

**North Central Texas**

**Water Quality Project**

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**Model  
Calibration and Validation  
(SWAT)**

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# North Central Texas



## Water Quality Project

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- SWAT
- Use readily available input
- Physically based
- Comprehensive – Process Interactions
- Continuous Time
  - Daily Time Step
- Simulate current Management and alternative management scenarios

# North Central Texas

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### SWAT: Contributing Factors

- Rainfall/ runoff
- Erosion and Sediment Transport
- Pollutant Loading
- Stream Transport
- Ground Water
- Landuse
- Management Practices

# North Central Texas



## Water Quality Project

### Eagle Mountain Watershed

- Size: 860 mile<sup>2</sup> (2,230 Km<sup>2</sup>)
- Bridgeport watershed





# North Central Texas

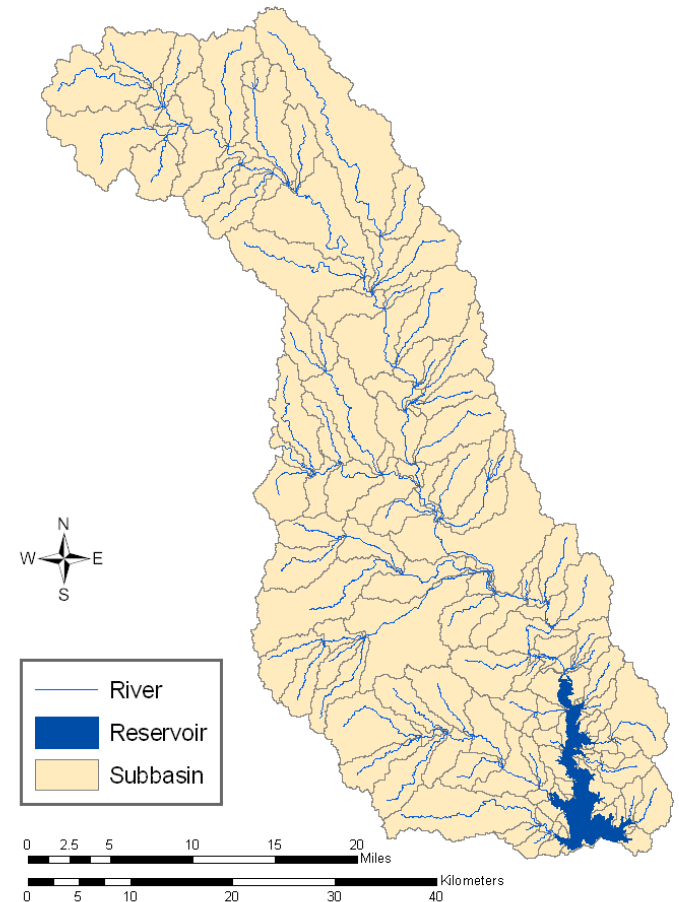
## Water Quality Project



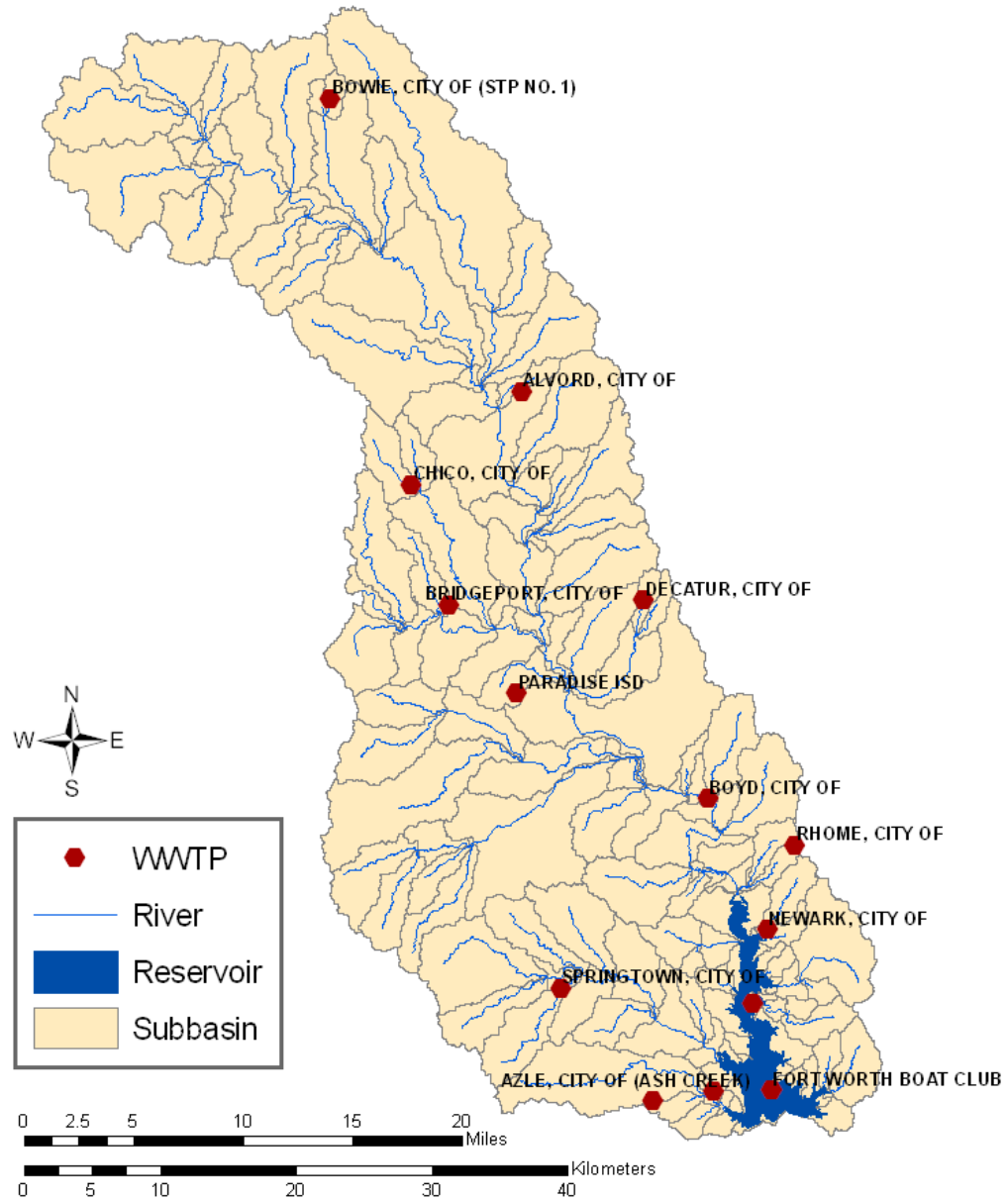
### Eagle Mountain Sub- Watersheds

- Delineated by SWAT
- Total 150 Sub-basins
- Local base monitoring and analyses
- Local parameter adjustment

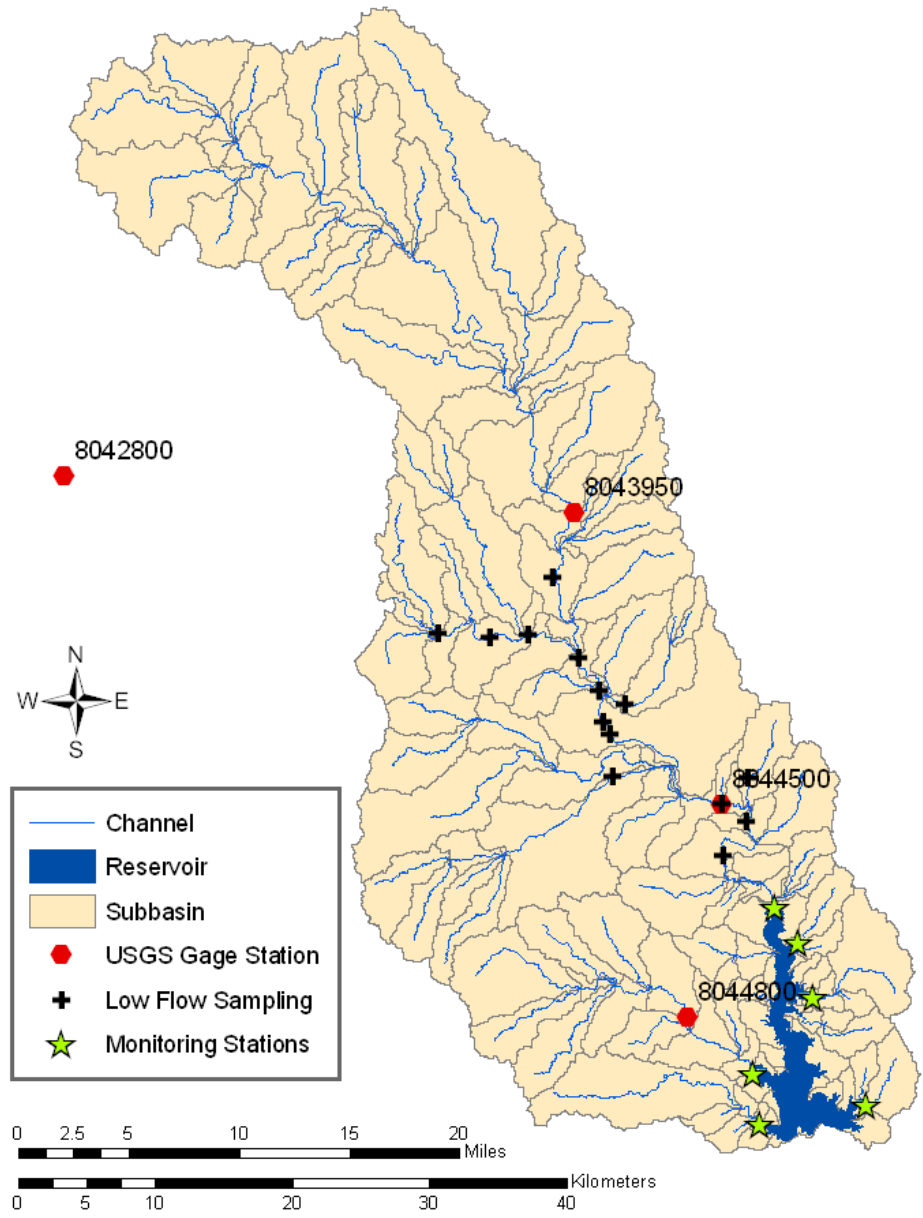
Eagle Mountain Watershed



# Eagle Mountain Watershed WWTPs



# Eagle Mountain Monitoring Sites





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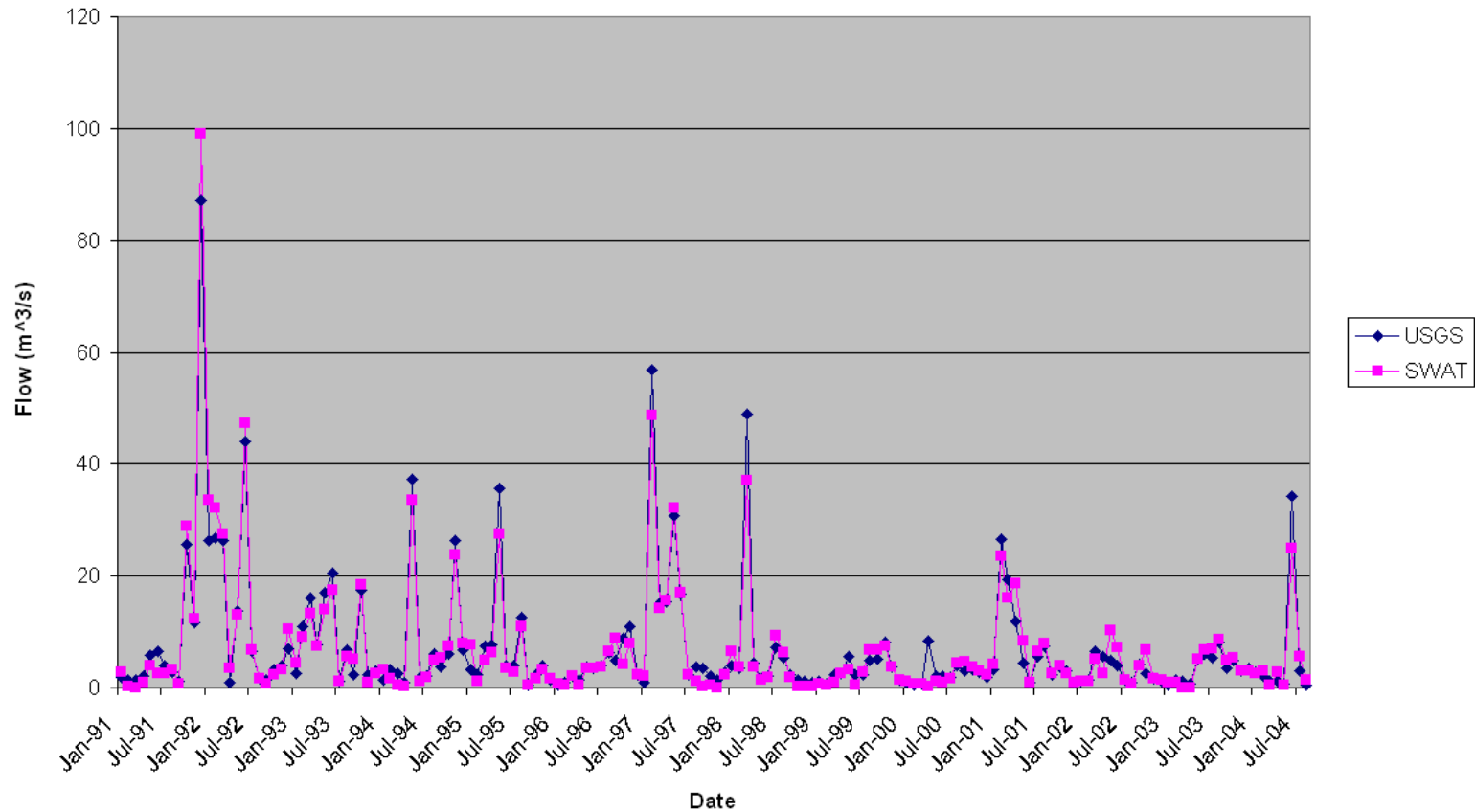
# **Flow Calibration**

# North Central Texas

## Water Quality Project



1991-2004  
USGS 08044500  
WF Trinity River near Boyd

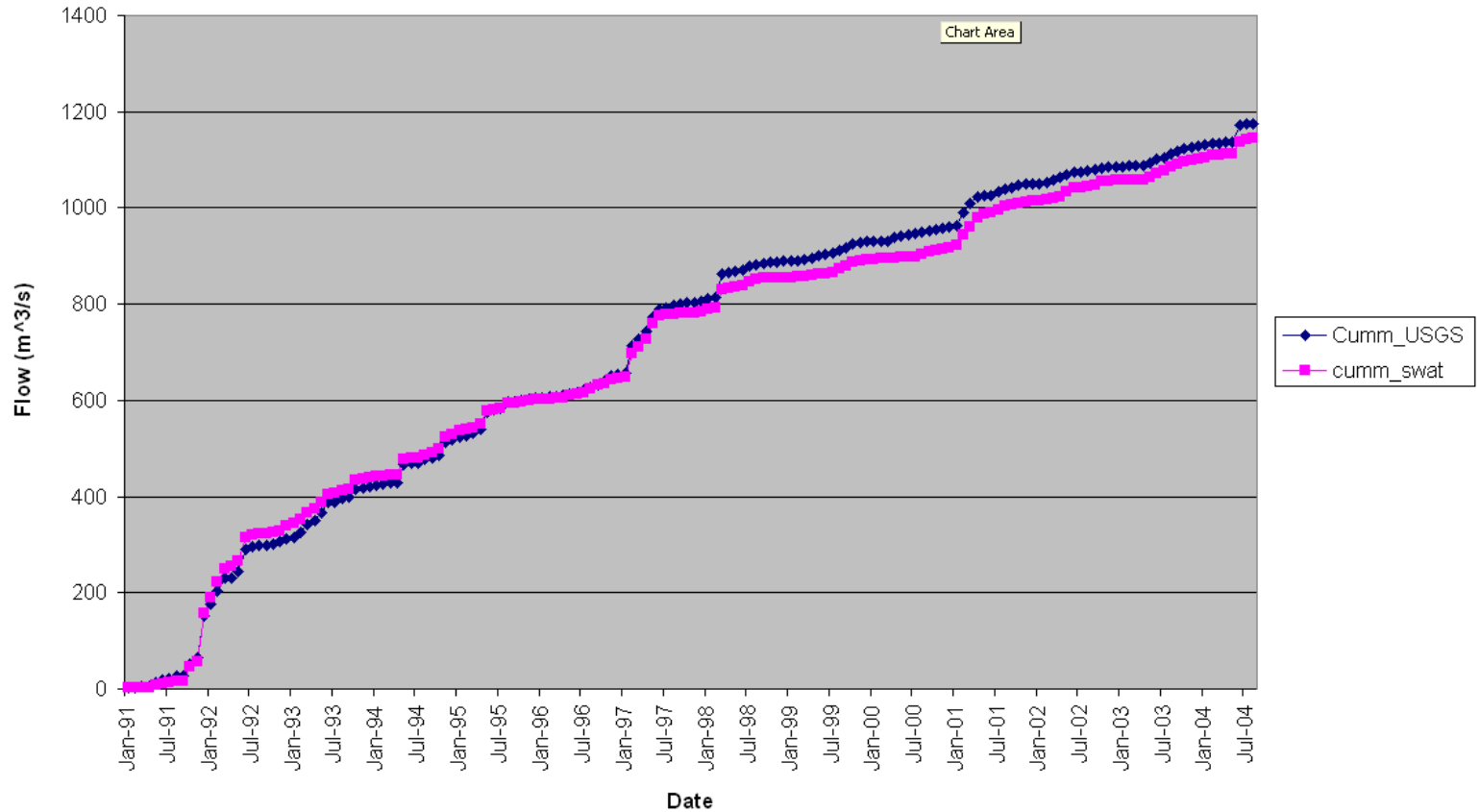


# North Central Texas

## Water Quality Project



1991-2004  
USGS 08044500  
WF Trinity River near Boyd

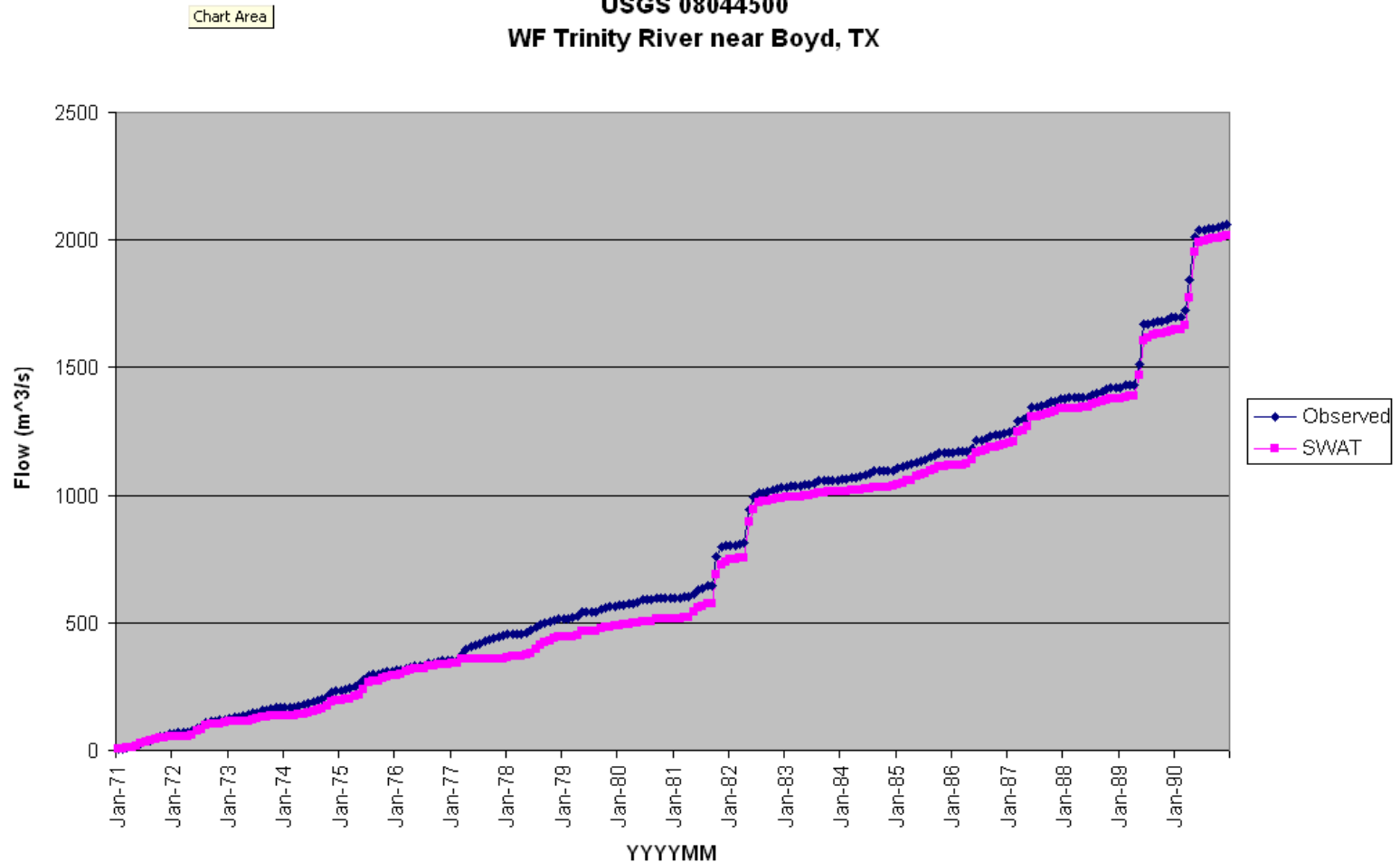


# North Central Texas

## Water Quality Project



1971-1990  
USGS 08044500  
WF Trinity River near Boyd, TX



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# **Sediment Calibration**

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## Water Quality Project

### Sediment Loads by Overland Flow

Period	Observed (metric ton)	Modeled (metric ton)	Differences (%)
<b>Total (Annual average)</b>	197,313	<b>196,909</b>	<b>-0.2%</b>
Calibration (1994 – 2004)		206,294	+4.6%
Validation (1970 – 1990)		191,748	-2.8%

# North Central Texas

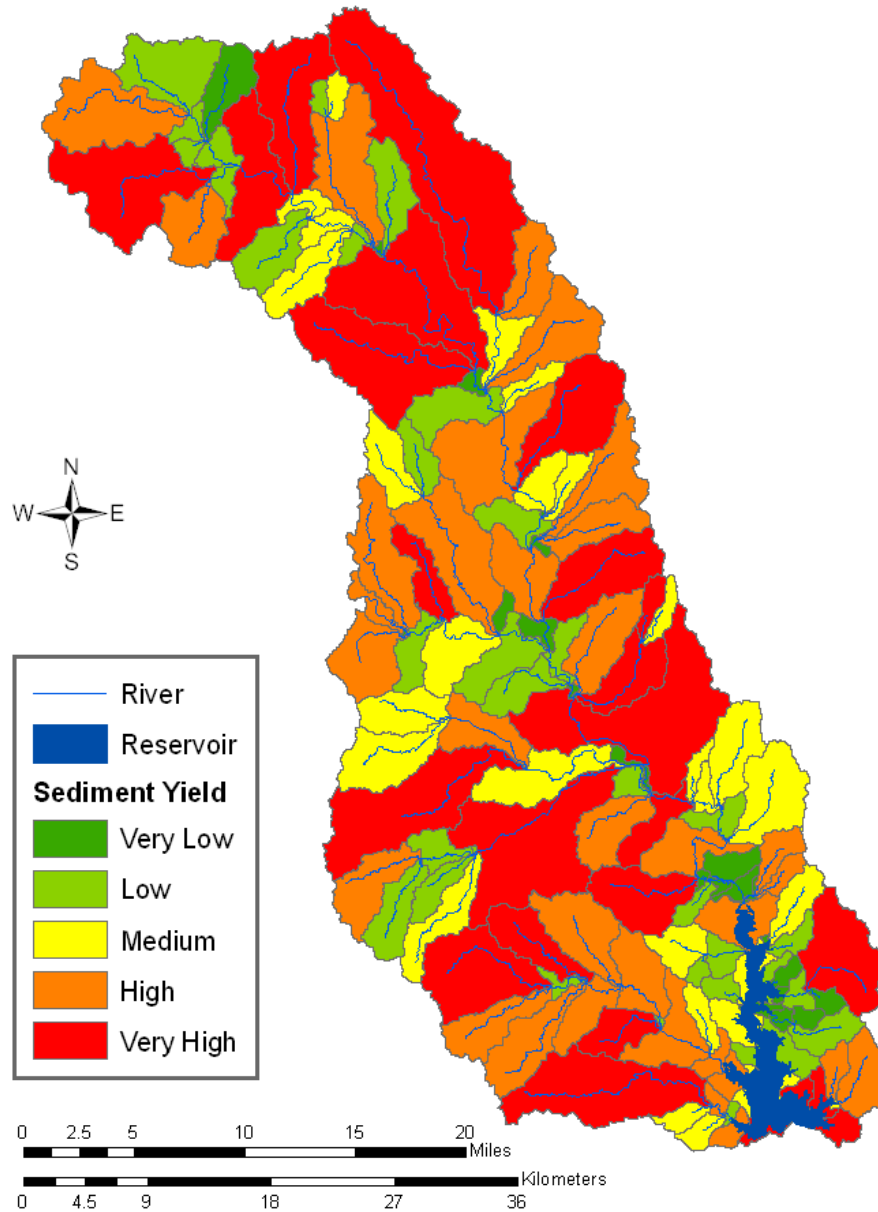


## Water Quality Project

### Sediment Loads at Reservoir

Period	Observed (metric ton)	Modeled (metric ton)	Differences
Total (Annual average)	295,822	303,216	+2.5%
Calibration (1994 – 2004)		263,827	-10.8%
Validation (1970 – 1990)		324,880	+9.8%

# Sediment Yield by Overland Flow





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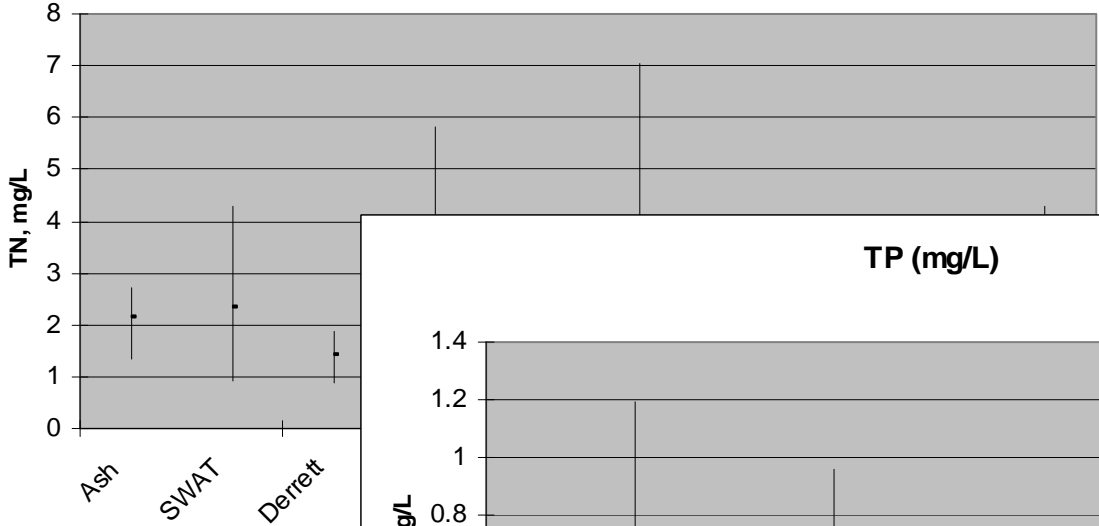
**Water Quality Project**

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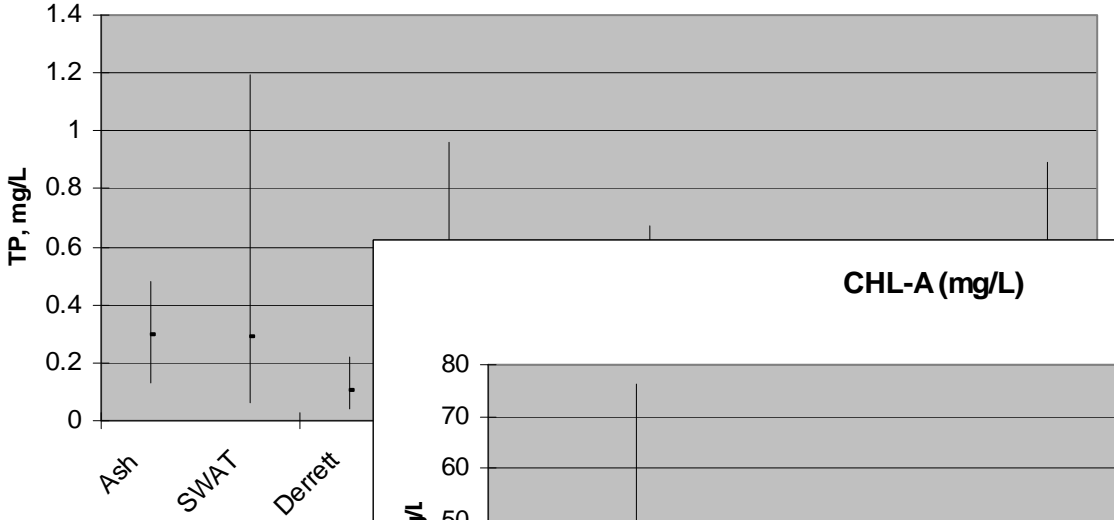
# **Nutrients Calibration**

# Monitoring Sites

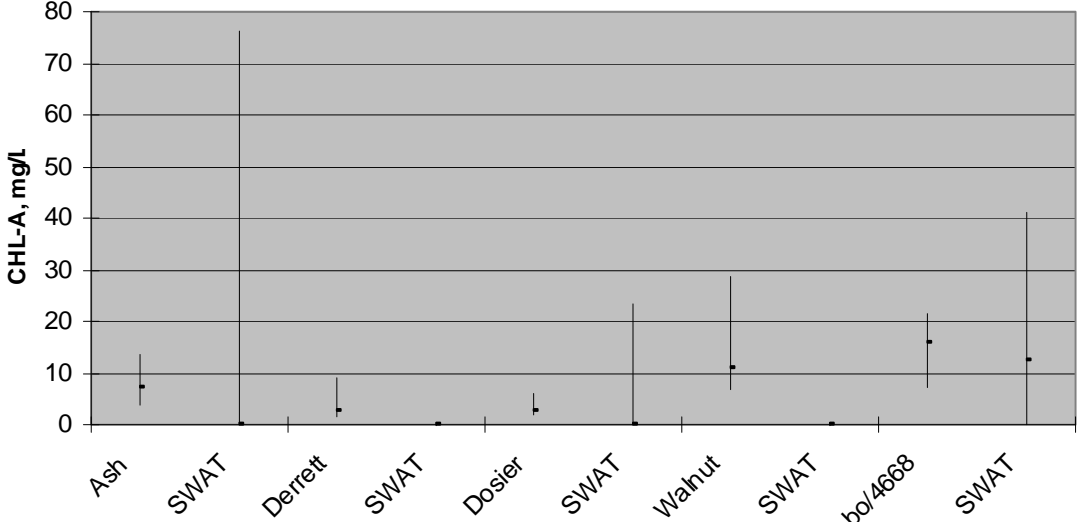
### TN (mg/L)



### TP (mg/L)

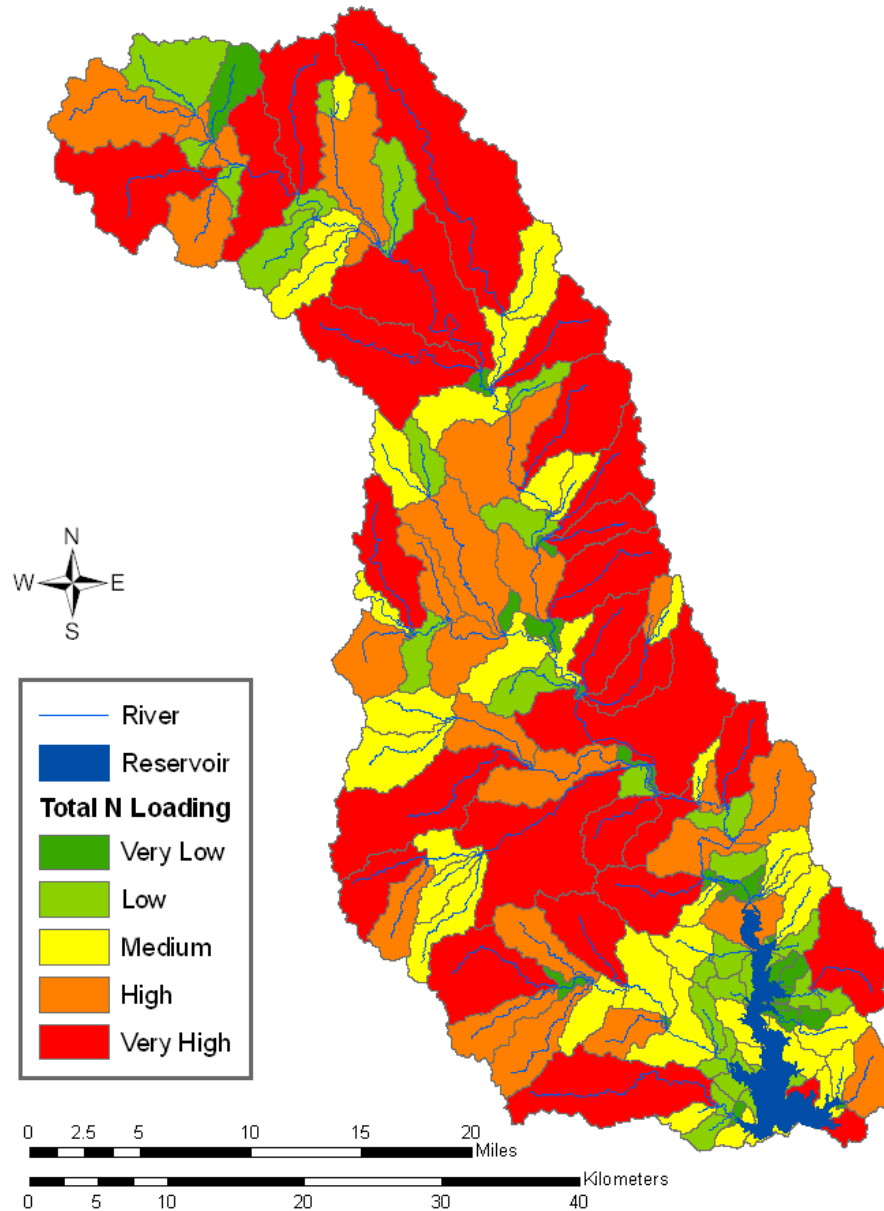


### CHL-A (mg/L)



WF @ Bobo/4668

# Total Nitrogen from Each Subbasin



# Total Phosphorous from Each Subbasin

