[EE] Evening Poster | H (Human Geosciences) | H-DS Disaster geosciences

[H-DS08]Natural hazards impacts on the society, economics and technological systems

convener:ELENA PETROVA(Lomonosov Moscow State University, Faculty of Geography), Hajime Matsushima(Research Faculty of Agriculture, Hokkaido University), Vivek Shandas

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The decade between 2007 and 2017 set a record for the number and scale of natural disasters and demonstrates high vulnerability of human society. The most serious consequences have the so-called natural-technological disasters in which natural hazards trigger accidents at technology and infrastructure such as nuclear power and chemical plants, oil refineries and pipelines, buildings and roads. A distinctive feature of natural-technological events, such as of the 2011 Tohoku earthquake, is their multi-hazard and synergistic nature, which creates cascading impacts, resulting in simultaneous occurrences of myriad catastrophes. The main goal of this multidisciplinary session is to summarize case studies of relationships between natural hazards and technological disasters, their social and economic consequences; and to encourage a discussion about tools and methods to prevent disasters and to minimize their consequences, disaster reconstruction, tourism for reconstruction, Eco-DRR, and green infrastructure.

[HDS08-P01]The 2017 Activity of Kamchatka Volcanoes and Danger to Aviation

*Olga Girina[1], Dmitry Melnikov[1], Alexander Manevich[1], Anton Nuzhdaev[1], Elena Petrova[2] (1.Institute of Volcanology and Seismology, Far East Division, Russian Academy of Sciences, 2.Lomonosov Moscow State University, Geography Faculty, Russia)

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Strong explosive eruptions of volcanoes are the most dangerous for aircraft because they can produce in a few hours or days to the atmosphere and the stratosphere till 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.

There are 30 active volcanoes in the Kamchatka, and several of them are continuously active. Scientists of KVERT monitor Kamchatkan volcanoes since 1993. In 2017, six of these volcanoes (Sheveluch, Klyuchevskoy, Bezymianny, Karymsky, Zhupanovsky and Kambalny) had strong and moderate explosive eruptions.

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 2017: on 04 February, 28 and 30 April, 02, 11, 16, 24 and 31 May, 03, 07, 08, 10, 14, 15, 16, 18 and 27 June, 02 and 23 July, 08 August, 07, 08, 11 and 13 September, 10 October, 02 and 07 November, 04 and 26 December; ash plumes rose up to 10-12 km a.s.l. and extended more 4000 km to the different directions of the volcano. Satellite data by KVERT showed a thermal anomaly over the volcano all year. Activity of the volcano was dangerous to international and local aviation.

A moderate explosive eruption of Klyuchevskoy volcano lasted from 02 March till 30 August, and after three months of relative lull, in December. Ash plumes rose up to 6-8 km a.s.l. (up to 8 km a.s.l. - 02 March and 06 May; and up to 7 km a.s.l. - 29 March, 23 April, 10-11 and 14-15 June, 18-20 August and 21 December), and extended more 600 km to the different directions from the volcano. Activity of the volcano was dangerous to international and local aviation.

Extrusive-explosive-effusive eruption of Bezymianny volcano began from 05 December 2016 (extrusive and effusive phases). Three strong explosive eruptions occurred in 2017: the first began at 01:30 UTC on 09 March (explosions sent ash up to 7-8 km a.s.l., ash plumes drifted more 400 km to the north-west and north from the volcano); the second began at 04:53 UTC on 16 June (explosions sent ash up to 12 km a.s.l., an ash cloud drifted more 2000 km to the east and south-east from the volcano); the third began at 03:40 UTC on 20 December (explosions sent ash up to 15 km a.s.l., an ash cloud drifted more 400 km to the north-east from the volcano). Two explosive eruptions were predicted by scientists of KVERT: the second - 18 hours before the event (VONA/KVERT at 10:50 UTC on 15 June: http://www.kscnet.ru/ivs/kvert/van/?n=2017-136); and the third – 35 minutes before the event (VONA/KVERT at 03:05 UTC on 20 December: http://www.kscnet.ru/ivs/kvert/van/?n=2017-266). Activity of the volcano was dangerous to international and local aviation.

Karymsky volcano was in a state of relative rest in January-May, but from 03 June its episodic explosive activity was resumed. Ash plumes rose up to 4-5 km a.s.l. and extended more 400 km to the different directions from the volcano. Strong explosive events of the volcano occurred on 19 September (up to 7 km a.s.l.). Activity of the volcano was dangerous to local aviation.

One explosive event at Zhupanovsky volcano occurred at 23:03 UTC on 16 September. The gas-steam column with some amount of ash rose up to 7 km a.s.l. Activity of the volcano was dangerous to local aviation.

The first historical eruption of Kambalny volcano lasted from 24 March till 11 April. According to satellite data, the explosive eruption began near 21:10 UTC on 24 March. Ash plumes rose up to 7 km a.s.l. and extended more 4000 km to the different directions from the volcano. Activity of the volcano was dangerous to local aviation.
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