

Final Calibration of the 2017 Water Quality and Sediment Transport Model (WQSTM) and Its Application to Key Scenarios

Modeling Workgroup Conference Call
November 27, 2017

Lew Linker, EPA-CBPO; Carl Cerco, Attain,
Richard Tian, UMCES and
the CBP Modeling Team



Chesapeake Bay Program
Science, Restoration, Partnership ₁

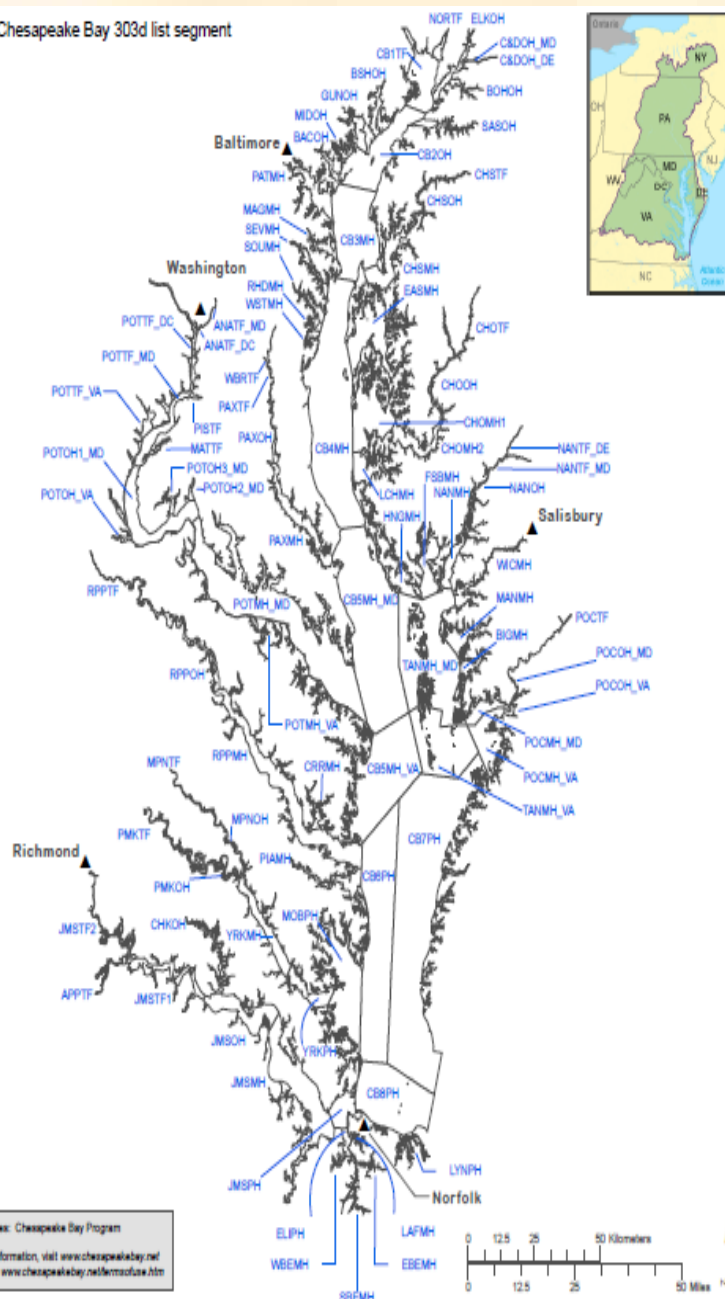
Phase 6 WQSTM* Bay Model

2017 Estimated Water Quality
Standard Achievement

Final calibration – Nutrient limitation

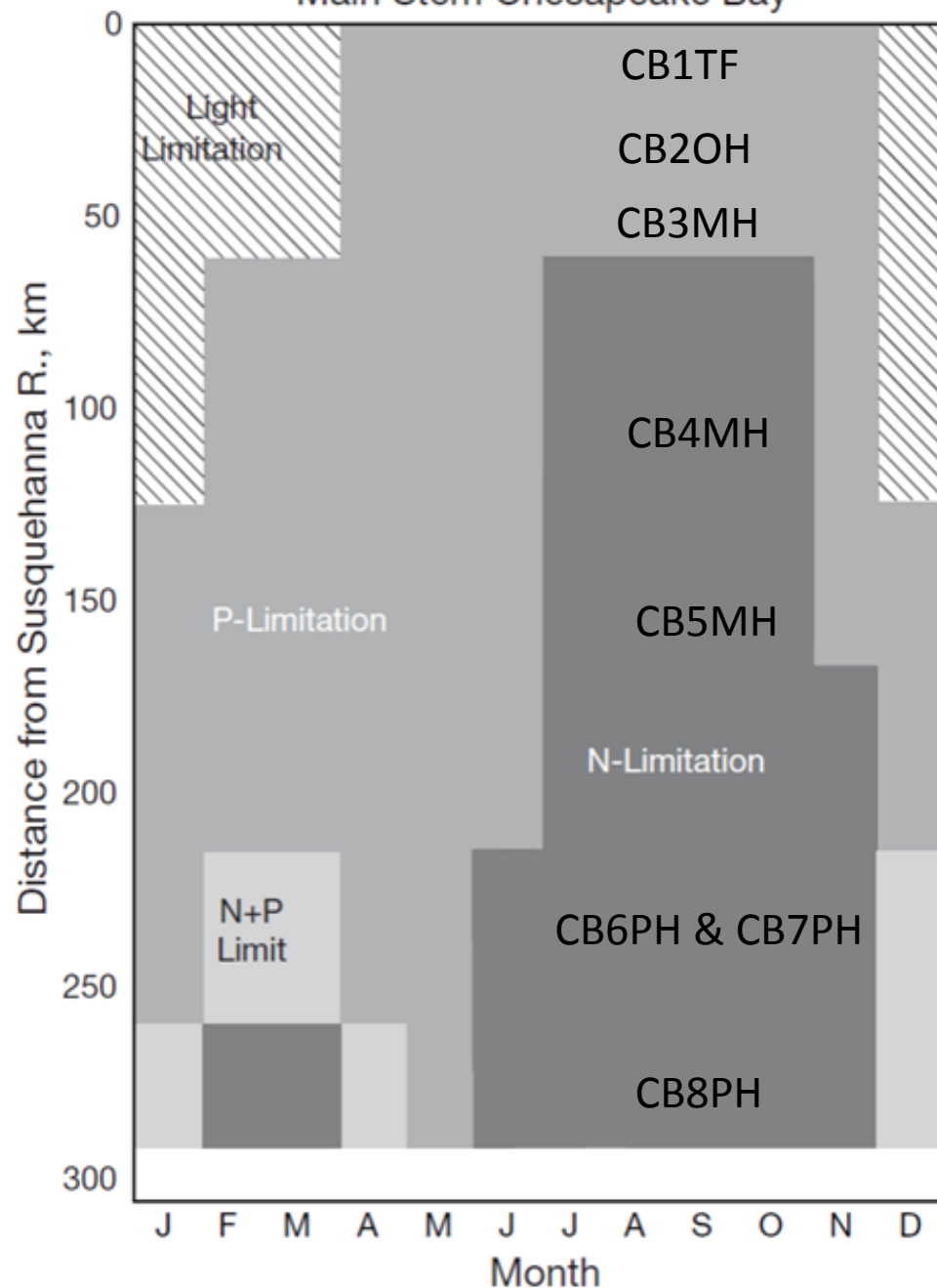
* Water Quality and Sediment Transport Model

Chesapeake Bay 303d list segment

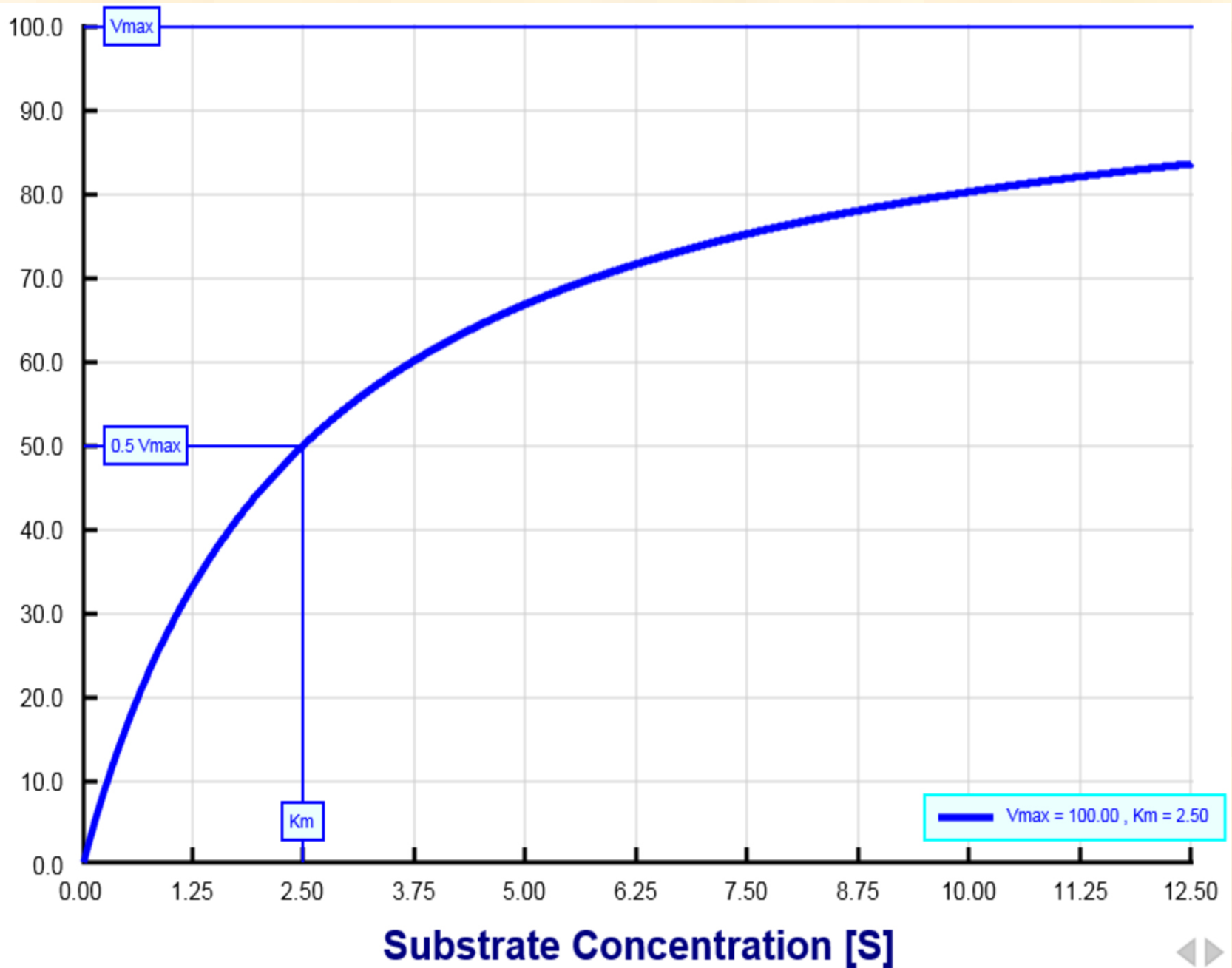


Data Sources: Chesapeake Bay Program
For more information, visit www.chesapeakebay.net
Disclaimer: www.chesapeakebay.net/termsandconditions.htm

Main Stem Chesapeake Bay

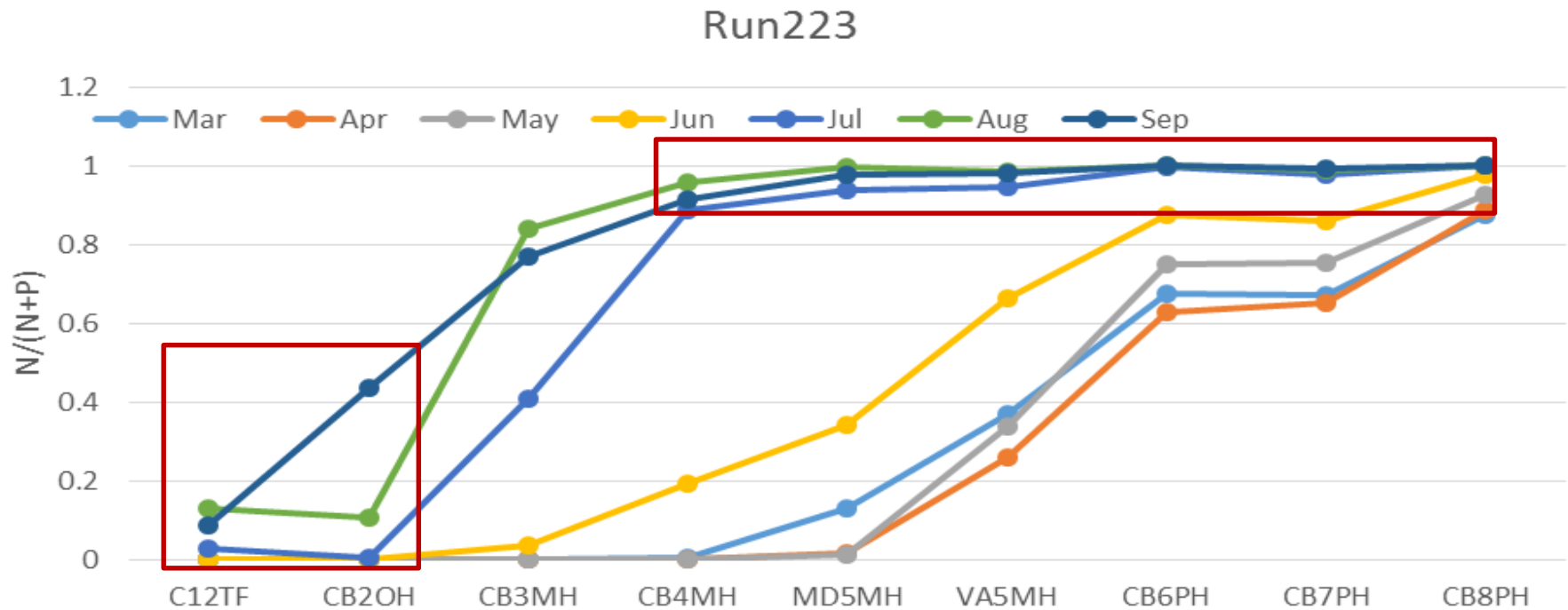
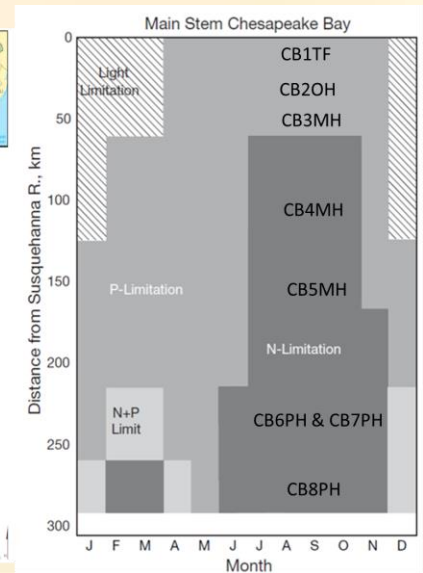
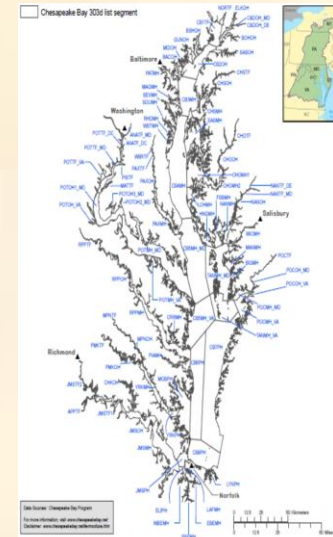


Growth Rate (G)



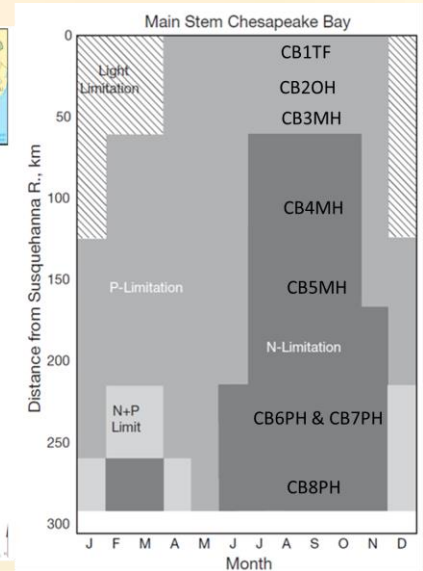
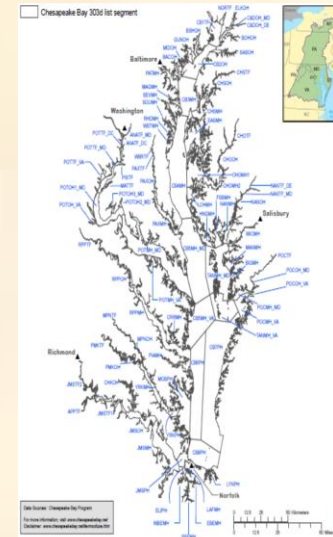
Final WQSTM assessment of nutrient limitation

- Appropriate representation of P limitation in the upper Bay (CB1 & CB2 should be P limited at all times).
- Appropriate N limitation in the lower Bay (CB4, CB5, CB6, CB7, and CB8 should be N limited in July, August, and September).

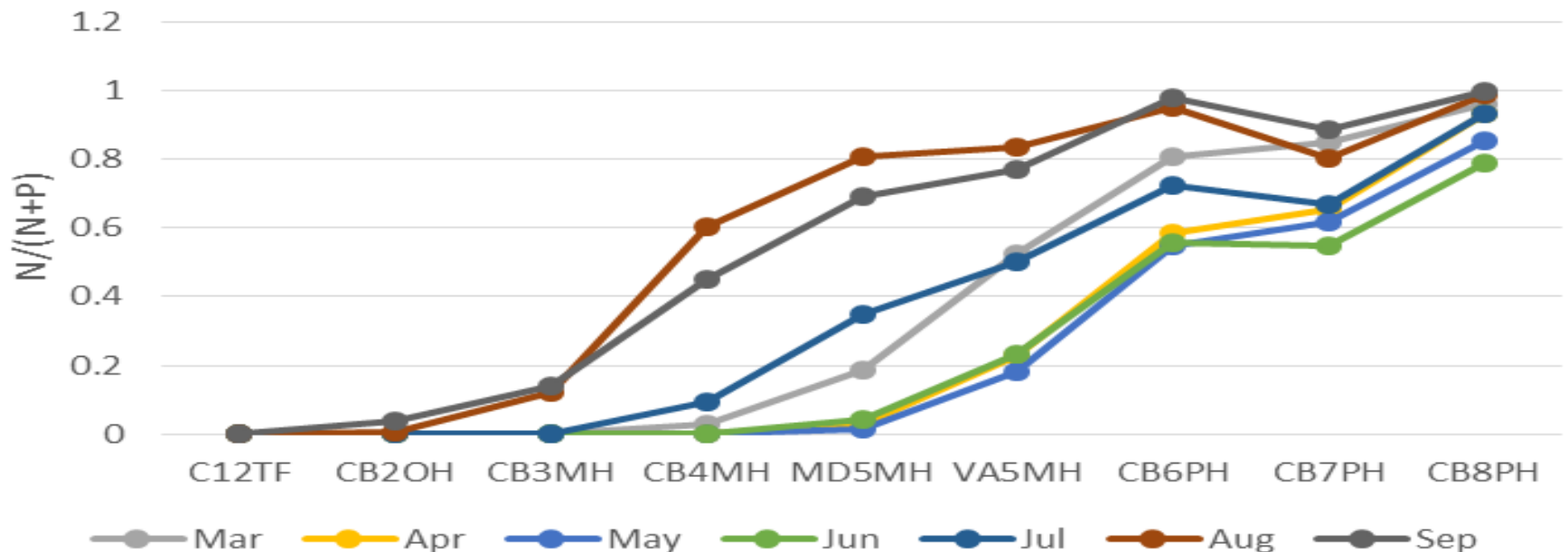


Phase 5.3.2

- Insufficient N limitation in CB4, CB5, CB6, and CB7 in June, July, August, and September (Should be entirely N limited in June from CB6 to CB8).



Phase 5.3.2

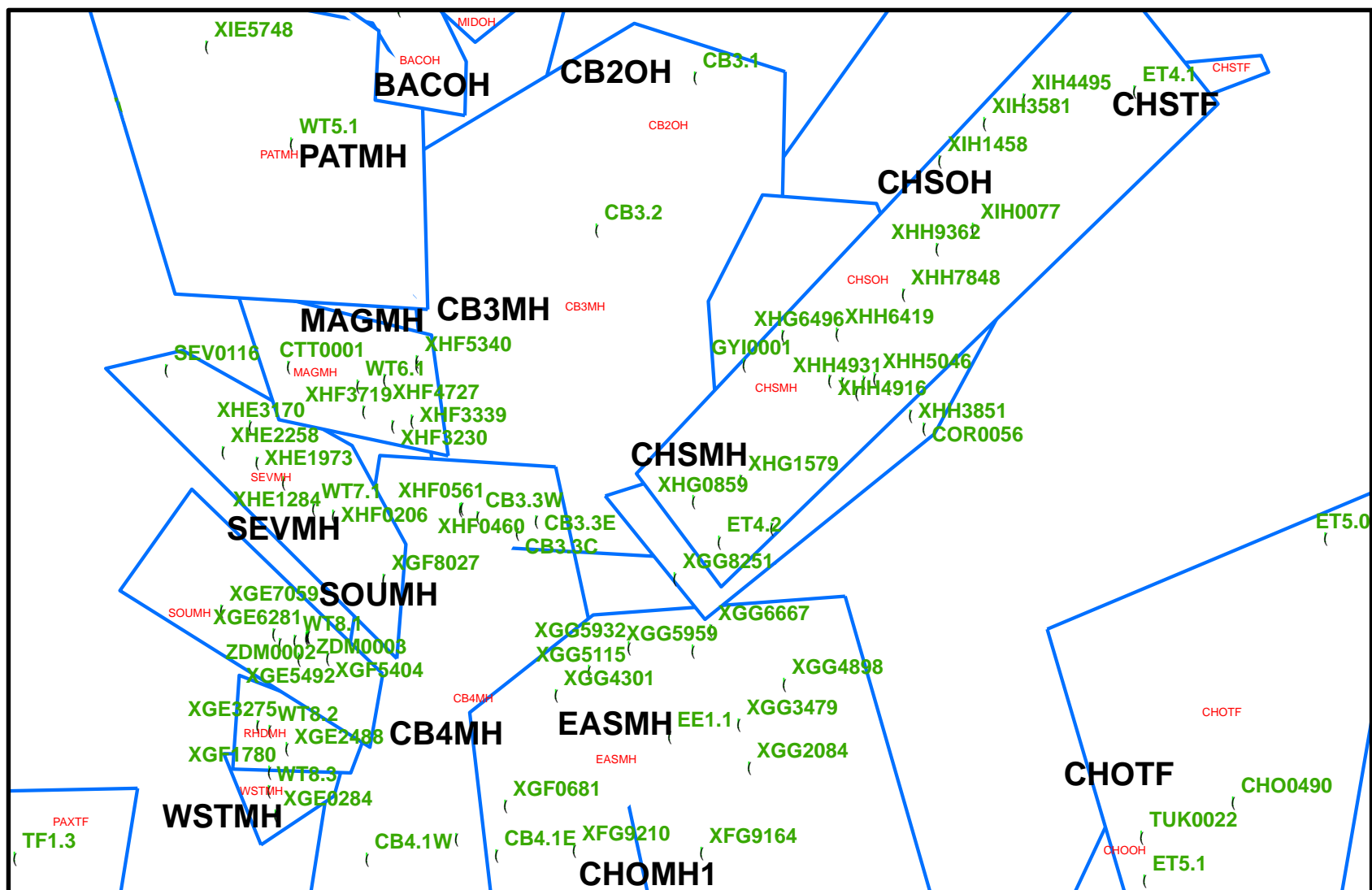


Phase 6 WQSTM* Bay Model

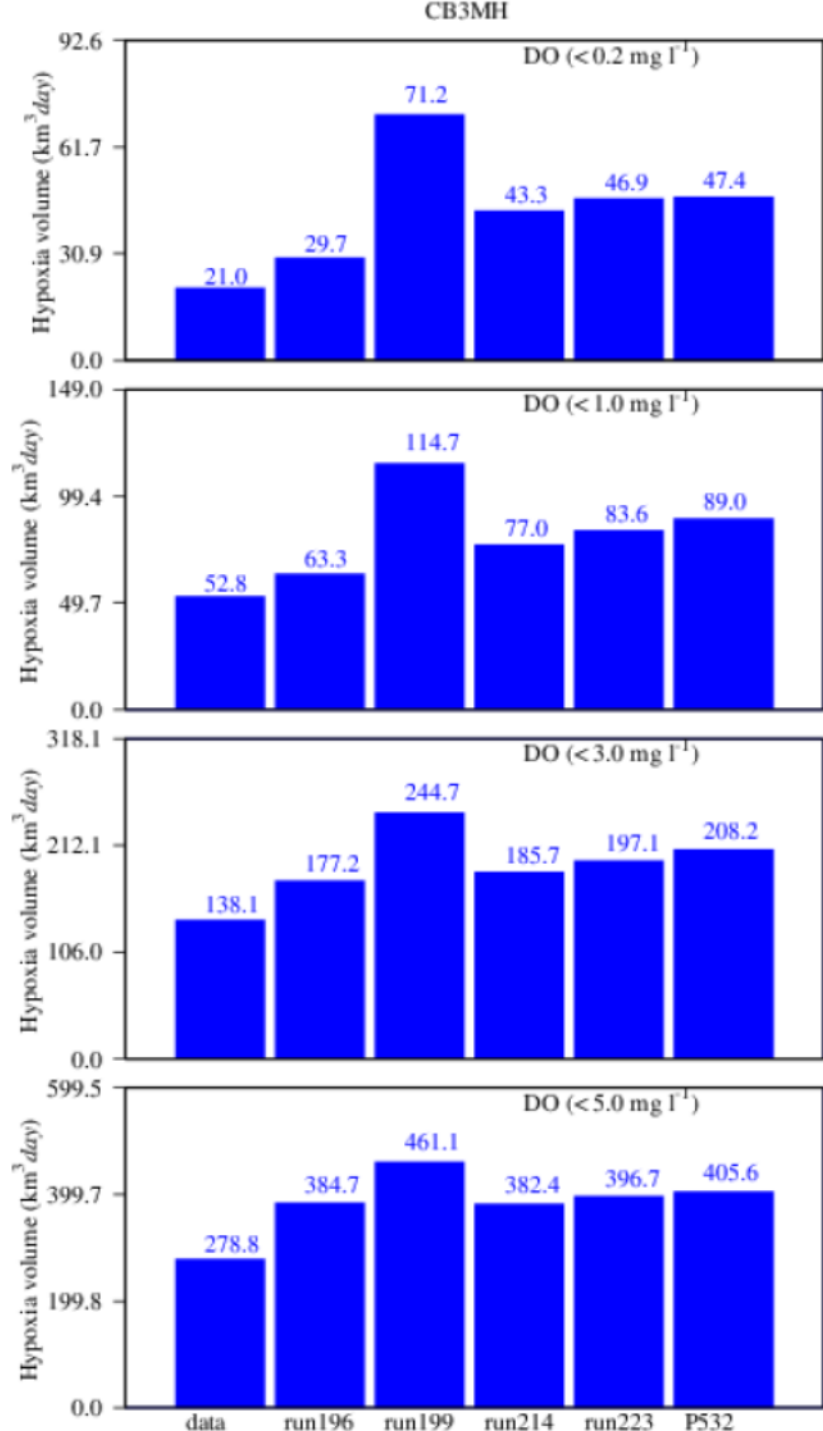
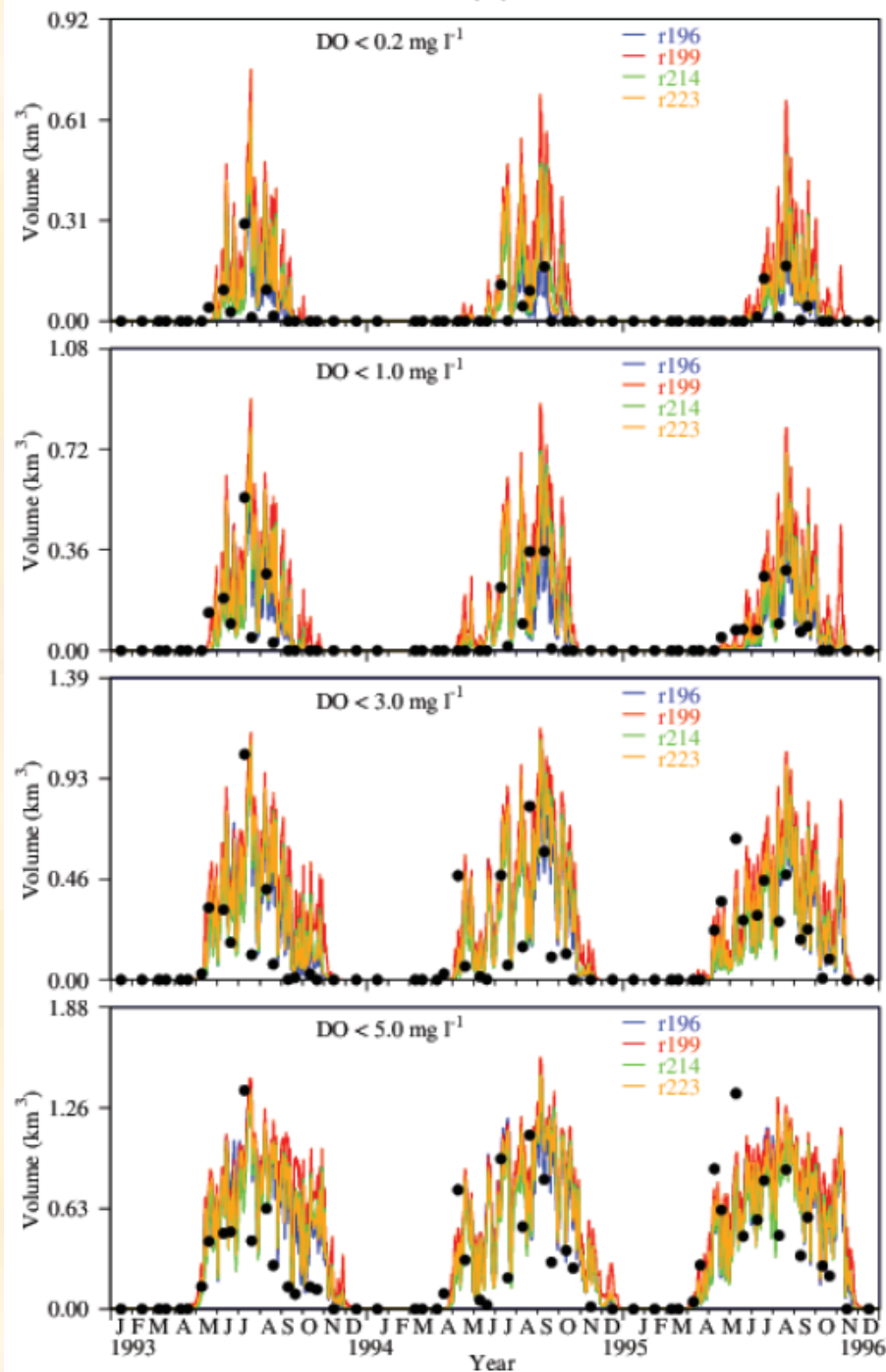
2017 Estimated Water Quality
Standard Achievement

Final calibration – Hypoxia simulation

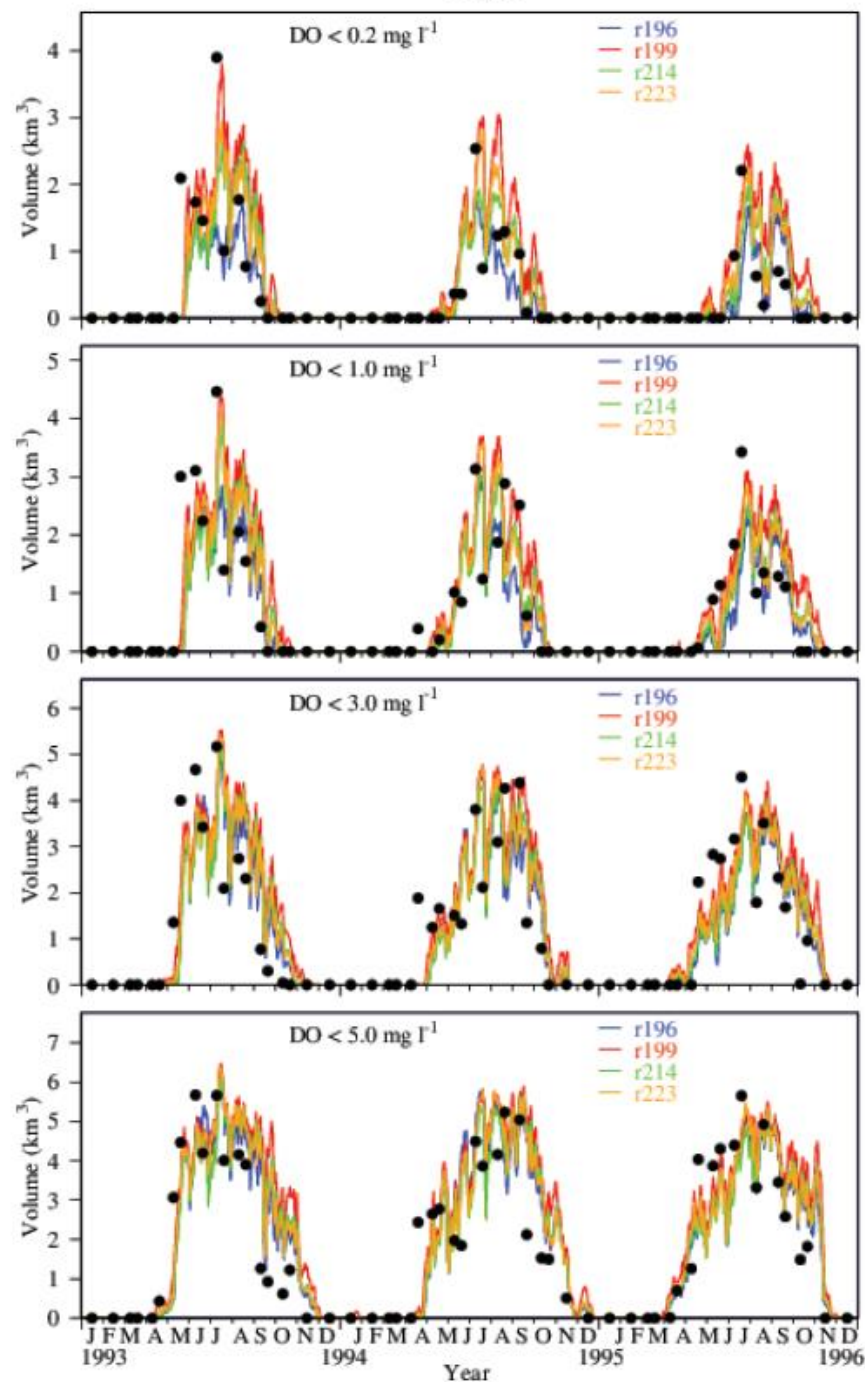
* Water Quality and Sediment Transport Model



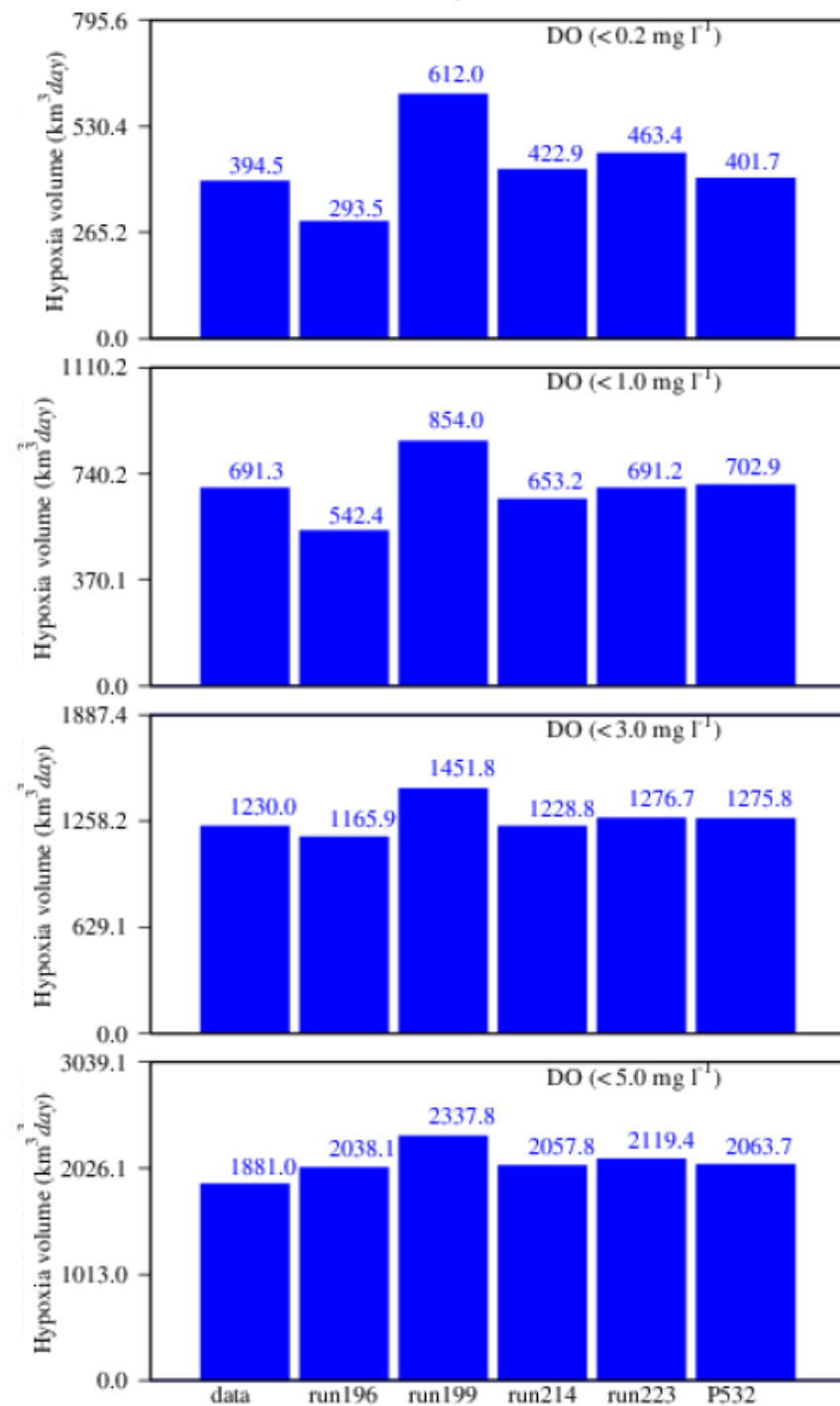
CB3MH



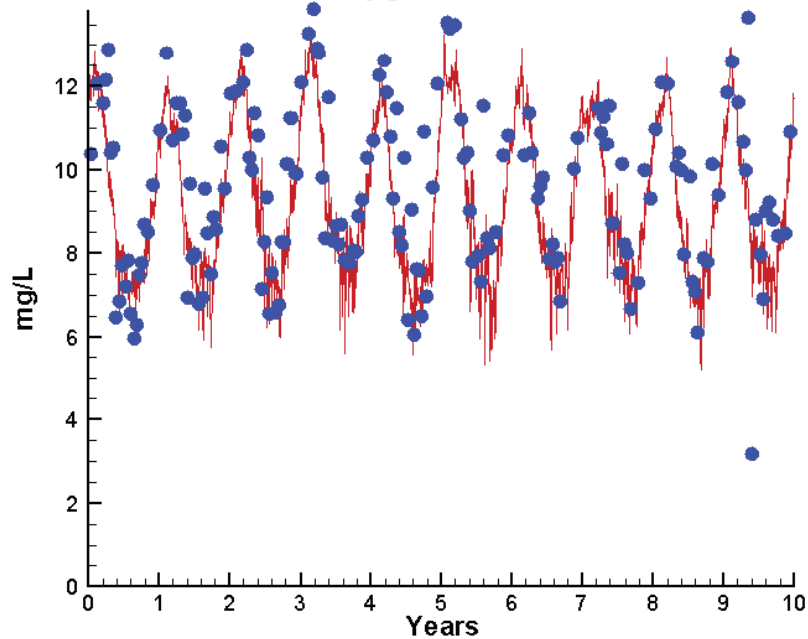
CB4MH



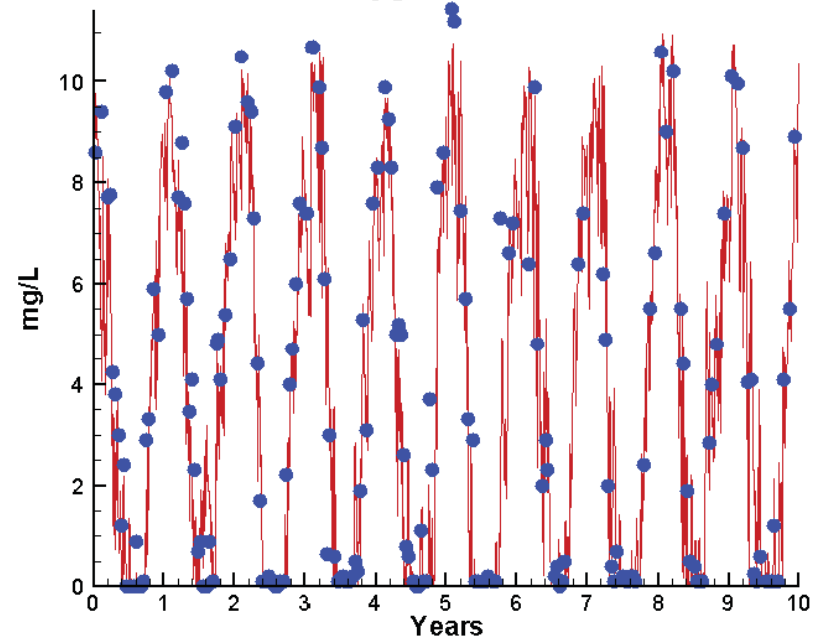
CB4MH



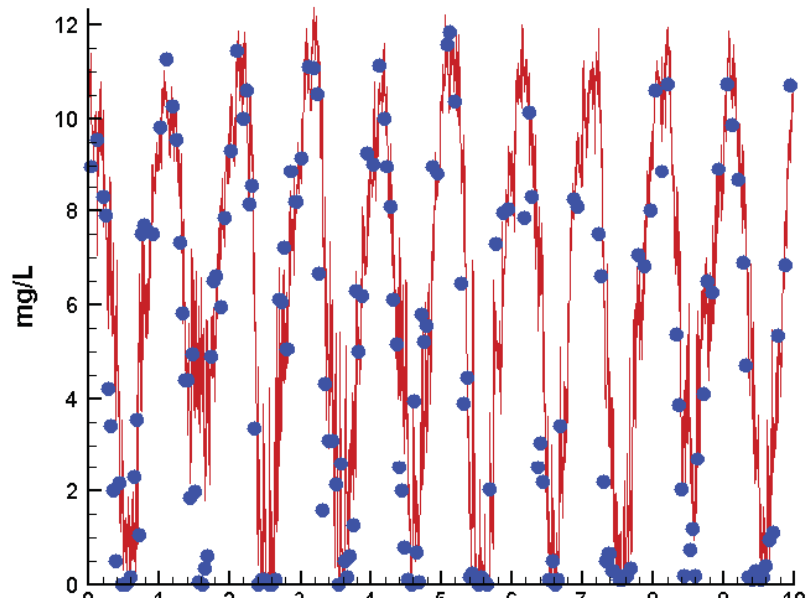
Run223 1991-2000
Dissolved Oxygen CB4.2C Surface



Run223 1991-2000
Dissolved Oxygen CB4.2C Bottom



Run223 1991-2000
Dissolved Oxygen CB4.2C Mid-Depth



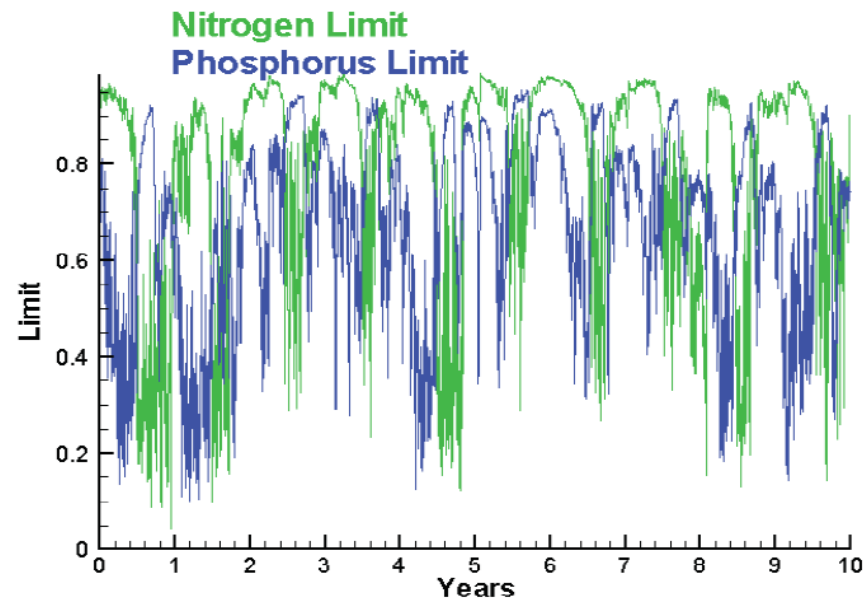
Mean Difference

Absolute Mean Difference

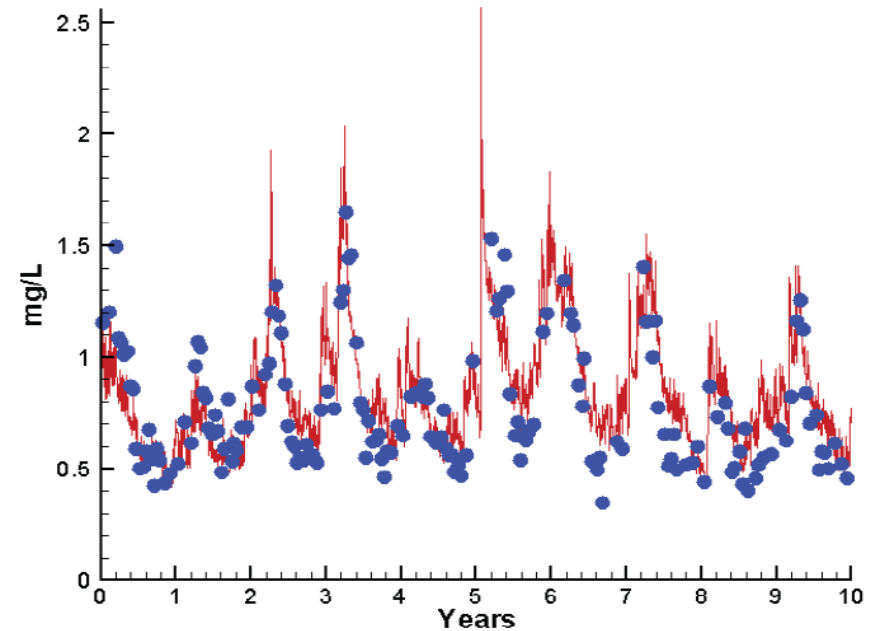
Top DO -0.5205
 Mid DO 1.0038
 Bot DO -0.4165

0.9002
 1.4866
 0.9393

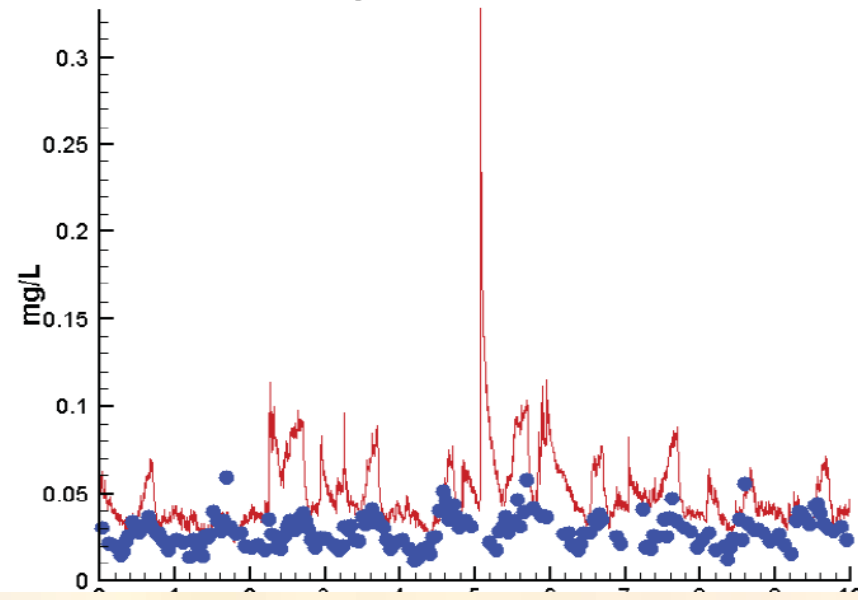
Run223 1991-2000
Algal Limits



Run223 1991-2000
Total Nitrogen CB4.2C Surface



Run223 1991-2000
Total Phosphorus CB4.2C Surface

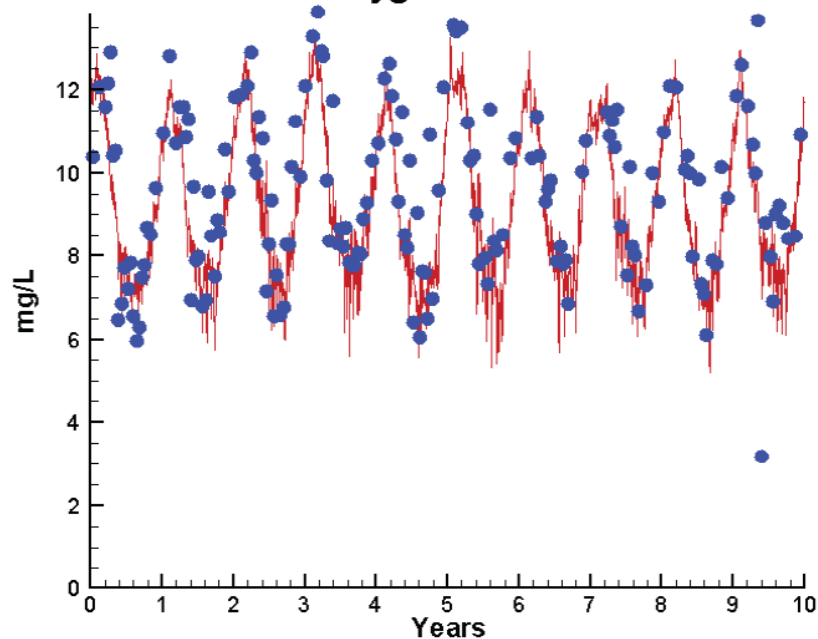


Mean Difference

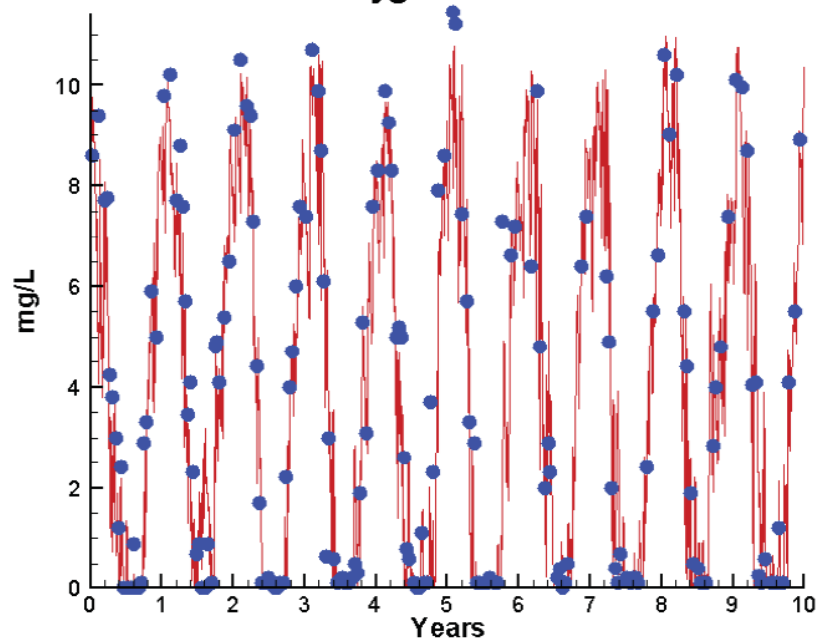
Absolute Mean Difference

	Mean Difference	Absolute Mean Difference
Chl	2.4157	5.0535
DIN	-0.0053	0.1028
KE	0.3059	0.3607
DIP	0.0062	0.0071
TP	0.0207	0.0214
TN	0.0625	0.1384

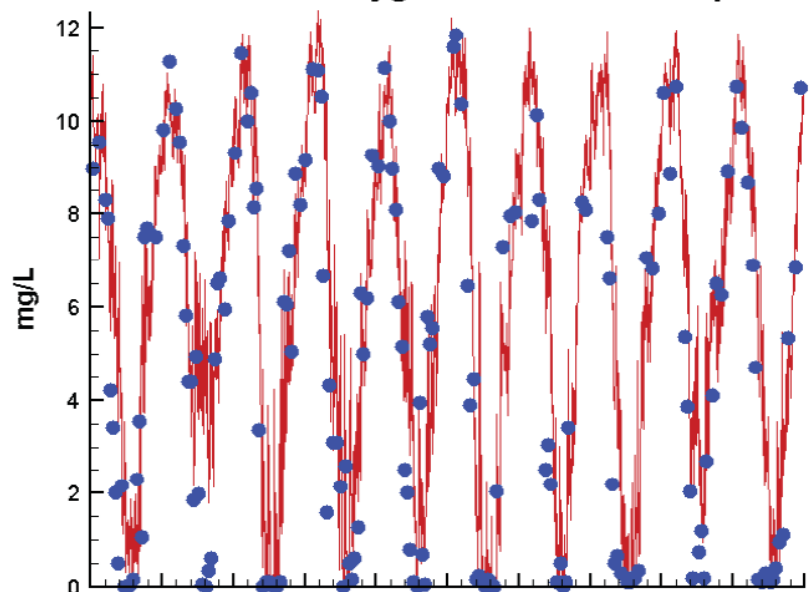
Run223 1991-2000
Dissolved Oxygen CB4.2C Surface



Run223 1991-2000
Dissolved Oxygen CB4.2C Bottom



Run223 1991-2000
Dissolved Oxygen CB4.2C Mid-Depth

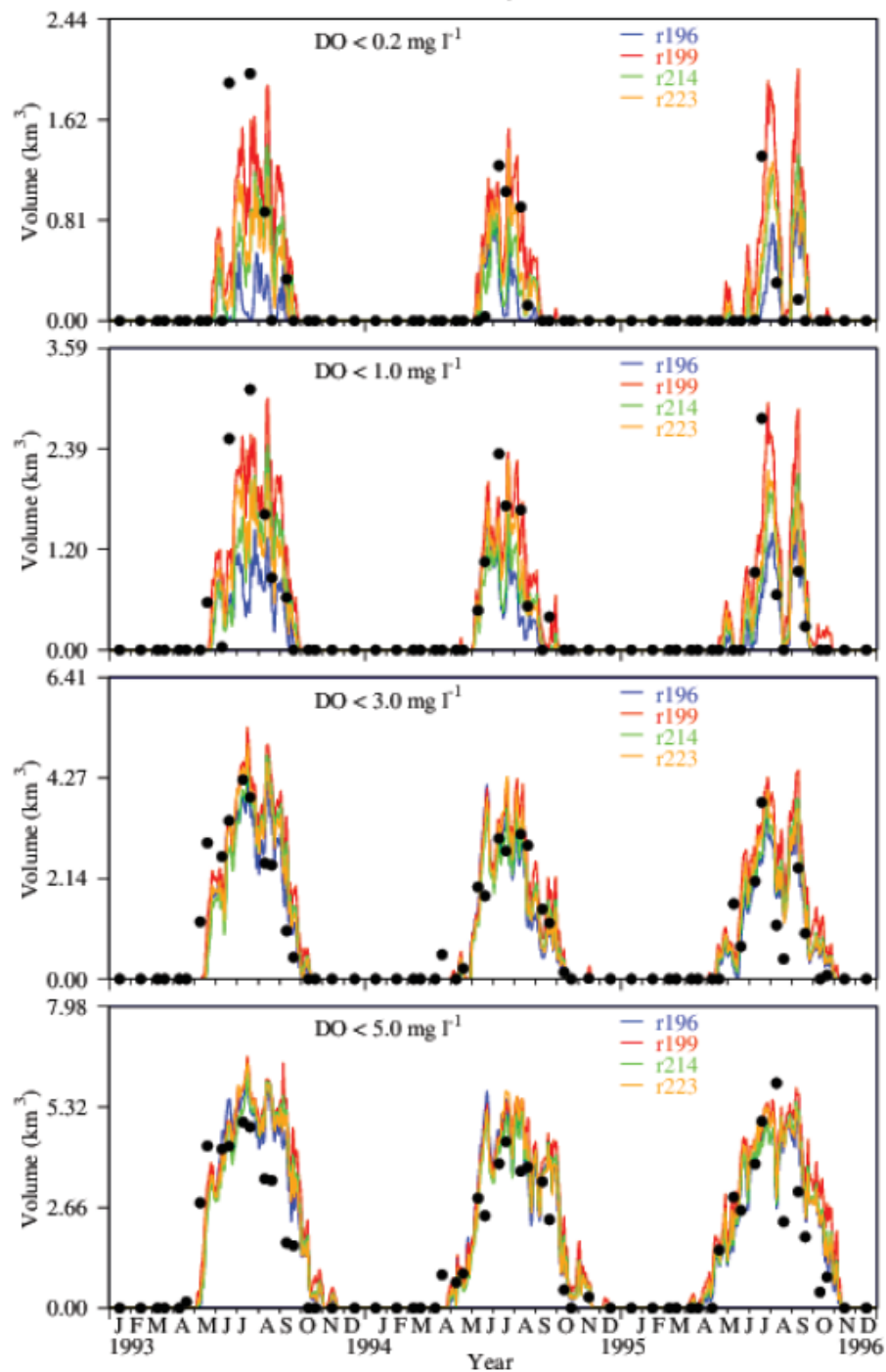


Mean Difference

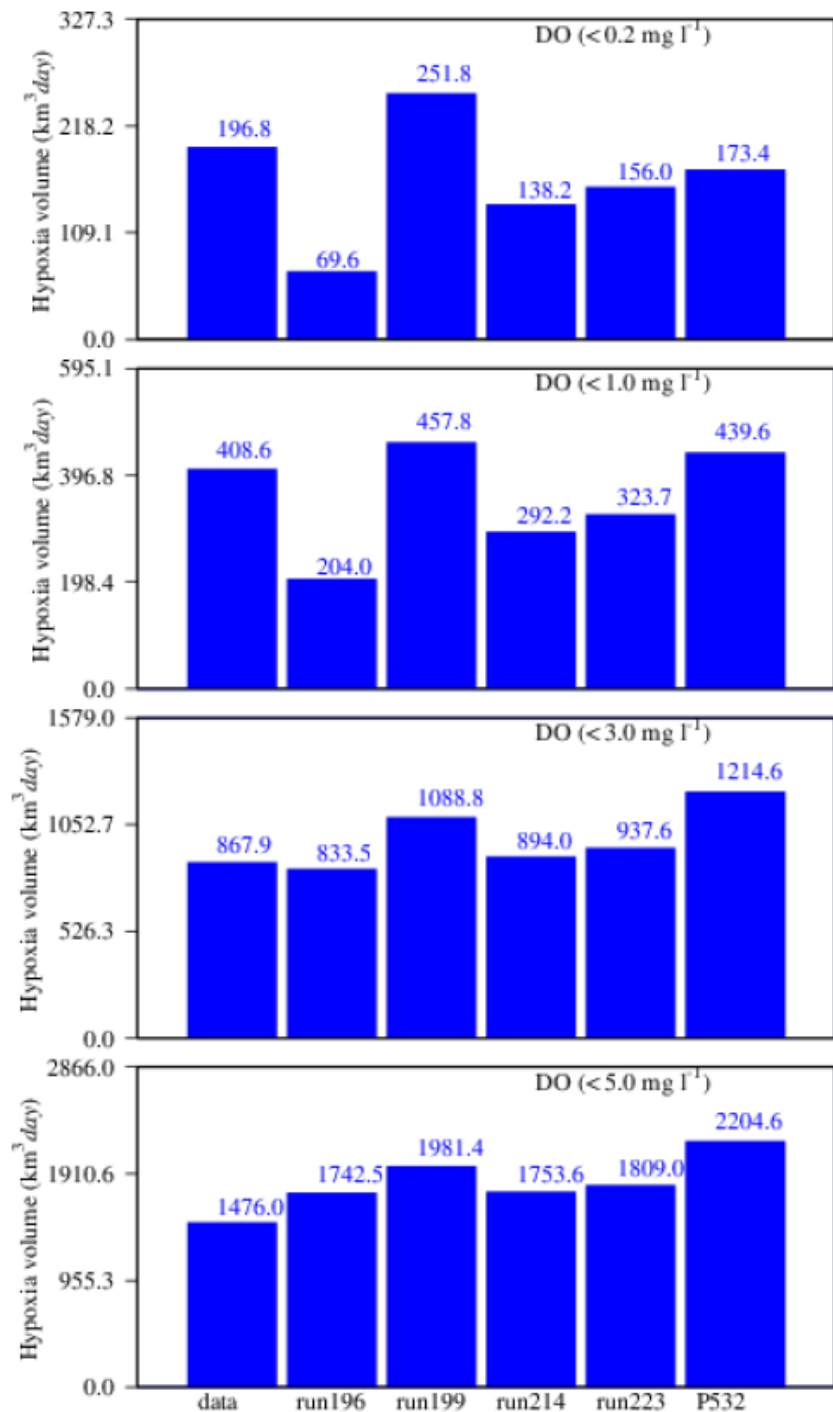
Absolute Mean Difference

Top DO	-0.5205	0.9002
Mid DO	1.0038	1.4866
Bot DO	-0.4165	0.9393

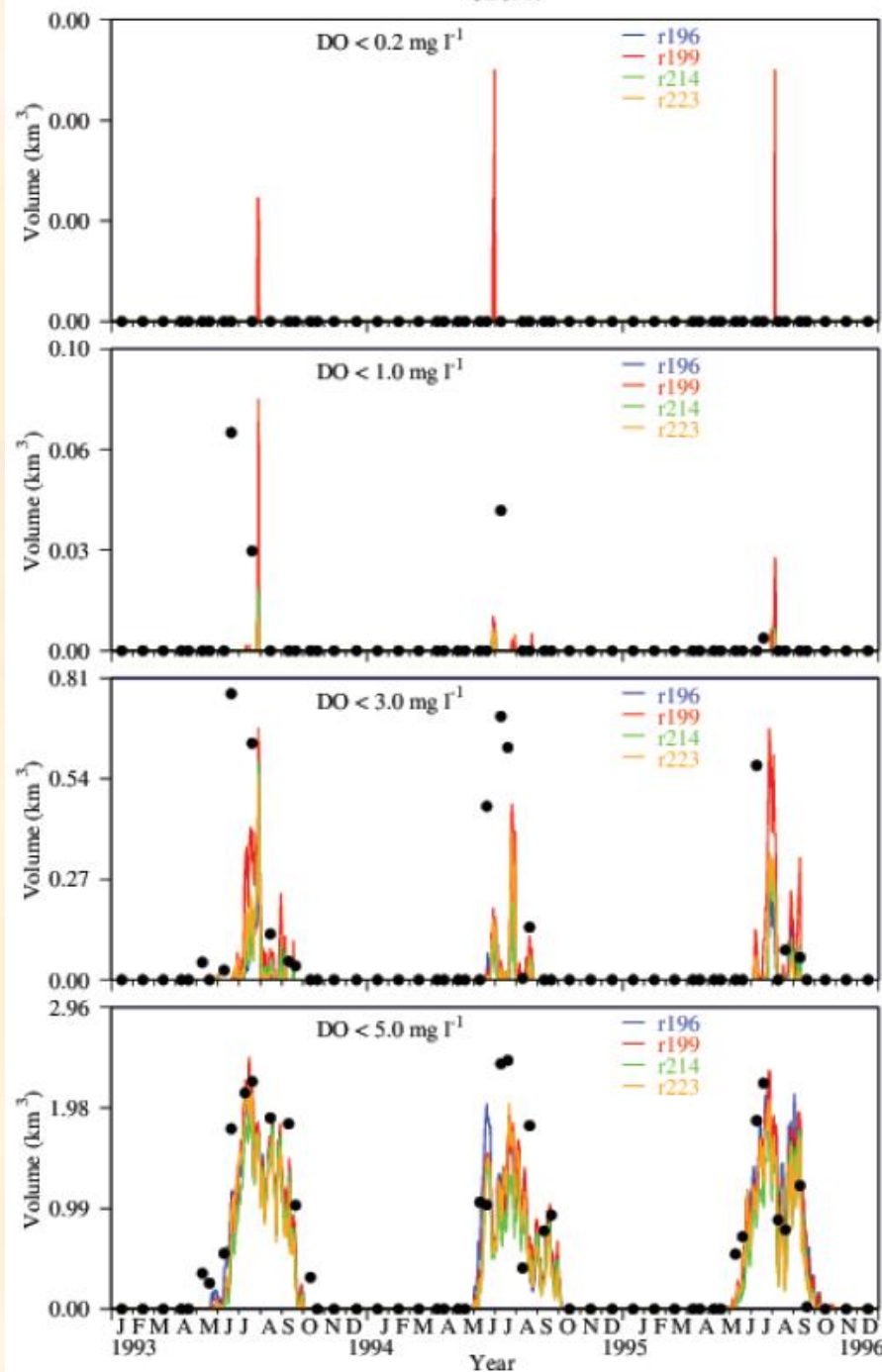
MD5MH



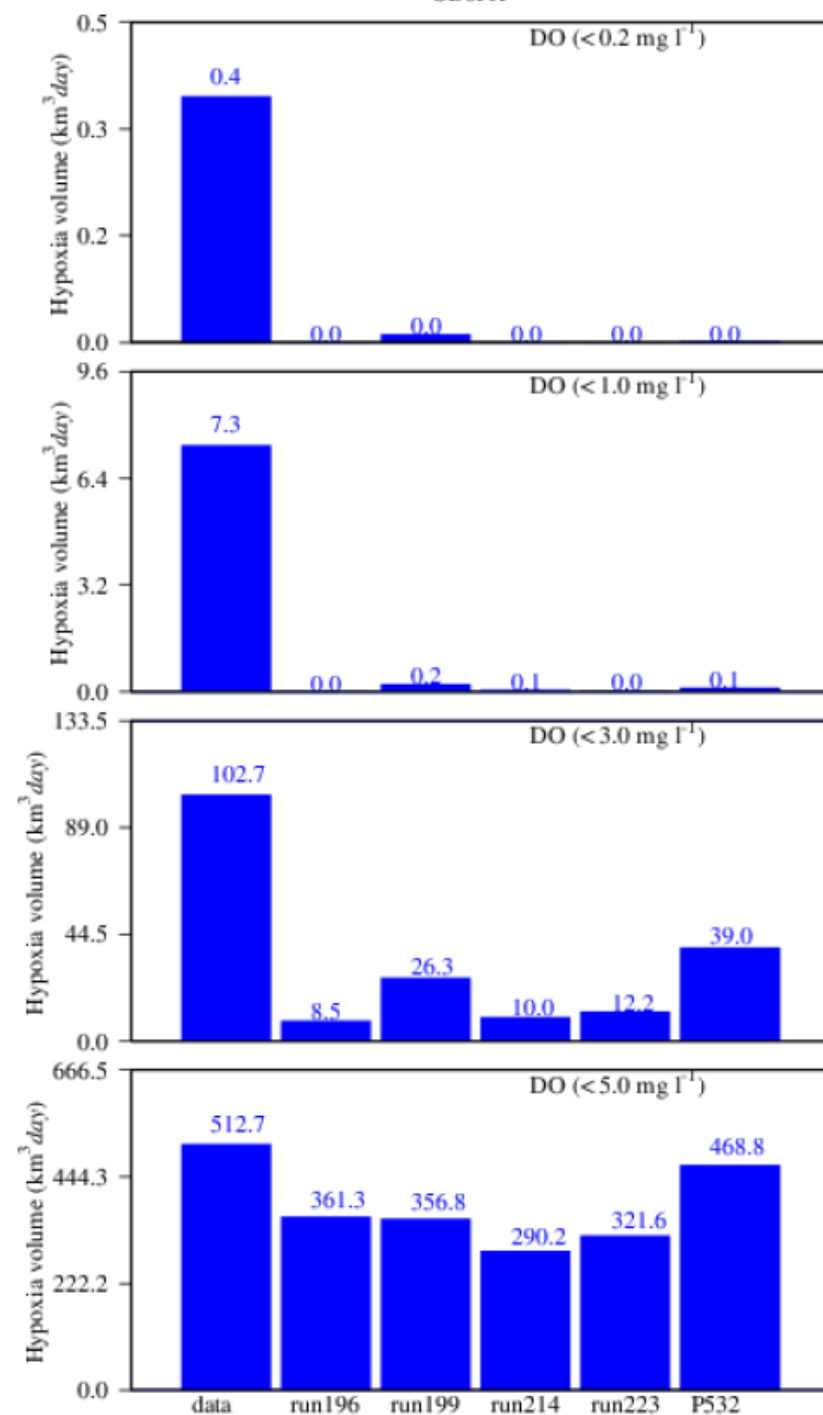
MD5MH

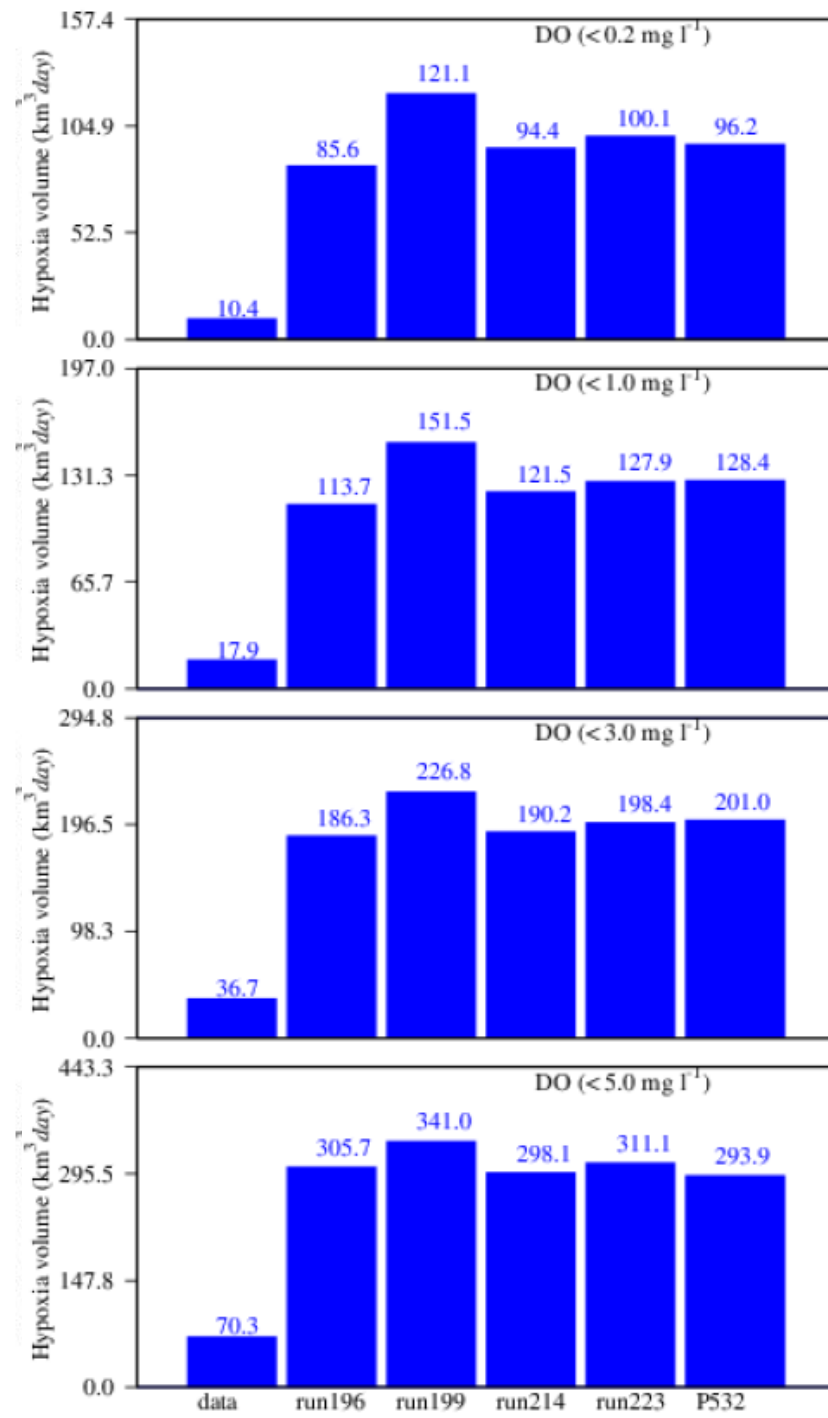
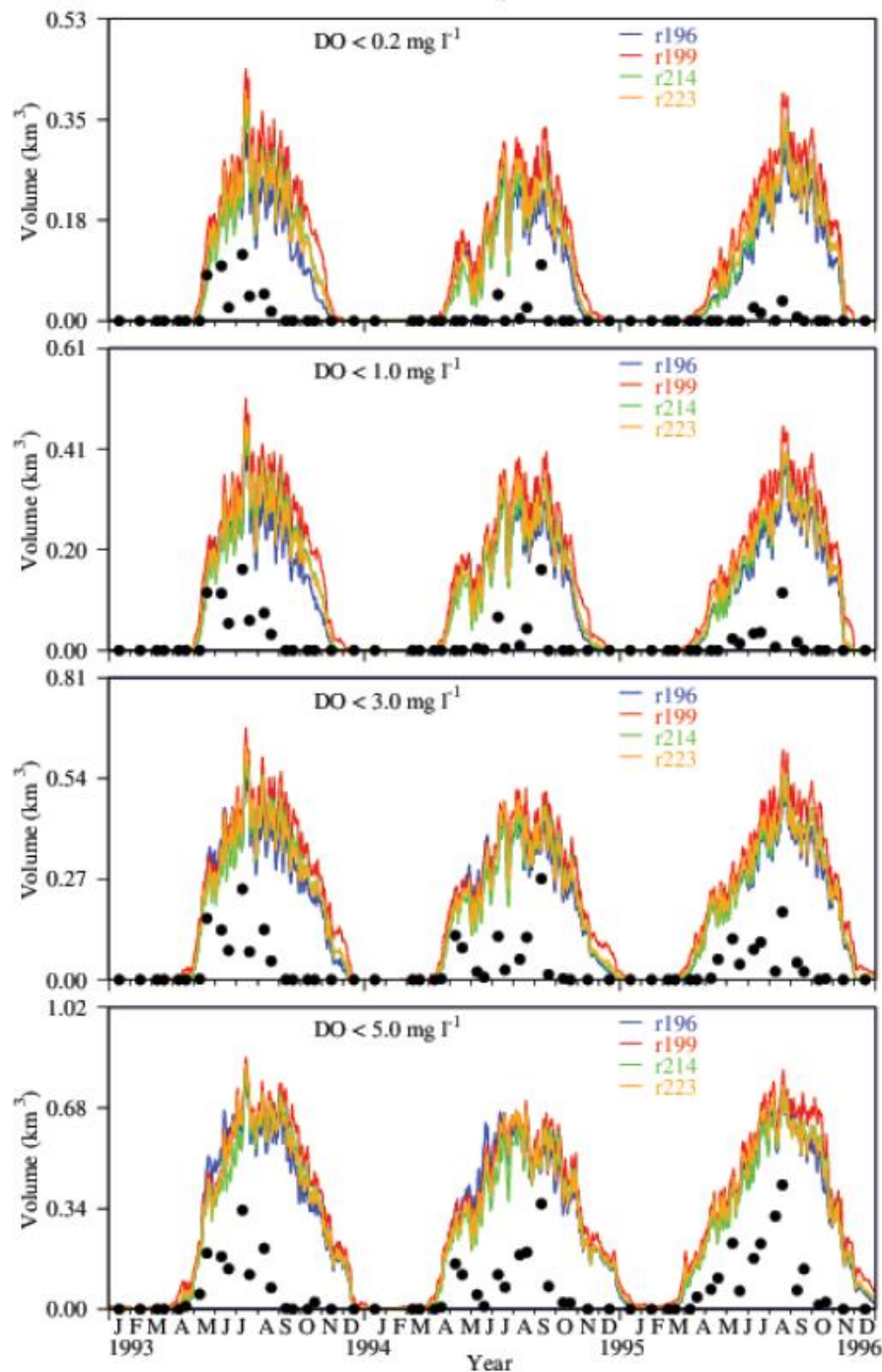


CB6PH

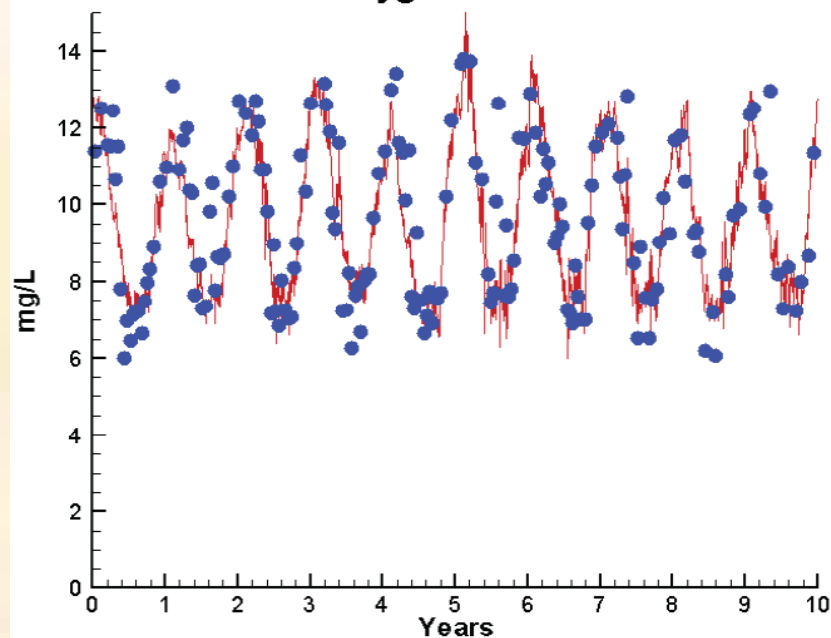


CB6PH

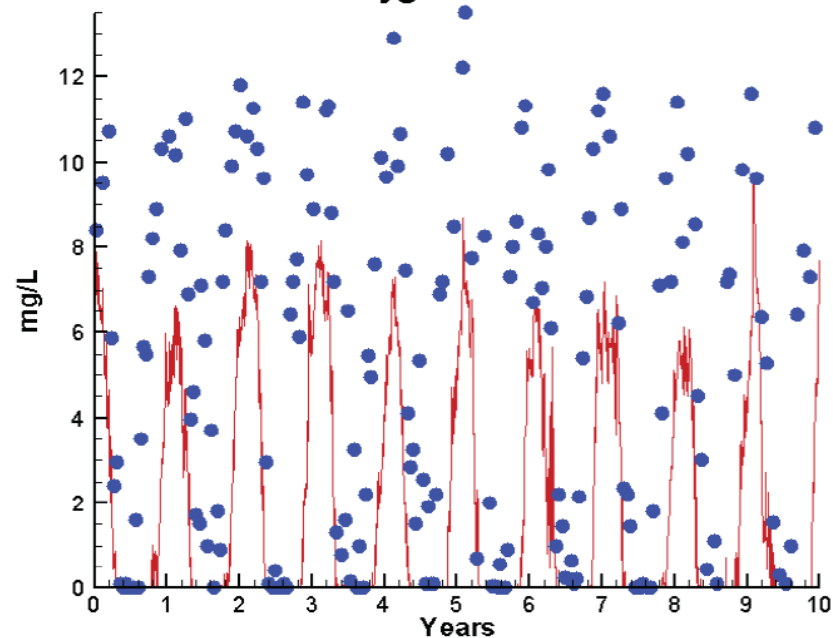




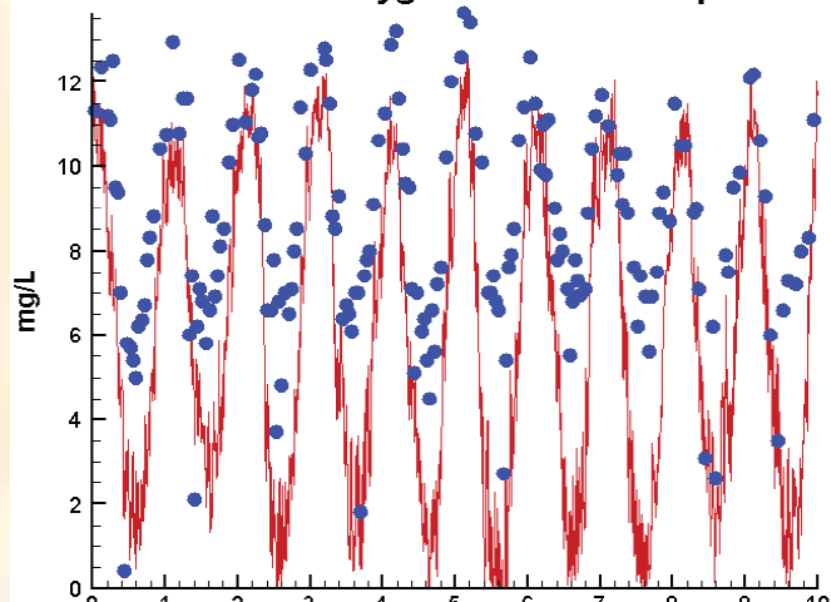
Run223 1991-2000
Dissolved Oxygen EE1.1 Surface



Run223 1991-2000
Dissolved Oxygen EE1.1 Bottom



Run223 1991-2000
Dissolved Oxygen EE1.1 Mid-Depth



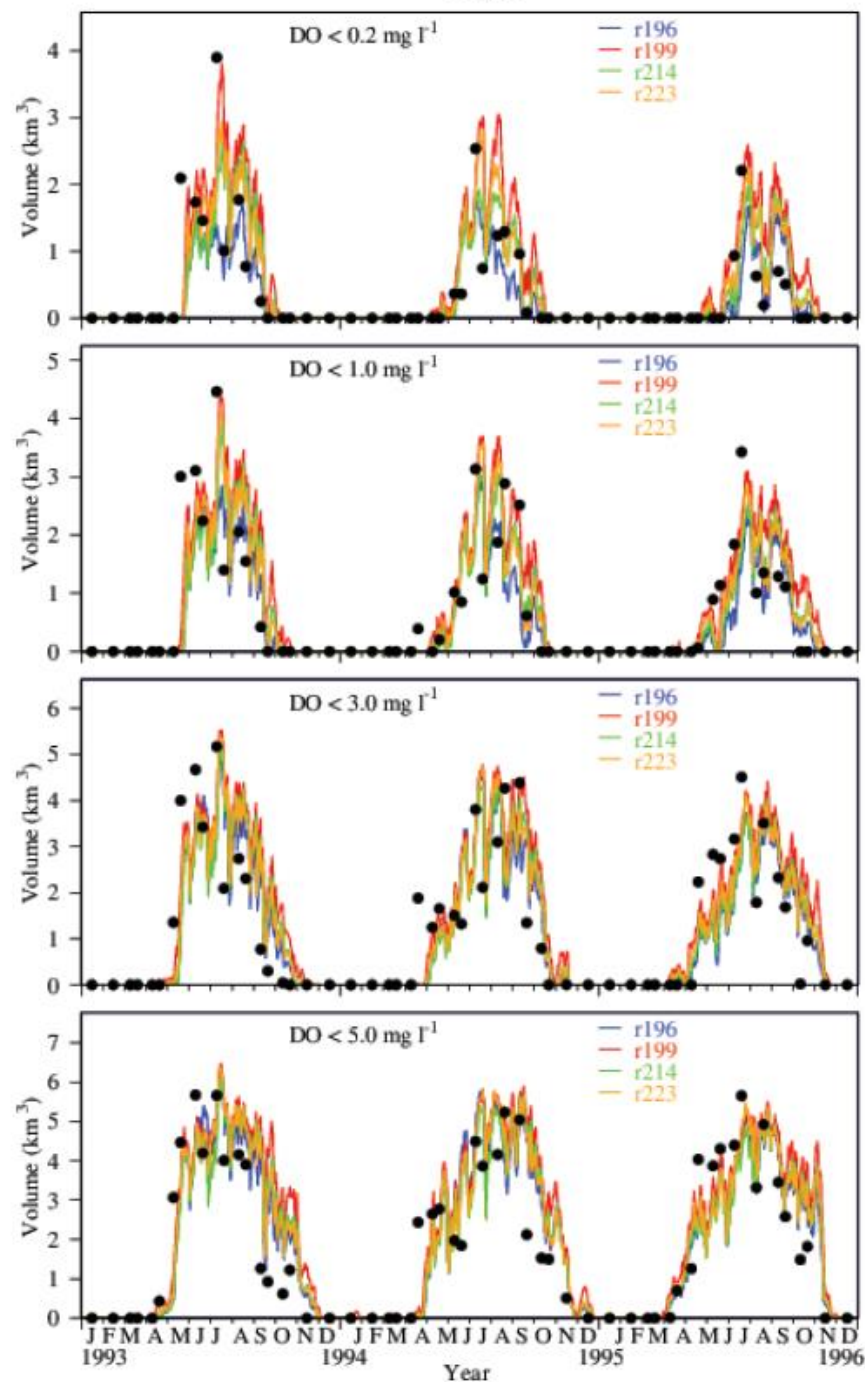
Mean Difference

Absolute Mean Difference

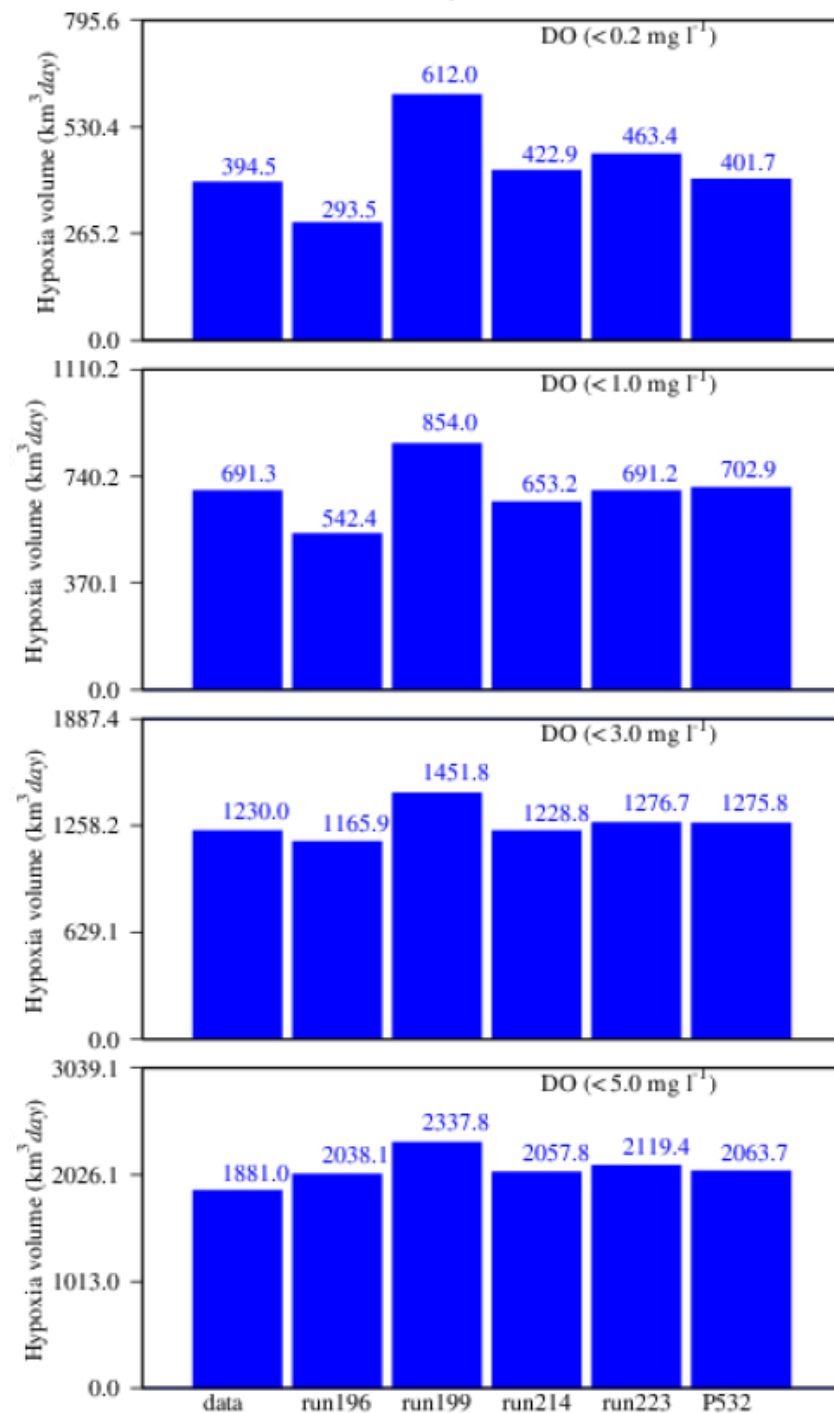
Top DO -0.1637
 Mid DO -3.2056
 Bot DO -3.6903

0.7896
 3.2775
 3.7084

CB4MH



CB4MH



Phase 6 WQSTM* Bay Model

2017 Estimated Water Quality
Standard Achievement

Key Scenarios

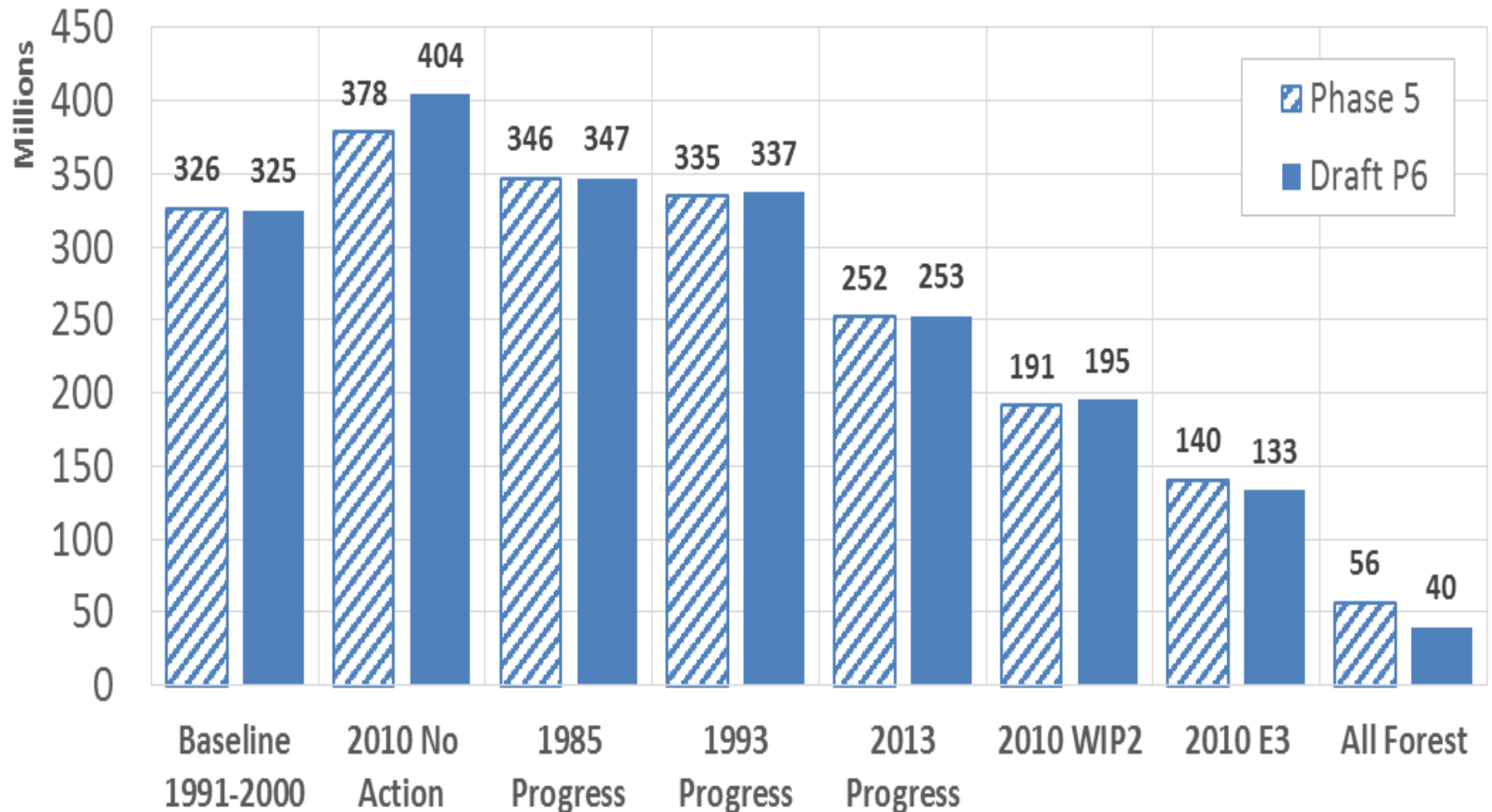
* Water Quality and Sediment Transport Model



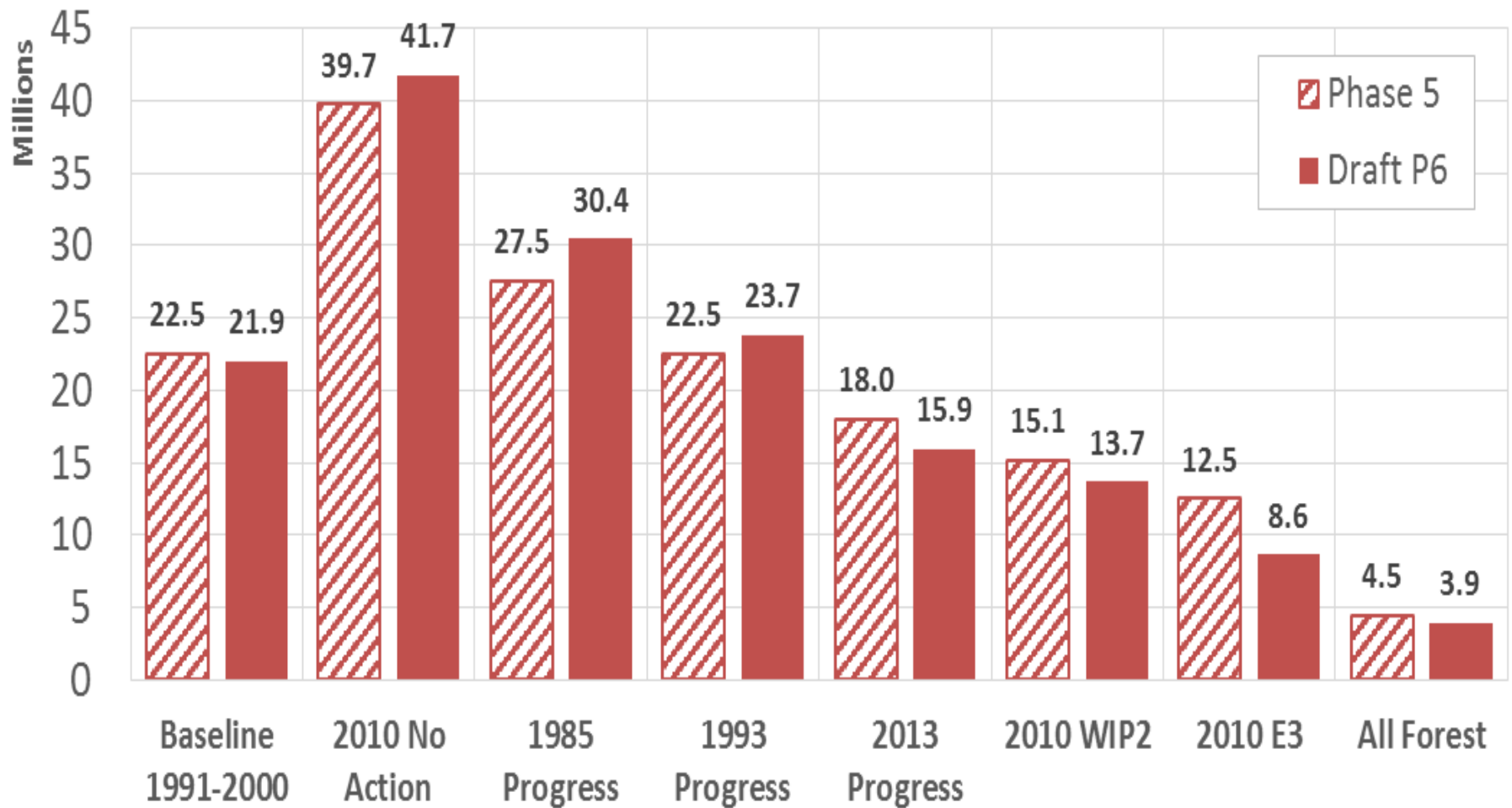
Decision Rules and Variances

- Round to whole numbers.
- Consider nonattainment of 1 percent to be, in fact, attainment to allow for a degree of uncertainty in the overall WQS assessment.
- Variances based on MD and VA's WQ Standard regulations:
 - Middle Ches. Bay Mainstem (CB4MH): 7% for deep-water use
 - Middle Ches. Bay Mainstem (CB4MH): 2% for deep-channel use
 - Patapsco River (PATMH): 7% for deep-water use
 - Lower Chester River (CHSMH): 16% for deep-channel use
 - Eastern Bay (EASMH): 2% for deep-channel use
- The 30-day mean DO criterion for Open Water is 4 mg/L mg/L for these segments:
 - Upper Pocomoke (POCTF)
 - Middle Pocomoke-Maryland (POCOH_MD)
 - Middle Pocomoke-Virginia (POCOH_VA)
 - Lower Pocomoke-Maryland (POCMH_MD)
 - Lower Pocomoke-Virginia (POCMH_VA)
 - Upper Mattaponi (MPNTF)
 - Lower Mattaponi (MPNOH)
 - Upper Pamunkey (PMKTF)
 - Lower Pamunkey (PMKOH)

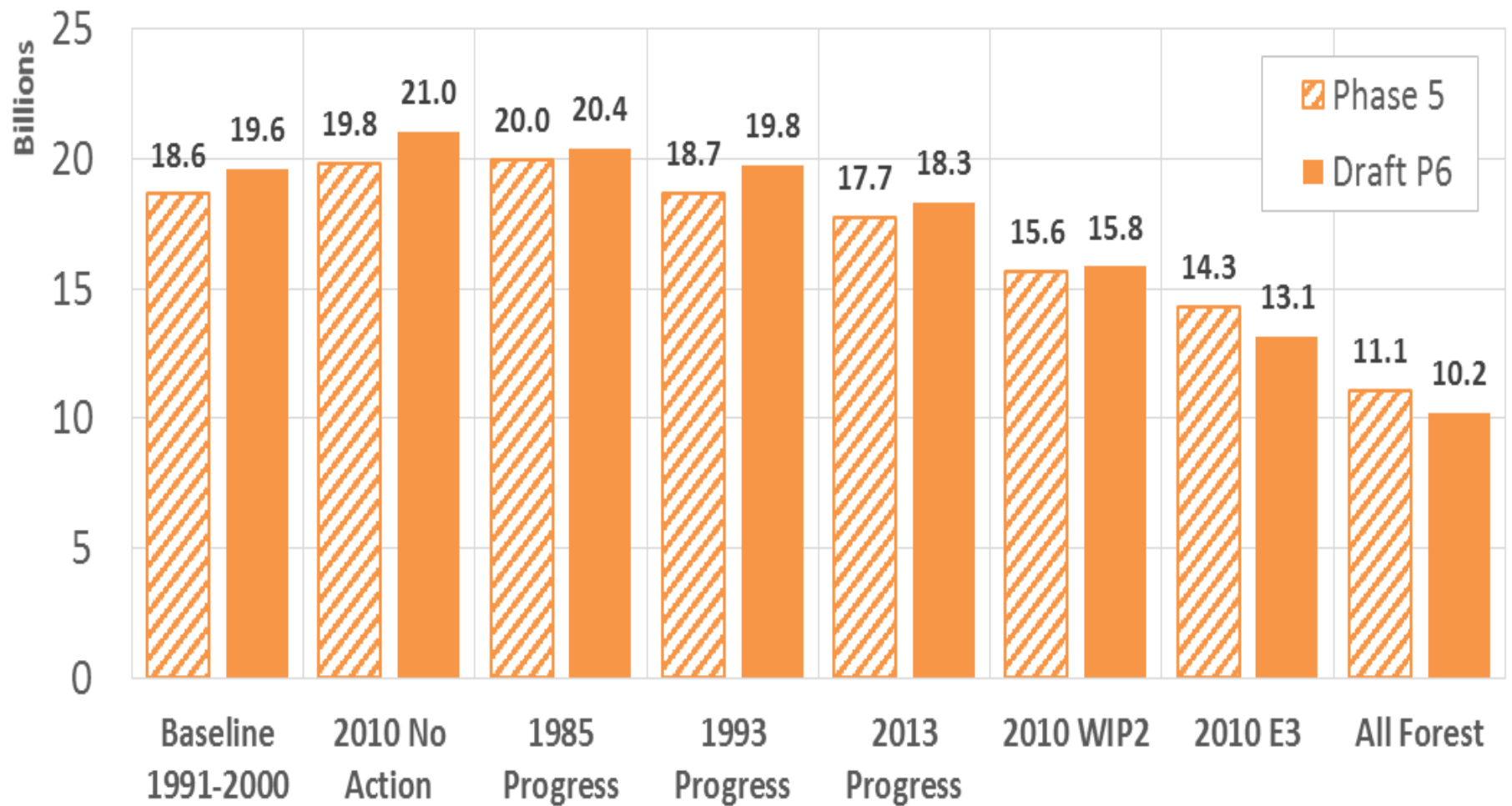
Key Scenario Total Nitrogen Delivery to the Bay (Mlbs)



Key Scenario Total Phosphorus Delivery to the Bay (Mlbs)



Key Scenario Total Suspended Solids Delivery to the Bay (Blbs)



Deep Channel DO Water Quality Standard Attainment (< 1 mg/l DO)

				1985	1993	2013	WIP2 +					
		Base	No Action	Progress	Progress	Progress	WIP2 + 5%	WIP2	WIP2 - 5%	Cono Infill	E3	All Forest
Run 223		325TN	404TN	347TN	337TN	253TN	205TN	195TN	185TN	208TN	133TN	40TN
11/27/17		21.9TP	41.7TP	30.4TP	23.7	15.9TP	14.4	13.7TP	13.0TP	15.4	8.6TP	3.9TP
CAST Loads		1993-1995	1993-1995	1993-1995	1993-1995	1993-1995	1993-1996	1993-1995	1993-1996	1993-1995	1993-1995	1993-1995
		Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
Cbseg	State	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel
CB3MH	MD	16.0%	12.7%	9.4%	7.6%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB4MH	MD	46.0%	53.0%	48.0%	46.2%	27.2%	8.8%	5.9%	3.4%	8.0%	0.0%	0.0%
CB5MH	MD/VA	14.2%	19.6%	15.7%	14.7%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHSMH	MD	37.4%	26.0%	20.0%	17.9%	6.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
POTMH	MD/VA	20.2%	21.1%	17.9%	16.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
POMMH	MD	20.4%	21.3%	18.0%	17.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RPPMH	VA	19.0%	25.4%	19.1%	16.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EASMH	MD	25.4%	27.3%	21.3%	18.7%	13.3%	7.8%	6.2%	5.1%	6.9%	0.0%	0.0%
MD5MH	MD	21.7%	26.5%	23.0%	21.8%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VA5MH	VA	4.5%	10.3%	5.8%	5.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PATMH	MD	24.8%	40.3%	32.7%	23.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Grey background for CB segments unassessed because of model limitations.

Yellow background for when variances are applied.

Deep Water DO Water Quality Standard Attainment (< 3 mg/l DO)

		1985			1993		2013		WIP2 +			
		Base	No Action	Progress	Progress	Progress	WIP2 + 5%	WIP2	WIP2 - 5%	Cono Infill	E3	All Forest
Run 223		325TN	404TN	347TN	337TN	253TN	205TN	195TN	185TN	208TN	133TN	40TN
11/27/17		21.9TP	41.7TP	30.4TP	23.7	15.9TP	14.4	13.7TP	13.0TP	15.4	8.6TP	3.9TP
CAST Loads		1993-1995	1993-1995	1993-1995	1993-1995	1993-1995	1993-1996	1993-1995	1993-1996	1993-1995	1993-1995	1993-1995
Cbseg	State	Deep Water	Deep Water	Deep Water	Deep Water	Deep Water	Deep Water	Deep Water	Deep Water	Deep Water	Deep Water	Deep Water
CB3MH	MD	2.1%	2.7%	1.8%	1.4%	0.3%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%
CB4MH	MD	21.0%	25.2%	21.1%	19.6%	9.6%	5.6%	5.0%	4.4%	5.5%	1.1%	0.0%
CB5MH	MD/VA	4.2%	4.7%	3.4%	3.2%	1.3%	0.5%	0.3%	0.1%	0.4%	0.0%	0.0%
CB6PH	VA	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB7PH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHSMH	MD	25.7%	11.3%	8.3%	3.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EASMH	MD	5.9%	25.4%	9.8%	2.2%	1.2%	0.5%	0.5%	0.5%	0.5%	0.4%	0.0%
PAXMH	MD	6.3%	17.1%	12.1%	8.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
POTMH	MD/VA	4.1%	7.0%	4.7%	4.4%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
POMMH	MD	4.1%	7.1%	4.8%	4.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RPPMH	VA	5.9%	10.7%	6.9%	5.9%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SBEMH	VA	0.0%	3.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YRKPH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MD5MH	MD	8.5%	9.3%	7.0%	6.5%	3.0%	1.4%	0.9%	0.6%	1.1%	0.0%	0.0%
VA5MH	VA	0.5%	0.7%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PATMH	MD	12.4%	17.3%	9.6%	6.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MAGMH	MD	51.0%	56.1%	51.0%	51.0%	13.1%	5.4%	1.2%	0.3%	5.4%	0.3%	0.0%
SOUMH	MD	18.6%	28.0%	20.3%	21.4%	3.0%	7.6%	3.0%	3.0%	7.6%	0.0%	0.0%
SEVMH	MD	6.1%	7.8%	6.4%	6.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

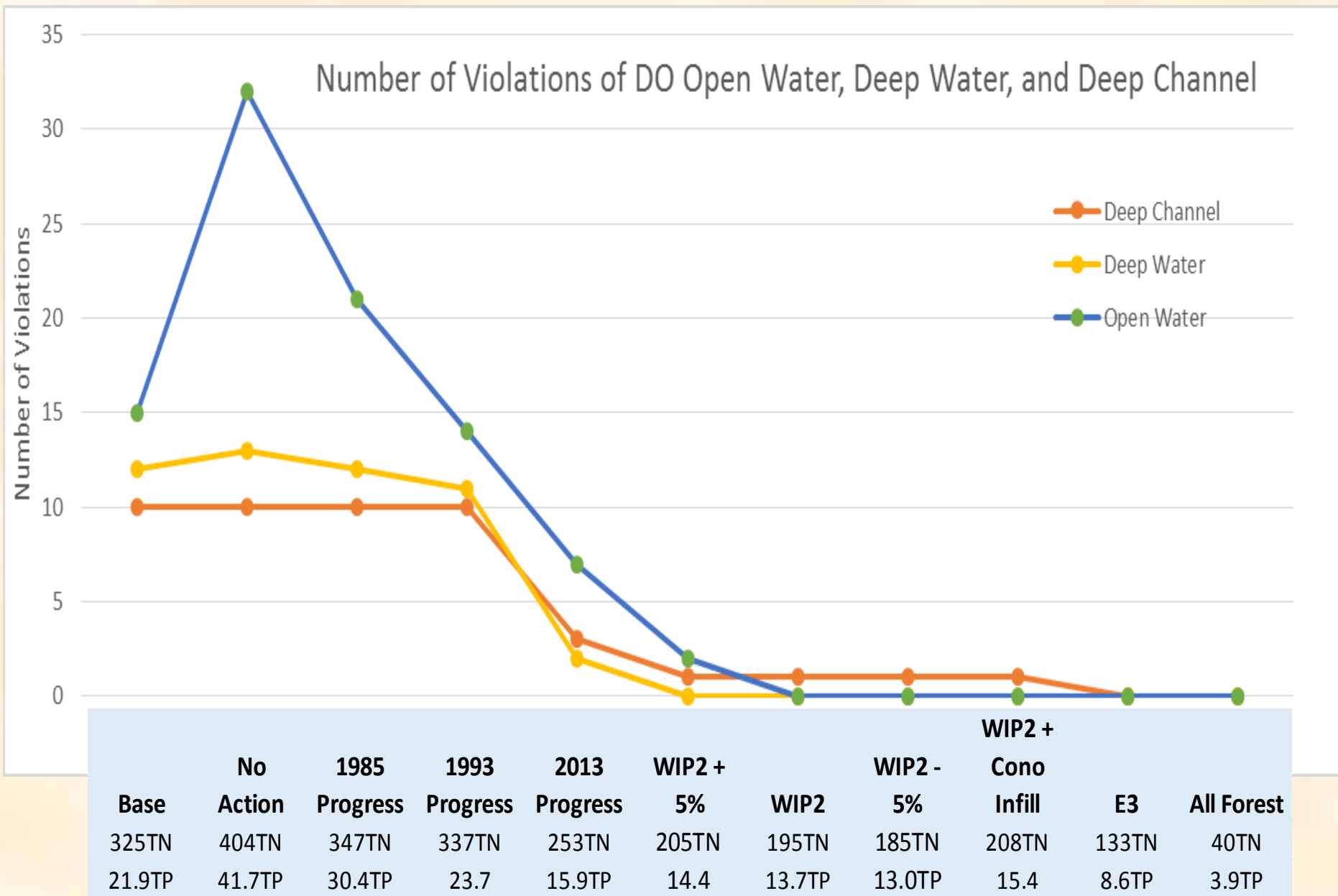
Grey background for CB segments unassessed because of model limitations.

Yellow background for when variances are applied.

Open Water DO Water Quality Standard Attainment (< 5 or 4 mg/l DO)

Run 223 11/27/17 CAST Loads		Base 325TN 121.9TP 1993-1995	No Action 404TN 41.7TP 1993-1995	1985 Progress 347TN 30.4TP 1993-1995	1993 Progress 337TN 23.7 1993-1995	2013 Progress 253TN 15.9TP 1993-1995	WIP2 + 5% 205TN 14.4 1993-1996	WIP2 195TN 13.7TP 1993-1995	WIP2 - 5% 185TN 13.0TP 1993-1996	WIP2 + Cono Infill 208TN 15.4 1993-1995	E3 133TN 8.6TP 1993-1995	All Forest 40TN 3.9TP 1993-1995
		Open Water	Open Water	Open Water	Open Water	Open Water	Open Water	Open Water	Open Water	Open Water	Open Water	Open Water
Cbseg	State											
CB1TF	MD	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB2OH	MD	0.0%	6.0%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB3MH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB4MH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB5MH	MD/VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB6PH	VA	2.4%	3.7%	2.9%	2.7%	0.8%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%
CB7PH	VA	5.5%	7.5%	6.1%	5.8%	2.6%	0.4%	0.3%	0.2%	0.3%	0.0%	0.0%
CB8PH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHOMH1	MD	1.7%	2.8%	1.9%	1.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHOMH2	MD	4.0%	12.8%	6.2%	4.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHOOH	MD	0.5%	10.4%	1.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHOTF	MD	0.0%	8.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHSMH	MD	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHSOH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHSTF	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EASMH	MD	0.0%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EBEMH	VA	22.7%	25.8%	22.7%	22.7%	18.5%	11.1%	8.2%	6.7%	11.1%	0.0%	0.0%
ELIPH	VA	4.5%	6.3%	4.9%	4.5%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JMSMH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JMSOH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JMSPH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JMSTF	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JMSTFL	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JMSTFLU	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MOBPH	VA	0.5%	0.8%	0.6%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MPNOH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MPNTF	VA	1.3%	1.3%	1.3%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PAXMH	MD	2.0%	8.8%	4.6%	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PAXOH	MD	20.7%	33.1%	28.7%	21.2%	1.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
PAXTF	MD	9.1%	9.4%	9.2%	9.4%	2.9%	7.8%	7.8%	7.8%	7.8%	0.0%	0.0%
PIAMH	VA	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PMKOH	VA	1.0%	7.4%	0.4%	0.7%	0.6%	0.5%	0.0%	0.5%	0.5%	0.0%	0.1%
PMKTF	VA	11.0%	15.6%	8.6%	11.0%	8.6%	8.6%	8.6%	6.9%	8.6%	4.6%	0.0%
POCMH	MD/VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MPCMh	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VPCMh	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
POTMHL	MD/VA	0.0%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
QOMMH	VA	0.0%	3.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
POTOH	MD/VA	0.9%	6.3%	1.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PO1OH	MD	1.1%	6.8%	1.8%	1.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
POTTF	MD/DC	0.0%	8.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DCPTF	DC	0.2%	3.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MDPTF	MD	0.0%	9.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RPBMH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RPPROH	VA	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RPPTF	VA	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SBEMH	VA	35.2%	37.1%	36.7%	33.9%	24.8%	18.8%	17.8%	15.8%	18.0%	8.2%	4.5%
TANMH	MD/VA	0.5%	2.5%	0.8%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TAMMH	ND	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TANMH	VA	2.0%	5.7%	2.7%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WBEMH	VA	11.1%	15.8%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	1.8%	0.0%
YRKMh	VA	23.9%	30.6%	27.2%	26.5%	9.2%	1.9%	0.8%	0.6%	1.4%	0.0%	0.0%
YRKPH	VA	2.2%	4.6%	1.9%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
APPTF	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
BACOH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
BIGMH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
BSOH	MD	0.4%	0.4%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
BSHOH	MD	0.7%	7.5%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CNDOH	MD/DE	0.0%	10.6%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHKOH	VA	0.0%	0.0%	0.0%	0.0%	4.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHRMH	VA	24.5%	26.4%	24.5%	24.5%	15.8%	5.2%	5.2%	5.2%	5.2%	1.8%	0.0%
ELKOH	MD	0.0%	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FSBMH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
GLNCH	MD	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	0.0%	0.0%
LCHMH	MD	0.1%	0.4%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MAGMH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MANMH	MD	0.6%	0.4%	0.4%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
MATTF	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MD5MH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NIDOH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NANMH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NANOH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NANTF	MD/DE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NORTE	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PATMH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PISTF	MD	4.4%	4.6%	4.5%	4.4%	4.4%	1.0%	0.8%	0.5%	0.7%	0.0%	0.0%
PO5OH	MD/VA	32.3%	32.3%	32.3%	32.3%	32.3%	32.3%	32.3%	32.3%	32.3%	17.9%	23.9%
MPCOH	MD	42.7%	47.1%	47.1%	42.7%	32.6%	32.3%	32.3%	32.3%	32.3%	17.9%	23.9%
VPCOH	VA	41.1%	47.1%	47.1%	41.1%	32.4%	32.3%	32.3%	32.3%	32.3%	17.9%	24.6%
POCTF	MD	43.4%	47.1%	47.1%	43.4%	32.5%	32.3%	32.3%	32.3%	32.3%	17.9%	23.8%
RHDMH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SASOH	MD	7.4%	29.5%	17.5%	9.2%	0.0%	0.6%	0.6%	0.0%	0.6%	0.0%	0.0%
SEVMH	MD	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SOLVMH	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VASMH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WICMH	MD	11.2%	11.2%	11.2%	11.2%	11.2%	5.0%	5.0%	4.7%	5.0%	4.7%	0.7%
WSTMH	MD	2.9%	0.5%	0.0%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DCATF	DC	18.0%	25.4%	19.1%	19.1%	12.6%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%
MDATF	MD	27.9%	18.1%	25.1%	28.2%	25.5%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%
DENTF	DE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MDNTF	MD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Grey background for CB segments unassessed because of model limitations.
Yellow background for when variances are applied





Conclusions:

- The WQSTM, as is the case for all the Modeling Workgroup assessment methods developed for the 2017 MPA, is quantitatively better than its 2010 equivalent.
- By and large, the estimated WIP2 implementation loads achieve all DO water quality standards in the Chesapeake except for CB4MH Deep Channel.
- The nonattainment in CB4MH Deep Channel is estimated to be 6 percent under the WIP2 loads, 8 percent under the WIP2 loads plus Conowingo infill, and 10 percent under WIP2 loads plus Conowingo Infill and conditions of 2025 temperature, precipitation, and sea level rise.
- Geographic Isolation Scenarios are now complete.
- Phase 3 WIP draft target loads are under development and will be presented at the December 4-5 Joint WQGIT and Modeling WG Meeting.