

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Environmental Assessment and Restoration, Bureau of Watershed Restoration

NORTHWEST DISTRICT • PENSACOLA BAY BASIN

Final TMDL Report

Appendix E:

Pensacola Bay Basin TMDL Model Results Bayou Chico (WBIDs 846 and 846C) North Escambia Bay (WBID 548AA) Figures/Tables



June 7, 2013

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E.1.1 General LSPC, EFDC, and WASP Model Information

Figure E.1.1.1. LSPC – EFDC – WASP Connectivity

LSPC to EFDC to WASP

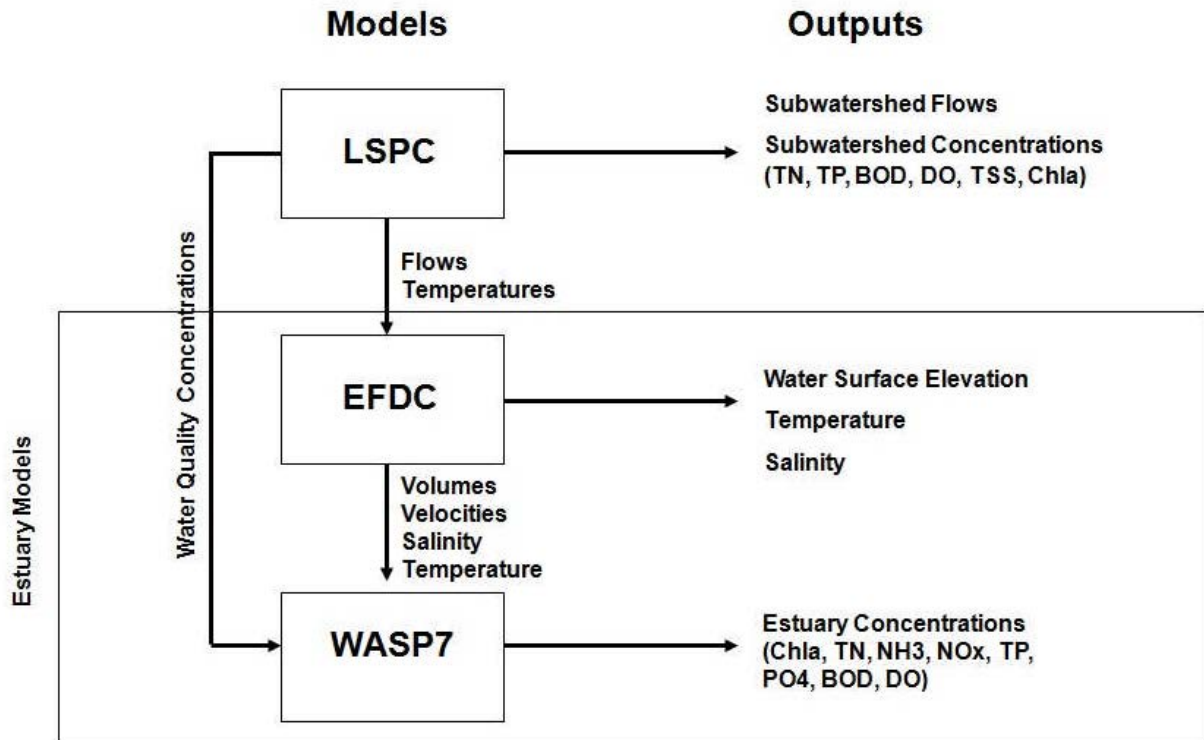


Table E.1.1.1. Pensacola Bay WASP Model Land Use Specification

- = Empty cell/no data

Land Use Code	Land Use Description	Area (acres)	%
7	Beaches/Dunes/Mud	238	0.01%
11	Open Water	38,596	0.88%
20	Utility Swaths	6,322	0.14%
21	Developed, Open Space	90,939	2.07%
22	Developed, Low Intensity	165,961	3.78%
31	Clearcut/Sparse	379,069	8.64%
33	Quarries/Strip Mines	28,694	0.65%
41	Deciduous Forest	431,599	9.84%
42	Evergreen Forest	1,569,967	35.78%
43	Mixed Forest	417,347	9.51%
73	Golf Courses	1,582	0.04%
80	Pasture	346,758	7.90%
83	Row Crop	245,234	5.59%
91	Forested Wetland	477,802	10.89%
92	Nonforested Wetland (Salt/Brackish)	0	0.00%
93	Nonforested Wetland (Freshwater)	57,919	1.32%
222	20+21+22 Impervious	7,392	0.17%
231	Developed, Medium Intensity Pervious	27,523	0.63%
232	Developed, Medium Intensity Impervious	5,748	0.13%
241	Developed, High Intensity Pervious	55,332	1.26%
242	Developed, High Intensity Impervious	18,753	0.43%
332	Catch-All for Remaining Impervious	14,913	0.34%
-	Total	4,387,688.00	100.00%

Figure E.1.1.2. Evaluation Zones and EFDC/WASP Model Grids for Pensacola Bay

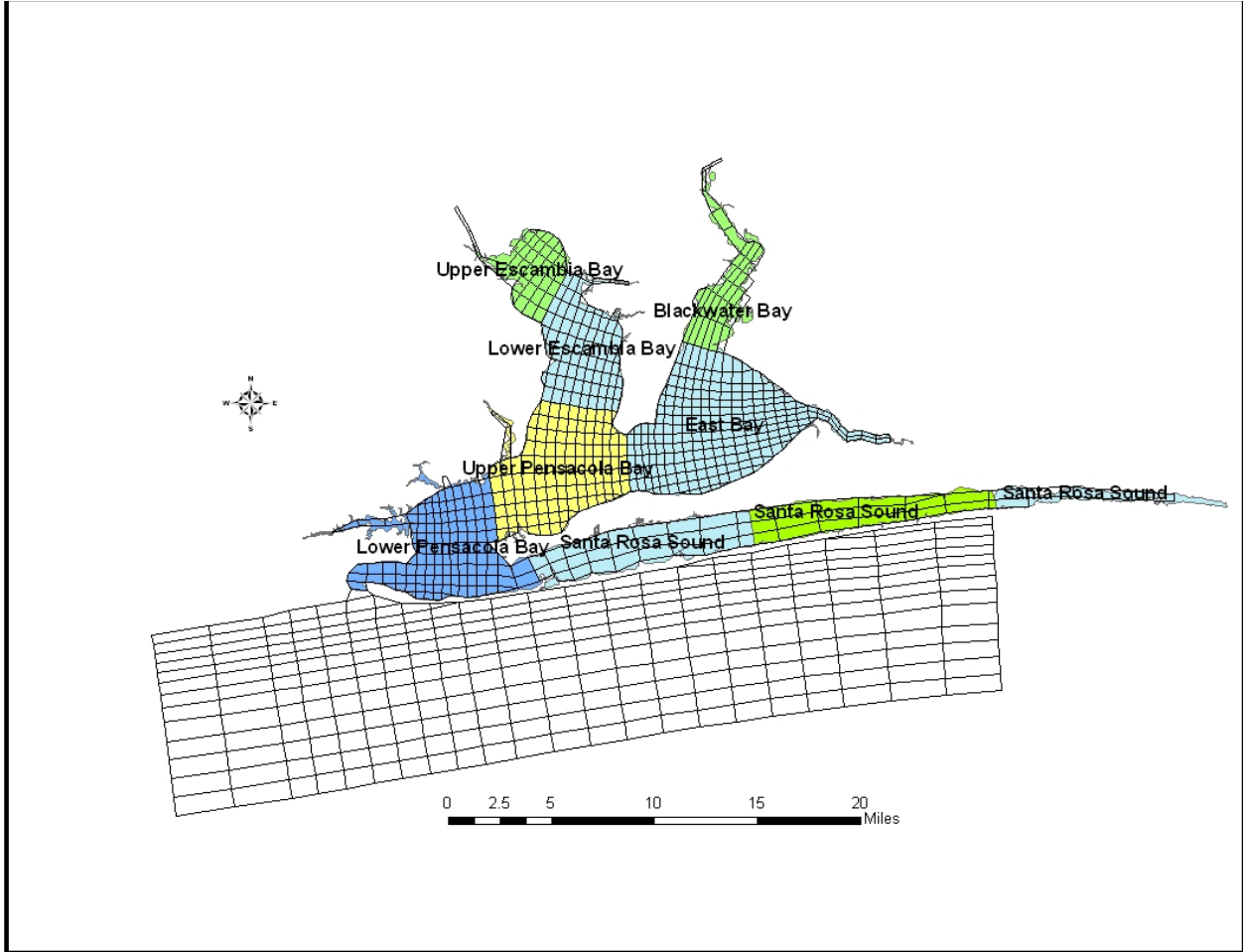


Table E.1.1.2. WASP Model Parameterization Bayou Chico and EPA and Department North Escambia Bay

Note: Yellow highlighting and boldface type indicates differences in EPA and DEP Calibration for Escambia Bay

Parameter	1= used	Chico Cal	EPA-Escambia Cal	DEP-Escambia Cal	Ranges Min	Ranges Max
Atmospheric Deposition of Nitrate (mg/m ² -day)	1	0.1	0.1	0.1	0	1000
Atmospheric Deposition of Ammonia (mg/m ² -day)	1	0.1	0.1	0.1	0	1000
Atmospheric Deposition of Orthophosphate (mg/m ² -day)	1	0	0	0	0	1000
Atmospheric Deposition of BOD1 (Ultimate) (mg/m ² -day)	0	0	0	0	0	1000
Atmospheric Deposition of Organic Nitrogen (mg/m ² -day)	0	0	0	0	0	1000
Atmospheric Deposition of Organic Phosphorus (mg/m ² -day)	0	0	0	0	0	1000
Nitrification Rate Constant @20 °C (per day)	1	0.4	0.01	0.01	0	10
Nitrification Temperature Coefficient	1	1.08	1.08	1.08	0	1.07
Half Saturation Constant for Nitrification Oxygen Limit (mg O/L)	1	0.5	0.5	0.5	0	2
Minimum Temperature for Nitrification Reaction, deg C	0	0	0	0	0	20
Ammonia Partition Coefficient to Water Column Solids, L/kg	0	0	0	0	0	1000
Ammonia Partition Coefficient to Benthic Solids, L/kg	0	0	0	0	0	1000
Denitrification Rate Constant @20 °C (per day)	1	0.09	0.09	0.09	0	0.09
Denitrification Temperature Coefficient	1	1.045	1.045	1.045	0	1.04
Half Saturation Constant for Denitrification Oxygen Limit (mg O/L)	1	0.01	0.01	0.01	0	0
Dissolved Organic Nitrogen Mineralization Rate Constant @20 °C (per day)	1	0.05	0.05	0.02	0	1.08
Dissolved Organic Nitrogen Mineralization Temperature Coefficient	1	1.047	1.047	1.047	0	1.08
Organic Nitrogen Decay Rate Constant in Sediments @20 °C (per day)	0	0	0	0	0	0.0004
Organic Nitrogen Decay in Sediment Temperature Coefficient	0	0	0	0	0	1.08
Fraction of Phytoplankton Death Recycled to Organic Nitrogen	1	1	1	1	0	1
Orthophosphate Partition Coefficient to Water Column Solids, L/kg	0	0	0	0	0	1000
Orthophosphate Partition Coefficient to Benthic Solids, L/kg	0	0	0	0	0	1000
Mineralization Rate Constant for Dissolved Organic P @20 °C (per day)	1	0.05	0.05	0.05	0	0.22
Dissolved Organic Phosphorus Mineralization Temperature Coefficient	1	1.04	1.04	1.04	0	1.08
Organic Phosphorus Decay Rate Constant in Sediments @20 °C (per day)	0	0	0	0	0	0.0004
Organic Phosphorus Decay in Sediments Temperature Coefficient	0	0	0	0	0	1.08
Fraction of Phytoplankton Death Recycled to Organic Phosphorus	1	1	1	1	0	1
Phytoplankton Maximum Growth Rate Constant @20 °C (per	1	2	2	2.0	0	3

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and North Escambia Bay (WBID 548AA), June 7, 2013

Parameter	1= used	Chico Cal	EPA- Escambia Cal	DEP- Escambia Cal	Range s Min	Ranges Max
day)						
Phytoplankton Growth Temperature Coefficient	1	1.07	1.07	1.07	0	1.07
Include Algal Self Shading Light Extinction in Steele (0=Yes, 1=No)	1	0.1	0.1	0.1	0	1
Exponent for Self Shading (Mult * TCHLA^Exp)	0	0	0	0	0	1
Multiplier for Self Shading (Mult * TCHLA^Exp)	0	0	0	0	0	1
Phytoplankton Self Shading Extinction (Dick Smith Formulation)	1	0.017	0.017	0.017	0	0.02
Phytoplankton Carbon to Chlorophyll Ratio	1	35	35	20	0	200
Phytoplankton Half-Saturation Constant for Nitrogen Uptake (mg N/L)	1	0.025	0.025	0.01	0	0.05
Phytoplankton Half-Saturation Constant for Phosphorus Uptake (mg P/L)	1	0.001	0.001	0.001	0	0.05
Phytoplankton Endogenous Respiration Rate Constant @20 °C (per day)	1	0.1	0.1	0.1	0	0.5
Phytoplankton Respiration Temperature Coefficient	1	1.05	1.05	1.05	0	1.08
Phytoplankton Death Rate Constant (Non-Zooplankton Predation) (per day)	1	0.03	0.03	0.03	0	0.25
Phytoplankton Zooplankton Grazing Rate Constant (per day)	1	0.02	0.02	0.02	0	5
Nutrient Limitation Option	0	0	0	0	0	1
Phytoplankton Decay Rate Constant in Sediments (per day)	0	0	0	0	0	0.02
Phytoplankton Temperature Coefficient for Sediment Decay	0	0	0	0	0	1.08
Phytoplankton Phosphorus to Carbon Ratio	1	0.019	0.019	0.025	0	0.24
Phytoplankton Nitrogen to Carbon Ratio	1	0.4	0.4	0.176	0	0.43
Phytoplankton Half-Sat. for Recycle of Nitrogen and Phosphorus (mg Phyt C/L)	1	0.005	0.005	0.005	0	1
Percent Light to Define Photic Zone	0	0	0	0	0	100
Light Option (1 uses input light; 2 uses calculated diel light)	1	2	2	2	1	2
Phytoplankton Maximum Quantum Yield Constant	1	720	720	720	0	720
Phytoplankton Optimal Light Saturation	1	350	350	350	0	350
Background Light Extinction Multiplier	0	0	0	0	0	10
Detritus & Solids Light Extinction Multiplier	1	0.02	0.02	0.02	0	10
DOC Light Extinction Multiplier	0	0	0	0	0	10
DOC(1) Light Extinction Multiplier	1	4	4	4	0	10
DOC(2) Light Extinction Multiplier	0	0	0	0	0	10
DOC(3) Light Extinction Multiplier	0	0	0	0	0	10
Waterbody Type Used for Wind Driven Reaeration Rate	1	2	2	2	0	3
Calc Reaeration Option (0=Covar, 1=O'Connor, 2=Owens, 3=Churchill, 4=Tsvoglou)	1	1	1	1	0	4

Draft TMDL Report: Pensacola Bay Basin, Appendix E: Bayou Chico (WBIDs 846 and 846C)
and North Escambia Bay (WBID 548AA), June 7, 2013

Parameter	1= used	Chico Cal	EPA- Escambia Cal	DEP- Escambia Cal	Range s Min	Ranges Max
Global Reaeration Rate Constant @ 20 °C (per day)	0	0	0	0	0	10
Elevation above Sea Level (meters) used for DO Saturation	0	0	0	0	0	15000
Reaeration Option (Sums Wind and Hydraulic Ka)	1	1	1	1	0	1
Minimum Reaeration Rate, per day	0	0	0	0	0	24
Theta -- Reaeration Temperature Correction	1	1.022	1.022	1.022	0	1.03
Oxygen to Carbon Stoichiometric Ratio	1	2.66	2.66	2.66	0	2.67
Use (1 - On, 0 - Off) Total Depth of Vertical Segments in Reaeration Calculation	0	0	0	0	0	1
BOD (1) Decay Rate Constant @20 °C (per day)	0	0	0	0	0	5.6
BOD (1) Decay Rate Temperature Correction Coefficient	0	0	0	0	0	1.07
BOD (1) Decay Rate Constant in Sediments @20 °C (per day)	0	0	0	0	0	0.0004
BOD (1) Decay Rate in Sediments Temperature Correction Coefficient	0	0	0	0	0	1.08
BOD (1) Half Saturation Oxygen Limit (mg O/L)	0	0	0	0	0	0.5
Fraction of Detritus Dissolution to BOD (1)	0	0	0	0	0	1
Fraction of BOD (1) Carbon Source for Denitrification	0	0	0	0	0	1
BOD (2) Decay Rate @20 °C (per day)	1	0.1	0.1	0.1	0	0
BOD (2) Decay Rate Temperature Correction Coefficient	1	1.04	1.04	1.04	0	0
BOD (2) Decay Rate Constant in Sediments @20 °C (per day)	0	0	0	0	0	0
BOD (2) Decay Rate in Sediments Temperature Correction Coefficient	0	0	0	0	0	0
BOD (2) Half Saturation Oxygen Limit (mg O/L)	1	0.2	0.2	0.2	0	0
Fraction of Detritus Dissolution to BOD (2)	1	0	0	0	0	1
Fraction of BOD (2) Carbon Source for Denitrification	1	1	1	1	0	1
BOD (3) Decay Rate Constant @20 °C (per day)	1	0.1	0.1	0.1	0	0
BOD (3) Decay Rate Temperature Correction Coefficient	1	1.04	1.04	1.04	0	0
BOD (3) Decay Rate Constant in Sediments (per day)	0	0	0	0	0	0
BOD (3) Decay Rate in Sediments Temperature Correction Coefficient	0	0	0	0	0	0
BOD (3) Half Saturation Oxygen Limit (mg O/L)	1	0.2	0.2	0.2	0	0
Fraction of Detritus Dissolution to BOD (3)	1	1	1	1	0	1
Fraction of BOD (3) Carbon Source for Denitrification	0	0	0	0	0	1
Detritus Dissolution Rate (1/day)	1	0.1	0.1	0.1	0	0
Temperature Correction for detritus dissolution	1	1.08	1.08	1.08	0	0

Table E.1.1.3. EFDC/WASP Calibration/Validation Targets (% difference between simulated and observed values)

Source: EPA, Donigian 2000

State Variable	Very Good	Good	Fair
Salinity	<15%	15-25%	25-40%
Water Temperature	<7%	8-12%	13-18%
Water Quality DO	<15%	15-25%	25-35%
Nutrients/Chla	<30%	30-40%	45-60%

Figure E.1.1.3. NPDES-Permitted Facilities Included Directly in WASP for Pensacola Bay



Table E.1.1.4. Point Sources Included Directly in EFDC/WASP

Note: Pensacola Main Street (FL0021440) is 100% reuse and no longer discharges to surface waters.

Six Point Sources Included in EFDC and WASP
Main Street WWTF NPDES FL0021440
Milton WWTF NPDES FL0021903
Navarre Beach NPDES FL0023981
Pensacola Beach NPDES FL0024007
Ascend Performance Materials LLC NPDES FL002488
Gulf Power Company Crist Plant NPDES FL0002275
Other Point Sources Included in LSPC

Figure E.1.1.4. Location of Hydrodynamic Calibration Stations for Pensacola Bay

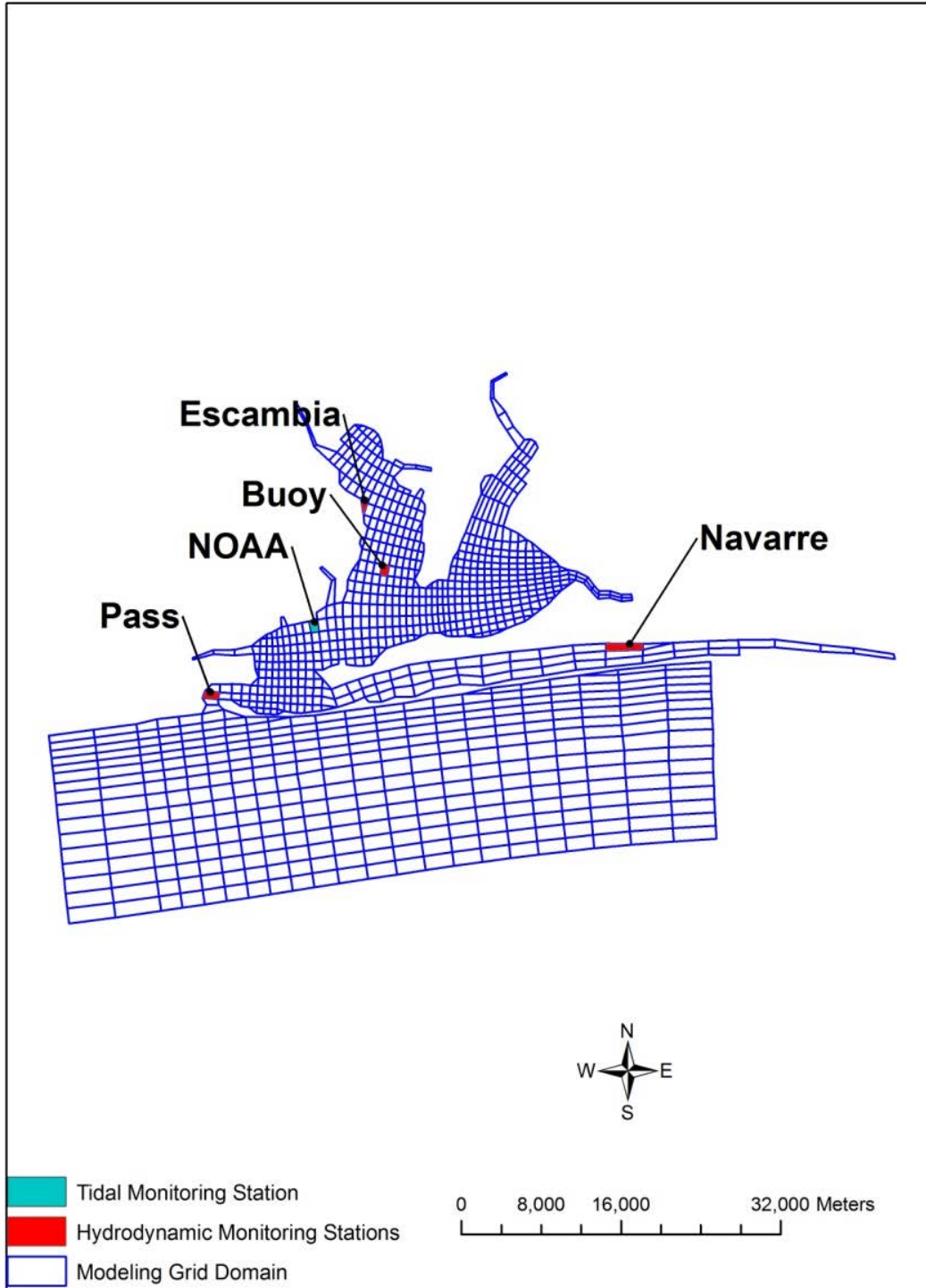


Figure E.1.1.5. Location of 12 Watershed Inputs to EFDC/WASP for Pensacola Bay (see Table E.1.5 subbasins for key)

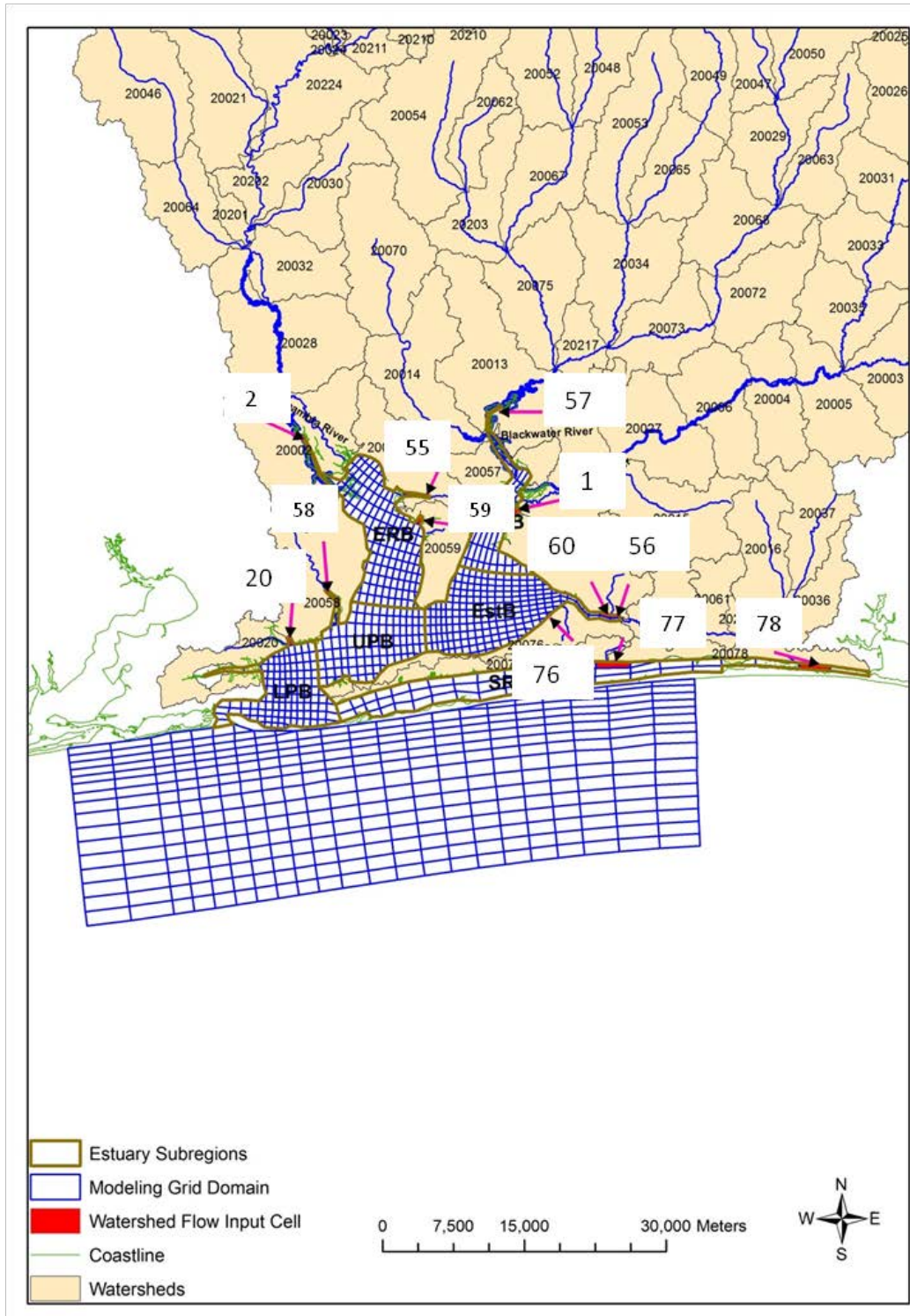


Table E.1.1.5. Pensacola Bay Watershed Inputs to EFDC/WASP

Note: Red highlighting and boldface type in the "Subbasin" column indicate subbasin numbers used in Figure E.1.1.5

Name	Subbasin	Model-I	Model-J
Yellow River	2000 1	45	42
Blackwater River	200 57	36	45
East Bay River	200 56	60	33
East Bay Dean Creek	200 60	59	33
East Bay Tom King	200 76	52	29
Escambia River	2000 2	14	40
Mulatto Bayou	200 55	27	43
Indian Bayou	200 59	30	41
Bayou Chico	200 20	16	29
Bayou Texar	200 58	22	31
Santa Rosa Sound (Williams Creek)	200 77	34	21
Santa Rosa Sound (Russell)	200 78	37	20

E.1.2 LSPC Pensacola Bay

Figure E.1.2.1. LSPC Subbasins and Watershed Point Sources

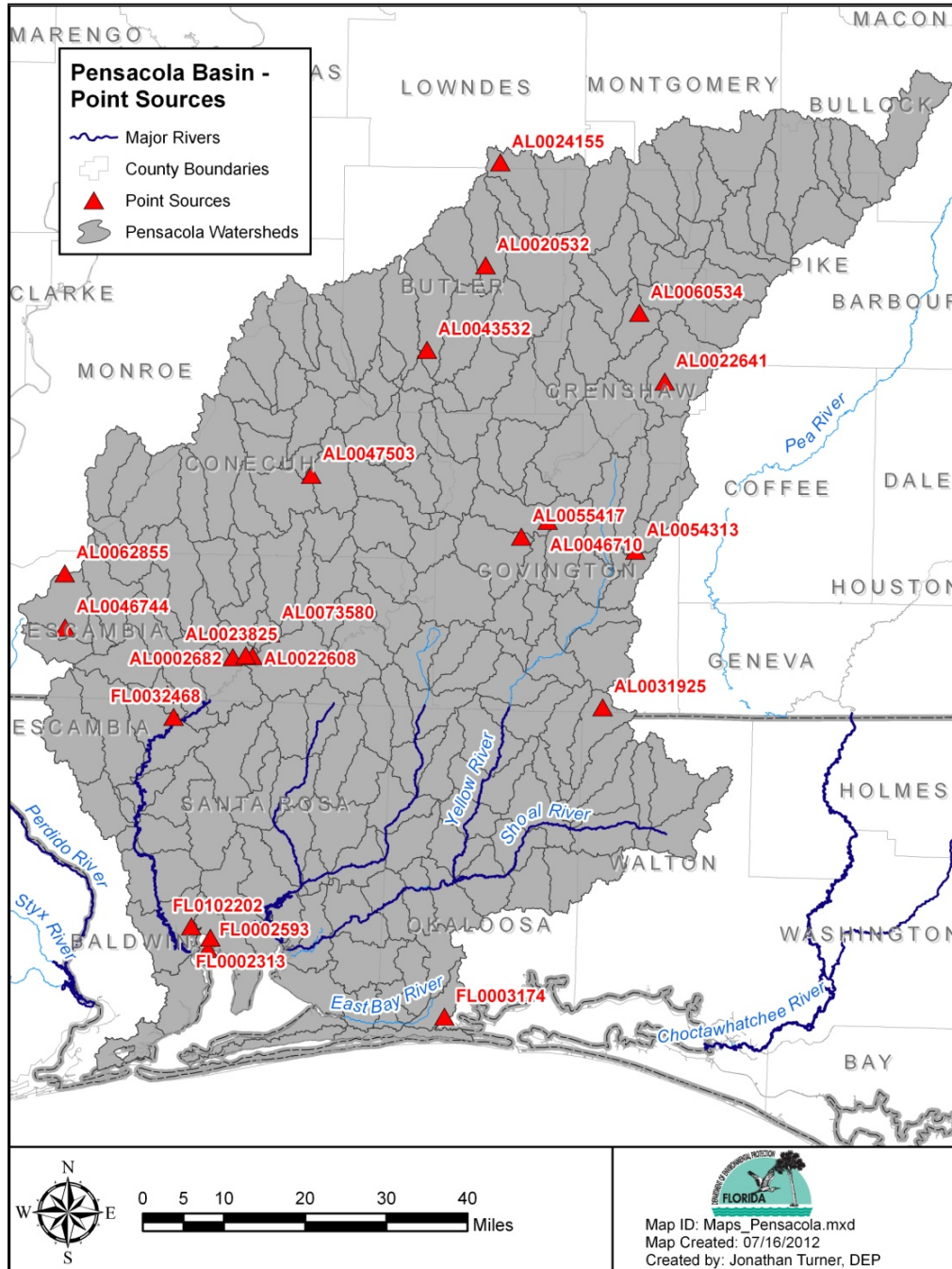


Figure E.1.2.2. LSPC Watershed Soils

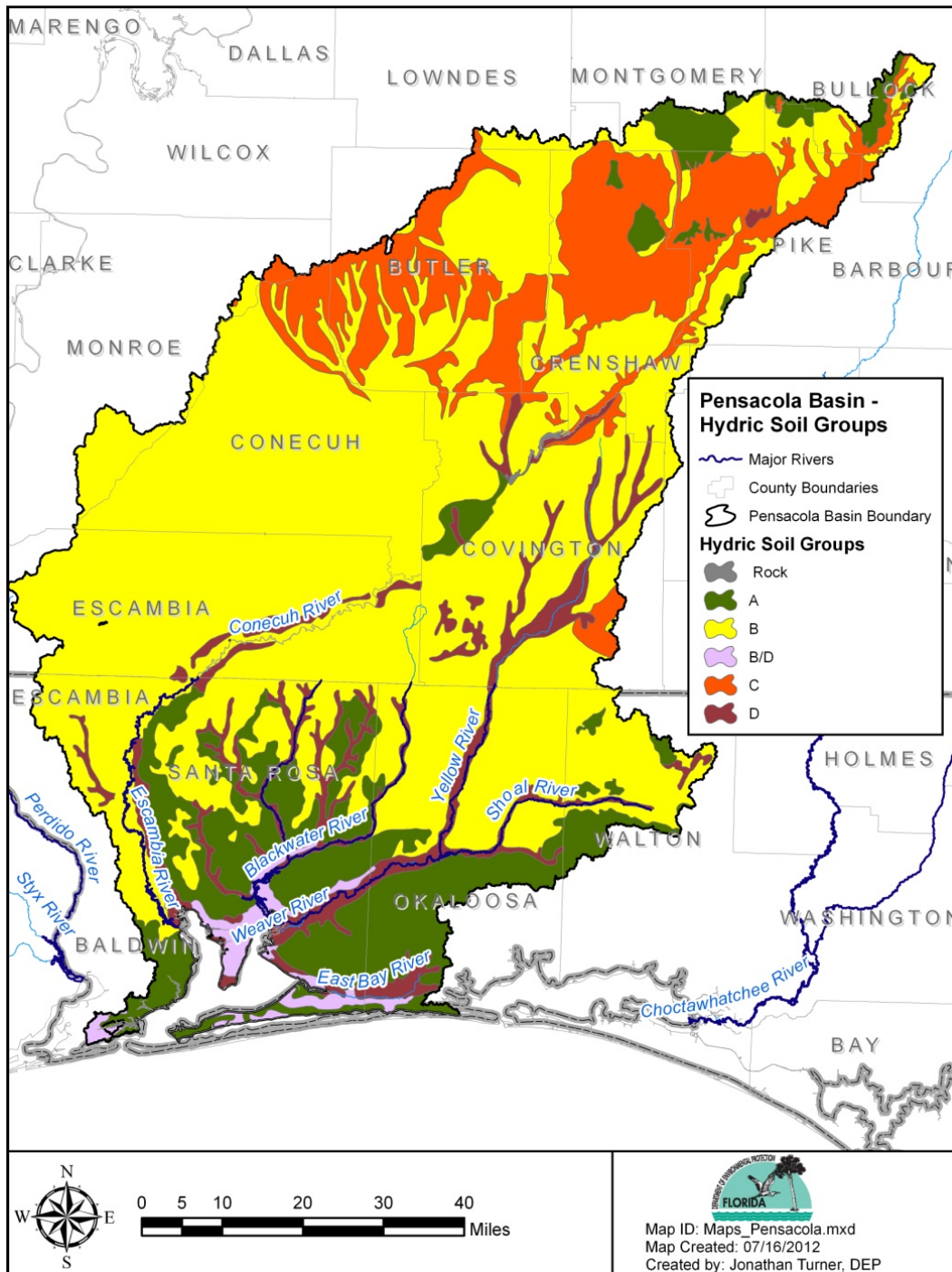


Figure E.1.2.3. LSPC Weather Stations

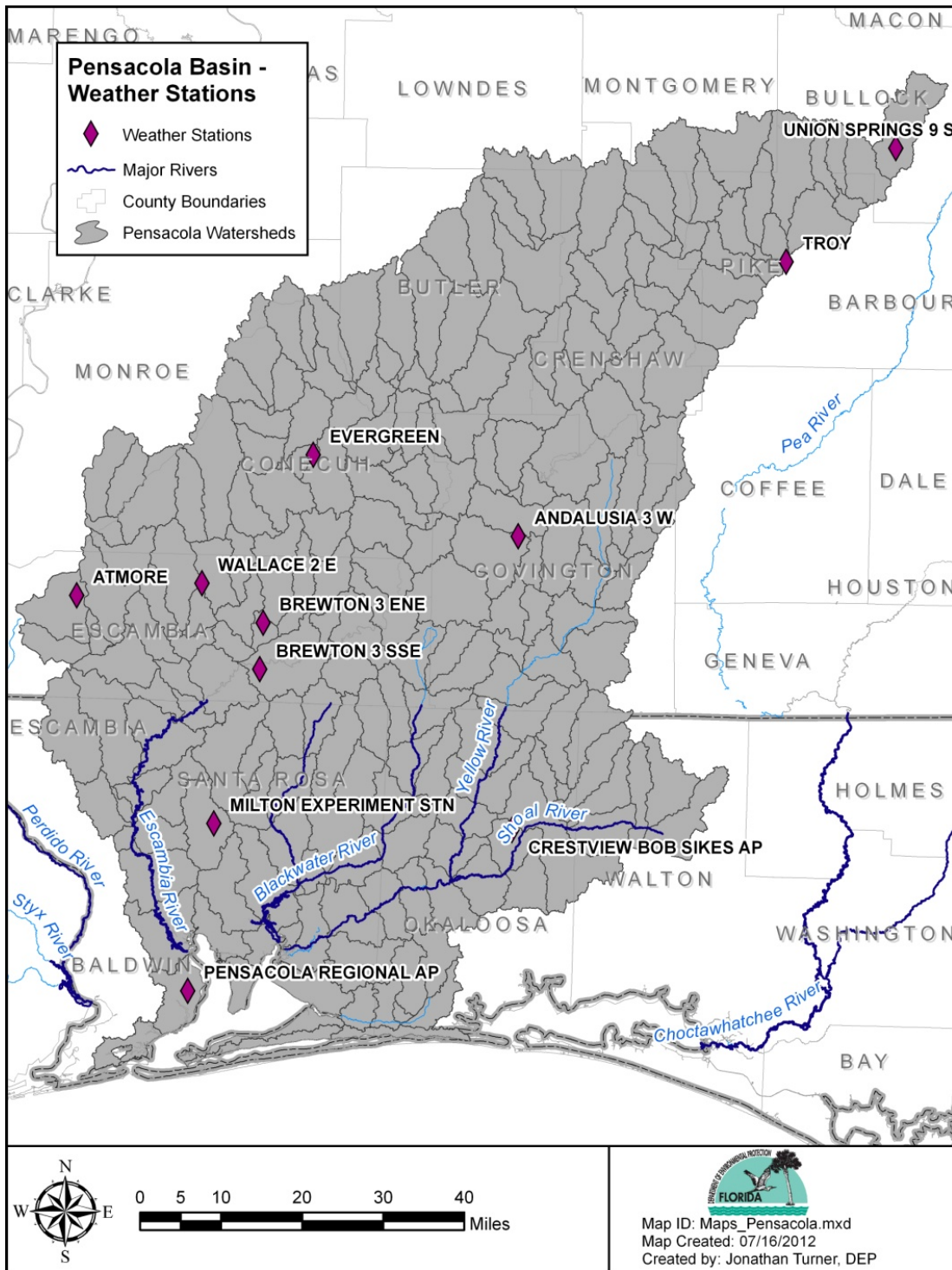


Figure E.1.2.4. LSPC Flow Calibration Stations

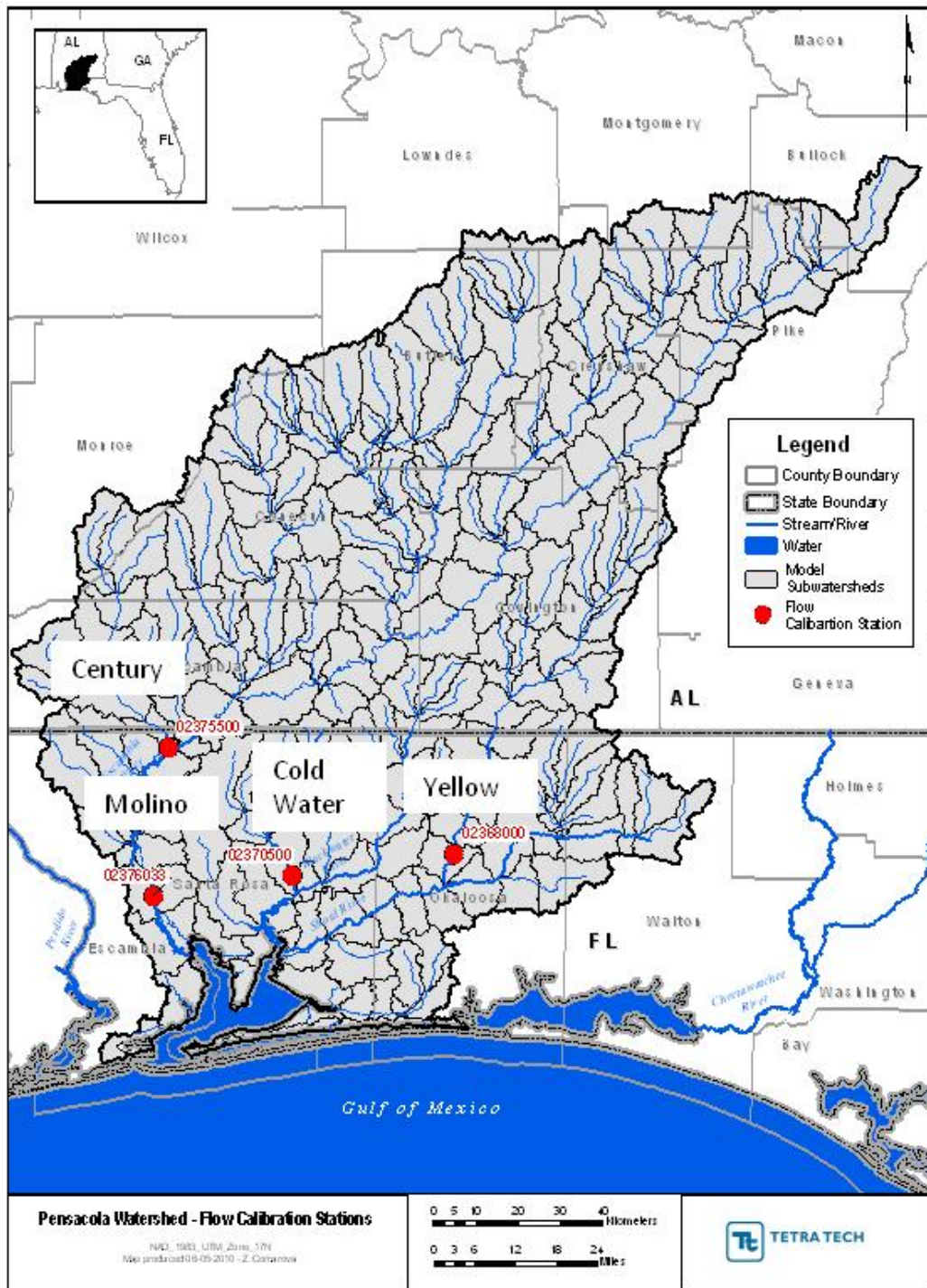


Figure E.1.2.5. USGS Annual Average Flow at Century (1935–2011)

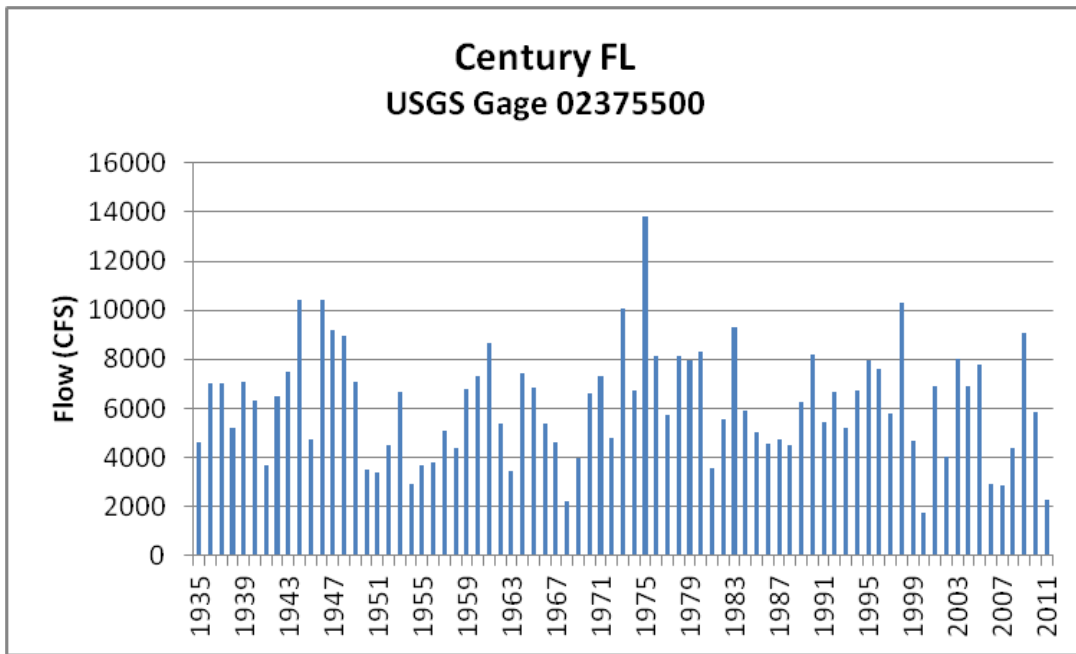


Figure E.1.2.6. USGS Annual Average Flow at Century and Molino (1983–2011)

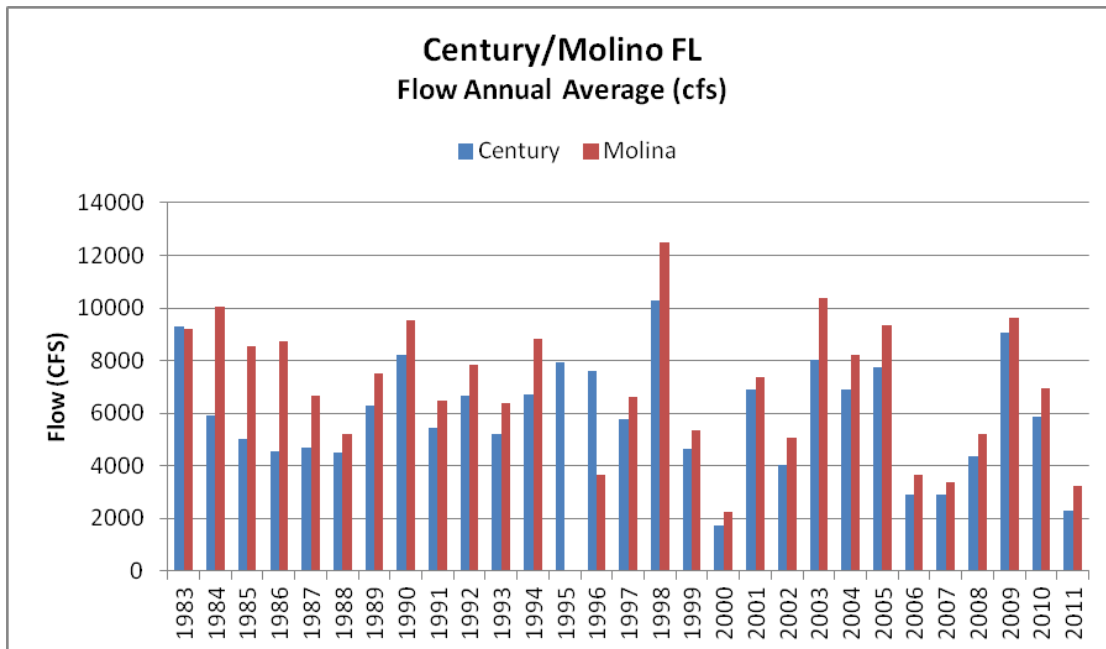


Figure E.1.2.7a. Observed and Predicted Daily Flow at Century (1997–2009)

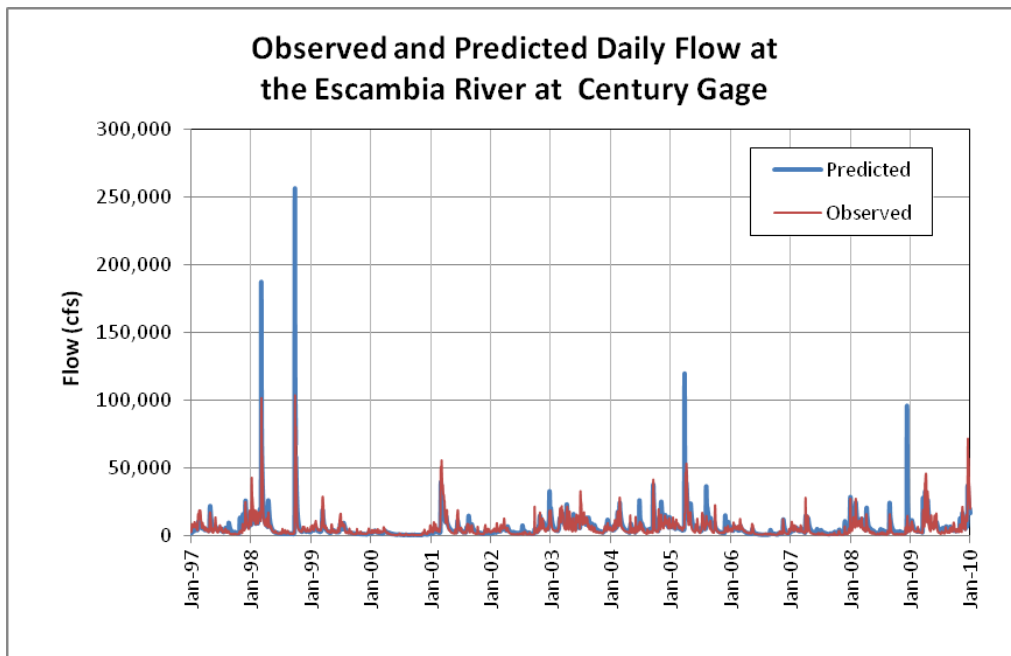


Figure E.1.2.7b. Observed and Predicted Daily Flow at Century (1997–2009) (Rescaled)

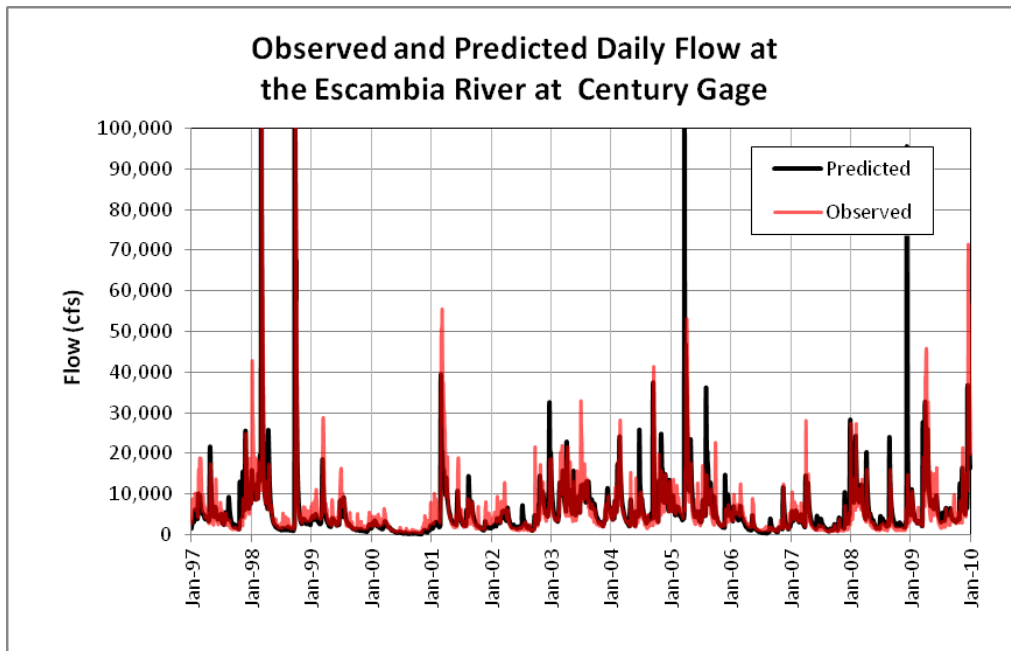


Figure E.1.2.8. Distribution of Observed and Predicted Daily Flow at Century (1997–2009)

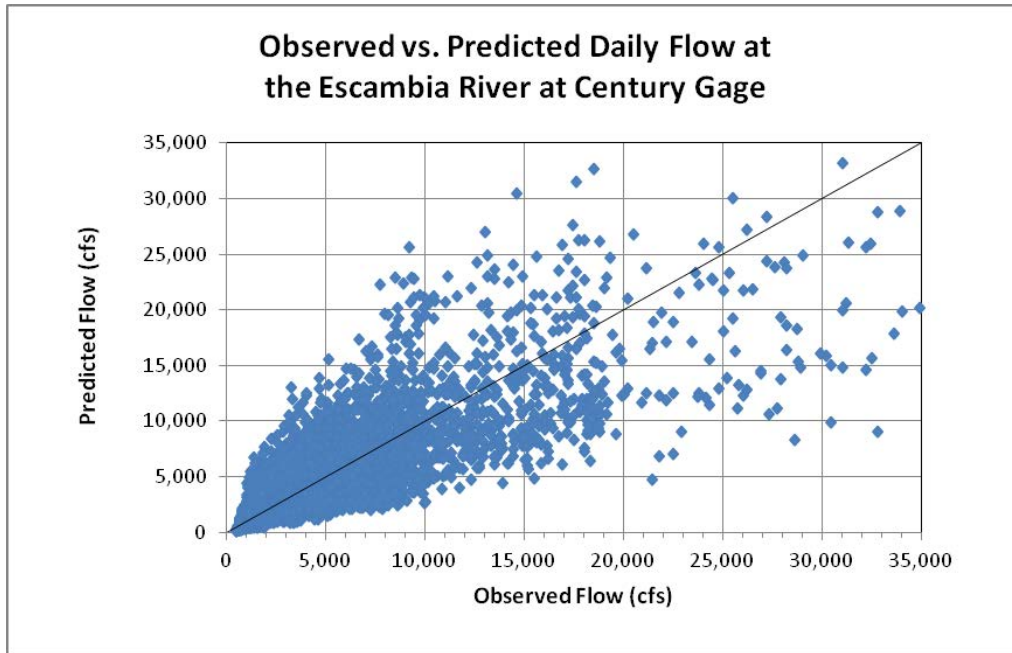


Figure E.1.2.9. Observed and Predicted Monthly Flow at Century (1997–2009)

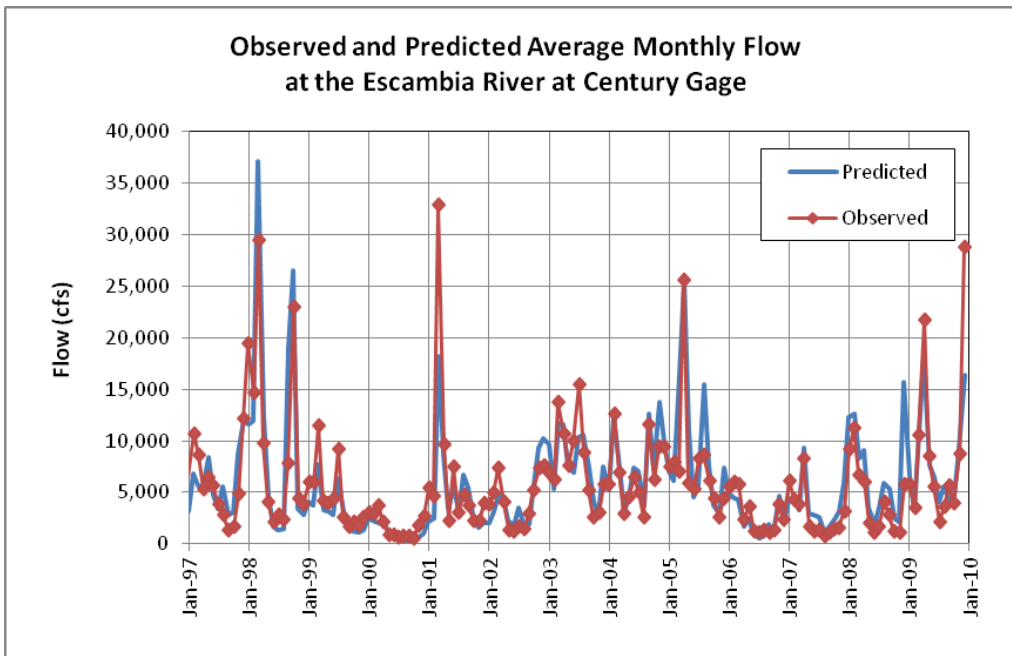


Figure E.1.2.10. Distribution of Observed and Predicted Monthly Flow at Century (1997–2009)

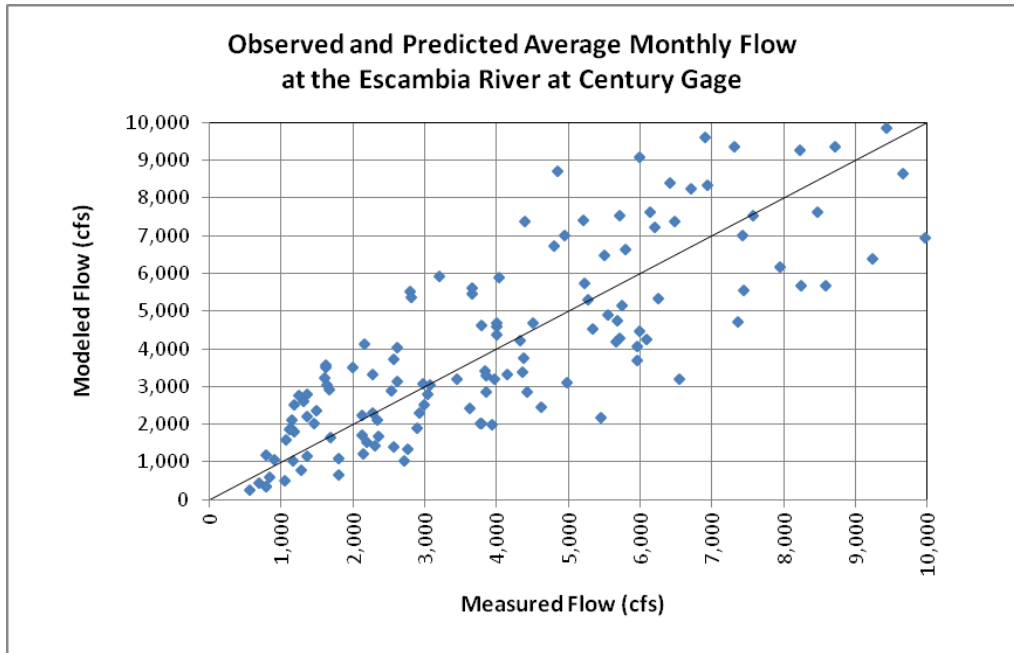


Figure E.1.2.11. TN (mg/L) Observed and Predicted Daily Average at Century (1996–2009)

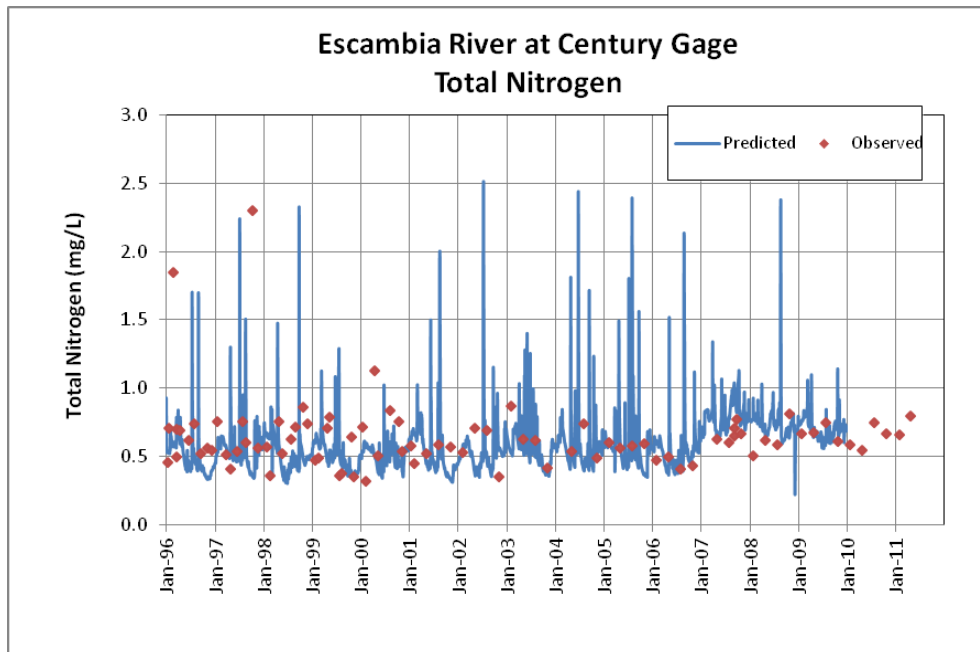


Figure E.1.2.12. TN (lbs/day) Observed and Predicted Daily Average at Century (1997-2009)

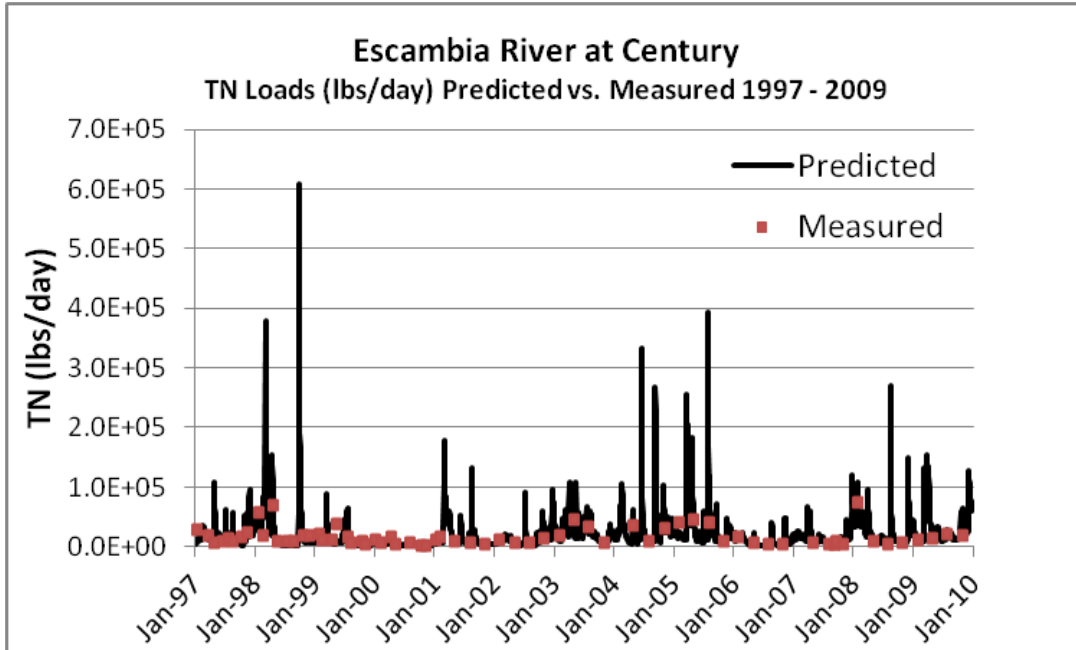


Figure E.1.2.13. Distribution of TN (lbs/day) Observed and Predicted at Century (1997-2009)

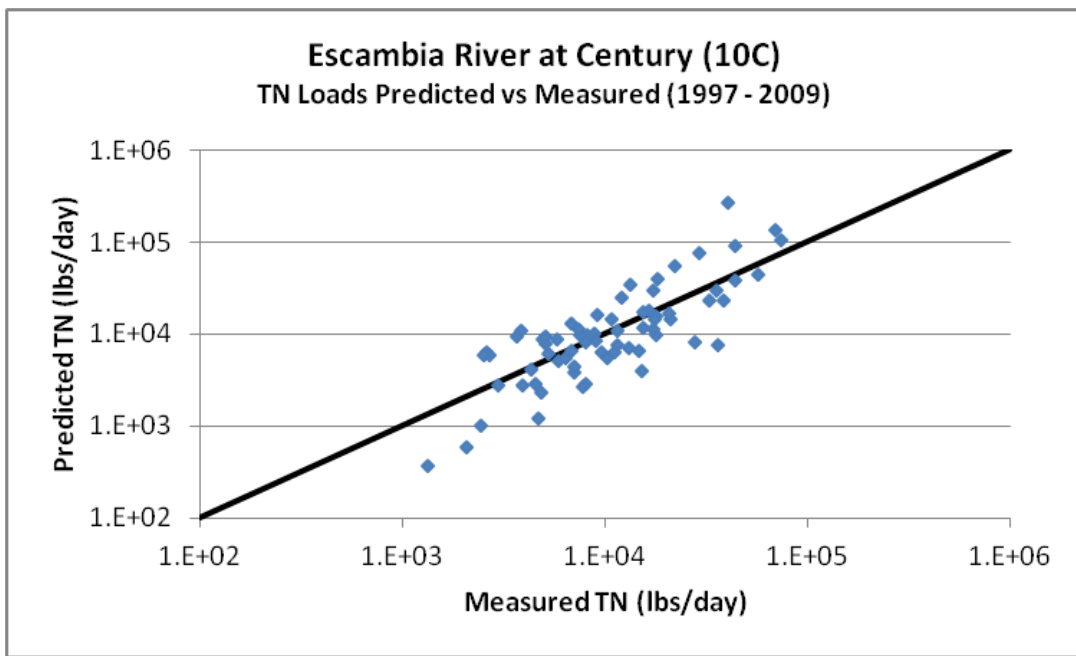


Table E.1.2.1. TN Calibration at Century Predicted vs. Observed Annual Average (lbs/yr)

Year	Paired Data TN Predicted (lbs/yr)	Paired Data TN Measured (lbs/yr)	% Error
1997	116,895	119,064	-1.8%
1998	230,533	202,682	13.7%
1999	75,884	113,548	-33.2%
2000	26,503	41,103	-35.5%
2001	38,206	44,769	-14.7%
2002	52,502	36,083	45.5%
2003	71,527	99,218	-27.9%
2004	113,418	72,642	56.1%
2005	307,982	130,028	136.9%
2006	25,517	27,059	-5.7%
2007	53,667	25,910	107.1%
2008	140,410	92,485	51.8%
2009	102,863	61,918	66.1%
Average 1997–2009	104,300	67,706	54.0%

Table E.1.2.2. TN at Century Total Predicted Annual Average (lbs/yr)

Year	Predicted Daily TN-P (lbs/yr)
1997	6,705,320
1998	13,046,681
1999	3,875,156
2000	1,215,469
2001	6,392,884
2002	4,854,215
2003	9,580,258
2004	10,010,218
2005	11,794,549
2006	2,909,942
2007	5,534,765
2008	9,747,027
2009	11,299,590
Average 1997-2009	7,458,929

Figure E.1.2.14. TP (mg/L) Observed and Predicted Daily Average at Century (1997-2009)

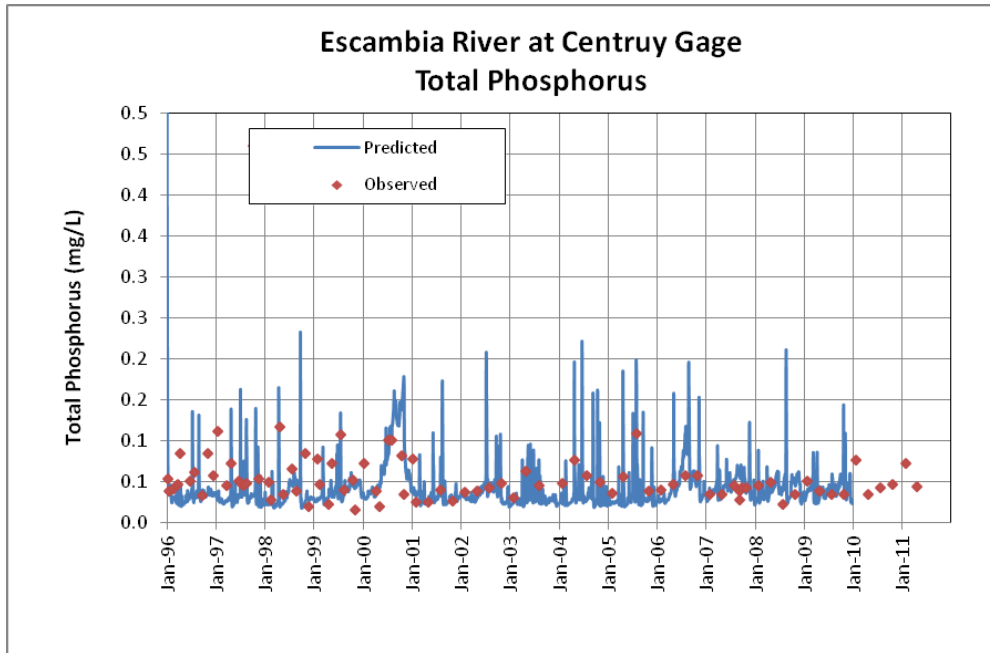


Figure E.1.2.15. TP (lbs/day) Observed and Predicted Daily Average at Century (1997-2009)

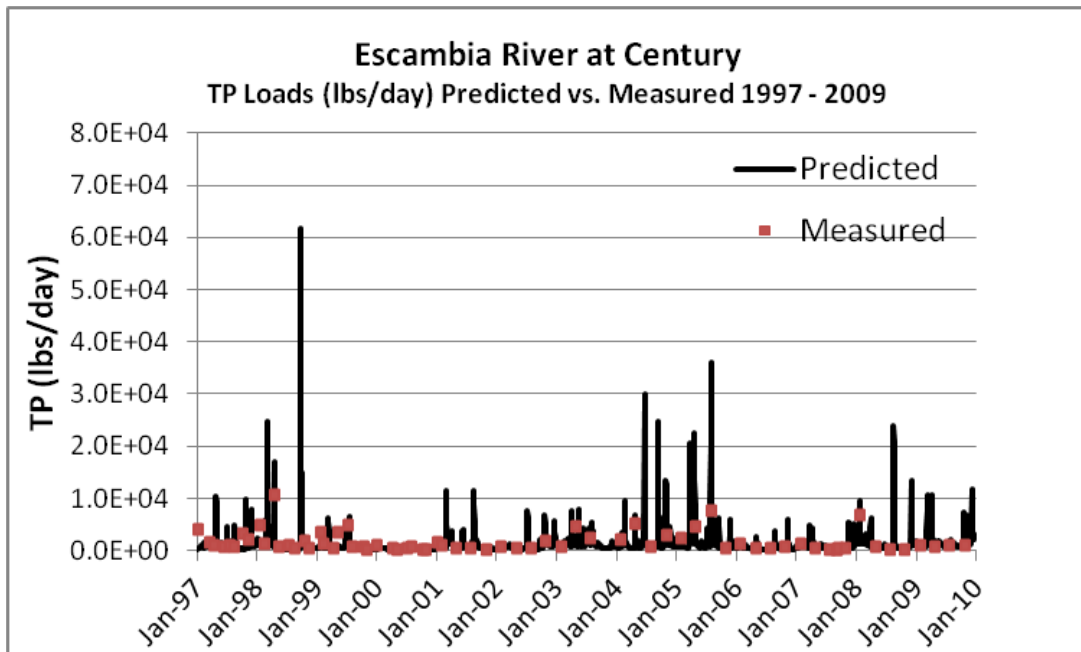


Figure E.1.2.16. Distribution of TP (lbs/day) Observed and Predicted at Century (1997-2009)

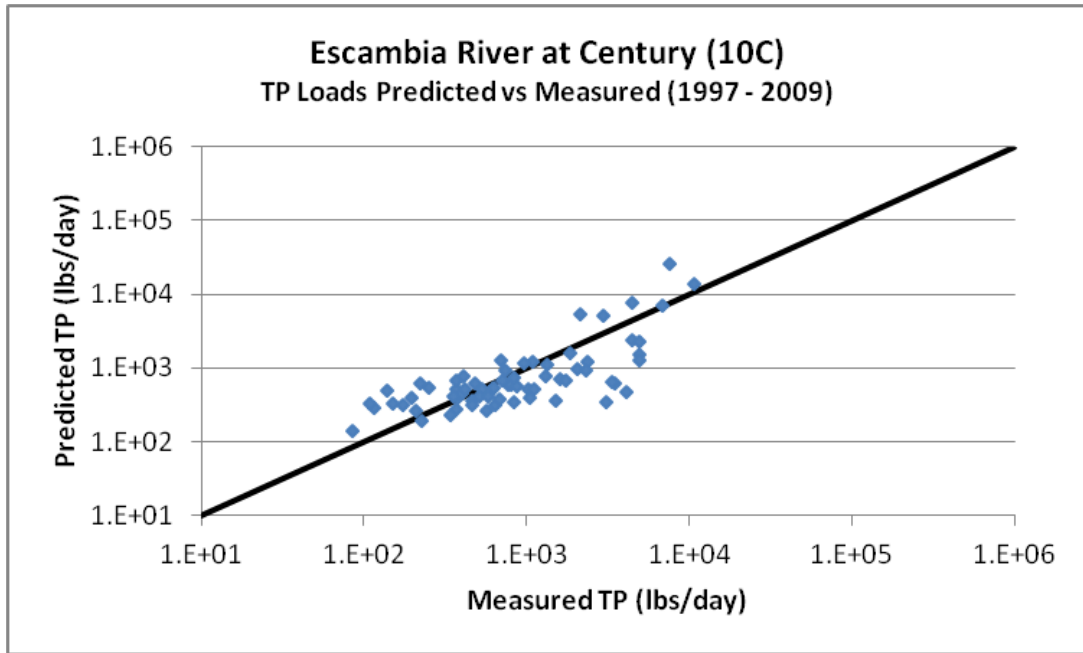


Table E.1.2.3. TP at Century Calibration Predicted vs. Observed Annual Average (lbs/yr)

Year	Paired Data TP Predicted (lbs/yr)	Paired Data TP Measured (lbs/yr)	% Error
1997	9,231	14,158	-35%
1998	18,849	20,891	-10%
1999	4,661	14,589	-68%
2000	1,968	2,903	-32%
2001	2,156	3,342	-35%
2002	2,864	3,272	-12%
2003	4,146	7,391	-44%
2004	8,964	10,555	-15%
2005	34,975	14,762	137%
2006	1,713	2,684	-36%
2007	4,261	2,563	66%
2008	9,050	7,847	15%
2009	6,093	3,533	72%
Average 1997–2009	8,379	8,345	0.4%

Table E.1.2.4. TP at Century Total Predicted Annual Average (lbs/yr)

Year	Predicted Daily TP-P (lbs/yr)
1997	407,372
1998	647,215
1999	255,562
2000	110,274
2001	367,970
2002	307,005
2003	494,152
2004	653,907
2005	695,160
2006	206,092
2007	299,957
2008	522,960
2009	625,825
Average 1997–2009	430,266

Figure E.1.2.17. TN Annual Average Concentration at Century (1980–2009)

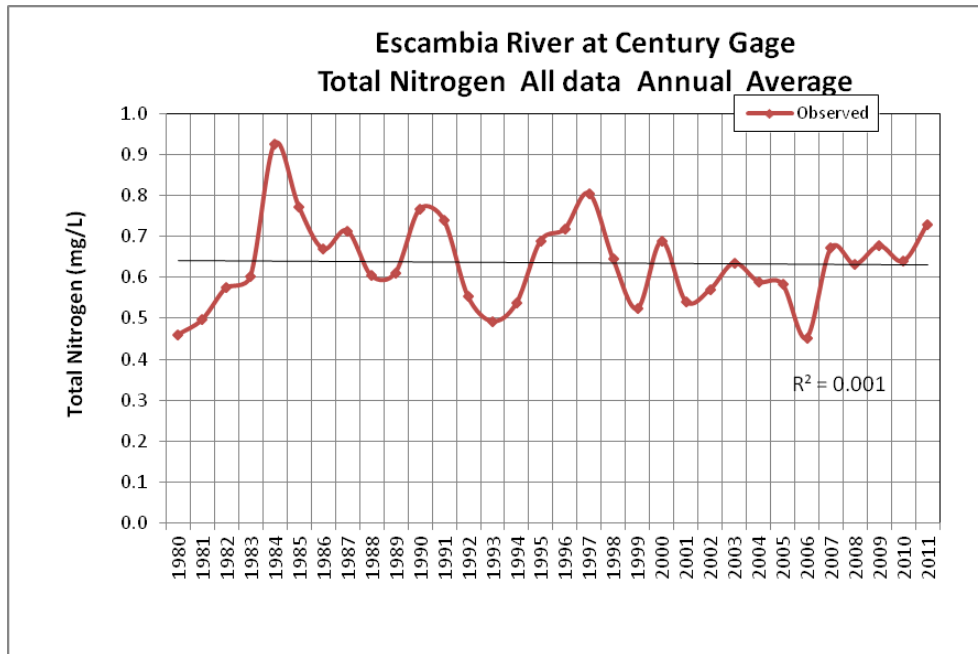


Figure E.1.2.18. TN Annual Average Concentration at Molino (1980–2009)

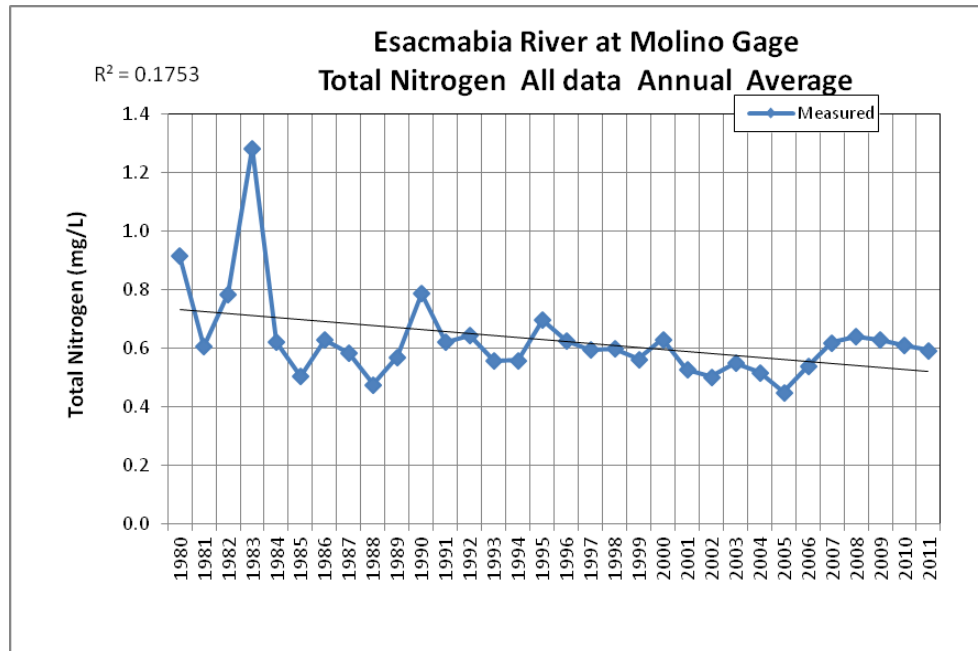


Figure E.1.2.19. TP Annual Average Concentration at Century (1980–2009)

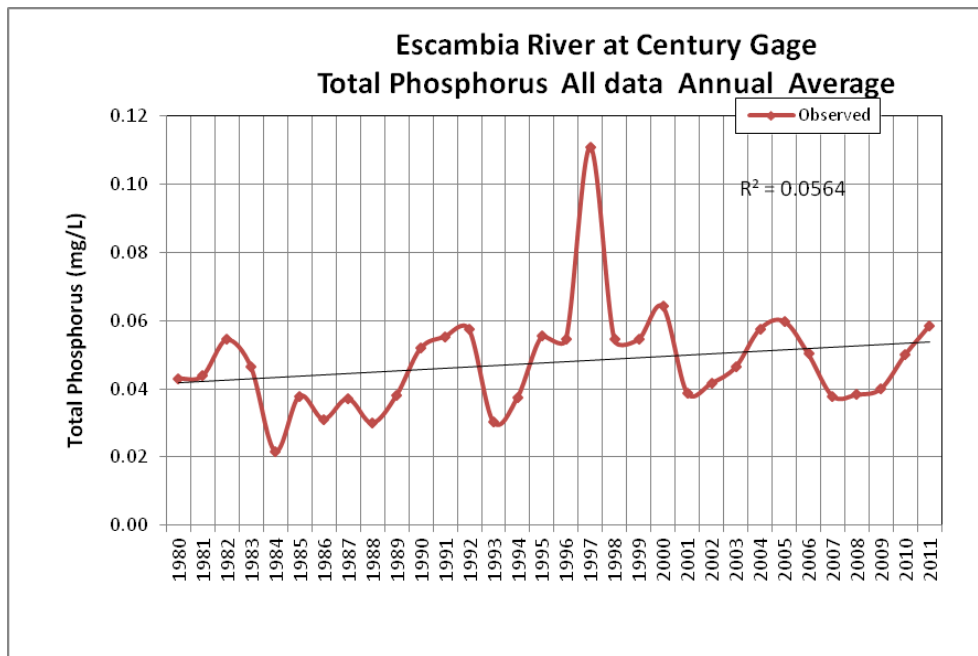


Figure E.1.2.20. TP Annual Average Concentration at Molino (1980–2009)

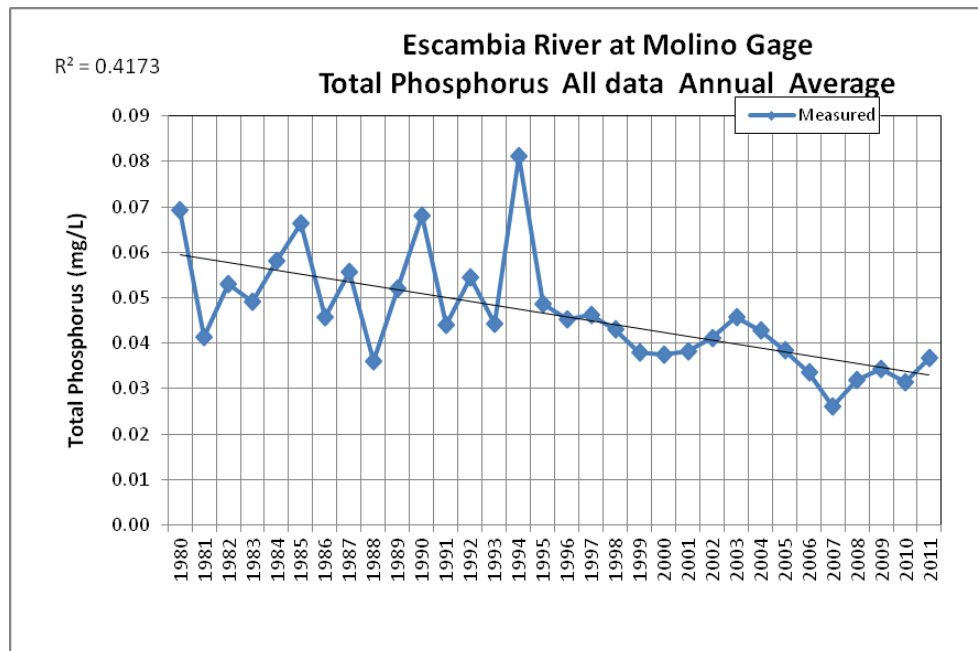


Table E.1.2.5. Century and Molino TN and TP Time Series Regressions, 1980 on

TP: Molino vs. Time

237 case(s) deleted due to missing data.

Dep Var: TPMOLINO N: 359 Multiple R: 0.288742 Squared multiple R: 0.083372

Adjusted squared multiple R: 0.080804 Standard error of estimate: 0.023688

Effect	Coefficient	Std Error	Std Coef	Tolerance	t	P(2 Tail)
CONSTANT	0.135348	0.016356	0.000000	.	8.27516	0.00000
DATEMOLINO	-0.000003	0.000000	-0.288742	1.000000	-5.69833	0.00000

Analysis of Variance

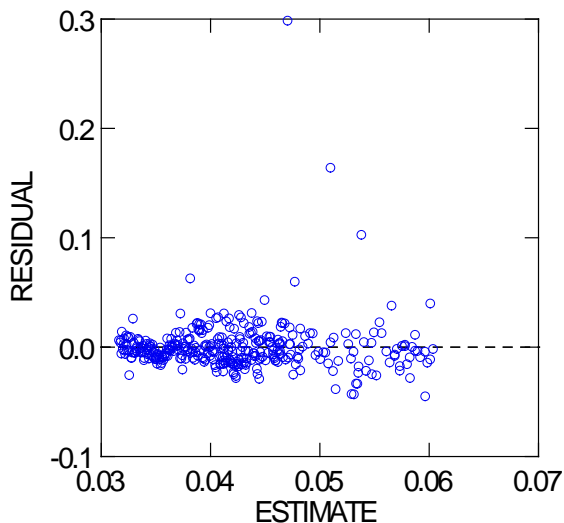
Source	Sum-of-Squares	df	Mean-Square	F-ratio	P
Regression	0.018220	1	0.018220	32.470989	0.000000
Residual	0.200314	357	0.000561		

*** WARNING ***

Case 35 is an outlier (Studentized Residual = 4.470981)
 Case 52 is an outlier (Studentized Residual = 7.461502)
 Case 78 is an outlier (Studentized Residual = 16.950567)

Durbin-Watson D Statistic 2.085373
 First Order Autocorrelation -0.042795

Plot of residuals against predicted values



TP: Century vs. Time

359 case(s) deleted due to missing data.

Dep Var: TPCENTURY N: 237 Multiple R: 0.093415 Squared multiple R: 0.008726

Adjusted squared multiple R: 0.004508 Standard error of estimate: 0.036316

Effect	Coefficient	Std Error	Std Coef	Tolerance	t	P(2 Tail)
CONSTANT	0.014081	0.023949	0.000000	.	0.58795	0.55713
DATECENTURY	0.000001	0.000001	0.093415	1.000000	1.43832	0.15167

Analysis of Variance

Source	Sum-of-Squares	df	Mean-Square	F-ratio	P
Regression	0.002728	1	0.002728	2.068752	0.151675
Residual	0.309933	235	0.001319		

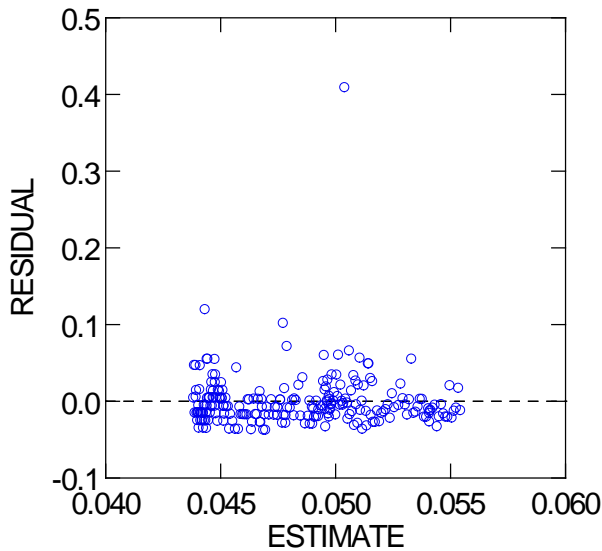
*** WARNING ***

Case 168 is an outlier (Studentized Residual = 16.724401)

Durbin-Watson D Statistic 2.017137

First Order Autocorrelation -0.008820

Plot of residuals against predicted values



TN: Molino vs. Time

235 case(s) deleted due to missing data.

Dep Var: TNMOLINO N: 134 Multiple R: 0.408872 Squared multiple R: 0.167176

Adjusted squared multiple R: 0.160867 Standard error of estimate: 0.106870

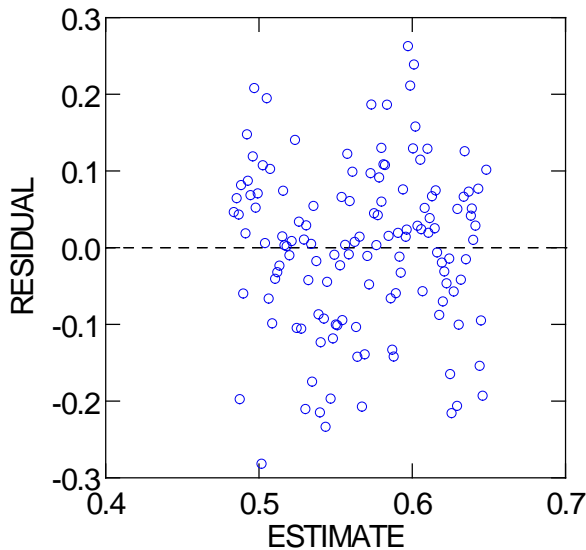
Effect	Coefficient	Std Error	Std Coef	Tolerance	t	P(2 Tail)
CONSTANT	-1.461147	0.394190	0.000000	.	-3.70671	0.00031
DATEMOLINO	0.000052	0.000010	0.408872	1.000000	5.14752	0.00000

Analysis of Variance

Source	Sum-of-Squares	df	Mean-Square	F-ratio	P
Regression	0.302629	1	0.302629	26.496925	0.000001
Residual	1.507611	132	0.011421		

Durbin-Watson D Statistic 1.362645
 First Order Autocorrelation 0.314534

Plot of residuals against predicted values



TN: Century vs. Time

134 case(s) deleted due to missing data.

Dep Var: TNCENTURY N: 235 Multiple R: 0.096534 Squared multiple R: 0.009319

Adjusted squared multiple R: 0.005067 Standard error of estimate: 0.276998

Effect	Coefficient	Std Error	Std Coef	Tolerance	t	P(2 Tail)
CONSTANT	0.347934	0.184128	0.000000	.	1.88963	0.06005
DATECENTURY	0.000008	0.000005	0.096534	1.000000	1.48044	0.14011

Analysis of Variance

Source	Sum-of-Squares	df	Mean-Square	F-ratio	P
Regression	0.168165	1	0.168165	2.191696	0.140107
Residual	17.877656	233	0.076728		

*** WARNING ***

Case 72 is an outlier (Studentized Residual = 6.737854)
 Case 109 is an outlier (Studentized Residual = 6.453695)
 Case 152 is an outlier (Studentized Residual = 4.600952)
 Case 167 is an outlier (Studentized Residual = 6.546450)

Durbin-Watson D Statistic 1.925445
 First Order Autocorrelation 0.036813

Plot of residuals against predicted values

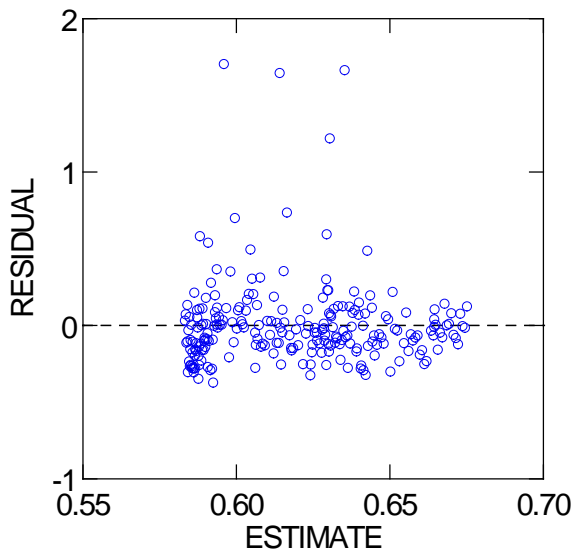


Table E.1.2.6. Century vs. Molino TN and TP Comparisons, 1980 on

TN CENTURY vs. MOLINO

Categorical values encountered during processing are:

SITE\$ (2 levels)

CENTURY, MOLINO

Kruskal-Wallis One-Way Analysis of Variance for 369 cases

Dependent variable is TN

Grouping variable is SITE\$

Group	Count	Rank Sum
-------	-------	----------

CENTURY	235	44394.500
---------	-----	-----------

MOLINO	134	23870.500
--------	-----	-----------

Mann-Whitney U test statistic = 16664.500

Probability is 0.351

Chi-square approximation = 0.871 with 1 df

TP CENTURY vs. MOLINO

Categorical values encountered during processing are:

SITE\$ (2 levels)

CENTURY, MOLINO

Kruskal-Wallis One-Way Analysis of Variance for 596 cases

Dependent variable is TP

Grouping variable is SITE\$

Group	Count	Rank Sum
-------	-------	----------

CENTURY	237	75568.500
---------	-----	-----------

MOLINO	359	102337.500
--------	-----	------------

Mann-Whitney U test statistic = 47365.500

Probability is 0.019

Chi-square approximation = 5.502 with 1 df

Table E.1.2.7. LSPC TN, TP, and CBOD Partitioning to WASP

TN partition for LSPC output

NH4-N	Nox-N	Org-N
0.1	0.5	0.4

TP partition for LSPC output

PO4-P	Org-P
0.5	0.5

f ratio for LSPC output (f=BODu/BOD5)

1.5

Table E.1.2.8. LSPC TN Calibration Terminal Reach Loading to Pensacola Bay

Year	Escambia River TN (lbs) (LSPC Reach 20002)	Bayou Mulatto TN (lbs) (LSPC Reach 20055)	Indian Bayou TN (lbs) (LSPC Reach 20059)	Bayou Texar TN (lbs) (LSPC Reach 20058)	Bayou Chico TN (lbs) (LSPC Reach 20020)	Blackwater River TN (lbs) (LSPC Reach 20057)	Yellow River TN (lbs) (LSPC Reach 20001)	East Bay River TN (lbs) (LSPC Reach 20056)	East Bay Dean Creek TN (lbs) (LSPC Reach 20060)	East Bay Tom King TN (lbs) (LSPC Reach 20076)	SRS Williams Creek TN (lbs) (LSPC Reach 20077)	SRS Russell TN (lbs) (LSPC Reach 20078)	Total TN (lbs)
2002	5,303,305	181,751	46,916	393,809	148,602	2,164,610	2,039,535	249,397	77,110	120,355	88,100	141,279	10,954,769
2003	10,453,210	222,670	76,200	492,162	209,312	3,878,893	4,250,534	495,374	147,541	179,947	118,588	183,289	20,707,720
2004	10,808,607	220,917	73,656	466,452	189,336	3,216,690	4,400,206	432,412	117,948	159,411	120,779	180,018	20,386,432
2005	13,110,569	339,690	138,356	728,503	326,912	4,830,731	5,811,061	683,249	257,504	293,460	203,500	292,203	27,015,738
2006	3,255,355	144,205	25,676	290,438	110,126	1,361,866	1,275,807	186,801	60,789	90,208	57,706	109,362	6,968,339
2007	4,398,062	184,414	47,164	355,492	142,929	1,396,437	1,665,000	222,953	91,156	122,973	84,167	135,041	8,845,788
2008	8,528,226	184,995	49,324	400,167	160,079	2,783,845	3,140,882	311,480	95,519	135,229	87,698	146,701	16,024,145
2009	10,497,328	278,781	112,265	595,946	257,269	4,237,936	5,051,893	598,666	183,812	228,345	166,201	242,530	22,450,972
Sum	66,354,663	1,757,423	569,557	3,722,969	1,544,565	23,871,008	27,634,918	3,180,332	1,031,379	1,329,928	926,739	1,430,423	133,353,904
Average	8,294,333	219,678	71,195	465,371	193,071	2,983,876	3,454,365	397,542	128,922	166,241	115,842	178,803	16,669,238
Lbs/d	22,724	602	195	1,275	529	8,175	9,464	1,089	353	455	317	490	45,668
Kg/d	10,308	273	88	578	240	3,708	4,293	494	160	207	144	222	20,715
% of Total	49.8%	1.3%	0.4%	2.8%	1.2%	17.9%	20.7%	2.4%	0.8%	1.0%	0.7%	1.1%	100.0%

Table E.1.2.9. LSPC TP Calibration Terminal Reach Loading to Pensacola Bay

Year	Escambia River TP (lbs) (LSPC Reach 20002)	Bayou Mulatto TP (lbs) (LSPC Reach 20055)	Indian Bayou TP (lbs) (LSPC Reach 20059)	Bayou Texar TP (lbs) (LSPC Reach 20058)	Bayou Chico TP (lbs) (LSPC Reach 20020)	Blackwater River TP (lbs) (LSPC Reach 20057)	Yellow River TP (lbs) (LSPC Reach 20001)	East Bay River TP (lbs) (LSPC Reach 20056)	East Bay Dean Creek TP (lbs) (LSPC Reach 20060)	East Bay Tom King TP (lbs) (LSPC Reach 20076)	SRS Williams Creek TP (lbs) (LSPC Reach 20077)	SRS Russell TP (lbs) (LSPC Reach 20078)	Total TP (lbs)
2002	409,983	9,135	955	11,103	3,457	80,316	112,320	7,091	864	1,814	3,644	2,681	643,363
2003	643,176	8,817	1,382	11,068	3,743	143,371	198,937	10,407	1,495	2,071	3,686	2,514	1,030,667
2004	800,565	9,480	1,363	11,544	3,718	129,537	244,484	9,404	1,135	2,046	4,294	3,108	1,220,678
2005	868,693	11,963	2,412	13,057	4,724	186,473	286,804	13,184	2,457	3,030	5,892	4,093	1,402,783
2006	294,204	7,793	567	8,244	2,549	46,097	72,336	6,371	628	1,349	2,669	2,199	445,007
2007	333,211	8,640	961	8,405	2,820	50,801	92,050	7,052	1,205	1,614	2,927	2,221	511,906
2008	568,844	8,232	820	9,162	2,936	98,505	167,365	8,362	843	1,528	2,867	2,182	871,646
2009	672,261	10,603	2,056	12,038	4,192	156,991	245,744	12,770	1,888	2,492	4,838	3,391	1,129,264
Sum	4,590,938	74,663	10,516	84,621	28,139	892,091	1,420,041	74,641	10,515	15,944	30,817	22,389	7,255,315
Average	573,867	9,333	1,315	10,578	3,517	111,511	177,505	9,330	1,314	1,993	3,852	2,799	906,914
lbs/d	1,572	602	195	1,275	529	8,175	9,464	1,089	353	455	317	490	24,516
kg/d	713	12	2	13	4	139	221	12	2	2	5	3	1,128
% of Total	63.3%	1.0%	0.1%	1.2%	0.4%	12.3%	19.6%	1.0%	0.1%	0.2%	0.4%	0.3%	100.0%

Table E.1.2.10. LSPC TN Natural Condition Terminal Reach Loading to Pensacola Bay

Year	Escambia River TN (lbs) (LSPC Reach 20002)	Bayou Mulatto TN (lbs) (LSPC Reach 20055)	Indian Bayou TN (lbs) (LSPC Reach 20059)	Bayou Texar TN (lbs) (LSPC Reach 20058)	Bayou Chico TN (lbs) (LSPC Reach 20020)	Blackwater River TN (lbs) (LSPC Reach 20057)	Yellow River TN (lbs) (LSPC Reach 20001)	East Bay River TN (lbs) (LSPC Reach 20056)	East Bay Dean Creek TN (lbs) (LSPC Reach 20060)	East Bay Tom King TN (lbs) (LSPC Reach 20076)	SRS Williams Creek TN (lbs) (LSPC Reach 20077)	SRS Russell TN (lbs) (LSPC Reach 20078)	Total TN (lbs)
2002	2,369,797	41,616	36,473	144,871	64,617	1,163,267	1,079,623	168,631	57,752	44,572	36,690	50,379	5,258,288
2003	5,042,404	63,019	61,353	166,717	95,001	2,250,862	2,409,172	361,513	117,876	71,688	50,970	66,264	10,756,839
2004	5,506,686	60,123	58,968	162,256	84,878	1,833,706	2,493,999	305,915	92,359	62,385	51,486	66,168	10,778,928
2005	6,796,770	108,192	111,225	217,474	145,152	2,806,915	3,351,948	503,784	207,521	117,424	85,841	107,967	14,560,214
2006	1,316,012	24,564	19,138	103,210	46,943	722,696	679,491	125,844	46,495	33,295	22,957	38,024	3,178,668
2007	1,761,847	41,505	36,063	120,128	59,965	721,744	821,593	143,147	68,610	44,932	33,795	46,666	3,899,994
2008	4,105,871	42,514	37,971	136,811	68,546	1,518,864	1,694,114	216,898	73,528	49,619	35,526	50,775	8,031,036
2009	5,007,727	87,038	91,110	185,331	112,660	2,347,800	2,819,134	430,818	145,661	88,418	70,697	86,188	11,472,582
Sum	31,907,114	468,570	452,301	1,236,799	677,762	13,365,854	15,349,074	2,256,548	809,801	512,334	387,961	512,431	67,936,550
Average	3,988,389	58,571	56,538	154,600	84,720	1,670,732	1,918,634	282,069	101,225	64,042	48,495	64,054	8,492,069
lbs/d	10,927	160	155	424	232	4,577	5,257	773	277	175	133	175	23,266
kg/d	4,956	73	70	192	105	2,076	2,384	351	126	80	60	80	10,553
% of Total	47.0%	0.7%	0.7%	1.8%	1.0%	19.7%	22.6%	3.3%	1.2%	0.8%	0.6%	0.8%	-
% Reduction from Calibration	52.6%	73.3%	20.6%	66.8%	56.1%	44.0%	44.5%	29.0%	21.5%	61.5%	58.1%	64.2%	49.4%

Table E.1.2.11. LSPC TP Natural Condition Terminal Reach Loading to Pensacola Bay

Year	Escambia River TP (lbs) (LSPC Reach 20002)	Bayou Mulatto TP (lbs) (LSPC Reach 20055)	Indian Bayou TP (lbs) (LSPC Reach 20059)	Bayou Texar TP (lbs) (LSPC Reach 20058)	Bayou Chico TP (lbs) (LSPC Reach 20020)	Blackwater River TP (lbs) (LSPC Reach 20057))	Yellow River TP (lbs) (LSPC Reach 20001)	East Bay River TP (lbs) (LSPC Reach 20056)	East Bay Dean Creek TP (lbs) (LSPC Reach 20060)	East Bay Tom King TP (lbs) (LSPC Reach 20076)	Williams Creek TP (lbs) (LSPC Reach 20077)	SRS Russell TP (lbs) (LSPC Reach 20078)	Total TP (lbs)
2002	136,565	2,072	646	6,674	2,061	33,117	41,384	2,904	645	1,064	2,103	1,482	230,719
2003	241,047	2,540	996	6,640	2,232	67,686	81,512	5,851	1,200	1,242	2,182	1,352	414,480
2004	395,256	2,529	970	6,890	2,207	62,429	119,069	5,120	874	1,210	2,492	1,679	600,724
2005	437,303	3,709	1,794	7,463	2,745	97,194	145,337	8,173	2,027	1,811	3,386	2,202	713,145
2006	76,947	1,337	355	4,766	1,462	18,615	24,671	2,117	463	759	1,433	1,109	134,036
2007	95,328	1,882	667	5,079	1,691	19,991	31,894	3,093	937	974	1,718	1,246	164,501
2008	221,336	1,748	536	5,642	1,761	42,560	70,519	3,603	639	915	1,692	1,213	352,164
2009	251,948	3,249	1,546	7,129	2,481	68,836	103,663	7,476	1,534	1,488	2,856	1,825	454,029
Sum	1,855,730	19,066	7,510	50,284	16,641	410,429	618,049	38,336	8,320	9,463	17,862	12,108	3,063,798
Average	231,966	2,383	939	6,285	2,080	51,304	77,256	4,792	1,040	1,183	2,233	1,514	382,975
lbs/d	636	7	3	17	6	141	212	13	3	3	6	4	1,049
kg/d	288	3	1	8	3	64	96	6	1	1	3	2	476
% of Total	60.6%	0.6%	0.2%	1.6%	0.5%	13.4%	20.2%	1.3%	0.3%	0.3%	0.6%	0.4%	-
% Reduction from Calibration	57.3%	74.5%	28.6%	40.6%	40.9%	54.0%	56.5%	48.6%	20.9%	40.6%	42.0%	45.9%	56.3%

Table E.1.2.12. LSPC TN and TP Summary Loading to Pensacola Bay

- = Empty cell/no data

Year	Total Calibration TN (lbs)	Total Natural TN (lbs)	Total Calibration TP (lbs)	Total Natural TP (lbs)
2002	10,954,769	5,258,288	643,363	230,719
2003	20,707,720	10,756,839	1,030,667	414,480
2004	20,386,432	10,778,928	1,220,678	600,724
2005	27,015,738	14,560,214	1,402,783	713,145
2006	6,968,339	3,178,668	445,007	134,036
2007	8,845,788	3,899,994	511,906	164,501
2008	16,024,145	8,031,036	871,646	352,164
2009	22,450,972	11,472,582	1,129,264	454,029
Sum	133,353,904	67,936,550	7,255,315	3,063,798
Average	16,669,238	8,492,069	906,914	382,975
lbs/d	45,668	23,266	24,516	1,049
kg/d	20,715	10,553	1,128	476
% Reduction	-	49.1	-	57.8

E.2 Bayou Chico Model Calibration Results

Figure E.2.1. LSPC Bayou Chico Subwatershed Boundaries with Modeled Area

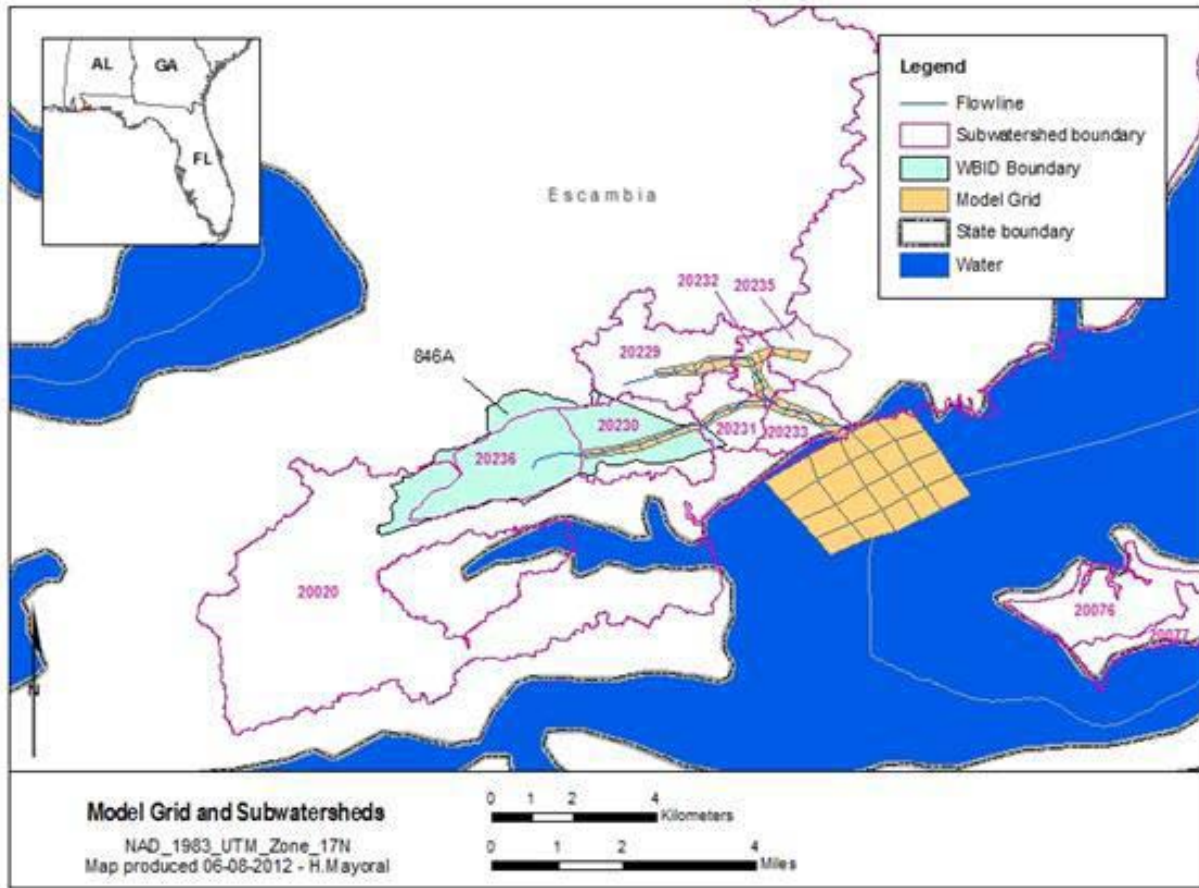


Figure E.2.2. EFDC/WASP Bayou Chico Model Cells and Watershed Input Locations

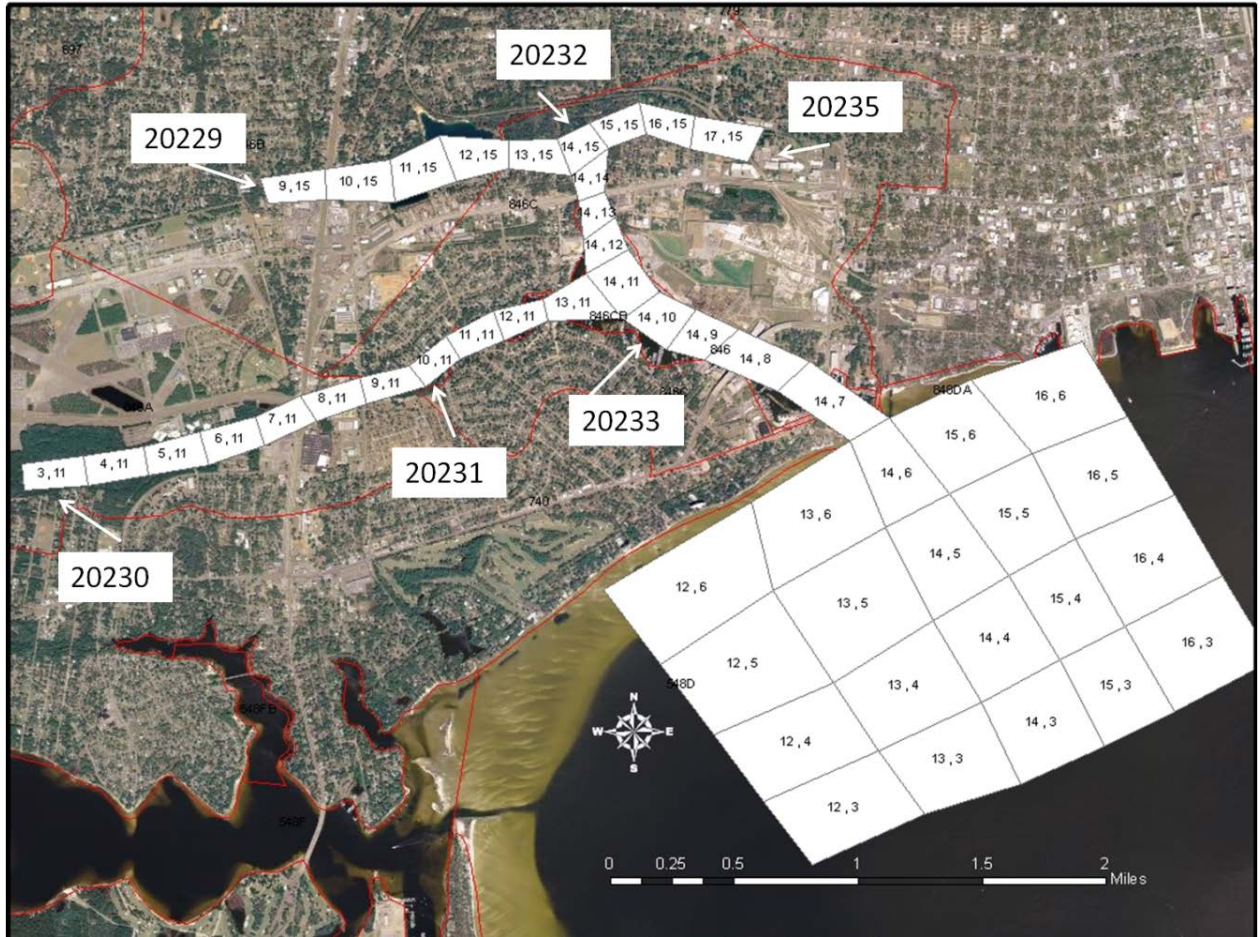


Table E.2.1. Bayou Chico Model Grid Specifications

Grid-I	Grid-J	Grid_DX (m)	Grid_DY (m)	Grid-Area (m ²)	Area (m ²)	Depth (m)	Top Segment ID	Bottom Segment ID
3	11	1,197.0	188.8	75.0	14,160.0	2.0	20	63
4	11	1,187.8	196.5	102.5	20,141.3	2.1	21	64
5	11	1,188.8	208.8	130.0	27,144.0	2.1	22	65
6	11	1,183.1	211.5	157.5	33,311.3	2.2	23	66
7	11	1,092.6	199.5	185.0	36,907.5	2.2	24	67
8	11	1,133.8	190.5	212.5	40,481.3	2.3	25	68
9	11	1,076.0	175.9	240.0	42,216.0	2.4	26	69
9	15	1,200.1	195.4	120.0	23,448.0	2.1	35	78
10	11	967.0	177.3	267.5	47,427.8	2.4	27	70
10	15	1,372.3	249.8	100.0	24,980.0	2.1	36	79
11	11	1,046.3	196.0	295.0	57,820.0	2.5	28	71
11	15	1,390.3	310.0	80.0	24,800.0	2.2	37	80
12	3	2,663.5	522.7	798.3	417,271.4	3.1	0	0
12	4	2,759.9	550.8	821.5	452,482.2	3.0	1	44
12	5	3,044.5	659.5	862.4	568,752.8	3.0	6	49
12	6	3,237.2	617.3	978.7	604,151.5	2.9	11	54
12	11	1,005.9	183.2	322.5	59,082.0	2.5	29	72
12	15	1,337.7	264.8	60.0	15,888.0	2.2	38	81
13	3	2,517.9	561.7	691.3	388,303.2	3.1	0	0
13	4	2,691.9	588.5	761.6	448,201.6	3.0	2	45
13	5	3,033.6	711.3	810.4	576,437.5	3.0	7	50
13	6	2,834.8	619.2	779.4	482,604.5	2.9	12	55
13	11	1,348.0	270.6	350.0	94,710.0	2.6	30	73
13	15	1,189.4	234.5	40.0	9,380.0	2.3	39	82
14	3	2,432.3	626.9	594.1	372,441.3	3.1	0	0
14	4	2,437.1	642.5	581.3	373,485.3	3.0	3	46
14	5	2,407.1	678.1	528.6	358,443.7	3.0	8	51
14	6	2,036.1	629.8	385.9	243,039.8	2.9	13	56
14	7	1,790.2	100.0	290.1	29,010.0	2.9	16	59
14	8	1,626.1	200.0	298.8	59,760.0	2.8	17	60
14	9	1,196.2	300.0	297.1	89,130.0	2.8	18	61
14	10	1,247.8	400.0	314.3	125,720.0	2.7	19	62
14	11	1,349.6	500.0	310.9	155,450.0	2.6	31	74
14	12	1,046.5	400.0	273.8	109,520.0	2.6	32	75
14	13	893.6	300.0	226.2	67,860.0	2.5	33	76
14	14	947.8	200.0	242.9	48,580.0	2.4	34	77
14	15	1,020.3	120.0	266.1	31,932.0	2.3	40	83

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and North Escambia Bay (WBID 548AA), June 7, 2013

Grid-I	Grid-J	Grid_DX (m)	Grid_DY (m)	Grid-Area (m ²)	Area (m ²)	Depth (m)	Top Segment ID	Bottom Segment ID
15	3	2,298.6	655.5	498.7	326,897.9	3.1	0	0
15	4	2,295.5	661.9	490.6	324,728.1	3.0	4	47
15	5	2,387.7	646.8	549.2	355,222.6	3.0	9	52
15	6	2,476.4	627.4	600.5	376,753.7	2.9	14	57
15	15	1,043.3	216.6	50.0	10,830.0	2.3	41	84
16	3	2,750.9	657.4	723.9	475,891.9	3.1	0	0
16	4	2,717.8	649.9	713.0	463,378.7	3.0	5	48
16	5	2,601.0	617.9	685.2	423,385.1	3.0	10	53
16	6	2,640.7	610.0	691.2	421,632.0	2.9	15	58
16	15	1,128.0	223.7	40.0	8,948.0	2.2	42	85
17	15	1,315.8	237.7	30.0	7,131.0	2.2	43	86

Table E.2.2. Model Grid Benthic Flux of DIN and DIP Bayou Chico

- = Empty cell/no data

Seg_bot	Grid-Area (m ²)	Flux-NH4 (mg/m ² /d)	NH4-N (kg/d)	Flux-PO4 (mg/m ² /d)	PO4-P (kg/d)
63	75.0	90	0.00675	0.35	0.00003
64	102.5	90	0.00923	0.35	0.00004
65	130.0	90	0.01170	0.35	0.00005
66	157.5	90	0.01418	0.35	0.00006
67	185.0	90	0.01665	0.35	0.00006
68	212.5	90	0.01913	0.35	0.00007
69	240.0	90	0.02160	0.35	0.00008
78	120.0	90	0.01080	0.35	0.00004
70	267.5	90	0.02408	0.35	0.00009
79	100.0	90	0.00900	0.35	0.00004
71	295.0	90	0.02655	0.35	0.00010
80	80.0	90	0.00720	0.35	0.00003
44	821.5	-	-	-	-
49	862.4	-	-	-	-
54	978.7	-	-	-	-
72	322.5	90	0.02903	0.35	0.00011
81	60.0	90	0.00540	0.35	0.00002
45	761.6	-	-	-	-
50	810.4	-	-	-	-
55	779.4	-	-	-	-
73	350.0	70	0.02450	0.14	0.00005
82	40.0	90	0.00360	0.35	0.00001
46	581.3	-	-	-	-
51	528.6	-	-	-	-
56	385.9	-	-	-	-
59	290.1	70	0.02031	0.14	0.00004
60	298.8	70	0.02092	0.14	0.00004
61	297.1	70	0.02080	0.14	0.00004
62	314.3	70	0.02200	0.14	0.00004
74	310.9	70	0.02176	0.14	0.00004

Seg_bot	Grid-Area (m ²)	Flux-NH4 (mg/m ² /d)	NH4-N (kg/d)	Flux-PO4 (mg/m ² /d)	PO4-P (kg/d)
75	273.8	70	0.01917	0.14	0.00004
76	226.2	90	0.02036	0.35	0.00008
77	242.9	90	0.02186	0.35	0.00009
83	266.1	90	0.02395	0.35	0.00009
47	490.6	-	-	-	-
52	549.2	-	-	-	-
57	600.5	-	-	-	-
84	50.0	90	0.00450	0.35	0.00002
48	713.0	-	-	-	-
53	685.2	-	-	-	-
58	691.2	-	-	-	-
85	40.0	90	0.00360	0.35	0.00001
86	30.0	90	0.00270	0.35	0.00001
Total	-	-	0.44	-	0.00143

Figure E.2.3. Upper Bayou Chico Salinity Calibration

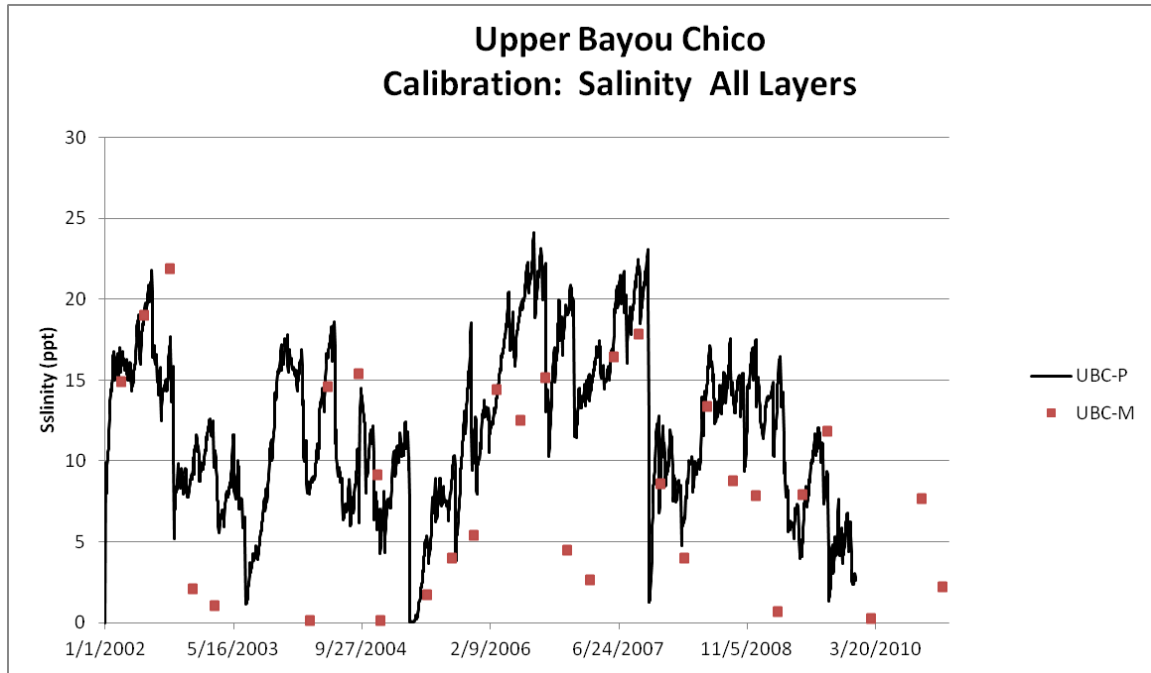


Table E.2.3. Upper Bayou Chico Salinity Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Upper Salinity (ppt) All Layers Predicted Average	Upper Salinity (ppt) All Layers Measured Average
2002	4	14.1	14.5
2003	1	9.4	1.0
2004	5	10.8	7.9
2005	3	7.9	3.7
2006	4	17.5	11.6
2007	4	15.6	11.4
2008	4	12.4	8.5
2009	3	8.3	6.8
Average	-	11.7	7.3
% Difference	-	-	-61.3%

Figure E.2.4. Lower Bayou Chico Salinity Calibration

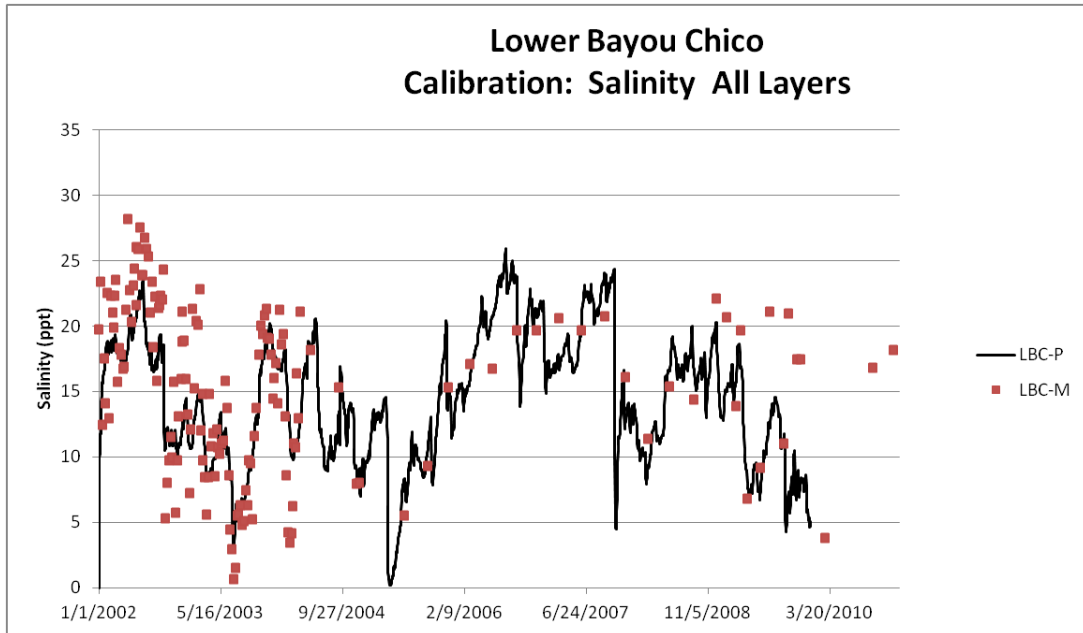


Table E.2.4. Lower Bayou Chico Salinity Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Lower Salinity (ppt) All Layers Predicted Average	Lower Salinity (ppt) All Layers Measured Average
2002	57	16.6	19.1
2003	52	11.6	11.9
2004	19	13.1	12.3
2005	3	10.2	10.0
2006	4	19.8	18.3
2007	4	18.2	19.3
2008	4	14.8	15.8
2009	10	10.8	15.8
Average	-	14.1	14.8
% Difference	-	-	4.7%

Figure E.2.5. Upper Bayou Chico NH4-N Calibration

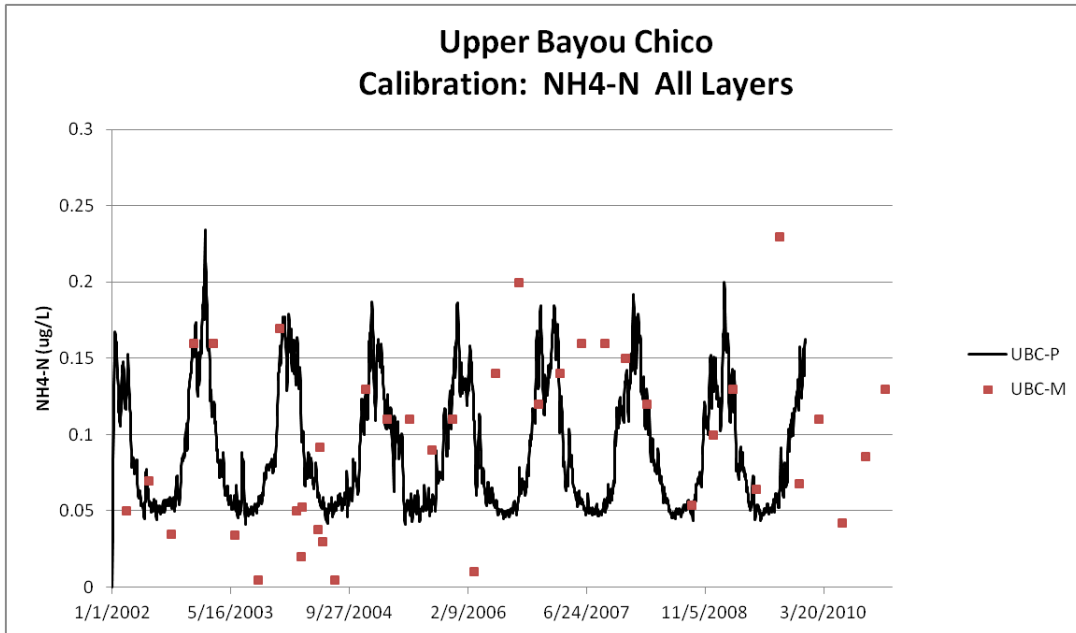


Table E.2.5. Upper Bayou Chico NH4-N Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Upper NH4-N (mg/L) All Layers Predicted Average	Upper NH4-N (mg/L) All Layers Measured Average
2002	4	0.088	0.079
2003	4	0.091	0.092
2004	8	0.089	0.052
2005	4	0.092	0.105
2006	4	0.088	0.118
2007	4	0.089	0.153
2008	3	0.090	0.091
2009	4	0.089	0.123
Average	-	0.090	0.105
% Difference	-	-	14.4%

Figure E.2.6. Lower Bayou Chico NH4-N Calibration

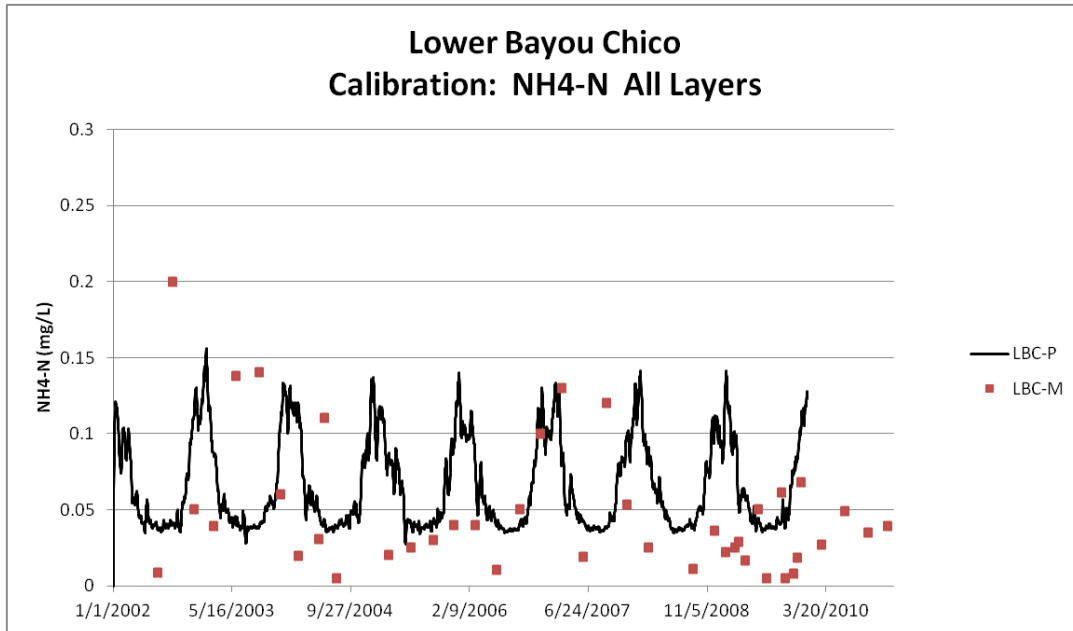


Table E.2.6. Lower Bayou Chico NH4-N Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Lower NH4-N (mg/L) All Layers Predicted Average	Lower NH4-N (mg/L) All Layers Measured Average
2002	3	0.064	0.076
2003	4	0.066	0.092
2004	4	0.066	0.055
2005	4	0.067	0.020
2006	4	0.064	0.035
2007	4	0.065	0.092
2008	3	0.067	0.030
2009	11	0.066	0.025
Average	-	0.066	0.050
% Difference	-	-	-32.5%

Figure E.2.7. Upper Bayou Chico NO₃-N Calibration

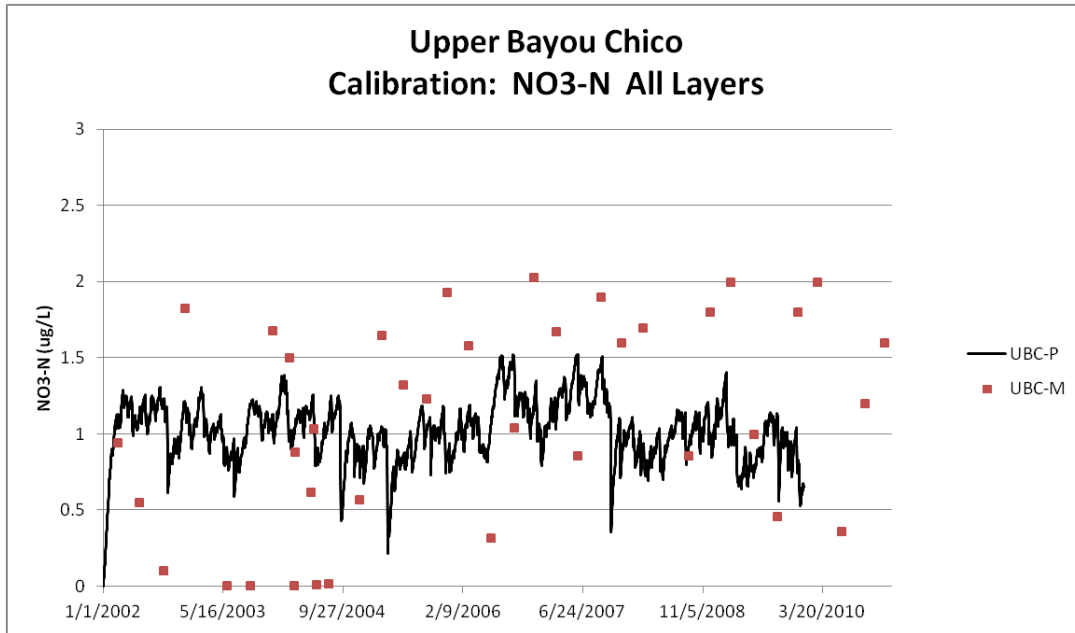


Table E.2.7. Upper Bayou Chico NO₃-N Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Upper NO ₃ -N (mg/L) All Layers Predicted Average	Upper NO ₃ -N (mg/L) All Layers Measured Average
2002	4	1.03	0.85
2003	3	1.02	0.56
2004	8	1.02	0.58
2005	4	0.91	1.53
2006	4	1.15	1.24
2007	4	1.15	1.51
2008	3	0.96	1.45
2009	4	0.92	1.32
Average	-	1.02	1.17
% Difference	-	-	13.0%

Figure E.2.8. Lower Bayou Chico NO₃-N Calibration

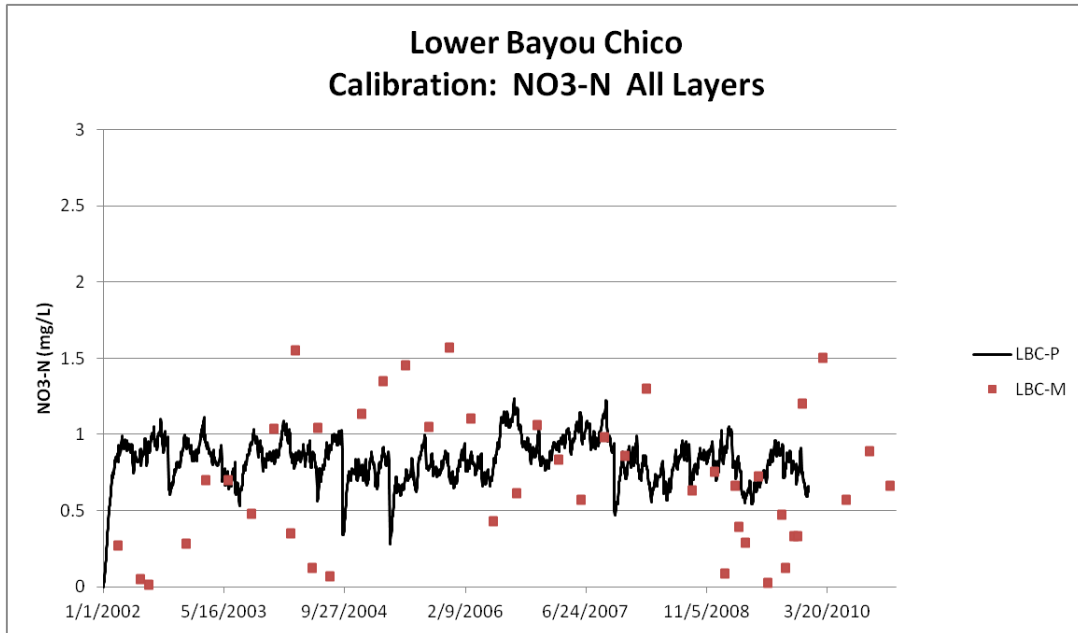


Table E.2.8. Lower Bayou Chico NO₃-N Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Lower NO ₃ -N (mg/L) All Layers Predicted Average	Lower NO ₃ -N (mg/L) All Layers Measured Average
2002	4	0.83	0.15
2003	4	0.84	0.73
2004	6	0.83	0.71
2005	4	0.75	1.36
2006	4	0.90	0.80
2007	4	0.92	0.81
2008	3	0.79	0.89
2009	11	0.78	0.42
Average	-	0.83	0.82
% Difference	-	-	-1.4%

Figure E.2.9. Upper Bayou Chico TN Calibration

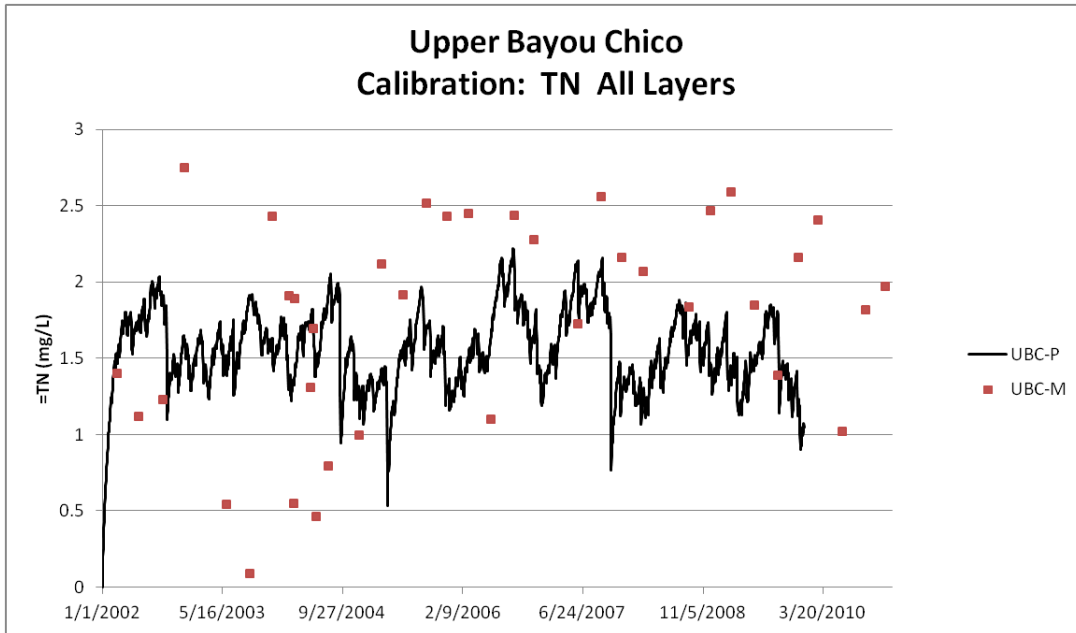


Table E.2.9. Upper Bayou Chico TN Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Upper TN (mg/L) All Layers Predicted Average	Upper TN (mg/L) All Layers Measured Average
2002	4	1.56	1.63
2003	3	1.58	1.02
2004	8	1.57	1.20
2005	4	1.45	2.25
2006	4	1.68	2.07
2007	3	1.66	2.15
2008	3	1.50	2.13
2009	4	1.44	2.00
Average	-	1.56	1.83
% Difference	-	-	15.0%

Figure E.2.10. Lower Bayou Chico TN Calibration

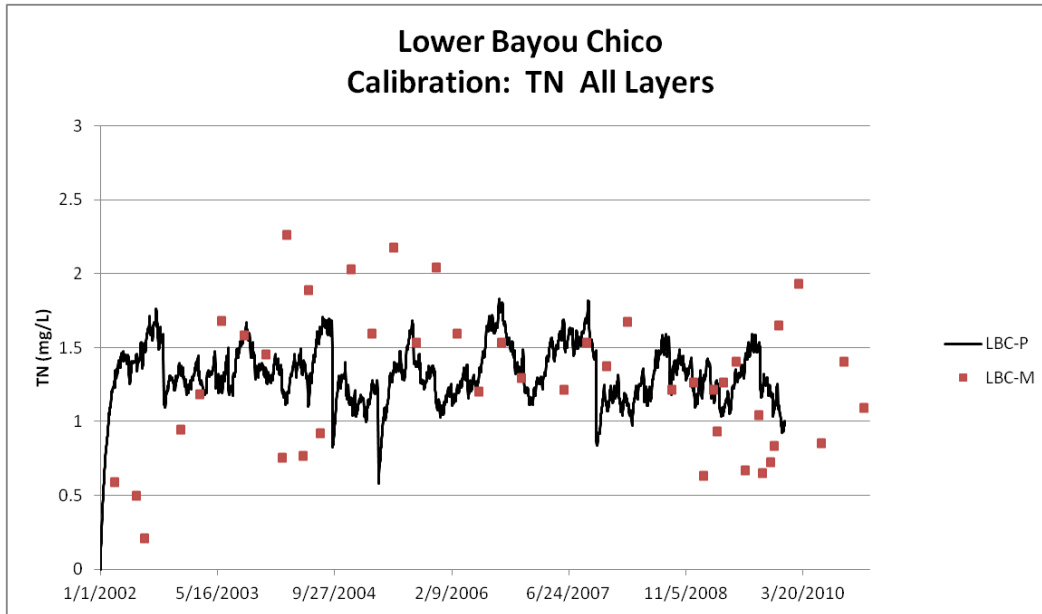


Table E.2.10. Lower Bayou Chico TN Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Lower TN (mg/L) All Layers Predicted Average	Lower TN (mg/L) All Layers Measured Average
2002	4	1.32	0.56
2003	4	1.35	1.47
2004	6	1.33	1.44
2005	4	1.24	1.83
2006	4	1.39	1.40
2007	3	1.39	1.37
2008	3	1.28	1.38
2009	11	1.26	1.00
Average	-	1.32	1.41
% Difference	-	-	6.6%

Figure E.2.11. Upper Bayou Chico PO4-P Calibration

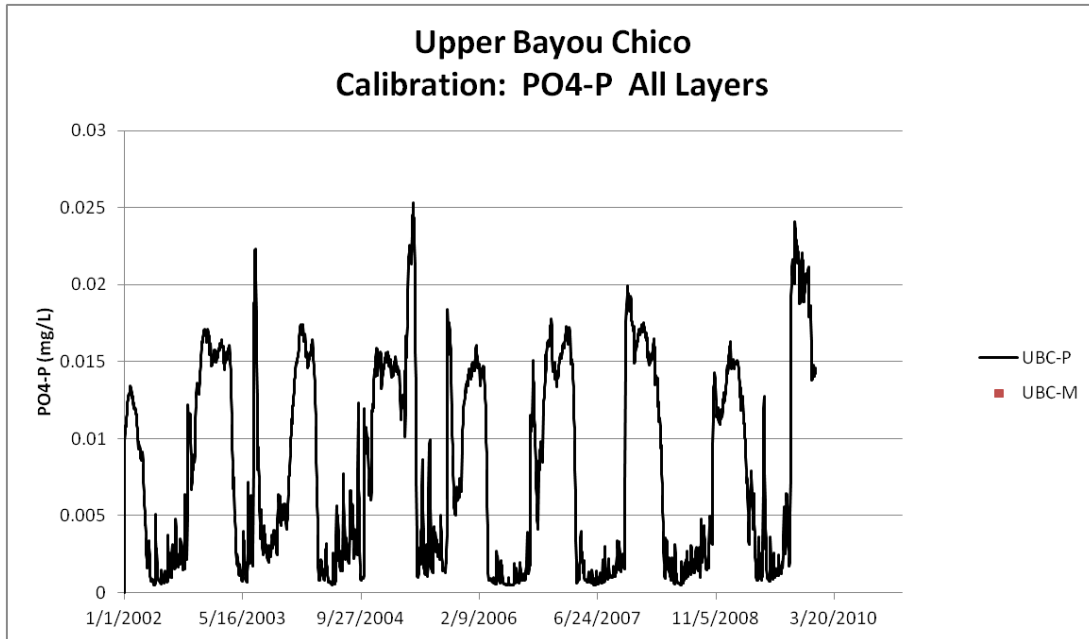


Table E.2.11. Upper Bayou Chico PO4-P Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Upper PO4-P (mg/L) All Layers Predicted Average	Upper PO4-P (mg/L) All Layers Measured Average
2002	-	0.0071	-
2003	-	0.0081	-
2004	-	0.0077	-
2005	-	0.0100	-
2006	-	0.0071	-
2007	-	0.0076	-
2008	-	0.0068	-
2009	-	0.0099	-
Average	-	0.0080	-

Figure E.2.12. Lower Bayou Chico PO4-P Calibration

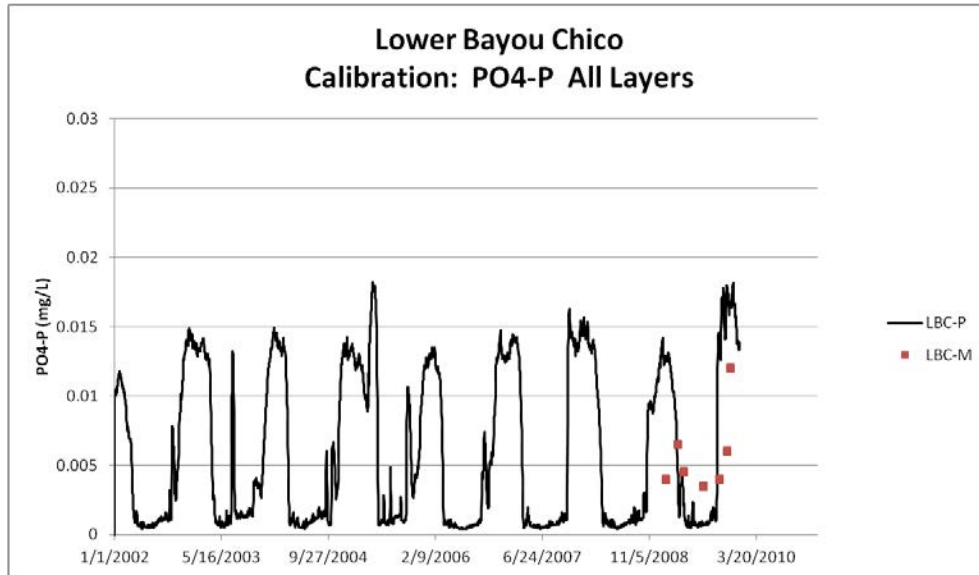


Table E.2.12. Lower Bayou Chico PO4-P Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Lower PO4-P (mg/L) All Layers Predicted Average	Lower PO4-P (mg/L) All Layers Measured Average
2002	-	0.0053	-
2003	-	0.0056	-
2004	-	0.0057	-
2005	-	0.0073	-
2006	-	0.0053	-
2007	-	0.0062	-
2008	-	0.0054	-
2009	7	0.0075	0.0058
Average	-	0.0060	0.0058
% Difference	-	-	-4.1%

Figure E.2.13. Upper Bayou Chico TP Calibration

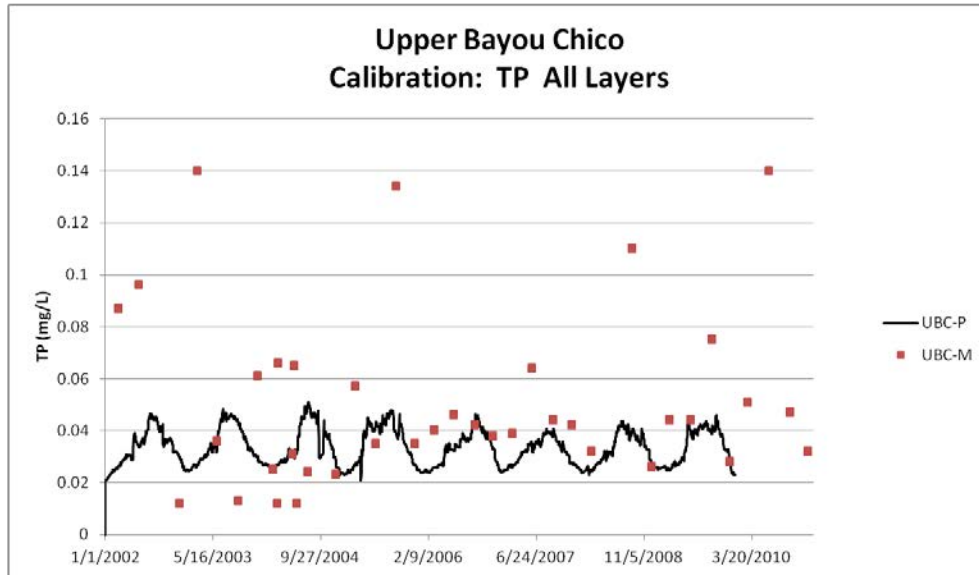


Table E.2.13. Upper Bayou Chico TP Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Upper TP (mg/L) All Layers Predicted Average	Upper TP (mg/L) All Layers Measured Average
2002	4	0.033	0.089
2003	4	0.034	0.063
2004	8	0.034	0.032
2005	4	0.035	0.065
2006	4	0.033	0.042
2007	4	0.032	0.047
2008	3	0.032	0.056
2009	4	0.034	0.048
Average	-	0.033	0.050
% Difference	-	-	33.7%

Figure E.2.14. Lower Bayou Chico TP Calibration

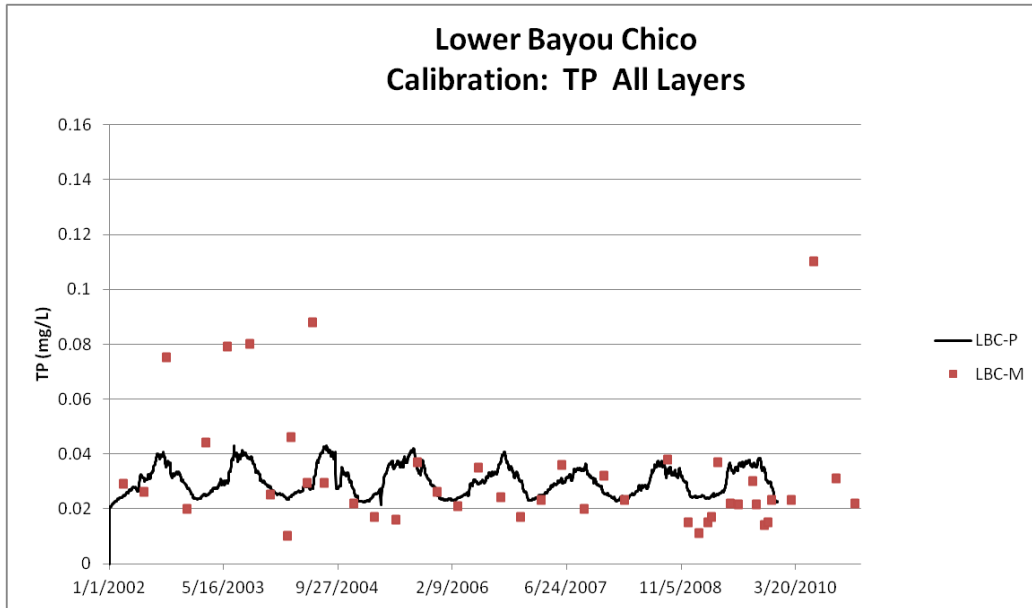


Table E.2.14. Lower Bayou Chico TP Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Lower TP (mg/L) All Layers Predicted Average	Lower TP (mg/L) All Layers Measured Average
2002	4	0.030	0.038
2003	4	0.031	0.057
2004	6	0.030	0.037
2005	4	0.031	0.024
2006	4	0.030	0.024
2007	4	0.029	0.028
2008	3	0.029	0.025
2009	11	0.030	0.021
Average	-	0.030	0.031
% Difference	-	-	2.9%

Figure E.2.15. Upper Bayou Chico CChla Calibration

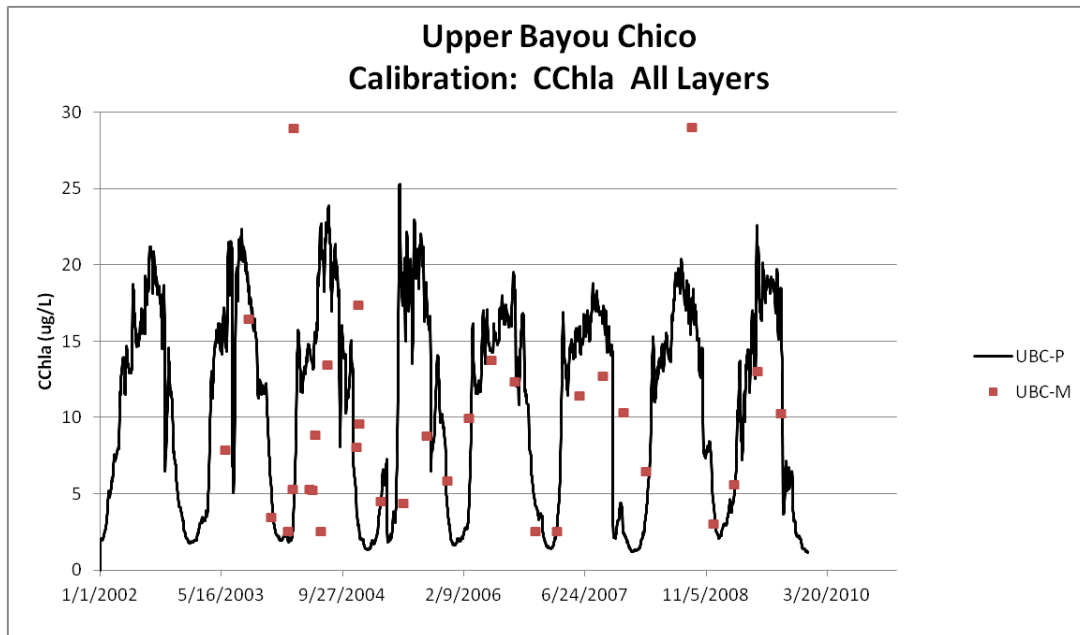


Table E.2.15. Upper Bayou Chico CChla Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Upper CChla (µg/L) All Layers Predicted Average	Upper CChla (µg/L) All Layers Measured Average
2002	-	11.27	-
2003	3	11.49	9.24
2004	11	11.43	9.71
2005	4	10.28	5.84
2006	4	10.97	9.61
2007	4	10.13	9.23
2008	3	10.95	12.82
2009	3	9.94	9.60
Average	-	10.74	9.43
% Difference	-	-	-13.8%

Figure E.2.16. Lower Bayou Chico CChla Calibration

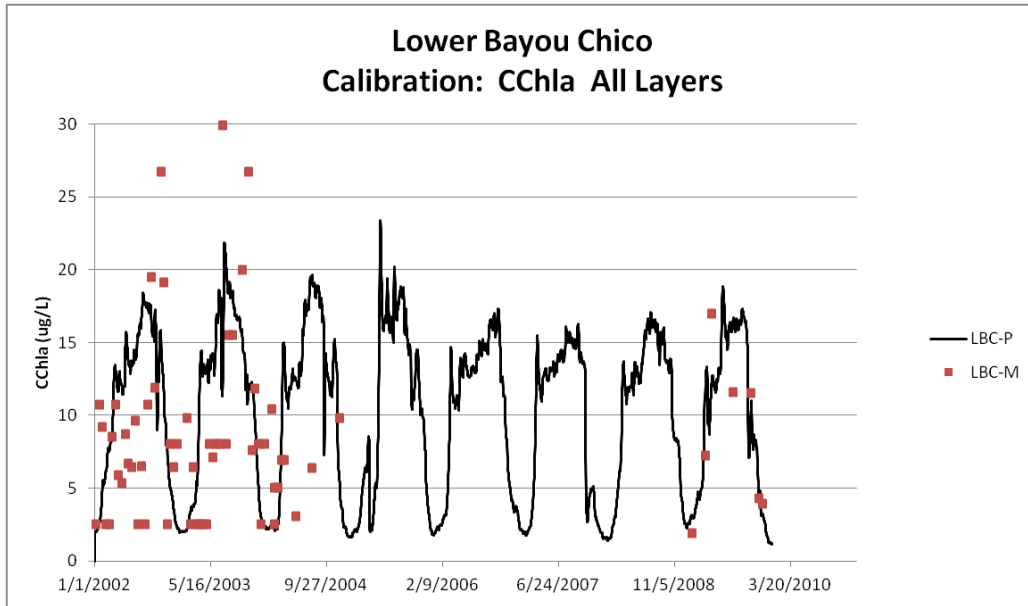


Table E.2.16. Lower Bayou Chico CChla Calibration

- = Empty cell/no data

Bayou Chico Cal	Measured Count	Lower CChla (µg/L) All Layers Predicted Average	Lower CChla (µg/L) All Layers Measured Average
2002	26	10.79	9.37
2003	23	11.21	12.07
2004	10	10.68	5.66
2005	-	10.17	-
2006	-	10.36	-
2007	-	9.44	-
2008	-	10.06	-
2009	7	9.70	9.03
Average	-	10.60	9.03
% Difference	-	-	-17.3%

E.3 Bayou Chico Natural Condition (NC)

The figures and tables in this section present both the predictions for the NC with the same benthic flux of DIN and DIP as the calibrated model (Pfx), as well as with no benthic flux (Pnf).

Figure E.3.1. Upper Bayou Chico NC: TN

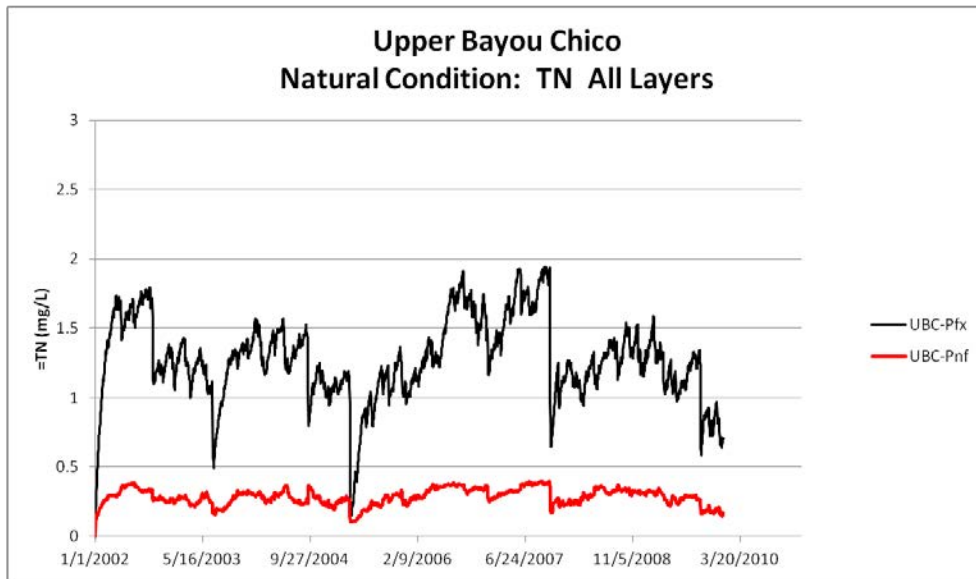


Table E.3.1. Upper Bayou Chico NC: TN

Bayou Chico NatC	Upper TN (mg/L) All Layers Predicted Flux	Upper TN (mg/L) All Layers Predicted No Flux
2002	1.41	0.30
2003	1.18	0.26
2004	1.29	0.28
2005	0.98	0.23
2006	1.48	0.34
2007	1.52	0.32
2008	1.26	0.31
2009	1.10	0.25
Average	1.26	0.28

Figure E.3.2. Lower Bayou Chico NC: TN

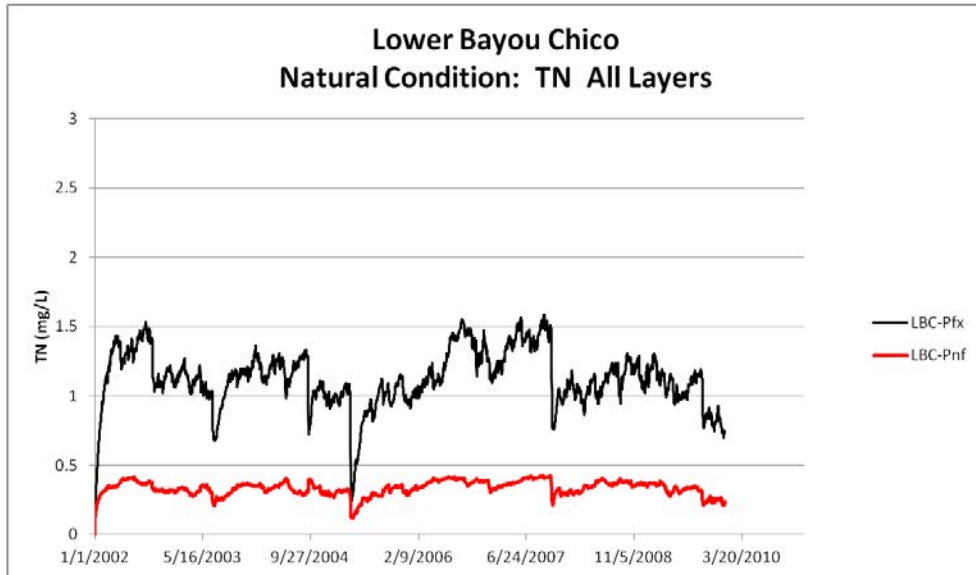


Table E.3.2. Lower Bayou Chico NC: TN

Bayou Chico NatC	Lower TN (mg/L) All Layers Predicted Flux	Lower TN (mg/L) All Layers Predicted No Flux
2002	1.21	0.34
2003	1.07	0.31
2004	1.15	0.33
2005	0.92	0.29
2006	1.25	0.38
2007	1.28	0.36
2008	1.11	0.36
2009	1.02	0.31
Average	1.12	0.33

Figure E.3.3. Upper Bayou Chico NC: TP

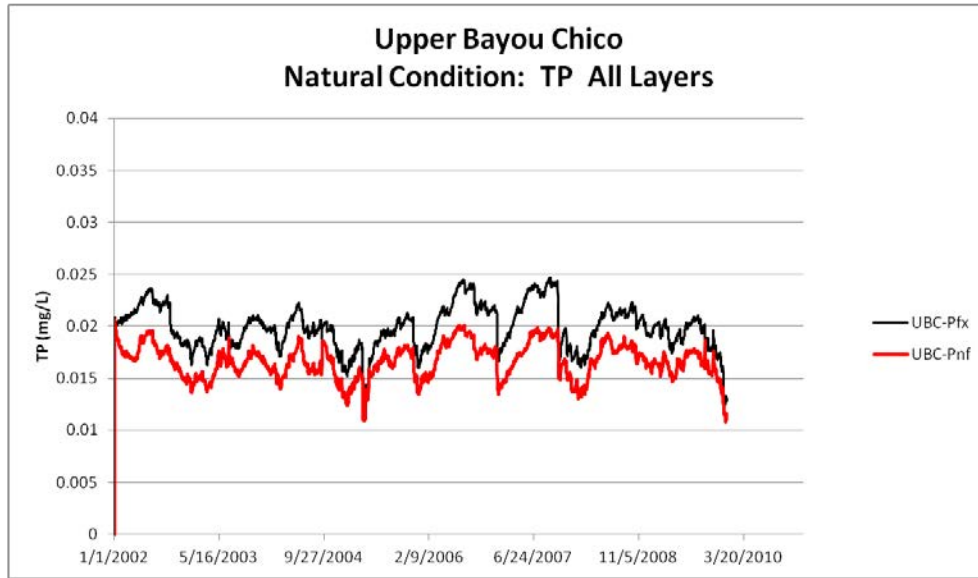


Table E.3.3. Upper Bayou Chico NC: TP

Bayou Chico NatC	Upper TP (mg/L) All Layers Predicted Flux	Upper TP (mg/L) All Layers Predicted No Flux
2002	0.021	0.017
2003	0.019	0.016
2004	0.019	0.016
2005	0.018	0.016
2006	0.021	0.018
2007	0.021	0.017
2008	0.020	0.017
2009	0.019	0.016
Average	0.020	0.017

Figure E.3.4. Lower Bayou Chico NC: TP

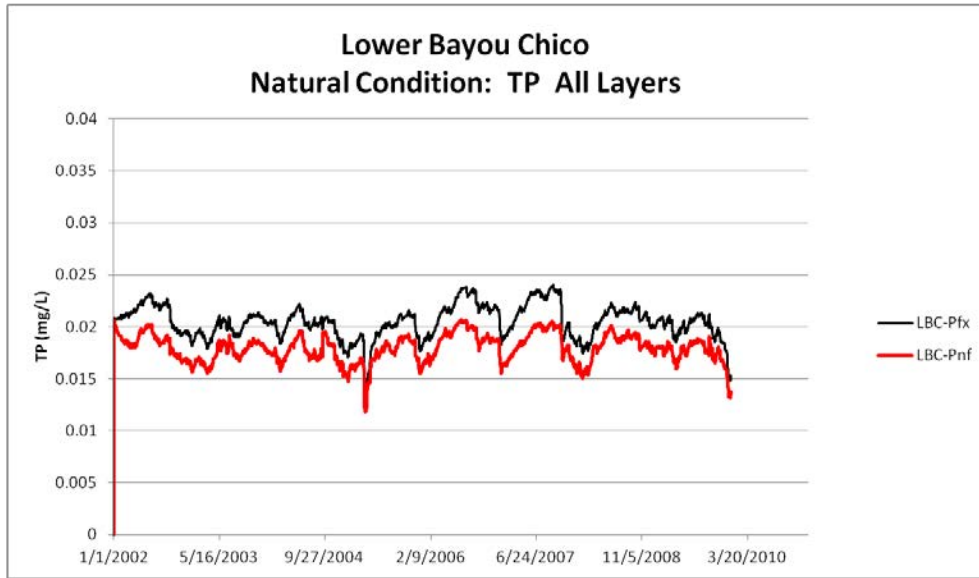


Table E.3.4. Lower Bayou Chico NC: TP

Bayou Chico NatC	Lower TP (mg/L) All Layers Predicted Flux	Lower TP (mg/L) All Layers Predicted No Flux
2002	0.021	0.018
2003	0.020	0.017
2004	0.020	0.018
2005	0.019	0.017
2006	0.022	0.019
2007	0.021	0.018
2008	0.021	0.018
2009	0.020	0.017
Average	0.020	0.018

Figure E.3.5. Upper Bayou Chico NC: CChla

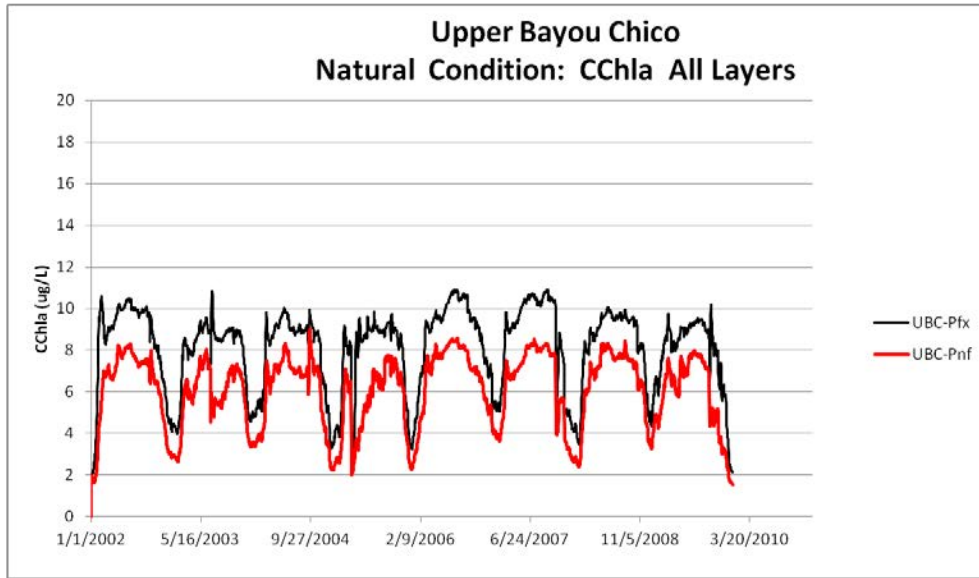


Table E.3.5. Upper Bayou Chico NC: CChla

Bayou Chico NatC	Upper CChla (ug/L) All Layers Predicted Flux	Upper CChla (ug/L) All Layers Predicted No Flux
2002	8.44	6.28
2003	7.85	5.75
2004	7.92	6.12
2005	7.44	5.23
2006	8.83	6.80
2007	8.61	6.42
2008	8.09	6.34
2009	7.78	5.77
Average	8.07	6.06

Figure E.3.6. Lower Bayou Chico NC: CChla

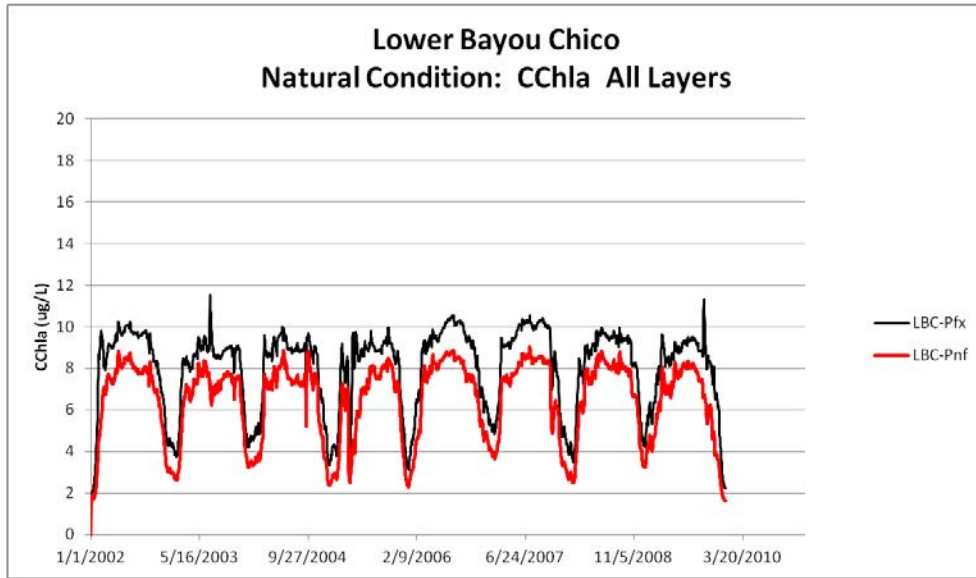


Table E.3.6. Lower Bayou Chico NC: CChla

Bayou Chico NatC	Lower CChla (ug/L) All Layers Predicted Flux	Lower CChla (ug/L) All Layers Predicted No Flux
2002	8.27	6.65
2003	7.84	6.38
2004	7.87	6.45
2005	7.57	5.94
2006	8.55	7.02
2007	8.47	6.80
2008	8.01	6.65
2009	7.84	6.22
Average	7.96	6.42

E.4 Bayou Chico TMDL (Nutrients)

Figure E.4.1. Upper Bayou Chico TMDL: TN

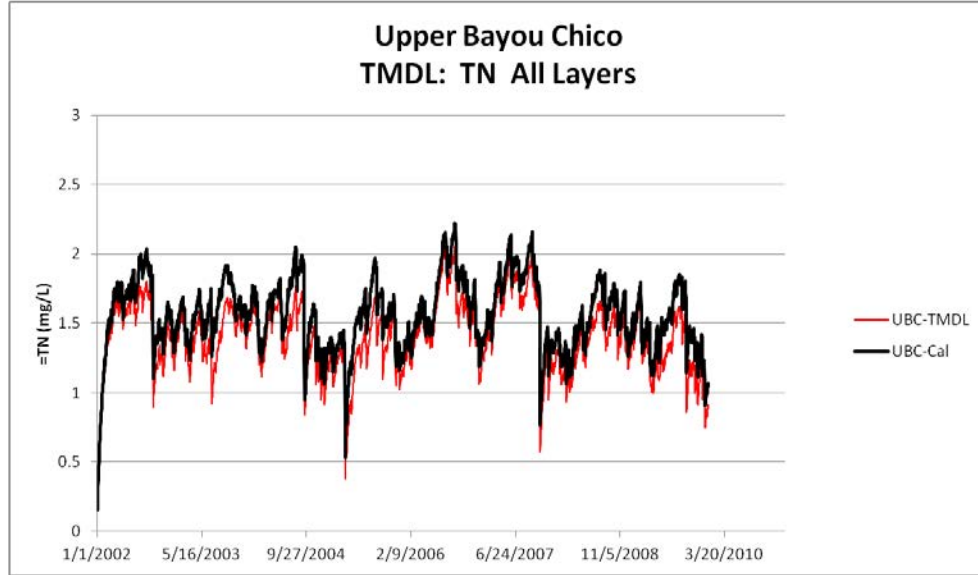


Table E.4.1. Upper Bayou Chico TMDL: TN

Bayou Chico	Measured	Upper TN (mg/L) All Layers Calibration	Upper TN (mg/L) All Layers TMDL	Upper TN (mg/L) All Layers Natural
2002	1.63	1.56	1.43	1.41
2003	1.02	1.58	1.41	1.18
2004	1.20	1.57	1.41	1.29
2005	2.25	1.45	1.26	0.98
2006	2.07	1.68	1.56	1.48
2007	2.15	1.66	1.54	1.52
2008	2.13	1.50	1.36	1.26
2009	2.00	1.44	1.27	1.10
Average	1.83	1.56	1.40	1.26

Figure E.4.2. Lower Bayou Chico TMDL: TN

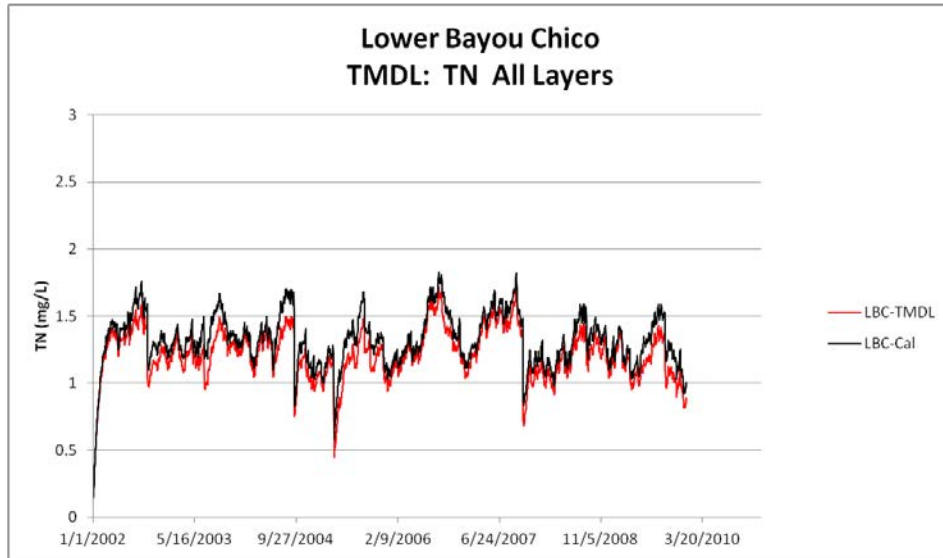


Table E.4.2. Lower Bayou Chico TMDL: TN

Bayou Chico	Measured	Lower TN (mg/L) All Layers Calibration	Lower TN (mg/L) All Layers TMDL	Lower TN (mg/L) All Layers Natural
2002	0.56	1.32	1.23	1.21
2003	1.47	1.35	1.23	1.07
2004	1.44	1.33	1.23	1.15
2005	1.83	1.24	1.11	0.92
2006	1.40	1.39	1.31	1.25
2007	1.37	1.39	1.30	1.28
2008	1.38	1.28	1.19	1.11
2009	1.00	1.26	1.14	1.02
Average	1.41	1.32	1.22	1.12

Figure E.4.3. Upper Bayou Chico TMDL: TP

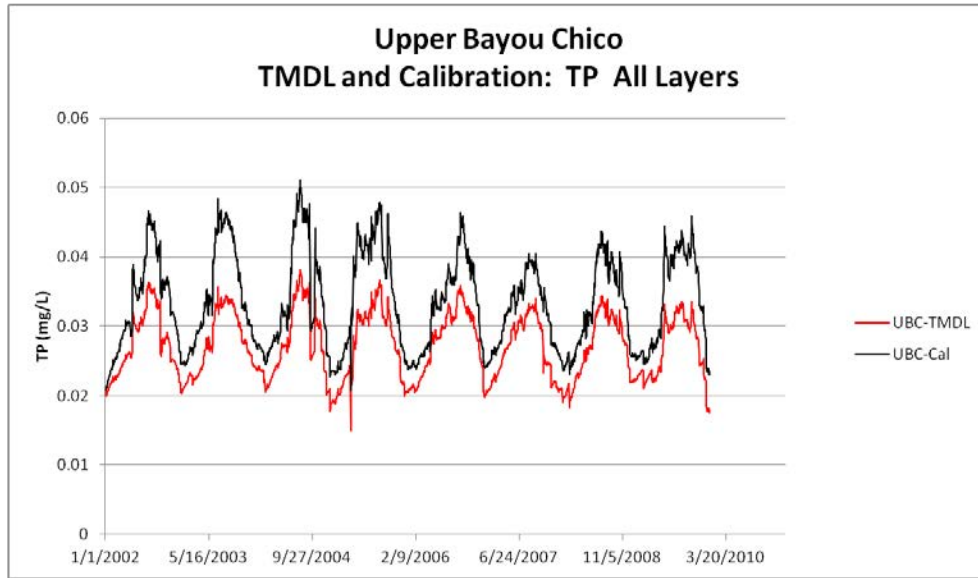


Table E.4.3. Upper Bayou Chico TMDL: TP

Bayou Chico	Measured	Upper TP (mg/L) All Layers Calibration	Upper TP (mg/L) All Layers TMDL	Upper TP (mg/L) All Layers Natural
2002	0.089	0.033	0.028	0.021
2003	0.063	0.034	0.028	0.019
2004	0.032	0.034	0.027	0.019
2005	0.065	0.035	0.027	0.018
2006	0.042	0.033	0.028	0.021
2007	0.047	0.032	0.027	0.021
2008	0.056	0.032	0.026	0.020
2009	0.048	0.034	0.027	0.019
Average	0.050	0.033	0.027	0.020

Figure E.4.4. Lower Bayou Chico TMDL: TP

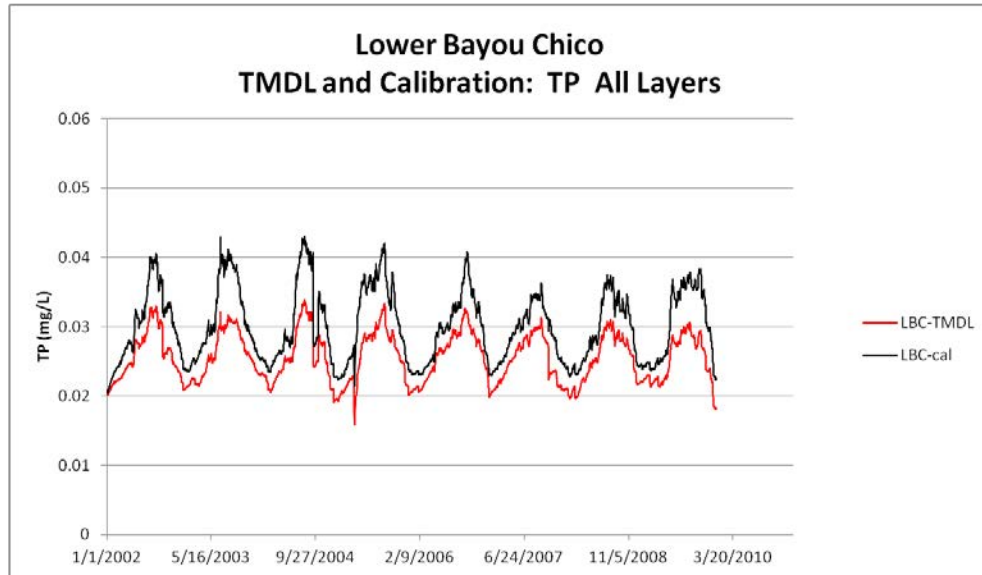


Table E.4.4. Lower Bayou Chico TMDL: TP

Bayou Chico	Measured	Lower TP (mg/L) All Layers Calibration	Lower TP (mg/L) All Layers TMDL	Lower TP (mg/L) All Layers Natural
2002	0.038	0.030	0.026	0.021
2003	0.057	0.031	0.026	0.020
2004	0.037	0.030	0.026	0.020
2005	0.024	0.031	0.025	0.019
2006	0.024	0.030	0.026	0.022
2007	0.028	0.029	0.025	0.021
2008	0.025	0.029	0.025	0.021
2009	0.021	0.030	0.025	0.020
Average	0.031	0.030	0.025	0.020

Figure E.4.5. Upper Bayou Chico TMDL: CChla

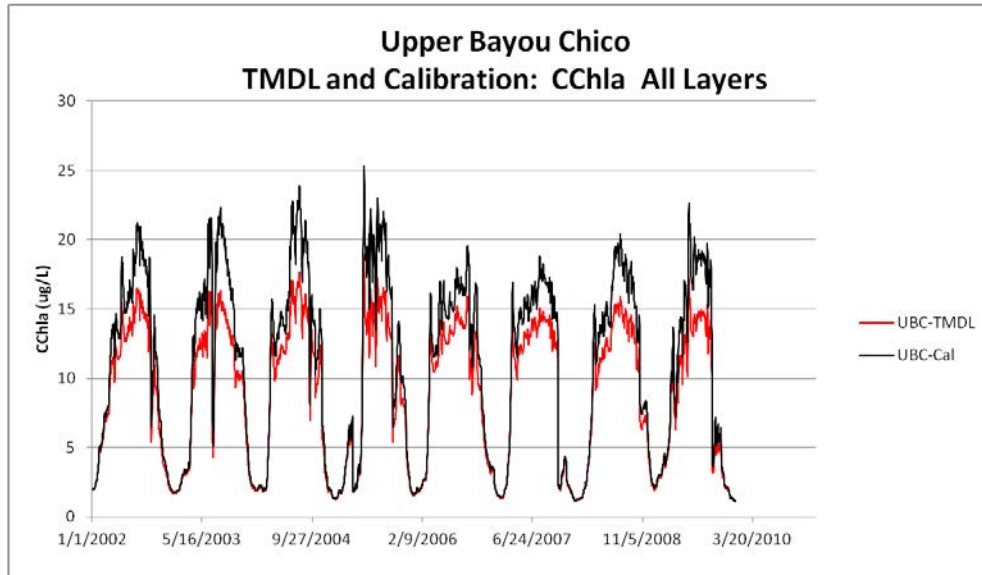


Table E.4.5. Upper Bayou Chico TMDL: CChla

- = Empty cell/no data

Bayou Chico	Measured	Upper CChla (µg/L) All Layers Calibration	Upper CChla (µg/L) All Layers TMDL	Upper CChla (µg/L) All Layers Natural
2002	-	11.27	9.45	8.44
2003	9.24	11.49	9.24	7.85
2004	9.71	11.43	9.31	7.92
2005	5.84	10.28	8.28	7.44
2006	9.61	10.97	9.44	8.83
2007	9.23	10.13	8.68	8.61
2008	12.82	10.95	9.12	8.09
2009	9.60	9.94	8.07	7.78
Average	9.43	10.74	8.88	8.07

Figure E.4.6. Lower Bayou Chico TMDL: CChla

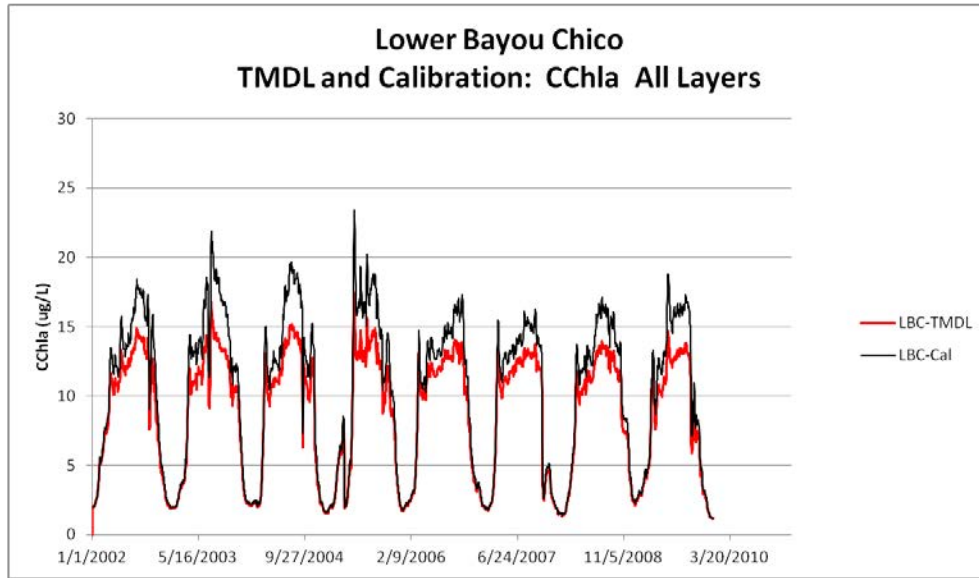


Table E.4.6. Lower Bayou Chico TMDL: CChla

Bayou Chico	Measured	Lower CChla (µg/L) All Layers Calibration	Lower CChla (µg/L) All Layers TMDL	Lower CChla (µg/L) All Layers Natural
2002	10.85	10.79	9.31	8.27
2003	10.25	11.21	9.26	7.84
2004	10.67	10.68	9.00	7.87
2005	9.30	10.17	8.43	7.57
2006	11.39	10.36	9.16	8.55
2007	10.23	9.44	8.39	8.47
2008	10.83	10.06	8.71	8.01
2009	9.48	9.70	8.16	7.84
Average	10.37	10.60	8.93	7.96

E.5 North Escambia Bay (NEB) Calibration

Figure E.5.1. Pensacola Bay EPA Calibration Stations and Station A4

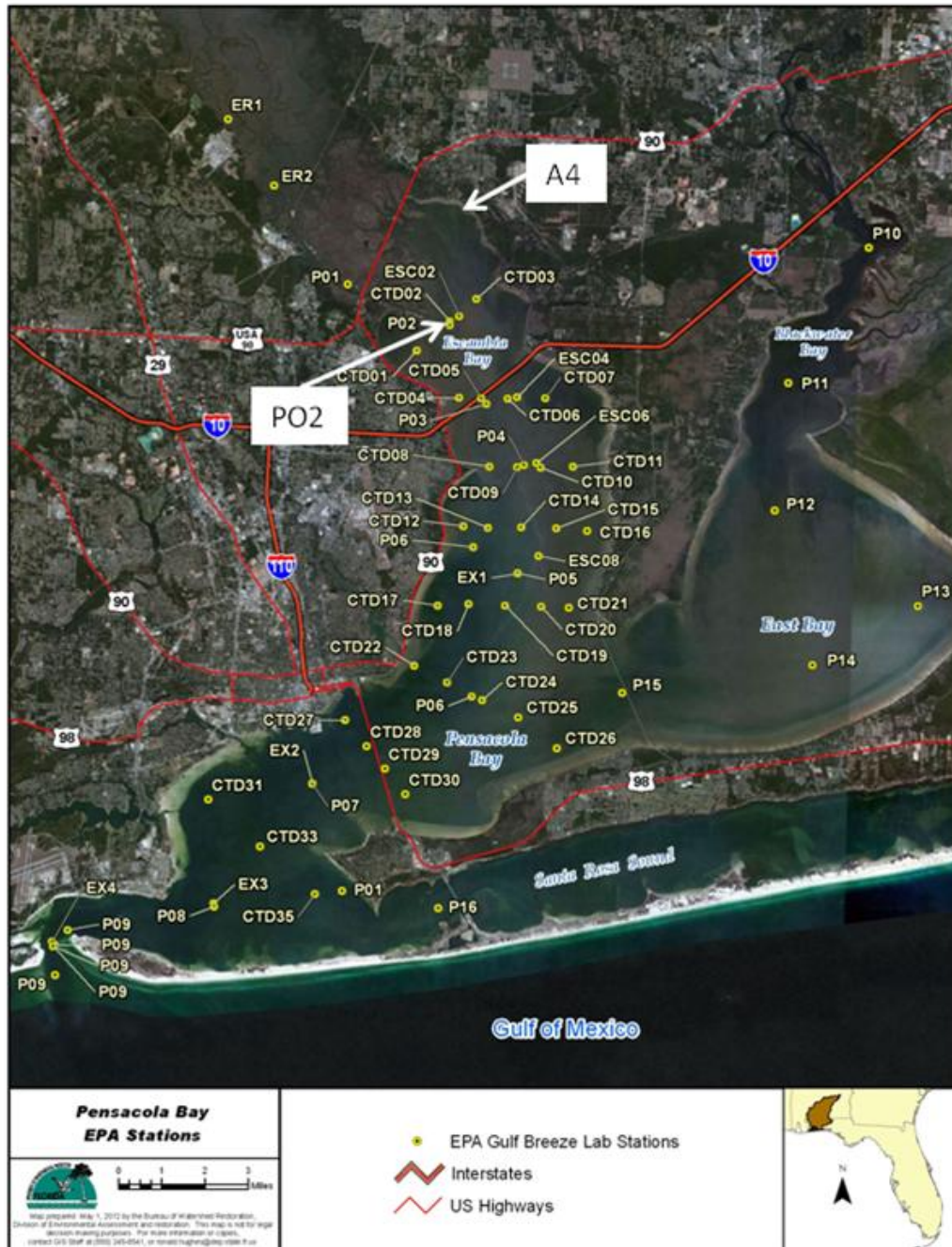


Figure E.5.2. NEB: Temperature Calibration Station PO2

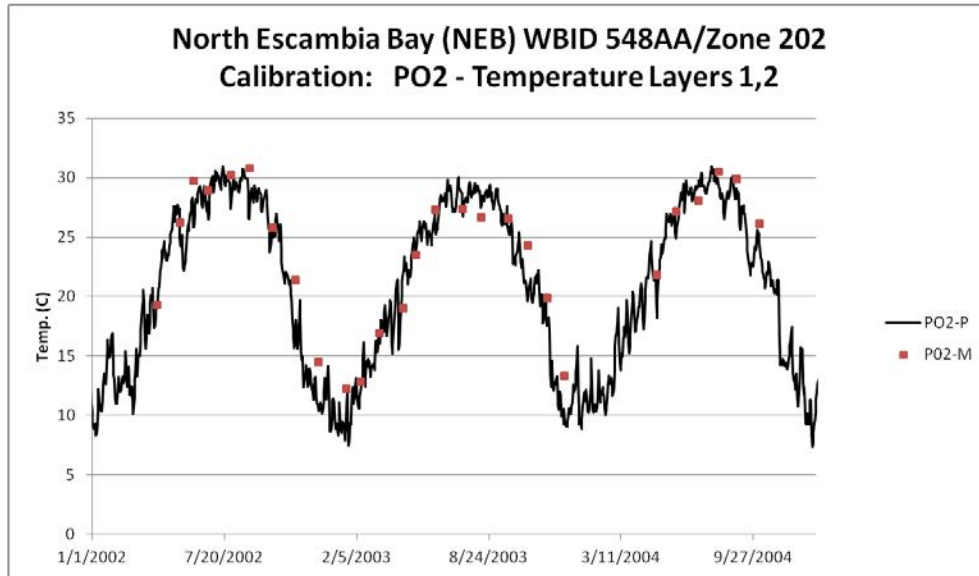


Table E.5.1 NEB: Temperature Calibration Station PO2

- = Empty cell/no data

NEB Cal	Temp (C) Measured Count	PO2 Predicted Average	PO2 Measured Average
2002	9	21.08	25.22
2003	12	20.68	20.85
2004	6	20.50	27.29
2005	-	20.66	-
2006	-	21.63	-
2007	-	21.38	-
2008	-	20.62	-
2009	-	20.42	-
Average	-	20.87	24.45
% Difference	-	-	14.6

Figure E.5.3. NEB: Temperature Calibration Station A4

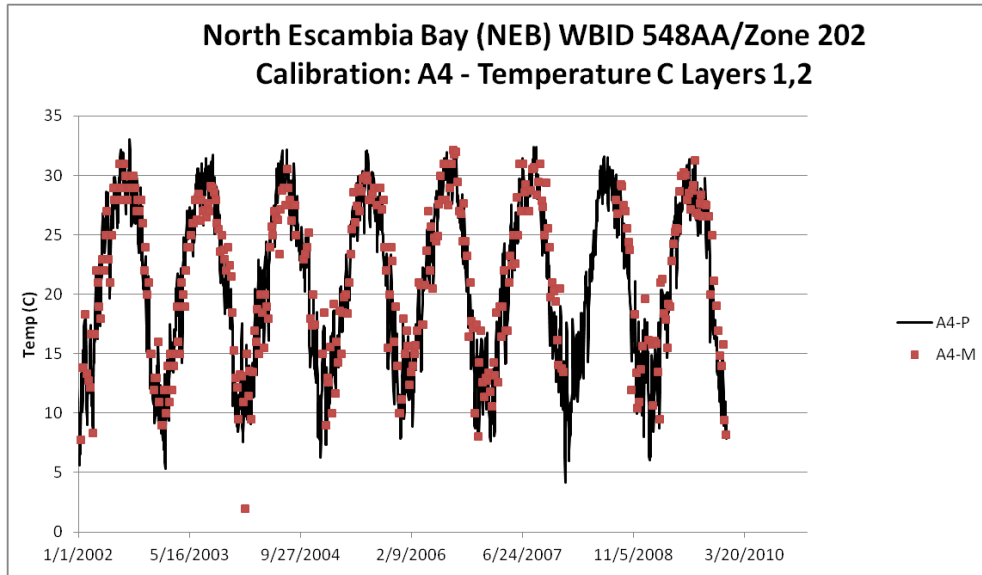


Table E.5.2. NEB: Temperature Calibration Station A4

- = Empty cell/no data

NEB Cal	Temp (C) Measured Count	A4 Predicted Average	A4 Measured Average
2002	52	21.15	21.82
2003	52	20.97	20.84
2004	44	20.85	20.90
2005	50	20.79	21.08
2006	52	21.33	21.89
2007	51	21.20	21.72
2008	17	20.55	20.93
2009	49	20.65	22.14
Average	-	20.93	21.42
% Difference	-	-	2.25

Figure E.5.4. NEB: Salinity Calibration Station PO2

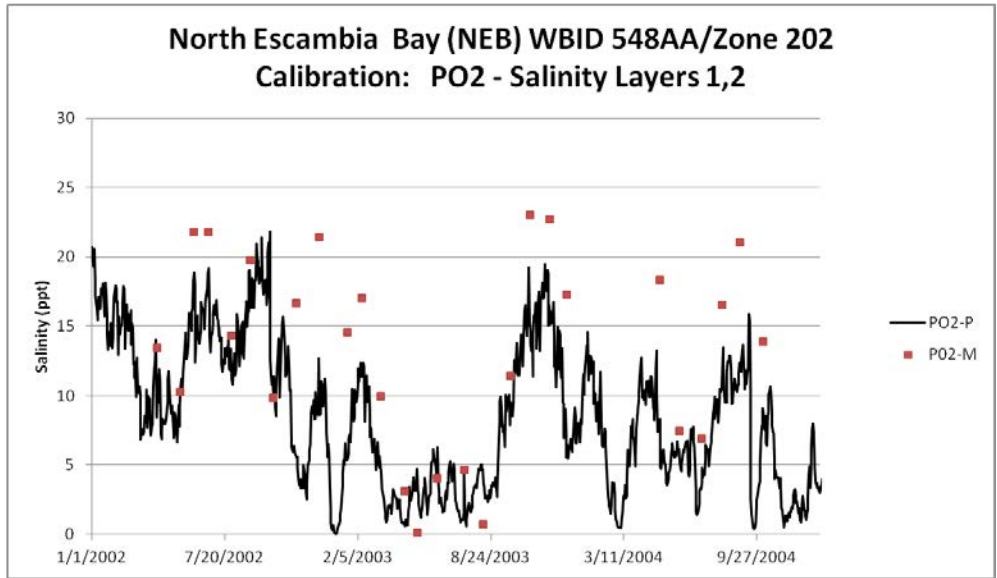


Table E.5.3. NEB: Salinity Calibration Station PO2

- = Empty cell/no data

NEB Cal	Salinity (ppt) Measured Count	PO2 Predicted Average	PO2 Measured Average
2002	9	12.47	16.61
2003	12	6.62	10.73
2004	6	6.51	14.05
2005	-	7.08	-
2006	-	14.40	-
2007	-	13.50	-
2008	-	8.61	-
2009	-	6.42	-
Average	-	9.45	13.80
% Difference	-	-	31.5

Figure E.5.5. NEB: Salinity Calibration Station A4

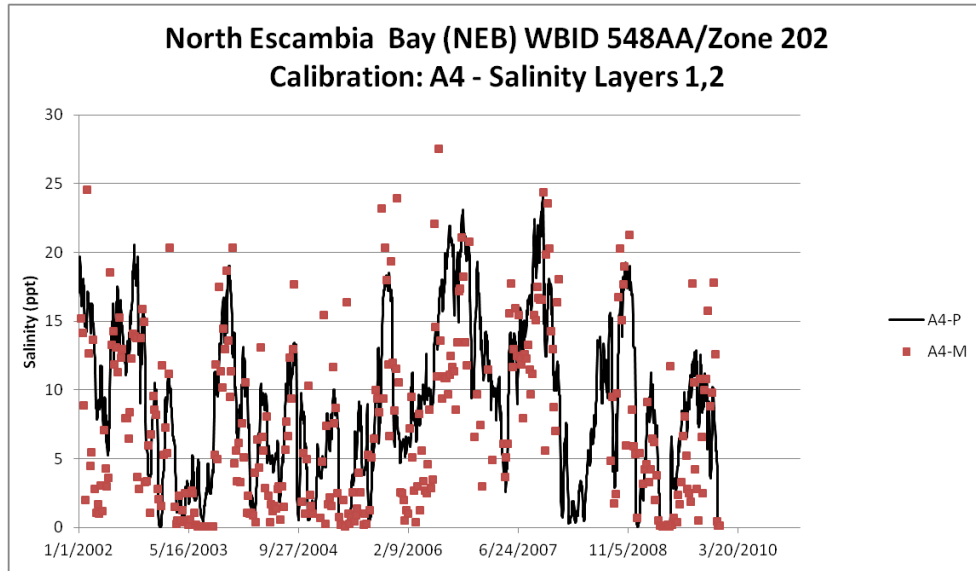


Table E.5.4. NEB: Salinity Calibration Station A4

- = Empty cell/no data

NEB Cal	Salinity (ppt) Measured Count	A4 Predicted Average	A4 Measured Average
2002	52	12.38	9.15
2003	49	6.57	5.37
2004	44	6.22	4.66
2005	48	6.83	6.70
2006	47	13.65	9.09
2007	41	13.28	12.74
2008	17	8.01	10.04
2009	50	6.13	4.78
Average	-	9.13	7.82
% Difference	-	-	-16.8

Figure E.5.6. EPA/NEB: CChla Calibration Station PO2

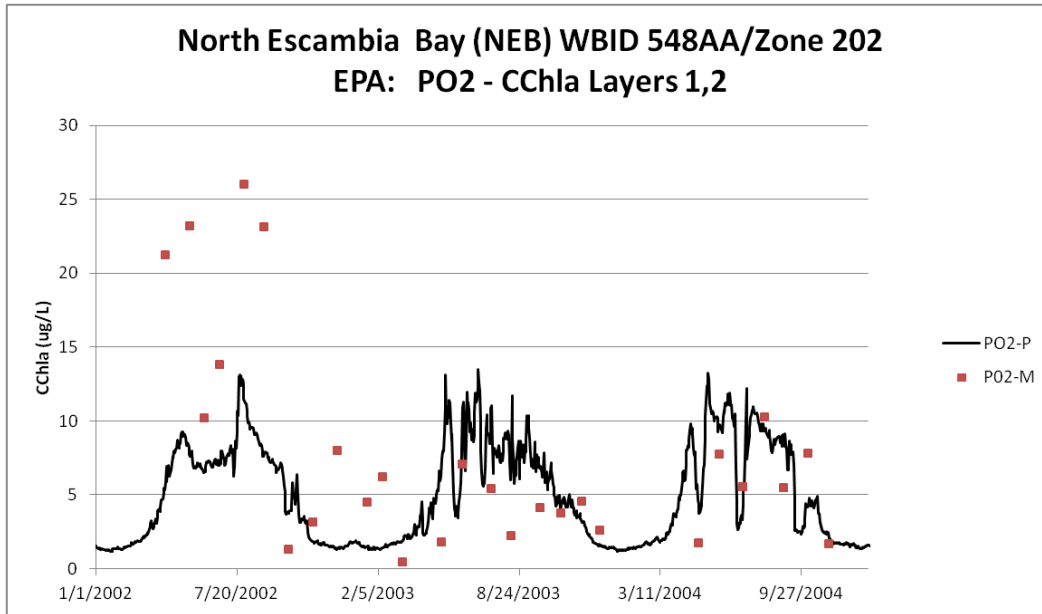


Table E.5.5. EPA/NEB: CChla Calibration Station PO2

- = Empty cell/no data

NEB EPA	CChla (µg/L) Measured Count	PO2 Predicted Average	PO2 Measured Average
2002	9	4.92	14.47
2003	11	5.01	3.91
2004	7	5.00	5.77
2005	-	4.69	-
2006	-	5.44	-
2007	-	5.85	-
2008	-	5.80	-
2009	-	5.27	-
Average	-	4.98	8.05
% Difference	-	-	38.2

Figure E.5.7. EPA/NEB: CChla Calibration Station A4

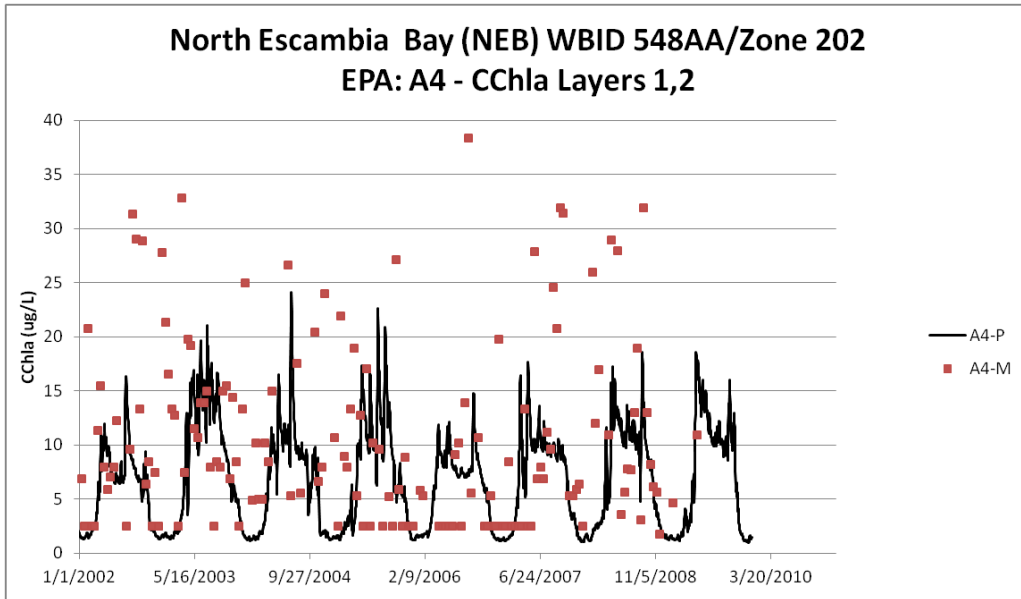


Table E.5.6. EPA/NEB: CChla Calibration Station A4

- = Empty cell/no data

NEB EPA	CChla (µg/L) Measured Count	A4 Predicted Average	A4 Measured Average
2002	24	5.70	11.40
2003	26	8.24	13.05
2004	16	6.69	13.33
2005	24	7.21	8.62
2006	21	6.04	14.27
2007	26	6.79	11.05
2008	19	7.21	13.15
2009	2	7.10	7.85
Average	-	6.87	11.59
% Difference	-	-	40.7

Figure E.5.8. EPA/NEB: NH4-N Calibration Station PO2

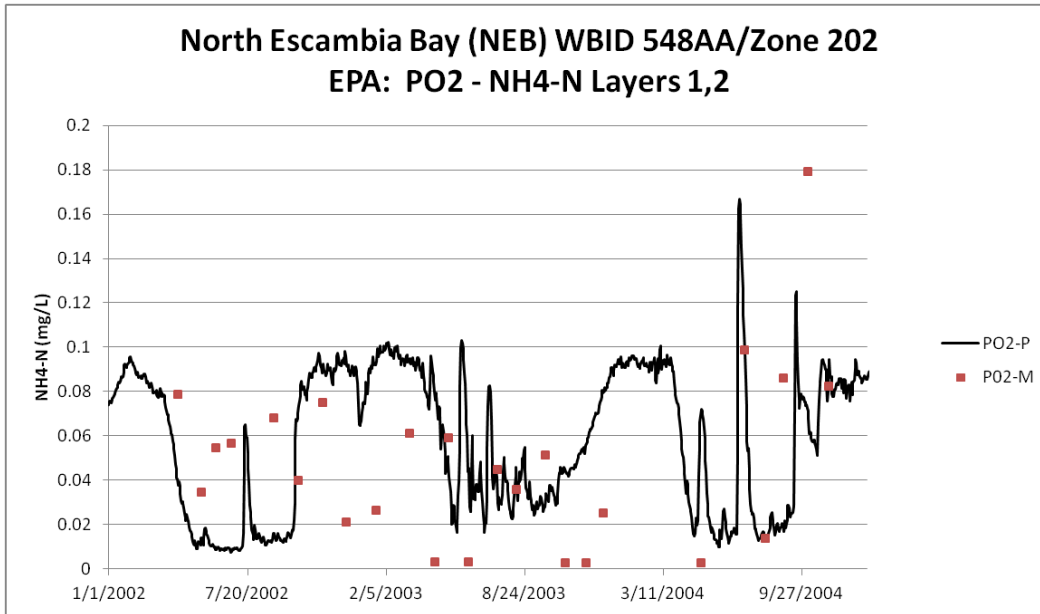


Table E.5.7. EPA/NEB: NH4-N Calibration Station PO2

- = Empty cell/no data

NEB EPA	NH4-N (mg/L) Measured Count	PO2 Predicted Average	PO2 Measured Average
2002	8	0.0520	0.0537
2003	11	0.0606	0.0288
2004	6	0.0622	0.0772
2005	-	0.0656	-
2006	-	0.0497	-
2007	-	0.0608	-
2008	-	0.0624	-
2009	-	0.0674	-
Average	-	0.0583	0.0532
% Difference	-	-	-9.4

Figure E.5.9. EPA/NEB: NH4-N Calibration Station A4

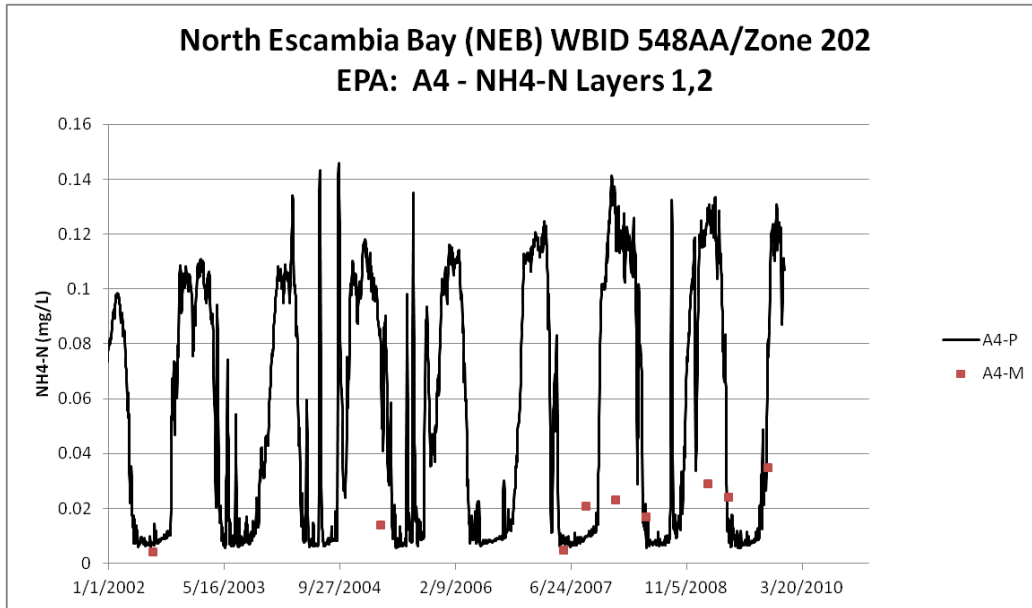


Table E.5.8. EPA/NEB: NH4-N Calibration Station A4

- = Empty cell/no data

NEB EPA	NH4-N (mg/L) Measured Count	A4 Predicted Average	A4 Measured Average
2002	1	0.0486	0.0041
2003	-	0.0469	-
2004	-	0.0578	-
2005	1	0.0559	0.0140
2006	-	0.0467	-
2007	2	0.0568	0.0130
2008	2	0.0571	0.0200
2009	3	0.0639	0.0293
Average	-	0.0565	0.0161
% Difference	-	-	-251.0

Figure E.5.10. EPA/NEB: NO3-N Calibration Station PO2

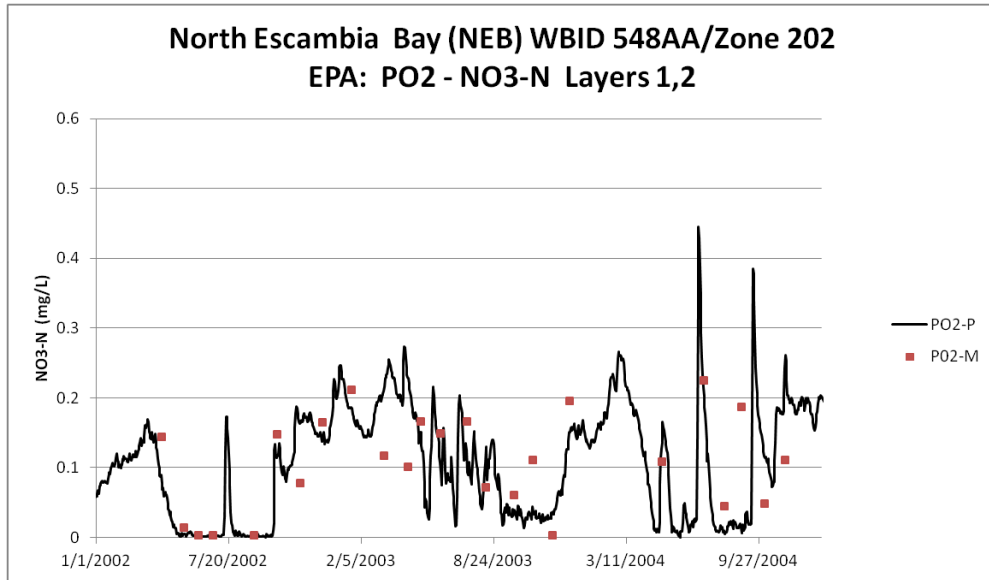


Table E.5.9. EPA/NEB: NO3-N Calibration Station PO2

- = Empty cell/no data

NEB EPA	NO3-N (mg/L) Measured Count	PO2 Predicted Average	PO2 Measured Average
2002	8	0.0758	0.0699
2003	11	0.1198	0.1233
2004	6	0.1254	0.1212
2005	-	0.1304	-
2006	-	0.0650	-
2007	-	0.0927	-
2008	-	0.1236	-
2009	-	0.1393	-
Average	-	0.1070	0.1048
% Difference	-	-	-2.1

Figure E.5.11. EPA/NEB: NO₃-N Calibration Station A4

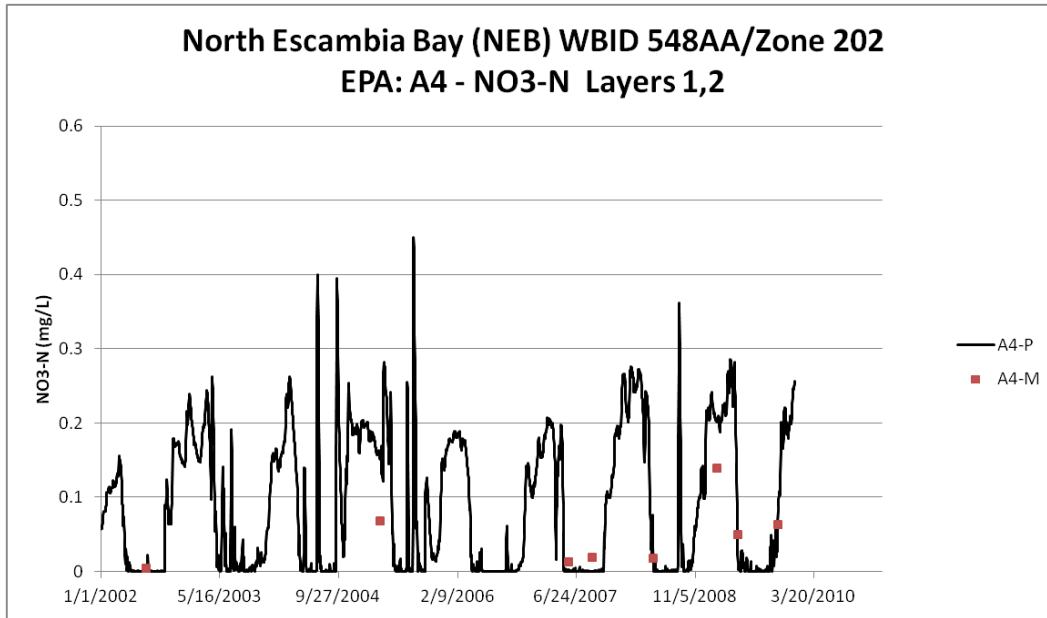


Table E.5.10. EPA/NEB: NO₃-N Calibration Station A4

- = Empty cell/no data

NEB EPA	NO ₃ -N (mg/L) Measured Count	A4 Predicted Average	A4 Measured Average
2002	1	0.0661	0.0050
2003	-	0.0810	-
2004	-	0.1116	-
2005	1	0.1048	0.0690
2006	-	0.0604	-
2007	2	0.0823	0.0160
2008	2	0.1094	0.7090
2009	3	0.1157	0.0843
Average	-	0.0957	0.1767
% Difference	-	-	45.9

Figure E.5.12. EPA/NEB: PO4-P Calibration Station PO2

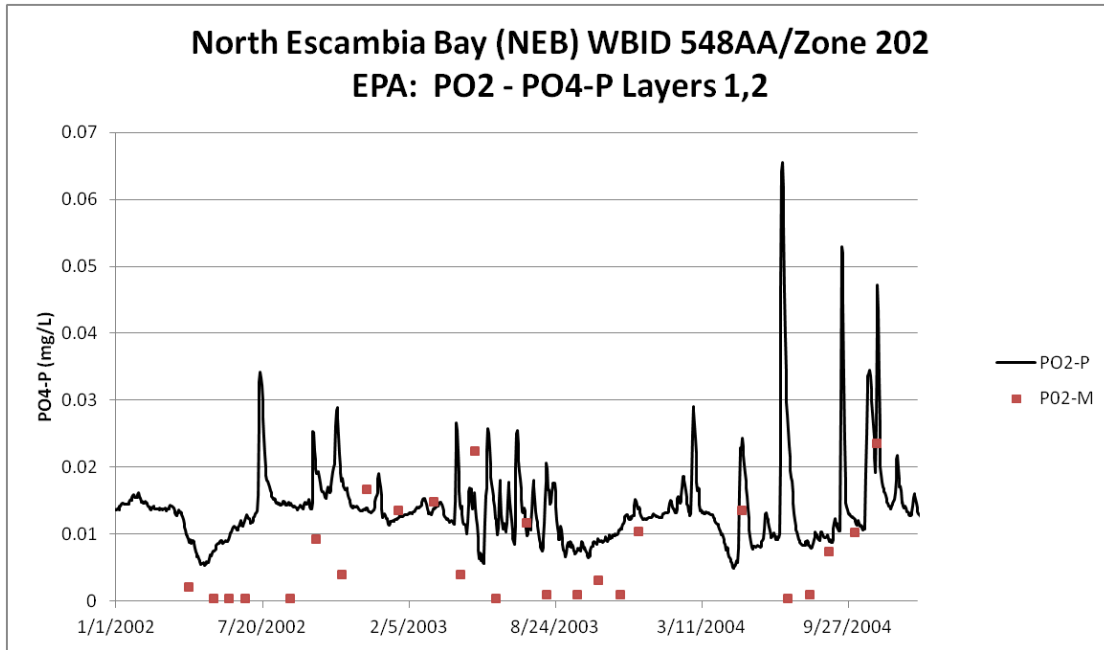


Table E.5.11. EPA/NEB: PO4-P Calibration Station PO2

- = Empty cell/no data

NEB EPA	PO4-P (mg/L) Measured Count	PO2 Predicted Average	PO2 Measured Average
2002	8	0.0140	0.0043
2003	11	0.0124	0.0076
2004	6	0.0150	0.0094
2005	-	0.0137	-
2006	-	0.0162	-
2007	-	0.0147	-
2008	-	0.0146	-
2009	-	0.0148	-
Average	-	0.0138	0.0071
% Difference	-	-	-95.1

Figure E.5.13. EPA/NEB: PO4-P Calibration Station A4

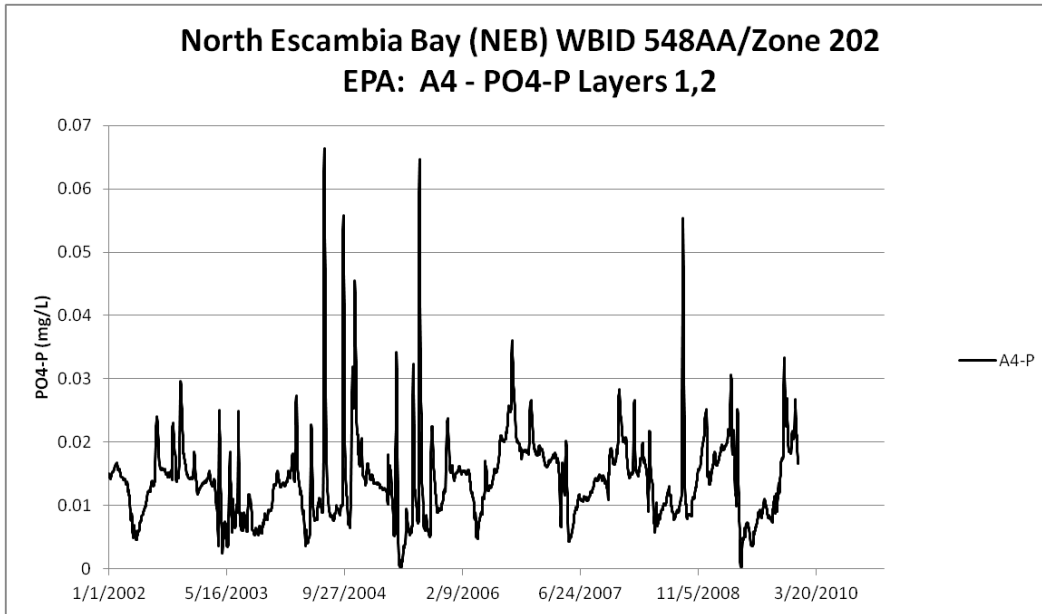


Table E.5.12. EPA/NEB: PO4-P Calibration Station A4

- = Empty cell/no data

NEB EPA	PO4-P (mg/L) Measured Count	A4 Predicted Average	A4 Measured Average
2002	-	0.0142	No Data
2003	-	0.0102	-
2004	-	0.0153	-
2005	-	0.0127	-
2006	-	0.0171	-
2007	-	0.0146	-
2008	-	0.0141	-
2009	-	0.0140	-
Average	-	0.0140	-
% Difference	-	-	No Data

Figure E.5.14. Department/NEB: CChla Calibration Station PO2

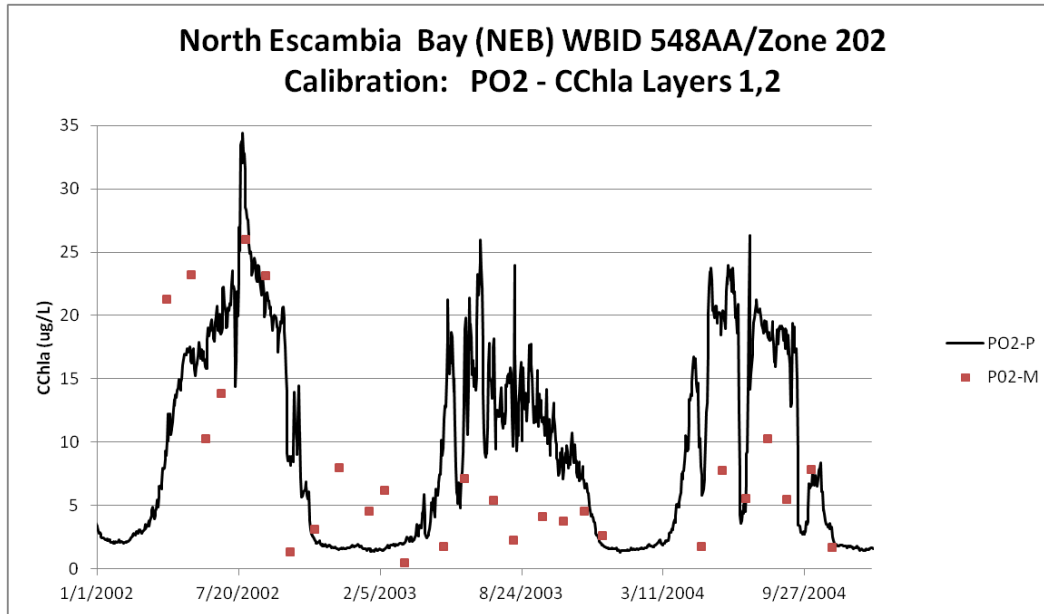


Table E.5.13. Department/NEB: CChla Calibration Station PO2

- = Empty cell/no data

NEB Calibration	CChla (µg/L) Measured Count	PO2 Predicted Average	PO2 Measured Average
2002	9	11.07	14.47
2003	11	8.18	3.91
2004	7	8.87	5.77
2005	-	7.59	-
2006	-	13.84	-
2007	-	11.87	-
2008	-	10.77	-
2009	-	9.03	-
Average	-	9.37	8.05
% Difference	-	-	-16.4

Figure E.5.15a. Department/NEB: CChla Calibration Station A4

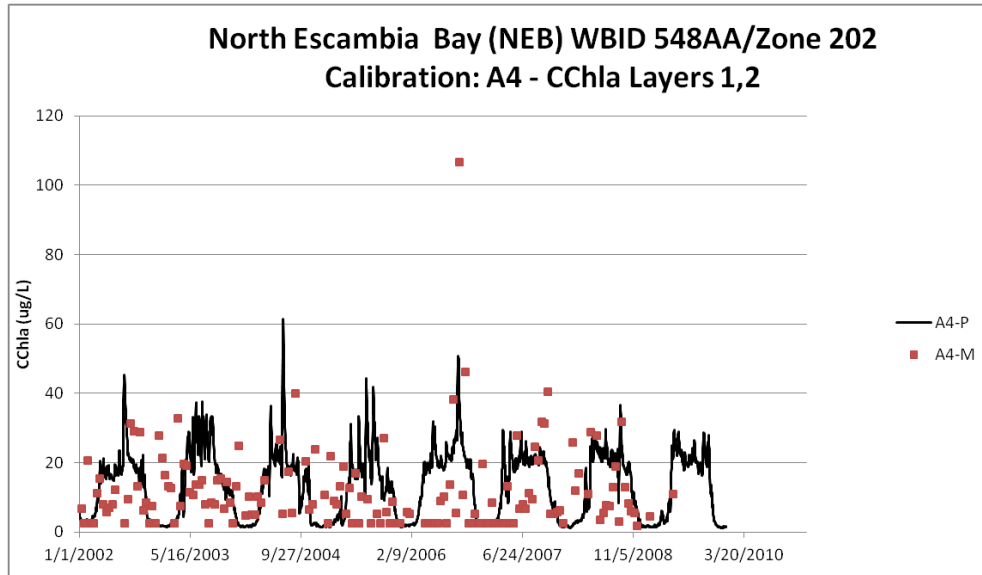


Figure E.5.15b. Department/NEB: CChla Calibration Station A4 Rescaled

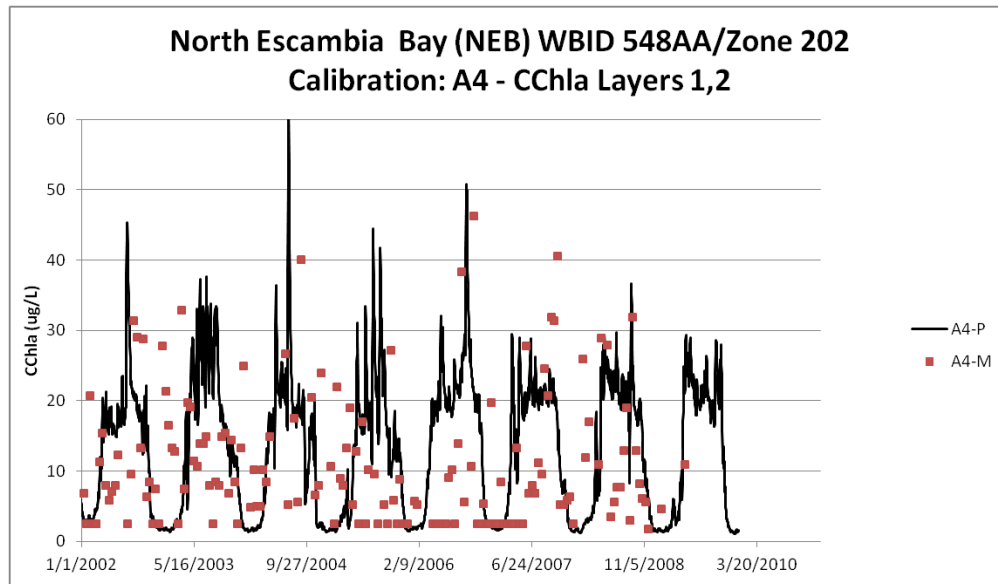


Table E.5.14. Department/NEB: CChla Calibration Station A4

- = Empty cell/no data

NEB Calibration	CChla (µg/L) Measured Count	A4 Predicted Average	A4 Measured Average
2002	24	12.79	11.40
2003	26	14.54	13.05
2004	16	12.57	13.33
2005	24	12.44	8.62
2006	21	15.66	14.27
2007	26	13.50	11.05
2008	19	13.43	13.15
2009	2	12.31	7.85
Average	-	13.41	11.59
% Difference	-	-	-15.7

Figure E.5.16. Department/NEB: NH4-N Calibration Station PO2

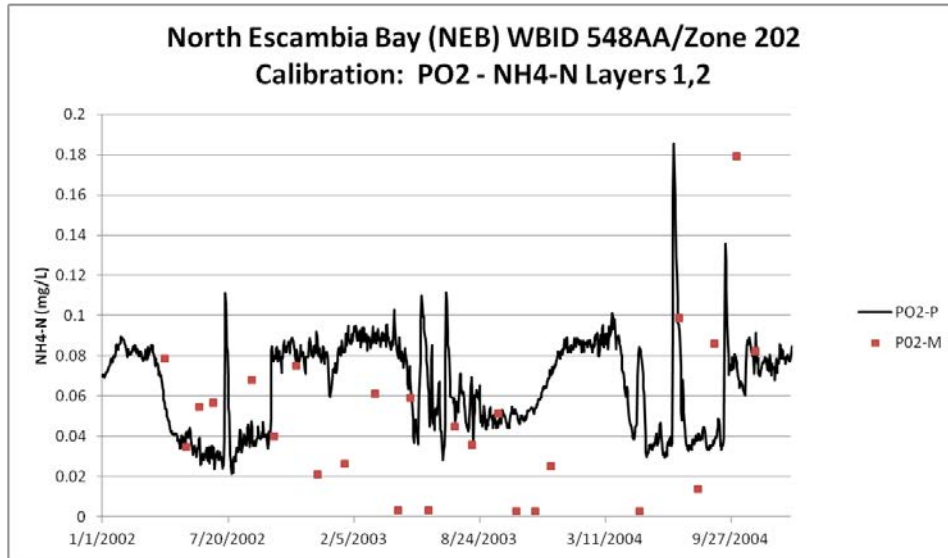


Table E.5.15. Department/NEB: NH4-N Calibration Station PO2

- = Empty cell/no data

NEB Calibration	NH4-N (mg/L) Measured Count	PO2 Predicted Average	PO2 Measured Average
2002	8	0.061	0.054
2003	11	0.067	0.029
2004	6	0.068	0.077
2005	-	0.071	-
2006	-	0.062	-
2007	-	0.075	-
2008	-	0.073	-
2009	-	0.075	-
Average	-	0.065	0.053
% Difference	-	-	-22.7

Figure E.5.17. Department/NEB: NH4-N Calibration Station A4

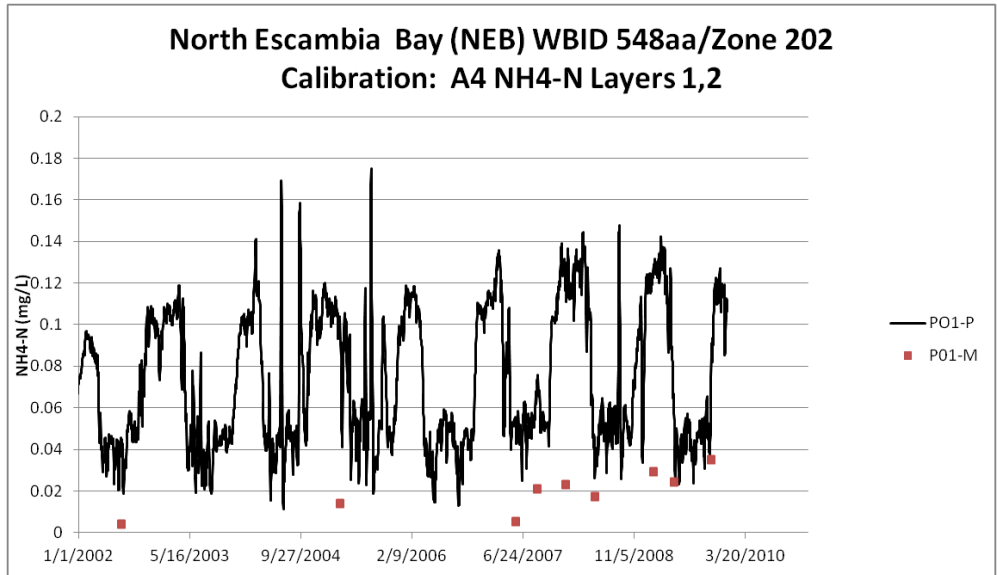


Table E.5.16. Department/NEB: NH4-N Calibration Station A4

- = Empty cell/no data

NEB Calibration	NH4-N (mg/L) Measured Count	A4 Predicted Average	A4 Measured Average
2002	1	0.065	0.004
2003	-	0.064	-
2004	-	0.076	-
2005	1	0.074	0.014
2006	-	0.065	-
2007	2	0.081	0.013
2008	2	0.080	0.020
2009	3	0.082	0.029
Average	-	0.077	0.016
% Difference	-	-	-375.7

Figure E.5.18. Department/NEB: NO₃-N Calibration Station PO2

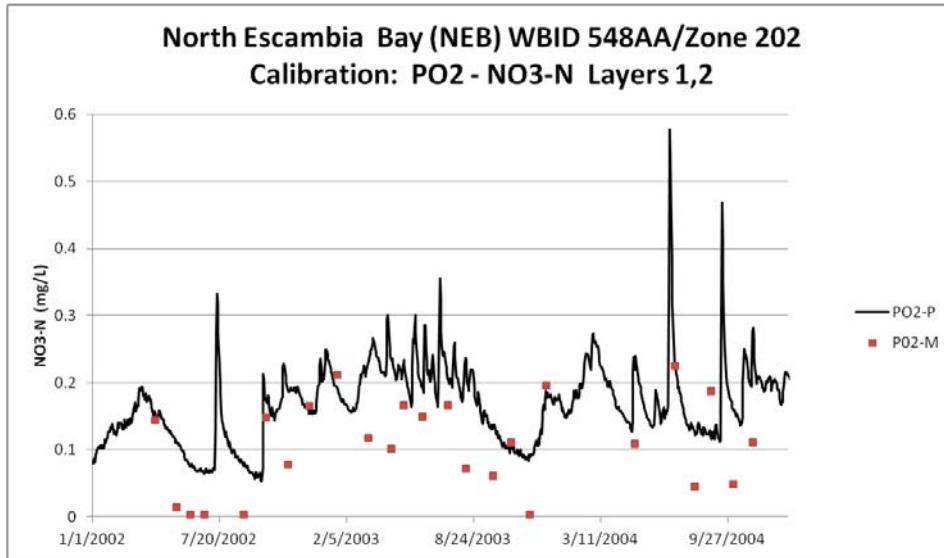


Table E.5.17. Department/NEB: NO₃-N Calibration Station PO2

- = Empty cell/no data

NEB Calibration	NO ₃ -N (mg/L) Measured Count	PO2 Predicted Average	PO2 Measured Average
2002	8	0.132	0.069
2003	11	0.183	0.123
2004	6	0.186	0.121
2005	-	0.189	-
2006	-	0.117	-
2007	-	0.167	-
2008	-	0.197	-
2009	-	0.206	-
Average	-	0.172	0.105
% Difference	-	-	-64.3

Figure E.5.19. Department/NEB: NO₃-N Calibration Station A4

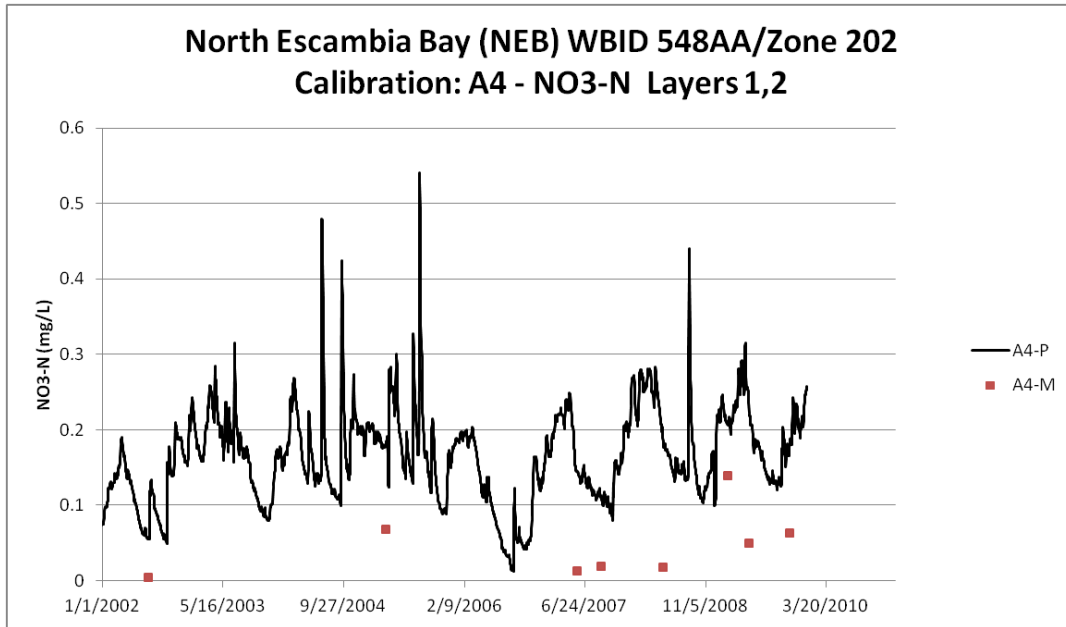


Table E.5.18. Department/NEB: NO₃-N Calibration Station A4

- = Empty cell/no data

NEB Calibration	NO ₃ -N (mg/L) Measured Count	A4 Predicted Average	A4 Measured Average
2002	1	0.123	0.005
2003	-	0.172	-
2004	-	0.182	-
2005	1	0.185	0.069
2006	-	0.110	-
2007	2	0.161	0.016
2008	2	0.192	0.709
2009	3	0.198	0.084
Average	-	0.165	0.177
% Difference	-	-	6.5

Figure E.5.20. Department/NEB: PO4-P Calibration Station PO2

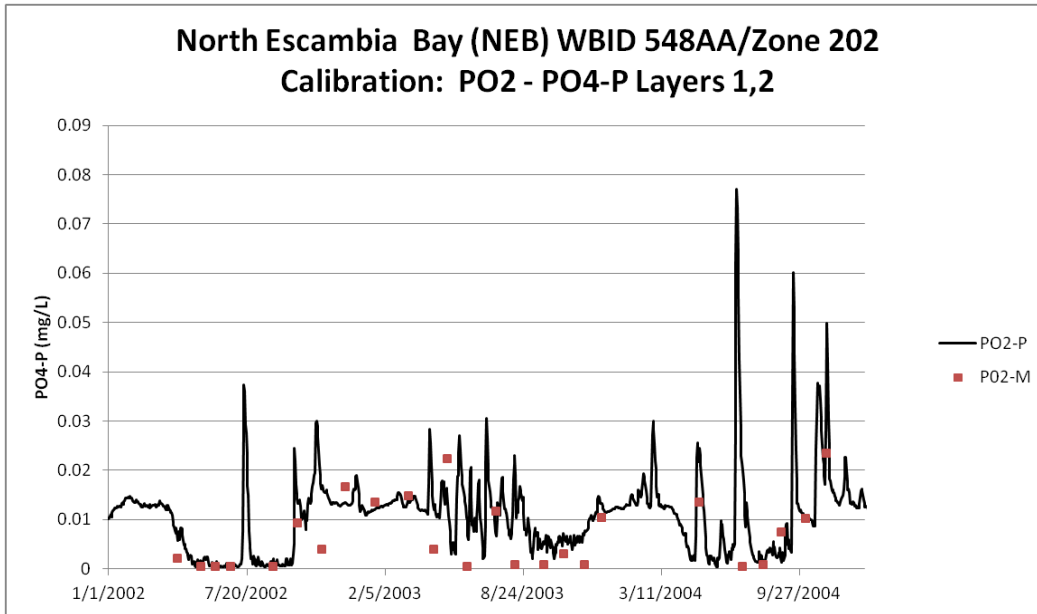


Table E.5.19. Department/NEB: PO4-P Calibration Station PO2

- = Empty cell/no data

NEB Calibration	PO4-P (mg/L) Measured Count	PO2 Predicted Average	PO2 Measured Average
2002	8	0.0087	0.0043
2003	11	0.0110	0.0076
2004	6	0.0127	0.0094
2005	-	0.0123	-
2006	-	0.0077	-
2007	-	0.0097	-
2008	-	0.0111	-
2009	-	0.0131	-
Average	-	0.0108	0.0071
% Difference	-	-	-52.7

Figure E.5.21. Department/NEB: PO4-P Calibration Station A4

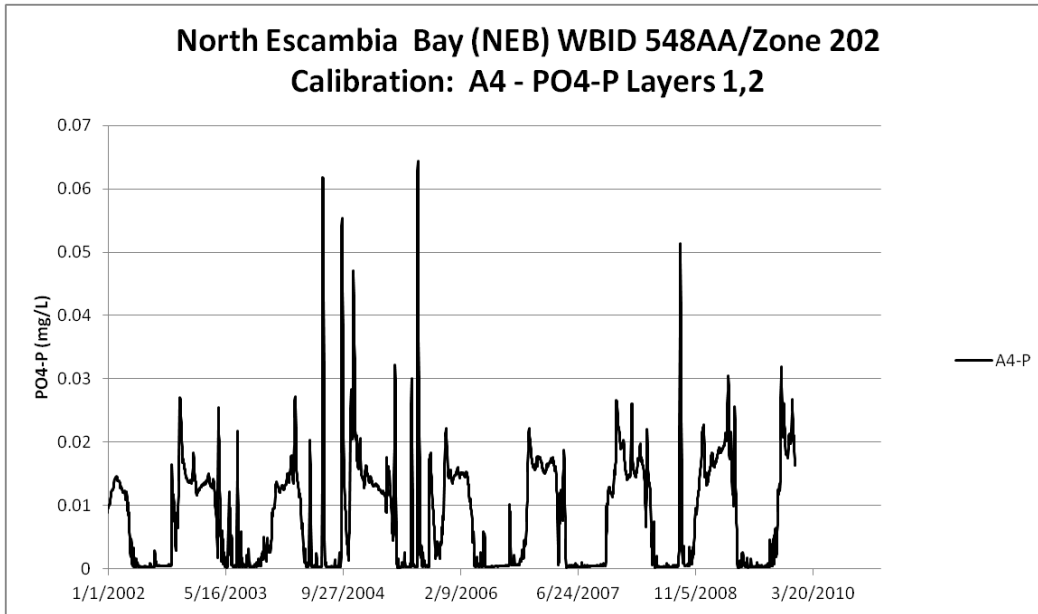


Table E.5.20. Department/NEB: PO4-P Calibration Station A4

- = Empty cell/no data

NEB Calibration	PO4-P (mg/L) Measured Count	A4 Predicted Average	A4 Measured Average
2002	-	0.0071	-
2003	-	0.0063	-
2004	-	0.0111	-
2005	-	0.0094	-
2006	-	0.0063	-
2007	-	0.0082	-
2008	-	0.0091	-
2009	-	0.0105	-
Average	-	0.0085	No Data
% Difference	-	-	-

E.6 North Escambia Bay Natural Condition vs. Department and EPA Calibration for WBID 548AA

Figure E.6.1. TN: Natural vs. Department and EPA Calibration Daily Average for WBID 548AA

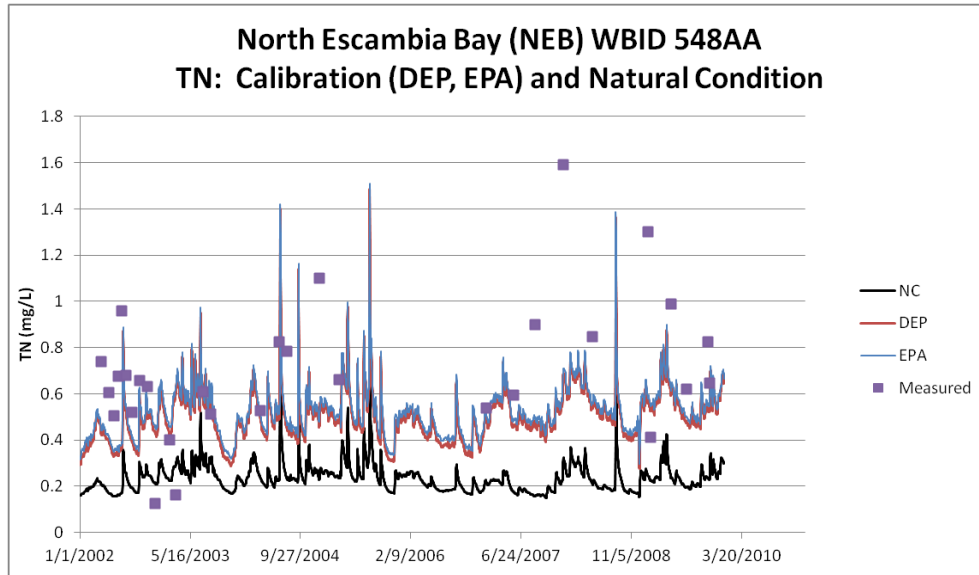


Table E.6.1. TN: Natural vs. Department and EPA Calibration Annual Average for WBID 548AA

- = Empty cell/no data

TN	Measured (mg/L)	Department (mg/L)	EPA (mg/L)	Natural (mg/L)
2002	-	0.43	0.45	0.21
2003	-	0.51	0.53	0.26
2004	0.81	0.52	0.54	0.26
2005	-	0.52	0.55	0.27
2006	-	0.43	0.46	0.21
2007	-	0.50	0.53	0.20
2008	-	0.55	0.58	0.24
2009	0.83	0.56	0.59	0.25
Mean	0.82	0.50	0.53	0.24

Figure E.6.2. Organic-N: Natural vs. Department and EPA Calibration Daily Average for WBID 548AA

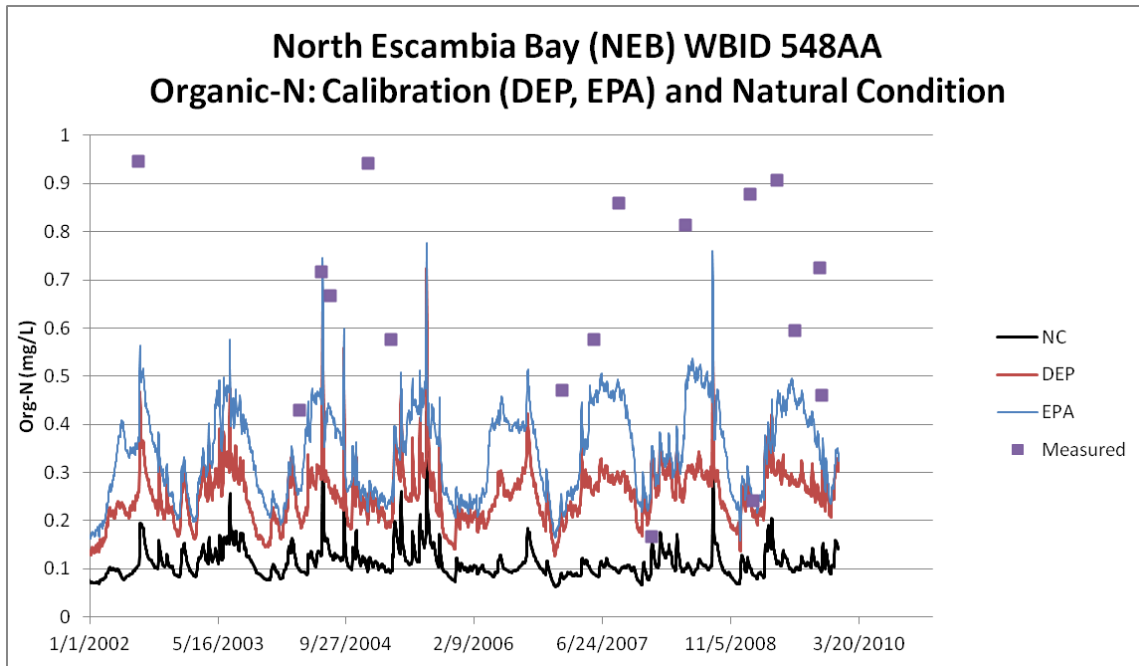


Figure E.6.3. TP: Natural vs. Department and EPA Calibration Daily Average for WBID 548AA

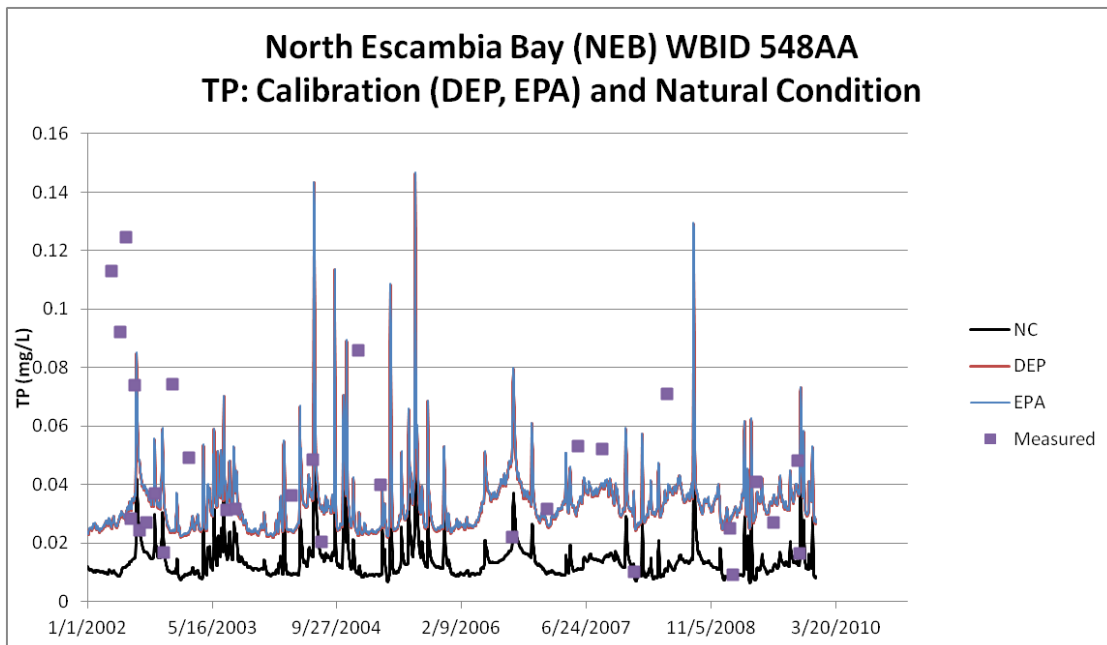


Table E.6.2. TP: Natural vs. Department and EPA Calibration Annual Average for WBID 548AA

- = Empty cell/no data

TP	Measured (mg/L)	Department (mg/L)	EPA (mg/L)	Natural (mg/L)
2002	-	0.032	0.032	0.014
2003	-	0.030	0.031	0.014
2004	0.048	0.034	0.035	0.017
2005	-	0.032	0.032	0.016
2006	-	0.035	0.036	0.014
2007	-	0.035	0.035	0.013
2008	-	0.035	0.035	0.013
2009	0.029	0.035	0.035	0.013
Mean	0.039	0.033	0.034	0.014

Figure E.6.4. CChla: Natural vs. Department and EPA Calibration Daily Average for WBID 548AA

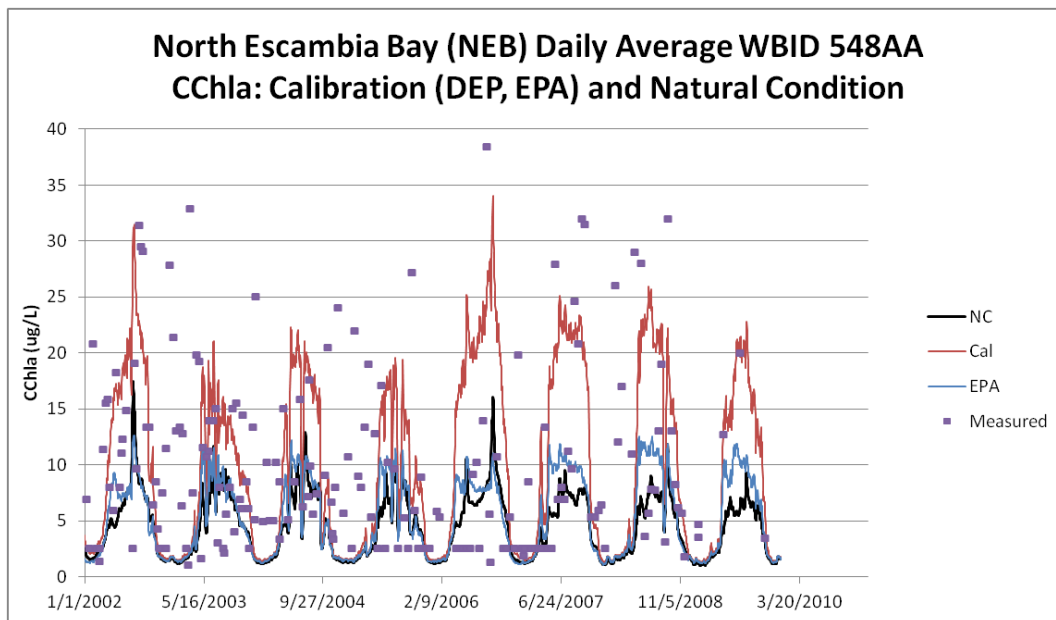


Table E.6.3. CChla: Natural vs. Department and EPA Calibration Annual Average for WBID 548AA

- = Empty cell/no data

CChla	Measured (µg/L)	Department (µg/L)	EPA (µg/L)	Natural (µg/L)
2002	12.32	10.94	5.01	4.84
2003	9.36	8.24	5.11	4.68
2004	8.76	8.79	5.06	4.51
2005	8.25	7.58	4.74	4.24
2006	10.95	13.70	5.55	5.35
2007	10.91	11.74	5.86	4.48
2008	13.23	10.69	5.86	4.41
2009	10.00	8.86	5.30	3.75
Mean	10.47	10.07	5.31	4.53

E.7 North Escambia Bay (WBID 584AA) TMDL (Nutrients)

Table E.7.1. CChla: Department and EPA Calibration

- = Empty cell/no data

¹ TN and TP were separately increased by 10% from the Escambia River and sources along eastern Escambia Bay (Terminal Reaches 20002, 20055, and 20059). Increases were made for both the EPA- and Department-calibrated models.

CChla ¹	EPA-TP10 (µg/L)	EPA-TN10 (µg/L)	EPA-Cal (µg/L)	Department- TP10 (µg/L)	Department-TN10 (µg/L)	Department-Cal (µg/L)
2002	7.58	5.29	5.01	11.67	10.94	10.94
2003	6.91	5.38	5.11	8.72	8.24	8.24
2004	7.14	5.34	5.06	9.33	8.79	8.79
2005	6.49	4.98	4.74	8.01	7.58	7.58
2006	8.62	5.85	5.55	14.63	13.70	13.70
2007	9.01	6.22	5.86	12.53	11.74	11.74
2008	8.70	6.21	5.86	11.39	10.69	10.69
2009	7.58	5.61	5.30	9.44	8.86	8.86
Mean	7.75	5.61	5.31	10.72	10.07	10.07
% Increase	31.5%	6.0%	-	6.0%	0.0%	-

Figure E.7.1. TN: Department Calibration, TMDL, and Natural Condition (WBID 548AA)

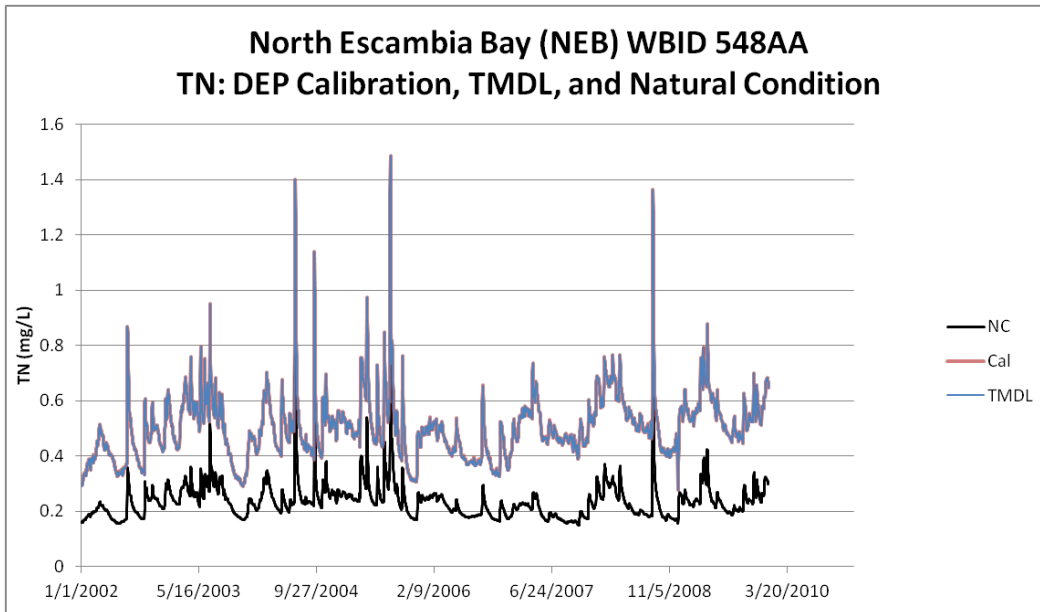


Table E.7.2. TN: Department and EPA Calibration vs. TMDL and Natural Condition (WBID 548AA)

- = Empty cell/no data

¹ Reductions in TN were not made.

TN	Measured (mg/L)	Department (mg/L)	EPA (mg/L)	TMDL ¹ (mg/L)	Natural (mg/L)
2002	-	0.43	0.45	0.43	0.21
2003	-	0.51	0.53	0.51	0.26
2004	0.81	0.52	0.54	0.52	0.26
2005	-	0.52	0.55	0.52	0.27
2006	-	0.43	0.46	0.43	0.21
2007	-	0.50	0.53	0.50	0.20
2008	-	0.55	0.58	0.55	0.24
2009	0.83	0.56	0.59	0.56	0.25
Mean	0.82	0.50	0.53	0.50	0.24

Figure E.7.2. TP: Department Calibration, TMDL, and Natural Condition (WBID 548AA)

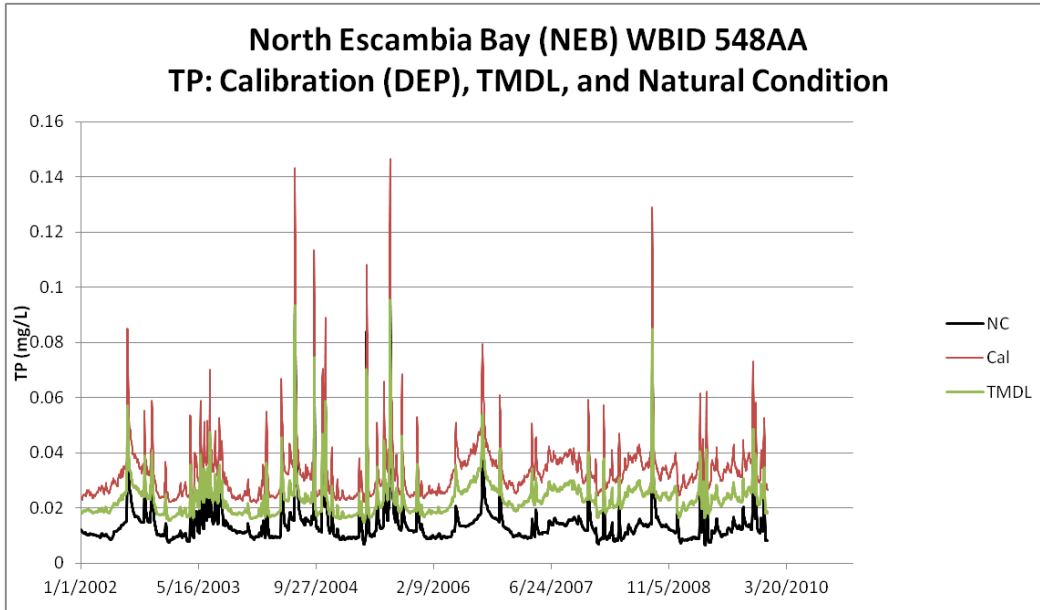


Table E.7.3. TP: Department and EPA Calibration vs. TMDL and Natural Condition (WBID 548AA)

- = Empty cell/no data

¹ Reductions in TP of 35% were made at all 12 terminal reaches in the Pensacola Bay model.

TP	Measured (mg/L)	Department (mg/L)	EPA (mg/L)	TMDL ¹ (mg/L)	Natural (mg/L)
2002	-	0.032	0.032	0.023	0.014
2003	-	0.030	0.031	0.021	0.014
2004	0.048	0.034	0.035	0.023	0.017
2005	-	0.032	0.032	0.022	0.016
2006	-	0.035	0.036	0.025	0.014
2007	-	0.035	0.035	0.024	0.013
2008	-	0.035	0.035	0.024	0.013
2009	0.029	0.035	0.035	0.024	0.013
Mean	0.039	0.033	0.034	0.023	0.014

Figure E.7.3. CChla: Department Calibration, TMDL, and Natural Condition (WBID 548AA)

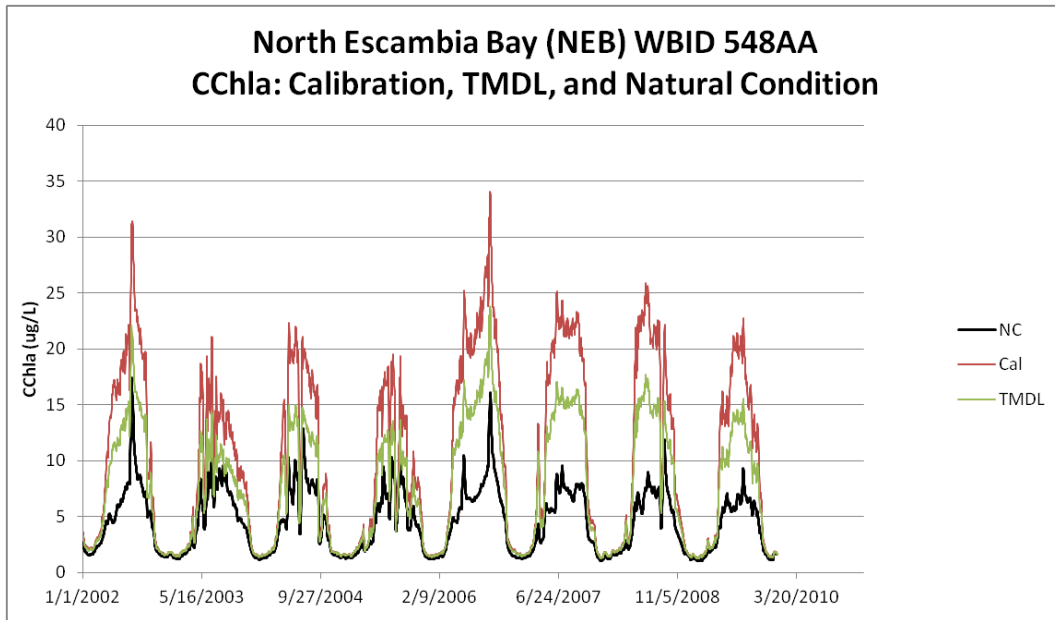


Table E.7.4. CChla: Department and EPA Calibration vs. TMDL and Natural Condition (WBID 548AA)

- = Empty cell/no data

(1) Reductions in TP of 35% were made at all 12 terminal reaches in the Pensacola Bay model.

CChla	Measured (µ/L)	Department (µg/L)	EPA (µg/L)	TMDL ¹ (µg/L)	Natural (µg/L)
2002	12.32	10.94	5.01	8.01	4.84
2003	9.36	8.24	5.11	6.27	4.68
2004	8.76	8.79	5.06	6.55	4.51
2005	8.25	7.58	4.74	5.77	4.24
2006	10.95	13.70	5.55	9.93	5.35
2007	10.91	11.74	5.86	8.56	4.48
2008	13.23	10.69	5.86	7.85	4.41
2009	10.00	8.86	5.30	6.53	3.75
Mean	10.47	10.07	5.31	7.43	4.53

Table E.7.5. TMDL Summary Table (WBID 548AA)

¹ Reductions in TP of 35% were made at all 12 terminal reaches in the Pensacola Bay model.

Average Load	Department-Calibration (lbs/yr)	TMDL¹ (lbs/yr)	% Reduction
Average TN Load	16,783,407	16,783,407	0%
Average TP Load	382,975	248,934	35%

E.8 Pensacola Bay Calibration Results Stations P01, PO3-P16

Figure E.8.1. NH4-N: Department Calibration at PO1

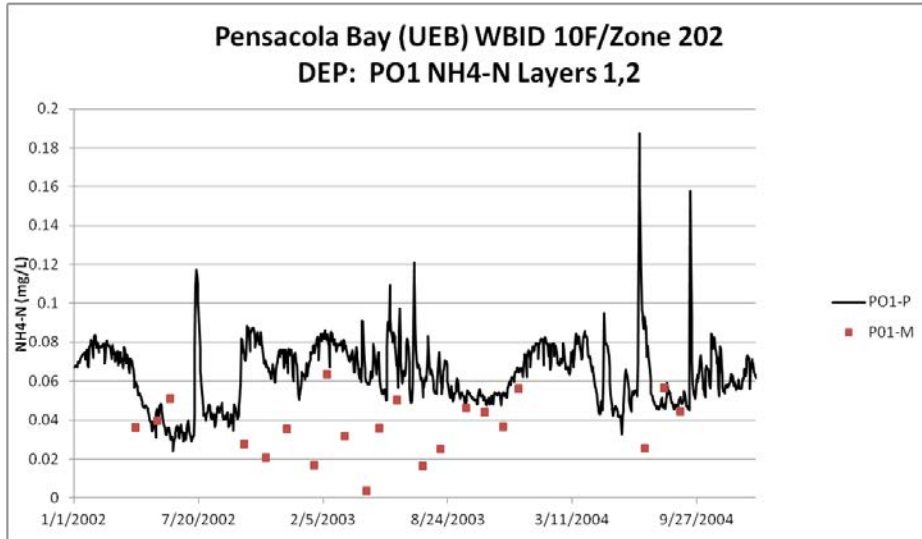


Figure E.8.2. NH4-N: Department Calibration at PO3

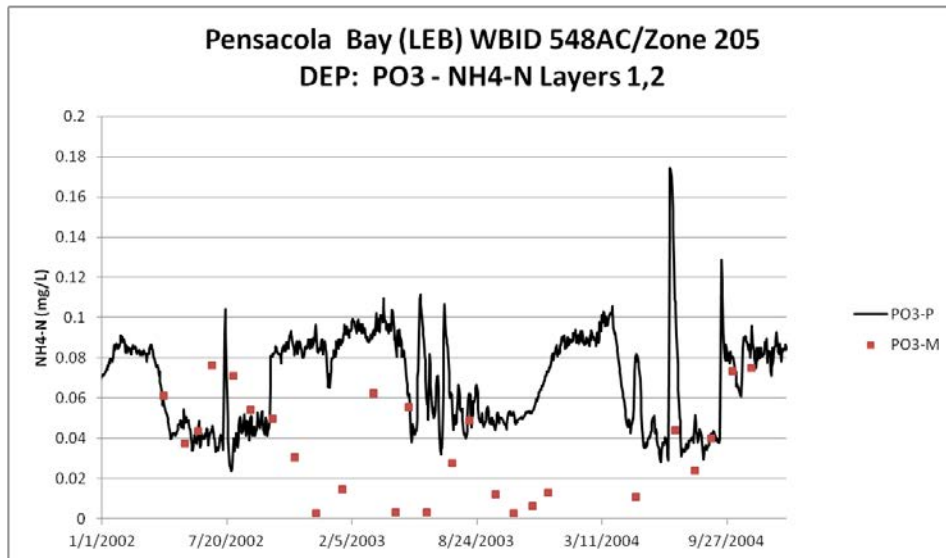


Figure E.8.3. NH4-N: Department Calibration at PO4

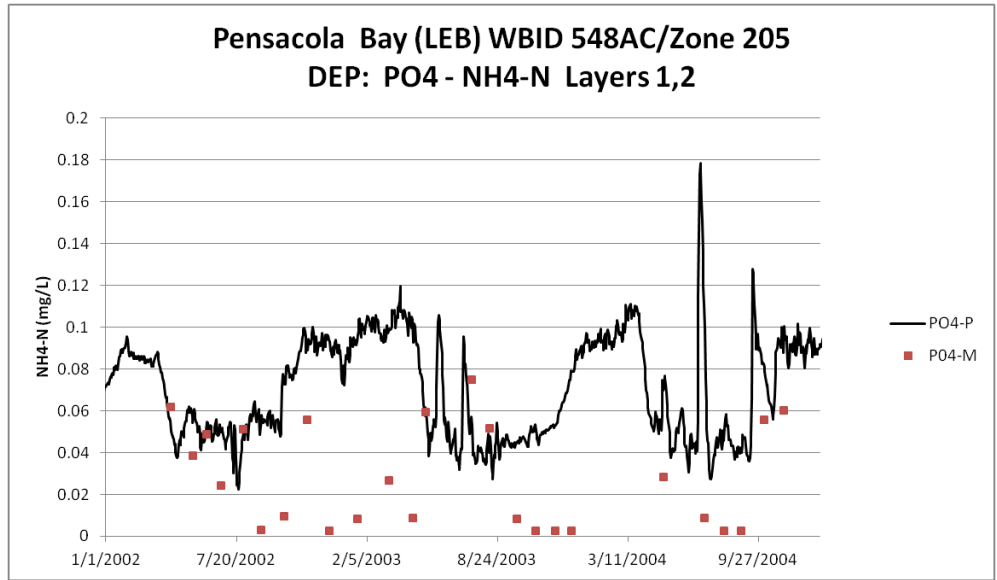


Figure E.8.4. NH4-N: Department Calibration at PO5

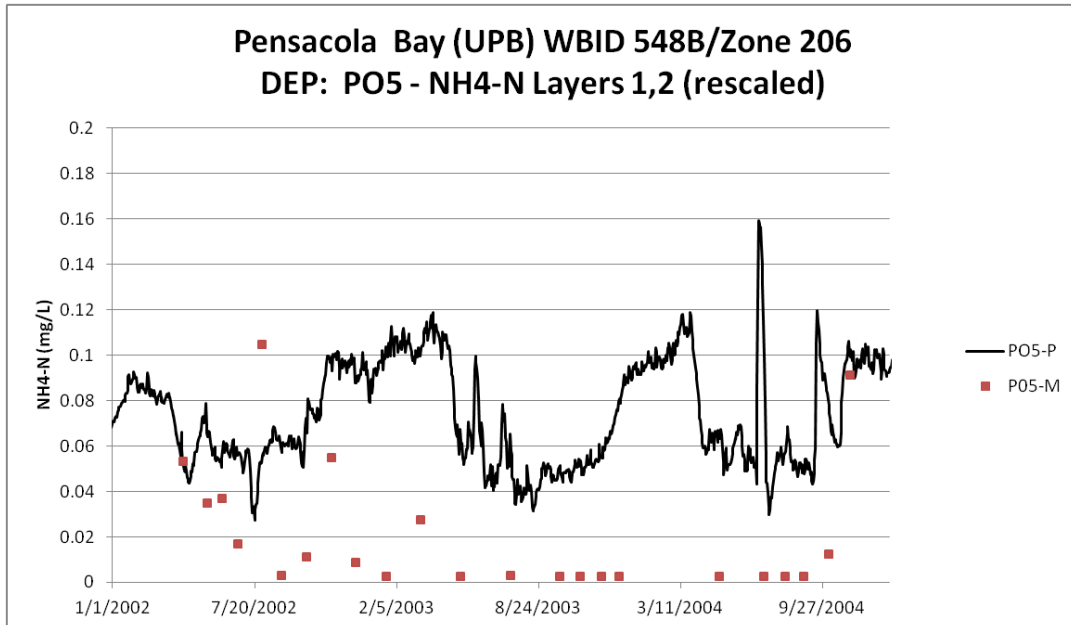


Figure E.8.5. NH4-N: Department Calibration at PO6

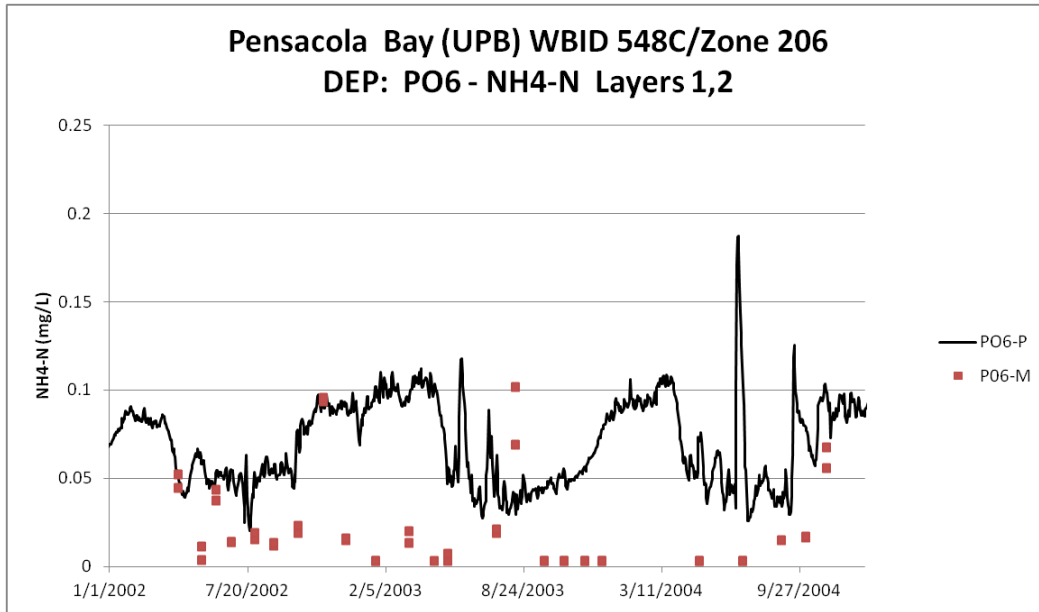


Figure E.8.6. NH4-N: Department Calibration at PO7

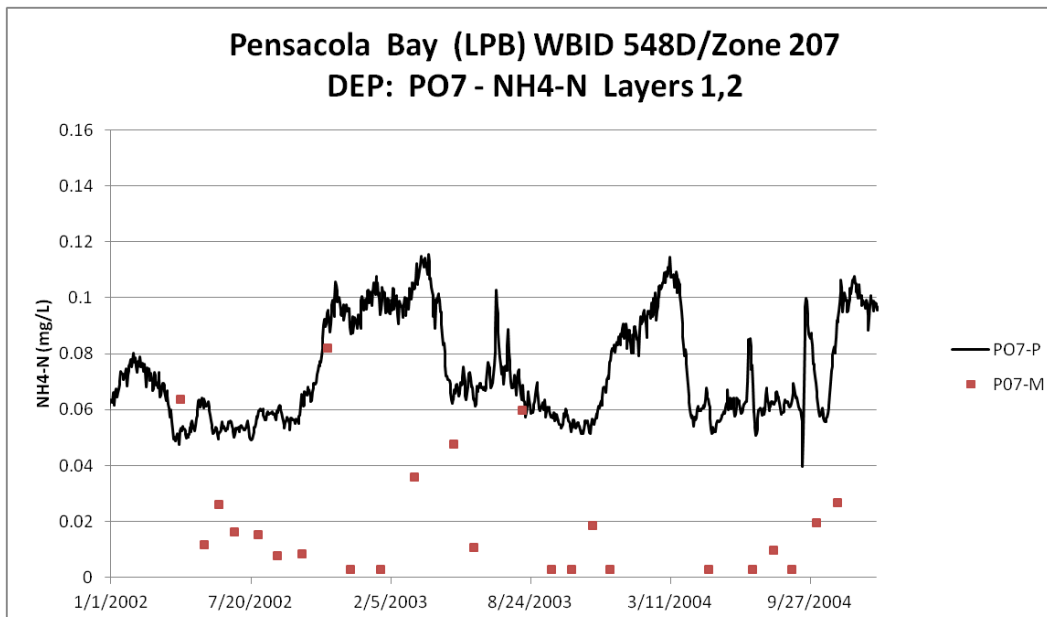


Figure E.8.7. NH4-N: Department Calibration at PO8

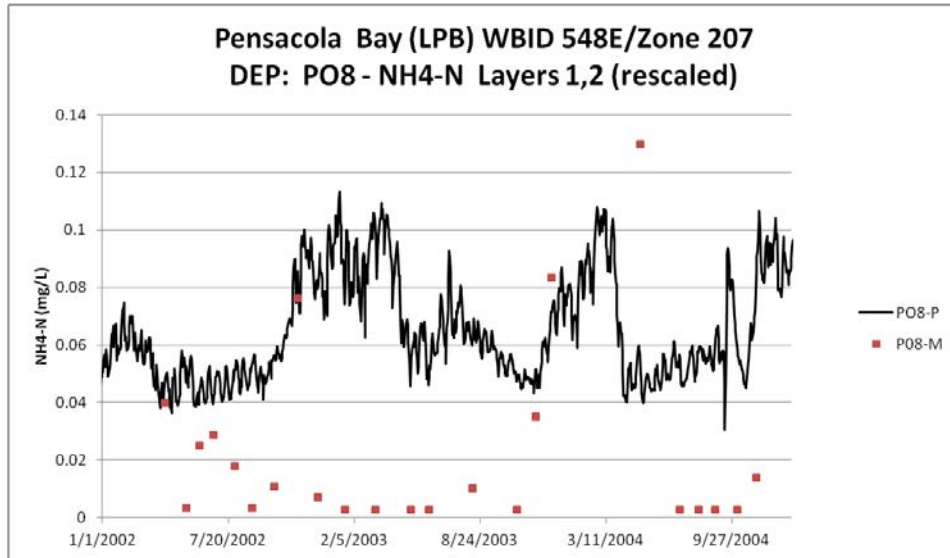


Figure E.8.8. NH4-N: Department Calibration at PO9

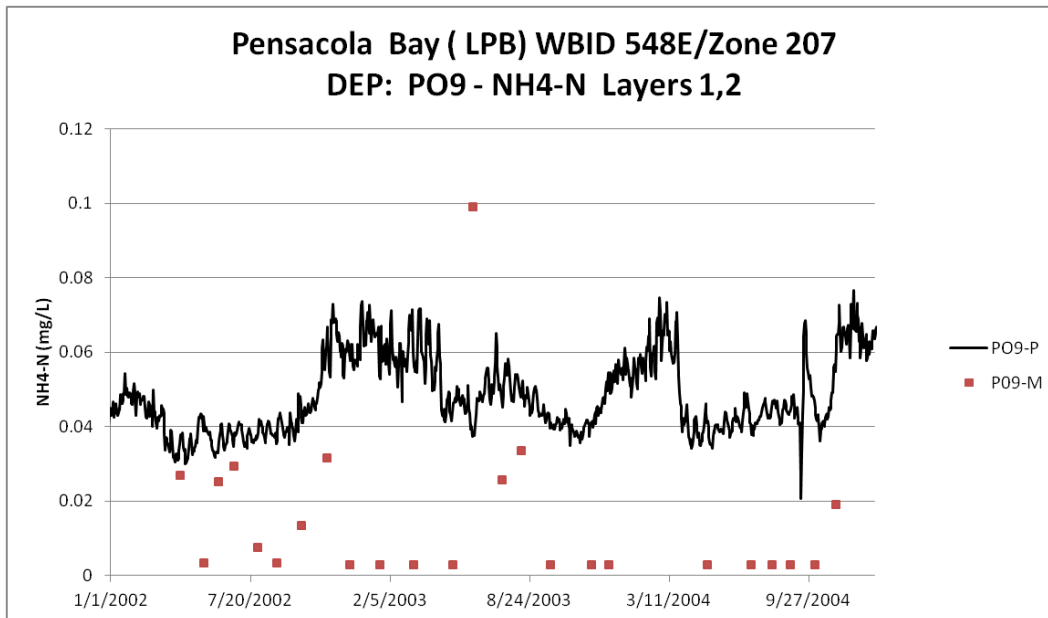


Figure E.8.9. NH4-N: Department Calibration at P10

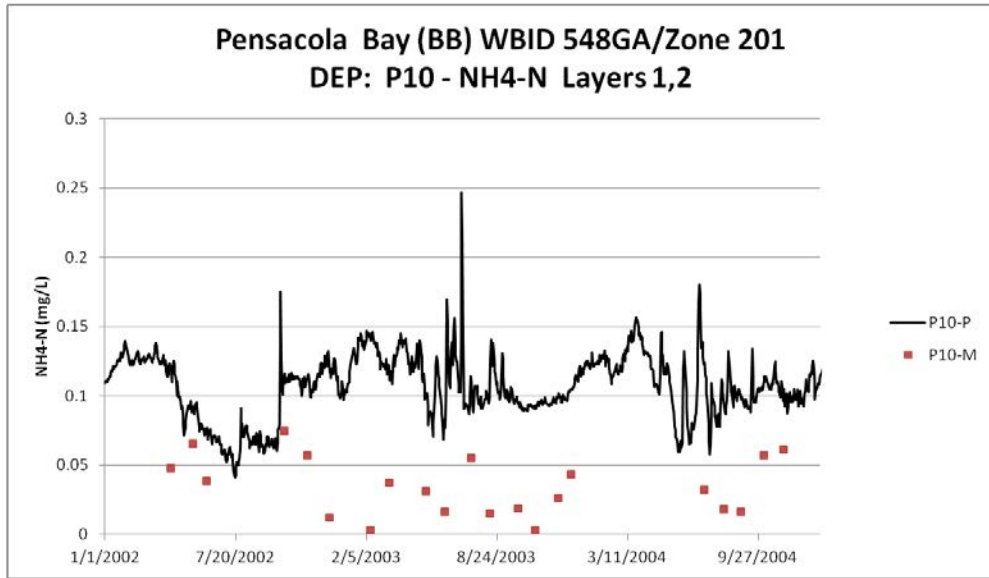


Figure E.8.10. NH4-N: Department Calibration at P11

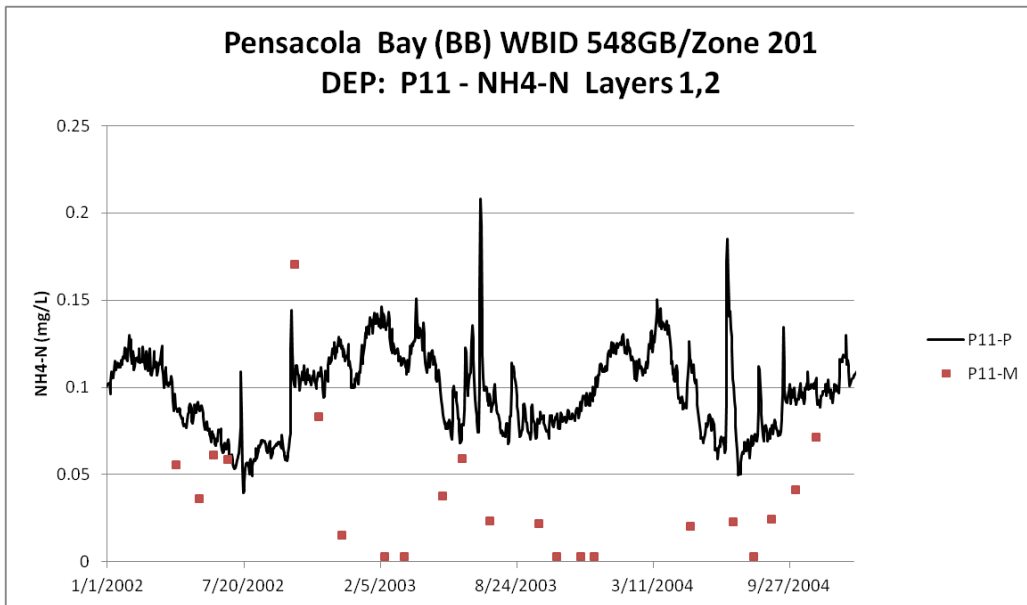


Figure E.8.11. NH4-N: Department Calibration at P12

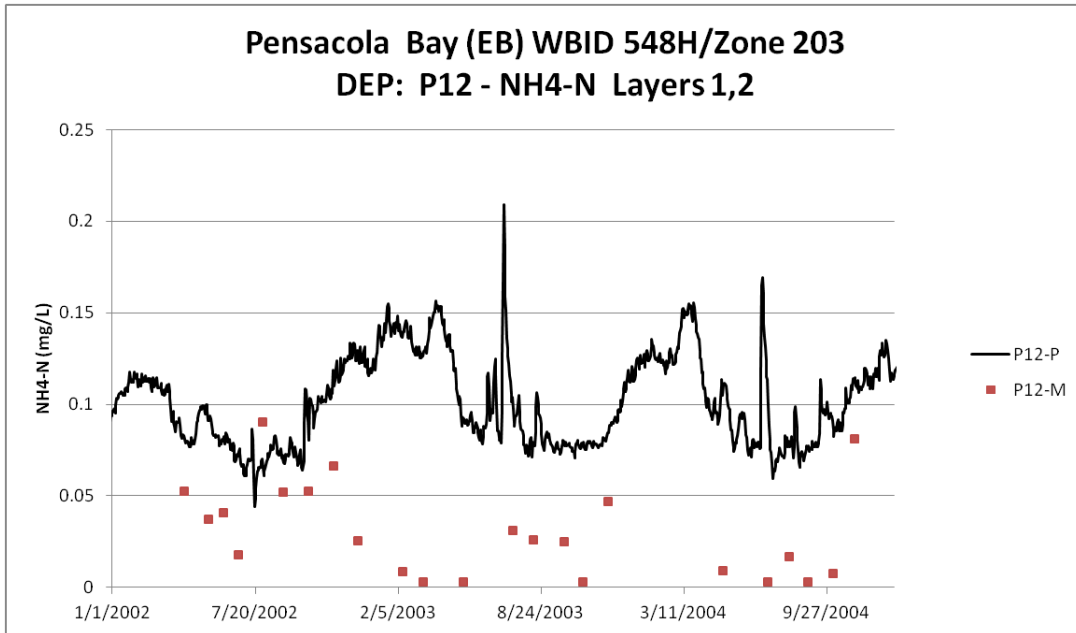


Figure E.8.12. NH4-N: Department Calibration at P13

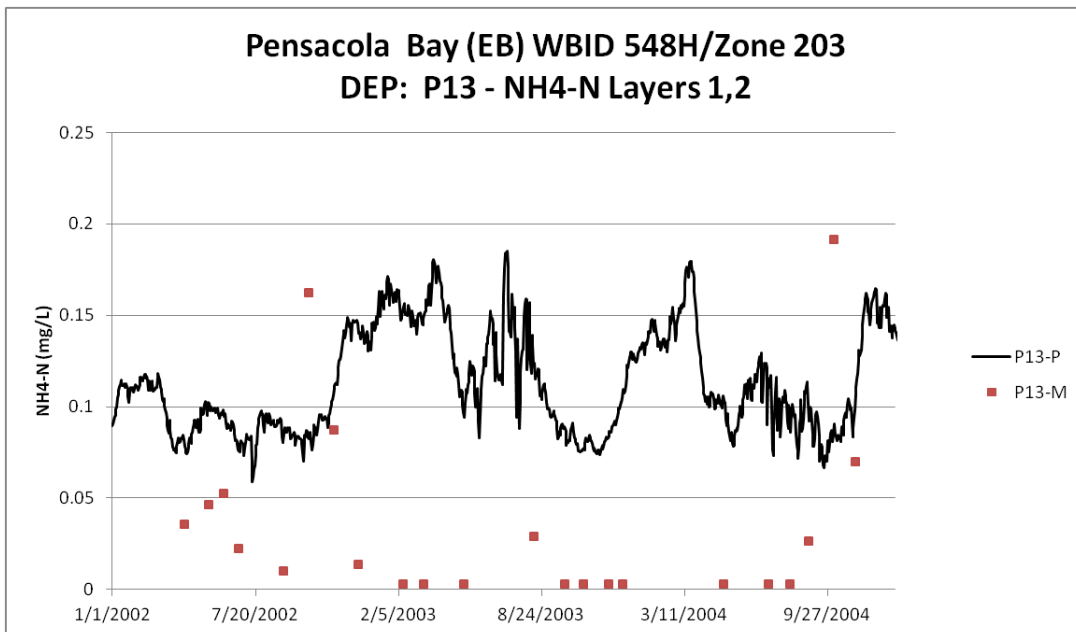


Figure E.8.13. NH4-N: Department Calibration at P14

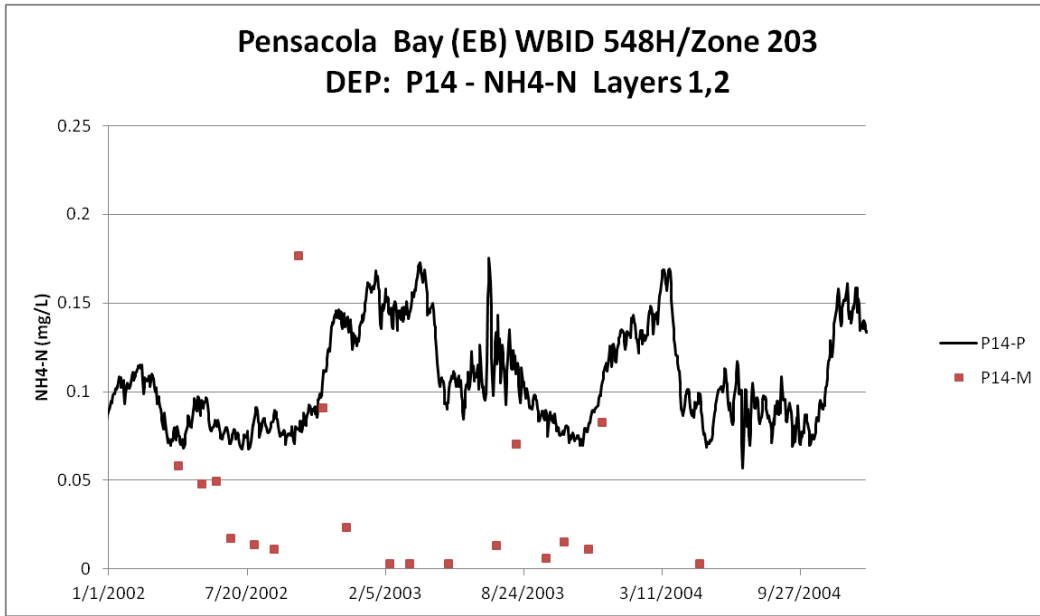


Figure E.8.14. NH4-N: Department Calibration at P15

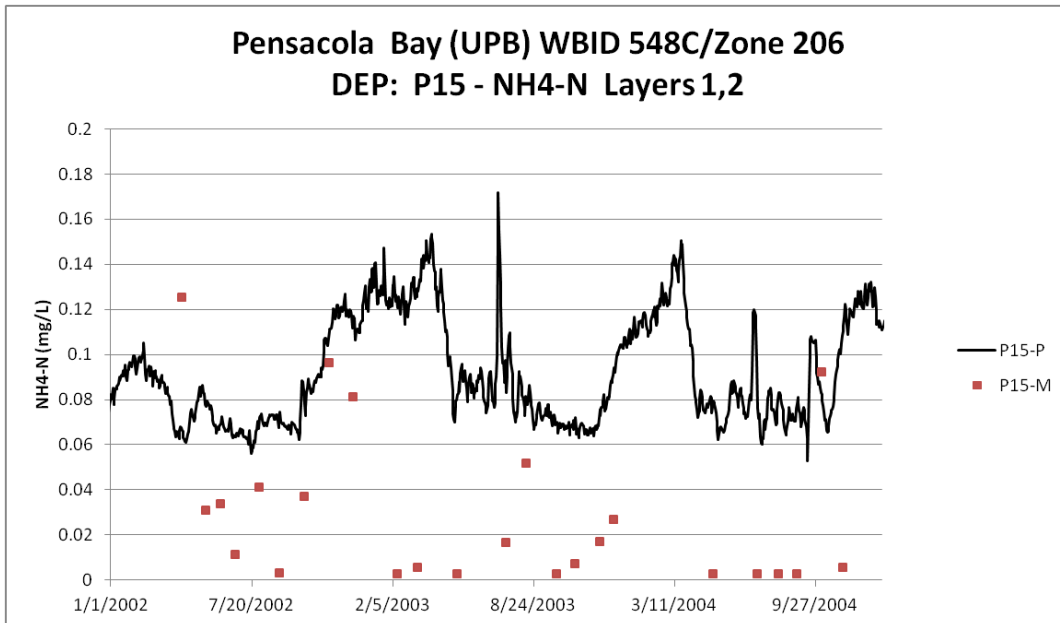


Figure E.8.15. NH₄-N: Department Calibration at P16

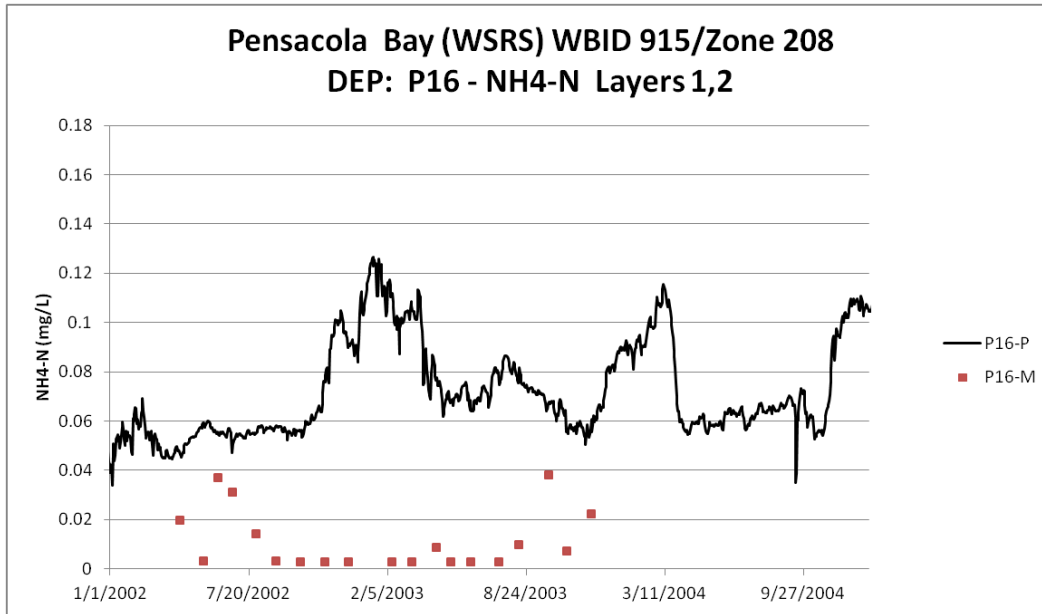


Figure E.8.16. NO₃-N: Department Calibration at PO1

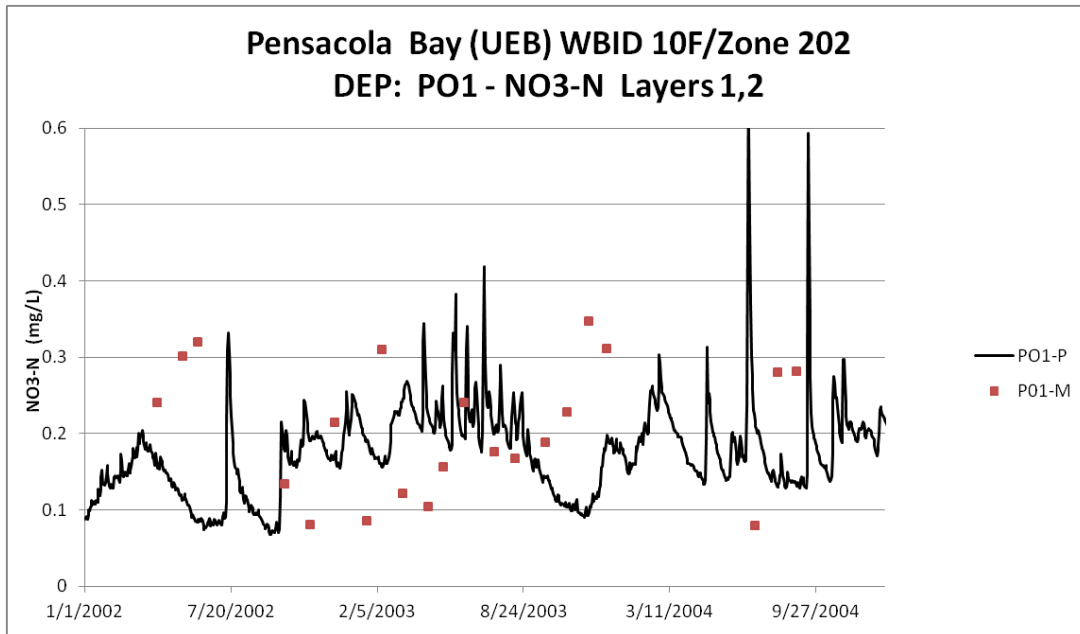


Figure E.8.17. NO₃-N: Department Calibration at PO3

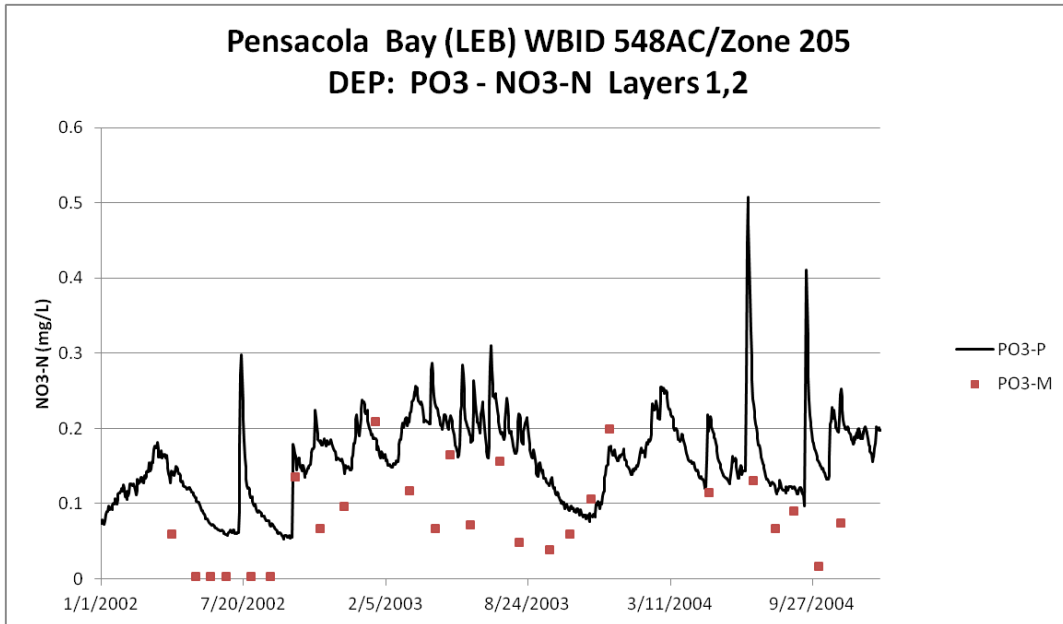


Figure E.8.18. NO₃-N: Department Calibration at PO4

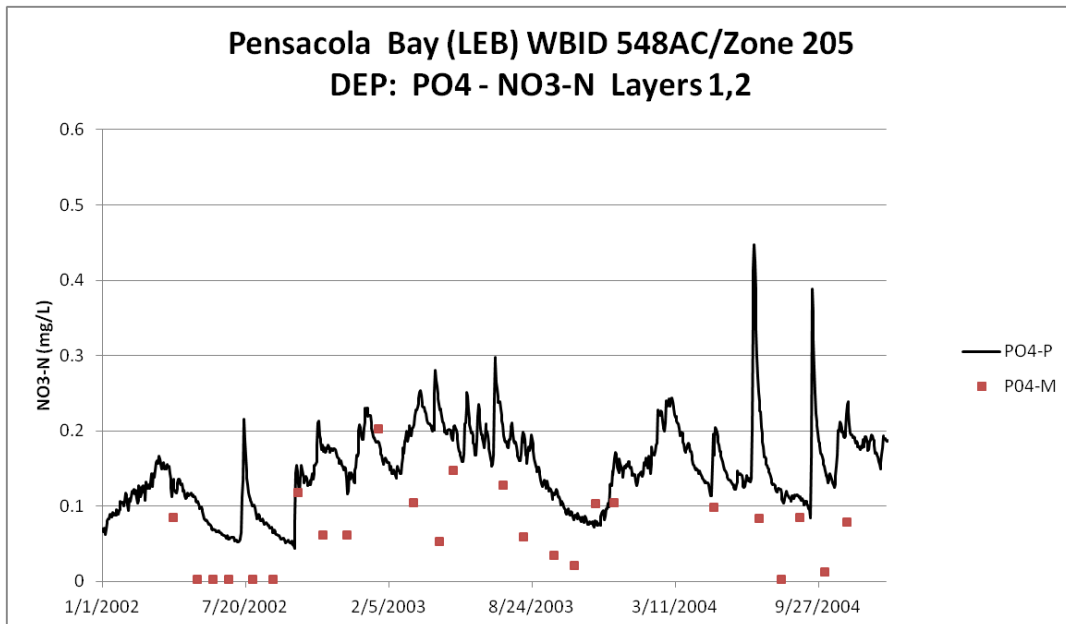


Figure E.8.19. NO₃-N: Department Calibration at PO5

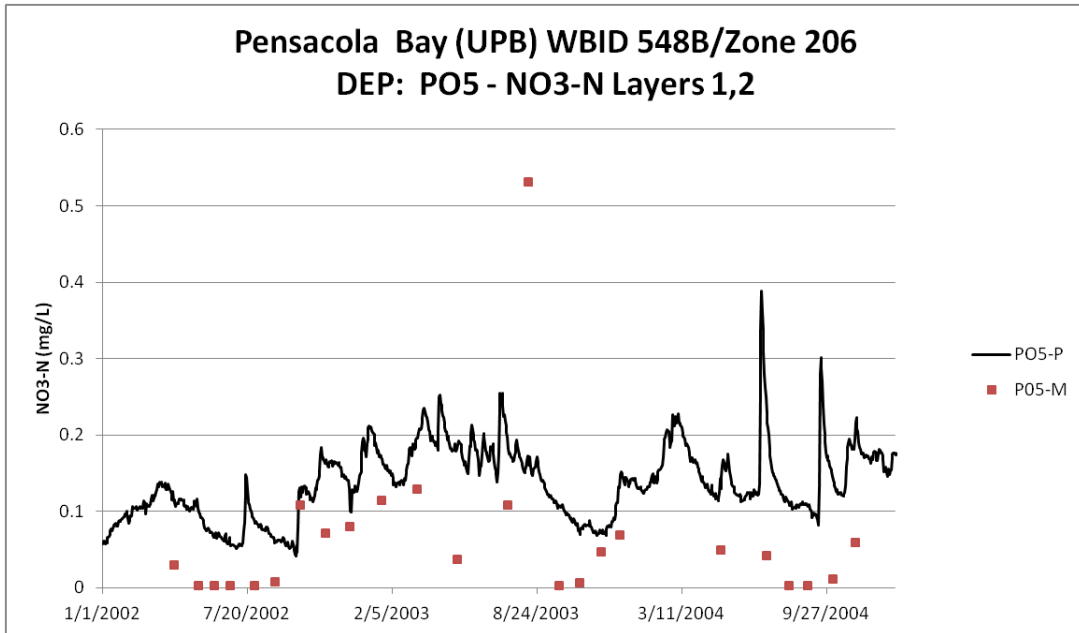


Figure E.8.20. NO₃-N: Department Calibration at PO6

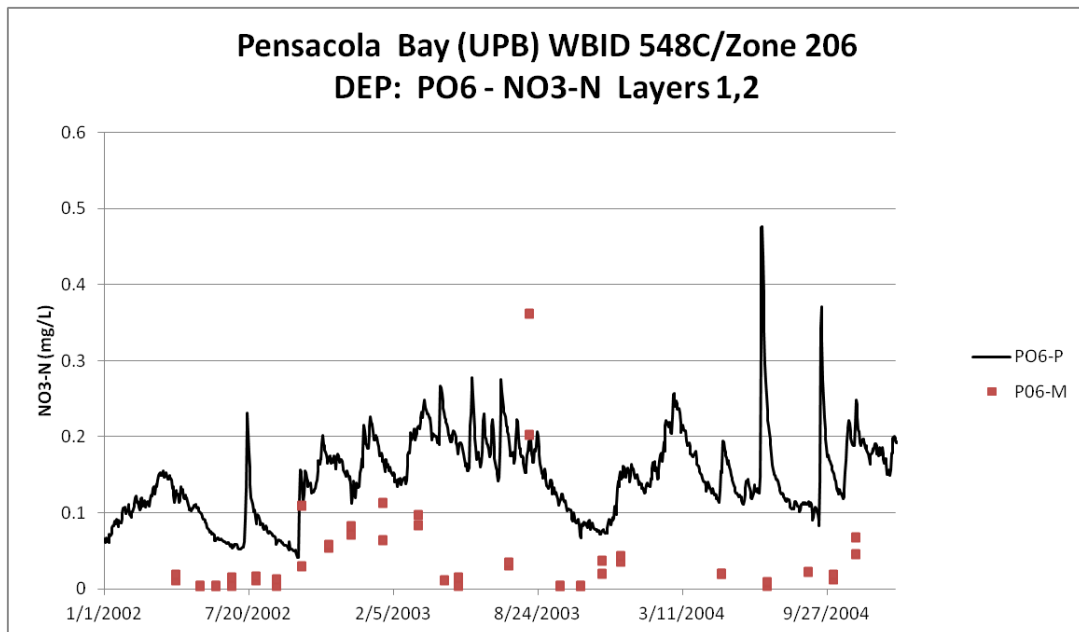


Figure E.8.21. NO₃-N: Department Calibration at PO7

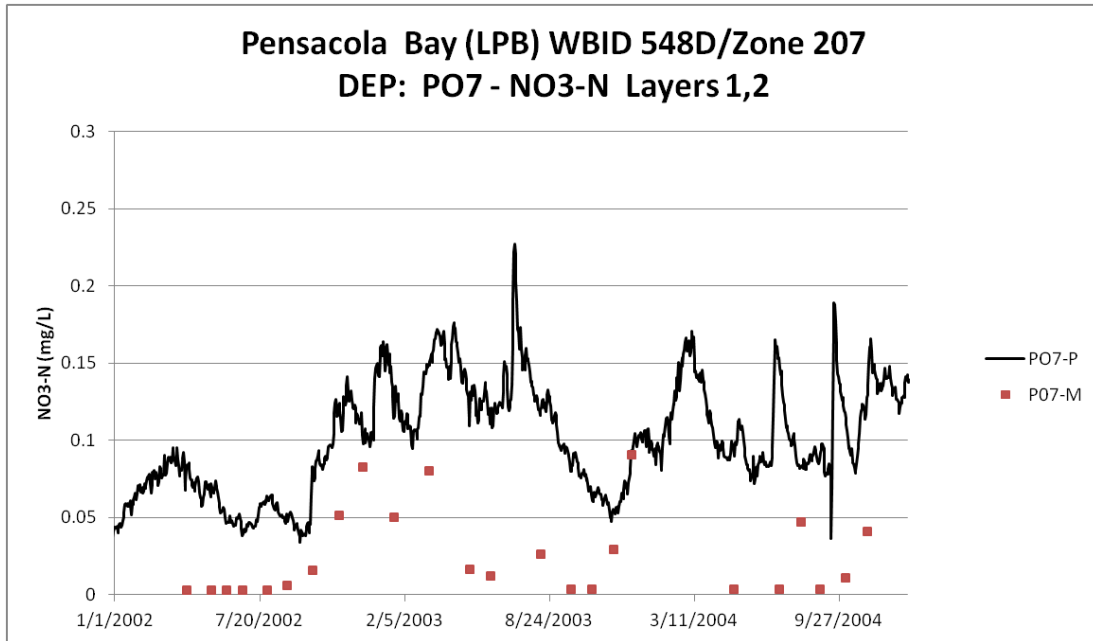


Figure E.8.22. NO₃-N: Department Calibration at PO8

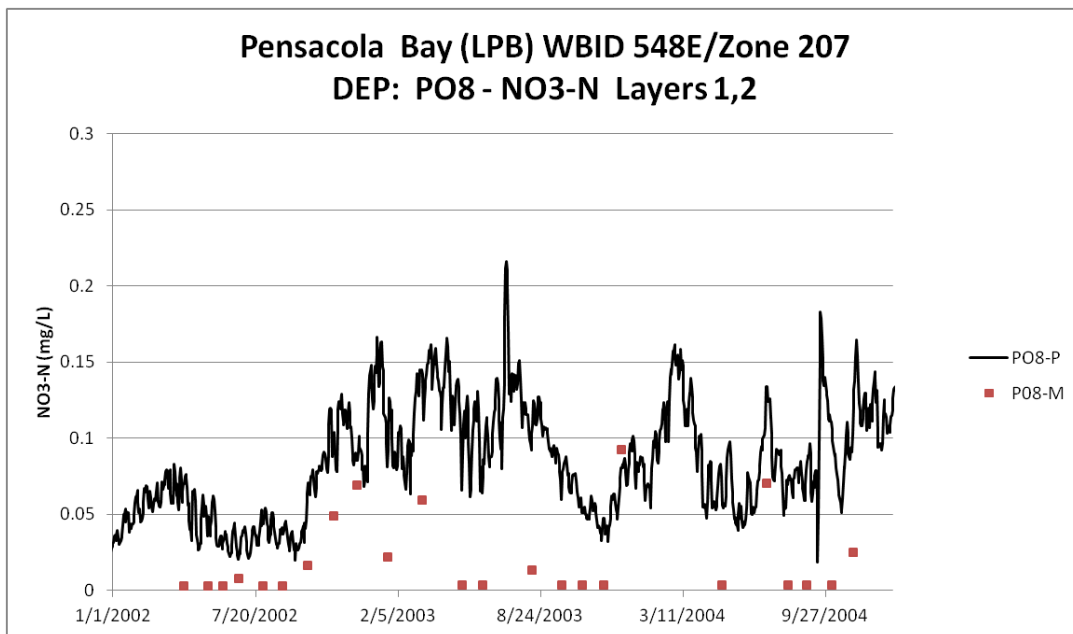


Figure E.8.23. NO₃-N: Department Calibration at PO9

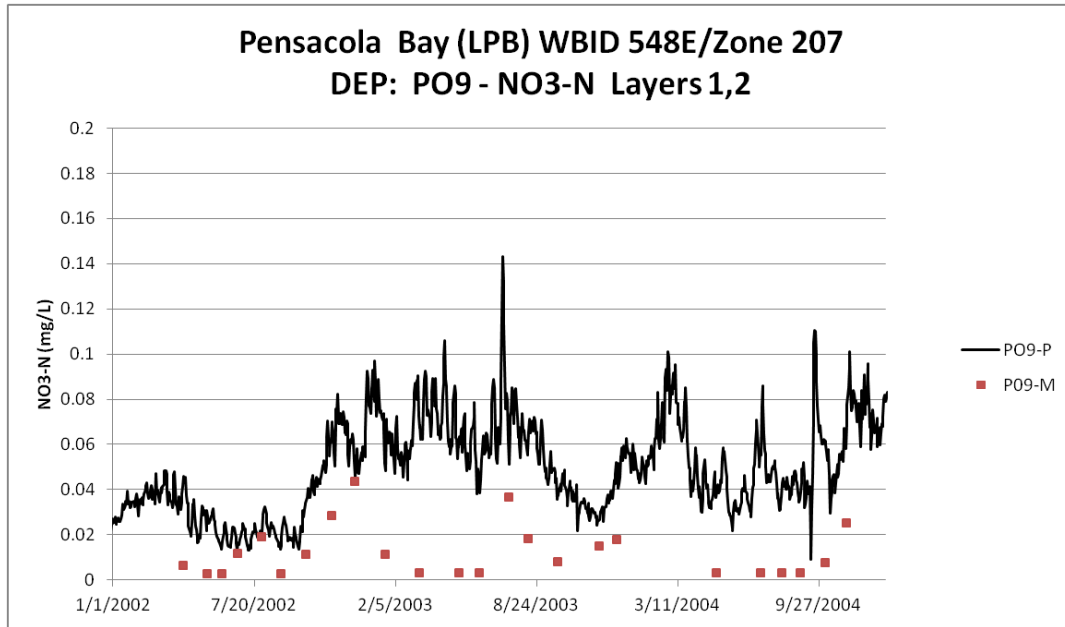


Figure E.8.24. NO₃-N: Department Calibration at P10

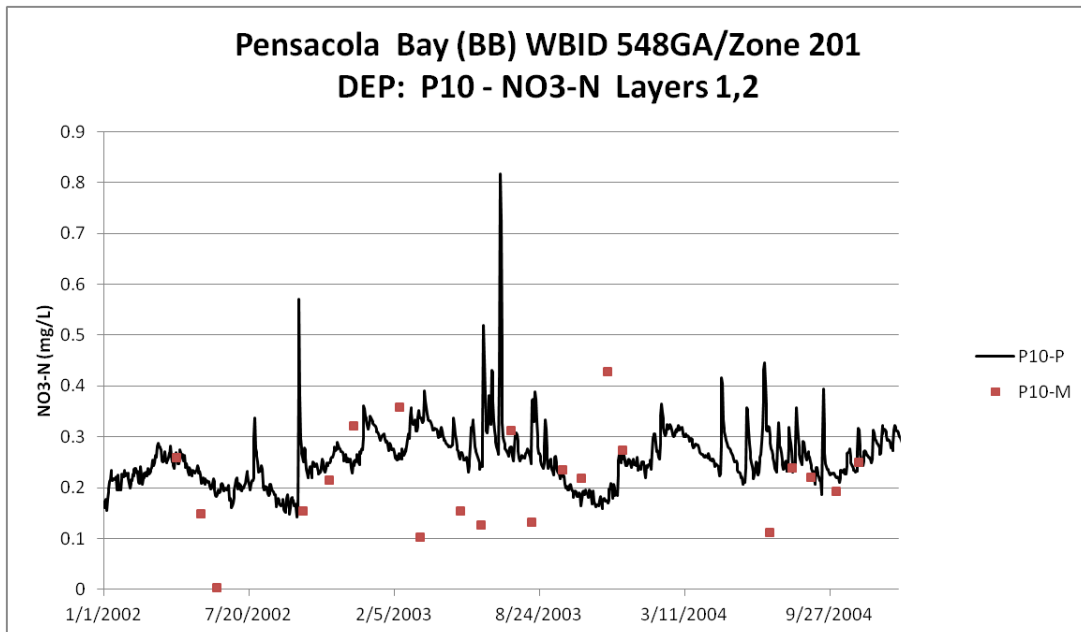


Figure E.8.25. NO₃-N: Department Calibration at P11

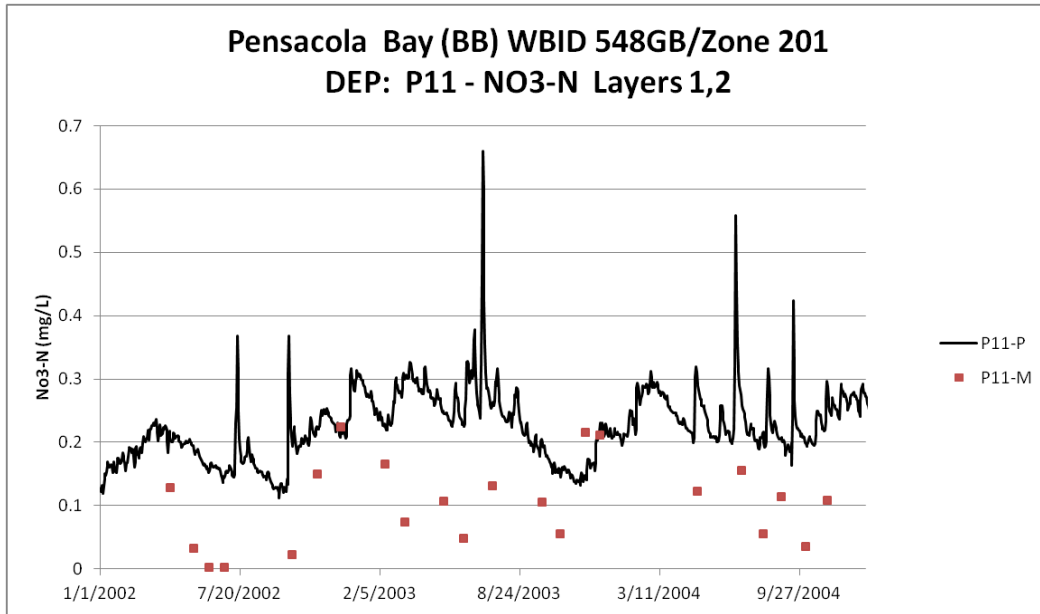


Figure E.8.26. NO₃-N: Department Calibration at P12

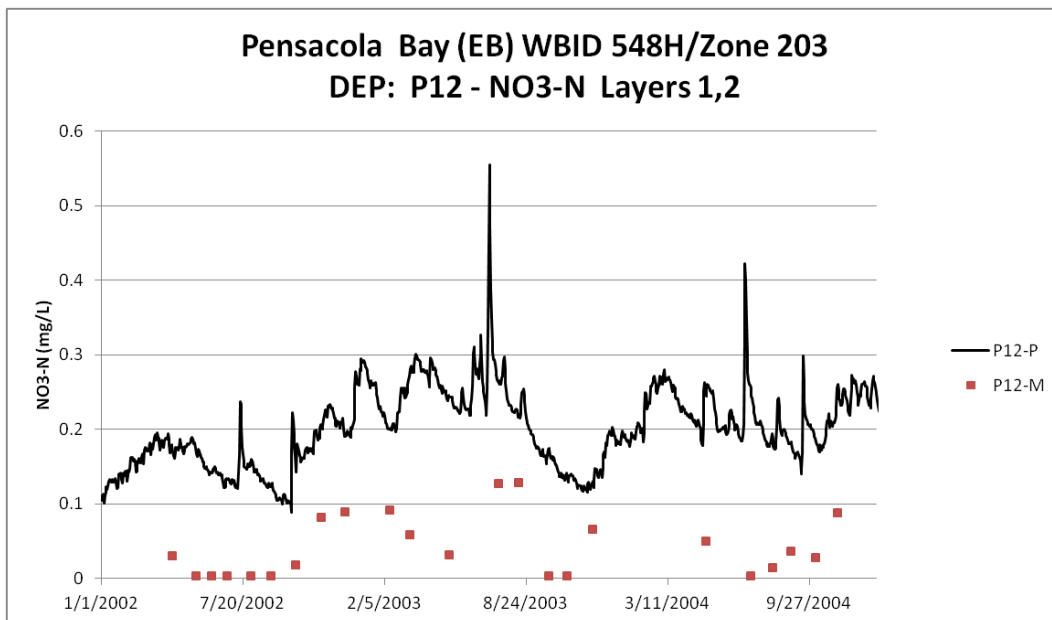


Figure E.8.27. NO₃-N: Department Calibration at P13

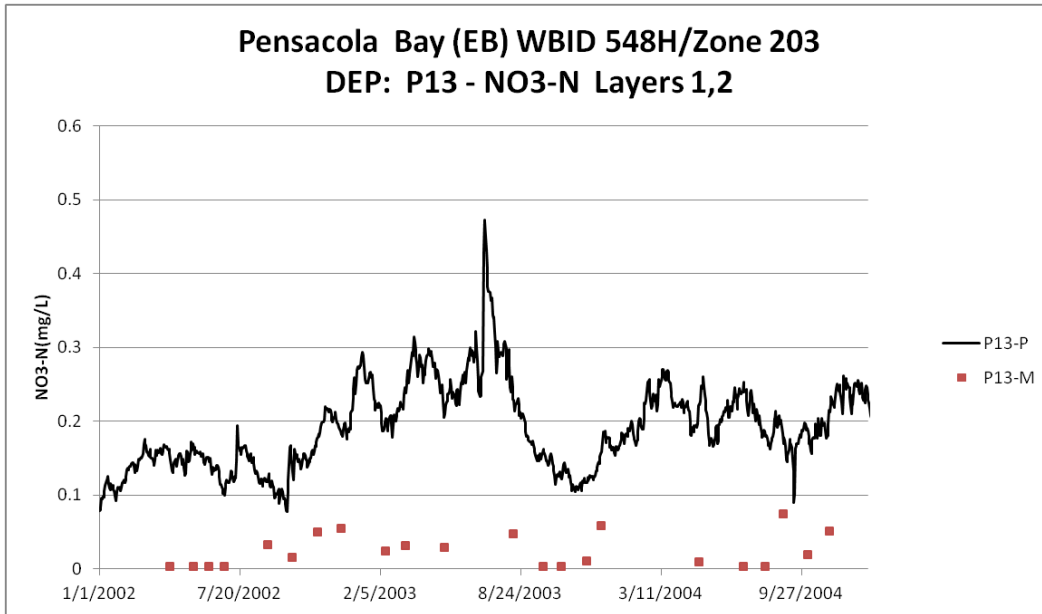


Figure E.8.28. NO₃-N: Department Calibration at P14

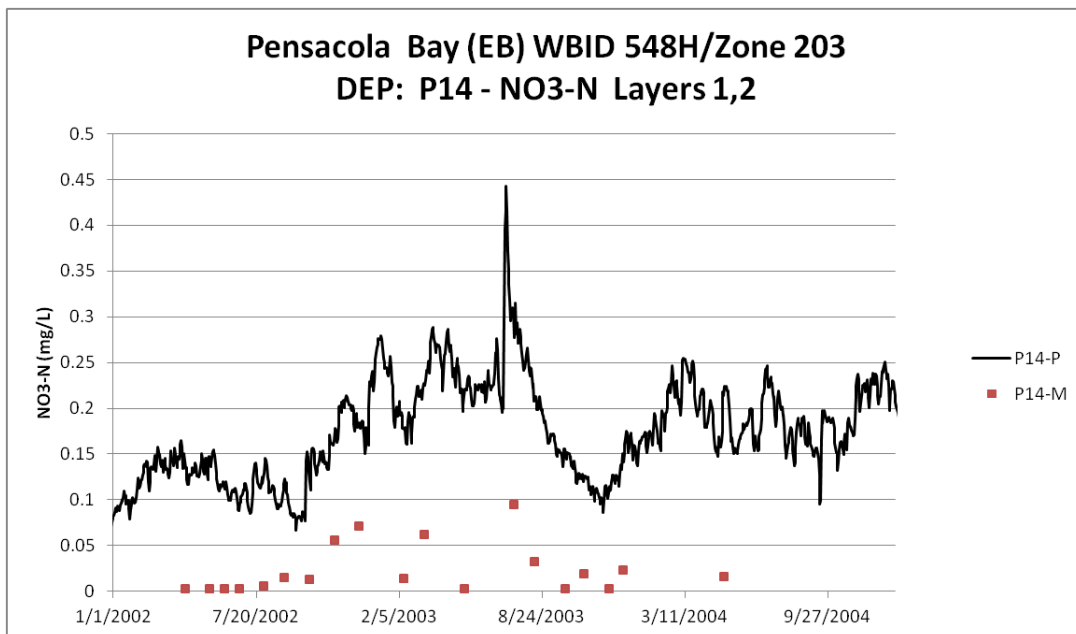


Figure E.8.29. NO₃-N: Department Calibration at P15

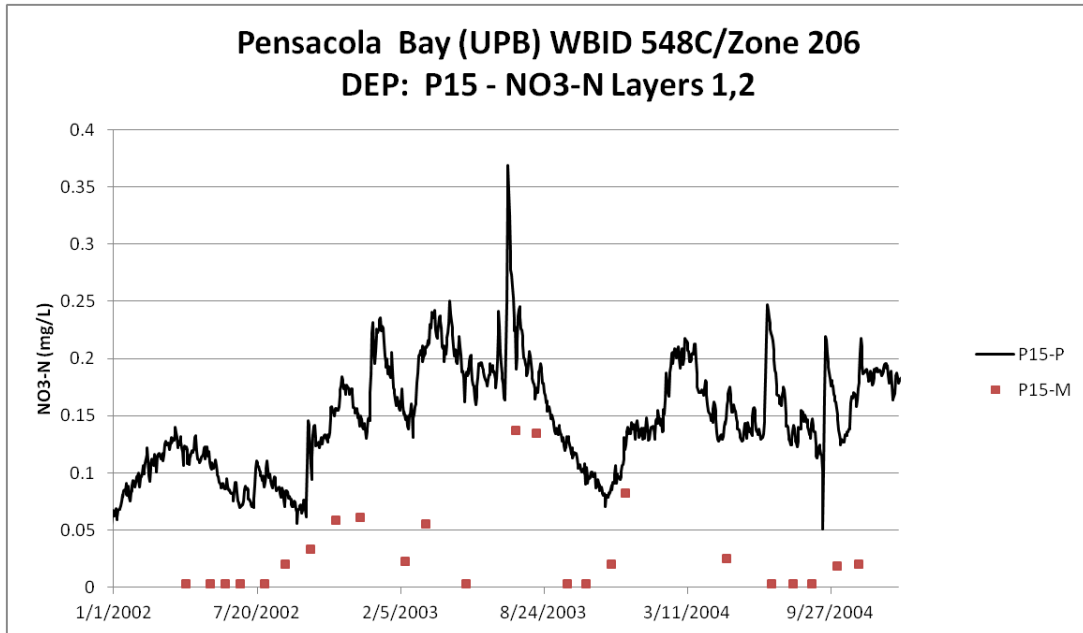


Figure E.8.30. NO₃-N: Department Calibration at P16

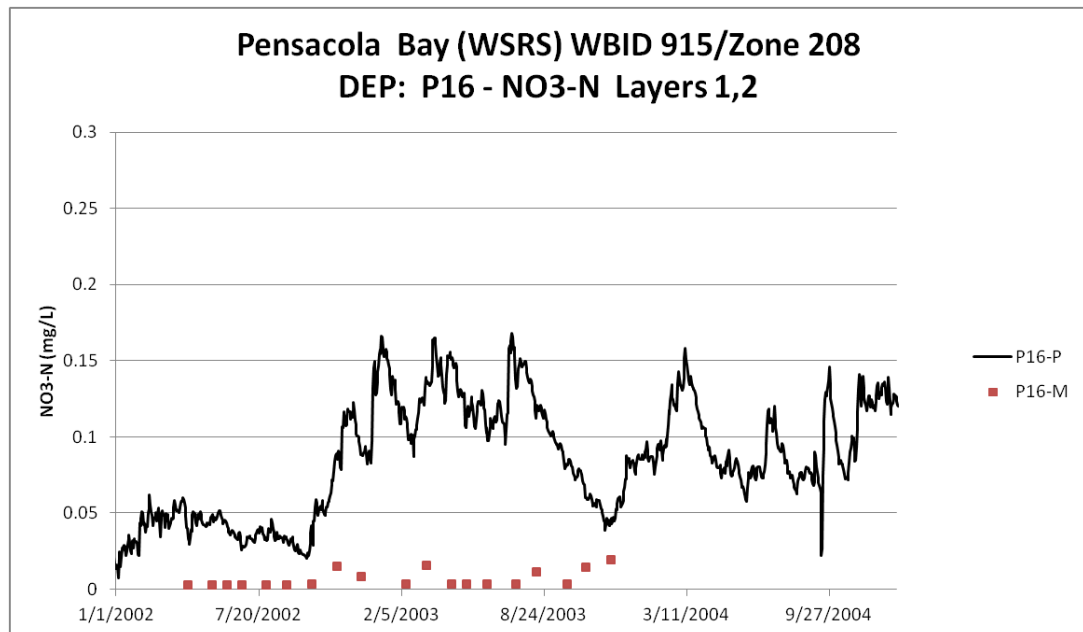


Figure E.8.31. PO4-P: Department Calibration at PO1

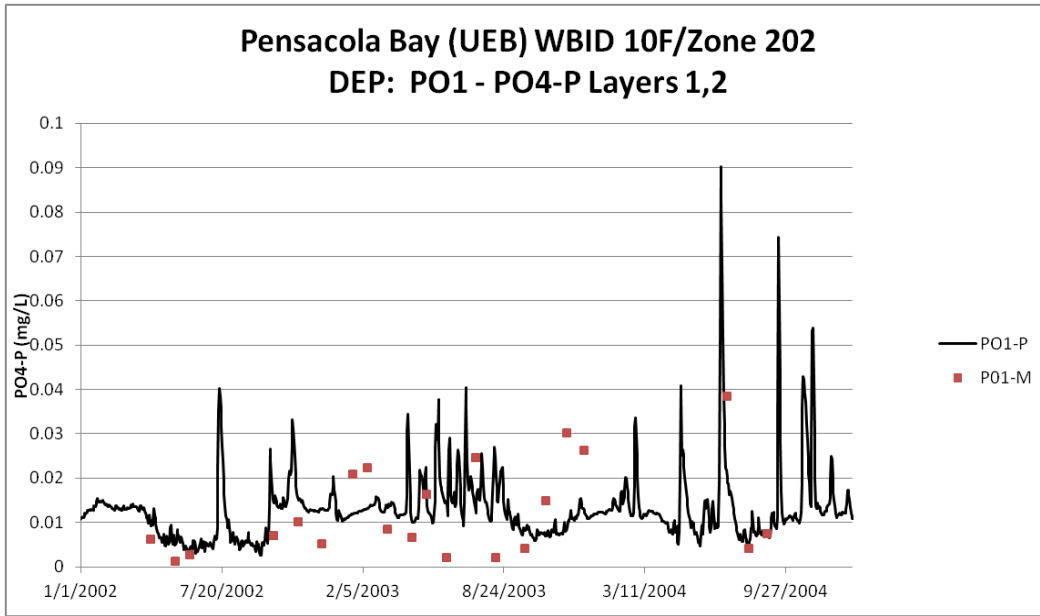


Figure E.8.32. PO4-P: Department Calibration at PO3

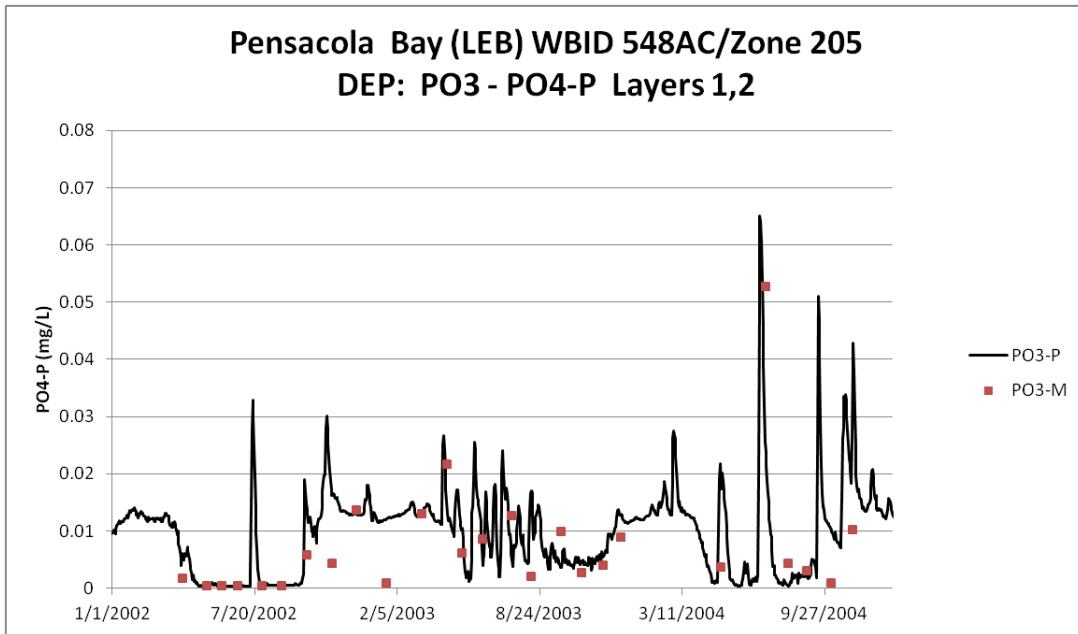


Figure E.8.33. PO4-P: Department Calibration at PO4

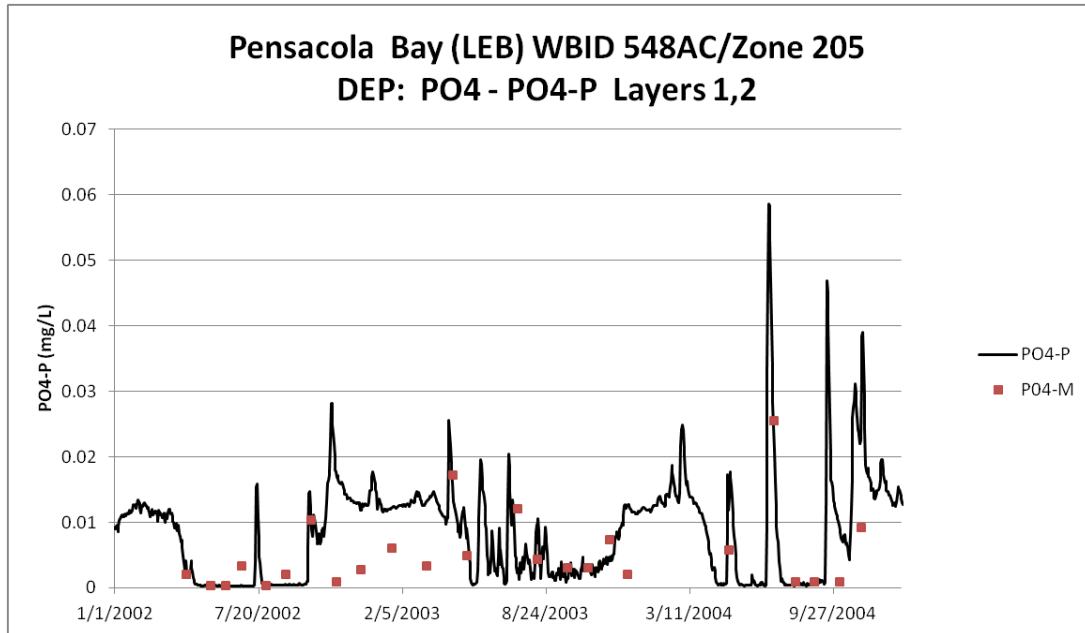


Figure E.8.34. PO4-P: Department Calibration at PO5

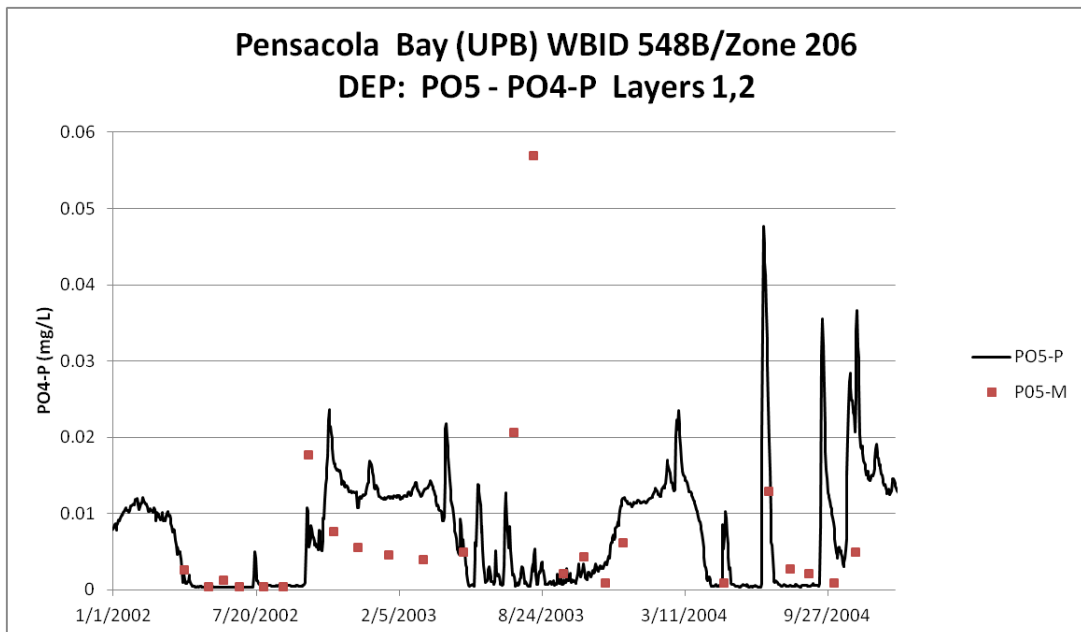


Figure E.8.35. PO4-P: Department Calibration at PO6

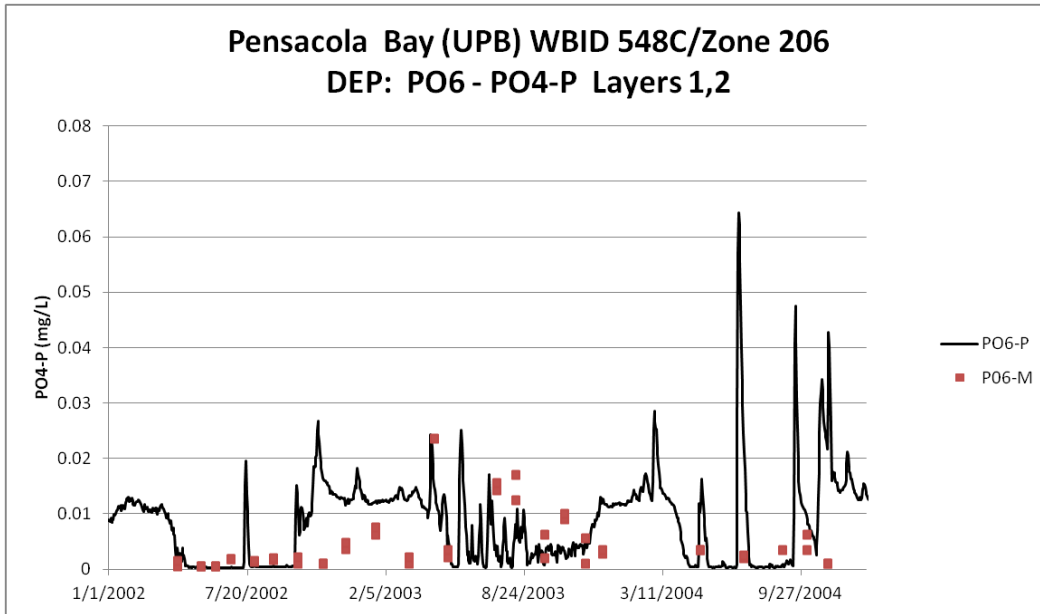


Figure E.8.36. PO4-P: Department Calibration at PO7

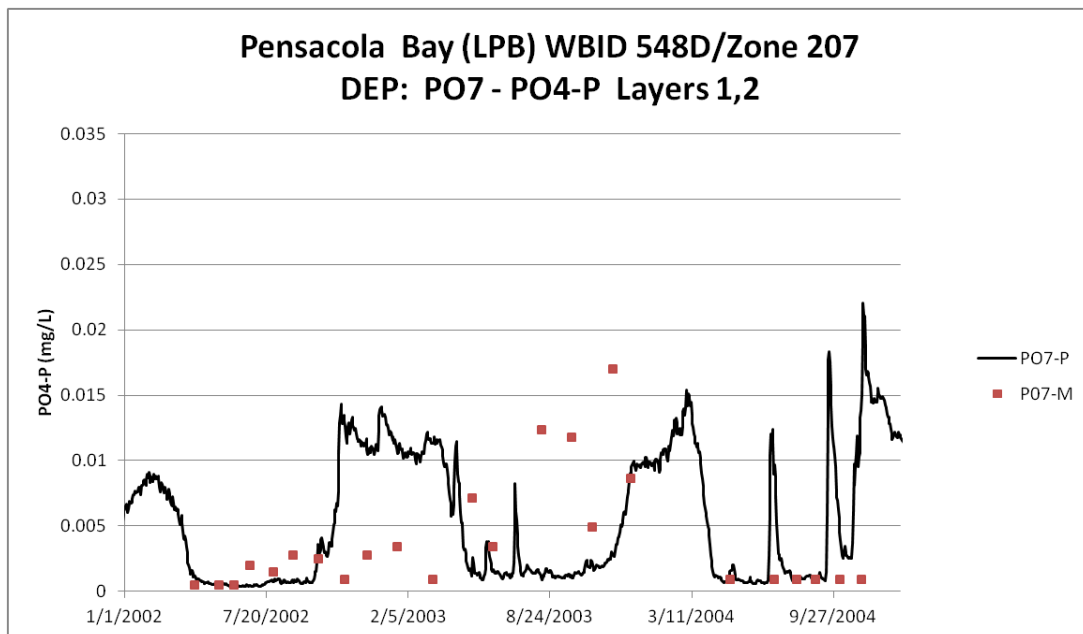


Figure E.8.37. PO4-P: Department Calibration at PO8

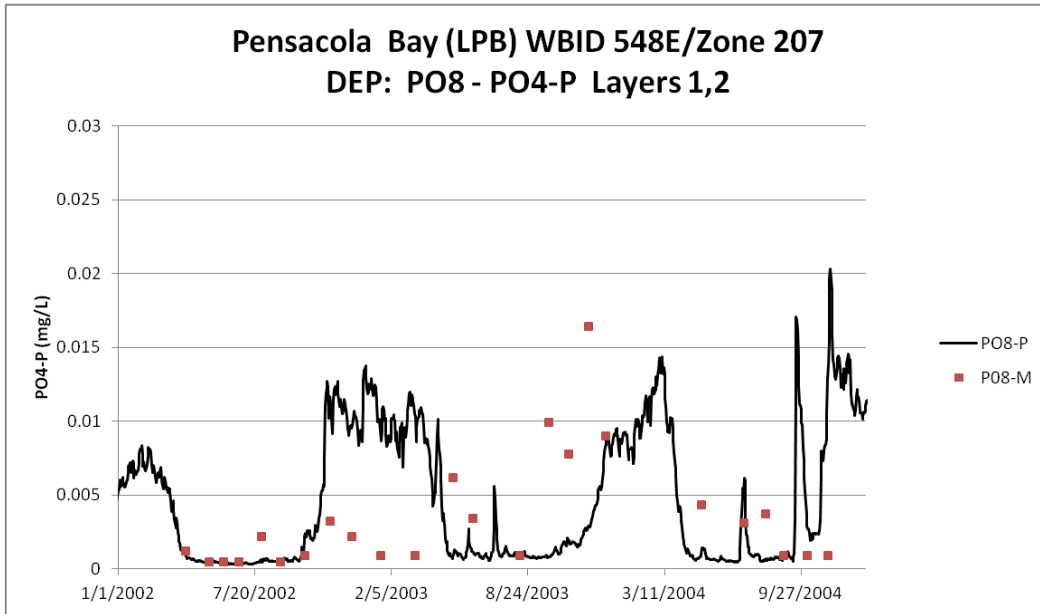


Figure E.8.38. PO4-P: Department Calibration at PO9

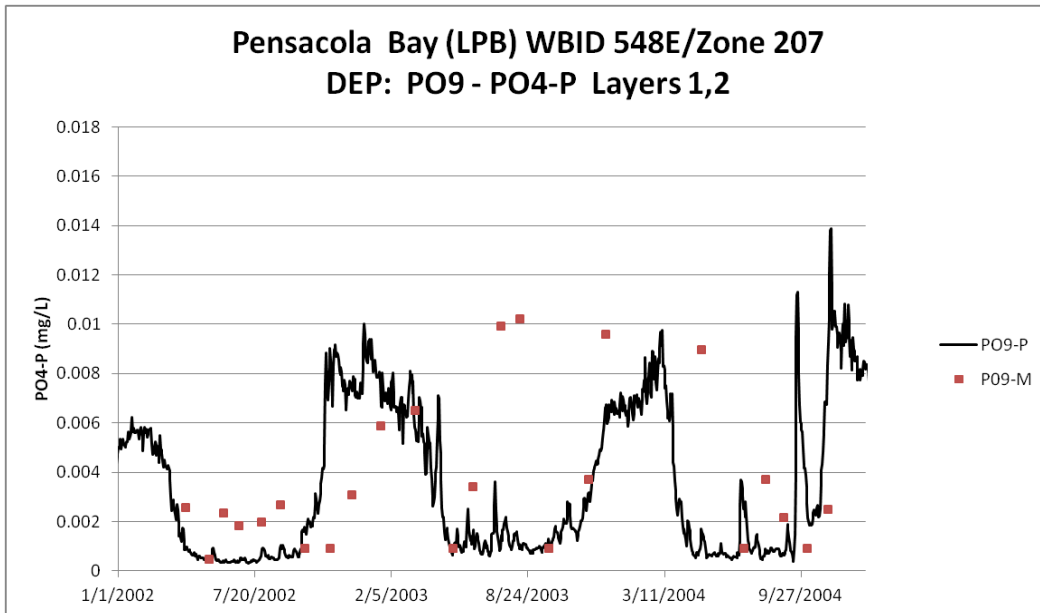


Figure E.8.39. PO4-P: Department Calibration at P10

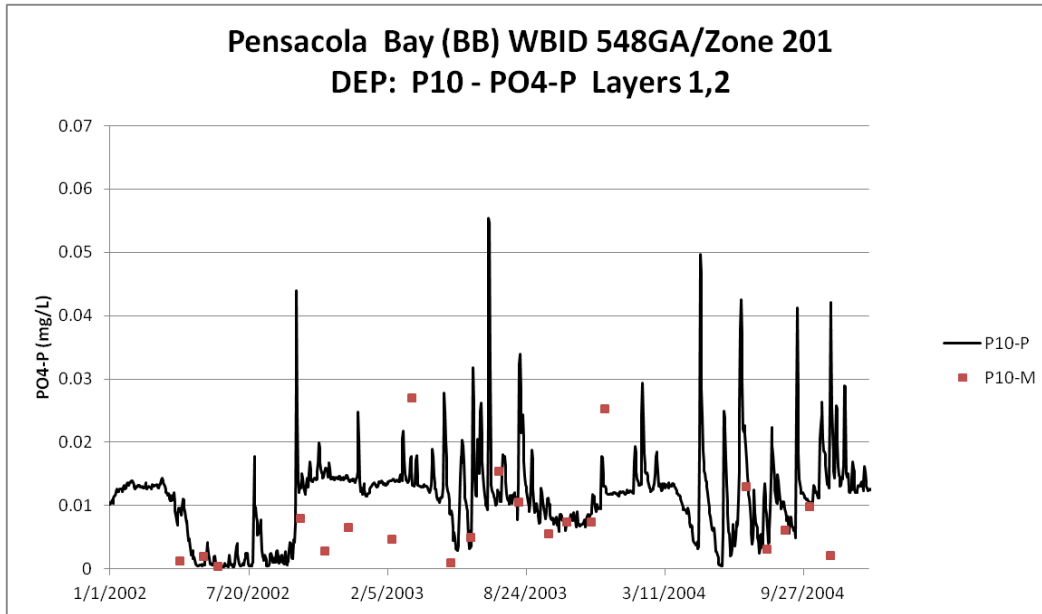


Figure E.8.40. PO4-P: Department Calibration at P11

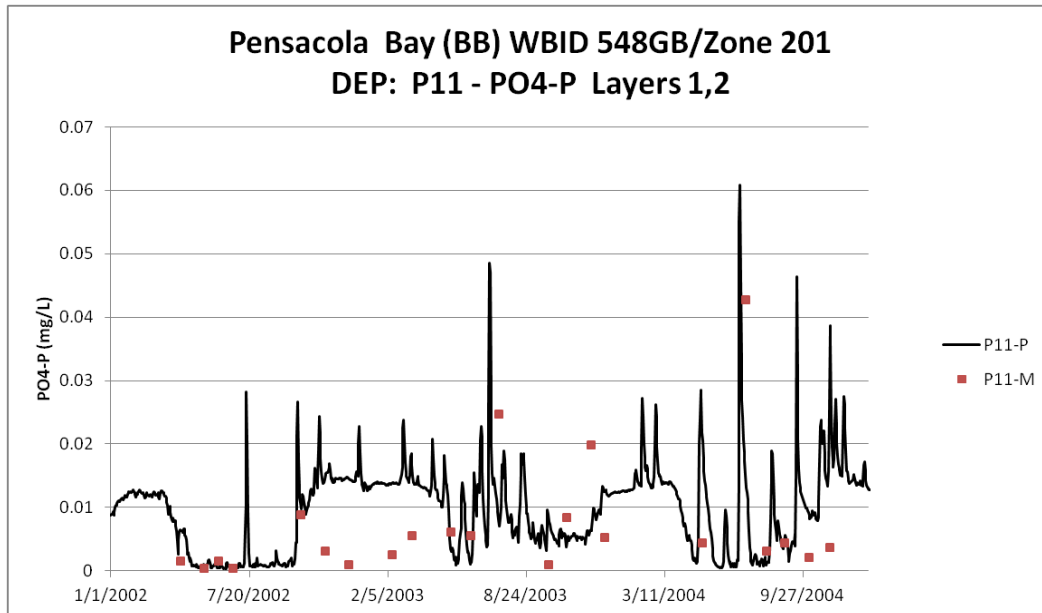


Figure E.8.41. PO4-P: Department Calibration at P12

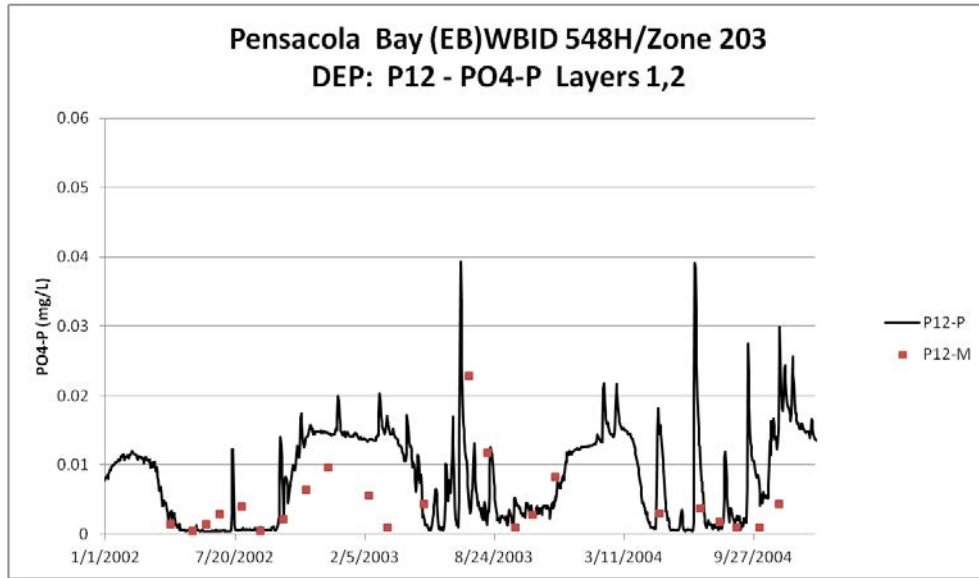


Figure E.8.42. PO4-P: Department Calibration at P13

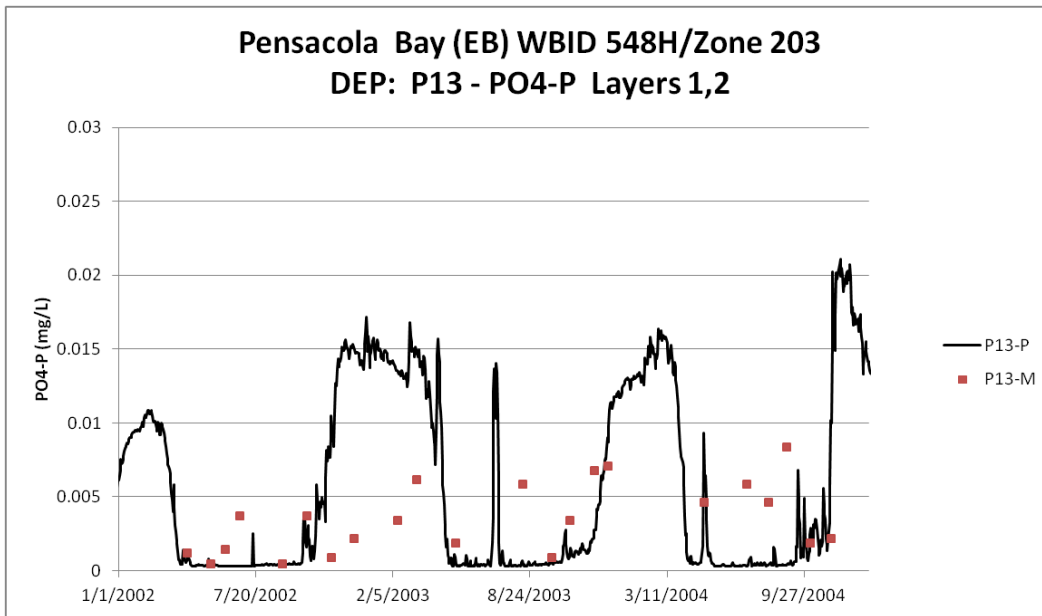


Figure E.8.43. PO4-P: Department Calibration at P14

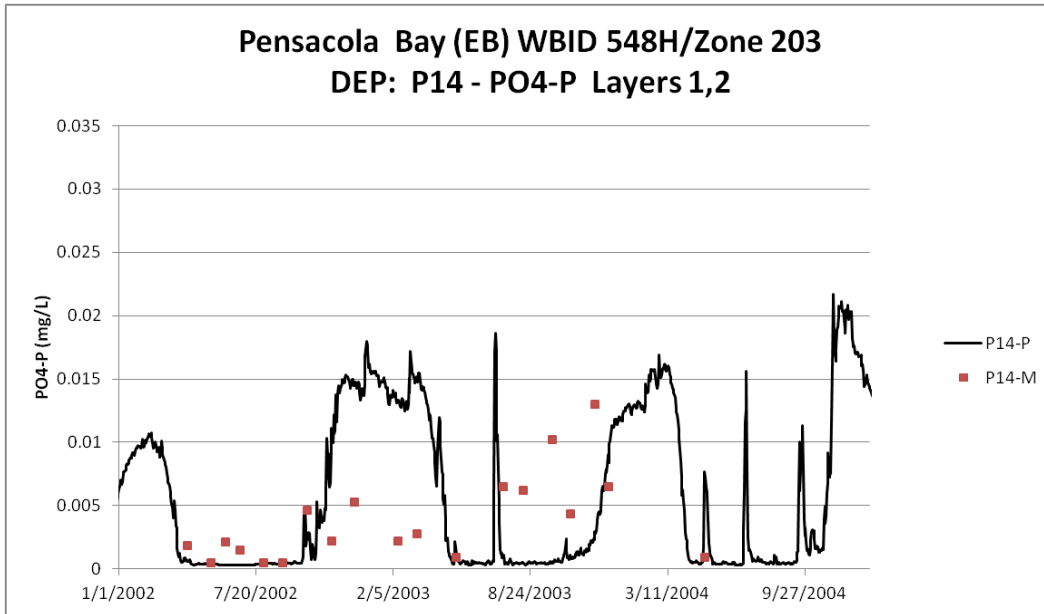


Figure E.8.44. PO4-P: Department Calibration at P15

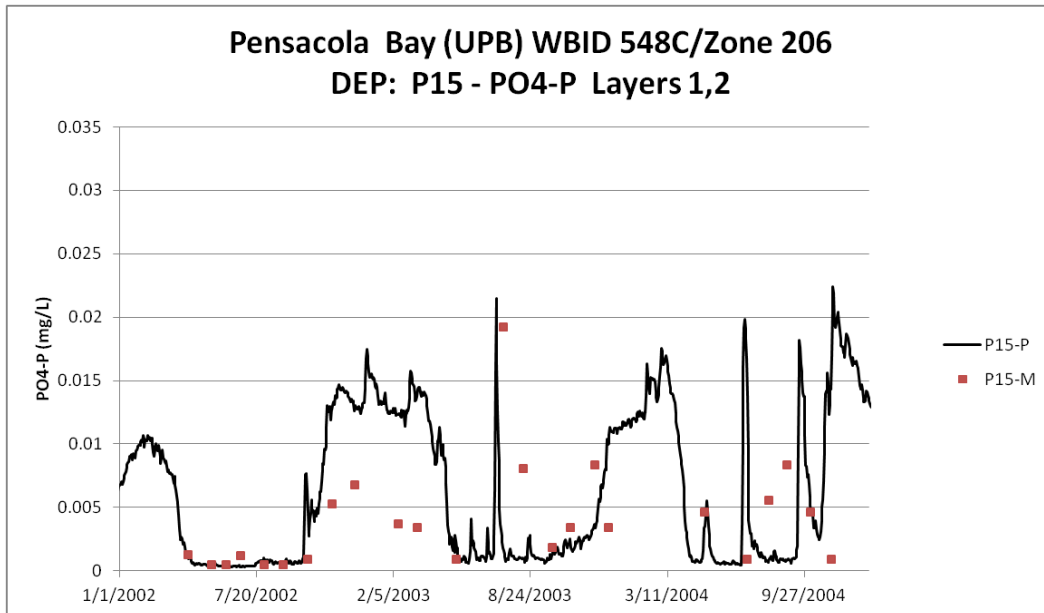


Figure E.8.45. PO4-P: Department Calibration at P16

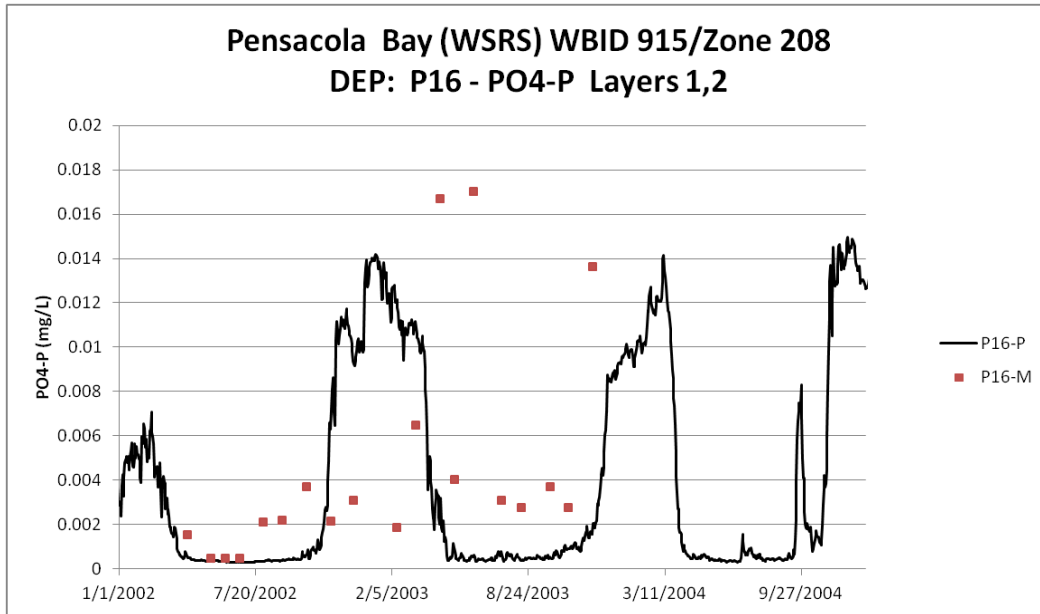


Figure E.8.46. CChla: Department Calibration at PO1

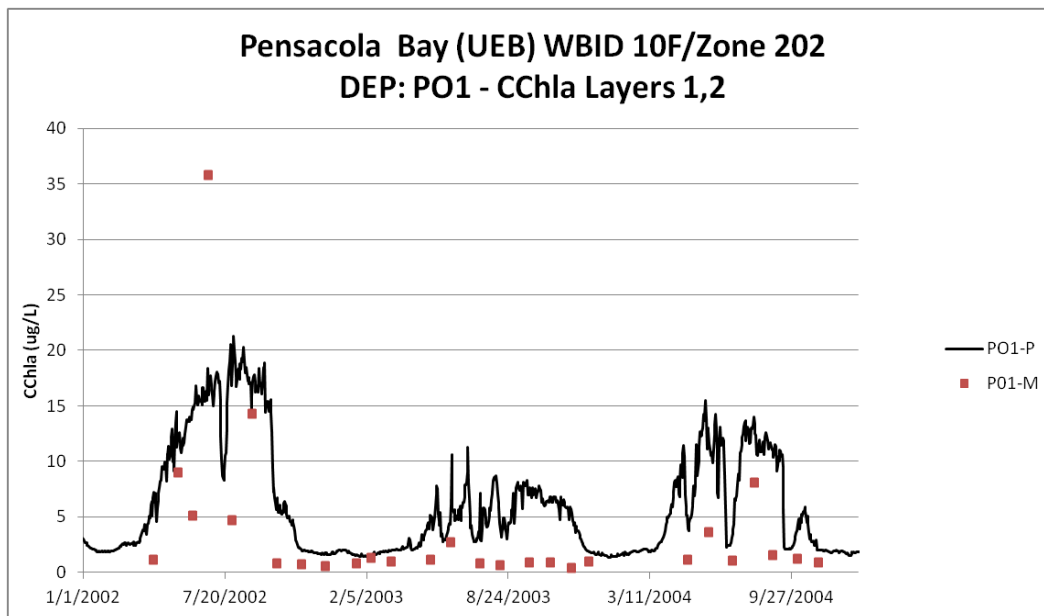


Figure E.8.47. CChla: Department Calibration at PO3

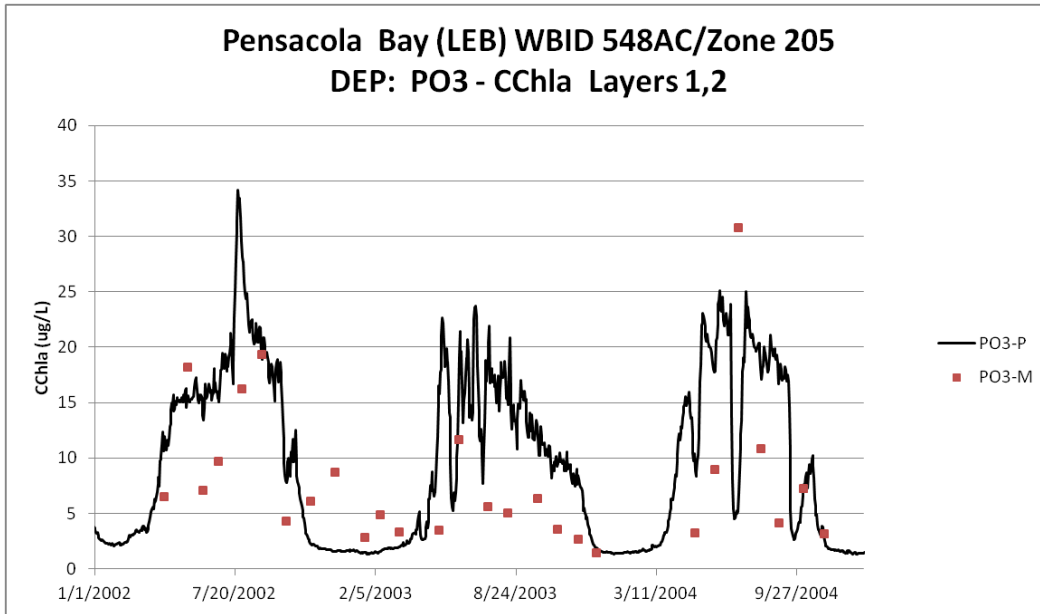


Figure E.8.48. CChla: Department Calibration at PO4

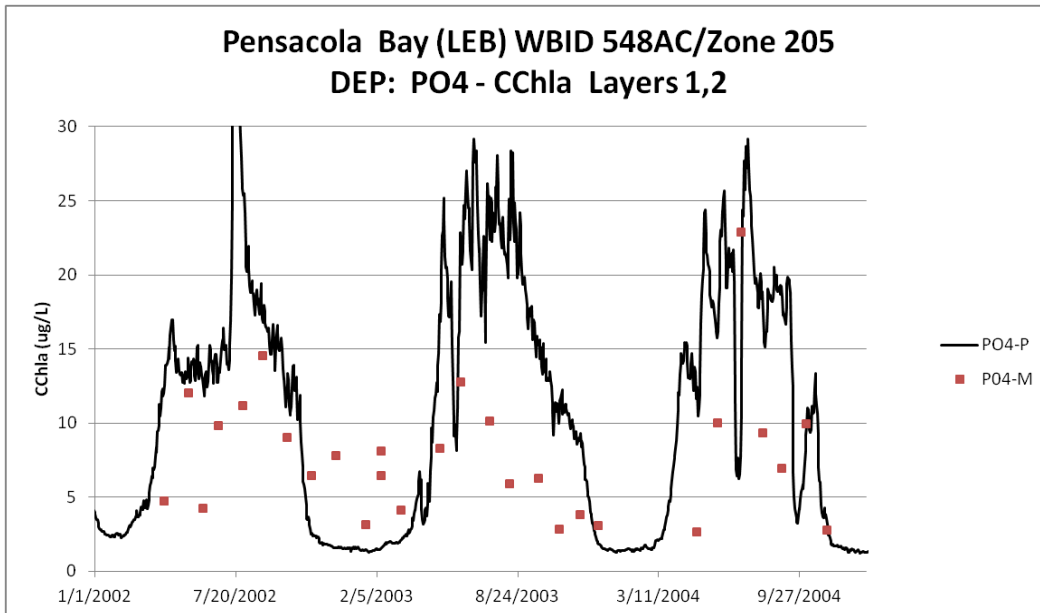


Figure E.8.49. CChla: Department Calibration at PO5

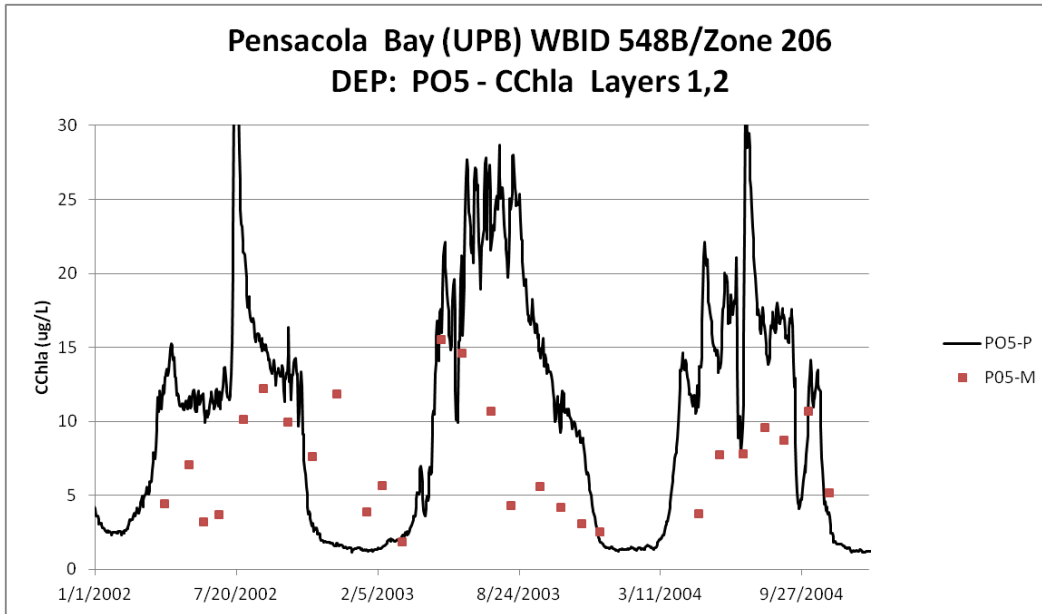


Figure E.8.50. CChla: Department Calibration at PO6

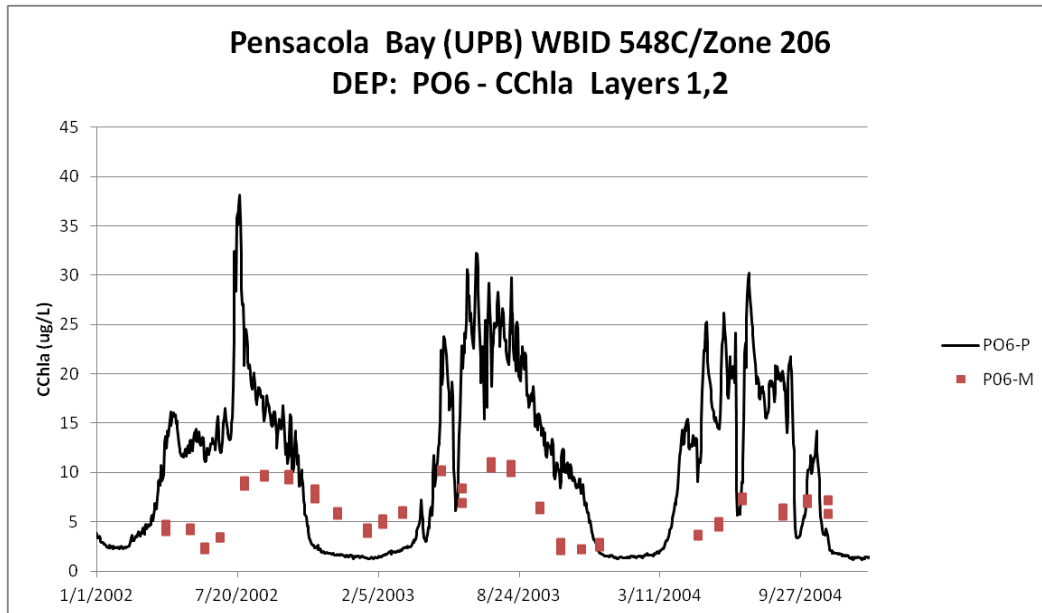


Figure E.8.51. CChla: Department Calibration at PO7

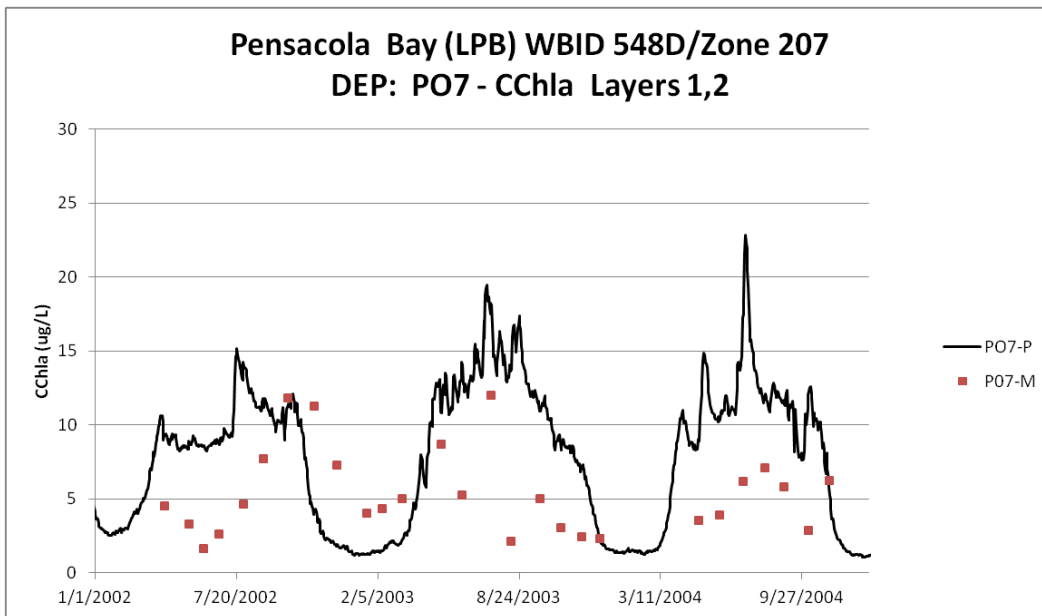


Figure E.8.52. CChla: Department Calibration at PO8

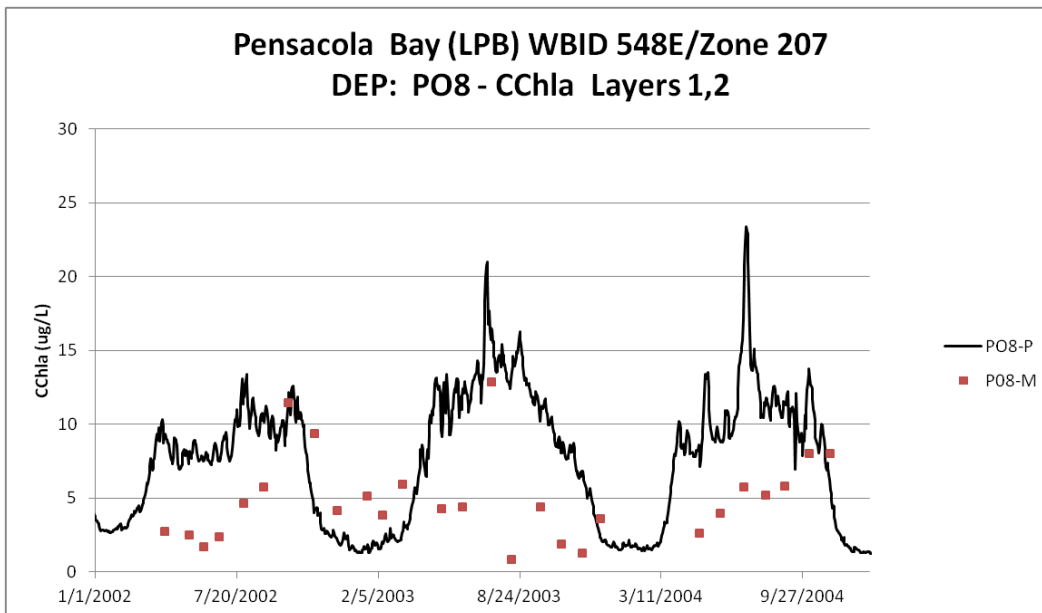


Figure E.8.53. CChla: Department Calibration at PO9

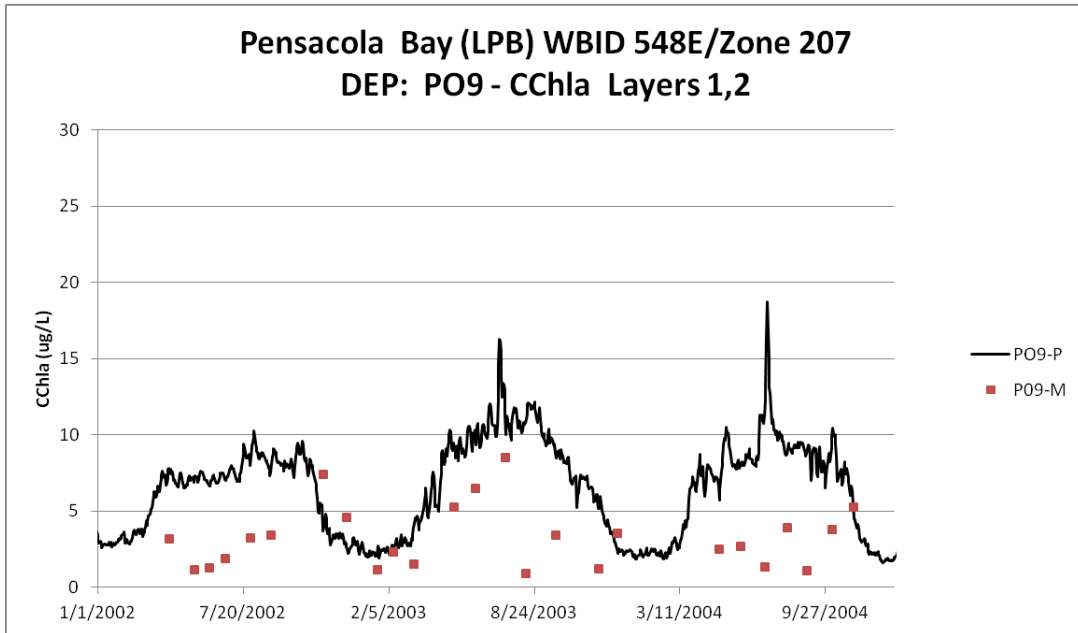


Figure E.8.54. CChla: Department Calibration at P10

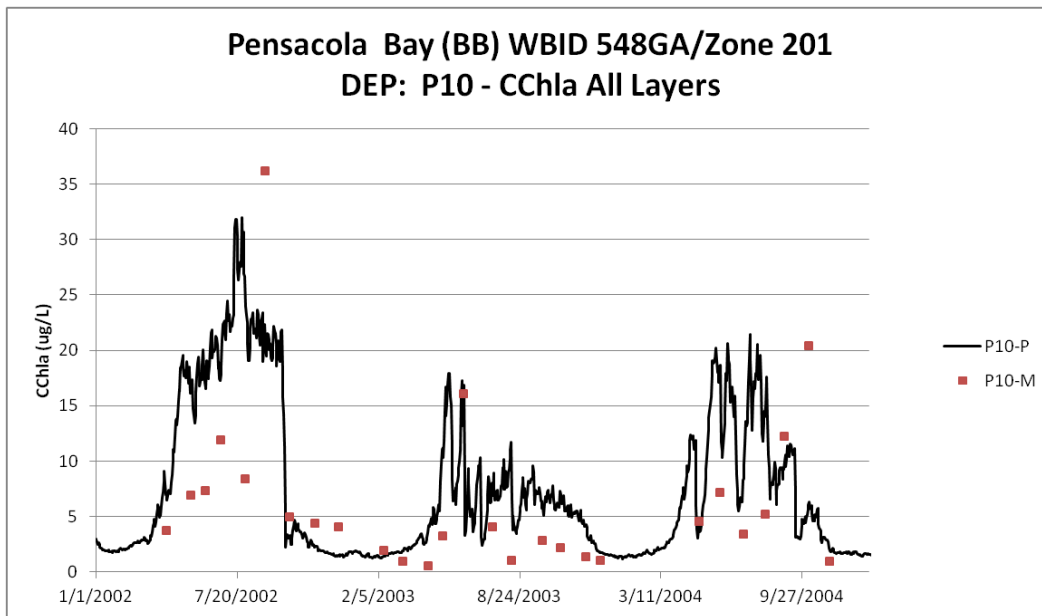


Figure E.8.55. CChla: Department Calibration at P11

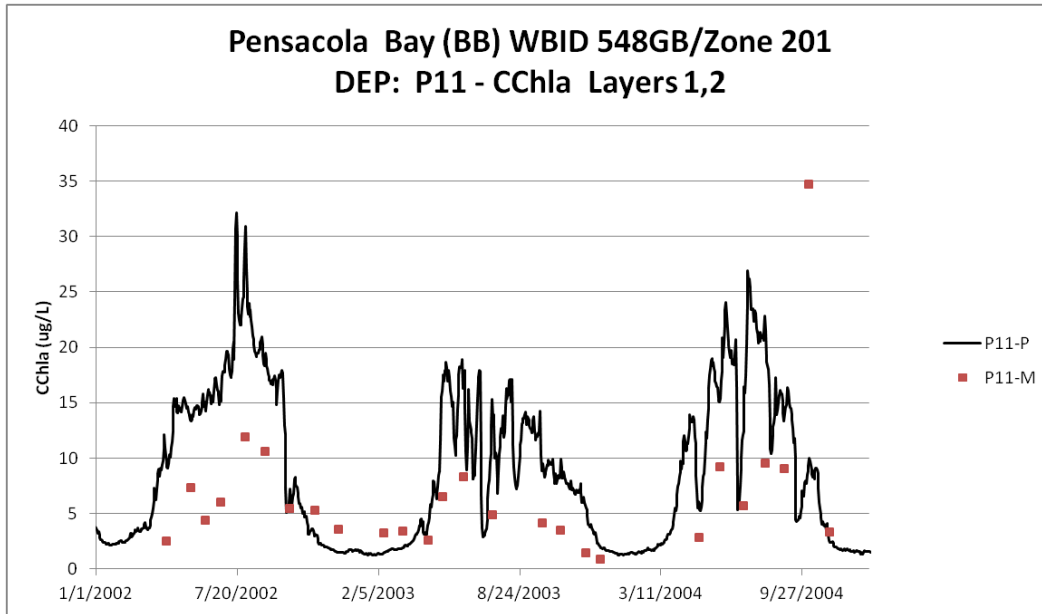


Figure E.8.56. CChla: Department Calibration at P12

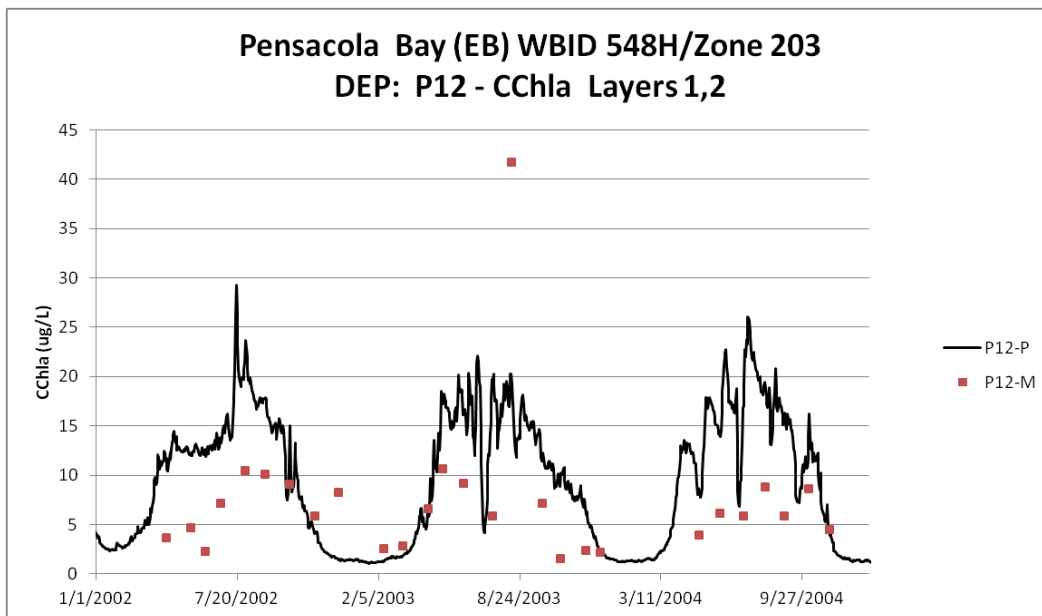


Figure E.8.57. CChla: Department Calibration at P13

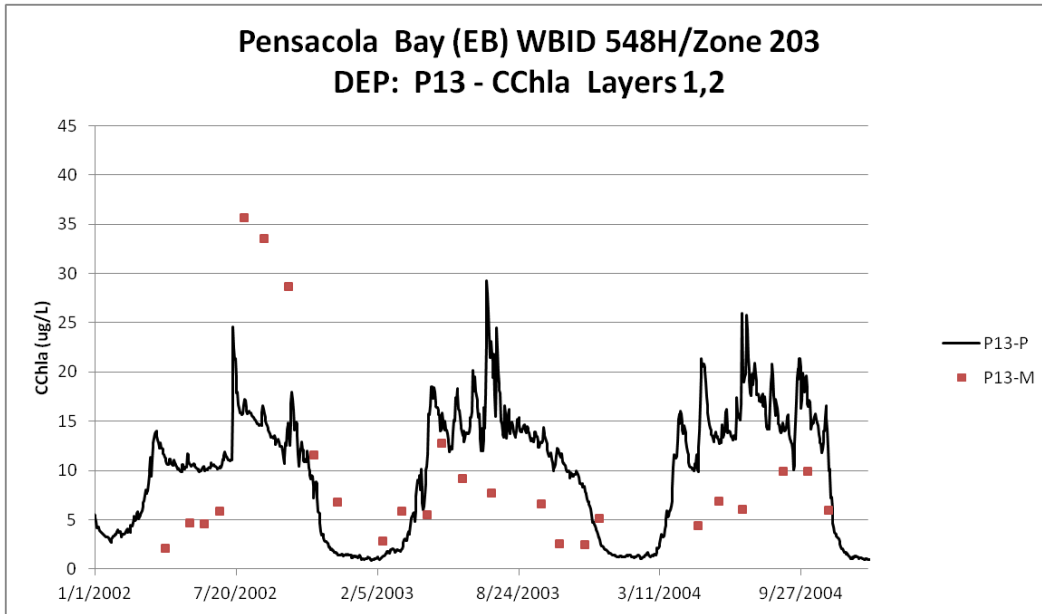


Figure E.8.58. CChla: Department Calibration at P14

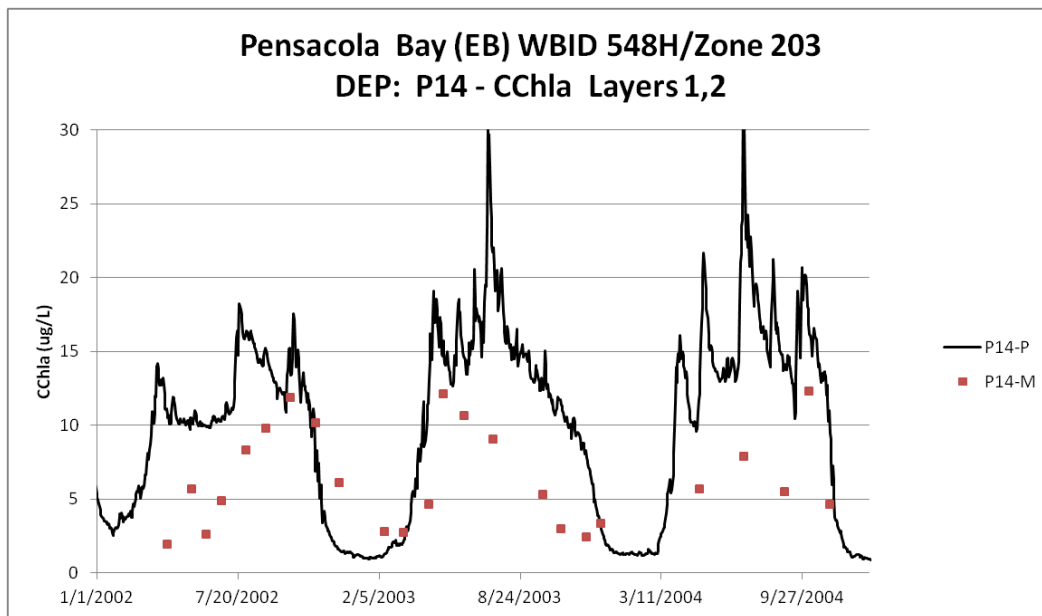


Figure E.8.59. CChla: Department Calibration at P15

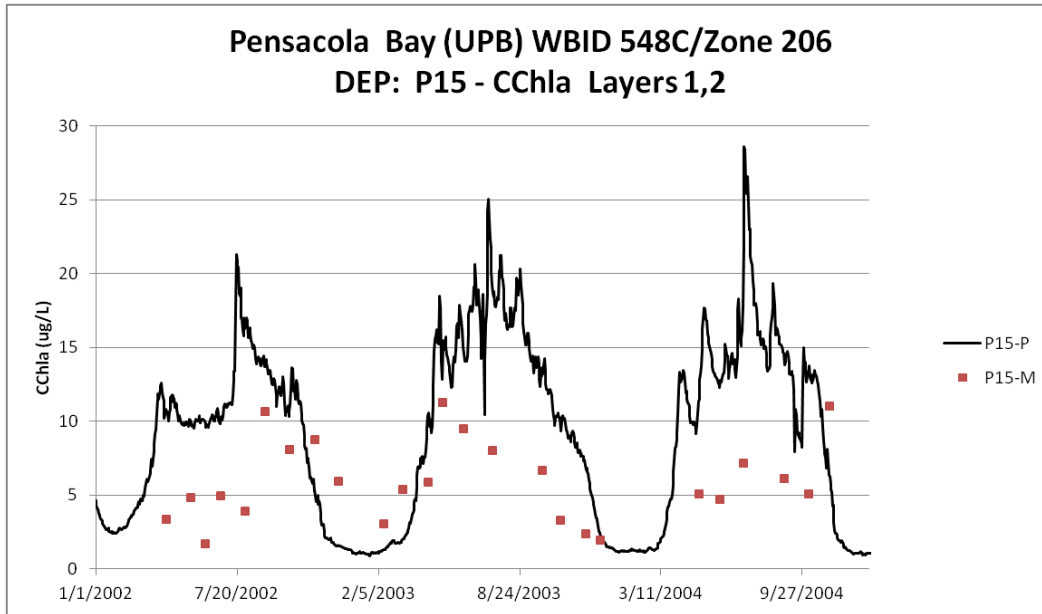
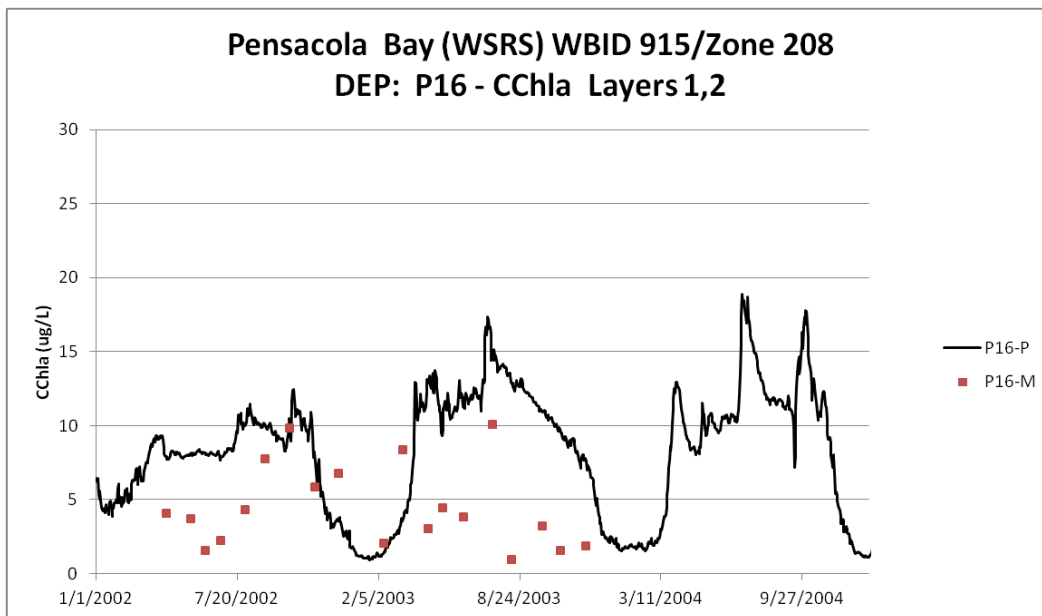


Figure E.8.60. CChla: Department Calibration at P16





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