



SOUTHWEST RESEARCH INSTITUTE



# Natural Hazard Assessments

## Evaluation of Facility Design, Safety, and Risk

The Natural Hazards Program team at Southwest Research Institute® (SwRI®) has well-established technical expertise and extensive experience developing comprehensive and reliable assessments of the potential damage natural hazards pose to human health and facility safety. The SwRI team includes seismologists, geologists, geotechnical engineers, civil and structural engineers, environmental engineers, volcanologists, and hydrologists.

SwRI has a long history of performing successful field studies, safety evaluations, and environmental assessments for some of the most complex and contested facilities and activities, including

- Nuclear power plants
- Spent nuclear fuel storage and disposal sites
- Nuclear fuel fabrication facilities
- In situ uranium recovery operations
- Material decommissioning
- Federal rulemaking

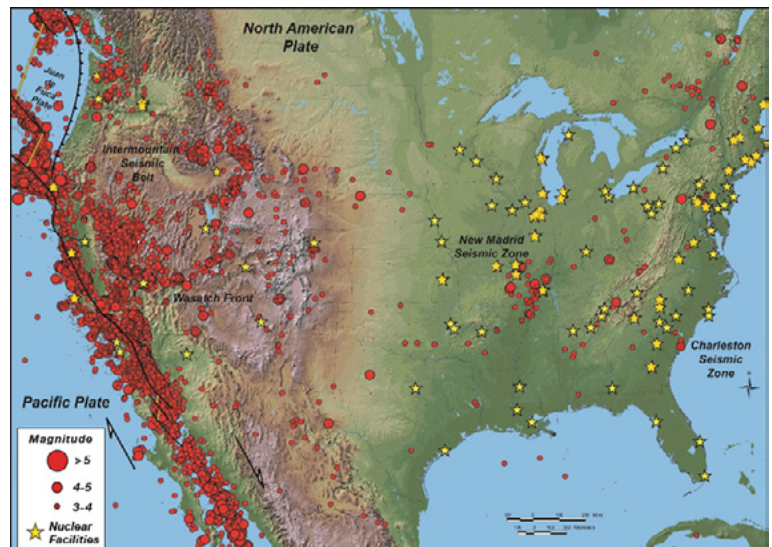
Our goal is to develop accurate and unbiased analyses that can be used to evaluate compliance with construction codes, environmental assessments, and safety regulations, as well as input to probabilistic risk analyses.

## Capabilities

- Site assessments and site characterization based on geological, geophysical, geotechnical, and meteorological studies
- Customized computer models
- Laboratory and field investigations
- Safety reviews, performance assessments, regulatory reviews, and probabilistic risk analyses
- Clearly written, technically defensible, and transparent reports and documents
- Expert testimony at hearings

## Hazard and Risk Assessments

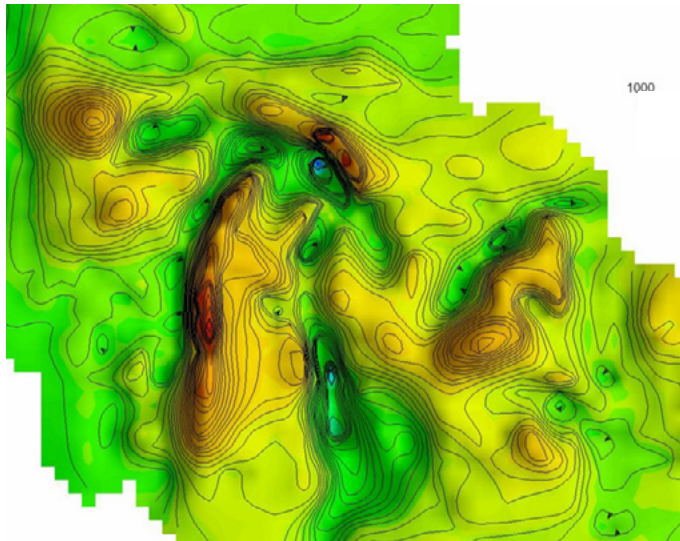
- Faulting and seismicity
- Earthquake-induced soil liquefaction
- Volcanism
- Flooding and extreme precipitation
- Dam failure
- Tsunamis
- High winds and tornado missiles



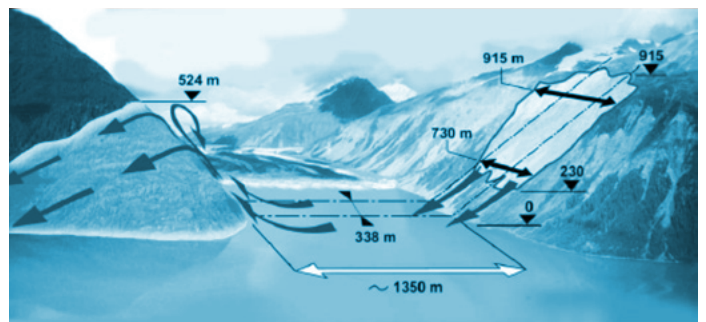
Seismicity map showing the location and magnitude of earthquakes in the contiguous United States (1965-2009) relative to NRC regulated nuclear facilities.

# Benefits of SwRI Support

- Rigorous screening for staff members and consultants to avoid conflict of interest
- Extensive knowledge of licensing projects within government agency regulatory frameworks
- Comprehensive understanding of diverse earth sciences, engineering, and probabilistic risk assessments
- High-quality unbiased and independent technical analyses
- Access to multidisciplinary technical experts and SwRI laboratories



Magnetic anomaly map of buried and faulted volcanic rocks near the Yucca Mountain nuclear waste repository site in Nevada. The anomaly map was produced from detailed surface measurements using a Cesium-Vapor magnetometer and high-resolution GPS. Identification of previously unknown igneous features were used to develop reliable probabilistic volcanic hazard models for the Yucca Mountain waste repository.



A magnitude 7.9 earthquake in Alaska triggered a massive rock fall and mega-tsunami in Lituya Bay, AK. SwRI developed a numerical model to simulate the rock fall, and calibrated the numerical model against a physical laboratory model. This numerical model provides predictive capabilities for potential future landslide-generated tsunamis.

## We welcome your inquiries.

For additional information, please contact:

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