

Investigating Oil Production and Consumption with My World GIS

Crude oil (petroleum) was formed from the remains of tiny sea animals and plants that lived millions of years ago in marine (water) environment. In this activity, you will use My World GIS to investigate patterns of crude oil (petroleum) production and consumption. You will

1. Examine countries with oil reserves.
2. Analyze crude oil production and consumption of countries in 1980 and 2008.
3. Investigate the relationship among countries' crude oil consumption and their populations.

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 Oil Production and Consumption with My World GIS**.

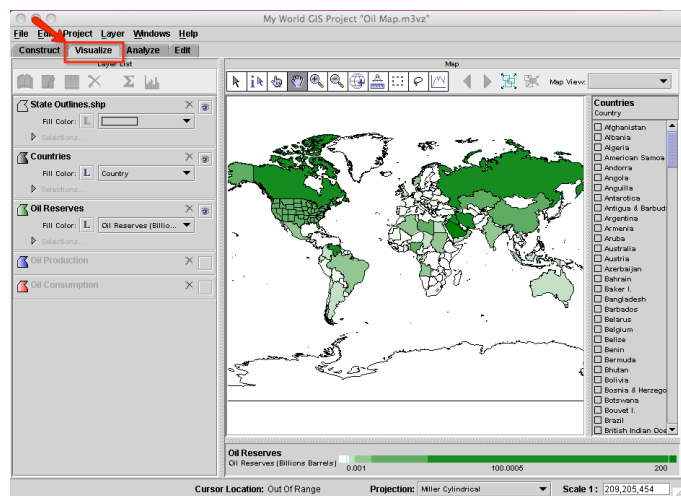


Step 2: Load data in My World GIS.

- a. **Double click** on the **Oil Map.m3vz** icon to open the file in My World GIS.







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





Step 3: Examine countries with oil reserves. (Questions 1 and 2)

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

a. Click on the Oil Reserves layer to make it active.	
b. Click on the table icon on the Layer List tool bar (see arrow).	
 Answer questions 1 and 2 on your investigation sheet. Oil reserves are the amount of oil that can be economically taken from crude oil reservoirs. Oil reserves are listed in amounts of billions of barrels. 1 barrel = 42 gallons. 1 billion = 1,000,000,000.	
c. Close the Table of Layer “Oil Reserves” window.	
d. Click the eye to turn the Oil Reserves layer off (see arrow).	



Step 4: Analyze oil production. (Questions 3 - 5)

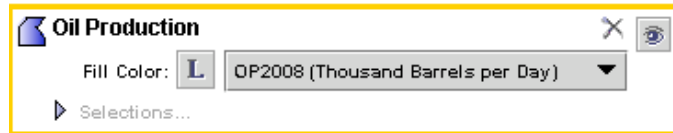
Let's investigate,

- Which countries produced **more** oil in 2008 than in 1980?
- Which countries produced **less** oil in 2008 than in 1980?

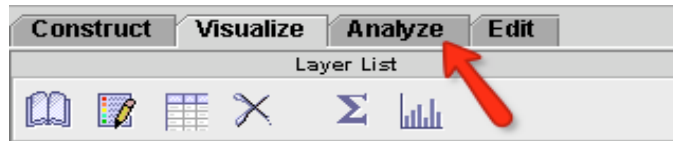
a. Click the small square to turn the Oil Production layer on (see arrow).	
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- b. Click the **Oil Production** layer to make it active.

The oil production layer for 2008 is initially displayed.



- c. Click on the **Analyze** tab above the **Layer List** (see arrow).



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

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

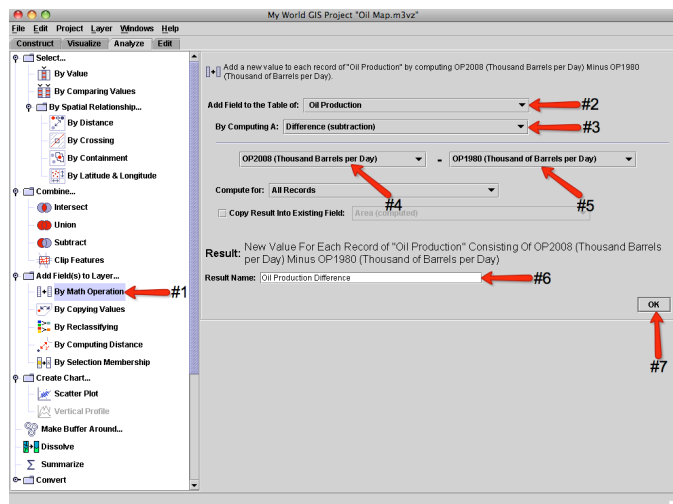
Click the box to the right of **By Computing A** and select **Difference (subtraction)** from the list (see arrow #3).

Select **OP2008 (Thousand Barrels per Day)** in the box on the left (see arrow #4).

Select **OP1980 (Thousand Barrels per Day)** in the box on the right (see arrow #5).

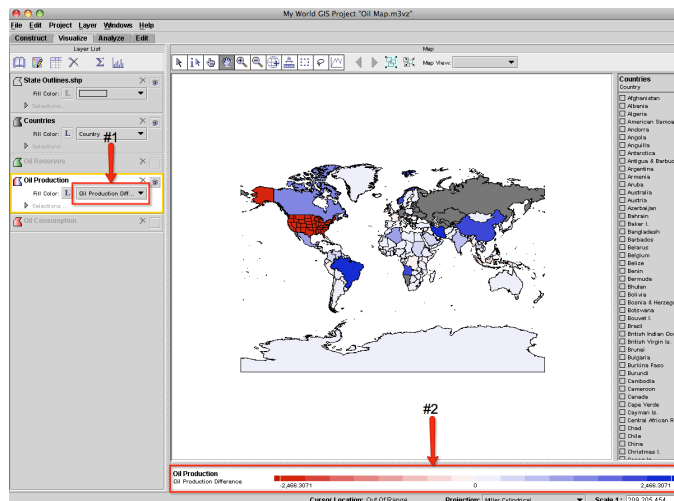
Type **Oil Production Difference** in the **Result Name** text box (see arrow #6).

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

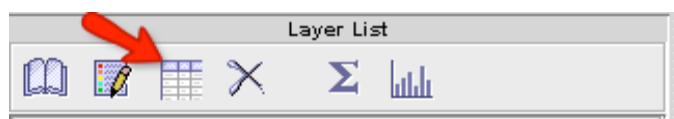


A new field called **Oil Production Difference** has been added to the Oil Production layer (see arrow #1).

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



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



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

Positive numbers mean that those countries produced **more** oil in 2008 than in 1980.

Scroll down to the bottom of the list to view countries with **negative** oil production differences.

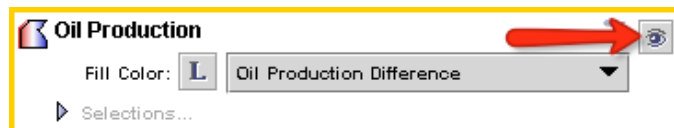
Negative numbers mean that those countries produced **less** oil in 2008 than in 1980.



Use the **Oil Production Difference** column to answer **questions 3, 4, and 5** on your investigation sheet.

- g. Close the **Table of Layer “Oil Production”** window.

- h. Click the eye to turn the **Oil Production** layer off (see arrow).


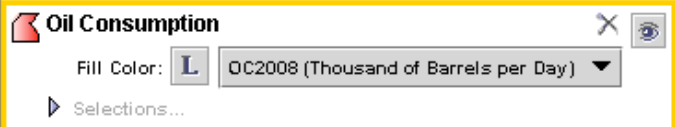
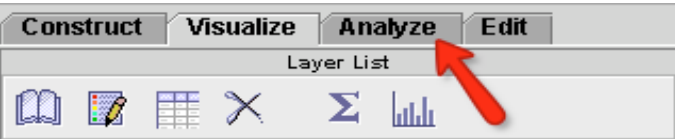
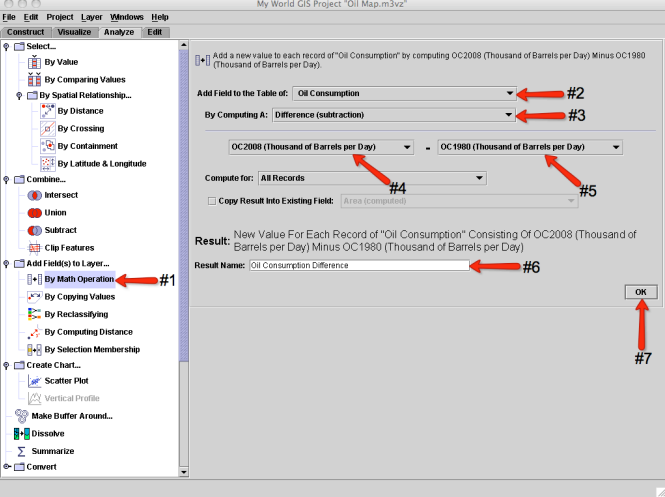




Step 5: Examine oil consumption. (Questions 6 - 8)

Let's investigate,

- Which countries consumed more oil in 2008 than in 1980?
- Which countries consumed less oil in 2008 than in 1980?

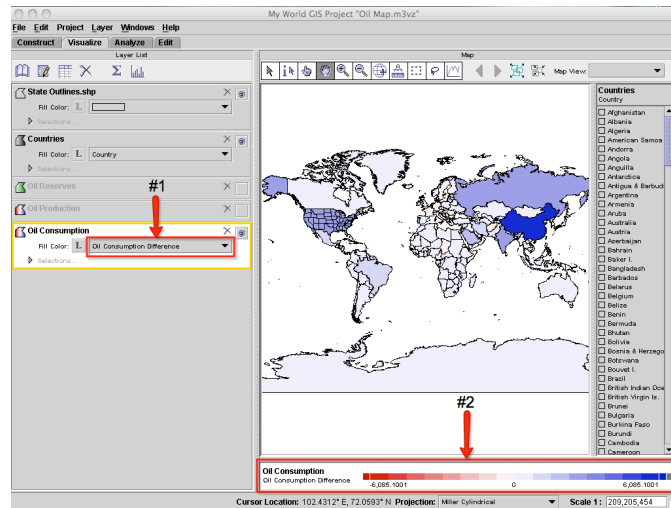
<p>a. Click the small square to turn the Oil Consumption layer on (see arrow).</p>	
<p>b. Click the Oil Consumption layer to make it active.</p> <p>The oil consumption layer for 2008 is initially displayed.</p>	
<p>c. Click on the Analyze tab above the Layer List (see arrow).</p>	
<p>d. Click By Math Operation (see arrow #1).</p> <p>Click the box to the right of Add Field to the Table of and select Oil 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 OC2008 (Thousand Barrels per Day) in the box on the left (see arrow #4).</p> <p>Select OC1980 (Thousand Barrels per Day) in the box on the right (see arrow #5).</p> <p>Type Oil Consumption Difference in the Result Name text box (see arrow #6).</p> <p>Click OK (see arrow #7).</p>	

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

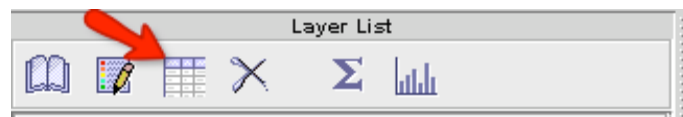
Look at the **Oil Consumption bar and legend** at the bottom of the map. Notice that the bar now includes both **positive** and **negative** numbers (see arrow #2).

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

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



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



- f. Sort the **Oil Consumption Difference** column in descending order.

Helpful hint: Click the column twice.

Positive numbers mean that those countries consumed **more** oil in 2008 than in 1980.

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

Negative numbers mean that those countries consumed **less** oil in 2008 than in 1980.



Use the **Oil Consumption Difference** column to answer **questions 6, 7, and 8** on your investigation sheet.

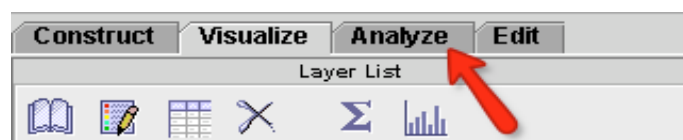
- g. Close the **Table of Layer “Oil Consumption”** window.



Step 6: Examine populations of countries. (Questions 9 and 10)

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

- a. Click on the **Analyze** tab above the **Layer List**.



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

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

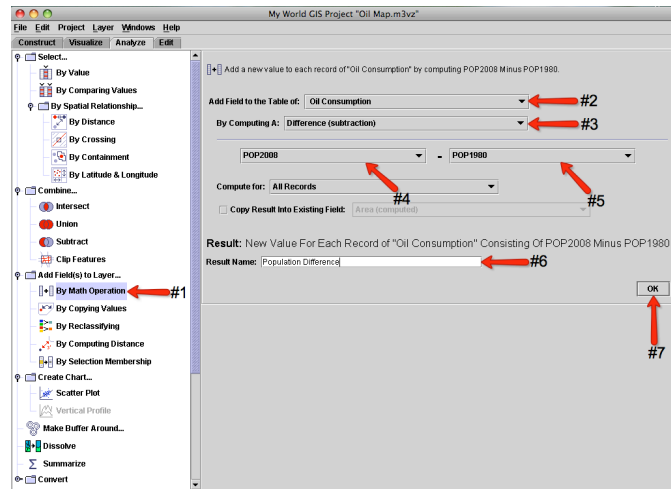
Click the box to the right of **By Computing A** and select **Difference (subtraction)** from the list (see arrow #3).

Select **POP2008** in the box on the left (see arrow #4).

Select **POP1980** in the box on the right (see arrow #5).

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

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



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

Look at the **Oil Consumption – Population Difference** bar and legend at the bottom of the map (see arrow #2).

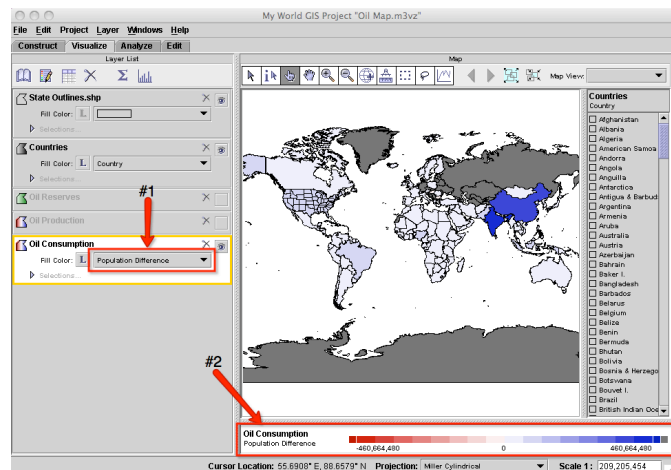
Countries that had a large population increase have a darker blue color.

Countries that had a smaller population increase have a lighter blue color.

Countries that had a large population decrease have a red color.

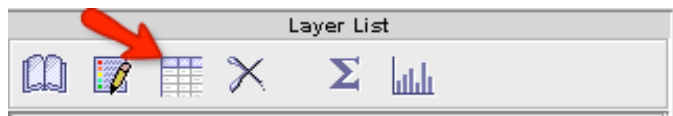
Countries that had a small population decrease have a pink color.

Countries whose population data was not available are gray in color.



Use the My World GIS map to answer **question 9** on your investigation sheet.

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



Use the **Population Difference** column to answer **question 10** on your investigation sheet.

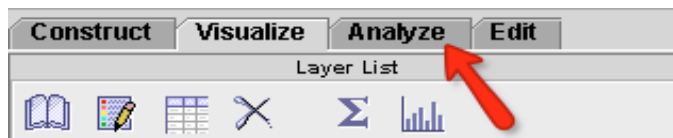
- d. Close the **Table of Layer “Oil Consumption”** window.



Step 7: Examine per capita oil consumption. (Questions 11 - 17)

Let's investigate each country's per capita oil consumption. Per capita oil consumption means the **average** amount of oil each person consumed.

- a. Click on the **Analyze** tab above the **Layer List**.



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

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

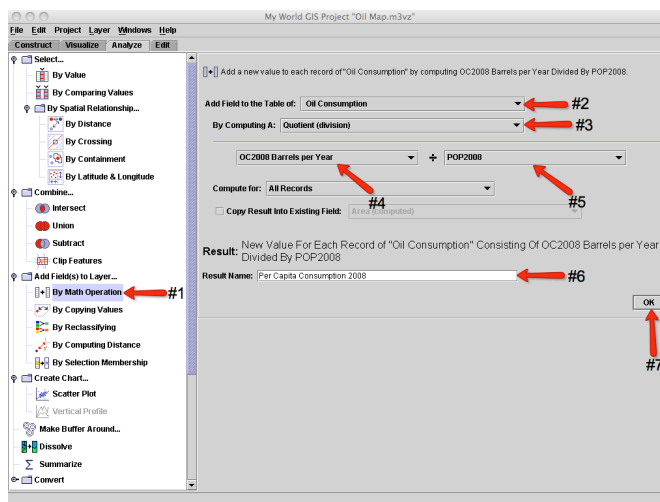
Click the box to the right of **By Computing A** and select **Quotient (division)** from the list (see arrow #3).

Select **OC2008 Barrels Per Year** in the box on the left (see arrow #4).

Select **POP2008** in the box on the right (see arrow #5).

Type **Per Capita Consumption 2008** in the **Result Name** text box (see arrow #6).

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

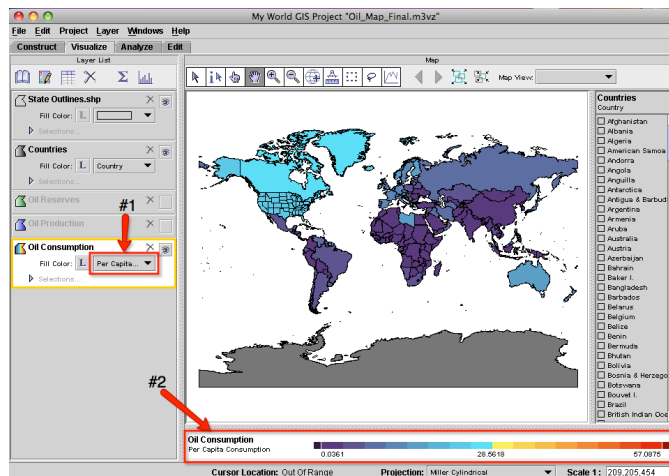


A new field called **Per Capita Consumption 2008** has been added to the Oil Consumption layer (see arrow #1).

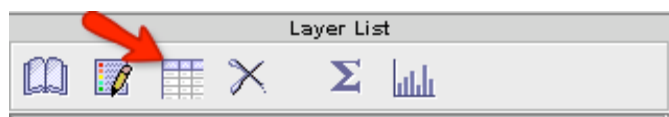
Per capita consumption means the **average** consumption of oil per person.

Look at the **Oil Consumption – Per Capita Consumption 2008** bar and **legend** at the bottom of the map (see arrow #2).

The lowest per capita consumption in 2008 was 0.0361 and the highest per capita consumption was 57.0875.

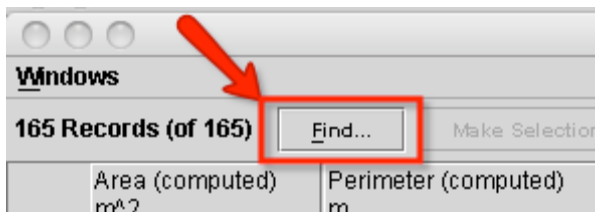


- c. Click on the **table** icon on the **Layer List** tool bar (see arrow).



Use the **Per Capita Consumption 2008** column to complete the **Oil Data Chart** 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.



Answer **questions 11 - 17** on your investigation sheet.