



## **Historical earthquakes at Ischia island and seismic hazard assessment**

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Historical data of seismicity at Ischia island (Southern Italy) cover a period of almost 800 years. Since 1228 numerous events exceeded VII MCS degree. The epicentral areas of the earthquakes are located in the northern sector of the island; only one earthquake (1302, VIII MCS degree) was correlated with the latter eruption occurred during 1301-02 AD along the eastern sector of the island. In few cases the earthquakes (1228, 1863, 1881, 1883 AD) were followed by landslides which have produced serious damage while, in average, ground effects (i.e. fractures, capacity and temperature variation of hot springs) were often observed before and after each event. The historical seismicity of Ischia shows the peculiar characteristics of volcanic earthquakes as shallow hypocentral depth ( $\sim 1$  km), high intensity, strong directional attenuation of effects and local amplification of damages. At Ischia, the 1883 AD earthquake of "Casamicciola" represents the unique example of modern age earthquake in Mediterranean volcanic area which produced more than 2300 fatalities. The catastrophic effects of this earthquake ( $I_{max}=XI$  MCS degree) covered an area of about  $3 \text{ km}^2$  in the northern sector of the island, while strong attenuation effects were observed, especially along the south and east directions. From 1883 AD until today a seismic silence in the island has been observed. Some events have been felt from the beginning of the 20<sup>th</sup> century while, in the last 10 years just few events ( $M < 2$ ), have been recorded by the INGV-OV surveillance seismic network, localized prevalently in the northern sector of the island. The lack of significant seismicity allows the study of macroseismic data of 1883 earthquake as the fundamental issue for hazard assessment, also if considering the increasing of housing density and the high exposed value in the island. Data of earthquake damages and ground effects, obtained by archive sources and literature, have been utilized (also using GIS cross-correlation with geological data) in order to

evaluate the tendency of the attenuation for different zones of the island, to detach the contribution of the source from the medium, and define the zones of maximum expected damage.