

Assessment of heavy metals concentrations in sediments of Bogdanas river at the Assiros-Lagadas area, Northern Greece

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Bogdanas river flows east of Thessaloniki in Northern Greece. Its sources are found at the western part of the Vertiskos mountain and flows along the Assiros and Lagada plane towards Koronia lake. In this study, variations of the heavy metal concentrations in Bogdanas river sediments have been evaluated. Sediment samples were collected at 8 representative sampling sites along the river, during two sampling periods. Chemical analysis indicated that the sediment samples show variable concentrations of heavy metals. Sediment quality assessment according to the limits determined by the European Community's legislation indicated that the river sediments were not contaminated, apart from 3 samples and 1 sample concerning Zn and Cu, respectively. On the other hand, sediment quality assessment according to the US EPA Sediment Quality Guidelines (SQG) revealed that there was heavy metal pollution with respect to especially Zn, Cu and Ni. Concerning Zn, only 1 sample is close to the EPA's moderately polluted level, while 10 samples surpass it and 5 samples exceed the EPA's heavily polluted level. Concerning Cu, 7 samples are classified as moderately polluted and 9 samples as heavily polluted. Finally, no pollution is defined for Ni, apart from 2 samples which are classified as moderately polluted. In conclusion, the research showed that the revealed heavy metal pollution is more attributed to the lithology of the area and less to human activity.

Morphotectonic analysis and branching for Mygdonia active fault system (Macedonia, N. Greece)

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The Mygdonia basin is considered to be of a rather moderate seismicity rate area, with strong earthquakes occasionally occurring and affecting the northern Greek mainland. It corresponds to a complicated extensional setting bounded from normal faults that reveal a characteristic S – shape development. According to previous studies, the central part of the basin which mainly consists of faults trending E – W, are active structures that played a basic role in the formation of the basin. Both active faults and earthquakes appear in populations, characterized by certain spatial properties. A composite examination is attempted in order to investigate both earthquake and fault population properties taking into account all the available information that can be extracted from the correlation of seismicity and topographic data of the broader Mygdonia domain. It is known that the establishment of a dense seismological network contributes to the detailed analysis of the majority of the active structures since the distribution of the earthquake foci reveal the presence and particular properties of the active seismogenic zones. All earthquakes with magnitude $M \geq 1.0$ which were recorded during the time period 2007 to 2009 from the National Greek Seismological Network are thoroughly examined. For this reason, arrival times of well recorded events that occurred in the basin were taken into account. The Wadati method was applied, to compute the V_p/V_s ratio and the origin times of the earthquakes with adequate data. Using the origin times derived from the best fitting data, travel times of the P waves were constructed to define the crustal structure in the area. In addition, time residuals were calculated in order to take into account the lateral variations of velocities. According to the results, all earthquakes that occurred in the area were relocated and their focal properties were determined again.