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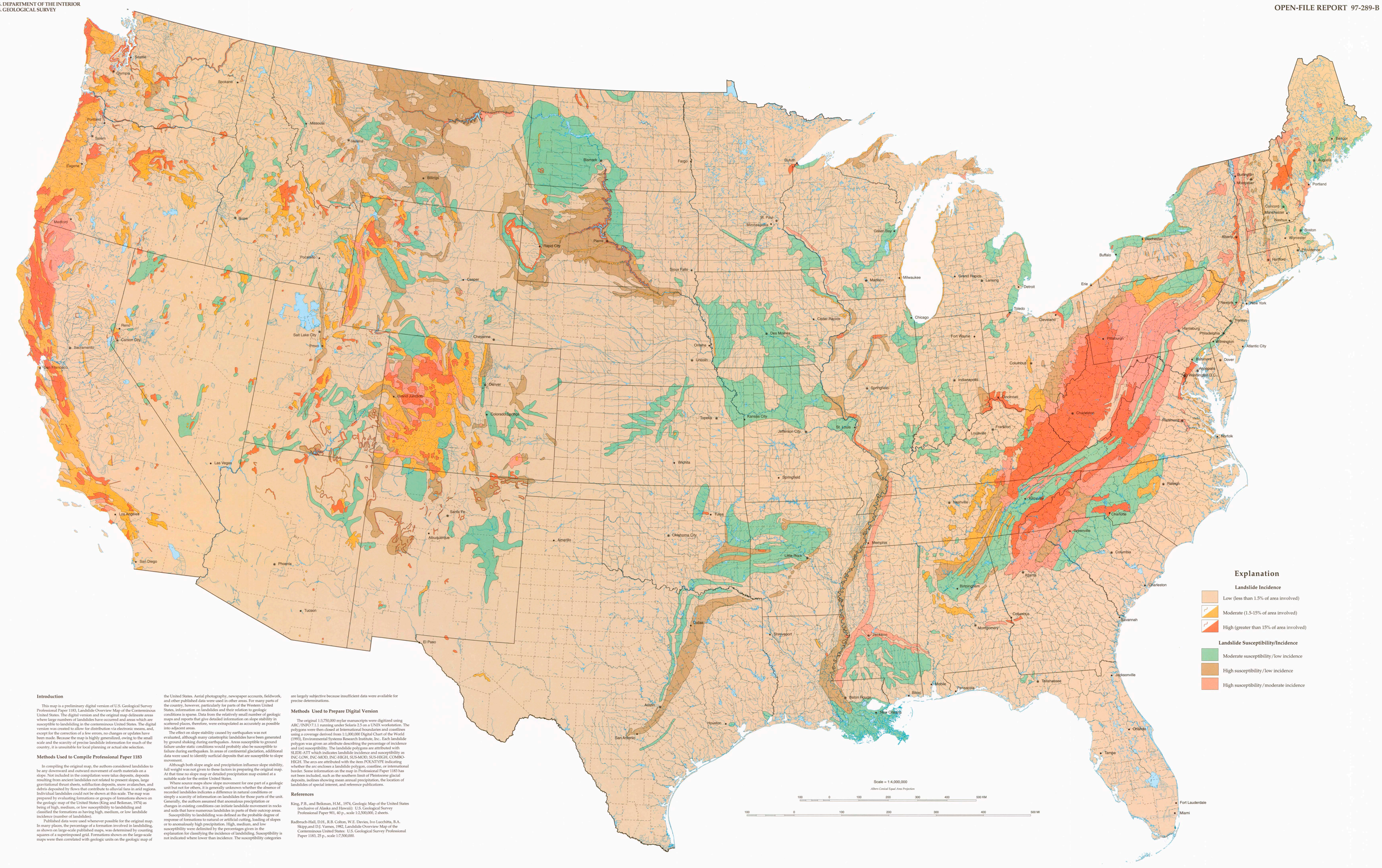

Digital representation of *Landslide Overview Map of the Conterminous United States*

by Dorothy H. Radbruch-Hall, Roger B. Colton, William E. Davies, Ivo Lucchitta, Betty A. Skipp, and David J. Varnes, 1982, U.S. Geological Survey Professional Paper 1183—Paper Edition

Digital compilation by
Jonathan W. Godt
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Introduction

This map is a preliminary digital version of U.S. Geological Survey Professional Paper 1183, Landslide Overview Map of the Conterminous United States. The digital version and the original map delineate areas where large numbers of landslides have occurred and areas which are susceptible to landsliding in the conterminous United States. The digital version was created to allow for distribution via electronic means, and, except for the correction of a few errors, no changes or updates have been made. Because the map is highly generalized, owing to the small scale and the scarcity of precise landslide information for much of the country, it is unsuitable for local planning or actual site selection.

Methods Used to Compile Professional Paper 1183

In compiling the original map, the authors considered landslides to be any downward and outward movement of earth materials on a slope. Not included in the compilation were talus deposits, deposits resulting from ancient landslides not related to present slopes, large gravitational thrust sheets, solifluction deposits, snow avalanches, and debris deposited by flows that contribute to alluvial fans in arid regions. Individual landslides could not be shown at this scale. The map was prepared by evaluating formations or groups of formations shown on the geologic map of the United States (King and Beikman, 1974) as being of high, medium, or low susceptibility to landsliding and classified the formations as having high, medium, or low landslide incidence (number of landslides).

Published data were used wherever possible for the original map. In many places, the percentage of a formation involved in landsliding, as shown on large-scale published maps, was determined by counting squares of a superimposed grid. Formations shown on the large-scale maps were then correlated with geologic units on the geologic map of the United States. Aerial photography, newspaper accounts, fieldwork, and other published data were used in other areas. For many parts of the country, however, particularly for parts of the Western United States, information on landslides and their relation to geologic conditions is sparse. Data from the relatively small number of geologic maps and reports that give detailed information on slope stability in scattered places, therefore, were extrapolated as accurately as possible into adjacent areas.

The effect on slope stability caused by earthquakes was not evaluated, although many catastrophic landslides have been generated by ground shaking during earthquakes. Areas susceptible to ground failure under static conditions would probably also be susceptible to failure during earthquakes. In areas of continental glaciation, additional data were used to identify surficial deposits that are susceptible to slope movement.

Although both slope angle and precipitation influence slope stability, full weight was not given to these factors in preparing the original map. At that time no slope map or detailed precipitation map existed at a suitable scale for the entire United States.

Where source maps show slope movement for one part of a geologic unit but not for others, it is generally unknown whether the absence of recorded landslides indicates a difference in natural conditions or simply a scarcity of information on landslides for those parts of the unit. Generally, the authors assumed that anomalous precipitation or changes in existing conditions can initiate landslide movement in rocks and soils that have numerous landslides in parts of their outcrop areas.

Susceptibility to landsliding was defined as the probable degree of response of formations to natural or artificial cutting, loading of slopes or to anomalously high precipitation. High, medium, and low susceptibility were delimited by the percentages given in the explanation for classifying the incidence of landsliding. Susceptibility is not indicated where lower than incidence. The susceptibility categories are largely subjective because insufficient data were available for precise determinations.

Methods Used to Prepare Digital Version

The original 1:3,750,000 mylar manuscripts were digitized using ARC/INFO 7.1.1 running under Solaris 2.5 on a UNIX workstation. The polygons were then closed at International boundaries and coastlines using a coverage derived from 1:1,000,000 Digital Chart of the World (1993). Environmental Systems Research Institute, Inc.. Each landslide polygon was given an attribute describing the percentage of incidence and (or) susceptibility. The landslide polygons are attributed with SLIDE-ATT which indicates landslide incidence and susceptibility as INC-LOW, INC-MOD, INC-HIGH, SUS-MOD, SUS-HIGH, COMBO-HIGH. The arcs are attributed with the item POLYTYPE indicating whether the arc encloses a landslide polygon, coastline, or international border. Some information on the map in Professional Paper 1183 has not been included, such as the southern limit of Pleistocene glacial deposits, isolines showing mean annual precipitation, the location of landslides of special interest, and reference publications.

References

King, P.B., and Beikman, H.M., 1974, Geologic Map of the United States (exclusive of Alaska and Hawaii): U.S. Geological Survey Professional Paper 901, 40 p., scale 1:2,500,000, 2 sheets.

Radbruch-Hall, D.H., R.B. Colton, W.E. Davies, Ivo Lucchitta, B.A. Skipp, and D.J. Varnes, 1982, Landslide Overview Map of the Conterminous United States: U.S. Geological Survey Professional Paper 1183, 25 p., scale 1:7,500,000.

Available from: U.S. Geological Survey Information Services Box 25286, Federal Center, Denver, Colorado 80225. The landslide database can be downloaded via 'anonymous ftp' from a USGS system named greenwood.er.usgs.gov (136.177.21.122). The files are located in a directory named /pub/open-file-reports/ofr-97-289. The files are available in ARC/INFO Export format.

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