Chapter 3
Google Earth Revisited:
Case Studies at the Plain of Larissa (Thessaly, Greece)

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ABSTRACT

The interpretation of photos and the processing of Google Earth imagery that allowed the "random" discovery as a result of a non-systematical research of numerous marks of buried constructions in the wide area of the city of Larisa (Thessaly, Greece) is presented in this chapter. Additional data as aerial photographs over time, satellite images and the digital terrain model of the same area has been used. From the numerous marks, this chapter mainly focuses on three positions where the positive marks (soil marks or/and crop marks), circular or/and linear, reveal on a satisfying level covered construction of great dimensions. The ongoing research activity of the research team along with this research highlights the advantages of using Google Earth imagery in an attempt to "random" mark of unknown covered constructions, or, in the frame of a systematic survey of aerial and remote sensing archaeology, as additional and not exclusive source of information.

INTRODUCTION

The ‘’ image ‘’ of a covered monument from the soil or / and crop, embedded in the analogue or digital image, is the result of the interaction of the covered monument with the prementioned elements. This ‘’ image ‘’ is internationally called ‘’ mark ‘’. The covered monument may be a ‘’ solid construction ‘’, e.g. the foundations of a building or an ‘’ open construction ‘’, e.g. an ancient ditch or an old stream (Figure

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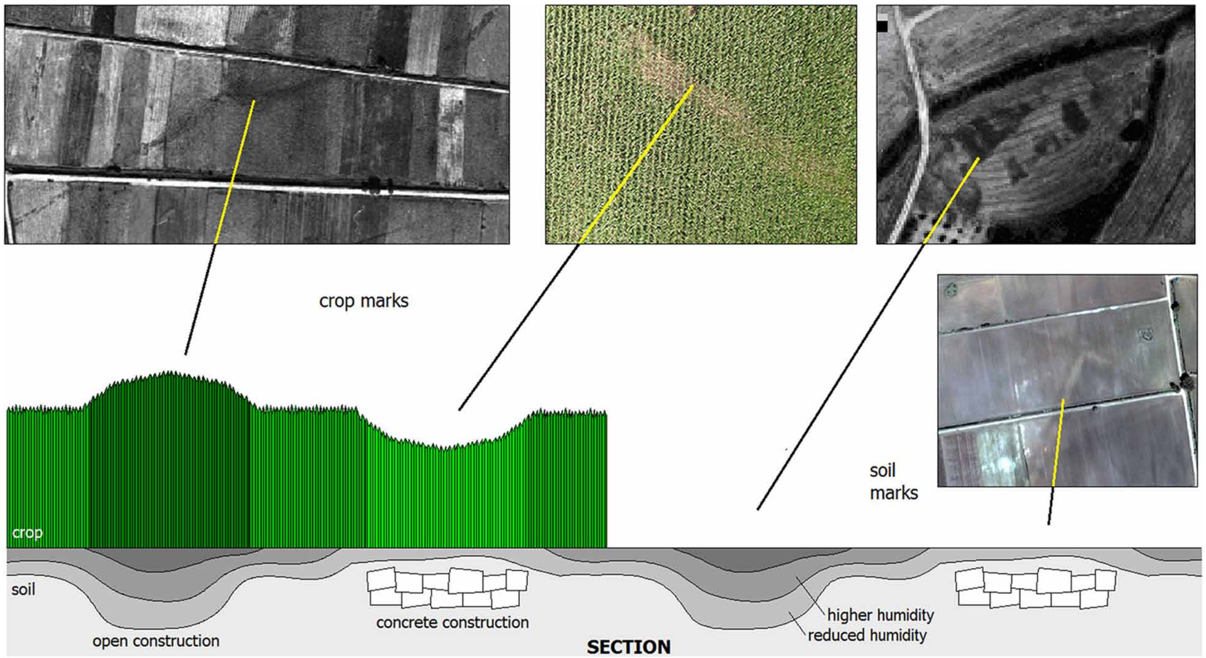
Figure 1. Anatomy of a mark (Kaimaris, 2006)



1). The result is, in the first case, the appearance of a negative soil or crop mark (light color or light gray in relation to the surroundings of the mark) and, in the second case, the appearance of a positive soil or crop mark (dark color or dark gray). The interaction of the covered monuments with the above elements (soil or crop) is very complex. The form of the event (kind of marks) and the intensity of its observation depend on dozens of factors, such as the type, size and depth of the covered monument, the amount of soil moisture, the temperature of the air, the soil, the type of cultivation or vegetation, the period and intensity of rainfall, the depth of the aquifer, etc. These factors cause, on the one hand, different soil moisture and temperature between the material covering the monument and the material on either side and, on the other hand, qualitative (height, density, color) and temperature difference between vegetation.

Thus, the amount of electromagnetic energy reflected or emitted by these materials (soil or vegetation) is different and is recorded by remote sensing systems (analogue photography, multispectral and panchromatic images, thermal images, etc.), allowing observations to be made on the ‘’ images ‘’ of the covered monuments (Kaimaris, 2006).

The tools for archaeologic forecasting are surface survey, historical sources, testimonies, field survey, historical map, aerial photography, satellite imagery and geophysical interruptions.

Google Earth (GE) can be characterized as a complementary and thus helping tool in the frame of a systematic survey of aerial and remote sensing archaeology (Kaimaris et al., 2011). More specifically, apart from the main use of GE imagery in archaeology, which is the observation and further study of known archaeological positions, in some occasions the imagery itself has led to a “random” tracing of unknown covered constructions.

For example, in the Philippi Plain (Macedonia, Greece) the editorial team is conducting systematic aerial and satellite archeology research since 2002. In 2011, during a periodic monitoring of the variation in the magnitude and number of traces of the covered ancient Via Egnatia and other laterally covered