Recent Eruptive History of La Malinche Volcano, Mexico: Towards the Construction of a Hazards Map

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La Malinche (4,461 m asl) is a potentially active andesitic-dacitic stratovolcano situated 25 km to the NE of Puebla, Mexico (1.3 million inhabitants). The oldest rocks in the area are Cretaceous limestones that crop out to the S and SE of La Malinche. To the W and N Tertiary lacustrine sediments are covered by younger sedimentary and pyroclastic material. The northern lacustrine sediments are overlain by andesitic rocks that form a chain of lava domes along a general E-W trend. La Malinche's eruptive history has been predominantly explosive during the last 45,000 y. Episodes of dome growth at the summit culminate with the emplacement of pyroclastic flows from dome colapse, and associated lahars. Four important pumice fall events are registered in the stratigraphy: The two oldest are more than 39,000 y. B.P., the next was dated at 21,500 y. B.P. and the youngest has an age that ranges beetwen 12,000 and 9,000 y. B.P. All of these events also produced pyroclastic flows. The oldest pyroclastic flow deposits dated are >39,000 y. B.P., and the youngest are 9,000 and 7,500 years old. Two minor partial edifice colapse events were dated at 29,500 y. B.P. and less than 23,700 y. B.P. The most recent eruption from La Malinche produced an ash-fall layer and ash-flow deposits dated at 3,100 y. B.P. In the documented stratigraphy, block-and-ash flows and pumice-and-ash flows have had maximum runouts in the range of 7-15 km. The two debris avalanche events had maximum runouts of 14 and 17 km. Lahar deposits can be observed more than 20 km from the summit.

Because the area around La Malinche is densely populated, we are concerned with the lack of an adequate hazards map. In addition to stratigraphic results we plan to employ computer tools that will simulate runout distances and travel times of potential future flow events to produce a hazards map.