

Preface to the special issue on man-made seismicity in Italy

Until a few years ago, Italy suffered from a deep lack of publicly shared knowledge about induced seismicity, compared to many other countries.

No public data were available to perform scientific studies of the phenomenon, and the few papers published from 1964 to 2004 came from in-house operations of private companies (Mucciarelli, 2013).

Three events contributed to drive a change in attitude toward induced seismicity in recent years:

- the improvement of the national seismic network (RSNC-INGV) reduced the completeness threshold in many areas, such that microseismicity associated with anthropogenic activity became more evident;
- for the first time, a company running a gas storage plant consented to host a monitoring system whose data and metadata could be made completely public [i.e., the Collalto seismic network managed by OGS on behalf of Edison Stocaggio S.p.A., see Priolo *et al.* (2015) for details];
- after the 2012 Emilia earthquake, rumours were spread that it could be related to human activities in the region, and this prompted a series of government-led initiatives, including two international commissions (Astiz *et al.*, 2014; ICHESE, 2014).

Two recent additional initiatives are noteworthy, which involved both Italian research institutions and public administrators. The first one led to a white paper on the status of knowledge about induced seismicity in Italy (Di Bucci *et al.*, 2014), and the second one led to the release of guidelines for mandatory monitoring of seismicity, ground deformation, and pore pressure in areas where human activities capable of generating earthquakes are carried out.

Following the first Italian conference in which a special session was devoted to man-made seismicity in Italy, this special issue collected five papers relevant to the topic.

The first two papers tackle an important problem for active tectonic countries: that is, how to separate man-made seismicity from the natural background. Peruzza *et al.* (2015) provide the results of the effort to separate explosions from tectonic seismicity in north-eastern Italy, while Lavecchia *et al.* (2015) are focused on the relationship between seismicity, tectonic faults, and human activities in the Emilia region struck by the 2012 earthquake sequence.

The following two papers are devoted to monitoring activity in areas where potential seismicity-inducing activities are present. Franceschina *et al.* (2015) present the example of a monitoring network around a field test for CO₂ storage in the Po Plain, while Stabile *et al.* (2015) perform a statistical reappraisal of induced seismicity in Val d'Agri, Italy.

The last paper, by Mucciarelli *et al.* (2015), tackles the problem comparing the seismic hazard from natural versus induced seismicity.

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