

**Philip J. Shaller, Ph.D., R.G., C.E.G.**  
**Senior Managing Scientist**

**Professional Profile**

Dr. Philip Shaller is a Senior Managing Scientist and head of the Geo Group within Exponent's Civil Engineering practice. He has worked for 20 years as an engineering geology consultant. His expertise includes geological and geotechnical site investigations, slope stability analysis, landslide and debris flow identification and mitigation, rheological modeling of debris flows, evaluation of debris flow recurrence intervals, potential travel pathways and protective structures, geologic field mapping, analysis of aerial photographs and remote sensing images including InSAR and synthetic aperture radar imagery, sub-surface characterization by means of small diameter borings, rock coring and large diameter borings (downhole logging), assessment of bedrock permeability by means of downhole packer testing, well construction and development, fluvial geomorphology, assessment of alluvial fan flooding patterns, field and aerial photo analysis of historic flood patterns, assessment of future flood pathways, investigation of fire-flood-erosion processes, investigation of dam failure, foundation construction and earthwork observation, rock mass characterization for tunneling and dam construction, seismic hazard characterization, assessment of aggregate resources for use as railroad ballast, expansive and collapsible soils hazards, coastal geomorphology, and karst geomorphology.

Dr. Shaller's specialty is in the field investigation and mechanics of large-scale landslides and debris flows. He also holds bachelors and masters degrees in geochemistry, with a specialty in the chemistry of liquid sulfur and aqueous- and vapor-phase sulfur compounds.

**Academic Credentials and Professional Honors**

Ph.D., Geology, California Institute of Technology, 1991  
M.S., Geochemistry, Montana College of Mineral Science and Technology, 1985  
A.B., Geochemistry, Occidental College, 1983

Robert P. Sharp Graduate Teaching Award, California Institute of Technology, Division of Geological and Planetary Sciences, 1990

Moderator (with MW Hart), Symposium on Long-Runout Landslides and Rock Avalanches, 52nd Annual Meeting of Association of Engineering Geologists, Lake Tahoe, CA, September 23, 2009.

**Licenses and Registrations**

Professional Geologist, California, #6132; Certified Engineering Geologist, California, #1912  
Registered Geologist, Idaho, #1010; Registered Geologist, Washington, #261  
40-Hour HAZWOPPER certification

## **Publications**

Shaller P, Shrestha P, Doroudian M, Sykora D, Hamilton D. Numerical modeling of the 2005 La Conchita landslide, Ventura County, California. In: Flood Hazard Identification and Mitigation in Semi- and Arid Climates. French R, Miller J (eds), College Press (London), in press.

French R, Fuller JE, Shaller P, Shrestha P. Needs and benefits of co-operation. In: Flood Hazard Identification and Mitigation in Semi- and Arid Climates. French R, Miller J (eds), College Press (London), in press.

Shaller P, Heron C. Proposed revision of marine terrace extent, geometry, and rates of uplift, Pacific Palisades. California Environmental & Engineering Geoscience 2004; X(3):253–275, August.

Shaller P, Shaller A, Abbot PL, Seymour DC (eds). Review of proposed mechanisms of Sturzstroms (long-runout landslides). pp. 185–202. In: Sturzstroms and Detachment Faults, Anza-Borrego State Park, California, South Coast Geological Society, Annual Field Trip Guidebook No. 24, October 1996.

Shaller P, Komatsu G. Landslides on Mars. pp. 18–21. In: Landslide News, No. 8, 1994.

Shaller P. Analysis of a large moist landslide, Lost River Range, Idaho, U.S.A. Canadian Geotechnical Journal 1991; 28:584–600.

## **Presentations and Published Abstracts**

Shaller PJ, Shrestha, PL, Hamilton, DL, Jordan N, Rezakani M. Assessment of alluvial fan flooding hazards and proposed mitigation, Thousand Palms, California. Presented at 2010 Floodplain Management Association Annual Meeting, Henderson, NV, November 3, 2010.

Shaller PJ, Shrestha PL, Doroudian M, Rezakani M. Assessment of flood hazard, Travertine Point Area, Southeastern California. Presented at 2010 Floodplain Management Association Annual Meeting, Henderson, NV, November 3, 2010.

Shaller PJ, Shrestha PL, Doroudian M, Hamilton DL, Sykora, DW. The January 10, 2005 La Conchita landslide. Presented at 2010 Geological Society of America Cordilleran Section and Pacific Section AAPG Meeting, Anaheim, CA, May 29, 2010.

Shaller PJ. An introduction to long-runout landslides. Presented at 52nd Annual Meeting of Association of Engineering Geologists, Lake Tahoe, CA, September 23, 2009.

Shaller PJ, Mathieson B, Okubo S. The Travertine rock avalanche, southern Santa Rosa Mountains, southeastern California. Presented at 52nd Annual Meeting of Association of Engineering Geologists, Lake Tahoe, CA, September 23, 2009.

Hart MW, Shaller P, Farrand GT, Olson B. Reconnaissance of long-runout rock avalanches in eastern California. Presented at 52nd Annual Meeting of Association of Engineering Geologists, Lake Tahoe, CA, September 23, 2009.

Shrestha PL, Hamilton DL, Cydzik K, Wardak S, Jordan N, Shaller PJ, Doroudian M. Flood hazard analysis and mitigation. Proceedings, International Conference on Water, Environment, Energy and Society (WEES-2009), pp. 699–706, New Delhi, India, January 12–16, 2009.

Wardak S, Murillo B, Hamilton D, Shrestha PL, Doroudian M, Cydzik K, Medellin J, Shaller PJ. Sedimentation analysis in an open channel network for existing and proposed development conditions. ASCE-EWRI World Environmental & Water Resources Conference, Honolulu, HI, May 12–16, 2008.

Shrestha PL, Hamilton D, Jordan N, Lyle JE, Doroudian M, Shaller PJ, Wardak S, Cydzik K, Medellin J. Inland flood hazard analysis and mitigation. ASCE-EWRI World Environmental & Water Resources Conference, Honolulu, HI, May 12–16, 2008.

Shaller P. Dig or drill? Weighing options for robotic planetary surface exploration missions. Presented at ASCE Aerospace Division, International Earth and Space Conference, Long Beach, CA, March 3-5, 2008.

Shaller P. Out of the frying pan and into the mud—The fire-flood sequence in southern California. Presented at a meeting of the Orange County Coastal Coalition, Newport Beach, CA, September 27, 2007.

Shaller P, Hamilton D, Lyle J, Mathieson E, Shrestha P. The fire-flood-erosion sequence in California—A recipe for disaster. Presented at ASCE World Environmental and Water Resources Congress, Omaha, NE, May 21–25, 2006.

Shaller P, Hamilton D, Shrestha P, Lyle J, Doroudian M. Investigation of flood and debris flow recurrence—Andreas Canyon, San Jacinto Range, Southern California. Presented at ASCE World Environmental and Water Resources Congress, Omaha, NE, May 21–25, 2006.

Shaller P. Investigating subsurface conditions in bouldery terrain. Presented at ASCE Aerospace Division International Earth & Space Conference, Houston, TX, March 5–8, 2006.

Shaller P, Shrestha P, Hamilton D, Doroudian M, Lyle J, Cattarossi A. Investigation of flood hazards on alluvial floodplains. Presented at ASCE World Water and Environmental Resources Congress, Anchorage, AK, May 16–19, 2005.

Shaller P, Wren J. 2005 landslides: Observations from the trenches. Presented at Minimum Continuing Legal Education Seminar Series, California Club, Los Angeles, CA, May 11, 2005.

Shaller P, Hamilton D, Shrestha P, Lyle J, Doroudian M. Investigating flood hazards on alluvial floodplains. Presented at Alluvial Fan Flood Hazard Management Symposium, Phoenix, AR, April 20–22, 2005.

Shaller P. Investigating the ups and downs of the geology of Las Vegas, Nevada. Presented at Pomona College (presentation to undergraduate students), Pomona, CA, February 21, 2005.

Shaller P, Hamilton D, Doroudian M, Shrestha P, Lyle J, Cattarossi A. Interpretation of tectonic, fluvial and eolian landforms in the Upper Coachella Valley, California, using aerial photography, DEM and LIDAR technology. Geological Society of America, Abstracts with Programs, Vol. 36, No. 5, p. 299, November 2004.

Shaller P, Hamilton D, Lyle J, Doroudian M, Shrestha P. Fire-flood-erosion sequence: Analysis and mitigation. Presented at ASFPM Arid Regions 10<sup>th</sup> Biennial Conference, Restoration and Management of Arid Watercourses, Mesa, AZ, November 2004.

Shaller P, Hamilton D, Lyle J, Doroudian M, Shrestha P. Multi-disciplinary approach to distinguishing flood hazards on alluvial floodplains. Presented at ASFPM Arid Regions 10<sup>th</sup> Biennial Conference, Restoration and Management of Arid Watercourses, Mesa, AZ, November 2004.

Shaller P, Mathieson E. Geological aspects of slope stability. Presented at Slope Stability and Landslides short course, University of Wisconsin-Madison Department of Engineering Professional Development, University of California Los Angeles, February 8–10, 2006, February 16–18, 2005, February 18–20, 2004, February 19–21, 2003, February 20–22, 2002, and February 21–23, 2001.

Shaller P, Medley E, Hamilton D, Lyle J, Mathieson E, Weirich F. Hydrologic impacts and watershed recovery following the 1999 Lowden Ranch Fire, Lewiston Area, Trinity County, California. Presented at Wildland Fire Impacts on Watersheds Conference, Denver, CO, October 2003.

Shaller P, Medley E, Sutarwala S. Meeting the challenges of characterizing subsurface conditions in bouldery terrain. Paper No. 115-8, Session No. 115, Engineering Geology (Posters). Presented at Annual Conference, Geological Society of America, Denver, CO, October 29, 2002.

Shaller P, Wren J, Sykora D. New approaches to evaluate and explain recurring geotechnical issues in litigation cases, Part 3: Synthetic Aperture Radar Interferometry (InSAR). Presented at 7<sup>th</sup> Annual ASCE Forensic Engineering Technical Group Meeting, Los Angeles Section, University of California Irvine, CA, May 10, 2002.

Shaller P, Gupta A, Saraf V. Gujarat Earthquake reconnaissance. Web page developed for Exponent Web Site, Spring, 2001.

Shaller P. Geologic work at the Getty Center, Los Angeles: A study in geologic complexity. Presented at 43 Annual Meeting of Association of Engineering Geologists, San Jose, CA, September 2000.

Shaller P, McSaveney M, Gillon M, Beetham R, Freeman T. Age and failure style of a large landslide complex at Matahina Reservoir, New Zealand. Presented at 40<sup>th</sup> Annual Meeting of

Association of Engineering Geologists, Portland, OR, October 1997, and in Geological Society of America, Abstracts with Programs, Vol. 29, p. 64, May 1997.

Shaller P, Heron C. Reinterpretation of wave-cut marine terraces west of Castellammare Mesa, Pacific Palisades, California. Geological Society of America, Abstracts with Programs, Vol. 29, p. 19, May 1997.

Shaller P. Review of proposed mechanisms of Sturzstroms (long-runout landslides). Presented at 24th Annual South Coast Geological Society Field Trip, October 1996.

Shaller P, Rapp L. Folds, faults and fills: The geology and geotechnical engineering of the Getty Center, Brentwood, California. Presented at Monthly Meeting of Association of Engineering Geologists, Southern California Section, Los Angeles, CA, June 1996.

Shaller P. Mechanics of long-runout landslides. Presented at Monthly Meeting of Association of Engineering Geologists, Southern California Section, Los Angeles, CA, February 1996.

Shaller P. The runaway mountain. Television appearance on documentary program *Horizon*, British Broadcasting Corporation, 1996.

Shaller P, Sabins E. Last motion on the Benedict Canyon Fault, Santa Monica Mountains, California. Geological Society of America, Abstracts with Programs, Vol. 26, p. 185, October 1994.

Shaller P, Murray B, Ivanov B. 3rd Caltech/U.S.S.R. Schmidt Institute of Earth Physics Conference on Long-Runout Landslides. *Landslide News*, No. 5, pp. 37–38, 1991.

Shaller P. Long-runout landslides on Mars. Presented at U.S.S.R. Academy of Sciences, O. Yu. Schmidt Institute of Earth Physics, Moscow, October 1990.

Shaller P, Murray B, Albee A, Shelton J. A large composite landslide/debris flow, Lost River Range, Idaho. Geological Society of America, Abstracts with Programs, Vol. 21, p. 344, October 1989.

Shaller P, Murray B, Albee A. Subaqueous landslides on Mars? Presented at 20<sup>th</sup> Lunar and Planetary Science Conference, pp. 990–991, October 1988.

## **Prior Experience**

Senior Staff Geologist to Project Geologist, Woodward-Clyde Consultants, 1991–1999  
Project Geologist, Bing Yen and Associates, 1999–2000

## **Project Experience**

Evaluated cause and origin of distress to single-family residence in La Mirada, California and possible relationships to underlying fill character and adjacent buried CMP storm drain line.

Led team that carried out post-earthquake reconnaissance of damaged infrastructure and ground deformation following the Mexicali Earthquake, April 4, 2010. Developed web site material based on findings of the reconnaissance.

Evaluated the engineering geologic feasibility of installing a pipeline system through the Niger Delta and contributed to the development of a preliminary risk assessment to assist the government and operator in quantifying potential risks and in making a go or no go decision on the project.

Evaluated geomorphic effects of early 2005 storm runoff on the Santa Clara River system in northern Los Angeles County, California. Documented areas of bank erosion by means of aerial photo analysis and field inspection.

Performed geologic and geomorphic investigations for 100-year flood hazard evaluations for sites located on active alluvial fan surfaces in Rosamond, Tujunga, North Fontana, Desert Hot Springs, Palm Springs, Thousand Palms, Indio, Oasis and Thermal, California, and Phoenix, Arizona. Combined field observations with aerial photo interpretation to document active and inactive portions of the alluvial fans. Used findings to document the geologic and geomorphic history of the sites, including the role of active tectonics and climate change on fan processes. Provided oversight for hydrologic modeling of peak 100-year stormwater flows on active portions of fans.

Conducted soils and geologic investigations for construction of temporary and permanent flood control levees in the Whitewater River spreading grounds and in the central Coachella Valley, California. Performed field investigations, including field mapping, drilling, logging and sampling of soils along levee alignments. Participated in development of recommendations for temporary and permanent levee construction.

Project engineering geologist for flood control-related investigations and design of detention dam, pipeline, and open channels at the Sunrise Mountain landfill, Las Vegas, Nevada. Performed or directed geologic mapping, aerial photo interpretation, mapping and characterization of late Quaternary faulting and seismic sources, rock coring, down-hole packer testing, test pits, aggregate sampling, and logging of fault trenches. Participated in preparation of design geotechnical report and provided geologic input for design plans.

Project manager for the geotechnical investigation of the Agua Caliente Cultural Museum, near Palm Springs, California. Conducted boulder mapping, directed test pit excavations, conducted an in-situ load test for collapsible soil, and prepared a summary geotechnical report. Also conducted an investigation of the debris flow flood hazard using aerial photos and field mapping and provided recommendations for mitigation of the hazard. Participated in discussions of footing design options with the project architect and structural engineer.

Project manager for the Lowden Fire investigation, Lewiston, California. Managed a six-member team evaluating the geologic, hydrologic and ecologic effects of a 1999 wildfire. The project entailed aerial photo analysis, engineering geologic evaluation of slope stability and mass wasting issues, storm water runoff and sediment yield analysis, as well as evaluation of the intensity of the burn and the level of recovery from the fire.

Project manager for investigation of alleged wall distress and out-of-tolerance residential slab tilts at a 1,300-home residential development in Las Vegas, Nevada. These claims were investigated by combining field observations and manometer measurements with In-SAR remote sensing techniques, historical aerial photographs of the development, geologic mapping, and available construction plans and documents.

Observed and documented field load testing for collapsible soils, Hamaca Refinery, Venezuela. Also performed geologic field mapping, logged test pits and trenches, developed geologic maps and cross sections, and participated in construction of project database.

Served as geology representative from Exponent in EERI-sponsored visit to site of January 2001 (magnitude 7.7) Gujarat, India, earthquake. Conducted 10-day field reconnaissance in epicentral region with team of seismologists seeking evidence of coseismic ground rupture.

Observed CPT-LIF testing at the Kinder-Morgan Mission Valley tank farm, San Diego, California. Developed geologic cross sections derived from the CPT data and developed maps and cross sections depicting the subsurface distribution of hydrocarbons beneath the facility.

Performed visual inspections and destructive testing for single-family residences and apartment complexes at various locations in Fontana, Huntington Beach, Laguna Niguel, Santa Monica, Van Nuys and Hollister, California, to investigate claims of slab distress, moisture intrusion and/or earthquake damage.

Performed historic air photo analysis for the Ocean Trails Golf Course, Rancho Palos Verdes, California. Documented intersections of construction haul roads and buried sewer pipeline in area of major slope failure.

Directed an investigation of a potentially life-threatening landslide complex at Lukes Farm, Matahina Reservoir, New Zealand, and a reconnaissance slope stability hazard investigation along the Pacific Coast Highway from Santa Monica to Malibu, California.

Assisted in the development of an emergency response and remediation of a landslide threatening a residential development in Diamond Bar, California, and performed an emergency evaluation and geotechnical investigation of a landslide at the Getty Villa museum complex in Pacific Palisades, California.

Performed a variety of geotechnical site investigation activities, including logging bucket auger borings for a proposed dam near Graybull, Wyoming; mapping stream scour above a heated oil pipeline in Santa Barbara, California; directing a CPT investigation of a bridge crossing of the San Gabriel River in Pico Rivera, California; and investigating and developing cross sections for the proposed expansion of a flood control channel in San Clemente, California. The latter

included observing the installation of two slope inclinometers in large fill slopes along the banks of the channel.

Served as a project geologist during construction of The Getty Center museum complex in Brentwood, California, and is the geologist of record for the site's funicular tramway. Developed cross sections, performed computer-aided slope stability evaluations, and logged a combined total of more than 100 test pits, bucket auger borings, drilled pier shafts, drilled slope drains, mass grading cuts, and spread footing excavations at the museum site.

Directed the engineering geologic investigation for a 115-mile railway alignment on the Tongue River, Montana. The project called for the excavation of major cuts and fills in areas underlain by soft sedimentary rock, coal deposits and burned coal.

Performed construction observation tasks, including the documentation of an approximately 1,000-foot long retaining wall footing in Chino Hills, California, and observed the over-excavation for a water pump plant in San Diego, California. Performed geologic mapping in mass grading cuts at a landslide overexcavation in Diamond Bar, California.

Performed investigations of landslide-related problems for home sites in Malibu, California, and an apartment complex in El Sereno, California.

Investigated vibration issues at a condominium complex in Anaheim, California, and construction defects case for a condominium complex in Lemon Grove, California.

Performed geotechnical and seismic investigations for city agencies. These projects include the revision of seismic safety elements for the City of Monterey Park, California, and the City of West Hollywood, California, as well as the reconstruction of an elementary school in Glendale, California, and the development of a sports park for the City of Chino Hills, California. The latter project included the construction of three groundwater monitoring wells in an area of historically high groundwater.

Served as an instructor at Ranch Santiago Community College in Santa Ana, California, and as a teaching assistant at the California Institute of Technology in Pasadena, California.

### **Professional Affiliations**

- Geological Society of America (member)
- Association of Engineering Geologists (member)
- Seismological Society of America (member)