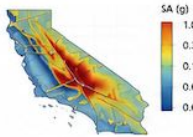




Computational Seismic Hazard Capabilities

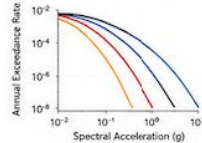
Integrated earthquake science. Community models. Open tools. **Reliable hazard information beyond available observations.**

Hazard Maps



Regional, continuous seismic hazard information for California

Hazard Curves



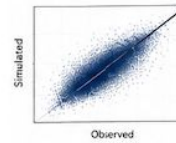
Site-specific probabilities of exceeding design shaking levels

Ground Motion Datasets



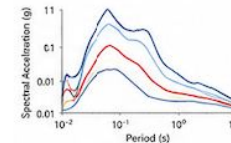
Large library of broadband simulated ground motions

Goodness of Fit



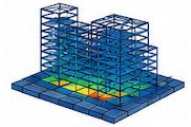
Quantitative assessments of simulation performance

Response Spectra



Site-specific response spectra for design and assessment

Building Response

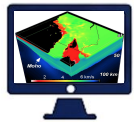


Inform structural response and performance

1

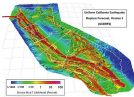
Model Earthquakes

To simulate future earthquakes from source to site effects



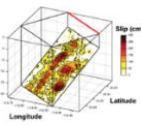
CEMs and Explorers

Community Earth Models (CEMs) describe California's faults, geology, and 3D Earth structure



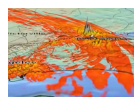
ERFs

Earthquake rupture forecasts (ERFs) covering all of California



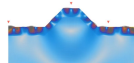
Rupture Generators

Realistic earthquake rupture scenarios for simulations



3D Wave Propagation

Simulate seismic waves through complex 3D Earth structure



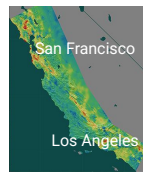
Site Effects Modules

Local site amplification and near-surface ground response

2

Simulate Ground Motions

To characterize future ground shaking from large earthquakes



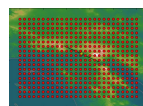
SCEC CyberShake

Regional 3D simulations using supercomputers to produce close to a billion seismograms that capture basin effects and ground-motion variability across entire fault systems



SCEC Broadband Platform

Generates site-specific, 1D broadband (0–20+ Hz) ground motions for historical and user-defined earthquake scenarios using multiple methods



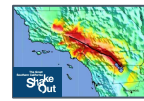
Simulation Datasets

A massive library of synthetic seismograms and simulation data representing millions of earthquake scenarios and realizations

3

Processing and Validation

To transform simulations into trusted community resources



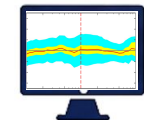
Ground Shaking Maps

Rapid ShakeMap-style visualization of simulated ground motions and intensity



Observational Data

Historical earthquake recordings and community datasets for validation



SCEC GMSV Toolkit

Generates standardized comparisons of simulations and observations using common engineering metrics



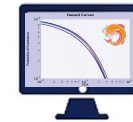
Scenarios & Benchmarks

Plausible California scenario earthquakes and benchmark datasets for validation

4

Hazard and Risk Analyses

To support engineering analysis, risk assessment, and design



OpenSHA

Computes site-specific probabilistic seismic hazard and disaggregation for engineering and risk analyses



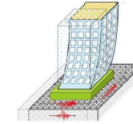
UGMS Data Access Tool

Provides site-specific MCER response spectra for the Los Angeles region per ASCE 7-16



Selected Ground Motions

Extracted, validated site-specific ground motions for engineering analysis and design



Building Insights

Simulation datasets prepared for response history analysis, PBEE, and collapse assessment

Collaborate with SCEC. Advance open science. Build earthquake resilience.



Academic, government, and industry partners



Open data, open-source code, and transparent documentation



Community standards and best practices



Training, education, and capacity building



Continuous improvement through feedback and innovation



How do you use ground motion simulations? Learn about the SCEC GM-SVU group.