

Studiedag: de rol van geofysisch onderzoek in het archeologieproces

Abstracts van de presentaties

-MEYLEMANS E., DESMEDT PH.: Geophysical prospection in Flanders: a summary

In this introduction we present an overview of the evolution and the current state of affairs concerning the practice of geophysical surveying in Flanders, and its embedding in the current legislation and the archaeological process.

-DE SMEDT PH., VERDONCK L., VERHEGGE J.: Some basic principles of archaeological geophysics

Short introduction to the basic principles governing the implementation of geophysics in archaeological prospection. An overview will be given of the main methods used in archaeological research, along with a reprise of the physical properties that are most targeted in archaeogeophysical surveys.

-SCHMIDT A.: Guidelines for the Use of Geophysics in Archaeology: should they be prescriptive?

In order to obtain meaningful archaeological results from geophysical surveys many issues have to be considered. These include a choice of suitable geophysical techniques for a site or project, good data quality to capture the archaeological features and allow meaningful data interpretation, data analysis that distinguishes between certain and assumed interpretations, comparability of reports, and data archiving. To make these choices some guidelines and baseline parameters are needed. They help to create meaningful tender documents or project briefs, select good value for money from contractors and hold them to account after delivery of their results.

However, "every site is different" and the parameters that determine the success of a geophysical survey are so plentiful (and sometimes unpredictable) that publishing a simple table or even algorithm does not seem to work. In addition, what may be an acceptable compromise between cost and quality in one country, may be considered unacceptable in another. The [Guidelines](#) written for the European Archaeological Council (EAC) are therefore less prescriptive in their details but discuss the most important points that should be considered and the questions that need to be asked before a geophysical survey is commissioned.

The overall conclusion is that it is best to provide only general statements about details (e.g. line spacing), but help with the design of very specific and highly detailed project briefs for individual surveys. Such specific documents are good for geophysical contractors as they create a level playing field and thereby separate conscientious from cheap quotations, and they are essential for the commissioning archaeologists as they allow to obtain the best output given the available budget.

-FASSBINDER J.: Archaeological prospecting at the Bavarian State Dept. Of Monuments & Sites: Between research and day to day routine

Geophysical prospection and aerial archaeology was institutionalized at the Bavarian archaeological service since 1975 (aerial archaeology) and 1982 (geophysics) as a tool to inventory and monitor archaeological sites of Bavaria. Since then ca. 50 000 sites were newly discovered and ca. 1000 sites were documented in detail by the means of geophysical prospection. In the first years we selected mainly extraordinary and most suitable sites for the geophysical (magnetometer) prospecting in order to demonstrate the extraordinary potential of these new non-destructive methods for site and monument protection. Since ca. 10 years, commercial geophysics increasingly plays an important role

in the daily routine of the archaeological service in Bavaria. However, this development has not led to a decline in workload, but creates additional work and a new field of duty for geophysicists of the Bavarian archaeological service: the prospection results of commercial companies have to be standardized and verified by specialists, and in the framework of the verification of conjectural monuments the archaeological prospection section has to provide measurement on selected case histories to support long term projects in urban planning.

-HULIN G.: Inrap and geophysics: towards a sustainable approach

Preventive archaeology policy is now well established in France. One of its main characteristics is to have trial trenching at the center of the archaeological process. With about 2000 archaeological studies carried out each year (1800 evaluations and 200 excavations), Inrap is the most renowned institute in France. In this context, the use of geophysics for archaeological evaluation has been very contentious. Some attempts to substitute all or part of trial trenching by geophysics have been made and all ended in failure. Indeed, if geophysics is seen as a step forward in most countries, in France, this technique is often seen as a step backwards concerning the evaluation phase for development-led archaeology. Nonetheless, Inrap doesn't wish to be deprived of this scientific tool. Compared to most countries which use geophysics mainly for archaeological evaluation (often on large areas and without any prior information), the institute promotes a rational use of geophysics on very specific case studies with clear scientific and/or technical issues. In most of the cases carried out by Inrap, geophysics occurs after trial trenching or as a complementary tool for the excavation phase. Therefore, much archaeological and pedological information is known and leads to a greatly improved geophysics efficiency. This results in several different uses, ranging from the identification of site extension outside the excavated zone to the global integration of the site in its surrounding landscape or soil studies on stripped areas.

In 2015, Inrap decided to develop this activity. At present, a team of 2 geophysicists with 18 technicians specialised in data acquisition is fully operational. Using this well-reasoned approach, 86 geophysical surveys have been carried out since (41 of which were in 2017), and all the indicators show an expansion and a good integration of geophysics by archaeologists.

-RENSINK E.: Archaeological prospection in the Netherlands. The contribution of geophysical techniques

In the Netherlands, trial trenching and (in sharp contrast to most other countries) borehole surveys traditionally are the most applied methods of archaeological prospection. Geophysical techniques are commonly applied in marine areas, but still are underrepresented in surveys dealing with the prospection of archaeological remains in land surfaces. Moreover, still there seems to be a focus on the investigation of specific types of sites consisting of brick walls, trenches, etc. In the paper the contribution of geophysics as part of the archaeological heritage cycle in the Netherlands is discussed, also making reference to the Best Practices Prospection project of the Cultural Heritage Agency of the Netherlands.

-ORBONS J.: Phantasies, bureaucracy and fear of the unfamiliar

Is that ground radar the mole with the camera on its nose? Can you find me the typology of the ceramic fragments under these piles of the demolished building? Geophysics does not give the solutions we need answered!

These are just a handful of questions and remarks that regularly get asked. No, we do not have the mole with the camera on its nose and no, we can't give the typology of ceramic fragments under a pile of rubble, we can't even detect them!

But geophysics in archaeology does work, plenty of examples. Fortunately when discussing an archaeological case, most archaeologists will have an open mind to include a geophysical survey in their examinations. So why are so few surveys actually carried out? Is it technical limitations? The technical options are rather well known.

Let us together philosophise on the good and poor examples and why it did work and did not work.

-NICHOLLS J.: Observations from recent use of geophysics in commercial archaeological mitigation: a Flemish and Irish perspective

Geophysical techniques are frequently employed in commercial archaeological evaluation in Ireland and the UK providing archaeologists and their clients with detailed information as to a given site's archaeological potential prior to proposed development. The results from these surveys are used to inform invasive archaeological methods such as test trenching and excavation in advance of construction. Despite very positive indications that geophysical methods can also be highly informative as a tool in commercial archaeological evaluation in Flanders still it appears few surveys are undertaken. Examples from recent geophysical surveys in both Ireland and Flanders are presented.

-VERBEEK B., SEINEN P.: De erfgoedradar: kansen voor vrijwilligers

Het doel van deze presentatie is te laten zien dat de inzet van de Erfgoedradar nieuwe kansen voor vrijwilligers in de archeologie biedt. Door wetgeving en economische omstandigheden zijn de mogelijkheden voor amateurarcheologen om op te graven of deel te nemen aan archeologisch (gravend) onderzoek beperkt. Met behulp van de Erfgoedradar kunnen amateurarcheologen zelf non-invasief onderzoek naar de aanwezigheid van archeologische sporen en resten uitvoeren.

Deze presentatie laat zien hoe grondradaronderzoek efficiënt door amateurarcheologen met beperkte financiële middelen kan worden ingezet om zelf non-destructief onderzoek te uit te voeren. Sinds 2014 is de WIMA actief op het gebied van grondradar binnen de archeologie en heeft inmiddels ruim 75 projecten succesvol afgerond, deels in samenwerking met de Rijksdienst voor het Cultureel Erfgoed. Deze kennis en ervaring heeft geleid tot het opstellen van een concreet stappenplan om daarmee het onderzoek succesvol te maken.

De resultaten van deze projecten laten zien dat de Erfgoedradar in staat is onder diverse omstandigheden antwoord te geven op een scala van onderzoeksvragen. Niet alleen grote structuren zoals fundamenten en restanten van kastelen, kerken en historische landschappelijke elementen maar ook de minder bekende structuren waaronder grafheuvels en karrensporen kunnen met de erfgoedradar in kaart worden gebracht.

-DEPRAETERE D.: Het gebruik van geofysische technieken binnen projecten van de Vlaamse Landmaatschappij

Geofysische technieken worden al langer ingezet als archeologische prospectietechniek binnen de projecten van de Vlaamse Landmaatschappij. Enkele cases tonen aan dat dit vooral gebeurt i.h.k. van fysieke bescherming en educatieve ontsluiting.

Kasteelsite van Roost – Bij de inrichting van het buurtpark *Heerlyckheid van Roost* te Haacht werden geofysische technieken aangewend als onderdeel van een archeologische voorstudie. Deze studie had als doel de site te evalueren en waarderen en daarbij het contextuele inzicht van de locatie te verruimen en ongekende en kwetsbare archeologische elementen en zones te lokaliseren en identificeren. De resultaten werden gebruikt om het inrichtingsplan aan te vullen, te corrigeren en op die manier ook nog archeologie-vriendelijker te maken. De resultaten bepaalden ook de randvoorwaarden voor een goed site-management. De wettelijk beschermde site is nu tegelijk educatief ontsloten en fysiek beschermd voor de toekomst.

Gallo-Romeinse vicus Kester en villasite Lombergveld – In het kader van het ruilverkavelingsproject Gooik werden een aantal sites onderzocht met geofysische technieken. Doelstelling: de sites op het ruilverkavelingsplan beter af te kunnen lijnen. Binnen het projectgebied werden maatregelen voorzien om de sites fysiek te beschermen en educatief te ontsluiten. Als direct gevolg van dit onderzoek werd de vicus Kester wettelijk beschermd.

Villasite Meer – Op deze villasite te Meldert (Hoegaarden) werden geofysische technieken ingezet ná een proefsleuvenonderzoek. Doelstelling: het vervolledigen van de grondplannen van het hoofd- en bijgebouw in functie van een grondplan-reconstructie en fysieke bescherming. Ook voor deze site wordt de procedure voor wettelijk bescherming opgestart en een educatieve ontsluiting wordt voorzien.

-VAN DEN OEVER F.: Geofysische prospectie, is de Nederlandse archeologie of bodem hier wel geschikt voor? Jazeker!

In Nederland vindt zo nu en dan geofysische prospectie voor archeologische doeleinden plaats, maar het blijft beperkt. Ook kunnen er zeker een aantal vragen gesteld worden. Wat is het technisch niveau van dergelijke geofysische onderzoeken? Hoe wordt omgegaan met de resultaten? Nederland met haar metersdikke pakketten vette klei en sponzig veen, moeten we er eigenlijk wel aan beginnen? Wat zijn de technische of academische ontwikkelingen in NL op het gebied van geofysisch onderzoek? De opdrachtgever blijft toch nog te vaak met de vraag zitten: *als ik niks zie, is er dan ook daadwerkelijk niks?*

-SAEY TH.: Wat is het potentieel van het geofysisch onderzoek bij het uitvoeren van archeologisch vooronderzoek in Vlaanderen?

Ondanks de complementariteit van geofysische prospectie met de meer conventionele vormen van archeologisch vooronderzoek, wordt die de laatste jaren slechts sporadisch ingezet. Desalniettemin kan een gecombineerde aanpak met een weloverwogen inzet van geofysisch onderzoek een verhoogde efficiëntie en een meerwaarde voor het gehele archeologische proces opleveren. In deze presentatie zullen enkele alternatieve benaderingen van die archeologisch vooronderzoek voorgesteld worden. Deze zullen vervolgens worden geïllustreerd aan de hand van voorbeelden uit commerciële onderzoeken in Vlaanderen.

-VERHEGGE J., VERDONCK L., DE SMEDT PH.: A practical perspective on the integration of geophysics in Flemish archaeological heritage management

We will demonstrate the implementation of geophysical methods in archaeology from a practical Flemish perspective, starting from the current organization of development-led and other archaeological research, policy and management. Archaeological geophysics is used in three settings.

Firstly, geophysical survey has been applied for purely scientific reasons by academic researchers in archaeological and other sciences over the past decades, which has formed the roots of geophysics in Flanders. After initial academic applications, the Flemish heritage agency stimulated the use of geophysics in management and selection/evaluation of possible archaeological scheduled monuments, alongside other non-destructive methods. Development led-archaeology is the final aspect of Flemish archaeology where geophysical methods have been implemented. The adoption of geophysical approaches to preventive archaeology remains limited, which can be attributed partly to the specific challenges of Flemish archaeology such as the heterogeneous sedimentary environment in which it is set. In a broader geographical perspective, the inherent complexities of geophysical surveying equally play an important role. While new legislative frameworks should facilitate the implementation of geophysical methods in development led archaeology, it is up to the 'commercial archaeologist' to rationalize if and how geophysics can be used in specific projects, and how the resulting data are translated to a robust assessment and advice for further research.

In this presentation, the complexities of archaeo-geophysics in Flanders will be addressed from a practical vantage point, whereby we relate the potential of geophysical methods to site-specific archaeological research questions in complex soil environments.

-Dix B., VYNCKIER G.: Using geophysics in historic gardens (poster presentation)

Traces of long abandoned gardens and historic phases of many still being used can be studied by a variety of methods. Geophysical survey techniques help to identify earlier layouts by locating the buried remains of former boundaries, paths and steps together with statue bases and other individual features. Details of previous water supply and drainage systems can be recovered in addition to finding filled-in ponds and related basins. Flowerbeds and other planting arrangements are similarly identified. The information assists with the development of appropriate site management and maintenance, and can also be used to target selective archaeological excavation as well as contributing to wider studies.

In former gardens the greatest geophysical distinctions generally arise from differences in soil moisture so that the clearest plants are often obtained by electrical earth resistance survey. Where historic garden layouts have become buried beneath a featureless expanse of lawn, the soil compaction and gravel or other bedding associated with former paths often provide an ideal high-resistance target. Likewise, the moisture-retaining properties of old flowerbeds may have survived long after their original cultivation to produce other anomalies. Magnetometry and ground-penetrating radar can be applied with the equal effectiveness, especially to the detection of metal pipes and underground drainage in addition to relocating lost structures such as fountain basins and related features.