

EAC GUIDELINES FOR THE USE OF GEOPHYSICS IN ARCHAEOLOGY

Questions to Ask and Points to Consider

EAC GUIDELINES 2

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PREFACE



These guidelines provide an overview of the issues to be considered when undertaking or commissioning geophysical survey in archaeology. As every project differs in its requirements (e.g. from finding sites to creating detailed maps of individual structures) and variations in geological and environmental conditions lead to different geophysical responses, there is no single 'best' survey technique or methodology. This guide, in its European approach, highlights the various questions to be asked before a survey is undertaken. It does not provide recipe-book advice on how to do a geophysical survey or a tick list of which technique is suitable under what conditions. Experienced archaeological geophysicists should be consulted to address the questions that are being posed. Using geophysical techniques and methods inappropriately will lead to disappointment and may, ultimately, result in archaeologists not using them at all. "If all you have is a hammer (or magnetometer), driving a screw becomes impossible".

Especially in the American literature the term 'remote sensing' is often used to describe geophysical as well as air and space based exploration of underground features (e.g. Wiseman and El-Baz 2007). By contrast, and in line with European traditions, a clear distinction is made here between ground-based geophysical techniques and remote sensing techniques. This is based on the imaging principles underlying the respective technologies. Ground based systems usually collect one spatially registered data sample from each sensor location (e.g. a single reading for each magnetometer, or a single trace from each GPR antenna). Remote sensing techniques, by contrast, collect spatially resolved data from a whole area of investigation from each sensor location, using either the system's optical aperture (e.g. photography) or a scanning device (e.g. laser sampling).

These guidelines are based on the experience of the authors in archaeological geophysics and influenced by various published sources. The bulk of the text is derived from the English Heritage guidelines on *Geophysical Survey*

in *Archaeological Field Evaluation* (English Heritage 2008) with terminology modified with reference to other publications (Gaffney and Gater 2003; Schmidt 2013a; Aspinall *et al.* 2008; Schmidt 2013b). The notation of numerical values follows the Anglo-Saxon system whereby the 'decimal point' is represented by a dot.

These guidelines were commissioned by the European Archaeological Council (EAC) and provide information on archaeological geophysics that is generically applicable. There are also some country-specific guidelines in place and additional information may be found in national heritage legislation. Some of this is summarised in a Wiki at www.archprospection.org/eacguidelines, which is continuously being updated.

Geophysical survey for archaeology has a wider academic and professional forum than was the case several years ago. A succession of biennial *International Conferences on Archaeological Prospection* started in 1995 at the University of Bradford in the U.K. and were held subsequently in Japan, Germany, Austria, Poland, Italy, Slovakia, France and Turkey. These meetings were attended by an ever greater variety of specialists in geophysics and remote sensing. The Near Surface Geophysics Group (NSGG) of the Geological Society in Britain has similarly hosted a continuing series of biennial one-day meetings devoted to recent research in the subject and other conference series also include regular sessions on archaeological geophysics (EAGE Near Surface Geoscience, EGU General Assembly, International Conference on GPR etc.). The journal *Archaeological Prospection*, initiated in 1994, has established itself as the main outlet for publication of relevant research and case studies; and the International Society for Archaeological Prospection (ISAP) was formed in 2003 (www.archprospection.org), publishing results from across the world in its quarterly newsletter. Archaeological geophysics is now a component of undergraduate teaching in many countries although currently the only post-graduate degree course specifically devoted to the subject is the MSc in Archaeological Prospection at the University of Bradford (bit.ly/146M4FQ).

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