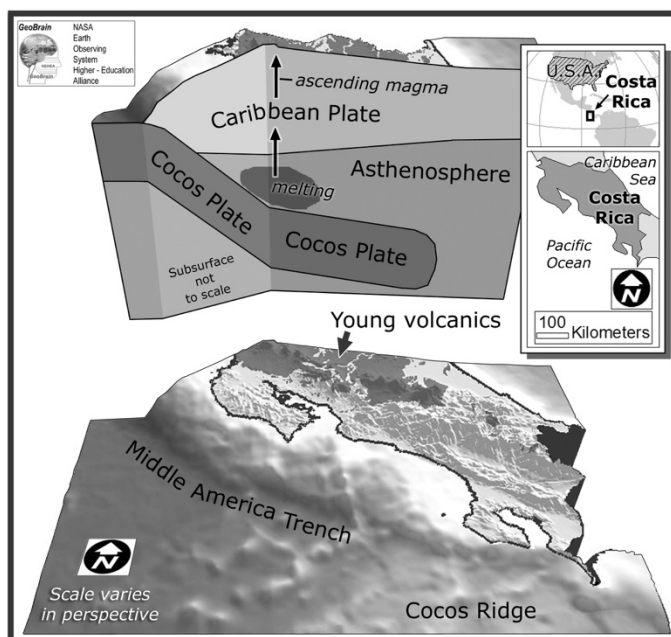


LOCAL GEOLOGY

Chirripó National Park is located in the heart of the Talamanca Mountain Range, which was formed by various geologic processes, including tectonic movement and igneous activity. Costa Rica and Panama are of far more recent geologic origin than the countries to the north and south. These two countries lie at the boundary where the Pacific's Cocos plate, a piece of the earth's crust some 510 km wide, meets the crustal plate underlying the Caribbean. The two are converging as the **Cocos Plate** moves east at a rate of about four inches a year. It is a classic subduction zone in which the heavier Cocos is forced under the Caribbean plate, and one of the most dynamic junctures on earth.

As these two chunks of crustal material collided, the rocks of the Cocos plate were pushed downward, subjecting them to increased heat and pressure that eventually turned them into molten rock under great pressure. Because the downward thrust was at an angle to the east, when the pressure build-up finally became too much and the lava and steam moved back upward towards the surface, they did so beneath the western edge of the Caribbean plate. The result was undersea volcanic eruptions. As layer after layer of cooled volcanic material collected, the peaks finally emerged above the ocean's surface, 40-50 million years ago. In this manner, an arc of volcanic islands formed in a line parallel to and east of the zone of contact between the two plates.



Millennia passed and eruptions continued to throw more material down the slopes of the rising volcanoes. The land area filled in around their bases, until as recently as three million years ago the uninterrupted land bridge, present-day Costa Rica and Panama, was completed between northern Central America and South America, giving rise to movements of plant and animal species both north (birds) and southwards (mammals). This recent land connection to two great continents, as well as the wide range of altitudes and climates, are in large part responsible for the incredibly high biodiversity to be found in an area as small as Costa Rica.



Rock formations on the summit of the Chirripó massif indicate that some 25,000 years ago the extinct volcanic arc of the Talamancas, where it never snows, was covered by glacial ice. This glacier formed during the last of the Great Ice Ages when

much of the northern hemisphere was also beneath ice, although the Chirripó glacier was not connected to those glaciers. A dozen or more small glacial lakes, piles of rounded rocks (moraines), striations on rock beds, and U-shaped valleys are all mute testimony to the existence of the former ice cover. The last glaciers retreated from this area only about 10,000 years ago.

The highlands represent the most complete evolution of the Talamanca Mountain Range's. The relief forms and the lithic materials here reveal the region's geologic history, while the presence of basaltic and andesitic rocks and tuffs provide evidence of prior igneous activity. The area is not actively volcanic, but hot springs near San Gerardo de Rivas hint at the cauldron below. Earth tremors are frequent.