

## Investigating Natural Gas Production and Consumption with My World GIS

Natural gas is made up of remains of dead plants and animals that lived millions of years ago. In this activity, you will use My World GIS to investigate patterns of natural gas production and consumption. You will

1. Examine countries with natural gas reserves.
2. Compare natural gas production and consumption of countries in 1980 and 2008.
3. Investigate the relationship among countries' natural gas consumption and its population.

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


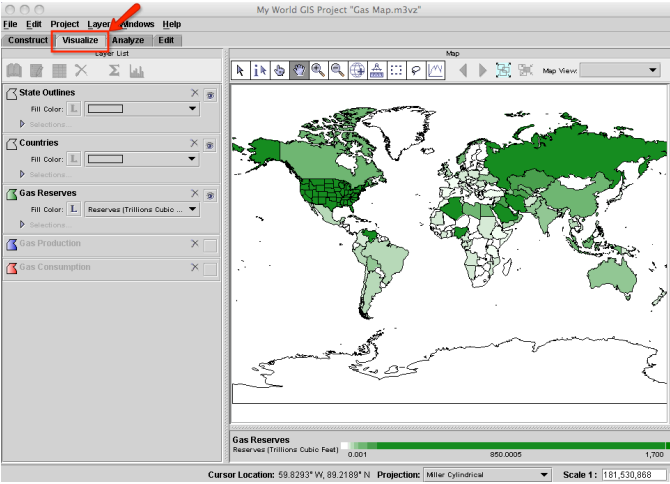


### Step 1: Download data.

- a. Go to [www.ei.lehigh.edu/learners/energy/](http://www.ei.lehigh.edu/learners/energy/)
- b. Click on **Investigating Natural Gas Production and Consumption with My World GIS**.




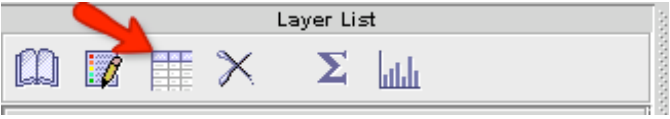

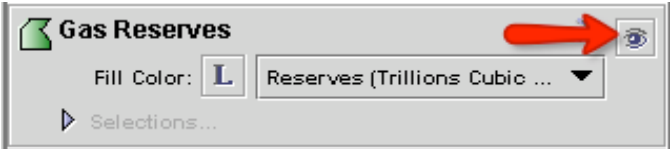
### Step 2: Load data in My World GIS.

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



### Step 3: Examine countries with natural gas reserves. (Questions 1 and 2)

Let's investigate which countries have large amounts of natural gas reserves.

<p>a. Click on the <b>Gas Reserves</b> layer to make it active.</p>	
<p>b. Click on the <b>table</b> icon on the <b>Layer List</b> tool bar (see arrow).</p>	
<p> Answer <b>questions 1</b> and <b>2</b> on your investigation sheet.</p> <p>Gas reserves are listed in amounts of trillions of cubic feet. 1 trillion = 1,000,000,000,000. 1 cubic foot = 28.32 liters</p>	
<p>c. Close the <b>Table of Layer "Gas Reserves"</b> window.</p>	
<p>d. Click the eye to turn the <b>Gas Reserves</b> layer off (see arrow).</p>	

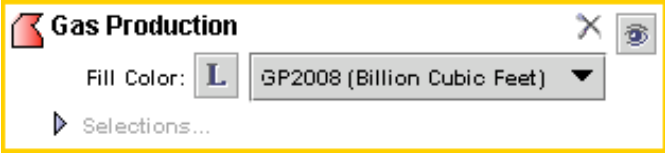
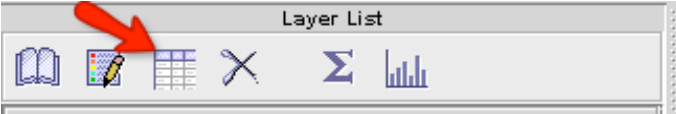



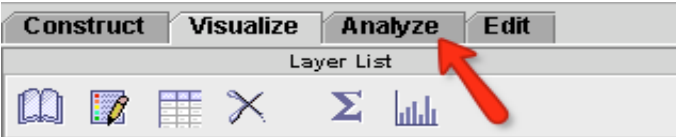


### Step 4: Analyze natural gas production. (Questions 3 - 6)

Let's investigate,

- Which countries produced large amounts of natural gas in both 1980 and in 2008?
- Which countries produced more natural gas in 2008 than in 1980?
- Which countries produced less natural gas in 2008 than in 1980?

<p>a. Click the square to turn the <b>Gas Production</b> layer on (see arrow).</p>	
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<p>b. Click the <b>Gas Production</b> layer to make it active.</p> <p>The Gas Production layer for 2008 is initially displayed.</p>	
<p>c. Click on the <b>table</b> icon on the <b>Layer List</b> tool bar (see arrow).</p>	
<p> Use the data table to answer <b>question 3</b> on your investigation sheet.</p>	
<p>d. Sort the <b>GP2008 (Billion Cubic Feet)</b> column in descending order. <b>Helpful hint:</b> Click the column twice.</p>	
<p> Answer <b>question 3</b> on your investigation sheet. Write the top 4 countries that produced large amounts of natural gas in the <b>2008 Natural Gas Production Data Chart</b> on your investigation sheet.</p>	
<p>e. Sort the <b>GP1980 (Billion Cubic Feet)</b> column in descending order. <b>Helpful hint:</b> Click the column twice.</p>	
<p> Write the top 4 countries that produced large amounts of natural gas in the <b>1980 Natural Gas Production Data Chart</b> on your investigation sheet. Use the <b>GP2008 (Billion Cubic Feet)</b> column to answer <b>question 4</b>.</p>	
<p>f. Close the <b>Table of Layer “Gas Production”</b> window.</p>	
<p>g. Click on the <b>Analyze</b> tab above the <b>Layer List</b> (see arrow).</p>	

h. Click **By Math Operation** (see arrow #1).

Click the box to the right of **Add Field to the Table of** and select **Gas Production** from the list (see arrow #2).

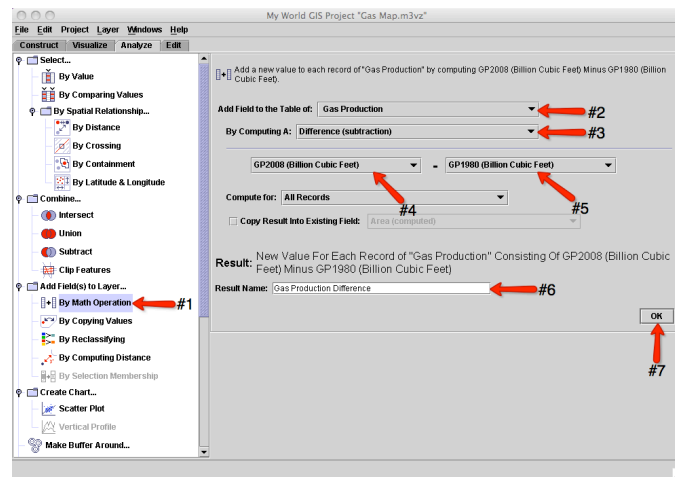
Click the box to the right of **By Computing A** and select **Difference (subtraction)** from the list (see arrow #3).

Select **GP2008 (Billion Cubic Feet)** in the box on the left (see arrow #4).

Select **GP1980 (Billion Cubic Feet)** in the box on the right (see arrow #5).

Type **Gas Production Difference** in the **Result Name** text box (see arrow #6).

Click **OK** (see arrow #7).

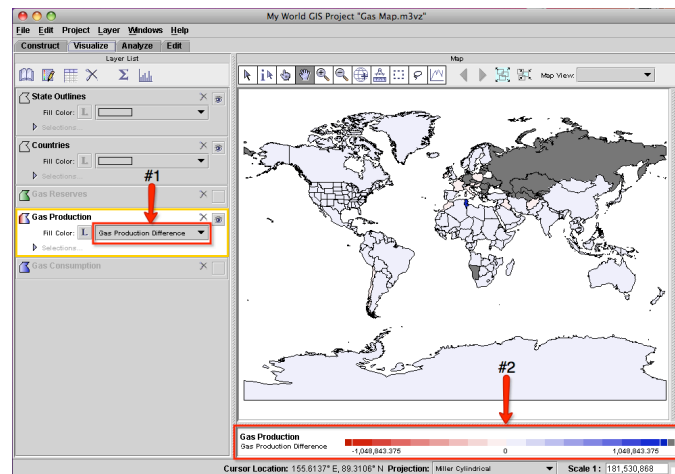


A new field called **Gas Production Difference** has been added to the Gas Production layer (see arrow #1).

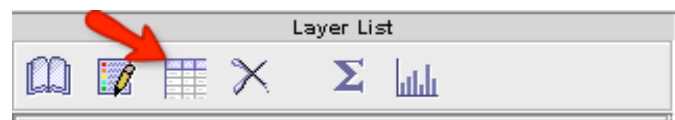
Look at the **Gas Production bar and legend** at the bottom of the map. Notice that the bar now includes both **positive** and **negative** numbers (see arrow #2).

Numbers that are **positive** represent countries that produced more natural gas in 2008 than in 1980.

Numbers that are **negative** represent countries that produced more natural gas in 1980 than in 2008.

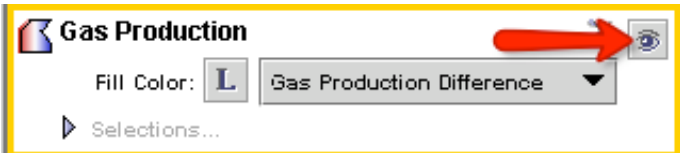


i. Click on the **table** icon on the **Layer List** tool bar.



Use the **Gas Production Difference** column to answer **questions 5 and 6** on your investigation sheet.

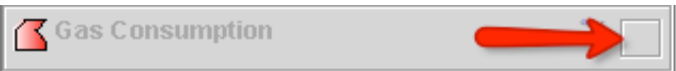

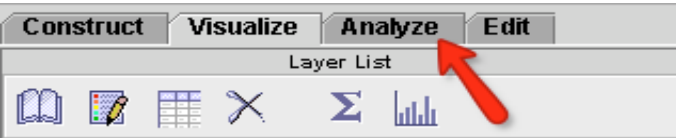
j. Close the **Table of Layer "Gas Production"** window.

<p>k. Click the eye to turn the <b>Gas Production</b> layer off (see arrow).</p>	
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 **Step 5: Examine natural gas consumption. (Questions 7 - 9)**

Let's investigate,

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

<p>a. Click the small square to turn the <b>Gas Consumption</b> layer on (see arrow).</p>	
<p>b. Click the <b>Gas Consumption</b> layer to make it active.  The Gas Consumption layer for 2008 is initially displayed.</p>	
<p>c. Click on the <b>Analyze</b> tab above the <b>Layer List</b> (see arrow).</p>	

d. Click **By Math Operation** (see arrow #1).

Click the box to the right of **Add Field to the Table of** and select **Gas Consumption** from the list (see arrow #2).

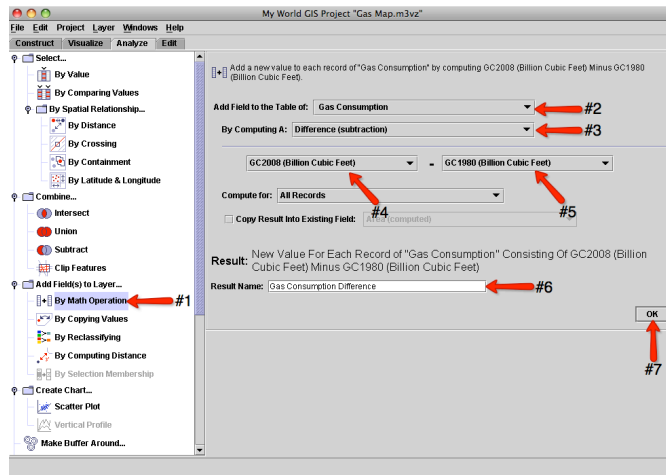
Click the box to the right of **By Computing A** and select **Difference (subtraction)** from the list (see arrow #3).

Select **GC2008 (Billion Cubic Feet)** in the box on the left (see arrow #4).

Select **GC1980 (Billion Cubic Feet)** in the box on the right (see arrow #5).

Type **Gas Consumption Difference** in the **Result Name** text box (see arrow #6).

Click **OK** (see arrow #7).

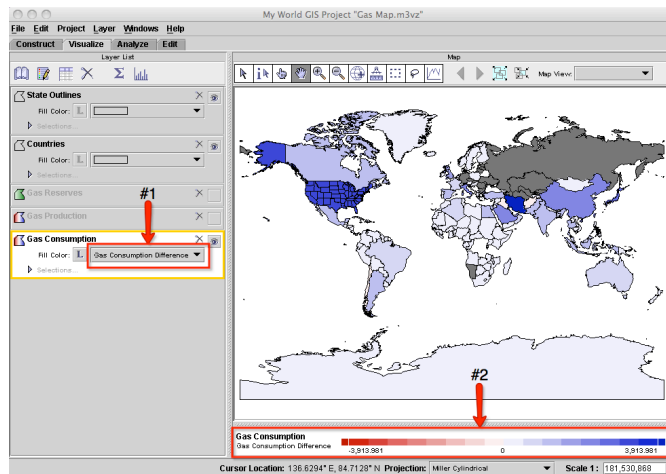


A new field called **Gas Consumption Difference** has been added to the Gas Consumption layer (see arrow #1).

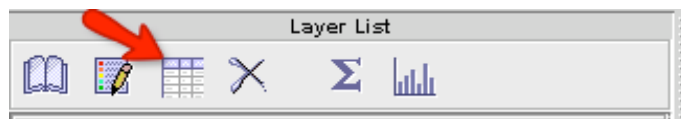
Look at the **Gas Consumption** bar and **legend** at the bottom of the map. Notice that the bar now includes both **positive** and **negative** numbers (see arrow #2).

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

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



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

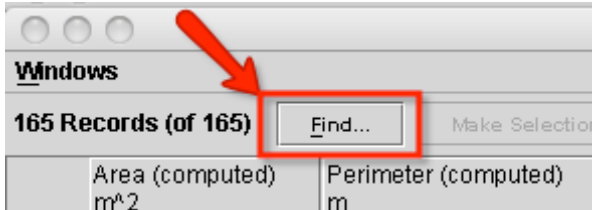


Use the **Gas Consumption Difference** column to answer **questions 7 and 8** on your investigation sheet. Use the **GC2008 (Billion Cubic Feet)** column to answer **question 9**.



Use the **GC2008 (Billion Cubic Feet)** column in My World GIS to complete the **Natural Gas Consumed in 2008** column on your investigation sheet.

You can use the **Find** feature located in the top left side of the data table (see arrow below) to search for the countries.

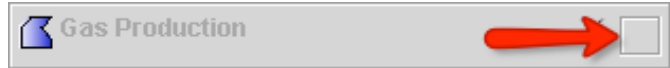


f. Close the **Table of Layer “Gas Consumption”** window.

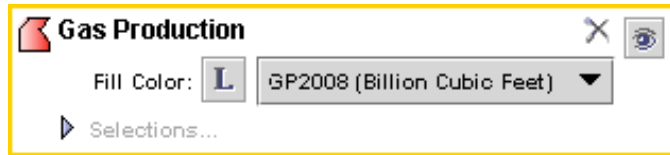
g. Click the eye to turn the **Gas Consumption** layer off (see arrow).



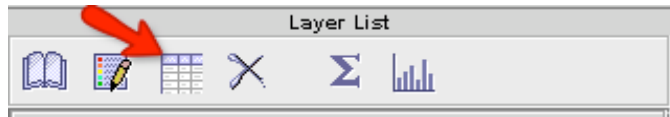
h. Click the square to turn the **Gas Production** layer on (see arrow).



i. Click the **Gas Production** layer to make it active.



j. Click on the **table** icon on the **Layer List** tool bar (see arrow).



Use the **GP2008 (Billion Cubic Feet)** column in My World GIS to complete the **Natural Gas Produced in 2008** column on your investigation sheet.



Answer **questions 10 - 12** on your investigation sheet.