Evaluating the potential of urban archaeological deposits: the case of Grosseto

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The project of urban archaeology in Grosseto (1998-2005)

We started with a project about the “diffused town” between Roselle and Grosseto in 1997. It relied upon the idea that the origin and the development of the latter had something to do with the decline of the former, and the spreading of the power centres in the countryside. The urban excavation began in 1998, and ended in 2005. It involved the major part of public areas within the town centre. It was originated by the need of public works (pipes and cables) and it was conducted as a partnership among Grosseto’s county, Italian Archaeological Heritage (Tuscany) and University of Siena. We made a GIS platform to manage and store the data where all excavations’ features were related to other sources (literary, cartographic, geological, palaeoenvironmental, archaeological, aerial photographs, and historical buildings). The close connection among these data was the base of the historical model we produced by publishing the results in 2007. Moreover, we made a potential map, which is still updated.

The town centre of Grosseto with the excavations’ areas (red polygons).

This considerable amount of data and evaluations found a place in the making of the permanent exhibition “Musaeolab”, the museum laboratory of the town. Here, students and visitors can learn and interact with the data-base and the scholars involved in the project.

Students working on the site during the excavation in front of the Renaissance fortress (above) and within the Carolingian church of S. Peter (below).

The Musaeolab of Grosseto. The entrance (above), the multimedia room (in the middle), and the students working on the finds (below).

The spatial analyses (2010-2012)

In 2010 a new phase of the project began. We shifted the focus from the traditional historical archaeology to the spatial analysis of archaeological data. Some results have been already published in 2011 and 2012. In particular, we focused on two issues. The first was the developing town and its territory. We asked, whether the 1823 cadastre could be a palynometric of a long-lasting process of sedimentation of traces (channels, ditches, roads, field boundaries). The picture on the right shows the hypothesis of a field system aligned with two crossing roads, whose centre is Grosseto. The picture below shows the town and its territory according to the 13th-century sources.

The district of the town of Grosseto in the 13th century and the land evaluation of the soils’ potential.

The productive potential suggests that the Comune of Grosseto could feed 8,000 people if all the best soils would have been cultivated each year for crops and no casualty occurred. This can be an answer to the question: “why this town did not develop enough to compete with other major Tuscan towns like Florence, Pisa or Siena?” The second issue aimed to get more suggestions about the rapid growing of the town. We chose to evaluate the presence/absence of well-dated stratigraphy between AD 900 and 1050, its relationship with the town subsoli, and with the major buildings recorded in the literary sources and/or attested by archaeology in the same period. A short sequence of the main results of this evaluation using the kriging interpolation are shown in the following pictures. They enforce the idea that the growth concentrated in few, more favourable areas closed to two churches. One of them, S. Pietro, has been excavated, proving to be a Carolingian building. The other, S. Leonardo, was founded in the middle of the more ancient features of the early medieval village.

The field boundaries of 1823 cadastre aligned with the two major roads in relationship with the distance from Grosseto.

Isotropic ordinary kriging of the values for the period AD 900-1050. The red contoured areas suggest the possible most intensively inhabited zones of the town centre in association with the major buildings mentioned in the literary sources for the same period.

The last attempts focus on the making of a general cost surface with attractors and obstacles. This powerful tool can be calibrated for any kind of evaluation, by establishing the relative weight of each factor in the raster calculator. Thus, one can evaluate the cost of moving from a single point in any direction in a given landscape, where rivers, lakes/lagoons, steep slope, low drainage soils are the hurdles and central places, fast drainage soils, springs, special resources are the attractors. It is more than calculating the simple least-cost path, because the idea of “cost” can be applied to many other issues, such as the distribution of commodities within a territory or the potential convenience of cultivating high potential soils in relationship to the distance from the town.

The cost surface of movement within the late medieval territory surrounding Grosseto (green to red map above) in relationship with the 3D surface in the same period (blue to brown map below).

The same interpolation overlaying the land units map of the town centre suggests that this expansion’s phase would affect only the most profitable areas, avoiding the valleys.