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INSTITUTO NACIONAL DE SISMOLOGIA, VULCANOLOGÍA, METEOROLOGÍA E HIDROLOGIA

MICHIGAN TECHNOLOGICAL UNIVERSITY

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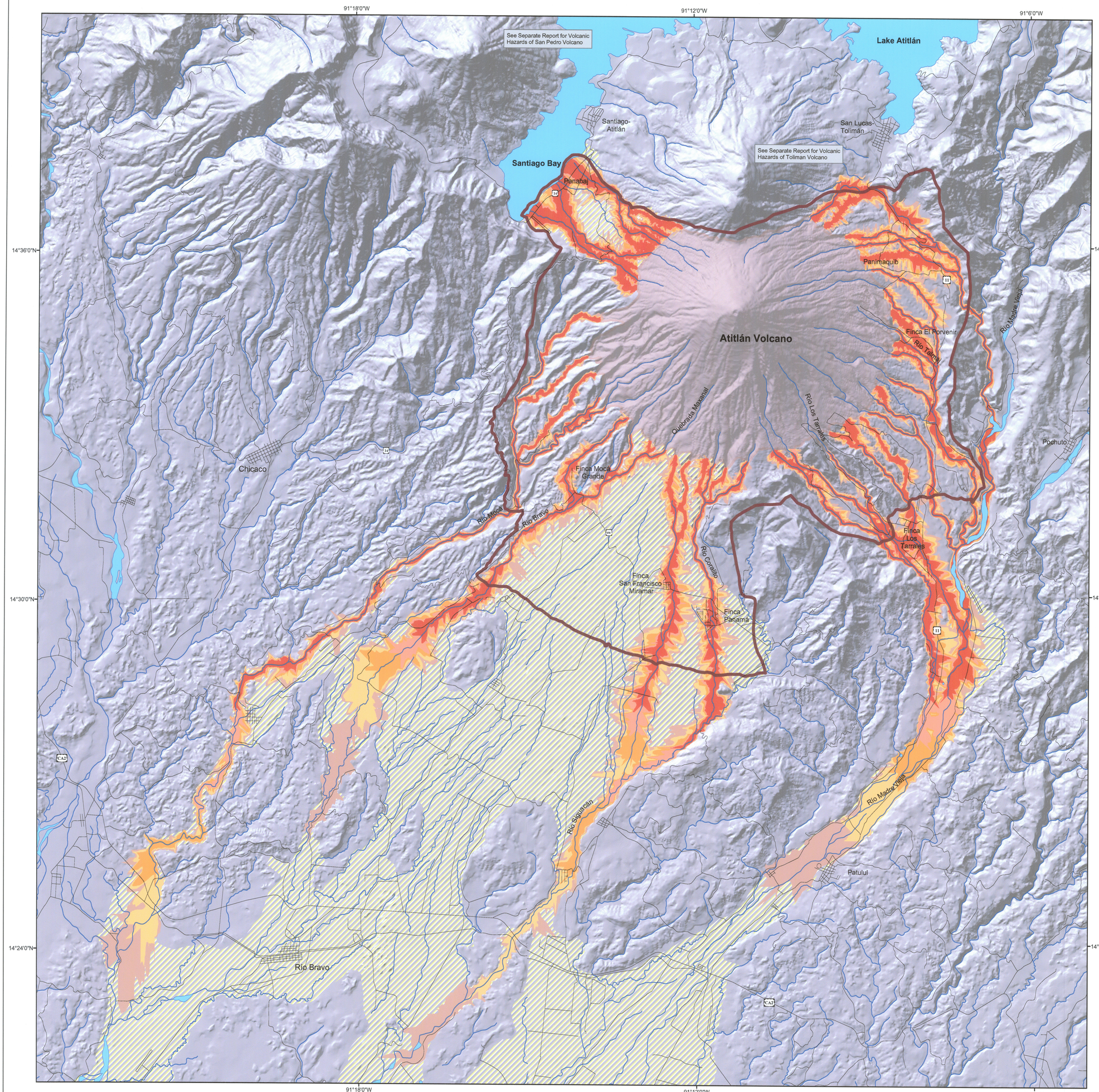
Plate 1 of 2




EXPLANATION

PROXIMAL-HAZARD ZONE
Area is subject to rapidly moving, devastating pyroclastic flows, lahars, debris avalanches, and ballistic falls, which could reach the hazard-zone boundary within a few minutes. Area is also subject to lava flows. Pyroclastic flows, lava flows and ballistic projectiles occur only during eruptions, whereas lahars and debris avalanches can occur during eruptions or as a result of intense rainfall or earthquake shaking. During any single eruption, rainfall event, or earthquake, some part of the zone may be affected, whereas other parts may be completely unaffected. All phenomena, except ballistic projectiles, are likely to move beyond the flanks of the volcano, thus beyond the limits of this zone. Pyroclastic flows, lahars, and debris avalanches that move beyond the proximal-hazard zone will travel down topographic lows away from the volcano.

PYROCLASTIC-FLOW AND LAVA-FLOW HAZARD ZONE
Areas that could be affected by pyroclastic flows, pyroclastic surges, lava flows, and ballistic projectiles in future eruptions from Atitlán volcano. The extent of the hazard zone is based on the maximum extent of pyroclastic deposits during past eruptions plus a distal fringe zone that could be affected by pyroclastic surges. Maximum extent of past lava flows is well within the limit of hazard zones.

LAHAR-HAZARD ZONES
Valleys heading on Atitlán Volcano are subject to lahars generated by eruptions, debris avalanches, intense rainfall, or earthquakes. Lahar-hazard zones are subdivided on the basis of a range of hypothetical lahar volumes. Smaller-volume lahars occur more frequently than larger-volume lahars. Large-volume lahars require that an eruption deposit a substantial tephra layer and/ or storms deliver intense rainfall.

Area that could be inundated by a lahar having a volume of 1 million cubic meters. Highest probability.

Area that could be inundated by a lahar having a volume of 2 million cubic meters.

Area that could be inundated by a lahar having a volume of 4 million cubic meters.

Area that could be inundated by a lahar having a volume of 8 million cubic meters.

Area that could be inundated by a lahar having a volume of 16 million cubic meters. Lowest probability.

LAHAR-RUNOUT, FLOOD, AND AGGRADATION HAZARD ZONE
Areas of low relief beyond the largest lahar-hazard zone that could be subject to flooding, channel migration, and sedimentation during large-volume events or because numerous smaller lahars have disrupted the upper channel. Because the area has low relief, it is difficult to forecast precisely how the channels will behave and therefore exactly which areas would be affected.

Note: Although the map shows sharp boundaries for hazard zones, the degree of hazard does not change abruptly at these boundaries. Rather, the hazard decreases gradually as distance from the volcano increases, because small events are more likely than large events, and decreases rapidly as elevation above the valley floor increases. Areas immediately beyond outer hazard zones should not be regarded as hazard-free because the boundaries of hazard zones can be located only approximately, especially in areas of low relief. Many uncertainties about the source, size, and mobility of future events preclude defining the boundaries of zero-hazard zones precisely.

Location Map

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Base maps from Guatemala 1:50,000 scale series; Chicacao, 1979 (1959-IV); San Lucas Tolliman, 1980 and 1979 (1959-I); Rio Bravo, 1984 and 1985 (1959-III); Patulul, 1979 (1959-II). Digital base maps from Tilan Averstar Inc. Universal Transverse Mercator projection, Zone 15. Horizontal datum, North American 1927. Vertical datum, mean sea level, Spheroid Clarke 1866.

Scale 1:50,000

0 1 2 3 4 Kilometers

0 1 2 3 4 Miles

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# Volcanic Hazard Zones for Atitlán Volcano, Guatemala

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