

Holocene raised shorelines along Athos Peninsula, Northern Aegean Sea, Greece – first data

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Athos or Agion Oros peninsula is the eastern of the three smaller peninsulas of Khalkidhiki in northern Aegean Sea. It is an elongated highly mountainous peninsula exceeding up to 2,030 m asl at Mt. Athos, surrounded by steep and high rocky coasts eroded by the sea. The peninsula consists of granite and metamorphic rocks mainly schist and gneiss in northern and central part, while the south part is dominated by marble. In this paper are presented the first data concerning the discovery of fossil raised shorelines that were located along the west and south coast of the peninsula. Due to steep coastal morphology that restricts any access from the land, geological reconnaissance was completed with a boat that shipped along the coastline from Ouranoupolis (at NW) up to Scala Kafsokalyvion pier (at SE). More than 40km of coastline were visually inspected and photographed in detail with a digital camera. Detail observations and the photographic record were used to document the fossil shorelines and to estimate their rising. On land reconnaissance of the coast line was realized at the Monastery of Agiou Dionysiou and along the footpath from Agiou Dionysiou towards Agiou Pavlou monasteries.

Results: The raised shorelines comprise marine notches, benches and micro-platforms that were cut on the hard rocks along the coast. Marble preserves the best traces especially the solution notches. On the contrary granite, schist and gneiss did not favour notches formation but in some places some relics of fossil raised wave-cut abrasion platforms were located, still surviving the coastal erosion. Very well preserved raised notches on the marble exceeding up to ~2m height from present sea-level were traced along a distance of ~4 km from Cape Diaporti to Cape Fonias and Skala Kafsokalyvion. They reveal at least 3 raised notches along the vertical marble coast from Cape Diaporti & “Simonos rock” up to Karoulia and Katounakia pier. While eastwards to Kafsokalyvia pier, where the coast reveals less inclination, one to two raised benches and micro-platforms were observed accompanied also with one or two notches. At Agiou Dionysiou monastery, where green-schist exposes, relics of a fossil wave-cut abrasion platform were found along the coast. At the top surface of this platform, raised at ~1m asl, some remnants of hard cemented coarse sands with gravel, pebbles and cobbles were found. These sediments, suffering present wave erosion, correspond to older coastal clastic sediments; they also contain many shell fragments of marine molluscs. Dating of a shell sample with the C¹⁴ AMS technique gave an age 3263 ± 45 BP.

Conclusions: It is the first time that raised coastlines are recognized in Northern Aegean Sea. The south part of Athos Peninsula reveals characteristic visible marks of neotectonic uplift, *i.e.* raised notches. Height of raised shorelines above present sea level indicates that rate of neotectonic movements exceeds the rate of Holocene sea level rise. Although one C¹⁴ AMS age is not enough to monitor the neotectonic uplift, it allows an estimation of the timing of this neotectonic event. If this age is representative, then a mean rate of active uplift is estimated at 1.3 – 1.5 mm/yr based on the Holocene sea level rise curves for northern Aegean (isostatic model for Aegean and curve of Thermaikos Gulf). There is an indication that relative sea level rise is strongly influenced by local conditions. Research is still in progress, in order to investigate the coastline along south and east side of the peninsula, especially in the area that marble is exposed along the coast, including more visits for sampling and topographic measurements. Geological reconnaissance was realized on November 2009, along the route followed by “Agia Anna”, the only boat allowed to carry visitors to Agion Oros monasteries.

Examination of the groundwater quality in a settlement of Eastern Hungary

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The water quality from groundwater wells in a small town, called Mikepércs, situated on the SW edge of the Nyírség, eastern part of Hungary, is investigated. By the time of the

research, the sewage network had not been yet constructed in Mikepércs, thus the inhabitants collected the sewage in septic tanks. In Mikepércs the tanks usually had not adequate insulation and therefore the majority of the sewage (more than 90% according to our estimations) was emitted into the soil. As there are sandy soils around the settlement the sewage can filter into the soil and reach easily the groundwater level at depth of about 1.5-3 m below ground surface. According to our preliminary expectation, we have detected significant pollution in most of the groundwater wells in Mikepércs, especially concerning orthophosphate, nitrate and ammonium pollutants, which concentrations were much over the hygienic limit value. Besides the watering of animals, sometimes people drink groundwater so we can say that consuming of groundwater can cause both human and animal health risk.

Measure of heavy metal load in the floodplain of the river Tisza

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The quality of the River Tisza is significantly influenced by the industrial activity of Ukraine and Romania. The main problem is the heavy metal pollution which can be in dissolved form in the water or attached to colloidal particles in the sediments. In this paper an investigation of soil samples taken from the floodplain of the river was carried out. Surface samples were collected and profiles were created. As, Cd, Co, Cu, Ni, Pb and Zn concentrations were determined. The results show significant and continuous heavy metal load. ANOVA test was carried out and the metal concentration in the upper layer of the active floodplain is proved to be considerably higher than in the reclaimed side. Regarding copper and zinc, in addition to the total metal content, their percentage available for plants (Cu and Zn percentages measured in the Lakanen-Erviö solution) is also more in the active floodplain than in the reclaimed side (copper: 27%, zinc: 47%). Discriminance analysis can identify the location of the soil samples (correlate to the levee) with 92% accuracy. Soil profile shows increased heavy metal loads in the top layer of the soil and proved that the accident in 2000 was not the only pollution occurrence. Based on the results we came to the conclusion that the pollution comes constantly with the sediments from the over arm of the River Tisza and its tributaries.

The role of the time factor in the hydrothermal metallogenesis related to the Neogene volcanism in the Carpathian-Pannonian Region

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Sudbuction-related terrestrial igneous/volcanic environments provide one of the most favorable conditions for hydrothermal ore genesis as recorded by world-class volcanic-hosted