SCEC4 Science Collaboration Planning

Greg Beroza (Co-Director)
SCEC Science Planning Cycle

- Science Plan Development (all summer)
- Proposals Due (11/7)
- Director Recommends to Agencies
- PC Review Meeting
- Proposals Reviewed (5 reviewers)
- Science Plan Finalized; RFP released (10/1)
- Annual Meeting
- Leadership Retreat (5/31-6/2)
- WE ARE HERE (9/6-10)
- Science Plan Input (9/6-10)
- Presentation to BoD
- WE ARE HERE
What’s New in the Collaboration Plan?

The Collaboration Plan is not greatly changed from last year.

There are a number of small changes and suggestions throughout the document.
What’s New in the Collaboration Plan?

An explicit call for simulations of ruptures such as those defined in UCERF3.
What’s New in the Collaboration Plan?

More detailed description of collaboration with the engineering community in validating ground motion simulations and physics-based PSHA.

InSAR-only and GPS-only geodetic models are now encouraged, particularly if they include a plan for assessing whether their results are in agreement or conflict with other data types.
What’s New in the Collaboration Plan?

A pathway for inclusion of operational transient detection algorithms into a testing framework.

A call for new approaches for assimilating real-time high-rate GPS, seismic data, and other potential observations into rapid source characterization.

A call by the Computational Science group for requests for allocations of resources, where appropriate.
What’s New in the Collaboration Plan?

A call to incorporate new data into the CVMs with validation for ground-motion prediction.

In several more attention to plasticity and its effect on rupture and wave propagation.

More emphasis on ground motion validation at high frequencies, for basin effects, and on the impact of distributed ground motions.
Comments/Suggestions?
SCEC4 Community Models

Community Stress Model

Community Geodetic Model

Community Velocity Models

Community Fault Model
Technical Activity Groups (TAGs)

Develop and test critical methods for solving specific forward and inverse problems.

Dynamic Rupture Code Verification
Aseismic Transient Detection
Source Inversion Validation
Earthquake Simulators
Ground Motion Simulation Validation
Earthquake Response Planning

From: ens@ens.usgs.gov (USGS ENS)
Subject: 2015-08-15 01:07:32 (M7.6) SOUTHERN CALIFORNIA 64.6-17.5 (1e5c8)
Date: August 18, 2015 at 6:19:40 PM PDT
To: beroza@stanford.edu
Reply-To: <ens@ens.usgs.gov>

### M7.6 - SOUTHERN CALIFORNIA

#### Preliminary Earthquake Report

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<td>Depth</td>
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www.iris.edu/hq/wavefields
SCEC4 Special Fault Study Areas

Integrated, multi-disciplinary projects focused on areas of complex fault behavior. Involve coordinated teams of researchers with diverse expertise.

Are we going to get to where we need to be?
San Gorgonio Pass – Special Fault Study Area

What is probability of a through-going San Andreas rupture?

• What is the earthquake potential in the San Gorgonio Pass?

• What is the subsurface geometry of active faulting through the San Gorgonio Pass?

June 2012 workshop – 35 participants
Sept 2014 workshop – 55 participants
Status of the Ventura SFSA

- Dolan et al. and Rockwell document large (5-6 m) coseismic uplift across Ventura-Pitas Point fault.
- Geodesy shows high localized shortening rates across Ventura Basin. Vertical geodetic data (InSAR, leveling, GPS, tide gauge) are being analyzed for uplift signals.
- Regional crustal deformation models are establishing distribution of slip throughout western Transverse Ranges.
- Earthquake catalogs are being refined. Stress drop estimates suggest uniform, low ~1 MPa events.
- Searching for evidence for paleotsunamis. Sims et al. find high-energy deposits at Carpinteria Slough.
- Acquiring and reprocessing off-shore seismic reflection data to image fault and sedimentary growth structure.
- Tsunami and dynamic rupture modeling is underway. Preliminary models suggest bathymetry is primary control on path.