

# **IASPEI Commission on Seismological Observation and Interpretation (CoSOI)**

## **Reports from working groups for the period September 2003 to March 2004**

### **Work group on reference events**

Members: Eric R. Engdahl, Paul G. Richards  
Chairman: Paul G. Richards

Bob Engdahl and Paul Richards co-chair this group, which has the task of building up the number of seismic sources whose location is accurately known. Such reference events can be used for a variety of purposes, of which probably the most important is calibration of travel times for the stations that detect these events. Calibrated stations can be expected to result in improved location estimates for all seismic sources detected at the stations.

The process of building up reference events around the world, together with data sets of the associated signals from these events at stations it is desirable to calibrate, is likely to be a task that will take several years and maybe even decades. This is not a flashy project, expected to reach quick conclusions, but rather a project that must be established in a way that a broad community will come to recognize. Therefore, we need to develop a practical framework in which the activity can grow steadily.

An essential activity of the working group, will be to inform the many seismologists who are potential beneficiaries of more accurate event locations, of the fact that current routine location estimates are commonly much more inaccurate than many users suppose.

The working group so far consists only of the co-chairs, who have discussed an arrangement in which the work of soliciting reference events may need to be separated from the work of assessing the quality of reference events that may be submitted in response to the solicitation. The co-chairs have a draft plan in which they will add members to the working group, choosing individuals who play a leading role in station operations and the preparation of seismicity bulletins for regions of major seismicity. An invitation to membership will also be an invitation to contribute reference events for a particular region. Once a number of members have been added who contribute reference events, the working group will acquire the credibility and momentum needed to make a wider solicitation of more reference events from the broad community of seismologists who can potentially make a contribution.

The co-chairs are working on a draft set of guidelines for what types of data and data analysis can successfully be used to develop reference events, and what types of data from the reference events are most useful at the stations which these events may help to calibrate.

The next two steps are for the co-chairs to finalize the draft guidelines, and to send out invitations to membership in the working group.

## **Work group on Magnitudes**

Members:

Peter Bormann, Jim Dewey, Peter Firbas, Soren Gregersen, Alexander Gusev, Jens Havskov (ex officio member), Won-Young Kim, Klaus Klinge, Howard Patton, Bruce Presgrave, Liu Ruifeng, Bob Uhrhammer, Karl Veith.

Chairman: Jim Dewey

### **A. Overall purposes of magnitude WG**

The purpose of our WG is to provide standards for making measurements from digital data to be used in calculating earthquake magnitudes. We are proposing standards for  $M_L$ ,  $M_S$ ,  $m_b$ ,  $m_B$ ,  $M_W$  and  $m_b(L_g)$ . Ideally we would wish a system of standardization that produces magnitudes that are unbiased with respect to magnitudes of the same type that are measured from traditional analog seismograms, that removes procedure-dependent network biases from cataloged earthquake magnitudes, that minimizes the number of seismological networks whose current procedures are judged “non-standard,” and that allows seismologists to take optimum advantage of digital data. The idealized objectives are in detail mutually exclusive, and our challenge is how best to make compromises so as to come close to the idealized objectives.

### **B. Goals completed or partially completed**

1. We have reached WG consensus on the broad characteristics of standard procedures for each magnitude, and presented the WG consensus to the seismological community at the Sapporo IUGG.
2. We are revising a draft of a paper that provides an overview of specific formulas, instrument responses, measurement time- and period- windows, etc., for the standard procedures, and that we intend to submit to Seismological Research Letters (SRL).

### **C. Goals to be reached by January 2005**

1. Prepare a longer, electronic, version of the SRL document that justifies selection of some formulas as standards instead of others, that gives recipes for the filters that produce the standard instrument responses, that provides examples of acceptable alternatives to the standard procedures, and that in general supplies details that must be left out of a SRL overview paper but that must be known in order for others to implement the standard procedures.
2. Prepare a set of digital test-data that may be accessed on-line and used to test seismological centers' implementation of the proposed standard procedures.
3. Submit to SRL the overview of WG-proposed standard procedures.

## **Work group on seismological archives**

Membership: RMW Musson, Johannes Schweitzer, Josep Batllo

Chairman: RMW Musson

To date, the Working Group has taken the list of seismic stations and their operational periods from the IASPEI Handbook and subjected it to a review, extending it with additional stations and in some cases improving the date ranges. The result of this process is a working file, existing as a spreadsheet, which will form the basis of the WG's activities. This file has a cell for each station-year of operation, which can be filled in to record the survival or non-survival of bulletins/seismograms.

A web site for the WG has been established. The address is [http://quakes.nmh.ac.uk/iaspei\\_wg.htm](http://quakes.nmh.ac.uk/iaspei_wg.htm). From this site it is possible to download a copy of the working file. As a result of the announcement of the WG's activities in the IASPEI Circular, a number of people have come forward to offer assistance, and the WG also has communication to some allied projects, notably the SSA's Archive Committee.

The pressing need is to establish contact with people with responsibility for, or knowledge about, existing archives in as many parts of the world as possible; otherwise we will encounter gaps in the final survey. This is the immediate priority for the next few months.