

Mechanisms of the caldera collapse and related hydro-explosions at Miyakejima volcano

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The sequence of the activity of Miyakejima volcano is as follows; 1) Westward dyke intrusion and drain-back of magma beneath the summit, 2) Development of summit collapse and repeated hydro-explosion, 3) Establishment of gas exit path and huge amount of gas emission. The wet materials around the sea level beneath the summit dropped into the void space caused by the drain-back of magma and were heated by hot volcanic gas degassed from magma, finally forming an unstable region. The repeated hydro-explosions might be caused by the destruction of phase-equilibrium in the unstable region.