

= Mount Cleveland (Alaska) =

Mount Cleveland (also known as Cleveland Volcano) is a nearly symmetrical stratovolcano on the western end of Chuginadak Island , which is part of the Islands of Four Mountains just west of Umnak Island in the Fox Islands of the Aleutian Islands of Alaska . Mt . Cleveland is 1 @, @ 730 m (5 @, @ 676 ft) high , and one of the most active of the 75 or more volcanoes in the larger Aleutian Arc . Aleutian natives named the island after their fire goddess , Chuginadak , who they believed inhabited the volcano . In 1894 a team from the U.S. Coast and Geodetic Survey visited the island and gave Mount Cleveland its current name , after then @-@ president Grover Cleveland .

One of the most active volcanoes in the Aleutian Arc , Cleveland has erupted at least 22 times in the last 230 years . A VEI 3 eruption in 1944 produced the arc 's only known volcanic fatality . Most recently Mount Cleveland has erupted three times in 2009 , twice in 2010 , and once in 2011 . The volcano 's remoteness limits opportunities for its study , and the Alaska Volcano Observatory relies heavily on satellites for monitoring . The volcano is primarily hazardous to aircraft ; many of the flights over the north Pacific approach the vicinity of the volcano , and volcanic ash released from eruptions can damage sensitive electronic equipment and sensors .

= = Geological setting = =

Mount Cleveland is located 490 km (304 mi) from the western end of the Aleutian Arc , a long volcanic chain extending off the coast of Alaska . Containing over 75 volcanoes , this volcanic arc occurs above the subduction zone where the Pacific Plate plunges under the North American plate . As the plate moves deeper into the earth , the increasing pressure results in the loss of volatiles , certain elements and compounds with low boiling points , from various hydrous minerals . One of these compounds is water ; its addition to the mantle wedge formed between the subducting and overriding plates lowers the melting point enough to allow magma to form . The melted material then rises to the surface and forms a volcano ? in this case , the Aleutian Arc .

= = Etymology = =

The native Aleut name for Mount Cleveland is Chuginadak (the name currently given to the island as a whole) , referring to the Aleut fire goddess , thought to reside in the volcano . The volcano 's name is a reference to its constant activity , and shows that it was likely highly active even in the distant past . Aleut oral tradition states that , at one time , the western and eastern halves of Chuginadak were separate islands , and that the isthmus joining them was created by volcanic activity sometime in prehistory . The " Islands of Four Mountains " name , the geographic group name for Cleveland and its neighbors , was given to the islands by Russian cartographers in the 19th century . Its current name , Mount Cleveland , was given to it by a U.S. Coast and Geodetic Survey expedition in 1894 , when it was originally observed by the USS Concord ; like the other volcanoes in the Four Islands group , Mount Cleveland was named after prominent American politicians at the time , Cleveland having been named after then @-@ president Grover Cleveland .

= = Geography and structure = =

Mount Cleveland is an almost symmetrical andesite stratovolcano in the Islands of Four Mountains , a volcanic group in the Aleutian Arc . Like all stratovolcanoes , Mount Cleveland grew as explosive eruptions , effusive eruptions , and lahars built it layer by layer into a concave @-@ up shape . It lies southeast of Mount Carlisle and northeast of Herbert Island . Mount Cleveland forms the western half of Chuginadak Island , a broad and uneven bell @-@ shaped landmass , and is the highest of the four volcanic islands . The island is completely uninhabited ; the nearest settlement is Nikolski on Umnak Island , about 75 km (47 mi) eastward .

Mount Cleveland is 8 ? 8 @. @ 5 km (5 @. @ 0 ? 5 @. @ 3 mi) wide at its base and roughly 29 km³ (7 cu mi) in volume . The volcano 's slope increases markedly with height , from 19 ° at its

lower flanks to 35 ° near its summit . Like many other Aleutian volcanoes , Cleveland 's flanks are especially rough up to 300 m (984 ft) , covered by multiple overlapping lava flows and debris fans that form an apron around the mountain . Lava flows are always built on top of debris flows as a result of the snow melt caused by the emission of heat just before an eruption . The flows are generally short , under 1 km (0 .6 mi) , and thin , less than 10 m (33 ft) thick , and are somewhat vegetated . Although Mount Cleveland is the tallest mountain in the group , it is rarely completely snowed in because of its constant activity disrupts snowfall . A lack of extant erosion shows that Mount Cleveland is likely a Holocene volcano , forming within the last 10 ,000 years . All known events have occurred at Mount Cleveland 's summit vent , but there are at least five small andesite to dacite volcanic domes on the lower flanks . At times Cleveland has had a summit lava dome . The volcano has no caldera .

The eastern half of Chuginadak , to which Mount Cleveland is connected by a narrow isthmus , consists of several low lying volcanic cones and two prominent peaks that have been heavily eroded , partly by glaciers . Known as the Tana volcanic complex , the two features measure 1 ,170 m (3 ,839 ft) and 1 ,093 m (3 ,586 ft) in elevation . A sample of rhyolite has been recovered from Concord Point , the easternmost point on the island .

= = Eruptive history = =

Eruptions from Mount Cleveland are generally vulcanian and strombolian in nature , characterized by short explosive ash clouds sometimes accompanied by a 'a flows , lava fountains , pyroclastic flows , ash and steam emissions , lava dome growth , and the ejection of breadcrust bombs . Hot springs were reportedly found on the volcano in the 1800s , and persistent fumarolic activity was observed in the 1980s and 1990s . Mount Cleveland is a site of persistent steam emissions and thermal anomalies that represent constant background activity . During 2011 , a summit lava dome formed , by continuous intrusion of magma at the summit . Late in 2011 , nearly 6 explosions demolished the dome . In June 2012 , another small dome was observed .

Little is known about Cleveland 's early eruptive history as its remoteness makes it a difficult area to investigate , and discrepancies in names have caused confusion between events there and those on nearby Carlisle . Even today , not all possible events are confirmed as eruptions by the Alaska Volcano Observatory , and many are listed as " possible . " In observed history , Mount Cleveland may have first erupted in 1744 ; the first confirmed eruption occurred in 1828 . The volcano erupted again in 1836 (possibly) , 1893 , 1897 (possibly) , 1929 (possibly) , 1932 , and 1938 (possibly) .

The first notable eruption from Mount Cleveland was a Volcanic Explosivity Index (VEI) 3 Vulcanian eruption that occurred between June 10 and June 13 , 1944 . Lava flows extended 5 kilometers (3 mi) from the summit , and an ash plume 6 ,000 m (19 ,685 ft) high was produced . Large boulders were reportedly ejected and carried out to sea by eruptive force . The eruption had the distinction of being the only confirmed direct volcanic fatality in Alaska ; a small detachment from the Eleventh Air Force was stationed on the volcano at the time , and one Sergeant Purchase left his post early in the eruption to take a walk and never returned , probably killed by mudslides . At approximately 10 : 20 , a boat sent to search for Purchase witnessed the end of the eruption . The island was abandoned for the remainder of the war .

Mount Cleveland erupted more recently in 1951 , 1953 , 1954 (possibly) , 1975 (possibly) , 1984 through 1987 , 1989 , 1994 , and 1997 . The volcano has received more focused attention in recent times due to its increased activity : it erupted in 2001 , 2005 , three times in 2006 , 2007 , three times in 2009 , and twice in 2010 . Of these , the most significant eruption was the 2001 eruption , which produced a 12 km (7 mi) high ash plume . This plume dispersed 120 to 150 km (75 to 93 mi) across Alaska , an unusual distance that allowed detailed satellite observations to be made . Nikolski and the surrounding region was the site of several hours of ashfall , represented in satellite imagery as areas of discolored snow . This eruption significantly disrupted air traffic in the area .

On June 19 , 2012 , a pilot reported an ash -producing explosion on Mount Cleveland . Due to continuing seismic activity , the volcano was placed on the USGS Volcano Watch List in the orange

or " watch " category the following day . AVO continues to keep Cleveland on the watch because of a persistent anomaly at the summit . AVO suspects it could be dome growth . Other minor ash producing explosions occurred on June 26 , July 12 , and August 19 .

On May 4 , 2013 , the volcano began a low @-@ level eruption , with a plume of ash observed at 15 @,@ 000 feet (4 @,@ 600 m) .

The volcano erupted several times in 2014 and 2015 , and a single explosion was detected by the AVO on April 16 , 2016 .

In total the volcano has erupted at least 22 times in the last 230 years .

= = Monitoring = =

Today , the Alaska Volcano Observatory monitors activity at Mount Cleveland using satellite imagery . Cloud cover often obscures the volcano , which makes many events difficult to follow . In addition , the low resolution of the satellite imagery allows minor events , which do not make an impression on the satellite picture , to pass unnoticed . There are no seismic or geophysical instruments on the mountain (the nearest are in Nikolski) , and some eruptions are first observed by pilots flying over the volcano . A field study was conducted in late 2001 , and an automatic system based on thermal anomalies was implemented following eruptive events in 2005 . In recent years the Alaska Volcano Observatory has made an effort to expand volcanic coverage westward along the Aleutian Arc .

The biggest threat posed by an eruption from Mount Cleveland is its ash plume , which can damage sensitive electronic equipment on overflying planes . Many aircraft traveling over the North Pacific and over the Arctic come within the vicinity of such a plume ; the only way to avoid damage is to reroute the flight , which delays arrival time and adds \$ 5 @,@ 500 to \$ 6 @,@ 000 in extra fuel costs . Cleveland has therefore been assessed by the United States Geological Survey as a volcano with " [a] high aviation threat score and no real @-@ time ground based monitoring at the present time " .