TAKE A CLOSE LOOK at your surroundings, and analyze everything that provides you comfort and sustenance. Consider the temperature and your shelter, food, clothing, and belongings. Can you determine the sources of these things? Is there anything you cannot trace back to a natural origin?

Objectives:

1. Compare natural resources and environmental systems.
2. Classify natural resources.

Key Terms:

- abiotic natural resources
- air
- atmosphere
- biosphere
- biotic natural resources
- climate
- domestication
- environmental systems
- exhaustible natural resource
- fossil fuels
- hydrosphere
- inexhaustible natural resource
- lithosphere
- minerals
- natural resources
- nonrenewable natural resources
- renewable natural resources
- soil
- water
- water cycle
- wildlife
- wind

Natural Resources and Environmental Systems Compared

Differentiating between natural resources and environmental systems is often not easy. They are closely related fields with much overlap.
**NATURAL RESOURCES**

_Natural resources_ are those things found in nature, such as forests, mineral deposits, soil, and fresh water, that have economic value. Air and wind, fossil fuels, minerals, people, soil, sunlight, water, and wildlife are types of natural resources.

**Atmosphere**

The _atmosphere_ is the gaseous layer that encompasses the earth. _Air_ is the mixture of gases that make up the atmosphere. _Wind_ is the movement of air. Water vapor, gases, and particulates can be found in the atmosphere.

**Fossil Fuels**

_Fossil fuels_ are fuels formed from the remains of dead animal and plant material deposited in a previous geologic time, typically millions of years ago. The energy in the fuels comes from the high carbon and hydrogen content of the deceased animals and plants. The burning of fossil fuels produces pollution and carbon dioxide linked to global warming.

Fossil fuels come in different forms, including peat, petroleum, natural gas, and coal. Peat is partially decayed vegetable matter that accumulates in bogs, where low oxygen levels and acidity inhibit decomposition. Petroleum is the liquid form of fossil fuels used to make gasoline and oils. Natural gas is the gaseous form of fossil fuels used in heating and cooking. Coal is the solid form of fossil fuels used in factories and in the generation of electricity.

**Minerals**

_Minerals_ are natural inorganic substances on or in the earth. They are not living things. Minerals are mined from the earth and are used to produce everything from iron to brick.

**People**

People help determine how other natural resources are used. As the human population has increased, there has been a greater demand for natural resources. The wise use of resources is necessary to ensure their future availability.
Soil

Soil is the outer layer of the earth’s surface that supports life. Plants obtain nutrients, water, and support from soil and convert radiant energy from the sun to chemical energy. Humans and other animals obtain sustenance from plants. Soil takes many years to form, but it can be easily lost by erosion. Therefore, soil must be protected in order for it to continue to be a resource.

Sunlight

Sunlight is the source of almost all the energy used on the earth. The light from the sun produces solar energy. Plants use this energy in the process of photosynthesis. People can also use this energy if it is harnessed using solar collectors.

Water

Water is a tasteless, colorless, liquid natural resource. All living things need water to survive. Water is a naturally occurring compound made up of two atoms of hydrogen and one atom of oxygen. Water can be found in three forms: solid, liquid, and gas. Water is continuously renewed through the water cycle. The water cycle is the movement of water from the earth’s surface to the atmosphere and back to the surface.

Wildlife

All the plants and animals that live in the wild are called wildlife. These plants and animals have not been domesticated. Domestication is the control of plants and animals by humans.

ENVIRONMENTAL SYSTEMS

Environmental systems are all the interactions between climate, the solid earth (lithosphere), water (hydrosphere), and the living things on Earth (biosphere).

Climate

Climate is the average weather conditions in a region over a period of years. Temperature, precipitation, wind, humidity, fog, and cloud cover are elements of climate. The atmosphere is a mixture of nitrogen (78 percent), oxygen (21 percent), and traces (remaining 1 percent) of carbon dioxide, argon, water vapor, and other components. Pollutants produced from natural fires accumulate in the atmosphere.
**Lithosphere**

The combination of soil and rock that makes up the earth’s crust is called the **lithosphere**. The lithosphere is the thin crust covering the molten part of the earth. The upper 1 km of the lithosphere interacts with the biosphere or the living things on Earth. Main constituents of the lithosphere are oxygen (47 percent), silicon (28 percent), aluminum (8 percent), iron (5 percent), calcium (4 percent), sodium (3 percent), potassium (3 percent) and magnesium (2 percent) in a crystalline state. The lithosphere is the main source of pollutants as raw materials are extracted by life and economic activities. Volcanic eruptions are a natural release of some pollutants. Pollutants from fossil fuels are the result of artificial extraction and combustion.

**Hydrosphere**

The **hydrosphere** is all the water on Earth, whether liquid, solid, salty, or fresh. Water serves as a solvent for elements such as sodium, magnesium, calcium, chloride, and sulfate dissolved in it. The oceans account for 97 percent of water forms, ice for 2 percent, and rivers, lakes, groundwater, and atmospheric vapor for 1 percent. Water is an important accumulator of pollutants.

**Biosphere**

All the communities of living things on Earth compose the **biosphere**. All living organisms, including animals and vegetation, are temporary accumulators (mercury, lead) and

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**FURTHER EXPLORATION...**

**ONLINE CONNECTION: Natural Resources and Environmental Systems Studies**

Would you consider a career related to natural resources and environmental systems? Many universities across America offer degree programs in these areas. Go online and search for university programs. Are there any offered in your state? What types of courses are required to obtain a degree?

If you are seriously considering this educational path, take the next step and contact the institutions that interest you the most.
sources for pollutants (natural fires). The biosphere also includes dead organisms and decayed organic matter.

### Natural Resources Classifications

Natural resources are classified in several ways.

#### Biotic and Abiotic Natural Resources

One way to classify natural resources is by their source of origin. Natural resources may be of biotic or abiotic origin. Natural resources of biotic origin come from the biosphere. **Biotic natural resources** are resources that may be living or were living at one time. Trees, animals, and microorganisms are living natural resources. Nonliving biotic natural resources include fossil fuels, such as coal and oil. **Abiotic natural resources** are resources that come from nonliving, nonorganic materials. Land, water, air, and minerals are abiotic natural resources.

#### Exhaustible and Inexhaustible Natural Resources

Some natural resources are considered inexhaustible. Other resources can be exhausted or used up. An **inexhaustible natural resource** is a resource that will not run out in the foreseeable future. Few resources are inexhaustible. Sunlight, wind, and geothermal energy are inexhaustible natural resources. An **exhaustible natural resource** is a resource that is available in limited quantity and can be completely used. Some exhaustible natural resources are renewable, whereas others are nonrenewable.

#### Renewable Natural Resources

**Renewable natural resources** are resources replaced naturally. Examples include fresh water, forests and other vegetation, and wildlife. They can be replenished and used again. Soil is also considered a renewable resource, but it may take many years for it to be replenished. If the consumption of renewable natural resources exceeds the regeneration of the resources, they may become exhausted.

[FIGURE 4. Fresh water is a renewable natural resource.]
Nonrenewable Natural Resources

Nonrenewable natural resources are resources that cannot be replaced after use. Minerals and fossil fuels are two types of nonrenewable natural resources. Although fossil fuels are replaceable from a human-use perspective, they are considered nonrenewable.

Summary:

Natural resources are those things found in nature, such as forests, mineral deposits, soil, and fresh water, that have economic value. Air and wind, fossil fuels, minerals, people, soil, sunlight, water, and wildlife are types of natural resources.

Environmental systems are all the interactions between climate, the solid earth (lithosphere), water (hydrosphere), and the living things on Earth (biosphere).

Natural resources may be of biotic or abiotic origin. Natural resources of biotic origin come from the biosphere. Some natural resources are considered inexhaustible. Other resources can be exhausted or used up. Renewable natural resources are resources replaced naturally. Nonrenewable natural resources are resources that cannot be replaced after use.

Checking Your Knowledge:

1. What are natural resources?
2. What are environmental systems?
3. What are examples of biotic and abiotic natural resources?
4. What are examples of inexhaustible and exhaustible natural resources?
5. What are examples of renewable and nonrenewable natural resources?
Expanding Your Knowledge:

Create a list of your day-to-day activities. Some examples might include “Slept in my house,” “Drank a glass of water,” “Got dressed with a cotton T-shirt and jeans.” Then determine whether the resources required for you to do these things are renewable natural resources or nonrenewable natural resources.

Web Links:

Natural Resources
http://www.eco-pros.com/naturalresources.htm

Agricultural Career Profiles
http://www.mycaret.com/career-profiles