2012 Mobile Bay Watershed Report

Alabama Department of Environmental Management

Field Operations Division
Environmental Assessment Section
Water Unit
May 2017

Coastal Waters Monitoring Program

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LIST OF ACRONYMS

A&I	Agriculture and Industrial water supply use classification
ADEM	Alabama Department of Environmental Management
CHL *a*	Chlorophyll *a*
CWA	Clean Water Act
CWMP	Coastal Waters Monitoring Program
DO	Dissolved Oxygen
F&W	Fish and Wildlife
LWF	Limited Warmwater Fishery
MAX	Maximum
MDL	Method Detection Limit
MIN	Minimum
NTU	Nephelometric Turbidity Units
OAW	Outstanding Alabama Waters
PWS	Public Water Supply
QAPP	Quality Assurance Project Plan
CWMP	Coastal Waters Monitoring Program
S	Swimming and Other Whole Body Water-Contact Sports
SD	Standard Deviation
SH	Shellfish Harvesting
SOP	Standard Operating Procedures
TEMP	Temperature
TN	Total Nitrogen
TMDL	Total Maximum Daily Load
TP	Total Phosphorus
TSS	Total Suspended Solids
USACE	United States Army Corp of Engineers
USEPA	United States Environmental Protection Agency

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INTRODUCTION

Mobile Bay has a drainage area of approximately 44,000 square miles, including two-thirds of the state of Alabama as well as portions of Mississippi, Georgia, and Tennessee. In terms of area, it is the sixth largest river basin in the nation. It has a mean annual flow of 62,000 cfs, the fourth largest in the nation. The surface waters of Mobile Bay cover 409 square miles with an average depth of 10 feet. The bay is subject to diurnal tide fluctuations with a range of approximately 1.5 to 2 feet. North to south, the bay is approximately 32 miles long and at its widest point, is 23 miles wide. The primary freshwater inflow comes from the Mobile River, with additional inflows from the Tensaw, Spanish, Apalachee, and Blakeley Rivers. Other tributaries include the Dog River and Fowl River on the west, and Fish River, Magnolia River, and Bon Secour River on the east. Mobile Bay is divided into several areas based on use classification, Table 1. These classifications include Fish & Wildlife (F&W), Swimming (S), and Shellfish Harvesting (SH). The Mobile Bay watershed provides valuable resources to the region including agriculture, fish and shellfish spawning habitats, and recreational activities such as boating, fishing, swimming, and hunting. It is bordered on the north by the Mobile River delta and on the west, east, and south by Mississippi Sound, Perdido Bay, and the Gulf of Mexico, respectively.

The Alabama Department of Environmental Management (ADEM) monitored stations within the Perdido and Mobile Bay watersheds within Baldwin and Mobile Counties as part of the 2012 assessment under the Coastal Waters Monitoring Program (CWMP). Data associated with sampling within the Perdido and Wolf Bay watersheds can be found in the 2012 Perdido Bay and Wolf Bay Watersheds Report (ADEM 2014). Implemented in 2011, the CWMP is designed to provide data to assess current water quality conditions, identify long-term trends in water quality, validate Best Management Practices (BMP) effectiveness and to develop Total Maximum Daily

Loads (TMDLs) and nutrient criteria, Table 2. The program is also being used to update protocols and methodologies to more accurately assess water quality conditions for estuaries and coastal rivers and streams. Although the CWMP is relatively new, most sites within it have been sampled in other programs throughout ADEM's history, with many having been sampled since the 1970's. Descriptions of all CWMP monitoring activities are available in ADEM's 2010 Monitoring Strategy (ADEM 2012).

Surface waters within Alabama are categorized according to their designated use classification and the degree to which the water quality supports its use classification. As required by Section 303(d) of the 1972 Clean Water Act (CWA), surface waters that do not meet their use classification are placed on Alabama's 303(d) List of Impaired Waters. Once a waterbody is listed as impaired, a TMDL is implemented to take measures needed for the waterbody to meet or exceed its water quality standards. Figure 1 shows a map of water bodies within the Mobile Bay watershed that are on the 2012 CWA 303(d) list as well as the 2010 approved TMDLs. Waterbodies with approved TMDLs and waterbodies that remain on the 303(d) list as impaired are listed in Table1 and 2.

The purpose of this report is to summarize data collected at 28 stations within the Mobile Bay watershed during the 2012 growing season and to evaluate growing season trends in nutrient concentrations using ADEM's historic dataset. Monthly and/or mean concentrations of nutrients [total nitrogen (TN); total phosphorus (TP)], algal biomass/productivity [chl *a*], and sediment [total suspended solids (TSS)] were compared to ADEM's historical data, Figure 1.

METHODS

Sampling stations were selected using historical data and previous assessments (Fig. 1). Specific location information can be found in Table 3.

Water quality assessments were conducted monthly, bi-monthly, or quarterly March-November. Sampling frequency varied year-to-year dependent on available resources. All samples were collected, preserved, stored, and transported according to procedures in the ADEM Field Operations Division Standard Operating Procedures (ADEM 2012), Surface Water Quality Assurance Project Plan (2008a), and Quality Management Plan (ADEM 2008b).

Mean growing season, March-October, TN, TP, chl *a*, and TSS were calculated for trend stations to evaluate water quality conditions at each site using data from 2005 through 2012. Monthly concentrations of these same parameters were graphed with ADEM's previously collected data for all stations within the focus watershed. Monthly growing season concentrations of dissolved oxygen (DO), salinity, and temperature were graphed at 1.5m (5ft), or mid-depth if less than 10ft deep, for comparison with ADEM's water quality criteria level of 5.0 mg/L DO. Growing season profiles of DO, salinity, and temperature were also graphed to show stratification of each parameter. Chemical analysis also includes select total and dissolved metals. While summary statistics of metals analysis are presented in Appendix Table 1, all metals analyses are available upon request.

Table 1. 303(d) listed waterbodies in the Mobile Bay watershed (2012).

Assessment Unit ID	Waterbody Name	County	Uses	Causes	Sources	Size	Downstream / Upstream Locations
AL03160204-0505-100	Mobile River	Mobile	LWF	Metals (Mercury)	Atmospheric deposition	7.61 miles	Mobile Bay / Spanish River
AL03160204-0403-112	Mobile River	Baldwin Mobile	F&W	Metals (Mercury)	Atmospheric deposition	20.90 miles	Spanish River / Cold Creek
AL03160204-0105-111	Cold Creek	Mobile	F&W	Metals (Mercury)	Contaminated sediments	4.21 miles	Mobile River / Dam 1 1/2 miles west of US Highway 43
AL03160204-0305-101	Chickasaw Creek	Mobile	LWF	Metals (Mercury)	Atmospheric deposition	4.43 miles	Mobile River / US Highway 43
AL03160204-0305-102	Chickasaw Creek	Mobile	F&W	Metals (Mercury)	Atmospheric deposition	6.64 miles	US Highway 43 / Mobile College
AL03160204-0303-100	Chickasaw Creek	Mobile	S/F&W	Metals (Mercury)	Atmospheric deposition	26.82 miles	Mobile College / Its source
AL03160204-0504-101	Threemile Creek	Mobile	A&I	Pathogens	Collection system failure Municipal Urban runoff/storm sewers	2.04 miles	Mobile River / Toulmins Spring Branch
AL03160204-0504-102	Threemile Creek	Mobile	A&I	Pathogens	Collection system failure Municipal Urban runoff/storm sewers	4.34 miles	Toulmins Spring Branch / Mobile Street
AL03160204-0504-300	Toulmins Spring Branch	Mobile	F&W	Ammonia Nutrients	Urban runoff/storm sewers	3.22 miles	Threemile Creek / Its source

Table 1. (continued)

Assessment Unit ID	Waterbody Name	County	Uses	Causes	Sources	Size	Downstream / Upstream Locations
AL03160204-0504-500	UT to Threemile Creek	Mobile	F&W	Nutrients	Urban runoff/storm sewers	1.04 miles	Threemile Creek / Its source
AL03160204-0505-201	Tensaw River	Baldwin	F&W	Metals (Mercury)	Atmospheric deposition	6.51 miles	Mobile Bay / Junction of Tensaw and Apalachee Rivers
AL03160204-0505-202	Tensaw River	Baldwin	OAW/S/F&W	Metals (Mercury)	Atmospheric deposition	21.73 miles	Junction of Tensaw and Apalachee Rivers / Junction of Briar Lake
AL03160204-0505-500	D'Olive Creek	Baldwin	F&W	Siltation (habitat alteration)	Land development	4.89 miles	D'Olive Bay / Its source
AL03160204-0505-800	Joes Branch	Baldwin	F&W	Siltation (habitat alteration)	Land development	1.57 miles	D'Olive Creek / Its source
AL03160204-0505-900	Tiawasee Creek	Baldwin	F&W	Siltation (habitat alteration)	Land development	3.54 miles	D'Olive Creek / Its source
AL03160204-0505-905	UT to Tiawasee Creek	Baldwin	F&W	Siltation (habitat alteration)	Land development	1.87 miles	Tiawasee Creek / Its source
AL03160204-0505-505	UT to D'Olive Creek	Baldwin	F&W	Siltation (habitat alteration)	Land development	1.22 miles	D'Olive Creek / Its source
AL03160204-0106-302	Tensaw River	Baldwin	OAW/F&W	Metals (Mercury)	Atmospheric deposition	2.93 miles	Junction of Briar Lake / Junction of Tensaw Lake

Table 1. (continued)

Assessment Unit ID	Waterbody Name	County	Uses	Causes	Sources	Size	Downstream / Upstream Locations
AL03160204-0106-303	Tensaw River	Baldwin Mobile	F&W	Metals (Mercury)	Atmospheric deposition	10.98 miles	Junction of Tensaw Lake / Mobile River
AL03160205-0300-102	Mobile Bay	Mobile	SH/F&W	Pathogens	Urban runoff/storm sewers	168.29 square miles	All except out to 1000 feet offshore from Mullet Point to Ragged Point
AL03160205-0300-202	Bon Secour Bay	Baldwin	SH/S/F&W	Pathogens	On-site wastewater systems Urban runoff/storm sewers	102.96 square miles	All except out to 1000 feet offshore from Fish River Point to Mullet Point
AL03160205-0300-500	Mobile Bay	Baldwin	S/F&W	Pathogens	Urban runoff/storm sewers	36.88 square miles	Northeast bay
AL03160205-0102-110	Halls Mill Creek	Mobile	F&W	Siltation (habitat alteration)	Land development	11.30 miles	Dog River / its source
AL03160205-0105-100	Middle Fork Deer River	Mobile	F&W	Organic enrichment (CBOD, NBOD)	Collection system failure Urban runoff/storm sewers	3.51 miles	Mobile Bay / Its source
AL03160205-0104-110	Fowl River	Mobile	S/F&W	Metals (Mercury)	Atmospheric deposition	20.56 miles	Mobile Bay / Its source

Table 1. (continued)

Assessment Unit ID	Waterbody Name	County	Uses	Causes	Sources	Size	Downstream / Upstream Locations
AL03160205-0202-210	Polecat Creek	Baldwin	S/F&W	Metals (Mercury)	Atmospheric deposition	7.89 miles	Fish River / Its source
AL03160205-0202-510	Baker Branch	Baldwin	F&W	Organic enrichment (CBOD, NBOD)	Pasture grazing	6.15 miles	Polecat Creek / Its source
AL03160205-0204-112	Fish River	Baldwin	S/F&W	Metals (Mercury)	Atmospheric deposition	30.01 miles	Weeks Bay / Its source
AL03160205-0204-112	Fish River	Baldwin	S/F&W	Pathogens	Pasture grazing	30.01 miles	Weeks Bay / Its source
AL03160205-0204-700	Cowpen Creek	Baldwin	S/F&W	Metals (Mercury)	Atmospheric deposition	7.04 miles	Fish River / Its source
AL03160205-0206-101	Bon Secour River	Baldwin	S/F&W	Metals (Mercury)	Atmospheric deposition	9.12 miles	Bon Secour Bay / One mile upstream from first bridge above its mouth
AL03160205-0206-102	Bon Secour River	Baldwin	S/F&W	Metals (Mercury)	Atmospheric deposition	4.38 miles	One mile upstream from first bridge above its mouth / Its source
AL03160205-0208-100	Oyster Bay	Baldwin	SH/F&W	Pathogens	Unknown source	0.95 square miles	Oyster Bay

Table 2. Approved TMDLs in the Mobile Bay watershed (2012).

Assessment Unit ID	Waterbody Name	County	Pollutant
AL03160204-0402-102	Bayou Sara	Mobile	CBOD, NBOD
AL03160204-0402-501	Norton Creek	Mobile	CBOD, NBOD
AL03160204-0304-103	Eightmile Creek	Mobile	Fecal Coliform
AL03160204-0304-200	Gum Tree Branch	Mobile	Fecal Coliform
AL03160205-0102-101	Dog River	Mobile	CBOD, NBOD, Fecal Coliform
AL03160205-0101-101	Dog River	Mobile	CBOD, NBOD, Fecal Coliform
AL03160205-0103-401	Rabbit Creek	Mobile	CBOD, NBOD, Fecal Coliform
AL03160204-0504-101	Threemile Creek	Mobile	CBOD, NBOD
AL03160204-0504-102	Threemile Creek	Mobile	CBOD, NBOD
AL03160204-0504-103	Threemile Creek	Mobile	CBOD, NBOD
AL03160204-0504-300	Toulmins Spring Branch	Mobile	Fecal Coliform
AL03160204-0504-500	UT to Threemile Creek	Mobile	Fecal Coliform
AL03160205-0101-400	Bolton Branch	Mobile	Fecal Coliform
AL03160205-0101-500	Eslava Creek	Mobile	Fecal Coliform
AL03160205-0101-600	Bolton Branch	Mobile	Fecal Coliform
AL03160205-0206-702	UT to Bon Secour River	Baldwin	Fecal Coliform
AL03160205-0300-201	Bon Secour Bay	Baldwin	Enterococcus
AL03160205-0300-101	Mobile Bay	Baldwin Mobile	Enterococcus
AL03160204-0504-200	Industrial Canal	Mobile	CBOD, NBOD
AL03160205-0102-110	Halls Mill Creek	Mobile	Enterococcus
AL03160205-0101-200	Moore Creek	Mobile	Enterococcus

Figure 1. 2012 Mobile Bay stations & impaired waterbodies.

Table 3. Descriptions for the monitoring stations in 2012 for the Mobile Bay watershed.

HUC8	County	Station Number	Use Classification	Waterbody Name	Station Description	Latitude	Longitude
03160204	Baldwin	BMBB-1	F&W	Bay Minette Basin	Middle of Bay Minette Basin	30.6978	-87.9206
03160204	Baldwin	BMCB-1	F&W	Bay Minette Creek	Bay Minette Ck, Baldwin Co. in the vicinity of Hwy 225 bridge. Lat/ Lon calculated at bridge crossing.	30.699472	-87.90219
03160204	Baldwin	BMCB-3	F&W	Bay Minette Creek	Bay Minette Ck @ Bromely Rd	30.7399	-87.8746
03160205	Baldwin	BS-1	S/F&W	Bon Secour River	Bon Secour River @ Oyster Bay Canal	30.30221	-87.73575
03160205	Mobile	Channel1a	F&W	Mobile Bay	Mobile ship channel just south of Arlington ship channel at channel marker 76	30.62973	-88.03263
03160205	Mobile	Channel2	S/F&W	Mobile Bay	Mobile ship channel south of Gaillard Island at channel marker 51	30.46437	-88.01577
03160204	Mobile	CS-1	F&W	Chickasaw Creek	Chickasaw Ck @ US Hwy 43 crossing	30.78224	-88.07248
03160204	Mobile	CS-2	LWF	Chickasaw Creek	Chickasaw Ck @ CSX Railroad crossing bridge at confluence with Mobile River	30.73925	-88.04571
03160205	Mobile	DGRM-1	S/F&W	Dog River	Dog River at AL Hwy 163.	30.5651	-88.0878
03160205	Mobile	DR-1	F&W	Dog River	Dog River @ Luscher (Creek) Park Boat Launch near I-10	30.62845	-88.10166
03160204	Baldwin	DLVB-2	F&W	D'Olive Creek	D'Olive Ck upstream of Co Rd 11	30.65269	-87.91181
03160204	Baldwin	DVBB-1	S/F&W	D'Olive Bay	Middle of D'Olive Bay	30.6453	-87.9179
03160205	Mobile	ESLM-4	F&W	Eslava Creek	Eslava Ck 1400ft upstream of McVay Rd	30.646504	-88.09556

Table 3. (continued)

HUC8	County	Station Number	Use Classification	Waterbody Name	Station Description	Latitude	Longitude
03160205	Mobile	FR-1	S/F&W	Fowl River	Fowl River @ AL Hwy 193 at Dauphin Island Parkway Bridge	30.44416618	-88.11305
03160205	Mobile	HMCM-2	F&W	Halls Mill Creek	Halls Mill Ck Approx. 1000 ft upstream of I-10	30.606189	-88.15053
03170009	Mobile	MB-2a	SH/S/F&W	Gulf of Mexico	Mobile ship channel just south of Sand Island Light in the Gulf of Mexico at buoy 10	30.1718	-88.04895
03160205	Baldwin	MB-3a	SH/S/F&W	Bon Secour Bay	Intracoastal Waterway in Bon Secour Bay at channel marker 127	30.28407	-87.85137
03160205	Baldwin	MGRB-9	OAW/S/F&W	Magnolia River	Magnolia River downstream of Noltie Creek.	30.3902	-87.8082
03160204	Mobile	MO-1A	F&W	Mobile River	Mobile River at L&N Railroad crossing.	30.8364	-87.94406
03160204	Mobile	MO-2	LWF	Mobile River	Mobile River @ Government Street (Bankhead Tunnel) in Mobile at Alabama State Docks	30.69137	-88.03646
03160205	Baldwin	MOBB-1	S/F&W	Mobile Bay	NE Mobile Bay	30.6276	-87.9548
03160204	Mobile	MOBM-1	PWS/F&W	Mobile River	Mobile River at Bucks near the MAWSS water intake	31.0137	-88.01853
03160205	Mobile	RBTM-5	F&W	Rabbit Creek	Rabbit Creek~1mile upstream of Hwy 193.	30.56503	-88.14146
03160205	Mobile	TC-1	F&W	Theodore Canal	Theodore Industrial Canal at AL Hwy 193 at Rangeline Rd.	30.533333	-88.12388
03160204	Baldwin	TENB-2	OAW/S/F&W	Tensaw River	Tensaw River approx. 0.3 miles ds of power line (near Blakely Park and Steam Mill Landing)	30.75291	-87.91987
03160204	Mobile	TM-1	A&I	Threemile Creek	Three Mile Creek between US Hwy 43 & railroad crossing	30.723983	-88.05911
03160205	Baldwin	WB-1	S/F&W *	Weeks Bay	Weeks Bay @ US Hwy 98 (Marina)	30.41469	-87.82583
03160205	Baldwin	WKBB-2	S/F&W *	Weeks Bay	Approximately 2.5 miles downriver of State Highway 98 bridge, near the confluence of Mobile Bay in the main navigation channel.	30.3796	-87.8339

*The special designation of Outstanding National Resource Water applies to this segment.

RESULTS

Growing season mean graphs of TN, TP, chl *a*, and TSS for trend stations are provided in this section (Figs. 2-5). Monthly, bi-monthly, or quarterly graphs for TN, TP, chl *a*, and TSS for all stations monitored are also provided (Figs. 6-9). DO, temperature, and salinity concentrations at 1.5m (5ft) or mid-depth are graphed in Fig. 10 with a comparison to ADEM's DO criteria of 5.0 mg/L. Depth profile graphs of DO, temperature, and salinity appear in Fig. 11. Summary statistics of all data collected during 2012 are presented in Appendix Table 1. The table contains the minimum, maximum, median, mean, and standard deviation of each parameter analyzed.

Stations with the highest concentrations of nutrients, chlorophyll, and TSS are noted in the paragraphs to follow. Though stations with the lowest concentrations may not always be mentioned, review of the graphs that follow will indicate these stations that may be potential candidates for reference waterbodies and watersheds.

While mean TN values in the Threemile Creek (TM-1) station have declined 2009-2012, values in this station have been the highest of all trend stations since 2009 (Fig. 2). Mean growing season TN values for most stations in the Mobile Bay watershed declined from 2010-2012 however values in Fowl River (FR-1), Mobile River (MO-1A), and Theodore Canal (TC-1) have increased (Fig. 2). In 2012, the highest monthly TN concentration was measured during October in Threemile Creek at TM-1 and the lowest was measured in June in Bon Secour Bay at MB-3a (Fig. 6). Most monthly TN concentrations were at or below historic means in all stations monitored.

From 2005 through 2012 two locations, Threemile Creek (TM-1) and Bon Secour River (BS-1), have alternated having the highest mean TP concentrations among trend stations with

TM-1 having the highest mean value in 2011 and 2012 (Fig. 3). While TP concentrations at BS-1 remain elevated compared to other monitored locations, concentrations have declined overall since 2005 at this location. Mean TP concentrations at the Theodore Canal (TC-1) location have also remained higher than other trend locations and in 2012 were higher than concentrations at BS-1. The remaining trend stations had consistently low TP concentrations from 2005-2012. The highest monthly TP concentrations were at Theodore Canal (TC-1) and Threemile Creek (TM-1) (Fig. 7). The lowest TP concentration recorded was in October at Halls Mill Creek (HMCM-2). With the exception of Bon Secour River (BS-1), Chickasaw Creek (CS-2), Threemile Creek (TM-1) and Theodore Canal (TC-1), monthly TP concentrations were at or above historic means for 2012.

In 2012, the highest mean growing season chl *a* value was calculated for Weeks Bay at WB-1 (Fig. 4). Mean growing season chl *a* concentrations appear to have declined over time in BS-1 while mean values have declined overall since 2008 in Channel-1a, DGRM-1, FR-1, MB-3a, MO-1A, MOBM-1, TC-1, TENB-2, WB-1 and Channel-2. Monthly chl *a* concentrations were highest in March for Weeks Bay at WB-1, this concentration was also above the historic mean (Fig. 8). Most monthly concentrations for the sampling season were at or below historic means. No nutrient criteria have been established in the coastal/estuarine waters of Alabama, though they are forthcoming.

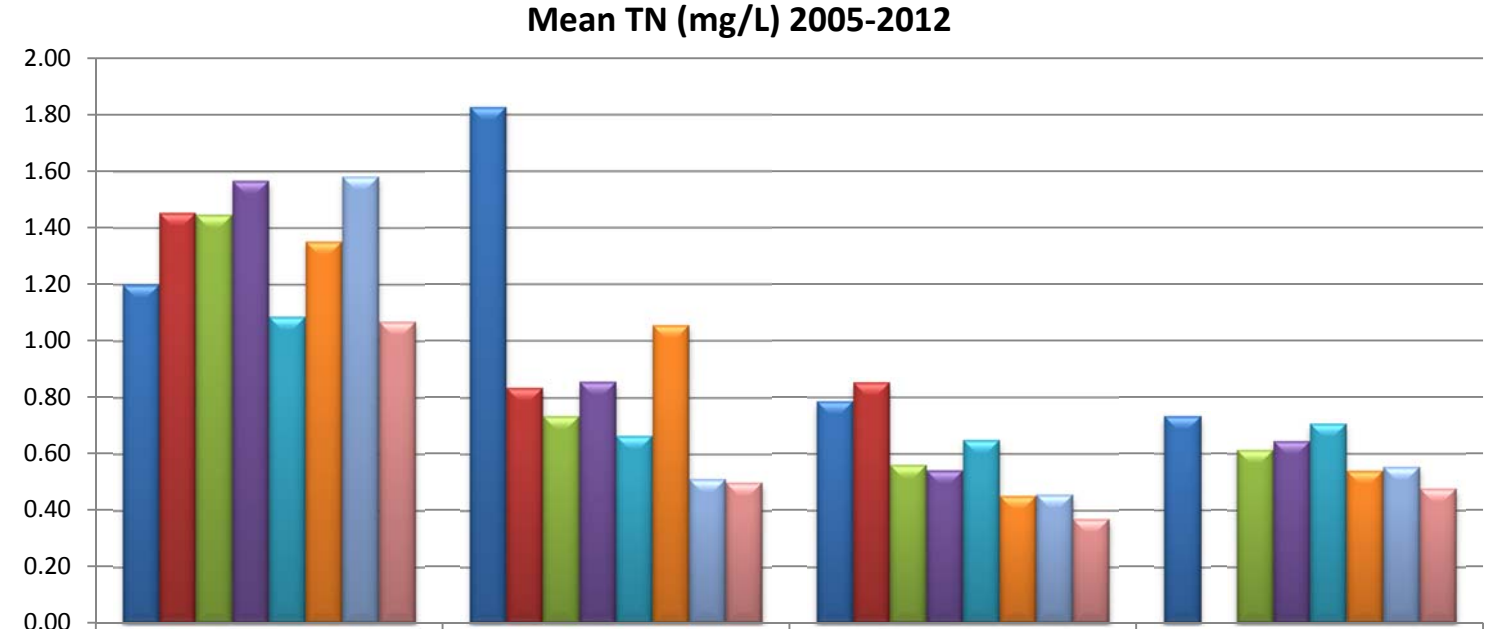
In 2012, the highest mean growing season TSS value was calculated for the Mobile River at MOBM-1 (Fig. 5). Bon Secour River (BS-1) and Mobile Bay at MB-3A had the most consistently high mean TSS concentrations from 2005-2012. The Fowl River has also had elevated TSS concentrations since monitoring began. The Mobile River had the highest single year mean during this period at MO-1A in 2009. Monthly concentrations for 2012 were the

highest in March in the Mobile River at MOBM-1, while Halls Mill and Rabbit Creeks had the lowest overall TSS concentrations for the year (Fig. 9). Most monthly concentrations were at or below historic means.

Dissolved oxygen concentrations at fourteen of the twenty eight stations examined were below the ADEM criteria limit of 5.0 mg/L at some point during the growing season, March through October. One location Mobile Bay at Channel-1a was near the criteria limit. This criteria measurement is taken at mid depth for stations that are less than 10ft in depth and at 5.0ft (1.5m) for stations greater than 10ft deep (ADEM Admin. Code R. 335-6-10-09) (Fig, 10). All of the sites that were below 5.0 mg/L were in rivers or creeks except for Weeks Bay at WB-1 and WKBB-2, which was below the DO criteria in September and Mobile Bay at MOBB-1 during July and September. Of the fourteen exceedances, all but four occurred between July and October. Locations where all measurements of dissolved oxygen were above the ADEM criteria included: Bay Minette Basin (BMBB-1), Bay Minette Creek (BMCB-1 and BMCB-3), Mobile Bay (Channel-2), Dog River (DGRM-1), D'Olive Bay (DVBB-1), Halls Mill Creek (HMCM-2), Gulf of Mexico (MB-2a), Bon Secour Bay (MB-3a), and the Magnolia (MGRB-9), Mobile (MO-1a and MOBM-1), and Tensaw Rivers (TENB-2).

Haloclines, a sharp change in the salinity of water with change in depth, were noted at least once in approximately half of the stations during the sampling period (Fig. 11). This is to be expected at times in the lower tributaries and estuarine areas of the Mobile Bay watershed.

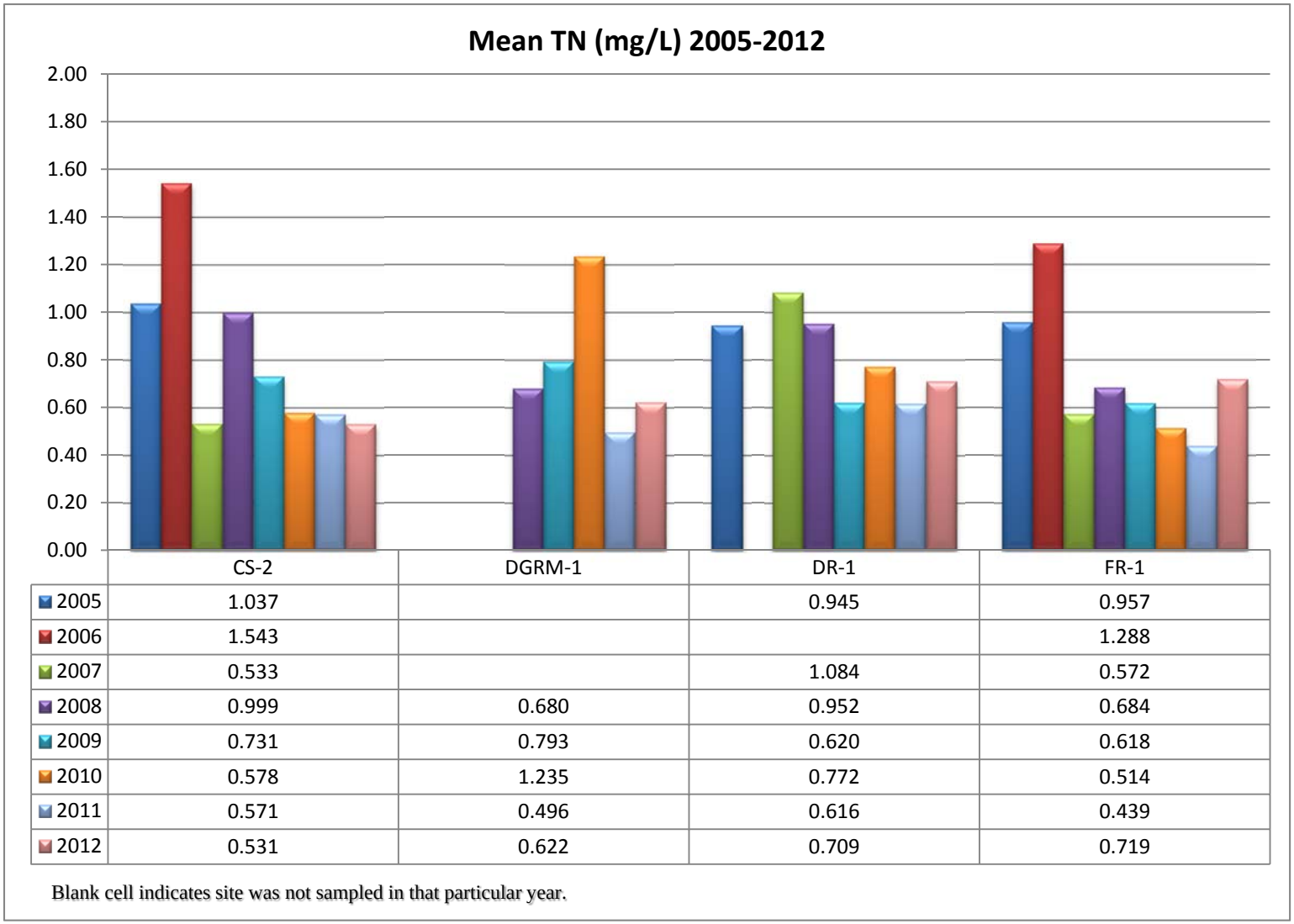
Figure 2. Mean growing season TN measured for the trend stations in the Mobile Bay watershed, 2005-2012.



	BS-1	CHANNEL-1A	CHANNEL-2	CS-1
2005	1.199	1.827	0.786	0.733
2006	1.453	0.835	0.852	
2007	1.446	0.735	0.561	0.613
2008	1.567	0.857	0.542	0.645
2009	1.086	0.665	0.649	0.707
2010	1.352	1.055	0.451	0.540
2011	1.582	0.512	0.456	0.554
2012	1.068	0.50*	0.37*	0.477

* Calculated using data collected outside of the growing season during November.
Blank cell indicates site was not sampled in that particular year.

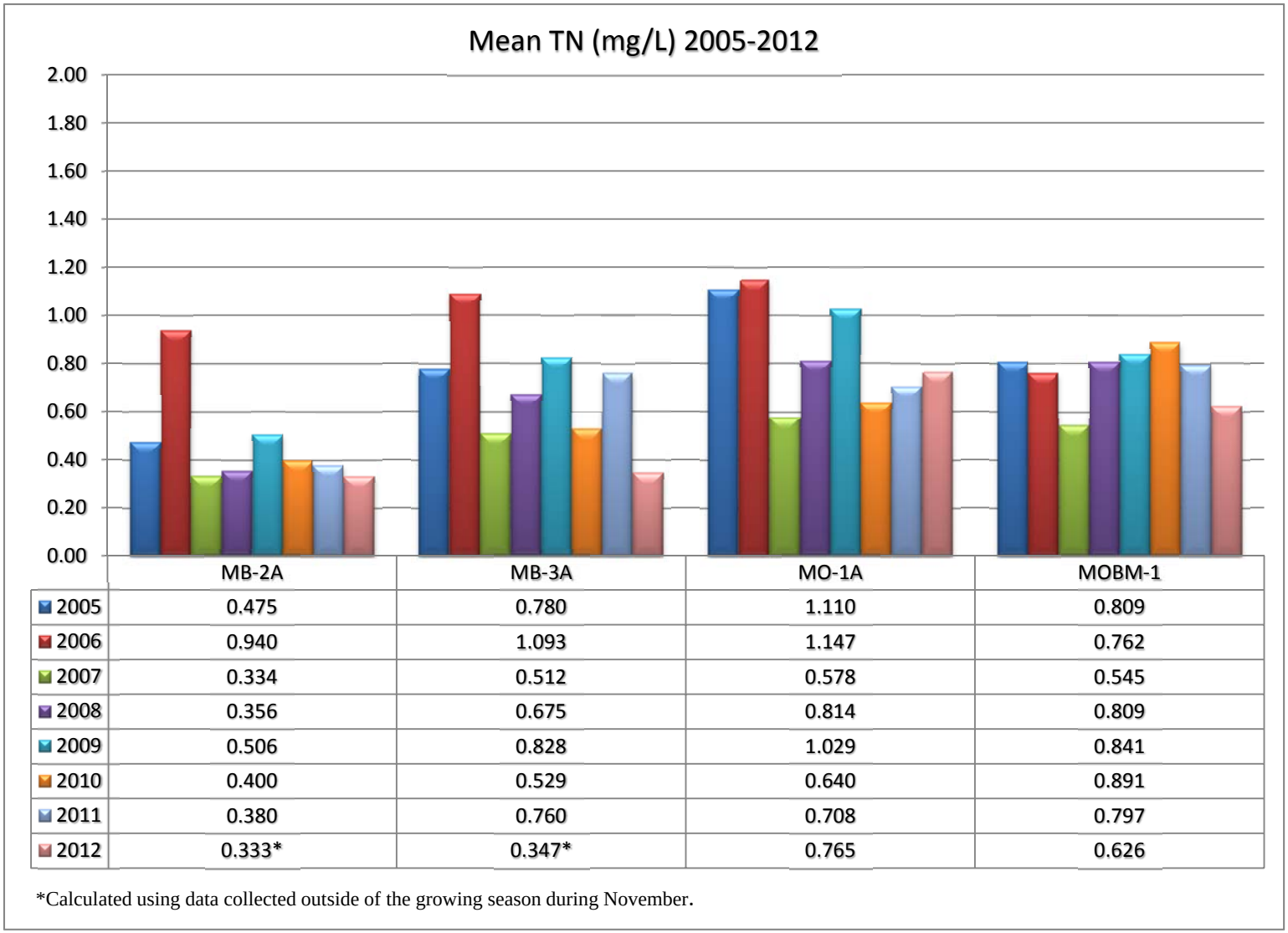
Figure 2. (continued)



	CS-2	DGRM-1	DR-1	FR-1
2005	1.037		0.945	0.957
2006	1.543			1.288
2007	0.533		1.084	0.572
2008	0.999	0.680	0.952	0.684
2009	0.731	0.793	0.620	0.618
2010	0.578	1.235	0.772	0.514
2011	0.571	0.496	0.616	0.439
2012	0.531	0.622	0.709	0.719

Blank cell indicates site was not sampled in that particular year.

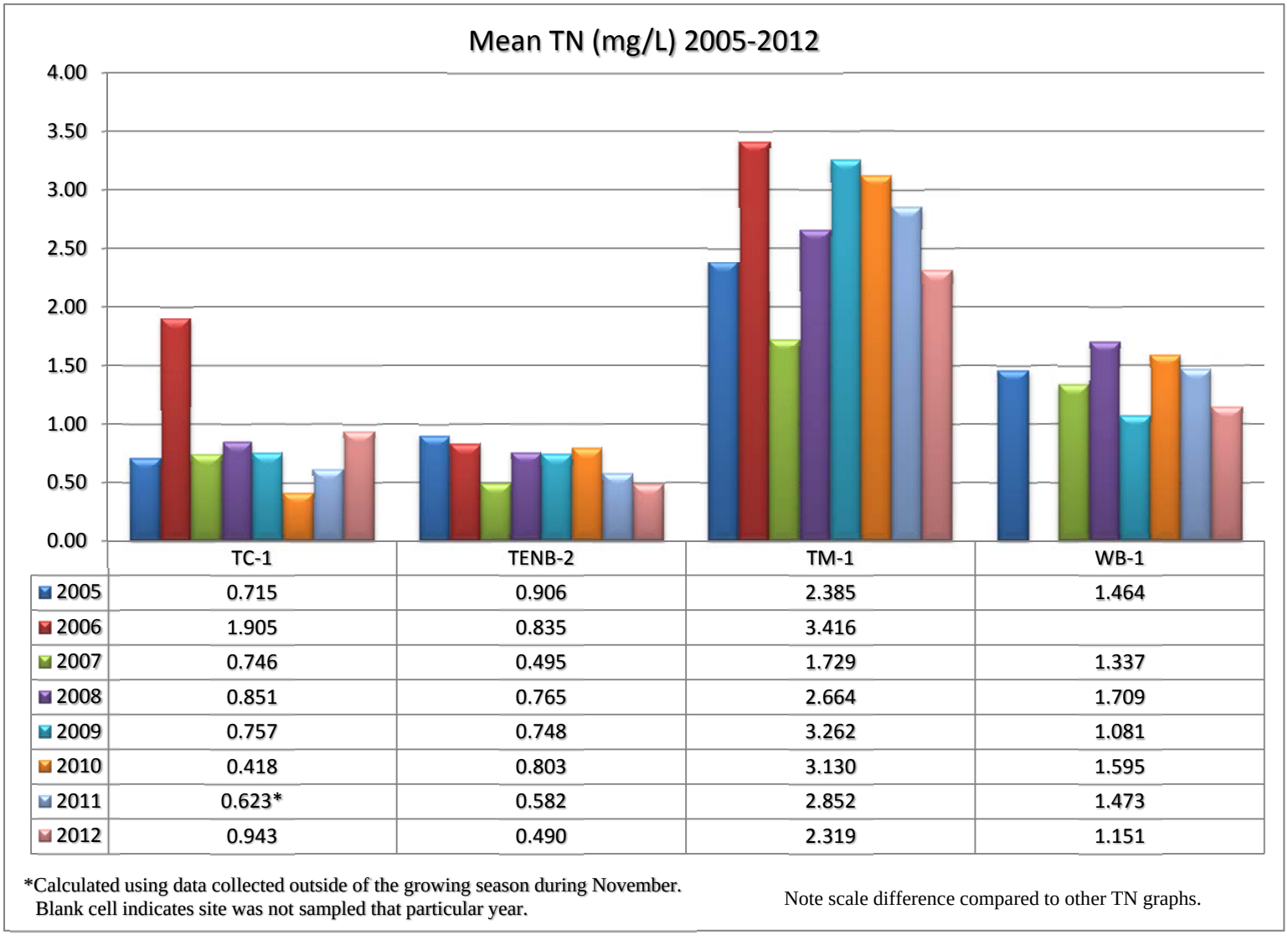
Figure 2. (continued)



	MB-2A	MB-3A	MO-1A	MOBM-1
2005	0.475	0.780	1.110	0.809
2006	0.940	1.093	1.147	0.762
2007	0.334	0.512	0.578	0.545
2008	0.356	0.675	0.814	0.809
2009	0.506	0.828	1.029	0.841
2010	0.400	0.529	0.640	0.891
2011	0.380	0.760	0.708	0.797
2012	0.333*	0.347*	0.765	0.626

*Calculated using data collected outside of the growing season during November.

Figure 2. (continued)

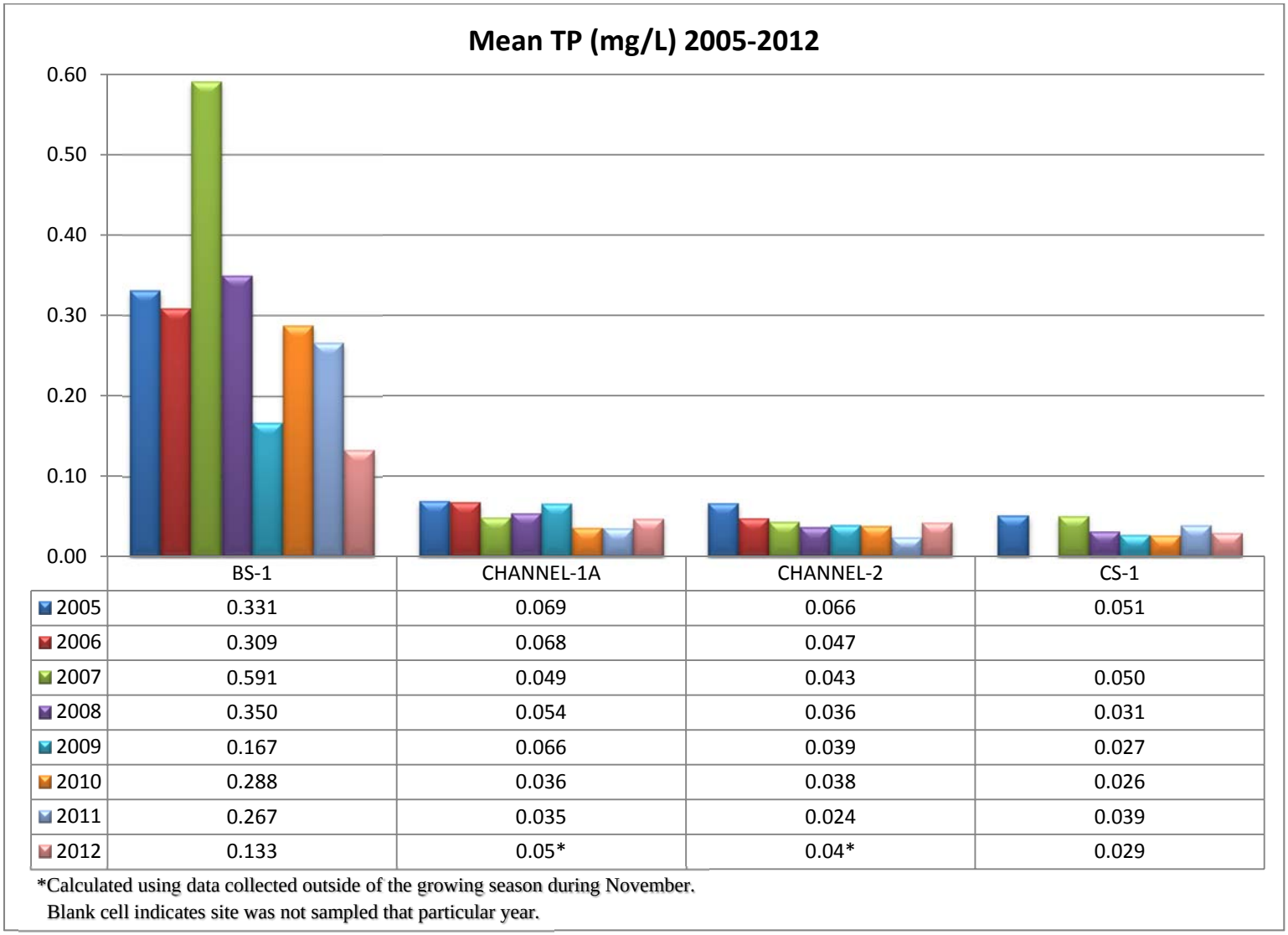


	TC-1	TENB-2	TM-1	WB-1
2005	0.715	0.906	2.385	1.464
2006	1.905	0.835	3.416	
2007	0.746	0.495	1.729	1.337
2008	0.851	0.765	2.664	1.709
2009	0.757	0.748	3.262	1.081
2010	0.418	0.803	3.130	1.595
2011	0.623*	0.582	2.852	1.473
2012	0.943	0.490	2.319	1.151

*Calculated using data collected outside of the growing season during November.
Blank cell indicates site was not sampled that particular year.

Note scale difference compared to other TN graphs.

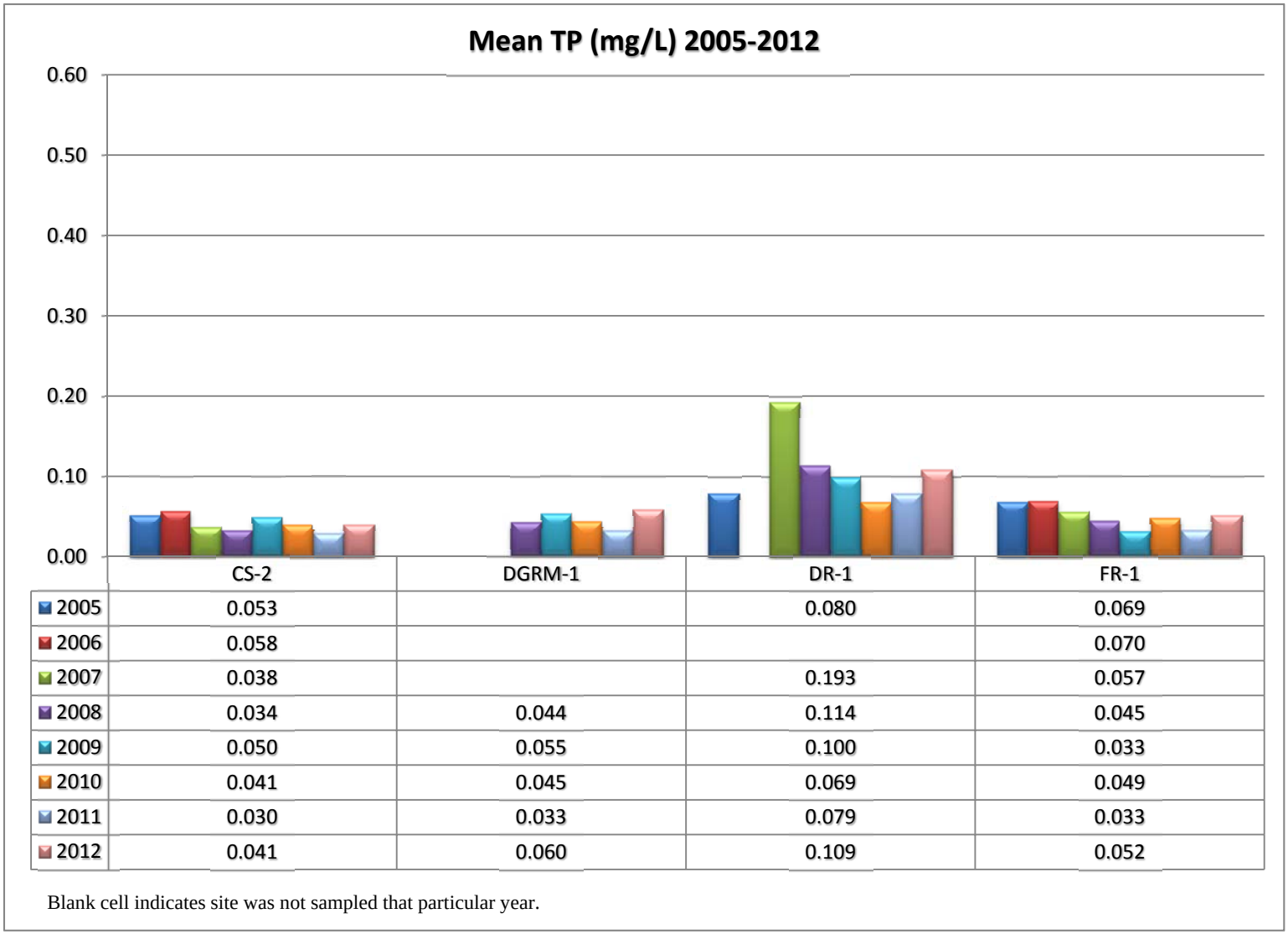
Figure 3. Mean growing season TP measured for the trend stations in the Mobile Bay watershed, 2005-2012.



	BS-1	CHANNEL-1A	CHANNEL-2	CS-1
2005	0.331	0.069	0.066	0.051
2006	0.309	0.068	0.047	
2007	0.591	0.049	0.043	0.050
2008	0.350	0.054	0.036	0.031
2009	0.167	0.066	0.039	0.027
2010	0.288	0.036	0.038	0.026
2011	0.267	0.035	0.024	0.039
2012	0.133	0.05*	0.04*	0.029

*Calculated using data collected outside of the growing season during November.
Blank cell indicates site was not sampled that particular year.

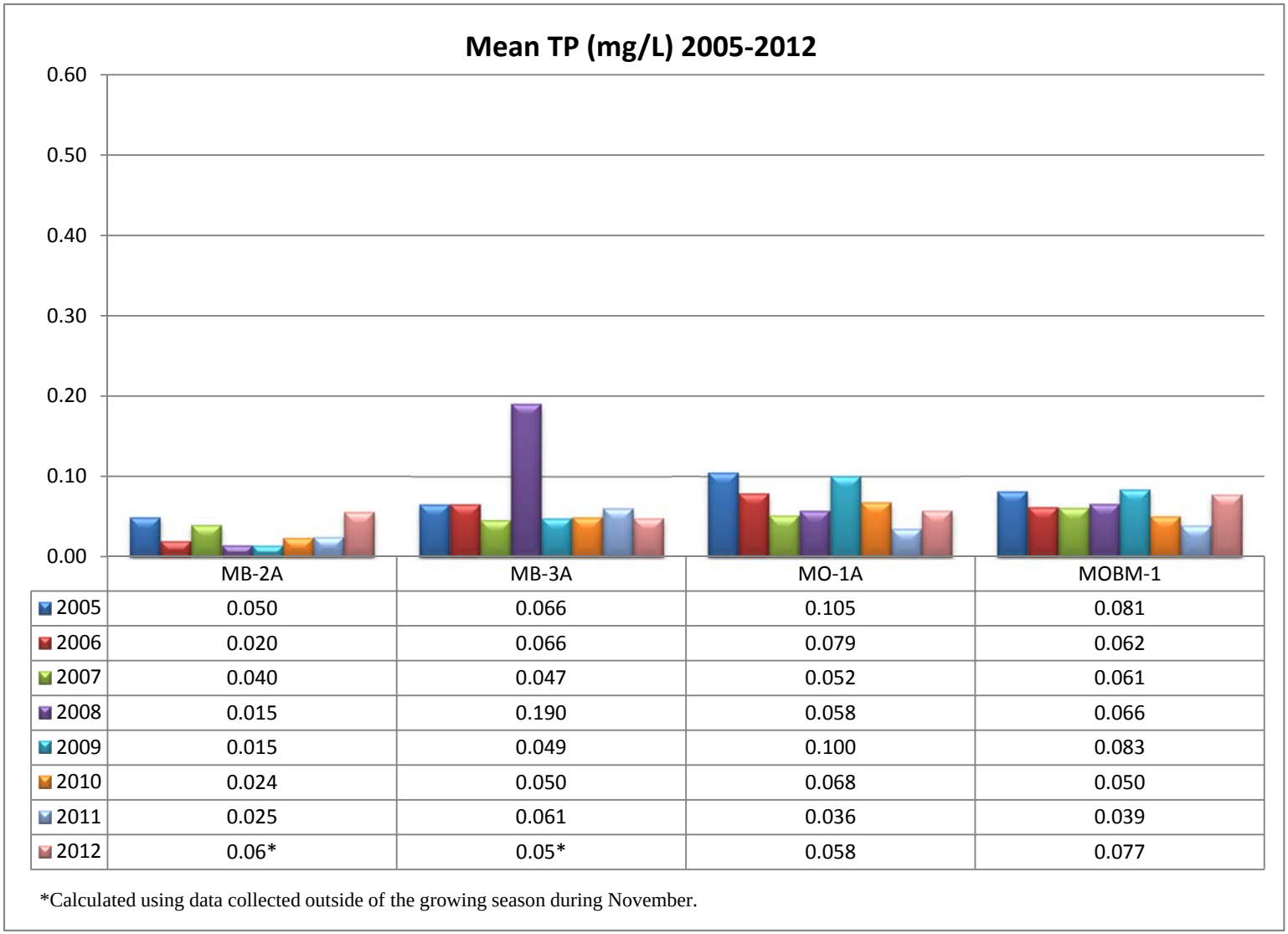
Figure 3. (continued)



	CS-2	DGRM-1	DR-1	FR-1
2005	0.053		0.080	0.069
2006	0.058			0.070
2007	0.038		0.193	0.057
2008	0.034	0.044	0.114	0.045
2009	0.050	0.055	0.100	0.033
2010	0.041	0.045	0.069	0.049
2011	0.030	0.033	0.079	0.033
2012	0.041	0.060	0.109	0.052

Blank cell indicates site was not sampled that particular year.

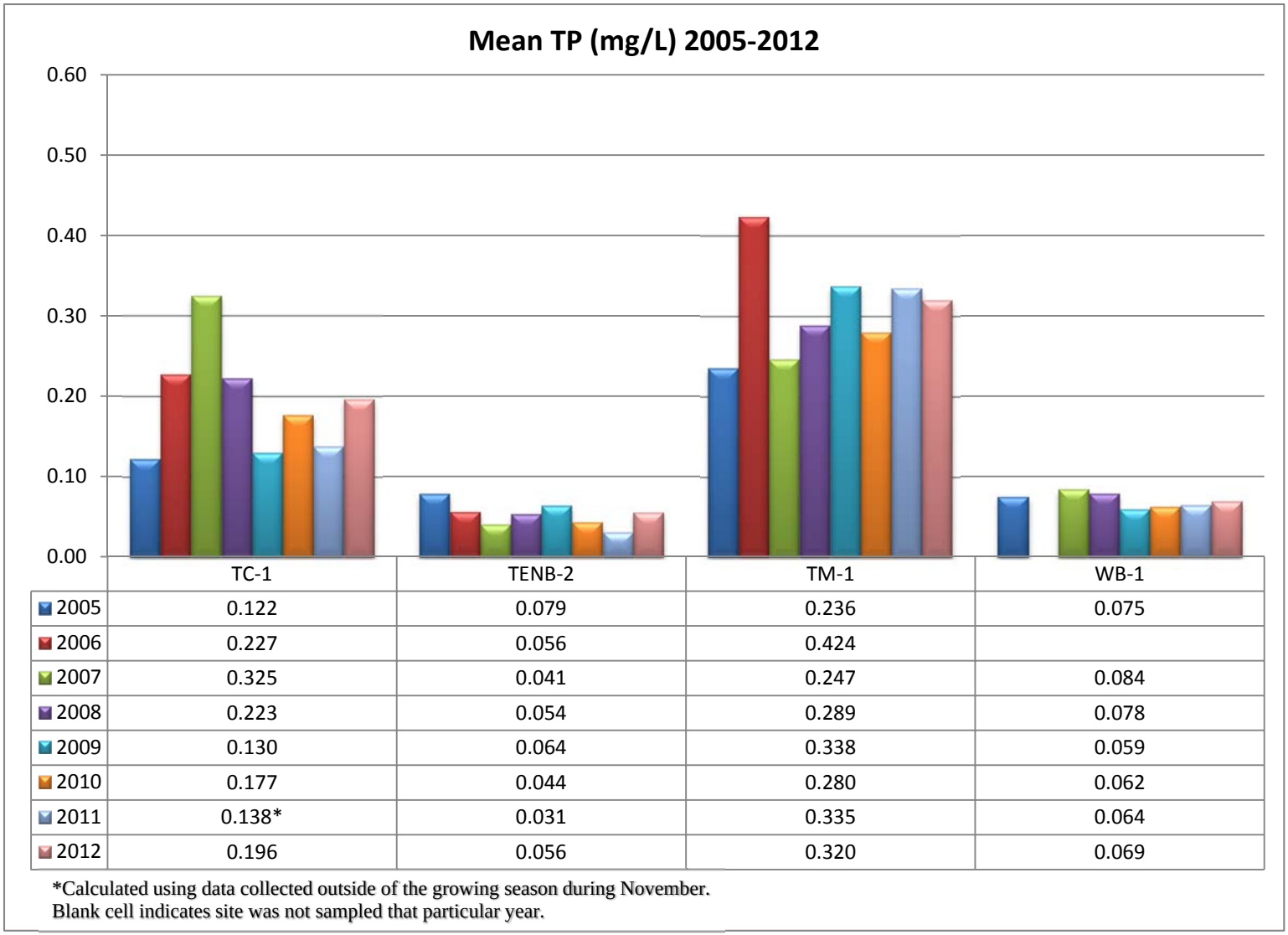
Figure 3. (continued)



	MB-2A	MB-3A	MO-1A	MOBM-1
2005	0.050	0.066	0.105	0.081
2006	0.020	0.066	0.079	0.062
2007	0.040	0.047	0.052	0.061
2008	0.015	0.190	0.058	0.066
2009	0.015	0.049	0.100	0.083
2010	0.024	0.050	0.068	0.050
2011	0.025	0.061	0.036	0.039
2012	0.06*	0.05*	0.058	0.077

*Calculated using data collected outside of the growing season during November.

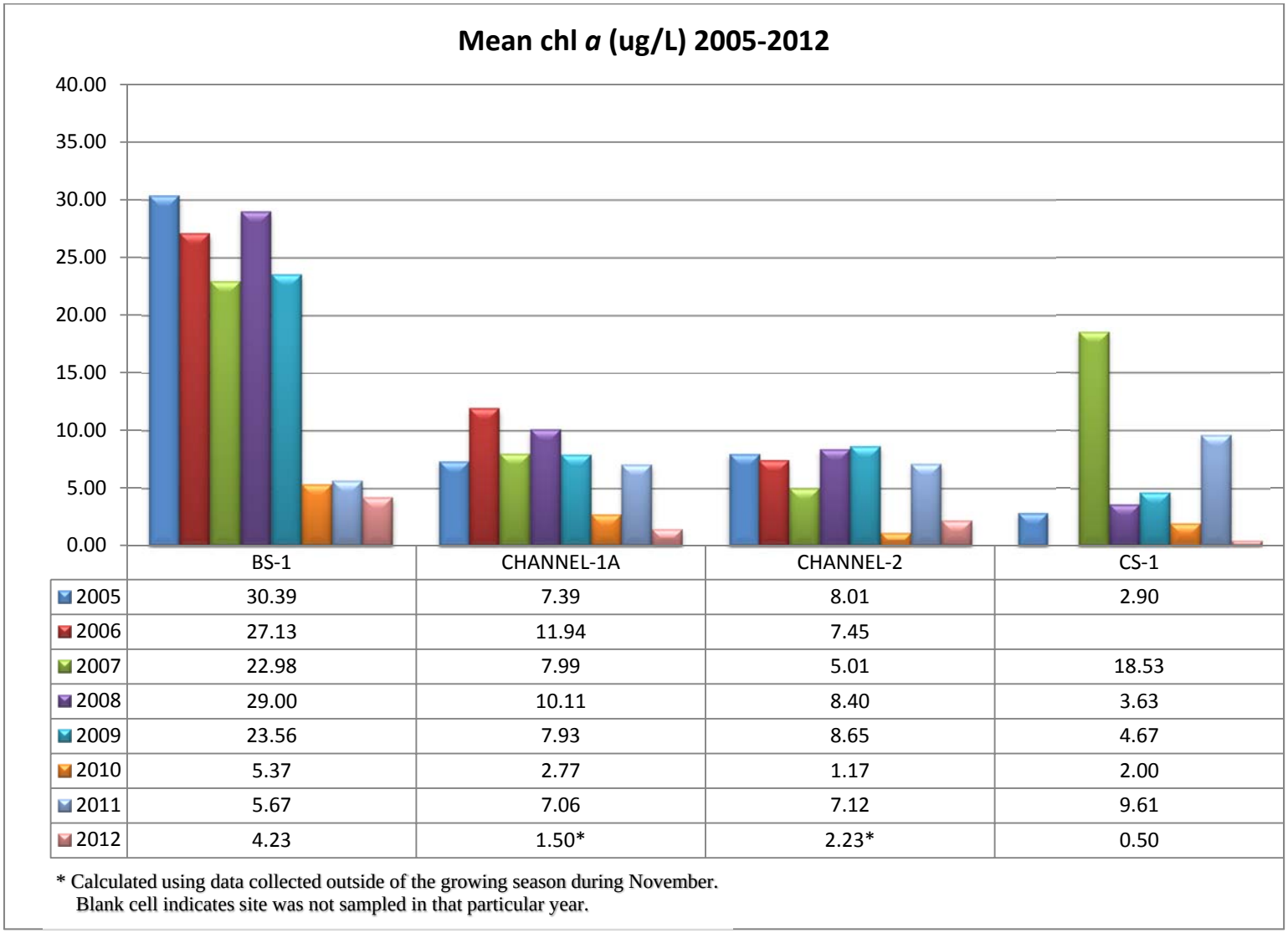
Figure 3. (continued)



	TC-1	TENB-2	TM-1	WB-1
2005	0.122	0.079	0.236	0.075
2006	0.227	0.056	0.424	
2007	0.325	0.041	0.247	0.084
2008	0.223	0.054	0.289	0.078
2009	0.130	0.064	0.338	0.059
2010	0.177	0.044	0.280	0.062
2011	0.138*	0.031	0.335	0.064
2012	0.196	0.056	0.320	0.069

*Calculated using data collected outside of the growing season during November.
Blank cell indicates site was not sampled that particular year.

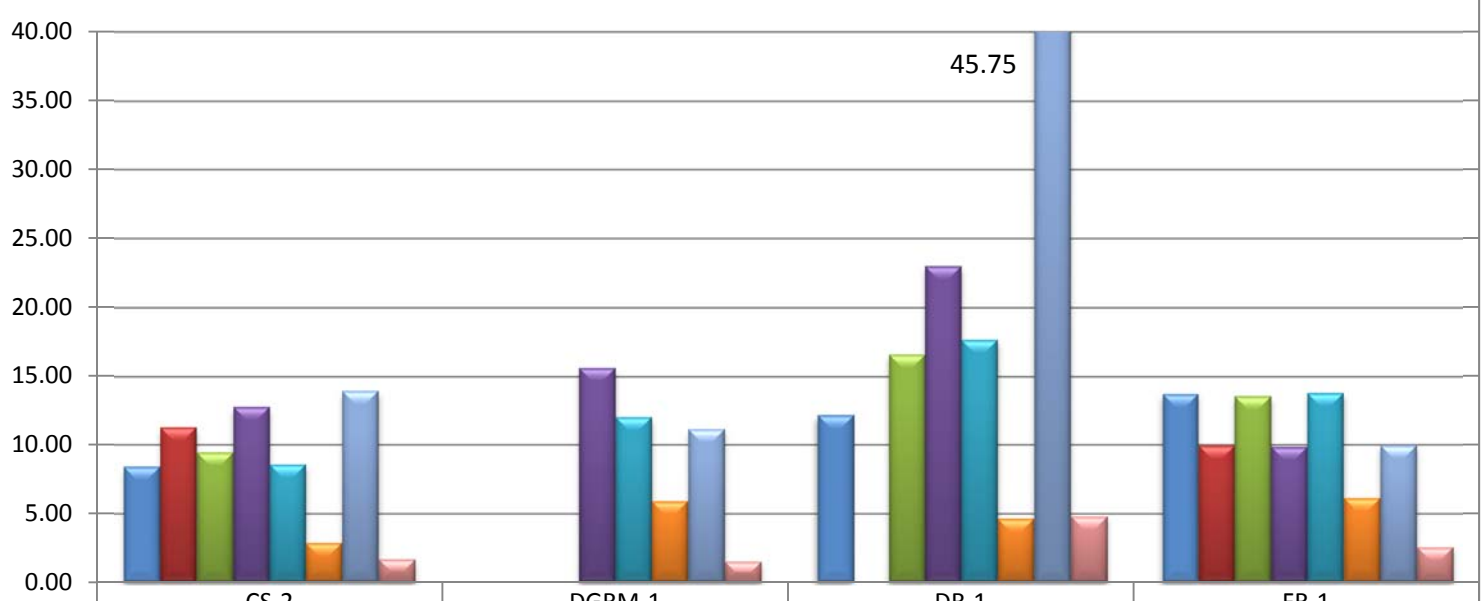
Figure 4. Mean growing season chl *a* measured for trend stations in the Mobile Bay watershed, 2005-2012.



	BS-1	CHANNEL-1A	CHANNEL-2	CS-1
2005	30.39	7.39	8.01	2.90
2006	27.13	11.94	7.45	
2007	22.98	7.99	5.01	18.53
2008	29.00	10.11	8.40	3.63
2009	23.56	7.93	8.65	4.67
2010	5.37	2.77	1.17	2.00
2011	5.67	7.06	7.12	9.61
2012	4.23	1.50*	2.23*	0.50

* Calculated using data collected outside of the growing season during November.
Blank cell indicates site was not sampled in that particular year.

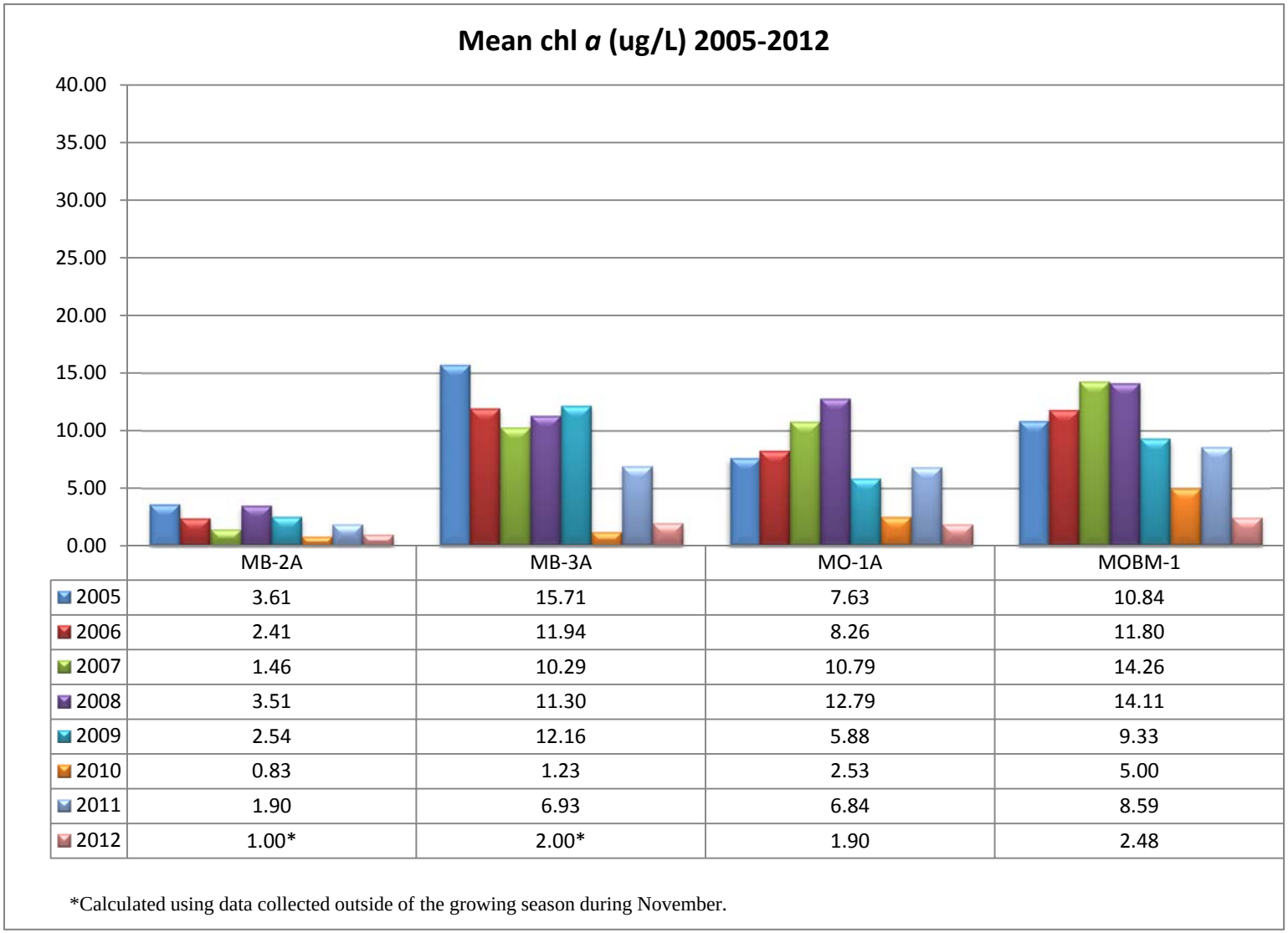
Figure 4. (continued)



	CS-2	DGRM-1	DR-1	FR-1
2005	8.40		12.13	13.67
2006	11.27			9.93
2007	9.43		16.60	13.50
2008	12.73	15.63	23.00	9.85
2009	8.57	12.00	17.67	13.73
2010	2.90	5.90	4.63	6.13
2011	13.88	11.13	45.75	9.95
2012	1.70	1.53	4.80	2.57

Blank cell indicates site was not sampled that particular year.

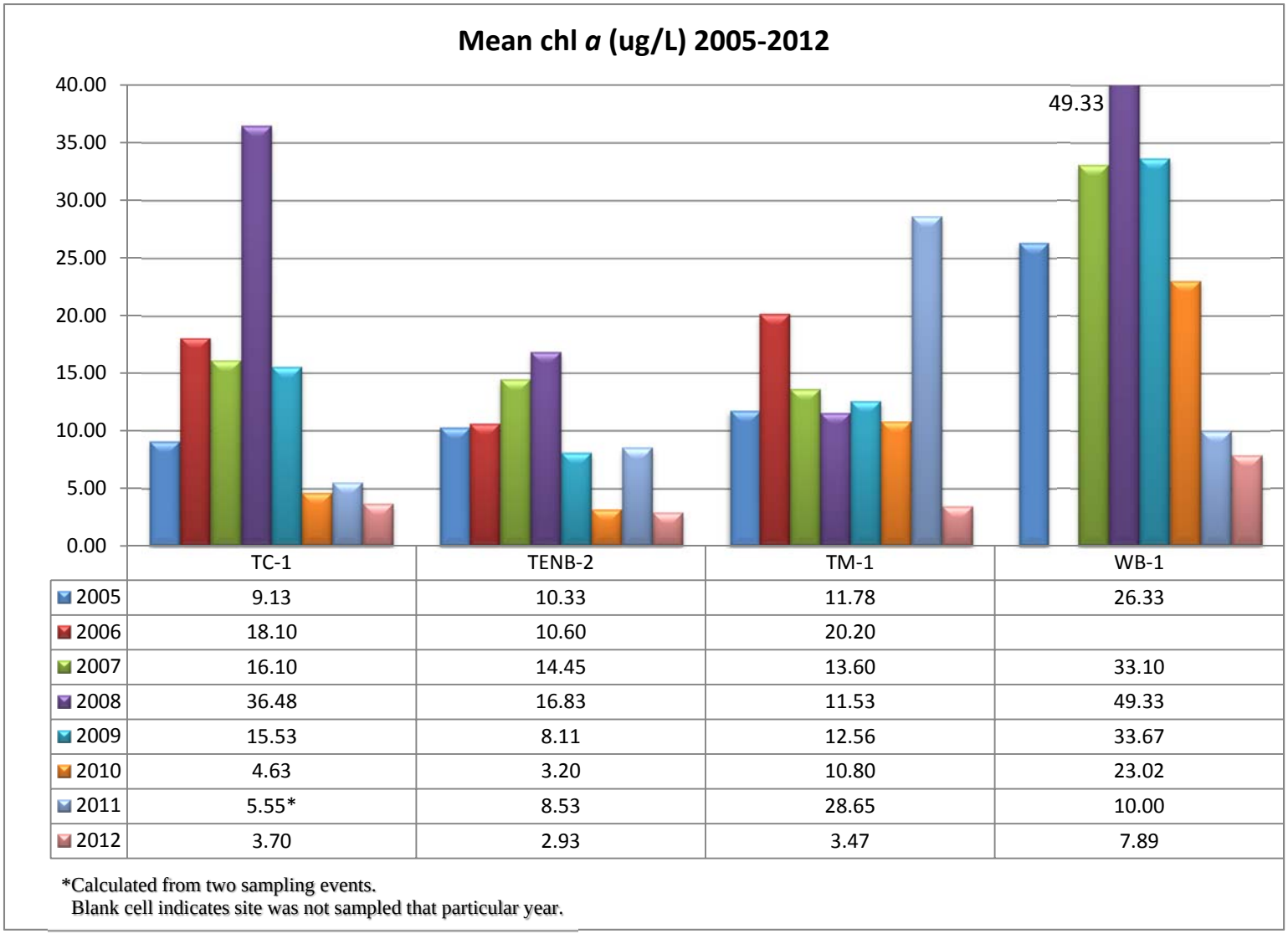
Figure 4. (continued)



	MB-2A	MB-3A	MO-1A	MOBM-1
2005	3.61	15.71	7.63	10.84
2006	2.41	11.94	8.26	11.80
2007	1.46	10.29	10.79	14.26
2008	3.51	11.30	12.79	14.11
2009	2.54	12.16	5.88	9.33
2010	0.83	1.23	2.53	5.00
2011	1.90	6.93	6.84	8.59
2012	1.00*	2.00*	1.90	2.48

*Calculated using data collected outside of the growing season during November.

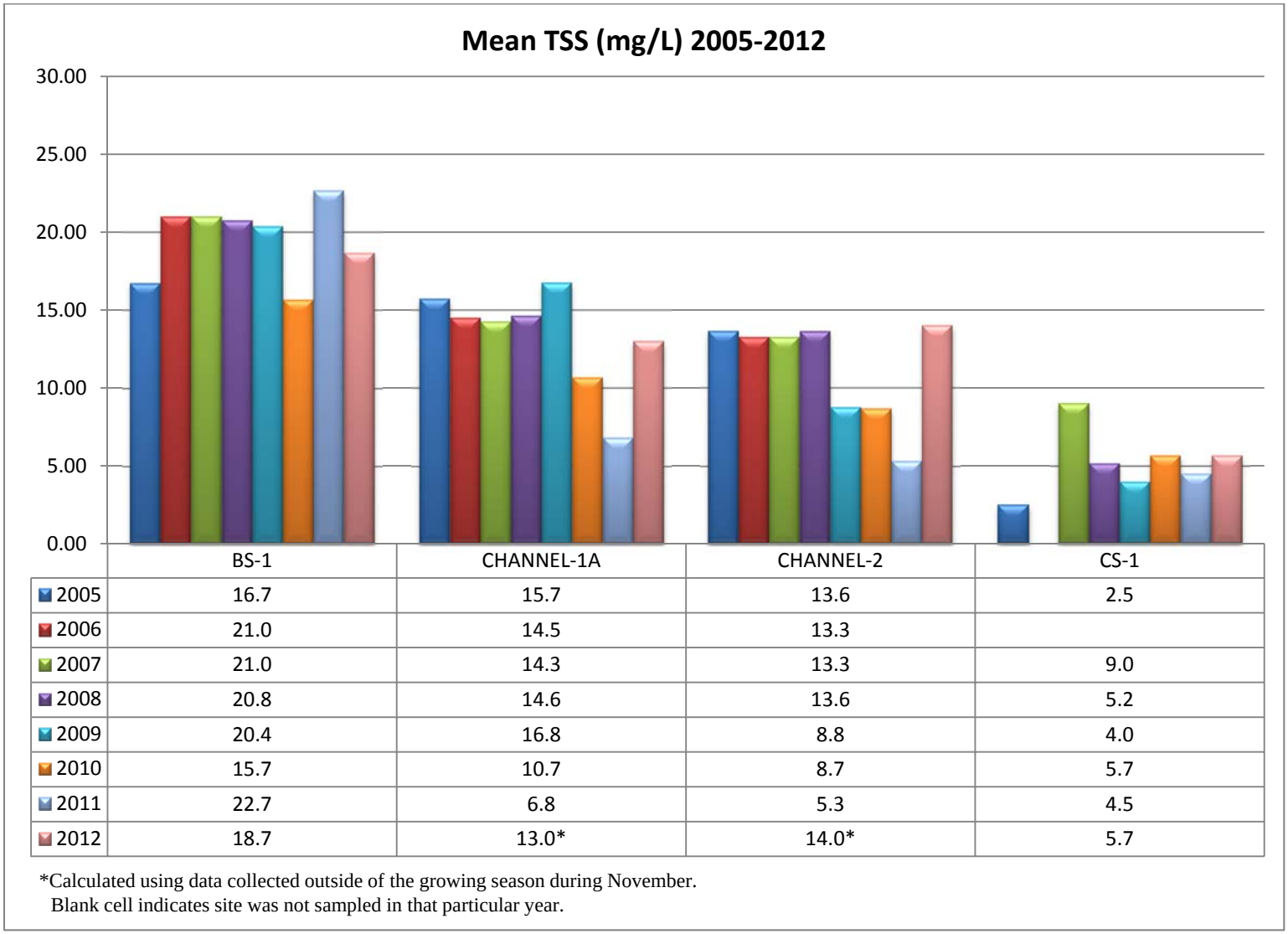
Figure 4. (continued)



	TC-1	TENB-2	TM-1	WB-1
2005	9.13	10.33	11.78	26.33
2006	18.10	10.60	20.20	
2007	16.10	14.45	13.60	33.10
2008	36.48	16.83	11.53	49.33
2009	15.53	8.11	12.56	33.67
2010	4.63	3.20	10.80	23.02
2011	5.55*	8.53	28.65	10.00
2012	3.70	2.93	3.47	7.89

*Calculated from two sampling events.
Blank cell indicates site was not sampled that particular year.

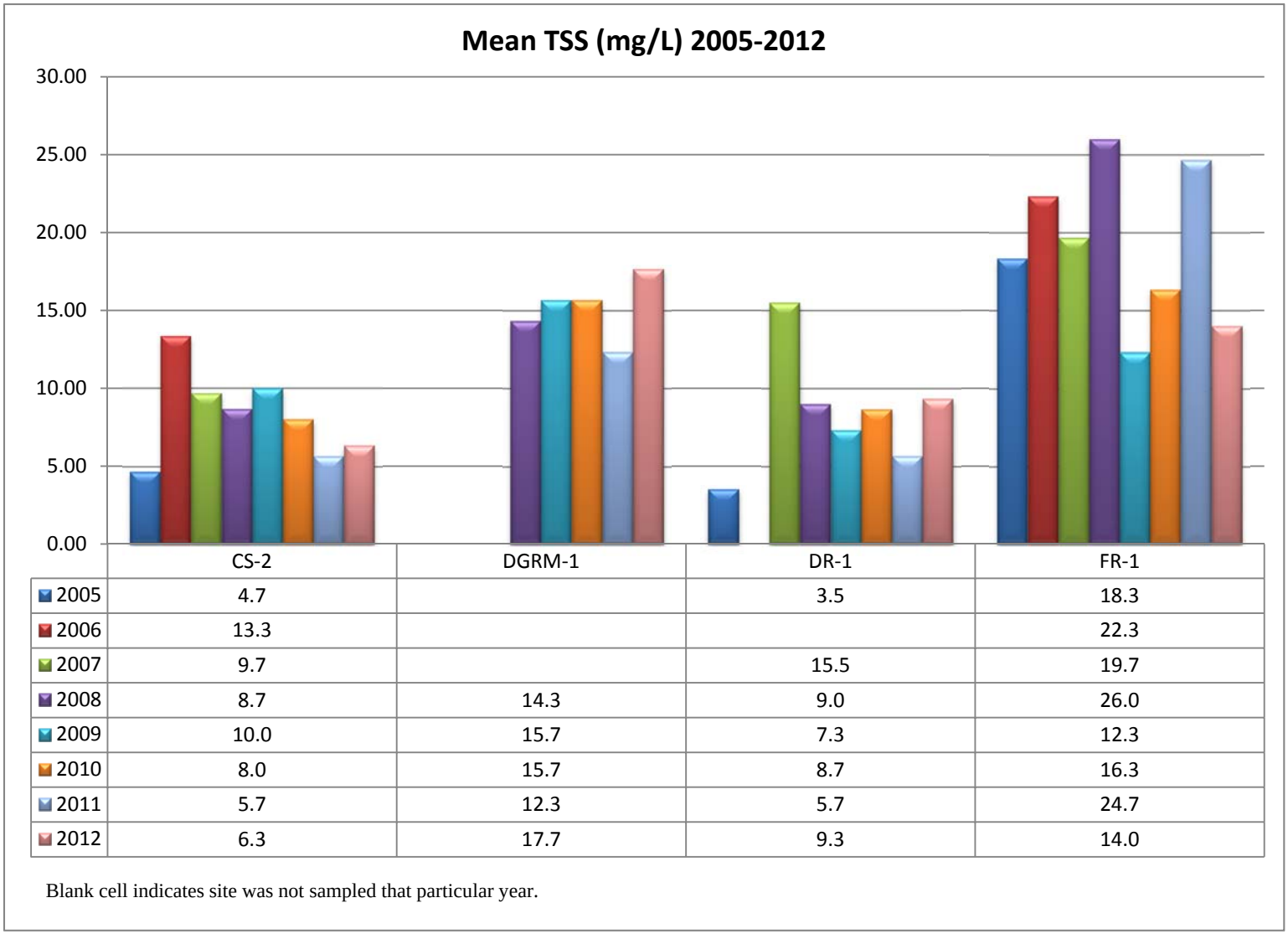
Figure 5. Mean growing season TSS measured for trend stations in the Mobile Bay watershed, 2005-2012.



	BS-1	CHANNEL-1A	CHANNEL-2	CS-1
2005	16.7	15.7	13.6	2.5
2006	21.0	14.5	13.3	
2007	21.0	14.3	13.3	9.0
2008	20.8	14.6	13.6	5.2
2009	20.4	16.8	8.8	4.0
2010	15.7	10.7	8.7	5.7
2011	22.7	6.8	5.3	4.5
2012	18.7	13.0*	14.0*	5.7

*Calculated using data collected outside of the growing season during November.
Blank cell indicates site was not sampled in that particular year.

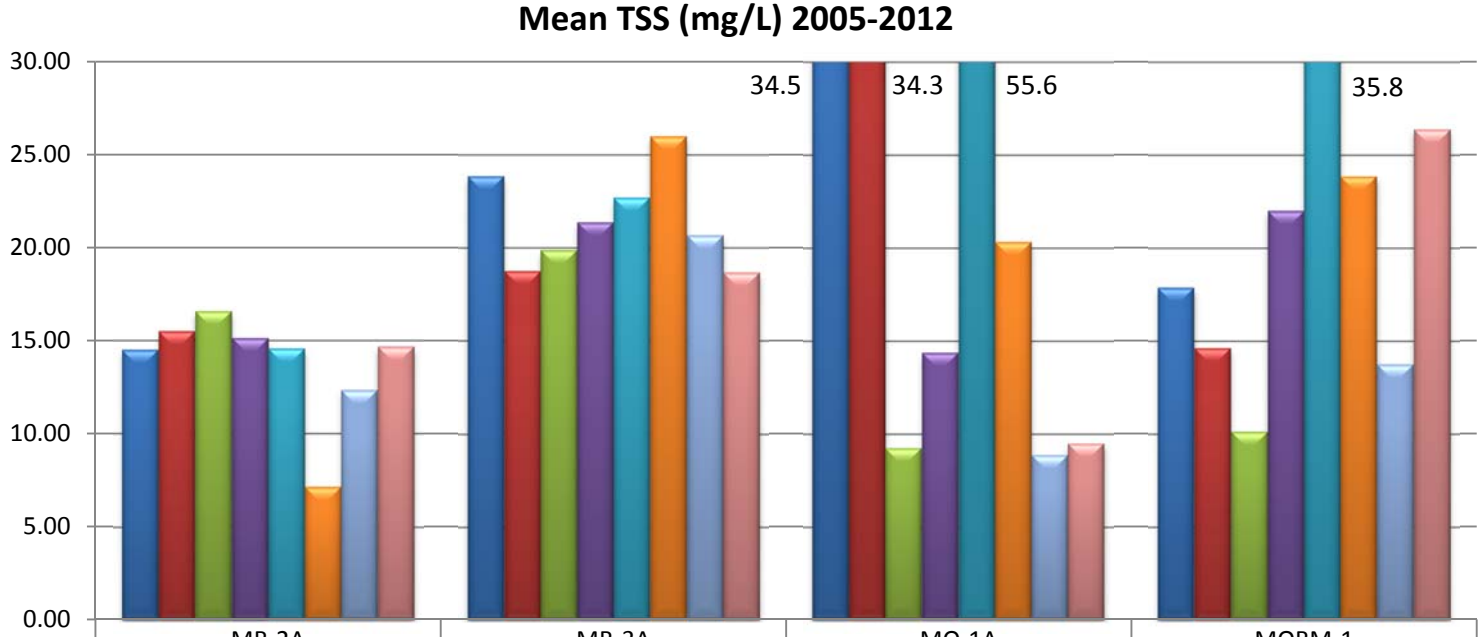
Figure 5. (continued)



	CS-2	DGRM-1	DR-1	FR-1
2005	4.7		3.5	18.3
2006	13.3			22.3
2007	9.7		15.5	19.7
2008	8.7	14.3	9.0	26.0
2009	10.0	15.7	7.3	12.3
2010	8.0	15.7	8.7	16.3
2011	5.7	12.3	5.7	24.7
2012	6.3	17.7	9.3	14.0

Blank cell indicates site was not sampled that particular year.

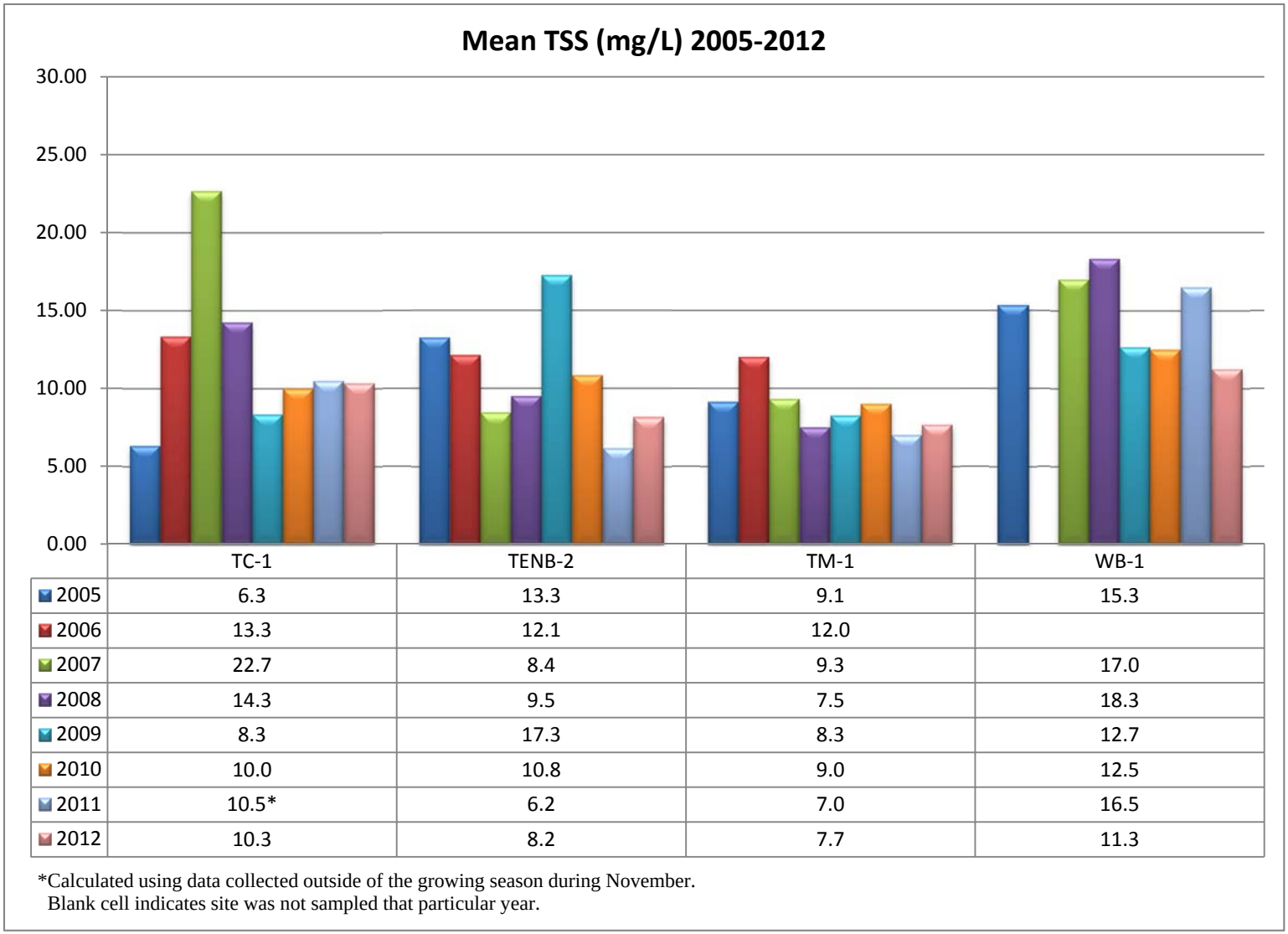
Figure 5. (continued)



	MB-2A	MB-3A	MO-1A	MOBM-1
2005	14.5	23.9	34.5	17.9
2006	15.5	18.8	34.3	14.6
2007	16.6	19.9	9.3	10.1
2008	15.1	21.4	14.4	22.0
2009	14.6	22.7	55.6	35.8
2010	7.2	26.0	20.3	23.9
2011	12.3	20.7	8.9	13.8
2012	14.7*	18.7*	9.5	26.4

*Calculated using data collected outside of the growing season during November.

Figure 5. (continued)



	TC-1	TENB-2	TM-1	WB-1
2005	6.3	13.3	9.1	15.3
2006	13.3	12.1	12.0	
2007	22.7	8.4	9.3	17.0
2008	14.3	9.5	7.5	18.3
2009	8.3	17.3	8.3	12.7
2010	10.0	10.8	9.0	12.5
2011	10.5*	6.2	7.0	16.5
2012	10.3	8.2	7.7	11.3

*Calculated using data collected outside of the growing season during November.
Blank cell indicates site was not sampled that particular year.

Figure 6. Monthly, bi-monthly, and quarterly TN concentrations measured in the Mobile Bay watershed, March-November 2012. The historic mean (1990-2012) and min/max ranges are also displayed for comparison. The "n" value equals the number of data points included in the monthly historic calculations. Absence of an n value denotes one data point with no historic mean.

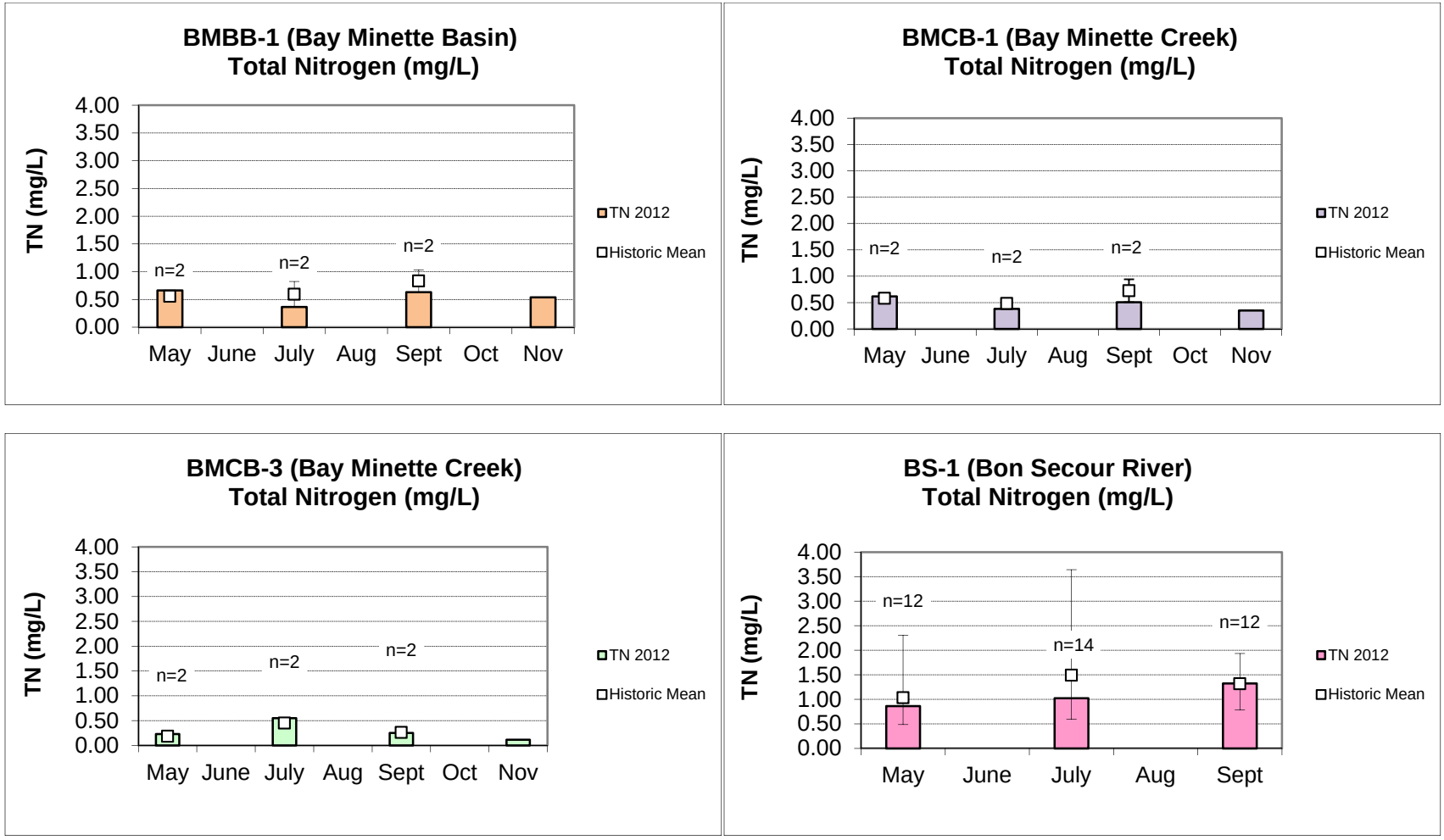


Figure 6. (continued)

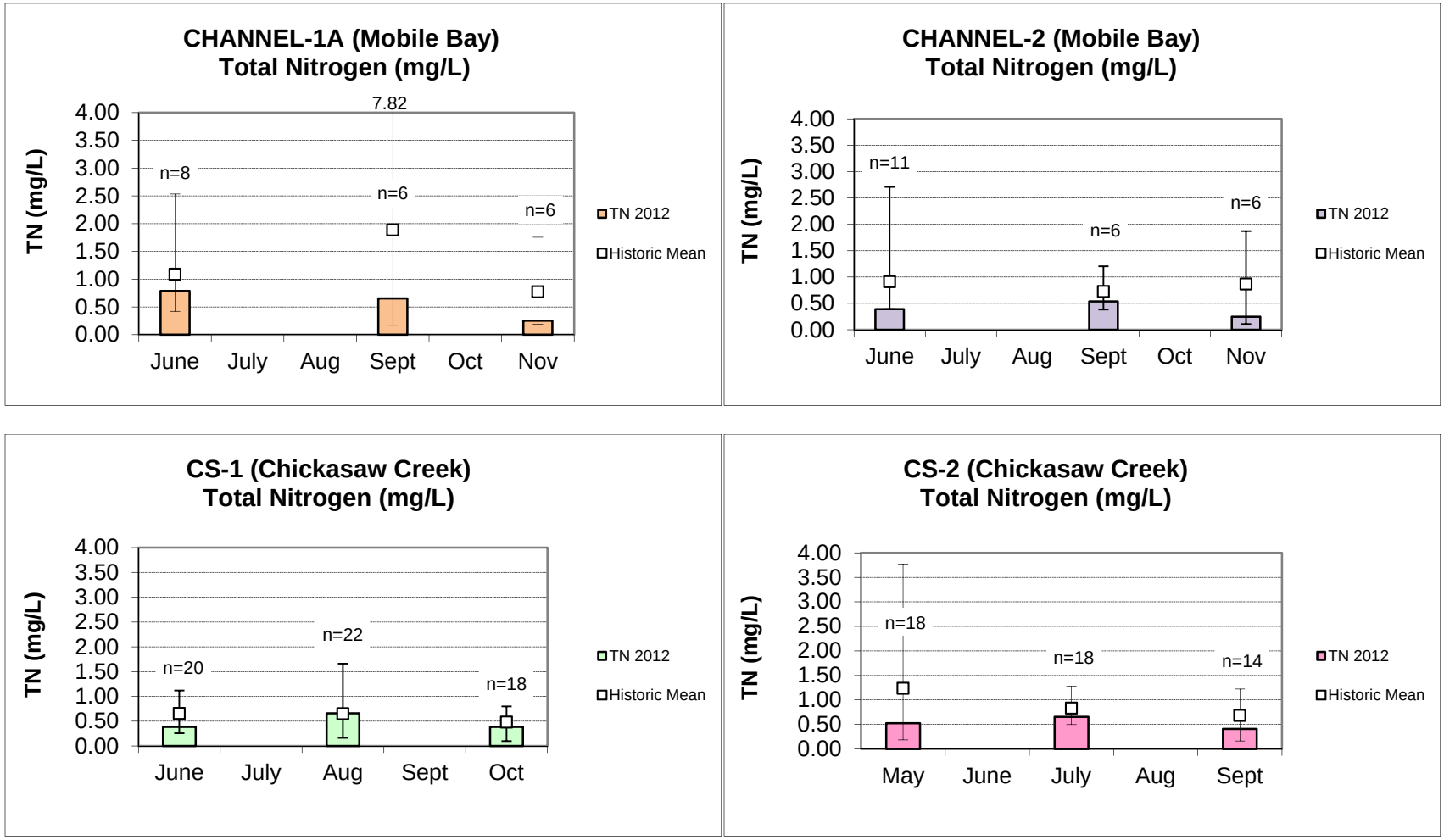


Figure 6. (continued)

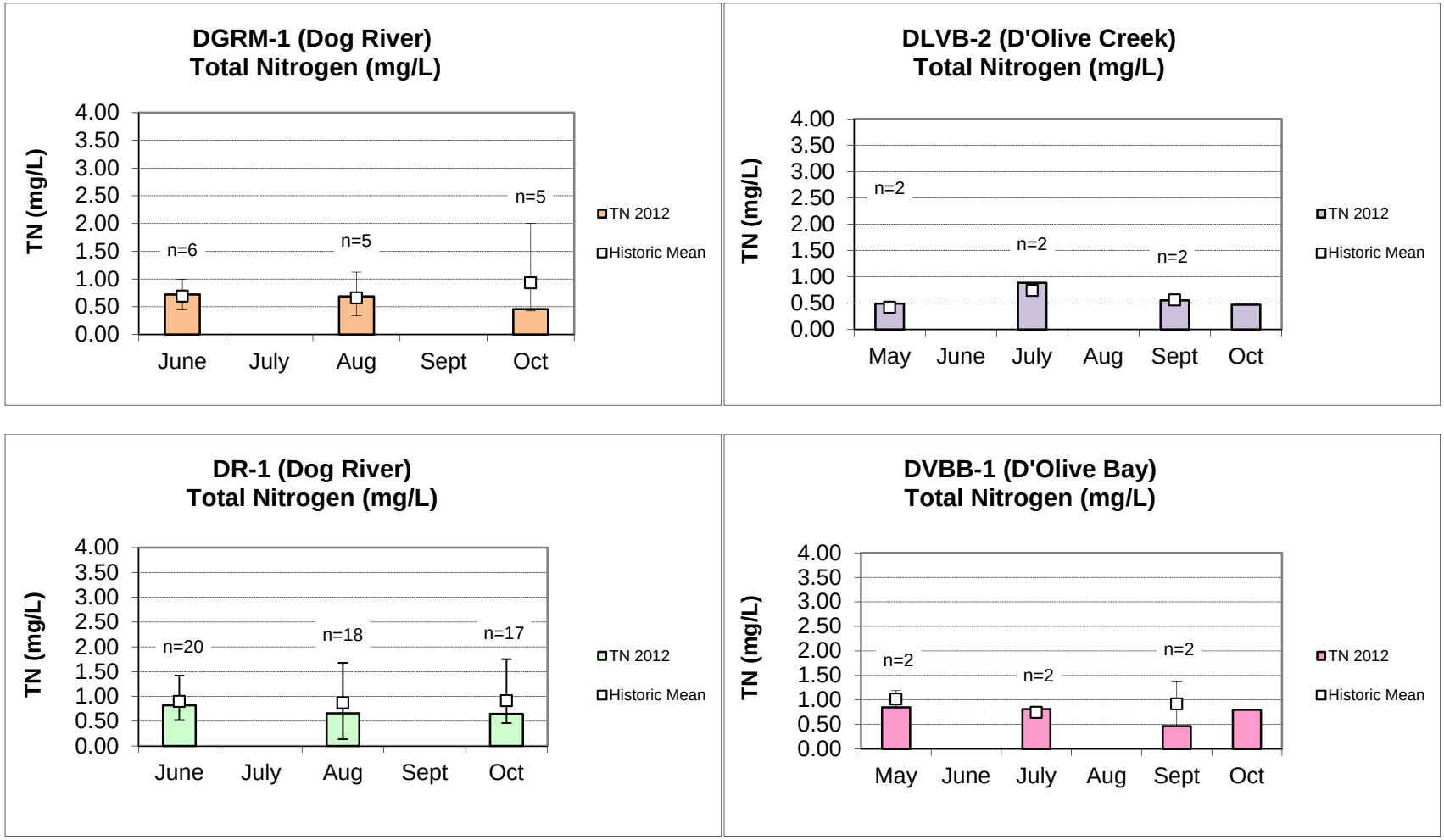


Figure 6. (continued)

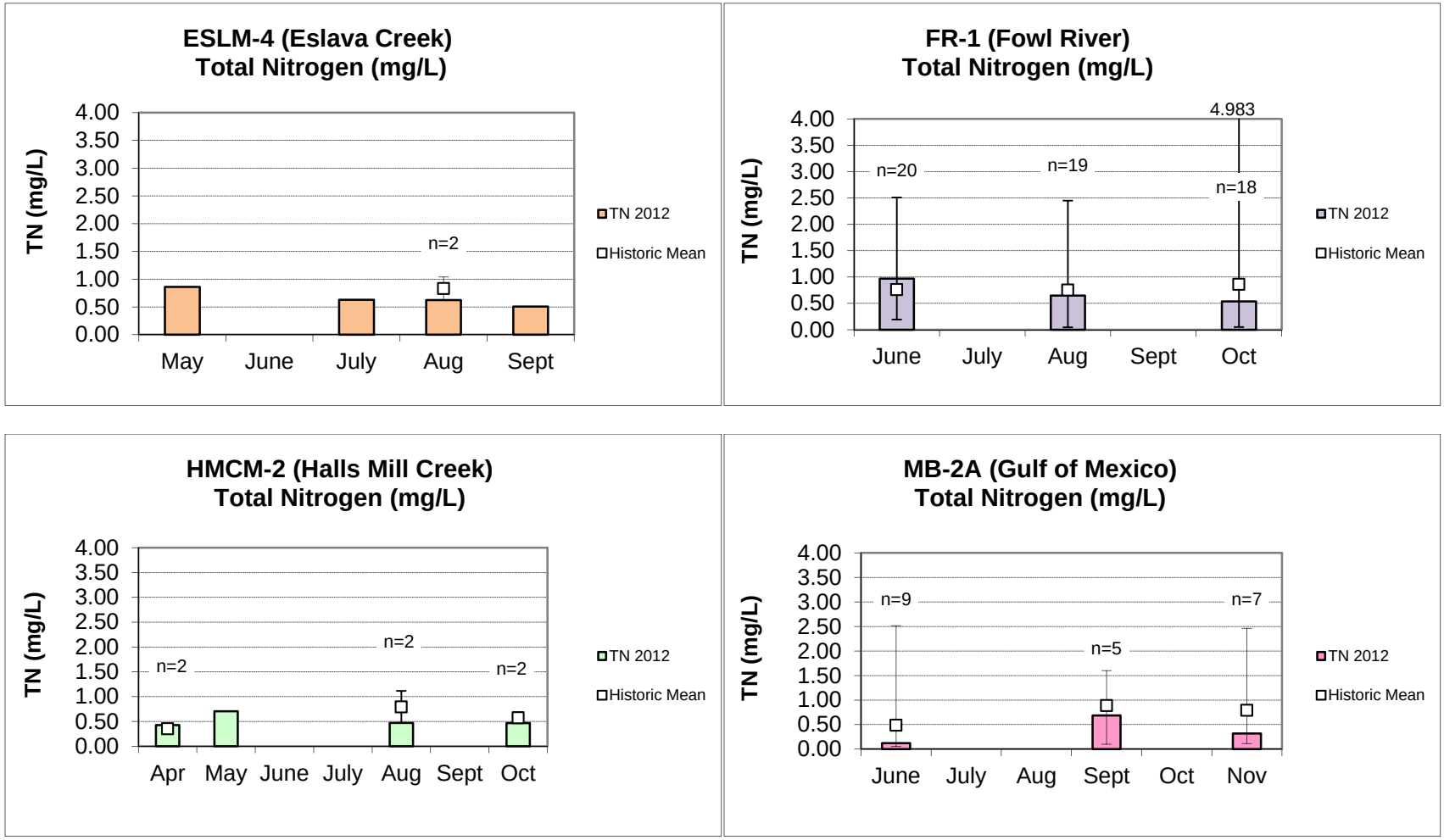


Figure 6. (continued)

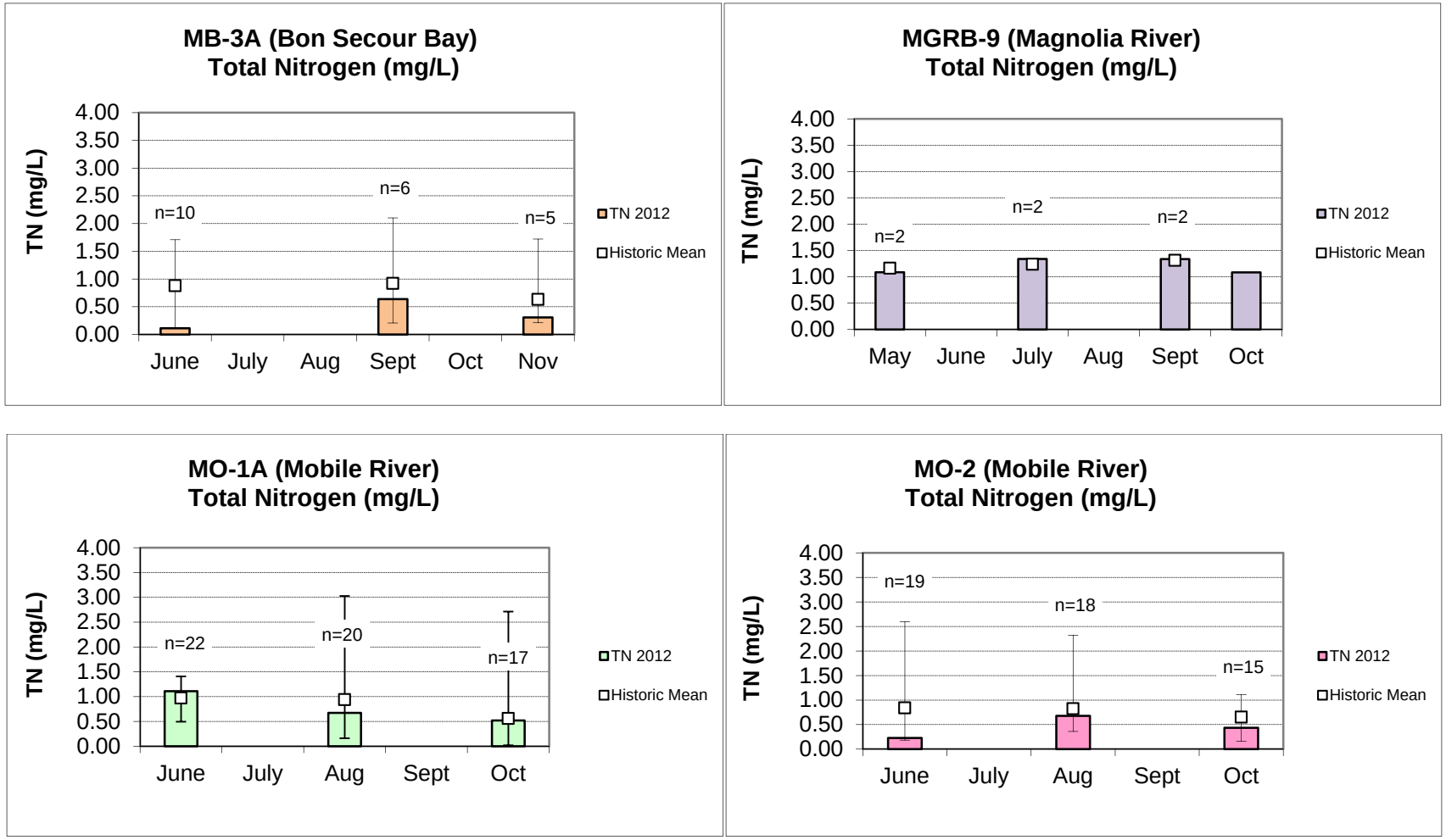


Figure 6. (continued)

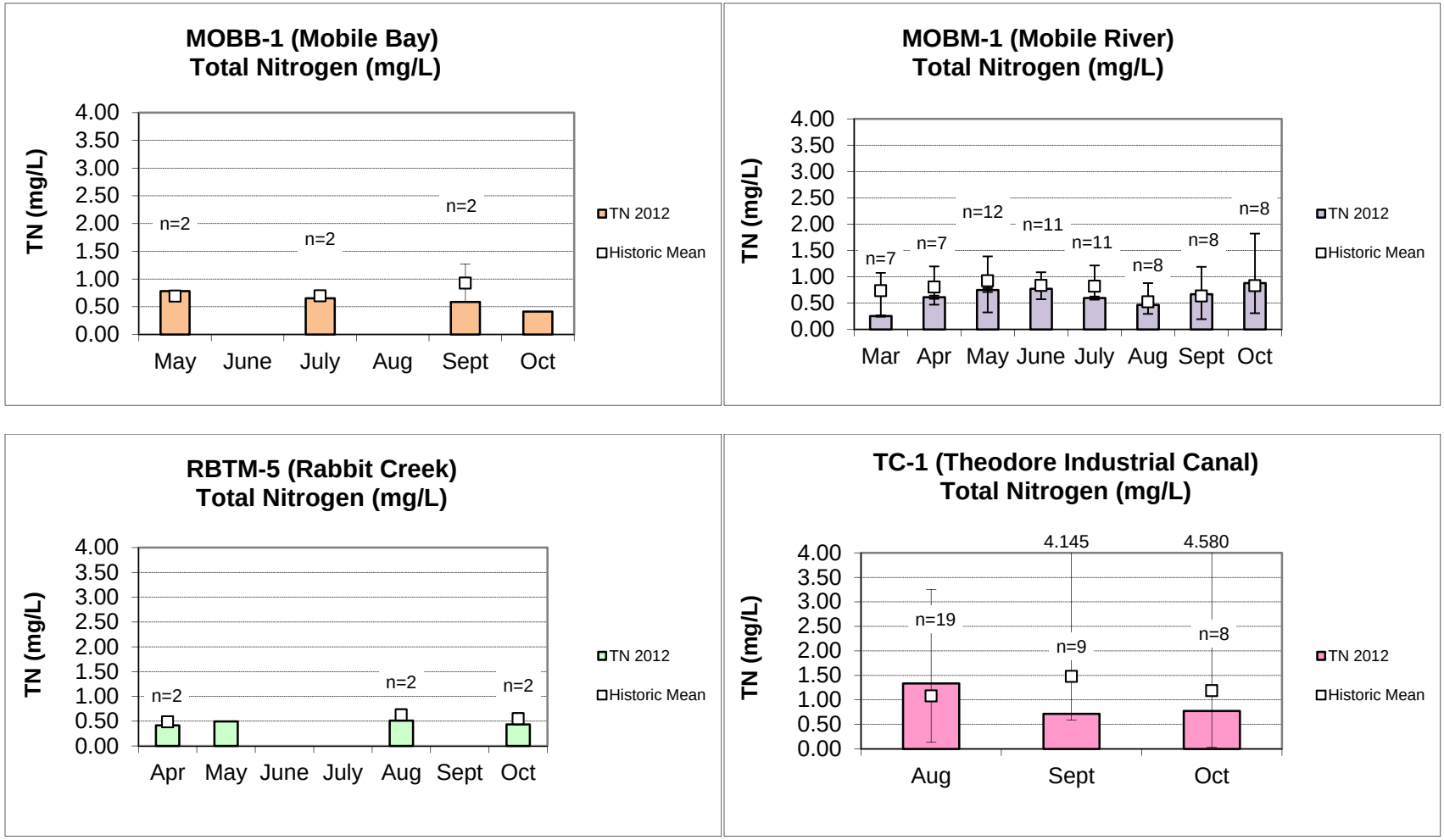


Figure 6. (continued)

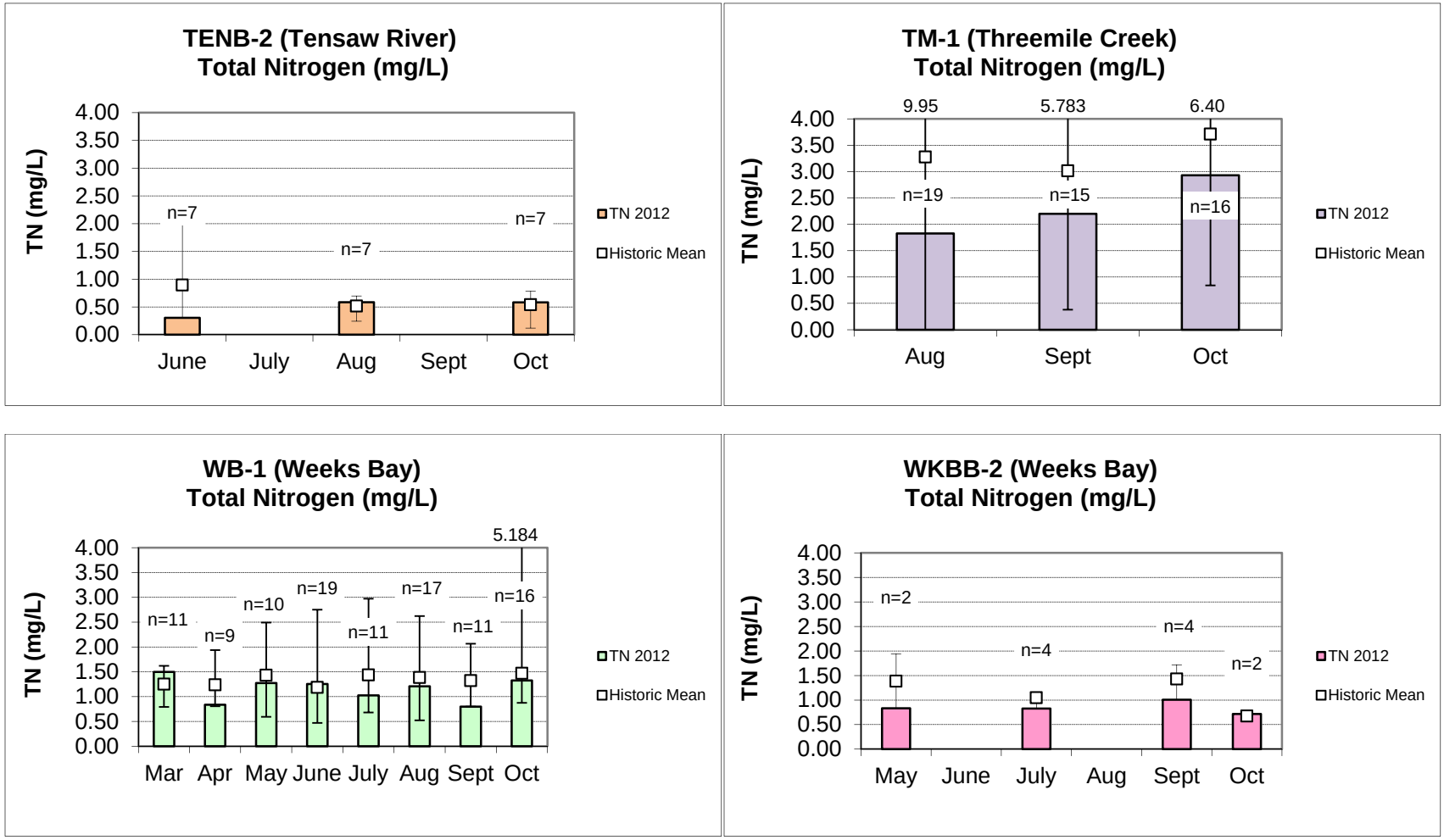


Figure 7. Monthly, bi-monthly, and quarterly TP concentrations measured in the Mobile Bay watershed, March-November 2012. The historic mean (1990-2012) and min/max ranges are also displayed for comparison. The "n" value equals the number of data points included in the monthly historic calculations. Absence of an n value denotes one data point with no historic mean.

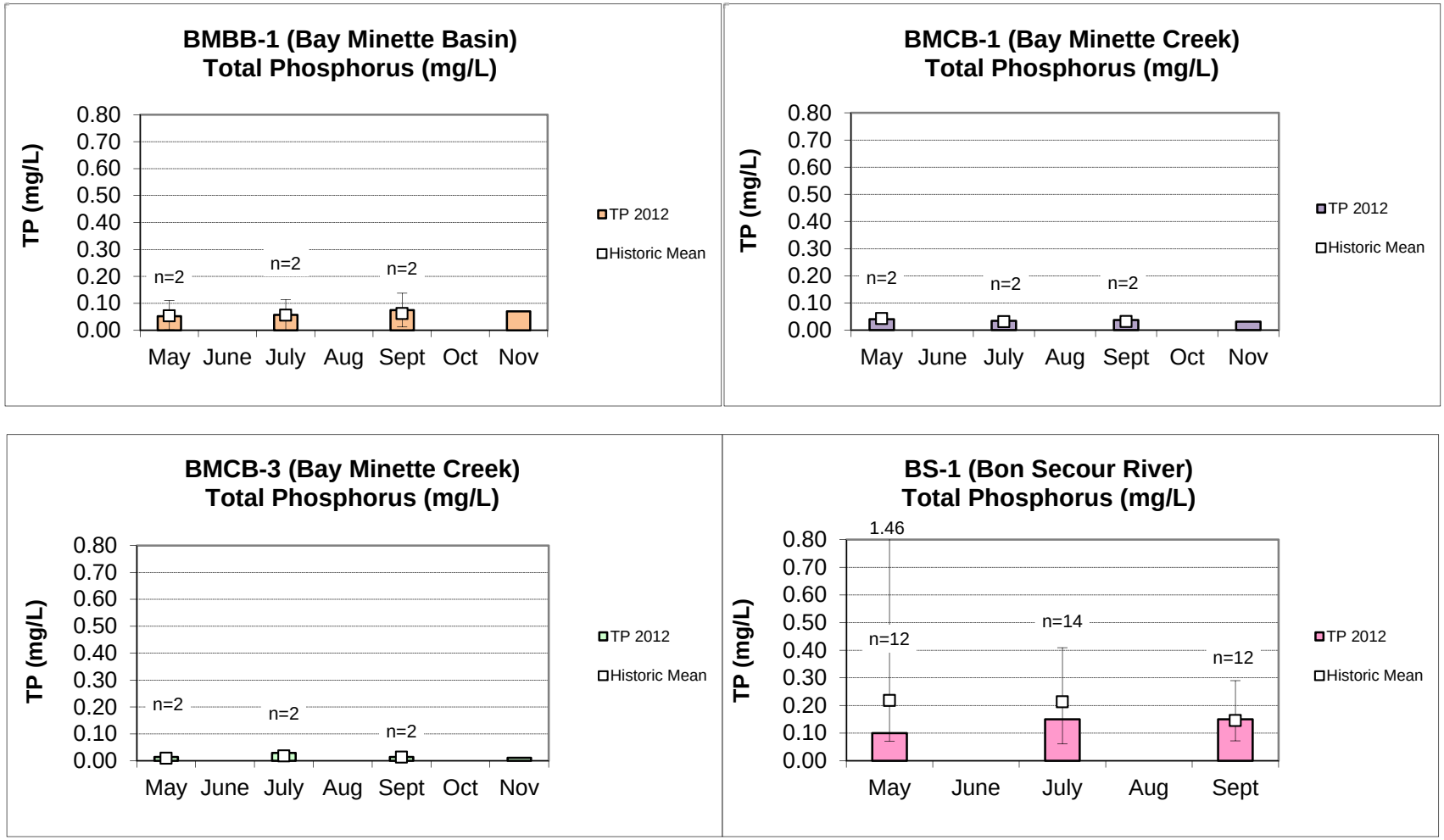


Figure 7. (continued)

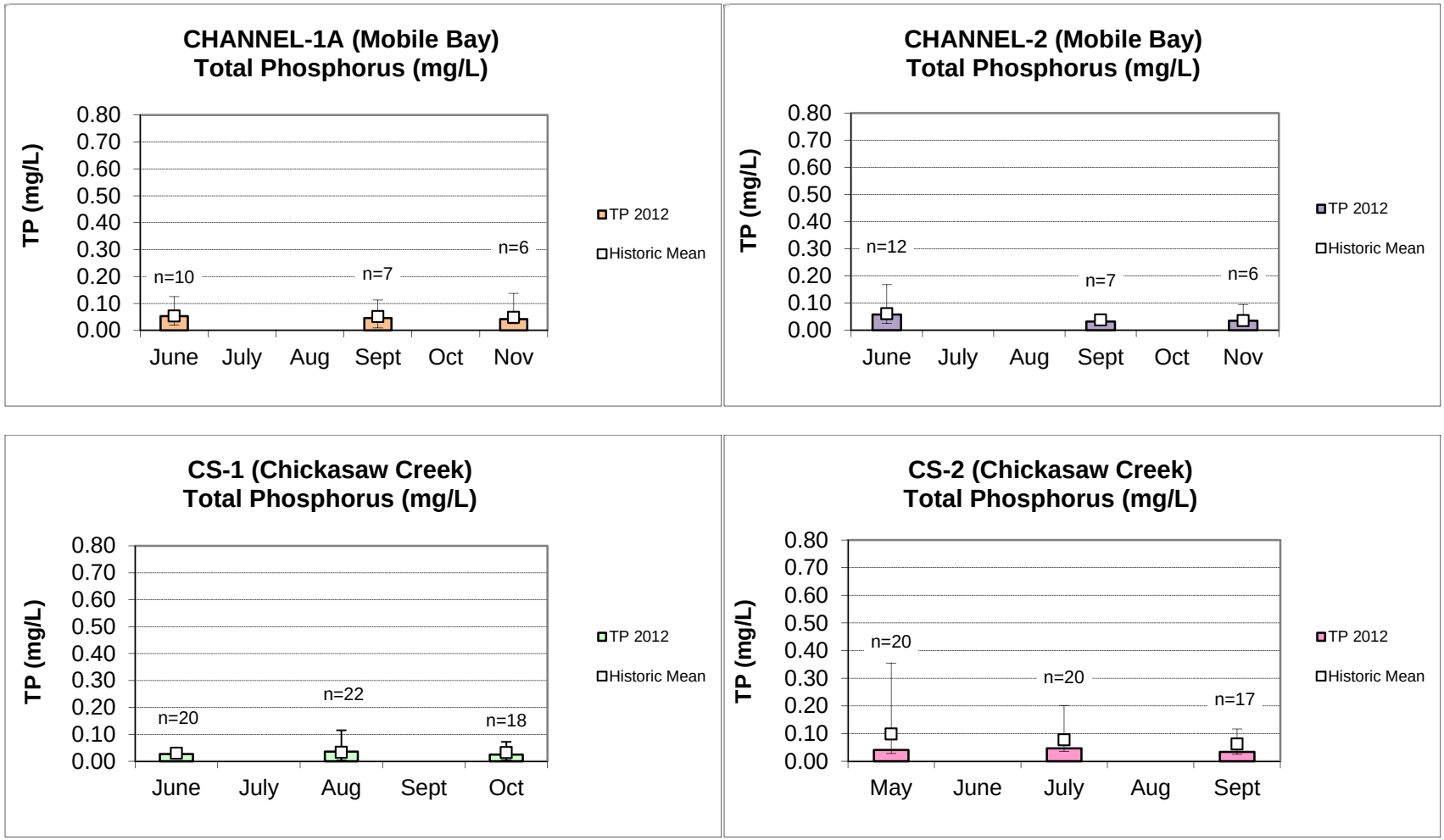


Figure 7. (continued)

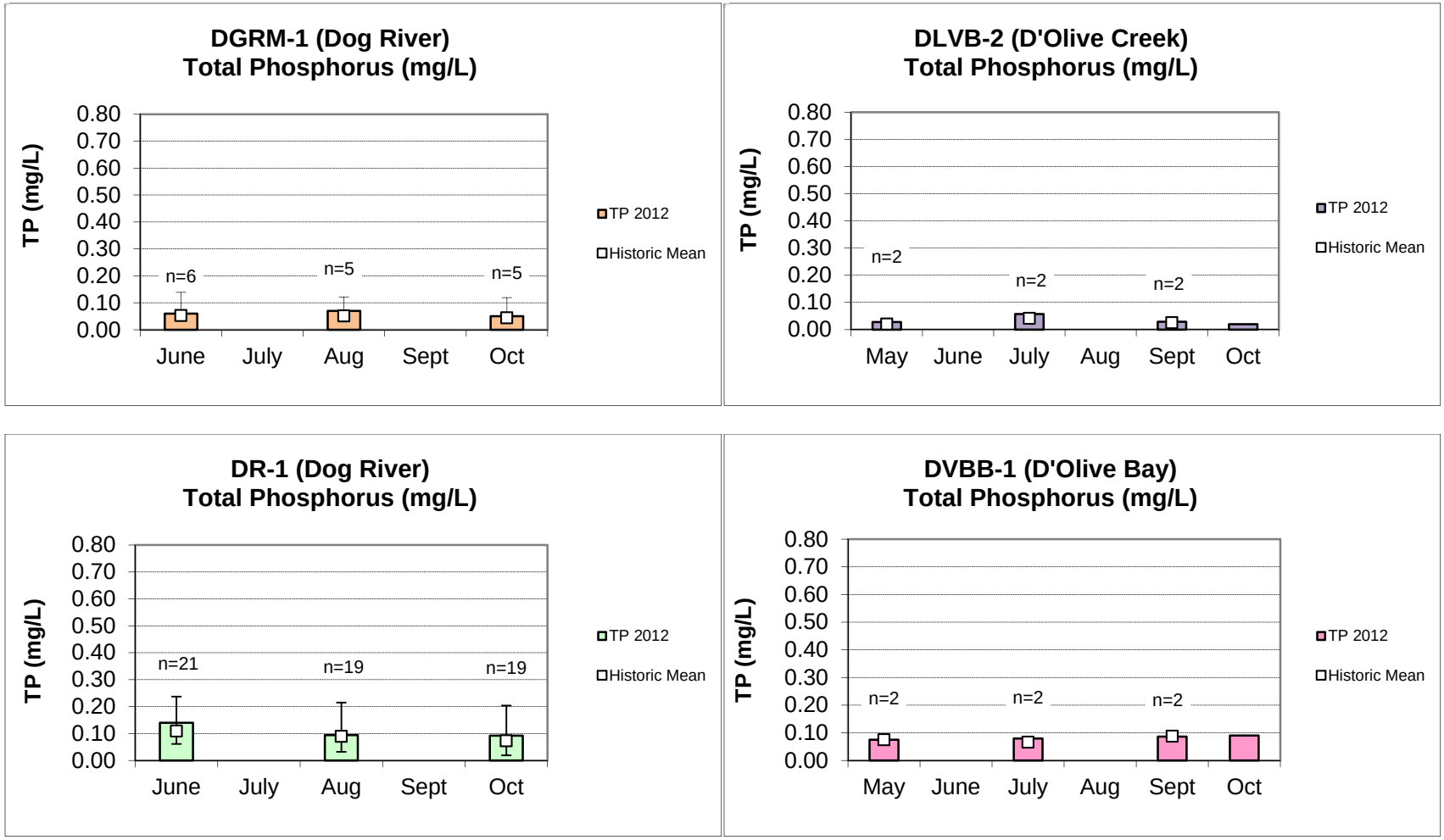


Figure 7. (continued)

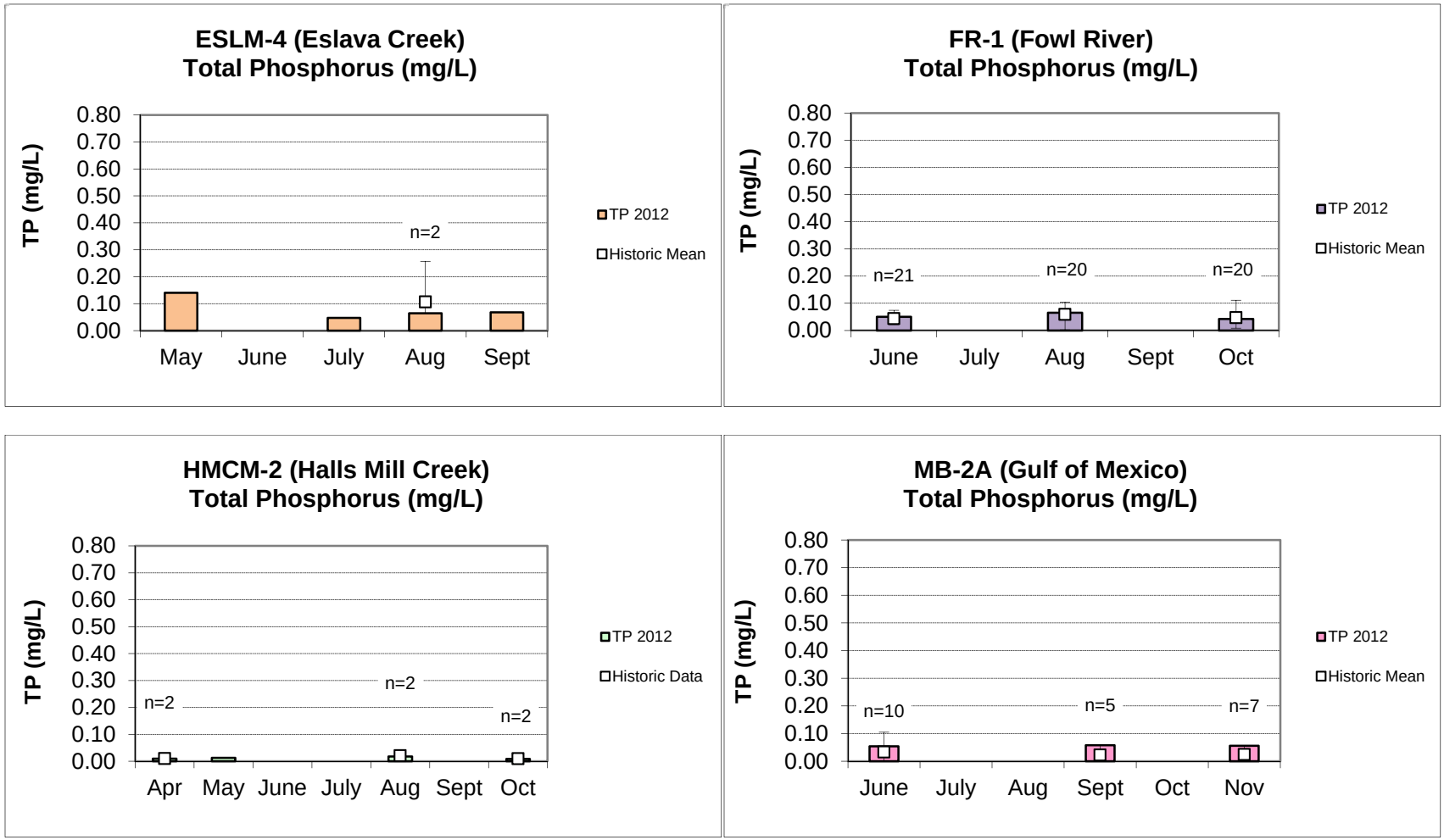


Figure 7. (continued)

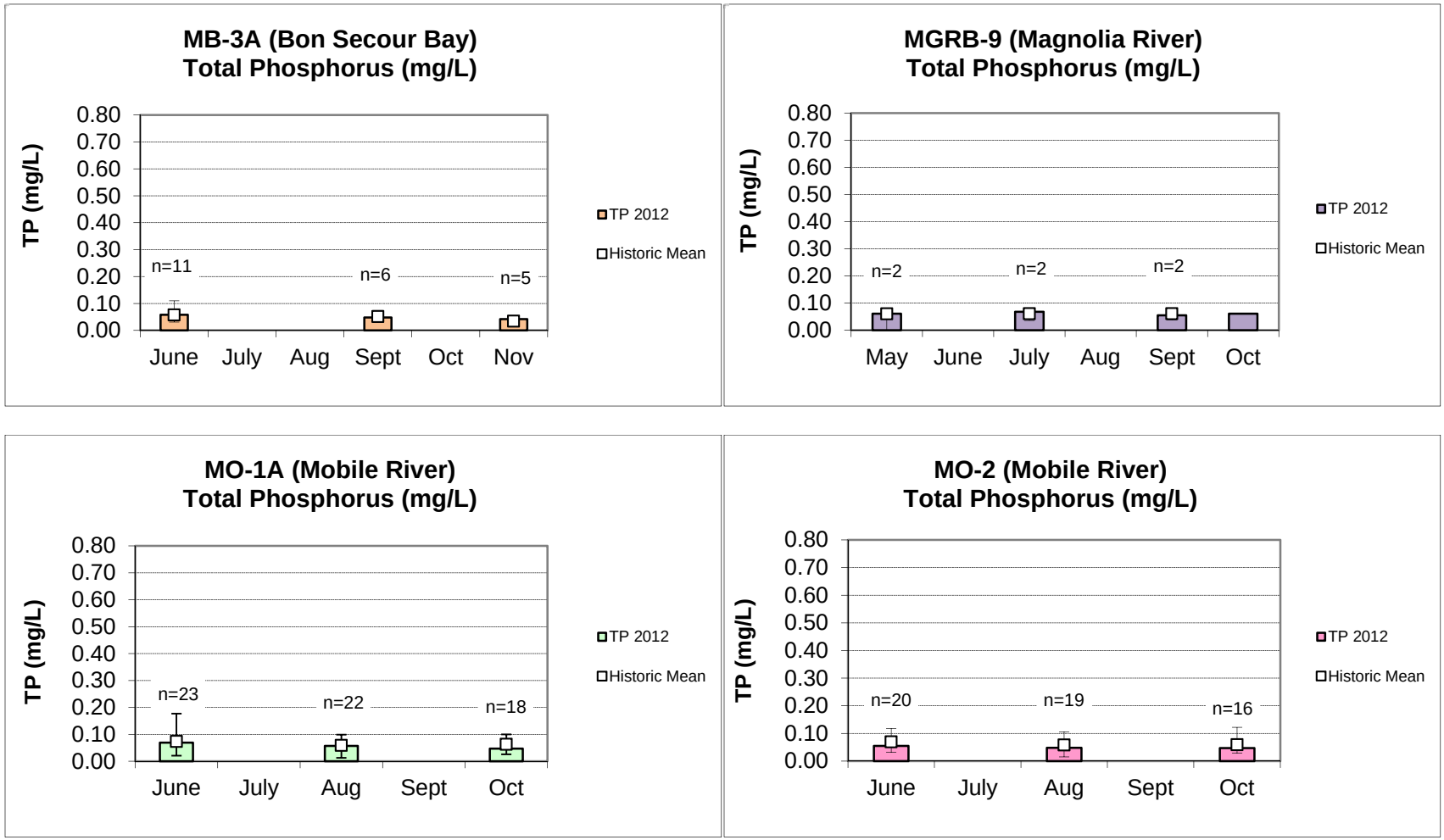


Figure 7. (continued)

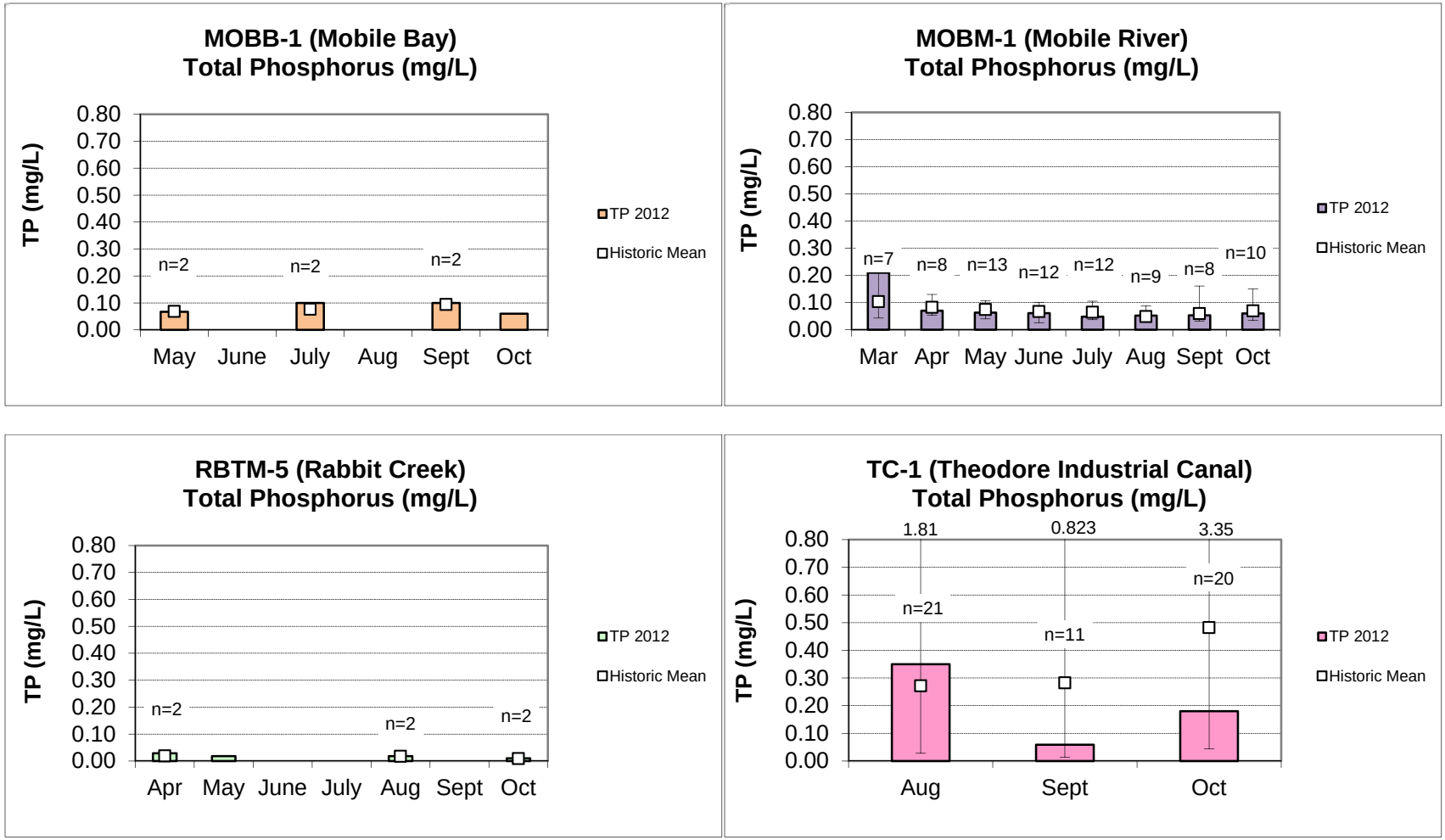


Figure 7. (continued)

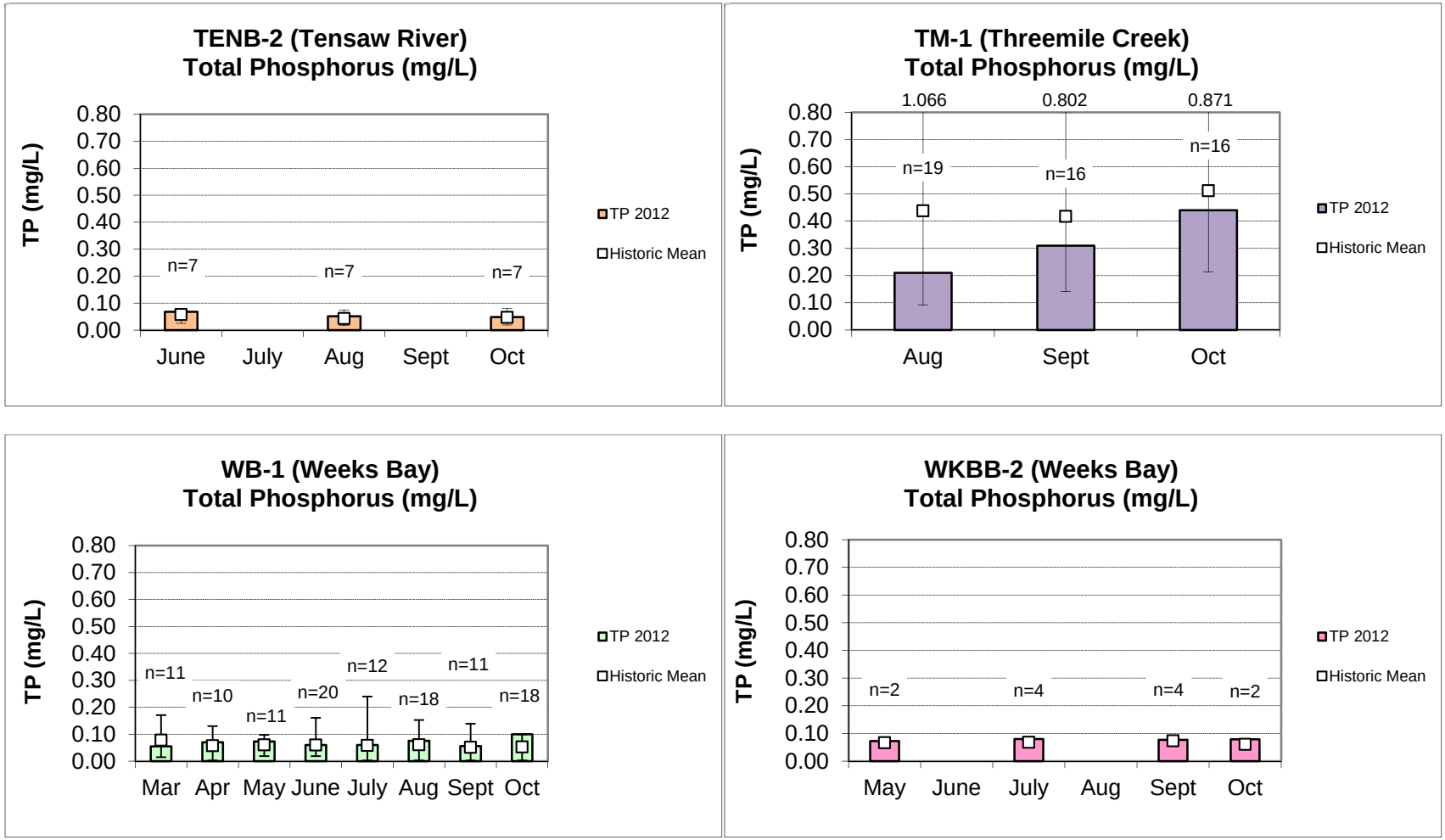


Figure 8. Monthly, bi-monthly, and quarterly chl a concentrations measured in the Mobile Bay watershed, March-November 2012. The historic mean (1990-2012) and min/max ranges are also displayed for comparison. The "n" value equals the number of data points included in the monthly historic calculations. Absence of an n value denotes one data point with no historic mean.

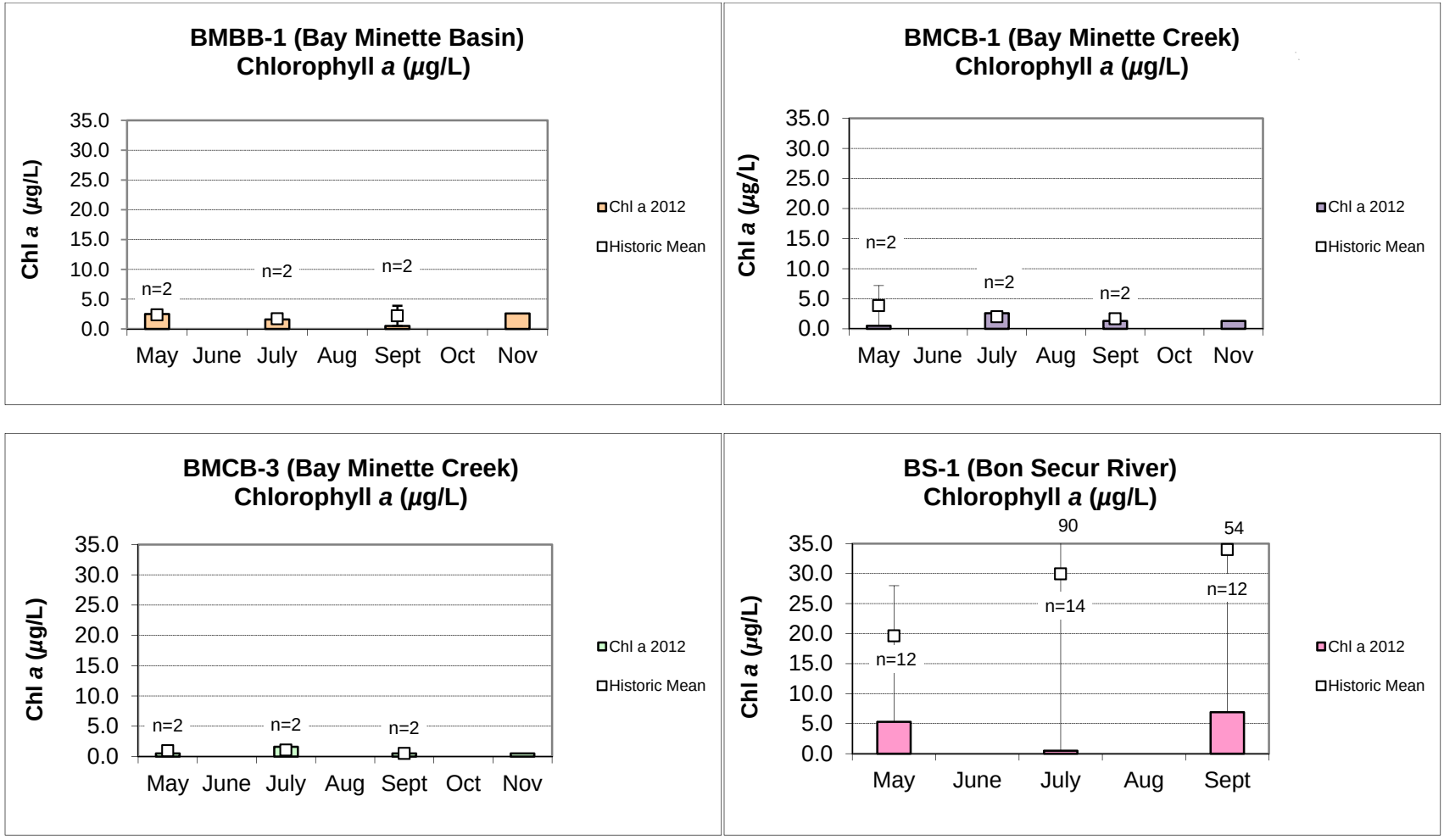


Figure 8. (continued)

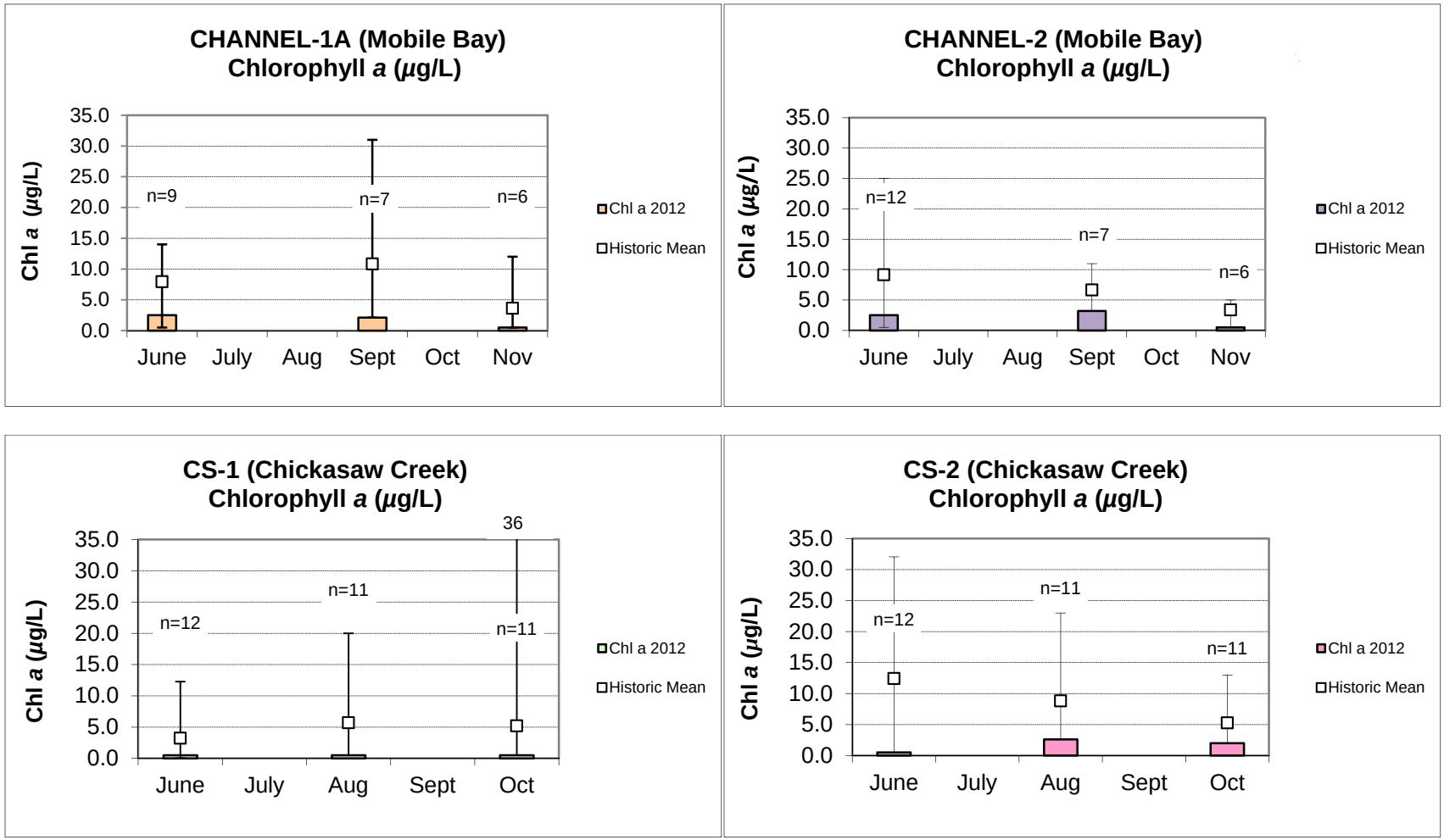


Figure 8. (continued)

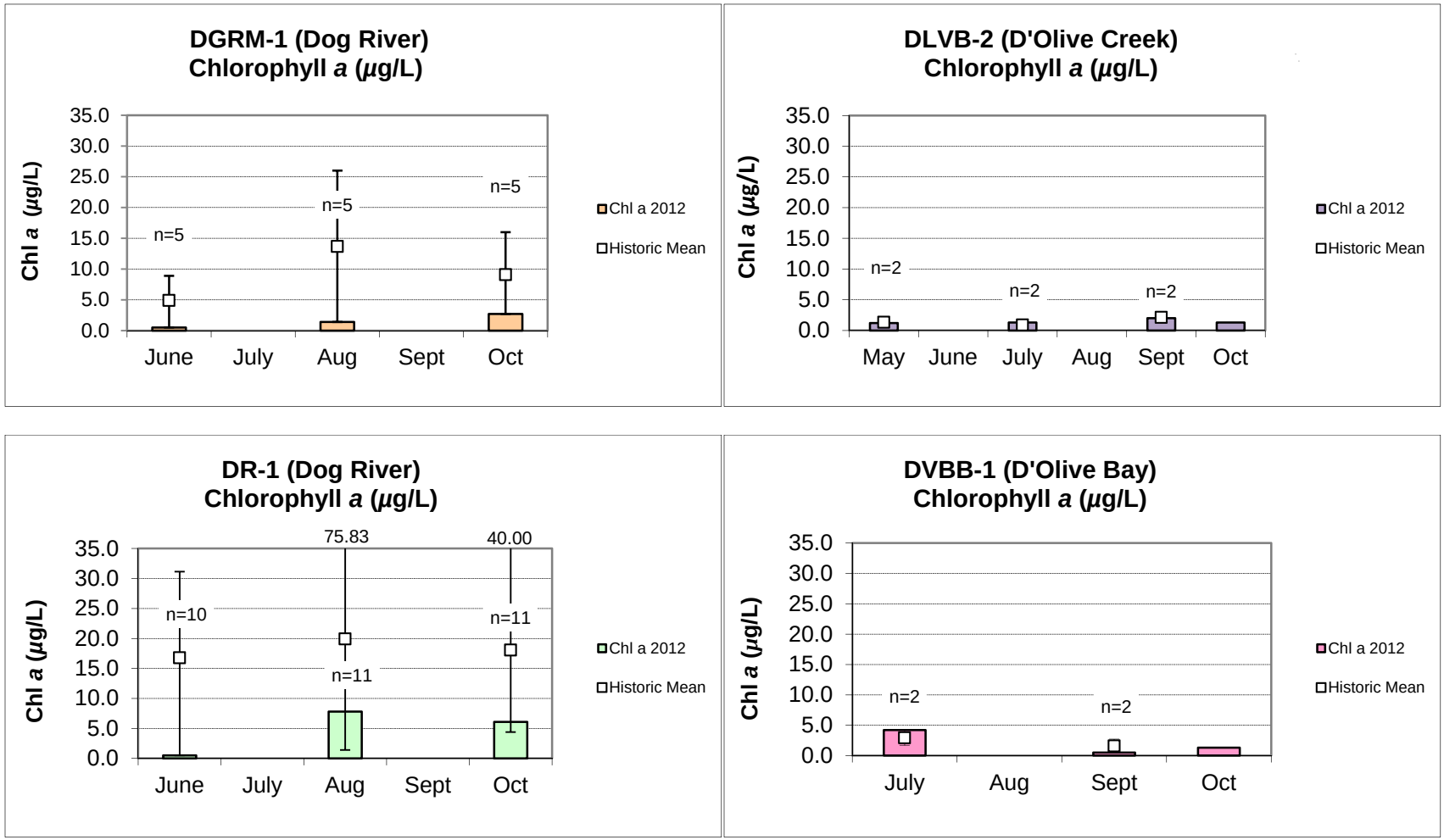


Figure 8. (continued)

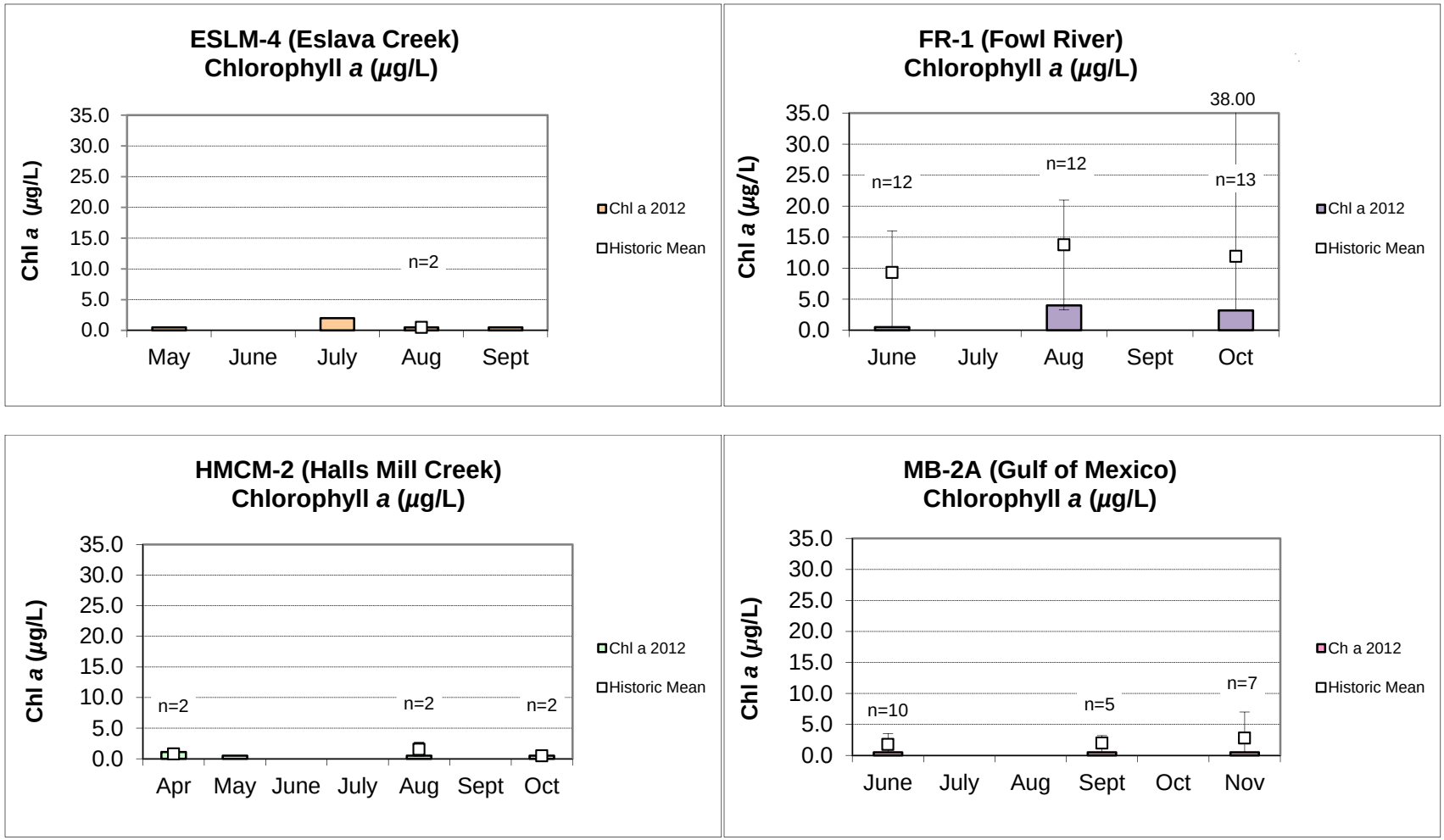


Figure 8. (continued)

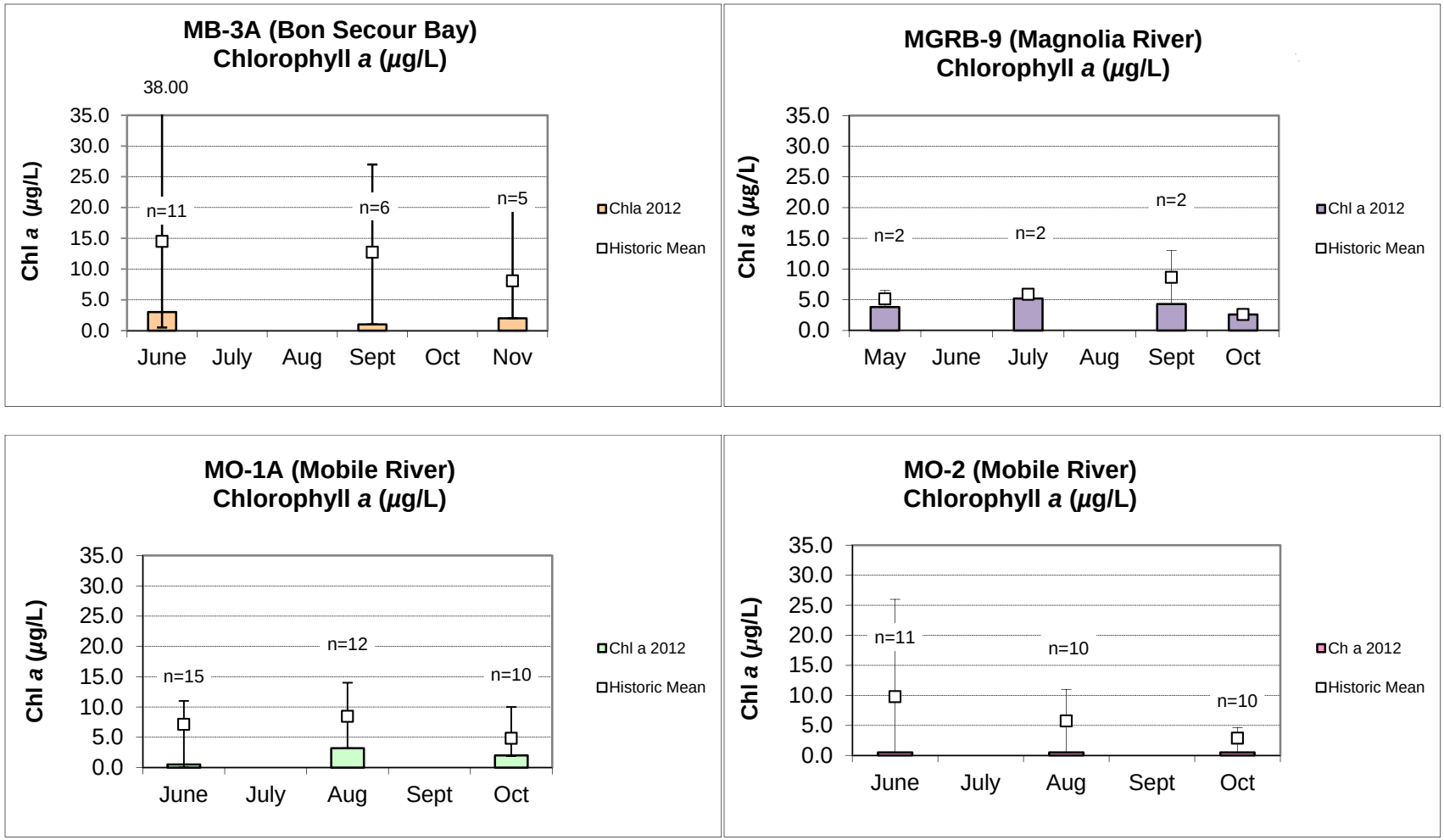


Figure 8. (continued)

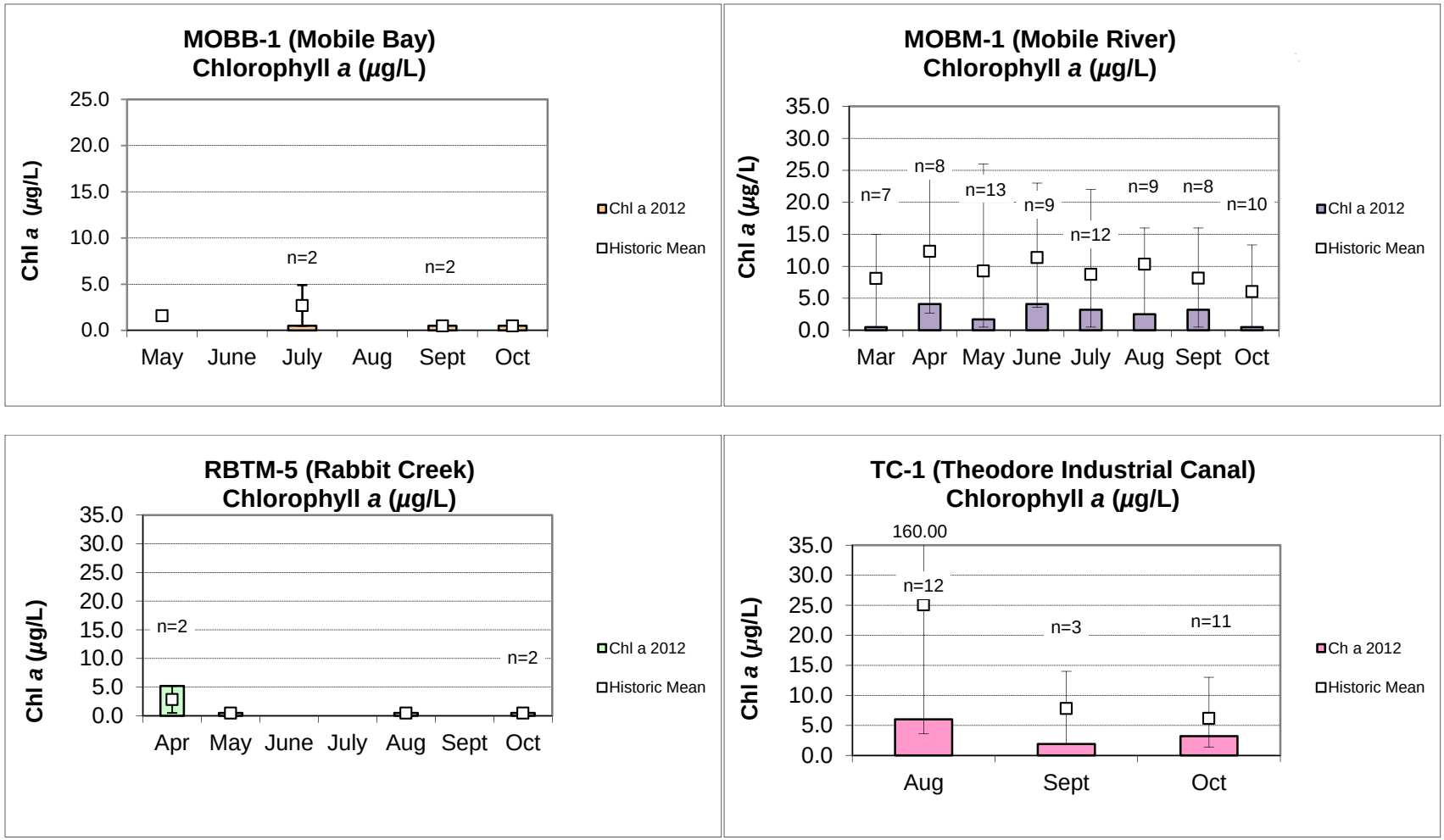


Figure 8. (continued)

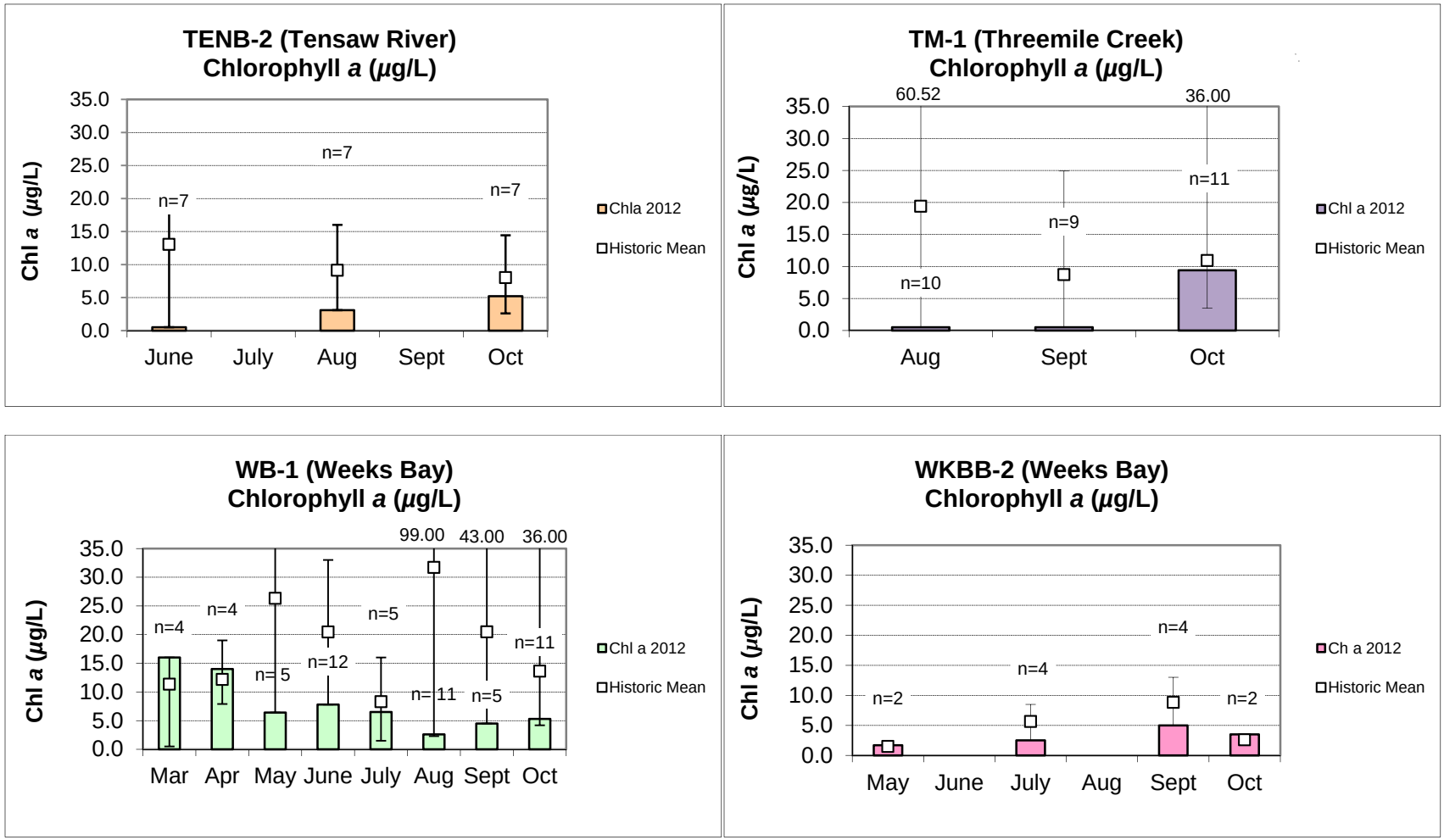


Figure 9. Monthly, bi-monthly, and quarterly TSS concentrations measured in the Mobile Bay watershed, March-November 2012. The historic mean (1990-2012) and min/max ranges are also displayed for comparison. The "n" value equals the number of data points included in the monthly historic calculations. Absence of an n value denotes one data point with no historic mean.

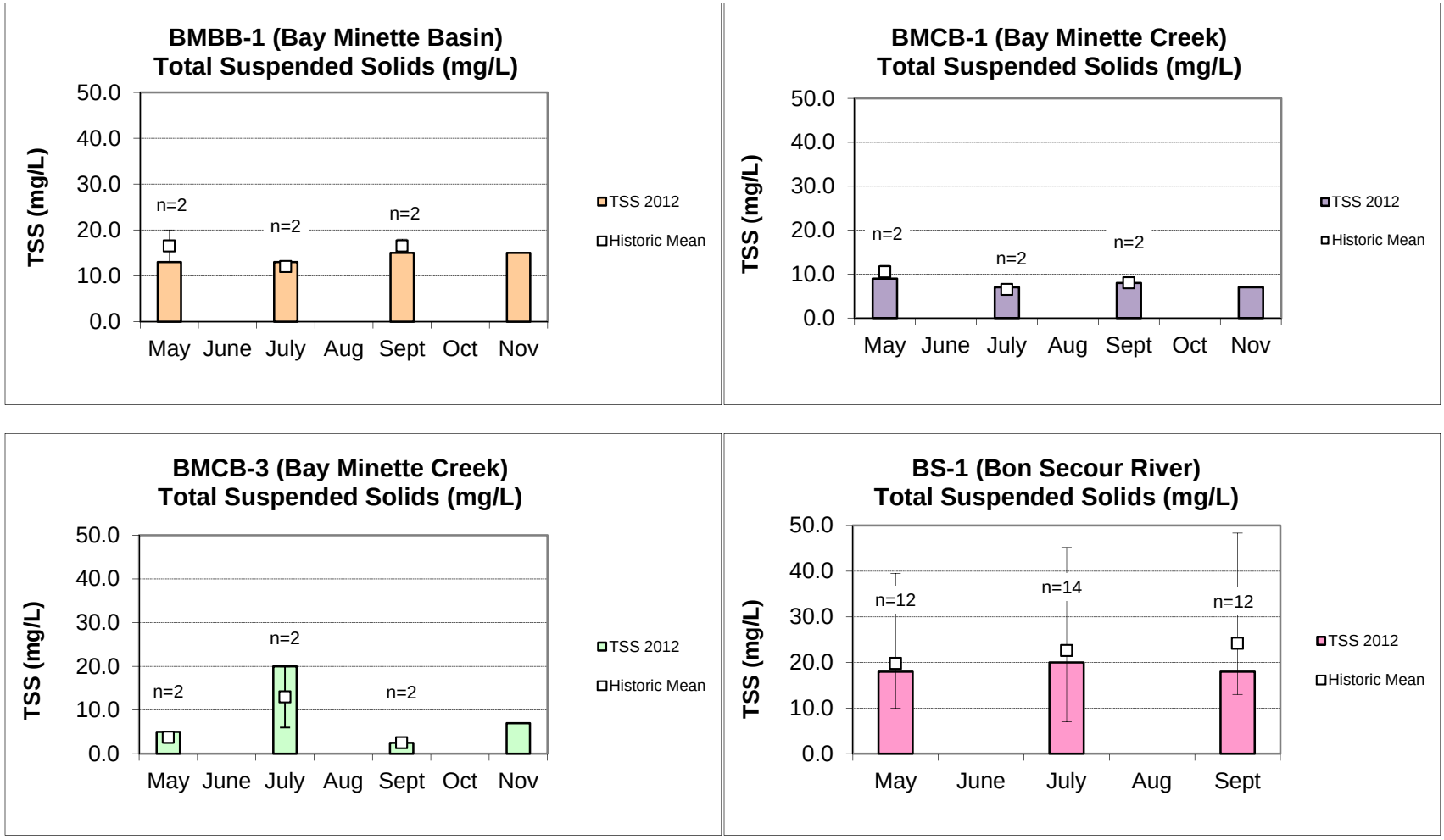


Figure 9. (continued)

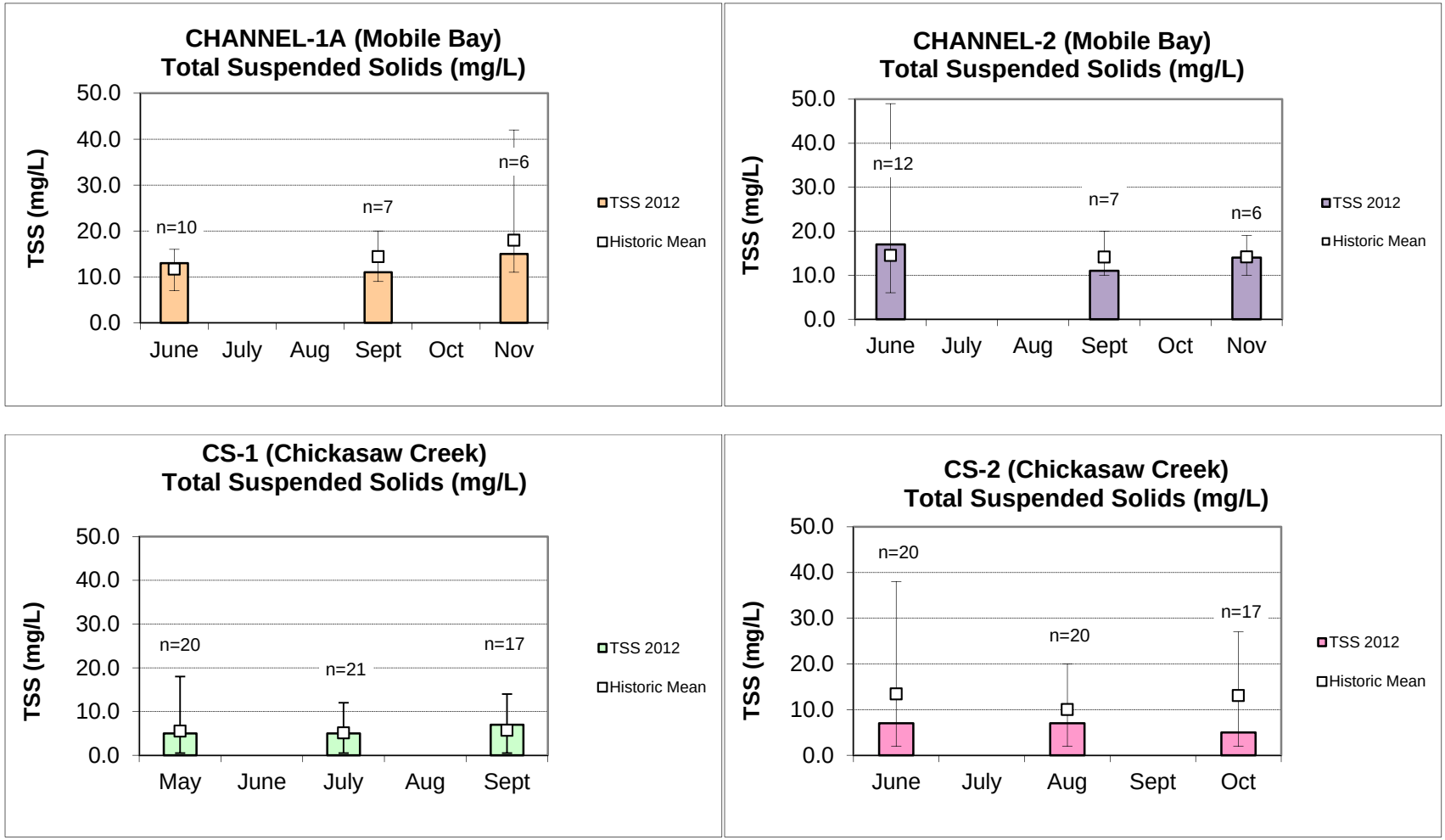


Figure 9. (continued)

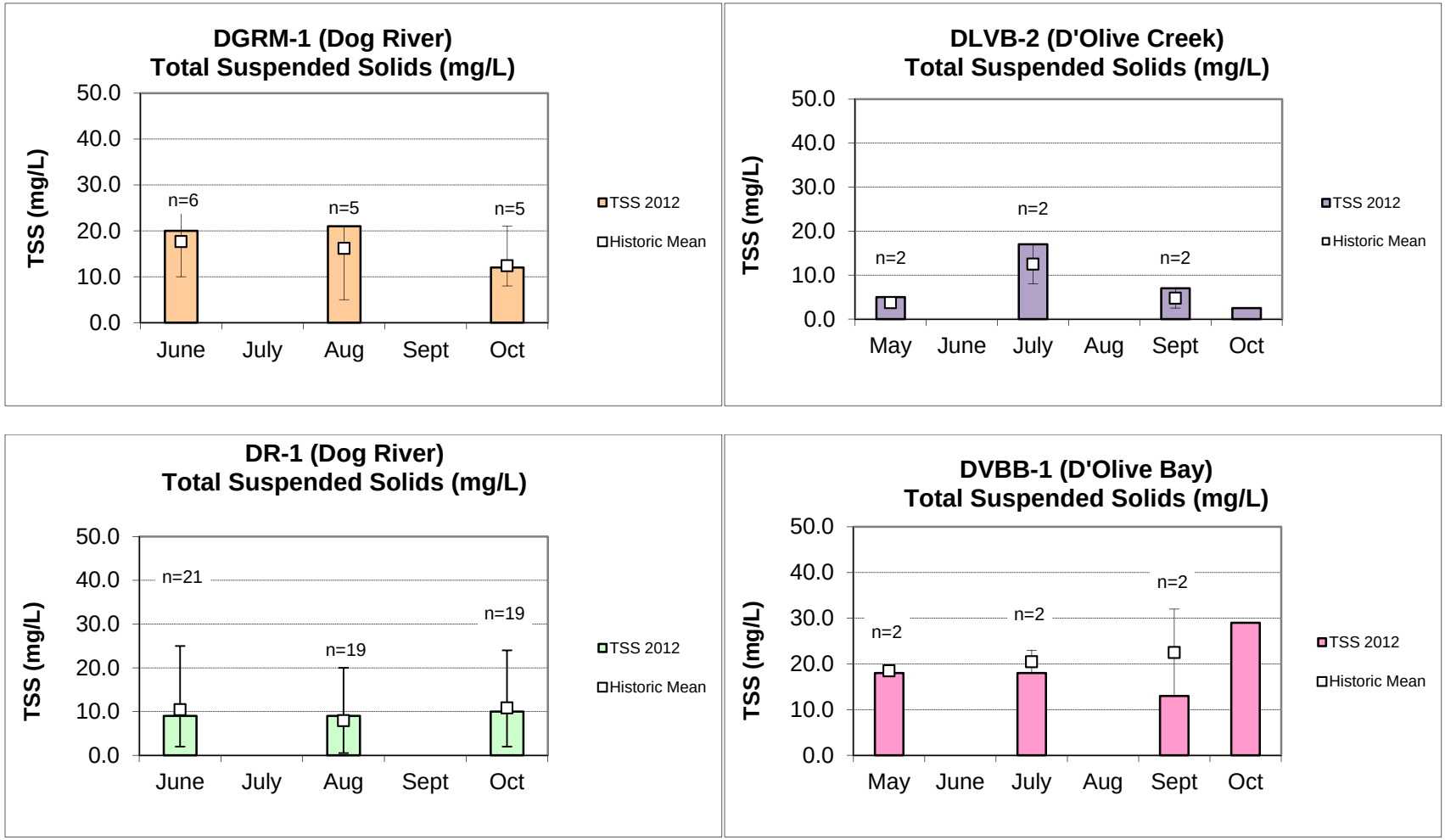


Figure 9. (continued)

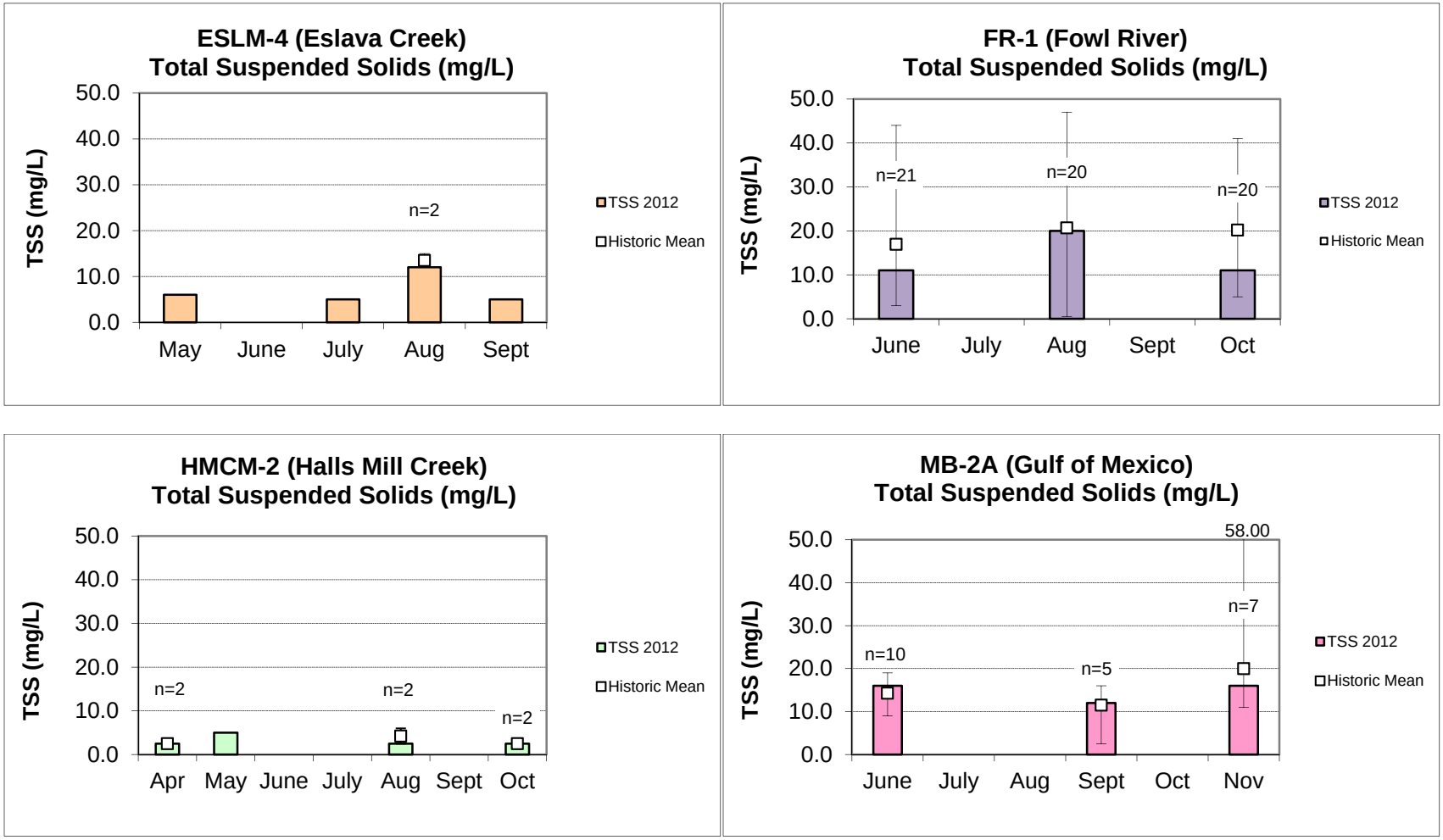


Figure 9. (continued)

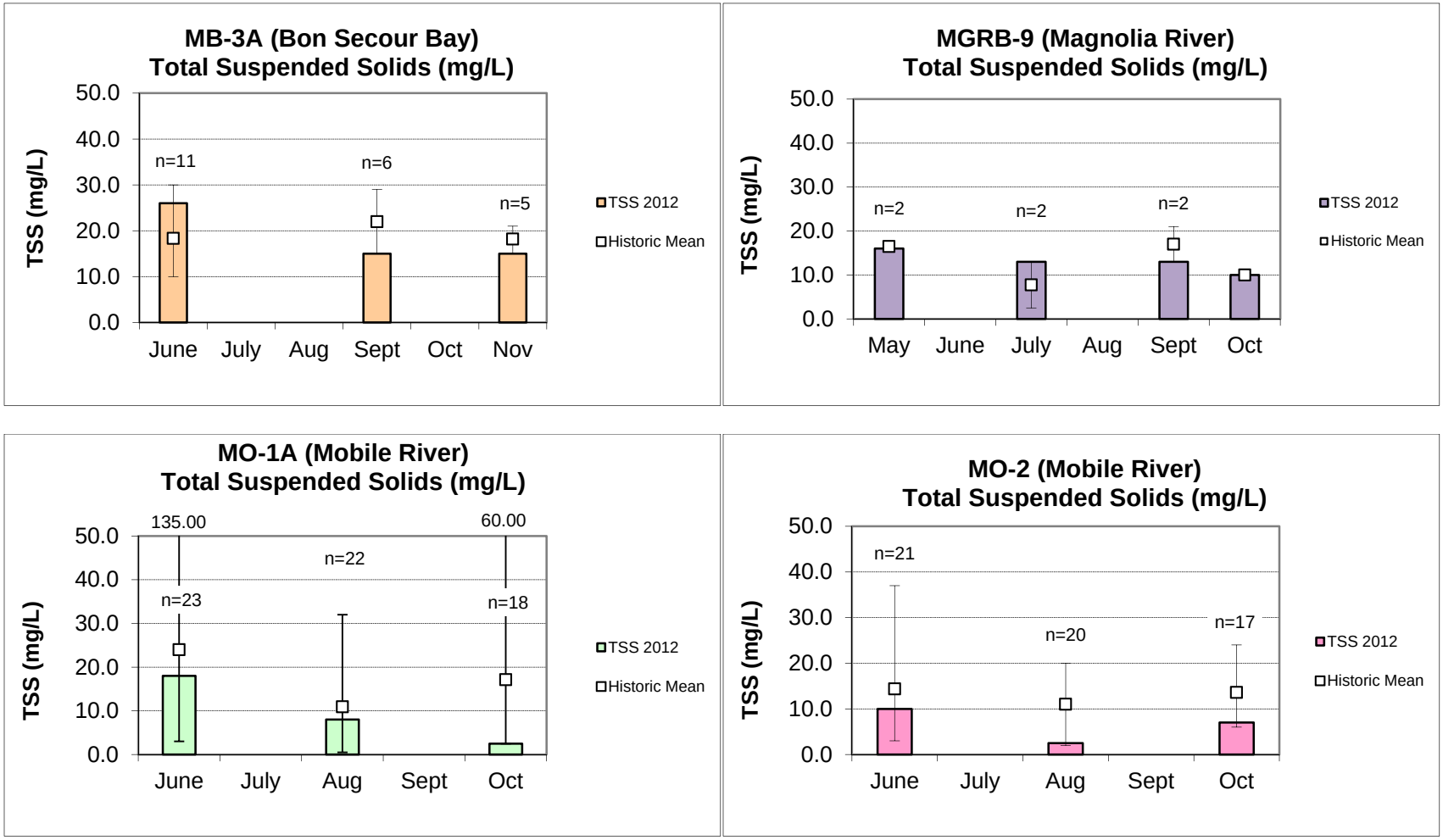


Figure 9. (continued)

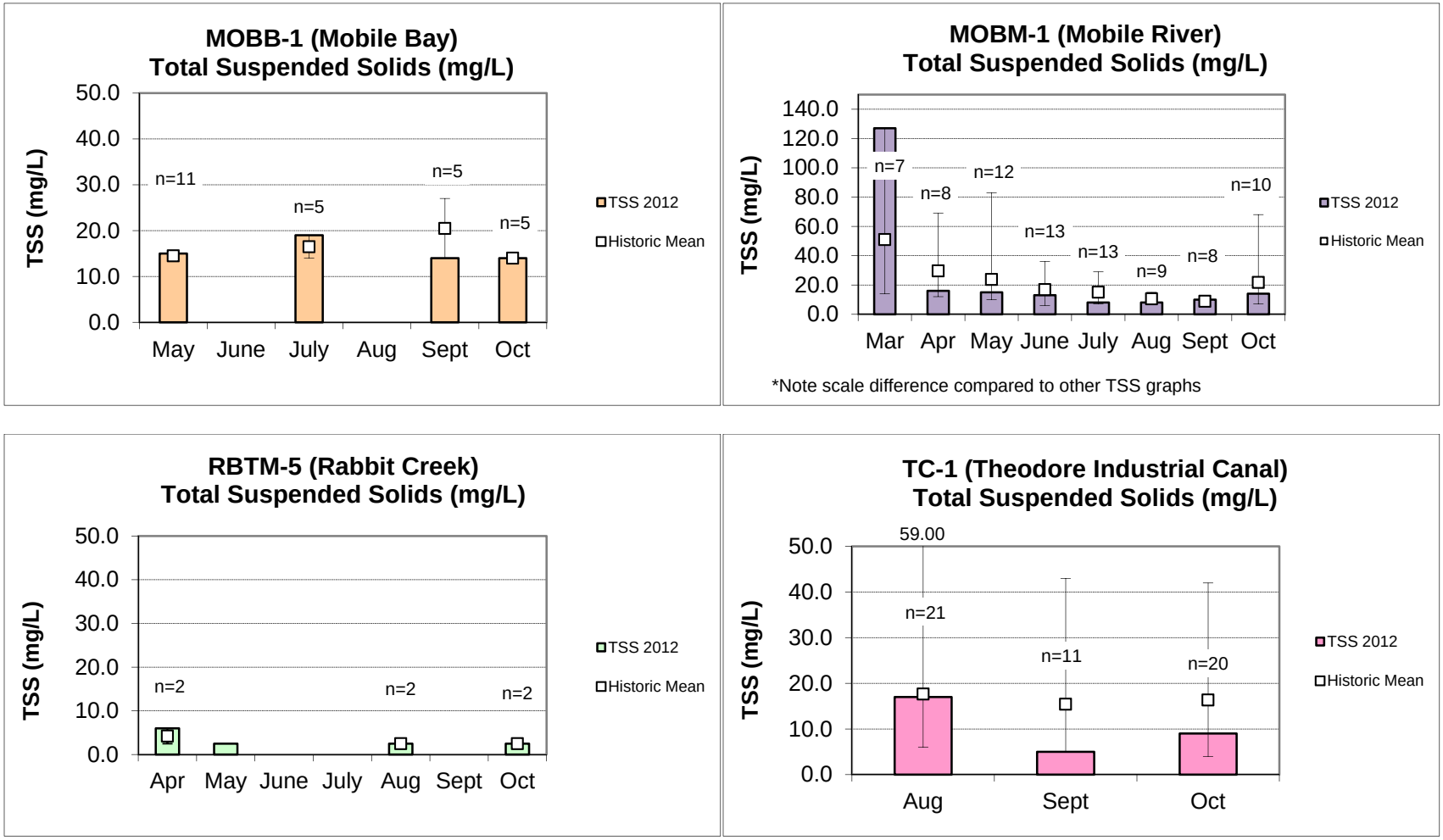


Figure 9. (continued)

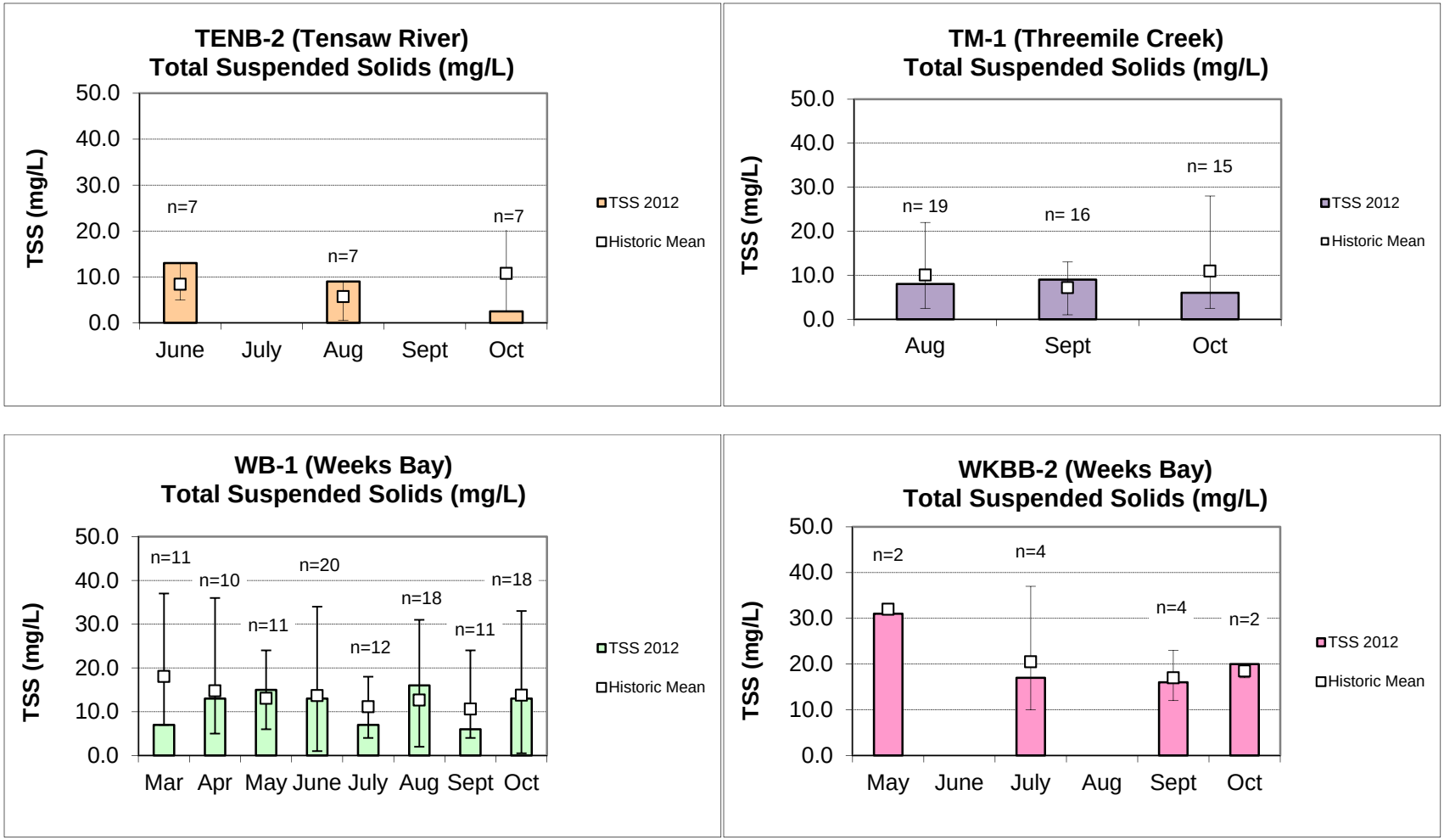
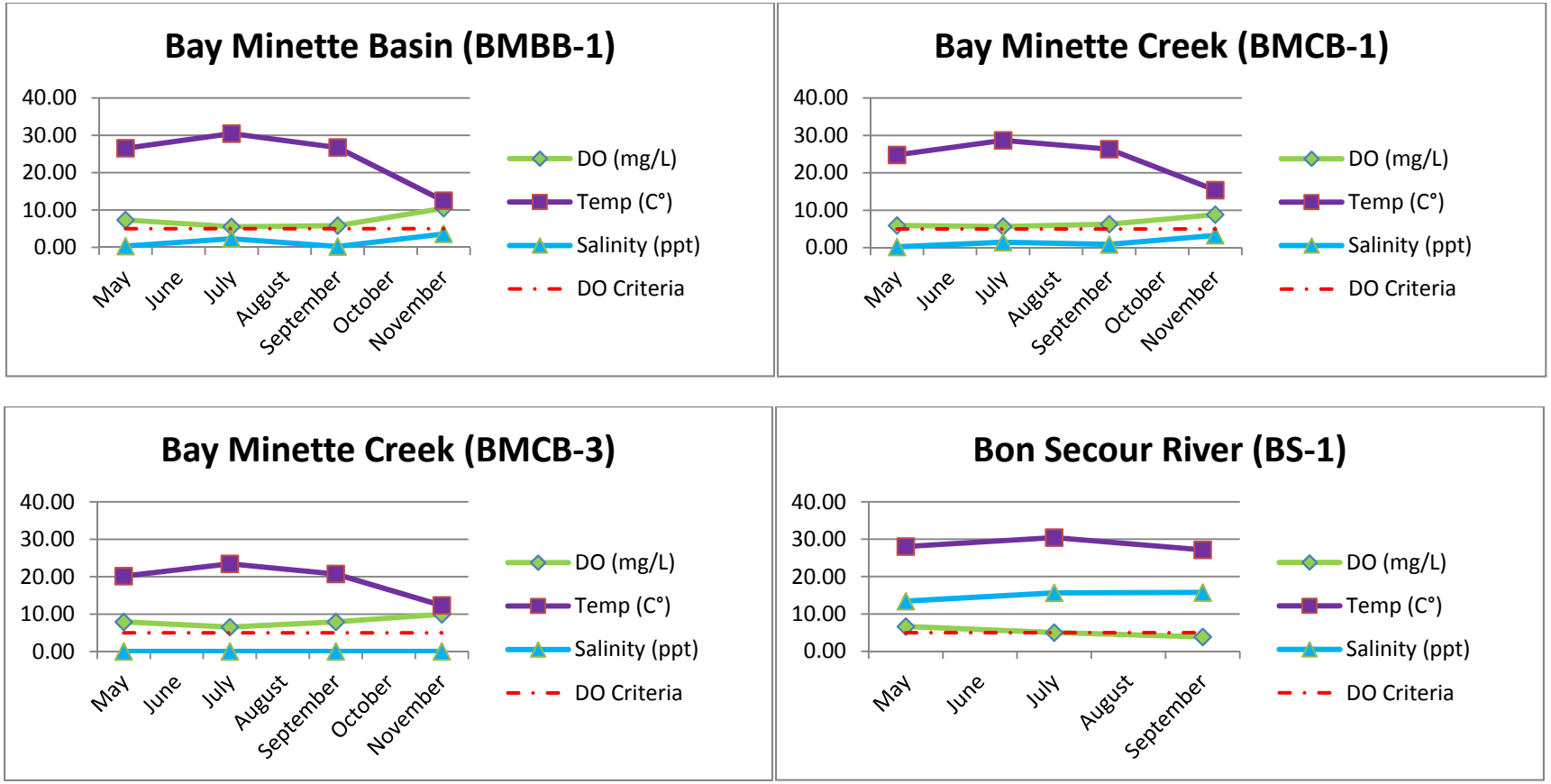


Figure 10. Monthly, bi-monthly, or quarterly DO, temperature, and salinity concentrations at 1.5 m (5 ft) or mid-depth for Mobile Bay watershed stations collected 2012. ADEM Water Quality Criteria requires a DO concentration of 5.0 mg/L at this depth (ADEM 2012).



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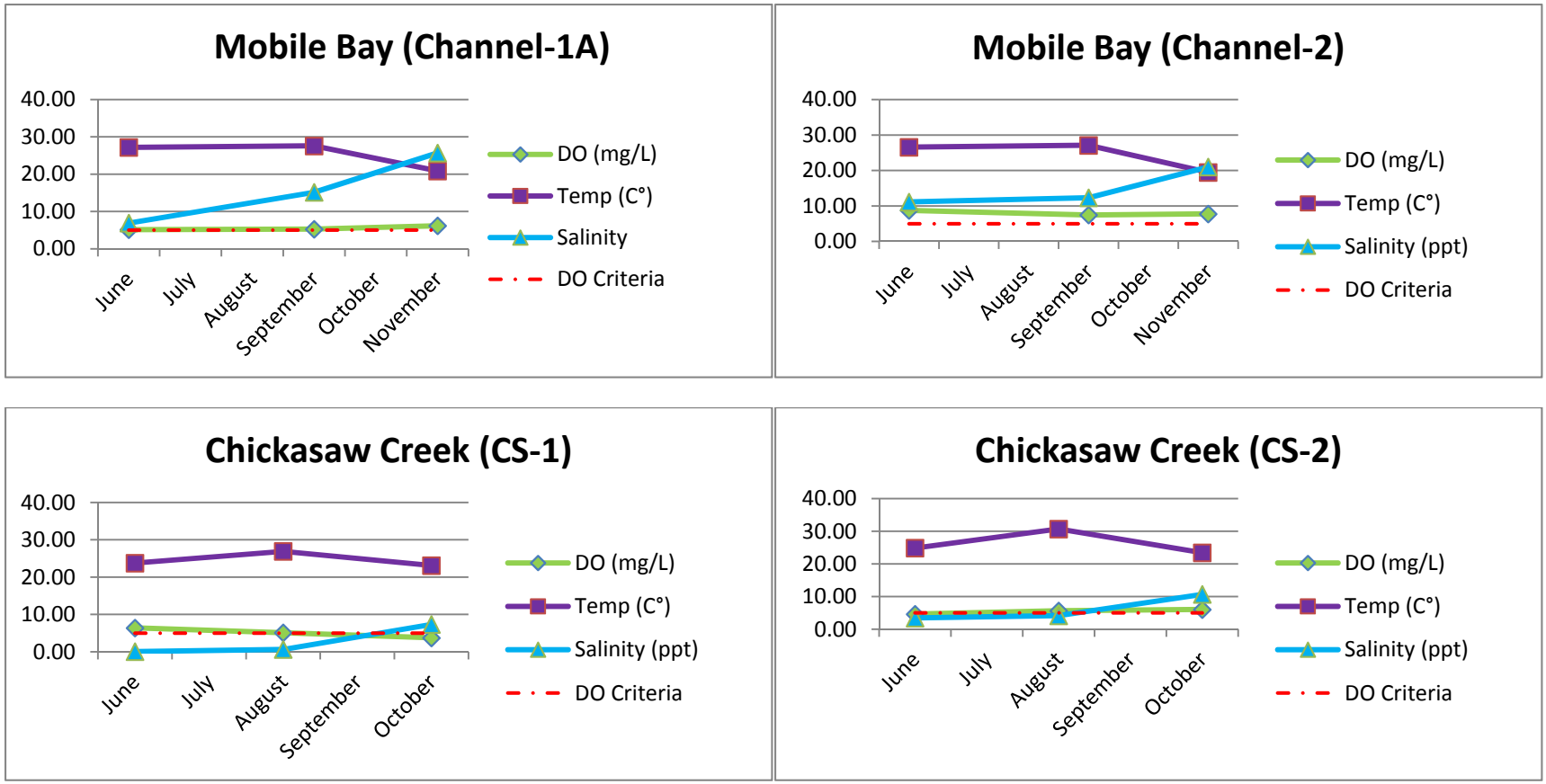

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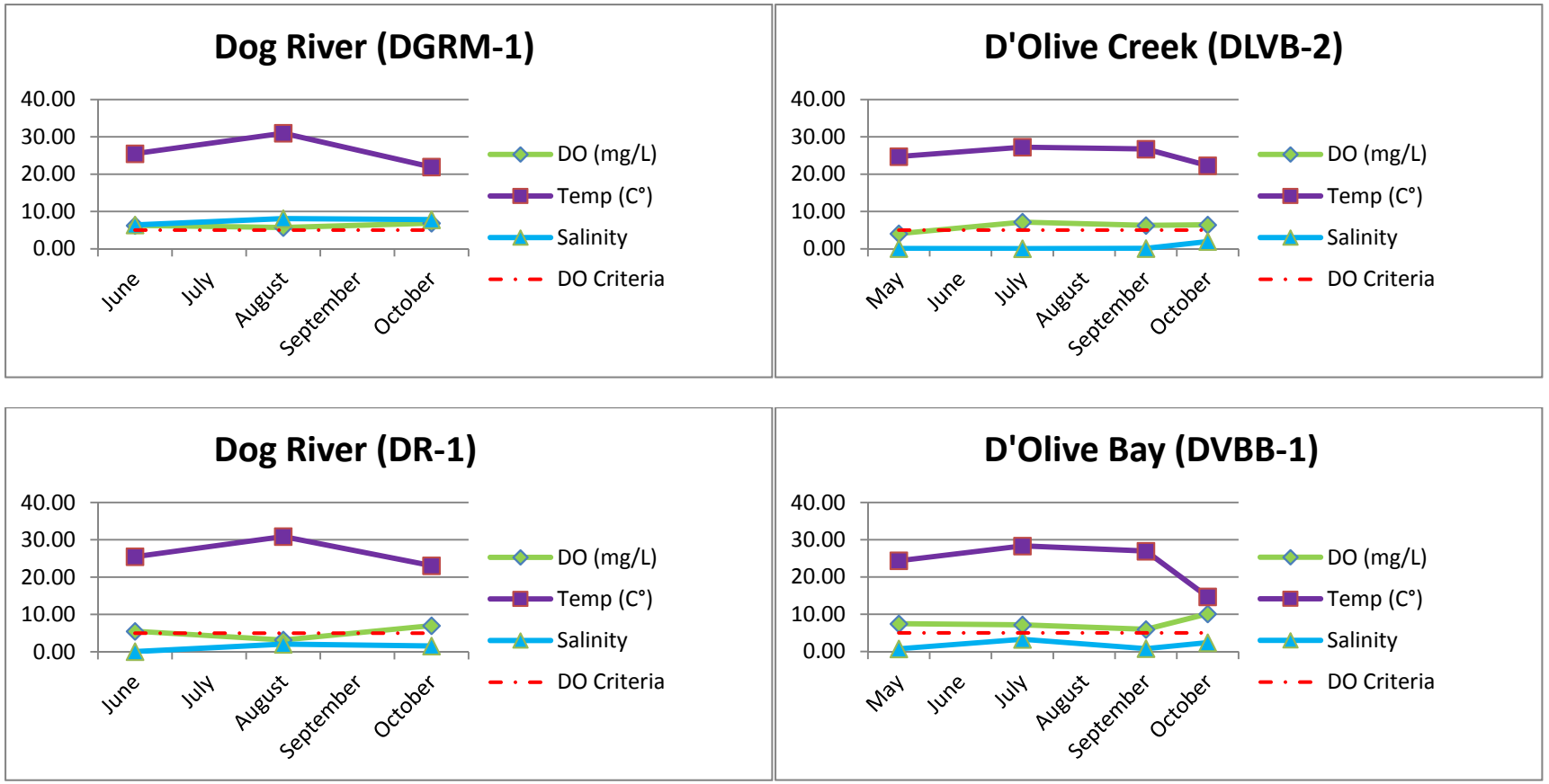

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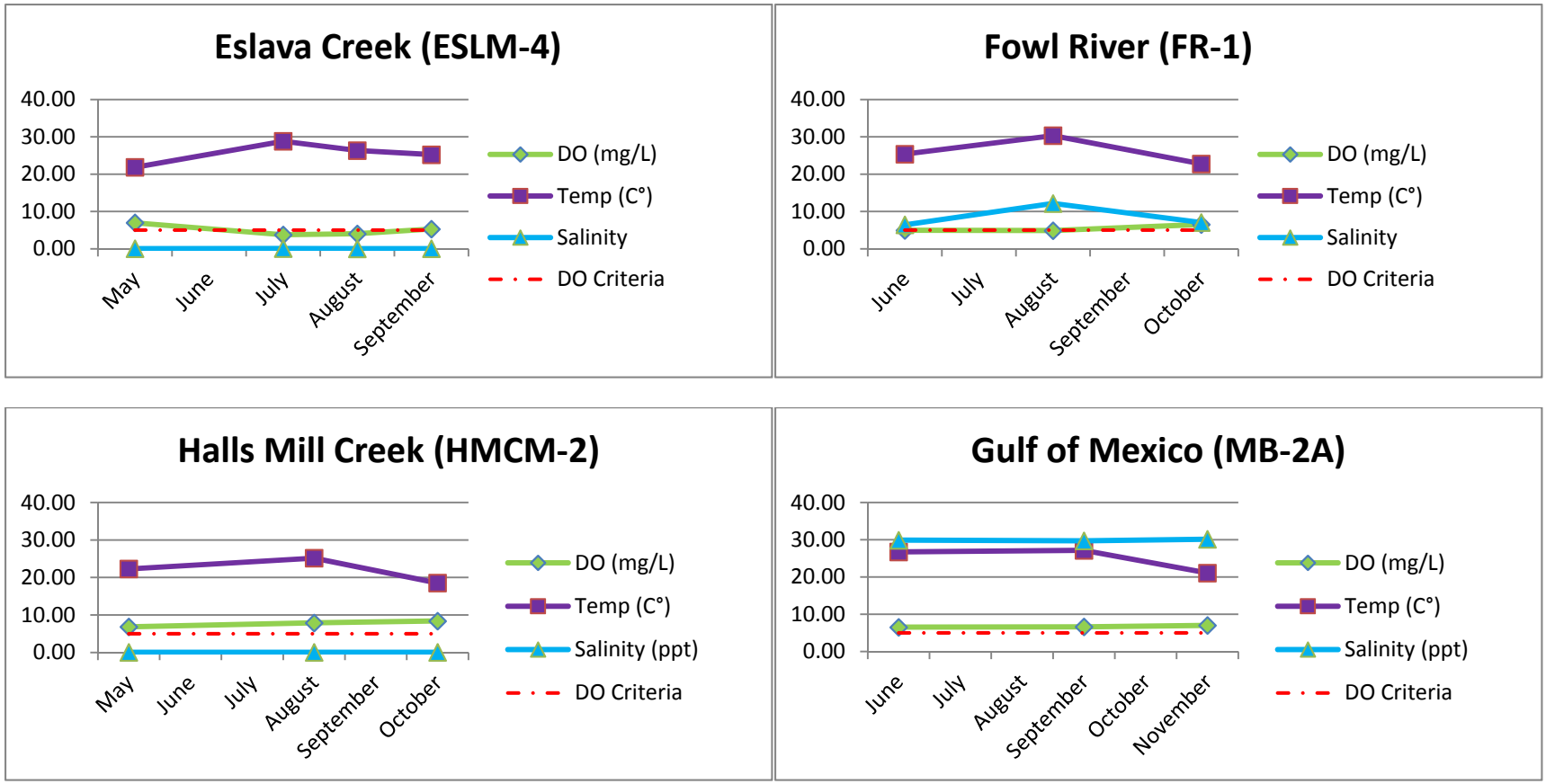

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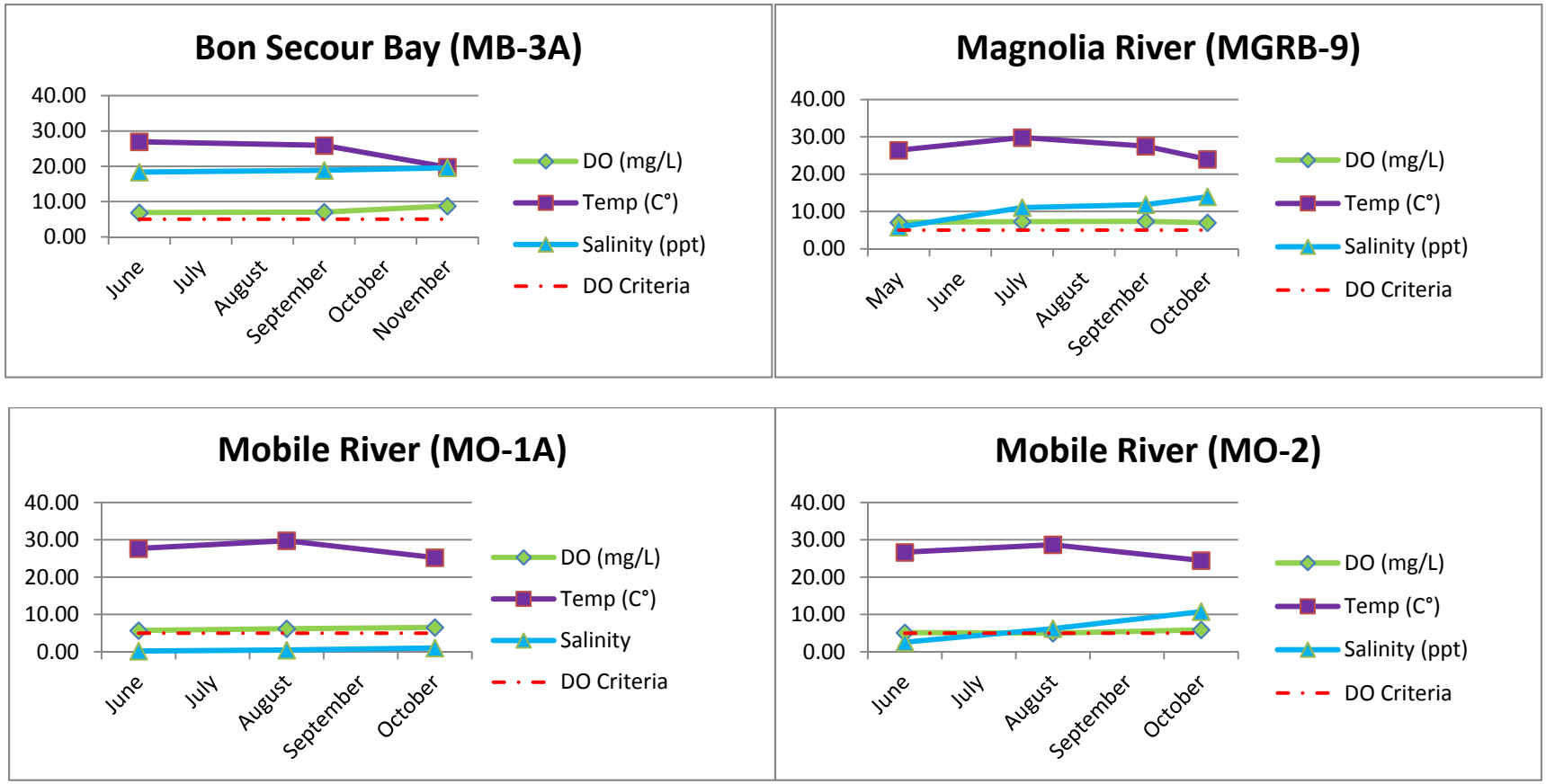

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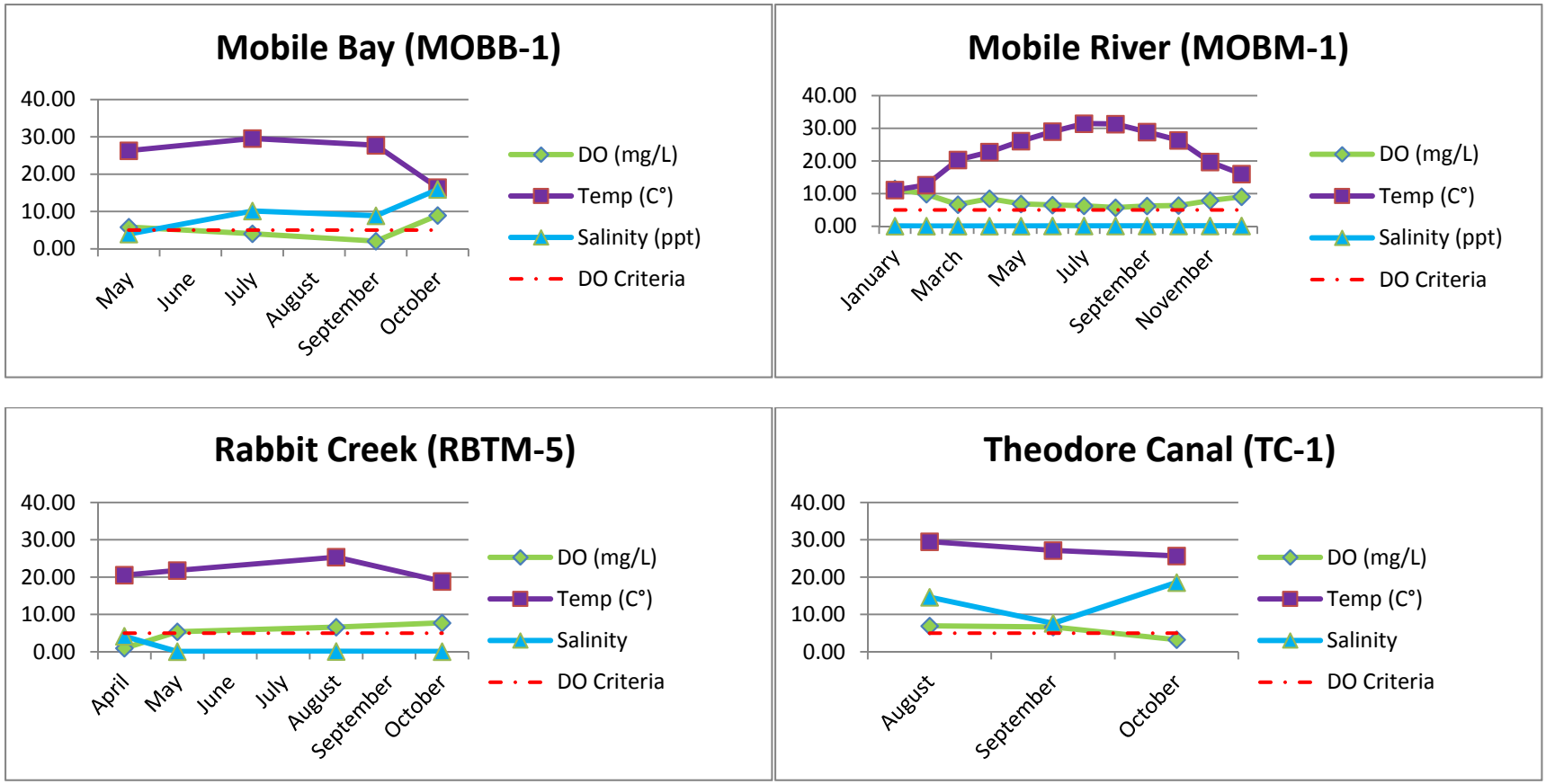

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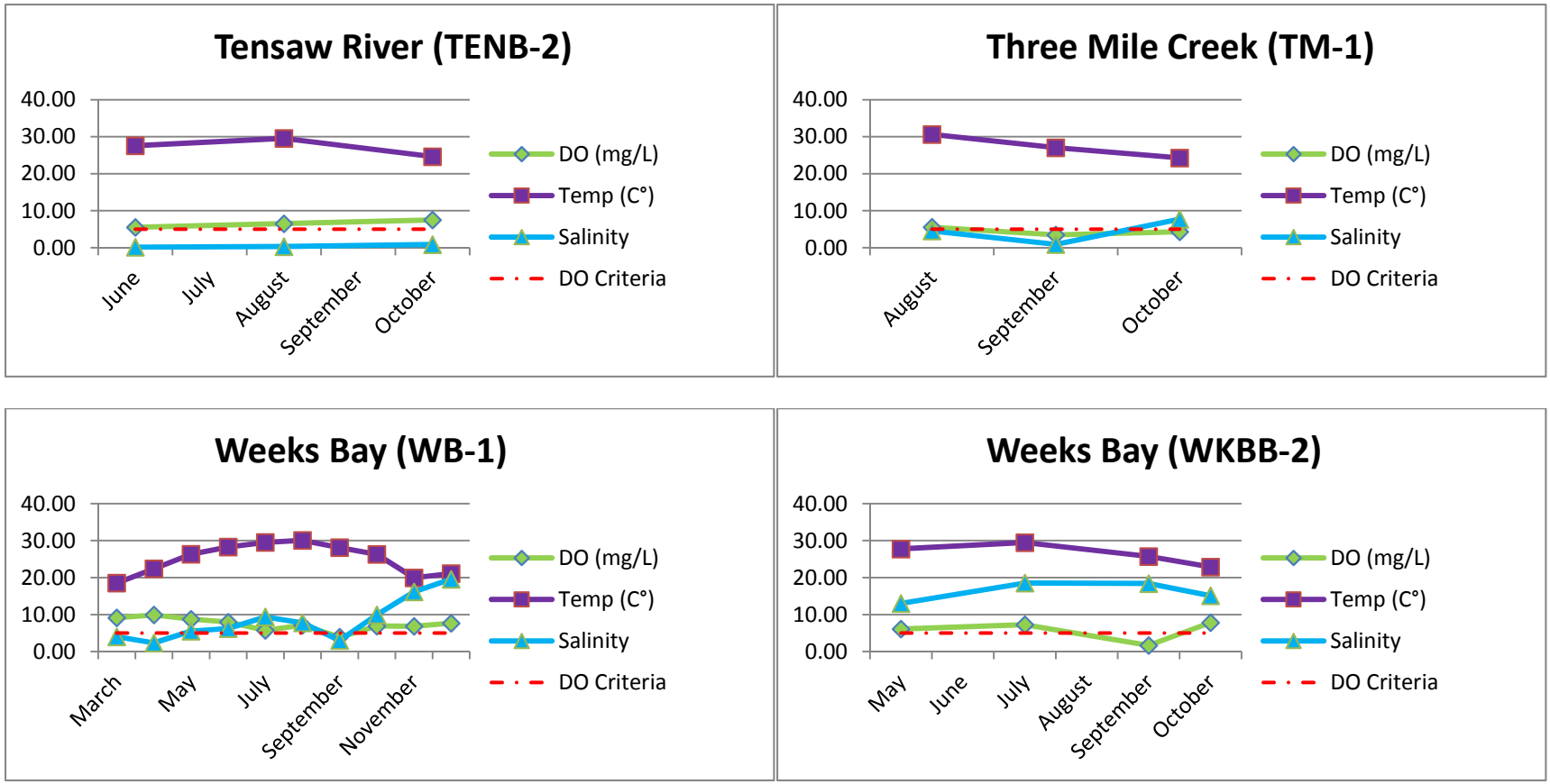
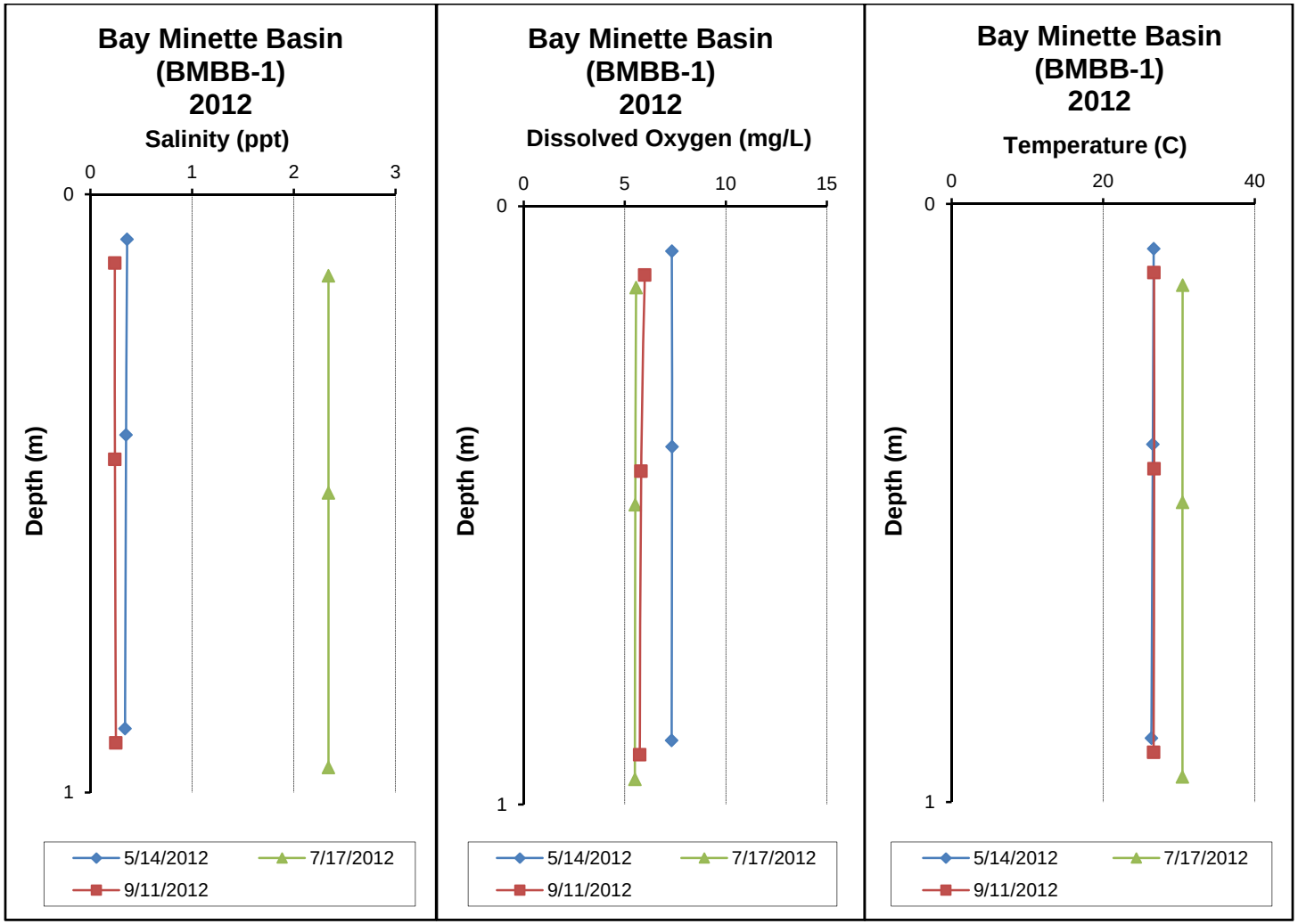


Figure 11. Semi-monthly depth profiles of salinity, dissolved oxygen, and temperature for Mobile Bay watershed, March-November, 2012.



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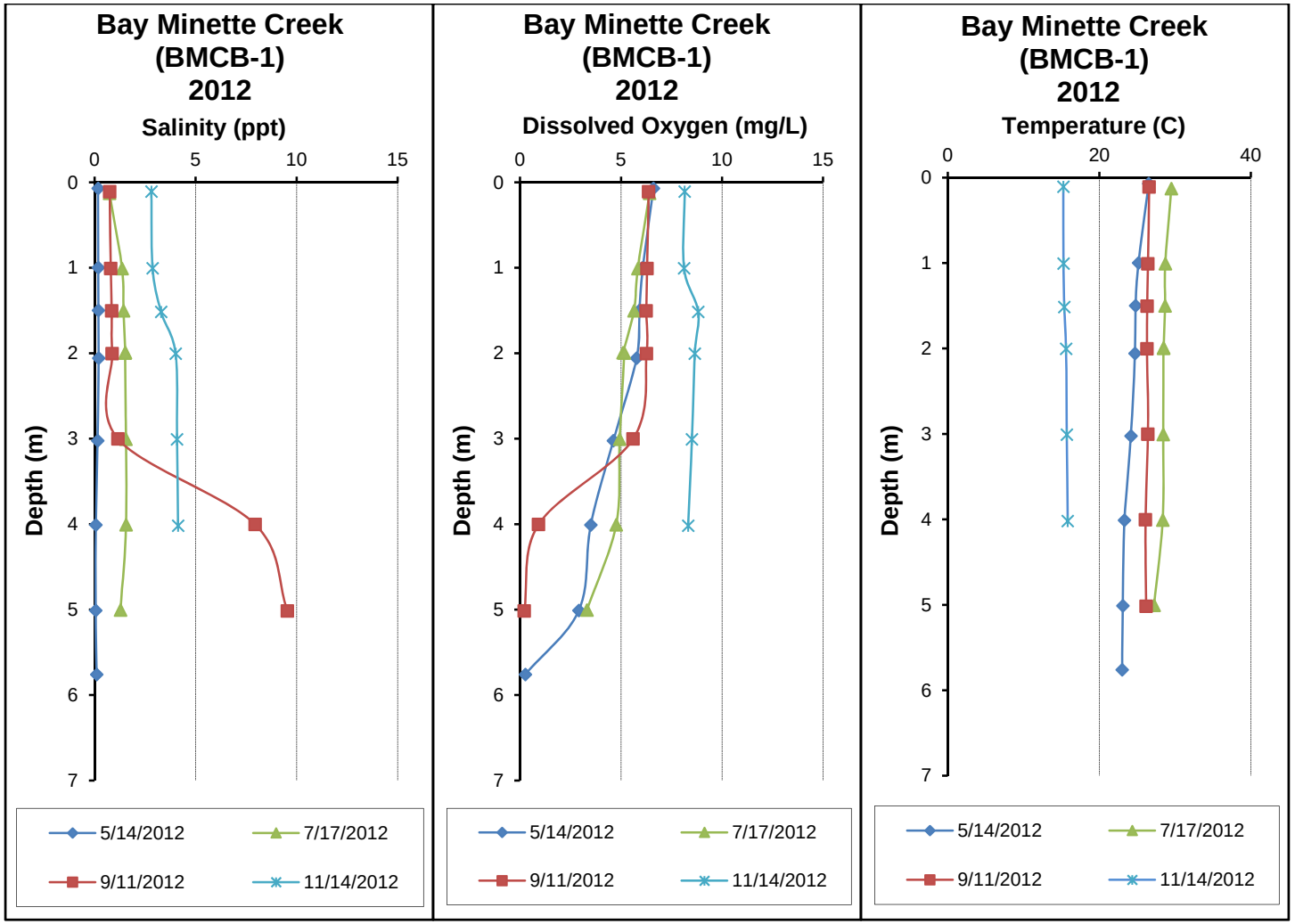

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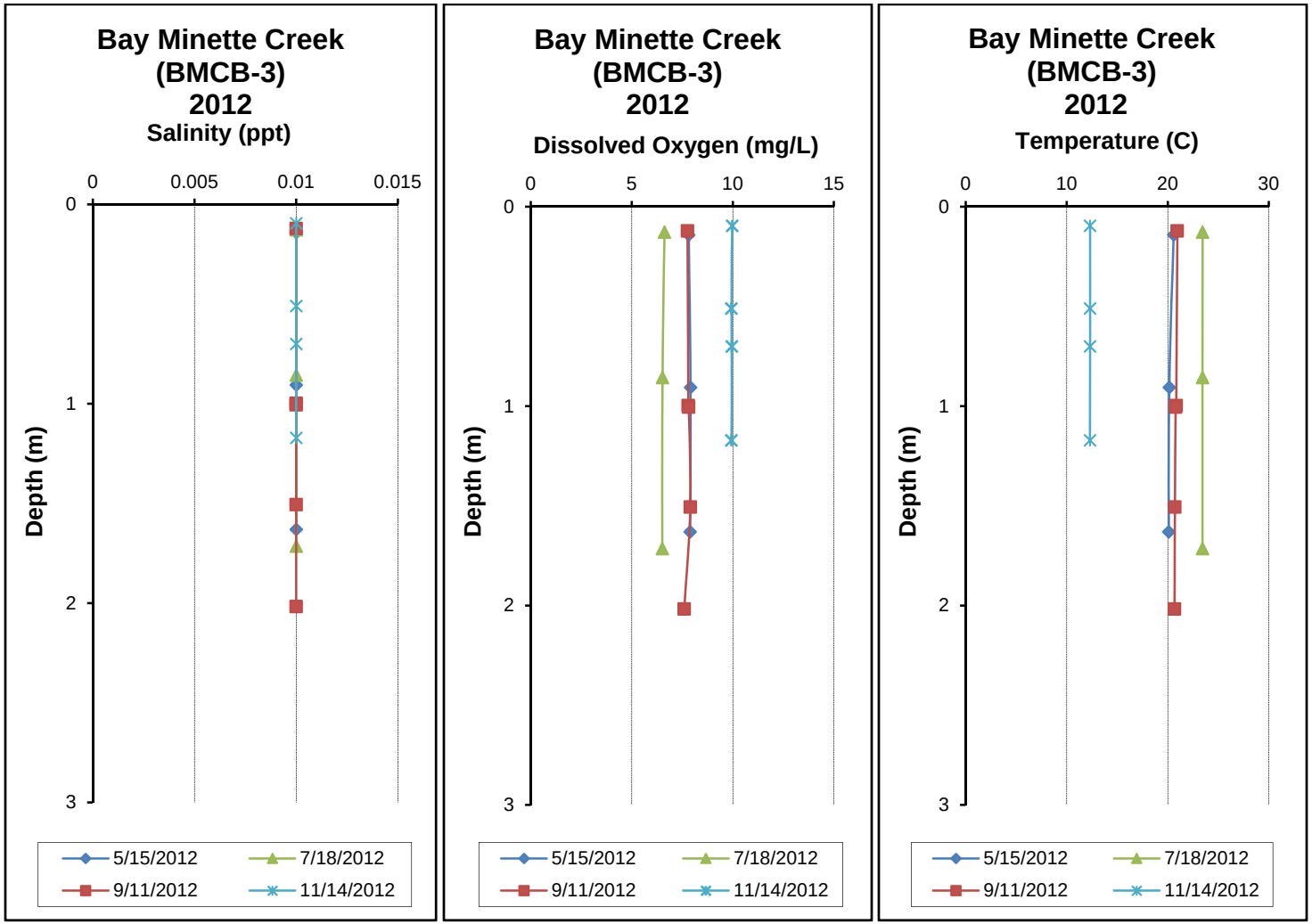

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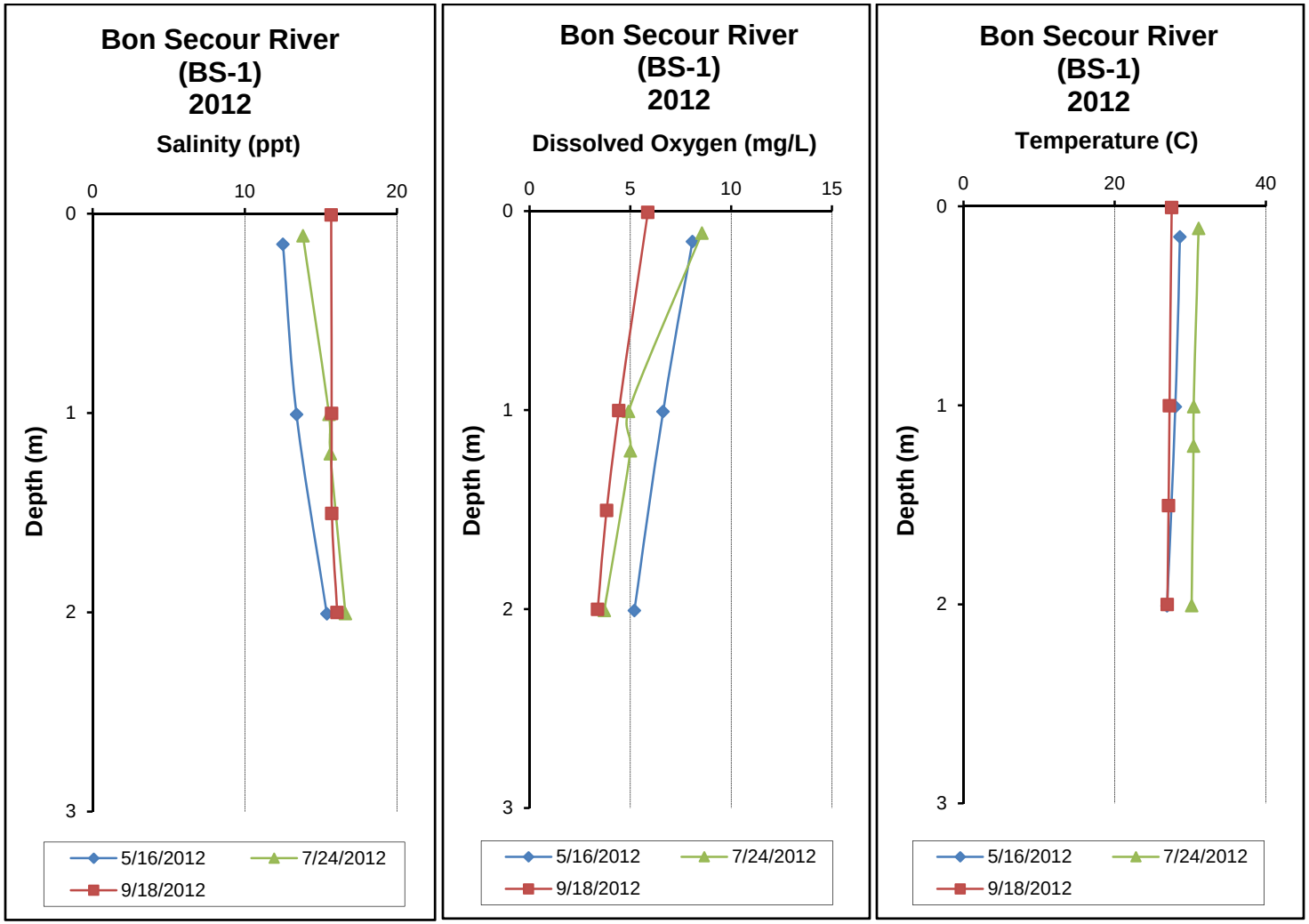

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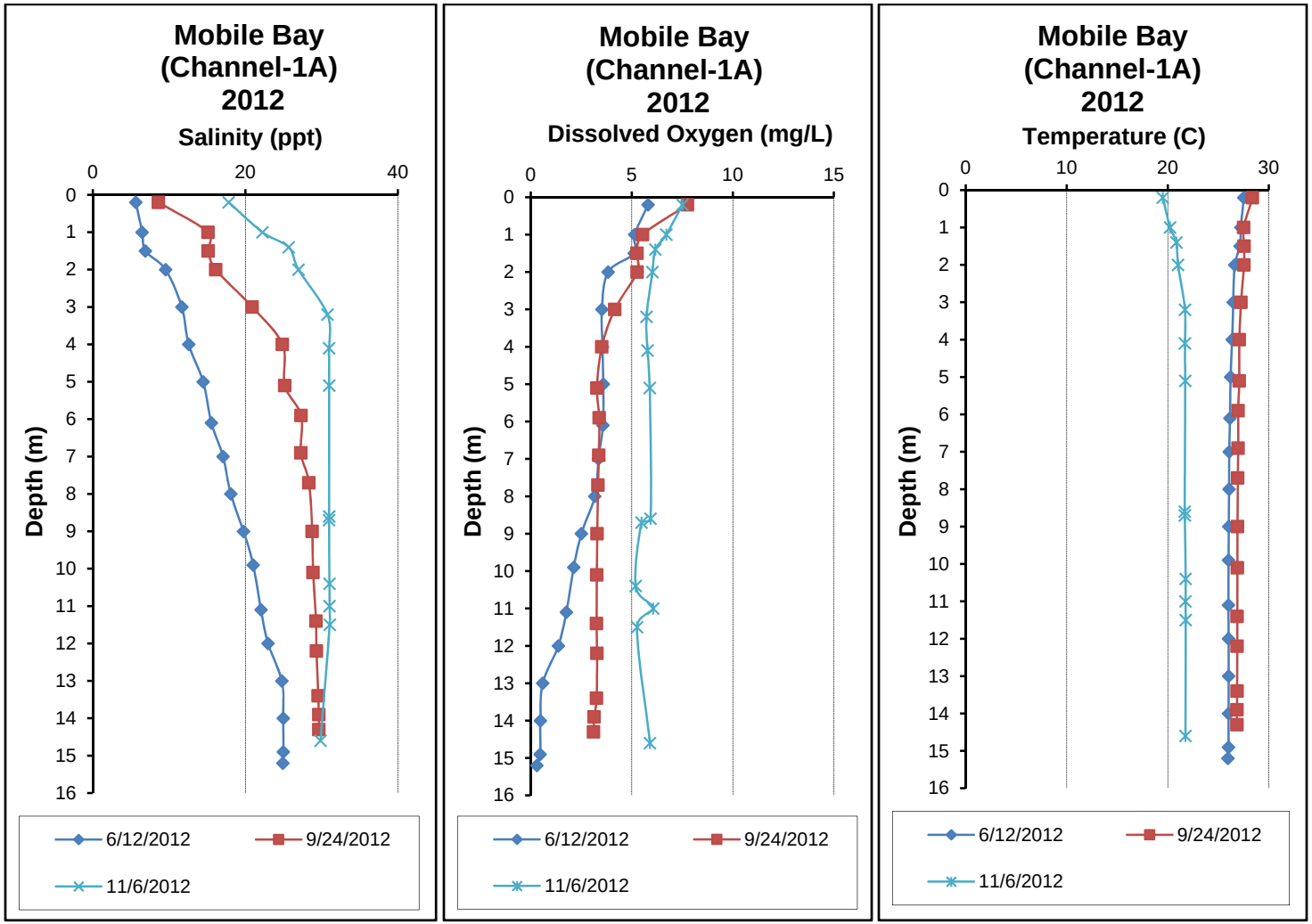

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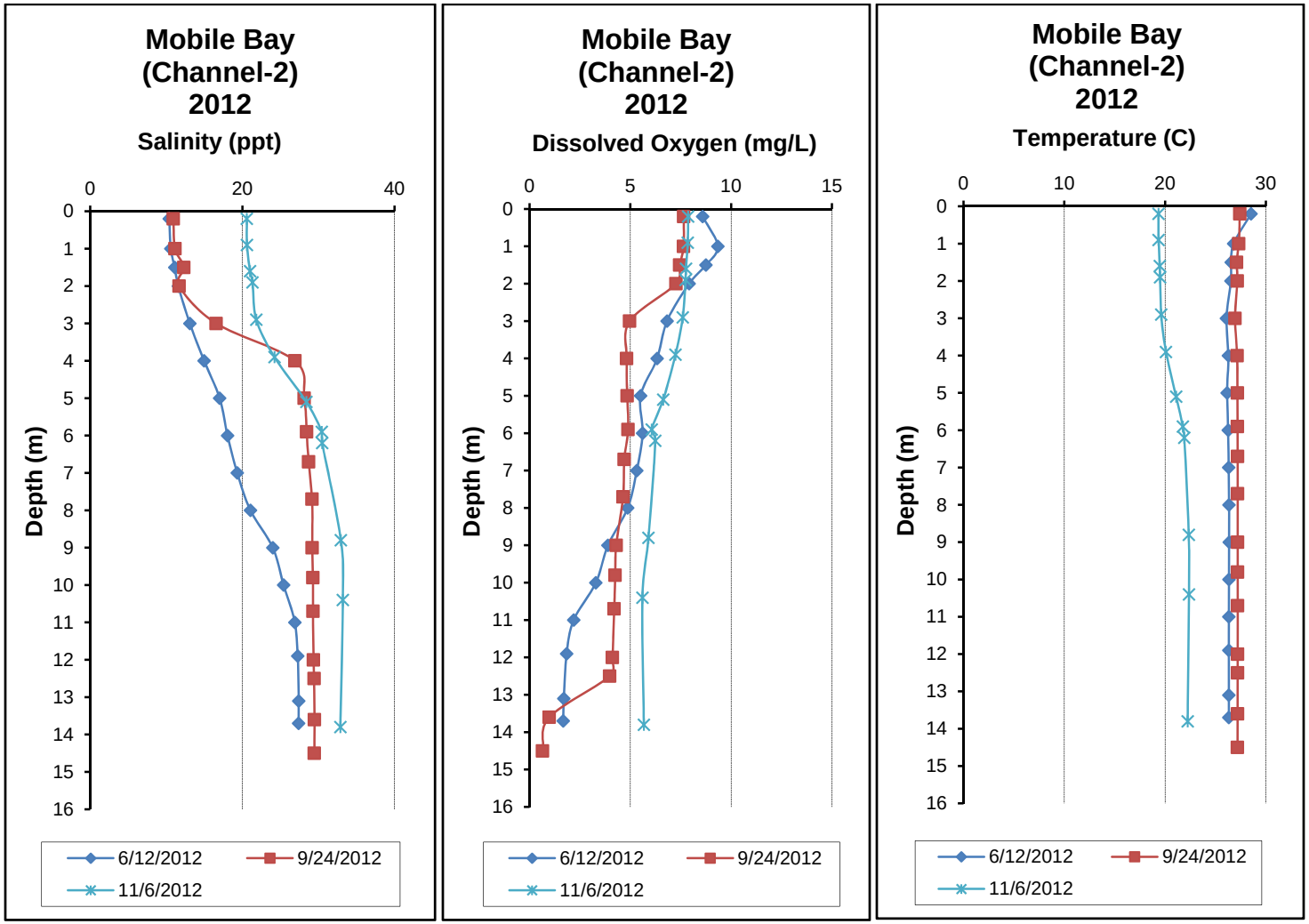

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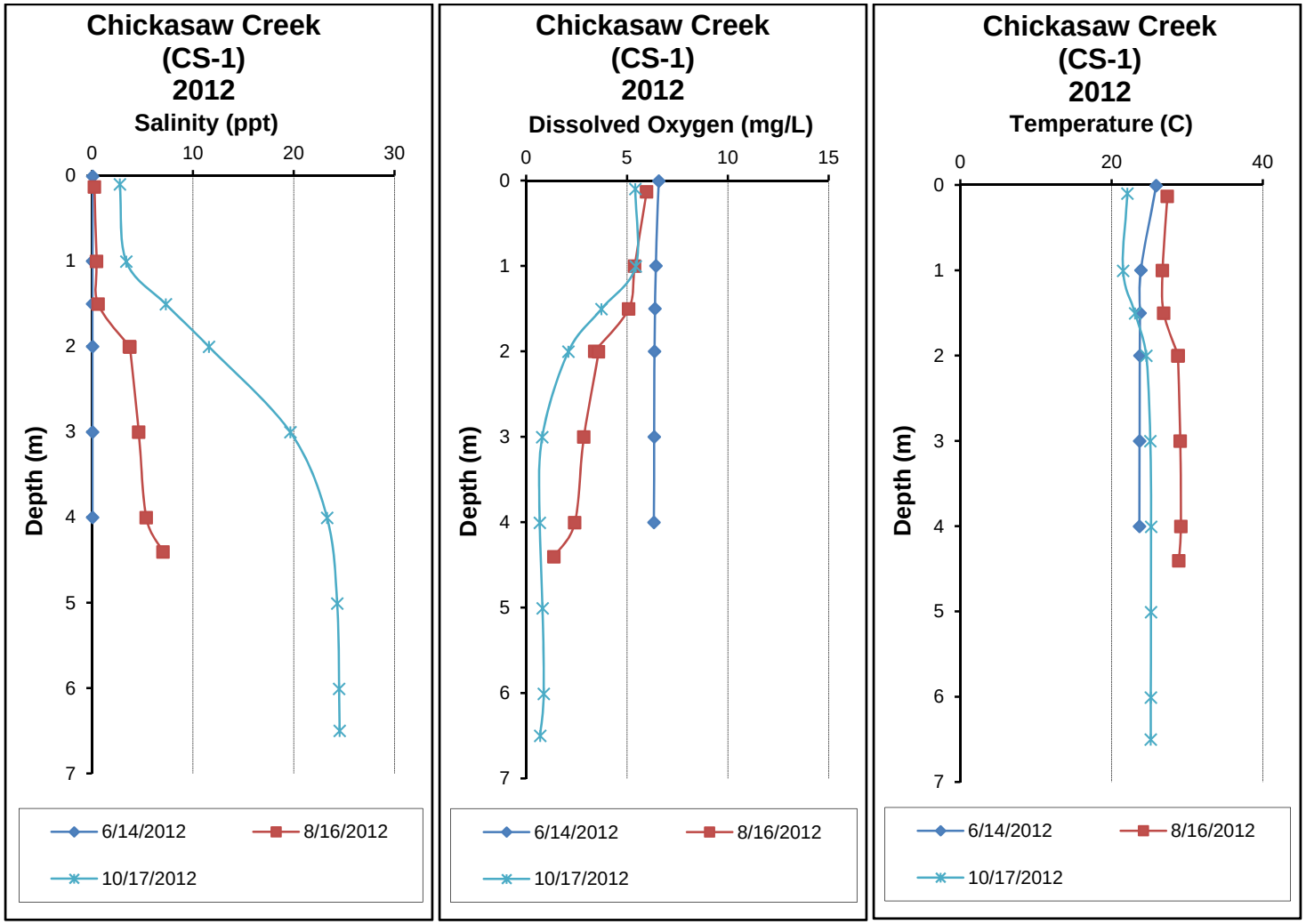

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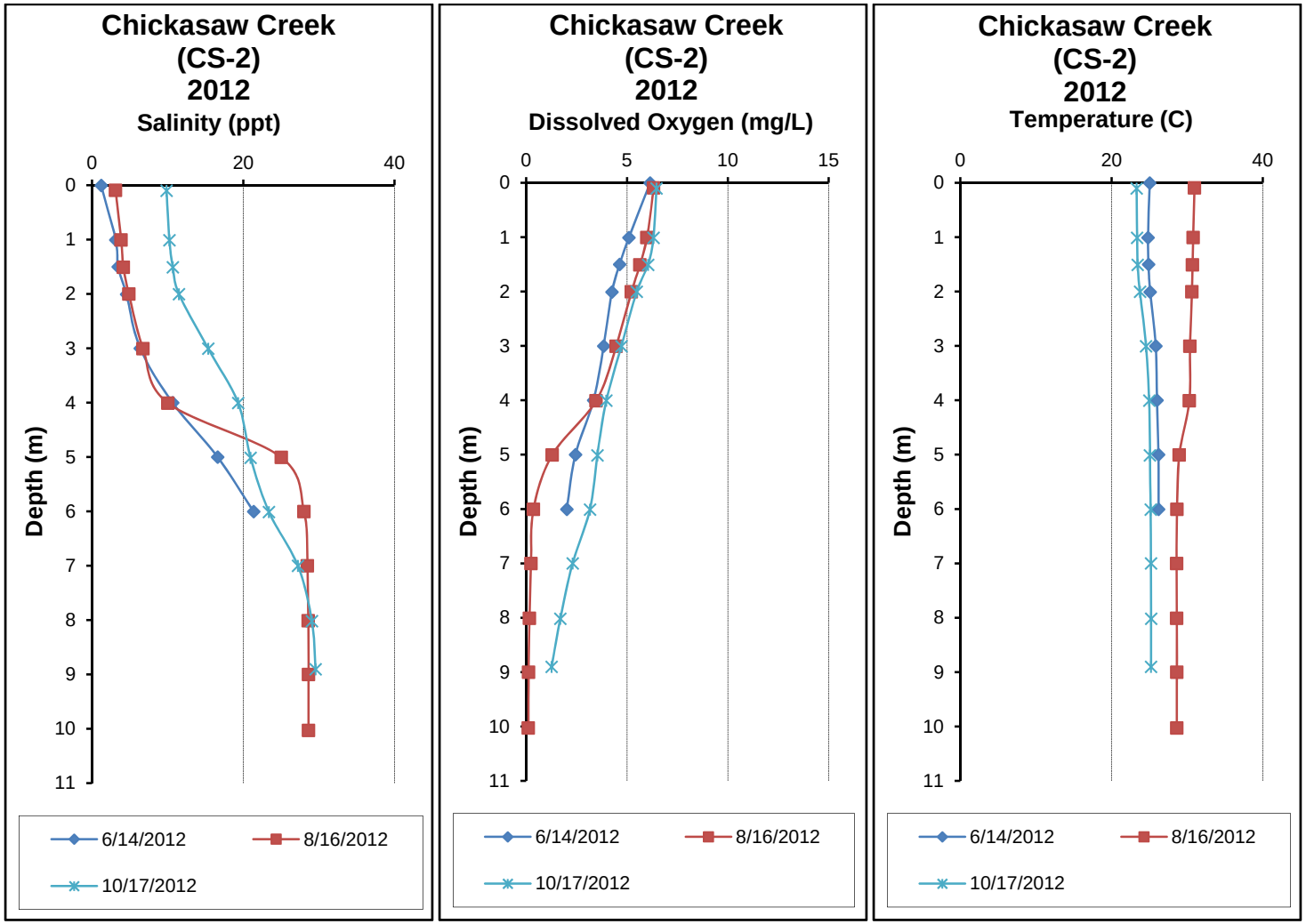

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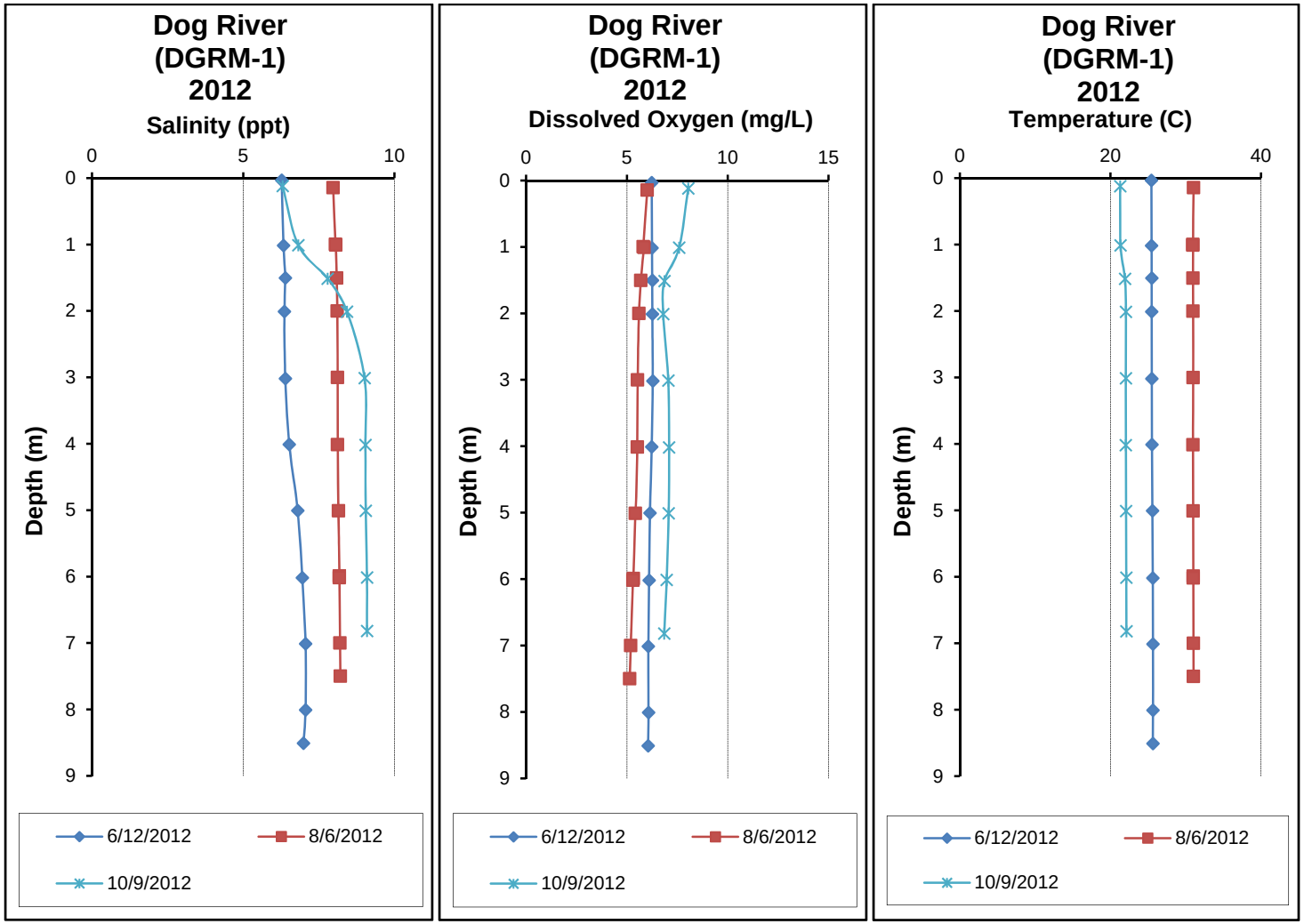

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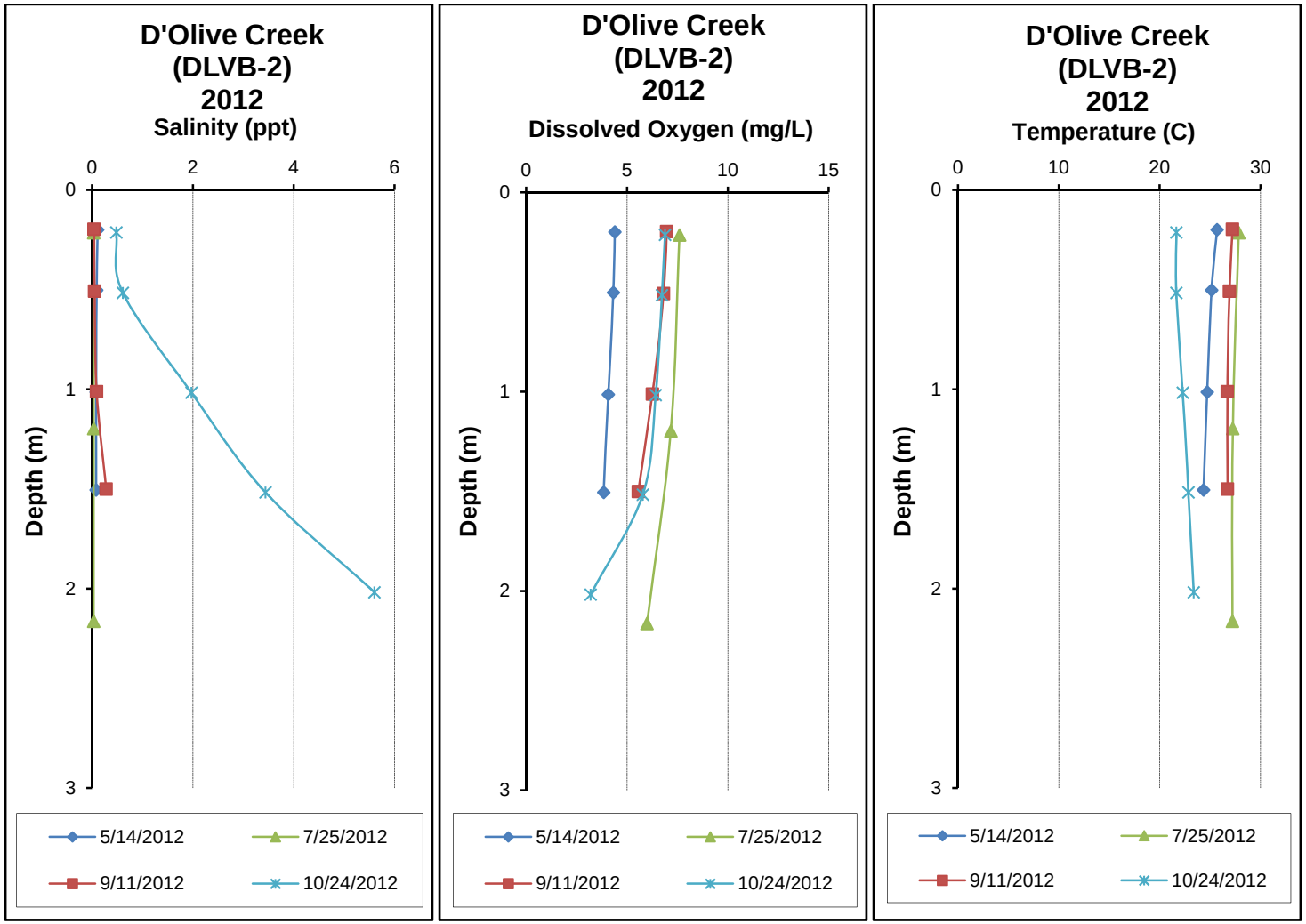

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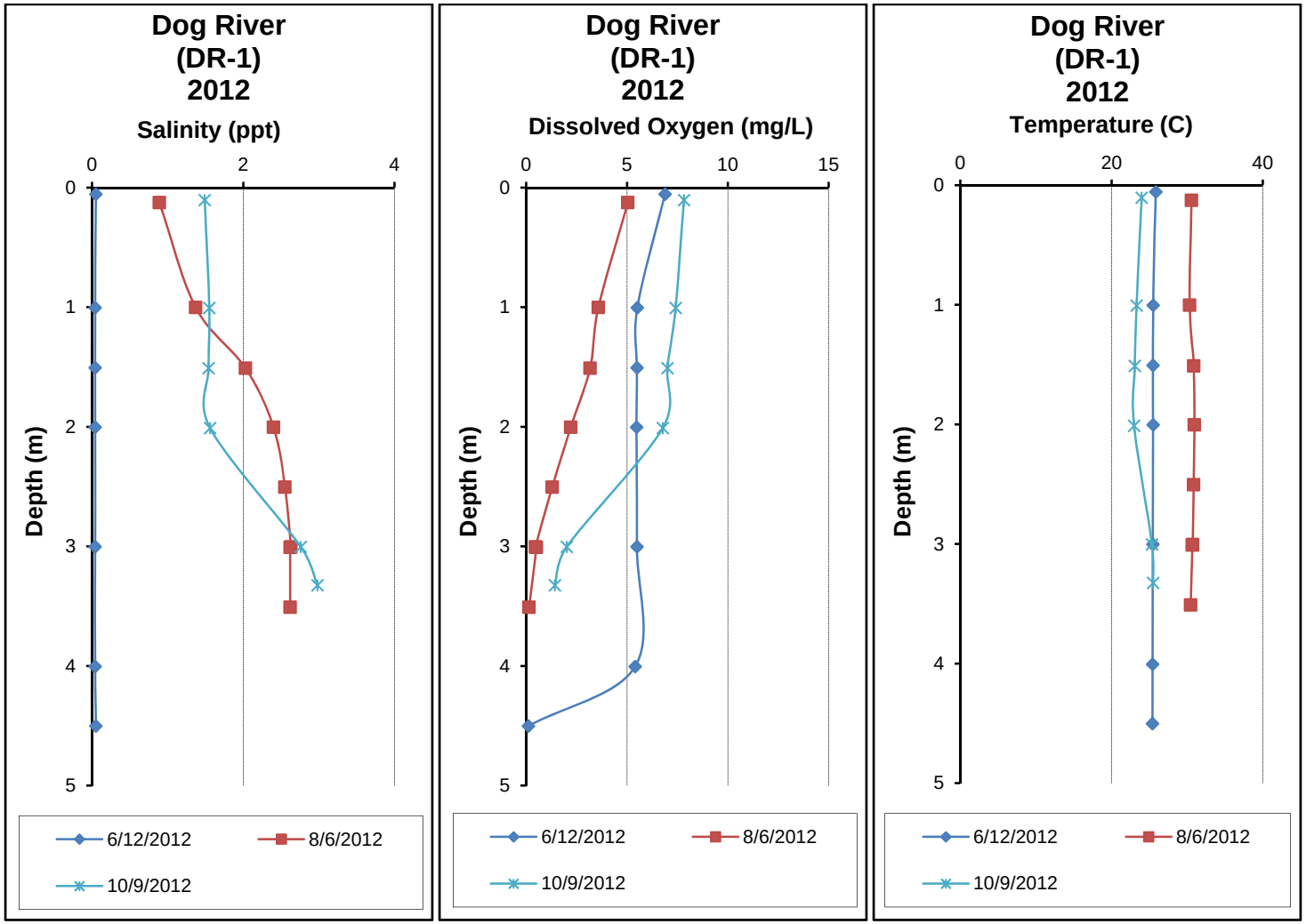

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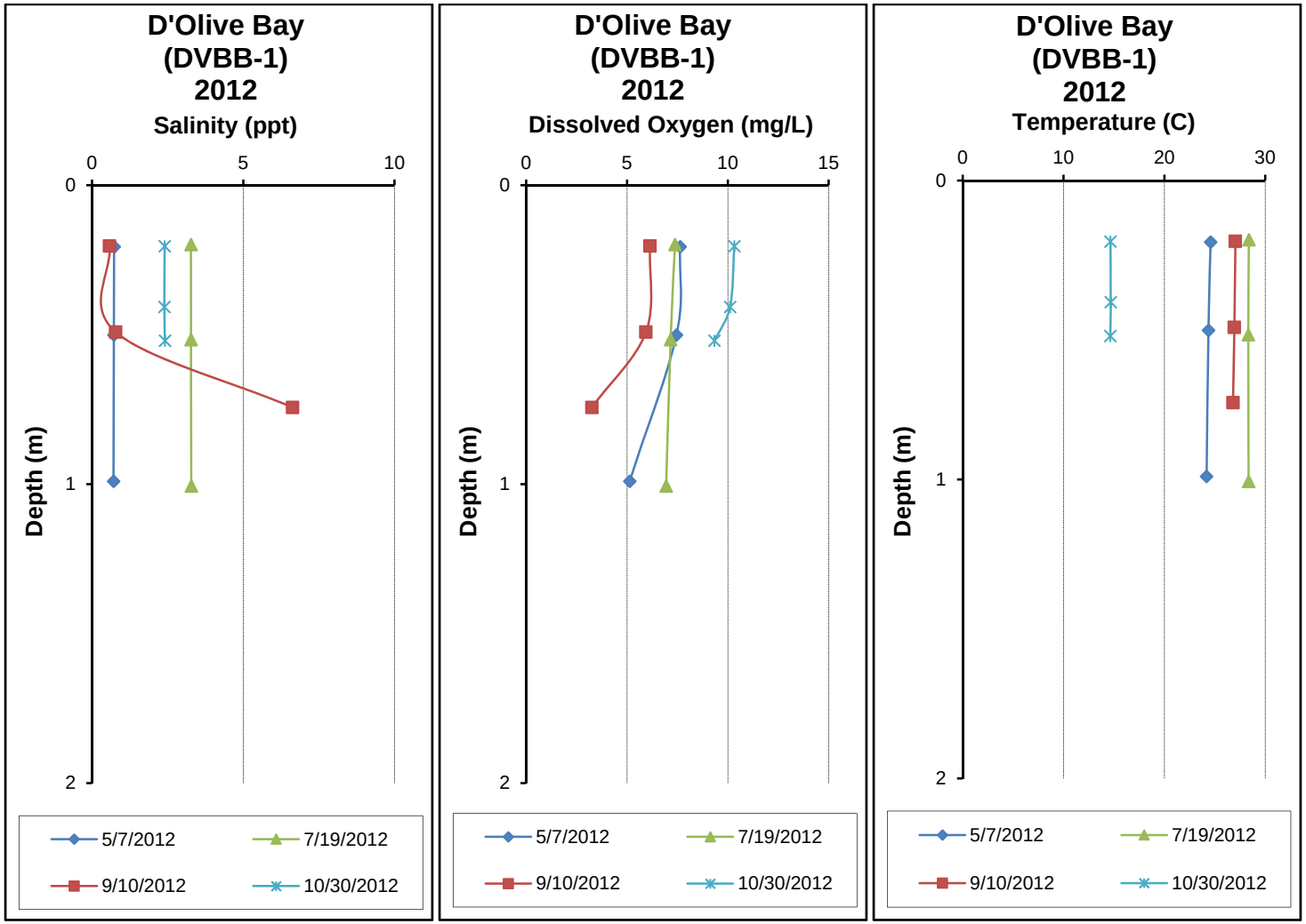

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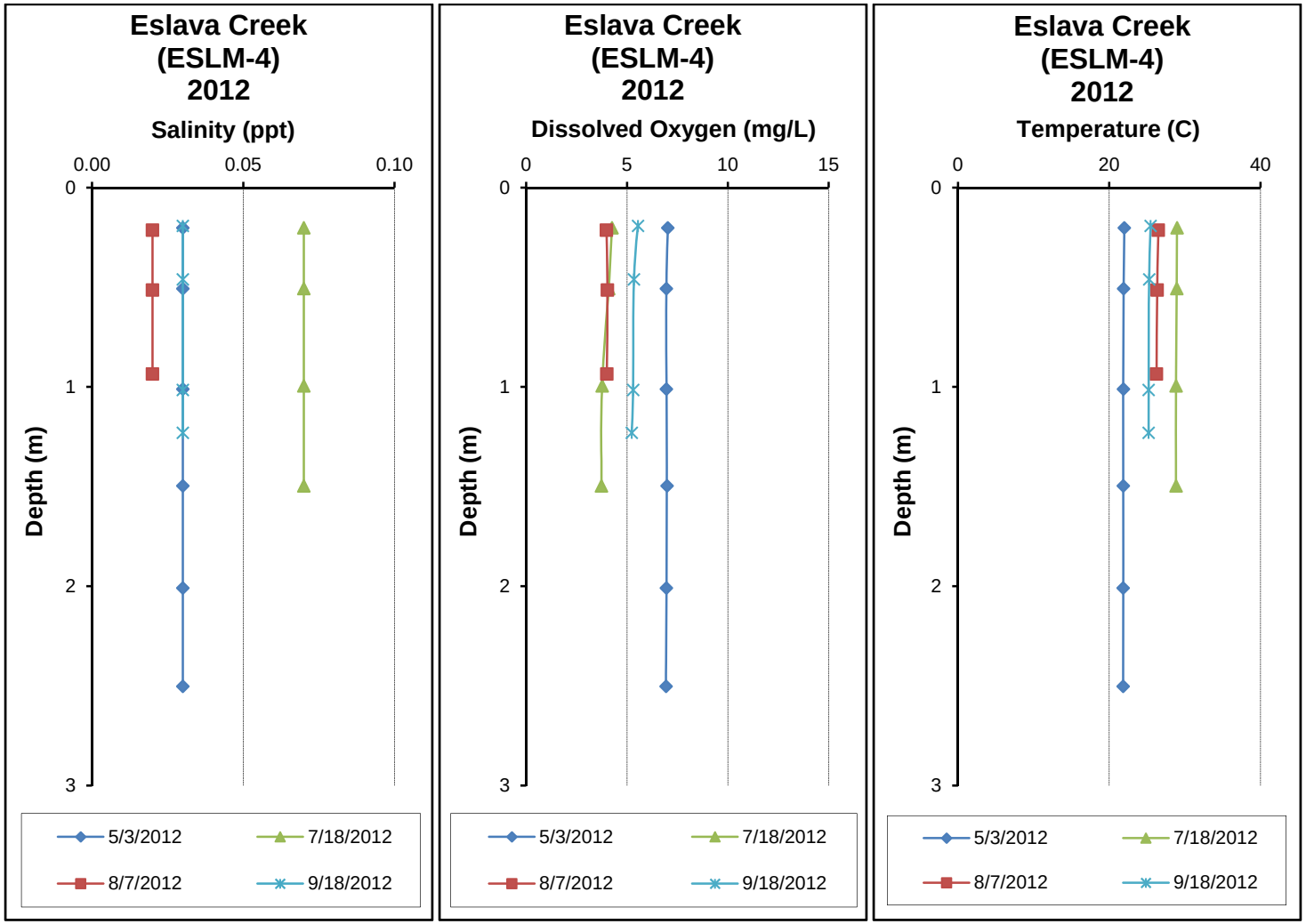

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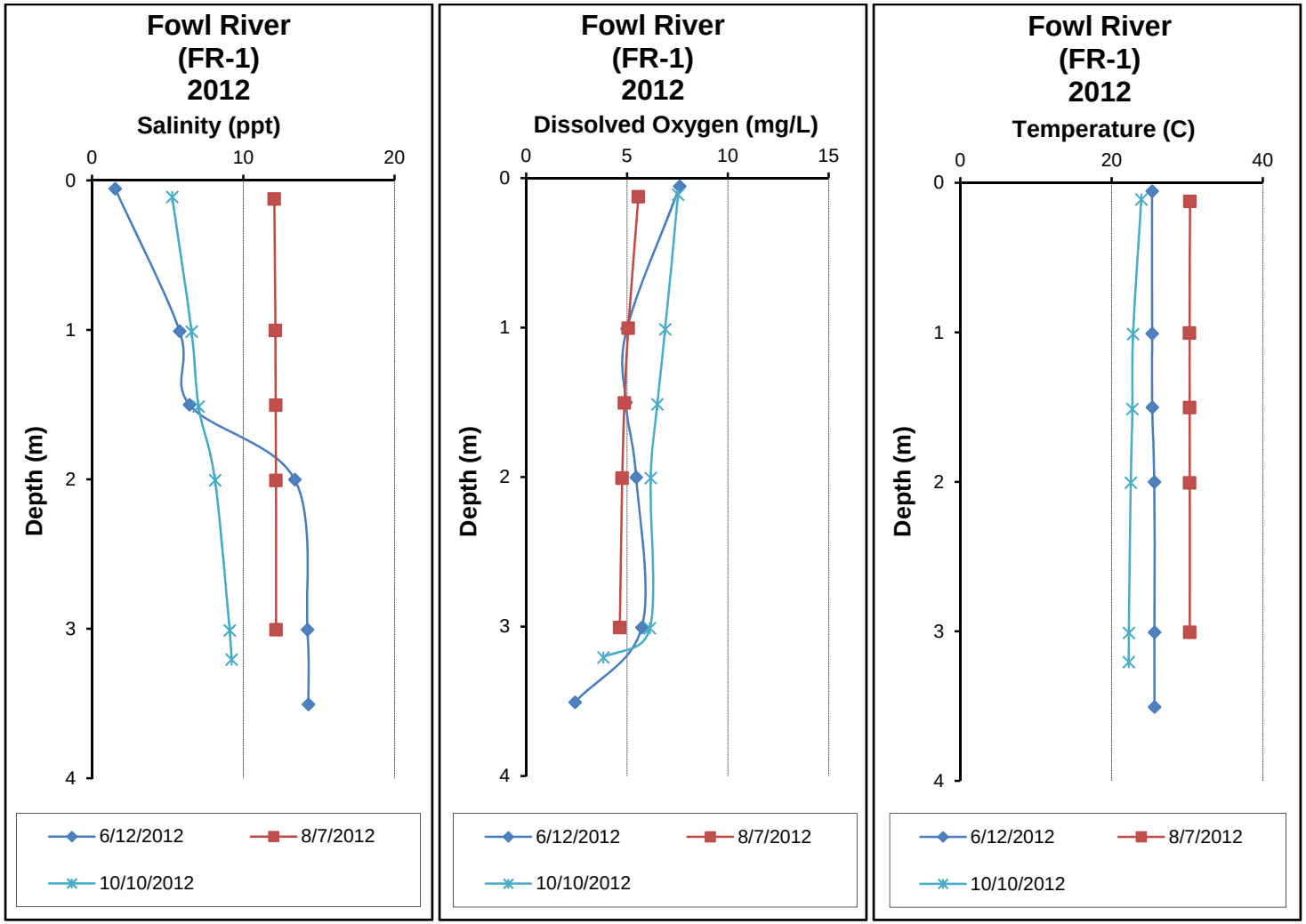

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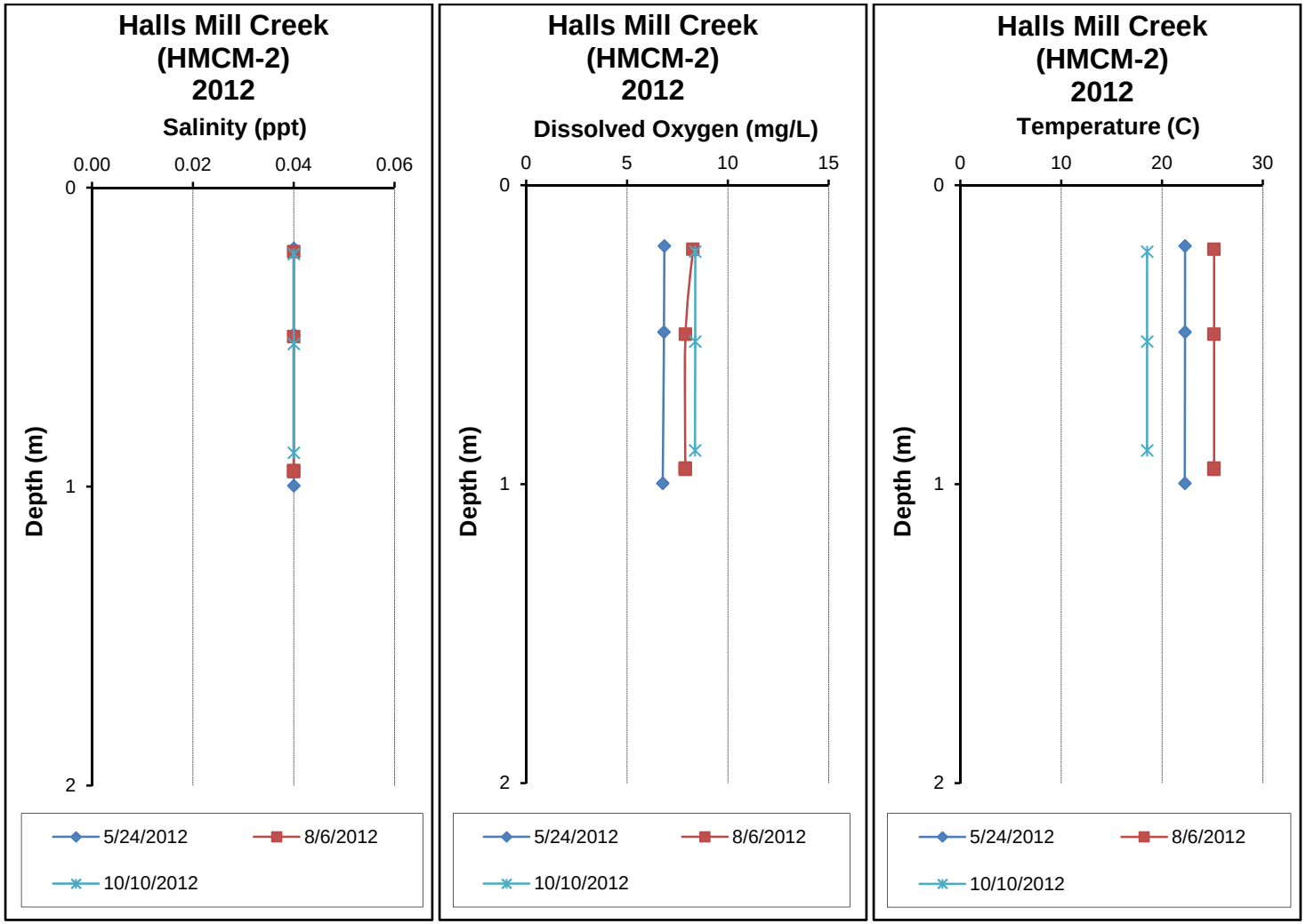

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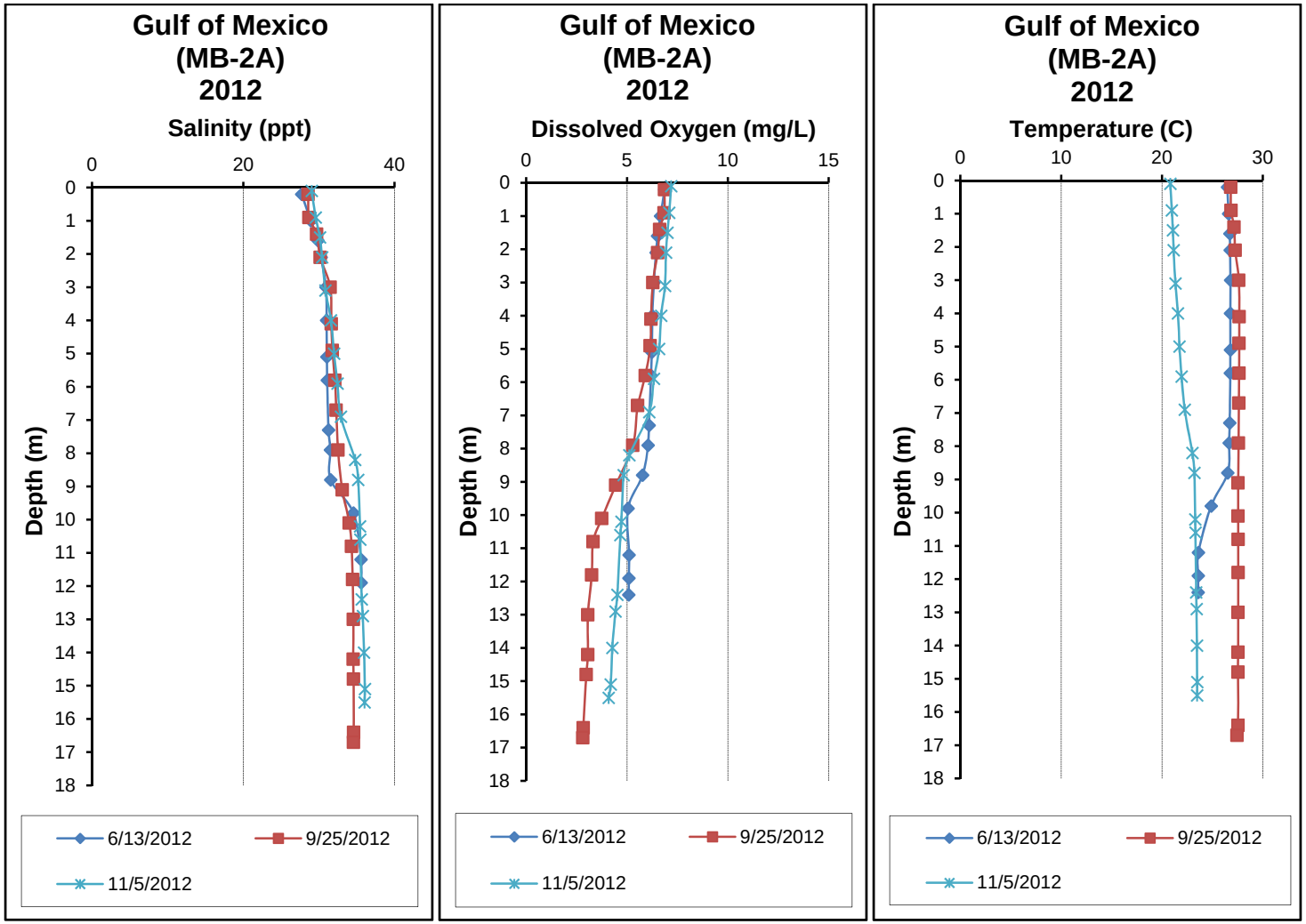

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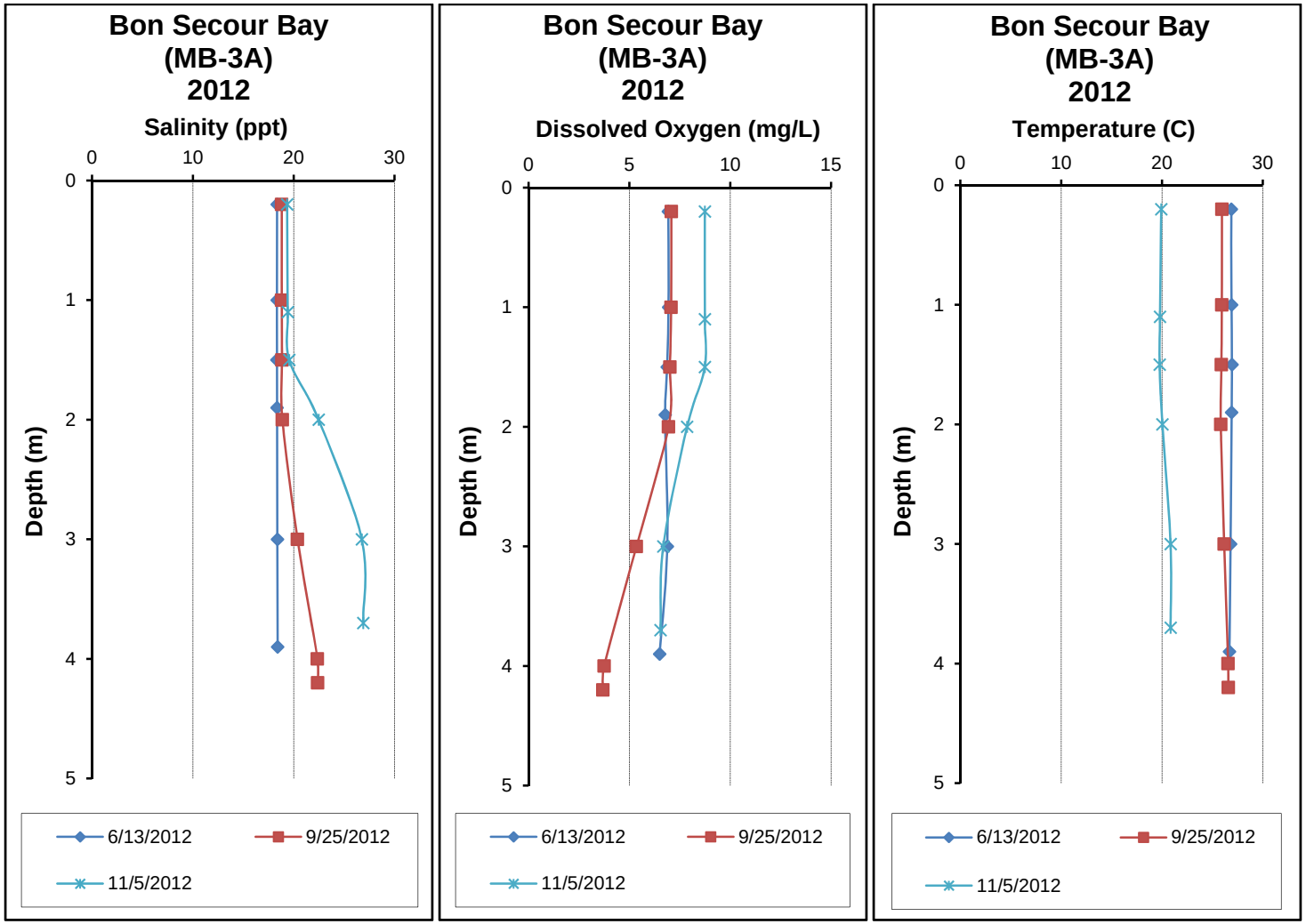

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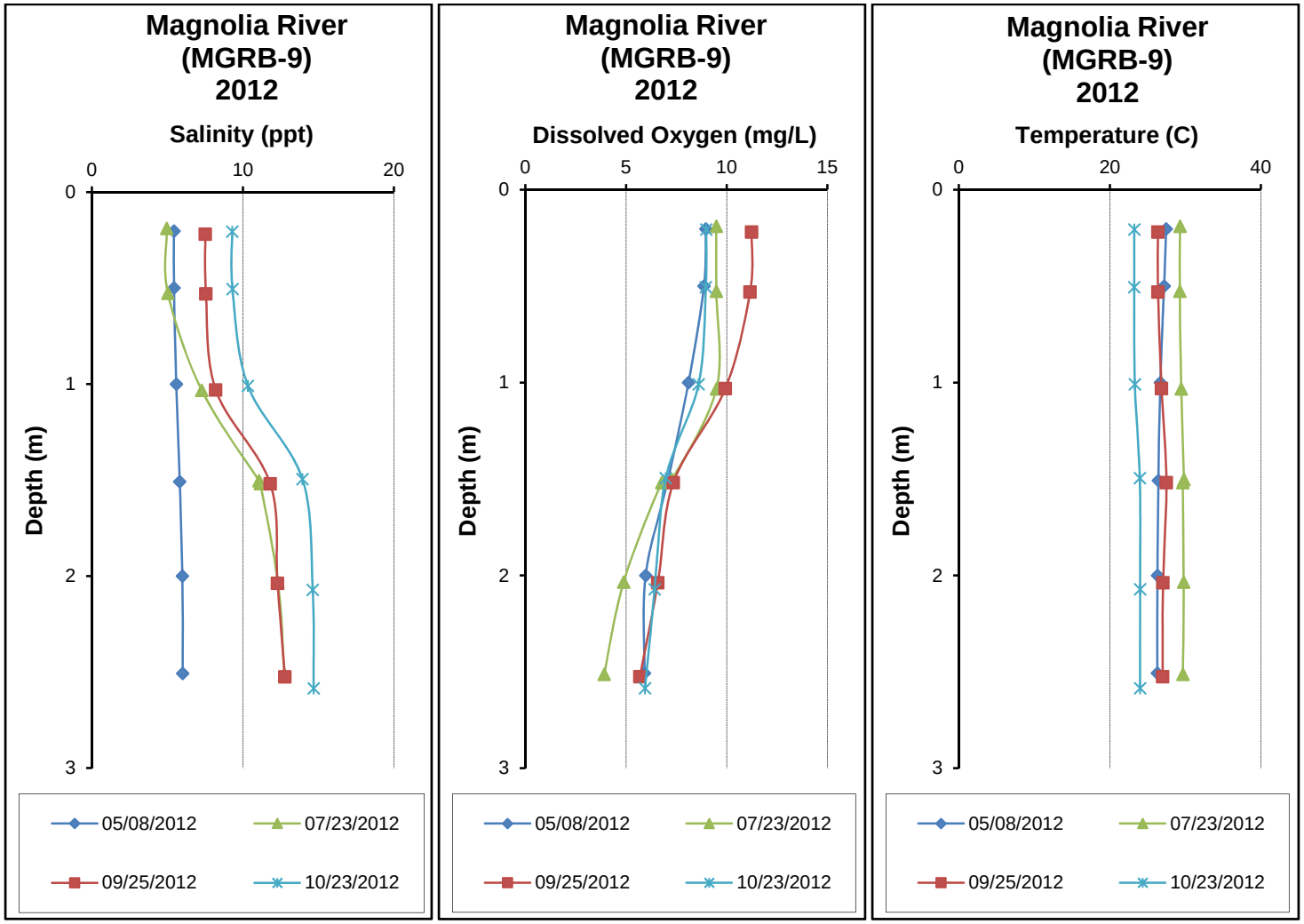

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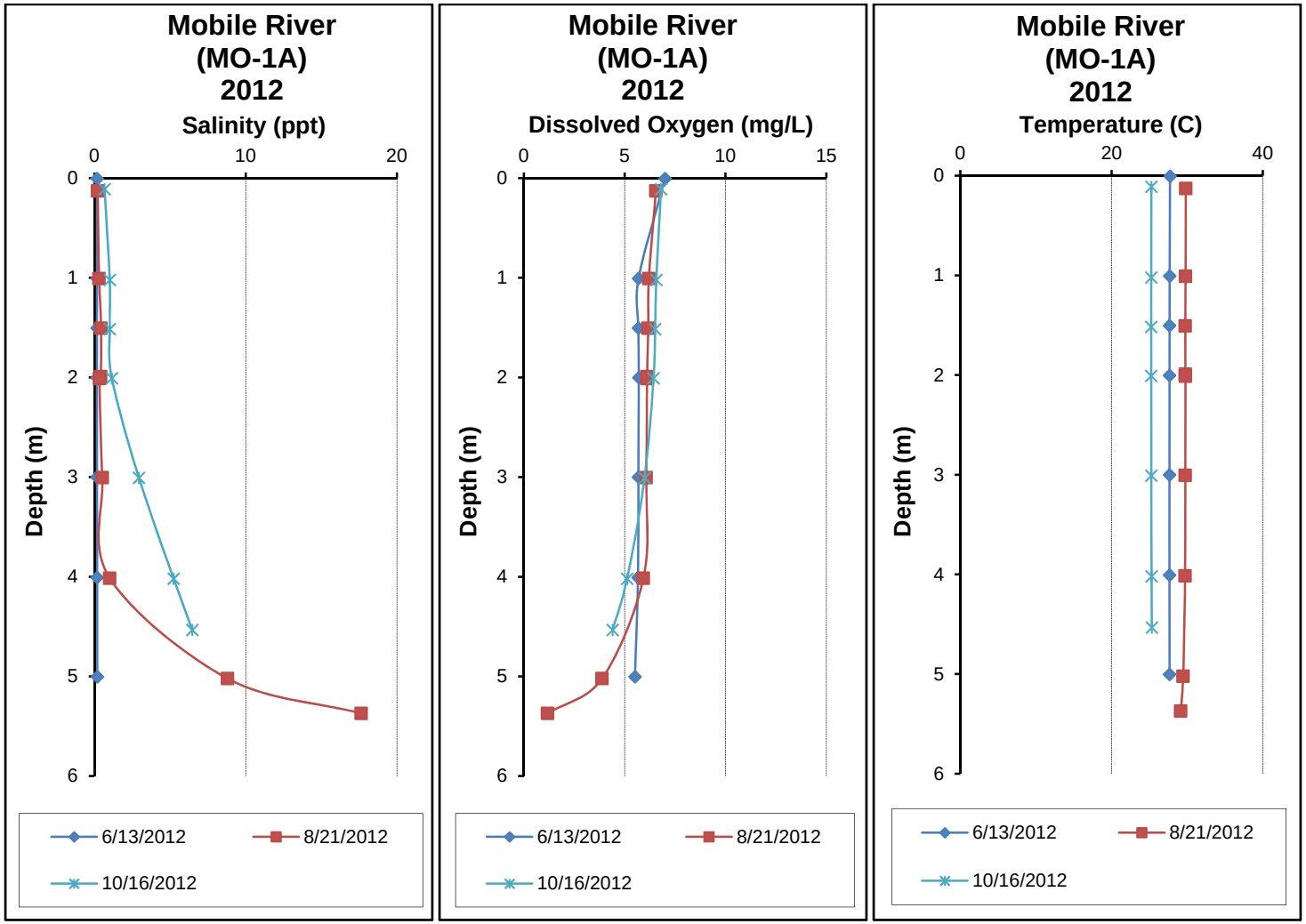

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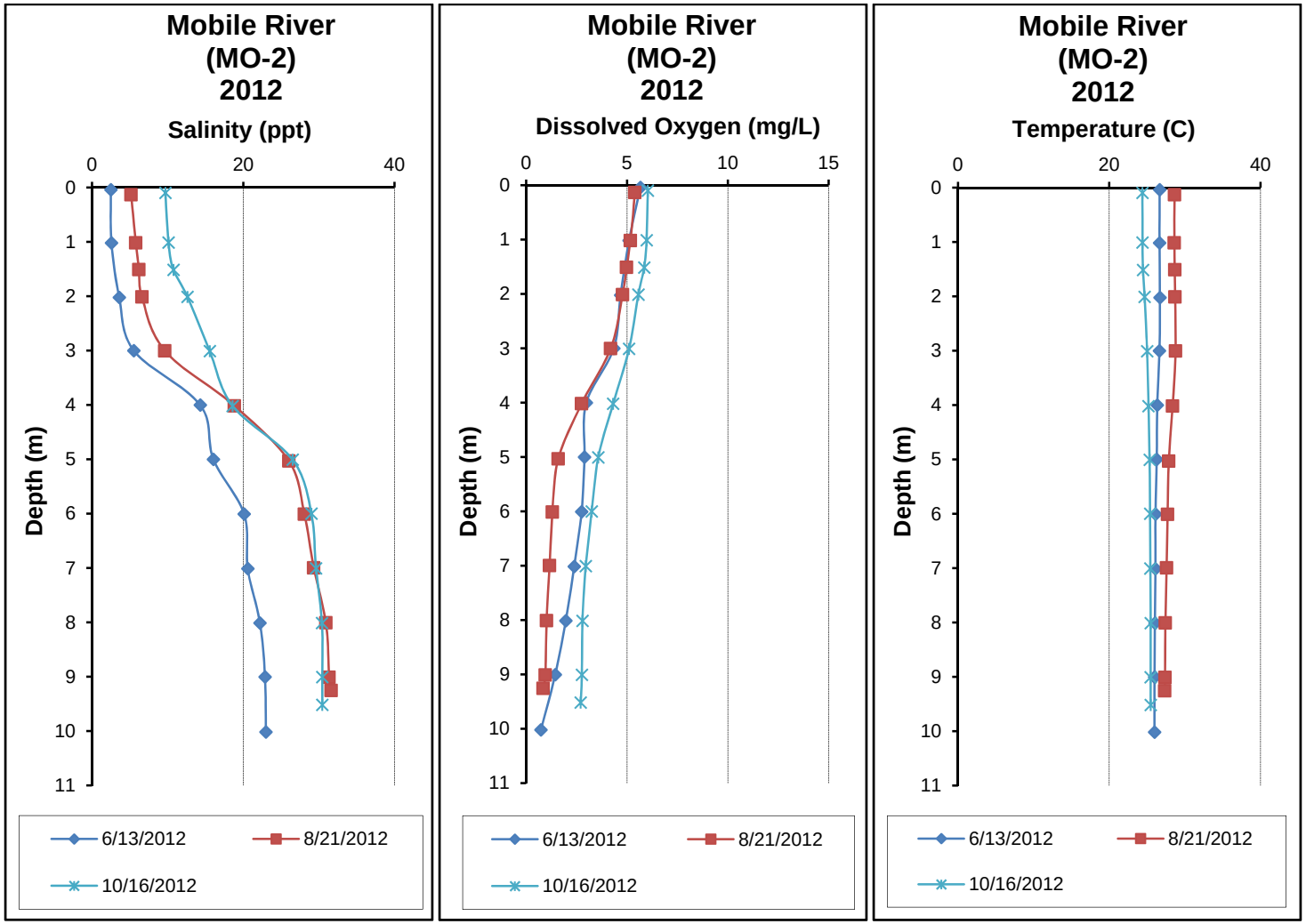

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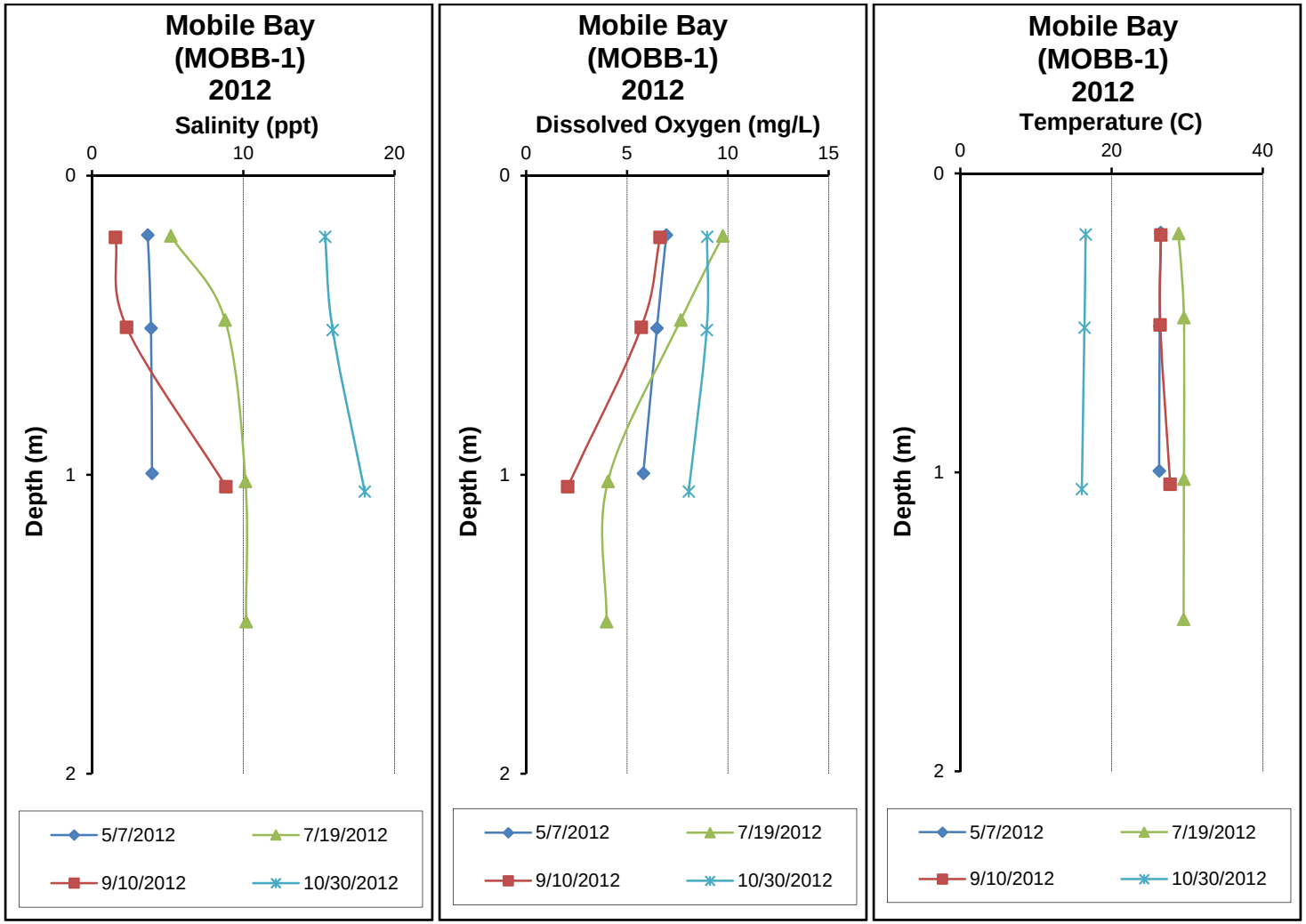

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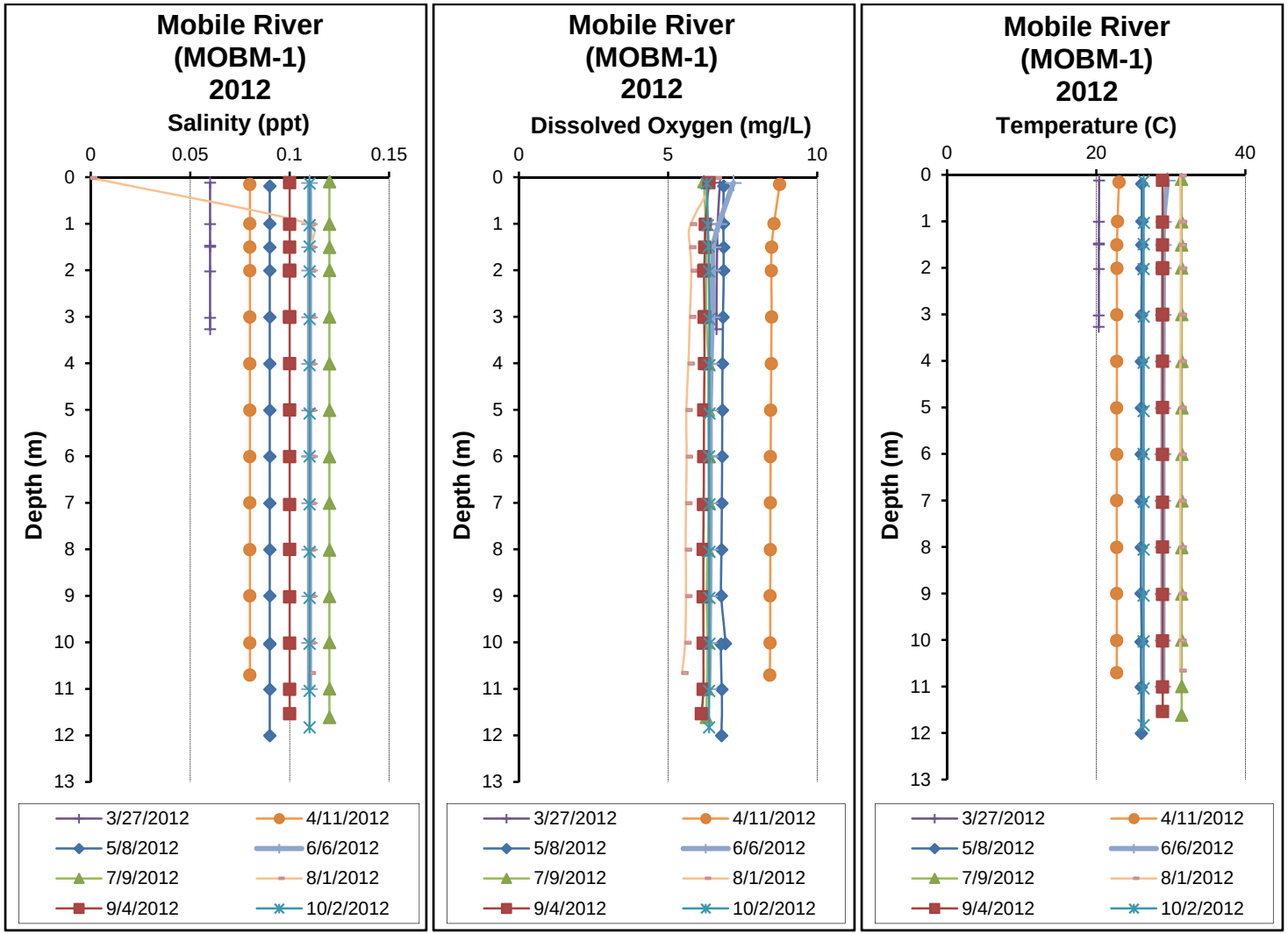

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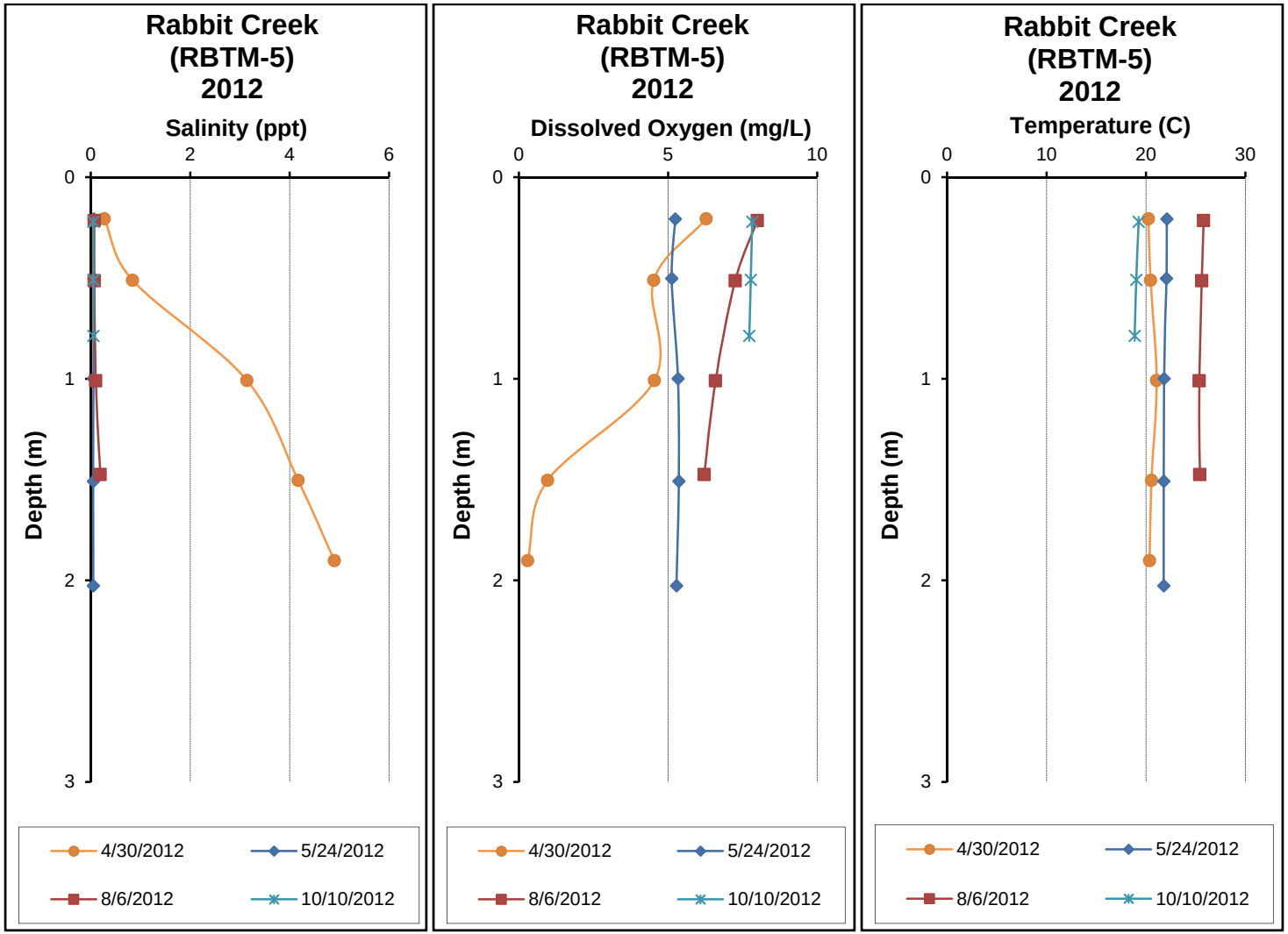

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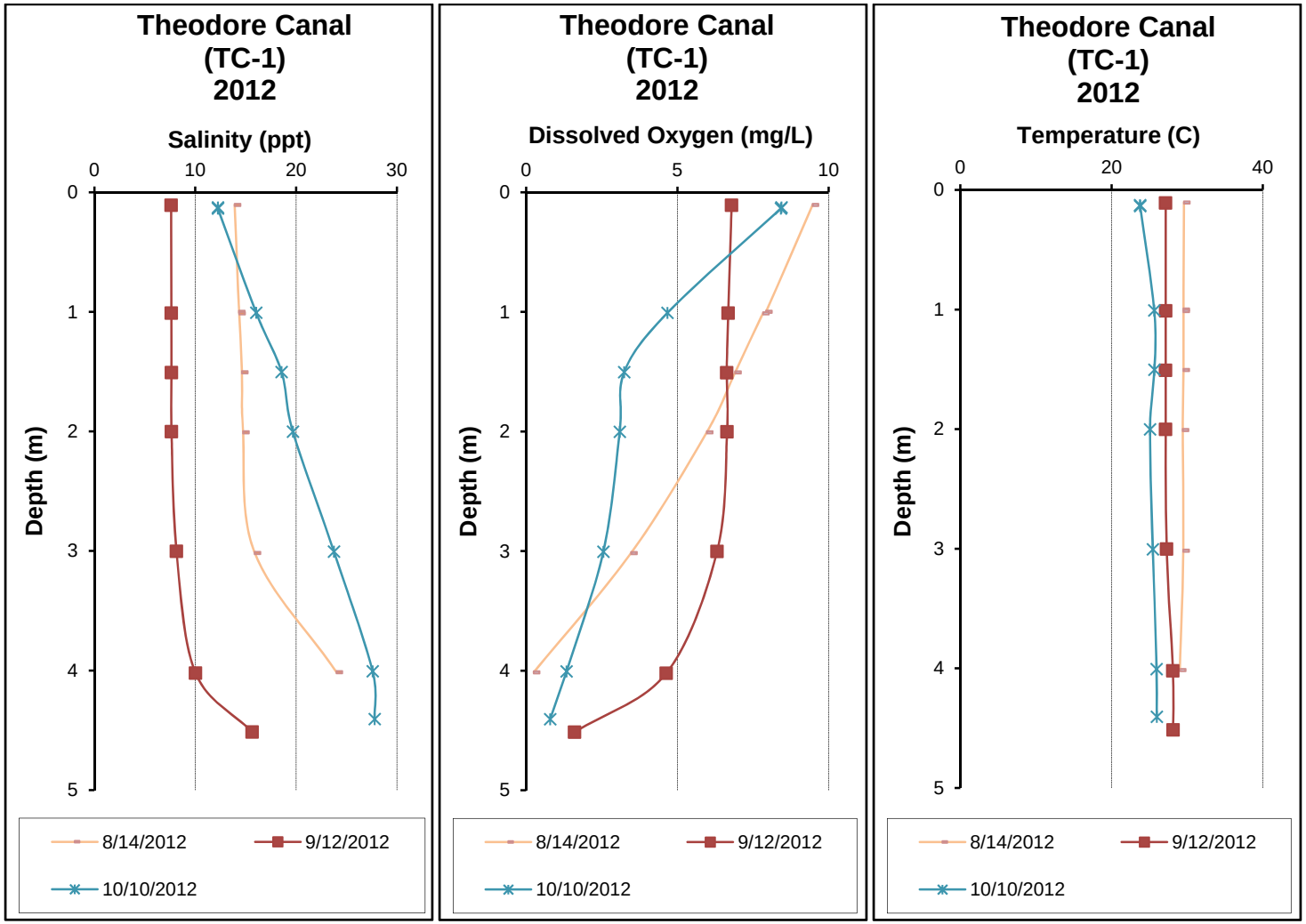

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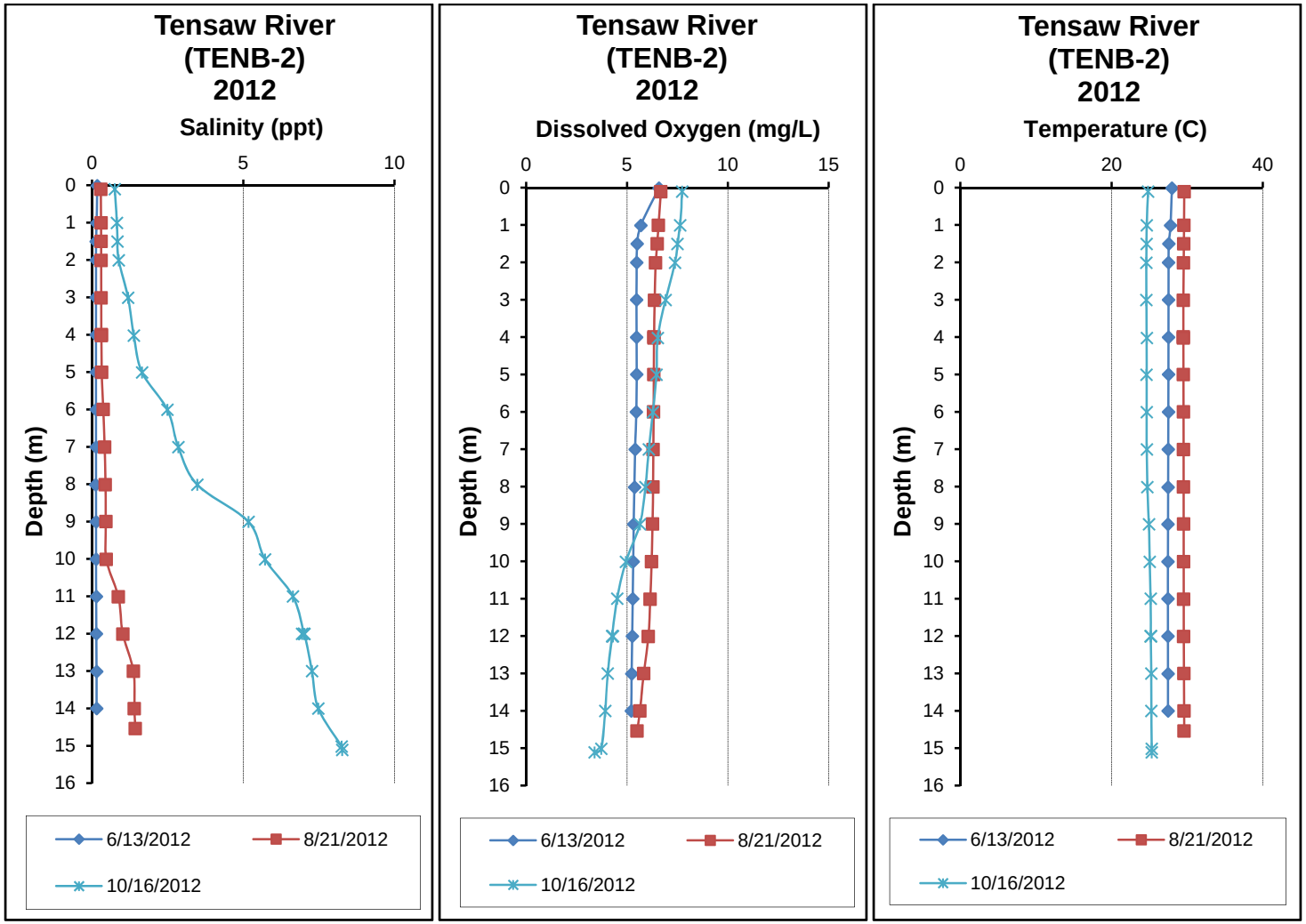

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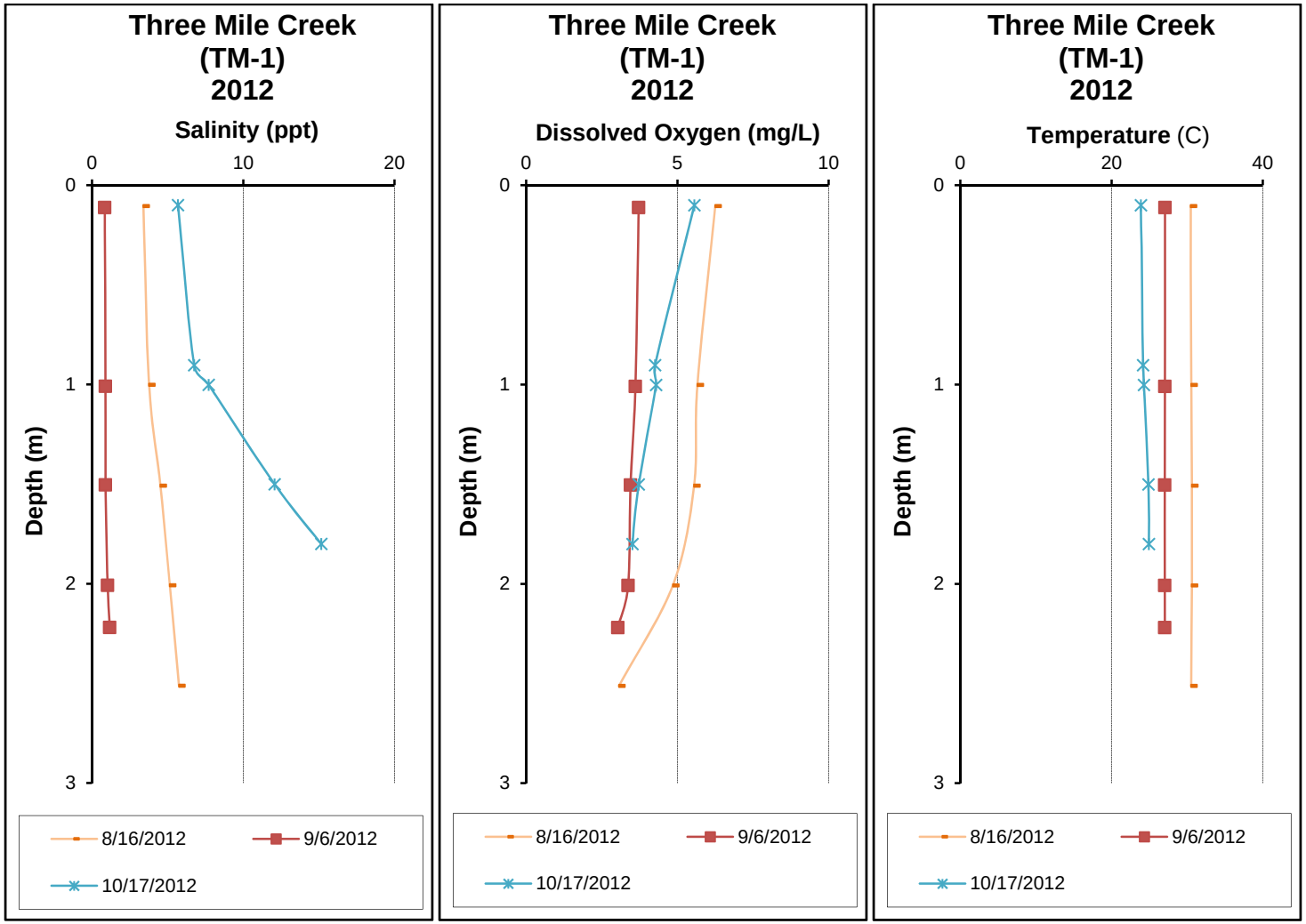

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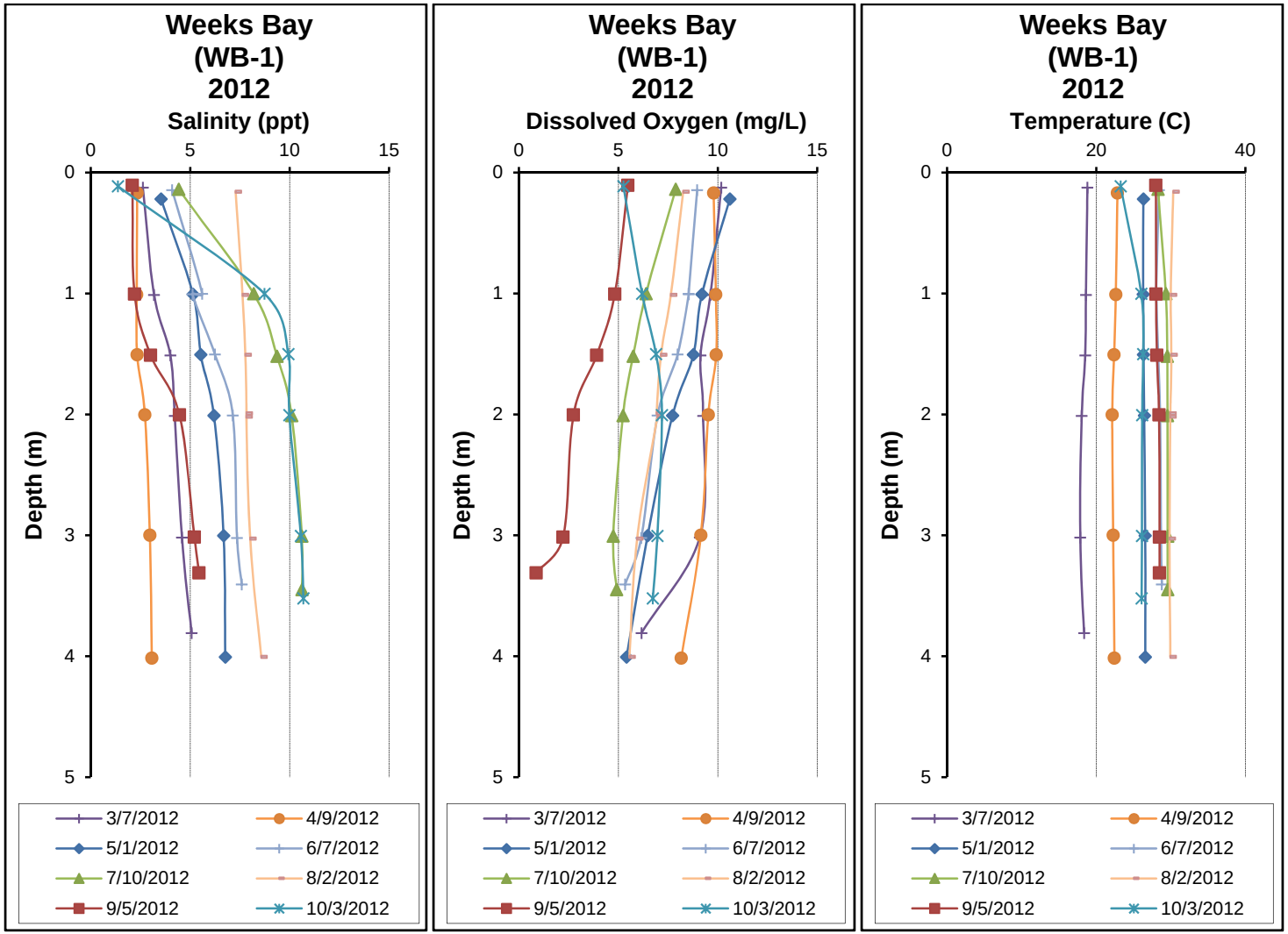

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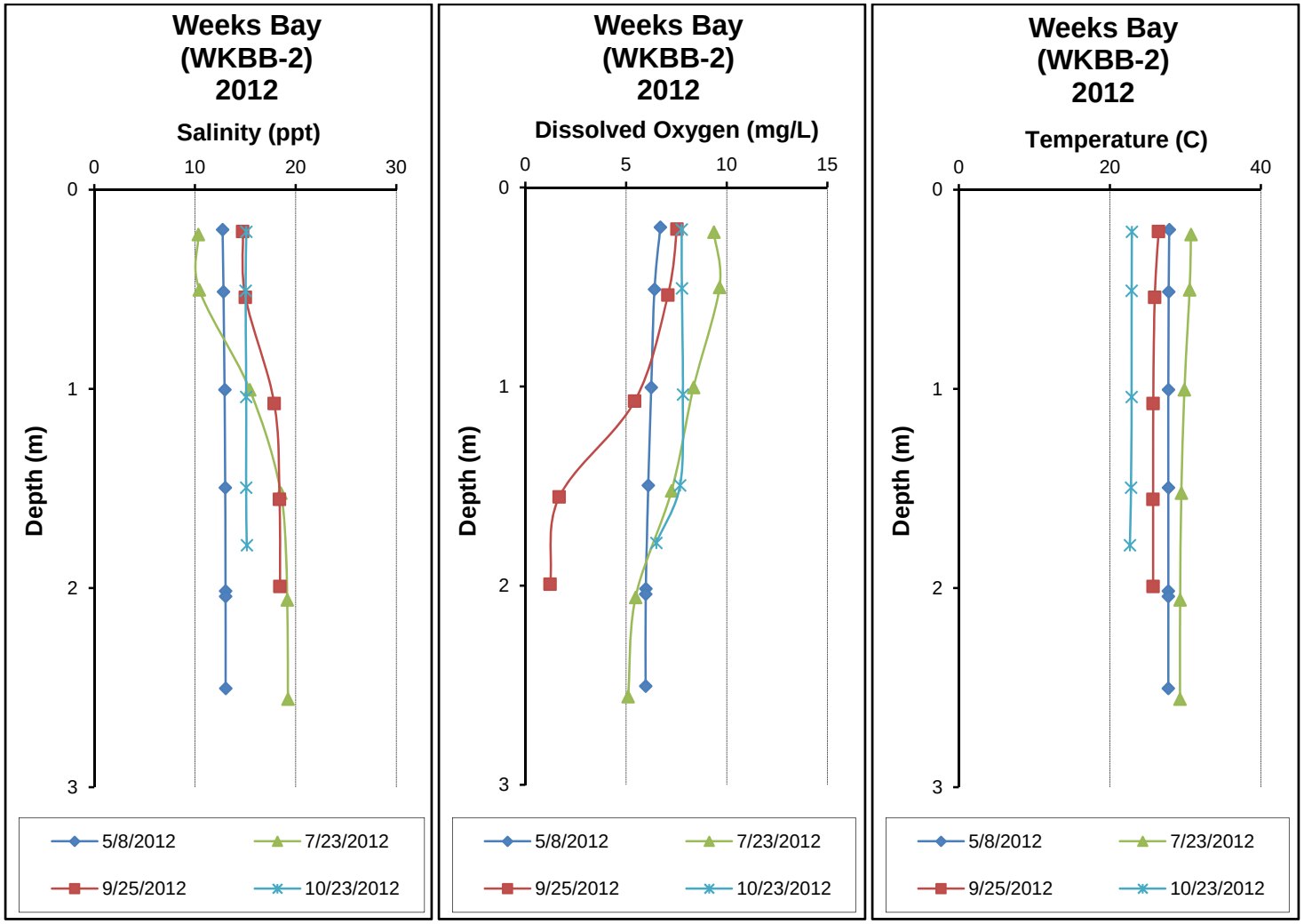

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APPENDIX

Appendix Table 1. Summary of Mobile Bay watershed water quality data collected in 2012. Minimum (min) and maximum (max) values calculated using minimum detection limits when results were less than this value. Median (med), mean, and standard deviation (SD) values were calculated by multiplying the MDL by 0.5 when results were less than this value.

Station		Parameter	N		Min	Max	Med	Avg	SD
BMBB-1		**Physical**							
		Temperature (°C)	3		12.5	30.5	26.7	23.2	9.5
		Turbidity (NTU)	4		12.0	17.0	14.5	14.5	2.1
		Total Dissolved Solids (mg/L)	4		306.0	3620.0	1,426.0	1694.5	1607.9
		Total Suspended Solids (mg/L)	4		13.0	15.0	14.0	14.0	1.2
		Specific Conductance (µmhos/cm@25C	3		500.4	6561.6	4,434.0	3832.0	3075.1
		Hardness (mg/L)	1					454.0	
	J	Alkalinity (mg/L)	4	<	3.0	62.0	55.0	43.4	28.2
		Chemical							
		Dissolved Oxygen (mg/L)	3		5.5	10.5	5.8	7.3	2.8
		pH (SU)	3		6.9	7.3	7.0	7.1	0.2
	J	Ammonia Nitrogen (mg/L)	4		0.020	0.030	0.020	0.022	0.005
	J	Nitrate+Nitrite Nitrogen (mg/L)	4	<	0.004	0.162	0.026	0.054	0.074
	J	Total Kjeldahl Nitrogen (mg/L)	4		0.320	0.660	0.500	0.495	0.141
	J	Total Nitrogen (mg/L)	4	<	0.365	0.662	0.585	0.549	0.134
	J	Dissolved Reactive Phosphorus (mg/L)	4		0.005	0.014	0.010	0.010	0.004
	J	Total Phosphorus (mg/L)	4		0.052	0.075	0.064	0.064	0.011
	J	CBOD-5 (mg/L)	4	<	2.0	2.3	1.0	1.3	0.6
	J	Chlorides (mg/L)	4		100.0	2000.0	835.0	942.5	911.0
		Total Metals							
	J	Aluminum (mg/L)	1					0.872	
		Iron (mg/L)	1					0.625	
		Manganese (mg/L)	1					0.194	
		Dissolved Metals							
		Aluminum (mg/L)	1				<	0.040	
		Antimony (µg/L)	1				<	3.6	
		Arsenic (µg/L)	1				<	1.8	
	J	Cadmium (µg/L)	1					0.060	
		Chromium (µg/L)	1				<	17.000	
		Copper (µg/L)	1				<	5.000	
	J	Iron (mg/L)	1					0.037	
	J	Lead (µg/L)	1					1.8	
		Manganese (mg/L)	1					0.153	
		Nickel (µg/L)	1				<	45.000	
		Selenium (µg/L)	1				<	2.5	
	J	Silver (µg/L)	1				<	0.215	
	J	Thallium (µg/L)	1				<	1.4	
	J	Zinc (µg/L)	1				<	32.000	
		Biological							
		Chlorophyll a (mg/m³)	4	<	1.00	2.60	2.05	1.80	0.98
	J	Enterococci (COL/DL)	4		2	68	5	20	32

Station	Parameter	N	Min	Max	Med	Avg	SD
BMCB-1	**Physical**						
	Temperature (°C)	4	15.4	28.7	25.5	23.8	5.8
	Turbidity (NTU)	4	7.0	9.0	8.5	8.2	1.0
	Total Dissolved Solids (mg/L)	4	227.0	3110.0	1,042.5	1355.5	1244.0
	Total Suspended Solids (mg/L)	4	7.0	9.0	7.5	7.8	1.0
	Specific Conductance (µmhos/cm@25C)	4	399.3	6021.3	2,229.0	2719.6	2405.8
	Hardness (mg/L)	1				223.0	
	Alkalinity (mg/L)	4	< 3.0	40.0	20.5	20.6	16.3
	Monthly Stream Flow (cfs)	3	138.8	402.8	340.8	294.1	138.0
	Stream Flow during Sample Collection (cfs)	3	138.8	402.8	340.8	294.1	138.0
	Chemical						
	Dissolved Oxygen (mg/L)	4	5.6	8.8	6.1	6.6	1.5
	pH (SU)	4	5.9	7.0	6.7	6.6	0.5
J	Ammonia Nitrogen (mg/L)	4	< 0.005	0.030	0.025	0.021	0.013
J	Nitrate+Nitrite Nitrogen (mg/L)	4	< 0.004	0.020	0.007	0.009	0.008
J	Total Kjeldahl Nitrogen (mg/L)	4	0.330	0.610	0.440	0.455	0.126
J	Total Nitrogen (mg/L)	4	< 0.350	0.617	0.445	0.464	0.122
J	Dissolved Reactive Phosphorus (mg/L)	4	0.004	0.010	0.006	0.006	0.002
J	Total Phosphorus (mg/L)	4	0.031	0.040	0.036	0.036	0.004
J	CBOD-5 (mg/L)	4	< 2.0	< 2.0	1.0	1.0	0.0
J	Chlorides (mg/L)	4	79.0	1700.0	595.0	742.2	687.6
	Total Metals						
J	Aluminum (mg/L)	1				0.566	
	Iron (mg/L)	1				0.561	
	Manganese (mg/L)	1				0.124	
	Dissolved Metals						
	Aluminum (mg/L)	1				0.040	<
	Antimony (µg/L)	1				3.6	<
	Arsenic (µg/L)	1				1.8	<
J	Cadmium (µg/L)	1				0.052	
	Chromium (µg/L)	1				17.000	<
	Copper (µg/L)	1				5.000	<
J	Iron (mg/L)	1				0.182	
	Lead (µg/L)	1				0.9	<
	Manganese (mg/L)	1				0.094	
	Nickel (µg/L)	1				45.000	<
	Selenium (µg/L)	1				2.5	<
	Silver (µg/L)	1				0.215	<
J	Thallium (µg/L)	1				1.4	<
J	Zinc (µg/L)	1				32.000	<
	Biological						
	Chlorophyll a (mg/m³)	4	< 1.00	2.60	1.30	1.42	0.87
J	Enterococci (COL/DL)	4	2	32	4	10	15

Station	Parameter	N		Min	Max	Med	Avg	SD
BMCB-3	**Physical**							
	Temperature (°C)	3		12.3	23.4	20.8	18.8	5.8
	Turbidity (NTU)	4		1.0	27.0	2.5	8.2	12.5
	Total Dissolved Solids (mg/L)	4		25.0	51.0	44.5	41.2	11.3
	Total Suspended Solids (mg/L)	4	<	5.0	20.0	6.0	8.6	7.8
	Specific Conductance (µmhos/cm@25C)	3		24.1	27.8	24.9	25.6	1.9
	[J] Hardness (mg/L)	1					5.1	
	Alkalinity (mg/L)	4	<	3.0	3.0	1.5	1.5	0.0
	Monthly Stream Flow (cfs)	3		21.4	257.7	44.2	107.8	130.4
	Stream Flow during Sample Collection (cfs)	3		21.4	257.7	44.2	107.8	130.4
	Chemical							
	Dissolved Oxygen (mg/L)	3		6.5	9.9	7.8	8.1	1.7
	pH (SU)	3		4.2	7.0	6.4	5.9	1.5
	[J] Ammonia Nitrogen (mg/L)	4	<	0.005	0.020	0.006	0.009	0.008
	[J] Nitrate+Nitrite Nitrogen (mg/L)	4		0.040	0.099	0.066	0.068	0.028
	[J] Total Kjeldahl Nitrogen (mg/L)	4	<	0.062	0.450	0.195	0.218	0.173
	[J] Total Nitrogen (mg/L)	4	<	0.114	0.549	0.240	0.286	0.185
	[J] Dissolved Reactive Phosphorus (mg/L)	4		0.004	0.010	0.008	0.007	0.003
	[J] Total Phosphorus (mg/L)	4		0.011	0.029	0.014	0.017	0.008
	[J] CBOD-5 (mg/L)	4	<	2.0	< 2.0	1.0	1.0	0.0
	[J] Chlorides (mg/L)	4		3.8	4.1	4.0	4.0	0.1
	Total Metals							
	[J] Aluminum (mg/L)	1					0.587	
	Iron (mg/L)	1					1.080	
	[J] Manganese (mg/L)	1					0.042	
	Dissolved Metals							
	Aluminum (mg/L)	1					0.326	
	Antimony (µg/L)	1					3.6	<
	Arsenic (µg/L)	1					1.8	<
	Cadmium (µg/L)	1					0.046	<
	Chromium (µg/L)	1					17.000	<
	Copper (µg/L)	1					5.000	<
	Iron (mg/L)	1					0.516	
	Lead (µg/L)	1					0.9	<
	[J] Manganese (mg/L)	1					0.044	
	[J] Nickel (µg/L)	1					45.000	<
	Selenium (µg/L)	1					2.5	<
	Silver (µg/L)	1					0.215	<
	Thallium (µg/L)	1					1.4	<
	[J] Zinc (µg/L)	1					32.000	<
	Biological							
	Chlorophyll a (mg/m³)	4	<	1.00	1.60	0.50	0.78	0.55
	[J] Enterococci (COL/DL)	4		36	1700	56	462	825

Station	Parameter	N		Min	Max	Med	Avg	SD
BS-1	**Physical**							
	Temperature (°C)	3		27.2	30.4	28.0	28.6	1.7
	Turbidity (NTU)	3		10.5	17.0	12.0	13.2	3.4
	Total Dissolved Solids (mg/L)	3		12000.0	14000.0	12,500.0	12833.3	1040.8
	Total Suspended Solids (mg/L)	3		18.0	20.0	18.0	18.7	1.2
	Specific Conductance (µmhos/cm@25C)	3		22345.3	25811.7	25,626.1	24594.4	1950.0
	Hardness (mg/L)	1					4700.0	
	Alkalinity (mg/L)	3		67.0	73.0	69.0	69.7	3.0
	Chemical							
	Dissolved Oxygen (mg/L)	3		4.4	6.6	4.9	5.3	1.2
	pH (SU)	3		7.2	7.6	7.6	7.5	0.2
	Ammonia Nitrogen (mg/L)	3	<	0.005	0.280	0.120	0.134	0.139
J	Nitrate+Nitrite Nitrogen (mg/L)	3		0.021	0.030	0.024	0.025	0.004
	Total Kjeldahl Nitrogen (mg/L)	3		0.830	1.300	1.000	1.043	0.238
J	Total Nitrogen (mg/L)	3		0.860	1.324	1.021	1.068	0.236
	Dissolved Reactive Phosphorus (mg/L)	3		0.015	0.067	0.045	0.042	0.026
J	Total Phosphorus (mg/L)	3		0.100	0.150	0.150	0.133	0.029
J	CBOD-5 (mg/L)	3	<	2.0	5.1	4.0	3.4	2.1
	Chlorides (mg/L)	3		7700.0	9000.0	8,900.0	8533.3	723.4
	Total Metals							
J	Aluminum (mg/L)	1					0.331	
	Iron (mg/L)	1					0.242	
	Manganese (mg/L)	1					0.123	
	Dissolved Metals							
J	Aluminum (mg/L)	1					0.084	
J	Antimony (µg/L)	1					1.4	<
	Arsenic (µg/L)	1					1.3	<
J	Cadmium (µg/L)	1					0.022	<
J	Chromium (µg/L)	1					12.000	
	Copper (µg/L)	1					5.000	<
J	Iron (mg/L)	1					0.036	<
J	Lead (µg/L)	1					1.3	
J	Manganese (mg/L)	1					0.022	
J	Mercury (µg/L)	1					0.061	
J	Nickel (µg/L)	1					45.000	<
	Selenium (µg/L)	1					1.1	<
J	Silver (µg/L)	1					0.015	<
J	Thallium (µg/L)	1					2.2	
	Zinc (µg/L)	1					32.000	<
	Biological							
	Chlorophyll a (mg/m³)	3	<	1.00	6.90	5.30	4.23	3.33
J	Fecal Coliform (COL/DL)	2		6	14	10	10	6
J	Enterococci (COL/DL)	3		2	64	2	22	36

Station	Parameter	N		Min	Max	Med	Avg	SD
Channel-1a	**Physical**							
	Temperature (°C)	3		20.9	27.6	27.2	25.2	3.8
	Turbidity (NTU)	3		7.3	12.1	9.8	9.8	2.4
	Total Dissolved Solids (mg/L)	3		6520.0	18000.0	15,600.0	13373.3	6055.2
	Total Suspended Solids (mg/L)	3		11.0	15.0	13.0	13.0	2.0
	Specific Conductance (µmhos/cm@25C)	3		12055.0	40174.0	24,950.0	25726.3	14075.6
	J Hardness (mg/L)	1					1100.0	
	Alkalinity (mg/L)	3		36.0	90.0	81.0	69.0	28.9
	Chemical							
	Dissolved Oxygen (mg/L)	3		5.1	6.2	5.3	5.5	0.6
	pH (SU)	3		7.2	8.0	7.7	7.6	0.4
	J Ammonia Nitrogen (mg/L)	3		0.020	0.200	0.080	0.100	0.092
	J Nitrate+Nitrite Nitrogen (mg/L)	3		0.043	0.098	0.054	0.065	0.029
	Total Kjeldahl Nitrogen (mg/L)	3		0.210	0.690	0.600	0.500	0.255
	J Total Nitrogen (mg/L)	3		0.253	0.788	0.654	0.565	0.278
	Dissolved Reactive Phosphorus (mg/L)	3		0.018	0.040	0.024	0.027	0.011
	Total Phosphorus (mg/L)	3		0.042	0.053	0.046	0.047	0.006
	J CBOD-5 (mg/L)	3	<	2.0	< 2.0	1.0	1.0	0.0
	Chlorides (mg/L)	3		3700.0	14000.0	9,100.0	8933.3	5152.0
	Total Metals							
	Aluminum (mg/L)	1					0.427	
	Iron (mg/L)	1					0.429	
	Manganese (mg/L)	1					0.106	
	J Mercury (µg/L)	1					0.080	
	Dissolved Metals							
	J Aluminum (mg/L)	1					0.076	
	Antimony (µg/L)	1					3.6	<
	J Arsenic (µg/L)	1					1.8	<
	Cadmium (µg/L)	1					0.220	
	Chromium (µg/L)	1					17.000	<
	Copper (µg/L)	1					5.000	<
	J Iron (mg/L)	1					0.054	
	J Lead (µg/L)	1					0.4	<
	Manganese (mg/L)	1					0.100	
	Nickel (µg/L)	1					45.000	<
	Selenium (µg/L)	1					2.5	<
	J Silver (µg/L)	1					0.200	<
	J Thallium (µg/L)	1					2.0	
	Zinc (µg/L)	1					32.000	<
	Biological							
	Chlorophyll a (mg/m³)	3	<	1.00	2.50	2.10	1.70	1.06
	J Enterococci (COL/DL)	3		2	70	18	30	36

Station	Parameter	N		Min	Max	Med	Avg	SD
Channel-2	**Physical**							
	Temperature (°C)	3		19.5	27.1	26.6	24.4	4.2
	Turbidity (NTU)	3		4.9	11.9	7.6	8.1	3.5
	Total Dissolved Solids (mg/L)	3		10400.0	17700.0	12,200.0	13433.3	3803.1
	Total Suspended Solids (mg/L)	3		11.0	17.0	14.0	14.0	3.0
	Specific Conductance (µmhos/cm@25C)	3		18791.0	33535.0	20,655.0	24327.0	8028.6
	[J] Hardness (mg/L)	1					1900.0	
	Alkalinity (mg/L)	3		52.0	81.0	77.0	70.0	15.7
	Chemical							
	Dissolved Oxygen (mg/L)	3		7.4	8.8	7.8	8.0	0.7
	pH (SU)	3		7.9	8.1	8.0	8.0	0.1
	Ammonia Nitrogen (mg/L)	3	<	0.005	0.140	0.070	0.071	0.069
	[J] Nitrate+Nitrite Nitrogen (mg/L)	3	<	0.015	0.040	0.008	0.018	0.019
	Total Kjeldahl Nitrogen (mg/L)	3		0.240	0.530	0.350	0.373	0.146
	[J] Total Nitrogen (mg/L)	3	<	0.248	0.538	0.390	0.392	0.145
	Dissolved Reactive Phosphorus (mg/L)	3		0.019	0.033	0.022	0.025	0.007
	Total Phosphorus (mg/L)	3		0.032	0.058	0.035	0.042	0.014
	[J] CBOD-5 (mg/L)	3	<	2.0	2.4	1.0	1.5	0.8
	Chlorides (mg/L)	3		6300.0	12000.0	7,300.0	8533.3	3043.6
	Total Metals							
	[J] Aluminum (mg/L)	1					0.364	
	Iron (mg/L)	1					0.261	
	[J] Manganese (mg/L)	1					0.031	
	[J] Mercury (µg/L)	1					0.111	
	Dissolved Metals							
	[J] Aluminum (mg/L)	1					0.095	
	Antimony (µg/L)	1					3.6	<
	[J] Arsenic (µg/L)	1					1.8	<
	Cadmium (µg/L)	1					0.031	<
	Chromium (µg/L)	1					17.000	<
	Copper (µg/L)	1					5.000	<
	Iron (mg/L)	1					0.036	<
	[J] Lead (µg/L)	1					0.4	<
	[J] Manganese (mg/L)	1					0.011	
	Nickel (µg/L)	1					45.000	<
	[J] Selenium (µg/L)	1					2.5	<
	[J] Silver (µg/L)	1					0.200	<
	[J] Thallium (µg/L)	1					1.4	
	Zinc (µg/L)	1					32.000	<
	Biological							
	Chlorophyll a (mg/m³)	3	<	1.00	3.20	2.50	2.07	1.40
	[J] Enterococci (COL/DL)	3		2	2	2	2	1

Station	Parameter	N	Min	Max	Med	Avg	SD
CS-1	**Physical**						
	Temperature (°C)	3	23.1	26.9	23.8	24.6	2.0
	Turbidity (NTU)	3	2.0	7.0	5.0	4.7	2.5
	Total Dissolved Solids (mg/L)	3	77.0	4420.0	716.0	1737.7	2344.8
	Total Suspended Solids (mg/L)	3	5.0	7.0	5.0	5.7	1.2
	Specific Conductance (µmhos/cm@25C)	3	83.3	12743.4	1,230.3	4685.7	7001.7
	J Hardness (mg/L)	1				15.2	
	Alkalinity (mg/L)	3	< 3.0	29.0	12.0	14.2	13.9
	Chemical						
	Dissolved Oxygen (mg/L)	3	3.7	6.4	5.1	5.1	1.3
	pH (SU)	3	7.0	7.5	7.2	7.2	0.2
	Ammonia Nitrogen (mg/L)	3	0.050	0.070	0.060	0.060	0.010
	J Nitrate+Nitrite Nitrogen (mg/L)	3	0.056	0.085	0.081	0.074	0.016
	Total Kjeldahl Nitrogen (mg/L)	3	0.300	0.580	0.330	0.403	0.154
	J Total Nitrogen (mg/L)	3	0.385	0.661	0.386	0.477	0.159
	J Dissolved Reactive Phosphorus (mg/L)	3	0.006	0.008	0.007	0.007	0.001
	Total Phosphorus (mg/L)	3	0.025	0.036	0.027	0.029	0.006
	J CBOD-5 (mg/L)	3	< 2.0	< 2.0	1.0	1.0	0.0
	J Chlorides (mg/L)	3	17.0	2600.0	360.0	992.3	1402.8
	Total Metals						
	Aluminum (mg/L)	1				0.432	
	Iron (mg/L)	1				0.853	
	J Manganese (mg/L)	1				0.048	
	Dissolved Metals						
	Aluminum (mg/L)	1				0.211	
	Antimony (µg/L)	1				3.6	<
	J Arsenic (µg/L)	1				2.2	
	J Cadmium (µg/L)	1				0.040	
	Chromium (µg/L)	1				17.000	<
	Copper (µg/L)	1				5.000	<
	Iron (mg/L)	1				0.319	
	Lead (µg/L)	1				0.4	<
	Manganese (mg/L)	1				0.052	
	J Mercury (µg/L)	1				0.060	
	Nickel (µg/L)	1				45.000	<
	Selenium (µg/L)	1				2.5	<
	Silver (µg/L)	1				0.200	<
	Thallium (µg/L)	1				1.4	<
	Zinc (µg/L)	1				32.000	<
	Biological						
	Chlorophyll a (mg/m³)	3	< 1.00	1.00	0.50	0.50	0.00
	Enterococci (COL/DL)	3	88	260	100	149	96

Station	Parameter	N		Min	Max	Med	Avg	SD
CS-2	**Physical**							
	Temperature (°C)	3		23.4	30.7	24.9	26.3	3.8
	Turbidity (NTU)	3		2.0	10.0	5.0	5.7	4.0
	Total Dissolved Solids (mg/L)	3		2290.0	11000.0	4160.0	5816.7	4585.2
	Total Suspended Solids (mg/L)	3		5.0	7.0	7.0	6.3	1.2
	Specific Conductance (µmhos/cm@25C)	3		6312.8	18054.7	7566.1	10644.5	6447.9
	J Hardness (mg/L)	1					400.0	
	J Alkalinity (mg/L)	3		6.0	64.0	56.0	42.0	31.4
	Monthly Stream Flow (cfs)	1					801.5	
	Stream Flow during Sample Collection (cfs)	1					801.5	
	Chemical							
	Dissolved Oxygen (mg/L)	3		4.6	6.0	5.6	5.4	0.7
	pH (SU)	3		6.6	7.0	6.9	6.8	0.2
	Ammonia Nitrogen (mg/L)	3		0.070	0.120	0.070	0.087	0.029
	J Nitrate+Nitrite Nitrogen (mg/L)	3		0.026	0.056	0.050	0.044	0.016
	Total Kjeldahl Nitrogen (mg/L)	3		0.360	0.630	0.470	0.487	0.136
	J Total Nitrogen (mg/L)	3		0.410	0.656	0.526	0.531	0.123
	J Dissolved Reactive Phosphorus (mg/L)	3		0.008	0.018	0.011	0.012	0.005
	Total Phosphorus (mg/L)	3		0.034	0.047	0.041	0.041	0.006
	J CBOD-5 (mg/L)	3	<	2.0	2.0	1.0	1.0	0.0
	Chlorides (mg/L)	3		1300.0	7000.0	2400.0	3566.7	3023.8
	Total Metals							
	Aluminum (mg/L)	1					0.470	
	Iron (mg/L)	1					0.563	
	Manganese (mg/L)	1					0.057	
	Dissolved Metals							
	J Aluminum (mg/L)	1					0.124	
	Antimony (µg/L)	1					3.6	<
	Arsenic (µg/L)	1					1.8	<
	Cadmium (µg/L)	1					0.031	<
	Chromium (µg/L)	1					17.000	<
	Copper (µg/L)	1					5.000	<
	Iron (mg/L)	1					0.209	
	J Lead (µg/L)	1					0.4	
	Manganese (mg/L)	1					0.066	
	J Mercury (µg/L)	1					0.181	
	Nickel (µg/L)	1					45.000	<
	Selenium (µg/L)	1					2.5	<
	Silver (µg/L)	1					0.200	<
	J Thallium (µg/L)	1					1.4	<
	Zinc (µg/L)	1					32.000	<
	Biological							
	Chlorophyll a (mg/m³)	3	<	1.00	2.60	2.00	1.70	1.08
	J Enterococci (COL/DL)	3		18	48	26	31	16

Station	Parameter	N		Min	Max	Med	Avg	SD
DGRM-1	**Physical**							
	Temperature (°C)	3		21.9	31.0	25.5	26.1	4.6
	Turbidity (NTU)	3		10.0	25.0	16.0	17.0	7.6
	Total Dissolved Solids (mg/L)	3		5850.0	7990.0	6,960.0	6933.3	1070.2
	Total Suspended Solids (mg/L)	3		12.0	21.0	20.0	17.7	4.9
	Specific Conductance (µmhos/cm@25C)	3		11251.6	14091.7	13,484.5	12942.6	1495.6
	J Hardness (mg/L)	1					1016.0	
	J Alkalinity (mg/L)	3		34.0	70.0	49.0	51.0	18.1
	Monthly Stream Flow (cfs)	1					4782.0	
	Stream Flow during Sample Collection (cfs)	1					4782.0	
	Chemical							
	Dissolved Oxygen (mg/L)	3		5.7	6.9	6.3	6.3	0.6
	pH (SU)	3		6.3	7.9	7.6	7.3	0.9
	J Ammonia Nitrogen (mg/L)	3		0.080	0.200	0.110	0.130	0.062
	J Nitrate+Nitrite Nitrogen (mg/L)	3	<	0.015	0.082	0.008	0.032	0.043
	Total Kjeldahl Nitrogen (mg/L)	3		0.450	0.680	0.640	0.590	0.123
	J Total Nitrogen (mg/L)	3	<	0.458	0.722	0.688	0.622	0.144
	J Dissolved Reactive Phosphorus (mg/L)	3		0.013	0.015	0.013	0.014	0.001
	Total Phosphorus (mg/L)	3		0.050	0.070	0.060	0.060	0.010
	J CBOD-5 (mg/L)	3	<	2.0	2.5	1.0	1.5	0.9
	Chlorides (mg/L)	3		3500.0	6300.0	4,300.0	4700.0	1442.2
	Total Metals							
	Aluminum (mg/L)	1					0.680	
	Iron (mg/L)	1					0.542	
	Manganese (mg/L)	1					0.058	
	Dissolved Metals							
	J Aluminum (mg/L)	1					0.060	
	Antimony (µg/L)	1					3.6	<
	Arsenic (µg/L)	1					1.8	<
	Cadmium (µg/L)	1					0.031	<
	Chromium (µg/L)	1					17.000	<
	Copper (µg/L)	1					5.000	<
	J Iron (mg/L)	1					0.048	
	J Lead (µg/L)	1					0.9	<
	J Manganese (mg/L)	1					0.040	
	J Mercury (µg/L)	1					0.161	
	Nickel (µg/L)	1					45.000	<
	Selenium (µg/L)	1					2.5	<
	J Silver (µg/L)	1					0.200	<
	J Thallium (µg/L)	1					1.4	<
	Zinc (µg/L)	1					32.000	<
	Biological							
	Chlorophyll a (mg/m³)	3	<	1.00	2.70	1.40	1.53	1.11
	J Enterococci (COL/DL)	3		2	230	2	78	132

Station	Parameter	N	Min	Max	Med	Avg	SD
DLVB-2	**Physical**						
	Temperature (°C)	2	22.3	27.2	24.8	24.8	3.5
	Turbidity (NTU)	4	4.2	46.0	9.4	17.2	19.3
	Total Dissolved Solids (mg/L)	4	91.0	10100.0	363.5	2729.5	4918.8
	Total Suspended Solids (mg/L)	4	< 5.0	17.0	6.0	7.9	6.4
	Specific Conductance (µmhos/cm@25C)	2	64.2	3725.0	1,894.6	1894.6	2588.6
	Hardness (mg/L)	1				22.0	
	Alkalinity (mg/L)	4	< 3.0	28.0	21.0	17.9	11.9
	Monthly Stream Flow (cfs)	0					
	Chemical						
	Dissolved Oxygen (mg/L)	2	6.4	7.2	6.8	6.8	0.5
	pH (SU)	2	6.4	6.5	6.5	6.5	0.1
	Ammonia Nitrogen (mg/L)	4	0.030	0.080	0.075	0.065	0.024
	J Nitrate+Nitrite Nitrogen (mg/L)	4	0.054	0.223	0.126	0.132	0.071
	Total Kjeldahl Nitrogen (mg/L)	4	0.250	0.740	0.445	0.470	0.202
	J Total Nitrogen (mg/L)	4	0.473	0.887	0.524	0.602	0.193
	J Dissolved Reactive Phosphorus (mg/L)	4	0.005	0.009	0.007	0.007	0.002
	J Total Phosphorus (mg/L)	4	0.020	0.057	0.028	0.034	0.016
	J CBOD-5 (mg/L)	4	< 2.0	< 2.0	1.0	1.0	0.0
	J Chlorides (mg/L)	4	6.1	290.0	26.5	87.3	135.6
	Total Metals						
	J Aluminum (mg/L)	1				0.637	
	Iron (mg/L)	1				1.580	
	Manganese (mg/L)	1				0.080	
	Dissolved Metals						
	Aluminum (mg/L)	1				0.270	
	Antimony (µg/L)	1				3.6	<
	J Arsenic (µg/L)	1				4.3	
	Chromium (µg/L)	1				17.000	<
	Copper (µg/L)	1				5.000	<
	Iron (mg/L)	1				0.803	
	J Manganese (mg/L)	1				0.038	
	J Nickel (µg/L)	1				45.000	<
	Selenium (µg/L)	1				2.5	<
	Thallium (µg/L)	1				1.4	<
	J Zinc (µg/L)	1				32.000	<
	Biological						
	Chlorophyll a (mg/m³)	4	1.20	2.00	1.30	1.45	0.37
	J Enterococci (COL/DL)	4	8	600	14	159	294

Station	Parameter	N	Min	Max	Med	Avg	SD
DR-1	**Physical**						
	Temperature (°C)	3	23.1	30.9	25.5	26.5	4.0
	Turbidity (NTU)	3	7.0	17.0	9.0	11.0	5.3
	Total Dissolved Solids (mg/L)	3	82.0	1620.0	1,580.0	1094.0	876.6
	Total Suspended Solids (mg/L)	3	9.0	10.0	9.0	9.3	0.6
	Specific Conductance (µmhos/cm@25C)	3	89.9	3874.9	2,956.4	2307.1	1974.3
	J Hardness (mg/L)	1				27.8	
	J Alkalinity (mg/L)	3	3.0	50.0	33.0	28.7	23.8
	Chemical						
	Dissolved Oxygen (mg/L)	3	3.2	7.0	5.5	5.2	1.9
	pH (SU)	3	7.3	7.8	7.6	7.6	0.2
	J Ammonia Nitrogen (mg/L)	3	< 0.005	0.160	0.002	0.055	0.091
	Nitrate+Nitrite Nitrogen (mg/L)	3	< 0.015	0.140	0.020	0.056	0.073
	J Total Kjeldahl Nitrogen (mg/L)	3	0.640	0.680	0.640	0.653	0.023
	J Total Nitrogen (mg/L)	3	< 0.648	0.820	0.660	0.709	0.096
	J Dissolved Reactive Phosphorus (mg/L)	3	0.008	0.076	0.021	0.035	0.036
	Total Phosphorus (mg/L)	3	0.092	0.140	0.094	0.109	0.027
	J CBOD-5 (mg/L)	3	< 2.0	2.5	2.4	2.0	0.8
	Chlorides (mg/L)	3	9.8	1100.0	850.0	653.3	571.1
	Total Metals						
	Aluminum (mg/L)	1				0.491	
	Iron (mg/L)	1				0.405	
	J Manganese (mg/L)	1				0.024	
	Dissolved Metals						
	Aluminum (mg/L)	1				0.216	
	Antimony (µg/L)	1				3.6	<
	J Arsenic (µg/L)	1				2.2	
	Cadmium (µg/L)	1				0.046	<
	Chromium (µg/L)	1				17.000	<
	Copper (µg/L)	1				5.000	<
	Iron (mg/L)	1				0.207	
	J Lead (µg/L)	1				1.5	
	J Manganese (mg/L)	1				0.024	
	J Mercury (µg/L)	1				0.100	
	Nickel (µg/L)	1				45.000	<
	Selenium (µg/L)	1				2.5	<
	J Silver (µg/L)	1				0.200	<
	Thallium (µg/L)	1				1.4	<
	Zinc (µg/L)	1				32.000	<
	Biological						
	Chlorophyll a (mg/m³)	3	< 1.00	7.80	6.10	4.80	3.82
	E. coli (MPN/DL)	3	7.0	550.0	17.0	191.3	310.6

Station	Parameter	N		Min	Max	Med	Avg	SD
DVBB-1	**Physical**							
	Temperature (°C)	2		24.4	28.3	26.3	26.3	2.8
	Turbidity (NTU)	4		20.5	39.0	26.0	27.8	7.9
	Total Dissolved Solids (mg/L)	4		709.0	3290.0	1,642.0	1820.8	1277.6
	Total Suspended Solids (mg/L)	4		13.0	29.0	18.0	19.5	6.8
	Specific Conductance (µmhos/cm@25C)	2		1439.2	6054.7	3,747.0	3747.0	3263.6
	Hardness (mg/L)	1					113.0	
	J Alkalinity (mg/L)	4	<	3.0	62.0	60.5	46.1	29.8
	Chemical							
	Dissolved Oxygen (mg/L)	2		7.2	7.4	7.3	7.3	0.2
	pH (SU)	2		7.5	7.7	7.6	7.6	0.2
	J Ammonia Nitrogen (mg/L)	4		0.010	0.090	0.035	0.042	0.034
	J Nitrate+Nitrite Nitrogen (mg/L)	4	<	0.004	0.188	0.079	0.087	0.095
	Total Kjeldahl Nitrogen (mg/L)	4		0.320	0.840	0.710	0.645	0.240
	J Total Nitrogen (mg/L)	4	<	0.468	0.850	0.805	0.732	0.177
	J Dissolved Reactive Phosphorus (mg/L)	4		0.009	0.020	0.017	0.016	0.005
	Total Phosphorus (mg/L)	4		0.075	0.090	0.082	0.082	0.007
	J CBOD-5 (mg/L)	4	<	2.0	2.7	1.0	1.4	0.8
	J Chlorides (mg/L)	4		380.0	1900.0	890.0	1015.0	761.1
	Total Metals							
	J Aluminum (mg/L)	1					0.378	
	Iron (mg/L)	1					0.551	
	Manganese (mg/L)	1					0.135	
	Dissolved Metals							
	J Aluminum (mg/L)	1					0.141	
	Antimony (µg/L)	1					3.6	<
	Arsenic (µg/L)	1					1.8	<
	J Cadmium (µg/L)	1					0.071	
	Chromium (µg/L)	1					17.000	<
	Copper (µg/L)	1					5.000	<
	J Iron (mg/L)	1					0.038	
	Lead (µg/L)	1					0.9	<
	J Manganese (mg/L)	1					0.031	
	J Nickel (µg/L)	1					45.000	<
	Selenium (µg/L)	1					2.5	<
	J Silver (µg/L)	1					0.215	<
	J Thallium (µg/L)	1					1.7	
	J Zinc (µg/L)	1					32.000	<
	Biological							
	Chlorophyll a (mg/m³)	3	<	1.00	4.20	1.30	2.00	1.95
	J Enterococci (COL/DL)	5		6	32	16	15	11

Station	Parameter	N	Min	Max	Med	Avg	SD
ESLM-4	**Physical**						
	Temperature (°C)	1				26.3	
	Turbidity (NTU)	4	8.8	24.0	12.4	14.4	7.1
	Total Dissolved Solids (mg/L)	4	43.0	97.0	50.0	60.0	25.4
	Total Suspended Solids (mg/L)	4	5.0	12.0	5.5	7.0	3.4
	Specific Conductance (µmhos/cm@25C)	1				53.6	
	Hardness (mg/L)	1				59.0	
	J Alkalinity (mg/L)	4	16.0	50.0	21.0	27.0	15.8
	Monthly Stream Flow (cfs)	2	-53.3	8.0	-23.7	-23.7	43.0
	Stream Flow during Sample Collection (cfs)	2	-53.3	8.0	-23.7	-23.7	43.0
	Chemical						
	Dissolved Oxygen (mg/L)	1				4.0	
	pH (SU)	1				6.6	
	J Ammonia Nitrogen (mg/L)	4	0.010	0.050	0.050	0.040	0.020
	J Nitrate+Nitrite Nitrogen (mg/L)	4	0.088	0.185	0.154	0.146	0.043
	Total Kjeldahl Nitrogen (mg/L)	4	0.370	0.690	0.490	0.510	0.139
	J Total Nitrogen (mg/L)	4	0.507	0.862	0.626	0.656	0.149
	J Dissolved Reactive Phosphorus (mg/L)	4	0.008	0.110	0.021	0.040	0.048
	Total Phosphorus (mg/L)	4	0.047	0.140	0.066	0.080	0.041
	J CBOD-5 (mg/L)	4	< 2.0	< 2.0	1.0	1.0	0.0
	J Chlorides (mg/L)	4	2.5	9.9	3.2	4.7	3.5
	Total Metals						
	J Aluminum (mg/L)	1				0.250	
	Iron (mg/L)	1				0.674	
	J Manganese (mg/L)	1				0.028	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.171	
	Antimony (µg/L)	1				< 3.6	
	Arsenic (µg/L)	1				< 1.8	
	Cadmium (µg/L)	1				< 0.046	
	Chromium (µg/L)	1				< 17.000	
	Copper (µg/L)	1				< 5.000	
	Iron (mg/L)	1				0.366	
	Lead (µg/L)	1				< 0.9	
	J Manganese (mg/L)	1				0.026	
	J Nickel (µg/L)	1				< 45.000	
	Selenium (µg/L)	1				< 2.5	
	Silver (µg/L)	1				< 0.215	
	Thallium (µg/L)	1				< 1.4	
	J Zinc (µg/L)	1				< 32.000	
	Biological						
	Chlorophyll a (mg/m³)	4	< 1.00	2.00	0.50	0.88	0.75
	J Enterococci (COL/DL)	4	210	14000	1200	4153	6600

Station	Parameter	N	Min	Max	Med	Avg	SD
FR-1	**Physical**						
	Temperature (°C)	3	22.8	30.3	25.4	26.1	3.8
	Turbidity (NTU)	3	9.0	18.0	16.0	14.3	4.7
	Total Dissolved Solids (mg/L)	3	2950.0	11600.0	6380.0	6976.7	4355.8
	Total Suspended Solids (mg/L)	3	11.0	20.0	11.0	14.0	5.2
	Specific Conductance (µmhos/cm@25C)	3	11342.0	20480.9	12279.7	14700.9	5027.6
	J Hardness (mg/L)	1				523.0	
	Alkalinity (mg/L)	3 <	3.0	66.0	49.0	38.8	33.4
	Chemical						
	Dissolved Oxygen (mg/L)	3	4.9	6.5	4.9	5.4	0.9
	pH (SU)	3	6.2	7.3	6.6	6.7	0.6
	J Ammonia Nitrogen (mg/L)	3	0.070	0.150	0.140	0.120	0.044
	J Nitrate+Nitrite Nitrogen (mg/L)	3 <	0.015	0.149	0.019	0.058	0.078
	Total Kjeldahl Nitrogen (mg/L)	3	0.530	0.820	0.630	0.660	0.147
	J Total Nitrogen (mg/L)	3 <	0.538	0.969	0.649	0.718	0.224
	Dissolved Reactive Phosphorus (mg/L)	3 <	0.002	0.012	0.010	0.008	0.006
	Total Phosphorus (mg/L)	3	0.042	0.065	0.050	0.052	0.012
	J CBOD-5 (mg/L)	3 <	2.0 <	2.0	1.0	1.0	0.0
	Chlorides (mg/L)	3	1700.0	9600.0	3800.0	5033.3	4091.9
	Total Metals						
	Aluminum (mg/L)	1				0.825	
	Iron (mg/L)	1				0.535	
	Manganese (mg/L)	1				0.082	
	Dissolved Metals						
	Aluminum (mg/L)	1				0.246	
	Antimony (µg/L)	1				3.6 <	
	Arsenic (µg/L)	1				1.8 <	
	Cadmium (µg/L)	1				0.031 <	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
	J Iron (mg/L)	1				0.146	
	J Lead (µg/L)	1				0.4 <	
	Manganese (mg/L)	1				0.088	
	J Mercury (µg/L)	1				0.178	
	Nickel (µg/L)	1				45.000 <	
	Selenium (µg/L)	1				2.5 <	
	J Silver (µg/L)	1				0.200 <	
	J Thallium (µg/L)	1				1.4 <	
	Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	3 <	1.00	4.00	3.20	2.57	1.83
	J Enterococci (COL/DL)	3	2	24	4	10	12

Station	Parameter	N	Min	Max	Med	Avg	SD
HMCM-2	**Physical**						
	Temperature (°C)	2	22.3	25.2	23.7	23.7	2.0
	Turbidity (NTU)	4	2.0	4.8	3.0	3.2	1.2
	Total Dissolved Solids (mg/L)	4	52.0	85.0	69.0	68.8	15.3
	Total Suspended Solids (mg/L)	4 <	5.0	5.0	2.5	3.1	1.2
	Specific Conductance (µmhos/cm@25C)	2	83.6	90.0	86.8	86.8	4.5
	Hardness (mg/L)	1				29.0	
	Alkalinity (mg/L)	4 <	3.0	37.0	22.5	20.9	15.1
	Monthly Stream Flow (cfs)	4	11.9	49.3	30.8	30.7	16.5
	Stream Flow during Sample Collection (cfs)	4	11.9	49.3	30.8	30.7	16.5
	Chemical						
	Dissolved Oxygen (mg/L)	2	6.8	7.9	7.4	7.4	0.8
	pH (SU)	2	6.7	6.8	6.7	6.7	0.1
	J Ammonia Nitrogen (mg/L)	4	0.010	0.130	0.050	0.060	0.056
	Nitrate+Nitrite Nitrogen (mg/L)	4	0.284	0.386	0.332	0.333	0.049
	J Total Kjeldahl Nitrogen (mg/L)	4 <	0.080	0.420	0.125	0.182	0.165
	J Total Nitrogen (mg/L)	4 <	0.424	0.704	0.468	0.516	0.127
	J Dissolved Reactive Phosphorus (mg/L)	4	0.007	0.012	0.008	0.009	0.002
	J Total Phosphorus (mg/L)	4	0.009	0.018	0.012	0.012	0.004
	J CBOD-5 (mg/L)	4 <	2.0 <	2.0	1.0	1.0	0.0
	Chlorides (mg/L)	4	8.3	8.4	8.3	8.3	0.0
	Total Metals						
	J Aluminum (mg/L)	1				0.102	
	Iron (mg/L)	1				1.010	
	J Manganese (mg/L)	1				0.028	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.132	
	Antimony (µg/L)	1				3.6 <	
	Arsenic (µg/L)	1				1.8 <	
	Cadmium (µg/L)	1				0.046 <	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
	Iron (mg/L)	1				0.601	
	Lead (µg/L)	1				0.9 <	
	J Manganese (mg/L)	1				0.033	
	J Nickel (µg/L)	1				45.000 <	
	Selenium (µg/L)	1				2.5 <	
	Silver (µg/L)	1				0.215 <	
	Thallium (µg/L)	1				1.4 <	
	J Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	4 <	1.00	1.10	0.50	0.65	0.30
	J Enterococci (COL/DL)	4	110	160	140	138	26

Station	Parameter	N	Min	Max	Med	Avg	SD
MB-2A	**Physical**						
	Temperature (°C)	3	21.1	27.2	26.7	25.0	3.4
	Turbidity (NTU)	3	2.4	3.5	2.6	2.8	0.6
	Total Dissolved Solids (mg/L)	3	22400.0	24300.0	22600.0	23100.0	1044.0
	Total Suspended Solids (mg/L)	3	12.0	16.0	16.0	14.7	2.3
	Specific Conductance (µmhos/cm@25C)	3	45736.0	46328.0	45974.0	46012.7	297.9
	J Hardness (mg/L)	1				5500.0	
	J Alkalinity (mg/L)	3	98.0	112.0	106.0	105.3	7.0
	Chemical						
	Dissolved Oxygen (mg/L)	3	6.5	7.0	6.6	6.7	0.2
	pH (SU)	3	8.1	8.2	8.1	8.1	0.1
	Ammonia Nitrogen (mg/L)	3 <	0.005	0.390	0.002	0.132	0.224
	J Nitrate+Nitrite Nitrogen (mg/L)	3 <	0.004	0.118	0.008	0.042	0.065
	J Total Kjeldahl Nitrogen (mg/L)	3	0.120	0.680	0.200	0.333	0.303
	J Total Nitrogen (mg/L)	3 <	0.122	0.688	0.318	0.376	0.287
	Dissolved Reactive Phosphorus (mg/L)	3 <	0.001	0.002	0.001	0.001	0.000
	J Total Phosphorus (mg/L)	3	0.054	0.058	0.056	0.056	0.002
	J CBOD-5 (mg/L)	3 <	2.0 <	2.0	1.0	1.0	0.0
	Chlorides (mg/L)	3	18000.0	19000.0	18000.0	18333.3	577.4
	Total Metals						
	J Aluminum (mg/L)	1				0.184	
	Iron (mg/L)	1				0.036 <	
	Manganese (mg/L)	1				0.002 <	
	J Mercury (µg/L)	1				0.102	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.110	
	Antimony (µg/L)	1				3.6 <	
	J Arsenic (µg/L)	1				1.8 <	
	J Cadmium (µg/L)	1				0.570	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
	Iron (mg/L)	1				0.036 <	
	J Lead (µg/L)	1				58.4	
	J Manganese (mg/L)	1				0.009	
	Nickel (µg/L)	1				45.000 <	
	J Selenium (µg/L)	1				2.5 <	
	J Silver (µg/L)	1				0.200 <	
	J Thallium (µg/L)	1				23.5	
	Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	3	1.00	1.00	0.50	0.50	0.00
	J Fecal Coliform (COL/DL)	3	2	2	1	1	0
	J Enterococci (COL/DL)	3	2	2	1	1	0

Station	Parameter	N	Min	Max	Med	Avg	SD
MB-3A	**Physical**						
	Temperature (°C)	3	19.8	26.9	25.9	24.2	3.9
	Turbidity (NTU)	3	8.0	14.9	10.1	11.0	3.5
	Total Dissolved Solids (mg/L)	3	15200.0	21100.0	15700.0	17333.3	3271.6
	Total Suspended Solids (mg/L)	3	15.0	26.0	15.0	18.7	6.4
	Specific Conductance (µmhos/cm@25C)	3	29671.0	31435.0	30412.0	30506.0	885.7
	J Hardness (mg/L)	1				3300.0	
	Alkalinity (mg/L)	3	55.0	89.0	89.0	77.7	19.6
	Chemical						
	Dissolved Oxygen (mg/L)	3	6.9	8.7	7.0	7.5	1.0
	pH (SU)	3	7.9	8.2	8.1	8.1	0.1
	Ammonia Nitrogen (mg/L)	3 <	0.005	0.230	0.002	0.078	0.131
	J Nitrate+Nitrite Nitrogen (mg/L)	3 <	0.004	0.015	0.008	0.006	0.003
	J Total Kjeldahl Nitrogen (mg/L)	3	0.110	0.630	0.300	0.347	0.263
	J Total Nitrogen (mg/L)	3 <	0.112	0.638	0.308	0.352	0.266
	Dissolved Reactive Phosphorus (mg/L)	3	0.029	0.037	0.030	0.032	0.004
	Total Phosphorus (mg/L)	3	0.042	0.058	0.048	0.049	0.008
	J CBOD-5 (mg/L)	3 <	2.0	2.0	1.0	1.3	0.6
	Chlorides (mg/L)	3	11000.0	12000.0	11000.0	11333.3	577.4
	Total Metals						
	Aluminum (mg/L)	1				0.521	
	Iron (mg/L)	1				0.339	
	J Manganese (mg/L)	1				0.031	
	J Mercury (µg/L)	1				0.153	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.107	
	Antimony (µg/L)	1				3.6 <	
	J Arsenic (µg/L)	1				1.8 <	
	Cadmium (µg/L)	1				0.031 <	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
	Iron (mg/L)	1				0.036 <	
	Lead (µg/L)	1				0.4 <	
	J Manganese (mg/L)	1				0.009	
	Nickel (µg/L)	1				45.000 <	
	J Selenium (µg/L)	1				2.5 <	
	Silver (µg/L)	1				0.200 <	
	J Thallium (µg/L)	1				6.7	
	Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	3	1.00	3.00	2.00	2.00	1.00
	Fecal Coliform (COL/DL)	3	2	2	1	1	0
	Enterococci (COL/DL)	3	2	2	1	1	0

Station	Parameter	N	Min	Max	Med	Avg	SD
MGRB-9	**Physical**						
	Turbidity (NTU)	4	8.8	15.0	11.2	11.5	2.9
	Total Dissolved Solids (mg/L)	4	5230.0	10600.0	9200.0	8557.5	2384.0
	Total Suspended Solids (mg/L)	4	10.0	16.0	13.0	13.0	2.4
	Hardness (mg/L)	1				1500.0	
	Alkalinity (mg/L)	4	27.0	54.0	44.5	42.5	12.1
	Monthly Stream Flow (cfs)	3	-233.3	336.9	129.1	77.8	288.3
	Stream Flow during SmplCollect (cfs)	3	-233.3	336.9	129.1	77.8	288.3
	Chemical						
	J Ammonia Nitrogen (mg/L)	4	0.010	0.120	0.040	0.052	0.048
	Nitrate+Nitrite Nitrogen (mg/L)	4	0.118	0.305	0.188	0.200	0.087
	Total Kjeldahl Nitrogen (mg/L)	4	0.780	1.200	1.035	1.012	0.181
	Total Nitrogen (mg/L)	4	1.085	1.339	1.212	1.212	0.145
	J Dissolved Reactive Phosphorus (mg/L)	4	0.007	0.019	0.014	0.014	0.006
	J Total Phosphorus (mg/L)	4	0.055	0.068	0.061	0.061	0.005
	J CBOD-5 (mg/L)	4	2.3	3.2	3.0	2.8	0.4
	Chlorides (mg/L)	4	3300.0	6900.0	5550.0	5325.0	1493.0
	Total Metals						
	J Aluminum (mg/L)	1				0.325	
	Iron (mg/L)	1				0.215	
	Manganese (mg/L)	1				0.073	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.152	
	Antimony (µg/L)	1				3.6 <	
	J Arsenic (µg/L)	1				1.8 <	
	J Cadmium (µg/L)	1				0.858	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
	J Iron (mg/L)	1				0.037	
	J Lead (µg/L)	1				0.9 <	
	J Manganese (mg/L)	1				0.016	
	J Nickel (µg/L)	1				45.000 <	
	J Selenium (µg/L)	1				2.5 <	
	J Silver (µg/L)	1				0.215 <	
	J Thallium (µg/L)	1				1.5	
	J Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m^3)	4	2.60	5.20	4.05	3.98	1.08
	Enterococci (COL/DL)	4	2	6	2	3	2

Station	Parameter	N	Min	Max	Med	Avg	SD
MO-1A	**Physical**						
	Temperature (°C)	3	25.2	29.8	27.7	27.5	2.3
	Turbidity (NTU)	3	8.0	25.0	8.0	13.7	9.8
	Total Dissolved Solids (mg/L)	3	216.0	989.0	344.0	516.3	414.3
	Total Suspended Solids (mg/L)	3	< 5.0	18.0	8.0	9.5	7.8
	Specific Conductance (µmhos/cm@25C)	3	355.8	1992.7	900.4	1083.0	833.6
	J Hardness (mg/L)	1				67.3	
	Alkalinity (mg/L)	3	26.0	59.0	40.0	41.7	16.6
	Chemical						
	Dissolved Oxygen (mg/L)	3	5.7	6.5	6.2	6.1	0.4
	pH (SU)	3	7.6	7.8	7.6	7.6	0.1
	Ammonia Nitrogen (mg/L)	3	0.040	0.060	0.050	0.050	0.010
	J Nitrate+Nitrite Nitrogen (mg/L)	3	0.100	0.279	0.197	0.192	0.090
	Total Kjeldahl Nitrogen (mg/L)	3	0.320	0.830	0.570	0.573	0.255
	J Total Nitrogen (mg/L)	3	0.517	1.109	0.670	0.765	0.307
	J Dissolved Reactive Phosphorus (mg/L)	3	0.009	0.013	0.011	0.011	0.002
	Total Phosphorus (mg/L)	3	0.047	0.069	0.057	0.058	0.011
	J CBOD-5 (mg/L)	3	< 2.0	< 2.0	1.0	1.0	0.0
	Chlorides (mg/L)	3	51.0	500.0	120.0	223.7	241.8
	Total Metals						
	Aluminum (mg/L)	1				0.743	
	Iron (mg/L)	1				1.010	
	Manganese (mg/L)	1				0.067	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.140	
	Antimony (µg/L)	1				< 3.6	
	Arsenic (µg/L)	1				< 1.8	
	J Cadmium (µg/L)	1				0.110	
	Chromium (µg/L)	1				< 17.000	
	Copper (µg/L)	1				< 5.000	
	J Iron (mg/L)	1				0.177	
	J Lead (µg/L)	1				1.0	
	J Manganese (mg/L)	1				0.022	
	J Mercury (µg/L)	1				0.044	
	Nickel (µg/L)	1				< 45.000	
	Selenium (µg/L)	1				< 2.5	
	J Silver (µg/L)	1				< 0.200	
	Thallium (µg/L)	1				< 1.4	
	Zinc (µg/L)	1				< 32.000	
	Biological						
	Chlorophyll a (mg/m³)	3	< 1.00	3.20	2.00	1.90	1.35
	J Enterococci (COL/DL)	3	2	12	2	5	6

Station	Parameter	N	Min	Max	Med	Avg	SD
MO-2	**Physical**						
	Temperature (°C)	2	24.5	28.7	26.6	26.6	3.0
	Turbidity (NTU)	3	5.0	16.0	5.0	8.7	6.4
	Total Dissolved Solids (mg/L)	3	2970.0	11000.0	7100.0	7023.3	4015.5
	Total Suspended Solids (mg/L)	3 <	5.0	10.0	7.0	6.5	3.8
	Specific Conductance (µmhos/cm@25C)	2	10987.9	18205.2	14596.6	14596.6	5103.4
	[J] Hardness (mg/L)	1				525.0	
	Alkalinity (mg/L)	3	25.0	77.0	59.0	53.7	26.4
	Chemical						
	Dissolved Oxygen (mg/L)	2	5.0	5.8	5.4	5.4	0.6
	pH (SU)	2	6.2	6.4	6.3	6.3	0.2
	Ammonia Nitrogen (mg/L)	3	0.080	0.140	0.130	0.117	0.032
	[J] Nitrate+Nitrite Nitrogen (mg/L)	3	0.087	0.168	0.165	0.140	0.046
	Total Kjeldahl Nitrogen (mg/L)	3 <	0.120	0.590	0.270	0.307	0.267
	[J] Total Nitrogen (mg/L)	3 <	0.228	0.677	0.435	0.447	0.225
	Dissolved Reactive Phosphorus (mg/L)	3	0.015	0.018	0.018	0.017	0.002
	Total Phosphorus (mg/L)	3	0.047	0.055	0.048	0.050	0.004
	[J] CBOD-5 (mg/L)	3 <	2.0 <	2.0	1.0	1.0	0.0
	Chlorides (mg/L)	3	1600.0	6400.0	4300.0	4100.0	2406.2
	Total Metals						
	Aluminum (mg/L)	1				0.502	
	Iron (mg/L)	1				0.607	
	Manganese (mg/L)	1				0.082	
	Dissolved Metals						
	[J] Aluminum (mg/L)	1				0.107	
	Antimony (µg/L)	1				3.6 <	
	Arsenic (µg/L)	1				1.8 <	
	Cadmium (µg/L)	1				0.031 <	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
	[J] Iron (mg/L)	1				0.127	
	[J] Lead (µg/L)	1				0.4 <	
	Manganese (mg/L)	1				0.076	
	[J] Mercury (µg/L)	1				0.123	
	Nickel (µg/L)	1				45.000 <	
	Selenium (µg/L)	1				2.5 <	
	[J] Silver (µg/L)	1				0.200 <	
	[J] Thallium (µg/L)	1				1.4 <	
	Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	3 <	1.00	1.00	0.50	0.50	0.00
	[J] Enterococci (COL/DL)	3	6	160	6	57	89

Station	Parameter	N	Min	Max	Med	Avg	SD
MOBB-1	**Physical**						
	Temperature (°C)	3	16.4	26.4	26.4	23.1	5.8
	Turbidity (NTU)	4	14.0	20.5	17.7	17.5	2.7
	Total Dissolved Solids (mg/L)	4	3910.0	12500.0	7730.0	7967.5	3851.1
	Total Suspended Solids (mg/L)	4	14.0	19.0	14.5	15.5	2.4
	Specific Conductance (µmhos/cm@25C)	3	4316.4	25954.3	7122.1	12464.3	11766.6
	Hardness (mg/L)	1				1700.0	
	Alkalinity (mg/L)	4 <	3.0	82.0	72.5	57.1	37.4
	Chemical						
	Dissolved Oxygen (mg/L)	3	5.7	9.0	6.5	7.0	1.7
	pH (SU)	3	6.9	7.8	7.7	7.4	0.5
J	Ammonia Nitrogen (mg/L)	4	0.020	0.180	0.060	0.080	0.070
J	Nitrate+Nitrite Nitrogen (mg/L)	4 <	0.004	0.116	0.048	0.053	0.060
	Total Kjeldahl Nitrogen (mg/L)	4	0.320	0.780	0.560	0.555	0.202
J	Total Nitrogen (mg/L)	4 <	0.413	0.782	0.619	0.608	0.154
J	Dissolved Reactive Phosphorus (mg/L)	4	0.007	0.039	0.028	0.025	0.013
	Total Phosphorus (mg/L)	4	0.060	0.100	0.084	0.082	0.021
J	CBOD-5 (mg/L)	4 <	2.0	2.3	1.0	1.3	0.6
J	Chlorides (mg/L)	4	2200.0	9200.0	4900.0	5300.0	3031.0
	Total Metals						
J	Aluminum (mg/L)	1				0.428	
	Iron (mg/L)	1				0.492	
	Manganese (mg/L)	1				0.197	
	Dissolved Metals						
J	Aluminum (mg/L)	1				0.131	
	Antimony (µg/L)	1				3.6 <	
J	Arsenic (µg/L)	1				1.8 <	
J	Cadmium (µg/L)	1				0.046 <	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
	Iron (mg/L)	1				0.036 <	
J	Lead (µg/L)	1				0.9 <	
	Manganese (mg/L)	1				0.096	
J	Nickel (µg/L)	1				45.000 <	
	Selenium (µg/L)	1				2.5 <	
J	Silver (µg/L)	1				0.215 <	
J	Thallium (µg/L)	1				1.5	
J	Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	3 <	1.00	1.00	0.50	0.50	0.00
J	Enterococci (COL/DL)	5	2	6	1	2	2

Station	Parameter	N	Min	Max	Med	Avg	SD
MOBM-1	**Physical**						
	Temperature (°C)	12	11.1	31.4	24.4	23.0	7.0
	Turbidity (NTU)	12	3.0	94.0	17.0	29.7	27.4
	Total Dissolved Solids (mg/L)	12	101.0	196.0	135.0	141.9	34.6
	Total Suspended Solids (mg/L)	12	8.0	127.0	15.5	29.5	34.6
	Specific Conductance (µmhos/cm@25C)	13	131.6	282.8	214.9	204.2	54.7
	Hardness (mg/L)	1				59.1	
J	Alkalinity (mg/L)	12 <	3.0	79.0	50.0	48.6	20.8
	Monthly Stream Flow (cfs)	11	527.0	55800.0	15000.0	20468.8	19950.0
	Stream Flow during Sample Collection (cfs)	11	527.0	55800.0	15000.0	20468.8	19950.0
	Chemical						
	Dissolved Oxygen (mg/L)	12	5.7	11.5	6.8	7.6	1.8
	pH (SU)	13	5.7	7.3	6.3	6.3	0.4
J	Ammonia Nitrogen (mg/L)	12 <	0.005	0.080	0.025	0.025	0.024
J	Nitrate+Nitrite Nitrogen (mg/L)	12	0.018	0.392	0.190	0.211	0.123
J	Total Kjeldahl Nitrogen (mg/L)	12 <	0.120	0.600	0.480	0.473	0.147
J	Total Nitrogen (mg/L)	12 <	0.256	0.885	0.722	0.684	0.183
J	Dissolved Reactive Phosphorus (mg/L)	12 <	0.005	0.024	0.011	0.011	0.006
J	Total Phosphorus (mg/L)	12	0.048	0.210	0.062	0.084	0.046
J	CBOD-5 (mg/L)	12 <	2.0 <	2.0	1.0	1.0	0.0
J	Chlorides (mg/L)	12	7.9	23.0	16.5	14.9	5.6
	Total Metals						
	Aluminum (mg/L)	1				0.478	
	Iron (mg/L)	1				0.569	
	Manganese (mg/L)	1				0.050	
	Dissolved Metals						
J	Aluminum (mg/L)	1				0.096	
	Antimony (µg/L)	1				3.6 <	
	Arsenic (µg/L)	1				1.8 <	
J	Cadmium (µg/L)	1				0.031 <	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
J	Iron (mg/L)	1				0.121	
J	Lead (µg/L)	1				0.4 <	
	Manganese (mg/L)	1				0.002 <	
	Mercury (µg/L)	1				0.040 <	
J	Nickel (µg/L)	1				45.000 <	
	Selenium (µg/L)	1				2.5 <	
J	Silver (µg/L)	1				0.200 <	
	Thallium (µg/L)	1				1.4 <	
J	Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	12 <	1.00	4.10	2.15	2.18	1.33
J	Enterococci (COL/DL)	12	2	370	11	48	105

Station	Parameter	N	Min	Max	Med	Avg	SD
RBTM-5	**Physical**						
	Temperature (°C)	2	21.1	21.8	21.4	21.4	0.5
	Turbidity (NTU)	4	2.4	6.6	3.2	3.8	1.9
	Total Dissolved Solids (mg/L)	4	88.0	2280.0	117.5	650.8	1086.4
	Total Suspended Solids (mg/L)	4 <	5.0	6.0	2.5	3.4	1.8
	Specific Conductance (µmhos/cm@25C)	2	113.2	5772.2	2942.7	2942.7	4001.5
	Hardness (mg/L)	1				37.0	
	Alkalinity (mg/L)	4 <	3.0	22.0	8.8	10.2	10.4
	Monthly Stream Flow (cfs)	2	-3.8	14.4	6.1	6.1	11.7
	Stream Flow during Sample Collection (cfs)	2	-3.8	14.4	6.1	6.1	11.7
	Chemical						
	Dissolved Oxygen (mg/L)	2	4.5	5.3	4.9	4.9	0.6
	pH (SU)	2	6.4	6.5	6.4	6.4	0.1
	J Ammonia Nitrogen (mg/L)	4 <	0.005	0.100	0.050	0.051	0.043
	Nitrate+Nitrite Nitrogen (mg/L)	4	0.116	0.326	0.224	0.222	0.095
	J Total Kjeldahl Nitrogen (mg/L)	4	0.110	0.320	0.270	0.242	0.095
	J Total Nitrogen (mg/L)	4	0.416	0.513	0.466	0.465	0.046
	J Dissolved Reactive Phosphorus (mg/L)	4	0.005	0.007	0.006	0.006	0.001
	Total Phosphorus (mg/L)	4	0.010	0.029	0.018	0.019	0.008
	J CBOD-5 (mg/L)	4 <	2.0 <	2.0	1.0	1.0	0.0
	Chlorides (mg/L)	4	16.0	1300.0	40.0	349.0	634.3
	Total Metals						
	J Aluminum (mg/L)	1				0.119	
	Iron (mg/L)	1				0.725	
	J Manganese (mg/L)	1				0.033	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.080	
	Antimony (µg/L)	1				3.6 <	
	J Arsenic (µg/L)	1				2.1	
	Cadmium (µg/L)	1				0.046 <	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
	Iron (mg/L)	1				0.435	
	Lead (µg/L)	1				0.9 <	
	J Manganese (mg/L)	1				0.040	
	J Nickel (µg/L)	1				45.000 <	
	Selenium (µg/L)	1				2.5 <	
	Silver (µg/L)	1				0.215 <	
	Thallium (µg/L)	1				1.4 <	
	J Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	4 <	1.00	5.20	0.50	1.68	2.35
	J Enterococci (COL/DL)	4	20	560	71	181	255

Station	Parameter	N	Min	Max	Med	Avg	SD
TC-1	**Physical**						
	Temperature (°C)	3	25.7	29.5	27.2	27.4	1.9
	Turbidity (NTU)	3	3.0	10.0	7.0	6.7	3.5
	Total Dissolved Solids (mg/L)	3	7890.0	14000.0	12000.0	11296.7	3115.1
	Total Suspended Solids (mg/L)	3	5.0	17.0	9.0	10.3	6.1
	Specific Conductance (µmhos/cm@25C)	3	13301.4	29999.4	24252.4	22517.7	8483.1
	Hardness (mg/L)	1				2600.0	
	Alkalinity (mg/L)	3	65.0	94.0	65.0	74.7	16.7
	Chemical						
	Dissolved Oxygen (mg/L)	3	3.2	6.9	6.6	5.6	2.0
	pH (SU)	3	6.3	7.9	7.2	7.1	0.8
	J Ammonia Nitrogen (mg/L)	3	0.040	0.260	0.150	0.150	0.110
	Nitrate+Nitrite Nitrogen (mg/L)	3 <	0.015	0.124	0.037	0.056	0.060
	Total Kjeldahl Nitrogen (mg/L)	3	0.650	1.300	0.710	0.887	0.359
	Total Nitrogen (mg/L)	3 <	0.718	1.337	0.774	0.943	0.342
	Dissolved Reactive Phosphorus (mg/L)	3	0.014	0.210	0.110	0.111	0.098
	Total Phosphorus (mg/L)	3	0.059	0.350	0.180	0.196	0.146
	J CBOD-5 (mg/L)	3 <	2.0	7.9	1.0	3.3	4.0
	J Chlorides (mg/L)	3	5200.0	11000.0	8000.0	8066.7	2900.6
	Total Metals						
	J Aluminum (mg/L)	1				0.179	
	J Iron (mg/L)	1				0.100	
	J Manganese (mg/L)	1				0.117	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.226	
	Antimony (µg/L)	1				3.6 <	
	Arsenic (µg/L)	1				1.8 <	
	J Cadmium (µg/L)	1				0.046 <	
	J Chromium (µg/L)	1				17.000 <	
	J Copper (µg/L)	1				5.000 <	
	J Iron (mg/L)	1				0.036 <	
	J Lead (µg/L)	1				0.9 <	
	J Manganese (mg/L)	1				0.002 <	
	J Nickel (µg/L)	1				45.000 <	
	J Selenium (µg/L)	1				2.5 <	
	J Silver (µg/L)	1				0.215 <	
	J Thallium (µg/L)	1				2.4	
	J Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	3	1.90	6.00	3.20	3.70	2.10
	J Enterococci (COL/DL)	3	2	2	2	2	1

Station	Parameter	N	Min	Max	Med	Avg	SD
TENB-2	**Physical**						
	Temperature (°C)	3	24.6	29.6	27.6	27.2	2.5
	Turbidity (NTU)	3	6.0	19.0	6.0	10.3	7.5
	Total Dissolved Solids (mg/L)	3	185.0	828.0	320.0	444.3	339.0
	Total Suspended Solids (mg/L)	3 <	5.0	13.0	9.0	8.2	5.3
	Specific Conductance (µmhos/cm@25C)	3	276.3	1668.4	620.1	854.9	725.2
	J Hardness (mg/L)	1				63.9	
	Alkalinity (mg/L)	3	47.0	62.0	52.0	53.7	7.6
	Chemical						
	Dissolved Oxygen (mg/L)	3	5.5	7.5	6.5	6.5	1.0
	pH (SU)	3	7.4	7.5	7.5	7.4	0.1
	J Ammonia Nitrogen (mg/L)	3 <	0.005	0.050	0.010	0.021	0.026
	J Nitrate+Nitrite Nitrogen (mg/L)	3	0.036	0.243	0.102	0.127	0.106
	J Total Kjeldahl Nitrogen (mg/L)	3 <	0.120	0.550	0.480	0.363	0.265
	J Total Nitrogen (mg/L)	3 <	0.303	0.586	0.582	0.490	0.162
	J Dissolved Reactive Phosphorus (mg/L)	3	0.005	0.011	0.006	0.007	0.003
	Total Phosphorus (mg/L)	3	0.048	0.068	0.051	0.056	0.011
	J CBOD-5 (mg/L)	3 <	2.0 <	2.0	1.0	1.0	0.0
	Chlorides (mg/L)	3	49.0	420.0	110.0	193.0	198.9
	Total Metals						
	Aluminum (mg/L)	1				0.592	
	Iron (mg/L)	1				0.755	
	Manganese (mg/L)	1				0.072	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.143	
	Antimony (µg/L)	1				3.6 <	
	Arsenic (µg/L)	1				1.8 <	
	Cadmium (µg/L)	1				0.046 <	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
	J Iron (mg/L)	1				0.180	
	Lead (µg/L)	1				0.9 <	
	J Manganese (mg/L)	1				0.015	
	J Mercury (µg/L)	1				0.047	
	Nickel (µg/L)	1				45.000 <	
	Selenium (µg/L)	1				2.5 <	
	Silver (µg/L)	1				0.215 <	
	Thallium (µg/L)	1				1.4 <	
	Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	3 <	1.00	5.20	3.10	2.93	2.35
	J Enterococci (COL/DL)	3	2	28	2	10	15

Station	Parameter	N	Min	Max	Med	Avg	SD
TM-1	**Physical**						
	Temperature (°C)	2	24.2	27.0	25.6	25.6	2.0
	Turbidity (NTU)	3	3.0	12.0	4.0	6.3	4.9
	Total Dissolved Solids (mg/L)	3	952.0	4980.0	4390.0	3440.7	2175.3
	Total Suspended Solids (mg/L)	3	6.0	9.0	8.0	7.7	1.5
	Specific Conductance (µmhos/cm@25C)	2	1760.4	11832.1	6796.2	6796.2	7121.8
	Hardness (mg/L)	1				801.0	
	Alkalinity (mg/L)	3	65.0	81.0	69.0	71.7	8.3
	Monthly Stream Flow (cfs)	1				403.9	
	Stream Flow during Sample Collection (cfs)	1				403.9	
	Chemical						
	Dissolved Oxygen (mg/L)	2	3.6	4.3	3.9	3.9	0.5
	pH (SU)	2	5.9	6.4	6.1	6.1	0.3
	Ammonia Nitrogen (mg/L)	3	0.140	0.380	0.160	0.227	0.133
	Nitrate+Nitrite Nitrogen (mg/L)	3	0.916	1.830	1.590	1.445	0.474
	Total Kjeldahl Nitrogen (mg/L)	3	0.610	1.100	0.910	0.873	0.247
	Total Nitrogen (mg/L)	3	1.826	2.930	2.200	2.319	0.561
	J Dissolved Reactive Phosphorus (mg/L)	3	0.120	0.300	0.200	0.207	0.090
	J Total Phosphorus (mg/L)	3	0.210	0.440	0.310	0.320	0.115
	J CBOD-5 (mg/L)	3 <	2.0	2.4	1.0	1.5	0.8
	J Chlorides (mg/L)	3	490.0	3800.0	2400.0	2230.0	1661.5
	Total Metals						
	J Aluminum (mg/L)	1				0.147	
	J Iron (mg/L)	1				0.234	
	J Manganese (mg/L)	1				0.060	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.236	
	Antimony (µg/L)	1				3.6 <	
	Arsenic (µg/L)	1				1.8 <	
	J Cadmium (µg/L)	1				0.056	
	J Chromium (µg/L)	1				17.000 <	
	J Copper (µg/L)	1				5.000 <	
	J Iron (mg/L)	1				0.043	
	Lead (µg/L)	1				0.9 <	
	J Manganese (mg/L)	1				0.031	
	J Nickel (µg/L)	1				45.000 <	
	Selenium (µg/L)	1				2.5 <	
	Silver (µg/L)	1				0.215 <	
	Thallium (µg/L)	1				1.4 <	
	J Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	3 <	1.00	9.40	0.50	3.47	5.14
	J Enterococci (COL/DL)	3	6	580	470	352	305

Station	Parameter	N	Min	Max	Med	Avg	SD
WB-1	**Physical**						
	Temperature (°C)	10	18.5	30.1	26.3	25.0	4.2
	Turbidity (NTU)	10	5.0	14.0	10.0	9.3	2.9
	Total Dissolved Solids (mg/L)	10	2550.0	14300.0	4775.0	6209.0	3618.6
	Total Suspended Solids (mg/L)	10	6.0	48.0	13.0	14.8	12.2
	Specific Conductance (µmhos/cm@25C)	10	4375.2	31377.4	12312.7	14244.1	8830.5
	Hardness (mg/L)	1				768.0	
	J Alkalinity (mg/L)	10 <	3.0	73.0	28.0	31.9	25.8
	Chemical						
	Dissolved Oxygen (mg/L)	10	3.9	9.9	7.4	7.4	1.7
	pH (SU)	10	5.9	8.3	7.4	7.3	0.6
	J Ammonia Nitrogen (mg/L)	10 <	0.005	0.100	0.070	0.060	0.034
	J Nitrate+Nitrite Nitrogen (mg/L)	10 <	0.015	0.747	0.189	0.248	0.194
	J Total Kjeldahl Nitrogen (mg/L)	10	0.240	1.200	0.800	0.807	0.301
	J Total Nitrogen (mg/L)	10 <	0.506	1.497	1.116	1.055	0.306
	J Dissolved Reactive Phosphorus (mg/L)	10 <	0.002	0.011	0.007	0.006	0.004
	Total Phosphorus (mg/L)	10	0.048	0.100	0.060	0.066	0.015
	J CBOD-5 (mg/L)	10 <	2.0	4.9	2.8	2.8	1.4
	J Chlorides (mg/L)	10	1300.0	10000.0	2900.0	4070.0	2957.5
	Total Metals						
	Aluminum (mg/L)	1				0.309	
	J Iron (mg/L)	1				0.189	
	Manganese (mg/L)	1				0.076	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.080	
	Antimony (µg/L)	1				3.6 <	
	Arsenic (µg/L)	1				1.8 <	
	J Cadmium (µg/L)	1				0.031 <	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
	Iron (mg/L)	1				0.036 <	
	J Lead (µg/L)	1				0.4 <	
	J Manganese (mg/L)	1				0.031	
	J Mercury (µg/L)	1				0.123	
	Nickel (µg/L)	1				45.000 <	
	Selenium (µg/L)	1				2.5 <	
	J Silver (µg/L)	1				0.200 <	
	J Thallium (µg/L)	1				1.4	
	Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	10	1.60	16.00	6.15	7.06	4.60
	J Enterococci (COL/DL)	10	2	56	6	15	18

Station	Parameter	N	Min	Max	Med	Avg	SD
WKBB-2	**Physical**						
	Temperature (°C)	1				25.7	
	Turbidity (NTU)	4	12.8	20.0	14.6	15.5	3.4
	Total Dissolved Solids (mg/L)	4	12200.0	14700.0	13250.0	13350.0	1287.1
	Total Suspended Solids (mg/L)	4	16.0	31.0	18.5	21.0	6.9
	Specific Conductance (µmhos/cm@25C)	1				29004.9	
	Hardness (mg/L)	1				2800.0	
	Alkalinity (mg/L)	4	31.0	78.0	65.5	60.0	20.7
	Chemical						
	Dissolved Oxygen (mg/L)	1				5.4	
	pH (SU)	1				7.8	
	J Ammonia Nitrogen (mg/L)	4	0.010	0.220	0.075	0.095	0.096
	Nitrate+Nitrite Nitrogen (mg/L)	4 <	0.004	0.046	0.008	0.016	0.020
	Total Kjeldahl Nitrogen (mg/L)	4	0.710	1.000	0.805	0.830	0.124
	Total Nitrogen (mg/L)	4 <	0.718	1.008	0.829	0.846	0.120
	J Dissolved Reactive Phosphorus (mg/L)	4 <	0.002	0.025	0.013	0.013	0.013
	J Total Phosphorus (mg/L)	4	0.073	0.080	0.078	0.077	0.003
	J CBOD-5 (mg/L)	4	2.4	3.2	2.6	2.7	0.3
	Chlorides (mg/L)	4	7300.0	9700.0	9100.0	8800.0	1148.9
	Total Metals						
	J Aluminum (mg/L)	1				0.363	
	Iron (mg/L)	1				0.272	
	Manganese (mg/L)	1				0.057	
	Dissolved Metals						
	J Aluminum (mg/L)	1				0.110	
	Antimony (µg/L)	1				3.6 <	
	J Arsenic (µg/L)	1				1.8 <	
	J Cadmium (µg/L)	1				0.748	
	Chromium (µg/L)	1				17.000 <	
	Copper (µg/L)	1				5.000 <	
	Iron (mg/L)	1				0.036 <	
	J Lead (µg/L)	1				0.9 <	
	J Manganese (mg/L)	1				0.009	
	J Nickel (µg/L)	1				45.000 <	
	J Selenium (µg/L)	1				2.5 <	
	J Silver (µg/L)	1				0.215 <	
	J Thallium (µg/L)	1				1.4 <	
	J Zinc (µg/L)	1				32.000 <	
	Biological						
	Chlorophyll a (mg/m³)	4	1.70	5.00	3.00	3.18	1.42
	Enterococci (COL/DL)	4	2	2	1	1	0

J = one or more of the values provided are estimated; N= # of samples; < = Actual value is less than the detection limit.