Parnassos-Ghiona deposit ranges from <10 ppm in typical red colored ore to 900 ppm in yellow-grey colored ore. The latter type occurs along and near faults and constitutes a significant (approximately 30 vol. %) portion of the bauxite ores. They are characterized by the presence of abundant pyrite and micro-organisms. Elevated arsenic contents are mostly associated with Fe-oxides/hydroxides in Ni-laterites, showing enrichment in REE, Co, Ni, Th and U contents, and with Al-oxides in bauxites. The sulphur isotope compositions of Fe sulphides from the bauxite deposit show a range from +10.2 to –30.2 per mil. Most negative values were obtained from grey-coloured ore samples. The organic matter may be related to the source of arsenic and play a major role in controlling the redox conditions, since they can drive the formation of pyrite or Fe-oxides.

On groundwater resources available in Oltenia Plain, Romania

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The Oltenia Plain occupies ca 8,400 km^2 in the SW Romania. With decreasing altitudes from north to south, it includes three W-E elongated subunits: a High Plain (210-110 m elevation), followed to the south by the Danube Terraces (140-35 m) and by the large Danube Floodplain (40–25 m). The fresh groundwater resources are located in the Pliocene-Quaternary formations. The oldest Berbesti Formation consists of lacustrine sands (50-150 m thick) and is overlapped by the Jiu-Motru Formation composed of swampy clays and coal beds with sands insertions (150-300 m). The next lithostratigraphic unit, the Lower Member of the Danube Formation (15-20 m) was built during the Early Pleistocene. Finally, the Danube River moulded Valley own profile. As a result, the higher relief of the Oltenia Plain formed repeated down-cuttings of five-stepped terrace sequence and the Floodplain (Upper Member of the Danube Formation).

The Berbesti Formation is a continuous multilayered aquifer, the hydraulic conductivity of 0.2-15 m/day and specific capacity values of 0.05-4.0 l/s/m.The Jiu-Motru Formation is the discontinuous multilayered aquifer (sands) on the mainly aquiclude clayey-coaly background. The specific capacity values of the lens-shaped tested sands are in the range of 0.01-0.25 l/s/m. The fine sands inserted on the aquiclude background are characterized by low Na+, K+, I+ contents and by higher contents of organic substances, CO_2, Fe_3+, $SO_2$4-, NO_2- and Br-. The hydraulic conductivity determined through tests in situ has values between 0.1 and 5.0 m/day. The specific capacity has a large variation interval from 0.2 to 5.0 l/s/m.

The Lower Member of the Danube Formation, represented by the alluvial fan, is discordantly disposed over the previous two formations and bears a continuous extended phreatic aquifer. Its potentiometric contour lines decrease from 200 m to the north to 95 m to the south. Despite the high hydraulic conductivity values (10-55 m/day), being situated at 40-60 m over the local base level of the floodplains, this aquifer discharges on the slopes of the main valleys and has limited resources.

The six mono-layer aquifers bear in the Upper Member of the Danube Formation with 5 terraces and the floodplain of the big watercourses (Danube, Jiu and Olt). Within the Upper Member, there is a N-S increase of productivity (from 1-3 l/s/m in the N strip, to 3-6 l/s/m in the middle one and > 6 l/s/m within the whole Danube Floodplain.

In the eastern subunit of the studied area – the so-called Leu-Rotunda Plain – the Danube Formation is covered by a continuous pile of the Aeolian Formation (30-35 m thick of loose wind-blown silts, clayey sands, fine to coarse sands, having like insertions fossil soils at different levels). Field investigations carried out during April 2010 in accordance to “Climate Change and Impact on Water Supply” Project (see logo) showed that the phreatic aquifer of the Aeolian Formation constitutes the historical source to feeding the people of 15 localities. In large areas, the depth of the water table ranges from 0.5 to 3 m, being vulnerable to estimated climate change. Its resource is contaminated by domestic seepage and fertilizers only within the perimeter of localities. There, the public fountains have around 1,200-2,100 μS/cm Electric

Conductivity, 85-225 mg/l Cl- and around 50-290 mg/l NO_3-. Outside of localities, the studied aquifers of the Aeolian Formation match drinking standards.

Morphotectonic analysis of Stavrakia fault scarp with emphasis on seismic risk assessment, Heraklion, Crete, Greece

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Stavrakia fault scarp occurs along the Heraklion – Mires highway adjacent to Stavrakia and Siva villages, forming the western slopes of a valley. The fault scarp is developed mainly in Tortonian marly, conglomerate and sand intercalations of the Ampelouzos formation and to the north, in Pliocene marls. It is NNE – SSW trending and southeast-dipping at 70°. Its apparent length is about 7.5 km fading out northwards in the river valley, whereas it is geologically unclear if it continues further to the south. In few places flat surfaces can be found with microstructures which indicate a normal sense of movement under an E – W extensional regime, whereas a vertical slip of about 30m can be determined.

Using GIS software, topographic maps of 1:5000 and satellite images we mapped 33 streams and small catchments that drain the footwall of the fault which appears as an elongated range at about 7,8 km at the study area. Basins develop almost perpendicular to the main valley and are elongated in shape, but quite small in size (about 90.000 m^2) with high mean slope values. 23 triangular facets of various sizes occur along the range frond formed by stream down-cutting and fault activity. In order to study uplift rates and erosion style of the footwall, as well as fault activity we have calculated three morphometric indices of the footwall catchments, i.e. the hypsometric integral (HI), the basin asymmetry (AF) and the valley width-to-height ratio (Vr). Additionally, we have also calculated the range sinuosity (S) as well as the facet size and mean slope (MS).

Although studied basins have a very small size and thus stream development and erosion are not so profound, several important results can be extracted from the morphometric analyses. Sinuosity value is S=1,11 indicating thus an actively deformed range for the footwall, which is in contrast with the opposite range sinuosity (Se=1,63) occurring at the hanging wall. The hypsometric integral of catchments shows generally values around 0,41 to 0,72 which indicate a high mean topography as a result of high rates of tectonic uplift. The higher value was observed for the B5 catchment at the southern edge of the fault scarp, whereas a strong trend for smaller values appears towards north. The basin asymmetry study didn't show any certain erosion pattern along the range. Values vary significantly among catchments from AF=80 to 24, however the higher values appear at the southern part and the lower at the northern indicating probably a decrease of erosion rate to the north. Except of few extreme values, the valley width-to-height ratio Vr is relatively very low (<1) in most catchments with an average of Vr=0,5 indicating high incision rates due to tectonic uplift. Rate values are randomly distributed along the range presenting no specific erosion pattern. Morphometric analyses of the facets indicated also that the largest facets appear at the southern edge of the fault scarp, whereas they become smaller towards north. The mean facet slopes, except three, vary generally between 22 – 30°, without presenting any spatial distribution.

All the above observations indicate that: (1) the study area is actively deformed; (2) the higher uplift rates occur about 1 km away from the southern edge of the fault scarp and; (3) uplift decreases gently towards the northern edge. The uplift pattern along the studied fault represents thus a half elliptical structure, leading us to suggest that the fault might extend 5 more kms to the south. Hence, in a possible reactivation its length can be a serious seismic threat for the nearby towns of Heraklion, located 6 kms to the north and the adjacent villages of Stavrakia and Siva.