



Water Quality Trends Update North Bosque River

Texas Institute for Applied Environmental Research, September 1, 2020

Waste Application Fields

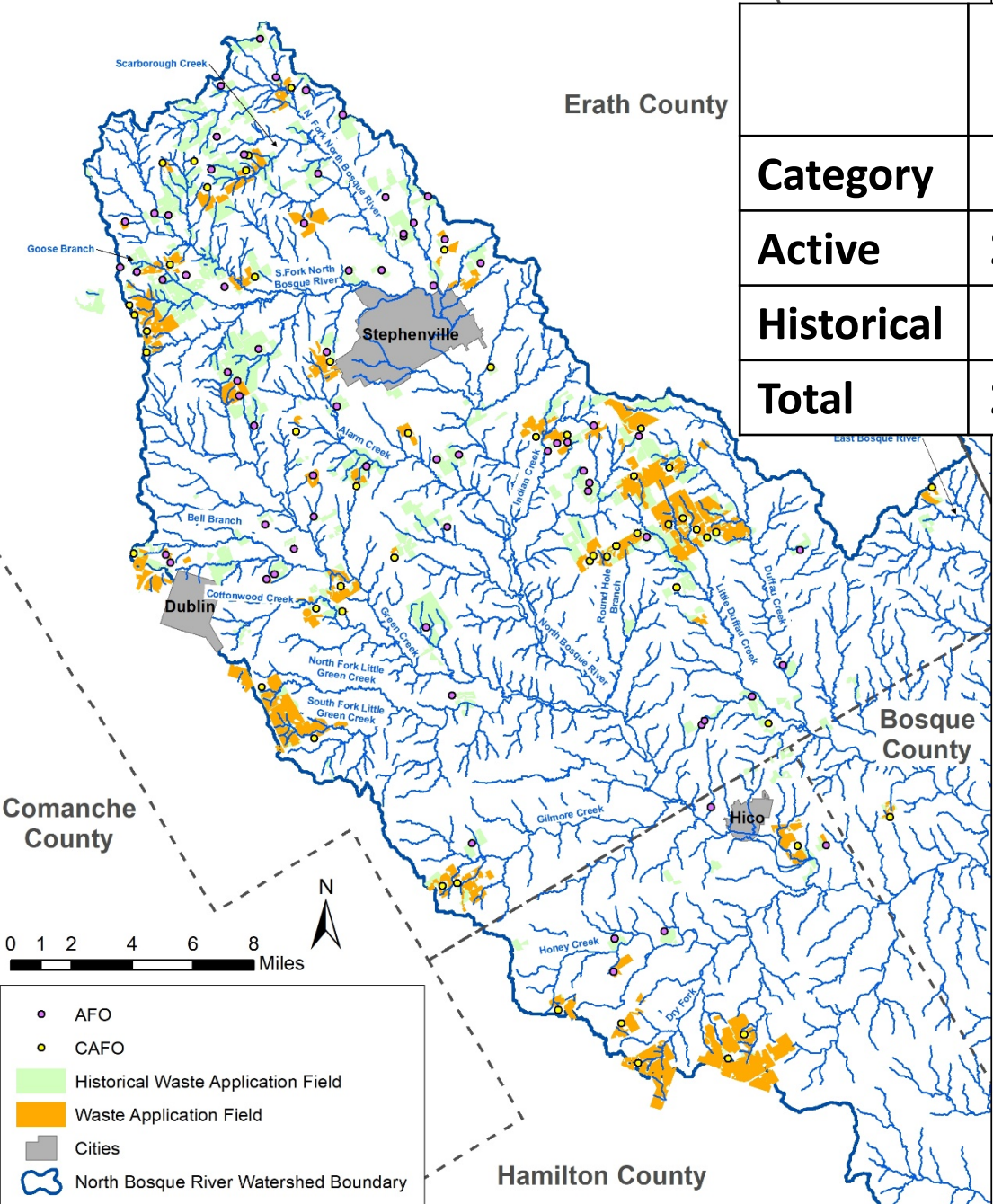
- TCEQ inspection data are reviewed and drive-by assessments of CAFOs and AFOs are performed annually by TIAER**
- WAFs associated with AFOs are determined to be either “Active” or “Historical” based on the AFO’s operational status**
- “Active” and “Historical” status for WAFs associated with CAFOs is determined based on TCEQ permit information**

Active vs. Historical WAFs

- **“Active”** indicates a WAF is currently permitted to receive waste
- **“Historical”** indicates that a WAF no longer has waste applied due to:
 - Expired permit
 - Facility is no longer operational
 - Soil phosphorus limit reached
 - Other change in the designated use of the field



Tolar



	2000 WAFs	2019 WAFs	
Category	Acres	Acres	Change
Active	24,554	14,485	-41%
Historical	2,142	18,659	771%
Total	26,696	33,144	24%

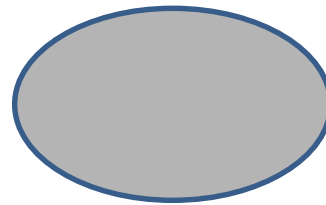
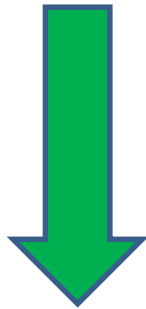
Changes in Land Use

Map represents conditions as of fall 2019

WAF = waste application field

Trends -

Is water quality improving?

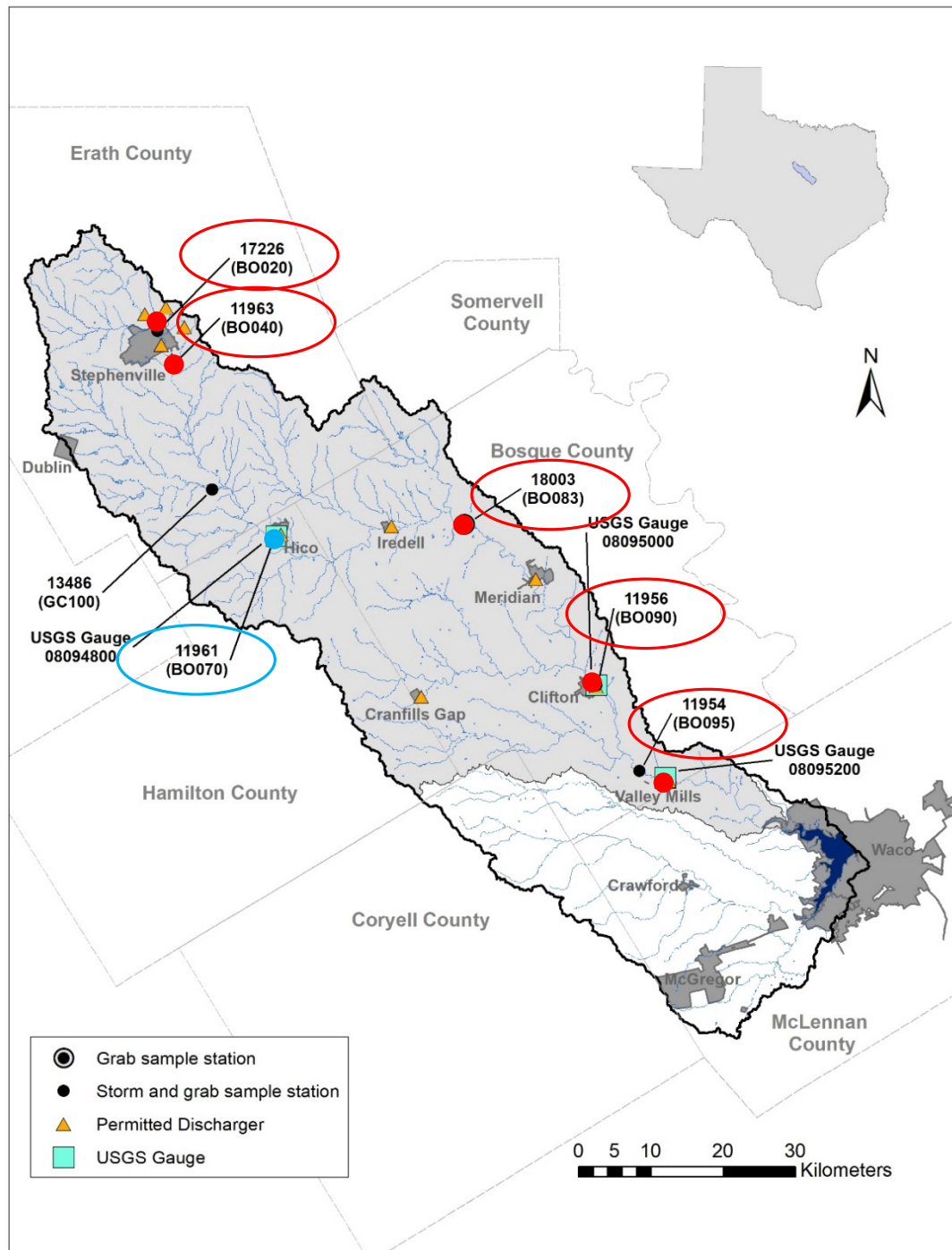


Sample Collection

- Routine Grab Samples for nutrients, chlorophyll- α , and TSS are collected bi-weekly
- *E. coli* samples are collected monthly
- Storm influenced samples are collected quarterly when possible

North Bosque Monitoring Stations

Index
Stations
circled in
Red



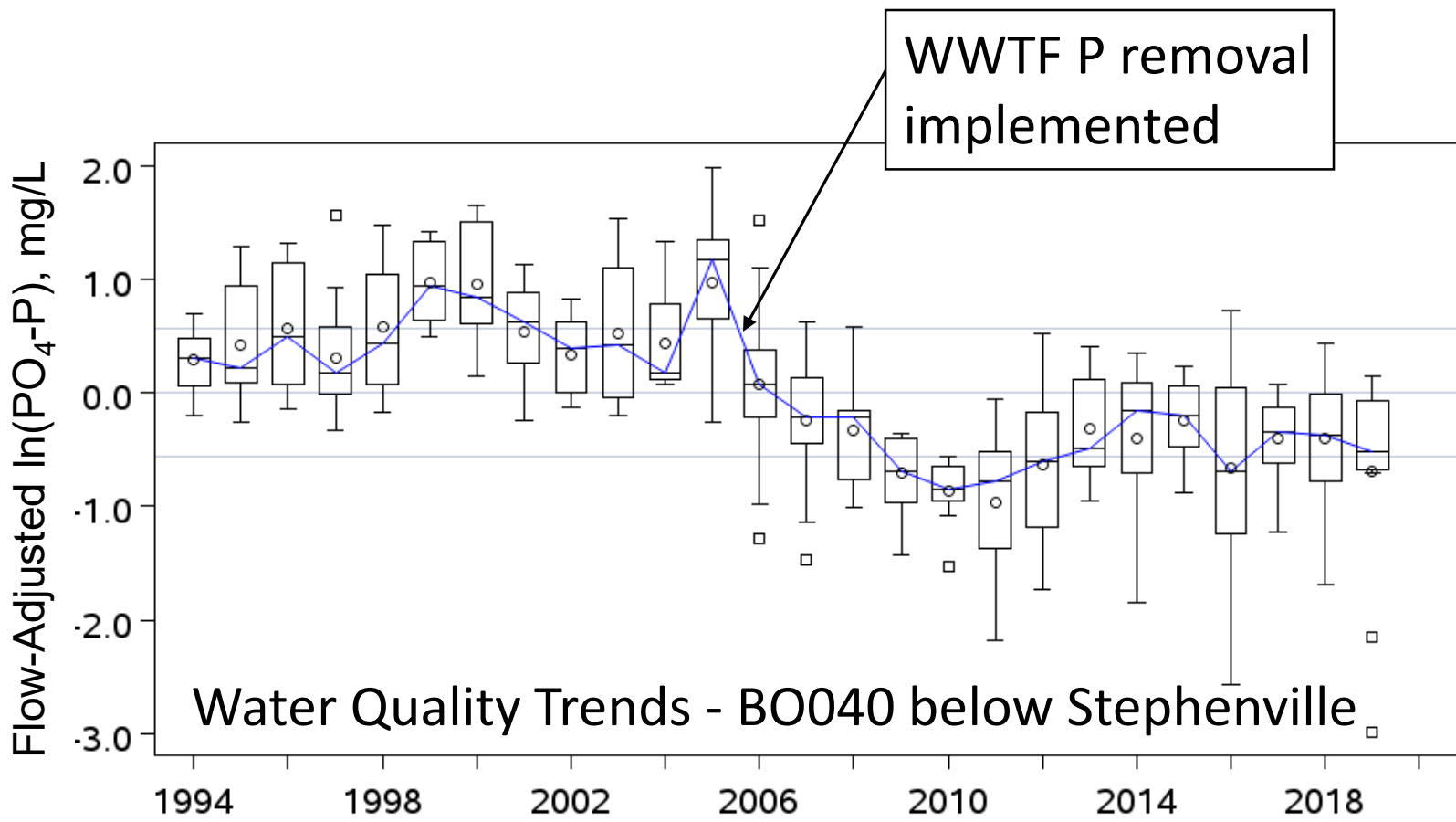
Phosphorus Trends

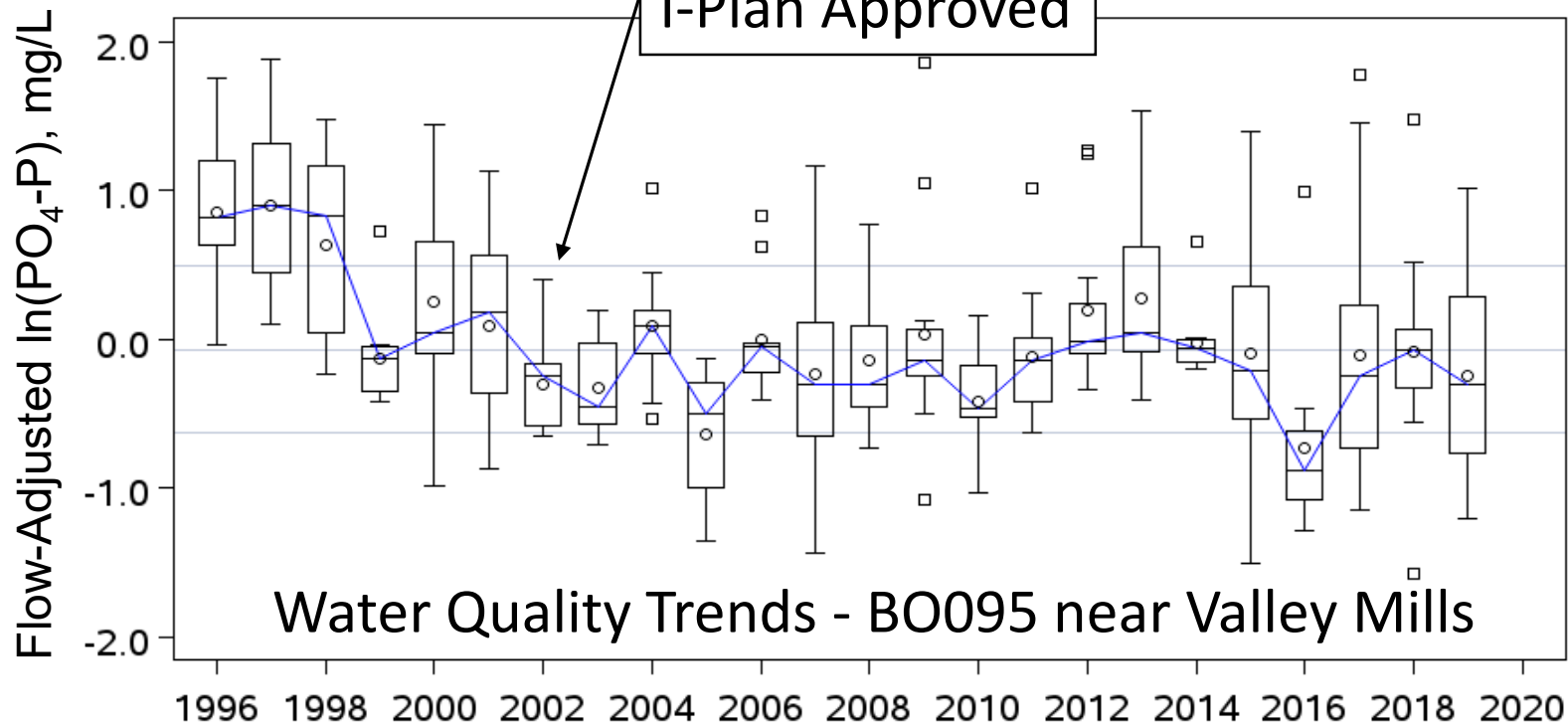
North Bosque River Index Stations (+1)

TIAER	TCEQ	Location	Period	SRP	Total P
BO020	17226	Above Stephenville	1997-2019		
BO040	11963	Below Stephenville	1994-2019		
BO070	11963*	Near Hico	1993-2019		
BO083	18003**	Near Iredell	2003-2019		
BO090	11956	Near Clifton	1996-2019		
BO095	11954	Near Valley Mills	1996-2019		

*Not a designated Index Station

** Limited flow data at station 18003



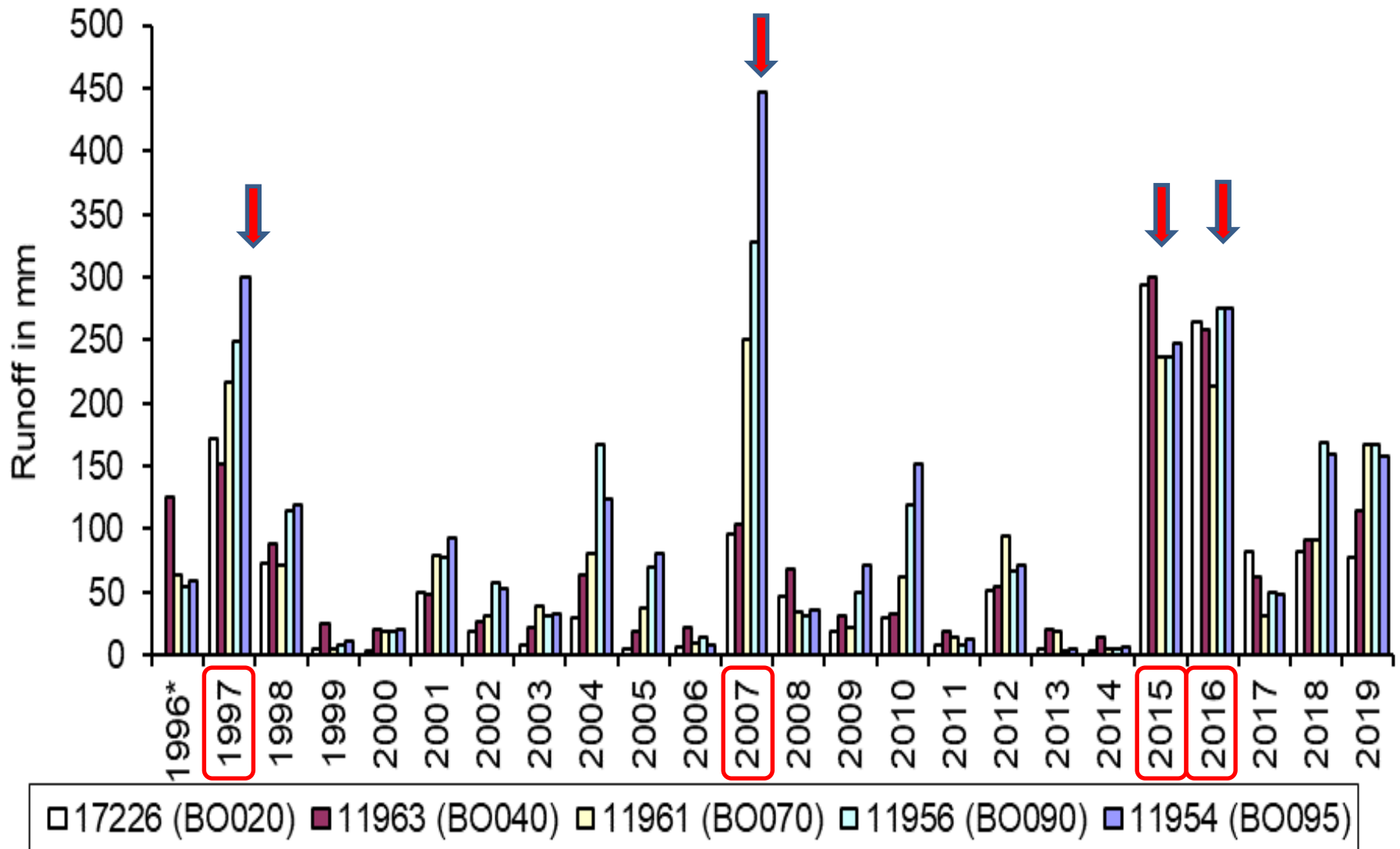


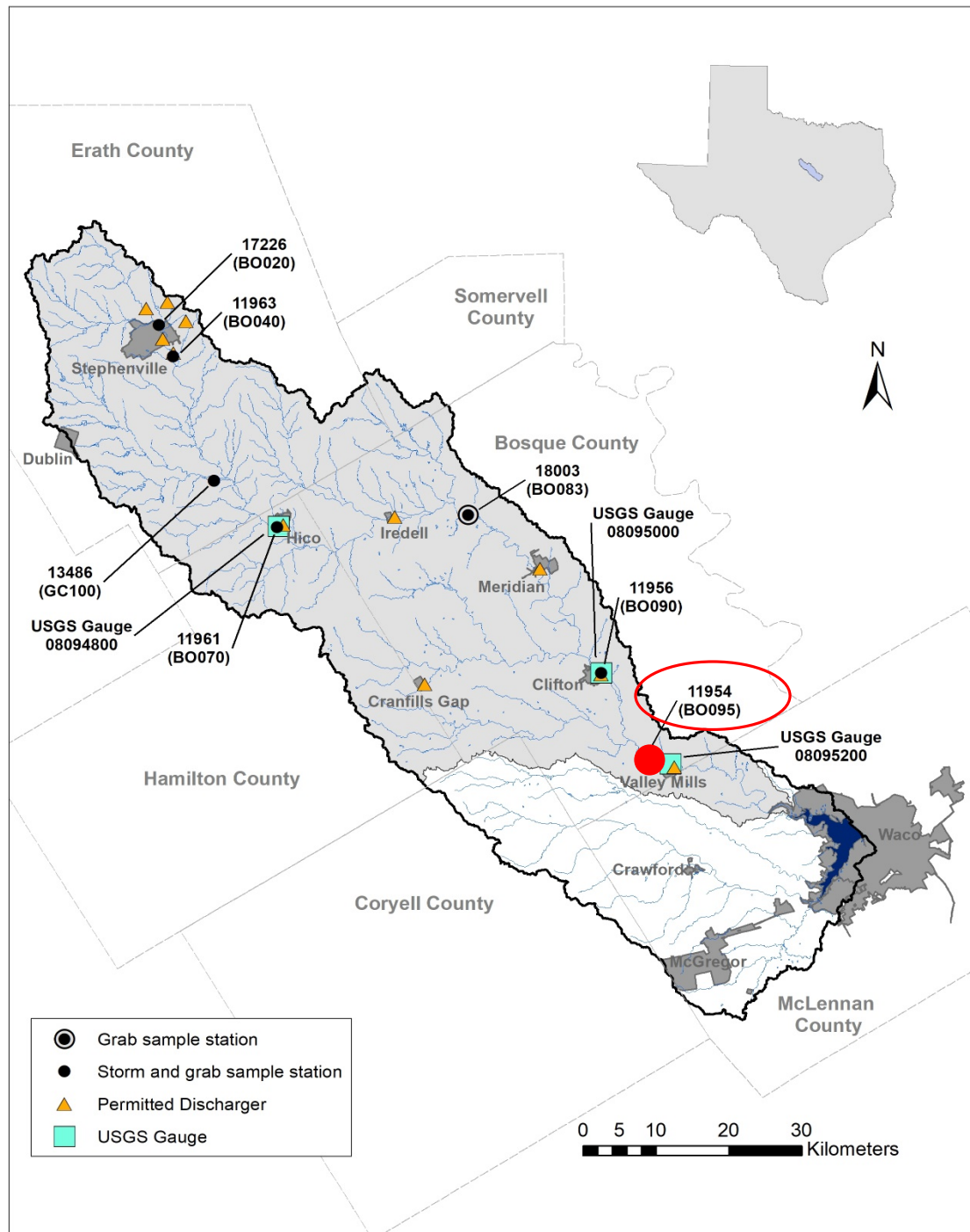
Have we met target goals?

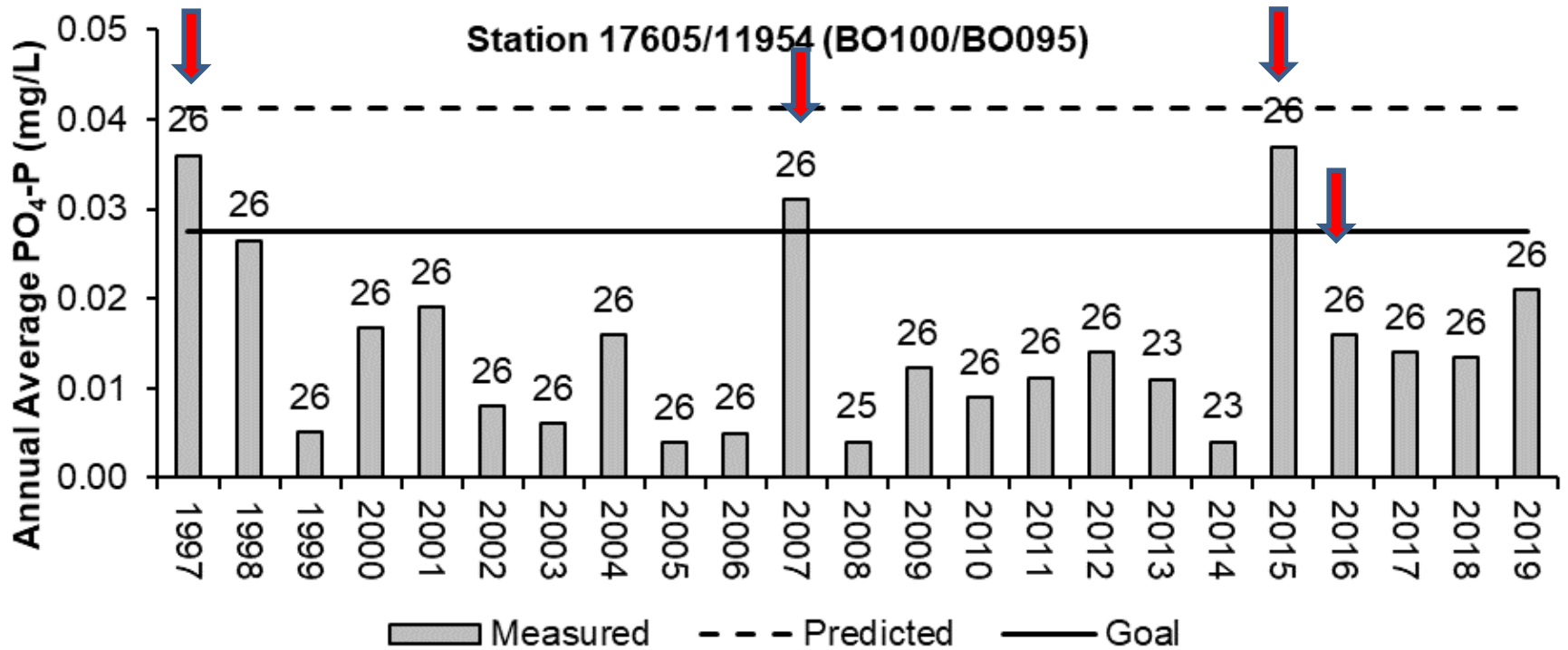


Not entirely, but getting close

Normalized Runoff Volume



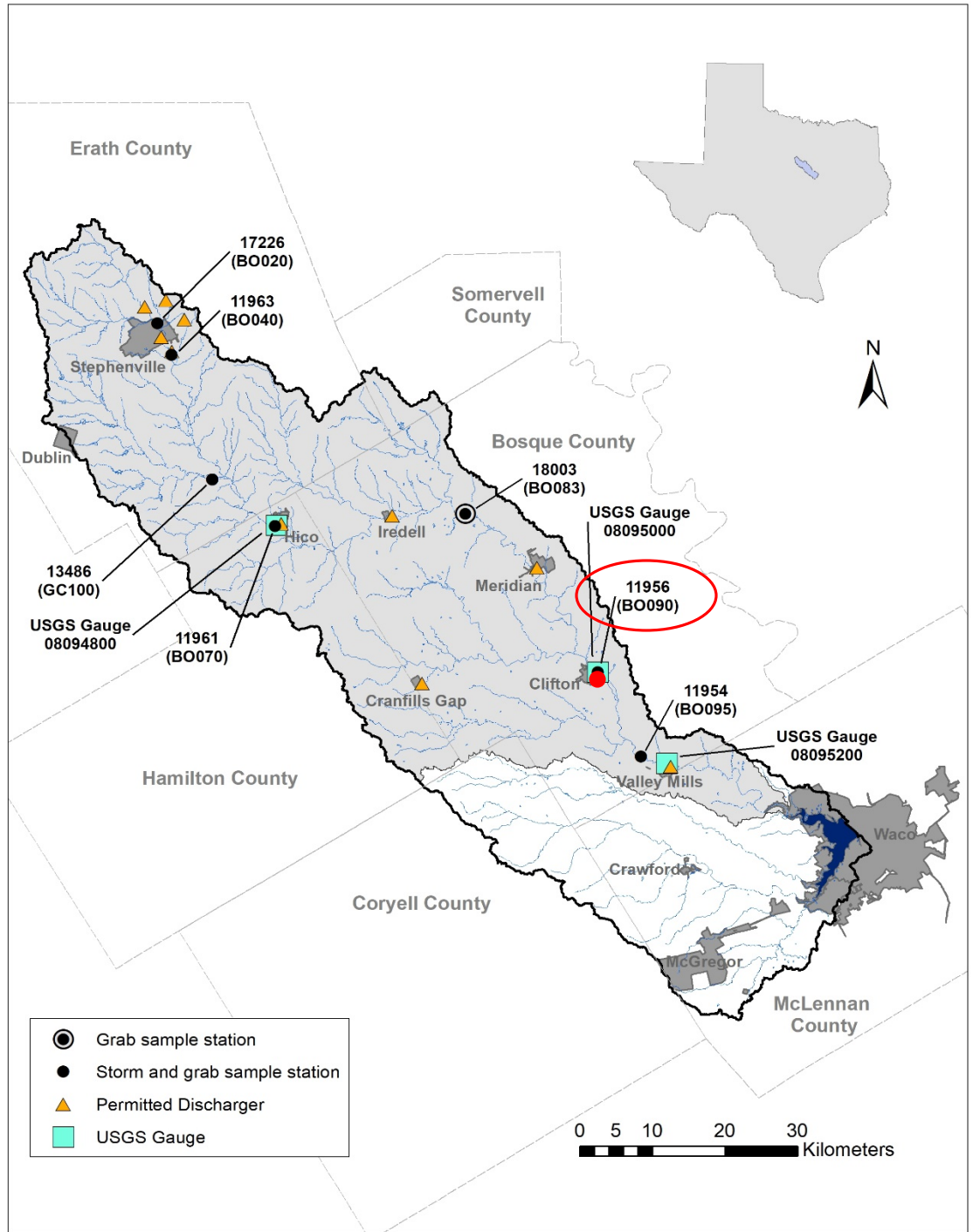


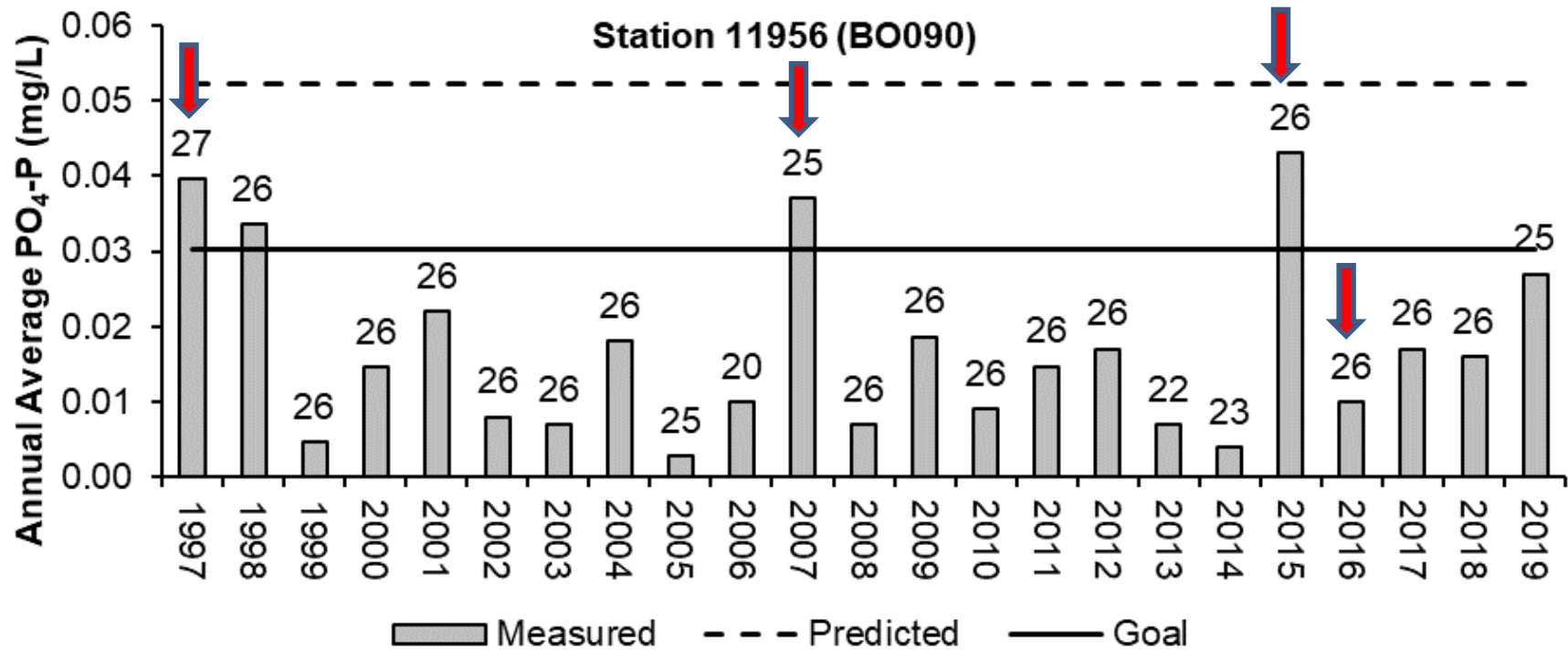


North Bosque
May 29, 2015



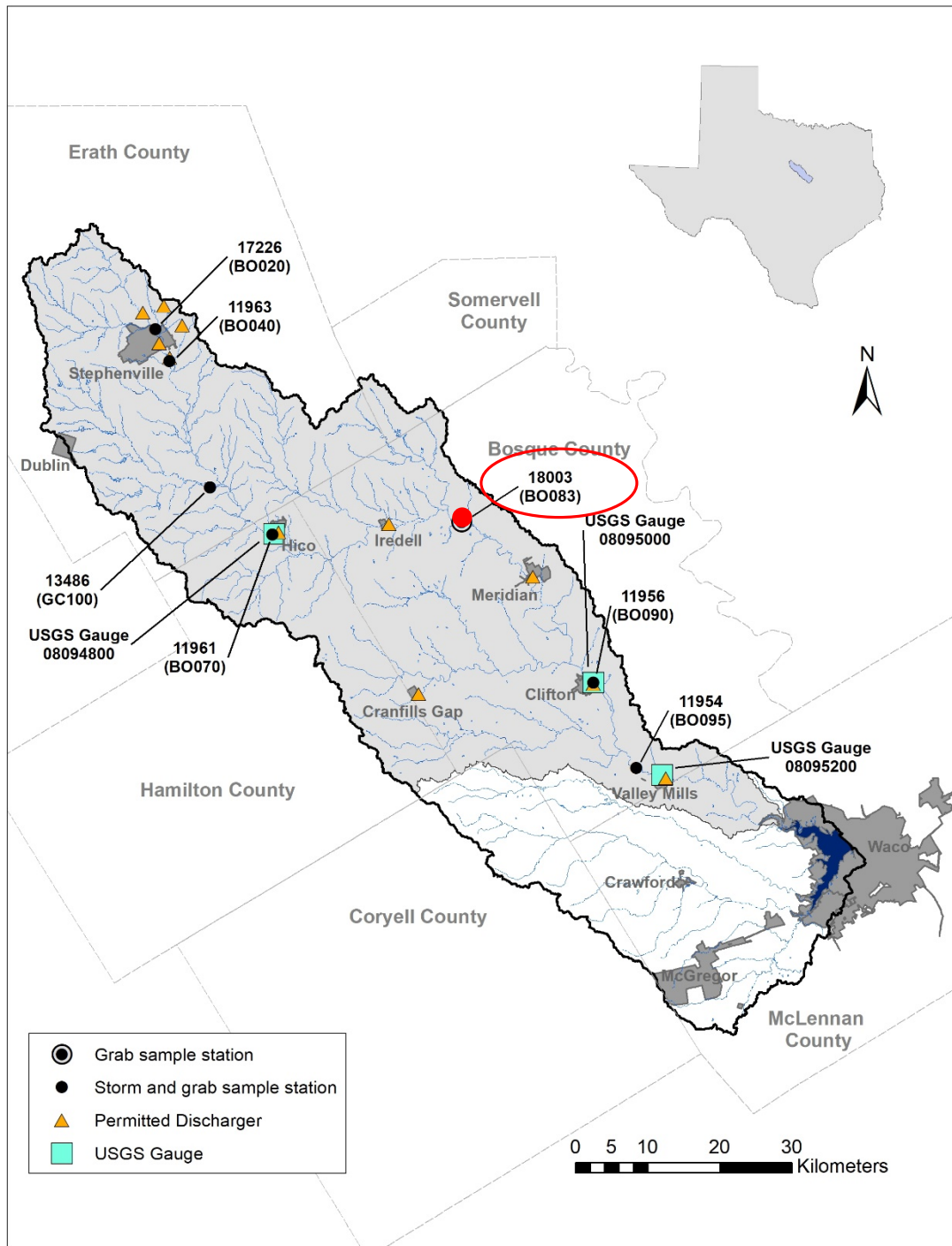
Station
17605/11954
located near
Valley Mills

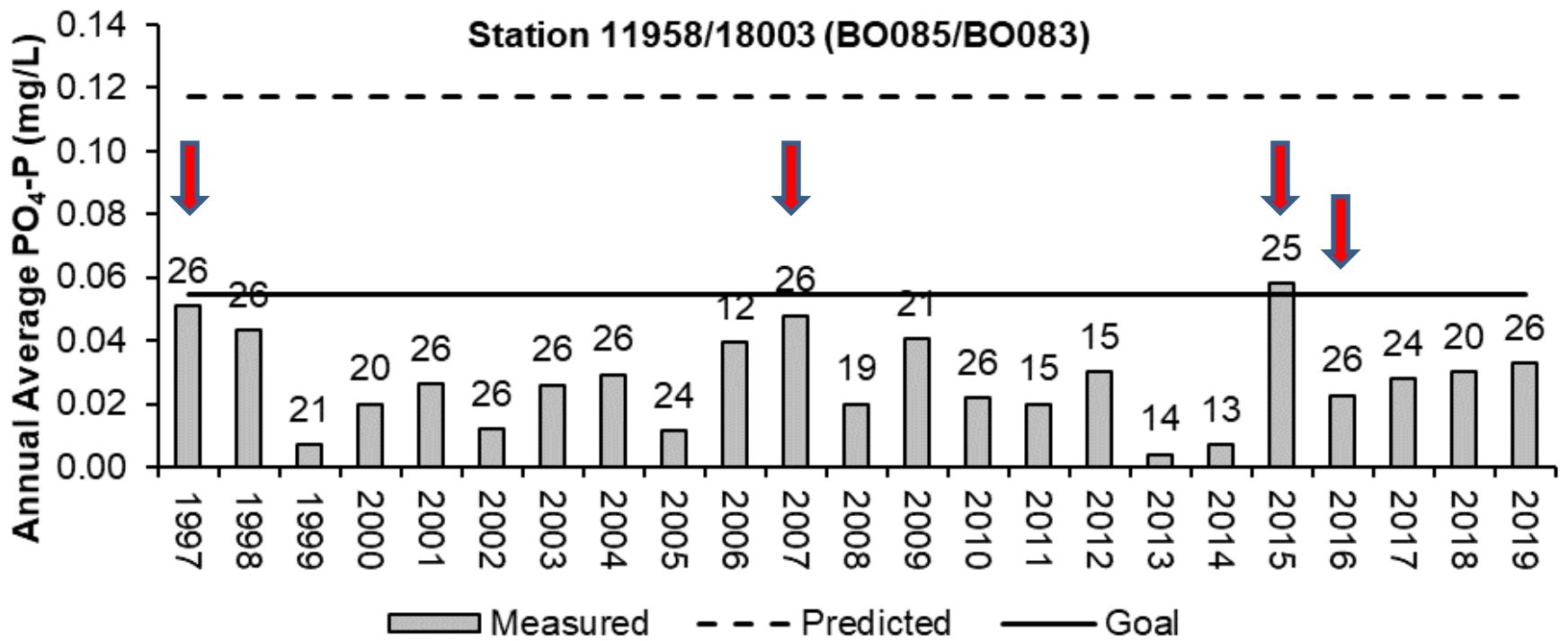




**Station 11956
located near
Clifton**

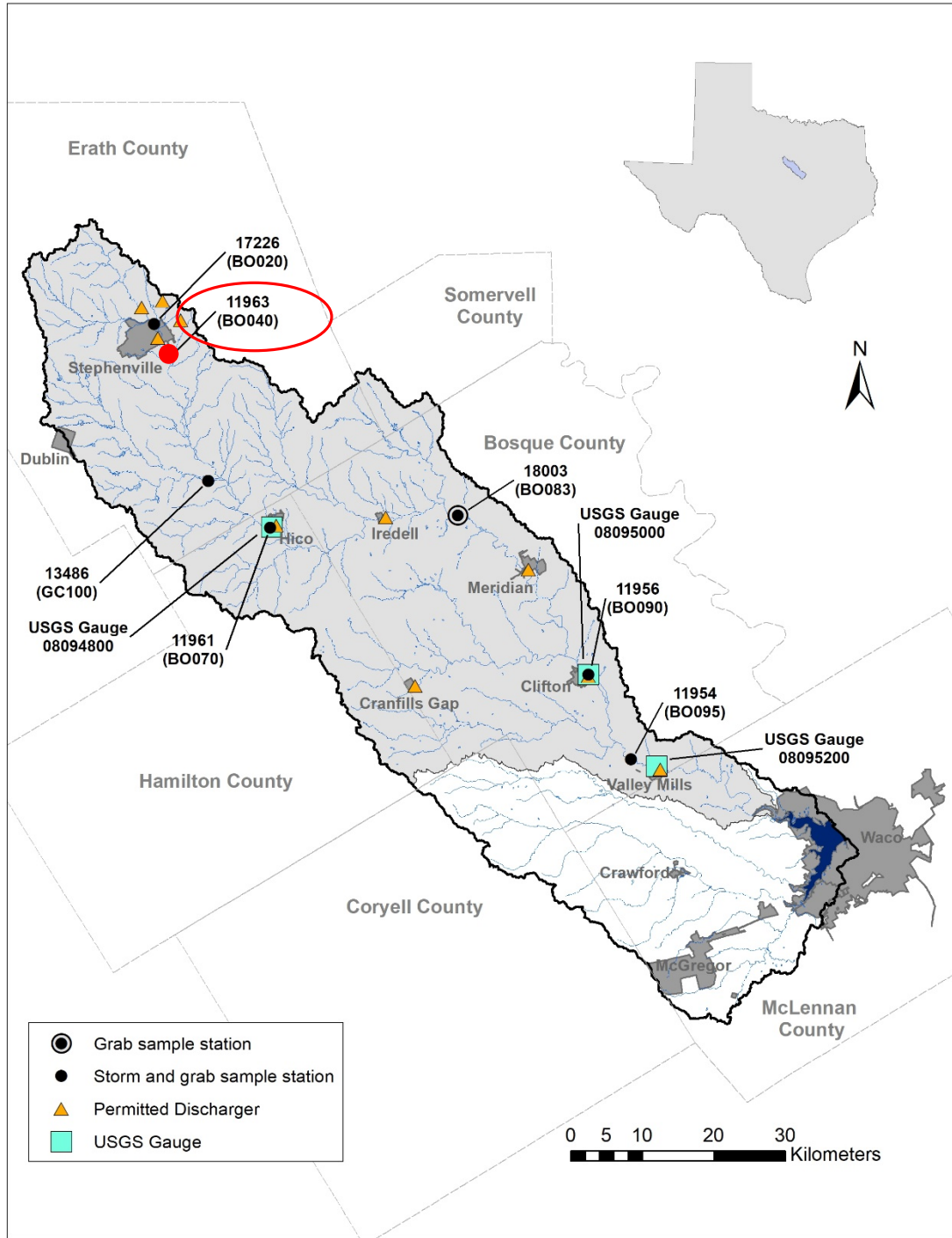


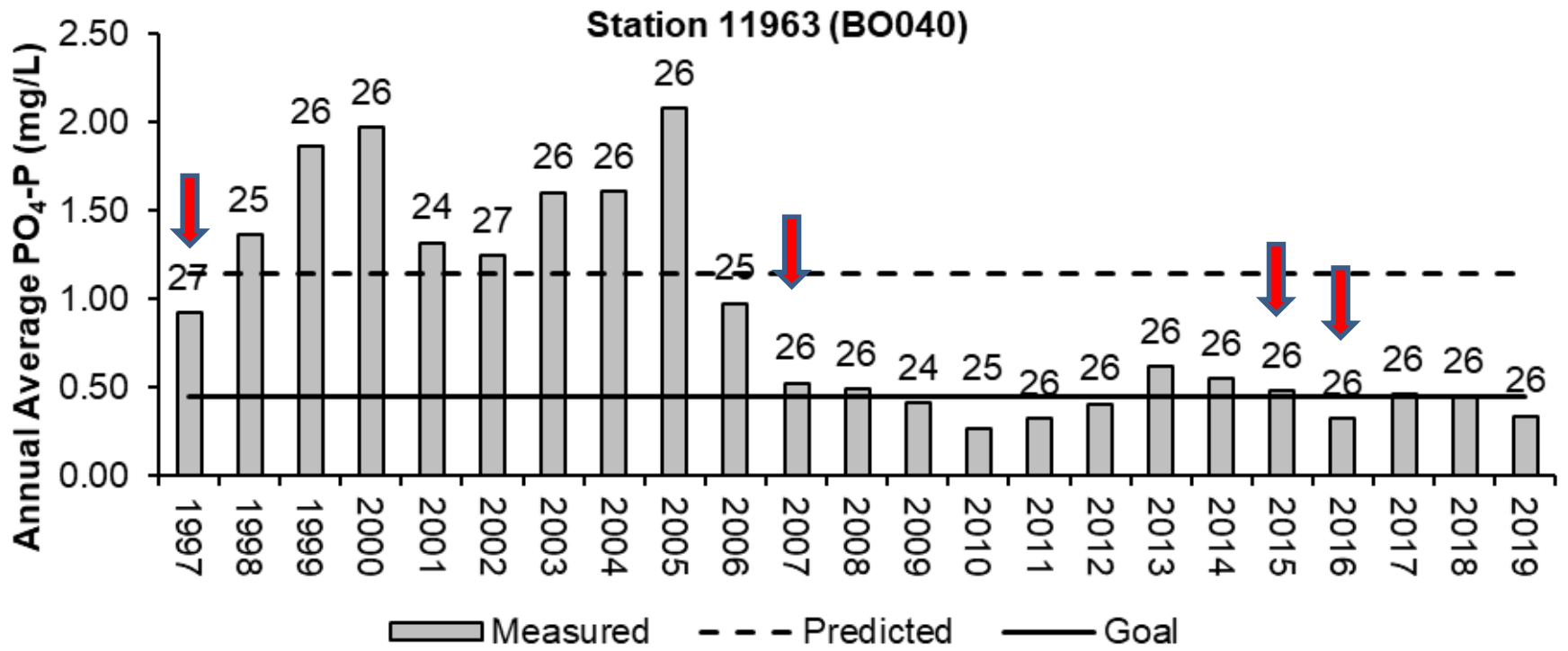




**Station
11958/18003
located near
Iredell**

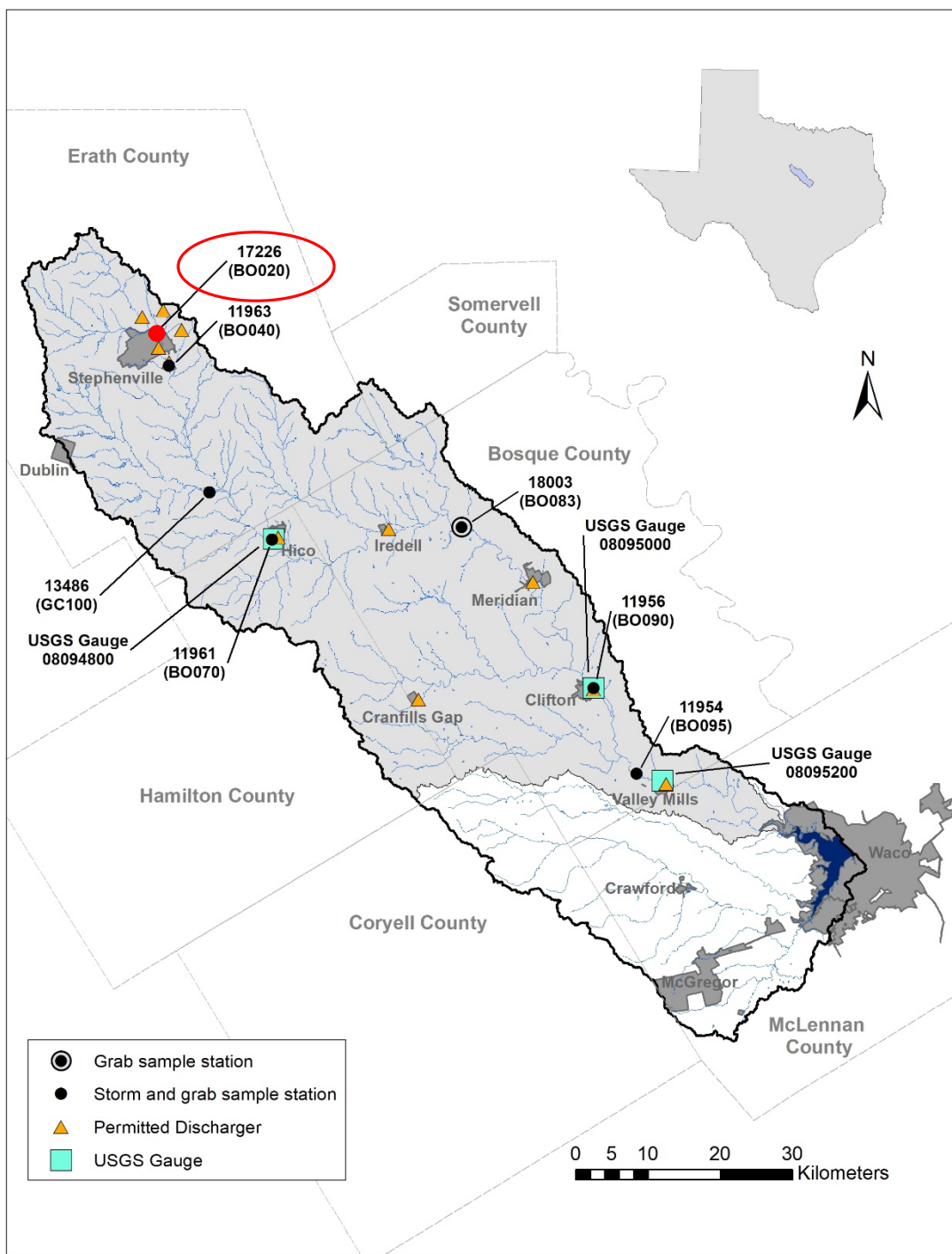


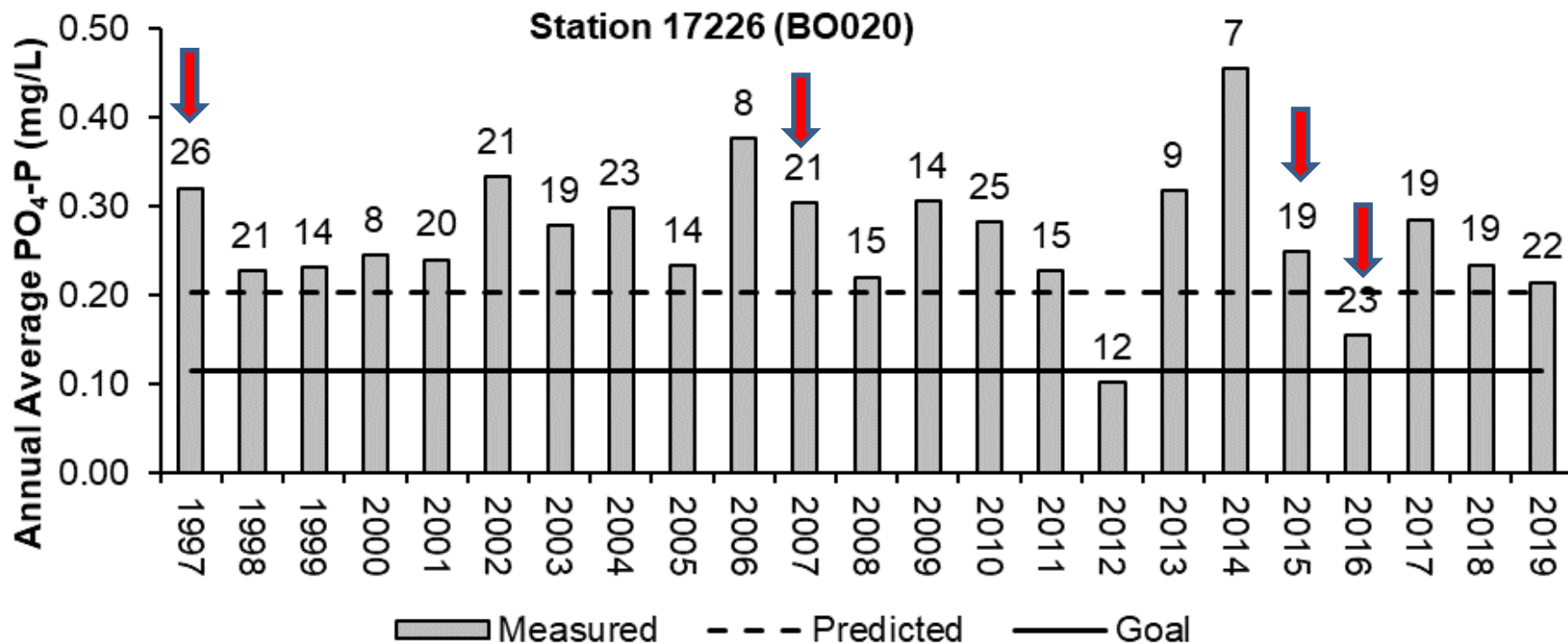




**Station 11963
located
below
Stephenville**







Station 17226
located
above
Stephenville

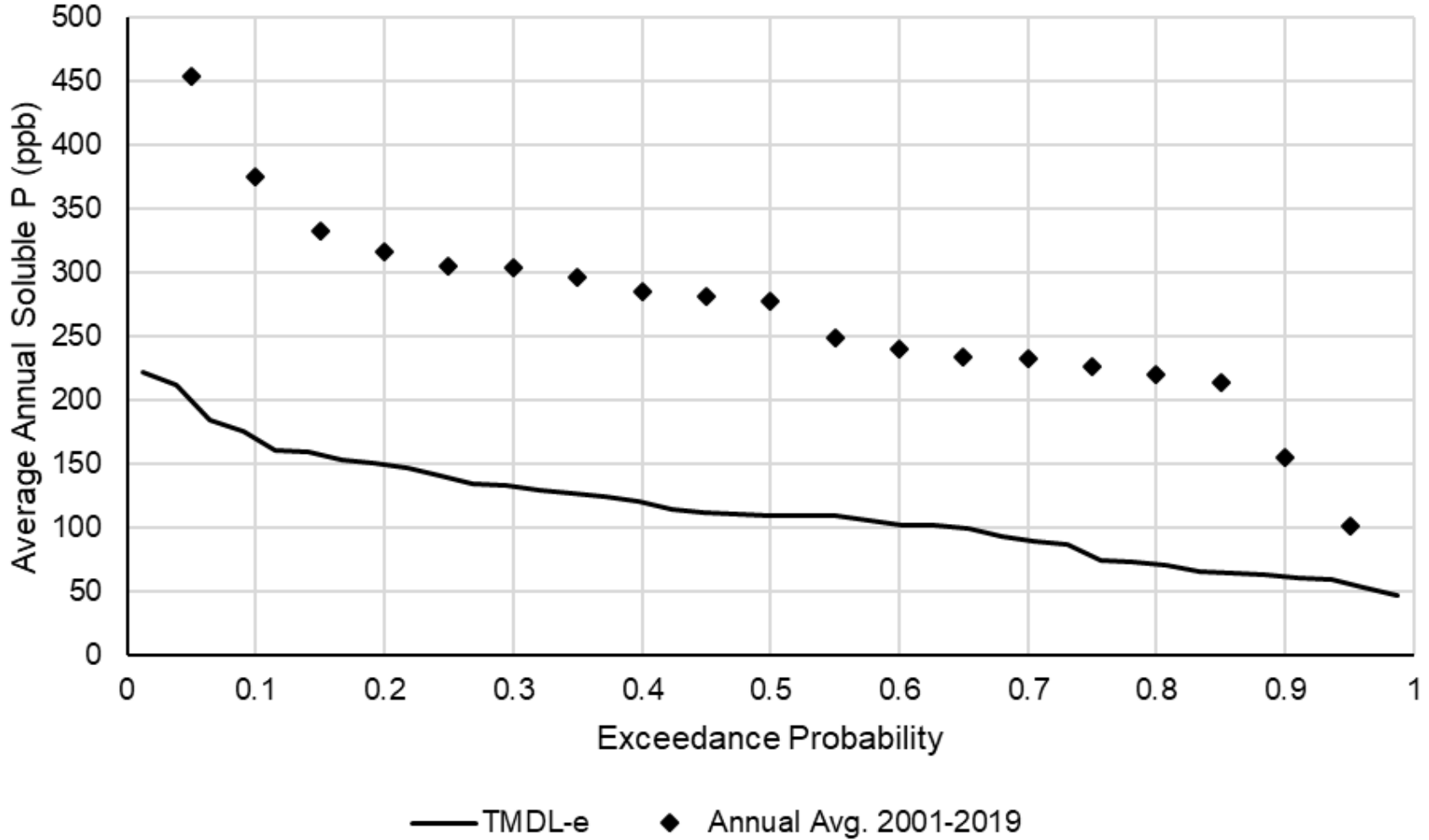


Probability Distribution Curves

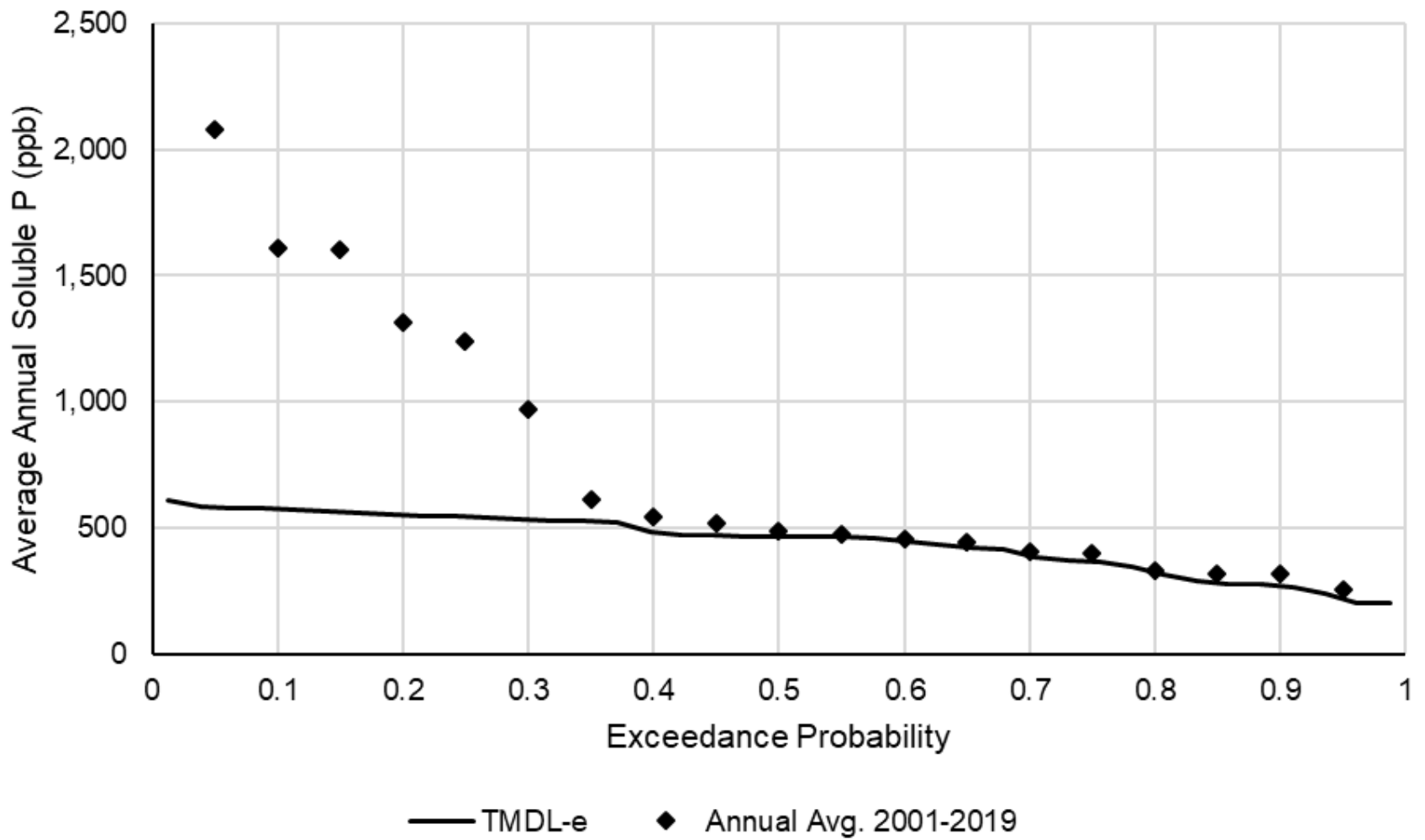
The I-Plan indicates the following for determining success:

- If the monitored data curve is entirely below the model predicted TMDL-e curve, then water quality goal is being attained.
- If the monitored data curve is entirely above the predicted TMDL e-curve then the water quality goal is not being attained.
- Partial attainment occurs if the monitored data curve crosses the model predicted TMDL-e curve.

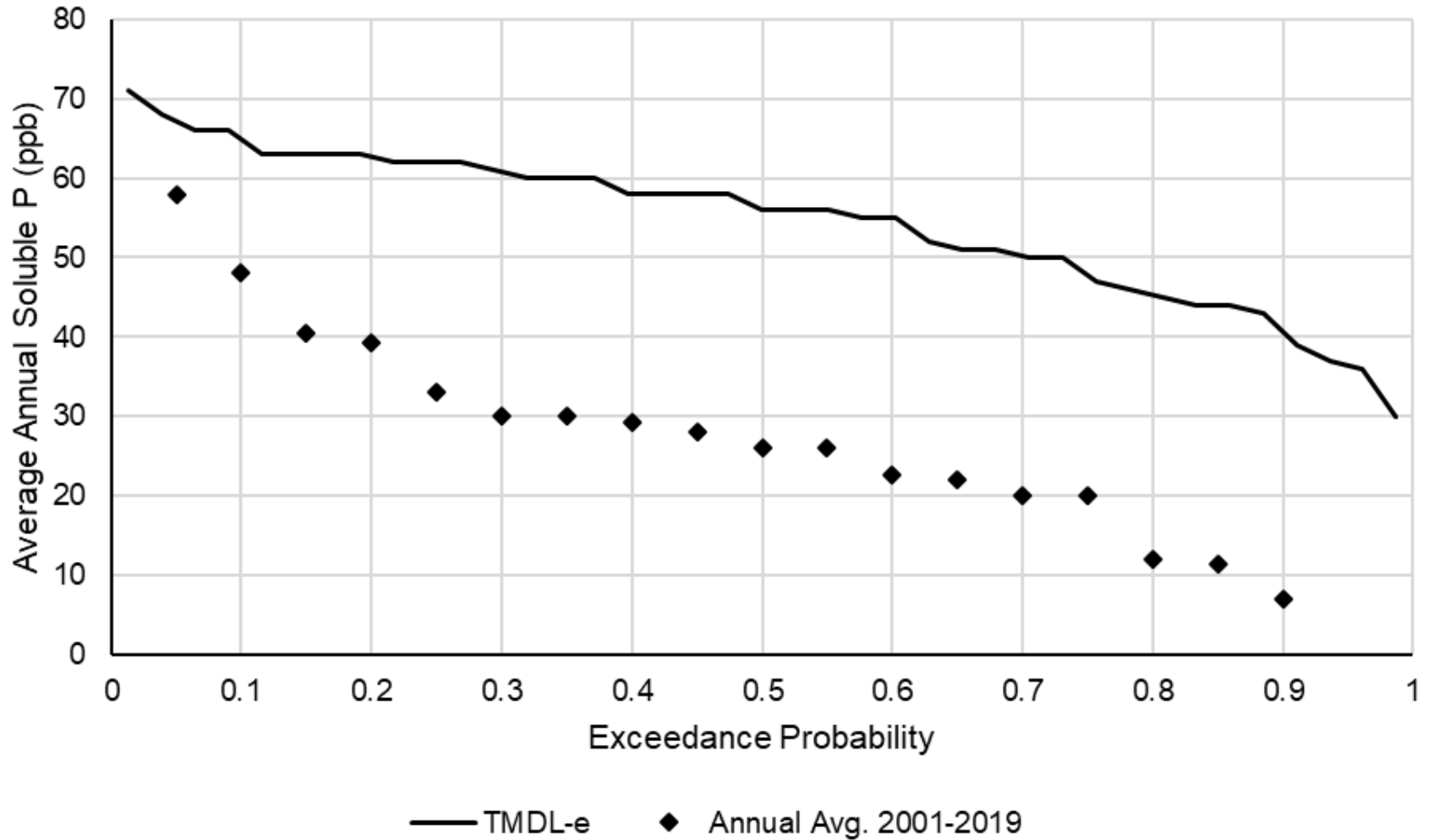
Station 17226 (BO020) Above Stephenville



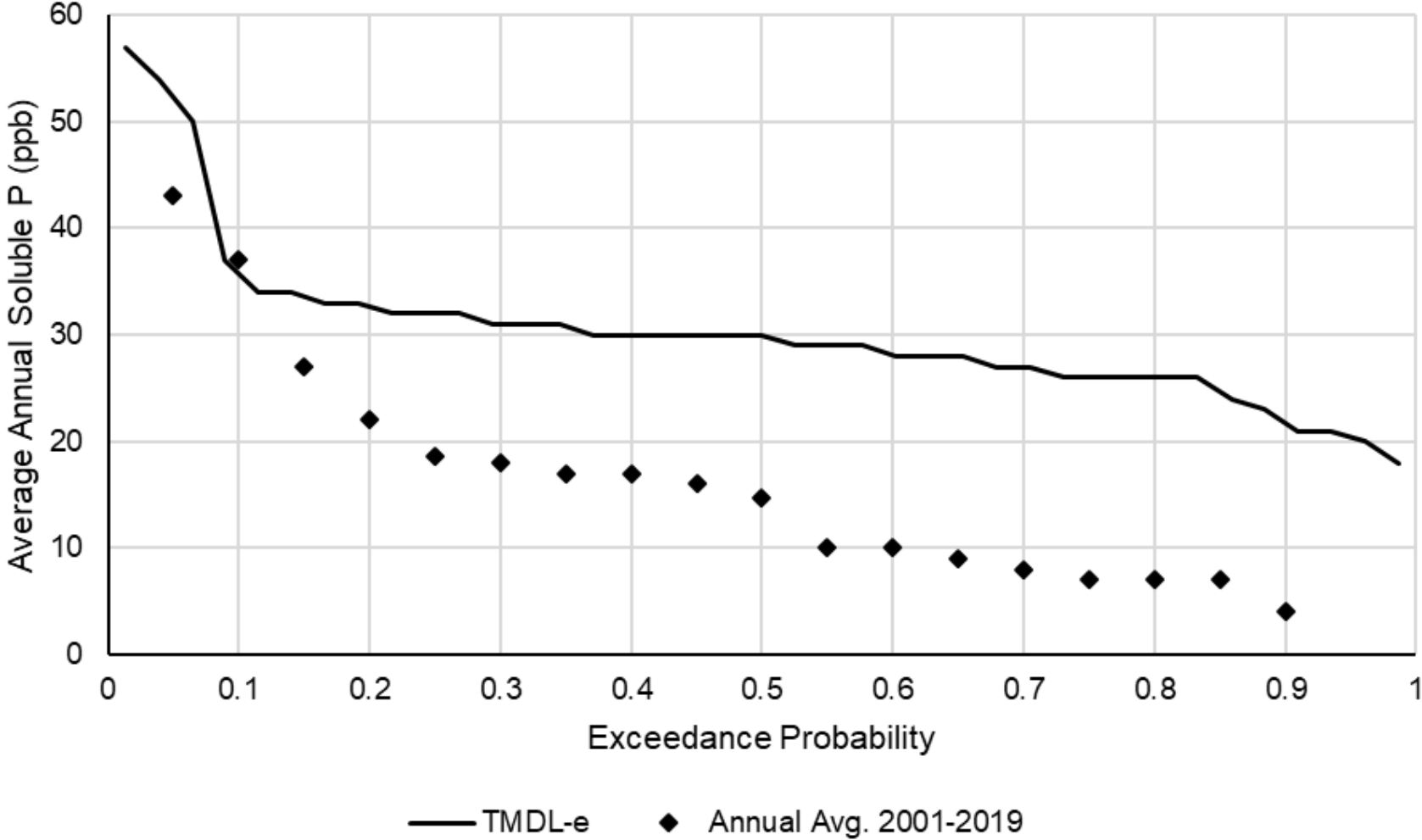
Station 11963 (BO040) Below Stephenville



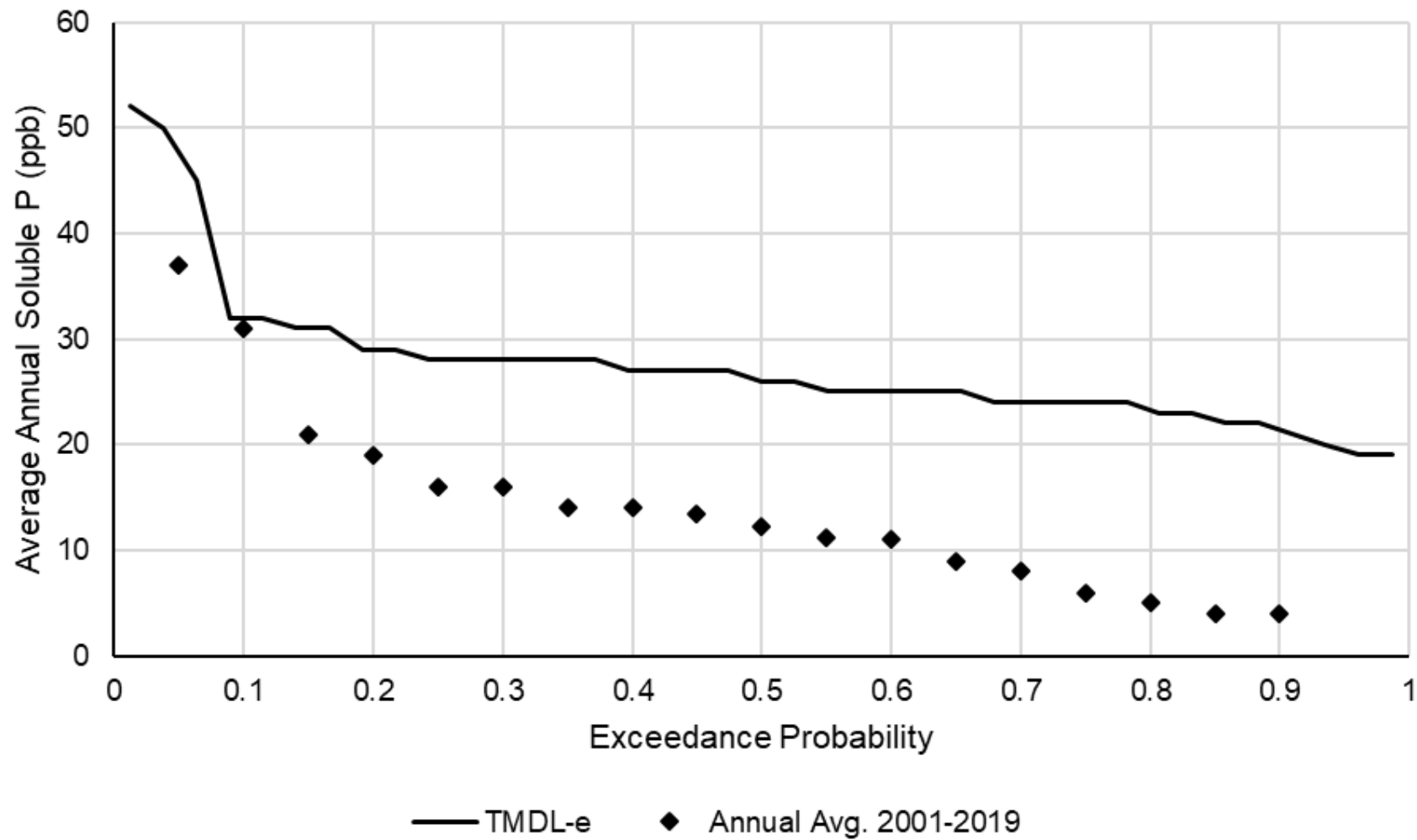
Station 11958/18003 (BO085/BO083) Above Meridian



Station 11956 (BO090) Clifton



Station 17605/11954 (BO100/BO095) Valley Mills



Is Water Quality Improving?

Yes!

Changes in
treatment by
WWTFs & land
management are
having an impact

