Extrusion at Santiaguito volcano, Guatemala 2009

Using time-lapse cameras positioned on top of Santa Maria volcano in Guatemala, photos have been taken on a nearly continuous basis since January of 2009. Four cameras operated from January to April capturing images once every five minutes during daylight hours (Approximately 12:00-24:00 GMT). From April on, two cameras operated from the summit of Santa Maria recording images once every 10 minutes during daylight hours. There is also one camera located at the Santiaguito Volcano Observatory that has been taking pictures once a minute during daylight hours since March. I hope to estimate current extrusion rates for the lava flow currently descending the southwest slope of the Caliente dome by tracking features over time and from different angles.

This information will help the monitoring effort at Santiaguito volcano in several ways. First, knowing how much new material is being expelled from the volcano can give us insight into how severe the lahars season could be. Although new material is not necessarily the only input into descending lahars, it is logically some of the least consolidated and therefore more easily included of the constituents. Owing to intense rainfall from June to November every year, lahars have been the most active hazard manifestation at Santiaguito, resulting in the partial destruction of the municipal head of El Palmar in 1983 and its subsequent total destruction in 1998.

Second, more exact extrusion rates can be used along with seismic and gas data to give a better idea of the overall level of activity of the system. Knowing if and when Santiaguito is entering into a new cycle of eruptive activity is valuable information in hazard mitigation efforts, as recommendations for municipal and national hazard plans can be made with more certainty and if necessary, urgency. I also hope to be able to use the pictures, seismic data, and gas data to correlate a type of explosion observed visually and their seismic signatures, which would help monitoring efforts considerable as the volcano is only visible 3-6 hours a day.

Additionally, photogrammetric estimations of extrusion rates may help to serve as a method of ground-truthing for remote sensing methods that have been employed to estimate extrusion rates in the past. Validating these techniques at Santiaguito lend confidence to similar estimations made elsewhere in the world where such long term photogrammetric monitoring is not possible.