

= Mount Vesuvius =

Mount Vesuvius ( pronunciation : / v??su?vi?s / ; Italian : Monte Vesuvio [ ?monte ve?zu?vjo ] , Latin : Mons Vesuvius [ mō?s w??s?w?.?s ] ; also Vesevus or Vesaevus in Roman sources ) is a stratovolcano in the Gulf of Naples , Italy , about 9 km ( 5 @.@ 6 mi ) east of Naples and a short distance from the shore . It is one of several volcanoes which form the Campanian volcanic arc . Vesuvius consists of a large cone partially encircled by the steep rim of a summit caldera caused by the collapse of an earlier and originally much higher structure .

Mount Vesuvius is best known for its eruption in AD 79 that led to the burying and destruction of the Roman cities of Pompeii , Herculaneum , and several other settlements . That eruption ejected a cloud of stones , ash , and fumes to a height of 33 km ( 20 @.@ 5 mi ) , spewing molten rock and pulverized pumice at the rate of 1 @.@ 5 million tons per second , ultimately releasing a hundred thousand times the thermal energy released by the Hiroshima bombing . At least 1 @,@ 000 people died in the eruption . The only surviving eyewitness account of the event consists of two letters by Pliny the Younger to the historian Tacitus .

Vesuvius has erupted many times since and is the only volcano on the European mainland to have erupted within the last hundred years . Today , it is regarded as one of the most dangerous volcanoes in the world because of the population of 3 @,@ 000 @,@ 000 people living nearby and its tendency towards explosive ( Plinian ) eruptions . It is the most densely populated volcanic region in the world .

= = Mythology = =

Vesuvius has a long historic and literary tradition . It was considered a divinity of the Genius type at the time of the eruption of 79 AD : it appears under the inscribed name Vesuvius as a serpent in the decorative frescos of many lararia , or household shrines , surviving from Pompeii . An inscription from Capua to IOVI VESVVIO indicates that he was worshipped as a power of Jupiter ; that is , Jupiter Vesuvius .

The historian Diodorus Siculus relates a tradition that Hercules , in the performance of his labors , passed through the country of nearby Cumae on his way to Sicily and found there a place called " the Phlegraean Plain " ( phlegraion pedion , " plain of fire " ) , " from a hill which anciently vomited out fire ... now called Vesuvius . " It was inhabited by bandits , " the sons of the Earth , " who were giants . With the assistance of the gods he pacified the region and went on . The facts behind the tradition , if any , remain unknown , as does whether Herculaneum was named after it . An epigram by the poet Martial in 88 AD suggests that both Venus , patroness of Pompeii , and Hercules were worshipped in the region devastated by the eruption of 79 . Mount Vesuvius was regarded by the Romans as being devoted to the hero and demigod Hercules .

= = Origin of the name = =

Vesuvius was a name of the volcano in frequent use by the authors of the late Roman Republic and the early Roman Empire . Its collateral forms were Vesaevus , Vesevus , Vesbius and Vesvius . Writers in ancient Greek used ?????????? or ?????????? . Many scholars since then have offered an etymology . As peoples of varying ethnicity and language occupied Campania in the Roman Iron Age , the etymology depends to a large degree on the presumption of what language was spoken there at the time . Naples was settled by Greeks , as the name Nea @-@ polis , " New City " , testifies . The Oscans , a native Italic people , lived in the countryside . The Latins also competed for the occupation of Campania . Etruscan settlements were in the vicinity . Other peoples of unknown provenance are said to have been there at some time by various ancient authors .

Some theories about its origin are :

From Greek ??

= " not " prefixed to a root from or related to the Greek word ?????????? =

" I quench " , in the sense of " unquenchable " .

From Greek ??

= " I hurl " and ??? " violence " , " hurling violence " , \* vesbia , taking advantage of the collateral form .

From an Indo @-@ European root , \* eus- < \* ewes- < \* ( a ) wes- , " shine " sense " the one who lightens " , through Latin or Oscan .

From an Indo @-@ European root \* wes =  
" hearth " ( compare e.g. Vesta )

= = Physical appearance = =

Vesuvius is a distinctive " humpbacked " mountain , consisting of a large cone ( Gran Cono ) partially encircled by the steep rim of a summit caldera caused by the collapse of an earlier and originally much higher structure called Monte Somma . The Gran Cono was produced during the eruption of AD 79 . For this reason , the volcano is also called Somma @-@ Vesuvius or Somma @-@ Vesuvio .

The caldera started forming during an eruption around 17 @,@ 000 ( or 18 @,@ 300 ) years ago and was enlarged by later paroxysmal eruptions ending in the one of AD 79 . This structure has given its name to the term " somma volcano " , which describes any volcano with a summit caldera surrounding a newer cone .

The height of the main cone has been constantly changed by eruptions but is 1 @,@ 281 m ( 4 @,@ 203 ft ) at present . Monte Somma is 1 @,@ 149 m ( 3 @,@ 770 ft ) high , separated from the main cone by the valley of Atrio di Cavallo , which is some 5 km ( 3 @.@ 1 mi ) long . The slopes of the mountain are scarred by lava flows but are heavily vegetated , with scrub and forest at higher altitudes and vineyards lower down . Vesuvius is still regarded as an active volcano , although its current activity produces little more than steam from vents at the bottom of the crater . Vesuvius is a stratovolcano at the convergent boundary where the African Plate is being subducted beneath the Eurasian Plate . Layers of lava , scoria , volcanic ash , and pumice make up the mountain . Their mineralogy is variable , but generally silica @-@ undersaturated and rich in potassium , with phonolite produced in the more explosive eruptions .

= = Formation = =

Vesuvius was formed as a result of the collision of two tectonic plates , the African and the Eurasian . The former was subducted beneath the latter , deeper into the earth . As the water @-@ saturated sediments of the oceanic African plate were pushed to hotter depths in the earth , the water boiled off and caused the melting point of the upper mantle to drop enough to create partial melting of the rocks . Because magma is less dense than the solid rock around it , it was pushed upward . Finding a weak place at the Earth 's surface it broke through , producing the volcano .

The volcano is one of several which form the Campanian volcanic arc . Others include Campi Flegrei , a large caldera a few kilometres to the north west , Mount Epomeo , 20 kilometres ( 12 mi ) to the west on the island of Ischia , and several undersea volcanoes to the south . The arc forms the southern end of a larger chain of volcanoes produced by the subduction process described above , which extends northwest along the length of Italy as far as Monte Amiata in Southern Tuscany . Vesuvius is the only one to have erupted within recent history , although some of the others have erupted within the last few hundred years . Many are either extinct or have not erupted for tens of thousands of years .

= = Eruptions = =

Mount Vesuvius has erupted many times . The famous eruption in 79 AD was preceded by numerous others in prehistory , including at least three significantly larger ones , the best known being the Avellino eruption around 1800 BC which engulfed several Bronze Age settlements . Since 79 AD , the volcano has also erupted repeatedly , in 172 , 203 , 222 , possibly 303 , 379 , 472 , 512 ,

536 , 685 , 787 , around 860 , around 900 , 968 , 991 , 999 , 1006 , 1037 , 1049 , around 1073 , 1139 , 1150 , and there may have been eruptions in 1270 , 1347 , and 1500 . The volcano erupted again in 1631 , six times in the 18th century , eight times in the 19th century ( notably in 1872 ) , and in 1906 , 1929 , and 1944 . There has been no eruption since 1944 , and none of the post 79 eruptions were as large or destructive as the Pompeian one .

The eruptions vary greatly in severity but are characterized by explosive outbursts of the kind dubbed Plinian after Pliny the Younger , a Roman writer who published a detailed description of the 79 AD eruption , including his uncle 's death . On occasion , eruptions from Vesuvius have been so large that the whole of southern Europe has been blanketed by ash ; in 472 and 1631 , Vesuvian ash fell on Constantinople ( Istanbul ) , over 1 000 kilometres ( 750 mi ) away . A few times since 1944 , landslides in the crater have raised clouds of ash dust , raising false alarms of an eruption .

== Before AD 79 ==

Scientific knowledge of the geologic history of Vesuvius comes from core samples taken from a 2 000 m ( 6 600 ft ) plus bore hole on the flanks of the volcano , extending into Mesozoic rock . Cores were dated by potassium - argon and argon - argon dating . The mountain started forming 25 000 years ago . Although the area has been subject to volcanic activity for at least 400 000 years , the lowest layer of eruption material from the Somma mountain lies on top of the 40 000 year old Campanian Ignimbrite produced by the Campi Flegrei complex , and was the product of the Codola Plinian eruption 25 000 years ago .

It was then built up by a series of lava flows , with some smaller explosive eruptions interspersed between them . However , the style of eruption changed around 19 000 years ago to a sequence of large explosive plinian eruptions , of which the 79 AD one was the most recent . The eruptions are named after the tephra deposits produced by them , which in turn are named after the location where the deposits were first identified :

The Basal Pumice ( Pomici di Base ) eruption , 18 300 years ago , VEI 6 , saw the original formation of the Somma caldera . The eruption was followed by a period of much less violent , lava producing eruptions .

The Green Pumice ( Pomici Verdoline ) eruption , 16 000 years ago , VEI 5 .

The Mercato eruption ( Pomici di Mercato ) ? also known as Pomici Gemelle or Pomici Ottaviano ? 8000 years ago , VEI 6 , followed a smaller explosive eruption around 11 000 years ago ( called the Lago Amendolare eruption ) .

The Avellino eruption ( Pomici di Avellino ) , 3800 years ago , VEI 5 , followed two smaller explosive eruptions around 5 000 years ago . The Avellino eruption vent was apparently 2 km west of the current crater , and the eruption destroyed several Bronze Age settlements of the Apennine culture . Several carbon dates on wood and bone offer a range of possible dates of about 500 years in the mid 2nd millennium BC . In May 2001 , near Nola , Italian archaeologists using the technique of filling every cavity with plaster or substitute compound recovered some remarkably well preserved forms of perishable objects , such as fence rails , a bucket and especially in the vicinity thousands of human footprints pointing into the Apennines to the north . The settlement had huts , pots , and goats . The residents had hastily abandoned the village , leaving it to be buried under pumice and ash in much the same way that Pompeii was later preserved . Pyroclastic surge deposits were distributed to the northwest of the vent , travelling as far as 15 km ( 9 3 mi ) from it , and lie up to 3 m ( 9 8 ft ) deep in the area now occupied by Naples .

The volcano then entered a stage of more frequent , but less violent , eruptions until the most recent Plinian eruption , which destroyed Pompeii .

The last of these may have been in 217 BC . There were earthquakes in Italy during that year and the sun was reported as being dimmed by a haze or dry fog . Plutarch wrote of the sky being on fire near Naples and Silius Italicus mentioned in his epic poem Punica that Vesuvius had thundered and produced flames worthy of Mount Etna in that year , although both authors were writing around 250 years later . Greenland ice core samples of around that period show relatively high acidity , which is

assumed to have been caused by atmospheric hydrogen sulfide .

The mountain was then quiet ( for 295 years , if the 217 BC date for the last previous eruption is true ) and was described by Roman writers as having been covered with gardens and vineyards , except at the top which was craggy . The mountain may have had only one summit at that time , judging by a wall painting , " Bacchus and Vesuvius " , found in a Pompeiian house , the House of the Centenary ( Casa del Centenario ) .

Several surviving works written over the 200 years preceding the 79 AD eruption describe the mountain as having had a volcanic nature , although Pliny the Elder did not depict the mountain in this way in his *Naturalis Historia* :

The Greek historian Strabo ( ca 63 BC ? AD 24 ) described the mountain in Book V , Chapter 4 of his *Geographica* as having a predominantly flat , barren summit covered with sooty , ash @-@ coloured rocks and suggested that it might once have had " craters of fire " . He also perceptively suggested that the fertility of the surrounding slopes may be due to volcanic activity , as at Mount Etna .

In Book II of *De architectura* , the architect Vitruvius ( ca 80 ? 70 BC - ? ) reported that fires had once existed abundantly below the mountain and that it had spouted fire onto the surrounding fields . He went on to describe Pompeiian pumice as having been burnt from another species of stone .

Diodorus Siculus ( ca 90 BC ? ca 30 BC ) , another Greek writer , wrote in Book IV of his *Bibliotheca Historica* that the Campanian plain was called fiery ( Phlegrean ) because of the mountain , Vesuvius , which had spouted flame like Etna and showed signs of the fire that had burnt in ancient history .

== = Eruption of AD 79 == =

In the year of 79 AD , Mount Vesuvius erupted in one of the most catastrophic and famous eruptions of all time . Historians have learned about the eruption from the eyewitness account of Pliny the Younger , a Roman administrator and poet .

Mount Vesuvius spawned a deadly cloud of stones , ash and fumes to a height of 33 km ( 20 @.@ 5 mi ) , spewing molten rock and pulverized pumice at the rate of 1 @.@ 5 Mt / s , ultimately releasing a hundred thousand times the thermal energy released by the Hiroshima bombing . The towns of Pompeii and Herculaneum were destroyed by pyroclastic flows and the ruins buried under dozens of feet of tephra .

== = = Precursors and foreshocks == = =

The 79 AD eruption was preceded by a powerful earthquake seventeen years beforehand on February 5 , AD 62 , which caused widespread destruction around the Bay of Naples , and particularly to Pompeii . Some of the damage had still not been repaired when the volcano erupted . The deaths of 600 sheep from " tainted air " in the vicinity of Pompeii indicates that the earthquake of 62 may have been related to new activity by Vesuvius

The Romans grew accustomed to minor earth tremors in the region ; the writer Pliny the Younger even wrote that they " were not particularly alarming because they are frequent in Campania " . Small earthquakes started taking place on 20 August 79 becoming more frequent over the next four days , but the warnings were not recognised .

== = = Scientific analysis of the eruption == = =

Reconstructions of the eruption and its effects vary considerably in the details but have the same overall features . The eruption lasted two days . The morning of the first day was perceived as normal by the only eyewitness to leave a surviving document , Pliny the Younger . In the middle of the day an explosion threw up a high @-@ altitude column from which ash began to fall , blanketing the area . Rescues and escapes occurred during this time . At some time in the night or early the next day pyroclastic flows in the close vicinity of the volcano began . Lights were seen on the

mountain interpreted as fires . People as far away as Misenum fled for their lives . The flows were rapid @-@ moving , dense and very hot , knocking down wholly or partly all structures in their path , incinerating or suffocating all population remaining there and altering the landscape , including the coastline . These were accompanied by additional light tremors and a mild tsunami in the Bay of Naples . By evening of the second day the eruption was over , leaving only haze in the atmosphere through which the sun shone weakly .

The latest scientific studies of the ash produced by Vesuvius reveals a multi @-@ phase eruption . The initial major explosion produced a column of ash and pumice ranging between 15 and 30 kilometres ( 49 @,@ 000 and 98 @,@ 000 ft ) high , which rained on Pompeii to the southeast but not on Herculaneum upwind . The chief energy supporting the column came from the escape of steam superheated by the magma , created from ground water seeping over time into the deep faults of the region .

Subsequently the cloud collapsed as the gases expanded and lost their capability to support their solid contents , releasing it as a pyroclastic surge , which reached Herculaneum but not Pompeii . Additional explosions reinstituted the column . The eruption alternated between Plinian and Peléan six times . Surges 3 and 4 are believed by the authors to have destroyed Pompeii . Surges are identified in the deposits by dune and cross @-@ bedding formations , which are not produced by fallout .

Another study used the magnetic characteristics of over 200 samples of roof @-@ tile and plaster fragments collected around Pompeii to estimate equilibrium temperature of the pyroclastic flow . The magnetic study revealed that on the first day of the eruption a fall of white pumice containing clastic fragments of up to 3 centimetres ( 1 @.@ 2 in ) fell for several hours . It heated the roof tiles up to 140 ° C ( 284 ° F ) . This period would have been the last opportunity to escape .

The collapse of the Plinian columns on the second day caused pyroclastic density currents ( PDCs ) that devastated Herculaneum and Pompeii . The depositional temperature of these pyroclastic surges ranged up to 300 ° C ( 572 ° F ) . Any population remaining in structural refuges could not have escaped , as the city was surrounded by gases of incinerating temperatures . The lowest temperatures were in rooms under collapsed roofs . These were as low as 100 ° C ( 212 ° F ) .

= = = The Two Plinys = = =

The only surviving eyewitness account of the event consists of two letters by Pliny the Younger to the historian Tacitus . Pliny the Younger describes , amongst other things , the last days in the life of his uncle , Pliny the Elder . Observing the first volcanic activity from Misenum across the Bay of Naples from the volcano , approximately 35 kilometres ( 22 mi ) , the elder Pliny launched a rescue fleet and went himself to the rescue of a personal friend . His nephew declined to join the party . One of the nephew 's letters relates what he could discover from witnesses of his uncle 's experiences . In a second letter the younger Pliny details his own observations after the departure of his uncle .

The two men saw an extraordinarily dense cloud rising rapidly above the mountain . This cloud and a request by messenger for an evacuation by sea prompted the elder Pliny to order rescue operations in which he sailed away to participate . His nephew attempted to resume a normal life , but that night a tremor awoke him and his mother , prompting them to abandon the house for the courtyard . Further tremors near dawn caused the population to abandon the village and caused wave action in the Bay of Naples .

The early light was obscured by a black cloud through which shone flashes , which Pliny likens to sheet lightning , but more extensive . The cloud obscured Point Misenum near at hand and the island of Capraia ( Capri ) across the bay . Fearing for their lives , the population began to call to each other and move back from the coast along the road . A rain of ash fell , causing Pliny to shake it off periodically to avoid being buried . Later that same day the ash stopped falling and the sun shone weakly through the cloud , encouraging Pliny and his mother to return to their home and wait for news of Pliny the Elder .

Pliny 's uncle Pliny the Elder was in command of the Roman fleet at Misenum , and had meanwhile

decided to investigate the phenomenon at close hand in a light vessel . As the ship was preparing to leave the area , a messenger came from his friend Rectina ( wife of Tascius ) living on the coast near the foot of the volcano explaining that her party could only get away by sea and asking for rescue . Pliny ordered the immediate launching of the fleet galleys to the evacuation of the coast . He continued in his light ship to the rescue of Rectina 's party .

He set off across the bay but in the shallows on the other side encountered thick showers of hot cinders , lumps of pumice and pieces of rock . Advised by the helmsman to turn back he stated " Fortune favors the brave " and ordered him to continue on to Stabiae ( about 4 @. @ 5 km from Pompeii ) .

Pliny the Elder and his party saw flames coming from several parts of the mountain . After staying overnight , the party was driven from the building by an accumulation of material , presumably , tephra , which threatened to block all egress . They woke Pliny , who had been napping and emitting loud snoring . They elected to take to the fields with pillows tied to their heads to protect them from rockfall . They approached the beach again but the wind prevented the ships from leaving . Pliny sat down on a sail that had been spread for him and could not rise even with assistance when his friends departed . Though Pliny the Elder died , his friends ultimately escaped by land .

In the first letter to Tacitus , Pliny the Younger suggested that his uncle 's death was due to the reaction of his weak lungs to a cloud of poisonous , sulphurous gas that wafted over the group . However , Stabiae was 16 km from the vent ( roughly where the modern town of Castellammare di Stabia is situated ) and his companions were apparently unaffected by the fumes , and so it is more likely that the corpulent Pliny died from some other cause , such as a stroke or heart attack . His body was found with no apparent injuries on the next day , after dispersal of the plume .

= = = Casualties from the eruption = = =

Along with Pliny the Elder , the only other noble casualties of the eruption to be known by name were Agrippa ( a son of the Herodian Jewish princess Drusilla and the procurator Antonius Felix ) and his wife .

By 2003 , around 1 @, @ 044 casts made from impressions of bodies in the ash deposits had been recovered in and around Pompeii , with the scattered bones of another 100 . The remains of about 332 bodies have been found at Herculaneum ( 300 in arched vaults discovered in 1980 ) . What percentage these numbers are of the total dead or the percentage of the dead to the total number at risk remain completely unknown .

Thirty @- @ eight percent of the 1 @, @ 044 were found in the ash fall deposits , the majority inside buildings . These are thought to have been killed mainly by roof collapses , with the smaller number of victims found outside of buildings probably being killed by falling roof slates or by larger rocks thrown out by the volcano . The remaining 62 % of remains found at Pompeii were in the pyroclastic surge deposits , and thus were probably killed by them ? probably from a combination of suffocation through ash inhalation and blast and debris thrown around . In contrast to the victims found at Herculaneum , examination of cloth , frescoes and skeletons show that it is unlikely that high temperatures were a significant cause . Herculaneum , which was much closer to the crater , was saved from tephra falls by the wind direction , but was buried under 23 metres ( 75 ft ) of material deposited by pyroclastic surges . It is likely that most , or all , of the known victims in this town were killed by the surges .

People caught on the former seashore by the first surge died of thermal shock . No boats have been found , indicating they may have been used for the earlier escape of some of the population . The rest were concentrated in arched chambers at a density of as high as 3 persons per square metre . As only 85 metres ( 279 ft ) of the coast have been excavated , the casualties waiting to be excavated may well be as high as the thousands .

= = = Later eruptions from the 3rd to the 19th century = = =

Since the eruption of 79 AD , Vesuvius has erupted around three dozen times . It erupted again in

203 , during the lifetime of the historian Cassius Dio . In 472 , it ejected such a volume of ash that ashfalls were reported as far away as Constantinople . The eruptions of 512 were so severe that those inhabiting the slopes of Vesuvius were granted exemption from taxes by Theodoric the Great , the Gothic king of Italy . Further eruptions were recorded in 787 , 968 , 991 , 999 , 1007 and 1036 with the first recorded lava flows . The volcano became quiescent at the end of the 13th century and in the following years it again became covered with gardens and vineyards as of old . Even the inside of the crater was filled with shrubbery .

Vesuvius entered a new phase in December 1631 , when a major eruption buried many villages under lava flows , killing around 3 @, @ 000 people . Torrents of boiling water were also ejected , adding to the devastation . Activity thereafter became almost continuous , with relatively severe eruptions occurring in 1660 , 1682 , 1694 , 1698 , 1707 , 1737 , 1760 , 1767 , 1779 , 1794 , 1822 , 1834 , 1839 , 1850 , 1855 , 1861 , 1868 , 1872 , 1906 , 1926 , 1929 , and 1944 .

= = = Eruptions in the 20th century = = =

The eruption of April 7 , 1906 , killed more than 100 people and ejected the most lava ever recorded from a Vesuvian eruption . Italian authorities were preparing to hold the 1908 Summer Olympics when Mount Vesuvius erupted , devastating the city of Naples . Funds were diverted to the reconstruction of Naples , requiring a new location for the Olympics to be found .

The last major eruption was in March 1944 . It destroyed the villages of San Sebastiano al Vesuvio , Massa di Somma , Ottaviano , and part of San Giorgio a Cremano . From March 18 to 23 , 1944 , lava flows appeared within the rim . There were outflows . Small explosions then occurred until the major explosion took place on March 18 , 1944 .

At the time of the eruption , the United States Army Air Forces ( USAAF ) 340th Bombardment Group was based at Pompeii Airfield near Terzigno , Italy , just a few kilometres from the eastern base of the mountain . The tephra and hot ash damaged the fabric control surfaces , the engines , the Plexiglas windscreens and the gun turrets of the 340th 's B @-@ 25 Mitchell medium bombers . Estimates ranged from 78 to 88 aircraft destroyed .

The eruption could be seen from Naples . Different perspectives and the damage caused to the local villages were recorded by USAAF photographers and other personnel based nearer to the volcano .

= = = The future = = =

Large plinian eruptions which emit lava in quantities of about 1 cubic kilometre ( 0 @.@ 24 cu mi ) , the most recent of which overwhelmed Pompeii , have happened after periods of inactivity of a few thousand years . Subplinian eruptions producing about 0 @.@ 1 cubic kilometres ( 0 @.@ 024 cu mi ) , such as those of 472 and 1631 , have been more frequent with a few hundred years between them . Following the 1631 eruption until 1944 every few years saw a comparatively small eruption which emitted 0 @.@ 001 ? 0 @.@ 01 km <sup>3</sup> of magma . It seems that for Vesuvius the amount of magma expelled in an eruption increases very roughly linearly with the interval since the previous one , and at a rate of around 0 @.@ 001 cubic kilometres ( 0 @.@ 00024 cu mi ) for each year . This gives an approximate figure of 0 @.@ 06 cubic kilometres ( 0 @.@ 014 cu mi ) for an eruption after 60 years of inactivity .

Magma sitting in an underground chamber for many years will start to see higher melting point constituents such as olivine crystallising out . The effect is to increase the concentration of dissolved gases ( mostly steam and carbon dioxide ) in the remaining liquid magma , making the subsequent eruption more violent . As gas @-@ rich magma approaches the surface during an eruption , the huge drop in pressure caused by the reduction in weight of the overlying rock ( which drops to zero at the surface ) causes the gases to come out of solution , the volume of gas increasing explosively from nothing to perhaps many times that of the accompanying magma . Additionally , the removal of the higher melting point material will raise the concentration of felsic components such as silicates potentially making the magma more viscous , adding to the explosive nature of the eruption .

The government emergency plan for an eruption therefore assumes that the worst case will be an eruption of similar size and type to the 1631 VEI 4 one . In this scenario the slopes of the mountain , extending out to about 7 kilometres ( 4 @. @ 3 mi ) from the vent , may be exposed to pyroclastic flows sweeping down them , whilst much of the surrounding area could suffer from tephra falls . Because of prevailing winds , towns to the south and east of the volcano are most at risk from this , and it is assumed that tephra accumulation exceeding  $100 \text{ kg / m}^2$  ? at which point people are at risk from collapsing roofs ? may extend out as far as Avellino to the east or Salerno to the south east . Towards Naples , to the north west , this tephra fall hazard is assumed to extend barely past the slopes of the volcano . The specific areas actually affected by the ash cloud will depend upon the particular circumstances surrounding the eruption .

The plan assumes between two weeks and 20 days ' notice of an eruption and foresees the emergency evacuation of 600 @, @ 000 people , almost entirely comprising all those living in the zona rossa ( " red zone " ) , i.e. at greatest risk from pyroclastic flows . The evacuation , by trains , ferries , cars , and buses is planned to take about seven days , and the evacuees will mostly be sent to other parts of the country rather than to safe areas in the local Campania region , and may have to stay away for several months . However , the dilemma that would face those implementing the plan is when to start this massive evacuation , since if it is left too late then thousands could be killed , while if it is started too early then the precursors of the eruption may turn out to have been a false alarm . In 1984 , 40 @, @ 000 people were evacuated from the Campi Flegrei area , another volcanic complex near Naples , but no eruption occurred .

Ongoing efforts are being made by the government at various levels ( especially of Campania ) to reduce the population living in the red zone , by demolishing illegally constructed buildings , establishing a national park around the whole volcano to prevent the future construction of buildings and by offering sufficient financial incentives to people for moving away . One of the underlying goals is to reduce the time needed to evacuate the area , over the next 20 or 30 years , to two or three days .

The volcano is closely monitored by the Osservatorio Vesuvio in Naples with extensive networks of seismic and gravimetric stations , a combination of a GPS @-@ based geodetic array and satellite @-@ based synthetic aperture radar to measure ground movement , and by local surveys and chemical analyses of gases emitted from fumaroles . All of this is intended to track magma rising underneath the volcano . No magma has been detected within 10 km of the surface , and so the volcano is classified by the Observatory as at a Basic or Green Level .

= = Vesuvius today = =

The area around Vesuvius was officially declared a national park on June 5 , 1995 . The summit of Vesuvius is open to visitors and there is a small network of paths around the mountain that are maintained by the park authorities on weekends .

There is access by road to within 200 metres ( 660 ft ) of the summit ( measured vertically ) , but thereafter access is on foot only . There is a spiral walkway around the mountain from the road to the crater .

= = Funiculì , Funiculà = =

The first funicular cable car on Mount Vesuvius opened in 1880 . It was later destroyed by the 1944 eruption . " Funiculì , Funiculà " , a famous Neapolitan song with lyrics by journalist Peppino Turco set to music by composer Luigi Denza , commemorates its opening .