Movement along the NE-SW fault located on the western margin of Milos triggered the hydrothermal activity which resulted in the formation of this deposit which seems to be controlled by alternating cycles of deposition of sulfides and hydrothermal manganese oxides within the fault which were probably the result of alternating periods of waxing and waning of seismic activity along that fault. The hydrothermal fluids penetrated the volcaniclastic sandstone which hosts the Aspro Gialoudi deposit along fractures and fissures, which led to the formation of this deposit in two stages as at Vani. The intense low-temperature,hydrothermal activity would have been relatively short lived. Furthermore, based on the REE geochemical data the hydrothermal fluids that formed the Cape Vani Mn oxides and hydroxides formations were mainly seawater. Although the Cape Vani formations were in contact with oxidising seawater for a sufficient period of time, our geochemical data (depletion of Mg, Ca in relation to the continental crust) suggest that there was no significant alteration of these formations by seawater after their deposition.

In general, the compositional data show that the elements most enriched in the Aspro Gialoudi, Vani and Vani Dome deposits relative to the average continental crust (Wedepohl 1995), lie in the sequence As>Pb>Sb>Cd >Mn>Tl>Mo>Zn>Cu>Ba>Be>Sr>Co>Bi. All the other elements analyzed are depleted in these deposits relative to the continental crust. The chalcophilic elements, the siderophilic elements Mo and Co plus barium and strontium are therefore the most strongly enriched in the hydrothermal Mn deposits relative to the average continental crust.

Preliminary carbon and oxygen isotope data on carbonate sequences from the Pădurea Craiului Mountains, Romania. Paleoenvironmental significance

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Isotope stratigraphy is a useful tool for stratigraphic correlation, especially for strata deposited during major perturbations of the carbon and oxygen cycles that affected the marine, terrestrial and atmospheric reservoirs. The Pădurea Craiului Massif (north-western extremity of the Apuseni Mountains, Romania) had a long-lasting evolution with a pre-Hercynian start, being mainly shaped during alpine orogenesis. Most of its formations belong to the Bihor tectonic unit. The basement is made up of crystalline schists of the meso-metamorphic Somes Series. Sedimentation started during Permian with detritic deposits interbedded with rhyolites. The overlying Triassic deposits are unconformable and include detritic formations (Lower Triassic) and massive layers of carbonate rocks (Middle Triassic). The almost complete lack of the Upper Triassic is due to the uplift of the region during the Cimmerian tectonic phase. The Lower Jurrasic deposits include the detritic formation (Hettangian–Lower Sinemurian), the limestone formation (Upper Sinemurian–Pliensbachian) and the marl formation with ammonites and belemnites (Toarcian). The Middle Jurassic consists mainly of marls. The Upper Jurassic formations are massive (over 100 m thick) and are made up exclusively of limestones. During the Upper Tithonian and Lower Cretaceous the limestone deposits have been uplifted which resulted in a paleo-karst surface that hosts discontinuous bauxite deposits. Lower Cretaceous sedimentation started with the deposition of fresh-water limestones (Hauterivian) followed by successive layers of marine limestones (Barremian), marls (Aptian), marine limestones (Aptian), glauconitic sandstone (Aptian-Albian) and ended with a package of red detritic deposits (Albian-Cenomanian?). After the intra-Turonian thrust movements, the Senonian sediments have a post-tectonic character and outcrop in several isolated area. Subsequent positive epirogenetic movements and two main phases of magmatic activity (Upper Cretaceous–Paleocene and Badenian–Pliocene) completed the morphogenesis of the Piatra Craiului Mountains.

The $\delta^{13}C_{PDB}$ and $\delta^{18}O_{PDB}$ values of bulk carbonate samples from the Mesozoic formations of the Pădurea Craiului Mountains vary from -2.27‰ to +2.97‰ and from -8.07‰ to -2.91‰, respectively. All isotope compositions correspond to seawater carbonates. An increasing trend of the $\delta^{18}O$ values with the age of the formations is to be noted. The highest values $\delta^{18}O$ (-4.44‰ to -2.91‰) correspond to the Cretaceous formations. The Triassic limestones display the lowest $\delta^{18}O$ value (-8.07‰) and this could be a consequence of the global oxygen isotope excursion recorded at the Permian/Triassic boundary. Such light $\delta^{18}O$ values are consistent with an Early Triassic warm, depleted of oxygen and stagnant ocean. The lowest $\delta^{13}C$ value (-2.27‰) was obtained for the Upper Jurassic limestone formation. As these limestones have been uplifted and karstified under lateritic conditions during the late Jurassic and early Cretaceous, the ^{13}C-depleted value probably resulted from an admixture of primary and diagenetic carbonate. The lower value could also be a remnant of the carbon isotope negative shift documented worldwide and caused by the Early Jurassic (Toarcian) oceanic anoxic event. All Cretaceous limestone formations display positive $\delta^{18}C$ values (1.78‰ to 2.97‰). Positive carbon-isotope excursions are generally compatible with times of low atmospheric carbon dioxide content. The Barremian marine limestones (Blid formation) display slightly lower $\delta^{13}C$ and $\delta^{18}O$ values relative to the Albian-Aptian limestones. Paired carbon and oxygen isotope determinations provide a possibility of interpreting not only changes in the global carbon and oxygen cycle through time, but as a discrimination criterion in problems of stratigraphic correlations as well. Paleotemperature estimations based on calcium bicarbonate and seawater isotopic fractionations give temperatures as high as 26°C for the Triassic limestones and between 22–23°C for the Jurrasic – Lower Cretaceous formations. These results are similar to the isotope temperature records of other carbonatic sequences of equivalent age. A larger number of data and high-resolution carbon and oxygen-isotope stratigraphy are required to develop a better understanding of changes in paleoenvironmental conditions.

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Time-Dependent probability distribution on faults associated to strong earthquakes (M≥6.5) in the broader Greece area

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Greece and the surrounding area are characterized by high seismicity. Strong earthquakes (M≥6.5) have repeatedly occurred in this area, as historical information and instrumental recording reveal. Using as input data 67 strong earthquakes that occurred since the beginning of the 20th century, the coseismic stress changes are calculated, in order to make a probabilistic earthquake forecast in the study area under the influence of past events. For this purpose, the calculated coseismic stress changes are translated into earthquake probability using an earthquake nucleation constitutive relation, which includes permanent and transient effect of the sudden stress changes. According to this method, a sudden change in stress seems to modify earthquake rate, moving other faults toward or away from failure, changing the probability of potential earthquake on these faults. Earthquake probability on a fault is lowest after the last event but as tectonic stress grows the odds of another earthquake increase. For all needed calculations a pdf (probability density function) for the time of failure for an earthquake of defined magnitude on the fault of interest must be taken into account along with the calculated stress changes on the fault. Specifically, the estimated probability values concern the probability in each part of a given fault or fault segment, and the probability distribution is illustrated across the specific fault. All calculations were performed at 10 km depth but it was necessary to check whether the estimated probability values vary with depth. Therefore, all estimations were performed for each fault or fault segment at the