

The impacts by pyroclastic surges at the 1990-1995 eruption of Unzen Volcano

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I investigated the impacts on houses of pyroclastic surges on 23 June, 1993 during the dome building eruption of the Unzen Volcano, Kyushu, Japan. A detailed analysis of the house damage of the 23 June, 1993 was used to study on the characteristics of the surges and to compare with the another reports from the eruptions of Soufriere Hills Volcano (1997) and historical eruptions. As a result, the characteristics of the surges, as inferred from the house damage, were the destructiveness and directionality of the current. Many houses above basement levels were removed at the axis of the current. Dynamic pressure was a major cause of damage. The high temperature of the current, causing the ignition of combustibles, was a major cause of damage even where the dynamic pressure was low at the periphery of the current. This study revealed that heat transfer correlated with the gradient of the current speed. House damage in impact area was attribute to the effects of directionality of the current, topography, sheltering, and probably current density. This case study has a similarity with the eruptions of Soufriere Hills Volcano (1997) and historical eruptions. The disaster potential for such violent surges has a clear implication for volcanic hazard assessment.