

Definition of the parameters of the Archaeological Potential of an urban area

Anichini F., Bini M., Fabiani F., Gattiglia G., Giacomelli S., Gualandi M.L., Pappalardo M., Sarti G.

First interdisciplinary considerations about the elements involved in the calculation of the archaeological potential of an urban area

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1. Introduction

Defining the parameters that help calculate the Archaeological Potential of an urban area is a constantly changing process that will stretch through the first project year. Consequently, this report is to be regarded as the result of a preliminary analysis conducted by the research group and involving all project members (archaeologists, geologists and mathematicians), and not as a definitive product. The latter will be the result of Work Package 8 regarding the implementation of the prototype of the Map of Archaeological Potential.

The analysis process involved 3 preliminary and subsequent phases:

Defining the archaeological potential of an urban area;

Identifying the parameters necessary for the implementation of a predictive model of the city throughout its various historical periods;

Identifying the parameters of archaeological potential.

2. Definition of Archaeological Potential

The first step consisted in defining the Archaeological Potential of an urban area, based on which the parameters allowing its calculation could be determined. The previous experience of the Department of Archaeological Sciences represented the starting

point of this activity.

The archaeological potential of an area represents the possibilities that a more or less significant archaeological stratification is preserved.

Archaeological potential is calculated by analysing and studying a series of historical-archaeological and paleo-environmental data retrieved from various sources, with a degree of approximation that may vary according to the quantity and quality of the data provided and their spatial and contextual relationships.

The archaeological potential of an area is, in itself, a factor independent of any other following intervention that is carried out, which must be regarded as a contingent risk factor.

The map of archaeological potential is a predictive model and, as such, is knowingly created as a decision-making tool.

3. Identification of the parameters for the predictive definition of the city throughout its historical periods

The process for defining overall urban archaeological potential consists in drawing up a series of predictive maps relating to the city's historical periods, which will be implemented during WP8 (tasks 8.1 and 8.2).

For this reason, the parameters required for the predictive definition of the city throughout its historical periods had to be defined to begin with, followed by the parameters needed for calculating the archaeological potential. This phase of the process required the contribution of the different disciplines involved in the project (geology, geomorphology and archaeology), which then merged together during the following phase.

In terms of subsurface geology, the criteria for determining the parameters for the predictive definition of the city throughout its historical periods basically refers to the distinction between river channel areas and extra-channel areas. The latter include wetlands and (dry) floodplain areas, in a broad sense. Paleo-depositional reconstruction of the uppermost subsurface, through *facies* analysis of a series of stratigraphic sections, will consequently allow the areas crossed by channels (prevailing lithology: sand), marshes (prevailing lithology: organic lime and clay with low consistency, peat and sand) and dry floodplain areas (prevailing lithology: consistent lime and clay, interrupted locally by thin sand layers) to be distinguished. The different settlement potential that these areas and their relations represent throughout the various periods helps predict the probable presence of settlements. This general criterion is applicable to all the stratigraphic intervals that we will be able to reconstruct, and must naturally be integrated with both archaeological and geomorphological data: whilst geological maps define stratigraphic units and sedimentary bodies, geomorphological maps show relief forms and define the geomorphic processes responsible for their genesis, in addition to recent modifications.

In order to define the values of archaeological potential on the basis of geomorphological data, therefore, it is necessary to understand, together with the archaeologists, the settlement criteria for a certain area during the various cultural phases. Generally speaking, each morphological unit (or morphotype) can be more or less suitable for settlements. Indeed, certain cultures prefer wetlands, others favour flat areas, while others have a preference for topographic summits. Geomorphological surveying, therefore, must be based on a detailed definition of the morphological units of the current landscape and on the identification of their spatial position. Particular attention must be given to their extension in order to outline their limits with relative accuracy. Subsequently, with the help of stratigraphic data regarding the uppermost subsurface, the diachronic evolution of the forms must be characterised. A distinction must be made particularly for cases presenting:

- continuity, over time, of geomorphic processes, yet spatial variation of forms (e.g. river processes continue to prevail yet the position of the riverbeds changes);
- geomorphic processes that follow on from the previous due to climatic modifications and/or crustal dynamics (e.g. marshes transformed into lagoons due to coseismic subsidence);

- geomorphic processes that commence or end by human intervention throughout the territory (e.g. deforestation, reclamation, etc.).

Determination of the criteria for a geomorphological-based predictive definition must also take into account the limits of paleo-topographic reconstruction connected to the compacting of sediments and to subsidence, which tend to reduce the differences in height between the morphological units. It must also be different for each historical period and strictly relate to the archaeological data.

In archaeological terms, the following parameters will be taken into consideration for the predictive definition of the city throughout its historical periods:

- typology of finds, inferred on the basis of the interpretation of the archaeological records and appropriately standardised in categories;
- quality and quantity of the archaeological data;
- spatial relations between the finds, which allow identification in probabilistic terms of the presence of further finds in areas that have not been archaeologically investigated;
- typological relations between the finds, which allow identification in probabilistic terms of the presence of further finds in areas that have not been archaeologically investigated;
- expert judgment: the experience of experts will be a useful tool for determining the possible existence of archaeological remains since their statistic and mathematical evaluation will use knowledge which would otherwise be difficult to manage.
- land use: it is important to consider all anthropic traces – including traces that are not strictly connected to constructions or settlements, such as agricultural and/or farming practices – and to assign a different parametric value to them.
- historical data from written sources and maps, thanks to which it is possible to reconstruct the city environment, both in the presence and (especially) absence of archaeological records.

In brief, the overall parameters that contribute to the predictive definition of the city throughout its various historical periods may be summarised as follows:

- **Typology of finds**
- **Quality and quantity of archaeological data**
- **Spatial relations between the finds (distance/depth)**
- **Typological relations between the finds**
- **Expert judgment**
- **Morphological units and geological facies**
- **Land use (pedology, palynology)**
- **Data that can be inferred from written sources (toponymy, land registry, documentary sources...)**

4. Parameters of Archaeological Potential

The final phase of analysis focused on defining the parameters that best determine urban archaeological potential and are based on a period predictive model.

The following parameters were identified:

- **Type of settlement:** the presence of settlement structures and their different typology directly contribute to determining the level of archaeological potential;
- Density of settlement: the topographic concentration of the settlement directly contributes to determining the level of archaeological potential;
- **Multi-layering of deposits:** the greater or lesser archaeological diachrony directly influences the level of archaeological potential;
- **Removable or non-removable nature of the archaeological deposit:** the presence of a deposit that cannot be removed has a direct impact on the level of archaeological potential.
- **Degree of preservation of the deposit:** calculated according to the presence of anthropic and natural removals and, therefore, to the presence of documented stratigraphic gaps, it directly influences the level of archaeological potential.
- **Depth of the deposit:** this is a controversial parameter and its use alongside the other parameters mentioned above will be evaluated during the course of the project. We are quite aware that this is a highly risky issue because it appears to be strictly related to the contingency aspects of the project execution and could be confused with the calculation of archaeological risk. Instead, the parameter that will be measured is related to whether the deposit is superficial or not and to the higher or lower possibilities of it being intercepted. The depth at which we expect an archaeological deposit to be preserved could represent a valid parameter within a decision-making tool. Consequently, the depth of the deposits could inversely have an impact on the level of archaeological potential.



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