

= Sangay =

Sangay ( also known as Macas , Sanagay , or Sangai ) is an active stratovolcano in central Ecuador . It is the most active volcano in Ecuador , having erupted three times in recorded history . It exhibits mostly strombolian activity ; the most recent eruption , which started in 1934 , is still ongoing . Geologically , Sangay marks the southern boundary of the Northern Volcanic Zone , and its position straddling two major pieces of crust accounts for its high level of activity . Sangay 's approximately 500 @, @ 000 @-@ year @-@ old history is one of instability ; two previous versions of the mountain were destroyed in massive flank collapses , evidence of which still litters its surroundings today .

Due to its remoteness , Sangay hosts a significant biological community with fauna such as mountain tapirs , giant otters , cocks @-@ of @-@ the @-@ rock , and king vultures . Since 1983 , its ecological community has been protected as part of the Sangay National Park . Although climbing the mountain is hampered by its remoteness , poor weather conditions , river flooding , and the danger of falling ejecta , the volcano is regularly climbed , a feat first achieved by Robert T. Moore in 1929 .

= = Geological setting = =

Lying at the eastern edge of the Andean cordillera , Sangay was formed by volcanic processes associated with the subduction of the Nazca Plate under the South American Plate at the Peru ? Chile Trench . It is the southernmost volcano in the Northern Volcanic Zone , a subgroup of Andean volcanoes whose northern limit is Nevado del Ruiz in Colombia .

The next active volcano in the chain , Sabancaya , is in Peru , a distant 1 @, @ 600 km ( 990 mi ) to the south . Sangay lies above a seismogenic tectonic slab located about 130 km ( 80 mi ) beneath Sabancaya , reflecting a sharp difference in the thermal character of the subducted oceanic crust , between older rock beneath southern Ecuador and Peru ( dated more than 32 million years old ) , and younger rock under northern Ecuador and Colombia ( dated less than 22 million years old ) . The older southern rock is more thermally stable than the northern crust , and to this is attributed the long break in volcanic activity in the Andes ; Sangay occupies a position at the boundary between these two bodies , accounting for its high level of activity .

= = Geology = =

Sangay developed in three distinct phases . Its oldest edifice , formed between 500 @, @ 000 and 250 @, @ 000 years ago , is evidenced today by a wide scattering of material opening to the east , defined by a crest about 4 @, @ 000 m ( 13 @, @ 120 ft ) high . This first Sangay , pockmarked by secondary ridges , is thought to have been 15 ? 16 km ( 9 ? 10 mi ) in diameter , with a summit located 2 to 3 km ( 1 to 2 mi ) southeast of the present summit . The curved shape of the remnants of this first structure indicates that it suffered a massive flank collapse , scattering the nearby forest lowlands with debris and causing a large part of its southern caldera wall to slide off the mountain , forming an embayment lower on its slopes . This 400 m ( 1 @, @ 312 ft ) thick block , the best preserved specimen of Sangay 's early construction , consists of sequentially layered breccias , pyroclastic flows , and lahar deposits . Acidic andesites with just under 60 % silicon dioxide dominate these flows , but more basic andesites can be found as well .

Sangay 's second edifice began to form anew after the massive sector collapse that damaged the first , being constructed between 100 @, @ 000 and 50 @, @ 000 years ago . Remnants of its second structure lie within the southern and eastern parts of the debris from its first collapse ; some remnants of the volcano lie to the west and north as well . Sangay 's second structure is believed to have had an east @-@ to @-@ west elongated summit , and like its first summit structure , it suffered a catastrophic collapse that created a debris avalanche 5 km ( 3 mi ) wide and up to 20 km ( 12 mi ) in length . It was likely less voluminous than the volcano 's first version , and its summit lay near Sangay 's current one .

Sangay currently forms an almost perfect glacier @-@ capped cone 5 @,@ 230 m ( 17 @,@ 159 ft ) high , with a 35 ° slope and a slight northeast @-@ southwest tilt . Its eastern flank marks the edge of the Amazon Rainforest , and its western flank is a flat plain of volcanic ash , sculpted into steep gorges up to 600 m ( 1 @,@ 970 ft ) deep by heavy rainfall . It has a west @-@ east trending summit ridge , capped by three active craters and a lava dome . Sangay has been active in its current form for at least 14 @,@ 000 years , and is still filling out the area left bare by its earlier incarnations , being smaller than either of them . Uniquely , in its 500 @,@ 000 years of activity , its magma plume has never changed composition or moved a significant distance .

Mainly andesitic in composition , Sangay is highly active . The earliest report of a historical eruption was in 1628 ; ash fell as far away as Riobamba , located 50 km ( 31 mi ) northwest of Sangay , and was severe enough to cover pastures and starve local livestock . The volcano erupted again in 1728 , remaining essentially continuously active through 1916 , with particularly heavy activity in 1738 ? 1744 , 1842 ? 1843 , 1849 , 1854 ? 1859 , 1867 ? 1874 , 1872 , and 1903 . After a brief pause , it erupted again on August 8 , 1934 , and has not completely quelled ever since , with heavy eruptive periods occurring in 1934 ? 1937 and 1941 ? 1942 .

Eruptions at Sangay exhibit strombolian activity , producing ashfall , lava flows , pyroclastic flows , and lahars . All known eruptions at the volcano have had a Volcanic Explosivity Index ( VEI ) of 3 . Despite its activity , Sangay is located in a remote , uninhabited region ; only a large Plinian eruption could threaten occupied areas 30 ? 100 km ( 19 ? 62 mi ) to its west . Nonetheless , a flank collapse on its eastern side , possible given the volcano 's construction and history , could displace nearby forest and possibly affect settlements . Access to the volcano is difficult , as its current eruptive states constantly peppers the massif with molten rock and other ejecta . For these reasons , it is not nearly as well @-@ studied as other , similarly active volcanoes in the Andes and elsewhere ; the first detailed study of the volcano was not published until 1999 .

= = Ecology = =

Sangay is one of two active volcanoes located within the namesake Sangay National Park , the other being Tungurahua to the north . As such it has been listed as a UNESCO World Heritage Site since 1983 . The area 's isolation has allowed it to maintain a pristine ecology relatively untouched by human interaction , and the park hosts a biome ranging from alpine glaciers on the volcanoes ' peaks to tropical forest on their flanks . Altitude and rainfall are the most significant local factors affecting fauna , and therefore the most lush ecosystems are found on the wetter parts of the volcano 's eastern slope .

The highest level below the snowline is dominated by lichen and bryophytes . Below this lies a zone of small trees and shrubs which develops into montane forest , principally in western valleys and on well @-@ irrigated eastern slopes , which occurs below 3 @,@ 750 m ( 12 @,@ 303 ft ) . Tree heights develop from 5 m ( 16 ft ) near the top to up to 12 m ( 39 ft ) below 3 @,@ 000 metres ( 9 @,@ 843 ft ) ; below 2 @,@ 000 m ( 6 @,@ 562 ft ) , subtropical rainforest is present , with temperatures between 18 and 24 ° C ( 64 and 75 ° F ) and up to 500 cm ( 196 @. @ 9 in ) of rainfall .

Fauna is similarly distributed , with distinct altitudinal zonation present . The highest altitudes support endangered mountain tapirs ( *Tapirus pinchaque* ) , cougars ( *Puma concolor* ) , guinea pigs ( *Cavia porcellus* ) , and Andean foxes ( *Lycalopex culpaeus* ) . Lower down , spectacled bears ( *Tremarctos ornatus* ) , jaguars ( *Panthera onca* ) , ocelots ( *Leopardus pardalis* ) , margays ( *Leopardus wiedii* ) , white @-@ tailed deer ( *Odocoileus virginianus* ) , brocket deer ( *Mazama* sp . ) , vulnerable pudús ( *Pudu* sp . ) , and endangered giant otters ( *Pteronura brasiliensis* ) can all be found . Bird species common in the area include Andean condors ( *Vultur gryphus* ) , cocks @-@ of @-@ the @-@ rock ( *Rupicola* sp . ) , giant hummingbirds ( *Patagona gigas* ) , torrent ducks ( *Merganetta armata* ) , king vultures ( *Sarcoramphus papa* ) , and swallow @-@ tailed kites ( *Elanoides forficatus* ) .

= = Recreation = =

Sangay can and has been climbed . It was first ascended in 1929 by Robert T. Moore , prior to its current eruption beginning in 1934 . However , the volcano 's current active state presents dangers to mountaineers in the form of falling ejecta ; in 1976 , two members of an expedition on the volcano were stuck and killed by falling debris . In addition , the volcano is located in a remote region with poor roads and is difficult to access , and periods of heavy rainfall can flood rivers and cause landslides , rendering the mountain routes impassable . Nonetheless , the Instituto Ecuatoriano Forestal y de Areas Naturales , which maintains an office near the mountain , facilitate such activities by providing local guides and rooms for rent for visitors . Ascension takes between 7 and 10 days from Quito . Conditions on the volcano are usually very wet and foggy , and mountaineers may be visually impaired from viewing the volcano as they ascend it .