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Surveying building vulnerability to explosive volcanic eruptions and applying the results for mitigation and civil defence.

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Explosive volcanic eruptions can cause devastation to nearby urban areas. Due to the large populations which are at risk and the challenges inherent in effecting and maintaining complete evacuations when a volcano threatens, assessing the potential impacts of explosive volcanic events can assist in communicating the dangers and determining the effectiveness of mitigation options. The work presented here describes the development and production of residential building inventories in urban areas threatened by small island volcanoes: Tenerife and Guadeloupe. The method focused on field surveys to identify, categorise, and analyse building characteristics which would indicate the impacts to structures, occupants, and communities of five volcanic phenomena: pyroclastic flow pressure, ash infiltration from a pyroclastic flow, tephra fallout, volcanic earthquakes, and volcano-induced fires. These data were used in a model that calculates impacts for given volcanological scenarios in each case study site. Understanding the level of dangers to occupants and how their buildings are most vulnerable assists in targeting mitigation measures. These results and the data collected can be presented to civil defence and other stakeholders in order to try to reduce impacts, but the limitations of the work should be clearly identified. This work contributes to the EU-funded project EXPLORIS (Explosive Eruption Risk and Decision Support for EU Populations Threatened by Volcanoes, EVR1-2001-00047).