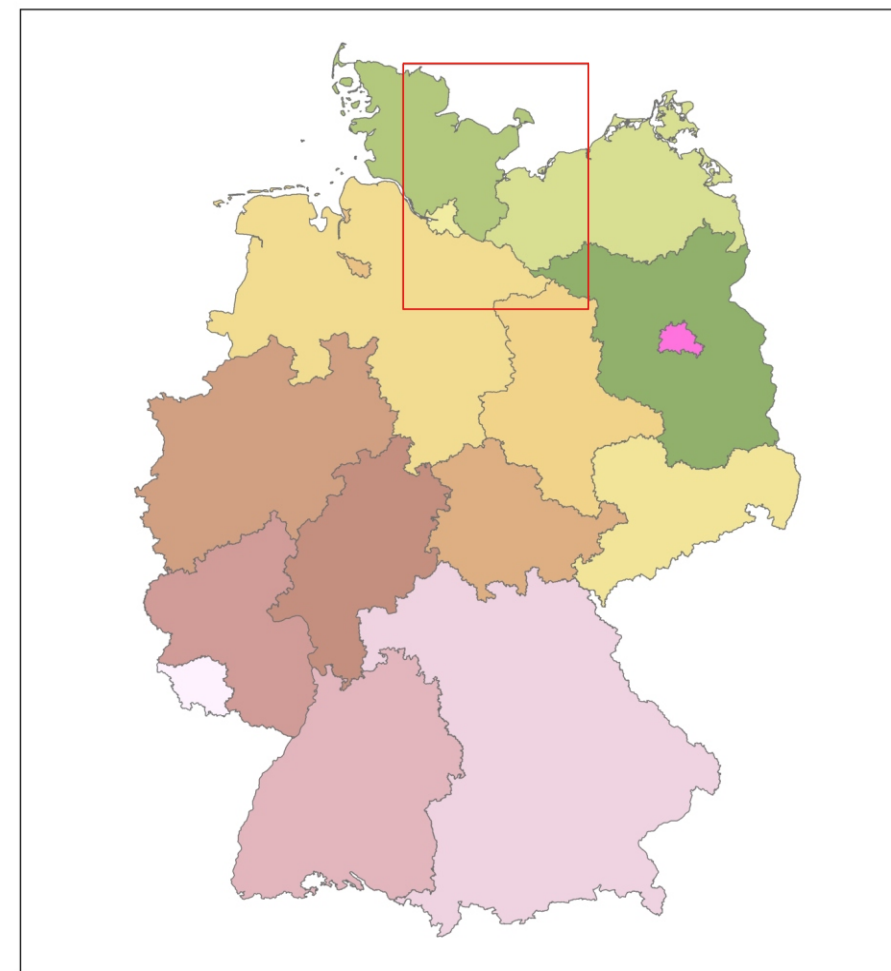


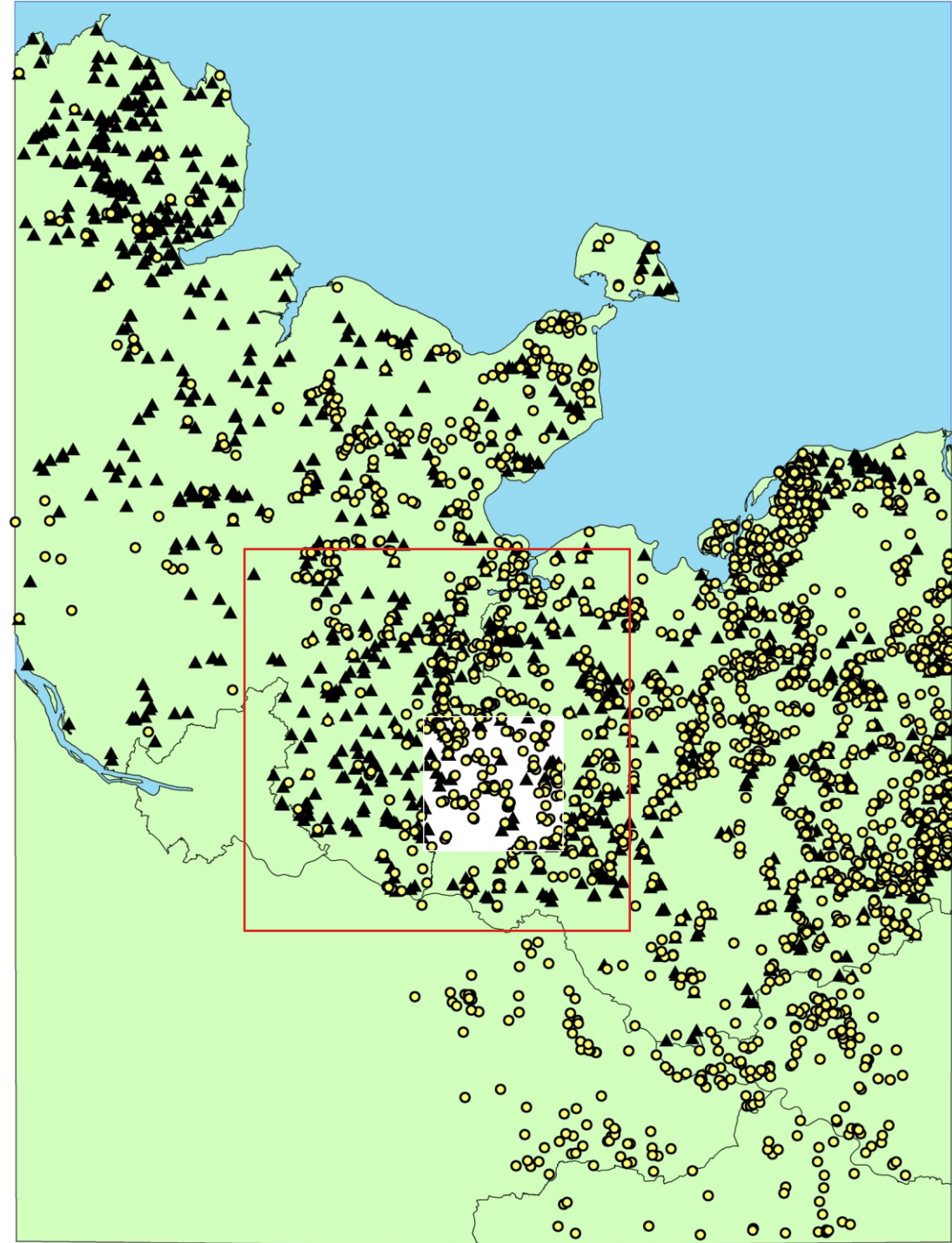
Slavs and Proximity to Watercourses The use of Corine Land Cover 2000, Local Drainage Direction Map and Topographic Position Index

Anne Klammt M.A. (Göttingen)/ Dipl. Geograph. Martin Steinert (Leipzig)



Area of study

Yellow spots - early medieval sites
Black spots - Roman Iron Age (recording not finished yet)

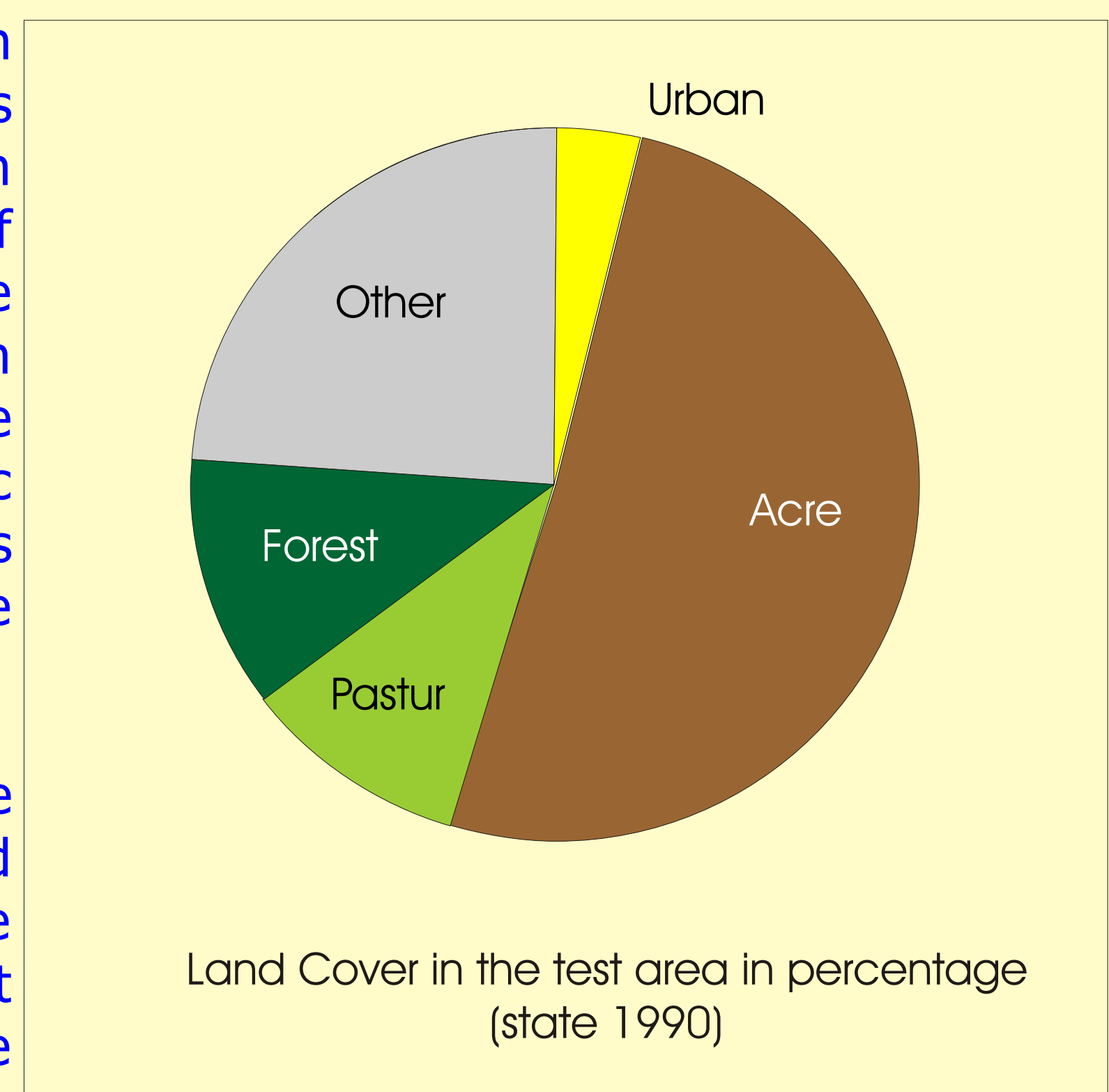


Proximity to rivers, streams, lakes and bogs has been emphasized almost stereotypically as a specific Slavonic trait of character, but does this fit reality? We try to get further with the solution of this problem by a.) calculating the surface distances on basis of a Local Drainage Map and b.) using the Topographic Position Index.

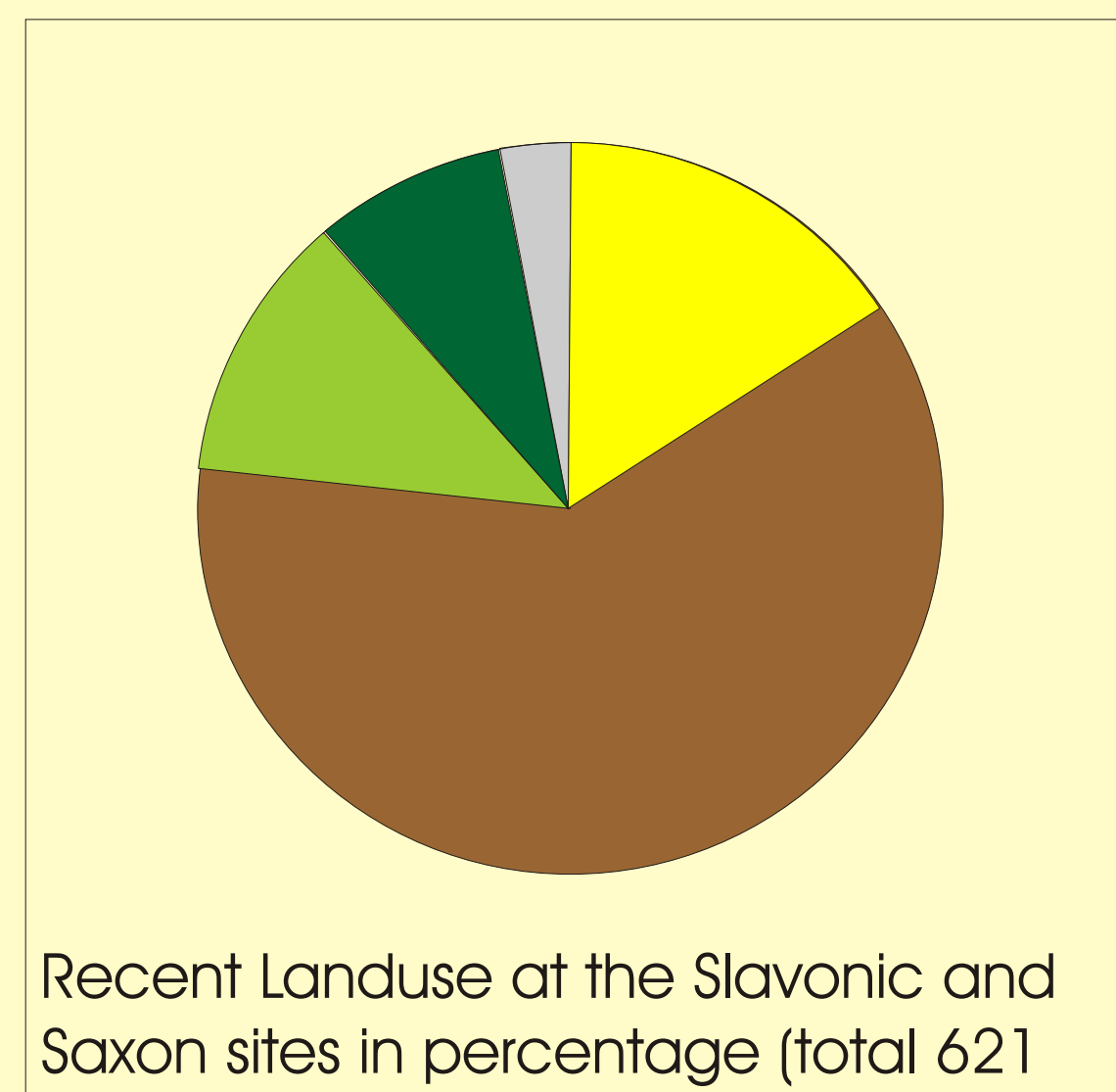
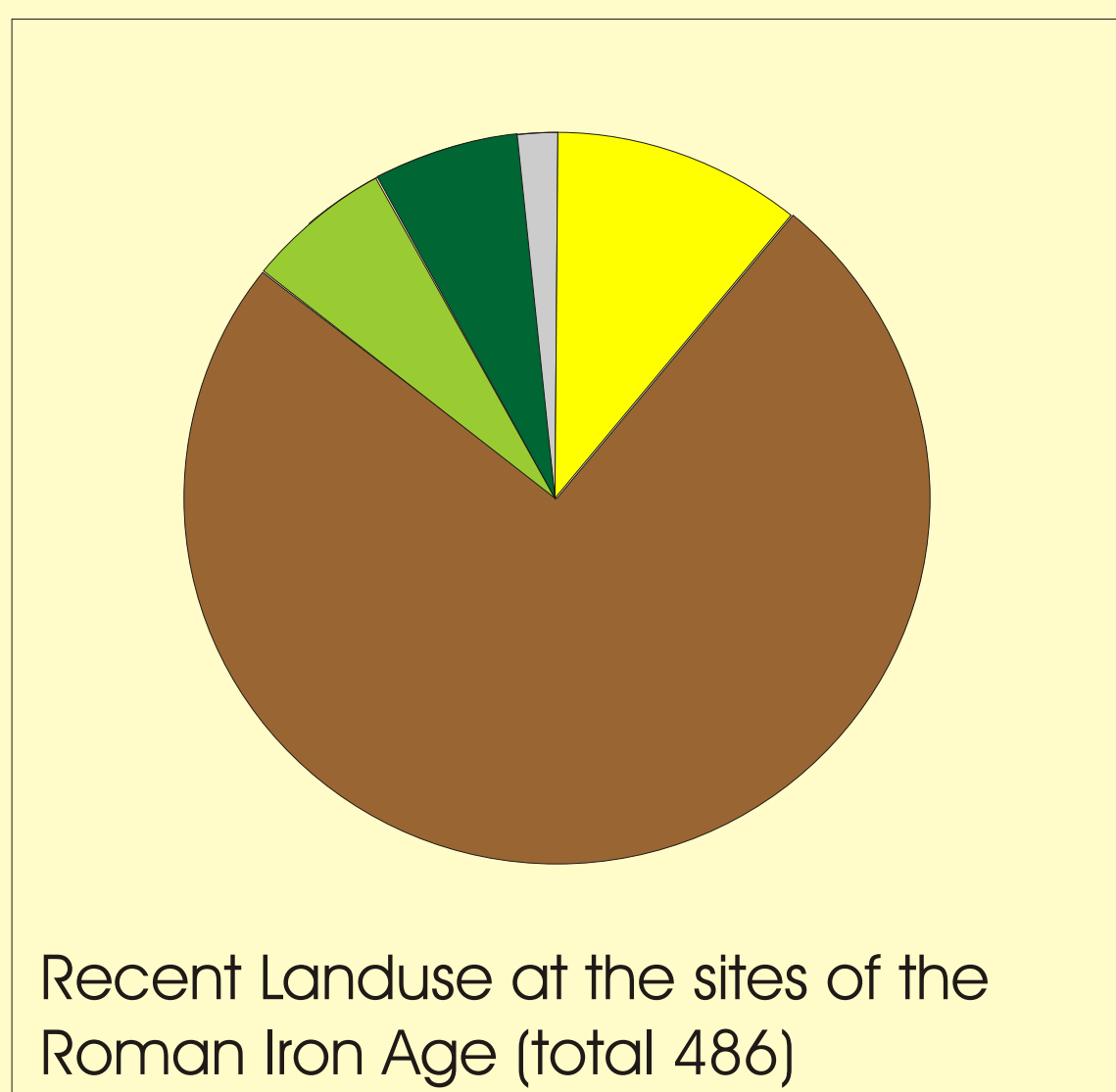
The ongoing dissertation focuses on the question, if there was a specific Slavonic way of using space. These issues will be addressed in a medium scaled study area of approximately 31000 km² in northern Germany. To specify patterns, the research compares the Slavonic east with its western neighbours the Saxon and Scandinavian regions during the early to high medieval period (8th -12th century) synchronically. A second level of the comparative onset parallelises the medieval layer with the spatial patterns of the roman iron age (1th -5th century).

There are differences - Corine Land Cover and archaeological sites

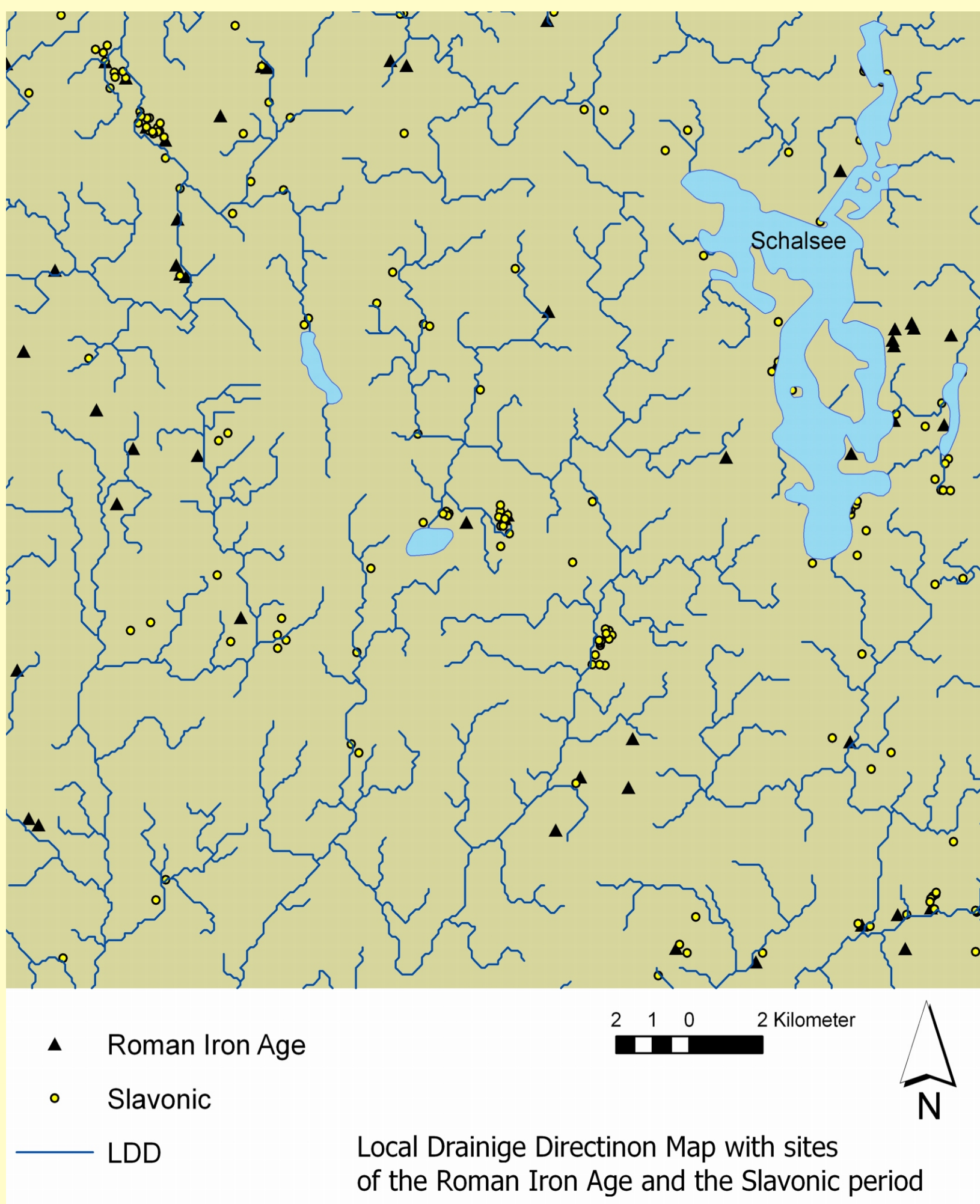
Since 2005 around 6000 sites have been recorded as a single dataset into an Access database. Beside the geographical position and an ID each dataset contains further information concerning for example the dating, constitution and history of the find complex. By no surprise are stray finds predominant. We expected, that the meaning of areas with arable land will be statistical overestimated by ploughed up sites. An intersection with the site-database of a test area (in the map above marked red) with the Corine Land Cover 2000 dates in Arc GIS 9 shows significant differences between the two periods (see the graphs).



We observed 360 Roman Iron Age sites on arrable land but only 266 had been statistically expected. The division between them is above 1. That means there is a significant preference of areas that are used for farming today. A similar preference or avoidance is not visible for the Slavonic sites.



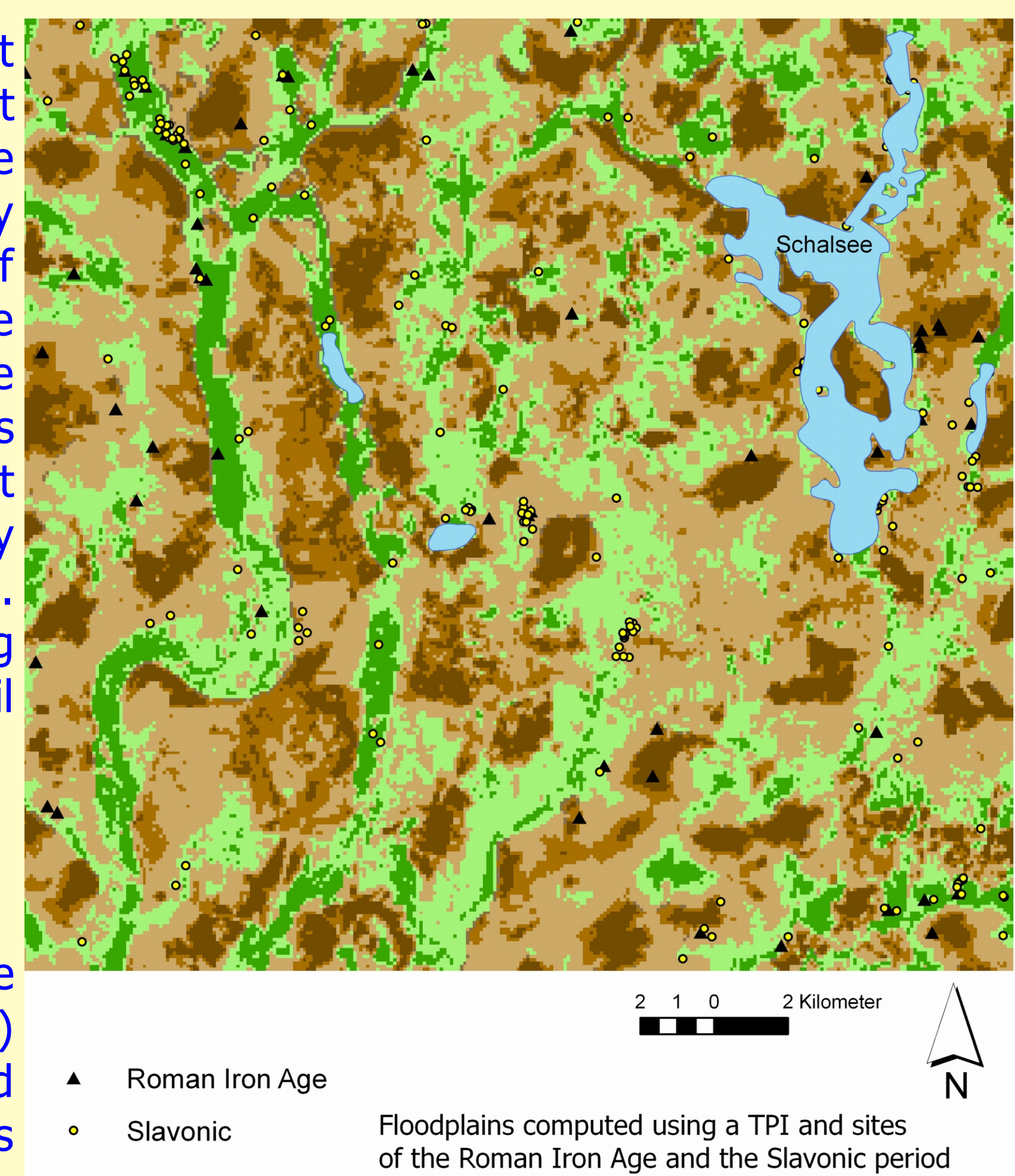
Local drainage direction maps - Water bodies beyond hydraulic engineering



The location and dynamic of water bodies changed since the observed period due to climatic changes, fluvial erosion and hydraulic engineering. We try to model a probable earlier state by a local drainage direction (LDD) map /test area marked white). The LDD is computed on basis of a Digital Elevation Modell (DEM) with the Open Source Program SAGA-GIS. The DEM itself derives from the free available 3 arcsec SRTM elevation data and is after preparing again with SAGA-GIS transformed to an ESRI Grid. The slope was derived with ArcView3.2a. Finally we computed the surface distance using the Spatial Analyst of the ESRI Arc GIS 9.

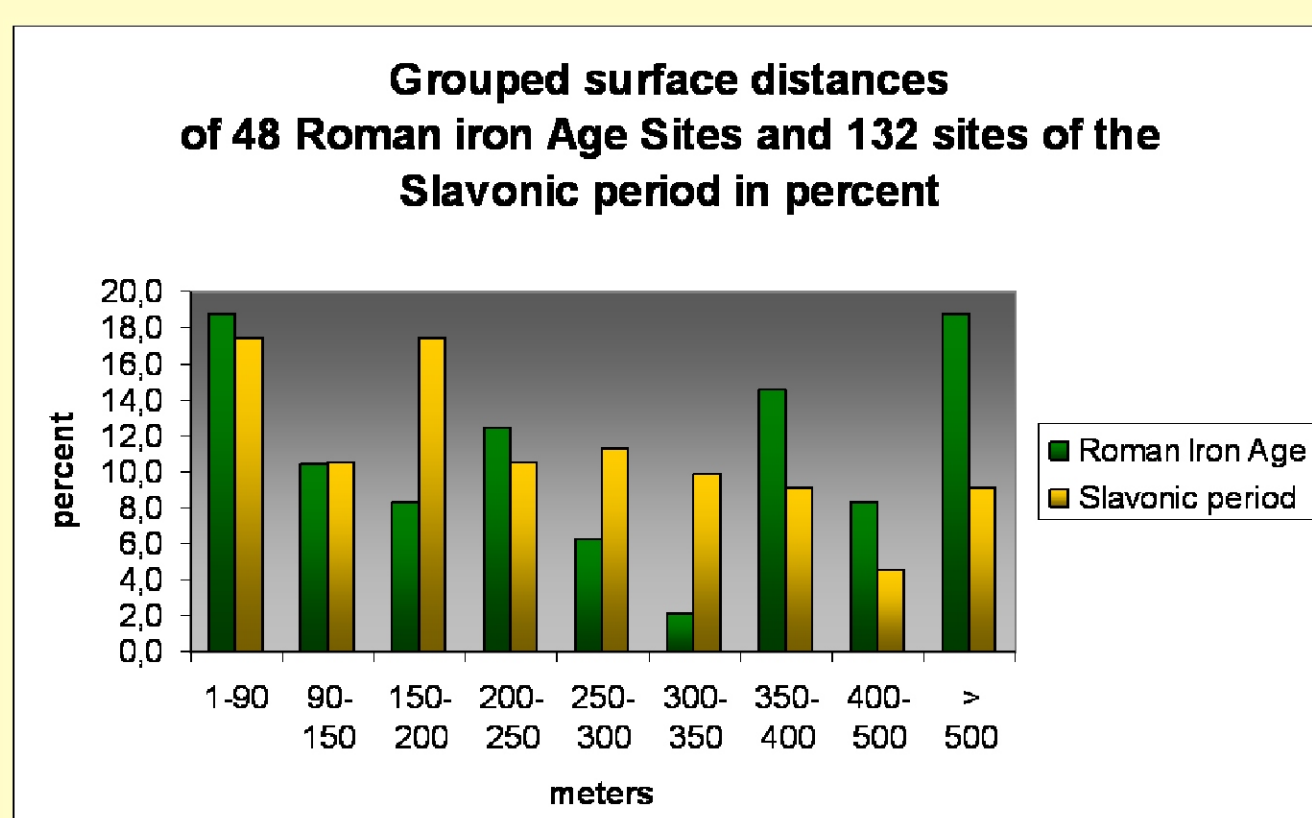
Topographic Position Index - In search of the floodplains

Searching for floodplains seems at first to be rather easy, but actually is quite complicated, as there are several different definitions of what a floodplain is. To facilitate matters, we decided to look for medium sized, flat valleys. We do this by the use of a Topographic Position Index (TPI). In order of that, we calculated a TPI value grid with a freely available ArcView Extension. The TPI is the basis for classifying the landscape into Slope Position and Landform Categories. As the TPI approach is very scale-dependent, we tried different scales ("neighbourhoods") and evaluated them by contrasting them with a soil map with the scale of 1:200.000. A neighbourhood of 2000 m shows a very convincing correlation between the proposed floodplains and the soil formations.



Results - comparing the surface distances

Comparing the results for the Roman Iron Age and the Slavonic and Saxon settlements, we concluded, that the proximity to some kind of watercourses is a ubiquitous phenomenon in spatial use. Significant differences are a.) a preferential of Slavonic settlements in proximity to floodplains and b.) and the location of sites on the drier areas close to watercourses during the Roman Iron Age.



Sources:
 Corine Land Cover 2000 - Deutsches Zentrum für Luft- und Raumfahrt e.V. Deutsches Fernerkundungszentrum (DFD) <http://www.corine.dfd.dlr.de>
 LDD - Conolly, J./Lake, M., Geographical Information Systems in Archaeology. (Cambridge 2006).
 SAGA-GIS <http://www.saga-gis.uni-goettingen.de/html/index.php>
 Soil map Bodenübersichtskarte 1:200.000
 SRTM version 2 - <ftp://e0srp01u.ecs.nasa.gov/srtm/version2/SRTM3/Eurasia>
 TPI - Jenness, J. 2006. Topographic Position Index (tpi_jen.avx) extension for ArcView 3.x, v. 1.3a. Jenness Enterprises. <http://www.jennessent.com/arcview/tpi.htm>.
 Weiss, A., Topographic Position and Landforms Analysis. Poster presentation, ESRI User Conference, 2006 San Diego, CA.