

## Large-scale collapses of Avachinsky and Koryaksky volcanoes – major volcanic hazard in Kamchatka, Russia

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Largest part of population of Kamchatka peninsula (about 300 000) is concentrated in two cities Petropavlovsk and Elizovo. The cities are located respectively on the distances 24 and 20 km from active volcanoes of Avachinsky and Koryaksky. Avachinsky is one of the most active volcanoes of Kamchatka – erupted 15 times during last three centuries, while Koryaksky produced 2 eruptions. Major hazard from the volcanoes is associated with possibility of large-scale lateral collapses of the volcanoes. Avachinsky has horseshoe-shaped crater formed 30 000 BP as a result of 10 cub.km landslide. Petropavlovsk is built on the surface of resulted debris avalanche deposit, which is locally up to several tens meters thick. By now the volcano partly rebuilt itself and is 2751 m high. In the case of new collapse, distal parts of the debris avalanche could reach Petropavlovsk. Last eruption of Avachinsky on October 5, 2001 was explosive and purely phreatic. It was caused by rapid decompression of hydrothermal system of the volcano due to opening of a 3-m-wide fissure crosscutting the summit. It is not clear why partial collapse of the edifice did not follow. Morphology and structure of Koryaksky volcano (3456 m high) resembles those of Avachinsky before its collapse 30 000 BP. If Koryaksky will produce similar or even smaller debris avalanche as Avachinsky, city Elizovo will be completely destroyed. Although both volcanoes are relatively well-monitored, special system of real-time monitoring of deformations of the volcanic edifices oriented on the forecast of possible collapses is necessary.