

Activity of Kamchatkan Volcanoes in 2012-2013 and Danger to Aviation

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There are 30 active volcanoes in the Kamchatka, and four of them (Sheveluch, Klyuchevskoy, Bezymianny and Karymsky) continuously active. In 2012-2013, eight of the Kamchatkan volcanoes - Sheveluch, Klyuchevskoy, Bezymianny, Kizimen, Karymsky, Zhupanovsky, Tolbachik, and Mutnovsky - had strong and moderate explosive eruptions (Girina et al., 2014, 2014a).

Strong explosive eruption of volcanoes is the most dangerous for aircraft because in a few hours or days in the atmosphere and the stratosphere can produce about several cubic kilometers of volcanic ash and aerosols. Ash plumes and the clouds, depending on the power of the eruption, the strength and wind speed, can travel thousands of kilometers from the volcano for several days, remaining hazardous to aircraft, as the melting temperature of small particles of ash below the operating temperature of jet engines (Gordeev, Girina, 2014).

The eruptive activity of Sheveluch Volcano began since 1980 (growth of the lava dome) and is continuing at present. Strong explosive events of the volcano occurred in 2012: on January 22-23; on March 16-17; March 25-30 – June 03; and on September 18: ash plumes rose up to 10 km a.s.l. and extended about 200-2000 km to the different directions of the volcano; and in 2013: on June 26, on October 18, and on December 03 and 28: ash plumes rose up to 10 km a.s.l. and extended about 200-500 km, respectively, to the south-west, south-southeast, and north of the volcano (Girina et al., 2014, 2014a, 2014c). A form of pyroclastic flows deposits with run-out 12 km accompanied these explosive eruptions. Activity of the volcano was dangerous to international and local aviation.

Klyuchevskoy volcano had two eruptions in 2012 and 2013: moderate Strombolian explosive eruption from September 01, 2012, till January 15, 2013; and strong Strombolian-Vulcanian explosive and effusive eruption from August 15, 2013, till December 15, 2013 (Girina et al., 2014, 2014a, 2014b, 2014c). There were five lava flows to effuse on the north-west, west and south-western volcanic flanks. Probably a flank eruption near the pass between Klyuchevskoy volcano and Kamen volcano began on October 11. Culmination of strong Vulcanian explosive activity of the volcano occurred on October 15-20: ash column rose up to

10-12 km a.s.l. and ash plumes extended to the different directions of the volcano according to cyclonic activity in the this area. Activity of the volcano was dangerous to international and local aviation.

The eruptive activity of Bezymianny volcano began since 1955, and is continuing at present as growth of the lava dome. Two explosive eruptions occurred on March 08 and September 01: ash plumes rose up to 8-12 km a.s.l. and extended about 1500 km to the east-north-east of the volcano (Girina et al., 2014). Activity of the volcano was dangerous to international and local aviation.

Tolbachik. Explosive-effusive fissure eruption at Tolbachinsky Dol began on November 27, 2012, and continued till about September, 2013. Four cinder cones grew at the fissure; lava flows extended about 20 km of vents (Girina et al., 2014a). Activity of the volcano was dangerous to international and local aviation.

Eruption of Kizimen volcano began on December 09, 2010, and finished on December 09, 2013. Activity of the volcano changed with time: in 2012-2013, there was effusive eruption from mid-January 2011, till September 2012, and extrusive-effusive eruption from September 2012, till September 2013 (Girina et al., 2014, 2014a). Activity of the volcano was dangerous to local aviation.

Karymsky volcano has been in a state of explosive eruption since 1996. The moderate Strombolian-Vulcanian explosive eruption continued during 2012-2013 (Girina et al., 2014, 2014a). Ash explosions rose up to 4.5 km a.s.l., and ash plumes extended to the different directions of the volcano. Activity of the volcano was dangerous to local aviation.

Moderate explosive phreatic eruption of Zhupanovsky volcano occurred on October 21-24, 2013 (Girina et al., 2014a). Ash explosions rose up to 5 km a.s.l. and ash plumes extended for about 120 km mainly to the east and south-east of the volcano. Activity of the volcano was dangerous to local aviation.

Several moderate phreatic explosions were noted by observers at Active crater of Mutnovsky volcano on July 03, 2013 (Girina et al., 2014a). Ash plumes were not noted at satellite images.

Activity of Kamchatkan volcanoes continues.

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