



NEtwork of Research Infrastructures for European Seismology

Deliverable D11
Long-term implementation plan and vision of the
European “Archive of Historical EArthquake Data”
(AHEAD)
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Activity:	Distributed Archive of Historical Earthquake Data
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Deliverable:	Long-term implementation plan and vision of the European “Archive of Historical EArthquake Data” (AHEAD)
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State-of-the-art

The main goal of the NA4 module “Distributed Archive or Historical Earthquake Data” of the EU NERIES project was to establish and implement an Archive of Historical Earthquake Data (AHEAD), with special reference to the background data (studies, macroseismic data points, etc.). The situation at the beginning of the project was described in the Dow:

“Intensity data in Europe are still collected and archived in isolation by many of the seismological observatories, with varying criteria and degrees of commitment. Only few countries (Italy, France, and Switzerland) have a consistent, available set of historical earthquake data, interpreted in terms of macroseismic intensity data points (IDP). In other areas, scattered data are available on paper, though the coordinates of the data points are not easily obtainable and the place-names are missing in many cases”.

Having in mind that NA4 had five partners (INGV, Italy; ETH, Switzerland; ITSAK, Greece; BGS, Great Britain and IGC, Spain), that some of them managed to get collaboration from a few more countries, and that the main time-window was 1000-1900, the situation at the end of the fourth year can be summarised as following:

- a) local archives, already established, implemented and made available through the internet in Italy, Switzerland, France, have been established at IGC (Catalunya), IGN (Spain), ITSAK and NKUA (Greece) and BGS (Great Britain), by making use of a software developed in the frame of NA4;
- b) the central archive is well established and runs by means of a software developed in the frame of NA4, too. An inventory is updated on a regular basis with the contribution of a number of selected investigators. Earthquake studies are collected, stored and made available taking care of the copyright issues. Macroseismic Data Points (MDPs) are collected, homogenised and made available through the internet;
- c) the NA4 European Earthquake Catalogue has been compiled for the events with $M > 5.8$. A wide campaign of calibration, on a regional basis, of three methods for determining earthquake parameters from MDPs has been performed with reference to the main five areas corresponding to the NA4 partners. Results have been applied to historical events.

Summarising, at the end of the fourth year (May 2010) NA4 has made available:

- a) local archives, consisting of earthquake studies and MDPs;
- b) a central archive 1000-1900, consisting of the inventory and the archive fake earthquakes (D1, D2, D6) and the European Macroseismic Database (EMD; D4, D7, D9);
- c) tools for determining earthquake parameters from MDPs (including the one developed in the frame of NA4, D3), with regional calibrations;
- d) a European Earthquake Catalogue 1000-1963 ($M > 5.8$), with earthquake parameters homogeneously determined (D5, D8, D10);
- e) software tailored for managing items a), b), c) and d).

What is lacking is:

- f) establishment of new local archives;
- g) expansion of AHEAD to the full time-window after 1900, including the events with $M \leq 5.8$;
- h) compilation of the EEC for the full time-window after 1000, including the events with $M \leq 5.8$;

Item h) will be obtained in the frame of the EU project SHARE, which includes a task devoted to the compilation of a consensus European-Mediterranean Earthquake Catalogue (current deadline November 2010). However, the NA4 approach is being adopted for the time-window 1000-1900 only.

2. Long-term vision

The establishment of the AHEAD, with its local and central units, provides a powerful, living and authoritative tool towards the full exploitation of the historical and macroseismic data. The point is how to maintain and implement AHEAD with respect to the data which could not be obtained within NA4 and to new data which will be released by new investigation. It has to be made clear that many countries have limited amount of data, most data are produced in the frame of national initiatives, and many institutions are still unwilling to share their data.

The software of the three methods for the determination of earthquake parameters from MDPs has been implemented in such a way to work on the same platform. It would be opportune to implement such a software on a web-platform, so that users can determine earthquake parameters according to their preference. It would also be opportune to investigate how to take into account the multiple determinations provided by the different methods.

The way towards a fully European AHEAD may be the establishment of a dedicated consortium (e.g., "EMIDIUS", or AHEAD), similar to ORFEUS, with a hosting institution, members and membership fees, a board, etc. and a limited staff (2 persons for data processing, software development etc.). The costs would not be heavy if a hosting institution can provide a place, hardware, website, etc. The consortium could then compete participating in proposals as a unit. However, some funding will be necessary to keep the engines on. The opportunities provided by EPOS should be investigated.

INGV Milano is ready to serve as hosting institution for AHEAD during the SHARE lifetime (until May, 2012). This time period can be also dedicated to investigate how and possibly to establish the consortium or another solution to allow AHEAD surviving.