

Introduction to the Geology of Fuerteventura

[Alan Gray's Handout](#)

Fuerteventura is one of the Canary archipelago islands, a group of volcanic islands formed as the result of a 'Hot Spot' in the ocean floor. Magma from the hot spot breaks through the Atlantic oceanic crust and erupts onto the sea floor forming Basalt sea mounts. The eruptions continue for long periods of time and the sea mount grows with each eruption. Eventually the sea mount rises above sea level to form an island like Fuerteventura.

As the volcanism subsides weathering becomes the dominant process and the island begins to erode with the erosion products washed into the ocean sediments around the island.

The other Canary Islands have been formed in the same way but are in different positions due to the motion of the North African tectonic plate in a NE direction. The position of the hot spot is more or less stationary although there is some evidence that it may have moved during the creation of the Canary archipelago due to the non-uniform age distribution of the islands.

Fuerteventura is the oldest island with the first appearance of basalt volcanism on the sea floor around 70MYA (Upper Cretaceous). The island as seen today only represents a small percentage of the original volcanic material which has been mostly eroded and is now on the ocean floor around the island.

The original island comprised 3 large shield volcanoes in the South, North and Centre. The basaltic lava flows from these shield volcanoes formed most of the original island most of which has been weathered away. The original caldera are now not obvious and can only be approximately located by tracing back the lines of the many remaining basalt ridges (*Cuchillos*) and detailed analysis of the rock type peculiar to caldera and its feeders. The position of parts of the three original caldera are now off the coast of the island.

More recent volcanic activity has erupted through the original lava flows producing the numerous cinder cones, volcanoes and lava fields seen today. Later intrusive magmas are evident as sheeted dykes and dyke swarms in the country rock. Ancient sea floor sediments can also be seen in places caused by uplift from the hot spot. Fossils are very rare but can be found in a few special places. See Day 1 write-up.

While most of the island is volcanic rock large areas of sand in places on the East coast can be found. This sand is not indigenous and has been windblown from the Sahara desert only 60 miles away during unusual weather conditions.

Fuerteventura is very arid compared to the other Canary Islands. This is mainly because of it being the oldest. The much longer period of weathering has reduced the heights of the mountains to well below those of the other islands. The current heights are not sufficient to cause regular orographic precipitation. The weather over the whole Canary Island region is dominated by the 'Azores High' which results in

the prevailing NE 'Trade Winds'. Weather fronts are normally absent in this kind of circulation making orographic rainfall the only regular source of water.

In spite of the arid conditions extensive farming has taken place in the past up to as recently as the 1970s. Underground water was pumped to the surface using wind driven pumps (See Day 2 write-up).

Fuerteventura is a world-renowned workshop for studying the mechanisms of both hot-spot volcanism, subsequent erosion and construction of an oceanic volcanic island.