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Dec. 15, 2013

Dr. William Leith
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12201 Sunrise Valley Drive
Reston, VA 20192

Dear Bill,

I wanted to provide a summary of SESAC's recommendations and thoughts following the November 6, 7 meeting held at Stanford University. These recommendations will be included in our report to the Director of the USGS and Congress as part of an annual report by SESAC. The content of this report has been through several iterations by SESAC and represents a consensus view. As always I am available for any subsequent discussions or clarifications.

With warm regards,

Ralph J. Archuleta
Professor of Earth Science

cc: Members, Scientific Earthquake Studies Advisory Committee
David Applegate, Associate Director, Natural Hazards

SESAC Meeting Report November 6, 7, 2013, Stanford University, Stanford, CA

SESAC held its semi-annual meeting at Stanford University on November 6, 7, 2013. Appendix A provides the agenda.

All members of SESAC (see Appendix B) were present with Jeff Freymueller attending via a conference call. USGS personnel in attendance were Bill Leith, Mike Blanpied, Jill McCarthy, Keith Knudsen, and Chuck Mueller with Elizabeth Lemersal and Cecily Wolfe on line. Others from the USGS attended in person or via a conference call. John Anderson, University of Nevada, Reno, chair of the National Seismic Hazard And Risk Assessment Steering Committee, attended the first day.

After a full day of reports including a superb synopsis of the exciting research being done at the USGS rock mechanics labs at Menlo Park including information about a NSF proposal DEFORM, SESAC discussed the topics on the agenda.

SESAC approved the formation of the National Seismic Hazard And Risk Assessment Steering Committee (NSHRASC), its charter and its inclusion as a subcommittee of SESAC. There were some edits to the charter membership but otherwise the charter was approved. The chair of the NSHRASC will be a member of SESAC.

Sequestration

A primary concern of SESAC is the on-going effects of sequestration. SESAC thinks that no further cuts to the external grants activity (research in response to the annual RFP) should be made as a response to sequestration. Further cuts to projects should come from those that had a lesser percentage cut than the external grants. With sequestration the USGS will have to make decisions for the Earthquake Hazards Program (EHP). SESAC also recommends that a 50-50 balance be enforced for the expenditure of funds between those for monitoring and those for the combination of hazard assessment and research. This percentage has changed over time from a 40-60 ratio (monitoring/ hazard assessment plus research) to what is now nearly 50-50. Balance in the program is essential for the health of the EHP.

Earthquake Early Warning

Support of earthquake early warning (EEW) is an area where the EHP is caught in a dilemma. On one hand it is a highly visible project, which has been supported by the USGS, and has the attention of the public as well as state and federal representatives. In essence, EEW should be a product of a thoroughly developed Advanced National Seismic System (ANSS) and USGS should play an important role in monitoring and issuing formal warnings.

However, the backbone of EEW is the network of instruments in the field and the data collection systems, only part of which are currently owned and operated by the USGS. In addition, almost all of the development of the early warning systems now comes from private funding to three external institutions: California Institute of Technology, University of California, Berkeley, and the University of Washington. Implementing EEW, even in a limited area, such as southern California, would be an unfunded program that would significantly over-extend current USGS resources. In the long-term, it is essential that USGS remain involved in the development, operation and eventual oversight of EEW, but new funding must be sought for this effort. In the

meantime, with no additional funding in the core USGS budget, coupled with sequestration, USGS is encouraged to remain involved in planning and development efforts, but SESAC cannot endorse any significant new USGS expenditures on operational EEW.

SESAC recommends that the USGS put EEW as a line item, similar to the Global Seismic Network (GSN), into the Department of Interior budget. It is simply not possible to think of EEW as a minor perturbation to the EHP that could be properly addressed by a slight shifting of the overall priorities of the EHP. The cost of EEW requires a major influx of additional funds to the USGS EHP. Otherwise the USGS EHP will suffer irreversible harm.

Induced Seismicity and National Seismic Hazard Maps

SESAC endorses the USGS decision to present the hazard represented by induced seismicity as a separate map in conjunction with the national seismic hazard maps. The national seismic hazard maps should be prepared with the best possible knowledge of natural earthquake hazards. The specific effects of induced seismicity can be quantified as an additional map, possibly an overlay of the primary maps. This may become the approach used for time-dependent hazard. The method of treating induced seismicity and time-dependent hazard and their inclusion is a subject to be considered by the newly constituted National Seismic Hazard And Risk Assessment Steering Committee.

Furloughs

SESAC opines that the USGS should consider furloughs as a means of absorbing the sequestration-induced budget cuts. So long as the EHP continues to fulfill its workload as if the budget cuts can be absorbed, the message to the DOI, OMB, and Congress is that the budget is sufficient.

Long-term sustainability of the USGS EHP

It is clear that even if the President's budget for 2014 were approved, the scope of the EHP requires a new paradigm for funding. Without significant increases in funding, elements critical to the mission of the EHP will have to be eliminated and new initiatives such as EEW, monitoring and analysis of induced seismicity, earthquake hazards in the eastern US cannot be launched. Moreover, the highly successful alliance with the Mendenhall Postdoctoral Researchers, which brings highly motivated and highly talented researchers into the EHP, will be so marginalized that it will fail to attract the personnel needed for a vigorous future. Without maintaining its core programs in monitoring, research and hazard assessment and without launching new critical initiatives, the EHP will stagnate. The budget for EHP is woefully insufficient. If the base budget is going to increase by only a percent or two per year (in the years it does not decrease), then the EHP must look to a different paradigm for funding elements necessary for successfully satisfying the goals of its mission. SESAC would be willing to work with EHP management to explore ways to develop such a paradigm.

SESAC Committee 2013

Professor Ralph Archuleta, Chair, University of California, Santa Barbara, CA
Professor Greg Beroza, Chair of ANSS, Stanford University, Stanford, CA
Professor Jeff Freymueller, University of Alaska, Fairbanks, AK
Ms. Julie Furr, Professional Engineer, Chad Stewart and Associates Engineering, Inc., Lakeland, TN
Dr. John Parrish, California State Geologist, Sacramento, CA
Professor Christine Powell, Center for Earthquake Research and Information, University of Memphis, TN
Professor Emeritus Terry Tullis, Chair of CEPEC, Brown University, Providence, RI
Dr. David Simpson, President IRIS, Washington DC

Scientific Earthquake Studies Advisory Committee (SESAC)

November 6-7, 2013

Stanford and USGS Menlo Park, CA

AGENDA with topic introductions

Nov. 6th Green Earth Sciences Building, Room 361

8:30 Meet-n-greet

8:45 Introductions, Agenda, SESAC business (Archuleta)

9:00 Program overview and sequestration (Leith)

As discussed in the last meeting, the EHP budget has decreased 11% since 2010 (-$6.27M). We face another possible-to-likely ~3% reduction in FY 2014. In this and the subsequent presentation, we will report on the impacts of sequestration in 2013 and how we expect to handle another in 2014. SESAC should comment on how this challenge is being managed and advise on priorities, both high and low, within the Program.

10:00 Science Center State-of-Health reports (Brocher, McCarthy)

10:45 Break

11:00 NEPEC Report (Tullis)

Report from the NEPEC, which will have met the previous two days and considered, in particular, whether it's recommendation from 2004 still stands, to continue monitoring and research at Parkfield through a full earthquake cycle, both in light of Program-wide budget cuts and other opportunities/priorities that have arisen in the past decade.

11:30 Nat. Seis. Hazard Map Steering Committee Report (Anderson, Mueller)

The ad hoc steering committee for the National Seismic Hazard Mapping project will be formalized as a subcommittee of the SESAC (like the ANSS Steering Committee). The committee worked intensively this year in support of finalizing updates to the maps, and its Chair will report on the issues involved in that update and on future considerations.

12:00 Induced Seismicity (Leith and others)

Induced seismicity monitoring and research continues as a significant and visible effort within the Program, which has redirected funds over the past two years to support it. Several significant papers have been published or are in review currently, and some key grants have been funded. A new field effort has begun at the carbon sequestration site in Decatur, IL.

12:30 Lunch - bring in

13:00 ANSS Steering Committee Report (Beroza)

The ANSS Steering committee has been reenergized; the Chair will report on its recent deliberations (see letter read-ahead). Several key programmatic issues fall under the purview of the committee, including earthquake early warning, portable instrument capabilities, replacing aging equipment and integrating GPS into network operations.

13:30 Earthquake Early Warning (Given or Leith)

The cities of L.A. and Long Beach have funded an expansion of the SCSN using DHS (UASI) funding; the build-out plan includes expanded real-time GPS as well. The California Governor has signed into law a bill that directs CalOES to implement a system and to identify the funding to do so. Moore Foundation funding for R&D ends in Dec. 2014. The program must decide whether to continue EEW development in the face of budget cuts.

14:00 Projects and plans in the rock physics & friction labs (Beeler, Lockner)

The SESAC has called for a review of the rock physics labs and research. The EHP supports a modest but very active program in this area, with several talented early-career researchers and two unique labs, one containing a variety of equipment for testing rock friction, failure, and permeability, the other featuring a 2-meter "big block" earthquake simulation apparatus.

14:40 Earthquake seismology in laboratory experiments (McLaskey)

15:00 DEFORM and discussion (Tullis and all)

DEFORM proposes increased resources for rock labs nationally, to “build infrastructure to support collaborations, foster efforts to educate a greater number of students…, build the next generation of experimental apparatus, and provide opportunities for early-career scientists and users of experimental rock deformation data to visit state-of-the-art labs and conduct experiments”. What is the appropriate USGS role in this effort?

15:30 Break and transit to Menlo Park

16:00 Rock Labs Tour (Lockner, Beeler, Kilgore, Moore, McLaskey, Morrow, Gray)

18:00 Adjourn

19:00 Group dinner - Rangoon Ruby (Burmese food, Palo Alto)

Nov. 7th Green Earth Sciences Building, Room 361

8:30 Open Discussion

9:30 Break

9:45 Executive Session

12:00 Adjourn

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