ISAPNEWS

The Newsletter of the International Society for Archaeological Prospection

Issue 67, December 2022

Editorial – Issue 67

This issue starts with the completion report from a project supported by the ISAP Fund. The podcasts from the 'Survey Like a Girl' project are well worth listening – do check them out (link in the article). The ISAP Management Committee was very pleased to support this outreach project that demonstrates the breath of topics that can be funded.

The two project reports in this issue are short versions of presentations delivered during the NSGG day-meeting on 6 December 2022 in London. Although both investigate sites that are whole landscapes their approaches are completely different, confirming that there is no single 'right' way to do things.

We are still collecting your photo contributions to compile another release of ISAPinacotheca. We hope that you will send us many more so that we can include them in the next issue. In the meantime, if you have any other photographs, data or text that you would like to publish quickly then do not hesitate to send them soon.

Armin Schmidt

editor@archprospection.org

No crop too high: The Cover Photograph shows the team from the Department of Archaeology, Govt. Nepal, during an earth resistance survey around the stupa of Ramagrama, Nepal (the crop is lentils). See also the rear page! © A Schmidt

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The 'Survey Like a Girl' Podcast - A project celebrating female archaeological geophysicists

ISAP Fund Completion Report

Kimberley Teale

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Acknowledgements

Thanks firstly go to the ISAP for their generous funding awarded through the ISAP Fund grant scheme, and in particular to Armin Schmidt and Paul Johnson for their guidance. Also, to the CIfA GeoSIG for their additional grant support to enable completion of the project. Sincere thanks go to the seven interviewees: Emma Brunning, Petra Schneidhofer, Susan Ovenden, Lucy Parker, Kayt Armstrong, Alice James and Anne Roseveare for giving freely their time for the interviews and of their support for the project.

The Project

www.SurveyLikeaGirl.co.uk

As part of this year's Chartered Institute for Archaeologists' (CIfA) conference, the CIfA Geophysics Special Interest Group (GeoSIG) celebrated '50 years of Archaeological Prospection', honouring the contribution that geophysics has made to the archaeology sector in such a short space of time. Given that the conference closely followed behind International Women's Day, the inspiration for the podcast came from the desire to not only celebrate the contribution of geophysics to our sector, but to celebrate the contribution of women within the profession.

Figure 1: The Interviewees Emma Brunning, Susan Ovenden, Alice James, Kimberley Teale , Petra Schneidhofer, Lucy Parker, Kayt Armstrong and Anne Roseveare.

I have met and been mentored by some brilliant female archaeological geophysicists, some of whom have supported and driven some of the greatest technological advances to our profession. I wanted to develop a project that would amplify their voices and share stories of discovery and development, to create a legacy to inspire a future generation of female surveyors, and to inspire those in the profession to stand up and make their voices heard. I also wanted to break down barriers in the hope of making the discipline feel more accessible.

With a tongue-in-cheek podcast title originating from being told at the start of my career to 'not survey like a girl', the podcast began organically in January 2022 through a series of conversations with peers, gathering ideas about who would make for good interview guests and what direction the podcasts should go in. A shortlist of seven professional female archaeological geophysicists were recruited and a timetable of interviews set up through spring and early summer, fitting in around the candidates' fieldwork and research schedules. Consultations were also held with contacts within the field of journalism and sound editing, obtaining advice about the interview process, structuring the podcasts, and how to record and edit the interviews

to ensure for a high-quality end product. Through this consultation period and following a recommendation, an external sound contractor was enlisted to undertake the sound editing and the creation of the podcast episodes. A website was built through WordPress to host the project, and Acast was selected as the host for the podcast episodes due to its ability to freely stream to a number of popular podcast platforms.

In the run-up to each interview, background research was conducted for each candidate enabling a structure to be drafted for each conversation. The interviews were conducted online and structured around the intention of having an informal chat, discussing how it all began for the subject and what inspired them to take up a career in archaeological prospection. Depending on the person's background, the interview then either delved into career defining moments, research paths or diversity from the sector.

Episode 1 focused on Emma Brunning, who had been an archaeological geophysicist since 2002, and her interview essentially acted as her 20th anniversary in the sector. Emma originally came through the folds of GSB Prospection, and her career highlights included surveying on Orkney and partaking in the geophysical surveys for Time Team for 10 years.

Episode 2 covered the fascinating research being undertaken by Dr Petra Schneidhofer in Norway, with a focus on the influence of environmental factors on GPR and magnetometer surveys, as well as the implementation of non-invasive methods in cultural heritage management. Petra's highlights included discussions around her dream job and driving a towed GPR through Stonehenge.

Episode 3 delved into the fascinating 35-year career of Dr Susan Ovenden. Topics covered included undertaking a PhD under the supervision of Arnold Aspinall, to being a key member of the GSB Prospection survey team, as well as one of the founding members of the original Time Team geophysics team.

Episode 4 focussed on Lucy Parker, reflecting on her career in marine geophysics, landing a dream job with Historic England and delving into her current PhD research into the effectiveness of geophysical survey within archaeological investigation.

Episode 5 covered the interesting research background of Dr Kayt Armstrong. Kayt's research includes geophysics in peatland environments, and three

post-doctoral research posts in the Netherlands, Greece and the UK. Kayt has a depth of insight into the geophysical world and her interview was particularly informative and interesting.

Episode 6 took a slightly different turn with Alice James – a consultant archaeologist with a background in geophysical prospection. The interview delved into Alice's history in commercial archaeology and the geophysics sector, as well as her two-year stint with the British School of Rome, and how her knowledge of geophysics had helped guide her career to date.

Episode 7 focussed on the 24+ year career of Anne Roseveare. With a background in chemical engineering, Anne has a unique insight into soil sciences and geophysics for environmental purposes as well as archaeology, which provided for a fascinating chat and podcast episode.

In total, to date, the podcast episodes have been downloaded 811 times (Figure 2) across 45 countries (Figure 3) and the Survey Like a Girl website has had 1,276 visitors. The episodes were downloaded a further 403 times from the Acast server, across 26 countries.

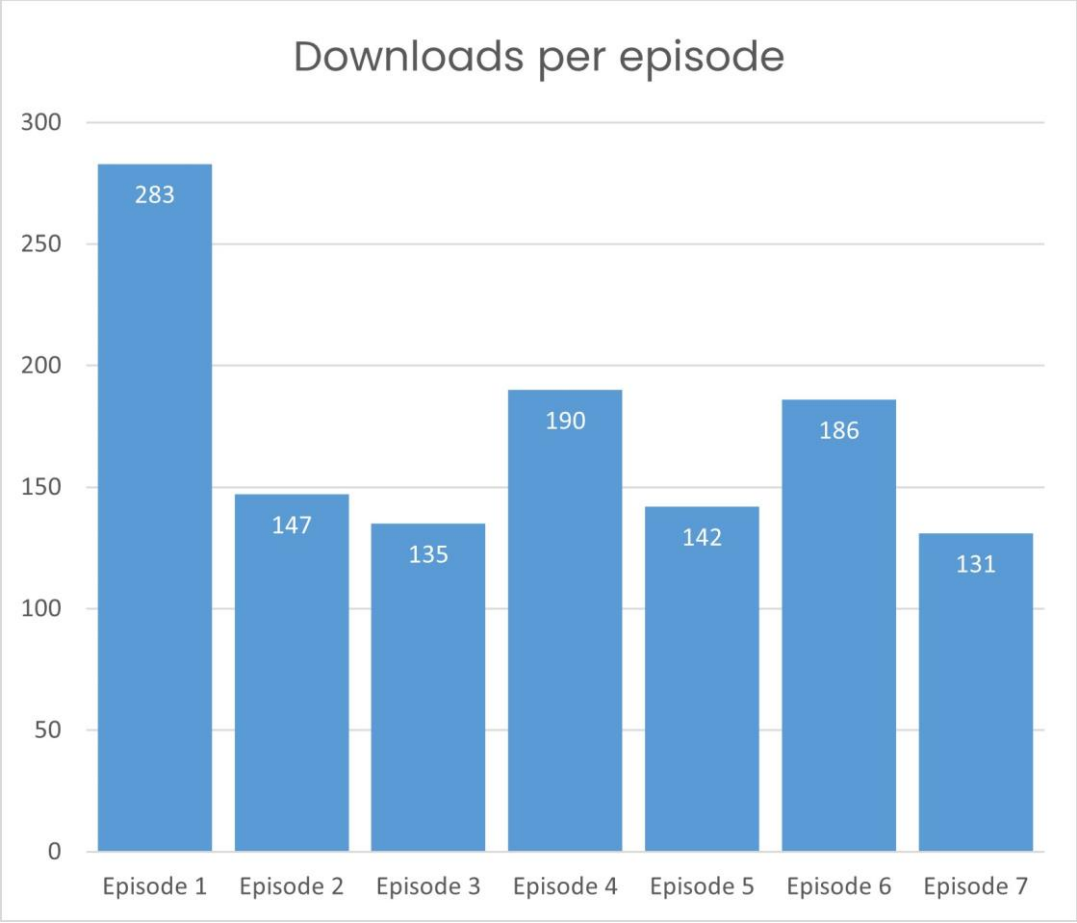

Figure 2: Downloads per episode.

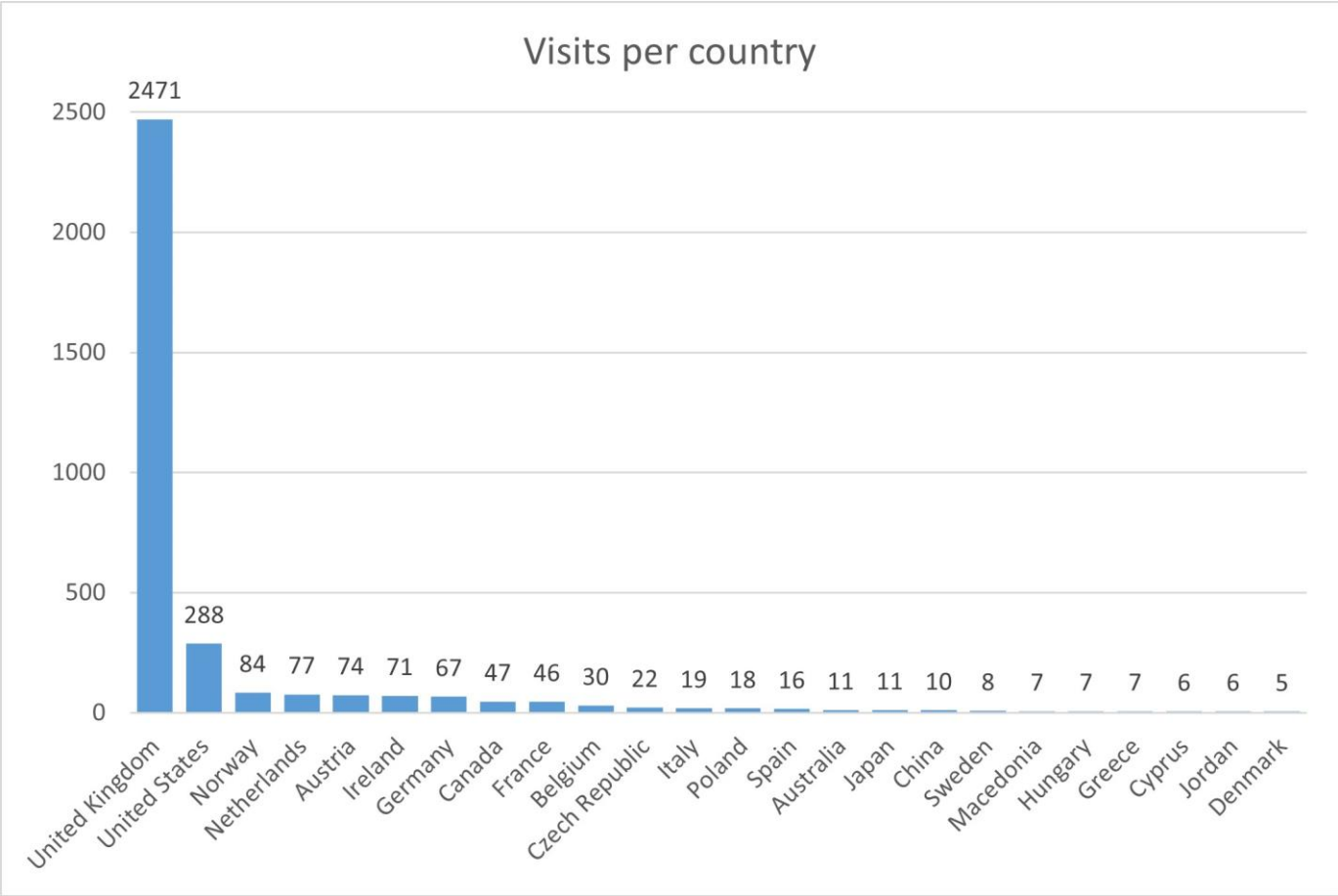

Figure 3: Web-site visits per country.

The website and Acast server will act as repositories for the podcast, and it is hoped that they can be kept freely available to anyone with an interest in geophysics, archaeology, or as a new topic of interest. Thank you to all who have listened to the podcasts so far. You can find them at www.SurveyLikeaGirl.co.uk , or on Spotify or Apple podcasts.

Large Scale Geophysical Investigations of the Medieval Manor of Austrått in Mid-Norway – Combining Metal Detecting, GPR and Magnetometer Surveys

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Introduction – metal detecting assemblages from Austrått

The Manor of Austrått is one of Norway's oldest manors and has been the home of a long line of chieftains, earls, and noblemen- and women dating back to the 10th century. Recent archaeological discoveries indicate that its history predates written sources and stretches back to the older Iron Age.

In 2015 and 2018, the county archaeologists in Trøndelag, in collaboration with Ørland Municipality, initiated metal detecting rallies focusing on the manor gardens and the fields surrounding the main manor buildings down to the present-day shoreline towards the Trondheim Fjord. This resulted in the discovery of about 450 artefacts dating back to the older Iron Age until the early 18th century. About 80 were older than the late Middle Ages and involved iron brooches, a folded runic letter in lead, finger rings, a Viking-age key, a rod for a scale weight, lead weights and a weapon crest from the 15th-century archbishop Bolt and his family. All of these tell a varied and long tale of activity indicating possible trade, burials, settlements and more. However, it is hard to discern purely based on the artefacts what kind of activity the finds might represent. This is why this site is chosen as one of several case study areas for the research project "PastCoast".

The PastCoast-project – using geophysical methods to understand metal detecting assemblages

The PastCoast-project is a multidisciplinary project funded by the Norwegian Research Council, investigating coastal Iron Age sites known from metal detecting assemblages. Ultimately the project aims at studying changes and breakpoints in the utilisation of prehistoric marine coastal environments, identifying possible causes for changes and creating an interpretive framework to identify possible human responses to changing environmental settings (Stamnes 2022). There is an untapped potential to use large-scale geophysical surveys combined with small-scale excavations to understand sites known mainly from metal detecting assemblages. One of the main objectives of the PastCoast-project is to survey a series of sites known mainly from metal detecting assemblages by large-scale high-resolution GPR and Magnetometer-surveys. It can then be investigated (a) if it is possible to detect subsoil features at these sites, and interpret them from an archaeological perspective, and (b) determine if there is a spatial relationship, locally and/or regionally, between the finds assemblages and subsoil features. This will help characterise these sites and improve the cultural-historical understanding of their context and significance.

Geophysical Surveys at Austrått – surveys and results

The geophysical investigations performed at Austrått involve large-scale GPR and magnetometer surveys. All in all, about 5.4 hectares of GPR data have been collected using the Kontur (previously 3d-radar) GPR with a ground-coupled antenna array with an inline and crossline spacing of 0.075 m (Figure 1). A 3.4 hectare magnetometer survey then followed this up, using a crossline spacing of 0.25 m using a towed 16 channel Sensys MXPDA magnetometer array.

Figure 1: GPR surveys at Austrått. Photo: Arne Anderson Stamnes.

The GPR investigation revealed a wide range of geophysical responses (Figure 2a). Some are clearly of cultural-historical significance, while others are more difficult to interpret. The surveys also revealed many modern features in the form of infrastructure and drainage patterns (Figure 2b).

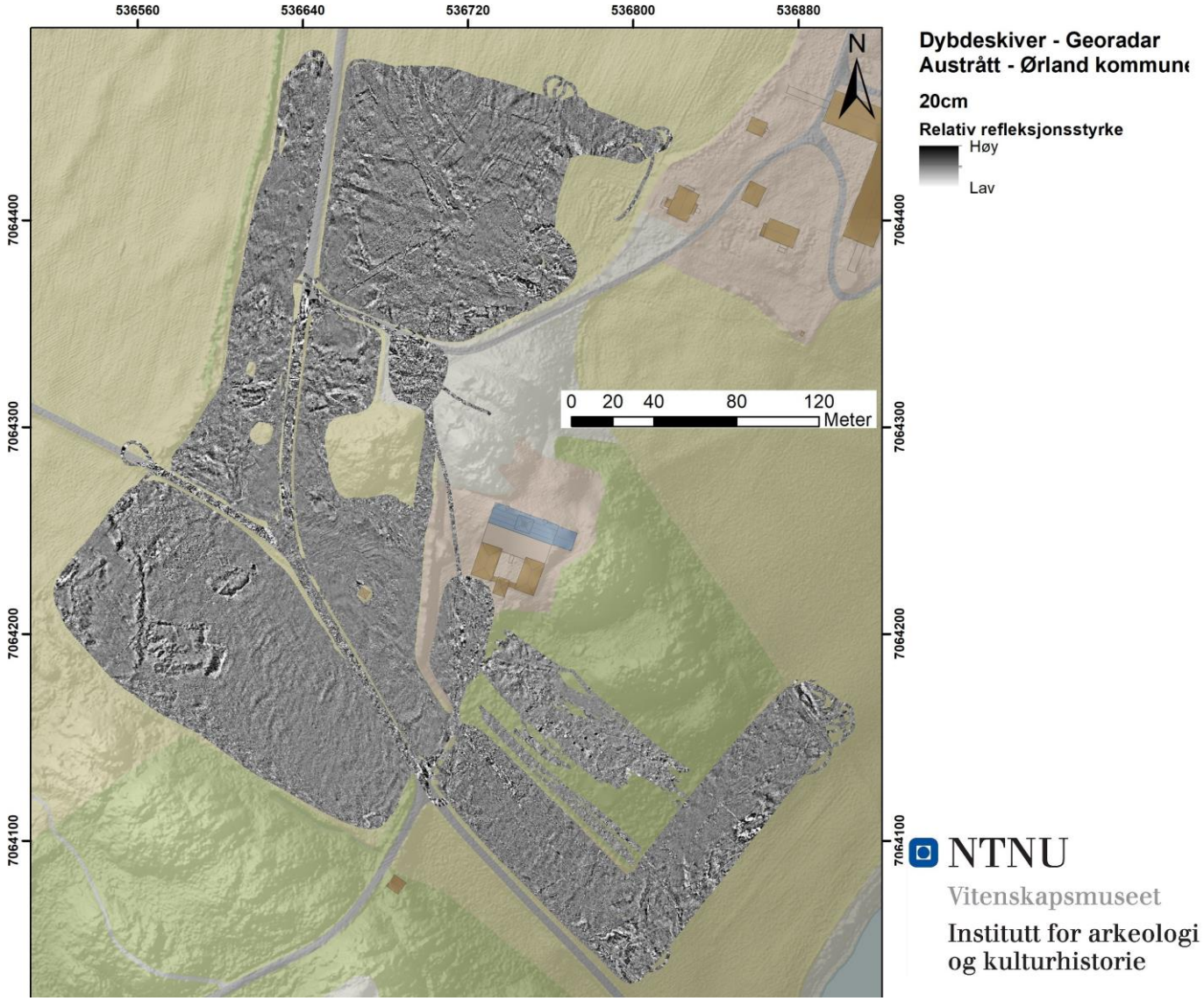

Figure 2a: GPR data from Austrått.

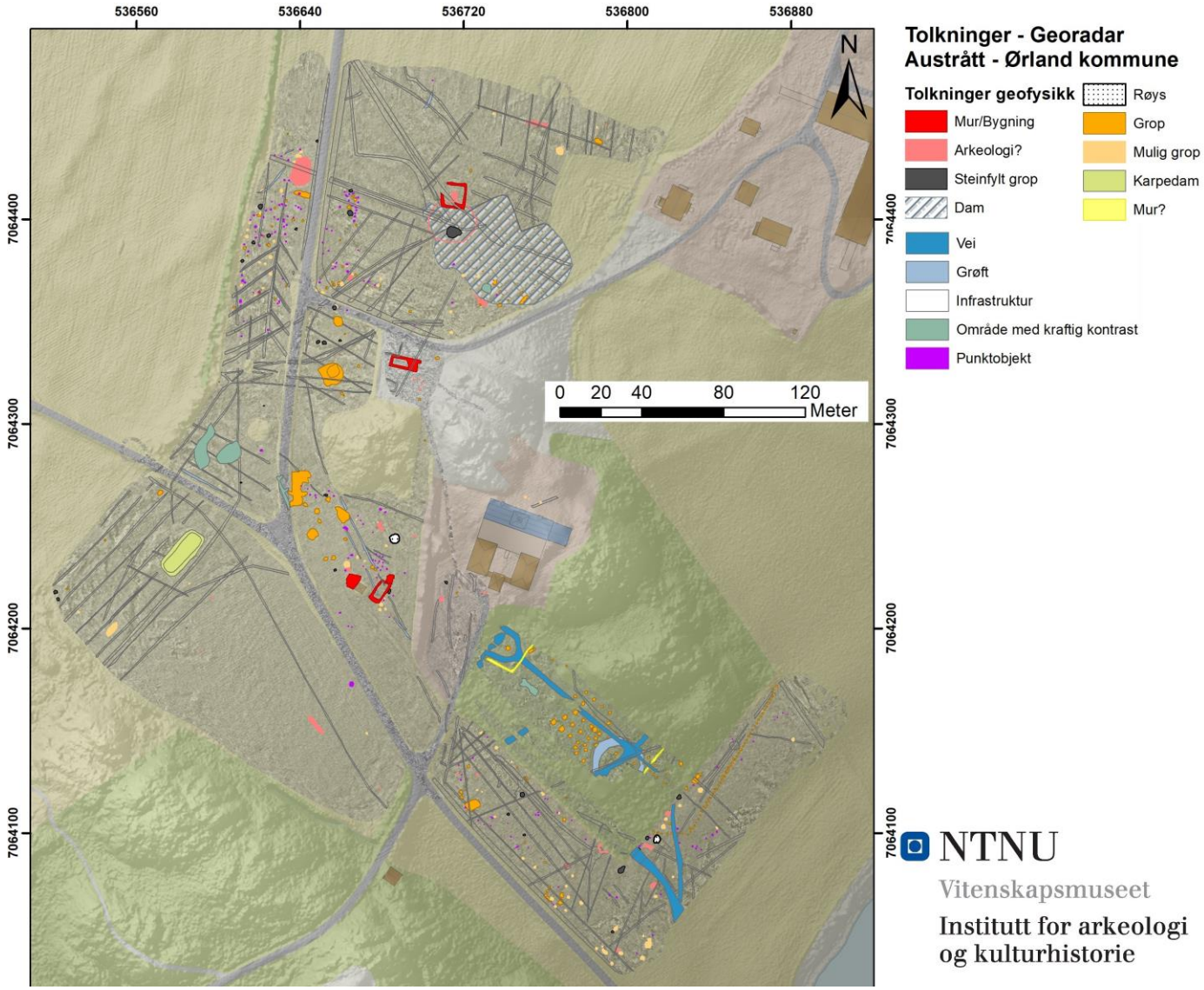

Figure 2b: Interpretation of GPR data from Austrått.

At least four anomalies are interpreted as house-foundations, where one is assumed to be the remains of the old medieval manor house. The size of this geophysical response is about 12 m × 7.5 m, and has a signature typical for stone-built walls (Figure 3). These must have been significant in size and height, as they are from 1 to 2 meters wide in some places. This area also shows a strong magnetometer-response. A key dated to Viking- or early medieval times was found nearby.

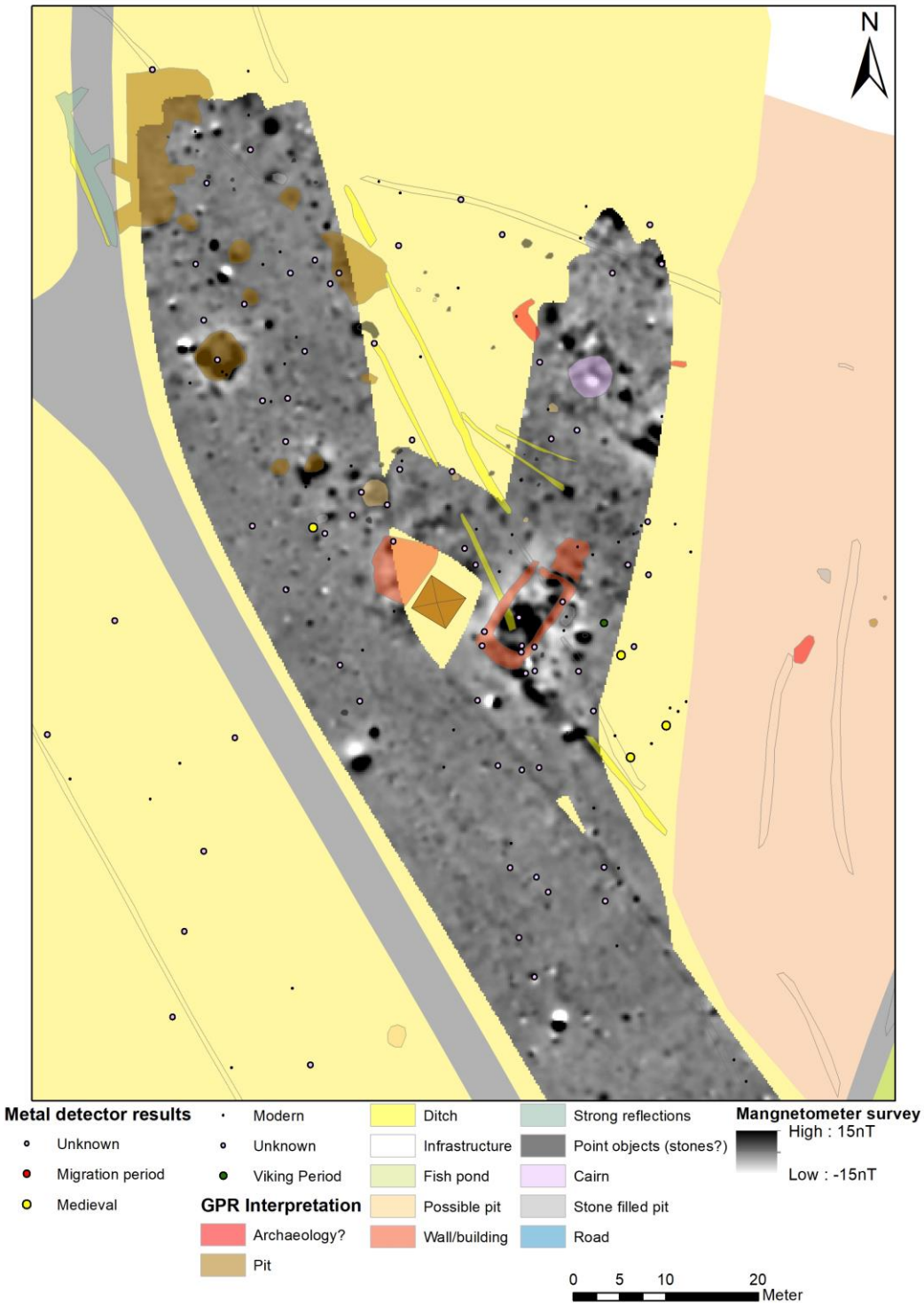

Figure 3: GPR interpretation and magnetometer data (-15 to +15 nT, black is positive), and distribution of metal detecting finds surrounding the possible manor-house.

The investigations also identified the location of a medieval fishpond. Several other larger responses interpreted as ponds were located, and prominent garden-archaeological features, including footpaths, trackways, and pits from renaissance-shrubberies that were later removed. The survey from the

garden area also revealed a circular ditch-like anomaly enclosing an area of approximately 19 m in diameter, possibly from a previously unknown Iron Age burial mound.

A total of over 300 possible pits were interpreted, of which 30 were classified as stone-filled pits. Such reflections at other surveys often revealed prehistoric cooking pits (Gustavsen *et al.* 2020). Some of the anomalies on this site have a notable magnetic response supporting this interpretation.

Summing up – comparing metal detecting finds and geophysical survey results

The geophysical surveys revealed many interesting reflections and geophysical responses, some of which indicate the presence of significant archaeological features. The survey results indicated several previously unknown building-remains, pointing to Medieval and more recent Renaissance activity on site. Combined with the metal detecting assemblages they tell a story of trade, settlement and prominent landscape reshaping in the form of the renaissance garden. In addition a possible ring ditch from a burial mound has been identified. Several Iron Age brooches tell a tale of Iron Age burials and settlements in the landscape. This gives the site an additional time depth of at least 400-500 years, dating back to the 5th century AD or possibly older. The stone-filled pits, if they are cooking pits, might be of the same age or older.

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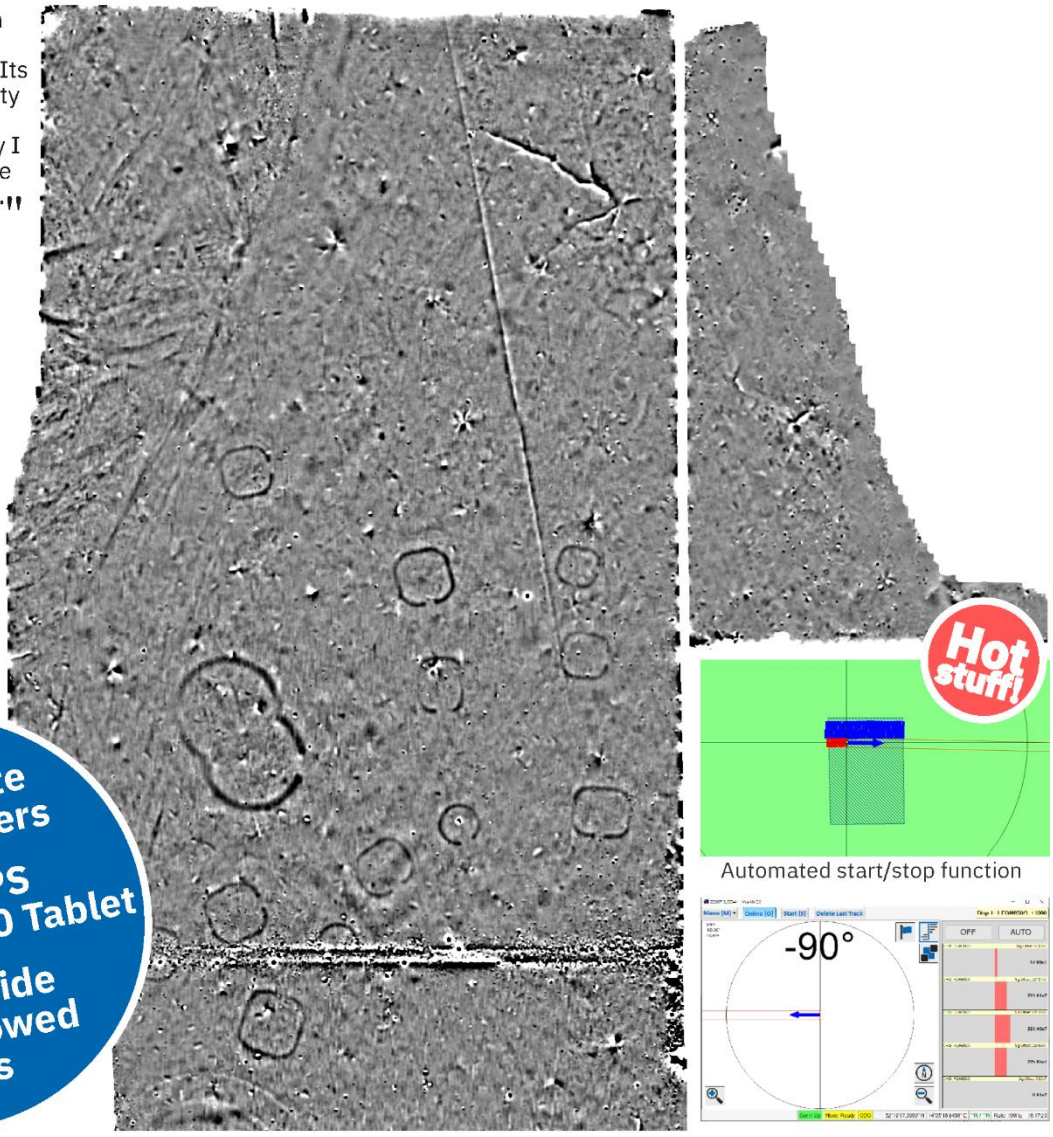

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V2

Naught but Tradition Remains? Multi-Instrument Geophysics and the Recovery of the Landscape of Grand-Pré

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Grand-Pré was one of the most prosperous French Acadian settlements in Northeast North America before it was occupied and destroyed by New England soldiers in 1755. By year end, its hundreds of residents had been loaded onto deportation ships and sent into exile to the American colonies (Faragher 2005). The global reach of their subsequent wanderings became legendary: France, England, the Caribbean, even the Falkland Islands (Hodson 2012). Many Acadian refugees found their way to Louisiana, where they became known as Cajuns.

Protestant immigrants transformed the Acadians' devastated northern homeland into a New England township in the 1760s. It was the Nova Scotia government's policy in these turbulent years not just to remove the Catholic French inhabitants, whose loyalties they regarded as suspect, but to replace them with immigrants from Connecticut, Massachusetts, and neighbouring provinces. Eventually, Acadian descendants reclaimed Grand-Pré as a place of solemn memorialization and pilgrimage (LeBlanc 2003; Gagné 2013). Grand-Pré National Historic Site of Canada and The Landscape of Grand Pré World Heritage Site today commemorate Acadian survival and celebrate the ingenuity of colonial-era farmers whose dykes and drains claimed the Great Meadow (Figure 1) from the world's highest tides (Bleakney 2004).

Figure 1: The Great Meadow (Grand-Pré) as viewed from the north. Photo: Ian McKay.

The American poet Henry Wadsworth Longfellow used the 1755 Deportation of the Acadians as inspiration for his epic poem "Evangeline: A Tale of Acadie" (Longfellow 1847). His vivid reimagining of the Acadian story energized modern Acadian nationalism and stimulated heritage development (Griffiths 1982; Fowler & Noël 2017). It also misrepresented the Acadians and their history. "Naught but tradition remains of the beautiful village of Grand-Pré," Longfellow sighed. But archaeology is proving him wrong.

For the past 20 years, our teams have combined a range of aerial and terrestrial remote sensing techniques with targeted archaeological excavations to recover the tangible remains of Acadian Grand-Pré. Like most common folk of their era, the French inhabitants of colonial Nova Scotia were generally not literate. As a result, few contemporary descriptions of their communities survive, and Grand-Pré's isolation from administrative centers further condemned it to be sketched only crudely on period maps. This is a case seemingly tailor-made for landscape-scale archaeological investigation, and we have been fortunate to have had the time here to work in a multi-

year feedback loop in which geophysical prospection is routinely ground-truthed with test excavation.

To begin, aerial remote sensing methods have some utility. Air photos of Grand-Pré date back to 1929 and they preserve important details about the dyked field system, which survived virtually intact from the late 17th century until heavy machinery brought massive change after WWII. Occasionally, a ruined house site may be glimpsed on the upland, but most have been ploughed flat since the 1970s. LiDAR can help in these cases because even ploughed sites often exhibit tell-tale variations in microtopography. LiDAR also allows georeferenced air photos and maps to be collated with topographic features, as in the case of the 1760s cadastral map depicting the 1760s layout of part of Horton Township (Figure 2). Drone-based digital photogrammetry can further model the surface with surprising sharpness, though it lacks LiDAR's ability to see through vegetation.

Figure 2: 1760s cadastral map of Grand-Pré georeferenced and applied to 2019 LiDAR-derived bare earth digital elevation model. Data courtesy of Province of Nova Scotia.

Our principal terrestrial prospection method is electromagnetic induction (EMI, measuring electrical conductivity and magnetic susceptibility) with the EM38 series of instruments by Geonics. These instruments allow us to survey large areas rapidly to identify areas of elevated archaeological potential. The Acadians built their homes, barns, and other outbuildings with timber, which was abundantly available, often using wattle-and-daub to fill wall cavities. Because many of their villages were burned either during the 1755

deportation or in the years after, their magnetic susceptibility footprints are often readily apparent against ambient magnetic susceptibility levels. Their preference for using highly magnetic basalt as building stone for foundations, the linings of cellar walls, or in hearths, only enhances magnetic contrasts. We find that a GPS-enabled prospection survey with line intervals of ca. 2 m (5 samples per second) is usually sufficient to intercept even a small dwelling on multiple adjacent lines, signalling a location warranting further study.

Circling back to such targets with formal survey grids clarifies the picture and often provides a blueprint for test excavation (Figure 3). These higher resolution surveys typically employ 0.5 m interline spacing and 10 readings per second (all EM38 surveys were undertaken in vertical dipole mode).

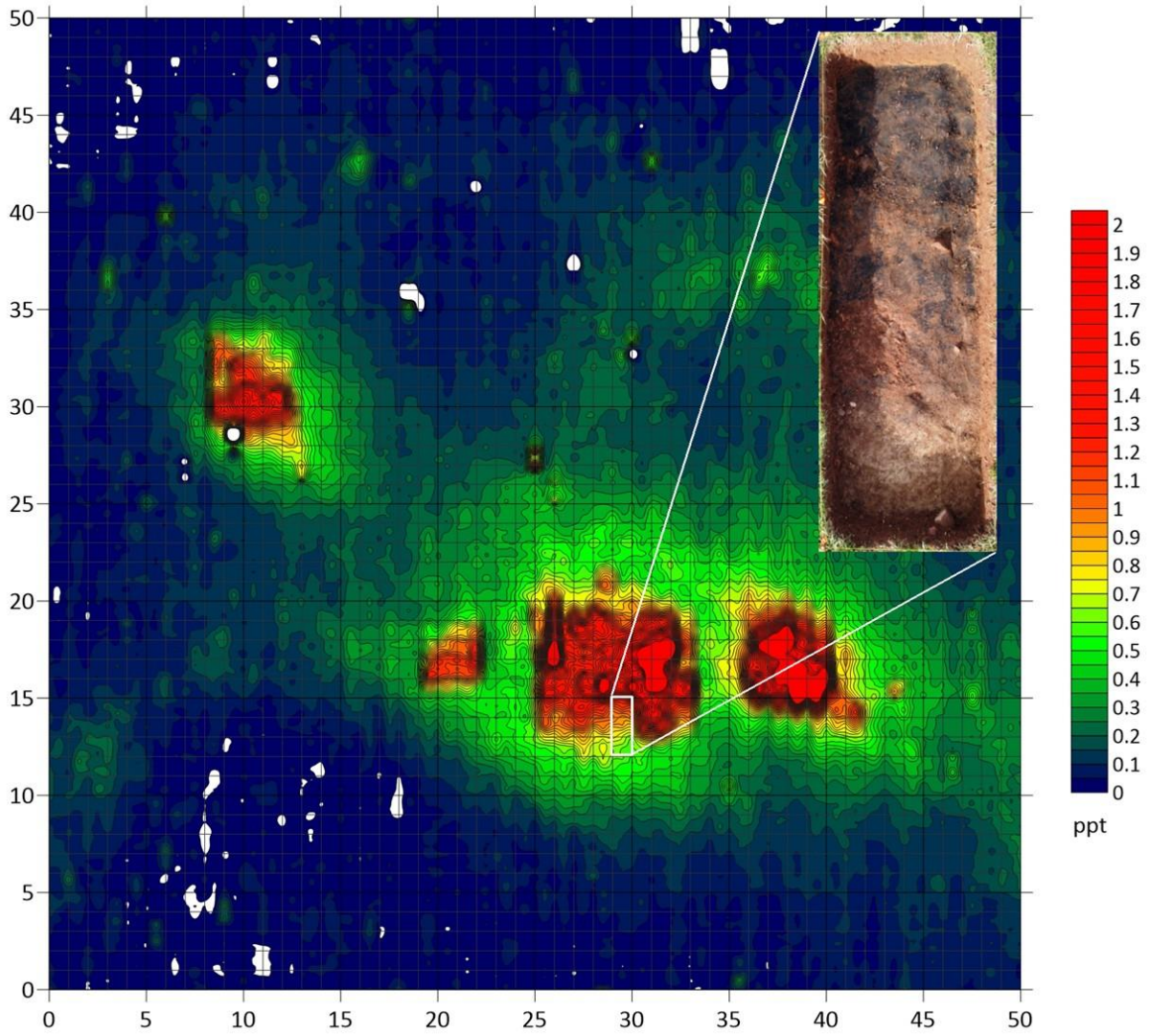

Figure 3: In-phase component of the EM38B data (representing magnetic susceptibility), showing rectangular structures, with excavation results.

Problems associated with instrument drift are easily mitigated by briefly holding the device aloft at the beginning and end of each line, which is also a puzzling ritual for onlookers (Figure 4). GPR surveys with the Noggin 500 by Sensors & Software further complement the picture by often revealing more deeply buried features, such as stone-lined drains, and by cutting through ferrous interference at the surface to define cellars, wells, and associated features with greater clarity than can often be achieved by electromagnetic induction surveys alone. Consequently, our results repeatedly demonstrate the value of multi-instrument surveys informed by historical research and excavation.

Figure 4: Raising the EM38B at the start and end of every survey line creates a 'nose' and 'tail' of zeroed readings on each line that can be used to help compensate for drift.

Much of the work of mapping this storied community is conducted as part of undergraduate coursework at Saint Mary's University. Progress is piecemeal and the study area is dauntingly vast, but our pace is steady.

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After the Earth Resistance Survey at Ramagrama, Nepal (see front cover) – happy faces!
(Image © Armin Schmidt)

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