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Volcaniclastic debris flows related to 472 AD eruption at Vesuvius: social and environmental impact from stratigraphic and geoarcheological data

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There is a growing number of evidences in the surrounding plain of Somma-Vesuvius volcano which indicate that along with primary volcanic processes (i.e. fallout, pyroclastic density currents) the syn-eruptive and post-eruptive volcaniclastic remobilization has severely impacted the ancient civilizations, which flourished in the area. This represents an important starting point for understanding the future hazard related to a potential (and not remote) renewal of volcanic activity of the Campaniana volcanoes. We present geoarcheological and stratigraphic data obtained from the analysis of more than 100 sections in the Campanian plain showing the widespread impact of volcaniclastic debris flows and floods originated from the reworking of the AD 472 eruption of Somma-Vesuvius both on the environment and on the human landscape. This eruption was one of the two sub-plinian historical events of Somma Vesuvius. This event largely impacted the northern and eastern territory surrounding the volcano with deposition of a complex sequence of pyroclastic fallout and pyroclastic current deposits. These sequences were variably affected by syn- and post-eruptive mobilization both along the Somma-Vesuvius slopes and the Apennine valleys with the emplacement of thick mud- and debris-flows which strongly modified the preexisting paleogeography of the Plain with irretrievable damages to the agricultural and urban landscape. The preexisting landscape was characterized by intense human occupation but characterized by a strong evidences of abandonment due to the progressive decline of the Roman Empire. The impact of volcaniclastic debris flow continued for decades after the eruption as highlighted in the studied sequences by the presence of 512 AD ash layer, and contributed to the final decline of the Roman civilization in the area.