Freie Universität Berlin

Institut für
Geographische Wissenschaften
Physische Geographie

Human - Environment Interactions in the Northern Pontic Steppe, Southern Russia

Marlen Schlöffel[1], Leon van Hoof[2], Brigitta Schütt[1], Ortwin Dally[2]

1 Freie Universität Berlin, Department of Earth Sciences, Physical Geography, Malteserstraße 74-100, 12249 Berlin

2 German Archaeological Institute, Eurasia Department, Berlin

Prehistoric settlement sites and numerous burial mounds provide evidence for the use of the northern Black Sea steppe as a living and economic area over several millennia. But the settlement data show a large variation through time (fig. 1, 5). Climate oscillations in the Holocene (fig. 2), with major respect to arid phases, are a determining factor for the development of the steppe concerning the landscape and settlement history. Archaeological findings in the northeast of the Azov Sea, show for example a very high population density for the second half of the Late Bronze Age (1600-1200 BC). In Eastern Europe this period is characterised by a relatively cool and wet climate. For the arid periods before and after this phase only sporadic settlements along the northern coastline of the Sea of Azov and on the Don delta are known (fig. 3).

Study area

The landscape history northeast of the Azov Sea is investigated in the middle Sambek Valley, 15 km west of the Don delta and 10 km distant from the coast of the Taganrog Bay (fig. 3, 4). The valley is surrounded by low-lying loess plateaus of at most 100 m above sea level. Characteristic landscape forming processes are slope wash, landslide, gully erosion and fluvial activity. Several Bronze Age settlements and burial grounds provide evidence for landuse within the Sambek river valley and its catchment (fig. 5).

Objectives and Methods

In order to answer the questions `*How did the steppe landscape develop under human activity and changing climate conditions in the Holocene and how did the natural environmental conditions influence the settlement activity?´* terrestrial archives are analysed along with the spatial and chronological variations of settlement patterns in the Bronze Age and Early Iron Age (fig. 5). The geoarchaeological research analyses the conditions that led to the rise and fall of the intensive settlement in the late Bronze Age. As reason for the end of this phase human induced landscape changes (overexploitation) together with increasing aridity are assumed to have caused the system to collapse.

A number of drilling cores (altogether 50 m of sediments) were taken from the middle course of the valley on the floodplain, the alluvial fans and inside settlement areas (fig. 4). The cores are processed concerning their geochemical and physical characteristics (e.g. grain size, organic and inorganic carbon contents, phosphate concentration and magnetic susceptibility). The sediment analyses focus on the identification of phases of landscape activity and landscape stability. In the area around the drilling locations geomorphic forms and processes were mapped in detail. The analyses of macro- and microfossils (pollen, spores, ostracods) as well as radiocarbon dating are still in progress.

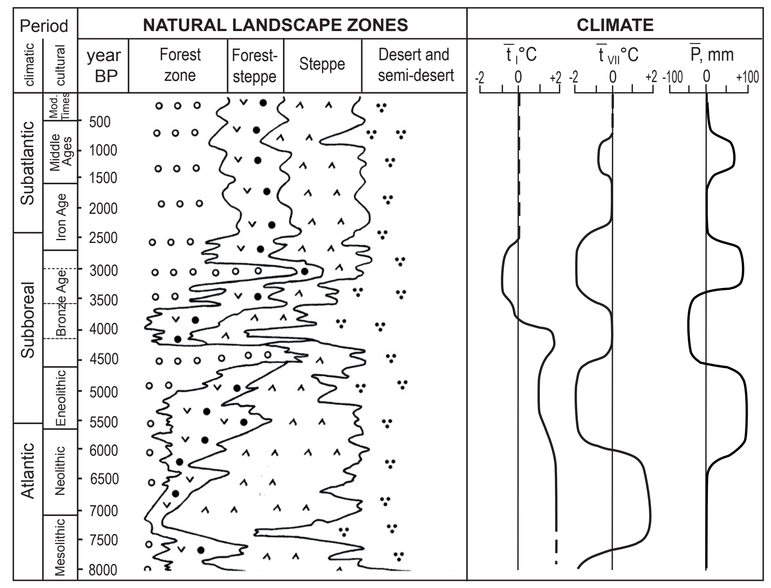

Fig. 1: Scheme of the landscape changes in Eastern Europe (after Spiridonova and Lavrushin, 1997) and climate oscillations of the last 8000 years of the northern Black Sea region (after Kremenetski 1995), right: curves of possible deviations of mean January temperature t_I°C, mean July temperature t_{VII}°C, and mean annual precipitation P mm in the steppe and forest-steppe belt.

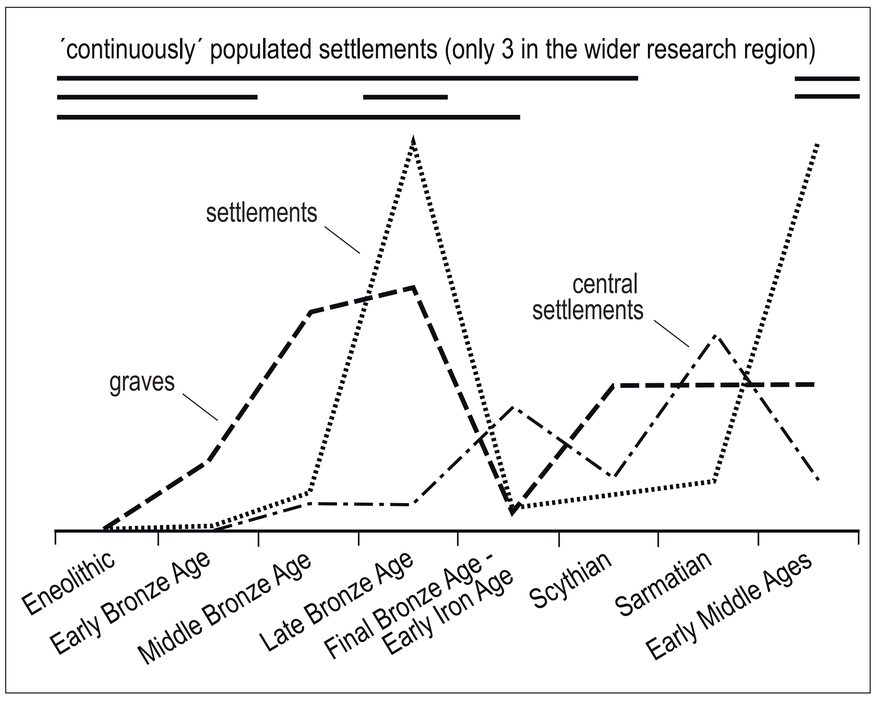

Fig. 2: Chronological distribution of archaeological sites within the region

Fig. 3: The northeastern Black Sea region

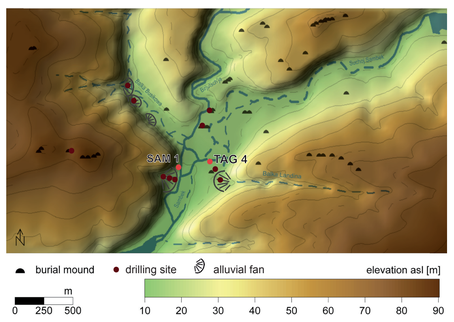

Fig. 4: The geoarchaeological study area of the middle Sambek Valley

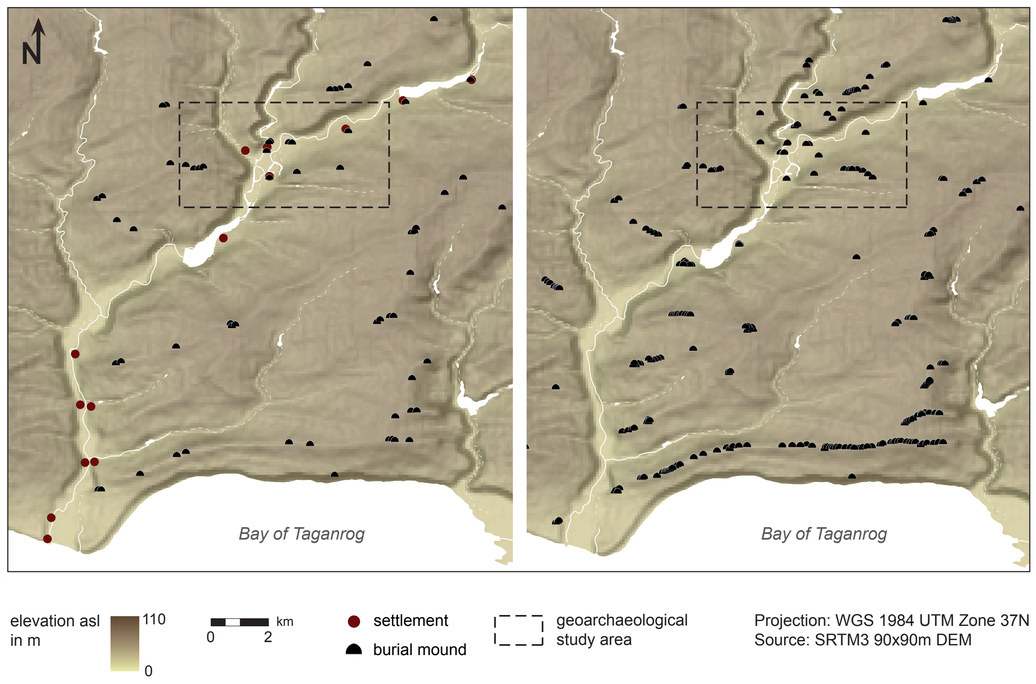

Fig. 5: Distribution of settlements and burial mounds in the Sambek Valley: The cultural landscape in the Late Bronze Age (left, 1600-1200 BC) and at the end of the Iron Age (right, 200 BC - 300 AD).

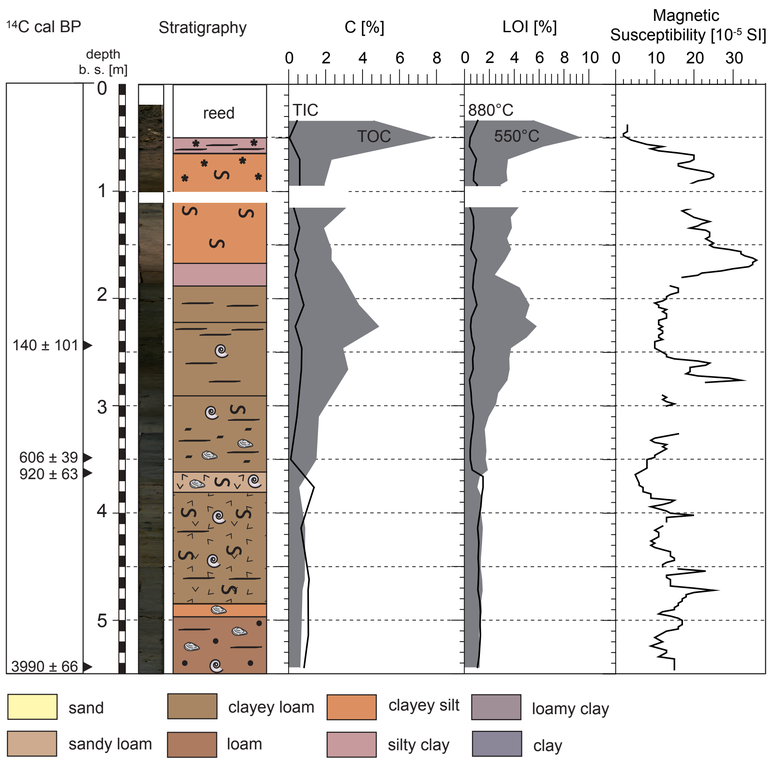

Fig. 6: Profil SAM 1

Stratigraphy of the Alluvial Sediments

The sediments of core SAM 1 (fig. 6) from the western part of the valley reflect the geomorphodynamic of the last 4000 years in over 5.5 m. The stratigraphy reveals several phases of alluvial sedimentation interrupted by layers of slope sediments. At 3.6 m below surface (b. s.) a clear alteration of the deposition process is evident. According to preliminary results and first ^{14}C-dates the slope erosion probably corresponds to the main settlement phases which are also phases of intensive land use: Late Bronze Age (3990 ± 66 cal BP), Middle Ages (920 ± 63, 506 ± 39 cal BP) and Russian Colonization / Soviet Union (140 ± 101 cal BP).

The profile TAG 4 (fig. 7) at the eastern part of the valley documents the development of an old meander of the Sambek river since the late Boreal (9500 BP). The profile is of 9 m depth and starts at the base with a 2 m thick clayey layer with intercalated sand layers. The clayey matrix is rich in fossil remains of aquatic plants and shell debris. Pollen grains and ostracods are well preserved and intended for further analyses. Above this limnic facies the stratigraphy reveals several phases of fluvial and alluvial sedimentation with a generally upward-fining.

The different facies of the alluvial sediments can be seen as an indicator for the dynamic and the migration of the river and as an indicator for the changing environmental conditions under which the sediments were deposited.

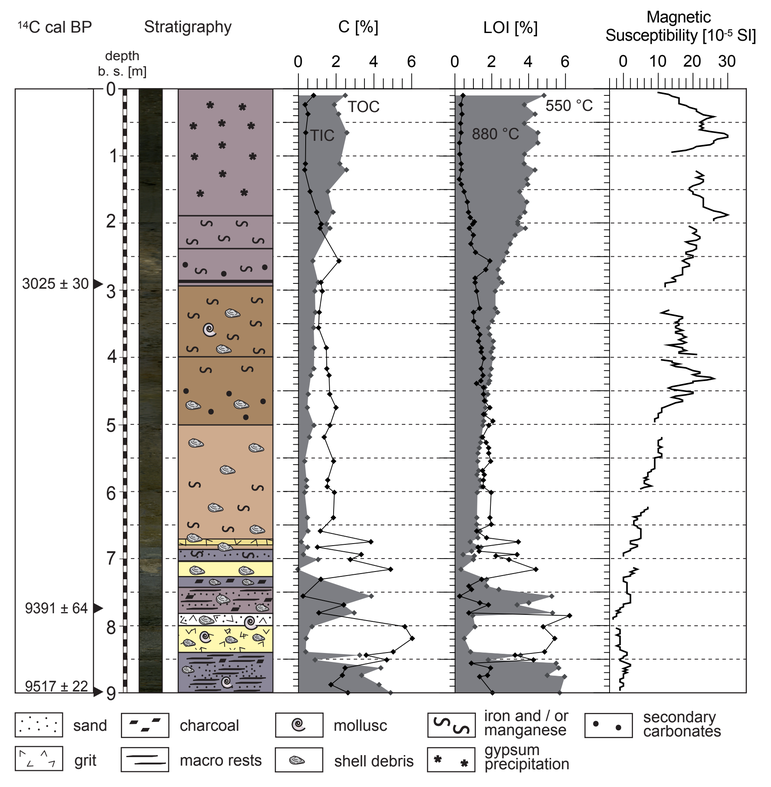

Fig. 7: Profil TAG 4

Contact
Marlen Schlöffel
Institute of Geographical Sciences
Freie Universität Berlin
Tel +49 30 838 70 348
Email marlen.schloeffel@fu-berlin.de

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