NNW-SSE and NNE-SSW) in the medial portion of the Dunajec River drainage basin appears to be indicated by the results of long-profile analyses of deformed straths, usually of early and middle Pleistocene age. Quaternary uplift of the marginal part of the Beskid Niski (Lower Beskidy) Mts. (W-E to WNW-ESE) in the mid-eastern part of the Outer Western Carpathians of Poland was estimated at 100-150 m, including no more than 40 m of uplift after the Elsterian stage. In the Pliocene and Quaternary the Polish Carpathians witnessed differential vertical and some remnant horizontal movements, resulting in the formation of elevated and subsided areas. Morphological examples of Quaternary tectonic activity include, i. a., disturbed longitudinal profiles of strath terraces. Valleys of the Outer Carpathians bear 5 to 9 terrace steps of Quaternary age. Most of Pleistocene terraces are strath or complex-response terraces; the Weichselian and Holocene steps are usually cut-and-fill landforms, except those located in the neotectonically elevated structures, characterised by the presence of young straths. Longitudinal profiles of individual strath terraces frequently show divergence, convergence, upwarping, downwarping, or tilting that can be indicative of young tectonic control. Moreover, the size and rate of dissection of straths of comparable age are different in different morphotectonic units; a feature pointing to variable pattern of Quaternary uplift. Rates of river downcutting result mainly from climatic changes throughout the glacial-interglacial cycles, but their spatial differentiation appears to be influenced by tectonic factors as well. Examples based on detailed examination of deformed straths and fluvial covers in selected segments of the Soła, Skawa, Dunajec, Wisłoka, Jasiołka and Wisłok rivers in the Polish Outer Carpathians appear to indicate Quaternary reactivation of both normal and thrust faults in the bedrock. The latter are mostly confined to the eastern portion of the Outer Carpathians.

Search for Mesolithic Landscapes in Lithuanian territorial waters

Žulkus V.

Institute of Baltic Region History and Archaeology, Klaipeda University, H. Manto 84, 92294 Klaipeda, Lithuania, vladas.zulkus@ku.lt

Over last decade members of Underwater Research Centre (URC) from The Institute of Baltic Region History and Archaeology (IBRHA) of Klaipeda University in several locations on the seabed of Lithuanian territorial waters discovered relicts of prehistoric coastlines and traces of submerged forests.

Ancient coastline is marked by stones of washed moraine on the seabed and relicts of coastal cliffs in the depth of 8-22 metres. These are washed separate moraine ridges and their groups, staying higher about 4 metres from actual bottom.

Particular attention of geologists and archaeologists is focused on findings of relict forests on the seabed. Submerged stumps are traced in three sites; two of them are in the neighbourhood of Klaipėda and the third one is south of it. They are separated by 5 km and 22 km (from north to south).

Most advance to the south is site RF-I (Relict forest-I), which is close to Juodkrante, on a sandy bottom in the depth of 26-29 metres. Three stumps with roots in moraine clay loam with about 15 cm of sandy layer had been discovered there. Stumps are rising to the height of 0,5 – 1,5 metres and they remain to be good condition (from 0,4 m to almost 1 m in diameter). The stumps were traced in a range of 6-8 m from each other. Close to them is a terrace with moraine issues of about 1 m in height. By means of ^{14}C method two stumps were dated. Calibrated date of one of the stumps is 8090 BC. That of the other one is 8948±155 BC. These are relicts of pines (Pinus). These pines belong to pre-boreal period, when level of the Baltic (Joldia) sea dropped to more than 30 metres.

On a stony bottom of the other site (RF-II), in the depth of 14,5 m, a wooden stump, rising 30 cm above the seabed, was traced. There is a sandy layer of 5 cm and clay loam slush around it. Two huge branches are deep in the clay loam. This sample is dated by 5831±120 BC and the date is calibrated.

RF-III appears to be on a sandy bottom, in the dept of 11 metres. Yet one single stump of a relict tree, 33-35 cm in diameter, is discovered there. It is rising up to 50 cm above sand.

Supposedly, the pine broke when falling eastwards from the west, in the direction of coast. Roots are covered with sand, the layer of which is about 40 cm. Under lies gravel. A section of the stump is dated by 7612±66 BC and the date is calibrated. Most probably, this submerged „forest“ is stretching towards the coast. In 19th century close to this site, in Kopgalis, waves washed ashore stumps of once growing there trees.

In the neighbourhood of to Sventoji, which is close to Latvian border, bathymetric measurements were made in 2009. Seabed images in the area of 52 km^2 were also received by side scan sonar. Research in the depth of 8 - 20 m disclosed interesting elements of destroyed relict coasts. Remains of trees were not traced.

All stumps of relict woods were traced incidentally. Attempts were made to find a supposed wreck in RF-I site (a quasi-wreck). A side scan sonar traced a dim object and after diving a trail-net, caught on a stump alongside other stumps, was discovered. At RF-III the sonar traced a dim contour. A few days later a stump was discovered there. Most probably, the sonar sensed remains of net, caught on a stump. Due to storm they were later taken away to another place. A stump for RF-II-1 site was traced, visually exploring the surroundings of huge underwater stones.

When analysing records of the sonar in RF-I site, in about 20-25 m from discovered stumps some small dim spots were traced on a sandy bottom. Perhaps, more stumps are resting there. The side scan sonar sensed similar trails in other site too, sometimes even in an area of a few hundred sq. metres. Yet relict forests had not been looked for systematically. In the summer of 2010 search for ancient coasts and relict forests in a territory of 20 km^2 is planned, which also includes RF-I area. Water area of about 45 m in depth will be explored, employing Multibeam Echosounder Sea Beam 1185. It will be followed by a diver inspection, and the sites will be filmed with underwater video. Samples of soil will be taken and analysed. Development of methodology for search of relict stumps on a sandy bottom is one of research aims. Search for submerged stumps is aggravated by the fact that most of them are rising above bottom for less than 1 m. Besides, according to available data, their density on the seabed is small. Yet no trunks are discovered. Only those broken close to the soil had survived. Another aim of the research is development of detailed picture of seabed relief. Hopefully, interpretation of data will enable to restore palaeo-geographical environment of this site in 9th – 8th millennium BC and discover probable inhabited locations of Mesolithic period.

The role of paleoseismology in studying an emerging or blind Fault: the case of Nisi fault, NW – Peloponnese, Greece

Zygouri V.[1], Kokkalas S.[1], Xypolias P.[1], Koukouvelas I.[1] and Papadopoulos G.[2]

[1]*Department of Geology, Division of Marine Geology and Geodynamics, University of Patras, Patras 26500, Greece, zygouri@upatras.gr; skokalas@upatras.gr, p.xypolias@upatras.gr, iannis@upatras.gr*
[2]*Institute of Geodynamics, National Observatory of Athens, Lofos Nymfon, Thissio, 118 10, Athens, Greece, g.papad@gein.noa.gr*

Geologic data at epicentral areas regarding surface slip following large earthquakes are occasionally contradicting in the exact locations of fault traces. In addition, this task is more difficult when a blind fault or previously unknown fault ruptures as is the case for the M_w: 6.4 June 8th 2008 Movri Mountain earthquake that struck NW – Peloponnesus, Greece is involved. This earthquake caused widespread deformation and damages in buildings, as well as extensive hazards especially in terms of ground surface ruptures. Three surface ruptures were triggered by the Movri Mountain earthquake showing the following geological characteristics. Vertical displacements, up to 30 cm have been identified along a major high angle NNW-striking, 6 km long segment of the co-seismic rupture around the Nisi village area (8 km SE of Varda). Along this rupture zone we also observed several secondary on fault coseismic features, such as landslides and liquefaction phenomena. NNE-trending ruptures in the Petrochori area (18 km ENE of Varda) were mainly observed along a ~500 m wide zone of diffused deformation, accompanied by many landslide phenomena. This rupture zone has a length of ~4km and aligns with the up to now aftershock distribution. The third set of WNW-