= Crater Glacier =

The Crater Glacier (also known as Tulutson Glacier) is a geologically young glacier that is located on Mount St. Helens , in the U.S. state of Washington . The glacier formed after the 1980 Eruption and due to its location , the body of ice grew rapidly , unknown to the public for nearly 20 years . The glacier once contained ice caves in the smooth ice before the 2004 @-@ 2008 volcanic activity . The growth of the lava dome and volcanic eruptions from 2004 to 2008 significantly altered the appearance of the glacier . In the same time period , several agencies decided to put an official name on the glacier which , at first , was Tulutson Glacier . A later decision made Crater Glacier the official glacier name . Despite the volcanic activity , the glacier continued to advance and by mid @-@ 2008 , the glacier completely encircled the lava domes . In addition , new glaciers (rock or ice) have formed around Crater Glacier as well .

= = Description = =

True to its name , the glacier lies inside the north @-@ facing crater left by the 1980 eruption of Mount St. Helens and the glacier 's elevation is about 6 @,@ 794 ft (2 @,@ 071 m) . A massive central lava dome emplaced from 1980 to 1987 occupies the center of the crater , and the glacier formed in the shape of a horseshoe around the dome , with two terminal moraines on the eastern and western sides . Heavy winter snowfall , repeated snow avalanches , rockfalls , and sun @-@ shading by the surrounding cliffs to the south , led to the exceptionally rapid growth of this glacier . Thus , the glacier composition is estimated to be six @-@ tenths ice and four @-@ tenths rock , with an average thickness of 328 feet (100 m) and a maximum thickness of around 656 feet (200 m) ; nearly as deep as Mount Rainier 's Carbon Glacier . None of the ice is older than the year 1980 , however , the volume of the new glacier is about the same as all the pre ? 1980 glaciers combined . The surface of the glacier looks dark and dirty in the summer due to the numerous rockfalls from the steep , unstable crater walls along with ash from eruptions , all of which help to insulate and protect the growing glacier . The 2004 @-@ 2008 volcanic activity created a series of domes that nearly split the glacier into two lobes at the south end of the crater . In spite of the four @-@ year lava dome building period , the glacier remains North America 's youngest and fastest growing glacier . With the joining of the termini on the north end of Crater Glacier in May 2008 , the body of ice completely encircles the lava domes . Meltwater from the glacier gives rise to Loowit Creek .

Pre @-@ 2004 eruption glacier caves of Crater Glacier

In 2000 , glacier caves were discovered on the then @-@ smooth glacier surface . Many of these glacier caves were big enough to explore , like the glacier caves on the summit of Mount Rainier . Most of the glacier caves were located near the 1980s lava dome , where hot steam and volcanic gas emissions from hidden fumaroles on the crater floor or lava dome melted holes in the young glacial ice . About 7 @,@ 900 feet or 2 @.@ 4 km of underground caves and passageways in the glacier were mapped and studied .

Other glaciers and new rock glaciers

Since 2004 , new glaciers have formed on the crater wall above Crater Glacier feeding rock and ice to Crater Glacier below . In addition , there are two rock glaciers to the north of the eastern lobe of Crater Glacier and one north of the western lobe . Two of these rock glaciers have merged with the Crater Glacier , with one on the west and one on the east . The other rock glacier on the eastern slopes of the crater wall is very close to touching the glacier .

= = Evolution of the Glacier = =

In the months after the eruption , the crater floor of St. Helens remained hot and unstable , with five minor volcanic eruptions , and lava dome construction between May and October 1980 . After the eruptions ceased in the winter of 1980 , the crater floor cooled down enough for snow and ice accumulation . Beginning with snowfall in the winter of 1980 @-@ 1981 , the glacier began to grow very rapidly in the shadow of the crater . The glacier thickened at a rate of as high as 50 ft (15 m)

per year and advanced northward as much as 135 ft (41 m) a year . This glacier growth was discovered by scientists working in the crater about seven to nine years later . However , the existence of the glacier was not publicized until 1999 . By 2004 , Crater Glacier covered about 0 @.@ 36 square mile (0 @.@ 93 km2) , about 20 % of the glacier area in the pre @-@ 1980 glaciers , and there was a western and eastern lobe flowing around the 1980s dome . Due to the gas emissions on the crater floor , there were glacier caves (ice caves) in the once smooth glacial ice , and several of them had been explored by the late 1990s .

With the volcanic activity from 2004 to 2008 , the glacier lobes were pushed aside and overthickened by the growth of new volcanic domes . As the two streams of ice were compressed between the caldera wall and the new lava domes , the ice moved rapidly downhill , much like the squeezing of toothpaste out of a container . This resulted in a very rapid advance of the glacier termini ; first the western glacier arm merged with the rock glacier on the western crater wall and then , both arms of the Crater Glacier joined north 1980s lava dome in May 2008 , despite the volcanic activity . In addition , the volcanic activity modified the surface of the glacier and transformed it from being mostly crevasse @-@ free to being a chaotic jumble of icefalls heavily criss @-@ crossed with crevasses and seracs due to movement of the crater floor and lava dome growth . At the south end , the new domes almost split the Crater Glacier into two separate glaciers and melted 10 % in volume of the glacier 's ice . However , cold rock on the edge of the glacier insulated the glacier ice from the 1 @,@ 300 ° F (700 ° C) lava spewing out of the lava domes , easing concerns of a catastrophic lahar caused by glacier melting . The porous nature of the crater floor also reduced the amount of meltwater flowing out of the caldera .

After the volcanic activity of the 2000s , the thickness of the glacier continues to increase at a slower rate of 15 ft (5 m) per year and the glacier continues to advance at 3 ft (1 m) per day . The latest aerial imagery taken in 2012 shows that the glacier has entered the upper reaches of the Loowit Creek canyon and the headwaters of the creek . Ice mixed with rock debris now spills into the canyon and the creek has been pushed to the east . Nearby , on the slopes of the eastern crater wall , the glacier touches one of the rock glaciers and the glacier is very close to merging with the other rock glacier . A medial moraine can be seen at the interface of the eastern and western arms of the Crater Glacier .

Glacier Evolution in the Caldera

= = Naming the glacier = =

Since the glacier was first observed to be forming and actively flowing in the late 1980s , most scientists working on the mountain have referred to it informally as the " crater glacier " . That name has been in wide use with the public (at least those who were aware of the glacier 's existence) for the two decades since the glacier formed , and has appeared in several scientific publications too . A single scientific paper , the most complete published study of the glacier to date , referred to it as the " Amphitheater glacier , " but that name has not been used otherwise .

Despite numerous observations and publications about the growing glacier in the late 1990s and early 2000s , no move was made to give the glacier a permanent and official name until late 2004 , after the current eruptive cycle began and the new dome began to split the glacier . At that time , a proponent from the Cowlitz tribe suggested the name " Tulutson Glacier , " from the Cowlitz language word for ice . In March 2005 , the Washington State Board on Geographic Names chose Tulutson over three other contenders (Crater , Spirit , and Tamanawas) , and so Tulutson Glacier became the de facto name .

However , the U.S. Board on Geographic Names had yet to make its decision , which would be official throughout the United States . The name Tulutson Glacier was submitted for consideration , along with Crater Glacier and Kraffts Glacier , which would have honored the volcanologists Katia and Maurice Krafft , killed by a pyroclastic flow in 1991 . In June 2006 , the U.S. BGN chose Crater Glacier because of its two @-@ decade precedent of common use , despite objections from the state of Washington and the United States Forest Service which both preferred Tulutson . The scientists at the USGS Cascades Volcano Observatory strongly supported Crater Glacier , and also

commented that Tulutson may not be an appropriate name since the volcano " lies inland in a region where the native language was not Cowlitz but Sahaptin . "

After the decision , some controversy erupted following an editorial in a local newspaper protesting the decision , and the state of Washington " has indicated that the name Tulutson Glacier will continue to appear on State products , although if the feature melts soon , as is anticipated , this may not be a great concern . " Despite these protests , the glacier 's official name remained Crater Glacier , though shortly after their June 2006 decision , the BGN received a follow @-@ up proposal to name the two arms of the glacier , East Crater Glacier and West Crater Glacier . This was because , at that point in time , the dome @-@ building eruptions had nearly split the glacier into an east and west arm . No further action has been taken on this matter and the merging of the ice streams north of the 1980s lava dome has rendered this move unnecessary .