



The Montserrat volcanic crisis: a community in danger

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The Caribbean island of Montserrat is dominated by the Soufriere Hills volcano, which has been in eruption since July 1995. This volcano, like most in the Caribbean, erupts sticky, red hot magma, which oozes out at the surface forming a lava dome. Although less spectacular than molten rivers of lava, such domes are far more dangerous, having the potential to produce devastating highly mobile mixtures of red hot rock, ash and gas known as pyroclastic flows. They are also liable to explode with little or no warning.

Montserrat is a British Dependent Territory and the BGS, in conjunction with the Seismic Research Unit (SRU) of the University of the West Indies, have been given the task of monitoring the ongoing eruption and advising the local administration as well as the UK Government on the hazards of the volcano. The Montserrat Volcano Observatory (MVO) has been established to undertake these tasks, staffed by members of the SRU, the BGS, UK universities and with a core of local staff.

There has been no doubt that the Soufriere Hills volcano poses a serious threat to the island's population since

the onset of extrusion of magma to the surface in November 1995. Over half of the 12,000 islanders have their homes in the shadow of the volcano. The capital town of Plymouth is just three miles to the west of the summit crater and built on material deposited by previous eruptions. Agriculture is focused on the fertile flanks of the volcano and the main hospital, shops, power station, industries and the only port all lie in the potential path of pyroclastic flows. The catastrophic effect of such flows was best shown during a similar type of eruption on the nearby French island of Martinique in 1902, when 29,000 people perished at the base of Mt Pelee.

The MVO assists in the management of the volcanic crisis by providing day to day information to the local administration on the status of the volcano and the ever-changing implications for risk to the population. Scientific monitoring using a range of geological and geophysical tools enables the volcanologists and seismologists at the MVO to track the course of the eruption closely. However, exact prediction of hazardous events is not possible in such a complex natural system. Although the southern part of the island has been evacuated for over a year, vital services were possible until recently in the

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capital Plymouth and at the country's airport thanks to the monitoring efforts of the MVO. However, a massive pyroclastic flow in late June 1997 led to the devastation of several villages and loss of life amongst those in the evacuated zone who had not heeded warnings disseminated through the far-reaching community education programme.

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The lessons learnt by this and other communities, such as the people of Armero, Columbia where 22,000 lives were lost in 1985, are being applied by the BGS in other areas at risk from volcanic eruptions. Projects in Central and South America are aimed at preparing communities for eruptions by providing maps of areas prone to different types of volcanic hazards and assessing the frequency of hazardous eruptions. Simple monitoring devices are also being installed to give some warning of impending eruptions. This work feeds into emergency and long-term development plans and should enable communities to interact with volcanoes more safely.



A pyroclastic flow, a mixture of red-hot rock, ash and gas, travelling at up to 50 mph down the southwestern flank of the Soufriere Hills volcano, Montserrat.