



## **Geomorphological Map of Mount St. Helens volcano (Washington, USA)**

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Mount St Helens (MSH) is a stratovolcano of the Cascadia volcanic arc, and is one of the most active in the United States. The present morphology is mainly due to the destructive eruption of 18 May 1980, triggered by a five-magnitude earthquake that caused the collapse of a vast sector of the northern part of the volcano, including some ice masses.

Here, we present a geomorphological map of the Mount St Helens, covering an area of 378 km<sup>2</sup> and with a specific focus on the volcano summit, which includes the crater zone and the present-day glacier that has formed inside. The mapping was done on a LIDAR DTM with a 3m resolution, acquired on October 2003, and Google Earth images.

An overlook of the LIDAR brought to light some interesting features linked to the 1980 collapse and relate mass movements. In particular, we found evidence of kettle holes and hummocky structures related to the disintegration of the original glaciers that occupied the summit in 1980. These are located in the northern sector of the volcano, probably the most affected area by the 1980 blast. Alluvial fans, peaty areas and a complex drainage system are some of the other structures recognised in the area.

An attempt has also been made to distinguish across different Holocene (pre 1980) lava flows, and describe their variable morphology, like the levee channels typical of the southern andesite lobes (Kalama eruptive period, C.E. 1479 – 1720). Some of these flows have been distinguished also with the help of a roughness exercise, applied to southern flank of the volcano.

The present-day glacier has a horseshoe shape surrounding a dome grown in the 80's. The terminal portion appears largely covered by debris and its shape and morphology is more typical of a rock glacier than a classic glacier. Several avalanches and their related channels have been mapped along the rim.