The Value of CSEP for NEPEC

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National Earthquake Prediction Evaluation Council (NEPEC)

0 Purpose is to provide advice and recommendations to the Director of the U.S. Geological Survey (USGS) on earthquake predictions and related scientific research

0 The Director of the USGS has the delegated responsibility under the Stafford Act (P.L. 93-288) to issue timely warnings of potential geologic disasters

0 Our website is http://earthquake.usgs.gov/aboutus/nepec/

0 We have 8-12 members
  0 Fewer than half can be federal employees
  0 The Chair cannot be a USGS employee
NEPEC’s Official Statement on CSEP

At the request of the USGS Earthquake Hazards Program, NEPEC evaluated CSEP at a meeting held on September 10, 2008.

Specifically, NEPEC was asked to comment on:

- Whether the CSEP approach is important and worthwhile
- Whether its current approach and capabilities are useful for NEPEC and USGS
- What capabilities should be added to CSEP
- Whether it would be appropriate for USGS to provide financial support to the SCEC testing center

NEPEC was briefed on CSEP’s current capabilities and future plans:

- Tom Jordan, Director of SCEC
- Danijel Schorlemmer, CSEP’s science lead at the SCEC testing center.
NEPEC’s Official Statement on CSEP

NEPEC’s recommendations as of May, 2009, provided in more detail below, are that:

1. CSEP is an important research activity that is relevant to the Stafford Act responsibility of the Director of the USGS to provide Federal guidance on earthquake predictions

2. USGS should play a part in supporting the future operation of the CSEP testing center at USC
NEPEC’s Official Statement on CSEP

NEPEC finds the CSEP concept and approach to be very worthwhile. It:

- Establishes an unbiased framework to evaluate prediction methods
- Enforces strict adherence to the scientific method
- Motivates investigators to accurately and unambiguously express prediction hypotheses
- Provides guidance and tools on formal testing of those hypotheses

These features should lead to progress in evaluating seismicity-based models.

Even for prediction methods that are not currently testable by CSEP, the collaboratory:

- Demonstrates a proper approach
- Illustrates the need for, and benefits of, rigor and patience

Additionally, CSEP is commended for taking leadership in organizing an international effort to address this important and difficult topic at the broadest scale possible.
NEPEC’s Official Statement on CSEP

0 The current CSEP activities focus on comparative testing of prediction methods based on seismicity and fault information that provide probabilistic predictions of moderate magnitude earthquakes on a geographic grid.

0 This approach is optimized:
   - To achieve useful statistics in a short time.
   - To advance the research field by providing insights into the predictability of earthquakes.

0 CSEP is currently of limited direct use to NEPEC and the USGS:
   - Earthquakes that pose a risk to the nation are larger.
   - Predictions are often posed in a variety of ways that cannot currently be evaluated by CSEP.
NEPEC’s Official Statement on CSEP

0 The usefulness of CSEP to USGS would be significantly increased with the added capability to
   0 Evaluate alarm-based predictions
   0 For larger earthquake magnitudes

0 Often, USGS is faced with the need to quickly comment on a prediction or emerging situation, without the time or ability to gain insight from a prolonged prospective test

0 There is a continuing unmet need to develop a suite of basic tools and reference models to rapidly establish a framework to put earthquake predictions into context
NEPEC’s Official Statement on CSEP

0 CSEP has developed procedures and safeguards that protect the intellectual property of investigators
  0 There are issues of ownership, availability of results, and publication of findings, that deserve continued discussion so that prediction researchers have the knowledge and comfort to submit their prediction methods for testing by CSEP

0 NEPEC believes that it appropriate that USGS play a part in supporting CSEP
  0 It is unlikely that the USGS can provide sole support at the level needed to sustain this effort
  0 SCEC should consider additional sources as well

0 USGS researchers interested in earthquake occurrence, statistics, forecasting and prediction should be encouraged to collaborate with CSEP
What has Changed in NEPEC’s View?

- We are in agreement with what was said 3 years ago.
- We recognize and are grateful for the many advances made by CSEP since our last formal review, many that are responsive to our concerns.
- Operational Earthquake Forecasting that is being planned for by the USGS in collaboration with CSEP would have a large impact on the role of NEPEC.
  - It could remove much of the role of NEPEC and the Director of the USGS in evaluating and pronouncing on earthquake predictions.
- If done well, this should benefit everyone.
- Consequently, NEPEC plans to be involved in understanding the ongoing planning and make recommendations to the Director.