



Cities on Volcanoes 9
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Puerto Varas, Chile

'Understanding volcanoes and society: the key for risk mitigation'



The 2014 – 2015 volcanic crisis and eruption of Bárðarbunga, Iceland: Operational response and hazard assessments

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Bárðarbunga; hazard assessment; operational response

On August 16 2014, an intense seismic swarm began below the eastern part of Bárðarbunga caldera in the north-west part of Vatnajökull ice-cap, Iceland, marking the onset of the first rifting episode in Iceland since the Krafla fires (1975-1984). A swarm of earthquakes migrated out of the Bárðarbunga caldera over 45 km, until the migration stopped and a small, effusive eruption started on August 29 in Holuhraun, lasting a couple of hours. On August 31 a second, more intense effusive eruption occurred, persisting for 180 days and releasing into the atmosphere more than 11 Mt of SO₂. Holuhraun has been the second eruption in Iceland since the eruption of Eyjafjallajökull in 2010, maintaining Icelandic eruptions under an international spotlight. Even though the long-range impact of the Holuhraun eruption has been minor and European countries suffered only marginally from it, to manage and live with such a prolonged effusive event has been a major effort for most of the Icelandic scientific community, civil protection authorities and for the local population. Here we retrace the main events that accompanied the volcanic crisis at Bárðarbunga, focussing on the scientific and operational responses throughout its duration. Particular attention is given to the links between the observed phenomena, interpretation of monitoring data, hazard assessment and direct actions taken by the authorities in charge of risk assessment and mitigation. The different roles of the involved institutions are clarified, helping to explain the wide and collaborative response on a national basis. A key finding of the study is that strong, internal collaboration between the scientific community and operational institutions is the basic element for proper crisis management. Iceland has been able to establish new eruption-



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response plans that ensured a well-coordinated reaction to the crisis, guaranteeing prompt and effective responses for future volcanic unrest.

