



Texas StreamTeam

Arroyo Colorado *E. coli* Bacteria Data Summary

January 2012

Water quality data have been collected on the Arroyo Colorado by Sharon Slagle, Rick Ramke, and Ruben Saldaña at three sites on the Arroyo Colorado (see map on pg. 3) with support from Texas Stream Team (TST). All water quality information collected by TST monitors is done so in accordance with the TST Quality Assurance Project Plan. For specific questions regarding methodology, please refer to this document which is available at <http://txstreamteam.rivers.txstate.edu/publications/program-forms.html> or call TST at 877-506-1401. This report summarizes the *E. coli* bacteria data from the Draft 2011 Arroyo Colorado Data Report, which is currently under review.

<i>E. coli</i> Bacteria								
June 2007-March 2011								
Site	#	Min	Avg	Geomean	Med	Max	Std Dev	% Exceedence
Site 1: Arroyo Colorado at South Alamo Floodway	60	35	669	392	400	6900	987	53
Site 2: Arroyo Colorado at FM 493	62	35	978	638	635	6000	1114	71
Site 3: Arroyo Colorado at Boat Ramp Downstream of Colorado Ave.	4	100	347	266	288	714	276	50

The Texas Commission on Environmental Quality (TCEQ) deems a site to be impaired if over 25% of *E. coli* bacteria observations exceed the single sample standard of 399 cfu/100mL or if the geometric mean exceeds a standard of 126 cfu/100mL. The methods for determining the appropriate sample size are complicated, but in general, data must span two years with a reasonable amount of time between sampling events.

Data for Site 1 and Site 2 indicate these to be two impaired locations with percentages of 53% and 71% exceedances and geomeans of 392 cfu/100mL and 638 cfu/100mL, respectively. Site 3 is located in the tidal segment of the Arroyo Colorado, and therefore has no *E. coli* bacteria standard. The TCEQ uses enterococci as the indicator bacteria for salt water influenced water bodies. It is, however, sampled by citizen monitors to assist with problem identification. The results are compared to the standard as a reference point. Two out of four of those data exceeded the standard, and the geomean of 266 exceeded the standard. More data would have to be collected to determine accurate conditions of this site however.

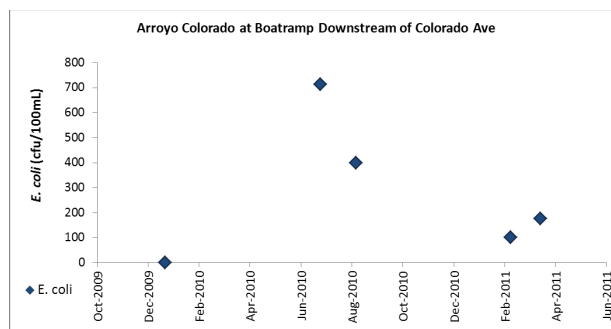
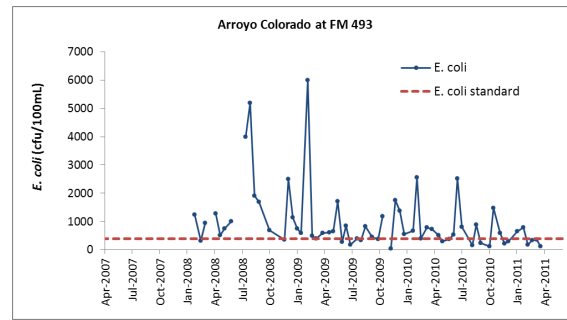
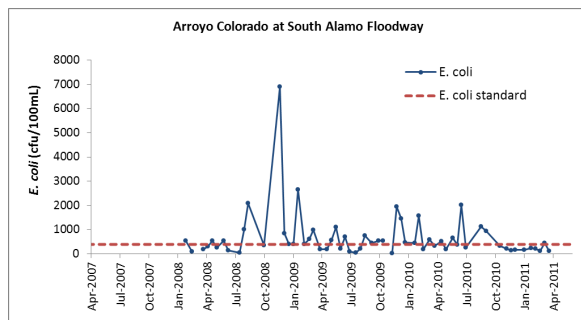
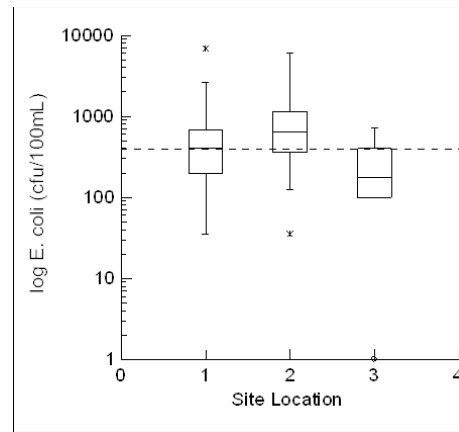
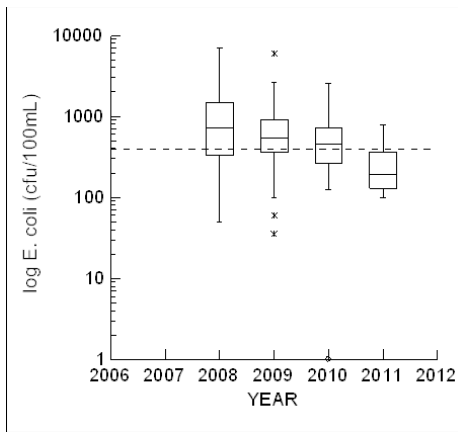
The graphs on the following page show data collected from three sites on the Arroyo Colorado. The numbers on the x-axis correspond with those displayed in the table above. The box plots show the distribution of data by year to assist the reader in determining any annual trends that may have occurred over the time period that these sites were sampled. The tops and bottoms of the boxes show the 75th and 25th percentile values, respectively, and the line through the middle of each box represents the median (50th percentile) value. Whiskers represent the 5th and 95th percentile values, and the dots are outliers. This means that the majority of values measured for each parameter fall within the boxes, while the whiskers are values that were more rarely observed.



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E. coli data show a decreasing trend from 2008 to 2011. The highest *E. coli* values tend to occur in the summer months between June and August and in the winter between December and February. Note that the 2011 data includes only samples collected from January through March, which influences the spread of data for that year.

All three sites have median values close to the maximum standard of 399 cfu/100mL (note log scale on *E. coli* graph). This standard does not apply to Segment 2201, where site #3 is located, but is included as a point of reference. *E. coli* colonies up to 6,900 cfu/100mL have been observed, with an overall exceedance rate of 61% for these three sites. Citizen monitoring data therefore seems to support the listing of Segment 2202 on TCEQ's 303(d) list for high bacteria levels. Median *E. coli* values are lowest at site #3, but as this site represents only 1 year of data (other sites have 4 years), no definitive conclusions can be drawn about upstream to downstream trends in *E. coli* bacteria.





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Arroyo Colorado Volunteer Monitoring Stations

