STATE OF UTAH
NATURAL RESOURCES
Utah Geological & Mineral Survey

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Norman H Bangerter, Governor
Dee C Hansen, Executive Director
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December 1, 1988

MEMORANDUM

TO: UGMS File

FROM: William F. Case & Suzanne Hecker

Subject: Search for geologic effects of 19 November, 1988, Bear Lake earthquake, Bear River Range, Utah.

The University of Utah Seismograph Stations (UUSS) reported that a magnitude 5.0 earthquake occurred at 12:42 PM on the 19th of November, 1988, at the Utah-Idaho border in the Bear River Range. The event was followed 18 minutes later by a magnitude 4.6 aftershock. UUSS reported another aftershock, measuring magnitude 3.4, which occurred at 3:46 on the morning of 28 November.

The UGMS investigated possible geologic effects of the Bear Lake earthquake because the level of ground shaking associated with magnitude 5.0 events is thought to be the general threshold for producing rock falls and liquefaction and may be great enough to trigger landslides, avalanches, and seiches (waves in a lake).

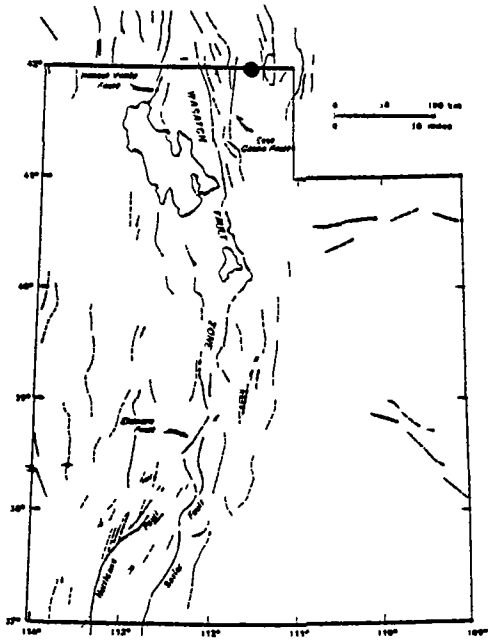
On November 21st, we did a reconnaissance for geologic effects of the ground shaking in an area several miles south and east of the Bear Lake earthquake epicenter. The search was limited to areas visible with binoculars from roads because of snowcover, limited time, and the amount of territory to be covered. We did walk along the Bear Lake shoreline at the UP&L pump house.

No geologic effects were seen: 1) along US 89 from Logan to St. Charles, Idaho; 2) along the road to the Beaver Mountain Ski Resort; or 3) along the road around Bear Lake. Specifically, we did not see evidence for landslides, avalanches, or rock falls on the slopes of the Bear River Range or along the steep range front east of Bear Lake. Minor amounts of debris fell on US 89 because of ground shaking, according to UDOT personnel. A UP&L person reported that he was in his cabin located in the epicentral area during the earthquake but no damage occurred

and no rock falls or avalanches were seen. We saw no cracks indicating liquefaction or other mass movement in the snow covering the sink areas near Logan Pass. We did not see evidence of liquefaction or seiches along the Bear Lake shoreline. The UP&L lake level gauge at the north shore of Bear Lake showed no fluctuation around the time of the quake, according to a UP&L representative.

No indication of surface fault rupturing (which is unlikely to accompany earthquakes much below a magnitude of 6.5) was seen along the possible Quaternary-age fault west of Beaver Mountain or along the Bear Lake fault. The location and geometry of both faults, with respect to the earthquake epicenters, make them unlikely candidates for the source of the seismicity.

cc: Dee Hansen
Lorayne Frank



GENERALIZED MAP OF YOUNG FAULTS IN UTAH

Epicenter Bear Lake Earthquake
November 19, 1988