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## **Cotopaxi Volcano awakening in 2015 and increased melting of the glaciers**

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On May 2015 the monitoring networks on Cotopaxi volcano (seismic and SO<sub>2</sub>) showed a significant increase from their background values. In June a tiltmeter on the NE flank started to show inflation, indicating the beginning of a new unrest period. On August 14, five small phreatic explosions occurred, accompanied by large gas and ash emissions. Three new episodes of ash and gas emissions occurred at the end of November 2015. Afterwards the different monitoring parameters indicated a progressive reduction of the activity. Thermal images (August/2015) showed the presence of new thermal anomalies (~15°C) inside the crevices on the N glaciers. At the same time fumarolic gases were observed coming out from those fractures. On September 3, water emerging from the basal fronts on the northern glaciers was clearly observed, while it was evident the appearance of countless new crevices in the majority of glacier end edges and also on the upper flanks. All this led to the conclusion that an abnormal process was producing increased melting of the glaciers. Starting on September it was possible to observe the presence of small secondary lahars descending several streams and we estimated that many of them were due to increased glacier melting. Orthophotos taken on August 18 and then again on October 8, showed a decrease of about 0.49 km<sup>2</sup> of the area covered by glaciers, representing a very high rate of glacier melting, not explained exclusively by Climate Change. We estimate that small batches of magma reached surface levels causing increased circulation of hot fluids inside the edifice, apparently reaching the basal area of the glaciers and producing increased melting. It is necessary to further investigate the hazard due to instability in the melting glaciers and their eventual collapse which could lead to greater secondary lahars.