

Investigating Coal Production and Consumption with My World GIS

Coal comes from the energy stored by land plants from swamps that lived hundreds of millions of years ago. In this activity, you will use My World GIS to investigate patterns of coal production and consumption. You will

1. Examine locations of coal fields in the USA.
2. Examine countries with coal reserves.
3. Compare coal production and consumption of countries in 1980 and 2008.
4. Analyze relationships between country populations and coal consumption.

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 **Investigating Coal Production and Consumption with My World GIS**.



Step 2: Load data in My World GIS.

<p>a. Double click on the Coal Map.m3vz icon.</p>	
<p>b. Check to make sure you are in the visualize mode (see arrow).</p>	



Step 3: Explore Coal Fields in the USA. (Questions 1 and 2)

a. **Zoom In**  to the United States to see regions with coal fields.



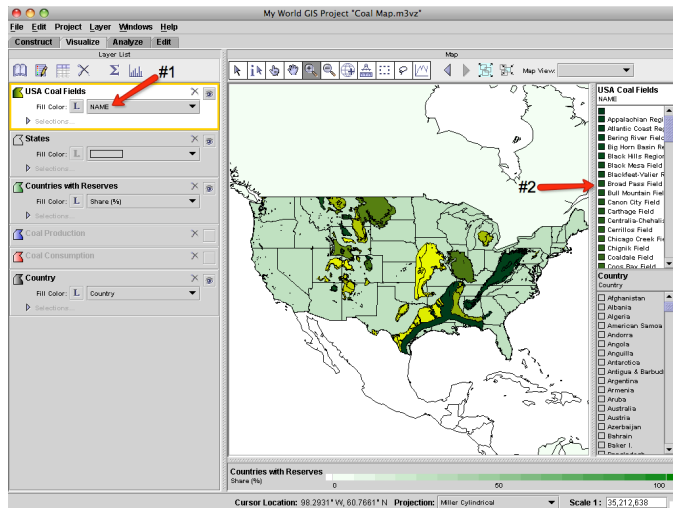
Use the GIS map to answer **question 1** on your investigation sheet.

b. Click on the **USA Coal Fields** layer to make it active.



c. Click the box in the USA Coal Fields layer and choose **NAME** from the drop-down list (see arrow #1).

My World GIS will highlight the different coal fields in different colors and display their names in the panel on the right (see arrow #2).




Use the GIS map to answer **question 2** on your investigation sheet.

d. Close the **Information for layer "USA Coal Fields"** window.

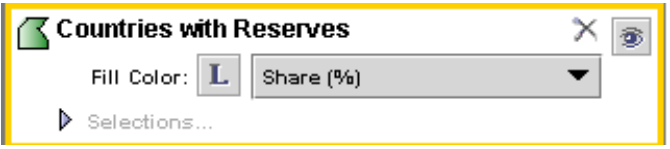
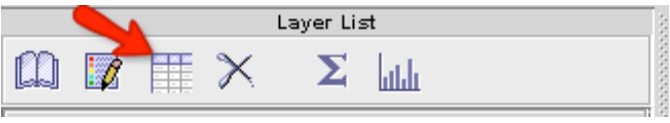


e. Click the eye to turn the **USA Coal Fields** layer off (see arrow).



f. Click on the **Zoom To All** tool  to display the entire world.



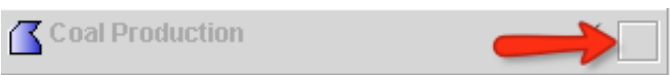

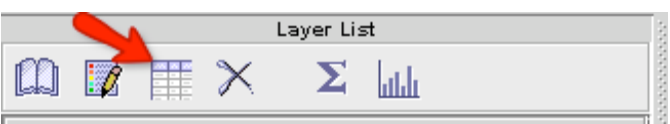
Step 4: Explore Countries with Coal Reserves. (Coal Reserves Data Chart)

<p>a. Click the Countries with Reserves layer to make it active.</p>	
<p>b. Click on the table icon on the Layer List tool bar (see arrow).</p>	
<p> Complete the Top 5 Countries with Coal Reserves Data Chart on your investigation sheet.</p>	
<p>c. Close the Table of Layer “Countries with Reserves” window.</p>	
<p>d. Click the eye to turn the Countries with Reserves layer off.</p>	



Step 5: Explore Coal Production. (Coal Production Data Charts and Question 3)

Let’s investigate which countries produced large amounts of coal in both 1980 and in 2008?

<p>a. Click the square to turn the Coal Production layer on (see arrow).</p>	
<p>b. Click the Coal Production layer to make it active. The Coal Production layer for 2008 is initially displayed.</p>	
<p>c. Click on the table icon on the Layer List tool bar (see arrow).</p>	

- d. Sort the **CP2008 (Thousand Short Tons)** column in descending order.
Helpful hint: Click the column twice.

NOTE: 1 short ton = 907.18 kg = 2000 pounds



Write the top 5 countries that produced large amounts of coal in the **2008 Coal Production Data Chart** on your investigation sheet.

- e. Sort the **CP1980 (Thousand Short Tons)** column in descending order.
Helpful hint: Click the column twice.



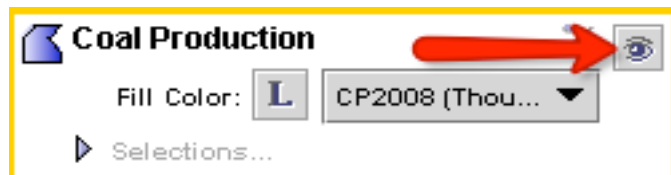
Write the top 5 countries that produced large amounts of coal in the **1980 Coal Production Data Chart** on your investigation sheet.

- f. Close the **Table of Layer “Coal Production”** window.



Use both the **1980** and **2008 Coal Production Data Charts** to answer **question 3** on your investigation sheet.



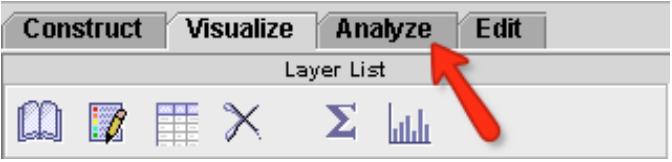
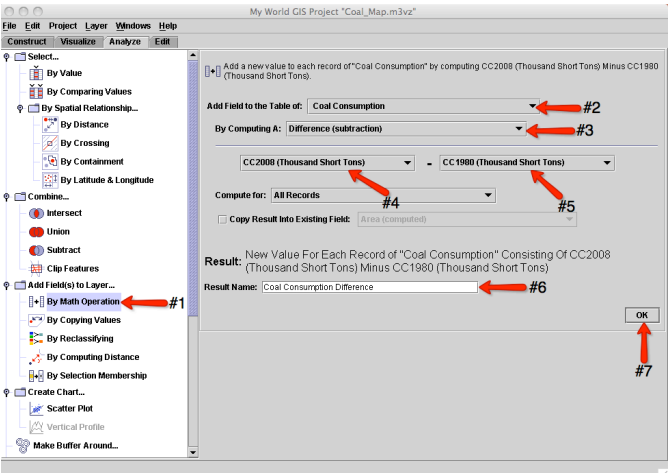
- g. Click the eye to turn the **Coal Production** layer off (see arrow).



 **Step 6: Explore Coal Consumption. (Questions 4 and 5)**

Let's investigate,

- Which countries consumed **more** coal in 2008 than in 1980?
- Which countries consumed **less** coal in 2008 than in 1980?

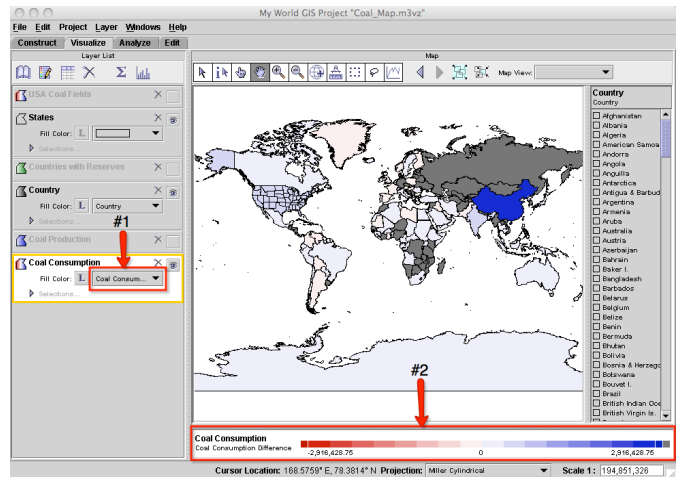
<p>a. Click the small square to turn the Coal Consumption layer on (see arrow).</p>	
<p>b. Click the Coal Consumption layer to make it active.</p> <p>The coal consumption layer for 2008 is initially displayed.</p>	
<p>c. Click on the Analyze tab above the Layer List (see arrow)</p>	
<p>d. Click By Math Operation (see arrow #1).</p> <p>Click the box to the right of Add Field to the Table of and select Coal Consumption from the list (see arrow #2).</p> <p>Click the box to the right of By Computing A and select Difference (subtraction) from the list (see arrow #3).</p> <p>Select CC2008 (Thousand Short Tons) in the box on the left (see arrow #4).</p> <p>Select CC1980 (Thousand Short Tons) in the box on the right (see arrow #5).</p> <p>Type Coal Consumption Difference in the Result Name text box (see arrow #6).</p> <p>Click OK (see arrow #7).</p>	

A new field called **Coal Consumption Difference** has been added to the Coal Consumption layer (see arrow #1).

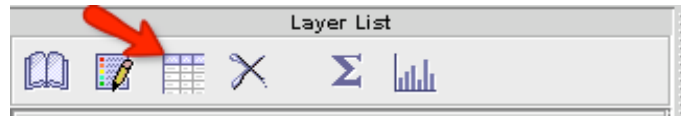
Look at the **Coal Consumption** bar and **legend** at the bottom of the map. Notice that the bar now includes both **positive** and **negative** numbers (see arrow #2).

Numbers that are **positive** represent countries that consumed **more** coal in 2008 than in 1980.

Numbers that are **negative** represent countries that consumed **less** coal in 2008 than in 1980.



- e. Click on the **table** icon on the **Layer List** tool bar.



- f. Sort the **Coal Consumption Difference** column in descending order.
Helpful hint: Click the column twice.

Scroll down to the bottom of the list to view countries with **negative** coal consumption differences.



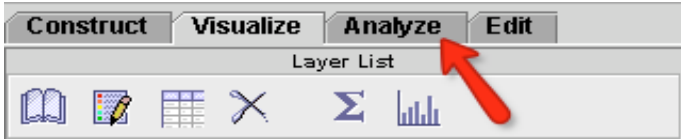
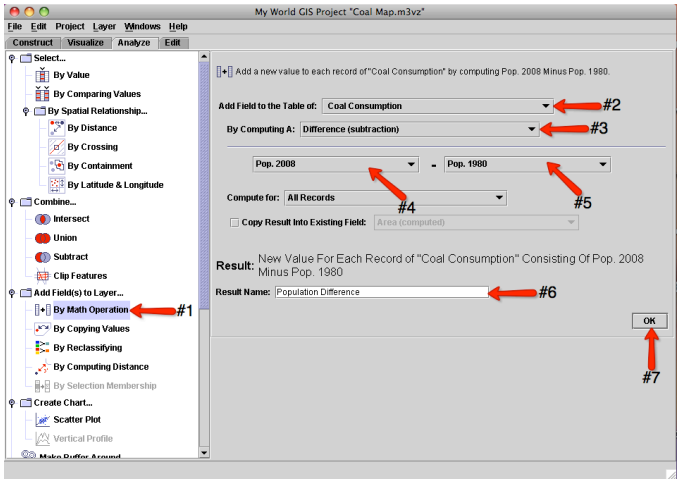
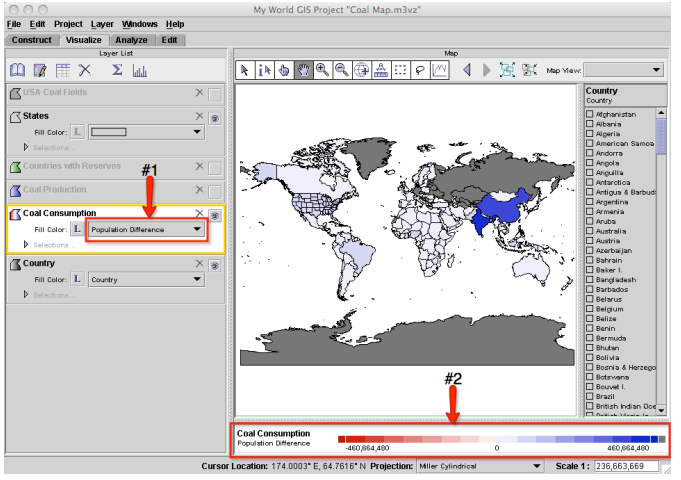
Use the **Coal Consumption Difference** column to answer **questions 4 and 5** on your investigation sheet.

- g. Close the **Table of Layer “Coal Consumption”** window.

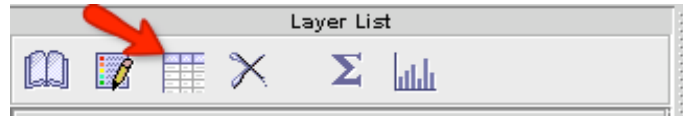


Step 7: Explore populations of countries. (Questions 6 and 7)

Let's investigate which countries have the largest population differences since 1980.

<p>a. Click on the Analyze tab above the Layer List (see arrow).</p>	
<p>b. Click By Math Operation (see arrow #1).</p> <p>Click the box to the right of Add Field to the Table of and select Coal Consumption from the list (see arrow #2).</p> <p>Click the box to the right of By Computing A and select Difference (subtraction) from the list (arrow #3).</p> <p>Select Pop. 2008 in the box on the left (see arrow #4).</p> <p>Select Pop. 1980 in the box on the right (see arrow #5).</p> <p>Type Population Difference in the Result Name text box (see arrow #6).</p> <p>Click OK (see arrow #7).</p>	
<p>A new field called Population Difference has been added to the Coal Consumption layer (see arrow #1).</p> <p>Look at the Coal Consumption – Population Difference bar and legend at the bottom of the map (see arrow #2).</p> <p>Countries that had large population differences have a darker blue color.</p> <p>Countries that had smaller population differences have a lighter blue color.</p> <p>Countries whose population data was not available are grey in color.</p>	

c. Click on the **table** icon on the **Layer List** tool bar.



Use the **Population Difference** column to answer **question 6** on your investigation sheet.



Use the **Pop. 2008** column to answer **question 7** on your investigation sheet.

d. Close the **Table of Layer "Coal Consumption"** window.



Use your data charts to answer **questions 8 and 9** on your investigation sheet.