

Where is the Best Place to Locate a New Wind Farm?

Wind is moving air and is a locally plentiful source of energy. In this activity, you will use My World GIS to examine wind speed patterns and land use in Pennsylvania to determine the best place to locate a new wind farm. You will

1. Examine wind speed patterns in Pennsylvania.
2. Examine land use patterns in Pennsylvania and in the Lehigh Valley.
3. Determine the best place to locate a new wind farm in the Lehigh Valley and in Pennsylvania.

Read **all** instructions and answer **each** question on your investigation sheet.



Step 1: Download data.

- a. Open your Web browser. Go to www.ei.lehigh.edu/learners/energy/
- b. Click on **Where is the Best Place to Locate a New Wind Farm?**

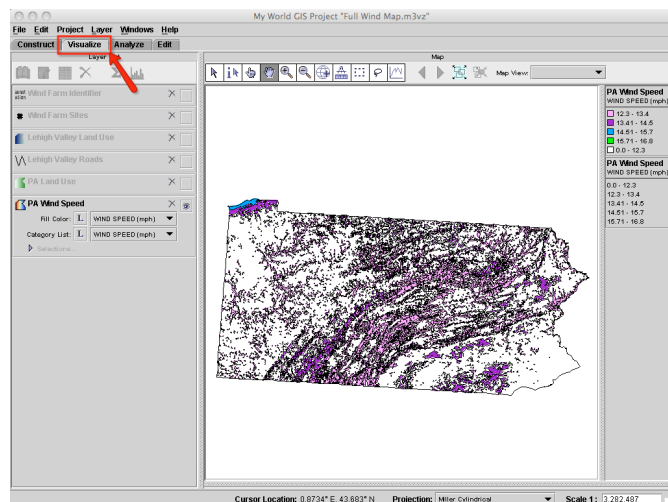


Step 2: Load data in My World GIS.

- a. **Double click** on the **Wind Map.m3vz** icon.



- b. Check to make sure you are in the **visualize** mode (see arrow).

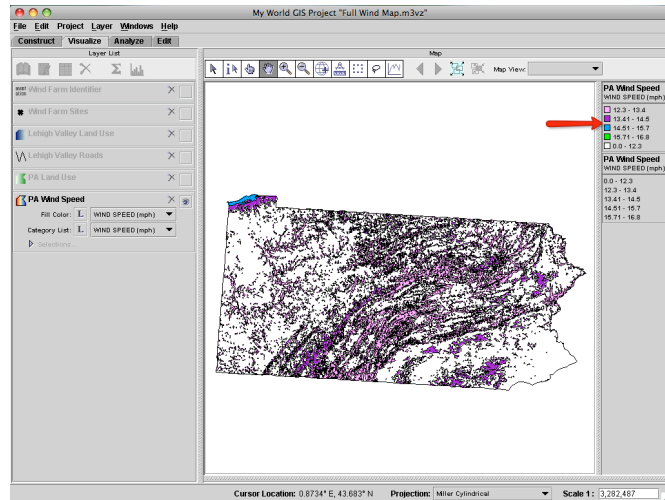




Step 3: Examine Patterns of Wind Speeds in Pennsylvania.

The map displays average wind speeds at 50 meters above the ground. In assessing optimal locations for a wind farm, it is better to examine wind speeds at 50 meters above the ground since surface wind speed and direction is influenced by surface roughness (ground, trees, buildings) or friction with the ground.

- a. Look at the different wind speeds on the map of Pennsylvania using the **PA Wind Speed** key in the panel on the right (see arrow).



Answer **question 1** on your investigation sheet.



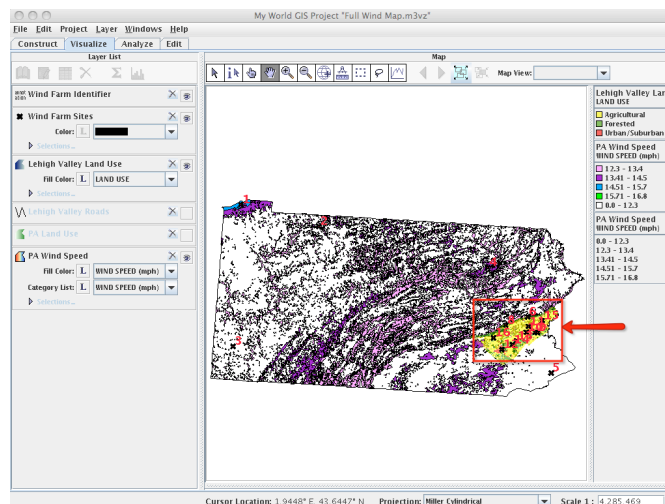
Step 4: Explore Wind Farm Sites.


Let's examine the wind speed and land use at the wind farm sites.

- a. Turn on the **Wind Farm Identifier**, **Wind Farm Sites**, and **Lehigh Valley Land Use** layers. **Helpful hint:** Click on the small squares at the right end of each of those layers.

16 sites on the map are displayed (with red numbers) where you could place a wind farm. Eleven sites are in the Lehigh Valley (see arrow) and 5 sites are in other locations in Pennsylvania.

NOTE: There are no actual wind farms located at these sites today.



b. Zoom in  closely to wind farm site 2.

c. Use the **PA Wind Speed** key to determine the wind speed at wind farm site 2 (see arrow #1).



Note the wind speed in the **Wind Farm Sites Data Chart** on your investigation sheet.

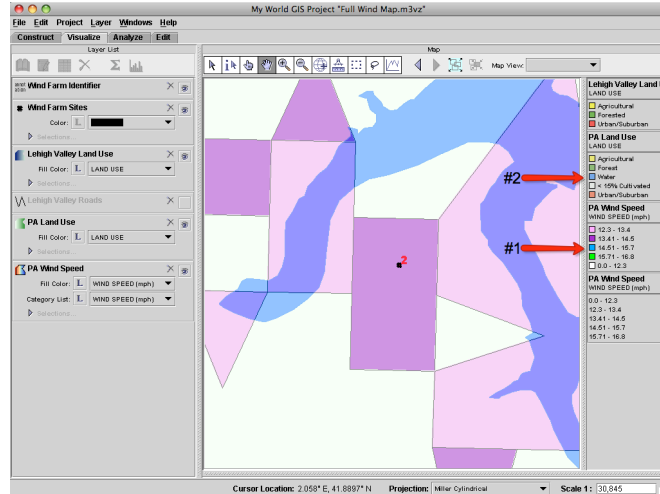
Turn the **PA Wind Speed** layer off.


Turn the **PA Land Use** layer on.

Use the **PA Land Use** key to determine the land use type at wind farm site 2 (see arrow #2).




Note the land use type in the **Wind Farm Sites Data Chart** on your investigation sheet.



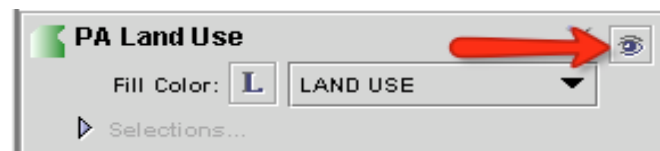
d. Click on the Zoom To All tool  to view the entire map.

e. Click the square to turn the **Lehigh Valley Roads** layer on (see arrow).



f. Zoom in  closely to wind farm site 8.

g. Turn the **PA Land Use** layer off (see arrow).



- h. Use the **Lehigh Valley Land Use** key to determine the land use type at wind farm site 8 (see arrow #1).



Note the land use type on the **Wind Farm Sites Data Chart** on your investigation sheet.

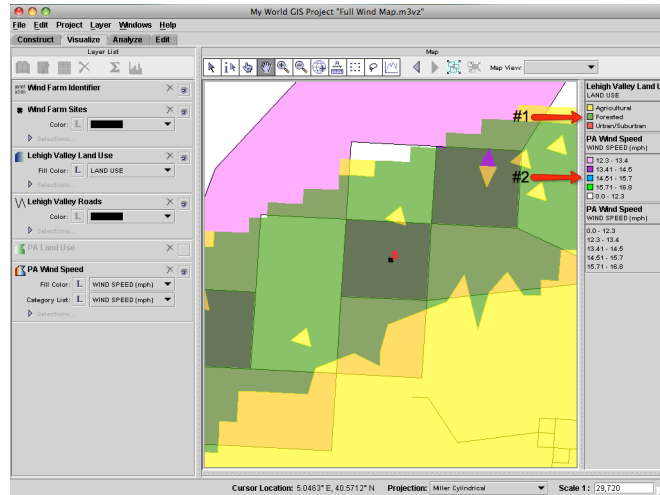
Turn the **Lehigh Valley Land Use** layer **off**.

Turn the **PA Wind Speed** layer **on**.

Use the **PA Wind Speed** key to determine the wind speed at wind farm site 8 (see arrow #2).



Note the wind speed in the **Wind Farm Sites Data Chart** on your investigation sheet.



- i. Click on the Zoom To All tool  and then select wind farm site **15**.

- j. Use the **PA Wind Speed** key to determine the wind speed at wind farm site 15 (see arrow #1).



Note the wind speed in the **Wind Farm Sites Data Chart** on your investigation sheet.

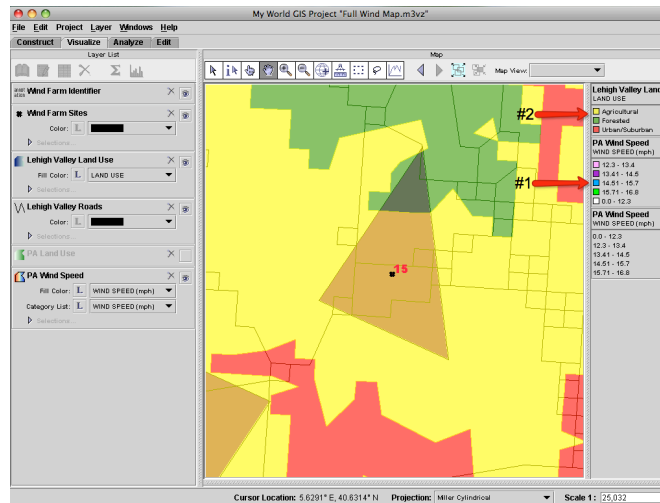
Turn the **PA Wind Speed** layer **off**.

Turn the **Lehigh Valley Land Use** layer **on**.

Use the **Lehigh Valley Land Use** key to determine the land use type at wind farm site 15 (see arrow #2).



Note the land use type in the **Wind Farm Sites Data Chart** on your investigation sheet.



Use your **Wind Farm Sites Data Chart** and the My World GIS map to answer **questions 3 – 8** on your investigation sheet.