# BASIN SUMMARY REPORT

## *GUADALUPE RIVER BASIN*

## *and the*

## *LAVACA-GUADALUPE COASTAL BASIN*

## *TEXAS CLEAN RIVERS PROGRAM*

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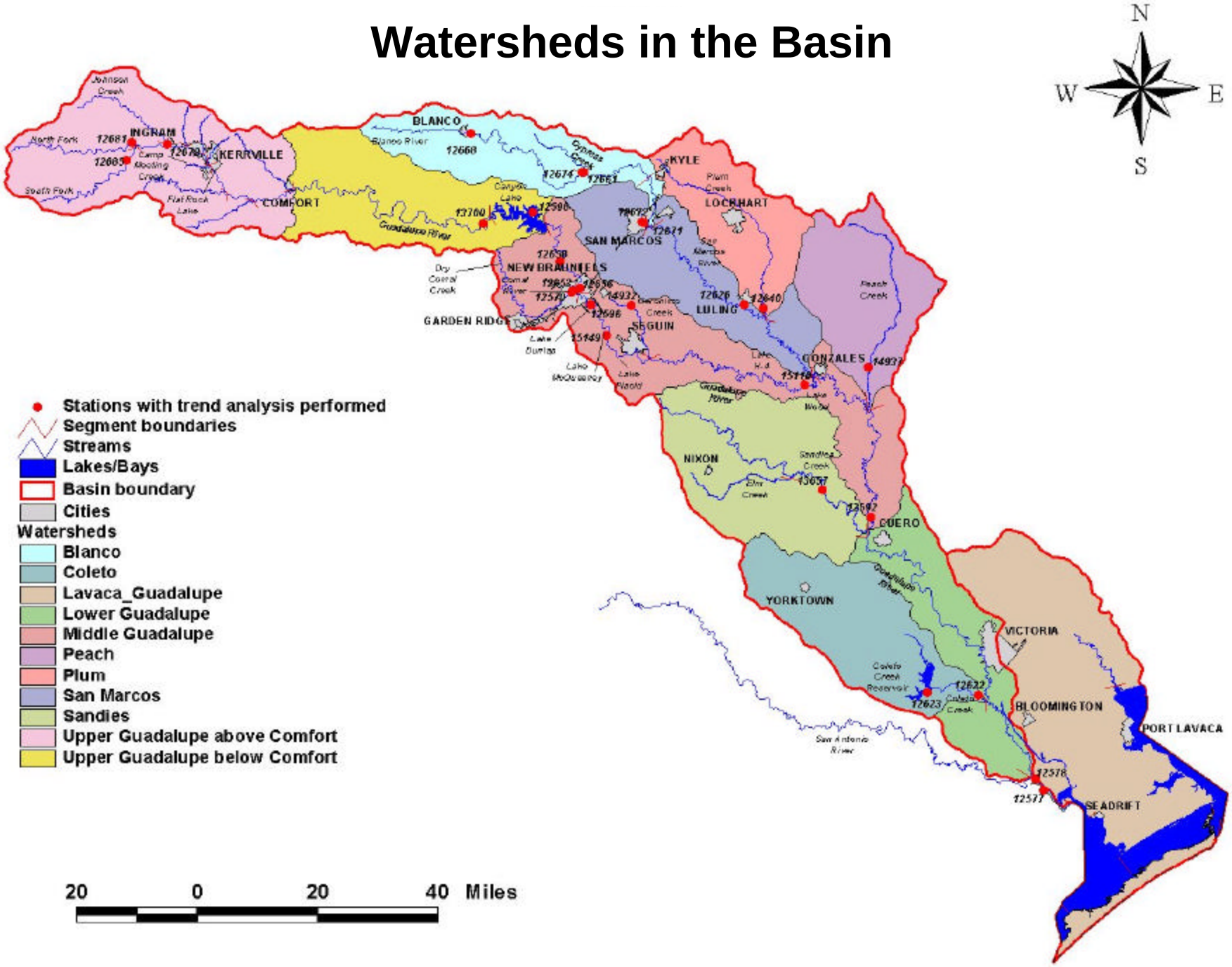
# MAIN TOPICS

- Analysis of monitoring data to see if water quality changing
- Review and summary of data in relation to screening levels and criteria
- Water Quality Events Inventory—things that happened that affect water quality

# Watersheds in the Basin



# Parameters Selected for Trend Analysis

| Parameter | Unit | Storet Code |
|---|---|---|
| Water Temperature | degree C | 00010 |
| Conductivity | mmhos/cm | 00094 |
| Dissolved Oxygen (DO) | mg/L | 00300 |
| pH | Standard unit | 00400 |
| Ammonia Nitrogen ($NH_3$-N) | mg/L | 00610 |
| Nitrate & Nitrite Nitrogen ($NO_3$+$NO_2$-N) | mg/L | 00630 or 00631 |
| Total Phosphorus (TP) | mg/L | 00665 |
| Chloride | mg/L | 00940 |
| Sulfate | mg/L | 00945 |
| Fecal Coliform (FC) | cfu/dL | 31616 |
| *E. Coli* (EC) | cfu/dL | 31648 or 31699 |
| Chlorophyll *a* | mg/L | 32211 |

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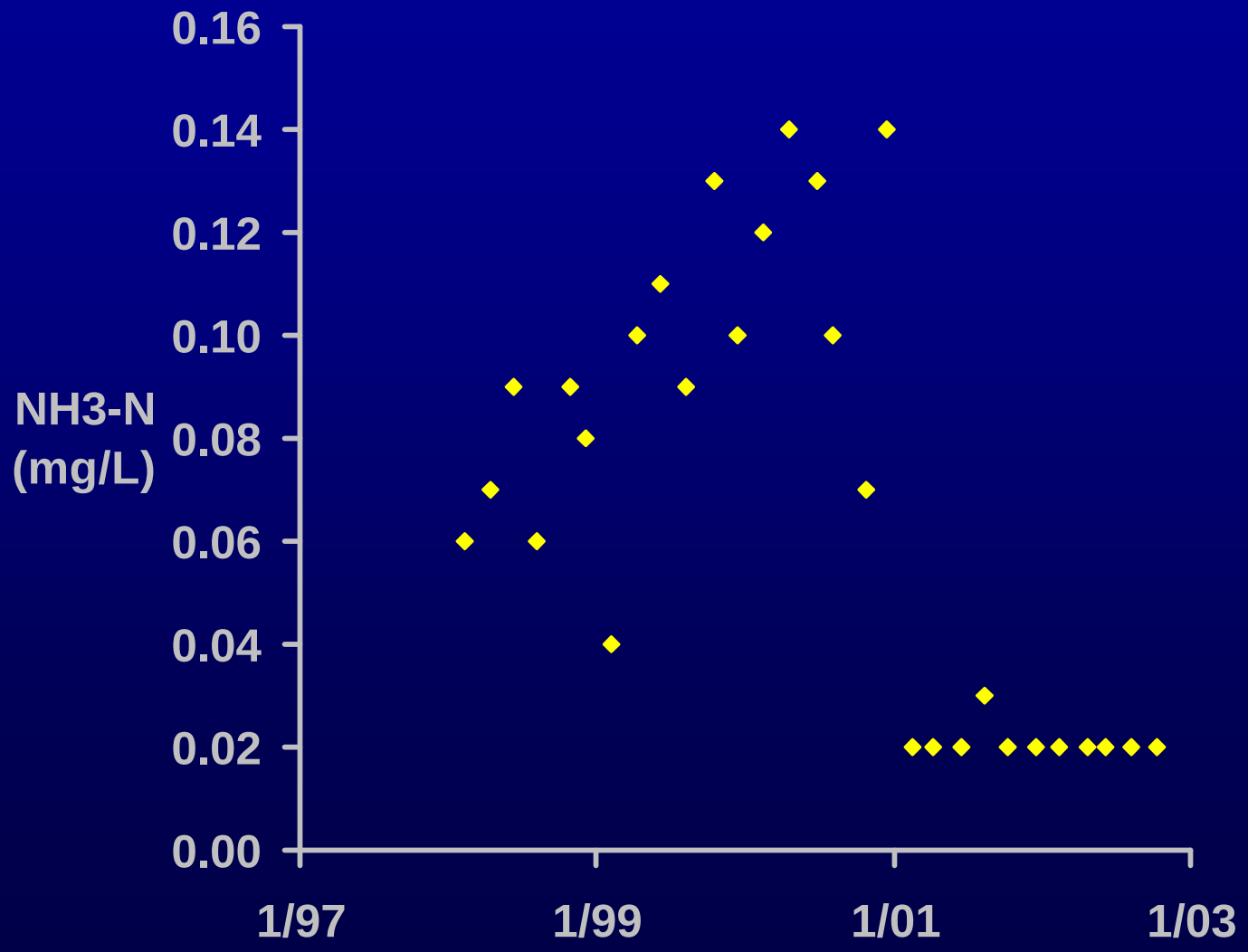
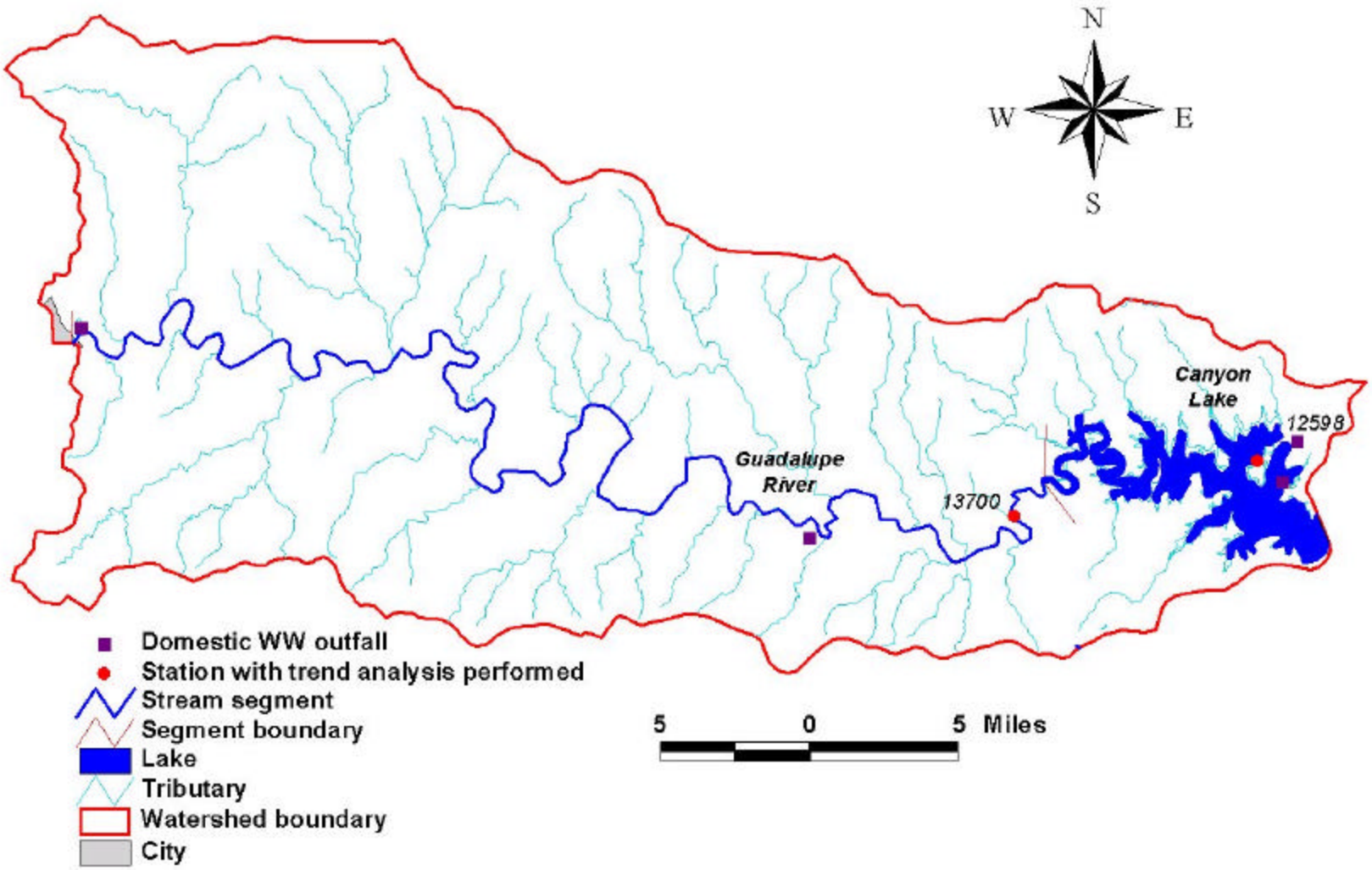
# Summary of Initial Trend Analysis

| Parameter | No. of data sets or stations | Decreasing trend | Increasing trend |
|---|---|---|---|
| Water Temperature | 22 | | 3 |
| Conductivity | 19 | | 5 |
| Dissolved Oxygen Deficit | 22 | 14 | |
| pH | 21 | 2 | 2 |
| Ammonia Nitrogen | 20 | | |
| Nitrate & Nitrite Nitrogen | 18 | 5 | 3 |
| Total Phosphorus | 23 | 7 | 1 |
| Chloride | 25 | 4 | 3 |
| Sulfate | 24 | 4 | 3 |
| Fecal Coliform | 19 | 5 | 1 |
| E Coli | 17 | 1 | |
| Chlorophyll *a* | 3 | | |
| TOTAL | 233 | 42 | 21 |

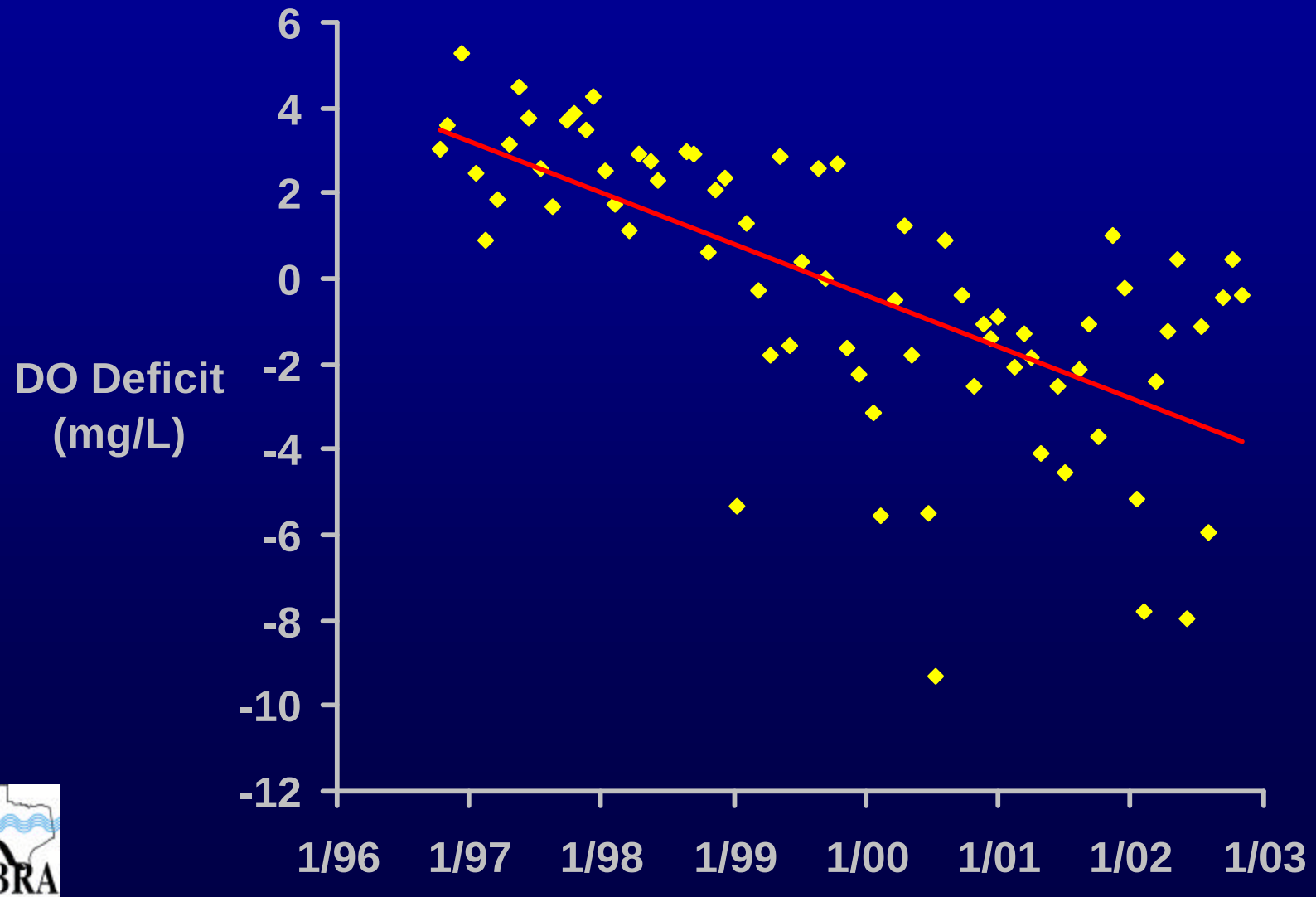
# $NH_3$-N Data, Guadalupe River at RR 311, 1.9 Mi SE of Spring Branch



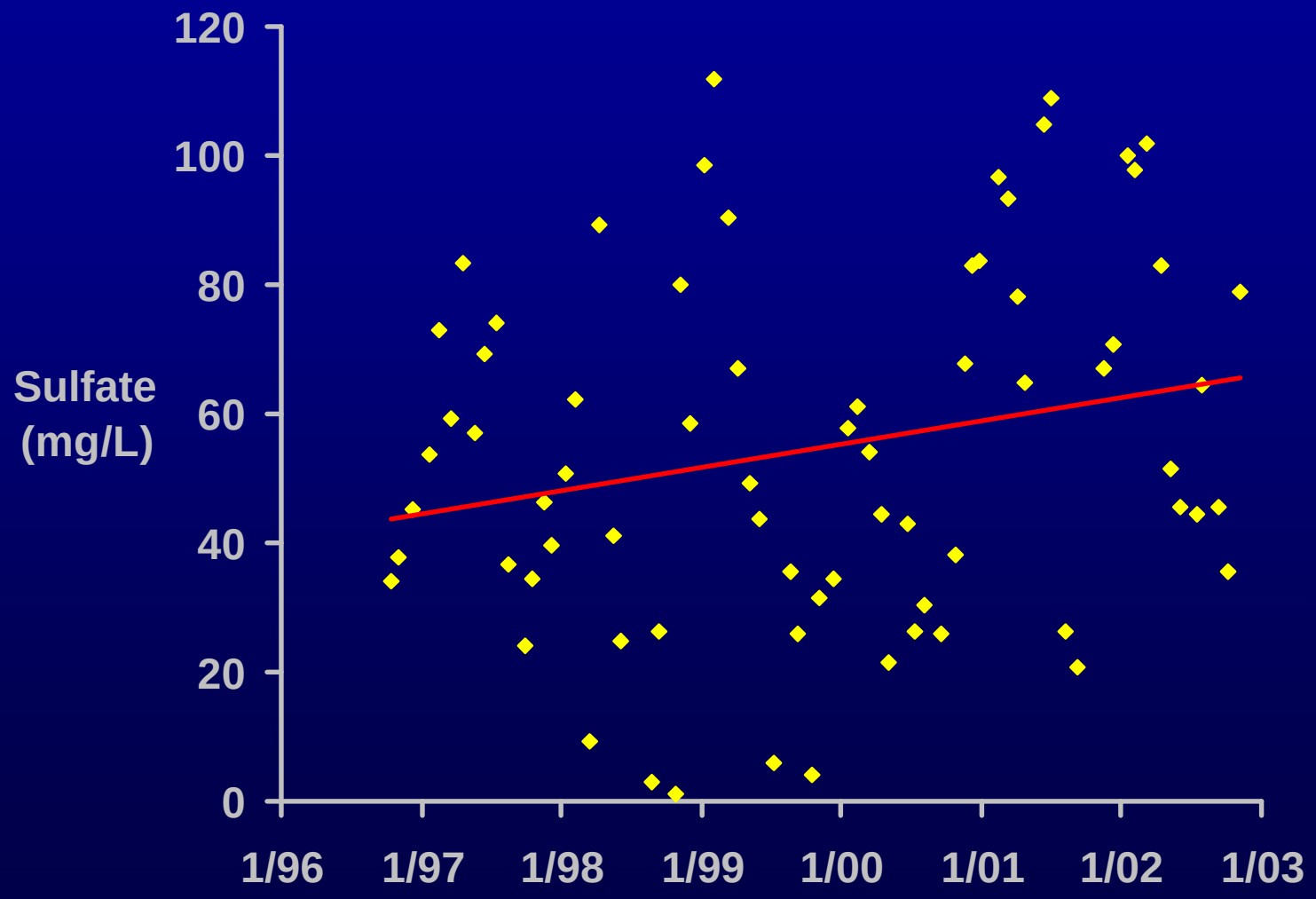
# Upper Guadalupe River Watershed Below Comfort



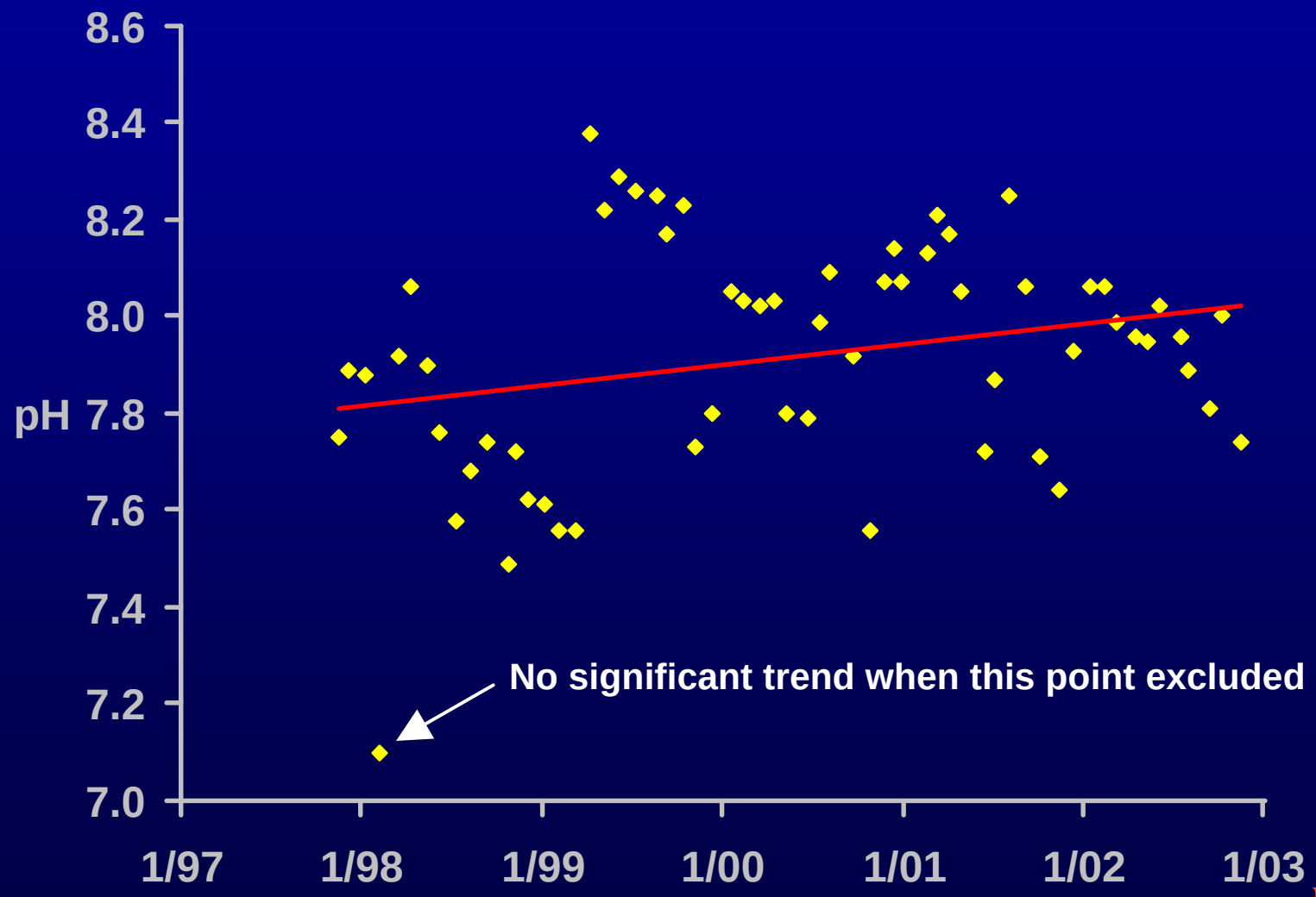
# DO Deficit, Dry Comal Creek at Missouri-Kansas-Texas Railway Crossing



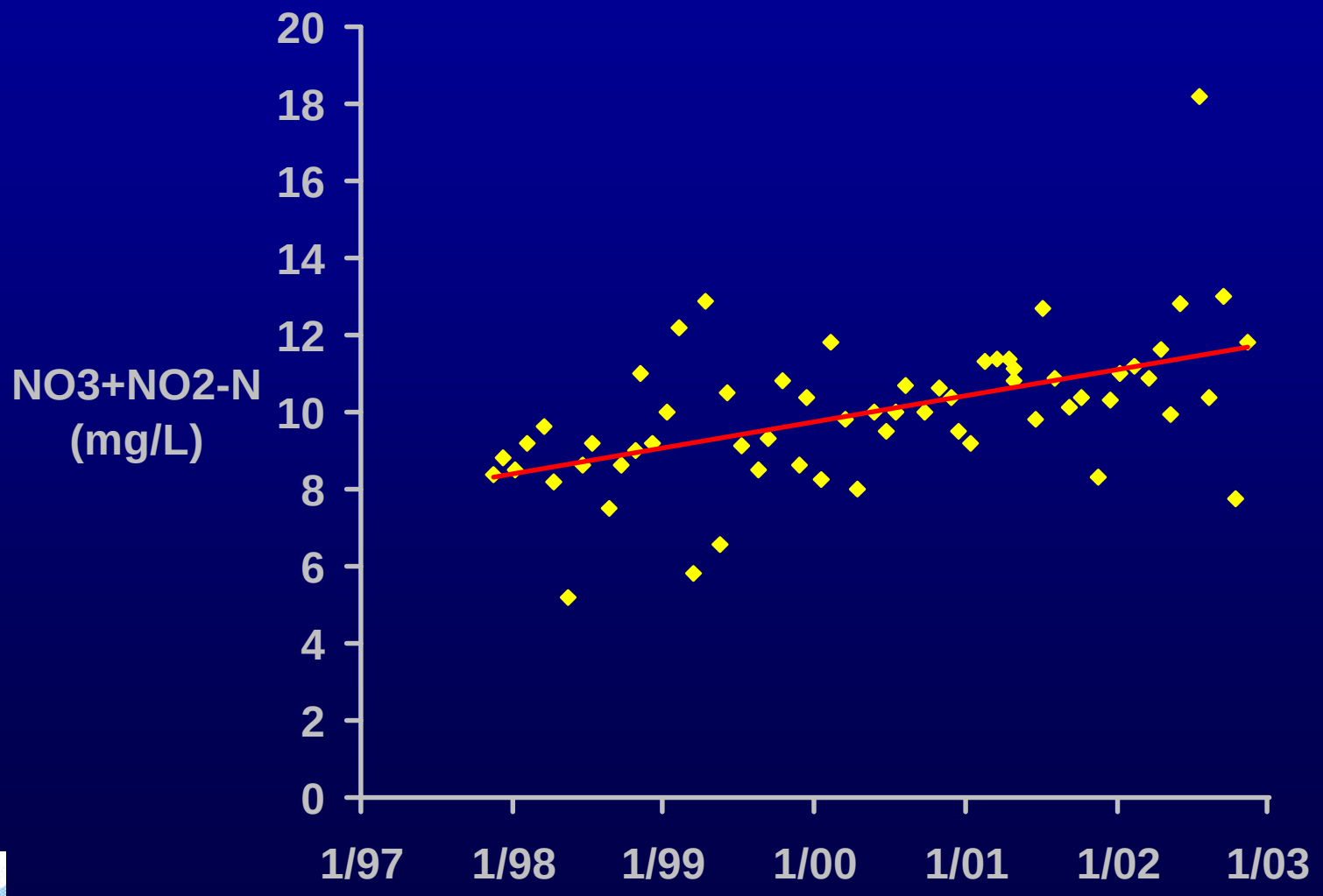
# Sulfate, Dry Comal Creek at Missouri-Kansas-Texas Railway Crossing



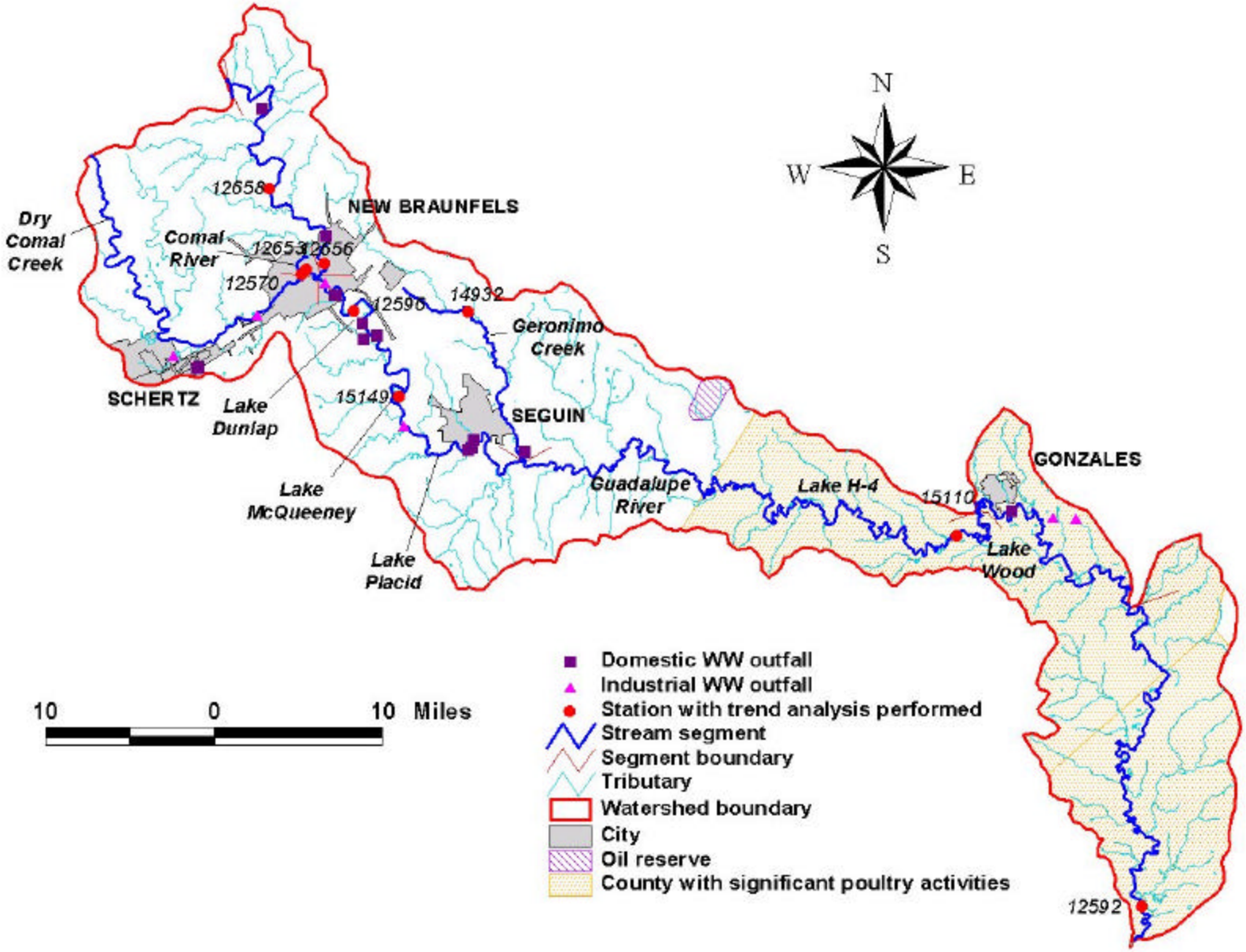
# pH, Lake McQueeney, 0.5 Mi upstream of Dam on SE Dam



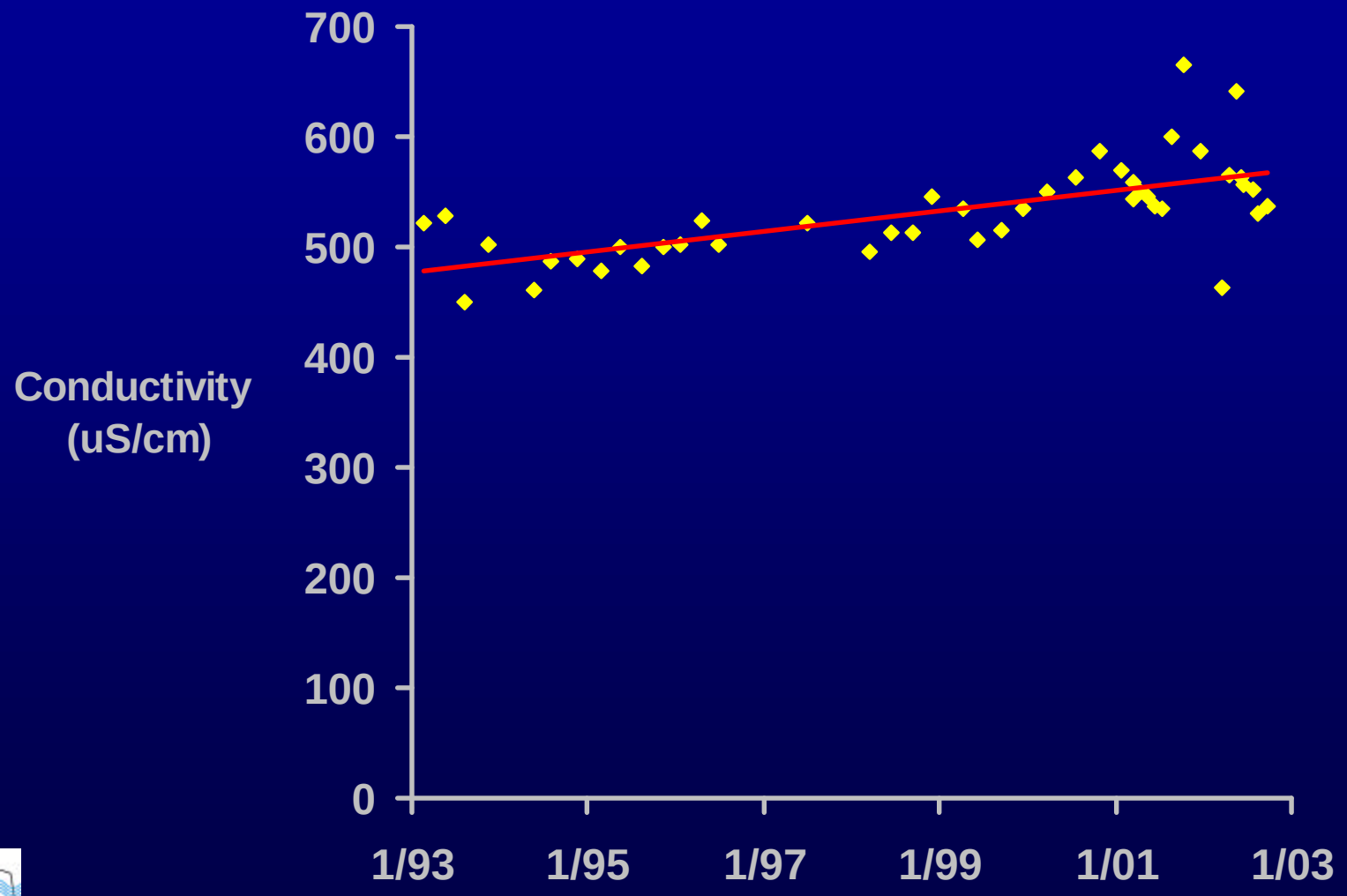
# $NO_3$+$NO_2$-N, Geronimo Creek at SH 123



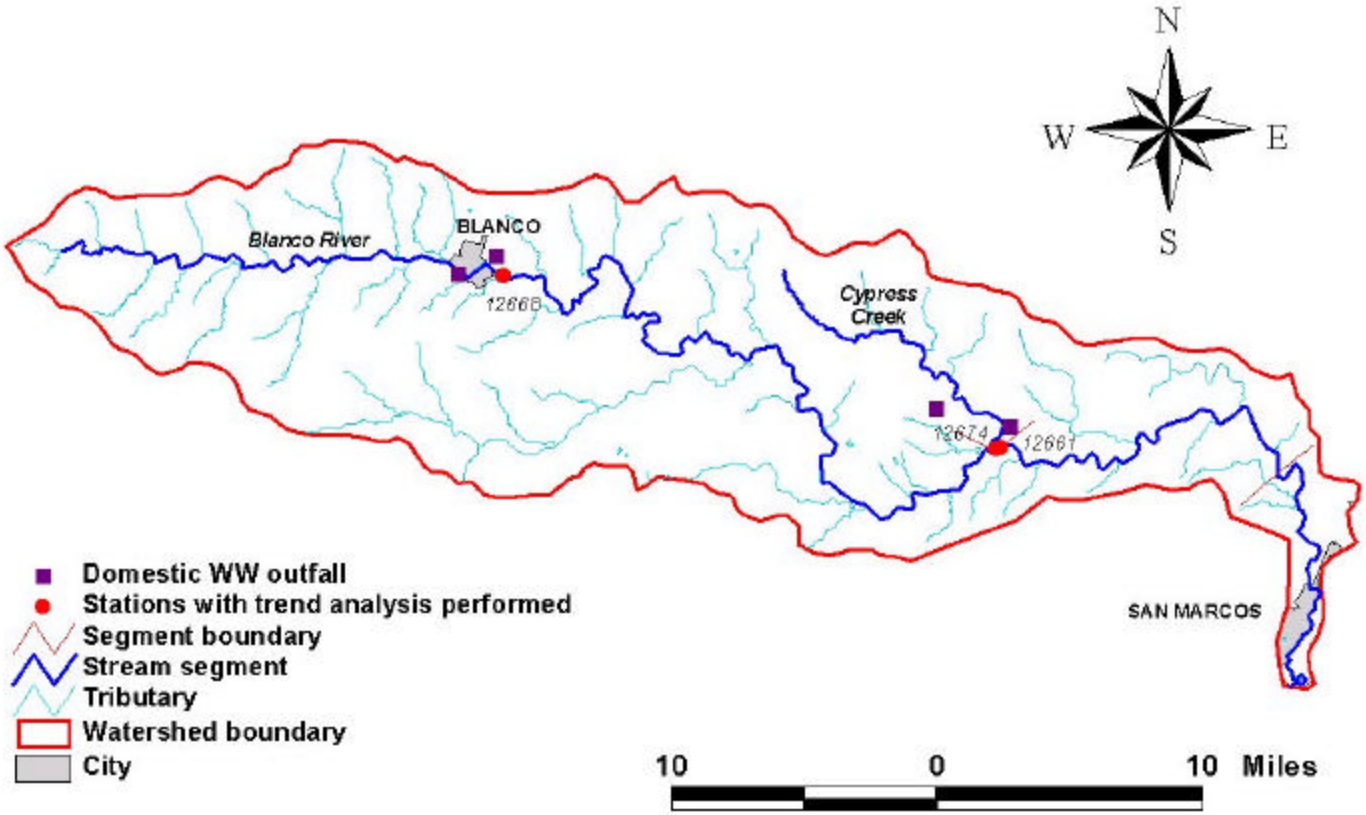
# Middle Guadalupe River Watershed



# Conductivity, Cypress Creek at FM 12 at Wimberley



# Blanco River Watershed



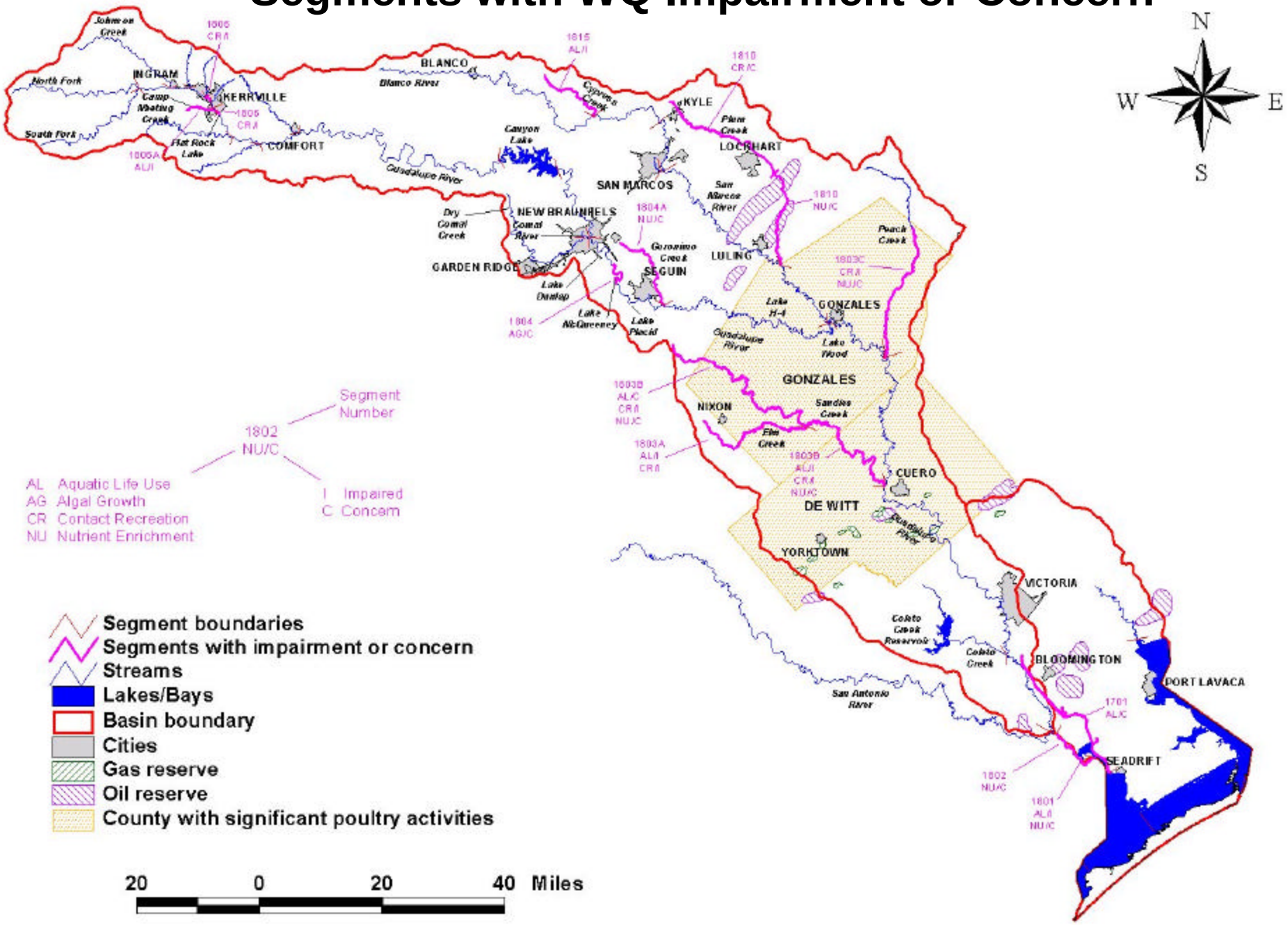
# Summary of Trend Analysis

| Watershed | Seg | Stn | Temp | | | Cond | | | DO def | | | pH | | | NO2+NO3-N | | | TP | | | Cl | | | SO4 | | | FC | | | EC | | | Chl a | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | All | Win | Sum | All | Win | Sum | All | Win | Sum | All | Win | Sum | All | Win | Sum | All | Win | Sum | All | Win | Sum | All | Win | Sum | All | Win | Sum | All | Win | Sum | All | Win | Sum |
| Upper Guadalupe | 1816 | 12678 | -- | | | -- | | | -- | | | ↓ | ↓ | ↓ | | | | ↓ | ↓ | ↓ | -- | | | ↑ | ↑ | -- | ↓ | -- | ↓ | | | | | | |
| River above | 1818 | 12685 | | | | | | | | | | | | | | | | | | | | | | | | | ↑ | ↑ | -- | | | | | | |
| Comfort | 1817 | 12681 | -- | | | -- | | | -- | | | -- | | | | | | | | | -- | | | -- | | | -- | | | | | | | | |
| Upper Guadalupe | 1805 | 12598 | -- | | | -- | | | ↓ | ↓ | -- | ↓ | -- | -- | -- | | | -- | | | ↓ | ↓ | -- | -- | | | -- | | | ↓ | -- | ↓ | -- | | |
| River below | 1806 | 13700 | -- | | | ↑ | ↑ | ↑ | ↓ | ↓ | ↓ | -- | | | ↑ | -- | -- | -- | | | -- | | | ↑ | ↑ | -- | | | | -- | | | | | |
| Middle Guadalupe | 1803 | 12592 | -- | | | -- | | | ↓ | ↓ | ↓ | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | | | |
| River | 1804 | 15110 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | | | |
| | 1804 | 15149 | -- | | | -- | | | -- | | | ↑ | ↑ | -- | ↓ | -- | -- | -- | | | -- | | | ↓ | -- | ↓ | | | | -- | | | -- | | |
| | 1804 | 12596 | -- | | | -- | | | ↓ | ↓ | -- | -- | | | -- | | | ↓ | -- | -- | -- | | | ↓ | ↓ | -- | ↓ | -- | -- | -- | | | -- | | |
| | 1812 | 12656 | | | | | | | | | | | | | | | | -- | | | -- | | | -- | | | -- | | | | | | | | |
| | 1812 | 12658 | ↑ | -- | ↑ | -- | | | ↓ | ↓ | ↓ | -- | | | -- | | | ↓ | ↓ | ↓ | ↓ | ↓ | -- | ↓ | ↓ | -- | -- | | | -- | | | | | |
| | 1811 | 12570 | ↑ | -- | ↑ | -- | | | ↓ | ↓ | ↓ | -- | | | ↓ | ↓ | ↓ | ↓ | -- | ↓ | -- | | | ↑ | ↑ | -- | -- | | | -- | | | | | |
| | 1811 | 12653 | ↑ | ↑ | -- | ↑ | ↑ | ↑ | ↓ | ↓ | ↓ | -- | | | ↓ | -- | -- | -- | | | -- | | | -- | | | ↓ | -- | ↓ | -- | | | | | |
| | 1804 | 14932 | -- | | | -- | | | ↓ | ↓ | ↓ | -- | | | ↑ | ↑ | ↑ | -- | | | ↓ | ↓ | -- | ↓ | ↓ | ↓ | -- | | | -- | | | | | |
| Blanco River | 1813 | 12661 | -- | | | | | | -- | | | -- | | | ↑ | ↑ | -- | -- | | | ↑ | ↑ | -- | -- | | | | | | | | | | | |
| | 1815 | 12674 | -- | | | ↑ | ↑ | ↑ | ↓ | ↓ | ↓ | -- | | | | | | ↑ | -- | -- | ↑ | ↑ | -- | -- | | | | | | | | | | | |
| | 1813 | 12668 | -- | | | -- | | | ↓ | -- | -- | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | | | |
| Plum Creek | 1810 | 12640 | -- | | | -- | | | ↓ | -- | -- | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | | | |
| San Marcos River | 1808 | 12626 | -- | | | ↑ | -- | -- | ↓ | -- | ↓ | -- | | | -- | | | ↓ | ↓ | ↓ | ↑ | -- | ↑ | -- | | | ↓ | ↓ | -- | -- | | | | | |
| | 1814 | 12671 | | | | | | | | | | | | | | | | | | | | | | | | | ↓ | ↓ | | | | | | | |
| | 1814 | 12672 | -- | | | | | | -- | | | | | | -- | | | -- | | | ↓ | | | | | | | | | -- | | | | | |
| Peach Creek | 1803 | 14937 | -- | | | -- | | | -- | | | ↑ | ↑ | ↑ | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | | | |
| Sandies Creek | 1803 | 13657 | -- | | | | | | ↓ | ↓ | -- | -- | | | | | | | | | -- | | | -- | | | | | | | | | | | |
| Coleto Creek | 1807 | 12622 | | | | | | | | | | | | | | | | -- | | | -- | | | -- | | | | | | | | | | | |
| | 1807 | 12623 | -- | | | ↑ | -- | -- | -- | | | -- | | | ↓ | ↓ | -- | -- | | | -- | | | -- | | | -- | | | -- | | | | | |
| Lower Guadalupe | 1801 | 12577 | | | | | | | | | | | | | | | | ↓ | ↓ | -- | -- | | | -- | | | | | | | | | | | |
| River | 1802 | 12578 | -- | | | -- | | | ↓ | ↓ | -- | -- | | | ↓ | ↓ | -- | ↓ | ↓ | ↓ | -- | | | -- | | | -- | | | -- | | | | | |

# COMPARISONS TO FIXED CRITERIA AND SCREENING LEVELS

- 305(b) Report
- 303(d) Listing
- TMDL

# Segments with WQ Impairment or Concern



# Summary of 305(b) Results

| | Impairment | Concern | Limited Data |
|---|---|---|---|
| DO | 4 | 4 | |
| Bacteria | 6 | 1 | 1 |
| Chloro a | | 1 | |
| NH3-N | | 4 | |
| NO3-N | | 5 | |
| TP | | 1 | |

# WATER QUALITY EVENTS INVENTORY

- Feb-March Lake Debris Cleanup
- Feb-Canyon Regional Water Quality study completed
- April-Hog Farm runoff investigated
- April-Seguin restaurant grease overflow to Walnut Branch
- May-Diesel spill at Guadalupe bridge

# OTHER FINDINGS

- No indication of problems with toxics such as metals or pesticides
- Fish conditions good but aquatic habitat may be limiting factor

# Biological and Habitat Assessment

| SITE | AQUATIC LIFE USE ACCORDING TO TCEQ | DATE | INDEX OF BIOTIC INTEGRITY IBI | HABITAT QUALITY INDEX HQI |
|---|---|---|---|---|
| BLANCO RIVER AT FM 165 1/2 MILE EAST OF BLANCO | Exceptional | 05/20/98 | Intermediate | Intermediate |
| | | 02/09/99 | Intermediate/Limited | Intermediate |
| | | 06/14/99 | Intermediate | Intermediate |
| | | 06/28/01 | Intermediate | Intermediate |
| | | 08/16/01 | Intermediate | Intermediate |
| DRY COMAL CREEK AT MISSOURI-KANSAS-TEXAS RAILROAD | Limited | 06/12/01 | Intermediate | Intermediate |
| | | 08/16/01 | Intermediate/Limited | Intermediate |
| GERONIMO CREEK AT SH 123 NEAR GERONIMO. TX | High | 06/27/01 | Intermediate/Limited | Intermediate |
| | | 08/16/01 | Limited | Intermediate |
| BIG JOSHUA CREEK AT WARING-WELFARE ROAD NORTH OF | ** | 06/14/02 | Intermediate | Intermediate |
| PEACH CREEK AT GONZALES CR 353, 14.0KM EAST OF GONZALES | High | 05/21/98 | Intermediate/Limited | Intermediate |
| | | 09/15/99 | Limited | Intermediate |
| | | 05/16/00 | Limited | Intermediate |
| | | 06/11/01 | Limited | Intermediate |
| | | 05/28/02 | Intermediate/Limited | Intermediate |
| PLUM CREEK AT OLD WOODEN BRIDGE ON CALDWELL CR 135, SE OF LULING | High | 02/09/99 | Limited | Intermediate |
| | | 06/19/99 | Limited | Intermediate |
| | | 05/09/00 | Limited | Intermediate |
| | | 06/26/01 | Intermediate/Limited | Intermediate |

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# RECOMMENDATIONS

- Water quality generally good with most uses supported
- Specific criteria needed for smaller streams
- Swimming criteria should be compared when use is suitable
- Site specific nutrient criteria needed
- Study needed for Kerrville bacteria
- Reduced monitoring possible for areas with improving conditions or no trend

# FURTHER MONITORING NEEDED

- S. Fork Guadalupe River, Bacteria
- River above Canyon, Cond. & Sulfate
- Comal River, Conductivity
- Geronimo Creek, Nitrate-N
- Cypress Creek, Conductivity
- Lower San Marcos River, Conductivity and Chloride