

Knowledge of seismic hazard for the preservation of cultural heritage: the case study of Naples (Southern Italy)

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The recent seismic sequence that struck central Italy, started the August 24, 2016, is characterized by five events with magnitude $M_w > 5.0$. The strongest events of the seismic sequence were the August 24, with $M_w = 6.0$ located between Accumoli and Amatrice towns and the October 30 with $M_w = 6.5$, located between Norcia and Visso town. These earthquakes shocked not only Central Italy, with the death of about 300 people and the almost complete destruction of historical towns (Amatrice, Arquata del Tronto, Accumoli, Pescara del Tronto, Castelluccio, Norcia, Visso), but also shook the entire Italian country, strongly proposing the issue of the vulnerability of the city historical centers. The knowledge, the conservation and preservation of the natural and urban environment represent issues to be faced urgently for preventing the devastation of our heritage, unique in the world. The historical center of Naples was affected by the 30 event October 2016 with an intensity $I = V$ MCS. In the last millennium more than a hundred earthquakes hit Naples, with intensity $I > III$ MCS, ten of which has exceeded the damage level, sometimes with intensity greater of VII MCS. The historical Neapolitan urban context suffered devastating effects, reaching levels of damage equal to the VIII degree MCS, as a result of the large earthquakes occurred in 1456 ($I = XI$ MCS), 1688 ($I = XI$ MCS) and 1805 ($I = X$ MCS). In the twentieth century the city of Napoli was shaken by the 1930, 1962 and 1980, the three strong earthquakes occurred in southern Apennines, between Irpinia and Basilicata regions. The review of earthquakes with higher energy ($M > 6$) shows that the metropolitan area of Naples suffered high damage levels with intensity $I = VIII$ MCS, especially in the historical center, with a damage recurring on the same architectonic elements of the historical heritage. The recent past of the seismic history teaches us that the Apennines is highly seismic, consequently in the future we can expected seismic events of the same magnitude that could still cause damages to the city of Naples. This brief review of the strong Apennines earthquakes highlights that the city of Naples has a high seismic risk level. Therefore is crucial to implement all appropriate measures to reduce seismic risk, but also for planning measures of prevention, useful for the preservation of the rich local architectural heritage declared a World Heritage Site by UNESCO in 1995.

References

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