Figure 29
Components of DO Depletion

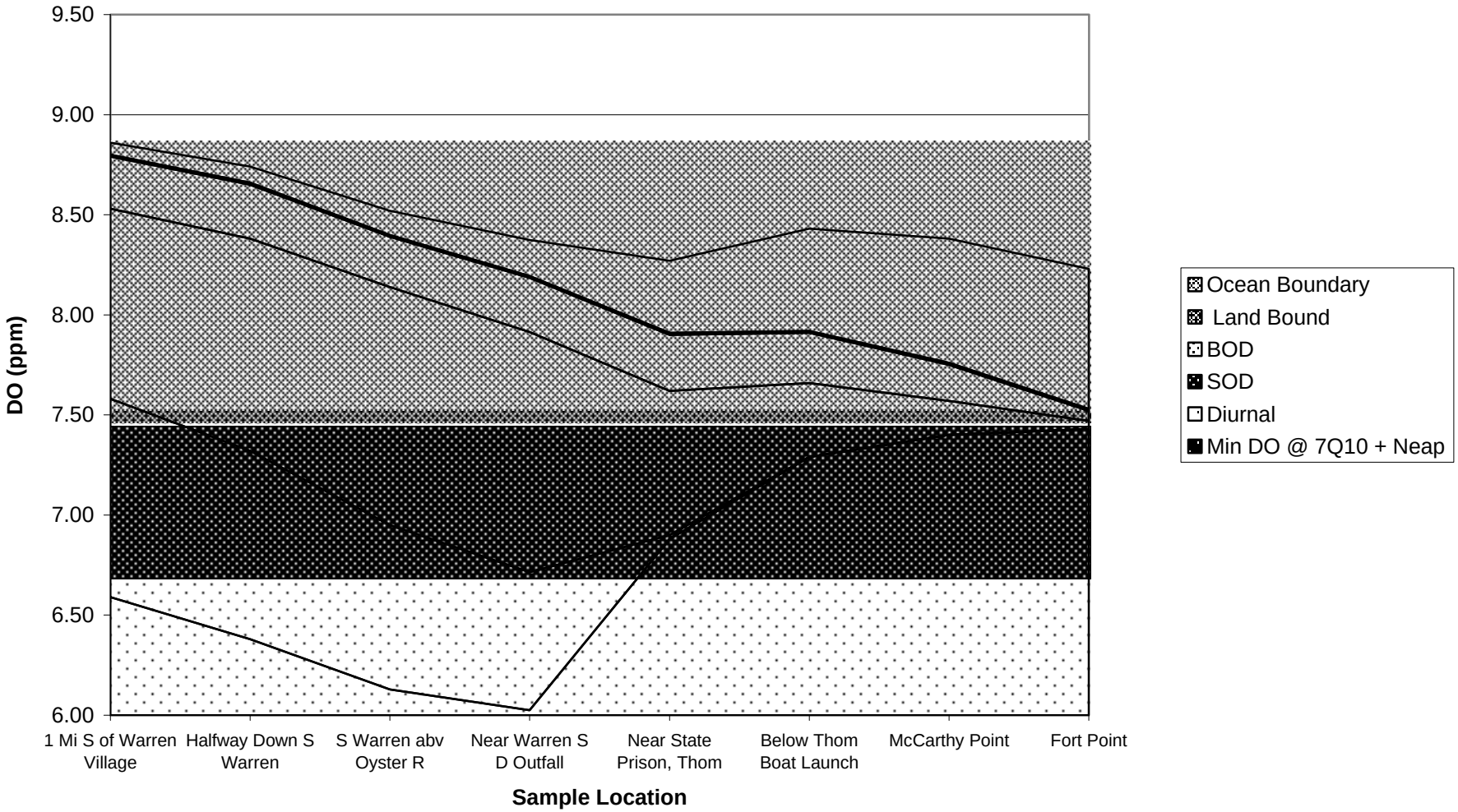

Figure 30
Model Prediction Run DO Compared to Required DO
Neap Tide
High Tide in AM
Warren S. D. at .151 mgd

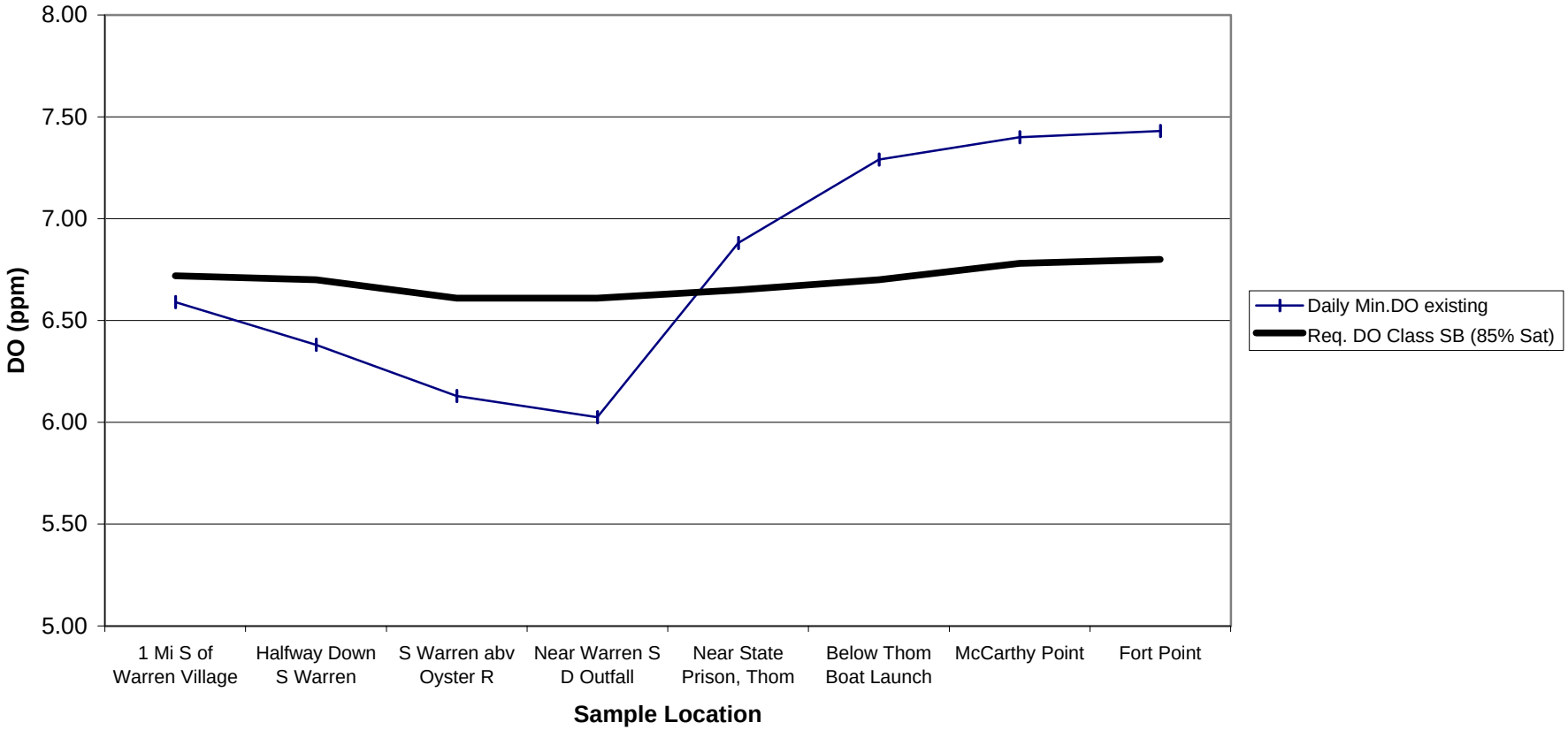

Figure 31
Time Sampled in Relation to High Tide

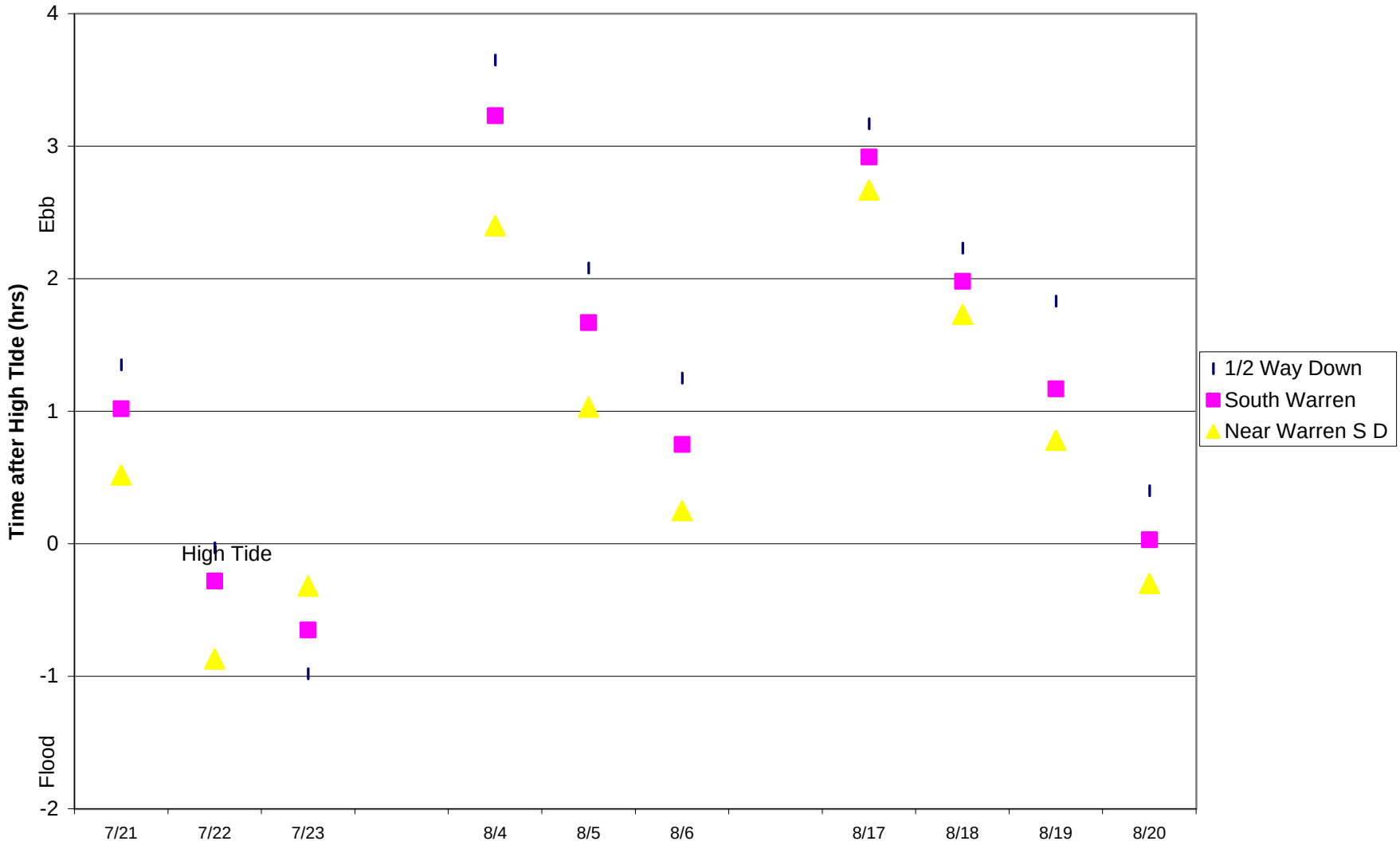

Figure 32
Dissolved Oxygen Vs Tidal Phase
SGE4 Halfway Down

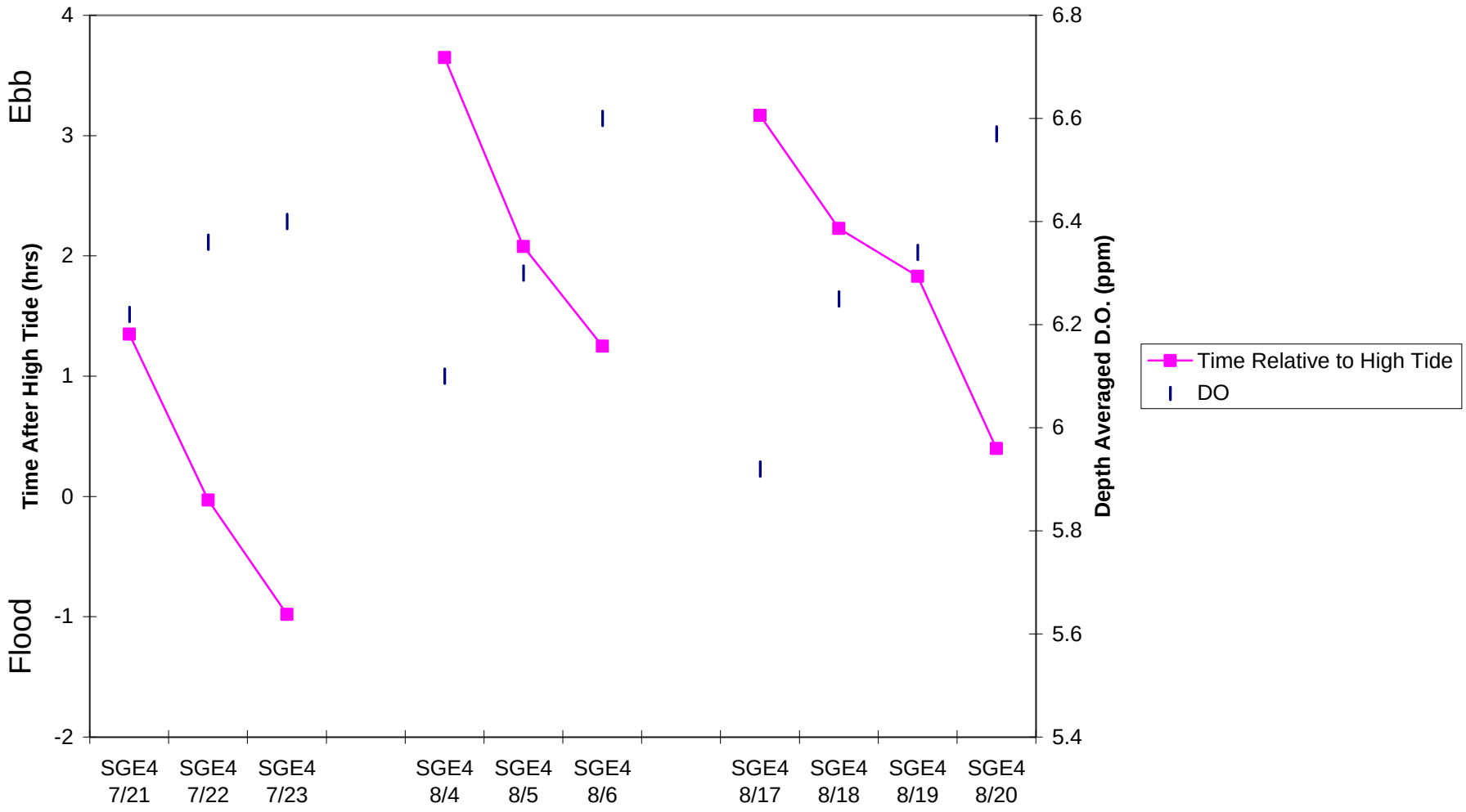

Figure 33
Dissolved Oxygen Vs Tidal Phase
SGE7 South Warren

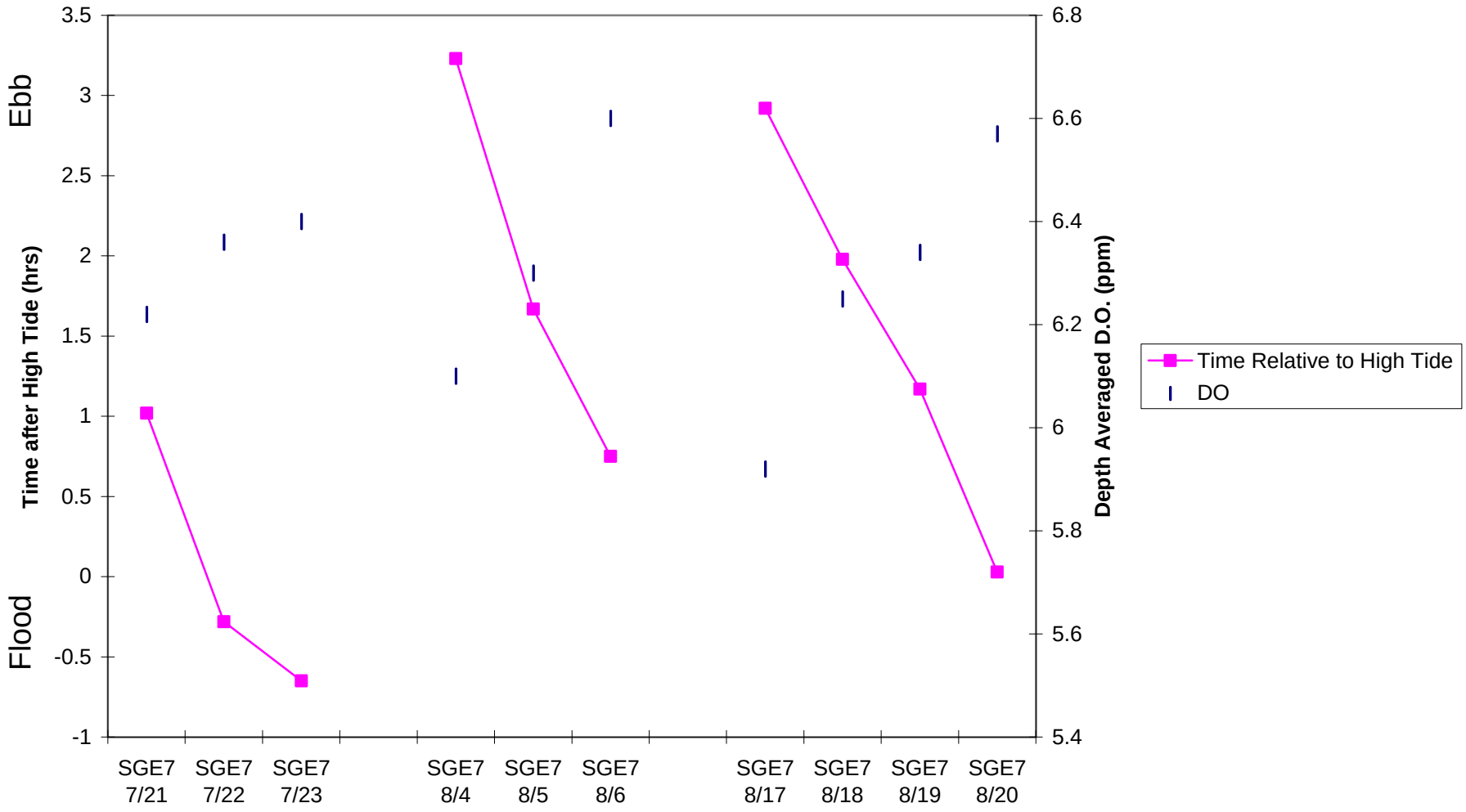

Figure 34
Effect of Ocean Boundary Dissolved Oxygen

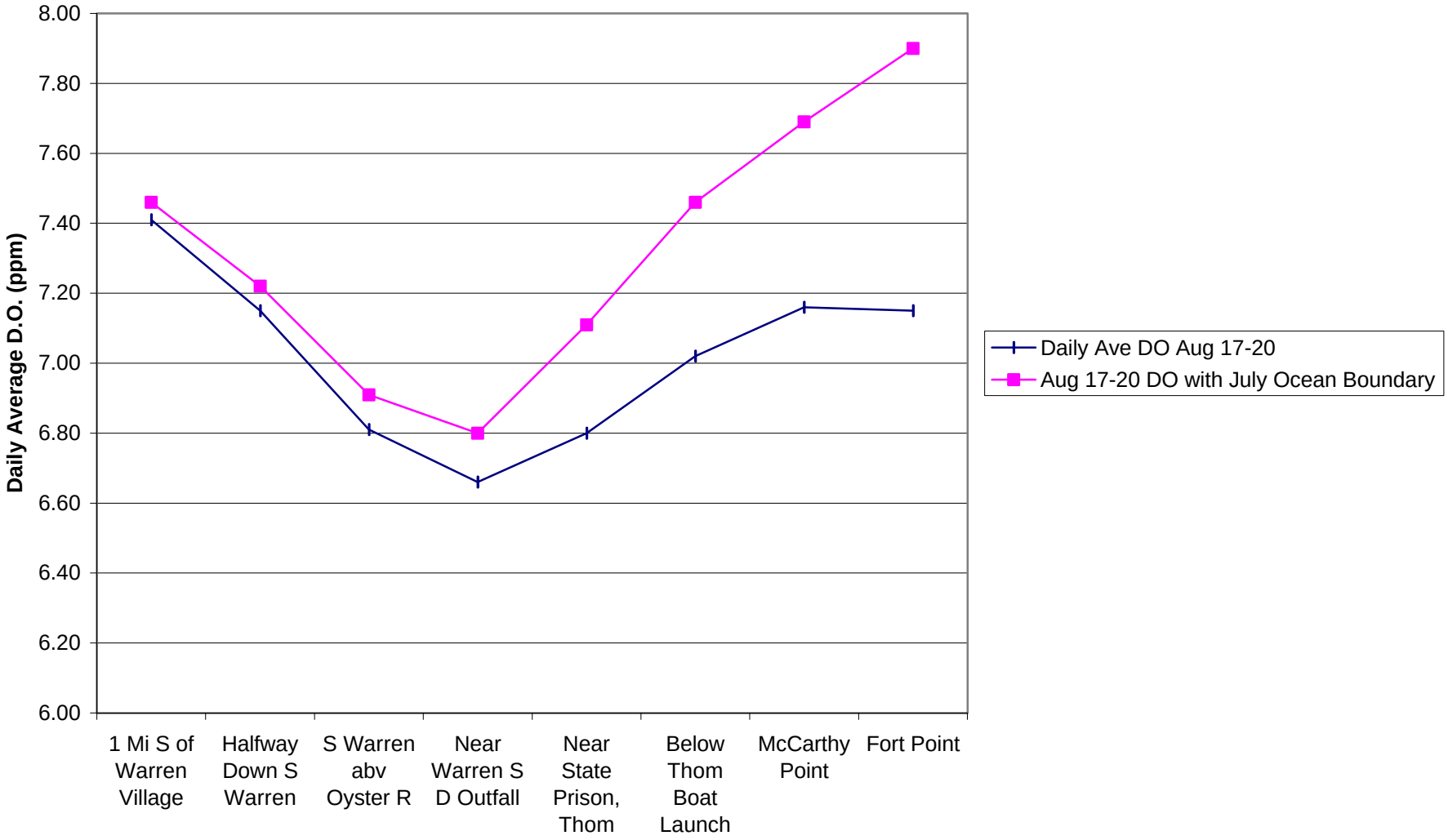

Figure 35
Warren S.D. Nitrogen

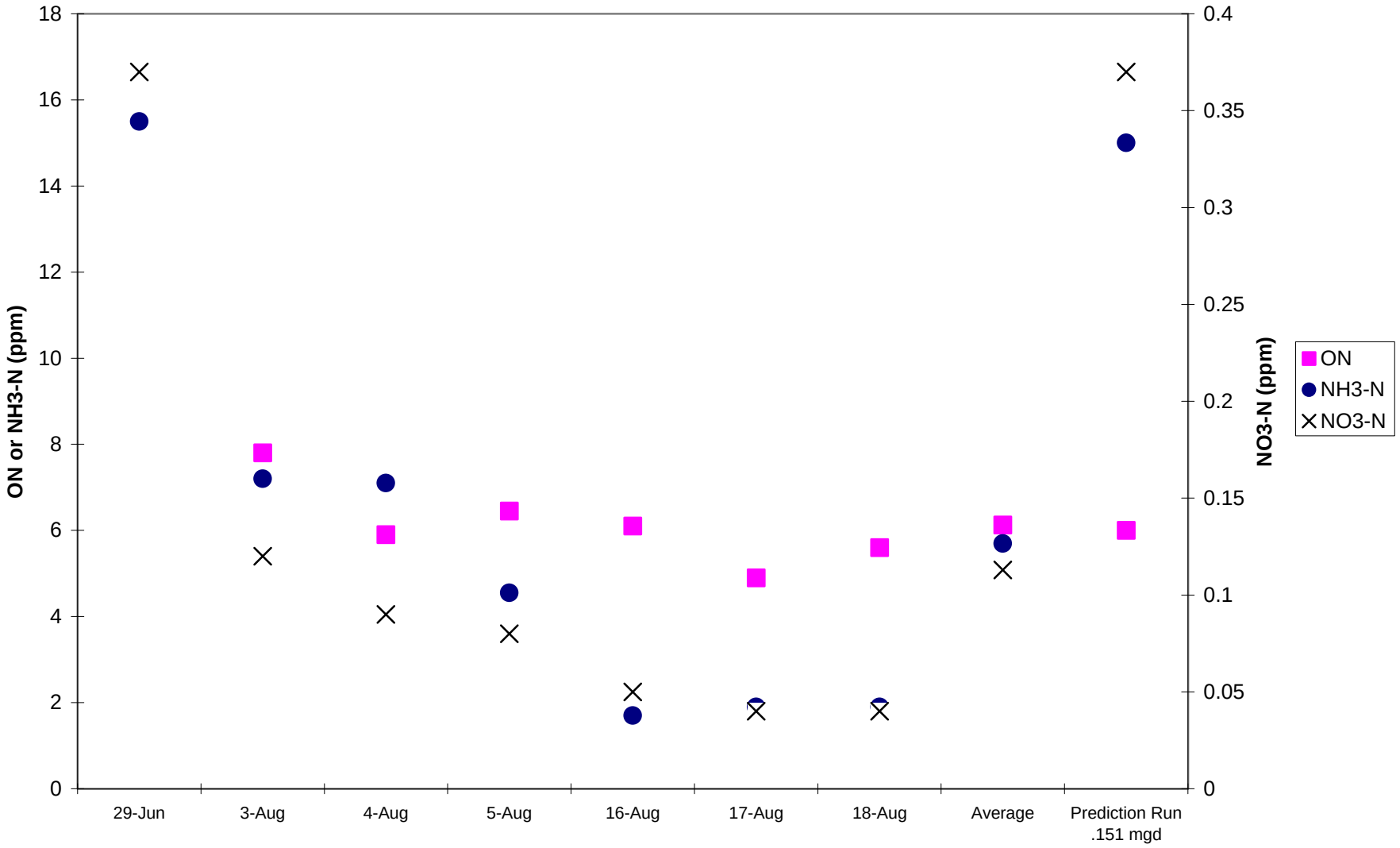

Table 1 Parameter Rates Used in Water Quality Model

Model Transport

Literature Source - Help and Limit Screens for Eutrophication Preprocessor for EPA WASP4/Eutro4 Model, Tetra Tech, 8/8/1991.

	Literature				
	Range	Default	Rate Used	Units	Considerations and Logic Used
Longitudinal Dispersion	Variable		4.8 - 100	m^2/sec	Calibration with Salinity. Dilution model simulations compares well with Cormix model. Compares well with reported dispersions of Hydroscience (1971).
Vertical Dispersion	Variable		1	cm^2 / sec	Calibration of DO
Phytoplankton Settling	0.1 - 18	0.5	1.5	m / day	Calibration of Chorophyll a

Environmental Parameters

Sediment Oxygen Demand	.1-10	0.5	.1 - 1.4	gm/m^{2-} day	Rate 10% lower than measured assigned as needed for DO calibration of model. Top segment SOD assigned as a ratio of top segment to bottom segment bottom areas.
Sediment NH4 Flux	6.6 - 660	33	3 - 41	mg / m^{2-}day	Redfield stoichiometric ratio and ammonia calibration
Sediment PO4-P Flux	.92 - 92	4.5	.5- 7	mg / m^{2-}day	Redfield stoichiometric ratio and PO4-P calibration
Light Extinction Coefficient	.04 - 2.5	0.5	.65 - 2.5	1 / m	Calculated from secchi depth measurements (= 1.44 / SD) (Holmes 1970) for turbid estuaries

Constants

Nitrification Rate	.1 - 10	0.25	0.2	1 / day	Calibration of NBOD and Nitrogen components
CBOD Decay Rate	.01 - 5.6	0.2	0.05	1 / day	Set = minimum default (laboratory bottle decay rate), calibration of BOD
Algae Growth Rate	1 - 4	1.8	1.7 - 2.0	1 / day	Calibration of chlorophyll a, vary by data set. Very close to default.
Algal Respiration Rate	.05 - .5	0.15	0.25	1 / day	Calibration of chlorophyll a, DO, turbidity of system
Algal Death Rate	0 - .25	0.02	0.02	1 / day	Default
Saturated Light Intensity	50 - 350	175	175	Ly / day	Default
Nitrogen Half Saturation Constant	.001 - .15	0.025	0.005	mg/l	Calibration of chlorophyll a, nutrients
Phosphorus Half Saturation Constant	.001 - .05	0.001	0.001	mg/l	Default
Carbon / Chlorophyll a Ratio	20 - 200	80	80	unitless	Default
Nitrogen / Carbon Ratio	.05 - .43	0.15	0.15	unitless	Default
Phosphorus / Carbon Ratio	.024 - .24	0.042	0.042	unitless	Default
Oxygen / Carbon Ratio		2.67	2.67	unitless	Default
Atmospheric Reaeration Rate	.01 - 100	Formulation	.12 - 1.4	1 / day	Calculated as maximum of OConnor-Dobbins formulation or minimum default (3 / depth). Rate assigned by reach and multplied by factor of two for suitable DO. calibration
Organic-N Mineralization Rate	.02 - .4*	0.075	.001 - .025	1 / day	Nitrogen Calibration
Organic-P Mineralization Rate	.01 - .7*	0.22	.001 - .15	1 / day	Phosphorus Calibration

Time Functions

Solar Radiation	10 - 1000	500	530 - 626	Ly / day	Calculated with desk top model. Vary with season and data set.
Fraction of Daylight	0 - 1	0.5	.57 - .625	unitless	Calculated with sunrise / sunset data. Vary seasonally and with data sets.

*Qual2EU User's Manual

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Table 2 Inputs to Model

Survey 1 7/20 to 7/23

	Flow	Concentrations								Loads		
		NH3-N	NO3-N	PO4-P	Chl a	CBODu	DO	ON	OP	CBOD	TDN	TP
	cfs	ppm	ppm	ppb	ppb	ppm	ppm	ppm	ppb	lb/day	lb/day	lb/day
Landward Boundary	20	0.018	0.020	7	1.25	3.56	7.80	0.48	17	383	4.1	2.58
Warren S.D.	0	0.000	0.000	0	0	0	0.00	0	0	0	0.0	0.00
Mill R + Tribs (10 mi^2)*	0.35	0.057	0.040	3	11.4	6.7	8.32	0.78	49	13	0.2	0.10
Oyster R	0.27	0.015	0.027	3	2.8	3.7	8.40	0.65	24	5	0.1	0.04
Other Tributaries (18 mi^2)*	0.38	0.030	0.060	3	5.7	4.8	8.60	0.68	34	10	0.2	0.08
Ocean Boundary	Top	0.020	0.005	15	3.3	1.9	7.92	0.4	16			
	Bottom	0.005	0.008	20	1	3.2	8.04	0.5	15			

Survey 2 8/3 to 8/6

	Flow	Concentrations								Loads		
		NH3-N	NO3-N	PO4-P	Chl a	CBODu	DO	ON	OP	CBOD	TDN	TP
	cfs	ppm	ppm	ppb	ppb	ppm	ppm	ppm	ppb	lb/day	lb/day	lb/day
Landward Boundary	9.70	0.023	0.013	4	2.3	4.5	8.23	0.51	15	235	1.88	0.99
Warren S.D.	0.10	6.280	0.100	3570	104	68	2.00	6.72	870	37	3.43	2.39
Mill R + Tribs (10 mi^2)*	0.10	0.090	0.060	3	15.8	8.5	9.08	0.81	58	5	0.08	0.03
Oyster R	0.13	0.013	0.017	2	2.6	3.7	8.20	0.59	19	3	0.02	0.01
Other Tributaries (18 mi^2)*	0.14	0.020	0.037	3	3.8	4.4	8.65	0.60	28	3	0.04	0.02
Ocean Boundary	Top	0.012	0.005	21	3.8	1.2	7.58	0.42	18			
	Bottom	0.012	0.020	27	1	2.3	7.67	0.52	18			

Survey 3 8/16 to 8/20

	Flow	Concentrations								Loads		
		NH3-N	NO3-N	PO4-P	Chl a	CBODu	DO	ON	OP	CBOD	TDN	TP
	cfs	ppm	ppm	ppb	ppb	ppm	ppm	ppm	ppb	lb/day	lb/day	lb/day
Landward Boundary	10	0.013	0.010	4	0.6	4.1	8.40	0.42	11	221	1.2	0.81
Warren S.D.	0.22	1.830	0.040	4130	66	70	2.00	5.27	870	83	2.2	5.92
Mill R + Tribs (10 mi^2)*	0.13	0.040	0.040	1	6.7	3.5	9.25	0.56	29	2	0.1	0.02
Oyster R	0.17	0.015	0.023	2	1.7	3.7	8.60	0.59	15	3	0.0	0.02
Other Tributaries (18 mi^2)*	0.20	0.015	0.063	3	2.5	3.9	9.15	0.55	23	4	0.1	0.03
Ocean Boundary	Top	0.005	0.005	24	3.1	1.6	7.27	0.4	16			
	Bottom	0.015	0.015	27	1	2.8	7.41	0.4	16			

*Additional flow and pollutant concentrations from 28 mi^2 of tributary drainage not measured estimated from weighted average of measured tributary data (30 mi2).

CFSM

0.0291667

0.016875

#REF!

0.8083333

0.00625

0.0555556

0.3322148

0.0108333

0.010625

0.1111111

0.0167785

Table 3 - Sensitivity Analysis
August 17-19 Data Set

Daily Average Dissolved Oxygen			Reaeration		Sediment Oxygen Demand		BOD decay		Dispersion		Algal Growth		Algal Respiration		Algal Settling	
Location		Base Case	x .5	x2	x .5	x2	x .5	x2	x .5	x2	x .5	x2*	x .5	x2*	x .5	x2
1 Mi S of Warren Village	Top	7.48	6.93	7.81	7.94	6.58	7.58	7.52	7.47	7.25	6.69	7.31	7.56	6.67	7.47	7.42
	Bottom	7.34	6.78	7.68	7.84	6.34	7.45	7.46	7.52	7.14	6.56	7.21	7.46	6.56	7.33	7.28
Halfway Down S Warren	Top	7.24	6.66	7.6	7.74	6.24	7.34	7.07	7.32	7.07	6.49	7.19	7.44	6.48	7.28	7.13
	Bottom	7.06	6.48	7.42	7.62	5.93	7.17	6.97	7.16	6.93	6.52	7.07	7.3	6.32	7.08	6.96
S Warren abv Oyster R	Top	6.9	6.31	7.3	7.45	5.78	7	6.6	6.98	6.89	6.33	7.09	7.19	6.32	6.96	6.78
	Bottom	6.73	6.16	7.13	7.36	5.47	6.84	6.49	6.68	6.76	6.13	6.99	7.07	6.13	6.79	6.61
Near Warren S D Outfall	Top	6.69	6.13	7.11	7.26	5.54	6.79	6.42	6.5	6.81	6.26	7.01	7	6.25	6.75	6.59
	Bottom	6.62	6.08	7.02	7.24	5.38	6.73	6.32	6.43	6.74	6.13	6.99	6.96	6.12	6.69	6.51
Near State Prison, Thom	Top	6.87	6.5	7.19	7.22	6.16	6.98	6.76	6.6	7.01	6.6	7.24	7.12	6.58	6.92	6.8
	Bottom	6.73	6.43	6.99	7.11	5.99	6.86	6.74	6.43	6.94	6.47	7.11	6.99	6.45	6.75	6.68
Below Thom Boat Launch	Top	7.14	6.94	7.34	7.3	6.8	7.24	7.17	6.93	7.22	6.93	7.51	7.32	6.93	7.18	7.08
	Bottom	6.9	6.74	7.06	7.11	6.49	7.03	7.01	6.64	7.06	6.75	7.17	7.08	6.72	6.92	6.88
McCarthy Point	Top	7.25	7.15	7.37	7.33	7.09	7.32	7.39	7.13	7.28	7.11	7.51	7.36	7.11	7.27	7.22
	Bottom	7.07	7	7.14	7.16	6.89	7.16	7.27	6.85	7.19	7	7.2	7.16	6.97	7.08	7.06
Fort Point	Top	7.3	7.25	7.32	7.3	7.23	7.58	7.3	7.26	7.28	7.23	7.37	7.31	7.23	7.28	7.27
	Bottom	7.01	7.29	7.32	7.32	7.26	7.62	7.33	7.22	7.34	7.29	7.33	7.32	7.27	7.3	7.3

Change in Dissolved Oxygen From Base Case			Reaeration		Sediment Oxygen Demand		BOD decay		Dispersion		Algal Growth		Algal Respiration		Algal Settling	
Location		Base Case	x .5	x2	x .5	x2	x .5	x2	x .5	x2	x .5	x2*	x .5	x2*	x .5	x2
1 Mi S of Warren Village	Top	7.68	-0.55	0.33	0.46	-0.9	0.1	0.04	-0.01	-0.23	-0.79	-0.17	0.08	-0.81	-0.01	-0.06
	Bottom	7.62	-0.56	0.34	0.5	-1	0.11	0.12	0.18	-0.2	-0.78	-0.13	0.12	-0.78	-0.01	-0.06
Halfway Down S Warren	Top	7.3	-0.58	0.36	0.5	-1	0.1	-0.17	0.08	-0.17	-0.75	-0.05	0.2	-0.76	0.04	-0.11
	Bottom	7.22	-0.58	0.36	0.56	-1.13	0.11	-0.09	0.1	-0.13	-0.54	0.01	0.24	-0.74	0.02	-0.1
S Warren abv Oyster R	Top	6.87	-0.59	0.4	0.55	-1.12	0.1	-0.3	0.08	-0.01	-0.57	0.19	0.29	-0.58	0.06	-0.12
	Bottom	6.78	-0.57	0.4	0.63	-1.26	0.11	-0.24	-0.05	0.03	-0.6	0.26	0.34	-0.6	0.06	-0.12
Near Warren S D Outfall	Top	6.69	-0.56	0.42	0.57	-1.15	0.1	-0.27	-0.19	0.12	-0.43	0.32	0.31	-0.44	0.06	-0.1
	Bottom	6.6	-0.54	0.4	0.62	-1.24	0.11	-0.3	-0.19	0.12	-0.49	0.37	0.34	-0.5	0.07	-0.11
Near State Prison, Thom	Top	6.98	-0.37	0.32	0.35	-0.71	0.11	-0.11	-0.27	0.14	-0.27	0.37	0.25	-0.29	0.05	-0.07
	Bottom	6.97	-0.3	0.26	0.38	-0.74	0.13	0.01	-0.3	0.21	-0.26	0.38	0.26	-0.28	0.02	-0.05
Below Thom Boat Launch	Top	7.33	-0.2	0.2	0.16	-0.34	0.1	0.03	-0.21	0.08	-0.21	0.37	0.18	-0.21	0.04	-0.06
	Bottom	7.2	-0.16	0.16	0.21	-0.41	0.13	0.11	-0.26	0.16	-0.15	0.27	0.18	-0.18	0.02	-0.02
McCarthy Point	Top	7.49	-0.1	0.12	0.08	-0.16	0.07	0.14	-0.12	0.03	-0.14	0.26	0.11	-0.14	0.02	-0.03
	Bottom	7.4	-0.07	0.07	0.09	-0.18	0.09	0.2	-0.22	0.12	-0.07	0.13	0.09	-0.1	0.01	-0.01
Fort Point	Top	7.56	-0.05	0.02	0	-0.07	0.28	0	-0.04	-0.02	-0.07	0.07	0.01	-0.07	-0.02	-0.03
	Bottom	7.59	0.28	0.31	0.31	0.25	0.61	0.32	0.21	0.33	0.28	0.32	0.31	0.26	0.29	0.29

* Falls outside range recommended in literature

Table 4 - Sensitivity Analysis
August 17 - 19 Data Set

Daily Average Chlorophyll a			Algal Growth		Algal Respiration		Algal Settling		Dispersion		N, P 1/2 Saturation Constants		Nitrogen, Phosphorus Ratio to Carbon		N, P Flux from Sediments	
Location		Base Case	x .5*	x2	x .5	x2	x .5	x2	x .5	x2	x .5*	x2	x .5	x2	x .5	x2
1 Mi S of Warren Village	Top	8.9	0.8	8.3	11.2	0.7	10	7.3	10.7	5.2	9.3	7.7	15.4	4.6	6.2	14.3
Halfway Down S Warren	Top	8.2	0.8	8.3	11	0.6	9.6	6.2	11.2	4.6	8.7	6.9	13.4	4.3	5.7	12.9
S Warren abv Oyster R	Top	6.5	0.8	7.9	9.5	0.6	8.2	4.4	9.5	3.8	7.1	5.4	10.2	3.6	4.6	10
Near Warren S D Outfall	Top	4.7	0.7	6.5	7.2	0.6	6.4	2.8	6.2	3.1	5.1	3.9	7	2.7	3.4	6.9
Near State Prison, Thom	Top	2.6	0.8	4.3	4.1	0.7	3.9	1.3	2.6	2.3	2.9	2.2	3.5	1.8	2.1	3.5
Below Thom Boat Launch	Top	2.1	1.1	3.6	3	1.1	2.9	1.3	1.8	2.2	2.3	1.9	2.4	1.8	1.9	2.5
McCarthy Point	Top	2.3	1.7	3.3	2.8	1.7	2.8	1.8	2	2.5	2.8	2.1	2.4	2.2	2.2	2.4
Fort Point	Top	2.8	2.6	3.2	3	2.6	3	2.6	2.6	2.9	2.8	2.8	2.8	2.8	2.8	2.8

Change in Chl a from Base Case			Algal Growth		Algal Respiration		Algal Settling		Dispersion		N, P 1/2 Saturation Constants		Nitrogen, Phosphorus Ratio to Carbon		N, P Flux from Sediments	
Location		Base Case	x .5*	x2	x .5	x2	x .5	x2	x .5	x2	x .5*	x2	x .5	x2	x .5	x2
1 Mi S of Warren Village	Top	8.9	-8.1	-0.6	2.3	-8.2	1.1	-1.6	1.8	-3.7	0.4	-1.2	6.5	-4.3	-2.7	5.4
Halfway Down S Warren	Top	8.2	-7.4	0.1	2.8	-7.6	1.4	-2	3	-3.6	0.5	-1.3	5.2	-3.9	-2.5	4.7
S Warren abv Oyster R	Top	6.5	-5.7	1.4	3	-5.9	1.7	-2.1	3	-2.7	0.6	-1.1	3.7	-2.9	-1.9	3.5
Near Warren S D Outfall	Top	4.7	-4	1.8	2.5	-4.1	1.7	-1.9	1.5	-1.6	0.4	-0.8	2.3	-2	-1.3	2.2
Near State Prison, Thom	Top	2.6	-1.8	1.7	1.5	-1.9	1.3	-1.3	0	-0.3	0.3	-0.4	0.9	-0.8	-0.5	0.9
Below Thom Boat Launch	Top	2.1	-1	1.5	0.9	-1	0.8	-0.8	-0.3	0.1	0.2	-0.2	0.3	-0.3	-0.2	0.4
McCarthy Point	Top	2.3	-0.6	1	0.5	-0.6	0.5	-0.5	-0.3	0.2	0.5	-0.2	0.1	-0.1	-0.1	0.1
Fort Point	Top	2.8	-0.2	0.4	0.2	-0.2	0.2	-0.2	-0.2	0.1	0	0	0	0	0	0

* Falls outside range recommended in literature

Table 5 Component Analysis
Prediction Run 1

Dissolved Oxygen			Sediment Oxygen Demand		Nutrient Flux from Sediments		BOD Decay		All Inputs		Downstream Boundary DO.		Upstream Boundary DO.		Diurnal from Algae	
Location		Daily Ave DO	Daily Ave DO	Diff DO	Daily Ave DO	Diff DO	Daily Ave DO	Diff DO	Daily Ave DO	Diff DO	Daily Ave DO	Diff DO	Daily Ave DO	Diff DO	Daily Minimum DO	Diff DO
1 Mi S of Warren Village	Top	7.56	8.47	0.91	7.1	-0.46	7.81	0.25	7.4	-0.16	7.62	0.06	7.57	0.01	6.59	0.97
	Bottom	7.41	8.41	1	6.98	-0.43	7.68	0.27	7.25	-0.16	7.47	0.06	7.42	0.01	6.44	0.97
Halfway Down S Warren	Top	7.32	8.33	1.01	6.89	-0.43	7.58	0.26	7.2	-0.12	7.4	0.08	7.33	0.01	6.39	0.93
	Bottom	7.13	8.25	1.12	6.73	-0.4	7.41	0.28	7.01	-0.12	7.21	0.08	7.13	0	6.20	0.93
S Warren abv Oyster R	Top	6.96	8.07	1.11	6.65	-0.31	7.2	0.24	6.88	-0.08	7.07	0.11	6.96	0	6.14	0.82
	Bottom	6.79	8.05	1.26	6.49	-0.3	7.06	0.27	6.72	-0.07	6.92	0.13	6.79	0	5.97	0.82
Near Warren S D Outfall	Top	6.72	7.87	1.15	6.53	-0.19	6.98	0.26	6.69	-0.03	6.89	0.17	6.73	0.01	6.03	0.69
	Bottom	6.66	7.9	1.24	6.43	-0.23	6.94	0.28	6.62	-0.04	6.84	0.18	6.66	0	5.97	0.69
Near State Prison, Thom	Top	6.88	7.59	0.71	6.79	-0.09	7.15	0.27	6.88	0	7.21	0.33	6.88	0	6.88	0.00
	Bottom	6.75	7.49	0.74	6.67	-0.08	7.05	0.3	6.74	-0.01	7.15	0.4	6.75	0	6.75	0
Below Thom Boat Launch	Top	7.14	7.47	0.33	7.1	-0.04	7.38	0.24	7.14	0	7.62	0.48	7.14	0	7.14	0
	Bottom	6.91	7.32	0.41	6.88	-0.03	7.18	0.27	6.91	0	7.45	0.54	6.91	0	6.91	0
McCarthy Point	Top	7.25	7.41	0.16	7.23	-0.02	7.41	0.16	7.25	0	7.84	0.59	7.25	0	7.25	0
	Bottom	7.07	7.26	0.19	7.07	0	7.27	0.2	7.07	0	7.72	0.65	7.07	0	7.07	0
Fort Point	Top	7.28	7.32	0.04	7.27	-0.01	7.33	0.05	7.28	0	7.97	0.69	7.28	0	7.28	0
	Bottom	7.3	7.35	0.05	7.3	0	7.36	0.06	7.3	0	8.02	0.72	7.3	0	7.3	0

Daily Ave Chlorophyll a			Sediment Oxygen Demand		Nutrient Flux from Sediments		BOD Decay		Non-Point Source Inputs		Warren S.D. at .151 mgd		Downstream Boundary	
Location		Base Case	Chl a	Diff Chl a	Chl a	Diff Chl a	Chl a	Diff Chl a	Chl a	Diff Chl a	Chl a	Diff Chl a	Chl a	Diff Chl a
1 Mi S of Warren Village	Top	9.8	9.8	0	4.6	-5.2	9.8	0	8.8	-1	8.5	-1.3	8	-1.8
Halfway Down S Warren	Top	9.1	9.1	0	4.3	-4.8	9.1	0	8.4	-0.7	7.8	-1.3	7.2	-1.9
S Warren abv Oyster R	Top	7.3	7.3	0	3.6	-3.7	7.3	0	6.8	-0.5	6.3	-1	5.6	-1.7
Near Warren S D Outfall	Top	5.3	5.3	0	2.7	-2.6	5.3	0	4.9	-0.4	4.5	-0.8	3.8	-1.5
Near State Prison, Thom	Top	2.9	2.9	0	1.8	-1.1	2.9	0	2.7	-0.2	2.6	-0.3	1.5	-1.4
Below Thom Boat Launch	Top	2.2	2.2	0	1.8	-0.4	2.2	0	2.2	0	2.1	-0.1	0.6	-1.6
McCarthy Point	Top	2.3	2.3	0	2.2	-0.1	2.3	0	2.3	0	2.3	0	0.2	-2.1
Fort Point	Top	2.8	2.8	0	2.8	0	2.8	0	2.8	0	2.8	0	0.03	-2.77

Table 6 Design Conditions Used for Model Prediction Runs

		Concentrations							
	Flow	NH3-N ppm	NO3-N ppm	PO4-P ppb	Chl a ppb	CBODu pm	DO ppm	ON ppm	OP ppb
Landward Boundary	10 cfs	0.013	0.01	4	0.6	4.1	8.4	0.42	11
Ocean Boundary	top	0.005	0.005	24	3.1	1.6	7.27	0.36	16
	bottom	0.015	0.015	27	1	2.8	7.41	0.38	16
Warren S.D.	.151 mgd	15	0.37	4000	66	156*	2	6	1000
	.232 mgd								
	.10 mgd	15 / 5.7	.37 / .11			234**		7.8 / 6.1	
	0.06 mgd								
Tide	Neap								
Temp	As measured in Aug 16-20 data set								
Parameter Rates	As assigned in Aug 16-20 data set								
Tributary Inputs	As assigned in Aug 16-20 data set								

* Derived from effluent licensed BOD5 of 20 ppm and BODu/BOD5 ratio of 7.8

** Derived from effluent licensed BOD5 of 30 ppm and BODu/BOD5 ratio of 7.8

Table 7 Summary of Model Prediction Runs

Comparison With Warren S. D. at .151 mgd and Zero Discharge

		Difference in Ambient Concentrations *				
Station	Location	Total Dissolved Nitrogen	Total Phosphorus	Carbonaceous BOD	Daily Min Dissolved Oxygen	Daily Average Chlorophyll a
		+ ppm	+ ppb	+ ppm	- ppm	+ ppb
SGE2	1 Mi S of Warren Village	0	9	0.24	0.03	1.3
SGE4	Halfway Down S Warren	0.003	10	0.27	0.02	1.3
SGE7	S Warren abv Oyster R	0.003	10	0.29	0.02	1
SGE9	Near Warren S D Outfall	0.011	10	0.27	0.03	0.8
SGE11	Near State Prison, Thom	0.005	7	0.14	0	0.3
SGE13	Below Thom Boat Launch	0.002	2	0.04	0	0.1
SGE16	McCarthy Point	0.001	1	0.02	0	0
SGE19	Fort Point	0	0	0	0	0
Measurement Accuracy		0.01	1	0.1	0.1	0.1

* This table compares the model prediction values for two independent runs; Warren S. D. at design flow (.151 mgd) and Warren S. D. at zero discharge.

Comparison With Warren S. D. at .232 mgd and Zero Discharge

		Difference in Ambient Concentrations *				
Station	Location	Total Dissolved Nitrogen	Total Phosphorus	Carbonaceous BOD	Daily Min Dissolved Oxygen	Daily Average Chlorophyll a
		+ ppm	+ ppb	+ ppm	- ppm	+ ppb
SGE2	1 Mi S of Warren Village	0.001	13	0.36	0.02	1.9
SGE4	Halfway Down S Warren	0.006	14	0.4	0.02	1.9
SGE7	S Warren abv Oyster R	0.014	14	0.43	0.02	1.5
SGE9	Near Warren S D Outfall	0.018	13	0.4	0.02	1.1
SGE11	Near State Prison, Thom	0.008	7	0.2	0.01	0.4
SGE13	Below Thom Boat Launch	0.002	2	0.09	0.01	0.2
SGE16	McCarthy Point	0.001	1	0.03	0.01	0.1
SGE19	Fort Point	0	0	0.01	0	0
Measurement Accuracy		0.01	1	0.1	0.1	0.1

* This table compares the model prediction values for two independent runs; Warren S. D. at design flow (.232 mgd) and Warren S. D. at zero discharge.

Table 8 Summary of Model Prediction Runs Warren at 0, .06, and .10 mdg
Warren S.D. at Maximum Nitrogen Concentrations ON=7.8, NH3-N=15, NO3-N=.37

		Model Predicted Chl a (ppb)			Chl a attributable to WSD	
Station	Location	WSD=0 mgd	WSD=0.060 mgd Historical	.WSD=0.10mgd Proposed Summer	WSD=0.060 mgd Historical	.WSD=0.10 mgd Proposed Summer
SGE2	1 Mi S of Warren Village	8.5	9	9.4	0.5	0.9
SGE4	Halfway Down S Warren	7.8	8.4	8.7	0.6	0.9
SGE7	S Warren abv Oyster R	6.3	6.7	7	0.4	0.7
SGE9	Near Warren S D Outfall	4.5	4.8	5	0.3	0.5
SGE11	Near State Prison, Thom	2.6	2.7	2.8	0.1	0.2
SGE13	Below Thom Boat Launch	2.1	2.2	2.2	0.1	0.1
SGE16	McCarthy Point	2.3	2.3	2.3	0	0
SGE19	Fort Point	2.8	2.8	2.8	0	0
Measurement Accuracy		0.1	0.1	0.1	0.1	0.1

Warren S.D. at Average Nitrogen Concentrations ON=6.1, NH3-N=5.7, NO3-N=.11

		Model Predicted Chl a (ppb)			Chl a attributable to WSD	
Station	Location	WSD=0 mgd	WSD=0.060 mgd Historical	.WSD=0.10mgd Proposed Summer	WSD=0.060 mgd Historical	.WSD=0.10 mgd Proposed Summer
SGE2	1 Mi S of Warren Village	8.5	8.8	8.9	0.3	0.4
SGE4	Halfway Down S Warren	7.8	8.1	8.3	0.3	0.5
SGE7	S Warren abv Oyster R	6.3	6.5	6.6	0.2	0.3
SGE9	Near Warren S D Outfall	4.5	4.7	4.8	0.2	0.3
SGE11	Near State Prison, Thom	2.6	2.6	2.7	0	0.1
SGE13	Below Thom Boat Launch	2.1	2.1	2.2	0	0.1
SGE16	McCarthy Point	2.3	2.3	2.3	0	0
SGE19	Fort Point	2.8	2.8	2.8	0	0
Measurement Accuracy		0.1	0.1	0.1	0.1	0.1

Warren S.D. at Maximum Nitrogen Concentrations ON=7.8, NH3-N=15, NO3-N=.37

		Model Predicted minimum DO (ppm)			DO Def from Warren (ppm)	
Station	Location	WSD=0 mgd	WSD=0.060 mgd Historical	.WSD=0.10mgd Proposed Summer	WSD=0.060 mgd Historical	.WSD=0.10 mgd Proposed Summer
SGE2	1 Mi S of Warren Village	6.52	6.5	6.5	0.02	0.02
SGE4	Halfway Down S Warren	6.3	6.29	6.29	0.01	0.02
SGE7	S Warren abv Oyster R	6.07	6.06	6.06	0.01	0.01
SGE9	Near Warren S D Outfall	6.03	6.02	6.02	0.01	0.01
SGE11	Near State Prison, Thom	6.29	6.29	6.29	0	0
SGE13	Below Thom Boat Launch	6.53	6.53	6.53	0	0
SGE16	McCarthy Point	6.66	6.66	6.66	0	0
SGE19	Fort Point	6.76	6.76	6.76	0	0
Measurement Accuracy		0.1	0.1	0.1	0	0