

RESIDENTS SHOULD BE LANDSLIDE-SMART

***Careful observation, simple prevention steps and common sense can help
avoid landslide disasters***

By Hawkeye Sheene

In Oceanside, San Diego County, and greater Southern California, citizens learned firsthand how devastating landslides can be during the heavier-than-normal rains in the winter of 2005. While all landslide damage cannot be prevented, home and business owners can take a number of precautions to make their property safer. In fact, it is the sole responsibility of the property owner to protect the stability of their property.

Landslides are a serious hazard common to almost every state in America. The government estimates that they cause up to \$2 billion in damages and from 25 to 50 deaths annually.

Landslides are typically associated with periods of heavy rainfall. Areas that are susceptible include locations with a history of landslides such as the top or the bases of steep slopes; bases of drainage channels and developed hillsides where septic systems are used.

Both the Federal Emergency Management Agency (FEMA) and the American Red Cross (see Web links below) provide useful information on landslide prevention, guidelines on what to do when a landslide occurs and tips on how to recover from such an event. Residents who believe they may be in a landslide-prone area should review available resources and take precautions to prevent a recurrence of the nightmares that plagued victims earlier this year.

According to FEMA, residents should be familiar with landslide warning signs such as:

Changing landscaping patterns such as storm-water drainage on slopes (especially the places where runoff water converges), land movement, small slides, flows, or progressively leaning trees.

Doors or windows that stick or jam for the first time.

New cracks in plaster, tile, brick, or foundations.

Outside walls, walks, or stairs beginning to pull away from the building.

Slowly developing, widening cracks appearing on the ground or on paved areas such as streets or driveways.

Breaking underground utility lines.

New, bulging ground appearing at the base of a slope.

In the midst of a landslide you may notice;

Water breaking through ground surfaces in new locations.

Fences, retaining walls, utility poles, or trees tilting or moving.

Faint rumbling sounds increasing in volume.

The ground slopes downward and may begin shifting in directions under your feet.

Unusual sounds, such as trees cracking or boulders knocking together which could indicate moving debris.

Collapsed pavement, mud, fallen rocks, and other indications of possible debris can be seen when driving (embankments along roadsides are particularly susceptible to landslides).

If you believe or know your property is in a susceptible area, contract with a private consulting company specializing in earth movement for advice on potential landslide issues you may face and on corrective measures that can be taken to protect your family and property.

Become familiar with the land around you. Learn whether landslides and debris flows have occurred in your area by contacting local officials, state geological surveys or departments of natural resources and university departments of geology. Knowing your surroundings can help you assess your risk for danger.

Water generates and triggers most slope problems. To reduce the risks of damage, identify your water sources. Get out in the rain and check areas like hill slopes, gullies, driveway and street drains, roof gutters, and downspouts to see from where water flows and where it goes.

Residents can also take preventive measures by cleaning gutters and fixing broken downspouts. Make sure that brow ditches (slope drainages) and area drains (in yards and patios) are in good condition and clear of all debris so as not to obstruct water flow. Roof and downspout drainage should be maneuvered away from slopes and directed into storm drains. Additionally road, driveway and patio water should be directed into storm drains.

While some situations may require more complex permanent solutions professional site investigations by both a technical engineer and an engineering geologist have been shown to reduce landslide damage over 95%. Technical solutions can greatly reduce such risks and would include an analysis of materials (soil and rock) present on your property and characterization of those materials (strength, stability, etc.), subsurface configuration (geological structures and dips) and ground and surface water conditions.

Potential major solutions could include drainage improvements, altered vegetation, strengthening of existing or the addition of retaining structures and directed surface grading.

Qualified geotechnical firms can be found by contacting the Board of Registration for Geologists and Geophysicists at www.dca.ca.gov/geology, the Board of Registration for Professional Engineers and Land Surveyors at www.dca.ca.gov/pels or the California Geotechnical Engineers Association at www.cgea.org.

For More Information:

Federal Emergency Management Agency (FEMA)

<http://www.fema.gov/areyouready/landslide.shtm>

American Red Cross

http://www.redcross.org/static/file_cont211_lang0_96.pdf

U.S. Geological Survey (SGS)

<http://landslides.usgs.gov>