



Name _____

Date _____

Turbidity & Hydrofracking

1. Go to www.fractracker.org.
 - a. Highlight the link at the top to “All Articles & Maps”; then “By Location”, then go to “State-by-State”.
 - b. Click on the state you are interested in learning more about. Describe what you learn about fracking in this state:

2. Now, go back to the “State-by-State” landing page and click on Pennsylvania. Click on the top picture which takes you to the PA Shale Viewer. You’ll have to click on this one more time to explore PA and the layers available. You can get details about all of the information in the legend by clicking on the “i” for information at the top left hand side of the screen. Using this information, answer the following:
 - a. How many wells does the map estimate are in PA? _____
 - b. How many violations are there in the state? _____
 - c. Where are most of the wells located?

3. Now, zoom in on a location in PA until the wells, permits, and violations are smaller colored dots (the scale at the bottom left should read 0-4 miles; if it doesn’t, keep zooming in). List two-three of the towns that you see in your new, zoomed-in view:



4. The streams and rivers on this map are light and black grey. Based on what you see, does PA seem to have regulations about whether wells need to be located away from waterways? Why or why not?

5. Based on what you have learned about turbidity, what do you think this information suggests about streams and turbidity levels in Pennsylvania?

6. Use the data table below to answer the questions that follow.

Shale	State	Total Wells	Average distance to a waterway (m)	% of wells within 100m of waterway	% of wells within 200m of waterway	% of wells within 300m of waterway
Marcellus	PA	2091	319	4	28	55
Marcellus	WV	1599	214	26	50	75
Marcellus	OH	42	230	19	55	79
Marcellus	NY	26	247	35	46	54
Fayetteville	AR	2834	353	10	32	51

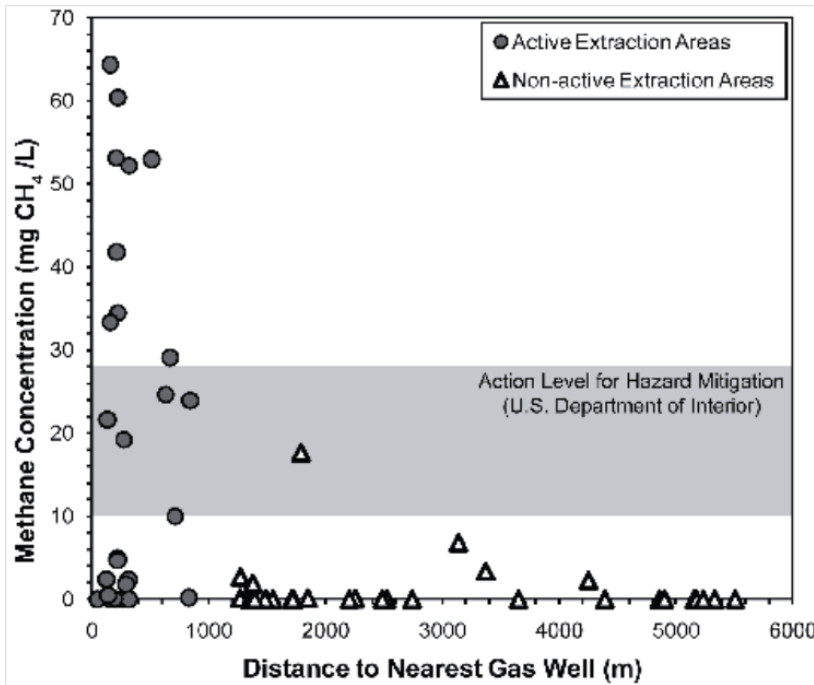
* Note: data are through 2010

** Data are from Entekin et al, 2011

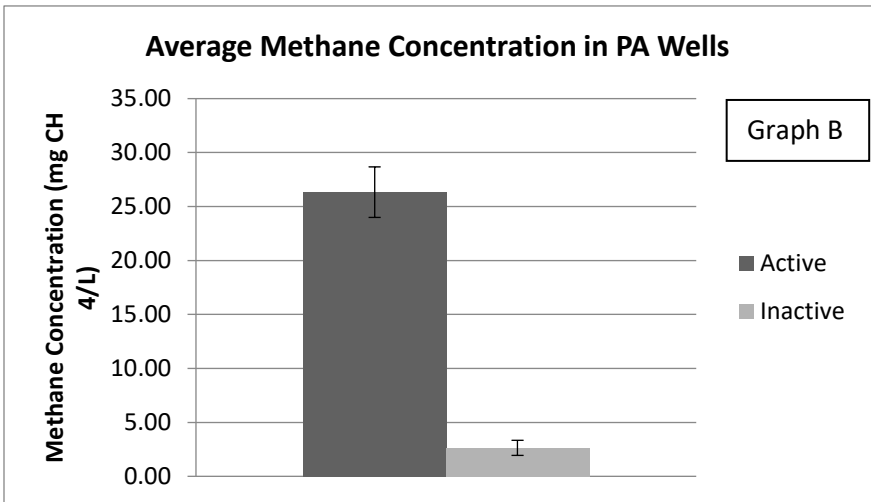
- Which state has the most wells? _____
- In which state are the wells the closest to a waterway? _____
- Which state has the highest percentage of wells within 300m of a waterway?



7. Look at the graphs below. Graph A is the same graph you saw in the first lesson, while Graph B shows averaged data and error bars for the active and inactive sampling sites:



Graph A



Graph B

a. Explain the trend you notice in the methane concentration.

b. Which graph do you think more clearly shows the trend? Explain.

c. Complete this chart:

Benefits of the scatterplot (Graph A):	Benefits of the bar graph w/ error bars (Graph B):
Drawbacks of the scatterplot (Graph A):	Drawbacks of the bar graph w/ error bars (Graph B):

8. Based on the information you have and what you've learned in this module, make a scientific argument (claim, evidence, reasoning) about whether hydrofracking causes ecological harm.

Claim

Evidence

Reasoning

9. Finally, what else would you like to know in order to make your scientific argument in #8, above, stronger? Explain.
