

Appendix 5-A

References

Ambrose et al., 1988 WASP4 Users Manual

Ambrose et al., 1993 WASP5 Users Manual and Documentation

Ambrose, R. B., T. A. Wool, and J. L. Martin. 1993. The Water Quality Analysis Simulation Program, WASP5, Parts A and B, Version 5.10. Environmental Research Laboratory, U.S. Environmental Protection Agency, Athens, GA.

Ambrose, R.B., T.A. Wool, and J.L. Martin. 1995. The Water Quality Analysis Simulation Program, WASP5. Part A: Model Documentation. Prepared for Environmental Research Laboratory, Office of Research and development, U.S. Environmental Protection Agency, Athens, GA.

Ambrose, R.B., T.A. Wool, J. P. Connolly, and R. Schanz. 1988. WASP4, A Hydrodynamic and Water Quality Model– Model Theory, User's Manual, and Programmers Guide. Environmental Research Laboratory, U.S. Environmental Protection Agency, Athens, GA. EPA/600/3-87-039.

Cerco, C.A., and T. Cole. 1993. Three-dimensional Eutrophication Model of Chesapeake Bay. American Society of Civil Engineers, Journal of the Environmental Engineering Division, 119(6):1006-1025.

Cerco, C.F. and T.M. Cole. 1995. User's Guide to the CE-QUAL-ICM Three-Dimensional Eutrophication Model: Release 1.0. Prepared for U.S. Army Waterways Experiment Station, Vicksburg, MS.

Chapra, S.C, 1997. Surface Water Quality Modeling, McGraw-Hill, New York, NY.

Craig, Paul M. 2008. User's Manual for EFDC_Explorer3: A Pre/Post Processor for the Environmental Fluid Dynamics Code. Dynamic Solutions, LLC, Knoxville, TN, April.

Crean, D. 2007. An Analysis of the Water Quality in the Caloosahatchee River Estuary. Paper presented by Dan Crean at December 19, 2007 Research and Water Quality Meeting.

Delft Hydraulics, Delft3D-RGFGRID: Generation and manipulation of curvilinear grids for FLOW and WAVE: User Manual, November, 2006.

Di Toro et al 1983 WASP3 Users Manual

Di Toro, D.M. 1978. Optics of Turbid Estuarine Water: Approximations and Applications. Water Res. 12:1059-1068.

Di Toro, D.M. 1986. A Diagenetic Oxygen Equivalents Model of Sediment Oxygen Demand. In: Sediment Oxygen Demand, K. Hatcher, (ed.), Inst. natural Resources, University of Georgia, Athens, GA, pp. 171.

Di Toro, D.M. 2001. *Sediment Flux Modeling*. Wiley-Interscience, John Wiley & Sons, Inc., New York, NY, 624 pp.

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

- Di Toro, D.M. et al. 1990. Sediment Oxygen Demand: Methane and Ammonia Oxidation. J. Environ. Eng., 116(5):945-986.
- Di Toro, D.M. J.J. Fitzpatrick and R.V. Thomann. 1983. Documentation for Water Quality Analysis Simulation Program (WASP) and Model Verification Program (MVP). Environmental Research Laboratory, U.S. Environmental Protection Agency, Duluth, MN, EPA-600/3-81-044.
- DiToro, Dominic M. 2001. Sediment Flux Modeling. Wiley-Interscience. New York. ISBN 0-471-13535-6.
- DSL LLC, 2007. "A 3D Hydrodynamic Model of the Caloosahatchee for Operational Applications,
- Duffie, J.A. and W.A. Beckman .1974. *Solar Radiation Thermal Processes*. John Wiley & Sons, Inc., New York, NY.
- Duffie, J.A. and W.A. Beckman .1974. *Solar Radiation Thermal Processes*. John Wiley & Sons, Inc., New York, NY.
- Hamrick, J.M., 1992. A Three-Dimensional Environmental Fluid Dynamics Computer Code: Theoretical and Computational Aspects. Special Report No. 317 in Applied Marine Science and Ocean Engineering, Virginia Institute of Marine Science, Gloucester Point, VA. 64pp.
- Hamrick, J.M., 1996. User's Manual for the Environmental Fluid Dynamics Computer Code. Special Report No. 331 in Applied Marine Science and Ocean Engineering, Virginia Institute of Marine Science, Gloucester Point, VA.
- Hendrickson, J., Trahan, N., Gordon, E. and Ouyang, Y., Feb. 2007. Estimating Relevance of Organic Carbon, Nitrogen, and Phosphorus Loads to a Blackwater River Estuary, JAWRA, Vol. 43, No. 1.
- Hendrickson, J., Trahan, N., Gordon, E. and Ouyang, Y., Feb. 2007. Estimating Relevance of Organic Carbon, Nitrogen, and Phosphorus Loads to a Blackwater River Estuary, JAWRA, Vol. 43, No. 1.
- Ji, Z-G. 2008. *Hydrodynamics and Water Quality Modeling Rivers, Lakes and Estuaries*. Wiley Interscience, John Wiley & Sons, Inc., Hoboken, NJ, 676 pp.
- Johnson MacAdams, 2001, Environmental Restoration Report: Stevenson Creek. Titusville, FL.
- Kremer, J.N. and S. W. Nixon. 1978. *A Coastal Marine Ecosystem. Simulation and Analysis*. Springer-Verlag, New York, NY.
- Lung, W, 2001. Water Quality Modeling and Waste Load Allocations and TMDLs.
- Martin, J.L. 2004. Supplement to Water Analysis Simulation Program (WASP) User Documentation. WASP Sediment Diagenesis Routines: Model Theory and User's Guide. Draft Final Report. Prepared by James L. Martin, Mississippi State University for Tetra Tech, Inc., Fairfax, VA. 10 October 2004.

- McPherson, B.F. and R.L. Miller .1994. Causes of light attenuation in Tampa Bay and Charlotte Harbor, Southwestern Florida. *Water Resources Bulletin*, 30(1): 43-53
- Park, K., A.Y. Kuo, J. Shen and J.M. Hamrick. 1995. A Three-Dimensional Hydrodynamic-Eutrophication Model (HEM-3D): Description of Water Quality and Sediment Process Submodels (EFDC Water Quality Model). Special Report in Applied Marine Science and Ocean Engineering No. 327, School of Marine Science, Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, VA.
- Park, K., A.Y. Kuo, J. Shen and J.M. Hamrick. 2000. A three-Dimensional Hydrodynamic-Eutrophication Model (HEM-3D): Description of Water Quality and Sediment Process Submodels (EFDC Water Quality Model). Special Report in Applied Marine Science and Ocean Engineering No. 327, School of Marine Science, Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, VA.
- SFWMD, 2007. Personal communication with Tim Lieberman, SFWMD.
- Tetra Tech .1999a. A Theoretical Description of Sediment Transport Formulations Used in the EFDC Model. Tech. Memo TT-EFDC-99-1, Tetra Tech, Inc., Fairfax, VA.
- Tetra Tech .1999b. A Theoretical Description of Toxic Contaminant Transport Formulations Used in the EFDC Model. Tech. Memo TT-EFDC-99-2, Tetra Tech, Inc., Fairfax, VA.
- Tetra Tech, Inc., 2000. EFDC Technical Memorandum: Theoretical and Computational Aspects of Sediment Transport in the EFDC Model. Prepared for U.S. EPA Office of Science and Technology, Washington, DC.
- Thomann, R.V. and J.J. Fitzpatrick .1982. Calibration and Verification of a Model of the Potomac Estuary. HydroQual, Inc. Final Report to DC Dept. Environmental Services, Washington, DC, 500 pp. + appendix
- Thomann, R.V. and J.L. Mueller .1987. *Principles of Surface Water Quality Modeling and Control*. Harper & Row Publishers, New York, NY.
- USEPA. 2006. Water Quality Analysis Simulation Program (WASP) Version 7.1, Release Notes, 7 February 2006, US Environmental Protection Agency, Region 4, Atlanta, Georgia.
- USEPA. 2007. Water Quality Analysis Simulation Program (WASP) Version 7.2, Release Notes, U.S. Environmental Protection Agency, Region 4, Atlanta, Georgia.
- Wetzel, R.G., 1983. *Limnology*, Saunders College Publishing, Harcourt Brace College Publishers, Forth Worth, TX.
- Wool, T. R.B. Ambrose, J.L. Martin and E.A. Comer. Undated. Water Quality Analysis Simulation Program (WASP) Version 6.0, U.S. Environmental Protection Agency, Region 4, Atlanta, Georgia.

Appendix 5-B

Summary of NEXRAD rainfall data and comparisons to the NOAA gage data

Summary of NEXRAD rainfall data and comparisons to the NOAA gage data, Data analyzed may contain gaps.

Station ID	Data Type	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Avg of 1996-2005
BEELINE_R	Gaged Data	51.0	47.5	34.6	49.7	35.0	35.8	54.8	50.6	50.6	62.8	37.9	47.2
	NexRad	48.4	54.0	45.4	50.9	30.3	41.1	46.5	54.5	63.7	52.5	N/A	48.7
	% difference	-5.2	13.6	31.5	2.3	-13.5	14.8	-15.2	7.7	25.8	-16.5	N/A	3.1
CREEK_R	Gaged Data	44.1	46.1	45.4	41.1	29.3	55.5	63.3	44.9	67.3	69.0	32.1	50.6
	NexRad	45.4	45.8	41.8	38.3	29.3	44.6	57.2	52.3	66.2	71.0	N/A	49.2
	% difference	3.0	-0.7	-7.9	-6.8	0.1	-19.5	-9.6	16.4	-1.7	2.8	N/A	-2.8
EXOTR	Gaged Data	44.1	50.9	46.2	54.9	29.3	50.1	50.5	47.9	49.7	59.4	34.6	48.3
	NexRad	43.4	42.9	46.3	49.4	29.1	43.6	56.1	51.0	50.0	63.8	N/A	47.6
	% difference	-1.6	-15.7	0.3	-10.1	-0.7	-12.9	11.1	6.5	0.7	7.5	N/A	-1.5
INDIAN_L_R	Gaged Data	44.1	60.5	60.6	54.0	28.5	44.4	63.2	44.0	53.4	63.5	31.9	51.6
	NexRad	47.3	54.6	40.6	47.6	28.0	30.1	57.1	50.2	56.0	76.6	N/A	48.8
	% difference	7.3	-9.6	-32.9	-11.8	-1.8	-32.1	-9.7	14.2	4.9	20.5	N/A	-5.4
INRCTY_R	Gaged Data	52.1	53.2	32.5	45.4	26.2	53.0	59.4	40.2	55.0	52.4	38.9	47.0
	NexRad	54.4	49.7	40.0	39.5	30.4	37.9	59.6	53.1	61.3	64.6	N/A	49.0
	%	4.4	-6.7	22.8	-13.0	16.1	-28.6	0.4	32.0	11.3	23.2	N/A	4.4

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

Station ID	Data Type	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Avg of 1996-2005
	difference												
KENANS1_R	Gaged Data	44.1	60.5	60.6	54.0	28.5	44.4	63.2	50.1	49.2	58.3	35.2	51.3
	NexRad	38.0	46.4	35.6	42.2	28.0	39.5	45.1	39.0	49.3	59.6	N/A	42.3
	% difference	-13.9	-23.2	-41.2	-21.8	-1.7	-10.9	-28.6	-22.2	0.2	2.3	N/A	-17.6
KIRCOF_R	Gaged Data	44.1	50.9	41.9	43.2	34.1	53.7	69.3	47.6	67.0	68.5	25.1	52.0
	NexRad	45.1	45.6	45.4	40.1	31.2	40.3	68.2	56.1	70.9	73.5	N/A	51.6
	% difference	2.3	-10.3	8.3	-7.2	-8.5	-25.1	-1.6	17.8	5.8	7.3	N/A	-0.8
KISSFS_R	Gaged Data	52.1	53.2	32.5	45.4	26.2	53.0	59.4	50.6	65.8	56.4	32.9	49.5
	NexRad	49.7	49.2	40.1	40.9	34.3	39.8	57.9	51.5	61.4	59.1	N/A	48.4
	% difference	-4.7	-7.7	23.3	-9.9	31.1	-25.0	-2.6	1.9	-6.7	4.9	N/A	-2.2
KRBNR	Gaged Data	37.5	44.3	51.2	38.9	23.2	31.4	43.8	40.2	43.5	51.0	26.3	40.5
	NexRad	37.7	48.8	55.3	42.7	27.3	36.6	59.0	43.2	47.0	52.9	N/A	45.0
	% difference	0.5	10.2	8.0	9.9	17.8	16.4	34.6	7.4	8.0	3.7	N/A	11.2
KREFR	Gaged Data	44.1	60.5	60.6	52.7	28.5	46.9	63.2	50.5	48.7	66.0	40.9	52.1
	NexRad	43.2	52.0	49.5	40.2	27.7	38.7	50.9	49.1	50.0	66.7	N/A	46.8
	%	-1.9	-13.9	-18.3	-23.7	-2.6	-17.5	-19.6	-2.8	2.8	1.0	N/A	-10.3

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

Station ID	Data Type	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Avg of 1996-2005
	difference												
LOTELA_R	Gaged Data	37.5	61.3	60.6	50.0	28.5	42.9	63.2	50.1	49.5	54.2	32.1	49.8
	NexRad	47.2	56.2	54.0	39.0	31.4	55.7	46.9	51.0	54.3	62.9	N/A	49.9
	% difference	25.8	-8.3	-10.9	-22.1	10.3	29.9	-25.8	1.8	9.7	16.0	N/A	0.1
PC61_R	Gaged Data	37.5	44.3	51.2	38.9	23.2	31.4	45.7	42.7	47.8	53.8	28.7	41.6
	NexRad	42.4	57.8	60.2	51.9	31.6	48.7	61.7	56.4	54.2	62.1	N/A	52.7
	% difference	13.0	30.6	17.6	33.5	36.4	55.1	34.9	32.3	13.5	15.5	N/A	26.6
PINE_ISL_R	Gaged Data	44.1	50.9	46.2	54.9	29.3	50.1	50.5	47.9	56.4	66.1	35.0	49.6
	NexRad	41.7	43.9	49.5	51.6	30.3	48.2	58.3	56.1	54.4	67.9	N/A	50.2
	% difference	-5.5	-13.7	7.3	-6.1	3.6	-3.8	15.4	17.2	-3.6	2.7	N/A	1.1
S59_R	Gaged Data	51.0	47.5	34.6	49.7	35.0	35.8	54.8	50.6	50.6	62.8	28.4	47.2
	NexRad	52.3	50.1	36.2	44.8	35.9	37.2	54.3	56.0	58.9	65.9	N/A	49.2
	% difference	2.5	5.5	4.6	-10.0	2.6	3.8	-0.9	10.6	16.4	4.9	N/A	4.0
S61W	Gaged Data	44.1	50.9	41.9	43.2	35.6	46.0	52.2	45.0	49.8	58.0	30.8	46.7
	NexRad	46.6	48.6	43.4	42.9	34.8	44.0	57.5	52.9	59.4	57.6	N/A	48.8
	%	5.7	-4.4	3.6	-0.8	-2.2	-4.4	10.0	17.5	19.2	-0.6	N/A	4.5

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

Station ID	Data Type	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Avg of 1996-2005
	difference												
S68_R	Gaged Data	37.5	46.5	52.7	40.1	24.9	35.7	50.5	43.5	34.0	40.3	21.2	40.6
	NexRad	36.0	45.8	51.2	42.3	25.8	35.8	51.9	43.2	41.3	47.2	N/A	42.1
	% difference	-4.1	-1.7	-2.8	5.2	3.7	0.2	2.8	-0.7	21.7	17.0	N/A	3.6
S82_R	Gaged Data	37.5	38.8	41.6	40.0	25.0	28.4	40.6	35.1	34.1	34.2	31.2	35.5
	NexRad	38.8	46.8	49.5	42.1	30.8	33.4	41.2	41.5	40.6	38.9	N/A	40.4
	% difference	3.4	20.6	19.1	5.4	23.3	17.7	1.5	18.1	19.1	13.5	N/A	13.6
SEBRING_R	Gaged Data	37.5	44.3	51.2	38.9	23.2	31.4	45.7	42.7	47.8	47.2	36.2	41.0
	NexRad	40.4	52.4	49.7	38.2	29.1	44.9	55.4	48.5	49.2	55.1	N/A	46.3
	% difference	7.6	18.3	-3.0	-1.8	25.4	42.9	21.1	13.8	3.0	16.7	N/A	12.9
SHING.RG	Gaged Data	52.1	53.2	32.5	45.4	26.2	53.0	61.8	48.3	54.9	53.2	22.1	48.1
	NexRad	52.0	49.6	40.6	44.2	30.3	47.6	62.0	49.6	59.3	62.5	N/A	49.8
	% difference	-0.3	-6.7	24.9	-2.7	15.6	-10.2	0.3	2.6	8.0	17.5	N/A	3.5
SNIVELY_R	Gaged Data	44.1	46.1	45.4	41.1	29.3	55.5	62.3	50.7	61.1	57.5	26.3	49.3
	NexRad	50.8	45.3	44.9	48.3	29.6	43.2	51.7	52.3	63.8	68.4	N/A	49.8
	%	15.2	-1.7	-1.2	17.8	0.8	-22.0	-16.9	3.3	4.5	19.0	N/A	1.1

Florida Department of Environmental Protection
 Caloosahatchee River Basin TMDL Model Support
 Task Assignment CDM07-04, May 2008

Station ID	Data Type	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Avg of 1996-2005
	difference												
TICK_ISL_R	Gaged Data	44.1	60.5	60.6	52.7	28.5	43.6	59.6	44.7	42.5	59.7	44.5	49.6
	NexRad	44.9	53.4	48.8	41.7	31.2	45.2	60.2	51.6	50.5	65.5	N/A	49.3
	% difference	1.8	-11.7	-19.4	-20.7	9.5	3.7	1.1	15.4	18.9	9.8	N/A	-0.7
TOHO2_R	Gaged Data	51.0	47.5	34.6	47.5	27.1	40.6	54.9	43.8	47.8	40.6	28.0	43.5
	NexRad	46.3	46.0	39.3	42.6	35.4	42.7	60.2	57.4	59.1	72.2	N/A	50.1
	% difference	-9.2	-3.1	13.8	-10.2	31.0	5.3	9.8	31.1	23.6	77.8	N/A	15.2
TOHO10_R	Measured	51.0	47.5	34.6	47.7	33.7	43.9	54.2	47.4	54.3	66.6	36.1	48.1
	Gaged Data	44.4	49.4	43.8	44.9	31.9	44.2	55.2	49.7	61.5	60.4	N/A	48.5
	% difference	-13.0	3.9	26.7	-5.9	-5.4	0.8	1.8	5.0	13.1	-9.3	N/A	0.9
WRWX	Gaged Data	44.1	46.1	45.4	41.1	29.3	55.5	62.3	50.7	62.6	59.1	25.8	49.6
	NexRad	52.7	49.3	44.4	41.5	33.6	45.8	56.0	51.3	61.8	67.8	N/A	50.4
	% difference	19.5	6.9	-2.3	1.1	14.7	-17.4	-10.0	1.3	-1.4	14.7	N/A	1.6

*NexRad data have data gaps for December of 1999, May 27-31 of 2000, and April & December of 2001

Summary of NEXRAD rainfall data and comparisons to the NOAA gage data, Data analyzed only available for same period.

Station ID		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Avg of 1996- 2005
LEHIGH W_R	Gaged Data	22.3	39.4	ND	ND	48.6	ND	50.6	ND	48.3	66.1	45.9
	NexRad	38.9	63.9	-	-	61.6	-	77.3	-	61.7	71.2	62.4
	% difference	74.7	62.0	-	-	26.8	-	52.8	-	27.7	7.8	42.0
NR	Gaged Data	ND	ND	ND	ND	58.3	ND	54.3	40.9	61.6	77.4	58.5
	NexRad	-	-	-	-	40.6	-	63.7	66.7	53.7	72.0	59.3
	% difference	-	-	-	-	-30.4	-	17.4	63.1	-12.8	-7.0	6.0
OLGA	Gaged Data	ND	ND	40.3	ND	ND	ND	76.3	57.6	51.5	65.1	58.1
	NexRad	-	-	69.1	-	-	-	74.0	69.2	59.7	72.7	68.9
	% difference	-	-	71.5	-	-	-	-3.0	20.2	15.8	11.7	23.3
PAGE_NCDC	Gaged Data	ND	ND	ND	ND	ND	ND	51.7	66.2	60.6	71.8	62.6
	NexRad	-	-	-	-	-	-	82.9	81.5	70.8	82.7	79.5
	% difference	-	-	-	-	-	-	60.4	23.2	16.8	15.2	28.9
PALMDALE_R	Gaged Data	37.5	49.9	ND	ND	34.5	ND	50.59	54.86	45.86	ND	45.6
	NexRad	39.0	57.2	-	-	42.6	-	61.66	62.72	52.24	-	53.8
	%	3.8	14.7	-	-	23.3	-	21.88	14.32	13.91	-	17.9

Florida Department of Environmental Protection
 Caloosahatchee River Basin TMDL Model Support
 Task Assignment CDM07-04, May 2008

	difference											
S78W	Gaged Data	38.5	46.4	46.1	ND	ND	ND	61.1	62.9	39.5	ND	49.1
	NexRad	38.3	47.9	60.1	-	-	-	73.1	73.5	43.6	-	56.1
	% difference	-0.3	3.3	30.3	-	-	-	19.5	16.9	10.4	-	13.3
TOWNSITE_R	Gaged Data	39.6	43.7	52.1	ND	26.0	ND	41.5	38.8	56.1	73.6	46.4
	NexRad	45.8	51.9	56.3	-	36.6	-	49.6	45.8	60.3	75.8	52.8
	% difference	15.5	19.0	8.1	-	40.8	-	19.5	17.9	7.6	3.0	16.4
WHIDDEN3_R	Gaged Data	35.4	56.1	57.7	ND	31.4	ND	61.9	ND	50.5	61.0	50.5
	NexRad	42.0	66.2	61.2	-	34.6	-	68.2	-	50.2	63.5	55.1
	% difference	18.6	18.2	6.1	-	10.2	-	10.2	-	-0.6	4.1	9.5
YF	Gaged Data	ND	ND	ND	ND	43.1	ND	ND	60.2	ND	56.4	53.2
	NexRad	-	-	-	-	53.5	-	-	79.6	-	75.2	69.4
	% difference	-	-	-	-	24.3	-	-	32.2	-	33.3	29.9

*ND = No complete data available.

Appendix 5-C

Table of BMP Pollutant Load Reductions by Parameters

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

Hydrologic Unit	BMP Load Reduction by Parameters				
	Total Suspended Solids	Nitrate and Nitrite N	Total Kjeldahl Nitrogen	Biochemical Oxygen Demand	Total Phosphorus
1	74.3%	4.0%	10.8%	20.1%	19.9%
2	43.2%	11.4%	9.2%	11.1%	11.6%
3	28.5%	3.3%	3.3%	4.0%	4.2%
4	41.0%	9.5%	10.0%	13.0%	13.3%
5	16.4%	7.4%	6.9%	8.6%	8.9%
6	12.2%	5.3%	4.1%	5.3%	5.5%
7	7.0%	10.2%	7.8%	9.5%	9.7%
8	2.9%	2.7%	2.3%	2.7%	2.8%
9	8.0%	5.7%	4.9%	6.2%	6.4%
10	30.3%	7.3%	9.3%	13.9%	14.1%
11	31.7%	15.8%	14.1%	18.2%	18.9%
12	84.6%	19.6%	21.2%	29.0%	29.6%
13	17.4%	9.3%	8.7%	11.4%	11.7%
14	23.2%	4.7%	4.7%	7.0%	7.1%
15	50.7%	12.1%	16.8%	24.3%	24.5%
16	1.6%	0.9%	1.0%	1.5%	1.5%
17	1.9%	1.7%	1.7%	2.3%	2.4%
18	11.7%	2.5%	4.0%	8.0%	7.8%
19	22.0%	4.2%	6.6%	15.4%	14.7%
20	3.5%	1.8%	3.2%	8.8%	8.2%
21	4.5%	3.7%	5.6%	9.5%	9.5%
22	3.2%	2.4%	3.5%	7.0%	6.8%
23	30.2%	5.6%	7.1%	12.3%	12.3%
24	32.5%	7.8%	10.6%	18.8%	18.6%
25	0.5%	0.1%	0.3%	0.5%	0.5%
26	0.0%	0.0%	0.0%	0.0%	0.0%
27	8.4%	3.3%	5.9%	14.7%	13.6%
28	18.6%	1.0%	4.3%	13.7%	12.2%
29	26.7%	9.8%	9.3%	4.8%	8.5%
30	9.6%	1.1%	2.7%	8.0%	7.1%
31	28.2%	9.7%	12.1%	18.4%	18.6%
32	5.2%	1.4%	3.2%	9.4%	8.4%
33	8.0%	1.2%	2.1%	4.5%	4.3%
34	9.8%	2.9%	4.3%	9.4%	9.0%
35	8.1%	2.9%	4.2%	7.8%	7.7%
36	28.7%	8.4%	14.0%	24.7%	24.3%
37	1.1%	0.4%	1.0%	3.6%	3.1%
38	17.7%	2.7%	4.8%	10.0%	9.8%
39	18.4%	5.9%	8.6%	15.0%	14.8%
40	61.3%	23.0%	18.5%	22.9%	23.4%
41	21.8%	3.9%	6.9%	15.9%	15.1%

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

Hydrologic Unit	BMP Load Reduction by Parameters				
	Total Suspended Solids	Nitrate and Nitrite N	Total Kjeldahl Nitrogen	Biochemical Oxygen Demand	Total Phosphorus
42	13.4%	3.1%	4.8%	12.6%	11.6%
43	1.9%	0.6%	0.5%	0.1%	0.3%
44	18.4%	7.7%	9.8%	18.3%	18.0%
45	5.9%	0.9%	1.2%	1.0%	1.5%
46	8.8%	1.3%	2.5%	5.2%	5.0%
47	19.0%	5.9%	11.4%	21.3%	20.7%
48	7.1%	1.6%	1.7%	1.3%	1.9%
49	0.0%	0.0%	0.0%	0.0%	0.0%
50	4.3%	0.7%	1.5%	4.4%	3.9%
51	6.3%	1.0%	1.8%	3.8%	3.6%
52	0.5%	0.3%	0.3%	1.2%	1.0%
53	0.0%	0.0%	0.0%	0.0%	0.0%
54	9.0%	2.1%	2.4%	4.2%	4.2%
55	0.6%	0.0%	0.0%	0.0%	0.0%
56	3.8%	1.0%	1.0%	1.6%	1.8%
57	8.6%	4.0%	3.7%	1.5%	3.0%
58	19.8%	4.6%	6.8%	12.7%	12.3%
59	13.0%	2.6%	4.6%	12.0%	11.2%
60	23.2%	8.7%	10.4%	14.9%	15.0%
61	12.7%	4.5%	5.8%	9.0%	8.9%
62	16.5%	2.8%	6.0%	15.0%	13.8%
63	0.1%	0.0%	0.2%	0.8%	0.7%
64	17.6%	1.8%	5.0%	14.6%	13.1%
65	0.0%	0.1%	0.0%	0.7%	0.6%
66	13.7%	2.3%	4.7%	12.6%	11.5%
67	15.2%	2.5%	6.8%	17.8%	16.2%
68	10.2%	1.3%	3.6%	11.8%	10.4%
69	2.0%	0.7%	0.4%	0.4%	0.7%
70	6.6%	1.5%	2.9%	8.8%	7.9%
71	3.7%	1.4%	2.6%	7.8%	6.9%
72	8.6%	3.3%	5.4%	12.3%	11.7%
73	4.2%	1.3%	2.6%	8.6%	7.7%
74	19.2%	2.6%	3.2%	3.9%	4.7%
75	0.2%	0.1%	0.3%	1.0%	0.8%
76	1.0%	0.7%	1.2%	5.2%	4.3%
77	1.1%	0.2%	0.4%	1.8%	1.5%
78	0.0%	0.0%	0.0%	0.0%	0.0%
79	6.2%	3.9%	6.5%	15.4%	14.6%
80	5.6%	3.3%	5.8%	15.5%	14.3%
81	9.4%	3.1%	7.2%	16.5%	15.6%
82	4.3%	1.7%	2.5%	4.3%	4.3%
83	7.0%	1.7%	2.5%	4.3%	4.2%
84	19.6%	5.5%	9.2%	15.3%	15.2%

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

Hydrologic Unit	BMP Load Reduction by Parameters				
	Total Suspended Solids	Nitrate and Nitrite N	Total Kjeldahl Nitrogen	Biochemical Oxygen Demand	Total Phosphorus
85	8.7%	1.0%	2.2%	5.7%	5.4%
86	9.4%	4.3%	5.6%	8.8%	8.8%
87	24.6%	5.9%	7.7%	11.5%	11.6%
88	8.0%	1.0%	2.7%	6.8%	6.3%
89	21.2%	6.8%	6.3%	8.1%	8.3%
90	1.0%	1.9%	2.0%	2.6%	2.6%
91	7.2%	2.3%	3.9%	5.9%	5.9%
92	10.7%	8.3%	8.8%	11.5%	11.6%
93	16.9%	6.5%	6.9%	8.7%	8.9%
94	14.4%	5.9%	5.6%	6.9%	7.3%
95	4.0%	1.9%	1.9%	2.4%	2.5%
96	1.6%	0.3%	0.8%	0.8%	0.8%
97	0.0%	0.0%	0.0%	0.0%	0.0%
98	3.1%	1.0%	0.7%	0.8%	0.9%
99	17.3%	7.3%	6.4%	8.0%	8.2%
100	31.7%	8.1%	7.3%	9.3%	9.7%
101	50.8%	6.6%	14.6%	24.2%	24.6%
102	60.3%	19.8%	17.6%	23.1%	24.1%

Appendix 5-D

HSPF Hydrologic Parameters for Agricultural Land Uses

HSPF Hydrologic Parameters for Agricultural Land Uses (under development)

Parameter	Definition	Units	Typical		Possible		Calibrated for the Caloosahatchee River Watershed
			Min	Max	Min	Max	
AGWETP	Fraction of remaining ET from active groundwater	None	0	0.05	0	0.2	0
AGWRC	Basic groundwater recession	None	0.92	0.99	0.85	0.999	0.92-0.975
BASETP	Fraction of remaining ET from base flow	None	0	0.05	0	0.2	0
CEPSC	Interception storage capacity	Inch	0.03	0.2	0.01	0.4	0.0-0.1
DEEPER	Fraction of groundwater inflow to deep recharge	None	0	0.2	0	0.5	0
FOREST	Fraction forest cover	None	0.00	0.5	0	0.95	0.0-1.0
INFEXP	Exponent in infiltration equation	None	2	2	1	3	2
INFILD	Ratio of max/mean infiltration capacities	None	2	2	1	3	2
INFILT	Index to infiltration capacity	Inch/hour	0.01	0.25	0.001	0.5	0.05-0.88
INTFW	Interflow/surface runoff partition parameter	None	1	3	1	10	2.0-3.0
IRC	Interflow recession parameter	None	0.5	0.7	0.3	0.85	0.75
KVARY	Groundwater recession variable	1/inch	0	3	0	5	0
LSUR	Length of overland flow	Ft	200	500	100	700	300
LZETP	Lower zone ET parameter	None	0.2	0.7	0.1	0.9	0.2 - 0.7
LZSN	Lower zone nominal soil moisture	inch	3	8	2	15	5.0-7.2
NSUR	Manning's n	None	0.15	0.35	0.1	0.5	0.12-0.27
PETMAX	Air temp below which ET is reduced	Deg F	35	45	32	48	40

Florida Department of Environmental Protection
 Caloosahatchee River Basin TMDL Model Support
 Task Assignment CDM07-04, May 2008

Parameter	Definition	Units	Typical		Possible		Calibrated for the Caloosahatchee River Watershed
			Min	Max	Min	Max	
PETMIN	Air temp below which ET is set to zero	Deg F	30	35	30	40	35
SLSUR	Slope of overland flow path	None	0.01	0.15	0.00 1	0.3	0.001
UZSN	Upper zone nominal soils moisture	inch	0.10	1	0.05	2	0.39 - 0.54

Appendix 5-E EFDC Calibration Plots

Table of Figures

Figure 5-E- 1 Caloosahatchee Water Quality Calibration: Dissolved Oxygen, CES04, Surface	1
Figure 5-E- 2 Caloosahatchee Water Quality Calibration: Dissolved Oxygen, CES04, Bottom	1
Figure 5-E- 3 Caloosahatchee Water Quality Calibration: Dissolved Oxygen, CES06, Surface	2
Figure 5-E- 4 Caloosahatchee Water Quality Calibration: Dissolved Oxygen, CES06, Bottom	2
Figure 5-E- 5 Caloosahatchee Water Quality Calibration: Dissolved Oxygen, PI-01.....	3
Figure 5-E- 6 Caloosahatchee Water Quality Calibration: Chlorophyll a, CES04	3
Figure 5-E- 7 Caloosahatchee Water Quality Calibration: Chlorophyll a, CES06	4
Figure 5-E- 8 Caloosahatchee Water Quality Calibration: Chlorophyll a, PI-01.....	4
Figure 5-E- 9 Caloosahatchee Water Quality Calibration: Total Phosphorus, CES04, Surface	5
Figure 5-E- 10 Caloosahatchee Water Quality Calibration: Total Phosphorus, CES04, Bottom	5
Figure 5-E- 11 Caloosahatchee Water Quality Calibration: Total Phosphorus, CES06, Surface	6
Figure 5-E- 12 Caloosahatchee Water Quality Calibration: Total Phosphorus, CES06, Bottom	6
Figure 5-E- 13 Caloosahatchee Water Quality Calibration: Total Phosphorus, PI-01.....	7
Figure 5-E- 14 Caloosahatchee Water Quality Calibration: Total Phosphate, CES04, Surface	7
Figure 5-E- 15 Caloosahatchee Water Quality Calibration: Total Phosphate, CES04, Bottom	8
Figure 5-E- 16 Caloosahatchee Water Quality Calibration: Total Phosphate, CES06, Surface	8
Figure 5-E- 17 Caloosahatchee Water Quality Calibration: Total Phosphate, CES06, Bottom	9
Figure 5-E- 18 Caloosahatchee Water Quality Calibration: Total Phosphate, PI-01.....	9
Figure 5-E- 19 Caloosahatchee Water Quality Calibration: Total Nitrogen, CES04, Surface	10
Figure 5-E- 20 Caloosahatchee Water Quality Calibration: Total Nitrogen, CES04, Bottom	10
Figure 5-E- 21 Caloosahatchee Water Quality Calibration: Total Nitrogen, CES06, Surface	11
Figure 5-E- 22 Caloosahatchee Water Quality Calibration: Total Nitrogen, CES06, Bottom	11
Figure 5-E- 23 Caloosahatchee Water Quality Calibration: Total Nitrogen, PI-01.....	12
Figure 5-E- 24 Caloosahatchee Water Quality Calibration: Ammonia Nitrogen, CES04, Surface.....	12

Figure 5-E- 25 Caloosahatchee Water Quality Calibration: Ammonia Nitrogen, CES04, Bottom.....	13
Figure 5-E- 26 Caloosahatchee Water Quality Calibration: Ammonia Nitrogen, CES06, Surface.....	13
Figure 5-E- 27 Caloosahatchee Water Quality Calibration: Ammonia Nitrogen, CES06, Bottom.....	14
Figure 5-E- 28 Caloosahatchee Water Quality Calibration: Ammonia Nitrogen, PI-01	14
Figure 5-E- 29 Caloosahatchee Water Quality Calibration: Nitrate Nitrogen, CES04, Surface	15
Figure 5-E- 30 Caloosahatchee Water Quality Calibration: Nitrate Nitrogen, CES04, Bottom.....	15
Figure 5-E- 31 Caloosahatchee Water Quality Calibration: Nitrate Nitrogen, CES06, Surface	16
Figure 5-E- 32 Caloosahatchee Water Quality Calibration: Nitrate Nitrogen, CES06, Bottom.....	16
Figure 5-E- 33 Caloosahatchee Water Quality Calibration: Nitrate Nitrogen, PI-01	17
Figure 5-E- 34 Caloosahatchee Water Quality Calibration: Total Organic Nitrogen, CES04, Surface.....	17
Figure 5-E- 35 Caloosahatchee Water Quality Calibration: Total Organic Nitrogen, CES04, Bottom.....	18
Figure 5-E- 36 Caloosahatchee Water Quality Calibration: Total Organic Nitrogen, CES06, Surface.....	18
Figure 5-E- 37 Caloosahatchee Water Quality Calibration: Total Organic Nitrogen, CES06, Bottom.....	19
Figure 5-E- 38 Caloosahatchee Water Quality Calibration: Total Organic Nitrogen, PI-01	19
Figure 5-E- 39 Caloosahatchee Water Quality Calibration: Total Suspended Solids, CES04, Surface	20
Figure 5-E- 40 Caloosahatchee Water Quality Calibration: Total Suspended Solids, CES04, Bottom	20
Figure 5-E- 41 Caloosahatchee Water Quality Calibration: Total Suspended Solids, CES06, Surface	21
Figure 5-E- 42 Caloosahatchee Water Quality Calibration: Total Suspended Solids, CES06, Bottom	21
Figure 5-E- 43 Caloosahatchee Water Quality Calibration: Total Suspended Solids, PI-01.....	22

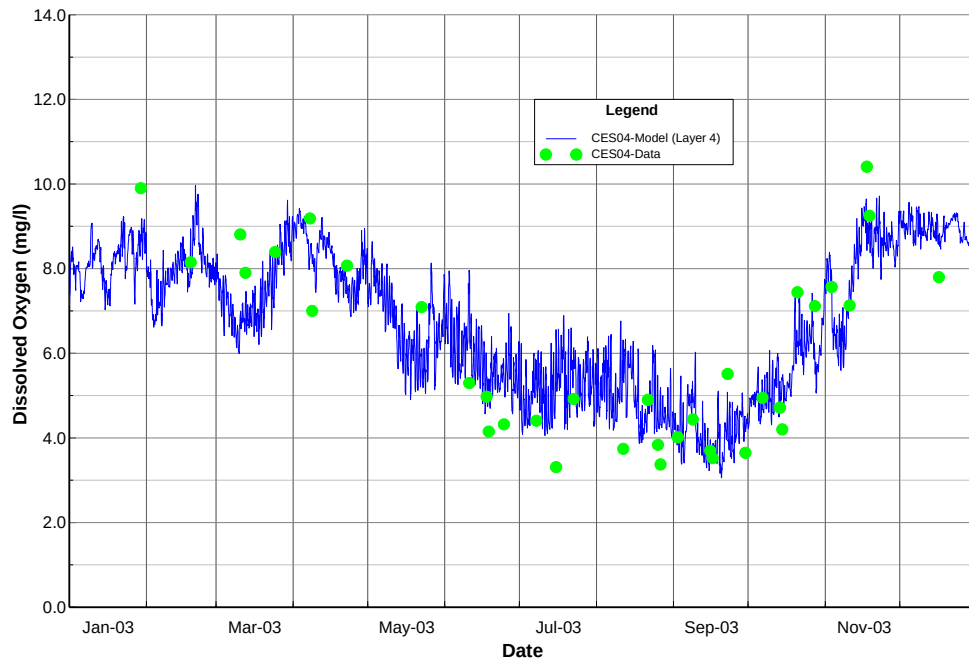


Figure 5-E- 1 Caloosahatchee Water Quality Calibration: Dissolved Oxygen, CES04, Surface

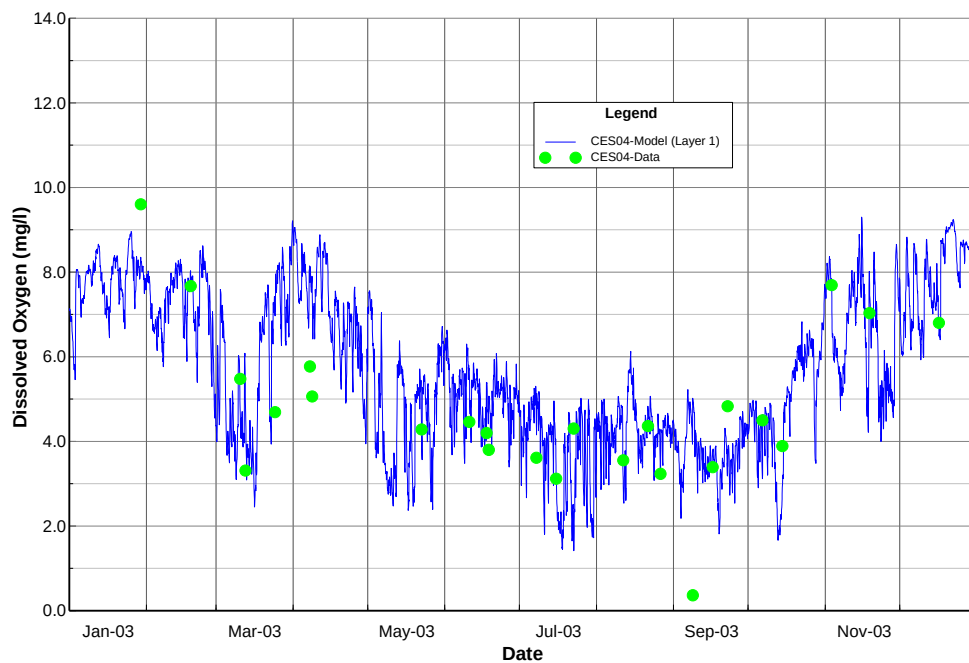


Figure 5-E- 2 Caloosahatchee Water Quality Calibration: Dissolved Oxygen, CES04, Bottom

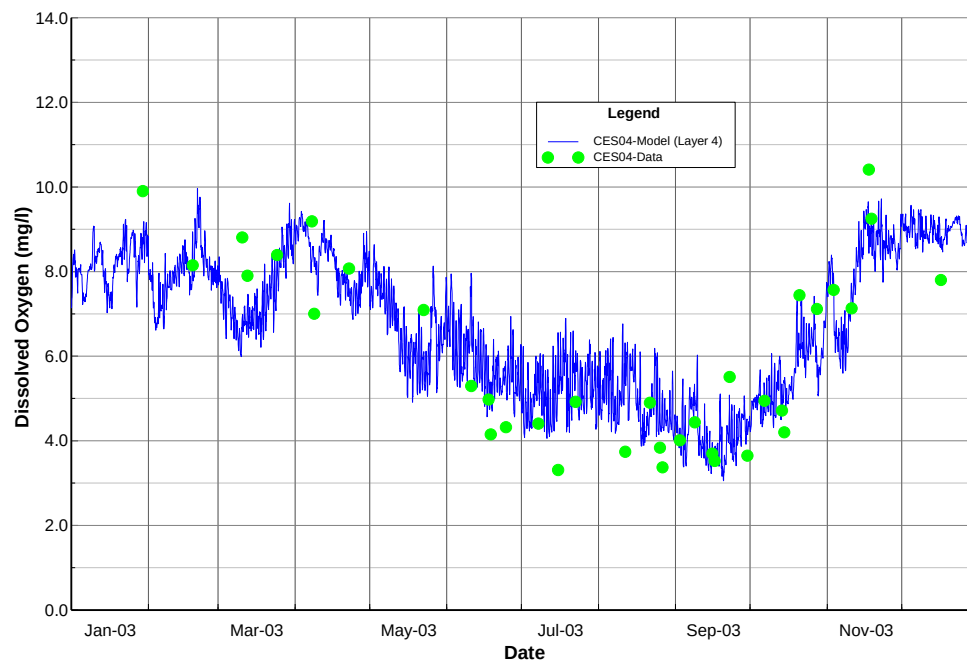


Figure 5-E- 3 Caloosahatchee Water Quality Calibration: Dissolved Oxygen, CES06, Surface

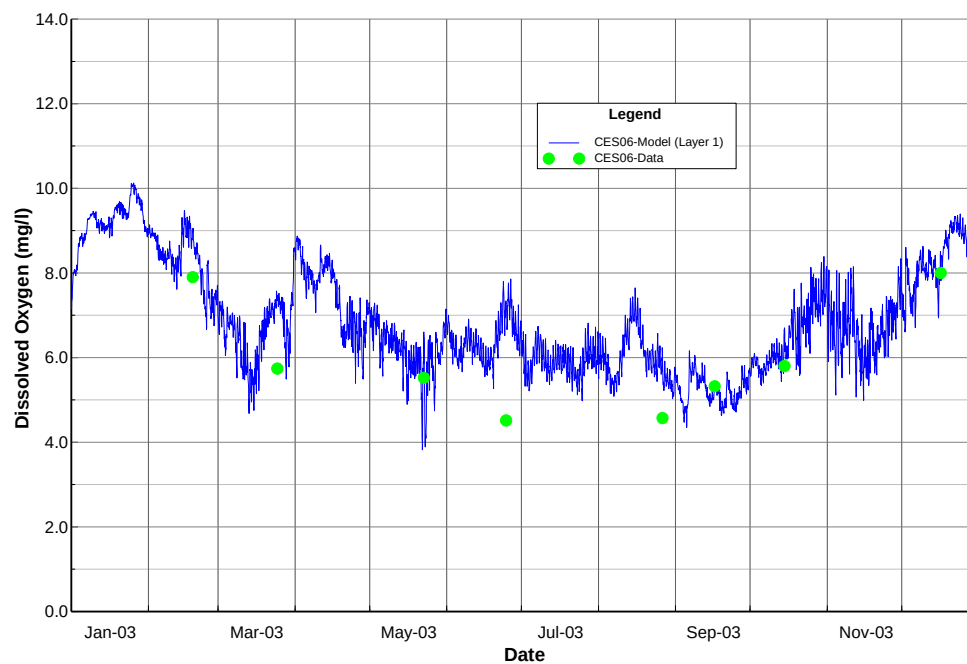


Figure 5-E- 4 Caloosahatchee Water Quality Calibration: Dissolved Oxygen, CES06, Bottom

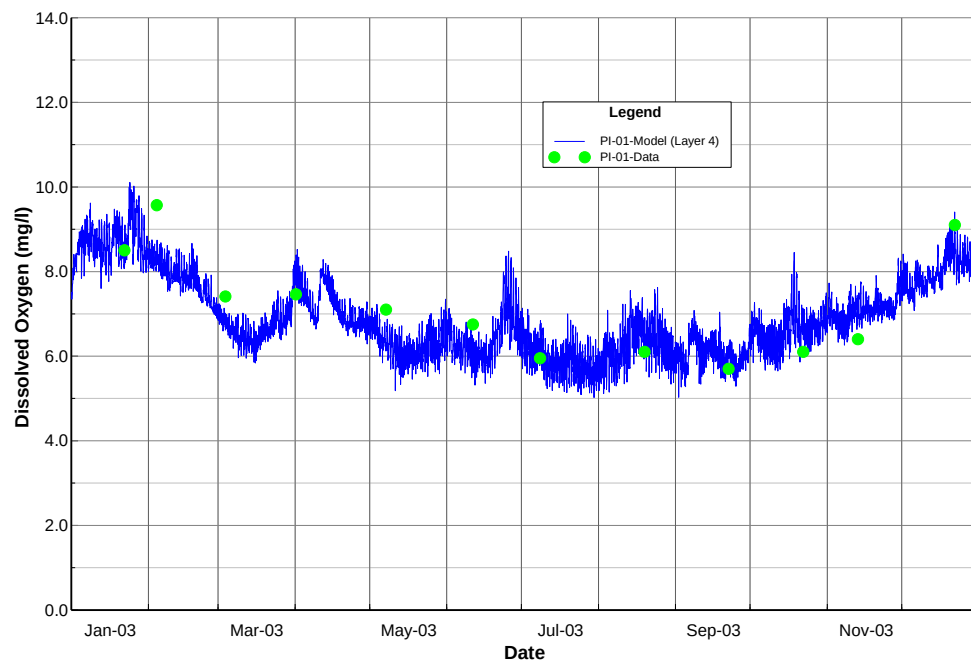


Figure 5-E- 5 Caloosahatchee Water Quality Calibration: Dissolved Oxygen, PI-01

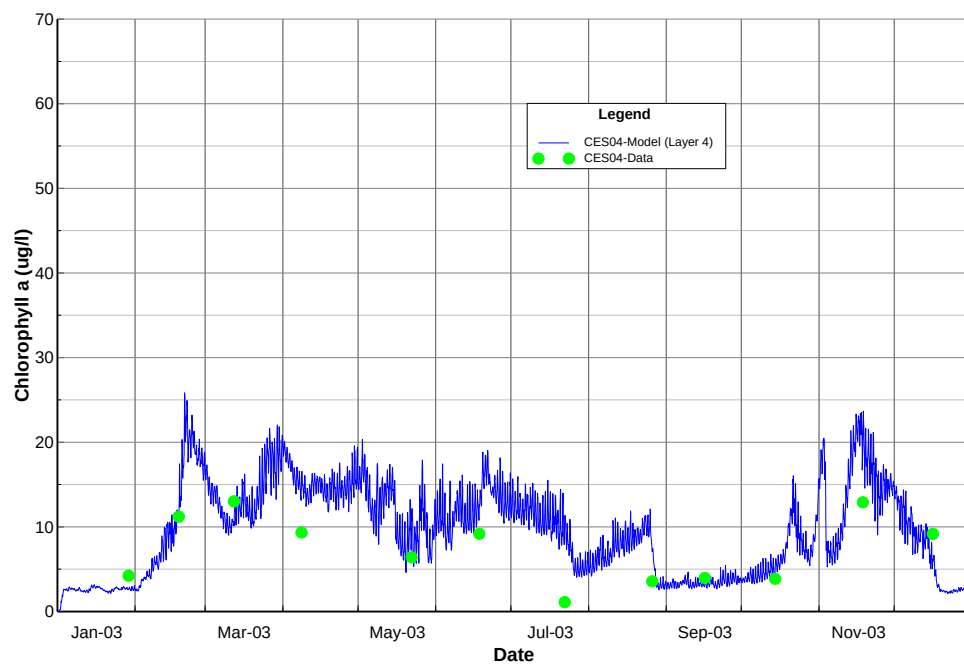


Figure 5-E- 6 Caloosahatchee Water Quality Calibration: Chlorophyll a, CES04

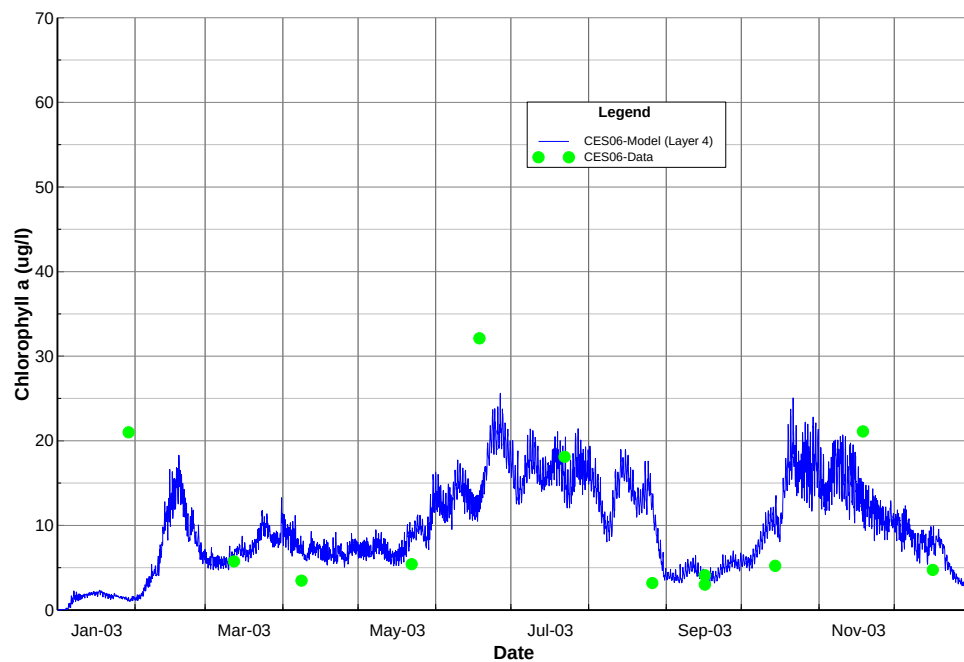


Figure 5-E- 7 Caloosahatchee Water Quality Calibration: Chlorophyll a, CES06

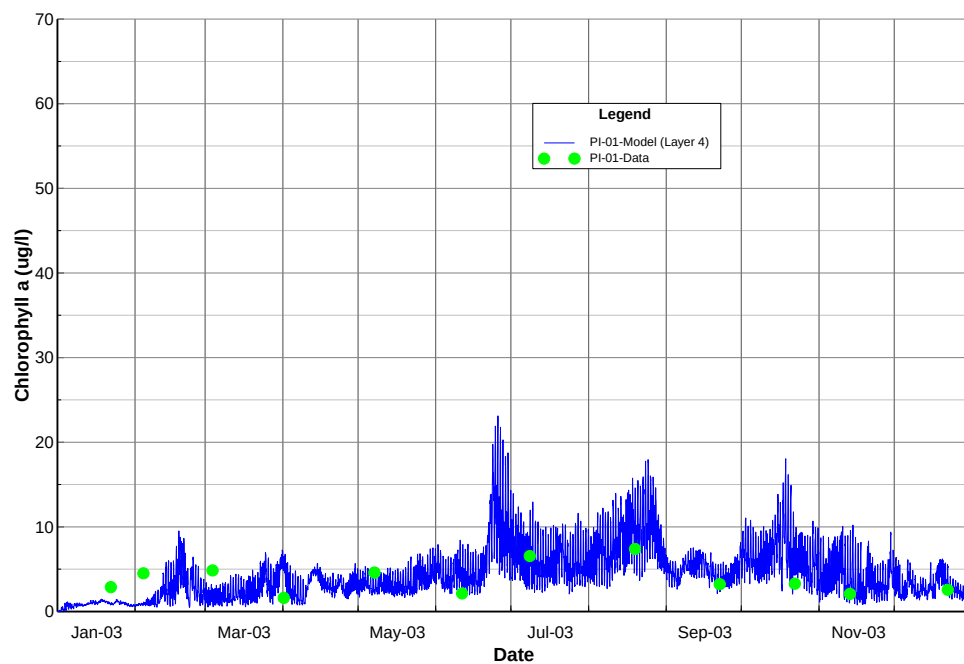


Figure 5-E- 8 Caloosahatchee Water Quality Calibration: Chlorophyll a, PI-01

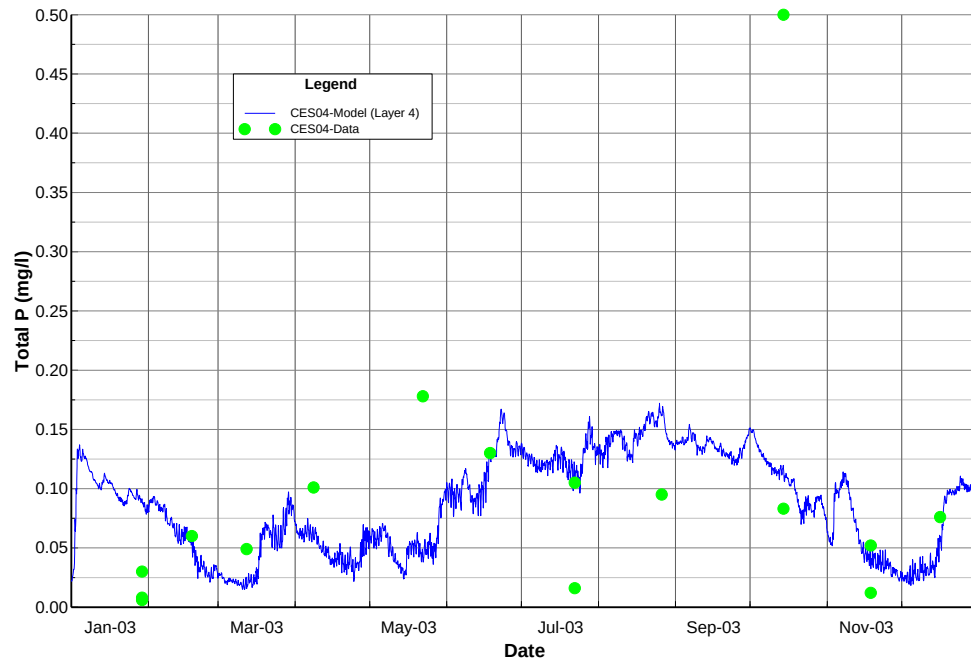


Figure 5-E- 9 Caloosahatchee Water Quality Calibration: Total Phosphorus, CES04, Surface

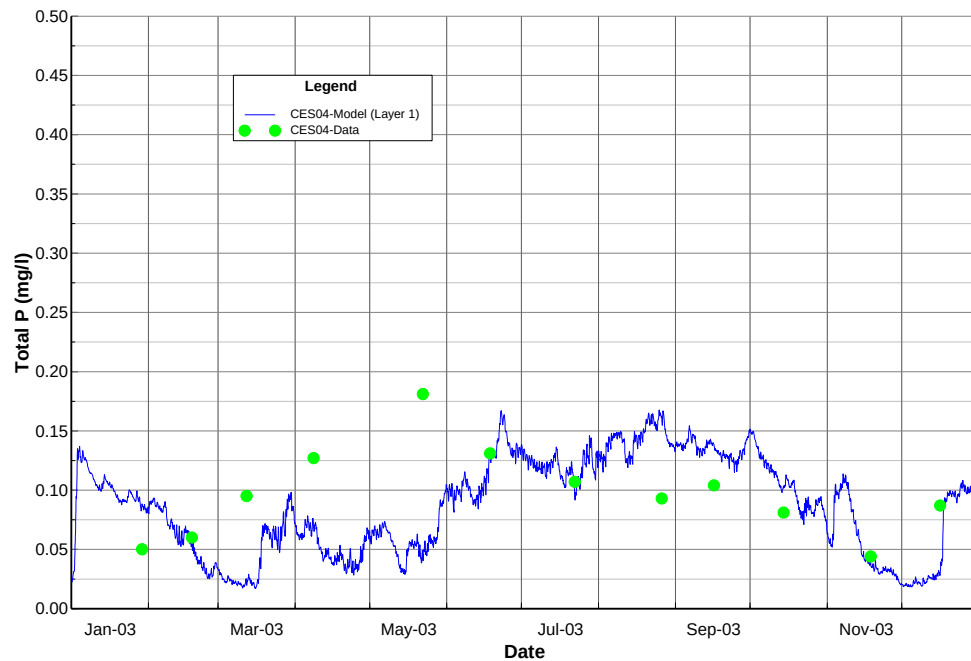


Figure 5-E- 10 Caloosahatchee Water Quality Calibration: Total Phosphorus, CES04, Bottom

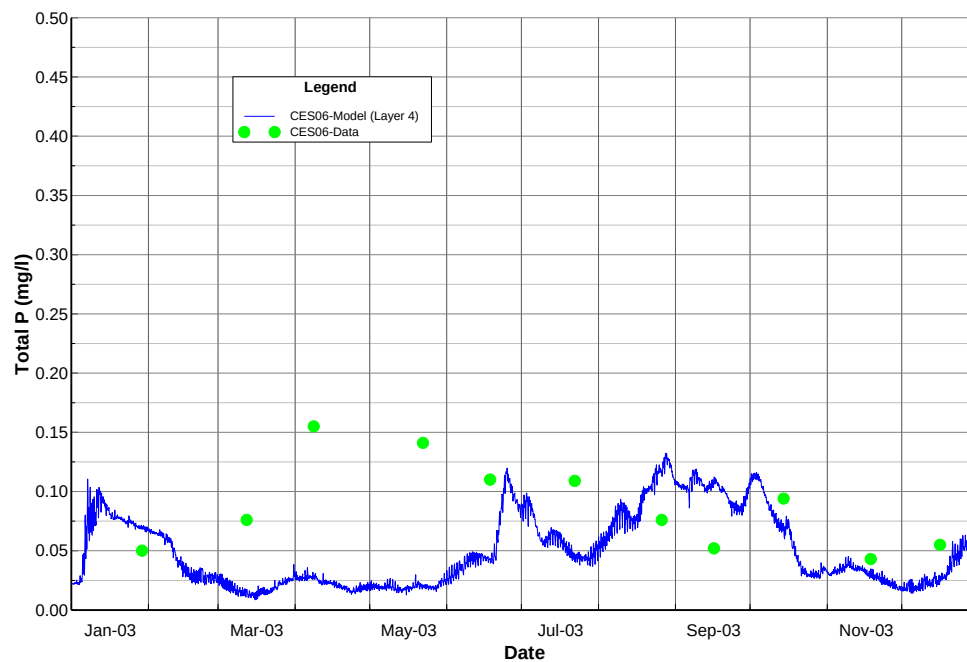


Figure 5-E- 11 Caloosahatchee Water Quality Calibration: Total Phosphorus, CES06, Surface

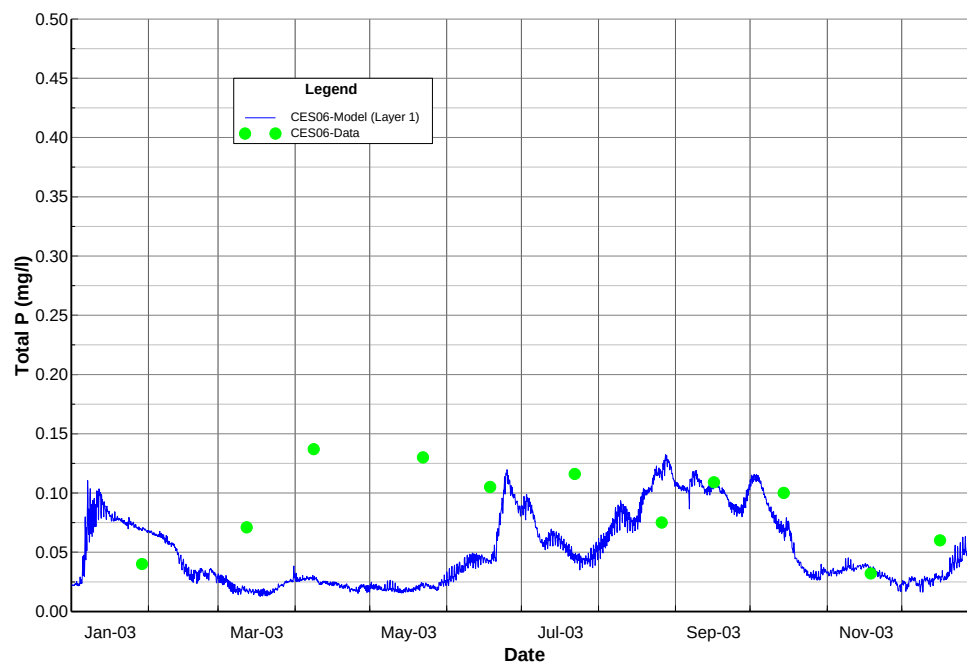


Figure 5-E- 12 Caloosahatchee Water Quality Calibration: Total Phosphorus, CES06, Bottom

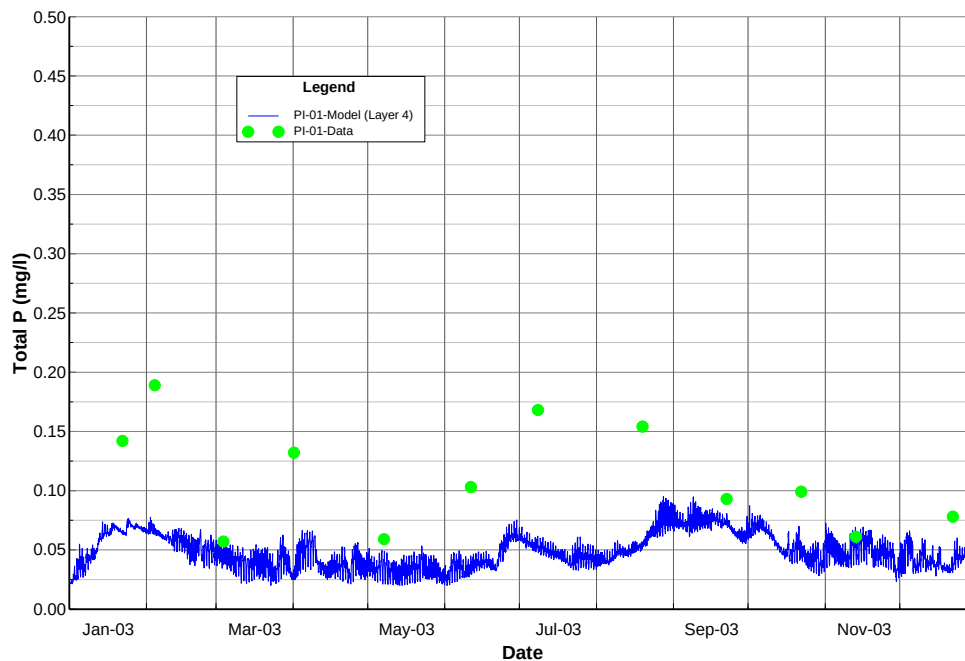


Figure 5-E- 13 Caloosahatchee Water Quality Calibration: Total Phosphorus, PI-01

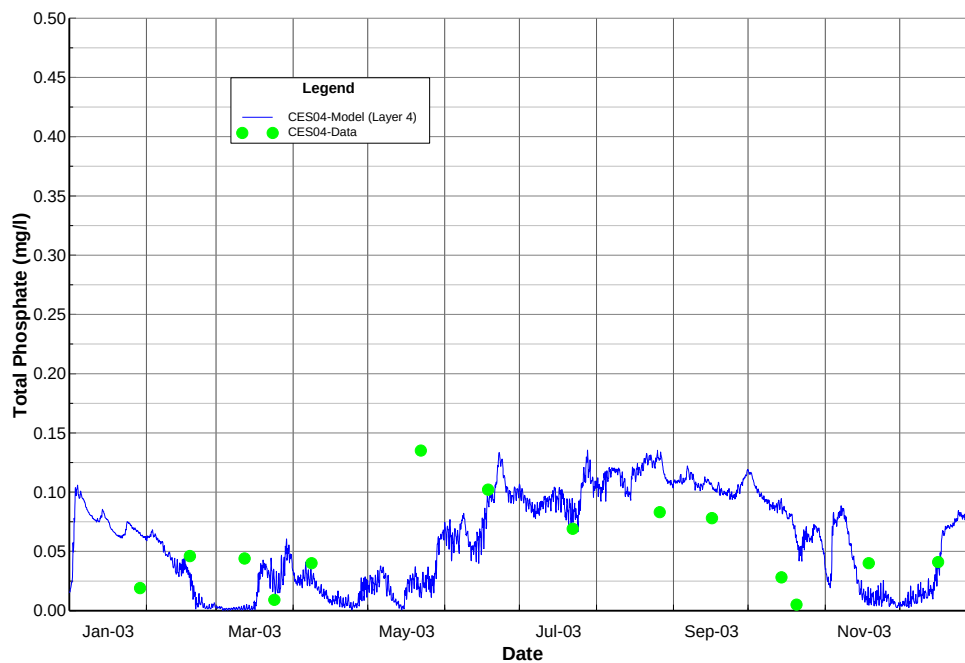


Figure 5-E- 14 Caloosahatchee Water Quality Calibration: Total Phosphate, CES04, Surface

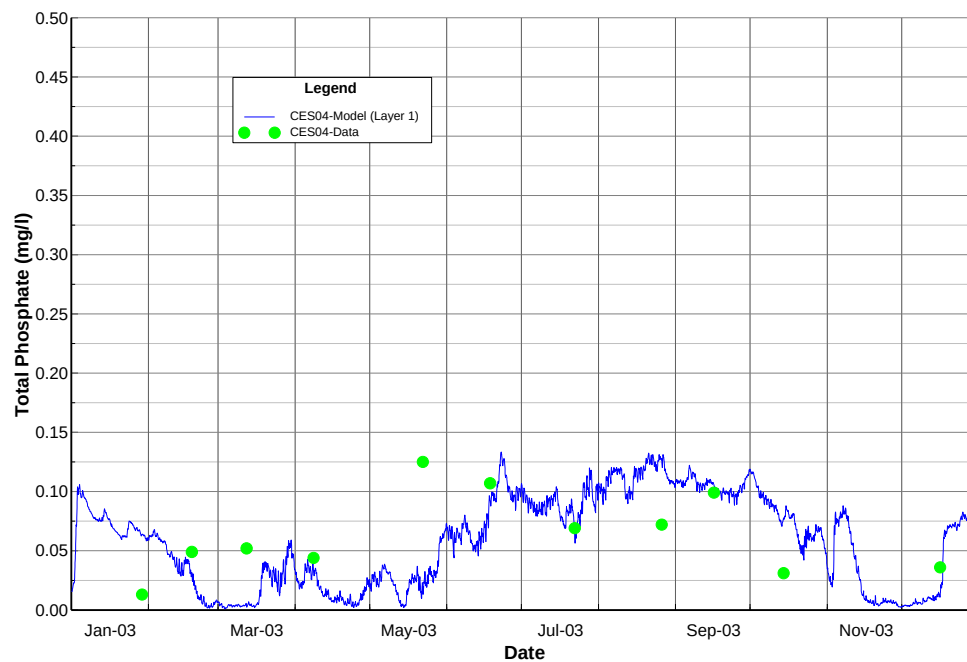


Figure 5-E- 15 Caloosahatchee Water Quality Calibration: Total Phosphate, CES04, Bottom

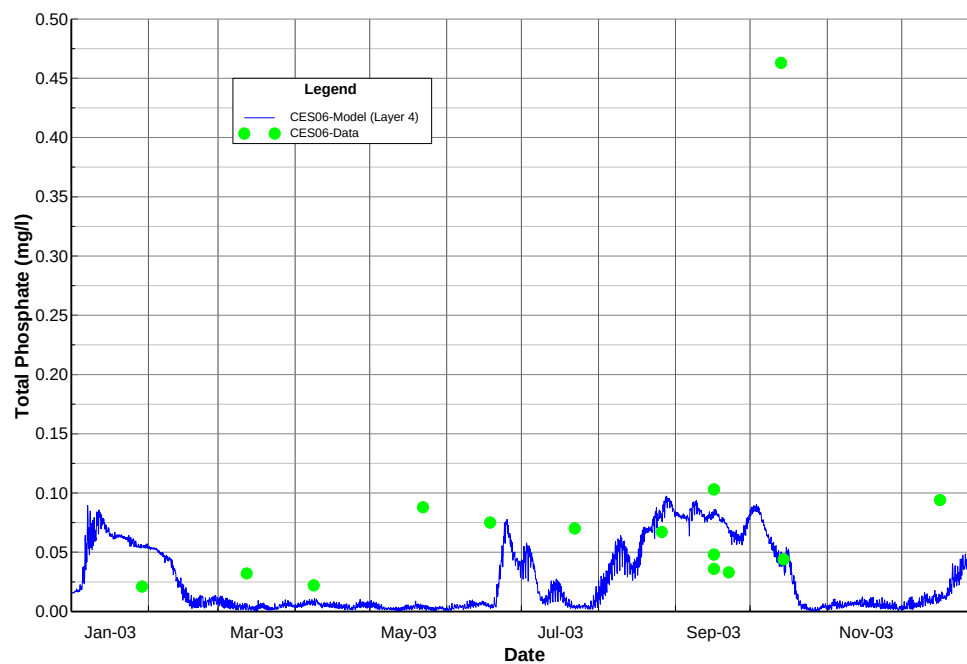


Figure 5-E- 16 Caloosahatchee Water Quality Calibration: Total Phosphate, CES06, Surface

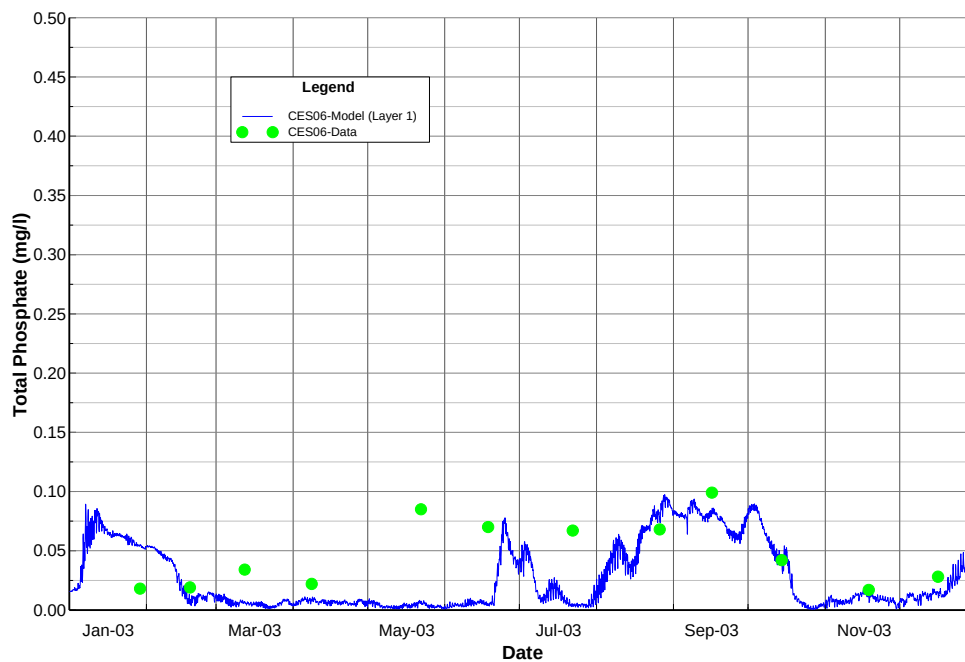


Figure 5-E- 17 Caloosahatchee Water Quality Calibration: Total Phosphate, CES06, Bottom

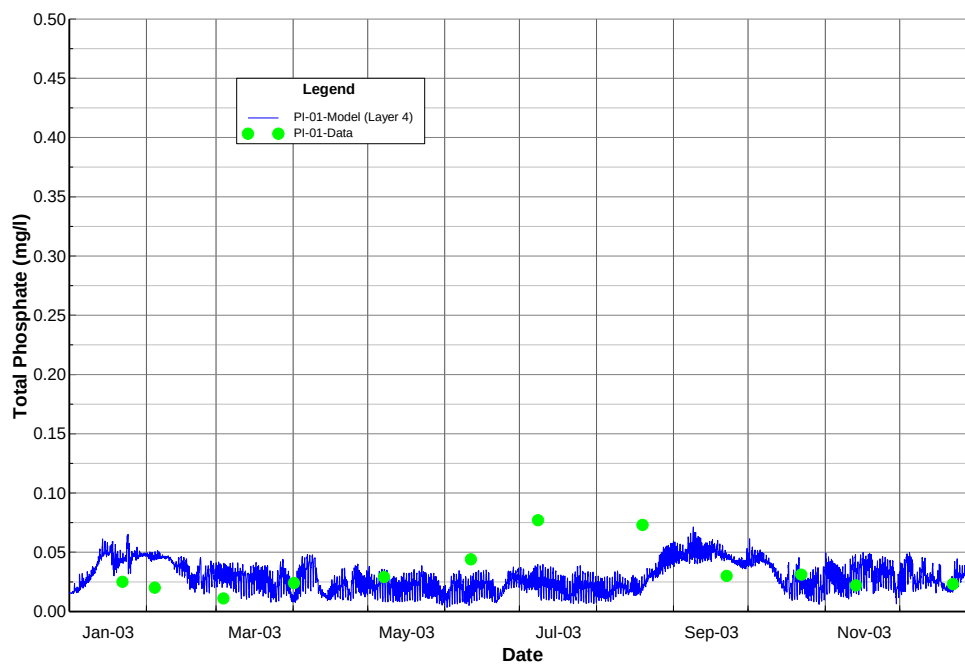


Figure 5-E- 18 Caloosahatchee Water Quality Calibration: Total Phosphate, PI-01

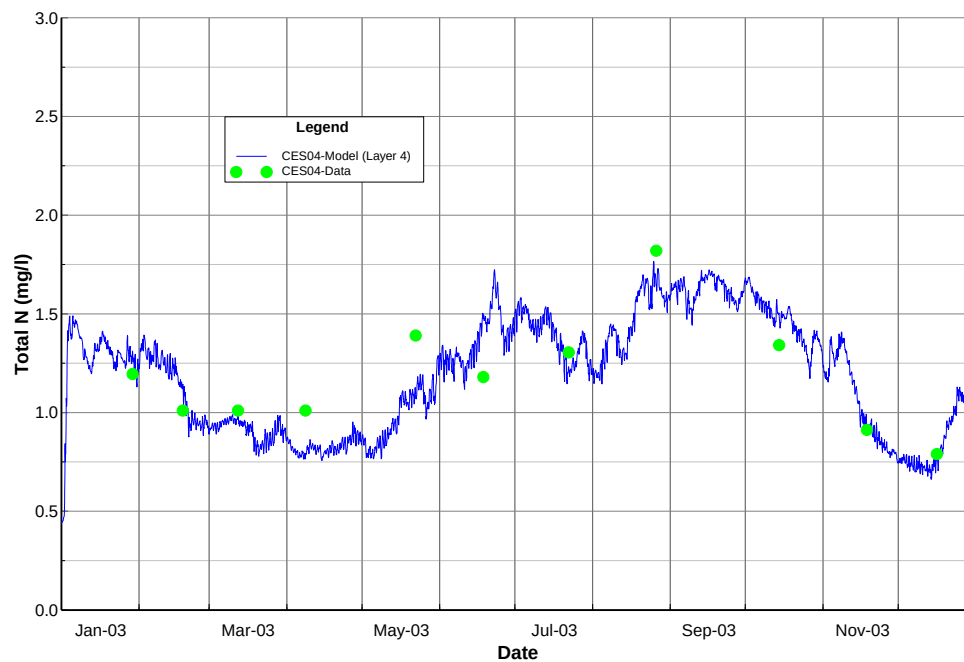


Figure 5-E- 19 Caloosahatchee Water Quality Calibration: Total Nitrogen, CES04, Surface

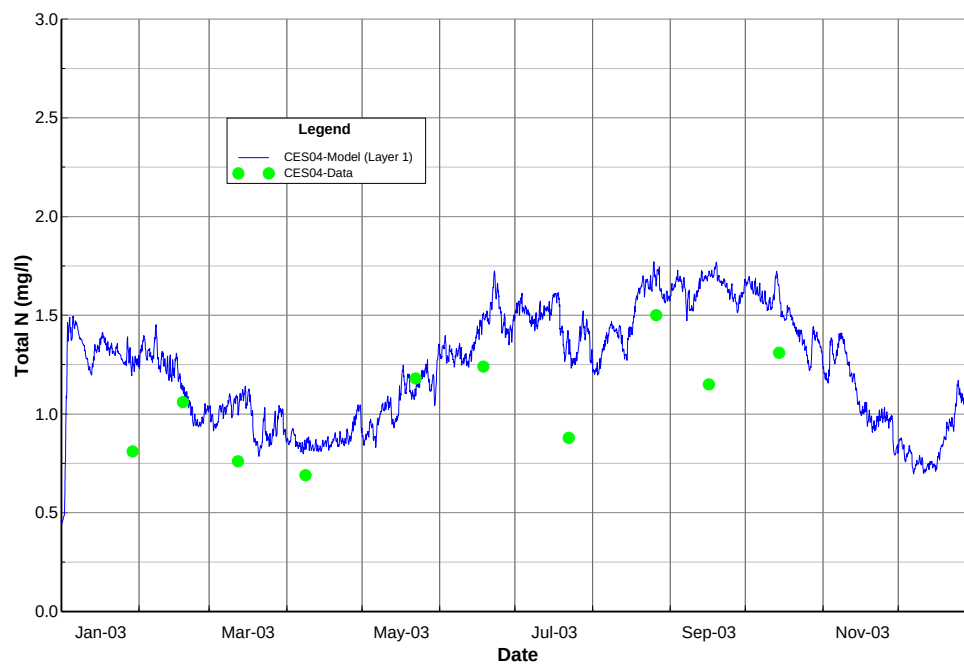


Figure 5-E- 20 Caloosahatchee Water Quality Calibration: Total Nitrogen, CES04, Bottom

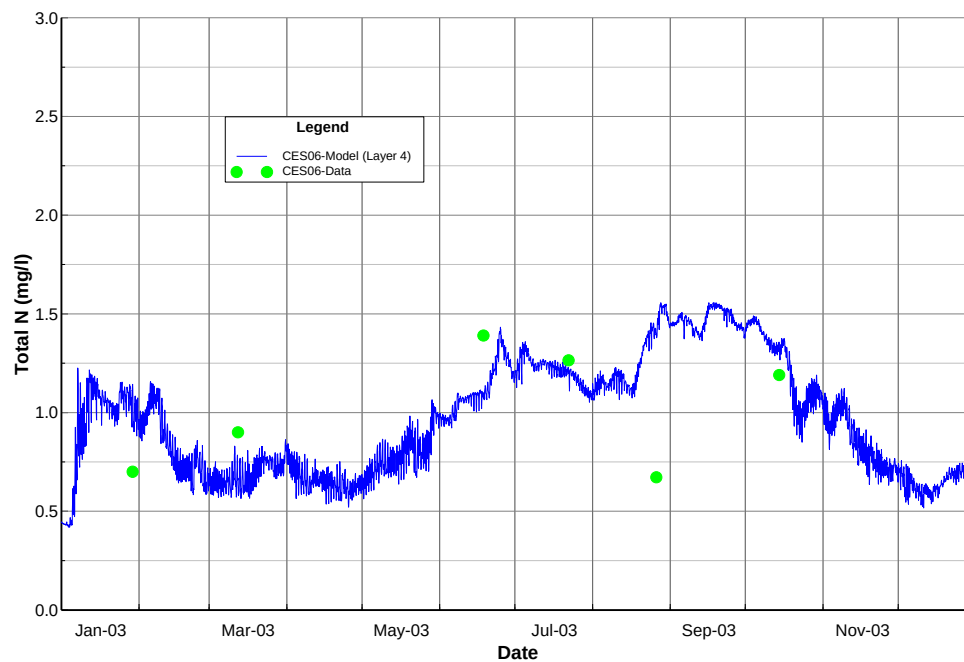


Figure 5-E- 21 Caloosahatchee Water Quality Calibration: Total Nitrogen, CES06, Surface

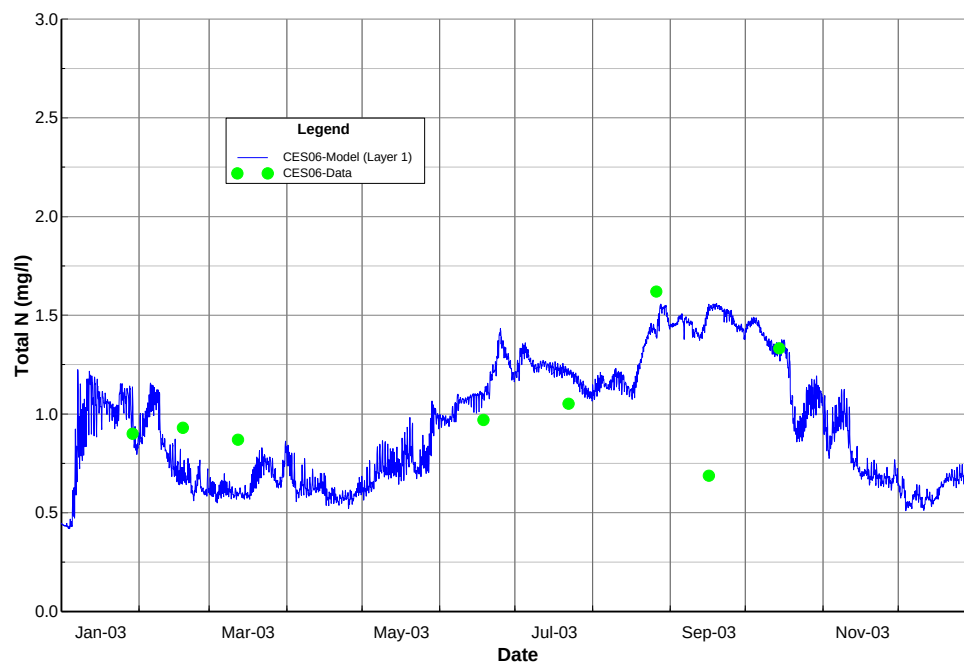


Figure 5-E- 22 Caloosahatchee Water Quality Calibration: Total Nitrogen, CES06, Bottom

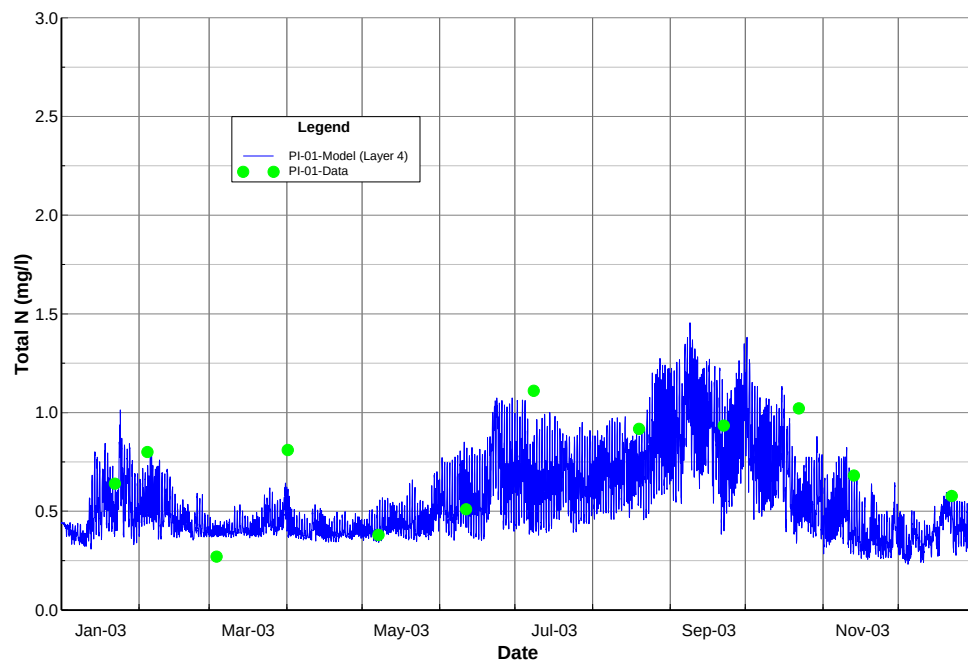


Figure 5-E- 23 Caloosahatchee Water Quality Calibration: Total Nitrogen, PI-01

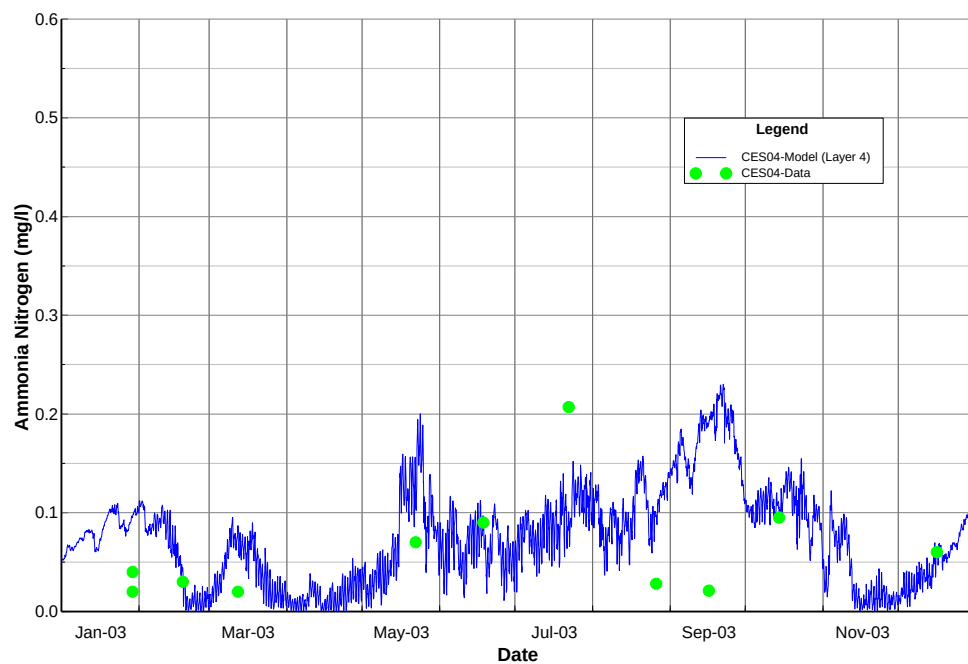


Figure 5-E- 24 Caloosahatchee Water Quality Calibration: Ammonia Nitrogen, CES04, Surface

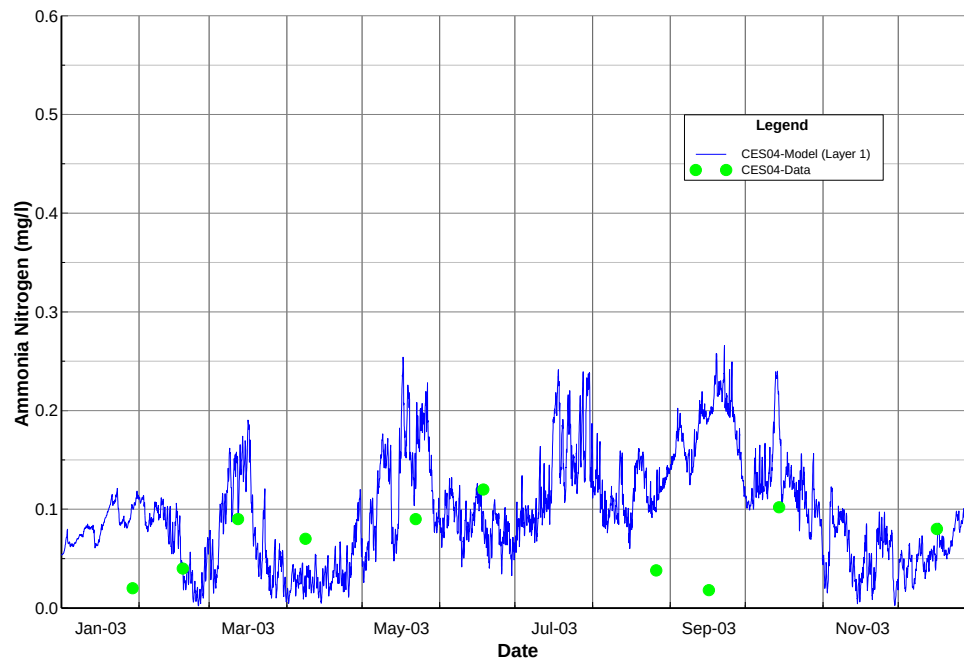


Figure 5-E- 25 Caloosahatchee Water Quality Calibration: Ammonia Nitrogen, CES04, Bottom

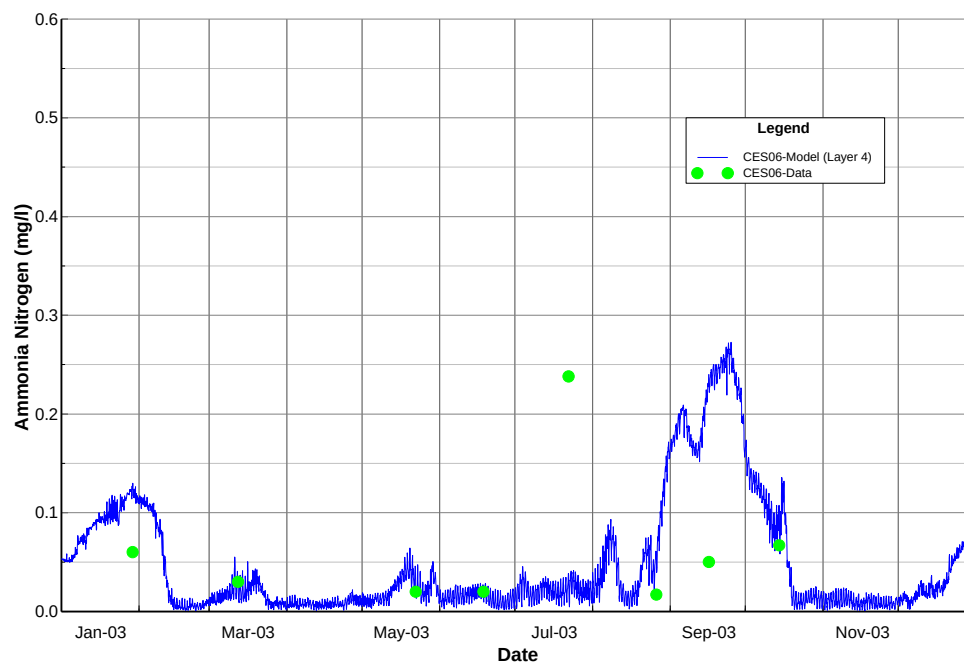


Figure 5-E- 26 Caloosahatchee Water Quality Calibration: Ammonia Nitrogen, CES06, Surface

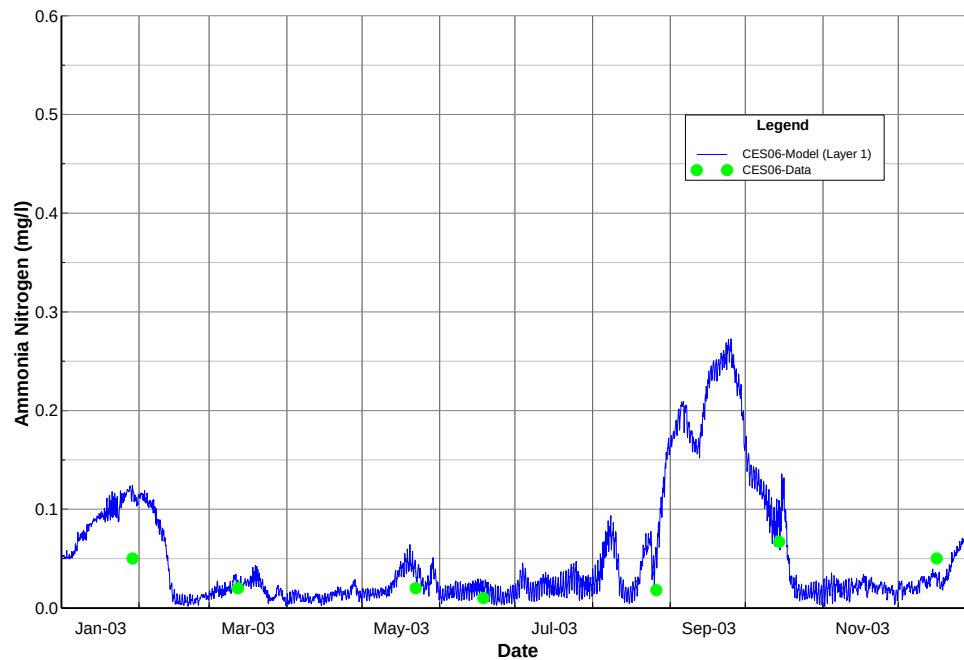


Figure 5-E- 27 Caloosahatchee Water Quality Calibration: Ammonia Nitrogen, CES06, Bottom

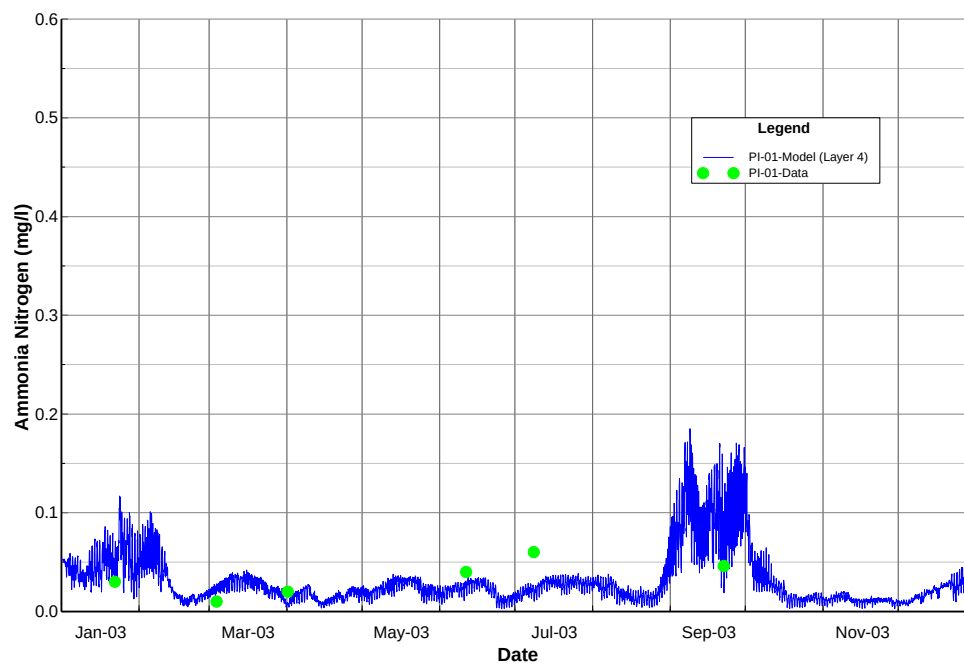


Figure 5-E- 28 Caloosahatchee Water Quality Calibration: Ammonia Nitrogen, PI-01

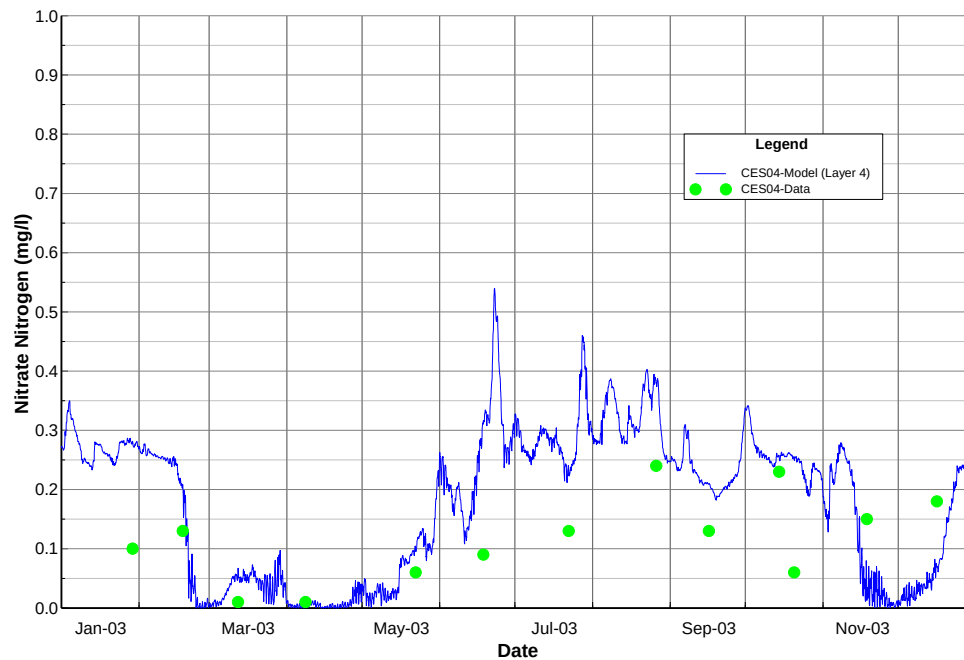


Figure 5-E- 29 Caloosahatchee Water Quality Calibration: Nitrate Nitrogen, CES04, Surface

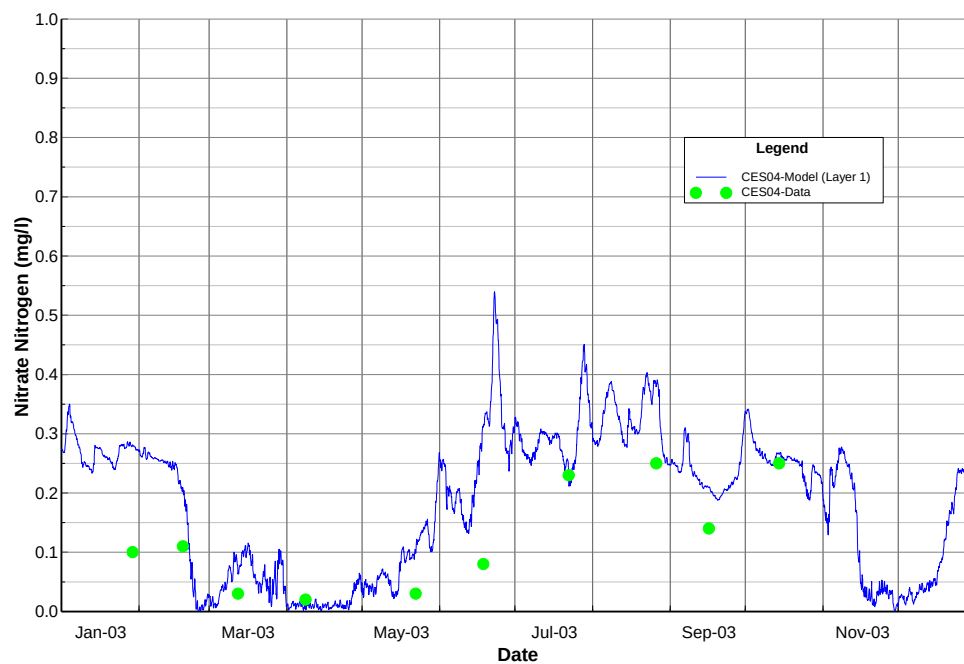


Figure 5-E- 30 Caloosahatchee Water Quality Calibration: Nitrate Nitrogen, CES04, Bottom

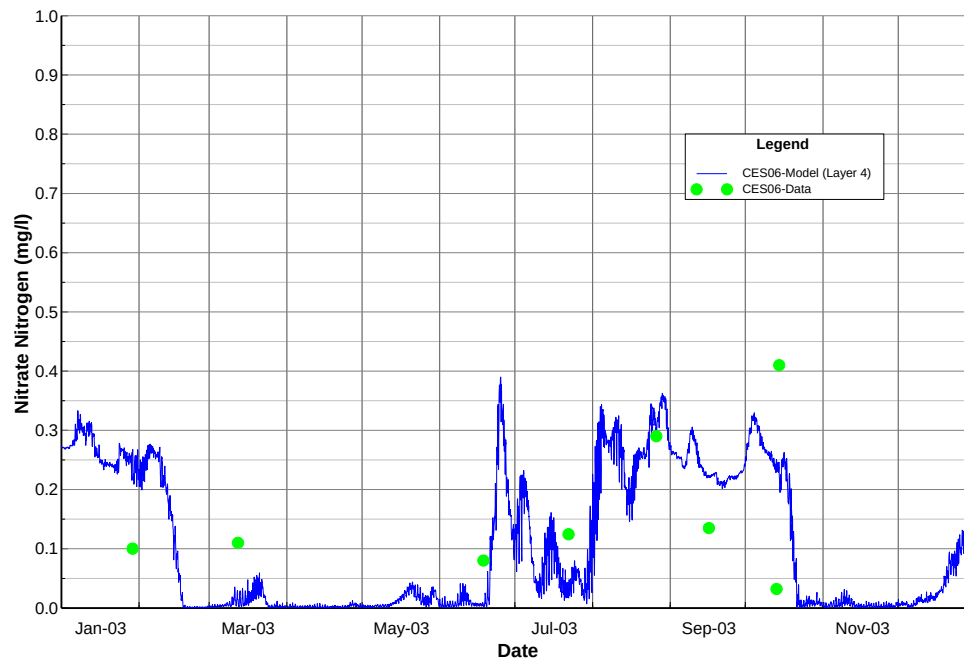


Figure 5-E- 31 Caloosahatchee Water Quality Calibration: Nitrate Nitrogen, CES06, Surface

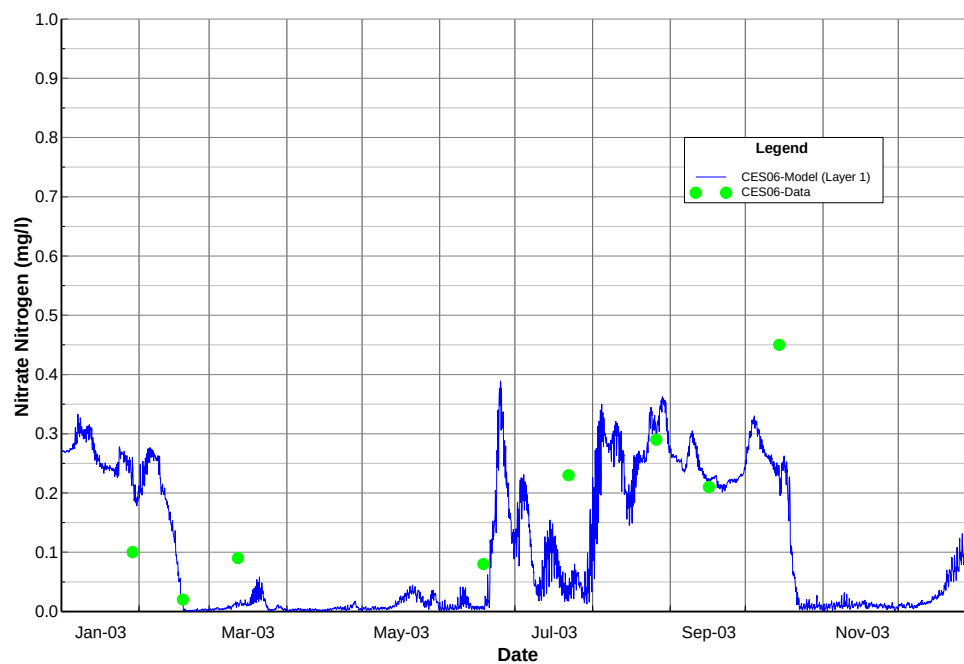


Figure 5-E- 32 Caloosahatchee Water Quality Calibration: Nitrate Nitrogen, CES06, Bottom

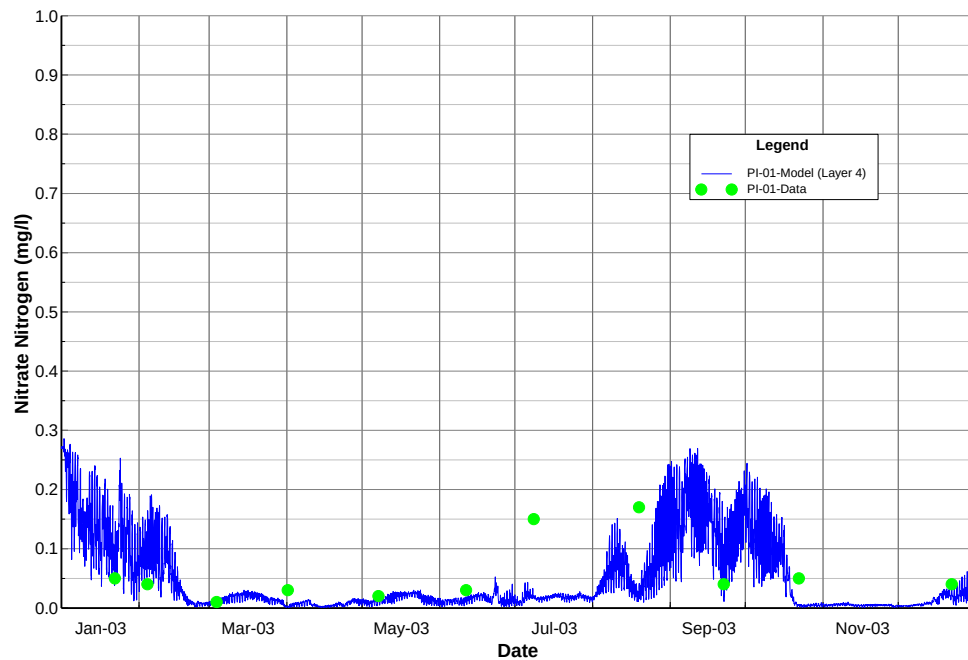


Figure 5-E- 33 Caloosahatchee Water Quality Calibration: Nitrate Nitrogen, PI-01

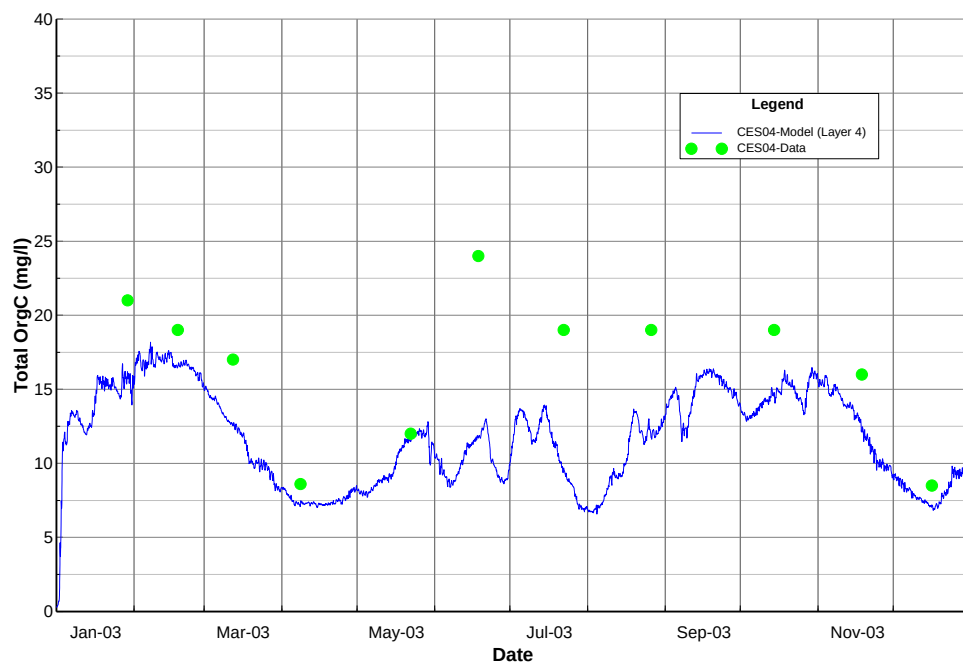


Figure 5-E- 34 Caloosahatchee Water Quality Calibration: Total Organic Nitrogen, CES04, Surface

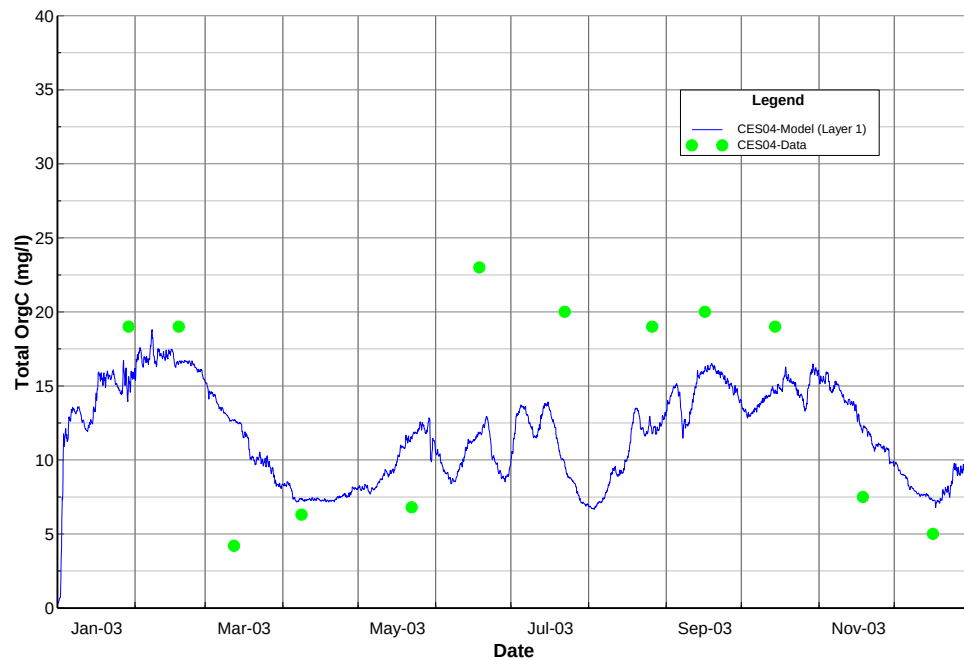


Figure 5-E- 35 Caloosahatchee Water Quality Calibration: Total Organic Nitrogen, CES04, Bottom

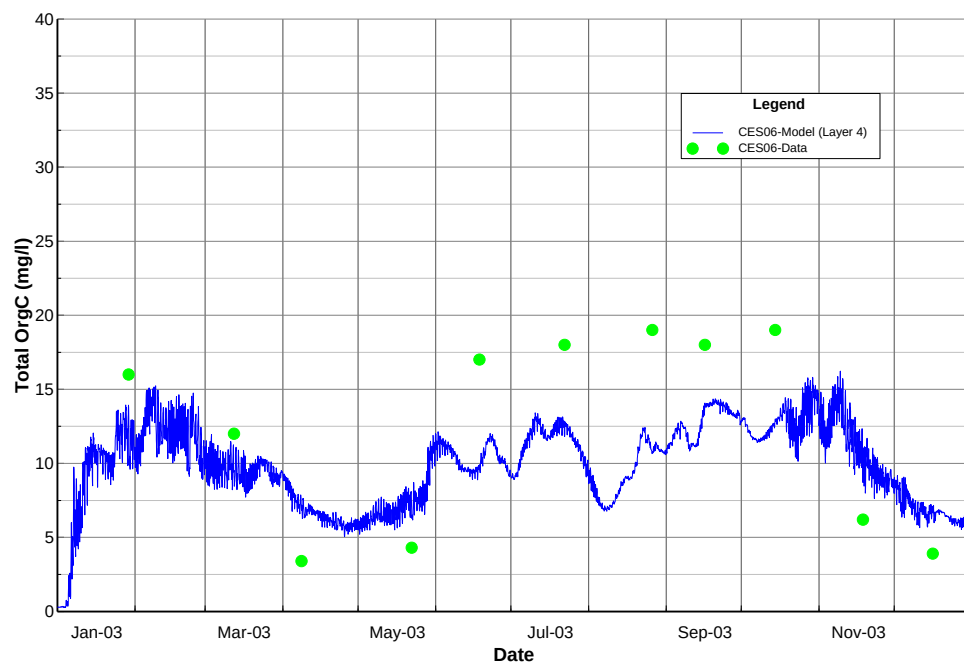


Figure 5-E- 36 Caloosahatchee Water Quality Calibration: Total Organic Nitrogen, CES06, Surface

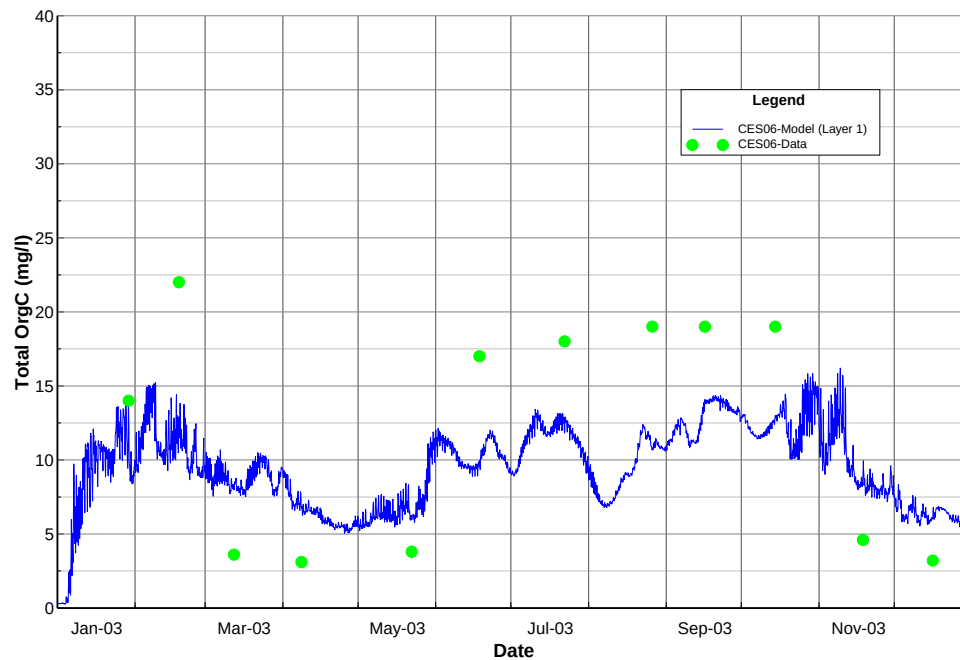


Figure 5-E- 37 Caloosahatchee Water Quality Calibration: Total Organic Nitrogen, CES06, Bottom

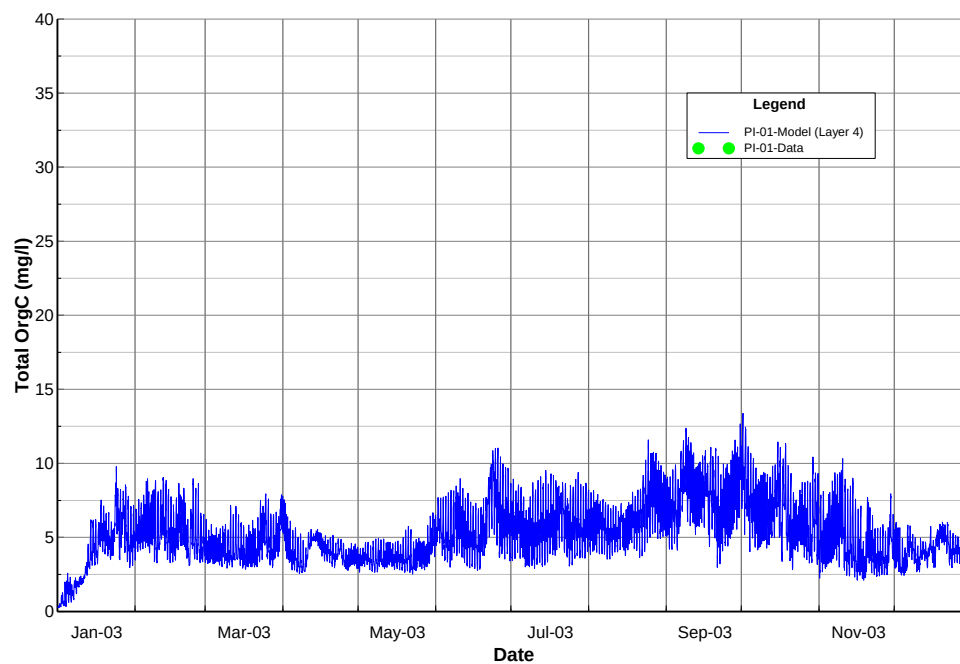


Figure 5-E- 38 Caloosahatchee Water Quality Calibration: Total Organic Nitrogen, PI-01

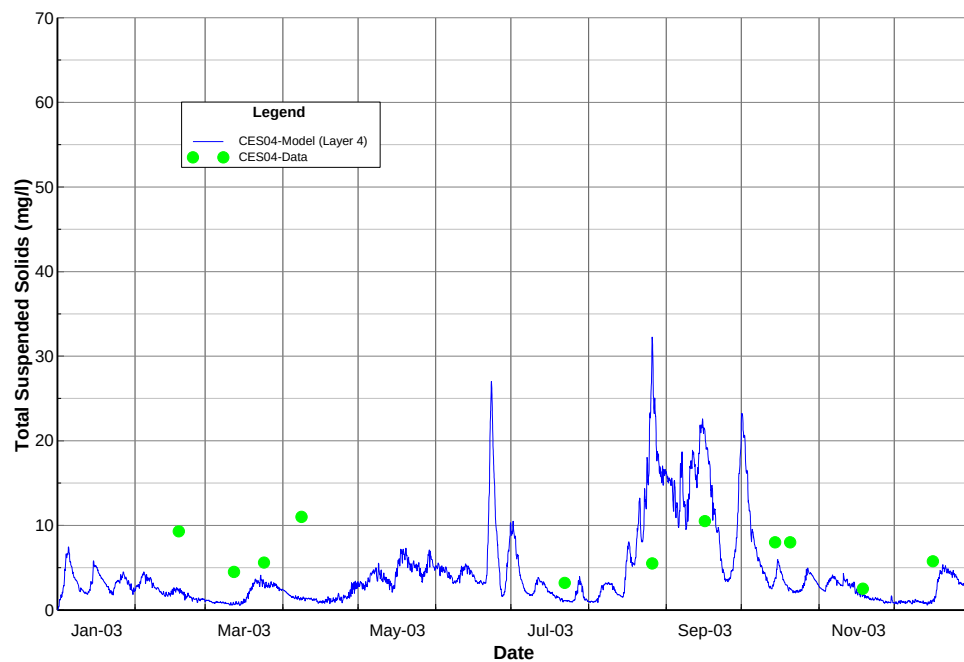


Figure 5-E- 39 Caloosahatchee Water Quality Calibration: Total Suspended Solids, CES04, Surface

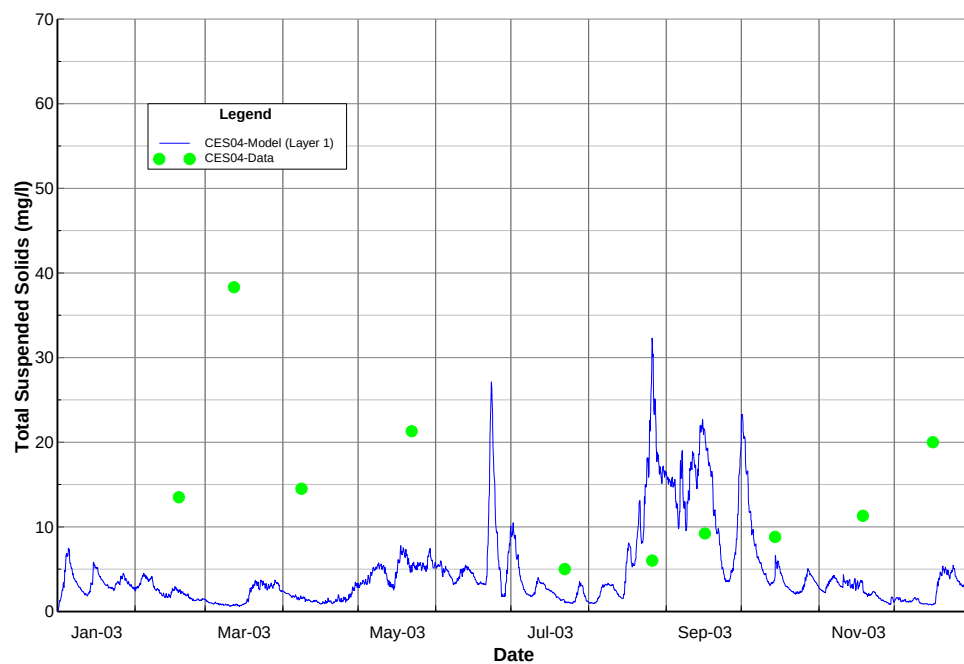


Figure 5-E- 40 Caloosahatchee Water Quality Calibration: Total Suspended Solids, CES04, Bottom

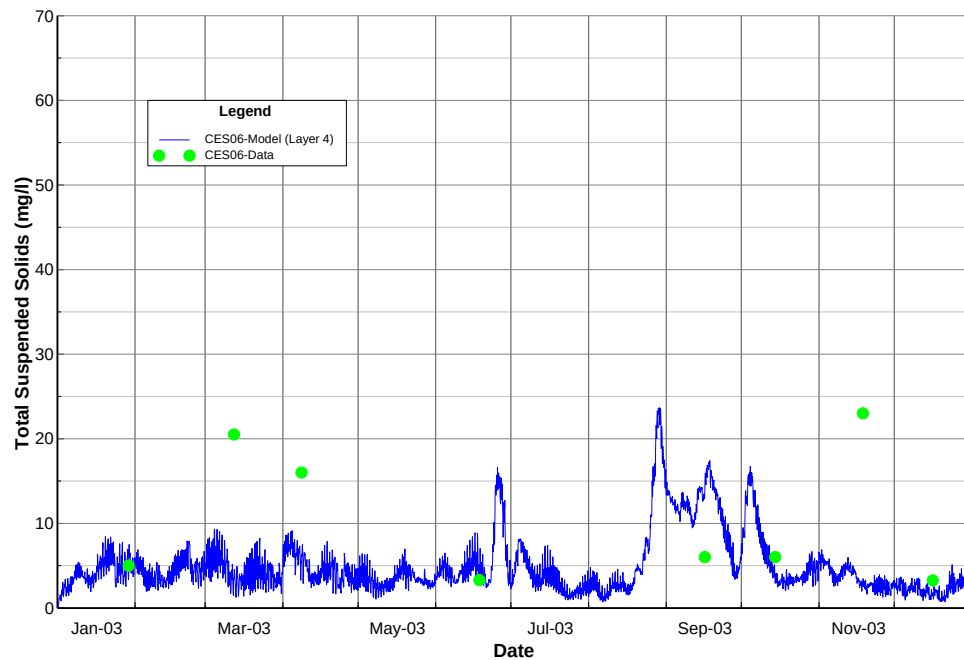


Figure 5-E- 41 Caloosahatchee Water Quality Calibration: Total Suspended Solids, CES06, Surface

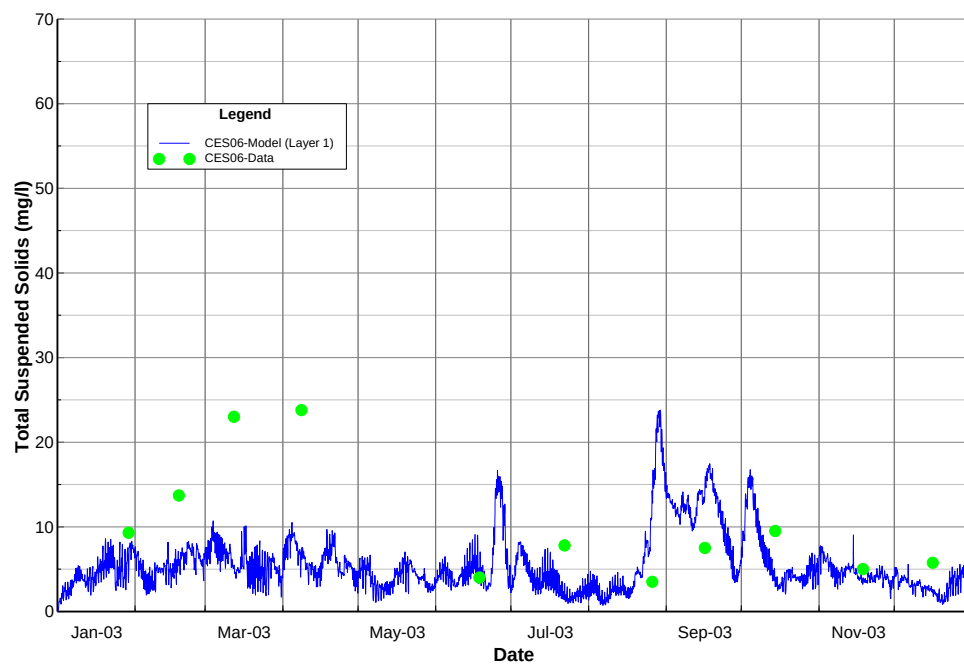


Figure 5-E- 42 Caloosahatchee Water Quality Calibration: Total Suspended Solids, CES06, Bottom

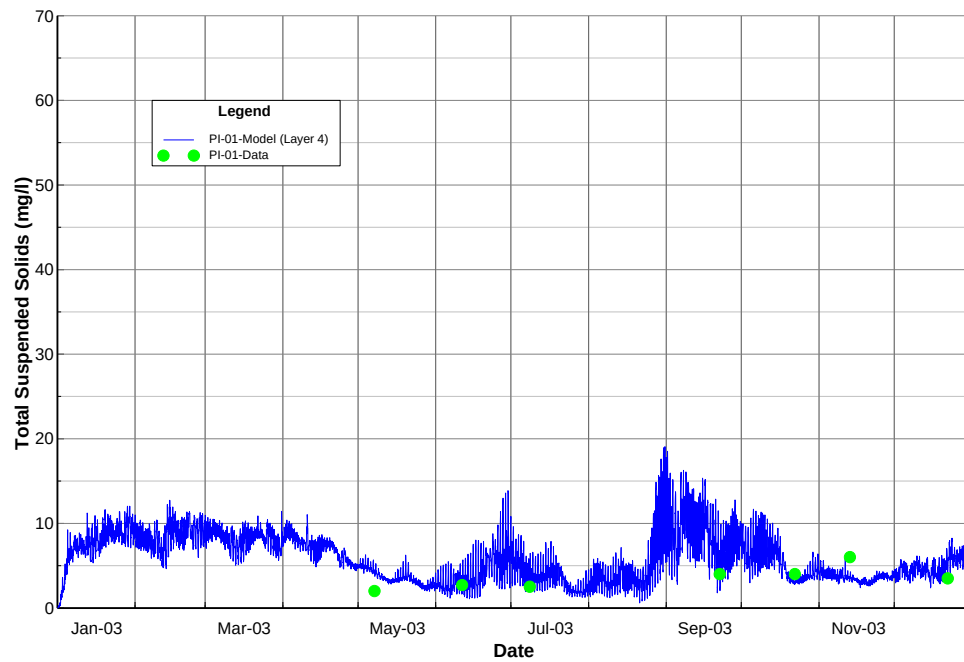


Figure 5-E- 43 Caloosahatchee Water Quality Calibration: Total Suspended Solids, PI-01

EFDC Model Run - Time Series Statistics

Caloosahatchee TMDL, Water Quality Calibration - 2003

Station ID	Layer/ Type	Starting Date/Time	Ending Date/Time	# Pairs	RMS	Data Average	Model Average
Dissolved Oxygen (mg/l)							
CES04	Surface	1/29/2003 18:20	12/16/2003 18:22	36	1.206	6.030	6.357
CES04	Bottom	1/29/2003 18:21	12/16/2003 18:30	25	1.604	4.758	5.218
CES06	Surface	1/29/2003 18:55	12/16/2003 16:55	36	1.311	7.340	6.929
CES06	Bottom	2/18/2003 20:52	12/16/2003 17:02	8	1.344	5.920	6.995
PI-01	Surface	1/22/2003 9:35	12/22/2003 9:20	12	0.763	7.178	7.161
Chlorophyll a (ug/l)							
CES04	Surface	1/29/2003 11:00	12/16/2003 11:02	12	4.647	7.319	9.622
CES06	Surface	1/29/2003 11:35	12/16/2003 10:15	12	9.111	10.596	8.259
PI-01	Surface	1/22/2003 9:35	12/22/2003 9:20	12	3.206	3.794	4.565
Total Phosphorus (mg/l)							
CES04	Surface	1/29/2003 11:00	12/16/2003 11:02	16	0.113	0.094	0.081
CES04	Bottom	1/29/2003 11:01	12/16/2003 11:10	12	0.058	0.097	0.082
CES06	Surface	1/29/2003 11:35	12/16/2003 10:15	11	0.067	0.087	0.052
CES06	Bottom	1/29/2003 11:36	12/16/2003 10:22	11	0.060	0.089	0.053
PI-01	Surface	1/22/2003 9:35	12/22/2003 9:20	12	0.074	0.111	0.050
Total Phosphate (mg/l)							
CES04	Surface	1/29/2003 11:00	12/16/2003 11:02	14	0.046	0.053	0.053
CES04	Bottom	1/29/2003 11:01	12/16/2003 11:10	11	0.048	0.063	0.058

EFDC Model Run - Time Series Statistics

Caloosahatchee TMDL, Water Quality Calibration - 2003

Station ID	Layer/ Type	Starting Date/Time	Ending Date/Time	# Pairs	RMS	Data Average	Model Average
CES06	Surface	1/29/2003 11:35	10/14/2003 12:33	14	0.120	0.085	0.042
CES06	Bottom	1/29/2003 11:36	12/16/2003 10:22	12	0.038	0.047	0.027
PI-01	Surface	1/22/2003 9:35	12/22/2003 9:20	12	0.026	0.034	0.029
Total Nitrogen (mg/l)							
CES04	Surface	1/29/2003 11:00	12/16/2003 11:02	11	0.173	1.178	1.163
CES04	Bottom	1/29/2003 11:02	10/14/2003 11:45	10	0.312	1.058	1.308
CES06	Surface	1/29/2003 11:35	10/14/2003 12:33	6	0.388	1.019	1.128
CES06	Bottom	1/29/2003 11:36	10/14/2003 12:35	8	0.351	1.045	1.126
PI-01	Surface	1/22/2003 9:35	12/22/2003 9:20	12	0.268	0.721	0.539
Ammonia Nitrogen (mg/l)							
CES04	Surface	1/29/2003 11:00	12/16/2003 11:02	11	0.075	0.062	0.098
CES04	Bottom	1/29/2003 11:01	12/16/2003 11:10	10	0.068	0.067	0.097
CES06	Surface	1/29/2003 11:35	10/14/2003 12:33	8	0.101	0.063	0.077
CES06	Bottom	1/29/2003 11:36	12/16/2003 10:22	7	0.033	0.034	0.055
PI-01	Surface	1/22/2003 9:35	9/22/2003 9:50	6	0.023	0.034	0.026
Nitrate Nitrogen (mg/l)							
CES04	Surface	1/29/2003 11:00	12/16/2003 11:02	13	0.124	0.117	0.184
CES04	Bottom	1/29/2003 11:02	10/14/2003 11:45	10	0.112	0.124	0.204

EFDC Model Run - Time Series Statistics

Caloosahatchee TMDL, Water Quality Calibration - 2003

Station ID	Layer/ Type	Starting Date/Time	Ending Date/Time	# Pairs	RMS	Data Average	Model Average
CES06	Surface	1/29/2003 11:35	10/14/2003 12:33	8	0.133	0.160	0.162
CES06	Bottom	1/29/2003 11:36	10/14/2003 12:35	8	0.125	0.184	0.131
PI-01	Surface	1/22/2003 9:35	12/22/2003 9:20	11	0.065	0.057	0.034
Total Organic Carbon (mg/l)							
CES04	Surface	1/29/2003 11:00	12/16/2003 11:02	11	5.847	16.645	11.920
CES04	Bottom	1/29/2003 11:01	12/16/2003 11:10	12	6.168	14.067	12.284
CES06	Surface	1/29/2003 11:35	12/16/2003 10:15	11	4.820	12.436	10.058
CES06	Bottom	1/29/2003 11:36	12/16/2003 10:22	12	5.564	12.192	10.162
Total Suspended Solids (mg/l)							
CES04	Surface	2/18/2003 12:00	12/16/2003 11:02	11	9.824	6.714	6.462
CES04	Bottom	2/18/2003 12:14	12/16/2003 11:16	10	18.081	14.790	7.147
CES06	Surface	1/29/2003 11:35	12/16/2003 10:15	8	10.268	10.381	5.182
CES06	Bottom	1/29/2003 11:36	12/16/2003 10:22	11	9.262	10.259	6.045
PI-01	Surface	5/7/2003 13:40	12/22/2003 9:21	7	1.575	3.529	3.295

Appendix 5-F EFDC Validation Plots

Table of Figures

Figure 5-F- 1 Caloosahatchee Water Quality Validation: Dissolved Oxygen, CES04, Surface	1
Figure 5-F- 2 Caloosahatchee Water Quality Validation: Dissolved Oxygen, CES04, Bottom	1
Figure 5-F- 3 Caloosahatchee Water Quality Validation: Dissolved Oxygen, CES06, Surface	2
Figure 5-F- 4 Caloosahatchee Water Quality Validation: Dissolved Oxygen, CES06, Bottom	2
Figure 5-F- 5 Caloosahatchee Water Quality Validation: Dissolved Oxygen, PI-01	3
Figure 5-F- 6 Caloosahatchee Water Quality Validation: Chlorophyll a, CES04	3
Figure 5-F- 7 Caloosahatchee Water Quality Validation: Chlorophyll a, CES06	4
Figure 5-F- 8 Caloosahatchee Water Quality Validation: Chlorophyll a, PI-01	4
Figure 5-F- 9 Caloosahatchee Water Quality Validation: Total Phosphorus, CES04, Surface.....	5
Figure 5-F- 10 Caloosahatchee Water Quality Validation: Total Phosphorus, CES04, Bottom	5
Figure 5-F- 11 Caloosahatchee Water Quality Validation: Total Phosphorus, CES06, Surface.....	6
Figure 5-F- 12 Caloosahatchee Water Quality Validation: Total Phosphorus, CES06, Bottom	6
Figure 5-F- 13 Caloosahatchee Water Quality Validation: Total Phosphorus, PI-01	7
Figure 5-F- 14 Caloosahatchee Water Quality Validation: Total Phosphate, CES04, Surface.....	7
Figure 5-F- 15 Caloosahatchee Water Quality Validation: Total Phosphate, CES04, Bottom	8
Figure 5-F- 16 Caloosahatchee Water Quality Validation: Total Phosphate, CES06, Surface.....	8
Figure 5-F- 17 Caloosahatchee Water Quality Validation: Total Phosphate, CES06, Bottom	9
Figure 5-F- 18 Caloosahatchee Water Quality Validation: Total Phosphate, PI-01	9
Figure 5-F- 19 Caloosahatchee Water Quality Validation: Total Nitrogen, CES04, Surface	10
Figure 5-F- 20 Caloosahatchee Water Quality Validation: Total Nitrogen, CES04, Bottom	10
Figure 5-F- 21 Caloosahatchee Water Quality Validation: Total Nitrogen, CES06, Surface	11
Figure 5-F- 22 Caloosahatchee Water Quality Validation: Total Nitrogen, CES06, Bottom	11
Figure 5-F- 23 Caloosahatchee Water Quality Validation: Total Nitrogen, PI-01	12

Figure 5-F- 24 Caloosahatchee Water Quality Validation: Ammonia Nitrogen, CES04, Surface	12
Figure 5-F- 25 Caloosahatchee Water Quality Validation: Ammonia Nitrogen, CES04, Bottom	13
Figure 5-F- 26 Caloosahatchee Water Quality Validation: Ammonia Nitrogen, CES06, Surface	13
Figure 5-F- 27 Caloosahatchee Water Quality Validation: Ammonia Nitrogen, CES06, Bottom	14
Figure 5-F- 28 Caloosahatchee Water Quality Validation: Ammonia Nitrogen, PI-01.....	14
Figure 5-F- 29 Caloosahatchee Water Quality Validation: Nitrate Nitrogen, CES04, Surface	15
Figure 5-F- 30 Caloosahatchee Water Quality Validation: Nitrate Nitrogen, CES04, Bottom	15
Figure 5-F- 31 Caloosahatchee Water Quality Validation: Nitrate Nitrogen, CES06, Surface	16
Figure 5-F- 32 Caloosahatchee Water Quality Validation: Nitrate Nitrogen, CES06, Bottom	16
Figure 5-F- 33 Caloosahatchee Water Quality Validation: Nitrate Nitrogen, PI-01.....	17
Figure 5-F- 34 Caloosahatchee Water Quality Validation: Total Organic Nitrogen, CES04, Surface	17
Figure 5-F- 35 Caloosahatchee Water Quality Validation: Total Organic Nitrogen, CES04, Bottom	18
Figure 5-F- 36 Caloosahatchee Water Quality Validation: Total Organic Nitrogen, CES06, Surface	18
Figure 5-F- 37 Caloosahatchee Water Quality Validation: Total Organic Nitrogen, CES06, Bottom	19
Figure 5-F- 38 Caloosahatchee Water Quality Validation: Total Organic Nitrogen, PI-01.....	19
Figure 5-F- 39 Caloosahatchee Water Quality Validation: Total Suspended Solids, CES04, Surface.....	20
Figure 5-F- 40 Caloosahatchee Water Quality Validation: Total Suspended Solids, CES04, Bottom	20
Figure 5-F- 41 Caloosahatchee Water Quality Validation: Total Suspended Solids, CES06, Surface.....	21
Figure 5-F- 42 Caloosahatchee Water Quality Validation: Total Suspended Solids, CES06, Bottom	21
Figure 5-F- 43 Caloosahatchee Water Quality Validation: Total Suspended Solids, PI-01	22

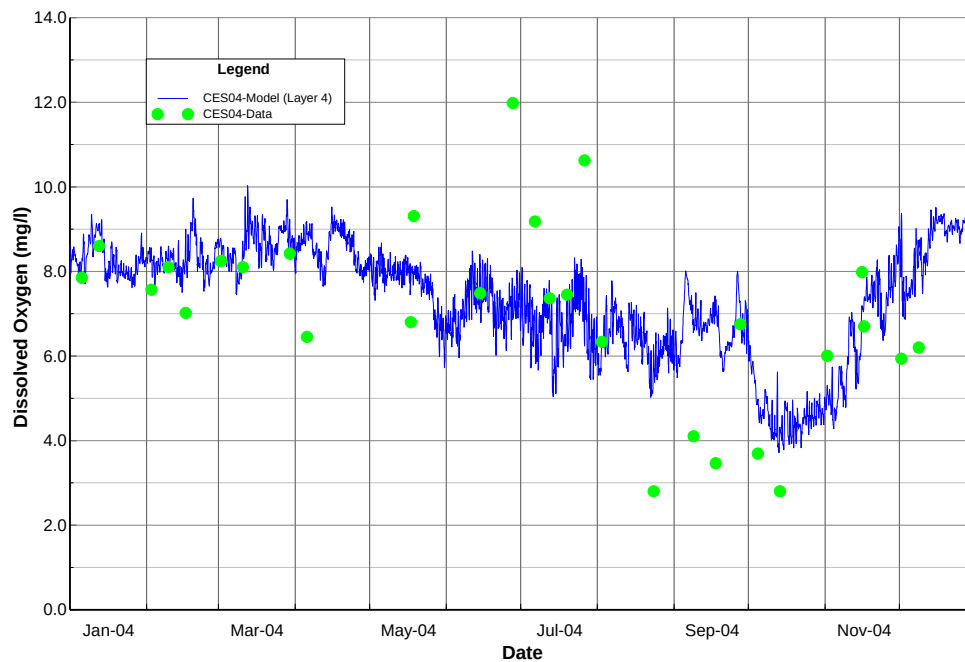


Figure 5-F- 1 Caloosahatchee Water Quality Validation: Dissolved Oxygen, CES04, Surface

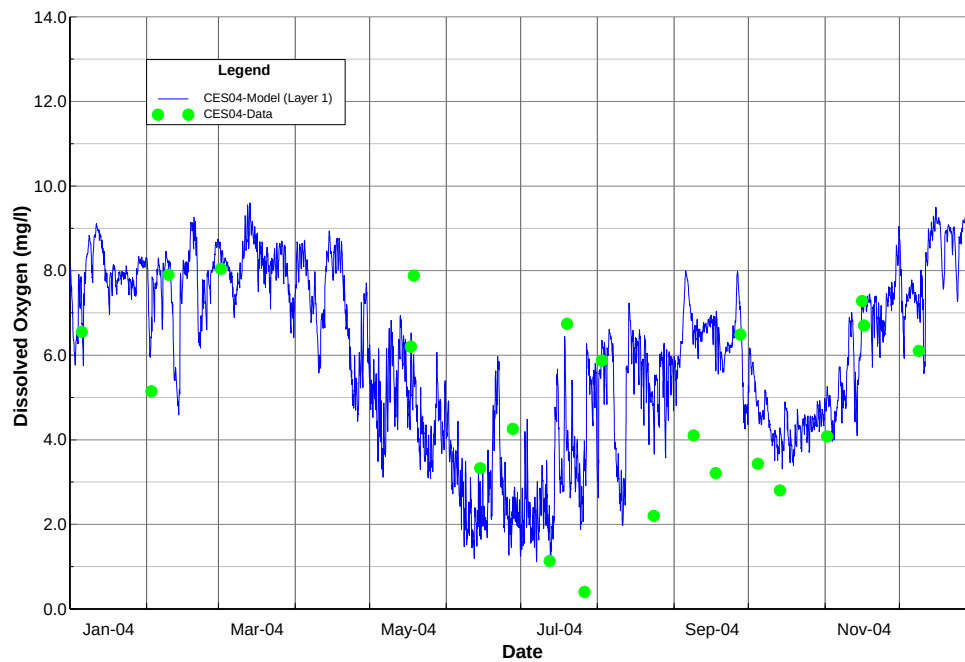


Figure 5-F- 2 Caloosahatchee Water Quality Validation: Dissolved Oxygen, CES04, Bottom

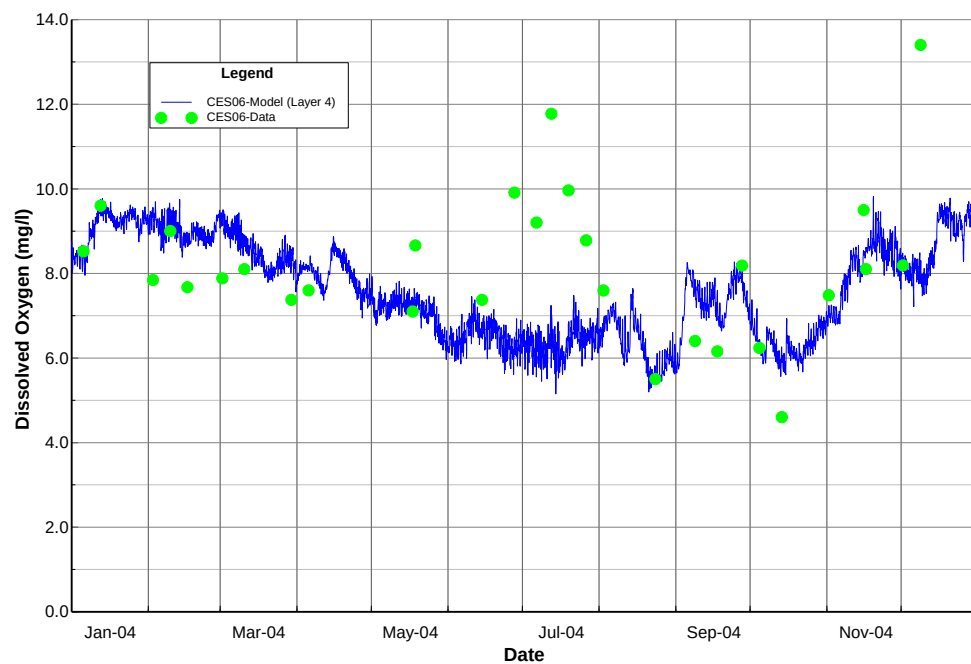


Figure 5-F- 3 Caloosahatchee Water Quality Validation: Dissolved Oxygen, CES06, Surface

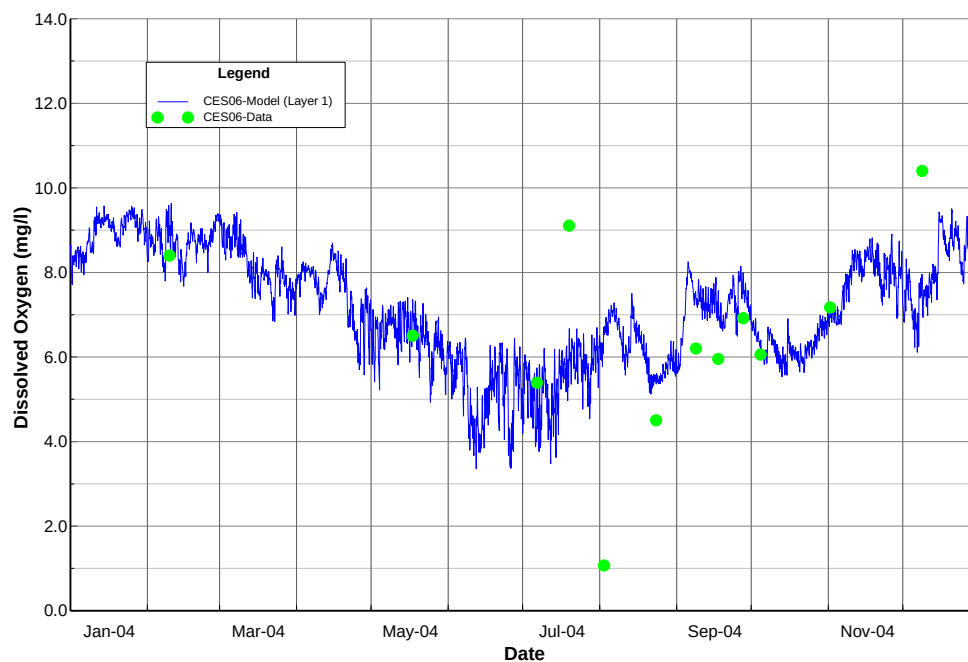


Figure 5-F- 4 Caloosahatchee Water Quality Validation: Dissolved Oxygen, CES06, Bottom

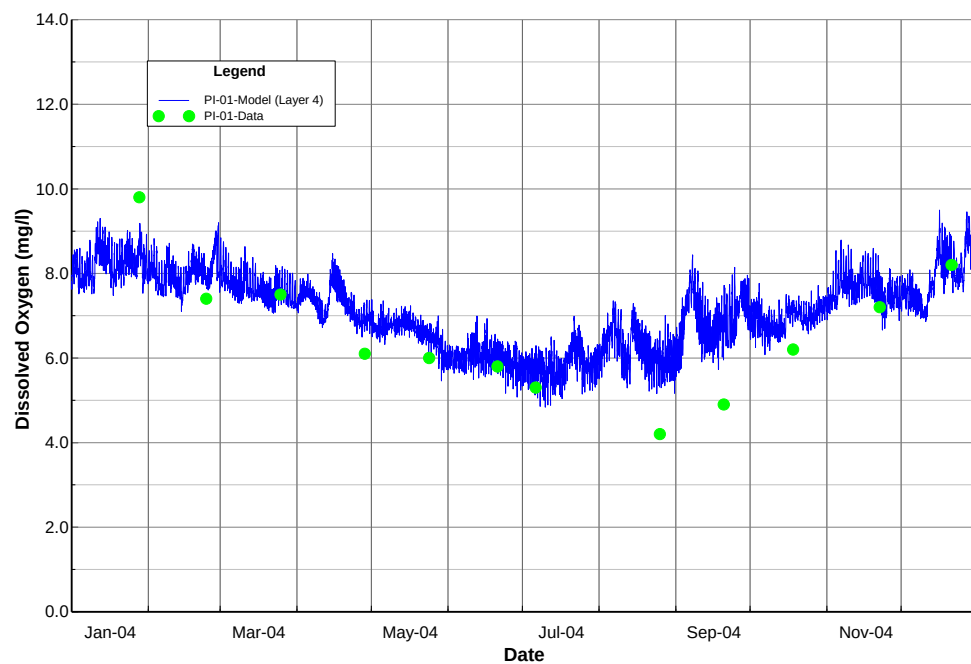


Figure 5-F- 5 Caloosahatchee Water Quality Validation: Dissolved Oxygen, PI-01

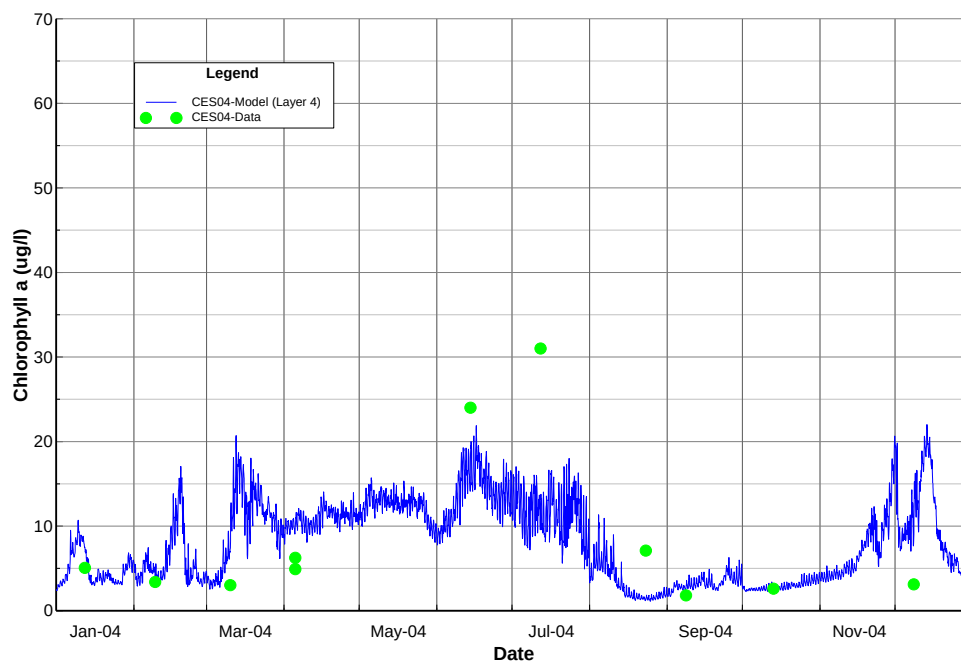


Figure 5-F- 6 Caloosahatchee Water Quality Validation: Chlorophyll a, CES04

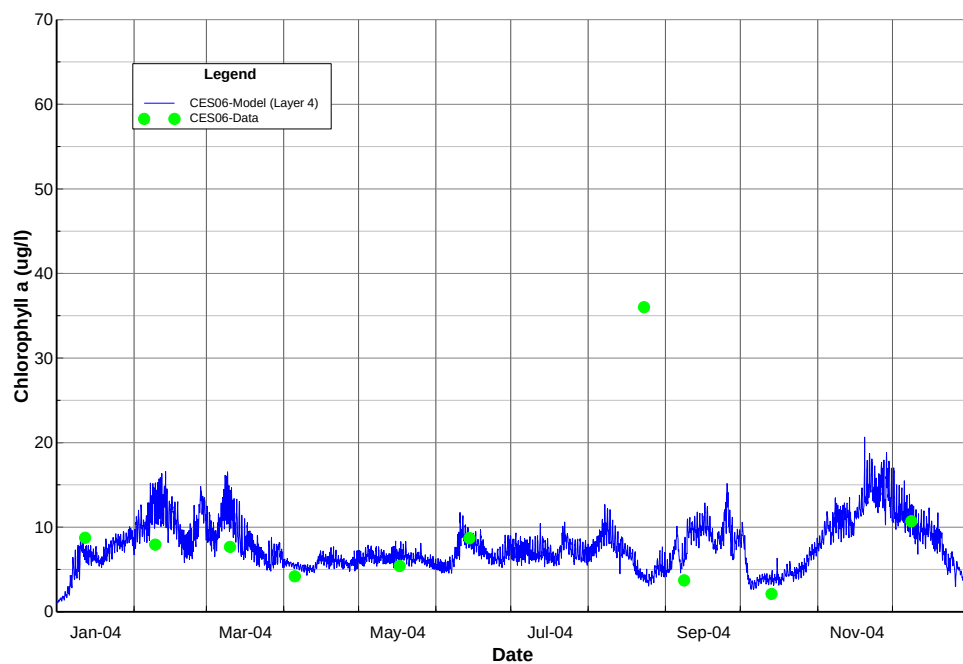


Figure 5-F- 7 Caloosahatchee Water Quality Validation: Chlorophyll a, CES06

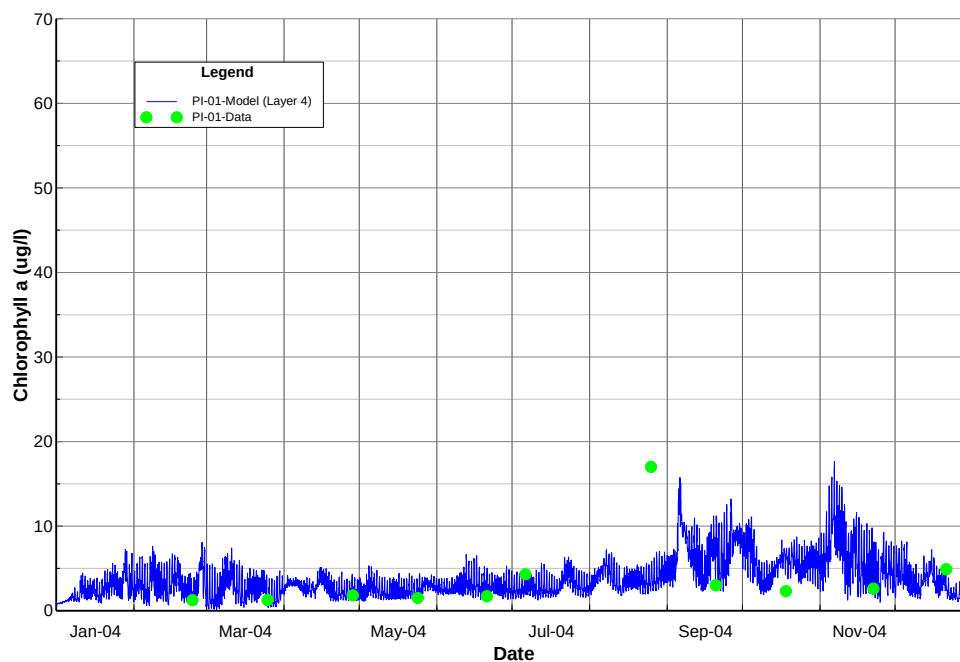


Figure 5-F- 8 Caloosahatchee Water Quality Validation: Chlorophyll a, PI-01

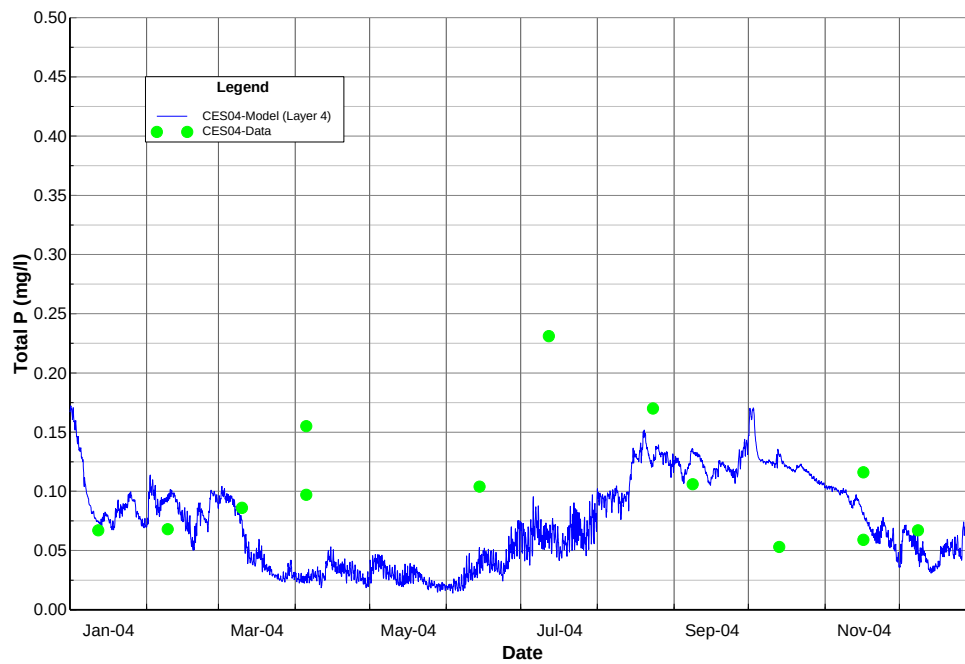


Figure 5-F- 9 Caloosahatchee Water Quality Validation: Total Phosphorus, CES04, Surface

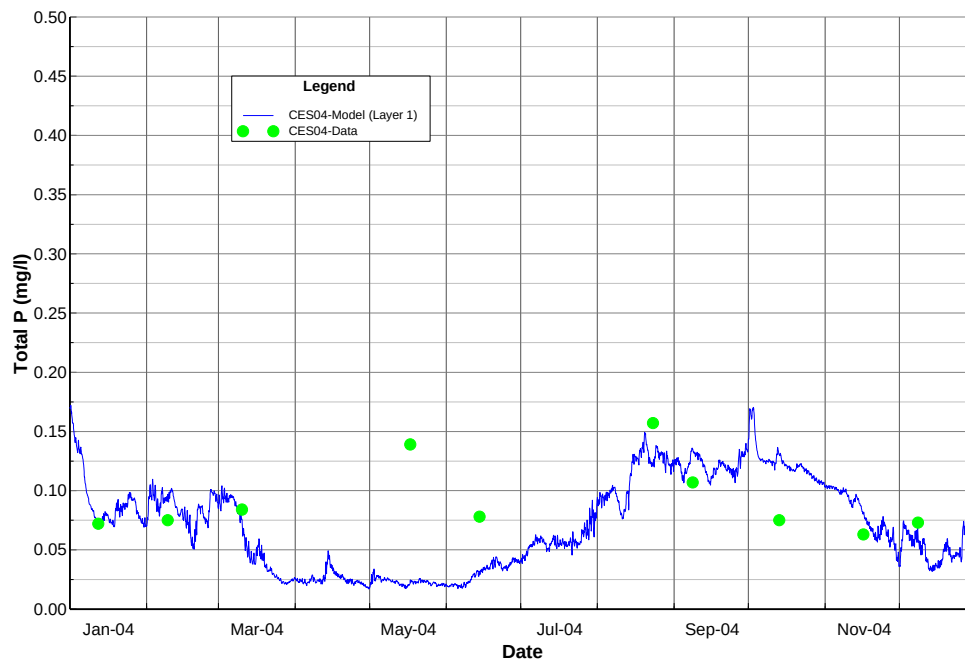


Figure 5-F- 10 Caloosahatchee Water Quality Validation: Total Phosphorus, CES04, Bottom

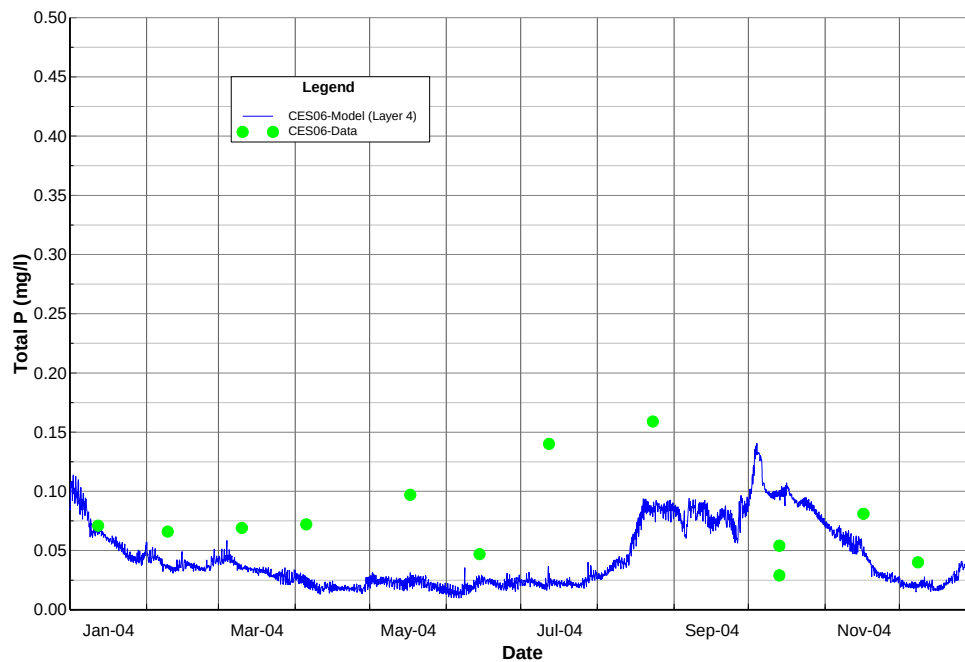


Figure 5-F- 11 Caloosahatchee Water Quality Validation: Total Phosphorus, CES06, Surface

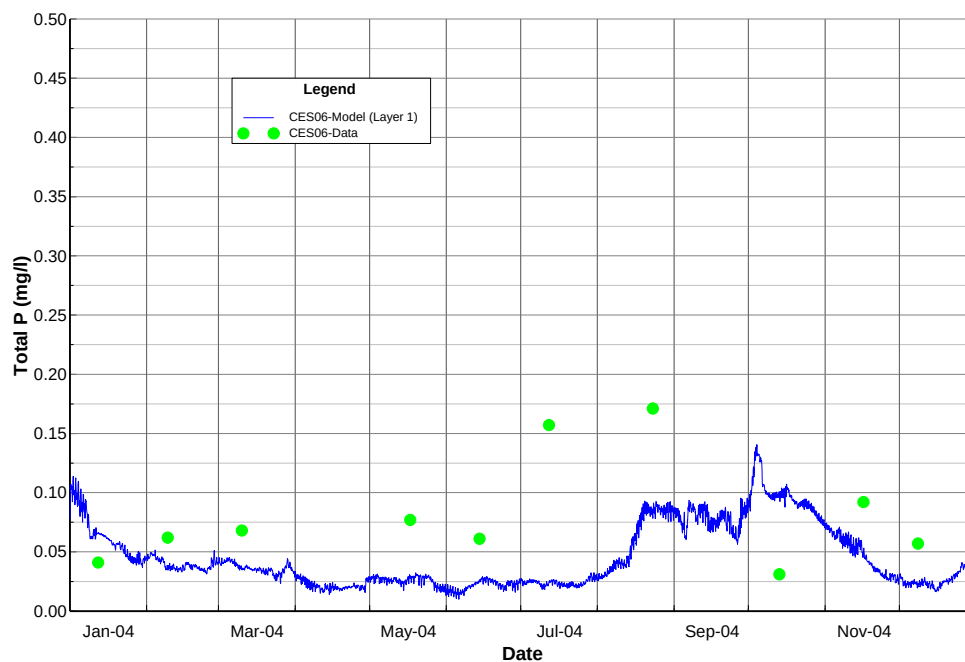


Figure 5-F- 12 Caloosahatchee Water Quality Validation: Total Phosphorus, CES06, Bottom

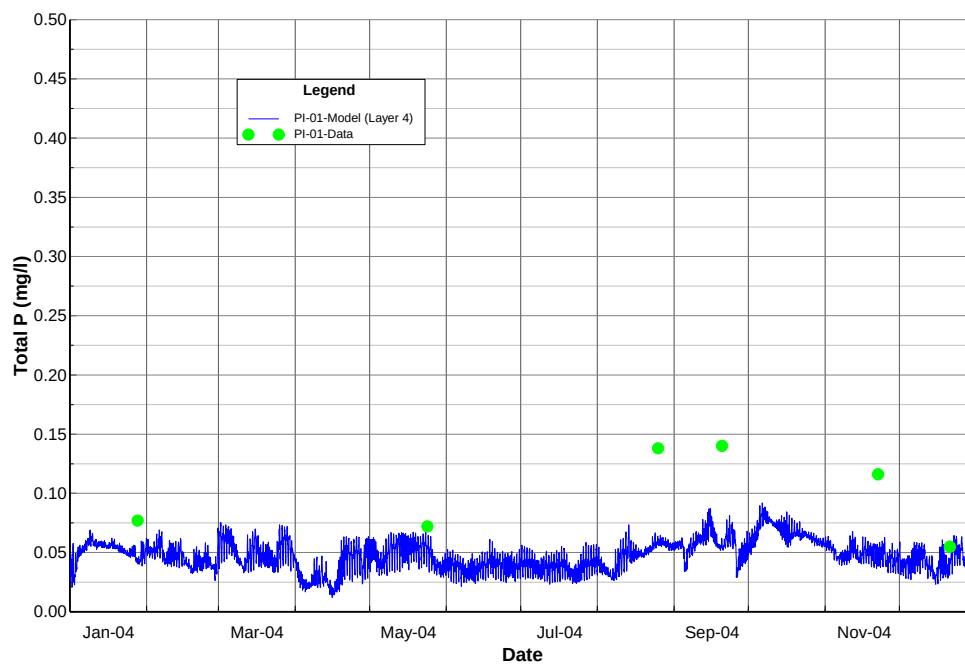


Figure 5-F- 13 Caloosahatchee Water Quality Validation: Total Phosphorus, PI-01

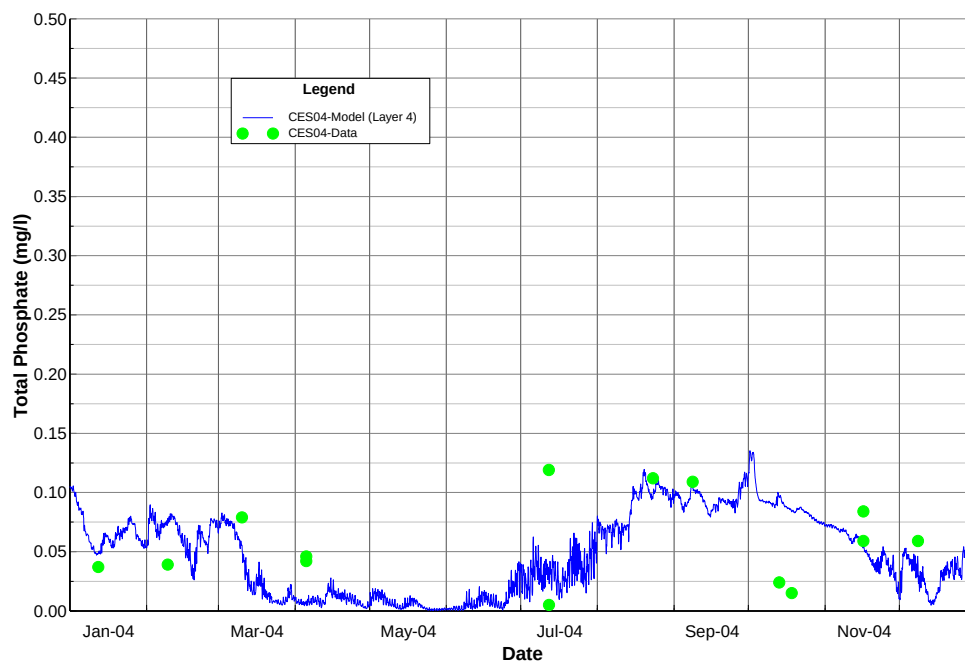


Figure 5-F- 14 Caloosahatchee Water Quality Validation: Total Phosphate, CES04, Surface

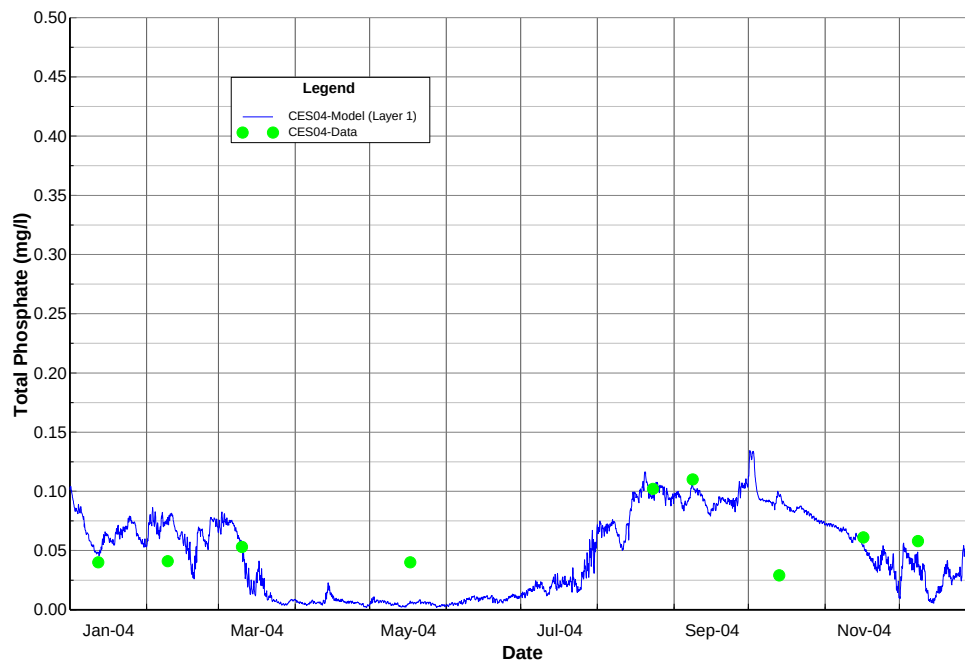


Figure 5-F- 15 Caloosahatchee Water Quality Validation: Total Phosphate, CES04, Bottom

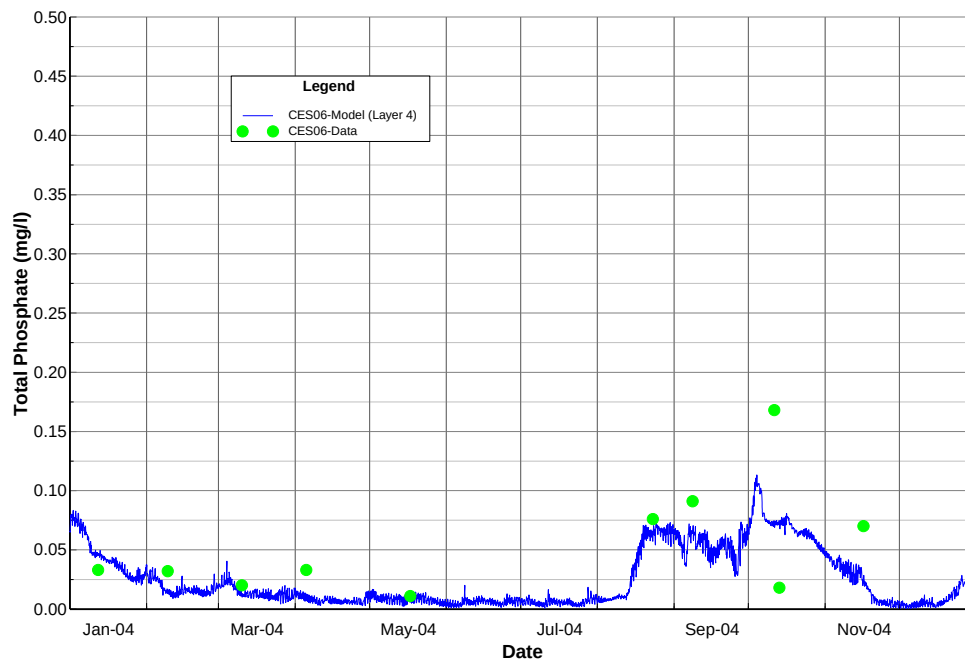


Figure 5-F- 16 Caloosahatchee Water Quality Validation: Total Phosphate, CES06, Surface

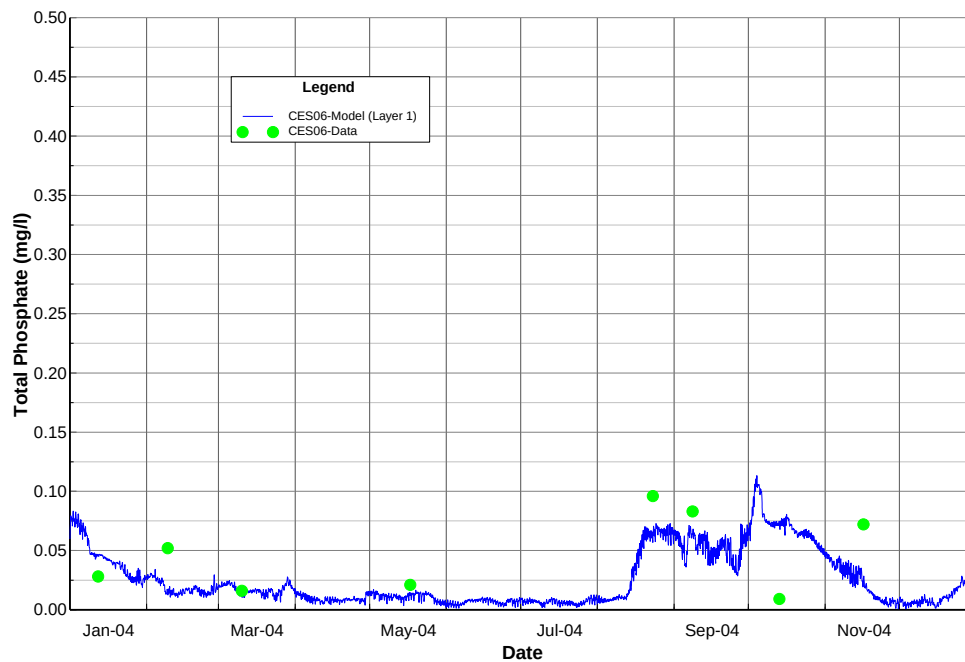


Figure 5-F- 17 Caloosahatchee Water Quality Validation: Total Phosphate, CES06, Bottom

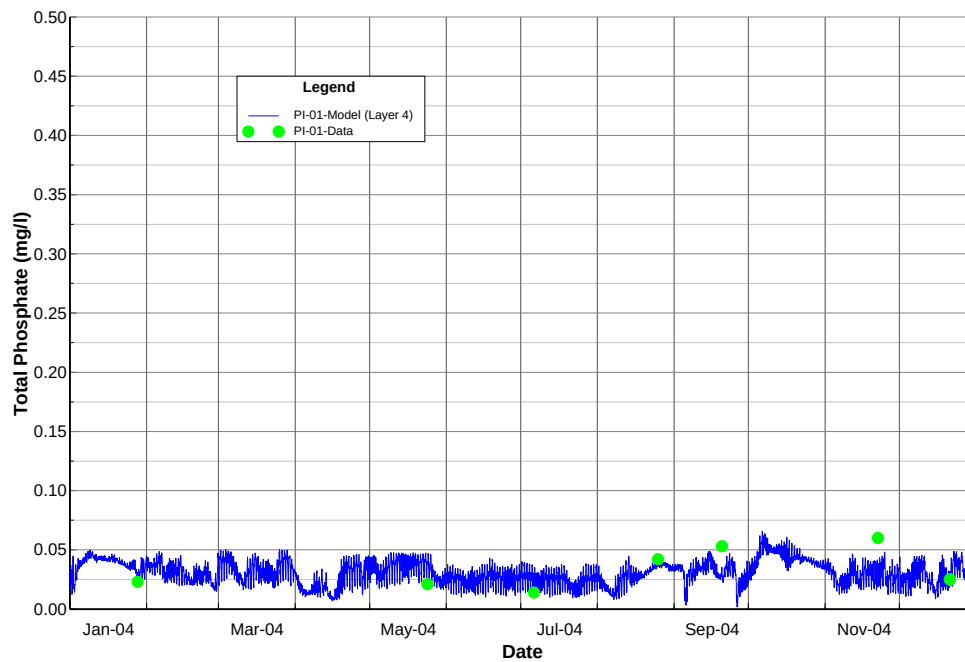


Figure 5-F- 18 Caloosahatchee Water Quality Validation: Total Phosphate, PI-01

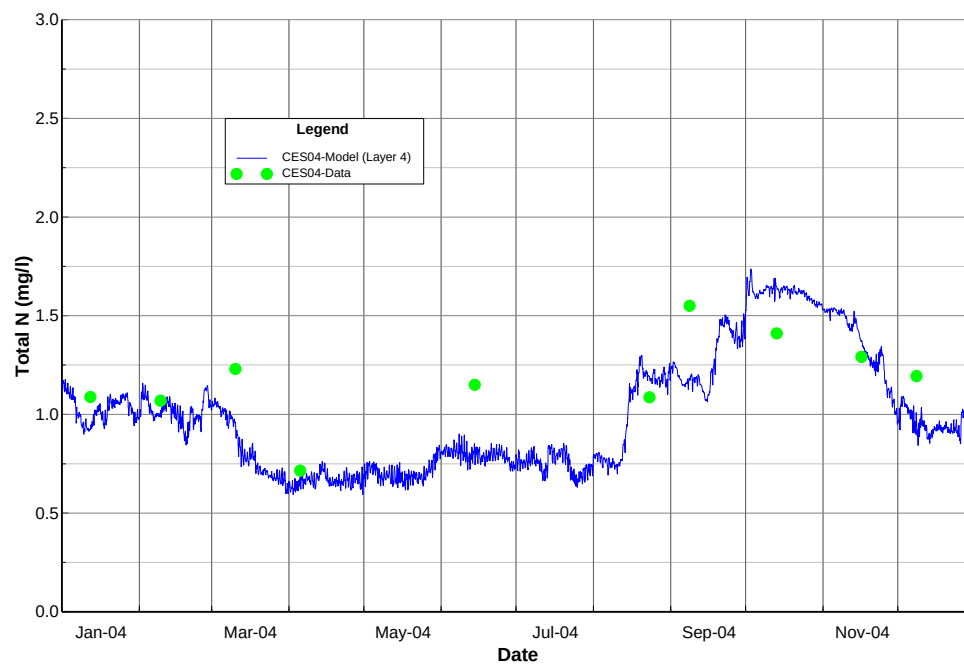


Figure 5-F- 19 Caloosahatchee Water Quality Validation: Total Nitrogen, CES04, Surface

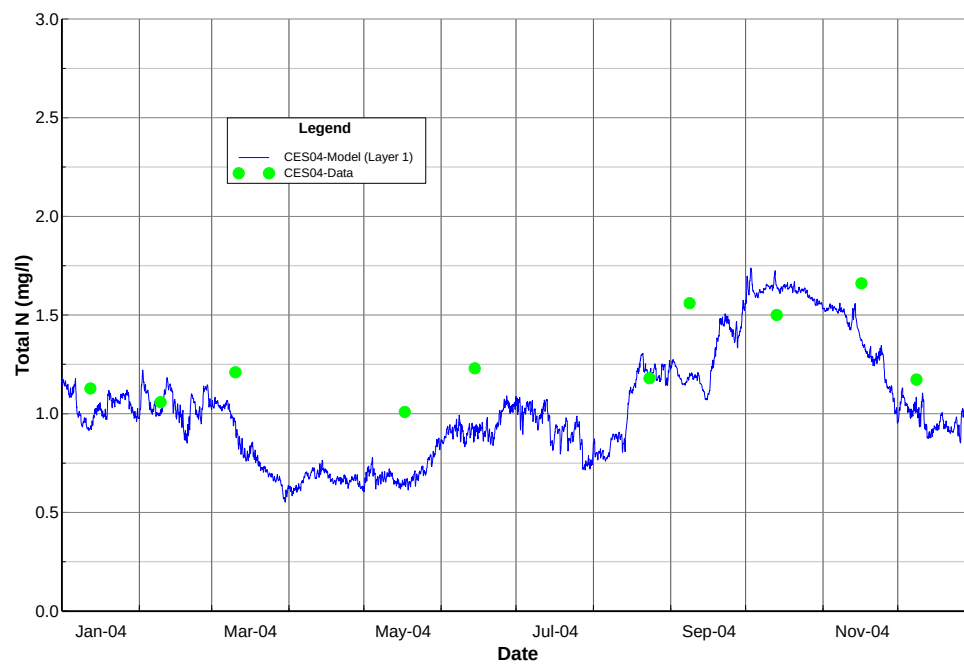


Figure 5-F- 20 Caloosahatchee Water Quality Validation: Total Nitrogen, CES04, Bottom

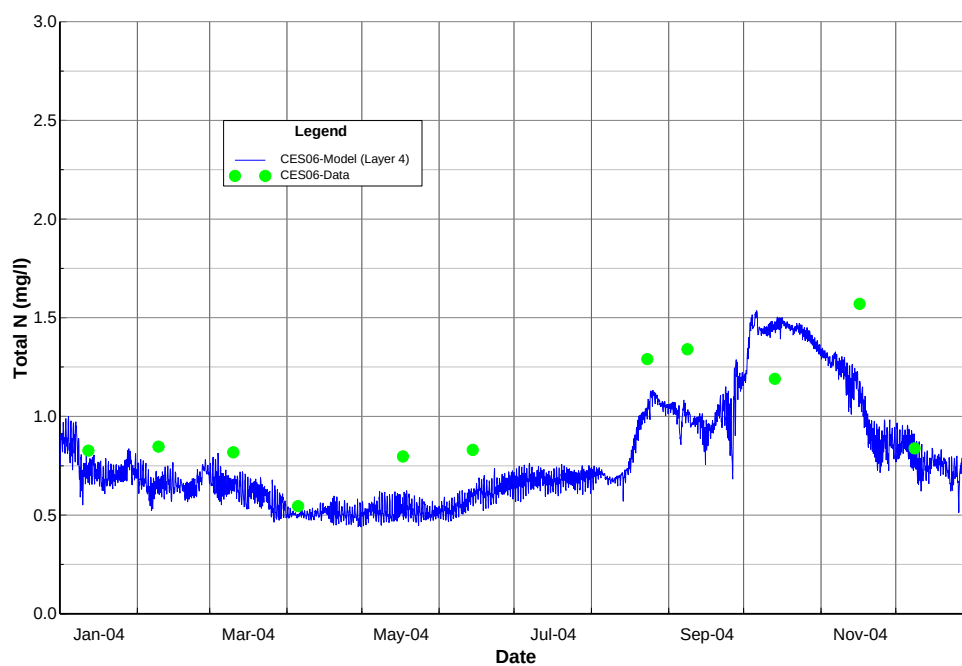


Figure 5-F- 21 Caloosahatchee Water Quality Validation: Total Nitrogen, CES06, Surface

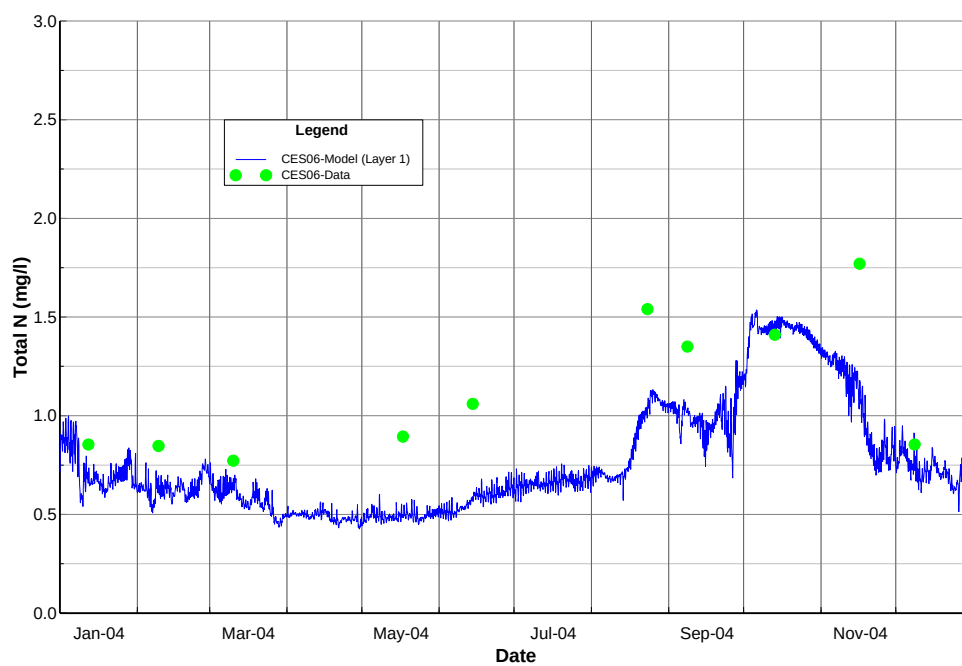


Figure 5-F- 22 Caloosahatchee Water Quality Validation: Total Nitrogen, CES06, Bottom

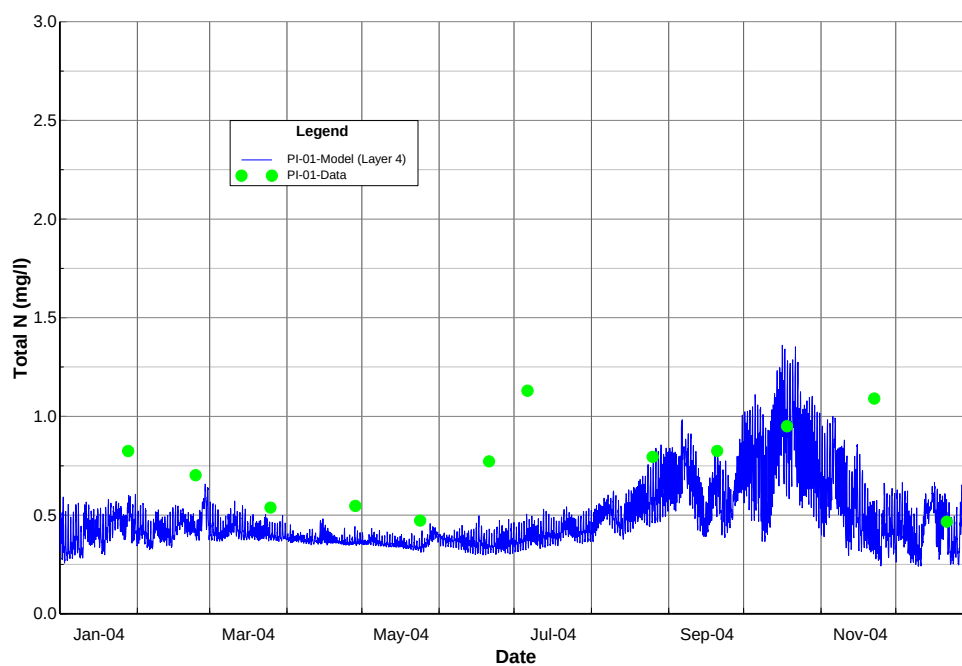


Figure 5-F- 23 Caloosahatchee Water Quality Validation: Total Nitrogen, PI-01

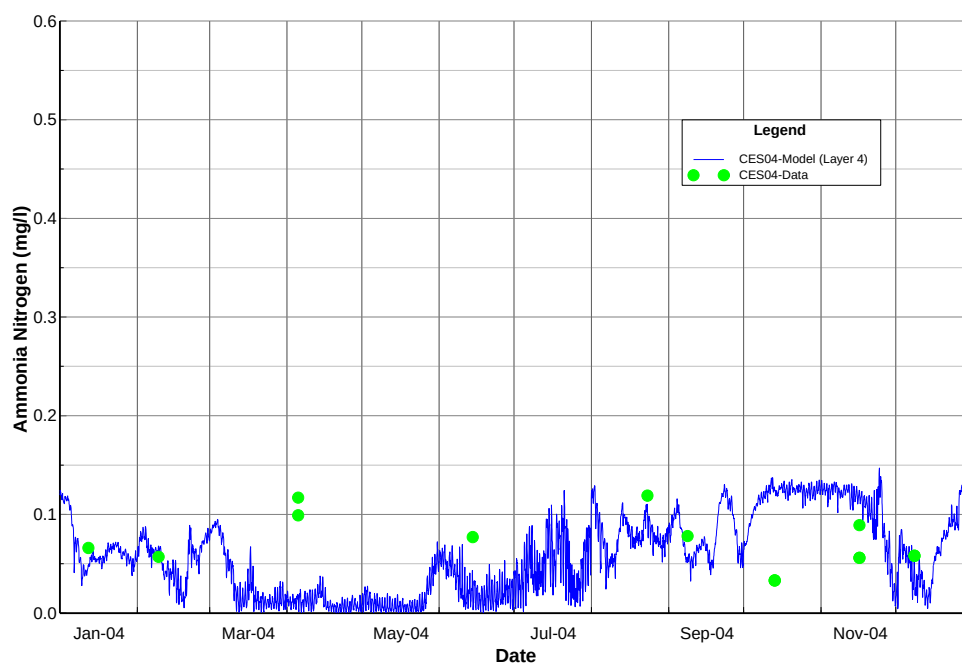


Figure 5-F- 24 Caloosahatchee Water Quality Validation: Ammonia Nitrogen, CES04, Surface

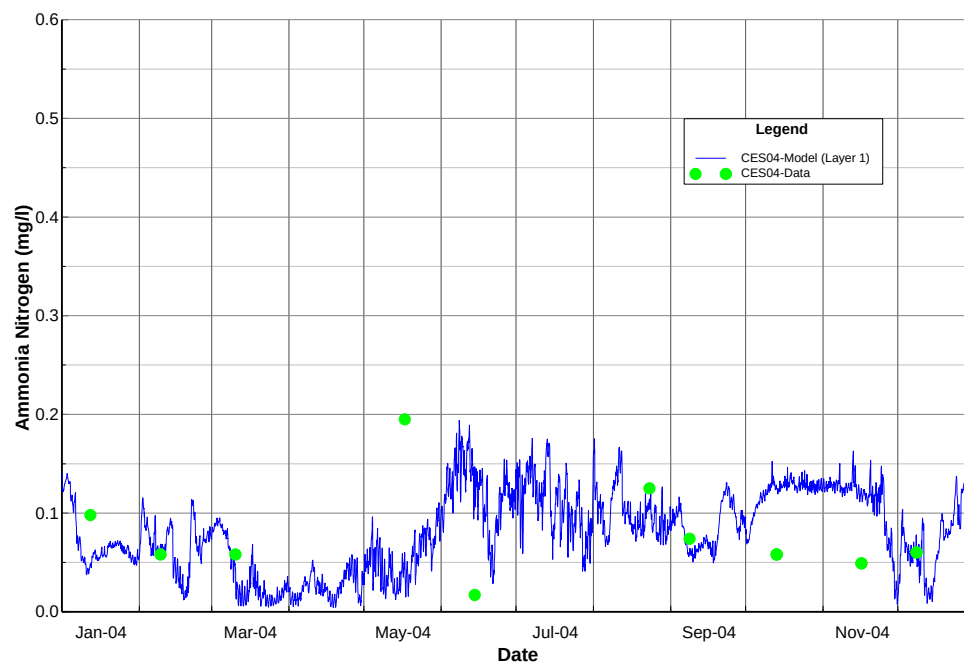


Figure 5-F- 25 Caloosahatchee Water Quality Validation: Ammonia Nitrogen, CES04, Bottom

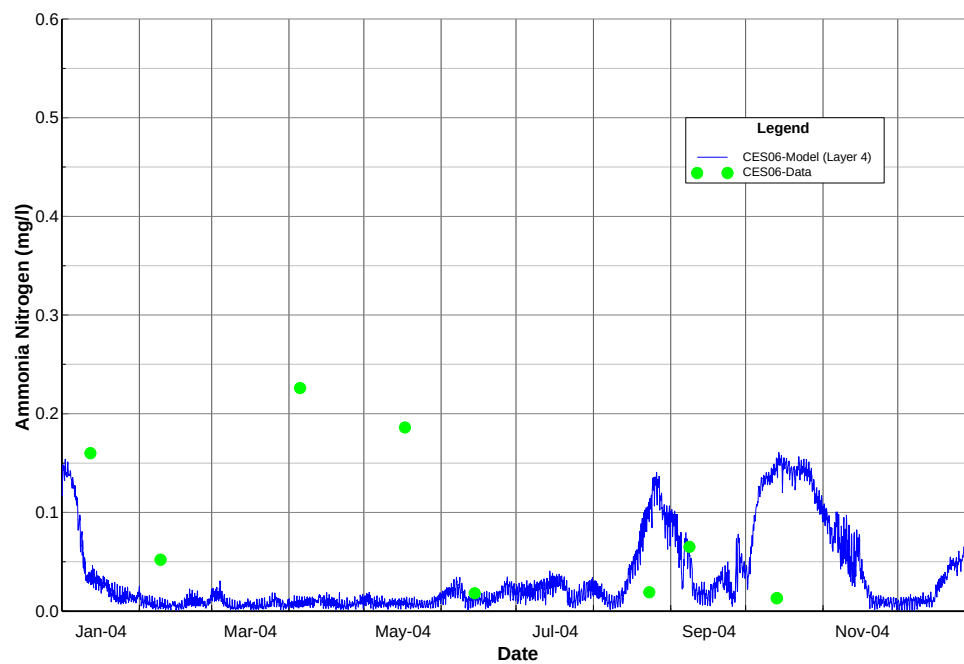


Figure 5-F- 26 Caloosahatchee Water Quality Validation: Ammonia Nitrogen, CES06, Surface

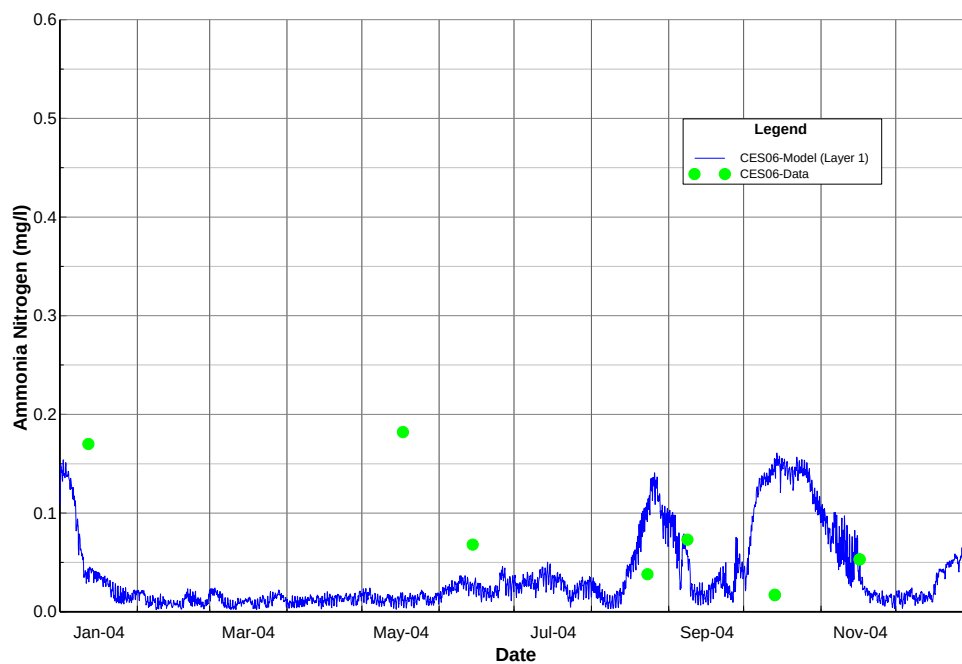


Figure 5-F- 27 Caloosahatchee Water Quality Validation: Ammonia Nitrogen, CES06, Bottom

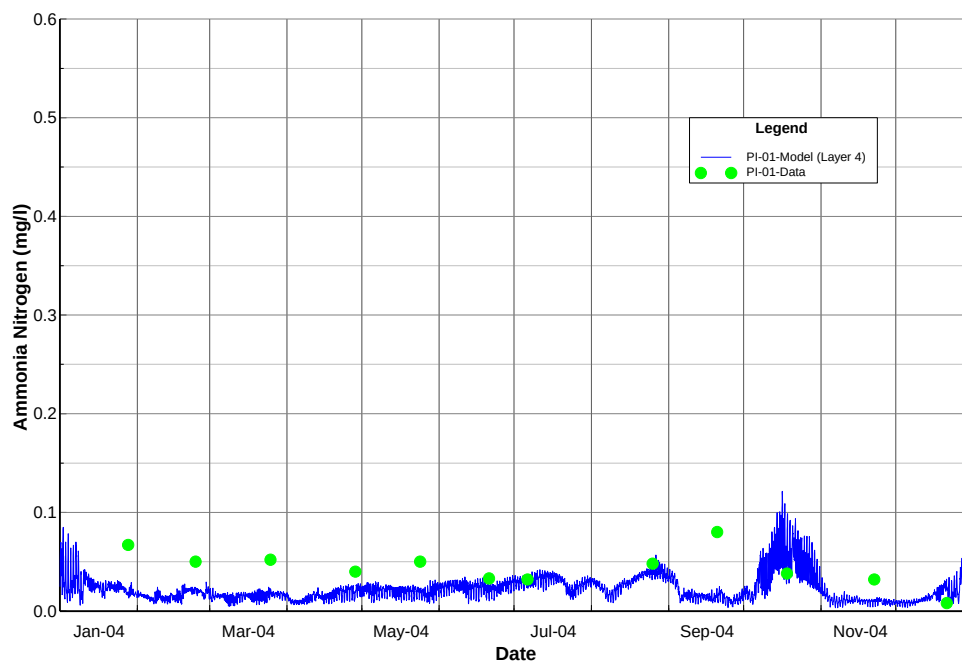


Figure 5-F- 28 Caloosahatchee Water Quality Validation: Ammonia Nitrogen, PI-01

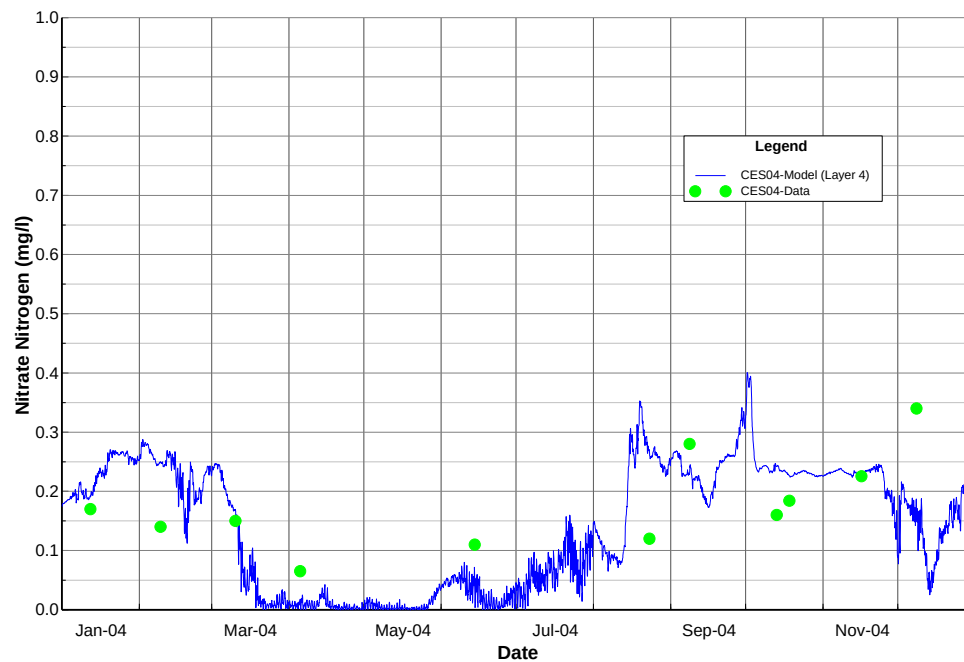


Figure 5-F- 29 Caloosahatchee Water Quality Validation: Nitrate Nitrogen, CES04, Surface

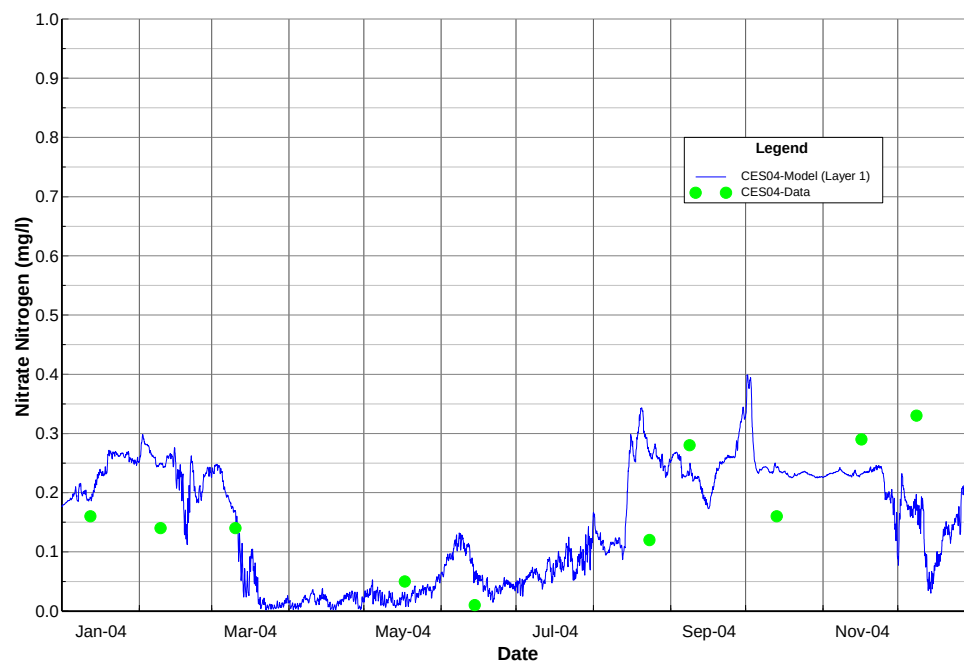


Figure 5-F- 30 Caloosahatchee Water Quality Validation: Nitrate Nitrogen, CES04, Bottom

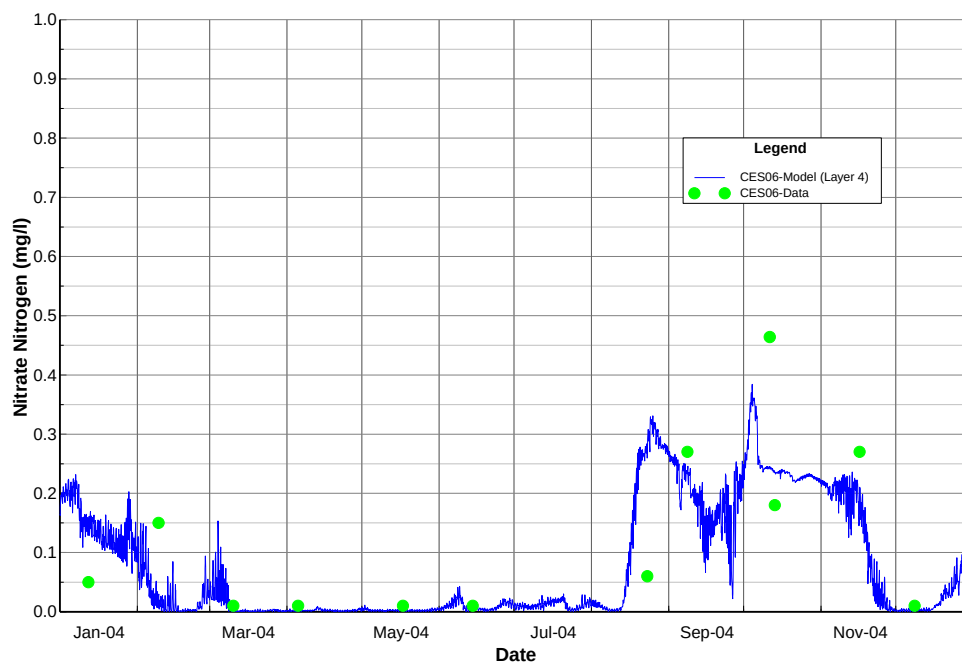


Figure 5-F- 31 Caloosahatchee Water Quality Validation: Nitrate Nitrogen, CES06, Surface

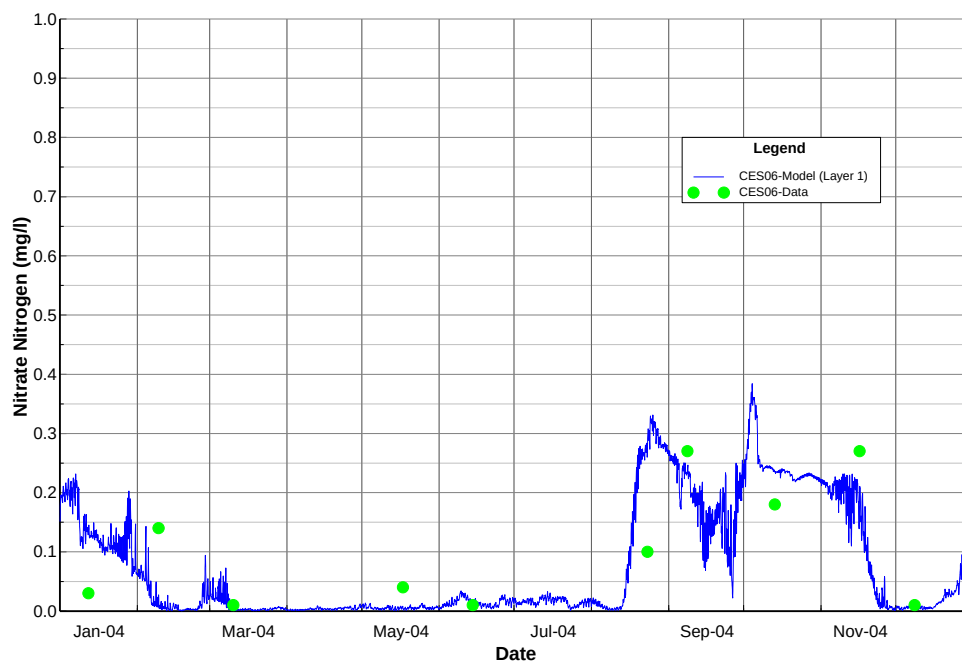


Figure 5-F- 32 Caloosahatchee Water Quality Validation: Nitrate Nitrogen, CES06, Bottom

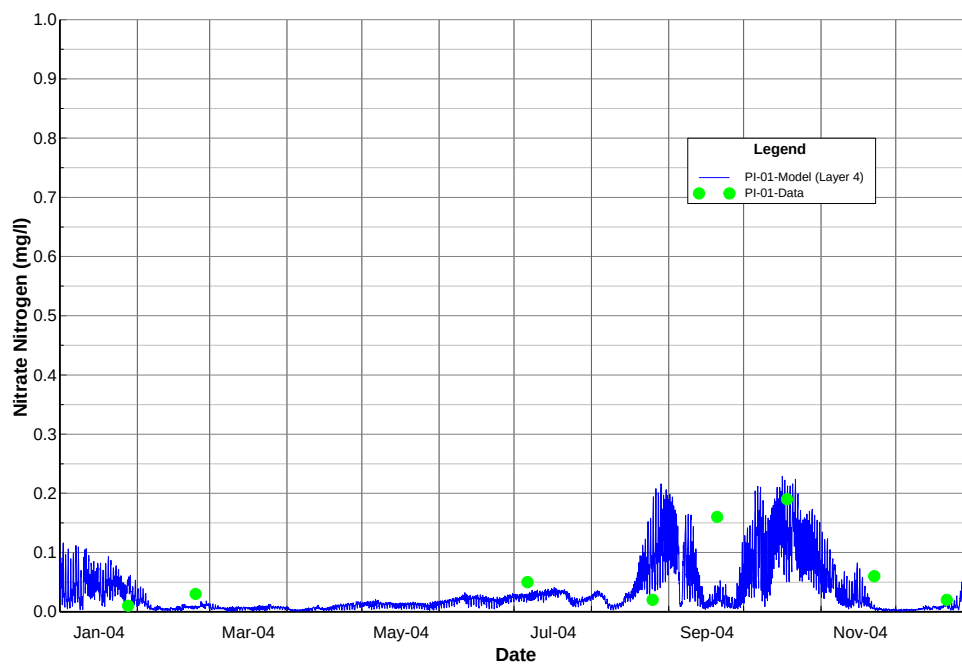


Figure 5-F- 33 Caloosahatchee Water Quality Validation: Nitrate Nitrogen, PI-01

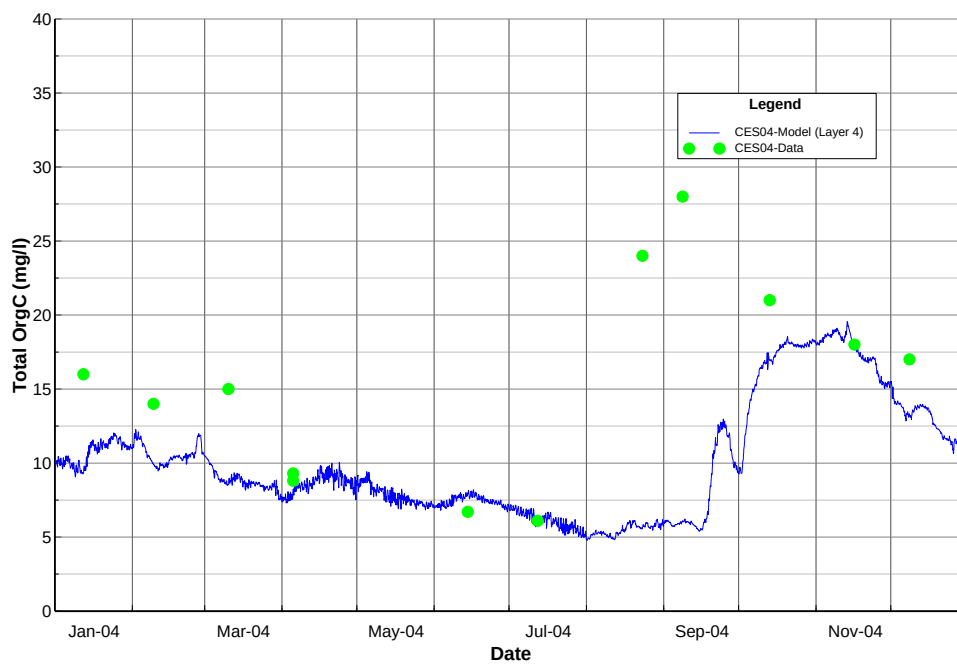


Figure 5-F- 34 Caloosahatchee Water Quality Validation: Total Organic Nitrogen, CES04, Surface

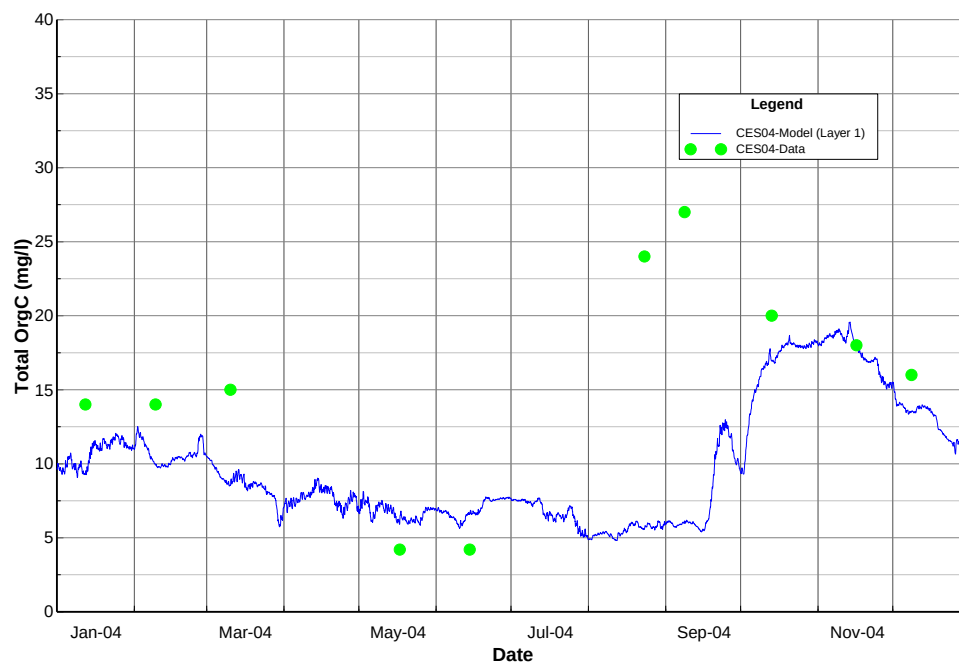


Figure 5-F- 35 Caloosahatchee Water Quality Validation: Total Organic Nitrogen, CES04, Bottom

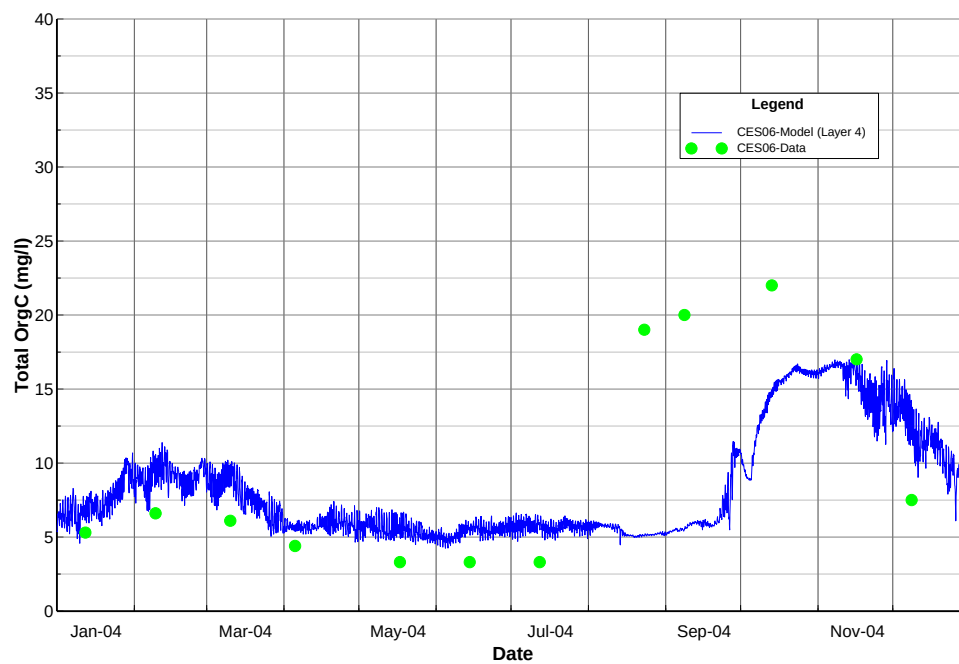


Figure 5-F- 36 Caloosahatchee Water Quality Validation: Total Organic Nitrogen, CES06, Surface

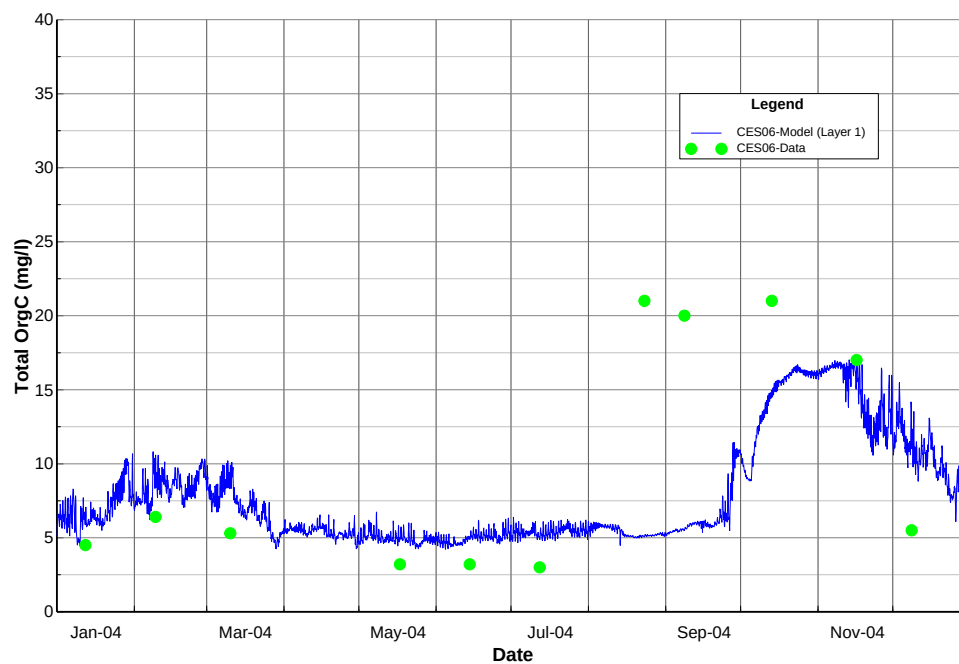


Figure 5-F- 37 Caloosahatchee Water Quality Validation: Total Organic Nitrogen, CES06, Bottom

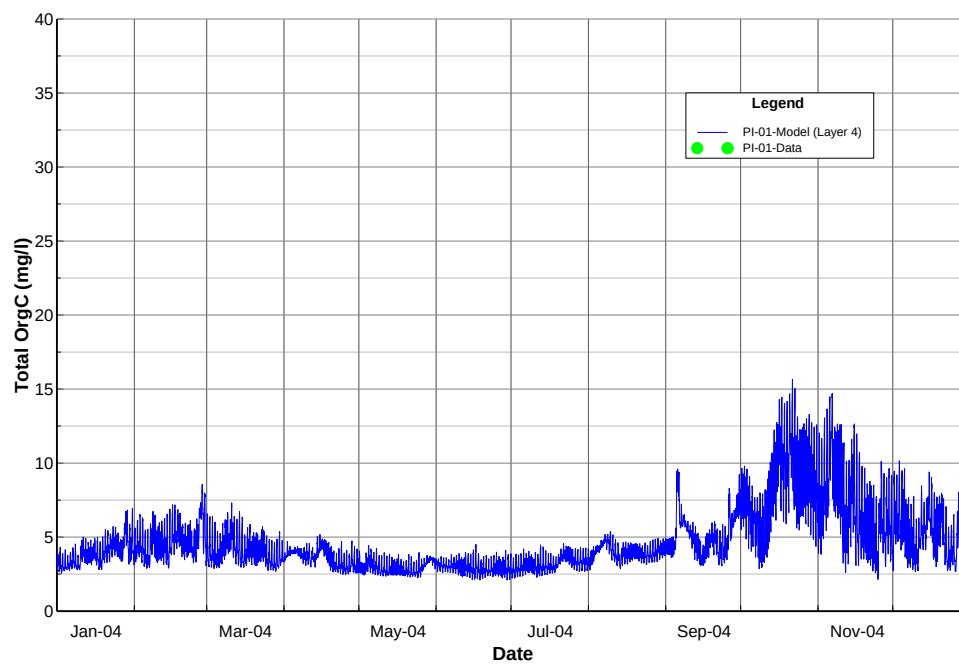


Figure 5-F- 38 Caloosahatchee Water Quality Validation: Total Organic Nitrogen, PI-01

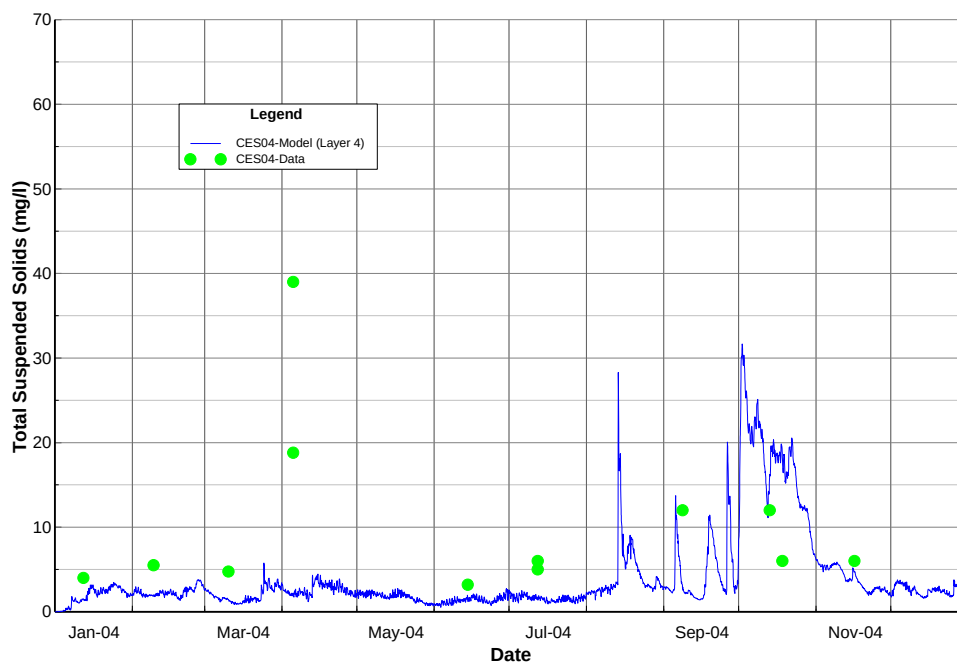


Figure 5-F- 39 Caloosahatchee Water Quality Validation: Total Suspended Solids, CES04, Surface

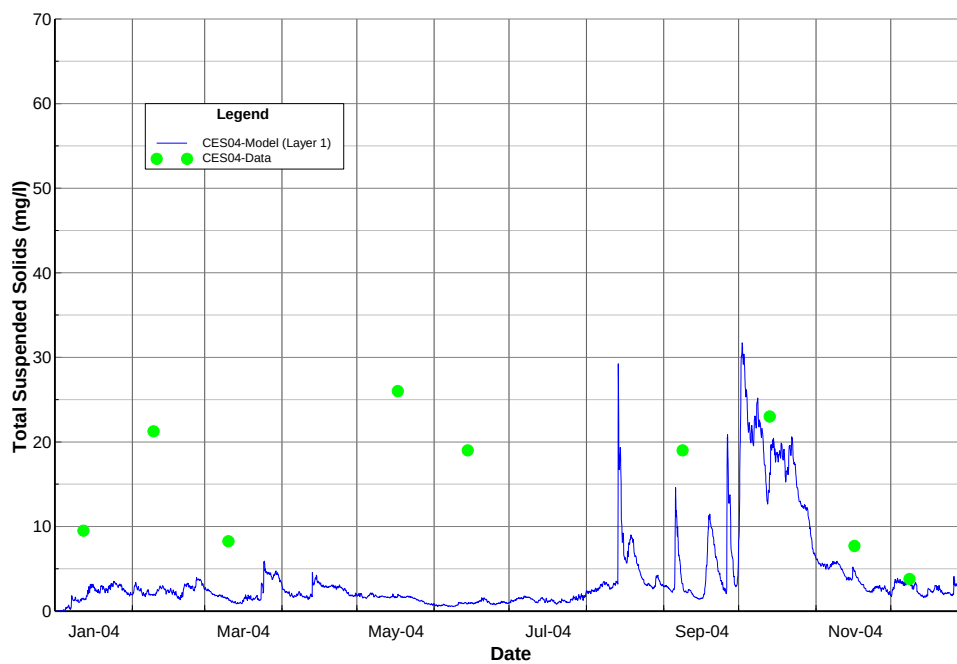


Figure 5-F- 40 Caloosahatchee Water Quality Validation: Total Suspended Solids, CES04, Bottom

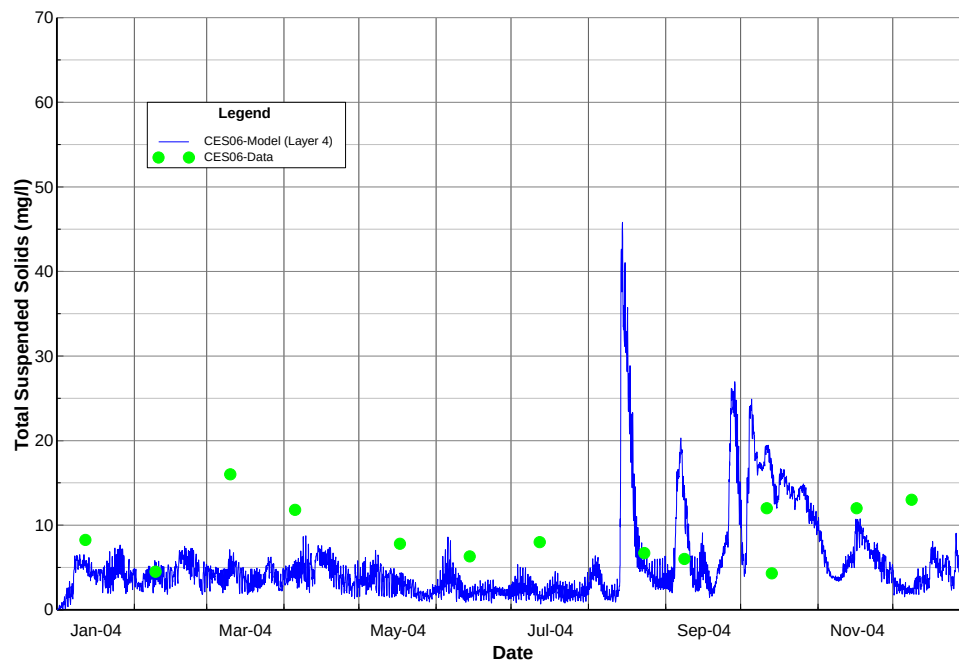


Figure 5-F- 41 Caloosahatchee Water Quality Validation: Total Suspended Solids, CES06, Surface

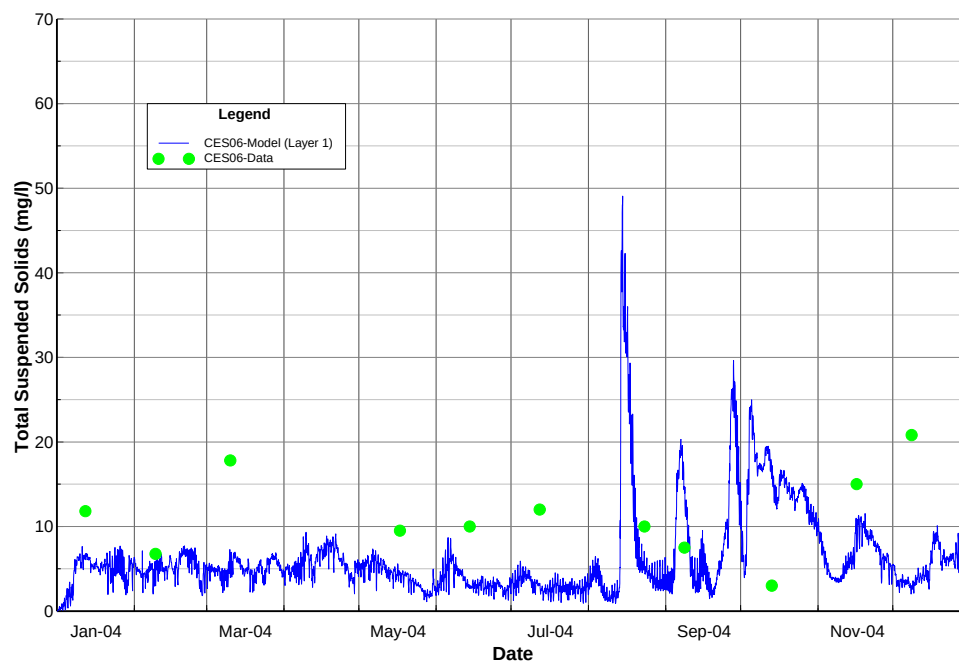


Figure 5-F- 42 Caloosahatchee Water Quality Validation: Total Suspended Solids, CES06, Bottom

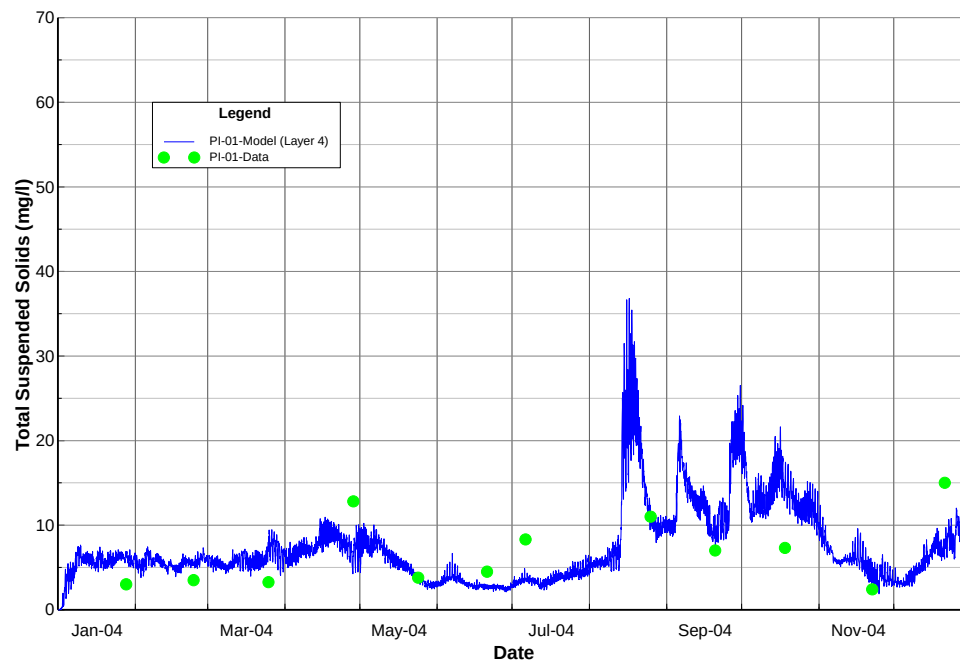


Figure 5-F- 43 Caloosahatchee Water Quality Validation: Total Suspended Solids, PI-01

EFDC Model Run - Time Series Statistics
Caloosahatchee River, Water Quality Validation - 2004

Station ID	Layer/ Type	Starting Date/Time	Ending Date/Time	# Pairs	RMS	Data Average	Model Average
Dissolved Oxygen (mg/l)							
CES04	Surface	1/5/2004 20:38	12/8/2004 19:07	29	2.029	7.010	7.493
CES04	Bottom	1/5/2004 20:38	12/8/2004 19:12	22	1.590	4.992	5.562
CES06	Surface	1/5/2004 19:15	12/8/2004 20:33	29	1.940	8.196	7.698
CES06	Bottom	2/9/2004 21:50	12/8/2004 20:38	12	2.110	6.472	7.038
PI-01	Surface	1/28/2004 9:27	12/21/2004 9:17	12	1.054	6.550	7.149
Chlorophyll a (ug/l)							
CES04	Surface	1/12/2004 11:31	12/8/2004 11:47	11	6.728	8.385	7.920
CES06	Surface	1/12/2004 10:42	12/8/2004 12:33	11	23.875	15.738	7.891
PI-01	Surface	2/24/2004 9:20	12/21/2004 9:17	11	4.540	3.783	3.773
Total Phosphorus (mg/l)							
CES04	Surface	1/12/2004 11:31	12/8/2004 11:47	13	0.072	0.106	0.077
CES04	Bottom	1/12/2004 11:33	12/8/2004 11:52	10	0.046	0.092	0.083
CES06	Surface	1/12/2004 10:42	12/8/2004 12:33	12	0.054	0.077	0.050
CES06	Bottom	1/12/2004 10:47	12/8/2004 12:38	10	0.063	0.082	0.047
PI-01	Surface	1/28/2004 9:27	12/21/2004 9:17	6	0.058	0.100	0.050
Total Phosphate (mg/l)							
CES04	Surface	1/12/2004 11:31	12/8/2004 11:47	14	0.043	0.059	0.056
CES04	Bottom	1/12/2004 11:33	12/8/2004 11:52	9	0.029	0.059	0.064
CES06	Surface	1/12/2004 10:42	11/16/2004 11:33	10	0.040	0.055	0.039
CES06	Bottom	1/12/2004 10:47	11/16/2004 11:38	8	0.035	0.047	0.038
PI-01	Surface	1/28/2004 9:27	12/21/2004 9:17	7	0.018	0.034	0.031

EFDC Model Run - Time Series Statistics

Caloosahatchee River, Water Quality Validation - 2004

Station ID	Layer/ Type	Starting Date/Time	Ending Date/Time	# Pairs	RMS	Data Average	Model Average
CES06	Surface	1/12/2004 10:42	11/16/2004 11:33	10	0.040	0.055	0.039
CES06	Bottom	1/12/2004 10:47	11/16/2004 11:38	8	0.035	0.047	0.038
PI-01	Surface	1/28/2004 9:27	12/21/2004 9:17	7	0.018	0.034	0.031
Total Nitrogen (mg/l)							
CES04	Surface	1/12/2004 11:31	12/8/2004 11:47	10	0.224	1.178	1.073
CES04	Bottom	1/12/2004 11:31	12/8/2004 11:45	10	0.235	1.271	1.097
CES06	Surface	1/12/2004 10:42	12/8/2004 12:33	11	0.239	0.990	0.830
CES06	Bottom	1/12/2004 10:47	12/8/2004 12:38	10	0.349	1.135	0.855
PI-01	Surface	1/28/2004 9:27	12/21/2004 9:17	12	0.340	0.759	0.519
Ammonia Nitrogen (mg/l)							
CES04	Surface	1/12/2004 11:31	12/8/2004 11:47	14	0.059	0.071	0.073
CES04	Bottom	1/12/2004 11:33	12/8/2004 11:52	13	0.068	0.074	0.089
CES06	Surface	1/12/2004 10:42	10/13/2004 12:05	9	0.125	0.084	0.058
CES06	Bottom	1/12/2004 10:47	11/16/2004 11:38	9	0.098	0.075	0.070
PI-01	Surface	1/28/2004 9:27	12/21/2004 9:17	12	0.032	0.044	0.027
Nitrate Nitrogen (mg/l)							
CES04	Surface	1/12/2004 11:31	12/8/2004 11:47	11	0.085	0.177	0.184
CES04	Bottom	1/12/2004 11:31	12/8/2004 11:45	10	0.085	0.168	0.186

EFDC Model Run - Time Series Statistics

Caloosahatchee River, Water Quality Validation - 2004

Station ID	Layer/ Type	Starting Date/Time	Ending Date/Time	# Pairs	RMS	Data Average	Model Average
CES06	Surface	1/12/2004 10:42	12/8/2004 12:33	12	0.103	0.125	0.116
CES06	Bottom	1/12/2004 10:47	12/8/2004 12:38	10	0.080	0.106	0.114
PI-01	Surface	1/28/2004 9:27	12/21/2004 9:17	8	0.063	0.068	0.052
Total Organic Carbon (mg/l)							
CES04	Surface	1/12/2004 11:31	12/8/2004 11:47	12	8.906	15.325	9.850
CES04	Bottom	1/12/2004 11:33	12/8/2004 11:52	10	9.376	15.640	10.088
CES06	Surface	1/12/2004 10:42	12/8/2004 12:33	12	6.608	9.817	8.621
CES06	Bottom	1/12/2004 10:47	12/8/2004 12:38	11	7.315	10.009	8.655
Total Suspended Solids (mg/l)							
CES04	Surface	1/12/2004 11:31	11/16/2004 10:48	12	12.736	10.188	4.607
CES04	Bottom	1/12/2004 11:31	12/8/2004 11:45	9	13.701	15.278	3.946
CES06	Surface	1/12/2004 10:42	12/8/2004 12:33	13	7.214	8.973	6.899
CES06	Bottom	1/12/2004 10:47	12/8/2004 12:38	11	9.503	11.286	6.473
PI-01	Surface	1/28/2004 9:21	12/21/2004 9:21	12	4.229	6.821	6.930

Appendix 5-G WASP Calibration Plots

Table of Figures

Figure 5-G- 1 Surface water temperature calibration for CES04	1
Figure 5-G- 2 Bottom water temperature calibration for CES04	1
Figure 5-G- 3 Surface water temperature calibration for CES06	2
Figure 5-G- 4 Bottom water temperature calibration for CES06	2
Figure 5-G- 5 Surface total P calibration for CES04	3
Figure 5-G- 6 Bottom total P calibration for CES04	3
Figure 5-G- 7 Surface total P calibration for CES06	4
Figure 5-G- 8 Bottom total P calibration for CES06	4
Figure 5-G- 9 Surface total phosphate calibration for CES04	5
Figure 5-G- 10 Bottom total phosphate calibration for CES04	5
Figure 5-G- 11 Surface total phosphate calibration for CES06	6
Figure 5-G- 12 Bottom total phosphate calibration for CES06	6
Figure 5-G- 13 Surface total N calibration for CES04	7
Figure 5-G- 14 Bottom total N calibration for CES04	7
Figure 5-G- 15 Surface total N calibration for CES06	8
Figure 5-G- 16 Bottom total N calibration for CES06	8
Figure 5-G- 17 Surface NH ₄ -N calibration for CES04	9
Figure 5-G- 18 Bottom NH ₄ -N calibration for CES04	9
Figure 5-G- 19 Surface NH ₄ -N calibration for CES06	10
Figure 5-G- 20 Bottom NH ₄ -N calibration for CES06	10
Figure 5-G- 21 Surface NO ₃ -N calibration for CES04	11
Figure 5-G- 22 Bottom NO ₃ -N calibration for CES04	11
Figure 5-G- 23 Surface NO ₃ -N calibration for CES06	12
Figure 5-G- 24 Bottom NO ₃ -N calibration for CES06	12

Figure 5-G- 25 Surface TOC calibration for CES04	13
Figure 5-G- 26 Bottom TOC calibration for CES04	13
Figure 5-G- 27 Surface TOC calibration for CES06	14
Figure 5-G- 28 Bottom TOC calibration for CES06	14
Figure 5-G- 29 Surface TSS calibration for CES04	15
Figure 5-G- 30 Bottom TSS calibration for CES04	15
Figure 5-G- 31 Surface TSS calibration for CES06	16
Figure 5-G- 32 Bottom TSS calibration for CES06	16

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

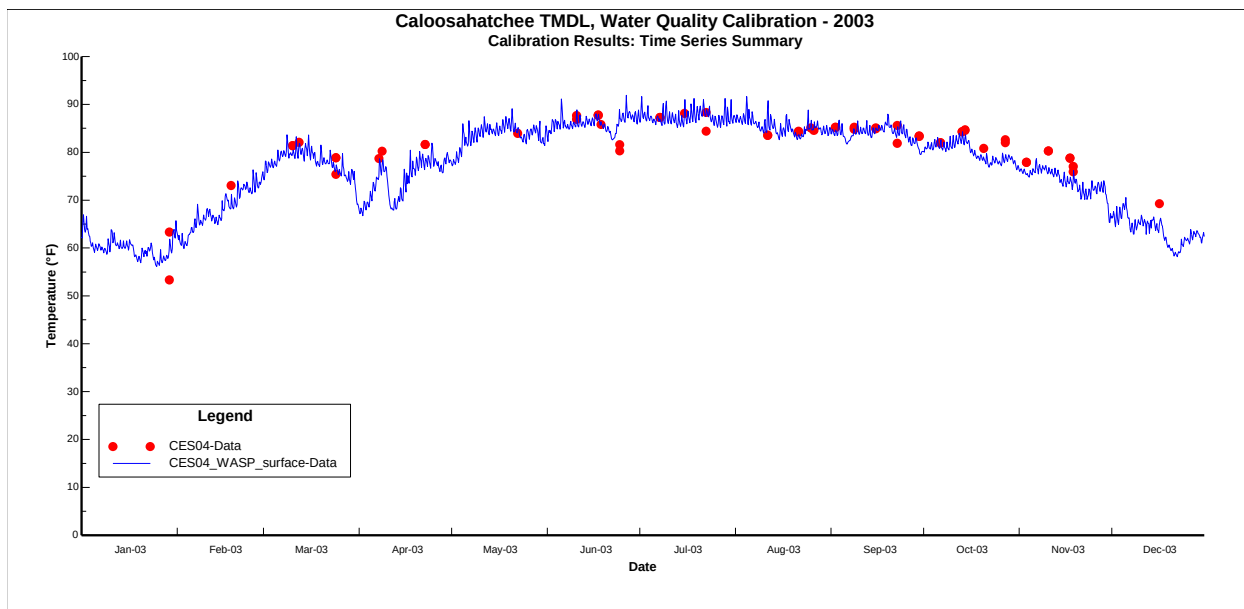


Figure 5-G- 1 Surface water temperature calibration for CES04

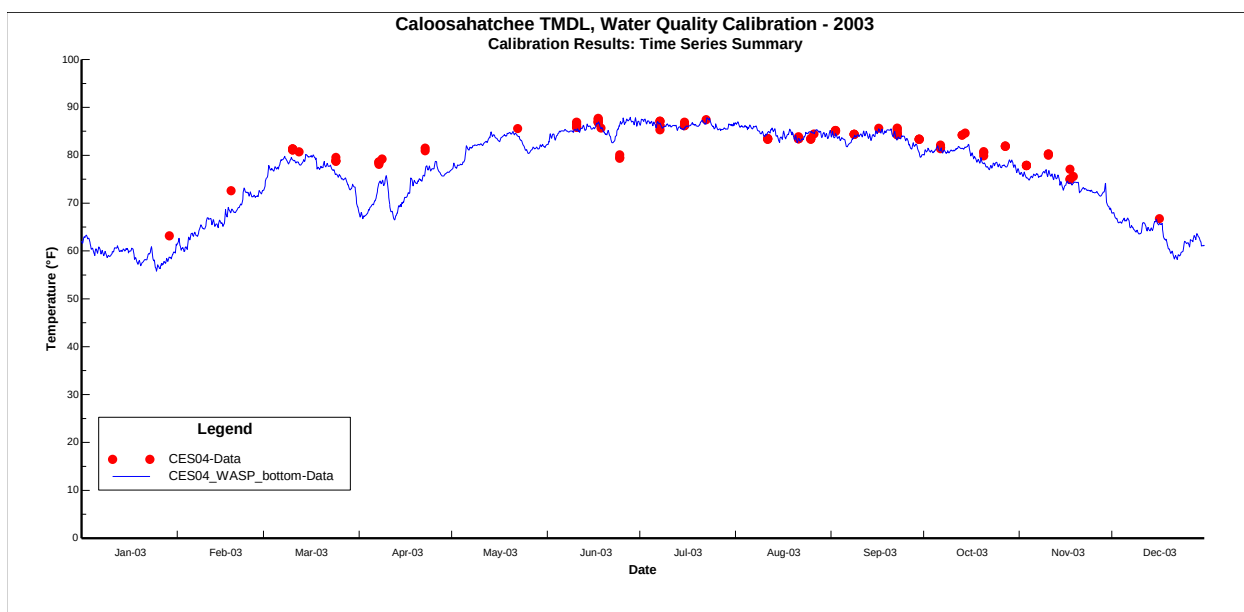


Figure 5-G- 2 Bottom water temperature calibration for CES04

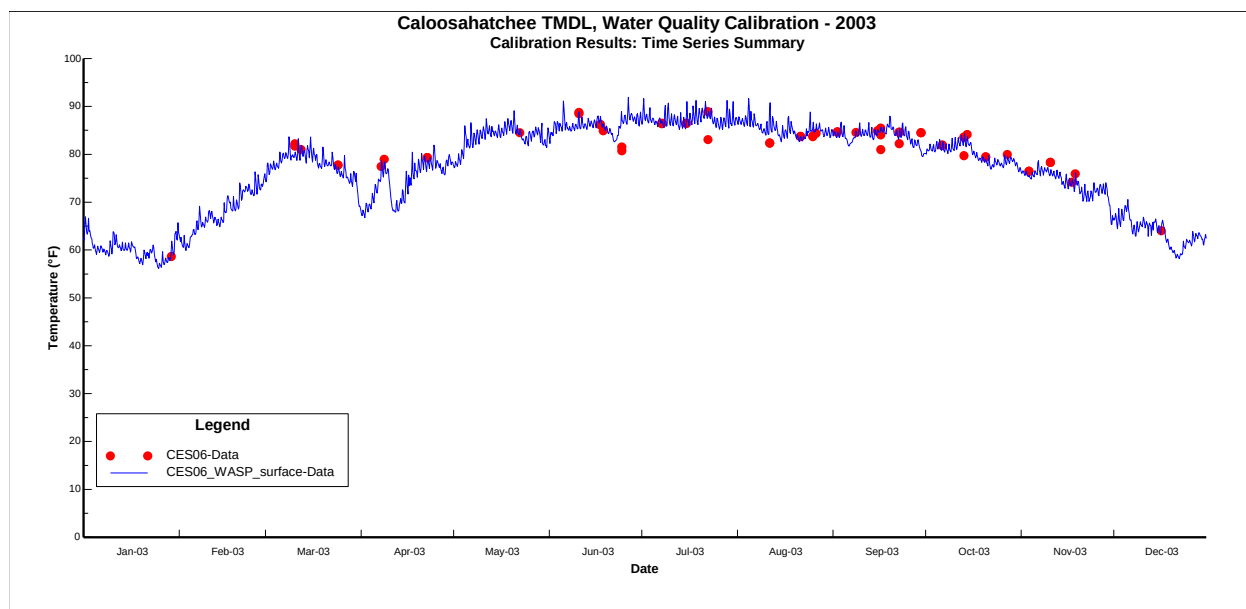


Figure 5-G- 3 Surface water temperature calibration for CES06

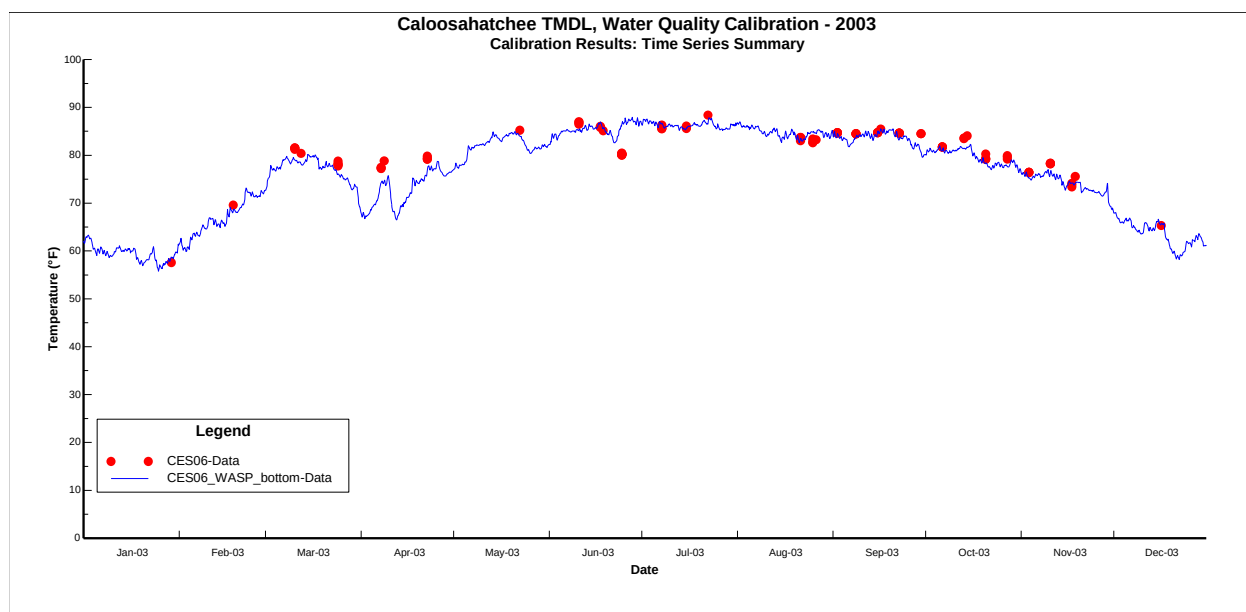


Figure 5-G- 4 Bottom water temperature calibration for CES06

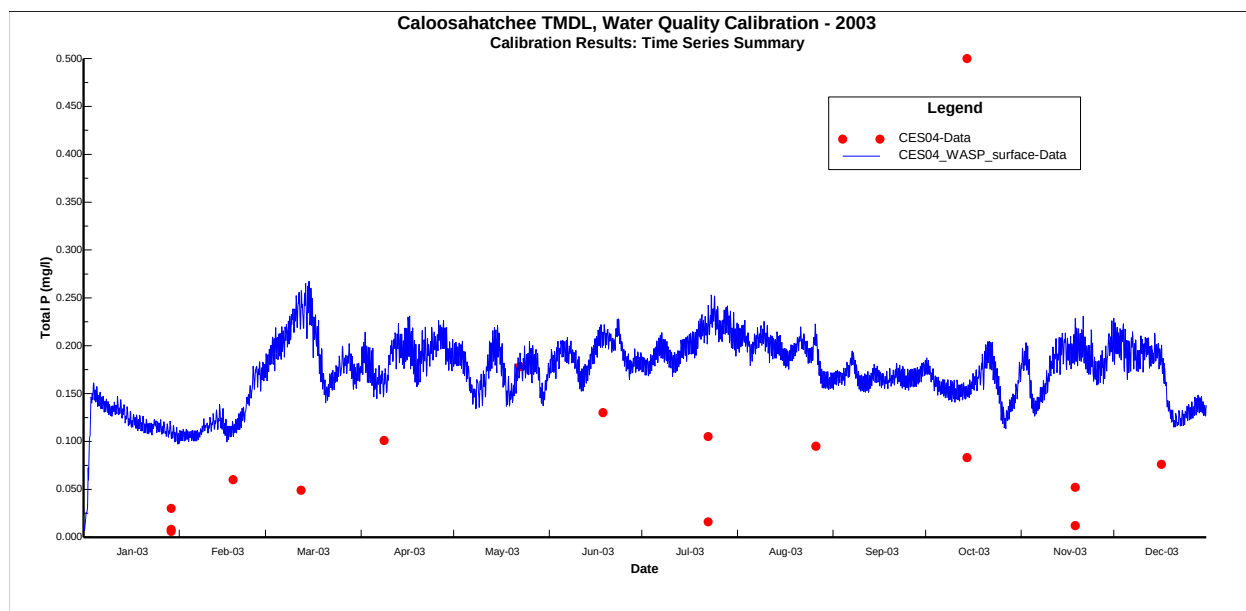


Figure 5-G- 5 Surface total P calibration for CES04

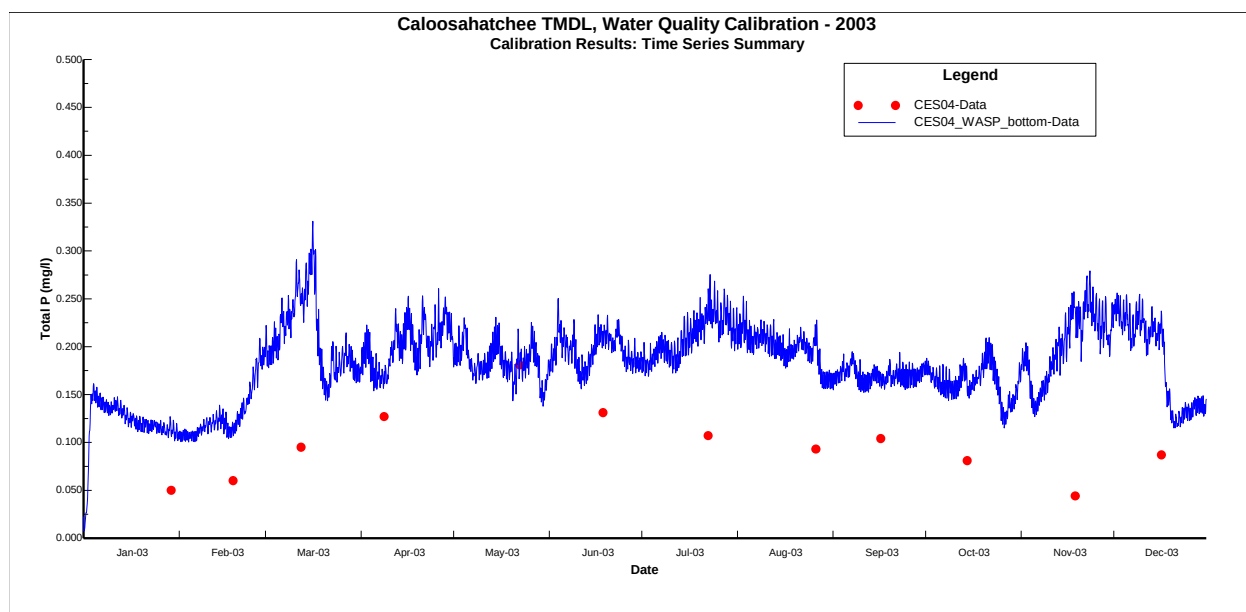


Figure 5-G- 6 Bottom total P calibration for CES04

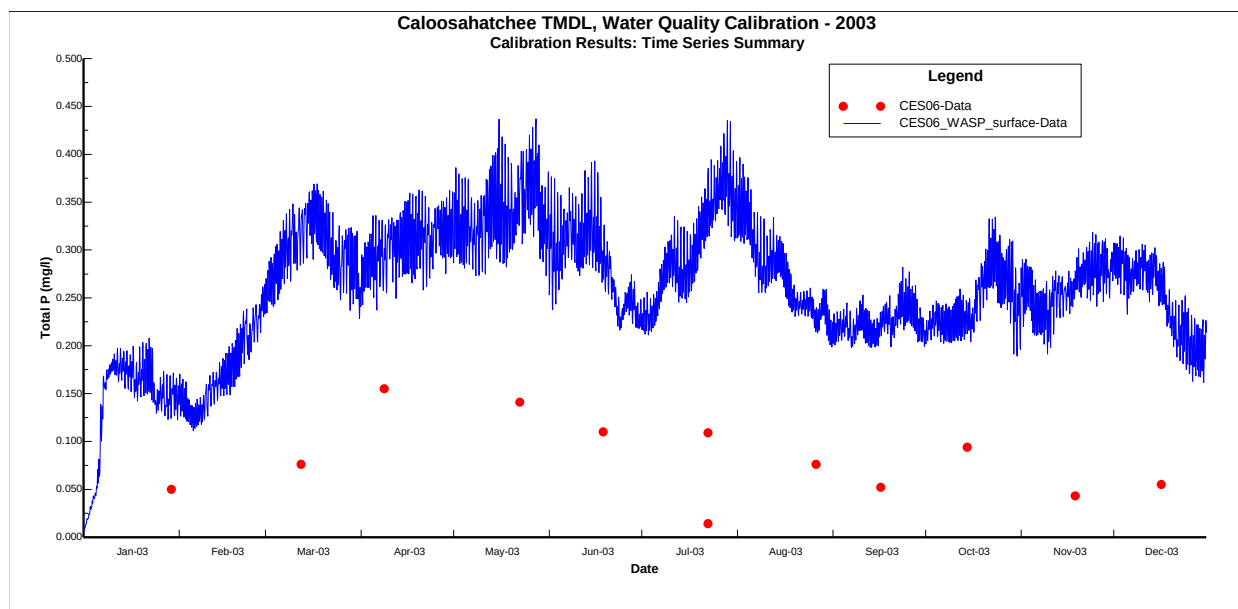


Figure 5-G- 7 Surface total P calibration for CES06

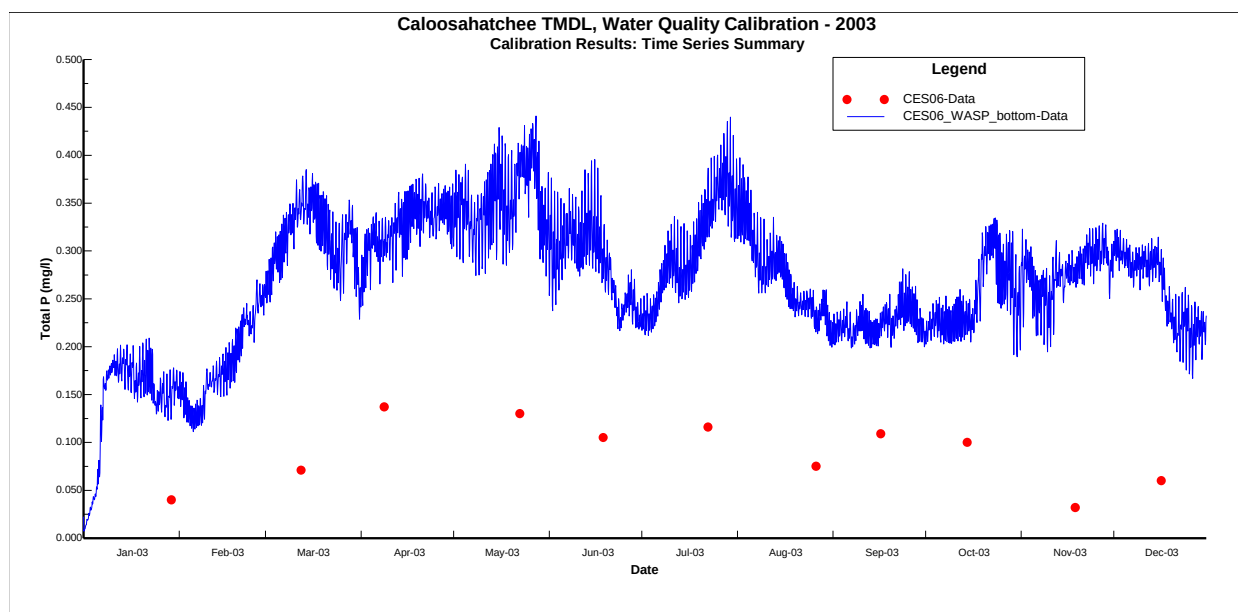


Figure 5-G- 8 Bottom total P calibration for CES06

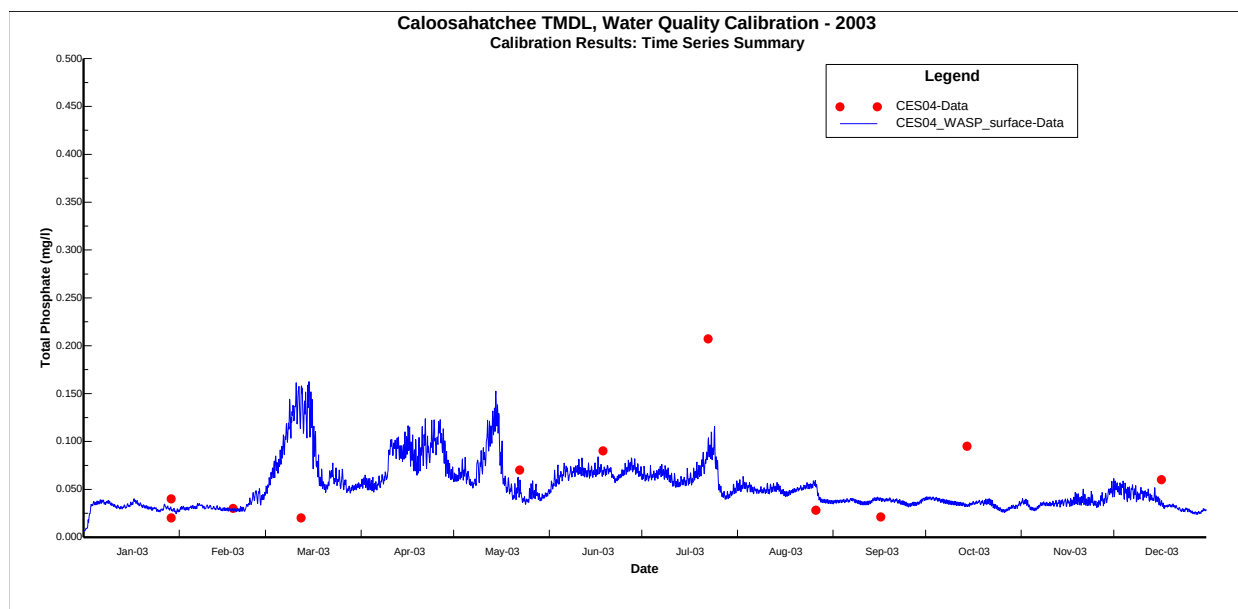


Figure 5-G- 9 Surface total phosphate calibration for CES04

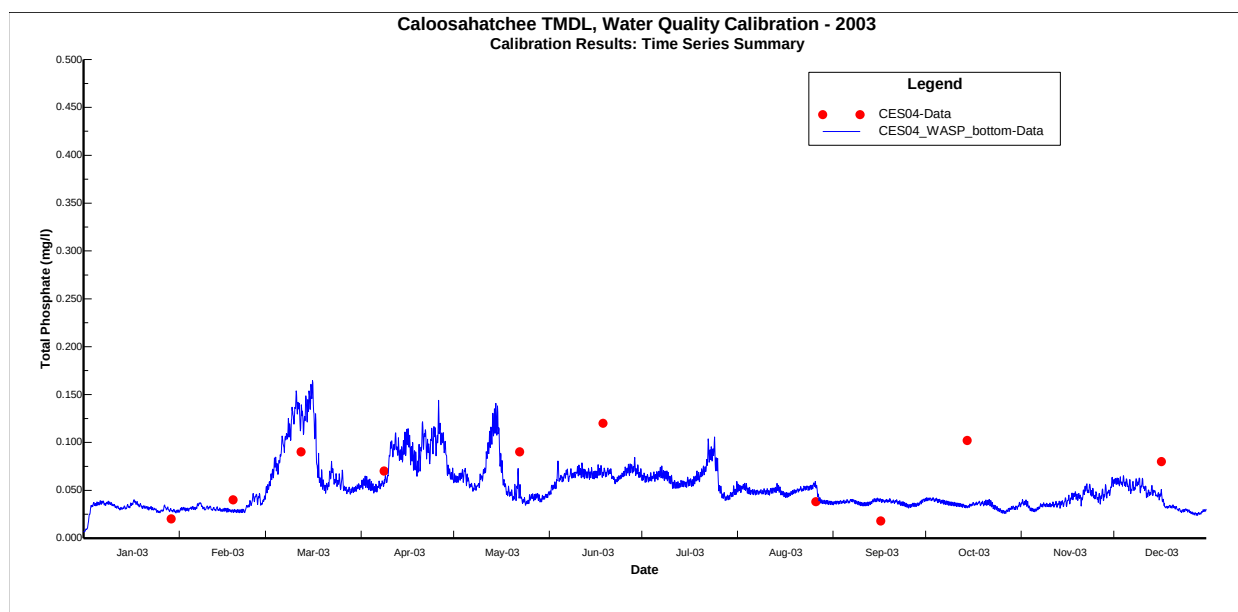


Figure 5-G- 10 Bottom total phosphate calibration for CES04

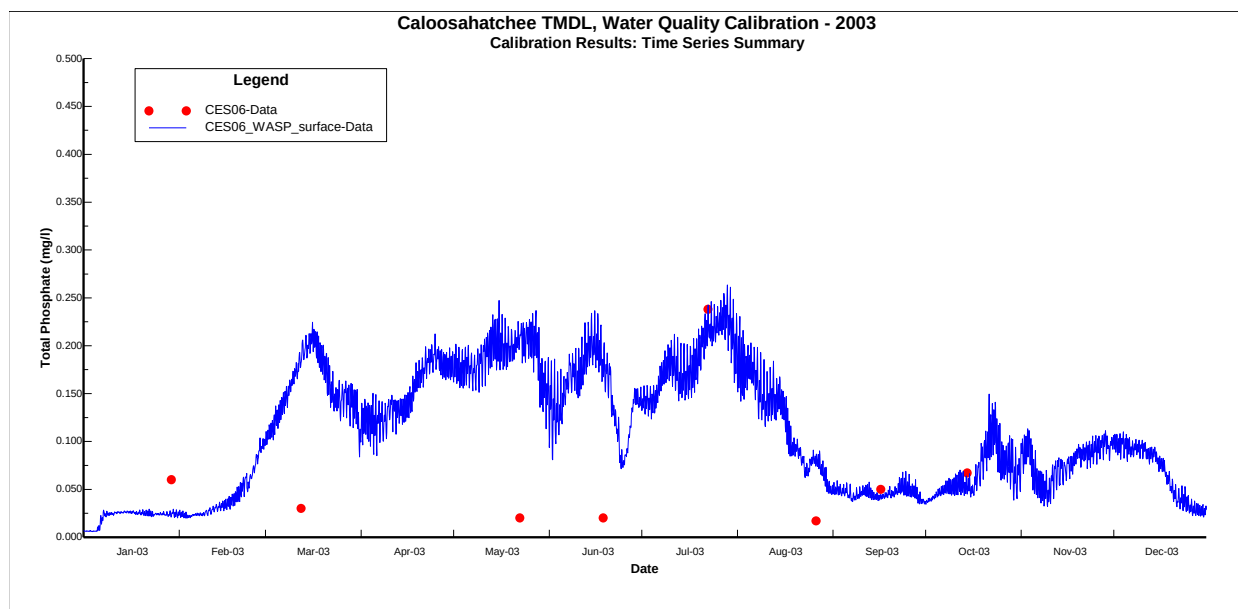


Figure 5-G- 11 Surface total phosphate calibration for CES06

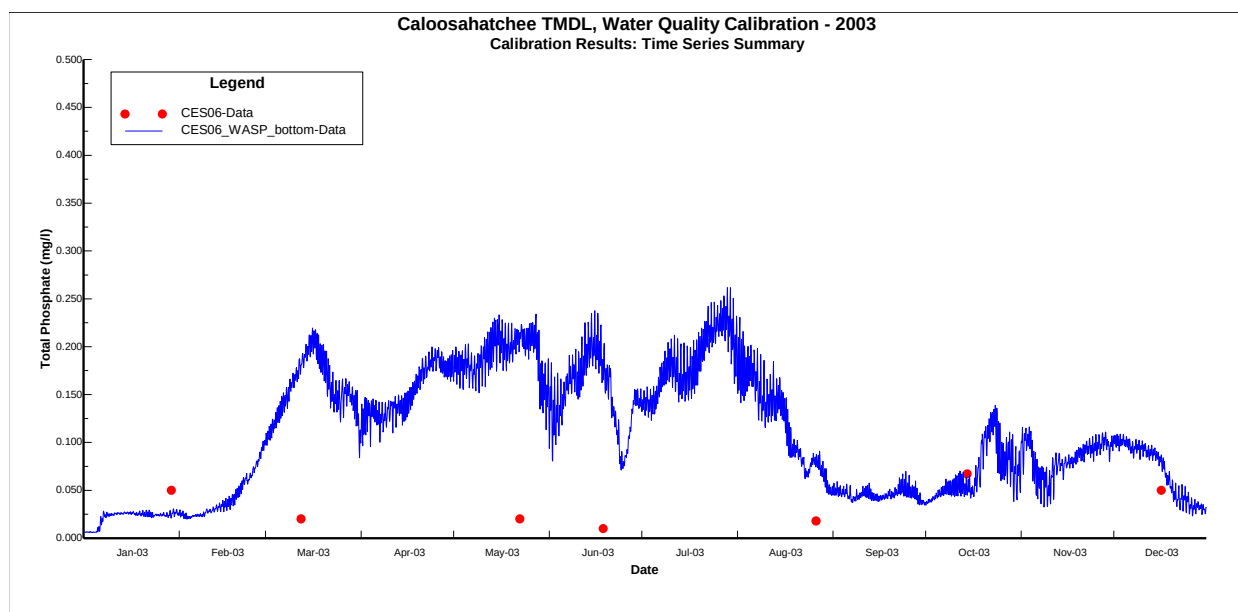


Figure 5-G- 12 Bottom total phosphate calibration for CES06

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

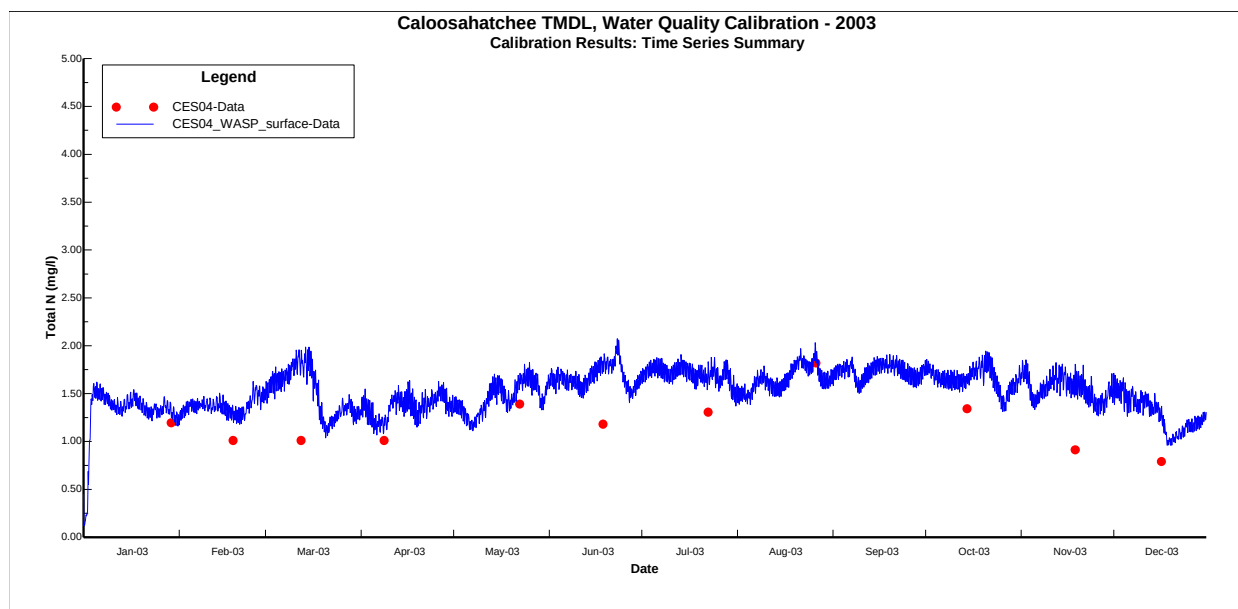


Figure 5-G- 13 Surface total N calibration for CES04

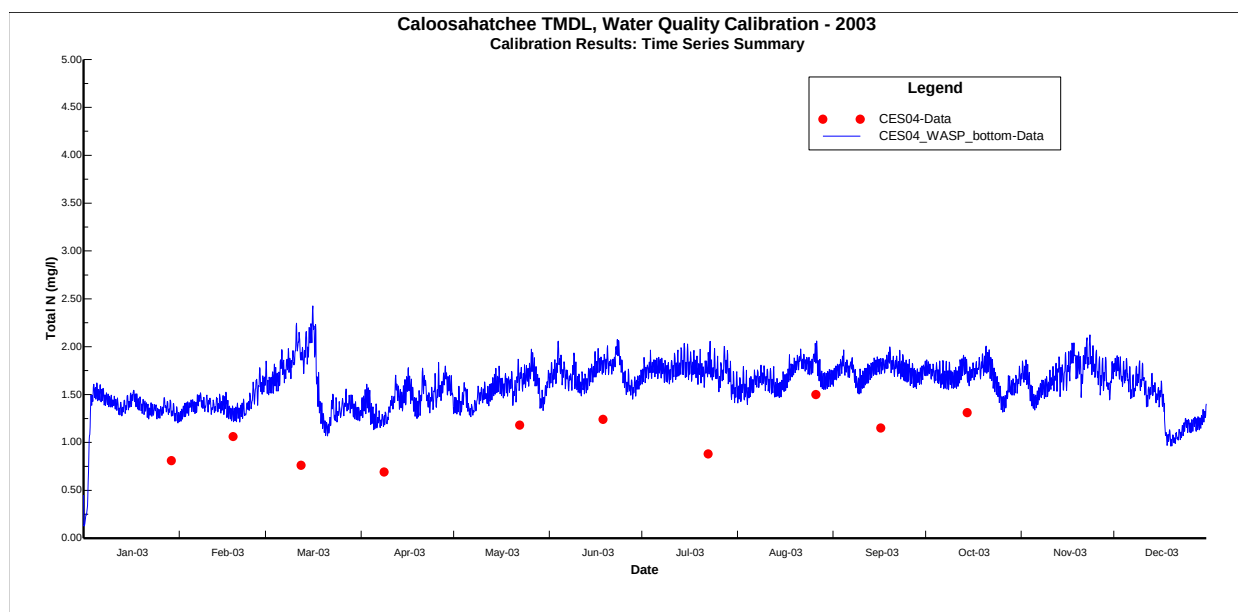


Figure 5-G- 14 Bottom total N calibration for CES04

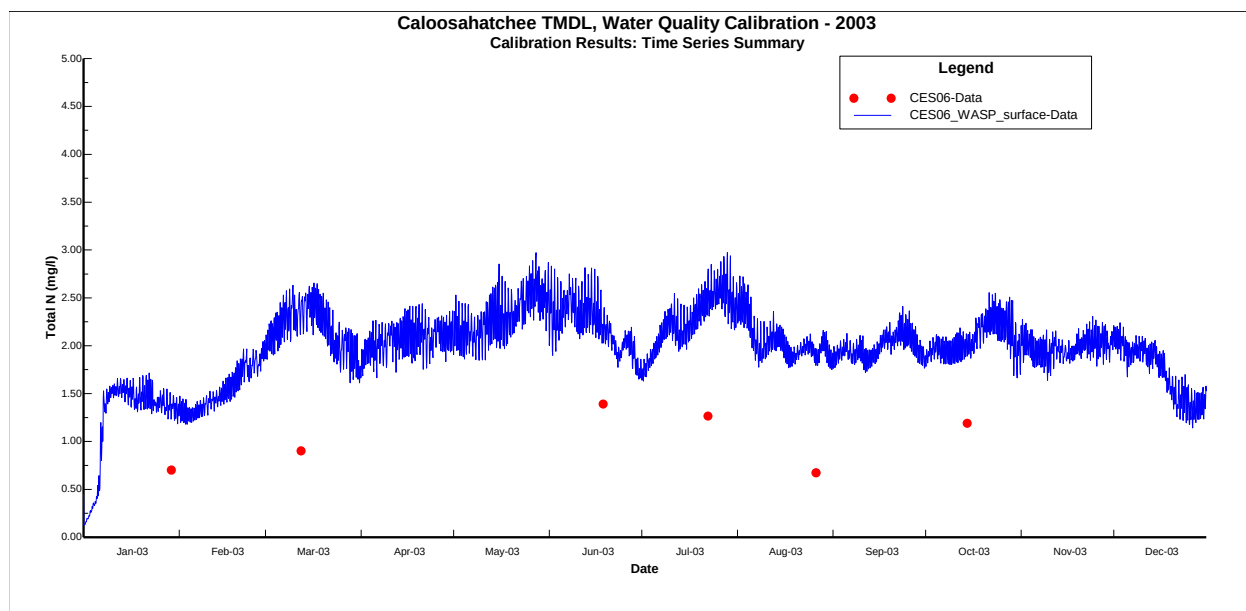


Figure 5-G- 15 Surface total N calibration for CES06

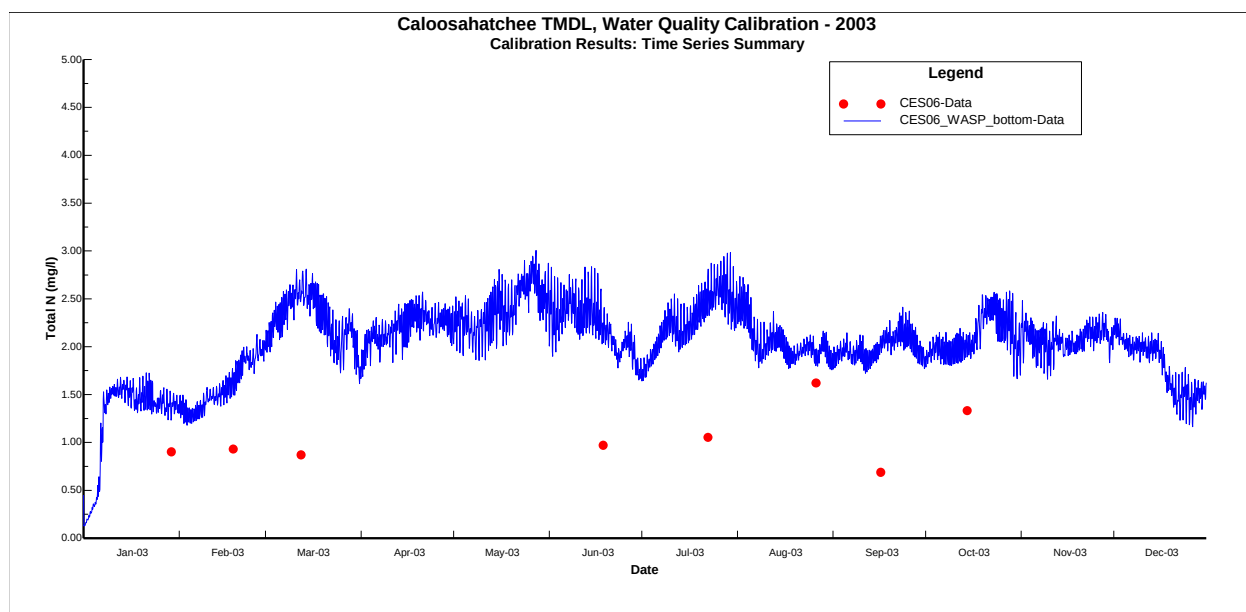


Figure 5-G- 16 Bottom total N calibration for CES06

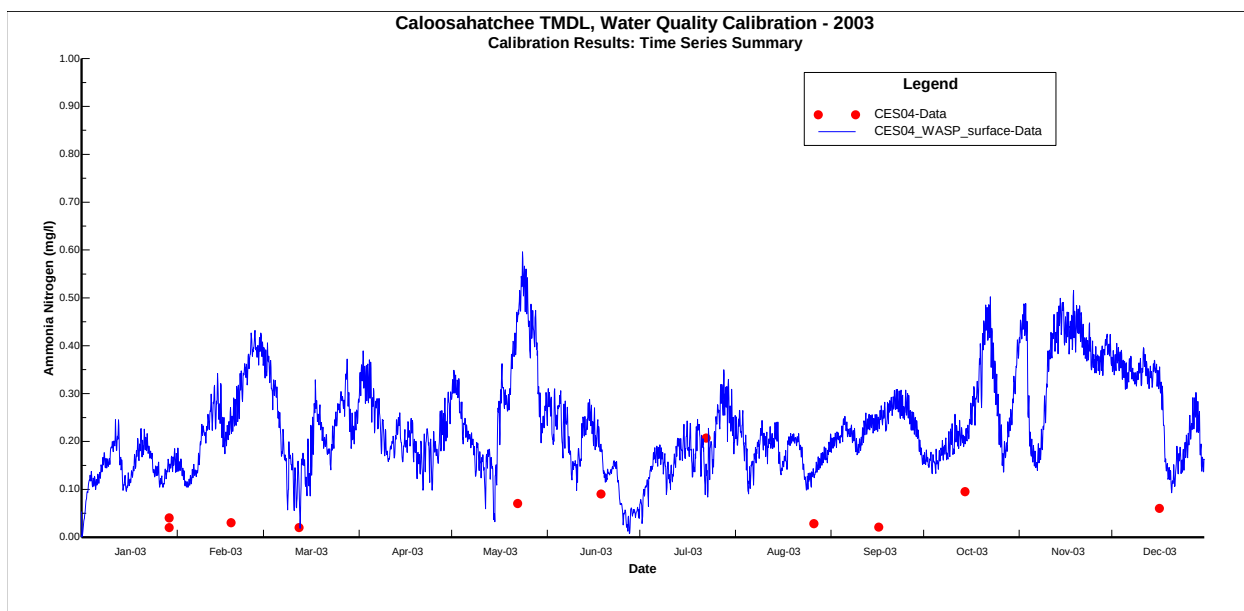


Figure 5-G- 17 Surface $\text{NH}_4\text{-N}$ calibration for CES04

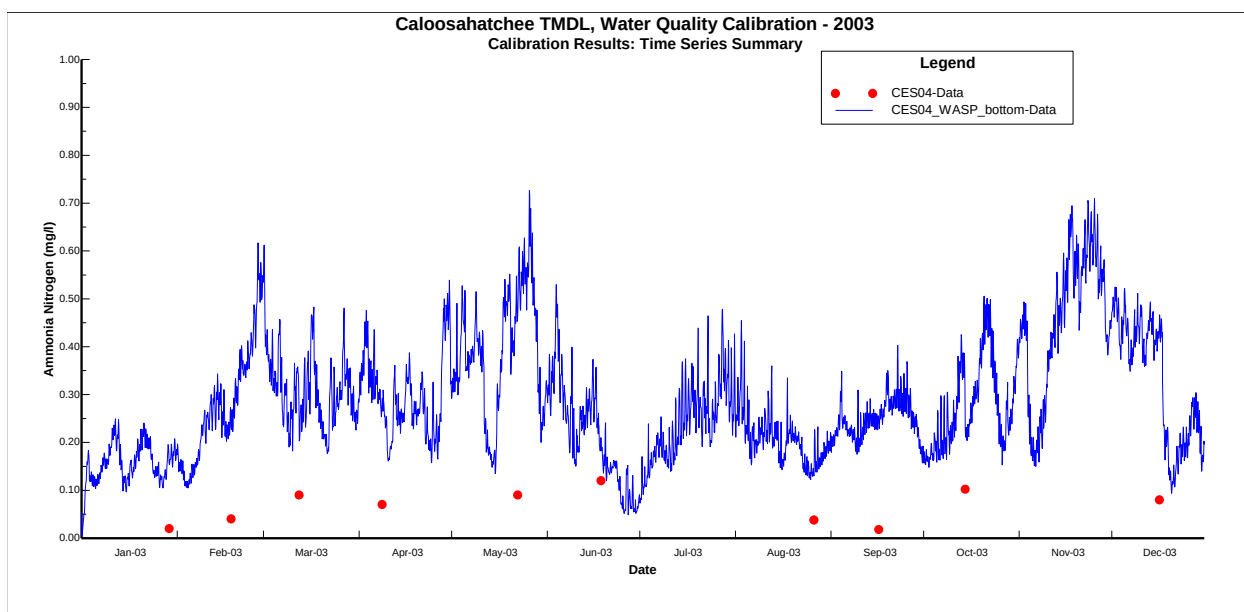


Figure 5-G- 18 Bottom $\text{NH}_4\text{-N}$ calibration for CES04

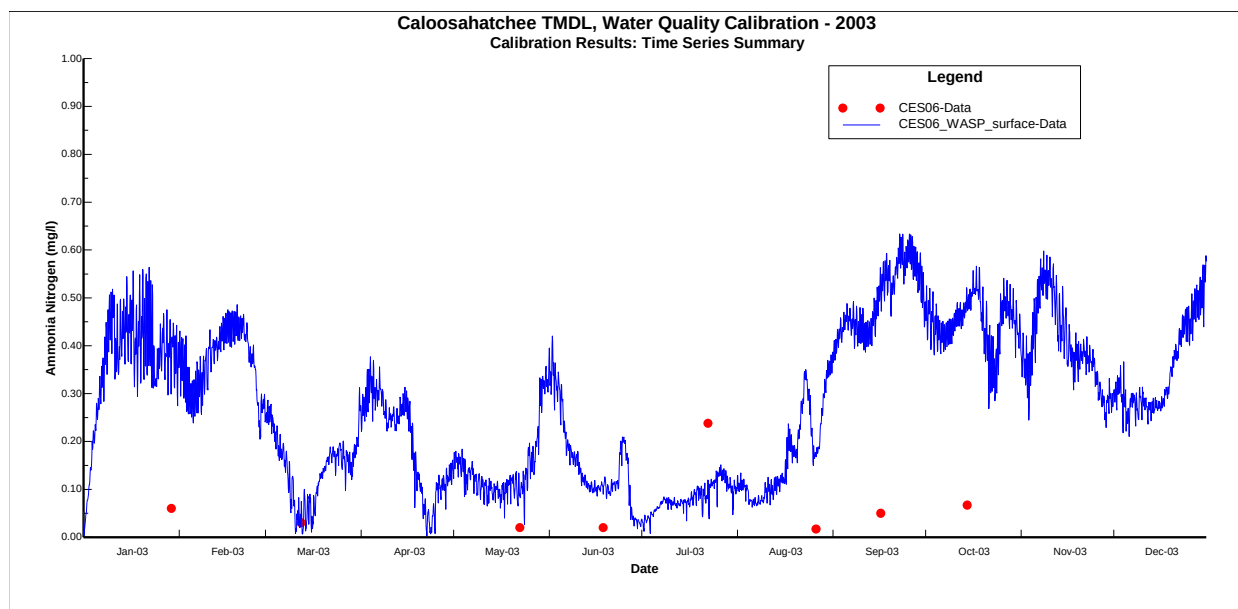


Figure 5-G- 19 Surface $\text{NH}_4\text{-N}$ calibration for CES06

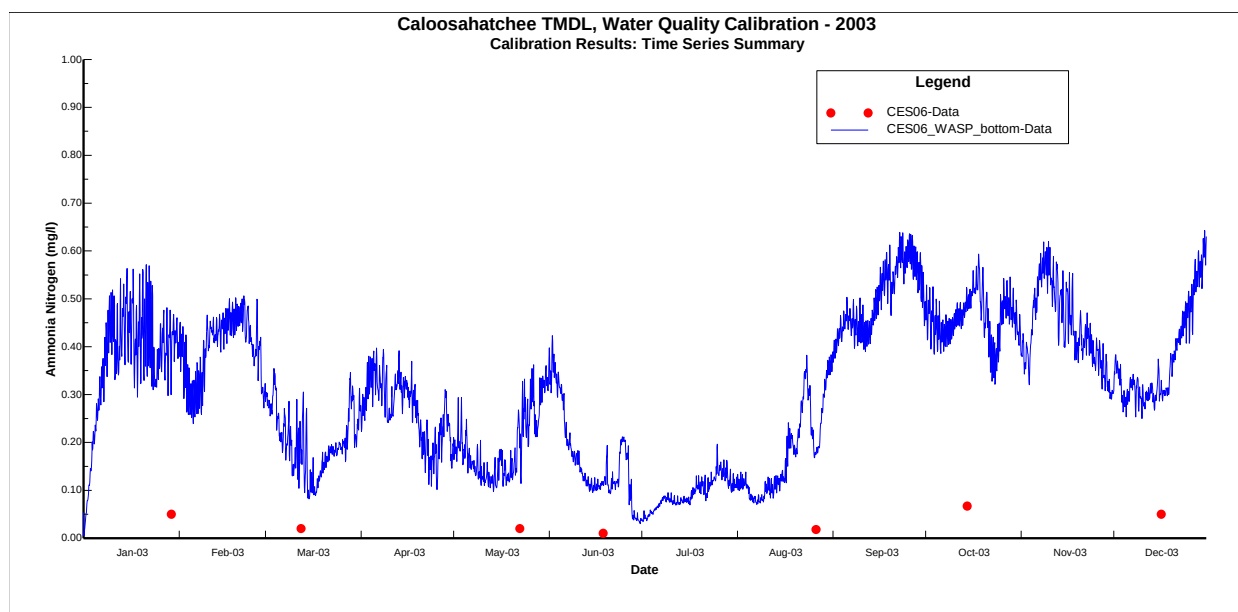


Figure 5-G- 20 Bottom $\text{NH}_4\text{-N}$ calibration for CES06

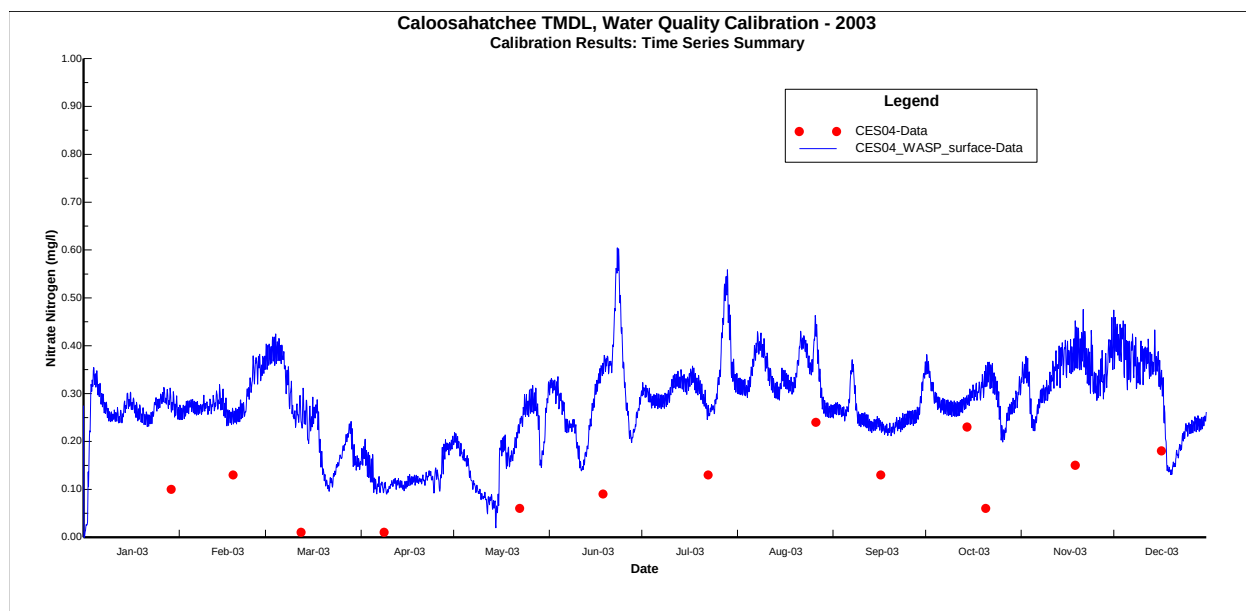


Figure 5-G- 21 Surface NO₃-N calibration for CES04

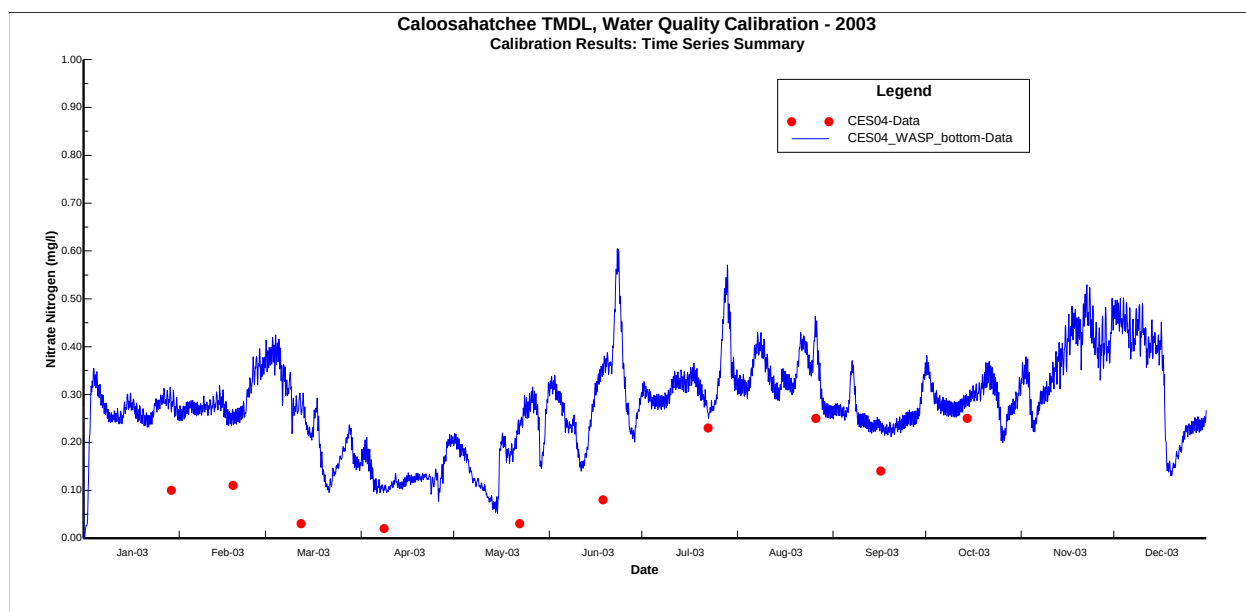


Figure 5-G- 22 Bottom NO₃-N calibration for CES04

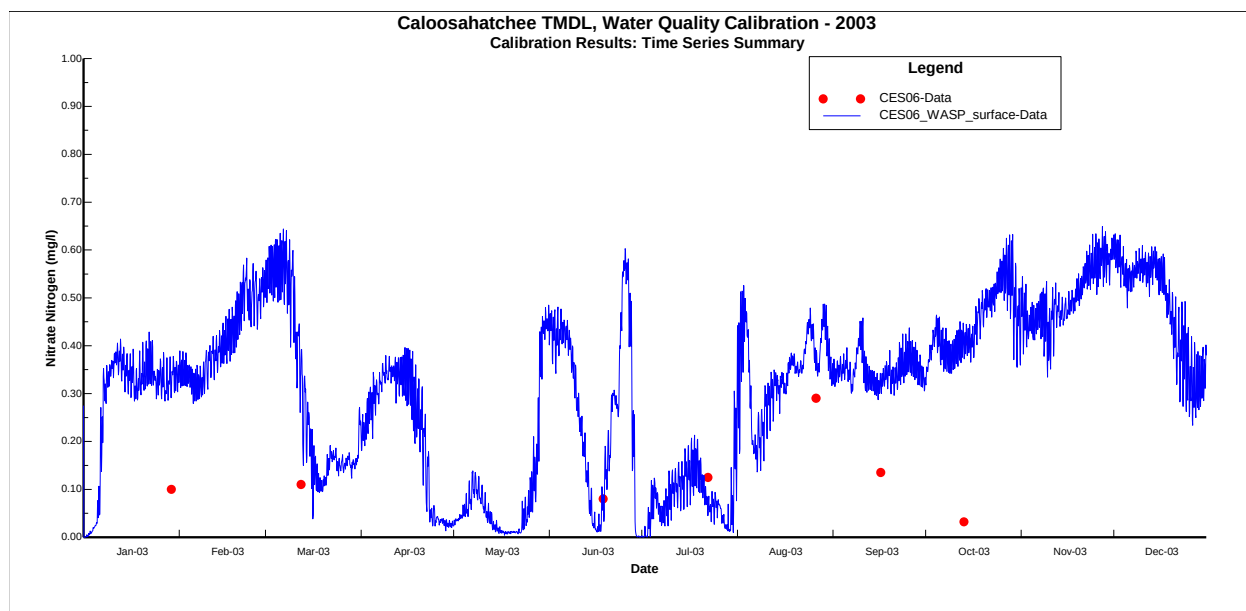


Figure 5-G- 23 Surface $\text{NO}_3\text{-N}$ calibration for CES06

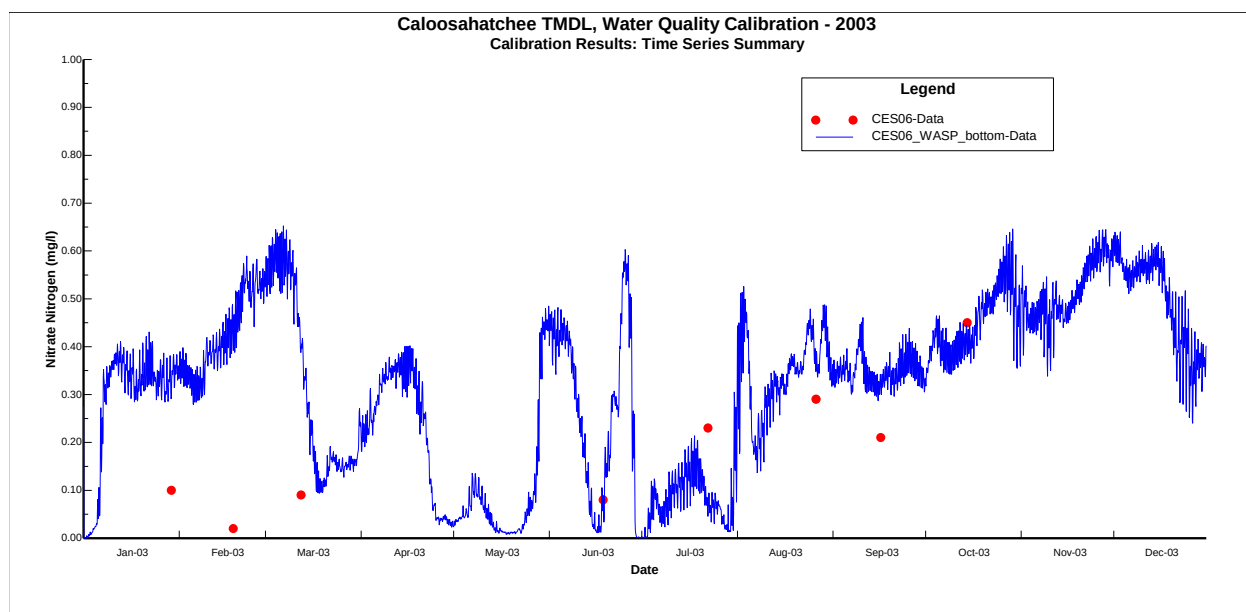


Figure 5-G- 24 Bottom $\text{NO}_3\text{-N}$ calibration for CES06

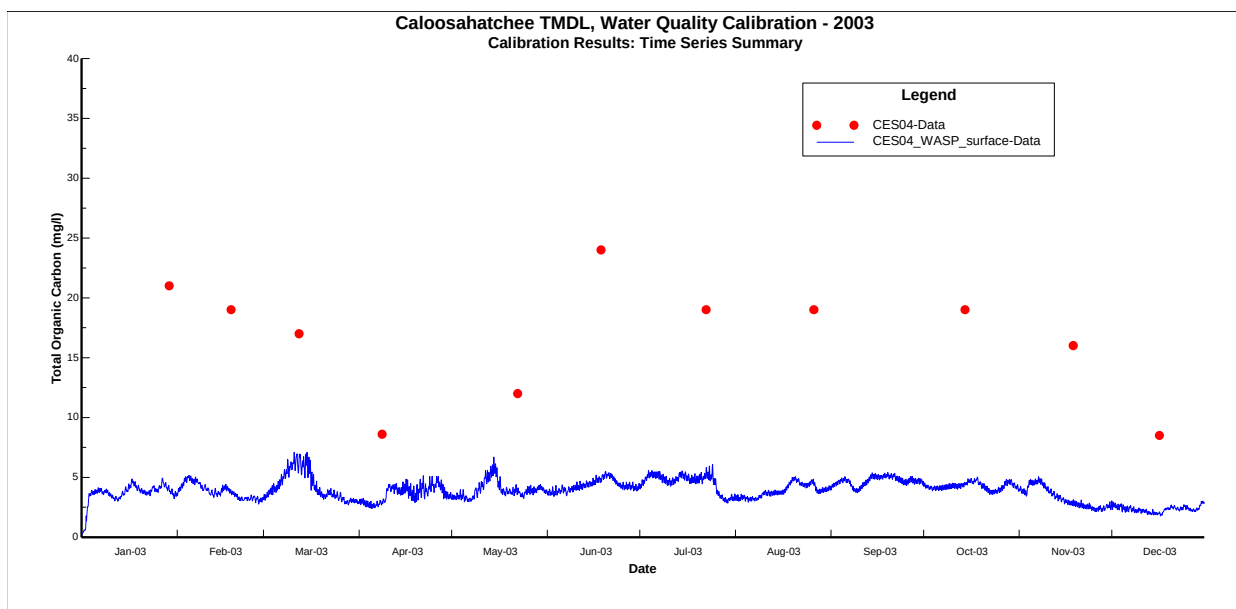


Figure 5-G- 25 Surface TOC calibration for CES04

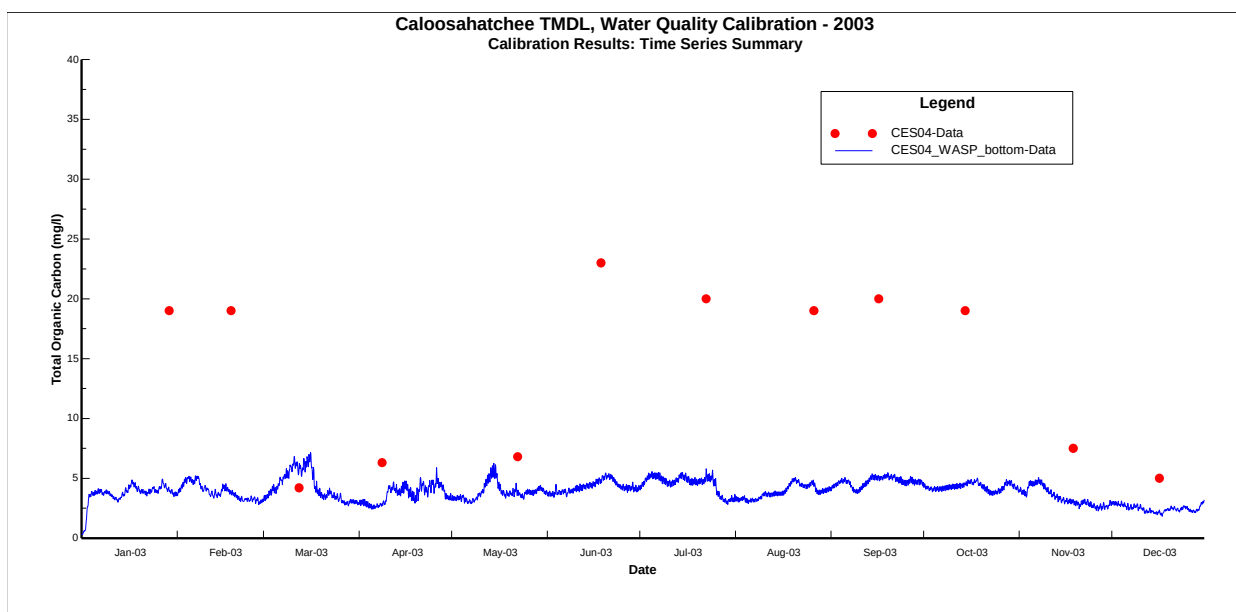


Figure 5-G- 26 Bottom TOC calibration for CES04

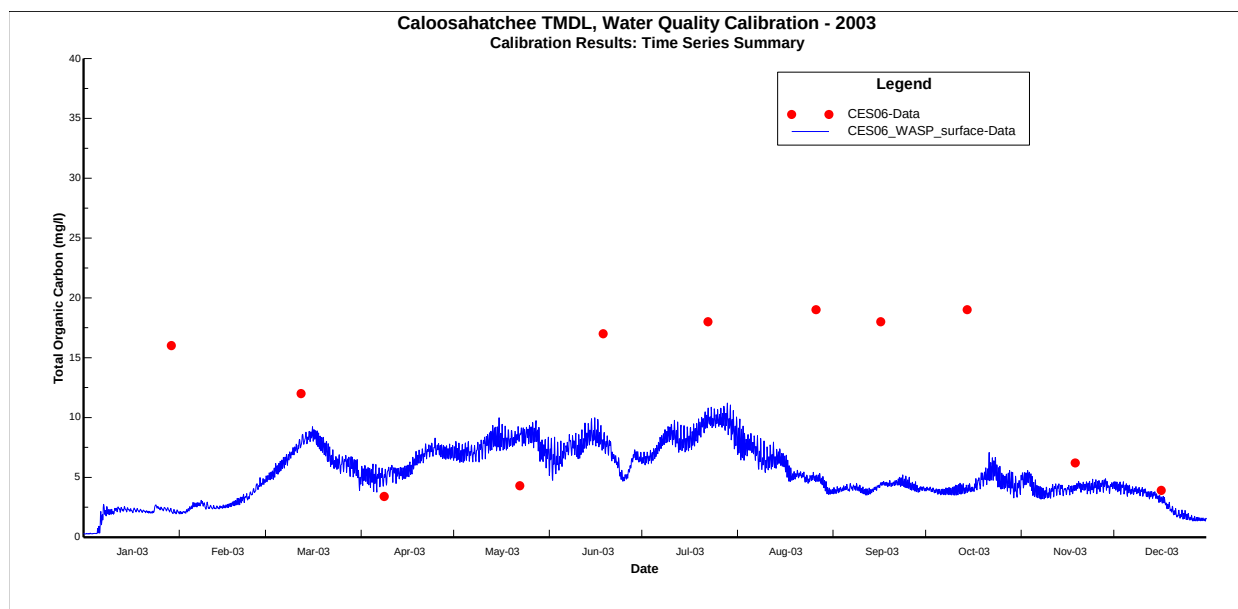


Figure 5-G- 27 Surface TOC calibration for CES06

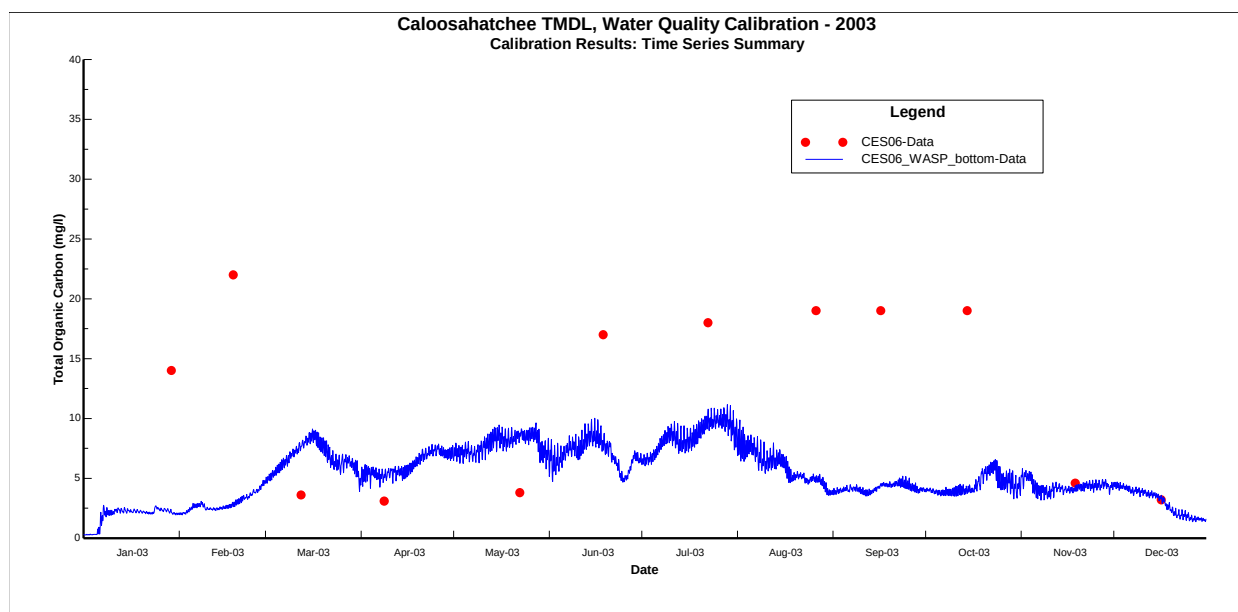


Figure 5-G- 28 Bottom TOC calibration for CES06

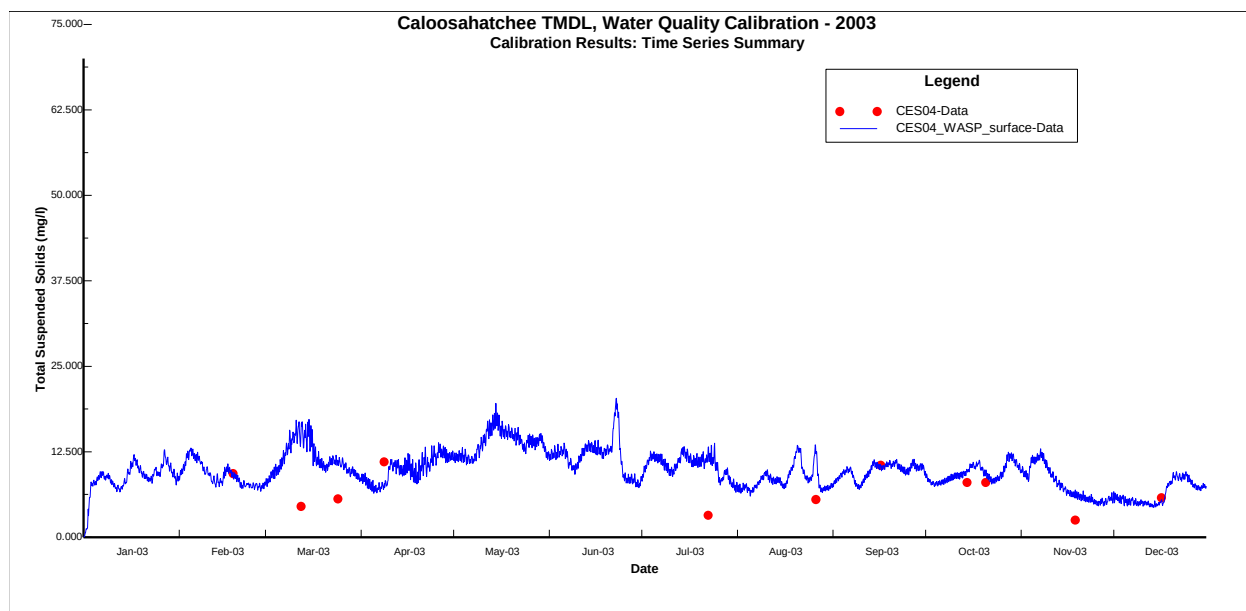


Figure 5-G- 29 Surface TSS calibration for CES04

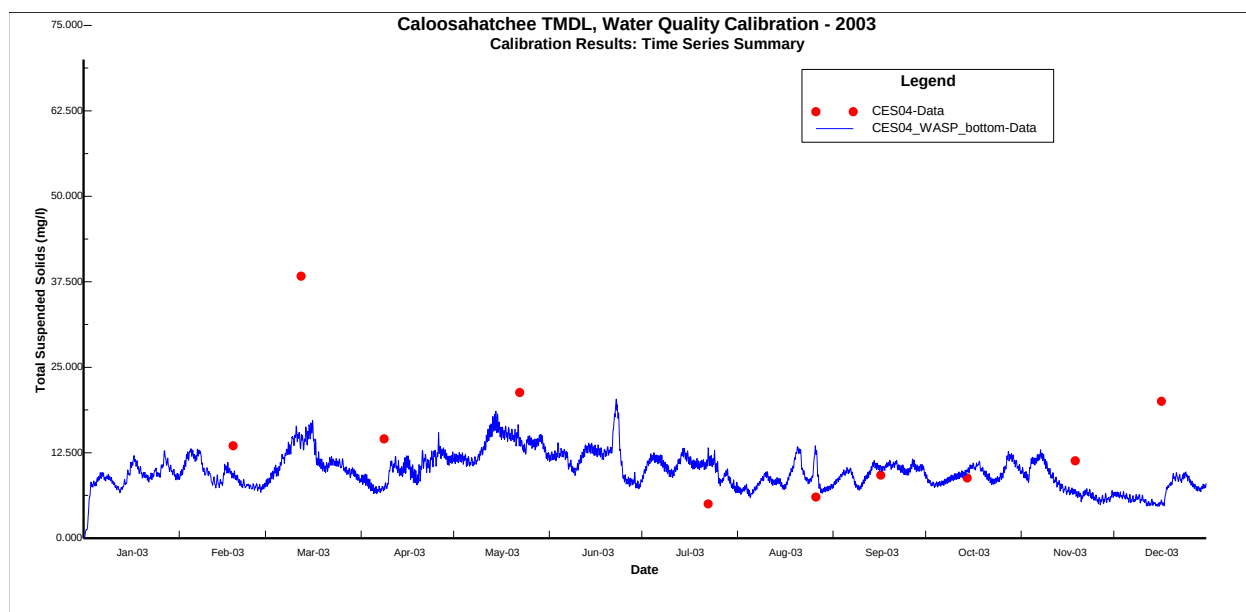


Figure 5-G- 30 Bottom TSS calibration for CES04

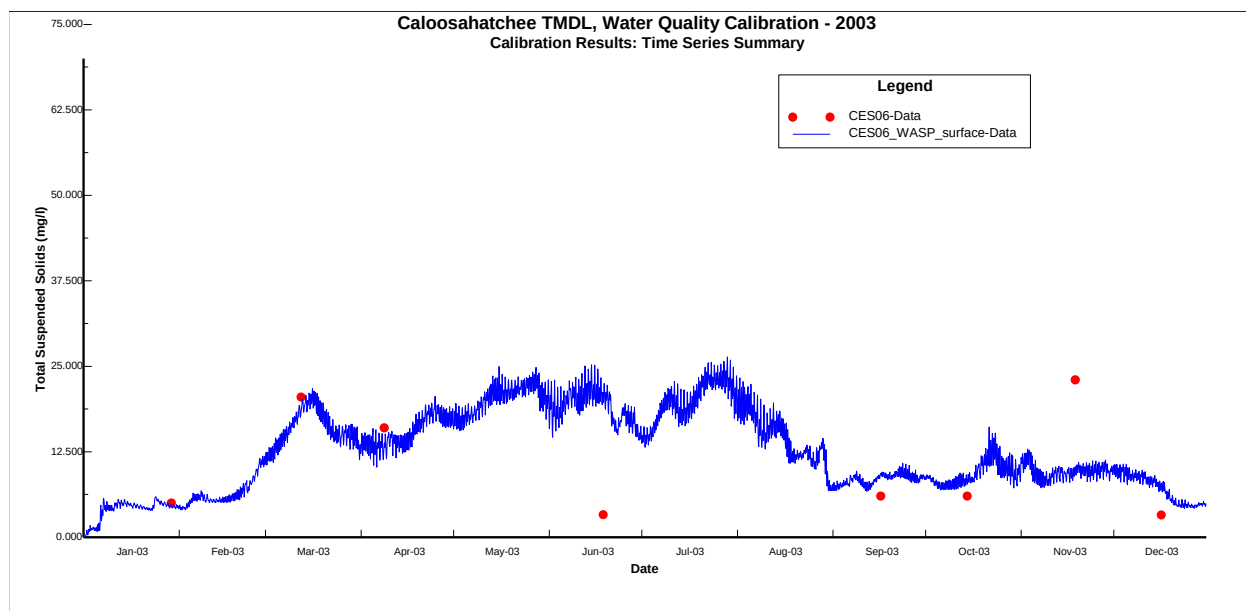


Figure 5-G- 31 Surface TSS calibration for CES06

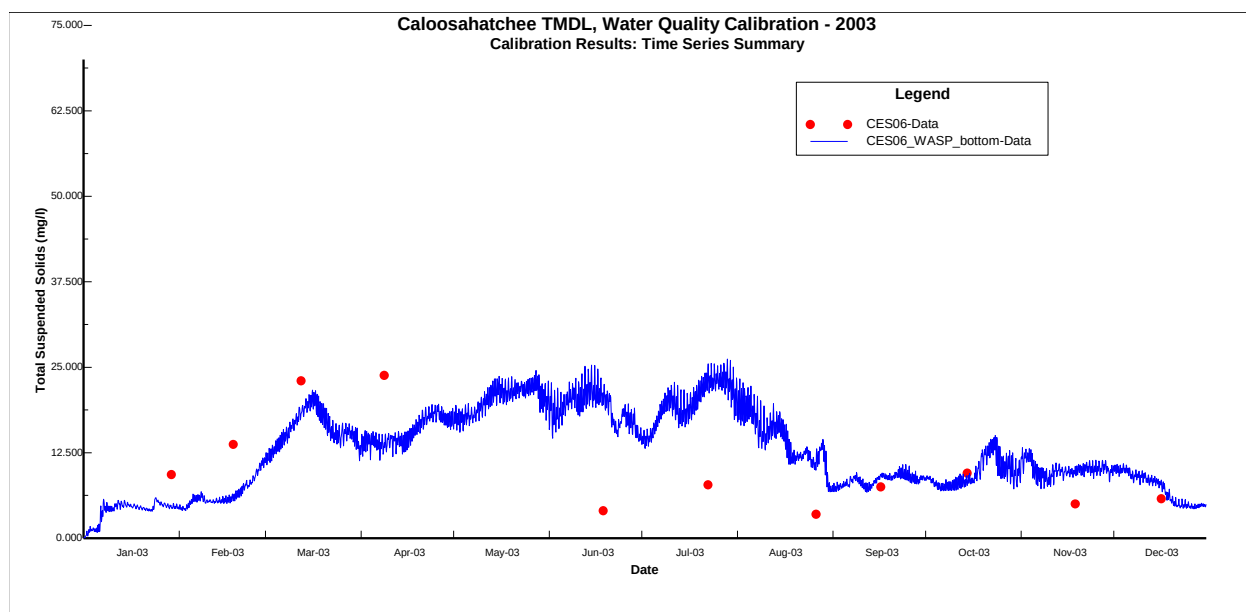


Figure 5-G- 32 Bottom TSS calibration for CES06

Appendix 5-H WASP Validation Plots

Table of Figures

Figure 5-H- 1 Surface water temperature validation for CES04	1
Figure 5-H- 2 Bottom water temperature validation for CES04	1
Figure 5-H- 3 Surface water temperature validation for CES06	2
Figure 5-H- 4 Bottom water temperature validation for CES06	2
Figure 5-H- 5 Surface total P validation for CES04.....	3
Figure 5-H- 6 Bottom total P validation for CES04.....	3
Figure 5-H- 7 Surface total P validation for CES06.....	4
Figure 5-H- 8 Bottom total P validation for CES06.....	4
Figure 5-H- 9 Surface total phosphate validation for CES04.....	5
Figure 5-H- 10 Bottom total phosphate validation for CES04	5
Figure 5-H- 11 Surface total phosphate validation for CES06.....	6
Figure 5-H- 12 Bottom total phosphate validation for CES06	6
Figure 5-H- 13 Surface total N validation for CES04	7
Figure 5-H- 14 Bottom total N validation for CES04	7
Figure 5-H- 15 Surface total N validation for CES06	8
Figure 5-H- 16 Bottom total N validation for CES06	8
Figure 5-H- 17 Surface NH ₄ -N validation for CES04	9
Figure 5-H- 18 Bottom NH ₄ -N validation for CES04	9
Figure 5-H- 19 Surface NH ₄ -N validation for CES06	10
Figure 5-H- 20 Bottom NH ₄ -N validation for CES06	10
Figure 5-H- 21 Surface NO ₃ -N validation for CES04	11
Figure 5-H- 22 Bottom NO ₃ -N validation for CES04.....	11
Figure 5-H- 23 Surface NO ₃ -N validation for CES06	12

Figure 5-H- 24 Bottom NO ₃ -N validation for CES06	12
Figure 5-H- 25 Surface TOC validation for CES04.....	13
Figure 5-H- 26 Bottom TOC validation for CES04	13
Figure 5-H- 27 Surface TOC validation for CES06.....	14
Figure 5-H- 28 Bottom TOC validation for CES06	14
Figure 5-H- 29 Surface TSS validation for CES04.....	15
Figure 5-H- 30 Bottom TSS validation for CES04.....	15
Figure 5-H- 31 Surface TSS validation for CES06.....	16
Figure 5-H- 32 Bottom TSS validation for CES06.....	16

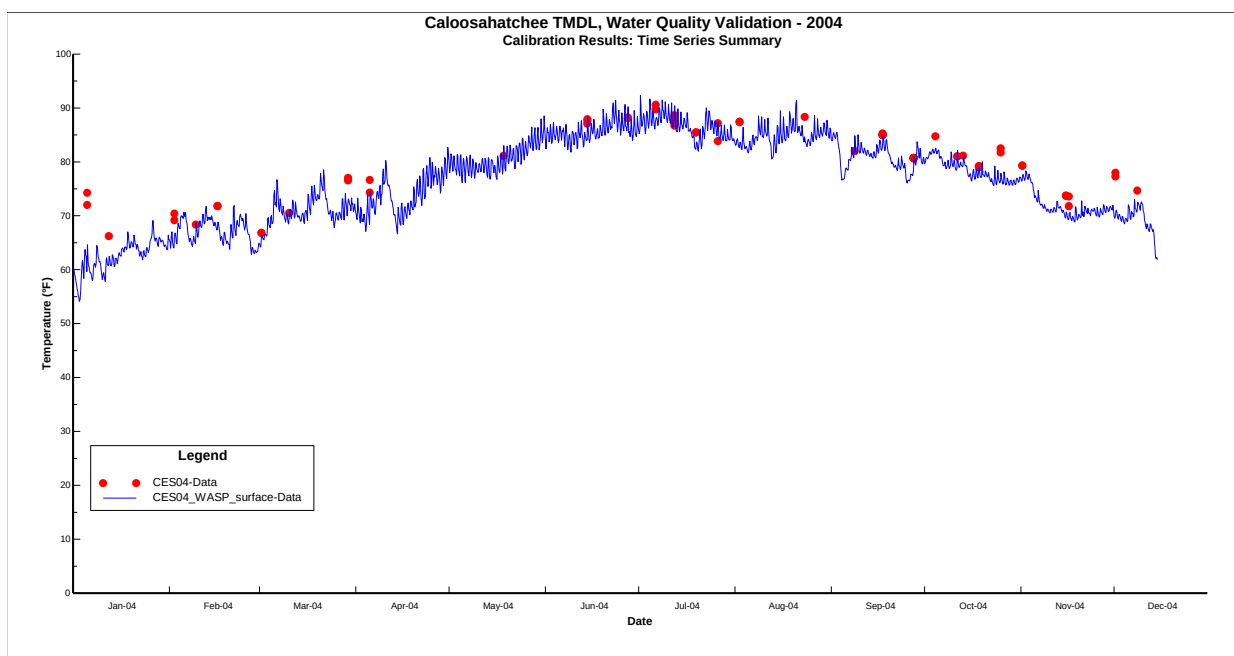


Figure 5-H- 1 Surface water temperature validation for CES04

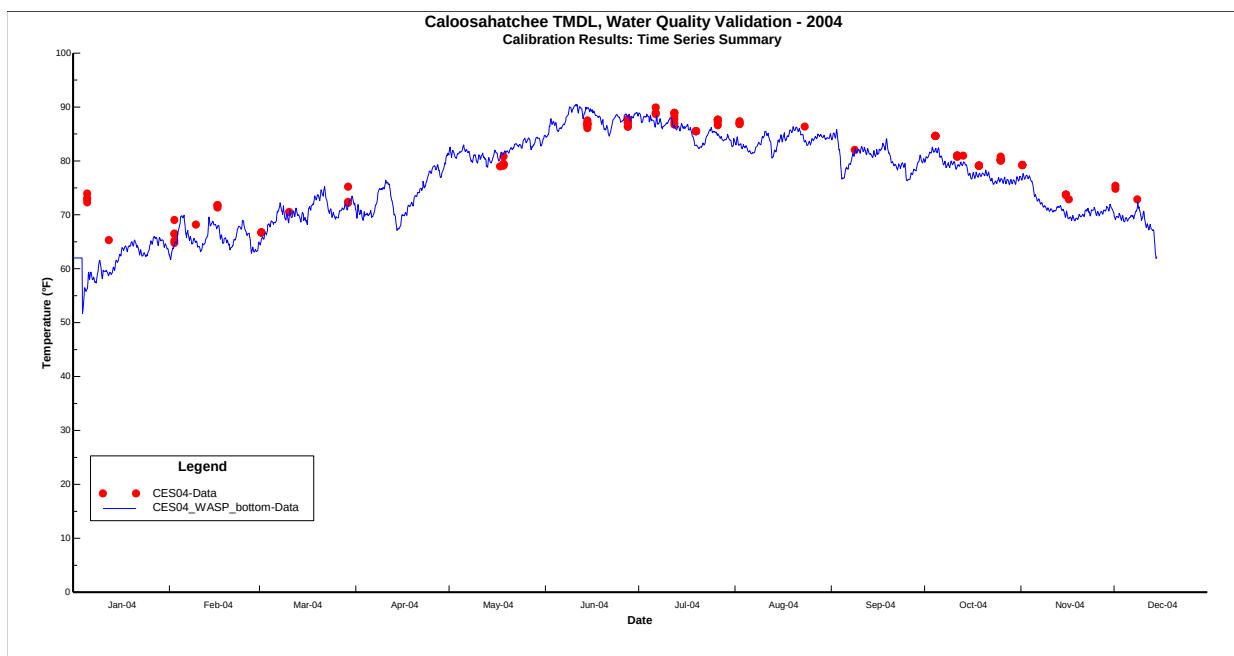


Figure 5-H- 2 Bottom water temperature validation for CES04

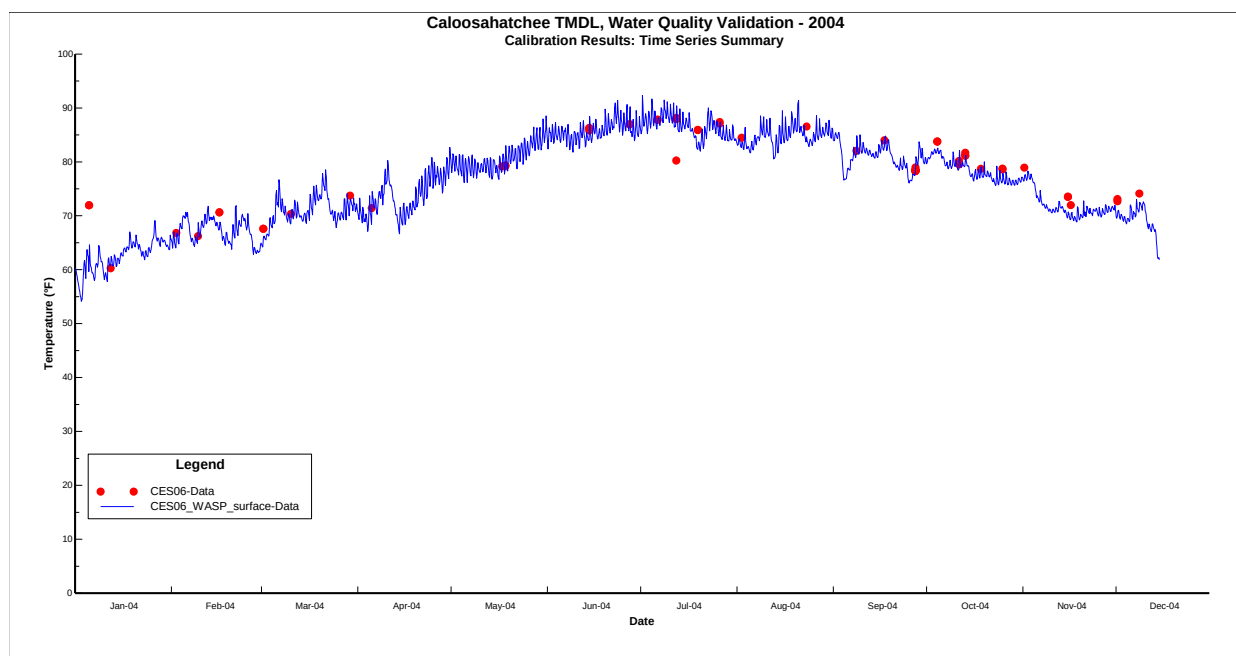


Figure 5-H- 3 Surface water temperature validation for CES06

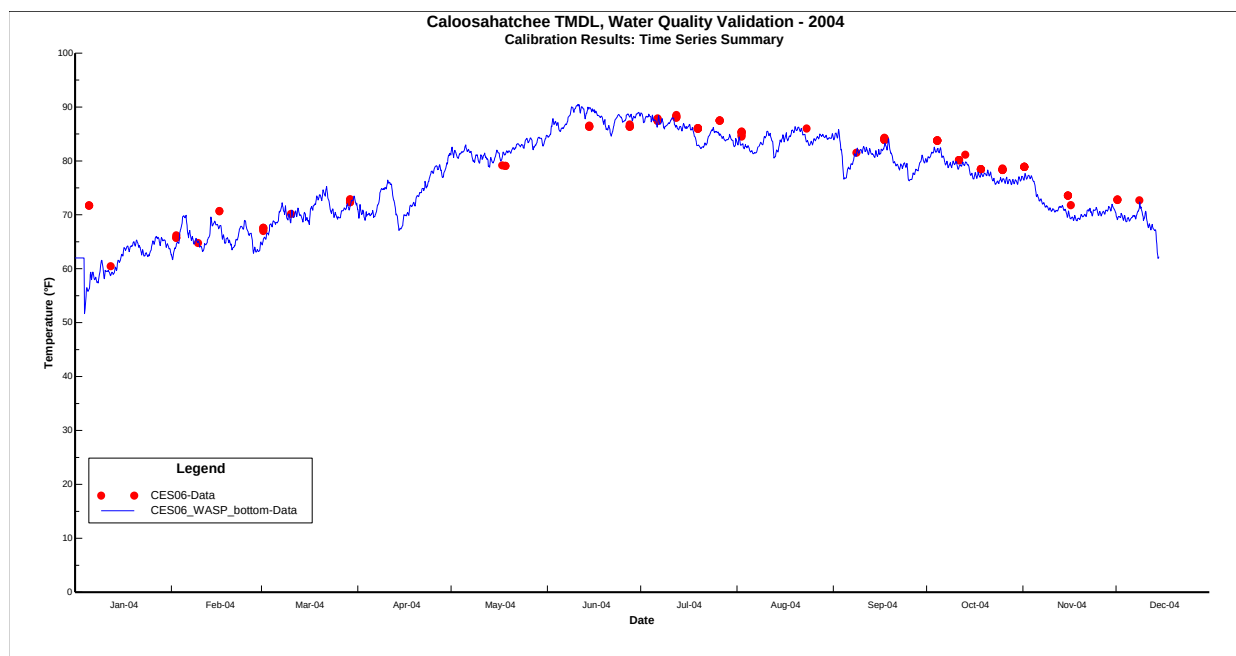


Figure 5-H- 4 Bottom water temperature validation for CES06

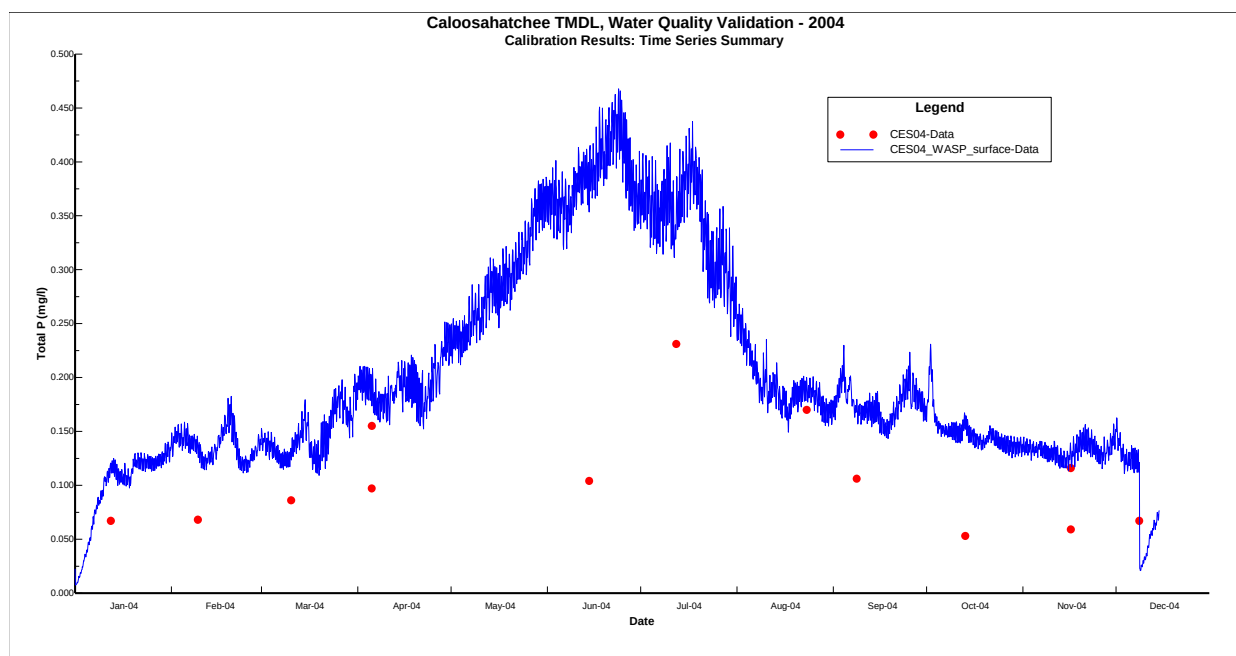


Figure 5-H- 5 Surface total P validation for CES04

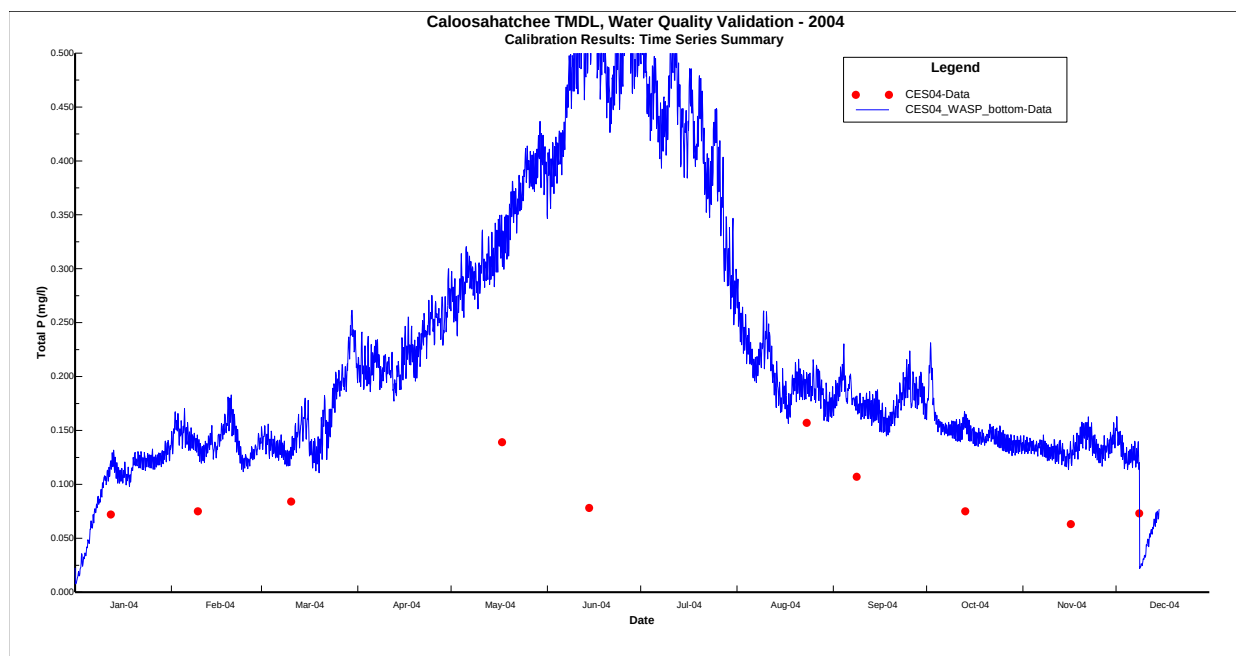


Figure 5-H- 6 Bottom total P validation for CES04

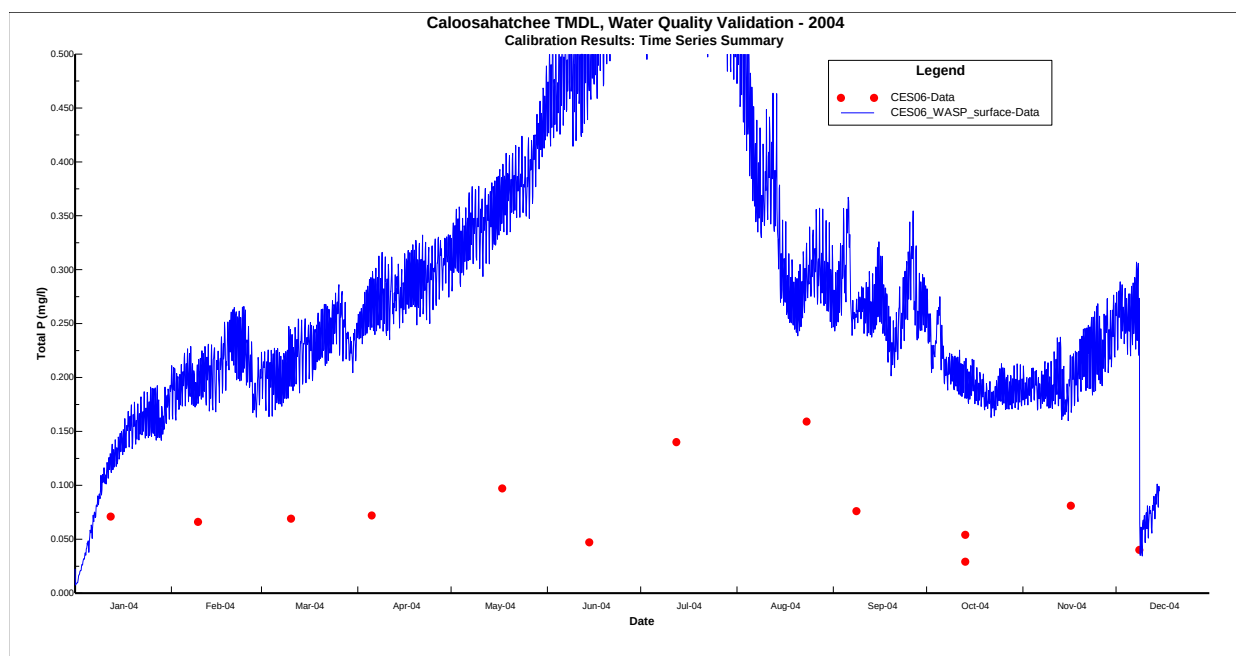


Figure 5-H- 7 Surface total P validation for CES06

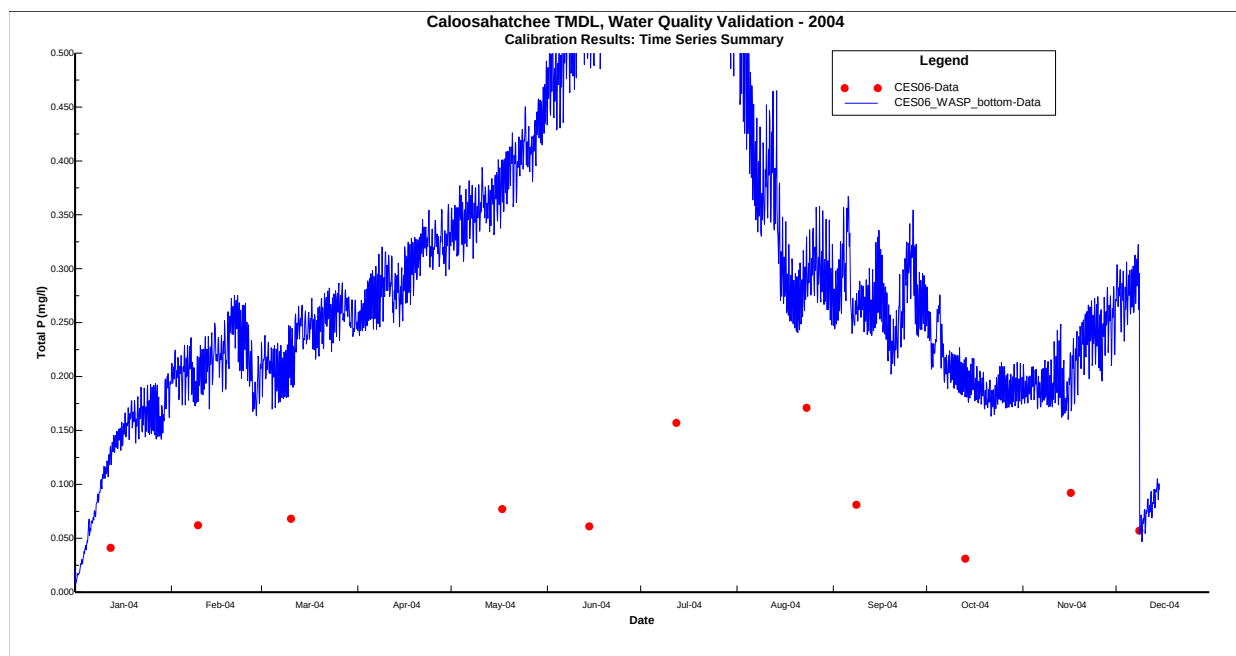


Figure 5-H- 8 Bottom total P validation for CES06

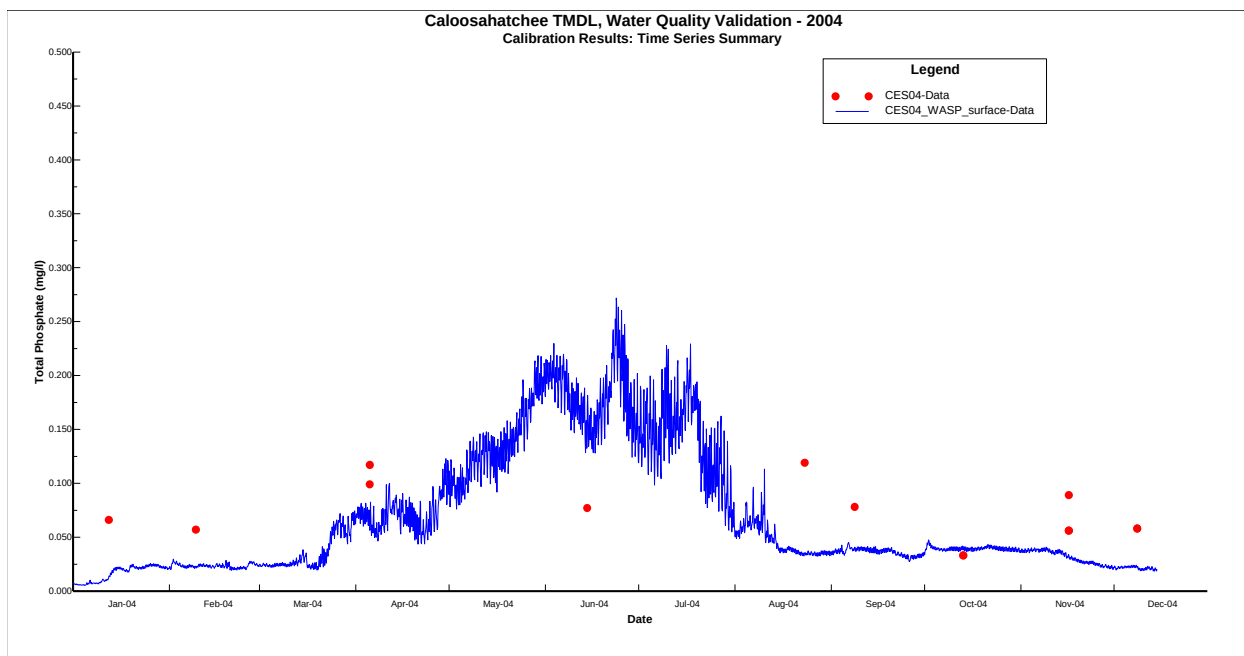


Figure 5-H- 9 Surface total phosphate validation for CES04

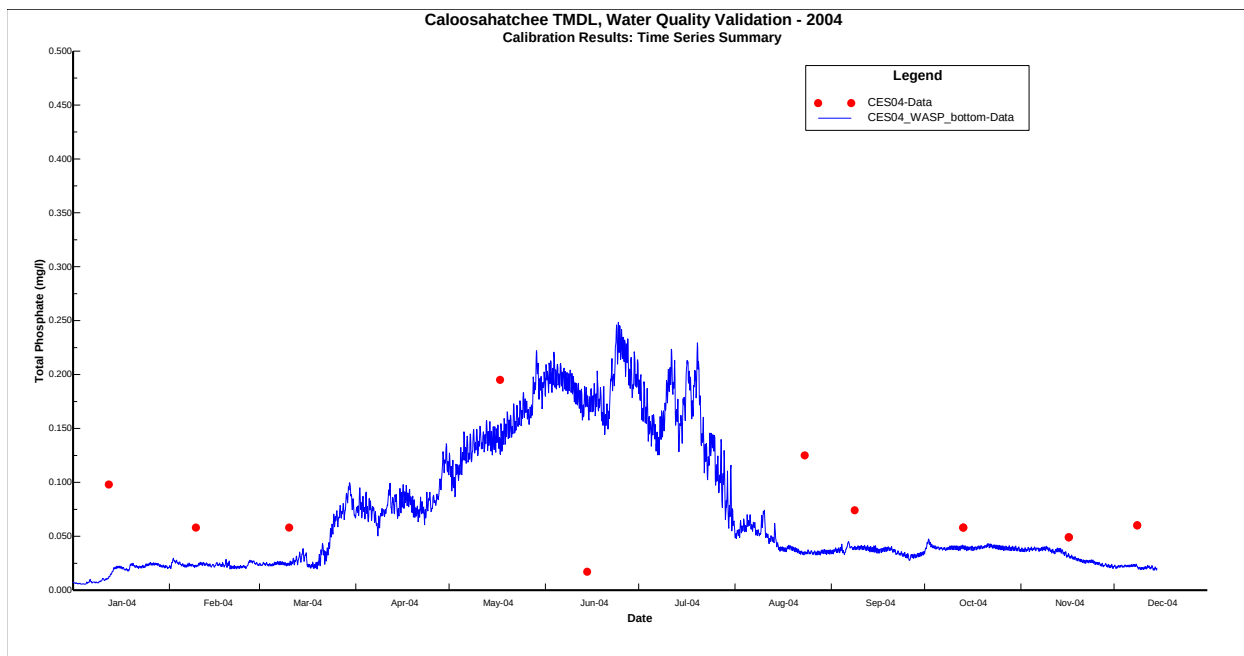


Figure 5-H- 10 Bottom total phosphate validation for CES04

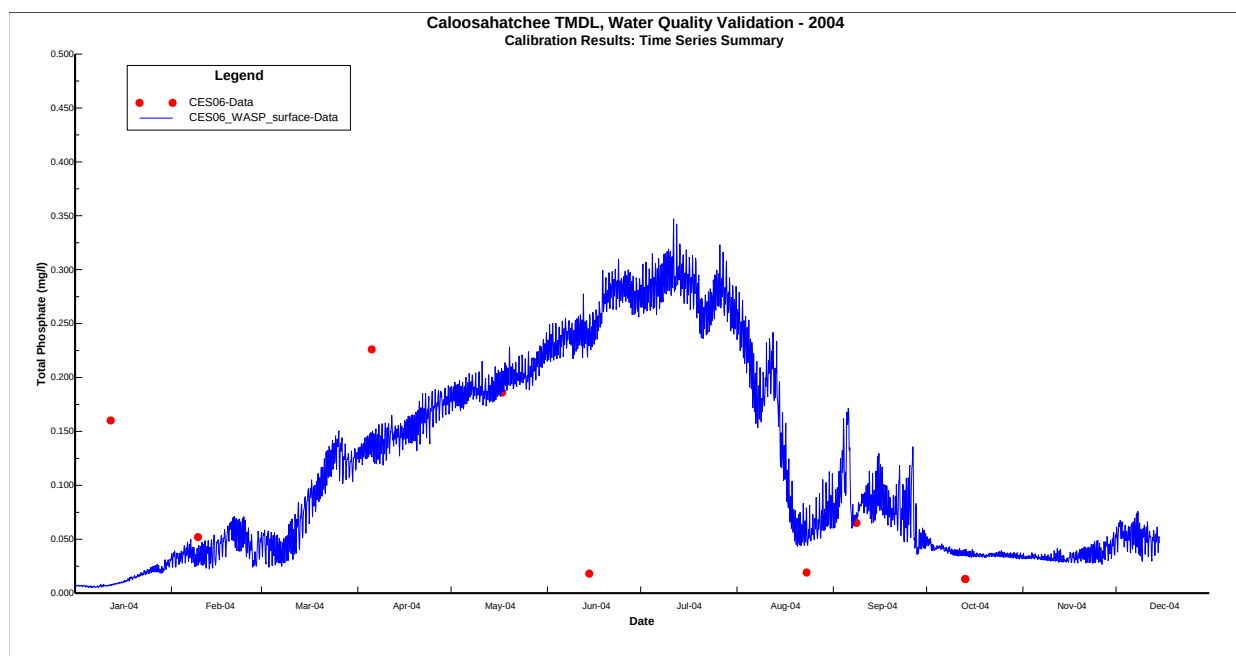


Figure 5-H- 11 Surface total phosphate validation for CES06

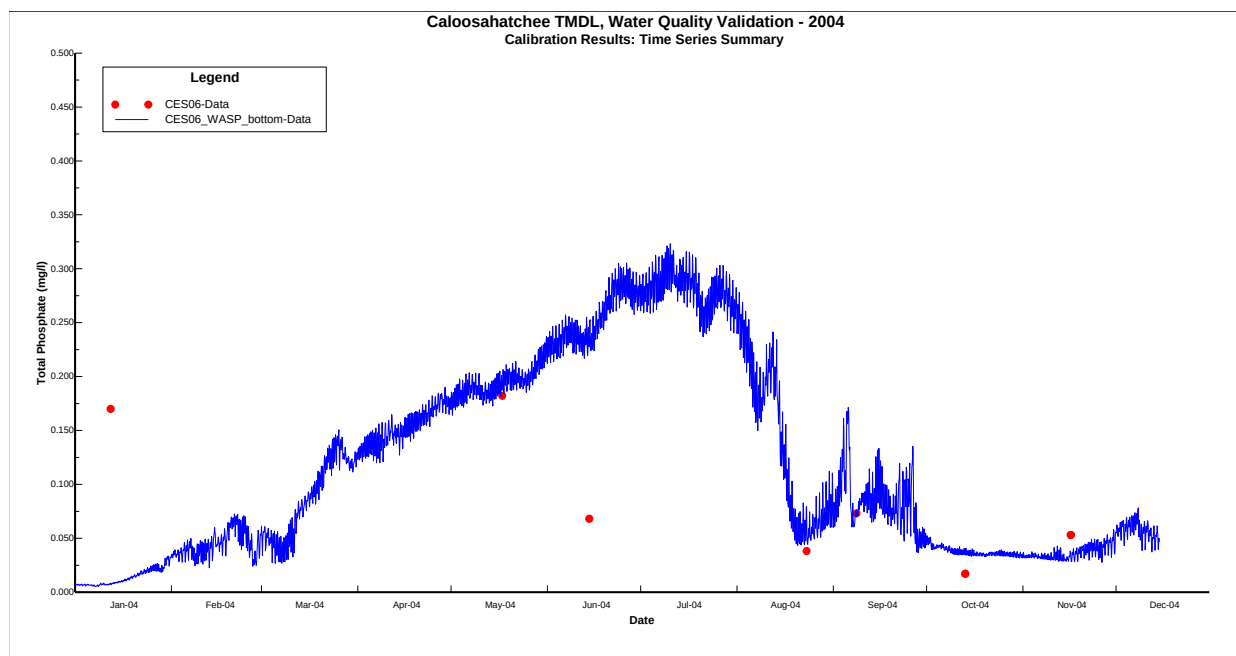


Figure 5-H- 12 Bottom total phosphate validation for CES06

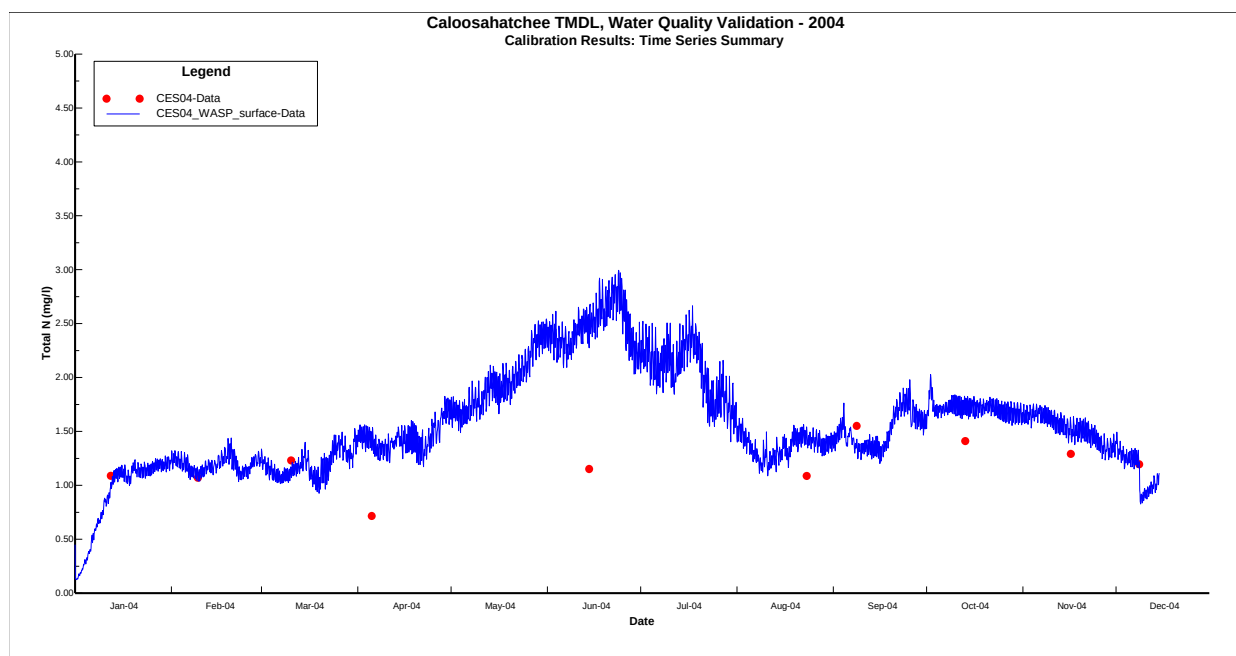


Figure 5-H- 13 Surface total N validation for CES04

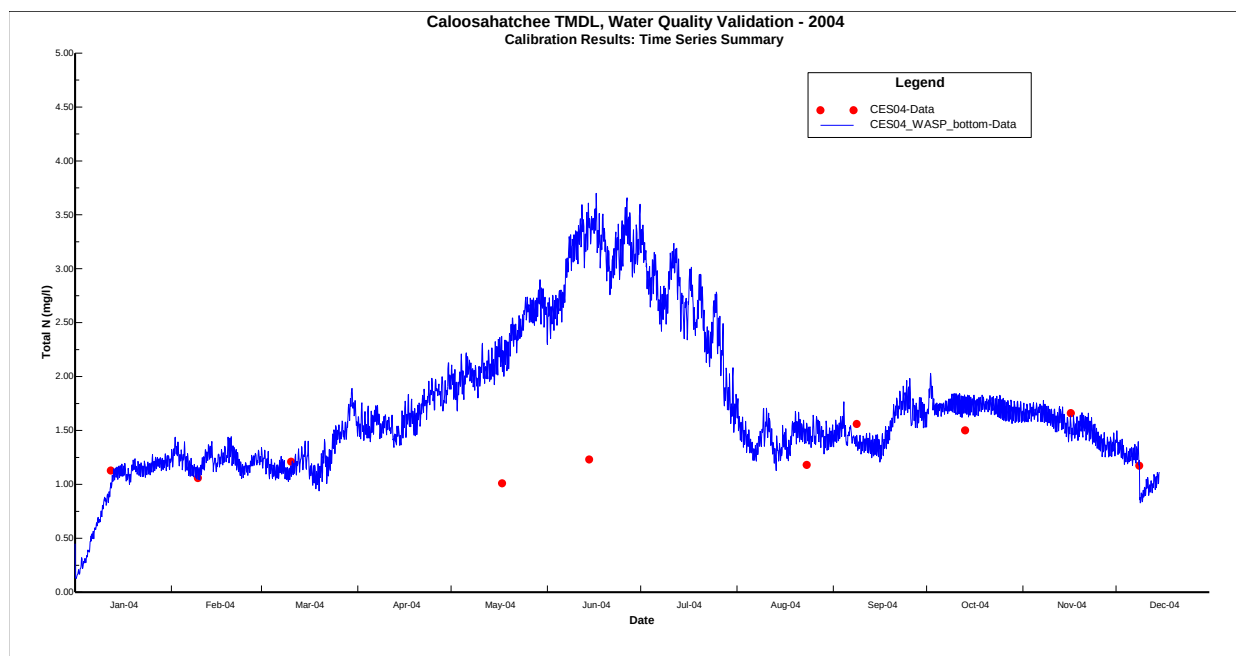


Figure 5-H- 14 Bottom total N validation for CES04

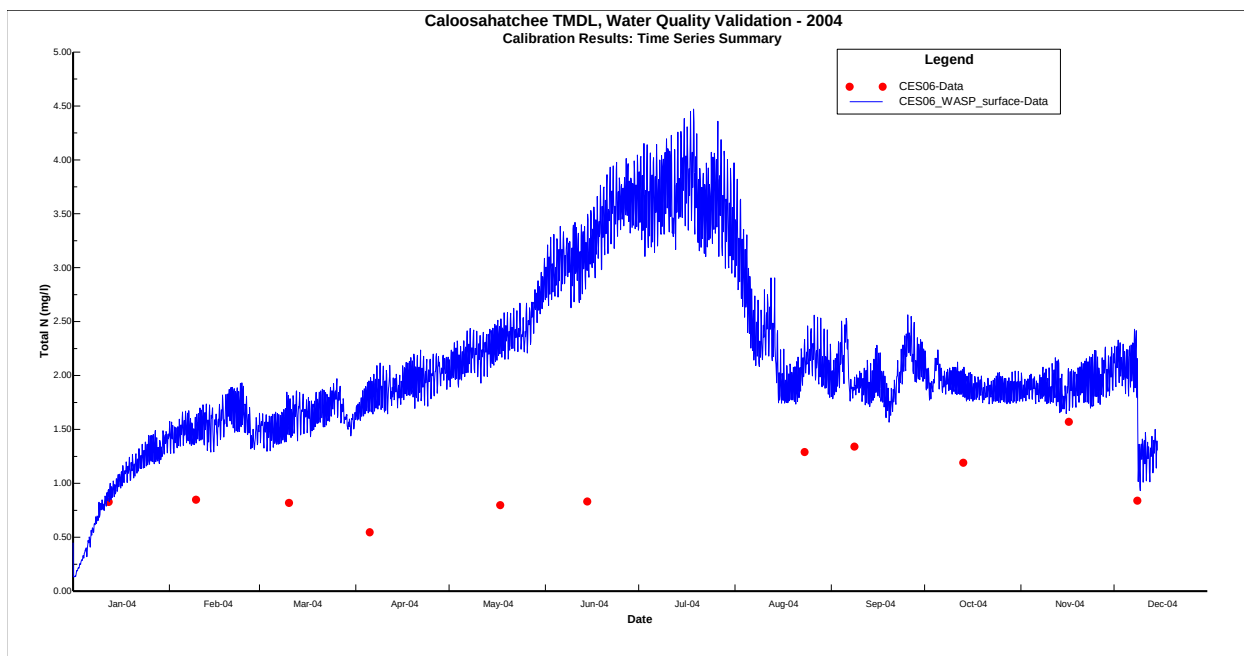


Figure 5-H- 15 Surface total N validation for CES06

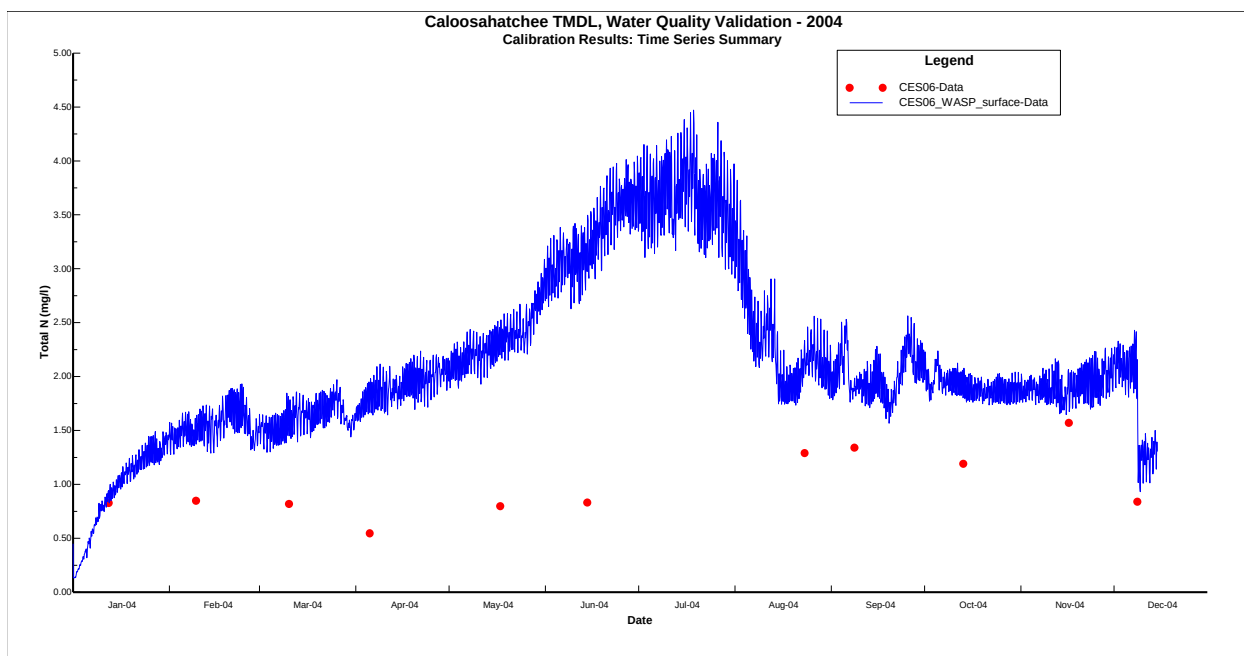


Figure 5-H- 16 Bottom total N validation for CES06

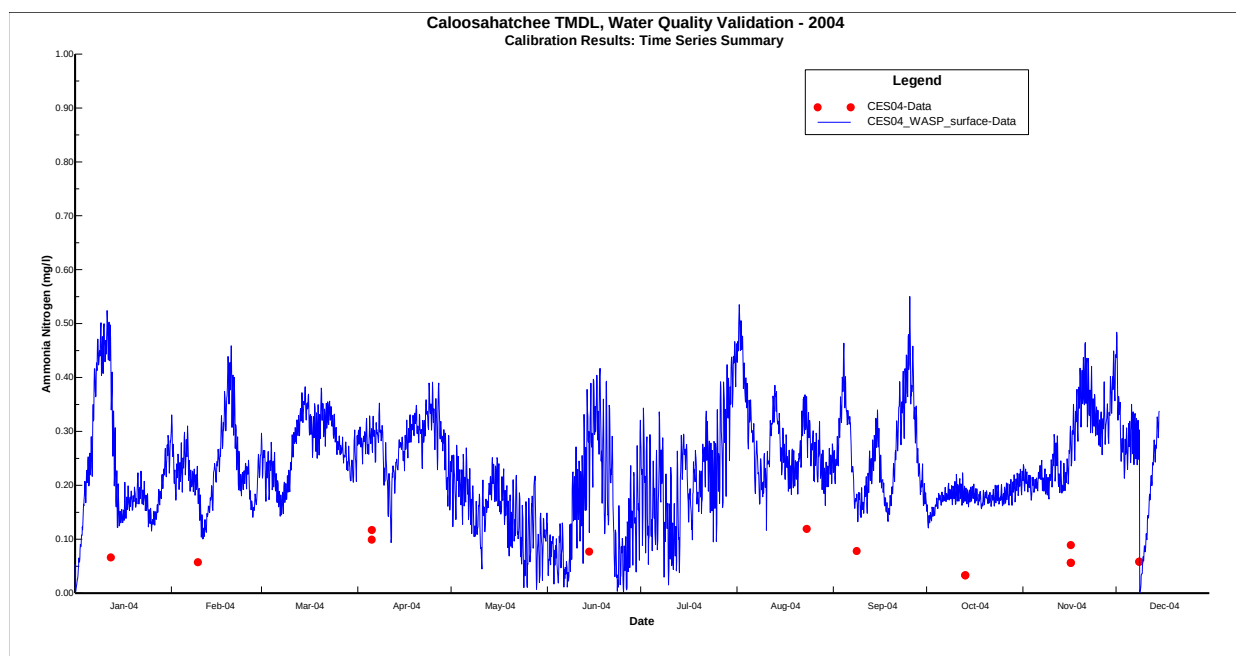


Figure 5-H- 17 Surface $\text{NH}_4\text{-N}$ validation for CES04

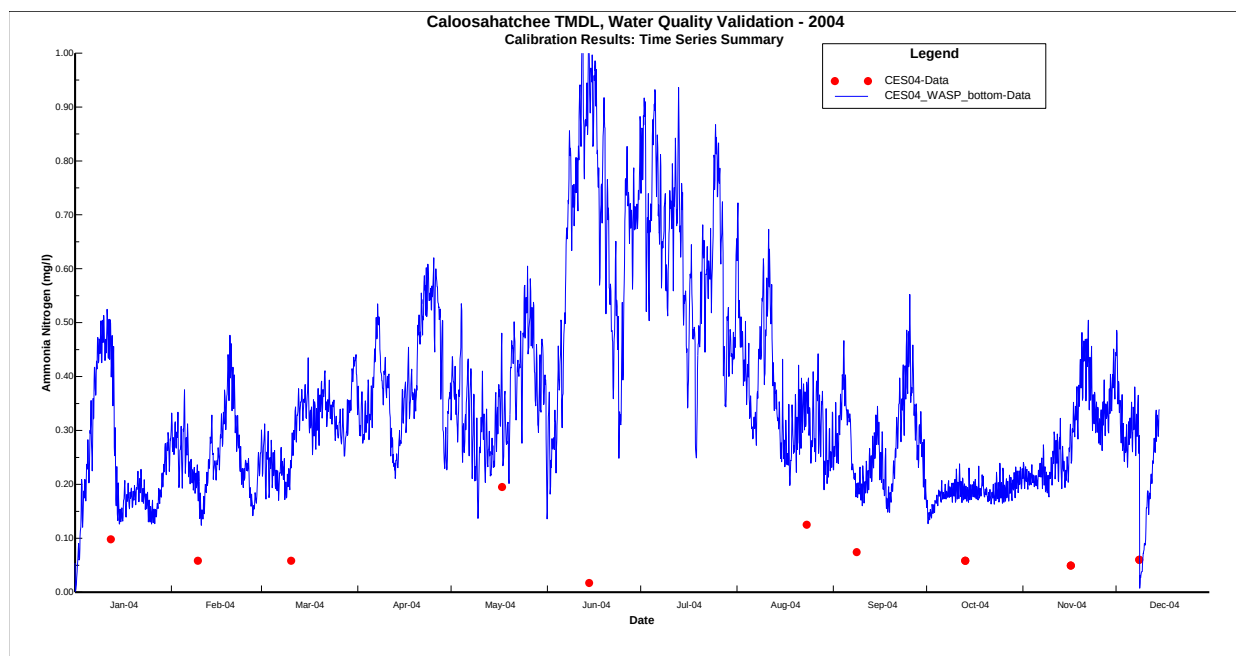


Figure 5-H- 18 Bottom $\text{NH}_4\text{-N}$ validation for CES04

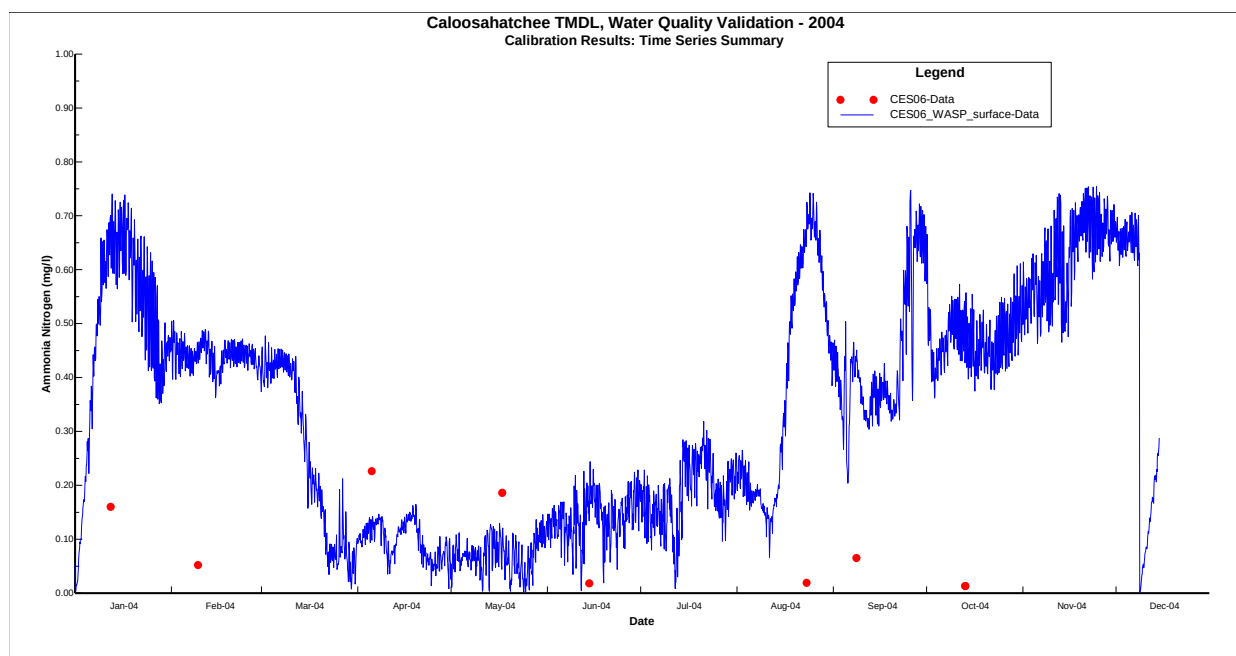


Figure 5-H- 19 Surface $\text{NH}_4\text{-N}$ validation for CES06

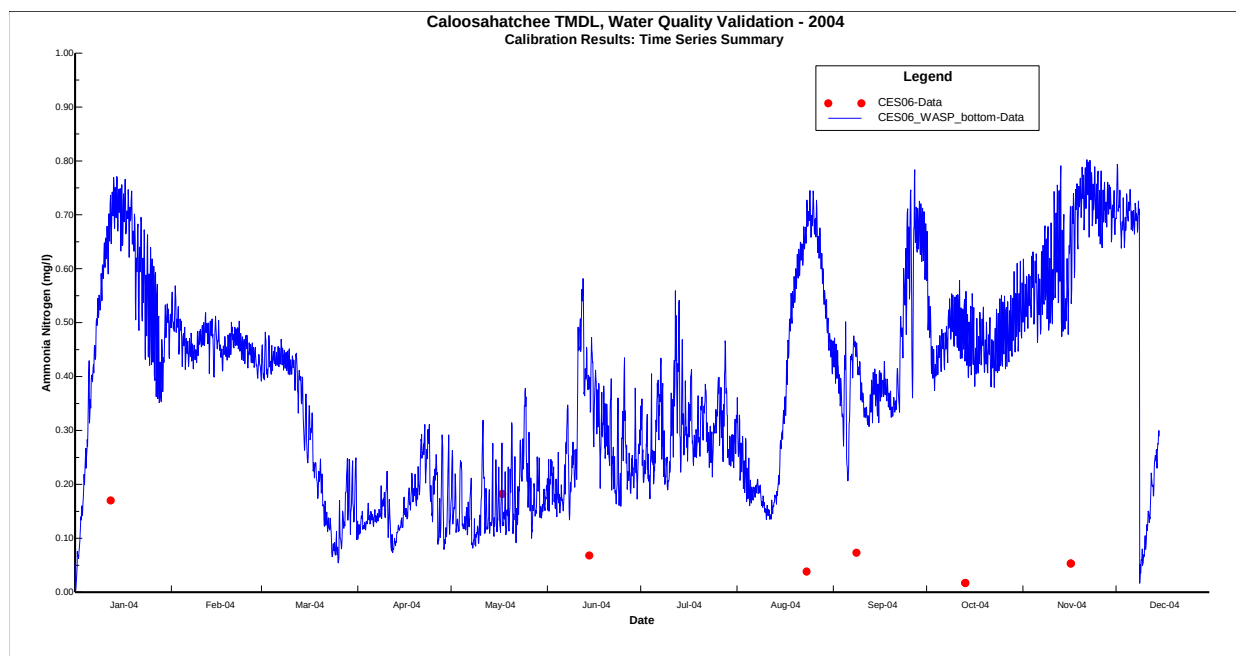


Figure 5-H- 20 Bottom $\text{NH}_4\text{-N}$ validation for CES06

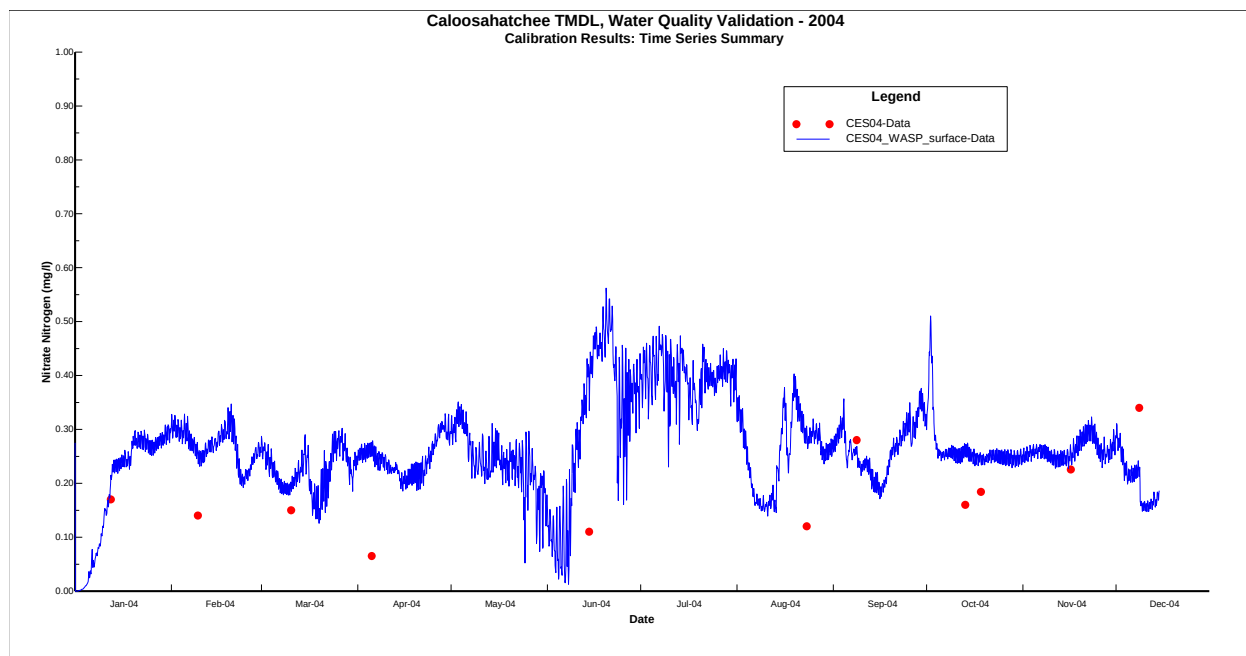


Figure 5-H- 21 Surface $\text{NO}_3\text{-N}$ validation for CES04

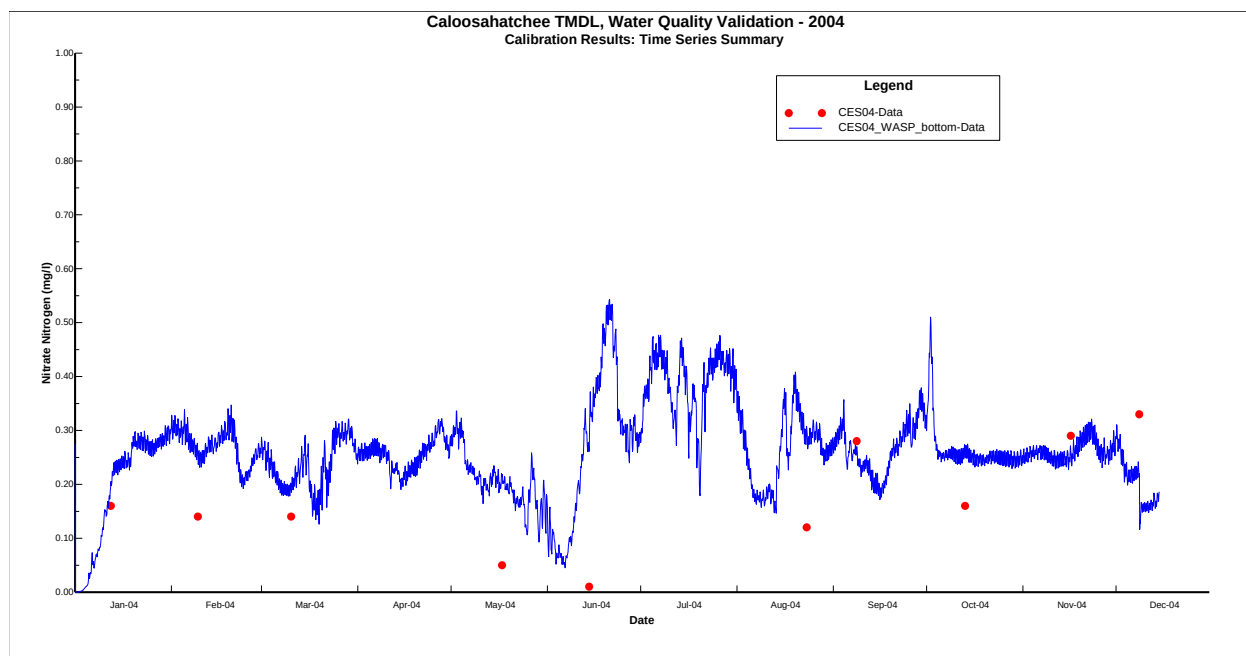


Figure 5-H- 22 Bottom $\text{NO}_3\text{-N}$ validation for CES04

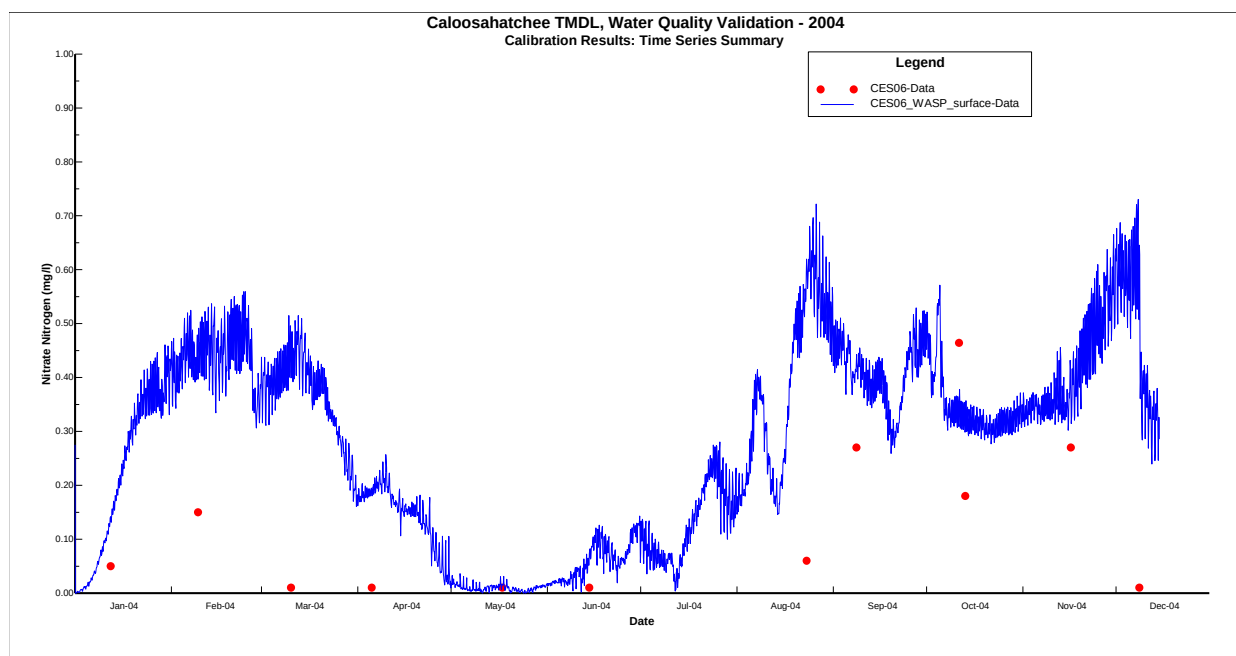


Figure 5-H- 23 Surface $\text{NO}_3\text{-N}$ validation for CES06

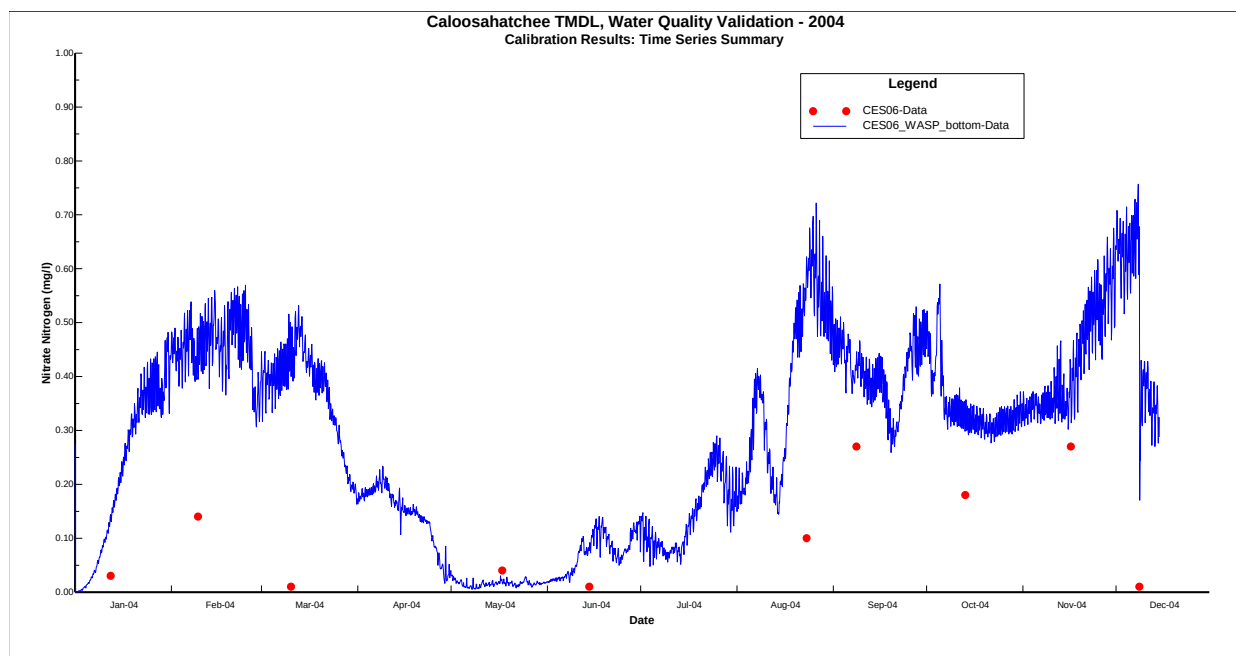


Figure 5-H- 24 Bottom $\text{NO}_3\text{-N}$ validation for CES06

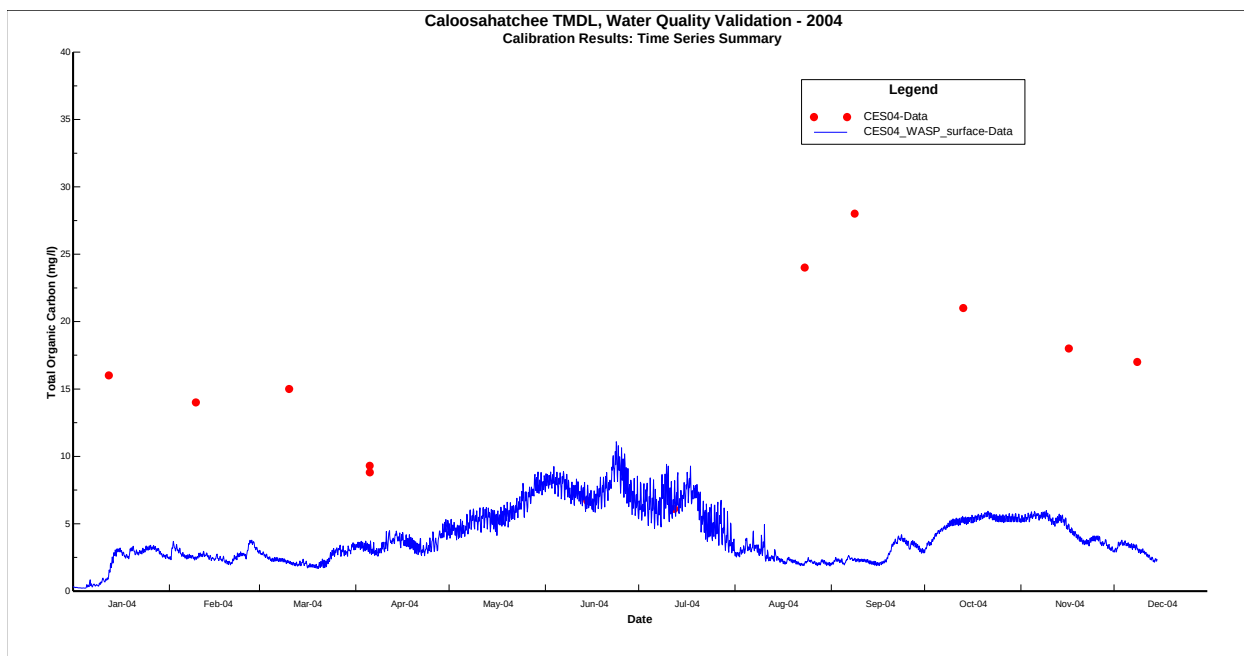


Figure 5-H- 25 Surface TOC validation for CES04

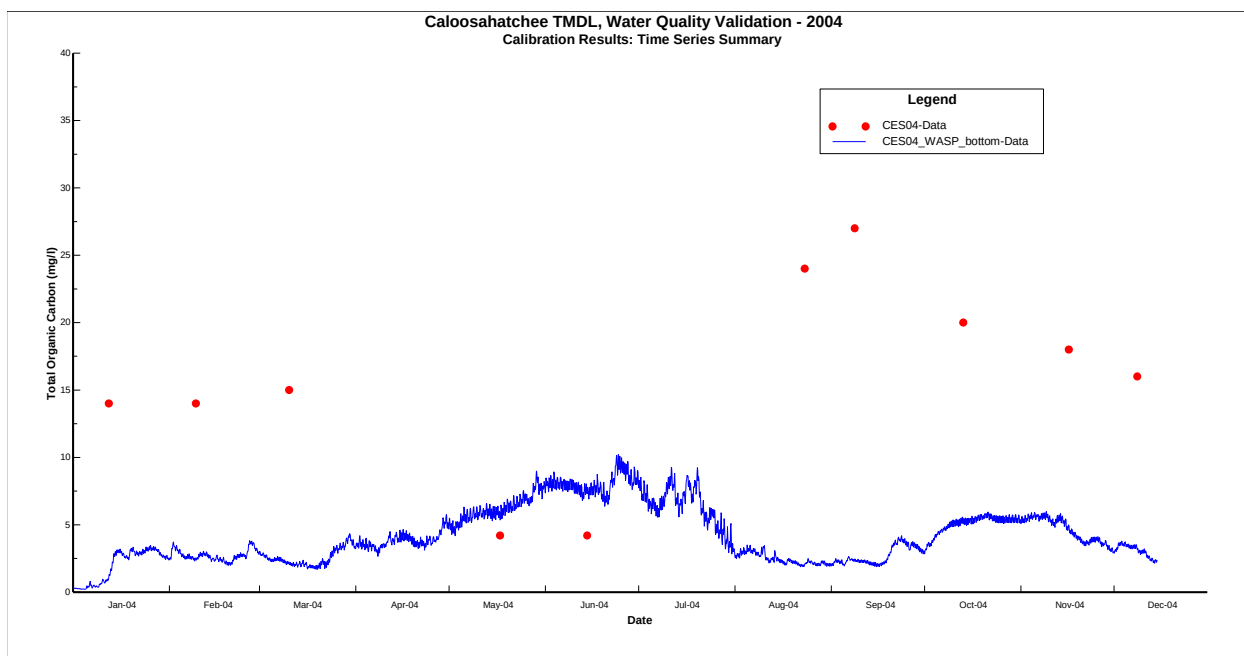


Figure 5-H- 26 Bottom TOC validation for CES04

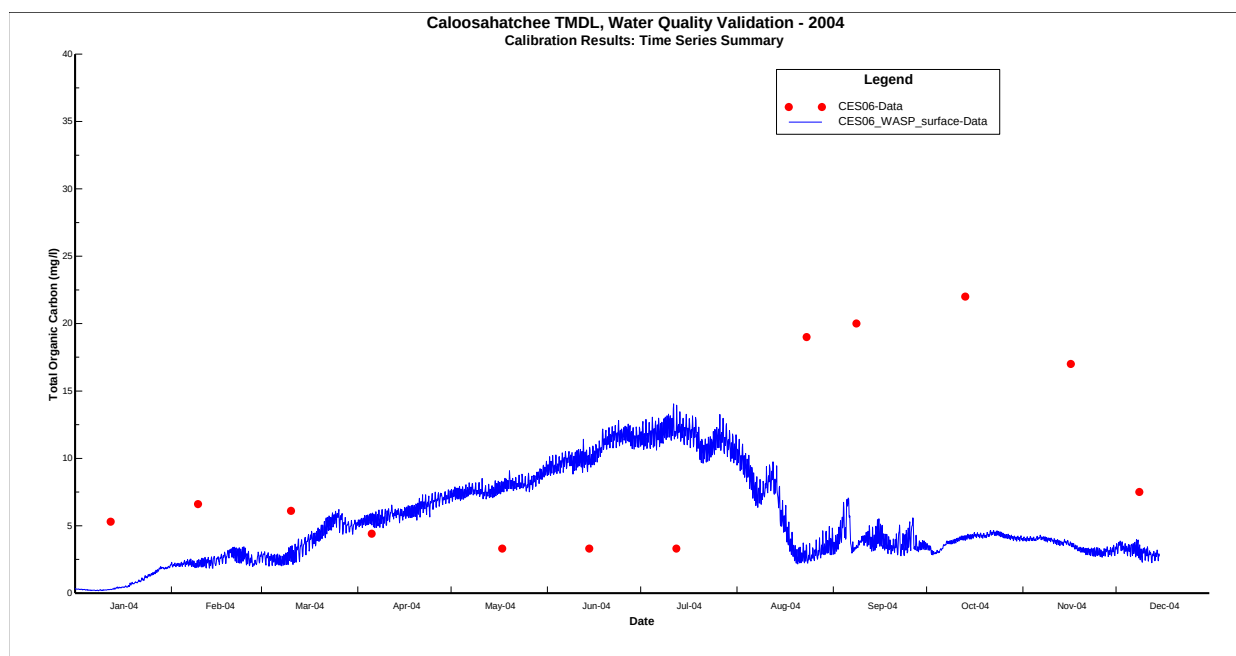


Figure 5-H- 27 Surface TOC validation for CES06

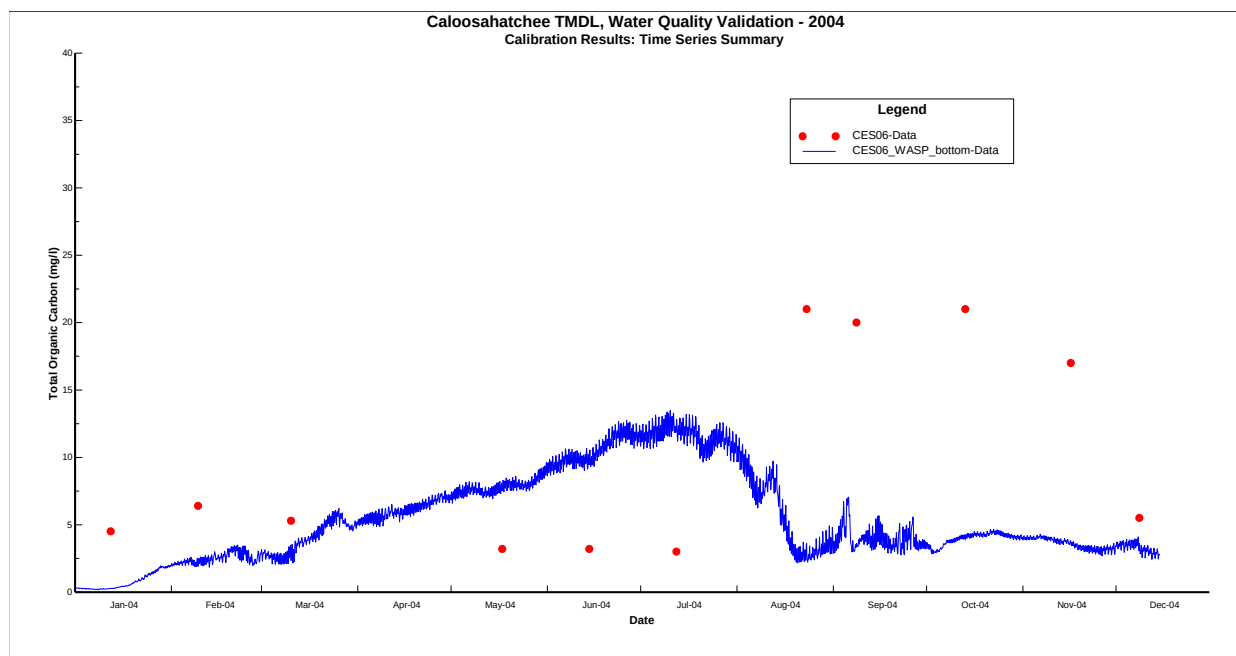


Figure 5-H- 28 Bottom TOC validation for CES06

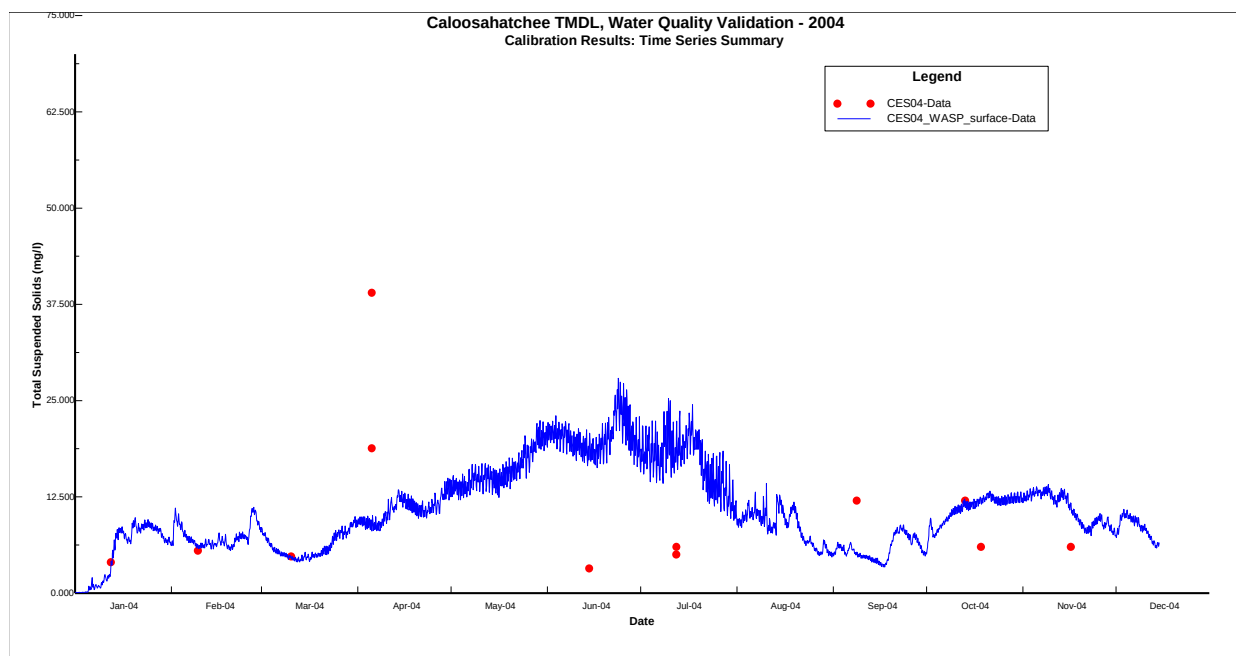


Figure 5-H- 29 Surface TSS validation for CES04

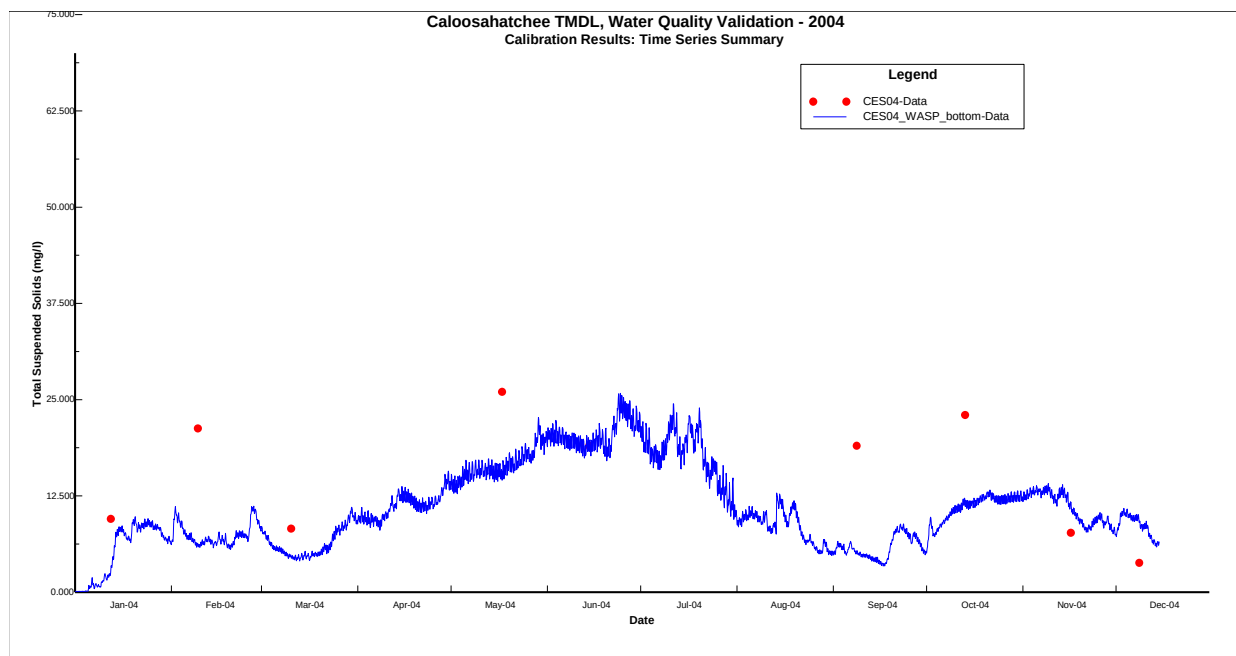


Figure 5-H- 30 Bottom TSS validation for CES04

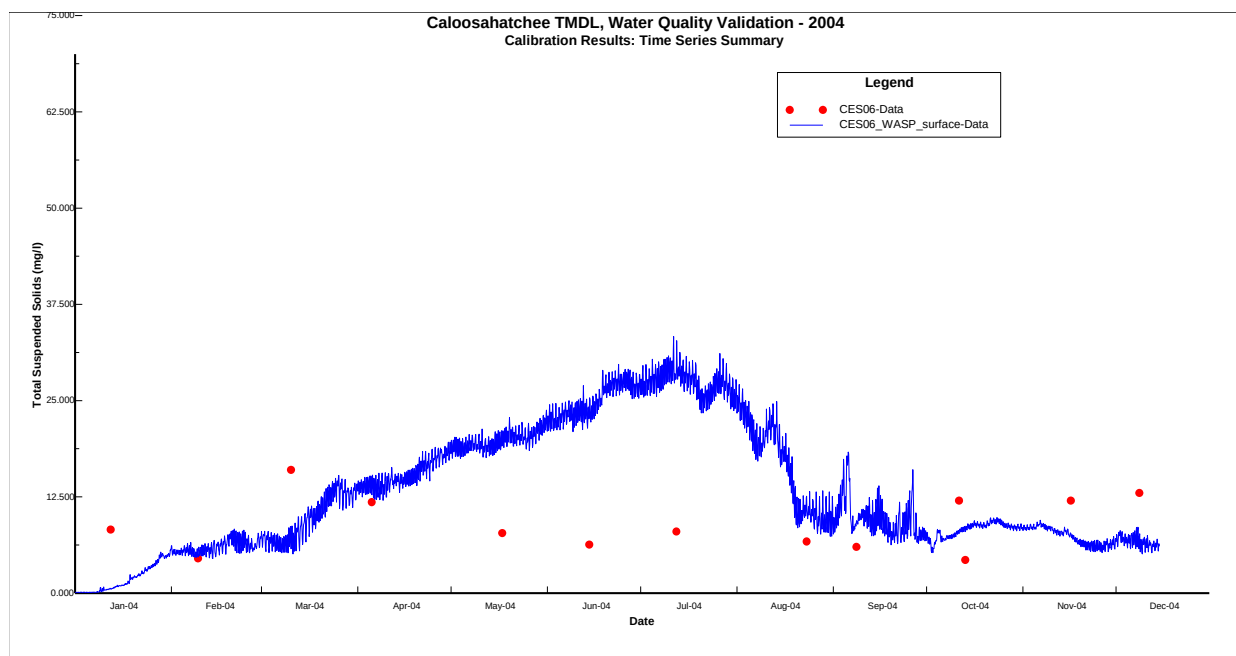


Figure 5-H- 31 Surface TSS validation for CES06

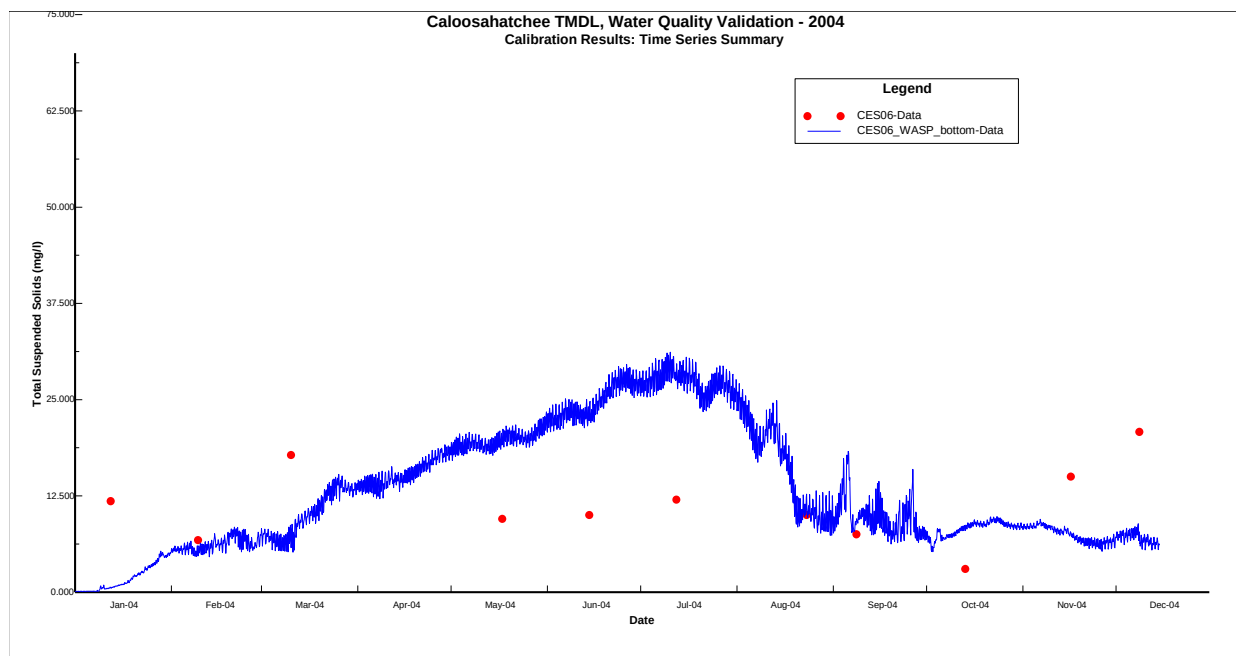


Figure 5-H- 32 Bottom TSS validation for CES06

Appendix 5-I

Comparison of EFDC and WASP Plots for Calibration

Table of Figures

Figure 5-I- 1 Comparison of surface water temperature for CES04	1
Figure 5-I- 2 Comparison of bottom water temperature for CES04	1
Figure 5-I- 3 Comparison of surface water temperature for CES06	2
Figure 5-I- 4 Comparison of bottom water temperature for CES06	2
Figure 5-I- 5 Comparison of surface total P for CES04	3
Figure 5-I- 6 Comparison of bottom total P for CES04	3
Figure 5-I- 7 Comparison of surface total P for CES06	4
Figure 5-I- 8 Comparison of bottom total P for CES06	4
Figure 5-I- 9 Comparison of surface total phosphate for CES04	5
Figure 5-I- 10 Comparison of bottom total phosphate for CES04	5
Figure 5-I- 11 Comparison of surface total phosphate for CES06	6
Figure 5-I- 12 Comparison of bottom total phosphate for CES06	6
Figure 5-I- 13 Comparison of surface total N for CES04	7
Figure 5-I- 14 Comparison of bottom total N for CES04	7
Figure 5-I- 15 Comparison of surface total N for CES06	8
Figure 5-I- 16 Comparison of bottom total N for CES06	8
Figure 5-I- 17 Comparison of surface NH ₄ -N for CES04	9
Figure 5-I- 18 Comparison of bottom NH ₄ -N for CES04	9
Figure 5-I- 19 Comparison of surface NH ₄ -N for CES06	10
Figure 5-I- 20 Comparison of bottom NH ₄ -N for CES06	10
Figure 5-I- 21 Comparison of surface NO ₃ -N for CES04	11
Figure 5-I- 22 Comparison of bottom NO ₃ -N for CES04	11
Figure 5-I- 23 Comparison of surface NO ₃ -N for CES06	12
Figure 5-I- 24 Comparison of bottom NO ₃ -N for CES06	12

Figure 5-I- 25 Comparison of surface TOC for CES04.....	13
Figure 5-I- 26 Comparison of bottom TOC for CES04	13
Figure 5-I- 27 Comparison of surface TOC for CES06.....	14
Figure 5-I- 28 Comparison of bottom TOC for CES06	14
Figure 5-I- 29 Comparison of surface TSS for CES04.....	15
Figure 5-I- 30 Comparison of bottom TSS for CES04	15
Figure 5-I- 31 Comparison of surface TSS for CES06.....	16
Figure 5-I- 32 Comparison of bottom TSS for CES06	16

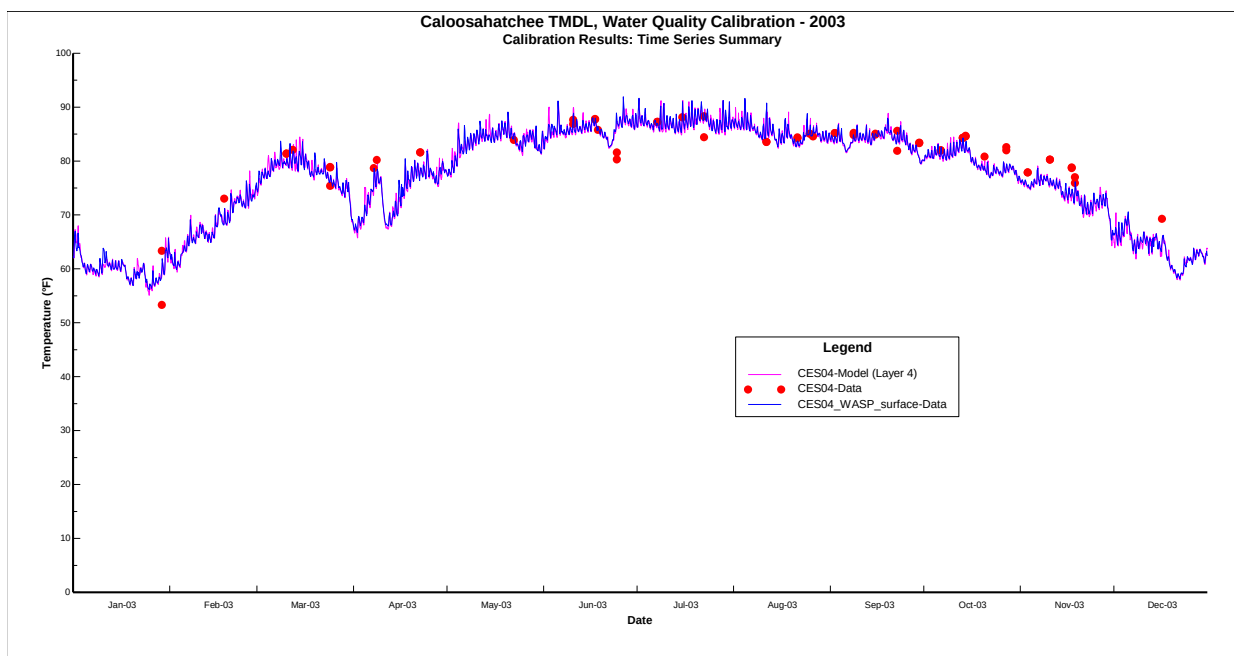


Figure 5-I- 1 Comparison of surface water temperature for CES04

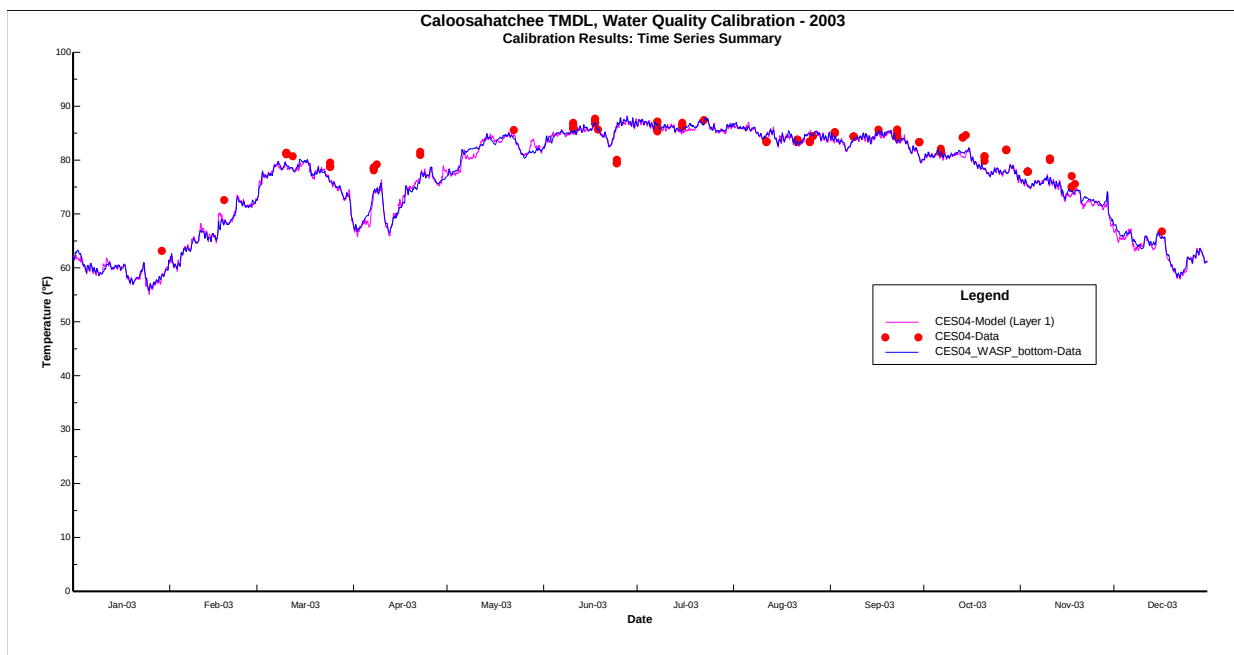


Figure 5-I- 2 Comparison of bottom water temperature for CES04

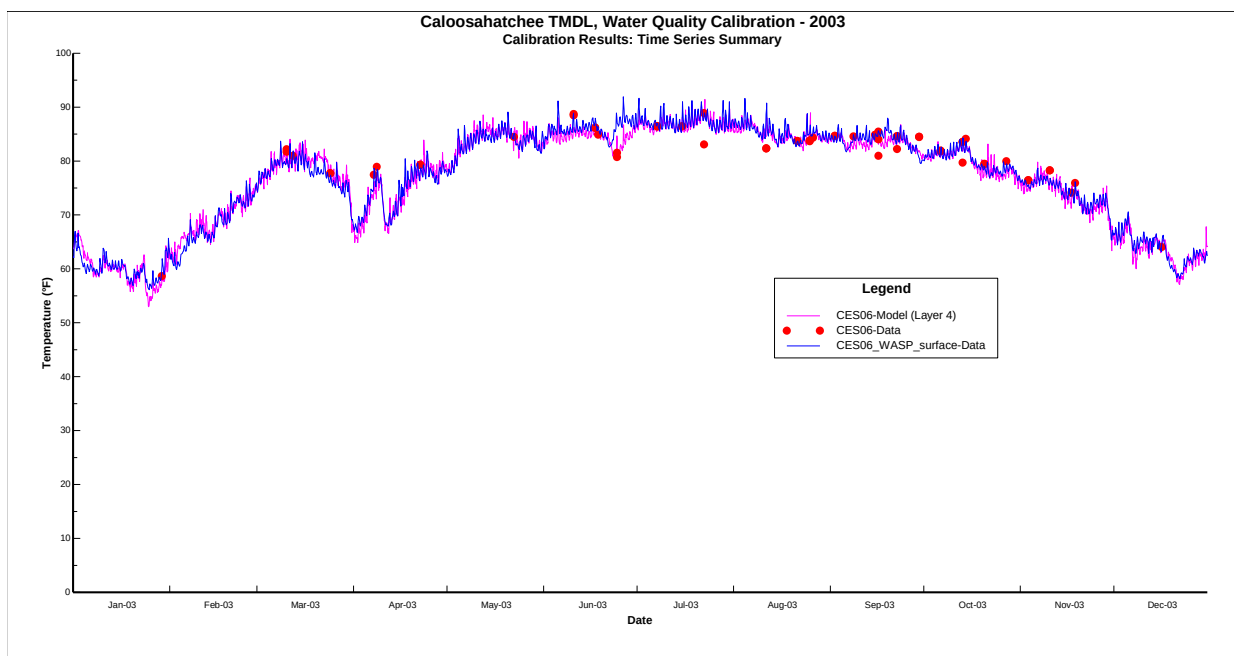


Figure 5-I- 3 Comparison of surface water temperature for CES06

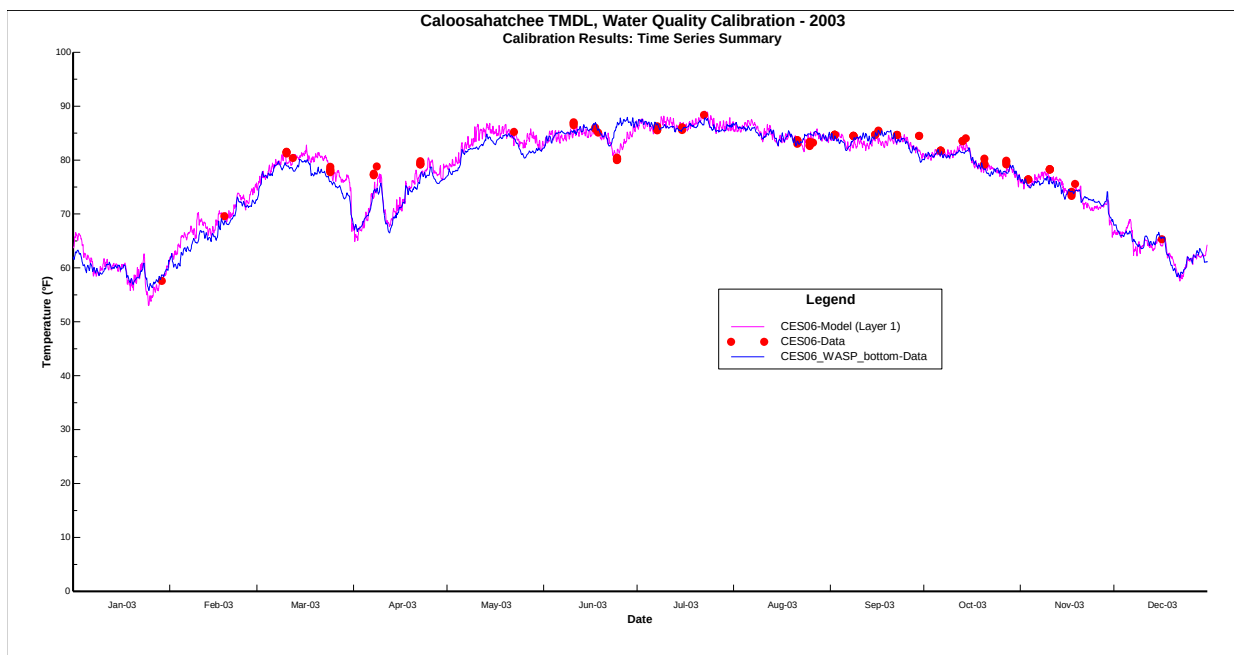


Figure 5-I- 4 Comparison of bottom water temperature for CES06

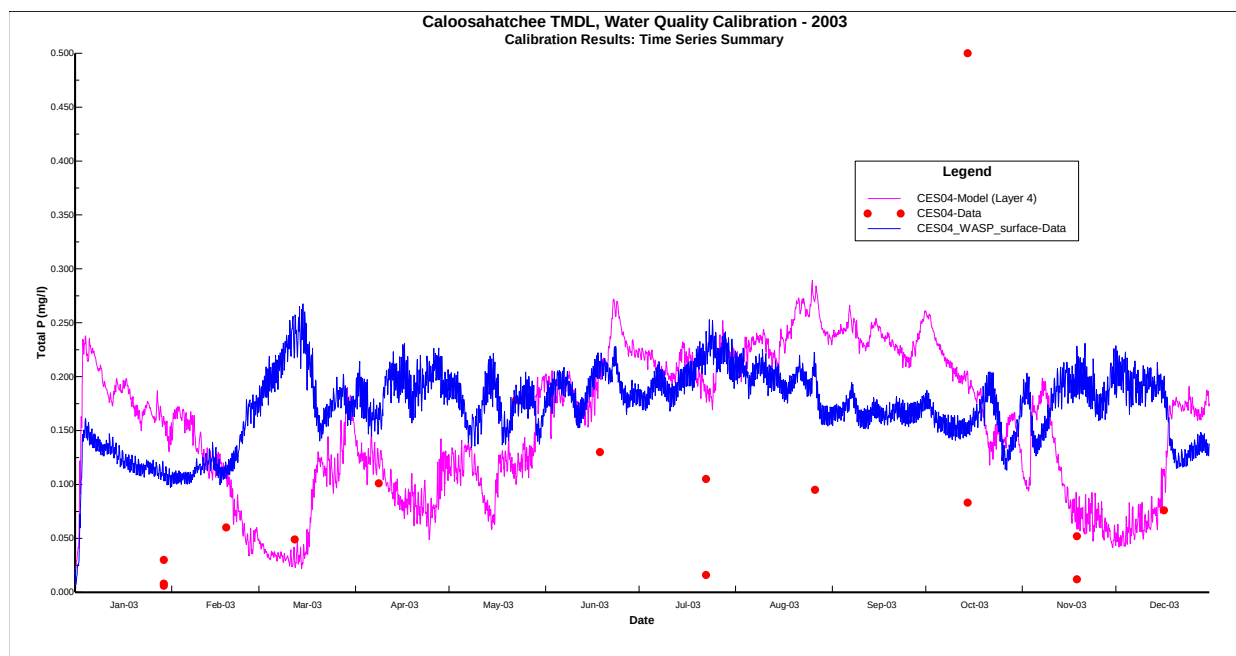


Figure 5-I- 5 Comparison of surface total P for CES04

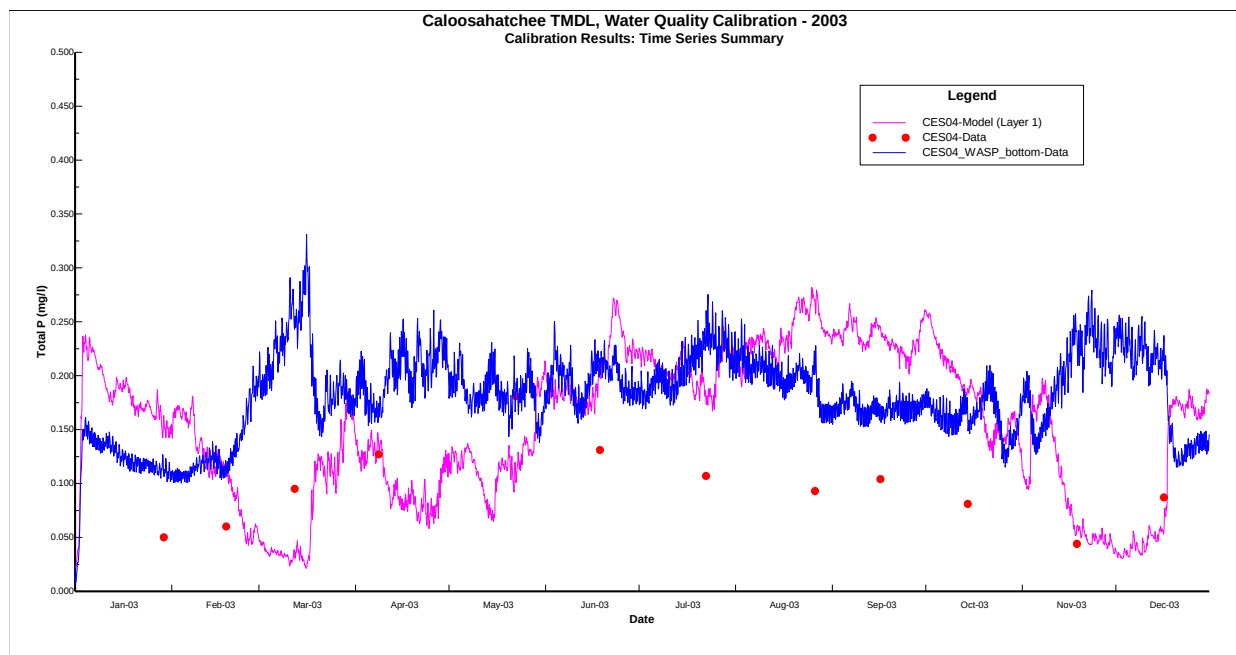


Figure 5-I- 6 Comparison of bottom total P for CES04

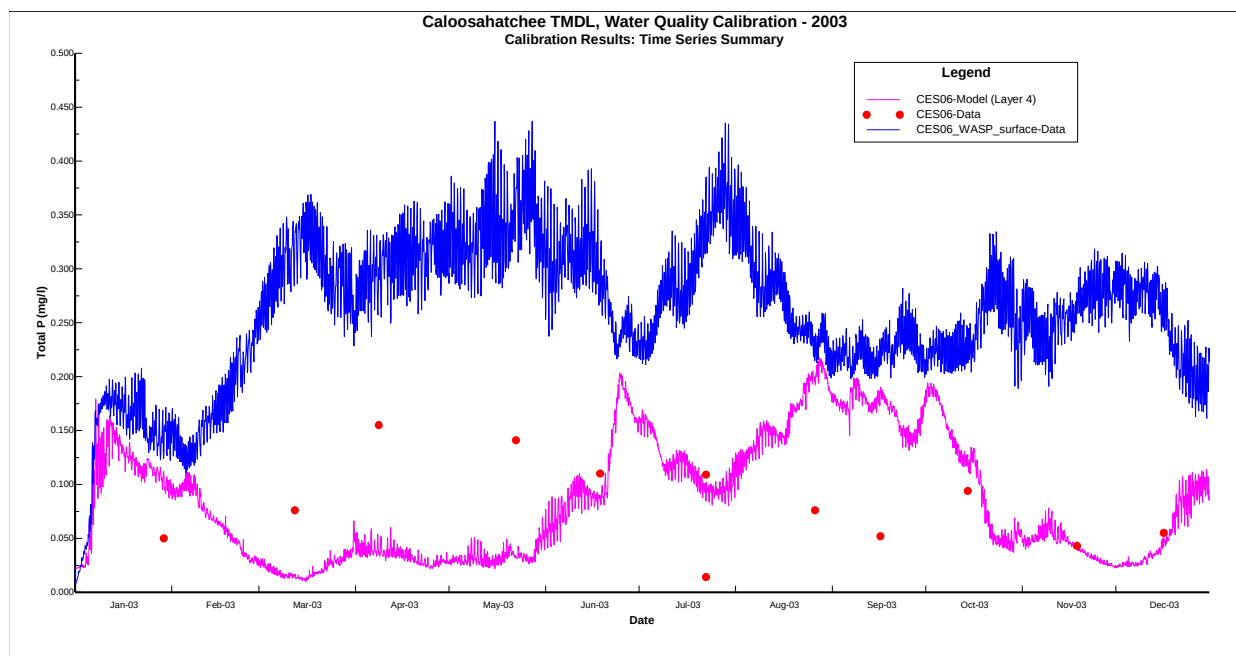


Figure 5-I- 7 Comparison of surface total P for CES06

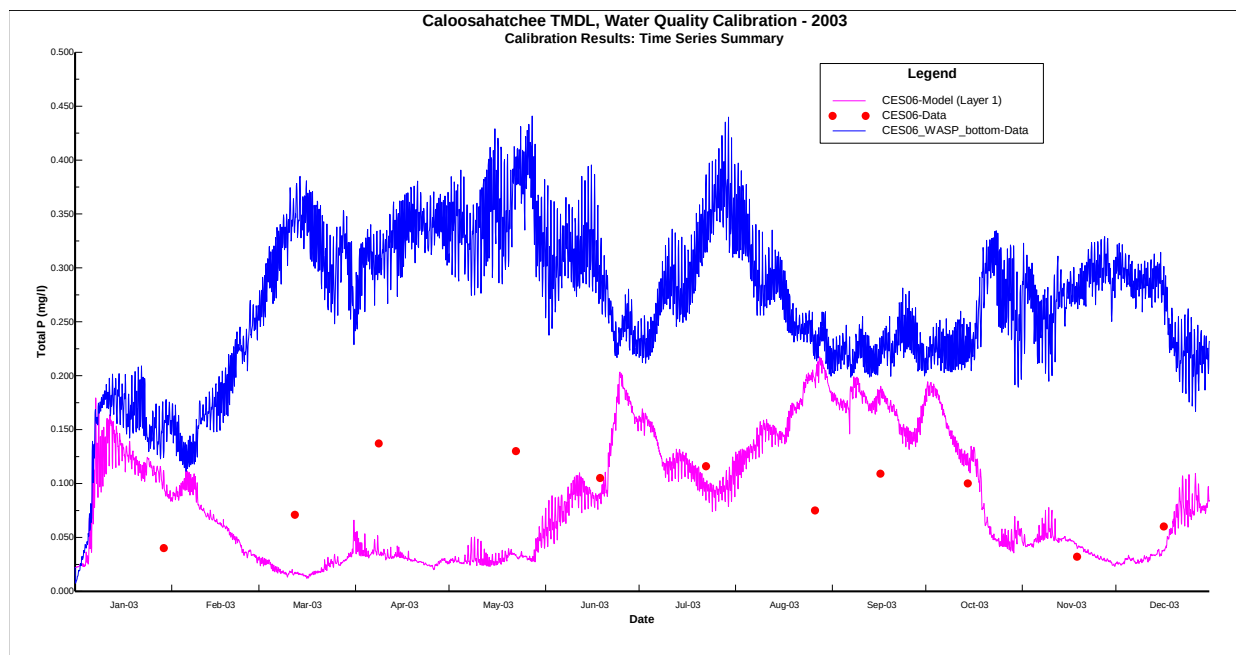


Figure 5-I- 8 Comparison of bottom total P for CES06

Florida Department of Environmental Protection
 Caloosahatchee River Basin TMDL Model Support
 Task Assignment CDM07-04, May 2008

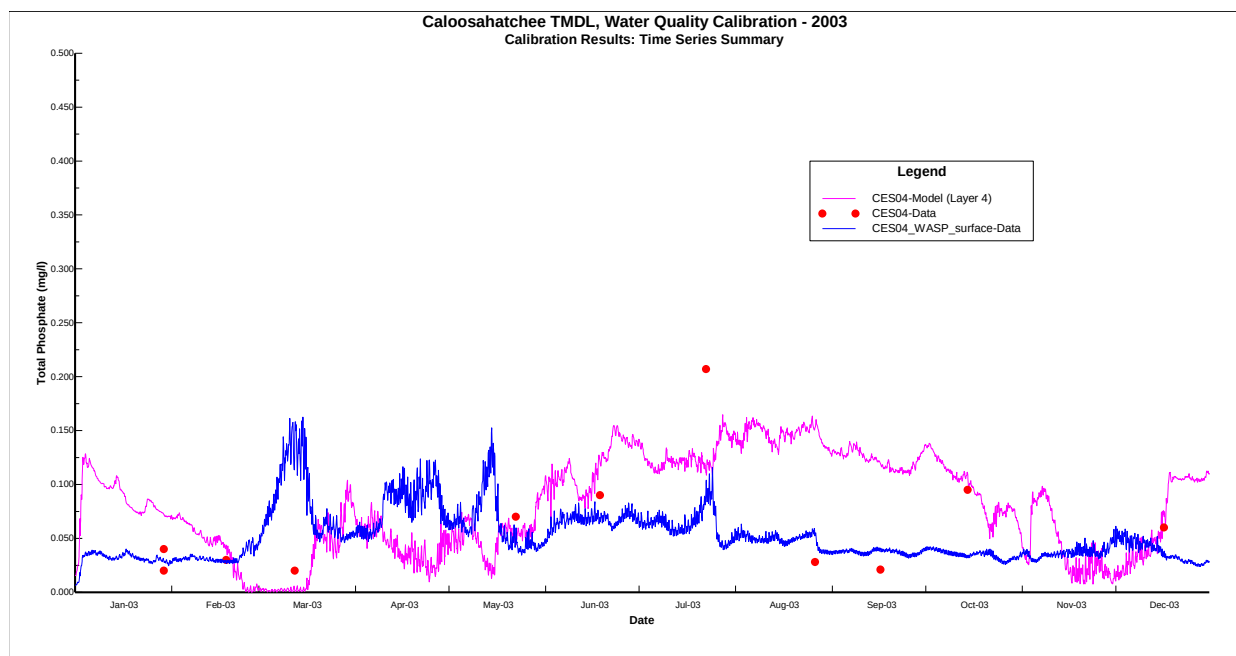


Figure 5-I- 9 Comparison of surface total phosphate for CES04

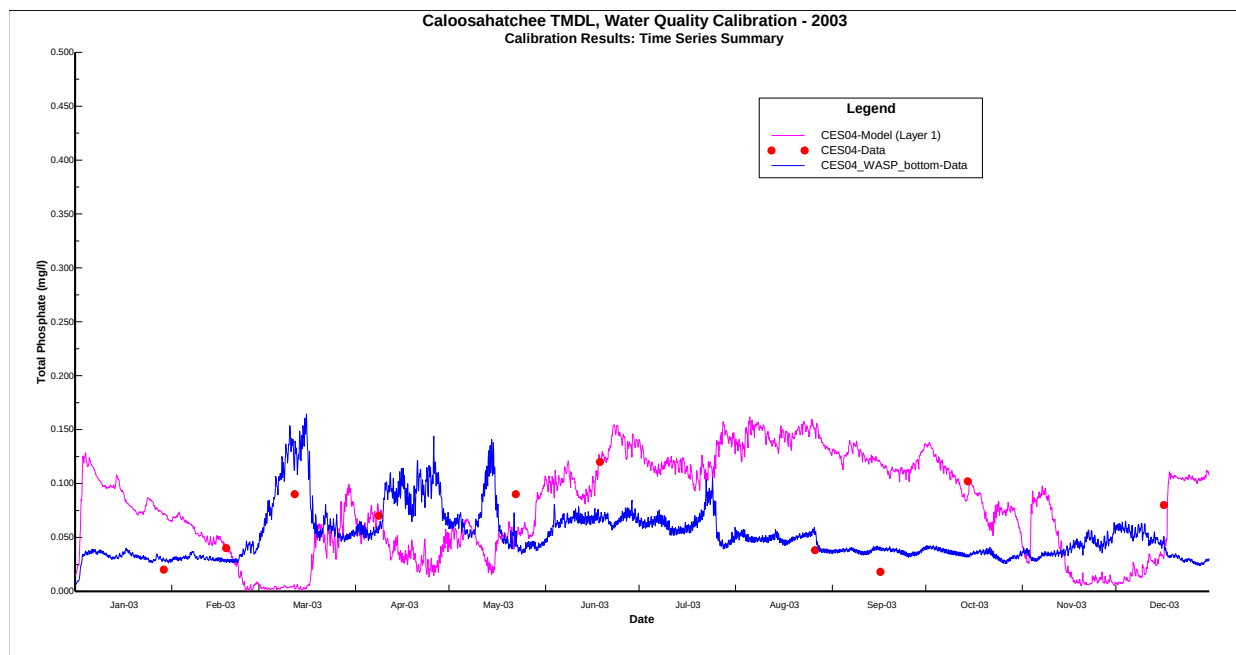


Figure 5-I- 10 Comparison of bottom total phosphate for CES04

Florida Department of Environmental Protection
 Caloosahatchee River Basin TMDL Model Support
 Task Assignment CDM07-04, May 2008

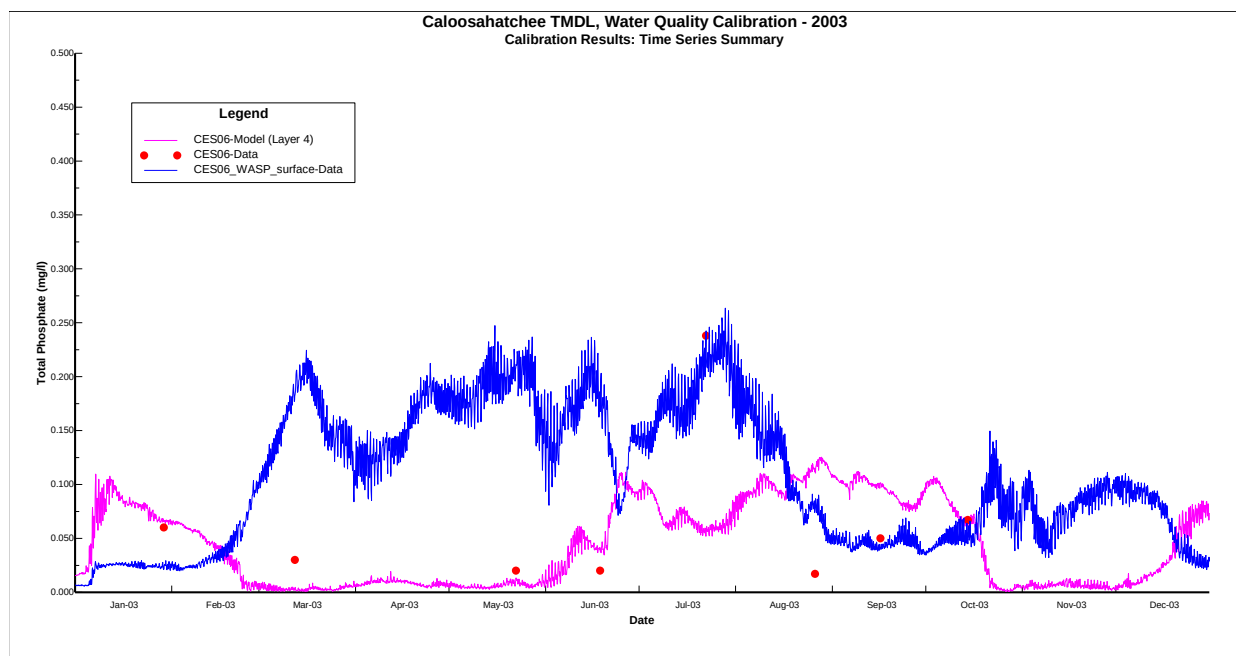


Figure 5-I- 11 Comparison of surface total phosphate for CES06

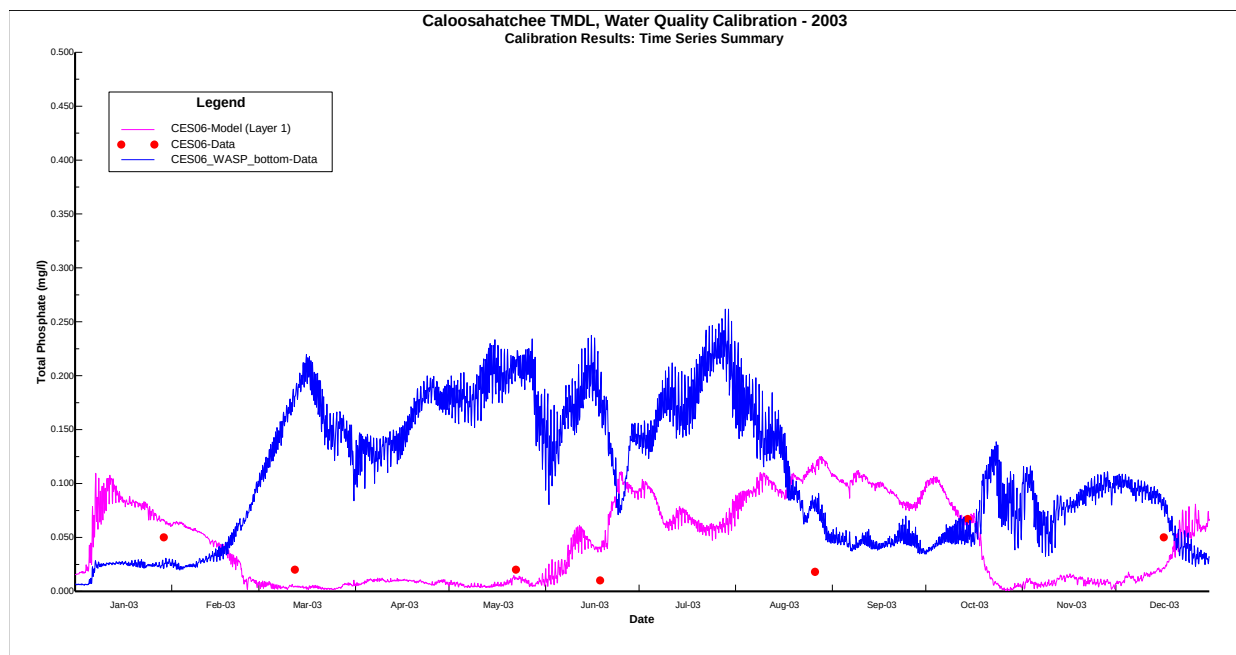


Figure 5-I- 12 Comparison of bottom total phosphate for CES06

Florida Department of Environmental Protection
 Caloosahatchee River Basin TMDL Model Support
 Task Assignment CDM07-04, May 2008

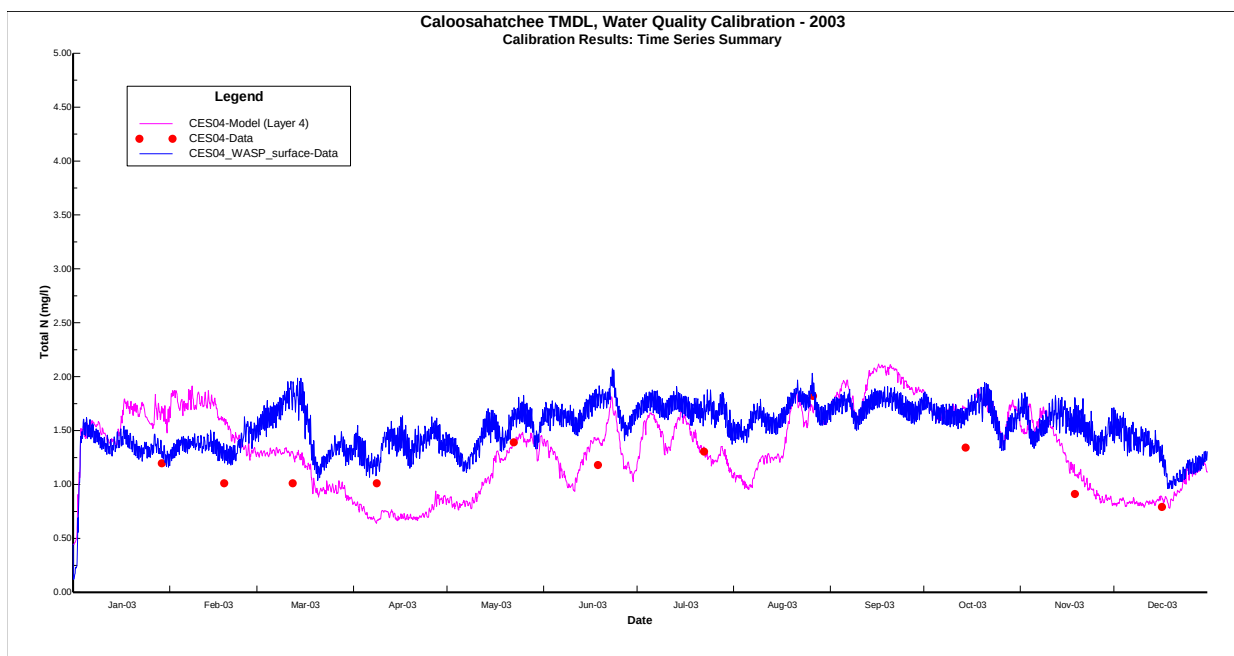


Figure 5-I- 13 Comparison of surface total N for CES04

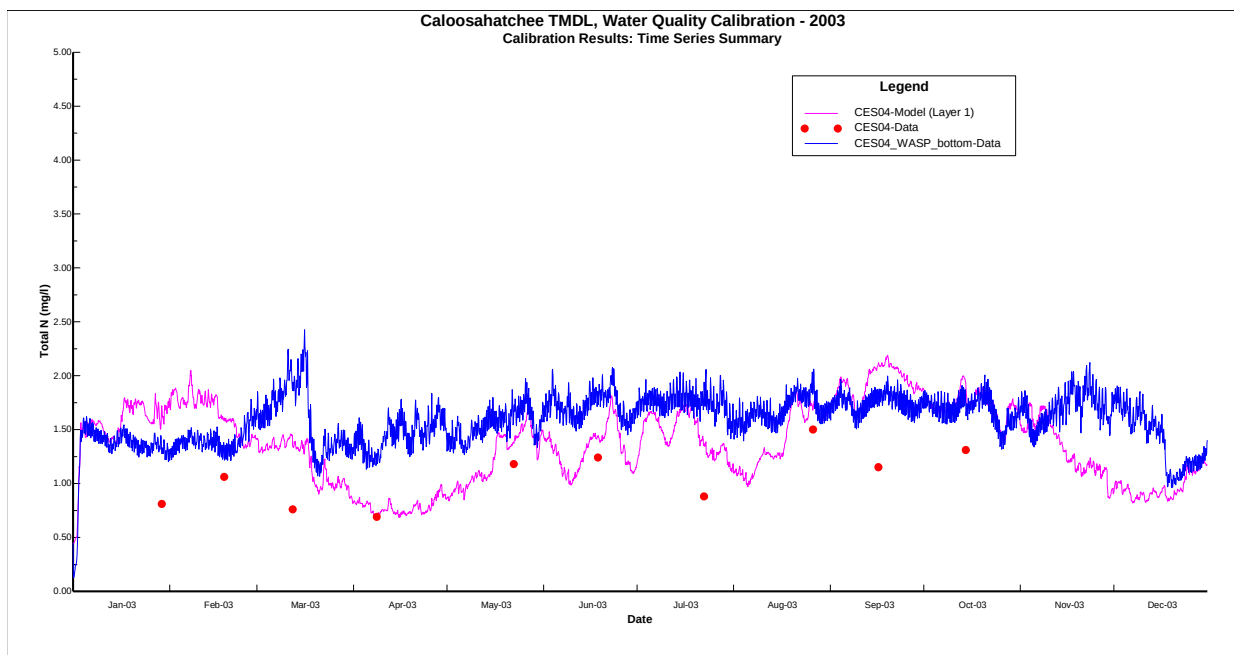


Figure 5-I- 14 Comparison of bottom total N for CES04

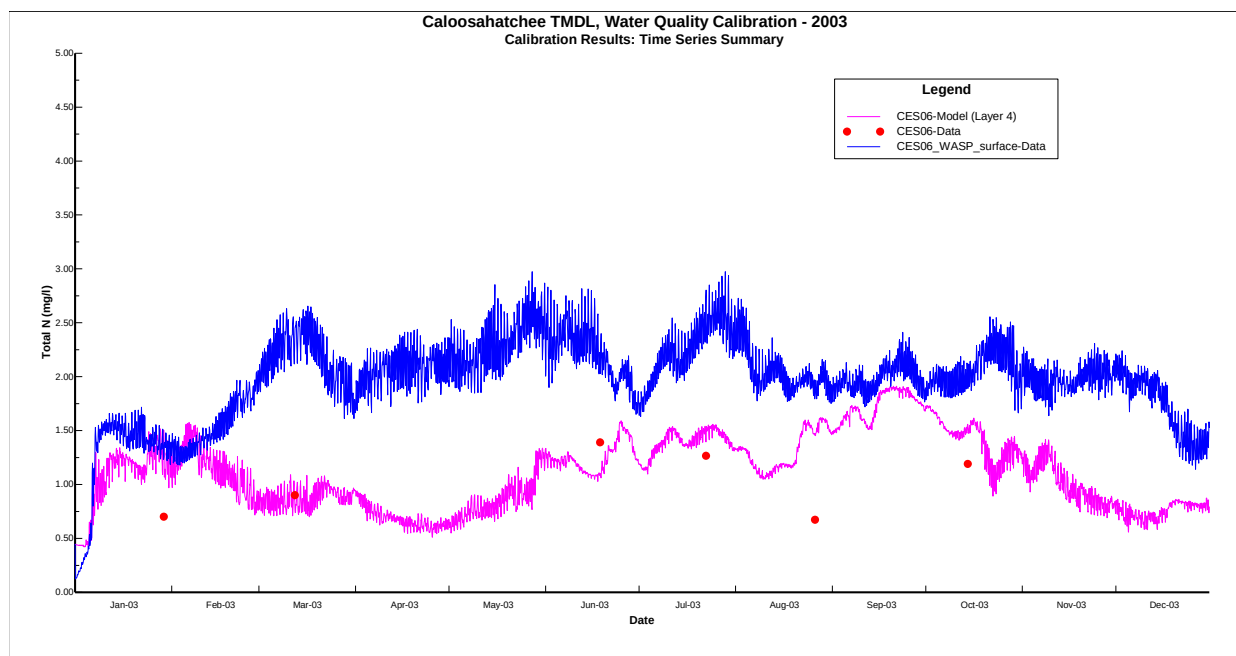


Figure 5-I- 15 Comparison of surface total N for CES06

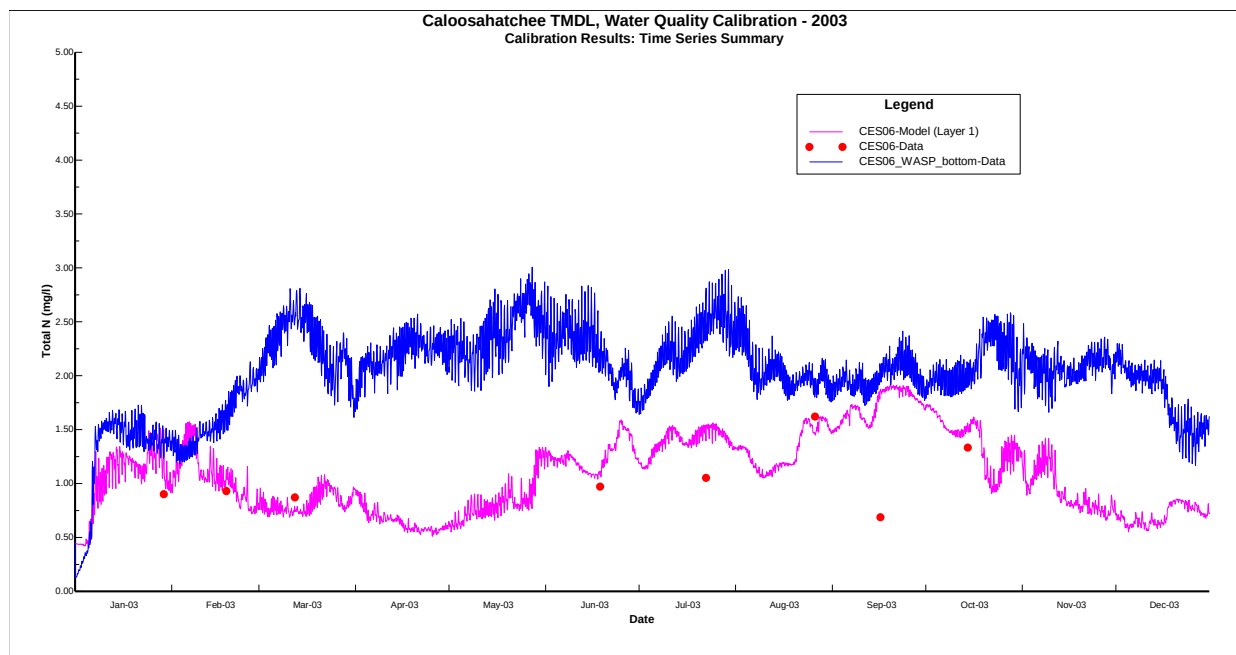


Figure 5-I- 16 Comparison of bottom total N for CES06

Florida Department of Environmental Protection
 Caloosahatchee River Basin TMDL Model Support
 Task Assignment CDM07-04, May 2008

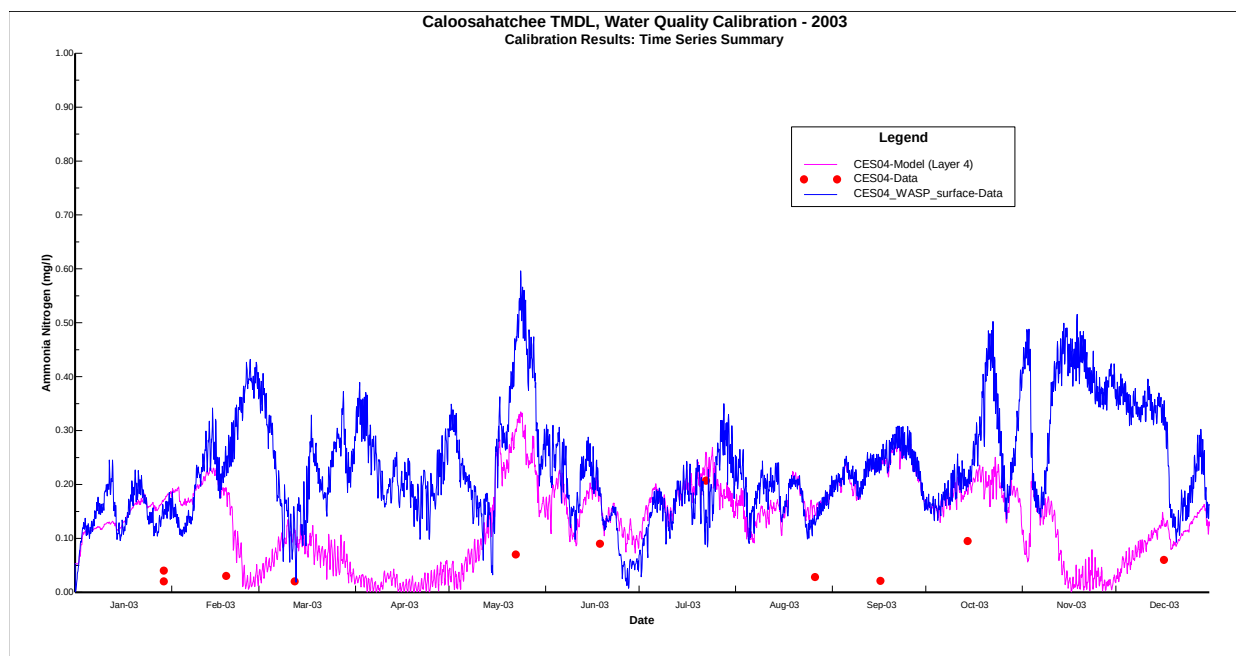


Figure 5-I- 17 Comparison of surface $\text{NH}_4\text{-N}$ for CES04

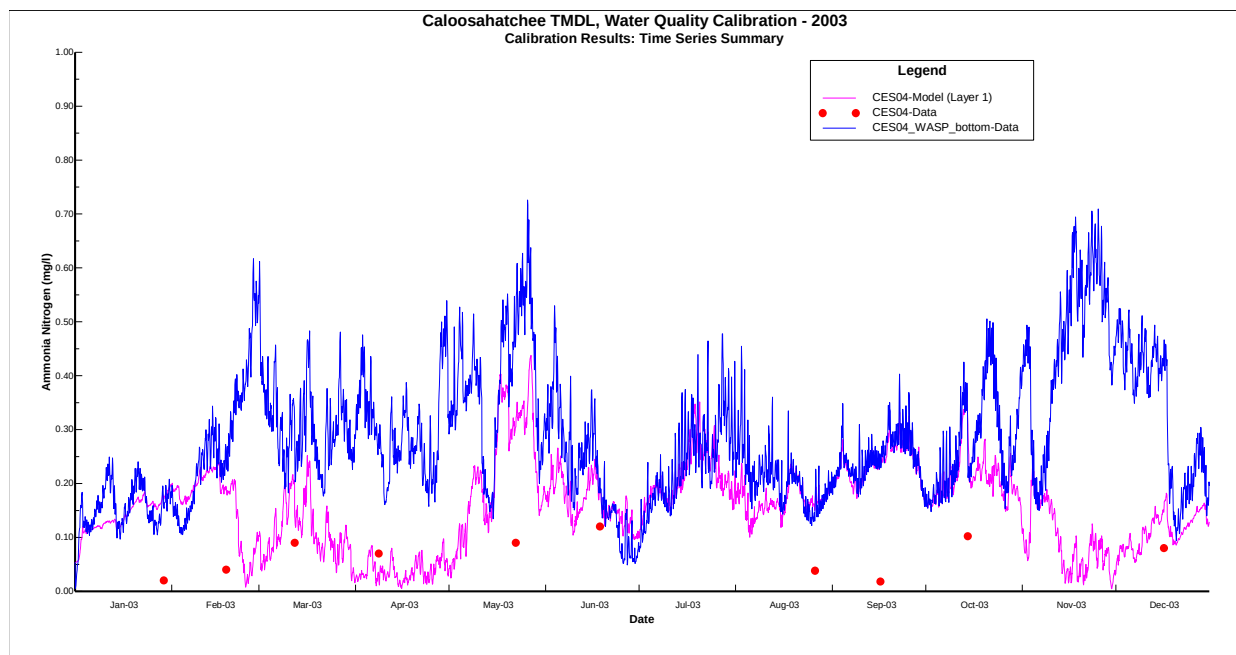


Figure 5-I- 18 Comparison of bottom $\text{NH}_4\text{-N}$ for CES04

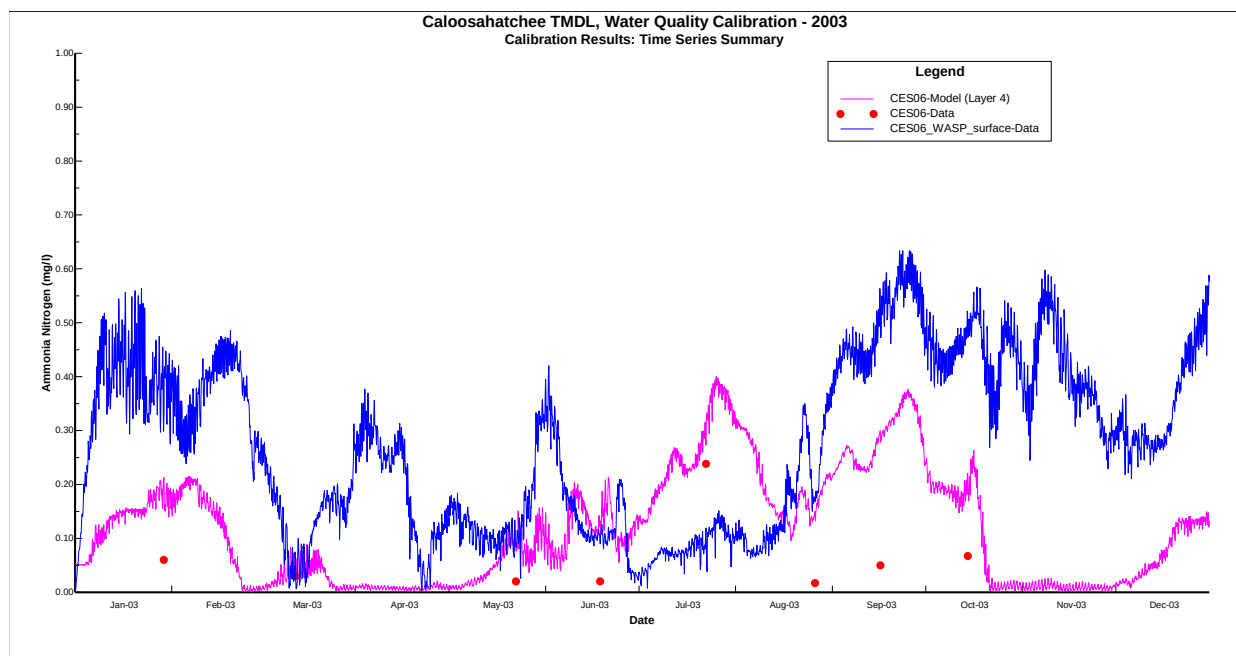


Figure 5-I- 19 Comparison of surface $\text{NH}_4\text{-N}$ for CES06

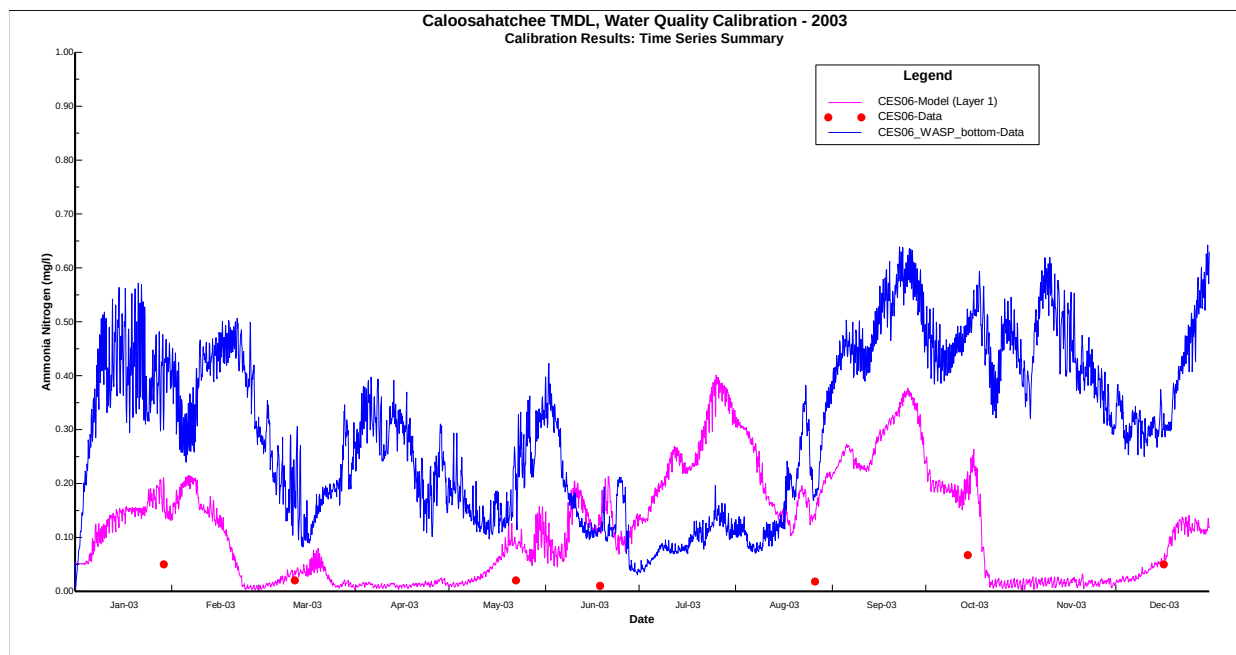


Figure 5-I- 20 Comparison of bottom $\text{NH}_4\text{-N}$ for CES06

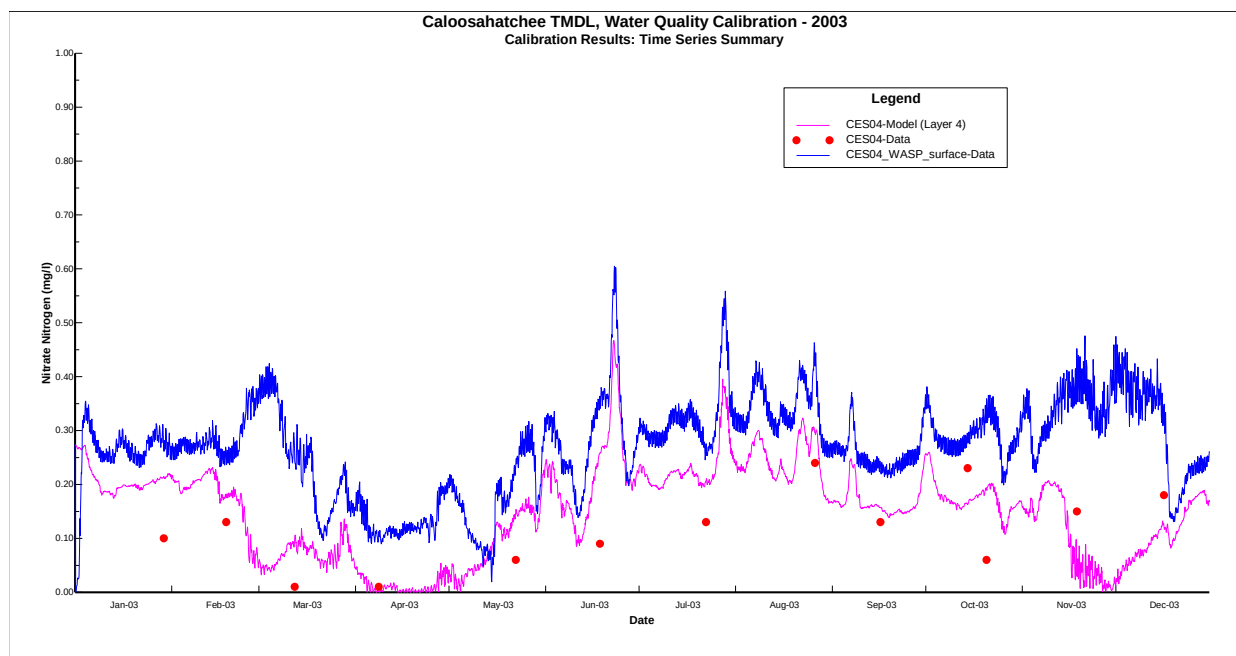


Figure 5-I- 21 Comparison of surface NO₃-N for CES04

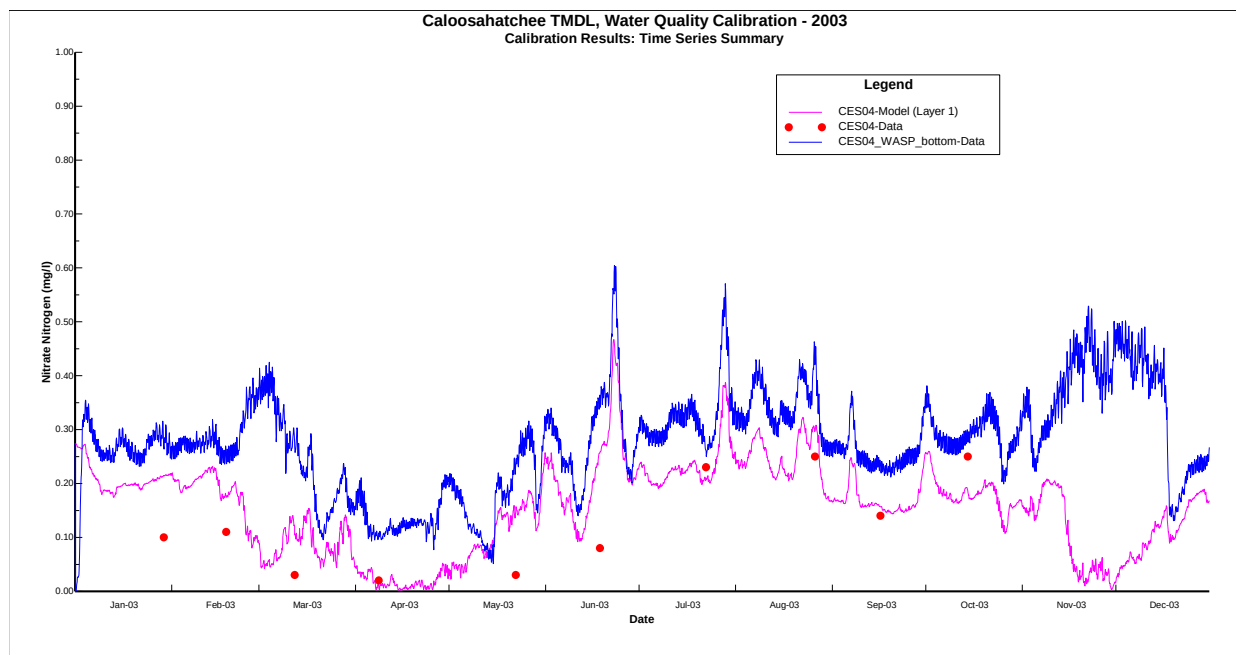


Figure 5-I- 22 Comparison of bottom NO₃-N for CES04

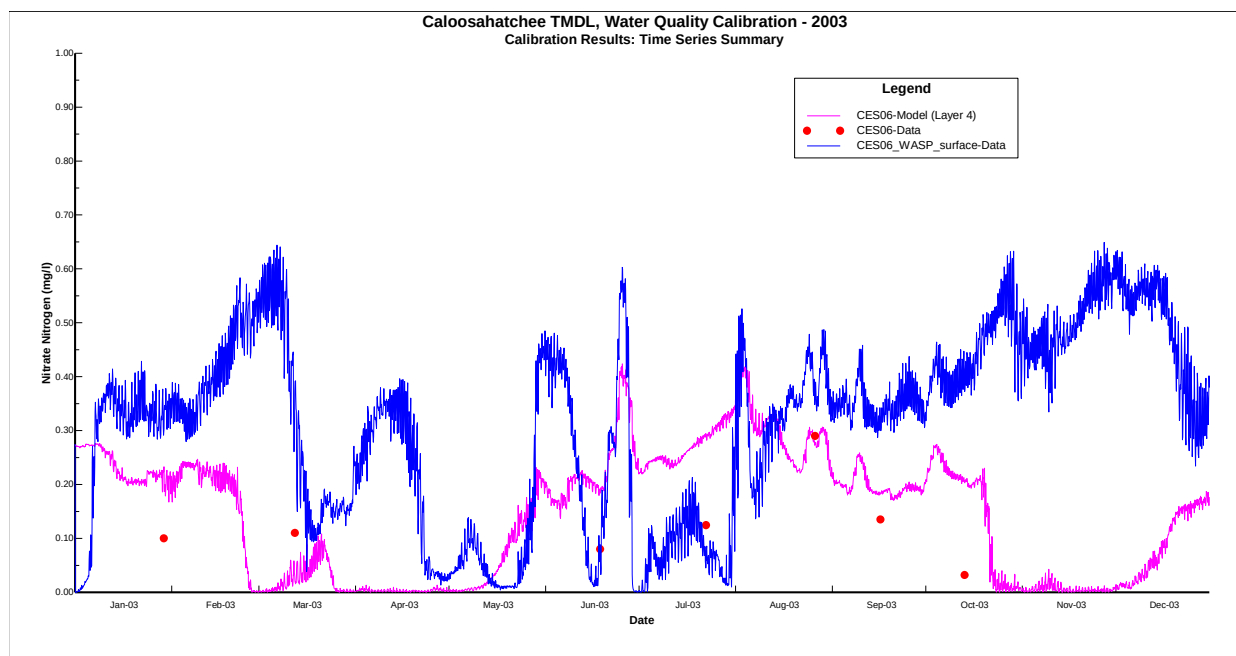


Figure 5-I- 23 Comparison of surface NO₃-N for CES06

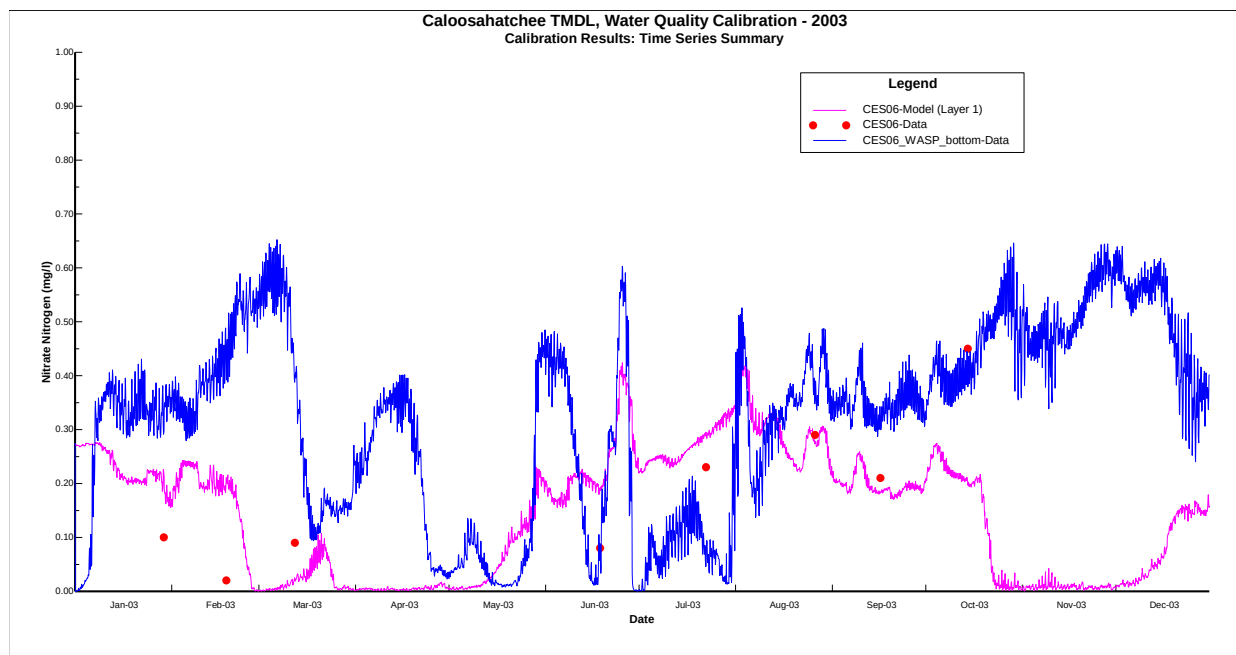


Figure 5-I- 24 Comparison of bottom NO₃-N for CES06

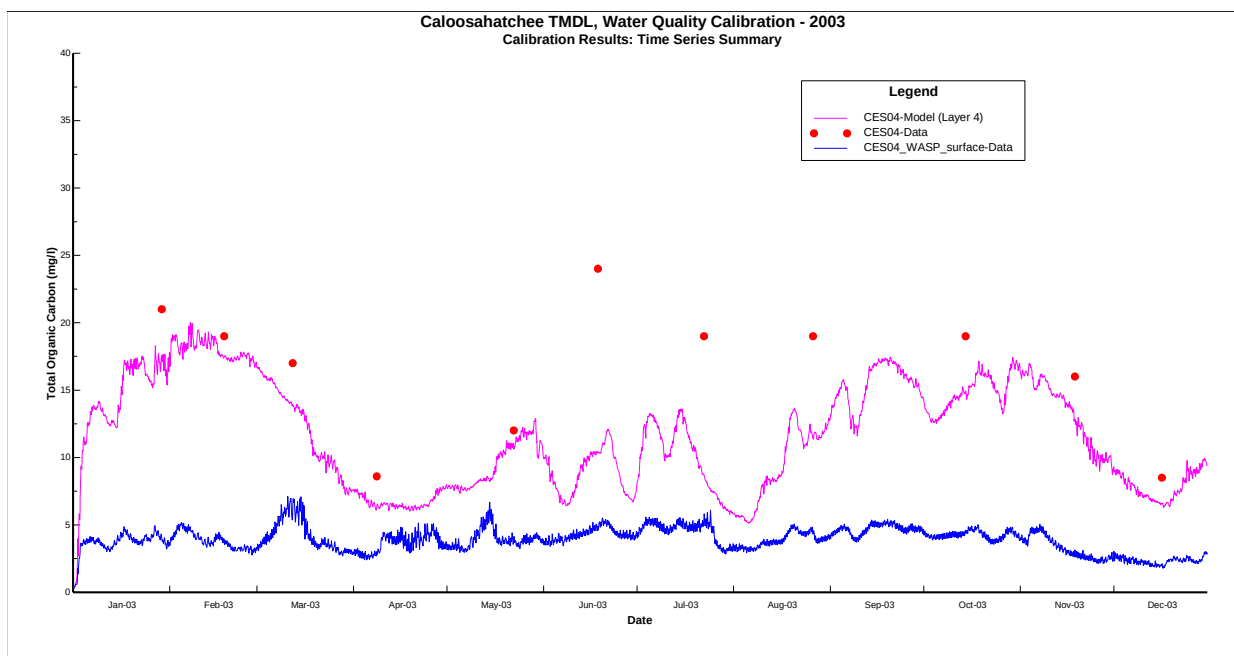


Figure 5-I- 25 Comparison of surface TOC for CES04

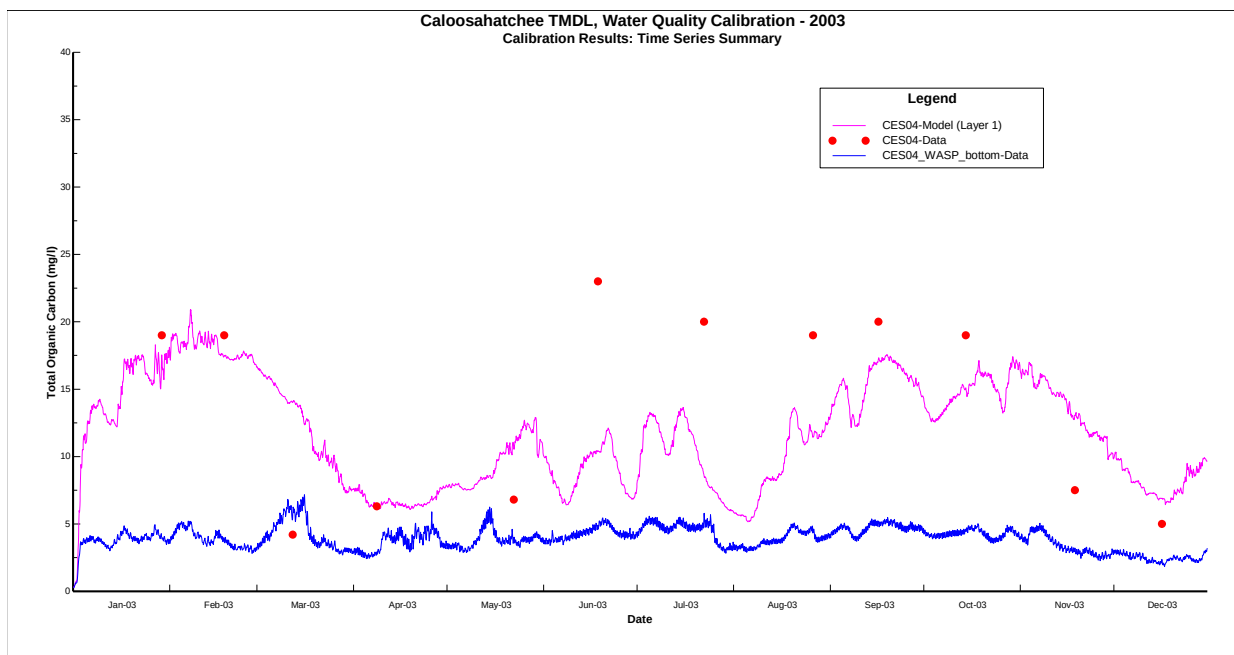


Figure 5-I- 26 Comparison of bottom TOC for CES04

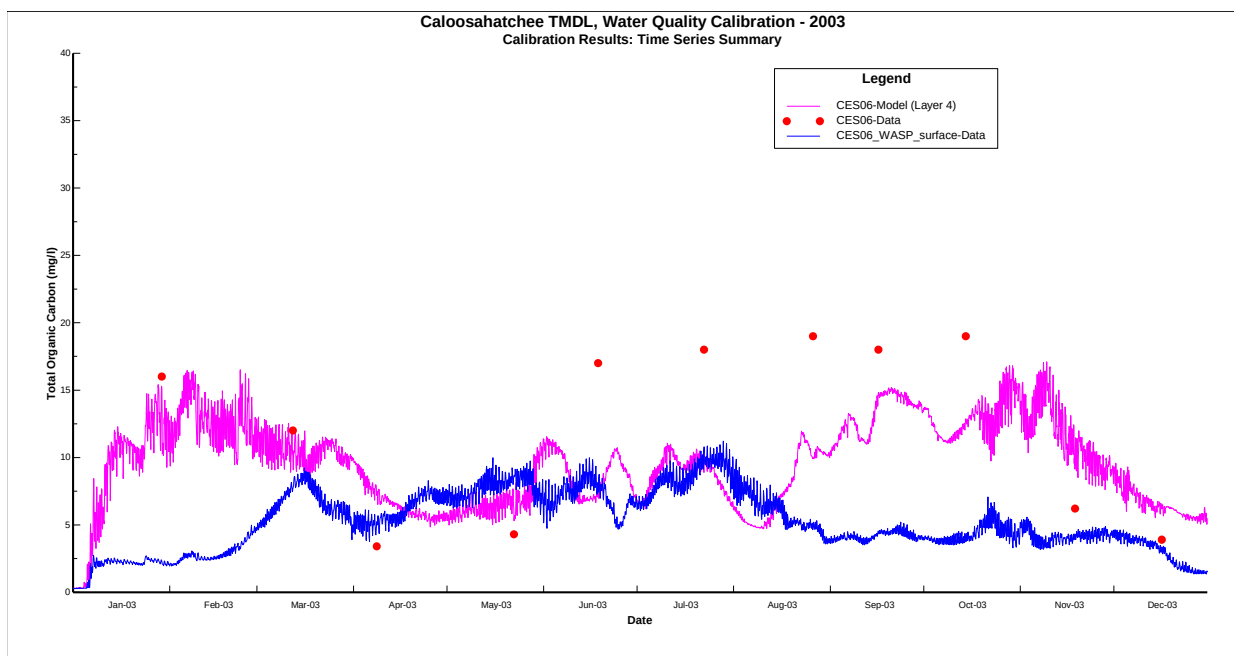


Figure 5-I- 27 Comparison of surface TOC for CES06

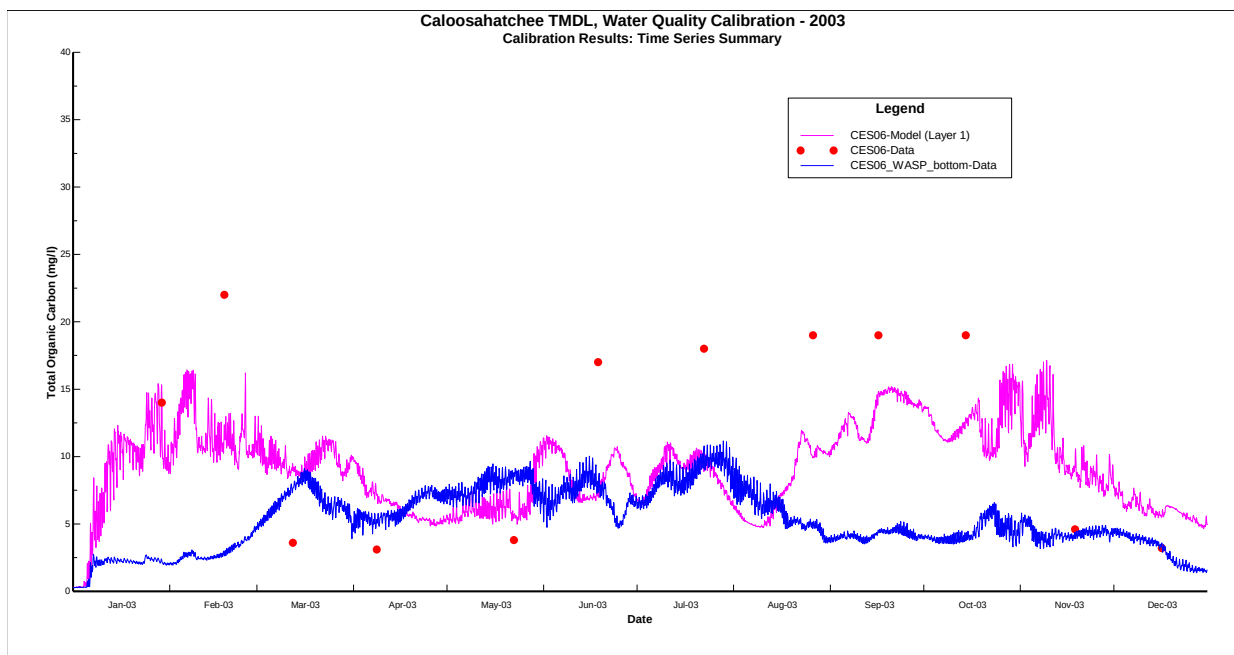


Figure 5-I- 28 Comparison of bottom TOC for CES06

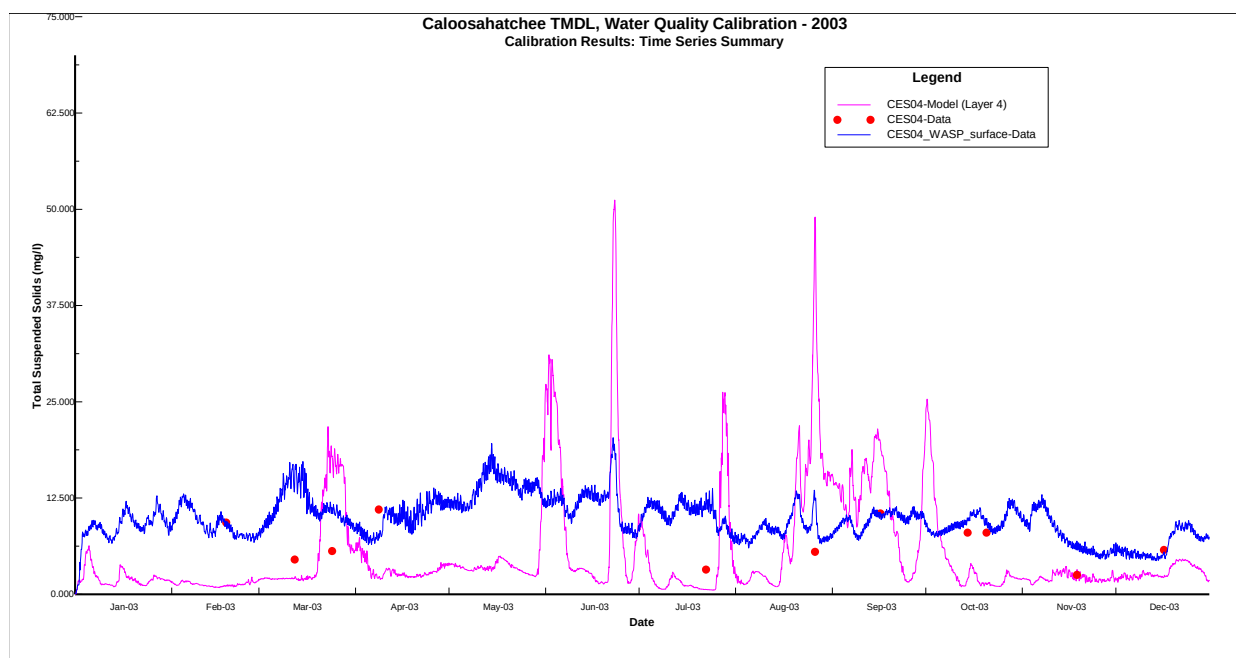


Figure 5-I- 29 Comparison of surface TSS for CES04

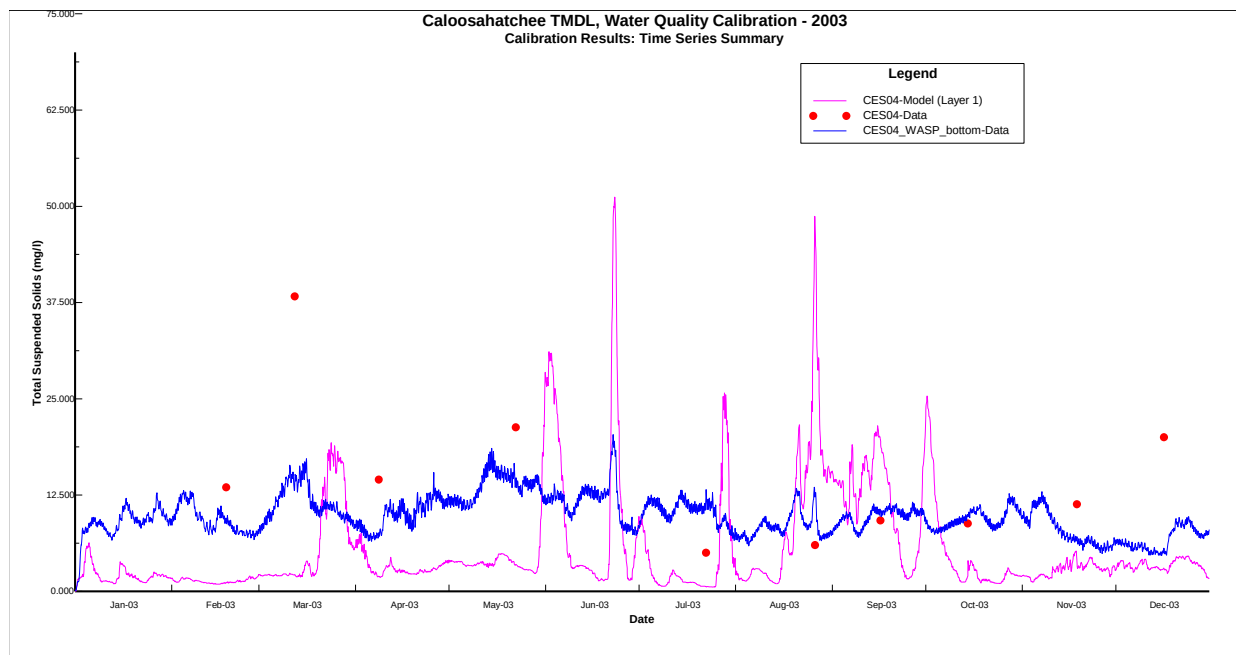


Figure 5-I- 30 Comparison of bottom TSS for CES04

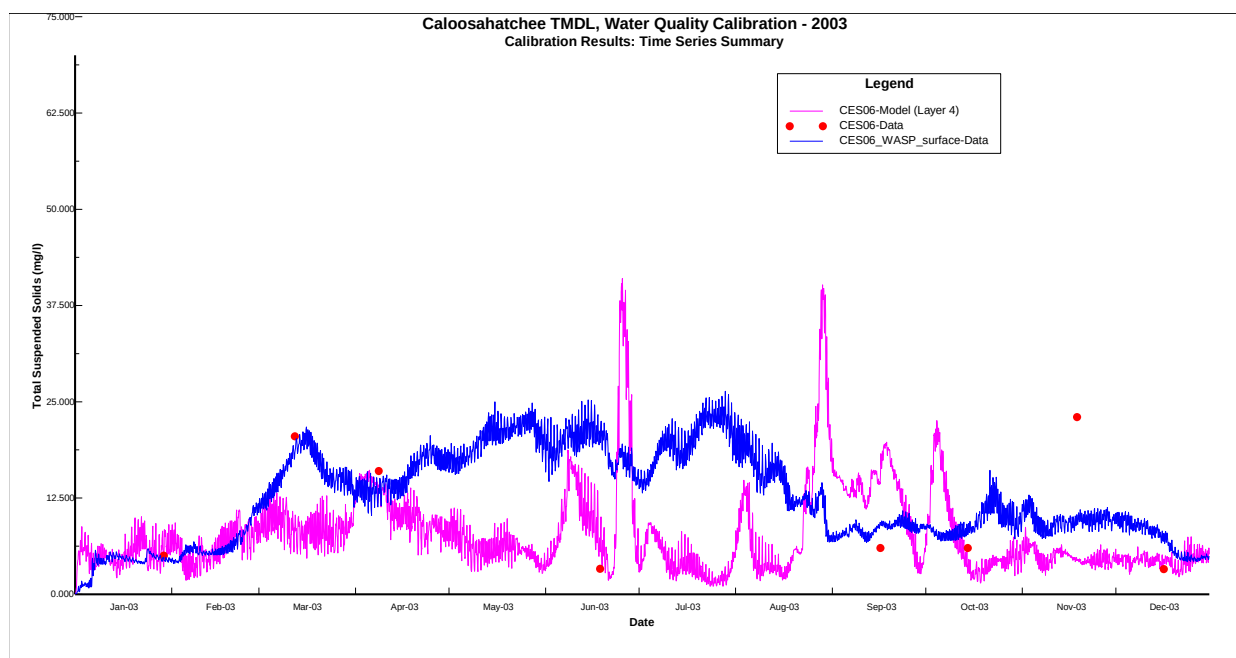


Figure 5-I- 31 Comparison of surface TSS for CES06

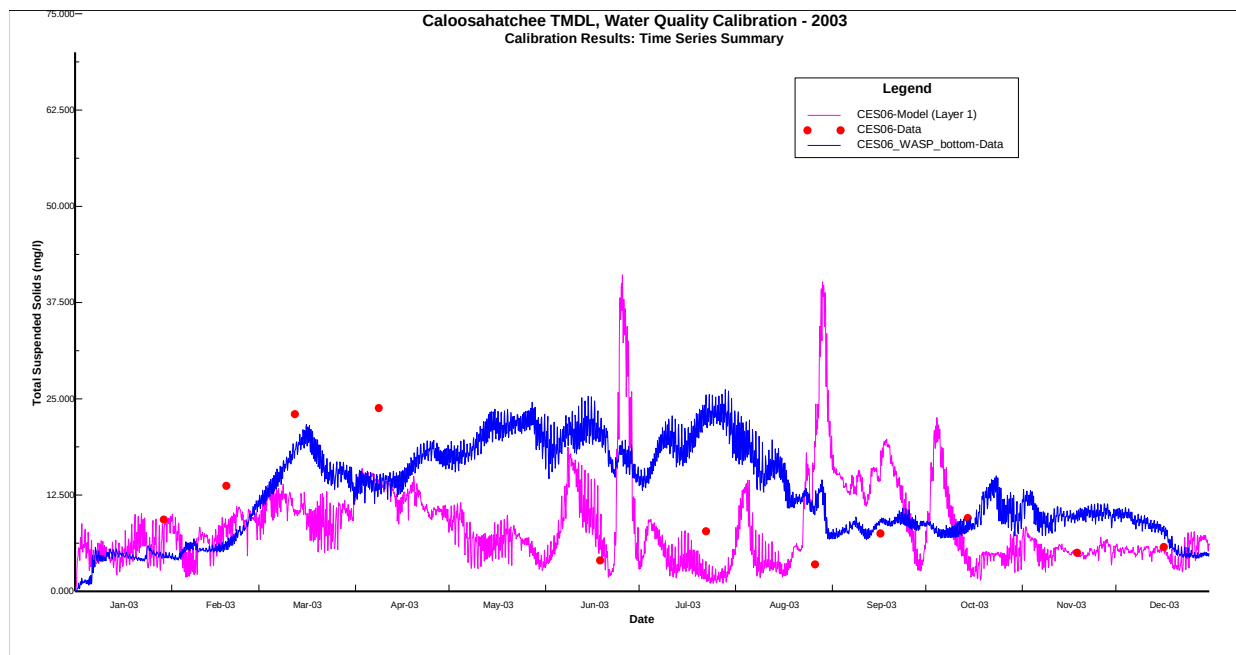


Figure 5-I- 32 Comparison of bottom TSS for CES06

Appendix 5-J

Comparison of EFDC and WASP Plots for Validation

Table of Figures

Figure 5-J- 1 Comparison of surface water temperature for CES04	1
Figure 5-J- 2 Comparison of bottom water temperature for CES04.....	1
Figure 5-J- 3 Comparison of surface water temperature for CES06	2
Figure 5-J- 4 Comparison of bottom water temperature for CES06.....	2
Figure 5-J- 5 Comparison of surface total P for CES04.....	3
Figure 5-J- 6 Comparison of bottom total P for CES04	3
Figure 5-J- 7 Comparison of surface total P for CES06.....	4
Figure 5-J- 8 Comparison of bottom total P for CES06	4
Figure 5-J- 9 Comparison of surface total phosphate for CES04	5
Figure 5-J- 10 Comparison of bottom total phosphate for CES04	5
Figure 5-J- 11 Comparison of surface total phosphate for CES06	6
Figure 5-J- 12 Comparison of bottom total phosphate for CES06	6
Figure 5-J- 13 Comparison of surface total N for CES04	7
Figure 5-J- 14 Comparison of bottom total N for CES04.....	7
Figure 5-J- 15 Comparison of surface total N for CES06	8
Figure 5-J- 16 Comparison of bottom total N for CES06.....	8
Figure 5-J- 17 Comparison of surface NH ₄ -N for CES04	9
Figure 5-J- 18 Comparison of bottom NH ₄ -N for CES04.....	9
Figure 5-J- 19 Comparison of surface NH ₄ -N for CES06	10
Figure 5-J- 20 Comparison of bottom NH ₄ -N for CES06.....	10
Figure 5-J- 21 Comparison of surface NO ₃ -N for CES04.....	11
Figure 5-J- 22 Comparison of bottom NO ₃ -N for CES04	11
Figure 5-J- 23 Comparison of surface NO ₃ -N for CES06.....	12
Figure 5-J- 24 Comparison of bottom NO ₃ -N for CES06	12

Figure 5-J- 25 Comparison of surface TOC for CES04	13
Figure 5-J- 26 Comparison of bottom TOC for CES04	13
Figure 5-J- 27 Comparison of surface TOC for CES06	14
Figure 5-J- 28 Comparison of bottom TOC for CES06	14
Figure 5-J- 29 Comparison of surface TSS for CES04	15
Figure 5-J- 30 Comparison of bottom TSS for CES04	15
Figure 5-J- 31 Comparison of surface TSS for CES06	16
Figure 5-J- 32 Comparison of bottom TSS for CES06	16

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

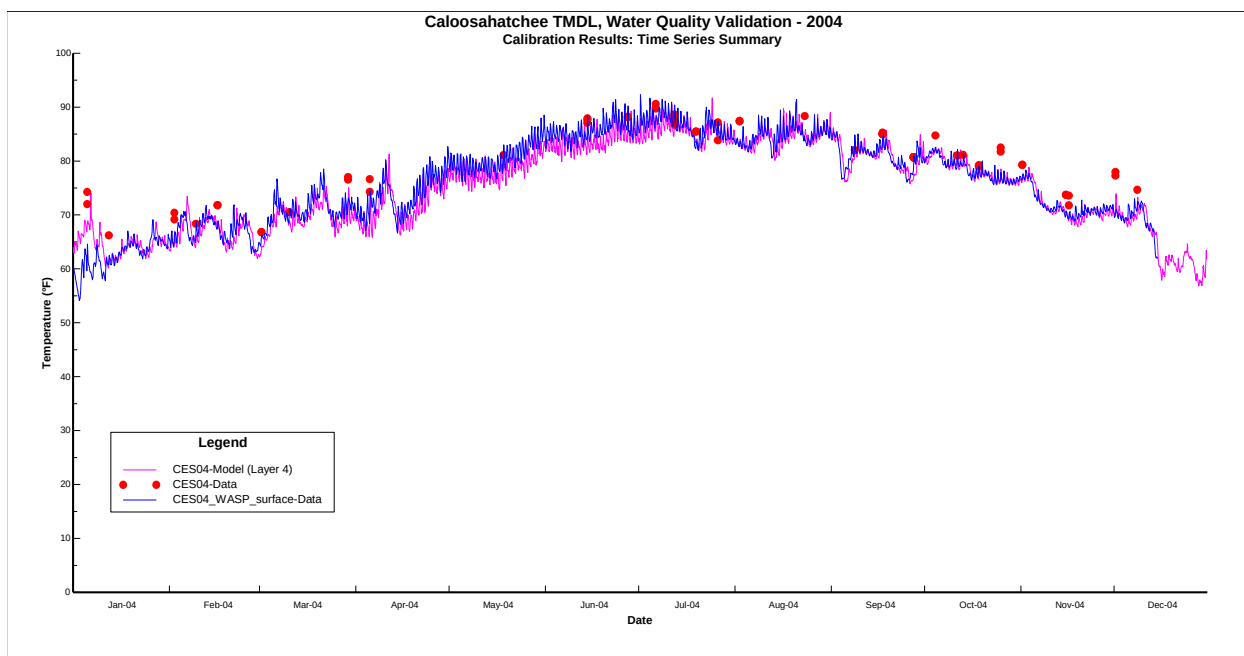


Figure 5-J- 1 Comparison of surface water temperature for CES04

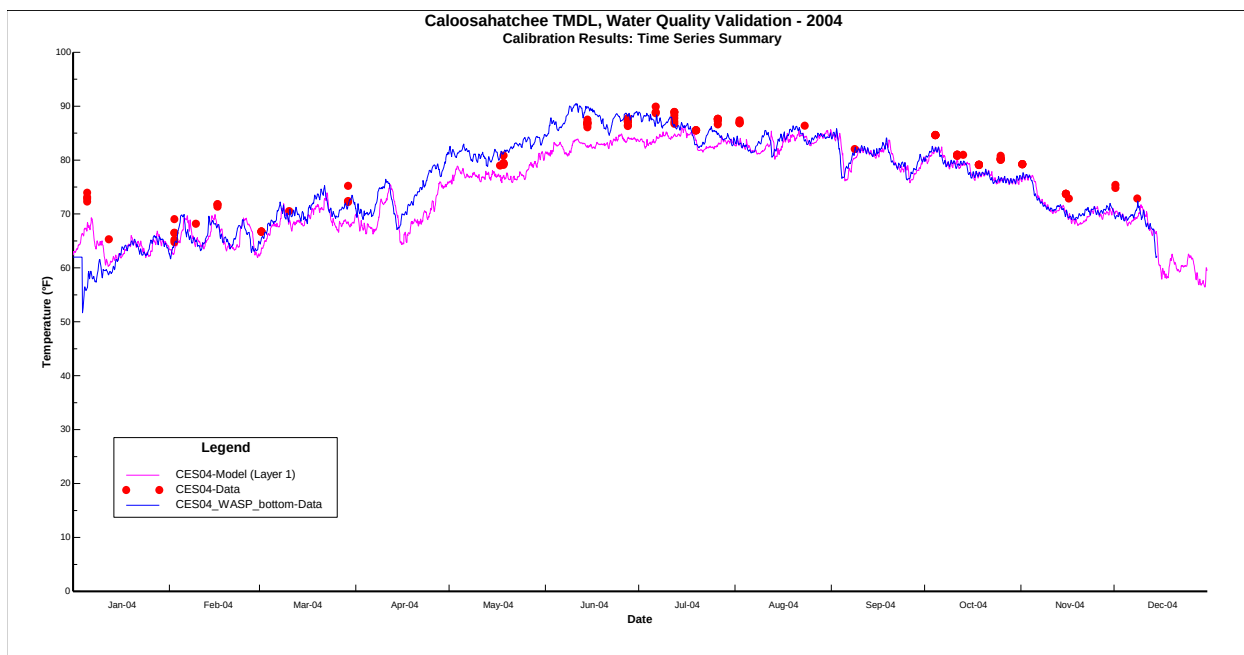


Figure 5-J- 2 Comparison of bottom water temperature for CES04

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

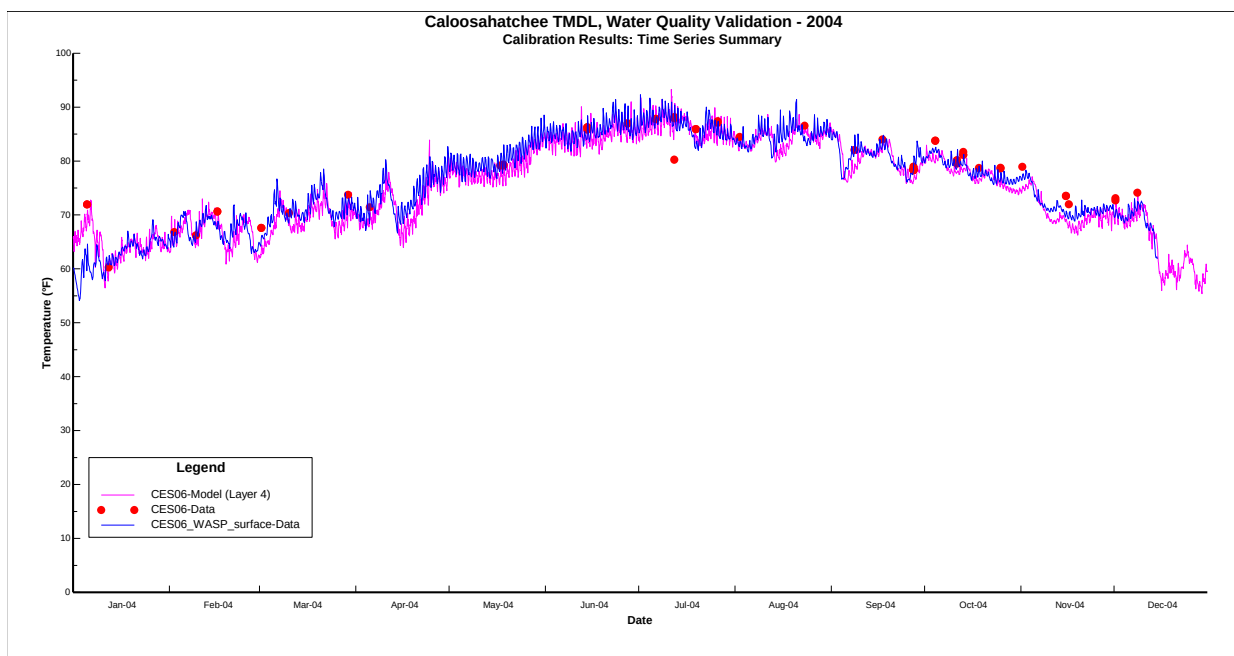


Figure 5-J- 3 Comparison of surface water temperature for CES06

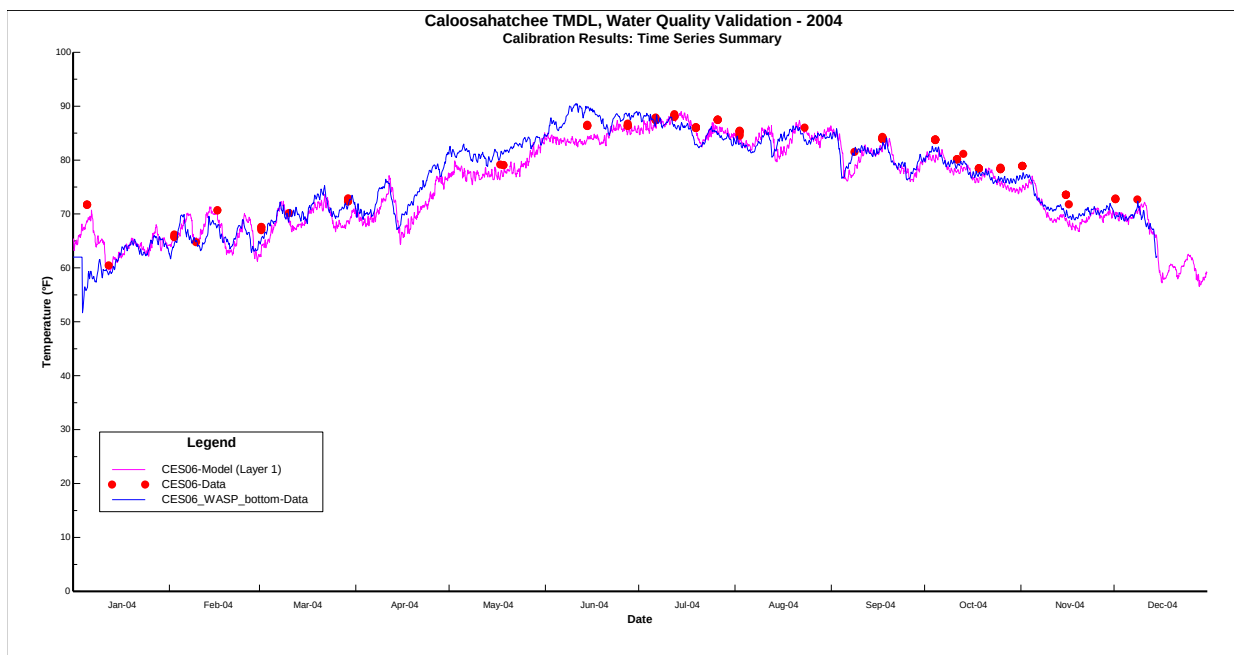


Figure 5-J- 4 Comparison of bottom water temperature for CES06

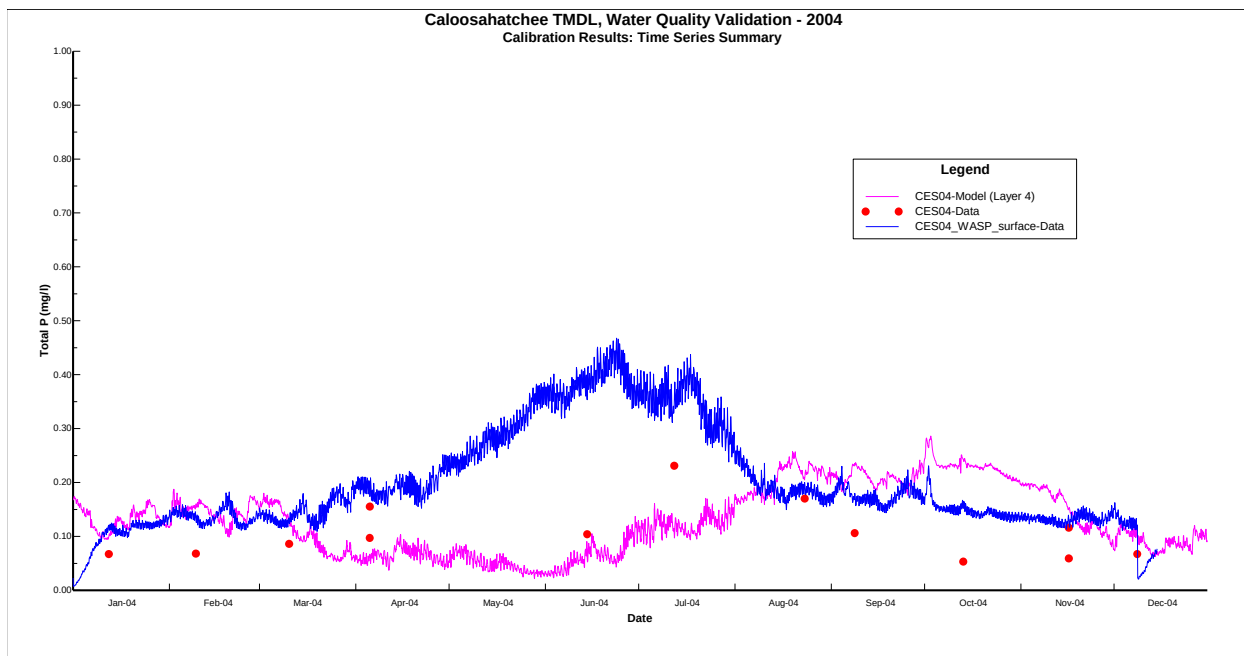


Figure 5-J- 5 Comparison of surface total P for CES04

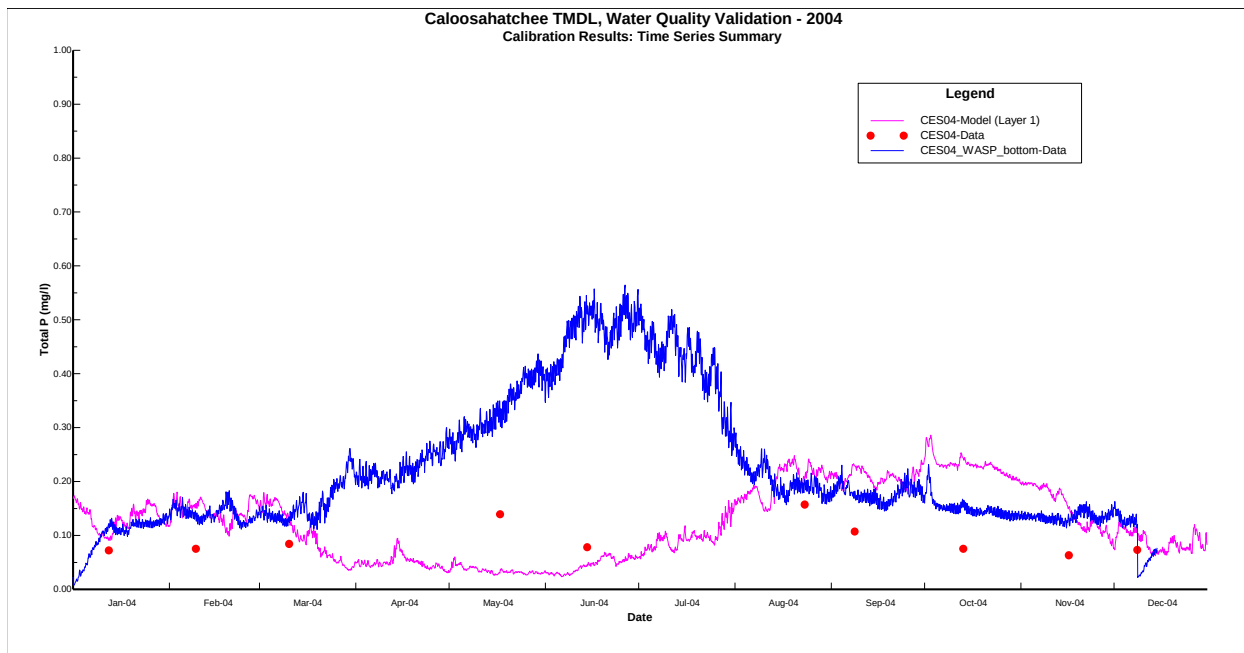


Figure 5-J- 6 Comparison of bottom total P for CES04

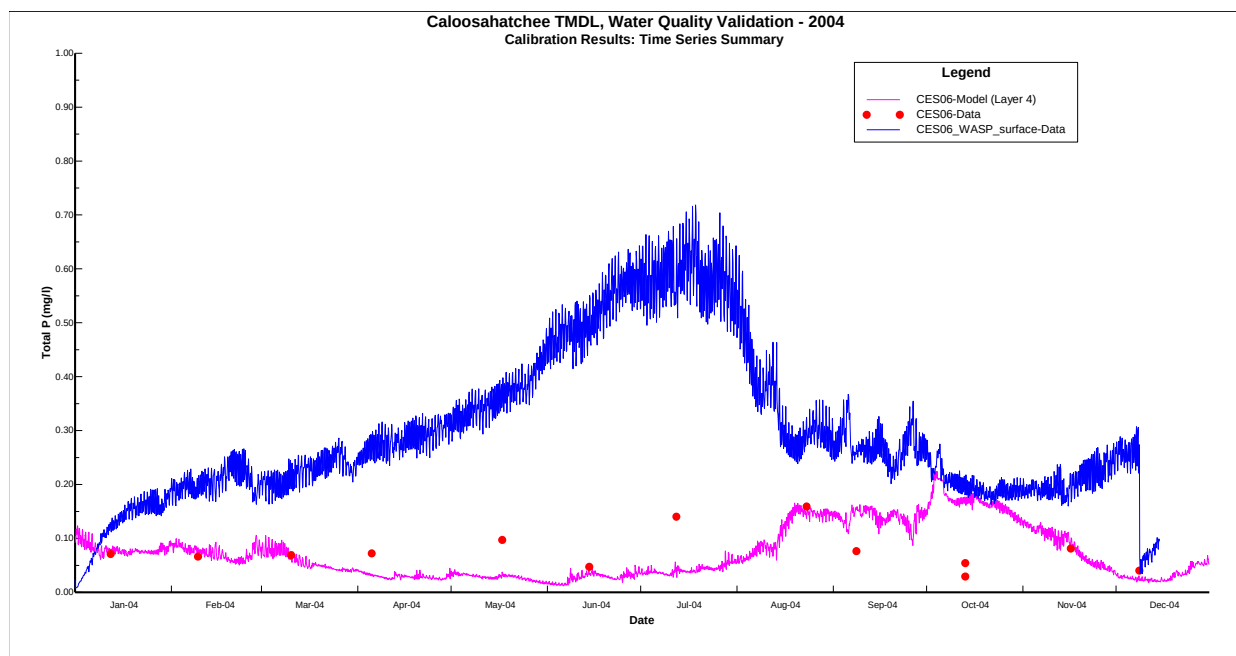


Figure 5-J- 7 Comparison of surface total P for CES06

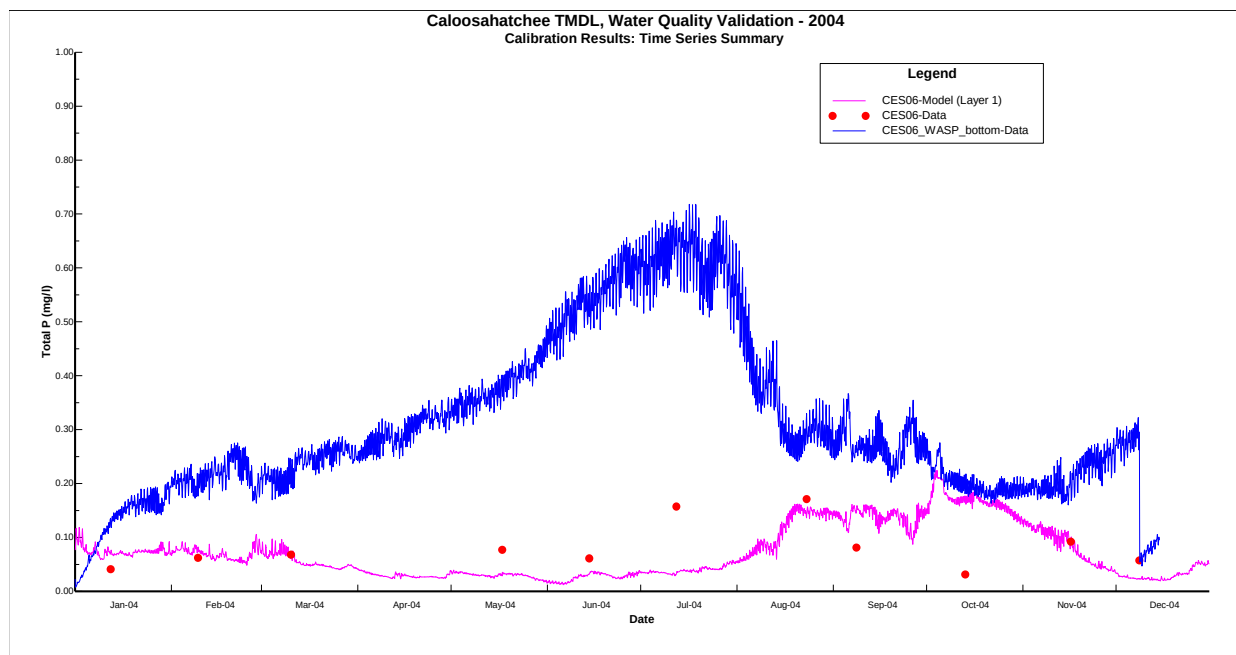


Figure 5-J- 8 Comparison of bottom total P for CES06

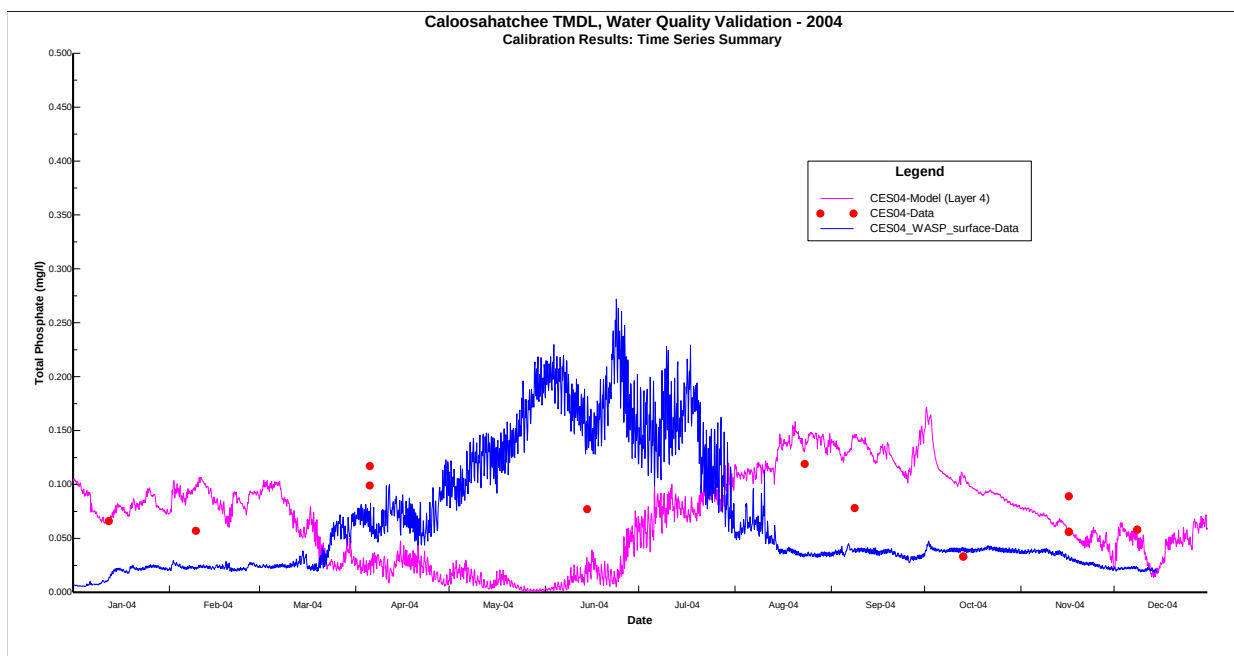


Figure 5-J- 9 Comparison of surface total phosphate for CES04

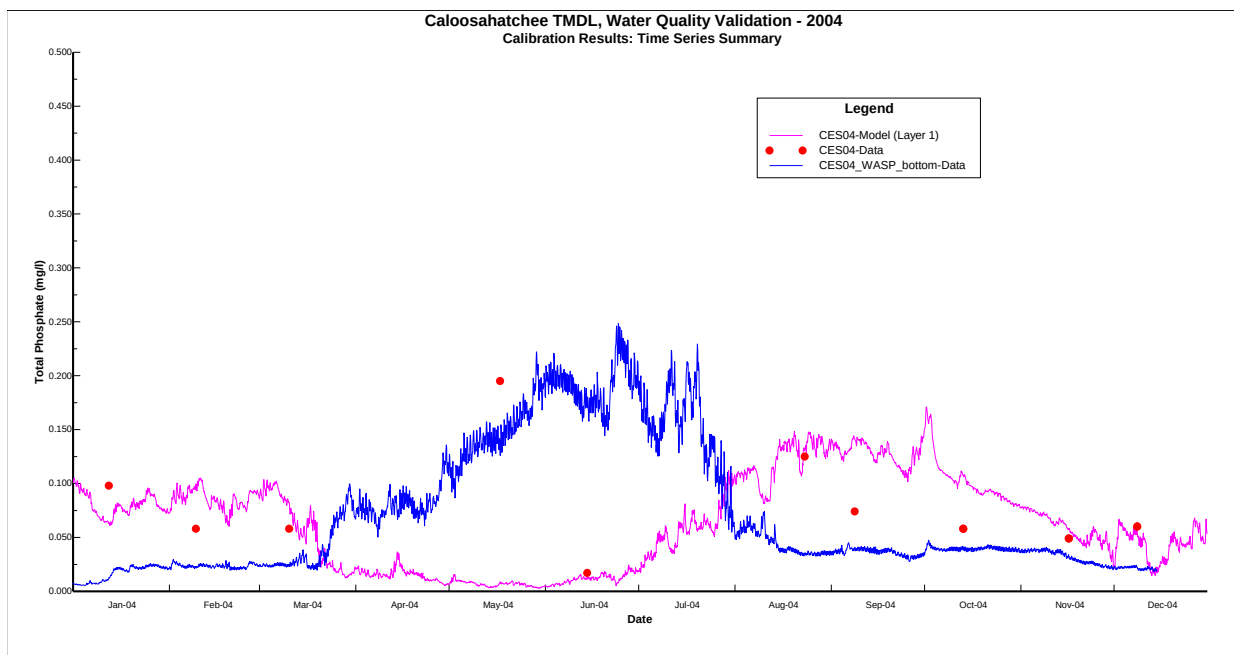


Figure 5-J- 10 Comparison of bottom total phosphate for CES04

Florida Department of Environmental Protection
Caloosahatchee River Basin TMDL Model Support
Task Assignment CDM07-04, May 2008

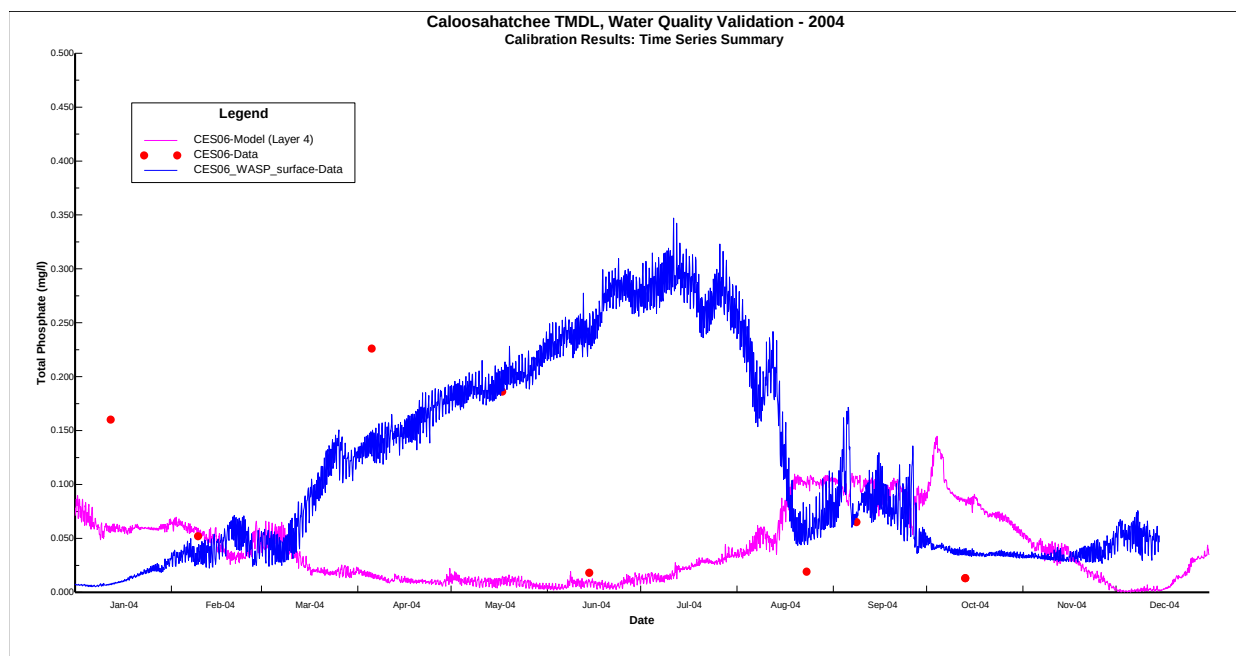


Figure 5-J- 11 Comparison of surface total phosphate for CES06

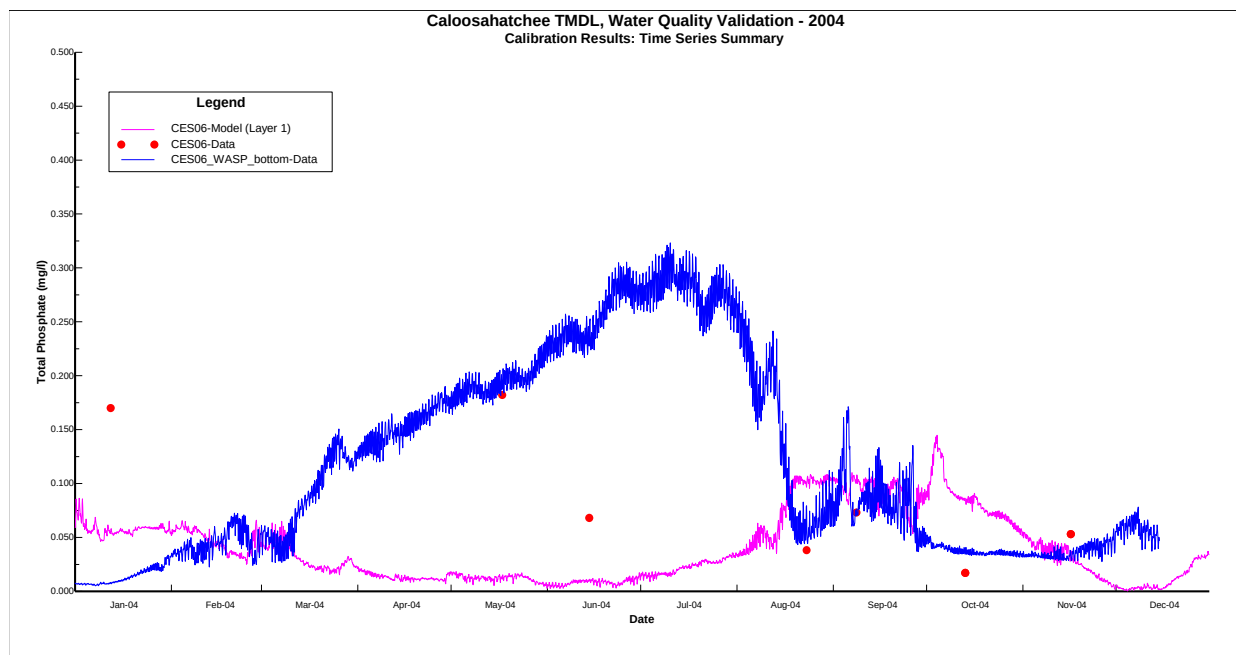


Figure 5-J- 12 Comparison of bottom total phosphate for CES06

Florida Department of Environmental Protection
 Caloosahatchee River Basin TMDL Model Support
 Task Assignment CDM07-04, May 2008

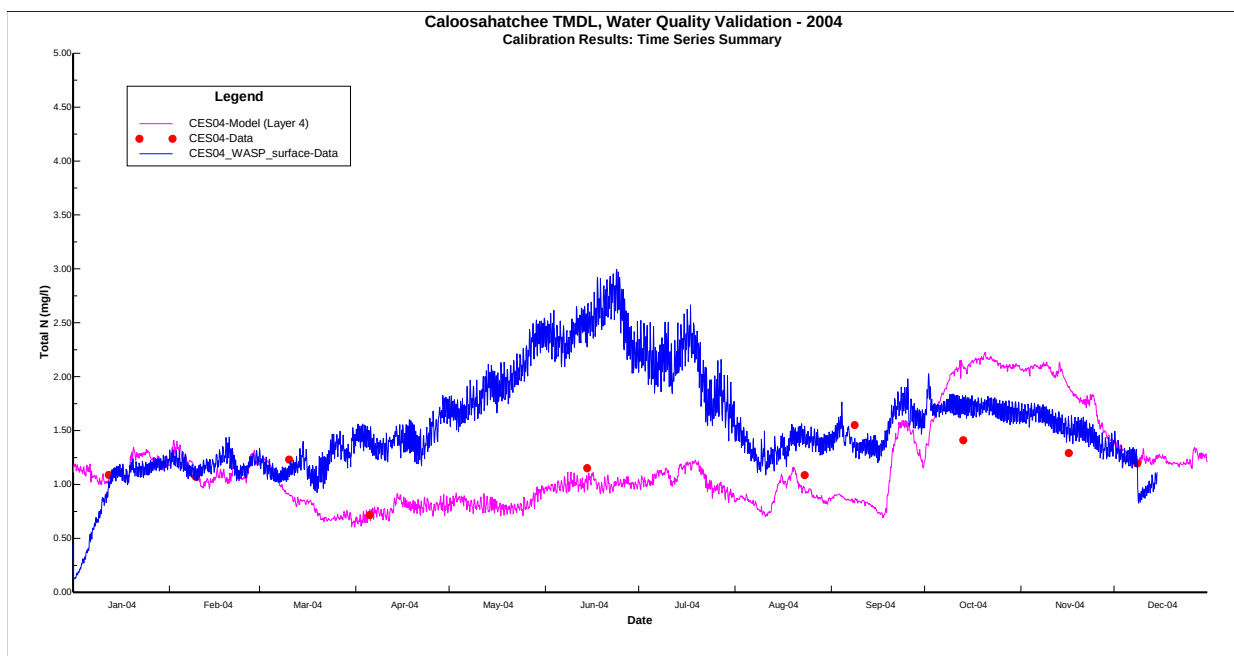


Figure 5-J- 13 Comparison of surface total N for CES04

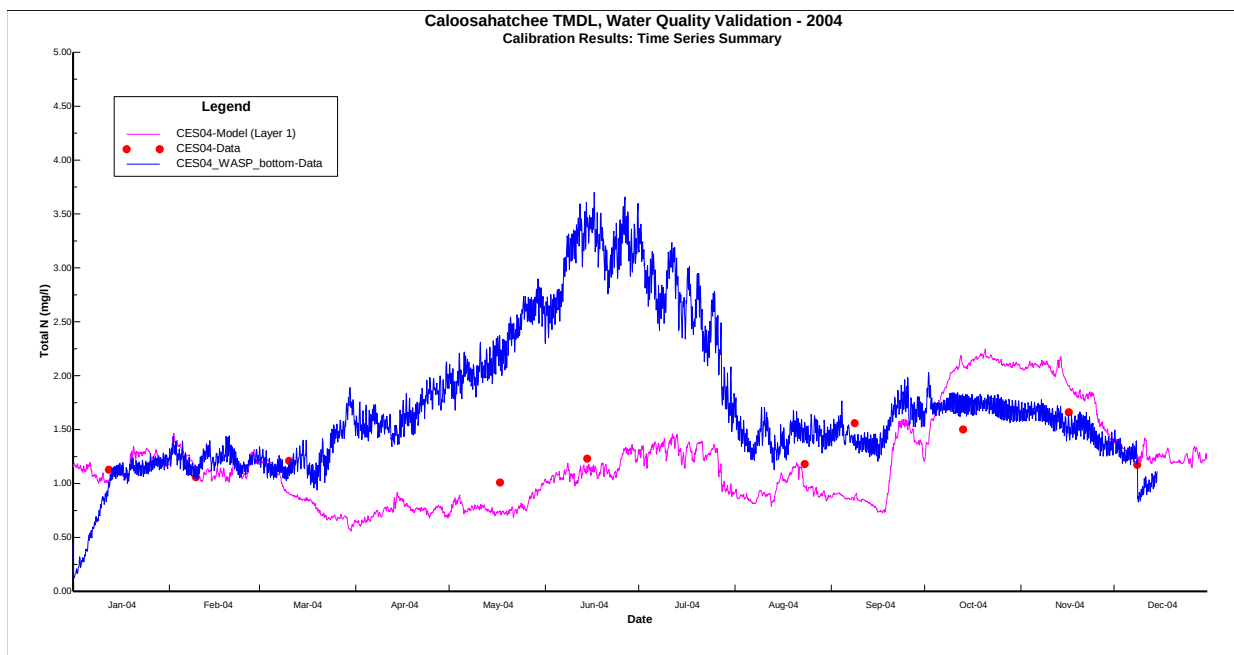


Figure 5-J- 14 Comparison of bottom total N for CES04

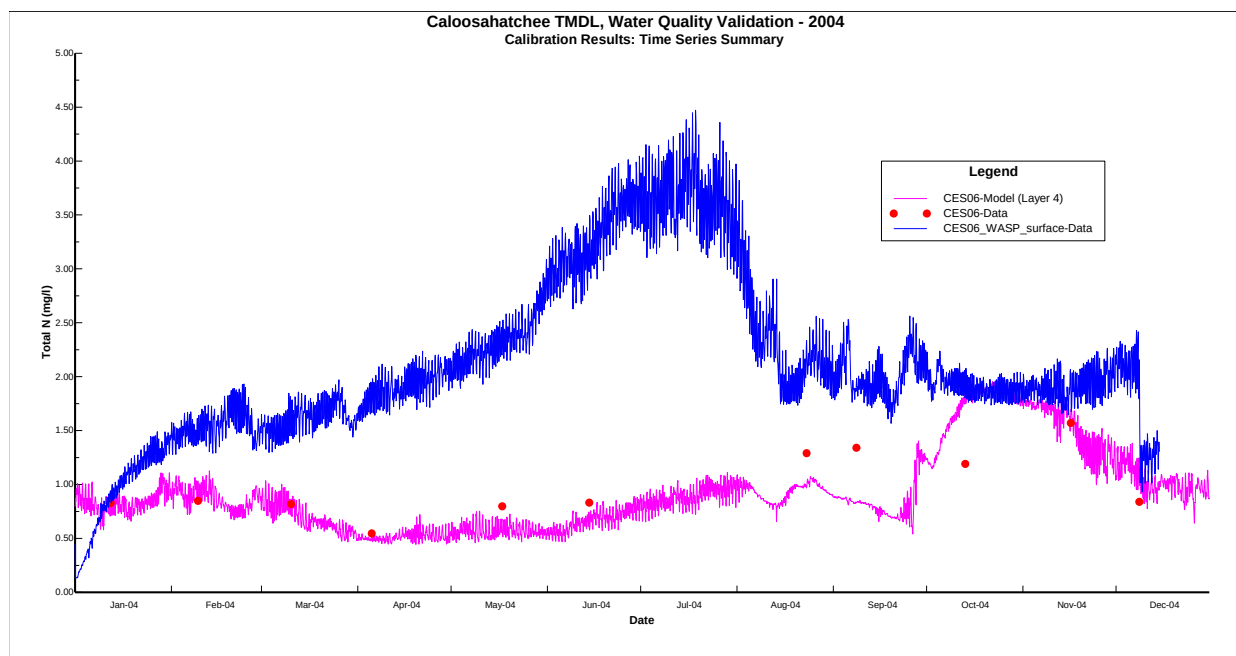


Figure 5-J- 15 Comparison of surface total N for CES06

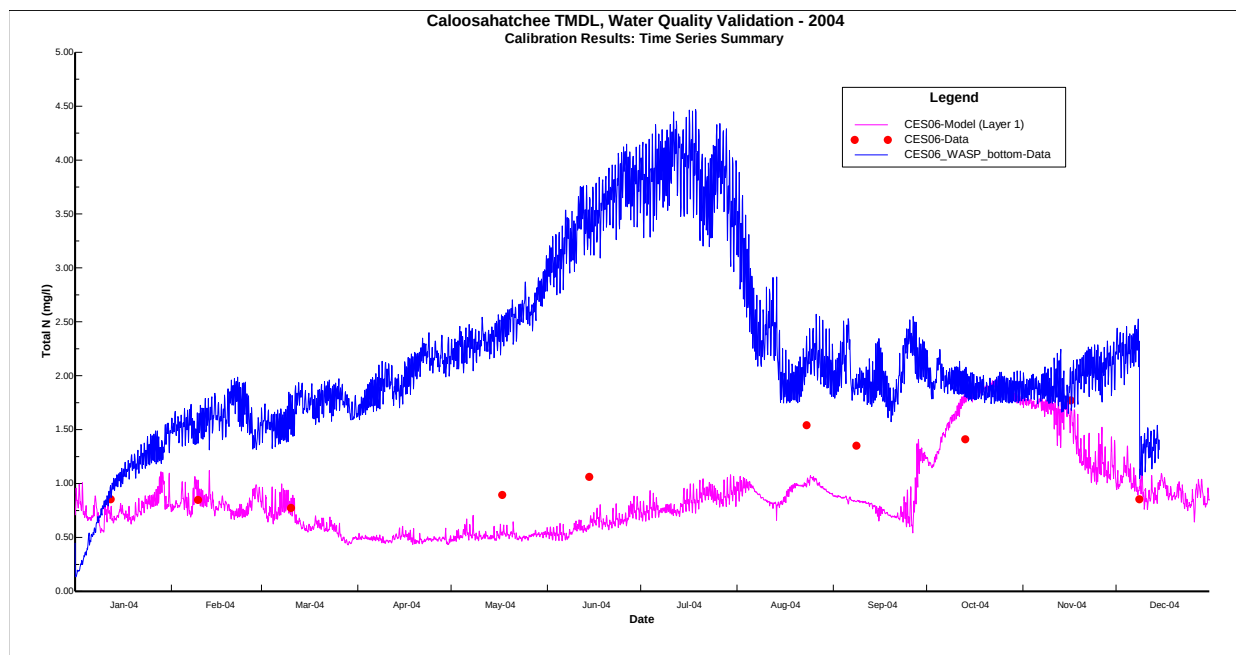


Figure 5-J- 16 Comparison of bottom total N for CES06

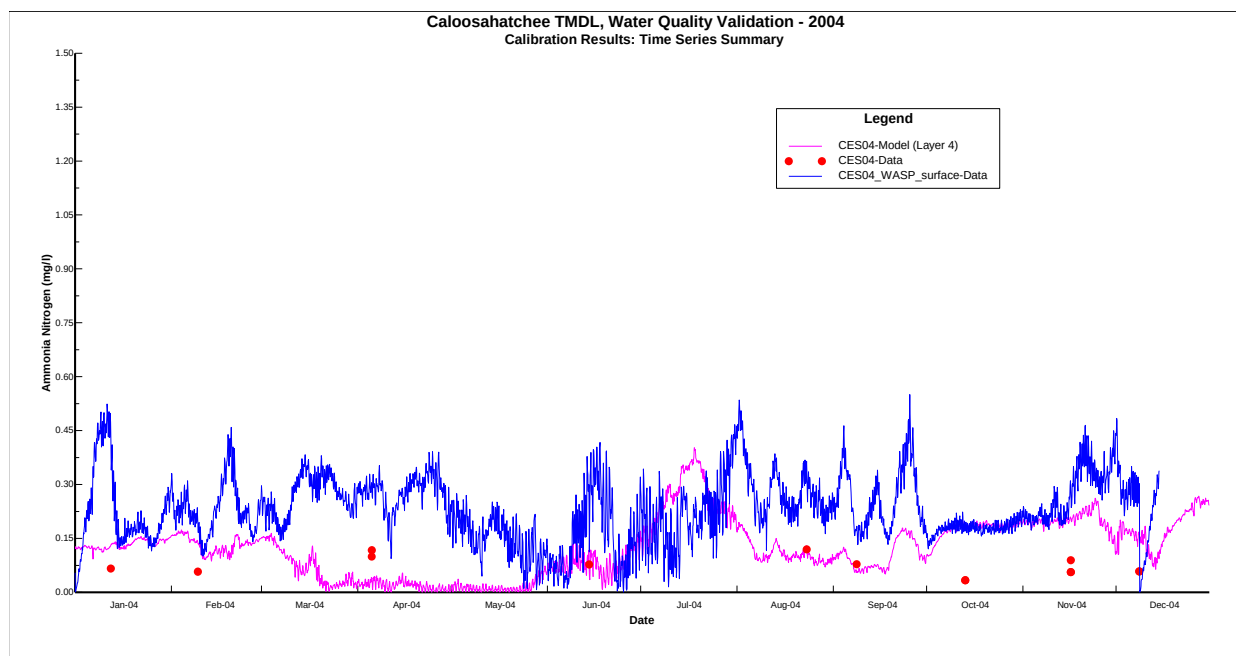


Figure 5-J- 17 Comparison of surface $\text{NH}_4\text{-N}$ for CES04

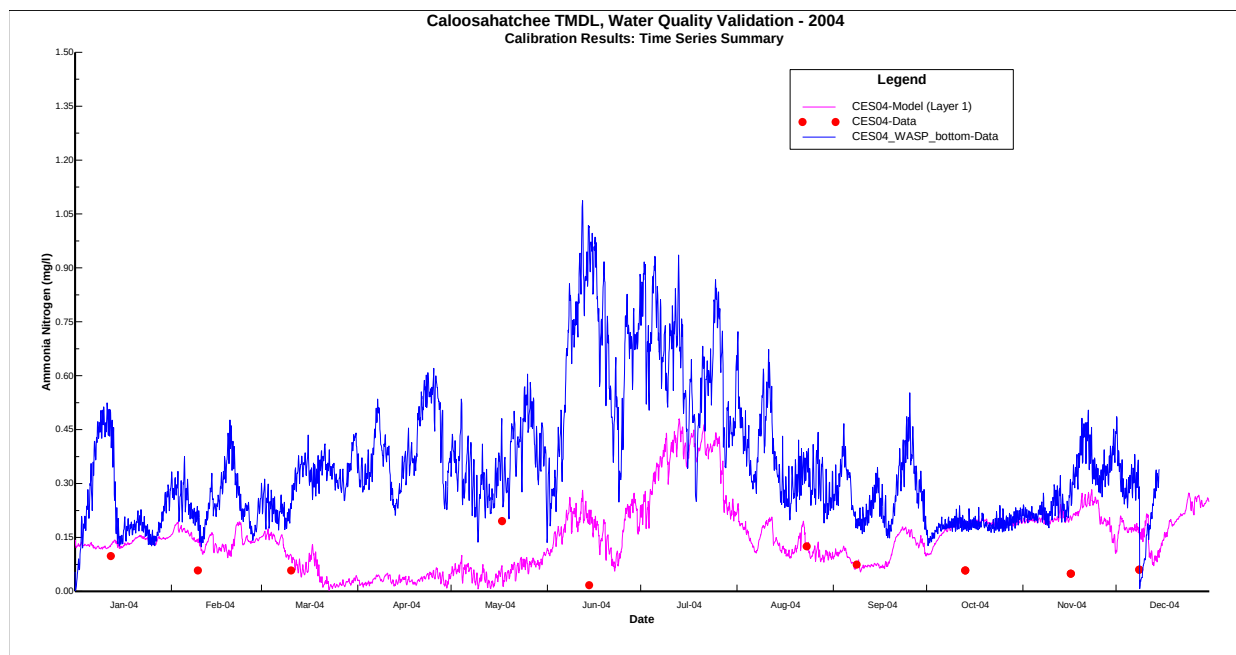


Figure 5-J- 18 Comparison of bottom $\text{NH}_4\text{-N}$ for CES04

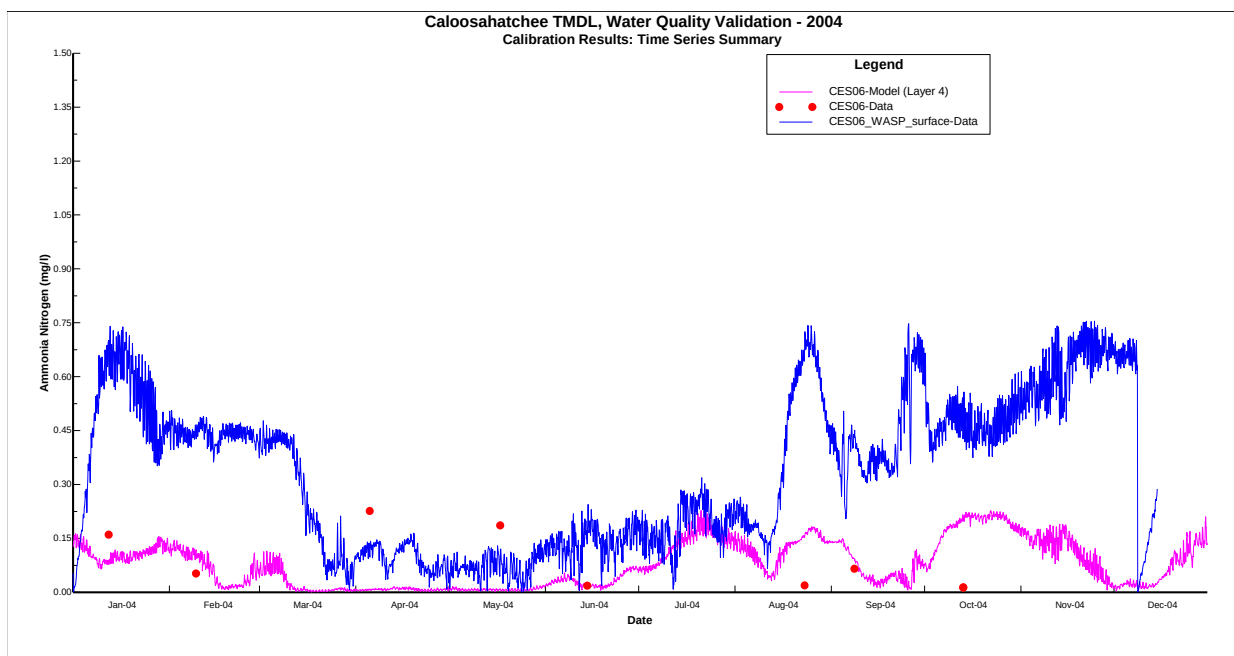


Figure 5-J- 19 Comparison of surface $\text{NH}_4\text{-N}$ for CES06

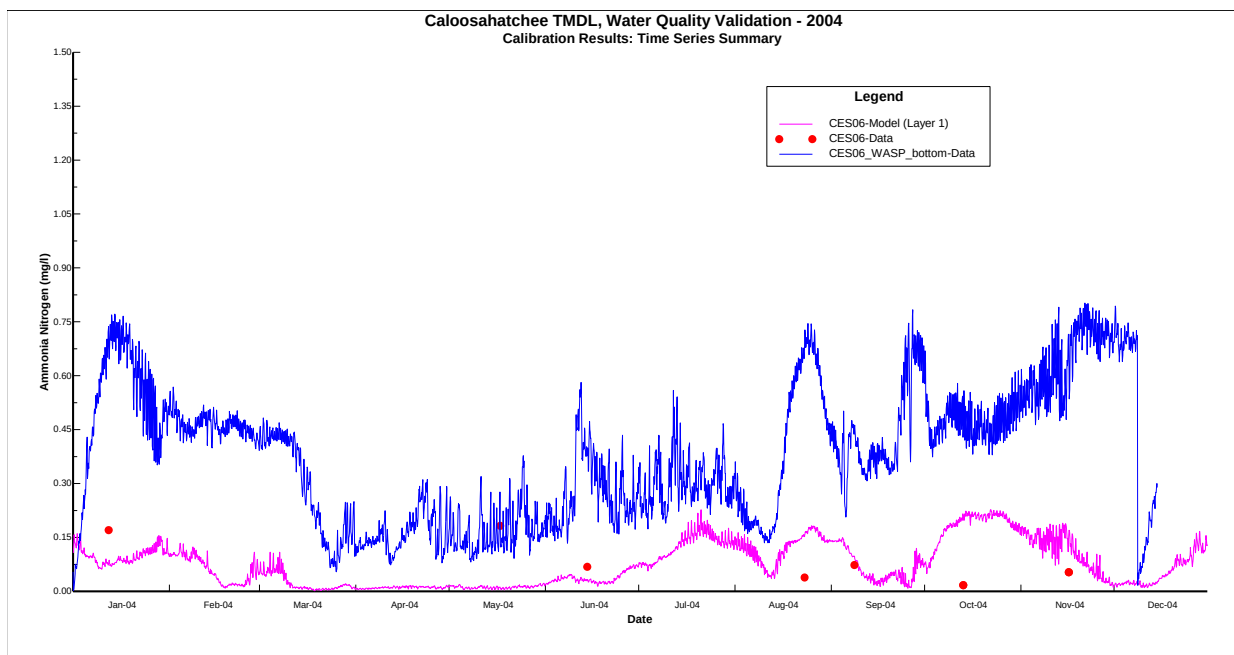


Figure 5-J- 20 Comparison of bottom $\text{NH}_4\text{-N}$ for CES06

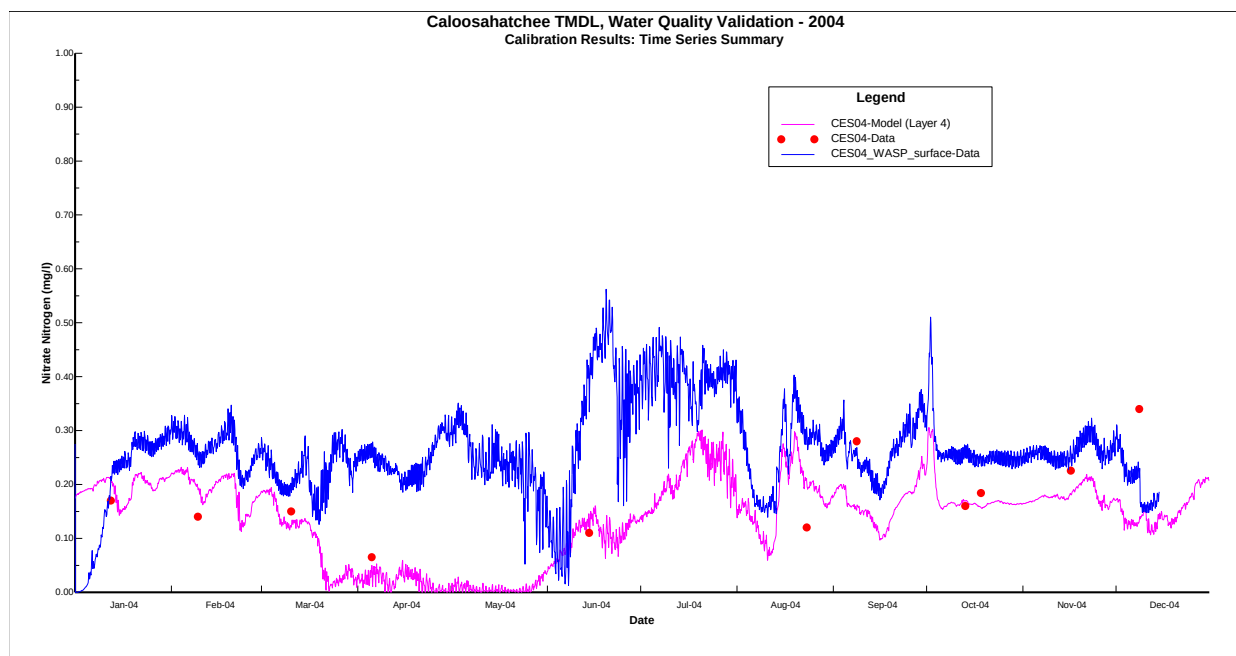


Figure 5-J- 21 Comparison of surface $\text{NO}_3\text{-N}$ for CES04

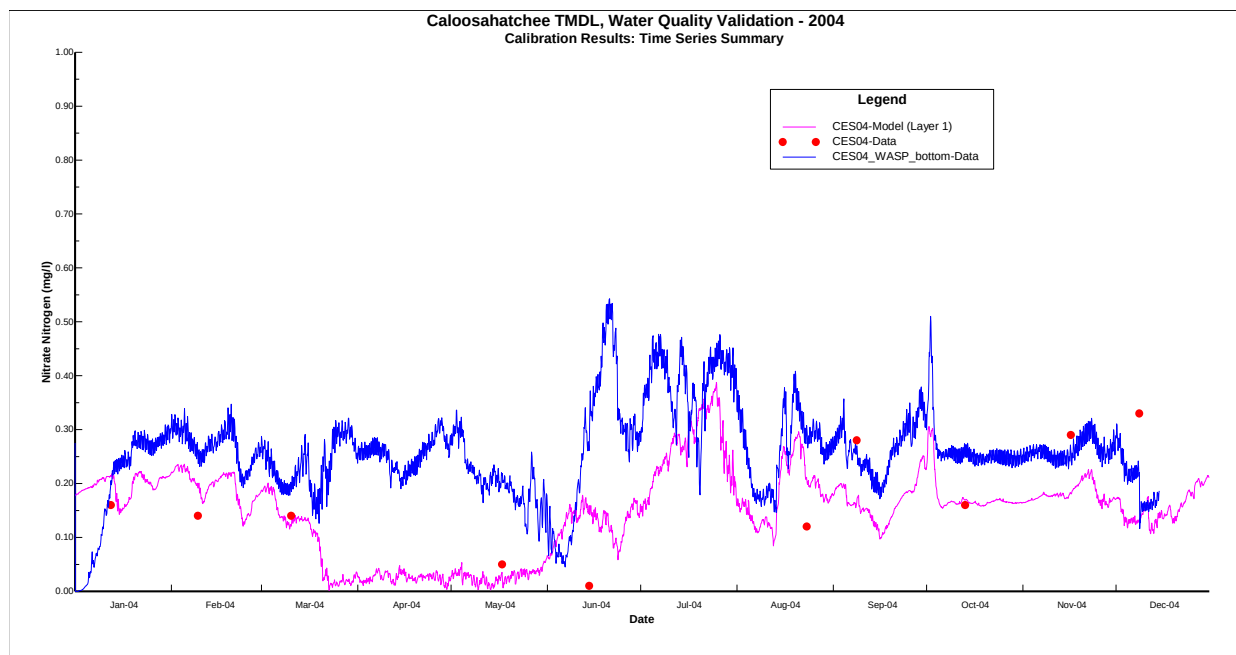


Figure 5-J- 22 Comparison of bottom $\text{NO}_3\text{-N}$ for CES04

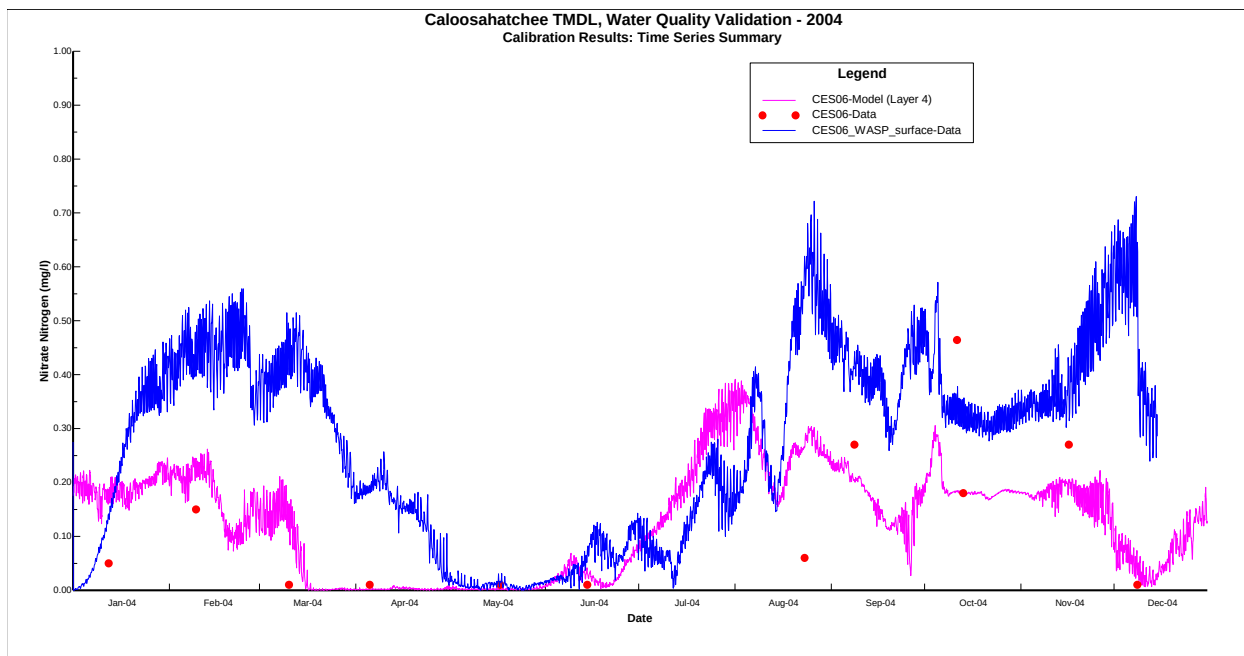


Figure 5-J- 23 Comparison of surface $\text{NO}_3\text{-N}$ for CES06

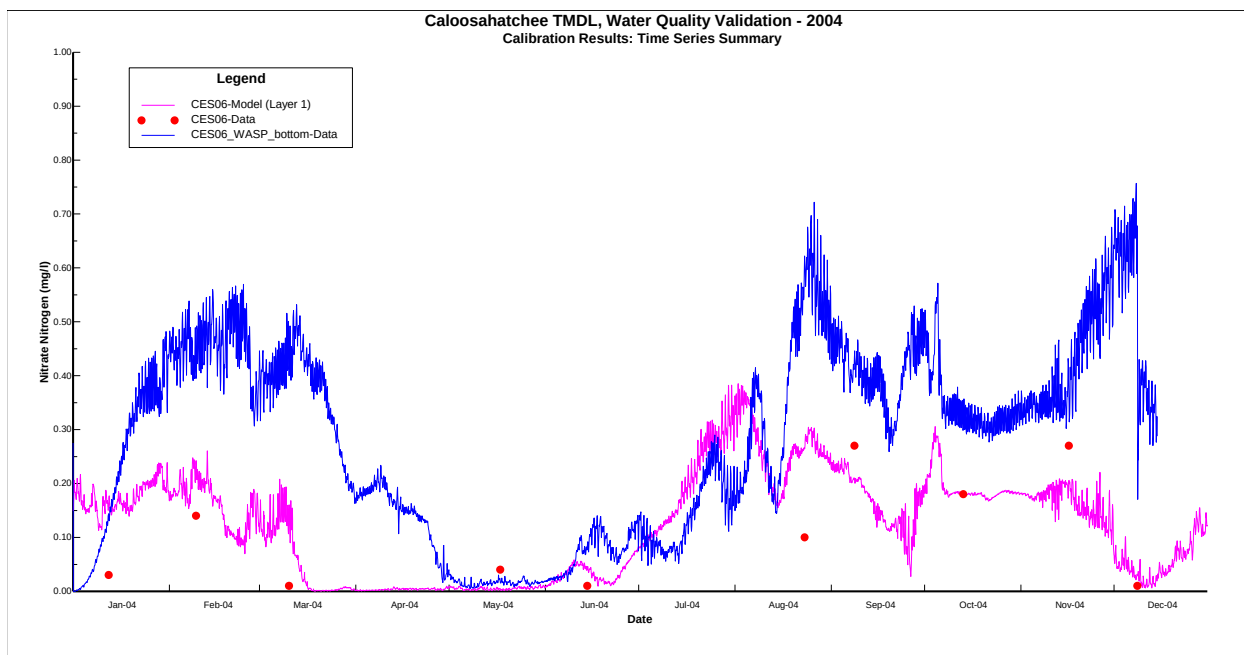


Figure 5-J- 24 Comparison of bottom $\text{NO}_3\text{-N}$ for CES06

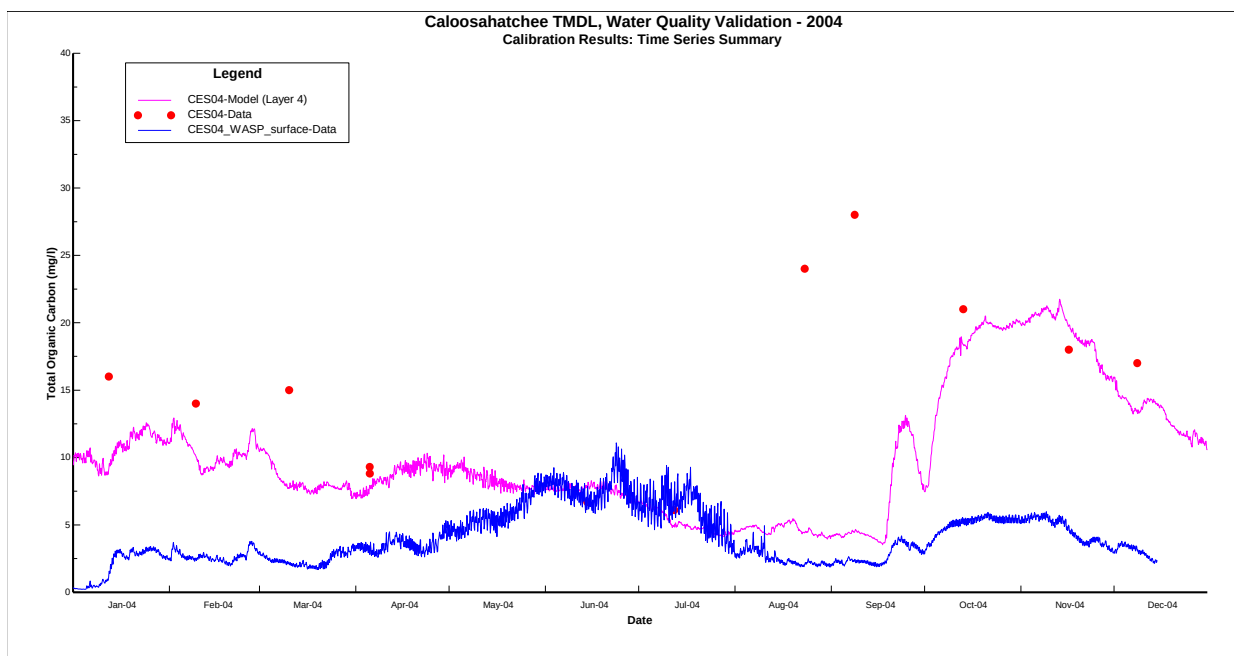


Figure 5-J- 25 Comparison of surface TOC for CES04

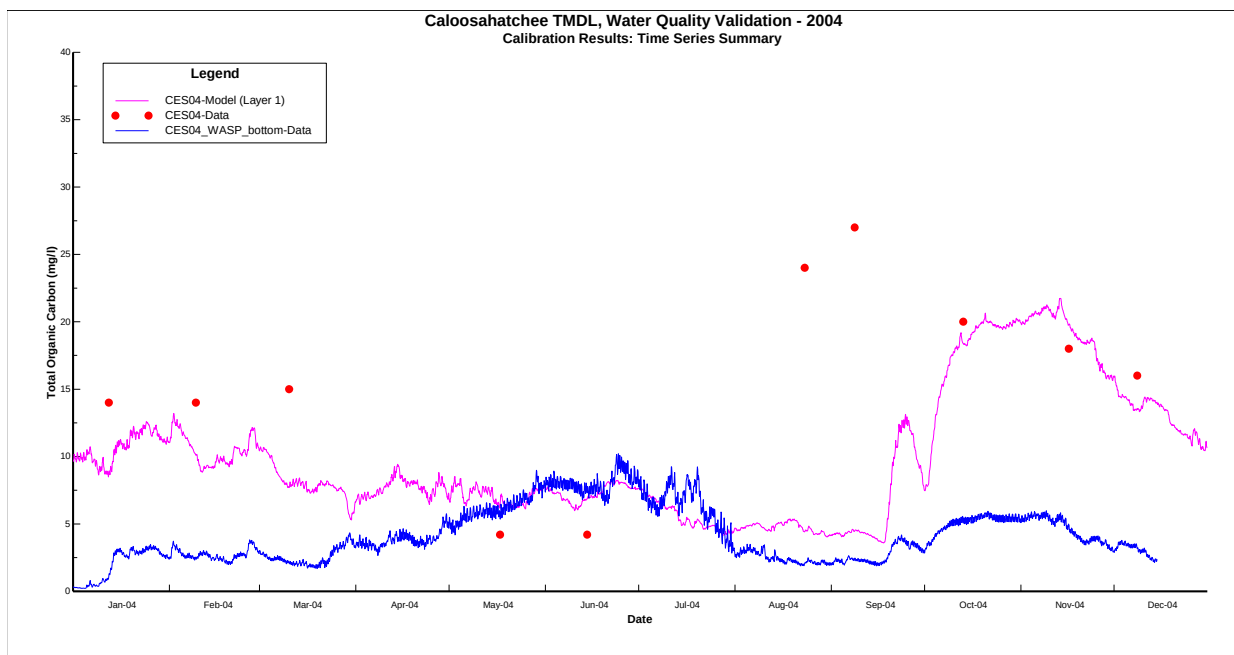


Figure 5-J- 26 Comparison of bottom TOC for CES04

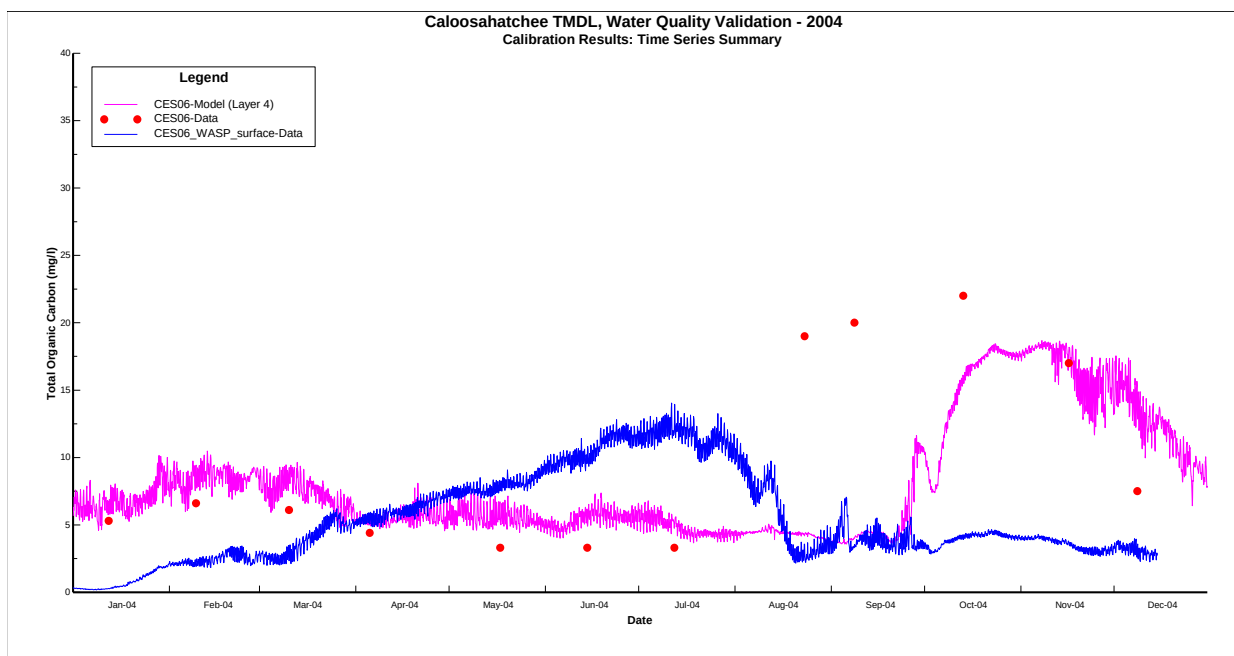


Figure 5-J- 27 Comparison of surface TOC for CES06

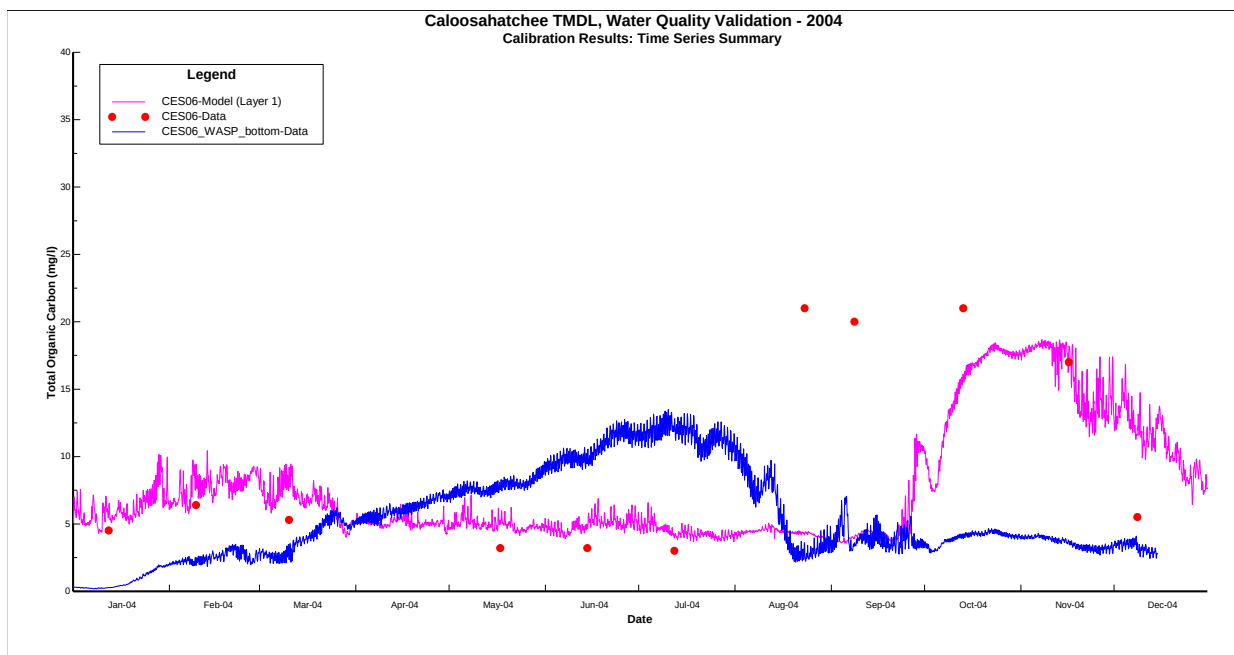


Figure 5-J- 28 Comparison of bottom TOC for CES06

Florida Department of Environmental Protection
 Caloosahatchee River Basin TMDL Model Support
 Task Assignment CDM07-04, May 2008

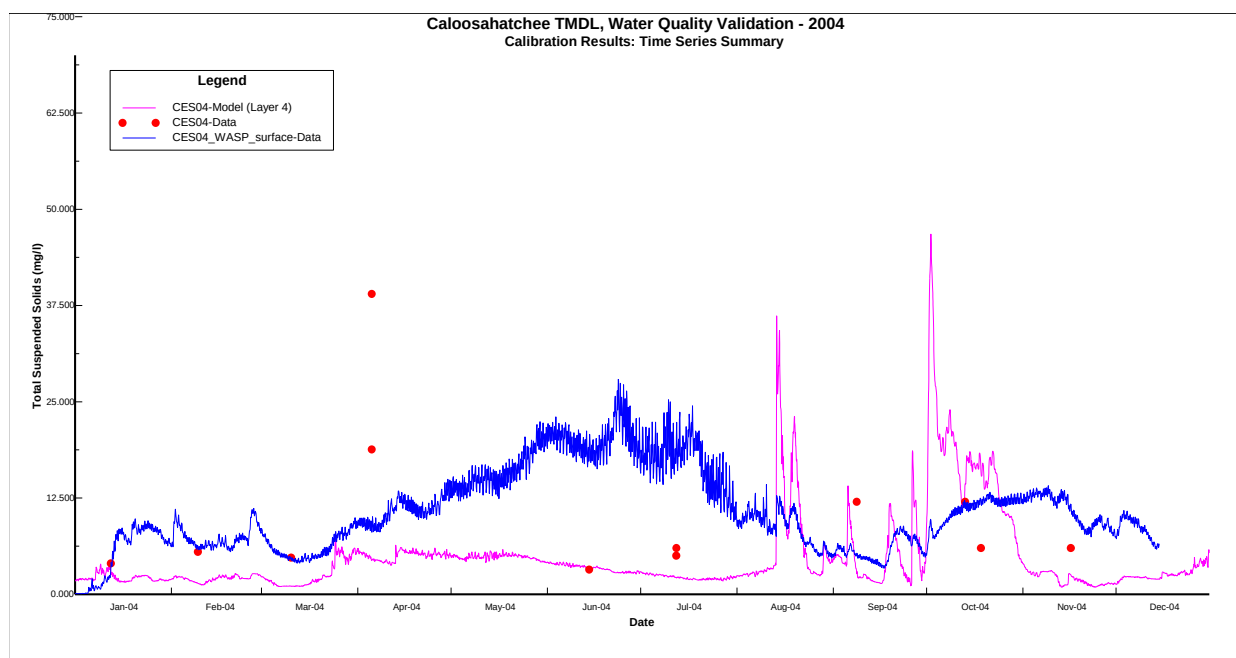


Figure 5-J- 29 Comparison of surface TSS for CES04

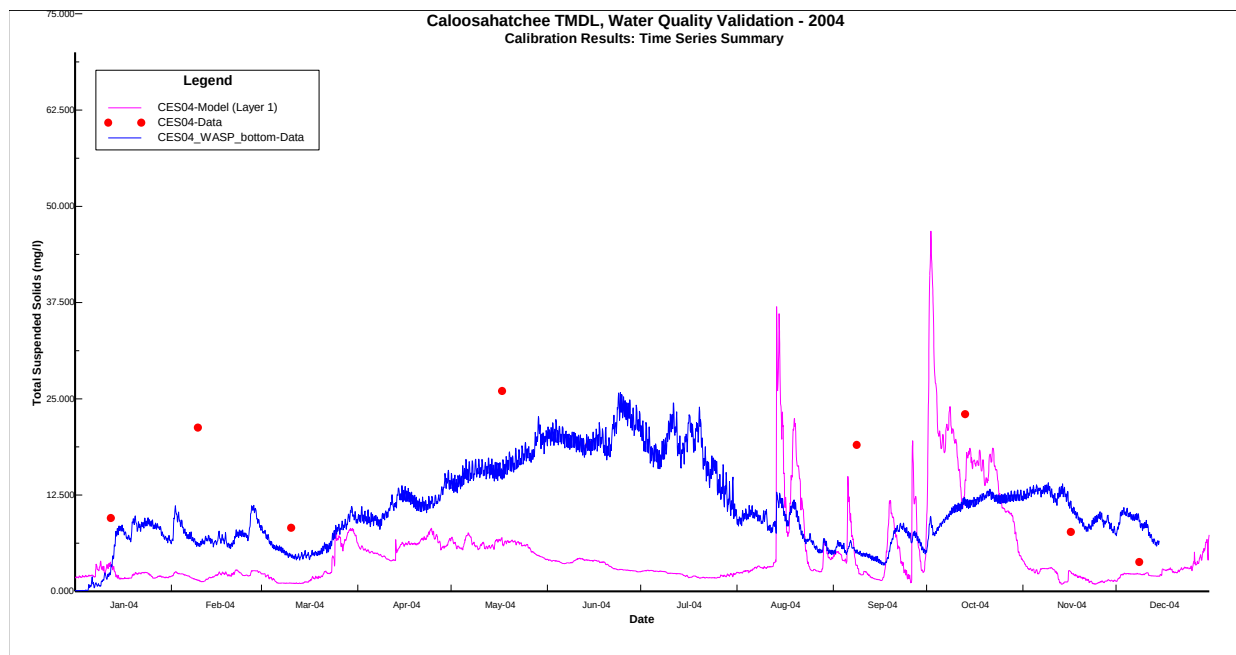


Figure 5-J- 30 Comparison of bottom TSS for CES04

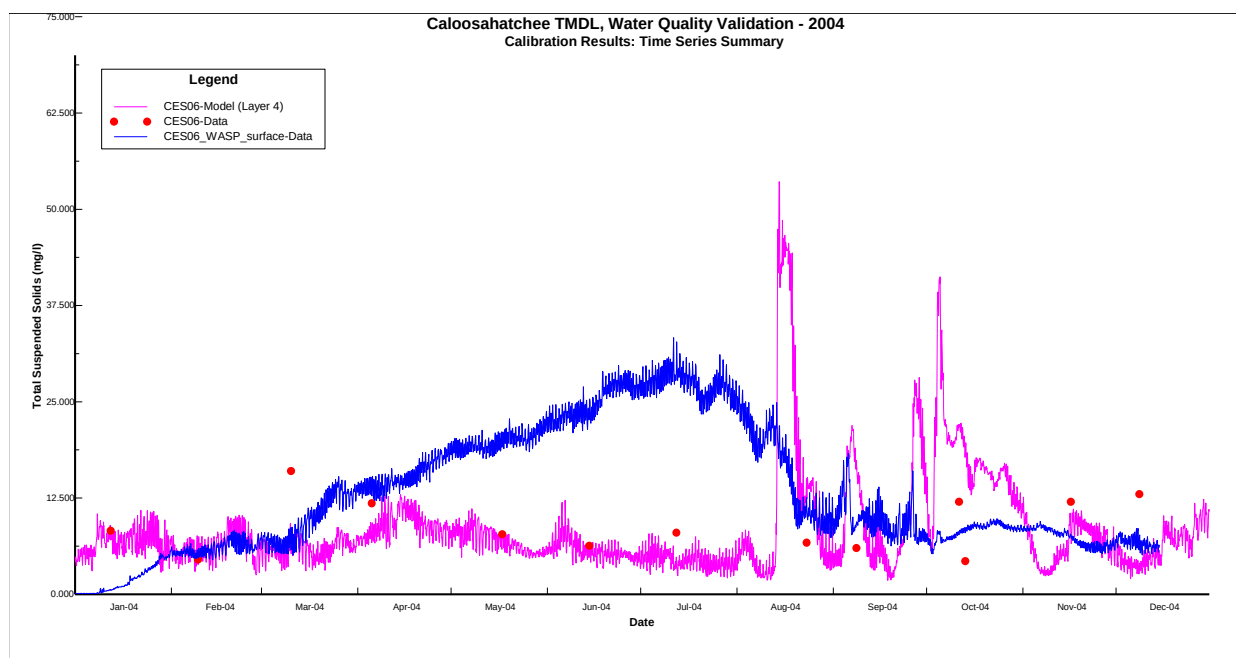


Figure 5-J- 31 Comparison of surface TSS for CES06

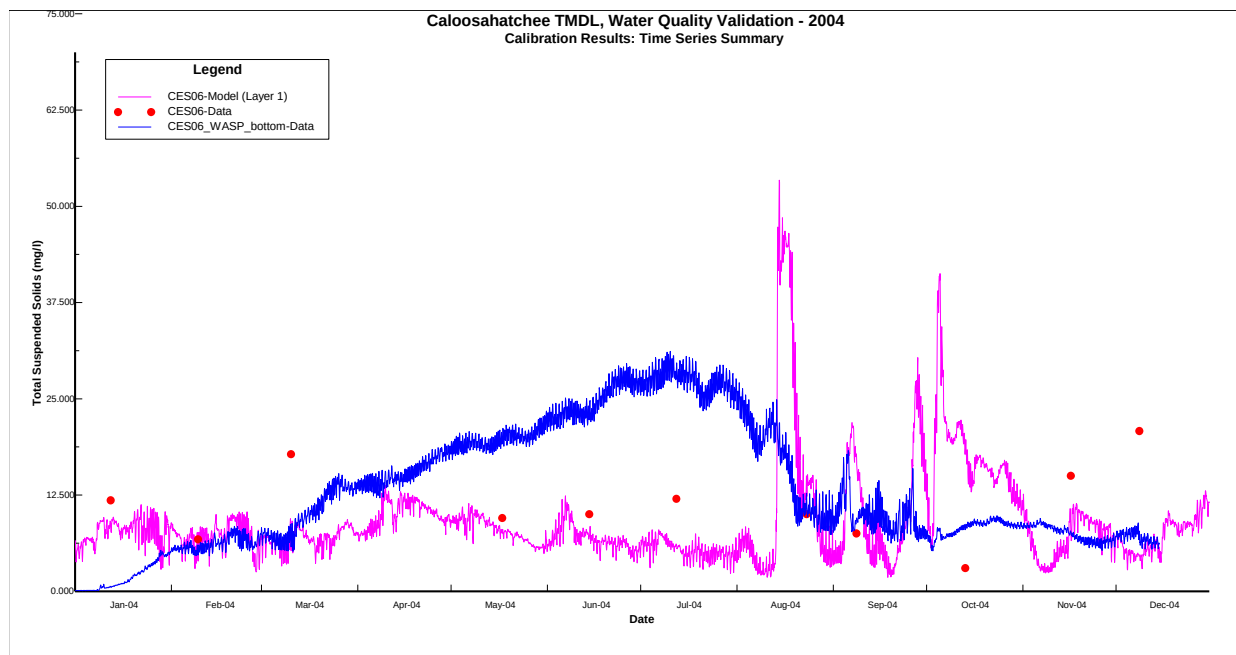


Figure 5-J- 32 Comparison of bottom TSS for CES06