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Post-collapse trends at Bezymianny Volcano, Kamchatka, Russia and the May 6, 2006 eruption

* Izbekov, P
pavel@gi.alaska.edu
Alaska Volcano Observatory, Geophysical Institute, University of Alaska Fairbanks, 903 Koyukuk Dr, Fairbanks, AK 99775 United States

Eichelberger, J
eich@gi.alaska.edu
Alaska Volcano Observatory, Geophysical Institute, University of Alaska Fairbanks, 903 Koyukuk Dr, Fairbanks, AK 99775 United States

Belousova, M
belousov@mail.ru
Institute of Volcanology and Seismology, Piip 9, Petropavlovsk-Kamcha, 683006 Russian Federation

Ozerov, A
ozerov@ozerov.ru
Institute of Volcanology and Seismology, Piip 9, Petropavlovsk-Kamcha, 683006 Russian Federation

PIRE team
http://www.gps.alaska.edu/PIRE/

Bezymianny volcano, Kamchatka was considered dormant until October 1955, when after ca. 1000-yr-long period of quiescence its activity resumed with moderate explosions and concurrent dome growth. On March 30, 1956 a sudden collapse of the edifice triggered a devastating directed blast followed by a vigorous Plinian eruption, which continued for 4 hours. The eruption destroyed the summit of the volcano and formed a 1.3-km- wide crater breached to the east. Within weeks after the paroxysmal eruption the volcano started rebuilding its edifice through almost continuous extrusion of the dome in the middle of the crater and sporadic explosive events, which occurred at least once per 2-3 years. Since mid 70s the dome-building extrusive activity has been complemented by effusions of lava flows, which often followed explosive events (e.g. Malyshev, 2000). The change from purely dome-building to coupled lava extrusion and explosive events correlates with a gradual change of composition of erupted magmas to more mafic compositions, i.e. 60.9±0.1 wt.% SiO_2 in 1956 and 57.3±0.1 wt.% SiO_2 in January 2005. The most recent explosive event at Bezymianny occurred on May 9, 2006. The eruption was preceded by two weeks of gradually increasing seismic activity, increasing number of rockfalls and avalanches at the dome, and stronger fumarolic activity (Senyukov and Girina, pers. comm. and KVERT updates). The explosive eruption occurred on May 9, 2006 and lasted 24 minutes, during which a continuous emission of ash and volcanic bombs produced a 15-km-high ash cloud, pyroclastic flows, and surges. The level of seismicity returned to a background level on May 10. Within a few weeks following the explosive phase of the eruption, a 180-m-long lava flow formed on the western flank, thus concluding a regular burst of eruptive activity at Bezymianny in May 2006. We were able to sample products of the latest eruption during August, 2006. Our ongoing petrological study and phase equilibria experiments will be used to infer the pre-eruptive conditions for the 1956 and 2006 Bezymianny magmas. Intriguing questions are how the magma system responded to the collapse of the edifice, what factors could be responsible for changes in the eruptive pattern of Bezymianny, and what these changes portend for the ongoing activity at Mount St Helens.

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