The geology of seattle

Science, Geology

The Geology of Seattle Seattle is located in the state of Washington in the Pacific Northwest. Seattle is metropolitan and has a population of nearly 3. 5 million. Seattle’s climate changes from wet and cold during the winter months to dry and hot during the summer months. The coast of Seattle is responsible for the growth of its economy, due to the large number of commercial ports. Seattle is in the destructive range of several volcanos within Washington, most prominently, Mt. Rainier. Topography Seattle is surrounded by large bodies of water and mountainous terrain.

The city itself lies on top of several hills, which include; Capitol Hill, Second Hill, Denny Hill, Beacon Hill, and Queen Anne Hill. From the center of Seattle you can find shoreline to the north, Bainbridge Island to the north-west, The Puget Sound to the west, Vashon Island to the south-west, Tukwila to the south, Renton to the south-east, Lake Mercer to the East, and Lake Forest Park to the north-east. Past the Puget Sound lie the Olympic Mountains. Seattle owes its specific structure due to glacial scouring and deposition and tectonic activity, subsequently modified by landsliding, stream erosion and deposition, and human activity.

Geological hazards Seattle is threatened by several geological hazards, such as earthquakes, flooding, volcanos and landslides and shore erosion. Perhaps one of the most prominent hazards to Seattle is the Massive volcano, MT. Rainier, which lies 54 miles southeast of Seattle. MT. Rainier stands at an elevation of 14, 411 feet and is very topographically prominent. Rainier is considered one of the world’s most dangerous volcanos. The composition of Rainier is very andesitic and upon it eruption could cause a violent explosion.

The glacial ice that sits atop the mountain can also cause massive lahars that could cause major damage to Seattle’s infrastructure as well as its economy. Although MT. Rainier displays no signs of imminent eruption, it has gone through several major eruptions in the past 3000 years. These eruptions include the Twin Creek eruptive episode 1, 500 years ago, the Fryingpan Creek eruptive period 1000 year ago, the Electron Mudflow 500 years ago, and several small eruption plumes in the 1800’s which caused black smoke to be seen to the early pioneers of the area.

It is projected that the potential damage to Seattle and the surrounding area would be catastrophic if MT. Rainer were to erupt. Geoff Clayton, a geologist working for a company called RH2 Engineering, was asked by Seattle Weekly to estimate the damages to the Settle area. By using a computer program, he reached a conclusion that the result of Mt. Rainer spawning lahars would be a devastating natural disaster. Clayton then quoted that," Before approaching Seattle, a lahar, he says, would have " wiped out Enumclaw, Kent, Auburn, and most of Renton, if not all of it. Clayton went on to say that if such a massive lahar could potentially cause tsunamis in Lake Washington and the Puget Sound, effectively flooding the port of Seattle. It is needless to say that if Seattle were to lose its commercial ports, the economic consequences would be dire. Another geological hazard that presents itself in Seattle is the risk of Earthquakes. Seattle lies within the ring of fire and is at risk of experiencing a crippling earthquake. The Seattle area has experienced several significant earthquakes in the past.

The most recent notable quake was in February 28, 2001 when a magnitude 6. 8 earthquake ravaged Pioneer Square. The quake caused significant

property damage but no fatalities. More powerful earthquakes have occurred farther in the past. On January 26, 1700 the area was struck with a staggering 9. 0 magnitude quake, and on December 14, 1872 Seattle was struck again with a 7. 3 magnitude quake. A few more semi-powerful quakes occurred between 1940 to the present day, however, fatalities were minimal. To predict the potential loss cause by another 9. earthquake hitting modern day Seattle, FEMA used " Hazus" (a computer program used by FEMA) and found that such an earthquake would cause billions of dollars of property damage, thousands of deaths and even more injuries to the population. The aftereffects of the earthquake would be equally devastating. The earthquake would trigger tsunamis form the surrounding water bodies, as well as fires and landslides. Effects such as these would be devastating and would take decades to repair. Seattle has hundreds of miles of waterfront surrounding the city.

With such a large amount of water around the city, flooding is a major concern to the residents of Seattle. Although tidal flooding from the Puget Sound and Lake Washington is a concern, the real threat of flooding comes from the system of undeveloped creeks and river that run through the city. These floods most often occur in the fall and winter due to the increased rainfall. Thornton Creek in northwest Seattle and Longfellow Creek in west Seattle are two creeks that are notorious for flooding during the winter months.

Thornton Creek has caused major water damage urban areas that border the creek when it has flooded in 1967 and again in 2003. Another flood of importance occurred in 2006 when record rainfall caused flash floods that

swept through the city during rush-hour. Although the floods in the Seattle are wide spread and intense, they cause few deaths. Landslides are another geological hazard that is common to the Seattle area. Landslides in Seattle can be caused by any number of factors, either natural or manmade. Landslides occur in areas that exhibit clay-sand contact or any other adverse soil and groundwater conditions.

If one were to look at all of the geological disasters in the Seattle area on a geological timescale, they would see just how prone to disasters Seattle is. Approximately every five hundred years Seattle experiences a 9. 0 earthquake. Any seismic activity on that scale would also cause tsunamis to devastate the area. Seattle is also under the constant threat of MT. Rainier erupting and spawning a massive lahar that would destroy downtown Seattle. Seasonal floods are a major threat to the residents of the Seattle regardless of the lengths the city has gone to prevent flood damages.