SCEC Advisory Council Recommendations

Palm Springs, California

16 September 2015

Gail Atkinson, AC Chair

Western University, London ON

SCEC Advisory Council Membership

- **Gail Atkinson, Chair (*Western University*)**
  - **Email: gmatkinson@aol.com**
- **Norm Abrahamson (*Pacific Gas and Electric*)**
- **Roger Bilham (*University of Colorado)***
- **Donna Eberhart-Phillips** (*UC Davis*)
- **Kate Long (*California Office of Emergency Services*)**
- **Warner Marzocchi (*INGV, Rome*)**
- **M. Meghan Miller** (*UNAVCO*)
- **Farzad Naeim* (Farzad Naeim Inc.)**
- **Tim Sellnow (*University of Kentucky*)**
- **John Vidale (*University of Washington*)**
- **Andrew Whittaker*** (*University of Buffalo*)

* (not present at meeting)

AC overall impressions

- **Over its 25 year history, SCEC has become the world's most effective, sustained and cohesive collaboration of earthquake scientists, dedicated to understanding the physics behind earthquake hazards at all scales, and addressing their impacts on society.**
- **SCEC is a model of the benefits of collaboration: the whole is greater than the sum of its parts – all the more remarkable because the SCEC parts represent a stunning breadth of expertise.**
- **SCEC displays consistently cutting-edge science, making major inroads in understanding earthquake faulting processes and their implications for ground motions.**
- **SCEC's earthquake engineering interactions represent a major SCEC4 accomplishment that provides a compelling rationale for support of SCEC5.**

2015 Advisory Committee focus

- Assessment of SCEC4 activities
- CEO Advisory Structure and Goals
- Other comments: leadership and major SCEC initiatives
- The SCEC5 proposal

Highlights of Progress on SCEC4 (1)

On target for successful completion of SCEC4. Notable areas of success this year:

1. **The apparent deficit in slip on many faults in southern California has important implications for hazard, and these questions will extend into SCEC5.**

2. **The novel combination of GPS and InSAR data are providing a better understanding of locked versus creeping sections of faults and how they interact.**

3. **Earthquake simulators are demonstrating their potential, for instance in describing earthquake clustering at different time scales – the short time scale typical for aftershocks, and a longer time modulation that may potentially explain the clustering observed in paleoseismic trenches, and the so-called open interval problem in California seismicity.**

Highlights of Progress on SCEC4 (2)

4. Excellent progress has been made in the last 2 years in the flourishing Special Fault Study Areas (SFSA). On track to successfully complete this SCEC4 component in 2016, with evaluation of the probabilities of a suite of plausible rupture scenarios in the 2 SFSAs.

5. Work on dynamic rupture models moves the ground motion simulation problem from kinematic models to more fundamental physical behavior of faults and ruptures. Validation of the dynamic rupture models against ground motion data should be a focus in the final year of SCEC4.

Highlights of Progress on SCEC4 (3)

6. Significant accomplishments in SCEC4 have been made in extending physics-based models of ground motion to higher frequencies. These developments hold the promise of allowing reduced epistemic uncertainty in prediction of ground motions for future large events, which has tremendous practical significance in earthquake engineering. Engagement with earthquake engineers is a major accomplishment in SCEC4.

7. Validation of simulations on BBP a major SCEC4 achievement. How much better are the constraints than just using the empirical models? For the last year of SCEC4, it may be useful to try to evaluate how much of the current kinematic model are controlled by physics and how much is controlled by empirical calibration.

CEO Activities

- **The already-remarkable SCEC CEO program continues to impress and expand in scope.**
- **The CEO planning committee structure is sound and will facilitate this critical and highly-successful area of activity.**
- **An external review has been conducted of CEO activities of SCEC4 and offers useful recommendations.**

Other comments

- Revised leadership model effectively addresses the immediate challenges in finding a new SCEC director, and sets the stage for a successful leadership succession; AC welcomes the new leadership strategy.
- Congratulations on the success of the major SCEC initiatives and their diversified funding; these are essential and important components of the SCEC program that set the stage for a successful SCEC5.
- The special initiatives have transformative potential to take a comprehensive physics-based approach to earthquake processes all the way through to hazard assessment – the results of this may truly change the way we view hazard and its mitigation.

Plans for SCEC5

- The prospects for SCEC5 are very exciting.

- SCEC leadership has shared a draft SCEC5 proposal with the AC and we have provided feedback.

- The AC is very impressed with the SCEC5 proposal – we appreciate the high level of involvement of the SCEC community in preparing this inspiring roadmap.

Thanks to the entire SCEC team for another great meeting!

See you next year

At SCEC5