

Module: Physical Geography
Topic Content: Physical and Environmental Changes

Physical and Environmental Changes



Click next to begin.

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Menu



Click each of the points on the map to explore examples of how humans have changed the landscape and the environment.

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Acid Rain: China

Click Each Point to Learn More

Acid Rain: China



Smokestacks at coal power plant

- China burns massive amounts of coal
- Burning coal produces sulfur dioxide
- Sulfur dioxide in the atmosphere causes acid rain
- One-third of the country experiences acid rain

Close


China burns massive amounts of coal in order to meet the nation's growing energy demands. Burning coal produces sulfur dioxide, which causes acid rain when excessive amounts are in the atmosphere. Approximately one-third of the country currently experiences acid rain.

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Acid Rain: Eastern North America

Click Each Point to Learn More

Acid Rain: Eastern North America



Acid rain has damaged water, soil, and vegetation

Buildings and statues have also been damaged

Caused by automobile and factory emissions

Close

Statue of George Washington damage by acid rain


Acid rain has impacted the northeastern portion of North America, damaging water, soil, vegetation, buildings, and statues. The acid rain in this region is largely caused by the emissions from factories and automobiles.

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Acid Rain: Germany

Click Each Point to Learn More

Acid Rain: Germany



The Black Forest is quickly diminishing

Many of the trees have been damaged by acid rain

Caused by pollution from automobiles and industries

Close

Forest damaged by acid rain


The wooded hills of the Black Forest in the southwestern part of Germany are quickly diminishing. Roughly 80% of the silver firs and almost 50% of the spruce trees have been damaged by acid rain. The acid rain is caused by the air pollution from surrounding industries and automobiles. Other forests in Germany and nearby countries are experiencing similar consequences.

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Acid Rain: Scandinavia

Click Each Point to Learn More

Acid Rain: Scandinavia



Dead fish on the bank of an acidic lake

Acid rain contains elevated levels of hydrogen ions

Acidity levels are higher than normal rain

Finland, Norway, and Sweden have acidic lakes

Close


Acid rain is precipitation that contains elevated levels of hydrogen ions, resulting in a higher acidity than normal. In the Scandinavian countries of Finland, Norway, and Sweden, acid rain has caused many of the lakes to become so acidic that they cannot support life.

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Agricultural Terracing: China and Southeast Asia

Click Each Point to Learn More

Agricultural Terracing: China and Southeast Asia



Rice terraces

- Practiced by farmers for thousands of years
- Sloped land is altered to create flat terraces
- Decreases erosion and runoff
- Conserves water resources

Close


For thousands of years, farmers in China and Southeast Asia have been altering sloped land to create flat steps, or terraces, for agriculture. Agricultural terracing decreases erosion and runoff, while conserving water resources for crops.

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Deforestation: Brazil

Click Each Point to Learn More

Deforestation: Brazil



Cleared forest in the Amazon

- Trans-Amazonian Highway was built in the 1970s
- Remote areas of Brazil became easily accessible
- Deforestation in the region rapidly increased
- Land is cleared by cutting down and burning the forest
- More land is cleared once the soil loses fertility

Close


In the early 1970s, the Trans-Amazonian Highway was built. It traversed the nation of Brazil through the Amazon rainforest, making many parts of the country easily accessible for the first time in modern history. It also led to rapid deforestation in the region. People began to clear land for agriculture by cutting down and burning parts of the forest. The land loses its fertility quickly, causing farmers to move on to a new area of land, clearing as they go.

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Deforestation: Malaysia

Click Each Point to Learn More

Deforestation: Malaysia



Aerial view of cleared forest

Logging and agriculture have caused deforestation

Some reports assert that the forests will be gone by 2020

Remaining forest is on nationally protected land

Has caused severe erosion and flooding

Close


Logging and agriculture have caused major deforestation in Malaysia. In fact, several reports assert that the forests will be completely gone by the year 2020. Most of the forest that currently remains is on nationally protected lands. The deforestation has caused severe erosion and flooding.

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Deforestation: Nepal

Click Each Point to Learn More

Deforestation: Nepal



Farmland in Nepal

Once a heavily forested country

Forests were cleared for agricultural use and timber

Soil erosion is a major problem

Close

Although the country was once heavily forested, deforestation has become a serious issue in Nepal. Large areas of forest have been cleared for agricultural use and the extraction of timber. This has led to major problems with soil erosion.

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Desertification: Africa

Click Each Point to Learn More

Desertification: Africa



Satellite image of the Sahara

Occurs when dry land loses more moisture

Creates desert land

Humans tried to cultivate land around the Sahara

The desert expands as the surrounding soil is depleted

Close


Desertification occurs when land that is already dry loses even more moisture, creating a desert. In areas around the Sahara, humans have tried to cultivate the land for crops and grazing animals. This depletes the nutrients in the soil, causing the Sahara to grow even larger, particularly in Algeria and Tunisia.

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Desertification: Asia

Click Each Point to Learn More

Desertification: Asia



Gobi Desert

Caused by overexploiting soil and climate change

Arid climates expand into semiarid regions

The Gobi Desert is expanding at a rapid rate

Close

Continue

In addition to overexploiting the soil, desertification is also caused by climate change. Increased temperatures and decreased precipitation cause arid climates to expand into semiarid regions. The Gobi Desert in Asia is expanding at a rapid rate, due to a combination of overgrazing, deforestation, and climate change.

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Polders: Netherlands

Click Each Point to Learn More

Polders: The Netherlands



A satellite image of a polder in the Netherlands, showing a large, irregularly shaped area of land reclaimed from water. The land is divided into a grid of smaller plots, with a network of canals and dikes visible. The surrounding water is dark, and the land is a mix of green and brown.

A polder is low-lying land that was reclaimed from water

Land is surrounded by dikes

The enclosed land is drained using pumps and canals

Polders are usually associated with the Dutch

Close

Satellite image of a polder in the Netherlands


A polder is a piece of low-lying land that has been reclaimed from a body of water. To reclaim the land, the area is surrounded by flood-resistant barriers called dikes. Once the polder is enclosed, the water is drained using pumps or canals, making the land suitable for agriculture or habitation. Polders are usually associated with the Dutch, because a large part of the Netherlands is located at or below sea level.

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Pollution: Chernobyl

Click Each Point to Learn More

Pollution: Chernobyl



Abandoned city with Chernobyl Nuclear Power Plant in the distance

- Chernobyl Nuclear Power Plant exploded in 1986
- Radioactive material was released into the atmosphere
- The area around the plant was heavily contaminated
- Evacuated area remains unsafe for human habitation

Close


In 1986, the Chernobyl Nuclear Power Plant in Ukraine suffered an explosion, and radioactive material was released into the atmosphere. This contaminated the air, which spread over various European countries. The immediate area around the power plant was heavily contaminated, killing animals and vegetation. The area around the plant was evacuated shortly after the accident, and remains unsafe for human habitation.

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Pollution: Mexico City

Click Each Point to Learn More

Pollution: Mexico City



Visible smog in Mexico City

- The capital of Mexico
- Mexico's most populous city
- In a valley surrounded by several large plateaus
- Has massive issues with water and air pollution

Close

Mexico City is the capital of Mexico, and its most populated city. Mexico City is located in the Valley of Mexico, which is surrounded by several large plateaus. The physical location of the city, coupled with the large concentration of people, has caused massive issues with water pollution and air pollution from vehicles.

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Pollution: Oil Spills

Click Each Point to Learn More

Pollution: Oil Spill



Release of liquid petroleum into the environment

Deepwater Horizon drilling rig exploded in 2010

Released oil into the Gulf of Mexico

Suffering continues because of the contamination

Close

Deepwater Horizon in the Gulf of Mexico

An oil spill is a form of pollution that involves the release of liquid petroleum into the environment, particularly in a marine ecosystem. In 2010, the Deepwater Horizon drilling rig experienced an explosion that released almost 5 million barrels of oil into the Gulf of Mexico. The water, wildlife, and people living in the surrounding area continue to suffer because of the water's contamination.

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Climate Change



Scientists have been predicting climate change would occur for years. There is evidence that these changes are already effecting the environment, and will likely become worse over time. For example, because of human activities that produce greenhouse gases, global temperatures have slowly increased, and will likely continue to rise 2.5 to 10 degrees Fahrenheit over the next century. The increase in global temperature melts ice sheets and glaciers, causing the sea level to rise. Furthermore, weather patterns have started to change drastically. Precipitation has increased in many regions, droughts and heat waves occur more frequently, and hurricanes have become stronger.