

Short Report on the Project „Holocene Flooding in Kephissos Fluvial System“ (HFKFS)

Project leader: Prof. Dr. Katja Sporn (Director AID Athens)

Project partner: Prof. Dr. Joachim W. Härtling (University of Osnabrueck)

Project time: 1.9.2021 – 31.12.2021

Project area: Kephissos Valley, Central Greece

Goals of Study:

- Identification of major flooding events in the Kephissos Valley, Central Greece
- Correlation of the results with major flooding events in the eastern Mediterranean

Methods:

On the 14th and 15th of September, 2021, geologists of EDAFOS Engineering Consultants (Athens) drilled two parallel boreholes to a depth of 11 m at Ag. Paraskewi village (38.58639°; 22.74692°) with an ACKER type drilling rig (EDAFOS 2021). One core was drilled with a conventional open sampling technique for stratigraphic interpretation, the second core was drilled with a closed liner (to prevent exposure of the samples to the light) for OSL dating. The open core was logged in the field and further analyzed for sedimentological parameters at the laboratory of the Department of Geography, University of Osnabrueck. The closed core was dated by Optical Stimulated Luminescence (OSL) at the National Centre for Scientific Research „DEMOKRITOS“, Athens (DEMOKRITOS 2022).

Results:

The core was logged to a depth of 10.2 m with a resolution of 10 cm. Below anthropogenically disturbed top layers, sedimentological analysis shows a first distinct layer of flood sediments („stark sandige Auelehme“) starting at a depth of 1.3 m. These upper sediments were dated at CAM 0.87 + 0.35 kabp, corresponding approximately with the sediments, which were analyzed in 2020 near ... at the same depth with CAM 1.05 + 0.13 kabp.

Further layers of very compact flood sediments, interrupted by less compact, krümelige sediments (initial soil formation) indicating flooding events at 3.83 + 0.45 kabp, 4.54 + 0.46 kabp, 5.17 + 0.62 / 6.15 + 0.71 kabp and 6.9 + 0.65 kabp.

Below a depth of 6.3 m a large time gap opens, since the sediments at 6.6 m were dated at 20.3 + 2.8 kabp. At 7.3 m depth a date of 122.7 + 11.5 kabp was measured!

Discussion:

The sediments recovered at Ag. Paraskewi show a distinct sequence of less compact sediments and very compact, layered, loamy layers, indicating at least 4 major flooding events during the holocene. There is no indication of limnic sediments, supporting the notion that Lake ... did not reach the location at Ag. Paraskewi.

The OSL dates fit partially with the dates reported in the review by Benito et al. (2015) for other areas in the Eastern Mediterranean, particularly with the 0.6-0.9 kabp, the 3.7-4.1 kabp and the 7.2-7.8 kabp events. However, the event at 1.6-2.0 kabp could not be detected in the core from this research, while additional events occurred between 4.5 and 6.15 kabp. This means, that extreme flooding events occurred in the Kephissos valley only during the High Middle Ages, the late Middle Bronze Age and the Neolithic Period.

The oldest, Pleistocene sediments show the typical sequence of warm and cold phases with the dated layer at 7.3 m at about 122 kabp, which places them into the Eem Interval. The sediments below 7.3 m could not be dated with OSL.