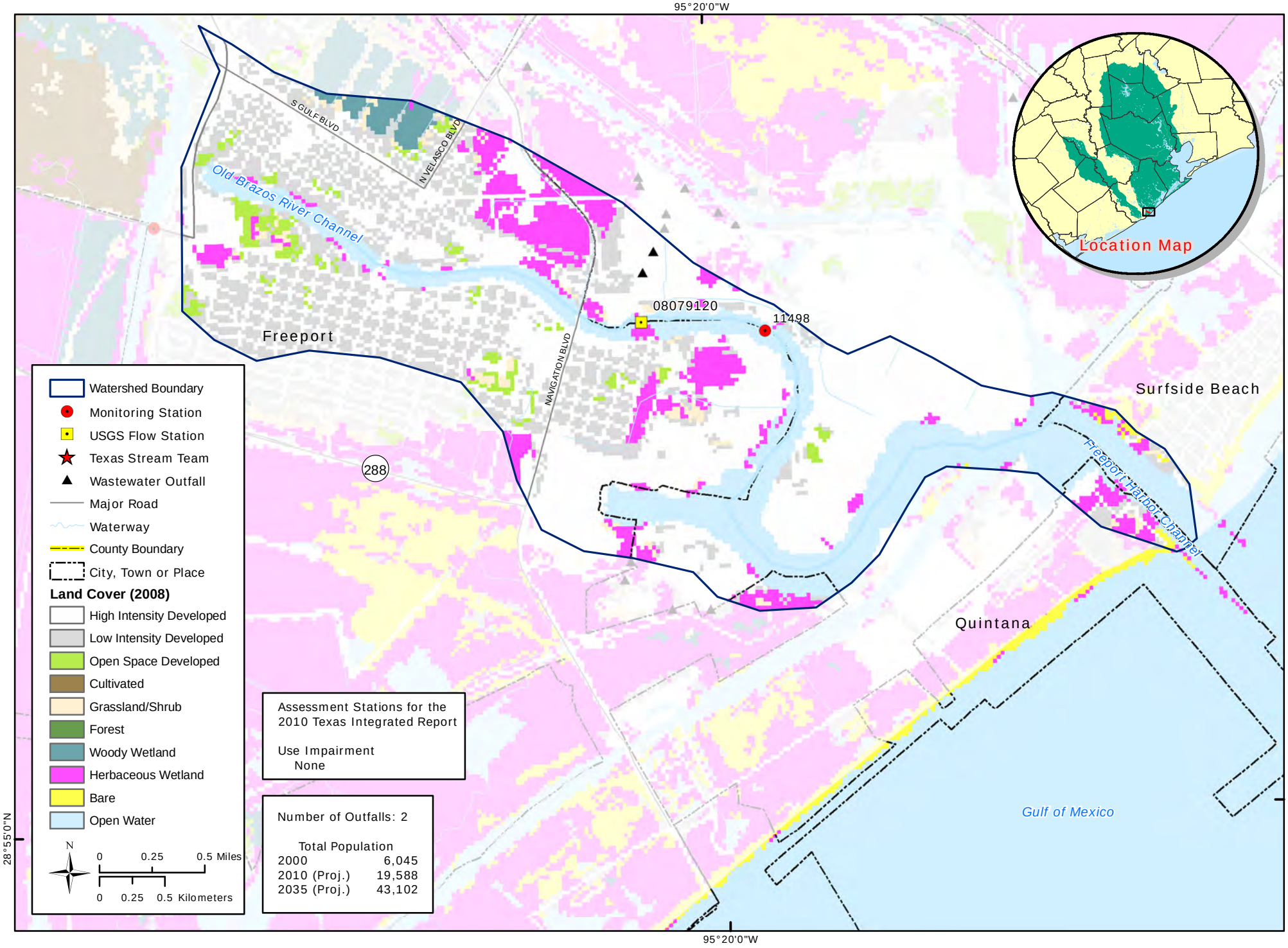
OLD BRAZOS RIVER CHANNEL - SEGMENT 1111



Segment Number:	1111	Name:	Old Brazos River Channel Tidal		
Length:	6 miles	Watershed Area:	5.3 square miles	Designated Uses:	High Aquatic Life; Contact Recreation
Number of Active Monitoring Stations:	1	Texas Stream Team Monitors:	0	Permitted Outfalls:	24
Description:	From the confluence with the Intracoastal Waterway in Brazoria County to SH 288 in Brazoria County.				

Degree of Impairment and Overall Trends

Segment ID	Dissolved Oxygen	Bacteria	Nutrients	PCBs/Dioxin	Chlorophyll *a*	Other
1111					100	

Indicates general improvement Indicates general degradation Numbers indicate percent of segment impaired

Monitoring Efforts

Site ID	Site Description	Frequency	Monitoring Entity	Parameter Groups
11498	Old Brazos River Channel midway between mouth and terminus	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll *a*

Segment 1111

Standards

Temperature (°C):	35
Dissolved Oxygen *(24-Hr Average)* (mg/L):	4.0
Dissolved Oxygen *(Absolute Minima)* (mg/L):	3.0
pH (standard units):	6.5-9.0
Enterococci (MPN/100mL) (grab):	89
Enterococci (MPN/100mL) (geometric mean):	35

Screening Levels

Ammonia-N (mg/L):	0.46
Nitrate-N (mg/L):	1.10
Orthophosphate Phosphorus (mg/L):	0.46
Total Phosphorus-P (mg/L):	0.66
Chlorophyll-*a* (µg/L):	21

Water Quality Issues Summary					
Issue	**2008 Assessment**	***Draft* 2010 Assessment**	**Affected Area**	**Possible Causes / Influences / Concerns Voiced by Stakeholders**	**Possible Solutions / Actions To Be Taken**
Elevated Chlorophyll *a* Concentrations	-	C	Entire segment	- Fertilizer runoff from surrounding watershed promote algal growth in waterways - Nutrient loading from WWTPs effluent, sanitary sewer overflows, and malfunctioning OSSFs promote algal growth	- Seek to improve storm water controls throughout watershed - Improve compliance and enforcement of existing storm water quality permits. - Support/continue/initiate public education regarding nutrients and consequences - Reduce or manage fertilizer runoff from agricultural areas
Elevated Heavy Metals in sediment "Iron"	-	C	Entire segment	- Dissolution from natural deposits - Discharges from domestic, agricultural or industrial sources. - Build up in pipelines, pressure tanks, water heaters and water softeners from industrial point sources - Particles deposition and resuspension processes due to dredging processes or tidal movements	- Increase monitoring and enforcement efforts to identify and control industrial point sources - Encourage additional testing to locate all unknown sources/deposits

Segment Discussion:

Watershed Characteristics: This small watershed comprises what was once the mouth of the Brazos River, in southern Brazoria County. The watershed is home to the Freeport petrochemical complex, which dominates the landscape. Beach-front residential development along with water recreational activities are observed in the lower reaches of the watershed at Surfside Beach and Quintana. There are large expanses of wetlands within and surrounding the watershed.

Water Quality Issues: While the recreation use is fully supported, the aquatic life and general uses are listed as water quality concerns in the *Draft* 2010 Texas Integrated Report (IR). Levels of chlorophyll *a*, higher than the standard of 21µg/mL, were found in 36% of the samples collected. Additionally, high levels of iron in sediment were found in four out of four sediment samples. However, these two parameters were not a listed concern in the 2008 Texas IR.

Special Studies/Projects: This segment was not included in any special studies or project during the past five years.

Trends: Regression analysis of watershed-level data revealed statistically significant trends for six water quality parameters. The median chlorophyll *a* concentration has been increasing significantly since 1995, the first year of monitoring for this parameter. In early 2007, the station reached a concentration level above the screening level, and it stayed above until early 2009. Total organic carbon (TOC) has also been identified as a significant trend in the watershed, but because most data are at or near the detection limit it cannot be considered an important trend (if it truly exists). Total suspended solids and volatile suspended solids, however, have both been significantly decreasing.

Regression analysis on data from only one individual monitoring station revealed five significant trends. Since only one station is used to analyze trends in the watershed, it is not surprising that station-level trends are similar to watershed-level trends. Station 11498, which is located near the mid-point of the river channel, shows a significant increase in chlorophyll *a* and TOC and a decrease in total suspended solids (TSS) and volatile suspended solids (VSS).

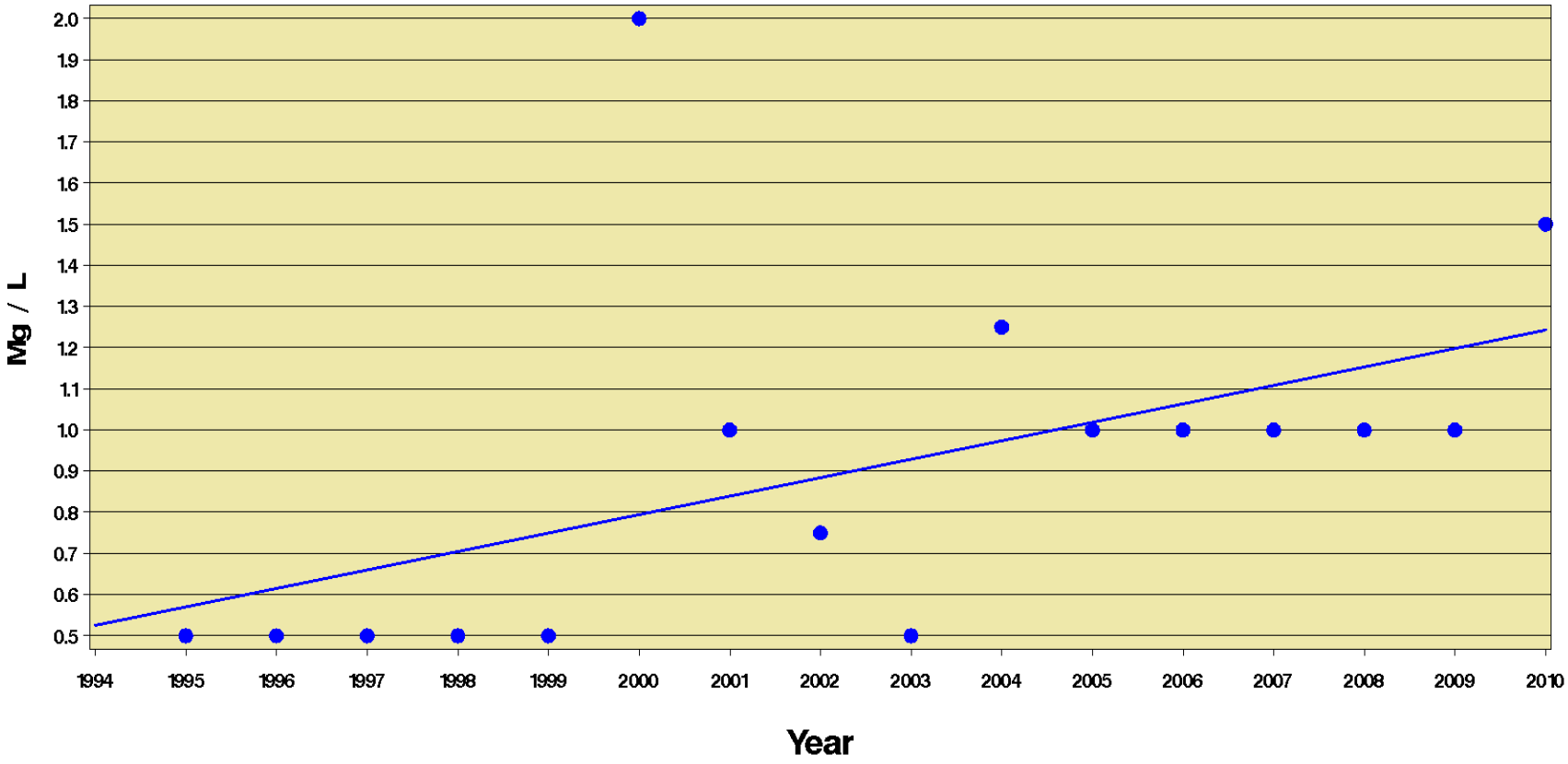
Recommendations:

- Address the various concerns found in this segment summary through stakeholder participation.
- Continue collecting water quality data to support actions associated with future watershed protection plan development and/or modeling.
- Work with local partner and contract labs to lower detection limits for nutrients.

Old Brazos River Channel Tidal

Segment: 1111 Parameter: Total Organic Carbon Annual Median

Water Body Type: Classified Estuary



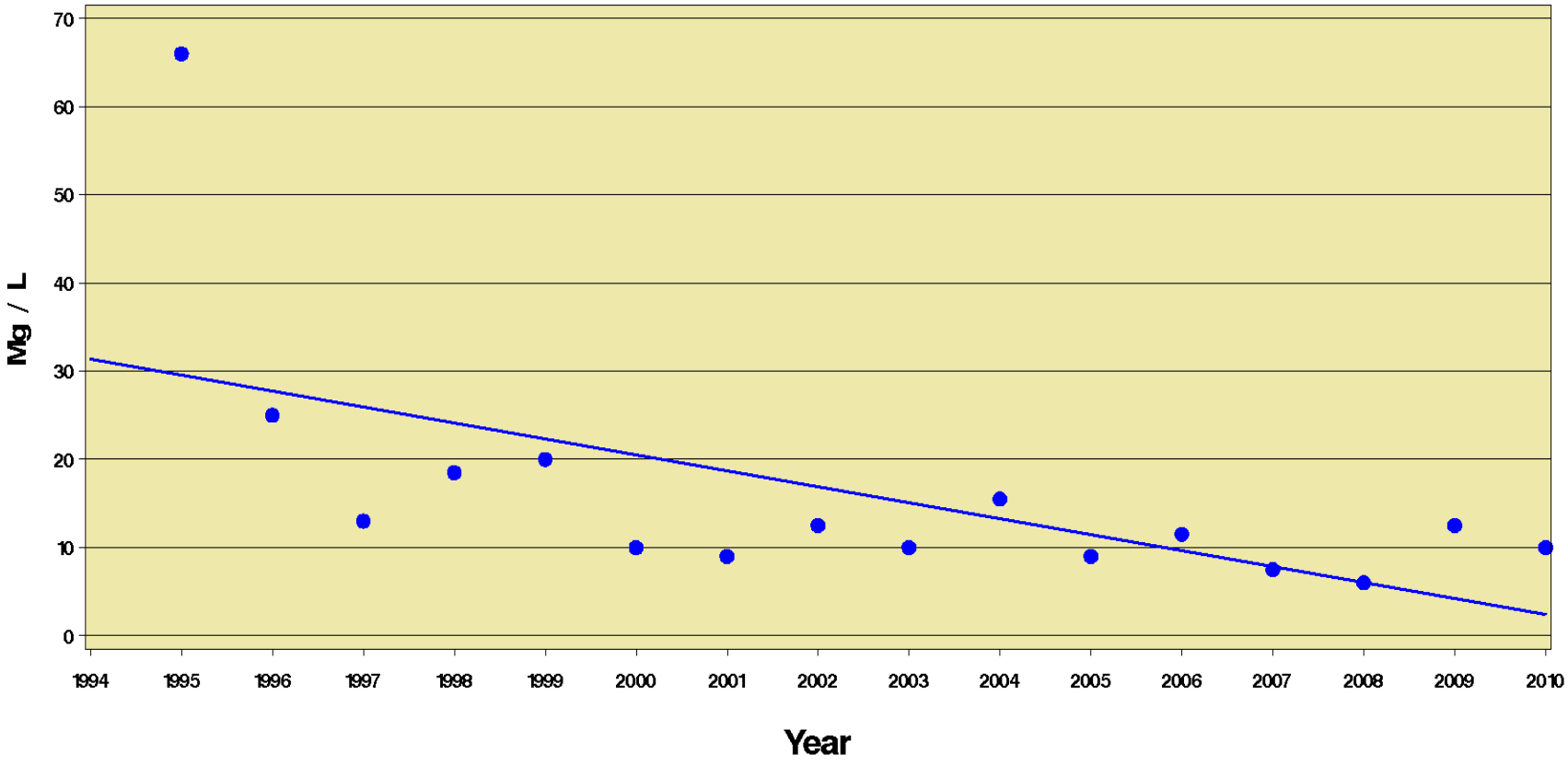
Trends are considered significant if the p–value is < 0.10

Trend is significant at p= 0.0485 R–Square = 0.2502 T–Value = 2.161 Number of samples: 54

Old Brazos River Channel Tidal

Segment: 1111 Parameter: Total Suspended Solids Annual Median

Water Body Type: Classified Estuary



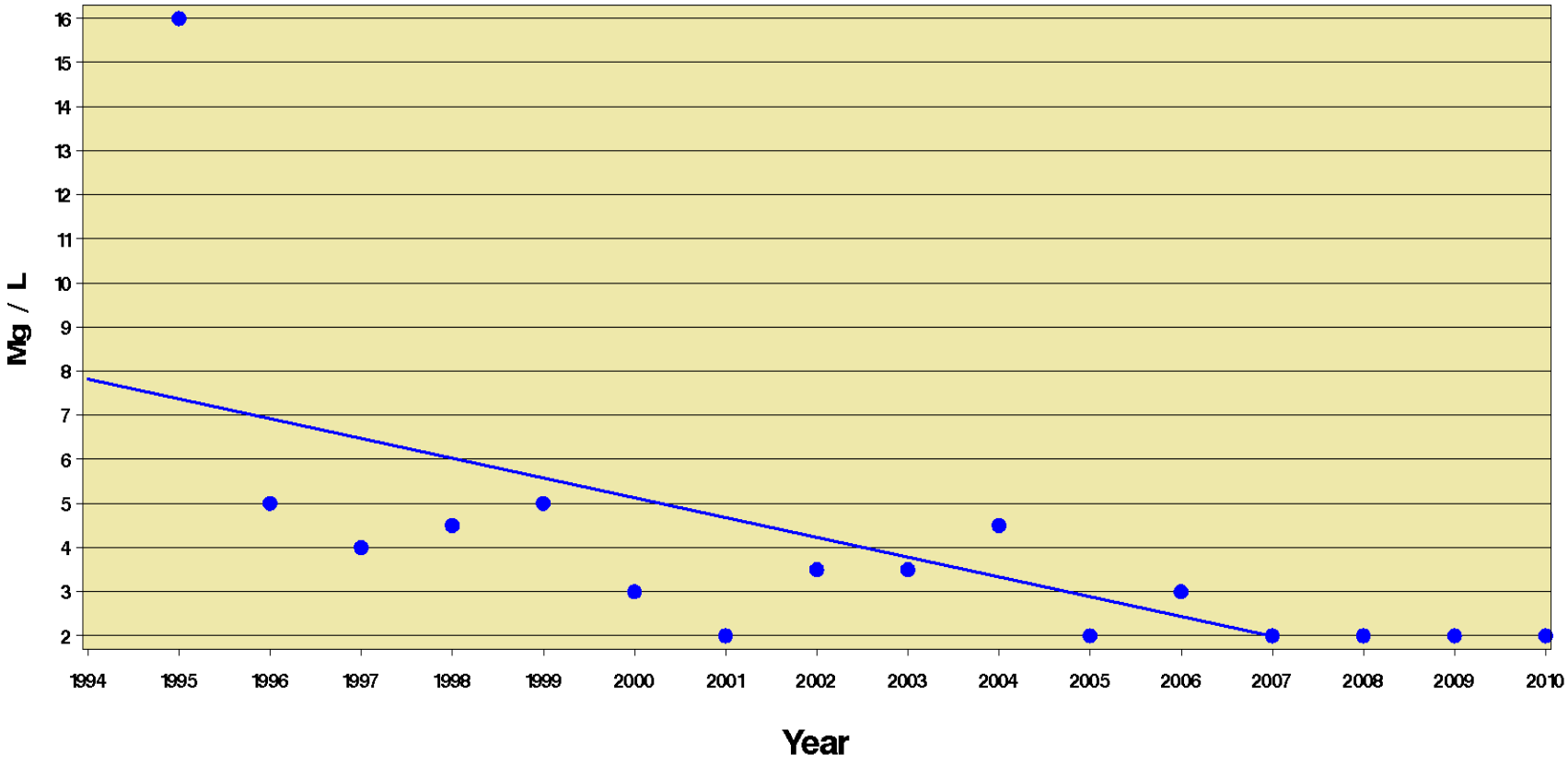
Trends are considered significant if the p–value is < 0.10

Trend is significant at p= 0.0133 R–Square = 0.3641 T–Value = –2.831 Number of samples: 57

Old Brazos River Channel Tidal

Segment: 1111 Parameter: Volatile Suspended Solids Annual Median

Water Body Type: Classified Estuary



Trends are considered significant if the p−value is < 0.10

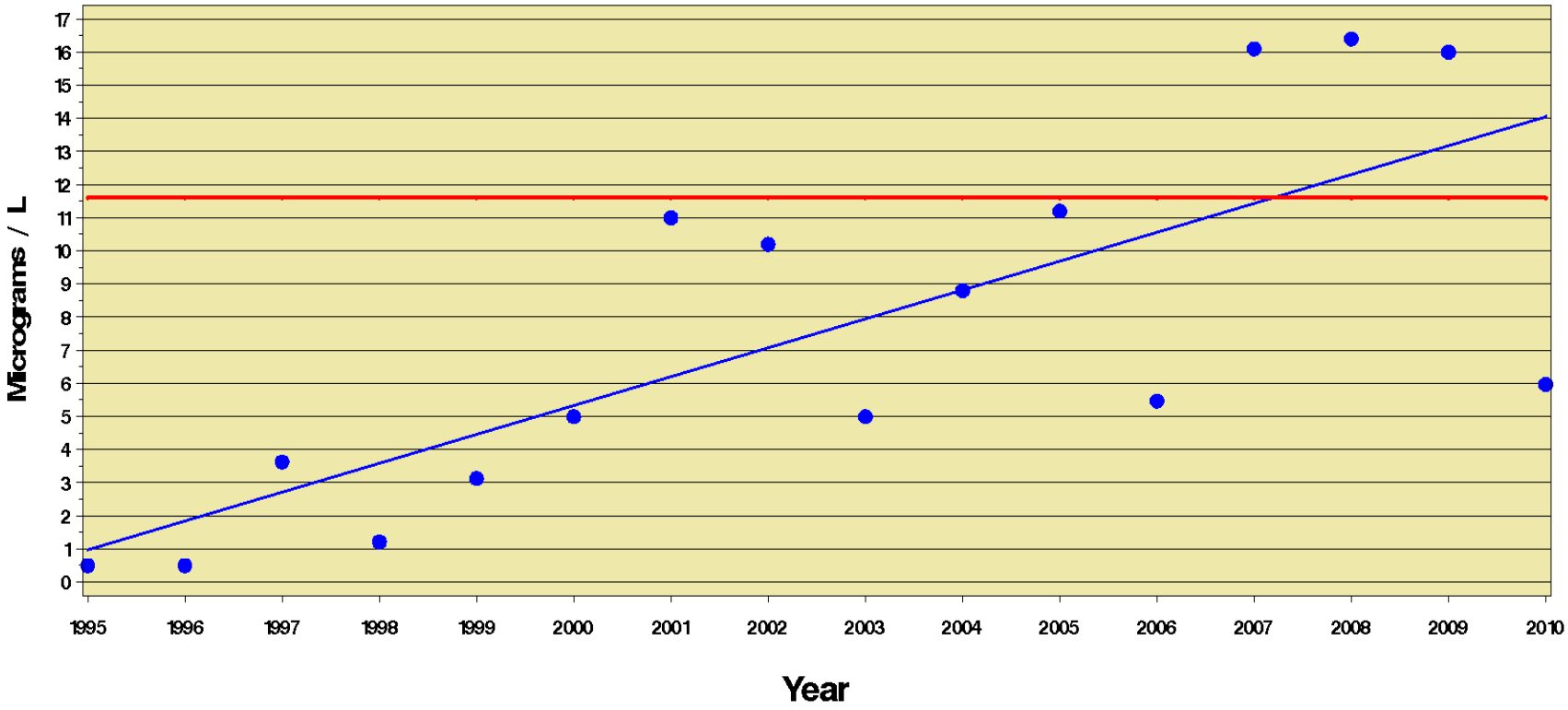
Trend is significant at p= 0.0091 R−Square = 0.3954 T−Value = −3.026 Number of samples: 56

Old Brazos River Channel Tidal

Monitoring Station: 11498 Segment: 1111 Assessment Unit: 1111_01

Parameter: Chlorophyll a Annual Median

2010 Nutrient Screening Level: 11.6 Micrograms / L



Trends are considered significant if the p–value is < 0.10

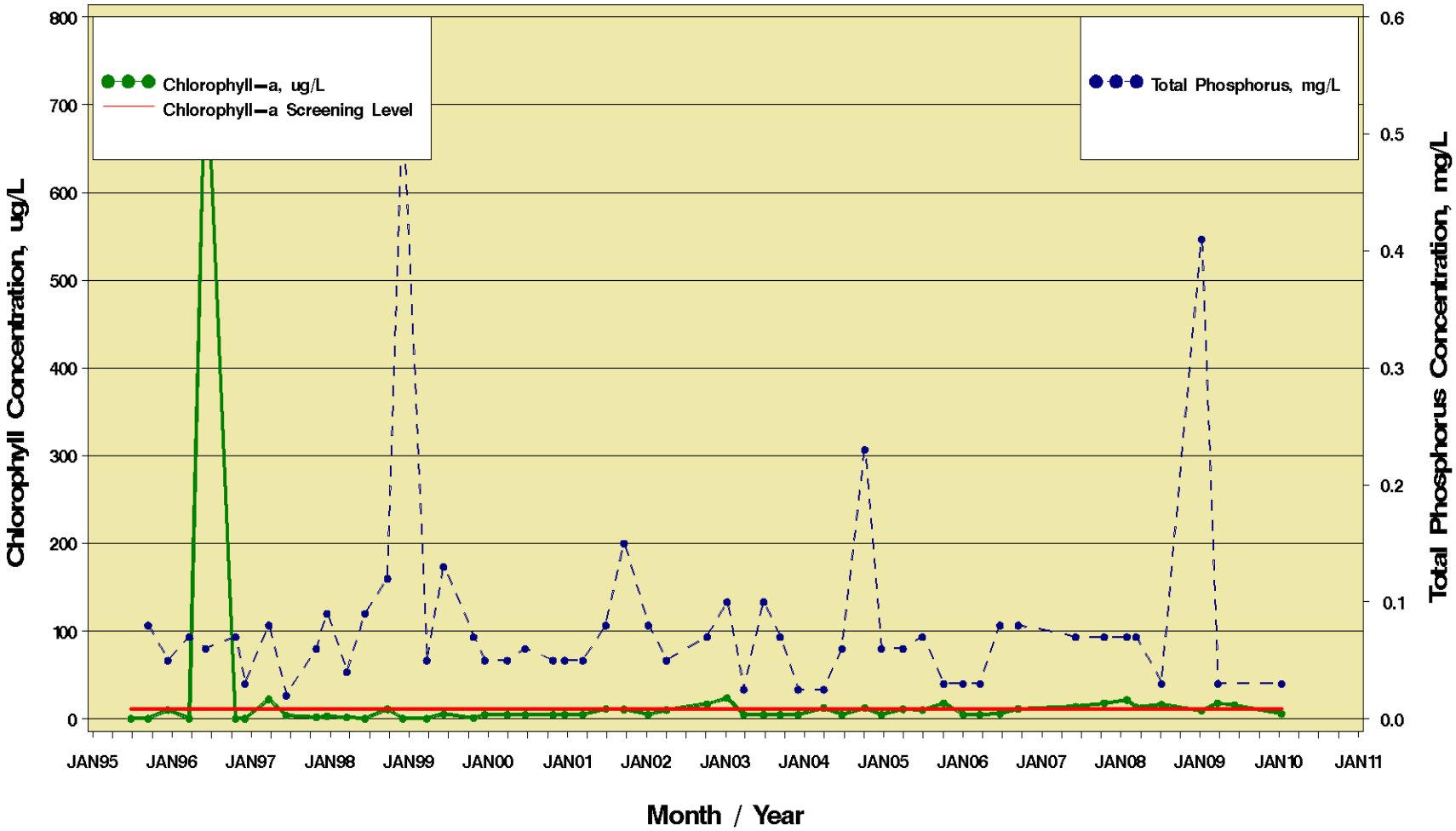
Trend is significant at p= 0.0007 R–Square = 0.5745 T–Value = 4.347 Number of Samples= 54

Red line indicates the applicable 2010 Nutrient Screening Level

Chlorophyll—a and Total Phosphorus Concentrations

Segment: 1111 Watershed: Old Brazos River Channel Tidal

Station: 11498 Assessment Unit: 1111_01

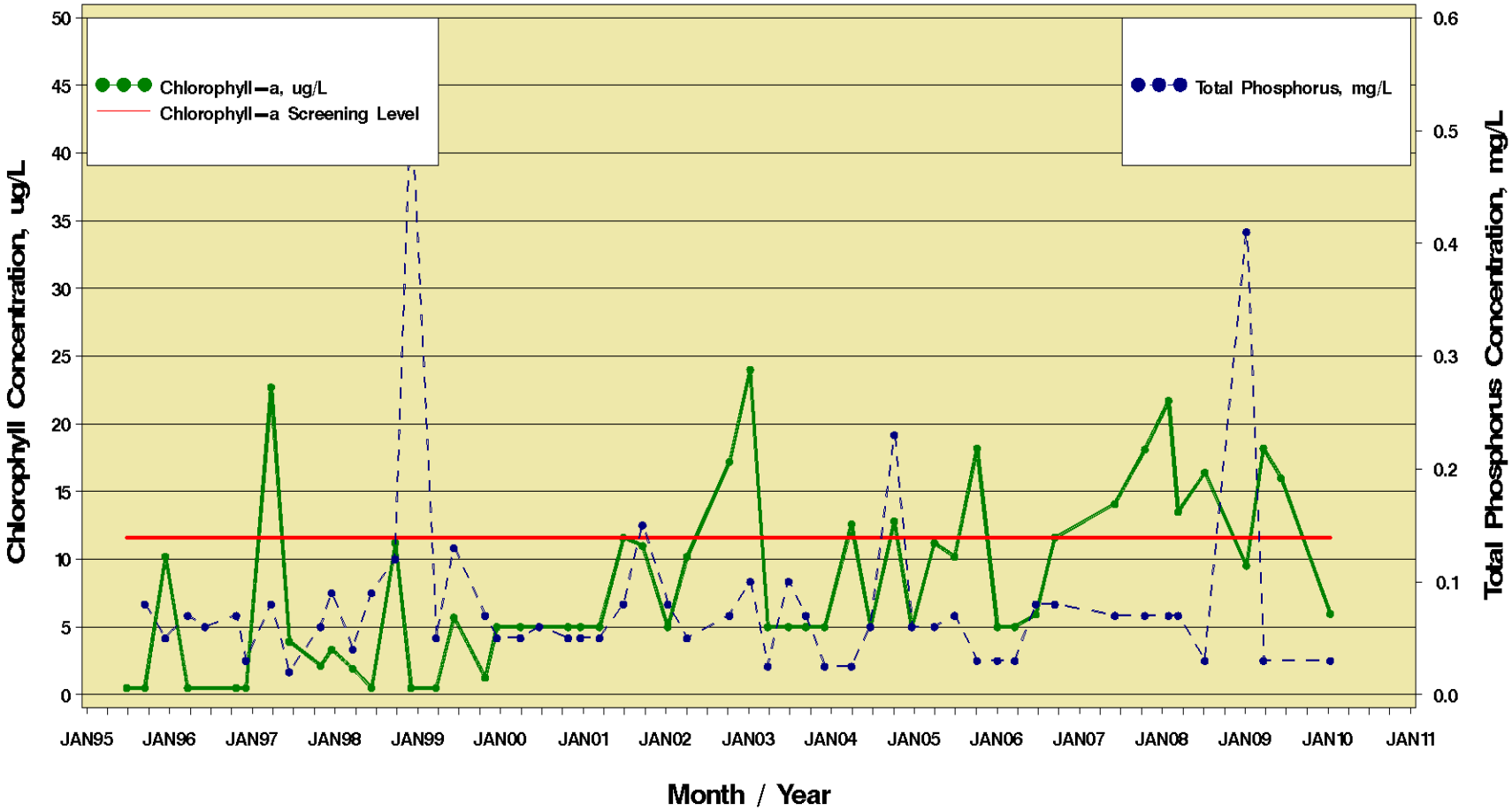


Chlorophyll—a and Total Phosphorus Concentrations

Segment: 1111 Watershed: Old Brazos River Channel Tidal

Station: 11498 Assessment Unit: 1111_01

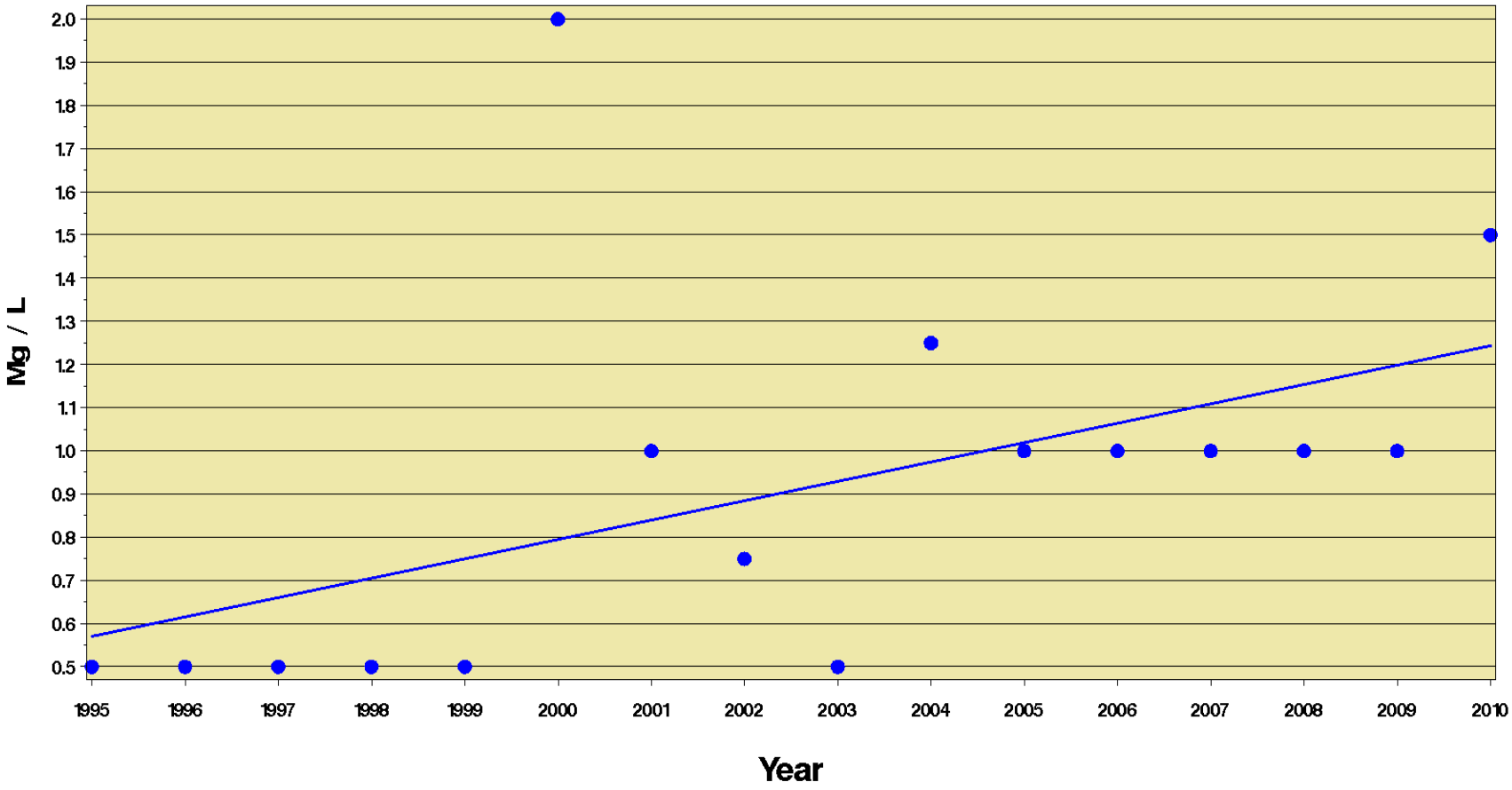
Note: Outlier of 772 ug/L removed for comparison to nutrient levels



Old Brazos River Channel Tidal

Monitoring Station: 11498 Segment: 1111 Assessment Unit: 1111_01

Parameter: Total Organic Carbon Annual Median



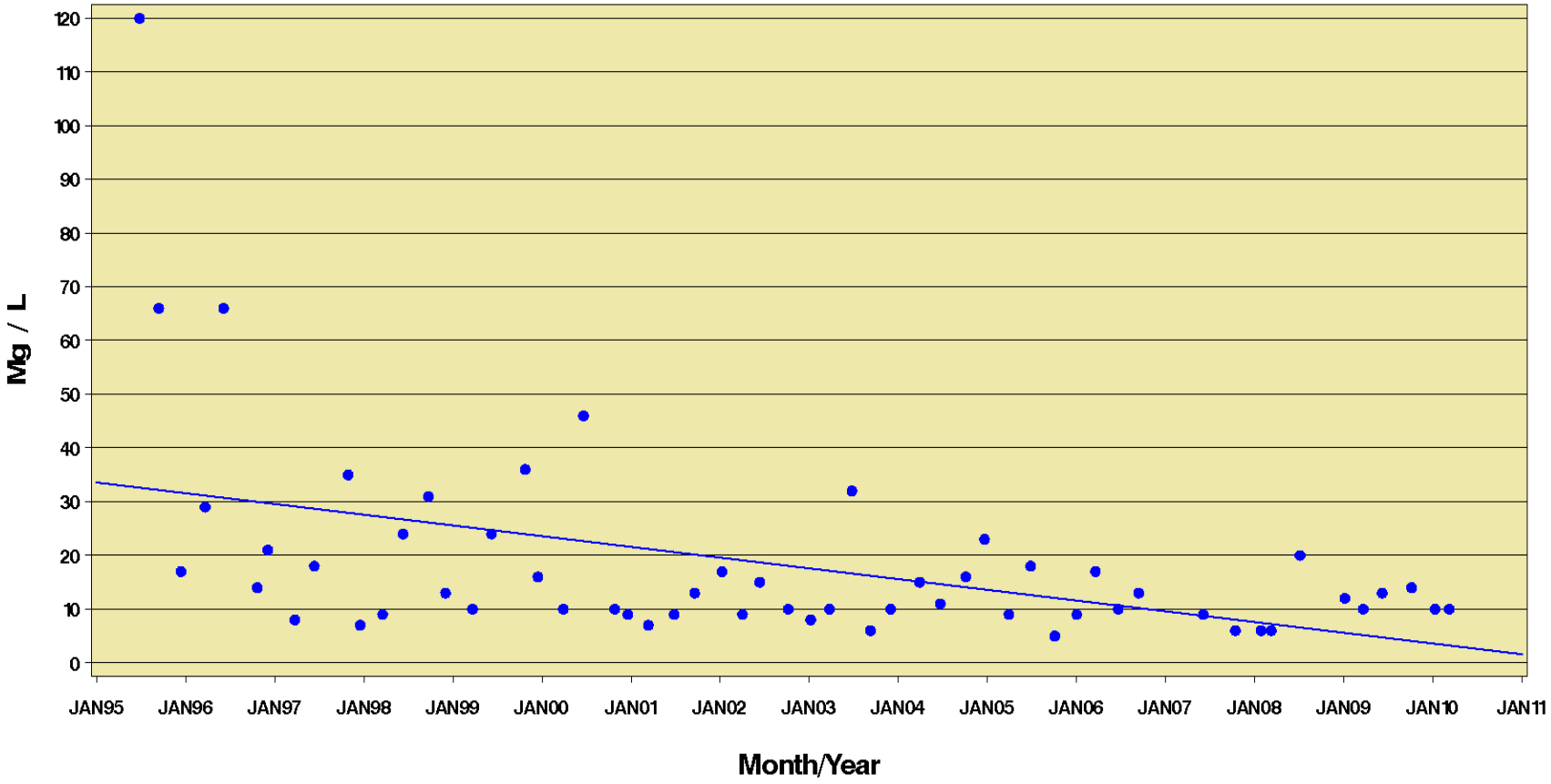
Trends are considered significant if the p-value is < 0.10

Trend is significant at p= 0.0485 R-Square = 0.2502 T-Value = 2.161 Number of Samples= 54

Old Brazos River Channel Tidal

Station: 11498 Segment: 1111 Parameter: Total Suspended Solids

Assessment Unit: 1111_01



Trends are considered significant if the p−value is < 0.10

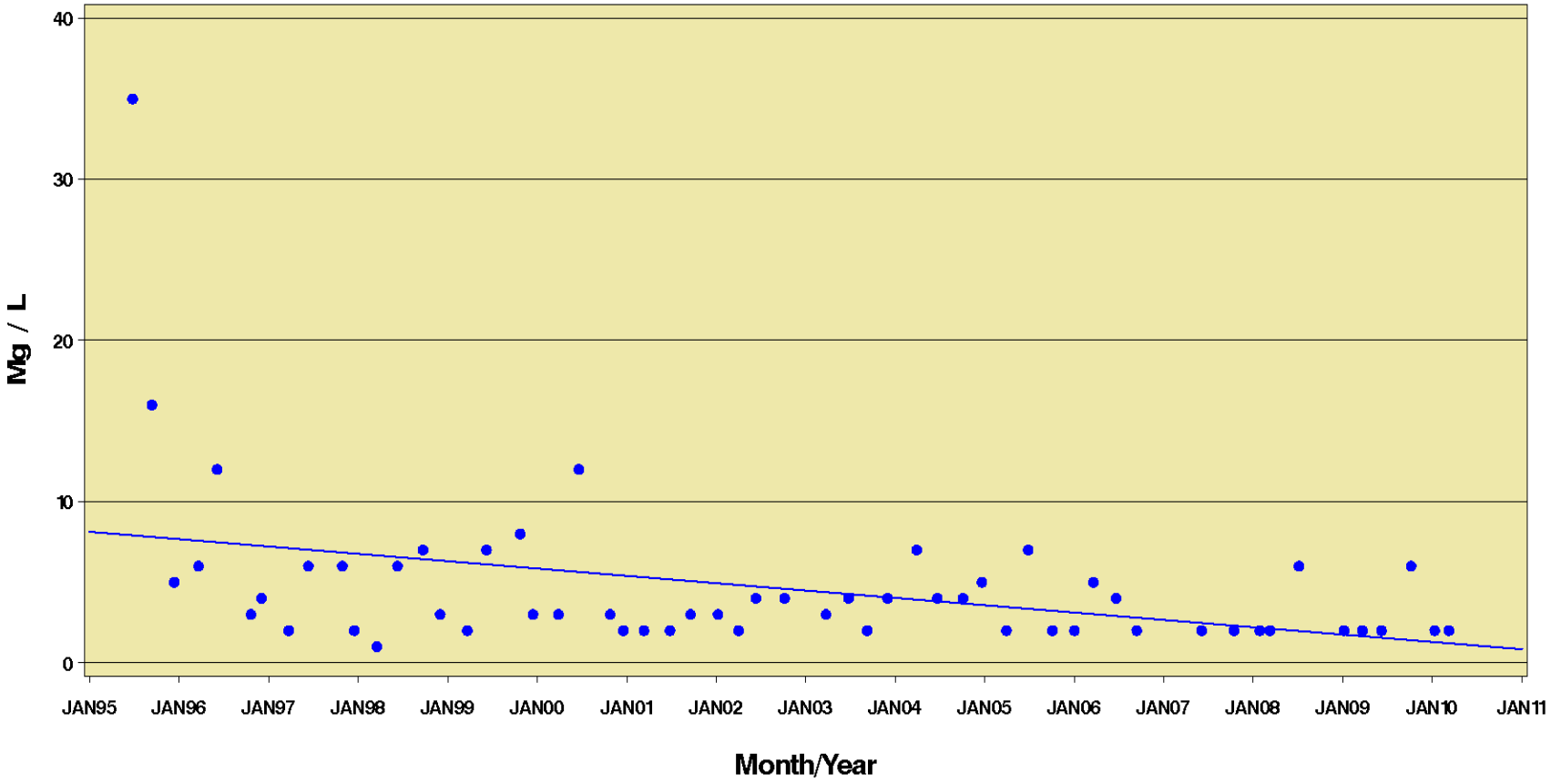
Trend is significant at p= 0.0001 R−Square= 0.2379 T−Value= −4.1440 Number of Samples= 57

The blue regression line applies to the plot of actual values ; regression statistics are derived from regression of log−transformed data

Old Brazos River Channel Tidal

Station: 11498 Segment: 1111 Parameter: Volatile Suspended Solids

Assessment Unit: 1111_01



Trends are considered significant if the p–value is < 0.10

Trend is significant at p = 0.0014 R–Square= 0.1735 T–Value= –3.3670 Number of Samples= 56

The blue regression line applies to the plot of actual values ; regression statistics are derived from regression of log–transformed data