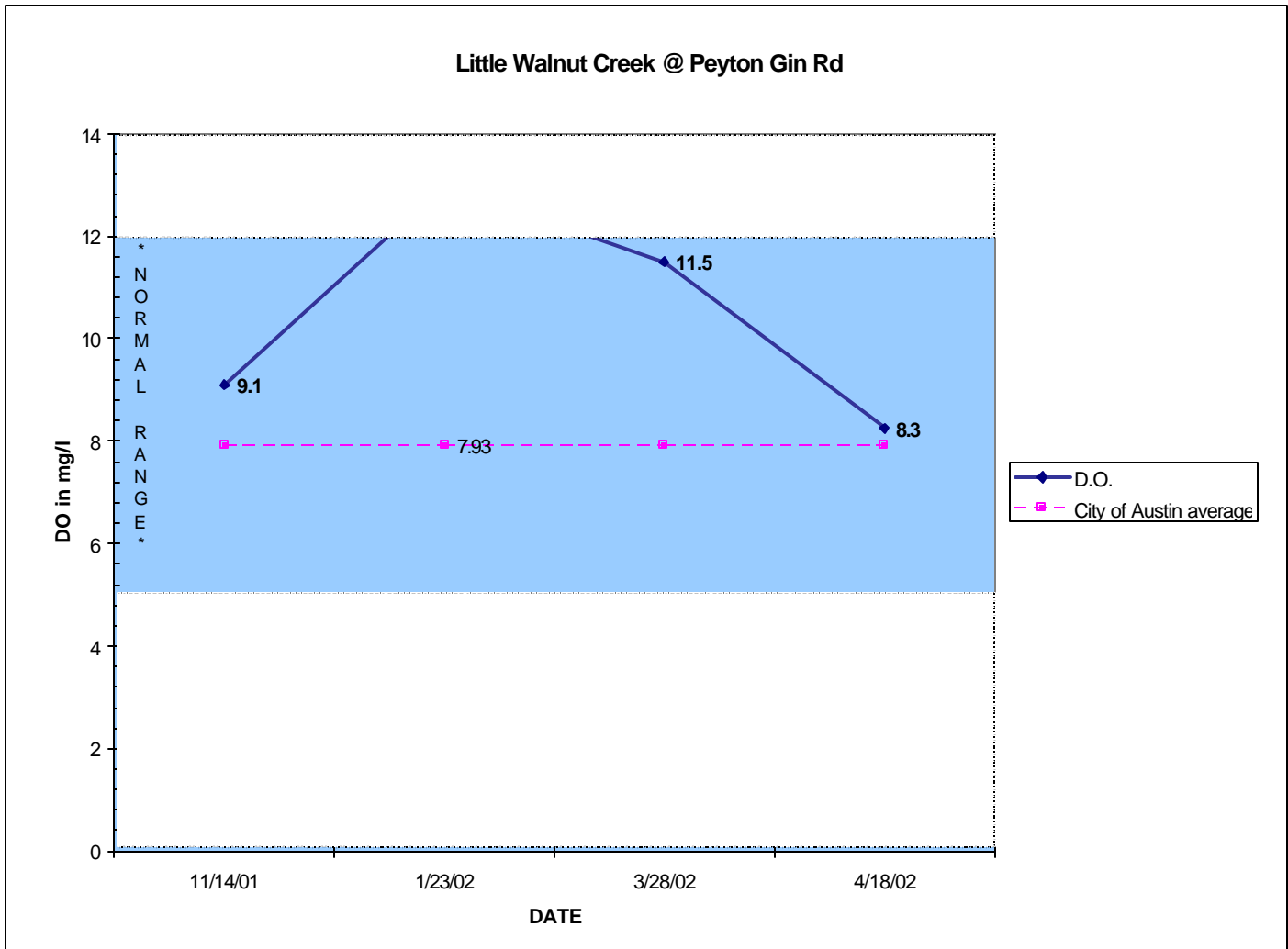


LITTLE WALNUT CREEK AT PAYTON GIN RD

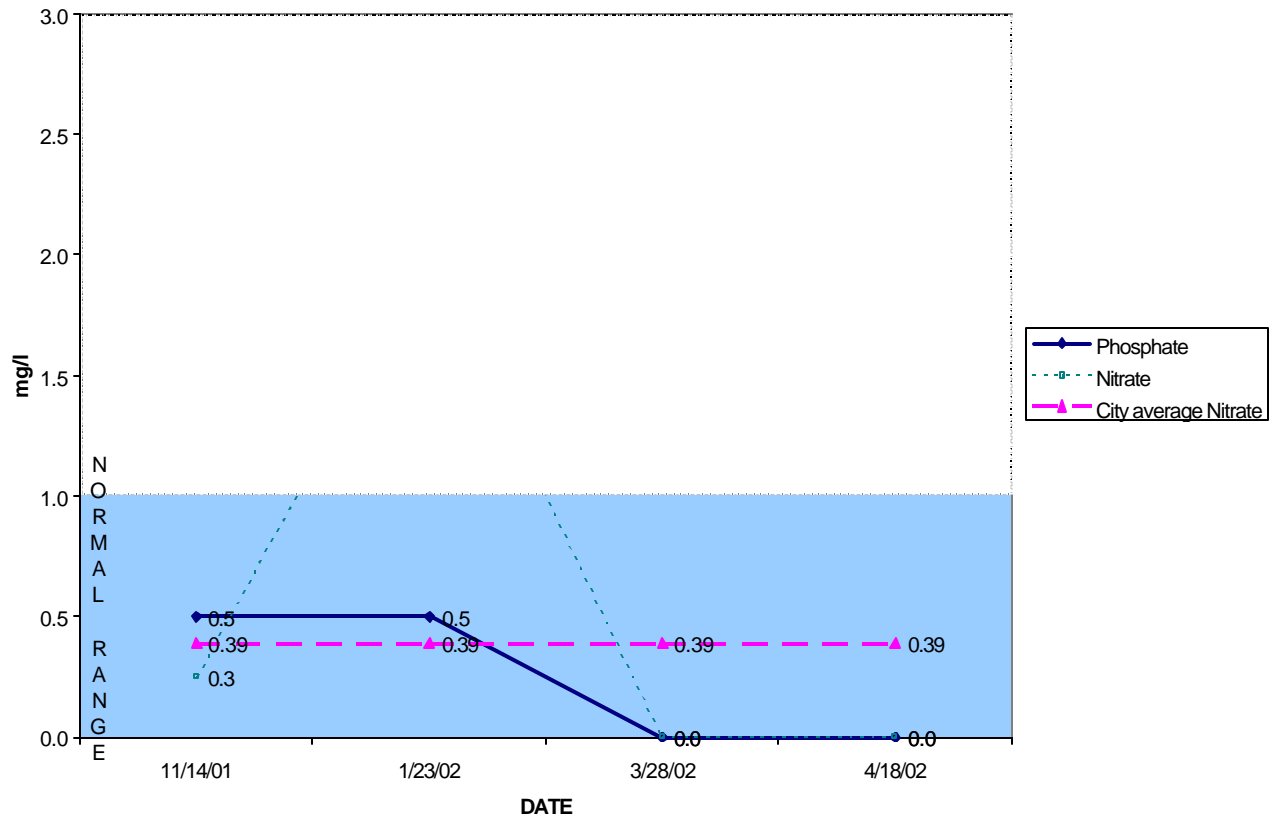
Lanier High School 2002 data



Look at the charts and answer the questions from what you know about water chemistry parameters.

1. Look at the above graph and circle the numbers which are not within the “normal” range. Expected normal numbers are those within an acceptable range for aquatic life to thrive or acceptable for human recreation (swimming or wading).
2. The dotted line shows the historical average D.O. collected by the City of Austin. Was D.O. at your site higher or lower than the City average?
3. What might have caused D.O. to increase in January?
4. What factors do you think lower D.O. (remove oxygen from the water)?

**Little Walnut Creek @ Payton Gin
Nutrients**

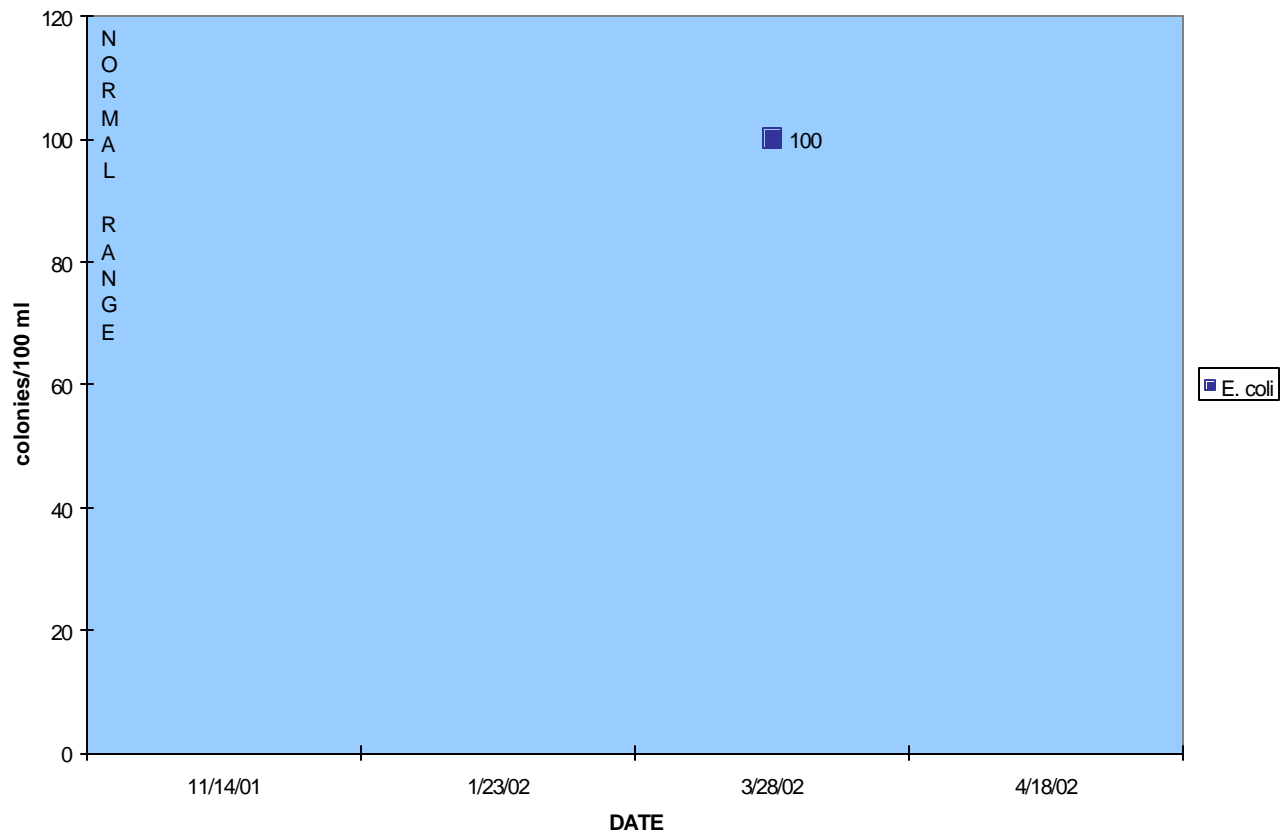


1. Look at the above graph and circle the numbers which are not within the “normal” range*.
2. What could be the source of nitrates or phosphates?
nitrate source:

phosphate source:
3. On 1/23/02 there was a spike in nitrates as well as high levels of bacteria. Within the last 3 years, one of the most common spill types in the Little Walnut Creek watershed reported to the Watershed Protection Department is sewage. Why do you think sewage spills are so common in Little Walnut Creek watershed?
4. Is the City historical average nitrate similar to Lanier’s findings?

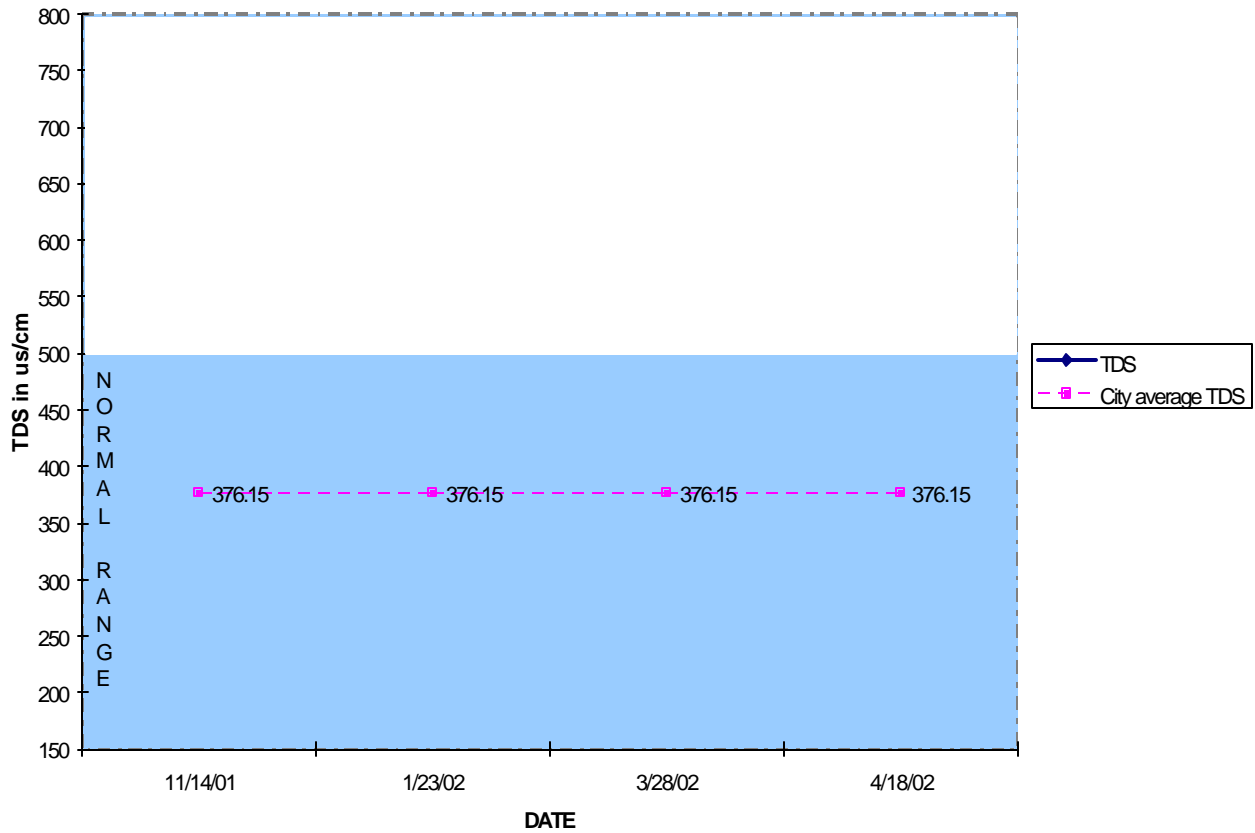
***Normal Range** - water quality values which are 1) within an acceptable range for aquatic life to thrive (in Austin creeks) or 2) acceptable for human recreational activity such as wading or swimming.

Little Walnut Creek @ Peyton Gin Rd
E. coli bacteria



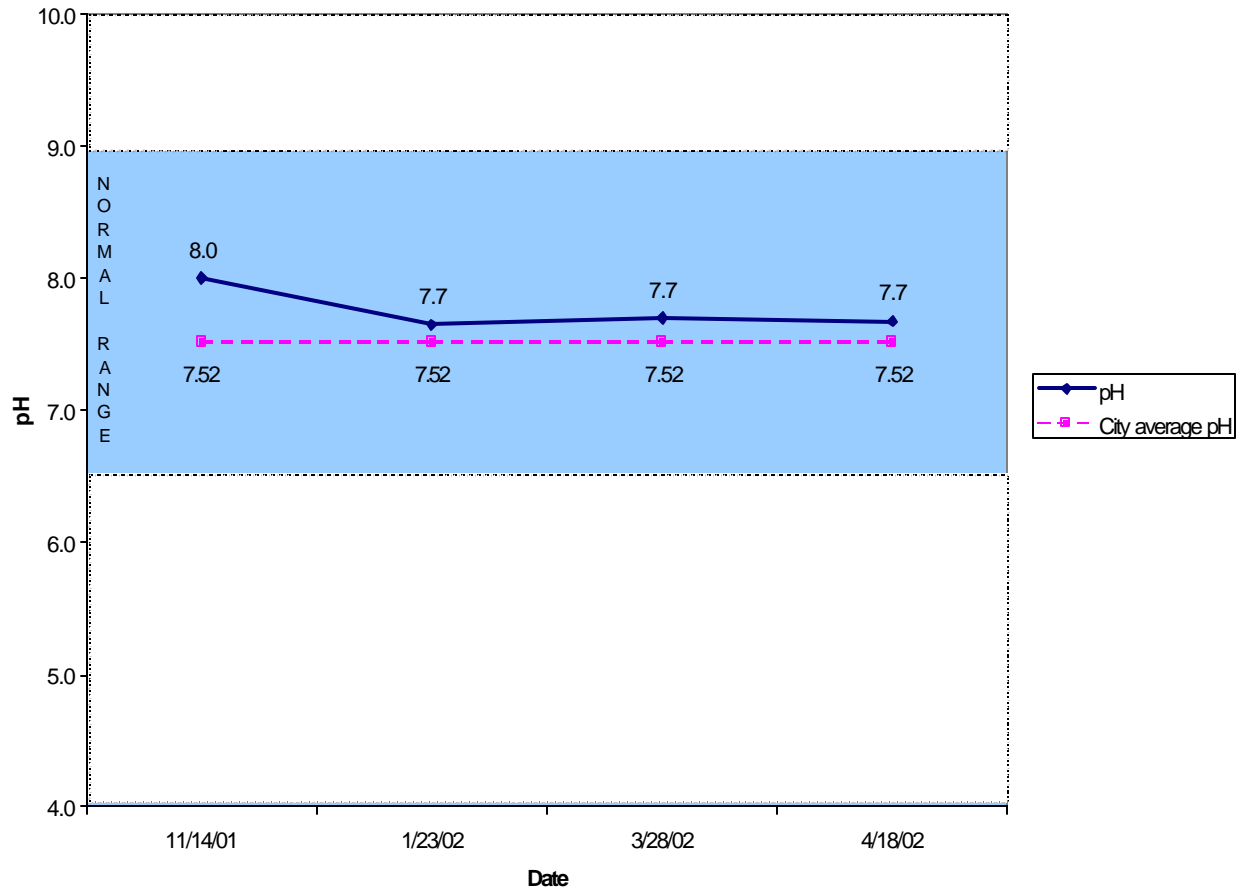
1. *E. coli* is an important indicator of water quality for recreational purposes because it tells us whether the water is swimmable. Any sample that is over 394 colonies in 100 ml of water will be in violation of the Texas standard, meaning the water is unsuitable for recreational activities. Does this value exceed the Texas standard?
2. What could be the source of *E. coli*?
3. Notice that last years class reported only one *E. coli* result and the City of Austin has no historical *E. coli* data. Why do you think it is important for your class to test this parameter?
4. Do you think it would be safe to swim after it rains? Why?

Little Walnut Creek @ Peyton Gin Rd TDS



1. Do any of these values fall within the normal range?
2. Excessively high conductivity readings can be caused by fertilizer runoff from lawns and leaking or broken sewer lines. Could there be a correlation between conductivity and nitrates? Explain your hypothesis.

Little Walnut Creek @ Peyton Gin
pH



1. Do all these values fall within the normal range? Is the Lanier data similar to the City's historical average?

2. What do you think causes Austin creeks to be basic? What could cause the water to become acidic?

Raw Data

Date	Nitrate-N mg/L	Phos mg/L	<i>E.coli</i> cfu/100 ml	Cond us/cm	pH std units	Temp °C	D.O. mg/L	Air Temp °C	Comments
11/14/01	0.3	0.5		675.0	8.0	21.0	9.1	22.5	thick plants on banks, trash
1/23/02	2.0	0.5		720.0	7.7	23.0	13.0	24.0	sewage spill?
3/28/02	<1	<1	100	720.0	7.7	24.0	11.5	29.0	Heron, <i>Gambusia</i> , Texas Cichlids
4/18/02	<1	<1		720.0	7.7	26.0	8.3	27.5	cattails, photos taken

Min									
Max									
Average	1.1	0.5	100.0	708.8	7.8	23.5	10.5	25.8	

1. Fill in the Minimum and Maximum values for each creek parameter.
2. From this data you class has collected, give an overall estimated water quality rating of this site.

Excellent Good Medium Bad Very Bad

NOTES FOR INSTRUCTOR

To get an accurate picture of your sites water quality, its always a good idea to find out more information about the history of your site. Understanding the history of your site will give you more background about the current problems you might be finding.

The City of Austin Watershed Protection Department has historically tested for water quality at your site. The data presented from the City of Austin shows data collected (on an irregular basis) from 1996-2001.

- Talk about Averages
1. Just by looking at the dates, which data gives you a more accurate view of the creeks health over a regular period of time?
 2. Look at the fecal coliform graph. High levels of these bacteria are often present in creeks after rain events since the rain flushes out untreated sewage from leaky septic systems and carries animal waste products in storm run-off. High fecal coliform counts are good indicators of the presence of other disease-causing bacteria or viruses which can result in infections of the eyes, ears, nose, and throat. How might you explain the increase in fecal coliform on August 4, 1995?
 3. Do your results confirm trends?
 4. Do they differ and if so, to what extent?
 5. Could anomalies be attributable to errors in methods?
 6. Why do you think it's important to test on a regular basis over a period of time?
 7. How could you determine the source of pollution (nitrates)? source or non point source?
 8. Do you now feel well equipped to explain your data to someone?



BACKGROUND FOR TEACHER TREND ANALYSIS

This is a sample “trend analysis” lesson you can use with your class to help students understand how to interpret and evaluate water quality data. This particular data was collected by aquatic science students at Lanier High School in 2002 from Little Walnut Creek at Payton Gin Road. The data also shows the City of Austin (collected by City of Austin biologists) averages for each parameter.

A lesson like this can be developed for your class after you have collected data over a period of time.

Our intention is for students to analyze data from the previous class year at the beginning of the semester and then analyze their own data at the end of the year.

If you would like this lesson adapted for your schools watershed, contact Sara Heilman, 974-3540, sara.heilman@ci.austin.tx.us.