

# Overview of the 2018 VWQM Report: 24 Years of Missouri Stream Team Volunteer Water Quality Data

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*The Missouri Stream Team Watershed Coalition*



# Missouri Stream Team

Volunteer Water Quality Monitoring Program

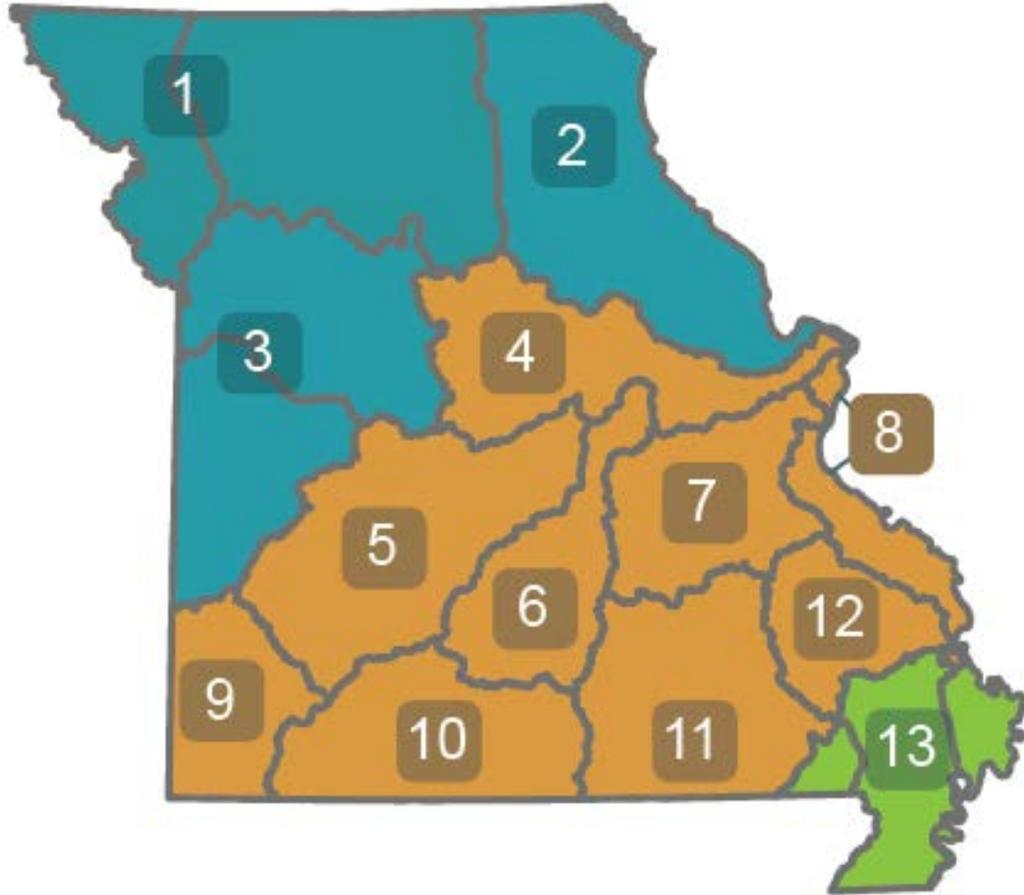


Summary of Data:  
1993-2016



- The Volunteer Water Quality Monitoring Program began in 1993
- In 2011, the first data summary report was completed, which compiled and analyzed the volunteer data from 1993-2010
- The 2011 reports were 2 separate reports – 1 for macroinvertebrates and 1 for chemistry
- The 2018 report is one consolidated report where both chemistry and macroinvertebrates are summarized on the same page for a particular region
- Available at <http://mstwc.org/whats-happening/stream-reports/>
- Part of biennial 305(b) report

# Data divided into 13 regions



Upper St. Francis region and Bootheel are separate regions, unlike the 2011 report which combined these regions.

## How much data was summarized?

- Level 2 or higher
- Chemistry samples at 627 sites. Sites with at least 5 monitoring events over 3 years.
- Macroinvertebrate samples at 413 sites. Sites that were sampled at least 4 years.
- Data from 40,000 sampling events

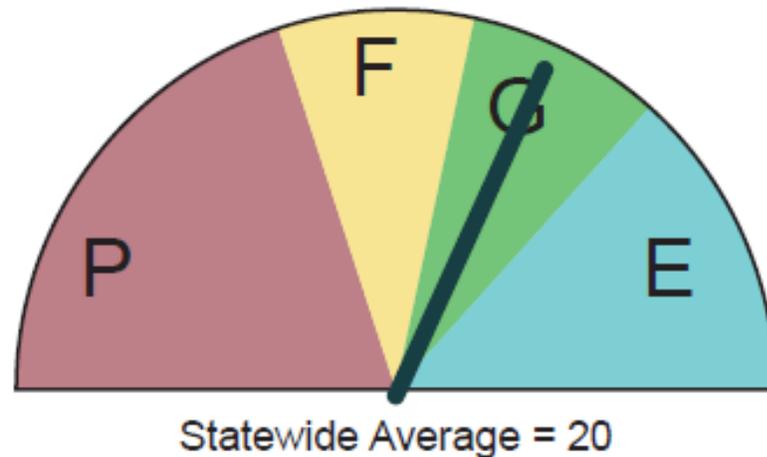
# Analyses - Chemistry

- Arithmetic average values were calculated for each water quality parameter for each site. This average value was then used as the one value to represent the site for that water quality parameter.
- Parameters: Dissolved Oxygen, pH, Nitrate, Ammonia, Phosphate, Chloride, Conductivity, and Turbidity.
- Compared to Screening Criteria Levels and investigated for trends.

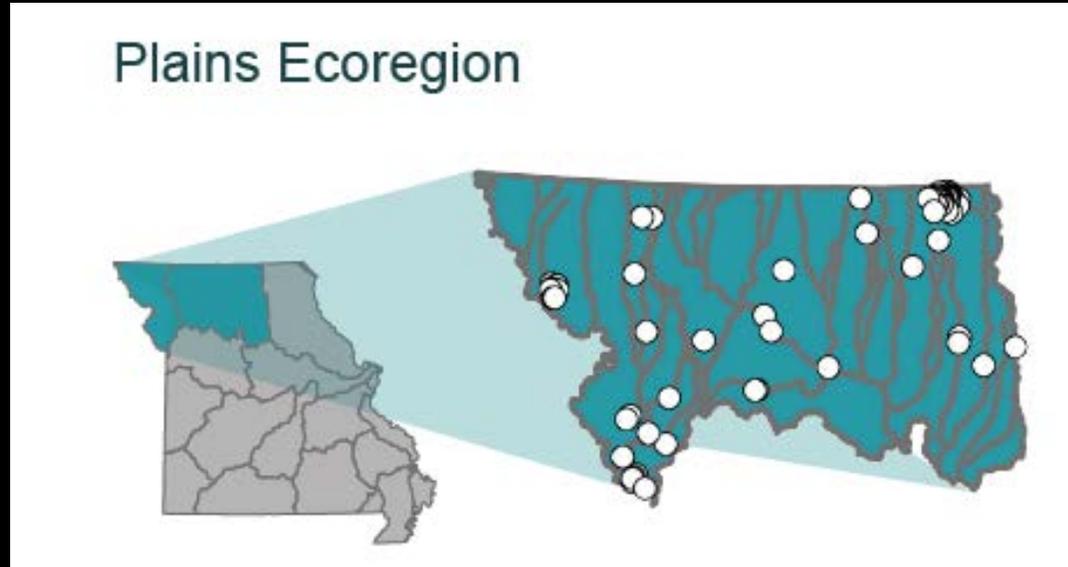
Parameter	Screening Criteria Level
Dissolved Oxygen	Less than 5 mg/L
pH	Less than 6.5
Nitrate	2.0 mg/L or greater
Ammonia	1.0 mg/L or greater
Phosphate	3.0 mg/L or greater
Chloride	230 mg/L or greater
Conductivity	1600 $\mu$ S/cm or greater
Turbidity	No screening value
Invertebrates	No screening value

# Analyses - Invertebrates

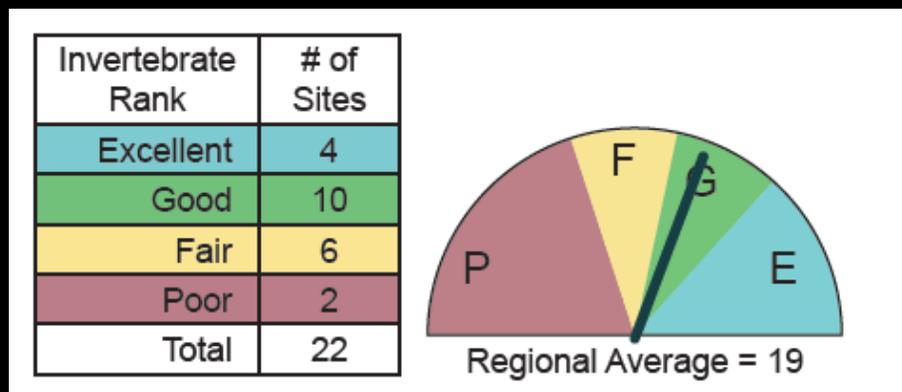
- Annual maximum Invertebrate values were averaged to give each site a final Invertebrate score.
- Score Categories: excellent (score  $>23$ ), good (score 18-23), fair (12-17) or poor ( $<12$ ).



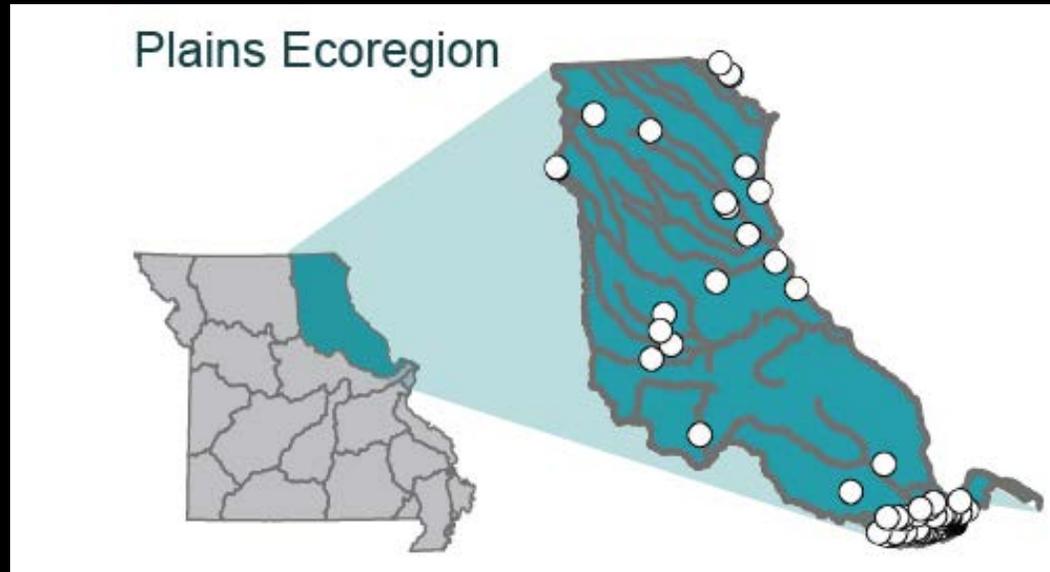
# Region 1: Nishnabotna, Platte, Grand and Chariton Rivers



- Values for Nitrate a concern, with 17% of sites exceeding the screening criteria for Nitrate and 20% exceeding for Ammonia
- 30% of sites had Turbidity values > 40 NTU

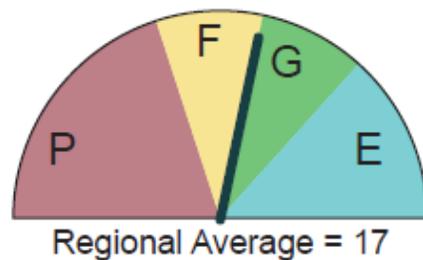


# Region 2: Cuivre and Salt Rivers

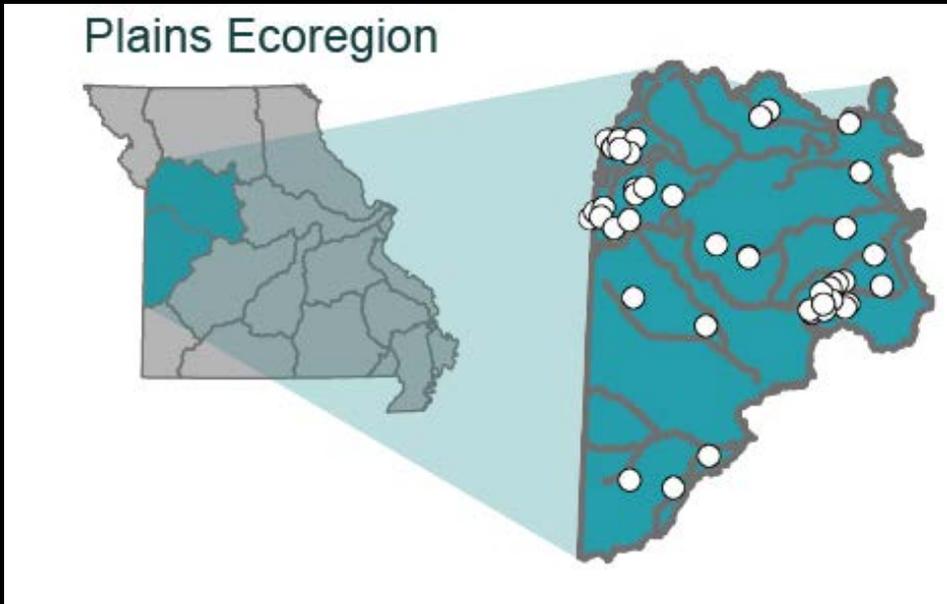


- Lower Invertebrate scores.
- Sites with higher Nitrate values tended to have lower Invertebrate scores.
- This region has St. Charles and rural watersheds.

Invertebrate Rank	# of Sites
Excellent	5
Good	13
Fair	16
Poor	4
Total	38

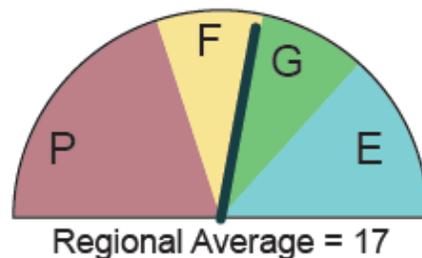


# Region 3: Blackwater, Lamine, Osage, and South Grand Rivers



- Regional Invertebrate Average was Fair
- 20% of sites had Turbidity values over 40 NTU

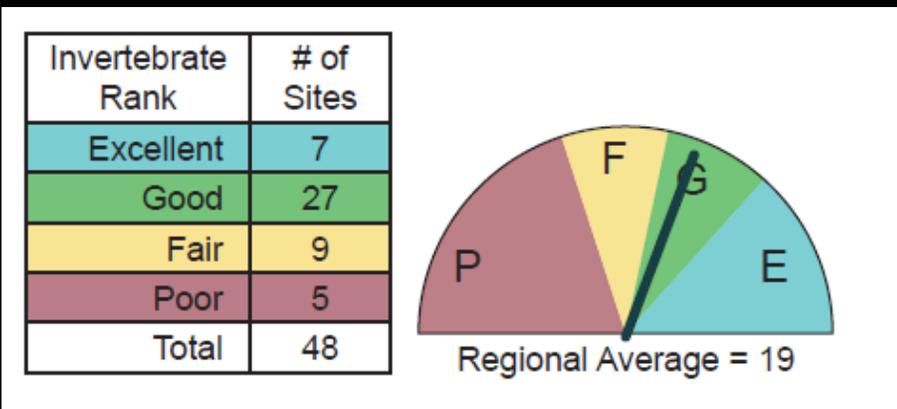
Invertebrate Rank	# of Sites
Excellent	2
Good	12
Fair	10
Poor	2
Total	26



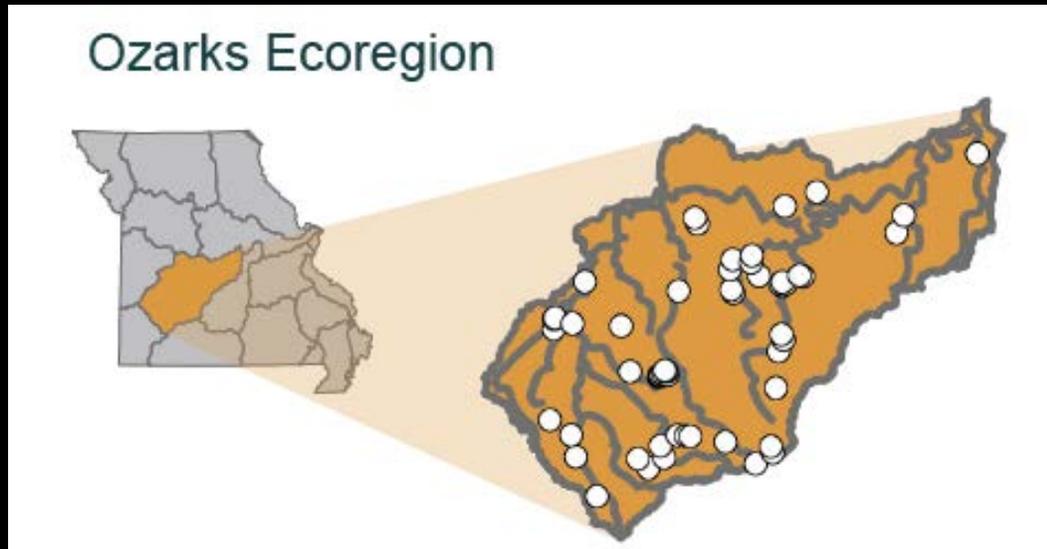
# Region 4: Moreau and Loutre Rivers



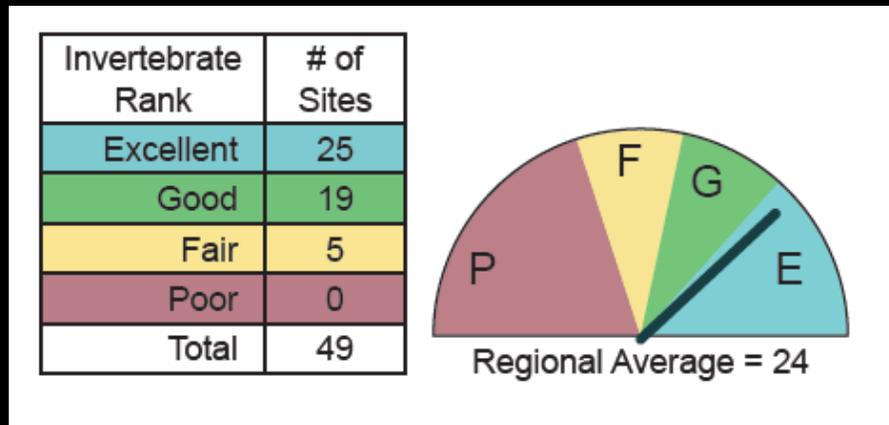
- 25% of assessed sites exceeded screening criteria for Chloride
- Higher Conductivity values tend to have lower Invertebrate scores



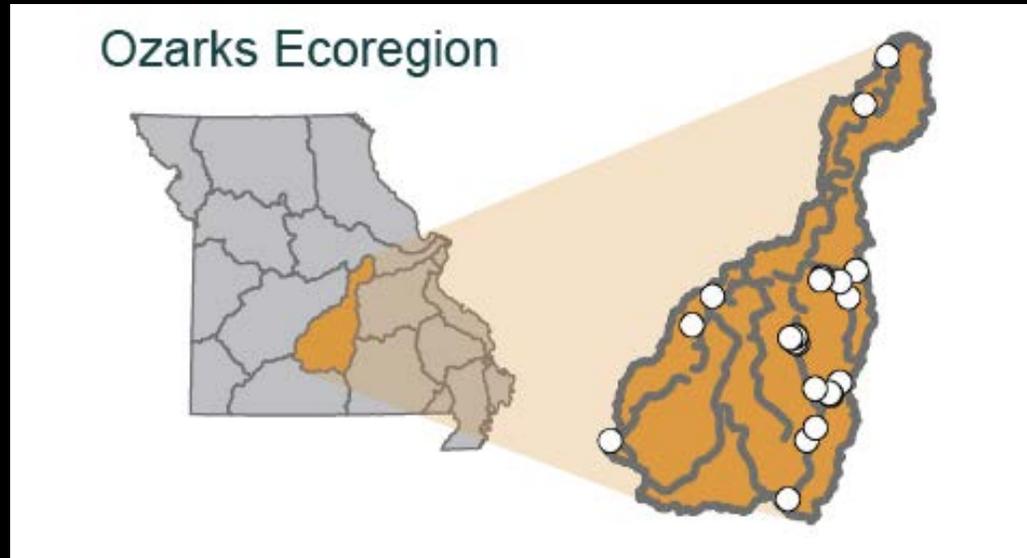
# Region 5: Osage River



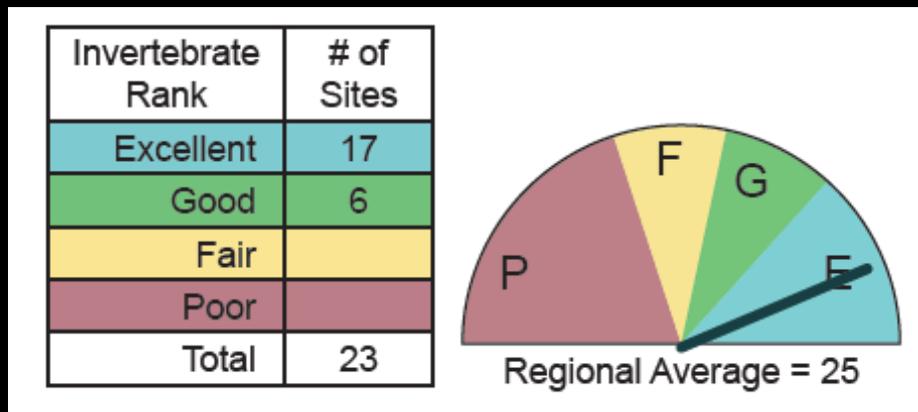
- Excellent ranking for Invertebrates
- 11% of sites had Nitrate values over the screening criteria of 2.0 mg/L



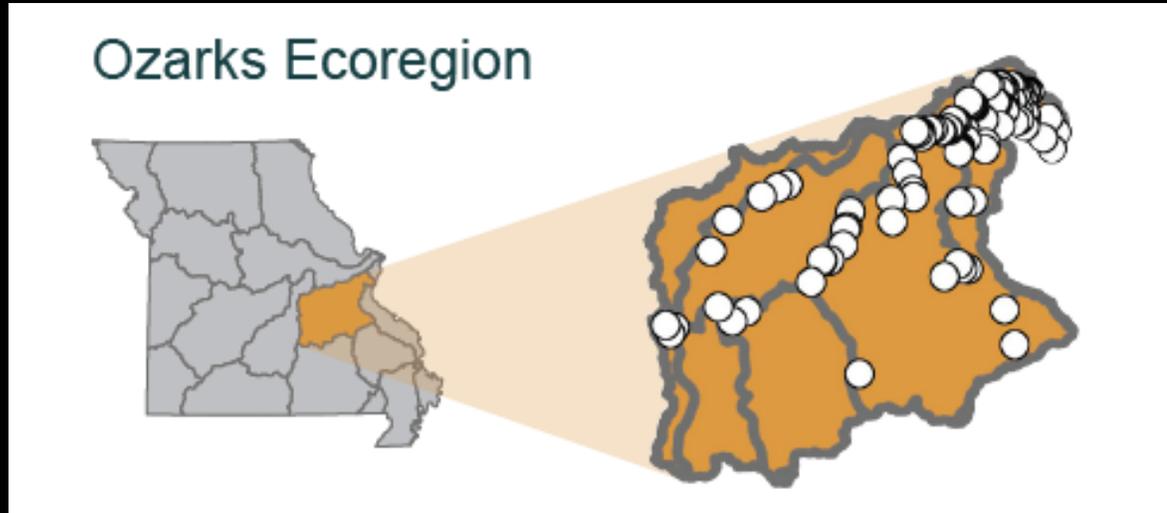
# Region 6: Gasconade River



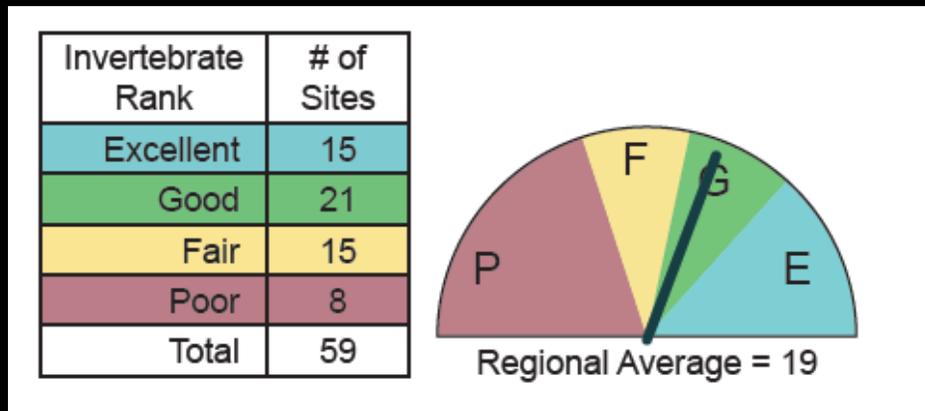
- Highest rate of Excellent scores for Invertebrates
- Region had some of the best water quality in the state



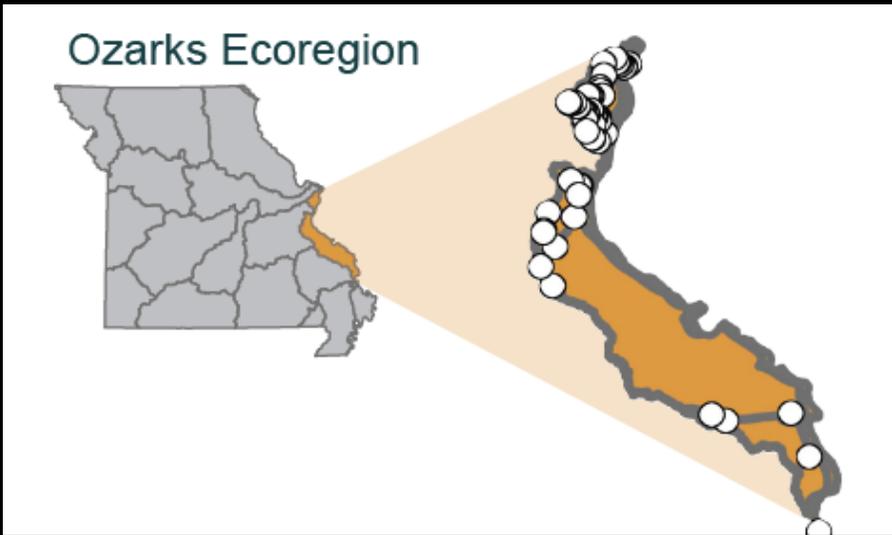
# Region 7: Meramec River



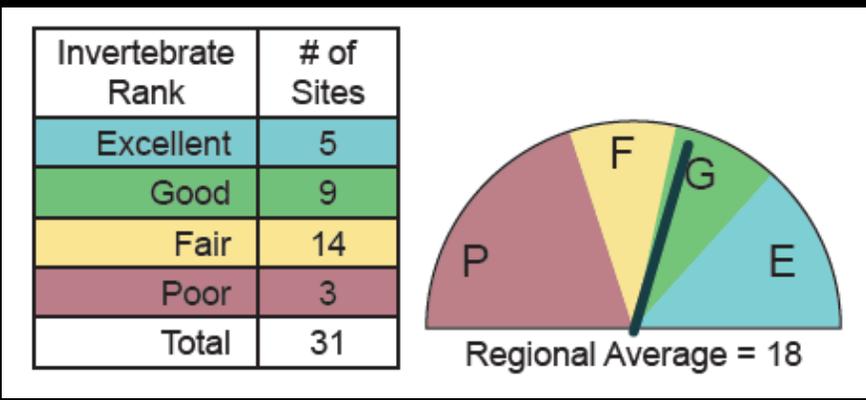
- 31% of sites exceeded screening criteria for Chloride
- Conductivity level tends to relate positively to Chloride level



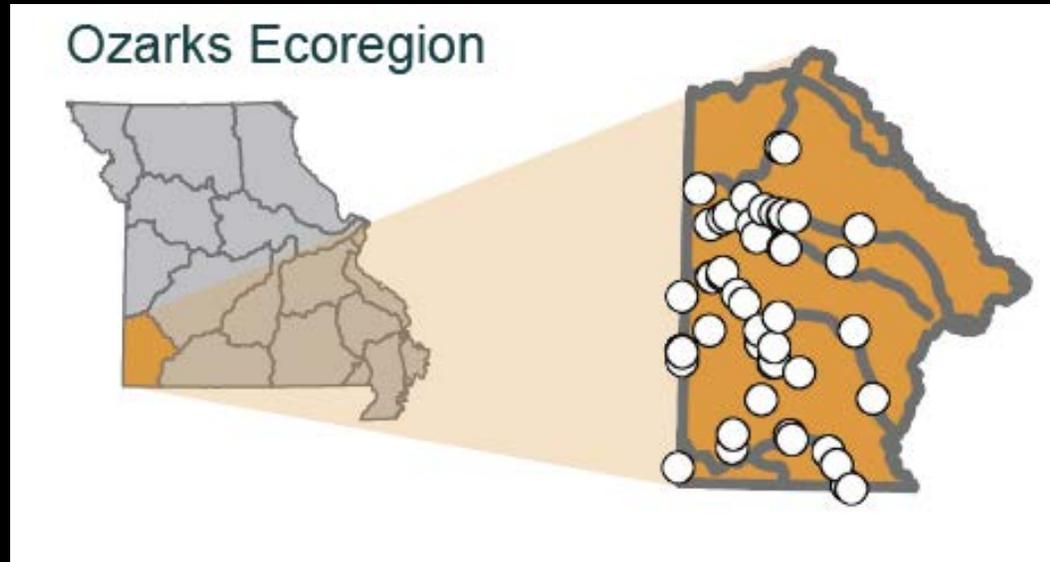
# Region 8: River des Peres, Apple, and Joachim Creeks



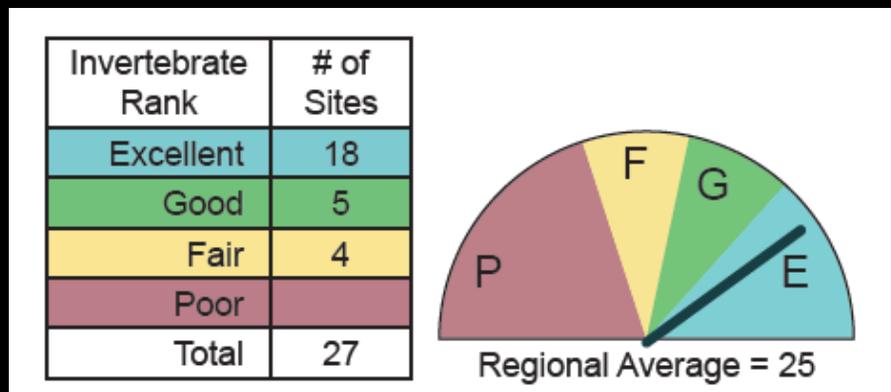
- 47% of assessed sites had Chloride values over the screening criteria
- Lower Invertebrate scores



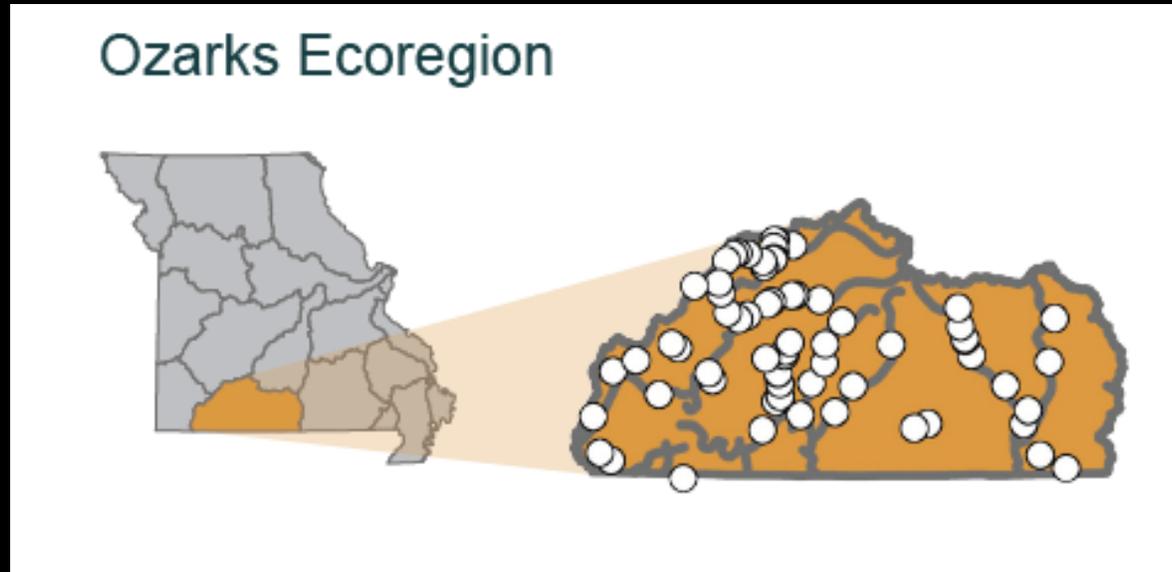
# Region 9: Neosho River



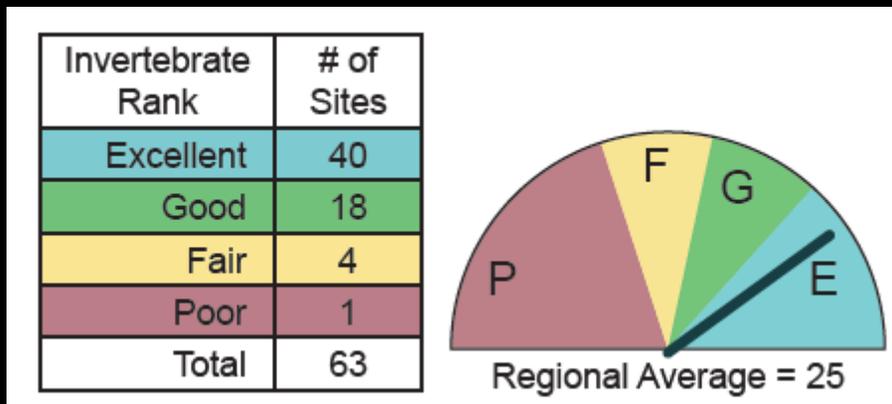
- High Nitrate concentrations – 49% exceed screening criteria level
- Despite this, Invertebrate scores were mostly Excellent



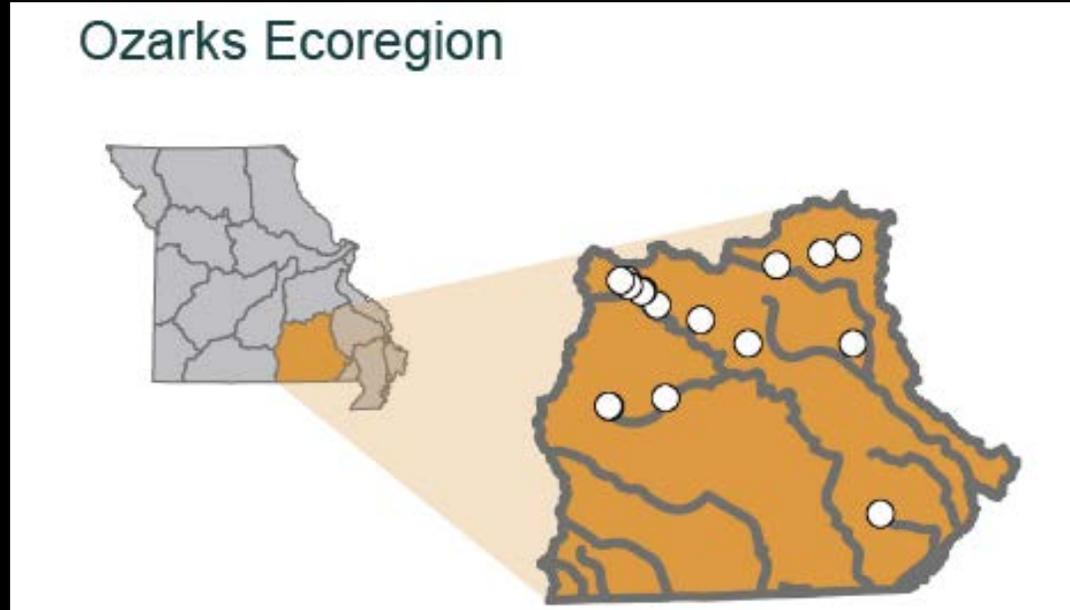
# Region 10: White River



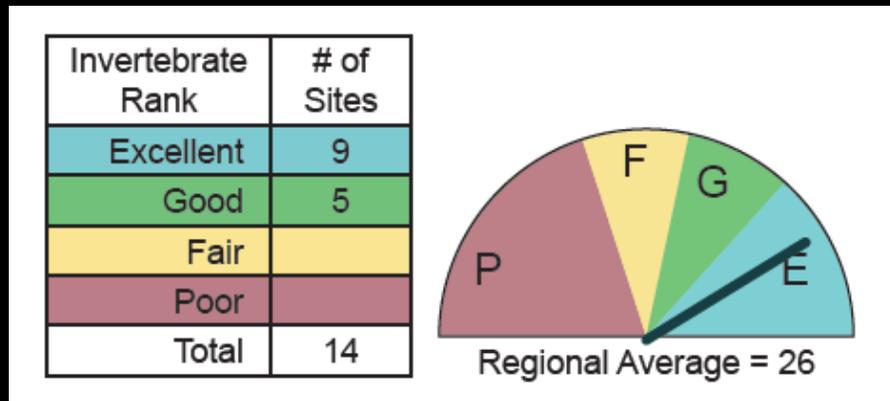
- 25% of sites exceeded Nitrate screening level
- Otherwise, water quality in this region is good.



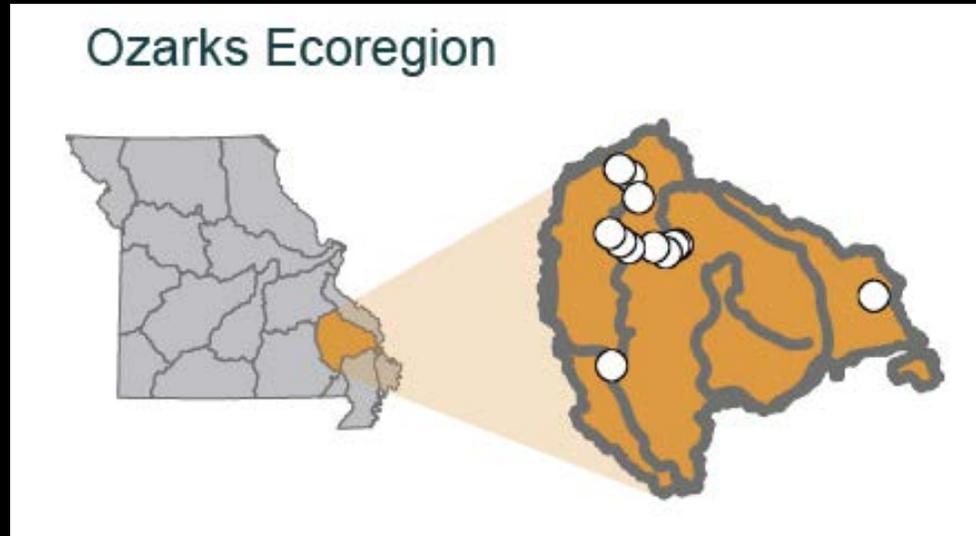
# Region 11: Black and Current Rivers



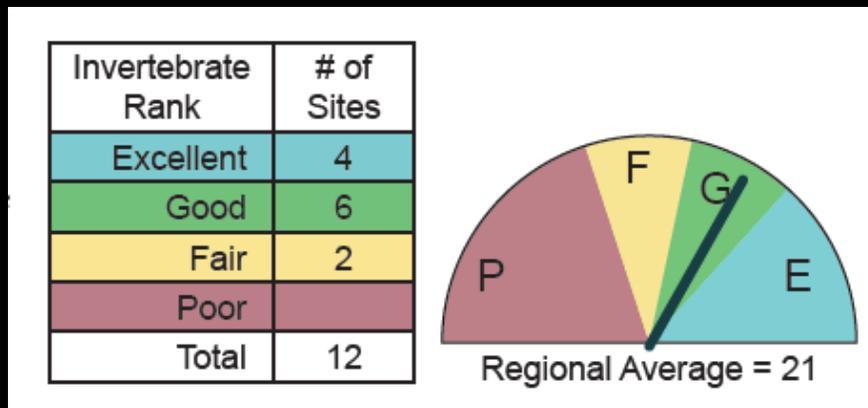
- Highest Invertebrate scores of all regions
- Lower number of assessed sites, so more opportunity for volunteer monitoring



# Region 12: Upper St. Francis and Castor Rivers



- Limited monitoring data – only 13 sites
- No exceedances of screening criteria levels



# Region 13: St. Francis and Little Rivers



- Only 2 assessed sites
- Low Invertebrate score of Fair
- Not enough data to make general regional water quality statements

# Questions or Comments?



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