Cary Institute of Ecosystem Studies

Data Explorations in Ecology Project

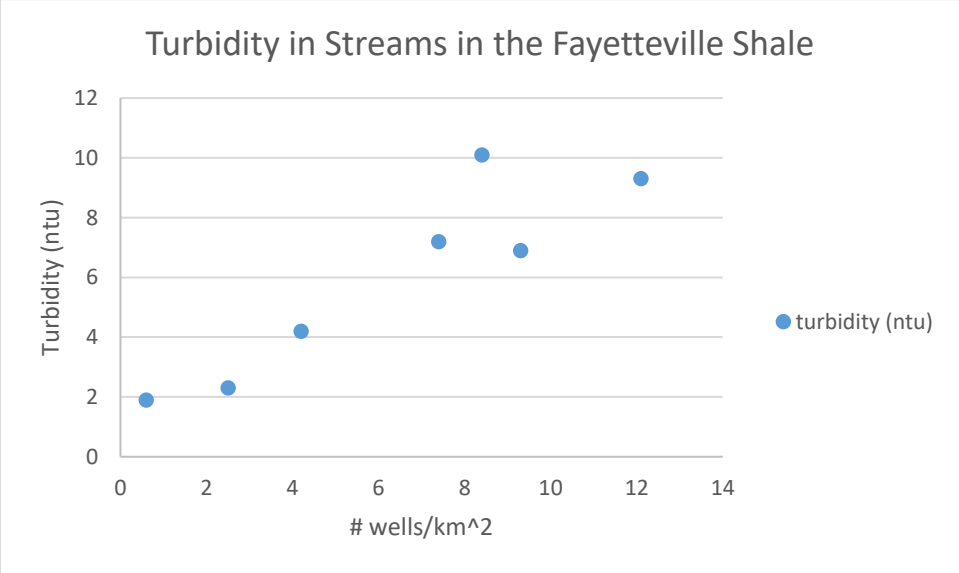
Name _____ Date _____

Hydrofracking Data

1. Explain turbidity in your own words.
   Turbidity is a way of talking about how cloudy the water is, which can be caused by sediment or plankton. Higher turbidity means that the water is cloudier (or less clear). It is measured by using a Secchi disc or measuring the amount of particles in the water that reflect light with a meter.

2. Use the data to create a scatter plot that shows the relationship between stream turbidity and the number of wells in an area. The researchers who gathered these data looked at seven streams in an area of Arkansas where the Fayetteville shale is located. Each stream had a different number of wells in its drainage area. They measured turbidity with a Hach meter in spring 2009, during high spring flow.

# wells /km^2	turbidity (ntu)
0.6	1.9
2.5	2.3
4.2	4.2
7.4	7.2
8.4	10.1
9.3	6.9
12.1	9.3



3. Describe the changes you see in the turbidity values as the number of wells increases.
   As the number of wells increases, the turbidity increases as well.

3. List the potential sources of variability in the investigation.

Real *– what might be some sources of variability that are due to the ecosystem?*	***Human/experimental*** *– variability due to human error, design etc*
• *Rainfall events could increase the turbidity due to runoff and erosion* • *Drought might reduce the amount of water in the streams, which could lead to increased sediment levels* • *Floods, currents, or wind could affect turbidity levels* • *Plankton growth could affect turbidity levels*	• *Sampling during different times of year might provide different results* • *Only seven streams were selected* • *Data might not have been collected often enough* • *The sampling equipment might have been working incorrectly or someone used the equipment incorrectly*

4. What impact do you think the change in turbidity will have on the aquatic ecosystem?

   Explain your claim.

   Student answers will vary, but students should have some ideas about the fact that increasing turbidity can affect aquatic life. Higher turbidity values can reduce the amount of plant or protist growth in the water, it can smother aquatic life, and it could affect the feeding abilities of larger organisms.