

Evolution of the 2006 explosive activity of Ubinas volcano, Peru

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Ubinas (16° 22' S, 70° 54' W; 5675 masl.) is known as the historically most active volcano in southern Peru, with 24 episodes of high fumarolic activity since the XVI century. Approximately 5000 people live in 6 towns located near the volcano. In August, 2005 Ubinas registered a slight increase in fumarolic activity. On 27 March 2006 ash fall occurred in the town of Querapi (4 km SE of the volcano). Between 28 March and 13 April, fumarolic activity was intense. At 18:25 on 14 April the first notable explosion occurred, and the associated gray, ash-laden eruptive column rose to 800m above the volcanos summit. On the 19th, a 60-m-diameter incandescent body of lava was observed in the summit crater. At 10:50 on the 20th, an ash column was propelled to 3 km above the crater rim, with dispersal to the west. From the 14th to 23rd of April, ash (with a thickness of 6 cm inside the caldera) and hydrothermally altered blocks (up to 70 cm in diameter) were emitted. The blocks were deposited only within the caldera rim, and were probably emitted on 20 April. These characteristics suggest that the activity at Ubinas through to 23 April was *phreatic in nature*. At 18:30 pm on 27 April, an explosive eruption emitted incandescent ballistic blocks to a distance of > 800m. These blocks are andesitic and similar in composition to material erupted from Ubinas in 1677. Petrological characteristics are indicate this was a *vulcanian activity*.

In May, activity consisted of variable emission of ash, to heights of 3 to 4 km, dispersed to the E, NE, SE, and to a maximum distance of 40 km. In June, activity was variable, with emission of ash again up to 4 km, principally on the 2nd, 29th and 22nd of the month, dispersed in all directions and to a maximum distance of 20km. In July, activity was again variable. Ash columns ascended to 3.5 km, notably on the 10th, 20th and 22nd, with dispersal to the W, NW; SW, and E, and to distances of 30km. Variable activity in August, included one significant ash column on the 12th, which ascended to 3km and dispersed material in a southerly direction and up to 40km distant. Variable activity also in September included one ash column to 2 km on the 12th, with dispersal to the E, SE, and N, to a distance of 20 km. In October, the emission of gas and ash had average heights of only around 500 m. Without precedent, on 0:59 on 13 October a notable explosion was followed by the emission of gas and ash to 1.8km and with NE dispersal to 25 km. At the time of this writing, gas and ash is

being dispersed to the SE, S, E and N.

The ash emitted from the end of April to October consists principally of fine ash that is grey in color. The ash is present in layers up to 8 cm thick within the caldera, and 1 cm thick at a distance of 6 km from the volcano. The ash is rich in crystal fragments of plagioclase, olivine, pyroxene, biotite, and Fe-Ti oxides. Ashfall has and continues to affect residents, livestock, and cultivation.