

Shavards Farm, Meonstoke, Hampshire Report on Geophysical Surveys, October 2014, February and March 2015

Andrew Payne

Discovery, Innovation and Science in the Historic Environment



SHAVARDS FARM, MEONSTOKE, HAMPSHIRE

REPORT ON GEOPHYSICAL SURVEYS, OCTOBER 2014 TO MARCH 2015

Andrew Payne

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SUMMARY

Magnetometer and earth resistance surveys were conducted in fields adjacent to Shavards Farm, Meonstoke, Hampshire, as part of the "Saxons in the Meon Valley" community based archaeological research project to provide training in the use of geophysical techniques. The site includes remains of a partially excavated Roman aisled hall type building, discovered during road widening in the 1930s, with Anglo-Saxon activity also recorded in the vicinity. Combined fluxgate magnetometer survey (1.87ha) revealed evidence for two previously unknown, plough-levelled prehistoric funerary monuments, one with a circular ring-ditch and the second of more elongated form. The earth resistance survey (1.13ha) further defined the villa remains and also partially resolved the circular ring-ditches detected by the magnetometry. A linear ditch associated with an excavated group of Anglo-Saxon graves was located by both techniques to the south of Shavards Farm.

CONTRIBUTORS

The field work was supervised by Andy Payne with the help of Dr Nick Stoodley (University of Winchester) and was conducted and organised by the Saxons in the Meon Valley team of volunteers and coordinators who contributed to the training and follow up surveys: Richard Burdett, Kate Cook, Anne Corden, Ray Davis, Brian and Jenny Eames, Mike Gaines, John Grunstein, Barry and Sandra Henderson, Guy Liardet, Mike Major, David Mugford, Alison Smalley, John Snow, Carl Raven, Peter O'Sullivan, Joan Terry, and John Whittaker.

ACKNOWLEDGEMENTS

The author is grateful to the landowners Jill and Bruce Horn for providing access to the site for the fieldwork training and indoor shelter from inclement weather for data downloading purposes. Paul Baggaley from Wessex Archaeology is thanked for supplying data from the previous geophysical survey at Shavards Farm for inclusion in this report.

ARCHIVE LOCATION

Fort Cumberland, Portsmouth.

DATE OF SURVEY

The fieldwork reported here was conducted in several stages between October 2014 and March 2015 and the report was completed on 15th July 2015. The cover shows a view of the site looking east towards Shavards Farm, against the backdrop of the Iron Age hillfort on Old Winchester Hill.

CONTACT DETAILS

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INTRODUCTION

Magnetometer and earth resistance surveys were conducted at Shavards Farm, near Meonstoke, Hampshire to investigate the wider environs of a partially excavated multi-storied Roman building of aisled hall type (NGR SU 6175210; NRHE Monument 239419), uncovered during widening of the A32 (Fareham to Alton) road in 1937. Further archaeological excavations by King Alfred's College, Winchester in the 1980s revealed Anglo-Saxon activity in the form of post-holes cut through the Roman structure (Frere 1990; Potter 1997). Anglo-Saxon burials were subsequently discovered and partially excavated to the south east (NGR SU 618207) between 1998-9 (Stoodley and Stedman 2001).

The primary purpose of the current survey was to provide training in the use of geophysical techniques to support the volunteer based "Saxons in the Meon Valley project" funded by the Heritage Lottery Fund (HLF), to better define the Anglo-Saxon burial site and investigate the relationship to any prehistoric and Roman activity that may have influenced the later settlement; similar associations are known more widely in the Wessex area (eg Peacock 2007). An initial geophysical survey over the Roman remains to the east of the A32 was conducted by Wessex Archaeology for the Meon Valley Project in November 2013 (Figure 1, Area 1; Urmston 2013), and was extended to the south as part of the volunteer training exercise in October 2014 (Figure 1, Area 2). Subsequent, independent surveys by the project volunteers during February to March 2015 extended the coverage to investigate the area containing the Anglo-Saxon burials to the south of the farm (Figure 1, Area 3) and over the Roman site to the west of the A32 (Figure 1, Area 4). In all cases both magnetometer and earth resistance techniques were employed.

The site of the excavated Roman aisled building (Area 1) lies in a pasture field on a terrace above the floodplain of the river Meon and extends across the A32 to a ridge of slightly higher ground overlooking the river valley to the west (Area 3). The Anglo-Saxon burials are found in an arable field to the south of the farm (Area 4). The local underlying geology consists of Cretaceous Lower Chalk series Zig Zag Chalk formations overlain by well drained, calcareous clayey and fine silty soils of the Blewbury (511d) association and also potentially by superficial river terrace deposits in some areas (Soil Survey of England and Wales 1983; British Geological Survey 1998). The surveys were conducted over the autumn and winter months and therefore weather conditions were generally damp and unsettled for much of the duration of the fieldwork.

METHOD

Magnetometer survey

Magnetometer survey was conducted using a Geoscan FM256 fluxgate gradiometer over a series of 30m grid squares established with a Trimble R8 series Global Navigation Satellite System (GNSS) in Area 2, or with ranging poles and tapes in Areas 3 and 4 (Figure 1). Readings were recorded on the 0.1 nanotesla (nT) resolution setting at 0.25m intervals along successive parallel traverses spaced 1.0m apart. The initial survey over Area 1 was conducted with a Bartington Grad 601-2 dual sensor fluxgate gradiometer and full details of the data acquisition parameters can be found in (Urmston 2013).

The magnetometer data is presented in Figure 2 in relation to the Ordnance Survey (OS) base map after minimal post acquisition processing including the suppression of any effects due to directional sensitivity and instrumental drift, by the setting of each traverse to a zero mean, and truncation of extreme values outside the range of ± 100 nT/m. Traceplots and greyscale images of the minimally processed magnetic data from Areas 1-3 are presented in Figure 4, and Figures 8(A) and 8(B) for Area 4.

Earth resistance survey

Earth resistance data was recorded over a series of 30m grid squares (Figure 1) using a Geoscan RM15 resistance meter and a PA5 electrode frame in the 0.5m twin electrode configuration with readings collected at 1.0m intervals along traverses spaced 1.0m apart, except for Area 4 where a higher resolution 0.5m x 0.5m sample density was used.

The resistance data is presented as linear greyscale images superimposed over the OS mapping in Figure 3 after minimal post acquisition processing including the application of a 2m radius threshold median filter to remove occasional extreme readings caused by poor probe contact (Scollar *et al.* 1990, 492). Additional processing of the data from Areas 1-3 is also shown to better resolve significant anomalies using a 3m radius high-pass filter and a contrast enhancing Wallis filter with 7m window radius and edge-to-background ratio of 0.9. Traceplots and greyscale images of the data from Areas 1-3 are presented in Figures 5-7, and in Figures 8(C) and (D) for Area 4.

RESULTS

Magnetometer survey

A graphical summary of the significant magnetic anomalies, [m1-18], discussed in the following text, superimposed on the base OS map data, is presented in Figure 9.

General response

The magnetic response over the whole survey area is relatively weak, similar to other sites previously surveyed on Lower Chalk geology (Corney et al. 1994; Martin 2008; Field et al. 2009; Linford et al. 2013a, 2013b).

Area 1 – Wessex Archaeology survey area

Two parallel linear anomalies [m1] and [m2] possibly relate to either boundary ditches or elements of a field system. The location of the partially excavated aisled hall has also been detected as an area of intense magnetic disturbance [m3], presumably related to modern ferrous material in the excavation back-fill as well as potentially re-deposited ceramic building material (CBM) from the Roman building itself. An area of raised magnetic response [m4], including several more pronounced anomalies [m5], may represent further occupation activity associated with the Roman villa. A series of weak, intermittent positive and negative responses [m6] extends into Area 2 and could be a linear boundary or trackway along the line of the historic field division (see [m10-12] below), passing through the Roman building complex [m3].

Area 2

Several near-surface ferrous responses [m7-9], most likely of recent origin, occur close to the farm buildings together with a series of broad very weakly defined anomalies [m10-12], on the line of a historic field boundary (OS Historic County Mapping Series: Hampshire 1843-1893 Epoch 1) coincident with a possible footpath or trackway, perhaps marked by a single surviving large walnut tree in the centre of the field.

Two weak ring-ditch type anomalies are likely to represent plough levelled barrows, one of circular form [**m13**] while the other [**m14**] is a more elongated oval shape, with straight parallel sides and rounded ends, with similarities to a Neolithic long barrow.

However, unlike a typical long barrow the ditches of [m14] appear continuous and may therefore represent an example of a rare and distinctive type of Neolithic oval barrow, thought to be a feature of the Meon Valley area, with 5 or 6 possible examples in the locality identified through aerial survey (Young 2011) including one outside the western ramparts of the nearby hillfort on Old Winchester Hill (NHRE Monument 239429). It is unclear whether the close proximity of [m13] and [m14] is deliberate or, indeed, if they are even of contemporary date; and whether the location of the Anglo-Saxon cemetery has been influenced by these earlier burial monuments (cf Storeys Meadow, West Meon; NRHE Monument 1587619). A possible pit-type response [m15] is present near the south-west ditch segment of [m14]. Very tentative weakly defined positive and negative linear anomalies [m16] are probably a response to near-surface geological drift deposits, geomorphology or relatively recent ground disturbance, perhaps even steam ploughing that is thought to have occurred in the area during the Victorian period.

Area 3

Despite the likely presence of Roman building remains, few significant anomalies beyond a number of very tentative weak linear responses of uncertain significance are present here together with some vague areas of magnetic noise [m17], apparently coincident with the structural remains. The poor magnetic results are unexpected, but perhaps alluvial overburden may have masked the magnetic response in this part of the site.

Area 4

A weak partial response [**m18**] to the linear ditch previously recorded by limited excavation (Stoodley and Stedman 2001) is the only anomaly detected in this area.

Earth resistance survey

A graphical summary of the significant earth resistance anomalies, [**r1-22**], discussed in the following text, superimposed on the base OS mapping, is provided in Figure 10.

Area 1 – Wessex Archaeology survey area

Linear low and high resistance anomalies [r1-3] correspond to the possible field boundary and trackway recorded in the magnetometer survey at [m2] and [m6], although the variable response of [r1-3] possibly reflects the differing

drainage properties of the underlying soil-types, indicated by the wide range of background resistance across Areas 1 and 2. A distinct rectilinear pattern of high resistance anomalies at [r4] is likely to indicate the remains of the Roman aisled hall located within the region of magnetic disturbance [m3] and is, perhaps, also associated with a very high resistance area [r5] to the south-west possibly related either to the previous excavation works or further collapsed building remains. The location of the structural remains [r4] and [r5] correlates well with the evidence for buildings [r9-11] revealed immediately to the north in Area 3 on the other side of the A32 road corridor.

Area 2

The mapped area of river terrace deposits (British Geological Survey 1998) appears as an irregular high resistance anomaly [r6], together with a tentative high resistance response [r7], possibly associated with coarse grained material eroding from the barrow mounds into segments of the ring-ditches [m13] and [m14]. An area of higher resistance surrounding the large walnut tree at [r8] is difficult to fully interpret and may be related to tree-roots and a surrounding patch of rougher vegetation.

Area 3

Rectilinear high resistance anomalies [r9-11] are most likely related to the known Roman villa complex and also include a sub-circular building [r12], approximately 10m in diameter, perhaps representing a small shrine. A more uniform area of very high resistance values [r13] may also represent deposits of collapsed building material and the wider extent of the site is, perhaps, indicated by further partially resolved structural remains found to the southwest at [r14] and [r15]. A possible enclosure surrounding the villa complex may be evident in the curving low resistance ditch-type response [r16] and, perhaps a continuation at [r17] that is bounded by a narrower high resistance linear anomaly [r18]. Whilst this may indicate a former enclosure boundary of the villa complex, a previous course of the Meon river channel is also possible and wider area survey would be required to fully resolve this interpretation.

Area 4

A broad low resistance anomaly is found at [**r19**] and most likely represents a trackway or ditch, together with bands of high resistance response [**r20**] and [**r21**] that may relate to remnant ridge and furrow or the superficial drift geology. A more complete interpretation of these anomalies is restrained by the limited survey area. Despite the detailed 0.5m by 0.5m reading interval used here, no convincing evidence for Anglo-Saxon burials has been revealed and

discrete low resistance anomalies such as [**r22**] are more indicative of either small quarries or some other type of pit.

CONCLUSIONS

The geophysical surveys at Shavards Farm have enhanced the understanding of the area encompassing the partially excavated Roman building and Anglo-Saxon cemetery, revealing two previously unknown plough-levelled prehistoric barrows as well as additional probable Roman structural remains associated with the villa complex. Earth resistance survey proved particularly effective for the location of the buried Roman building remains where the magnetic response was unclear, although the gradiometer survey did resolve the ring-ditches of the barrow monuments far more clearly, demonstrating the complementary nature of these two techniques. One of the barrows revealed by the magnetometer survey is of particular significance due to its unusual, regionally distinctive oval form which is suggestive of other rare Neolithic monuments with an apparent concentration in the Meon valley area. The Anglo-Saxon burials at Shavards Farm may, therefore, be associated with the earlier burial monuments revealed by the geophysics.

LIST OF ENCLOSED FIGURES

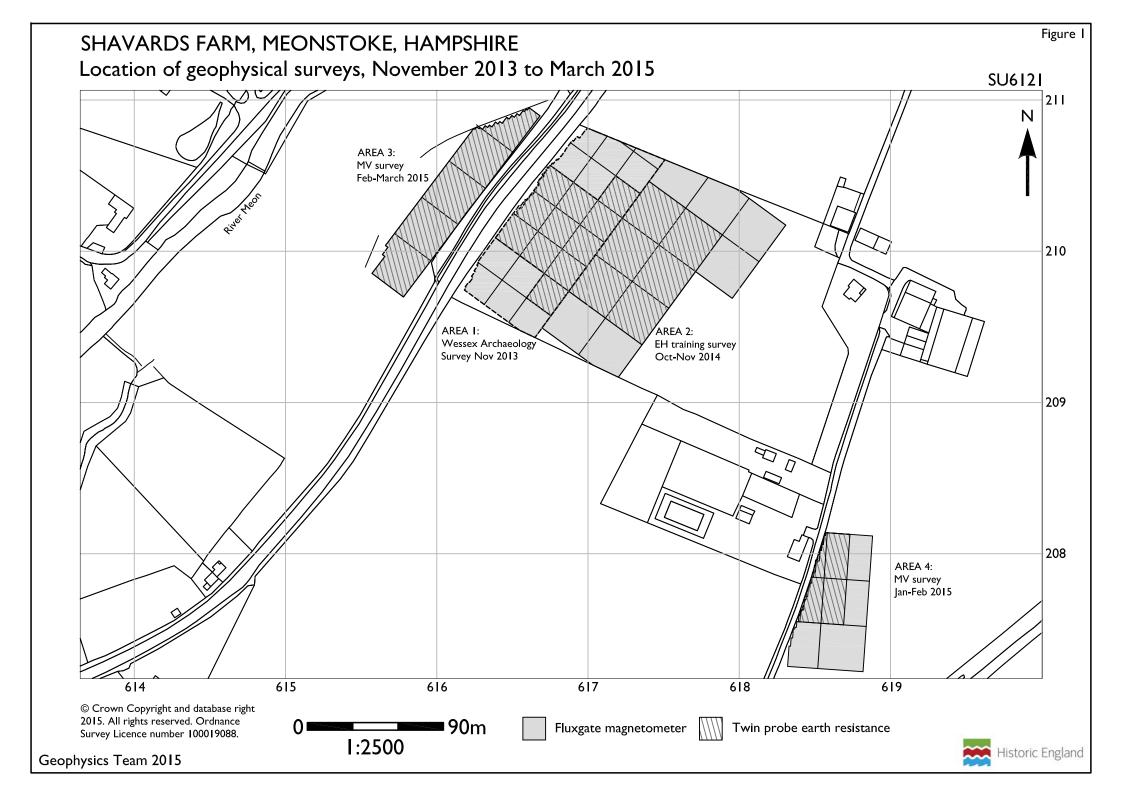
- Figure 1 Location of the geophysical survey Areas 1-4 superimposed over the base OS mapping data (1:2500).
- Figure 2 Linear greyscale images of the minimally processed fluxgate gradiometer data superimposed over base OS mapping (1:2500).
- Figure 3 Linear greyscale images of the minimally processed earth resistance data superimposed over base OS mapping (1:2500).
- Figure 4 (A) Traceplot and (B) linear greyscale image of the magnetic data from Area 1 with the same representations shown in (C) and (D) for Area 2, and (E) and (F) for Area 3. All data is shown following initial drift correction and reduction of extreme values (1:1000).
- Figure 5 (A) Traceplot and (B) linear greyscale image of the earth resistance data from Area 1 following application of a 2m radius threshold median filter to remove occasional extreme readings caused by poor probe contact (1:1000). Additional linear greyscale images of the data are shown after (C) Wallis (contrast enhancement) filtering and (D) high-pass filtering (4m radius) to selectively enhance significant archaeological anomalies.
- Figure 6 (A) Traceplot and (B) linear greyscale image of the earth resistance data from Area 2 following application of a 2m radius threshold median filter to remove occasional extreme readings caused by poor probe contact (1:1000). Additional linear greyscale images of the data are shown after (C) Wallis (contrast enhancement) filtering and (D) high-pass filtering (4m radius) to selectively enhance significant archaeological anomalies.
- Figure 7 (A) Traceplot and (B) linear greyscale image of the earth resistance data from Area 3 following application of a 2m radius threshold median filter to remove occasional extreme readings caused by poor probe contact (1:1000). Additional linear greyscale images of the data are shown after (C) Wallis (contrast enhancement) filtering and (D) high-pass filtering (4m radius) to selectively enhance significant archaeological anomalies.
- Figure 8 (A) Traceplot and (B) linear greyscale image of the minimally processed fluxgate gradiometer data from Area 4 together with a traceplot (C) and greyscale image (D) of the earth resistance data, collected at a reading interval of 0.5m by 0.5m (1:1000).

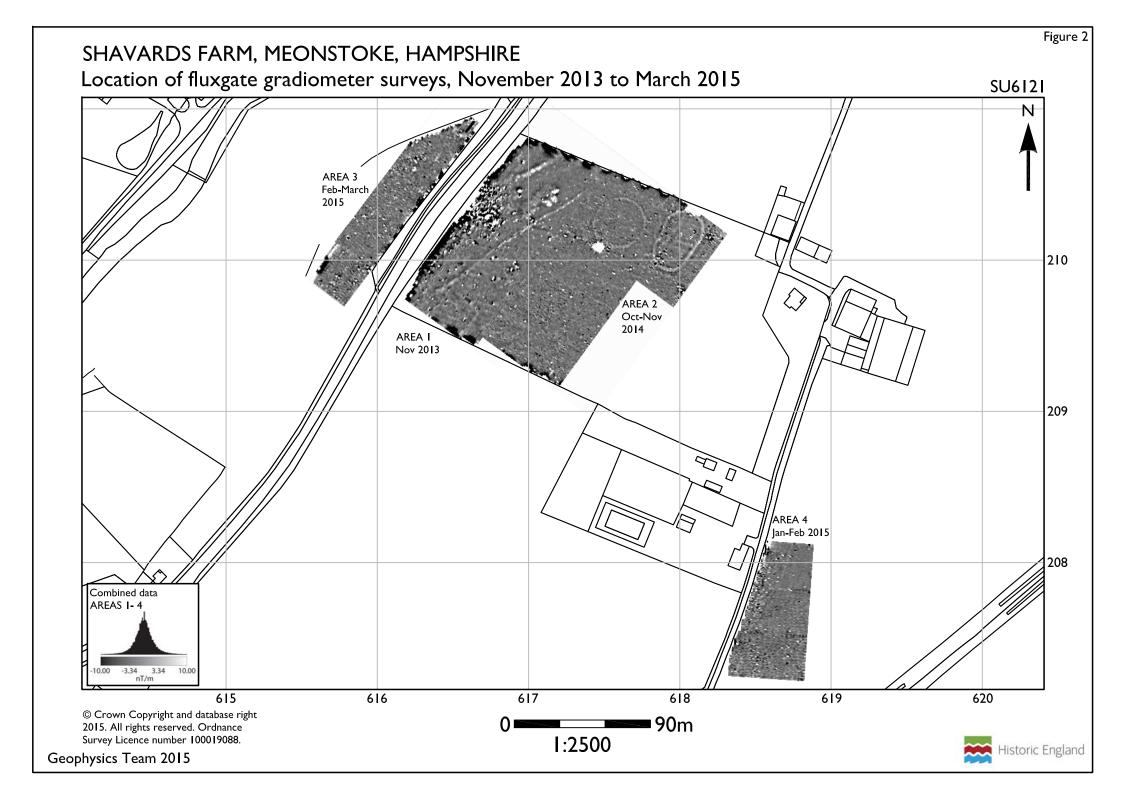
- Figure 9 Graphical summary of significant anomalies detected by the magnetic surveys superimposed over the base OS mapping (1:2500).
- Figure 10 Graphical summary of significant earth resistance anomalies superimposed over the base OS mapping (1:2500).

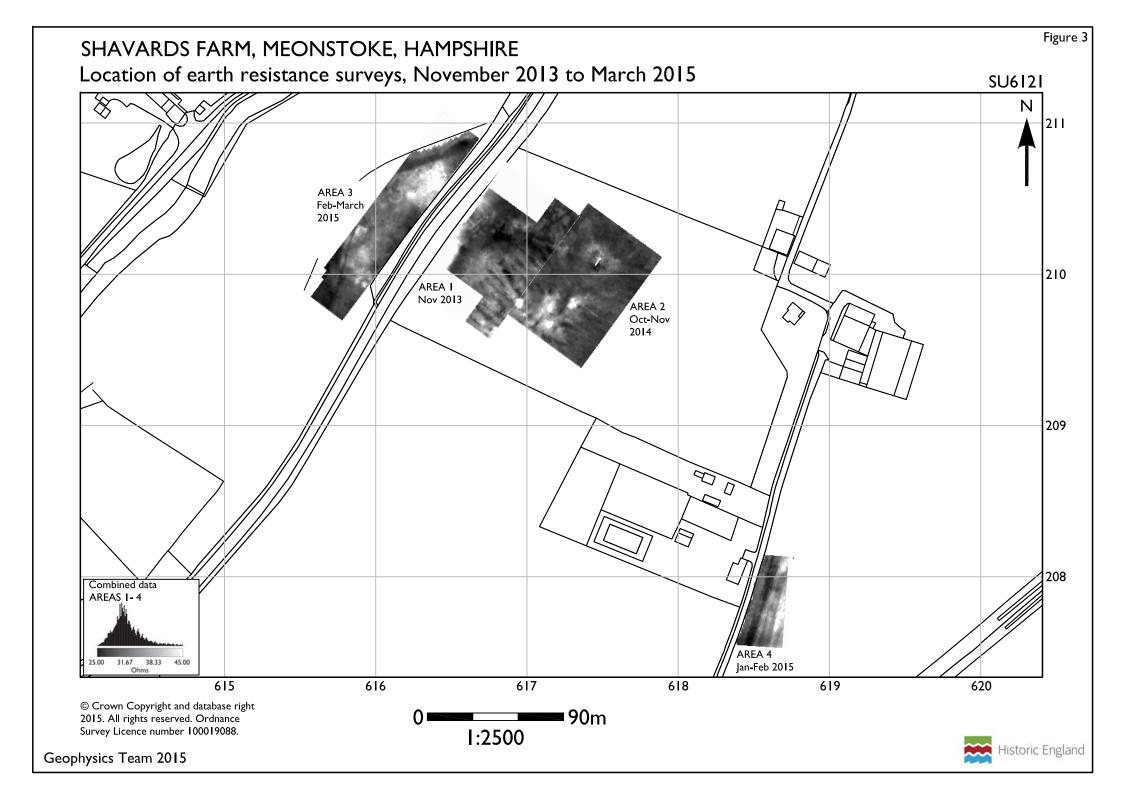
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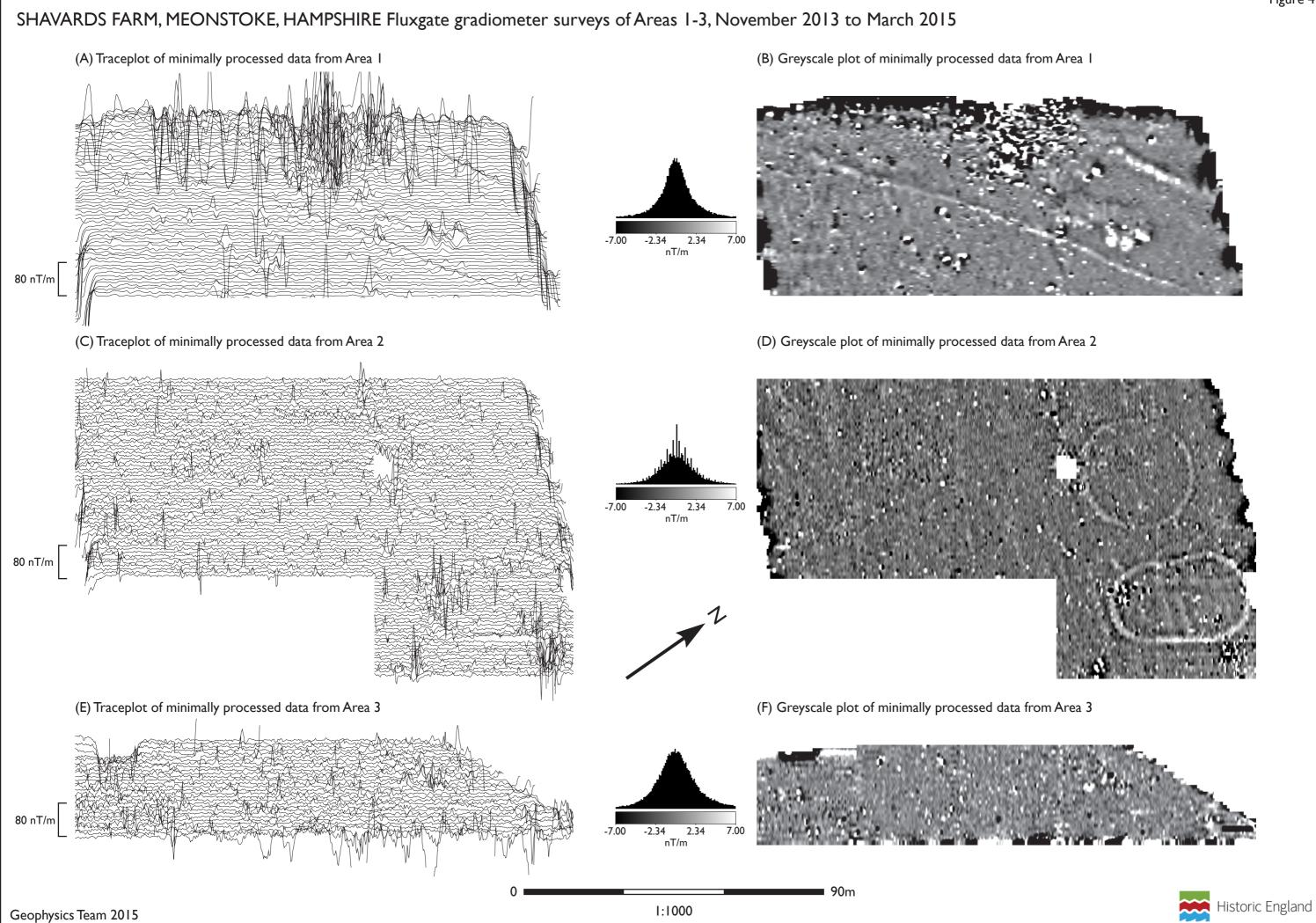
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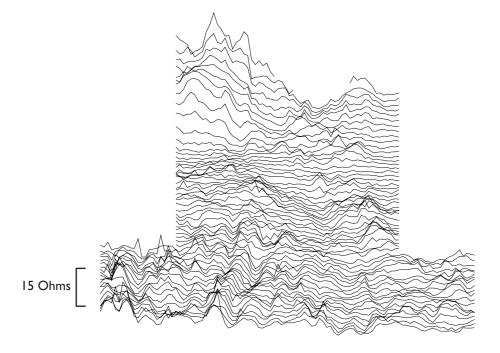




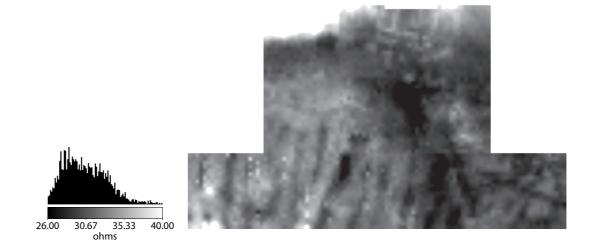


SHAVARDS FARM, MEONSTOKE, HAMPSHIRE Earth resistance data from Area 1, November 2013

(A) Traceplot of minimally processed data



(B) Linear greyscale plot of minimally processed data

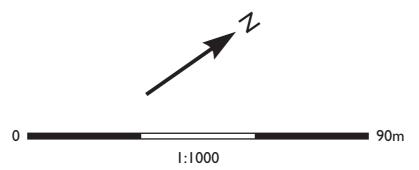


(C) Linear greyscale plot of data after Wallis filtering



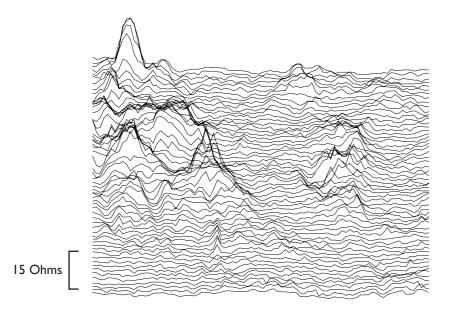
(D) Linear greyscale plot of high-pass filtered data



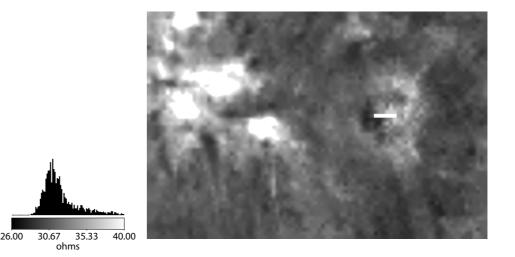


SHAVARDS FARM, MEONSTOKE, HAMPSHIRE Earth resistance data from Area 2, October to November 2014

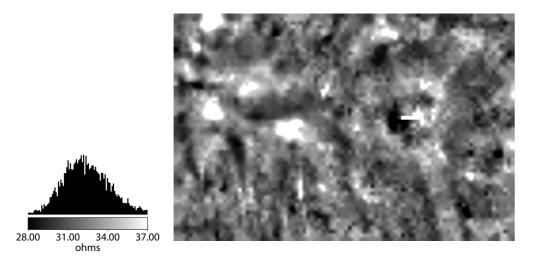
(A) Traceplot of minimally processed data



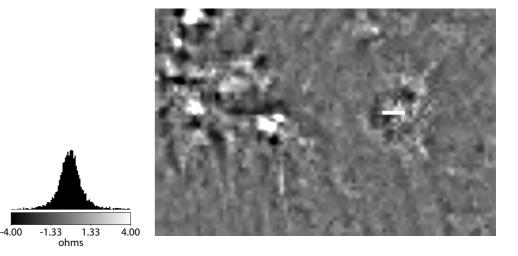
(B) Linear greyscale plot of minimally processed data



(C) Linear greyscale plot of data after Wallis filtering



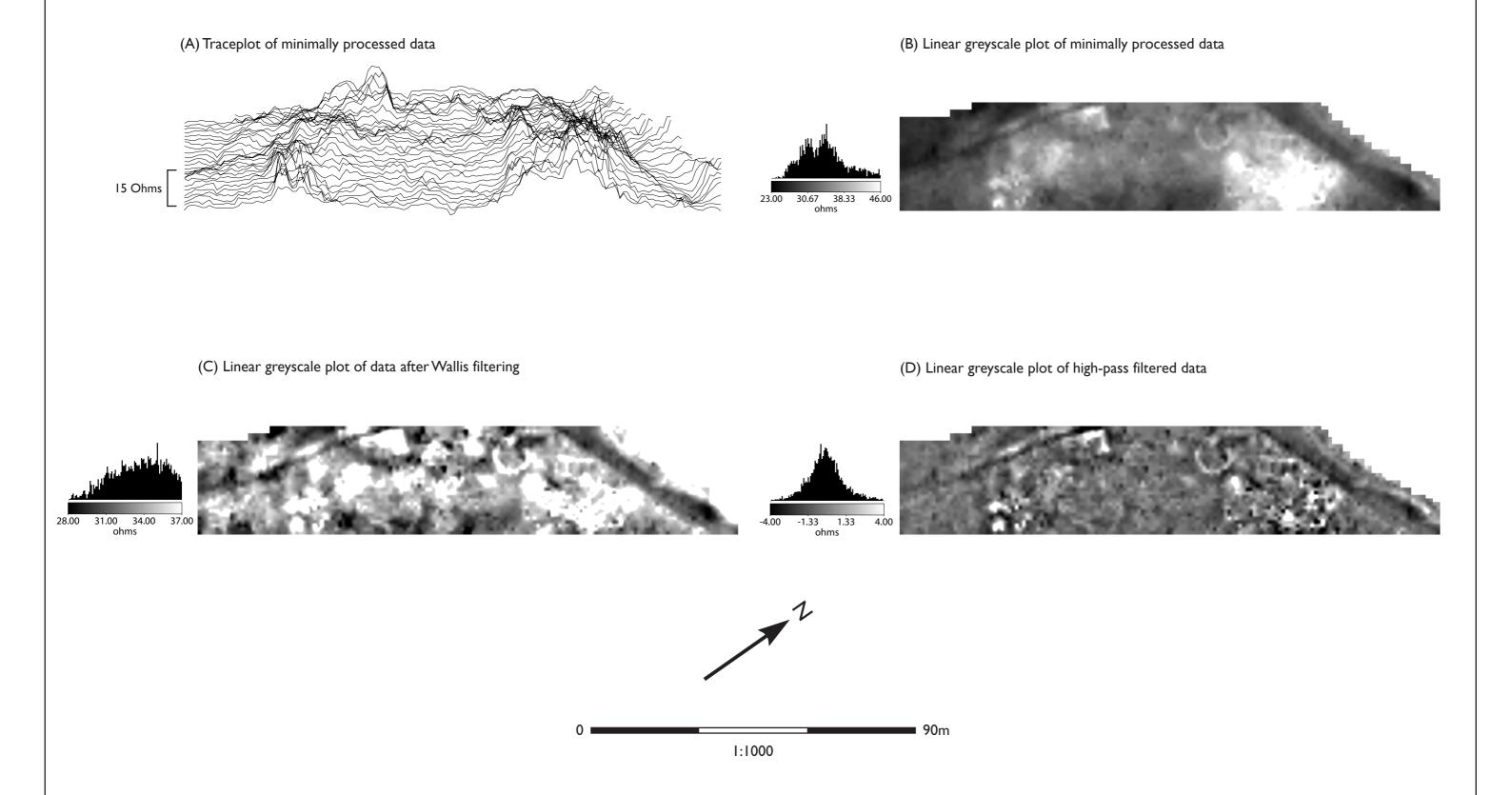
(D) Linear greyscale plot of high-pass filtered data



0 1:1000 90m

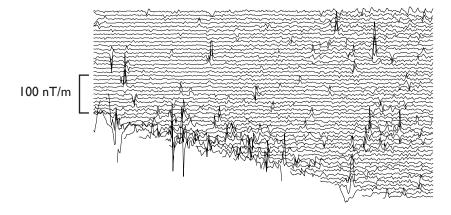


SHAVARDS FARM, MEONSTOKE, HAMPSHIRE Earth resistance data from Area 3, March 2015

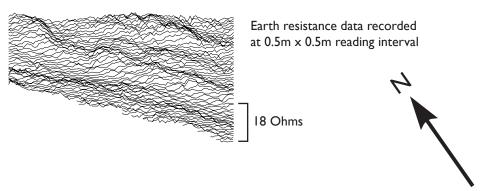


Fluxgate gradiometer and earth resistance data from Area 4, January to February 2015

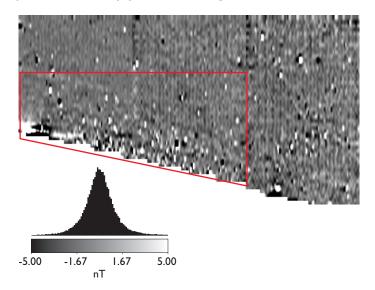
(A) Traceplot of minimally processed magnetometer data



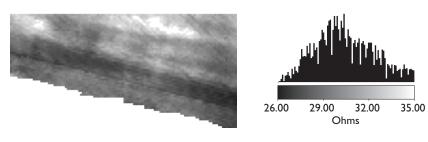
(C) Traceplot of minimally processed resistance data



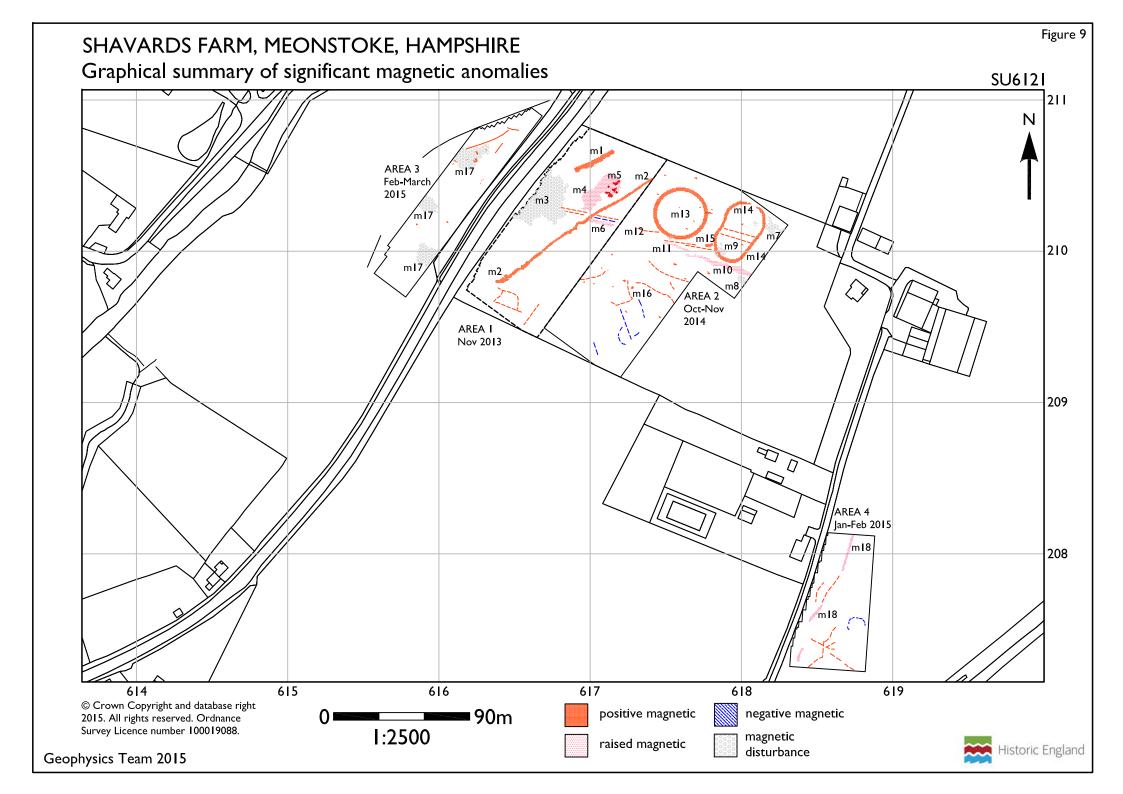
(B) Greyscale plot of minimally processed magnetometer data

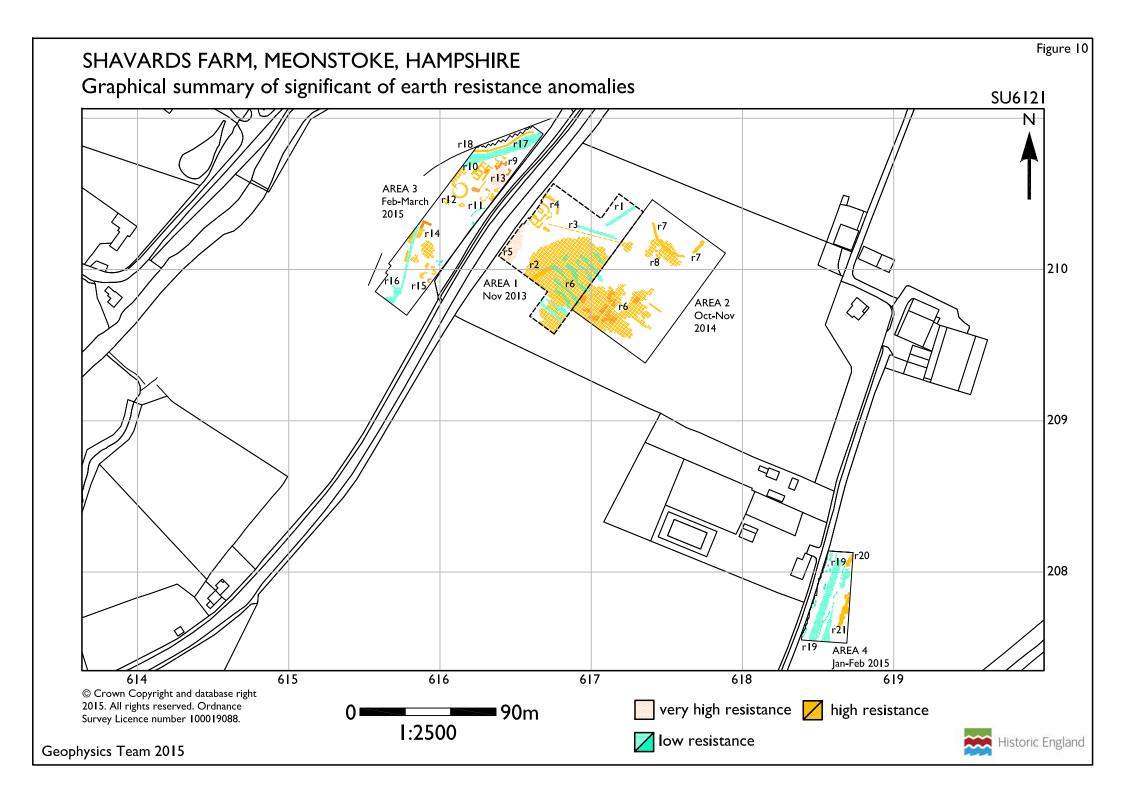


(D) Linear greyscale plot of minimally processed resistance data



resistance survey in relation to magnetometer coverage

















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