

**EXPLANATION**

● Location of damaging landslide. The number identifies the landslide in the database. Data on file with authors, USGS, Menlo Park, California and Golden, Colorado.

**SUMMARY**

Sonoma County's landscape is characterized by the steep ridges and canyons of the California Coast Ranges. Local drainage is mostly into the Russian and Petaluma Rivers. The eastern part of the county consists dominantly of the upland Mayacmas Mountains, which reach elevations well above 1,000 m and have a typically mediterranean climate. This area is underlain mostly by Mesozoic sedimentary and igneous rocks and Miocene to Pleistocene volcanic rocks. It encompasses the world's largest commercial geothermal development. The central part of the county consists of the broad Russian River valley, flanked by a series of northwest-trending fault-controlled uplands and eastern valleys (such as Alexander and Knights Valleys), with extensive vineyards that produce some of the best wines in California. Western Sonoma County receives much greater rainfall than the eastern part of the county. It is underlain mostly by the same Mesozoic sedimentary basement rocks, but includes fewer Neogene volcanic rocks and a generally thicker overlying section of marine to non-marine Miocene and younger rocks. The county is bounded on the west by the Pacific Ocean, and two major active right-lateral strike-slip fault systems slice through the county in the western and eastern parts: the San Andreas fault and the Rogers Creek-Healdsburg-Maacama fault systems, respectively. Most of the population is centered in the Santa Rosa Valley.

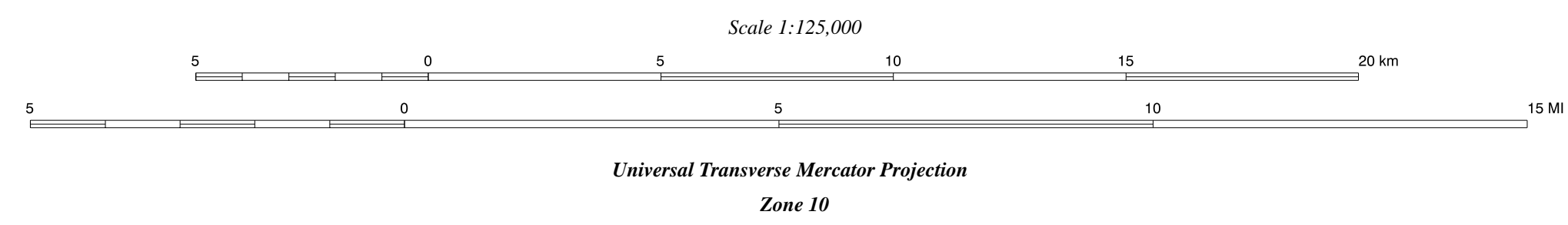
Landslides caused an estimated \$21 million in damage at seven major locations. The three most heavily damaged sites were: (1) Rio Nido, (2) Hidden Acres, and (3) Gold Ridge.

Rio Nido is located just north of the Russian River in the west central part of the county. This small community is in and along the margins of several steep canyons. A rotational and translational rock slump began to move high on a ridge above the town following the heavy rains of early February. The frontal part slumped and liquefied, forming debris flows that crashed into homes along Upper Canyon Three Road. Three homes were destroyed and four more were severely damaged. The road and all underground and above-ground utilities were destroyed. The threat of further slippage of the main slide and resulting debris-flow activity forced the evacuation of 140 homes downslope from the slide. Mitigation strategies are continuing to be developed.

Hidden Acres is in Bennett Valley, southeast of Santa Rosa. Here a translational slide has destroyed five homes and all utilities. The slide resumed movement in early 1999 due to heavy winter rains.

Gold Ridge, near Sebastopol, in the southwest part of the county, is the site of a translational, rock block slide that has forced the evacuation of three severely damaged homes and destroyed a county road. Monitoring of other residences and geotechnical evaluation continue.

The damage total for Sonoma County could rise, depending on the success of mitigation efforts at Rio Nido. Damage totals and information were provided by: Rich Holmer—Sonoma County Permit and Resource Management Department, William McCormick—Kleinfielder Inc., Sandy Coval—Director of Sonoma County Office of Emergency Services, and Chris Godley—Sonoma County Office of Emergency Services.



MAP SHOWING LOCATIONS OF DAMAGING LANDSLIDES IN SONOMA COUNTY, CALIFORNIA, RESULTING FROM 1997-98 EL NIÑO RAINSTORMS

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Digital data prepared using ARC/INFO 7.1.2 running under Solaris 2.6 on a UNIX workstation. Map formatted using Adobe Illustrator 8.0 running under Mac OS 8.6.

Shaded relief base derived from Graham, S. E., and Pike, R. J., 1997. Shaded Relief Map of the San Francisco Bay Region, California, U.S. Geological Survey Open-File Report 97-745-B.

Any use of trade, product or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

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This map was produced on request, directly from digital files, on an electronic plotter. It is also available as a PDF file at <http://greenwood.cr.usgs.gov>

For sale by U.S. Geological Survey Information Services Box 25286, Federal center, Denver, CO 80225.

