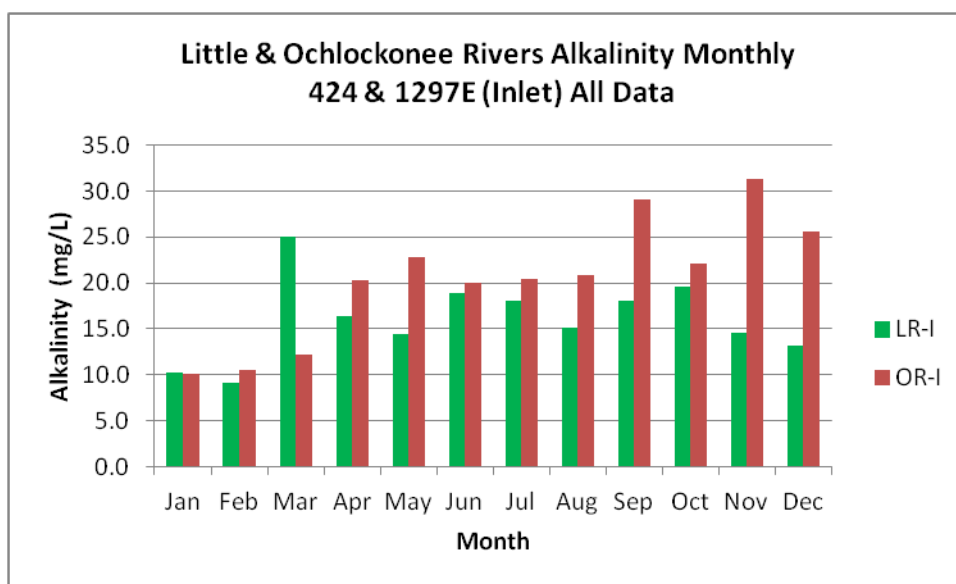


Figure B.5.4. Little and Ochlockonee River WBIDs Monthly Average Alkalinity

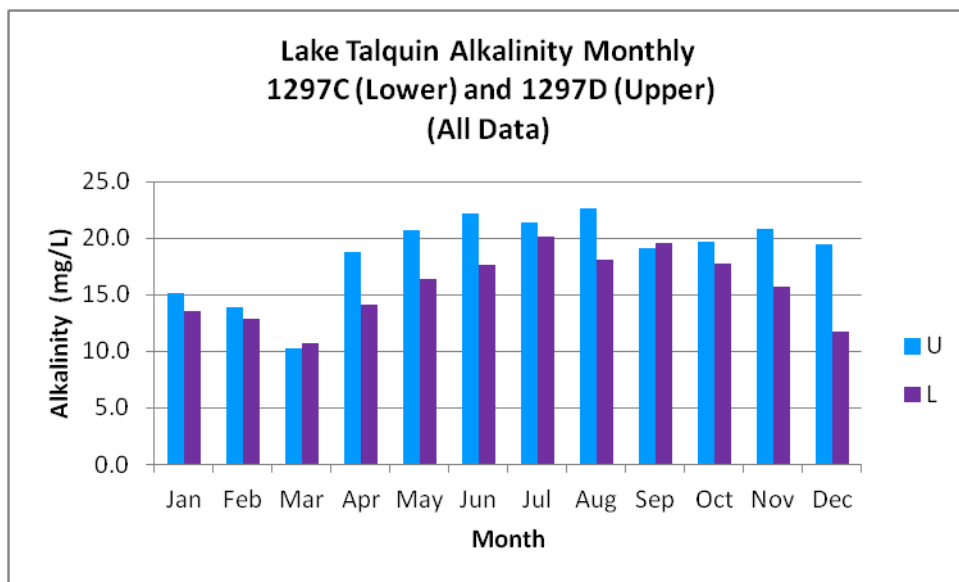


Figure B.5.5. Lake Talquin Upper and Lower WBIDs Monthly Average Alkalinity

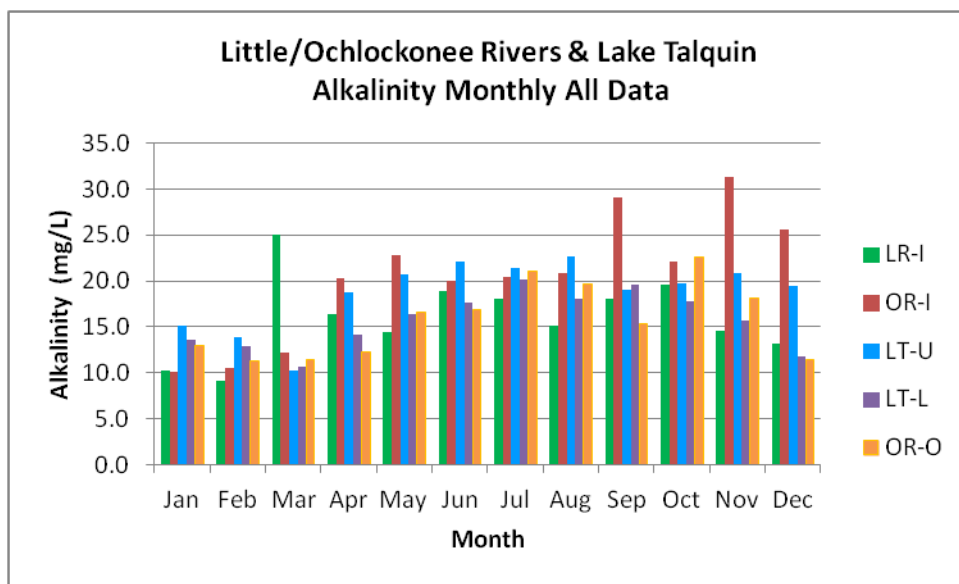


Figure B.5.6. Little/Ochlockonee Rivers and Lake Talquin Upper and Lower WBIDs Monthly Average Alkalinity

TN:

The TN monthly average concentration (**Figure B.5.7**) in the Ochlockonee River above the lake is often less than half the concentration in the Little River above the lake and appears to have the same general pattern with increasing concentrations between January and April, corresponding with increased flow in the rivers, lower concentrations in late summer, increasing through October/November, and then decreasing in December. In both areas of the lake (**Figure B.5.8**), concentrations are generally less than in the incoming Ochlockonee and Little Rivers. For most months of the year, the TN in the Upper area of the lake is greater than in the Lower area of the lake and declines from January through March, then increases to maximum levels in late summer. It appears that TN concentrations in the Upper lake hold steady during the fall and early winter while concentrations in the lower lake gradually decline. The TN concentrations of the Ochlockonee River below the lake (**Figure B.5.9**) are always less than the monthly average concentrations of the two main incoming rivers and less than the in-lake concentrations during April through July. The concentrations below the lake more closely follow the pattern in the Lower lake than the upstream rivers as they flow into Lake Talquin. The results for TN during the period 2005–2013 indicate that both major rivers have GM concentrations (OR-I 1.05 mg/L and LR-I 1.80 mg/L) well above the concentrations in the lake (LT-U 0.68 mg/L and LT-L 0.80 mg/L). The TN GM concentration in the OR-O below the lake of 0.74 mg/L is just above the concentration in Upper area of the lake and just below the concentration in the Lower area of the lake that discharges to the OR-O. In combination with the other data, this appears to indicate that the lake is retaining a large fraction of the nitrogen from incoming sources.

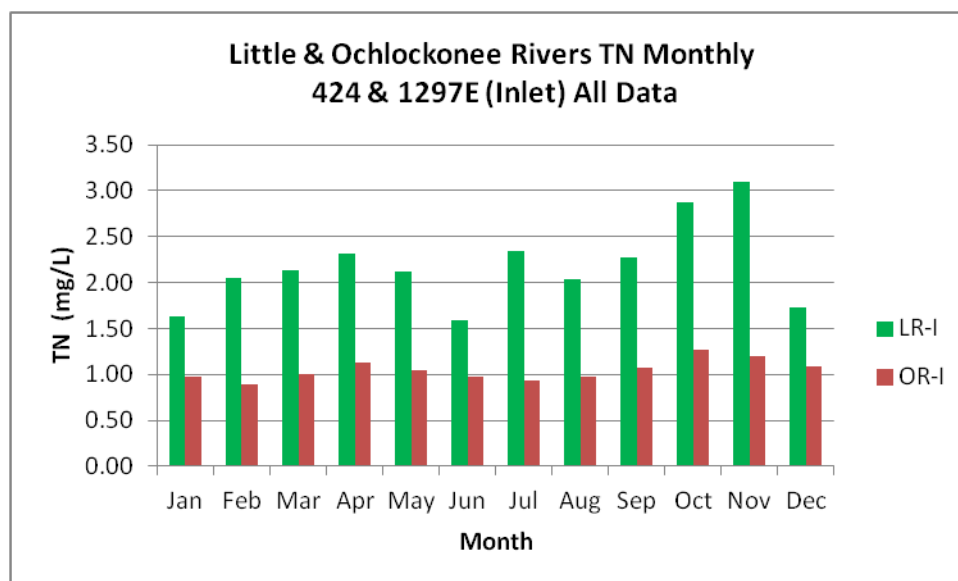


Figure B.5.7. Little and Ochlockonee River WBIDs Monthly Average TN

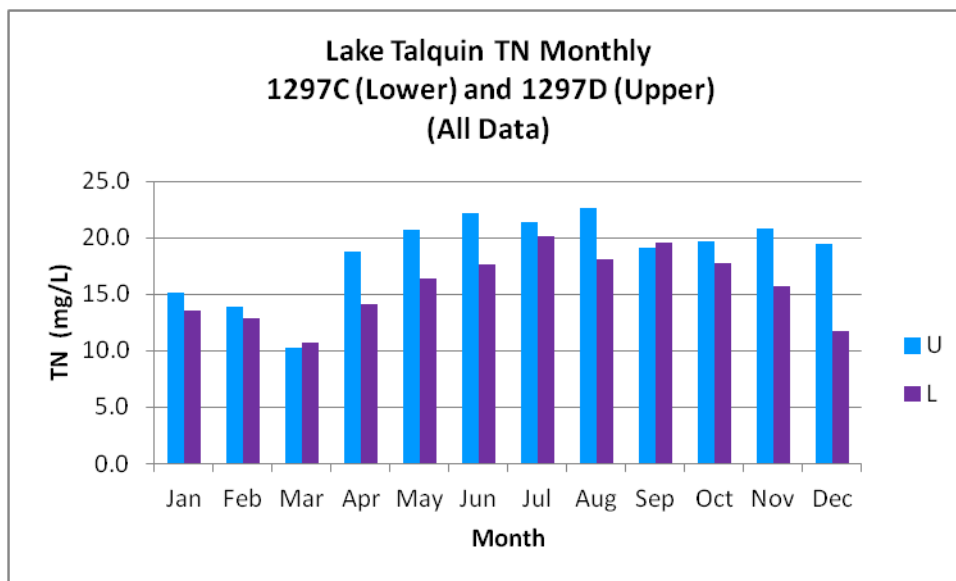


Figure B.5.8. Lake Talquin Upper and Lower WBIDs Monthly Average TN

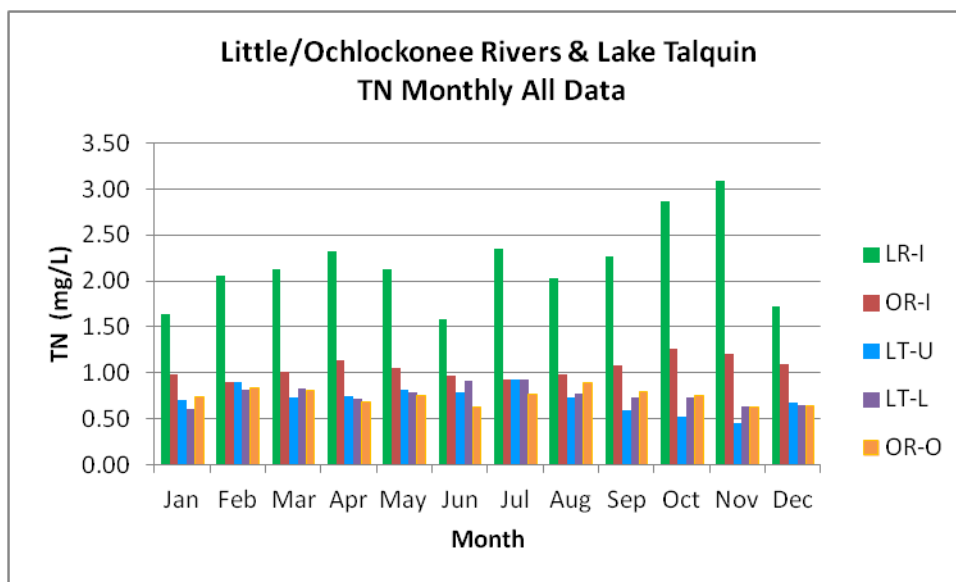


Figure B.5.9. Little/Ochlockonee Rivers and Lake Talquin Upper and Lower WBIDs Monthly Average TN

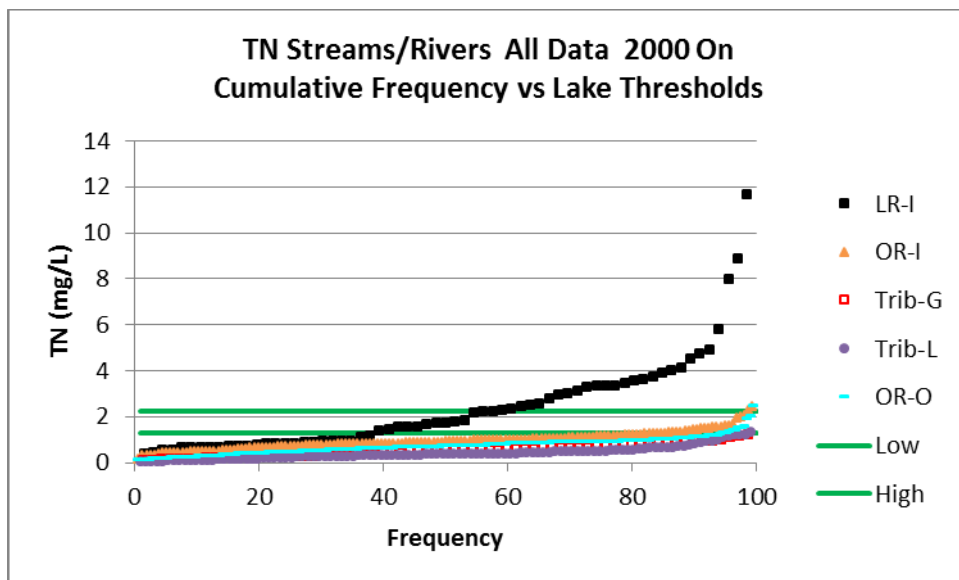


Figure B.5.10. TN Streams/Rivers All Data 2000 On Cumulative Frequency vs Lake Thresholds

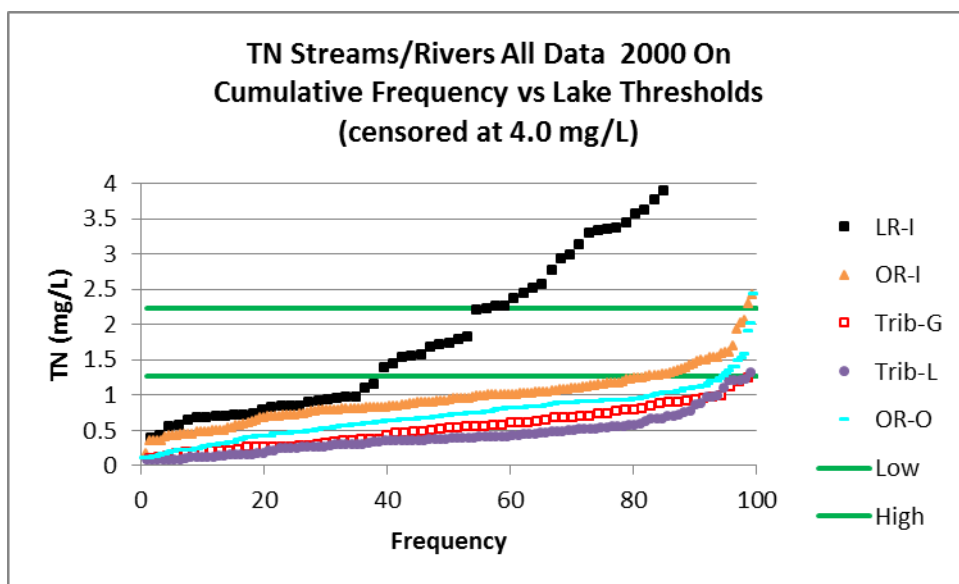


Figure B.5.11. TN Streams/Rivers All Data 2000 On Cumulative Frequency vs Lake Thresholds (censored at 4.0 mg/L)

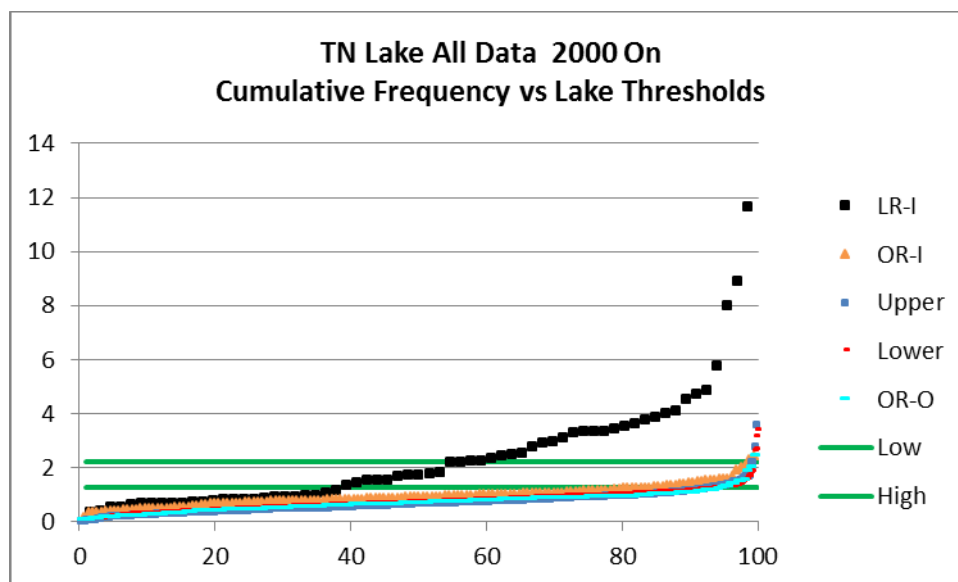


Figure B.5.12. TN Lake All Data 2000 On Cumulative Frequency vs Lake Thresholds

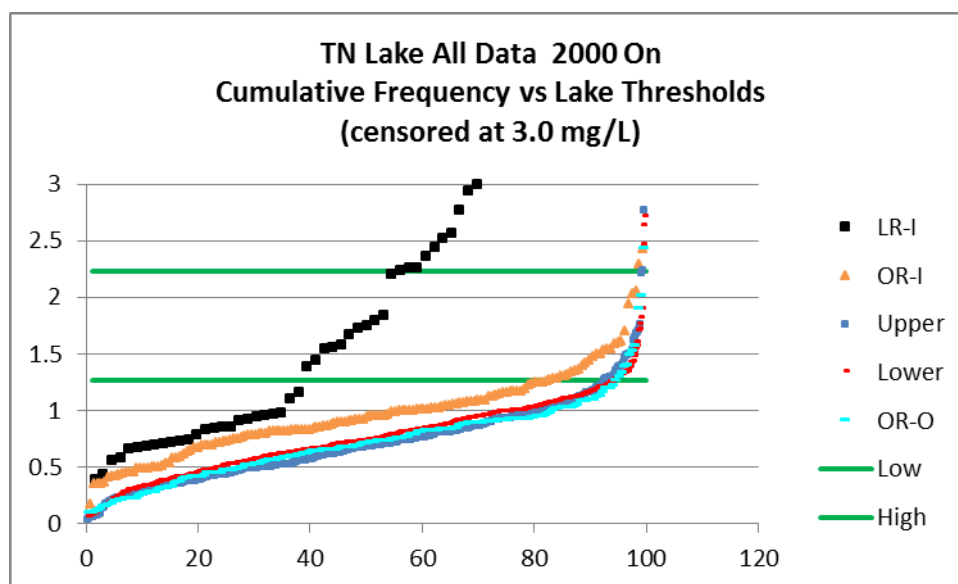


Figure B.5.13. TN Lake All Data 2000 On Cumulative Frequency vs Lake Thresholds (censored at 3.0 mg/L)

Table B.5.1. TN Tributaries Cumulative Frequency vs Lake Thresholds (2000–Current)

	TN	TN-Low	TN-High
Tribs	%<1.27	%>1.27	%>2.23
OR-I	83.0	17.0	1.3
LR-I	31.0	69.0	50.0
Tribs-G	100.0	0.0	0.0
Tribs-L	98.5	1.5	0.0
OR-O	94.0	6.0	0.9

Table B.5.2. TN Tributaries vs Lake Cumulative Frequency vs Lake Thresholds (2000–Current)

	TN	TN-Low	TN-High
Lake	%<1.27	%>1.27	%>2.23
OR-I	83.0	17.0	1.3
LR-I	31.0	69.0	50.0
Upper	92.4	7.6	0.8
Lower	87.5	12.5	0.9
OR-O	94.0	6.0	0.9

TP:

The TP monthly concentration (**Figure B.5.14**) in the Ochlockonee River is often greater than the concentration in the Little River and appears to have a different seasonal pattern. Both rivers show fairly steady concentrations from April through August. From August through December concentrations in the Little River decline while concentrations in the Ochlockonee river above the lake appear to either hold steady or increase slightly. It should be noted that at the same time TP concentrations in the Little River are declining (August–November) TN concentrations are increasing. Whereas the TN and TP patterns in the Ochlockonee River above the lake are similar. For seven months of the year (March and June–November) the TP in the Upper area of the lake (**Figure B.5.15**) is less than in the Lower area of the lake. In both areas, concentrations peak in July and generally decline through November. The TP concentrations of the Ochlockonee River below the lake (**Figure B.5.16**) are always less than the concentrations of the incoming rivers. The seasonal pattern in the river shows four peak concentration periods, January, April, July, and September. The results for TP during the period 2005–2013 indicate that both major rivers have equivalent GM concentrations (OR-I 0.107 mg/L and LR-I 0.102 mg/L) of TP that are well above the concentrations in the lake (LT-U 0.056 mg/L and LT-L 0.054 mg/L). The data indicate

that both the Upper and Lower areas of the lake have equivalent GM TP concentrations that are equivalent to the GM concentration in the OR-O below the lake of 0.055 mg/L.

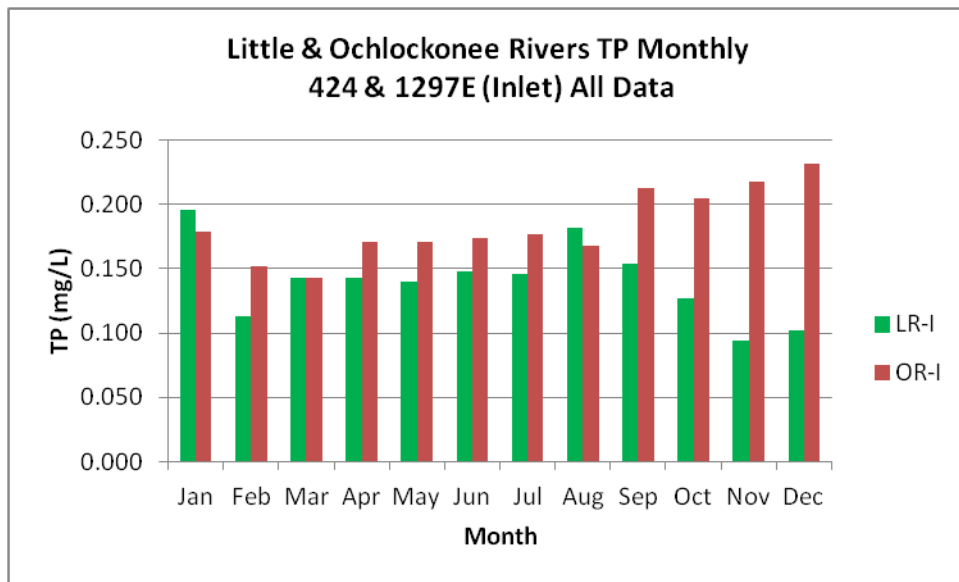


Figure B.5.14. Little and Ochlockonee River WBIDs Monthly Average TP

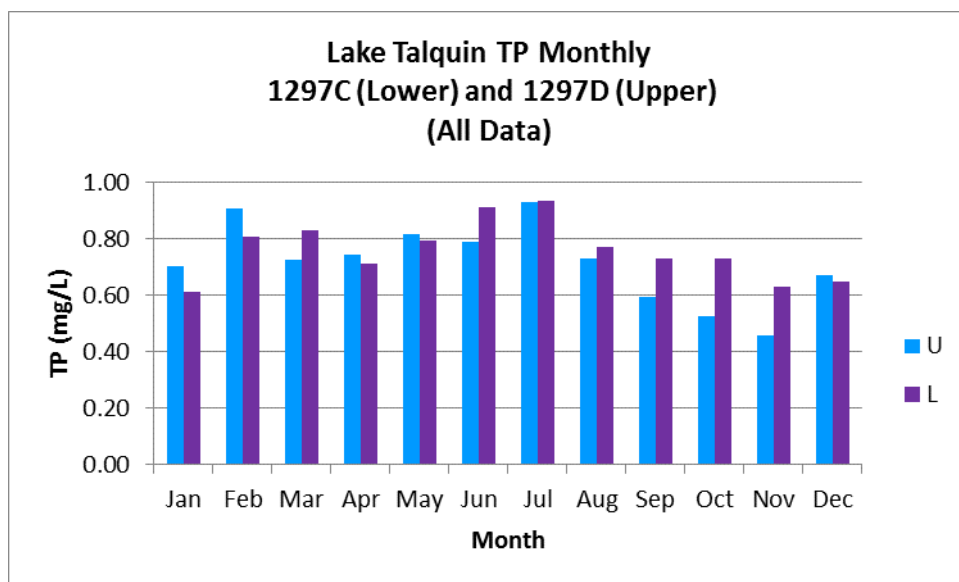


Figure B.5.15. Lake Talquin Upper and Lower WBIDs Monthly Average TP

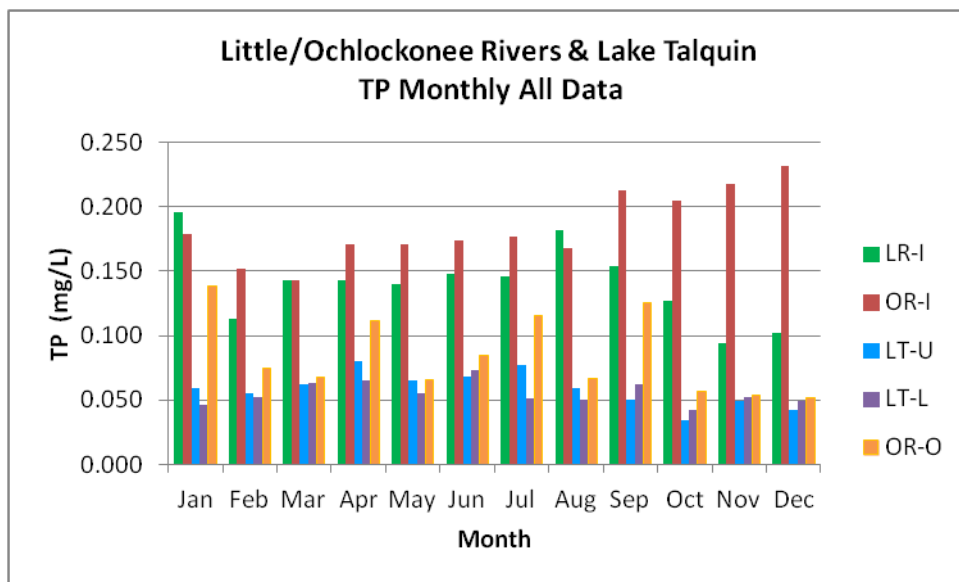


Figure B.5.16. Little/Ochlockonee Rivers and Lake Talquin Upper and Lower WBIDs Monthly Average TP

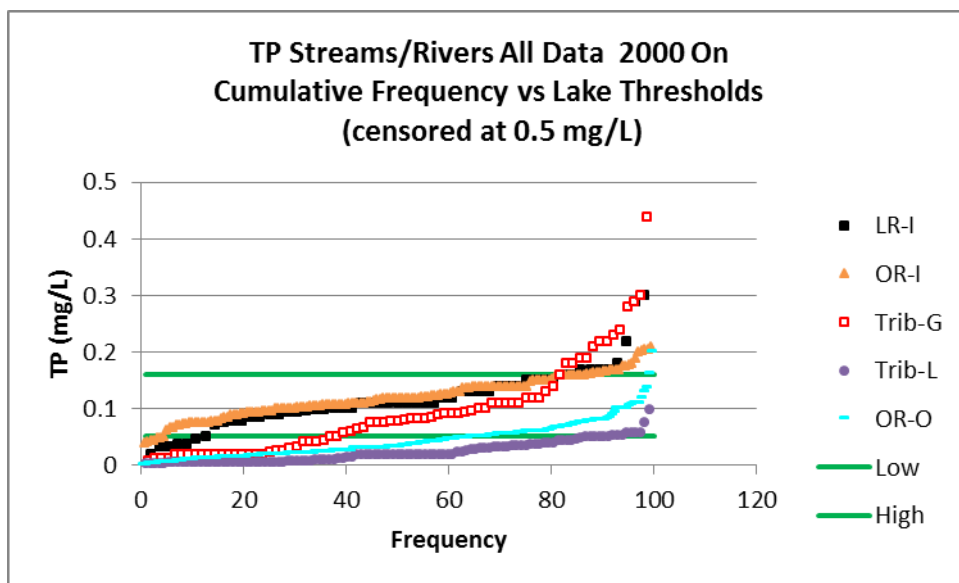


Figure B.5.17. TP Streams/Rivers All Data 2000 On Cumulative Frequency vs Lake Thresholds

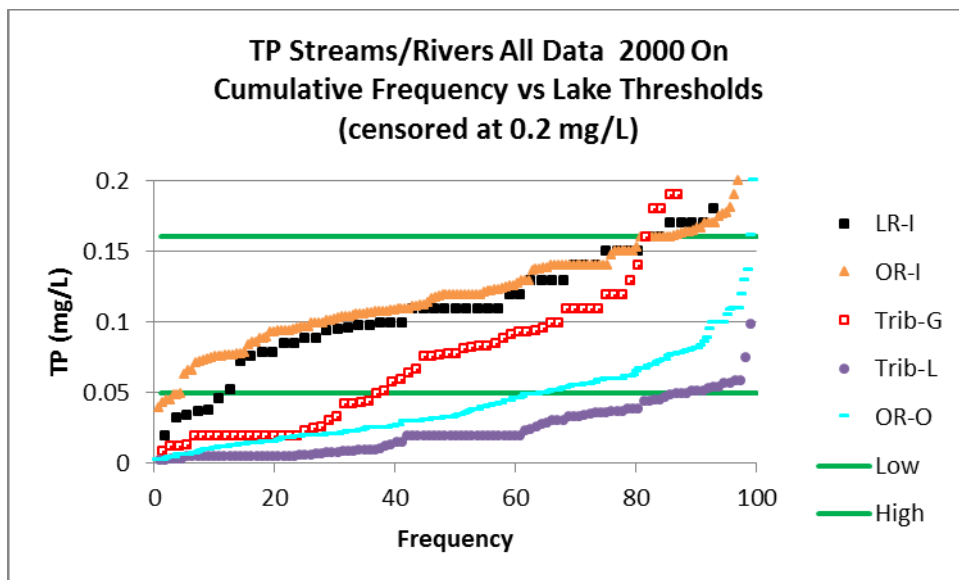


Figure B.5.18. TP Streams/Rivers All Data 2000 On Cumulative Frequency vs Lake Thresholds (censored at 0.2 mg/L)

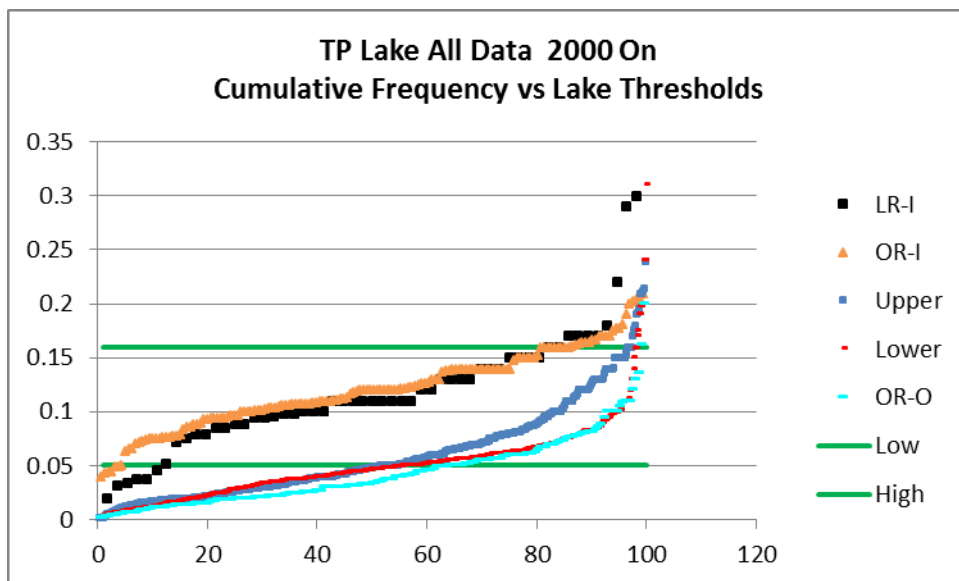


Figure B.5.19. TP Lake All Data 2000 On Cumulative Frequency vs Lake Thresholds

Table B.5.3. TP Tributaries Cumulative Frequency vs Lake Thresholds (2000–Current)

	TP	TP-Low	TP-High
Tribs	%<0.05	%>0.05	%>0.16
OR-I	4.5	95.5	14.0
LR-I	12.0	88.0	14.0
Tribs-G	38.0	62.0	18.0
Tribs-L	89.0	11.0	0.0
OR-O	65.5	34.5	1.2

Table B.5.4. TP Tributaries vs Lake Cumulative Frequency vs Lake Thresholds (2000–Current)

	TP	TP-Low	TP-High
Lake	%<0.05	%>0.05	%>0.16
OR-I	4.5	95.5	14.0
LR-I	12.0	88.0	14.0
Upper	53.3	46.7	2.5
Lower	56.7	43.2	1.9
OR-O	65.5	34.5	1.2

TN to TP Ratio:

TN to TP ratios (**Figure B.5.20**) indicates that the OR-I has a 2000–2013 annual average ratio of 8.5 indicating nitrogen limitation. The LR-I TN/TP average annual ratio of 14.8 for this period indicate co-limitation and is a reflection of the higher concentrations of nitrogen in the Little River over the Ochlockonee River. Data for the lake indicate that except for 2000 and 2013, the TN/TP ratio in the Upper area of the lakes is greater than 10 and generally lower than the TN/TP ratio in the Lower area of the lake, reflecting the influence of the OR-I. The data indicate that the lake becomes progressively more co-limited as you move from the Upper (13.6) area of the lake towards the dam (16.6). The TN/TP ratio of the river below the lake is 18.3. Results from averaging the monthly average GM TN and TP concentrations indicate that the OR-I (5.8), Richlander Creek (8.3), Rocky Comfort Creek (5.7), Bear Creek (5.9), and the OR-O (9.8) all tend to be N-Limited. Both the Upper (12.5) and Lower (14.0) areas of the lake, the LR-I (16.5), Polk Creek (18.4), Ocklawaha Creek (28.4), and Hammock creek tend to be Co-limited. Both Freeman Creek (53.1) and Harvey Creek (30.9) tend to be P-limited.

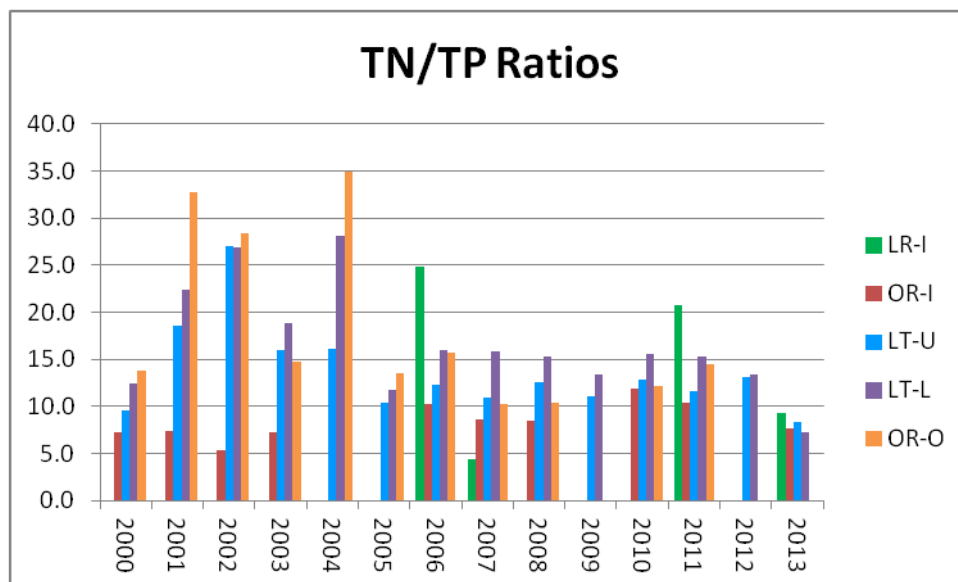


Figure B.5.20. Little and Ochlockonee Rivers and Lake Talquin Monthly Average TN/TP Ratio

CChla:

The CChla monthly concentration (**Figure B.5.21**) in the Ochlockonee River is greater than the concentration in the Little River during February through April and September through November and appears to have a similar seasonal pattern. Both rivers show higher concentrations during May, July, September, and November. The rivers exhibit fairly low concentrations from January through April, September, October, and December. The monthly average CChla concentration in the lake (**Figure B.5.22**) is always greater in the Lower area, averaging 4.9 ug/L higher. Both areas of the lake have peak concentrations in May and June with a large decrease in July. The average of the May and June monthly concentrations for the lake is 24.6 ug/L and for July it is 9.5 ug/L, a 61 % reduction from the May-June average. This large reduction in July may be related to the large increase in rainfall (58 %) that occurs in between May (average 3.7 inches) and June (average 8.8 inches). The data indicate that the increase in rainfall results in reduced CChla in the inflowing rivers, direct dilution of the lake, and a reduced residence time for the lake during this portion of the growing season. CChla monthly average concentrations in the lake rebound in August and September to about 17.2 ug/L and then gradually decline. The monthly average CChla in the Ochlockonee River below the lake (**Figure B.5.23**) is always less than the concentration in the lake with a maximum difference of 17.7 ug/L in July (9.3 ug/L and 27.0 ug/L, respectively). The results for CChla during the period 2005–2013 indicate that both major rivers have lower CChla GM concentrations than the lake. The data for the lake indicate the Lower area is more productive than the Upper area and the CChla in the river below the lake are about double the concentrations in the two upstream main rivers.

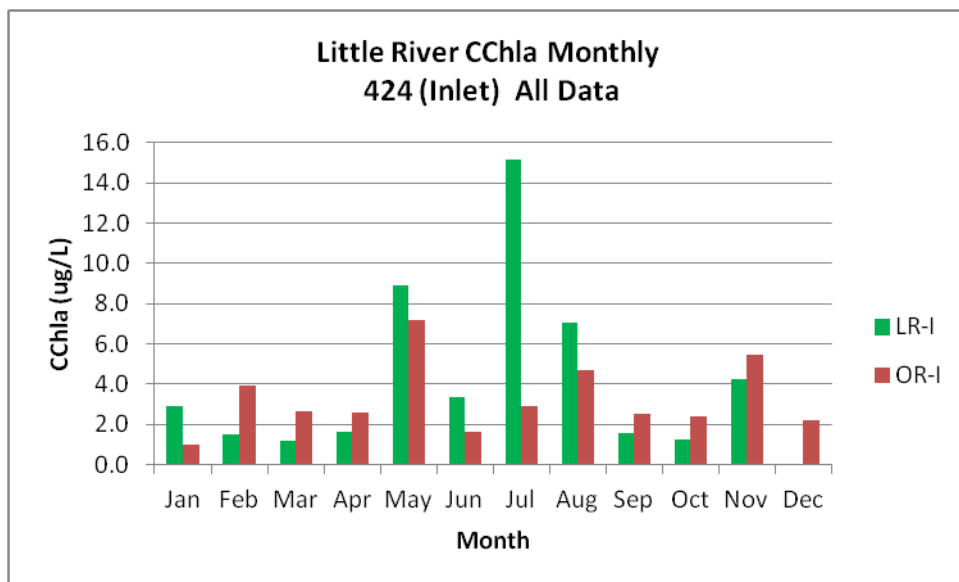


Figure B.5.21. Little and Ochlockonee River WBIDs Monthly Average CChla

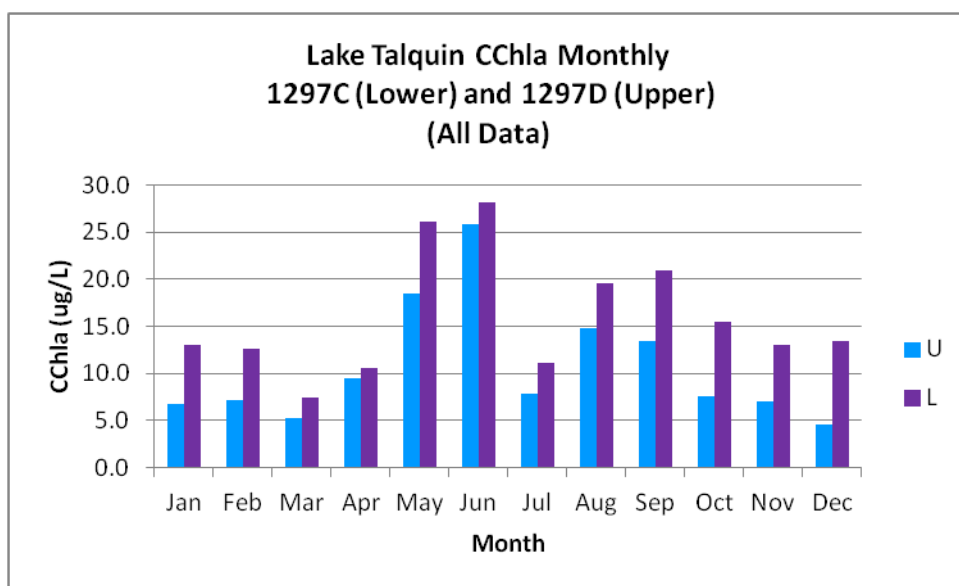


Figure B.5.22. Lake Talquin Upper and Lower WBIDs Monthly Average CChla

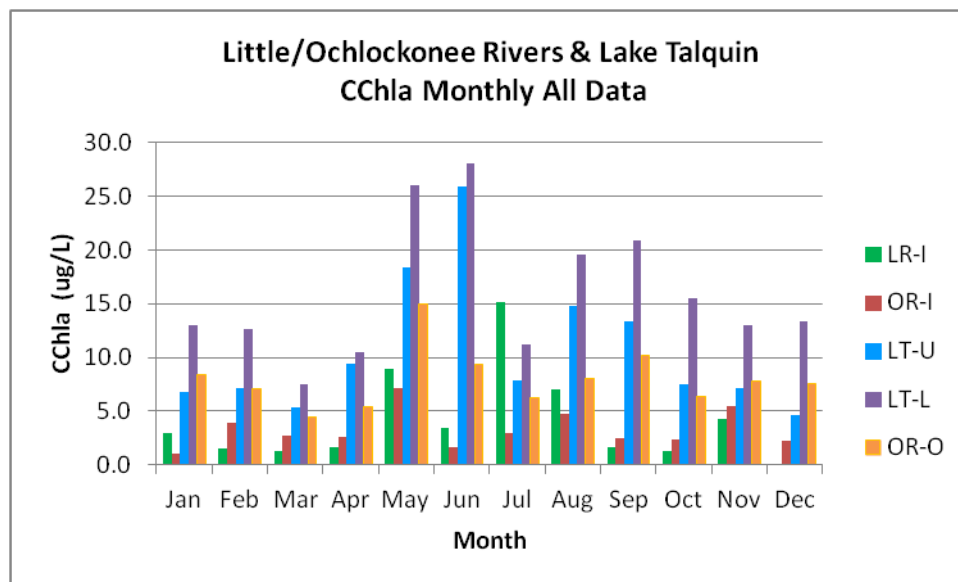


Figure B.5.23. Little/Ochlockonee Rivers and Lake Talquin Upper and Lower WBIDs Monthly Average CChla

BOD5:

The BOD5 monthly concentration (**Figure B.5.24**) in the Ochlockonee and Little Rivers follow a similar seasonal pattern from October through April with opposite trends from May through September. The monthly average BOD5 concentration in the lake (**Figure B.5.25**) is always greater in the Lower area, averaging 0.3 mg/L higher. Both areas of the lake have peak concentrations in May and June. The results for BOD5 during the period 2005–2013 indicate that both major rivers have lower BOD5 concentrations than the lake.

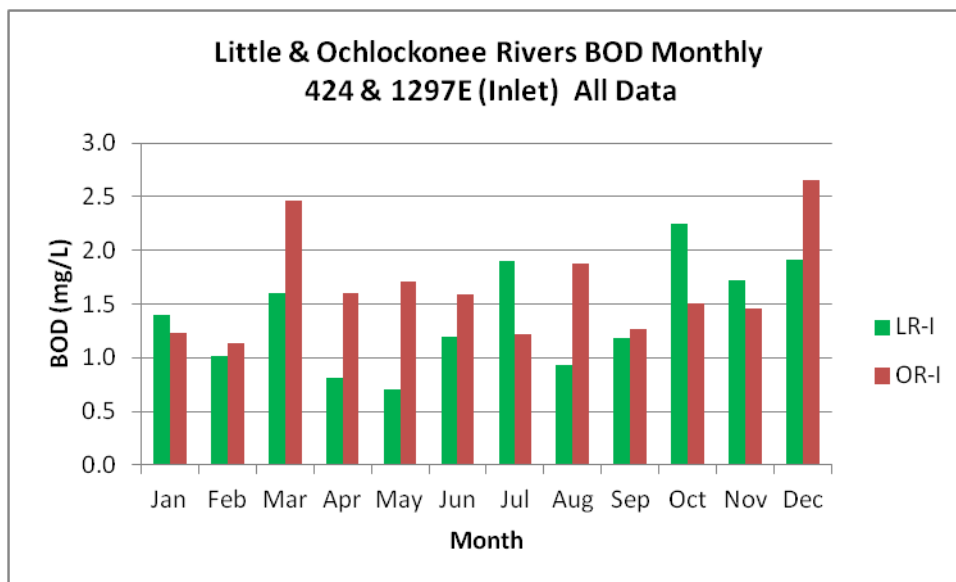


Figure B.5.24. Little and Ochlockonee River WBIDs Monthly Average BOD5

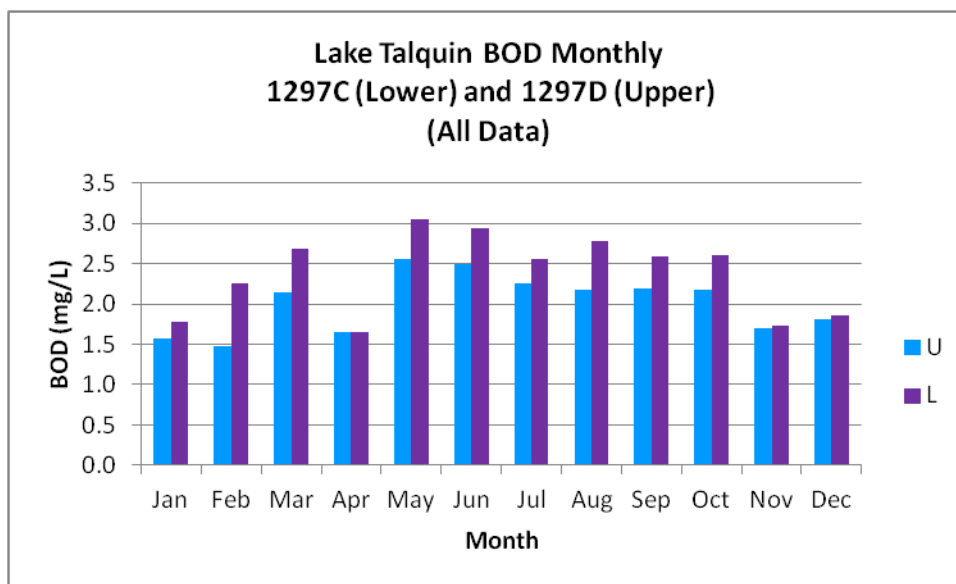


Figure B.5.25. Lake Talquin Upper and Lower WBIDs Monthly Average BOD5

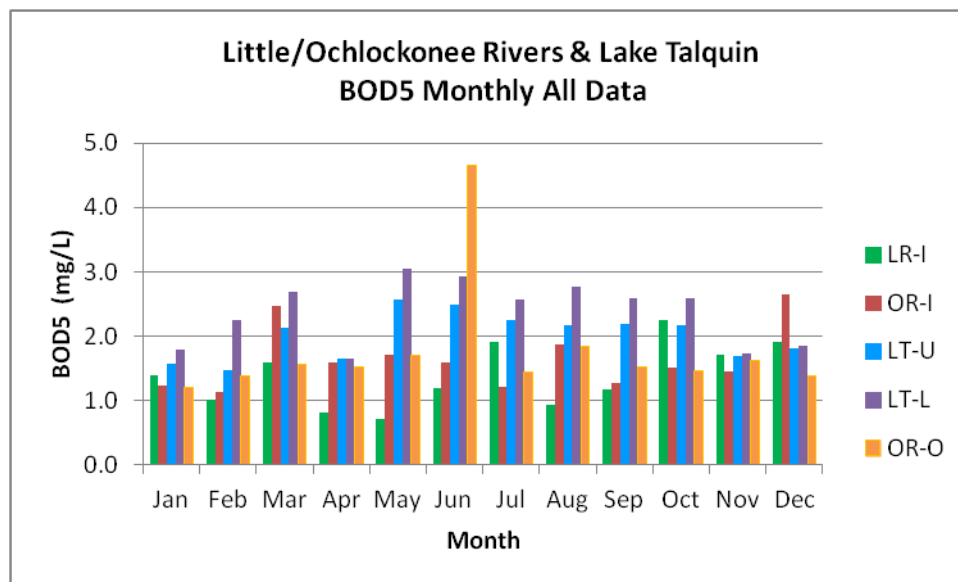


Figure B.5.26. Little/Ochlockonee Rivers and Lake Talquin Upper and Lower WBIDs Monthly Average BOD5

Dissolved Oxygen:

The DO monthly concentration (**Figure B.5.27**) in the Ochlockonee River is less than the concentration in the Little River for all months except January and appears to have a similar seasonal pattern. Both rivers have lower concentrations during April through August. The monthly average DO concentration in the lake (**Figure B.5.28**) is slightly greater in the Lower area during March, April May, and October. Both areas of the lake have the lowest DO concentrations in August. The monthly average DO in the Ochlockonee River below the lake (**Figure B.5.29**) follows the seasonal pattern in the lake. The results for DO during the period 2005–2013 indicate that both major rivers have DO average concentrations greater than the lake, as does the Ochlockonee River below the lake.

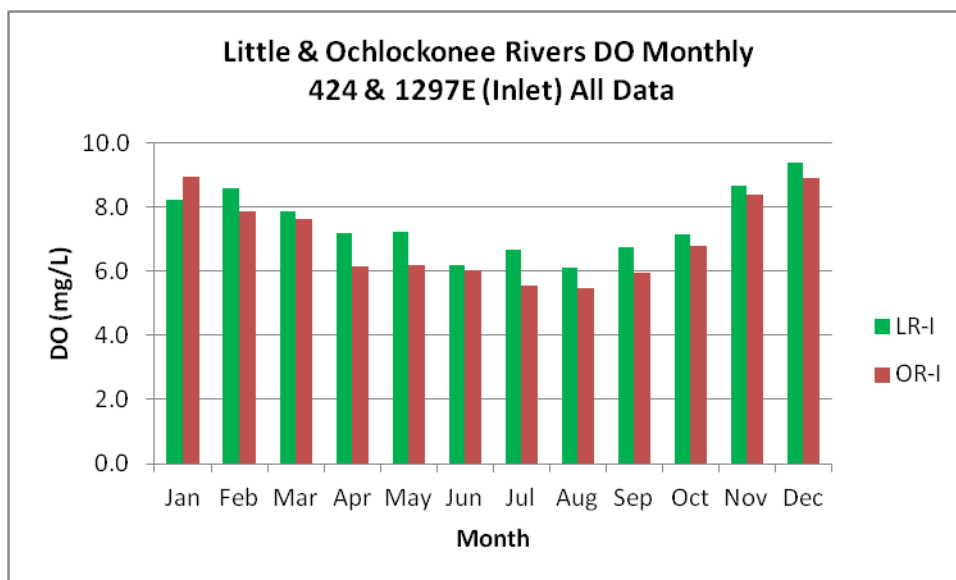


Figure B.5.27. Little and Ochlockonee River WBIDs Monthly Average DO

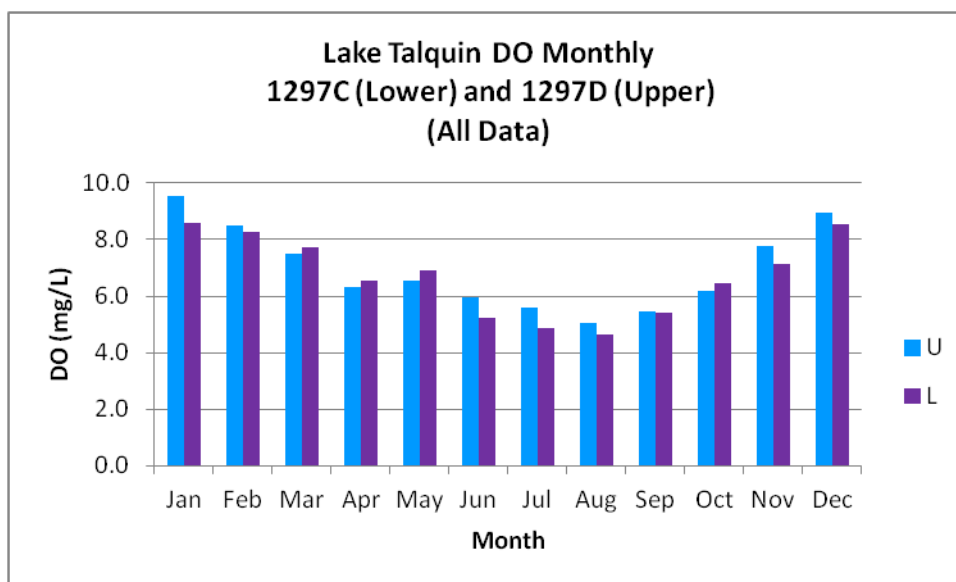


Figure B.5.28. Lake Talquin Upper and Lower WBIDs Monthly Average DO

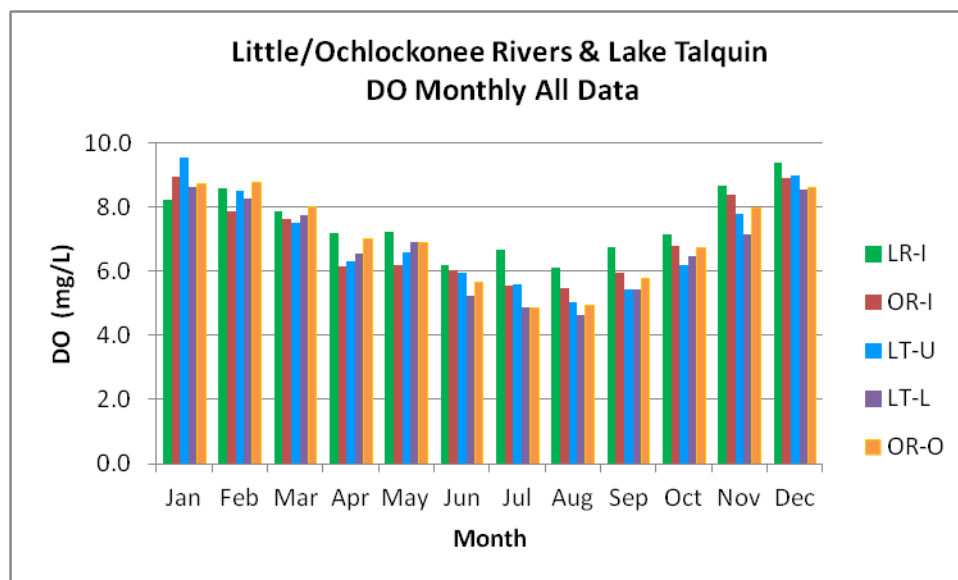


Figure B.5.29. Little/Ochlockonee Rivers and Lake Talquin Upper and Lower WBIDs Monthly Average DO

Dissolved Oxygen Percent Saturation:

The DO percent saturation (DO%S) monthly concentration (**Figure B.5.30**) in the Ochlockonee River is similar or slightly less than the average in the Little River except during June and October and appears to have a similar seasonal pattern. Both rivers show higher levels during November and December. The monthly average values in the lake (**Figure B.5.31**) are similar and follow the same seasonal pattern. The monthly average DO%S values in the Ochlockonee River below the lake (**Figure B.5.32**) are greater than the values in the lake during the summer (June, July, August, and September) and similar or less during other months of the year. The results for the period 2005–2013 indicate that both major rivers have higher values than the lake. The data for the lake indicate the Lower area is more productive (higher DO%S) than the Upper area.

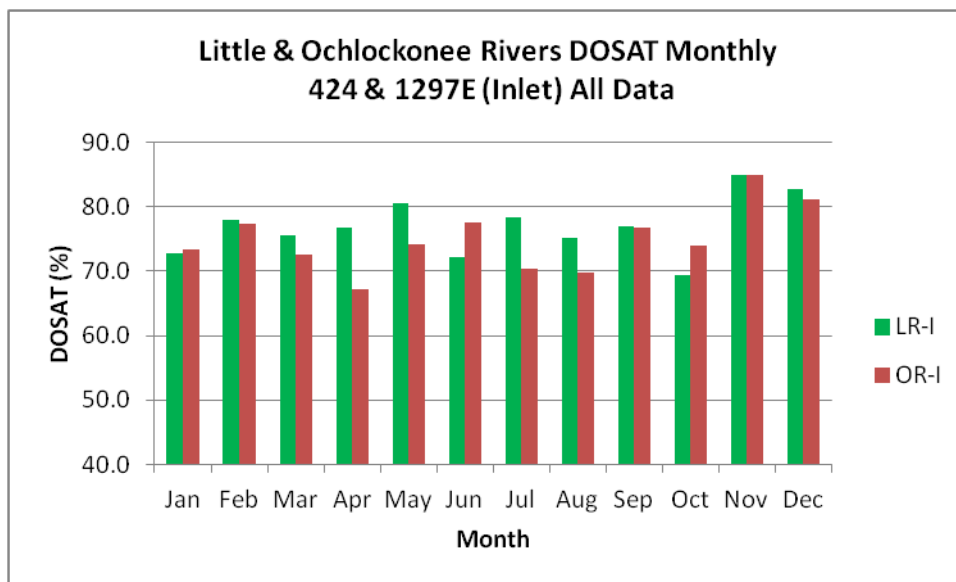


Figure B.5.30. Little and Ochlockonee River WBIDs Monthly Average DOSAT

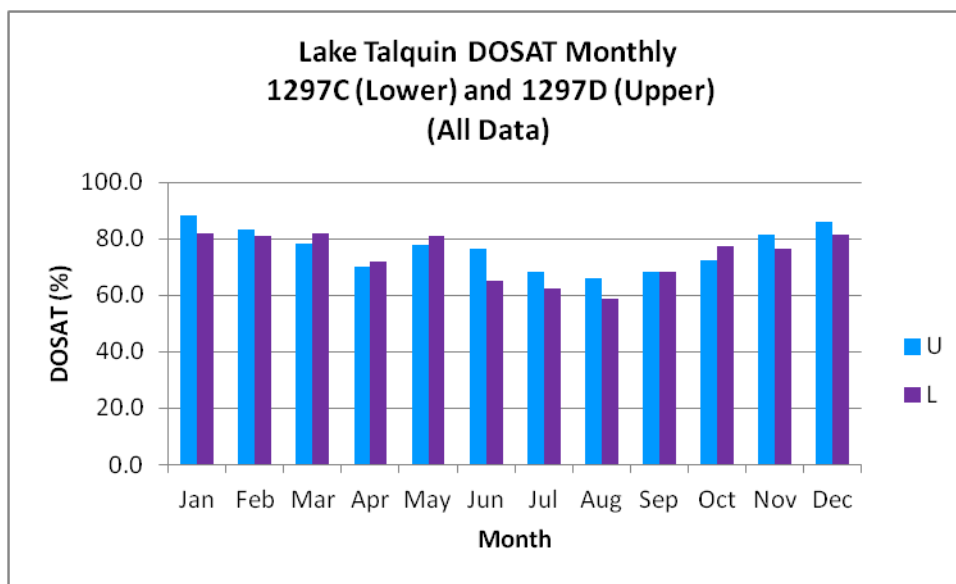


Figure B.5.31. Lake Talquin Upper and Lower WBIDs Monthly Average DOSAT (upper 2 meters)

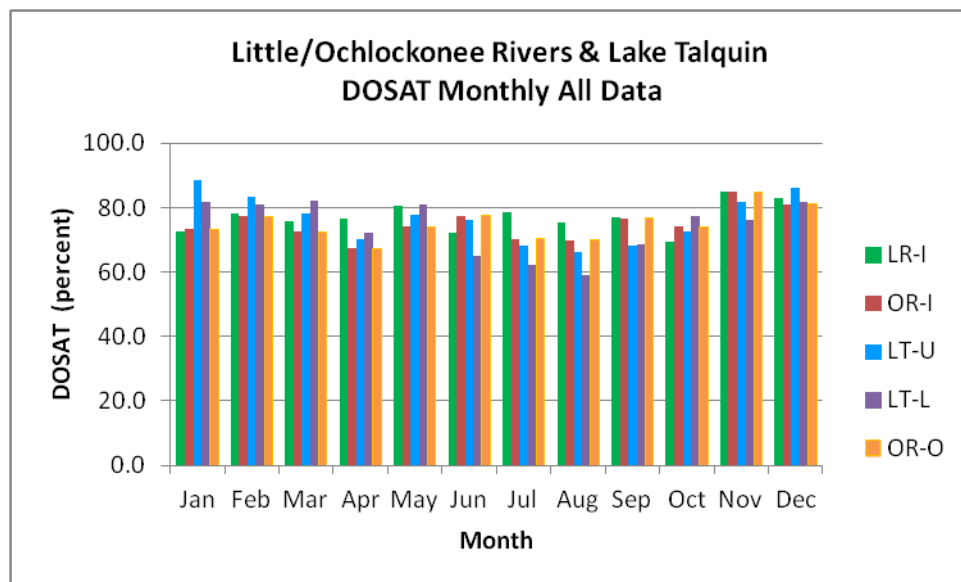


Figure B.5.32. Little/Ochlockonee Rivers and Lake Talquin Upper and Lower WBIDs Monthly Average DOSAT

B.6 Summary of Land Use Data

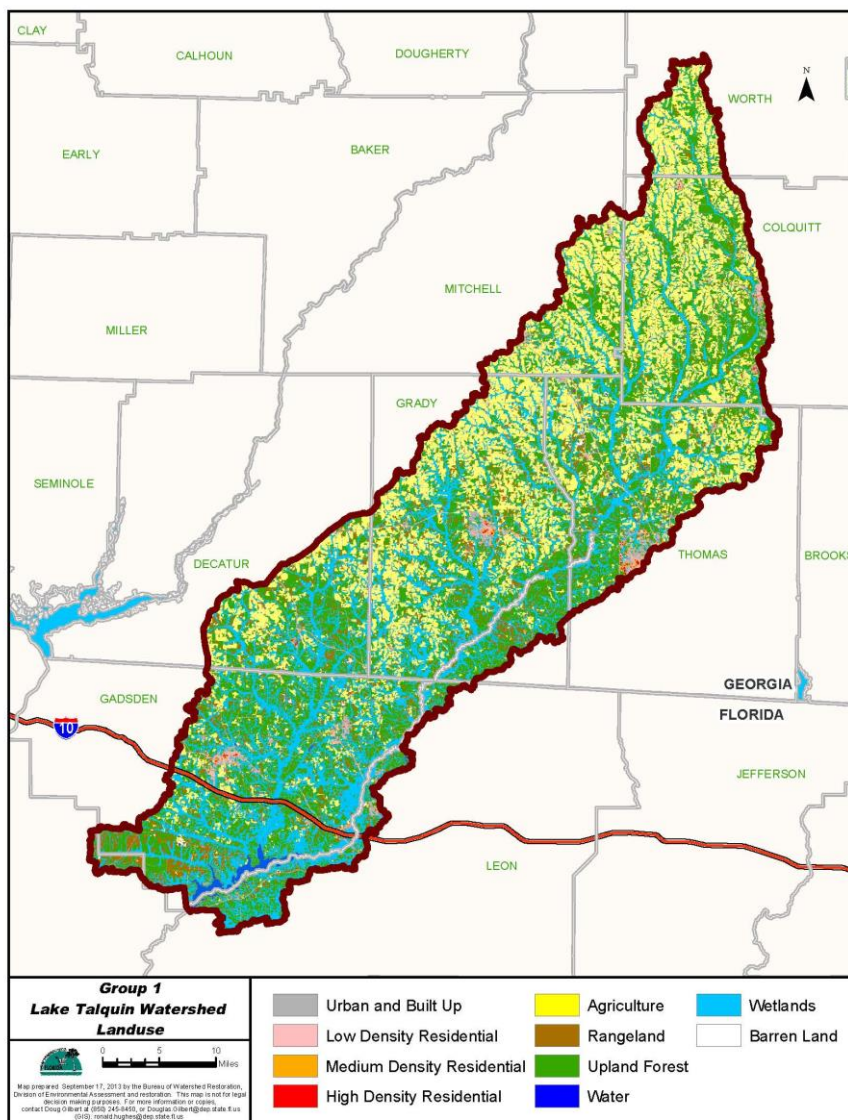


Figure B.6.1. Principal Land Uses in the Lake Talquin Watershed 2006

Table B.6.1. Classification of Land Use Categories in the Lake Talquin Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	13,629.2	21.3	1.4
21	Urban Built up	47,743.3	74.6	4.8
22	Low Density Residential	14,205.0	22.2	1.4
23	Medium Density Residential	2,442.1	3.8	0.2
24	High Density Residential	1,200.1	1.9	0.1
31	Barren Land	1,662.6	2.6	0.2
41	Upland Forest	307,305.2	480.2	30.6
52	Rangeland	78,766.2	123.1	7.8
81	Agriculture	280,674.7	438.6	28.0
90	Wetlands	256,402.3	400.6	25.5
TOTAL	Watershed	1,004,030.6	1,568.8	100.0

Ochlockonee River above Lake Talquin

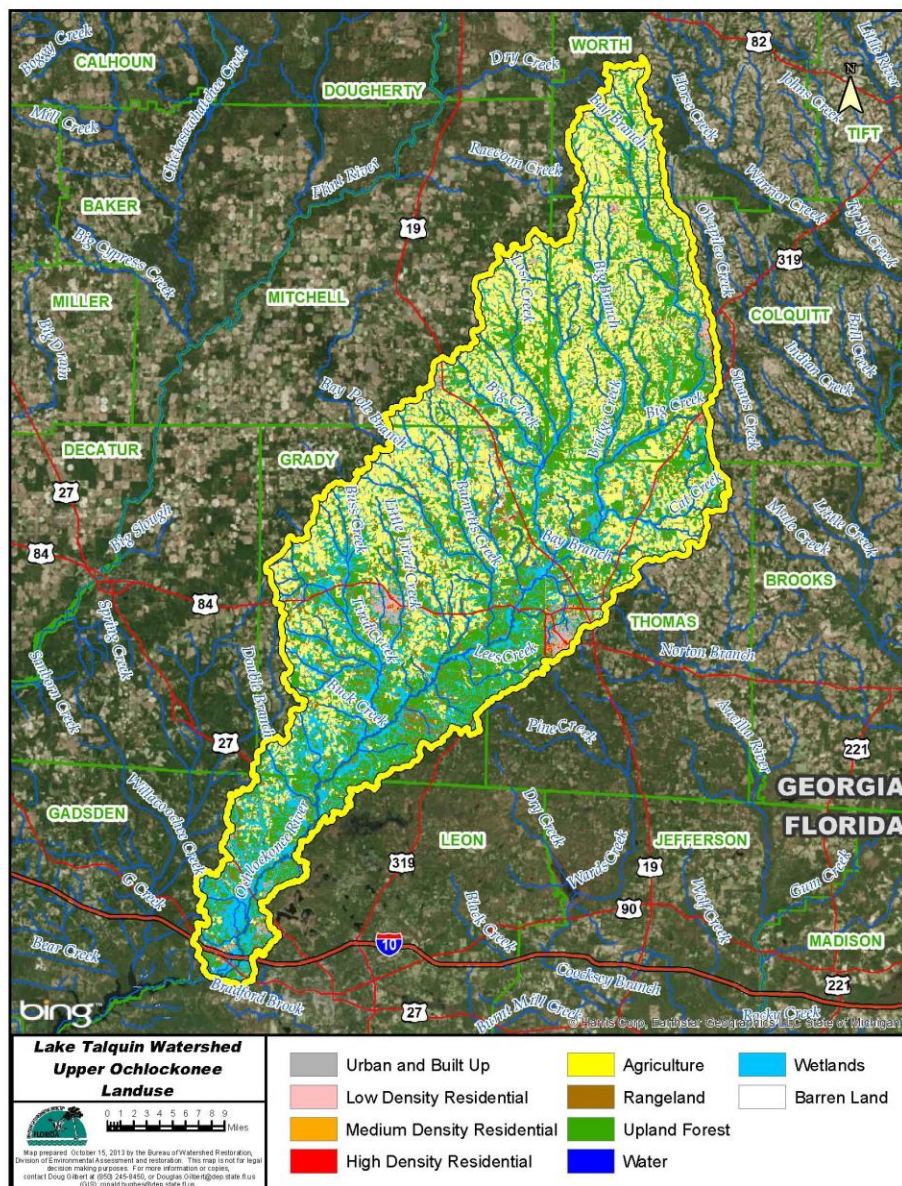


Figure B.6.2. Principal Land Uses in the Ochlockonee River Watershed above Lake Talquin 2006

Table B.6.2. Classification of Land Use Categories in the Ochlockonee River above Lake Talquin Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	5,234.3	8.2	0.8
21	Urban Built up	33,994.0	53.1	4.9
22	Low Density Res	10,597.5	16.6	1.5
23	Medium Density Res	1,871.4	2.9	0.3
24	High Density Res	929.2	1.5	0.1
31	Barren Land	872.0	1.4	0.1
41	Upland Forest	201,640.8	315.1	29.2
52	Rangeland	49,878.1	77.9	7.2
81	Agriculture	231,796.5	362.2	33.6
90	Wetlands	153,385.1	239.7	22.2
Total	Watershed	690,198.9	1,078.4	100.0

Hunter Creek

Hunter Creek drains directly to Lake Talquin between the Ochlockonee River and Little River.

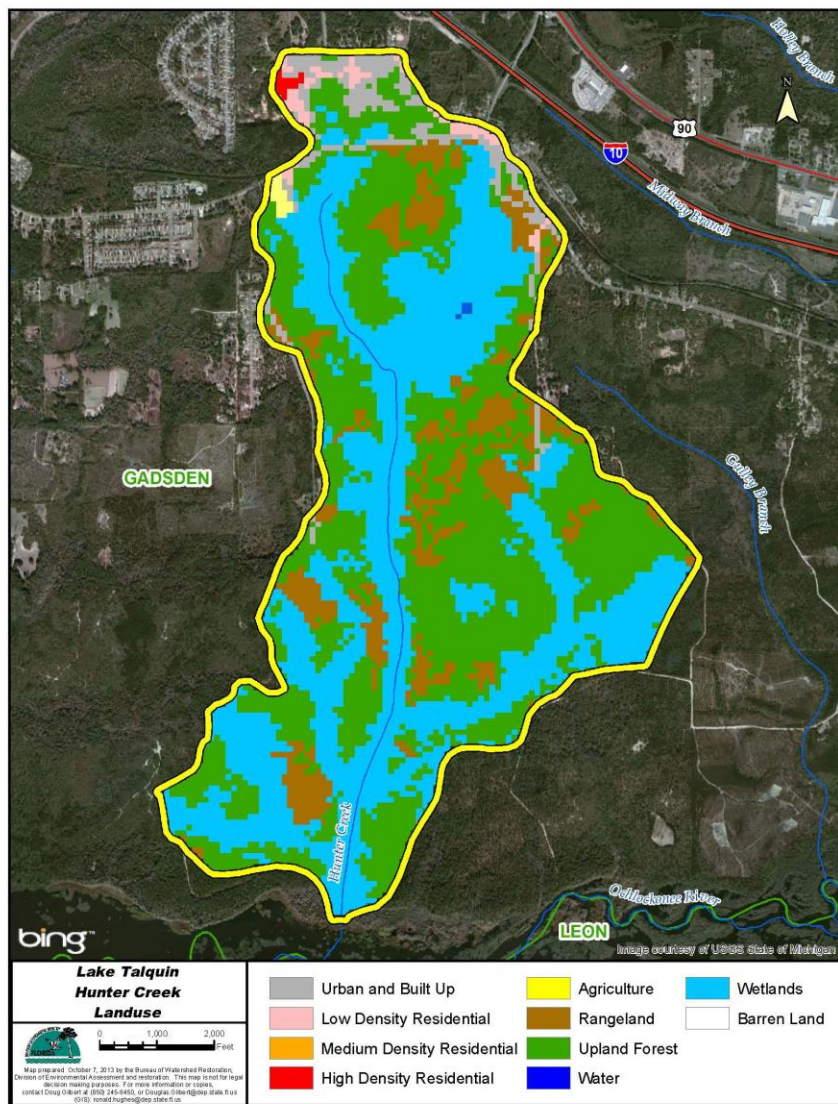


Figure B.6.3. Principal Land Uses in the Hunter Creek Watershed 2006

Table B.6.3. Classification of Land Use Categories in the Hunter Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	1.1	0.0	0.1
21	Urban Built up	59.6	0.1	3.7
22	Low Density Res	18.0	0.0	1.1
24	High Density Res	3.3	0.0	0.2
41	Upland Forest	679.9	1.1	42.8
52	Rangeland	173.5	0.3	10.9
81	Agriculture	4.4	0.0	0.3
90	Wetlands	649.6	1.0	40.9
Total	Watershed	1,589.4	2.5	100.0

Double Branch

Double Branch drains directly to Lake Talquin between the Ochlockonee River and Little River.

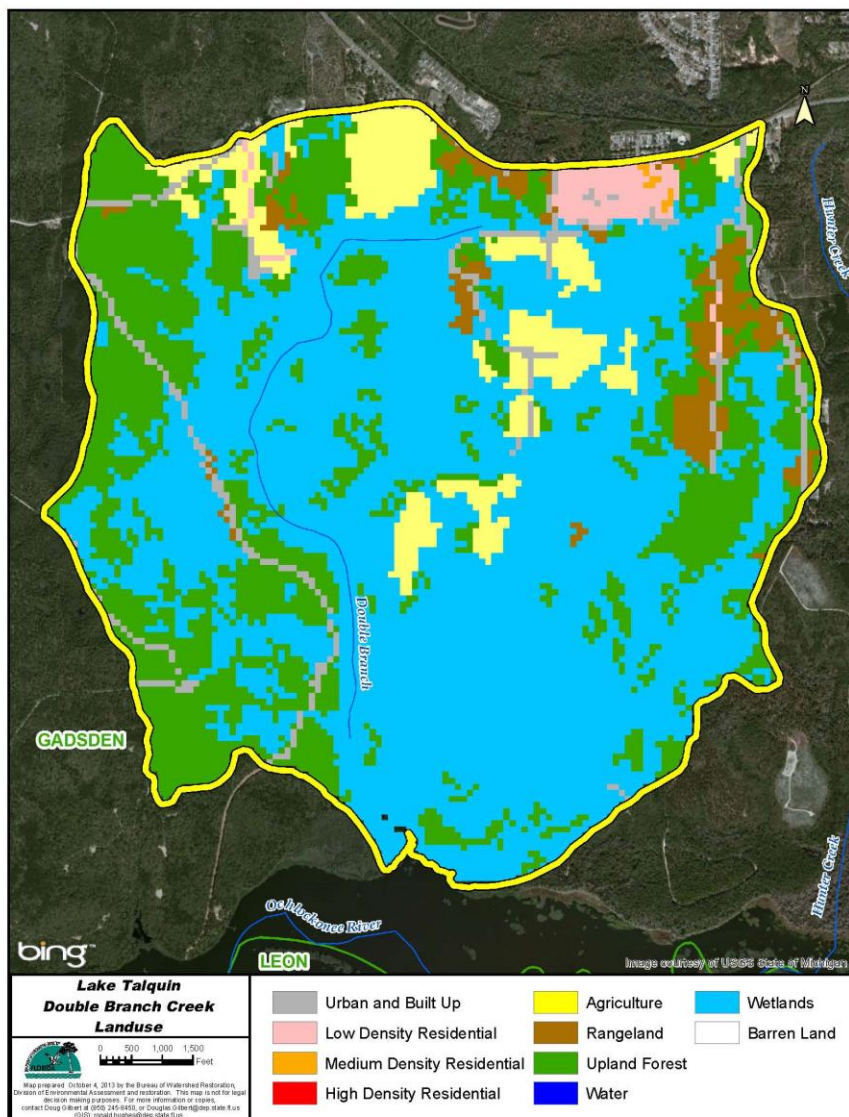


Figure B.6.4. Principal Land Uses in the Double Branch Watershed 2006

Table B.6.4. Classification of Land Use Categories in the Double Branch Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
21	Urban Built up	87.0	0.1	3.2
22	Low Density Res	42.5	0.1	1.6
23	Medium Density Res	2.7	0.0	0.1
41	Upland Forest	724.8	1.1	27.1
52	Rangeland	91.4	0.1	3.4
81	Agriculture	184.8	0.3	6.9
90	Wetlands	1,545.9	2.4	57.7
Total	Watershed	2,679.0	4.2	100.0

Mule Creek

Mule Creek drains directly to Lake Talquin between the Ochlockonee and Little Rivers.

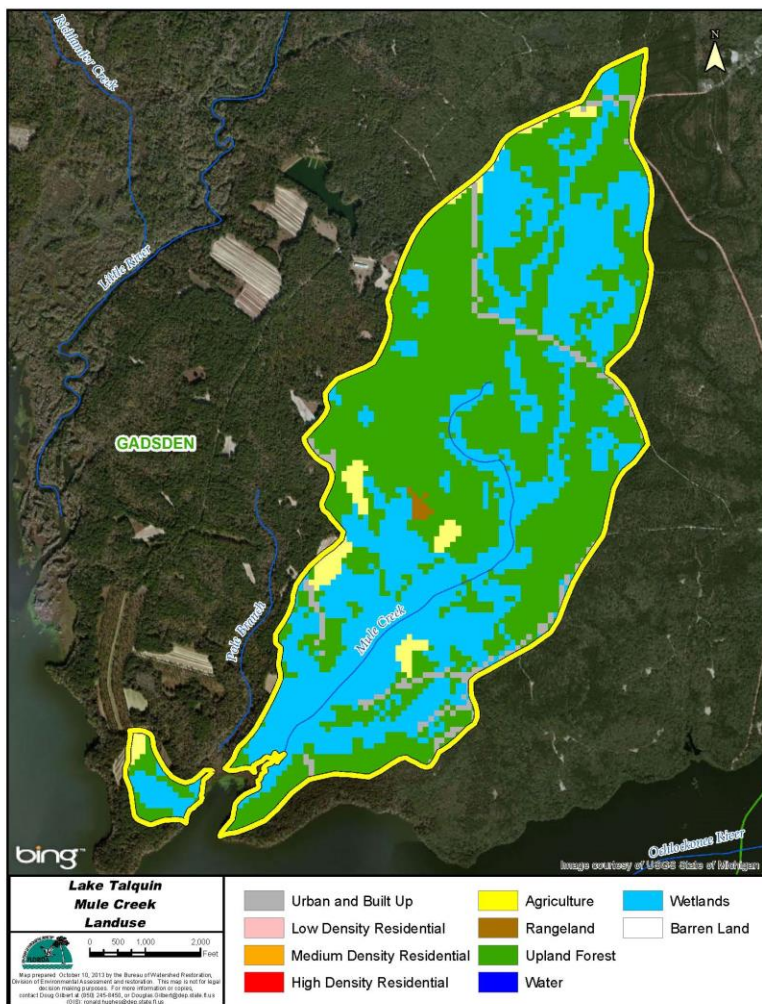


Figure B.6.5. Principal Land Uses in the Mule Creek Watershed 2006

Table B.6.5. Classification of Land Use Categories in the Mule Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
21	Urban Built up	42.7	0.1	3.4
41	Upland Forest	691.4	1.1	54.3
52	Rangeland	3.3	0.0	0.3
82	Agriculture	36.3	0.1	2.8
90	Wetlands	498.6	0.8	39.2
Total	Watershed	1,272.3	2.0	100.0

No OSTDS in Mule Creek

Pole Creek

Pole Creek drains directly to Lake Talquin between the Ochlockonee and Little Rivers.

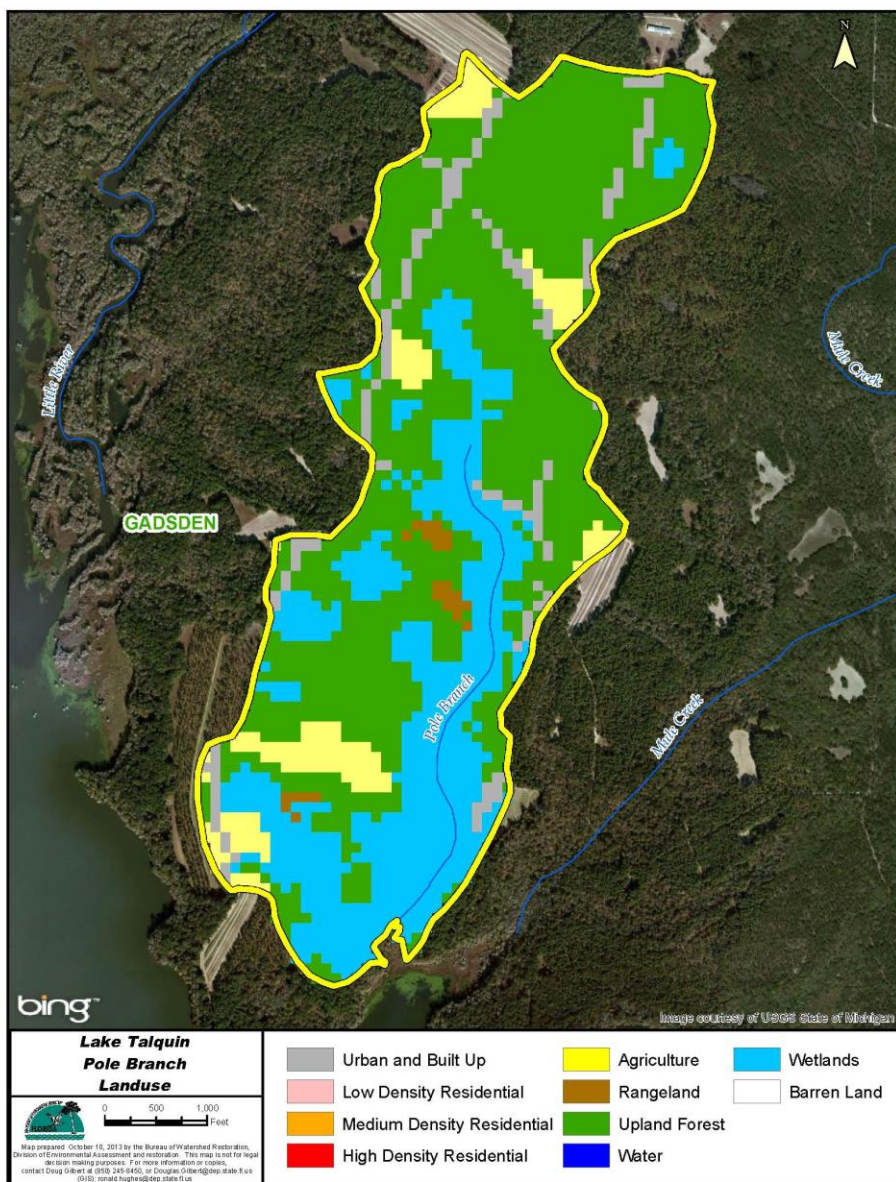


Figure B.6.6. Principal Land Uses in the Pole Branch Watershed 2006

Table B.6.6. Classification of Land Use Categories in the Pole Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
21	Urban Built up	33.6	0.1	6.7
41	Upland Forest	281.6	0.4	55.8
52	Rangeland	5.8	0.0	1.1
82	Agriculture	37.1	0.1	7.4
90	Wetlands	146.8	0.2	29.1
Total	Watershed	504.8	0.8	100.0

No OSTDs in Pole Creek watershed

Little River Above Lake Talquin:

The Little River has its origin just below where Attapulugus Creek joins with Salem Creek. The creeks that either make up or drain to the Little River are presented from upstream to downstream.

Attapulugus Creek

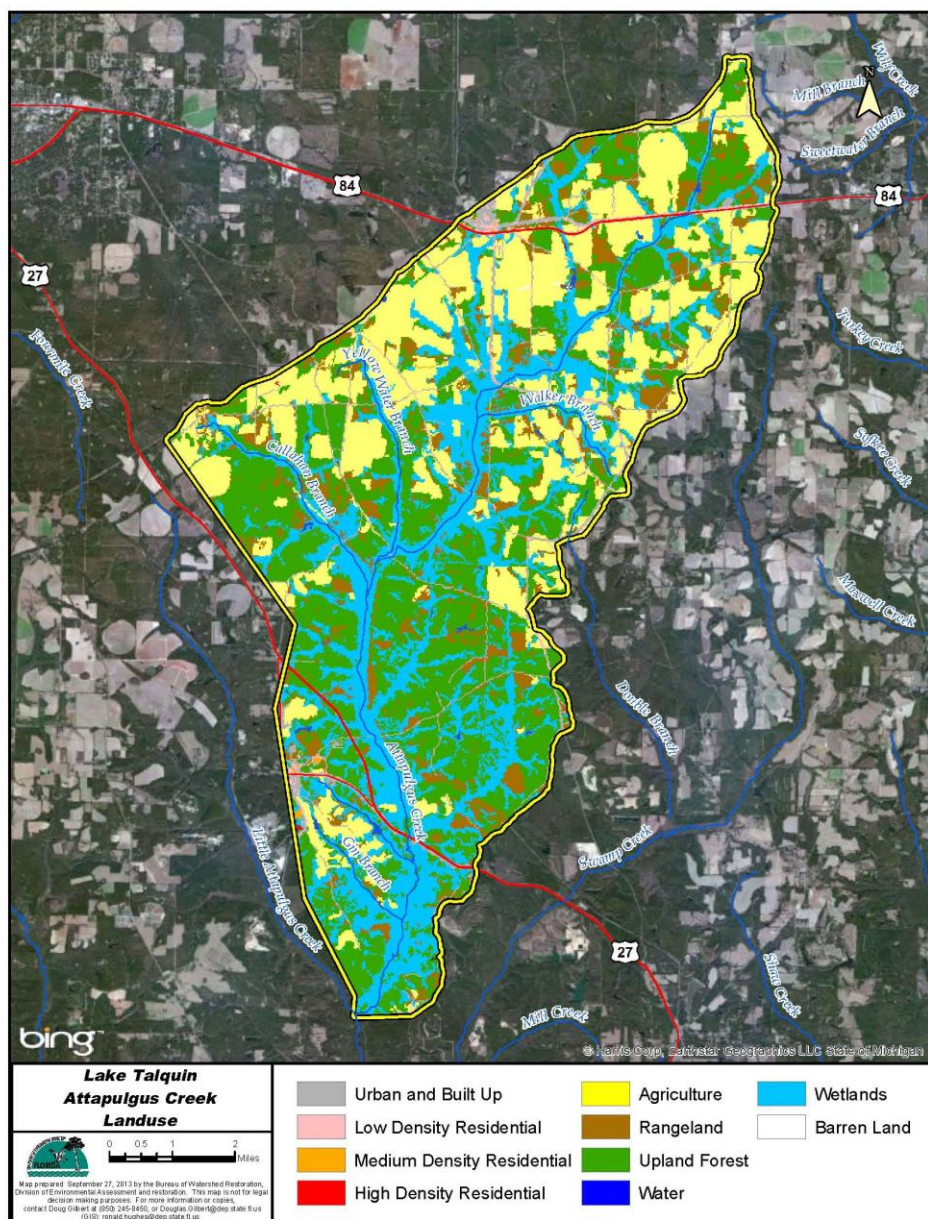


Figure B.6.7. Principal Land Uses in the Attapulugus Creek Watershed 2006

Table B.6.7. Classification of Land Use Categories in the Attapulugus Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	170.8	0.3	0.4
21	Urban Built up	1,505.4	2.4	3.7
22	Low Density Res	478.1	0.7	1.2
23	Medium Density Res	38.3	0.1	0.1
24	High Density Res	5.6	0.0	0.0
31	Barren Land	12.7	0.0	0.0
41	Upland Forest	13,601.6	21.3	33.1
52	Rangeland	4,004.4	6.3	9.7
81	Agriculture	10,592.2	16.6	25.8
90	Wetlands	10,680.0	16.7	26.0
Total	Watershed	41,089.1	64.2	100.0

Little Attapulqus Creek

Little Attapulqus Creek drains to Attapulqus Creek.

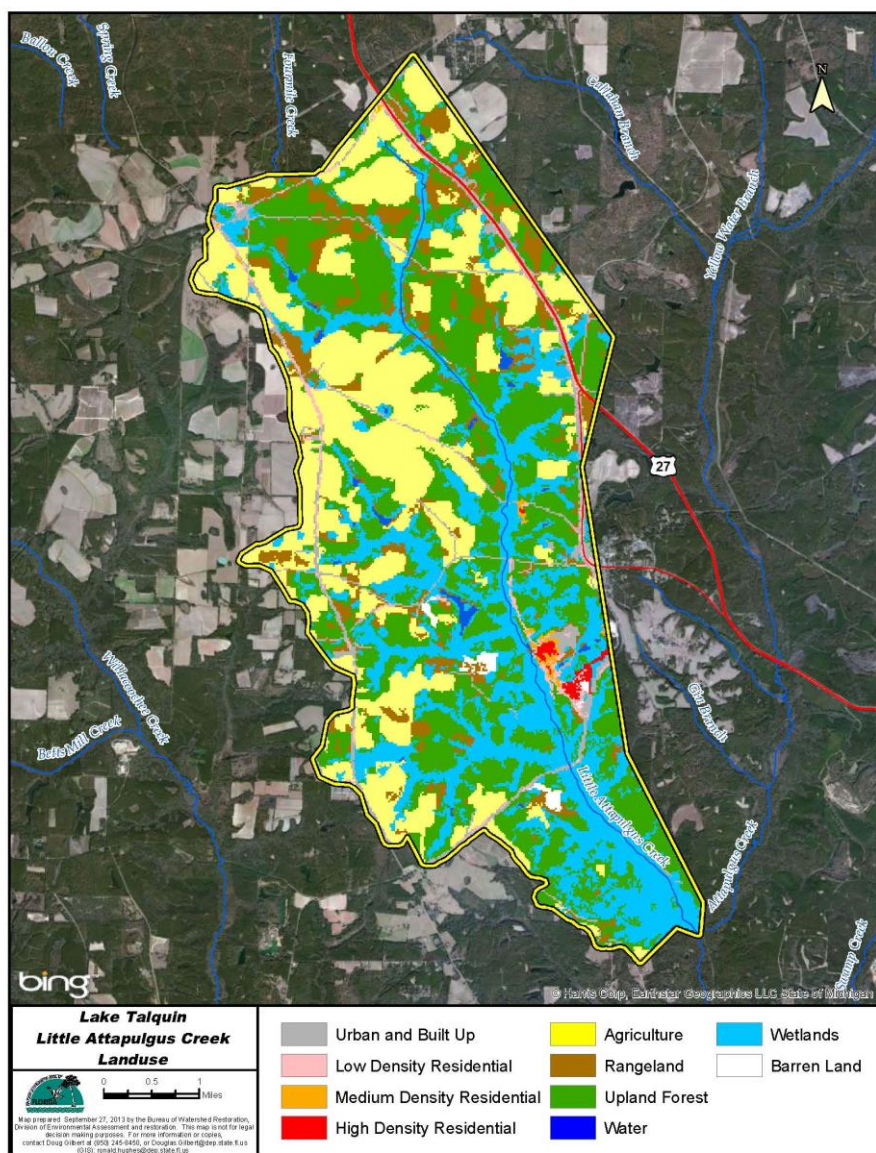


Figure B.6.8. Principal Land Uses in the Little Attapulqus Creek Watershed, 2006

Table B.6.8. Classification of Land Use Categories in the Little Attapulugus Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	104.3	0.2	0.7
21	Urban Built up	698.8	1.1	4.4
22	Low Density Res	285.8	0.4	1.8
23	Medium Density Res	52.0	0.1	0.3
24	High Density Res	58.9	0.1	0.4
31	Barren Land	81.2	0.1	0.5
41	Upland Forest	5,243.2	8.2	32.9
52	Rangeland	1,404.0	2.2	8.8
81	Agriculture	4,113.2	6.4	25.8
90	Wetlands	3,919.0	6.1	24.6
Total	Watershed	15,960.3	24.9	100.0

Swamp Creek

Swamp Creek drains to the Attapulgus Creek.

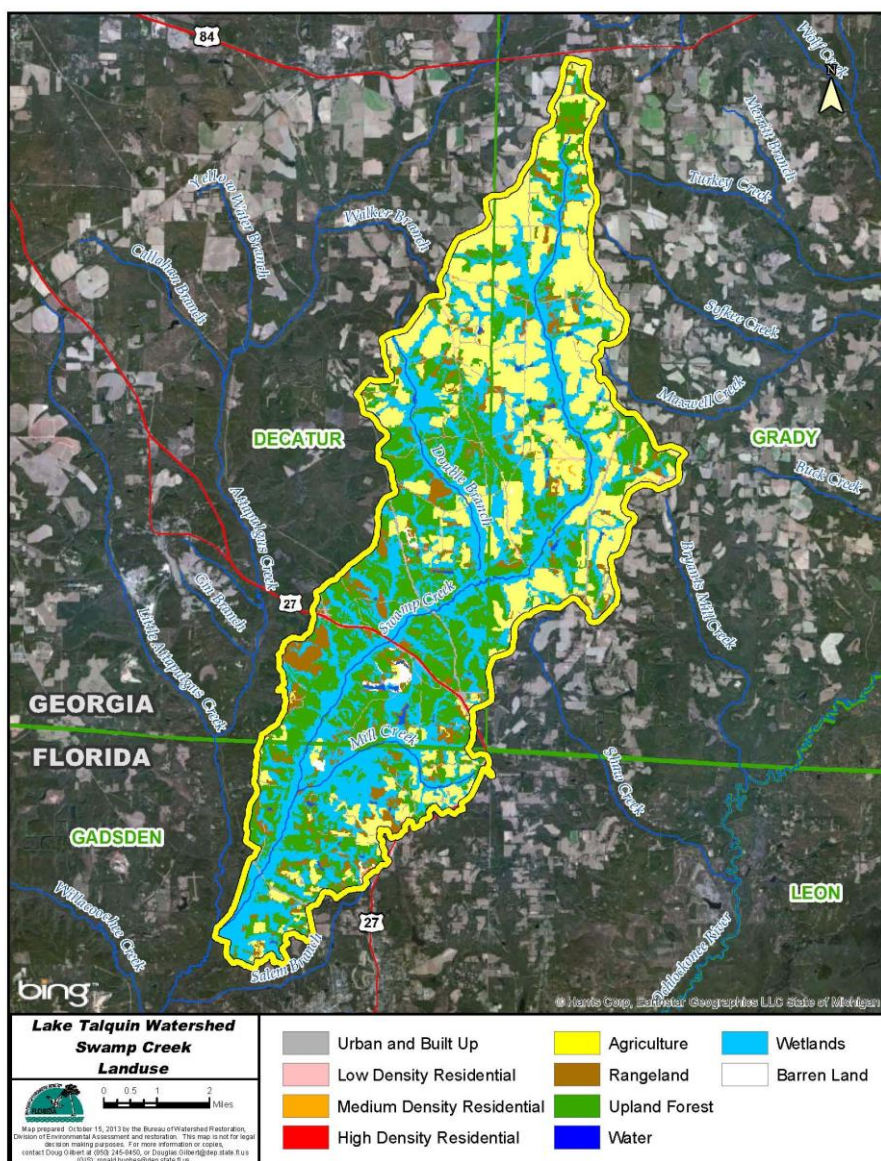


Figure B.6.9. Principal Land Uses in the Swamp Creek Watershed, 2006

Table B.6.9. Classification of Land Use Categories in the Swamp Creek Watershed, 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	247.5	0.4	0.7
21	Urban Built up	1,308.6	2.0	3.6
22	Low Density Res	253.5	0.4	0.7
23	Medium Density Res	39.6	0.1	0.1
24	High Density Res	5.8	0.0	0.0
31	Barren Land	180.4	0.3	0.5
41	Upland Forest	10,066.4	15.7	27.5
52	Rangeland	2,783.5	4.3	7.6
81	Agriculture	10,131.8	15.8	27.7
90	Wetlands	11,539.8	18.0	31.6
Total	Watershed	36,556.9	57.1	100.0

Salem Creek

Salem Creek drains to Attapulugus Creek in the area where Attapulugus Creek becomes the Little River.

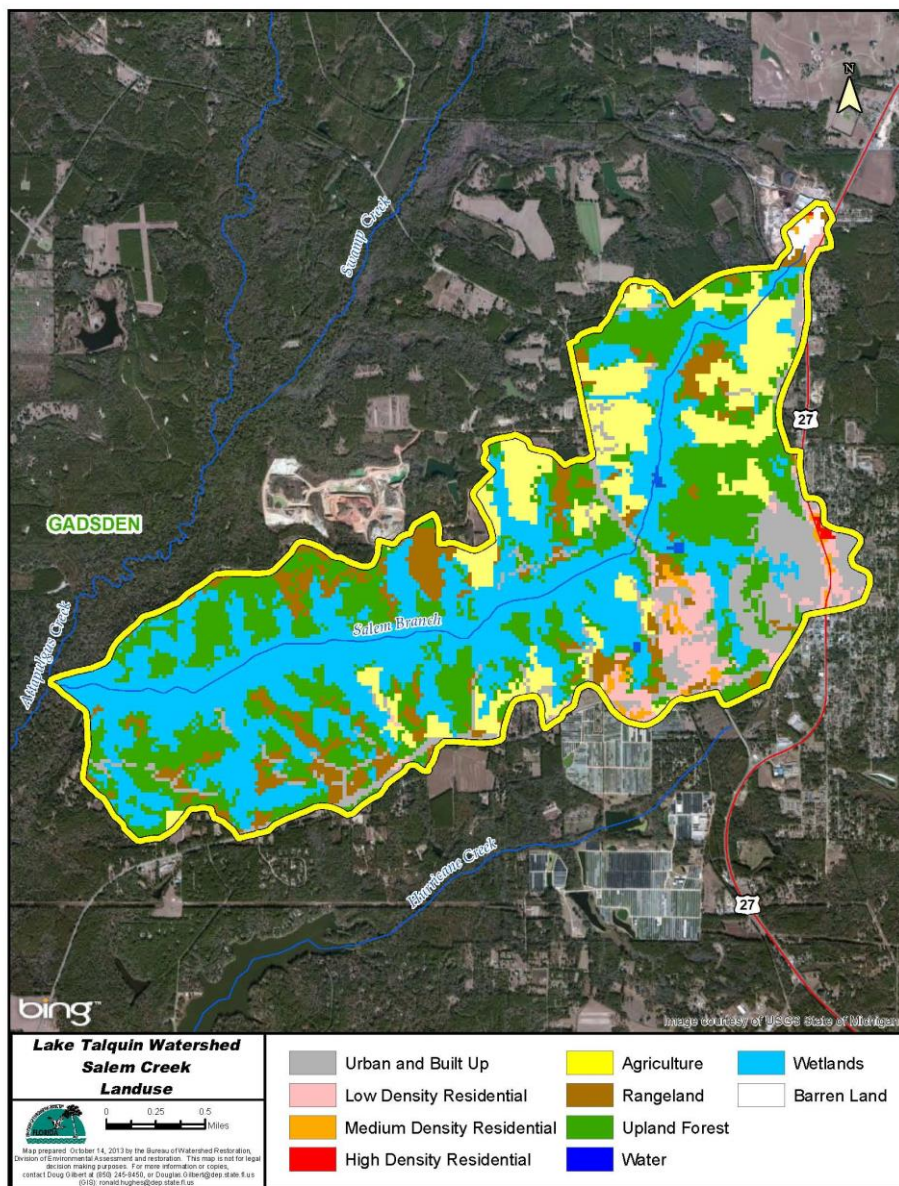


Figure B.6.10. Principal Land Uses in the Salem Creek Watershed, 2006

Table B.6.10. Classification of Land Use Categories in the Salem Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	6.4	0.0	0.2
21	Urban Built up	340.9	0.5	9.6
22	Low Density Res	134.5	0.2	3.8
23	Medium Density Res	33.1	0.1	0.9
24	High Density Res	4.0	0.0	0.1
31	Barren Land	17.3	0.0	0.5
41	Upland Forest	999.2	1.6	28.2
52	Rangeland	315.6	0.5	8.9
81	Agriculture	453.2	0.7	12.8
90	Wetlands	1,234.3	1.9	34.9
Total	Watershed	3,538.7	5.5	100.0

Willacoochee Creek

Willacoochee Creek drains to the Little River just below the confluence with Salem Creek.

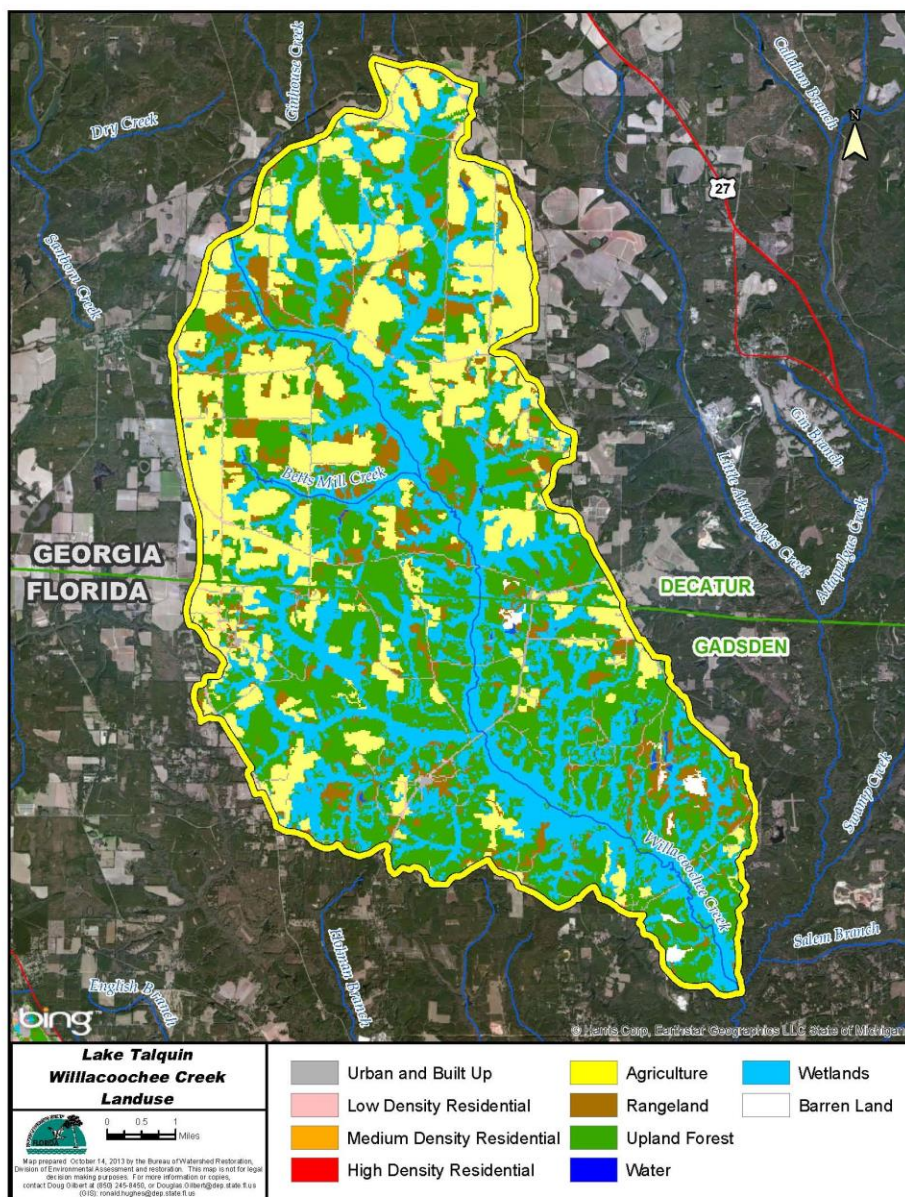


Figure B.6.11. Principal Land Uses in the Willacoochee Creek Watershed, 2006

Table B.6.11. Classification of Land Use Categories in the Willacoochee Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	113.6	0.2	0.3
21	Urban Built up	1,331.3	2.1	3.2
22	Low Density Res	148.8	0.2	0.4
23	Medium Density Res	12.9	0.0	0.0
24	High Density Res	1.6	0.0	0.0
31	Barren Land	180.1	0.3	0.4
41	Upland Forest	14,472.1	22.6	34.8
52	Rangeland	3,531.2	5.5	8.5
81	Agriculture	10,044.0	15.7	24.2
90	Wetlands	11,754.0	18.4	28.3
Total	Watershed	41,589.4	65.0	100.0

Quincy Creek

Quincy Creek drains to the Little River

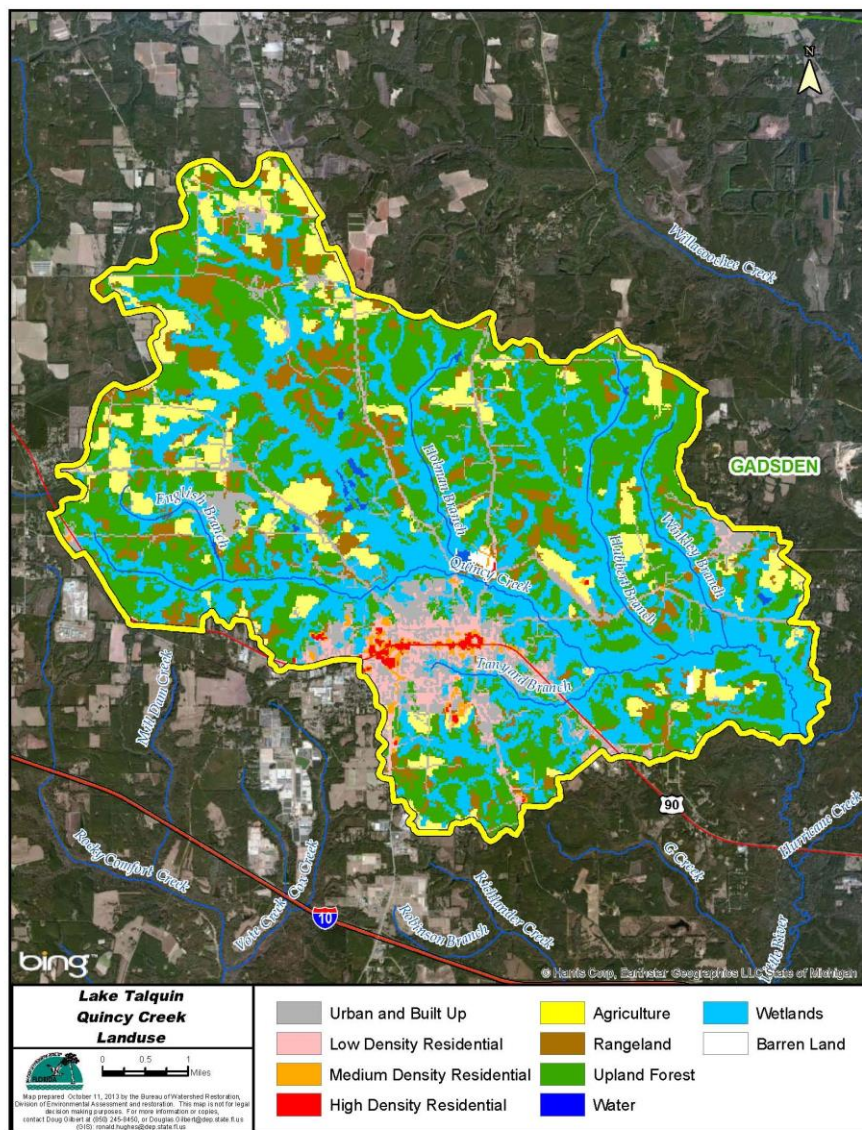


Figure B.6.12. Principal Land Uses in the Quincy Creek Watershed 2006

Table B.6.12. Classification of Land Use Categories in the Quincy Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	111.0	0.2	0.4
21	Urban Built up	2,264.0	3.5	9.0
22	Low Density Res	743.5	1.2	3.0
23	Medium Density Res	200.4	0.3	0.8
24	High Density Res	103.4	0.2	0.4
31	Barren Land	58.7	0.1	0.2
41	Upland Forest	8,775.0	13.7	34.9
52	Rangeland	2,351.8	3.7	9.4
81	Agriculture	2,456.1	3.8	9.8
90	Wetlands	8,045.5	12.6	32.0
Total	Watershed	25,109.4	39.2	100.0

Hurricane Creek

Hurricane Creek drains to the Little River

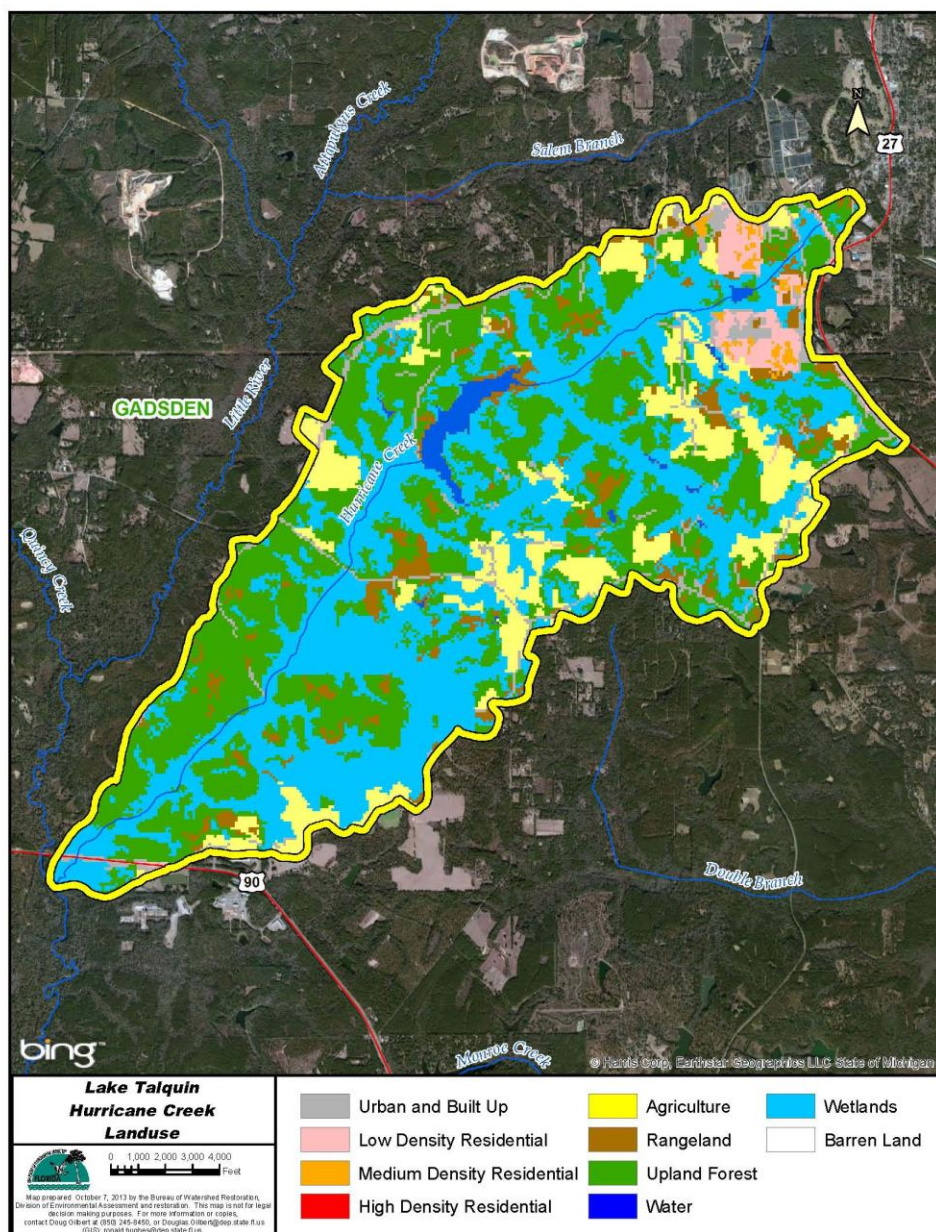


Figure B.6.13. Principal Land Uses in the Hurricane Creek Watershed 2006

Table B.6.13. Classification of Land Use Categories in the Hurricane Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	131.9	0.2	1.6
21	Urban Built up	365.2	0.6	4.4
22	Low Density Res	183.7	0.3	2.2
23	Medium Density Res	47.8	0.1	0.6
41	Upland Forest	2,894.5	4.5	35.3
52	Rangeland	475.7	0.7	5.8
81	Agriculture	928.3	1.5	11.3
90	Wetlands	3,180.5	5.0	38.8
Total	Watershed	8,207.4	12.8	100.0

Monroe Creek

Monroe Creek drains to the Little River.

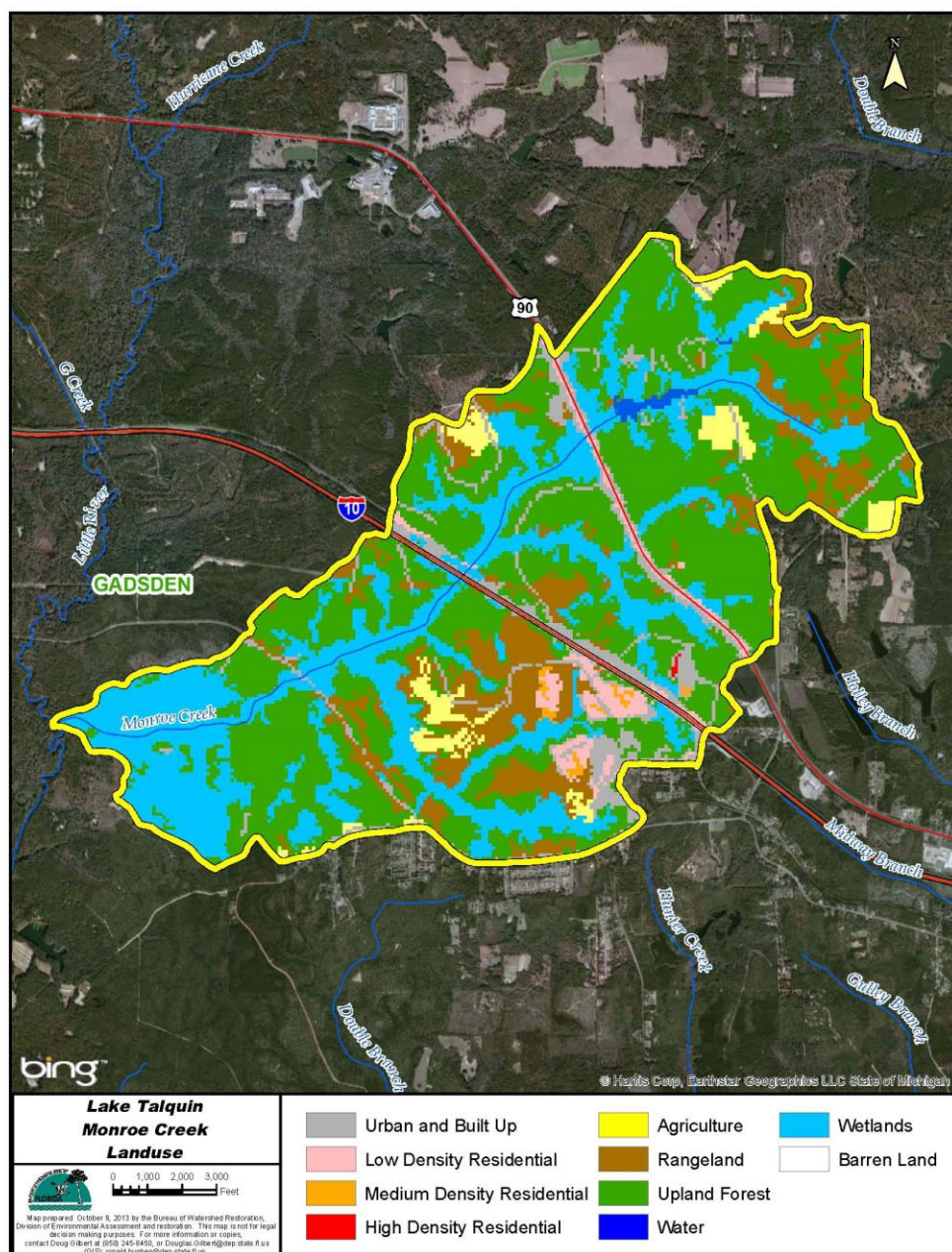


Figure B.6.14. Principal Land Uses in the Monroe Creek Watershed 2006

Table B.6.14. Classification of Land Use Categories in the Monroe Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	22.0	0.0	0.4
21	Urban Built up	399.9	0.6	7.7
22	Low Density Res	135.2	0.2	2.6
23	Medium Density Res	16.9	0.0	0.3
24	High Density Res	2.2	0.0	0.0
41	Upland Forest	2,391.8	3.7	45.9
52	Rangeland	659.2	1.0	12.7
81	Agriculture	168.6	0.3	3.2
90	Wetlands	1,411.3	2.2	27.1
Total	Watershed	5,207.1	8.1	100.0

Richlander Creek

Richlander Creek

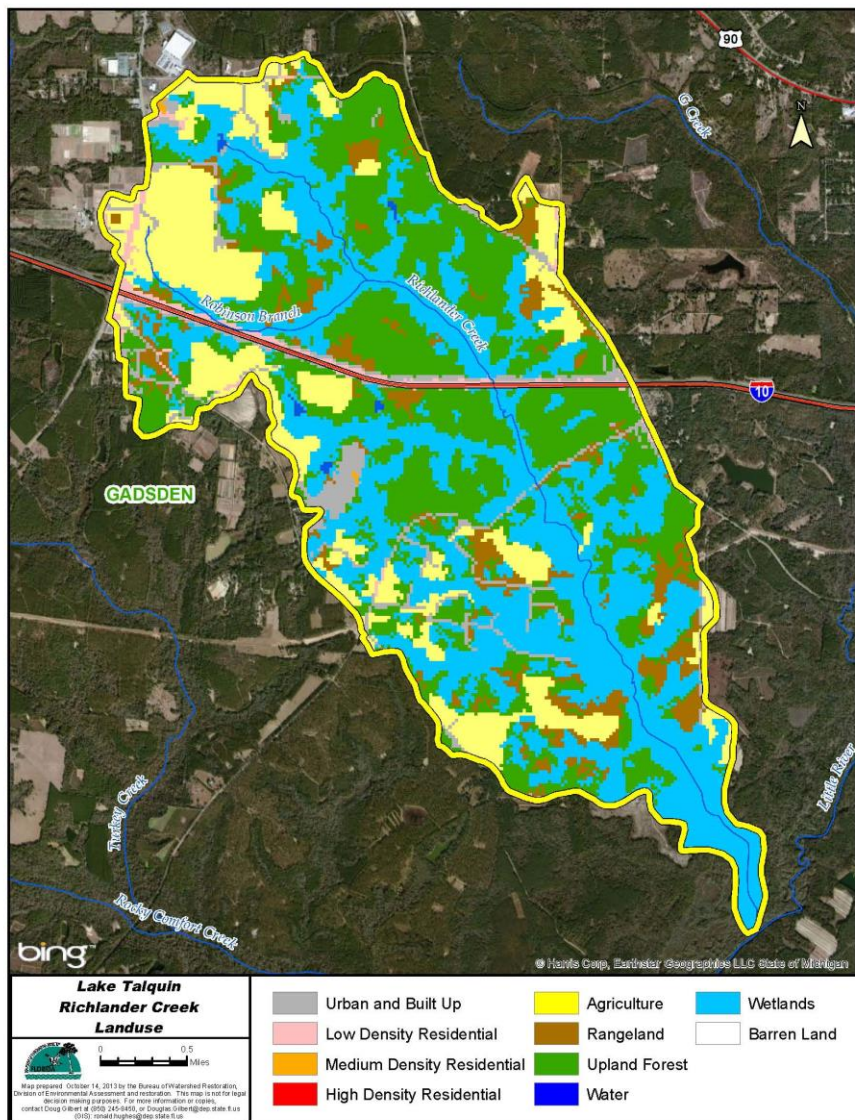


Figure B.6.15. Principal Land Uses in the Richlander Creek Watershed 2006

Table B.6.15. Classification of Land Use Categories in the Richlander Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	12.9	0.0	0.2
21	Urban Built up	329.1	0.5	5.7
22	Low Density Res	139.4	0.2	2.4
23	Medium Density Res	4.7	0.0	0.1
41	Upland Forest	1,861.4	2.9	32.1
52	Rangeland	421.0	0.7	7.3
81	Agriculture	914.7	1.4	15.8
90	Wetlands	2,119.0	3.3	36.5
Total	Watershed	5,802.3	9.1	100.0

Little River Area

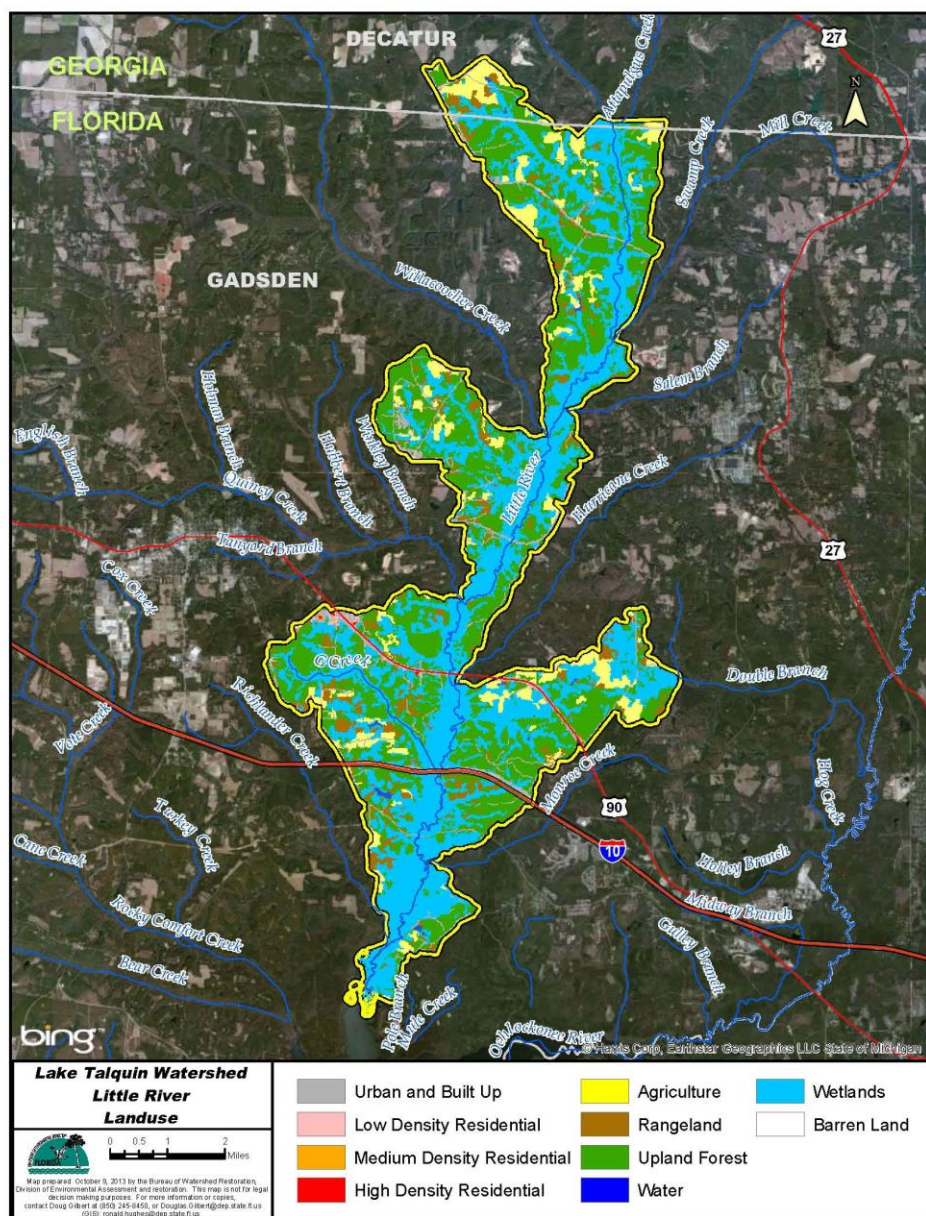


Figure B.6.16. Principal Land Uses in the Little River Watershed 2006

Table B.6.16. Classification of Land Use Categories in the Little River Area 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	134.8	0.2	0.6
21	Urban Built up	1,017.2	1.6	4.2
22	Low Density Res	198.2	0.3	0.8
23	Medium Density Res	10.5	0.0	0.0
24	High Density Res	8.0	0.0	0.0
31	Barren Land	3.1	0.0	0.0
41	Upland Forest	9,227.1	14.4	37.9
52	Rangeland	1,394.2	2.2	5.7
81	Agriculture	1,837.0	2.9	7.5
90	Wetlands	10,527.0	16.4	43.2
Total	Watershed	24,357.0	38.1	100.0

Rocky Comfort Creek

Rocky Comfort Creek drains directly to Lake Talquin.

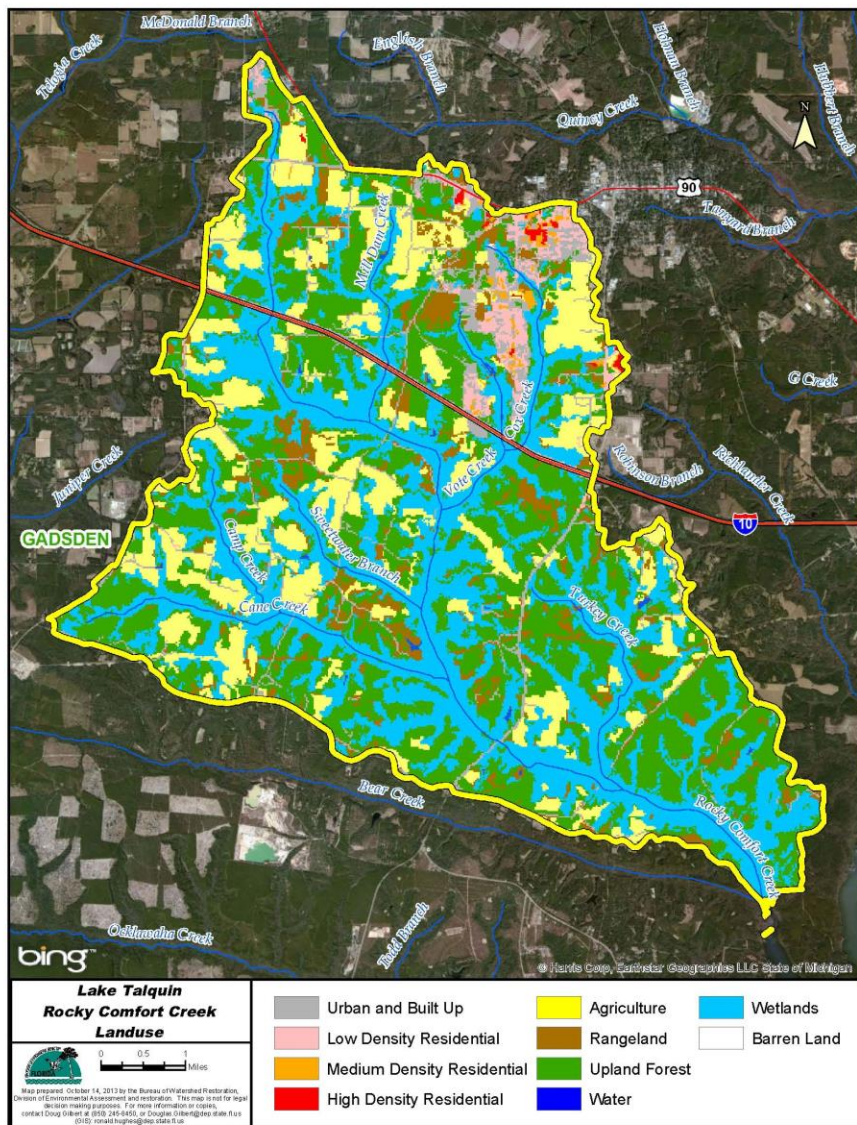


Figure B.6.17. Principal Land Uses in the Rocky Comfort Creek Watershed 2006

Table B.6.17. Classification of Land Use Categories in the Rocky Comfort Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	58.3	0.1	0.2
21	Urban Built up	1,631.9	2.5	5.9
22	Low Density Res	669.6	1.0	2.4
23	Medium Density Res	134.3	0.2	0.5
24	High Density Res	67.8	0.1	0.2
31	Barren Land	1.8	0.0	0.0
41	Upland Forest	9,393.3	14.7	33.8
52	Rangeland	1,854.5	2.9	6.7
81	Agriculture	4,528.4	7.1	16.3
90	Wetlands	9,416.6	14.7	33.9
Total	Watershed	27,756.5	43.4	100.0

Bear Creek

Bear Creek drains directly to Lake Talquin.

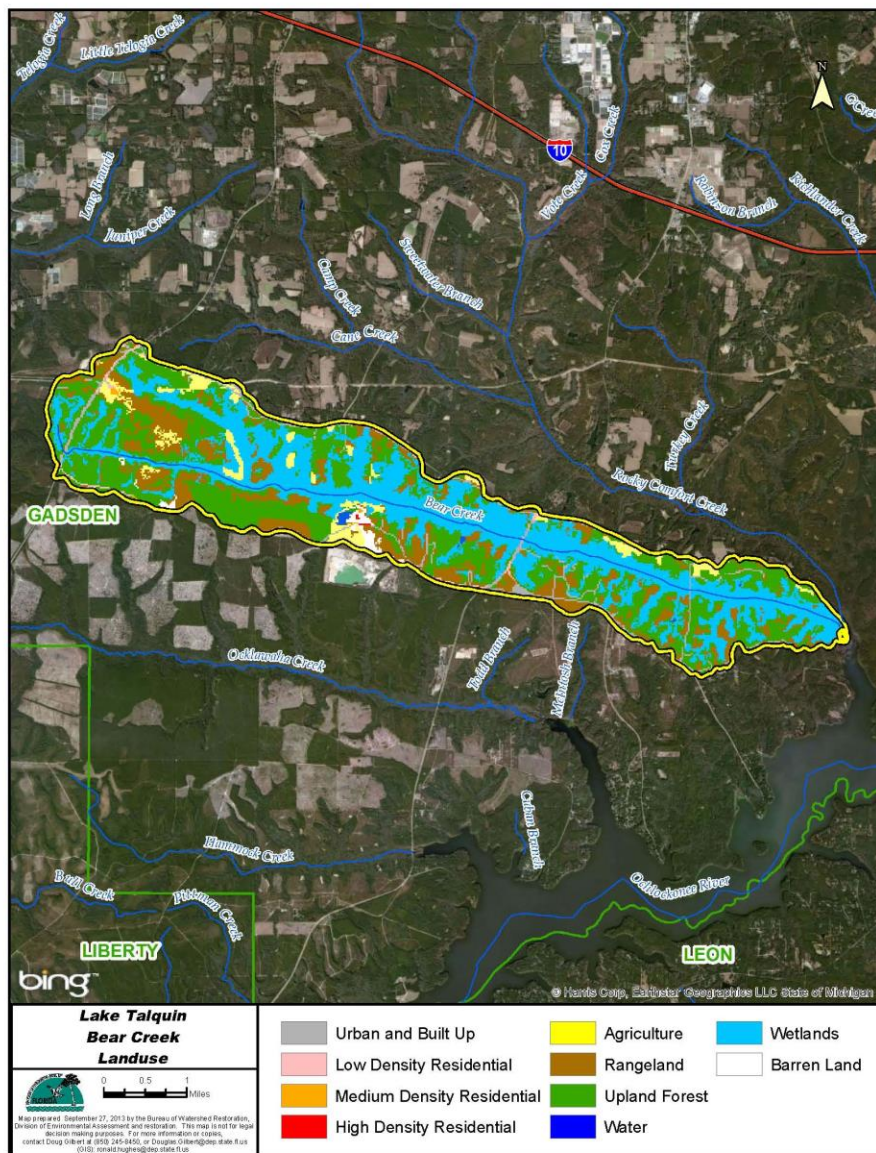


Figure B.6.18. Principal Land Uses in the Bear Creek Watershed, 2006

Table B.6.18. Classification of Land Use Categories in the Bear Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	21.3	0.0	0.3
21	Urban Built up	233.5	0.4	3.1
22	Low Density Res	42.3	0.1	0.6
23	Medium Density Res	9.1	0.0	0.1
24	High Density Res	3.3	0.0	0.0
31	Barren Land	68.7	0.1	0.9
41	Upland Forest	2,719.0	4.2	35.9
52	Rangeland	1,279.9	2.0	16.9
81	Agriculture	332.0	0.5	4.4
90	Wetlands	2,875.1	4.5	37.9
Total	Watershed	7,584.3	11.9	100.0

McIntosh Branch

McIntosh Branch drains directly to Lake Talquin.

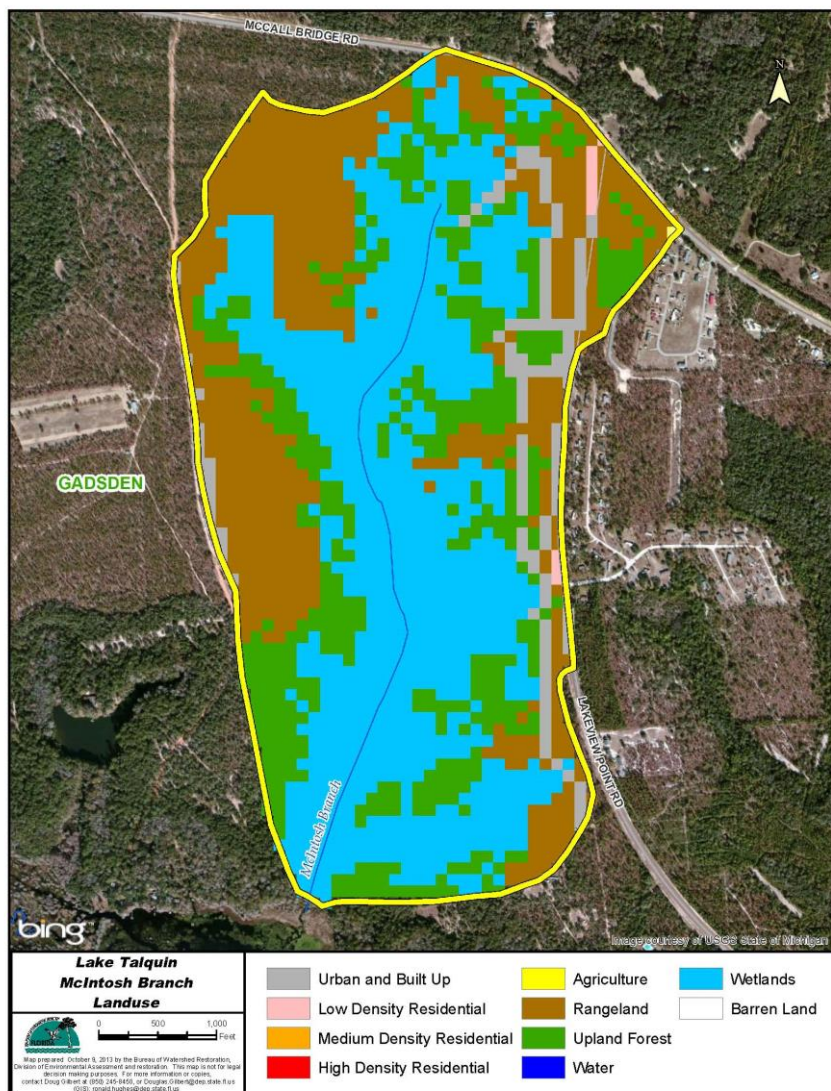


Figure B.6.19. Principal Land Uses in the McIntosh Branch Watershed, 2006

Table B.6.19. Classification of Land Use Categories in the McIntosh Branch Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
21	Urban Built up	28.0	0.0	5.7
22	Low Density Res	2.2	0.0	0.5
41	Upland Forest	108.1	0.2	22.0
52	Rangeland	142.1	0.2	29.0
82	Agriculture	0.2	0.0	0.0
90	Wetlands	210.2	0.3	42.8
Total	Watershed	490.8	0.8	100.0

No stations, no septic tanks

Ocklawaha Creek

Ocklawaha Creek drains directly to Lake Talquin.

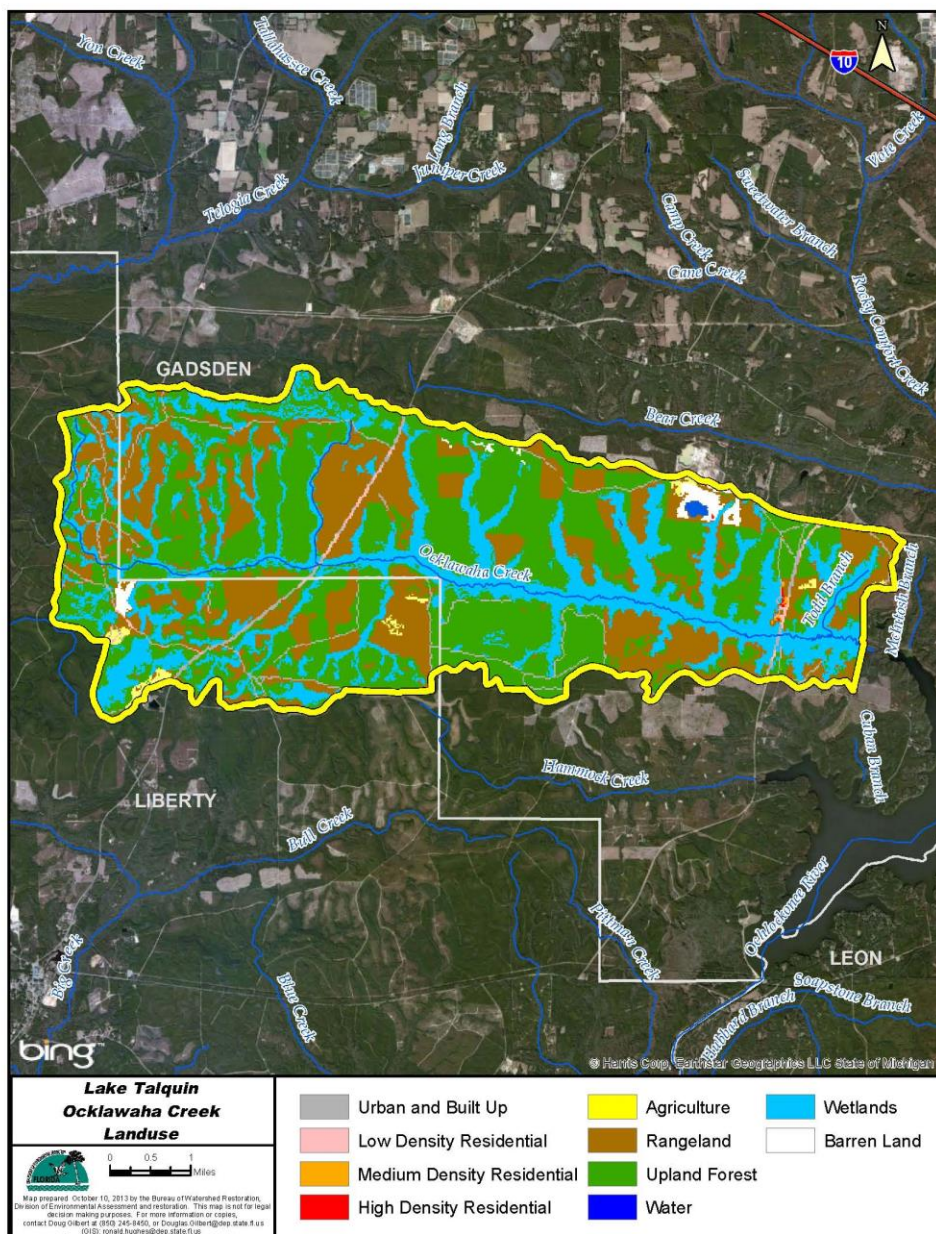


Figure B.6.20. Principal Land Uses in the Ocklawaha Creek Watershed 2006

Table B.6.20. Classification of Land Use Categories in the Ocklawaha Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	30.7	0.0	0.2
21	Urban Built up	533.1	0.8	2.7
22	Low Density Res	73.8	0.1	0.4
23	Medium Density Res	9.3	0.0	0.0
24	High Density Res	9.3	0.0	0.0
31	Barren Land	193.9	0.3	1.0
41	Upland Forest	8,622.4	13.5	43.4
52	Rangeland	5,505.8	8.6	27.7
82	Agriculture	133.2	0.2	0.7
90	Wetlands	4,773.7	7.5	24.0
Total	Watershed	19,885.4	31.1	100.0

Cuban Branch

Cuban Branch drains directly to Lake Talquin.

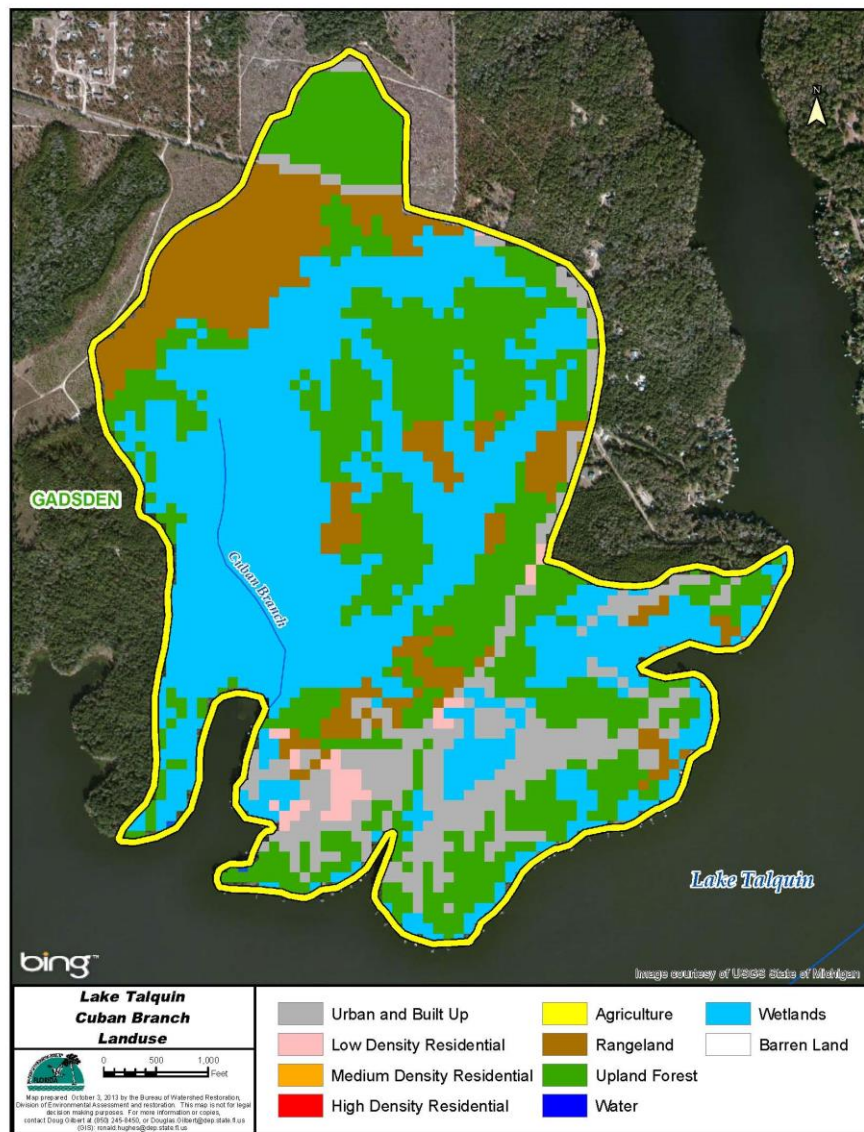


Figure B.6.21. Principal Land Uses in the Cuban Branch Watershed 2006

Table B.6.21. Classification of Land Use Categories in the Cuban Branch Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	0.4	0.0	0.1
21	Urban Built up	80.3	0.1	11.6
22	Low Density Res	8.5	0.0	1.2
41	Upland Forest	227.3	0.4	33.0
52	Rangeland	92.5	0.1	13.4
90	Wetlands	280.4	0.4	40.7
Total	Watershed	689.4	1.1	100.0

**Table B.6.22. Classification of Land Use Categories in the Hammock Creek Watershed
2006**

LU Code	Land Use	Acres	Square Miles	Percentage
21	Urban Built up	228.2	0.4	5.1
22	Low Density Res	32.0	0.1	0.7
42	Upland Forest	1,651.1	2.6	37.0
52	Rangeland	1,184.9	1.9	26.5
81	Agriculture	29.6	0.0	0.7
90	Wetlands	1,342.6	2.1	30.0
Total	Watershed	4,468.3	7.0	100.0

Freeman Creek

Freeman Creek drains directly to Lake Talquin.

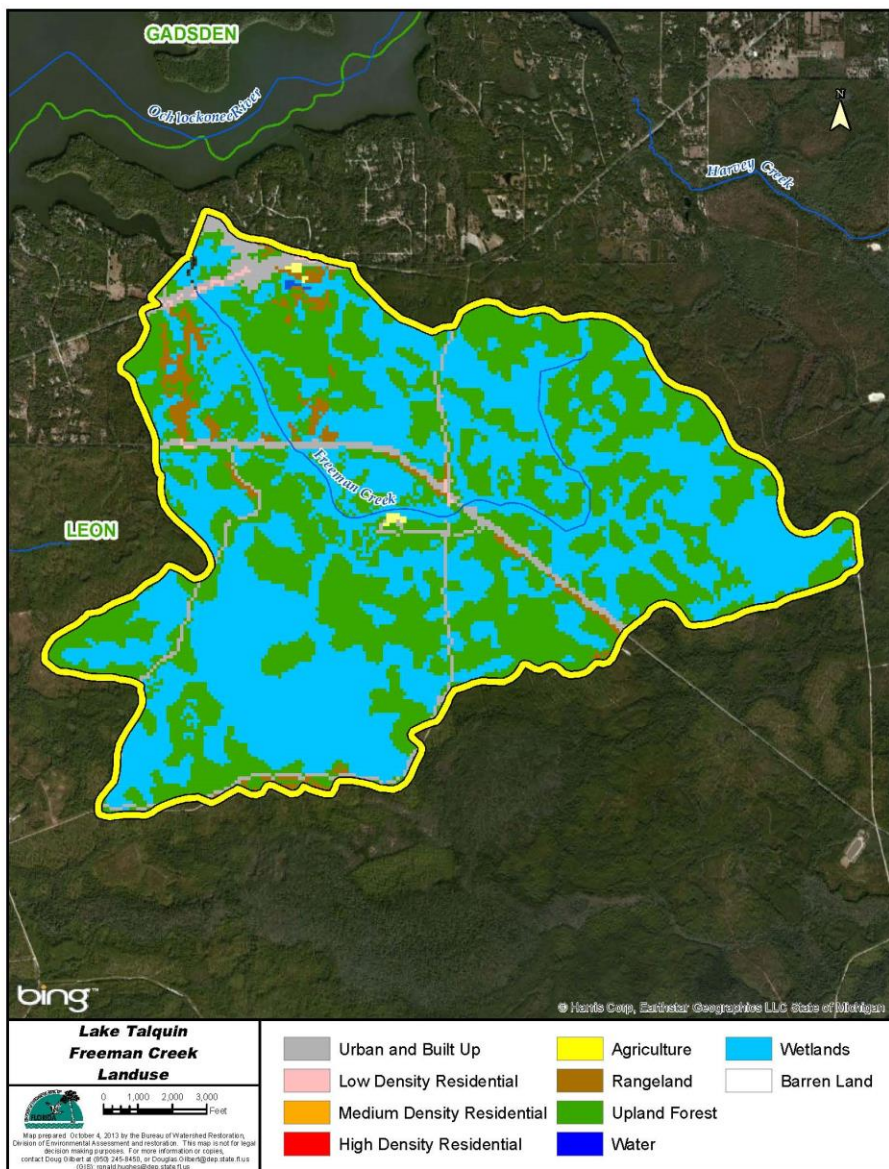


Figure B.6.23. Principal Land Uses in the Freeman Creek Watershed 2006

**Table B.6.23. Classification of Land Use Categories in the Freeman Creek Watershed
2006**

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	2.9	0.0	0.1
21	Urban Built up	198.8	0.3	4.0
22	Low Density Res	10.9	0.0	0.2
41	Upland Forest	2,181.9	3.4	43.9
52	Rangeland	118.5	0.2	2.4
81	Agriculture	6.9	0.0	0.1
90	Wetlands	2,448.1	3.8	49.3
Total	Watershed	4,968.1	7.8	100.0

Harvey Creek

Harvey Creek drains directly to Lake Talquin.

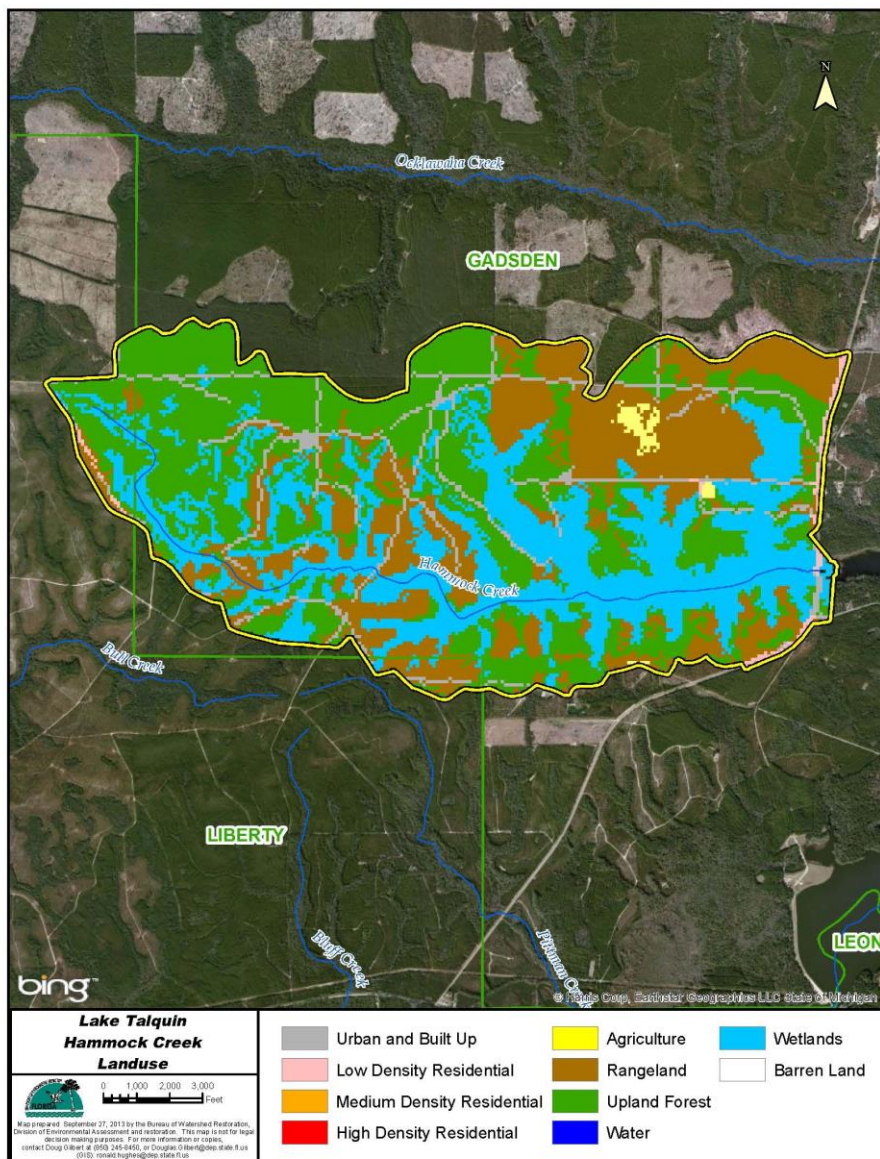


Figure B.6.24. Principal Land Uses in the Harvey Creek Watershed 2006

Table B.6.24. Classification of Land Use Categories in the Harvey Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
21	Urban Built up	184.8	0.3	3.5
22	Low Density Res	17.6	0.0	0.3
41	Upland Forest	2,178.3	3.4	41.1
52	Rangeland	188.6	0.3	3.6
81	Agriculture	42.0	0.1	0.8
90	Wetlands	2,687.9	4.2	50.7
Total	Watershed	5,299.2	8.3	100.0

Polk Creek

Polk Creek drains directly to Lake Talquin.

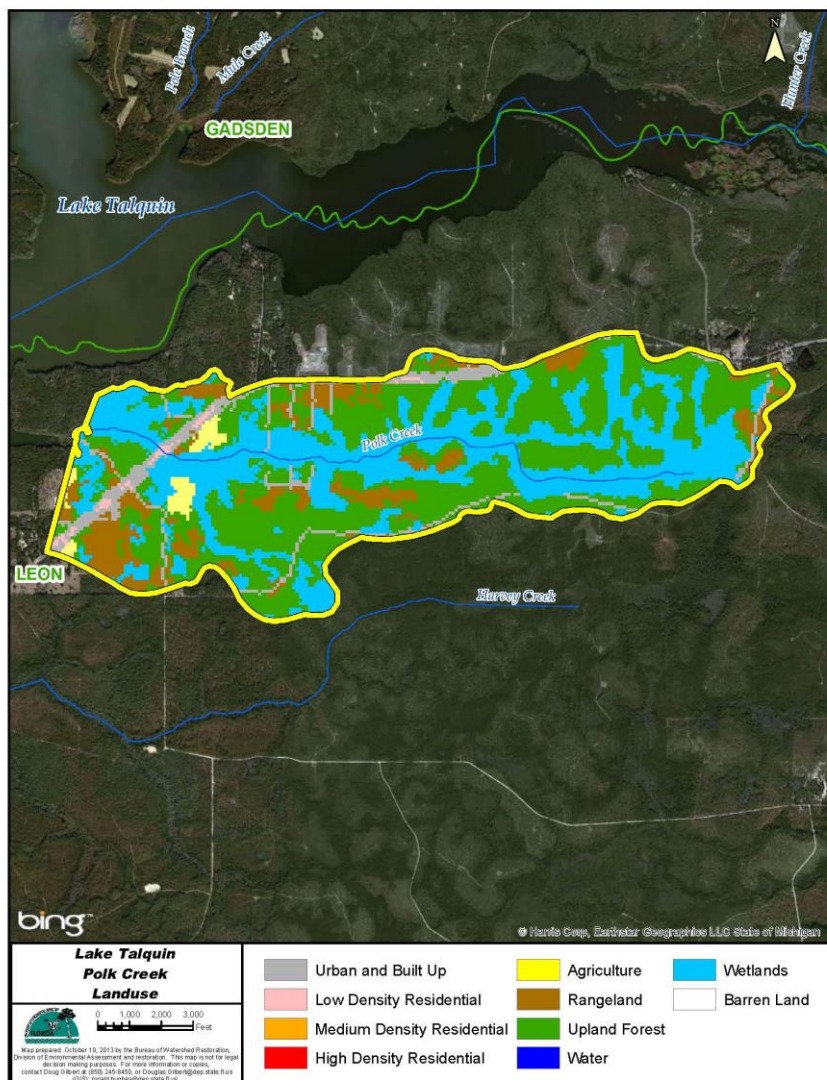


Figure B.6.25. Principal Land Uses in the Polk Creek Watershed 2006

Table B.6.25. Classification of Land Use Categories in the Polk Creek Watershed 2006

LU Code	Land Use	Acres	Square Miles	Percentage
21	Urban Built up	188.8	0.3	6.7
22	Low Density Res	18.0	0.0	0.6
41	Upland Forest	1,241.8	1.9	44.3
52	Rangeland	308.7	0.5	11.0
81	Agriculture	47.4	0.1	1.7
90	Wetlands	999.9	1.6	35.7
Total	Watershed	2,804.6	4.4	100.0

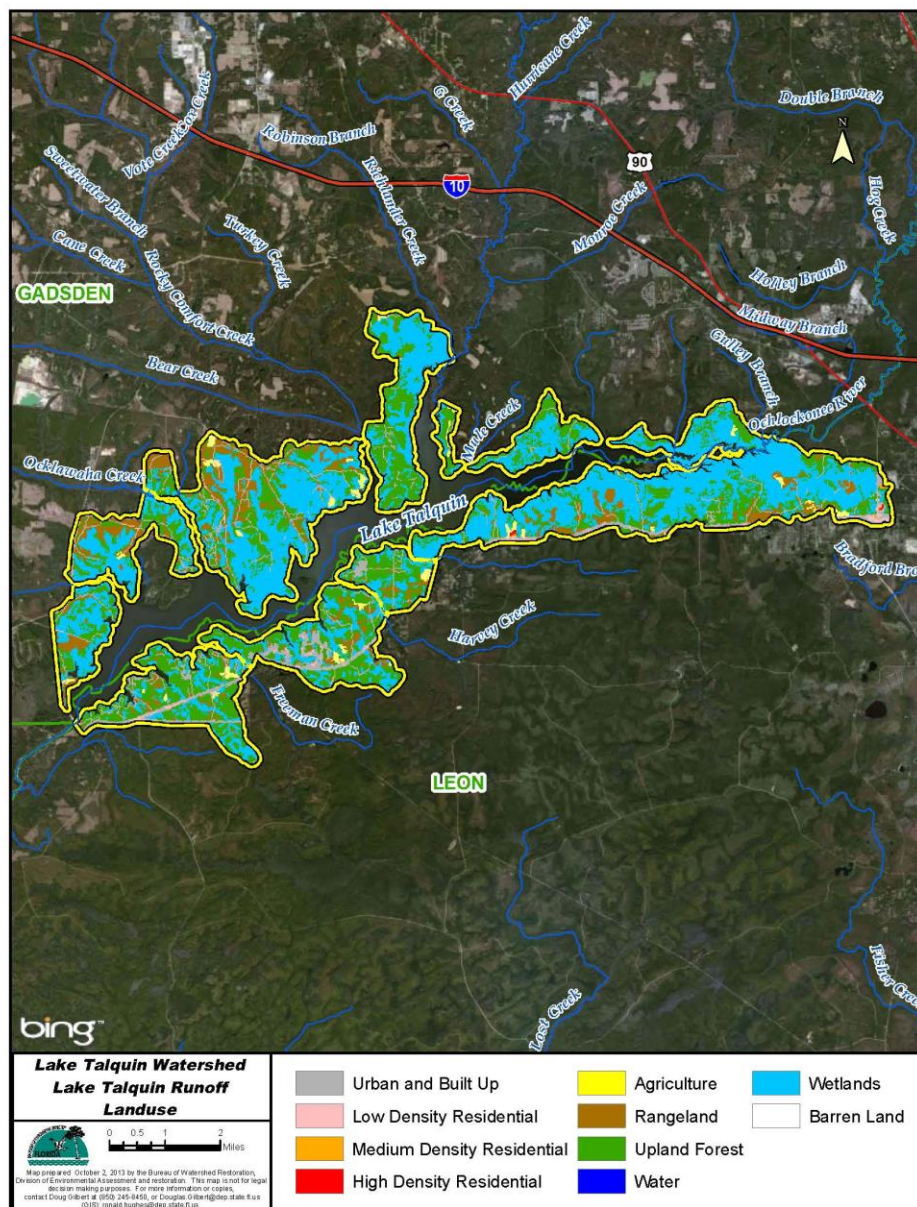


Figure B.6.26. Principal Land Uses in the Lake Talquin Runoff Area to Lake Talquin 2006

Table B.6.26. Classification of Land Use Categories in the Lake Talquin Runoff Area Draining Directly to Lake Talquin 2006

LU Code	Land Use	Acres	Square Miles	Percentage
11	Water	20.2	0.0	0.1
21	Urban Built up	1,347.7	2.1	7.4
22	Low Density Res	135.0	0.2	0.7
23	Medium Density Res	8.7	0.0	0.0
24	High Density Res	9.8	0.0	0.1
41	Upland Forest	6,076.2	9.5	33.2
52	Rangeland	1,684.6	2.6	9.2
81	Agriculture	280.2	0.4	1.5
90	Wetlands	8,735.9	13.6	47.7
Total	Watershed	18,298.4	28.6	100.0