

The Galapagos Islands are located in the Pacific Ocean, off the coast of Ecuador. There are 13 main islands and 8 minor islands in the group. Their remoteness has meant that many species found on the islands are unique to the group and live there in isolation from the rest of the world. This allowed Charles Darwin to make some very interesting observations and propositions based on what he saw in the Galapagos.



The **Galapagos Islands** lie within the equatorial zone (near the Equator) and are located on the Nazca **tectonic plate**. This is a perpetually moving piece of the earth's crust that is heading eastward over what is known as the **Galapagos Hotspot**. ... The Nazca and Cocos plates also meet the vast Pacific **plate** here to create a Triple Junction that means this area is rife with volcanic activity.





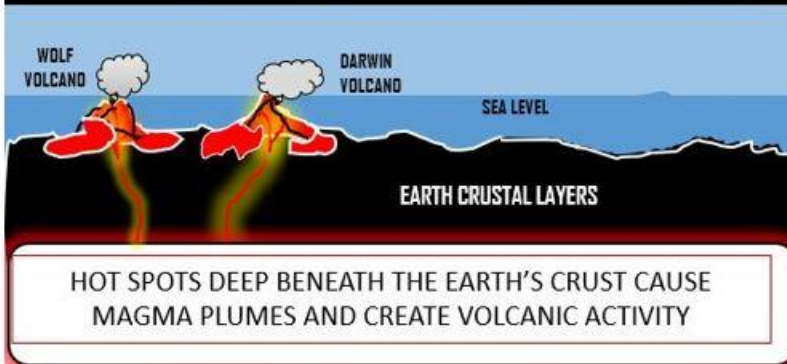


Viewed from space, the Galapagos Islands have been described as looking like pimples emerging from the surface of the Pacific Ocean.

# POSSIBLE STAGES IN THE FORMATION OF THE ISABELA ISLAND\*

\* The formation of Isabela Island took many thousands of years of eruption. These diagrams are generalised. The order may have been different but the final shape and formation processes are accurate

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## STAGE 1 - SUBMARINE VOLCANOES FORM

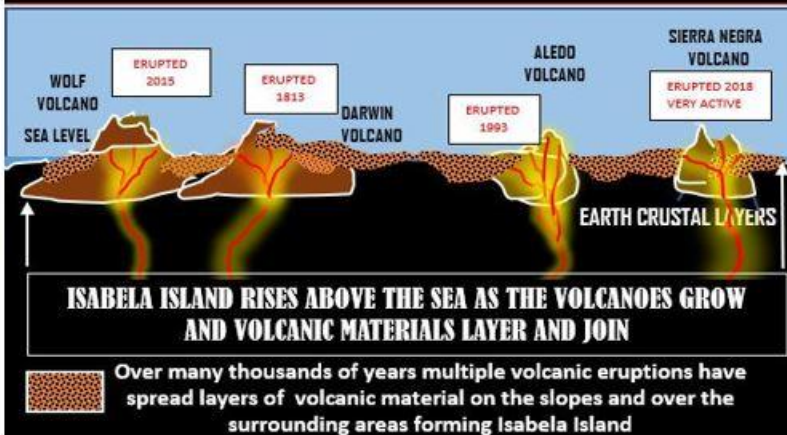
Deep beneath the crustal surface the hot spots generated magma plumes which penetrated the earth surface. Successive eruptions resulted in the initial formation of Wolf and Darwin volcanic peaks. The sea boiled. Volcanic debris poured out of the volcanic vents. Undersea lava flows spread the volcanic material and the two volcanoes were almost joined while they were under the sea.



## STAGE 2- VOLCANIC FLOWS ABOVE THE SEA

Vulcanologists generally believe that the Wolf and Darwin volcanoes were the first two to emerge from the sea. During their series of eruptions they grew in height. From their volcanic vents they expelled mixtures of ash, steam and pumice. Magma reached the surface and flowed through the vents. The lava flows spread around the volcanoes forming the first part of Isabela Island – the twin volcanoes of Wolf and Darwin. The Aledo and Sierra Negra volcanoes considered to be the most recent on Isabella Island were possibly in the process of emerging above the sea. Isabella Island was producing three different eruption phases- volcanic lava flows; volcanic dust clouds and earthquake warnings (Sierra Negra Volcano)

## THREE DIFFERENT ERUPTION PHASES OF ISABELA ISLAND



## STAGE 3- ISABELA ISLAND FORMS BY THE JOINING OF MATERIALS EMITTED FROM THE VOLCANOES DURING ERUPTIONS

The first section of Isabela Island to rise above sea level was the smaller section formed by the growth of the Wolf and Darwin volcanoes. With numerous eruptions these volcanoes spread volcanic material around the volcanic vents. Lava and mud flows covered the areas surrounding the volcanic peaks. The area of the island increased by the later development of the Aledo and Sierra Negra volcanoes. All of these volcanoes are still listed as "active". With the growth of tourism these volcanoes are monitored and warning levels are issued. When the warning levels suggest that volcanoes reach the "likely to issue materials" there are bans on landing tourists on the island





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## THE GALAPAGOS ISLANDS – VOLCANIC VARIETY

### EXPLANATION

Photographs – Doug Roberts

The Galapagos Islands are on the UNESCO WORLD HERITAGE LIST. The islands have emerged from the sea within an area of 8,010 square kilometres. The islands have developed over many thousands of years of volcanic eruption. The photograph above (1) indicates cone volcanoes. Other photographs (2, 3) show volcanic flows with materials from eruptive events flowing across the landscape. Sierra Negra (Photos 4,5) is the most active volcano. The photographs show lava flows and valley distortion from the 2018 eruption) The area is dotted with remnants of volcanic rocks as shown in photograph 6. The islands have formed and changed over many thousands of years. The hotspots beneath the islands moved as the crustal plates moved. Consequently the islands to the east were the first to emerge from the sea. The western islands (notably Fernandida and Isabela) were formed by more recent eruptions. Many of the volcanoes of the eastern islands are considered **dormant** while volcanoes on the western islands are on the **active** list. Though in the equatorial climatic area the cold ocean currents provide low temperatures and humidity which explain the unique varieties of plants and animals.



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