Lesson 5: Regional Effects of Climate Change

Though most dramatic in the Arctic, how is climate change affecting the rest of the world?

Region #1: Maldives

This island nation located in the Indian Ocean about 435 miles (700 km) southwest of Sri Lanka is seven and a half percent the size of the U.S. State of Rhode Island and is home to almost 393,500 people. The Maldives holds the record for being the flattest and lowest nation. Its highest natural elevation is 7.5 feet (2.3 meters) above sea-level, although in certain areas, the land has been constructed to be somewhat higher. The Maldives is composed of 26 atolls which are low-lying coral islands and 1,192 islets (200 of which are inhabited by people). Islets are mounds of broken coral and other reef detritus (waste) that stick out of the water in shallow lagoons.

The Tsunami of December 26, 2004 almost completely flooded the Maldives with waves of up to five feet high. The tsunami killed at least seventy-five people and the devastation from the waves left many people homeless. After the tsunami, the shape of the islands had changed and now the maps of the country are having to be redrawn.

The two major industries of the Maldives are tourism and fisheries. Around half a million tourists each year visit resorts in the Maldives. Fisheries employ about a third of the citizens of the Maldives. Other industries such as shipping, banking and manufacturing are growing.

The Maldives has the highest per-capita GDP (gross domestic production, which is one way economists measure wealth) of all the nations in South Asia. The Maldives GDP is around 8,730 U.S. Dollars per person per year.
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Region #2: Norway

The Scandinavian nation of Norway is approximately the size of the U.S. State of New Mexico and is home to 5,136,700 people. Norway is a long and thin country with a very long coastline on the North Atlantic, Barents Sea, Arctic Ocean, North Sea and Norwegian Sea. The northern part of Norway is north of the Arctic Circle.

The moderating influence of the oceans and the Gulf Stream make the climate in coastal Norway quite temperate, considering how far north it is. Temperatures in the capital, Oslo, average 61 degrees F (16.4 degrees C) in the summer and 24 degrees F (-4.3 degrees C) in the winter. The climate further inland and further to the north can be more severe and in the far north, it is sub-arctic.

In recent years, however, Norway has been experiencing warmer temperatures. The average temperature in Norway over the last fifteen-years has been 1.8 to 4.5 degrees F (1 to 2.5 degrees C) warmer in January and .9 to 1.8 degrees F (.5 to 1 degree C) warmer in July.

More than two-thirds of Norway is covered in rugged mountains. Several major glaciers occupy the central mountain plateau.

The economy of Norway is based on petroleum and natural gas exports, forestry, fishing, mining and hydroelectric power. Less than three percent of the land in Norway is arable (able to be farmed).
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Region #3: Iowa

The U.S. state of Iowa is home to almost three million people. It is located in the upper Midwest. The upper Midwest has a continental climate, which means that it is far away from the temperature-moderating influence of the oceans. This means that winters can get cold, with days as cold as 0 degrees F (-18 degrees C). This also means that summers can get very hot, with days over 100 degrees F (38 degrees C).

Iowa’s main industries are agriculture, manufacturing and insurance. About ninety percent of the land area in Iowa is used for farming. Iowa leads the nation in the production of pork, corn, soybeans and eggs. Iowa also leads the nation in the amount of corn-derived ethanol (a fuel) produced. Iowa also produces beef, dairy, sheep and honey.

Iowa receives an average of 34 inches of precipitation each year. The months of April through October receive the most rain. This relatively regular rainfall, especially during the growing season, means that it has traditionally been possible to grow crops in Iowa without irrigation, although certain farmers do irrigate.

The Mississippi River forms the eastern border of Iowa and the Missouri River forms the western border. From May through September of 1993, heavy rains caused record flooding on the Mississippi, Missouri and numerous other major rivers in the upper Midwest. The flood caused billions of dollars in damages in what was one of the worst natural disasters in the United States’ history. In contrast, in the winter of 2012-2013, the Mississippi River experienced the worst drought in 50 years. The lack of precipitation reduced water levels and threatened to halt shipping on the river which would have massive economic consequences.
Region #4: The Republic of Chad

Chad is a landlocked nation in Central Africa, larger than the states of Texas and California combined. It is home to about 10,330,000 people, 80% of whom rely on subsistence farming and livestock raising for their livelihood. Chad's main exports have been, until recently, cotton, cattle and chewing gum. Beginning on 2003, however, Chad began to export petroleum at a rate that has quickly grown. Chad is considered a lesser-developed country (LDC) and is one of the more poor countries in the world with annual per capita GDP at $1,865.

Chad is distant from the ocean and gets little precipitation. Only three percent of the land in Chad is arable, meaning able to be cultivated with crops. Chad has frequent droughts, persistent hot and dry winds and frequent locust plagues (insects that destroy crops).

Lake Chad, which is on the border of Chad and neighboring Cameroon, was once the second-largest lake in Africa. In the past several decades, however, Lake Chad has been shrinking and is now less than ten percent of its former size. Lake Chad doubles in size during the rainy season.

The only two important rivers in Chad are in the southwest of the country and flow into Lake Chad. The low-lying plains in the Lake Chad Basin get frequent enough rainfall during the rainy season to allow agriculture without irrigation. Daytime temperatures in this region range from around 80 degrees F (27 degrees C) in the coolest months to around 104 degrees F (40 degrees C).

The center of the country is arid plains inhabited by mostly nomadic people (people who, instead of living in permanent housing, move frequently to follow livestock or desirable weather conditions).

The northern part of Chad is desert and receives only trace amounts of rain. Daytime temperatures in the northern desert range from around 90 degrees F (32 degrees C) in the coolest months to around 113 degrees F (45 degrees C) in the hottest months.
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Region #5: The Amazon River Basin

The Amazon River basin covers about 2.7 million square miles in eight different South American countries. The climate is warm and humid with an average daily temperature of almost 80 degrees F (26.6 degrees C) and an average annual rainfall of around 80 inches (203 cm). There is little seasonal temperature variation in the Amazon basin.

There is typically no dry season in the Amazon River Basin. The basin often floods between June and October. This wet climate supports the Amazon rainforest, the largest rainforest in the world.

The main channel of the Amazon River is usually between one and six miles wide and is usually navigable by large steamers as far as 900 miles upstream of its mouth. This river is an important means of transportation for people along its length.

In recent years, however, the Amazon has experienced extreme drought, at times being reduced to a trickle, stranding boats and stressing ecosystems.
Region #6: Southern California

The southern quarter of the U.S. State of California is home to around 24 million people and contains the second largest metropolitan area in the United States (encompassing Los Angeles, San Diego and neighboring cities) as well as the surrounding desert. Coastal areas in southern California are home to unique ecosystems as well as to human communities.

Southern California has a diversified economy that includes the service industry, entertainment, tourism, technology, construction, manufacturing, finance, insurance, real estate and trade as well as agriculture and fishing. Southern California leads the nation in production of fruit and vegetables such as broccoli, carrots, onions, tomatoes, lettuce, almonds, strawberries, oranges and flowers. These crops depend on irrigation (the agricultural Imperial Valley averages less than 3 inches [7.6 cm] of rain a year and the San Joaquin Valley averages less than six inches [15.2 cm] of rain a year, making them both deserts). With irrigation, however, the land can produce two crops a year and is a major source of the nation’s fresh produce during the winter.

The large human population in Southern California needs water as well, and securing and distributing enough water for everyone’s needs is continually an issue in this area.

Parts of Southern California are moist enough to allow trees to grow, but are still dry enough that forest fires are a common occurrence. With the frequent winds fueling the flames, wildfires in southern California can be intense. Wildfires can destroy the vegetation that previously prevented erosion and when intense rains come after wildfires, they can sometimes trigger landslides, ash flows and flash floods.