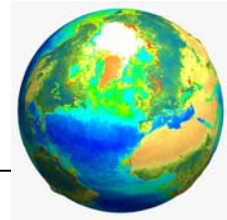


# Deserts Fact Sheet

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Approximately one-third of the Earth's land surface is desert, arid land with meager rainfall that supports only sparse vegetation and a limited population of people and animals. Deserts--stark, sometimes mysterious worlds--have been portrayed as fascinating environments of adventure and exploration from narratives such as that of Lawrence of Arabia to movies such as "Dune." These arid regions are called deserts because they are dry. They may be hot, they may be cold. They may be regions of sand or vast areas of rocks and gravel peppered with occasional plants. But deserts are always dry.

Deserts are natural laboratories in which to study the interactions of wind and sometimes water on the arid surfaces of planets. They contain valuable mineral deposits that were formed in the arid environment or that were exposed by erosion. Because deserts are dry, they are ideal places for human artifacts and fossils to be preserved. Deserts are also fragile environments. The misuse of these lands is a serious and growing problem in parts of our world.

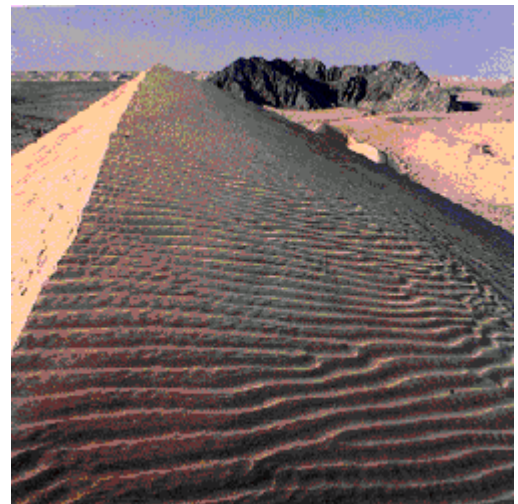


There are almost as many definitions of deserts and classification systems as there are deserts in the world. Most classifications rely on some combination of the number of days of rainfall, the total amount of annual rainfall, temperature, humidity, or other factors. In 1953, Pevelil Meigs divided desert regions on Earth into three categories according to the amount of precipitation they received. In this now widely accepted system, extremely arid lands have at least 12 consecutive months without rainfall, arid lands have less than 250 millimeters of annual rainfall, and semiarid lands have a mean annual precipitation of between 250 and 500 millimeters. Arid and extremely arid lands are deserts, and semiarid grasslands generally are referred to as steppes.

## Desert Features

Sand covers only about 20 percent of the Earth's deserts. Most of the sand is in sand sheets and sand seas--vast regions of undulating dunes resembling ocean waves "frozen" in an instant of time.

Nearly 50 percent of desert surfaces are plains where eolian deflation--removal of fine-grained material by the wind--has exposed loose gravels consisting predominantly of pebbles but with occasional cobbles.



The remaining surfaces of arid lands are composed of exposed bedrock outcrops, desert soils, and fluvial deposits including alluvial fans, playas, desert lakes, and oases. Bedrock outcrops commonly occur as small mountains surrounded by extensive erosional plains.

## Soils

Soils that form in arid climates are predominantly mineral soils with low organic content. The repeated accumulation of water in some soils causes distinct salt layers to form. Calcium carbonate precipitated from solution may cement sand and gravel into hard layers called "calcrete" that form layers up to 50 meters thick.

## Plants

Most desert plants are drought- or salt-tolerant. Some store water in their leaves, roots, and stems. Other desert plants have long tap roots that penetrate the water table, anchor the soil, and control erosion. The stems and leaves of some plants lower the surface velocity of sand-carrying winds and protect the ground from erosion.

Deserts typically have a plant cover that is sparse but enormously diverse. The Sonoran Desert of the American Southwest has the most complex desert vegetation on Earth. The giant saguaro cacti provide nests for desert birds and serve as "trees" of the desert. Saguaro grow slowly but may live 200 years. When 9 years old, they are about 15 centimeters high. After about 75 years, the cacti are tall and develop their first branches. When fully grown, saguaro are 15 meters tall and weigh as much as 10 tons. They dot the Sonoran and reinforce the general impression of deserts as cacti-rich land.

## Water

Rain does fall occasionally in deserts, and desert storms are often violent. A record 44 millimeters of rain once fell within 3 hours in the Sahara. Large Saharan storms may deliver up to 1 millimeter per minute. Normally dry stream channels, called arroyos or wadis, can quickly fill after heavy rains, and flash floods make these channels dangerous. More people drown in deserts than die of thirst.

Though little rain falls in deserts, deserts receive runoff from ephemeral, or short-lived, streams fed by rain and snow from adjacent highlands. These streams fill the channel with a slurry of mud and commonly transport considerable quantities of sediment for a day or two. Although most deserts are in basins with closed, or interior drainage, a few deserts are crossed by 'exotic' rivers that derive their water from outside the desert. Such rivers infiltrate soils and evaporate large amounts of water on their journeys through the deserts, but their volumes are such that they maintain their continuity.