

Via e-mail

INFORMAL COMMUNICATION

To: Larry Salomone
From: Walter Arabasz and Carl Stepp
Date: February 23, 2011
Subject: PPRP Feedback on CEUS SSC Working Meeting #9

This note provides some written feedback from the PPRP on CEUS SSC Working Meeting #9, held at EPRI Headquarters in Palo Alto, California, on February 7–8, 2011. It summarizes PPRP comments made at the end of the working meeting and adds some additional perspective.

General Comments

Based on the TI Team discussions, the PPRP was very encouraged that its major comments on the initial draft of the CEUS SSC report were being addressed in an appropriate manner. We commend the TI Team for taking the time to revise and enhance the earthquake catalog being used for this project. The PPRP anticipates that this catalog will represent a major advance forward for the technical community. The PPRP is also encouraged that the TI Team is working toward closure on addressing our comments related to *b*-value, the approach and method for smoothing and earthquake-recurrence assessment, and the derivation of maximum magnitudes.

Based on collective experience from the August–September 2010 review cycle of the CEUS SSC Draft Report, the PPRP urges the TI Team to be fully satisfied with the results and documentation for the next iteration of the Project report before releasing it for review. We expect that what we receive for review in the next cycle will have been carefully vetted, including careful attention to any significant discrepancies between model predictions and observed historical seismicity (for example, cases such as the area of St. Paul, Minnesota, in the July 2010, draft report).

We are pleased to learn that progress is being made on planning and arrangements for the Project's Public Website. The simultaneous activation of the Public Website with the release of the CEUS SSC Technical Report, scheduled for December 31, 2011 (*Revised CEUS SSC Schedule, 2/22/11*) will be greatly helpful to meet user needs.

Reminder Regarding Methods with a Weight of 1.0 and SSHAC Guidance

After listening to a detailed description of the Penalized Likelihood Approach, the PPRP calls the TI Team's attention to an attachment included in the PPRP's Informal Communication of October 13, 2010, in which we distilled our major concerns on the July 31, 2010, draft report. The attachment was labeled, *PPRP Commentary on New Methods (or Other Methods) with a Weight of 1.0 and SSHAC Guidance*. Replacing a range of alternative approaches used in the community with a single approach places a significant burden on the TI Team to show that SSHAC guidance is being met.

Approach to Smoothed Seismicity

The Penalized Likelihood Approach has evolved sufficiently to be accepted by the TI Team as the tool of choice for assessing the spatial variation of earthquake recurrence rate and b -value. Nevertheless, the influence of factors such as spatial incompleteness remains incompletely understood. Thus, while the Smoothing Model is a powerful tool, it seems prudent in assessing the spatial variation of earthquake recurrence to incorporate considerations of variations in tectonic histories and properties of the seismic sources to complete the TI Team's assessments. In other words, guidance by physical and tectonic insights is desirable.

The approach of establishing an initial b -value using the seismicity of the CEUS Model Region appears to be solid. We encourage the TI Team to consider discussing with a few selected seismologists their views on the variation in b -value as part of reviewing the smoothness of b -value maps and decisions by the TI Team related to the final sets of weights for smoothing parameters.

The TI Team has a number of difficult decisions to make in the very near future regarding recurrence assessment and especially the smoothing parameters. Although objective specification of these parameters is being considered, it appears likely from the presentations at the meeting that "analyst-specified" parameters will significantly influence the selection procedure. Accordingly, it is important for the purposes of developing a consensus among the TI team on these parameters—and for transparency in the decision process for the end user—that specific criteria be defined and used in the parameter-selection process so that the finally specified parameters be as objective as possible. We encourage vigorous internal interactions among the TI Team before the smoothing parameters are finalized.

Initial Branch of the Logic Tree

One issue that was not discussed in detail at Working Meeting #9 relates to the logic-tree weights applied to the initial branch in the logic tree—namely, maximum-magnitude zonation versus seismotectonic zonation. The tables that the TI Team described using the criteria for the definition of zonation will improve the basis for TI Team decisions. Having said this, the TI Team is encouraged to review all relevant information and data as part of developing its final set of weights for the initial branch of the logic tree. Without having seen sensitivity results on this weighting, we assume that the relative weights may be important in the overall determination of hazard. In any case, the weights need to be well justified, and their justification will be carefully reviewed by the PPRP.

Importance and Usefulness of Early Information to the PPRP

It was clear from the working meeting that closing on the earthquake catalog, finalizing and implementing the maximum-magnitude approach, and executing the final smoothing and recurrence calculations are on the critical path to completing Chapters 3 and 5—and ultimately completing the hazard calculations for the seven test sites. While the June 2011 Project Briefing will provide the opportunity to evaluate where the project stands, final versions of Chapters 3, 5, and 8 will not be available before that briefing. Given this, the PPRP encourages the project and TI Team to provide as much pertinent material to the PPRP before that briefing. Such material could include electronic versions of the earthquake catalog, final intensity and

magnitude-conversion relationships, the final prior distribution being used to derive maximum magnitude distributions, a table displaying the final weighted maximum magnitudes for each of the seismic sources, a set of smoothing maps for each of the sources, and the final logic tree with weights.

The Stakeholder Briefing that was held February 9–10, 2011 (following Working Meeting #9) reinforced the expectation by the Project Sponsors that the PPRP stay engaged with the TI Team, as the team makes key decisions, so that the PPRP can efficiently perform their participatory review and potentially prevent delays in finalizing the CEUS SSC Model. Keeping the PPRP aware in a timely way concerning the specifics on completion of activities 8 (final smoothing), 9 (implementation of weights and conversions to hazard), and 10 (documentation of responses to comments on chapters 3, 5, and 8)—which are all to be completed well before the next scheduled Project Briefing in June 2011—will be important for arriving at that milestone with confidence in PPRP endorsement.

If you need more information or clarification, please contact either of us.

For the PPRP,

Walter J. Arabasz
Tel: 801-581-7410
arabasz@seis.utah.edu

J. Carl Stepp
Tel: 830-833-5446
cstepp@moment.net

Copy: PPRP Members