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From mapping faults to delineating seismogenic sources: version 3.0 of the Database of Individual Seismogenic Sources (DISS)

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We present version 3.0 (rel. 3.0.2) of the Database of Individual Seismogenic Sources (DISS), a vast database that builds upon seven years of experimentation and testing and over three decades of published scientific work. DISS' main object is the Seismogenic Source. The Database was initiated in 1999 as a standalone research project, but was subsequently developed and expanded in scope thanks to funding from Italy's Civil Defense authorities.

DISS' principal purpose is to supply an integrated view of potentially damaging seismogenic process in Italy. In version 3.0 we distinguish three main categories of Seismogenic Sources based on their attributes, their expected use, the nature and reliability of data used to define them:

- "Individual Seismogenic Sources" (GGSources) are obtained from geological and geophysical data and are characterized by a full set of geometric (strike, dip, length, width and depth), kinematic (rake) and seismological parameters (average displacement, magnitude, slip rate, recurrence interval) and by a rating of the associated uncertainties. Individual Seismogenic Sources are assumed to exhibit "characteristic" behavior with respect to rupture length/width and expected magnitude. They are tested against worldwide databases for internal consistence in terms of length, width, average displacement and magnitude. This category of sources favors accuracy of the information supplied over completeness of the sources themselves. As such, they can be used for deterministic assessment of

seismic hazard, for calculating earthquake and tsunami scenarios, and for tectonic and geodynamic investigations.

- "Seismogenic Areas" (SASources) are still obtained from geological and geophysical data and characterized by geometric (strike, dip, width, depth) and kinematic (rake) parameters, but their length is more loosely defined and spans two or more Individual Sources. They are not assumed to be capable of a specific earthquake but their potential can be derived from existing earthquake catalogues. A Seismogenic Area is essentially inferred on the basis of regional surface and subsurface geological data, that are exploited well beyond the simple identification of active faults or youthful tectonic features. Opposite to the previous case, this category of sources favors completeness of the record of potential eartquake sources over accuracy of source description. In conjunction with seismicity and modern strain data, Seismogenic Areas can thus be used for regional probabilistic seismic hazard assessment and for investigating large-scale geodynamic processes.

- "Macroseismic Sources" are exclusively obtained from automatic processing of macroseismic data of earthquakes with M 5.5 and larger. They are subdivided into three categories (Macroseismic-Well Constrained, referred to as MW-Sources; Macroseismic-Poorly Constrained, MPSources; Macroseismic-Deep, MDSources) depending on the quality of the macroseismic dataset and on the parameters supplied for each of them. The main scope of macroseismic sources is to feed the previous two categories of sources and to constrain the seismogenic properties and potential of poorly known areas.

Similarly to its previous version, DISS v. 3.0 also stores different support datasets such as bibliographic references, literature data, geographic and administrative data, geological, seismological or paleoseismological data and various historical and instrumental catalogues. All the information is organized as major layers of a GIS System that enables the user to explore all data types at different scales and levels and to perform spatial analyses and complex statistical computations.

DISS v. 3.0 is available both as a standalone application and as an Internet-based cartographic server. Please refer to (http://www.ingv.it/%7ewwwpaleo/DISS3/) for further information.