

One Earthquake, Two Scenarios: The Baffling Case of the 1467 Siena Earthquake.

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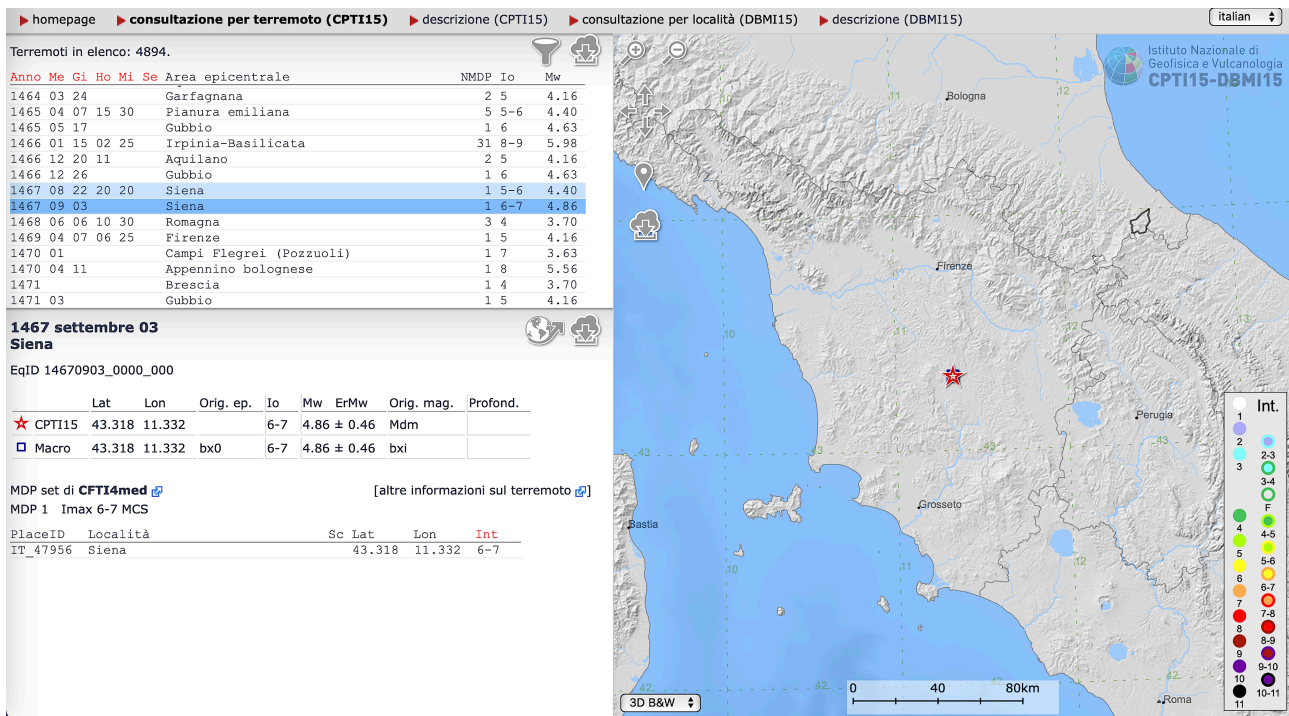
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Historical seismology is a work in progress: the overall picture of a given historical earthquake, no matter how long taken for granted, can sometimes change, either thanks to the discovery of “new” (i.e. previously unknown or unheeded) historical sources, or by considering the research output of other disciplines.

Historical seismologists tend to give precedence in their studies to written evidence, derived (when a choice is possible) from the sources 1) most likely to provide information useful to fulfill their main objectives (i.e. assessing macroseismic data points, reconstructing macroseismic fields and damage scenarios), and 2) not requiring long-drawn out, possibly unsuccessful searches that would hardly fit with their generally tight deadlines. Unavoidably, this approach mean to discard interesting but elusive evidence, whose records are buried too deep to make a search cost-effective, or were never written down at all but survive as the marks which past earthquakes left on buildings. It is up to the scholar to find ways and means to interpret these unwritten records, even if the readings taken are not always conclusive.

The archaeoseismological study of historic towns and buildings allows to gain in-depth knowledge of how a given earthquake interacted with architectures and building components and in some cases, it can also provide evidence of the social, economic, or even political consequences of some earthquakes. The project *PROTECT – Knowledge for PReventiON - Technique s for repairing seismic damage from the medieval period to the modern era* (financed by the European Union’s Horizon 2020 research and innovation program together with a Marie Skłodowska-Curie Individual Fellowship) applies, on an entirely experimental basis, the methods of archaeoseismological analysis to the historic centre of Siena (Tuscany), to improve the knowledge of its context for purposes of seismic risk reduction. By weaving together the information gathered by different humanistic and scientific disciplines, the PROTECT project aims to define an operational protocol for the archaeoseismological reading of the historic centre of Siena (or part of it). This protocol could be exported to other Italian/European towns, with a view to improve our understanding of their historic heritage and the best ways to protect it from seismic risk.

The PROTECT project started in December 2021 with a first step aimed at a general analysis of the historic city centre with reference to a specific earthquake. After an initial look at the seismic history of Siena, the choice fell on the August-September 1467 seismic sequence (Fig. 1).



What led to the choice of this comparatively “minor” earthquake (Mw 4.8 according to Rovida et al., 2022) was dictated by the awareness that the Archivio di Stato of Siena preserved a so far unexploited source of exceptional documentary value, the “Lira” of the year 1468. This is a huge collection of tax statements compiled less than a year after the earthquake, by all Siennese citizens and including details on the state of repair of their property. A careful sifting of this “Lira” allows to extract a “snapshot” of the state of conservation of Siennese buildings in 1468. The thematic cartography derived from the collected data was transferred into a GIS environment and the data obtained from this analysis have been used as the basis for undertaking some specific archaeological expeditious analyses of architectural complexes in the historic centre of Siena in order to verify whether the historical source data were legible in the stratigraphy of the buildings.

This paper presents the preliminary results of the analysis carried out within the PROTECT project on the 1467 Siena earthquake. The picture of the seismic sequence – as handed down by the Italian “seismological tradition” and reconstructed by two separate teams of historical seismologists (Castelli et al., 1996; Guidoboni et al., 2007) on the basis of a set of mainly narrative, contemporary or nearly contemporary sources - is challenged by the output of the consultation of the “Lira” of 1468. Was the 1467 earthquake a stronger and more damaging event than contemporary witnesses made it out to have been? Or, perhaps, did its moderate shaking interact with buildings whose vulnerability was already enhanced by some other factor? As it often happens in historical investigation, looking at a “well-known” situation from an unusual point of view makes way for new interpretative perspectives.

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