

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

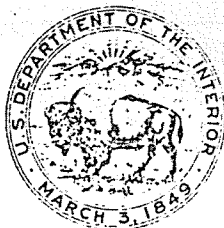
Section 2

INTERIM REPORT ON THE GUATEMALAN EARTHQUAKE  
OF 4 FEBRUARY 1976 AND THE ACTIVITIES

Summary of Important Findings  
by  
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Some of the important interim findings of the U.S. Geological Survey investigations of the Guatemalan earthquake are summarized:



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with Geological Survey standards and  
nomenclature

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1. The earthquake, which claimed more than 22,000 lives, was caused by sudden slip on the Motagua fault. Ground breakage was observed along a 240-km segment of the fault; however, the total length of faulting is probably more than 300 km extending from the vicinity of Puerto Barrios, where a large aftershock occurred, into the state of Chimaltenango, where more than 13,000 people were reported killed. As much as 140 cm of horizontal slip was measured on the fault where it passes about 20 km north of Guatemala City.
2. Slip also occurred on several secondary faults, some of which extend into developed areas in the western part of Guatemala City. These faults pose a significant hazard because of their proximity to urbanized areas and areas of future development.
3. The earthquake caused extensive landsliding that blocked or destroyed many communication routes. Landslide debris deposited in stream valleys constitutes an immediate serious hazard in many localities. In some instances the debris has formed natural dams blocking drainages. Such dams are subject to catastrophic failure as the level of the impounded water increases and perhaps overtops the dam. The slide deposits are also likely to move as debris flows, if they become sufficiently water saturated during the rainy season. Finally, additional landslides are likely to occur in the rainy season on steep slopes weakened by the earthquake.
4. The provisional surface-wave magnitude of the earthquake is 7.5; however, this value is subject to revision upon the analysis of additional data.
5. Hundreds of aftershocks followed the main earthquake. The largest, which caused additional damage in Guatemala City on February 6, has a surface-wave magnitude approaching 6.0. Many of the small recorded aftershocks lie off the Motagua fault and will assist in delineating hazardous secondary faults.
6. One complete seismoscope record of strong motion in Guatemala City was obtained for the main earthquake. Neither of the two accelerographs in the city recorded the earthquake.
7. The maximum Modified Mercalli intensity observed in any section of Guatemala City was IX. Pockets of high intensity were scattered throughout the city.
8. A large scatter in the intensity <sup>and</sup> level of damage was observed in the vicinity of the Motagua fault. Adobe structures within 10 km of the fault were essentially undamaged at some localities; in other places there was widespread collapse of adobe buildings at greater distances from the fault. Collapse of adobe structures accounted for most of the deaths in the earthquake.
9. Damage occurred to modern earthquake-resistive buildings in Guatemala City. This earthquake is similar in many respects to shocks that might occur in parts of coastal California; accordingly, investigations of damage to earthquake-resistive structures in Guatemala City provide indications of how buildings might respond in a similar earthquake occurring on the San Andreas fault or one of the related strike-slip faults.